REPAIR MANUAL
D01 - TRIGGER 50

Vers. 2015_01

KSR MOTO AUSTRIA

INTRODUCTION

It is important that you read this repair manual carefully before the start of work.
Only use **GENERIC/ KSR spare parts**.

KSR Motot Motorcycles is a registered brand by KSR Group GmbH.

This vehicle can only fulfil the demands placed on it if the service work is made by qualified experts and in accordance with the service schedule.

The repair manual was written to correspond to the current state of this model.
We reserve the right to make changes in this manuals in the interest of technical advancements and improvements without a notice.
It is recommended that repair work will be done by a fully educated mechanic.
We will not provide descriptions of general workshop methods, safety rules that necessary in a workshop.

All specifications refers to the current state and are nonbinding. KSR Group GmbH specifically reserves the right to modify the information in this manual without notice and without specifying reasons.

KSR Group GmbH accepts no liability deviations from illustrations and descriptions or misprints and other errors.

The models in this manual partly contain special equipment that does not belong to the regular scope of delivery further the illustrations and pictures are symbolic images, and may differ from the actual components.

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KSR GROUP

KSR Group GmbH
A-3500 Krems, Austria

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WARRANTY

The work prescribed in the service schedule must be carried out in an authorized workshop and confirmed in the customer‘s service card, otherwise no warranty claims will be recognized. No warranty claims can be considered for damage resulting from manipulations and/or alterations to the vehicle.

NOTES AND WARNINGS

Pay attention to the notes/warnings in this manual.

⚠ WARNING

- Identifies dangers that will lead to environmental damage if the measures are not taken.
- Identifies dangers that is likely to lead to fatal or serious injury if the measures are not taken.
- Identifies dangers that will lead to considerable machine and material damage if the measures are not taken.
- Identifies dangers that will immediately lead to fatal or serious permanent injury if the appropriate measures are not taken.

REPAIR MANUAL

It is important that you read this manual completely before the start of work. It contains useful information how to repair and maintain the vehicle.

FUEL AND LUBRICANTS

Use only the fuels, oils and lubricants according to specifications as listed in this manual.
Please consider that KSR Group GmbH give no approval for Bio- Ethanol (E 10 or higher) fuel.

SPARE PARTS AND ACCESSORIES

Only use spare parts and accessory that have been approved or recommended by KSR Group GmbH.

PRACTICE

Special tools are required for some work but mostly professional work shop equipment is enough for service, repair and maintenance of the vehicle. Special tools mentioned inside of this manual.
When thread locker is used on connections (e.g., Loctite®), follow the instructions for use from the manufacturer. After disassembly, clean the parts that are to be reused and check them for damage and wear. Replace damaged or worn parts.

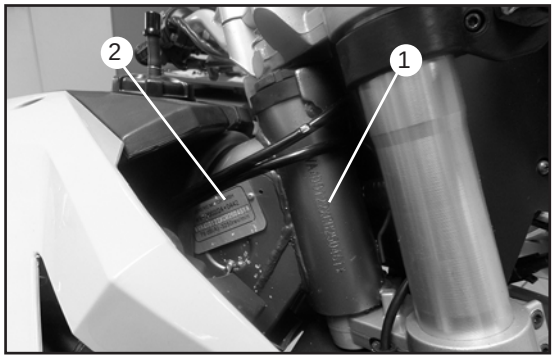
IMPORTANT

- After each repair or maintenance work security check and a test drive must be done.
- Before you delivery the vehicle to the customer a road safety test must be done.

LOCATION OF SERIAL NUMBERS

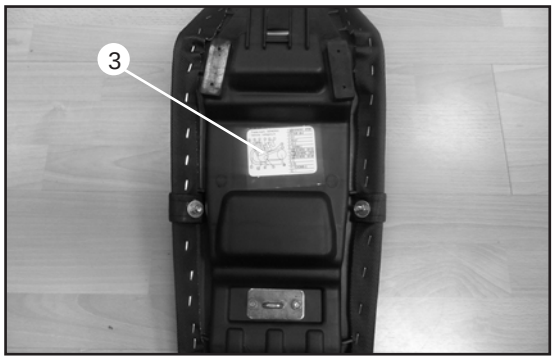
VIN (CHASSIS NUMBER) AND FRAME PLATE

The vehicle identification number (VIN) (1) is punched into the right side of the steering tube. The frame plate (2) is located on the right side in front of the frame.



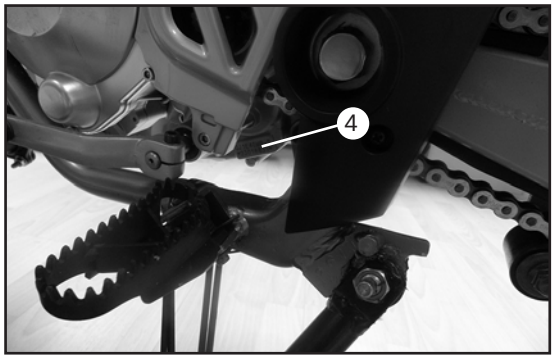
ANTI TEMPERING LABEL

The anti tempering label (3) is fixed on the inner side of the seat bench.



ENGINE NUMBER

The engine number (4) is stamped into the left side of the engine case.



DECRYPTING THE VEHICLE IDENTIFICATION NUMBER

EXAMPLE: VA4D0115XDB775449

VA4 -	WORLD MANUFACTURER INDEX (NAME OF MANUFACTURER)
D01 -	MODEL TYPE
1 -	VARIANT OF MODEL
5 -	VERSION OF MODEL
X -	RANDOM NUMBER
D -	YEAR OF PRODUCTION (CB = 2012/ DB = 2013,.....)
B -	ASSEMBLING PLANT (LOCATION OF FACTORY)
775449	SERIAL NUMBER

GENERAL SPECIFICATION

ENGINE
Engine type: Liquid cooled 2 - stroke
Cylinder arrangement: Horizontal (+60°) single cylinder
Displacement: 49.6 cm³
Compression ratio: 7.0:1
Max. output (kw/rpm): 2.2 kW/ 6500 rpm
Max. torque (Nm/rpm): 3.6 Nm/ 5500 rpm
Starting system: Electric starter and Kick starter
Lubrication system: Fresh oil lubrication

ENGINE OIL QUANTITIY
Capacity: 1 L
Recommended type: CASTROL Power 1-Racing 2T Fully Synthetic

TRANSMISSION OIL
Quantity 0.5 L for disassemble/ 0.4 for replacement
Recommended type: CASTROL Power 1-Racing 4T 10W-40

AIR FILTER ELEMENT
Foam filter

FUEL
Recommended fuel: Unleaded gasoline only ≥ 95 Oct
Do not use Bio-Ethanol fuel - E10 is not permitted
Fuel tank capacity: 10 L ± 0.2 L

CARBURETTOR
Type/ Manufacturer: PZ19JB JB-4/ LEADER or QJ
Main jet: 95
Idle jet: 22.5

SPARK PLUG
Manufacturer/ model: NGK/BR8ES

CLUTCH
Clutch type: Multi-disc in oil bath

TRANSMISSION TYPE
Manual, 5 speed

CHASSIS
Frame type: Steel tube

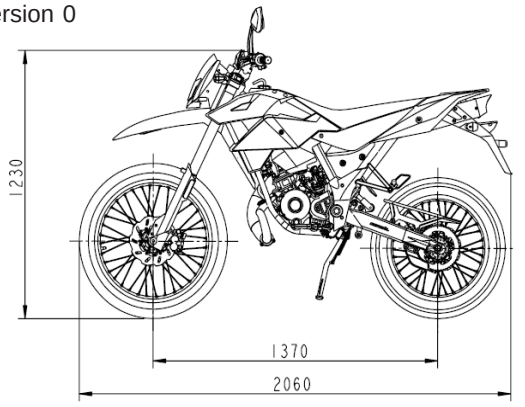
TIRES (Version 0 = Trigger X)
Front tire
Type: Tubeless/ Pressure on cold tire: 2.25 bar
Size: Rim: 1.6*21
Tire: 3.00-21

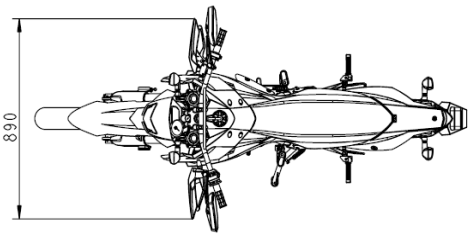
Rear tire
Type: Tubeless/ Pressure on cold tire: 2.25-2.5 bar
Size: Rim: 1.85*18
Tire: 4.10-18

TIRES (Version 1 = Trigger SM)
Front tire
Type: Tubeless/ Pressure on cold tire: 2.25 bar
Size: Rim: 2.5*17
Tire: 100/80-17

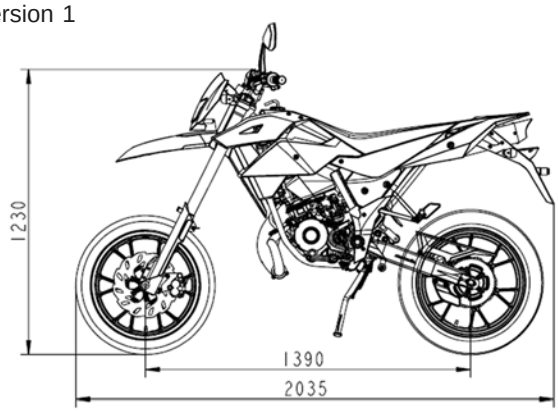
Rear tire
Type: Tubeless/ Pressure on cold tire: 2.25-2.5 bar
Size: Rim: 3.00*17
Tire: 130/80-17

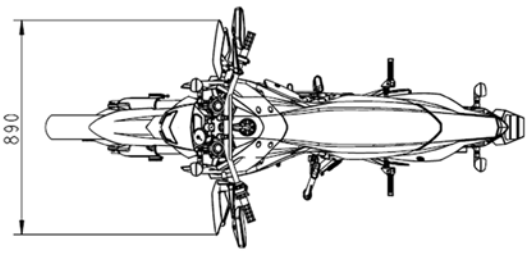
Version 0





Version 1





GENERAL SPECIFICATION

BRAKES
Front brake
Type: Single Hydraulic disc brake (280 mm)/ Right hand operation
Brake fluid: DOT4
Recommended brake fluid: (CASTROL SUPER DISK BRAKE FLUID DOT 4.)

Rear brake
Type: Hydraulic disc brake (220 mm)/ Right foot operation
Brake fluid: DOT4
Recommended brake fluid: (CASTROL SUPER DISK BRAKE FLUID DOT 4.)

FRONT SUSPENSION
Type: Telescopic fork
Spring/shock absorber type: Coil spring/oil damper

REAR SUSPENSION
Type: Unit swing
Spring/shock absorber type: Coil spring/oil damper

ELECTRICAL SYSTEM
Ignition system: CDI
Charging system: Magneto

BATTERY
Model: YT4L-BS/ 12V, 3 Ah

LIGHT AND BULBS

Headlight :	12 V , 35.0 W
Tail/brake light:	12 V , 21.0 W / 5.0W
Position light	12 V, 35.0 W
Front turn signal light:	12 V, 10.0 W
Rear turn signal light:	12 V, 10.0 W
License plate light:	12 V, 5.0 W
High beam indicator light:	12 V, 2 W
Turn signal indicator lights:	12 V, 3 W
N signal indicator light:	12V, 3 W
Instrument lights (2x):	12V, 3 W

MAIN FUSES
10.0 A

SPECIFIC TIGHTENING TORQUES

MODULE	PART	TORQUE / Nm
Electrical System	Starting motor clutch cover bolt	12
	Starting motor clutch locknut	95
	Rectifier bolt	5
	Fixing bolt of ignition coil	9
	Fixing bolt of flywheel	35-40
Wheel Axles	Front wheel spindle	55 - 62
	Rear wheel spindle nut	85 - 98
Fuel tank	Fixing bolt for fuel tank	5-9
	Cushion mounting bolt	9-10
Front brake system	Fixing bolt of brake disc	22-29
	Mounting bolt of brake caliper	22-29
	Fixing bolt of hand brake lever braket	5-9
Rear brake system	Fixing bolt of brake disc	22-29
	Mounting bolt of brake caliper	22-29
	Fixing bolt of hand brake lever braket	5-9
Rear shock absorber	Top nut of rear shock absorber	37-44
	Bottom nut of rear shock absorber	37-44
Front fork	Front shock absorber mounting bolt	37-44
Handlebar	Upper bracket assembly mounting bolt	40-60
Muffler	Mounting bolt for muffler	5-9
	Combined screw for muffler protecting plate	5-9
Engine	Cylinder cover nut	18-22
	Fixing nut in the power gear of clutch	50-60
	Stud bolt of air cylinder	18-22
	Clutch locknut	50-60
	Spark plug	10-15
	Limiting screw of the feet starter lever	35-40
	Shift positioned bolt	10-16
	Mould assembling bolt	10-12
	Bolts on the right and left crankcase cover	10-12
	Loop bolt	10-12
	Motor fixing bolt	10-12
	Seperating disk bolt of clutch	10-16
	Fixing bolt of inlet valve	10-12
	Setscrew of shift display	4-7
	Setscrew of constant temperature set	4-7
	Setscrew of electric wire clamp	4-7
	Fixing bolt of water pump	10-12
Frame	Rear swing arm shaft nut	70-83

GENERAL TIGHTENING TORQUES

If no specific torque is given for a bolted assembling use the table below to tighten the screws. If you release a bolted and glued assembling it must be glued in assembling again. For the bonding of screws use Loctite ® 243 ™, follow the instructions for use from the manufacturer.

MAXIMUM TORQUE IN NM REFERRING ISO 898/1 FOR METRIC FASTENERS/ COEFFICIENT OF FRICTION 0.12			
Size	*Strength (R) 3.6	*Strength (R) 8.8	*Strength (R) 12.9
M1.6	0.047 Nm	0.169 Nm	0.285 Nm
M 2	0.10 Nm	0.35 Nm	0.60 Nm
M 2.5	0.21 Nm	0.73 Nm	0.12 Nm
M 3	0.36 Nm	0.12 Nm	0.21 Nm
M 4	0.82 Nm	3.0 Nm	5.1 Nm
M 5	1.6 Nm	5.9 Nm	10.0 Nm
M 6	2.8 Nm	10.1 Nm	17.4 Nm
M 8	6.8 Nm	24.6 Nm	42.2 Nm
M 10	13.7 Nm	48 Nm	83 Nm
M 12	23 Nm	84 Nm	144 Nm
M 14	37 Nm	133 Nm	229 Nm
M 16	57 Nm	206 Nm	354 Nm
M 18	80 Nm	295 Nm	492 Nm
M 20	112 Nm	415 Nm	692 Nm

*The value R (strength) indicates the material property. The lower the value of R is the lower the torque of the bolts.

SPECIAL TOOLS

Special tools are required for some work but mostly professional work shop equipment is enough for service, repair and maintenance of the vehicle. After disassembly, clean the parts that are to be reused and check them for damage and wear. Replace damaged or worn parts.

NAME	REMARKS
Flywheel extractor	Figure 1
Spacer gauge	Figure 2
Dismounting tools for bearing	Figure 3
Assembling tools for bearing	Figure 4
Oil-seal dismounting tool	Figure 5
Handle of dismounting tools	Figure 6
Piston pin exhaustion apparatus	Figure 7
Piston ring opening pincer	Figure 8
Spark plug circular wrench	Figure 9
Dial dictator (subito) - Measure inner bore	Figure 10
Cylinder diameter tester	Figure 11
Inner hexagon wrench	Figure 12
Rest wrench	Figure 13
Micrometer	Figure 14
Circular wrench	Figure 15
Dial indicator	Figure 16
Magnetic stand, V-shape block	Figure 17
Square caliper	Figure 18
Whack-type screw drive	Figure 19
Front fork oil seal dismounting tools	Figure 20
Front part seal element driving-in tools	Figure 21
Steering nut wrench	Figure 22
Universal meter	Figure 23
Spring clip-ring clipper	Figure 24
Ignition tester	Figure 25
Clutch holder	Figure 26
Valve guide remover	Figure 27
Valve guide installer	Figure 28
Valve clearance adjuster	Figure 29
Valve spring remover	Figure 30
Valve guide reamer	Figure 31
Crankcase remover	Figure 32
Dial gauge, V-block	Figure 33
Brake bleeder device	no picture

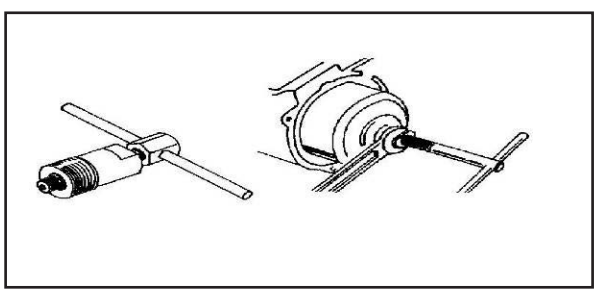


Fig. 1

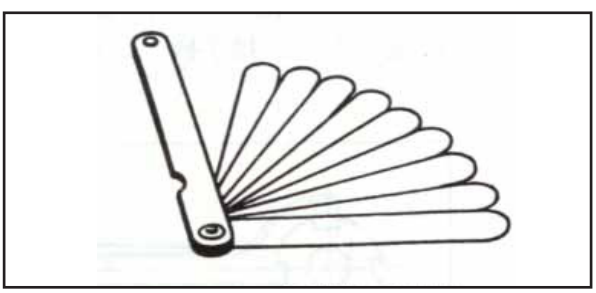


Fig. 2

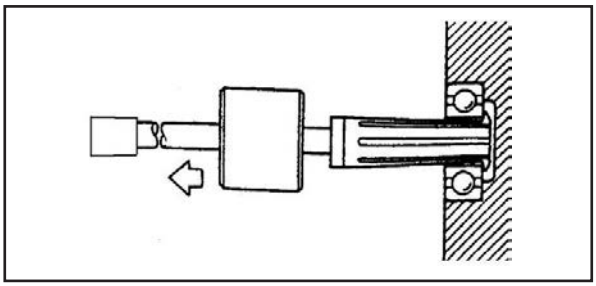


Fig. 3

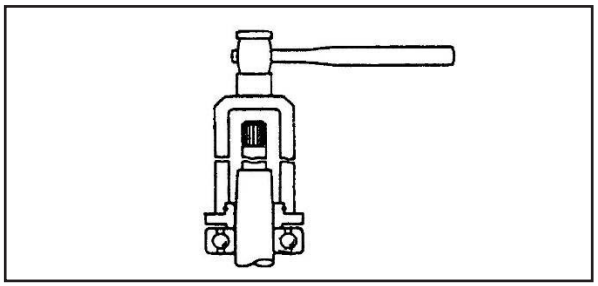


Fig. 4

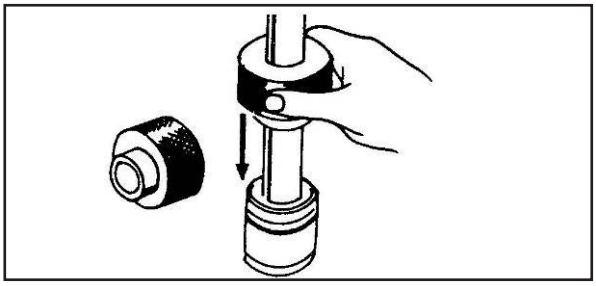


Fig. 5

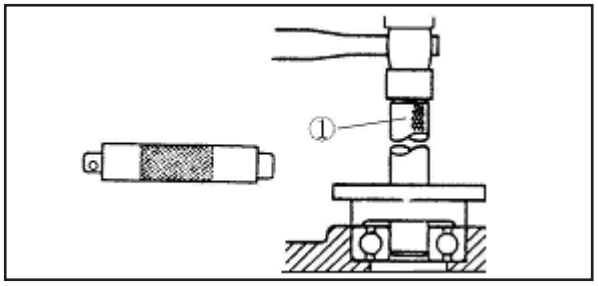


Fig. 6

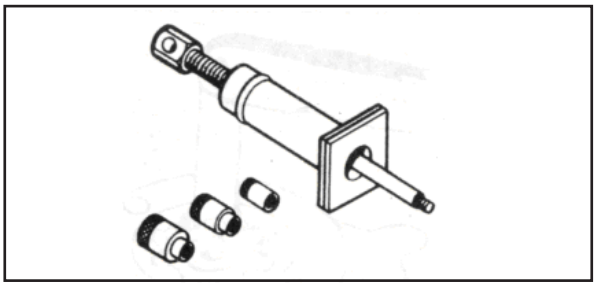


Fig. 7

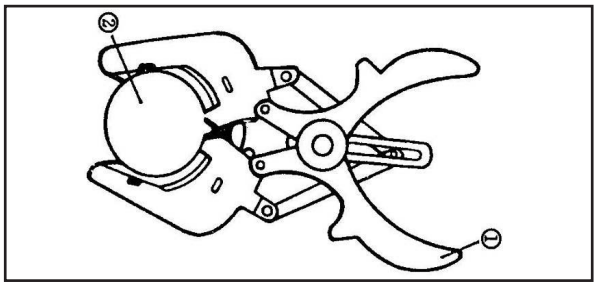


Fig. 8

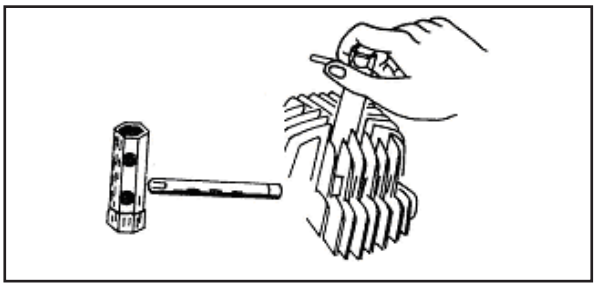
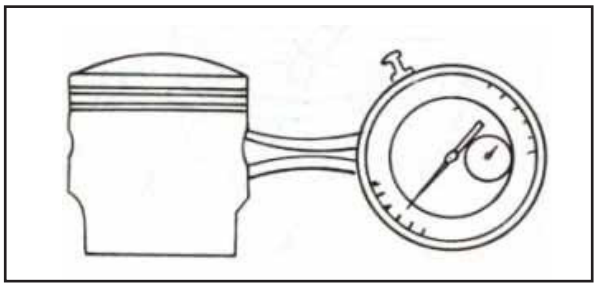


Fig. 9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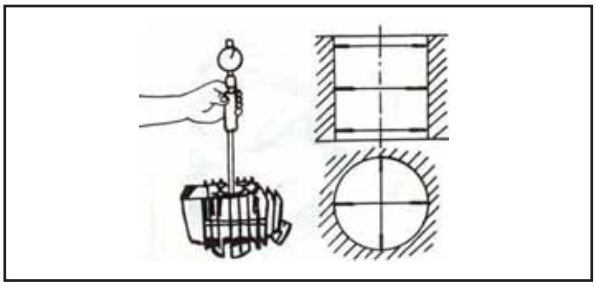
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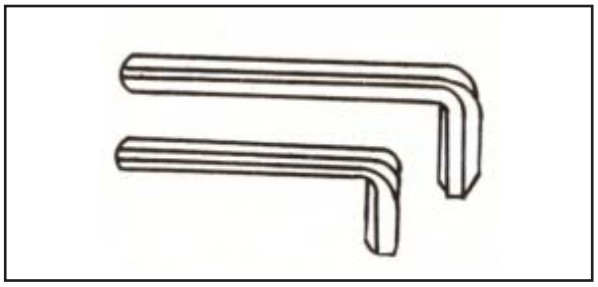
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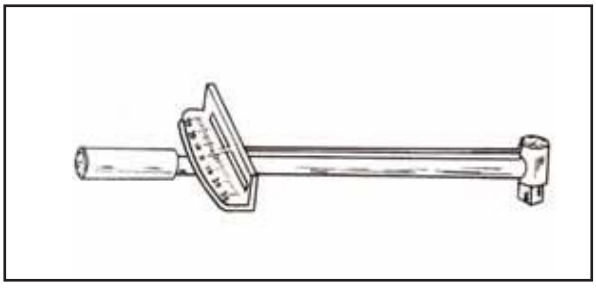


Fig. 13

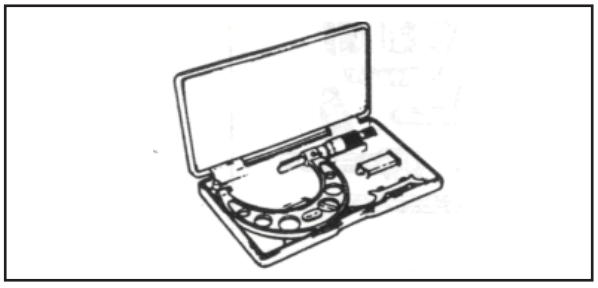
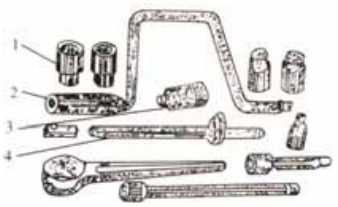


Fig. 14



1. Bush-head 2.Shake-handle
3.Ratchet type wrench 4.Connecting-rod

Fig. 15

Fig. 16

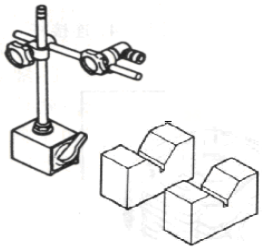


Fig. 17

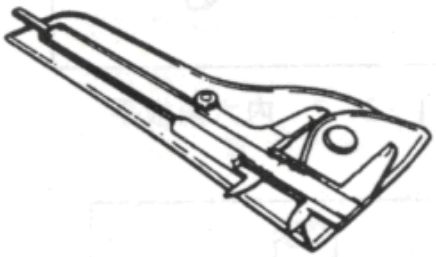


Fig. 18

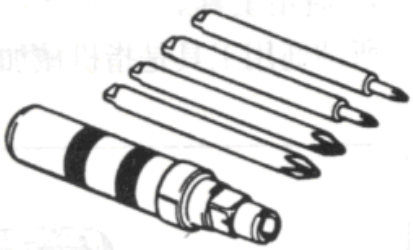


Fig. 19

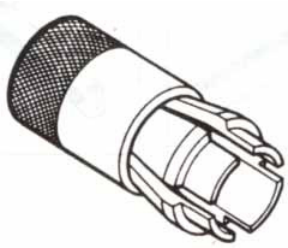


Fig. 20

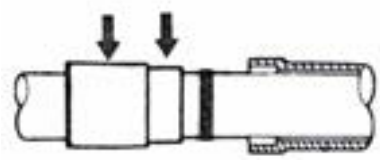


Fig. 21a

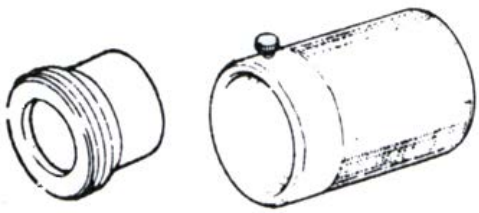


Fig. 21b

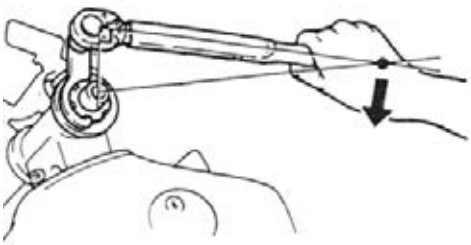


Fig. 22a

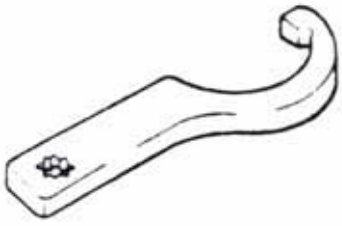


Fig. 22b

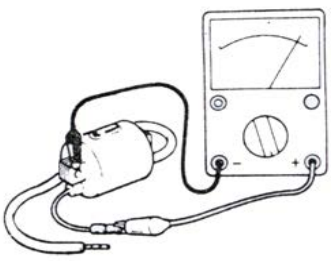


Fig. 23a

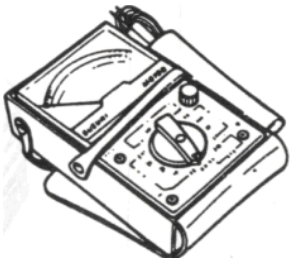


Fig. 23b

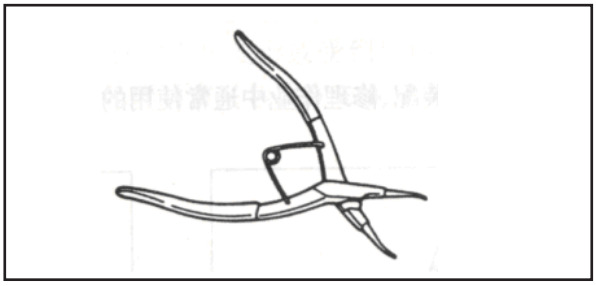


Fig. 24

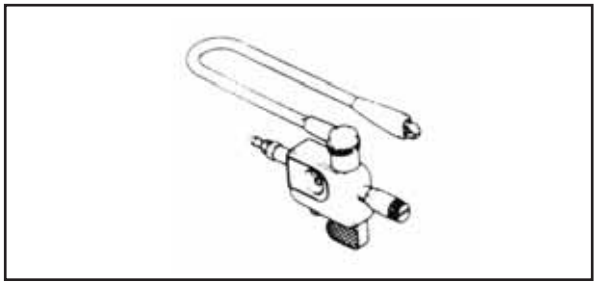


Fig. 25

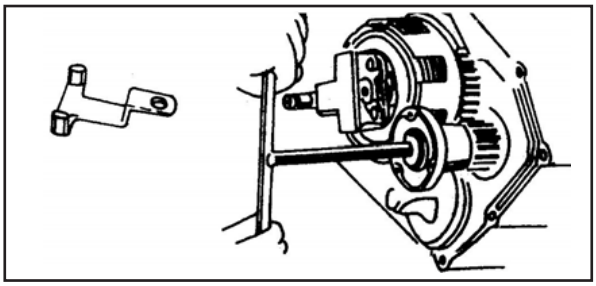


Fig. 26

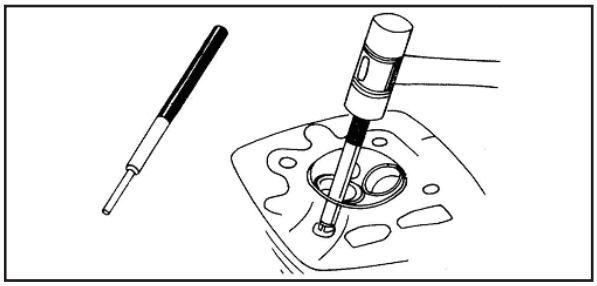


Fig. 27

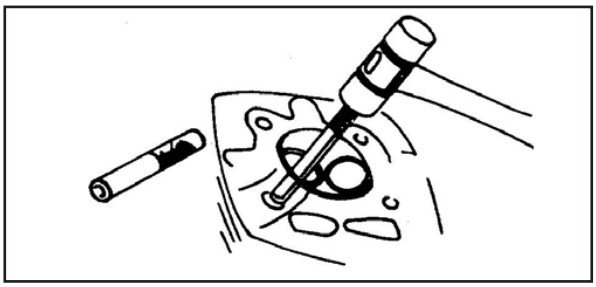


Fig. 28

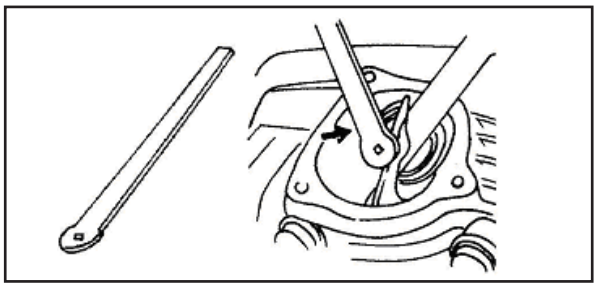


Fig. 29

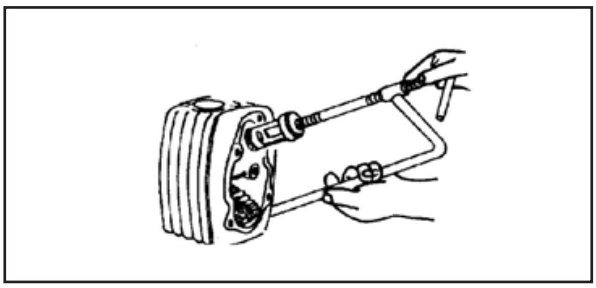


Fig. 30

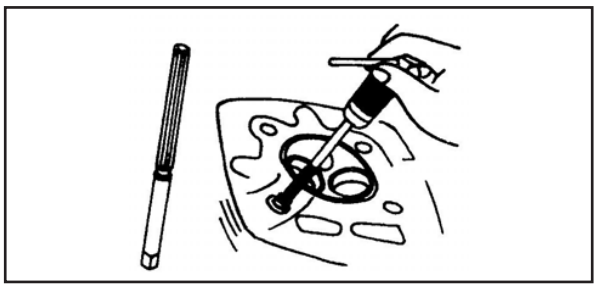


Fig. 31

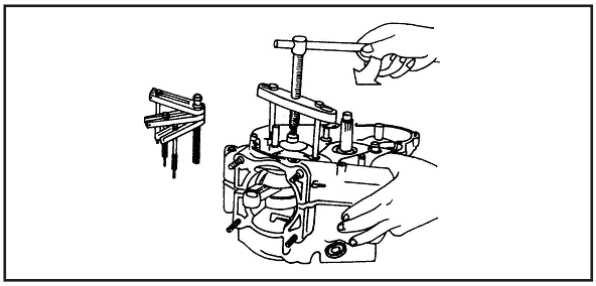


Fig. 32

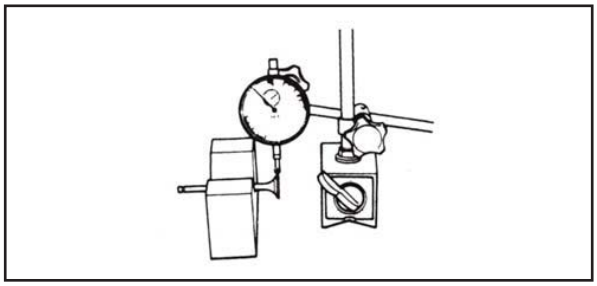


Fig. 33

Following special tools are not used for 2-stroke engines:

-> Fig. 27, Fig. 28, Fig. 29, Fig. 30, Fig. 31, Fig.32, Fig. 33

1. PERIODIC MAINTENANCE

PERIODIC MAINTENANCE CHART

Important maintenance work have to be carried out by an authorized workshop.

CHECKLIST OF CONSTANT MAINTENANCE

The inspection intervals are required, otherwise, no guarantee can be granted.		1000 km or 1. month	4.000 km or 6. month	7.000 km or 12. month	10.000 km or 18. month	13.000 km or 24. month
PART	**TO DO**					
Air filter	Clean / exchange	√	√	exchange	√	√
Wheels, rims	Control	√	√	√	√	√
Tires	Control / tire pressure		√	√	√	√
Wheel bearing	Control / exchange		√	√	√	√
Steering bearing	Control / clean / lubricate	√	√	√	lubricate	√
Screws Coverparts	Control / tighten		√	√	√	√
Brake system	Control / clean / exchange		√	√	√	√
Main stand	Control / clean / lubricate		√	√	√	√
Front fork	Control		√	√	√	√
Rear suspension	Control		√	√	√	√
Oil filter	Clean	√		√		√
Engine oil	Control / exchange	exchange	√	exchange	√	exchange
Valves (Engine)	Control / adjust	√	√	√	√	√
Transmission oil*	Exchange	exchange		exchange		exchange
Variomatic belt*	Control / exchange		√	exchange	√	
Fly wheels*	Control / exchange		√	exchange	√	
Driven chain / sprokets*	Control / clean / exchange	√	√	√	√	√
Clutch	Control	√	√	√	√	√
Cable / bowden	Control / clean / lubricate	√	√	√	√	√
Throttle	Control / adjust / lubricate		√	√	√	√
Lights / switches	Control / adjust	√	√	√	√	√
Fuel line / fuel filter	Control / exchange		√	exchange	√	√
Idle speed	Control / adjust	√	√	√	√	√
Exhaust system	Control / tighten		√	√	√	√
Coolant*	Control	√	√	√	√	√

CAUTION: Variomatic belt, fly wheels respectively drive chain/sproket, spark pluge, fuel filter and air filter element have to be exchanged every 7000km. Only use duration coolant. Brake lines have to be exchanged at least every 4 years. From 13.000km or 24th month the inspection should be made every 7000km. The vehicle is constantly checked for rust. The owner is responsible for rust prevention.

* Model specific deviations are possible

ENGINE

Oil/ Oil pump

Item		Standard	Service Limit
Transmission oil capacitiy	Oil for replacement	0.4+/- 0.1 L	--
	Oil for disassemble	0.5+/- 0.1 L	--
Engine oil capacity	Engine oil	1 L	
Oil pump	Outer diameter of the piston	--	2.45 mm

Cylinder/ Piston

Item			Standard value [mm]	Allowable limit [mm]
Air cylinder	Bore diameter		40.27 - 40.28	40.3
	Bend		---	0.05
	Cylindricity		---	0.05
	Roundness		---	0.05
Piston and piston ring	Clearance between the piston ring and the pinston ring groove	Top ring	0.015 - 0.05	0.09
		Second ring	0.015 - 0.05	0.09
	Interface clearance	Top ring	0.1 - 0.25	0.5
		Second ring	0.1 - 0.25	0.5
	Outer diameter of piston		40.22 - 40.23	40.2
	Clearance of piston and air cylinder		0.04 - 0.06	0.1
	Bore diameter of piston pin hole		12.002 - 12.008	12.04
	Outer diameter of piston pin		11.994 - 12	11.96
	Clearance of piston pin hole and piston		0.002 - 0.014	0.08
	Bore diameter of connectin rod small end		14.995 - 15.006	15.06

Carburettor

Item		Standard value
Carburettor	Throat diameter	17.5
	Main nozzle	B03
	Main jet	95
	Idle jet	22.5
	Needle valve	B05-Z

Fuel tank

Item	Standard	Tolerance
Fuel tank capacity	10 L	+/- 0.2 L

TRANSMISSION

Item		Standard value [mm]	Allowable limit [mm]
Crankshaft	Clearance of connecting rod big end in right and left direction	0.1 - 0.35	0.55
	Axial clearance of connecting rod big end in vertical angle	0 - 0.008	0.005
	Vibration	---	0.1
Clutch	Thickness of wearing plate	2.9 - 3	2.6
	Length of pressure spring	29.4 - 30.6	29.0
Shift mechanism	Bore diameter of shift fork	7.825 - 7.845	7.91
	Thickness of shift fork	3.95 - 4.05	3.9
	Outer diameter of shift drum	41.8 - 42	41.75
	Locked groove width of shift drum	6.05 - 6.15	6.3

ELECTRICAL SYSTEM

Item			Specification
Battery	Capacity		12 V / 3 AH
	Voltage (20°C)	Fully recharged	13.1 V
		Must be recharged	12.3 V
	Charging current	Standard	0.4 A
		Quick	1.5 A
	Charging period	Standard	5-10 h
		Quick	1 h
Magneto	Max. capacity		80W / 1500 rpm
	Coil impedance value (20°C)		Between white and black 3.3 - 3.5 Ω
Voltage regulator	Type		single-phase semi wave SCR charge, SCR semi wave short circuit mode
	Battery recharging voltage		14-15 V / 5000 rpm

IGNITION

Item			Standard value
Spark plug			NGK/BR8ES
Spark plug gap			0.6 - 0.7 mm
Ignition coil impedance value (20°C)	Primary coil		0.4 Ω±10% (bl/w-bl)
	Secundary coil	With spark plug cover	8-11 KΩ
		Without spark plug cover	4.5-5.5 KΩ
Resistance value of trigger (20°C)			100-200 Ω (bl/w-gr/w)
Trigger voltage			Above 1.7 V

STARTER MOTOR

Item	Standard value	Allowable limit
Brush length of startup motor	12.5 mm	8.5 mm
Liner of startup idler shaft		8.3 mm
Outer diameter of startup idler shaft		7.94 mm

WHEELS

Item	Specification		Tire pressure (bar)
Tire pressure unit	Front wheel of inside	3.00-21	2.25
	Rear wheel of inside	4.10-18	2.25
	Front wheel	100/80-17	2.25
	Rear wheel	130/80-17	2.25

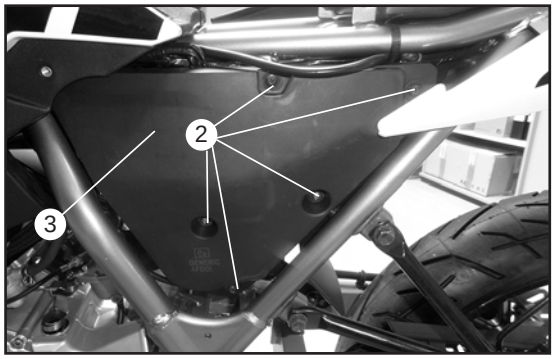
Measuring position	Item		Standard value (mm)	Service limit (mm)
Front wheel shaft	Curvature			0.2
Front wheel	Wheel shimmy	Longitudinal		2.0
		Transversal	Within 1.0	2.0

AIR CLEANER

Replacement of the air filter element.

1. Remove the seat and the covers on the left side (1).

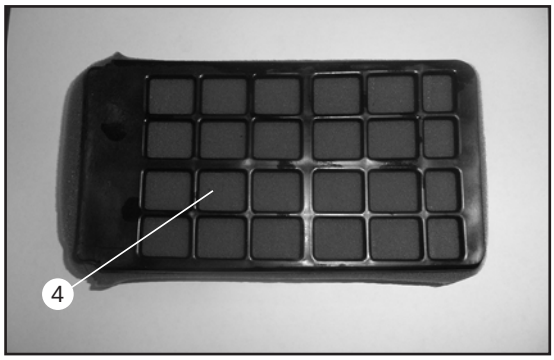
2. Remove the five mounting bolts (2) and the cover (3) to remove the air cleaner element (4).
3. Assembling in reversed order.



Check to see if the filter element is polluted or damaged. If it is polluted or damaged, please replace with a new one.

CHANGING INTERVALS

If the motorcycle is frequently driven on bad road or in rain, it should be replaced early. Under normal condition replace it referring the maintenance chart.

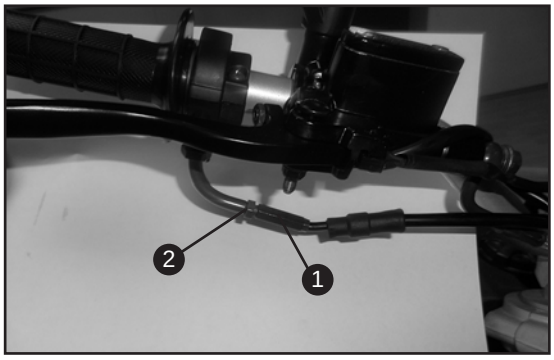


NOTE

Please note that it is a paper element. Do not use any air filter oil or other to protect or clean the element. Use only appropriate air pressure to clean the element.

THROTTLE WIRE INSPECTION/ ADJUSTMENT

Check the smoothness of accelerator pull wire.
Free displacement: 5-10 mm

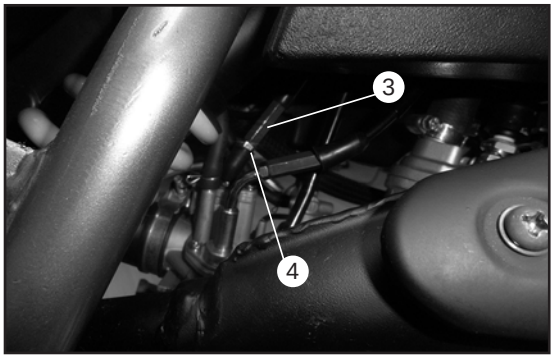


NOTE

The main adjusting position is on the throttle grip.

1. To adjust the free play of the throttle grip loosen the fixing nut (2) and adjust by turning adjusting nut (1).
2. After the adjustment is done tighten the nut (2).

The second adjusting position is on the carburettor.

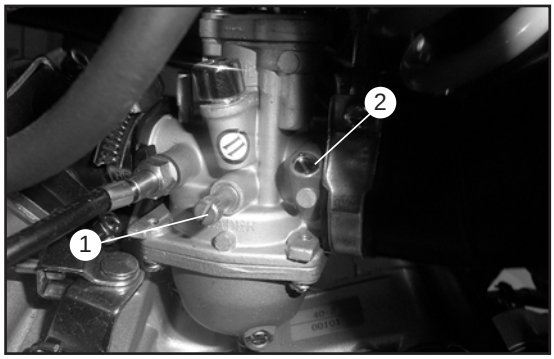


1. To adjust the free play of the gas wire loosen the fixing nut (4) and adjust by turning adjusting nut (3).
2. After the adjustment is done tighten the nut (4).

NOTE

When the gas wire work sluggishly check if it is damaged or rusty. Replace it if worn or grease it with silicone spray if it is rusty.

IDLE ADJUSTMENT



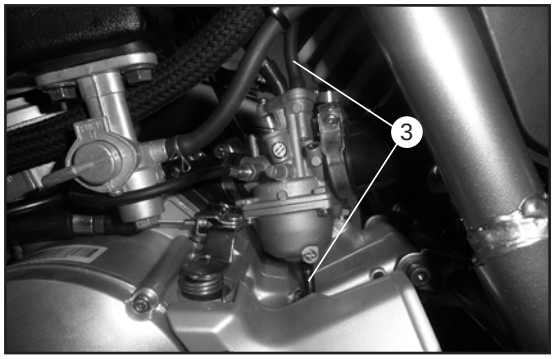
Start and warm up the engine for about 3 minutes, so that the engine will operate in normal running temperature. Adjust the idle adjustment screw (1) and set the idle speed to 1800 U/min.
Create a round and stabile engine speed, using the air/ fuel control screw (2).

Reset the idle adjustment screw (1) and set the engine speed down to 1200-1500 ± 100 U/min.
Pull the throttle for several times for acceleration and inspect whether the idle speed is steady.

CARBURETTOR ADJUSTMENT

Attention: When the vehicle is ready for sell, the idle adjusting bolts have already been adjusted, so they generally require no adjustment. When dismantling the carburettor, the number of turning of the bolts should be recorded because this is very helpful during the installation.
Switch on and warm up the machine for about 3 minutes, so that the engine will operate in normal running temperature;
Adjust the idle adjustment bolts and set engine speed to be 1800 U/min.
Screw the mixture adjustment bolt to the end with proper force.
At this point the engine will stall, if not inspect whether air escapes at the interface of air filter, whether the bolt is tightened and whether the intake of the air filter is blocked;
Withdraw the mixture adjustment bolt for 1 1/2 circle anti-clockwise;
Slowly adjust the mixture adjustment bolts anti-clockwise, till the engine speed reaches its utmost mixture.
Reset the idle adjustment screw and set the engine speed down to 1200-1500±100 U/min.
Pull the throttle for several times for acceleration and inspect whether the idle speed is steady.
Test the outlet and compare it with the specified standards.

FUEL HOSE INSPECTION

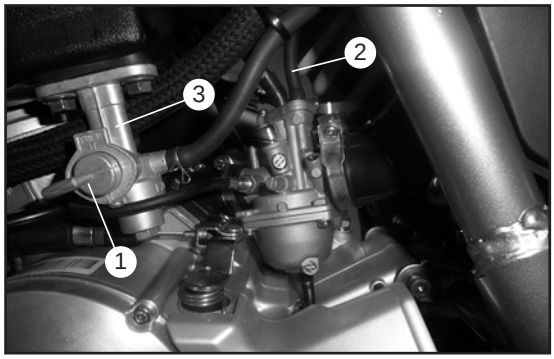


When working on the carburettor, engine and during each maintenance work, check the fuel lines (3). Please note that this may not be brittle or leaking. Leaking fuel can ignite and cause serious injury and damage.

⚠ WARNING

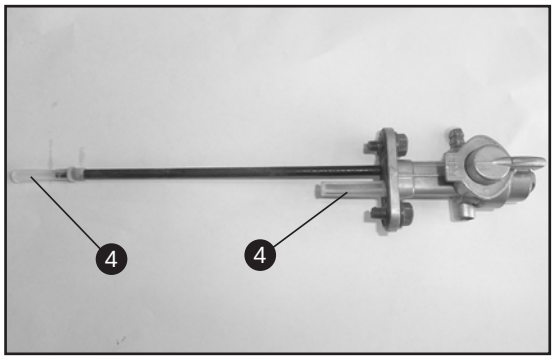
If the fuel line is brittle or leaking it must be replaced immediately.

FUEL FILTERS CLEANING



The fuel filter must be changed concerning the maintenance chart or when it is blocked.
Always check the fuel filter during each work on the fuel system.
The fuel filters are placed in the tank.

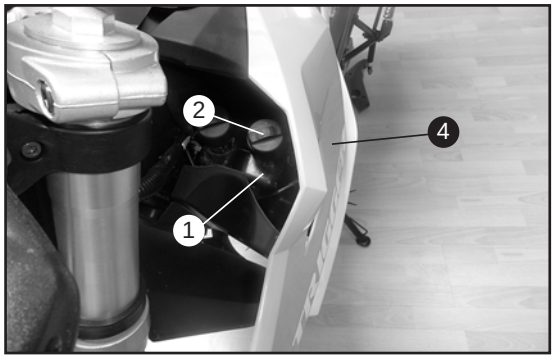
Cleaning:
1. Switch of the ignition.
2. Switch the fuel cock (1) to the “OFF” position.
3. Disconnect the fuel line (2) from the Carburetor
4. Leave out the fuel (switch the fuel cock to the “ON” position).
5. Remove the fuel tank.
6. Remove the fuel cock (3).
7. Clean the two fuel filters (4).
8. Reassemble in reverse order.



ENGINE OIL LEVEL INSPECTION

When it is necessary to refill engine oil please only use the recommended type.

Recommended engine oil
Quantity 1 L
Castrol Power 1-Racing 2T Fully Synthetic



Under regular conditions the engine oil consumption is approximately 1L/ 700 km.
The engine oil must be checked by the end user during each fuel refilling.
The engine oil tank (1) is located on the left handle side in the front.

Engine oil level inspection
1. Switch of the ignition.
2. Remove the engine oil tank cap (2).
3. Check the oil level.
4. Refill the recommended engine oil type till overflow hose (3) shown on the next page.
5. Reassemble in reverse order.

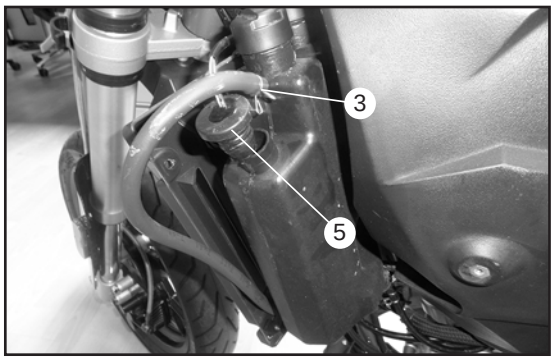
NOTE

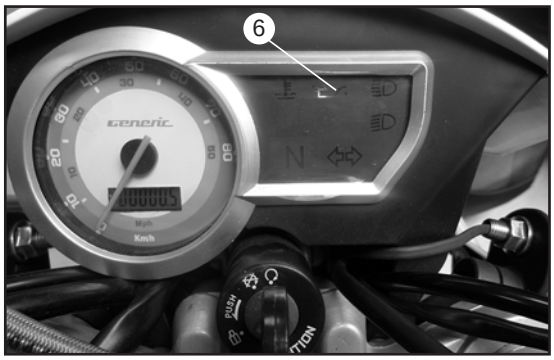
- Check the engine oil level when the engine is warmed up.
- Check the oil level just one minute after stopping the engine.

If the engine oil level become too low the red indicator light will come on.
If the engine oil level will be not indicated correct please check the oil level sensor (5).
If the oil level sensor do not work correct you must replace it against a new one.

ENGINE OIL LEVEL SENSOR INSPECTION

1. Remove the front left side cover (4).
2. Remove the oil level sensor (5).
3. Switch on the ignition
4. Remove the oil level sensor, move the floater up and down and check if the indicator light (6) in the dashboard comes on or not. If the indicator light do not come one replace the oil level sensor.



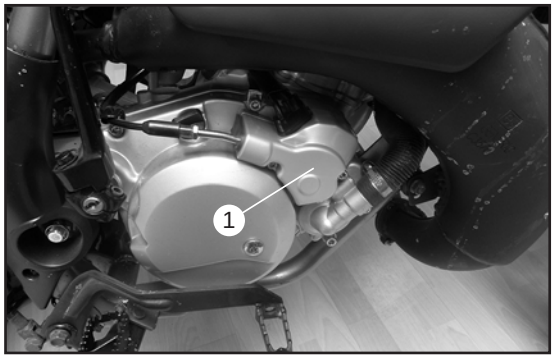


OIL PUMP INSPECTION

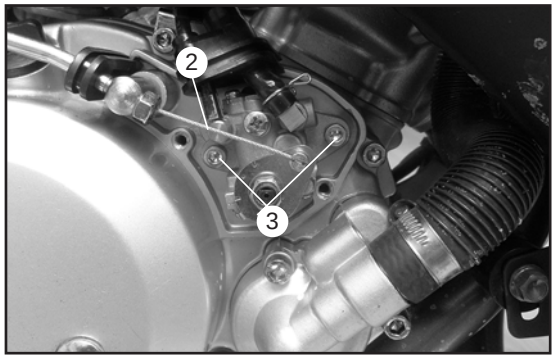
The lubricating system supplies oil to the wear surfaces to reduce part wear and friction, to cool parts, and to carry away impurities. The throttle cable is connected with the carburettor and the oil pump. The oil pump supplies oil from the oil tank to the carburettor. From the carburettor the fuel-oil mixture is injected in the cylinder head.

The oil pump cable must open the pump earlier (1° on the throttle grip) than the carburetter cable opens the throttle, to secure enough lubrication in the mixture. When you pull the throttle grip, you must feel a easy resistance from the oil pump. When you keep pulling, you must feel a stronger resistance from the carburettor. The cables can be adjusted on the oil pump and on the carburettor. The right adjustment is very important to prevent any engine damage.

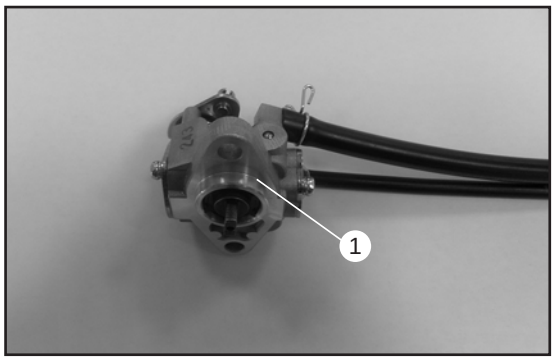
To inspect the oil pump you must remove first the oil pump cover (1).



Disconnet the oil pump cable (2).
Release the screws (3) to remove the oil pump.



When you inspect the oil pump you can check several points.

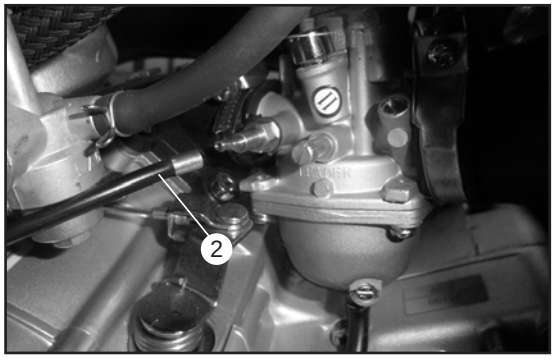


1. Is the oil pump leaking (1)?
2. Does the oil pump work properly?

1. Does the oil pump leak (1)?

Check the gaskets on the oil pump shaft. If the gaskets are damaged or worn replace the oil pump.

2. Does the oil pump work properly ?



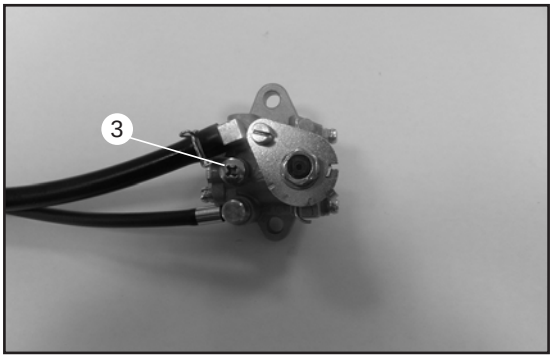
To test the proper function of the oil pump, the oil pump must be mounted.

1. Remove the oil line (2) from the carburettor.
2. Start the vehicle and open the throttle ~ 80%.
3. After ~ 5 sec. a drop of oil must emerge.
4. Average flow is ~ 1 drop of oil/ 5 - 10 sec. in idle speed.

Let the engine work max. 30 sec. without lubrication.

A) When oil appear wipe away the first drop of oil and repeat the process to make sure that the pump works proper.
B) If there no oil appear please check below points.

Bleed the oil pump ?



NOTE

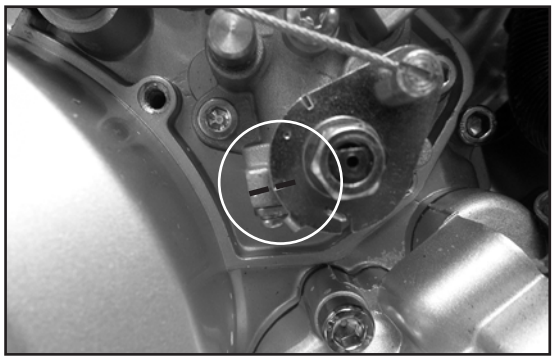
To bleed the oil pump it is not necessary to start the engine. The oil flows automatically due to gravity.

1. Open the bleed screw (3) until only oil flows from the pump. There must be no air present.
2. Next, check whether the oil pump works proper. If not we recommend to bleed the oil system as described in the next step.

Bleed the oil system ?

1. Remove the oil tube also from the oil tank and refill the system from the top with fresh oil.
2. For this use a one way syringe or similar. The system must be refilled in the direction from the oil tank.
3. When the system is refilled correct connect the oil tube to the oil tank and do the above test once again.
4. If everything is fine you can reassemble all parts.

OIL PUMP ADJUSTMENT



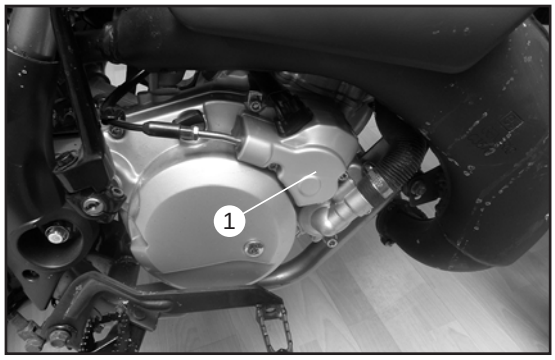
⚠ WARNING

Before you start to adjust the oil pump make sure that the oil circuit is vented correct. If you are start to adjust before the system is vented correct you risk an engine failure during the adjustment.

NOTE

It doesn't matter which variant is installed because both need to become adjusted in the same way.

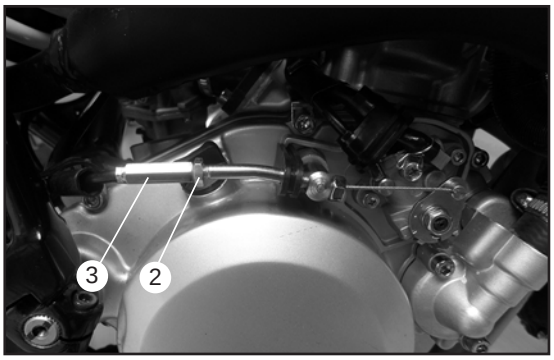
Adjustment preparation



1. Remove the oil pump cover (1).
2. Check if all components installed correct. (Check oil pump inspection)
3. Check the default settings of the oil pump.

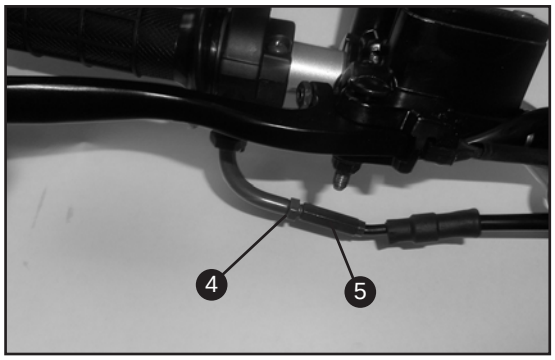
a) The oil pump start working as soon the throttle grip is turned.
b) The oil pump start work to late. It could be possible that the engine runs without oil. The settings need to be readjusted.

Adjustment

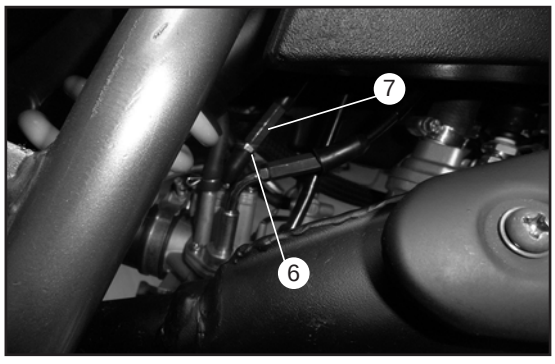


There are 3 positions which have to be considered for a correct adjustment.

1. Oil pump: Open the fixation nut (2) and turn the adjustment nut (3) to get the recommended setting.
2. After the settings correct tighten the fixation nut. If it is not possible to get the recommended setting you also have to readjust the settings of the throttle wire (3).

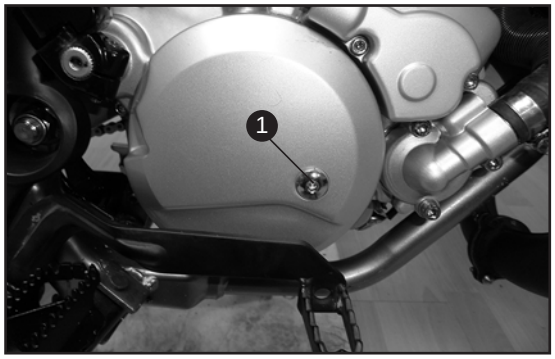


3. Throttle grip: Open the fixation nut (4) and turn the adjustment nut (5) to get the recommended setting. After the settings correct tighten the fixation nut.
4. Final you have to check if the oil pump and the throttle valve of the carburettor work synchronized. If not readjust the carburettor in the same way.



5. If the throttle valve in the carburettor and the oil pump do not work synchronized you must readjust the throttle valve settings on the carburettor. Open the fixation nut (6) and turn the adjustment nut (7) to get the recommended setting.

TRANSMISSION OIL LEVEL INSPECTION

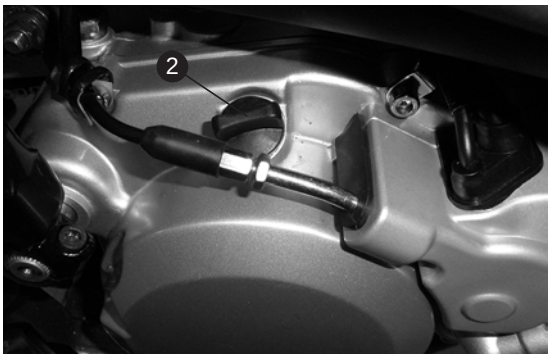


1. Switch of the ignition.
2. Place the vehicle on a flat ground.
3. Open the level screw (1).

NOTE

Oil can flow out.

4. If no oil flow out of the level screw, open the oil cap (2) and fill oil in, till oil flow out of the level screw.

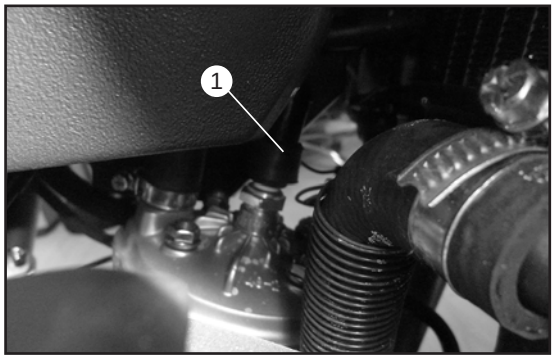


NOTE

- Check the engine oil level when the engine is warmed up.
- Check the oil level just one minute after stopping the engine.

RECOMMENDED TRANSMISSION OIL
Quantity 0.5 L for disassemble/ 0.4 for replacement
Recommended type: CASTROL Power 1 - Racing 4T 10W-40

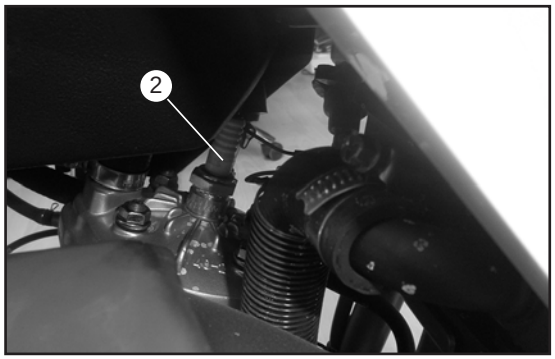
SPARK PLUG INSPECTION



1. Remove the spark plug cap (1).

NOTE

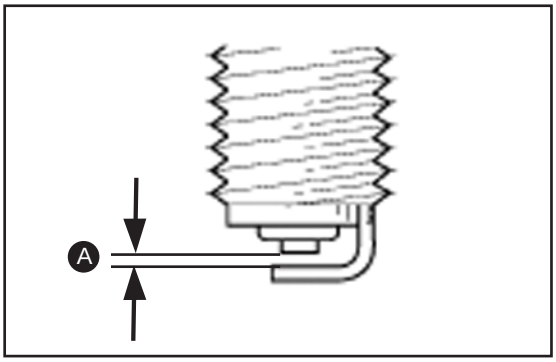
Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.



2. Remove the spark plug (2).
3. Check the spark plug and replace it if it is damaged.
4. Check the spark plug gap and adjust it if it is not correct.

PART NO.	TORQUE
2	10-15 Nm

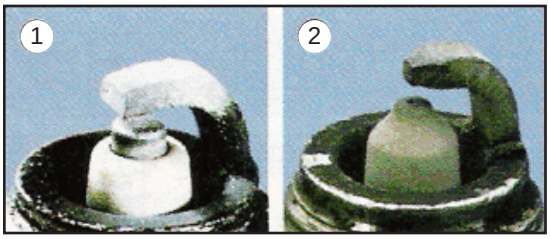
Allowable limit A: Clearance: 0.6-0.7 mm



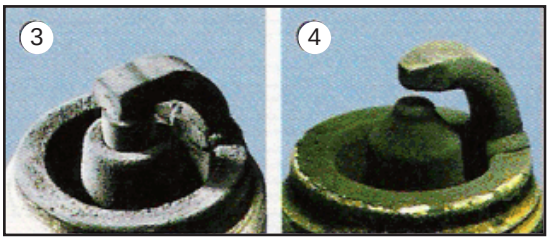
⚠ WARNING

When you need to replace the spark plug always control the installed type in before the replacement. It could be possible that based on technical innovations the type which is described will change.

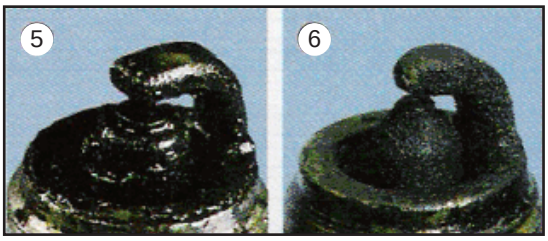
SPARK PLUG IMAGES AND ANALYSIS



Colour: 1. Gray/ 2. Light brown
Analysis: Engine management ok



Colour: 3. Matt black/ 4. Velvety coating
Analysis: Fuel/ air mixture wrong. Too much fuel!
Solution: Fuel/ air mixture need to adjust.
How to adjust see page 21.



Colour: 5. Oily soot/ 6. Oil coal
Analysis: Too much oil.
Solution: Check lubrication system.
Check piston rings.

SPARK PLUG REPLACEMENT

1. Follow the instructions on page 27.
2. Reassemble in reverse order.

RECOMMENDED SPARK PLUG TYPES:
NGK/BR8ES

CYLINDER PRESSURE INSPECTION

NOTE

The pressure inspection should be made when the engine is warm.

1. Warm up the engine for several minutes.
2. Stop the engine, remove the spark plug and insert a pressure gauge (1).
3. Turn choke valve to its full open position.
4. Set throttle handle to its full open position and start the engine.
5. Start the engine till reading of pressure gauge.

Standard value: 6-8 bar
Allowable limit: 5.5 bar

NOTE

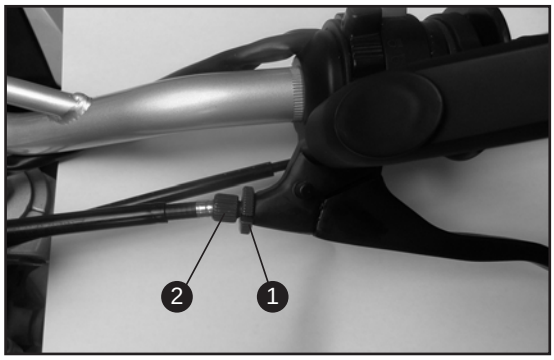
1. Check the following items if the compression pressure is too low.
   - If the cylinder head gasket is damaged
   - The wear or damage of piston ring
   - The wear of piston and cylinder

2. Check the following items if the compression pressure is too high.
   - Carbon deposition in combustion chamber or on the top of the piston.

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Cylinder pressure below the allowable limit	Worn piston ring or cylinder	Check the carburettor
	Defect gasket	Clean or replace the fuel filter
Cylinder pressure higher than the allowable limit	Carbon deposition in combustion chamber or piston	Remove the deposition or replace the affected parts

CLUTCH CABLE FREE PLAY ADJUSTMENT



The clutch system is operated by a steel cable. By adjusting the steel cable, the clutch can be set. Check clearance of clutch cable.

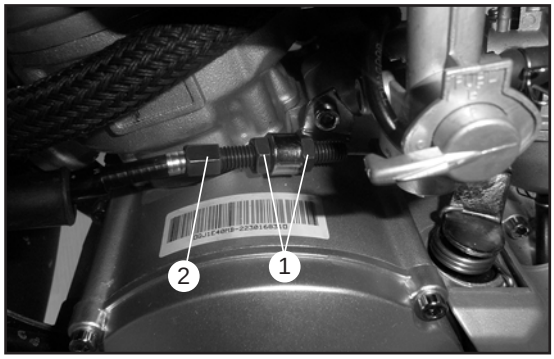
1. Operate the clutch lever until pressure builds. The free play (A) between the 0 position and the pressure point must be 10 to 15 mm. When free play is higher or lower the clutch cable need to be adjusted.
2. To adjust the cable loosen the locknut (1) turn the adjustment nut (2) in or out till the free play of the lever is ok.
3. Tighten the locknut.

Allowable limit: A= 10 - 15 mm

NOTE

If the clutch cable free play cannot be obtained on the handlebar side of the clutch cable, use the adjusting nut on the engine side.

ADJUSTING THE CLUTCH CABLE FREE PLAY ON THE ENGINE SIDE



1. To adjust the cable loosen the locknuts (1).
2. Turn the adjustment nut (2) in or out till the free play of the lever is ok.
3. Tighten the locknuts.

CLUTCH ADJUSTMENT

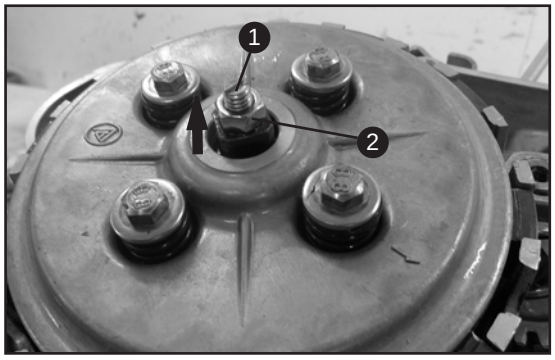
NOTE

When the clutch lever free play is correct and the clutch do not work sufficient check the clutch settings. Before you start to dismantle the engine, check the oil level first. You don't have to remove the engine from frame while checking the clutch.

1. Warm up the engine for several minutes.
2. Place a container under the engine.
3. Drain the oil.

NOTE

The mark on the push lever should flee with the mark on the left engine cover as shwon in picture (1).

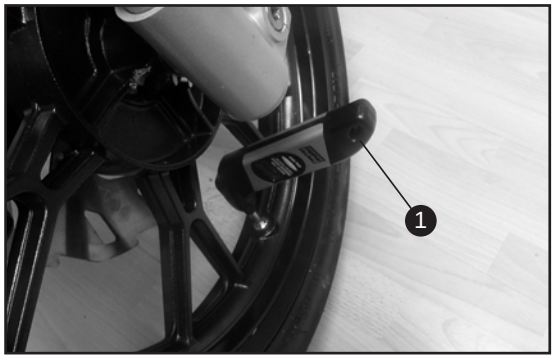


4. Remove the right engine cover.
5. Lock the clutch push rod (1) with a screwdriver.
6. Loose the locknut (2) counterclockwise.
7. Turn the clutch push rod until you feel resistance.
8. Then turn the clutch push rod out a 1/4 - 1/2 turn.
9. Tighten the locknut.
10. Assembling in reversed order.

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Shifting difficult	Improperly adjusted clutch cable	Adjust the clutch cable
	Improperly adjusted push lever position	Adjust the position
	Improper engagement of clutch push rod	Adjust the clutch push rod
	Clutch plates defect (bent, worn or broken)	Replace the clutch plates
Oil level wrong or viscosity wrong	Oil consumed or polluted	Replace or refill the engine oil

AIR PRESSURE INSPECTION



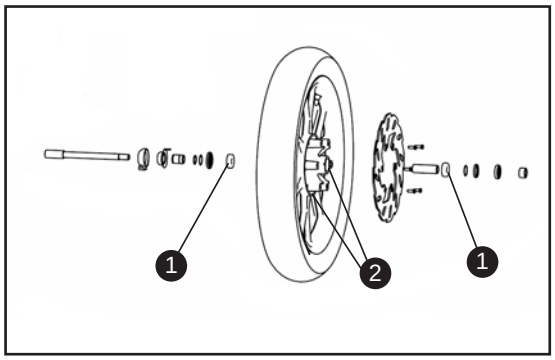
⚠ WARNING

Low tire air pressure leads to abnormal wear and overheating of the tire. The tire pressure should be measured under cold condition.
Use a conventional pressure gauge (1) to test the tire pressure.
Correct tire air pressure ensures optimal riding comfort and maximum tire service life.

SPECIFICATION		PRESSURE/ BAR
Front tire	100/80-17	2.25
Front rim	2.50*17	
Rear tire	130/80-17	2.25 - 2.5
Rear rim	3.00*17	

WHEEL BEARING AND WHEEL AXLE DAMAGE INSPECTION FRONT

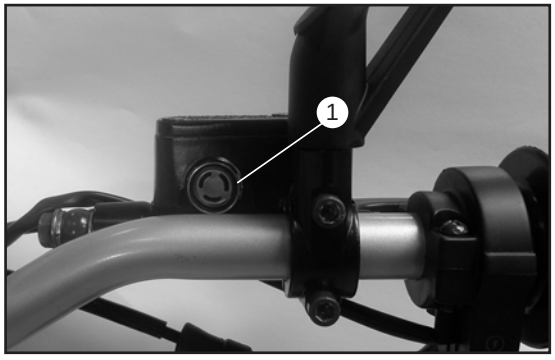
The wheels rotate with difficulties, sounds strange or have too much free play, the wheel-axle bearings (1) or the gear seats (2) are in failure. To locate the error, the wheel should be removed.



BRAKE FLUID LEAK INSPECTION FRONT

If the brake fluid level falls below the inspection glass (1) mark, this indicates a leakage in the brake system or worn-out brake linings.

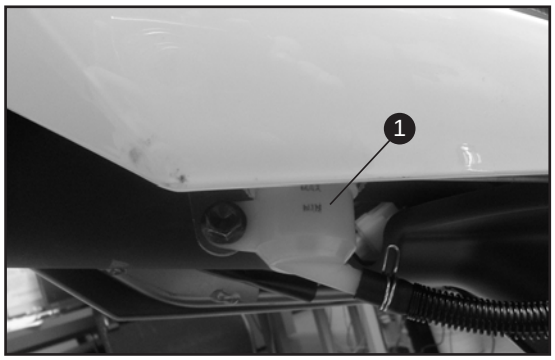
1. Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
2. Check the brake fluid level.
3. Check the brake system and do not continue riding if the system is leaking.



BRAKE FLUID LEAK INSPECTION REAR

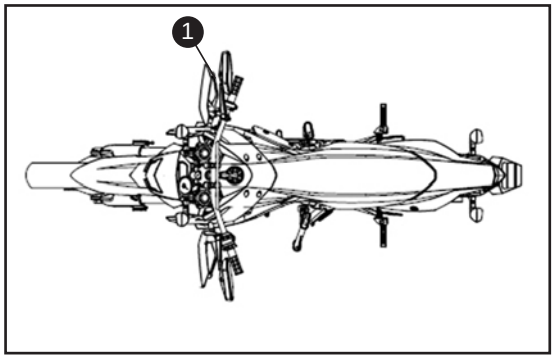
If the brake fluid level falls below the MIN (1) mark, this indicates a leakage in the brake system or worn-out brake linings.

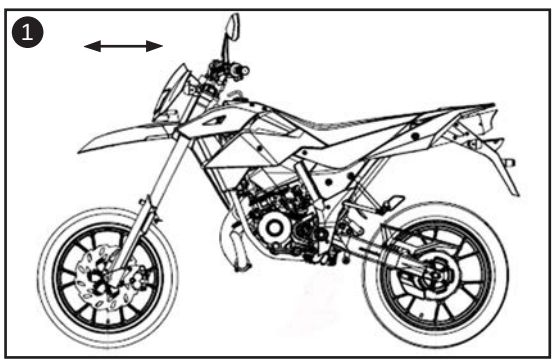
1. Move the brake fluid reservoir mounted on rear frame to a horizontal position.
2. Check the brake fluid level.
3. Check the brake system and do not continue riding if the system is leaking.



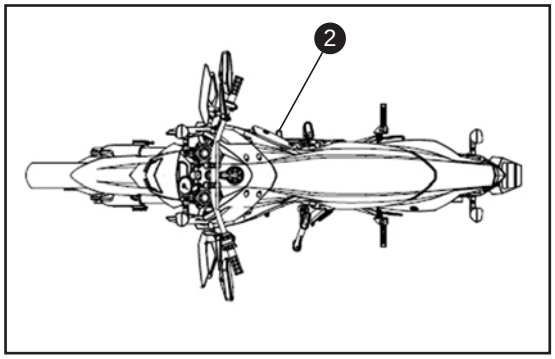
BRAKE OPERATION INSPECTION FRONT

1. Operate the hand brake lever (1) until the brake pads lie on the brake disc and check if there is a pressure point. If there is no pressure point check the brake system.
2. While operate the front brake lever push forward and backward hard (picture 1) on the handlebar to check if the front system is working. If the brake do not work correct check the brake system.
3. Final make a driving test with low speed and check if the brake system is working. If the brake do not work correct check the brake system.



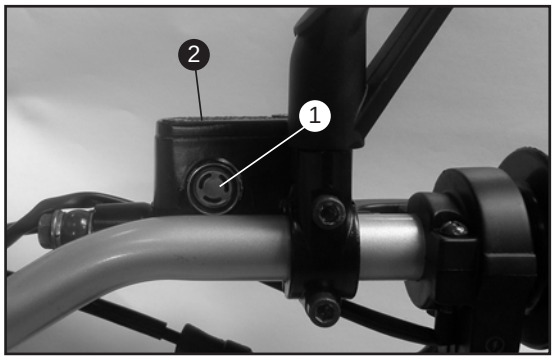


BRAKE OPERATION INSPECTION REAR



1. Operate the foot brake lever (2) until the brake pads lie on the brake disc and check if there is a pressure point. If there is no pressure point check the brake system.
2. While operate the foot brake lever push the vehicle forward and backward (picture (1) on page 31) on the handlebar to check if the brake system is working. If the brake do not work correct check the brake system.
3. Final make a driving test with low speed and check if the brake system is working. If the brake do not work correct check the brake system.

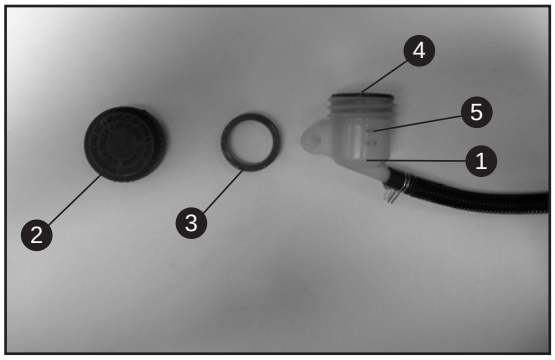
BRAKE FLUID LEVEL INSPECTION FRONT



After a certain time the brake pads start to wear out and the brake fluid level falls down. If the brake fluid level falls below the MIN (1) mark, check the brake pads or and the brake system for any leakage. Never add brake fluid only without checking the system.

1. Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
2. Check the brake fluid level.
3. Add brake fluid if necessary.
4. Remove the cover (2) with the membrane.
5. Add brake fluid to the MAX level.
6. Mount the cover (2) with the membrane.

BRAKE FLUID LEVEL INSPECTION REAR



After a certain time the brake pads start to wear out and the brake fluid level falls down. If the brake fluid level falls below the MIN (1) mark, check the brake pads and the brake system for any leakage. Never add brake fluid only without checking the system.

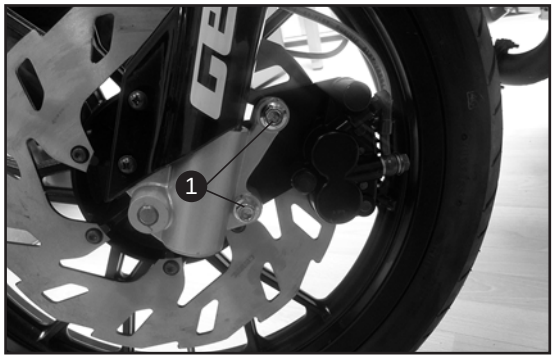
1. Remove the brake fluid reservoir (1).
2. Hold the brake fluid reservoir on a horizontal position.
3. Check the brake fluid level.
4. Add brake fluid if necessary.
5. Remove the cover (2).
6. Remove the plastic part (3) and the rubber part (4).
7. Add brake fluid to the MAX (5) level.
8. Mount the cover (2).

Brake fluid type	CASTROL SUPER DISK BRAKE FLUID DOT 4
Brake fluid boiling temperature	> 170°C
Brake fluid water content	< 3%

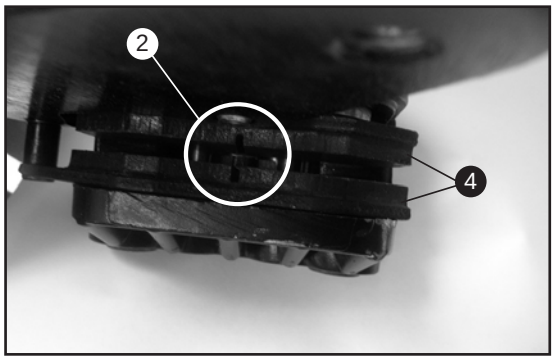
FRONT BRAKE PADS INSPECTION

Reduced braking efficiency caused by worn brake pads.
Change worn brake pads immediately. Always replace the brake pads in pair.

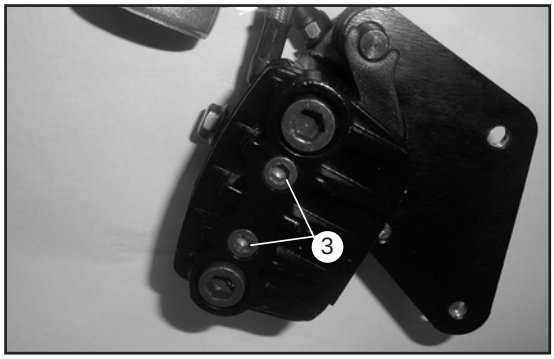
1. Loose the mounting bolts (1) of the braking calliper bracket.



2. If the minimum thickness is less than the indicators (2), damage or cracking is visible change the front brake pads.



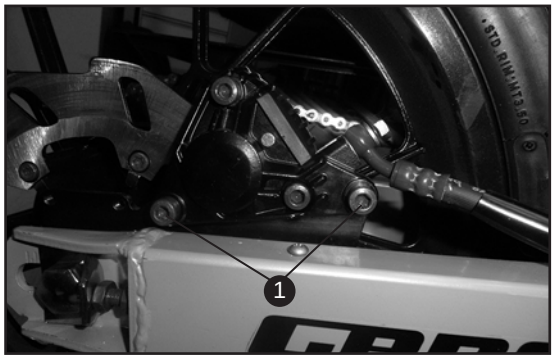
3. Loosen the two mounting bolts (3).
4. Change the brake pads (4) in pair.
5. Reassemble in reverse order.



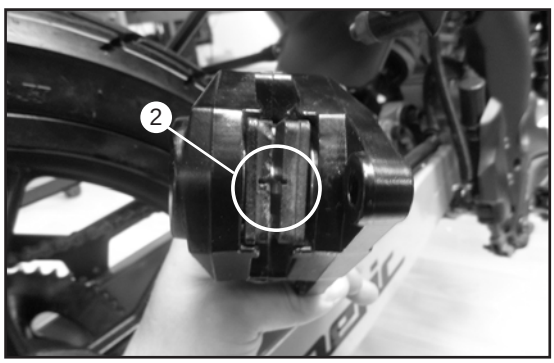
REAR BRAKE PADS INSPECTION

Reduced braking efficiency caused by worn brake pads.
Change worn brake pads immediately. Always replace the brake pads in pair.

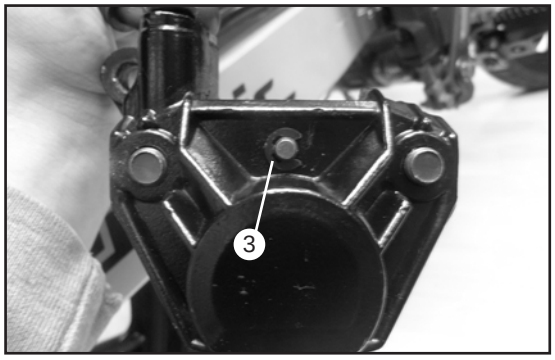
1. Loose the mounting bolts (1) of the braking calliper bracket.



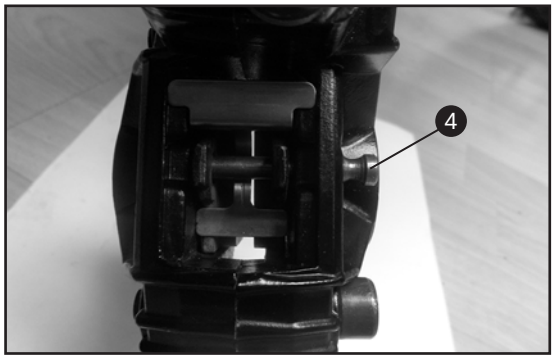
2. If the minimum thickness is less than the indicators (2), damage or cracking is visible change the rear brake pads.



3. Remove the circlip (3).



4. Remove the bolt (4).
5. Change the rear brake pads in pair.
6. Reassemble in reverse order.



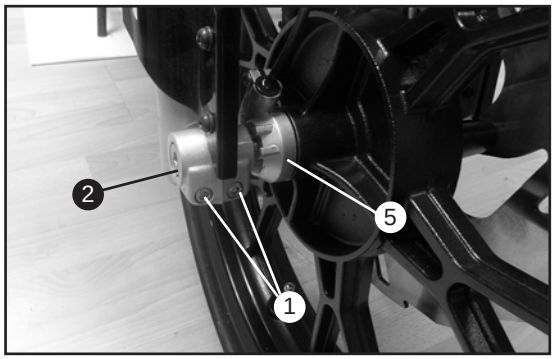
FRONT BRAKE DISC INSPECTION

1. Check the thickness of the front disk at several places on the disk to see if it conforms to measurement.

Allowable limit A: 3 mm

If the brake disk thickness is less than the specified value change the brake disk. Check the front disk for damage, cracking and deformation. If the brake disk exhibits damage, cracking or deformation change the brake disc.

2. Place an appropriate supporting stand under the vehicle in order to raise the front wheel up.
3. Loosen the two screws (1).
4. Remove the front axle (2) in order to remove the front wheel.
5. Remove the six screws (3) to remove the front brake disc (4) and mount a new one if the old one is worn.

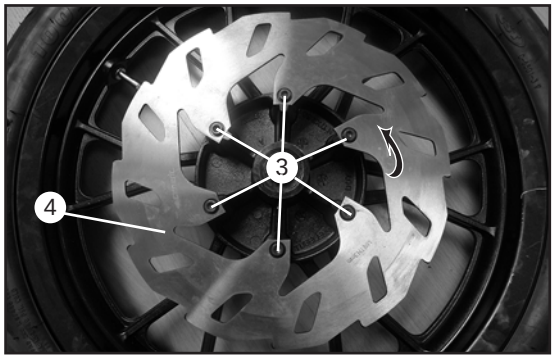


NOTE

Take care to the position of the new brake disc (Arrow).

6. Reassemble in reverse order.

PART. NO.	TORQUE
3	22-29 Nm



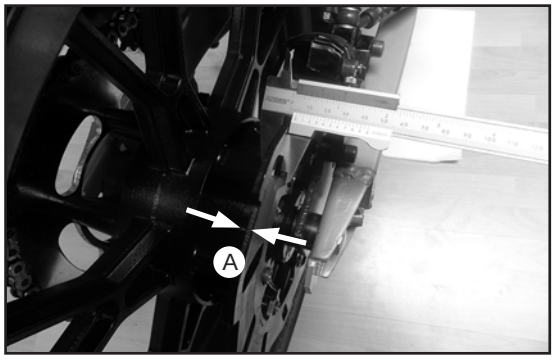
NOTE

Take special care that the axle spacer and the speedometer gear (5) installed correct.

⚠ WARNING

Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary. Please consider that a dirty brake disc influence the brake performance.

REAR BRAKE DISC INSPECTION

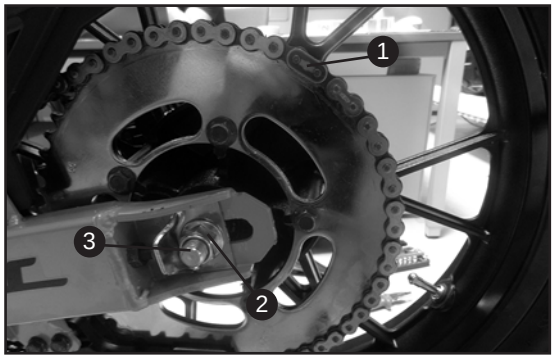


1. Check the thickness of the rear disk at several places on the disk to see if it conforms to measurement.

Allowable limit A: 3 mm

If the brake disk thickness is less than the specified value change the brake disk. Check the front disk for damage, cracking and deformation. If the brake disk exhibits damage, cracking or deformation change the brake disc.

2. Place an appropriate supporting stand under the vehicle in order to raise the rear wheel up.
3. Disconnect the chain (1).
4. Remove the rear axle-nut (2) to remove the axle (3) in order to remove the rear wheel.
5. Remove the six screws (4) to remove the rear brake disc (5) and mount a new one if the old one is worn.



NOTE

Take care to the position of the new brake disc (Arrow).

6. Reassemble in reverse order.

PART. NO.	TORQUE
3	85-98 Nm
4	22-29 Nm

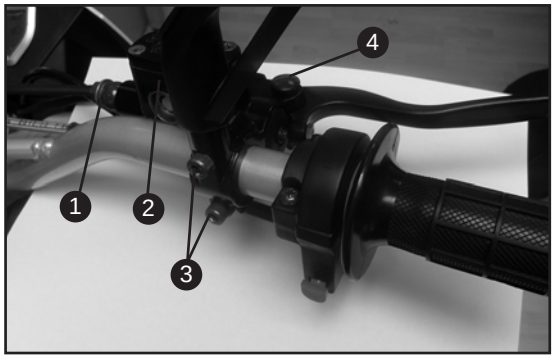
NOTE

Take special care that the axle spacer are installed correct.

⚠ WARNING

Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary. Please consider that a dirty brake disc influence the brake performance.

FRONT BRAKE LEVER/ MASTER BRAKE CYLINDER REPLACEMENT



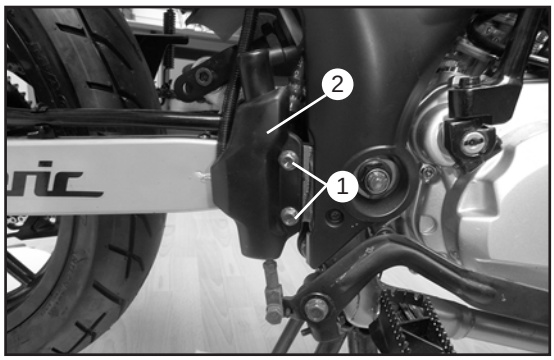
When the performance of the front brake is poor it could be possible that the plunger module gaskets are defect.

1. Drain the brake fluid from the hydraulic brake system.
2. Remove the brake line (1) from the master cylinder (2).
3. Remove the two bolts attaching the brake master cylinder (3).
4. Remove the brake master cylinder.
5. Remove the brake lever bolt (4) and the brake lever.
6. Replace defect parts and assemble in reversed order.
7. Refill the brake system.

NOTE

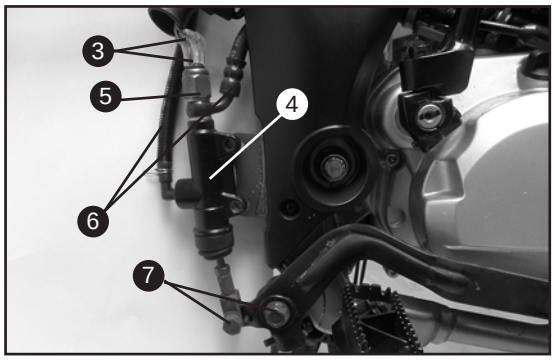
The plunger module is not available separately.

FOOT BRAKE LEVER/ MASTER BRAKE CYLINDER REPLACEMENT



When the performance of the rear brake is poor it could be possible that the plunger module gaskets are defect.

1. Drain the brake fluid from the hydraulic brake system.
2. Remove the two bolts (1) of the master cylinder cover (2).



3. Remove the two brake plugs (3) from the master cylinder (4).
4. Remove the nut (5).
5. Remove the two brake lines (6).
6. Remove the foot brake lever bolts (7) and the foot brake lever.
7. Replace defect parts and assemble in reversed order.

⚠ WARNING

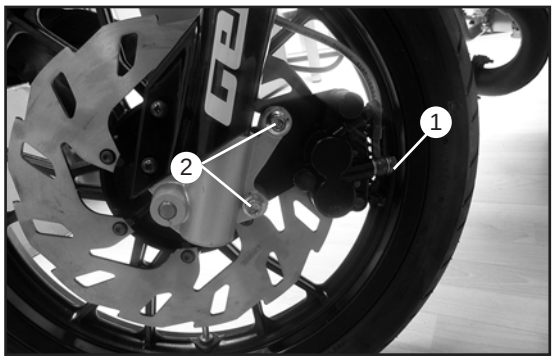
When you need to replace the foot brake lever, always control the spiral spring is positioned correct.

8. Refill the brake system.

NOTE

The plunger module is not available separately.

FRONT BRAKE CALLIPER REPLACEMENT



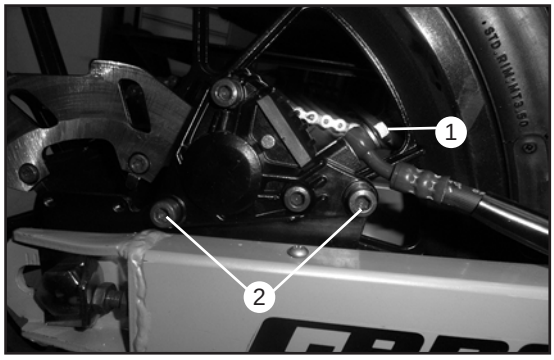
When the performance of the front brake is poor it could be possible that the gaskets of the front brake calliper defect or the brake pads are worn.

1. Drain the brake fluid from the hydraulic brake system.
2. Remove the banjo bolt (1) from the master brake cylinder.
3. Remove the two bolts (2) attaching the brake calliper.
4. Replace the brake calliper.
5. Reassemble in reverse order.
6. Refill the brake system.

NOTE

Always renew the washer of the banjo bolt.

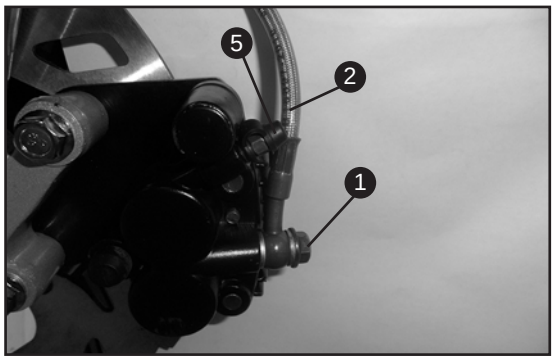
REAR BRAKE CALLIPER REPLACEMENT



When the performance of the rear brake is poor it could be possible that the gaskets of the rear brake calliper defect or the brake pads are worn.

The following steps are the same as described in
“**FRONT BRAKE CALLIPER REPLACEMENT”.**

FRONT BRAKE HOSE REPLACEMENT

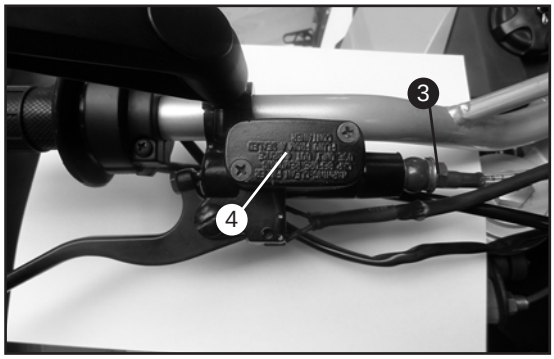


When the front brake hose is leaking, cracked or worn you had to replace it.

Please consider that there is no need to remove the brake calliper when you need to replace the brake hose.

⚠ WARNING

Brake fluid can cause skin irritation on contact.
Avoid contact with skin and eyes, and keep out of the reach of children.
Wear suitable protective clothing and goggles.
If brake fluid gets into your eyes, rinse thoroughly with water and contact a doctor immediately.
Brake fluid can damage paint, rubber and plastic parts. When brake fluid dripping on such parts wipe it away immediately.



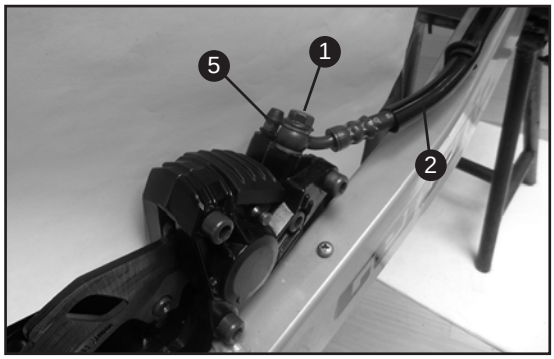
1. Place a container under the brake calliper.
2. Remove the banjo bolt (1) and empty the brake hose (2).
3. Remove the banjo bolt (3) from the master brake cylinder.
4. Replace the brake hose. Take care that the brake hose is installed correct and is connected to all brackets. Use new gaskets when you connect the brake hose.
5. Remove the cover (4) with the membrane.
6. Add the recommended brake fluid to the MAX level.
7. Open the bleed valve (5) and add a brake bleeding tool on the valve. Start to aspirate the brake fluid as long as air is in the system. Take care that the brake fluid level in the master brake cylinder will not fall lower than the MIN level otherwise you suck air in the system once again.
   Suck continuously the air out of the system and add brake fluid continuously until the system has been bleeded.
9. Close the vent valve and refill the brake fluid level to the MAX level.
10. Reassemble all other parts in reverse order.

REAR BRAKE HOSE REPLACEMENT

When the rear brake hose is leaking, cracked or worn you must replace it.

Please consider that there is no need to remove the brake calliper when you need to replace the brake hose.

⚠ WARNING



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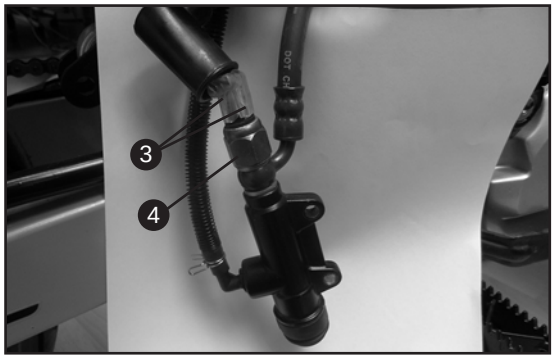
Avoid contact with skin and eyes, and keep out of the reach of children.
Wear suitable protective clothing and goggles.
If brake fluid gets into your eyes, rinse thoroughly with water and contact a doctor immediately.
Brake fluid can damage paint, rubber and plastic parts. When brake fluid dripping on such parts wipe it away immediately.

1. Place a container under the brake calliper.
2. Remove the banjo bolt (1) and empty the brake hose (2).

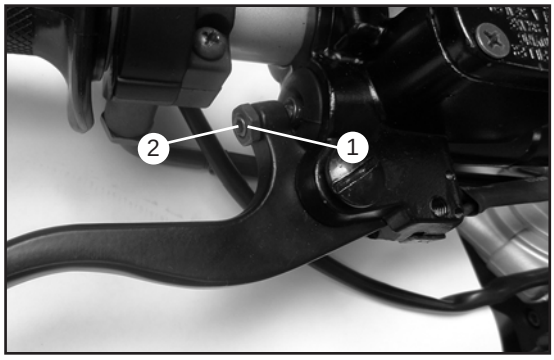
3. Remove the master brake cylinder cover.
4. Remove the two plugs (3).
5. Remove the banjo bolt (4) from the master brake cylinder.
6. Replace the brake hose. Take care that the brake hose is installed correct and is connected to all brackets. Use new gaskets when you connect the brake hose.
7. Remove the brake fluid reservoir.
8. Add the recommended brake fluid to the MAX level.
9. Open the bleed valve (5) and add a brake bleeding tool on the valve. Start to aspirate the brake fluid as long as air is in the system. Take care that the brake fluid level in the master brake cylinder will not fall lower than the MIN level otherwise you suck air in the system once again.
   Suck continuously the air out of the system and add brake fluid continuously until the system has been bleeded.
9. Close the vent valve and refill the brake fluid reservoir to the MAX level.
10. Reassemble all other parts in reverse order.



FRONT BRAKE LEVER ADJUSTMENT

1. Loosen the nut (1).
2. To Adjust the front brake lever, screw the bolt (2) in or out.
3. If the position of the lever is adjust, thighten the nut (1).

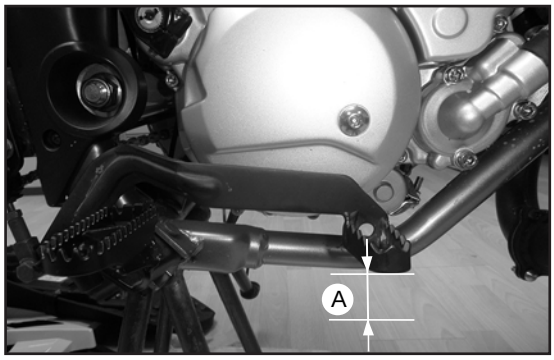
If you can not adjust the free play correct check the brake pads for wear.

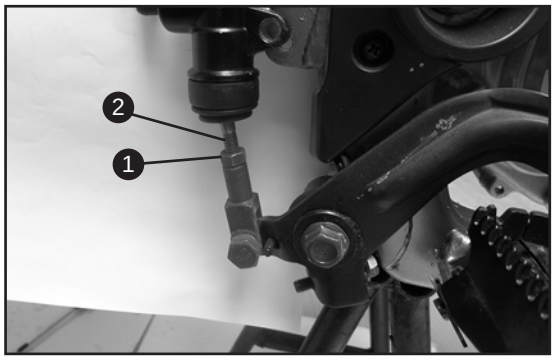


REAR BRAKE LEVER ADJUSTMENT

1. Operate the right foot brake lever until the brake pads lie down on the brake drum. The free play (A) between the 0 position and the pressure point must be 10 to 20 mm. When free play is higher or lower the steel rod need to be adjusted.
1. Remove the master brake cylinder cover.
2. Loosen the nut (1).
3. To adjust the foot brake lever, screw the bolt (2) in or out.
4. Thighten the nut (1).
5. Reassemble in reverse order.

If you can not adjust the free play correct check the brake pads of wear.





DRIVE CHAIN SLACK INSPECTION

NOTE

The drive chain slack must be checked at the tightest point on the chain.

⚠ WARNING

A drive chain that is too tight can overload the engine and other parts. One that is too loose can skip and damage the swingarm or cause an accident.
Keep the drive chain slack within the specified limits.

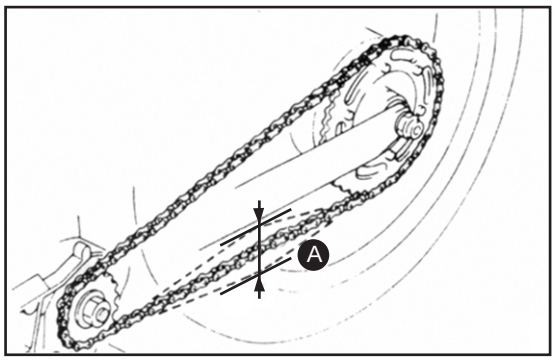
1. Place the motorcycle on a level surface.

NOTE

Both wheels should be on the ground without a rider on the motorcycle.

2. Move the rear wheel several times and look for the tightest position of drive chain.
3. Check the drive chain slack (A).

Allowable range A: 10 - 20 mm

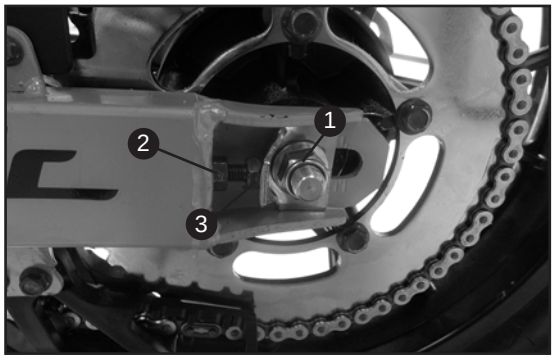


NOTE

If the chain tension is not on the specified range, adjust it.

DRIVE CHAIN SLACK ADJUSTMENT

1. Loosen the fixing nut (1) of the rear axle.
2. Loosen the fixing lock (2). Adjust the chain with the adjustment bolts (3) on both sides until the specified drive chain slack is obtained.
3. Move the rear wheel several times and check the chain slack again.
4. Thighten the the lock nut (2) and thighten the fixing nut (1) of the rear axle.



PART. NO.	TORQUE
1	85 - 98 Nm

NOTE

When it is necessary to replace a worn drive chain, do not install a new drive chain onto worn sprockets or install a worn drive chains on new sprockets.
Keep both sprocket and drive chain in good conditions, or newly replaced chain or sprocket will be worn soon.

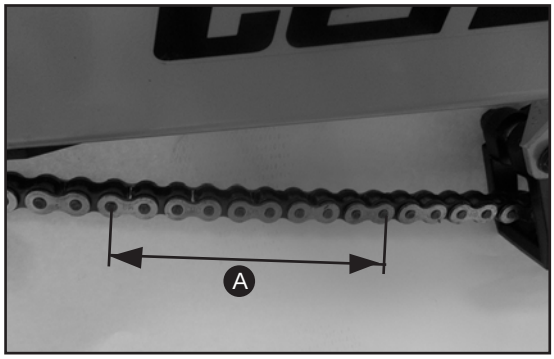
DRIVE CHAIN LUBRICATION

NOTE

If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced continuously, especially when the motorcycle is used in dusty areas.
Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage the chain. Use only suitable detergent to clean and lubricate the drive chain.

RECOMMENDED CHAIN LUBRICANT:
Chain Spray: Castrol chain spray O-R

DRIVE CHAIN WEAR INSPECTION



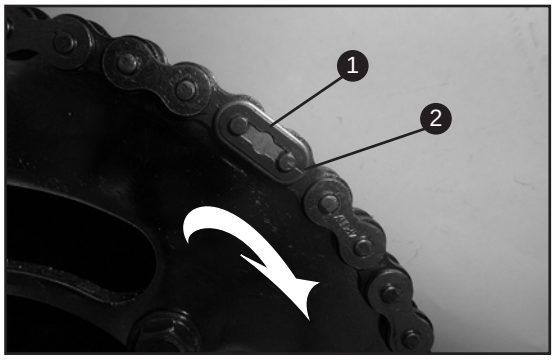
1. Measure length of 10 chain links. If they cannot meet the specified value, replace the drive chain.

Allowable limit A: 127 mm

NOTE

Stretch the chain by hands and then measure it. The measuring range is from chain link roller to inner side of roller.
When any damage is visible on the chain replace it.

DRIVE CHAIN REPLACEMENT

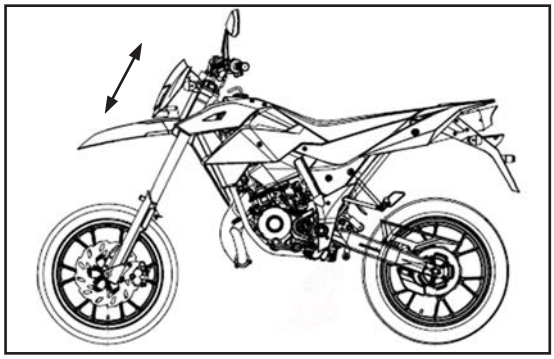


1. Relax the rear wheel.
2. Open the chain lock (1) of the defect chain.
3. Install the new chain in reversed order.
4. Fix the rear wheel in reversed order. Take care about the correct installation and correct chain slack.

NOTE

The open side of the chain lock (2) must be installed into backward rotation direction (arrow).

FRONT FORK OPERATION INSPECTION

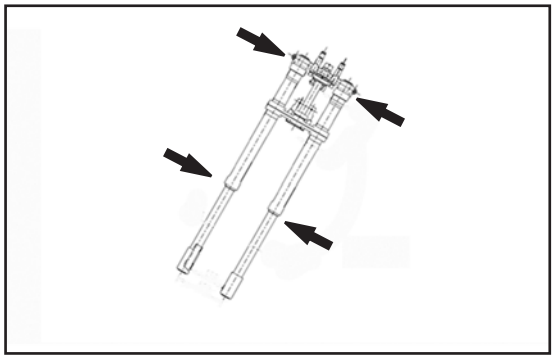


NOTE

At every inspection the fork should be controlled.

1. Apply the front brake and compress the front shock absorber up and down (arrows) to check for correct operation.
2. When the fork stick, feel spongy or the free play between the fork tubes is too big replace the defect fork leg.
3. Check if each screw is tightened.

FRONT FORK OIL LEAK INSPECTION

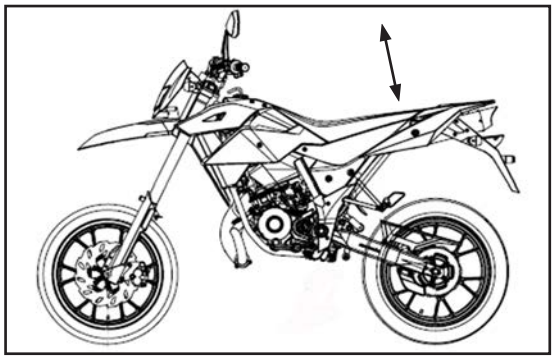


NOTE

At every inspection check also if the fork is tight.

1. Check the dust/ oil seal between the fork legs and the top end (arrows). When oil is leaking replace the affected fork leg.

REAR SHOCK OPERATION INSPECTION



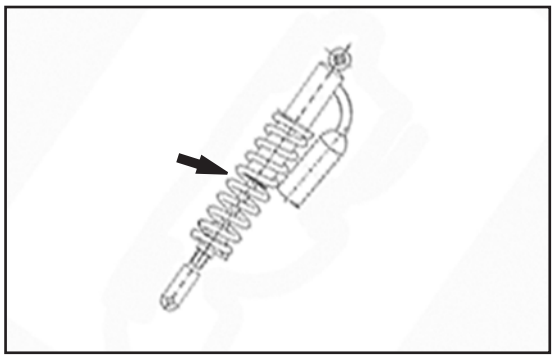
NOTE

At every inspection the rear shock absorbers should be controlled.

1. Compress the rear shock absorber up and down to check for correct function (arrows).
2. Check whether a part of the rear shock absorber is damaged or loosened.
3. Put the vehicle on the main stand and move the rear wheel up down and left right to check whether any bush or bearing is loosened or has abnormal free play.
4. When the absorbers stick, feel spongy or there is any other abnormity replace it.
5. Check if each screw is tightened.

The rear shock absorber is spring loaded. The spring preload can be adjusted with the locknuts (arrows) continuously. Choose the preferred setting by your self. The factory setting refers to a rider weight of approximately 75 kg.

REAR SHOCK OIL LEAK INSPECTION

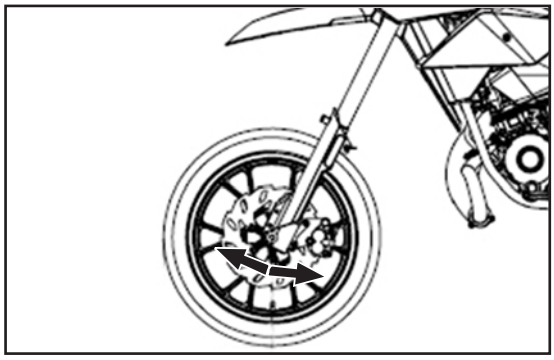


NOTE

At every inspection the rear shock absorbers should be controlled.

1. Check the dust/ oil seal and check if the spring are in correct condition. When oil is leaking, a spring is cracked or worn replace the shock absorber (arrow).

STEERING PLAY INSPECTION

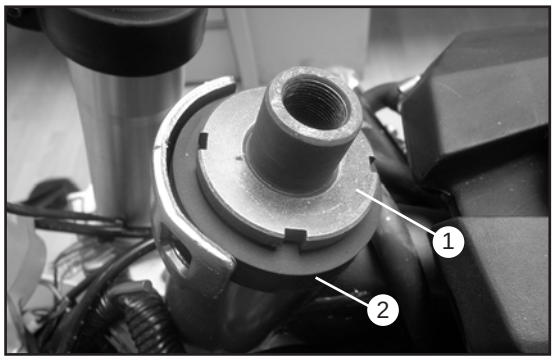


Worn or loose steering bearings may cause danger. Therefore, the operation of the steering must be checked as follows at the intervals specified in the periodic maintenance and lubrication chart.

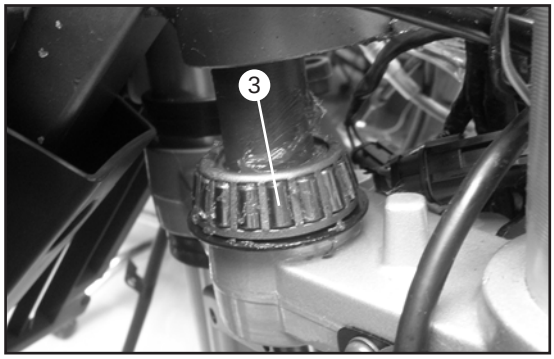
1. Place a stand under the vehicle to raise the front wheel off the ground.
2. Hold the lower ends of the front fork legs and try to move them forward and backward (arrows). Check the steering head for looseness or binding by turning the front fork all the way in both directions.
3. If any free play or binding can be felt, replace the steering bearing.

STEERING BEARING LUBRICATION

1. Place the vehicle on a level surface.
2. Remove the head light, speedometer, handlebar and upper triple tree.
3. Remove the fixation nut (1) and the dust cap (2).
4. Lift the vehicle or lower the front fork.

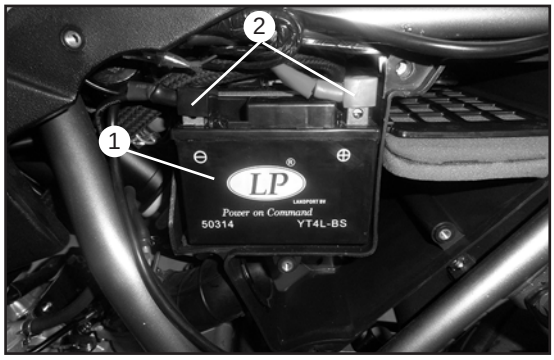


5. Now grease lower bearing (3). Please use only high quality grease to keep water away.
6. After the bearings are greased assemble the parts in reverse order.



BATTERY INSPECTION/ CHARGING

The battery (1) is located on the right side of the vehicle. It is recommended to extend the battery whenever it needs servicing. Disconnect the battery poles (2) to extend the battery.

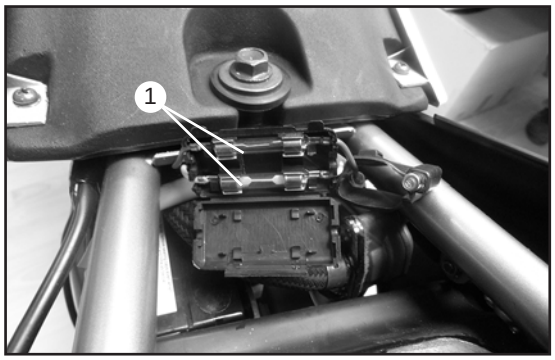


1. This is a conventional battery. You can remove the sealing caps to maintain the balancing between the cells. The manual for the battery first fill you will receive together with the battery. Only fill with distilled water.
2. Before you install the battery first time please charge it for at least 8 hours.
3. Charge the battery with a maximum of 10% of the capacity specified on battery housing.
4. Do not connect the battery with the wire harness of the vehicle when the vehicle is parked in the show room for more than one month.
5. Please maintain/ charge the battery every 2 weeks when the vehicle is not in use.
6. The voltage range of the battery is -12.3 Volt (DC) to - 13.1 Volt (DC).
7. To measure the Voltage of the battery use a conventional volt meter (3). Measure between the battery terminals.
8. When you charge the battery installed in the vehicle disconnect the negative cable of the wire harness.
9. When you remove the battery from the vehicle disconnect the negative pole first.
10. When you install the battery to the vehicle connect the plus pole first. Add battery pole grease between the battery poles and the cables.
11. The recharging voltage of the vehicle regulator rectifier is approximately 14 Volt/ 5000 rpm.

⚠ WARNING

Battery acid and battery gases cause serious cauterization. Keep batteries out of the reach of children. Wear suitable protective clothing and goggles. Avoid contact with battery acid and battery gases. Keep the battery away from sparks or open fire. Charge only in well ventilated rooms. In the event of skin contact, rinse with large amounts of water. If battery acid gets in the eyes, rinse with water for at least 15 minutes and contact a doctor.

FUSES



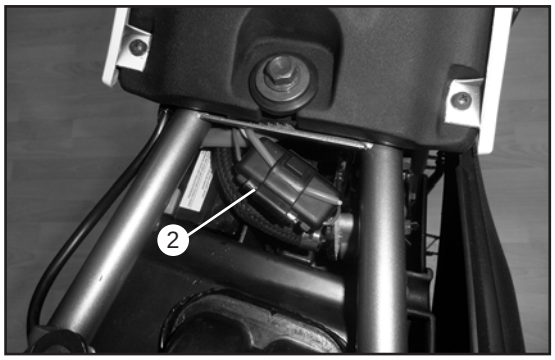
The main fuses (1) are located next the battery. In the fuse socket strap a replacement fuse (2) is added.

NOTE

To avoid a short circuit, always set the main switch to “OFF” when checking or replacing a fuse.

1. Insult a new fuse of the correct amperage rating.

FUSE	AMPERE RATING
Main Fuses	10 Ampere
Replacement	10 Ampere



2. Set on the switches to verify if the electrical circuit is operational.
3. If the fuse immediately blows again, check the electrical circuit.

⚠ WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

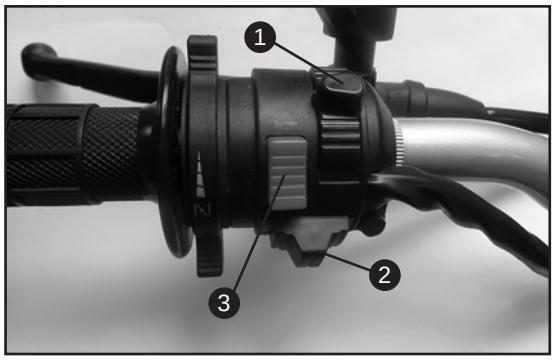
LIGHT AND SWITCHES OPERATION INSPECTION

1. Place the vehicle on the stand and start the engine.

NOTE

Some functions do not work as long the engine is not running.

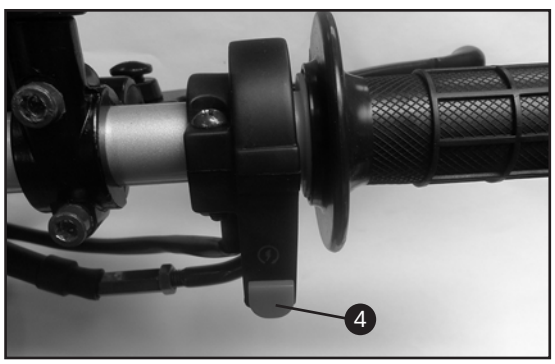
2. Now you can test one by one the functions of all switches, the function of the rear and front light and the brake light.



Switches/ Functions - left side

1. **High/ Low beam switch/ Flasher**
2. **Indicator switch**
3. **Horn switch**

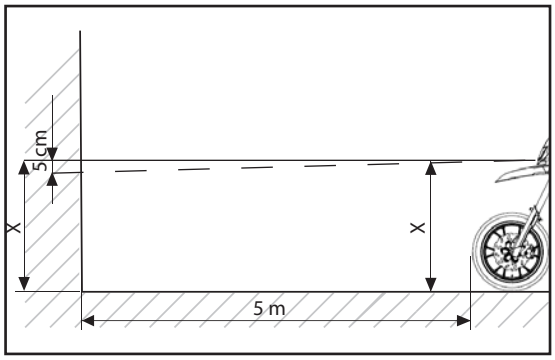
Switches/ Functions - right side



4. **Starter Button**

HEADLIGHT AIMING INSPECTION

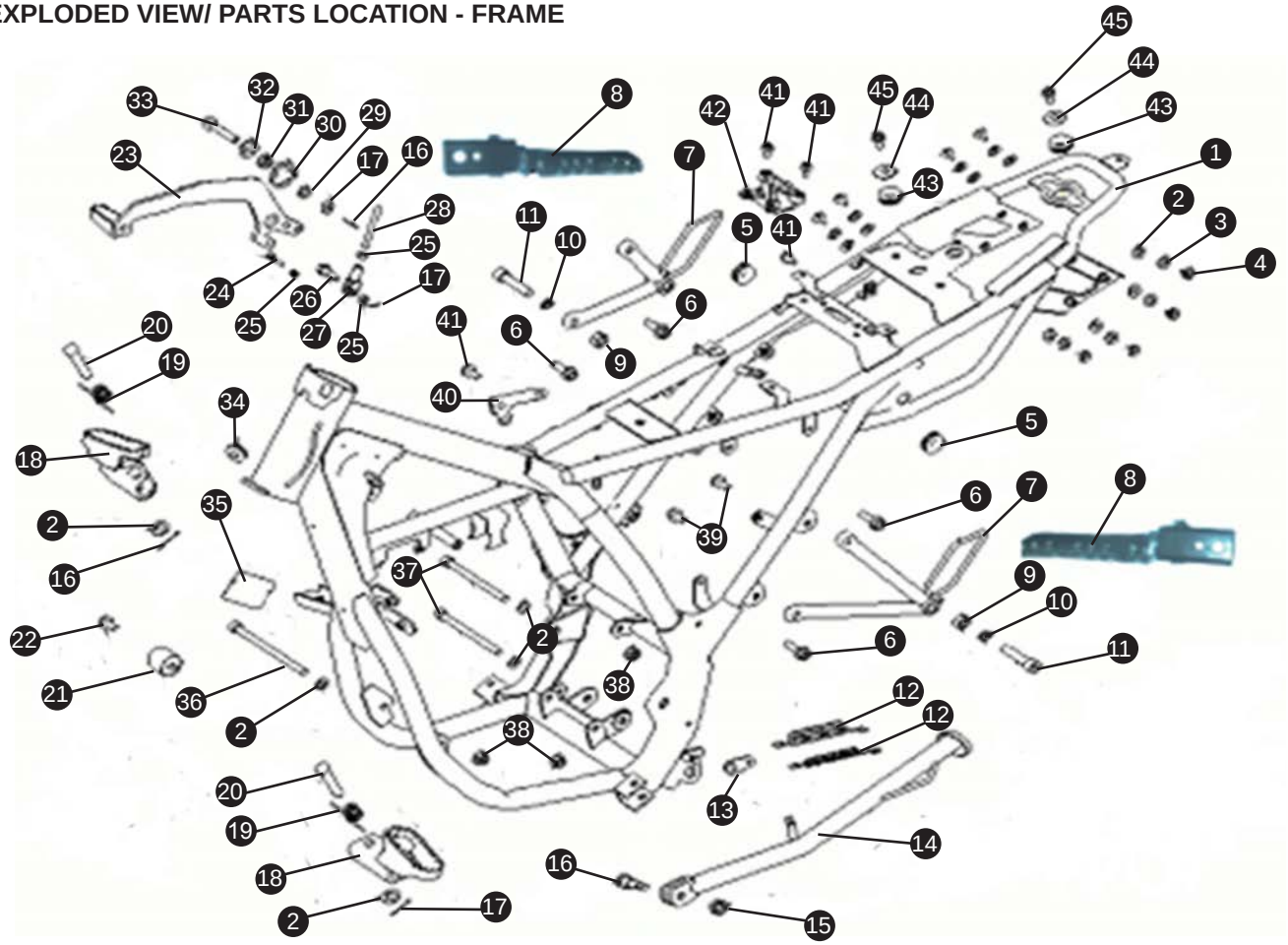
1. Place the vehicle at a distance of 5 meters in front of a wall. The vehicle must be placed horizontally.
2. Measure the distance from the ground to the middle of the headlight bulb (X).
3. Transfer this value to the wall and mark it with an X.
4. Then make a second X, 5 centimetre below the first X.



5. Turn the screw (1), placed on the front side of the headlight, in or out to adjust the height of the low beam.

2. REPAIR AND DIAGNOSTICS

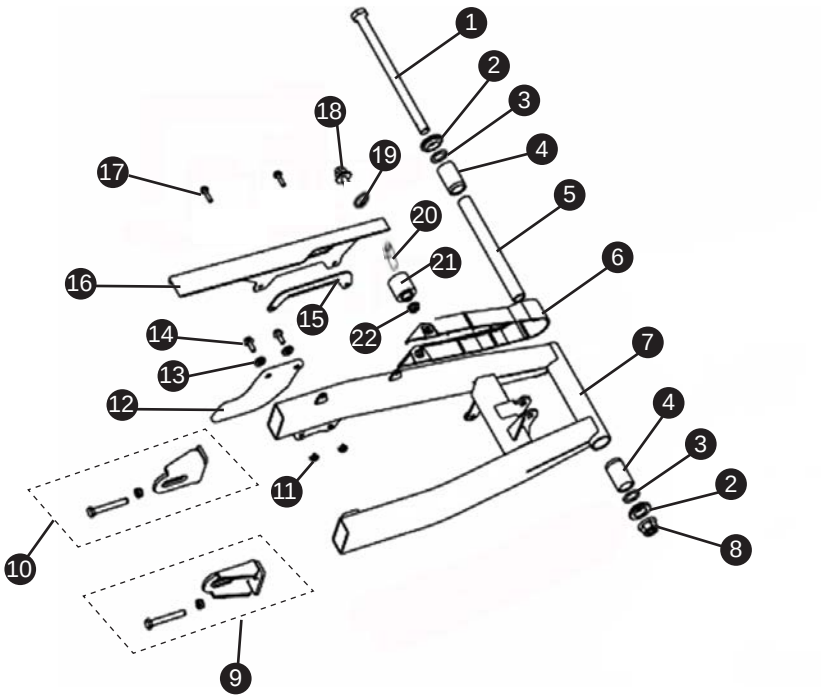
EXPLODED VIEW/ PARTS LOCATION - FRAME



PART LIST - FRAME

1. Frame
2. Screw M15×12
3. Washer M8
4. Rubber pad
5. Rubber pad
6. Screw M8x25
7. Bracket passenger footrest
8. Passenger footrest
9. Nut M10
10. Snap ring M10
11. Screw M10x45
12. Spring- Side stand
13. Locking plate
14. Side stand 320mm
15. Nut M10x1,25
16. Screw M10x1,25
17. Splint
18. Footrest
19. Spring
20. Pin
21. Exhaust bracket
22. Screw M6x8
23. Foot brake lever
24. Screw M6x30
25. Nut M6
26. Screw M6
27. Pull handle
28. Pull rod
29. Washer
30. Spring
31. Nut M8
32. Washer
33. Screw M8x50
34. Rubber pad
35. Direction sign
36. Screw M8x120
37. Screw M8x100
38. Nut M8
39. Screw M6x20
40. Bracket
41. Screw M6x12
42. Lock mechanism seat
43. Rubber pad
44. Spacer sleeve
45. Screw M8x16

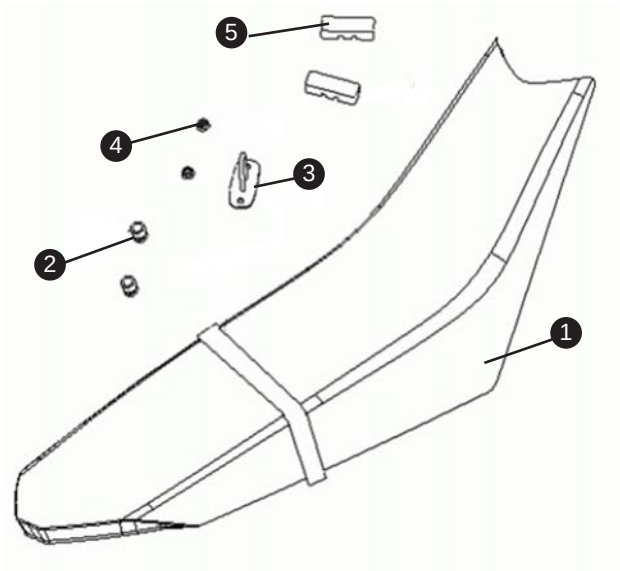
EXPLODED VIEW / PARTS LOCATION - REAR SWING ARM



PART LIST - REAR SWING ARM

1. Mounting shaft
2. Anti dust ring
3. O-Ring
4. Bush
5. Sleeve
6. Chain guid
7. Rear swing arm
8. Nut M14x1.5
9. Chain adjuster right
10. Chain adjuster left
11. Nut M6
12. Chain guid
13. Spacer sleeve
14. Screw M6x16
15. Bracket chain case
16. Chain case
17. Screw Mx16
18. Screw M8x50
19. Washer M8
20. Spacer sleeve
21. Chain roller
22. Nut M8

EXPLODED VIEW / PART LOCATION - SEAT



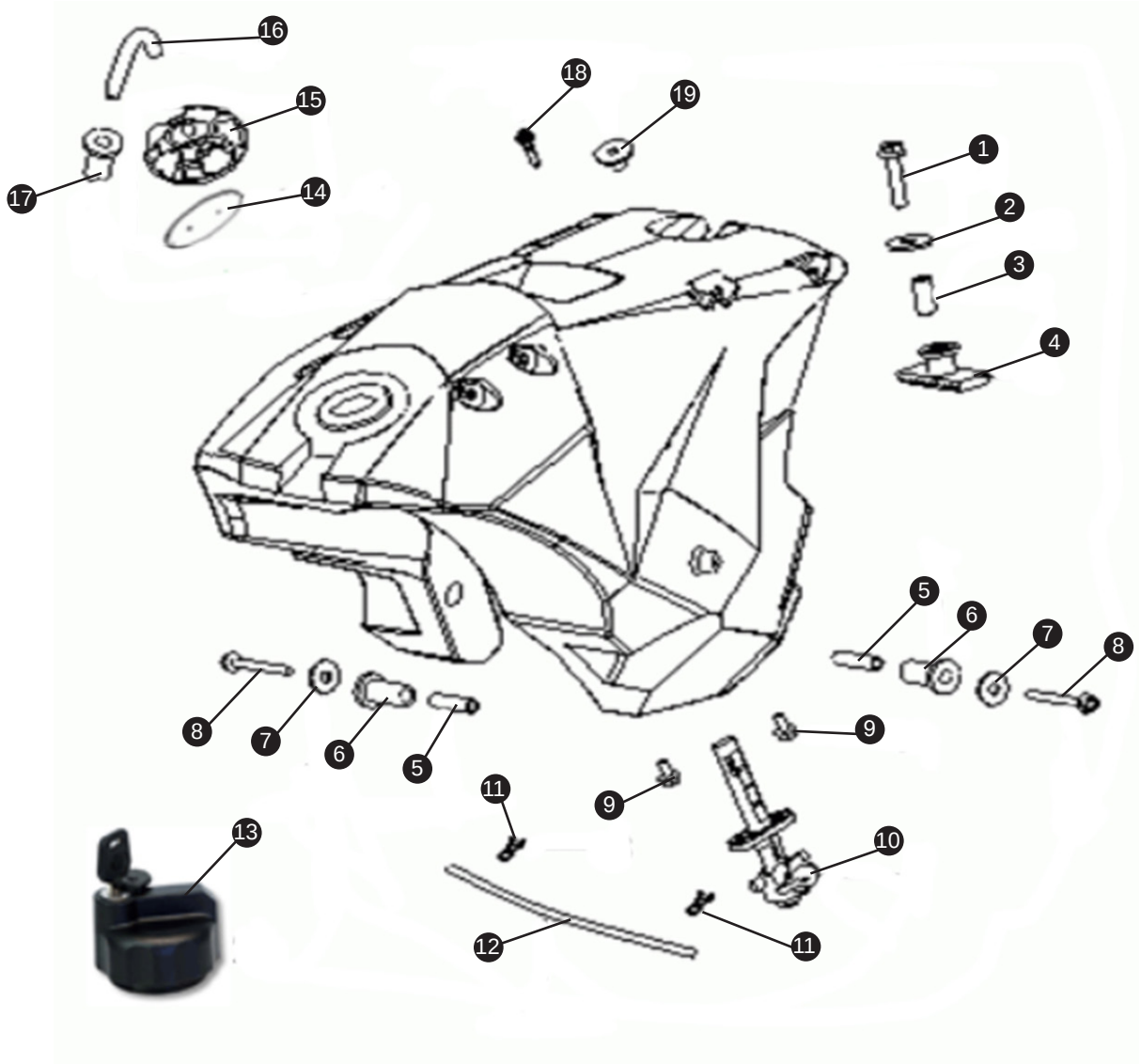
PART LIST - SEAT

1. Seat
2. Rubber pad
3. Catch snap lock
4. Nut M5
5. Rubber pad

TIGHTENING TORQUE OF FASTENING PARTS ON CHASSIS

FASTENING POSITION AND PART NAME	TORQUE
Front wheel spindle	55-62 Nm
Fixing bolt of steering lever	5-9 Nm
Rear wheel spindle nut	85-98 Nm
Topping nut of the rear shock absorber	37-44 Nm
Bottom nut of the rear shock absorber	37-44 Nm
Fixing bolt of brake disc rear	22-29 Nm
Mounting bolt of brake caliper rear	22-29 Nm
Fixing bolt of brake disc front	22-29 Nm
Mounting bolt of brake caliper front	22-29 Nm

EXPLODED VIEW / PART LOCATION - FUEL SYSTEM



PART LIST FUEL SYSTEM

1. Screw M8x40
2. Washer M8
3. Sleeve
4. Rubber pad
5. Sleeve
6. Bush
7. Washer
8. Screw M6x55
9. Screw M6x12
10. Petcock
11. Hose clamp
12. Fuel hose
13. Tank closure
14. Fuel tank cap gasket
15. Tank closure
16. Breather hose
17. Disposable breather hose
18. Screw M4×20
19. Bracket

SPECIFICATION

FUEL

Recommended fuel: Unleaded gasoline only ≥ 95 Oct (SP 95 - SP 98)
Do not use any Bio-Ethanol fuel.
Fuel tank capacity: 10.0 L ± 0.2 L

NOTE

Fuel switch shall be set at “OFF” position while removing fuel tank.

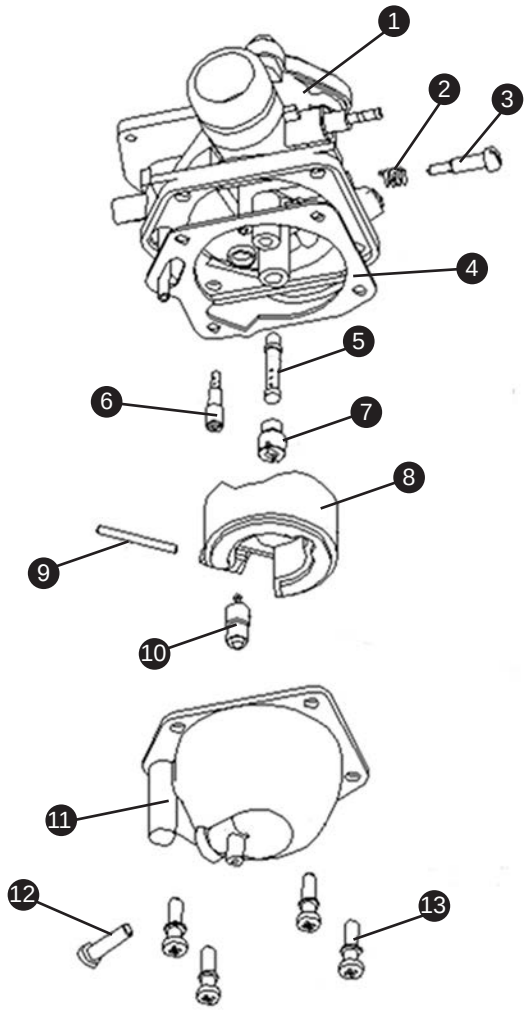
SPECIAL TOOLS

See page 12 - 15

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Engine turns but does not start or dies off	Idle speed is not set correctly	Adjust the idle speed
	No gasoline in the fuel tank	Refill gasoline
	Water in the carburettor or the jet is blocked	Check the carburettor
	Fuel filter blocked	Clean or replace the fuel filter
Engine have no idle	Idling jet blocked	Check the carburettor
	Adjusting screw on carburettor distorted	Adjust the idle speed
	Carburettor running over because float needle is worn or blocked	Check the carburettor
	Loose carburettor jet	Check the carburettor
Engine power is poor	Fuel filter contaminated	Clean the filter
	Failure in fuel system	Check the fuel system
	Error at fuel cock	Check the system
	Fuel tank cap is blocked	Check or replace it

EXPLODED VIEW / PART LOCATION - CARBURETTOR



PART LIST - CARBURETTOR

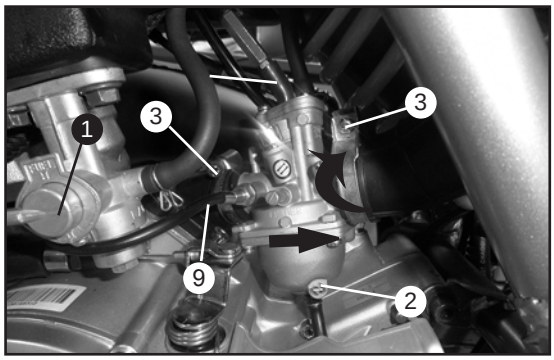
1. Carburettor assy MJ95/ NJ22.5
2. Spring
3. Idle adjustment screw
4. Float chamber gasket
5. Main bubble tube
6. Idle Jet 22.5
7. Main jet 95
8. Floater
9. Floater pin
10. Needle valve
11. Float chamber
12. Drain screw
13. Screw M4x12

NOTE

Use a cloth to block the intake manifold after dismounting carburettor to avoid other article entry.

For the detailed specification see page 8 and 18.

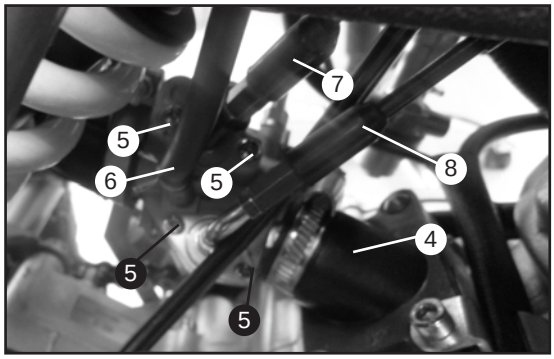
CARBURETTOR REMOVAL



1. Switch the fuel cock to “OFF” (1).
2. Empty the carburettor by opening the drain screw (2).
3. Loosen the two hose clamps (3).
4. Pull the carburetto backwards to disconnect the carburettor from the membrane (4).
5. Turn the carburettor right and loosen the four screws (5) of the gas wire bracket and the choke wire bracket.
6. Disconnect the carburettor from fuel line (6), gas wire (7), choke wire (8) and the oil pump line (9).

NOTE

Take care about the fuel residues.



7. Pull out the carburettor.
8. Assembling in reversed order.

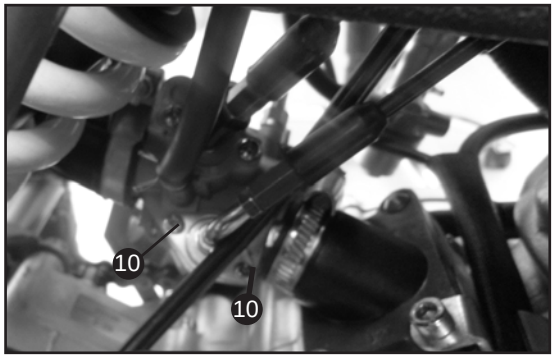
NOTE

Look to the grove on the membrane and the pin on the carburettor.

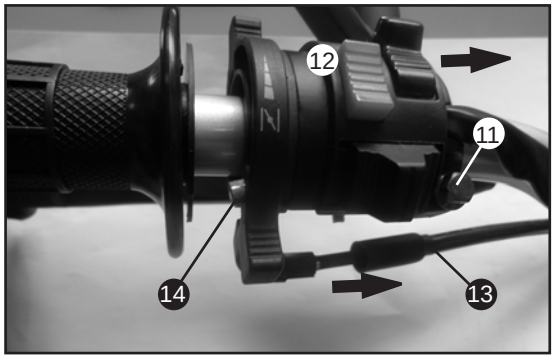
⚠ WARNING

Fuel is poisonous and a health hazard.
Avoid contact between fuel and skin, eyes and clothing. Do not inhale fuel vapours. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If fuel is swallowed, contact a doctor immediately. Change clothing that has come into contact with fuel. Store fuel in a suitable canister according to regulations and keep it out of the reach of children.

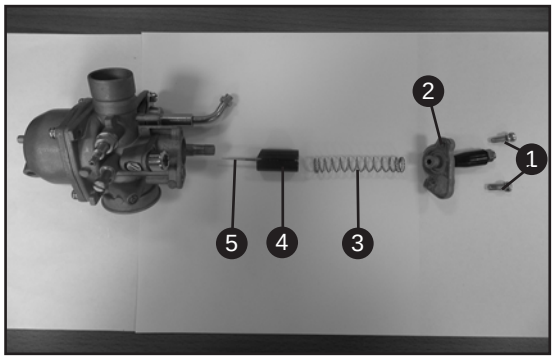
CHOKE/ CABLE REMOVAL



1. Switch the fuel cock to “OFF” (1).
2. Loosen the two hose clamps (3).
3. Turn the carburettor right.
4. Loosen the two screws (10).
5. Loosen the screw (11).
6. Slide the left handle switch (12) to the right.
7. Slide the choke cable (13) to the right.
8. Feed out the cable (14).
9. Assembling in reversed order.



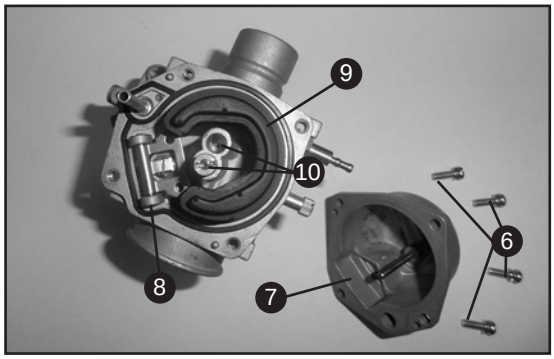
CARBURETTOR UPPER COVER REMOVAL



1. Loosen the bolts (1) and dismantle the upper cover (2).
2. Take out the spring (3), valve piston (4) and the needle (5).
3. Examine the attrition condition of the parts.
4. If one the parts is worn down, it should be replaced.
5. Examine the attrition condition of the needle (5).
6. If the needle is worn down, it should be replaced.
7. Loosen screws (6) and take off the float chamber (7).
8. Dismantle the floater pin (8), floater (9) and valves (10).

NOTE

To enrich or reduce the fuel mixture position the clip to another groove. When you install the clip and lift the needle the mixture is enriched and vice versa. Do the settings gradually.



9. Examine if the needle valve core, needle valve and the float components are damaged or worn.
10. If the needle valve core is damaged or worn down, it should replaced.
11. If the needle valve seat is worn down, then the carburettor body should be replaced.
12. If the floater tongue piece is worn down, it should be replaced.
13. Examine the idle metering hole, the main metering hole and the main nozzle to see if they are damaged, worn down or stained. If so, they should be replaced.
14. Examine the plunger to see if it is worn down. If so, it should be replaced.
15. Examine the carburettor body and the oil-fired pipe. If they are stained, clean every part with gasoline and blow them dry with pressure air.
16. Always replace the needle valve and valve seat as a set.

CARBURETTOR ADJUSTMENT

Idle speed and air control adjustment see page 18.

PART	DEFAULT SETTINGS
Needle (5)	2. groove from above
Floater chamber level	4 - 5 mm

FUEL SUPPLY INSPECTION

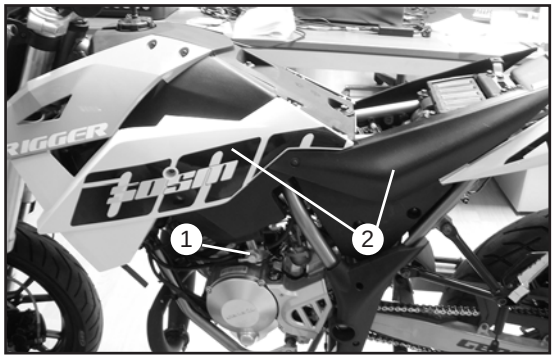
1. Start to check one by one the whole fuel supply system for leaks and wear. If a part is defect please replace it immediately.

PARTS WHICH MUST BE CHECKED

1. Fuel tank
2. Fuel cock
3. Fuel tubes
4. Hose clamps
5. Vacuum tubes
6. Fuel filters
7. Gaskets and seals
8. Carburettor

FUEL TANK REMOVAL

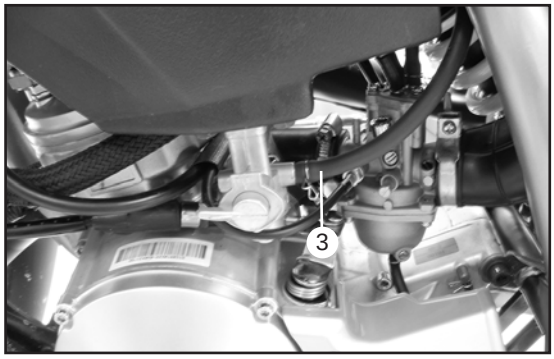
1. Switch of the ignition.
2. Switch the fuel cock (1) to the “OFF” position.
3. Remove the seat bench and the side covers (2).



4. Disconnect the fuel line (3) from the fuel cock.

NOTE

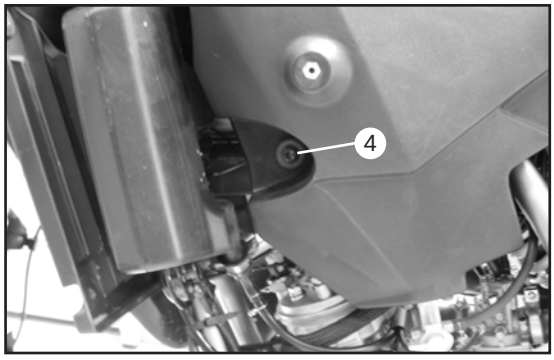
The fuel line is filled with fuel. Block it immediately after removal from the fuel cock. It´s recommended to drain the fuel from the tank before removal.



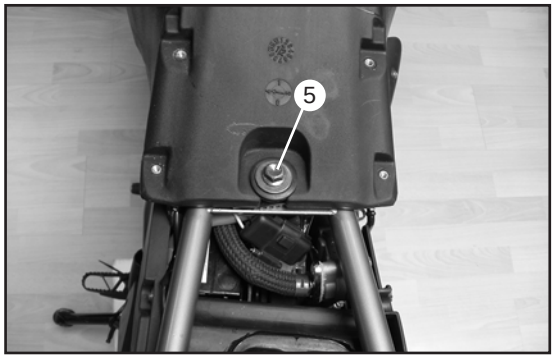
5. Remove the bolt (4) on the left and right side of the tank.

NOTE

Only one side (left side) is shown.



6. Remove the bolt (5) on the top of the tank.



7. Slide the fuel tank backwards to remove it.
8. Assembling in reversed order.

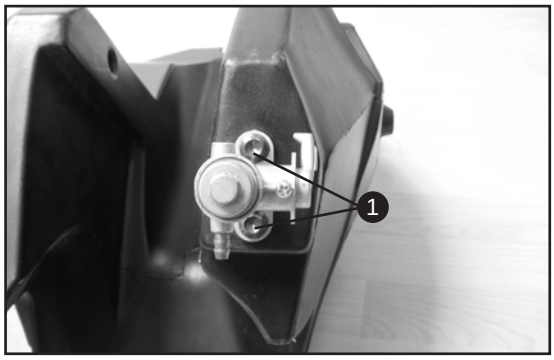
NOTE

Check the correct position before tightening the bolts.

FUEL COCK REMOVAL

NOTE

It´s recommended to drain the fuel from the tank before removal.



1. Switch off the ignition.
2. Switch the fuel cock to the “OFF” position.
3. Disconnect the fuel line from the Carburettor
4. Leave out the fuel (switch the fuel cock to the “ON” position).
5. Remove the fuel tank.
6. Lossen the two screws (1).
7. Remove the fuel cock.
8. Assembling in reverse order.

NOTE

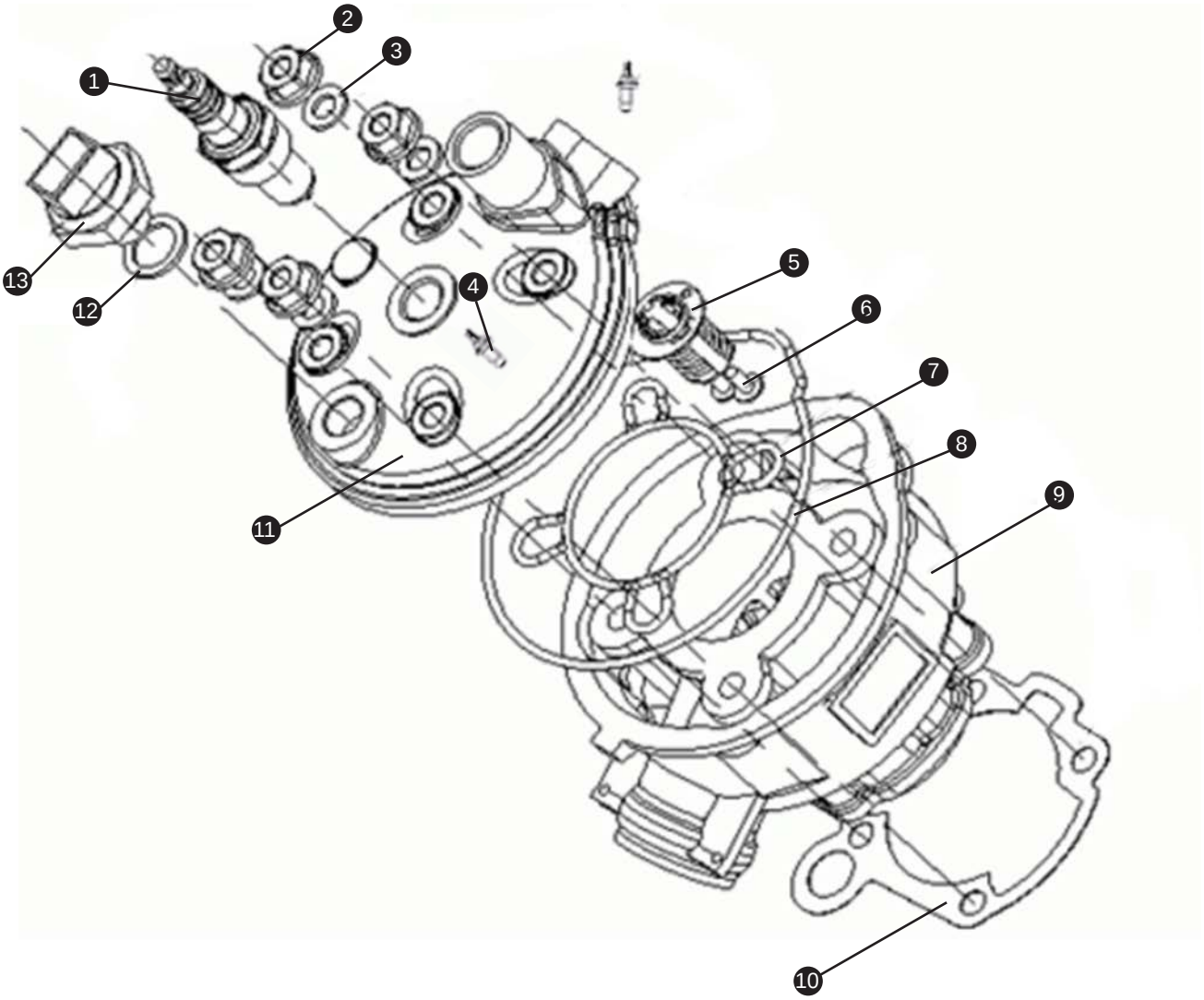
Keep the fuel cock switch in correct position when tighten the nut.

TORQUE LIST

PART. NO.	TORQUE
1	Tighten that no fuel is leaking

For screws that are not listed use standard values (page 11).

EXPLODED VIEW / PART LOCATION - CYLINDER/ CYLINDER COVER



PART LIST - TOP ENGINE

1. Spark plug
2. Nut
3. Washer
4. Temperature sensor
5. Thermostat
6. Screw M4x10
7. Cylinder head gasket
8. Outer cylinder head gasket
9. Cylinder
10. Cylinder gasket
11. Cylinder cover
12. Seal ring
13. Thermo switch

NOTE

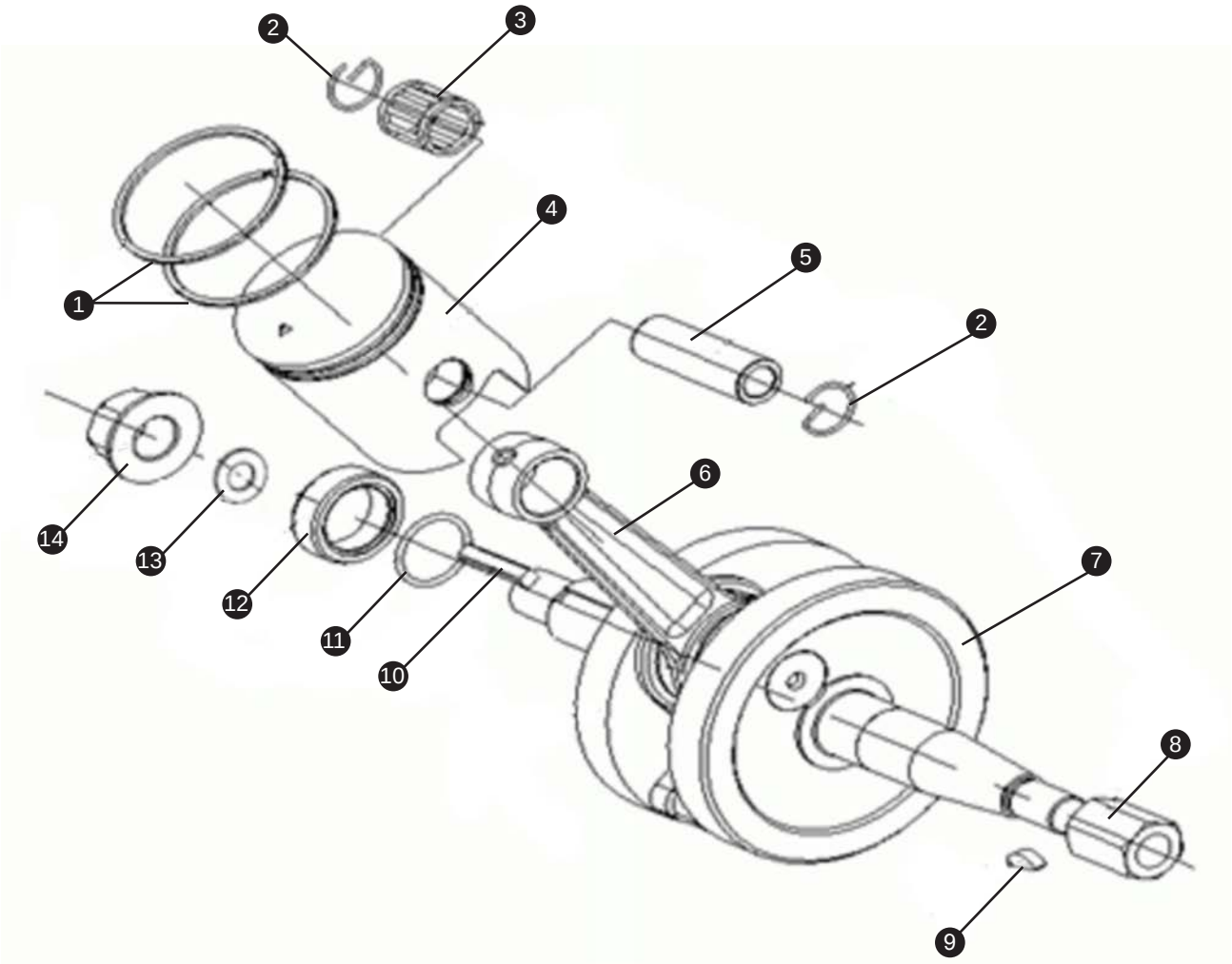
In order to guarantee the sealing between cylinder and cylinder cover the cylinder cover undertakes a very big Torque.
All parts should clean and blow dry by compressed air before inspecting and measuring.

TORQUE LIST

PART. NO.	TORQUE
1	10-15 Nm
2	18-22 Nm

For screws that are not listed use standard values (page 11).

EXPLODED VIEW / PART LOCATION - CRANK ASSEMBLY

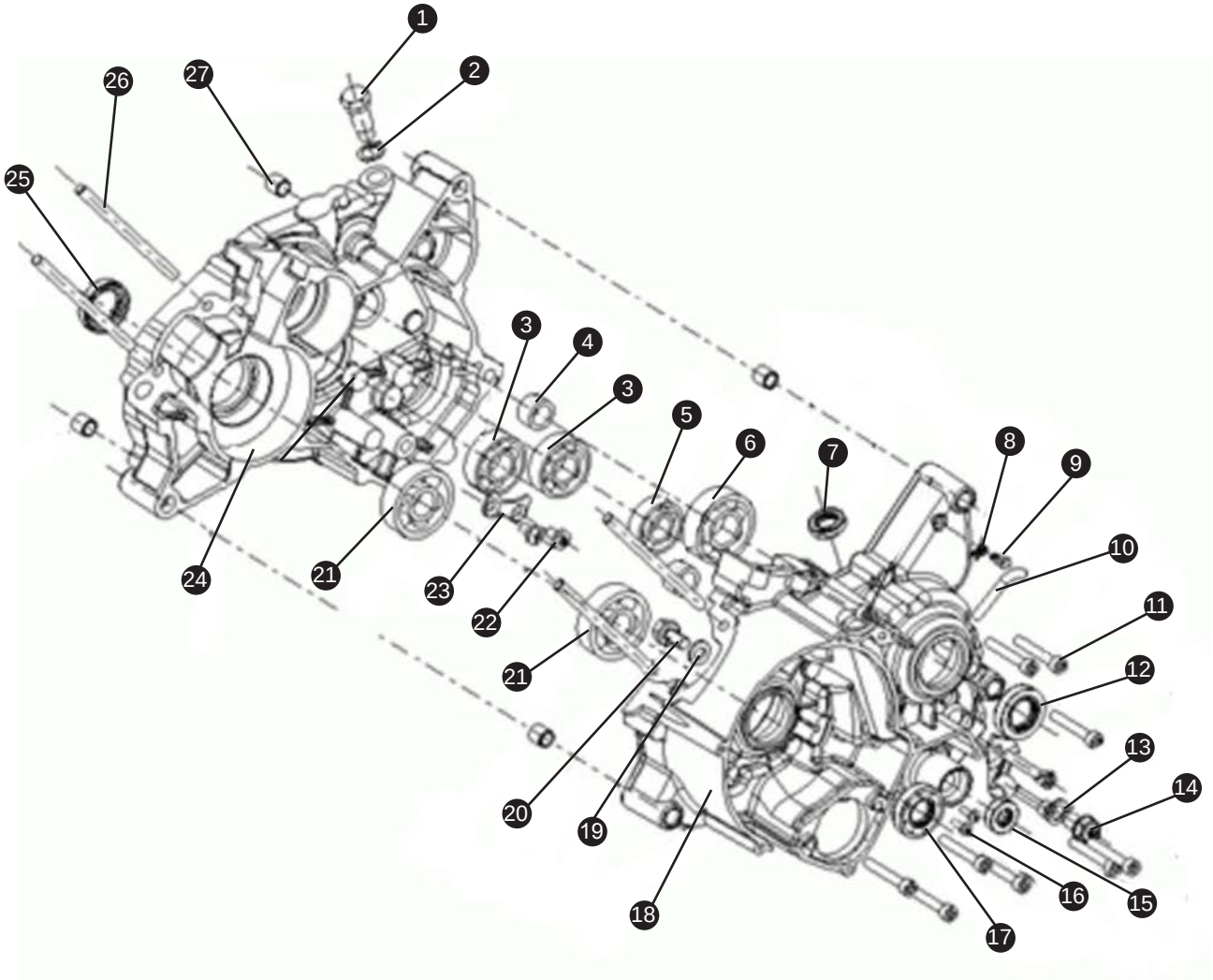


PART LIST - CRANK ASSEMBLY

1. Piston ring
2. Piston pin clip
3. Needle bearing
4. Piston
5. Piston pin
6. Connectin rod
7. Crankshaft
8. Nut
9. Woodruff key
10. Woodruff key
11. O-Ring 15.5x1.5
12. Bush
13. Washer
14. Nut

PART. NO.	NOTE
14	Stick in

EXPLODED VIEW / PART LOCATION - CRANKCASE



PART LIST - CRANKCASE

1. Nut
2. Seal ring
3. Bearing 6203
4. Needle bearing
5. Bearing 6202
6. Bearing
7. Simmering 13.7x24x5
8. Hose clamp
9. Engine breather connection
10. Breather hose
11. Nut M6x55
12. Simmering 20x35x7
13. Seal ring
14. Neutral switch gear
15. Simmering 12x22x7
16. Tapping screw
17. Simmering 17x35x7
18. Crankcase left
19. Seal ring
20. Nut M8x12
21. Main bearing
22. Nut M6x12
23. Locking plate
24. Crankcase right
25. Simmering 24x35x7
26. Stud

SPECIAL TOOLS

See page 12-15

TORQUE LIST

PART. NO.	TORQUE
11	8 - 12 Nm

For screws that are not listed use standard values (page 11).

SPECIFICATION

ENGINE TYPE	2 STROKE LIQUID COOLED
Fuel type	Unleaded gasoline ≥ 95 Oct (SP 95 - SP 98) Do not use any Bio - Ethanol fuel
Number of cylinder	1 + 60° horizontal - liquid cooled
Bore and stroke	40.25×39
Displacement	49.6 ccm
Start system	Electric starter
Lubrication	Fresh oil lubrication
Air cleaner	Paper element
Carburettor	Main jet: 95/ Idle jet: 22.5
Idling speed - rpm	1800 ± 100 rpm/min
Maximum torque	3.60 Nm/ 5500 rpm/min
Maximum power	2.20 kW/ 6500 rpm/min
Compression ratio	7.0:1
Spark plug	NGK/BR8ES

SPECIAL TOOLS

See page 12-15

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Engine does not start when the electric starter button is pushed	Battery discharged	Charge the battery
		Check the charging of the battery
		Check if the generator is working correctly
	Fuse is blown	Check or replace
	Starter relay defective	Check the starter relay
	Starter motor defective	Check the starter motor
Engine turns but does not start or dies off	A fuse is blown	Check or replace
	Idle speed is not set correctly	Adjust the idle speed
	Spark plug is contaminated	Check or replace
	Wire harness is worn	Check the wiring harness
	Contact problem in a plug	Check the plugs of the wiring harness
	No gasoline in the tank	Refill gasoline
	Water in carburetor, jet blocked or failure in the pressurized system	Check the carburetor and pressurized system
	Problem with the fuel filter	Check or replace
Engine has no idle	Idling jet blocked	Check the carburetor system
	Spark plug defective	Check or replace
	Adjusting screw on carburetor distorted	Adjust the idle speed
Engine does not speed up	Carburetor running over because float needle dirty or worn	Check the carburetor system
	Loose carburetor jets	Check the carburetor system
	Air filter contaminated	Clean the filter
	Fuel filter contaminated	Clean the filter
	Failure in fuel system	Check the fuel system
	Problem with the carburretor	Check the carburretor
	Exhaust system leaky or deformed	Check exaust system
Blue smoke emission	To much oil support	Check the oil pump
Black smoke emission	Fuel/ Air ratio wrong - too much fuel	Check the carburretor
Low compression	Piston, piston rings, gaskets, crankcase or cylinder worn or damaged, inlet or exhaust valve do not seal of.	Check all parts and replace if necessary
High compression	Combustion chamber and the carbon deposition on the top of the piston.	Check all parts and replace if necessary
Piston noice	Piston, piston rings, piston pin, cylinder, conrod or bearing are worn or damaged	Check all parts and replace if necessary
Heavy smoke	Oil back flow valve defect	Replace the oil back flow valve

ENGINE OVERHAUL/ REMOVAL

NOTE

It's not necessary to remove the engine in order to remove the following components:

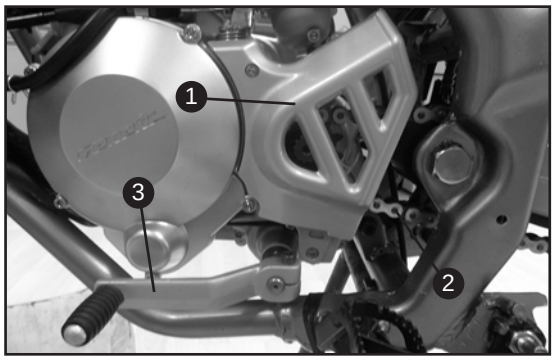
- Cylinder cover
- Cylinder
- Piston and piston ring
- Clutch
- Drive gear
- Gear shift shaft
- Magneto rotor
- Stator
- Oil pump
- Water pump

For a better understanding, the following steps are described with replaced engine.

ENGINE PREPARATION

To reach the top end of the engine proceed as follow.

1. Switch of the fuel cock.
2. Remove the seat bench and the side covers.
3. Empty the carburettor by opening the drain screw.
4. Disconnect all attachments (carburettor, exhaust,...) from the engine.
5. Unplug all electrical cables, remove the clutch wire, the drive chain cover (1), the drive chain (2), the shift linkage (3) and the rear brake lever.



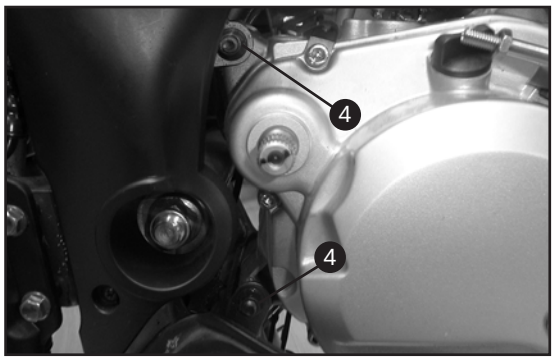
NOTE

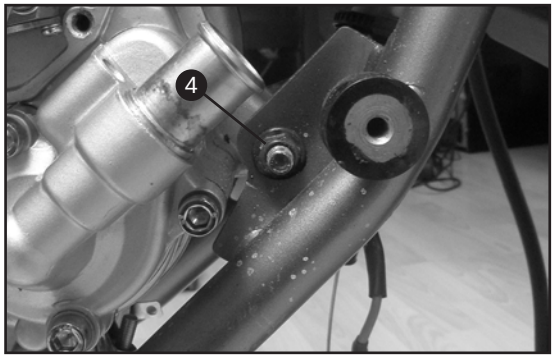
Take care about the fuel residues and the position of the cable plugs and hoses.

ENGINE REMOVAL

If you need to remove the entire engine follow points 1 to 5 - engine preparation - and go ahead with point 6.

6. Support the engine and vehicle from below before starting to remove the engine hanger and hanger bolts.
7. Remove the hanger nuts (4) and hanger bolts.





NOTE

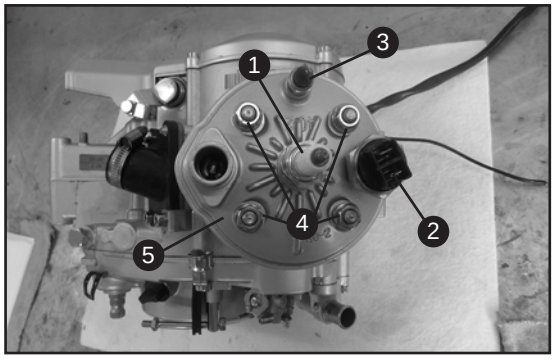
Now the engine is without an fixation and can be removed.

⚠ WARNING

Avoid that the engine falls down otherwise the alloy cast parts of the engine may be damaged.

CYLINDER COVER REMOVAL

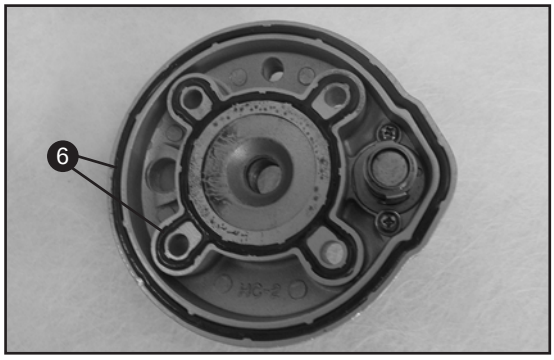
1. Remove the spark plug (1), the thermo switch (2), the temperature sensor (3) and the four nuts (4).



2. Remove the cylinder head (5) and gaskets (6).

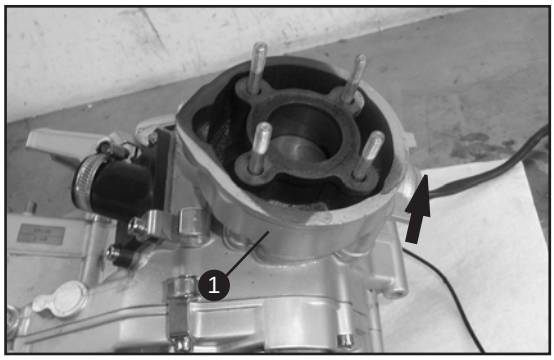
NOTE

Loosen each nut (4) 1/4 turn, and remove them after all nuts are loosened.
Renew the gaskets (6).



CYLINDER REMOVAL

1. Remove the cylinder head (1) by pulling the cylinder head off.

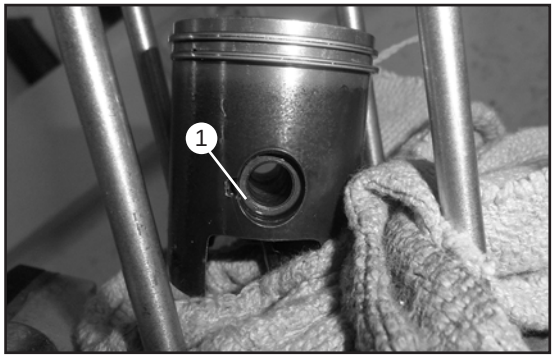


PISTON REMOVAL

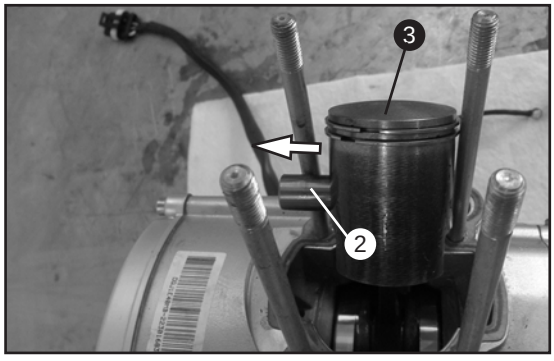
⚠ WARNING

Before start to disassembling the piston is recommended to secure the crankcase opening with a rag.

1. Remove the C-type piston pin clip (1).

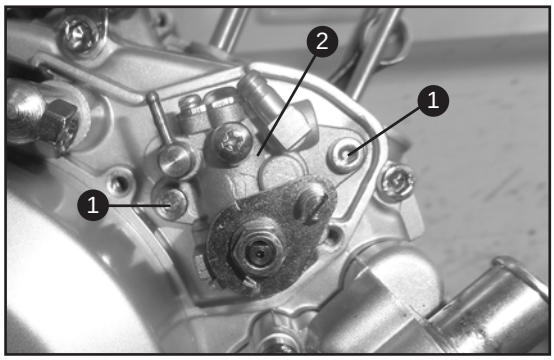


2. Push out the piston pin (2).
3. Remove the piston (3).



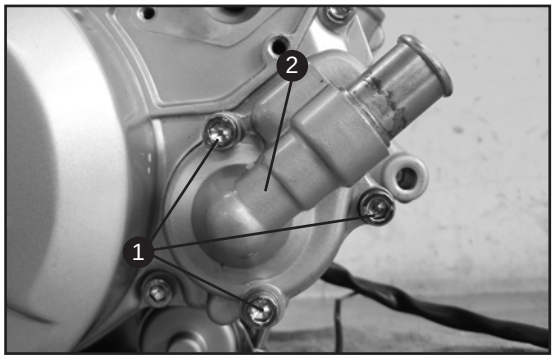
OIL PUMP REMOVAL

1. Remove the two bolts (1) and remove the oil pump (2).



WATER PUMP REMOVAL

1. Remove the three bolts (1) and remove the water pump (2).

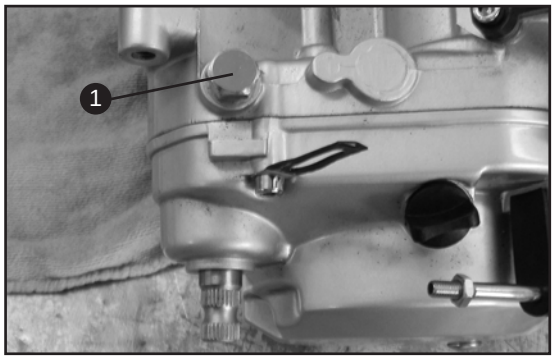


CRANKCASE COVER (RIGHT) REMOVAL

NOTE

Drain the engine oil before start with the disassembling.

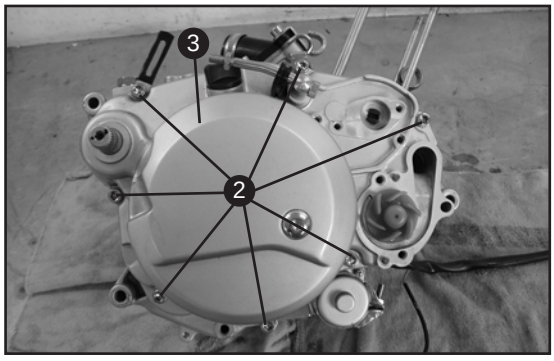
1. Remove the screw (1) to slacken the kick starter.



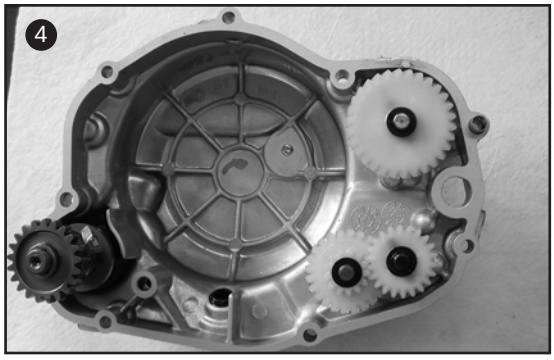
2. Remove the bolts (2) and detach the crank case cover (3).

NOTE

It is recommended to loosen the bolts crosswise before complete removal.

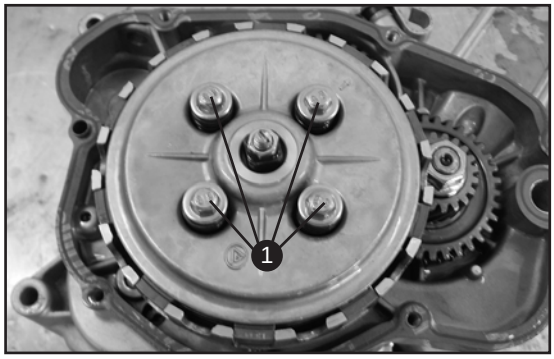


3. Controll the gears and if a gear is damaged please renew this one (picture 4).

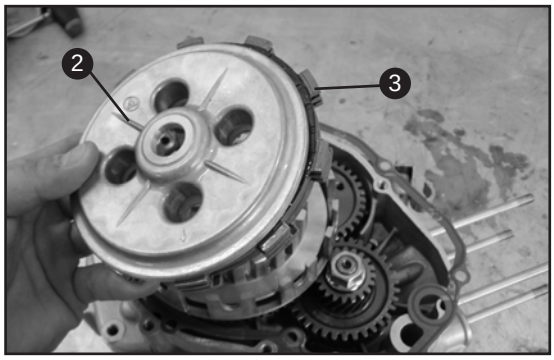


CLUTCH REMOVAL

1. Remove the four clutch screws (1) with their springs.



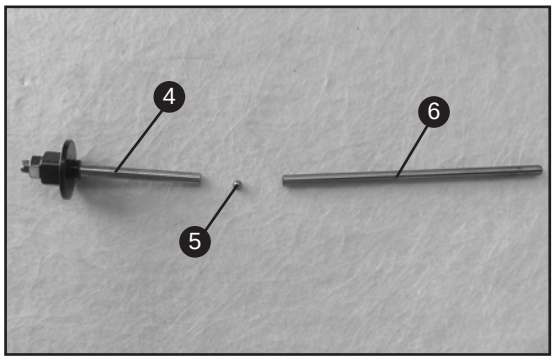
2. Remove the clutch pressure plate (2) and the friction plates (3).



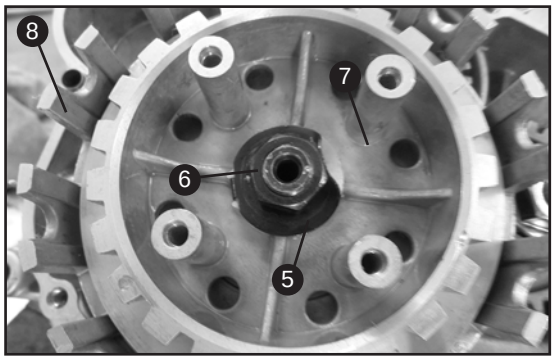
3. Rotate the engine and pull out the clutch push rod (4) with the bearing ball (5) and the bolt (6).

NOTE

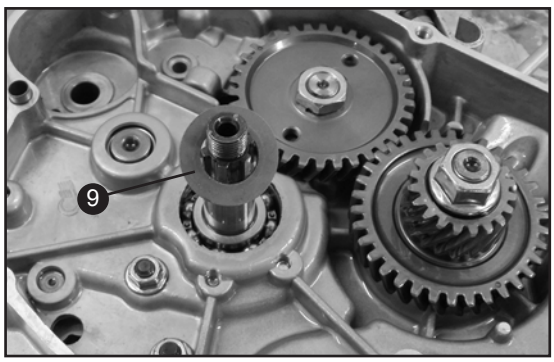
Watch out not to lose the bearing ball.



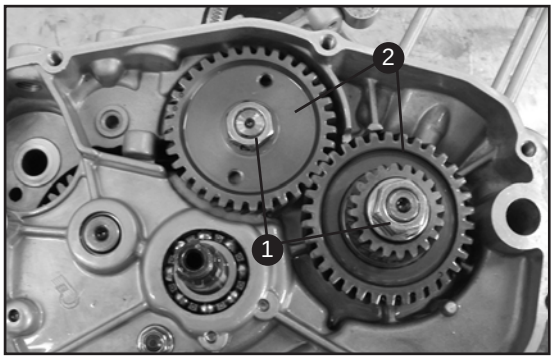
4. Loose the secure washer (5) for clutch nut and remove the clutch nut (6) and the secure washer.
5. Pull out the inner clutch basket (7) and the outer clutch basket (8) .



6. Also remove the washer (9). It is possible that the washer is pinched on the rear side of the basket.



CRANKSHAFT GEAR AND MAIN SHAFT GEAR REMOVAL

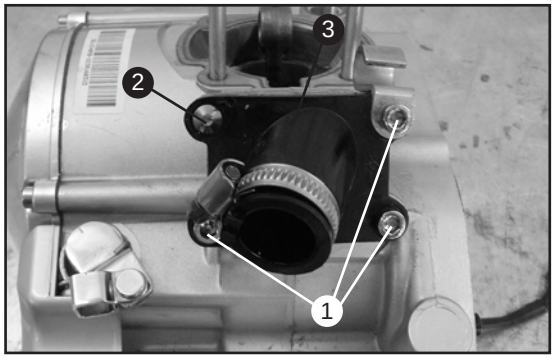


1. Remove the two nuts (1) and remove the two gears (2).

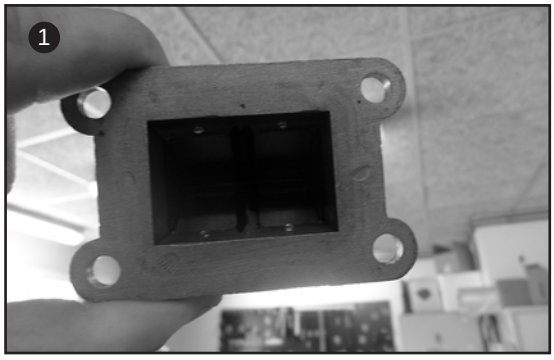
NOTE

Watch out not to lose the dowel pins.

MEMBRANE REMOVAL

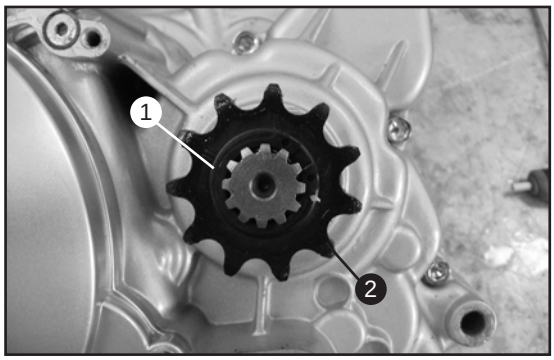


1. Remove the three screws (1) and the secure screw (2).
2. Remove the mebrane (3).

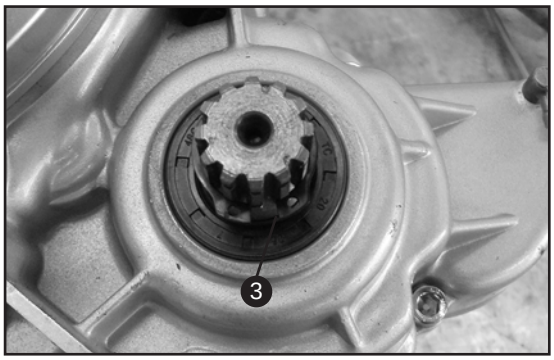


3. Controll the membrane to their thickness. Hold up the membrane and look if light shine through (picture 1).

SPROCKET REMOVAL



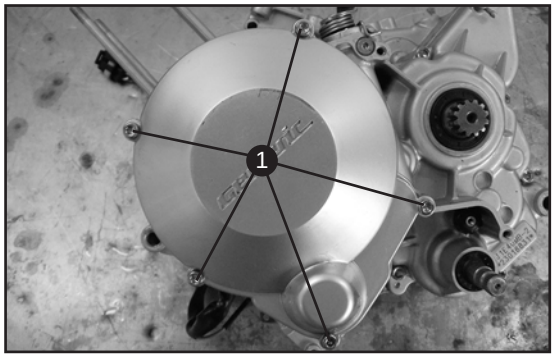
1. Remove the circlip (1) and remove the sprocket (2).



2. Remove the second circlip (3).

CRANKCASE COVER (LEFT) REMOVAL

1. Remove the socket head cap screws (1) to remove the left crankcase cover.

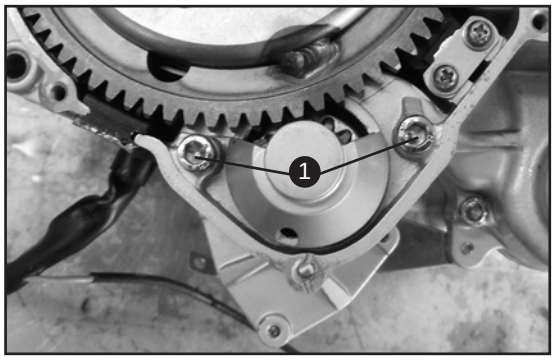


NOTE

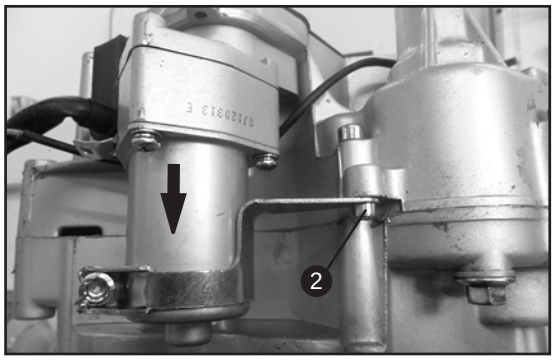
It´s recommended to loosen the screws crosswise before complete removal.

STARTER REMOVAL

1. Remove the two screws (1).



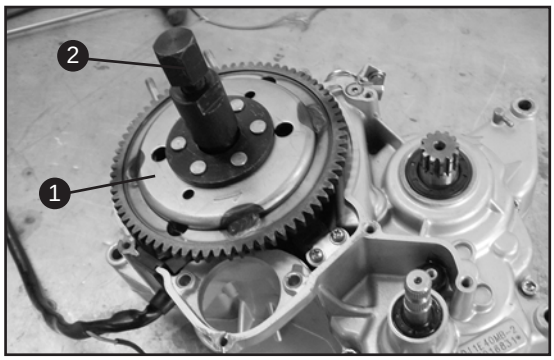
1. Remove the screw (2) and pull the starter down to remove the starter.



STARTER GEAR REMOVAL

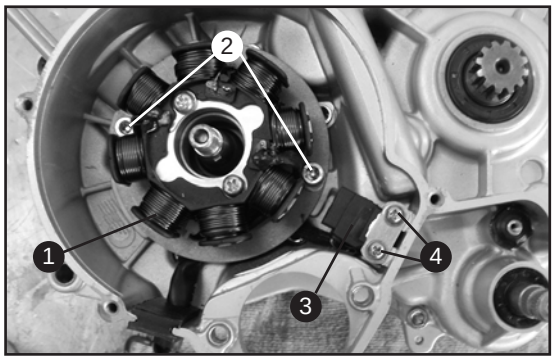
1. Remove the starter gear nut.
2. Remove the starter gear (1) by using a puller M20x1.5 (2).

Special tool see page 12-15.



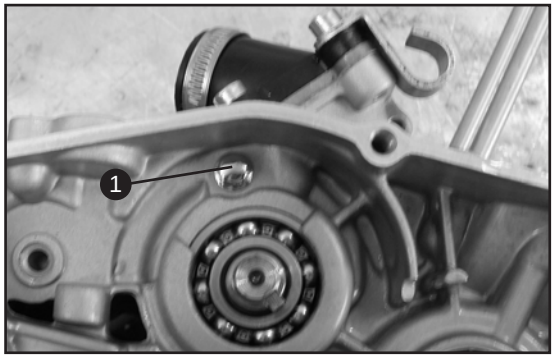
STATOR REMOVAL

1. To extend the stator (1), remove the bolts (2).
2. To extend the pick up (3), remove the screws (4).

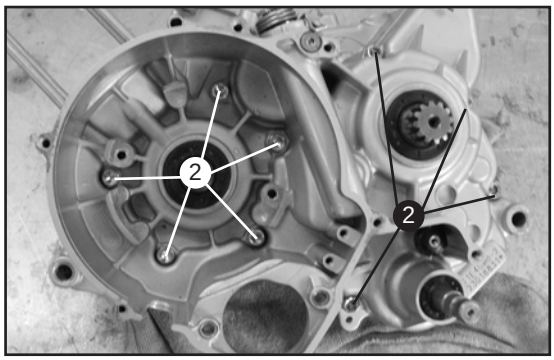


CRANKCASE SEPARATION

1. Rotate the engine 180° and remove the bolt (1) to the right side.



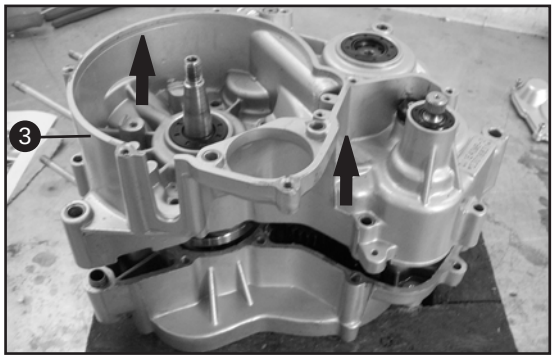
2. Rotate the engine back to the left engine side.
3. Remove the nine bolts (2).



NOTE

It is recommended to loosen the bolts crosswise before complete removal.

4. Pull off the left crankcase (3).

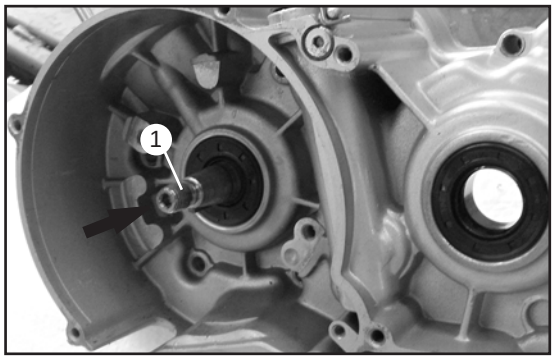


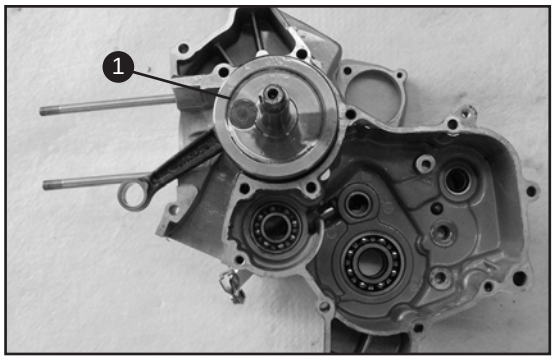
NOTE

- If it is necessary use a soft hammer to tap on the case half.
- Tap only on reinforced portions of case.
- Don't tap on gasket mating surface.
- Work slowly and carefully.
- Make sure the case halves separate evenly. If the cases don't separate, check for a remaining case screw or fitting.
- Don't force.

CRANKSHAFT REMOVAL

1. Pull out the crankshaft (1) of the left crankcase.



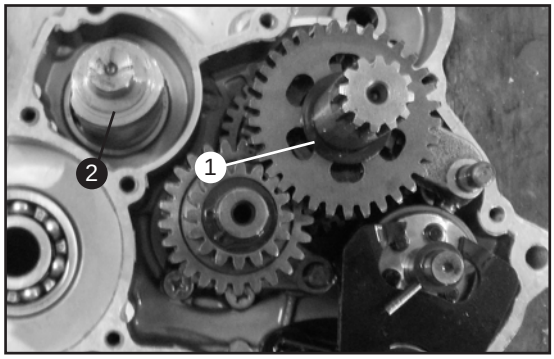


TRANSMISSION DISASSEMBLY

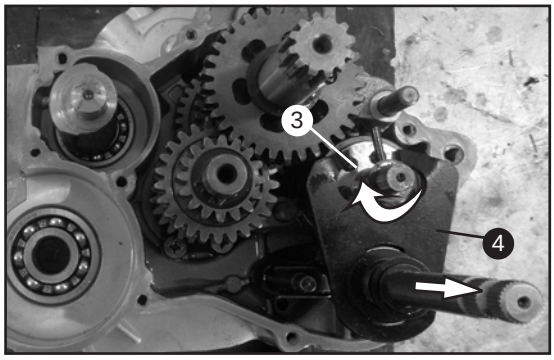
NOTE

After removal of the crank case first check the position of the transmission washer (1).

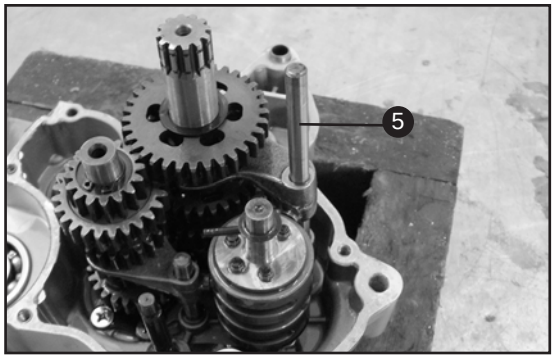
1. Remove the balancer shaft (2).



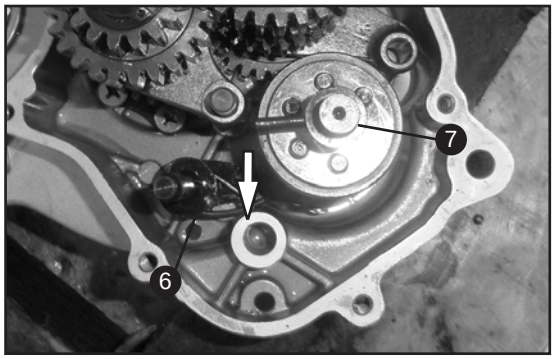
2. Turn the shift drum (3) till you can pull out the shift shaft (4).



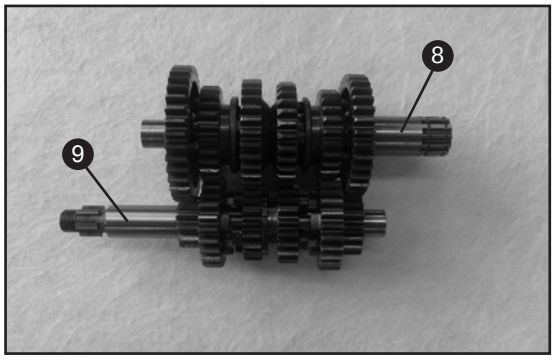
3. Lift the shifting fork shaft (5).



4. Pull back the preload device (6) till it is possible to remove the shift drum (7).



5. Remove the drive shaft (8) and driven shaft (9) together.



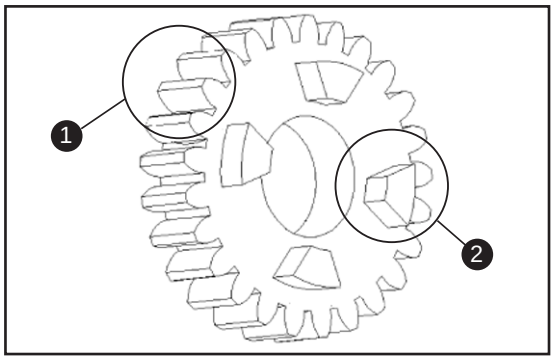
NOTE

- In Case of a defect of a transmission gear replace always in a pair.
- Remove damaged bearings if necessary with a bearing puller.
- Use only genuine spare parts.
- Before assembling the engine clean the crankcase and all sealing surfaces carefully.
- Wash all used parts before install again and apply clean engine oil to all moving and sliding parts.
- Replace all gaskets and check the condition and function of each part during assembly carefully.

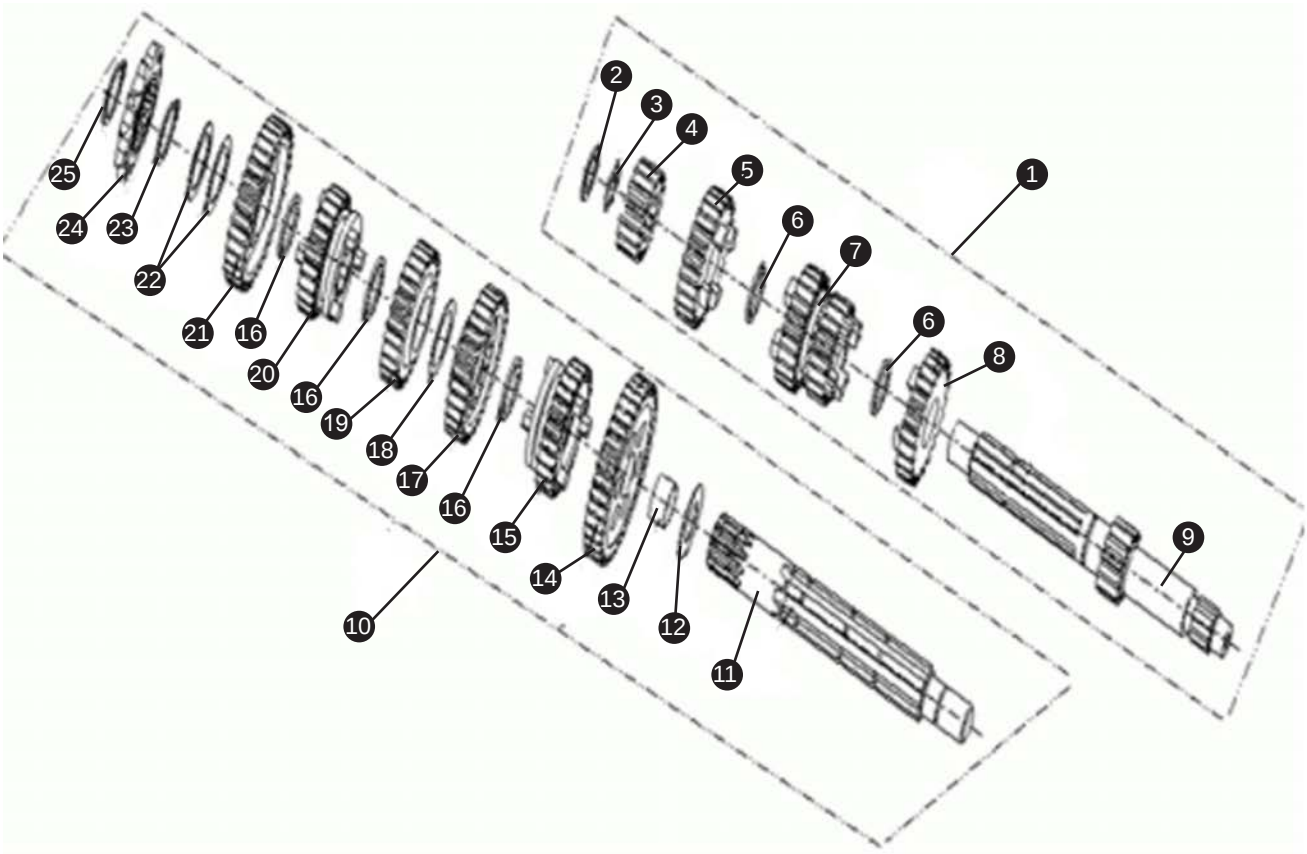
INSPECTION OF TRANSMISSION AND GEAR SHIFT MECHANISM

NOTE

Check respectively wear of tooth surface (1) and drive pawls (2). If they are seriously worn or damaged, replace them. Remove bearing and oil seal on left crankcase. Check if bearing and oil seal are injured. Replace if necessary.



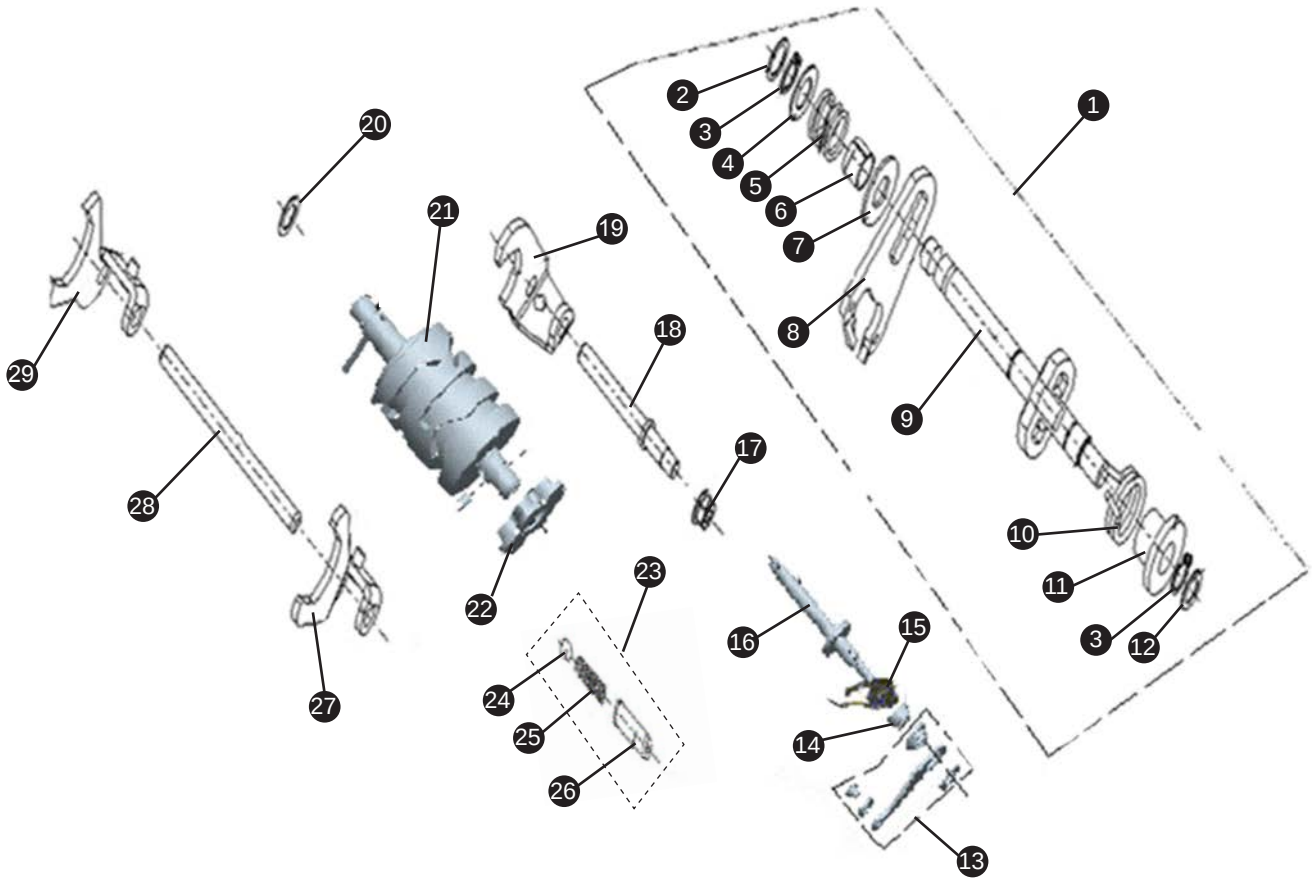
EXPLODED VIEW / PART LOCATION - PRIMARY SHAFT ASSY/SECONDARY SHAFT ASSY



PART LIST - PRIMARY SHAFT ASSY/SECONDARY SHAFT ASSY

1. Primary shaft assy
2. Circlip
3. Spacer
4. Drive wheel 2nd gear
5. Drive wheel 6th gear
6. Circlip
7. Drive wheel 3rd and 4th gear
8. Drive wheel 5th gear
9. Primary shaft
10. Secondary shaft assy
11. Secondary shaft
12. Spacer
13. Bush
14. Gearwheel 1st gear
15. Gearwheel 5th gear
16. Circlip
17. Gearwheel 3rd gear
18. Spacer
19. Gearwheel 4th gear
20. Gearwheel 6th gear
21. Gearwheel 2nd gear
22. Spacer
23. Circlip
24. Engine drive sprocket 11 T
25. Circlip

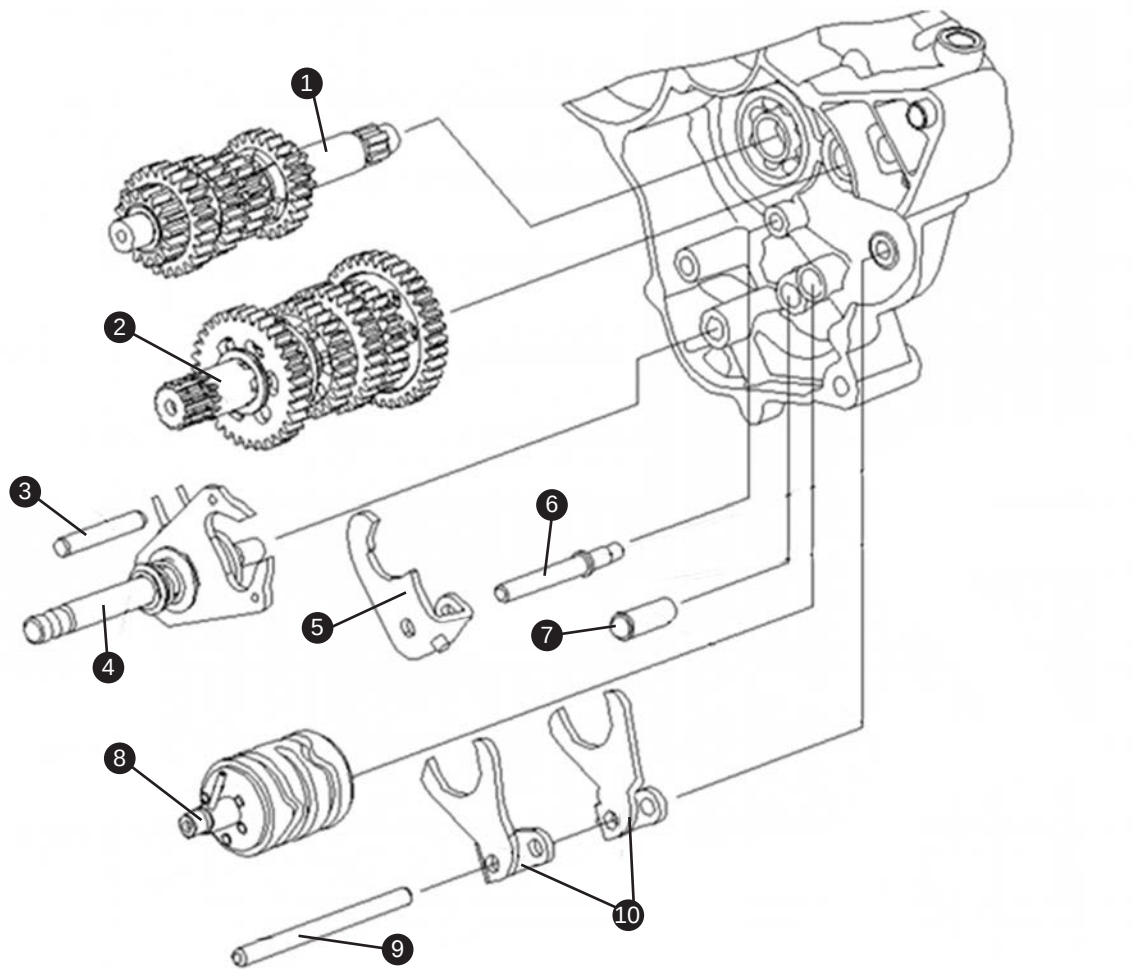
EXPLODED VIEW / PART LOCATION - SHIFT MECHANISM



PART LIST - SHIFT MECHANISM

1. Gear shift shaft assy
2. Circlip
3. Washer
4. Washer
5. Spring
6. Female
7. Washer
8. Plate gear shift shaft
9. Gear shift shaft
10. Spring
11. Spring bracket
12. Spacer
13. Stop lever
14. Bush
15. Spring
16. Shaft
17. Nut M6
18. Guid shaft shift fork
19. Shift fork
20. Spacer
21. Shift fork
22. Star washer
23. Detent
24. Steel ball
25. Spring
26. Sleeve
27. Shift frok
28. Guid shaft shift fork
29. Shift fork

EXPLODED VIEW / PART LOCATION - REDUCTION GEAR



PART LIST- REDUCTION GEAR

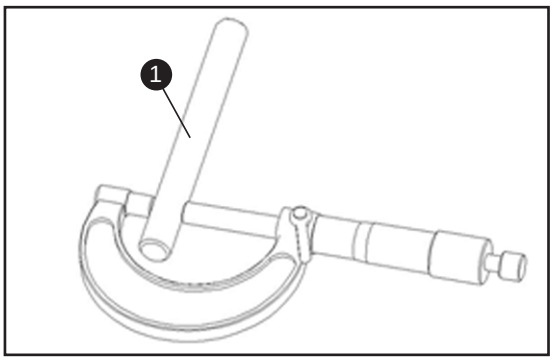
1. Primary shaft assy
2. Secondary shaft assy
3. Pin of return spring
4. Shift shaft set
5. Middle fork
6. Middle fork shaft
7. Fixer set
8. Shift drum
9. Left and right fork shaft
10. Left and right fork

TRANSMISSION AND SHIFT MECHANISM INSPECTION

	ITEM	STANDARD VALUE (mm)	ALLOWABLE LIMIT (mm)
Shift mechanism	Bore diameter of shift fork	7.825 - 7.845	7.91
	Shift fork thickness	3.95 - 4.05	3.9
	Shift drum outer diameter	41.8 - 42	41.75
	Locked groove width of shift drum	6.05 - 6.15	6.3

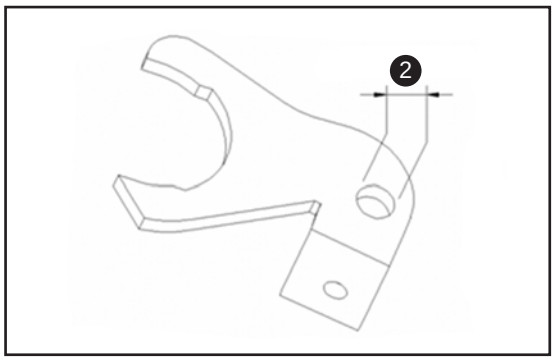
Check the shift fork shaft (1) with an micrometer.

Allowable limit: 7.91 mm



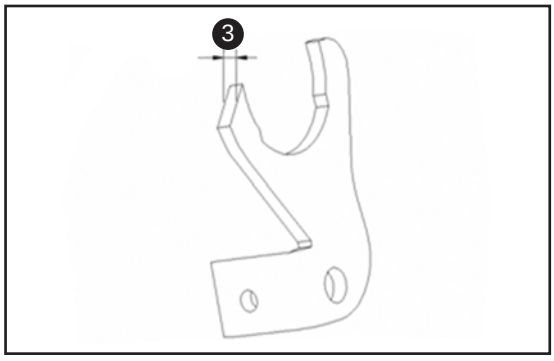
Check the bore diameter of the shift fork (2) with an subito.

Allowable limit: 7.91 mm



Check the thickness of the shift fork (3) with an square caliper.

Allowable limit: 3.9 mm

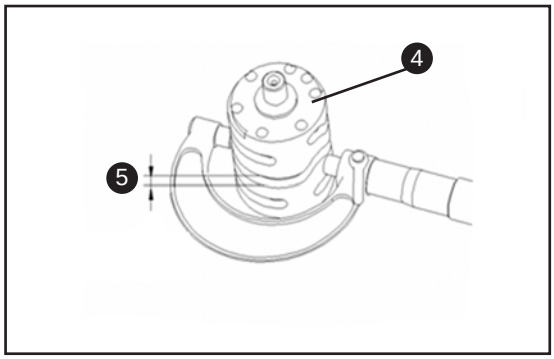


Check the diameter of the shift drum (4) with an Micrometer.

Allowable limit: 4.75 mm

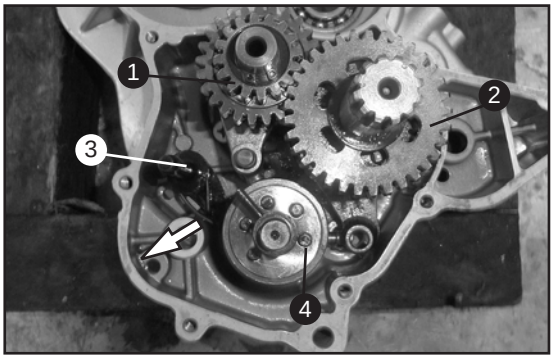
Check the width of gearshift drum lock groove (5) with an square caliper.

Allowable limit: 6.3 mm



TRANSMISSION ASSEMBLING

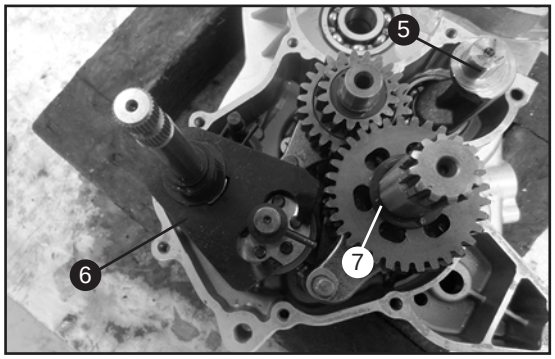
1. Install the primary shaft assy (1) and the secondary shaft assy (2).
2. Pull back the preload device (3) and install the shift drum (4).



NOTE

Watch out to the position of the preload device.

3. Install the balance shaft (5) and the shift shaft set (6).

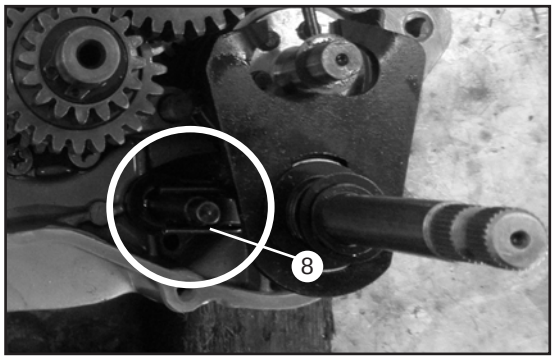


NOTE

Do not forget the washer (7) of the secondary shaft assy.

NOTE

Watch out to the position of the return spring (8).



TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Hard to engage gear	Worn or destroyed gearshift fork	Replace
	Broken shift fork guide pin	Replace
	Worn gear pawl	Replace
Difficult gearshift	Clutch does not separate completely	Check the clutch mechanism as well the clutch discs and conditions of the oil
	Defect transmission pull spring	Replace
	Worn gearshift drum lock groove	Replace
Automatic gearshift	Connecting pawl is worn and its edge turns round	Replace
	Weak transmission unit return spring	Replace
	Worn gearshift drum and shift fork	Replace

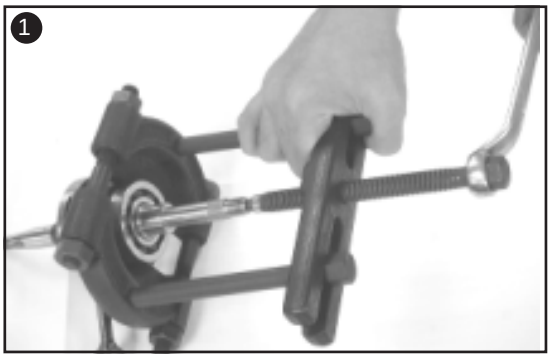
NOTE

1. Inspect and clean all parts carefully before assembling.
2. Check all used bearings and replace if necessary. Install the bearing only with the right tool.
3. If you are not proficient, leave the job an specialist.

CRANKSHAFT INSPECTION

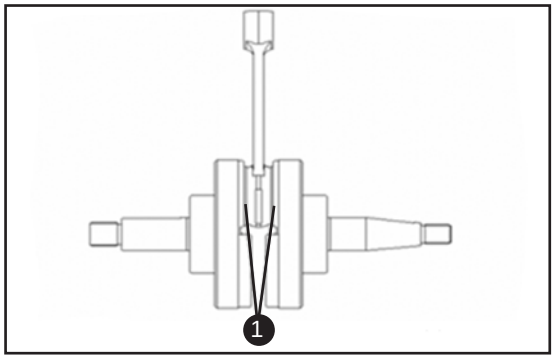
ITEM		STANDARD VALUE (mm)	ALLOWABLE LIMIT (mm)
Crankshaft	Clearance of connecting rod big end in right and left direction	0.1 - 0.35	0.55
	Axial clearance of connecting rod big end in vertical angle	0 - 0.008	0.05
	Vibration	---	0.1

1. Remove the bearings off the crankshaft by using an universal bearing puller (pictue 1).



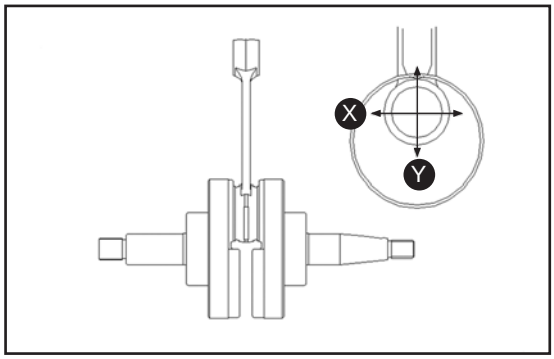
2. Measure the connecting rod axial side clearance (1).

Allowable Limit : 0.55 mm



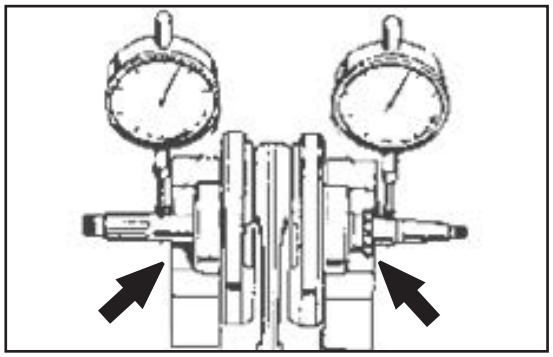
3. Measure the connecting rod radial clearance in X and Y direction.

Allowable Limit (X/Y): 0.05 mm

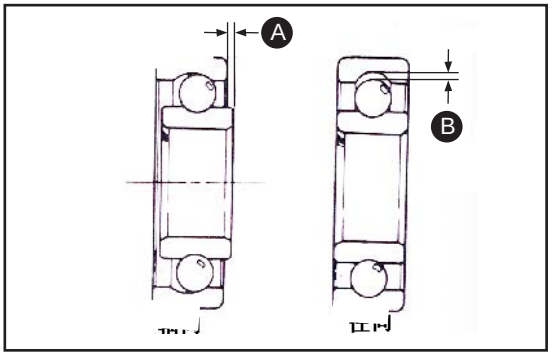


4. Measure the run-out at the bearing pins of the crankshaft.

Allowable Limit (A/B): 0.1 mm

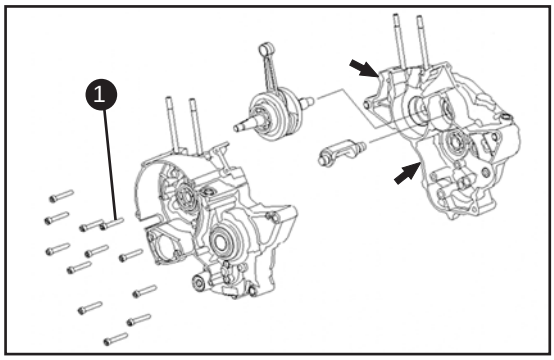


5. Check the crankshaft bearings for excessive play. The bearings must be replaced if they are noisy or have excessive play.



NOTE

If the crankshaft, transmission shaft and balance shaft installed in the left crankcase put some surface sealant thin on the plane surfaces of the left crankcase (arrow). Please note that there is no separate gasket available.
Installation of right crankcase should work smooth and without additional force. Watch out the shafts move to the right position before fixing the crankcases with screws. Disassemble and assemble again if the engine parts do not fit together smooth.
If necessary heat up the right crankshaft bearing before assembling.



Tighten all screws (1) with the specific torque in reversed order of disassembling.

Do not forget the screw on the right engine side.

TORQUE LIST

PART NO.	TORQUE
1	10 - 12 Nm

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Noise out from the crankcase	Loosen or damaged parts (bearings, gears,....) in the crankcase	Replace

TOP END PARTS INSPECTION

NOTE

Before reinstall the piston and piston pin measure all dimensions if they are within the limits.

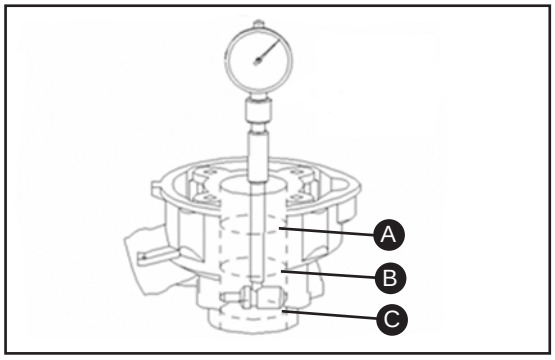
	ITEM		STANDARD VALUE [mm]	ALLOWABLE LIMIT [mm]
Cylinder	Cylinder inner diameter		40.27 - 40.28	40.3
	Cylindrically		---	0.05
	Roundness		---	0.05
	Flatness		---	0.05
Piston	Piston pin hole inner diameter		12.002 - 12.008	12.04
	Piston pin outer diameter		11.994 - 12	11.96
	Piston outer diameter		40.22 - 40.23	40.2
	Clearance between piston and piston pin		0.002 - 0.014	0.08
	Clearance between the piston ring and piston ring groove	Top ring	0.015 - 0.05	0.9
		Second ring	0.015 - 0.05	0.9
	Joint clearance of piston ring	Top ring	0.1 - 0.25	0.5
		Second ring	0.1 - 0.25	0.5
Connection rod	Connecting rod small end inner diameter		14.995 - 15.006	15.06
	Clearance between linkage rod and piston pin		0.002 - 0.014	0.08

CYLINDER INSPECTION

1. Inspect the abrasion and the wear of the cylinder inner wall.
2. Measure the cylinder bore with an subito at three levels of A, B and C.

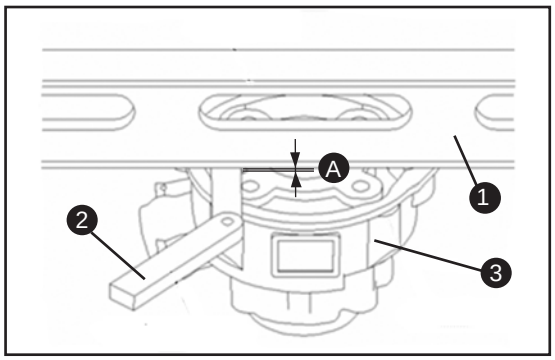
   Allowable service limit: 40.3 mm

3. Check if the cylinder is broken. Check for any carbon deposition. If necessary replace it.



1. Inspect the flatness of the cylinder. (1. Ruler, 2. Measuring gauge, 3. Cylinder)

Allowable limit A: 0,05 mm

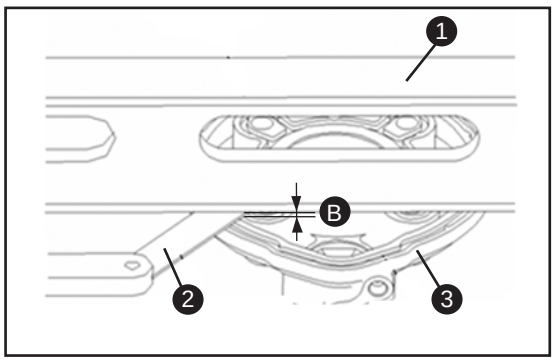


NOTE

Inspect the cylinder head in the same way.

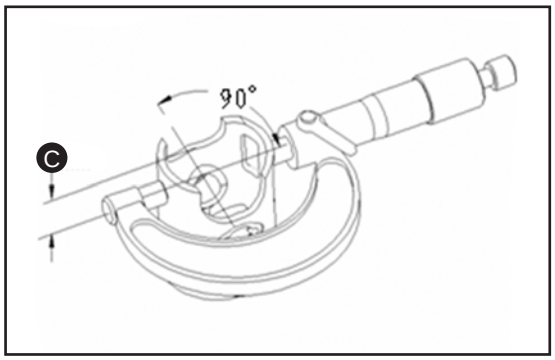
2. Inspect the flatness of the cylinder head. (1. Ruler, 2. Measuring gauge, 3. Cylinder head)

Allowable limit B: 0,05 mm



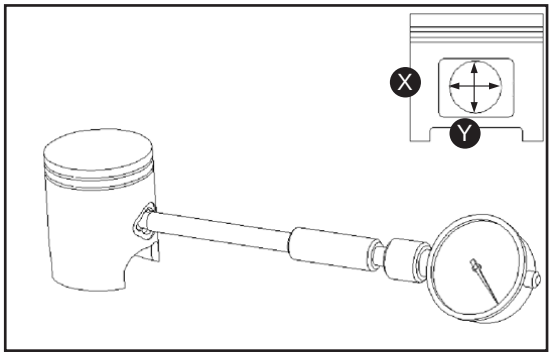
3. The measuring position and the piston pin form an angle of 90 degree, and 15.5mm (C) below the skirt of piston.

Allowable limit C: 40.2 mm



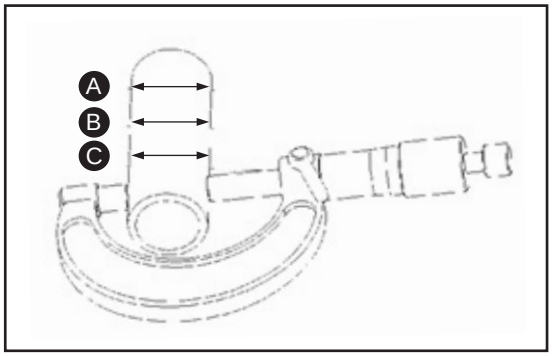
4. Measure the bore diameter of the piston pin hole. Measure both X and Y directions.

Allowable limit X/Y: 12.04 mm

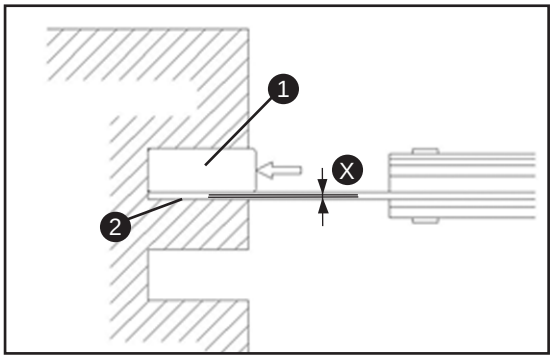


5. Measure the outer diameter of the piston pin at three levels of A, B and C.

Allowable limit: 11.96 mm

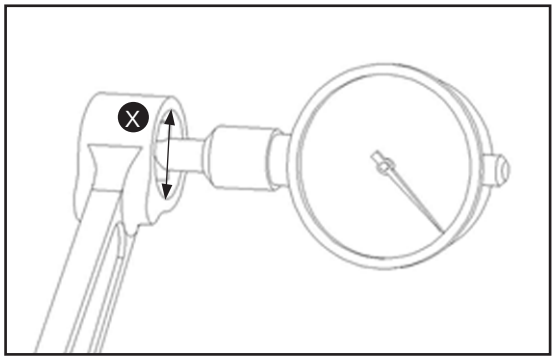


6. Measure the clearance (X) between piston ring (1) and piston ring groove (2) with an spacer gauge.



Allowable limit: Top ring: 0.09 mm
Second ring: 0.09 mm

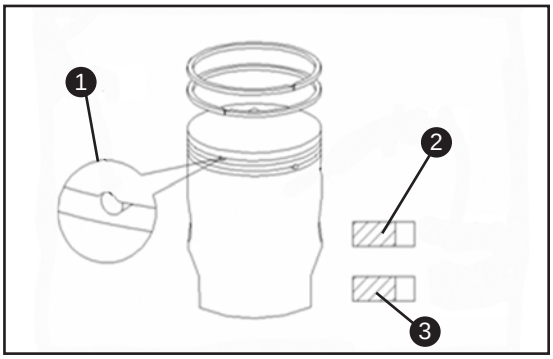
7. Measure the bore diameter (X) of the connecting rod small end inner diameter with an subito.



Allowable limit: 15.06 mm

PISTON INSTALLATION

1. Put some oil on each piston ring and the piston.
2. Install the piston ring by aligning it with the guide pin (1) on the piston.

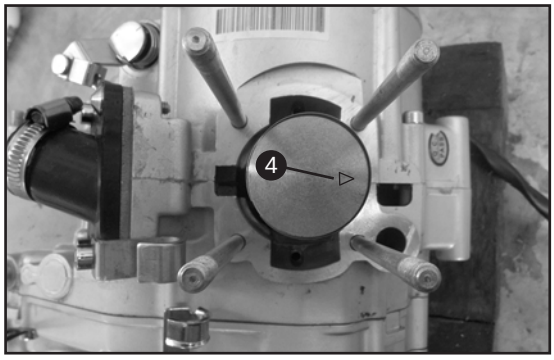


(2): Top ring
(3): Second ring

NOTE

The piston should not be scratched and the piston ring should not be broken.
The piston ring should be assembled with its marked side upward.

3. Install according to the arrow mark (4) on the piston top.

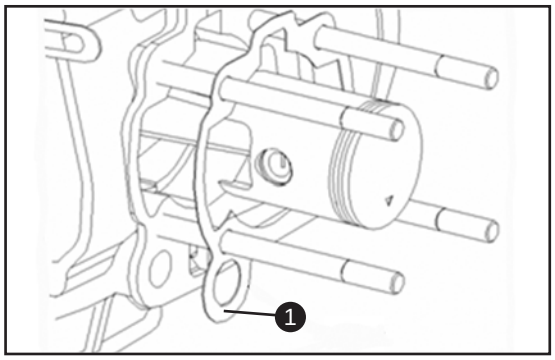


⚠ WARNING

The retaining ring should not fall into the crankcase.

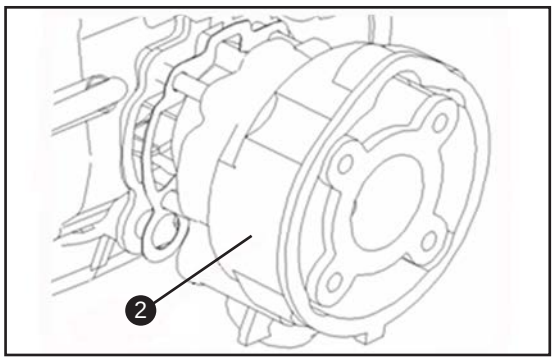
CYLINDER INSTALLATION

4. Install the cylinder gasket (1).
5. Add some fresh engine oil on the piston, piston ring and the inner cylinder wall.



NOTE

A piston ring pincer helps to install the piston in the cylinder (2). Handle with care not to damage or scratch any part.

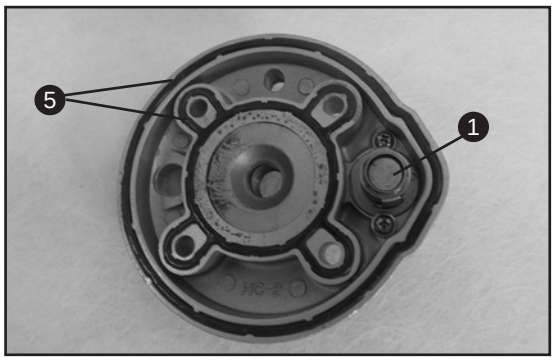


CYLINDER COVER INSTALLATION

NOTE

Before reinstall the cylinder head check all parts.

- Constant temperature set (1)
- Spark plug (2)
- Temperature controller (3)
- Temperature sensor (4)

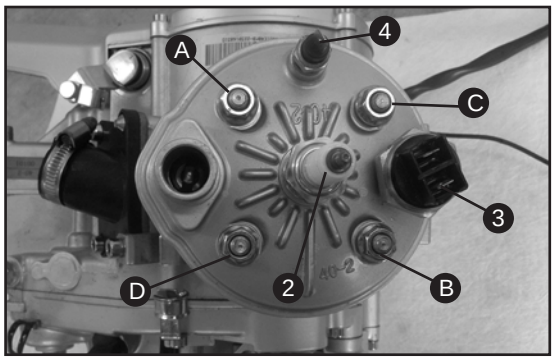


NOTE

Improperly tightened cylinder head bolts may result in gasket leaks, stud failure and distortion of the cylinder and/or cylinder head.

All the components shall be cleaned before installation, and purged with high-pressure air.

1. Use new gaskets (5).
2. Apply a small dab of medium strength threadlocker to threads .
3. Alternately turn each cylinder head bolt until finger tight.
4. Tighten the cylinder head bolts in the sequence (A-B-C-D) shown in the picture.



TORQUE LIST

PART. NO.	TORQUE
A,B,C,D	18 - 22 Nm
2	8 - 12 Nm
3	8 - 12 Nm
4	8 - 12 Nm

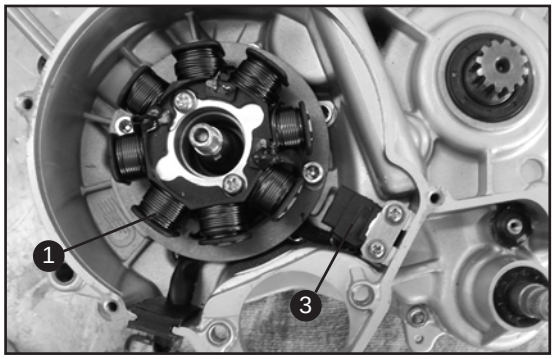
For screws that are not listed use standard values (page 11).

LEFT CRANKCASE ASSEMBLING

1. Install the stator (1) and the pick up (2).
   Tighten the srews in specific torque.

NOTE

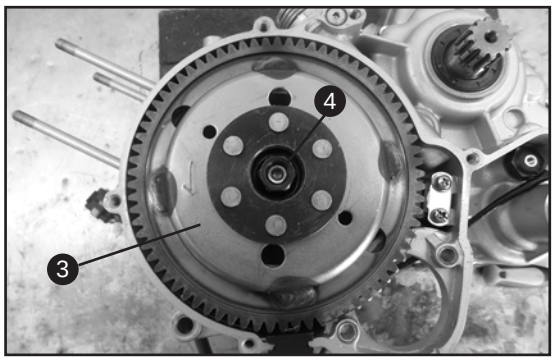
If there is any signal fault of generator or pick up replace the stator together with the pickup.



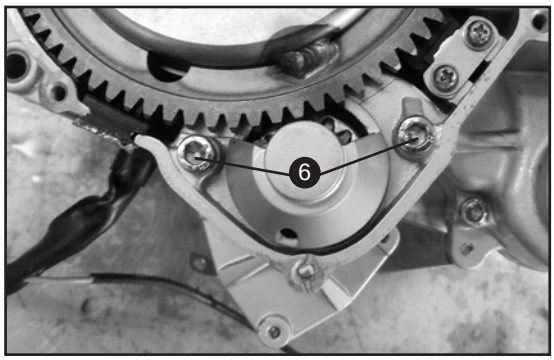
2. Install the starter gear (3).

TORQUE LIST

PART. NO.	TORQUE
4	35 - 40 Nm



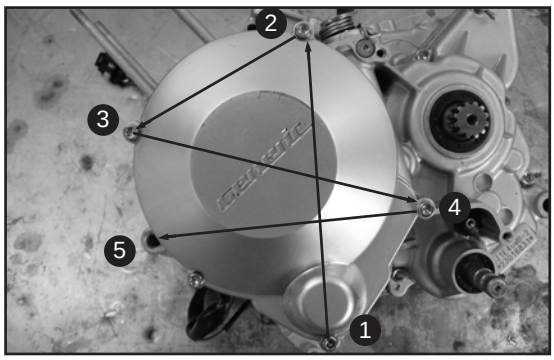
3. Pull the starter (5) in the crankcase and tighten the screws (6) in specific torque.



4. Alternately turn each bolt until finger tight.
5. Tighten the bolts in sequence (1-5) shown in the picture.

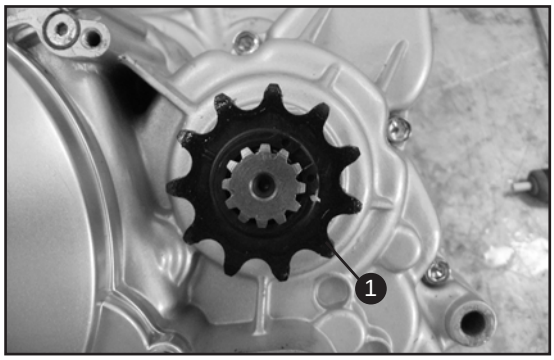
TORQUE LIST

PART NO.	TORQUE
1-5	10 - 12 Nm



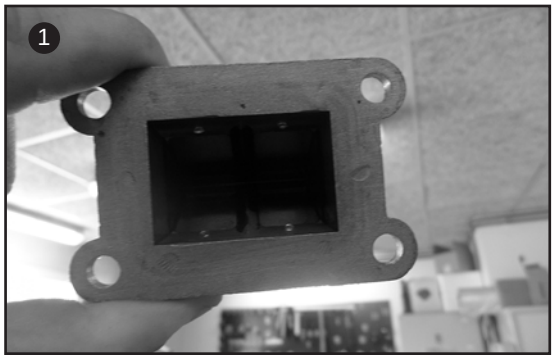
SPROCKET INSTALLATION

1. Assemble the sprocket in reverse order of removal (see page 65)



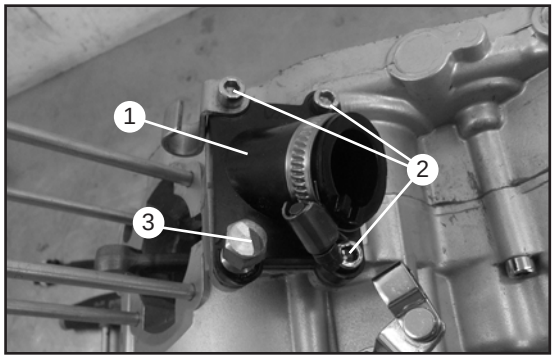
MEMBRANE INSPECTION

1. Controll the membrane to their thickness. Hold up the membrane as shown in the picture (1) and look if light shines throug. If light shines throug the membrane renew the membrane.



MEMBRANE INSTALLATION

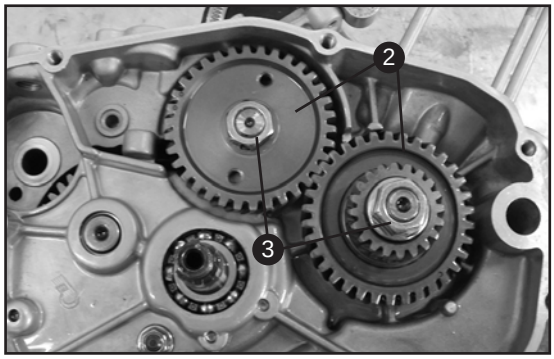
1. Install the membrane (1) and thighten the three bolts (2) in specific torque.
2. Tighten the secure bolt till the head (3) of the bolt brakes away.



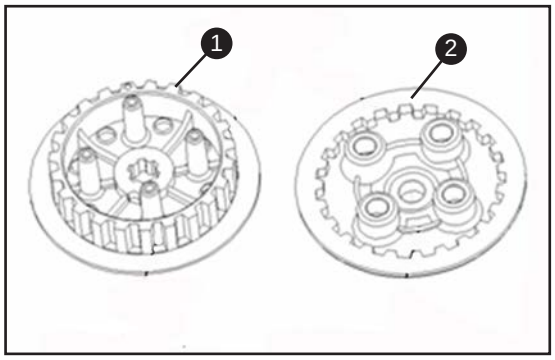
RIGHT CRANKCASE ASSEMBLING

1. Install the dowel pins.
2. Install the crankshaft gear (1) and the primary shaft gear (2) together. Do not use any additional force like a rubber hammer. If necessary heat up the crankcase and cool down the crankshaft. Install the crankshaft together with the primary shaft gear at the following marking (Picture 1).

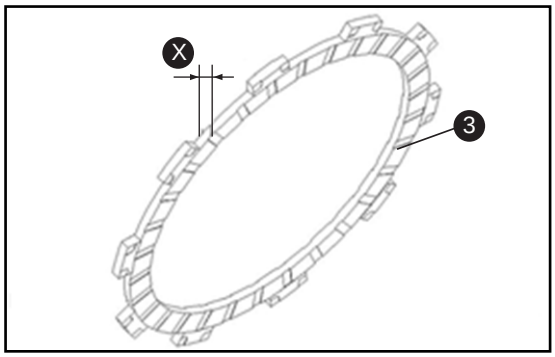
3. Tighten the two nuts (3).
4. Before continue assembling check the clutch.



CLUTCH INSPECTION



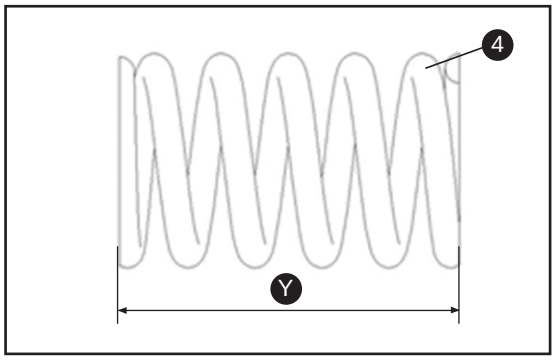
1. Check if there are burs or broken parts on the center bracket (1) or pressure plate (2) of clutch. If there are, fix and adjust with a file.
2. Check if teeth of pressure plate and center bracket are injured. If they are, replace them.



3. Check the thickness of clutch friction plates (3).

Allowable limit X: 2,6 mm

4. Check the metal discs.
5. When the metals worn, wrapped or glazed, replace it.



6. Check the free length of pressure spring (4).

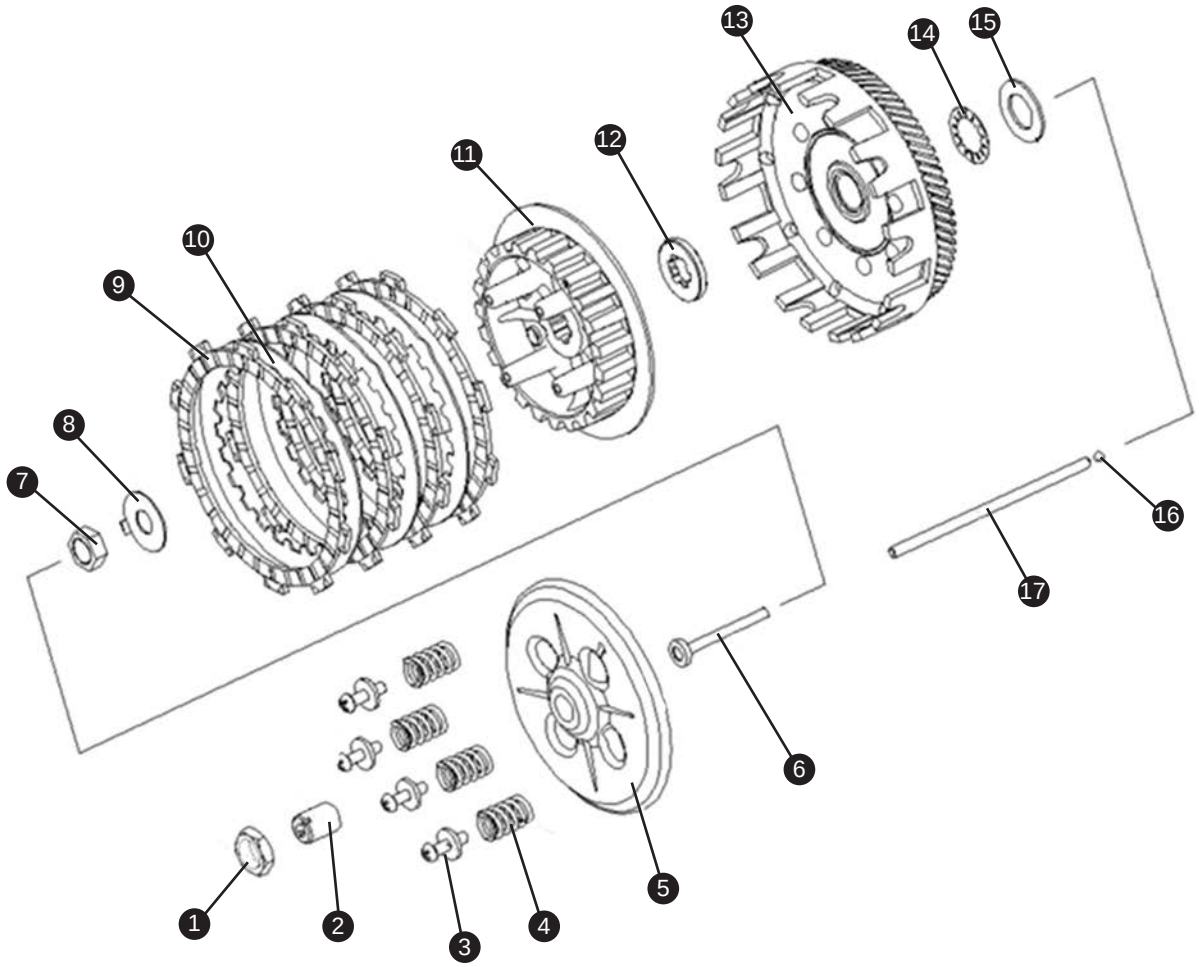
Allowable limit Y: < 29,7 mm.

7. When one of the springs is below the allowable limit or very weak replace it.

NOTE

Replace clutch friction plates or clutch metal discs always as set.

EXPLODED VIEW / PART LOCATION - CLUTCH

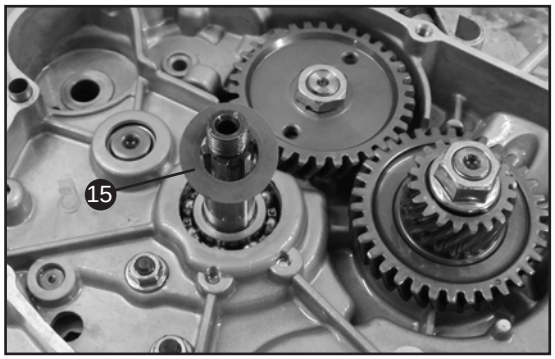


PART LIST - CLUTCH

1. Clamp nut
2. Adjustment bolt
3. Bolt and gasket
4. Pressure spring
5. Pressure cover
6. Outward release lever
7. Locknut
8. Fixing gasket
9. Wearing plate
10. Iron friction plate
11. Center
12. Internal gasket
13. Housing set
14. Dish gasket
15. Washer
16. Bearing ball
17. Inward release lever

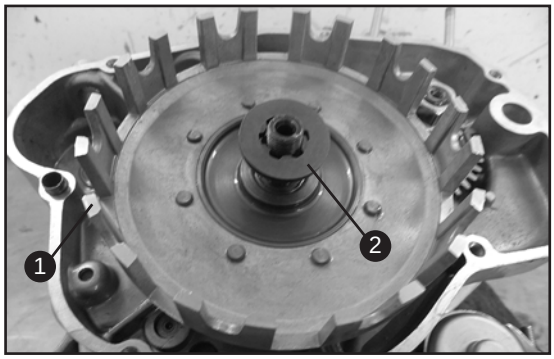
NOTE

Before start to assemble the clutch, install the washer (15) first.



CLUTCH ASSEMBLING

1. Install housing set (1) and the internal gasket (2).

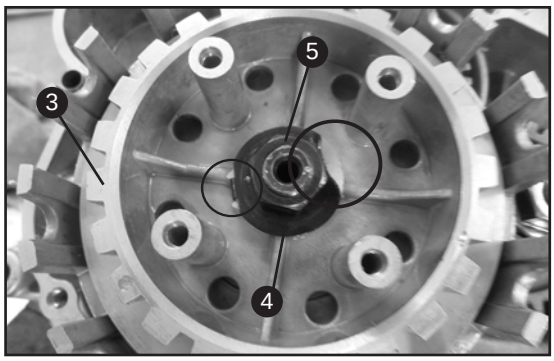


2. Install the center (3), the secure washer (4) and the nut (5).

NOTE

Watch out to the position of the secure washer.

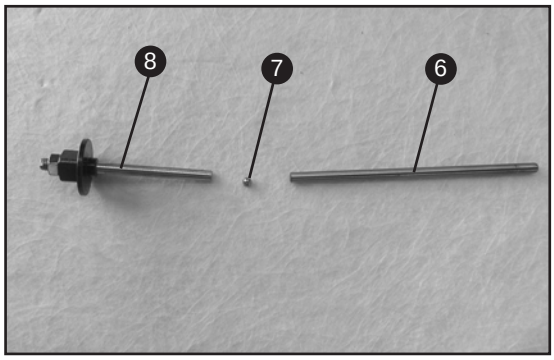
3. Tighten the locknut (5) an fix the secure washer (4).



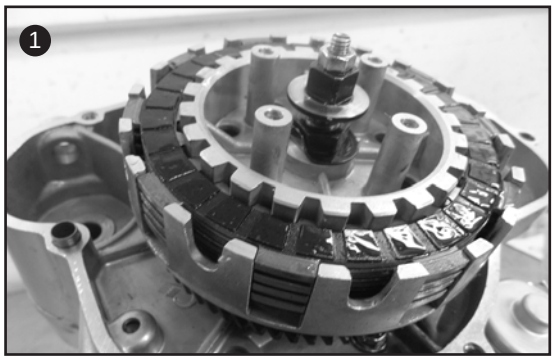
TORQUE LIST

PART NO.	TORQUE
5	50 - 60 Nm

4. Insert inward release lever (6), bearing ball (7) and outward release lever (8) afterwards.



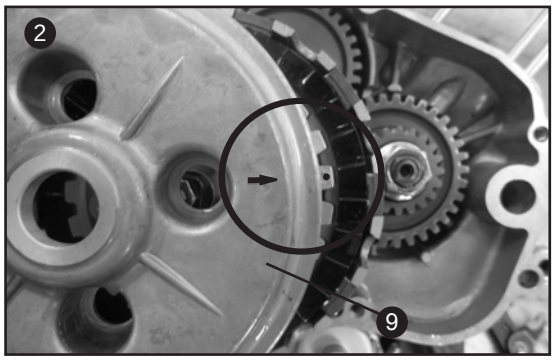
5. Start assembling the clutch with a wearing plate. Alternately clutch wearing plate and iron friction plate (picture 1).



6. Afterwards install the pressure plate (9).

NOTE

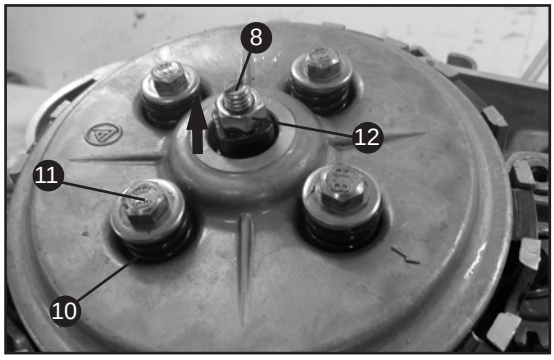
Watch out to the position of the pressure cover.
The arrow on the pressure cover had to show to the point on the center (picture 2).



7. Install the springs (10) and the screws (11).
8. Tighten the screws.

TORQUE LIST

PART. NO.	TORQUE
11	10 - 16 Nm

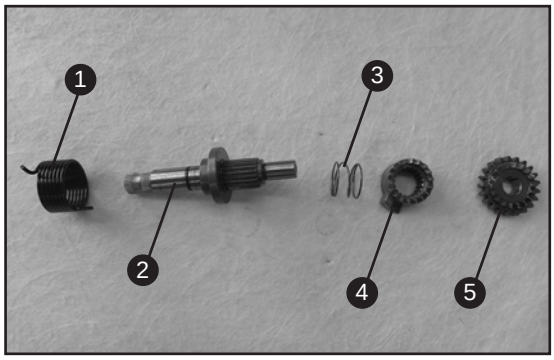


OUTWARD RELEASE LEVER ADJUSTMENT

1. Pull out the release lever (8). The clearance should be about 1mm.
2. If the clearance is not 1mm, loosen the nut (12) and screw in or out.
3. Tighten the nut (12).

ACTUATING LEVER INSPECTION

1. Inspect the elasticity of the return spring (1) and ratchet spring (3) and if there is damage, replace them.
2. Inspect the actuating lever (2), the ratchet (4) and the actuating gear (5) and if there is damgae, replace them.

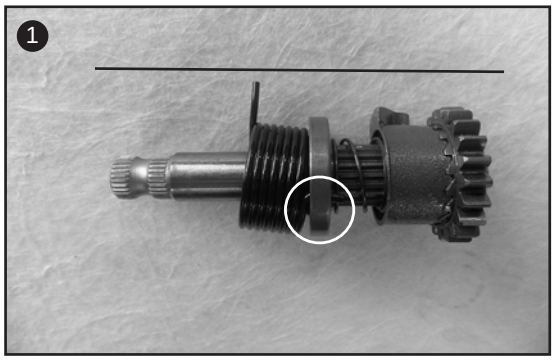


ACTUATING LEVER ASSAMBLING

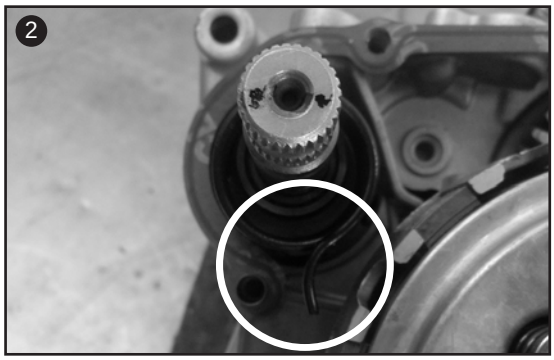
1. Assemble the actuating lever as shown in picture (1).
2. Take special care about the assemble of the return spring and the ratchet.

NOTE

The return spring tap had to get in the bore of the actuating lever. The second return spring tap should be in a axial line witch the ratchet tap.



3. Install the actuating lever.
4. The second return spring should be in the middle between the clutch and the guid pin as shown in picture (2).

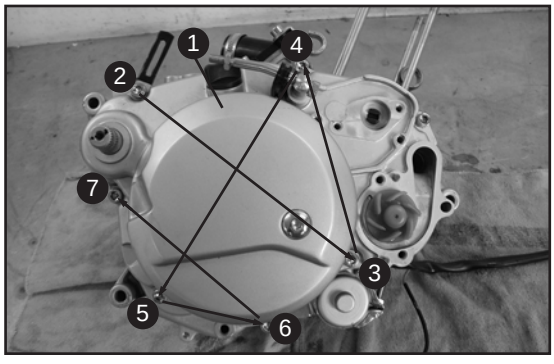


RIGHT CRANKCASE ASSEMBLING

5. Alternately turn each bolt until finger tight.
6. Tighten the bolts in sequence (2-7) shown in the picture.

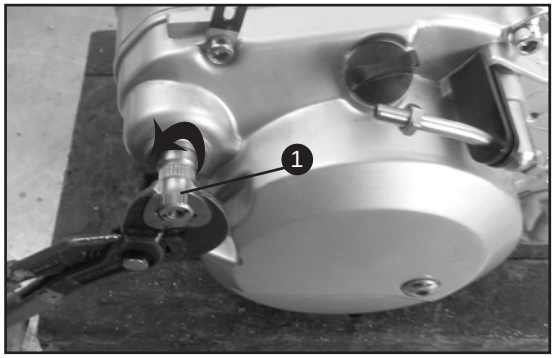
TORQUE LIST

PART. NO.	TORQUE
2-7	10 - 12 Nm

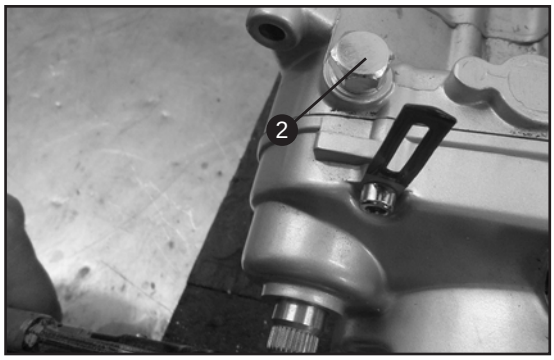


ACTUATING LEVER ADJUSTMENT

1. Turn the actuatin lever (1) 180° counter clockwise (arrow).



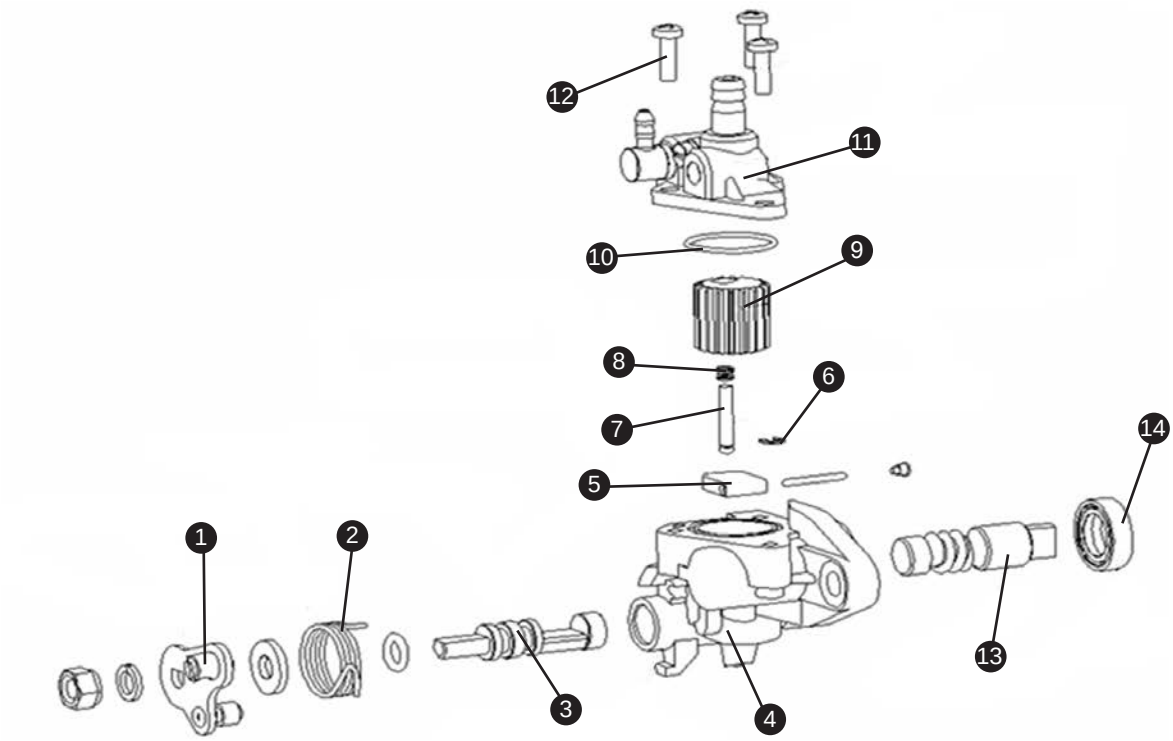
2. After turning the actuating lever, screw in the bolt (2).



TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Tight clutch release lever	Clutch cable defect, twisted or contaminated	Replace or clean it
	Defect push rod or lifter bearing	Replace it
Clutch slips at acceleration	To less clutch clearance	Adjust it
	Worn clutch disc	Replace it
	Weak clutch spring	Replace it
	Sticky push rod	Replace or clean it
	Oil wasted or level incorrect	Adjust level or replace it
	Clutch cable incorrect adjusted	Adjust it
Gearshift difficult	Worn or broken clutch pads	Replace it
	Clutch springs weak or broken	Replace it
	Oil wasted or level incorrect	Adjust level or replace it
Clutch not released or motorcycle drags when clutch released	Wrong oil type or level incorrect	Adjust level or replace it
	Too big push rod clearance	Adjust it
	Clutch cabel incorrect adjusted	Adjust it

EXPLODED VIEW / PART LOCATION - OIL PUMP



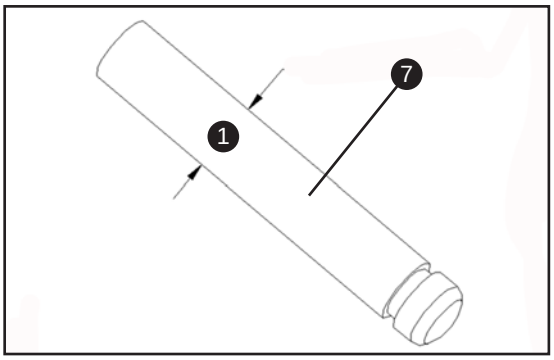
PART LIST OIL - PUMP

1. Throttle handle set
2. Torsion spring
3. Camshaft
4. Oil pump body
5. Regulating plate
6. Circlip
7. Piston
8. Piston spring
9. Worm wheel
10. Oil pump cover gasket
11. Oilpump cover
12. Bolt
13. Worm gear
14. Oil seal

OIL PUMP INSPECTION

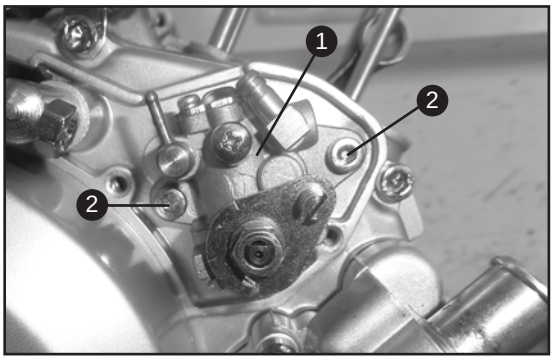
1. Inspect wear and tear of the worm wheel and worm gear. Severe wear and replace.
2. Inspect wear and tear of the camshaft. Severe wear and replace.
3. Measure the outer diameter (1) of the piston (7).

Allowable limit: 2.45 mm



OIL PUMP ASSEMBLING

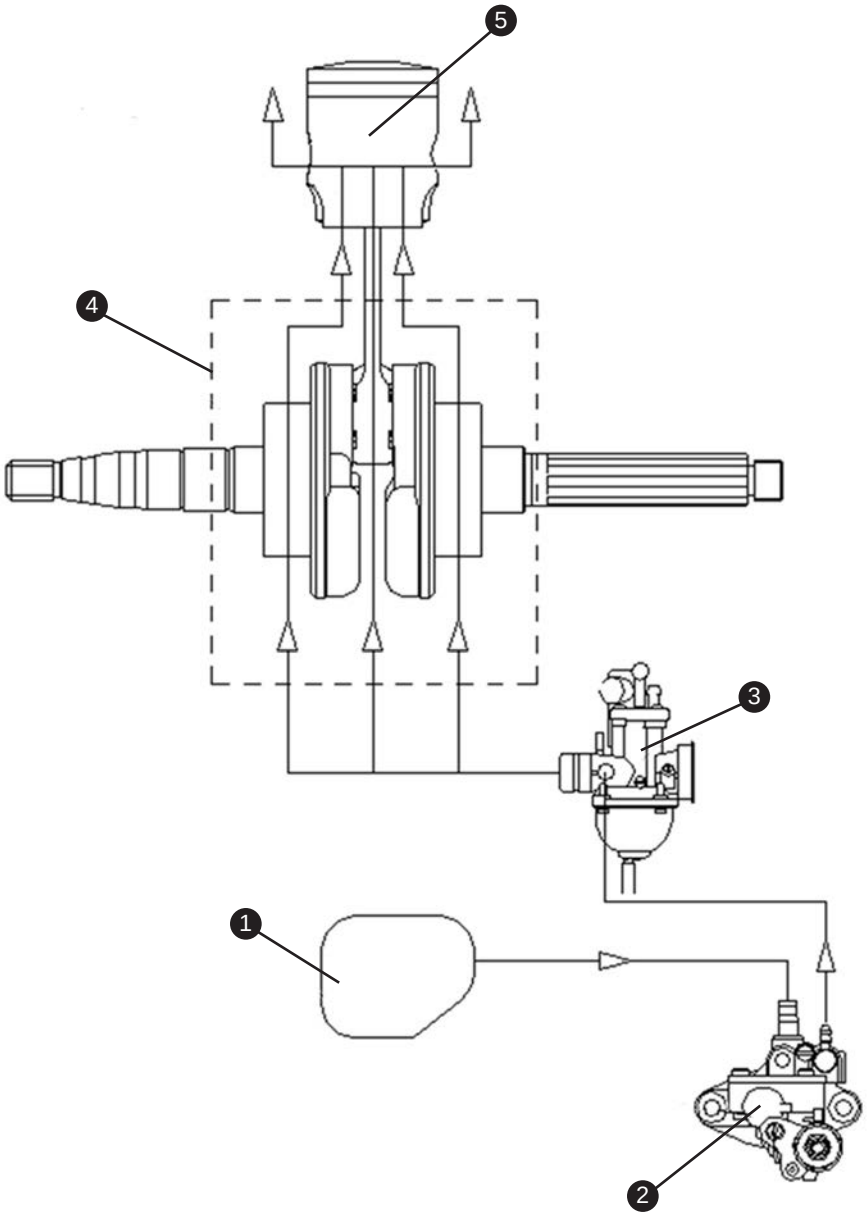
1. Install the oil pump (1) on the right crankcase and check free movement.
2. Tighten the bolts (2).



TORQUE LIST

PART NO.	TORQUE
2	8 - 12 Nm

LUBRICATION SCHEME



PART LIST - LUBRICATION SYSTEM

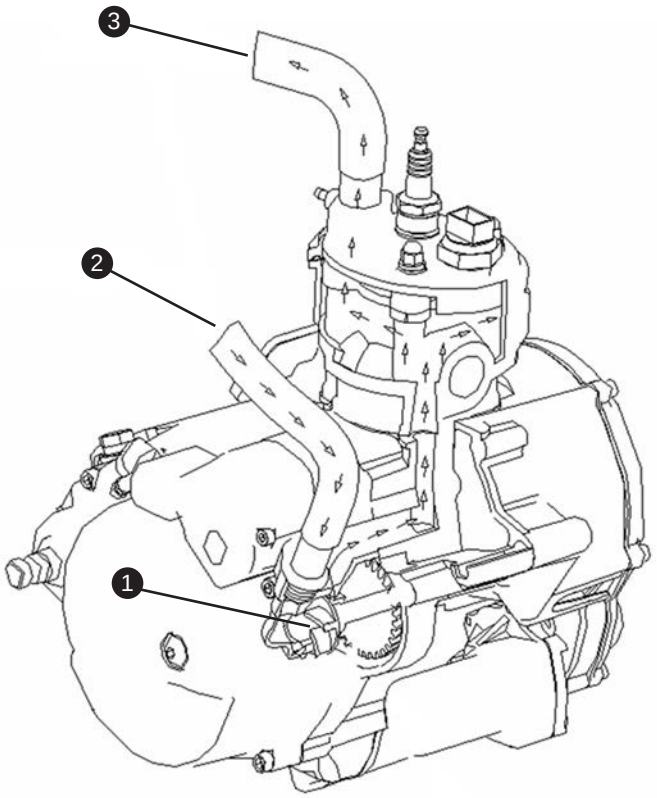
1. Oil tank
2. Oil pump
3. Carburettor
4. Crankshaft
5. Crankcase

Oil flow direction

NOTE

When the engine oil pump is removed, clean carefully all the components and purge them with high-pressure air.
During engine oil pump removal and installation, pay attention not to drop anything into the crankcase.

COOLING SYSTEM SCHEME



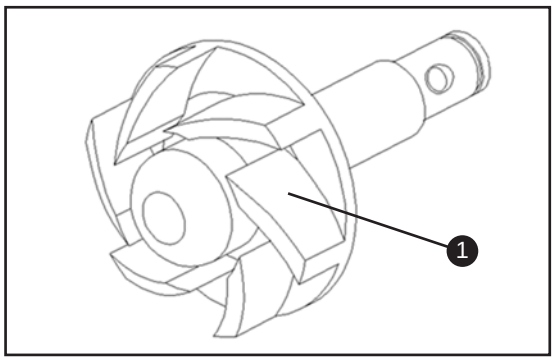
PART LIST - LUBRICATION SYSTEM

1. Water pump
2. Connected to the water tank
3. Flow back to the water tank

Water flow direction

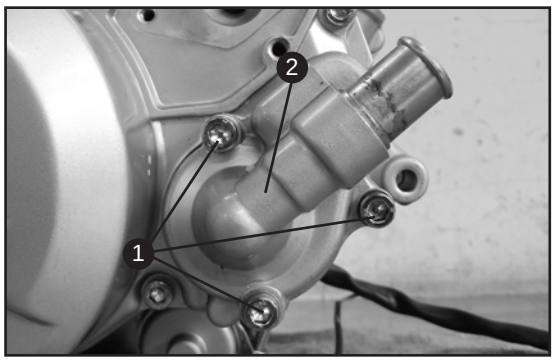
WATER PUMP INSPECTION

1. Inspect the wear and tear of the impeller set (1). Severe wear and replace it.



WATER PUMP ASSEMBLING

1. Install the oil pump (1) on the right crankcase and check free movement.
2. Tighten the bolts (2).



NOTE

Renew the gasket.

TORQUE LIST

PART NO.	TORQUE
2	8 - 12 Nm

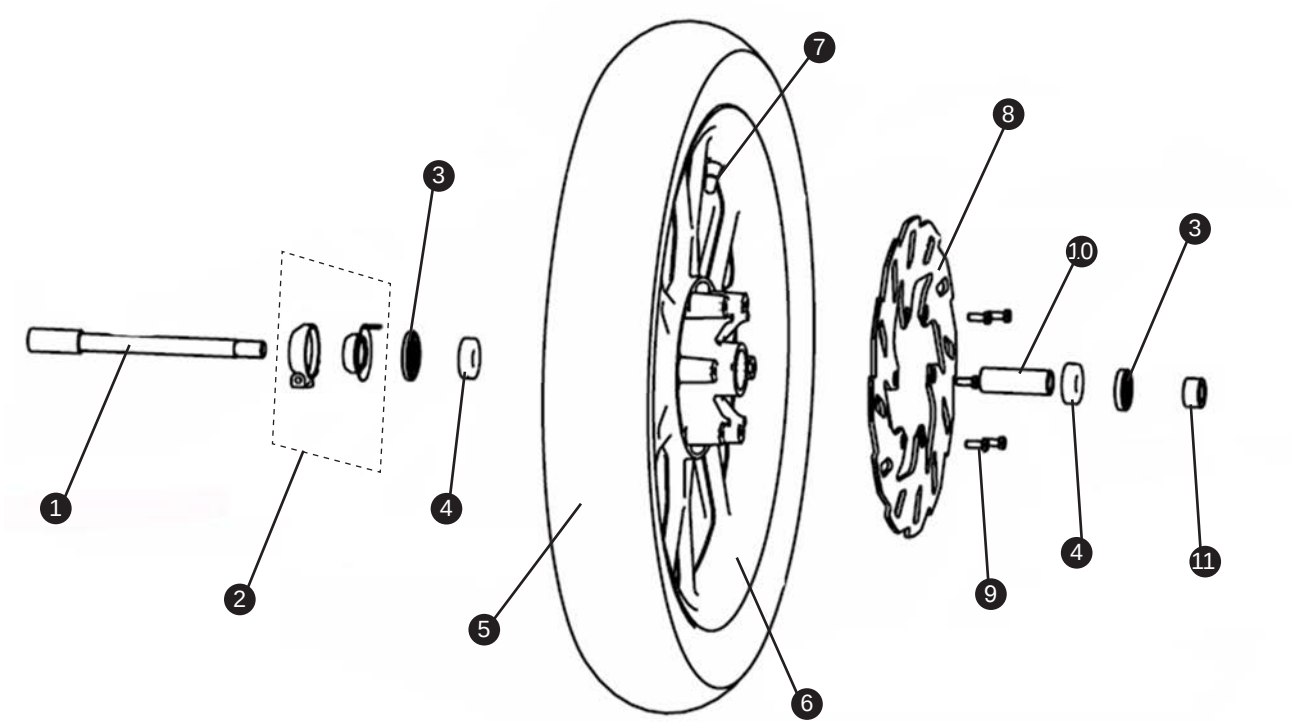
NOTE

Assemble the engine to the frame in reversed order of removal.

⚠ WARNING

Add oil and water before starting the engine. Double check engine oil amount by engine oil niveau screw.

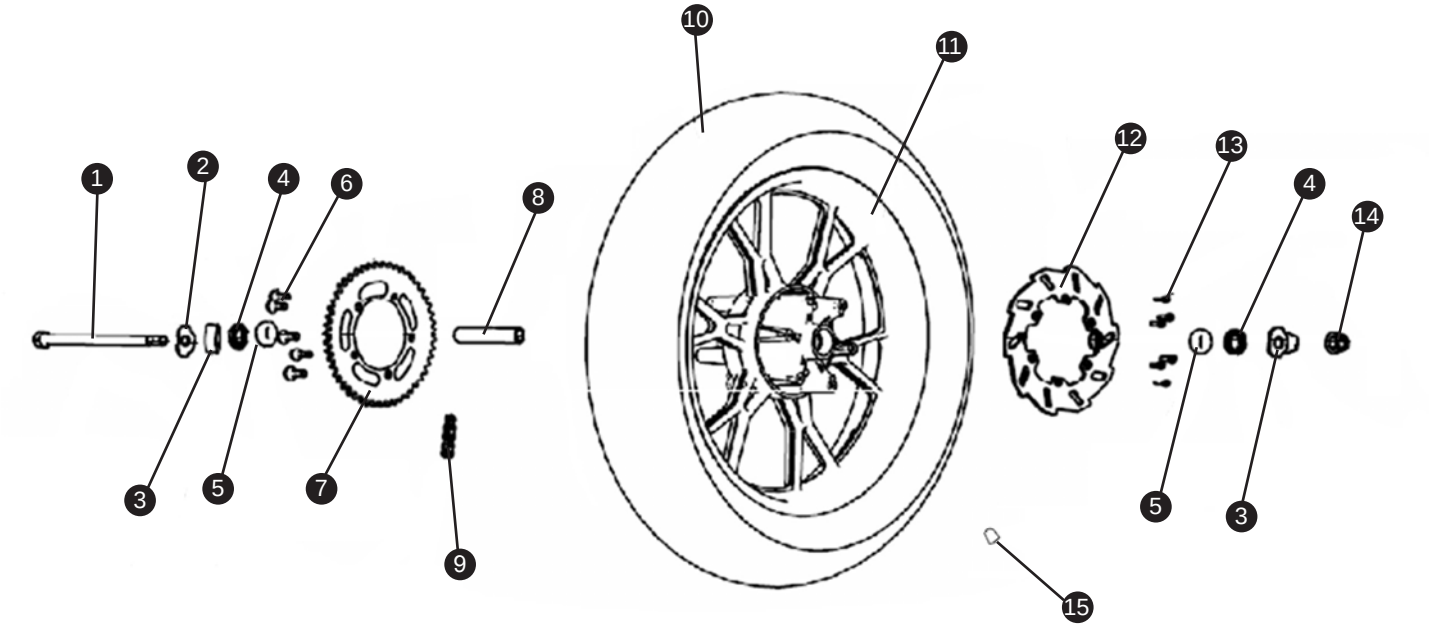
EXPLODED VIEW / PART LOCATION - FRONT WHEEL



PART LIST - FRONT WHEEL

1. Axle
2. Speedometer
3. Oil seal 22x35x7
4. Rolling bearing 6202-2RS
5. Tire 100/80-17
6. Rim 2.25x17
7. Valve/ dust cap
8. Brake disc
9. Mounting bolts
10. Middl shaft sleeve
11. Left shaft sleeve

EXPLODED VIEW / PART LOCATION - REAR WHEEL



PART LIST-REAR WHEEL

1. Axle
2. Press plate
3. Left sleeve
4. Oil seal 22x35x7
5. Rolling bearing 6202-2RS
6. Mounting bolts of chain wheel
7. Chain wheel 55T
8. Bearing sleeve
9. Chain 420DX-1x128
10. Tire 130/80-17
11. Rim 3.00x17
12. Brake disc
13. Mounting bolts of brake disc
14. Fixing nut M14x1.5
15. Valve/dust cap

ITEM	DIMENSION	PRESSURE/ BAR	MINIMUM TREAD DEPTH
Front tire	100/80 - 17	2.25	Technically - 1,6 mm Legal value may be different
Front rim	2.50 x 17		
Rear tire	130/80 - 17	2.5	Technically - 1,6 mm Legal value may be different
Rear rim	3.00 x 17		

TROUBLESHOOTING

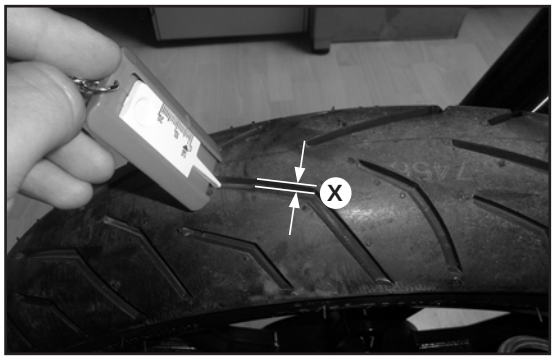
FAILURE	CAUSE	TO DO
It's hard to move the wheels or wobbly Front Wheel	One wheel bearing is damaged	Replace the bearing
	The tire air pressure is to low	Adjust the air pressure
Wheel unbalanced	Rim damaged	Replace the rim
	Tire worn	Replace the tire or Balance the wheel
Abnormal or scratching noise	Wheel bearing loosened or worn	Replace the bearing
	Speedometer drive defect	Replace the speedometer drive

WHEELS (RIMS)

The wheel rims should be checked for cracks, bends. If any damage is found replace the rim. Do not attempt even the smallest repair of the wheel. The wheel should be balanced whenever either the tire or the rim has been changed or replaced. An unbalanced wheel can result in poor performance, adverse handling characters, and a shortened tire life.

TIRES

The tires must be checked during each workshop visit. If a tire tread shows crosswise lines (minimum tread depth), the tire has a fragments in it, the sidewall is cracked then replace the tire immediately. Operating the motorcycle with excessively worn tires will decrease the riding stability and can lead to loss of control. Please replace the excessive worn tires immediately.

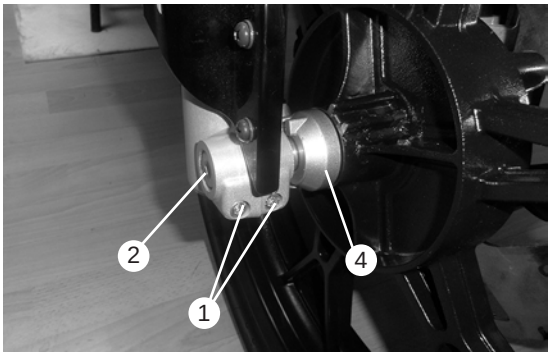


NOTE

Allowable tread limit X : Technically - 1,6 mm

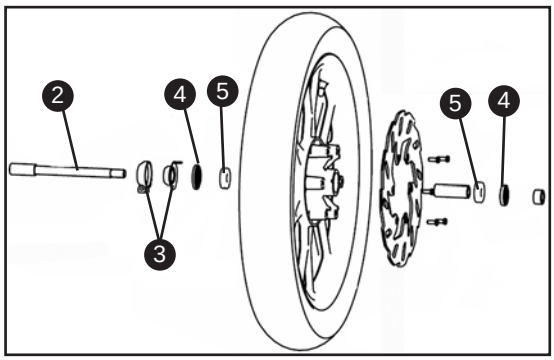
WHEEL BEARING REPLACEMENT FRONT WHEEL

The wheels rotate with difficulties. The wheel-axle bearing or the gear seats are in failure. To find the error, the wheel must be removed.



1. Stand the motorcycle reliably.
2. Loosen the two screws (1).
3. Remove front axle (2), take down speedometer gear assembly (3) and front wheel.
4. If necessary screw off bolts and remove front mudguard and lead wire of odometer.

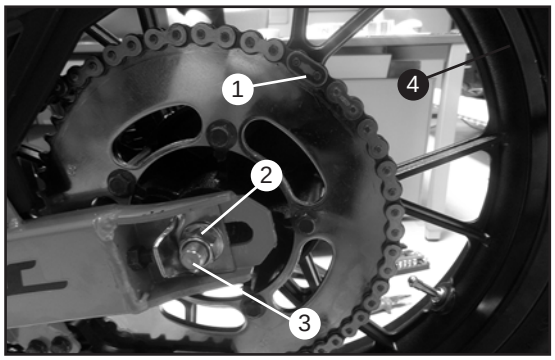
5. Remove oil seal (4) and bearing (5).
6. Reassemble in reverse order.



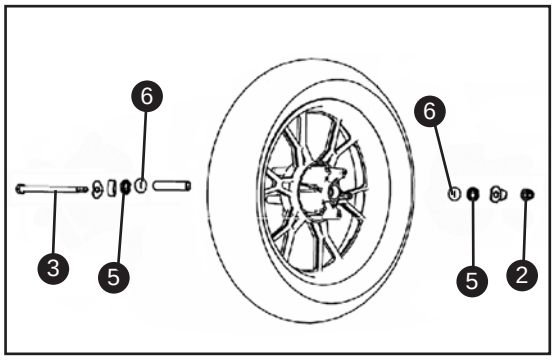
TORQUE LIST

PART NO.	TORQUE
1	5-9 Nm
2	55-62 Nm

WHEEL BEARING REPLACEMENT REAR WHEEL

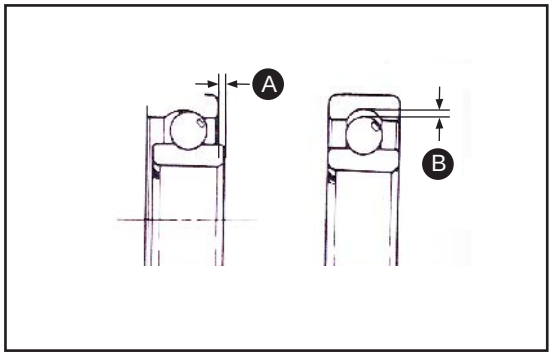


1. Place the vehicle on a suitable repair stand.
2. Disconnect the chain (1).
3. Remove the fixing nut (2) and remove the axle (3).
4. Remove the rear wheel (4).



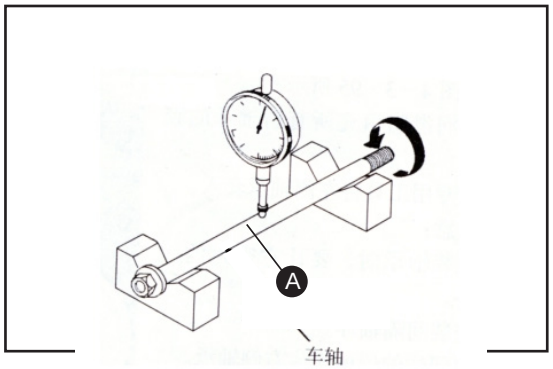
5. Remove the oil seal (5) and the bearing (6).
6. Reassemble in reverse order.

WHEEL BEARING INSPECTION



1. Examine the rolling condition of the bearing. Rotate inner race with a finger.
2. If it doesn't roll, or the bearing is damaged, or out of clearance (A,B) or loosened or rough spot it should be replaced.

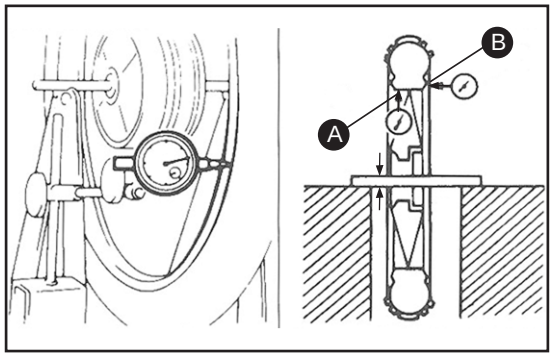
WHEEL AXLE INSPECTION



1. Put the wheel axle on a V-shape seat and use dial indicator to measure its eccentricity.

Allowable limit A: 0.2 mm

RIM INSPECTION



1. Place the wheel on a precise support and check the imbalance with a dial indicator.
2. Turn the wheel with your hands and read it from the dial gauge.

Allowable limit: A: Axial: replace it, if it's over 2.0 mm
B: Lateral: replace it, if it's over 2.0 mm

3. If the rim is out of limit repair or replace it.

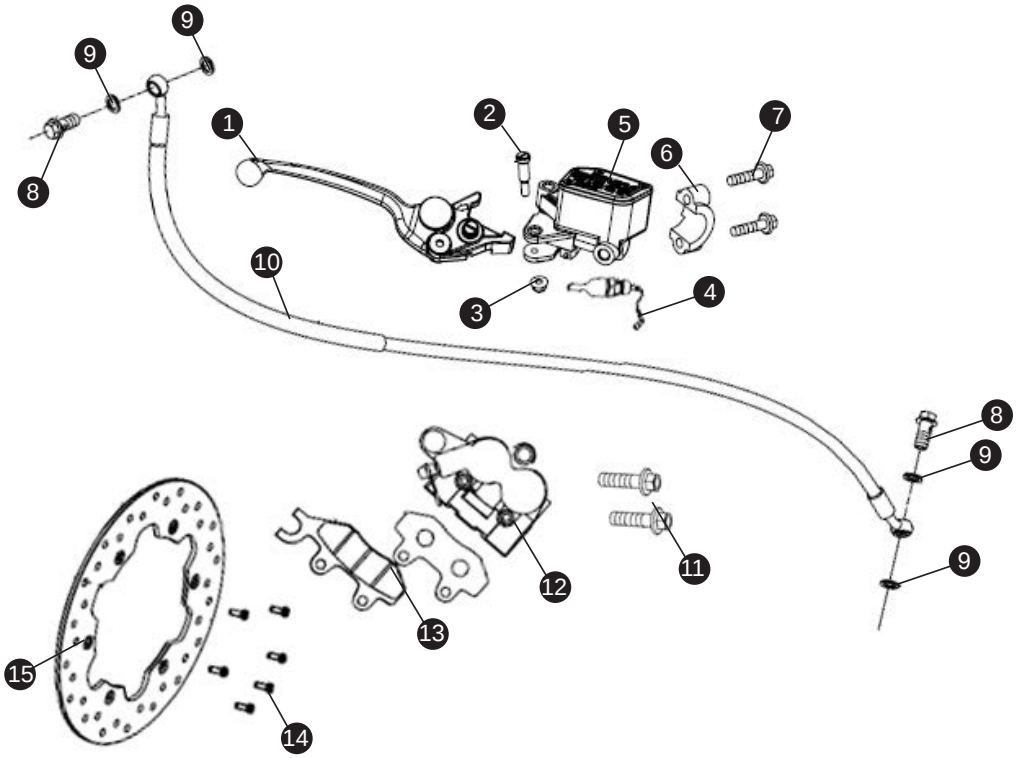
NOTE

Also check the wheel bearings. This could be the cause of the defect.

EXPLODED VIEW / PART LOCATION - FRONT BRAKE

⚠ WARNING

THE BRAKING COMPONENTS MAY NOT BE SPOIL BY OIL DURING INSTALLATION OR DISASSEMBLY. RINSE WITH STIPULATED CLEANING AGENT IN ORDER TO AVOID REDUCTION OF BRAKING QUALITY.



PART LIST - FRONT BRAKE

1. Brake lever
2. Brake lever bolt
3. Nut M 6
4. Brake light switch
5. Master brake cylinder
6. Master brake cylinder clamp
7. Clamp bolt M 6 x 23
8. Banjo bolt
9. Gasket
10. Brake hose
11. Brake calliper bolts M 8 x 30
12. Brake calliper with anchor plate
13. Brake pads
14. Brake disc bolts M 6 x 16
15. Brake disc

SPECIFICATION

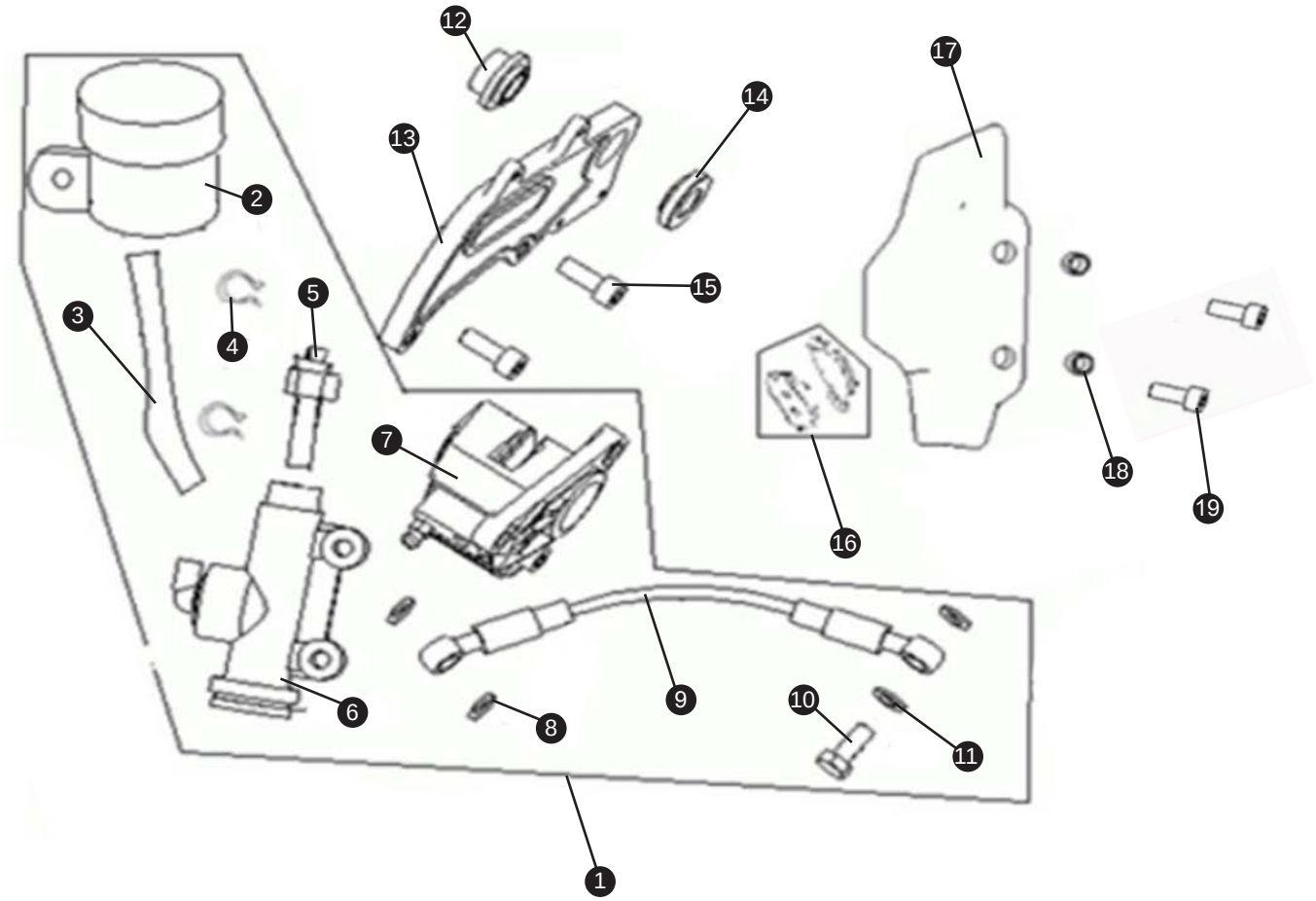
ITEM	STANDARD VALUE [mm]	ALLOWABLE LIMIT [mm]
Thickness of front brake disc	4.0	3.0
Thickness of front brake pads	4.5	3.0
Diameter of front brake disc	280	-

TORQUE LIST

PART NO.	TORQUE
Front brake / No. 2	3 Nm
Front brake / No. 7	5 - 9 Nm
Front brake / No. 8	22- 24 Nm
Front brake / No. 11	22- 29 Nm
Front brake / No. 14	22 - 29 Nm

For screws that are not listed use standard values (page 9).

EXPLODED VIEW / PART LOCATION - REAR BRAKE



PART LIST-REAR WHEEL

1. Brake system
2. Brake fluid reservoir
3. Brake line
4. Clamp
5. Brake light switch
6. Master cylinder
7. Caliper
8. Seal
9. Brake line
10. Banjo bolt
11. Seal
12. Distance caliper
13. Adapter plate
14. Distance caliper
15. Nut M8x20
16. Brake pads
17. Cover master cylinder
18. Bush
19. Nut M6x20

SPECIFICATION

ITEM	STANDARD VALUE [mm]	ALLOWABLE LIMIT [mm]
Thickness of front brake disc	4.0	3.0
Thickness of front brake pads	4.5	3.0
Diameter of front brake disc	280	-

TORQUE LIST

PART NO.	TORQUE
Rear brake / No. 10	22-24 Nm
Rear brake / No. 15	22-29 Nm

For screws that are not listed use standard values (page 9).

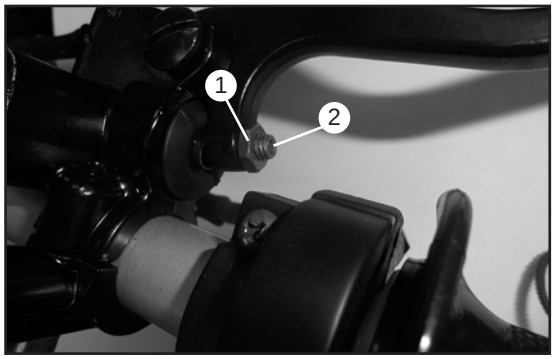
SPECIAL TOOLS

See page 12-15.

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Poor brake performance	Unfavourable brake adjustment	Adjust the brake system
	Brake pads worn	Replace the brake pads
	Brake pads installed improperly	Install the brake pads proper
	Brake pads or brake disc contaminated	Clean or replace the brake pads and clean the brake disc/ drum
	Air in the front brake hose	Bleed the brake hose
	Gasket(s) leaky	Replace affected gasket
Strange sound during braking	Brake pads glazed	Replace the brake pads
	Burrs	Grind away burr
	Brake pads or brake disc contaminated	Clean or replace the brake pads and clean the brake disc/ drum
Pulsing during braking	Brake disc worn	Replace brake disc
	Brake drum worn	Repalce the rear rim

BRAKE LEVERS / FRONT BRAKE LEVER

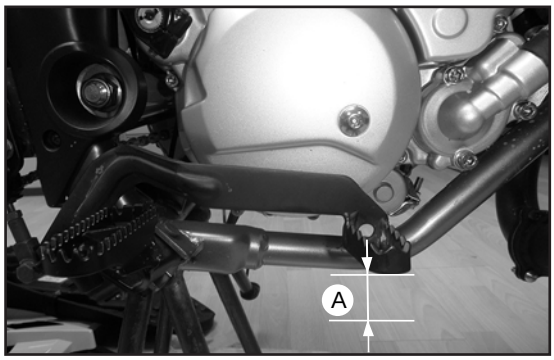


The front brake lever is located on the right side of the handle-bar.

NOTE

This lever operated by hydraulic the front brake. It is not possible to adjust the free-play of the front brake lever. When the brake lever feels spongy or the brake performance is poor the front brake system have to be bleeded.
It is possible to adjust the grip width by loosing the fixing nut (1) and screwing the adjustment bolt (2) in or out.
See page 38.

BRAKE LEVERS / REAR BRAKE PEDAL



The rear brake pedal is located on the right side of the vehicle.

NOTE

This lever operated by hydraulic the rear brake. When the brake pedal feels spongy, the brake performance is poor or the free play (A) is not correct the rear brake system have to be adjust-ed. See page 38.

BRAKE FLUID

⚠ WARNING

1. Never use dirty or unspecified brake fluid or mix different brake fluids because it will damage the brake system.
2. Brake fluid spilled on brake pads or brake disk will reduce the braking effect. Clean the brake pads and brake disk with a high quality brake degreaser.
3. When servicing the brake system, use shop towels to cover plastic parts and coated surfaces to avoid damage caused by splash of brake fluid.
4. Do not allow dust or water to enter the brake system during refilling.
5. Brake fluid should be replaced at least every 2 years.

SPECIFICATION

Brake fluid type	CASTROL SUPER DISK BRAKE FLUID DOT 4
Brake fluid boiling temperature	> 170°C
Brake fluid water content	< 3%

BRAKE HOSE

1. When the front/rear brake hose is leaking, cracked or worn you had to replace it.

NOTE

Please consider that there is no need to remove the brake calliper when you need to replace the brake hose.

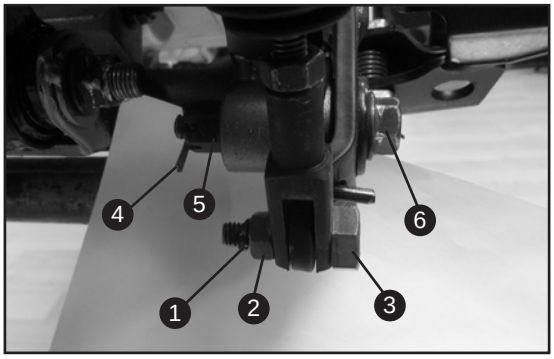
2. When the brake hose need to be replaced use only genuine parts.
3. For brake hose replacement see page 37.

FRONT/ REAR BRAKE PAD INSPECTION

Reduced braking efficiency caused by worn brake pads.
Change worn brake pads immediately. Always replace the brake pads in pair.

Front: See page 32
Rear: See page 33

BRAKE PEDAL REPLACEMENT



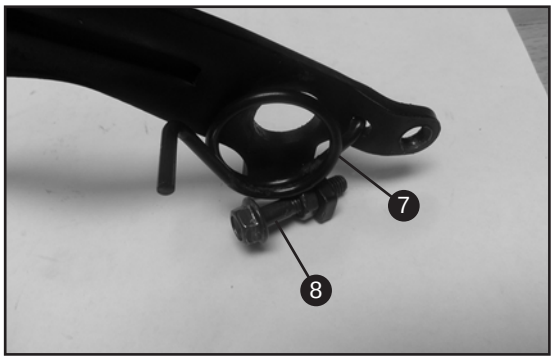
1. Remove the splint (1) and loosen the fixation nut (2) to remove the screw (3).
2. Remove the splint (4) and loosen the fixation nut (5) to remove the screw (6).

⚠ WARNING

If you remove the screw (6), the brake pedal can be spring out.

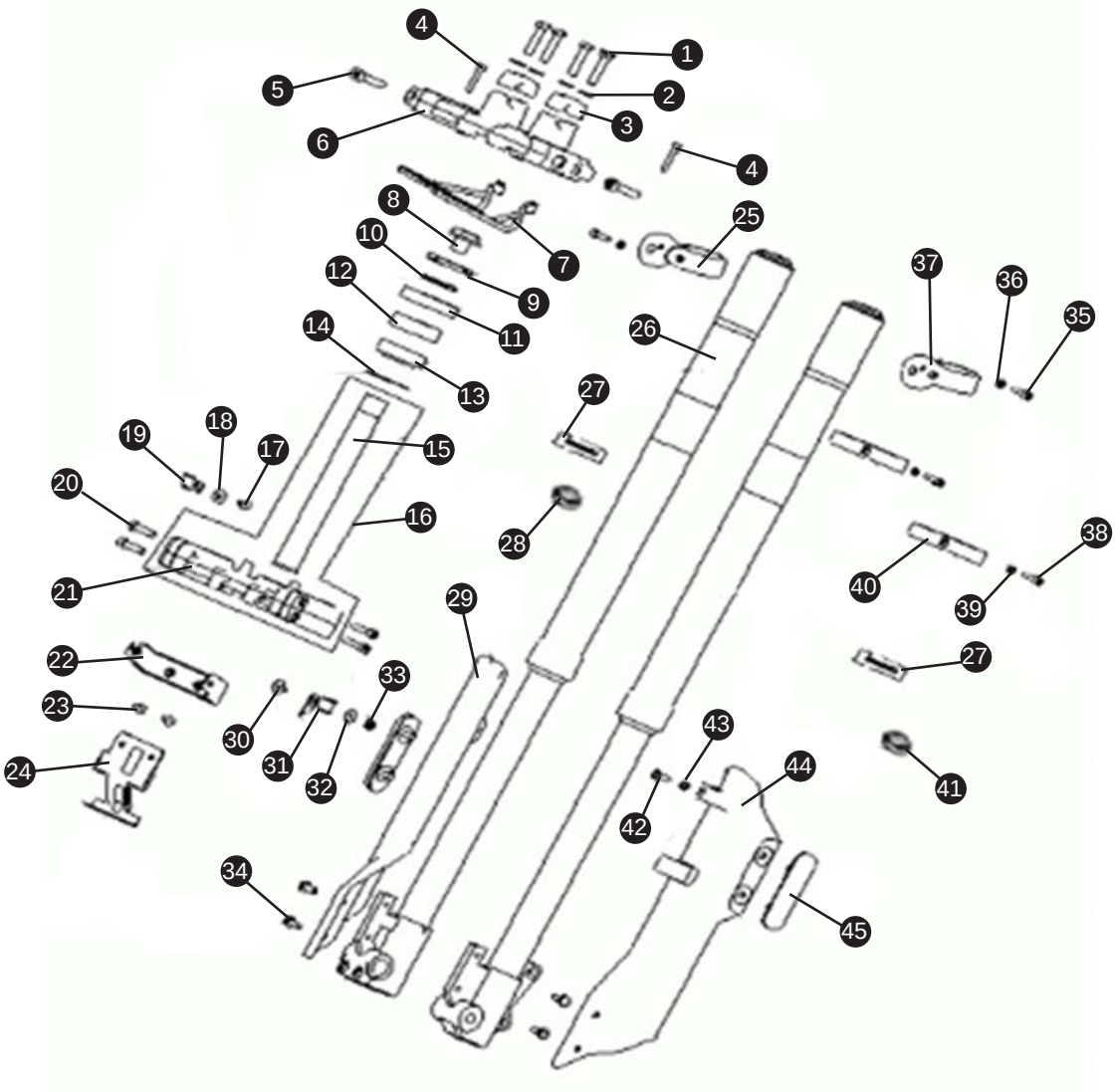
NOTE

Look to the position of the spring (7) and the screw.



3. After removing the fixation nut (5) for the foot brake lever you can pull off the foot brake pedal to the side.
4. Unscrew the adjustment screw (8). Screw the adjustment screw in the new brake pedal in.
5. Assemble the new brake lever in reverse order.

EXPLODED VIEW / PART LOCATION - FRONT SUSPENSION



PART LIST - FRONT SUSPENSION

1. Screw M8x35
2. Washer M8
3. Upper handlebar clamp
4. Screw M5x30
5. Screw M8x40
6. Upper triple tree
7. Bracket speedometer
8. Locknut steering
9. Nut
10. Upper bearing race
11. Lower bearing race
12. Bearing 6205-2RS
13. Bearing 30205
14. Seal
15. Steering column
16. Lower triple tree assy
17. Screw M5x12
18. Washer M5
19. Bracket
20. Screw M6x30
21. Lower triple tree
22. Bracket head light
23. Screw M5x12
24. Bracket head light
25. Bracket indicator right
26. Shock absorber
27. Oil seal
28. Dust ring
29. Fork cover right
30. Screw M5x12
31. Bracket speedometer drive cable
32. Washer M5
33. Nut M5
34. Screw M6x16
35. Screw M5x25
36. Nut M5
37. Bracket indicator left
38. Screw M5x25
39. Nut M5
40. Bracket brake hose
41. Dust ring
42. Screw M5x20
43. Nut M5
44. Fork cover left
45. Reflector orange

TORQUE LIST

PART NO.	TORQUE
8	5-9 Nm

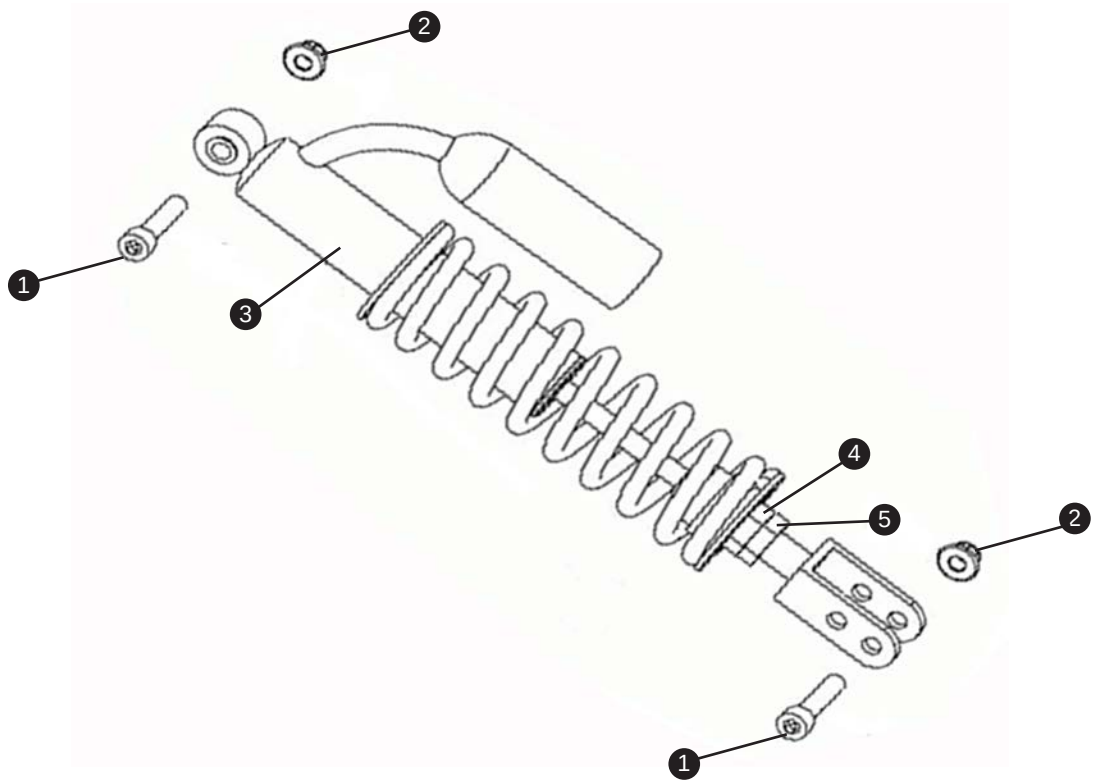
SPECIFICATION

ITEM	DESCRIPTION	VALUE
Fork travel	Telescope unit (cartridge) - oil/ spring	110 mm max. travel
Upper bearing	6205-2RS	
Lower bearing	30205	

DESCRIPTION (VERSION 0)	STANDARD	NOTE
Air chamber length by fork rod (gas filling)	80 mm	
Air chamber length by fork rod (spring)	95 mm	FILLING WITHOUT SPRING
Oil	15 wt	
Azotic	1.2 bar	

DESCRIPTION (VERSION 1)	STANDARD	NOTE
Air chamber length by fork rod (gas filling)	80 mm	
Air chamber length by fork rod (spring)	95 mm	FILLING WITHOUT SPRING
Oil	15 wt	
Azotic	1.5 bar	

EXPLODED VIEW / PART LOCATION - ADJUSTABLE REAR SUSPENSION



PART LIST-REAR SUSPENSION

1. Screw M10x1.25x50
2. Nut M10x1.25
3. Shock absorber
4. Adjust nut
5. Lock nut

SPECIFICATION

ITEM	DESCRIPTION	VALUE
Rear shock absorbers	Adjustable, spring loaded telescope units (cartridge)	60 mm max. travel

TORQUE LIST

PART NO.	TORQUE
2	37 - 44 Nm

NOTE

By turning the lock nut (5) and adjustment nut (4) the suspension setting is changeable. The factory setting is done for the driver and passenger.

1. Open the lock nut (5).
2. Turn in or out the adjustment nut (4).
3. Secure the adjustment nut by closing the lock nut.

⚠ WARNING

The adjustment must be the same on the left and right side. The more the spring is compressed the harder the suspension. Never exceed the max. payload - 150 kg.

SPECIAL TOOLS

There are no special tools recommended because defect suspension elements may not be dissembled. Always´s replace defect suspension elements.

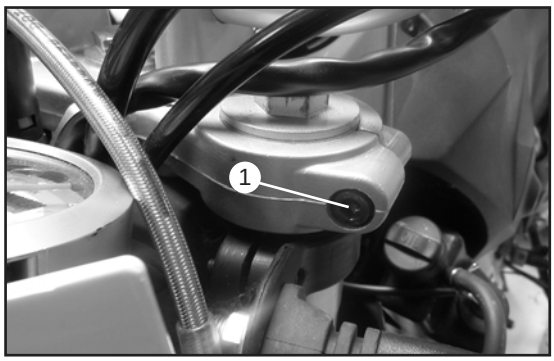
TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Vehicle difficult to steer	Insufficient tire pressure	Adjust the tire pressure
	Broken or bent fork leg	Replace the affected fork leg
	Uneven front shock absorbers	Control and adjust or replace affected fork leg
Soft front shock absorber	Weak shock spring	Replace the affected fork leg
	Insufficient damper oil	Replace the affected fork leg
Front shock absorber noise	Broken or bent fork leg	Replace the affected fork leg
	Loose fork fasteners	Tighten the fasteners
	Lack of lubrication	Replace the affected fork leg
Leaking fork leg	Gasket defect	Replace the affected fork leg
Weak rear shock absorber spring	Spring worn or broken	Replace the rear shock absorber
Leaking rear shock absorber	Gasket defect	Replace the rear shock absorber

NOTE

Before each repair of a defect suspension element consider the max. payload the vehicle.

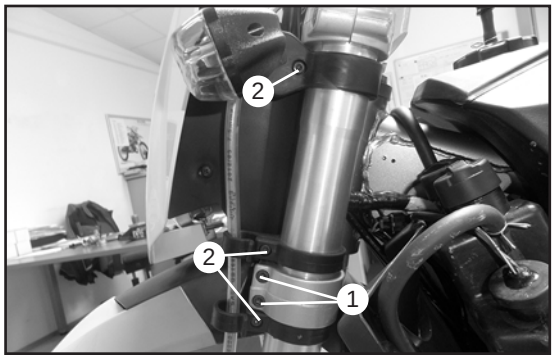
FRONT SUSPENSION REPLACEMENT



1. Place an appropriate supporting stand under the vehicle in order to raise the front wheel up.
2. Remove the brake calliper and brake line bracket, the front wheel, the front fender and the handle bar.

NOTE

The fork legs have a second pair of internal fork leg bolts which avoid that fork oil flow out.



3. Loosen the bolts (1) on the lower and upper triple tree on both sides and the bolts (2) an the left side.
4. Drag the fork leg downwards.
5. Replace the affected fork leg.
6. Assemble in reversed order.

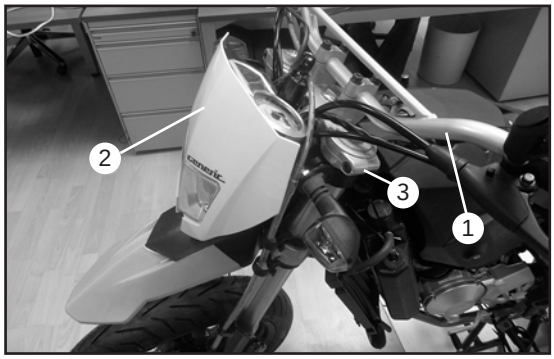
TORQUE LIST

PART NO.	TORQUE
1	37-44 Nm

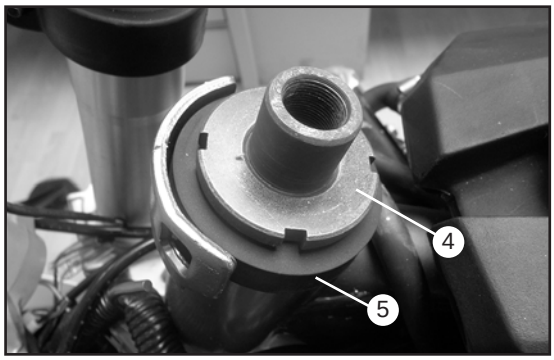
For screws that are not listed use standard values (page 11).

FRONT SUSPENSION WHOLE FORK REPLACEMENT

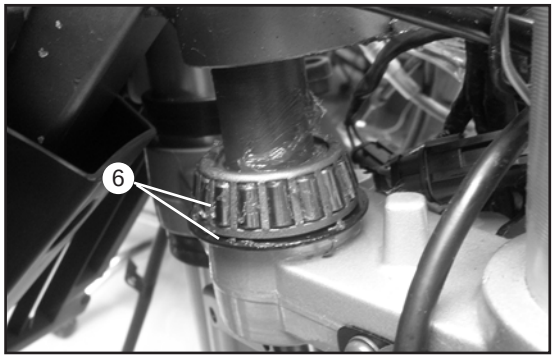
1. Place an appropriate supporting stand under the vehicle in order to raise the front wheel up.
2. Remove the handlebar (1), head light (2), and upper triple tree (3).
3. Remove the brake calliper and brake line bracket, the indicator brackets, the front wheel, and the front fender.



4. Remove the fixation nut (4) and the dust cap (5).



5. Lift the vehicle or lower the front fork.
6. Remove the lower bearing components (6) from the removed front fork.



NOTE

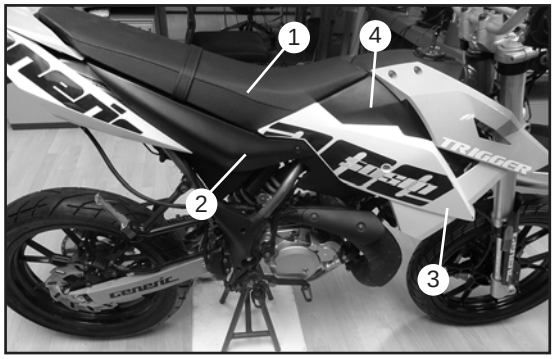
All clamps and brackets which screwed on the lower triple tree must be also removed.

7. Assembling in reversed order.

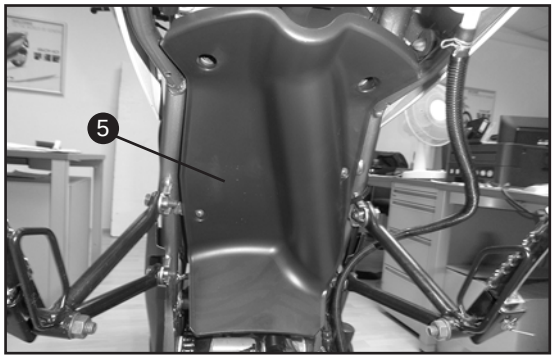
.

REAR SUSPENSION REPLACEMENT

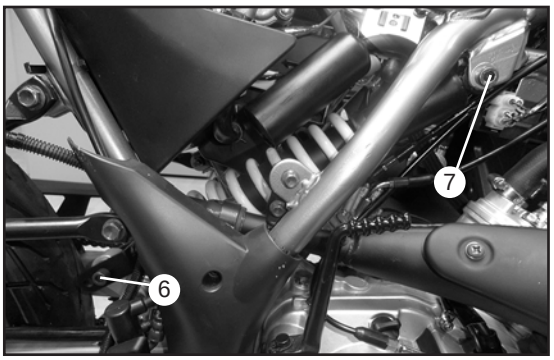
1. Place the vehicle on a motorcycle stand on a flat surface to raise the rear wheel up.
2. Remove the seat (1), the right side cover (2), the front right side cover (3) and the tank (4).



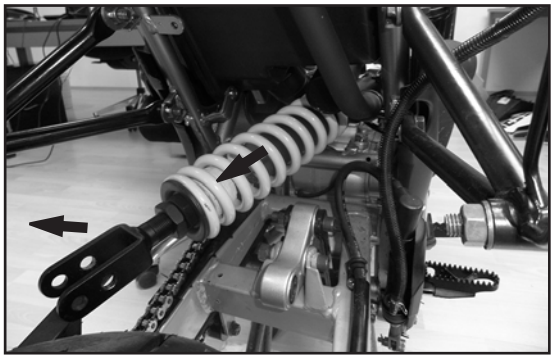
3. Remove the rear fender cover (5).



1. Remove the lower bolt (6) first and upper bolt (7) of the shock absorber.



2. Pull the shock absorber backwards and remove it to the left side (Arrows).
3. Assemble the new shock in reverse order.



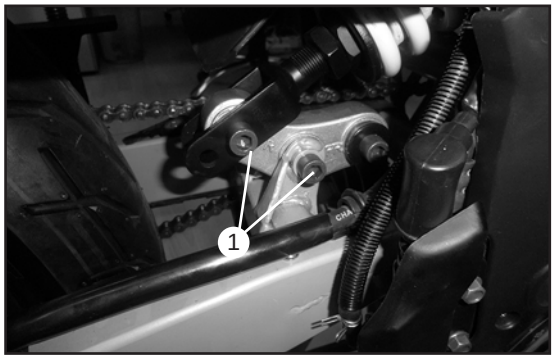
TORQUE LIST

PART NO.	TORQUE
No. 6	37-44 Nm
No. 7	37-44 Nm

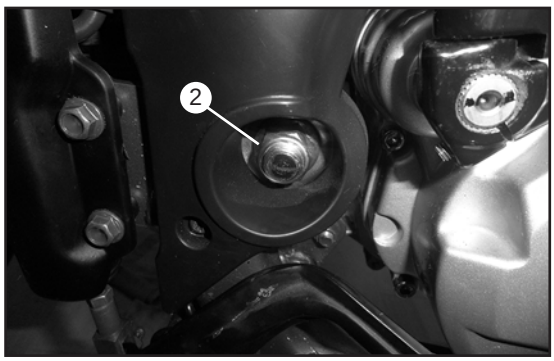
REAR SWING ARM REPLACEMENT

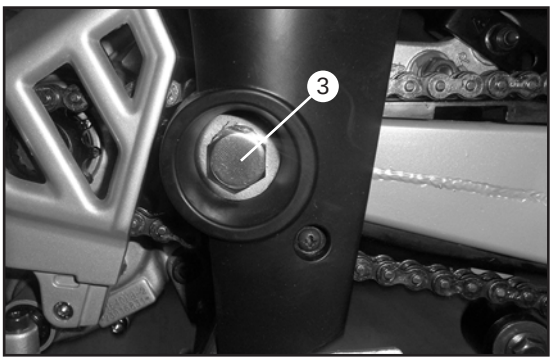
To replace the rear swing arm please follow the below mentioned steps:

1. Place the vehicle on a motocycle stand on a flat surface.
2. Open the chain lock and remove the chain.
3. Disassemble the rear brake parts which are connected to the swing arm or the rear wheel.
4. Loose the rear wheel shaft and remove the rear wheel.
5. Remove the two bolts (1) of the rear suspension.

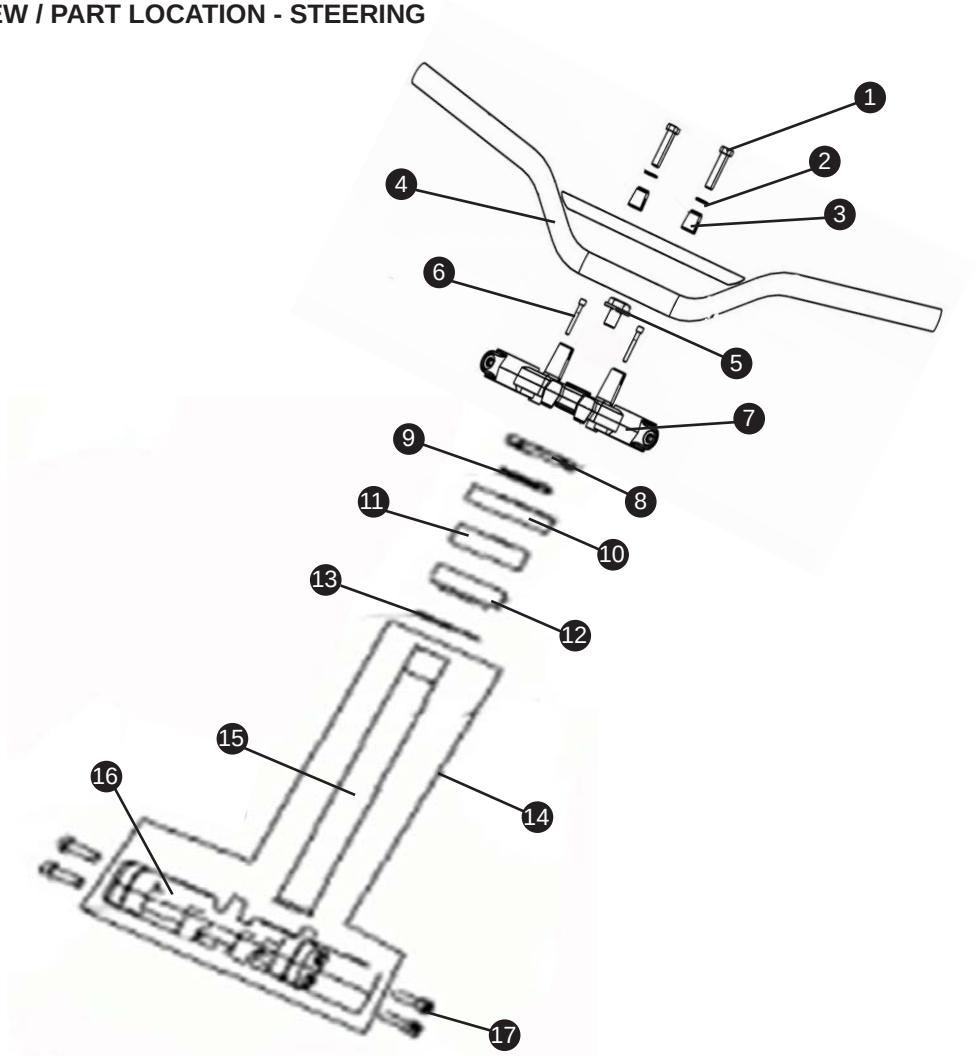


6. Lose the rear swing arm shaft nut (2) on the rigt side and pull out the rear swing arm shaft (3) to the left.
7. Replace the chain case, the chain guid front, the chain guid rear, the chain roller and the brake wire clamps and provide the parts on the new swing arm.
8. Assemble the new swing arm in reverse order.
9. After assembling in reverse order adjust the chain tension, check the rear brake operate correct and check if all nuts are tightened securely.





EXPLODED VIEW / PART LOCATION - STEERING



PART LIST - STEERING

1. Screw M8x35
2. Washer
3. Upper handlebar clamp
4. Handlebar
5. Locknut steering
6. Screw M5x30
7. Upper triple tree
8. Nut
9. Upper bearing race
10. Lower bearing race
11. Bearing 6205-2RS
12. Bearing 30205
13. Seal
14. Lower triple tree assy
15. Steering column
16. Lower triple tree
17. Screw M6x30

SPECIFICATION

ITEM	DESCRIPTION
Upper bearing	6202-2RS
Lower bearing	30205

TORQUE LIST

PART NO.	TORQUE
1	20 - 23 Nm
5	40 - 48 Nm

SPECIAL TOOLS

See page 12-15

TROUBLESHOOTING

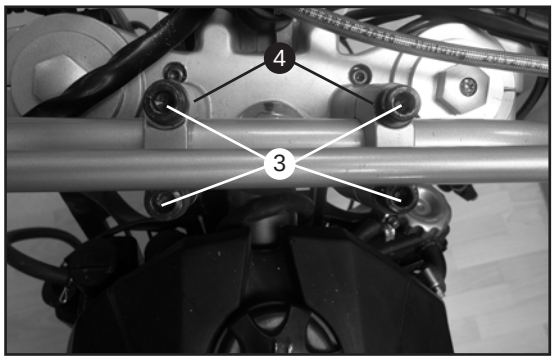
FAILURE	CAUSE	TO DO
Vehicle difficult to steer	Steering bearing loose	Retighten the bearing
	Steering bearing worn	Replace the steering components

HANDLEBAR REPLACEMENT

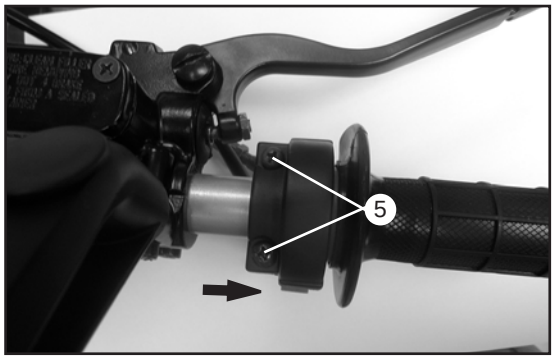
In case of any damage of the handlebar you must replace it.

1. Remove the left (1) and right handle switch (2) as described in the manual.

2. Loosen the four screws (3) and remove the handlebar clamp (4).



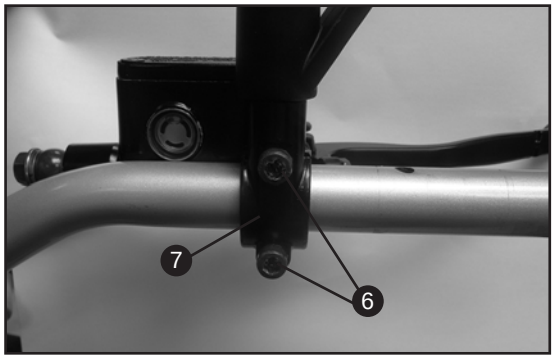
3. Loosen the two screws (5) and remove the right handle swicht by sliding to the right. If the wires are too short, put the handlebar to the left.



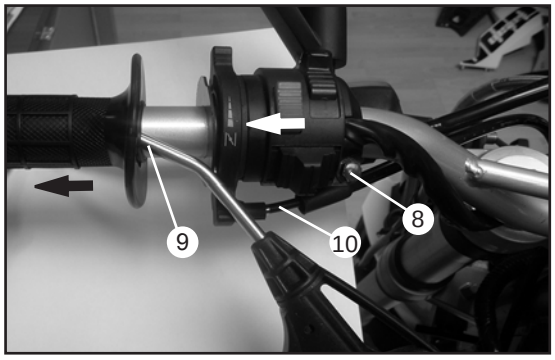
4. Remove the two screws (6) of the front brake clamp (7) to remove the front brake lever . It is not necessary to remove the rear view mirror.

NOTE

If you remove the front brake handle do not apply the brake as pulling the brake in a non horizontal position of the brake system could let air get into the brake system which would lead to a loss of brake pressure.



5. Loosen the screw (8) and slide the left handle switch to the right.
6. Pull off the left grip from the handle bar would be more difficult as the grip is normally glued with grip glue.
   We suggest to use compressed air (9) and in same way pull the grip to the left.



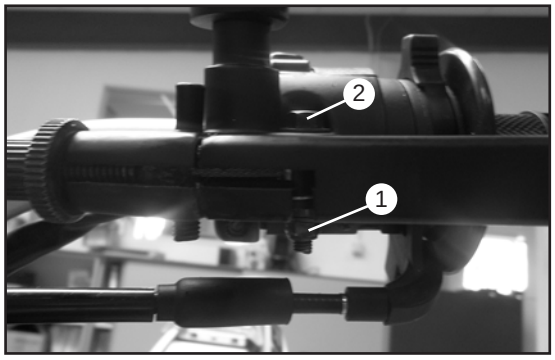
NOTE

We suggest buying a new left handle grip if it is necessary to replace the handlebar.

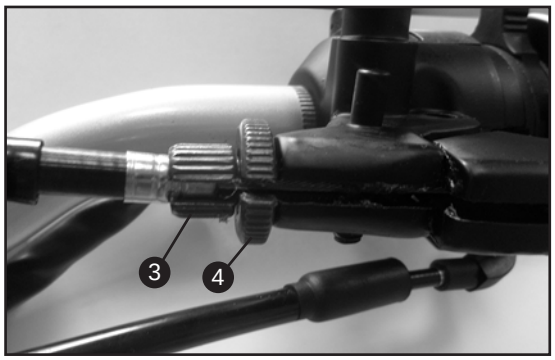
7. Disconnect the choke cable (10) and slide the left handle switch to the left. It is not necessary to remove the rear view mirror.
8. Replace the damaged handlebar.
9. Assemble the handlebar in reverse order.

CLUTCH LEVER REPLACEMENT

1. Loose the secure nut (1) for the clutch lever and unscrew the clutch lever bolt (2).

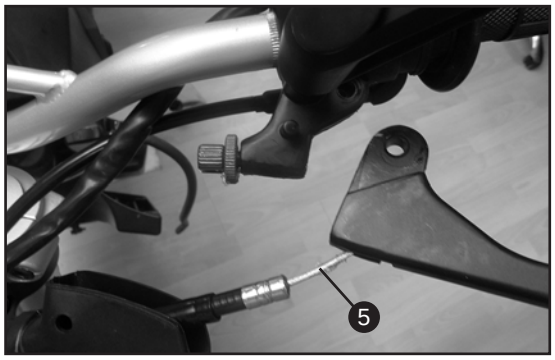


2. Rotate the clutch cable adjustment nut (3) and the secure nut (4) till the grooves are in line.
3. Now it is possible to remove the complete clutch lever together with the clutch cable from the clutch coupling joint.



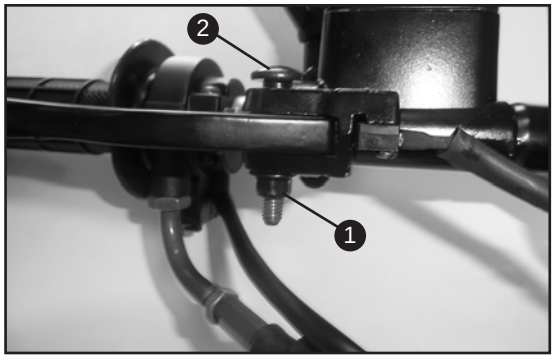
4. Unhinge the clutch cable (5) from the clutch lever to replace the clutch lever.

5. Assemble the new clutch lever in reverse order.

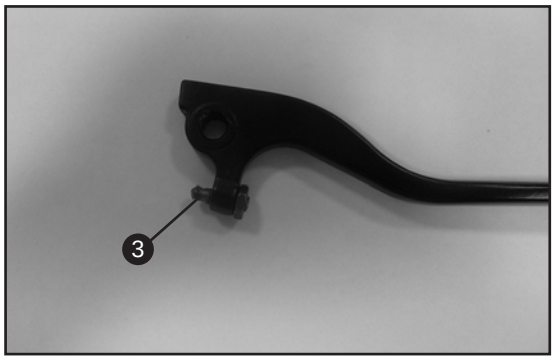


BRAKE LEVER REPLACEMENT

1. Loose the secure nut (1) for the brake lever and unscrew the brake lever bolt (2) with a flat-headed screwdriver.
2. Now it is possible to remove the brake lever from the front brake system.



3. Unscrew the adjustment screw (3). Screw the adjustment screw in the new brake lever in.
4. Assemble the new brake lever in reverse order.



EXHAUST REPLACEMENT

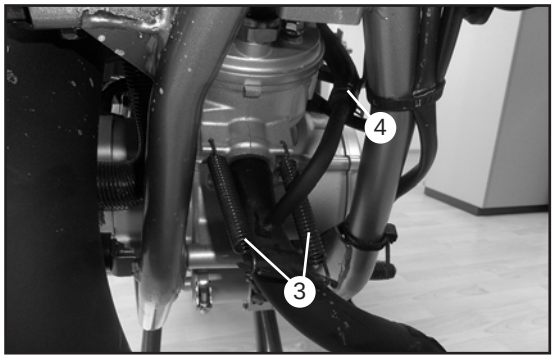
In case of a damaged muffler remove the exhaust pear (1) consisting of two parts or the silencer (2) and replace the damage exhaust part with a new one.

NOTE

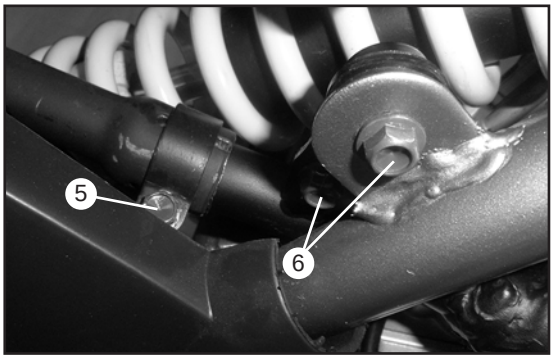
If you remove the muffler short after a ride take care as the muffler could be still very hot.

<u>Exhaust pear</u>

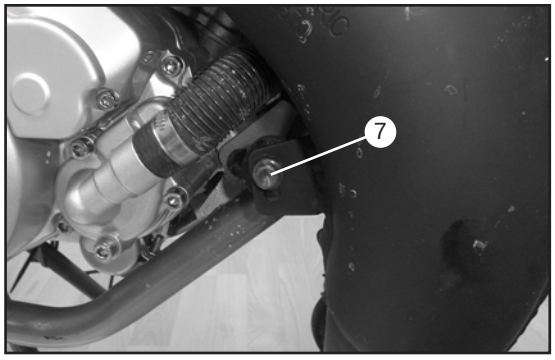
1. Remove the two springs (3) and disconnect the hose (4) of the secondary air system.



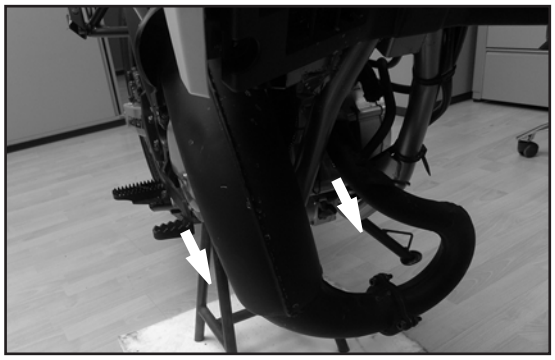
2. Loosen the screw (5) and the two screws (6).



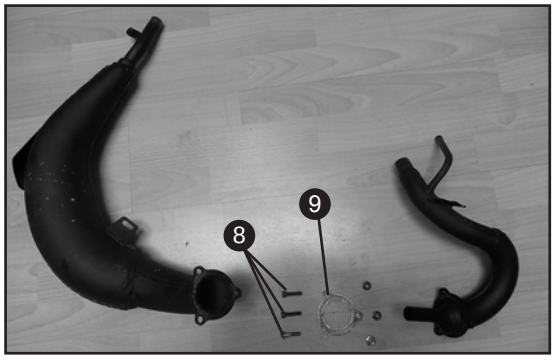
3. Remove the screw (7).



4. Pull the exhaust pear frontwards (arrows).



5. To disconnect the exhaust pear remove the three screws (8). If you disconnect the exhaust pear always renew the gasket (9) with a new one.
6. Assembling in reverse order.

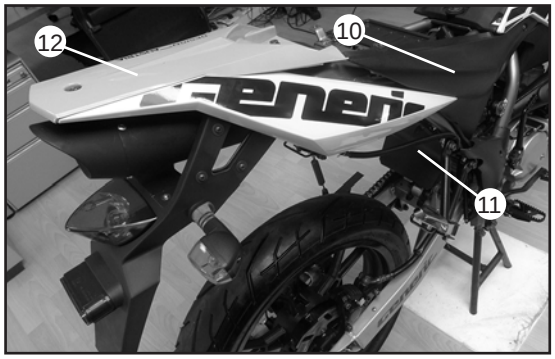


Silencer

1. Remove the seat, the side cover (10), the rear fender (11) and the rear cover (12) .

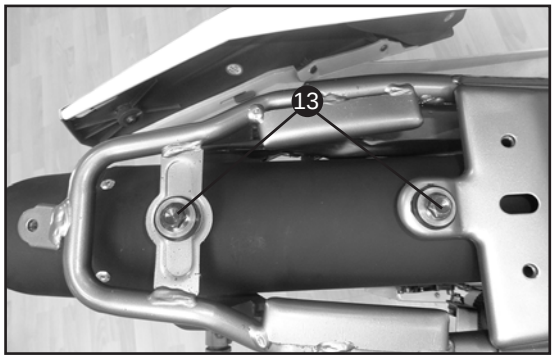
NOTE

It is not nessecary to disconnect the seat lock cable from the rear side cover (12).



2. Remove the screw (5).

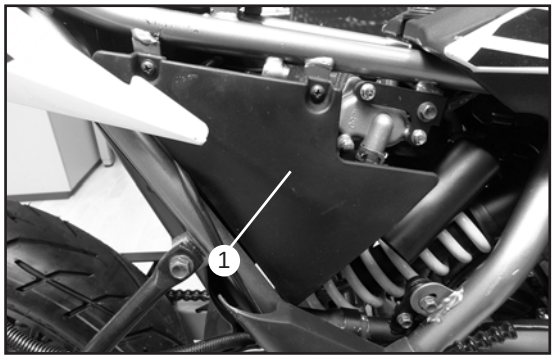
3. Remove the two screws (13).



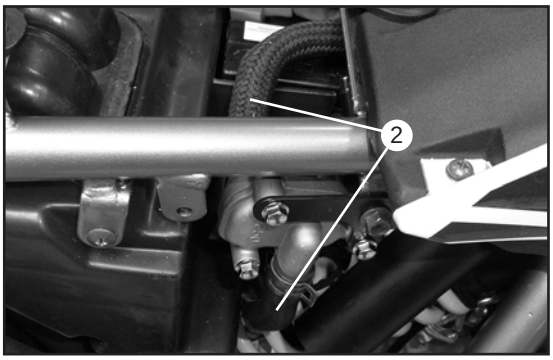
4. Pull the silencer backwards (Arrow).
5. Assembling in reverse order.

SECONDARY AIR SYSTEM INSPECTION

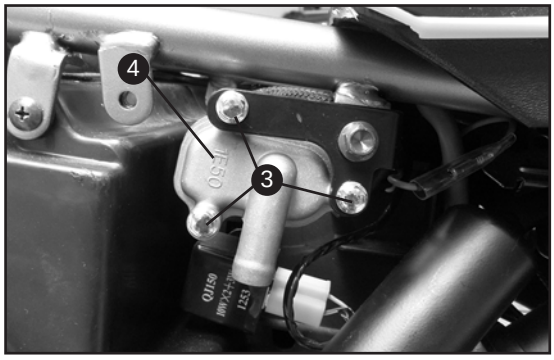
1. Remove the seat, the right side cover and the cover (1).



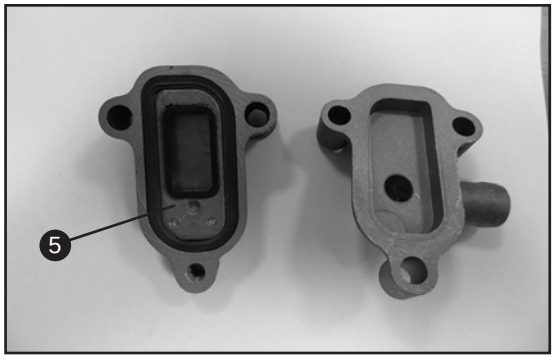
2. Disconnect the two hoses (2).



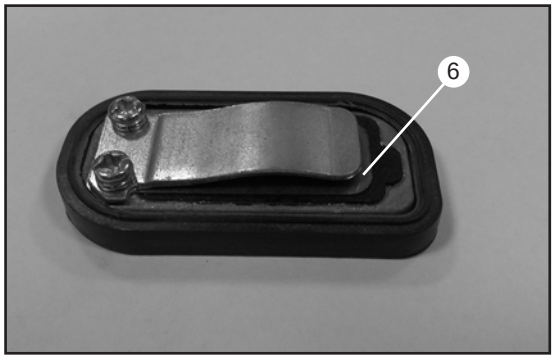
3. Remove the three screws (3) and remove the secondary air system (4).



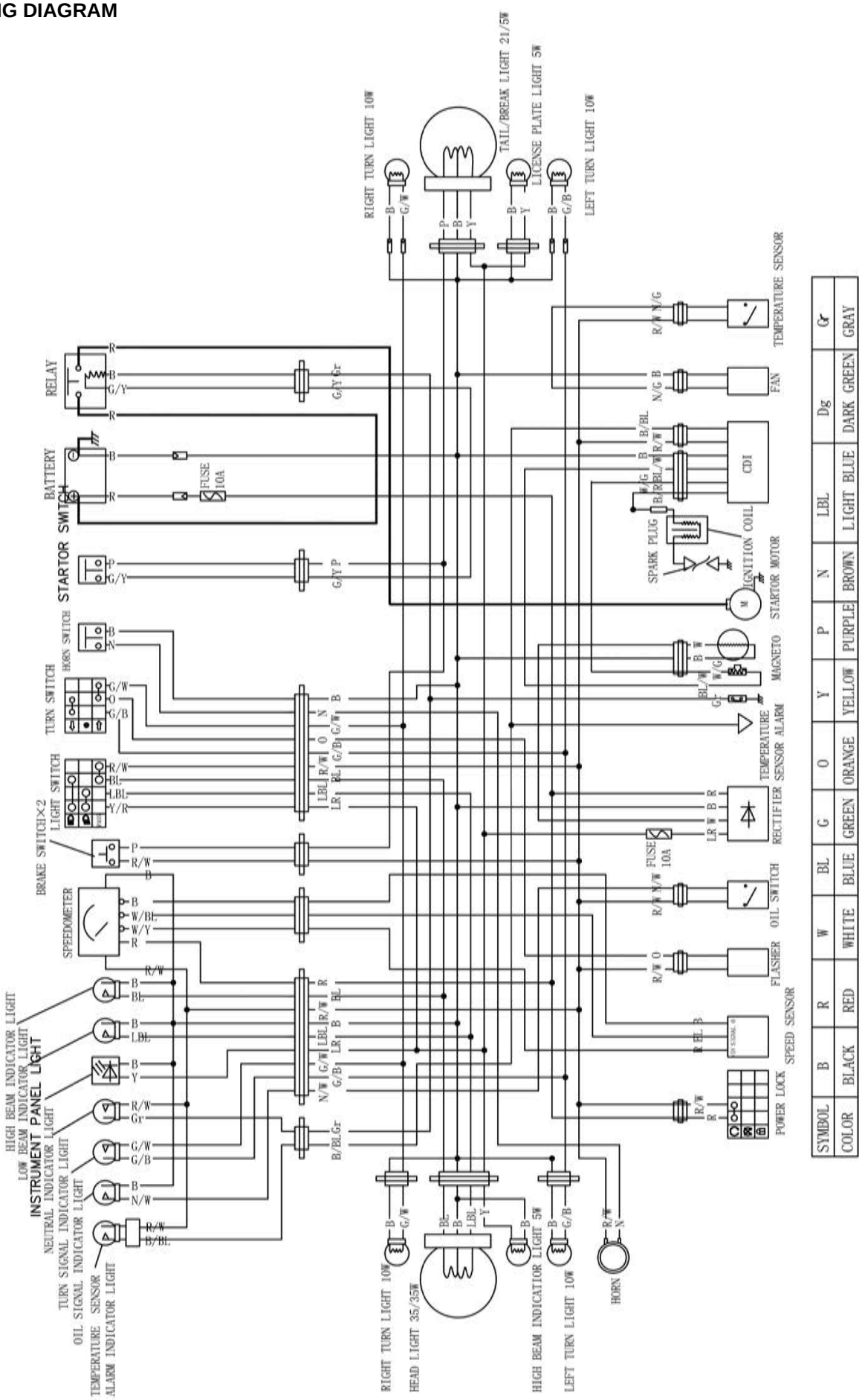
4. Remove the membrane cover (5).



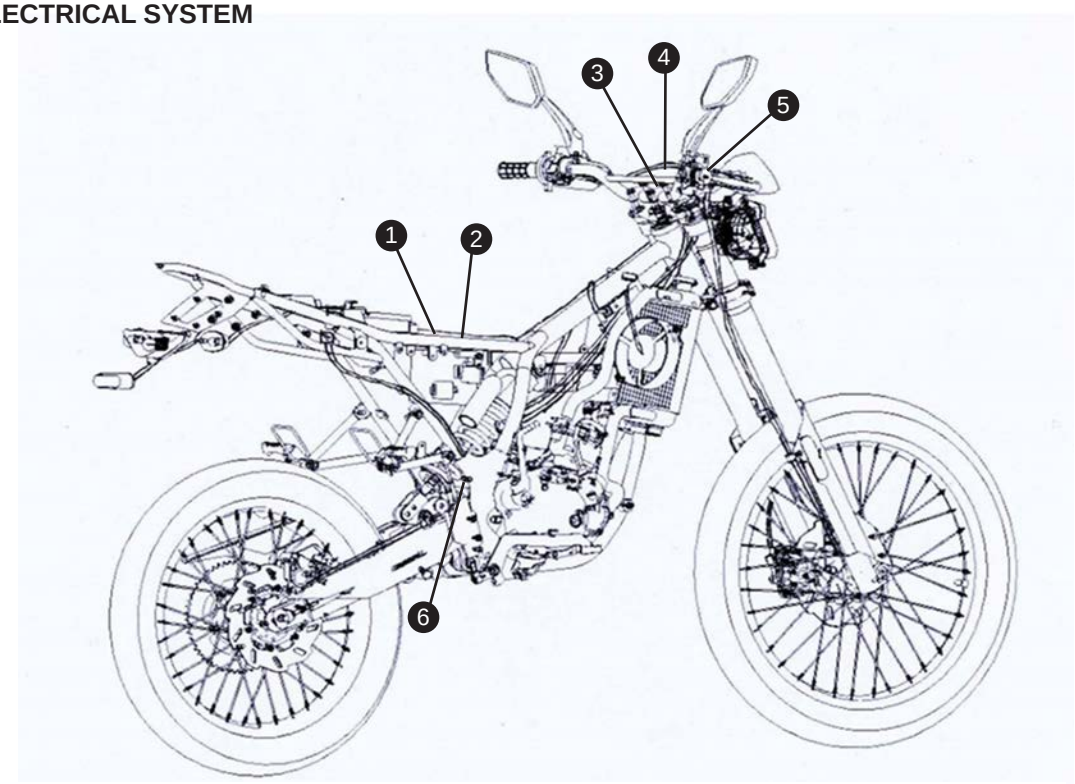
5. Controll the membrane (6).
6. If the membrane is broken or work wrong please replace the whole secondary air system.
7. Install the secondary air system in reverse order.

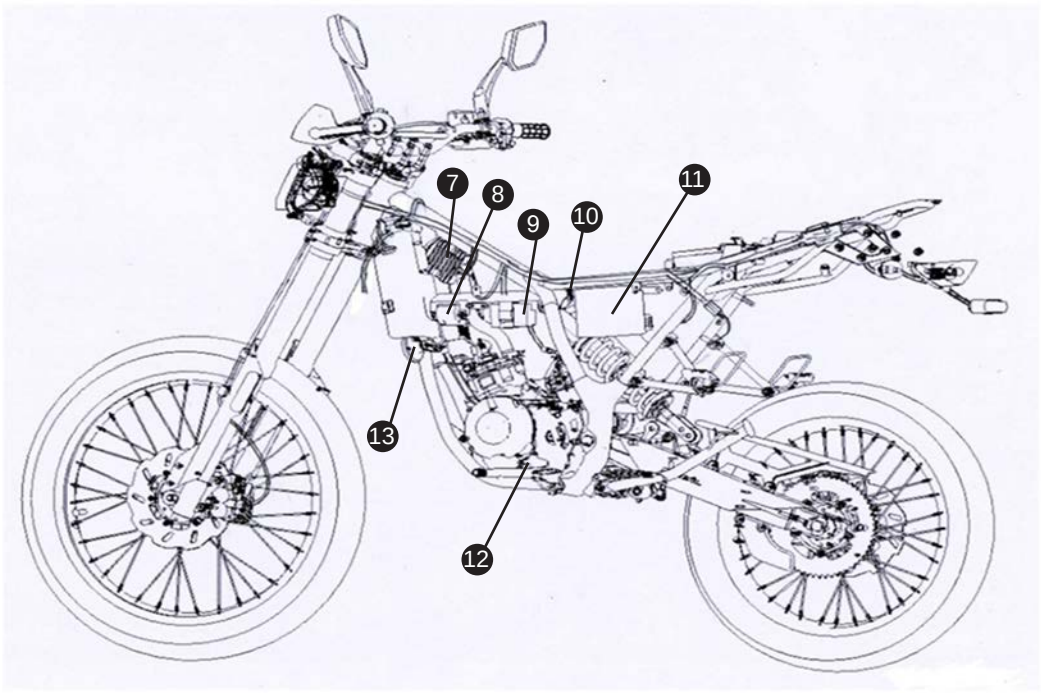


WIRING DIAGRAM



LOCATION - ELECTRICAL SYSTEM

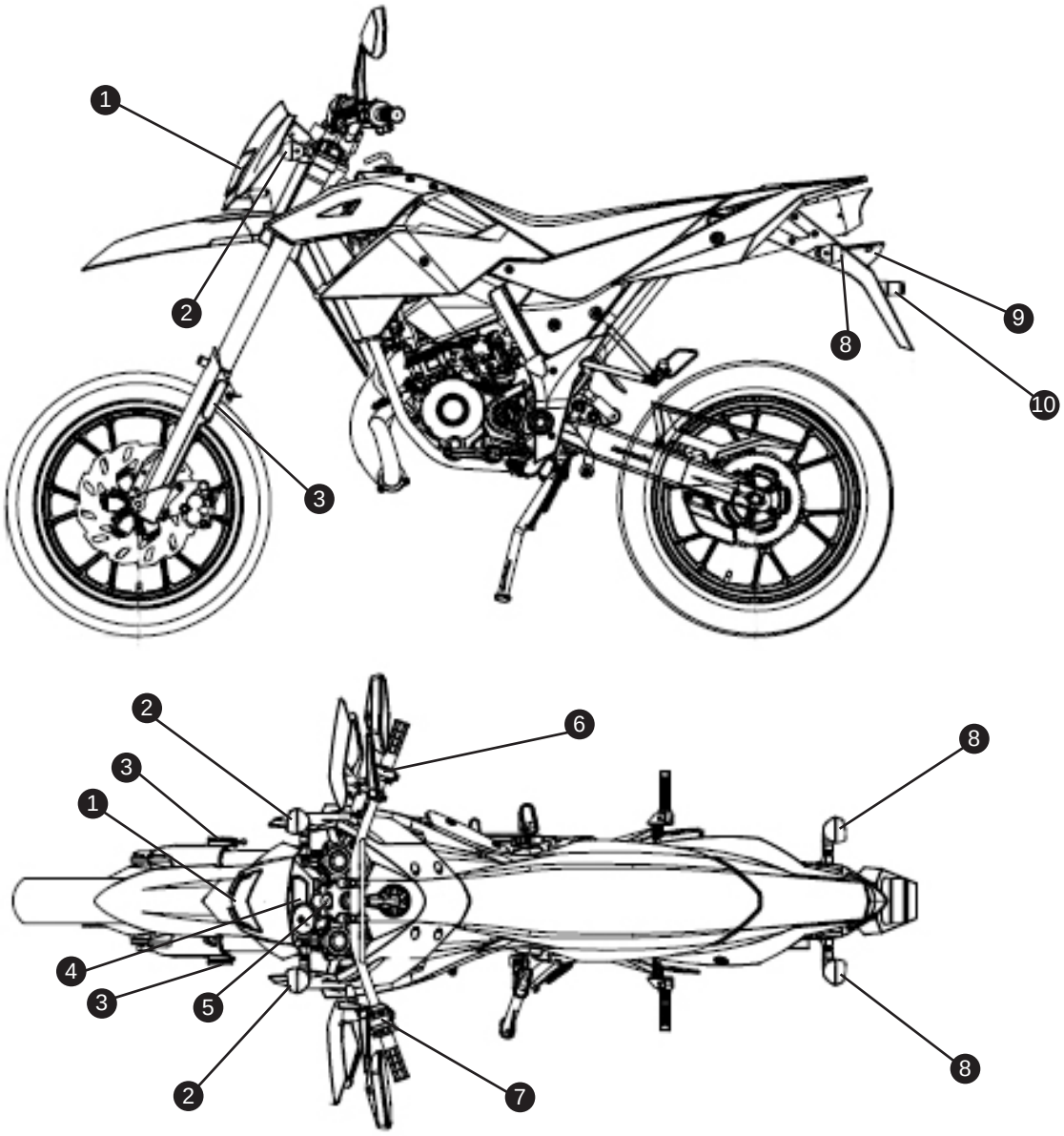




PART LIST- ELECTRICAL SYSTEM

1. Winker relay
2. Main fuses 10 Ampere
3. Main switch/ power lock module
4. Speedometer
5. Front brake - brake light switch
6. Rear brake - brake light switch
7. Regulator rectifier
8. Ignition coil
9. CDI (capacitor discharge ignition)
10. Starter relay
11. Batterie 12V / 3Ah
12. Neutral sensor
13. Horn

LOCATION - LIGHTS / INSTRUMENTS SWITCHES



PART LIST - LIGHTS / INSTRUMENTS SWITCHES

1. Head light
2. Turn signal front
3. Side reflector
4. Instrument panel and indicators
5. Main switch/ power lock module
6. Handle switch right
7. Handle switch left
8. Turn signal rear
9. Rear light and brake light
10. Rear reflector and number plate light

CERTIFICATION NO.

PART NAME	CE NO.
Head light	E4 - 0011534
Rear light	E4 - 0011535
Number plate light	E11 - 0000066
Indicators	E4 - 000875
Side reflector	E4 - 023273
Rear reflector	E11 - 023584

SPECIFICATION

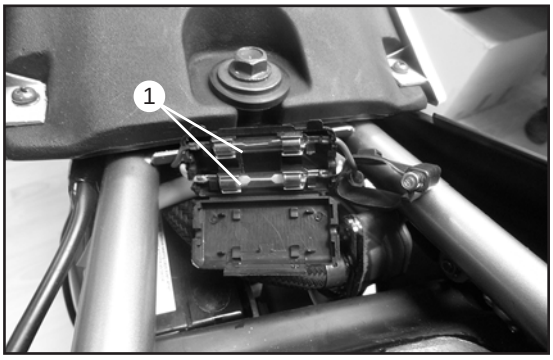
ITEM	NOMINAL VALUE		
Spark plug	NGK/BR8ES		
Spark plug gap	0.6-0.7 mm		
Resistance value of ignition coil (20°C)	Primary coil	0.4 Ω±10%	
	Secondary coil	With spark plug cover	8-11 KΩ
		Without spark plug cover	4.5 - 5.5KΩ
Resistance value of trigger (20°C)	100-200 Ω (bl/w-gr/w)		
Trigger voltage	Above 1.7 V		
Battery (Model: YT4L-BS/ 12 V, 3.0 Ah)	Capacity	12 V / 3 AH	
	Voltage	13.1 - 12.3 V	
	Charging current	Standard	0.4 A
		Quick	1.5 A
	Charging period	Standard	5-10 h
		Quick	1 h
Magneto	Capacity	80W/5000 rpm	
	Impedance value of charging coil (20°C)	Between white and black 3.3-3.5 Ω	
Voltage regulator	Type	single-phase semi wave SCR charge, SCR semi wave short circuit mode	
	Voltage limit	Lightning limit	12.0-14.0 V / 5000 rpm
			13.5 V / 5000 rpm
		Charge limit	14-15 V / 5000 rpm
Fuse	2 Mainfuse 10 Ampere		

SPECIAL TOOL

See page 12-15

FUSE REPLACEMENT

If the fuse is burned out, find the cause and repair it. The fuse holder is located beside the battery below the seat.



1. Turn off the main switch and all electrical circuits.
2. Remove the seat.
3. Replace the blown fuse (1) and then install a new fuse of the specified amperage.

⚠ WARNING

Do not use a fuse of a higher amperage rating than recommended to avoid causing extensive damage to the electrical system and possibly a fire.

SPECIFICATION

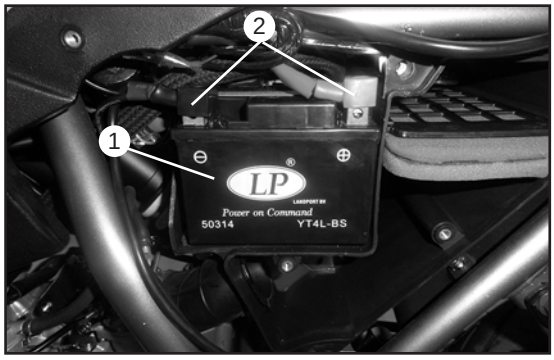
ITEM	DESCRIPTION	VALUE
Fuses	Two glass tube fuse	10 A

TROUBLESHOOTING

FAILURE	CAUSE	TO DO
Fuse blown	Electrical circuit shorted	Find the cause and repair it. Replace the blown fuse.
	Electrical circuit is overloaded	Find the cause and repair it. Replace the blown fuse.

BATTERY GENERAL INFORMATION

The battery (1) is located on the right side of the vehicle. It is recommended to extend the battery whenever it needs servicing. Disconnect the battery poles (2) to extend the battery.



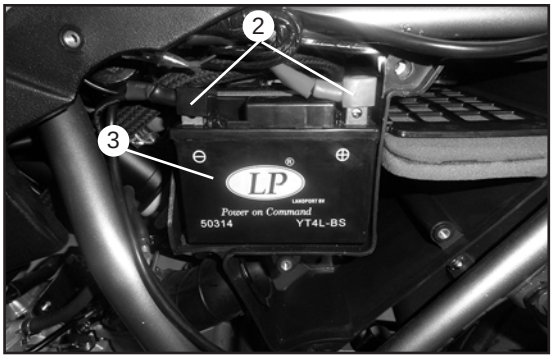
NOTE

1. The battery can be charged and discharged, and used repeat edly. If a battery is laid aside after discharging, its service life will be shortened and its performance is degraded. Performance of a battery is usually reduced after about 2-3 years' run. Voltage of the performance-reduced (capacity drops) battery can be resumed, but the voltage will run down quickly while loading.
2. Overcharging of battery: Usually overcharging is demonstrated by the battery itself. If short circuit occurs inside the battery, there will be no voltage or very low voltage on the terminals of the battery. Adjuster fails: it indicates too high voltage on the battery, the life-span of the battery will be shortened.
3. When the battery is not be used for a long period, it will self-discharge and its capacitance will drop. The battery should be recharged every two weeks.
4. Charging system inspection: please perform inspection in the sequence listed in the fault diagnosis table.
5. If there is current going through the electric part, please do not remove the connector, or the voltage will be very high and electronic components inside the voltage adjuster will be damaged. Set ignition switch at "Off" position and then begin your operation.

6. Inspect the entire electric load.
7. Quick charging is forbidden except in emergency.
8. During quick recharging, the battery must be removed from the motorcycle and recharged.
9. A voltmeter shall be employed to check recharged battery.

BATTERY REMOVAL

1. Remove the seat and the left side covers (1).
2. Disconnect the battery poles (2).
3. Remove the battery (3).



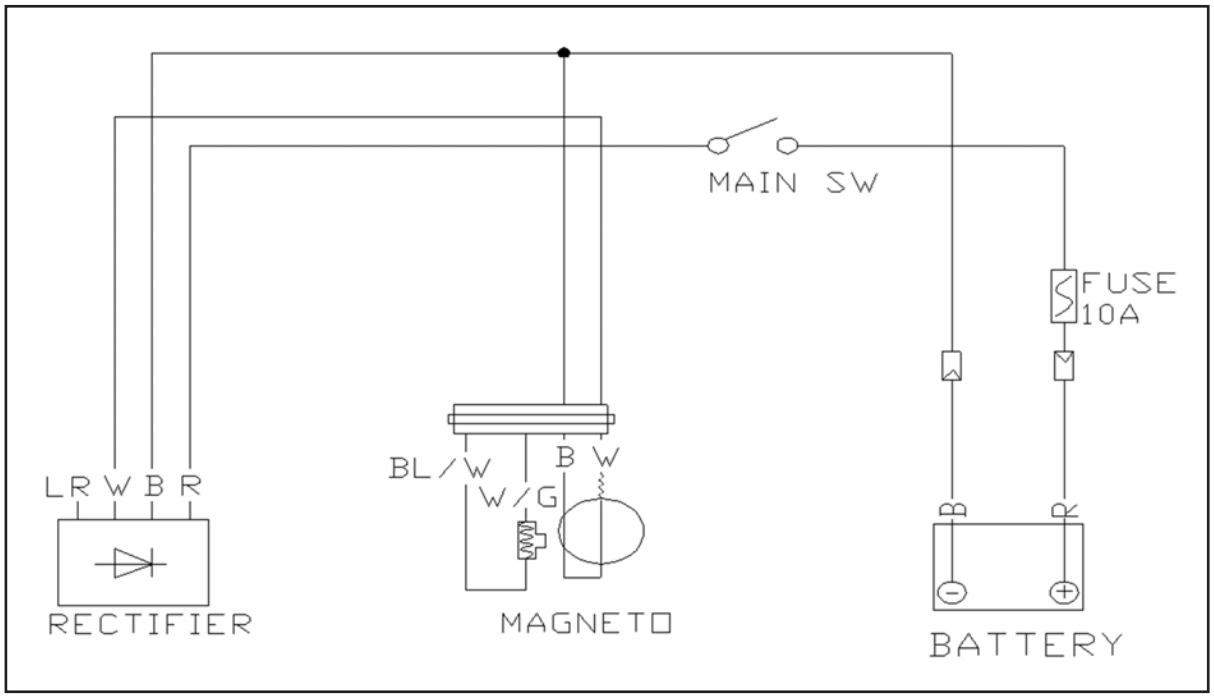
⚠ WARNING

- Whenever you remove the battery from the vehicle, disconnect the negative wire first and the positive wire second.
- Assemble in reverse order and add battery pole grease between the battery poles and the wires.
- Keep the battery away from ignition sources
- Shut off the charger first once before connect or disconnect the battery.
- If you do not shut off the charger first the flashes during connecting or disconnecting could cause an explosion.
- Do not exceed the above mentioned charging times at the specific charging current.
- Fast charging cannot be used except in contingency situations.
- Do not measure the voltage within 30 minutes after charging.

TROUBLESHOOTING - BATTERY AND CHARGING SYSTEM

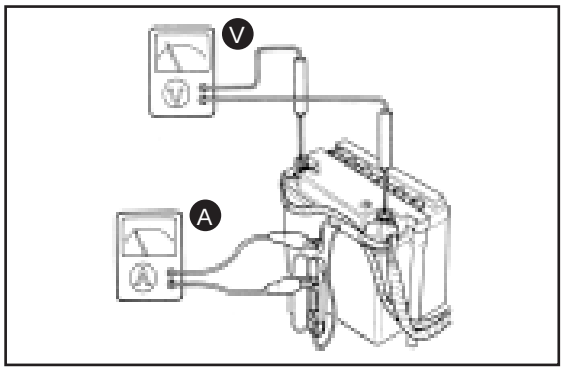
FAILURE	CAUSE	TO DO
No power supply	Defect battery	Find the cause and replace the battery.
	Disconnected battery cable	Connect the battery cable.
	Fuse blown	Find the cause, repair it and replace the fuse.
	Faulty main switch	Replace the main switch.
Low power	Weak battery	Charge the battery or replace it.
	Loose battery connection	Tighten the connection.
	Charging system failure	Check the components step by step and replace the defect parts.
	Faulty regulator/rectifier	Replace the regulator/ rectifier.
Intermittent power	Loose battery cable connection	Tighten the connection.
	Loose charging system connection	Tighten the connection.
	Loose connection or short circuit in ignition system	Tighten the connection and repair the affected component.
Charging system failure	Loose, broken or shorted wire or connector	Tighten the connection and repair the affected component.
	Faulty regulator/rectifier	Replace the regulator/ rectifier.
	Faulty generator	Check and replace the generator if necessary.

CHARGING SCHEME



CHARGING PERFORMANCE TEST

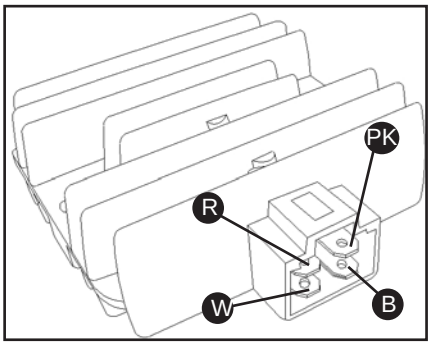
1. Remove the battery cover on the left side.
2. Stop the engine and open the fuse box.
3. Disconnect the wire from the fuse. Connect an ampere meter (A) between the wire and fuse terminal.
4. Connect the battery positive (+) to the voltmeter (V) positive (+) probe and battery negative (-) to the voltmeter negative (-) probe.
5. Start the engine. Gradually increase engine speed to test the output. If the clamping voltage exceeds the specified value inspect the regulator rectifier.
6. Inspect the clamping voltage of lightning system.



REGULATOR - RECTIFIER INSPECTION

Disconnect the plug from the regulator rectifier.
Check continuity between main wiring terminals in the following way.

Multimeter (- / +)	White (W)	Red (R)	Pink (PK)	Black (B)
	Unit: MΩ			
White (W)		27.04	15.15	25.40
Red (R)	0		0	0
Pink (PK)	21.35	0		22.33
Black (B)	5.07	22.68	3.63	



Item (wire color)	Judging Method
Between battery positive (red) and body ground	-> Battery voltage
Between battery negative (black) and body ground	-> Lead wire
Between charging coil (white) and body ground	-> No power flowing
Between charging coils (white 1, 2 and 3) and body ground	-> Resistance between the coils

GENERATOR CHARGING COIL

Inspection:
Conduction test between generator and vehicle ground:

1. Use a multimeter for a check between the white cable of the generator and vehicle block.If there is conduction at any of the white cable the generator has to be replaced.

Charging test:
1. Start the engine and run the engine on idle.
2. Measure the voltage between the white cables of generator and vehicle block.
3. The voltage at idle speed should be above 30V.

NOTE

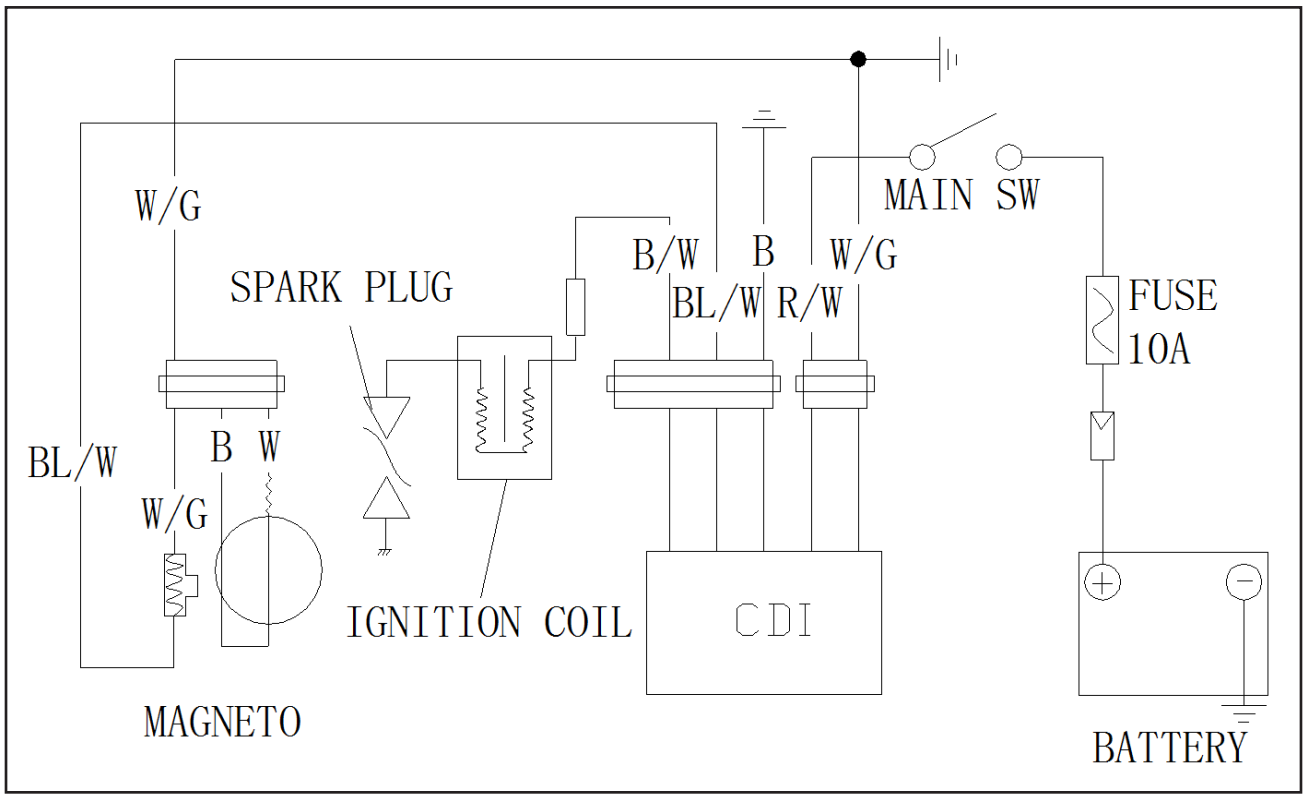
Switch to alternating current on your multimeter to measure the Voltage of Generator.

⚠ WARNING

Inspection of alternator charging coil can be performed on the engine.

For the generator replacement please check Engine disassembling and assembling manuel.

IGNITION SYSTEM



PREPARATORY DATA
Precautions on operation

1. Ignition system inspection: Please perform inspection in the sequence listed in the fault diagnosis table.
2. Ignition system uses electronic-type automatic timing device, which is solidified in the CDI assembly, so it is unnecessary to adjust the ignition time.
3. Ignition system CDI shall not be dropped and hung, or heavily knocked (this is also the main reason for its failure). Pay special attention to this while removing it.
4. Most of the ignition system problem due to poor contact of sockets. Please check first if parts of the connector are well contacted.
5. Check if heat value of spark plug is proper. Improper spark plug may result in unsmooth engine running or burn of spark plug
6. The maximum voltage is taken to introduce inspection items in this Part. Inspection methods for impedance value of ignition coil are also recorded and judged.
7. Check ignition switch according to the continuity test table.
8. Remove magneto and stator on operation instructions.

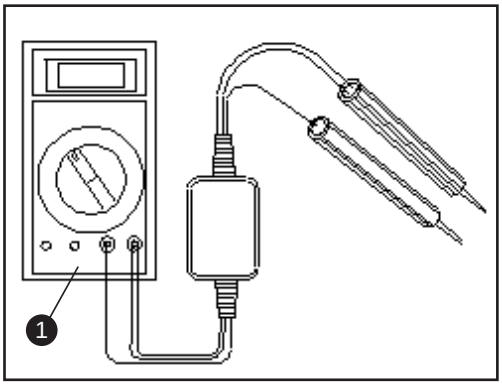
SPECIFICATION

Item			Standard Value
Spark plug			NGK/BR8ES
Spark plug clearance			0.6-0.7mm
Ignition coil impedance value (20°C)	Primary coil	Black/White-black	0.4 Ω ± 10%
	Secondary coil	White spark plug cap	8-11 KΩ (bl – spark plug cover)
		Without spark plug cap	4.5-5.5 KΩ (bl – ignition cable)
Impedance value of trigger (20°C)	Blue/white - white/green		100 - 200Ω
Trigger voltage			Higher than 1.7V

FAULT DIAGNOSIS

ITEM	FAILURE	CAUSE	TO DO
Ignition coil	High voltage to low	The interior resistance is too low and test it with a designated tester.	Replace
		The cranking speed is too low.	Search for error and repair
		The tester is disturbed.	If the voltage measured for several times is above standard, then the value is normal.
		Poor contact of ignition system wire	Check and repair
		Bad act of the ignition coil	Check and replace
		Bad act of the charge coil	Peak voltage test
Side voltage	No high voltage, off-and-on high voltage	Connecting error in tester	Check and repair
		Bad act of the main switch	Check and replace
		Poor contact of CDI joint	Check and repair
		Short circuit or poor contact of CDI ground wire	Check, repair or replace
		Bad act of charge coil	Peak voltage test
		Bad act of trigger	Peak voltage test
		Bad act of connector for high voltage wire	Check, repair or replace
		Bad act of CDI group (when items abnormal or when there is no spark in the spark plug)	Replace
	Normal high voltage, no spark	Bad act of spark plug or power leak in secondary coil	Check and replace
		Bad act of ignition coil	Check and replace
Charge coil	No high voltage	The interior resistance is too low.	Test it with a designated tester.
		The cranking speed is too low.	Search for error and repair
		Bad act of the charge coil (no abnormality in Items)	Peak voltage test
	No high voltage, off-and-on high voltage	Bad act of the ignition coil	Check and replace
		Bad act of the charge coil	Check and replace
Trigger	High voltage too low	The interior resistance is too low.	Test it with a designated tester.
		The cranking speed is too low.	Search for error and repair
		Bad act of the charge coil (no abnormality in Items)	Peak voltage test

IGNITION SYSTEM INSPECTION



NOTE

When there is no spark from the spark plug, check if components of wiring are loosened or badly connected and make sure if all the voltage values are normal.

There are many brands of multimeters (1) with different interior impedance. The values they measured may not be exactly the same.

PRIMARY VOLTAGE OF IGNITION COIL

If an old spark plug is removed and replaced with a good one, make sure the plug is tighten correctly.

⚠ WARNING

Inspect when spark plug is installed on the cylinder head and compression pressure is normal.

NOTE

Voltage of ignition coil cannot be measured.

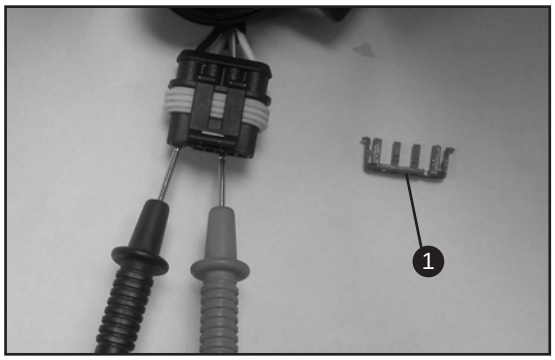
Function of Ignition coil can be tested in the following way:

1. Remove the spark plug from the cylinder head.
2. Remove the spark plug cap from ignition coil.
3. Connect the dynamic spark tester between ignition cable and engine ground (-)
4. Press the start button and check the ignition spark gap.
5. Spark gap at a good working ignition system should reach ~15mm.

⚠ WARNING

Please do not touch the metal parts with your fingers while measuring the voltage, or you will be shocked. Please take care.

TRIGGER (PICK UP)



Inspect when spark plug is installed on the cylinder head and compression pressure is normal.

1. Disconnect the pick up cable from the main wire.
2. Disconnect the clamp (1) to ease the measurement.
3. Connect the multimeter to the pick up cable
   Positive (+) to blue/white and negative (-) black cable
4. Set multimeter to alternating current
5. Turn on the ignition and press the start button.
   Minimum voltage should be above 1.7 V

TRIGGER INSPECTION

Inspect of the trigger can be conducted on the engine.

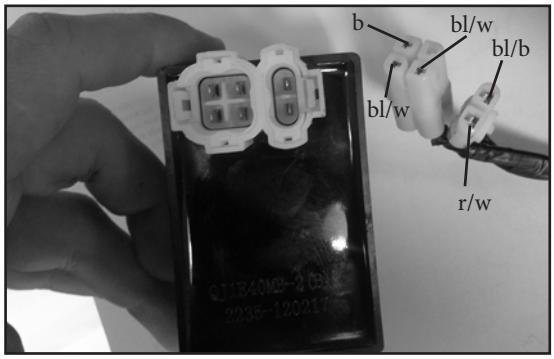
1. Disconnect the pick up cable from the main wire.
2. Connect the multimeter on the to the pick up cable
3. Positive (+) to blue/white and negative (-) green/white cable
4. Set multimeter to resistance check Ω.
5. Standard is between 200 – 300 Ω
6. If the value is above or below the measured value replace the stator

If the measured voltage is below 1V please replace the PICK UP.

⚠ WARNING

The metal area of the multimeter mustn`t be touched by fingers to prevent electroshock.

CDI ASSEMBLY



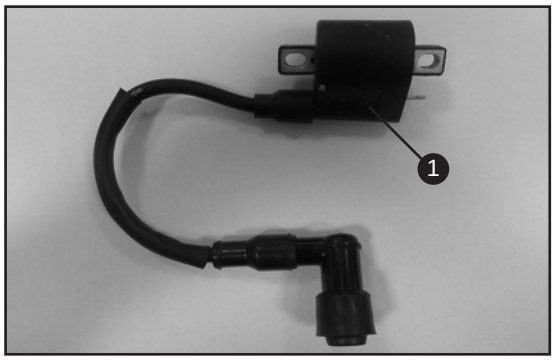
b- black
bl/w - black/white
bl/b - blue/black
r/w - red/white
bl/w - blue/white

System Inspection
Remove CDI assembly and check components related to the ignition system at the wiring terminal.

Inspection
Remove CDI assembly and check if connectors are loosend or corrosive.

IGNITION COIL

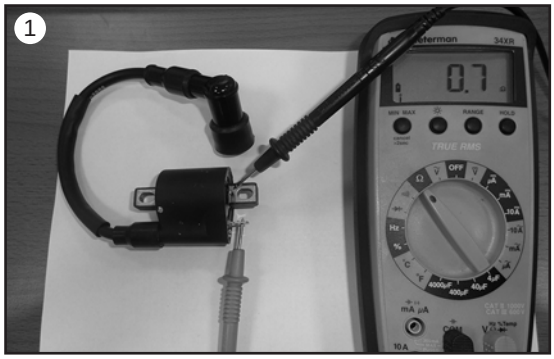
IGNITION COIL REMOVAL



1. Remove the Fuel tank.
2. Remove the spark plug cap from spark plug.
3. Remove the wires of ignition coil (1).
4. Disassemble the ignition coil fixing bolts and take off the ignition coil.

Install it in reverse order of removal.

PRIMARY COIL INSPECTION



Measure impedance between terminals of primary coil as shown in picture (1).

Standard value: 0.7 Ω ± 10% (20°C)

Impedance value within the range is good.

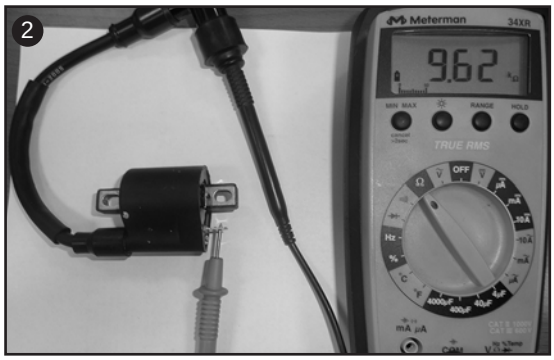
Impedance value “∞” indicates broken wire inside the coil.
-> Replace coil.

SECONDARY COIL
Measure the impedance between lead-wire side of spark plug cap and terminal as shown in picture (2).

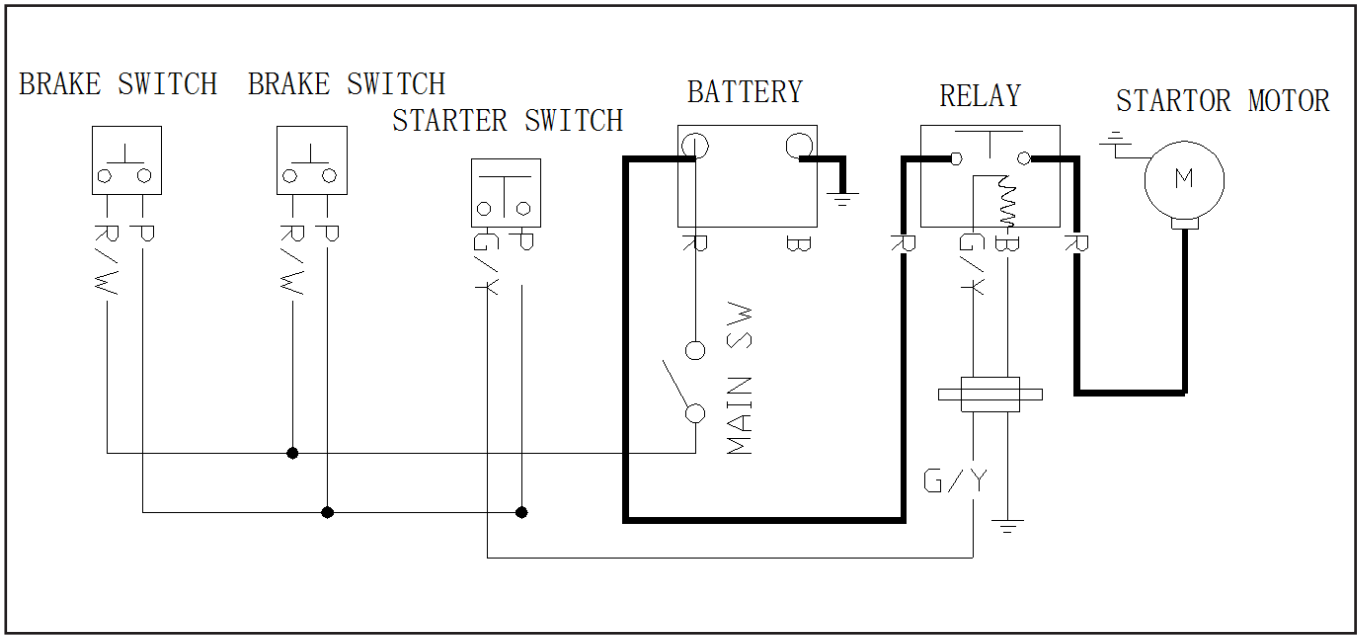
Standard value: 8-11 KΩ (20°C)

Impedance value within the range is good.

Impedance value "∞" indicates broken wire inside the coil.



STARTING SYSTEM



PREPARATORY DATA

Precautions on operation.
Starting motor removal can be performed on the engine.
Starting clutch removal refers to removal instruction**.**

TORQUE LIST

PART	TORQUE
Starting motor clutch cap bolt	12 Nm
Starting motor clutch locknut	95 Nm

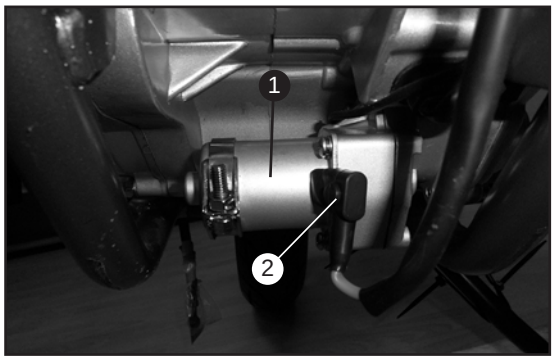
FAULT DIAGNOSIS

FAILURE	CAUSE	TO DO
Unable to start up	Fuse blown	Replace fuse
	Power shortage in battery	Replace battery
	Bad acts of main switch	Check and replace
	Bad act of startup clutch	Check and repair - replace if nessecary
	Bad act of brake switch	Check and replace
	Bad act of start relay	Check and replace
	Poor contact of connecting wire	Check and repair
	Bad act of starter motor	Check and replace
Rotating force of starter motor too weak	Power shortage in battery or battery empty	Replace or charge
	Poor contact of connecting wire	Check and repair
	Gear of the starter motor jammed with foreign body.	Check and repair
No force of starter motor	Bad act of startup clutch	Check and repair
	Reverse revolution of starter motor	Replace
	Power shortage in battery or battery empty	Replace or charge

STARTING MOTOR

⚠ WARNING

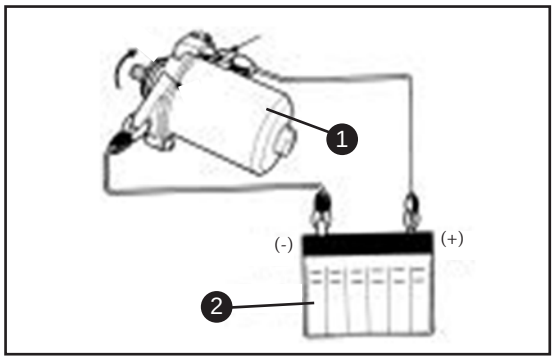
Before removing starting motor (1), the ignition switch must be set at “OFF” position. Disconnect battery grounding wire and then turn on the power supply to check if starting motor runs to confirm your operation is safe.



Disconnect the starter wire (2).
Remove the starter motor as described in the part for engine disassembling in this manual (page 66).

STARTING MOTOR INSPECTION

1. Disassemble the starter (1).
2. Connect a full charged battery (2) to the starter motor and check for operation.
   If the starter does not operate correct -> replace the starter motor.
3. Check the starter shaft. If it’s worn replace the starter motor.
4. Install starter back in engine.



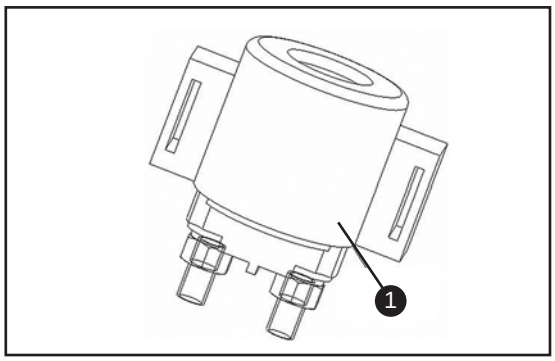
STARTING RELAY ACTUATION INSPECTION

1. Disassemble related cover parts.
2. Turn on the main switch, check the Engine “stop switch” is turned on too and press the start button.

-> No action:
Inspect the start relay (1) – replace if necessary.

NOTE

Before doing further tests with the start relay disconnect the starter cable from starter motor and make sure the cable does not touch the engine or any frame part.

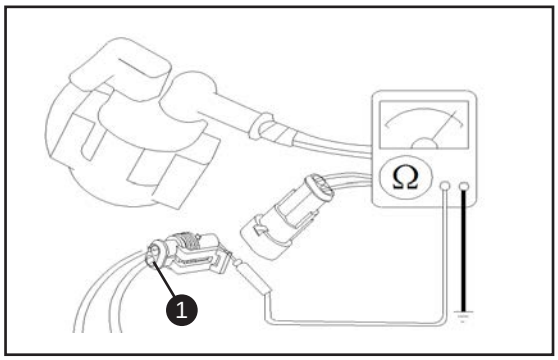


STARTING RELAY VOLTAGE INSPECTION

1. Disconnect the plug (green/yellow) (1).
2. Turn on the main switch, check the Engine “stop switch” is turned on too.
3. Press the start button and measure the voltage between the ground wire of frame and green/yellow wire of start relay.

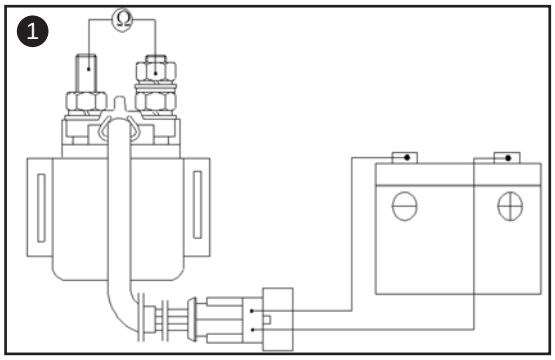
Measured voltage should be same as battery voltage.

When there is no voltage at wire terminal of starting relay, inspect start button, engine “stop switch” and lead wire.



ACTUATION INSPECTION

1. Connect starting relay with battery and connect terminal of starting motor with multimeter (picture 1).
2. Connect the fully charged battery between the orange/red line and green/ yellow line of the relay. At this point the relay should give out a “Click” sound and the ohmmeter resistance reads “0”.



BULBS REPLACEMENT GENERAL INFORMATION

PREPARATORY DATA

Precautions on operation:
While trouble shooting electric faults, please check continuity of electric component as current flowing over it.
Confirm state of battery before any inspection, including battery voltage.

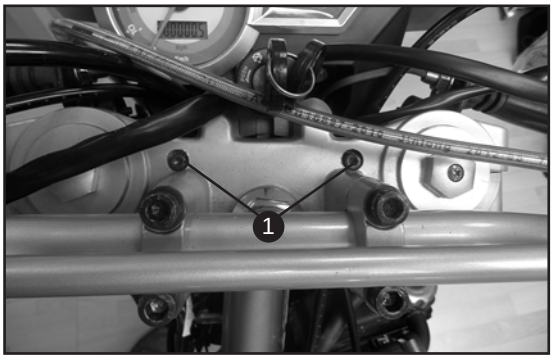
FAULT DIAGNOSIS

1. Turn on the main switch and the light switch.
2. Check rear light, front position light and low beam.
3. Turn on high beam and check if high beam is working.
4. Apply the front brake and check if brake light is working.
5. Apply the rear brake and check if brake light is working.
6. Turn on the left and right winker and check all winkers are working.

If the relative light is not working a reason could be:
1. A defect bulb.
2. A defect light switch.
3. The connector has a poor contact or the wire is broken.
4. The battery voltage is low.
5. If there is no electric power at all main fuse could be burned also.

HEADLAMP BULB REPLACEMENT

1. Remove the two headlight screws (1).

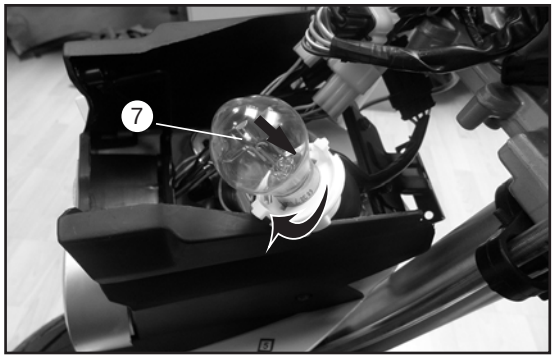


2. Remove the four screws (2) of the front fender (3).

3. Remove the rubber cap (4) from the head light mask (5).

4. Twist the lock plate (6) counterclockwise till you can remove it.

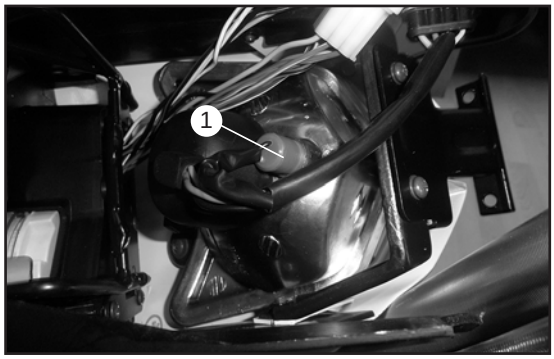
5. Pull the bulb (7) in and twist it clockwise till you can remove it.
6. Replace the defect bulb and reassemble in reverse order.



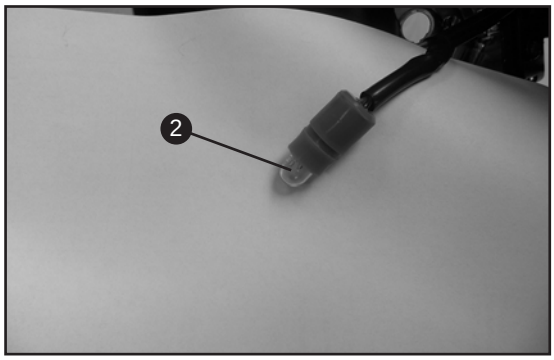
POSITION LIGHT BULB REPLACEMENT

To replace the position light bulb follow the below listed points of 1. and 2.

3. Pull out the position light plug (1).



4. Replace the defect bulb (2) and assemble in reverse order.



⚠ WARNING

When the bulb is lit, keep your hands and inflammable materials some distance away from it. Lighting bulb is hot, touch it when it cools down.
Avoid touching bulb glass with your bare hands during installation and staining it with oil, which may affect transparency, service life and luminous flux of bulb.
If oil is adhered to the bulb, clean it with a cloth moistened with alcohol or highly volatile rubber solution.

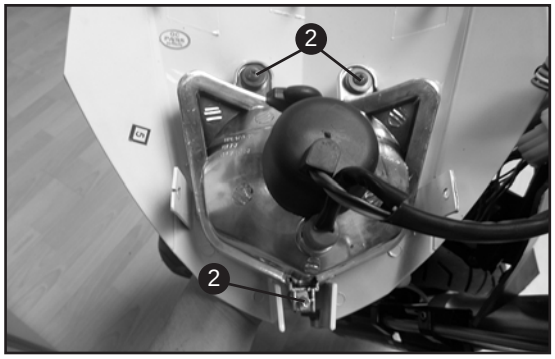
WHOLE HEADLIGHT REPLACEMENT

1. If it's necessary to replace the whole headlight disconnect the headlight plug.
2. Remove the two screws (1) on the left and right side.
3. Disconnect the two parts of the headlight.

NOTE

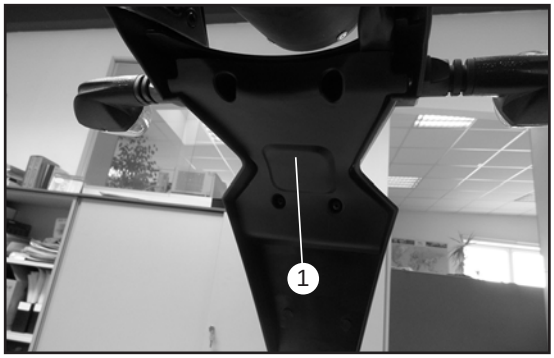
Only one side (left side) is shown.

4. Remove the three screws (2) and replace the whole headlight.
5. Install the new headlight in reverse order.
6. Adjust the height of the low beam. (See page 45)

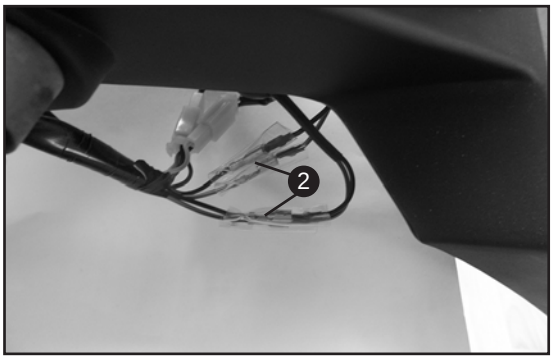


REAR WINKER REPLACEMENT

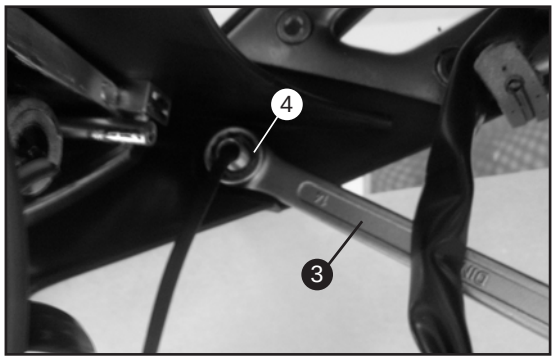
1. Remove the rear fender cover (1).



2. If it is need to replace the whole rear winker, disconnect the winker cables (2) first.
   The plugs for right or left rear winker are located below the rear fender cover .

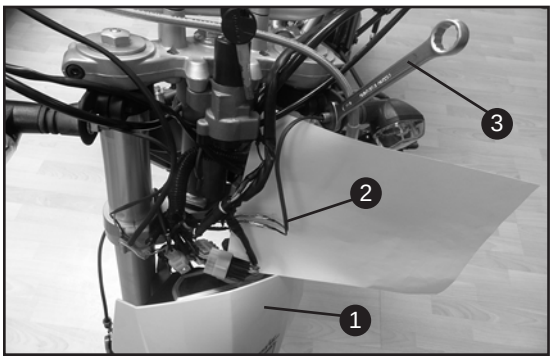


3. Thread a 14mm flat wrench (3) and loosen the winker fixation nut (4).



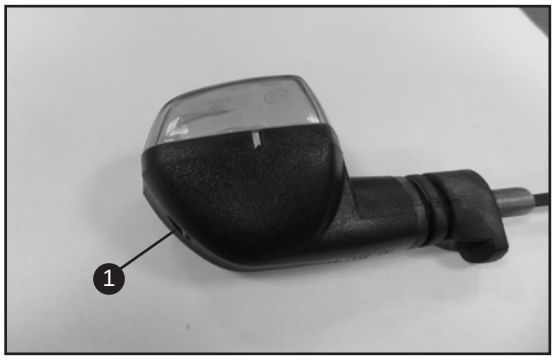
FRONT WINKER REPLACEMENT

1. To replace the front winker it is first necessary to remove the whole head light (1).
2. Disconnect the winker cables (2) from the main wire and unscrew the winker fixation nut by using a 14mm flat wrench (3).
3. Assemble the new winker and the whole head light in reverse order.

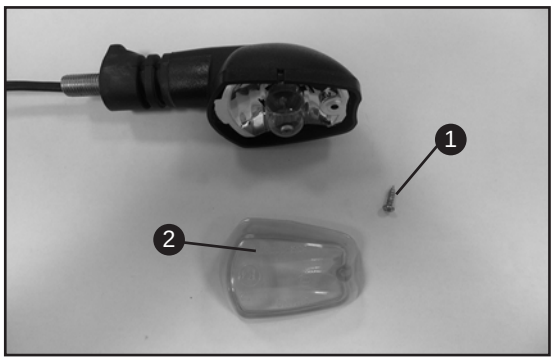


BULB WINKER REPLACEMENT

1. Turn off the ignition switch.
2. Screw off the self-tapping screw (1) on the turn signal lamp.

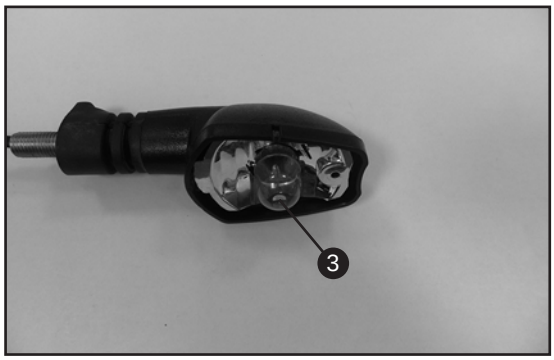


3. Remove the indicator lens (2).



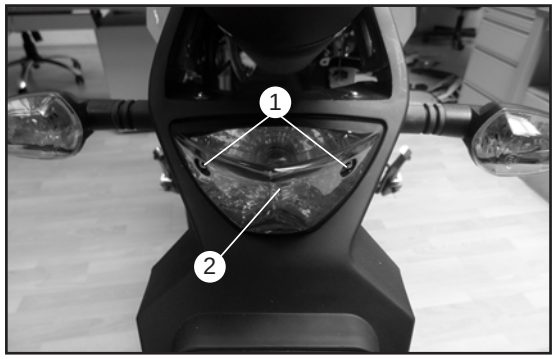
4. To replace the bulb (3) press the bulb and rotate clockwise until you can pull out the bulb.

5. Install the bulb in the reverse order of removal.



BULB TAILLIGHT REPLACEMENT

1. Screw off the two screws (1) and remove the taillight lens.

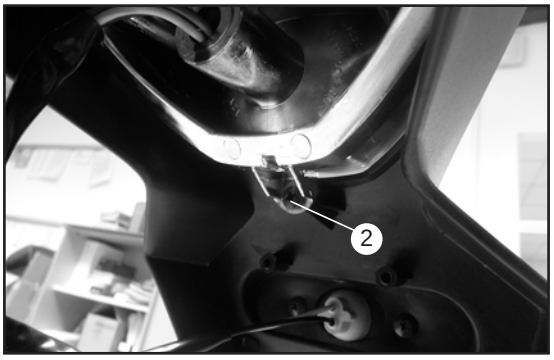


2. To replace the bulb (3) press the bulb and rotate counter-clockwise until you can pull out the bulb.
3. Assemble the new rear light in reverse order.

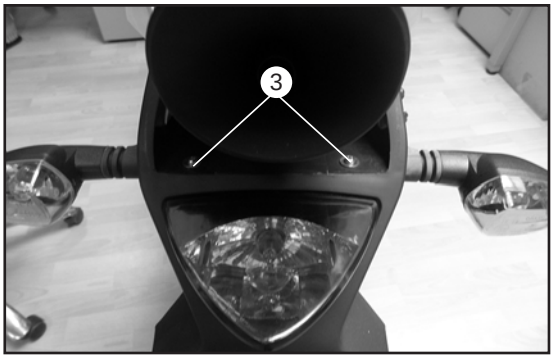
TAILLIGHT REPLACEMENT

1. Remove the rear fender cover.
2. Disconnect the taillight cable (1).

3. Remove the screw (2).

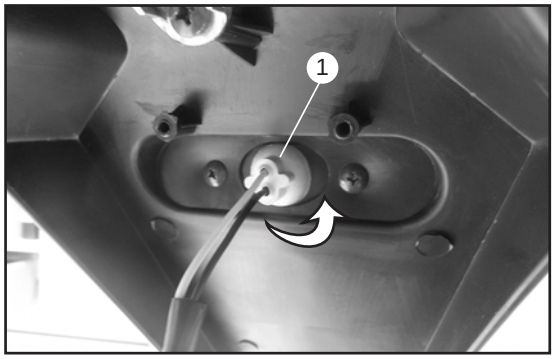


4. Remove the two screws (3).
5. Pull the taillight out of the cover.
6. Reassemble in reverse order.

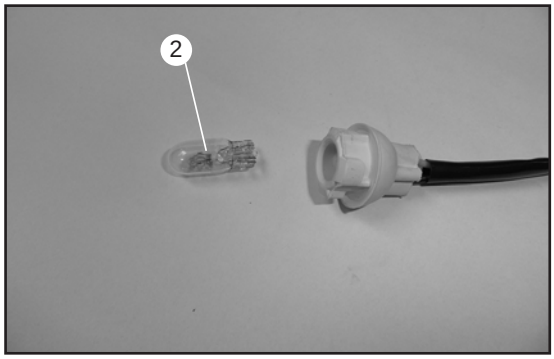


LICENSE PLATE BULB REPLACEMENT

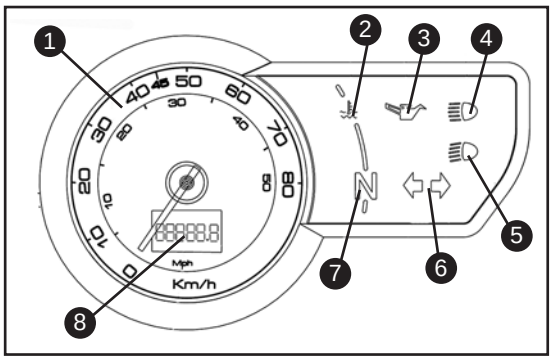
1. Remove the rear fender cover.
2. To remove the license plate light bulb you have to rotate the white rubber cap (1) 45° counterclockwise and pull out the plug.



3. Pull the bulb (2) out of the white rubber cap .
4. Install the license plate bulb in reverse order of removal.

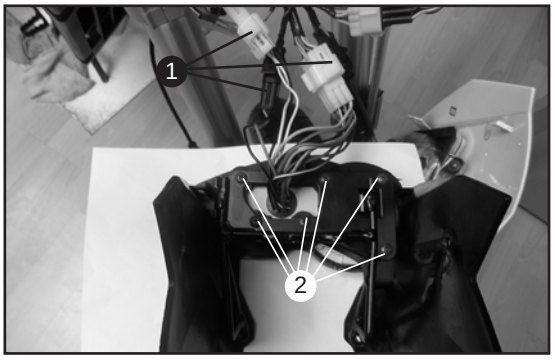


SPEEDOMETER DESCRIPTION



1. Speedometer
2. Engine coolant tell-tale
3. Engine oil tell-tale
4. Main-beam headlamp tell-tale
5. Dipped-beam headlamp tell-tale
6. Direction tell-tale
7. Neutral tell-tale
8. Odometer

SPEEDOMETER REPLACEMENT

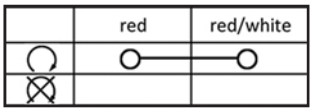


1. Remove the headlight before removing the speedometer.
2. Remove the two screws on the left and right side to disconnect the headlight bracket and the speedometer bracket.
3. Disconnect the cables (1).
4. Unscrew the six hexagonal (2) bolts from underneath.
5. Replace the whole instrument panel if necessary.
6. Install the instrument orderly in the reverse order of removal.

⚠ WARNING

It is not possible to repair the Instrument panel.
If you face any defect of the panel please replace the whole Instrument.

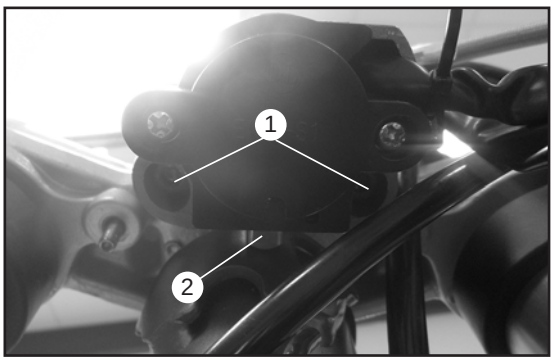
IGNITION SWITCH INSPECTION



1. Remove the headlight.
2. Disconnect the ignition switch plug.
3. Use a continuity tester to measure the ignition switch (1) as shown in the illustration.
4. If the main switch does not work correct replace it.

"⊠" (OFF) position: All the circuits are broken.
"○" (ON) position: Ignition circuit is switched on and engine can be started. When the switch is at this position, the key cannot be pulled out.

IGNITION SWITCH REPLACEMENT



1. Remove the headlight.
2. Disconnect the ignition switch plug.
3. Remove the two bolts (1).
4. Assembly in reverse order.

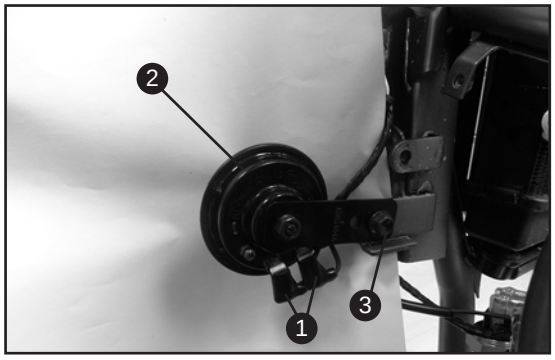
STEERING LOCK

1. The steering lock (2) is located in the ignition switch.
2. If the steering lock does not work correct, replace the ignition switch (see above).

ELECTRIC HORN INSPECTION

1. Disconnect the horn wire (1) from the horn (2).
2. The horn is works correct if it sounds when a 12V battery is connected to the plugs.

If the horn does not work correct replace it.

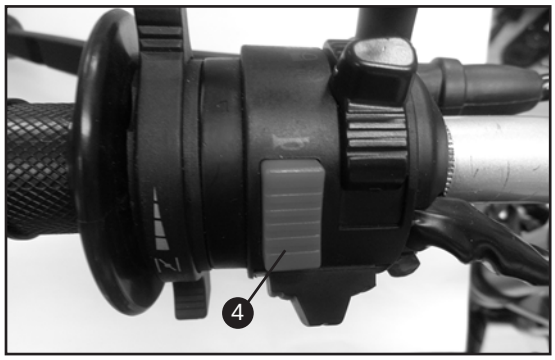


ELECTRIC HORN REPLACEMENT

1. Remove the seat, the side covers the tank and the oil/water tank.
2. Loosen the screw (3) (size: 13) and replace the horn.

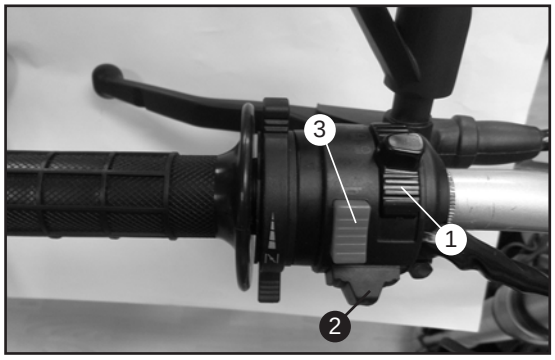
⚠ WARNING

If the horn works while it is connected to the battery but not when pressing the handle switch check the cables and the horn switch (4).



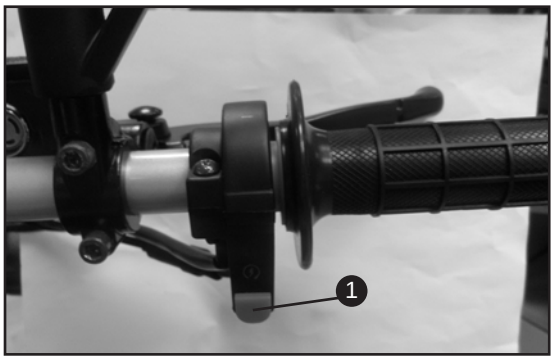
LEFT HANDLE SWITCH

1. Light switch
2. Winker switch
3. Horn switch



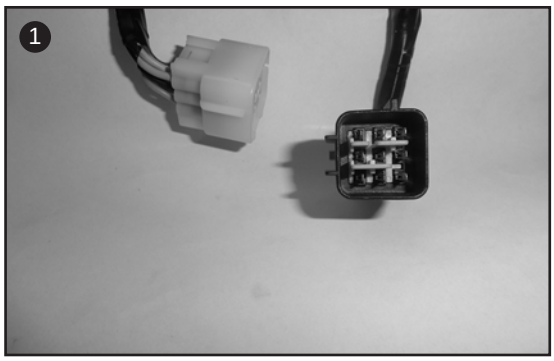
RIGHT HANDLE SWITCH

1. Start switch



LEFT HANDLE SWITCH INSPECTION

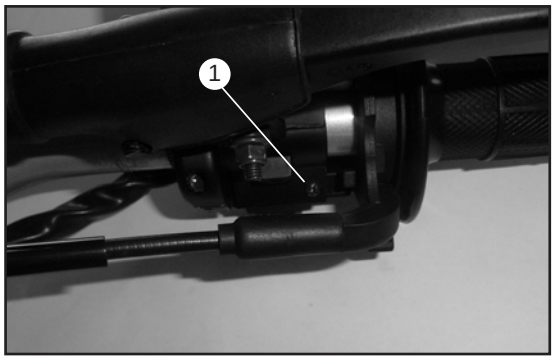
1. Remove the headlight.
2. Disconnect the cables of the left handle switch as shown in the picture (1).
3. Use a continuity tester to measure the switches as shown in the illustrations below.
4. In case of damage the handle switch need to be replaced.



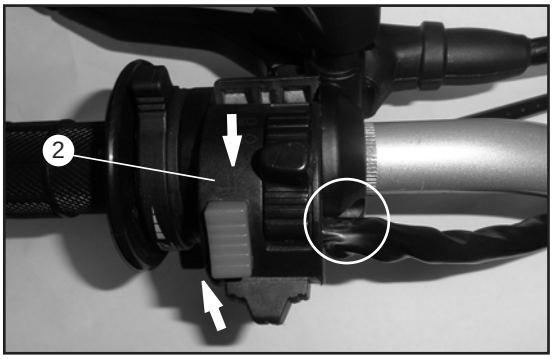
	Green / Black	Brown	Blue	Light Blue	Pink	Black	Orange	Green / White	Red / White
Flash light switch			○						○
Dimmer switch				○	○				
High beam switch			○		○				
Horn		○				○			
Winker left	○						○		
Winker right							○	○	

LEFT HANDLE SWITCH REPLACEMENT

1. Remove the headlight.
2. Disconnect the cables of the left handle switch.
3. Remove the screw (1) of the left handle switch.



4. Lift the left handle switch (2) in the height and pull it backwards.
5. Assemble the new handle switch in reverse order.

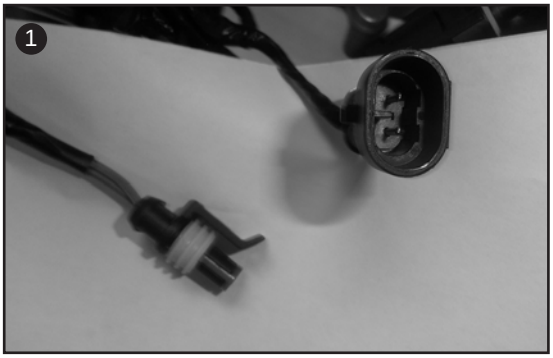


⚠ WARNING

Watch out, not to bend or twist the cable**.**

RIGHT HANDLE SWITCH INSPECTION

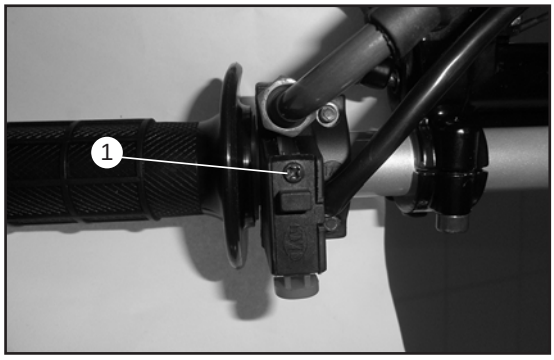
1. Remove the headlight.
2. Disconnect the cable of the left handle switch as shown in the picture (1).
3. Use a continuity tester to measure the switches as shown in the illustrations below.
4. In case of damage the handle switch need to be replaced.



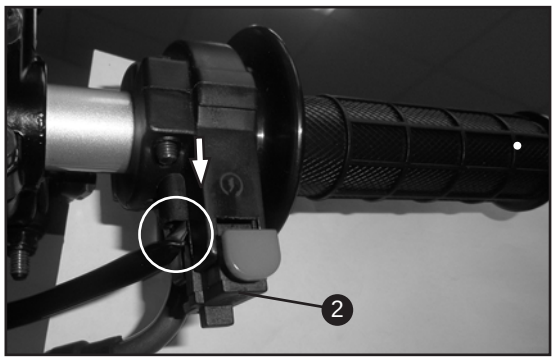
	Purple	Green / Yellow
Startor	○	○

RIGHT HANDLE SWITCH REPLACEMENT

1. Remove the headlight.
2. Disconnect the cables of the right handle switch.
3. Remove the screw (1) of the right handle switch.



4. Pull the right handle switch (2) downwards.
5. Assemble the new handle switch in reverse order.

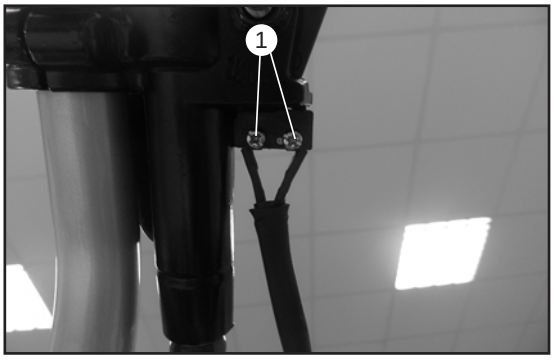


⚠ WARNING

Watch out, not to bend or twist the cable**.**

FRONT BRAKE LIGHT SWITCH INSPECTION / REPLACEMENT

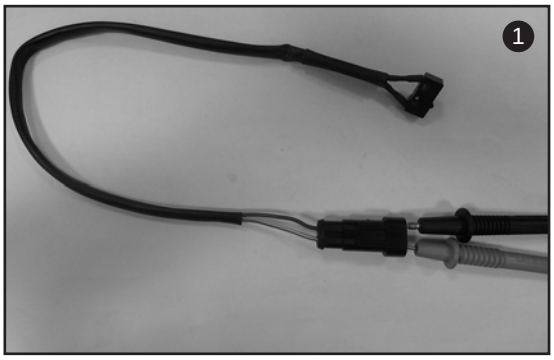
1. Remove the headlight.
2. Disconnect the cables of the front brake light switch.
3. Loosen the screws (1) to remove the switch from the right handle.



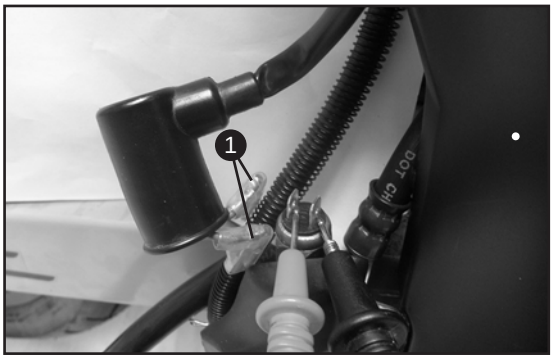
4. Before replacing the front brake switch, double check its function.

   Check with a continuity tester (picture 1) :
   Switch pressed: no continuity
   Switch released: continuity

5. Assemble the new switch in reverse order.



REAR BRAKE LIGHT SWITCH INSPECTION

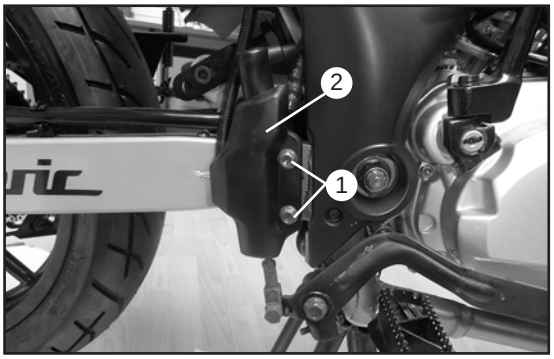


1. Disconnect the two plugs (1) of the brake light switch from the main wire.
   The two plugs are located on the top of the rear brake master.

   Check the brake light switch with a continuity tester:
   Brake pedal pressed: continuity
   Brake pedal released: no continuity

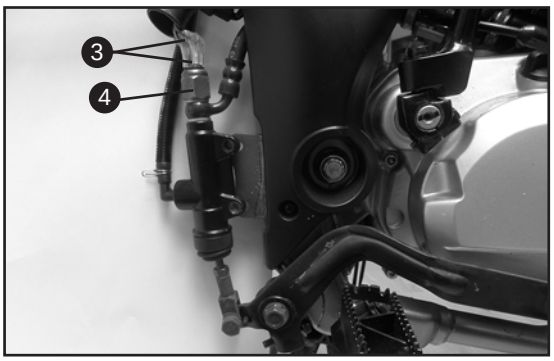
2. If the switch is still not working correct replace the rear brake light switch.
3. Assemble in reverse order.

REAR BRAKE LIGHT SWITCH REPLACEMENT



In case the rear brake light switch is not working correct please replace the switch. For a correct replacement please follow the below mentioned steps.

1. Drain the brake fluid from the hydraulic brake system.
2. Remove the two bolts (1) of the master cylinder cover (2).

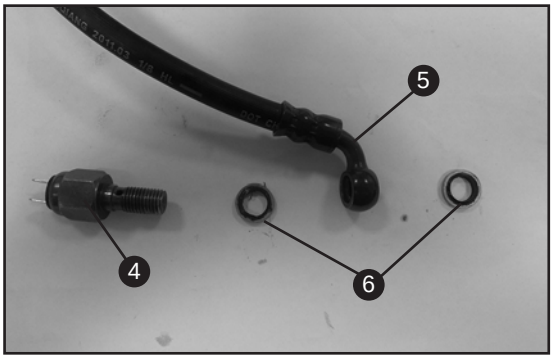


3. Disconnect the two plugs (3).
4. Remove the rear brake light switch (4).

NOTE

If you can not loosen the rear brake light switch, screw on the two bolts (1) without the master cylinder cover (2).

5. Pull down the brake hose (5) and the sealing rings (6).

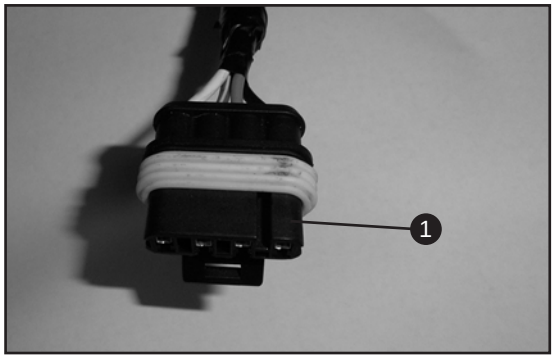


NOTE

Please also renew the sealing rings (6).

6. Assemble in reverse order.

NEUTRAL SENSOR INSPECTION



1. If it is not possible to reach the water residenze plug (1), remove the seat, the side covers, the tank and the oil/water tank.
2. Disconnect the plug coming from the engine.
3. Use a continuity tester to measure the switch as shown in the illustrations below.

	Black	Grey
Neutral	○———	———○
A Gear	○	○

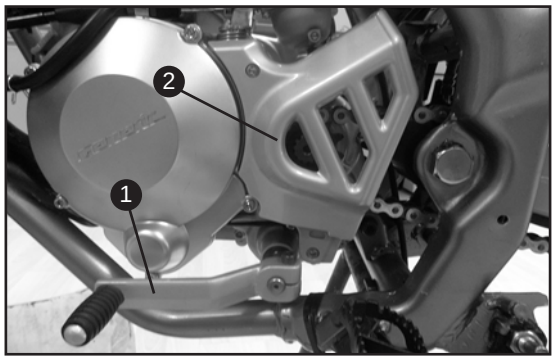
NOTE

Controll the measure:
Shift in a gear and controll the illustartion.

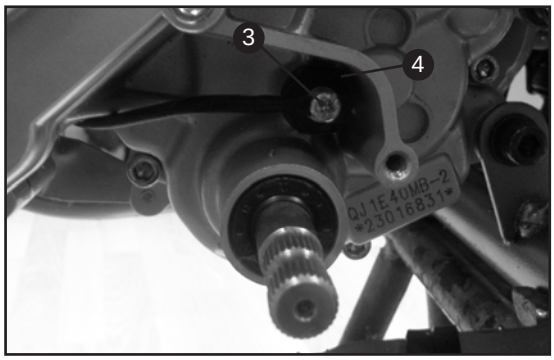
4. In case of damage the switch need to be replaced.
5. Assemble in reverse order.

NEUTRAL SENSOR REPLACEMENT

If you need to replace the neutral sensor please follow the below mentioned steps.



1. Remove the chain protection (1) and the gear shift (2).



2. Remove the screw (3) and the neutral sensor (4) with a 16 nut.

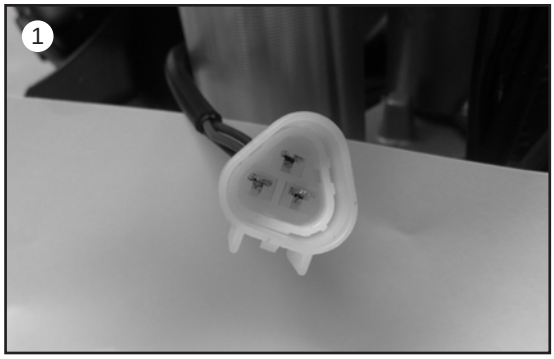
⚠ WARNING

3. Replace the neutral sensor and assemble in reverse order.

NOTE

Do not tighten the neutral sensor too strong.

SPEED SENSOR INSPECTION



1. The speed sensor plug (picture 1) is located behind the headlight.
2. Remove the headlight and disconnect the plug**.**
3. Disconnect the plug and use a continuity tester to measure the sensor as described.

Switch the multimeter to DC - Voltage

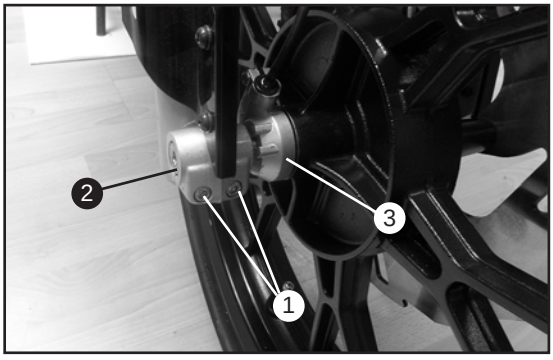
1. Connect a 2kΩ resistor between the power line and the signal line of the speed sensor.

2. Connect a 12V Battery (+ to the red cable and – to the black cable) to the sensor.

3. Link one pin of multimeter to the signal line (blue) and the other pin to minus (black).

4. Turn the speed sensor and check if the value changes. If the values don't change the speed sensor is damaged. Replace the sensor.

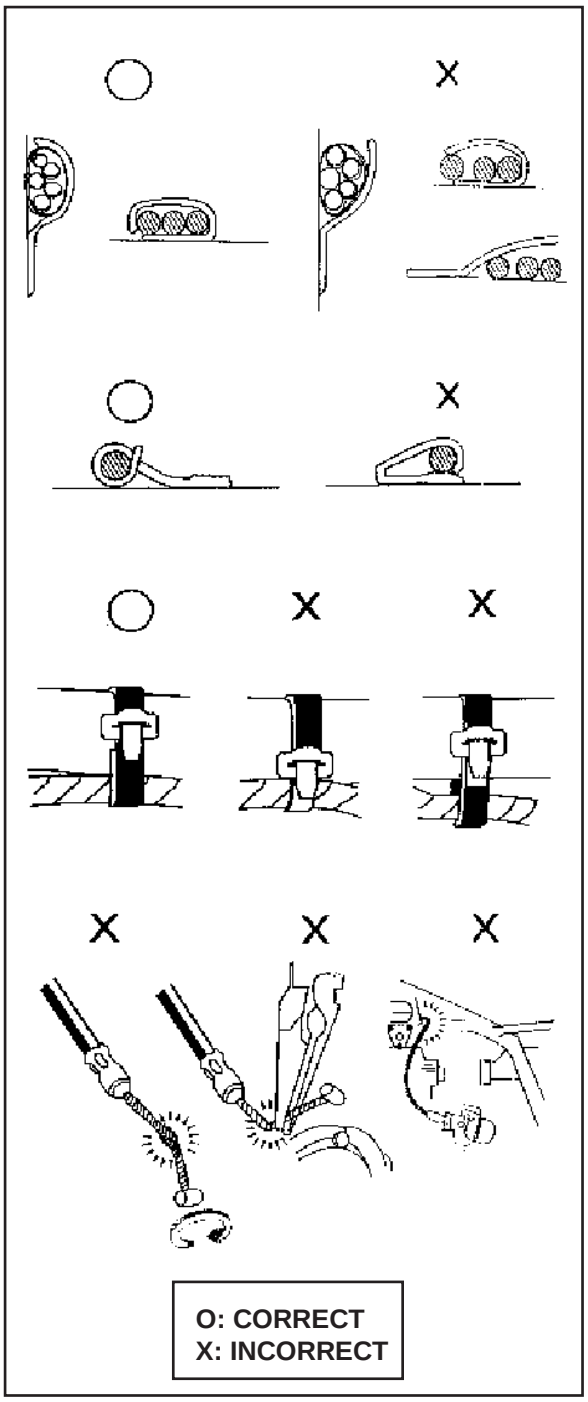
SPEED SENSOR REPLACEMENT



1. Place the vehicle on a suitable stand to lift the front wheel.
2. Unplug the speed sensor.
3. Loosen the bolts (1).
4. Screw out the front axle (2) and lower the front wheel till you can remove the speed sensor (3).
5. Assemble the new speed sensor in reverse order.

NOTE

- Loose cable is a hidden trouble to electrical safety. After clamped check each cable to ensure electrical safety.
- It is not allowed to leave any wire clip bending towards bonding points.
- Bind each cable to its designated position.
- It is not allowed to lay a cable to end or a sharp corner on frame.
- It is not allowed to lay a cable to end of a bolt or screw.
- When laying a cable, keep it away from any heat source or any place where may bite it when it is moving.
- When laying a cable along a handle, avoid it being strained too tightly or loosely and it can not interfere with any adjacent part at any turning point.
- All cables should be laid smoothly without twist or knot.
- Before butt-jointing a connector, check if its sheath has been damaged and if it is overstretched.
- If a cable is at a sharp corner or outer corner, use tape or hose to protect it.
- After a cable is repaired, use tape to bind it securely.
- Keep all control cables from bend or twist because dumb control will result in case any control cable is damaged.



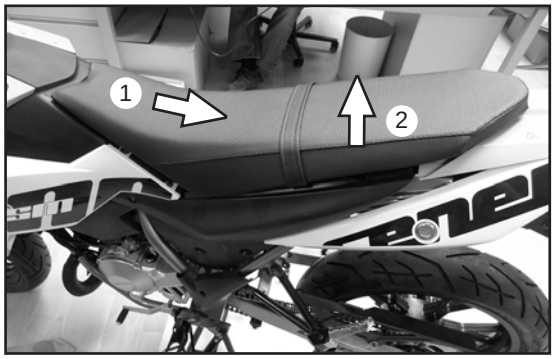
FAULT DIAGNOSIS

ITEM	FAILURE	CAUSE	TO DO
Ignition coil	High voltage to low	The interior resistance is too low and test it with a designated tester.	Replace
		The cranking speed is too low.	Search for error and repair
		The tester is disturbed	If the voltage measured for several times is above standard, then the value is normal.
		Poor contact of ignition system wire	Check and repair
		Bad act of the ignition coil	Check and replace
		Bad act of the charge coil	Peak voltage test
Side voltage	No high voltage, off-and-on high voltage	Connecting error in tester	Check and repair
		Bad act of the main switch	Check and replace
		Poor contact of CDI joint	Check and repair
		Short circuit or poor contact of CDI ground wire	Check, repair or replace
		Bad act of charge coil	Peak voltage test
		Bad act of trigger	Peak voltage test
		Bad act of connector for high voltage wire	Check, repair or replace
		Bad act of CDI group (when items abnormal or when there is no spark in the spark plug)	Replace
	Normal high voltage, no spark	Bad act of spark plug or power leak in secondary coil	Check and replace
		Bad act of ignition coil	Check and replace
Charge coil	No high voltage	The interior resistance is too low.	Test it with a designated tester.
		The cranking speed is too low.	Search for error and repair
		The tester is disturbed	If the voltage measured for several times is above standard, then the value is normal.
		Bad act of the charge coil (no abnormality in Items)	Peak voltage test
	No high voltage, off-and-on high voltage	Bad act of the ignition coil	Check and replace
		Bad act of the charge coil	Check and replace
Trigger	High voltage too low	The interior resistance is too low.	Test it with a designated tester.
		The cranking speed is too low.	Search for error and repair
		The tester is disturbed	If the voltage measured for several times is above standard, then the value is normal.
		Bad act of the charge coil (no abnormality in Items)	Peak voltage test
	No high voltage, off-and-on high voltage	Bad act of the ignition coil	Check and replace
		Bad act of the charge coil	Check and replace

COVER REPLACEMENT

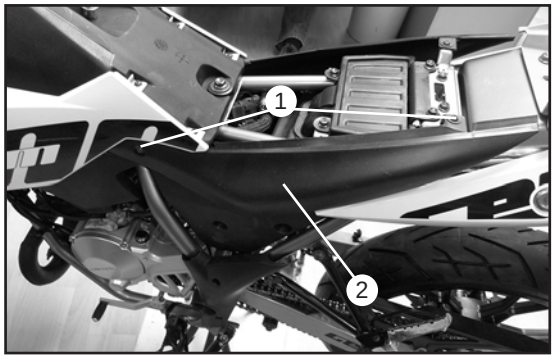
SEAT REMOVAL

1. Turn the key clockwise (arrow) and lift the seat up.



2. To get off the seat, lift (1) the seat and pull it back (2).
3. Install the seat in reverse order

LEFT/RIGHT SIDE COVER REMOVAL

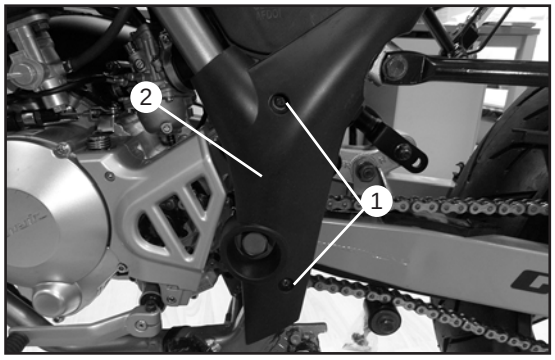


1. Remove the seat.
2. Remove the screws (1).
3. Remove the left/right side cover (2).
4. Install the left/right side cover in reverse order.

NOTE

Only one side (left side) is illustrated.

LEFT/RIGHT LOWER SIDE COVER REMOVAL



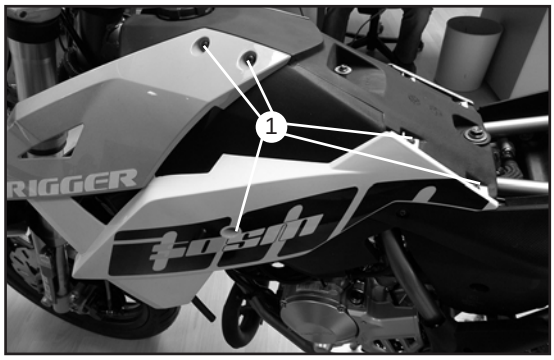
1. Remove the screws (1).
2. Remove the lower side cover (2).
3. Install the left/right lower side cover in reverse order.

NOTE

Only one side (left side) is illustrated.

LEFT/RIGHT TANK SIDE COVER REMOVAL

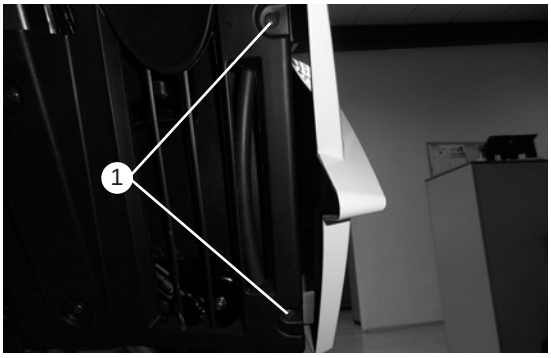
1. Remove the five screws (1).



2. Remove the two screws (2) of the protection mesh.
3. Remove the left/right tank side cover.
4. Install the left/right tank side cover in reverse order.

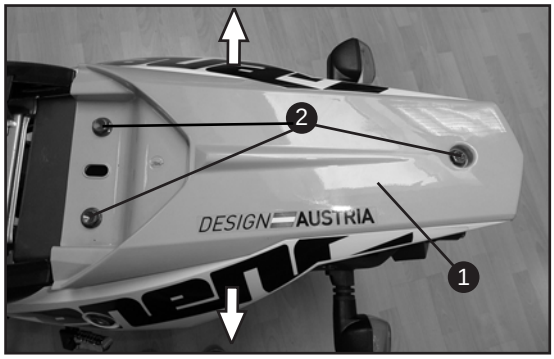
NOTE

Only one side (left side) is illustrated.



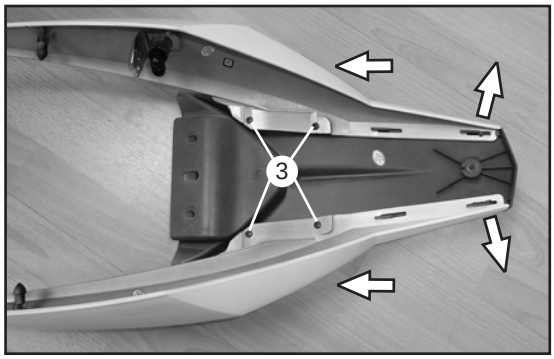
REAR BODY PANEL REMOVAL

1. Remove the seat and the side covers.
2. To remove the rear body panel (1) it is necessary to remove the rear side covers.
3. Remove the three bolts (2).
4. Pull the left rear side cover to the left and the right rear side cover to the right (arrows).

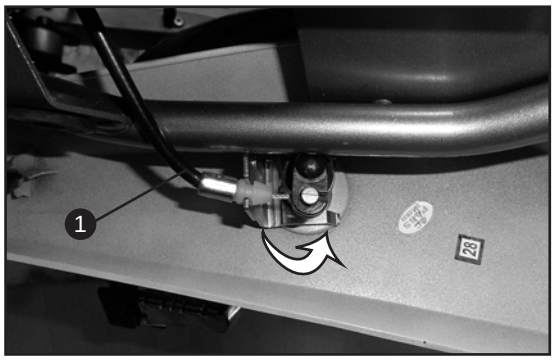


5. Now pull it to the left side as shown in picture (1).

6. Remove the four screws (3).
7. Pull the side covers first forward and then pull it up.
8. Install the rear body panel in reverse order.



REAR SIDE COVER REMOVAL



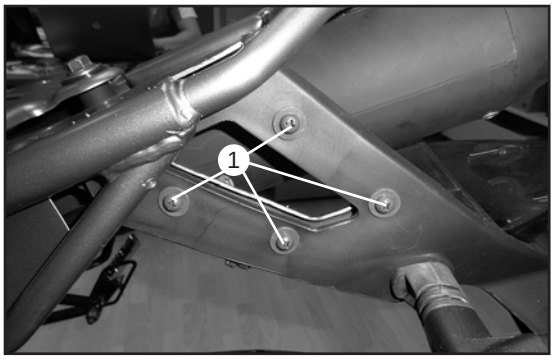
1. Follow the steps 1-4 of rear body panel removal.

⚠ WARNING

Before you remove the rear cover you must to uncouple the seat lock from the cable. Lift the seat lock cable (1) afterwards turn it to the right. When the cable and the slot of the seat lock are in line you can remove the cable.

2. Follow the steps 6-7 of rear body panel removal.
3. Install the rear side covers in reverse order.

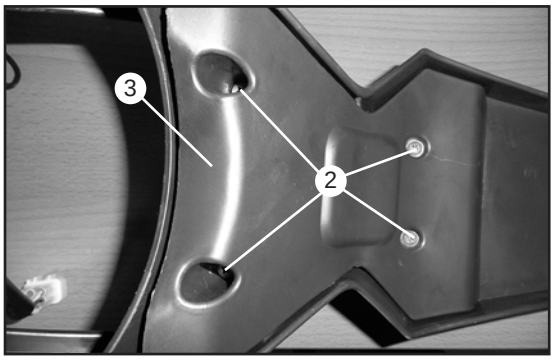
REAR FENDER REMOVAL



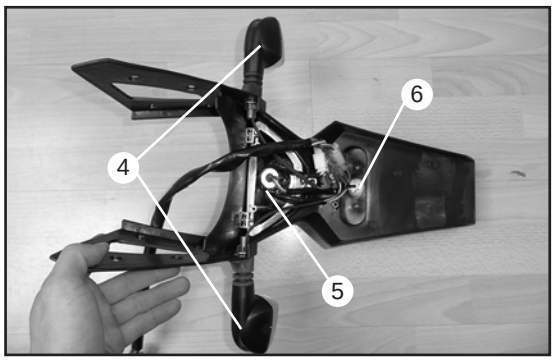
1. Remove the rear side cover with the rear body panel.
2. Remove the four screws (1) on the left and the four screws on the right side.

NOTE

Only one side (left side) is illustrated.



3. Remove the four screws (2) and remove the inner rear fender (3).



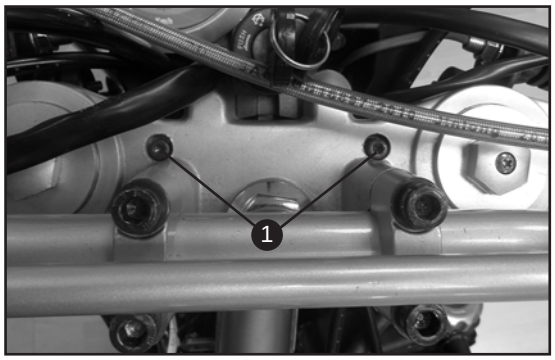
4. Remove the left and right turn signal rear (4), the rear light (5) and the rear reflector with number plate light (6).
5. Install the rear fender in reverse order.

FRONT FENDER REMOVAL

1. To remove the front fender (1), remove the four screws (2).

HEADLIGHT COVER REMOVAL

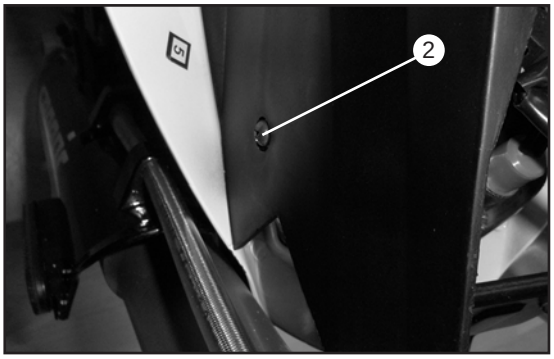
1. Remove the front fender.
2. Remove the two screws (1).



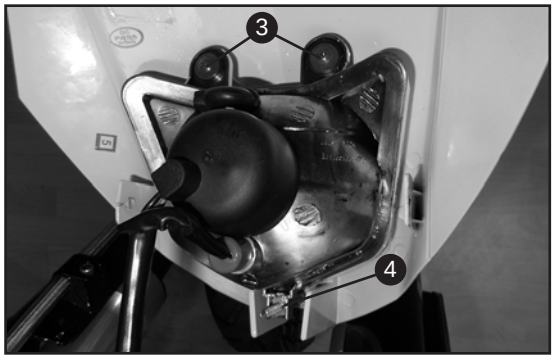
3. Remove the screw (2) on the left and right side.

NOTE

Only one side (left side) is illustrated.

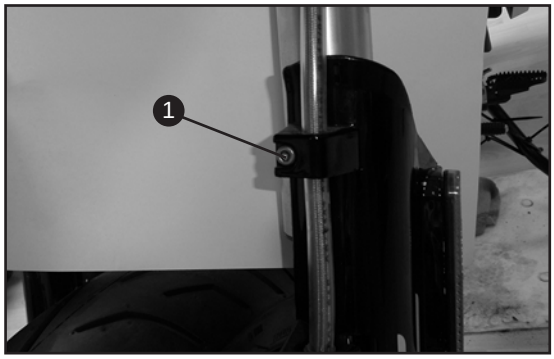


4. Remove the headlight cover by removing two screws (3) and the one screw (4).
5. Install the headlight cover in reverse order.



COVER FRONT SHOCK ABSORBER LEFT REMOVAL

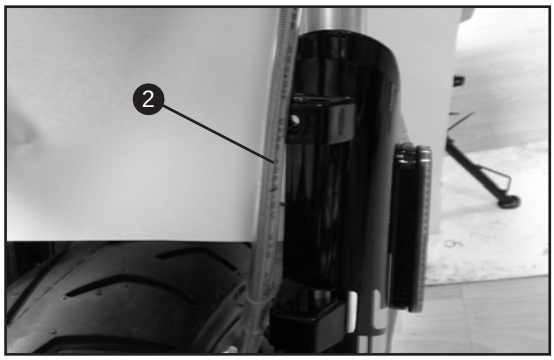
1. Remove the screw (1).



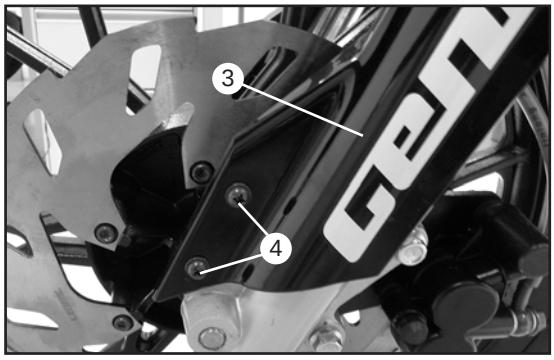
NOTE

Look to the nut on the rear.

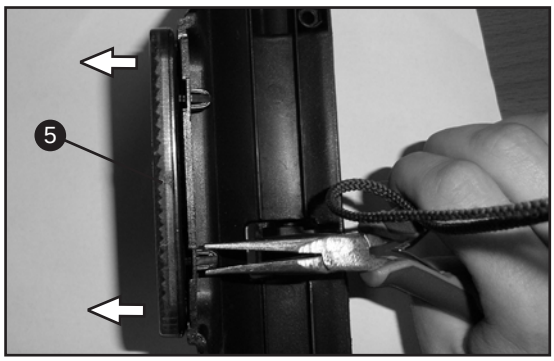
2. Thread of the breaking hose (2).



3. To remove the cover front shock absorber left (3) remove the two screws (4).



4. To remove the side reflector (5), press together the clip and pull the side reflector sidewards.
5. Install the cover front shock absorber left in reverse order.

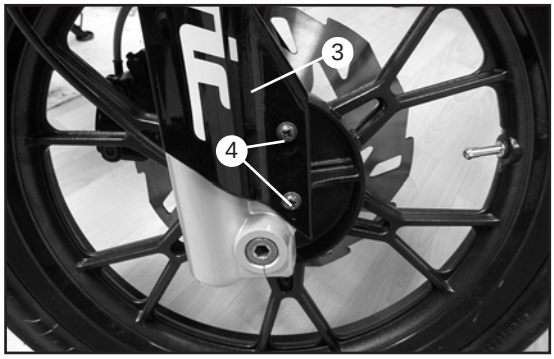


COVER FRONT SHOCK ABSORBER RIGHT REMOVAL

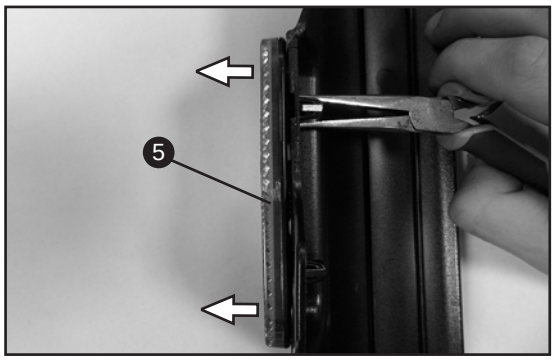
1. To remove the speedsensor cable (1), remove the screw (2).

NOTE

Look to the nut on the rear.



2. To remove the cover front shock absorber right (3) remove the two screws (4).



3. To remove the side reflector (5), pull down the clip and pull the side reflector sidewards.
4. Install the cover front shock absorber right in reverse order.

⚠ WARNING

When ever you remove a cover where a light or an electrical component is installed disconnect those parts from the main harness.

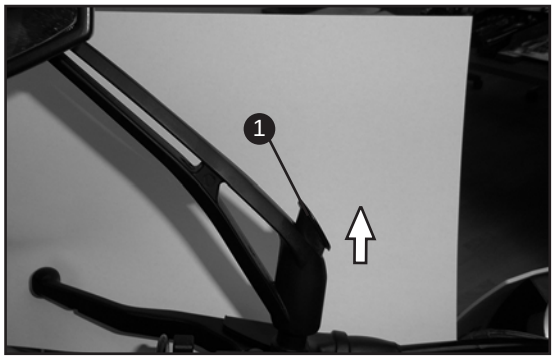
Do not damage any body cover during installation or disassembly.
Do not damage the knuckle on body cover during installation or disassembly.
Align the panel and cover plate on the body cover with their own grooves.
Correctly install the knuckle of each part in assembly.
No spare parts should be damaged in installation of the cover.

BACK VIEW MIRROWS

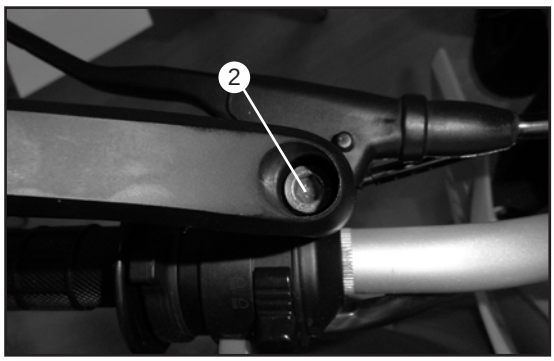
At all repairs in the area of the handle bar is advised to remove the back view mirrors.
To prevent damage during installation of the back view mirror consider that on the right side is a left-handed thread and vice versa.

BACK VIEW MIRROWS REMOVAL

1. Remove the cap (1) by pulling it out (arrow).



2. Remove the bolt (2).
3. Install the mirrow in reverse order.



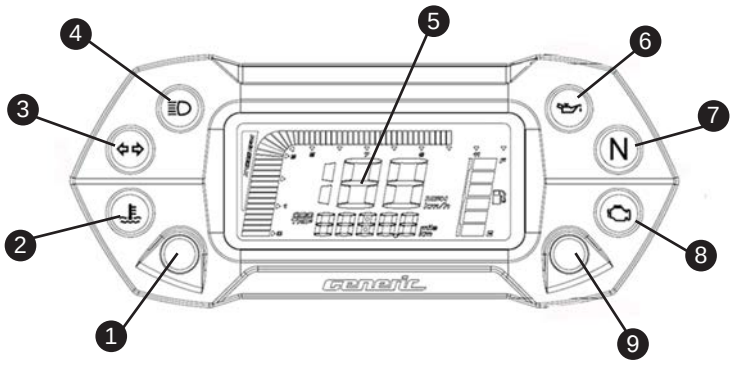
NOTE

Only one side (left side) is illustrated.

⚠ WARNING

RIGHT SIDE = LEFT SIDE THREAD
LEFT SIDE = RIGHT SIDE THREAD

SECOND SPEEDOMETER



PART LIST SECOND SPEEDOMETER

1. Left button
2. Temperature - Red light
3. Turn signal - Green light
4. High beam - Blue light
5. Display
6. Oil light - Red light
7. Neutral light - Green light
8. Engine light - Yellow light
9. Right button

SWITCH BUTTON FUNCTION LIST

Function	Power	Dsiplay	Left button	Right button	Action
Function switch	KEY-ON	ODO	<3seconds		Switch to TRIP
	KEY-ON	TRIP	<3seconds		Swtich to TIME
	KEY-ON	TIME	<3 seconds		When error code appear, screen display will switch to DTC. If not, the screen wil be switch to ODO
	KEY-ON	DTC	<3 seconds		Switch to ODO
Trip clear	KEY-ON	TRIP	>3 seconds		Trip reset
Oil light ODO record clea	KEY-ON	ODO (Oil light light up)		>3 seconds	Oil maintenance reset (Oil lights shut down)
DTC checking	KEY-ON	DTC	<3 seconds		Switch to error code
Unit switch	KEY-ON	km/h (ODO/TRIP/TIME)	>3 seconds		Switch to mph
	KEY-ON	Mph (ODO/TRIP/TIME)	>3 seconds		Switch to km/h
Back light color switch	KEY-ON	Blue (ODO/TRIP/TIME)	<3 seconds		Switch to Yellow
	KEY-ON	Yellow (ODO/TRIP/TIME)	<3 seconds		Switch to Blue
Enter setting	KEY-ON	Main screen	>3 seconds	>3 seconds	Enter hour setting, hour digital flashing
	KEY-ON	hour digital flashing		<3 seconds	Adjust clock, digital from 0-23
	KEY-ON	hour digital flashing	<3 seconds		Enter minutes setting, minutes digital flashing
	KEY-ON	minutes digital flashing		<3 seconds	Adjust minutes, digital 0-59
	KEY-ON	minutes digital flashing	<3 seconds		Enter Tire setting, hundreds` digital flashing
Tire setting	KEY-ON	4th digital flashing		<3 seconds	Adjust thousands separator from 0-2
	KEY-ON	4th digital flashing	<3 seconds		Enter tire setting, hundreds` digital flashing
	KEY-ON	3rd digital flashing		<3 seconds	Adjust hundreds` digital from 0-9
	KEY-ON	3rd digital flashing	<3 seconds		Enter tire setting, tens` digital flashing
	KEY-ON	2nd digital flashing		<3 seconds	Adjust tens` digital from 0-9
	KEY-ON	2nd digital flashing	<3 seconds		Enter tire settings, first digital flashing
Default setting	KEY-ON	Version 0 (Trigger X)			Default 2207 mm
		Version 1 (Trigger SM)			Default 1859 mm
Sensor point setting	KEY-ON	Default flashing		<3 seconds	Adjust Default, digital from 0-9
	KEY-ON	Default flashing	<3 seconds		Enter cycle and piston setting, The function can be set will flashing
Cycle and piston setting	KEY-ON	Default flashing		<3 seconds	Adjust cycle and piston setting, digital from: P-0.5,1,2,3,4,5,6
	KEY-ON	Default flashing	<3 seconds		Quite setting screen back to main screen

REMOVAL OF POWER LIMITATION

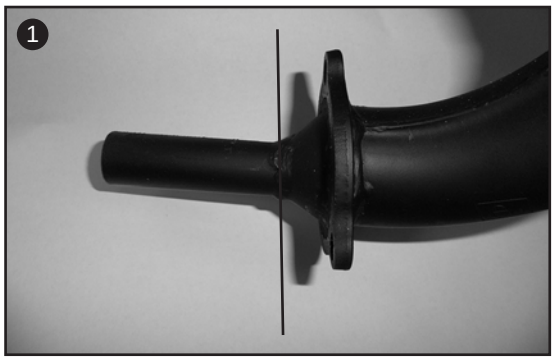
⚠ WARNING

THE REMOVAL OF POWER LIMITATION IS IN THE MOST COUNTRIES NOT LEGAL. IN CAUSE OF DETHROTTLING ALL CLAIMS OF WARRANTY EXPIRE AND ALL DAMAGES OF THE VEHICLE IS IN YOUR OWN RESPONSIBILITY.

There are 2 levels of dethrottling.

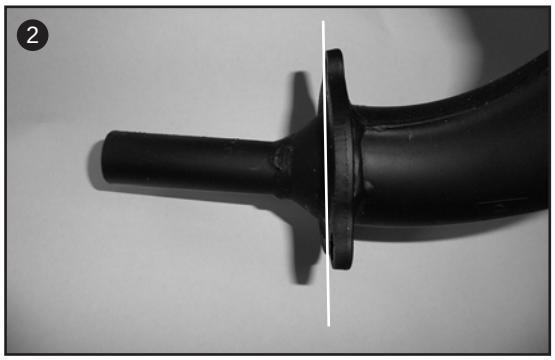
Level 1 (about 50-60 Km/h)

1. Remove the exhaust pear.
2. Cut off the throttle at the first weld as shown in the picture (1).
3. Install the exhaust pear in reverse order.

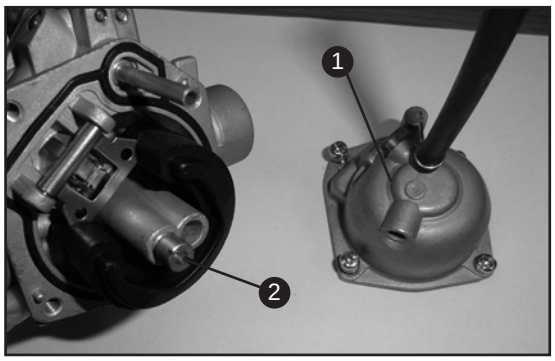


Level 2 (about 65-70 Km/h)

1. Remove the exhaust pear.
2. Cut off the complete throttle as shown in the picture (2).
3. Install the exhaust pear in reverse order.



4. Remove the carburettor.
5. Remove the carburettor cover (1).
6. Replace the main jet 95 (2) with a main jet 102.
7. Install the carburetto in reverse order.
8. Remove the spark plug.
9. Replace the spark plug NGK/BR8ES with a spark plug NGK/BR7ES.
10. Install the spark plug in reverse order.



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