Workshop Manual

CR 50 / 2011
SM 50 / 2011

Ed. 01-09-2010

Husqvarna

1st edition (10-2009)

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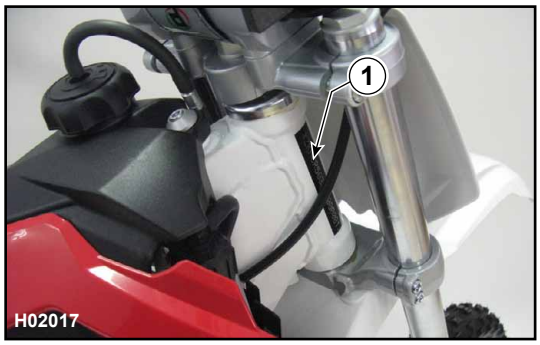
MODELS COVERED (from serial number onwards)



1. Chassis serial number

CR 50: ZKHCR5030BV000001
SM 50: ZKHSM5030BV000001

Foreword
This publication is designed for use by **HUSQVARNA** Service Centres to assist authorised personnel in the maintenance and repair of the models covered in this manual. The technical information provided in this manual is a critical complement to operator training and operators should become thoroughly familiar with it.
For ease of understanding, diagrams and photographs are provided next to the text.
Notes with special significance are identified as follows throughout the manual:

 Accident-prevention rules for operator and persons working nearby.

 Damage to vehicle and/or its components may result from incompliance with relevant instructions.

 Additional information concerning the operation covered in the text.

Useful tips
To prevent problems and ensure effective service work, observe the following **HUSQVARNA** recommendations:
– before repair, evaluate the customer's description of the problem and ask the appropriate questions to clearly identify problem symptoms;
– diagnose the problem and identify the causes clearly. This manual provides basic background information that must be supplemented with the operator's expertise and specific training available through **HUSQVARNA** held at regular periods;
– plan ahead before starting work: gather any spare parts and tools to avoid unnecessary delays;
– avoid unnecessary disassembly work to get to the part that needs repairing.
Always read the relevant instructions and follow the disassembly sequence outlined in this manual.

Recommended shop practices
1 Always replace gaskets, sealing rings and split pins with new ones.
2 When loosening or tightening nuts or bolts, always begin with the bigger ones or from the centre. Tighten to the specified torque and follow a cross pattern.
3 Always mark any parts or positions that might be confused upon assembly.
4 Use genuine **HUSQVARNA** parts and the recommended lubricant brands.
5 Use special tools where specified.
6 Technical Bulletins might contain more up-to-date setting data and procedures than this manual. Be sure to read them.

IMPORTANT: Where not specified, reassembled components must be tightened to the proper torque as indicated in the tables provided in Chapter "X".

Table of Contents

NOTES

Unless otherwise specified, data and specifications apply to all models.

Section b

1) **CR** models are RACING motorcycles, and are warranted to be free from operating defects; a scheduled maintenance chart for racing use is provided in Section B.

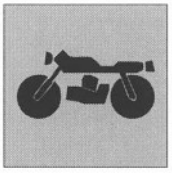
* In order to maintain the vehicle's "Guarantee of Functionality", the client must follow the maintenance programme indicated in Section B by having the required maintenance inspections carried out at authorised HUSQVARNA dealers. The cost for changing parts and for the labour necessary in order to comply with the maintenance plan is charged to the Client. The warranty becomes NULL AND VOID if the motorcycle is rented.

Notes
Left and right side is determined when seated on motorcycle.

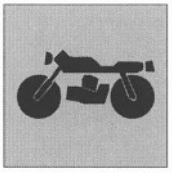
Z: number of teeth

A: Austria
AUS: Australia
B: Belgium
BR: Brazil
CDN: Canada
CH: Switzerland
D: Germany
E: Spain
F: France
FIN: Finland
GB: Great Britain
I: Italy
J: Japan
USA: United States of America

Unless otherwise specified, data and instructions apply to all market variants.



Section A



Engine
Single cylinder, 2 stroke
Bore.....39.5 mm
Stroke.....40 mm
Displacement.....49 cm^3.
Compression ratio 7.12:1

Fuel system
Carburettor type .....Dell'Orto.....PHBG 19
High speed jet.....85
Low speed jet 65

Lubrication
Engine ..... 3% fuel-oil mixture during running-in and 2% after running-in.
Crankcase

Cooling
Liquid, with twin radiator

Ignition system
Spark plug type.....NGK BR8 ECM
Spark plug electrode gap.....0.7 mm

Kick start

Drive and transmission
Drive pinion gear ..... Z 10
Sprocket ..... Z 43
Transmission ratio 4.3

Chassis
Single frame, in steel tubes with rectangular and circular section; rear chassis in steel squared sectioned tubes.

Suspension
Front
Type.....hydraulic fork with advanced stanchion; tubes ø 32 mm
Travel.....185 mm

Rear
Type..... progressive with hydraulic single shock absorber
(spring preload adjustment)
Wheel travel.....200 mm

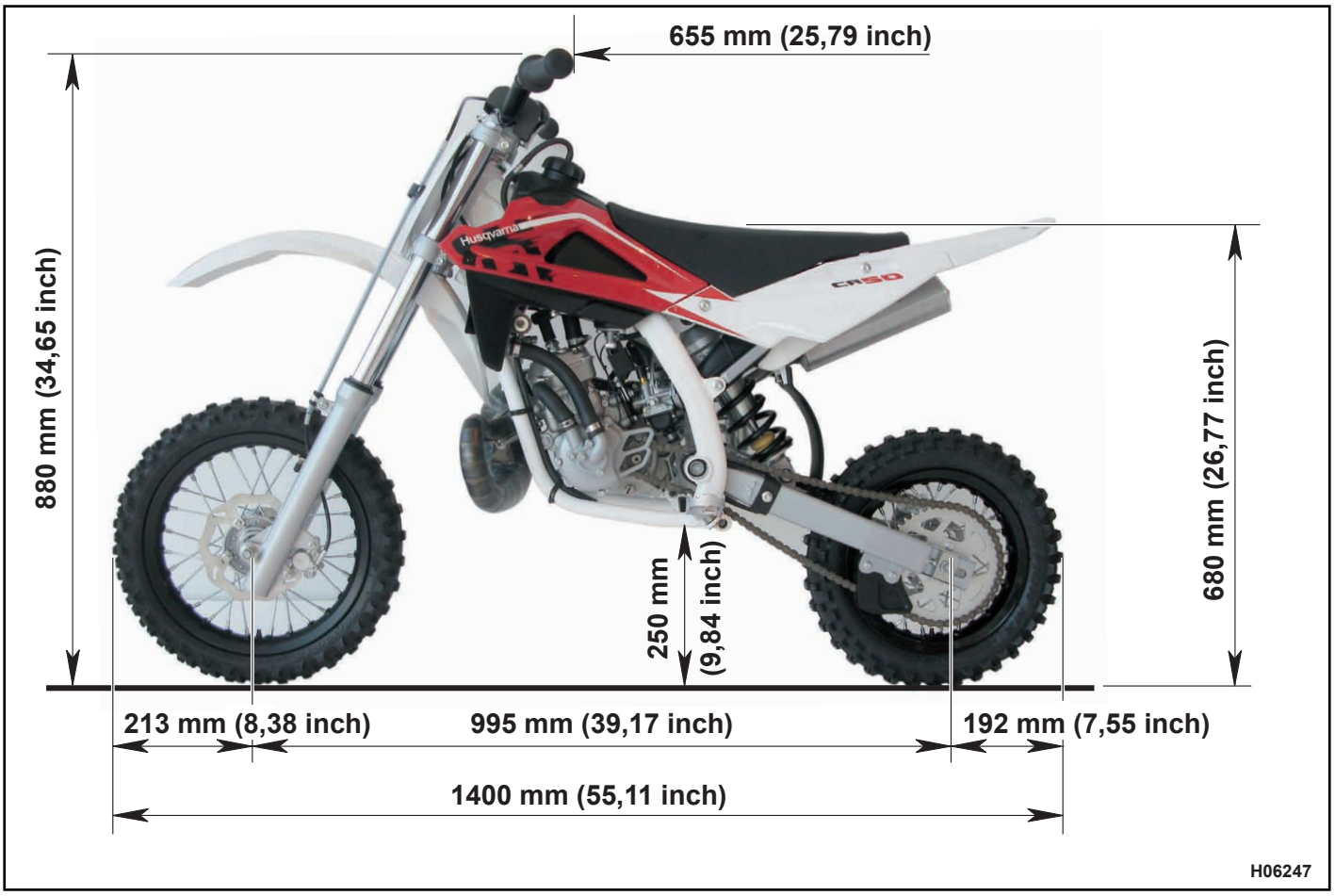
Brakes
Front
Type.....fixed disc Ø 260 mm
with hydraulic control.

Rear
Type.....fixed disc Ø 260 mm
with hydraulic control.

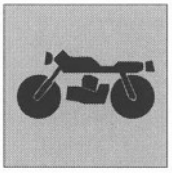
Wheels
Rims
CR
Front .....in light alloy: 1.5x12”
Rear.....in light alloy: 1.6x10”
SM
Front .....in light alloy: 1.5x10"
Rear.....in light alloy: 1.5x10"

Tyres
CR
Front ..... PIRELLI SCORPION 60/100 12” 36M
Rear..... PIRELLI SCORPION 2.75 -10 37J NHS
SM .....SAVATECH 3.50-10 51P TL MC31 S-RACER

Cold tyre pressure
Front ..... 1.2 Kg/cm^2
Rear..... 1.5 Kg/cm^2



Electrical components location
The ignition system includes the following elements:
- Generator on the inner side of L.H. crankcase half cover;
- Electronic transducer under the fuel tank;
- Spark plug on cylinder head;



Overall dimensions - Weight
Kerb weight, without fuel ..... 43.4 kg (95.6 lb)
*: max. width

Capacities	**Type**	**Quantity**
Fuel tank	3% fuel-oil mixture during running-in, then 2%	2.7 litres
Oil inside crankcase	SAE 20/30	150 cc (oil change)
Front fork oil	CASTROL SYNTHETIC FORK OIL - 5W	
Coolant	CASTROL MOTORCYCLE COOLANT	0.55 litres
Front brake fluid	CASTROL RESPONSE SUPER (DOT 4)	
Rear brake fluid	CASTROL RESPONSE SUPER (DOT 4)	
Drive chain lubrication	CASTROL CHAIN LUBE RACING	
Grease lubrication	CASTROL LM GREASE 2	
Electric contact protection	CASTROL METAL PARTS CLEANER	
Fillers for radiator	AREXONS LIQUID FILLER	
Air filter oil	AGIP FORMULA FILTER "Foam air filter protection oil"	
Air filter detergent	AGIP "Filter clean foam air detergent fluid"	

IMPORTANT - Do not add any additives to fuel or lubricants.

Section B

ENGINE	After the first 5 hours	Every 20 hours	Every 40 hours	Once a year	Before the competition
Transmission fluid level check	●	●			
Transmission fluid change	●	●			
Engagement speed check	●	●			●
Spark plug check and/or change, electrode gap adjustment		●			
Check of carburettor fixing onto intake manifold		●			
Check for the presence of cracks on intake manifold		●			
Idle speed adjustment (hot engine)		●			
Washers of washer valve check		●			
Clutch shoes wear		●			
Clutch drum wear check		●			
Water pump shaft and relevant bearing wear check		●			
Water pump impeller wear check		●			
Cylinder and piston wear check		●			
Axle shafts offset check		●			
Connecting rod big end bearing radial clearance check		●			
Connecting rod big end bearing radial clearance		●			
Connecting rod small end bearing radial clearance		●			
Main bearing check		●			
Crankshaft bearings and connecting rod big end bearing replacement			●		
Carburettor float chamber emptying and cleaning		●		●	

CHASSIS	After the first 5 hours	Every 20 hours	Once a year	Before the competition
Fork complete maintenance			●	
Swinging arm mount cleaning and greasing			●	
Steering bearing and seal cleaning and greasing			●	
Brake fluid change			●	
Brake fluid level, pad thickness, brake disc check		●		●
Brake hose condition check		●		●
Front lever and brake pedal operation check and adjustment	●	●		●
Braking system screw tightening check	●	●		●
Exhaust system check		●		
Control cable lubrication and smoothness check	●	●		●
Air filter and air box cleaning	●	●		●
Shock absorber and fork operation check		●		●
Swinging arm mount check		●		●
Steering bearing check and/or adjustment		●		●
Screw tightening check		●		●
Spoke tension and rim concentricity check	●	●		●
Tyre pressure and conditions check		●		●
Chain, master link, front and rear sprocket wear check	●	●		●
Lubricating the chain	●	●		●
Wheel bearing clearance check	●	●		●

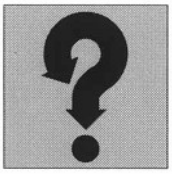
CHECKS	Before every use	After every cleaning	After offroad use
Transmission fluid level check	●		
Coolant level check	●		
Brake fluid level check	●		
Brake seal wear check	●		
Brake operation check	●	●	
Control cable lubrication and adjustment		●	
Fork dust seal removal and cleaning			●
Chain cleaning, tensioning check and lubrication		●	●
Air filter and air box cleaning			●
Tyre pressure and wear check	●		
Fuel pipe condition check	●		

Section C

TROUBLESHOOTING

ENGINE

Trouble	Cause	Remedy
Engine does not start or has starting trouble	**Insufficient compression**	
	1. Piston seized	Replace
	2. Connecting rod small or big end seized	Replace
	3. Worn piston rings	Replace
	4. Worn cylinder	Replace
	5. Cylinder head loosely tightened	Tighten
	6. Head gasket leaking	Replace
	7. Spark plug loose	Tighten
	Weak or no spark	
	1. Spark plug faulty	Replace
	2. Fouled or wet spark plug	Clean or dry
	3. Spark plug electrode gap too wide	Adjust
	4. Ignition coil faulty	Replace
	5. High-tension cables open circuit or shorted	Check
	Fuel does not reach the carburettor	
	1. Tank cap breather clogged	Clean
	2. Fuel cock clogged	Clean
	3. Fuel feed pipe clogged	Clean
	4. Filter on carburettor fitting dirty	Clean
	5. Floater valve or floaters faulty	Replace
	6. Linkage is blocking floater valve	Release
	Carburettor flooding	
	1. High fuel level in bowl	Adjust
	2. Floater valve or floaters worn or stuck open	Replace or release
Engine stalls easily	1. Fouled spark plug	Clean
	2. Carburettor jets clogged	Clean
	3. Low idle	Adjust
Engine is noisy	**Noise seems to come from piston**	
	1. Too much piston-to-cylinder clearance	Replace
	2. Worn piston rings or piston grooves	Replace
	3. Too much carbon build-up in combustion chamber or on piston crown	Clean
	Noise seems to come from crankshaft	
	1. Worn main bearings	Replace
	2. Connecting rod big end has too much side clearance or end float	Replace
	3. Crankshaft gear damaged	Replace
	4. Crankshaft locknut loose	Tighten



TROUBLESHOOTING

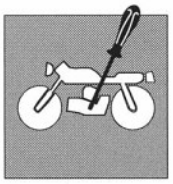
Trouble	Cause	Remedy
Noise seems to come from the secondary transmission chain	1. Chain stretched (worn) or improperly adjusted 2. Worn transmission sprockets	Replace or adjust Replace
Clutch slips	1. Weak clutch Belleville washers 2. Worn clutch counterweights	Replace Replace
Clutch is hard to operate	1. Uneven Belleville washer load	Replace
Engine has low power	1. Dirty air filter 2. Carburettor main jet clogged or wrong size 3. Poor fuel quality 4. Intake coupling loose 5. Spark plug electrode gap too wide 6. Insufficient compression	Clean Clean or replace Replace Tighten Adjust Identify cause
Engine overheats	1. Combustion chamber and/or piston crown fouled with carbon deposits 2. Insufficient oil inside crankcase or wrong oil use 3. Obstructions blocking air flow on radiator 4. Cylinder head gasket leaking 5. Clutch slips	Clean Top up or change Clean Replace Adjust

CHASSIS

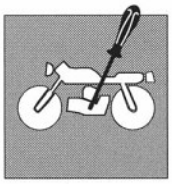
Trouble	Cause	Remedy
Handlebar turns hard	1. Insufficient tyre pressure	Inflate
	2. Bearing adjuster ring nut or steering stem nut overtightened	Adjust
	3. Bent steering stem	Replace bottom yoke
	4. Worn or seized steering bearings	Replace
Handlebar vibration	1. Bent fork legs	Replace
	2. Bent front wheel axle	Replace
	3. Warped chassis	Replace
	4. Bent front wheel rim	Replace
	5. Worn front wheel bearings	Replace
Damping is too hard	1. Too much oil in fork legs	Remove excess oil
	2. Fork oil viscosity too high	Change
	3. Overinflated tyres	Deflate
	4. Improperly set rear shock absorber	Adjust
Damping is too soft	1. Insufficient oil in fork legs	Top up
	2. Fork oil viscosity too low	Change
	3. Weak fork springs	Replace
	4. Weak rear shock absorber spring	Replace
	5. Improperly set rear shock absorber	Adjust
Wheel (front and rear) vibrates	1. Bent wheel rim	Replace
	2. Worn wheel hub bearings	Replace
	3. Incorrect spoke tension	Adjust
	4. Wheel axle nut loose	Tighten
	5. Worn rear swinging arm bearings	Replace
	6. Improperly adjusted chain tensioners	Adjust
	7. Improperly balanced wheel	Balance
Rear suspension is noisy	1. Worn shock absorber ball joints	Replace
	2. Shock absorber faulty	Replace
Poor braking (front and rear)	1. Air in brake system	Bleed
	2. Insufficient fluid in tank	Top up
	3. Worn brake pad and/or disc	Replace
	4. Damaged disc	Replace
	5. Improperly adjusted brake pedal	Adjust
	6. Water in brake system	Change fluid

ELECTRICAL SYSTEM (see also Section M)

Trouble	Cause	Remedy
Spark plug fouls easily	1. Mixture too rich 2. Dirty air filter 3. Worn piston rings 4. Worn piston or cylinder liner	Adjust carburettor setting Clean Replace Replace
Spark plug electrodes overheat	1. Mixture too lean 2. Spark plug electrode gap too close 3. Heat rating too high	Adjust carburettor setting Adjust Replace with recommended spark plug



Section D



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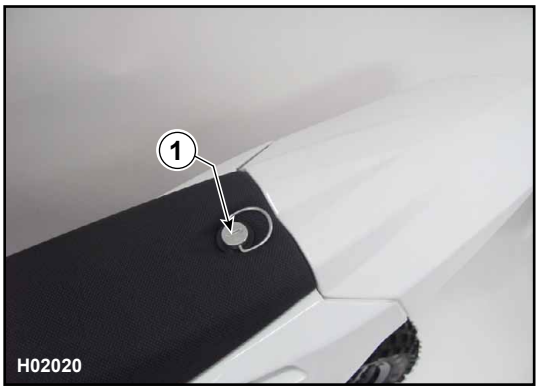
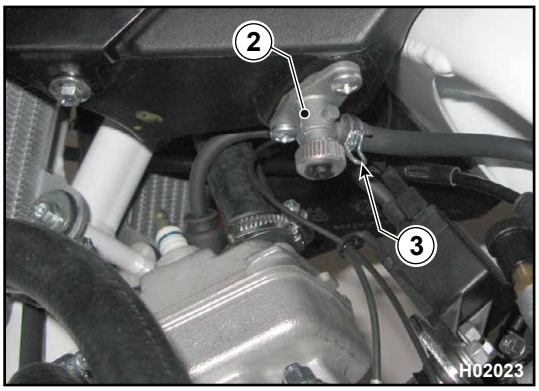
SM 50



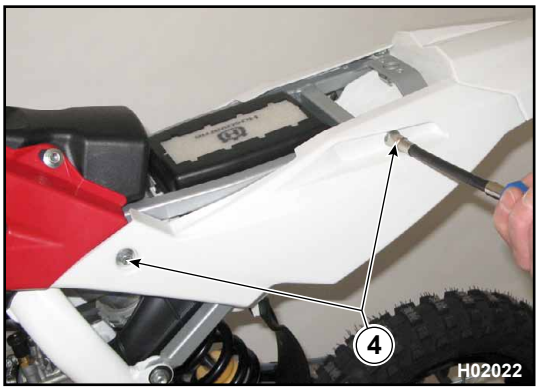
Saddle removal

Turn the rear fixing (1) counterclockwise.
Remove saddle (2) from front retaining screw.



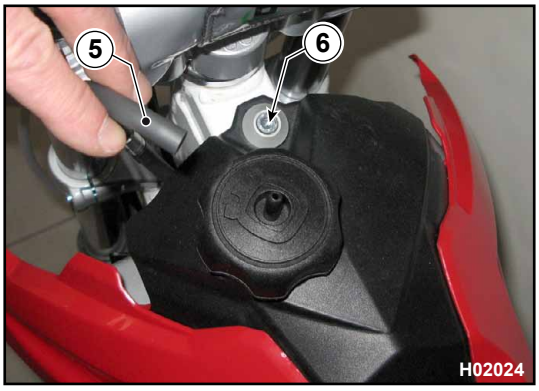
Tank removal

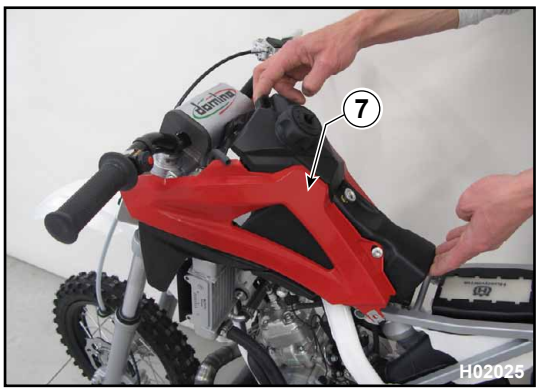
Remove the saddle as described in the relevant paragraph.
Close the fuel cock (2) and loosen the clamp (3) on the hose running to the carburettor. Detach hose (4) from carburettor making sure to drain any fuel in the hose into a container.

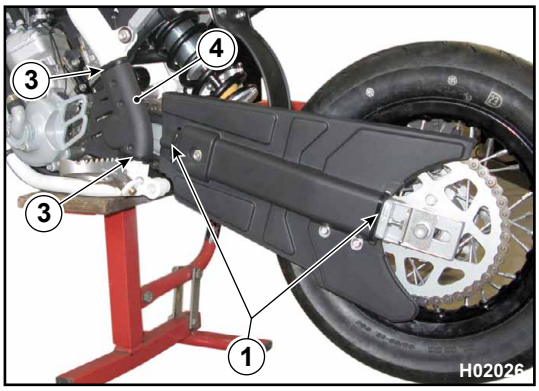


Remove the screws (4) and the side panels.

Disconnect the breather hose (5).
Remove the retaining screw (6), and then the tank (7) together with scoops.

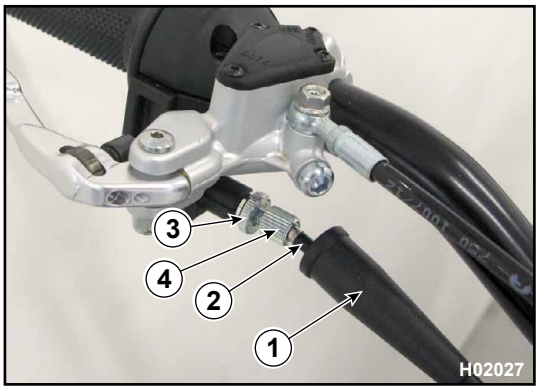






Chain guard removal

Cut clips (1), and remove guard (2).
Cut clips (3), and remove sprocket guard (4).



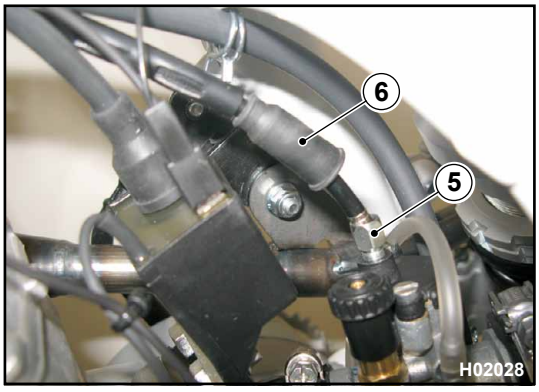
Throttle cable adjustment

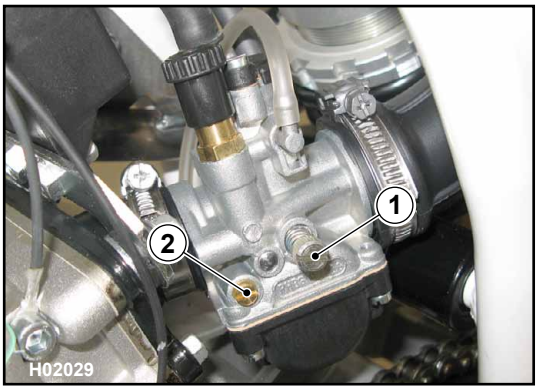
To check the correct adjustment of the throttle cable, operate as follows:
- move rubber cap (1) at cable end;
- push and pull cable (2) to make sure it has about 2 mm free play;
- if not so, loosen the lock ring nut (3) and suitably turn the adjuster screw (4) (loosen to decrease play or tighten to increase it);
- tighten back the lock ring nut (3).

Operation with damaged throttle cable could result in an unsafe riding condition.

Exhaust gas contains poisonous carbon monoxide. Never run the engine indoors.

For a further adjustment, move rubber cap (6) aside, and turn carburettor screw (5).





Carburettor adjustment

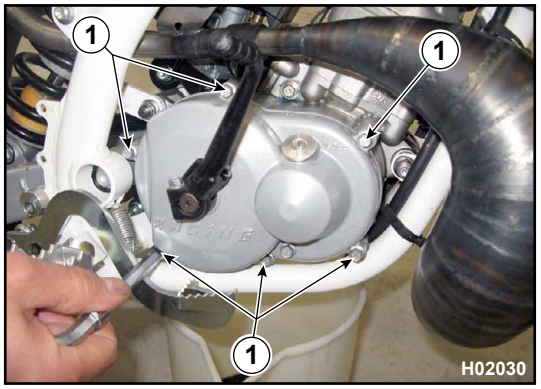
Adjust the carburettor with warm engine and with the throttle control in closed position. Proceed as follows:

- turn the idle speed adjuster screw (1) located on the left-hand side of the vehicle, until setting idle RPM quite high (turn clockwise to increase the speed and counter clockwise to reduce the speed).
- Turn the adjuster screw (2) clockwise to fully closed position, and then turn it back 3 turns.
- Gradually loosen the screw (1) until achieving suitable idle speed setting.

Idle adjustment

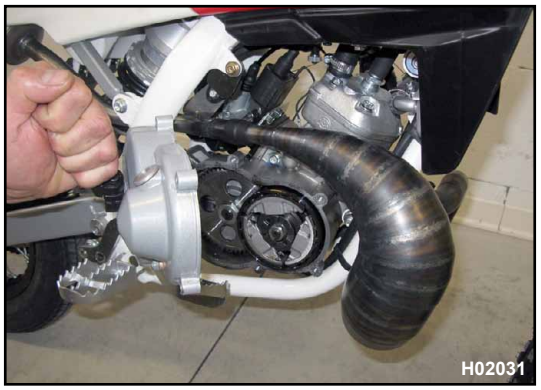
Adjust the carburettor with warm engine and with the throttle control in closed position. Proceed as follows:

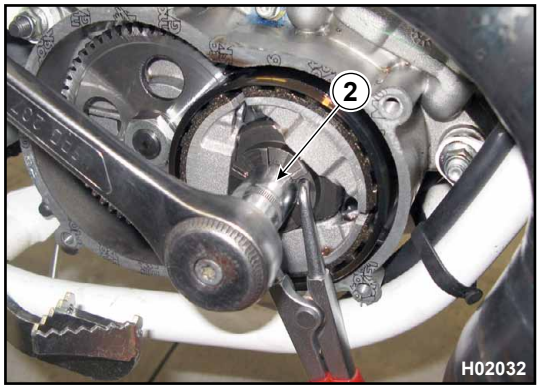
- Turn the idle speed adjuster screw (1) located on the left-hand side of the vehicle, until setting idle RPM as required (turn clockwise to increase the speed and counter clockwise to reduce it).



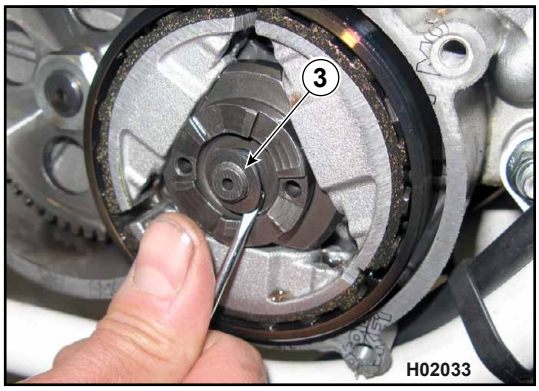
Clutch replacement / setting

- Drain oil as described in the relevant paragraph.
- Using a 8 mm wrench, undo the six screws (1) and remove the cover with start lever;

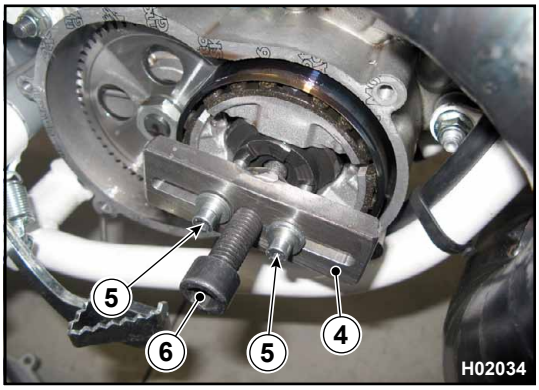




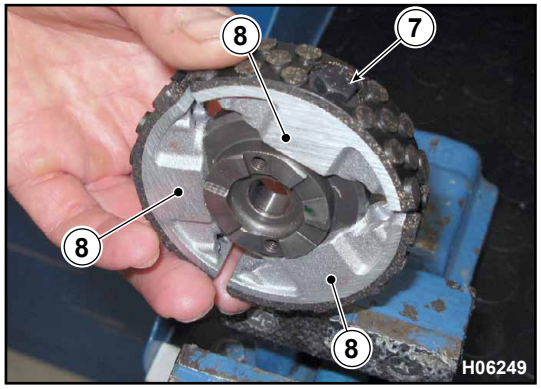
- Using long nose pliers, lock clutch rotation, and undo nut (2) with a 15 mm wrench;



- Remove washer (3);



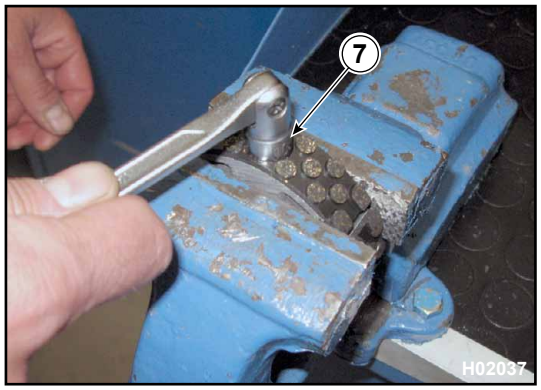
- Fit puller (4), by screwing screws (5) inside clutch threaded holes;
- Screw puller central screw (6) until removing clutch assembly, then remove puller from clutch assembly;

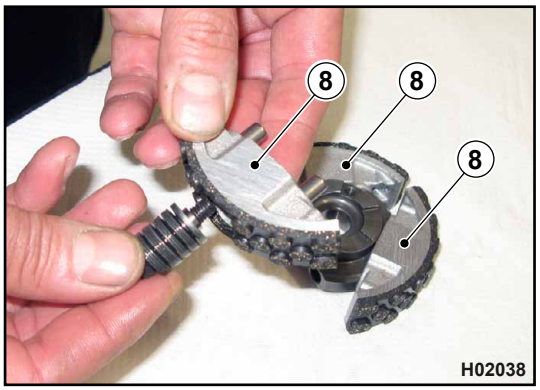


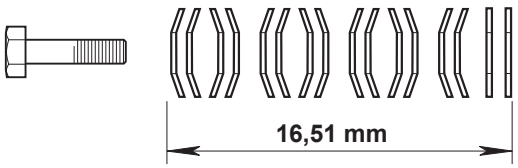
- Using a 10 mm ring wrench, undo screws (7) securing counterweights (8) to central body;
- Remove screw (7) with Belleville washers from counterweights (8).

To change clutch setting, just vary the position of Belleville washers. It can be Harder or Softer.

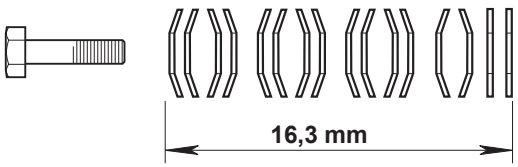
Clutch setting shall be changed on all the three Belleville washer units.



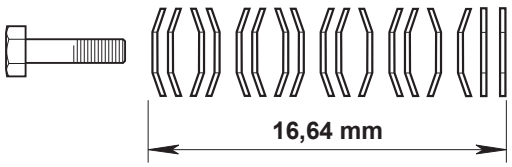




STANDARD SETTING
(14 washers - pack size 16.51 mm):

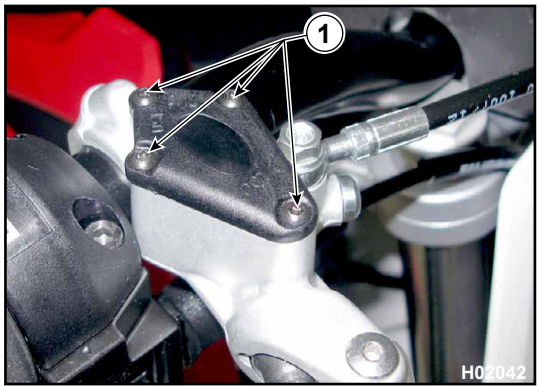


SOFT SETTING
(14 washers - pack size 16.3 mm):



HARD SETTING
(15 washers - pack size 16.64 mm):

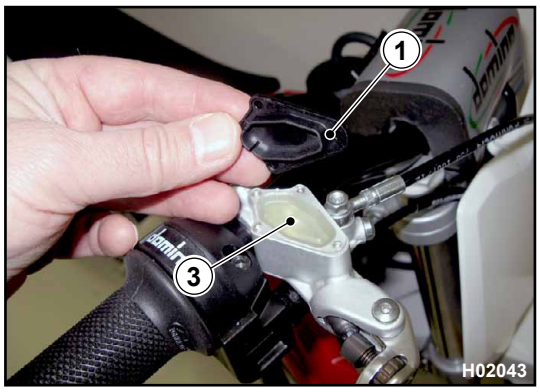
Reassemble all parts, in the reverse order compared to disassembly, securing screws (7) and central plate (2) with Loctite 243.



Front brake fluid level check

To check front brake fluid level, proceed as follows:

- Position minicross on a flat ground and in vertical position;
- Undo screws (1), and remove cover (2) with diaphragm (3);



- check that oil level is about 3 mm from the upper edge; if necessary, top up using an oil specified in "LUBRICATION AND SUPPLIES" table.

A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.

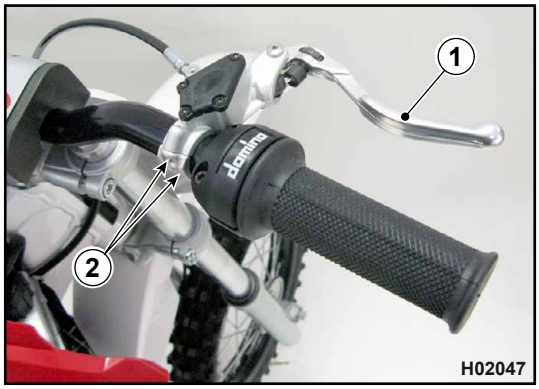
If the brake lever feels mushy when pulled, there may be air in the brake line or the brake may be defective: CHECK THE BRAKING SYSTEM (see Section "L").

Too much brake lever free play may reduce braking action: CHECK BRAKE PAD THICKNESS (see Section "L").

Do not spill brake fluid onto any painted surface or lens (for example lights lens).

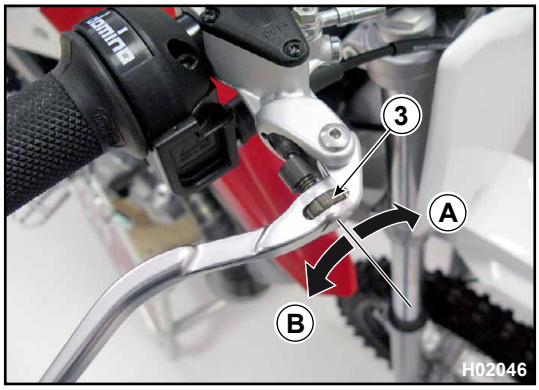
Do not mix two brands of fluid. Completely change the brake fluid in the brake system if you wish to switch to another fluid brand.

Brake fluid may cause irritation. Avoid contact with skin or eyes. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.

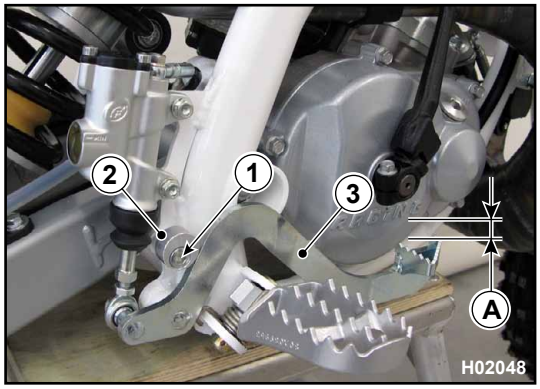


Front brake lever adjustment

POSITION ADJUSTMENT
Brake lever (1) can be adjusted by loosening screws (2).
When finished, tighten screws again (2).



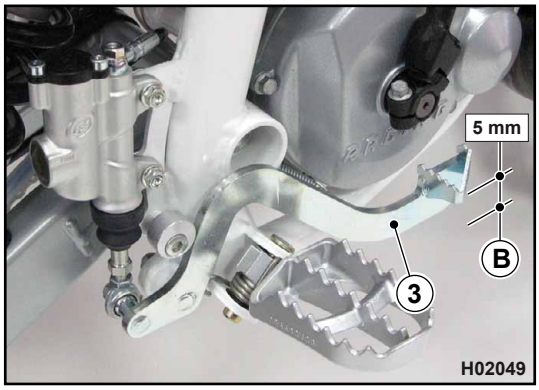
LEVER DISTANCE ADJUSTMENT
Lever (1) distance from throttle twistgrip can be adjusted using ring nut (3); turn it clockwise "A" to approach the lever, and turn it counter clockwise "B" to drive it away.



Rear brake pedal position adjustment

The position of the rear brake pedal with respect to the footrest may be adjusted according to individual needs.
For adjusting, proceed as follows:
- Loosen the screw (1).
- turn the cam (2) in order to raise or lower the brake pedal (3) within the range available (A);
- When finished, tighten the screw (1).

Once this adjustment is completed, adjust the free play of the pedal following the instructions provided in paragraph "Rear brake pedal free play adjustment".

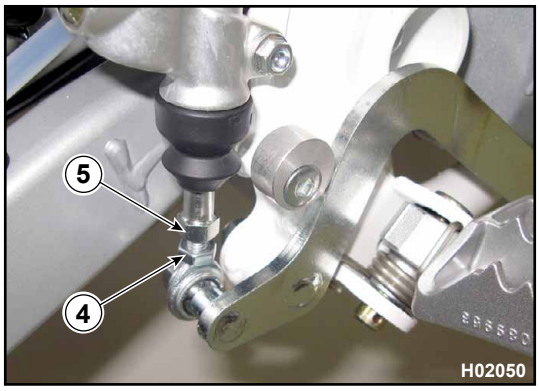


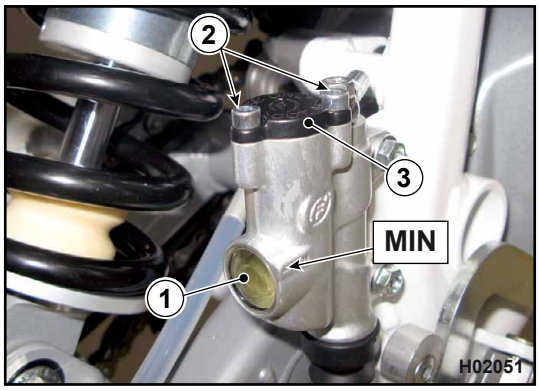
Rear brake pedal free play adjustment

The rear brake pedal (3) should have a free play (B) (5 mm) before the brakes begin to bite. Should this not happen, operate as follows:
- loosen nut (4);
- operate the pump rod (5) to increase or decrease the free play;
- tighten nut (4) at the end of the operation.

When the free play requirement is not met, the brake pads will be subjected to an early wear that may lead to TOTAL BRAKE INEFFECTIVENESS.

If the brake pedal feels mushy when pulled, there may be air in the brake line or the brake may be defective. CHECK THE BRAKING SYSTEM (see Section L).





Rear brake fluid level check

Fluid level - visible through sight glass (1) - must be above the minimum notch on master cylinder reservoir.
To restore fluid level, loosen the two screws (2), and remove cover (3). Top up using a fluid specified in "LUBRICATION AND SUPPLIES" table.

A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.

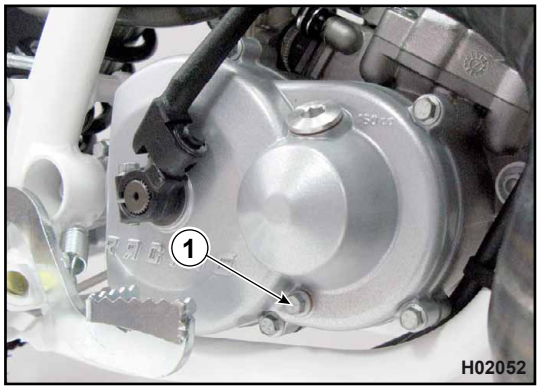
If the brake pedal feels mushy when pulled, there may be air in the brake line or the brake may be defective. CHECK THE BRAKING SYSTEM (see Section "L").

Too much brake lever free play may reduce braking action: CHECK BRAKE PAD THICKNESS (see Section "L").

Do not spill brake fluid onto any painted surface or lens (for example lights lens).

Do not mix two brands of fluid. Completely change the brake fluid in the brake system if you wish to switch to another fluid brand.

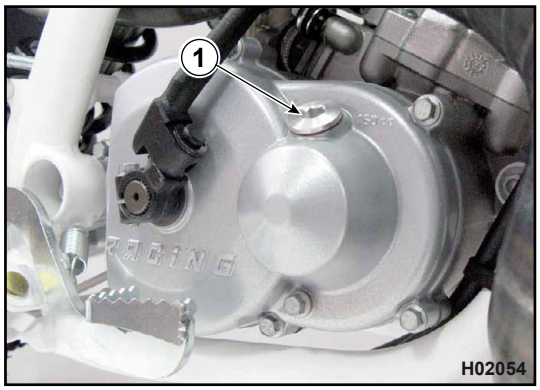
Brake fluid may cause irritation. Avoid contact with skin or eyes. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.



Oil level check

- Position minicross on a flat ground and in vertical position;
- Undo screw (1), and check that oil level skims hole edge.

In case of low oil level, top up using a syringe inside level screw hole.



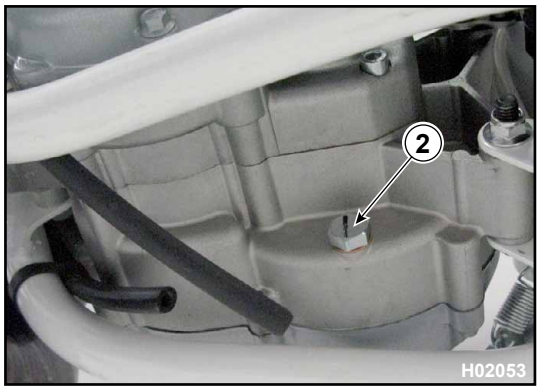
Oil replacement

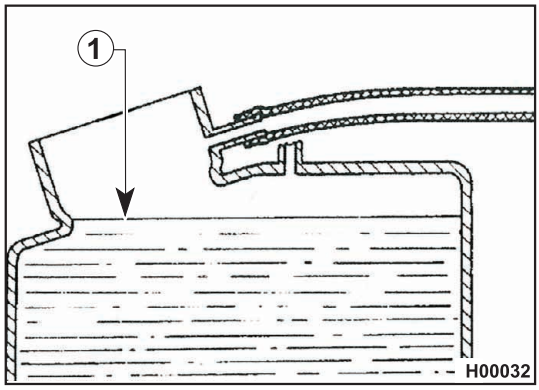
Be careful not to touch hot engine oil.

Drain the oil with WARM ENGINE; proceed as follows:

- Remove oil filler cap (1);
- put a drip pan under engine;
- remove oil drainage plug (2);
- evacuate the exhausted oil;
- refit oil drainage plug (2) (15 Nm / 1.5Kgm / 11.06 ft/lb);
- pour the recommended quantity of oil through the filler hole (1).

Check oil level as specified in the relevant paragraph.



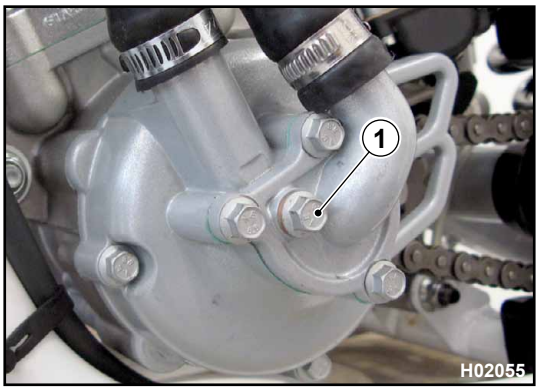


Coolant level check

Check level (1) in right-hand radiator when engine is cold (place the motorcycle so that it is perpendicular to the ground). The coolant should be approximately 10 mm above the cells.
The radiator cap features two locking positions: the first one is for prior discharge of pressure from the cooling system.

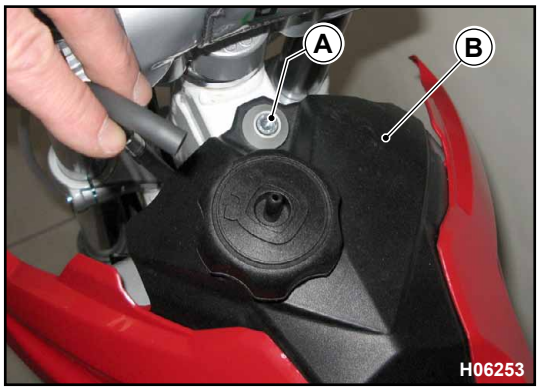
Avoid removing radiator cap when engine is hot, as coolant may spout out and cause scalding.

Difficulties may arise in eliminating coolant from painted surfaces. If this occurs, wash off with water.

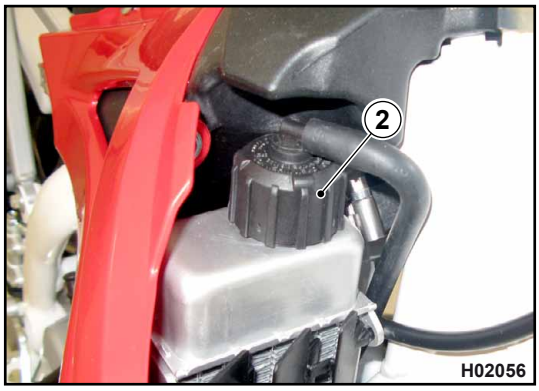


Coolant replacement

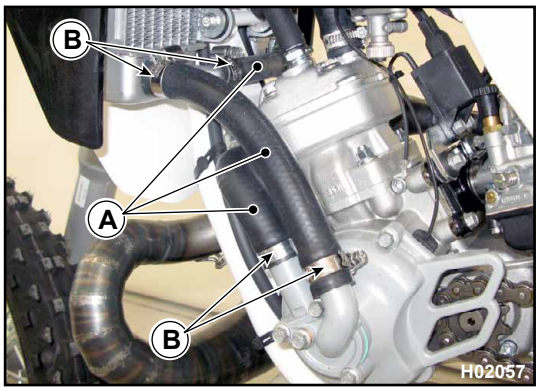
Place a vessel on the L.H. side of the cylinder, under the screw (1).



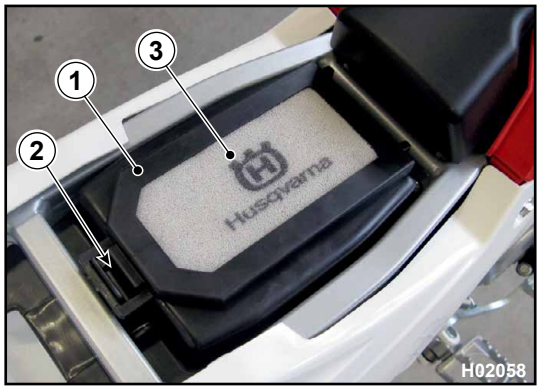
Undo screw (A), and slightly lift tank (B).



SLOWLY open the R.H. radiator cap (2); slope the motorcycle on the left side to drain the coolant easily in the vessel.
Pour the necessary quantity of coolant in the radiator then warm up the engine in order to eliminate any possible air bubbles.



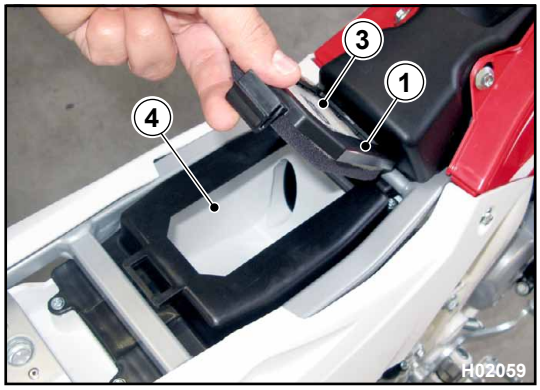
Periodically check the connecting hoses (see "Scheduled Maintenance Chart"): this will avoid coolant leakage and consequent engine seizure. If hoses (A) show cracks, swelling or hardening due to sheaths desiccation, their replacement shall be advisable.
Check the correct tightening of the clamps (B).



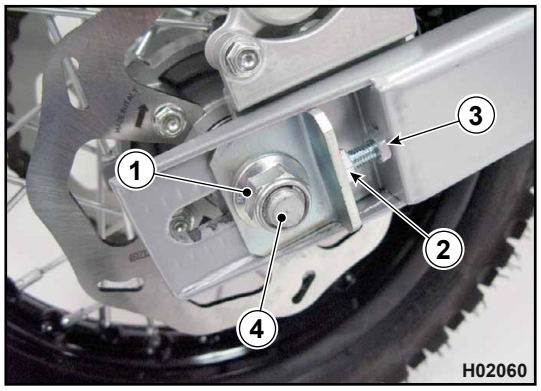
Air filter check and cleaning

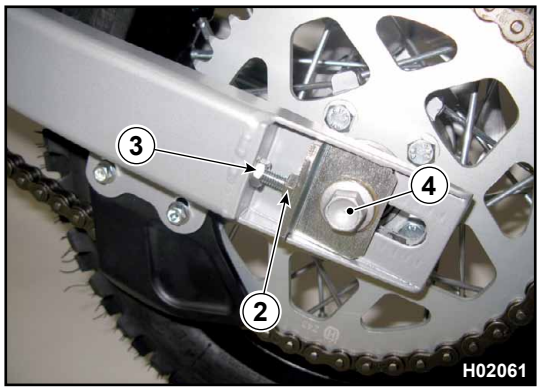
- Remove the saddle as described in the relevant paragraph.
- Remove plastic frame (1) by releasing the corresponding clip (2), and then remove air filter (3);
- Clean filter (3) with suitable products, dip it in the special oil, squeeze it until all the oil has come out, and then let it dry before reassembly.

We recommend having always a spare filter



- Clean filter box (4) inner side with a cloth;
- Reassemble all parts, in the reverse order compared to disassembly.





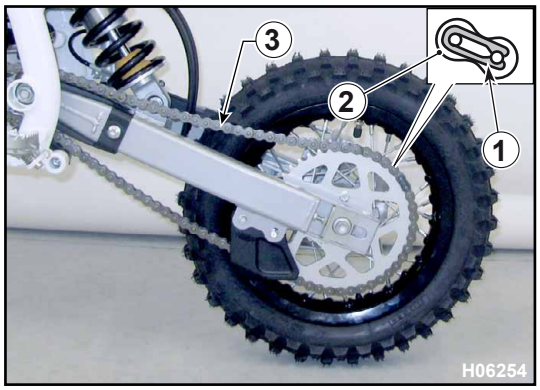
Chain adjustment

Chain should be checked, adjusted and lubricated as per the "Maintenance Chart (see Section B)" to ensure safety and prevent excessive wear. If the chain becomes badly worn or is poorly adjusted (i.e., if it is too loose or too taut), it could escape from sprocket or break.
Remove chain protective guards, as indicated in the corresponding paragraph.

Position minicross onto a stand, and insert a 2÷5 mm dia. shim above upper chain guide.
Adjust chain tension so as to allow shim slide without any forcing, and without the chain being too slack.

If it is not, proceed as follows:
- Loosen hexagon nut (1).
- Loosen check nuts (2) on both sides.
- Turn screw (3), on both sides of rear swinging arm, to increase or decrease chain tension, taking special care to centre wheel inside rear swinging arm using the notches on swinging arm as a reference.
- Once the desired tension has been reached, lock rear wheel axle (4) with hexagon nut (1) to the tightening torque of 80 Nm; 8 kgm; 59 ft/lb, and lock screws (3) with check nuts (2).

With the chain fully tensioned, insert a suitable shim to check whether chain is slackened. Should this be the case, contact a Husqvarna authorised Dealer to have the chain changed.



Chain lubrication

Lubricate the chain following these instructions.

Never use grease to lubricate the chain. Grease helps to accumulate dust and mud, which act as abrasive and help to rapidly wear out the chain, the front and rear sprockets.

Disassembling and cleaning

When particularly dirty, remove and clean the chain before lubrication. Proceed as follows:

- Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.
- remove chain protective guards, as indicated in the corresponding paragraph.
- remove clip (1), master link (2), then remove chain (3). To reassemble, reverse the above procedure.

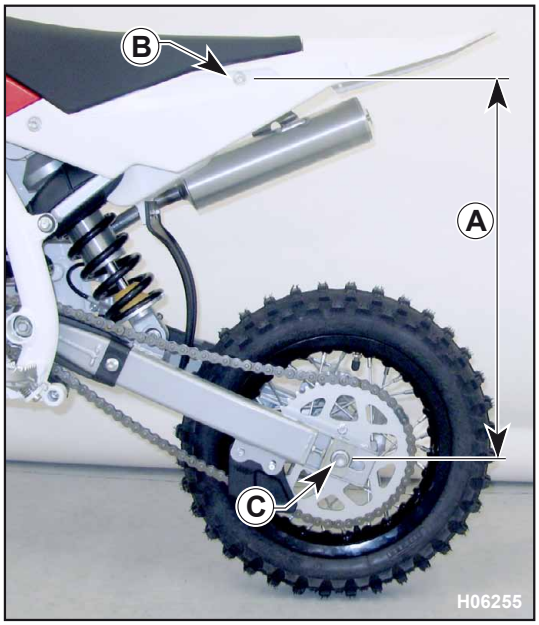
Make sure that the chain is neither worn out nor damaged. If the rollers or the links are damaged, replace the chain by following the instructions given in the Scheduled Maintenance Chart. Ensure that the sprockets are not damaged. Wash and clean the chain as described hereunder.

Washing the chain

Wash using petroleum or naphtha. If you use fuel or especially trichloroethylene, dry and lubricate the chain to avoid oxidisation.

Chain lubrication

After drying, dip the chain in Molybdenum Disulphide chain lubricant, if possible, or in warm high-viscosity engine oil (if warmed up, oil will be more fluid).



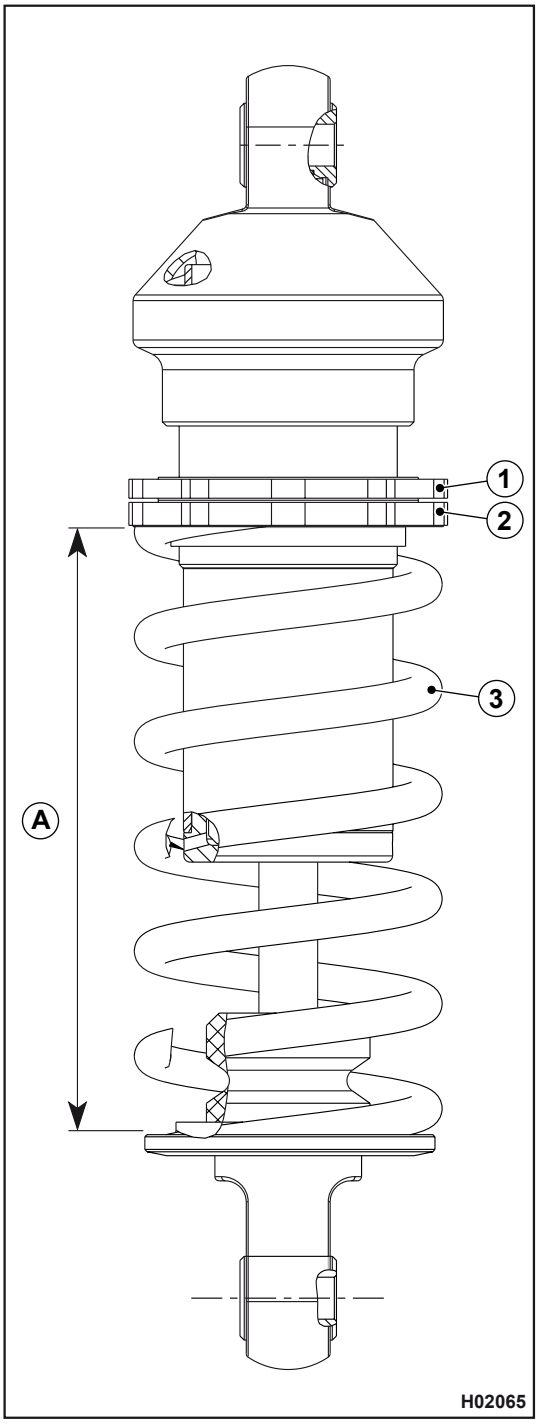
B: panel retaining screw axis
C: rear wheel axle height

Shock absorber adjustment

The rear shock absorber must be adjusted to suit rider weight and terrain conditions.

Proceed as follows:

1. With the bike resting on the ground, without rider, measure distance (A).
2. Sit on the motorcycle in normal riding position with full riding gear on.
3. Have someone else measure distance (A) again.
4. The difference between these two measurements is the distance the rear end settles when the rider sits on the motorcycle (RIDER SAG). Recommended lowering is 20 mm (0.79 in), with cold shock absorber.
5. To achieve correct rider sag for your weight, adjust the spring preload of the shock absorber (see relevant paragraph).



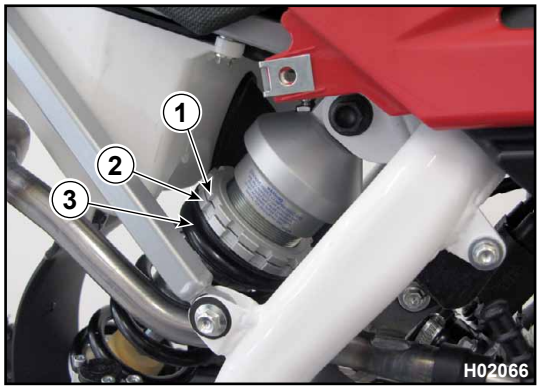
The standard length of the preloaded spring is as follows:
A= 145 ± 1.5 mm

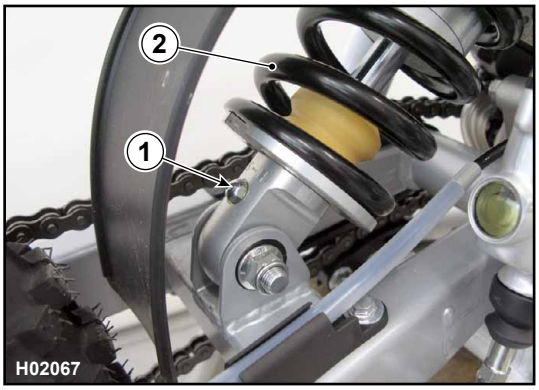
Shock absorber spring preload adjustment

Proceed as follows:

1. Remove right-hand side panel, as described in the relevant paragraph.
2. Clean lock ring nut (1) and adjuster ring nut (2) of the spring (3).
3. Either with a hook wrench or an aluminium punch, loosen the lock ring nut.
4. Turn the adjuster ring nut as required.
5. Adjust preload to suit your weight or riding style, and tighten lock ring nut firmly (tightening torque 20 Nm - 2 Kgm - 14.75 ft/lb).
6. Refit right-hand side panel.

Be careful not to touch hot exhaust pipe while adjusting the shock absorber.





Shock absorber compression and rebound damping adjustment

Shock absorber rebound stroke can be adjusted.

B) REBOUND - Standard setting: 1.25 turns ± 0.25 (from the fully closed position)

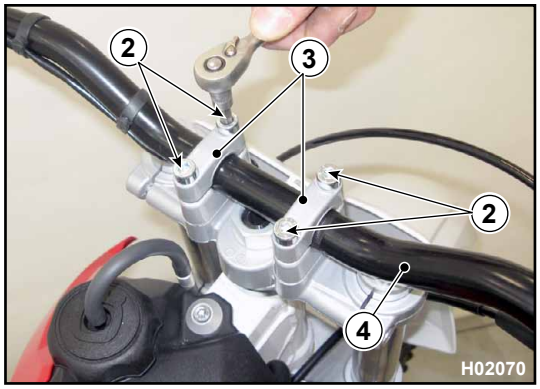
To reset the standard setting, turn lower adjuster (1) clockwise until reaching the fully closed position. Then turn it back by the mentioned turns.
In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

Shock absorber springs (2)
STANDARD
K=5 daN/mm

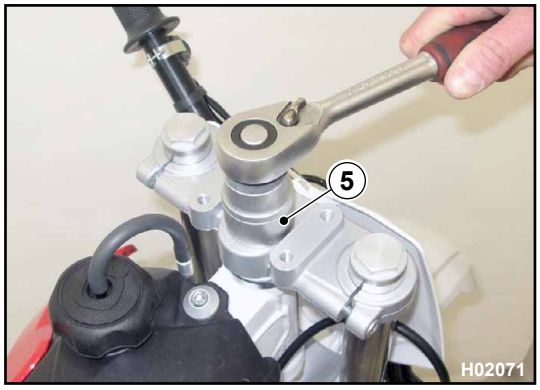
Steering bearing clearance adjustment

For safety reasons, the steering should always be adjusted so that the handlebar turns freely and without play. To check steering adjustment, set a stand or a block under the engine and see that the front wheel is lifted from the ground. Press lightly on the handlebar grips to cause the front end to rotate; the handlebar should turn smoothly. Sit on the ground in front of the front wheel and hold the lower ends of the fork legs. Push and pull in a front to rear motion to feel for play.
If any play is detected, adjust as follows:

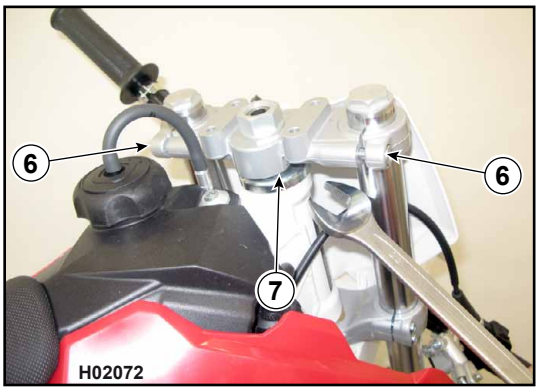
- Remove bumper (1).



- Use a 6 mm Allen wrench to loosen screws (2), remove clamps (3), and move handlebar (4) aside.

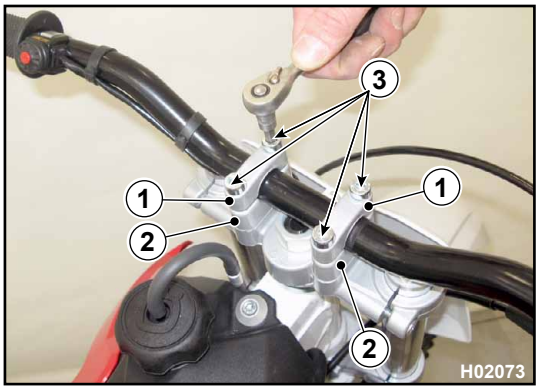


- Loosen steering head tube nut (5);



- Loosen the two bolts (6) securing steering head onto fork legs (use a 6 mm Allen wrench);
- Screw ring nut (7) with a 27 mm lowered wrench to the torque of 10 Nm, 3 Kgm, 7.38 ft/lb then increase until reaching a soft steering, without clearance;
- Tighten steering head tube nut (5) to 30 Nm, 3 Kgm, 22.13 ft/lb;
- Tighten the two bolts (6) on the steering head to 25 Nm, 2.5 Kgm, 18.44 ft/lb.
- Refit all the disassembled parts in reverse order, making sure to refit clamps (3) in the same direction, and tightening screws (2) to 25 Nm, 2.5 kgm, 18.44 ft/lb, so that the front and rear distance between upper and lower clamp is alike.

After having refit handlebar, make sure that throttle cable and front brake pipe are in the correct position.

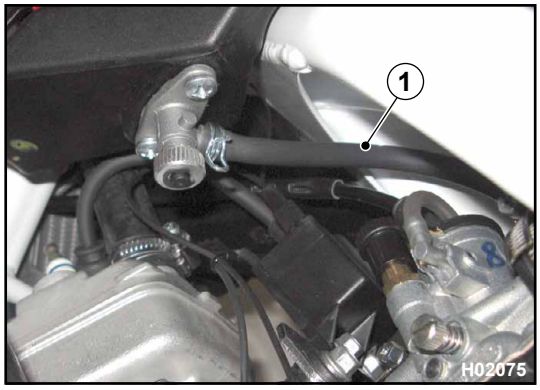


Handlebar position change

Handlebar position can be changed to better suit your riding style. To perform this adjustment, remove the retaining screws (3) on upper clamp (1) and lower clamp (2).

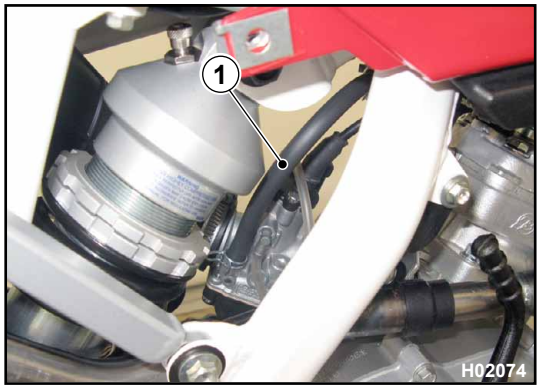
- Rotate lower clamps by 180° to move handlebar position forward or backward (approx. 10 mm- 0.04 in.) compared to the original position.

Once finished, tighten the two screws (3) to 25 Nm, 2.5 Kgm, 18.44 ft/lb



Fuel supply hose inspection

Check the hose (1) for leaks and replace it as required.
Remove the supply hose as described in Section "E".



Exhaust system check

Remove exhaust system components as described in Section "E". Ensure that pipe (1) and silencer (2) do not show any sign of failure or damage: replace if cracked or damaged.

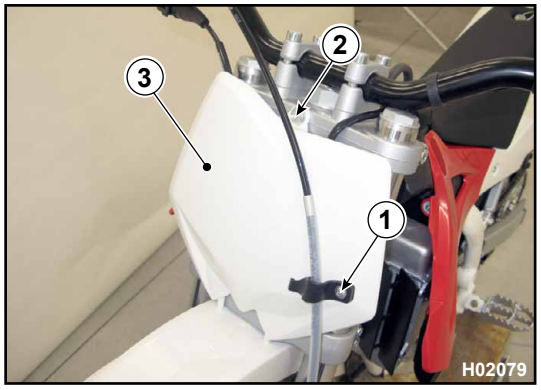
Section E

Foreword

This section describes the operations preliminary to engine removal.
Please note that, in order to gain access to certain motorcycle components (rear shock absorber, electrical parts, wiring, etc.), it may be necessary to partially remove some parts.

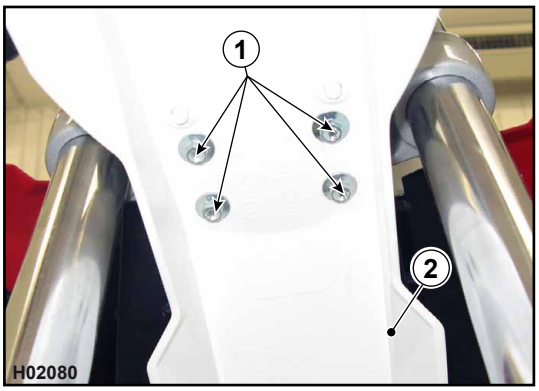
RIGHT-HAND SIDE

LEFT-HAND SIDE



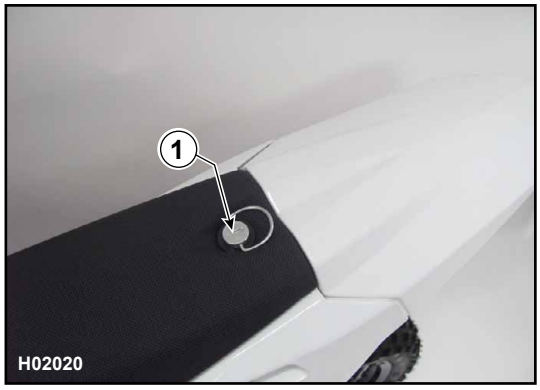
Number holder removal

- Loosen front brake cable guide screw (1).
- Loosen screw (2) using a 8 mm ring wrench, and lift number holder to remove it.



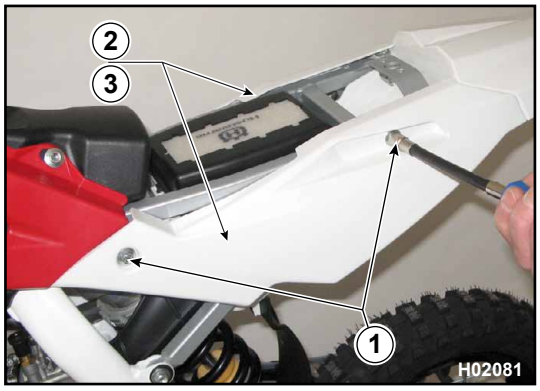
Front mudguard removal

- Loosen the four screws (1) with a 8 mm ring wrench, and remove mudguard (2).



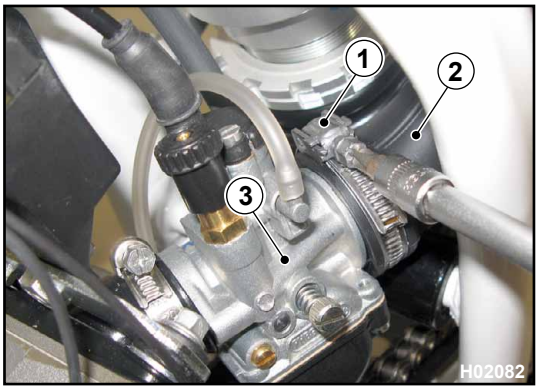
Saddle removal

Turn the rear fixing (1) counterclockwise.
Remove saddle (2) from front retaining screw.



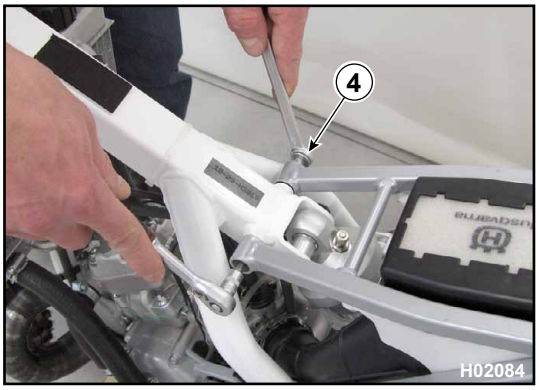
Side panel removal

- Remove the saddle as described in the relevant paragraph.
- Loosen the retaining screws (1) and remove the side panels (2) and (3).

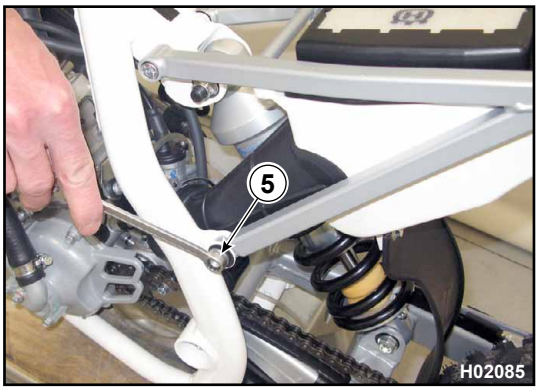


Rear chassis complete with mudguard and air box removal

- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Remove the fuel tank as described in section "D".
- Remove the exhaust silencer as described in the relevant paragraph.
- Slacken the clamp (1) that secures the rubber coupling (2) of the air box at the carburettor end (3).

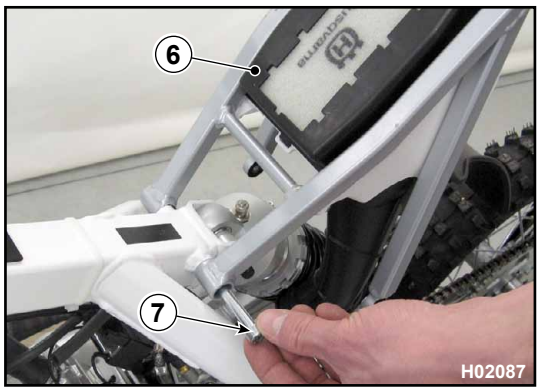


- Work with a 6 mm Allen wrench on the left side and a 12 mm ring wrench on the right side. Remove nut (4), leaving pin in its position.



- Remove the lower fixing (5) on both sides of the rear chassis using a 10 mm ring wrench.

- Lift the subframe (6) at the rear end so as to release carburettor rubber union (2).

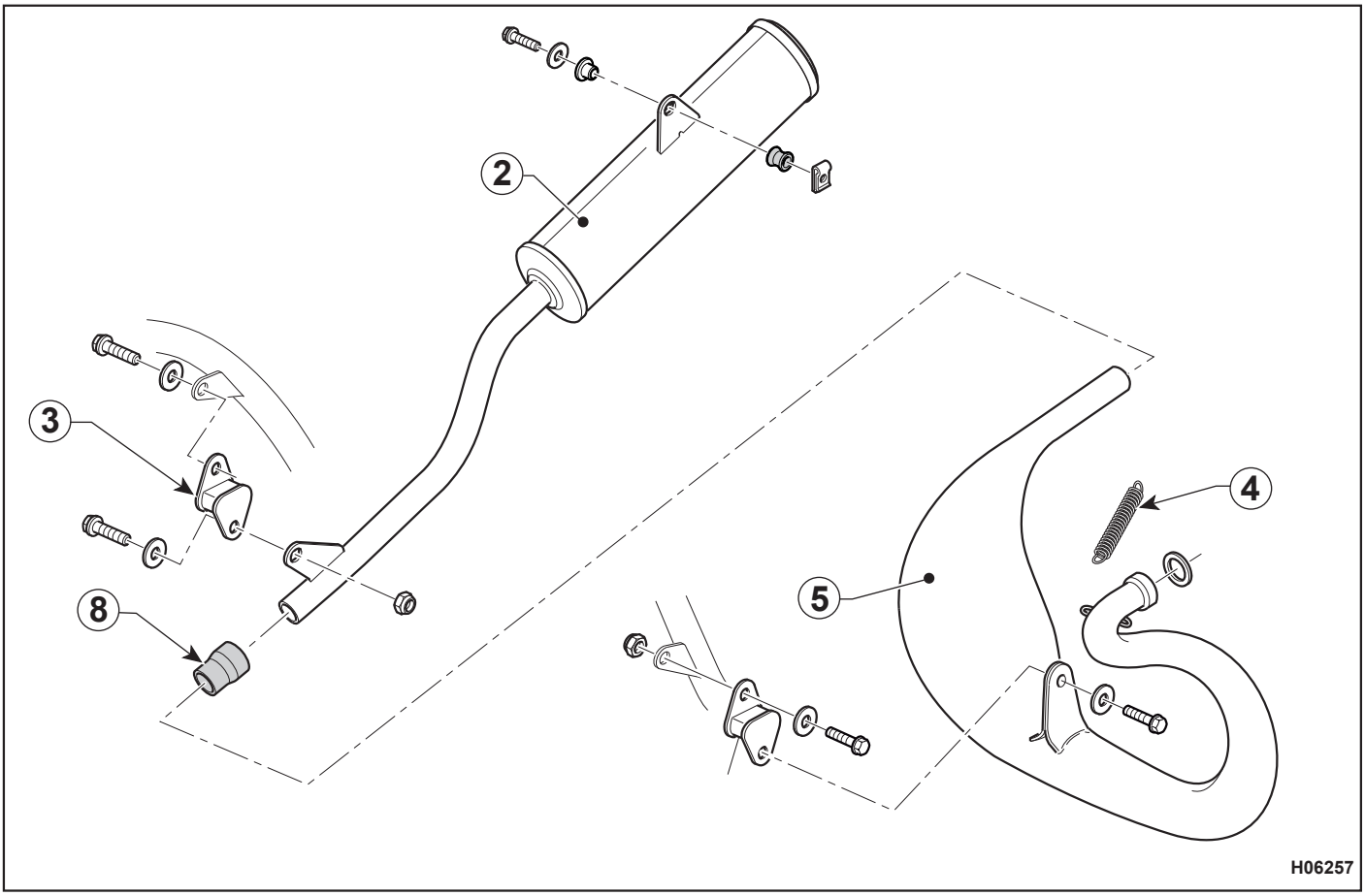


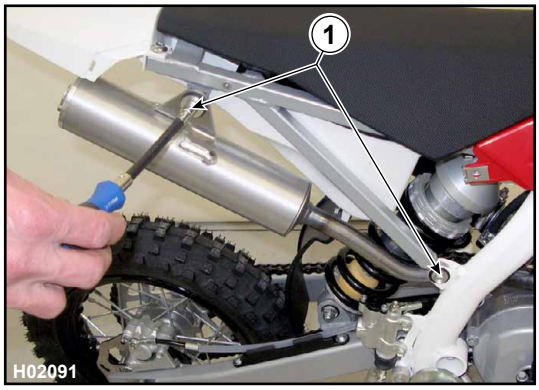
- Remove pin (7) and subframe (6) with filter box.

- Refit all the disassembled parts in reverse order, making sure to correctly refit rubber union (2) onto carburettor so as to prevent it from sucking not-filtered air.

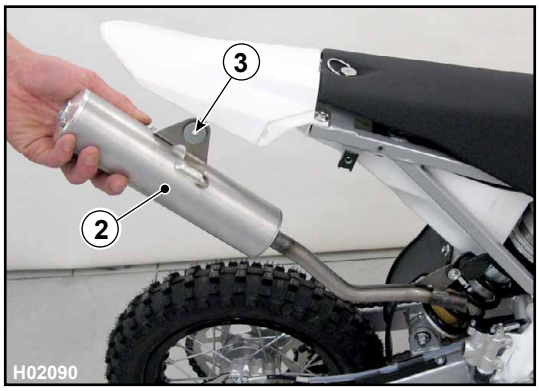
- See section "X" for tightening torque figures

Exhaust system removal

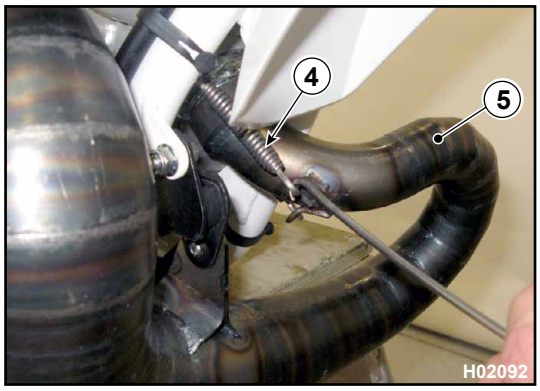




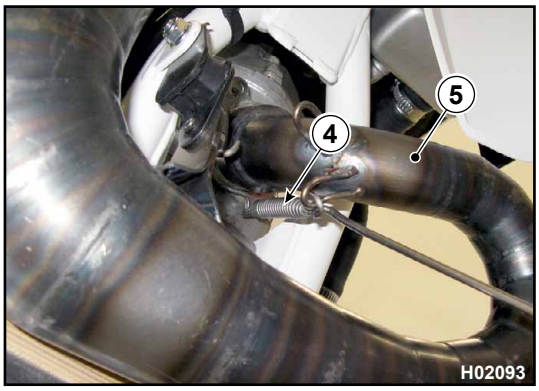
- Remove the saddle as described in the relevant paragraph.
- Remove the right-hand side panel as described in the relevant paragraph.
- Loosen the two screws (1) using an 8 mm wrench.

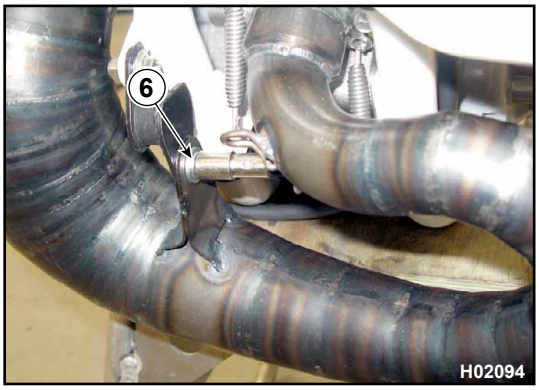


- Remove silencer (2) with flexible mount (3).

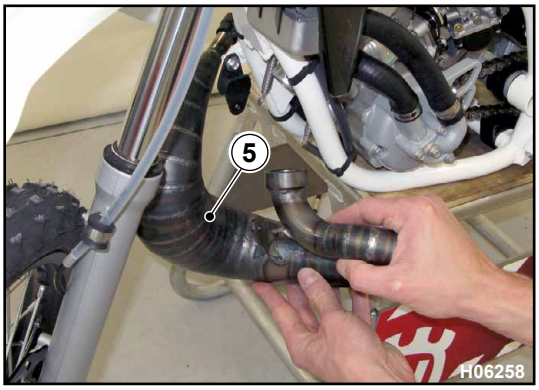


- Disconnect springs (4) from muffler (5).





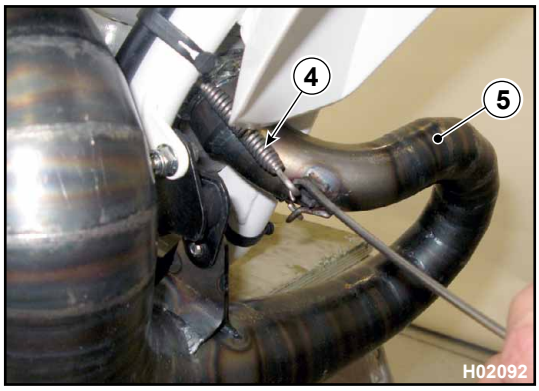
- Loosen the screw (6) with a 8 mm ring wrench.



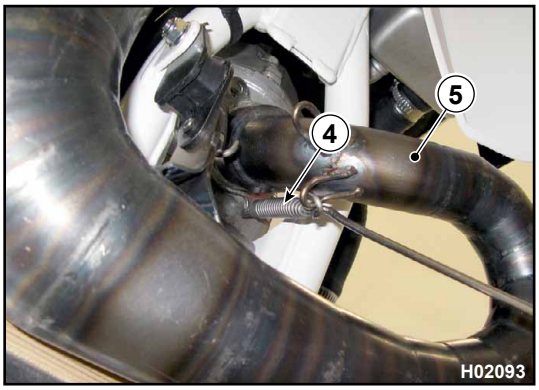
- Remove muffler (5).

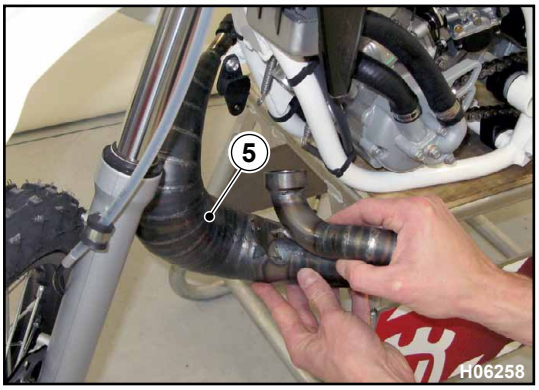
- Check seal (7), change if damaged;

To make reassembly operations easier, smear some grease onto seal (7)



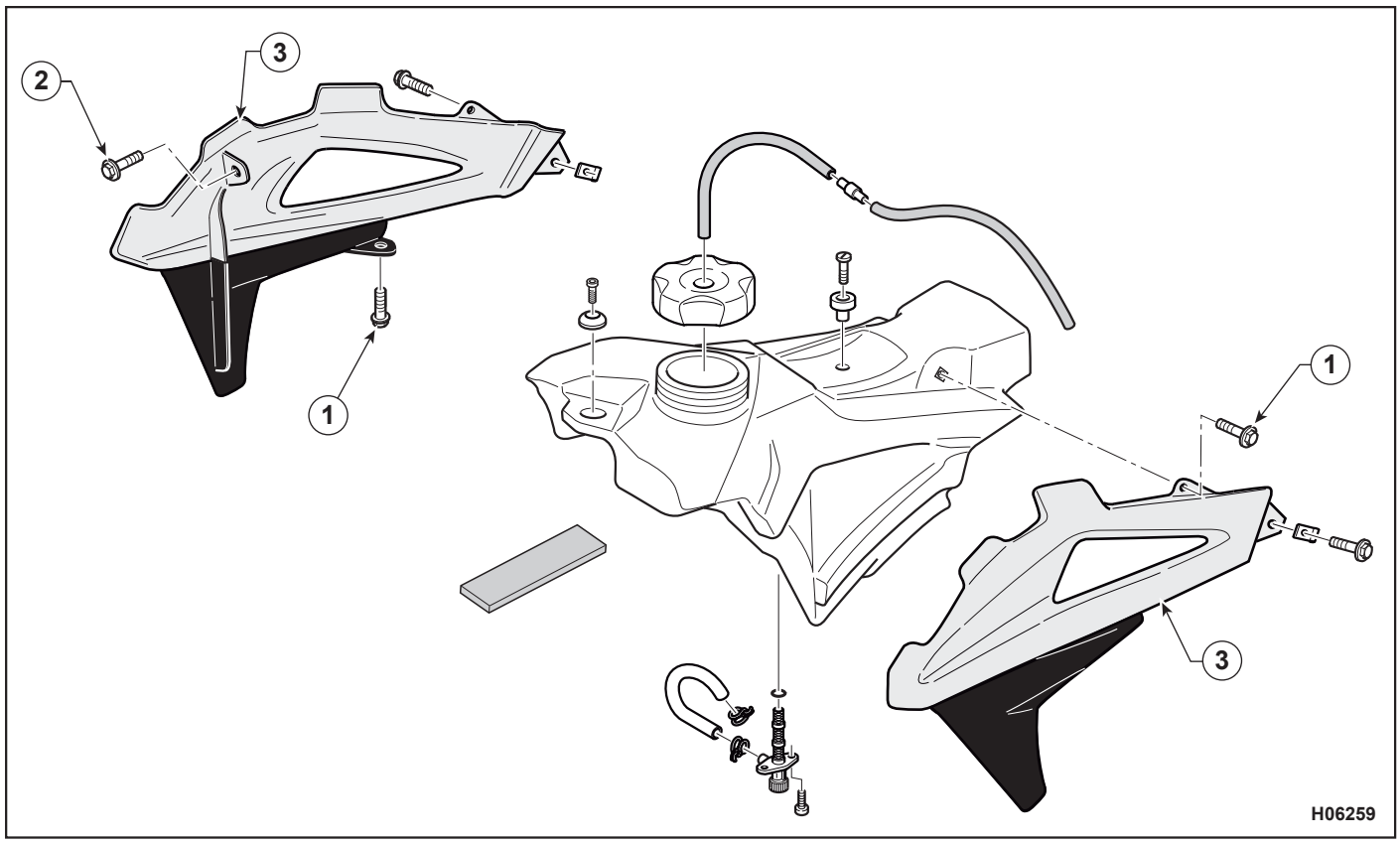
- Reassemble all parts, in the reverse order compared to disassembly. After hooking springs (4), screw muffler (5) and silencer (2) screws, but do not tighten them.

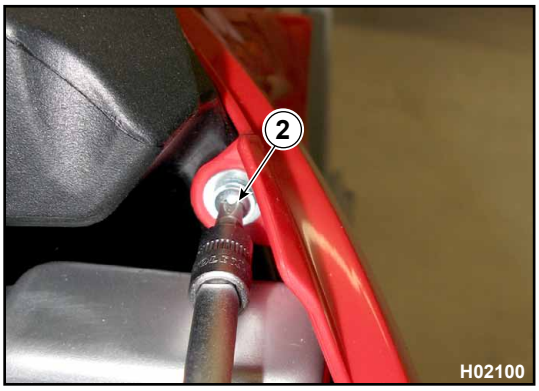


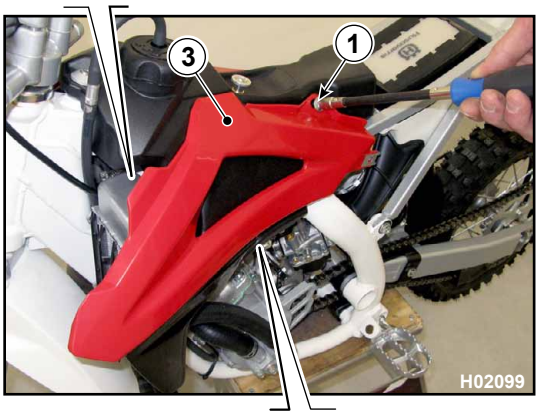


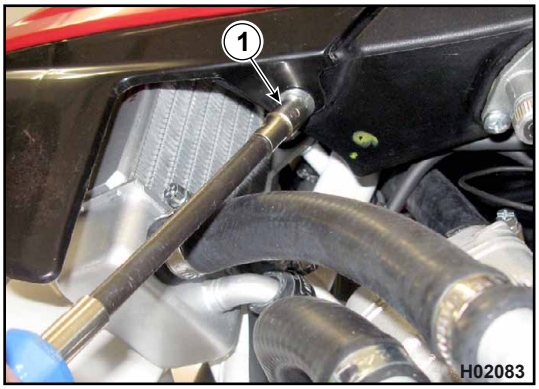
- Check exhaust system and sleeve (8) exact positions, and then tighten screws.
- See section "X" for tightening torque figures

Scoops and spoiler removal

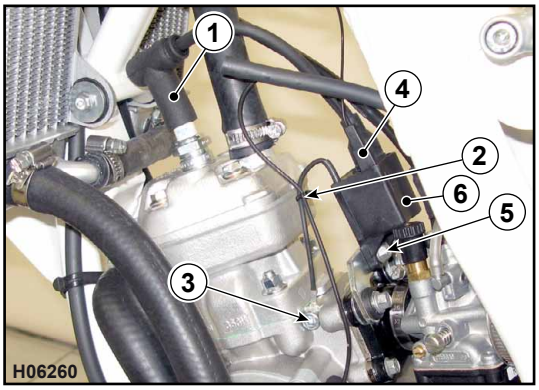


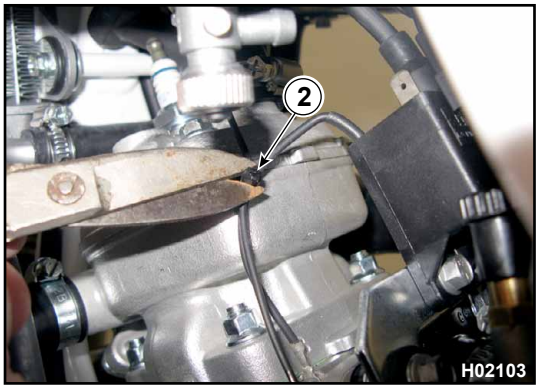


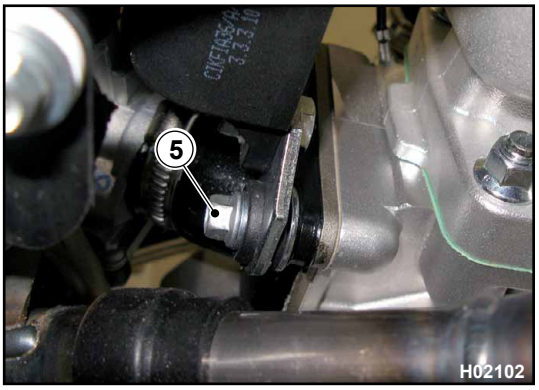




- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Loosen the screws (1) using a 8 mm ring wrench and, with a Phillips screwdriver loosen screw (2) and remove scoop (3).
- Repeat the procedure to remove the other scoop.

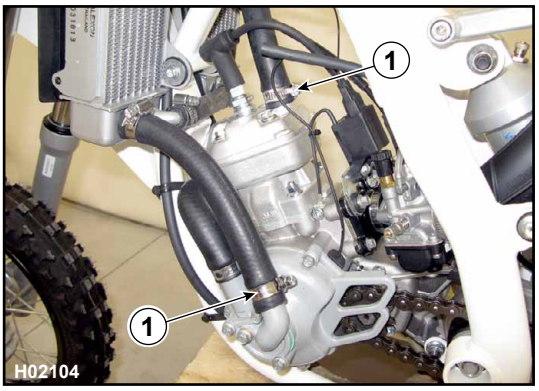






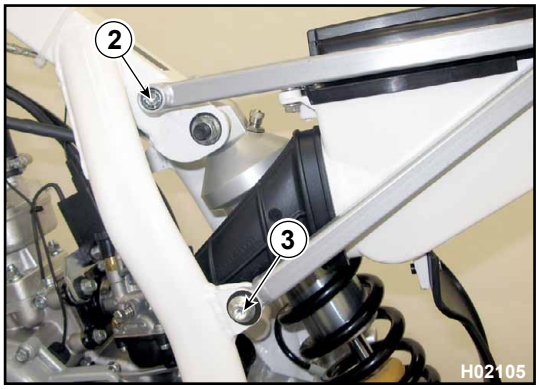
Transducer removal

- Remove: saddle and fuel tank as described in the relevant paragraphs.
- Remove the spark plug cap (1).
- Cut clamp (2).
- Loosen ground screw (3) using a 5 mm Allen wrench.
- Disconnect the connector (4).
- Using a 8 mm ring wrench, loosen the two screws (5) of transducer mounting bracket, then remove transducer (6) with bracket.

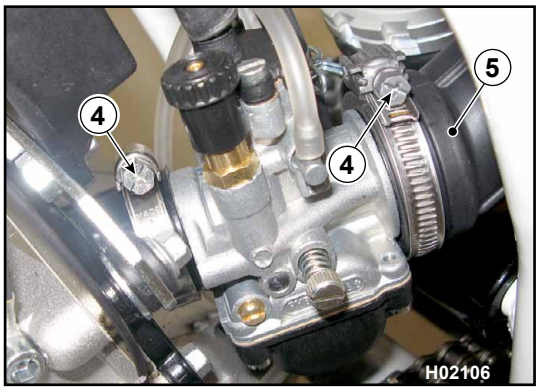


Engine removal

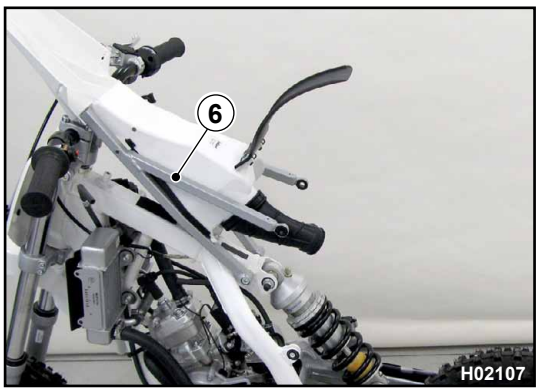
- Remove the fuel tank as described in the relevant paragraph.
- Remove the chain as described in the relevant paragraph.
- Empty the cooling system as described in the relevant paragraph.
- Remove the exhaust system as described in the relevant paragraph.
- Loosen clamps (1) and release engine from sleeves.

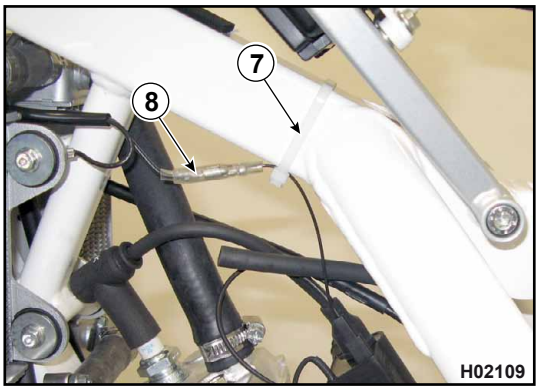


- Loosen rear chassis upper pin (2).
- Undo and remove the two lower screws (3) from rear chassis.

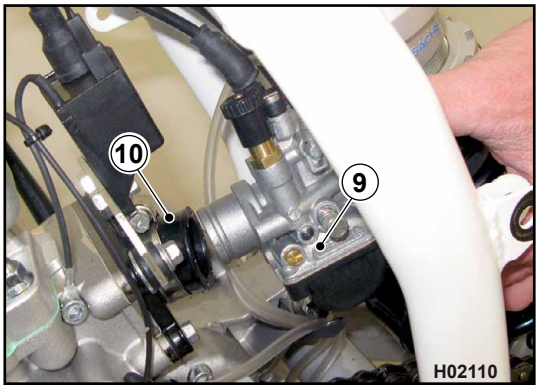


- Disconnect clamps (4) and remove intake manifold (5) from carburettor, then turn subframe (6).



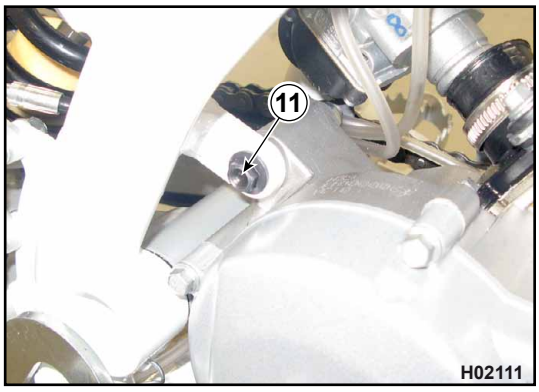


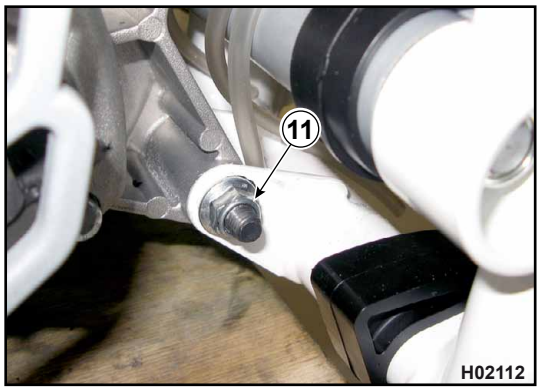
- Cut clamp (7), and disconnect stop switch electrical connector (8).

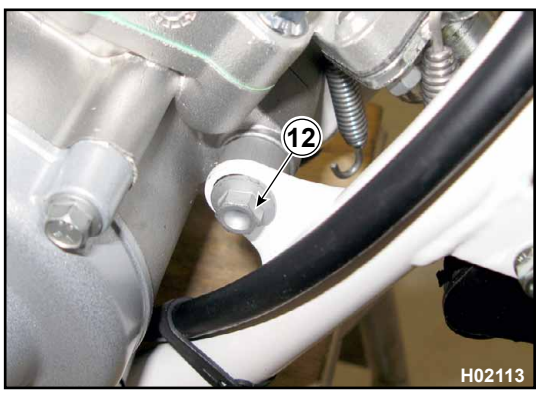


- Disconnect carburettor (9) from intake manifold (10).

- With a 10 mm ring wrench on the right side and a 12 mm ring wrench on the left side, remove engine mount rear pins (11).



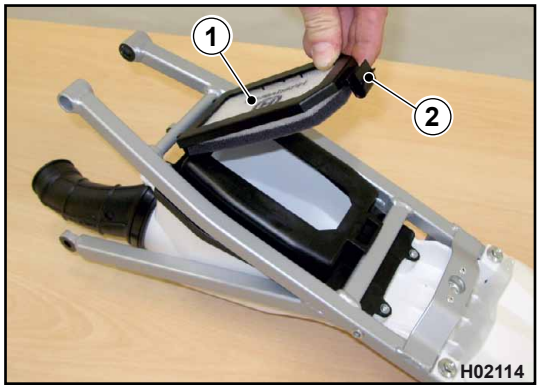




- With a 10 mm ring wrench on the right side and a 12 mm ring wrench on the left side, remove engine mount front pin (12).

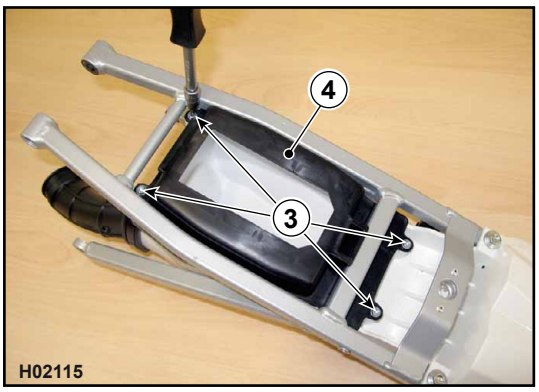
Keep spacers and shims; mark them so as to refit them in the same position.

- Release engine from connectors by slightly turning it clockwise.
- Slide engine out from the left-hand side.

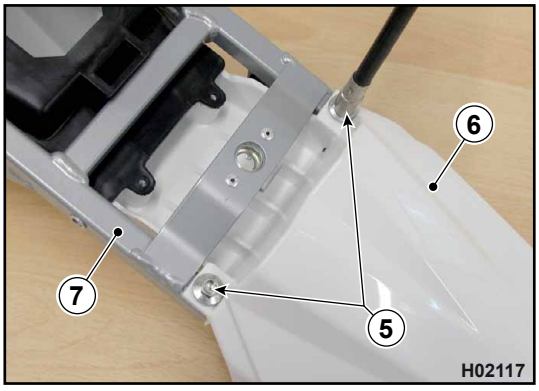


Rear mudguard with filter box removal

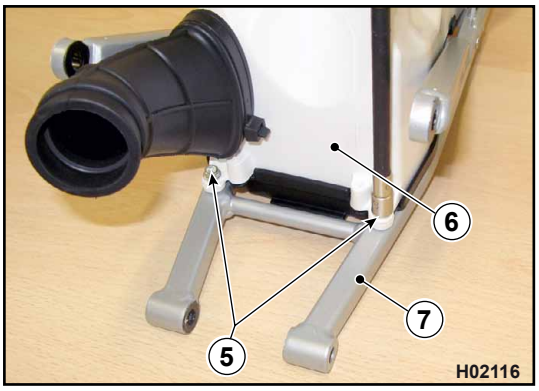
- Remove rear chassis as described in the relevant paragraph.
- Remove filter with support (1) by pressing the retaining tab (2).

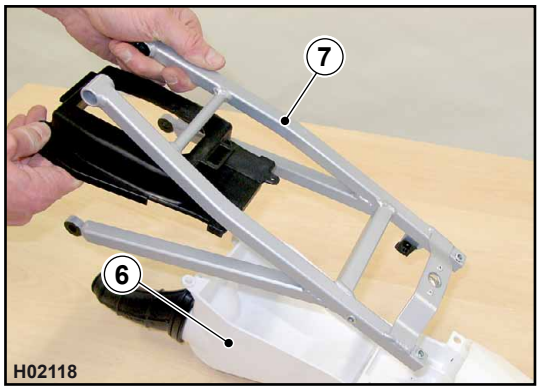


- Remove the four screws (3) securing filter box cover (4). (TORX screws)



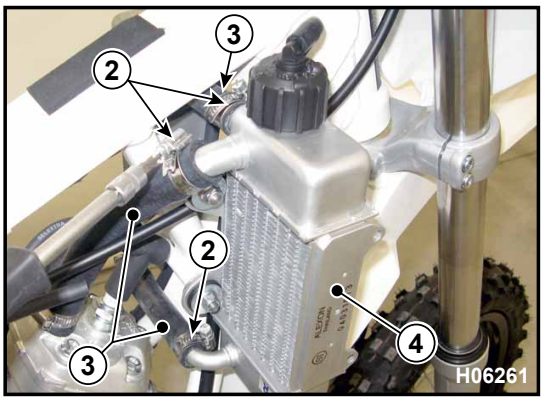
- Using a 8 mm ring wrench, remove the four screws (5) securing rear mudguard / filter box (6) to subframe (7).
- Disassemble the different components.



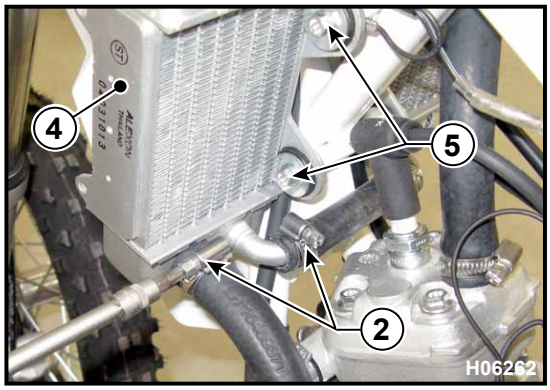


Radiator removal

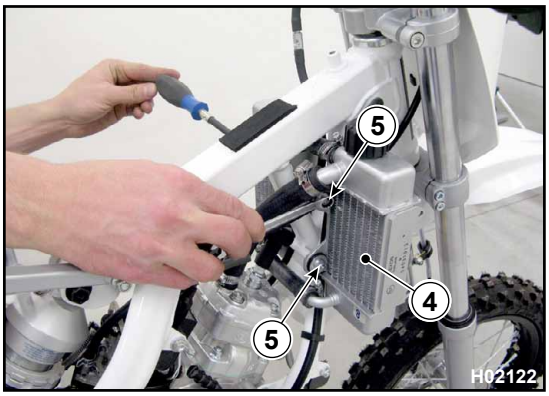
- Remove the fuel tank together with scoops and spoilers as outlined in the relevant paragraphs.
- Drain coolant as described in the relevant paragraph.
- Remove the plastic grids (1) from radiators by slightly bending them.

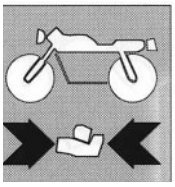


- Undo pipe clamps (2).
- Disconnect pipes (3) from radiators (4).

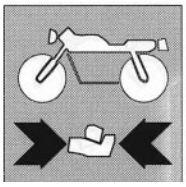


- Loosen screws (5), and remove the two radiators (4).
  (8 mm ring wrench)





Section F



ADJUSTMENTS / SETTING

CARBURETTOR SETTING

Original setting

Carburettor is originally set for an altitude of approx. 500 m above sea level, a temperature of approx. 20°C, for a mainly offroad use, and for premium gasoline available in the central European area (NO 95), mixed with 2-stroke oil.

Information for setting change

You shall always start from carburettor original setting, with the following preliminary conditions: perfectly clean air filter, exhaust system and carburettor. Based on the past experience, it is recommended to make any change by varying main jet, idle jet and carburettor needle jet only; any change to other components of the carburettor will not give any remarkable result.

GENERAL RULE: high altitude or temperature .....lean mixture
low altitude or temperature .....rich mixture

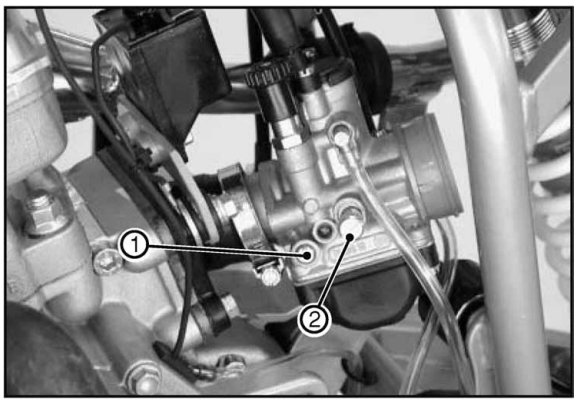
WARNING

- Use premium gasoline (no 95) only, mixed with high-quality 2-stroke engine oil. Other types of fuel can cause damage to the engine, and will also make warranty null and void.
- Use high-quality 2-stroke engine oil of well known brands, only.
- A too low oil level or a poor quality oil lead to engine early wear and, in the worst case, even to irreparable damages to the engine itself. Too much oil, on the contrary, results in high exhaust grad of smoke, and soot deposits onto spark plug.
- Should you wish to get a lean mixture, proceed with extreme care by reducing jets by one number at a time in order to prevent piston overheating and seizure.

Should engine operation still be uneven after setting change, then the possible cause could be a mechanical failure at the ignition system.

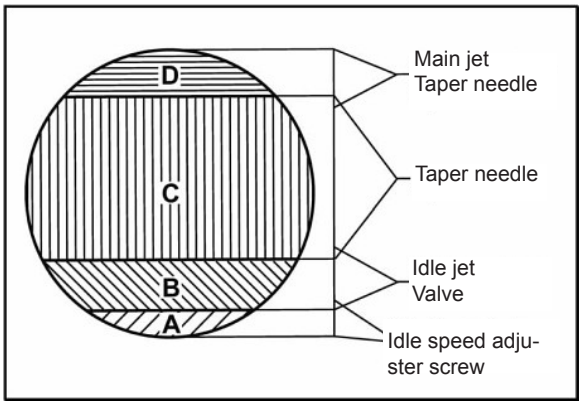
Basic indications on carburettor wear

Throttle valve, taper needle and main nozzle get worn very easily due to engine vibration. This could thus result in carburettor malfunction (ex. mixture enrichment).



Idle speed - A

Operation with closed throttle valve. Rpm value is checked by mixture adjuster screw (1) and idle speed adjuster screw (2); adjust with the engine hot, only. Turn screw to slightly increase engine rpm. Turn it clockwise to increase engine rpm; turn it counterclockwise to decrease engine rpm. Turn screw to achieve a steadier and more constant engine operation (basic setting of air adjuster screw = open by 3.5/3 turns). Turn screw again to take engine back to standard idle speed.



Valve opening - B

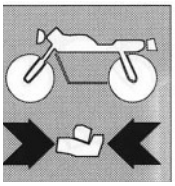
Operation with throttle valve during opening. Engine rpm is controlled by idle jet and by valve shape. If, after idle speed correct adjustment and load reduction, engine gallops, emits a lot of smoke and abruptly reaches full power at high rpm when valve is opened, this means that carburetion is too rich, namely that fuel level is too high, or that floater needle is not sealed.

Reduced load - C

Operation with throttle valve partially opened. Engine rpm is controlled by taper needle only (shape and position). Reduced load operation and low rpm are controlled by idle speed adjustment, while operation at high rpm is controlled by main jet. If engine runs with a 4-stroke cycle or at reduced power during acceleration with the throttle valve partially opened, needle shall be lowered by one notch. If engine knocks, mainly during acceleration and close to high rpm, needle shall be raised. If the above-described situations occur at reduced load lower rpm, set a leaner mixture if engine gets wet, and a richer mixture if it knocks.

Full load - D

Operation with valve fully opened. Engine rpm is controlled by main jet and taper needle. If, after a short ride with fully opened throttles, the insulation of a new spark plug is very clear or white, or if engine runs at 4 strokes, a larger main jet shall be used; if lining is dark or darkened, use a smaller main jet.



CLEANING

Clean bike at regular intervals so as to keep plastic parts surface in good conditions.
We recommend using hot water with a detergent usually available on the market and a sponge. Strong dirt can be removed with a light water jet.

Never clean the bike with a high-pressure cleaner or a strong water jet! Water high pressure could reach electric components, connectors, Bowden cable commands, bearing, carburettor, etc... and cause damage or lead to the early breakage of these parts.

- For engine washing, use cleaners available on the market. Very dirty points will have to be cleaned with a special brush.

STORAGE

Should you plan not to ride the bike for a long time, take the following actions:

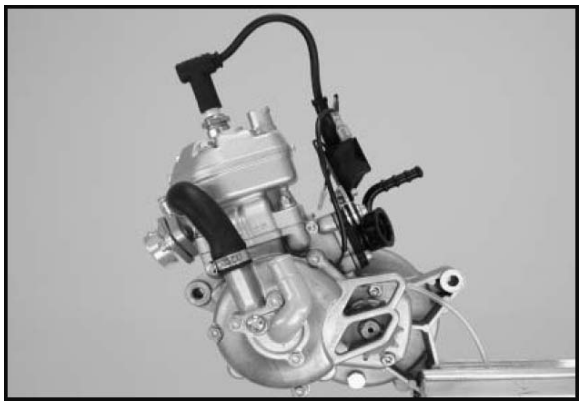
- Change engine oil, oil filter and fine mesh filter (an old oil contains harmful impurities).
- Check anti-freeze and coolant levels.
- Heat the engine up again, close fuel cock, and allow engine to turn off by itself.
  Then open the drain screw positioned onto carburettor tank to drain off also the remaining fuel.
- Remove spark plug and pour approx. 5 cc of engine oil inside cylinder through spark plug hole. Operate kick start pedal 10 times in order to let engine oil be distributed on cylinder wall, then refit spark plug.
- Drain fuel from tank, and collect it inside a special container.

It is not recommended to start the engine, just for a short time, of a bike during a long inactivity period. Engine would not heat enough up and, consequently, the water vapour created during combustion would condensate and lead to rusting of easily-oxidizable parts.

RESTART AFTER INACTIVITY

- Fill tank with new fuel

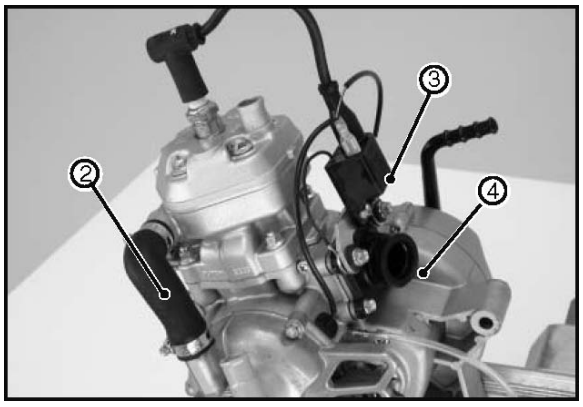
Before bike seasonal inactivity, check all parts for wear and operation. Should some maintenance, repair or change works be necessary, have them carried out during inactivity as workshops will be less busy during this period. Long waiting times at the workshops at the beginning of the season can be thus avoided.



ENGINE DISASSEMBLY

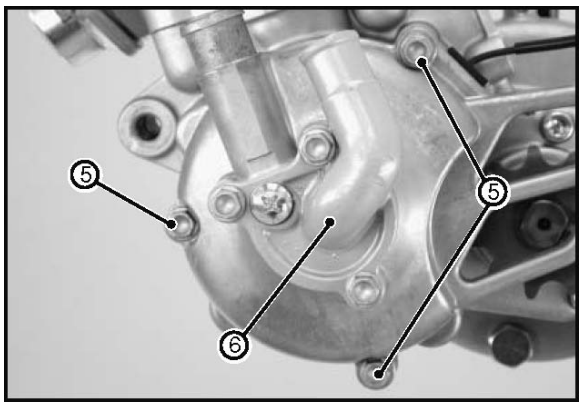
Engine locking

- Thoroughly clean engine before disassembly.
- You can vice engine locking rear support with protective jaws (see picture).



Cooling sleeve, intake flange, and ignition coil removal

- Loosen hose clamps and disconnect water sleeve (2).
- Slide pin (3) out of ignition coil, remove cap from spark plug.
- Loosen the 4 screws on intake flange (4); remove ignition coil with support, intake flange and reed unit.
- Remove spark plug.

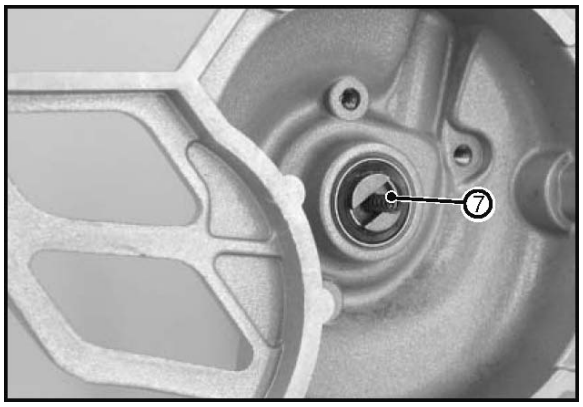


Ignition cover removal

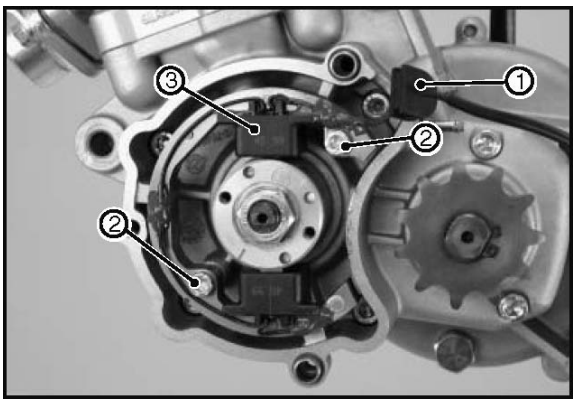
- Loosen screws (5) and remove ignition cover.

Water pump (6) is positioned outside, onto ignition cover.

- Ignition cover is centred thanks to two centring bushings that usually stay inside engine crankcase, and should be removed using suitable pliers.

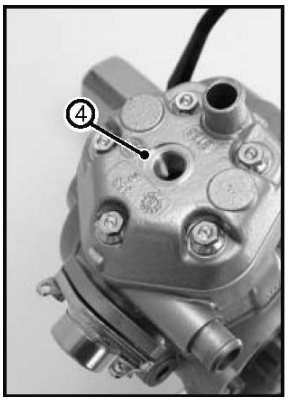


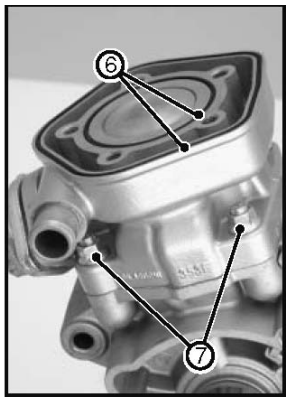
Water pump features a hole housing a spring (7).



Stator removal

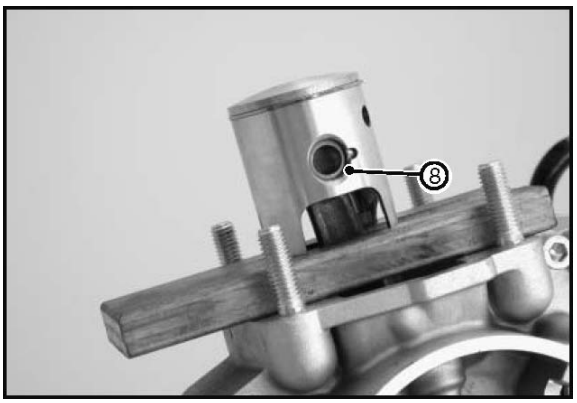
- Slide cable guide (1) out of crankcase.
- Remove TCEI (2) screws from stator (3).
- Take stator (3) out of crankcase with the utmost care.



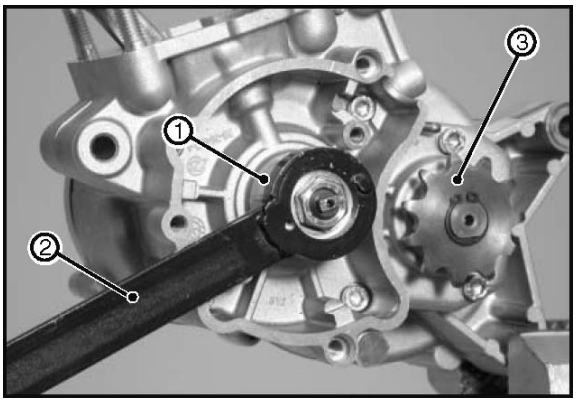


Cylinder head, cylinder and piston removal

- Working crossways, undo cylinder head screws, then remove them.
- Dispose of screw washers, and remove cylinder head (4).
- Remove and dispose of cylinder O-rings (6).
- Working crossways, loosen the 4 screws (7) at cylinder bottom, and slide cylinder out from top working with extreme care.



- Position piston on the self-manufactured wooden support.
- Using a suitable tool, remove piston pin snap ring (8).
- Separate piston pin from piston by hand, remove piston, and manually remove needle roller bearing from connecting rod.
- Remove cylinder bottom gasket.



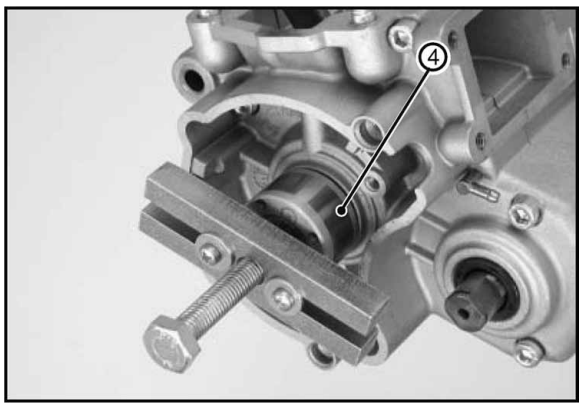
Rotor disassembly

- Lock rotor (1) with special tool (2) to prevent it from moving, open and remove nut.

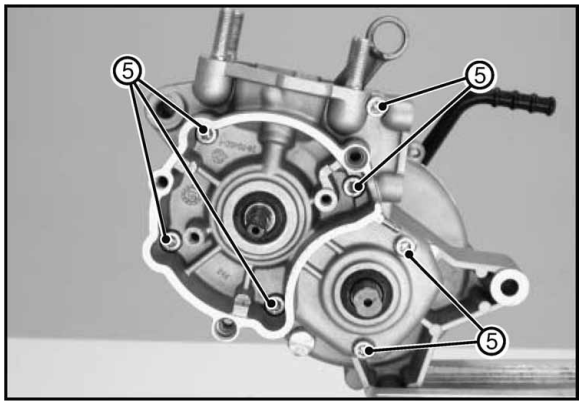
A shim, positioned under nut, is left onto rotor due to magnetic pull.

The two pins of special tool shall not engage inside threaded holes as they could damage thread, and prevent rotor removal.

- Remove circlip (3) from chain sprocket, then remove sprocket.

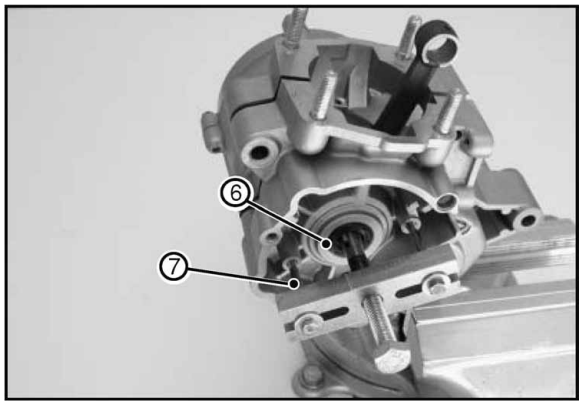


- Screw puller to rotor with 2 M4x35 screws. Slide out rotor (4) by screwing the jacking bolt.
- Remove key from keyway.



Crankcase halves splitting

- Undo and remove the seven TCEI screws (5) keeping the two crankcase halves together.

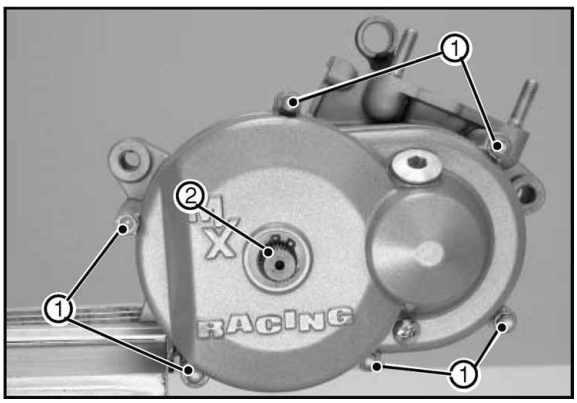


- Screw puller with two M5x50 screws (7) onto crankcase.
- With puller installed, separate crankcase halves by screwing the jacking bolt. At the same time, gently tap crankcase with a plastic hammer to prevent output shaft (6) bearing from getting stuck.

Should output shaft bearing get stuck, do not continue crankcase halves separation procedure. You should first release any tension from crankcase by gently tapping it with a plastic hammer in order to prevent any damage to crankcase.

- Separate crankcase, remove gasket, and dispose of it.

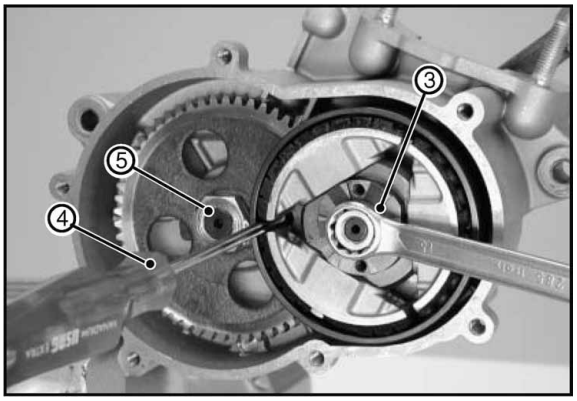
Crankcase halves are centred by two centring bushings. Remove them.



Clutch and primary drive removal

- Lock engine so as to gain access to clutch side.
- Remove kick start pedal, and remove the 6 screws (1) from clutch cover.
- Remove clutch cover, and dispose of seal.

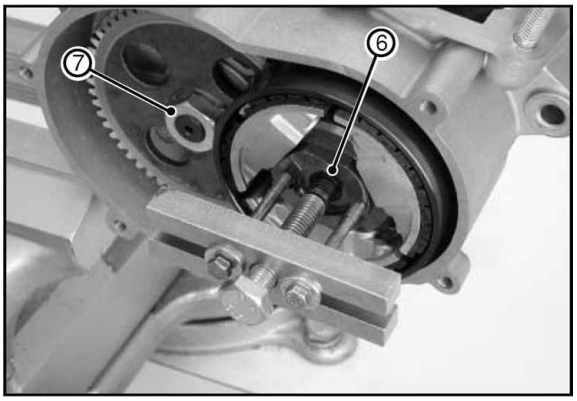
Do not remove circlip (2) to prevent kick start pedal shaft from coming out of crankcase and the corresponding spring to cause any damage.



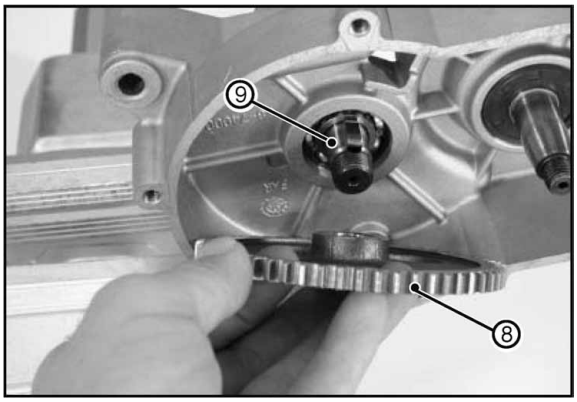
- Lock centrifugal clutch (3) using a suitable screwdriver (4).

Primary drive drum and sprocket feature some holes: screwdriver shall pass through these holes.

- Bend output shaft nut lock washer (5) edge.
- Loosen clutch nut and output shaft nut, then remove screwdriver.



- Remove nut with washer from crankshaft.
- Using some M5x50 screws, screw puller to centrifugal clutch (6), hold puller tight, and slide centrifugal clutch out of crankshaft by screwing the jacking bolt.
- Remove centrifugal clutch with bearing and shims from crankshaft.
- Remove nut (7) and lock washer from output shaft.

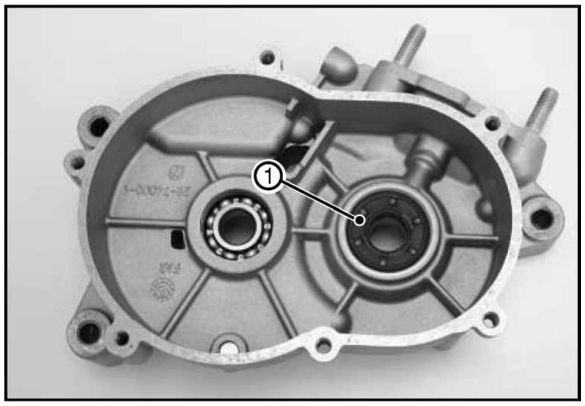


- Slide primary drive sprocket (8) out of shaft, remove key (9) from shaft keyway.
- Using a press or a suitable puller, remove crankshaft and output shaft from crankcase.

Do not remove the two shafts from crankcase with a hammer, as this could cause damage to both crankshaft and crankcase.

OPERATIONS ON THE SINGLE PARTS

Read this section at least once before starting the following operations. Then you should define the assembly order so that bearings are installed after crankcase halves have been heated one time only. To force bearings out or, if necessary, using a hammer, the corresponding crankcase half shall be laid (after having removed centring bushings) onto a flat surface wide enough so that the whole mating surface of crankcase half can well rest on it without being damaged. To this end, we recommend using a wood board. Bearings and oil seals should never be installed with a hammer and, if a press is not available, they shall be installed with the utmost care using a suitable drift. With the crankcase at a temperature of approx. 150°C, cold bearings usually come out of their seats spontaneously. If, after cooling, bearing are well locked into their seats, replace engine crankcase.

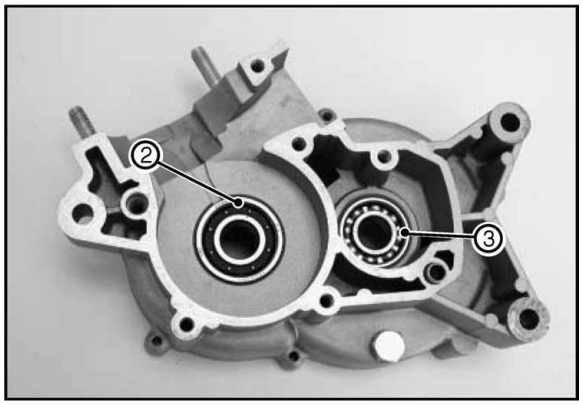


Operations on the right-hand crankcase half

Remove oil seal (1), and heat crankcase half onto an electric hob up to approx. 150° C.

If, with the crankcase at a temperature of 150 °C, you tap crankcase half on a flat wood board, bearings usually come out of their seats spontaneously. If necessary, force bearings out of their seats.

- Centring bushings shall always be removed first to prevent any damage to the crankcase.
- The tools used to force new bearings into their seats shall be manufactured so as to lay just onto bearing outer ring nut. Failure to comply with this requirement leads to bearing damage upon assembly.

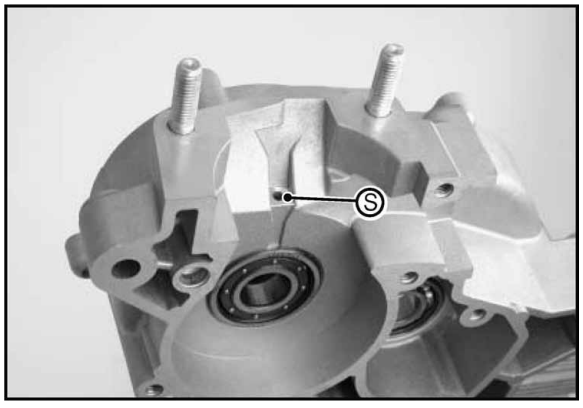


Crankshaft ball bearing (2).
With a suitable spindle, press ball bearing from the outside to the inside. Force the new ball bearing fully home from the inside.

Crankshaft ball bearing protrudes approx. 1 mm out of crankcase surface.

Output shaft ball bearing (3).
With a suitable spindle, press ball bearing from the outside to the inside.
Force the new ball bearing fully home from the inside.

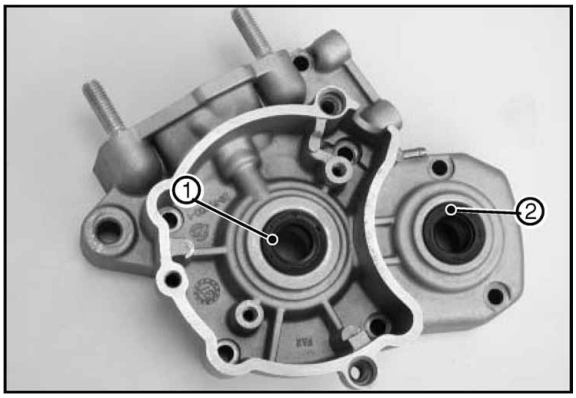
Output shaft ball bearing is levelled with crankcase surface.



Crankshaft oil seal (1).
Press the new oil seal from the outside, with sealing lip pointing in.

Oil seal is positioned approx. 1 mm below crankcase surface.

Allow crankcase to cool down, then check that all bearings are well installed into their seats.
Then check that the S lubrication hole for crankshaft ball bearing and gearbox breather union is free.

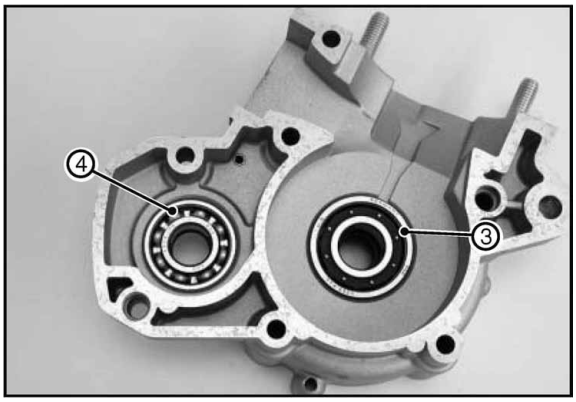


Operations on the left-hand crankcase half

Remove oil seals (1) and (2), and heat crankcase half onto an electric hob up to approx. 150°C.

If, with the crankcase at a temperature of 150 °C, you tap crankcase half on a flat wood board, bearings usually come out of their seats spontaneously. If necessary, force bearings out of their seats.

The tools used to force new bearings into their seats shall be manufactured so as to lay just ono bearing outer ring nut. Failure to comply with this requirement leads to bearing damage upon assembly.



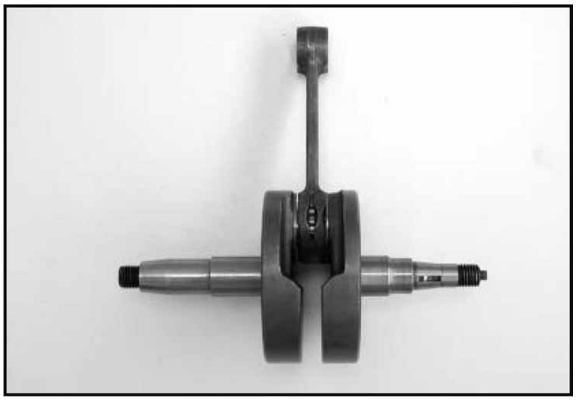
Crankshaft ball bearing (3).
With a suitable spindle, press ball bearing from the outside to the inside.
Force the new ball bearing fully home from the inside.

Crankshaft ball bearing protrudes approx. 1 mm out of crankcase surface.

Output shaft ball bearing (4).
With a suitable spindle, press ball bearing from the outside to the inside. Force the new ball bearing fully home from the inside.

Output shaft ball bearing is levelled with crankcase surface.

Crankshaft oil seal (1).
Force and level the new oil seals from the outside, with the sealing lip pointing in.
Allow crankcase to cool down, then check that all bearings are well installed into their seats.

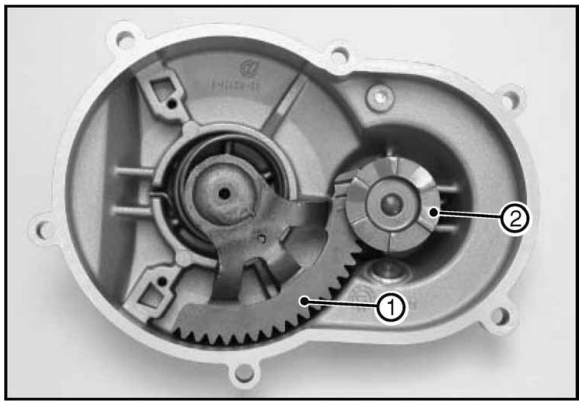


Crankshaft measurement

If the crankshaft is reused, check shaft axes offset.

Shaft axes offset 0.05 mm (0.0019 in)

Connecting rod big end bearing and mating axis can be checked only when disassembled, and this operation should thus be carried out only in a specialised workshop.



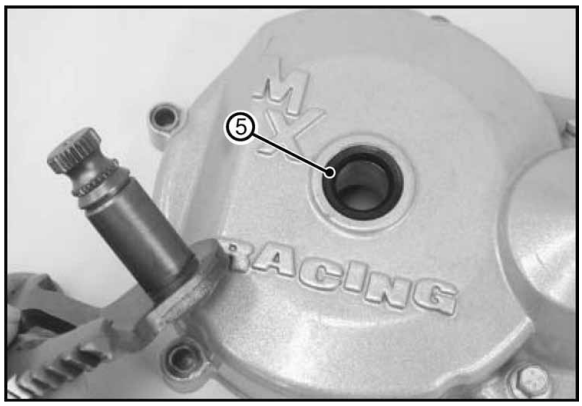
Operations on clutch cover

Clutch cover shall be removed only if some parts are faulty or if the O-ring has lost is sealing capacity.

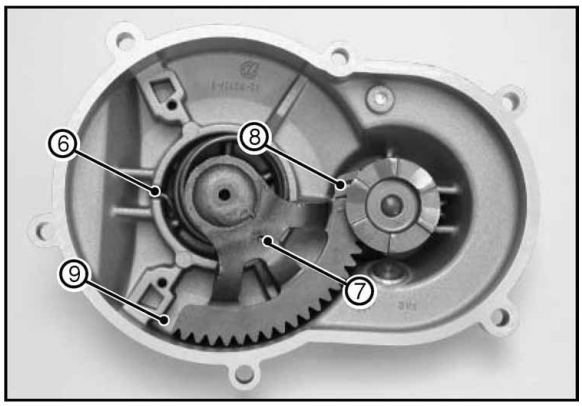
- Turn kick start pedal shaft (1) against spring strength (counterclockwise), and remove starter engagement gear (2), then check teeth for wear.

Should it be necessary to remove kick start pedal shaft, remove outer circlip and take kick start pedal shaft out from cover with extreme care.

Kick start pedal spring is preloaded so, when removing kick start pedal shaft, it shall be released.

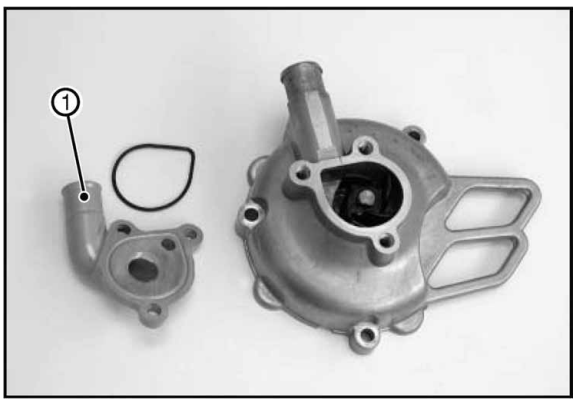


Clean kick start pedal shaft, and remove the old oil seal (5) with a suitable tool, then replace it with a new one to be pressed inside its seat flush with the surface.



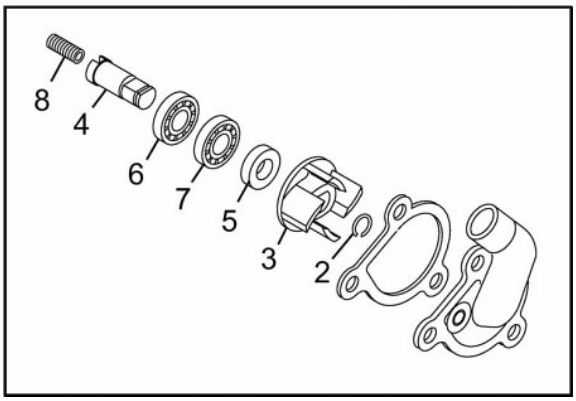
Upon reassembly, push kick start pedal shaft inside clutch cover just enough to hook spring (6 and 7). Turn kick start pedal shaft counterclockwise to load spring, and just after this operation you can fully install kick start pedal shaft inside clutch cover. Keep kick start pedal shaft turned, fit starter engagement gear, and release shaft.

To prevent kick start pedal shaft from hitting clutch cover, shaft toothing features a distorted end (8) engaging with starter gear. There shall always be a gap between kick start pedal shaft and stopper (9).



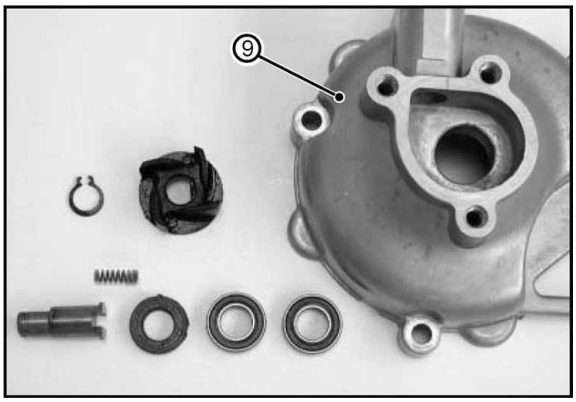
Water pump overhaul

- Remove cover (1), and dispose of O-ring.

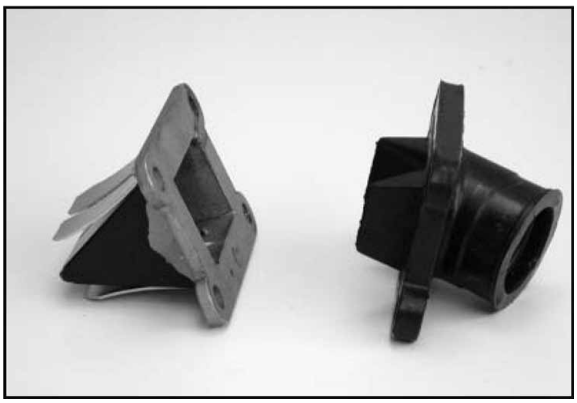


- Remove circlip (2) using suitable pliers.
- Slide water pump impeller (3) out of water pump shaft (4).
- Pull out water pump shaft (4) and the two bearings (6 and 7).
- Remove sealing ring (5).

There is a spring (8) that has to be removed before disassembly.



- Fit the new sealing ring (5) with the open side pointing water pump impeller.
- Push the two new bearings (6 and 7) onto water pump shaft (4).
- Slightly grease water pump shaft at the sealing ring, force it fully home with bearings inside ignition cover (9), and check for smooth motion.
- Fit water pump impeller, and circlip.
- Fit cover (1) with a new O-ring.
- Refit spring (8), secure it with a bit of grease inside hole, if necessary.

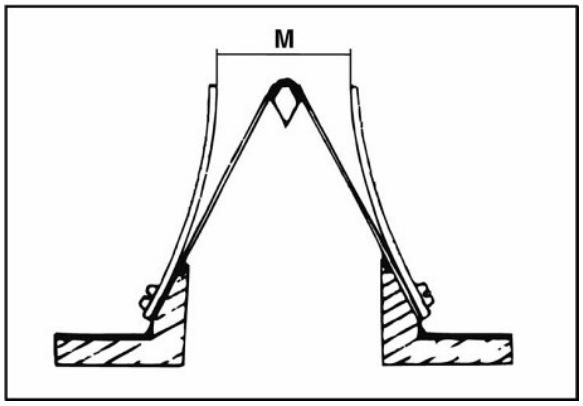


Reed unit, intake flange

Reeds loose their tensioning over time, with a consequent power loss. Damaged or worn reeds shall be replaced.
If reed crankcase sealing surfaces are also damaged, change the whole reed unit.

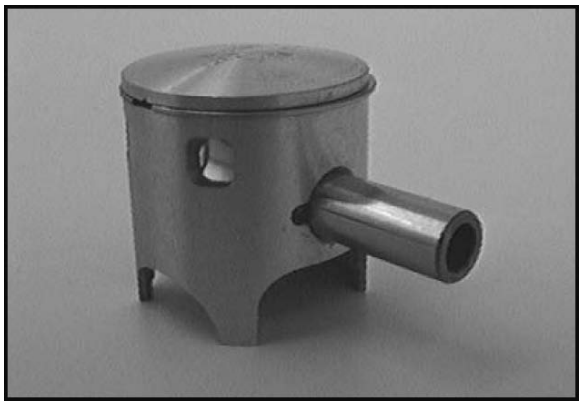
Upon reassembly, secure all reed crankcase screws with loctite 243.

Intake flange
Check for cracks or other types of damage.



Reed unit
Using a sliding gauge, measure the gap (M) between stop plates. If the measured value does not correspond to the rated value, suitably bend stop plates.

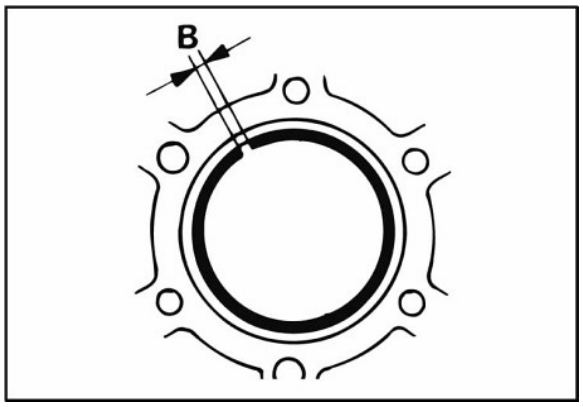
Distance M = 17 mm (0.67 in)



Piston check

If you are reusing a used piston, check the following points:

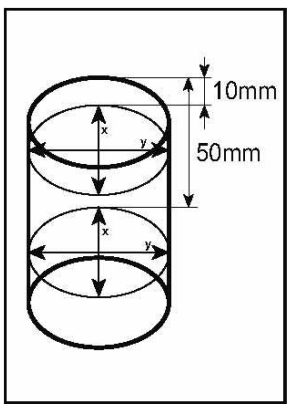
1. Check for the presence of any bruise on piston sliding surface and seizure (light signs of seizure can be eliminated with an abrasive stone).
2. Piston ring shall not be stuck in the corresponding groove. To clean piston groove, you can use an old piston ring or some abrasive paper (grain 400).
3. Piston ring anti-torsional retainer shall be securely installed inside piston, and show no signs of wear.
4. Check for piston ring wear and gap.



Piston ring gap measurement

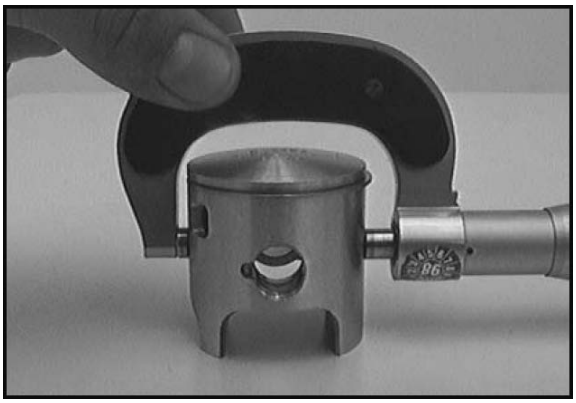
- Install ring inside cylinder, and align it with piston (approx. 10 mm (0.39 in) under cylinder upper edge).
- Using a feeler gauge, measure piston ring gap (B).
  Piston ring gap: max. 0.20 mm (0.0078 in)

Should gap be above the specified value, check piston and cylinder for wear. If piston and cylinder wear values are within tolerance, change piston ring.



Piston and cylinder measurement, piston assembly clearance definition

- Cylinder wear is determined by measuring cylinder with a dial gauge 10 mm (0.39 in) and 50 mm (1.97 in) below sliding surface upper edge.
- Measure cylinder diameter in both X and Y axes so as to detect any out-of-round.
- Piston is measured at skirt, across piston pin, approx. 32 mm (1.26 in) under piston upper edge, just above slotting.
- Piston installation clearance is calculated by deducting piston max. diameter from cylinder min. diameter.



Piston installation clearance

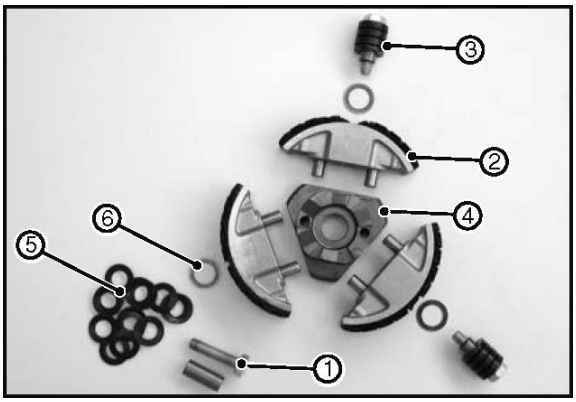
LC engine : 0.045 - 0.055 mm (0.0015 - 0.0021 in)

REF.	PISTON	LC CYLINDER
A	39.455 - 39.460 mm 1.553 - 1.554 in	39.505 - 39.510 mm 1.555 - 1.556 in
B	39.461 - 39.465 mm 1.5536 - 1.5537 in	39.511 - 39.515 mm 1.5556 - 1.5557 in
C	39.466 - 39.470 mm 1.5538 - 1.5539 in	39.516 - 39.520 mm 1.5557 - 1.5559 in
D	39.471 - 39.475 mm 1.554 - 1.5541 in	39.521 - 39.525 mm 1.5559 - 1.5561 in

When changing piston and cylinder, make sure that they bear the same marking.
The corresponding marking (A - D) is stamped on piston crown and cylinder skirt.

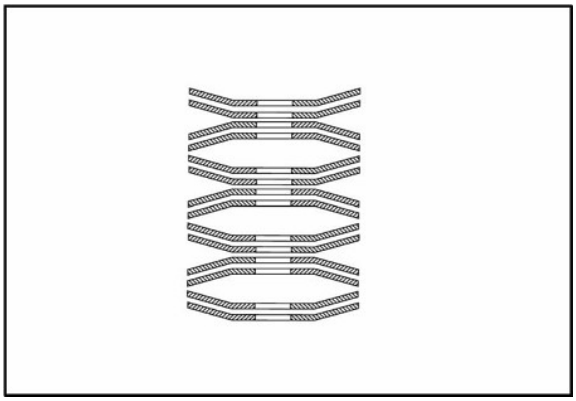
The tolerance limits of the relevant components are specified in the above table.

Always make sure that an installation clearance of at least 0.045 mm (0.00177 in.) is present.



Centrifugal clutch overhaul

- Loosen TE screws (1) from clutch shoes (2), and remove them together with spring packs (3) from clutch hub (4).
- Remove TE screws with bushings and spring packs from clutch shoes.

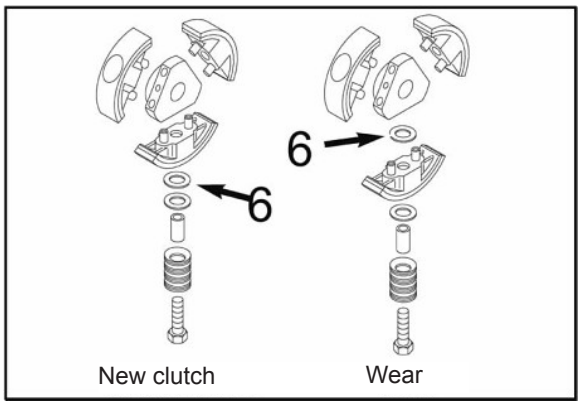


Spring packs consist of 14 Belleville washers (5), which shall be over-stacked as shown in the picture.

- Between spring packs and shoes, there are washers (6) to be used for clutch spring preloading.

Engagement rpm can be varied through spring packs preload. a preload increase of 0.5 mm results in an engagement rpm increase of approx. 500 rpm.

- With engagement rpm, we mean the number of revolutions at which clutch starts engaging, and the bike starts running.
- Check engagement rpm on the rev. counter and, if necessary, adjust it at 8,500 - 9,000 rpm.



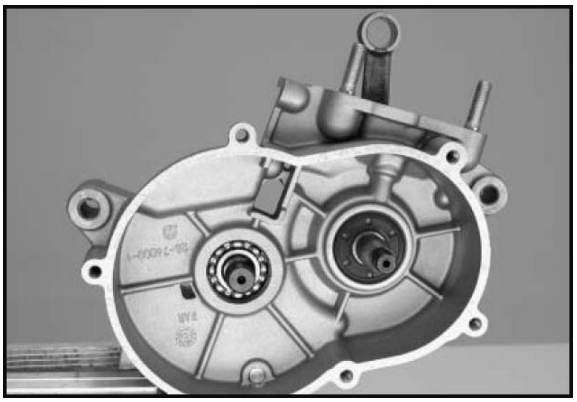
Clutch wear compensation

- Check clutch shoes for wear. If seals show just minor signs of wear, they can be refit.

- New centrifugal clutch has an outer diameter of approx. 82.5 mm (3.25 in).
- To compensate for a slight seal wear, you can add one of the preloading washers (6) of each pack between clutch hub and shoes - see figure.
  If a single washer is assembled, it can be used to this end.
- Centrifugal clutch drum inner diameter shall not exceed 84.4 mm (3.32 in) (84.0 mm (3.31 in) when new).
- Whenever carrying out any maintenance or repair work on clutch, make sure that spring packs are free from any dirt, as serious failures may arise.

Reassemble all parts, in the reverse order compared to disassembly.
TE screws (1) shall be secured with Loctite 243 (12 Nm / 12 Kgm / 8.85 ft/lb).

ENGINE REASSEMBLY

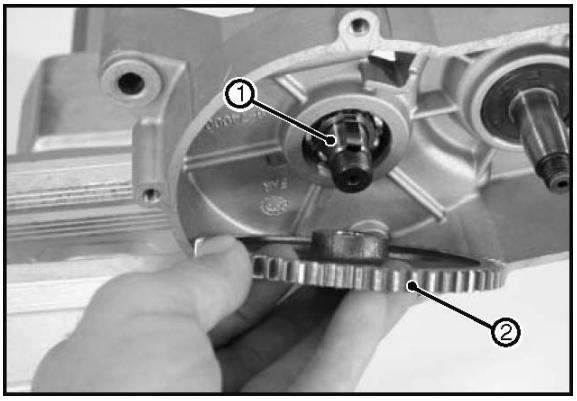


Crankshaft and output shaft assembly

- Heat right-hand side crankcase half on an electric hob.
- Oil the two bearings, and slightly grease oil seal.
- Install output shaft and crankshaft inside bearings.

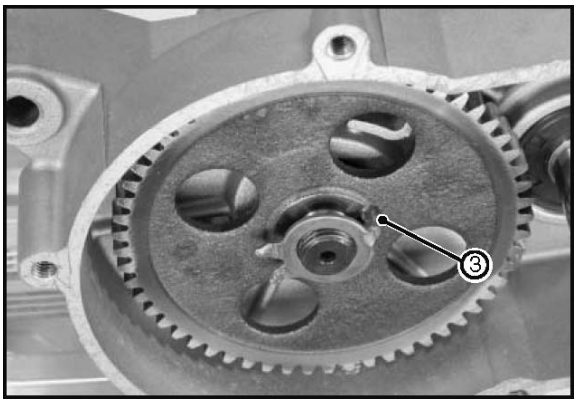
Connecting rod shall be positioned almost vertically.

Do not force the two shafts inside bearings using a hammer, as this could result in bearings and crankshaft damage.



Primary drive assembly

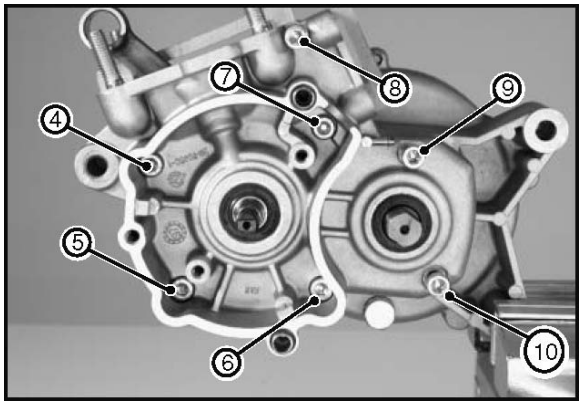
- Insert key (1) inside output shaft keyway.
- Install primary drive sprocket with the collar side (2) on output shaft.



- Install nut lock washer.

Lock washer prong (3) shall engage inside primary drive sprocket hole.

Screw nut M14x1.25.



Left-hand crankcase half assembly

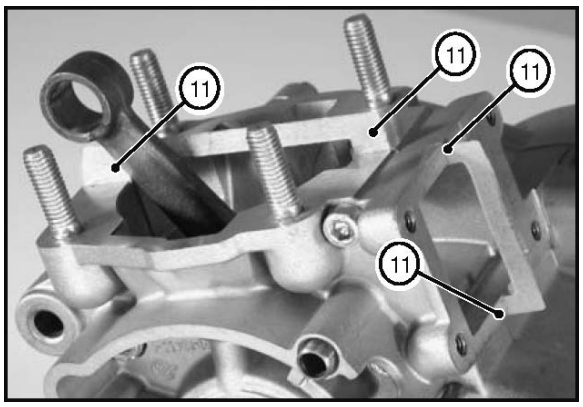
- Fit the 2 centring bushings 7x9x10, and install a new seal.

Seal is cut to size only after left-hand crankcase installation.

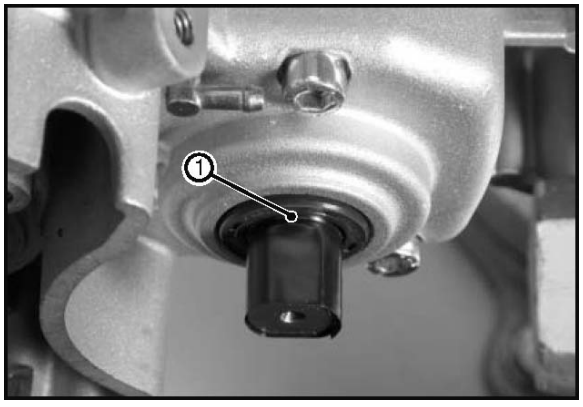
- Heat left-hand crankcase on an electric hob and assemble it.
- Screw the 7 TCEI screws.

Screws 4, 8 and 10 are M6x40; screws 5, 6, 7 and 9 are M6x35.

- Tighten screws (4-5-6-7) working crossways. Tightening torque 10 Nm / 1.0 Kgm / 7.38 ft/lb.
- Tighten screws (8-9-10) to a torque of 10 Nm / 1.0 Kgm / 7.38 ft/lb.
- Using a plastic hammer, gently tap crankcase at the bearings in order to release any tension.
- Turn the two shafts to check that they move smoothly.



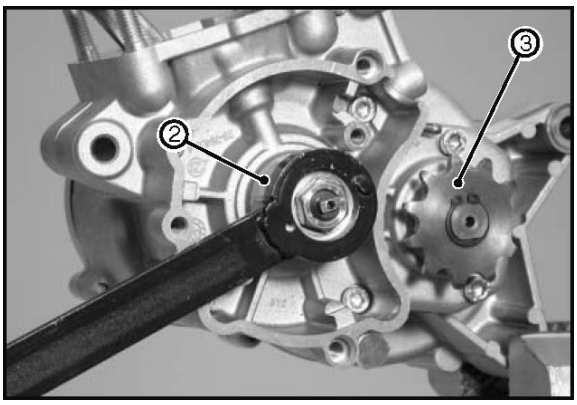
- Using a sharp knife, cut the protruding seal (11) flush with the edge.



- To prevent any damage to oil seal, wind some adhesive tape around output shaft square edge (1).

Insulating tape should just reach the square edge in order to be easily removable after oil seal assembly.

- Slightly grease oil seal lip, and force it inside crankcase.
- Remove insulating tape with extreme care.

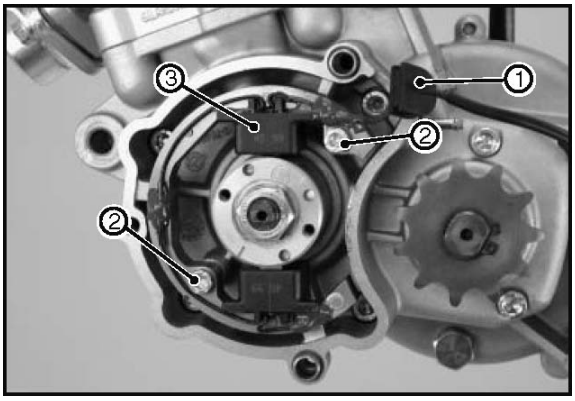


Ignition assembly

- Insert key inside crankshaft groove.
- Fit rotor (2) with washer, counteract with the special tool, secure nut in place with Loctite 243, and tighten to 20 Nm / 2.0 Kgm / 14.75 ft/lb.

Special tool pins shall not engage inside rotor threaded holes, as they would cause damage to threads.

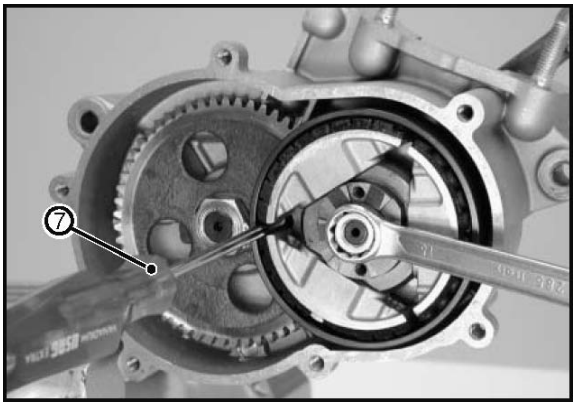
- Slide chain sprocket (3) with collar pointing back onto output shaft, and fit circlip.



- Fit stator (4) inside crankcase.

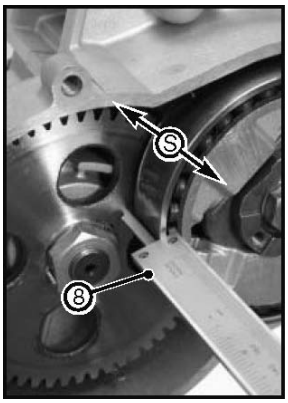
To make assembling operations easier, you can slightly compress stator with your fingers. Before screwing it, check for its correct seat. Stator shall neither tilt nor get stuck.

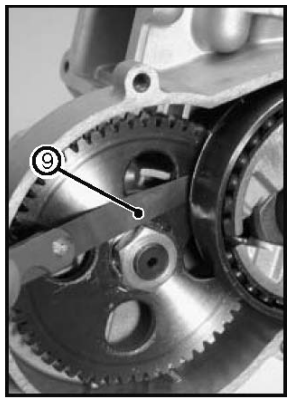
- Lock stator hexagon socket head cap screws M5x25 (5) with Loctite 243, and tighten them to a torque of 8 Nm / 0.8 Kgm / 5.9 ft/lb.
- Position cable guide (6).



Clutch assembly

- Insert shim(s) (25x15) onto crankshaft, fit needle roller bearing, and centrifugal clutch drum.
- Fit centrifugal clutch.
- Using a suitable screwdriver (7), lock centrifugal clutch, drum and primary drive sprocket.
- Lock crankshaft nut M10x1.25 with Loctite 243, and tighten to a torque of 35 Nm / 3.5 Kgm / 25.81 ft/lb.
- Tighten output shaft nut to a torque of 40 Nm / 4.0 Kgm / 29.50 ft/lb.
- Bend output shaft nut lock washer.

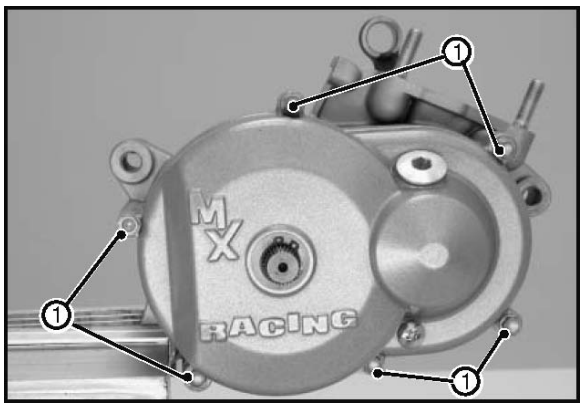




To ensure centrifugal clutch correct operation, there shall be an axial clearance S of 0.2 - 0.7 mm (0.01 - 0.03 in) between drum and clutch unit.

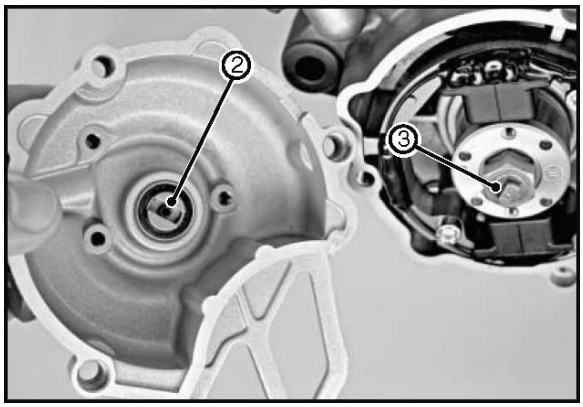
- Using a slider gauge (8), measure drum axial clearance:
  press drum towards primary drive sprocket, and measure the distance between drum upper edge and primary drive sprocket.
  Then remove drum from primary drive sprocket, and repeat measurement; the difference between the two readings corresponds to drum axial clearance.
- Using a feeler gauge (9), measure the distance between drum and primary drive sprocket: it should be at least 0.5 mm (0.02 in).

If the axial clearance or the distance are not within tolerance, compensate with shims. Shims are available with different thicknesses.



Clutch cover assembly

- Fit the new gasket, and assemble the clutch cover.
- Screw clutch cover with 6 screws M6x25 (1), tighten screws to a torque of 10 Nm / 1.0 Kgm / 7.38 ft/lb.



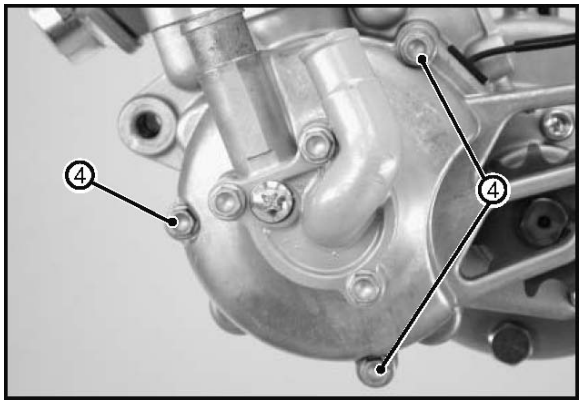
Ignition cover

- Fit centring bushings 7x9x10.
- Align water pump control drive groove (2) with the corresponding mark (3) on crankshaft.

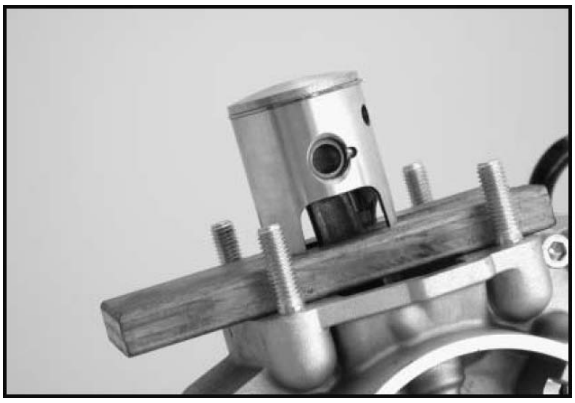
Make sure that spring is assembled inside water pump shaft.

- Fit cover and turn it over with alternate motion, until pump control starts engaging.

Do not attempt forcing ignition cover, as some parts could be damaged.

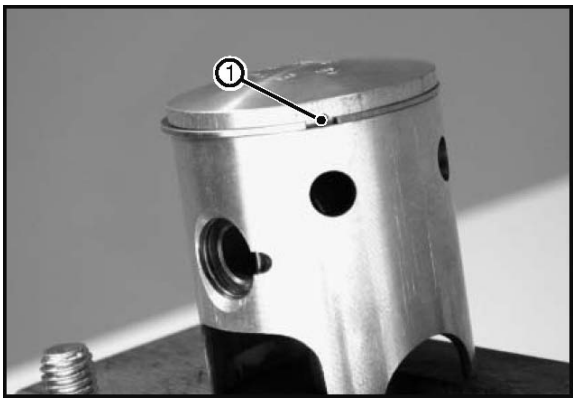


- Screw ignition cover with the three TE screws TE M6x25 (4) to the tightening torque of 10 Nm / 1.0 Kgm / 7.38 ft/lb.



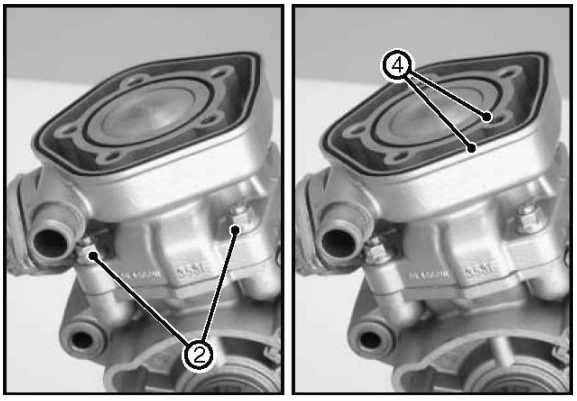
Piston assembly

- Secure connecting rod with the wooden support.
- Oil connecting rod small end bearing, and install it inside connecting rod small end.
- Lay down piston, the arrow on piston crown indicates exhaust groove direction.
- Manually slide piston pin inside connecting rod small end, and fit piston pin retaining ring with the open side facing down.

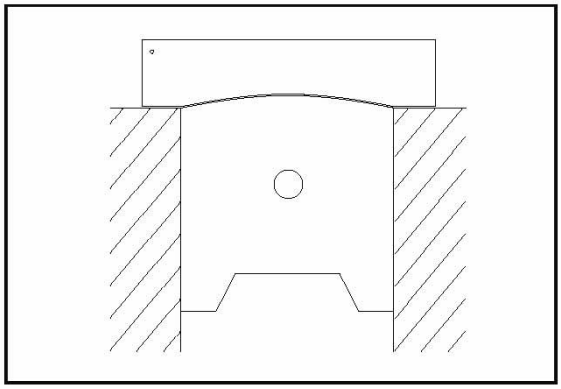


- Turn piston ring so as to make antitorsional piston ring engage inside piston ring opening (1).
- Fit cylinder bottom gasket, compress piston ring by hand, and install oiled cylinder onto piston.

If neither piston, nor cylinder, crankshaft, engine crankcase have been changed, you can use a gasket having the same thickness as before.



- Working crossways, tighten flanged nuts (2) at cylinder bottom to a torque of 18 Nm / 1.8 Kgm / 13.28 ft/lb.
- Install new O-rings (4) inside grooves.



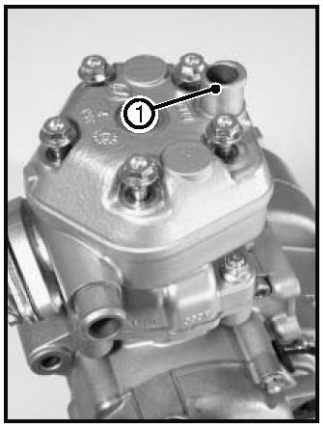
"X" size adjustment

- "X" is the size between piston upper edge and cylinder upper edge, with the cylinder tightened, and the piston at T.D.C.
- Adjust "X" size with the utmost care, by placing in-between cylin der bottom gaskets having different thicknesses.

If "X" size is too high, i.e. if there is a gap between piston and gauge, engine compression will decrease, and engine will lose power. If "X" size is adjusted at too a low value, i.e. if there is a gap between cylinder and gauge, engine will knock and overheat.

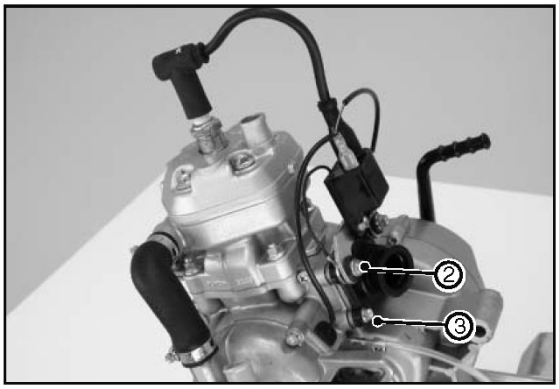
- Position gauge onto cylinder and move piston at T.D.C. (see drawing). When "X" size is correctly adjusted, gauge will rest on both piston and cylinder without any gap.
- Adjust "X" size by adding or removing cylinder bottom gaskets.

To increase "X" size, add cylinder bottom gaskets, while to decrease it, remove some of them.



Cylinder head assembly

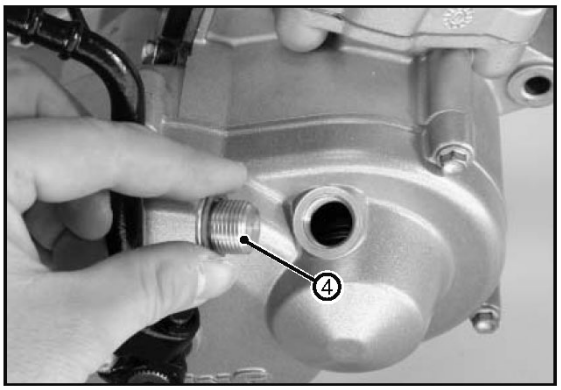
- Position cylinder, water fitting (1) shall be on intake side.
- Use new sealing washers on cylinder head screws, tighten cylinder head screws working crossways and in two steps to a torque of 15 Nm / 1.5 kgm / 11.06 ft/lb.



Water pipe, intake flange and ignition coil assembly.

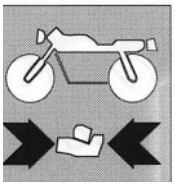
- Connect water pipe and tighten hose clip.
- Fit reed unit and intake valve with a new seal.

- Longer screws (M6x40) (2) are screwed inside upper holes; even support and ignition coil ground connection are secured with these screws.
- Shorter screws (M6x20) (3) are screwed inside lower holes.
- Intake flange points chain sprocket.
- Screw spark plug, install cap, and connect ignition system connector to coil, fit kick start pedal, and gearbox breather tube.



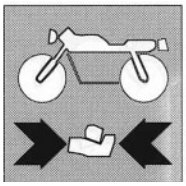
Gearbox oil filling

- Make sure that gearbox oil drain screw is tightened to 15 Nm / 1.5 kgm / 11.06 ft/lb.
- Remove oil filling screw (4) and fill with 150 to 200cc of Dexron II of gearbox oil, refit oil filling screw, and tighten to 5 Nm / 0.5 kgm / 3.69 ft/lb.



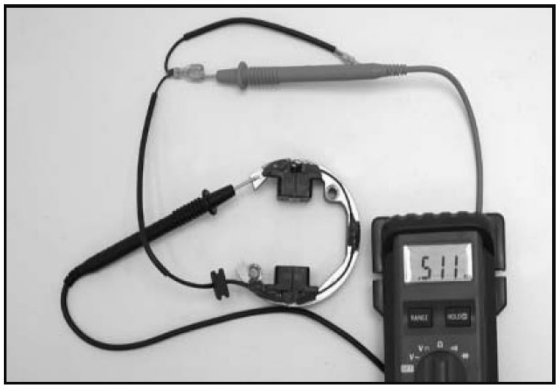
TROUBLESHOOTING

FAULT	CAUSE	REMEDY
Engine does not start	Command error	Open fuel cock, top up fuel, open air with the engine cold.
	Interrupted fuel supply	Disconnect fuel pipe from carburettor, put it inside a container, and open fuel cock: - if some fuel pours out, clean carburettor - if no fuel pours out, check tank breather, and clean fuel cock.
	Electrode gap too high	Decrease electrode gap (0.6 mm)
	Fouled, wet spark plug or with bridge electrodes	Clean or change spark plug.
	Faulty spark plug cap or spark plug	Remove spark plug, connect ignition cable, keep spark plug still to ground (naked point on engine) and start engine; with this procedure spark plug should release a very strong spark. - if spark plug does not release any spark, disconnect spark plug cap from ignition cable, keep it approx. 5 mm away from ground, and operate kick start pedal. - if now a spark is visible, replace spark plug cap. - if even now no spark is visible, have the ignition system checked.
	Scratched ground cable Faulty ground push-button	Disconnect ground push-button black cable from ignition coil, and check spark. If spark is OK, repair the faulty cable section or the ground push-button.
	Loose or oxidised ignition system connectors	Check connectors and smear them with waterproof spray.
	Spark is too weak	Check ignition system.
	Water inside carburettor or clogged jets	Remove and clean carburettor.
	Idle speed adjuster screw not adjusted	Adjust idle speed again, or replace idle speed adjuster screw.
Engine does not run at idle speed	Faulty ignition system	Check ignition system.
	Wear signs	Overhaul engine
	Moved air filter	Clean or replace filtering element



FAULT	CAUSE	REMEDY
Too low engine power	Fuel supply partially interrupted or pipes not correctly positioned	Blow through fuel duct, and clean carburettor.
	Loss of compression due to a loose spark plug	Tighten spark plug.
	Exhaust pipe bent or faulty	Check exhaust pipe for any damage.
	Reed plates without tension or reed crankcase sealing surfaces or reed plates damaged	Change reed plates or reed crankcase.
	Wear signs	Overhaul engine
Engine rpm do not increase and engine runs at four strokes	Carburettor overflows due to a too high level adjustment, floater needle seat is dirty or worn	Clean carburettor, change floater needle, if necessary, and adjust level
	Loose carburettor jets	Tighten carburettor jets
Engine misses at high rpm	Spark plug has a poor quality or a wrong heat rating	Use one of the spark plugs listed in the "Technical Specifications"
	Loose or oxidised ignition system connectors	Check connectors, and seal them with silicone
Engine misfires	No fuel	Clean fuel ducts, check tank breather hose, and clean fuel
	The installed spark plug has a wrong heat rating (self-ignition)	Use one of the spark plugs listed in the "Technical Specifications"
	The engine intake is incorrect.	Check cylinder and carburettor tightening, check that intake flange does not show any crack
The engine overheats	No fluid inside cooling system	Top up coolant. Check cooling system sealing.
	Very dirty radiator fins.	Clean radiator fins with a soft jet of water.
	Foam inside cooling system	Change coolant, use branded anti-freeze and antirust additive.
	Bent water pipe	Fix water pipe.
	Wrong advance due to loose stator	Tighten screws, and secure them with Loctite 243
	Compression adjustment too high	Correctly adjust compression.
White smoke release (vapour inside exhaust gases)	Faulty cylinder head or gasket (and O-rings)	Check cylinder head, and change cylinder head gasket (with O-rings), if necessary

FAULT	CAUSE	REMEDY
Gearbox oil coming out of breather pipe	Too much gearbox oil	Correct gearbox oil level.



IGNITION SYSTEM VALUES READING.

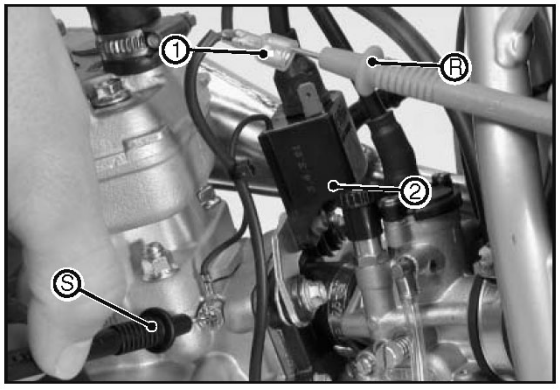
Stator

- Disconnect stator connector and, using a digital multimeter, measure stator resistance.
- Resistance shall be 500 Ω ± 40 Ω at 20°C.

There is no need to remove stator to make this reading.

Ignition coil

- Undo spark plug cap.
- Measure coil secondary side resistance between high voltage cable and ignition coil ground.
- Resistance shall be 2250 Ω ± 250 Ω at 20°C.

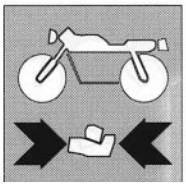


Ignition static parameters measurement with peak voltage adapter.

Measurement conditions:
- cold engine
- saddle and tank removed from bike
- all coupling contacts and ground connections without any corrosion.
- for each measurement, strongly press kick start pedal all the way down at least 5 times.

Check pulse transmitter / charge coil on output signal - unipolar connector (1):

- Position peak voltage adapter R red pushrod onto connector, S black pushrod to ground, and connector 1 disconnected from ignition coil (2): reading on the multimeter: 270 volt ± 10 volt
- same measurement, but with connector (1) connected to ignition voltage: reading on the multimeter: 270 volt ± 10 volt.



ENGINE - TECHNICAL DATA

Engine type ..... 2-stroke Otto single-cylinder with reed infeed
Bore x stroke ..... 39.5 x 40 mm
Displacement ..... 49 cm^3
Carburettor ..... Dell'Orto PHBG 19
Lubrication ..... mixture lubrication
Fuel supply ..... NO 95 unleaded premium gasoline and 2-stroke high-quality oil mixture
Mixture ratio ..... 3% during running-in
2% after running-in

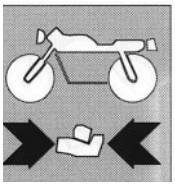
Primary drive ..... Spur gear,16: 57 Z ratio
Cooling liquid ..... cooling with 0.5 litres, consisting of 50% antifreeze, 50% distilled water, at least -25°
Air filter ..... wet with sponge
Spark plug ..... NGK BR 8 ECM electrode gap 0.6 mm
Gearbox oil ..... 150 cc of oil for automatic transmission
Main bearings ..... 2 ball bearings
Connecting rod big end bearing ..... needle roller bearing
Connecting rod small end bushing ..... needle roller bearing
Piston rings ..... 1 R piston ring

ORIGINAL CARBURETTOR SETTING

MODEL	CR 50
Carburettor type	Dell'Orto PHBG 19
Main jet	85
Main nozzle	260 AU
Idle jet	48
Taper needle	W9
Needle position	3.
Open mixture adjuster screw	3.0
Throttle valve	60
Start jet	60

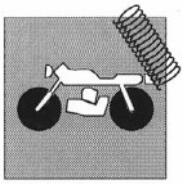
TOLERANCE AND ASSEMBLING CLEARANCES

DESCRIPTION	SUBJECT	VALUES
Crankshaft shaft axes offset	-	max 0.050 mm
Handwheels outer measurement	-	38 mm ± 0.05 mm
Connecting rod big end bearing	Radial clearance	max 0.030 mm
Piston	Assembly clearance	0.045 - 0.055 mm
Piston ring	Gap	max 0.20 mm
Clutch shoes	Outer diameter	82.5 mm (new)
Clutch drum	Diameter	max 84.4mm (84.00-84.01)
Spring min. length	-	19.6 mm

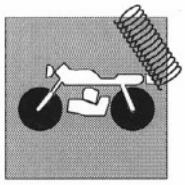


ENGINE TORQUE FIGURES

DESCRIPTION	SUBJECT	VALUES
Primary drive sprocket nut	M14x1.25	40 Nm
Ignition rotor nut	M10x1.25	20 Nm
Clutch hub nut	M10x1.25	Loctite 243 + 35 Nm
Cylinder head screw	M6	Loctite 243 + 12 Nm
TE screw - clutch shoes	M7	15 Nm
Cylinder bottom nut	M8	18 Nm
Stator TCEI screw	M5	Loctite 243 + 8 Nm
Gearbox oil filling screw	M16	5 Nm
Oil drain screw	M10	15 Nm
Other engine screws	M5	7 Nm
Other engine screws	M6	10 Nm
Other engine screws	M8	30 Nm



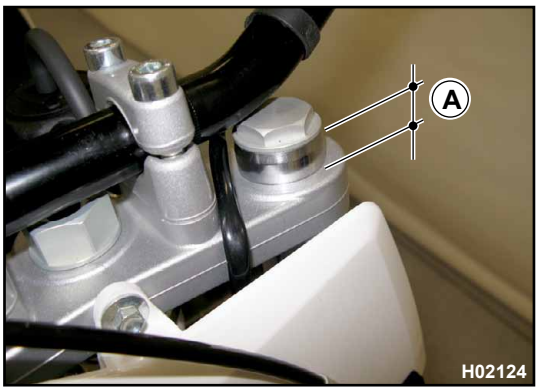
Section



FRONT SUSPENSION

CR 50

SM 50

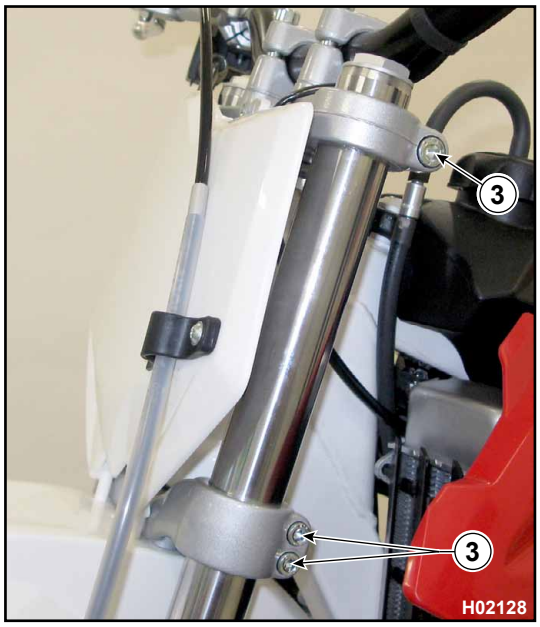


Front fork removal

Measure height "A" (it will need to be restored to original value on assembly). Set a block under the engine and see that the front wheel is lifted from the ground and then proceed as follows:

- Remove the screw (1) and the brake line clamp on the left-hand side;

- Remove the brake calliper from the L.H. fork leg loosening the two retaining screws (2);
- Remove the front wheel as described in Section "Y";



- Loosen the bolts (3) that secure the fork legs to steering head and bottom yoke;
- Remove the fork legs.

Refit fork legs and front wheel as described in Section "Y".

Set height "A" back to original value.

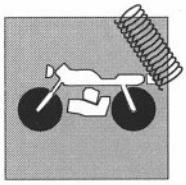
Fork spring specifications

Length = 350 mm

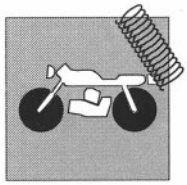
Ø outer = 26 mm

Ø inner = 19.4 mm

Constant K = 0.2 Kgm



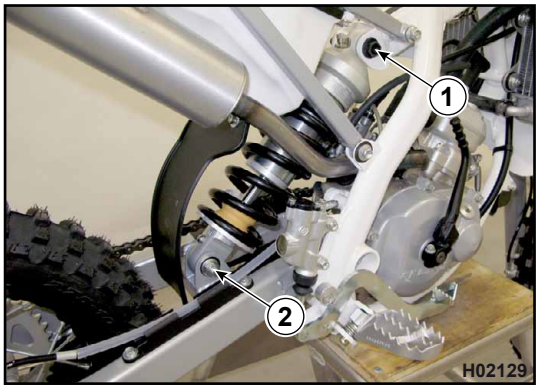
Section J



REAR SUSPENSION

Rear shock absorber

TIGHTENING TORQUE FIGURES
1-2= 40 Nm/ 4 Kgm/ 29.50 ft/lb

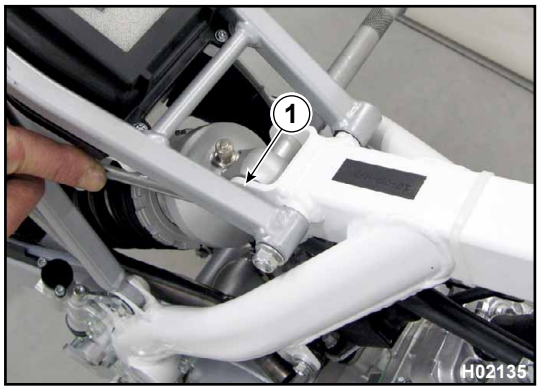


Rear suspension

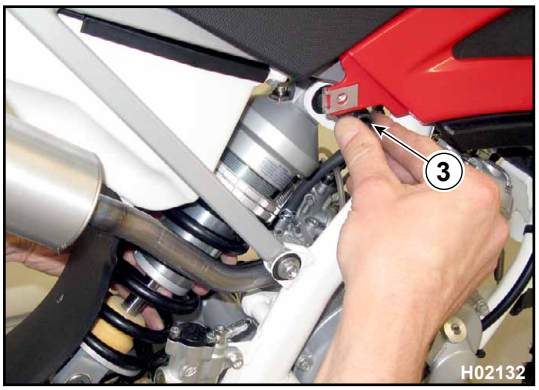
The suspension of this motorcycle consists of a shock absorber and a swinging arm. The spring preload of the shock absorber can be adjusted to suit riding and terrain conditions. Hydraulic damping is also adjustable using outer adjuster screws. Periodically check all components for wear.

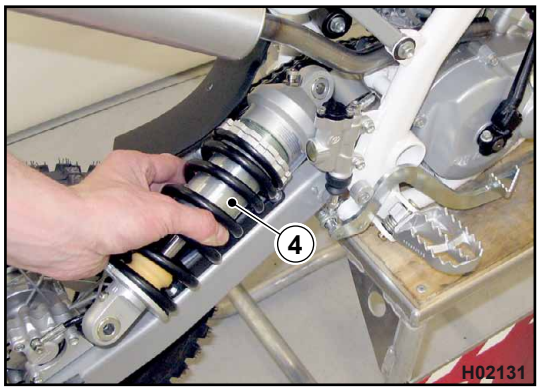
Rear shock absorber removal

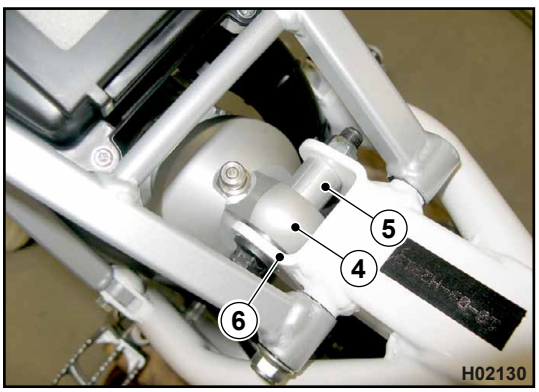
- Remove the side panels as described in the relevant paragraph.
- Using two 14 mm ring wrenches, loosen nuts (1) on shock absorber pins, leaving these latter in their seat.



- Slightly lift rear wheel, and remove lower pin (2).
- Remove upper pin (3), and shock absorber (4).



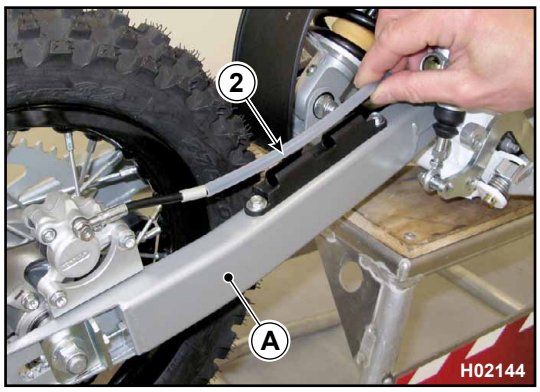




Upon reassembly, position spacer (5) again onto upper pint between shock absorber (4) and chassis (6).
Upon reassembly, insert upper pin (3) from the right to the left, and the lower pin (2) from the left to the right.

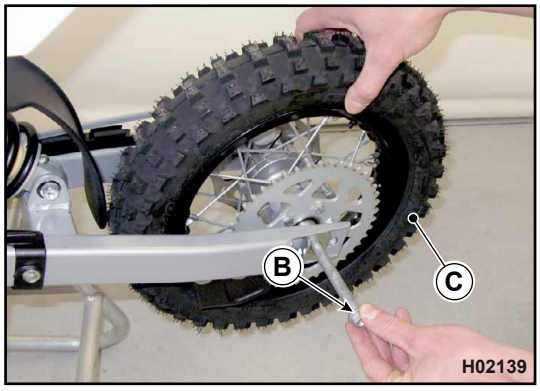
Disassembling and servicing the swinging arm

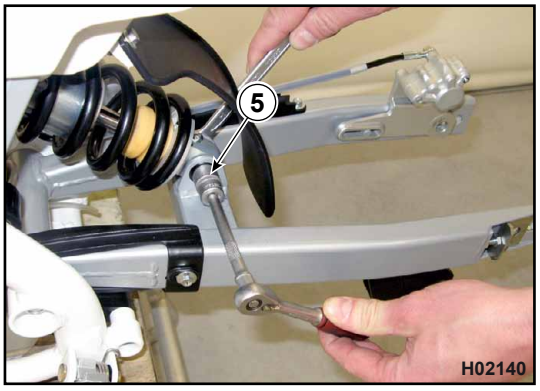
- Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.
- Remove the secondary drive chain (1) and detach the rear brake line (2) from the swinging arm (A).

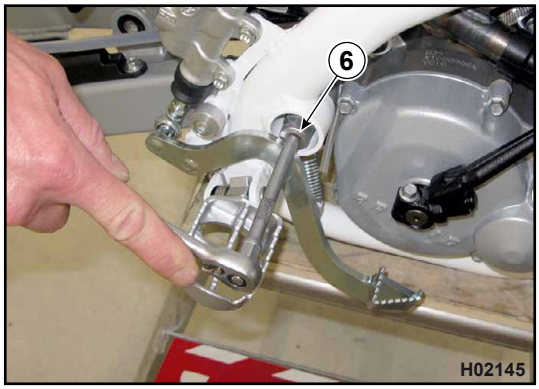


- Remove the wheel axle nut (3) and the wheel axle (B). There is no need to loosen the chain tensioners (4) on the swinging arm; in this way, the chain tension will remain unchanged after reassembly.

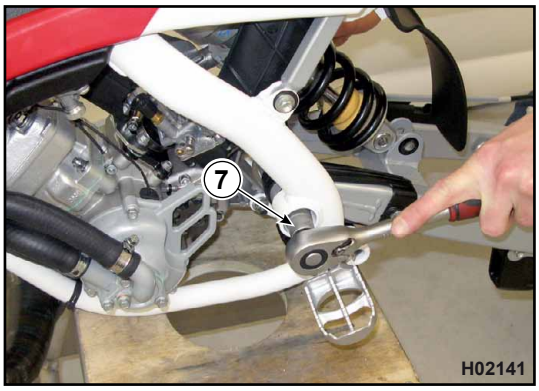
- Remove the complete wheel (C).
- Remove shock absorber lower shaft (5).

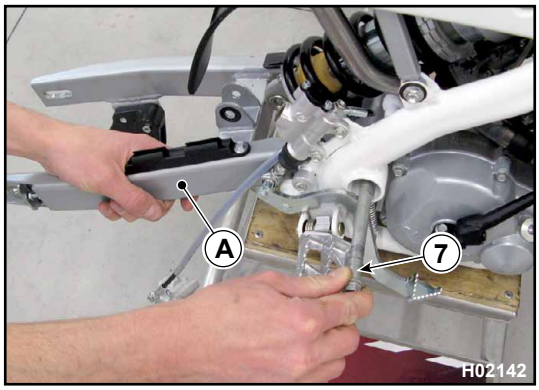


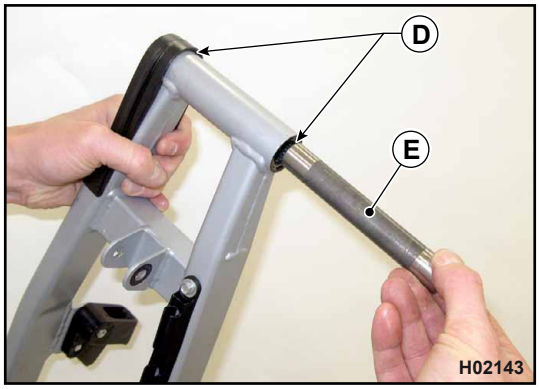




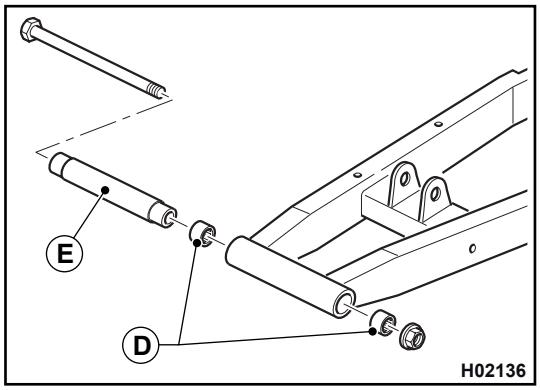
- With a 17 mm socket wrench on the left side and a 14 mm socket wrench on the right side, remove nut (6) from swinging arm shaft (7), and then remove swinging arm (A).



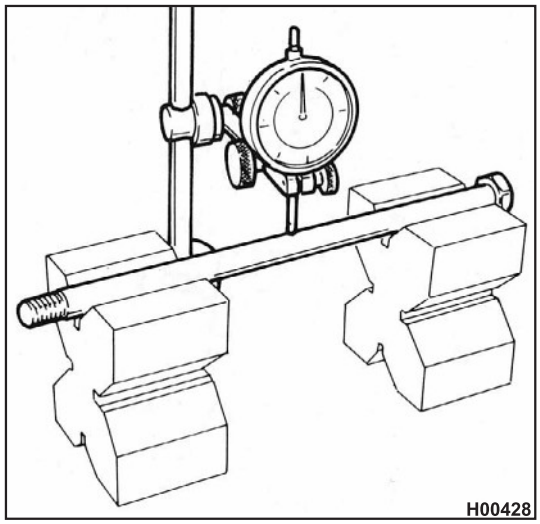




- Check swinging arm shaft straightness, and slide out spacer (E).
- Check roller cages (D) and spacer (E) for wear; turn the bushing inside the roller cage: if you feel any tightness or hear noise, replace them.

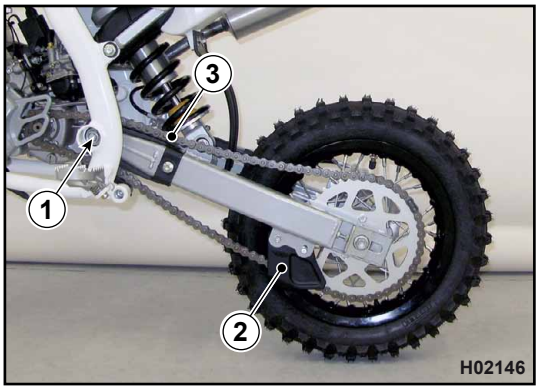


TIGHTENING TORQUE FIGURES
5-6 =80 Nm / 8 Kgm / 59 ft/lb



Servicing the swinging arm shaft

Check shaft taper using a dial gauge. Place the shaft on two identical reference blocks. Turn the shaft and move the dial gauge horizontally to determine the amount of distortion.
Service limit: 0.30 mm.



Chain roller, chain guide, chain slider

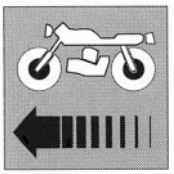
Check the wear of the above-mentioned elements and replace them when necessary.

Check the chain guide alignment, and remember that a bent element can cause chain early wear. In this case, chain might unwrap from the sprocket.

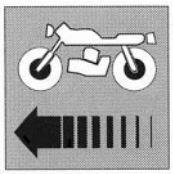
1 Chain roller

2 Chain guide

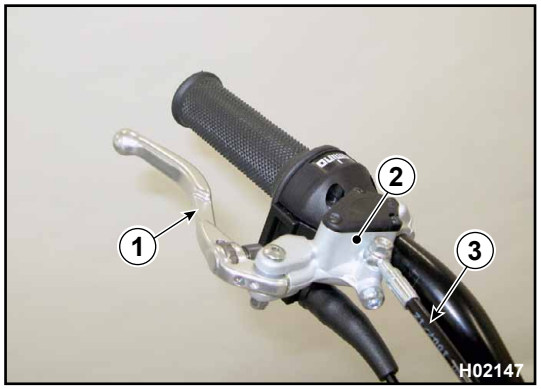
3 Chain slider

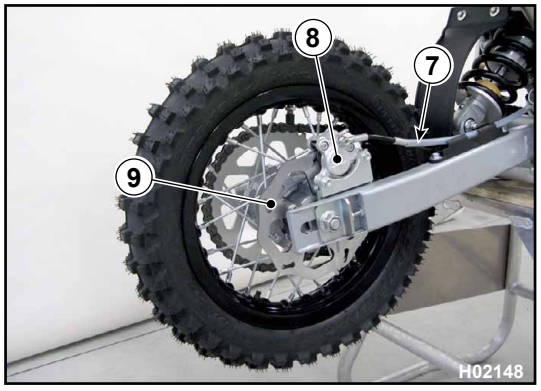


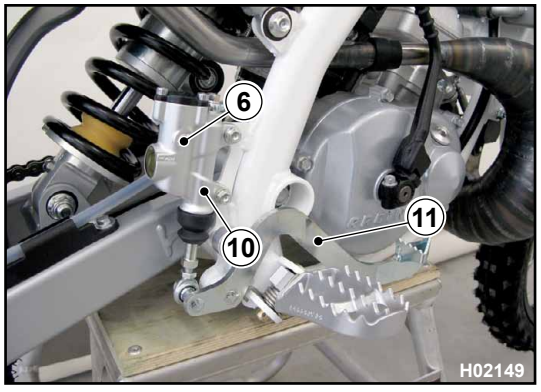
Section L



BRAKES







Braking system

The braking system uses two independent circuits. Each system is equipped with a brake calliper connected to a master cylinder with a fluid reservoir.

1. Front brake lever
2. Front brake master cylinder with fluid reservoir
3. Front brake line
4. Front brake calliper
5. Front brake disc
6. Rear brake fluid reservoir
7. Rear brake line
8. Rear brake calliper
9. Rear brake disc
10. Rear brake master cylinder
11. Rear brake control pedal

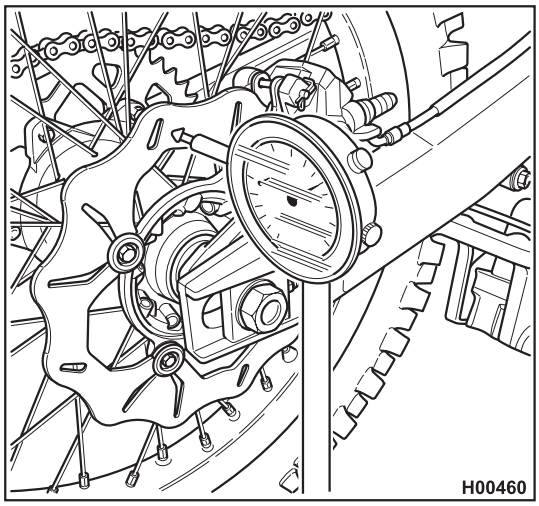
Brake disc

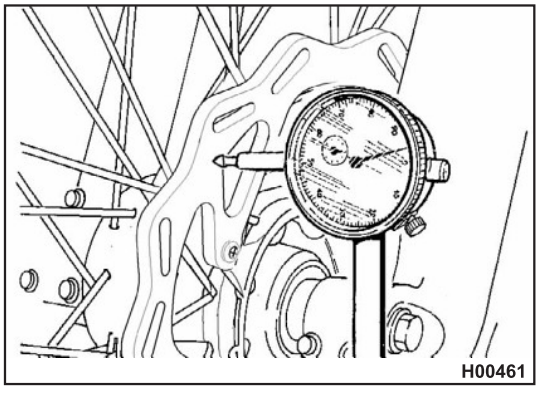
Checking the brake disc is an important safety procedure; the disc must be spotless, i.e. free from corrosion, oil or other dirt or deep scoring.

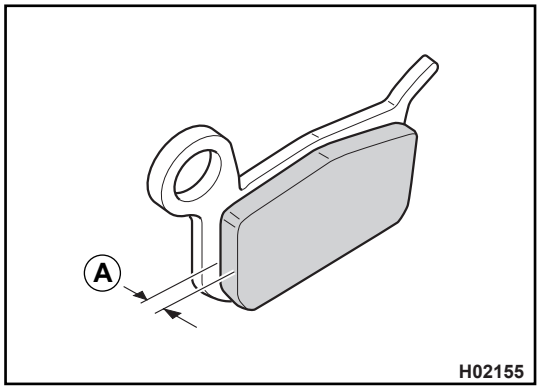
Front brake disc diameter: .....260 mm
Front brake disc thickness (when new): .....3.0 mm
Wear limit: .....2.5 mm
Rear brake disc diameter: .....140 mm
Rear brake disc thickness (when new): .....3.10 mm
Wear limit: .....2.5 mm

Disc warpage must not exceed 0.15 mm (check disc mounted on the rim with a dial gauge).

To remove the disc from the wheel rim, you need to loosen the four retaining screws. On assembly, clean all mating surfaces thoroughly and tighten the screws to the specified torque.





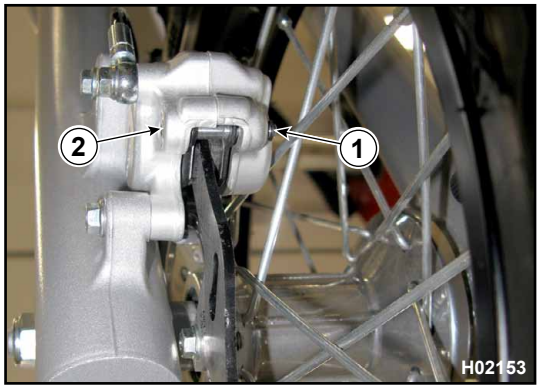


Checking brake pads for wear / replacing the pads

Check brake pad wear.
Service limit "A"
- 1 mm (front and rear pads)

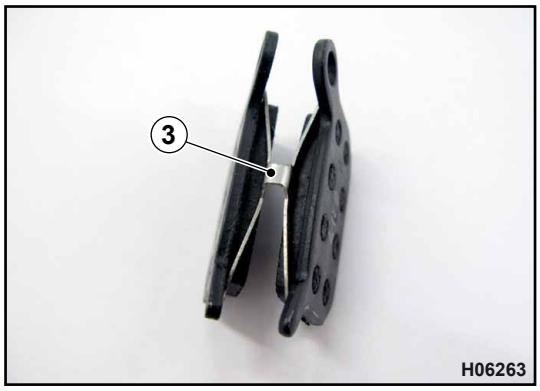
If service limit is exceeded, always replace the pads in pairs.
Be careful that no brake fluid or any oil gets on brake pads or discs. Clean off with alcohol any fluid or oil that inadvertently gets on the pads or disc.
Replace the pads with new ones if they cannot be cleaned satisfactorily.

FRONT



PADS REMOVAL
- Remove retaining ring (1).
- Undo pin (2).
- Remove pads.

Do not work the brake lever or pedal while removing the pads.

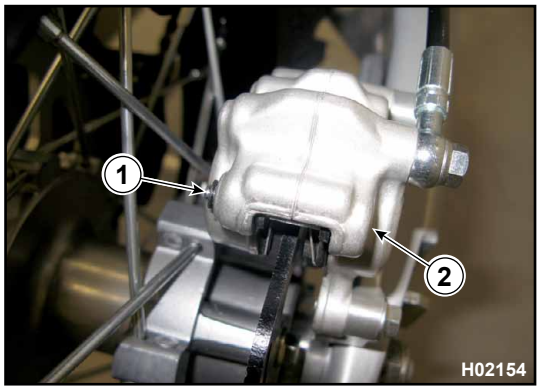


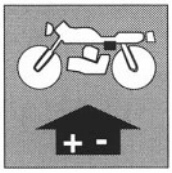
PADS INSTALLATION
- Install new brake pads, taking care to correctly position clip (3).
- Screw pin (2), and refit retaining ring (1).

Retaining ring (1) is a safety component, thus make sure it is correctly installed.

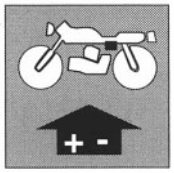
If the above procedure is followed, after brake pad change, there is no need to bleed the system, but you can simply pull control lever several times until taking pistons back to their original position.

REAR



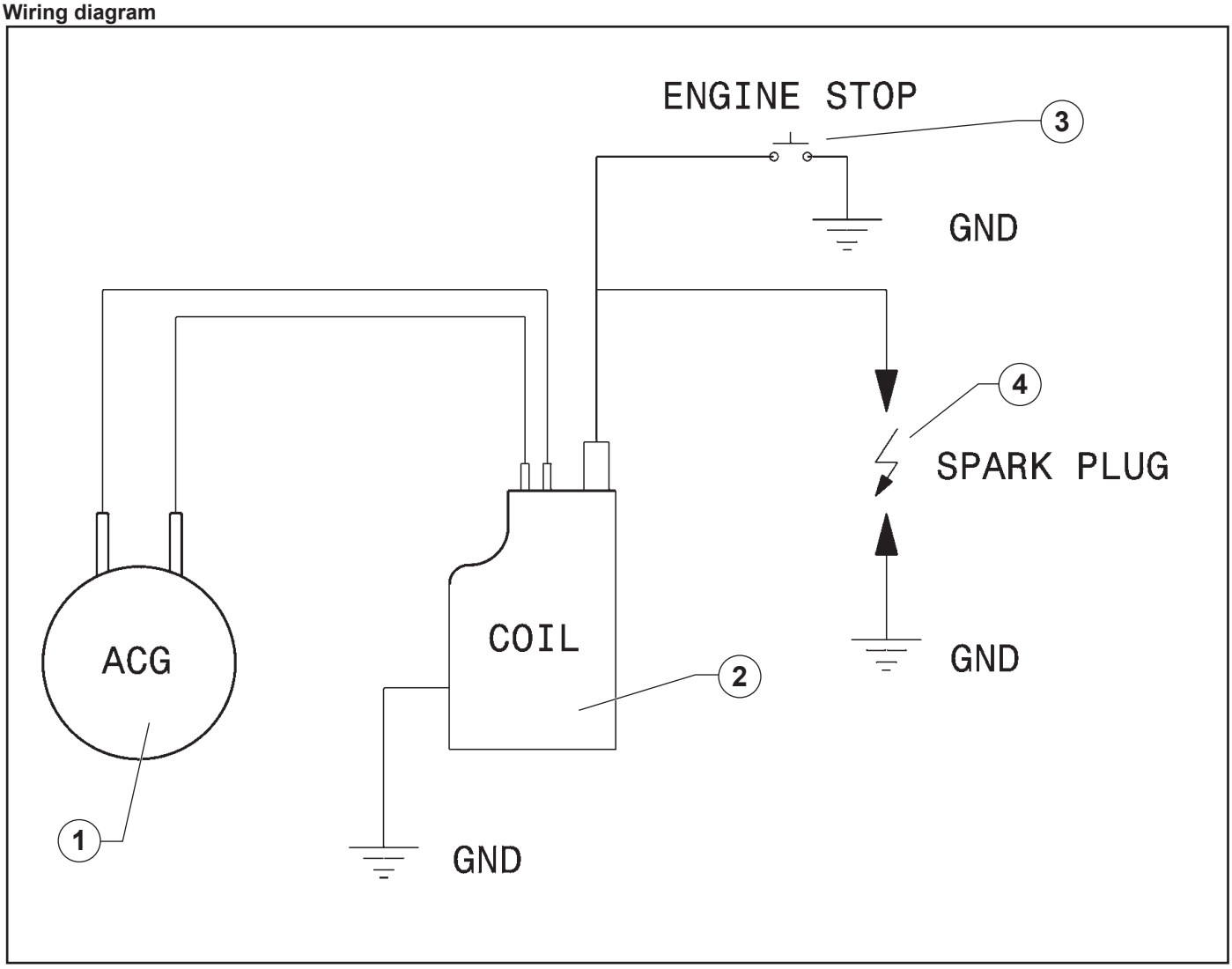


Section M



ELECTRICAL SYSTEM

Wiring diagram

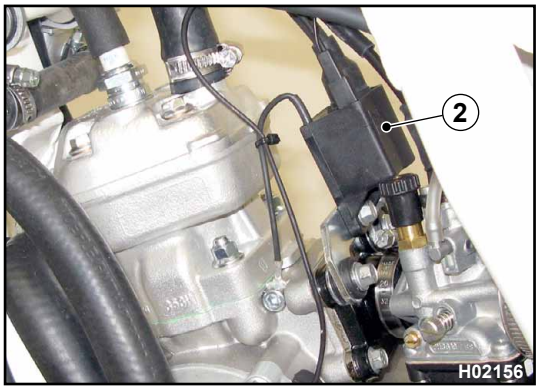


1. Alternator
2. Electronic transducer
3. Engine kill
4. Spark plug

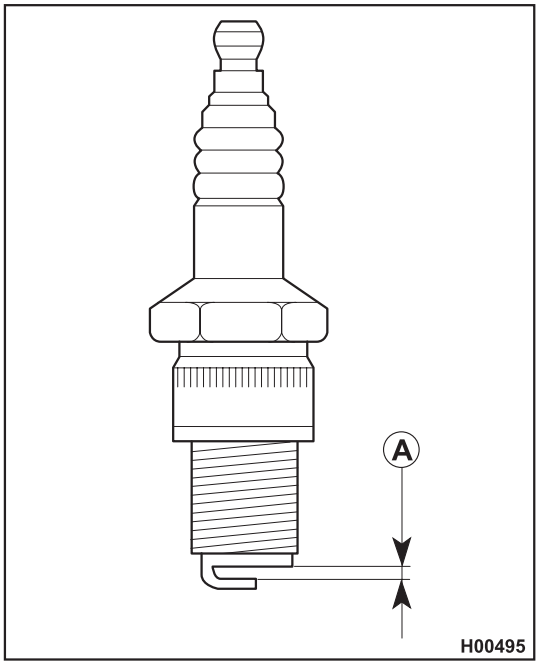
Electrical components location

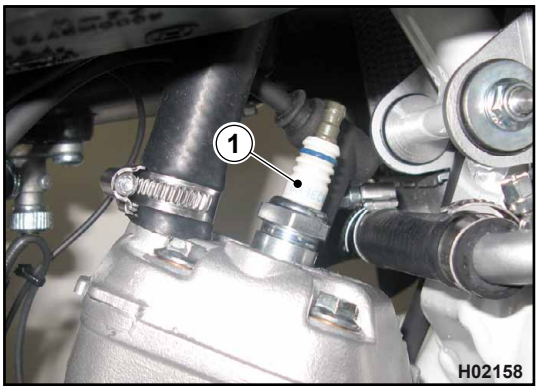
The ignition system includes the following elements:

- Generator (1), on the inner side of L.H. crankcase half cover;



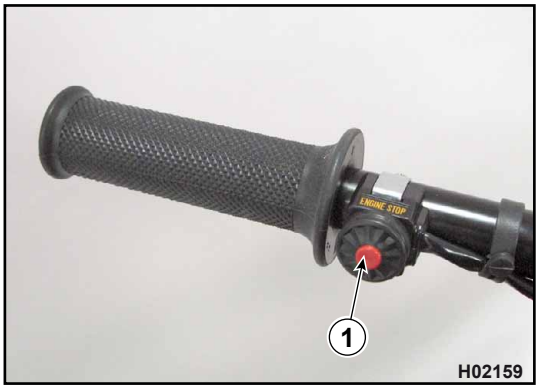
- Transducer (2) positioned under fuel tank close to carburettor.





Spark plug

Spark plug (1) is a "NGK" BR8ECM. Check electrode gap "A" (0.7 mm). A wider gap may cause difficulties in starting the engine and overload the coil. A gap that is too narrow may cause difficulties when accelerating, when idling or poor performance at low speed. Clean off any dirt around spark plug base before removing the spark plug. It is good practice to closely inspect the spark plug after removal, as any deposits on it and the colour of the insulator provide useful indications on spark plug heat rating, carburetion, ignition and the general condition of the engine. Before refitting the spark plug, accurately clean the insulator with a wire brush. Smear some graphite grease on spark plug thread, do it fully home finger tight then tighten it to 10÷12 Nm torque. Loosen the spark plug then tighten it again to 10÷12 Nm. Spark plugs which have cracked insulators or corroded electrodes should be replaced.



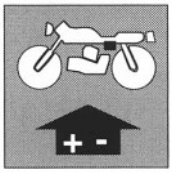
Handlebar switches

Measure continuity on the different switches using a meter. Replace any part found to be faulty.

Left-hand switch

1 Engine stop button

POSITION \ COLOUR	B-W	Bk
ON	○—○	
OFF		

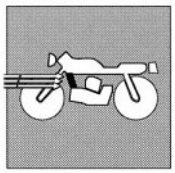


IMPORTANT

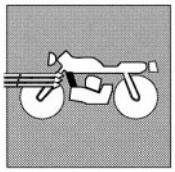
Before washing the motorcycle, it is necessary to duly protect the following parts from water:

a) Rear opening of the muffler;
b) Clutch and front brake levers, handgrips, handlebar switches;
c) Air filter intake;
d) Steering head, wheel bearings;
e) Rear suspension drag drop link.

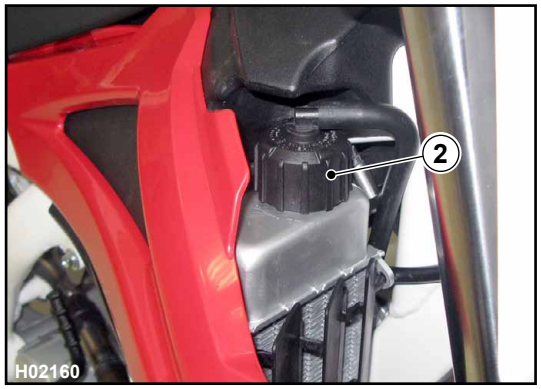
HIGH-PRESSURE WATER OR AIR JETS SHALL MUST NOT contact ELECTRIC PARTS.



Section N



ENGINE COOLING



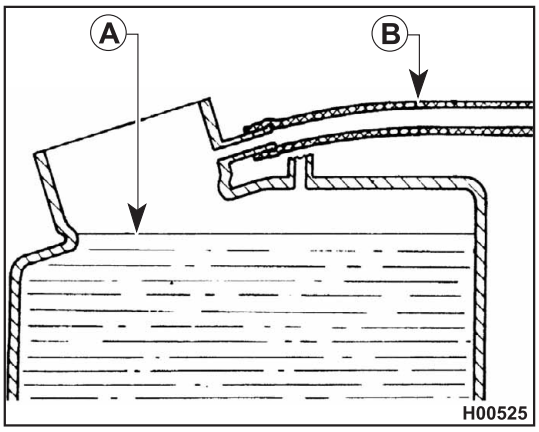
Coolant level check

Coolant takes the heat from the piston-cylinder-and-head assembly and transfers it to the radiator, where it is released to the atmosphere. Checking coolant level at regular periods is critical to ensuring proper operation of the cooling system.

Without cooling medium (water), no heat exchange occurs between cylinder head and radiator. The cylinder and piston assembly will overheat and seize and in the worst scenario, crankshaft damage may result.

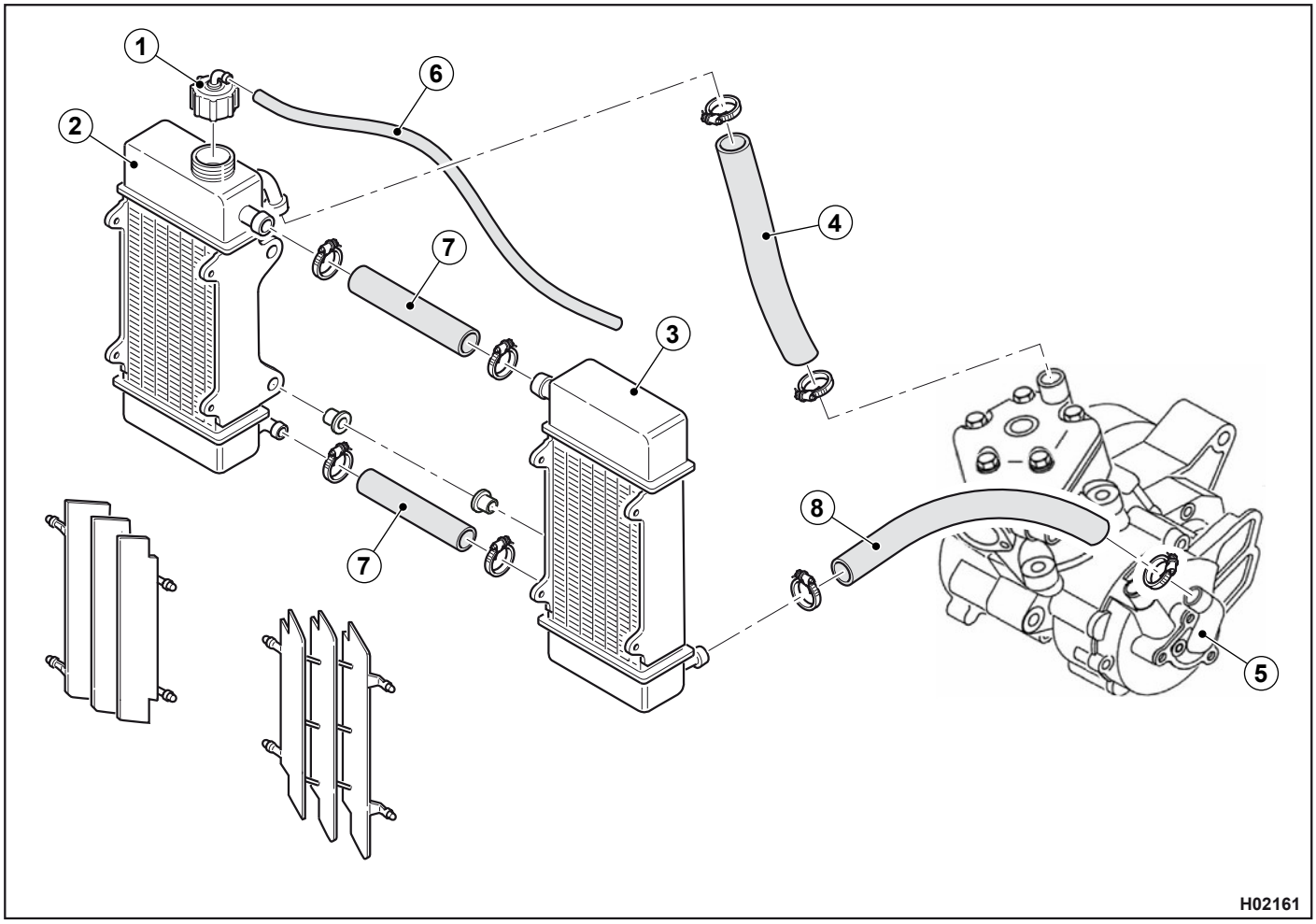
If the event of engine overheating, check that the radiator is full.
Level in the radiator must be checked from cold (see Section D).
In the event you need to check level when the engine is hot, be sure to discharge pressure gradually.
The radiator cap (1) has a pressure-relief position to depressurize the system safely.

Failure to follow the above instructions will create a risk of scalding for operator and any persons standing nearby.



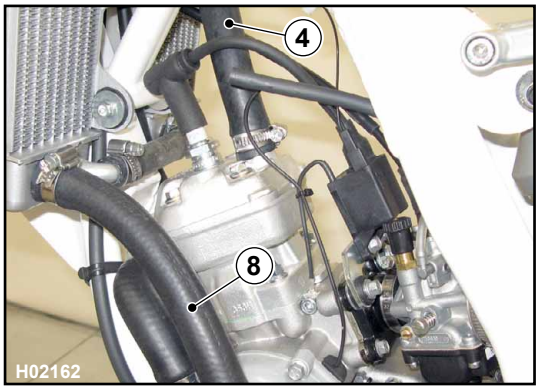
A. Coolant level
B. Breather hose

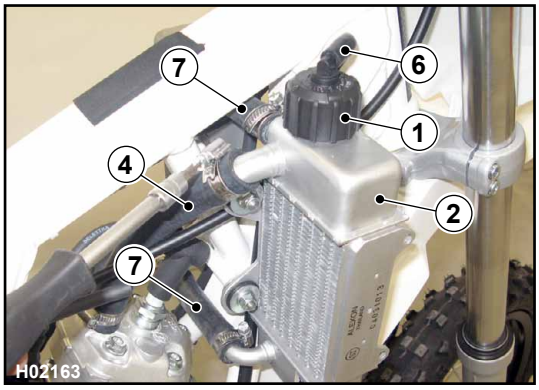
Cooling circuit



The forced circulation cooling system uses a centrifugal pump (located to the left of the head) and two down-draft radiators.

1 Radiator cap
2 Right-hand radiator
3 Left-hand radiator
4 Radiator to head pipe
5 Water pump
6 Breather hose
7 Radiator connecting pipes
8 Radiators to water pump lower pipe





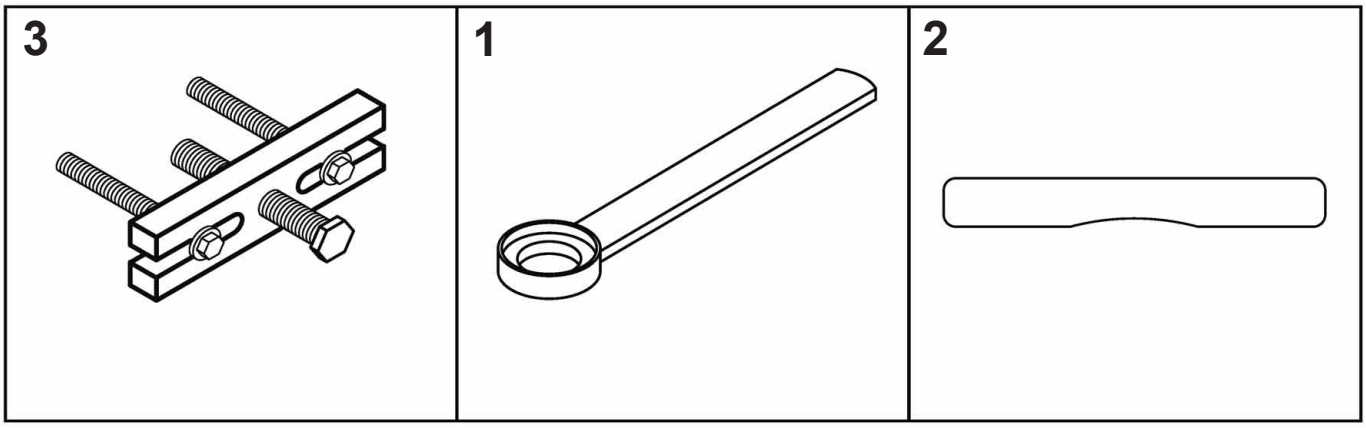
Engine cooling system overhaul

If the coolant runs too hot, check the radiators. Any foreign matter trapped between the fins (such as leaves, bugs, mud, etc.) will obstruct air flow and must be removed carefully to avoid damage to radiator. Straighten any bent fins to ensure free flow of air. If the cooling mass is clogged or damaged, no more than 20% of its surface must be affected. If damage exceeds this limit, the radiator must be replaced. Periodically check the connecting hoses (see Section B, "Scheduled Maintenance Chart"); this will avoid coolant leakage and consequent engine seizure. If hoses show cracks, swelling or hardening due to sheaths desiccation, their replacement shall be advisable. Check the correct tightening of the clamps.

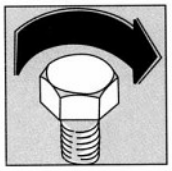
Section W

SPECIAL TOOLS

	HUSQUARNA PART No.	DESCRIPTION
1	(**8000 H4605**)	Rotor locking wrench
2	(**8000 H6011**)	Squish check foil
3	(**8000 H6012**)	Puller complete

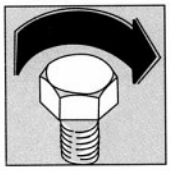


TIGHTENING TORQUE FIGURES



Section X

Tighten all nuts and screws to the specified torque using a torque wrench. If not tightened securely, a nut or a screw might become damaged or work itself loose, causing damage to motorcycle and injury to rider. An overtightened nut or screw might become damaged, its thread might strip, or the nut/screw might fail and work itself loose. Listed in the table are the tightening torque figures for the most important nuts and screws, which have determined in accordance with thread diameter, pitch and specific application. These figures are obtained after cleaning the threads with solvent.



TIGHTENING TORQUE FIGURES

CHASSIS

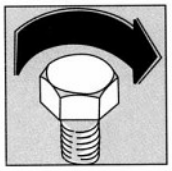
CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
Z00062796	Chain roller to chassis retaining screw	M8	8.8	1	15		
ZA0091697	Lower and upper rear engine retaining screw	M8	8.8	2	35		LOCTITE 243
ZB00B2684	Front engine retaining screw	M8	8.8	1	35		LOCTITE 243
Z00043928	Engine locknut	M8	8.8	3	35		LOCTITE 243
60ND02558	Chain guide to chassis retaining screw	M8	8.8	1	15		
Z00043928	Chain guide to chassis retaining nut	M8	8.8	1	15		
8000H3822	Saddle pillar upper retaining screw	M8	8.8	1	25		
Z00043928	Saddle pillar upper locknut	M8	8.8	1	25		
Z00069056	Saddle pillar lower retaining screw	M8	8.8	2	25		

HANDLEBAR AND CONTROLS

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
61ND15062	Pushrod adjuster check nut	M6	8.8	1	4		
Z00044240	Lever ball joint retaining nut	M6	8.8	1	10		LOCTITE 243
Z00043928	Brake lever to chassis retaining nut	M8	8.8	1	20		LOCTITE 243
YA0055241	Cam retaining screw	M6	8.8	1	4		
Z00062728	Front brake pipe clamp to fork retaining screw	M6		1	10		
Z00044240	Front brake pipe clamp to fork retaining nut	M6		1	10		

1 Nm = 0.73756 ft/lb

TIGHTENING TORQUE FIGURES



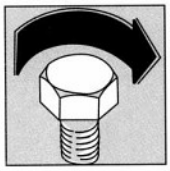
FRONT SUSPENSION

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
	Head to damper rods retaining screw	M8		2	25		Supplied by Marzocchi
	Handlebar clamp retaining screw	M8		4	25		Supplied by Marzocchi
8000H3620	Steering preload nut				see notes		Set at 10N/m, and then loosen until reaching a clearance-free soft steering
8000H3820	Steering upper nut				30		

REAR SUSPENSION

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
8B00H2753	Swinging arm shaft	M12	8.8	1	80		
8A00A8421	Chain slider onto fork retaining screw with collar	M5		1	4		
ZH0067545	Rear chain guide fixing	M6	8.8	1	4		
Z00062730	Rear chain guide fixing	M6		1	4		
Z00061313	Rear chain guide nut	M6	8.8	2	4		
ZC0095305	Shock absorber to chassis retaining screw	M10	8.8	1	40		
8000H4144	Shock absorber to swinging arm retaining screw	M10	8.8	1	40		
Z00042022	Shock absorber lock nut	M10	8.8	2	40		
Z00042023	Swinging arm shaft retaining nut	M12	8.8	1	80		
Z00020536	Rear brake tube ring self-tapping screw			2	4		

1 Nm = 0.73756 ft/lb



TIGHTENING TORQUE FIGURES

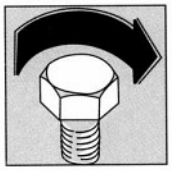
FAIRING AND MUDGUARDS

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
8000A8423	Front mudguard retaining screw with collar	M5		4	4		
8000A8423	Number holder table screw with collar	M5		1	4		
8000H0534	Pipe guide self-tapping screw			1	4		
8A00A8421	Rear mudguard front retaining screw with collar	M5		2	4		
ZA0067997	Rear mudguard rear TEF screw	M5			4		
8A00A8421	Right-hand rear side panel retaining screw with collar	M5		2	4		
8A00A8421	Left-hand rear side panel retaining screw with collar	M5		2	4		
8A00A8421	Left-hand rear side panel retaining screw with collar	M5		3	4		
8A00A8421	Left-hand front panel retaining screw with collar	M5		3	4		
U00055134	Clip nut	M5		2	4		
8000A8423	Flap mud TEF nut	M6		2	5		
800046893	Flap mud clip nut	M6		2	5		

FUEL SUPPLY SYSTEM

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
60N407335	Tank front retaining screw	M6		1	4		
Z00037745	Cock self-tapping screw			2	4		

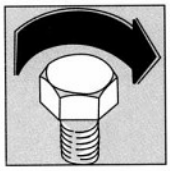
1 Nm = 0.73756 ft/lb



WHEELS AND BRAKES

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
Z00062726	Front brake disc fixing	M6		5	10		LOCTITE 243
8A00H2753	Front wheel axle	M12		1	80		
Z00062726	Rear brake disc fixing	M6		5	10		LOCTITE 243
8000H3835	Sprocket fixing	M7		5	15		LOCTITE 243
8000H2753	Rear wheel axle	M12		1	80		
Z00042023	Front and rear wheel retaining nut	M12		2	80		
8000H4147	Chain tensioner adjuster screw	M6		2	5		
61ND15062	Adjuster nut and chain tensioner	M6		2	5		
Z00062731	Upper front brake calliper retaining screw	M6		1	10		LOCTITE 243
ZPA067545	Lower front brake calliper retaining screw	M6		1	10		LOCTITE 243
ZE0067545	Front rear brake calliper retaining screw	M6		1	10		LOCTITE 243
Z00062727	Rear brake calliper rear retaining screw	M6		1	10		LOCTITE 243
Z00062728	Rear brake master cylinder fixing	M6		2	10		
Z00044240	Rear brake master cylinder fixing	M6		2	10		

1 Nm = 0.73756 ft/lb



TIGHTENING TORQUE FIGURES

EXHAUST

CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
Z00062727	Damping pad to chassis retaining screw	M6		2	10		
Z00044240	Damping pad to chassis retaining nut	M6		2	10		
Z00062725	Damping pad to muffler retaining screw	M6		2	10		
Z00044240	Silencer retaining nut	M6		1	10		
Z00062729	Silencer retaining screw	M6		1	10		
U00060873	Silencer clip nut	M6		1	10		

COOLING SYSTEM

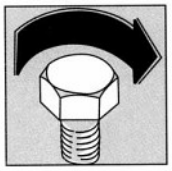
CODE	DESCRIPTION	SIZE	CLASS OF MATERIAL	Qty	RATED TORQUE (Nm)	ACCEPT. RES. TORQUE (Nm)	NOTES
8000H4148	Radiators TEF screw	M6		2	8		
Z00044240	Radiator flanged self-locking nut	M6		2	8		

1 Nm = 0.73756 ft/lb

NOTE: Unless otherwise specified, standard torque values for the different thread sizes are as follows

M5x0.8	5.6-6.2 Nm	0.57-0.63 Kgm	4.1-4.5 ft/lb
M6x1	7.6-8.4 Nm	0.80-0.85 Kgm	5.8-6.1 ft/lb
M8x1.25	24-26 Nm	2.4-2.6 Kgm	17.3-18.8 ft/lb

TIGHTENING TORQUE FIGURES



NOTE: Unless otherwise specified, standard torque values for the different thread sizes are as follows (+/- 5%)

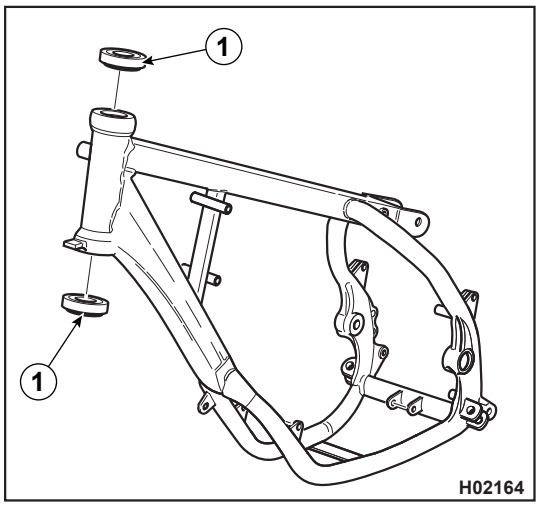
Steel screws on plastic, with metal spacers	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on brass, copper, aluminium	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on iron, steel	M4	3 Nm	0.3 Kgm	2.2 ft/lb
Steel screws on plastic, with metal spacers	M5	4 Nm	0.4 Kgm	3 ft/lb
Steel screws on brass, copper, aluminium	M5	4 Nm	0.4 Kgm	3 ft/lb
Steel screws on iron, steel	M5	6 Nm	0.6 Kgm	4.4 ft/lb
Steel screws on plastic, with metal spacers	M6	6.5 Nm	0.65 Kgm	4.8 ft/lb
Steel screws on brass, copper, aluminium	M6	6.5 Nm	0.65 Kgm	4.8 ft/lb
Steel screws on iron, steel	M6	10.5 Nm	1 Kgm	7.7 ft/lb
Steel screws on brass, copper, aluminium	M8	16 Nm	1.6 Kgm	11.8 ft/lb
Steel screws on iron, steel	M8	26 Nm	2.6 Kgm	19.1 ft/lb
Steel screws on iron, steel	M10	52 Nm	5.2 Kgm	38.3 ft/lb
Steel screws on iron, steel	M12	100 Nm	10 Kgm	73.8 ft/lb
Steel screws on iron, steel	M14	145 Nm	14.5 Kgm	107 ft/lb

Section Y

Chassis

The single frame branches off at the exhaust and is made of steel tubes with circular, rectangular and ellipsoidal section; the rear chassis is made from light alloy. Refer to the figure for a quick inspection. Use the dimensions reported below to determine whether the chassis needs realigning or replacing.

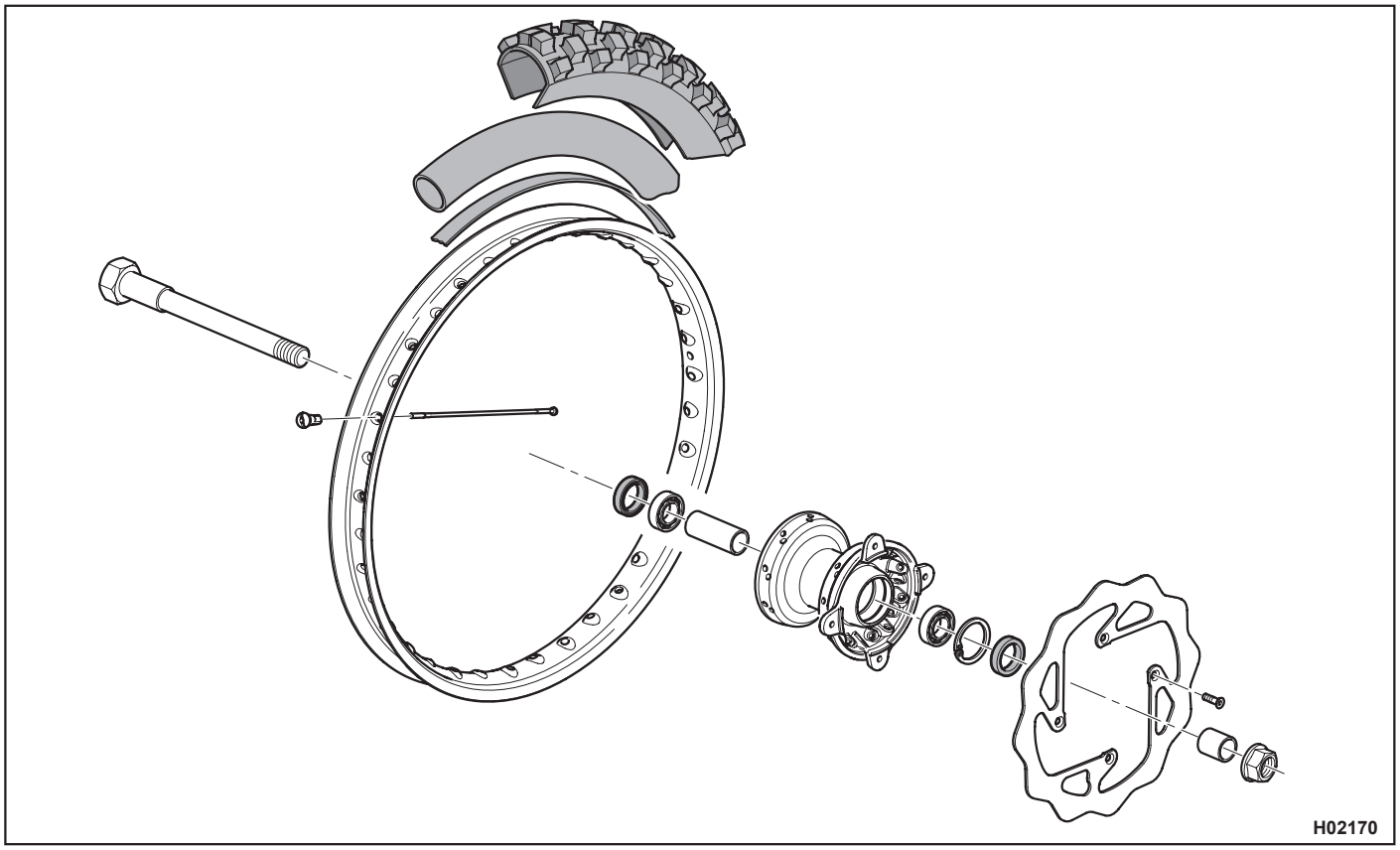
A badly damaged chassis must be replaced.



Lubrication points (lubricant)

1 Steering bearings (grease)

Front wheel



Light alloy wheel hub and rim with high-strength steel spokes.

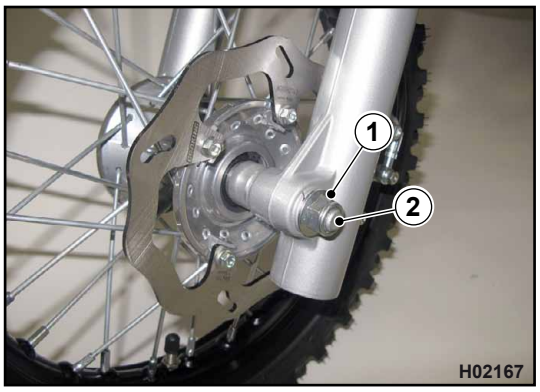
Make, type and size of wheel rims ..... light alloy: 1.5x12”

Make, type and size of tyre..... "Pirelli" Scorpion
60/100 12" 36M

Cold tyre pressure ..... 1.2 Kg/cm^2

Removing the front wheel

Set a stand or a block under the engine and see that the front wheel is lifted from the ground.

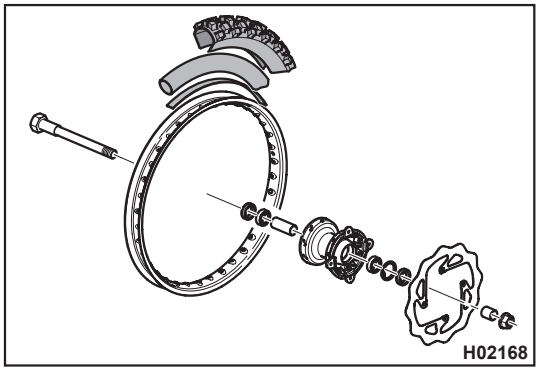


Loosen nut (1) positioned on left-hand side;

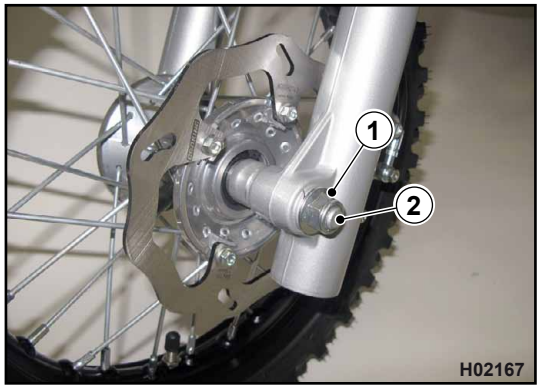
Slide out axle (2) on right-hand side, and remove wheel.

Do not operate the front brake lever when the wheel has been removed; this causes the calliper pistons to move outwards.

After removal, lay down the wheel with brake disc on top.



Reassembling the front wheel



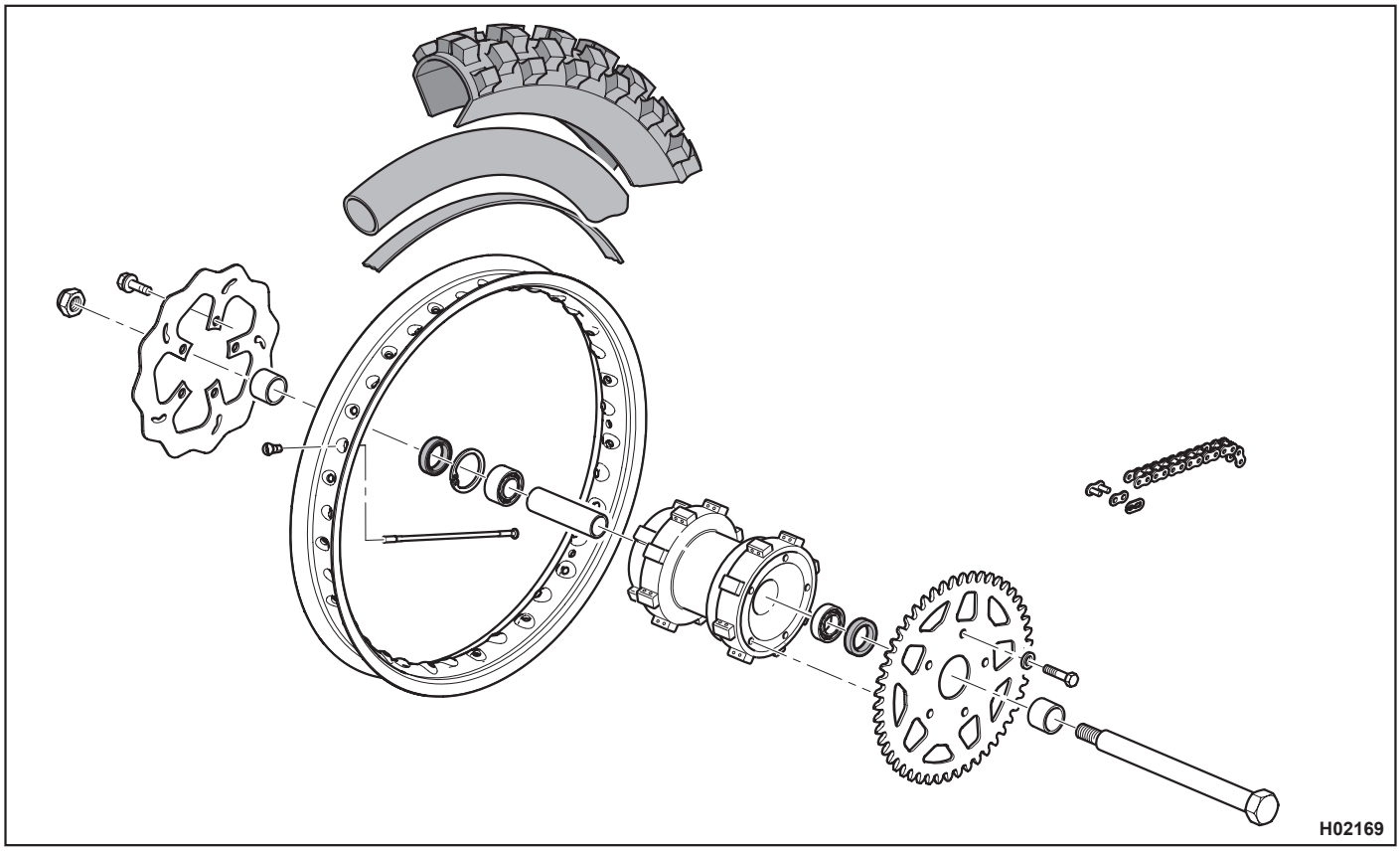
Fit the wheel between the fork legs so as to set the brake disc into the calliper.

Fit the wheel axle (2) from the R.H. side, after greasing it and push it fully home against the L.H. fork leg; during this operation, the wheel should be turned.

Screw nut (1) on fork left-hand side. (80 Nm, 8 Kgm, 59 lb/ft)

After reassembly, pull the brake control lever until the pads are against the brake disc.

Rear wheel



Light alloy wheel hub and rim with high-strength steel spokes.

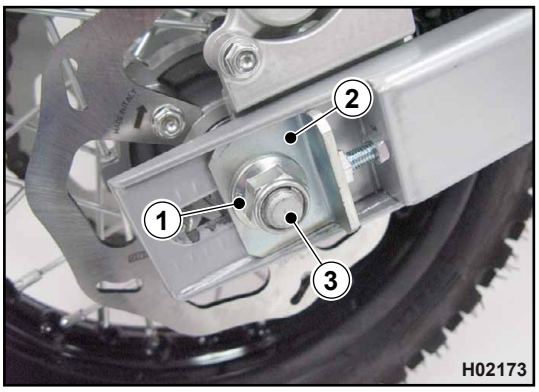
Make, type and size of wheel rim ..... light alloy: 1.6x10";

Make, type and size of tyre..... "Pirelli" Scorpion;
2.75-10 37JNHS

Cold tyre pressure ..... 1.5 Kg/cm^2

Removing the rear wheel

Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.



Unscrew the nut (1) of the wheel axle (3) and extract it. It is not necessary to loosen the chain tensioners (2); in this way, the chain tension will remain unchanged after reassembly.

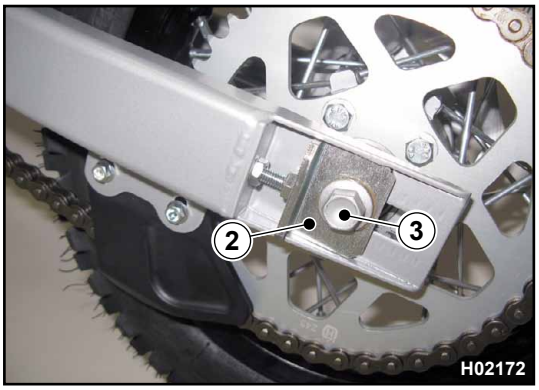
Extract the complete rear wheel, keeping the spacers located at the hub sides.

To reassemble, reverse the above procedure remembering to insert the brake disc into the calliper.

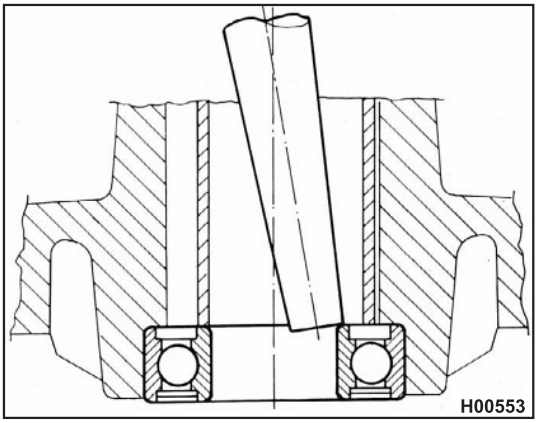
Do not operate the rear brake pedal when the wheel has been removed; this causes the calliper pistons to move outwards.

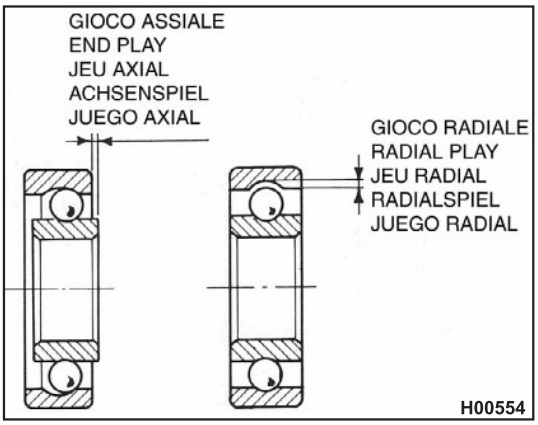
After removal, lay down the wheel with brake disc on top.

After reassembly, depress the brake pedal until the pads are against the brake disc.



Tightening torque figures
1: 80 Nm / 8 Kgm / 59 ft/lb





Wheel servicing

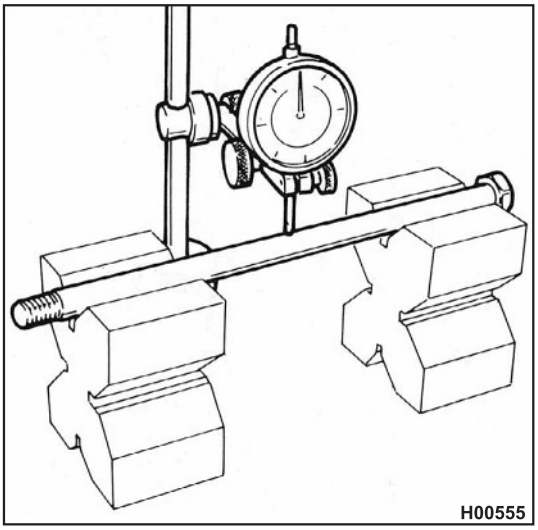
Check the wheel hub bearings for wear. If you find too much (radial or axial) clearance, replace the bearings as follows:

- place the hub on a flat surface with an appropriate hole (for when you knock out the bearing);
- use a hammer and a punch to knock out the bearing; apply pressure only on the inner race of the bearing (see figure);
- tap at different positions so as to keep the bearing square in its seat;
- remove the spacer and use the same procedure for the other bearing.

Discard the bearings after removal. Never reuse them.

Before installing the new bearings, check to ensure the seat is clean and shows no grooves or scratches. Lubricate the seat before installing the bearing. Drive the bearing into place using the special installer that only applies pressure to the outer race. Fit the spacer and the other bearing. Check for perfect alignment as you slide the axle into place.

Wheels should be balanced after each service.

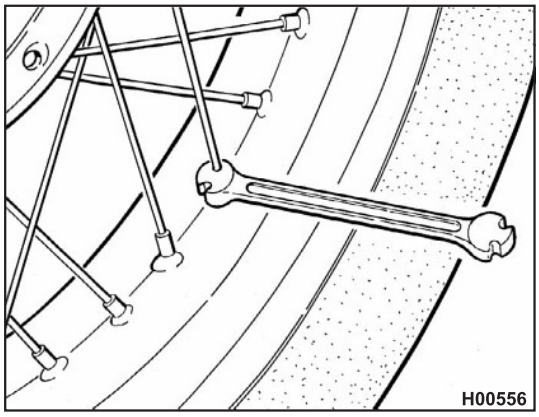


Wheel axle warpage

If warped beyond the maximum limit allowed, the axle must be straightened or replaced. Replace the axle if it cannot be straightened so as to meet the maximum limit allowed.

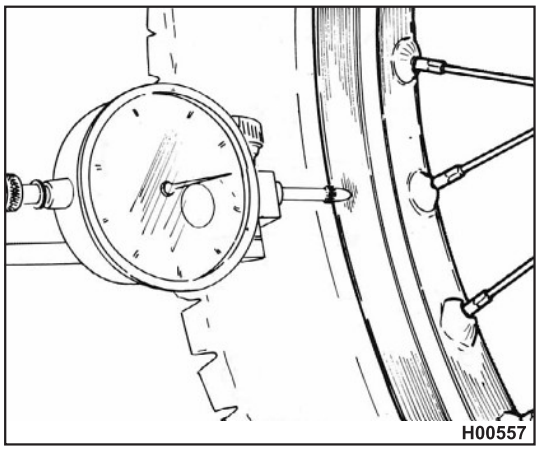
Axle runout over 100 mm

Wheel axle	Standard	Max limit
Wheel axle	less than 0.1 mm	0.2 mm (0.0078 in.)



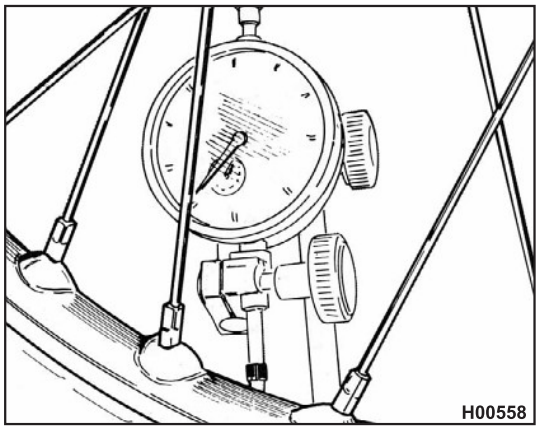
Wheel spokes

Make sure all nipples are firmly tightened (4.4 Nm, 0.45 Kgm, 3.2 ft/lb). Retighten if needed. Improper tightening will affect motorcycle stability; for a quick check, simply tap the spokes with the tip of a metal tool (such as a screwdriver): a clear, crisp sound indicates proper tightening, a dull sound means that the spokes need to be tightened.

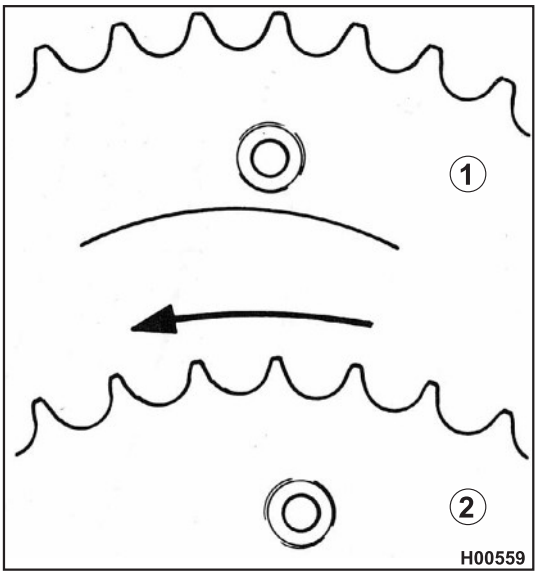


Wheel rim warpage

The table below reports the allowed limits for wheel rim warpage. Exceeding runout or out-of-round are generally due to worn bearings. When this is the case, replace the bearings. If this does not solve the problem, change the wheel rim or the wheel.



Standard		Max limit
Side runout	less than 0.5 mm	2 mm (0.078 in.)
Out-of-round	less than 0.8 mm	

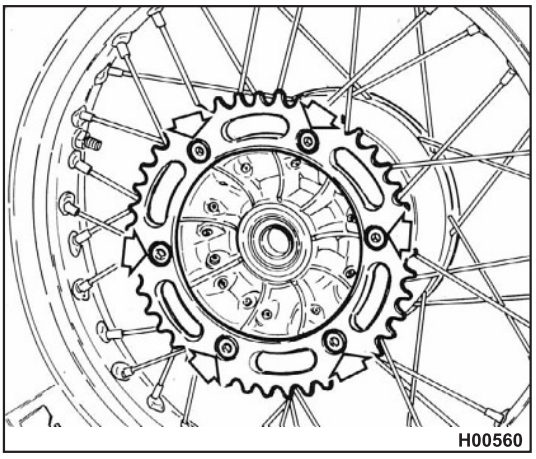


Rear chain sprocket, secondary drive sprocket and chain

The figure at the side shows the profiles of a normally worn and an exceedingly worn sprocket.

1 Normal wear

2 Exceeding wear

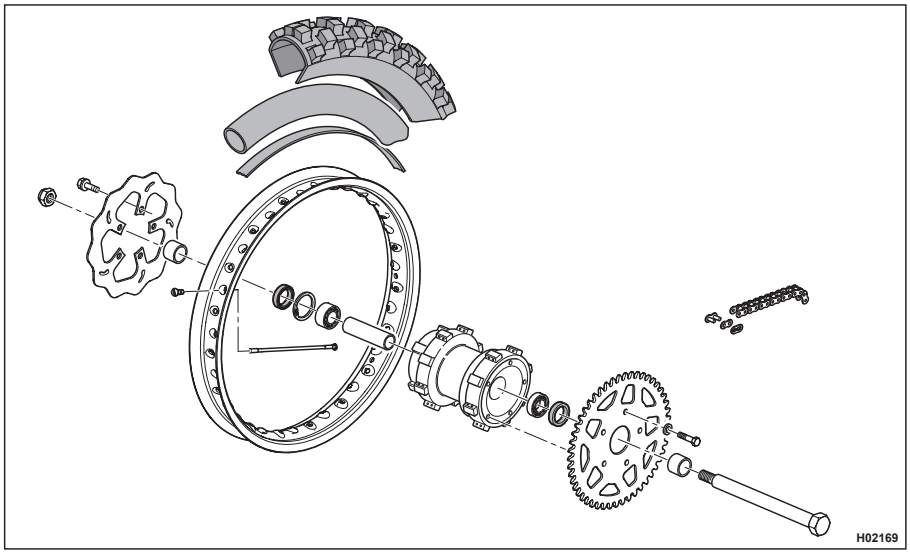


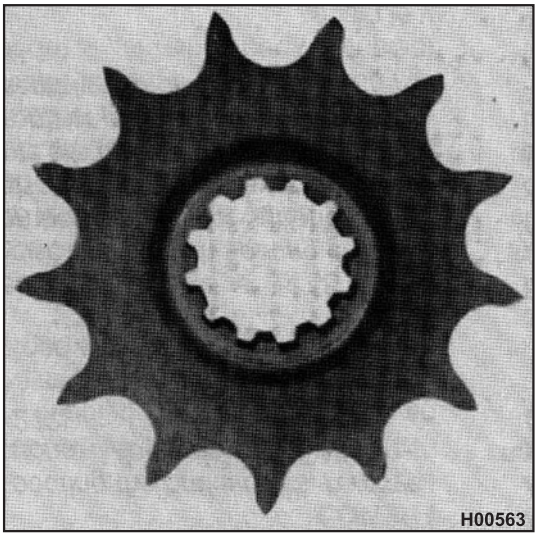
If the sprocket is exceedingly worn, replace it after loosening the six screws that retain it to the hub.

Chain and sprockets must always be replaced as a set.

Tightening torque figures

3: 15 Nm, 1.5 Kgm, 11.6 ft/lb + LOCTITE 243





Checking pinion and sprockets for wear

Check the transmission sprocket for damage or wear. When worn down like the sprocket shown in the figure, it must be replaced.

Wheel misalignment causes abnormal wear, making the motorcycle unsafe to ride.

Dirt caked on sprockets and chain collected while riding on muddy or wet terrain increases chain tension. If you expect to ride on muddy or wet terrain, slacken the chain a bit. Riding on muddy terrain significantly increases chain and sprocket wear.