Husqvarna®

CR 125 2011
WR 125 2011

Workshop Manual Ed. 06-2011

1st edition (06-2011)

CR 125 2011 - WR 125 2011

Husqvarna

Workshop Manual

CR 125 2011
WR 125 2011

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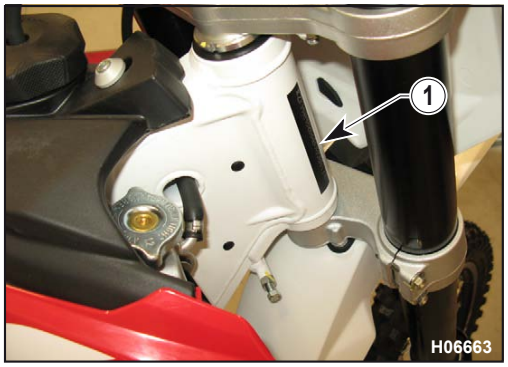
MODELS COVERED (from serial number onwards)



1. Chassis serial number

CR 125: ZKH4H00AABV050001
WR 125: ZKH4H00AABV000001

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

 Accident-prevention rules for operator and persons working nearby.

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

 Additional information concerning the operation covered in the text.

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

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

Table of Contents

NOTES

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

Section b

CR 125 2011 - WR 125 2011

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

WR models are for ROAD USE (DERATED); they are guaranteed exempt from functional defects and covered with legal guarantee, as long as the STANDARD CONFIGURATION IS MAINTAINED and the suggested maintenance table shown in Section “B” is observed.
For **WR** models modified to RACING SPECIFICATIONS (FULL POWER RATING), observe the scheduled maintenance chart for racing use provided in Section B.

* This motorcycle has not been designed to travel over long distances with the engine at top rpm, as in long-distance road or highway travel. Riding over long distances at full throttle may result in severe engine damage.

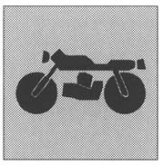
IMPORTANT
VEHICLE CONFIGURATION as outlined below is a prerequisite for the warranty to remain valid:
A) STANDARD MOTORCYCLE, FOR ROAD USE: DERATED;
B) COMPETITION MOTORCYCLE, RACING USE: with FULL POWER ENGINE

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

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

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

Section A



Engine
Type ..... single cylinder, 2 stroke
Cooling ..... liquid
Bore ..... mm 54 (2.12 in.)
Stroke ..... mm 54,5 (2.14 in.)
Displacement ..... cm^3 124,82 (7.61 cu. in.)
Compression ratio (with closed ports) 8,8:1

Starting
Type ..... kick start

Timing system
Type ..... reed valve at intake in the crankcase and H.T.S. valve with mechanical control at the exhaust

Lubrication
Motore ..... 4% (1:25) of oil-gasoline mix during running in; NOT LESS than 3% (1:33) when running in is over

Primary drive transmission/Gearbox ..... by the oil contained in the crankcase

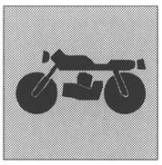
Ignition
Type ..... electronic digital capacitor-discharge type, with variable advance
Spark plug type.....CHAMPION QN 84/NGK BR9EG
Spark plug gap ..... 0,6 mm (0.0236 in.)

Fuel system
Type.....Carburettor “Mikuni” TMX 38
Venturi diameter ..... mm 38 (1.50 in.)
High speed jet (CR).....460
High speed jet (WR) 380
Low speed jet (CR).....35
Low speed jet (WR).....15
Starting jet (CR).....80
Starting jet (WR).....50
Main nozzle R-8 (914)
Floater (n°2) .....g 6,1
Throttle valve (CR) 4,0
Throttle valve (WR).....5,0
Metering pin.....6BFY43
Metering pin slot (CR)..... 3rd
Metering pin slot (WR).....2nd
Idle mixture adjusting screw (CR).....1+1/4 turns
Idle mixture adjusting screw (WR).....1+1/2 turns

Primary drive
Drive pinion gear ..... Z 22
Clutch ring gear ..... Z 71
Transmission ratio 3,227

Clutch
Type.....oil bath multiple disc clutch, mechanical control

Transmission
Type..... constant mesh gear type



Transmission ratio

1st gear	2,357 (z 33/14)
2nd gear	1,866 (z 28/15)
3rd gear	1,579 (Z 30/19)
4th gear	1,350 (Z 24/22)
5 th gear	1,181 (Z 26/22)
6 th gear	1,000 (Z 21/21)

SECONDARY DRIVE

Transmission sprocket	Z 13
Rear wheel sprocket	Z 50
Transmission ratio	3,846
Transmission chain dimensions	5/8”x1/4”

FINAL RATIOS

1st gear	29,258
2nd gear	23,170
3rd gear	19,599
4th gear	16,757
5th gear	14,699
6th gear	12,412

FRAME

Type	Steel single tube cradle (roud tubes); light alloy rear frame.

FRONT SUSPENSION

Type	”Upside-down” telescopic hydraulic front fork with advanced axle (adjustable in compression and rebound stroke); stanchions tubes Ø 1.89 in.
Legs axis stroke	300 mm (11.80 in.)

REAR SUSPENSION

Type	progressive with hydraulic single shock absorber (spring preload adjustment)
Wheel stroke	296 mm (11.65 in.)

FRONT BRAKE

Type	fixed disc Ø 10.24 in. “Wave” type with hydraulic control and floating caliper

REAR BRAKE

Type	floating disc, Ø 9.45 in. “Wave” type with hydraulic control and floating caliper

RIMS

Front	in light alloy: 1,6x21”
Rear (CR)	in light alloy: 2,15x19”
Rear (WR)	in light alloy: 2,15x18”

Tires

Front	
(CR)	80/100-21”
(WR)	90/90-21”
Rear	
(CR)	100/90-19”
(WR)	120/90-18”

Cold tire pressure

(front) (*) ..... 12.8÷14.2 psi
(front) (%) ..... 15.6 psi
(rear) (*) ..... 11.4÷12.8 psi
(rear) (%) ..... 14.2 psi

(*) Racing use - (%) Road use

Electrical components location

The ignition system includes the following elements:
- Generator, on the inner side of L.H. crankcase cover;
- Spark plug on cylinder head;

(CR)
- Electronic ignition coil under the fuel tank;
- Electronic control unit positioned on left-hand side, under tank.

(WR)
- Transducer secured onto a bracket under fuel tank;
- Voltage regulator secured onto a bracket close to transducer.

(WR)
The electrical system includes the following elements:
- Flashing indicator device under the fuel tank
- Headlamp with twin halogen bulb of 12V-35/35W and parking light bulb of 12V-5W;
- LED taillight;
- Turning indicators 12V-10W bulb;
- Horn up front on right side, near the radiator.

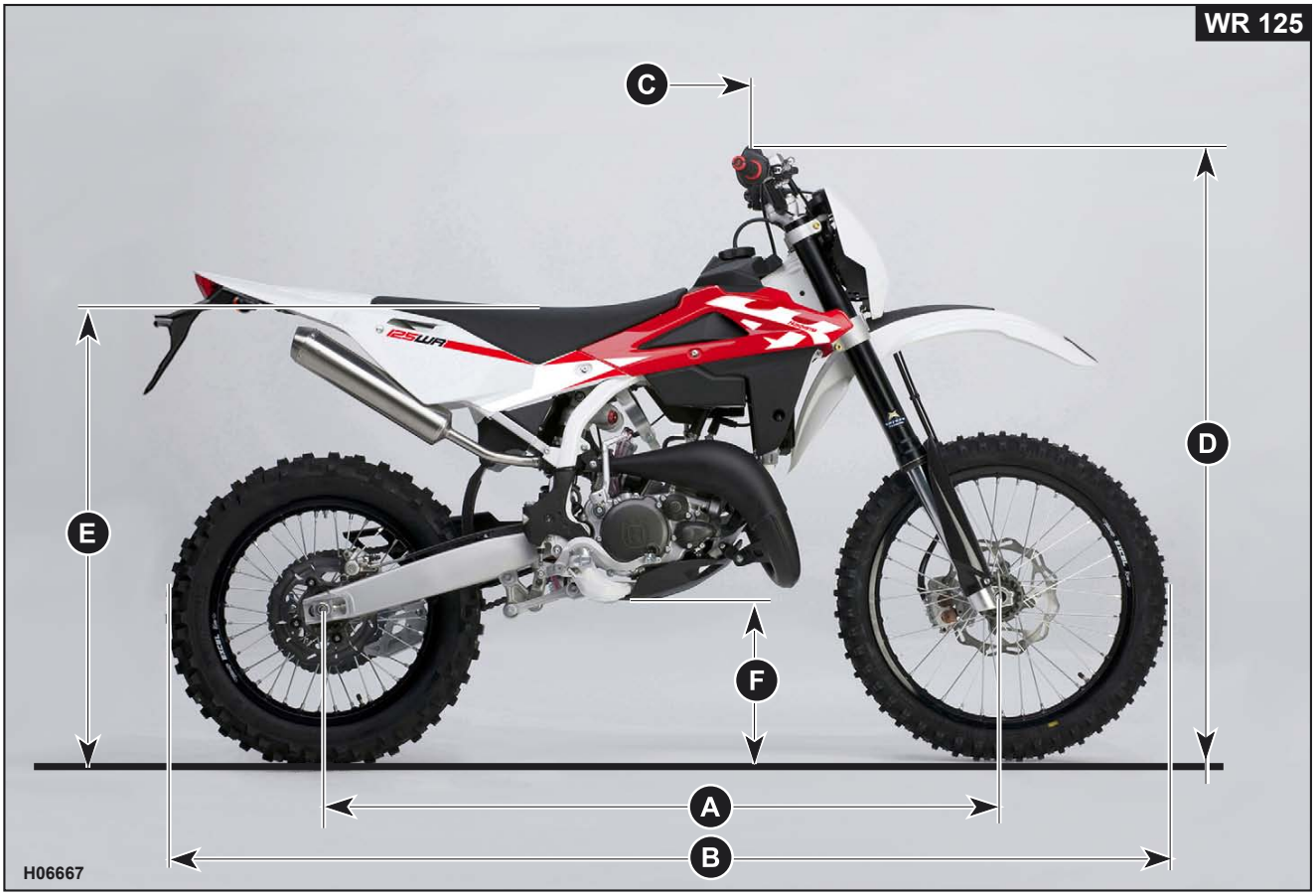
Overall dimensions

Wheelbase A
(CR)..... mm 1460 (57.48 in.)
(WR)..... mm 1465 (57.68 in.)
Overall length B
(CR)..... mm 2215 (87.2 in.)
(WR)..... mm 2260 (88.98 in.)
Overall width C
(CR)..... mm 820 (32.28 in.)
(WR)..... mm 840 (33.07 in.)
Overall height D
(WRE)..... mm 1305 (51.38 in.)
(WR)..... mm 1300 (51.18 in.)

Saddle height E
(CR)..... mm 985 (38.78 in.)
(WR)..... mm 975 (38.39 in.)
Minimum ground clearance F
(CR)..... mm 325 (12.08 in.)
(WR)..... mm 315 (12.04 in.)

Weight

Kerb weight, without fuel (CR):.....92 Kg (202,83 lb)
Kerb weight, without fuel (WR):.....96 Kg (211,64 lb)



Capacities	Type	Quantity
Fuel tank capacity (reserve included)	98 octane unleaded fuel	7 l -1.54 Imp. Gall 1.59 U.S. Gall
Fuel reserve		1,5 l - 0.33 Imp. Gall 0.34 U.S. Gall
Coolant capacity		0.24÷0.29 Imp. Gall 0.25÷0.3 U.S. Gal
Transmission oil		0.18 Imp. Gall 0.18 U.S. Gall
Engine lubricating oil	CASTROL A747	
Gearbox and primary drive lubricating oil	CASTROL POWER 1 RACING 10W-40	
Engine coolant	CASTROL MOTORCYCLE COOLANT	
Brake system fluid	CASTROL RESPONSE SUPER DOT 4	
Grease lubrication	CASTROL LM GREASE 2	
Final drive chain lubrication	CASTROL CHAIN LUBE RACING	
Front fork oil	KHL15-11	(CR) 352 cm^3 (WR) 643 cm^3 140 mm
Electric contact protection	CASTROL METAL PARTS CLEANER	
Fillers for radiator	AREXONS TURAFALLE LIQUIDO	

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

Section B

WR - CR 125 Competition motorcycle, racing use: with full power engine	SCHEDULED MAINTENANCE CHART						
	ENGINE						
ITEM	COUPON AFTER FIRST 4 hours	COUPON EVERY 4h CR/8h WR	COUPON EVERY 8h CR/16h WR	COUPON EVERY 16h CR/32h WR	COUPON EVERY 32h CR/64h WR	 EVERY 40h CR/80h WR	REPLACE IF NEC-ESSARY
CYLINDER ASSY .			C				X
REED VALVE					C		X
PISTON ASSY.				S			
CONNECTING ROD ASSY.				S			
EXHAUST VALVE DRIVE REGULATOR					C		
EXHAUST VALVE FORK				S			
EXHAUST VALVE COUNTERSHAFT				S			
EXHAUST VALVE CONTROL ROD				S			
EXHAUST VALVE			P				
TRANSMISSION OIL	S		S				
SET OF MATCHED PRIMARY				C			X
CLUTCH DISCS HOUSING				C			X
CLUTCH DISCS			C				X
CLUTCH DISCS PRESSURE PLATE				C			X
CLUTCH SPRING				C			X
CLUTCH DISCS HOUSING				C			X
CLUTCH DISENGAGEMENT ROD				C			X
CLUTCH CONTROL SHAFT				C			X
CLUTCH SPRING PLATE				C			X

LEGEND
C: CHECK
L: LUBRICATE
P: CLEAN
S: CHANGE

NOTES:
- REPLACE GASKETS AND SEALS AFTER EACH REMOVAL;
- REPLACE SCREWS AND BOLTS IF DAMAGED;
- PERFORM A GENERAL INSPECTION AFTER RIDING ON MUDDY OR SANDY TERRAIN.

WR - CR 125 Competition motorcycle, racing use: with full power engine	SCHEDULED MAINTENANCE CHART						
	CHASSIS						
ITEM	COUPON AFTER FIRST 4 hours	COUPON EVERY 4h CR/8h WR	COUPON EVERY 8h CR/16h WR	COUPON EVERY 16h CR/32h WR	COUPON EVERY 32h CR/64h WR	EVERY 40h CR/80h WR	REPLACE IF NECESSARY
DRIVE SPROCKET			C				X
STARTING PEDAL				L			
GEAR CONTROL PEDAL			C				X
SPARK PLUG			S				
SPARK PLUG CAP			C				X
CARBURETOR ASSY.		P			R		
AIR FILTER			C / P				X
AIR FILTER BOX/CARBURETOR MANIFOLD				C			X
RADIATORS		C					X
COOLANT HOSES AND CLAMPS		C					X
COOLANT		C					X
FOOTRESTS, FOOTREST PINS AND SPRINGS			C				X
SADDLE FRAME FASTENING BOLTS, ENGINE FASTENING BOLTS	C			C			
SIDE STAND		C					
CHAIN GUIDE ROLLER, BEARINGS		C					
STEERING HEAD, STEERING CROWN WITH PIN			L				
FRONT FORK			R				
HANDLEBAR HOLDERS AND FASTENING SET	C			C			
REAR SWING ARM BUSHINGS				C			
REAR CHAIN SLIDER				C			X
REAR SUSPENSION LINKS BUSHINGS				C			
REAR CHAIN GUIDE/REAR CHAIN GUARD		C					X
REAR SWING ARM PIVOT NEEDLE BEARINGS			L				
REAR SHOCK ABSORBER						R	
REAR SUSPENSION LINKS NEEDLE BEARINGS AND GUDGEON PIN		L					
THROOTLE CONTROL ASSY.		C, L					
CLUTCH CONTROL ASSY.		C					
THROOTLE AND CLUTCH CABLES		C		L			X
FRONT BRAKE DISC			C				X
FRONT BRAKE SYSTEM FLUID		C				S	
REAR BRAKE DISC			C				X
REAR BRAKE SYSTEM FLUID		C				S	

WR - CR 125 Competition motorcycle, racing use: with full power engine	SCHEDULED MAINTENANCE CHART						
	CHASSIS						
ITEM	COUPON AFTER FIRST 4 hours	COUPON EVERY 4h CR/8h WR	COUPON EVERY 8h CR/16h WR	COUPON EVERY 16h CR/32h WR	COUPON EVERY 32h CR/64h WR	 EVERY 40h CR/80h WR	REPLACE IF NECESSARY
BRAKE PADS		C					X
BRAKE SYSTEM PUMP/CALIPER HOSES		C					
FUEL HOSES		C				S	X
EXHAUST SILENCER PACK				C			X
EXHAUST PIPE AND SILENCER		C					X
WHEEL SPOKES TENSION	C		C				
WHEEL HUB BEARINGS					S		
REAR DRIVEN SPROCKET			S				
REAR DRIVEN SPROCKET SCREWS TIGHTENING	C		C				
REAR TRASMISSION CHAIN	C,L		S				X
BOLTS AND NUTS TIGHTNESS	C			C			

LEGEND
C: CHECK
L: LUBRICATE
P: CLEAN
S: CHANGE

NOTES:
- REPLACE GASKETS AND SEALS AFTER EACH REMOVAL;
- REPLACE SCREWS AND BOLTS IF DAMAGED;
- PERFORM A GENERAL INSPECTION AFTER RIDING ON MUDDY OR SANDY TERRAIN.

WR 125 Standard motorcycle, street legal (with limited power engine)	SCHEDULED MAINTENANCE CHART					
	ENGINE					
ITEM	COUPON AFTER FIRST 1000Km	COUPON EVERY 1500 Km	COUPON EVERY 3000 Km	COUPON EVERY 7000 Km	COUPON EVERY 10000 Km	REPLACE IF NECESSARY
CYLINDER ASSY .			C			X
REED VALVE				C		X
PISTON ASSY.			S			
CONNECTING ROD ASSY.				S		
EXHAUST VALVE DRIVE REGULATOR				C		
EXHAUST VALVE CONTROL ROD				S		
EXHAUST VALVE			C			
TRANSMISSION OIL	S		S			
SET OF MATCHED PRIMARY					C	X
CLUTCH DISCS HOUSING			C	C		X
CLUTCH DISCS				C		X
CLUTCH DISCS PRESSURE PLATE			C	C		X
CLUTCH SPRING			C	C		X
CLUTCH DISCS HOUSING			C	C		X
CLUTCH DISENGAGEMENT ROD			C	C		X
CLUTCH CONTROL SHAFT			C	C		X
CLUTCH SPRING PLATE			C	C		X

LEGEND
C: CHECK
L: LUBRICATE
P: CLEAN
S: CHANGE

NOTES:
- REPLACE GASKETS AND SEALS AFTER EACH REMOVAL;
- REPLACE SCREWS AND BOLTS IF DAMAGED;
- PERFORM A GENERAL INSPECTION AFTER RIDING ON MUDDY OR SANDY TERRAIN.

WR 125 Standard motorcycle, street legal (with limited power engine)	**SCHEDULED MAINTENANCE CHART**					
	CHASSIS					
ITEM	COUPON AFTER FIRST 1000Km	COUPON EVERY 1500 Km	COUPON EVERY 3000 Km	COUPON EVERY 7000 Km	COUPON EVERY 10000 Km	REPLACE IF NECESSARY
DRIVE SPROCKET				C		X
STARTING PEDAL					L	
GEAR CONTROL PEDAL				C		X
SPARK PLUG					S	
SPARK PLUG CAP		C			C	X
CARBURETOR ASSY.				P		
AIR FILTER			C / P			
AIR FILTER BOX/CARBURETOR MANIFOLD					C	X
RADIATORS				C		X
COOLANT HOSES AND CLAMPS				C		X
COOLANT	C	C				X
FOOTRESTS, FOOTREST PINS AND SPRINGS		C				X
SADDLE FRAME FASTENING BOLTS, ENGINE FASTENING BOLTS	C		C			
SIDE STAND	C		C			
CHAIN GUIDE ROLLER, BEARINGS	C		C			
STEERING HEAD, STEERING CROWN WITH PIN		L				
FRONT FORK		R				
HANDLEBAR HOLDERS AND FASTENING SET	C		C			
REAR SWING ARM BUSHINGS			C			
REAR CHAIN SLIDER			C			X
REAR SUSPENSION LINKS BUSHINGS			C			
REAR CHAIN GUIDE/REAR CHAIN GUARD	C		C			X
REAR SWING ARM PIVOT NEEDLE BEARINGS		L				
REAR SHOCK ABSORBER					R	
REAR SUSPENSION LINKS NEEDLE BEARINGS AND GUDGEON PIN			L			
THROOTLE CONTROL ASSY.			C / L			
CLUTCH CONTROL ASSY.			C (•)			
THROOTLE AND CLUTCH CABLES			L			X
FRONT BRAKE DISC		C				X
FRONT BRAKE SYSTEM FLUID					S	
REAR BRAKE DISC			C			X
REAR BRAKE SYSTEM FLUID					S	
BRAKE PADS	C		C			X

WR 125 Standard motorcycle, street legal (with limited power engine)	SCHEDULED MAINTENANCE CHART					
	CHASSIS					
ITEM	COUPON AFTER FIRST 1000Km	COUPON EVERY 1500 Km	COUPON EVERY 3000 Km	COUPON EVERY 7000 Km	COUPON EVERY 10000 Km	REPLACE IF NECESSARY
BRAKE SYSTEM PUMP/CALIPER HOSES				C		X
FUEL HOSES					S	X
EXHAUST SILENCER PACK			C			X
EXHAUST PIPE AND SILENCER	C		C			X
WHEEL SPOKES TENSION	C	C				
WHEEL HUB BEARINGS				S		
REAR DRIVEN SPROCKET		S				
REAR DRIVEN SPROCKET SCREWS TIGHTENING	C	C				
REAR TRASMISSION CHAIN	C,L	S				X
BOLTS AND NUTS TIGHTNESS	C		C			

LEGEND
C: CHECK
L: LUBRICATE
P: CLEAN
S: CHANGE
C (•): CHECK CLEARANCE

NOTES:
- REPLACE GASKETS AND SEALS AFTER EACH REMOVAL;
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Section C

ENGINE

Trouble	Cause	Remedy
Engine does not start or has starting troubles	**Insufficient compression**	
	1. Piston seized	Replace
	2. Connecting rod small or big end seized	Replace
	3. Worn piston ring	Replace
	4. Worn cylinder	Replace
	5. Cylinder head loosely tightened	Tighten
	6. Spark plug loose	Tighten
	Weak or no spark	
	1. Spark plug faulty	Replace
	2. Fouled or wet spark plug	Clean or dry
	3. Spark plug electrode gap too wide	Adjust
	4. Ignition coil faulty (CR)	Replace
	5. Faulty transducer (WR)	Replace
	5. High-tension cables open circuit or shorted	Check
	The carburettor is not receiving fuel	
	1. Tank cap breather clogged	Clean
	2. Fuel cock clogged	Clean
	3. Clogged fuel inlet hose	Clean
	4. Floater valve faulty	Replace
	5. Linkage is blocking floater valve	Release
	Carburettor floods	
	1. High fuel level in bowl	Adjust
	2. Floater valve worn or stuck open	Replace or release
Engine stalls easily	1. Fouled spark plug	Clean
	2. Electronic control unit faulty (CR)	Replace
	3. Faulty transducer (WR)	Replace
	4. Carburettor jets clogged	Clean
	5. Low idle	Adjust

Trouble	Cause	Remedy
Engine is noisy	**Noise seems to come from piston**	
	1. Too much piston-to-cylinder clearance	Replace
	2. Worn piston rings or piston grooves	Replace
	3. Too much carbon build-up in combustion chamber or on piston crown	Clean
	Noise seems to come from crankshaft	
	1. Worn main bearings	Replace
	2. Connecting rod big end has too much side clearance or end float	Replace
	3. Crankshaft gear damaged	Replace
	Noise seems to come from the clutch	
	1. Worn plates	Replace
	2. Too much clearance between clutch housing and friction plates	Replace
	Noise seems to come from gearbox	
	1. Worn gears	Replace
	2. Worn gear grooves	Replace
Noise seems to come from the secondary drive chain	1. Chain stretched (worn) or improperly adjusted	Replace or adjust
	2. Worn transmission sprockets	Replace
The clutch slips	1. Clutch adjuster screw with insufficient clearance	Adjust
	2. Weak clutch springs	Replace
	3. Worn clutch plates	Replace
The clutch is tight	1. Clutch adjuster screw with exceeding clearance	Adjust
	2. Non uniform spring load	Replace
	3. Bent clutch plates	Replace
The gears cannot be inserted.	1. Clutch does not disengage	Adjust
	2. Bent or seized shifter forks	Replace
	3. Worn gear ratchets	Replace
	4. Damaged shifter fork shafts	Replace
Gear shift pedal does not return to original position	1. Weak or broken selector return spring	Replace
	2. Worn shifter forks	Replace

Trouble	Cause	Remedy
Transmission jumps out of gear	1. Worn sliding gear dogs	Replace
	2. Worn gear grooves	Replace
	3. Worn dog slots in gears	Replace
	4. Worn selector shaft splines	Replace
	5. Worn shifter fork shafts	Replace
	6. Worn shifter forks	Replace
Engine has low power	1. Dirty air filter	Clean
	2. Poor fuel quality	Replace
	3. Intake coupling loose	Tighten
	4. Spark plug electrode gap too wide	Adjust
	5. Insufficient compression	Check for the cause
	6. Carburettor main jet clogged or of the wrong size	Clean or replace
	7. Too much ignition advance	Adjust
	8. Deposits on the exhaust valve	Clean
	9. Exhaust valve wrongly installed	Check / Adjust
The engine overheats	1. Dirty combustion chamber and/or piston crown with carbon deposits	Clean
	2. Insufficient oil in engine or wrong oil	Top up or change
	3. Obstructions blocking air flow on radiator	Clean
	4. Cylinder head gasket leaking	Replace
	5. The clutch slides	Adjust
	6. Too much ignition delay	Adjust
Coolant drops around spark plug electrodes	1. Cylinder head gasket leaking	Replace
	2. Porosities inside head dome	Replace
Oil level increase inside crankcase due to the presence of coolant	1. Water pump impeller shaft leaking	Check

CHASSIS

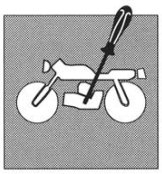
Trouble	Cause	Remedy
The handlebar is hard to turn	1. Insufficient tyre pressure	Inflate
	2. Bearing adjuster ring nut or steering stem nut overtightened	Adjust
	3. Bent steering stem	Replace bottom yoke
	4. Worn or seized steering bearings	Replace
Handlebar vibration	1. Bent fork legs	Replace
	2. Bent front wheel axle	Replace
	3. Warped chassis	Replace
	4. Bent front wheel rim	Replace
	5. Worn front wheel bearings	Replace
Damping is too hard	1. Too much oil in fork legs	Remove excess oil
	2. Fork oil viscosity too high	Replace
	3. Overinflated tyres	Deflate
	4. Improperly set rear shock absorber	Adjust
	5. The compression damping adjuster adjustment is too hard	Adjust
	6. Damaged bushing	Replace
	7. Bent slide pipe	Replace
Damping is too soft	1. Insufficient oil in fork legs	Top up
	2. Fork oil viscosity too low	Replace
	3. The fork spring free lenght is shorter than service limit	Replace
	4. Damaged damping valve	Replace
	5. Damaged oil seals	Replace
	6. The compression damping adjuster adjustment is too soft	Adjust
(**Front and rear) wheel vibrates**	1. Bent wheel rim	Replace
	2. Worn wheel hub bearings	Replace
	3. Incorrect spoke tension	Adjust
	4. Wheel axle nut loose	Tighten
	5. Worn rear swinging arm bearings	Replace
	6. Improperly adjusted chain tensioners	Adjust
	7. Improperly balanced wheel	Balance

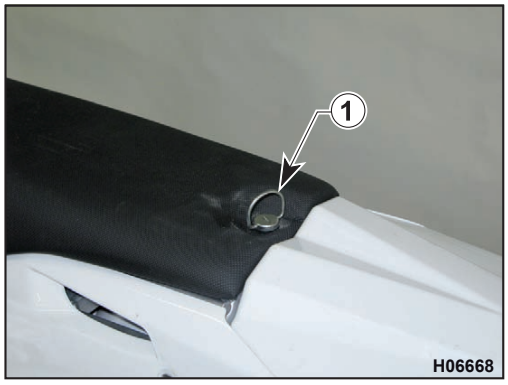
Trouble	Cause	Remedy
Rear suspension is noisy	1. Worn link rod spacers or bearings	Replace
	2. Worn shock absorber ball joints	Replace
	3. Shock absorber faulty	Replace
Poor braking (front and rear)	1. Air in brake system	Bleed
	2. Insufficient fluid in tank	Top up
	3. Worn brake pad and/or disc	Replace
	4. Damaged disc	Replace
	5. Improperly adjusted brake pedal	Adjust
	6. Water in brake system	Change fluid

ELECTRICAL SYSTEM (see also Section M)

Trouble	Cause	Remedy
The spark plug gets dirty easily	1. Dirty air filter	Clean
	2. Worn piston rings	Replace
	3. Worn piston or cylinder liner	Replace
	4. Mixture too rich	Adjust carburettor
Spark plug electrodes overheat	1. Spark plug electrode gap too close	Adjust
	2. Heat rating too high	Replace with recommended spark plug
	3. Mixture too lean	Adjust carburettor
Generator does not charge or is not providing enough charge (WR)	1. Cables running to voltage regulator improperly connected or shorted	Connect correctly or replace
	2. Voltage regulator faulty	Replace
	3. Generator coil faulty	Replace
Generator overcharges battery (WR)	1. Voltage regulator faulty	Replace

Section D



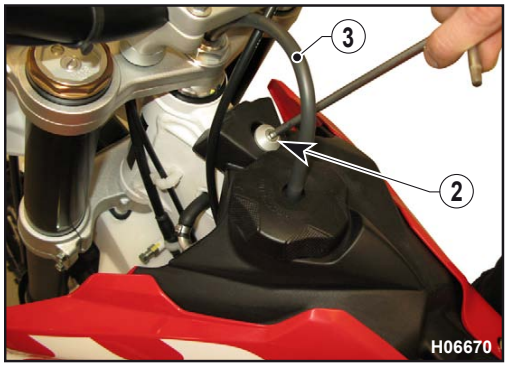


Saddle removal

Turn the rear fixing (1) counter clockwise, remove it and extract the saddle.

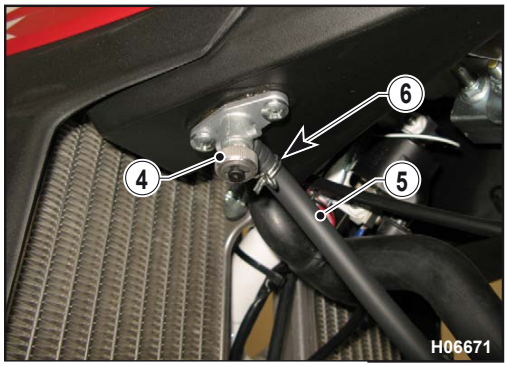
Tank removal

Remove the saddle as described in the relevant paragraph.
Remove the screws (1) and the side panels.
(8 mm Allen wrench)

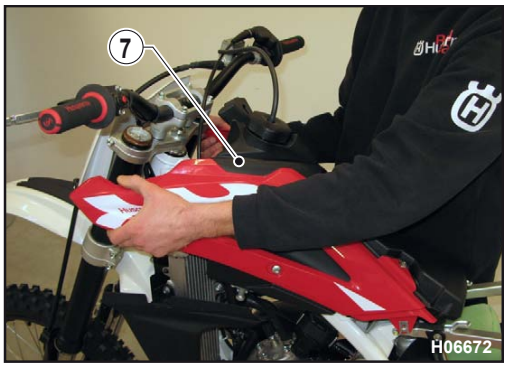


Remove the tank retaining screw (2).
(8 mm Allen wrench)

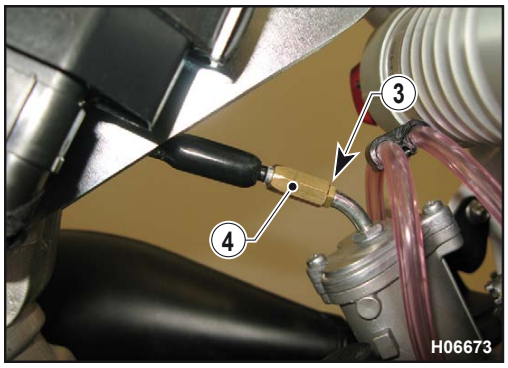
Slide out the breather hose (3).



Release the clamp (6), close the cock (4) and disconnect the hose (5).



Lift the front part of the tank (7) and remove it from the bike with the scoops.

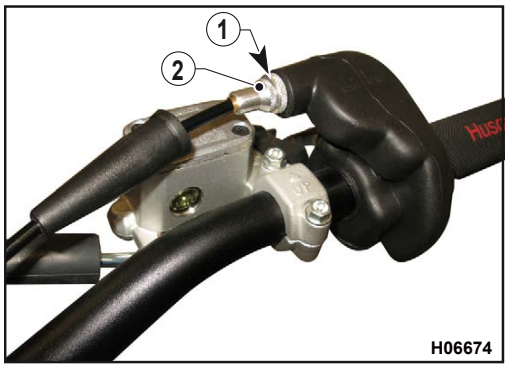


Throttle cable adjustment

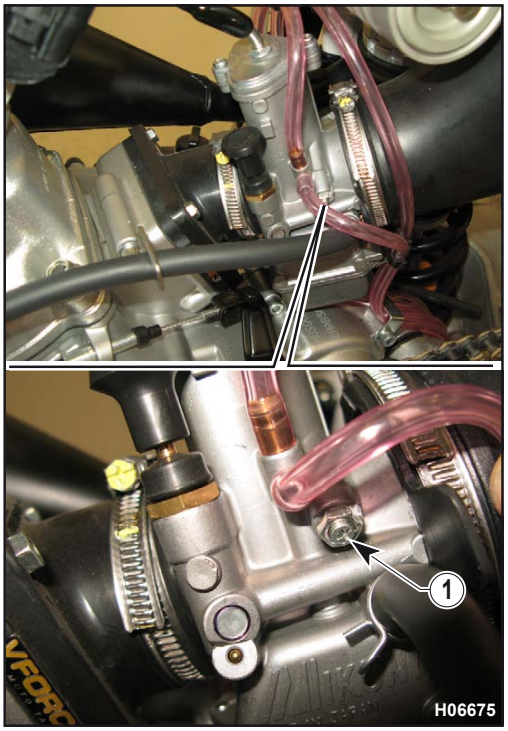
The throttle cable can be adjusted using the screw set on the throttle, or using the adjusting screw set on the
carburettor cover. To check for proper adjustment of throttle cable, proceed as follows:

- remove rubber cap;
- move transmission sheath to and fro to ensure a play of approx. 1 mm;
- should play be greater than 1 mm, loosen lock nut (1) and register (2); should play less than 1 mm, then tighten lock nut and register;

- if register (2) should not provide sufficient movement to allow for correct adjustment, then adjust register placed on carburetor.
  There should be approx. 1 mm play on latter register; should this not be the case, then loosen lock nut (3), and loosen or tighten screw (4), to respectively increase or decrease the play.



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

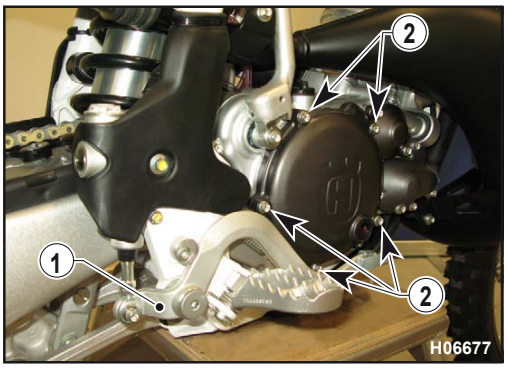


Idle adjustment

Idling should be adjusted only when the engine is hot and throttle is closed, as follows:

- turn the idle speed adjuster screw (1) until setting 1500 RPM ± 100 (turn clockwise to increase the speed and counter clockwise to reduce the speed).

Exhaust gas contains poisonous carbon monoxide gas. Never run the engine in a closed area or in a confined area.



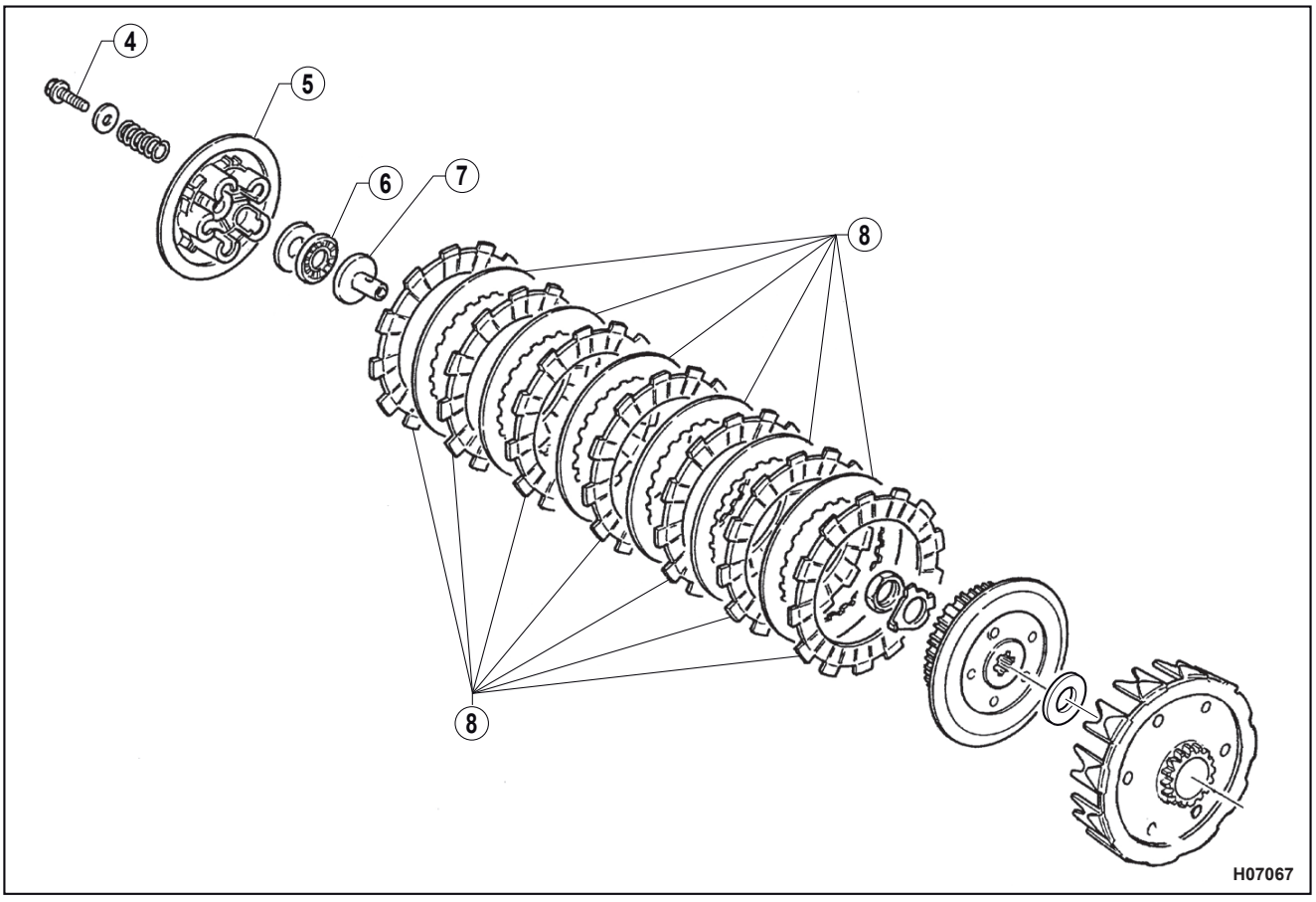
Clutch plate replacement

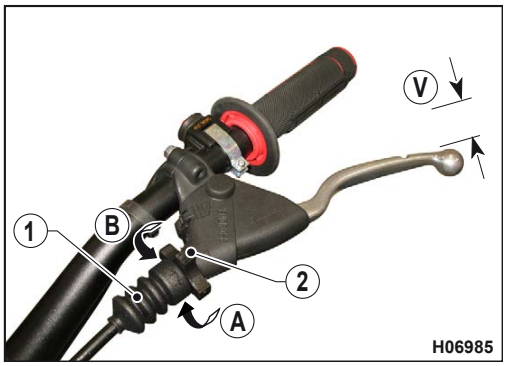
Drain transmission oil as outlined in the relevant paragraph.

- Remove the brake pedal (1).
- Remove the five retaining screws (2) and the clutch cover (3).
- Using an 8 mm wrench, unscrew the five screws (4) securing the clutch springs. Remove springs, pressure plate (5) with bearing (6) and clutch actuator plate (7).
- Remove the plates (8), lubricate the new plates with engine oil and install them (always start with a friction plate).

Refit clutch actuator plate, bearing and pressure plate.
Tighten the spring screws gradually in a cross pattern.
When refitting the clutch cover, check gasket for wear and replace as required.

For additional information on assembly procedures, see Section "H" Engine assembly.



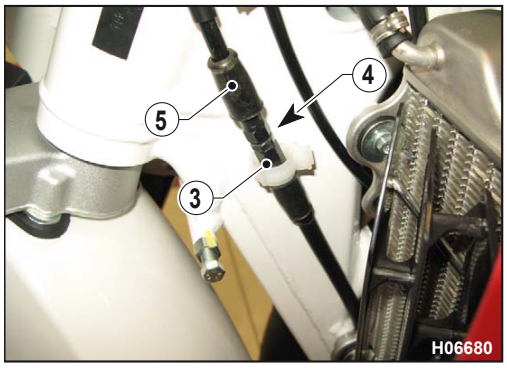


Adjustment of the clutch control lever

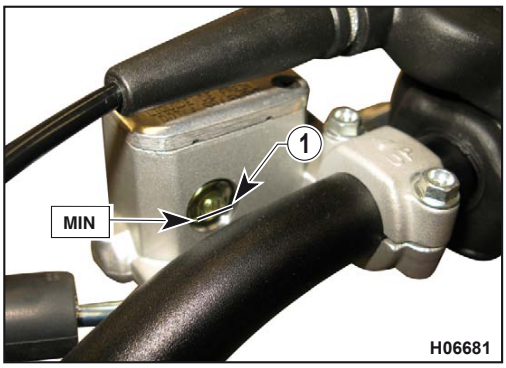
To adjust the clutch control lever, you will need to adjust cable tension using the adjuster on the lever.

- Shift the rubber protection (1).
- Work on the adjuster screw (2), turn it in the direction indicated by the arrow (A) to decrease clearance, turn it in the direction indicated by the arrow (B) to increase it.
  There should be at least 10 mm (0.39 in.) free play (V) before the clutch begins to disengage.

The adjustment can be also effected with tightener (3) set on the left of the frame. Take care to tighten properly the lock nut. If the clutch slips under load or drags in disengaged position after play has been adjusted, it must be taken apart for inspection.



(3) Adjusting screw
(4) Locknut
(5) Rubber cap

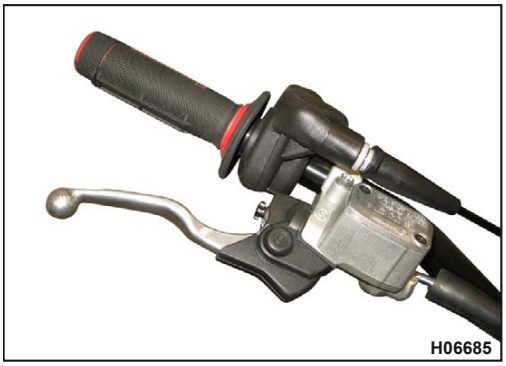


Front brake fluid level check

The level of the fluid in pump reservoir must never be below the minimum value (1), which can be checked from the window on the rear side of the pump body. A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.

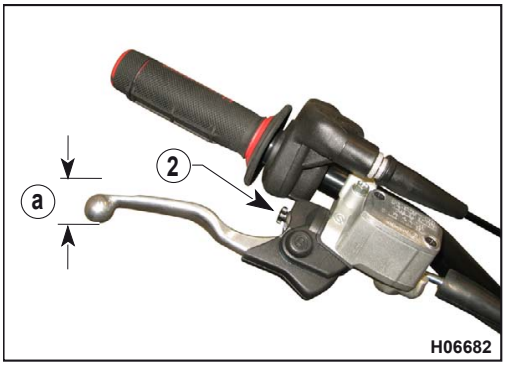
If the brake lever feels mushy when pulled, there may be air in the brake lines or the brake may be defective.
Check the system or proceed to drainage as outlined in the relevant paragraph.

Do not spill brake fluid onto any painted surface or light lens.



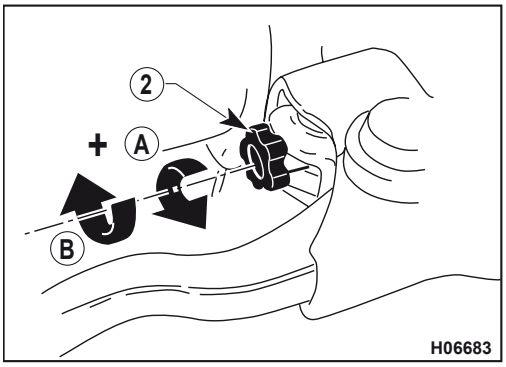
Do not mix two brands of fluid. Completely change the brake fluid in the brake system if you wish to switch to another fluid brand.

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

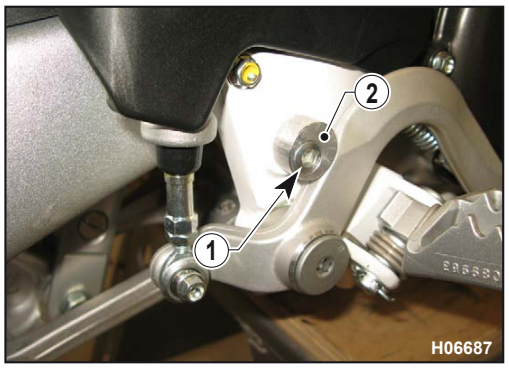


Front brake lever adjustment

The adjuster (2), located on the control lever, allows adjusting of the free play (a).
Free play (a) must be at least 10 mm (0.39 in.).



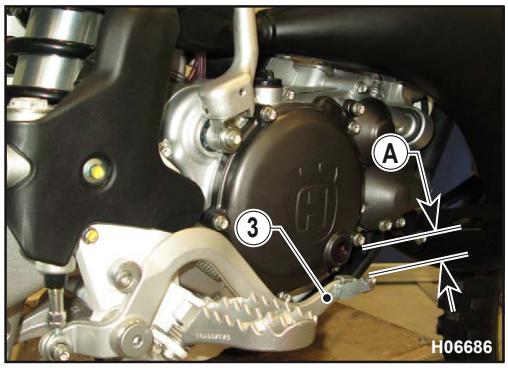
A: to encrease clearance
B: to decrease clearance

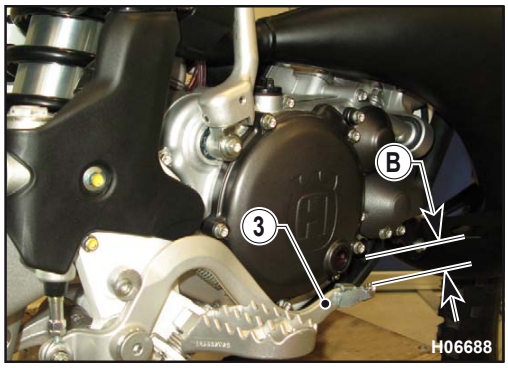


Rear brake pedal position adjustment

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

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



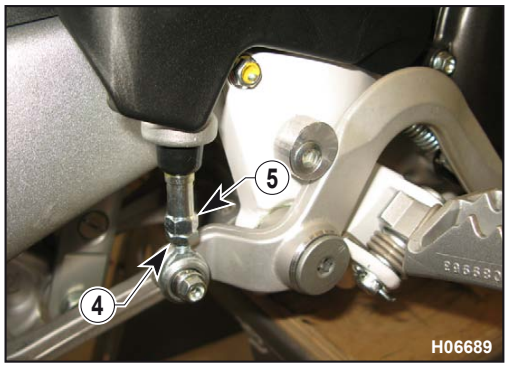


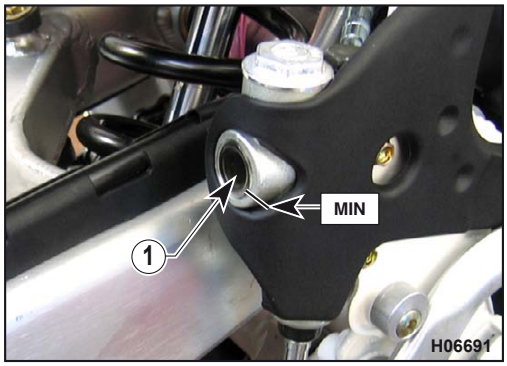
Rear brake pedal free play adjustment

The rear brake pedal (3) should have 5 mm free play (B) before the brake begins to bite. Should this not happen, operate as follows:
- Loosen the nut (4);
- Operate the master cylinder linkage (5) to increase or decrease free play;
- Tighten the nut (4) at the end of the operation.

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

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





Rear brake fluid level check

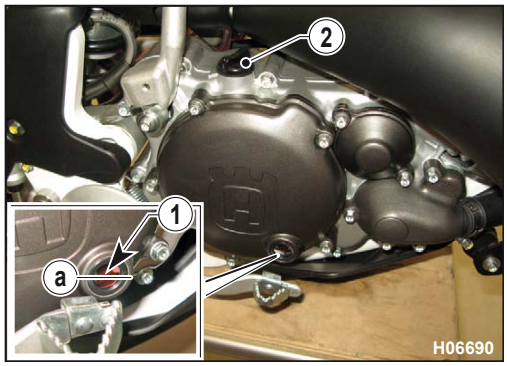
Master cylinder fluid level - visible through sight glass (1) - must be above the minimum notch on master cylinder reservoir.
A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.

If the brake pedal feels mushy when pulled, there may be air in the brake lines or the brake may be defective.
Check the system or proceed to drainage as outlined in the relevant paragraph.

Do not spill brake fluid onto any painted surface or light lens.

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

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

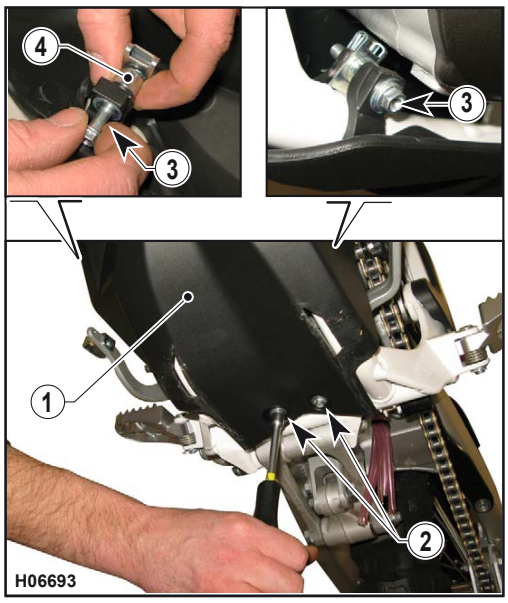


Checking the oil level

Keeping the motorbike level and upright, check the oil level through the inspection (1) window on the right crankcase. Make sure the level (a) is about midway of the sight glass.
To top up, remove the filler cap (2).

Have this operation made with warmed-up engine.

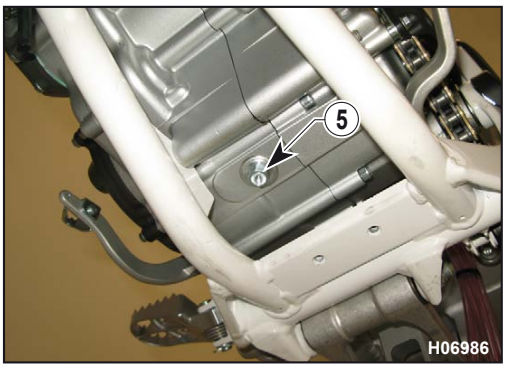
Be careful not to touch hot engine oil.



Changing transmission/gearbox oil

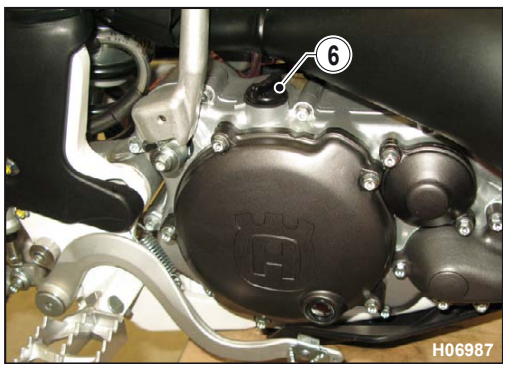
Remove the engine guard (1) by loosening the lower screws (2) and the side screws (3).

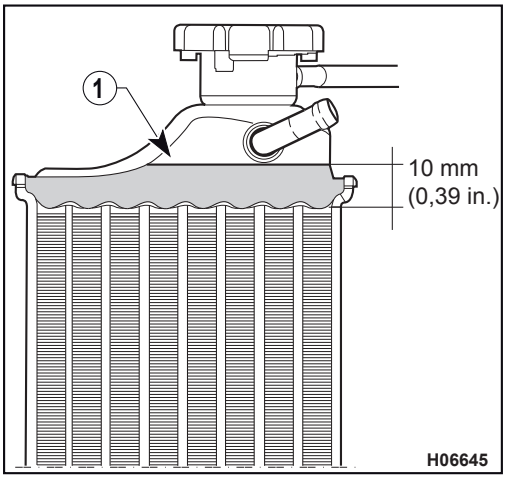
On reassembly, make sure the spacer (4) is correctly positioned.

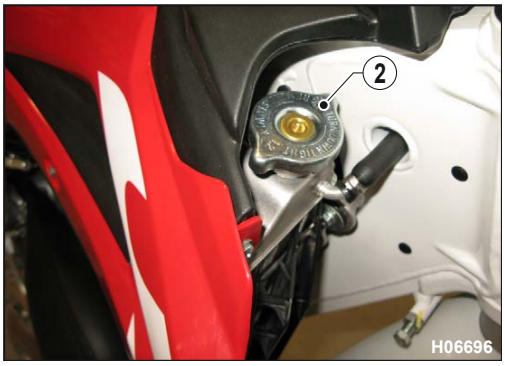


To change oil, unscrew the undersump cap (5), remove the cap (6) and let the oil drain completely; then screw the cap back on with its seal and pour fresh oil through the filler hole.
Use only the prescribed quantity and type of oil.

Have this operation made with warmed-up engine.





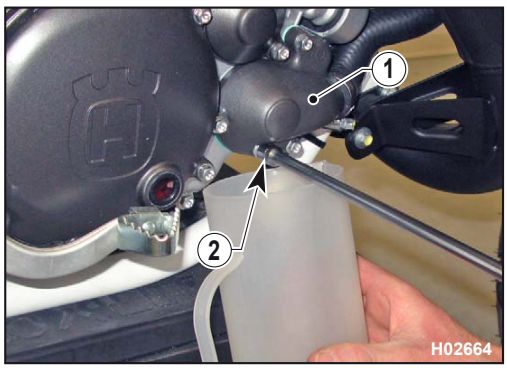


Coolant level check

Check level (1) in right-hand radiator when engine is cold (place the motorcycle so that it is perpendicular to the ground). The coolant should be approximately 0.39 in. above the cells.
The radiator cap features two locking positions: the first one is for prior discharge of pressure from the cooling system.

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

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

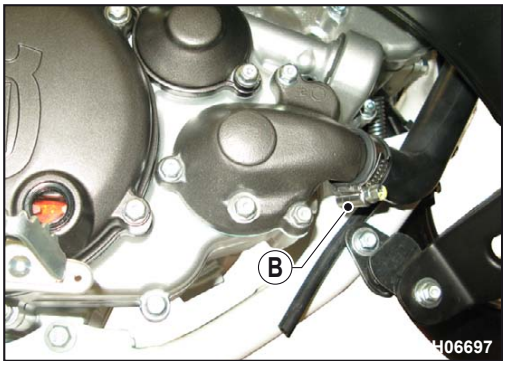


Coolant replacement

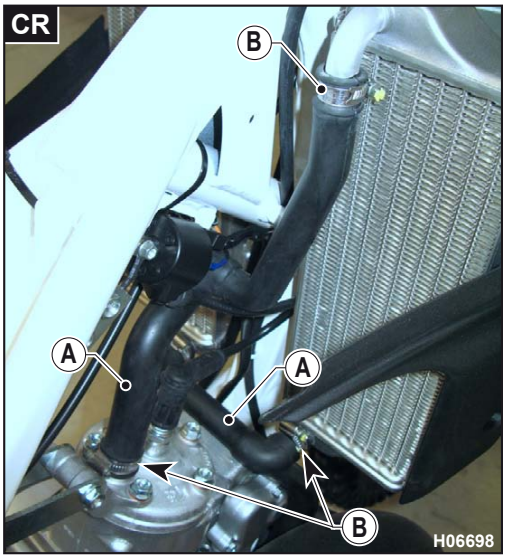
- Place the vehicle on a flat ground and in horizontal position.
- Place a vessel of adequate capacity on the right side of the vehicle under the water pump (1).
- Loosen the exhaust screw (2) using an 8 mm wrench.
- Slowly open the RH radiator cap (3) and let the liquid drain.
- After drain, tighten the screw (2) replacing the aluminium sealing washer.

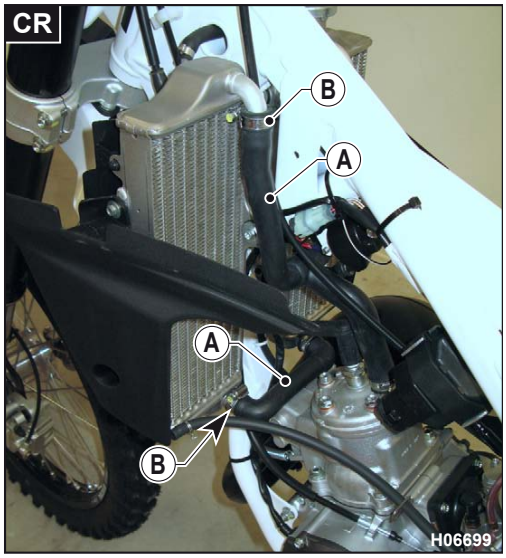
Avoid removing radiator cap when engine is hot, as coolant may spout out and cause scalding.

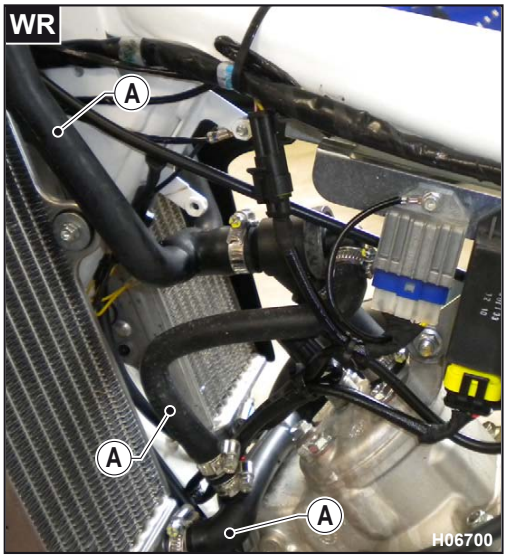
Difficulties may arise in eliminating coolant from painted surfaces. If this occurs, wash off with water.

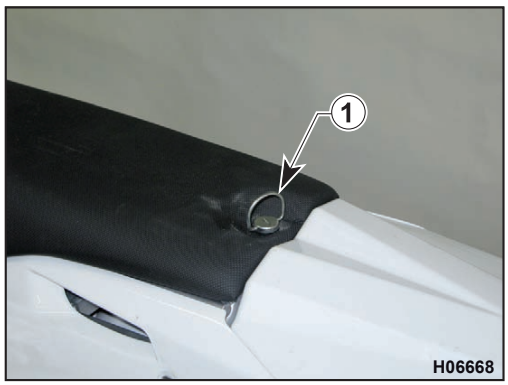


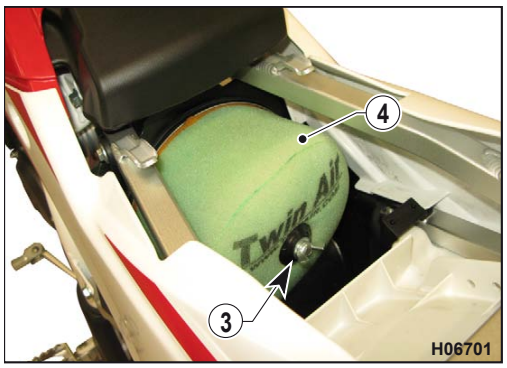
Pour the necessary quantity of coolant in the radiator then warm up the engine in order to eliminate any possible air bubbles.
Periodically check the connecting hoses (see “Scheduled Maintenance Chart”): this will avoid coolant leakage and consequent engine seizure. If hoses (A) show cracks, swelling or hardening due to sheaths desiccation, their replacement shall be advisable.
Check the correct tightening of the clamps (B).

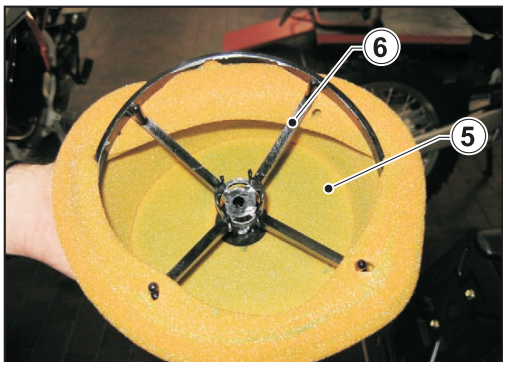












Air filter check

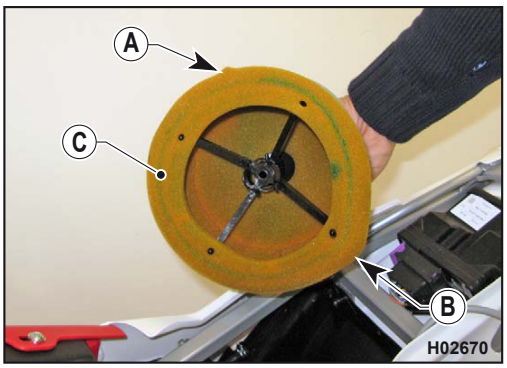
Turn the rear fixing (1) counter clockwise, remove it and extract the saddle releasing it from the front retaining screw.
Remove the screw (3), remove the complete air filter (4) and separate filter (5) from rear chassis (6).

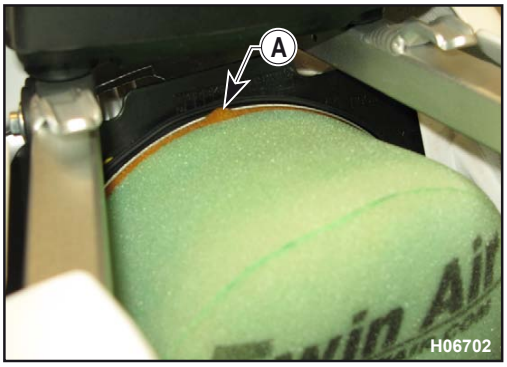
Air filter cleaning

Wash the filter with a specific detergent (CASTROL FOAM AIR FILTER CLEANER or similar) then dry it fully (wash filter with gasoline only in case of necessity).Plunge the filter in special oil for filters (CASTROL FOAM AIR FILTER OIL or similar) then wring it to drain superfluous oil.

Do not use gasoline or a low flash-point solvent to clean the element. A fire or explosion could result.

Clean the element in a well ventilated area, and do not allow sparks or flames anywhere near the working area.





Assembly

To ensure tight fit, slightly (C) grease filter edge on side facing filter housing.
While re-inserting the filter into its housing, make surs that piece (A) is turned upwards and edge (B) is on the left lower side of the filter case. Reassemble the parts previously removed.

If the element assembly is not installed correctly, dirt and dust may enter and the engine resulting in rapid wear of the piston rings and cylinder.

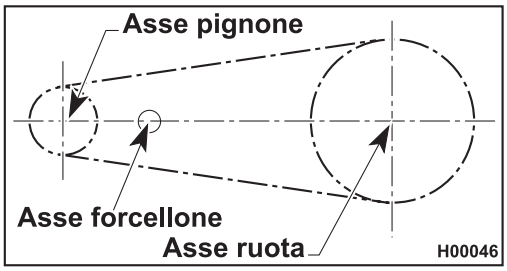
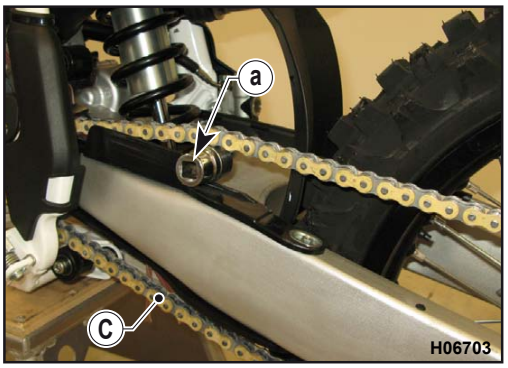


Fig. A

Asse pignone = Sprocket axis
Asse forcellone = Swinging arm axis
Asse ruota = Wheel axis

Secondary drive chain adjustment

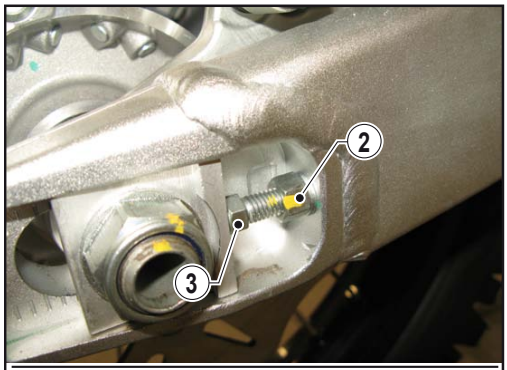
Chain should be checked, adjusted and lubricated as per the "Maintenance Chart" (see Section B) to ensure safety and prevent excessive wear. If the chain becomes badly worn or is poorly adjusted (i.e., if it is too loose or too taut), it could escape from sprocket or break. To adjust chain tension, you need to lower the rear end of the motorcycle so as to bring the axes of rotation of sprocket, swinging arm and rear wheel into alignment as shown in figure "A", and then turn the rear wheel three turns. In this condition, the chain should be neither taut nor slack. (Fig. A).

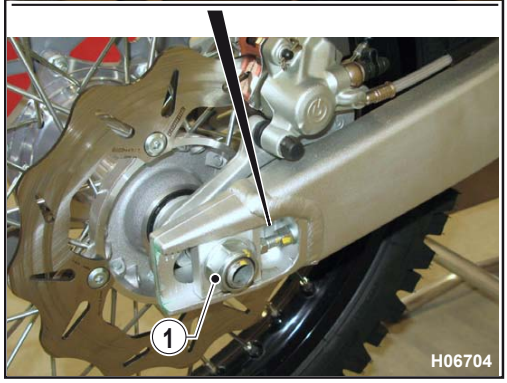


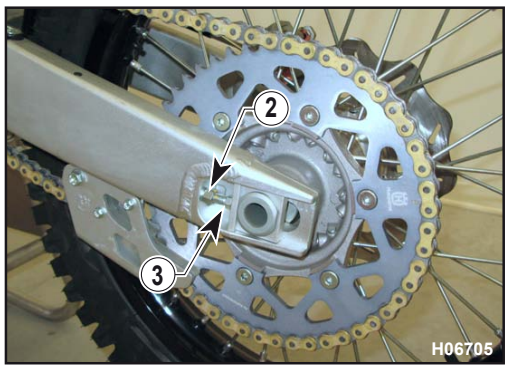
Quick adjustment (Fig. B)
Insert a 35 mm socket (a) (or a shim of the same size) at the position shown in the figure and check that the lower section (C) of the chain is slightly taut.
If it is not, proceed as follows:

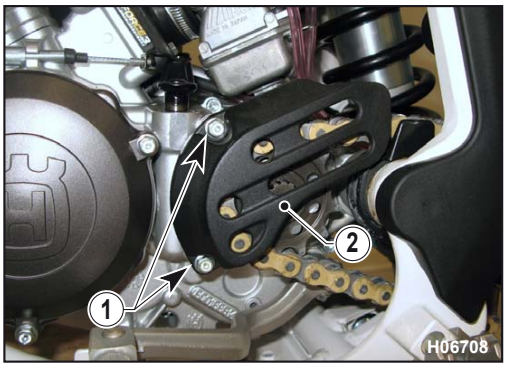
- Loosen the wheel axle nut (1) on the right-hand side using a 27 mm socket wrench;
- Loosen the check nuts (2) on both chain tensioners with a 12 mm wrench and work the screws (3) until achieving the correct tension;
- When the adjustment is completed, tighten the check nuts (2) and the wheel axle nut (1).

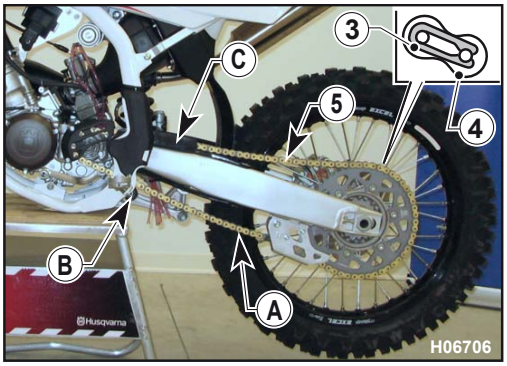
After any adjustment, always check wheel alignment and tighten wheel axle securely.











A = Chain guide eye
B = Chain guide roller
C = Chain slider

Chain lubrication

Lubricate the chain following these instructions.

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

Disassembling and cleaning

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

- Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.
- Remove: screws (1), sprocket guard (2), clip (3), master link (4) and chain (5). To reassemble, reverse the above procedure.

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

Washing a chain without O-rings (CR)

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

Washing the chain with OR (WR)

Wash using oil, diesel oil, or paraffin oil. Never use gasoline, tricloroetilene, or solvents, as the OR may suffer damages.
Use instead special sprays for chains with OR.

Lubricating a chain without O-rings (CR)

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

As an alternative, you can use suitable spray lubricants.

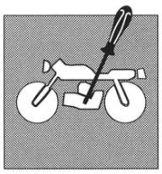
Lubricating the chain with OR (WR)

Lubricate all metallic and rubber (OR) elements using a brush, and use engine oil with SAE 80-90 viscosity for the internal and external parts.

As an alternative, you can use suitable spray lubricants.

Assemble the master link clip (3) by setting the closed side facing the chain direction of rotation, as shown in the figure.

The master link is the most critical safety part in the drive chain. Even if the master links are reusable when in good conditions, for safety purposes we advise using a new master link when reassembling the chain.
Accurately adjust the chain as described in the relevant paragraph.



The chain lubricant shall NEVER get in contact with the tyres or the rear brake disc.

Chain guide roller, chain guide roller, chain guide, chain slider
Check the wear of the above-mentioned elements and replace them when necessary.

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

Suspension setup according to track condition

Following are a few guidelines to find the right suspension setup for different types of terrain. Always start from the suspensions standard setting before making any change. Afterwards, increase or decrease the adjusting clicks, one at a time.

HARD GROUND

Front fork: softer compression setting.
Shock absorber: softer compression setting.
For fast tracks, a softer compression and rebound setting both front and rear will give more grip.

SANDY GROUND

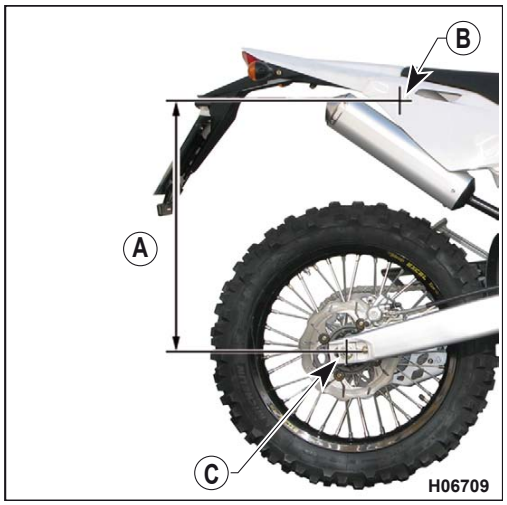
Front fork: set compression harder, or replace the standard spring with a harder spring and set the compression softer and the rebound harder.
Shock absorber: harder compression, and especially harder rebound settings. Work on the spring preload to lower the motorcycle riding height (rear end).

MUDDY GROUND

Front fork: set compression harder, or replace the standard spring with a harder spring.
Shock absorber: harder compression and rebound settings or replace the standard spring with a harder spring. Work on the spring preload to lift the motorcycle riding height (rear end). Changing the springs front and rear is advised in order to compensate for increased motorcycle weight due to caked-on mud.

NOTES

If the fork remains too soft or too hard no matter what setting you choose, check oil level in the fork tubes, as it might be too low or too high. Remember that the more oil you add, the more frequently you will need to bleed the forks. If changes to suspension settings take no effect, check the adjuster assemblies, as they might be stuck.
Standard settings, available replacement springs and adjusting procedures are outlined in the following pages.



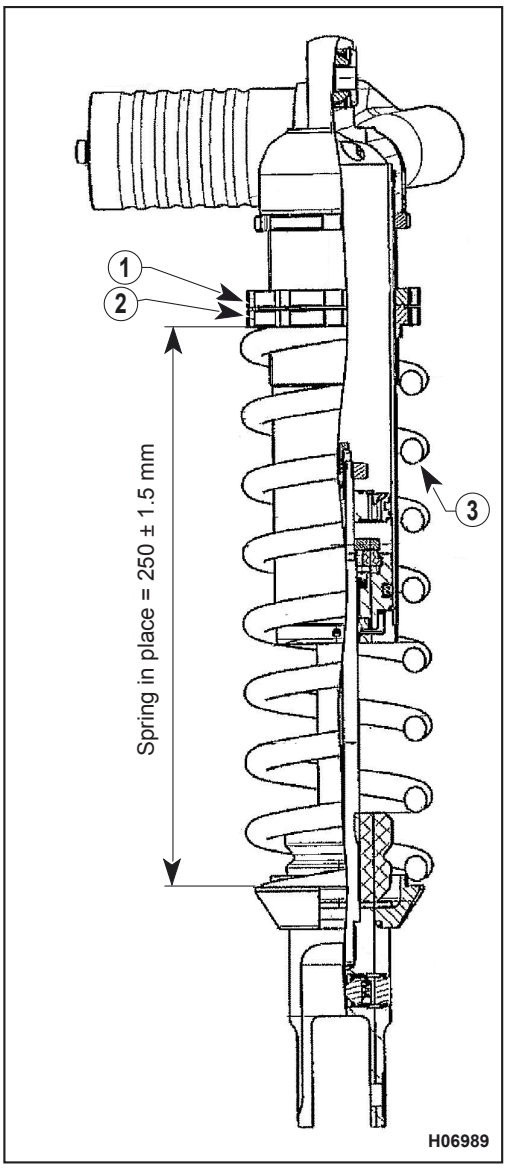
B: panel retaining screw axis
C: rear wheel axle height

Shock absorber adjustment

The rear shock absorber must be adjusted to suit rider weight and terrain conditions.
Proceed as follows:

1. Place the motorcycle on the stand and measure distance (A).
2. Sit on the motorcycle in normal riding position with full riding gear on.
3. Have someone else measure distance (A) again.
4. The difference between these two measurements is the distance the rear end settles when the rider sits on the motorcycle (RIDER SAG). The shock absorber lowering should be of about 100 mm.
5. To achieve correct rider sag for your weight, adjust the spring preload of the shock absorber (see relevant paragraph).

The shock absorber adjustment affects both the stability and the handling of the motorcycle. After changing the standard suspension setting, ride with care.

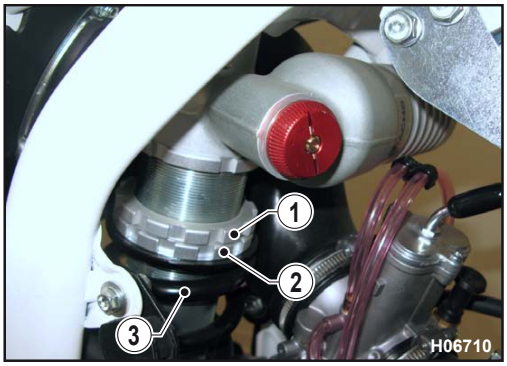


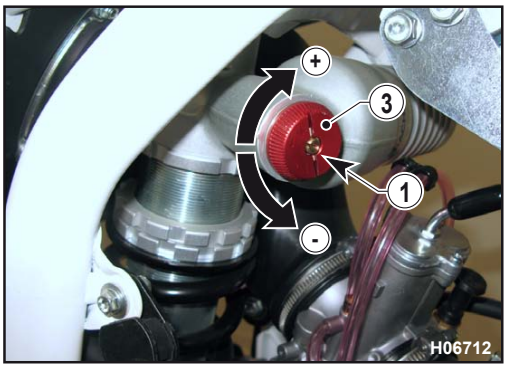
Shock absorber spring preload adjustment

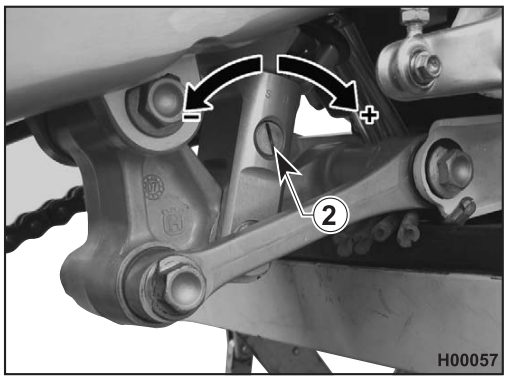
Proceed as follows:

1. Place yourself on the right-hand side of the motorcycle.
2. Clean lock ring nut (1) and adjuster ring nut (2) of the spring (3).
3. Either with a hook wrench or an aluminium punch, loosen the lock ring nut.
4. Turn the adjuster ring nut as required.
5. Adjust preload to suit your weight or riding style and tighten the lock ring nut firmly (tightening torque 40 Nm - 4 Kgm - 29.50 ft/lb).

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







Shock absorber compression and rebound damping adjustment

Adjustment of the compression stroke is independent from the rebound stroke.

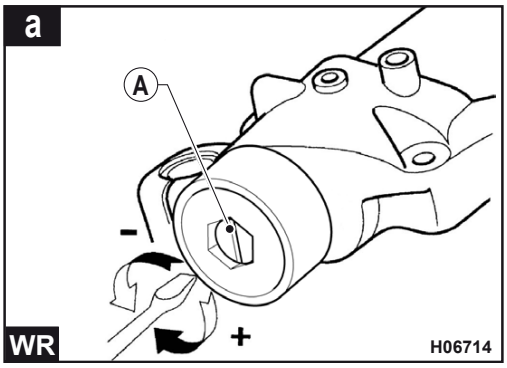
A) COMPRESSION - Standard setting:
1) Low damping speed:
-15 clicks (± 2 clicks)
(adjuster 1)

3) High damping speed:
-15 clicks (± 2 clicks)
(adjuster 3)

To reset the standard setting, turn upper adjusters (1) and (3) clockwise until reaching fully closed position. Then turn them back the number of clicks specified above.
In order to obtain a smooth braking efficiency, turn the adjusters counter clockwise. Vice versa to obtain a harder braking action.

B) REBOUND - Standard setting:
-18 clicks (± 2 clicks)

To reset the standard setting, turn lower adjuster (2) clockwise until reaching fully closed position. Then turn it back by the mentioned clicks.
In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

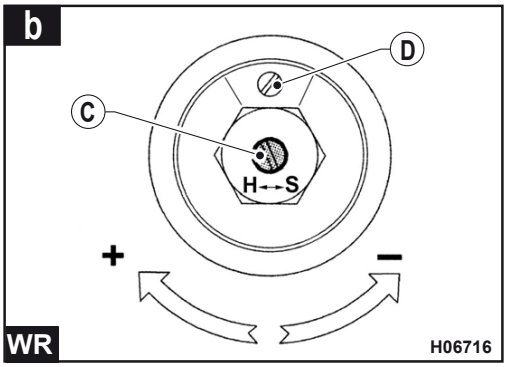


KAYABA front fork adjustment

- COMPRESSION (Fig. a)
  (CR: TOP ADJUSTER; WR: LOWER ADJUSTER)

CR: -9 clicks
WR: -10 clicks

To reset standard calibration, turn adjuster screw (A) clockwise to reach the fully closed position; then turn it back by the mentioned clicks. In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.



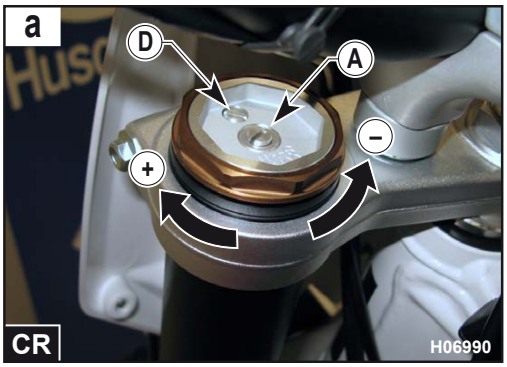
- REBOUND (Fig. b)
  (CR: LOWER ADJUSTER; WR: TOP ADJUSTER)

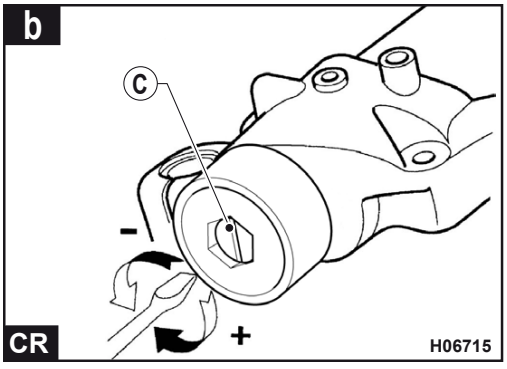
CR: -13 clicks
WR: -10 clicks

To reset standard setting, turn adjuster (C) clockwise to reach the fully closed position; then, turn it back by the mentioned clicks. In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

- BLEEDING (Fig. a/b) (to carry out after each competition, or monthly).
Set the motorcycle on a central stand, release the fork fully extended and loosen the bleed valve (D). Once this operation is over, tighten the valve.

Never force the adjuster screws beyond the maximum open and closed positions.

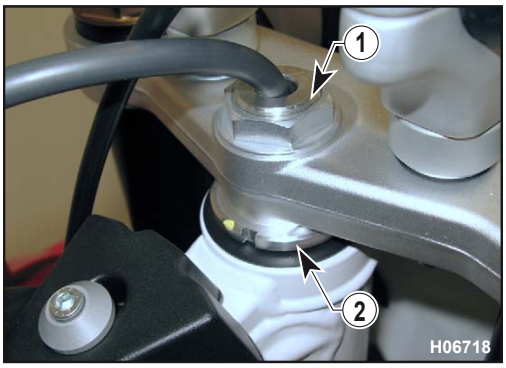


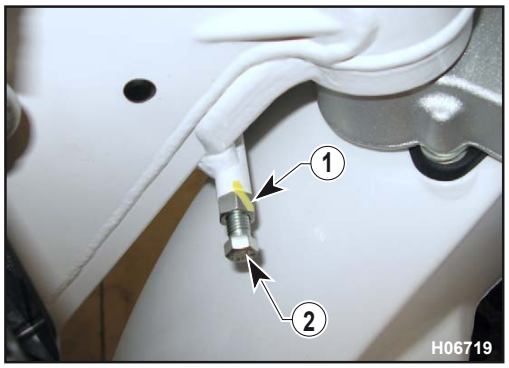


Steering bearing clearance adjustment

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

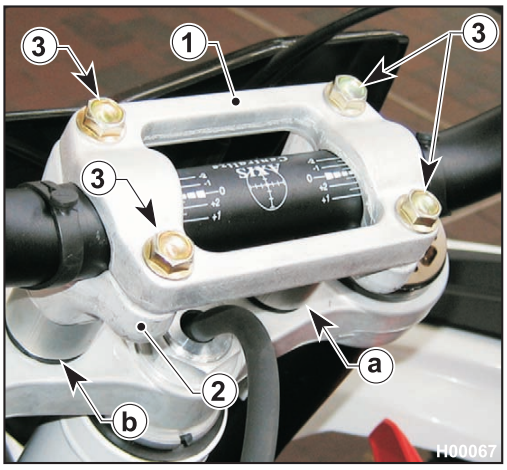
- Loosen the steering head tube nut (1);
- loosen the two screws (3) securing steering head to fork legs;
- Turn the steering head tube ring nut (2) clockwise using the special key until achieving correct play adjustment;
- Tighten the steering head tube nut (1) to 80÷90 Nm, 7÷9 Kgm, 59÷66,38 ft/lb;
- Tighten the two bolts (3) on the steering head to 22,5÷26,5 Nm, 2,3÷2,7 Kgm, 16,59÷19,55 ft/lb.





Steering angle adjustment

Steering angle can be modified by means of the adjuster assemblies located on either side of the steering head tube as follows: loosen the check nut (1), turn the adjuster screw (2) until setting the desired steering angle and then re-tighten the check nut (1). Make the same changes on both sides.



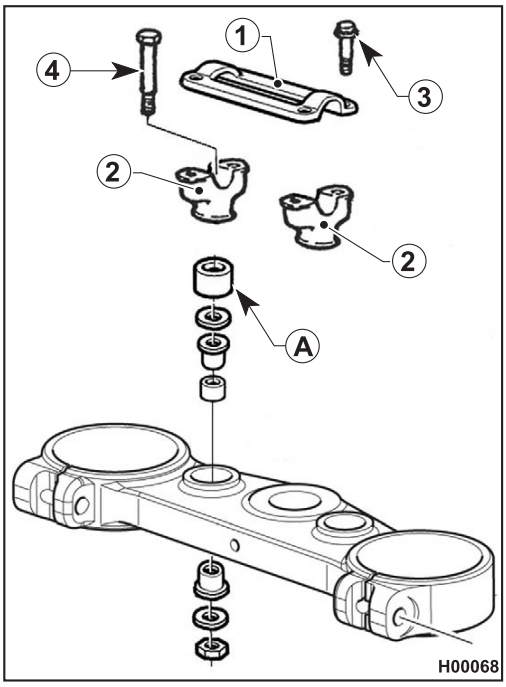
Changing handlebar position and height

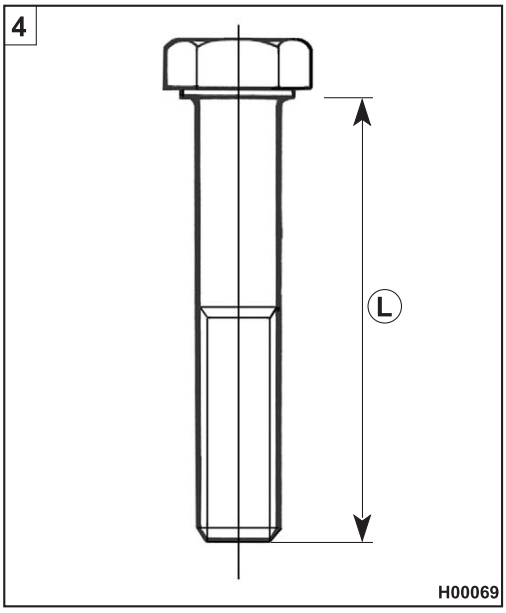
Handlebar position (a) and height (b) can be modified to better suit your personal preferences. To perform these adjustments, remove the handlebar clamp bolts (3) and (4), and then remove the handlebar upper (1) and lower (2) clamps.

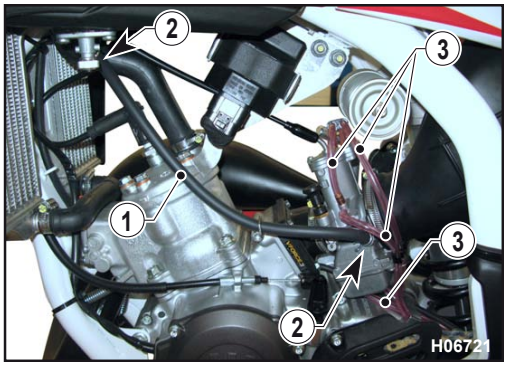
a) Changing handlebar position
   Rotate the lower clamp by 180° to move handlebar position forward or backward (10 mm - 0.04 in.).

b) Changing handlebar height
   Remove the lower spacer (A) and replace the screw (4) with a 65 mm long screw.

When finished, tighten the bolts (3) to 2.75-3.05 kgm (27 -30 Nm; 19.9-22 lb/ft) and the bolts (4) to 2.0-2.2 kgm (19.6 -21.6 Nm; 14.5-15.9 lb/ft).

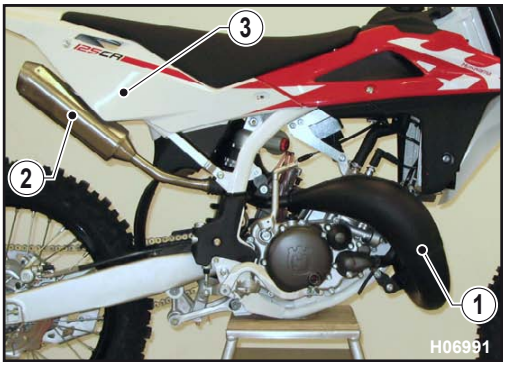






Fuel supply hose inspection

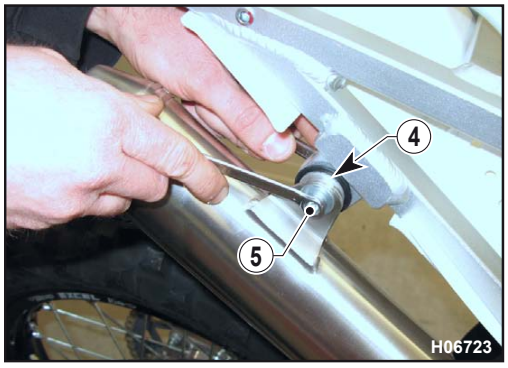
- Check the pipe (1) starting from tank cock and reaching the carburettor. If cracked, replace it by releasing the two clamps (2).
- Check the conditions of the breather hoses (3), if they are cracked or hardened they must be replaced.

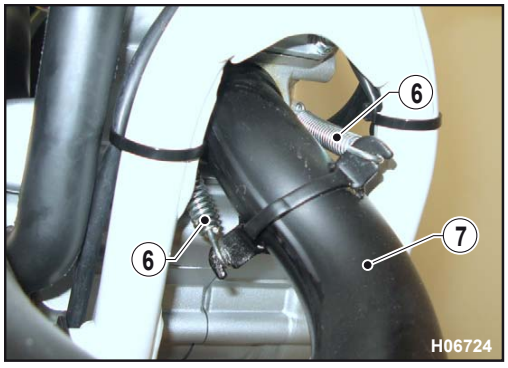


Exhaust system check

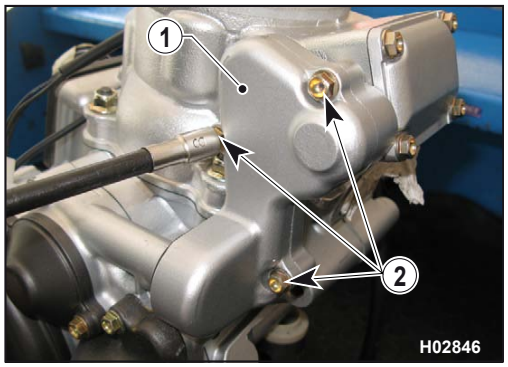
Remove exhaust system components as described in Section "E". Ensure that pipe (1) and silencer (2) do not show any sign of failure or damage: replace if cracked or damaged.

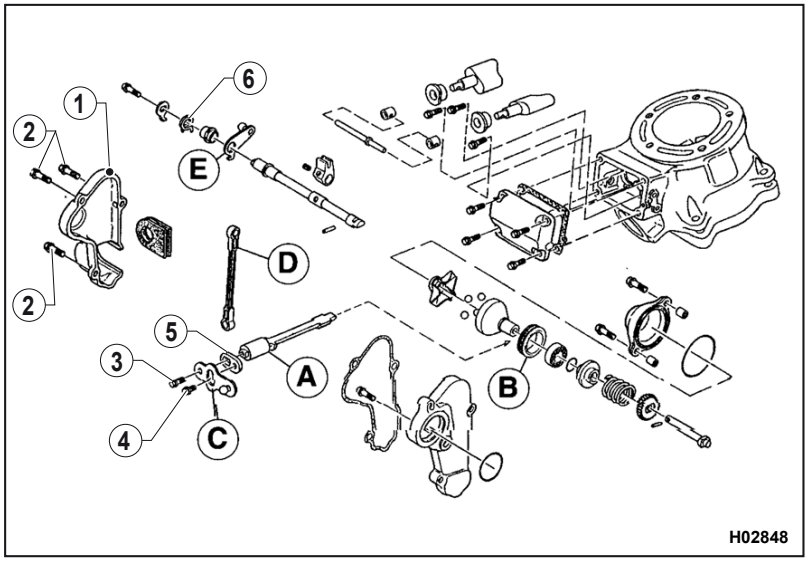
- Remove the right-hand side panel (3) and check the conditions of the silentblock (4). If damaged, replace them by loosening screws (5) (8 mm wrench on the outside and 10 mm wrench on the inside).
- Check the conditions of the springs (6) securing manifold (7) to the head; replace them if they have lost elasticity.

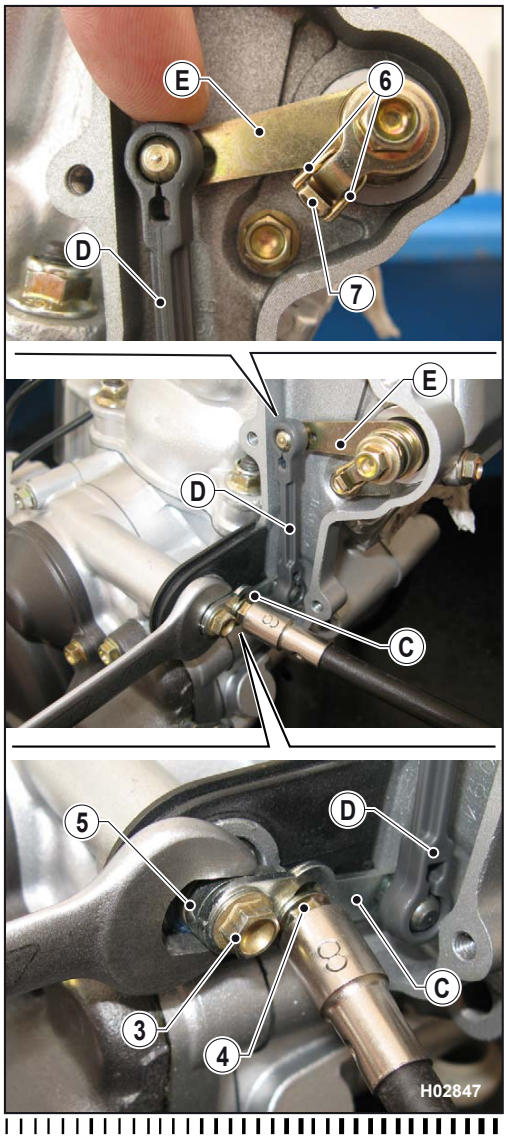




Exhaust valve position check





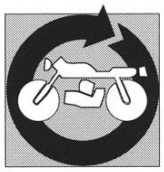


The cylinder has a double exhaust valve system called H.T.S. (HUSQVARNA TORQUE SYSTEM), ensuring engine top performance. These valves are controlled by a centrifugal governor making them open at approx. 7500 rpm ± 200. This governor, positioned on engine right side, operates the valve through a leverage system consisting of a layshaft (A) operated by centrifugal governor gear (B); of a lever (C) pivoting on such shaft; of a connection lever (D) and another control lever (E) pivoting on the valve control shaft. With the valves fully closed, the min. distance from the piston must be equal to or over 0.4÷0.5 mm (0.0157÷0.0197 in.).

To perform this adjustment proceed as follows:

- Remove the cover (1) by loosening the screws (2) using an 8 mm wrench.
- Loosen the screws (3) and (4) locking plate (5) in place using a 13 mm wrench.
- Using a 13 mm wrench clear up plate rotation (5) and, keeping the plate (5) in its position, at the same time with a finger place the lever (D) so that the ends of the spring (6) are resting on tooth (7) as shown in the figure, then lock the screws (4) and (5) in their positions.
- Tighten the screws (1) and (2) to the specified torque.

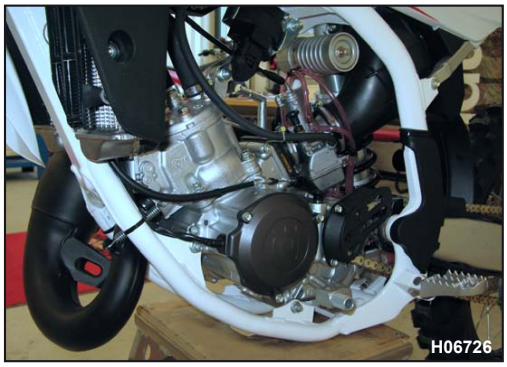
Section E



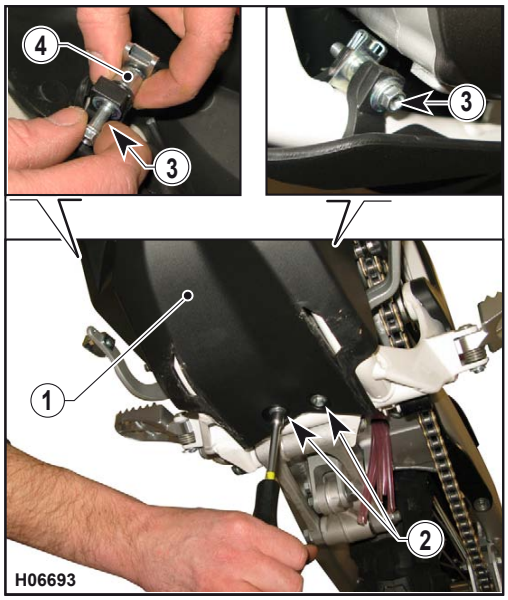
Foreword

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

RIGHT-HAND SIDE



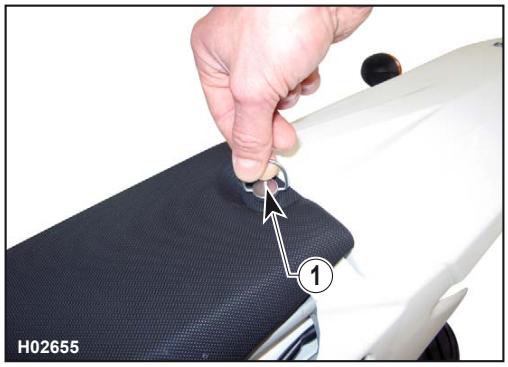
LEFT-HAND SIDE



Engine guard removal

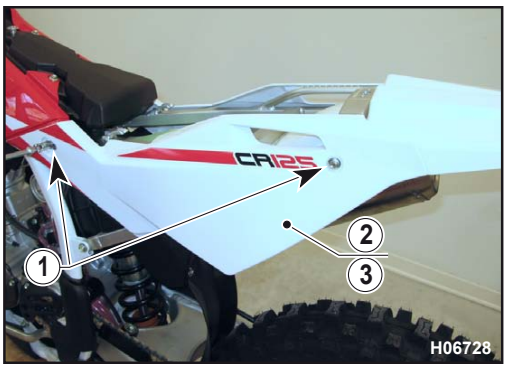
Remove the engine guard (1) by loosening the lower screws (2) and the side screws (3).

On reassembly, make sure the spacer (4) is correctly positioned.



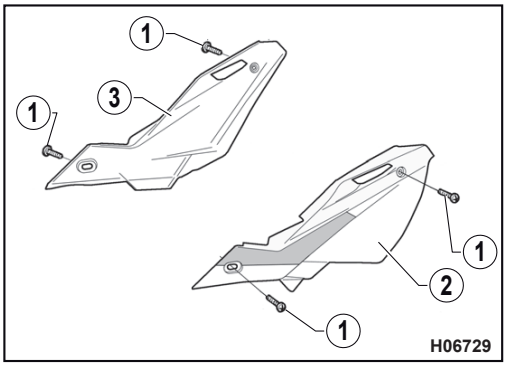
Saddle removal

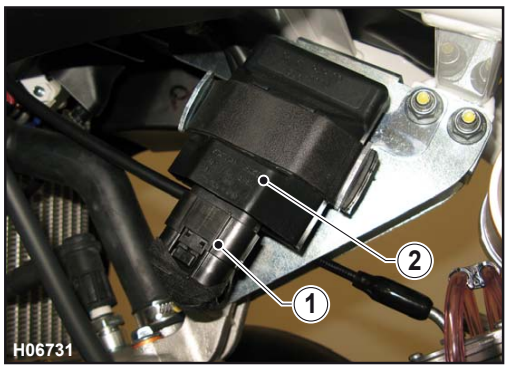
- Turn the rear fixing (1) counter clockwise and remove the saddle.



Side panels removal

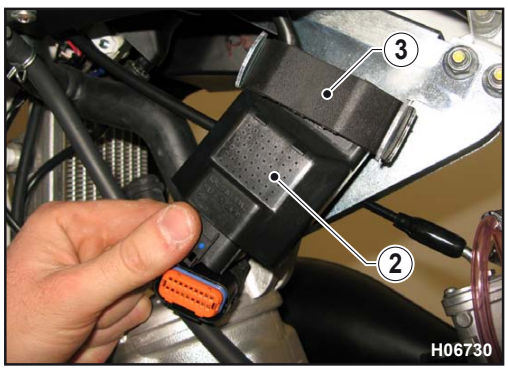
- Remove the saddle as described in the relevant paragraph.
- Using an 8 mm wrench, loosen retaining screws (1) and remove side panels (2) and (3).

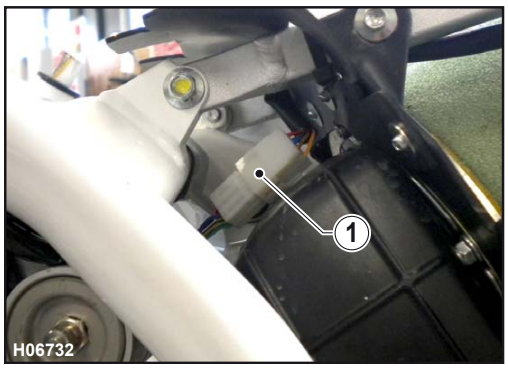




Electronic control unit removal (CR)

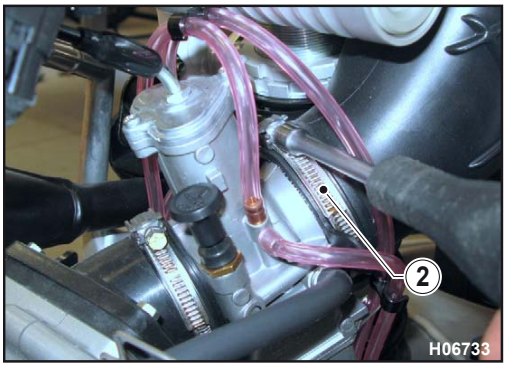
- Release connector (1) from control unit (2).
- Remove control unit (2) from the special vibration mount (3).



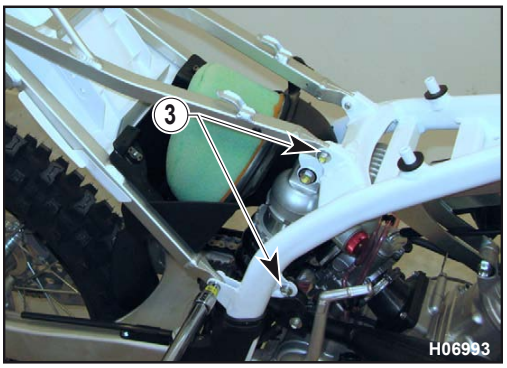


Removal of rear chassis complete with mudguard and air box

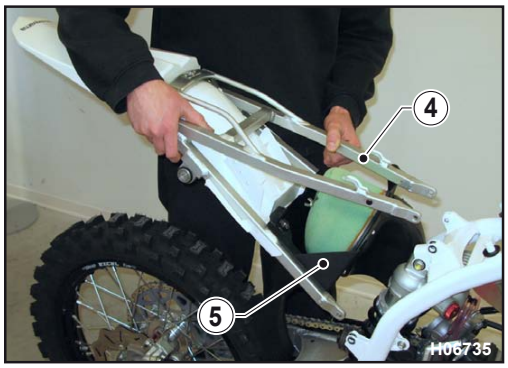
- Remove saddle, side panels, tank, silencer, as outlined in the relevant paragraphs.
- Shear the plastic clips securing wiring to rear chassis (WR).
- Disconnect the connector (1) between main wiring harness and rear wiring harness (WR).



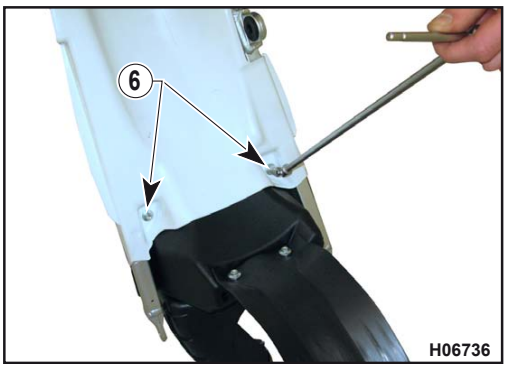
- Loosen clamp (2) securing filter box to carburettor.



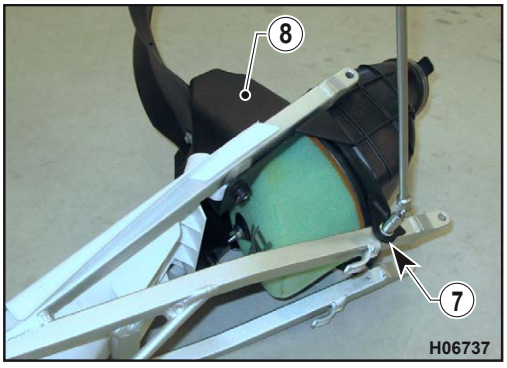
- Using a 10 mm wrench, loosen screws (3) on both sides of chassis.

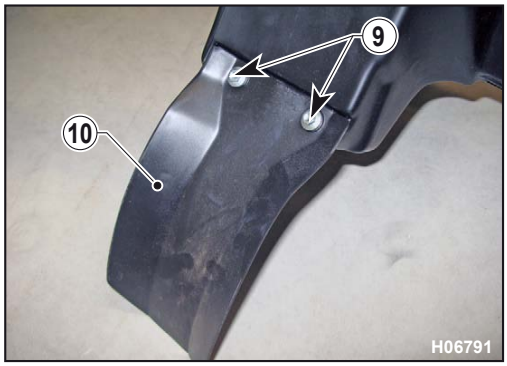


- Lift chassis (4) complete with filter box (5).

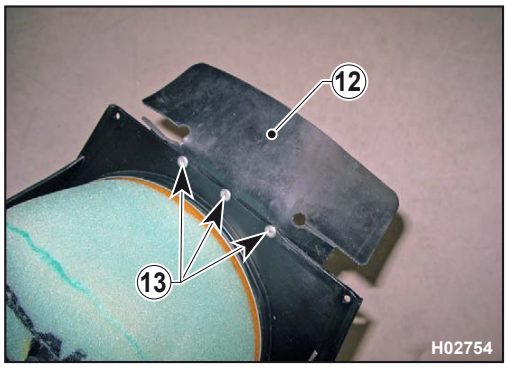


- Using an 8 mm wrench, loosen the two inside screws (6) and the two side screws (7) and remove the filter box (8).



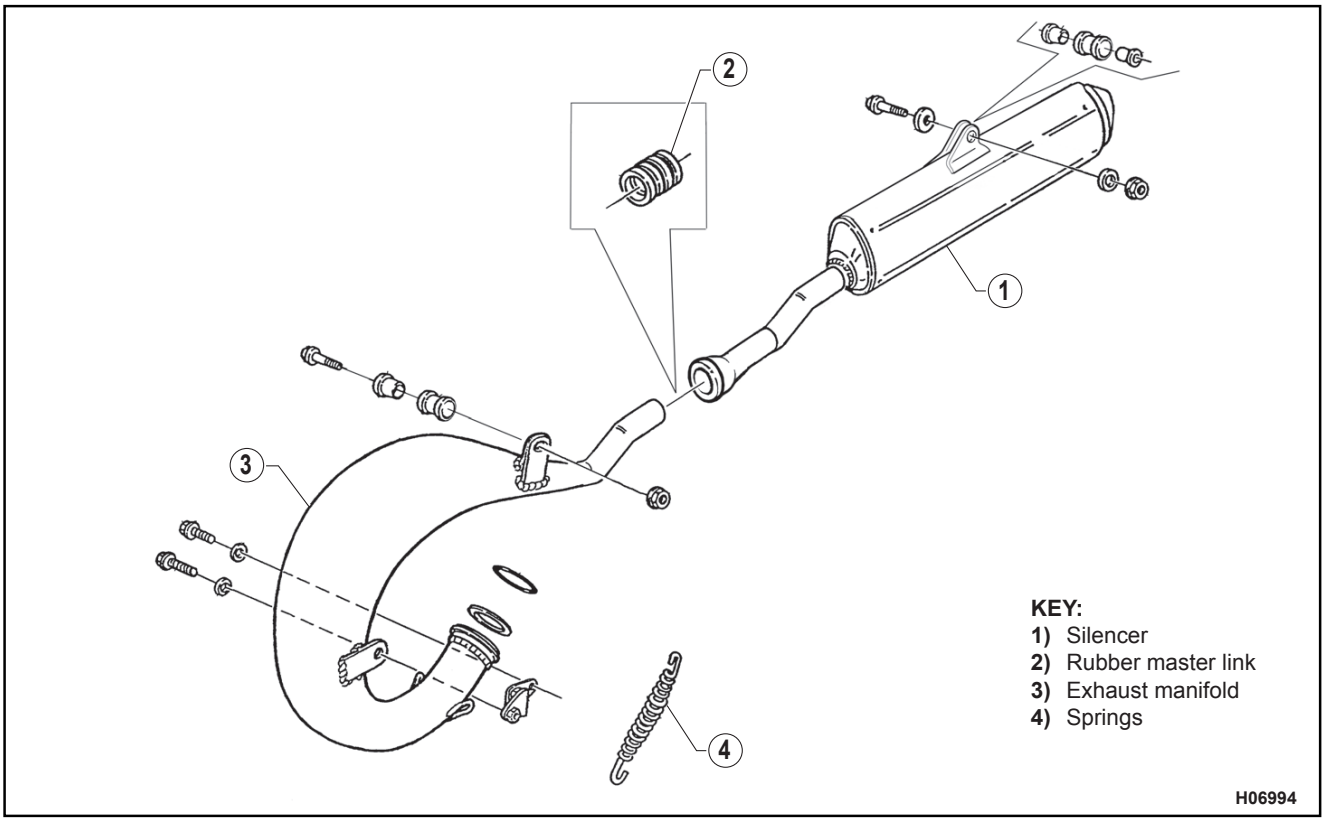


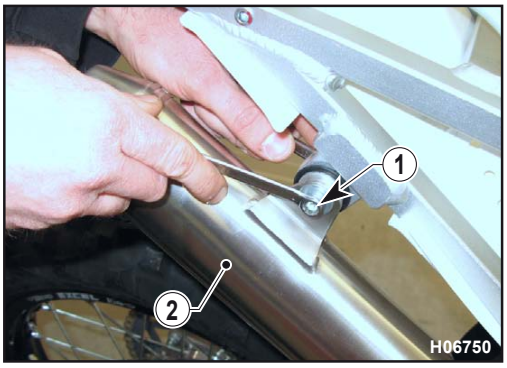
- Using an 8 mm wrench, loosen the two screws (9), and remove shock absorber protection (10).

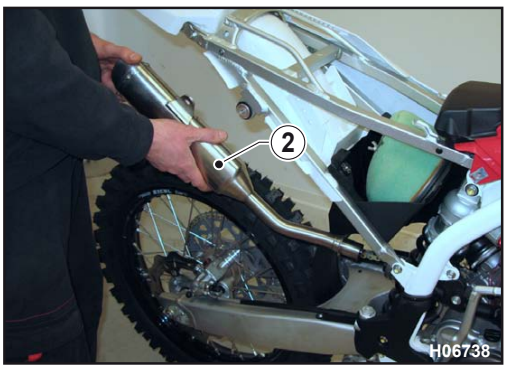


- Remove rivets (13), and remove upper rubber protection (12).
- Remove the air filter.

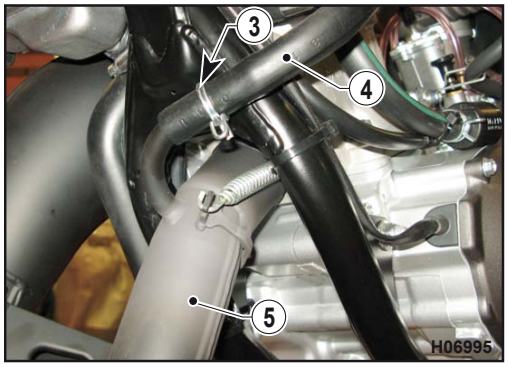
Exhaust system removal



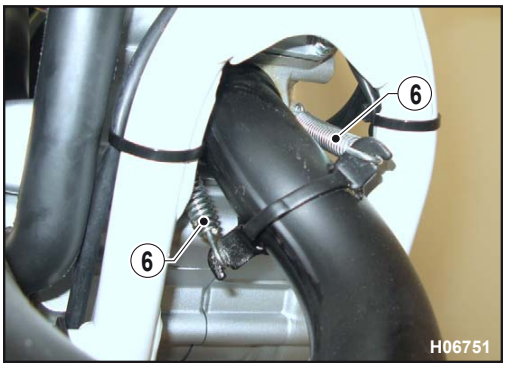




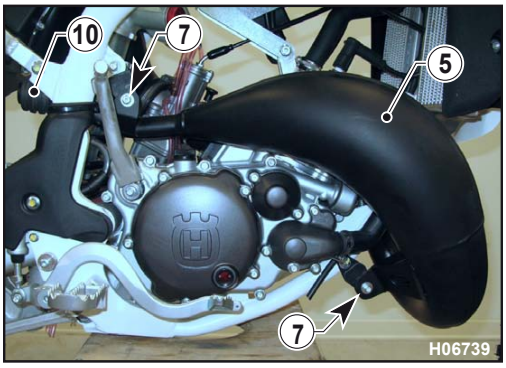
- Remove the saddle as described in the relevant paragraph.
- Remove the right-hand side panel as described in the relevant paragraph.
- Using an 8 mm T-wrench on the outside and a 10 mm T-wrench on the inside, remove the silencer (2) retaining screw (1) and remove it from the motorcycle.



- Remove clamp (3) and disconnect secondary air circuit pipe (4) from exhaust manifold (5).

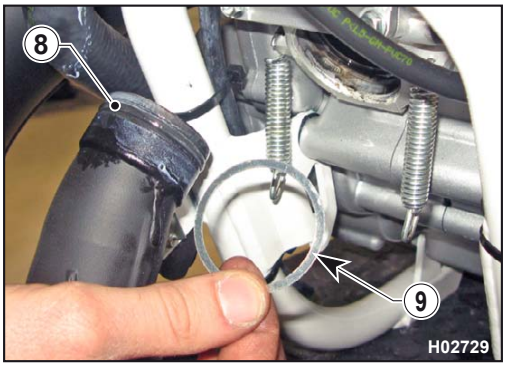


- Release the two springs (6).

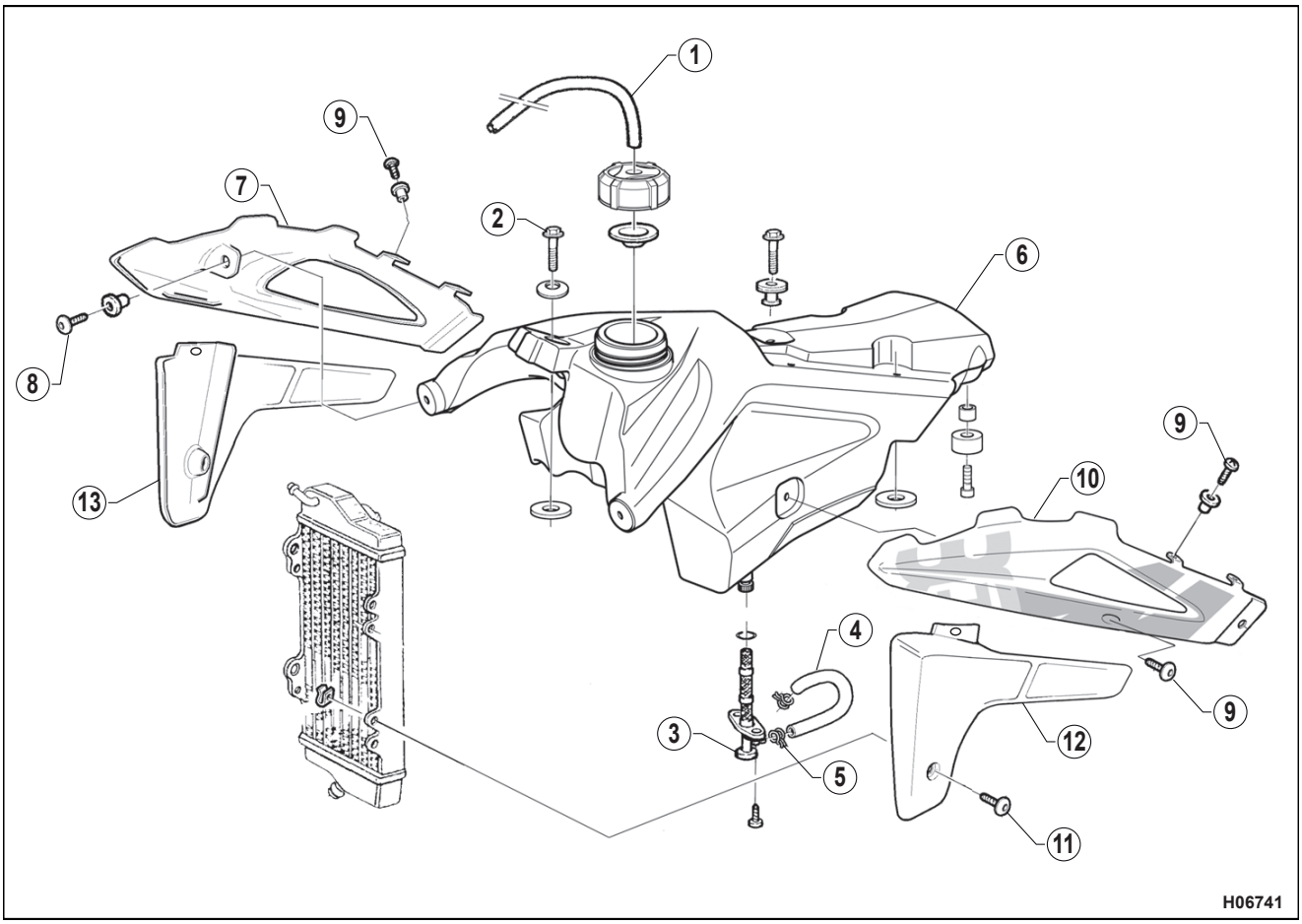


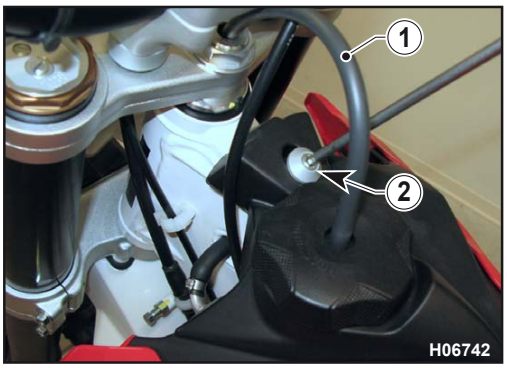
- To remove manifold (5), loosen screw (7) with an 8 mm wrench.

Check seal (8) and metal gasket (9) for wear. Change, if damaged.
Check the rubber master link (10) for wear. Change, if damaged.

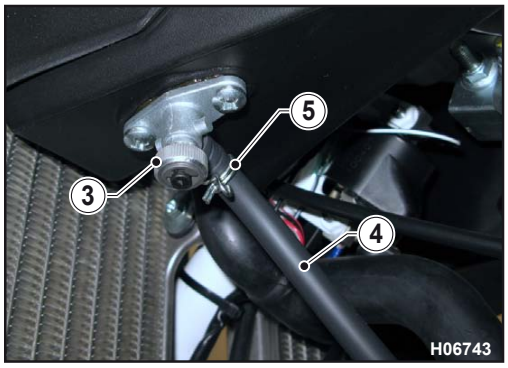


Fuel tank and scoop removal

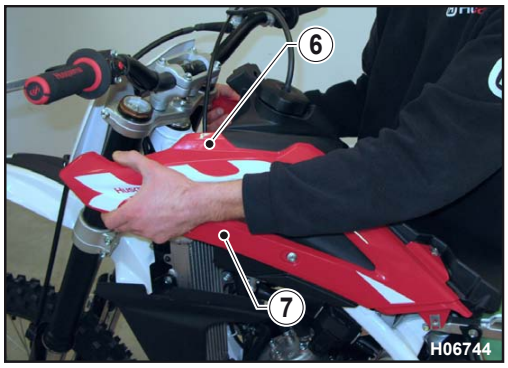




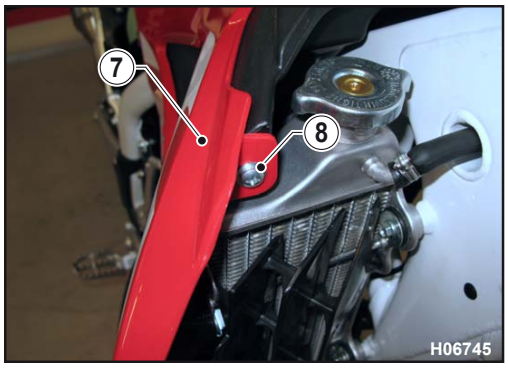
- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Remove the breather hose (1).
- Loosen tank retaining screw (2) (with an 8 mm Allen wrench).



- Close fuel cock (3), release clamp (5), and disconnect pipe (4).

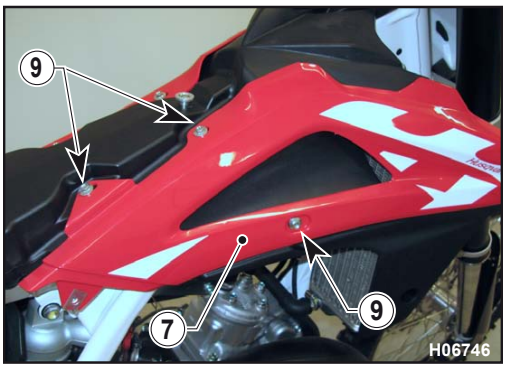


- Raise the tank (6) from the front end, and remove it from bike complete with scoops (7).

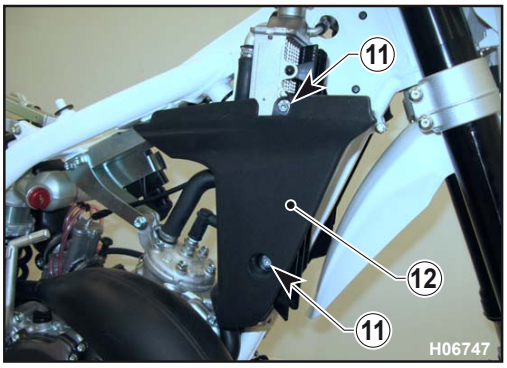


Scoop removal

- Remove the saddle and side panels, as outlined in the relevant paragraphs.
- Loosen front screw (8) between scoop (7) and tank.

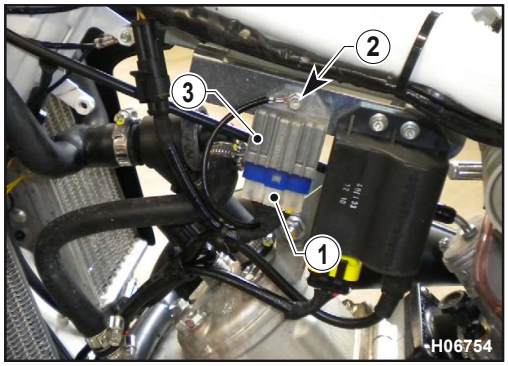


- Using an 8 mm wrench, loosen screws (9); then remove right-hand side scoop (7).
- Repeat this procedure for the left-hand side scoop (10).



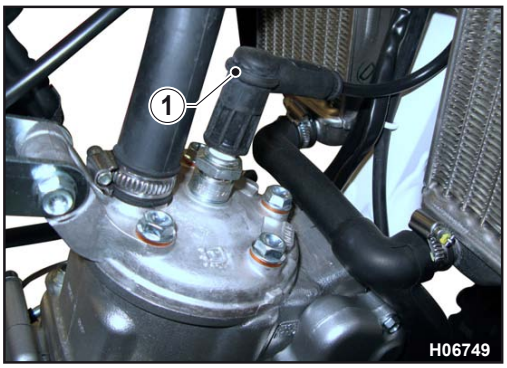
Spoiler removal

- Remove the fuel tank as outlined in the relevant paragraph.
- Using an 8 mm socket wrench, loosen the two screws (11) and remove the left-hand side (12) and right-hand side (13) spoiler.



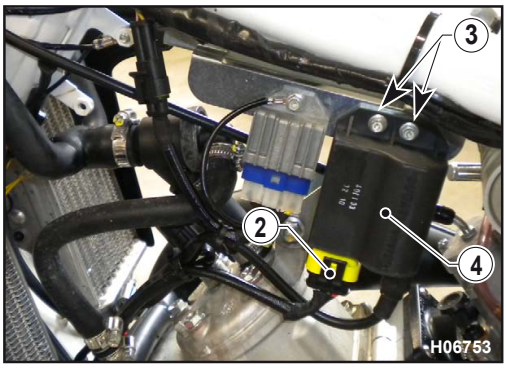
Voltage regulator removal (WR)

- Remove: saddle and fuel tank as described in the relevant paragraphs.
- Disconnect the connector (1).
- Loosen the retaining screw (2) and remove the regulator (3). (8 mm wrench)

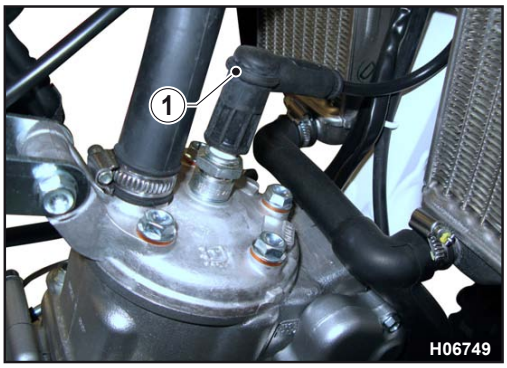


Transducer removal (WR)

- Remove: saddle and fuel tank as described in the relevant paragraphs.
- Remove the spark plug cap (1).

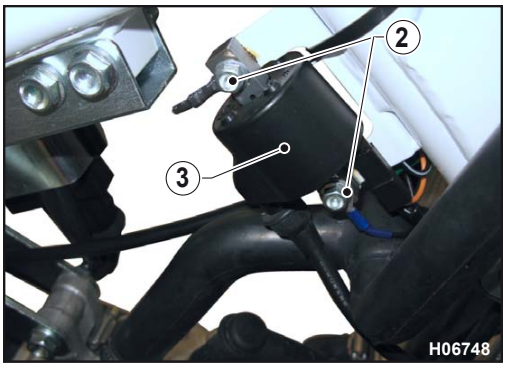


- Disconnect the connector (2).
- Remove the retaining screws (3) and then the transducer (4). (8 mm wrench)

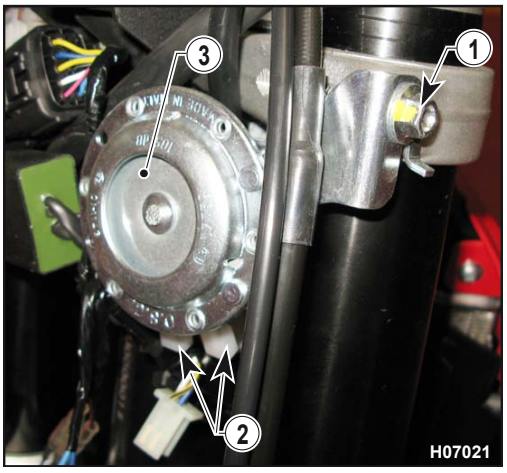


Coil removal (CR)

- Remove: saddle and fuel tank as described in the relevant paragraphs.
- Remove the spark plug cap (1).

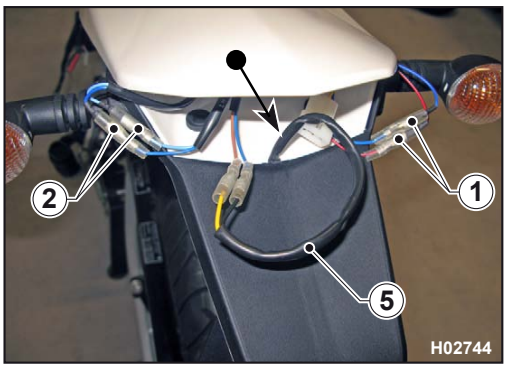


- Using an 8 mm wrench, loosen the retaining screws (2) and remove the coil (3).



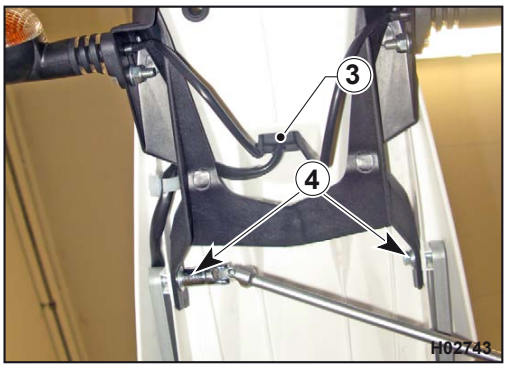
Horn removal (WR)

- Remove the headlamp fairing as outlined in the relevant paragraph.
- Using an 8 mm wrench, loosen screw (1).
- Disconnect the two connectors (2) and remove the horn (3) with its bracket.



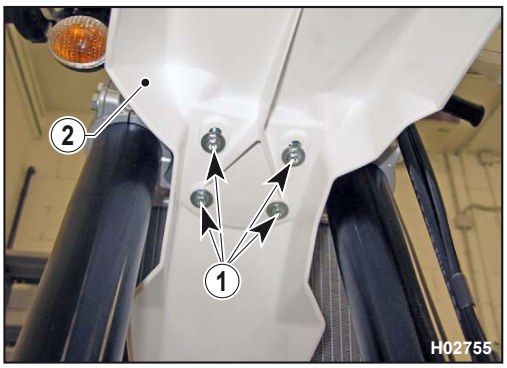
Number plate holder removal (WR)

- Remove tail light as outlined in section M.
- Disconnect rear turning indicator connectors (1) and (2).



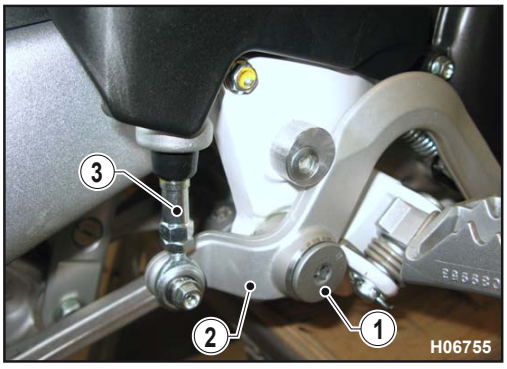
- Slide turning indicator cables out of rubber gaiter (3).
- Using an 8 mm wrench, loosen screws (4), and remove number plate holder complete with turning indicators.

On reassembly, make sure that number plate holder light cable (5) is positioned as shown in the figure.



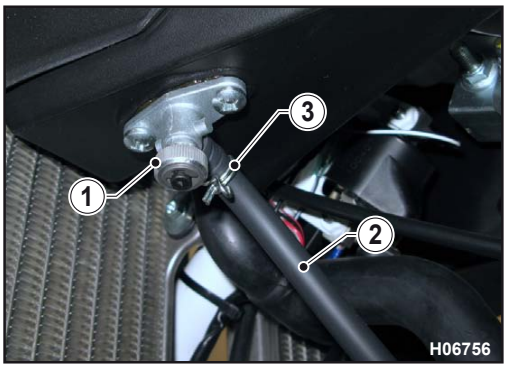
Front mudguard removal

- Using an 8 mm wrench, loosen the four screws (1), and remove mudguard (2).



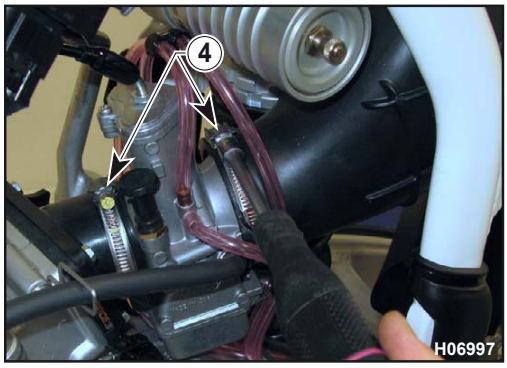
Rear brake removal

- Using a 6 mm Allen wrench, loosen screw (1), and remove lever (2) complete with pump pushrod (3).

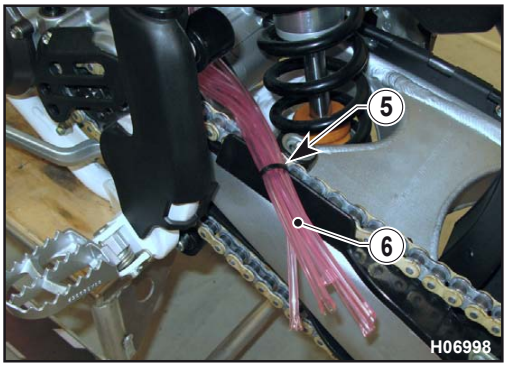


Carburettor removal

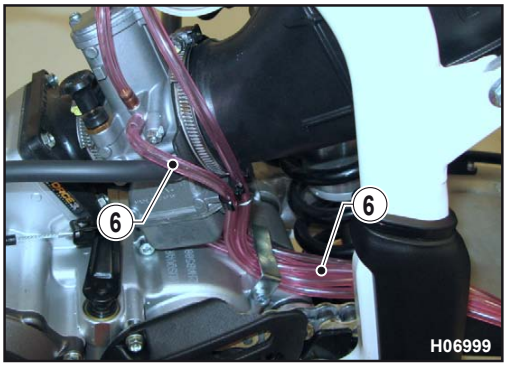
- Close fuel cock (1), release clamp (3), and disconnect pipe (2).

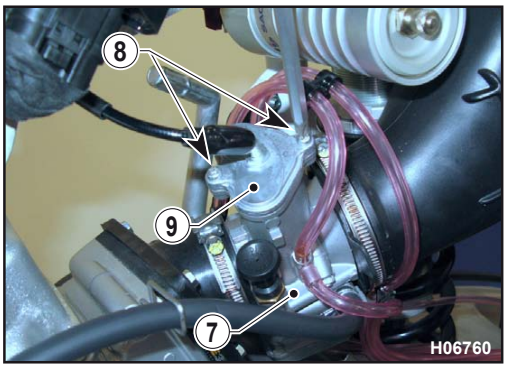


- Loosen clamps (6).

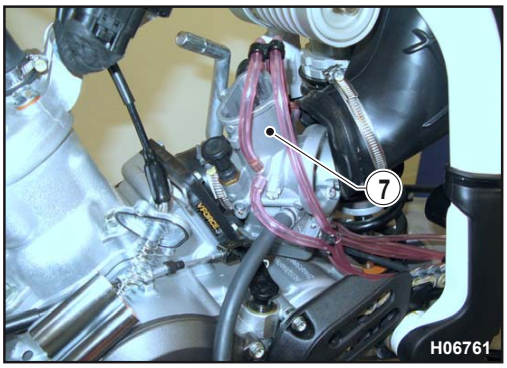


- Cut the clamps (5) and disengage the breather hoses (6) from their holder clamps.



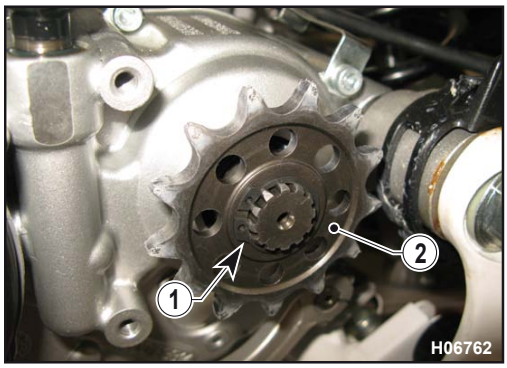


- Slightly turn carburettor (7) to the left, loosen the screws (8) and remove the cover (9).



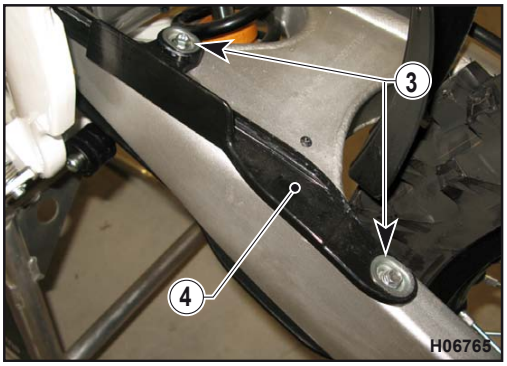
- Detach carburettor (7) and remove it from the left-hand side

On reassembly, take care that carburettor breather hoses (6) are correctly positioned inside their seats and that they are not kinked.

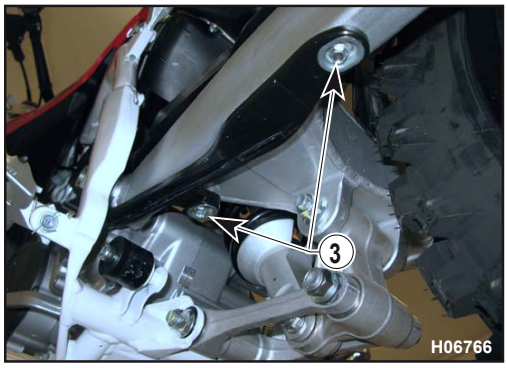


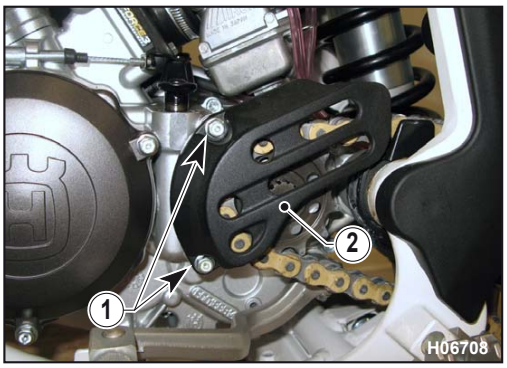
Chain slider removal

- Remove the chain as described in the relevant paragraph.
- Remove the circlip (1) and slide the sprocket (2) out.



- Loosen the four screws (3) on the slider (4) using an 8 mm wrench.
- Slide the chain slider out of the bike front side.

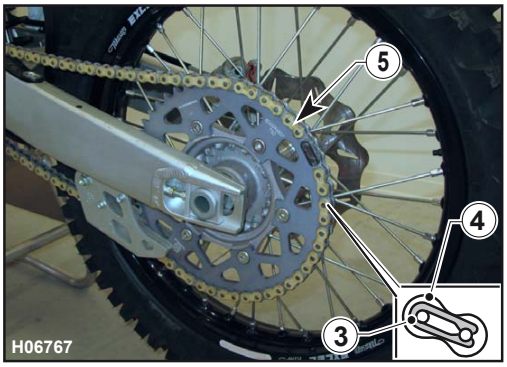


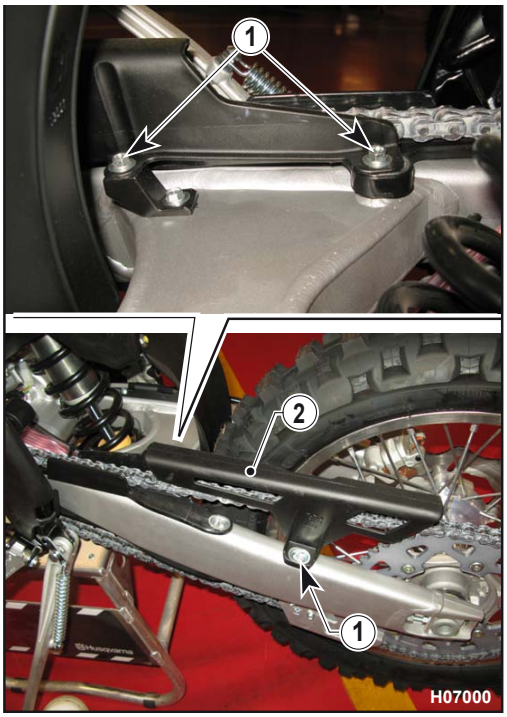


Secondary drive chain removal

To remove chain, proceed as follows:

- Remove: screws (1), sprocket guard (2), clip (3), master link (4) and chain (5).



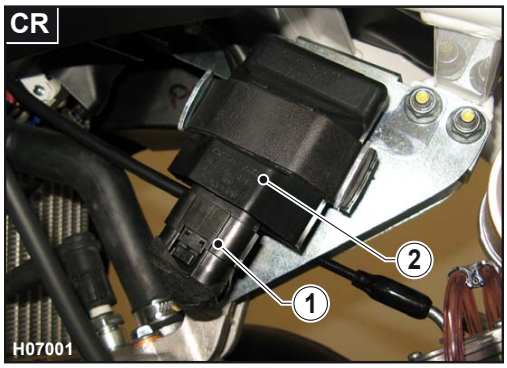


Chain guard removal (WR)

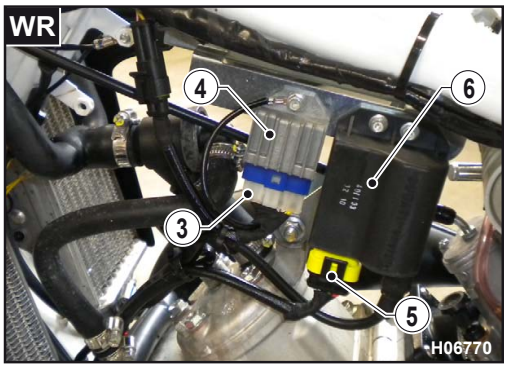
- Loosen screws (1) using an 8 mm wrench and remove the chain guard (2).

Engine removal

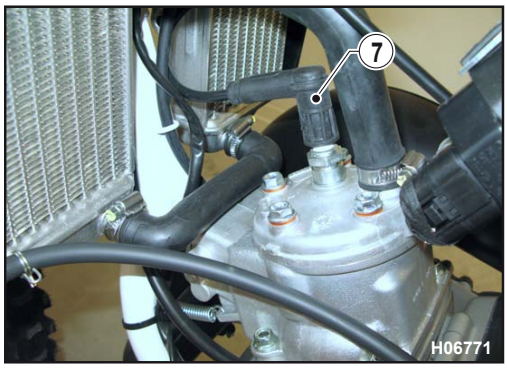
- Remove the saddle as described in the relevant paragraph.
- Remove the fuel tank as described in the relevant paragraph.
- Remove the exhaust system as described in the relevant paragraph.
- Drain all coolant as described in the relevant paragraph.
- Remove secondary drive chain as described in the relevant paragraph.
- Remove rear brake pedal as described in the relevant paragraph.
- Remove carburettor as described in the relevant paragraph.
- Remove secondary drive chain as described in the relevant paragraph.



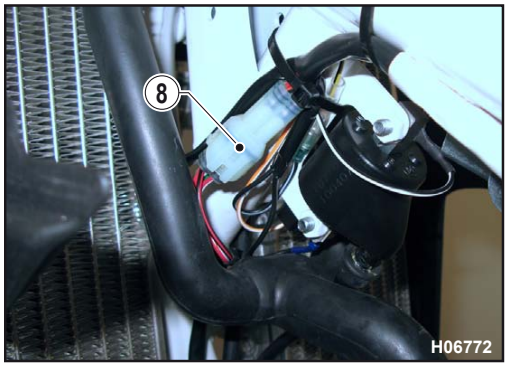
(CR)
- Release connector (1) from electronic control unit (2).



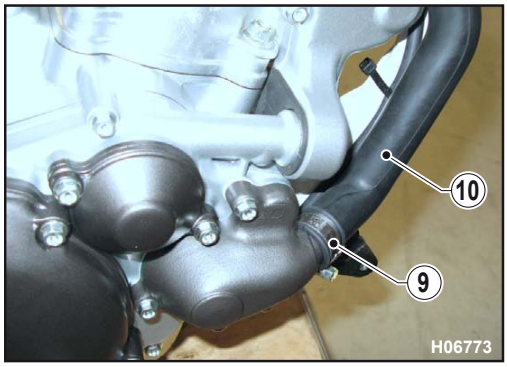
(WR)
- Disconnect the connector (3) of the voltage regulator (4) and the connector (5) of the transducer (6).



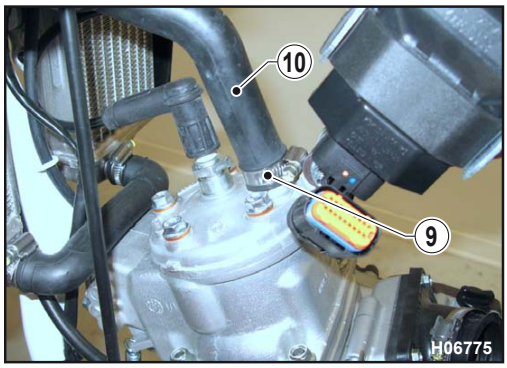
- Take off the spark plug cap (7).

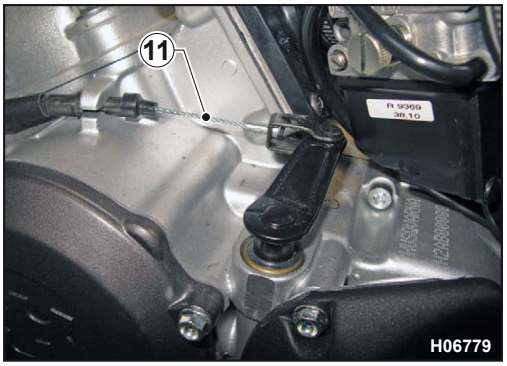


- Disconnect the connector (8) of the power generator.

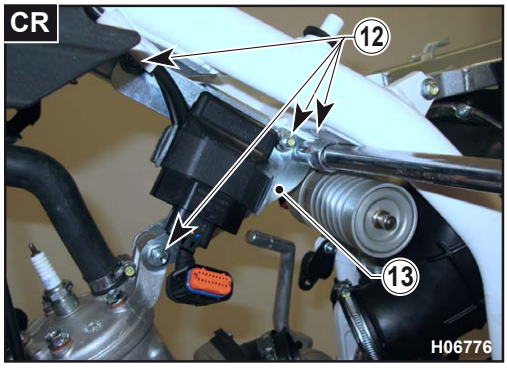


- Open clamps (9) and disconnect the hoses (10) that connect the cooling system to the engine.

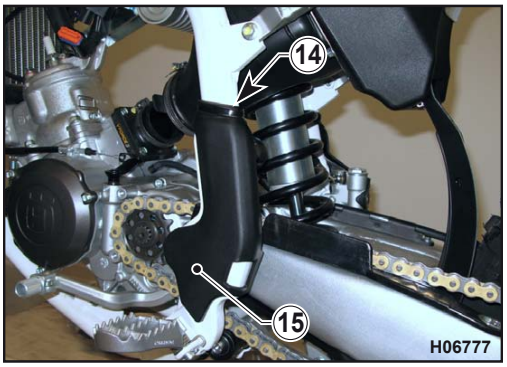




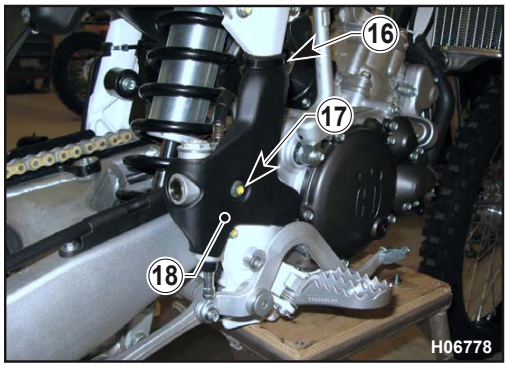
- Lift retaining tab, and disconnect clutch cable (11).



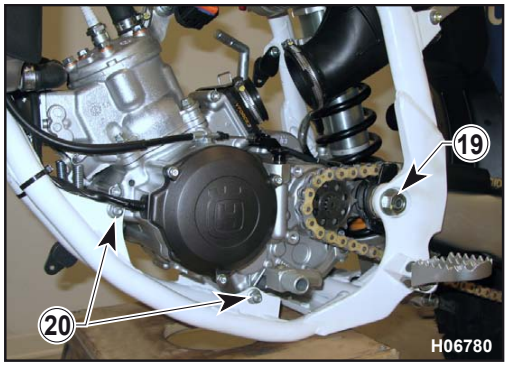
- Using a 12 mm wrench, loosen the screws (12) of the left-hand side bracket (13) of the head clevis and remove it.



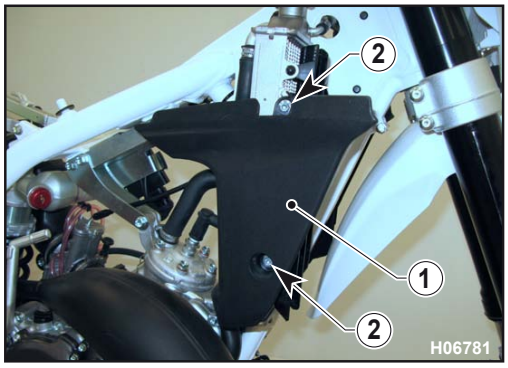
- Cut the clamp (14) and remove the left-hand side protection (15).



- Cut the clamp (16), loosen the screw (17) (using an 8 mm wrench) and remove the protection (18).

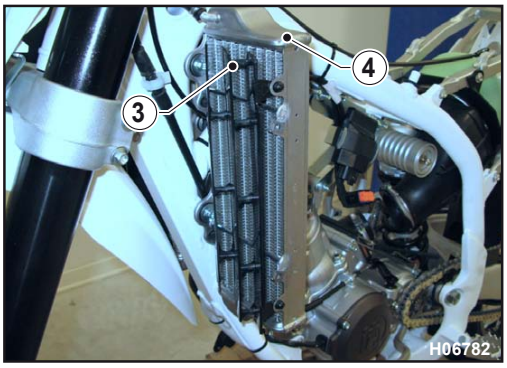


- Using a 27 mm wrench, loosen nut (19) on swinging arm shaft then, working on the right side, remove swinging arm shaft until releasing engine, but without removing swinging arm.
- Using a 12 mm wrench on the left side and a 10 mm wrench on the right side, loosen nuts (20), then remove engine retaining screws.
- Slightly raise engine, and remove it from bike left side.

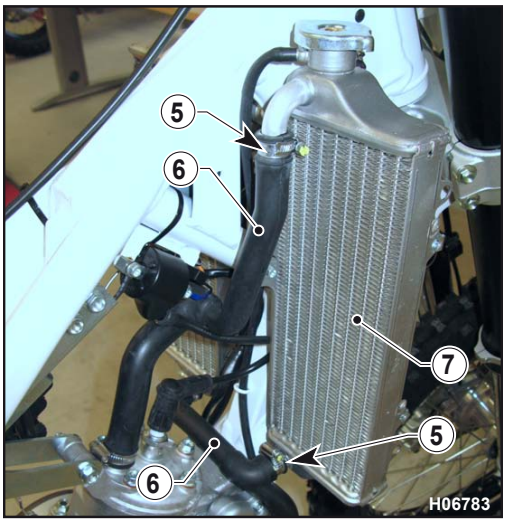


Radiator removal

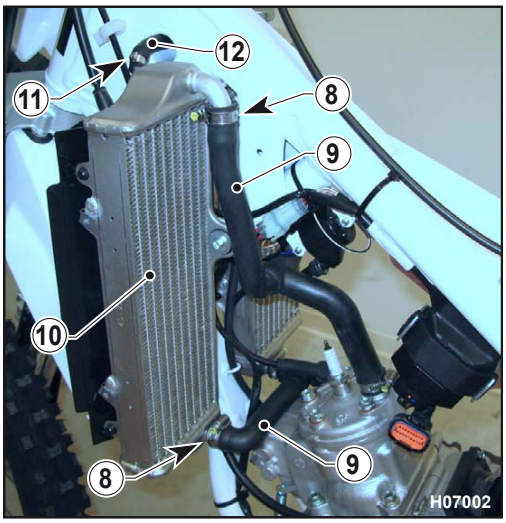
- Remove the fuel tank together with scoops and spoilers as outlined in the relevant paragraphs.
- Drain all coolant as outlined in the relevant paragraph.
- Using an 8 mm wrench, loosen screws (2), and remove radiator protections (1).



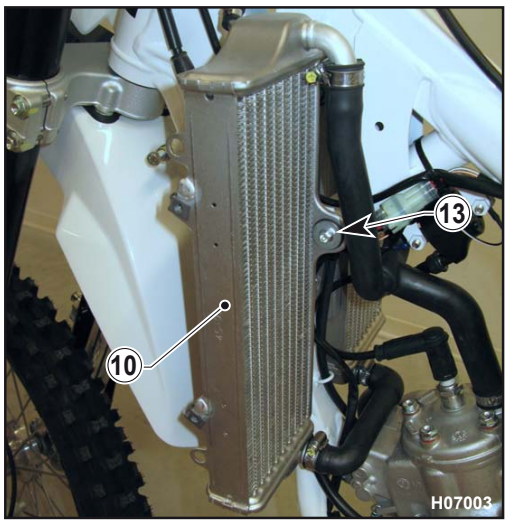
- Remove the plastic grids (3) from the radiators (4).



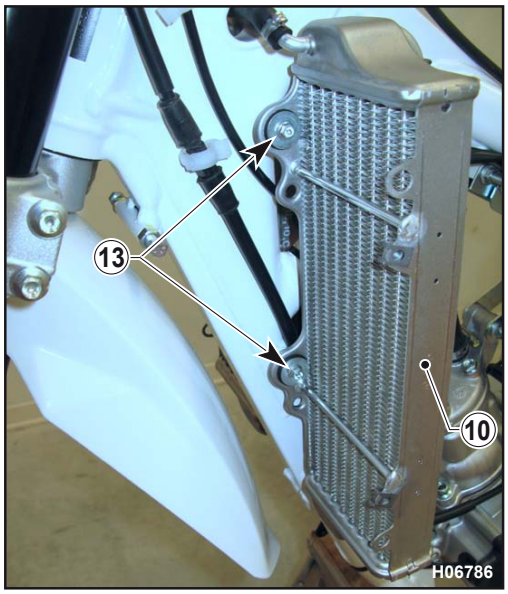
- Open clamps (5), and disconnect hoses (6) from right-hand radiator (7).

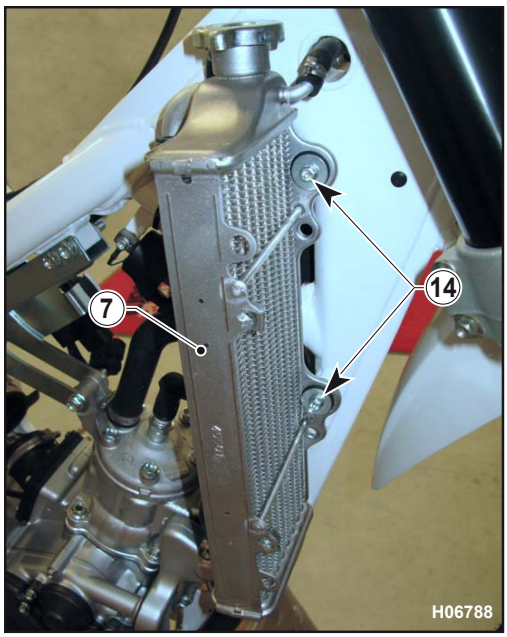


- Open clamps (8), and disconnect hoses (9) from left-hand radiator (10).
- Open clamp (11), and disconnect the radiator connecting hose (12).

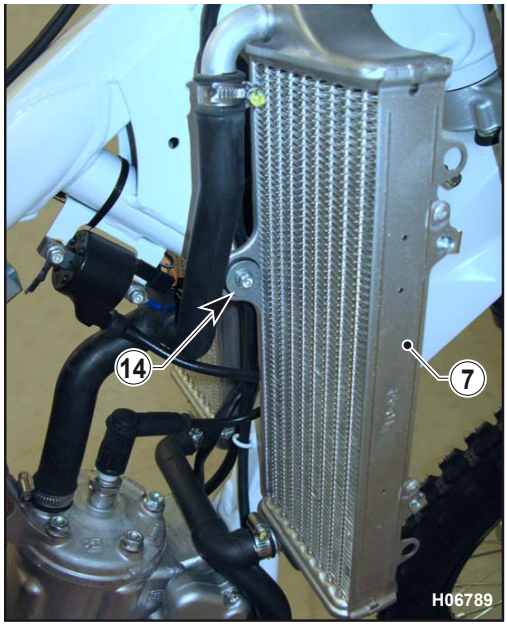


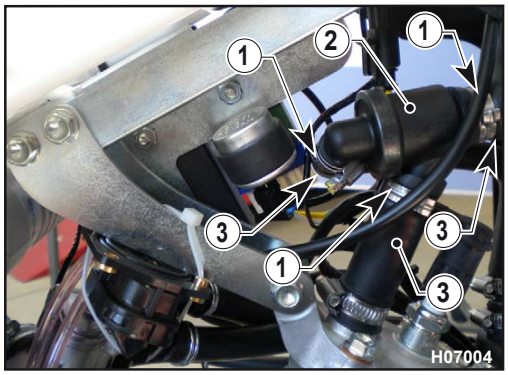
- Using an 8 mm wrench, loosen screws (13), and remove left-hand radiator (10).

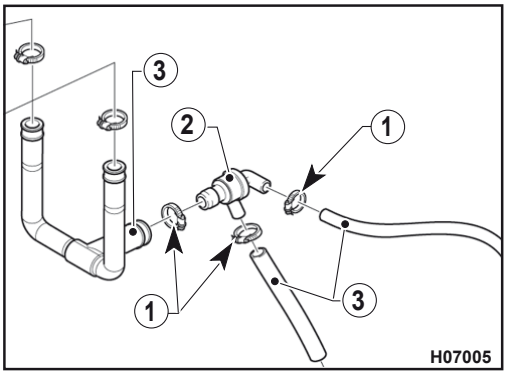




- Using an 8 mm wrench, loosen screws (14), and remove right-hand radiator (7).



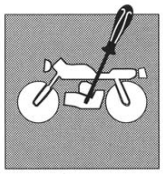




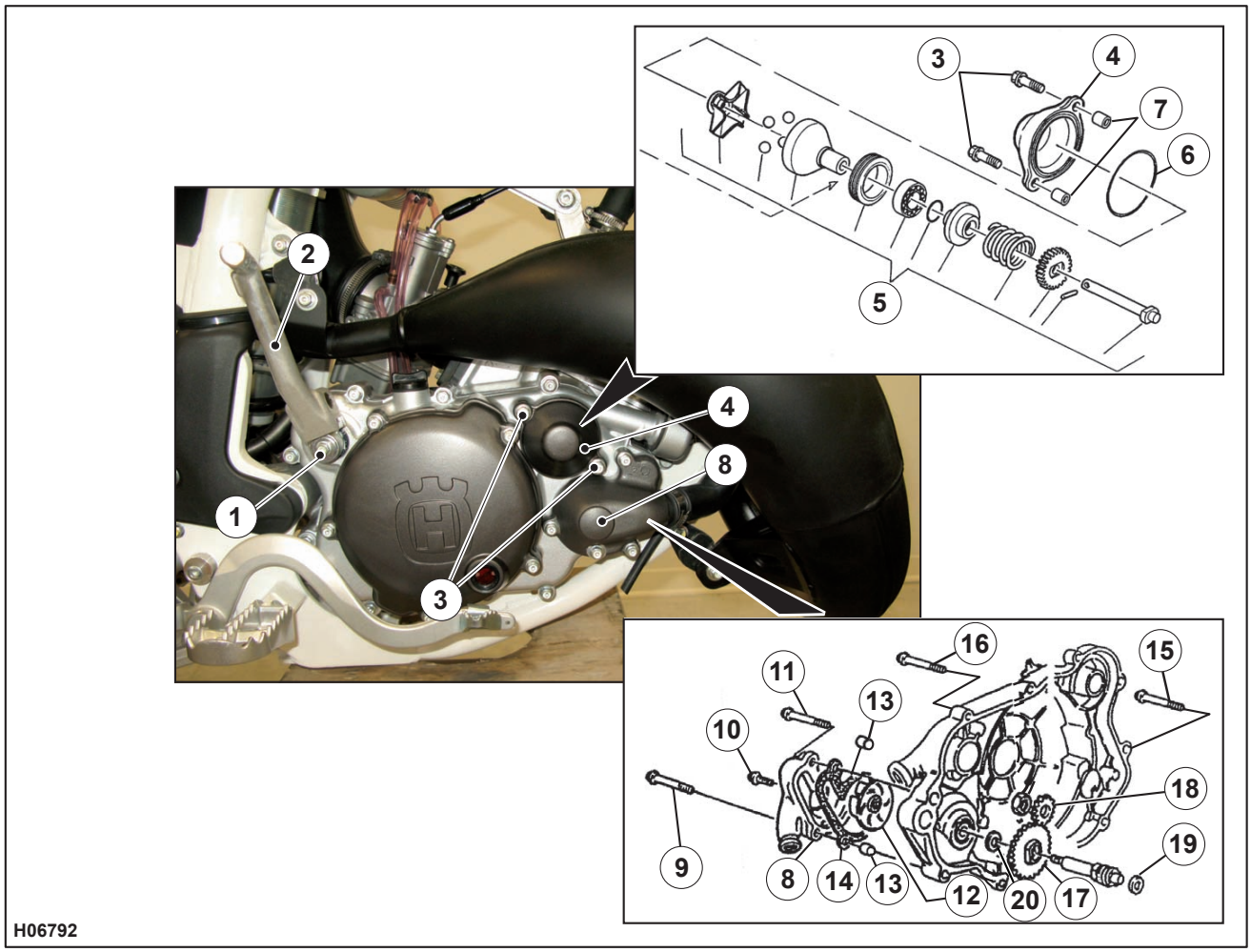
Thermostat removal (WR)

- Remove fuel tank, and drain all coolant as outlined in the relevant paragraph.
- Open the three clamps (1) securing the thermostat (2).
- Disconnect the hoses (3) and remove the thermostat (2).

Section F



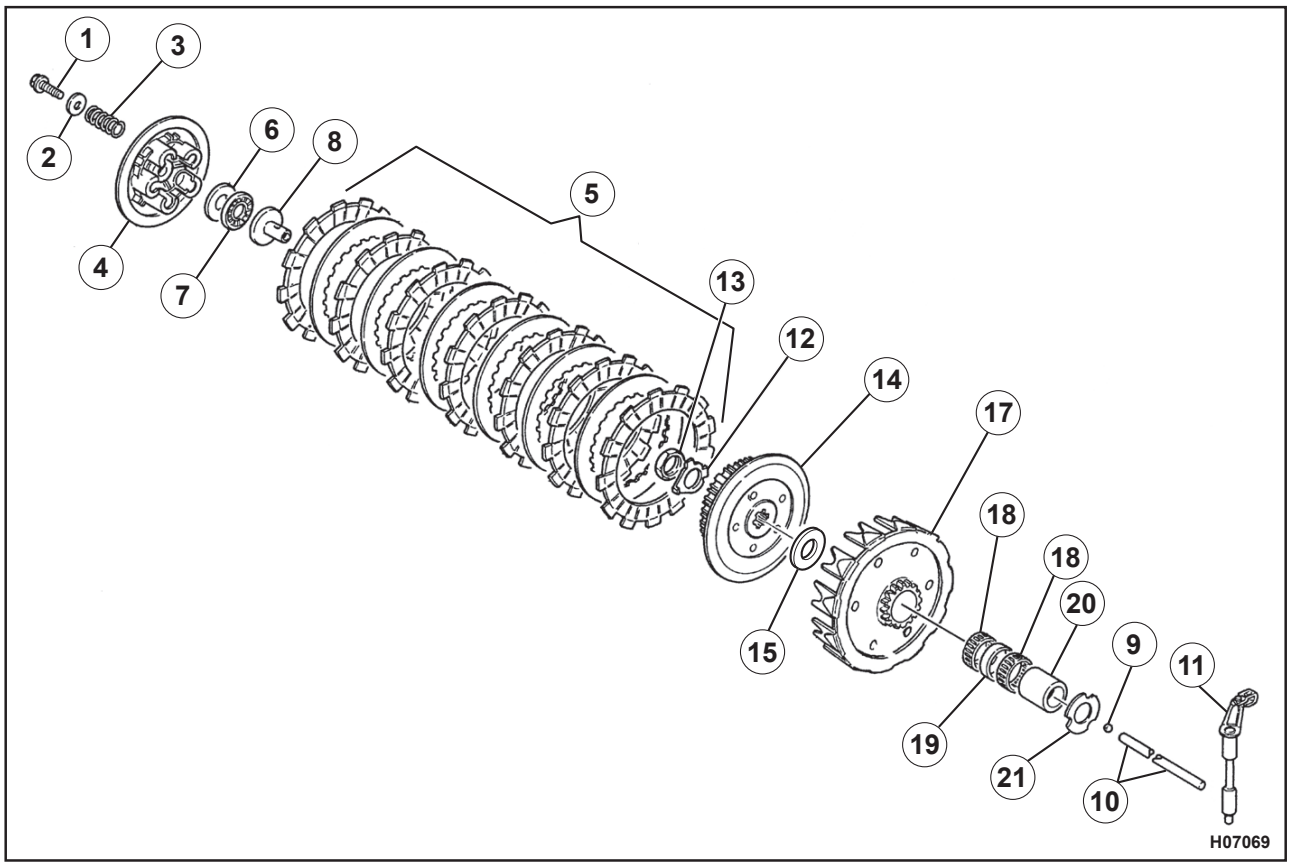
Right-hand side component and cover disassembly



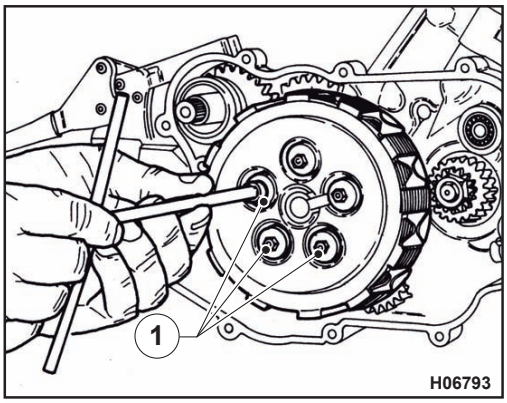
To make disassembly operations easier, it is recommended to place engine block onto a rotating support, securing it on the upper side.
Loosen screw (1), and remove the kick start lever (2). (8 mm wrench)
Loosen the two screws (3), and remove regulator cover (4).
- Remove the complete regulator (5); on reassembly, check the O-ring (6) for damages and make sure that the two bushings (7) are correctly positioned.

Remove water pump cover (8), by loosening the
retaining screws (9), (10) and (11).
Remove water pump impeller (12) by turning it by hand counter clockwise.
On reassembly, take care that pump cover centring bushings (13) are positioned close to the two longer screws, and replace gasket (14).
Loosen the eight retaining screws (15 and 16, two and six pieces respectively) on crankcase half right-hand side cover.
Remove cover, by levering onto starter shaft end. Collect seal.
Slide out water and oil pump control shaft, complete with nylon gears (17) and (18), from inside the cover. Collect shims (19) and (20).

Clutch components

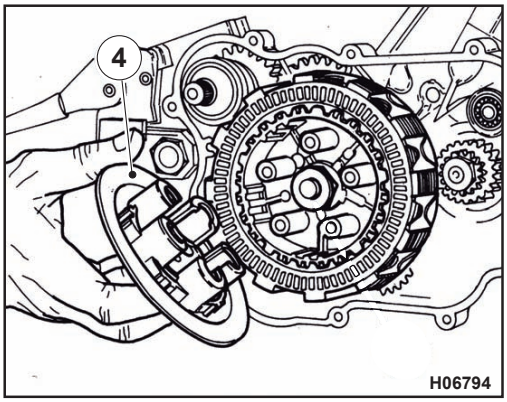


1 Screw
2 Washer
3 Spring
4 Pressure plate
5 Clutch assembly
6 Thrust washer
7 Needle roller bearing
8 Retainer
9 Ball
10 Pushrod
11 Clutch control shaft
12 Lock washer
13 Nut
14 Clutch hub
15 Washer
17 Clutch housing
18 Needle roller bearing
19 Spacer
20 Spacer
21 Washer

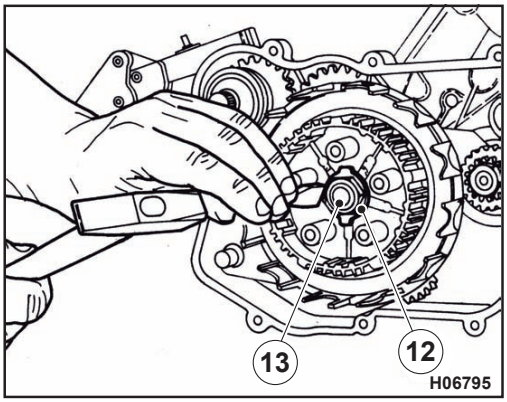


Clutch-side crankcase half component disassembly

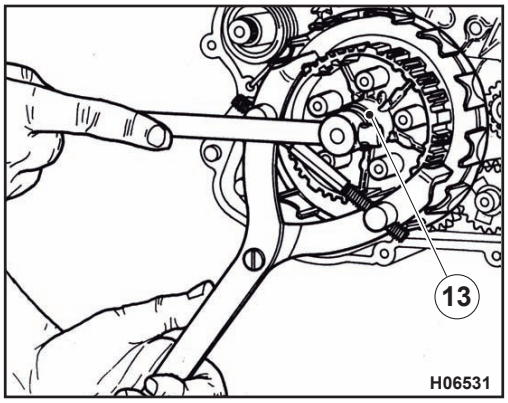
Working crossways, loosen the five retaining screws (1) on clutch springs, and remove them together with the relevant washers (2) and springs (3).



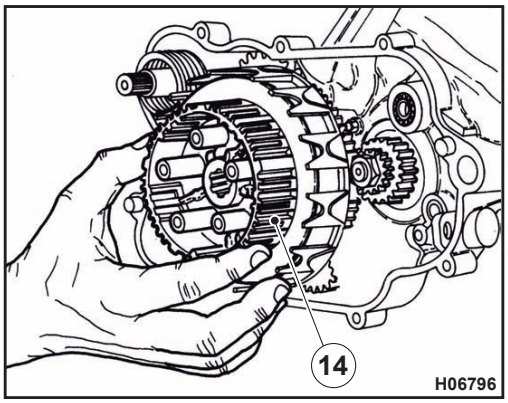
Remove pressure plate (4) and clutch plates pack (5) from hub.
Slide thrust washer (6), axial roller bearing (7) and retainer (8) out of primary shaft end. Tilt engine block on the right side, and slide out ball (9) and pushrod (10).
Working on the opposite side, slide out clutch control lever (11) together with return spring and bushing.



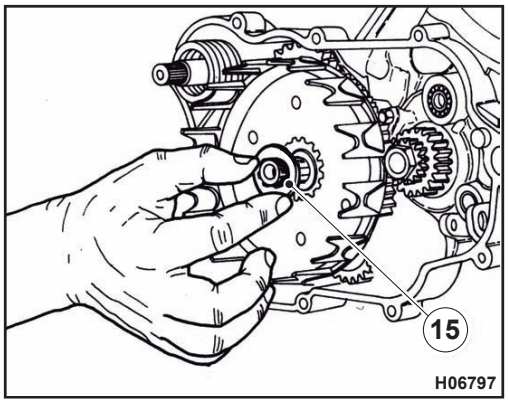
Using a chisel and a hammer, straighten the bent sections of lock washer (12) on clutch hub sealing nut (13).



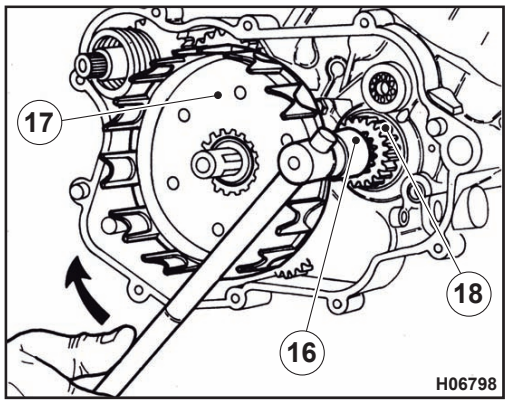
Carry out this operation using special tool part no. **8000 79015** with the ends inserted inside the two opposite grooves on clutch hub.
Lock clutch hub in place with tool, and loosen locking nut (13) with a 22 mm socket wrench.



Slide nut (13), lock washer (12) and clutch hub (14) out of primary shaft end.

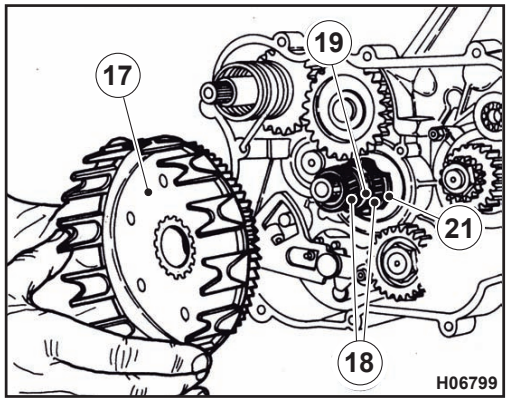


Slide washer (15) out of primary shaft.

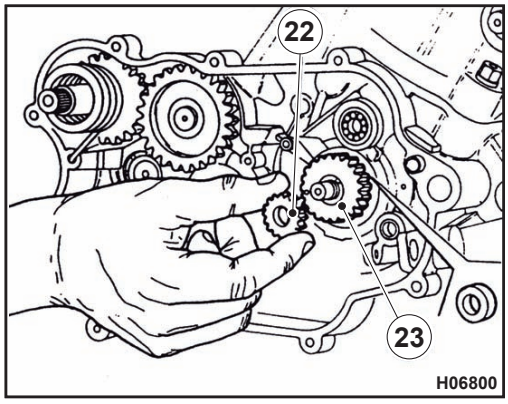


Crankshaft nut (16) has a left-hand thread.

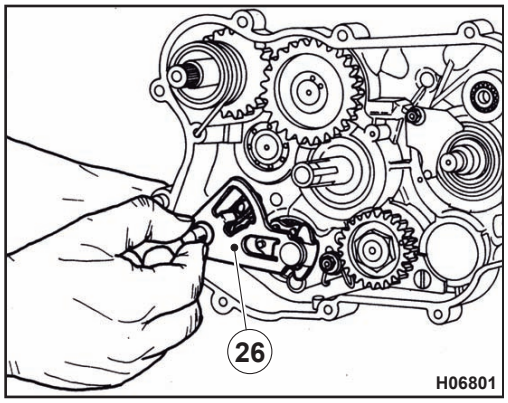
Loosen crankshaft nut (16) placing a 1/2 gear or an aluminium shim between clutch housing gear (17) and crankshaft gear (18).



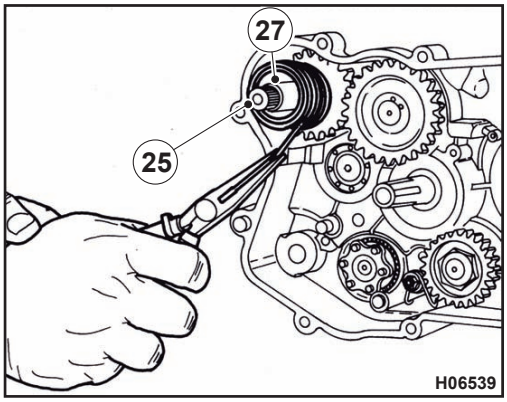
Slide clutch housing (17), the two needle roller cages (18) with spacer (19), the inner spacer (20) and three-tab washer (21) out of primary shaft.



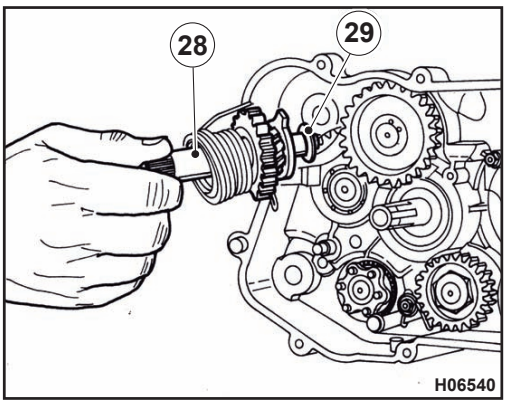
Slide water pump control gear (22) and primary drive gear (23) out of crankshaft.
Remove the Woodruff key from crankshaft.



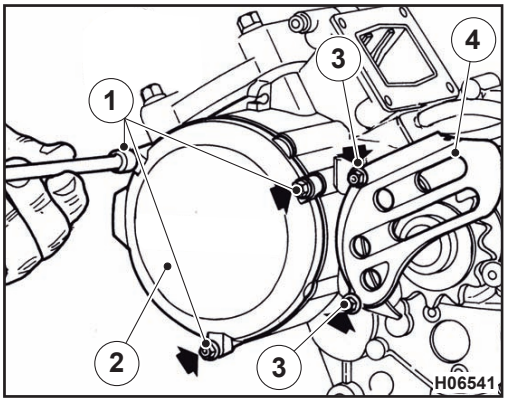
Slide selector shaft (26) out of right crankcase half rear side.



Disengage return spring (27) on starter shaft (28) from its retainer on right crankcase half.

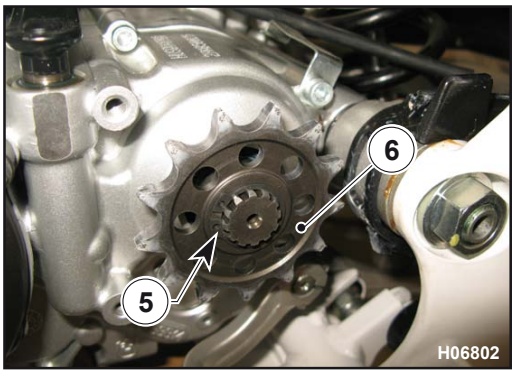


Working on the inner side, slide out starter shaft assembly (28) complete with control gear, and collect washer (29).



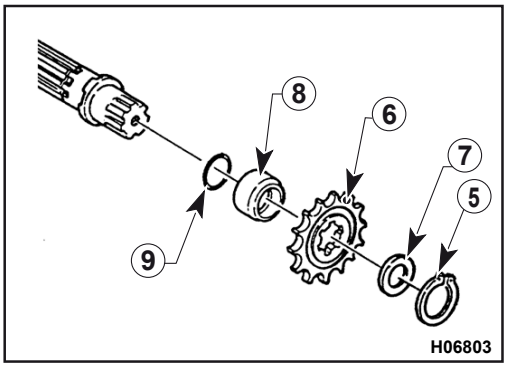
Sprocket-side component and cover disassembly

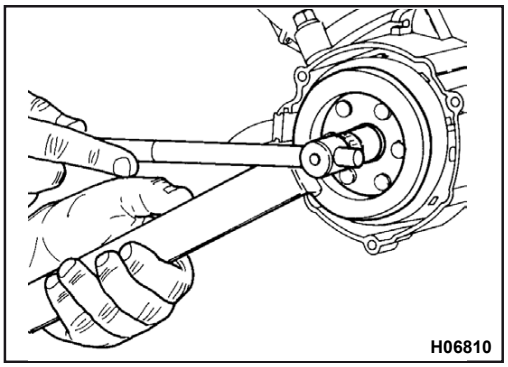
Loosen the three retaining screws (1), and remove cover (2). Collect gasket. Loosen the two retaining screws (3) on sprocket cover (4), and remove it together with the protective plate and spacers.



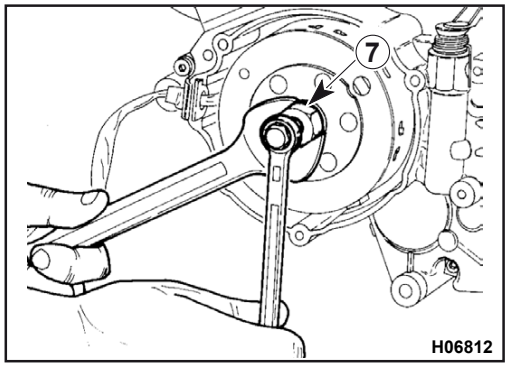
Remove circlip (5) and slide out sprocket (6), washer (7), spacer (8) and the OR gasket (9).

NOTE: On reassembly, position the spacer (8) with the O-ring seat (9) towards the inside.

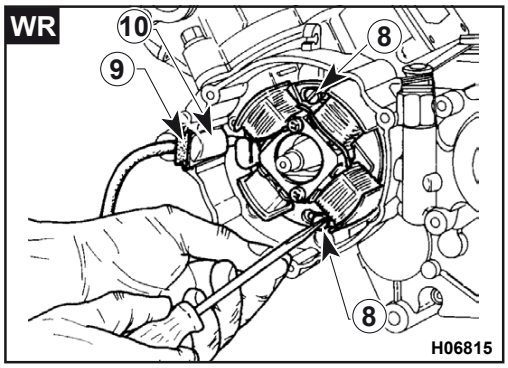




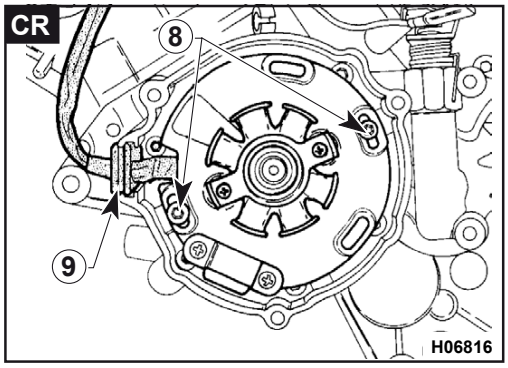
Prevent rotor rotation using a suitable tool.
Using a 17 mm (CR) or 19 mm (WR) socket wrench, loosen rotor sealing nut.
Remove lock washer.

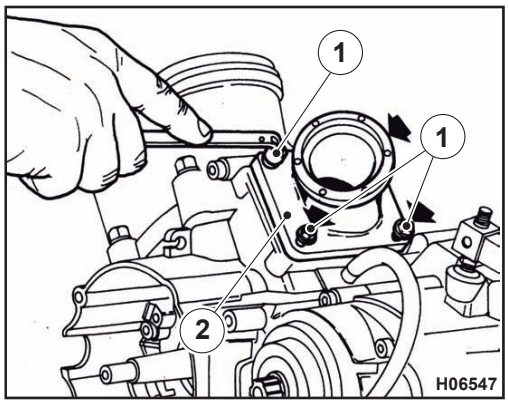


Use the tool (7) part no. **8000 60516 (WR)** or **8000 46613 (CR)** and secure it onto rotor.
Holding the tool in place with a 22 mm (WR) or 19 mm (CR) Allen wrench and working clockwise on the central screw, remove rotor from crankshaft with a 14 mm (WR) or 17 mm (CR) Allen wrench.



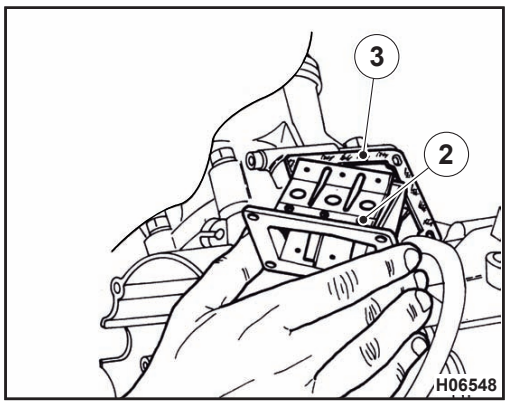
Loosen the screws (8) which fix the stator. Remove the rubber cable run (9) and plate (10) (for WR only) from the left half-casing, then remove the stator.
Remove the Woodruff key from crankshaft.





Intake valve disassembly

Using the special wrench part no. **8000 98431** loosen the four sealing screws (1) on intake valve unit (2).
Slide out the carburettor-to-valve fitting.

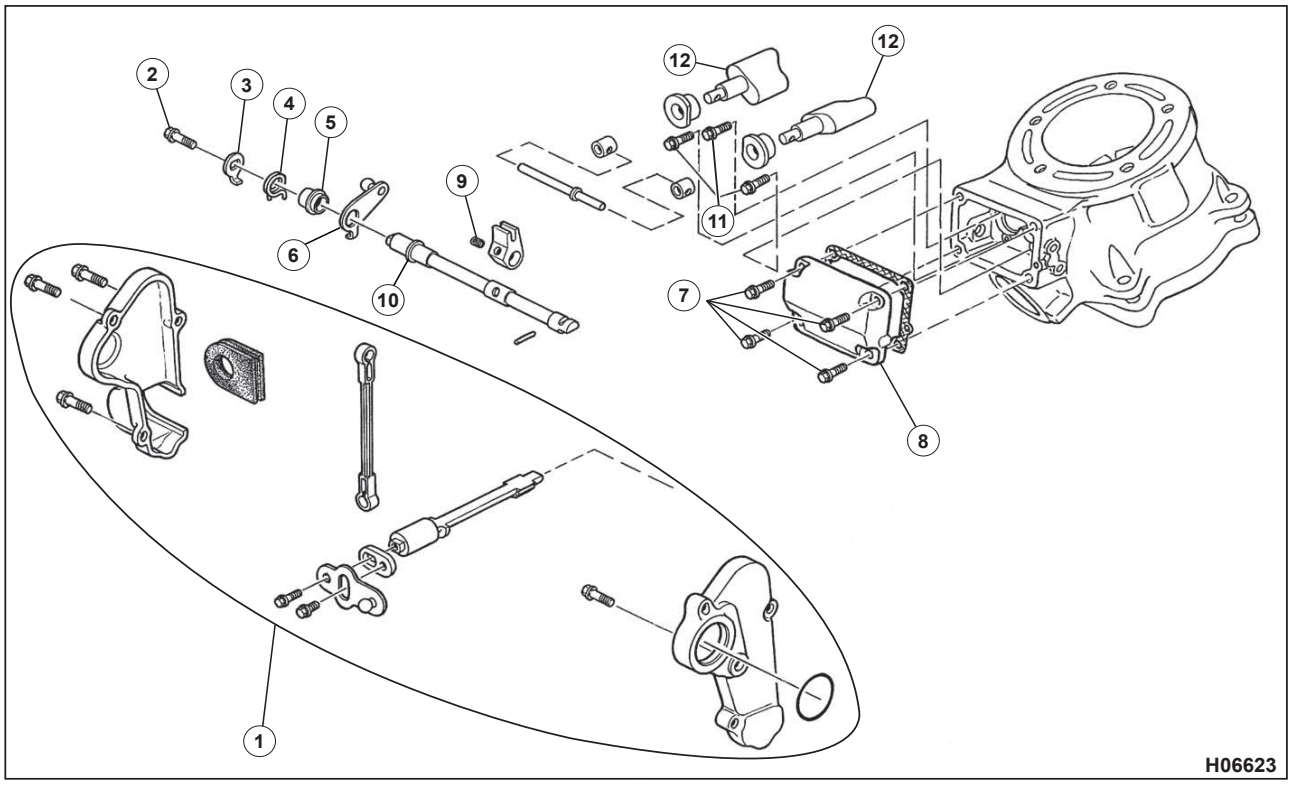


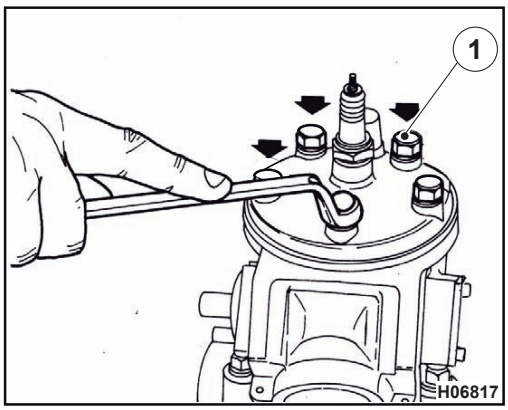
Remove intake valve (2) from crankcase, and collect gasket (3).

Exhaust valve disassembly

- Remove exhaust valve control unit (1) ad described in the relevant paragraph.
- Loosen screw (2), and remove parts (3), (4), (5) and (6).

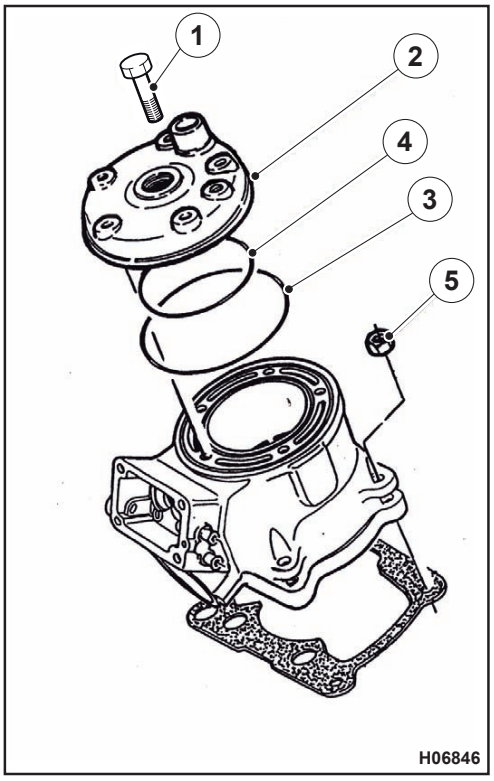
Remove screws (7) and cover (8). Loosen grub screw (9), duly turn shaft (10), and remove if from its seat on cylinder. Remove screws (11) and exhaust valves (12).





Piston-cylinder-and-head assy disassembly

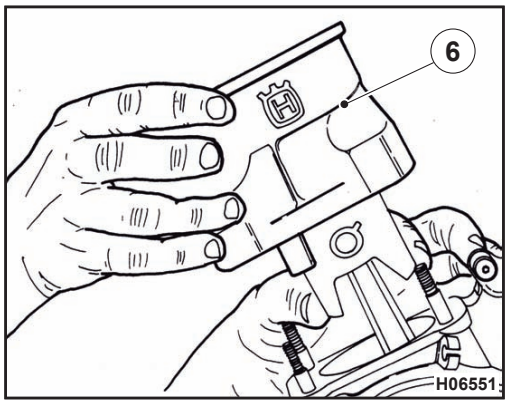
Head, cylinder and piston can be disassembled also at an earlier stage, as this procedure is independent of the disassembly operations carried out so far.
The piston-cylinder-and-head assy removal proves now necessary in order to separate the crankcase halves.
Loosen the five head sealing screws (1) on cylinder, and collect the washer underneath.



Remove head (2), and collect the two outer (3) and inner (4) O-rings.

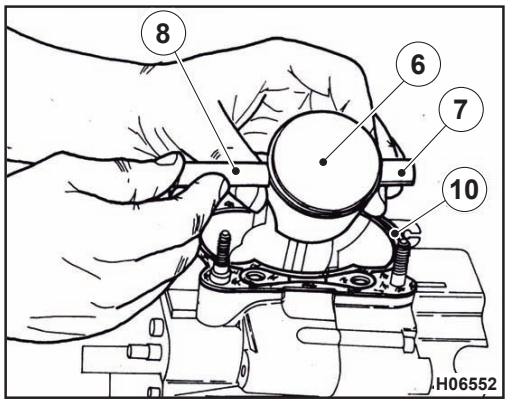
NOTE: The O-rings between head and cylinder shall be changed upon each reassembly.

Loosen the four retaining nuts (5) between cylinder and crankcase.

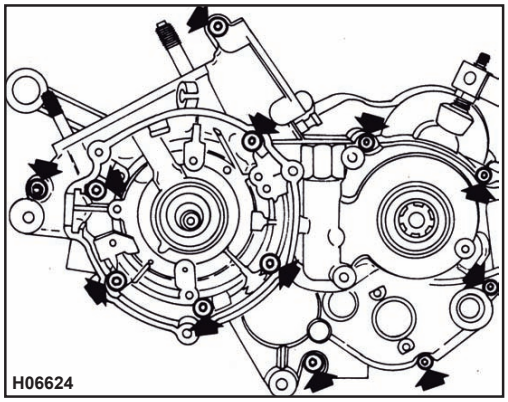


Slide cylinder (6) out of crankcase stud bolts, by duly supporting piston with your hands when it is separated from cylinder.

WARNING - When removing the cylinder, do not let it rotate as piston ring end could enter gaps thus preventing piston removal and causing damage to the piston ring itself. To eliminate this risk, removal operations shall be carried out with the piston at BDC.

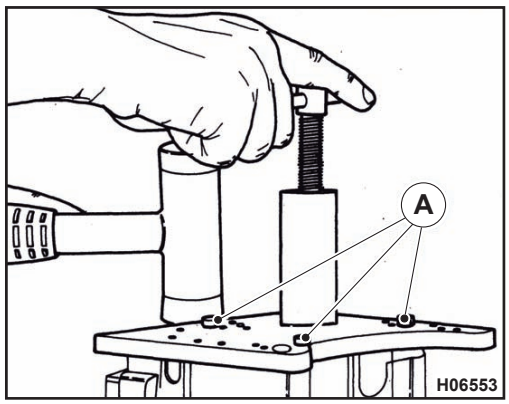


Remove one of piston pin (7) retainers, duly support piston and partially slide out piston pin using a cylindrical pin (8) until piston is free.
Remove piston (9) with piston pin.
Slide roller cage out of connecting rod.
On reassembly, replace gasket (10).

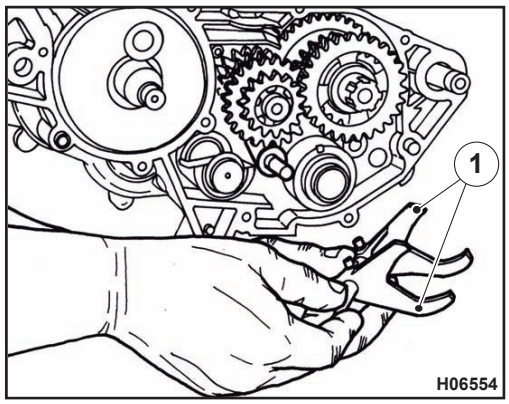


Splitting the crankcase

Loosen the 12 retaining screws on left crankcase half.

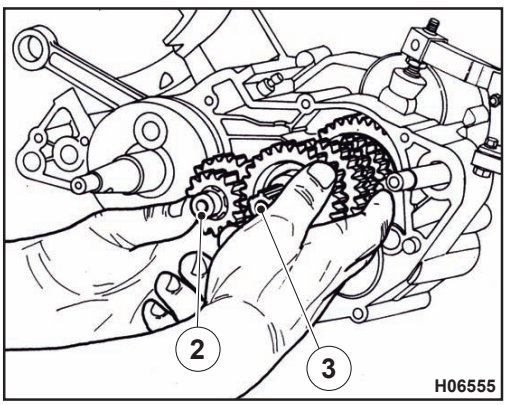


With the gearbox in neutral position, fit tool part no. **8000 79016** on left crankcase half (with 3 duly-sized "A" screws), work on the central pin and separate crankcase halves.
To make this operation easier, tap output shaft end with a mallet while working with tool pin.
Remove shims from crankshaft, primary shaft and selector shaft.

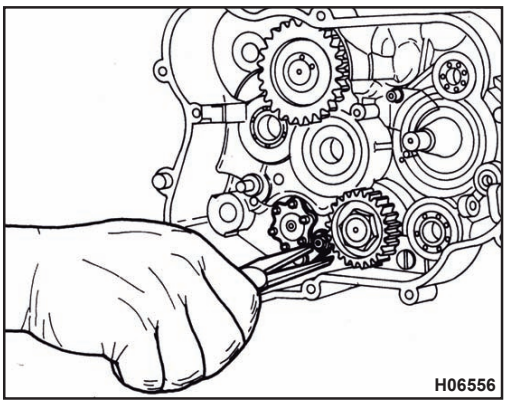


Gearbox removal

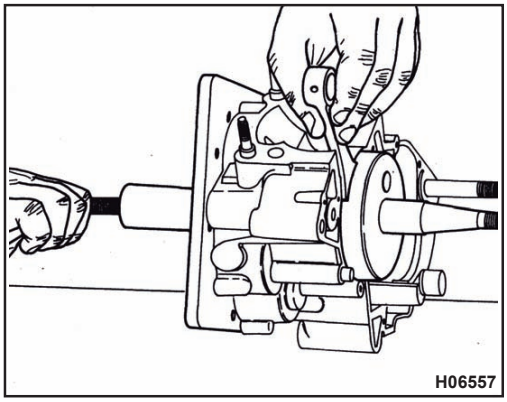
Remove the two pins with shifter forks (1).



Remove the two gearbox shafts (2) and (3), complete with gears, at the same time.
To make this operation easier, tap primary shaft end with a mallet.
Take special care to shims.



Using pliers, counteract spring action and turn ratchet to allow selector shaft removal. Slide out selector shaft from the left side.



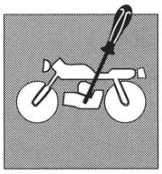
Crankshaft removal

Should it be necessary to remove crankshaft from right crankcase half, use the same tool part no. **8000 79016** already used for crankcase splitting.
Align tool holes with those on right crankcase half outer side, and secure tool with three screws of a suitable length. Duly support crankshaft, and work on central pin to remove it.

When removing crankshaft, never tap on its end, even with a plastic hammer.

To remove bearing, that will remain integral to the crankshaft on the left side, use tool part no. **8000 89030**. On reassembly, take special care to position shim between shaft and bearing.

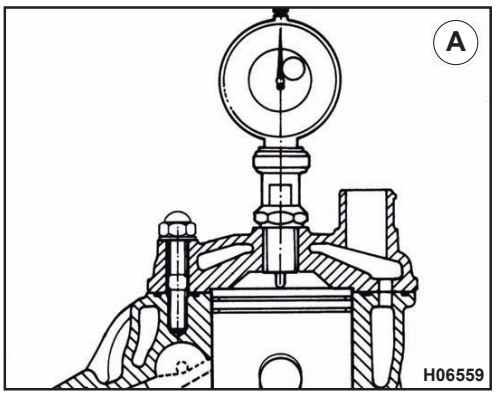
Section G

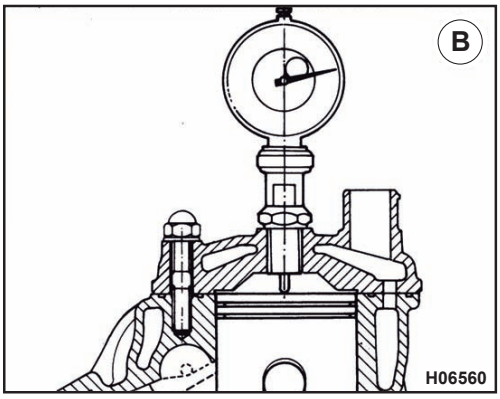


Cleaning parts

All parts must be cleaned with gasoline and dried with compressed air.

During this procedure flammable vapours develop and metal particles may be blown at high speed, it is therefore recommended to perform this procedure away from open flames or sources of ignition, and to wear goggles.





B - A= 1.2 mm / 0.047 in.

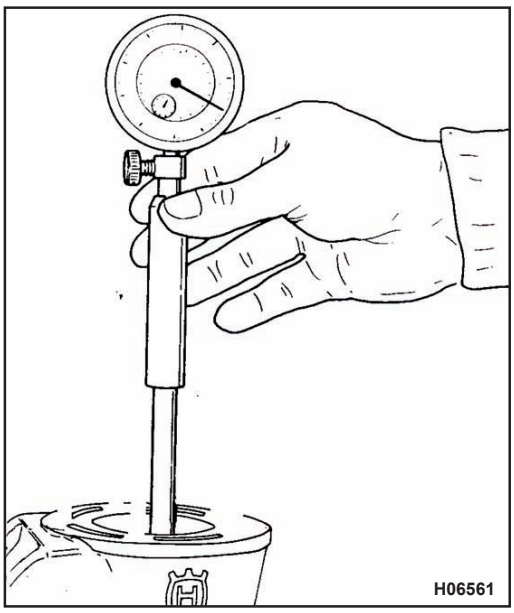
Compression ratio check

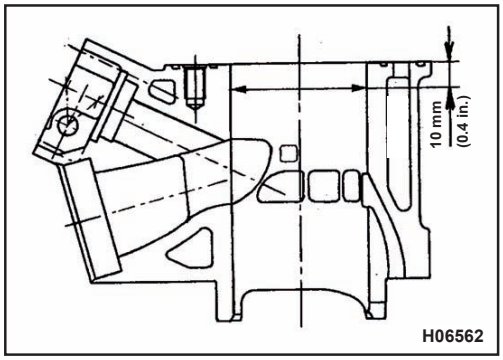
To check if the compression ratio is correct, proceed as follows:

a) remove the cylinder together with the head from the crankcase ;
b) remove the piston from the connecting rod, carefully clean it and install it inside cylinder until it rests against the corresponding sector on the combustion chamber (such part, as well, has to be cleaned from deposits)
c) screw a dial gauge into the spark plug hole, and reset it on the piston position indicated in figure (A);
d) remove the piston and reassemble it on the connecting rod;
e) reassemble the cylinder together with the head inserting the 0.5 mm seal on the crankcase;
f) take the piston to the T.D.C., and check that the reading on the dial gauge is equal to 1.2 mm (0.05 in.) (figure B);
g) should the reading be different, restore the correct condition using a cylinder foot gasket of suitable thickness.

Alternatively:

a) Remove the head, screw a dial gauge into the spark plug hole, and reset it on a surface plane;
b) rest head onto cylinder, take piston to the T.D.C. and check that the reading on the meter is 1.2 mm (0.05 in.);
c) should the reading be different, restore the correct condition by using a cylinder foot gasket of thickness.





Cylinder

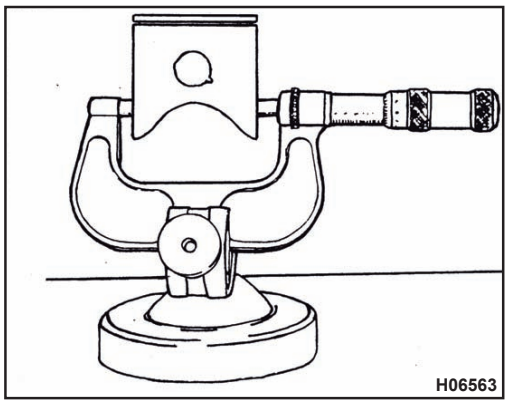
Light alloy cylinder with "NIKASIL"-coated liner.
Once the cylinder has been activated, the max. allowed out-of-round value is 0.015 mm (0.0006 in.).
In case of damages or excessive wear the cylinder shall be replaced. Cylinders are marked by a letter or a colour referring to the class they belong to.

Cylinder measuring

Check that the internal surface is perfectly smooth and free from scuffing.
Take the reading of the liner diameter (DN), 10 mm from the upper surface, as indicated in the diagram, towards the exhaust axis.

Clearances

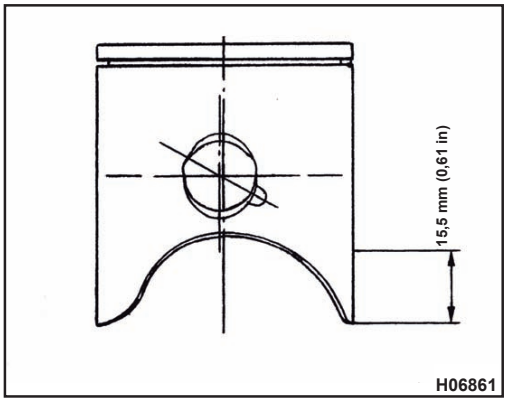
To ensure the best operating conditions and maximum performance, all clearances must be within the specified tolerance. A tight fit will lead to seizure as moving parts heat up; whereas a loose fit will cause annoying vibration resulting in early wear of moving parts.

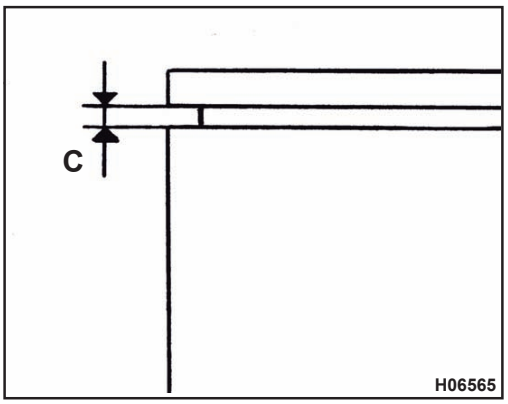


Piston

Clean off any carbon deposits from piston crown and grooves. Perform a careful visual inspection of the piston and check its dimensions. There should be no signs of forcing, scuffing, cracking or other damage.

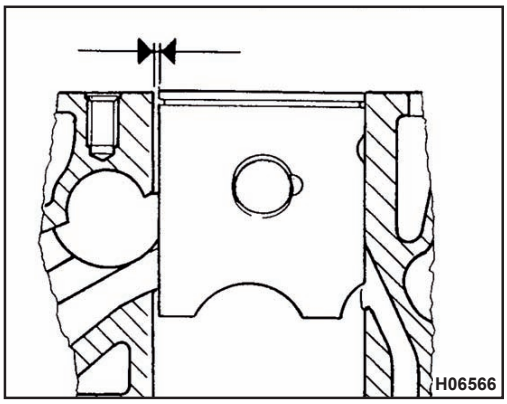
The piston diameter (D) shall be measured 15.5 mm (0.61 in.) from the skirt bottom, perpendicularly to the piston pin axis.





Piston groove height (C)

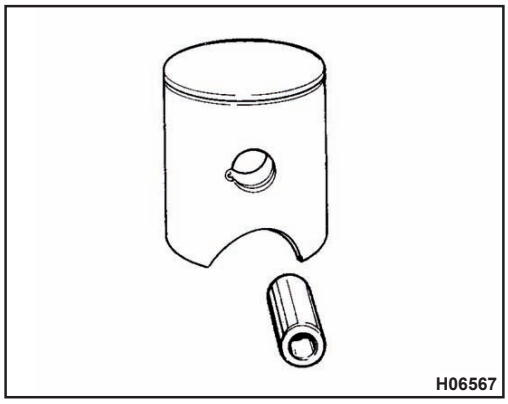
Standard	Max. size limit
1.02 ÷ 1.04 mm (0.0401÷0.0409 in.)	1.1 mm (0.043 in.)



Cylinder to piston clearance

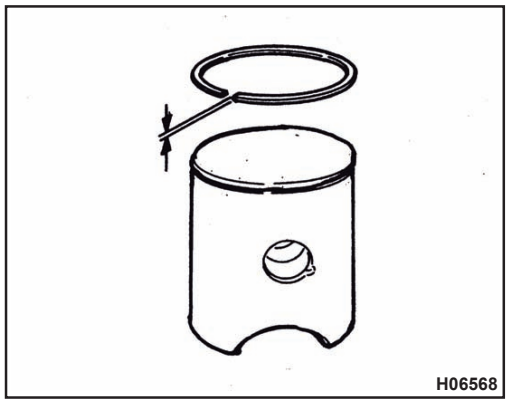
The piston-cylinder units are supplied already coupled; should the cylinders and pistons of some units have been accidentally mixed up, it will be necessary to measure the diameters as outlined in the previous paragraphs.
Take these measurements at a stabilised temperature of 20°C.
Preferential clearance DN-D1 = 0.035÷0.055 mm (0.00138÷0.00216 in.)
Wear limit 0.080 mm (0.00315 in.).

Cylinder		Piston		
Abbreviation	Size	Abbreviation	Size	Clearance
A-B or **BLACK-BLUE**	53.985÷53.995 (2.1254÷2.1258)	A - B	53.940÷53.950 (2.1236÷2.1240)	from 0.035 (0.00138 in.) to 0.055 (0.00216 in.)
C-D or **PINK-GREEN**	53.995÷54.005 (2.1258÷2.1262)	C - D	53.950÷53.960 (2.1240÷2.1244)	from 0.035 (0.00138 in.) to 0.055 (0.00216 in.)
E-F or **RED-WHITE**	54.005÷54.015 (2.1262÷2.1266)	E - F	53.960÷53.970 (2.1244÷2.1248)	from 0.035 (0.00138 in.) to 0.055 (0.00216 in.)



Piston pin

It must be perfectly smooth, with no signs of scuffing, dents or bluing due to overheating. Check the piston pin to piston clearance: it shall be 0.002÷0.009 mm (0.000079÷0.000354 in.). Wear limit 0.012 mm (0.0005 in.). When replacing the piston pin it is also necessary to replace the needle roller bearing cage (in compliance with what specified in the paragraph "piston pin-piston-connecting rod small end clearance").

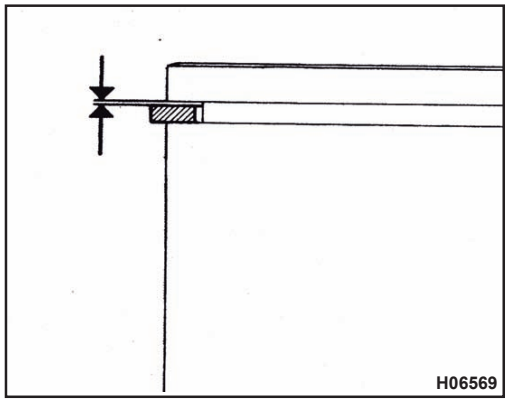


Piston rings

Visually check the piston ring and the relevant seat in the piston.
If the piston ring is worn or damaged, it has to be replaced (the set is available as spare part).
If the piston ring seat is worn or damaged as well, both piston and piston ring shall be replaced.
When a new piston ring is fitted on a used piston, make sure that the piston ring seat is not unevenly worn.
The piston ring should be positioned perfectly parallel to the groove surfaces in the piston. Otherwise, the piston shall be replaced.

Piston ring height

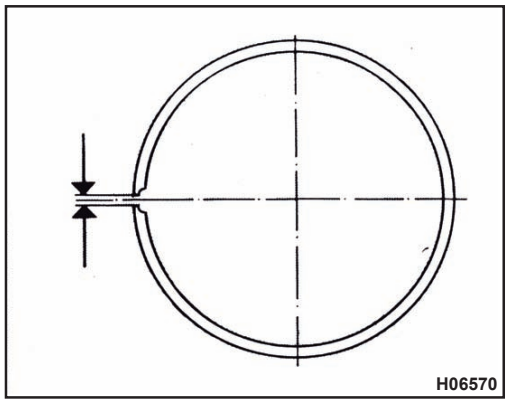
Standard	Max. size limit
0.978÷0.990 mm (0.0385÷0.0390 in.)	0.96 mm (0.038 in.)



The table shows the values of the axial clearance between lower, upper piston ring and piston seat.

Piston ring to groove clearance

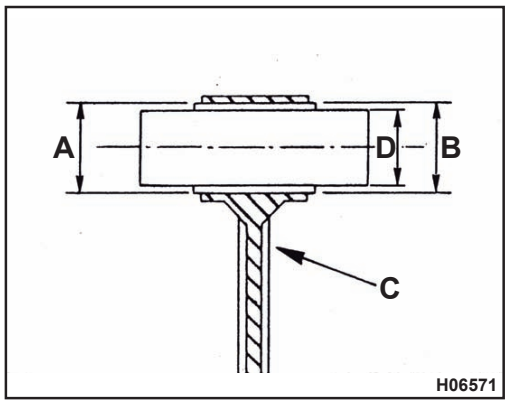
Standard	Max. size limit
0.030÷0.062 mm (0.00118÷0.00244 in.)	0.18 mm (0.0071 in.)



Piston ring to cylinder clearance

Insert the piston ring at the bottom of the bore (where minimum wear occurs) taking care to position it squarely, and measure end gap.

Standard	Max. size limit
0.15 -0.30 mm (0.0059÷0.0118 in.)	0.50 mm (0.0196 in.)

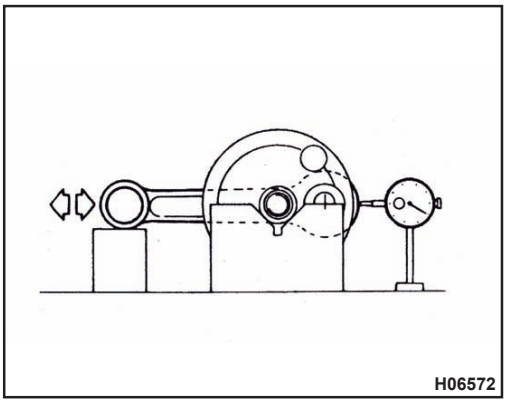


Piston pin-piston-connecting rod small end clearance

The table below is a list of the possible clearances allowing to reach the right radial clearance of 0.002÷0.010 mm (0.000078÷0.000393 in.).
If, during engine overhaul, a radial clearance higher than the max. allowed value of 0.015 (0.00059 in.) is found and the colour mark (C) is no longer visible on the connecting rod, it will be necessary to measure the diameter "A" of the connecting rod small end and, based on this value, the proper needle roller bearing cage will have to be assembled.

NOTE: When asking for the needle roller bearing cage, specify the selection.

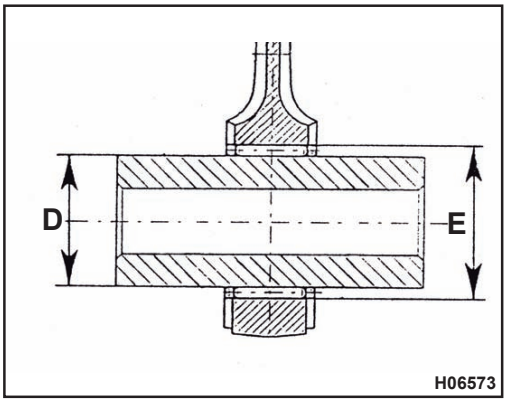
"A" connecting rod small end hole diameter colour selection - mm (in.)	"D" piston pin diameter colour selection - mm (in.)	"B" needle roller bearing cage diameter selection
White 18.998÷19.000 (0.7479÷0.7480)	White 14.998÷14.996 (0.5904÷0.5903)	-1÷-3
Black 19.000÷19.002 (0.7480÷0.7481)	Black 15.000÷14.998 (0.5905÷0.5904)	-1÷-3
Black 19.000÷19.002 (0.7480÷0.7481)	White 14.998 ÷14.996 (0.5904÷0.5903)	0÷-2
Red 19.002÷19.004 (0.7481÷0.7482)	Black 15.000÷14.998 (0.5905÷0.5904)	0÷-2



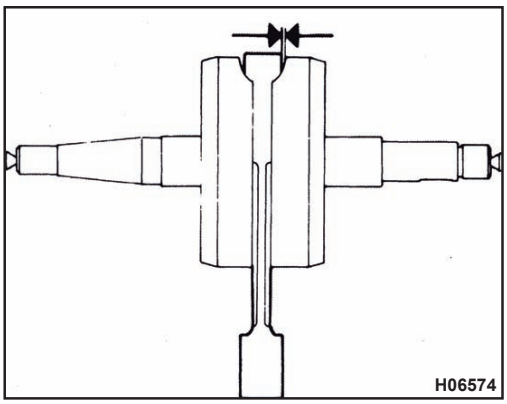
Pin-flywheel-connecting rod big end clearance

The table below is a list of the possible clearances allowing to reach the right radial clearance of 0.20÷0.028 mm. If, during engine overhaul, a radial clearance higher than the max. allowed value of 0.050 is found, it will not be necessary to measure the diameter "E" of connecting rod big end and the diameter "D" of flywheel pin. Based on these values, assemble the suitable needle roller bearing cage.

NOTE: When asking for the needle roller bearing cage, specify the selection.



"E" connecting rod small end hole diameter colour selection - mm (in.)	"D" pin-flywheel-connecting rod big end hole diameter colour selection - mm (in.)	Needle roller bearing cage diameter selection
White 30.014÷30.016 (1.1816÷1.1817)	Black 23.998÷23.996 (0.9448÷0.9447)	-2÷-4
Black 30.016÷30.018 (1.1817÷1.1818)	White 23.996÷23.994 (0.9447÷0.9446)	0÷-2
Black 30.016÷30.018 (1.1817÷1.1818)	Red 24.000 ÷23.998 (0.9449÷0.09448)	-2÷-4
Red 30.018÷30.020 (1.1818÷1.1819)	Black 23.998÷23.996 (0.9448÷0.9447)	0÷-2

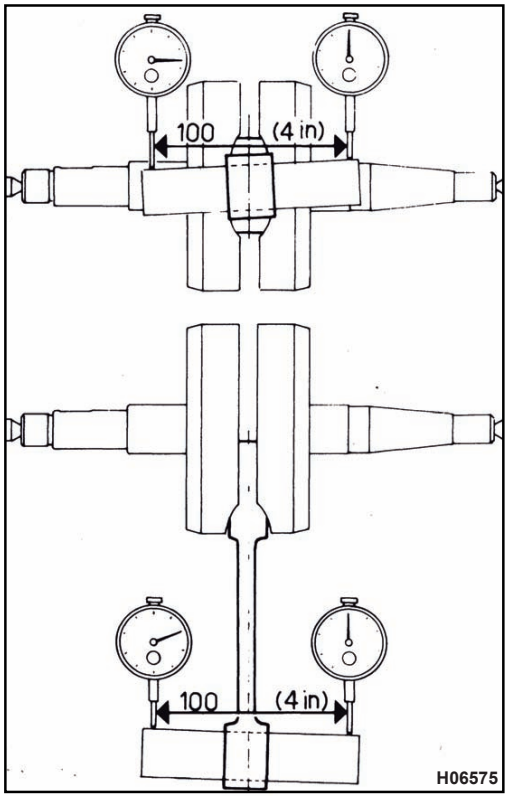


Connecting rod

Due to the stresses the connecting rod is subject to, its original dimensions change in a more or less noticeable way. The connecting rod tests are meant to check its wholeness.
Should readings not comply with the max. allowed wear limits, it will be necessary to replace it.
These tests can be carried out even with connecting rod assembled to crankshaft.

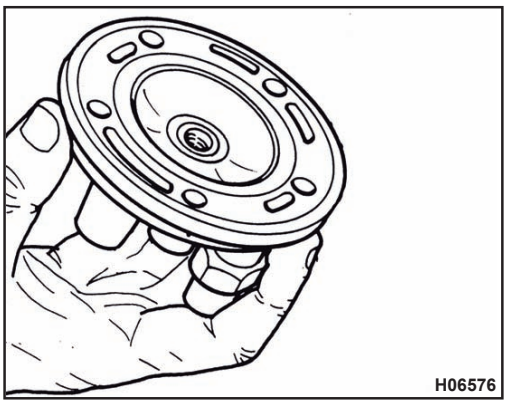
Big end axial clearance

Standard	Max. wear limit
0.45÷0.84 mm (0.0177÷0.0331 in.)	1.1 mm (0.043 in.)



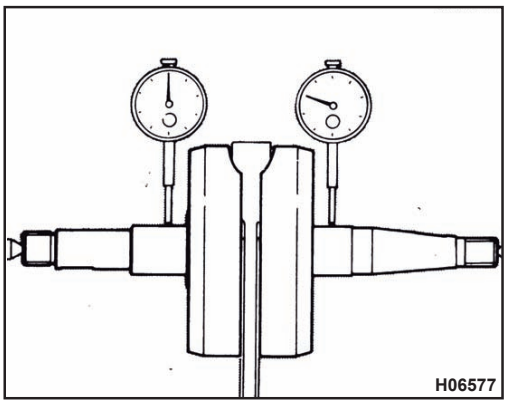
Connecting rod twist, warping

Standard	Max. wear limit
max. 0.025/100 mm (max. 0.00098 in./4 in.)	0.05/100 mm (0.0019 in./4 in.)



Head

Remove carbon deposits from the combustion chamber. Make sure that there is no cracking and that the sealing surfaces do not feature scoring, dents or any other kind of damages. Flatness must be perfect as well as spark plug seat threading.

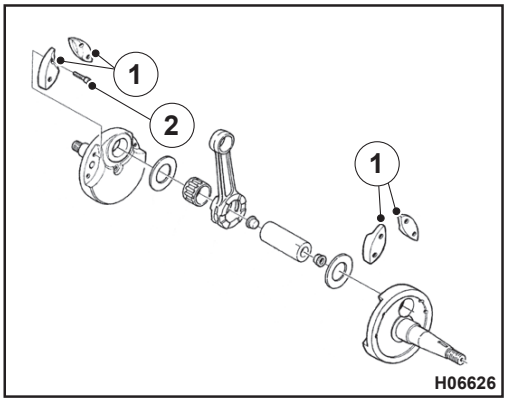


Crankshaft

Main journals should show no scoring or scuffing. Threads, keyways and splines must be in good condition.

Crankshaft straightness

Standard	Max. wear limit
less than 0.02 mm (0.00078 in.)	0.05 mm (0.0019 in.)

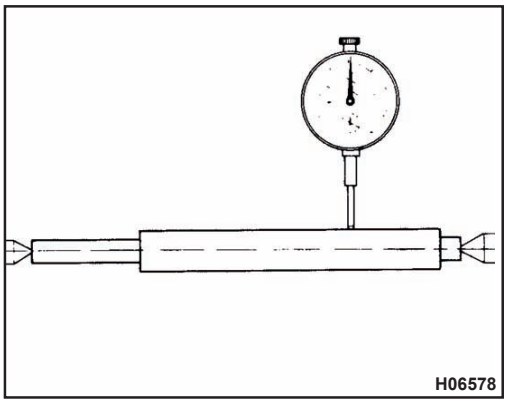


To disassemble crankshaft, use a support and suitable punches.
On reassembly, comply with the specified tolerances.

Assemble the coupling pin into the flywheel-halves with an oil having a C=3 ENGLER viscosity at 50°(cSt viscosity at 40°C=32).

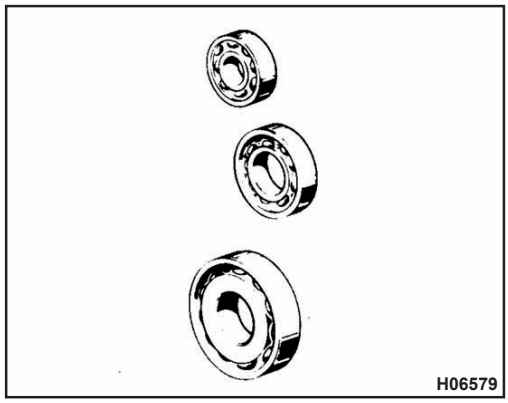
Loosen screw (2) and remove the pads (1).

On reassembly, tighten the screws (2) with Loctite 270.



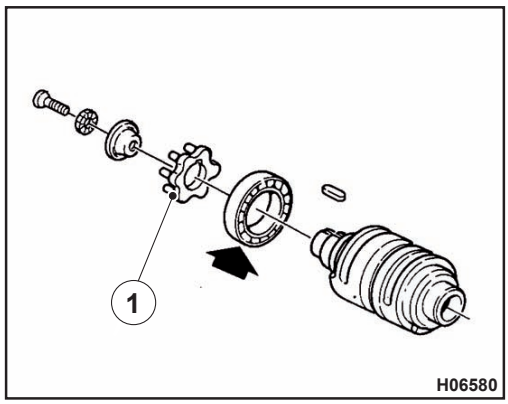
Various crankshaft straightness check

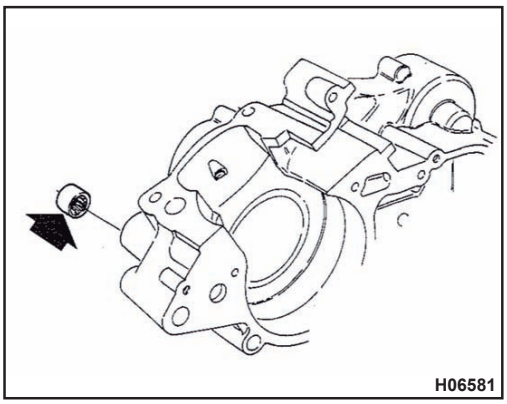
Place the crankshaft between centres and take the measurement with a dial gauge, checking that the detected value does not exceed 0.05 mm (0.00196 in.).



Bearings

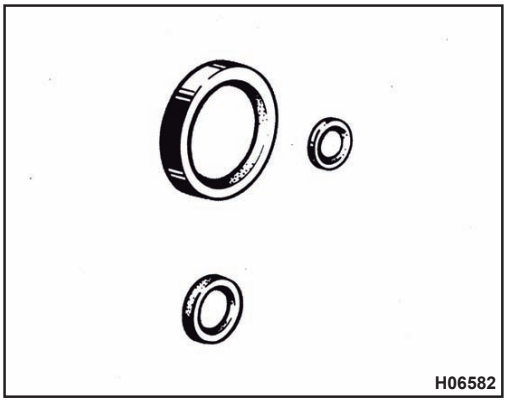
Carefully wash bearings with mixture and dry with compressed air without turning them. Lightly lubricate and slowly turn the internal ring by hand; Rotation unevenness, hard spots or excessive clearance shall not be found. It is good practice to replace the bearings at each engine overhaul. The main bearings shall always be removed in pairs and installed with the **writing pointing outwards;** to replace them it is necessary to heat up the crankcase halves in a furnace at 90°÷100°C and remove the bearing using a driver tool and a hammer. Install the new bearing (while the crankcase is still hot) perfectly squarely with respect to the housing axis, using the special installer that only applies pressure to the outer race. Let the parts cool down, and make sure that the bearing is tightly secured to the crankcase half.
To replace the bearing onto the gear selector shaft, use puller part no. **8000 43720**.
Make sure that the sector gear (1) is not loose; if necessary,replace the key, the screw and the washer, and reassemble with Loctite 648.





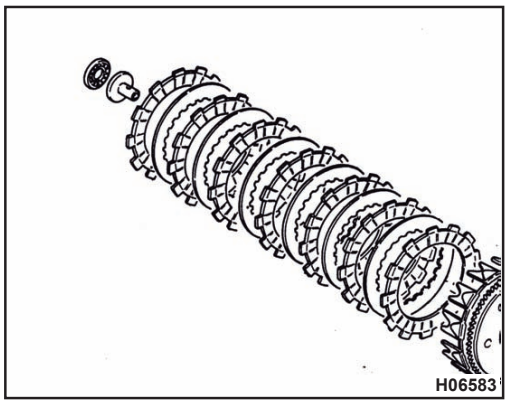
Needle roller bearing replacement

To remove the needle roller bearing of the water pump shaft, use special tool part no. **8000 43824**.



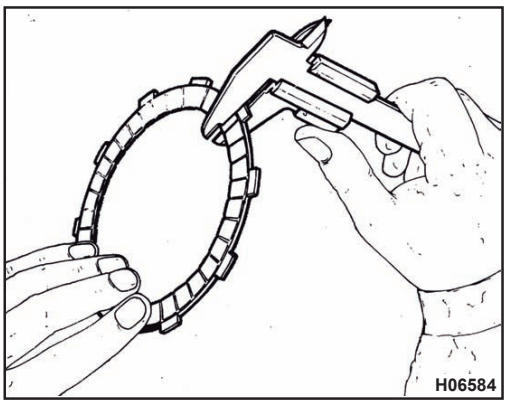
Oil seal replacement

Replace the oil seals at each engine overhaul. To install the new oil seals, insert them squarely into their housings and use suitable driver tools.
After the assembly, lubricate with engine oil the oil seal lip.
Carry out this operation with utmost care and attention.



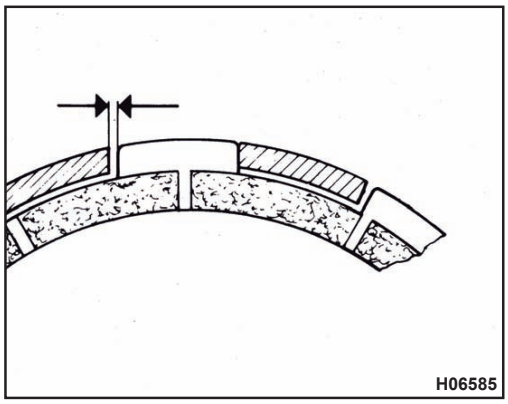
Clutch unit

Inspect all clutch components to make sure they are in the best conditions. Clutch plates should show no signs of bluing, scoring or distortion; the plates fitted with friction material shall have a thickness complying with the values indicated in the table.



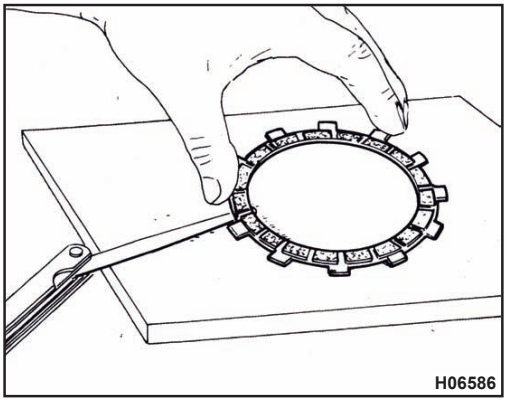
Friction plate thickness

Standard	Max. size limit
3 mm (0.11 in.)	2,9 mm (0.114 in.)



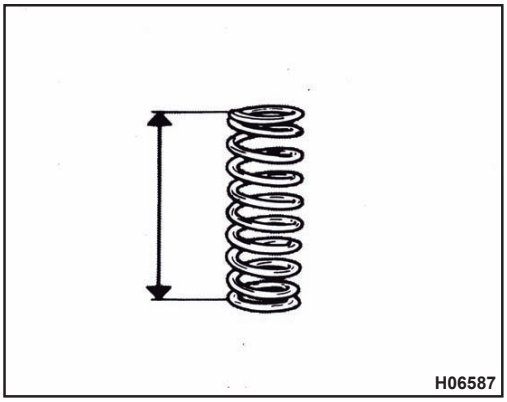
Friction plate to clutch housing clearance

Standard	Max. size limit
0,15÷0,25 mm (0.006÷0.010 in.)	0,35 mm (0.014 in.)



Clutch plate distortion

	Standard	Max. wear limit
Friction plate	(within 0.05 mm) (0.0019 in.)	0.2 mm (0.0078 in.)
Steel plate	(within 0.01 mm) (0.0004 in.)	0.25 mm (0.0098 in.)



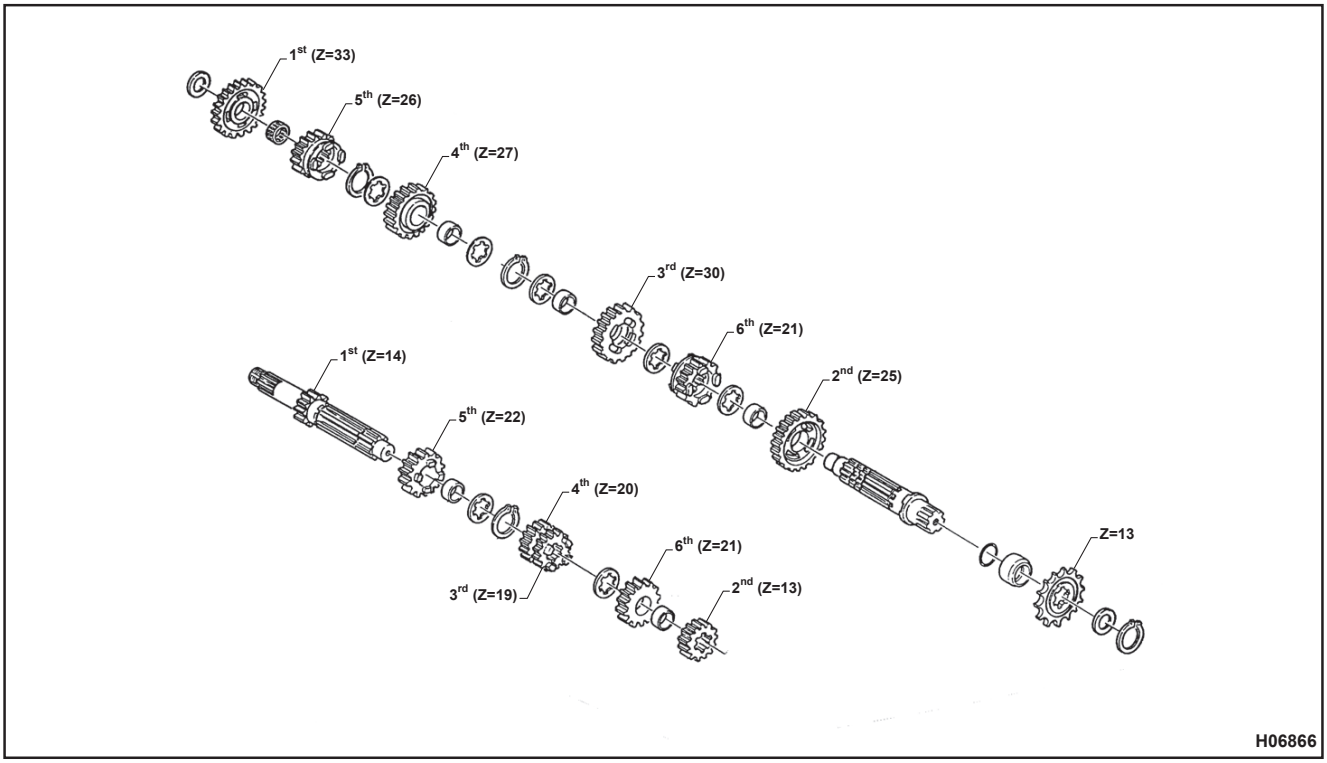
Clutch spring

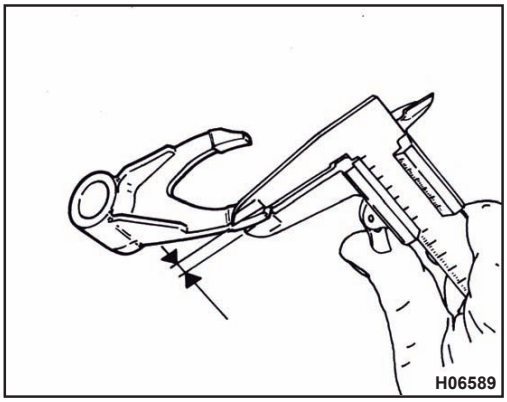
The free length of the clutch springs must not be smaller than the value indicated below.

Free check length	
Standard	**Max. wear limit**
42,5 mm (1.67 in.)	40 mm (1.57 in.)

Gear change

Check that the gear front coupling teeth are in perfect conditions, make sure that the idle gears rotate freely on their shafts and that their clearance is not higher than 0.10 mm (0.004 in.). The shaft threading and grooves must be in perfect conditions.
Moreover, make sure that the gear selector components are in good conditions.
Check that the selector groove width complies with the specified tolerance.



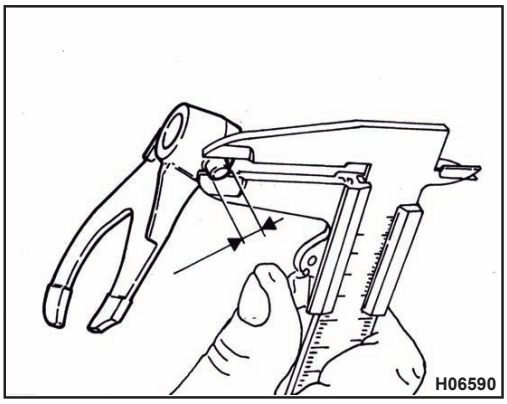


Shifter forks

Visually inspect the shifter forks and replace any bent fork. A bent fork will make gears hard to engage and let the transmission jump out of gear unexpectedly under loading.

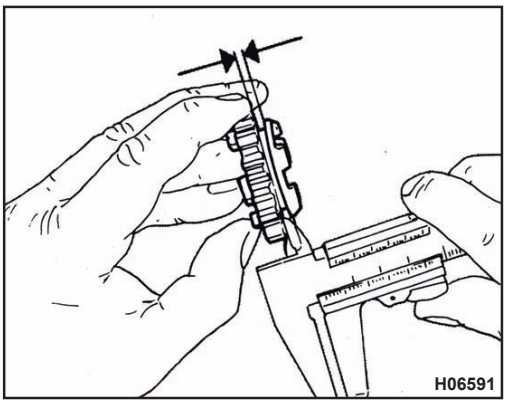
Fork slider thickness

Standard	Max. size limit
3.35÷3.43 mm (0.132÷0.135 in.)	3.31 mm (0.130 in.)



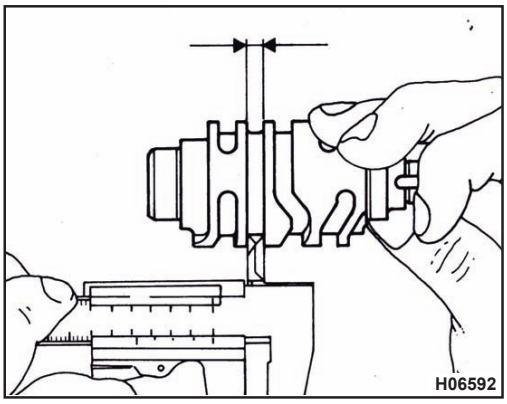
Fork guide pin diameter

Standard	Max. size limit
5.8÷5.9 mm (0.228÷0.232 in.)	5.75 mm (0.226 in.)



Gear groove length

Standard	Max. size limit
3,75÷3,82 mm (0.148÷0.150 in.)	3,9 mm (0.153 in.)



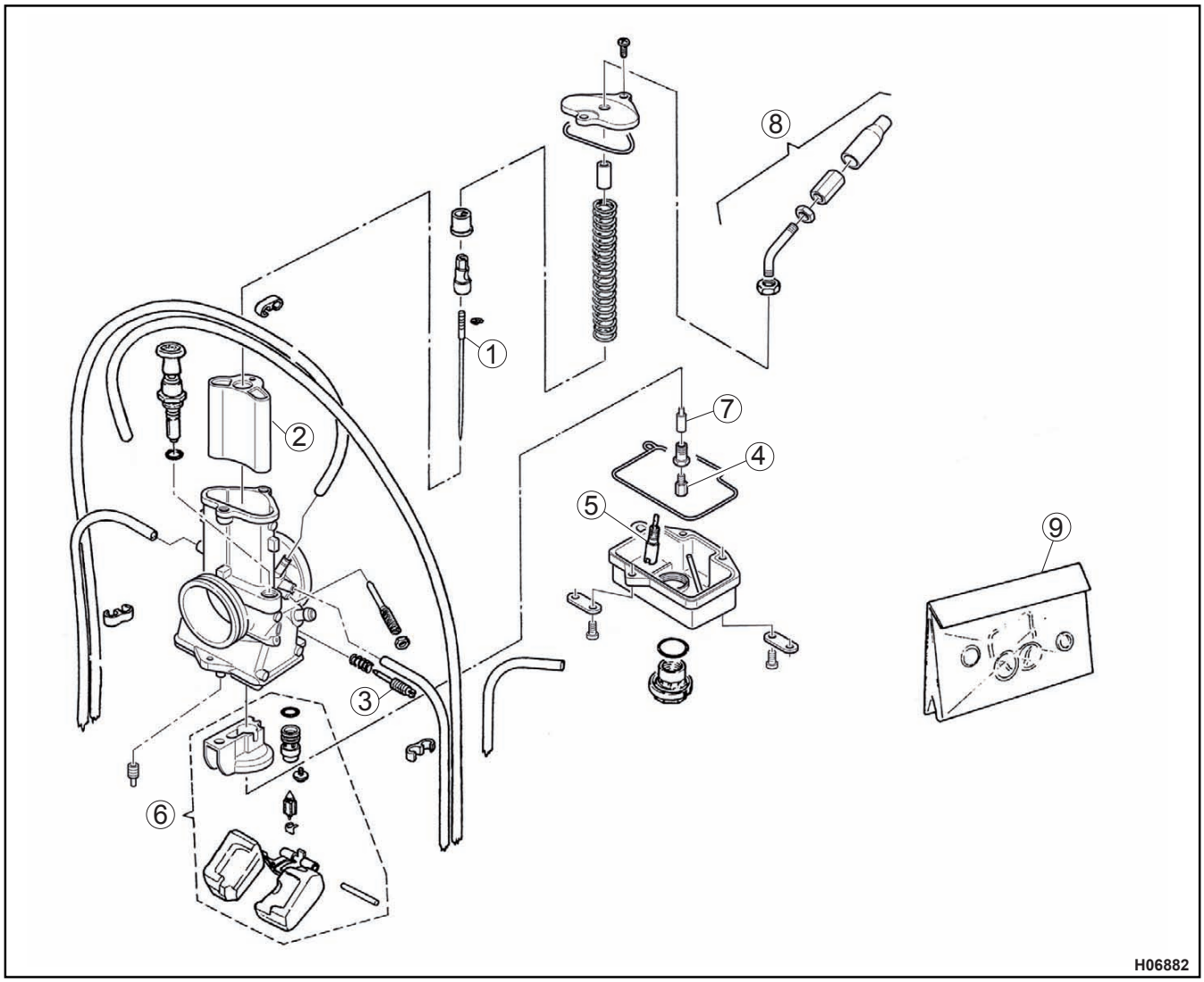
Control shaft groove width

Standard	Max. size limit
6.05÷6.15 mm (0.238÷0.242 in.)	6.20 mm (0.244 in.)

Carburettor overhaul, adjustment and maintenance

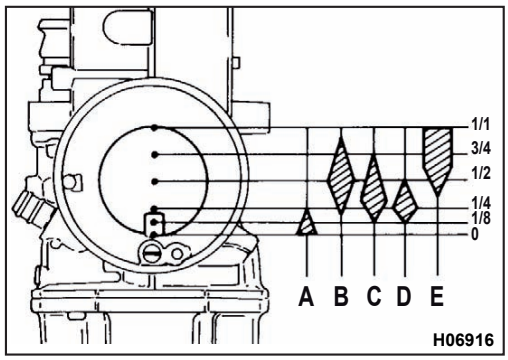
The carburettor setting was determined by the manufacturer after performing extensive tests in a diverse range of condition of use; it is therefore recommended that no changes be made.
However, if the motorcycle is used in particular environments, it may be necessary to change the initial setting.
The following chapters provide an overview of how the carburettor works as well as instructions to change its setting.

Carburettor



The figure shows the carburettor parts. Some of them, which regulate the air and fuel flows, are subject to precision operations and vary according to setting.
These parts belong to the three main circuits that supply mixture to the throttle valve openings.
These circuits are:
a) IDLE CIRCUIT
b) OFF-IDLE CIRCUIT
c) OPEN THROTTLE CIRCUIT

1) Taper needle
2) Throttle valve
3) Idle air screw
4) Main jet
5) Idle jet
6) Floater unit
7) Main nozzle
8) Throttle cable adjuster screw unit
9) Gasket unit



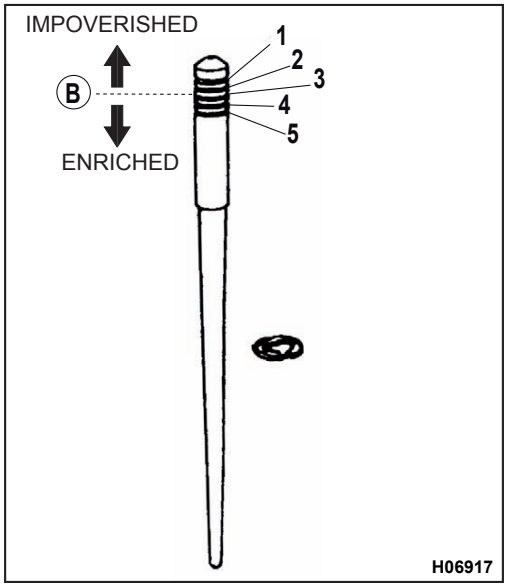
The diagram shows the influence of parts 1, 2, 3, 4, 5 on the throttle valve openings.
A: idle air screw + idle jet
B: taper needle groove
C: taper needle
D: throttle valve bevelled edge
E: Main jet
Before making any changes to the setting, it is necessary to establish at which opening of the valve the air-fuel mixture is not correct. This can be done by observing the initial colour of the exhaust emissions, the conditions of the spark plug, the response of the throttle control, the power supplied, etc. ... Then, the parts that require setting must be replaced or adjusted by following the instructions below.

Idle jet

The idle jet regulates the quantity of fuel that must be supplied to its circuit and is marked by an identification number that indicates its size. The higher this number is, the larger the diameter of the jet, leading to a corresponding mixture enrichment.

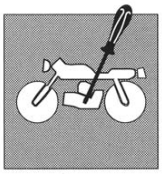
Idle air screw

The idle air screw regulates the quantity of air in the idle circuit; by loosening or fastening this screw, it is possible to enrich or impoverish the mixture.



Taper needle retainer position

The taper needle is secured to the throttle valve by a retaining ring. The bottom of the needle has a conical shape, while the top has five grooves, to which the retaining ring is secured. To adjust the air-fuel mixture with the taper needle, vary the position of the retainer, which is initially positioned on the 3rd groove. If the retainer is positioned on the lower grooves, the needle goes up, the clearance of the main nozzle increases and the mixture is enriched.



Taper needle

The taper needle influences the air-fuel mixture from the small and medium openings of the throttle valve. Size 60, at the end of the code found on the part, indicates that the external diameter is 2.60 mm. The smaller the diameter of the needle, the more the mixture is enriched.

Size of the throttle valve's bevelled edge

The size of the throttle valve's bevelled edge influences the air-fuel ratio at openings of the valve from 1/8 to 1/2 and especially between 1/8 and 1/4. If the valve's bevelled edge increases, the resistance to air flow decreases, leading to an increase in the air intake with a corresponding impoverishment of the mixture. Conversely, if the valve's bevelled edge decreases the mixture is enriched.

Main jet

The main jet regulates the quantity of fuel that must be supplied to its circuit and is marked by an identification number that indicates its size. The higher this number is, the larger the diameter of the jet, leading to a corresponding mixture enrichment.

Carburettor setting

The concentration of oxygen in the air changes in relation to temperature, altitude and humidity; these elements therefore influence the setting of the carburettor. Since the effects of humidity on oxygen concentration are negligible, the two elements that must be taken into consideration are temperature and altitude. Therefore, the quantity of fuel to be mixed with air must vary according to specific environmental conditions, keeping in mind that an increase in the oxygen concentration in the air causes the impoverishment of the mixture, while a decrease leads to its enrichment.

How to evaluate the mixture

For a correct setting, it is necessary to evaluate correctly the air-fuel mixture supplied by the carburettor; below is a list of guidelines for the evaluation.

The symptoms of a too poor mixture are the following:
- The engine overheats;
- Acceleration is faulty;
- The engine tends to knock and makes an irregular noise;
- The spark plug tip is white or grey;
- The engine does not develop power.

The symptoms of a too rich mixture are the following:
- The engine behaves like a 4 stroke;
- The engine misfires at low rpm;
- Deposits on the spark plug;
- Acceleration is faulty;
- The exhaust releases excessive emissions.

How to set the carburettor

The paragraphs below explain how to modify the carburettor setting.
Before making any changes, operate the motorcycle and observe the reactions of the engine to different openings of the throttle control, accelerations, etc. ...
Always start from the default setting when making any changes.
For the standard setting refer to the data in chapter “A”.

Idle circuit adjustment

- Adjust the idle adjuster screw following the instructions in the chapter “SETTINGS AND ADJUSTMENTS”.
- Following the guidelines above, establish if the idle jet in use is correct. If the mixture is rich, replace the jet with a smaller one; if it is poor, replace it with a larger one.

EXAMPLE: with an initial jet of 40, if the mixture is rich, change to a jet of 35;conversely, change to a jet of 45.

For available jets see Parts Catalogue.

Open throttle circuit adjustment

With an opening of the throttle control from 3/4 to maximum, once the idle circuit has been adjusted, perform the open throttle circuit adjustment by following the instructions above.

- Before performing the off-idle circuit adjustment, adjust the open throttle circuit.

EXAMPLE: with an initial jet of 400, if the mixture is rich, change to a jet of 390; if it is poor, change to a jet of 410.

For available jets see Parts Catalogue.

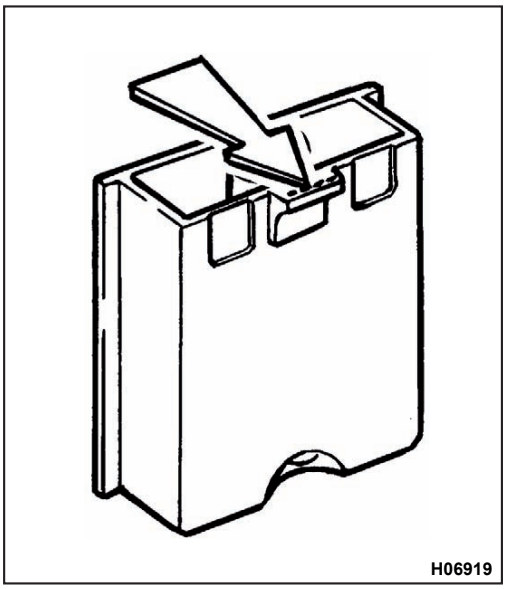
Off-idle adjustment

Check the state of the mixture and perform the adjustment by choosing the suitable taper needle.

Final idle circuit adjustment

Perform the final adjustment once all adjustments have been performed correctly.

- Turn the idle air screw of 1/2 to 2 turns to adjust the mixture.
- If the mixture cannot be adjusted, perform the idle circuit adjustment again.



Throttle valve replacement

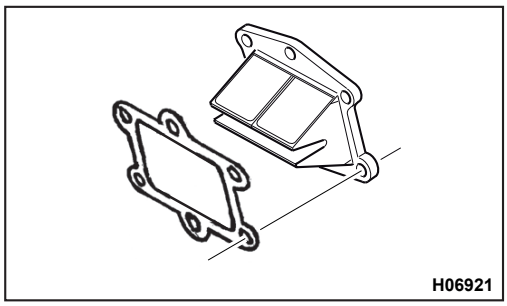
The throttle valve's bevelled edge height is printed on its top; when replacing the valve, switch to a larger or smaller one (if you want to impoverish or enrich the mixture) going up in size 0.5 each time.

For available throttle valves see Parts Catalogue.

Final off-idle adjustment

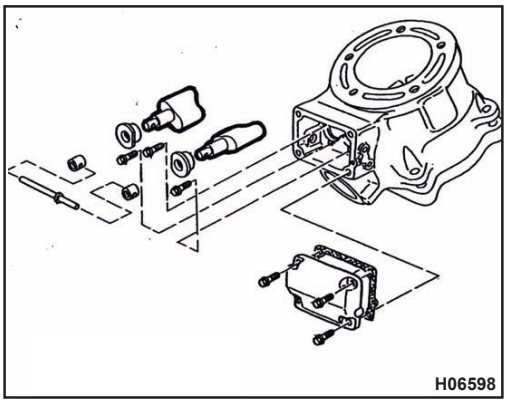
Perform the adjustment by adjusting the groove of the taper needle retainer.

For available taper needles see Parts Catalogue.



Washer valve

Make sure that plates are neither worn nor broken.
Should this be the case, replace the plates and the plate stops. When refitting the removed parts, apply **Loctite** on the screws.

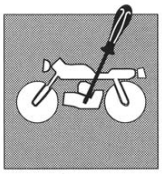


Exhaust valve

Clean the valves with a spark plug cleaner brush or with thin sand paper. Clean and replace them following the intervals indicated in section "B".

Do not use scrapers or tool bits which may damage the external surfaces of the valve, affecting its sealing capacity against the cylinder.

Section H

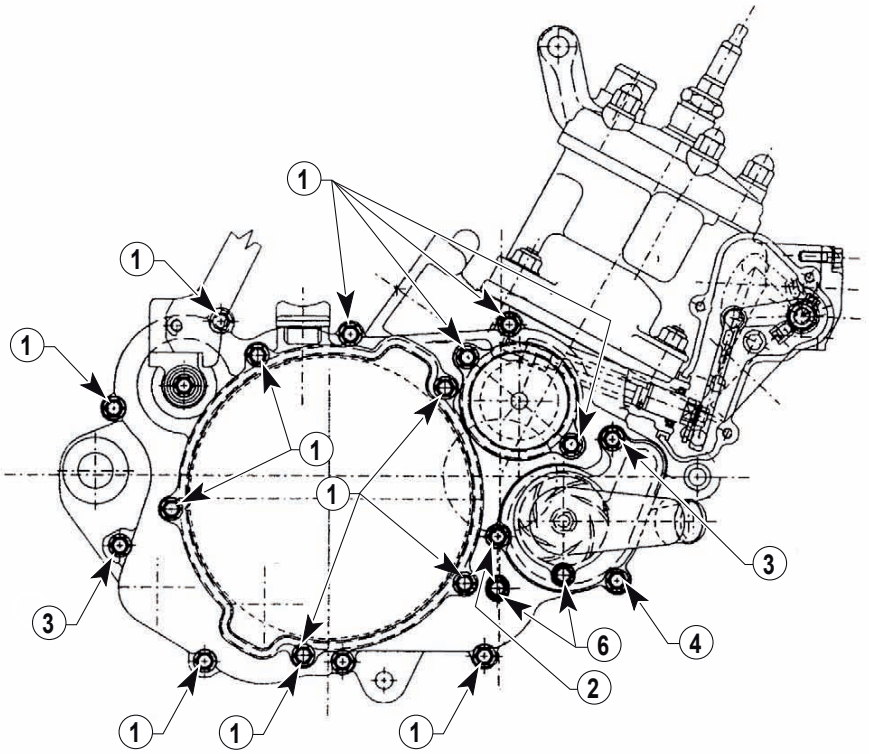


General

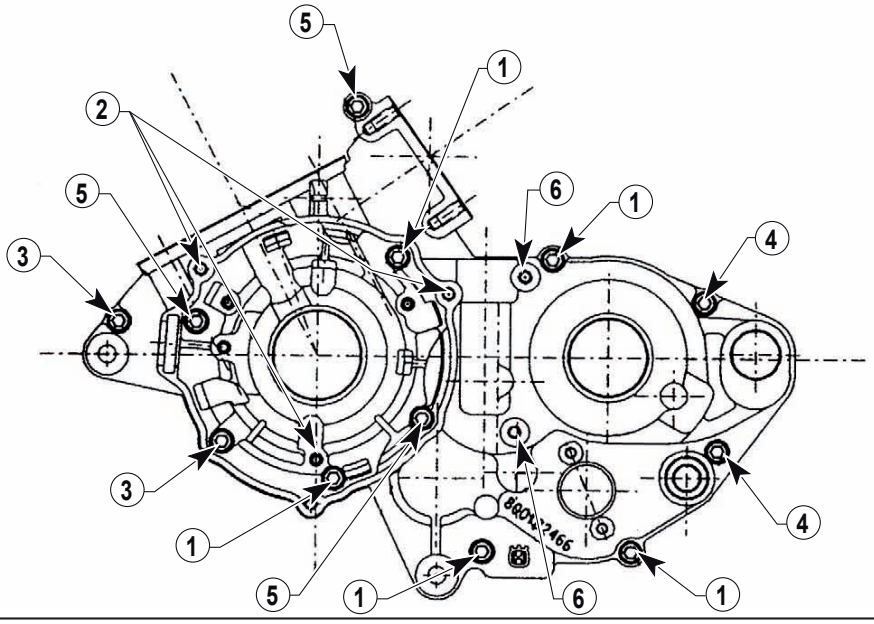
To reassemble, reverse the disassembly procedure. Any special instructions concerning reassembly operations are expressly highlighted in the text. Gaskets, oil seals, metal clips, sealing washers in deformable material (copper, aluminium, fibre etc.) and self-locking nuts must always be replaced.
Bearing specifications and dimensions have been calculated for a certain operating life.
We recommend replacing the bearings - especially those exposed to heavy loading - also considering that checking them for wear is not an easy procedure.
These recommendations are in addition to the dimensional checks of individual components specified in the relevant section (see Section “ENGINE OVERHAUL”).
Cleaning all components thoroughly is critical to reliability; bearings and any wear parts must be lubricated with engine oil before assembly.
Screws and nuts must be locked to the tightening torque figures indicated.

Generic fasteners

1: M6 x 25
2: M6 x 20
3: M6 x 35
4: M6 x 45
5: M6 x 55
6: M6 x 8



1: M6 x 35
2: M6 x 20
3: M6 x 50
4: M6 x 65
5: M6 x 45
6: M6 x 16

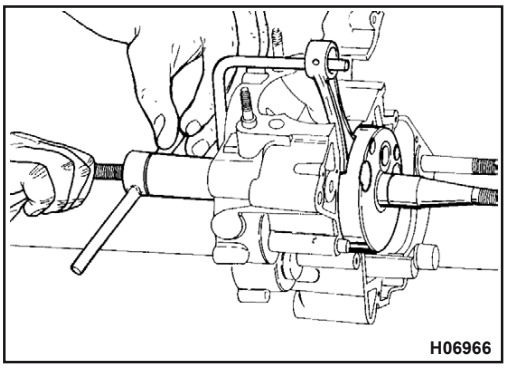


Item summary and general assembly notes

PARTS	PROCEDURES
Flywheel - Crankshaft taper end	Degrease with suitable degreasers
Crankcase crankshaft	Fit the shaft inside the pre-heated bearings
Starter drive shaft	Press with "Loctite 648"
Crankshaft - Bearings	Pre-heating seat at 100°C/125°C
Piston pin - Connecting rod - Cage	Check selection colours coupling (see Sect. G)
Oil seal	Check oil seal wear
Crank	Apply oil on installation (Engler viscosity at 50° C=3)
Crankshaft sealing ring - clutch side	Assemble the spring side towards the primary drive sprocket

LUBRICATION POINTS	LUBRICANT
Pin - Connecting rod small end	•Oil
Roller bearing - Pin - Connecting rod big end	•Oil
Piston - Cylinder liner	•Spray oil
Clutch housing roller bearing	•Oil
Shaft gears	•Oil
O-rings	•Oil and grease
Starter and gearbox drive shaft sleeves	Molicote
Mating parts - Gearbox	Molicote
Engine sealing rings	•Grease
Clutch drive shaft	•Grease
Clutch pin and drive shaft	•Oil
Cylinder head inner O-ring	•Do not grease
Dowel pin	•Oil or grease
Centrifugal governor bearings	•Oil
Exhaust valves	•Oil
Exhaust valves drive shaft	•Oil

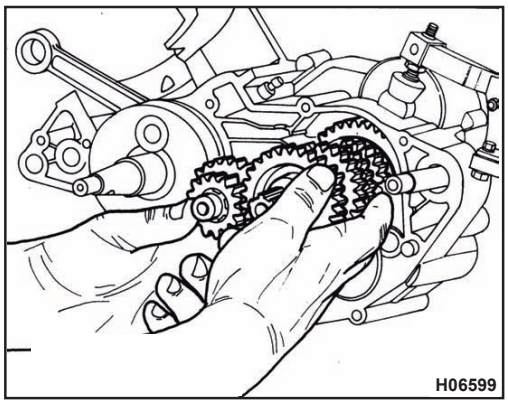
• See "SUPPLIES" table (Section A).



Crankshaft reassembly

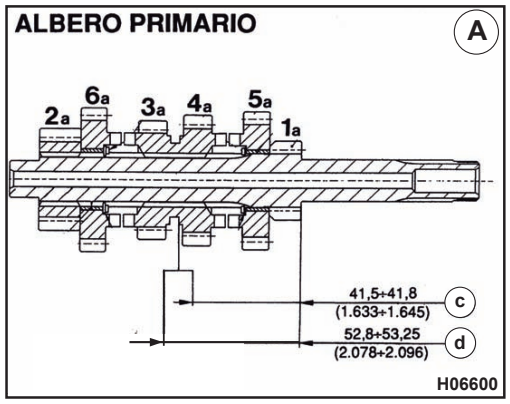
To reassemble the crankshaft on the right-hand side crankcase half use the tool part no. **8000 79016**.
If it has not been done during disassembly, remove the plate retaining the sealing ring by loosening the retaining screw (on reassembly, apply **Loctite**). By doing so, the tool will be lying on a flat surface and the crankshaft will be assembled correctly.

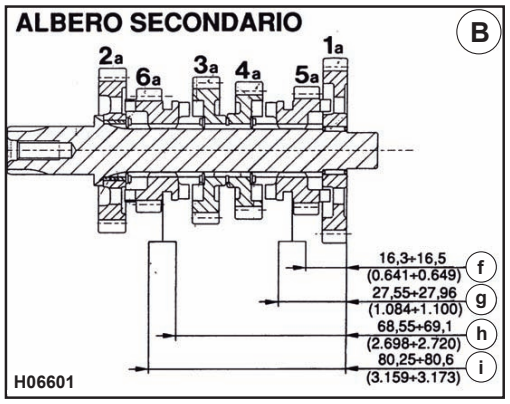
Before fitting it, lubricate contact surfaces with engine oil.



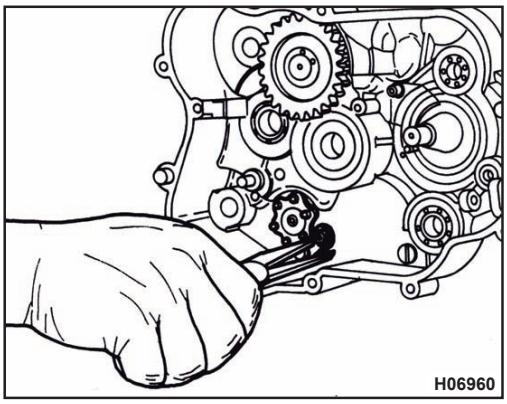
Gear shift part reassembly

Fit the original shim at the end of the output shaft. If the selector shaft or the gear shafts are replaced, it will be necessary to determine the thickness of the shims to be fitted in order to achieve the correct axial clearance.
Selector shaft and gear shafts axial clearance: 0.3÷0.4 mm (0.012÷.015 in.).
The Parts Office can supply shims having different thickness so as to achieve correct axial clearance.
Fit the original shims if removed parts are to be reassembled.
Fit the primary and output shaft at the same time inside the right crankcase half with the 1st - 4th gear fork of the output shaft already inside its seat.
For correct gearbox operation, check control dimensions shown in the figures.

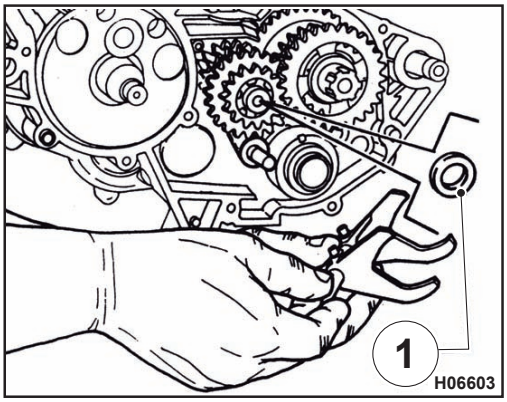




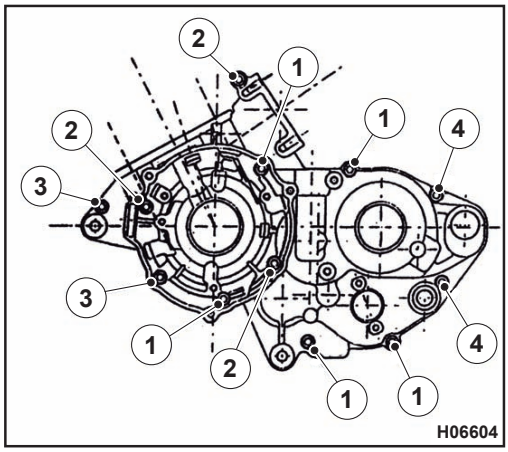
A Primary shaft
B Output shaft
c 5th gear pressing on 1st gear
d 6th gear pressing on 2nd gear
f Fully against the shaft
g 4th gear pressing on circlip
h 3rd gear pressing on circlip
i 2nd gear fully against the shaft



Fit the selector shaft with its bearing and sector gear well lubricated with engine oil in the right half crankcase. If the ratchet is already assembled on the outer side of the crankcase half, use pliers to counteract the action of the spring so as to allow the insertion of the selector shaft.

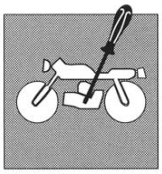


Fit the gearbox forks into their seats on the sliding gears; Engage the forks control pins into the selector shaft grooves. This operation is easier if the gear is in "neutral". Assemble the well lubricated fork sliding pins into their seats in the right crankcase half: both have the same length. Fit the original shim (1) on primary shaft end.

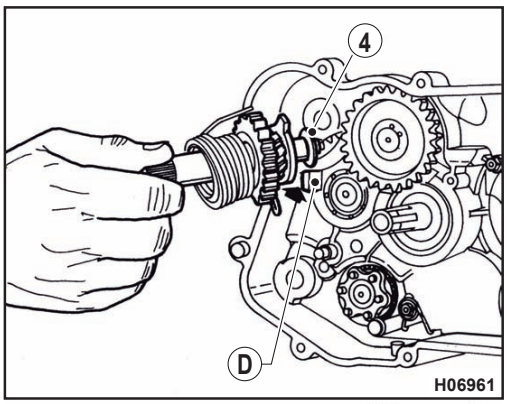


Check the position of the centring bushings and place a new gasket on the right crankcase half. Close the crankcase halves with the suitable retaining screws, see relevant diagram.

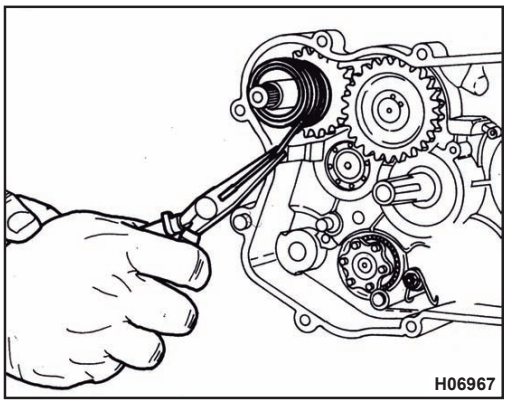
1 - M6X35 screw - No. 5 pieces.
2 - M6X45 screw - No. 3 pieces.
3 - M6X50 screw - No. 2 pieces.
4 - M6X65 screw - No. 2 pieces.

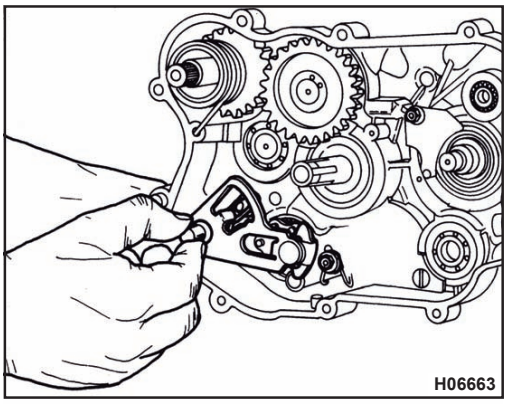


WARNING - In case of incorrect sealing, the following operating failures may occur:
Air seepage causing a leaner mixture and possible engine seizure.
Oil leak from gearbox area to crankshaft area; this may lead to a fast consumption of lubricant causing gearbox overheating and seizure.
When closing the crankcase halves, check that they are perfectly aligned and correctly positioned.
Make sure that the crankshaft and the gear shafts can rotate freely (in neutral).
Should these shafts not rotate correctly, tap them with a rubber hammer to allow their correct settling.
Should this problem still occur, open the crankcase halves again.
After closing the crankcase halves, block off the cylinder seat with a clean cloth to prevent accidental any dirt or foreign matter from entering the crankshaft area.

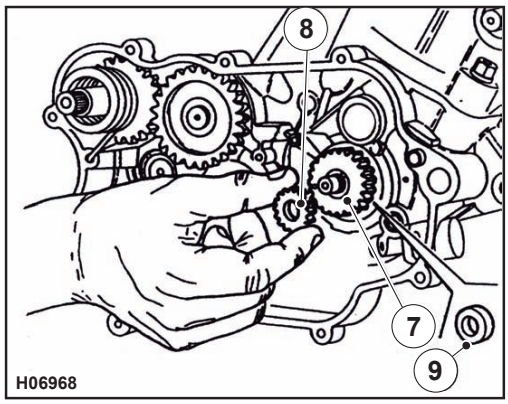


Fit the original shim (4) on starter shaft end, and insert it in the right crankcase half seat. Mind the positioning of the clutch spring end, it must be fitted between the rear end of the crankcase half and the protruding tooth (D).
Pre-charge the lever return spring by turning its end clockwise until it is fitted inside the special crankcase half hole.

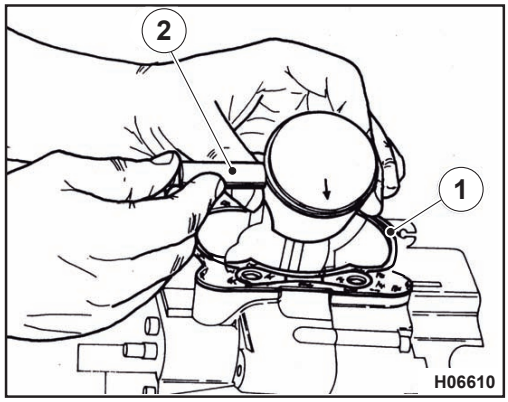




Fit the selector shaft with spacer spring inside the crankcase half. Position it so that the pin on the crankcase half can be inserted between the ends of the selector shaft spring and that the two pins of the selector shaft are between the selector teeth.

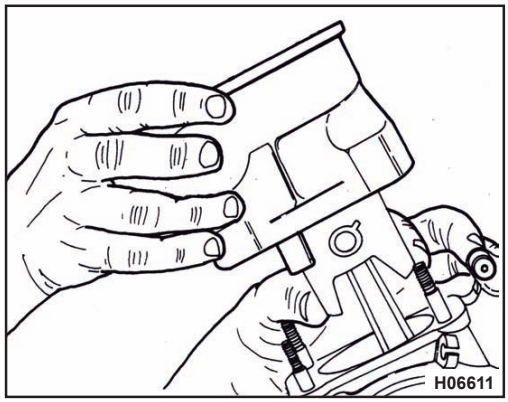


Fit the spacer (9) and the tab in the crankshaft seat, and install the primary drive gear (7) and the water pump control gear (8).



Piston-cylinder-and-head reassembly

Fit the roller cage on connecting rod small end, and position cylinder bottom seal (1).
Install the piston with its rings inside the connecting rod, taking care that the arrow on the crown is pointing the exhaust. Push the lubricated piston pin (2) into the piston by hand, and lock it in place with its clips.



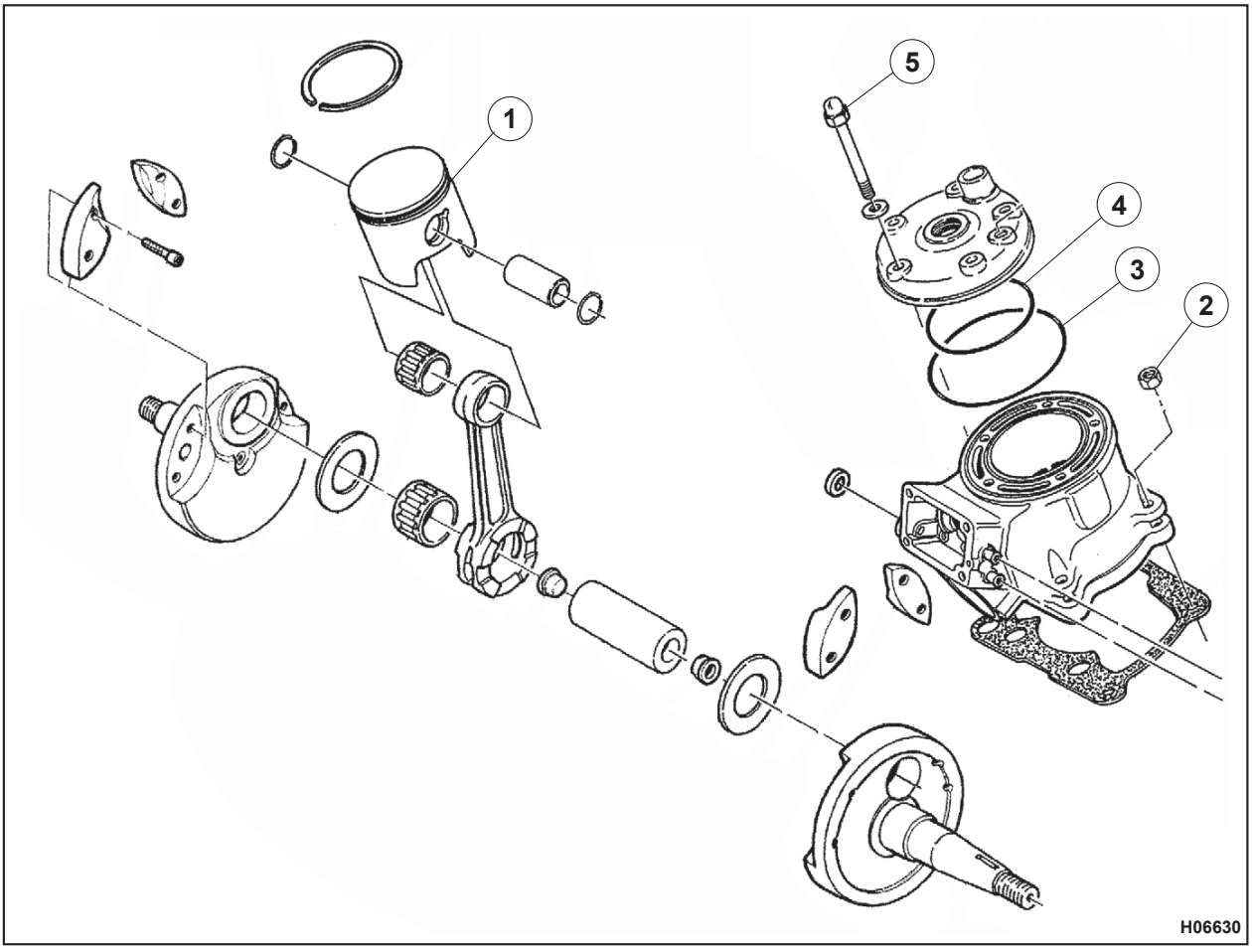
Lubricate all the parts to be assembled with engine oil and fit the cylinder into the piston by compressing the ends of the piston rings with your fingers (or using a universal piston installation tool).

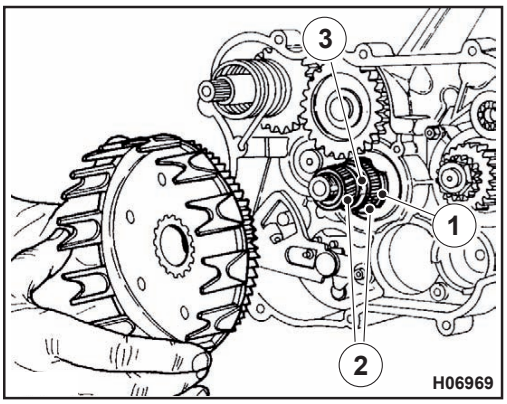
During installation, avoid rotating the cylinder since piston ring ends could enter ducts.

Rotate the crankshaft and check that the piston (1) slides freely inside cylinder. Tighten the nuts (2) between cylinder and crankcase to the recommended torque, working crossways.

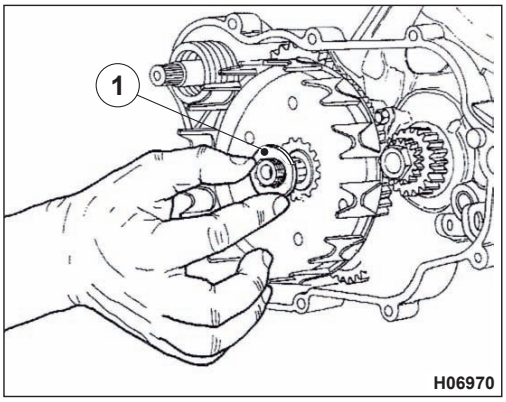
Fit the duly greased external (3) and internal (4) O-rings in the cylinder seats and insert the head inside cylinder stud bolts.

Working crossways, lock head retaining screws (5) tightening them to the recommended torque.



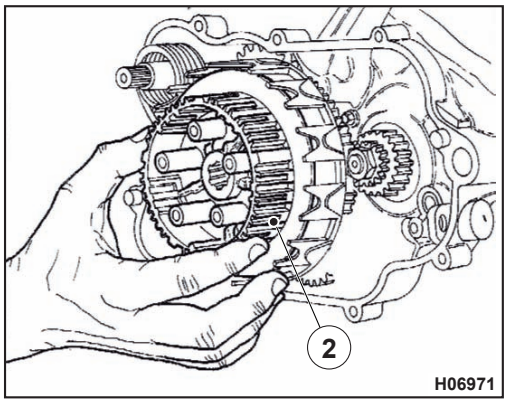


Fit the three-stab washer (1), the inner spacer and the two roller cages (2) with the spacer (3) into the primary shaft.
Insert the clutch housing.

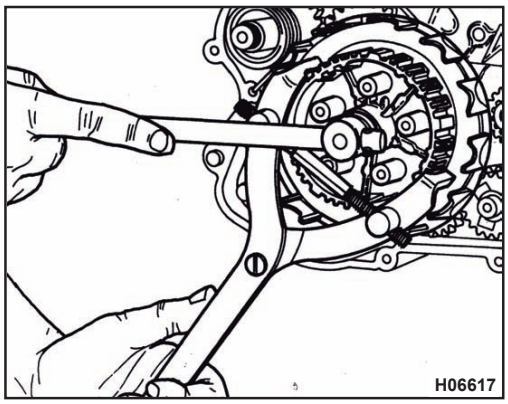


Clutch reassembly

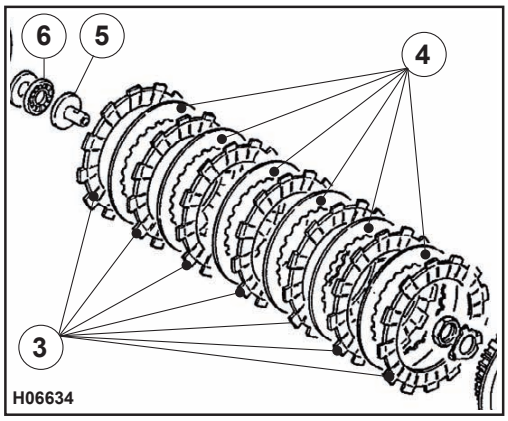
Fit bushing, spring and clutch control lever shaft inside L.H. crankcase half seat. Fit the washer (1) and the disengagement group into the primary shaft in the following order: the fist rod and the ball. All these parts must be greased before reassembly.



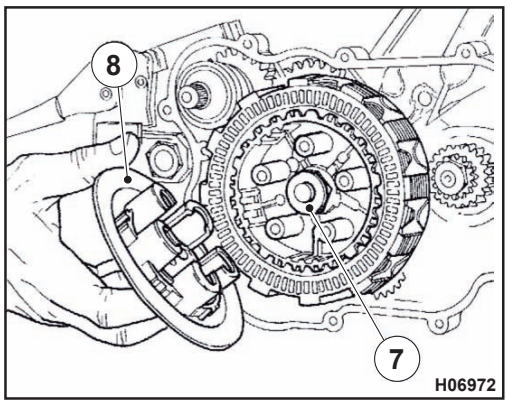
Insert the clutch hub (2) in the primary shaft.



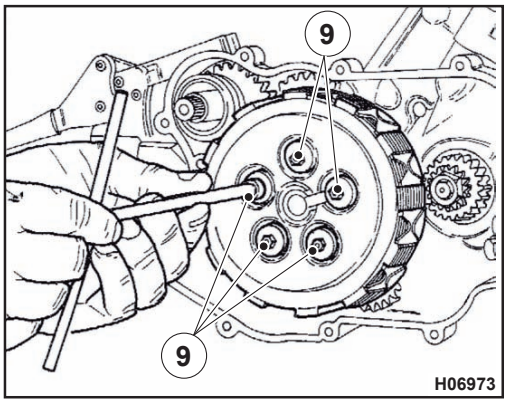
Install the lock washer and hub locking nut.
While locking the hub with tool part no. **8000 79015,** lock the nut with a 22 mm socket wrench to the specified tightening torque. Rivet washer onto nut.



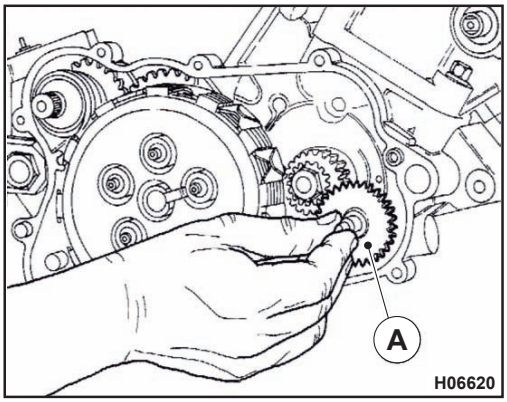
Fit the friction plates starting by one of the seven line steel plates (3) and alternate it with one of the six friction plates (4); the last friction plate (3) will complete the pack.
Insert the spring retainer (5) and the axial needle roller bearing (6) on primary shaft end.



Fit the bearing thrust washer (7) and assemble the pressure plate (8).



Fit the clutch springs (9) and lock them onto hub with the suitable washers and screws.

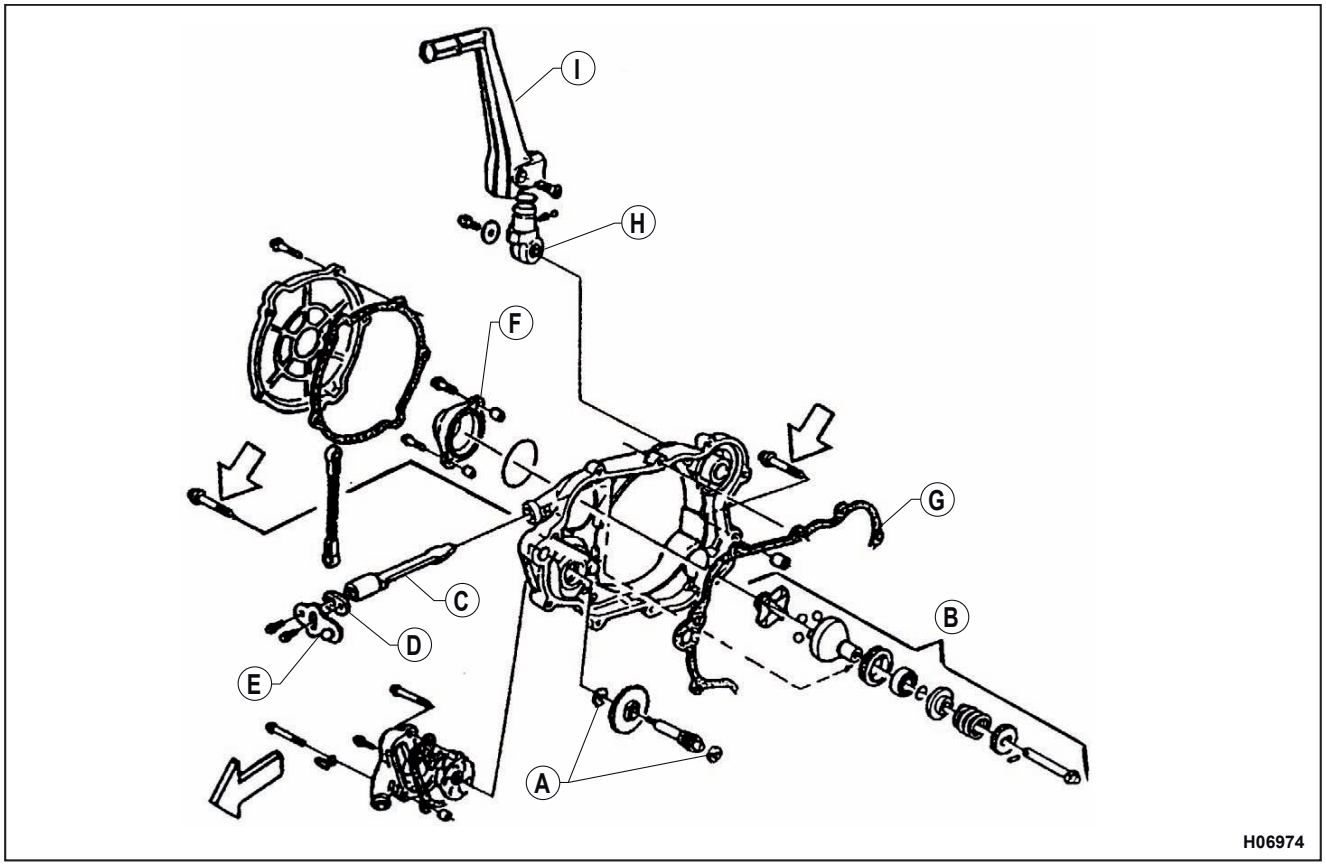


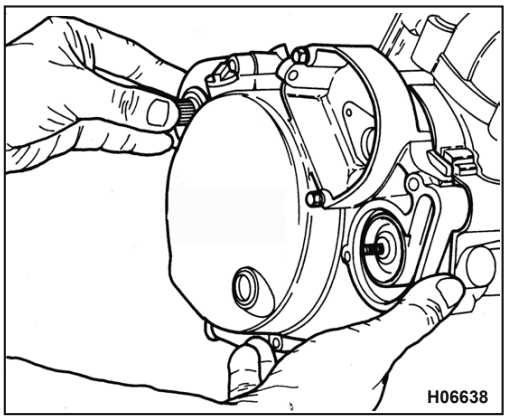
Right cover reassembly

Install the original shim at the ends of water pump control shaft (A) and introduce it inside its seat on RH crankcase half.

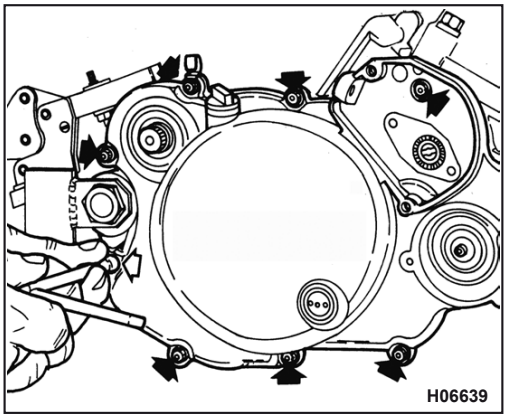
Fit these parts with the centrifugal governor (B) into their seats on the right-hand side cover. Fit the layshaft (C) with its control lever (D) and connection lever (E) into the right-hand side cover.
Install the gasket (G) on the crankcase half, and check the correct position of the centring bushings; reassemble the right-hand side cover making sure that the ends of the water pump and centrifugal governor control shafts can be easily installed in their seats on the right-hand side crankcase half.
Insert the eight retaining screws, bearing in mind that the ones at the rear centring bushing (white arrow) are longer than the others. Refit the centrifugal governor cover (F). Refit the clamp (H) then lubricate and refit the kick start pedal (I).

Turn the layshaft (C) so that its toothless end faces the seat of the centrifugal governor. Once fitted into the cover, turn the layshaft until it meshes with the centrifugal governor gear.

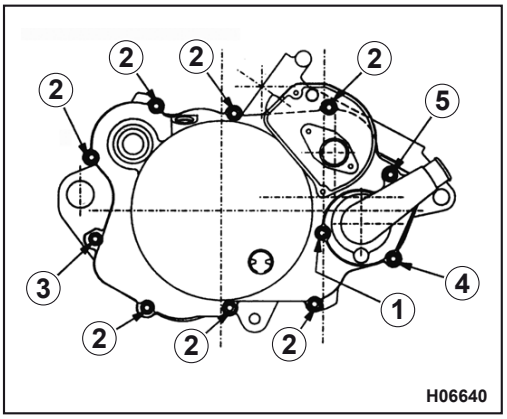




Install the gasket on the crankcase half, and check the correct position of the centring bushings; proceed to RH cover reassembly, taking care that the water pump control shaft end can be easily installed inside its special cover seat.

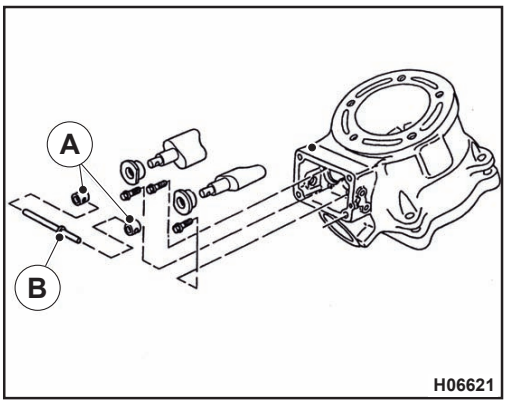


Insert the eight retaining screws, taking care that the one at the rear centring bushing (white arrow) is longer than the other ones. Moreover, the oil pump pipe retaining bracket must be installed under the screw placed on top of the kick start lever.



Screw assembly diagram

1 - M6X20 screw - No. 1 piece.
2 - M6X25 screw - No. 7 pieces.
3 - M6X35 screw - No. 1 piece.
4 - M6X45 screw - No. 1 piece.
5 - M6X55 screw - No. 1 piece.



Exhaust valve reassembly

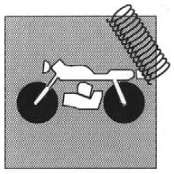
To reassemble the exhaust valves, simply reverse the removal procedure minding that with completely closed valves, the min. distance from the piston must be equal to or grater than 0.4÷0.5 mm (0.0157÷0.0197 in.).
On bushings (A), check the wear of the seats holes for pin (B); if worn, replace the parts.

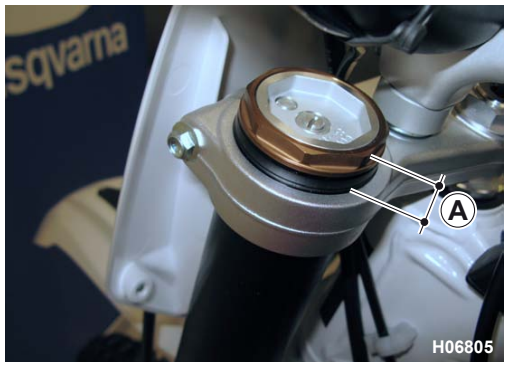
Once engine reassembly is over, fit it back on the chassis resetting the original and previously removed assemblies and cooling circuit connections. Perform the necessary adjustments as described in section "Settings and adjustments".

Exhaust valve position check

Check the exhaust valve position in paragraph (see section D).

Section



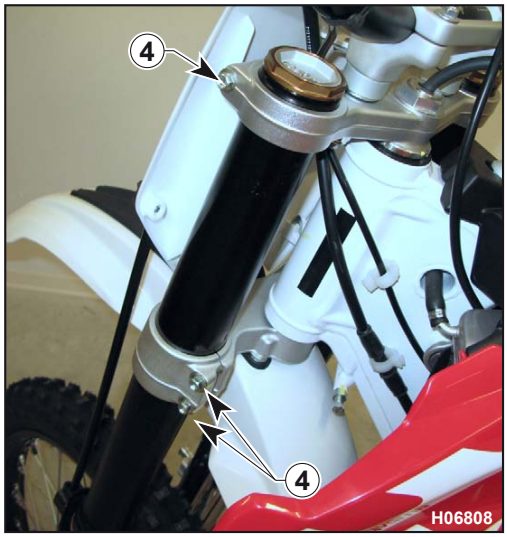


Front fork removal

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

- remove the screws (1) and the brake line clamp on the left-hand side;
- remove the six screws (2) and the fork leg guards;

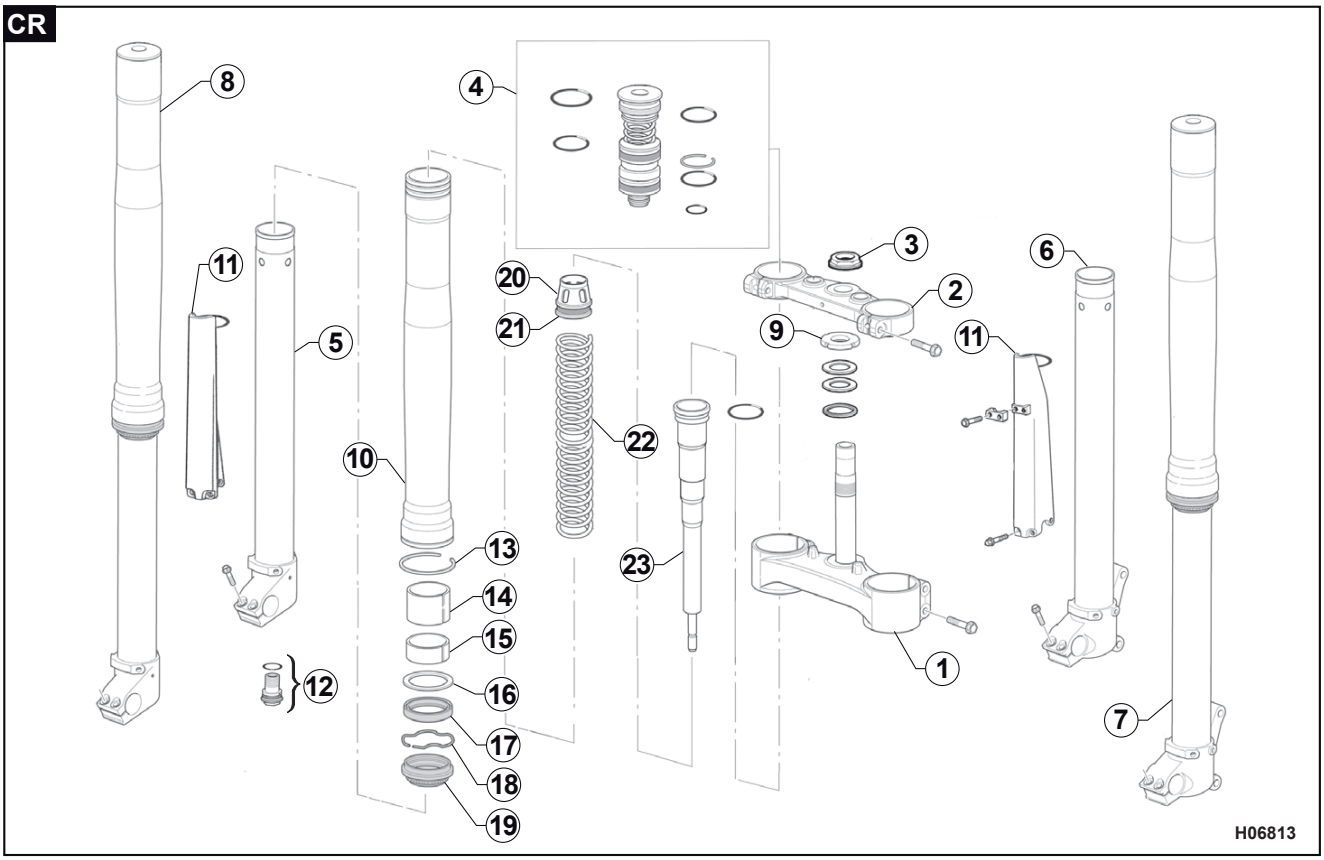
- remove the brake calliper from the L.H. fork leg loosening the two retaining screws (3);
- remove the front wheel as described in Section "Y";



- loosen the bolts (4) that secure the fork legs to steering head and bottom yoke;
- remove the fork legs.

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

Set height "A" back to original value.



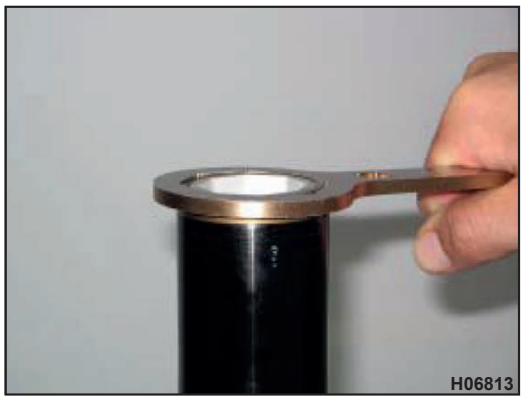
Front fork overhaul

Front suspension (CR)

Front suspension is handled by a KAYABA upside-down telescopic hydraulic fork with advanced axle and 48 mm legs. Wheel travel is 300 mm.

Key

1) Bottom yoke with pin
2) Steering head
3) Nut
4) Compression valve
5) RH fork leg
6) LH fork leg
7) LH fork leg
8) RH fork leg
9) Ring nut
10) RH outer tube
11) Leg protection
12) Rebound adjuster screw
13) Retaining ring
14) Bushing
15) Bushing
16) Washer
17) Sealing ring
18) Retaining ring
19) Dust seal
20) Bushing
21) Bushing
22) Spring
23) Complete damper unit



Front fork disassembly (CR)

Loosen the cap nut at the top of each outer tube.

it is good practice to moderately slacken the cap nuts before removing the fork legs from the motorcycle

Drain oil from the damper unit.

Clamp the wheel axle carrier in a vice and loosen the adjuster screw.

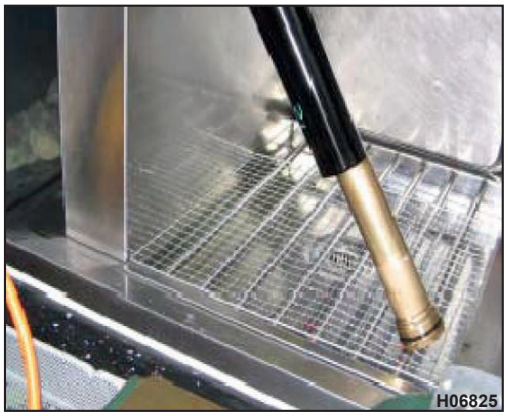
Push down the inner tube.
Slip the tool shown in the figure between wheel axle carrier and cartridge nut.
Hold the nut with a wrench and remove the adjuster screw.
Be careful not to hurt your fingers.

Take the cartridge out of the outer tube.

Do not remove the nut at the bottom end of the cartridge.

Remove the bottom valve assembly from the cartridge.
Hold the cartridge octagonal nut with the suitable tool to prevent rotation.
Use a similar tool in the octagonal recess of the bottom valve assembly.
Use a key to slacken the bottom valve assembly.

Check the O-rings on the bottom valve assembly for damage.
Replace as required.



If outer tube and inner tube are still assembled together, place the fork leg upside down and allow at least 20 minutes for oil to drain.

Remove the dust seal using a flat head screwdriver.

Remove the retaining ring using a flat head screwdriver.

Pull the inner tube until separating it from the outer tube.

To facilitate removal, quickly (but carefully) pump the tubes back and forth until separating them.

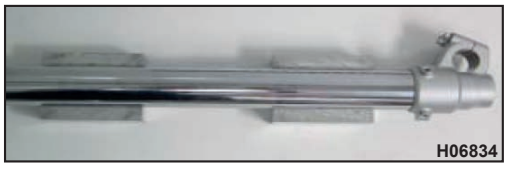
Remove the sealing rings and the metal rings mounted on the inner tube.

Do not reuse any metal parts after removal.
Replace them with new components.
Replace damaged sealing rings.
Washer and retaining ring may be reused if they are not damaged.

Check the rebound adjuster rod for distortion or damage.
Replace as required.

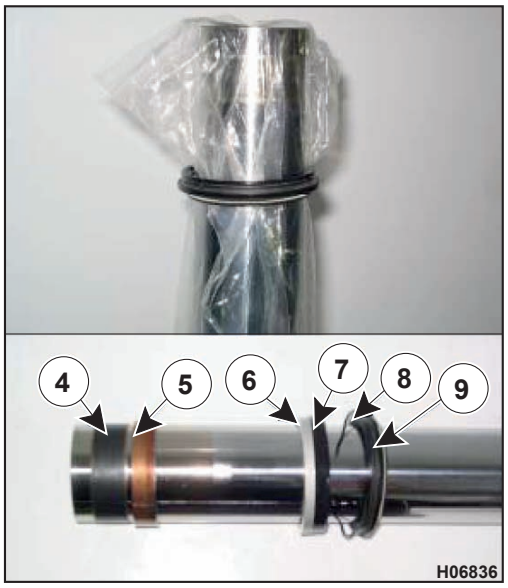
Check the rebound adjuster.
Replace damaged O-rings.
Replace the complete assembly (do not reuse it).

Check the spring.
Replace it if:
outside diameter is damaged or exceedingly worn.
Free length is 454 mm (17.8 in.) or less.



Check the inner tube.
Replace if distorted.
(Never attempt to repair or reuse a distorted fork tube).
If the tube shows surface defects, sand the surface.
If repair is not possible, replace the tube.
(Never reuse an inner tube if scored or showing bulges on the outer surface).

Check the outer tube.
Replace the tube is any distortion is detected or if the sliding surface is damaged.

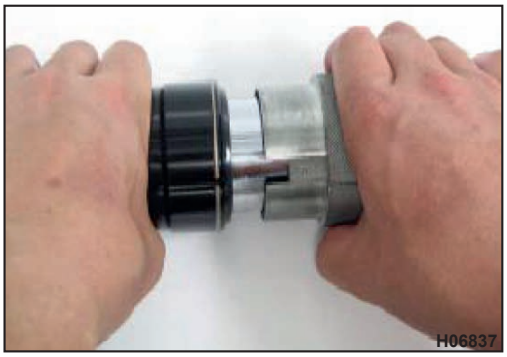


Mount sealing rings and metal parts on the inner tube.
See the figure below for the installation sequence.

Grease the edge of the sealing ring.

Before sliding the sealing ring over the inner tube, cover tube edge with plastic as shown in the figure.

This will avoid damage to the oil seal lip.



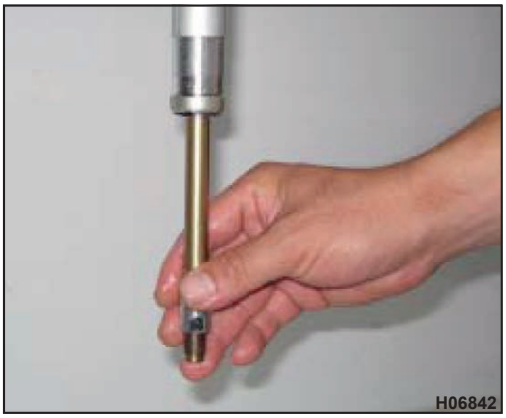
Fit metal bushing and washer to outer tube using an appropriate installer.
Fit the oil seal to the outer tube and push it home using an appropriate installer.
Make sure that the retaining ring groove inside the outer tube is fully visible.

Install the retaining ring.
Make sure that the retaining ring is fully seated in the groove inside the outer tube.

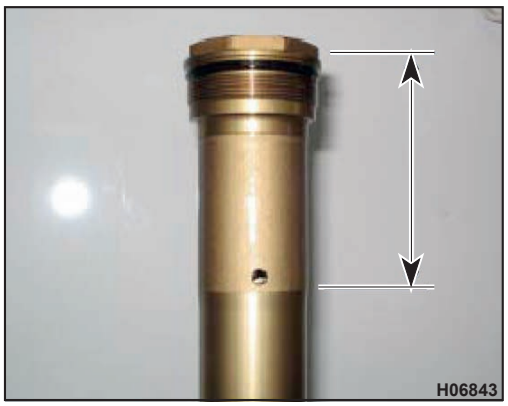
Fit the dust seal to the outer tube.
Make sure that there is not play between dust seal and outer tube.

Refit the cartridge.
Tighten the nut all the way onto the rebound adjuster rod.
Make sure rebound adjuster rod thread length is at least 15 mm (0.6 in.).

Fill the cartridge with the specified oil.



Pump the piston rod up and down repeatedly to remove any air from the cylinder.



Pull the piston rod until fully extended.
Check oil level. It should be about 145 mm (5.7 in.).

Push the piston rod all the way down and install the bottom valve assembly.
With the bottom valve assembly installed, check that the piston rod is fully extended.

Hold the cartridge octagonal nut to prevent rotation.
Use a similar tool in the octagonal recess of the bottom valve assembly.
Tighten the bottom valve assembly to 29 Nm (21.4 ft/lb) using a wrench.

Hold the cartridge with the piston rod end pointing downwards as shown in the figure.
Pump the piston rod up and down a dozen times to help oil reach all points of the unit.

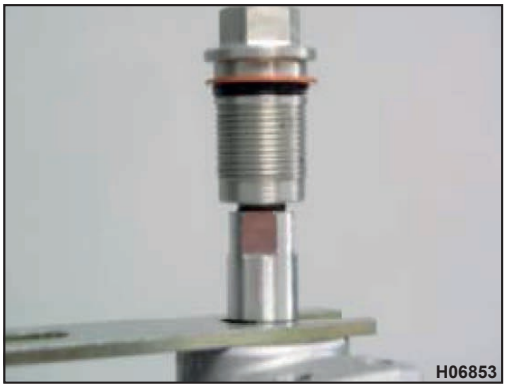
Drain excess oil from the cartridge pushing the damper unit all the way home.
Be careful not to distort or damage the piston rod or any other parts.
Please note that excess oil may flow out from the hole located before the reservoir.
If you see no oil flowing out, it means that there isn't enough oil in the cartridge.
Add oil to the cartridge before refitting it.

Drain excess oil from the reservoir.

Clean off any excess oil from the cartridge.
Install spring guide and spring on the cartridge.

Insert the cartridge into the inner tube.

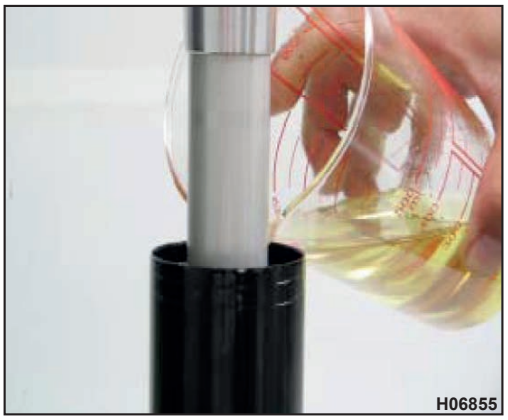
Push down the inner tube.
Slip the tool shown in the figure between wheel axle carrier and cartridge nut.
Insert the rebound adjuster rod into the piston rod and tighten the adjuster screw.
Be careful not to hurt your fingers.



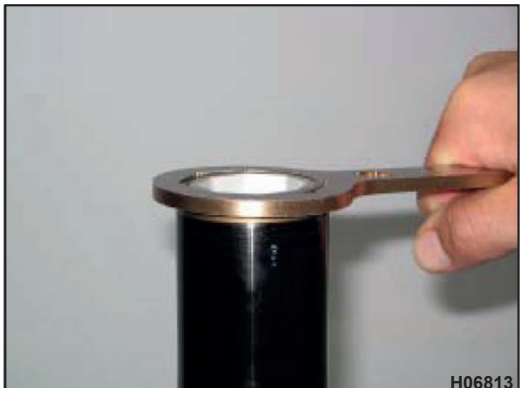
Tighten the adjuster screw all the way in.
Make sure that there is some play between the bottom edge of the adjuster screw and the upper edge of the nut.

Tighten nut and adjuster to 28 Nm (20.6 ft/lb) using a wrench.

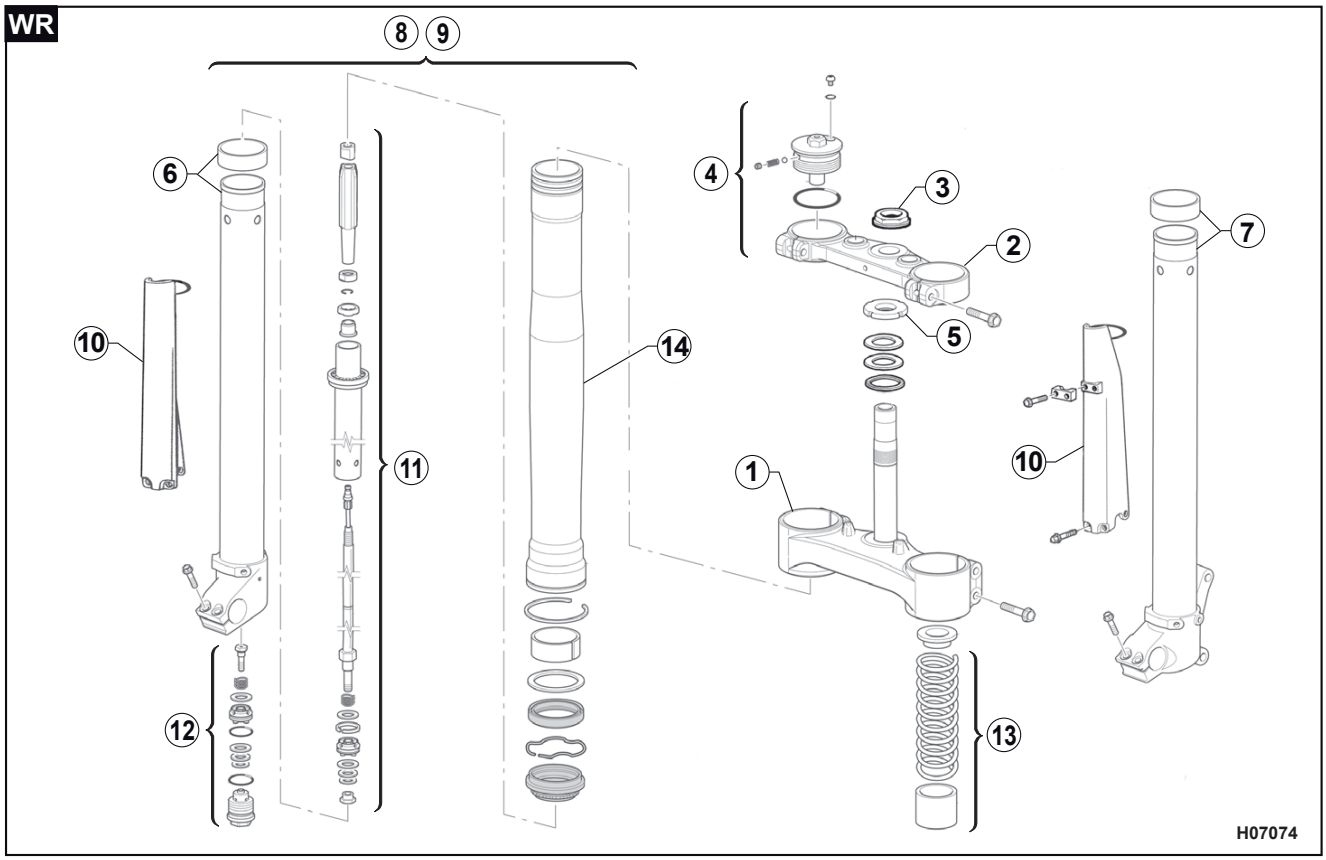
Clamp the wheel axle carrier in a vice and tighten the adjuster screw onto the carrier to 55 Nm (40.5 ft/lb).



Fill the outer tube with the specified quantity of oil (352 cm^3).



Tighten the cylinder onto the outer tube to 29 Nm (21.4 ft/lb).



Front suspension (WR)

Front suspension is handled by a KAYABA upside-down telescopic hydraulic fork with advanced axle and 48 mm legs. Wheel travel is 300 mm.

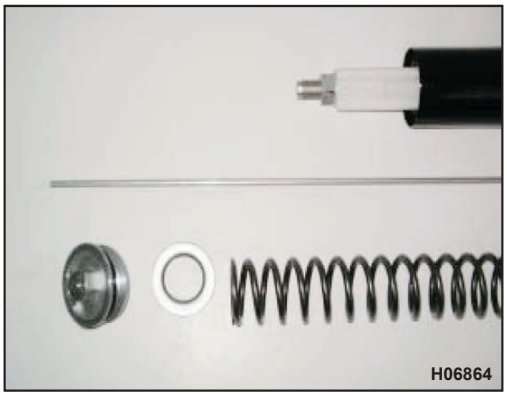
Key

1) Bottom yoke with pin
2) Steering head
3) Nut
4) Cap unit
5) Ring nut
6) RH fork leg
7) LH fork leg
8) LH fork leg
9) RH fork leg
10) Leg protection
11) Damper unit
12) Bottom nut
13) Spring kit
14) LH/RH outer tube

Loosen the cap nut at the top of each outer tube.

it is good practice to moderately slacken the cap nuts before removing the fork legs from the motorcycle).

Loosen the fork cap nut and the nut with a wrench.



Remove top cap nut, spring retainer, spring and rebound adjuster rod.

Drain the oil.
Pump the piston rod up and down to drain oil from the cylinder.

Remove nut, spring guide, O-ring and collar bushing.

Hold the cartridge top end steady.
Loosen and remove the bottom valve assembly.

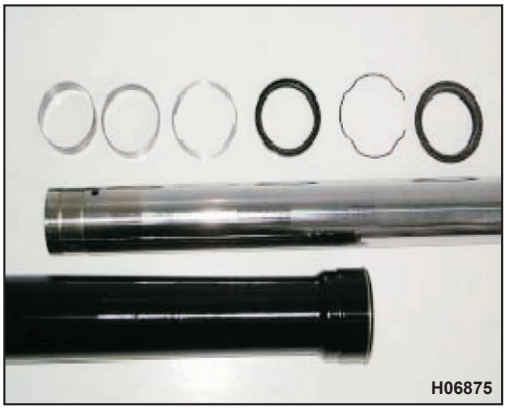
Take the cartridge out of the outer tube.

Remove the dust seal using a flat head screwdriver.

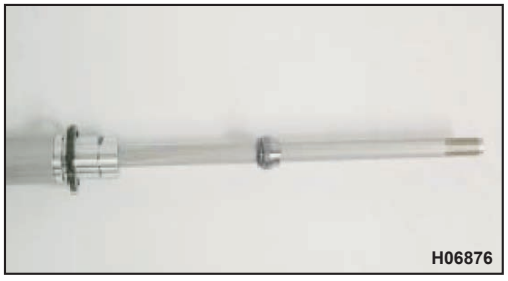
Remove the retaining ring using a flat head screwdriver.

Pull the inner tube until separating it from the outer tube.

To facilitate removal, quickly (but carefully) pump the tubes back and forth until separating them.

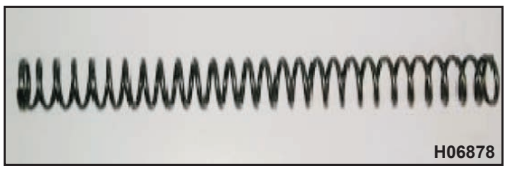


Remove the sealing rings and the metal rings mounted on the inner tube.
Do not reuse any metal parts after removal.
Replace them with new components.
Replace damaged sealing rings.
Washer and retaining ring may be reused if they are not damaged.

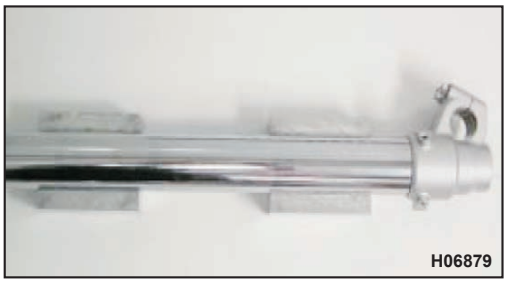


Check the rebound adjuster rod for distortion or damage.
Replace as required.

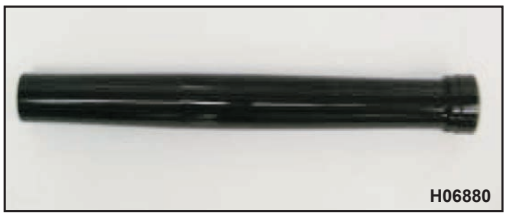
Loosen and remove the bottom valve assembly.
Replace damaged O-rings.
Replace the complete assembly (do not reuse it).



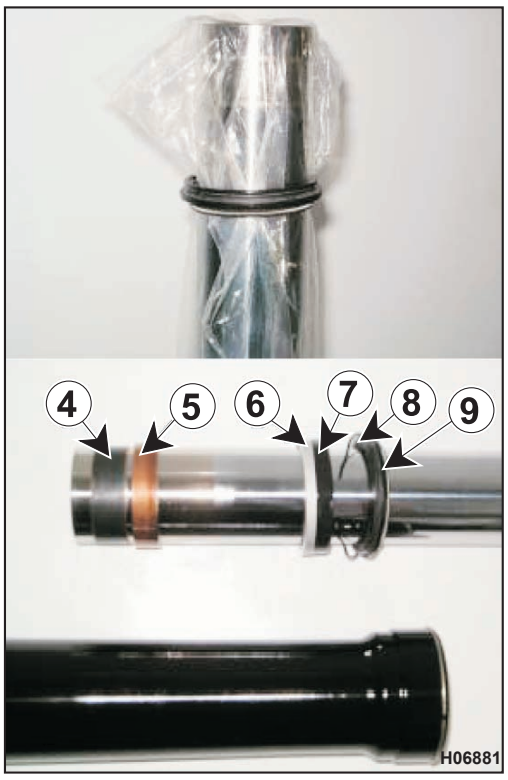
Check the spring.
Replace it if:
outside diameter is damaged or exceedingly worn.
Free length is 460 mm (18.11 in.) or less.



Check the inner tube.
Replace if distorted.
(Never attempt to repair or reuse a distorted fork tube).
If the tube shows surface defects, sand the surface.
If repair is not possible, replace the tube.
(Never reuse an inner tube if scored or showing bulges on the outer surface).



Check the outer tube.
Replace the tube is any distortion is detected or if the sliding surface is damaged.

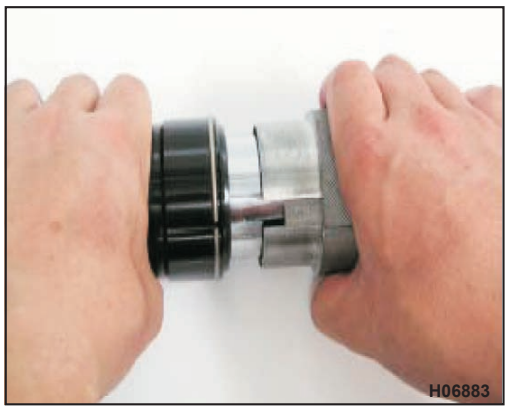


Mount sealing rings and metal parts on the inner tube.
See the figure below for the installation sequence.

Grease the edge of the sealing ring.

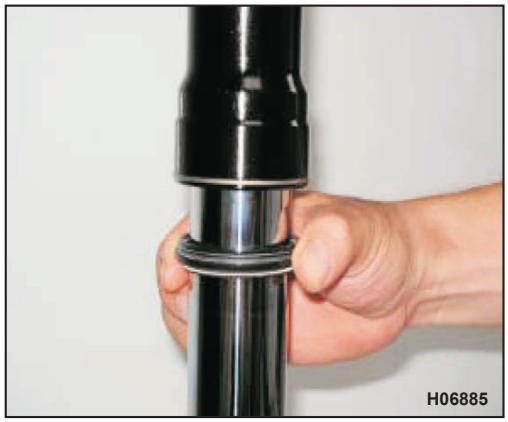
Before sliding the sealing ring over the inner tube, cover tube edge with plastic as shown in the figure.

This will avoid damage to the oil seal lip.



Fit metal bushing and washer to outer tube using an appropriate installer.
Fit the oil seal to the outer tube and push it home using an appropriate installer.
Make sure that the retaining ring groove inside the outer tube is fully visible.

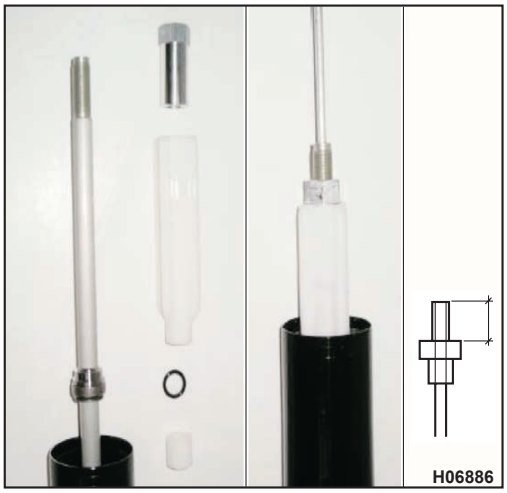
Install the retaining ring.
Make sure that the retaining ring is fully seated in the groove inside the outer tube.



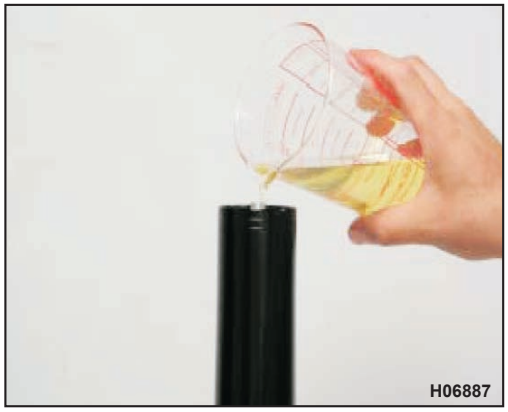
Fit the dust seal to the outer tube.
Make sure that there is not play between dust seal and outer tube.

Insert the cartridge into the outer tube.

Hold the cartridge top end into place.
Tighten the bottom valve assembly to 55 Nm (40.5 ft/lb).



Fit collar bushing, O-ring, spring guide and nut onto piston rod.
Insert the rebound adjuster rod into the piston rod.
Make sure that at least an 18 mm (0.71 in.) portion of the rebound adjuster rod protrudes from the piston rod.



Oil filling.
Fill with the specified quantity of oil.
Fill the damper unit with the specified quantity of oil (643 cm^3).
Slowly pump the piston rod up and down to help oil reach all points of the cartridge.

If you haven't drained all oil from the damper unit on disassembly, follow the procedure outlined below (Filling oil to specified level).

Filling oil to specific level
Fill the damper unit with oil up to the top edge of the outer tube.
Slowly pump the outer tube up and down to help oil flow equally into both inner and outer tube.
Now slowly pump the piston rod up and down to help oil reach all points of the cartridge.

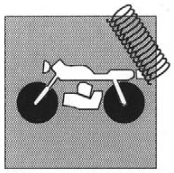
Add oil if level in the damper unit is too low

Finally top up to the upper edge of the outer tube.
Allow the fork leg to rest until no more air bubbles can be seen, then top up oil to specified level, 140 mm below fork sleeve upper edge (with maximum compression, without spring).
Insert the rebound adjuster rod into the piston rod.
Insert spring and spring guide retainer and tighten the cap nut.

Tighten fork cap nut and nut to 28 Nm (20.6 ft/lb).

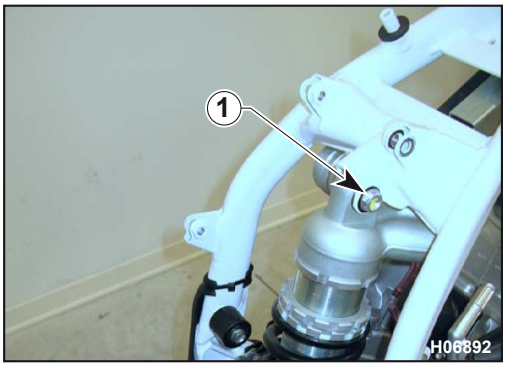
Tighten cap nut onto outer tube to 30 Nm (22 ft/lb).

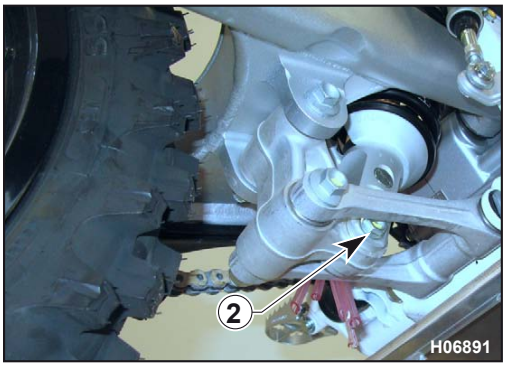
Section J

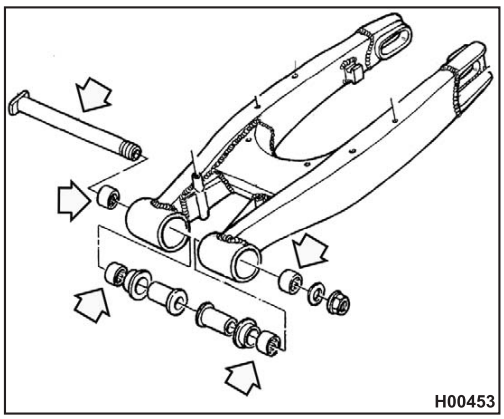


Rear shock absorber

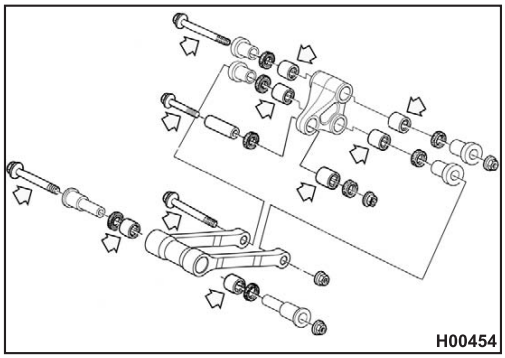
TIGHTENING TORQUE FIGURES
44 ÷49 Nm/ 4.4 ÷4.5 Kgm/ 32.5-36.2 H/Lb

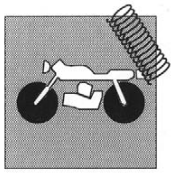






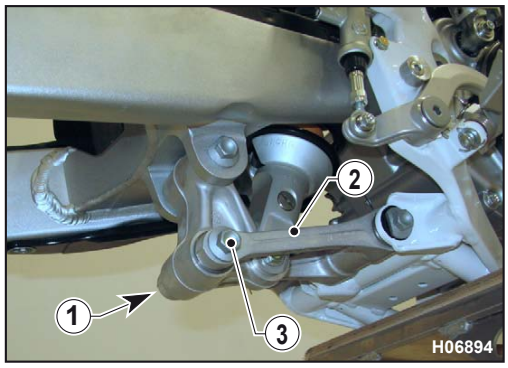
Lubrication points (grease)





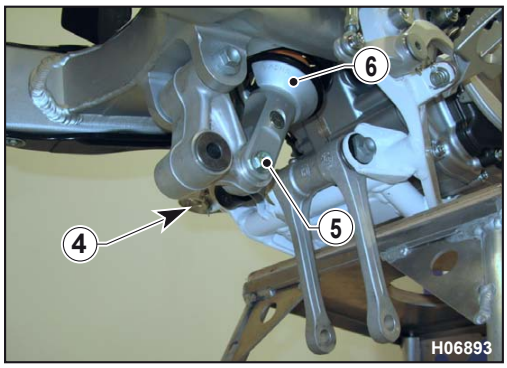
Rear suspension

The rising-rate rear suspension is made up of a shock absorber, a linkage system and a swinging arm. The spring preload of the shock absorber can be adjusted to suit riding and terrain conditions. Hydraulic damping is also adjustable using outer adjuster screws. Periodically check all components for wear.

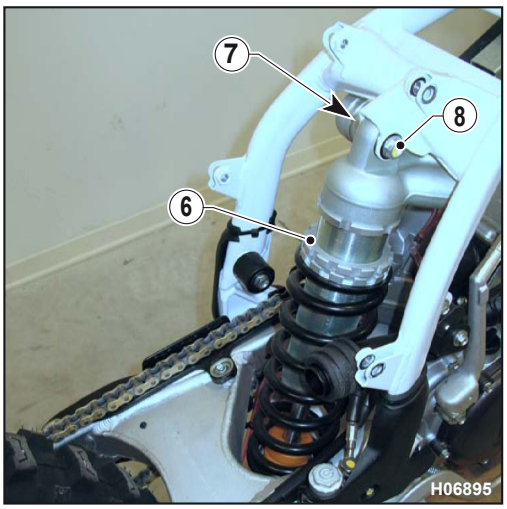


Rear shock absorber removal

- Fit a support under the engine so that the rear wheel is raised off the ground.
- Remove rear chassis, as described in paragraph E - General Procedures.
- Using a 14 mm wrench on the right-hand side and a 17 mm wrench on the left-hand side, loosen on the left-hand side of the motorcycle the drag link (2) nut (1) and remove the pin (3).

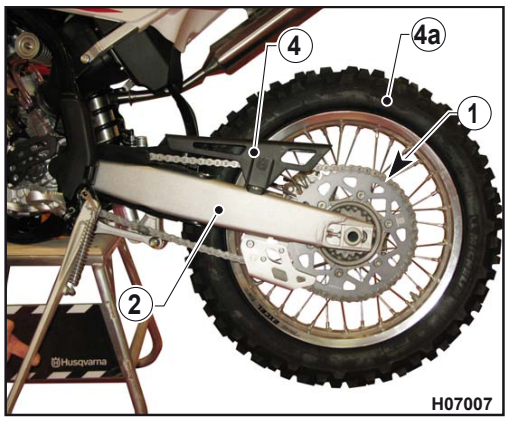


- Using a 14 mm wrench, loosen nut (4).
- Slightly raise rear swinging arm and remove shock absorber (6) lower pin (5) from the right side.



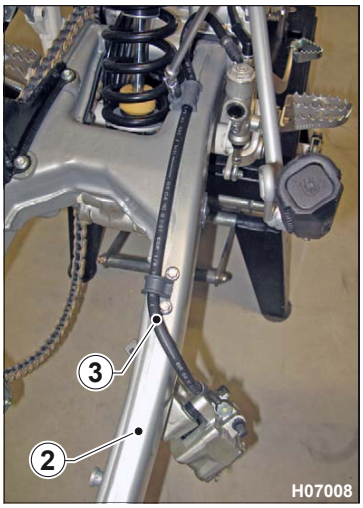
- Using a 14 mm wrench, loosen upper nut (7); then remove upper pin (8) and shock absorber (6) from the right side.

On reassembly, position nut (4), nut (1), and nut (7) on the left side of shock absorber retaining pins.



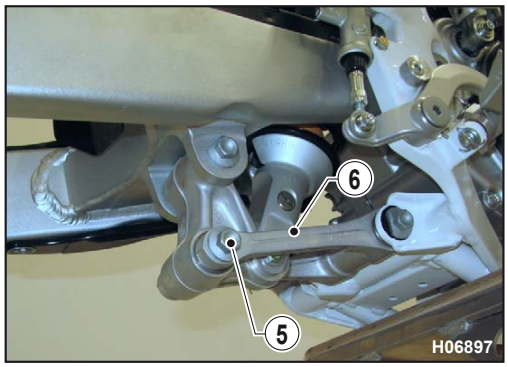
Disassembling and servicing the swinging arm

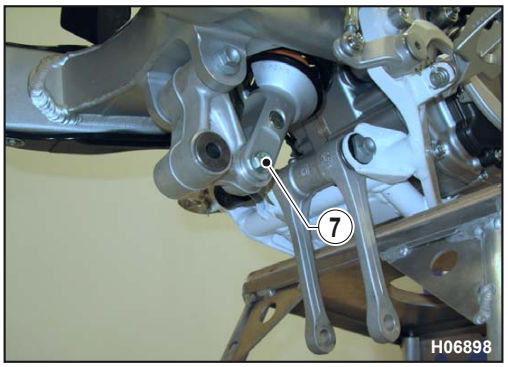
- Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.
- Remove secondary drive chain (1), release rear brake line (3) from swinging arm (2), and remove chain guard (4) (WR) as outlined in the relevant paragraphs (see section E).
- Remove rear wheel (4a) as outlined in the relevant paragraph (see section Y).

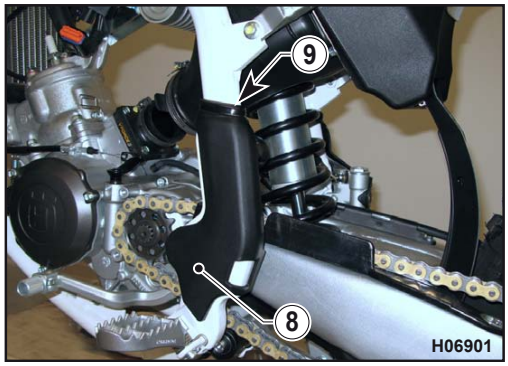


- Using a 17 mm Allen wrench on the left side and a 14 mm Allen wrench on the right side, loosen and remove drag link (6) pin (5).
- Using a 14 mm wrench, loosen and remove shock absorber bottom retaining pin (7).

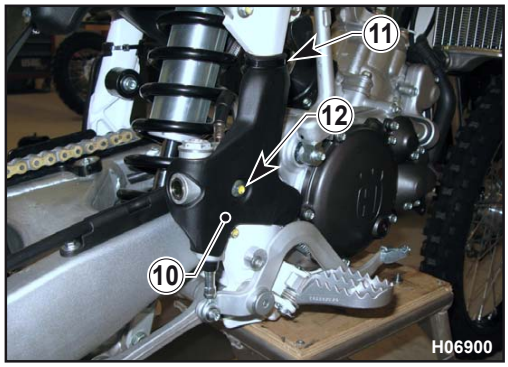
On reassembly, make sure that pin (5) and (7) heads are positioned on bike left side.





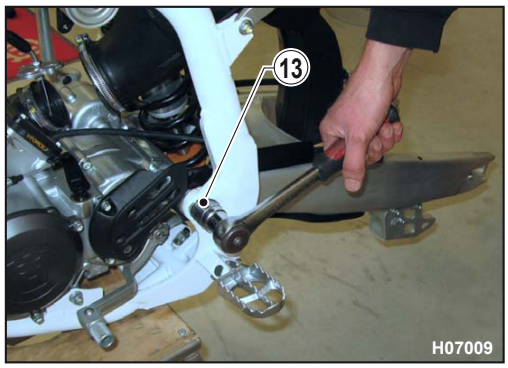


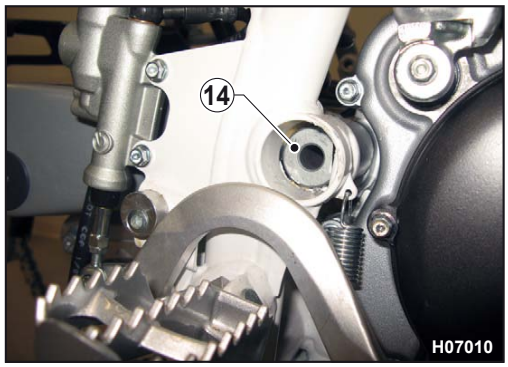
- Remove plastic (8) by cutting clamp (9) and plastic (10) by cutting clamp (11) and loosening screw (12).

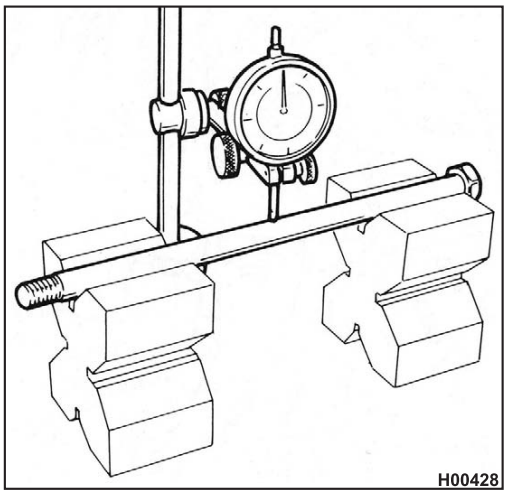


- Using a 22 mmm wrench, loosen nut (13) on the left side, and remove pin (14) on the opposite side.
- Remove swinging arm.

On reassembly, position nut (13) on the left side of motorcycle.

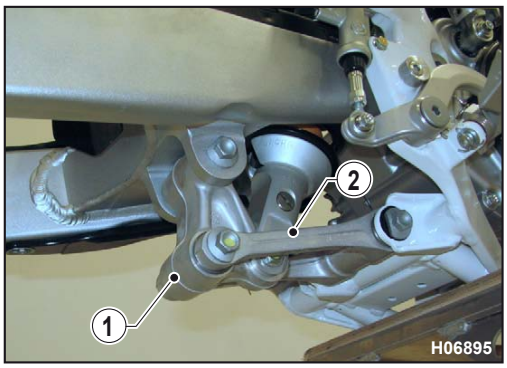






Servicing the swinging arm shaft

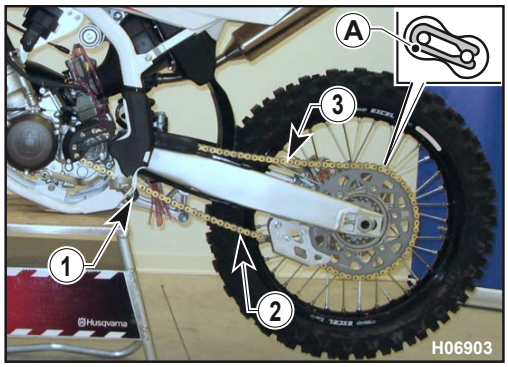
Check shaft taper using a dial gauge. Place the shaft on two identical reference blocks. Turn the shaft and move the dial gauge horizontally to determine the amount of distortion.
Service limit: 0.30 mm.



Servicing the rear suspension drop and drag link

With drop link (1) and drag link (2) still in place (connected to swinging arm and chassis, respectively), rock them both back and forth in all directions to check for radial and axial clearance. Some axial clearance in the drop drag link is required for the swinging arm to achieve the ideal position for proper operation. If any radial clearance is detected, remove the part from swinging arm or chassis, and check inner spacers and bearings for wear.

Grease the inner race of the bearings before refitting them.



Chain roller, chain guide, chain slider

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

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

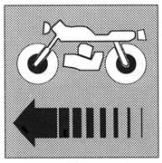
1 Chain roller

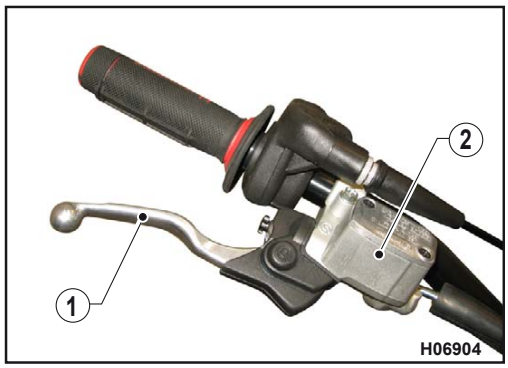
2 Chain guide

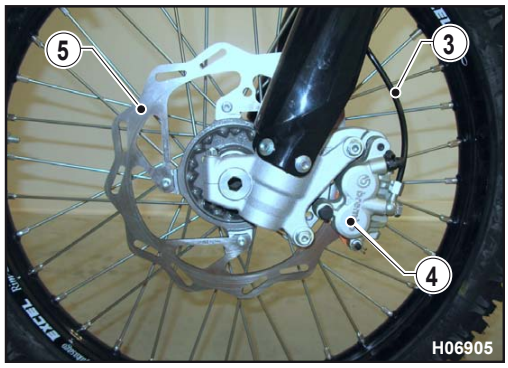
3 Chain slider

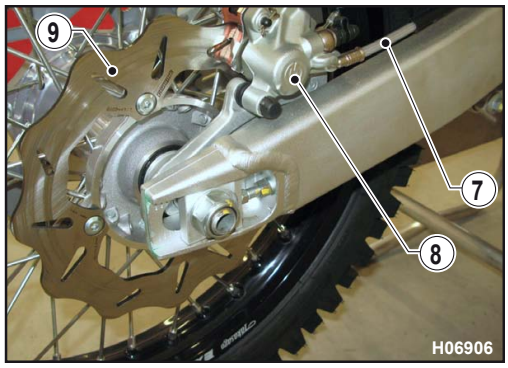
A Master link clip

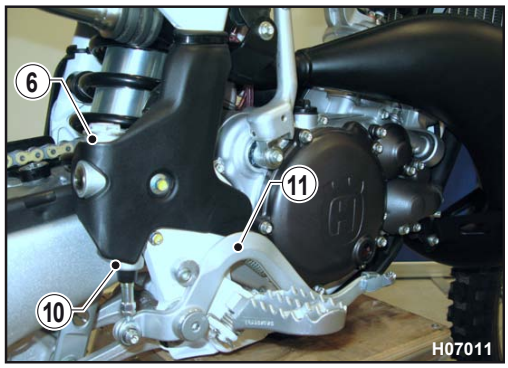
Section L







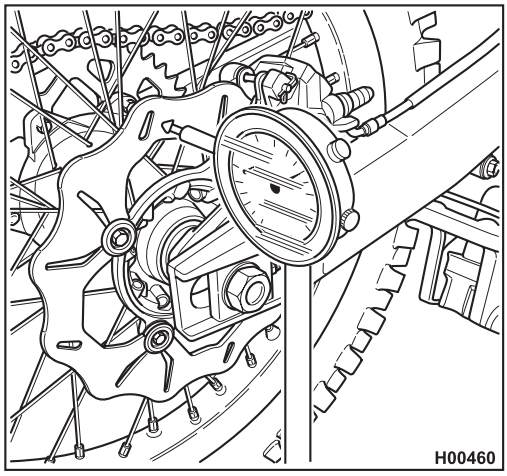


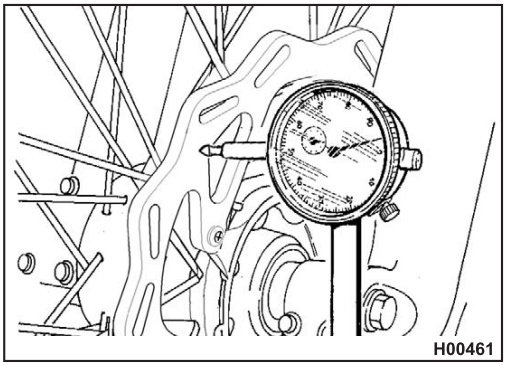


Braking system

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

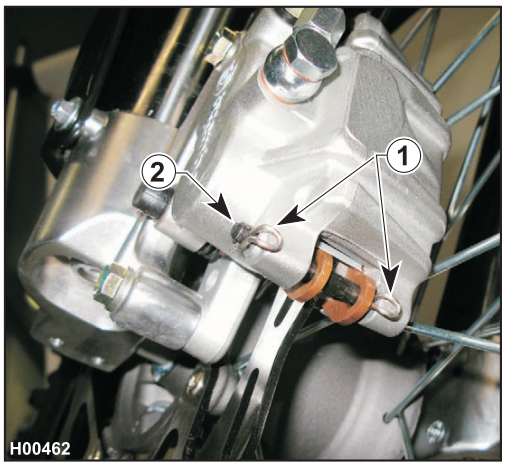
1. Front brake lever
2. Front brake master cylinder with fluid reservoir
3. Front brake line
4. Front brake calliper
5. Front brake disc
6. Rear brake fluid reservoir
7. Rear brake line
8. Rear brake calliper
9. Rear brake disc
10. Rear brake master cylinder
11. Rear brake control pedal





Brake disc

Checking the brake disc is an important safety procedure; the disc must be spotless, i.e. free from corrosion, oil or other dirt or deep scoring.
Front brake disc diameter: 260 mm (10,236 in.)
Front brake disc thickness (when new): 3,0 mm (0,12 in.)
Wear limit: 2,5 mm (0,1 in.)
Rear brake disc diameter: 240 mm (9,449 in.)
Rear brake disc thickness (when new): 4,0 mm (0,16 in.)
Wear limit: 3,4 mm (0,134 in.)
Disc warpage must not exceed 0,15 mm (0,006 in.) (check disc mounted on the rim with a dial gauge).
To remove the disc from the wheel rim, you need to loosen the four retaining screws. On assembly, clean all mating surfaces thoroughly and tighten the screws to the specified torque.



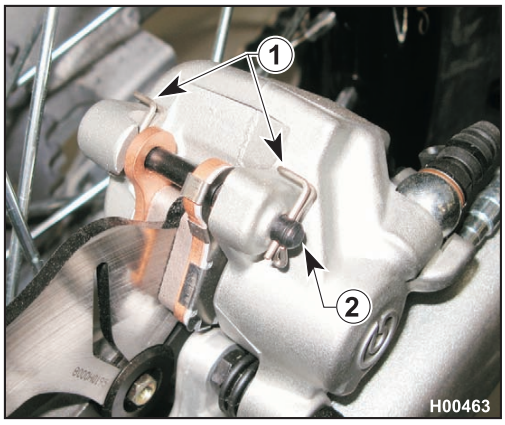
Checking brake pads for wear / replacing the pads

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

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

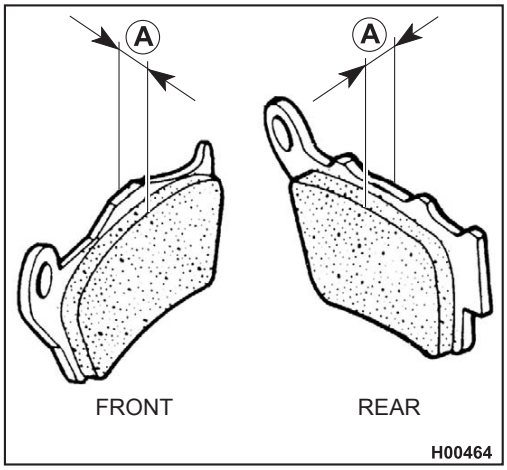
PADS REMOVAL
- Remove clips (1).
- Slide out pins (2).
- Remove pads.

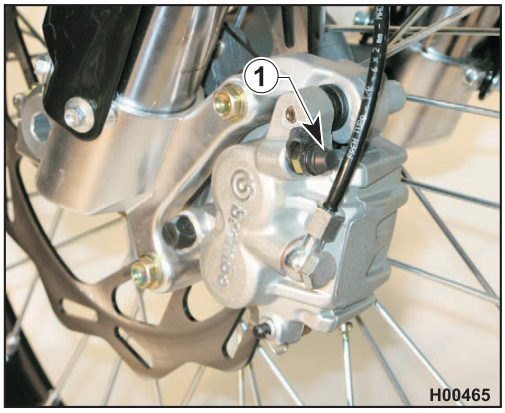
Do not work the brake lever or pedal while removing the pads.



PADS INSTALLATION
- Install new brake pads.
- Reassemble the two pins (2) and the clips (1).

The above procedure eliminates the need to bleed the braking system after replacing the pads. Simply operate the control lever several times until bringing the pistons back to their normal position.

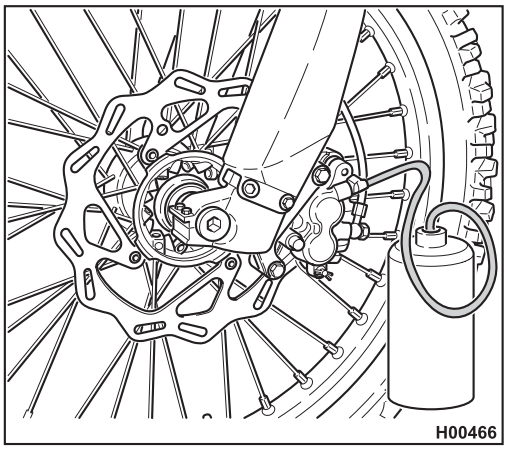




Bleeding the front braking system

A long travel and mushy feel of the brake lever indicate that there is air in the system and the brake needs bleeding.
Bleeding procedure is as follows:

1) Take the rubber cap off the bleed valve (1).
2) Attach a clear plastic hose to the calliper bleed valve and place the other end of the hose in a vessel (make sure the hose end stays dipped in the fluid throughout the procedure).
3) Remove the reservoir plug (2) and the rubber gaiter and fill fresh fluid into the reservoir.
4) Loosen the bleed valve (1) and operate the lever (3) repeatedly.
5) Slightly tighten the bleed valve (1) and release the lever (3).
6) Repeat steps (4) and (5) until the fluid flowing out of the hose looks clear and free of air bubbles: now tighten the bleed valve (1).
7) Top up fluid level (A) and refit rubber gaiter and reservoir cover (2).

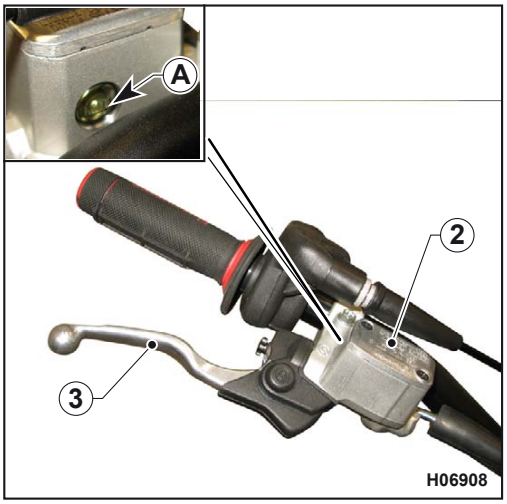


Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.

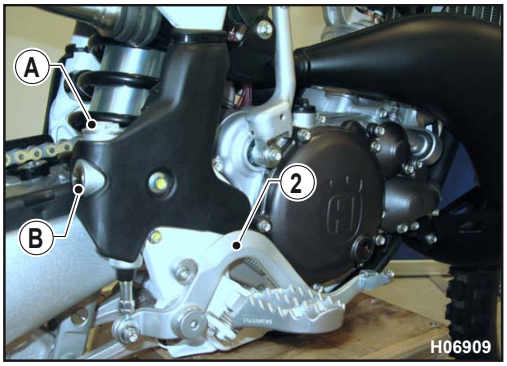
Brake fluid is corrosive. In the event of contact with eyes, rinse with abundant water.

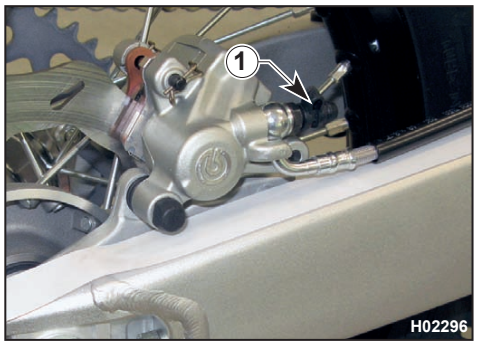
Motorcycle handlebar must be turned to the left during the bleeding procedure. This will keep the master cylinder reservoir higher, making bleeding easier.

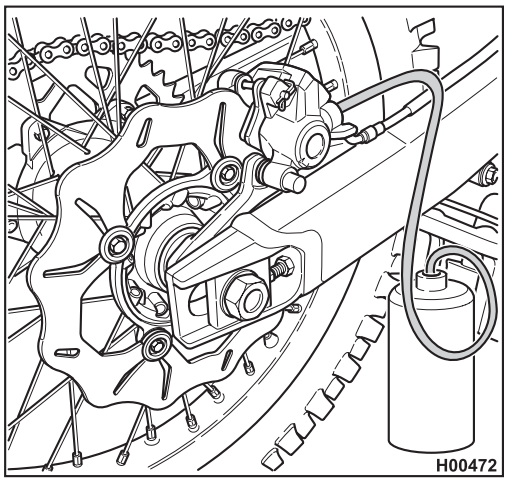
If brake lever or brake pedal feel mush after a fall or a repair resulting in loss of braking, bleed the circuit as described above.



Bleed valve tightening torque: 12-16 Nm, 1.2-1.6 Kgm, 8.8-11.8 ft/lb.







Bleeding the rear braking system

A long travel and mushy feel of the brake pedal indicate that there is air in the system and the brake needs bleeding.
Bleeding procedure is as follows:

1) Remove reservoir cap (A) (21 mm wrench) and diaphragm and fill with fluid (DOT 4).
2) Attach a clear plastic hose to the calliper bleed valve (1) and place the other end of the hose in a vessel (make sure the hose end stays dipped in the fluid throughout the procedure).
3) Loosen the bleed valve (1) and operate the pedal (2) repeatedly.
4) Slightly tighten the bleed valve (1) and release the pedal (2).
5) Repeat steps (3) and (4) until the fluid flowing out of the hose looks clear and free of air bubbles: now tighten the bleed valve (1).
6) Tighten the bleed valve to the specified torque and check fluid level (B) in the reservoir before refitting the cap (A). If the bleeding procedure was performed correctly, the pedal will no longer have that mushy feel. If not so, repeat the procedure.

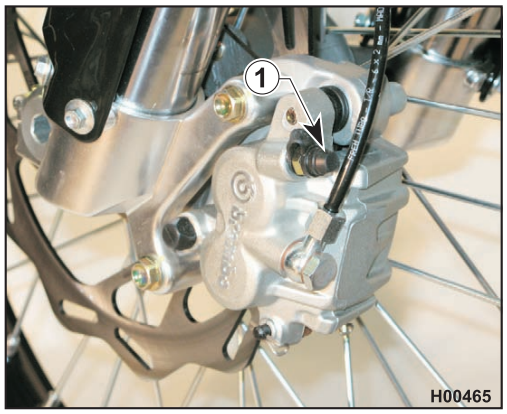
Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.

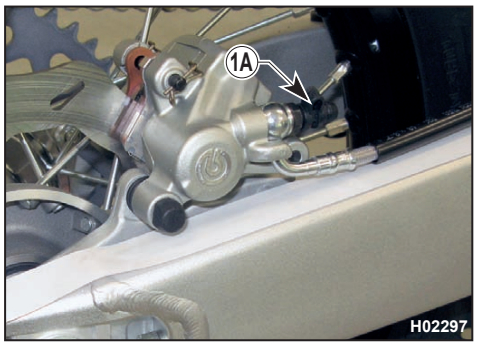
Brake fluid is corrosive. In the event of contact with eyes, rinse with abundant water.

Motorcycle handlebar must be turned to the left during the bleeding procedure. This will keep the master cylinder reservoir higher, making bleeding easier.

If brake lever or brake pedal feel mush after a fall or a repair resulting in loss of braking, bleed the circuit as described above.

Bleed valve tightening torque: 12-16 Nm, 1.2-1.6 Kgm, 8.8-11.8 ft/lb.





Changing the fluid

Brake fluid should be checked and changed as per the "Maintenance Chart" (see Section B), or earlier if contaminated with debris or water.

Do not change brake fluid in the rain or with a strong wind.

Use only fluid (of the specified type) taken from a sealed container. Never reuse brake fluid.

Avoid the ingress of contaminants such as dirt, water, etc. into the reservoir.

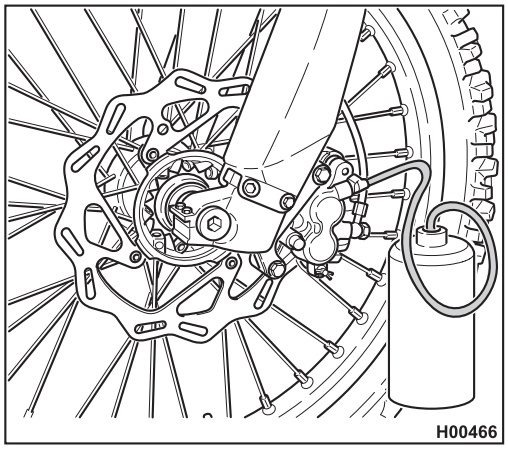
Do not keep the reservoir open without its cover longer than necessary; this would increase the risk of contamination.

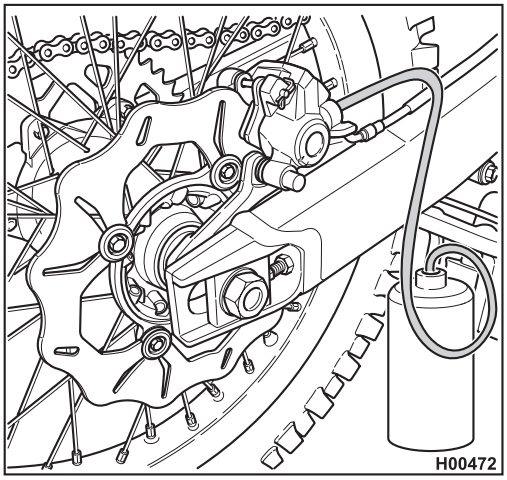
Handle the fluid with care to avoid damage to painted parts.

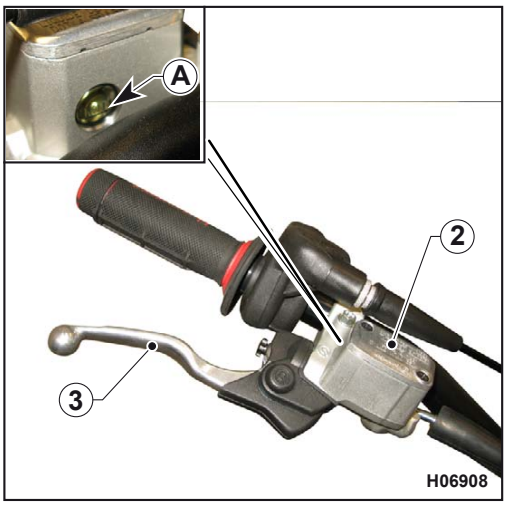
Do not mix two brands of fluid. This would reduce boil-over point, leading to loss of braking efficiency or degrading of rubber parts.

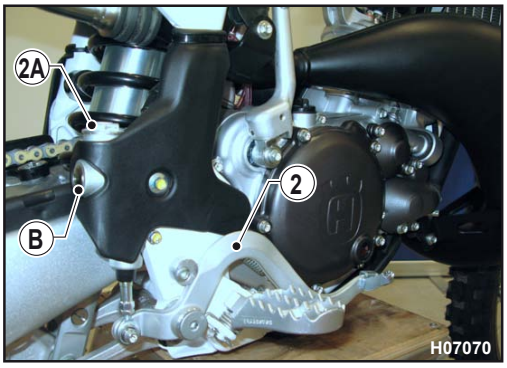
Replacement procedure is as follows:

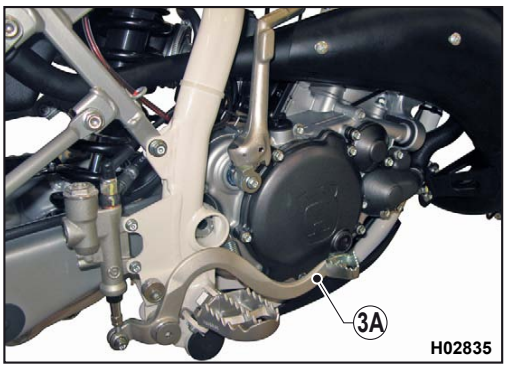
1) Take the rubber cap off the bleed valve (1) or (1A).
2) Attach a clear plastic hose to the calliper bleed valve and place the other end of the hose in a vessel (make sure the hose end stays dipped in the fluid throughout the procedure).



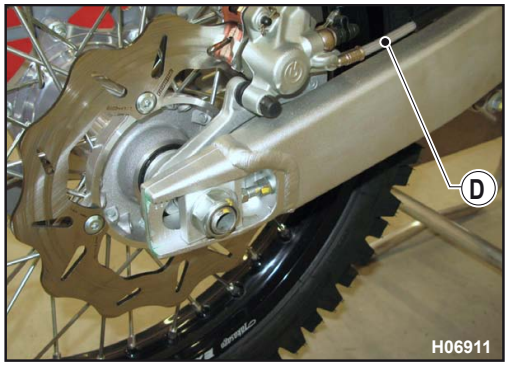




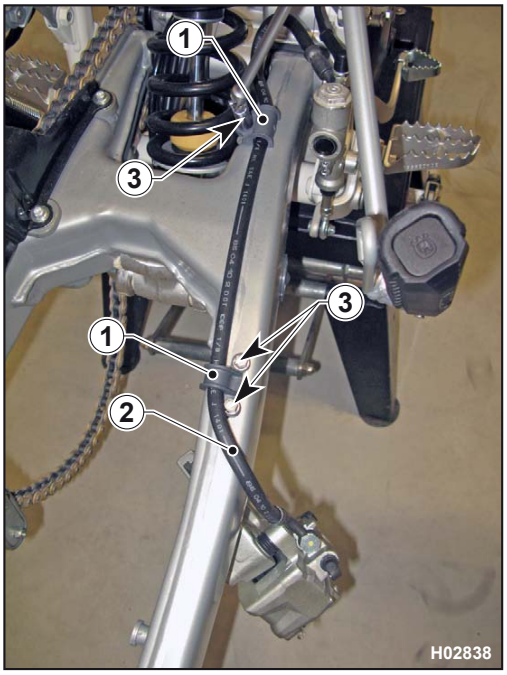




3) Remove the reservoir cap (2) or (2A, 21 mm wrench) and the rubber gaiter and fill the reservoir with fresh fluid.
4) Loosen the bleed valve (1) or (1A) and operate the brake lever (3) or the brake pedal (3A) repeatedly until draining all fluid.
5) Slightly tighten the bleed valve (1) or (1A) and release the brake lever (3) or pedal (3A).
6) Repeat steps (4) and (5) until the fluid flowing out of the hose looks clear and free of air bubbles: now tighten the bleed valve (1) or (1A).
7) Top up with fluid up to level (A) or (B) and refit rubber gaiter and reservoir cover.
   After changing the fluid, you will need to bleed air from the circuit.

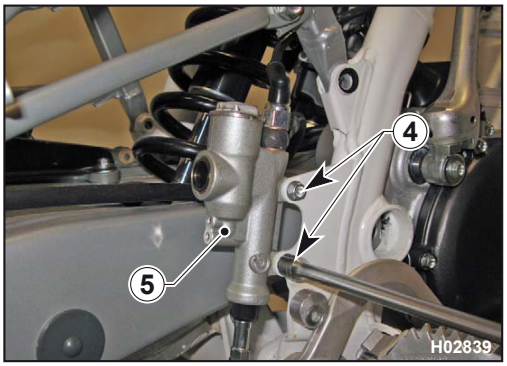


Periodically check the connecting hoses (C) and (D) (see Scheduled Maintenance Chart, Section B): replace worn or cracked hoses.

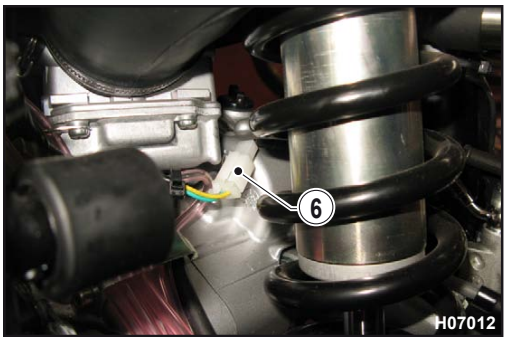


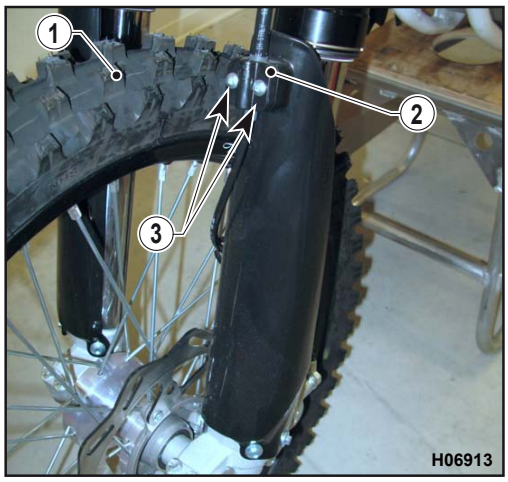
Removal of the rear braking system

- Remove the rear wheel as outlined in the paragraph (see chapter Y).
- Remove the hose (2) supports (1) by loosening the screws (3) using an 8 mm wrench.



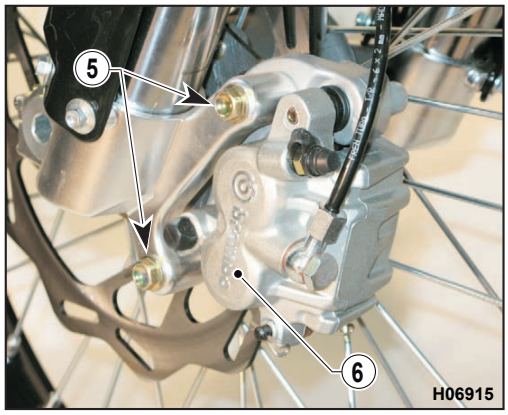
- Loosen the two screws (4) and remove the pump (5) by disconnecting the microswitch connector (6) (WR).



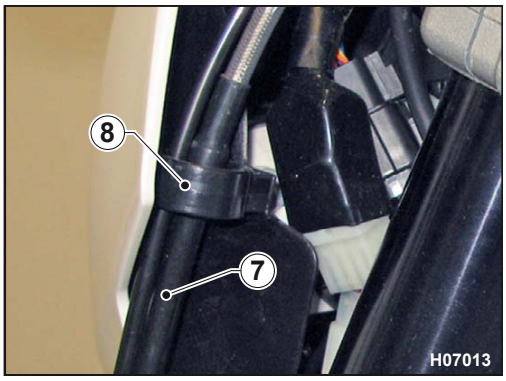


Removal of the front braking system

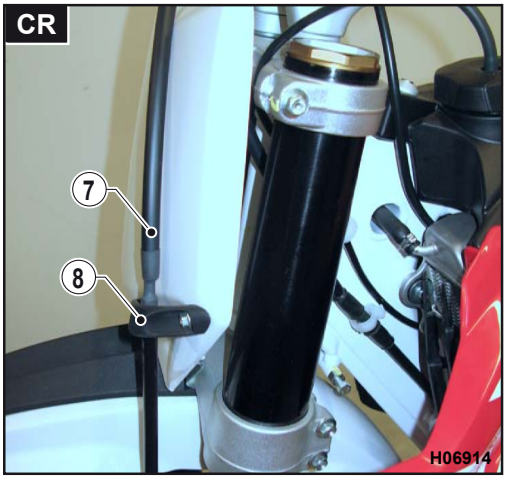
- Remove the front wheel (1) as outlined in the relevant paragraph (see section Y).
- Loosen the screws (3) and remove the block (2).

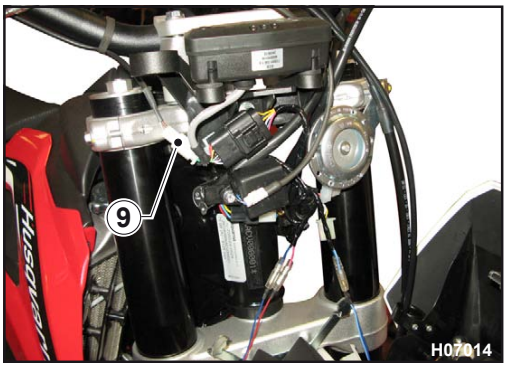


- Loosen the two screws (5) and disconnect the brake calliper (6).

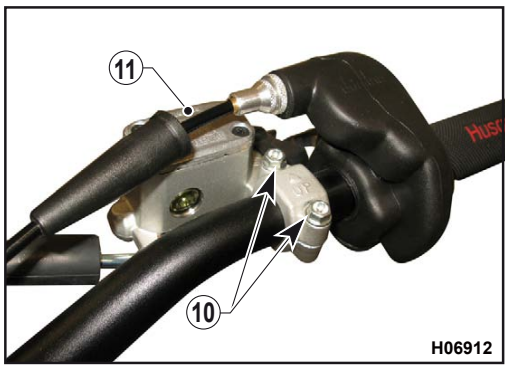


- Release the hose (7) from the support (8).



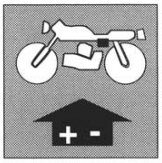


- Disconnect the STOP microswitch connector (9).

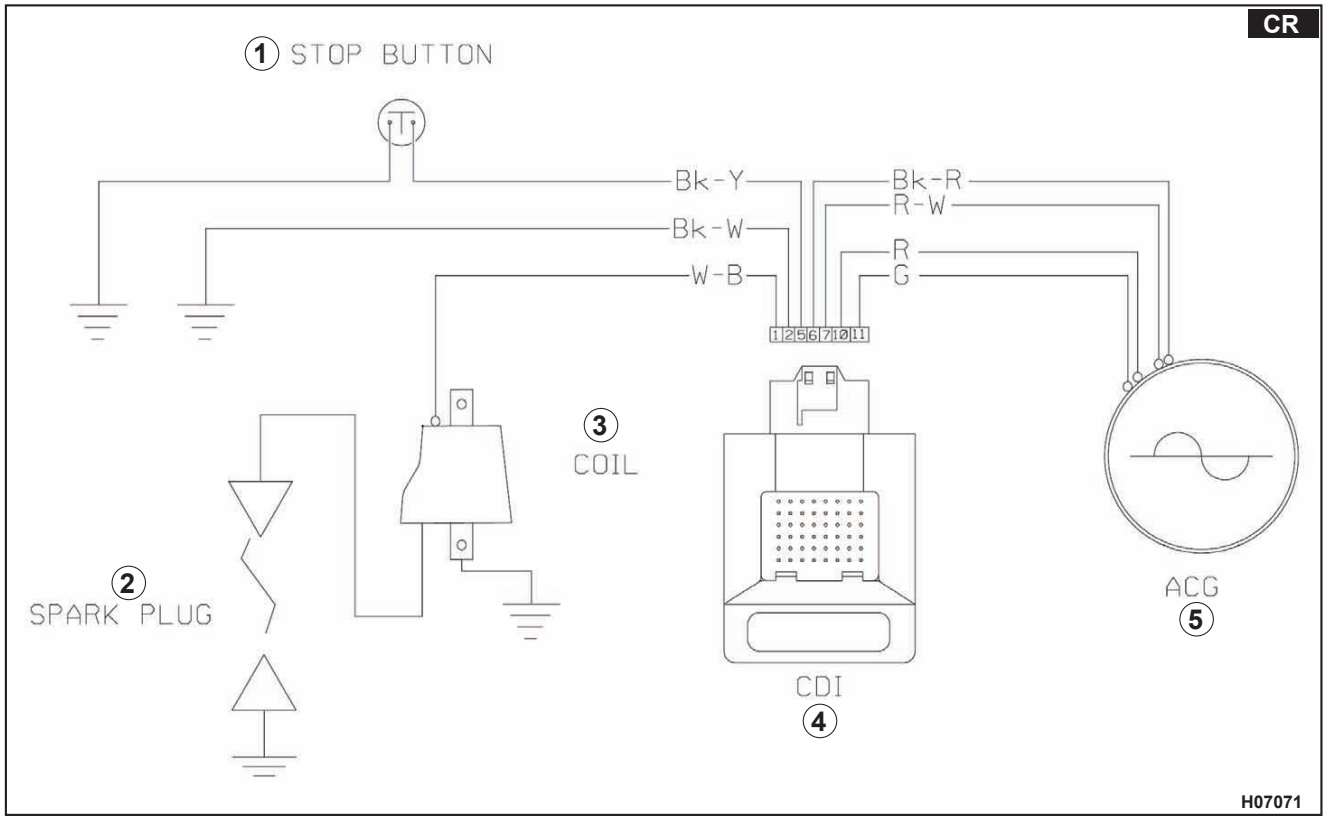


- Loosen the two screws (10) (6 mm wrench) and remove the brake lever (11) complete with pump and tank.

Section M



Wiring diagram (CR)



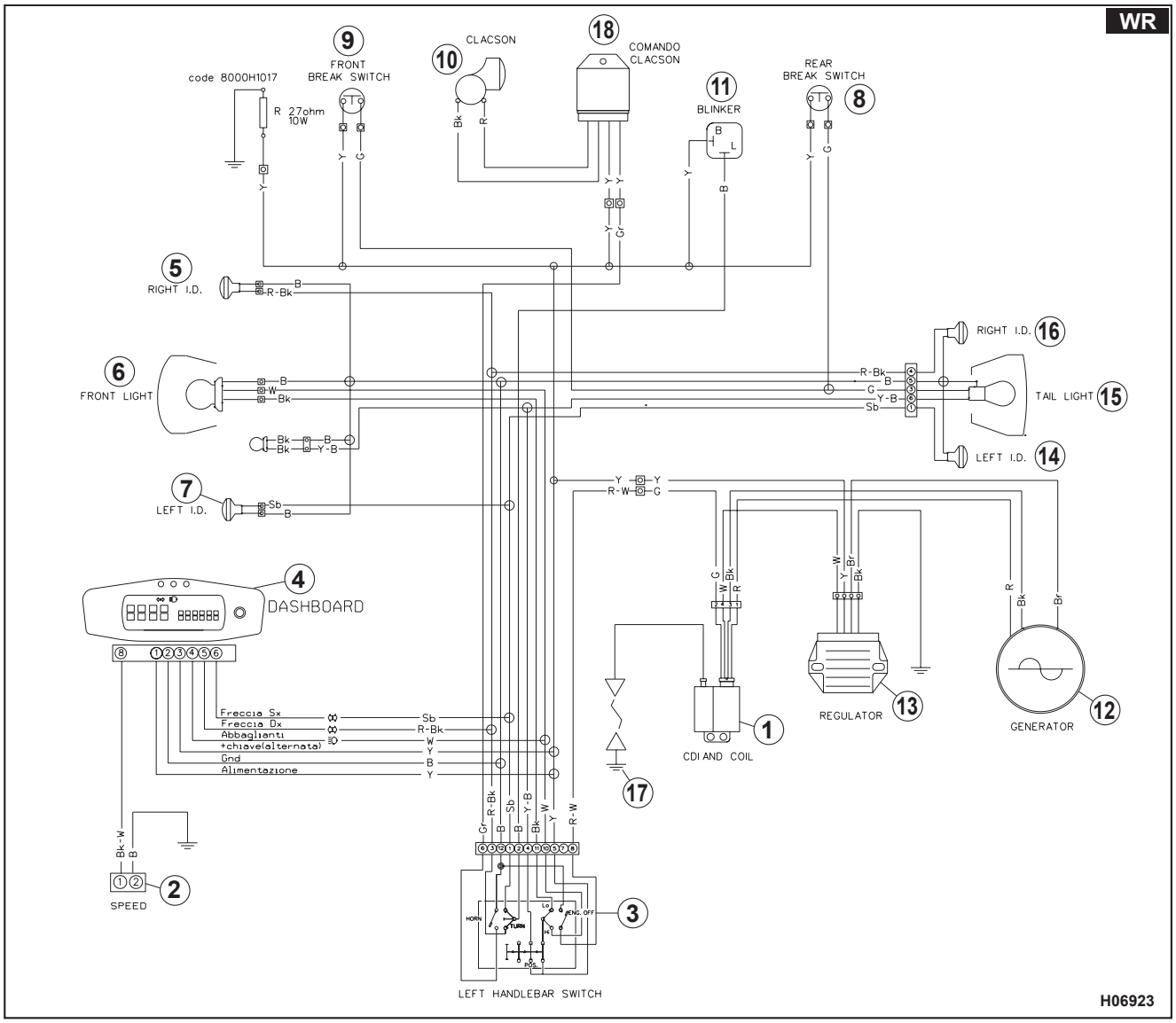
Key to wiring diagram

1. Engine stop button
2. Spark plug
3. Coil
4. Control unit
5. Generator

Colour coding key

R..... Red
Y..... Yellow
B..... Blue
G..... Green
W..... White
Bk..... Black
P..... Pink
V..... Violet
Sb..... Sky blue
Gr..... Grey
O..... Orange
Br..... Brown

Wiring diagram (WR)

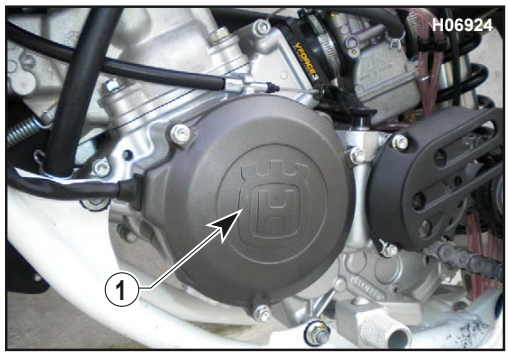


Key to wiring diagram

1. Transducer
2. Speed sensor
3. L.H. switch
4. Dashboard
5. Front R.H. turning indicator
6. Headlamp
7. Front L.H. turning indicator
8. Rear stop light switch
9. Front stop light switch
10. Horn
11. Turning indicators flasher
12. Alternator
13. Voltage regulator
14. Rear L.H. turning indicator
15. Tail light
16. Rear R.H. turning indicator
17. Spark plug
18. Horn controller

Colour coding key

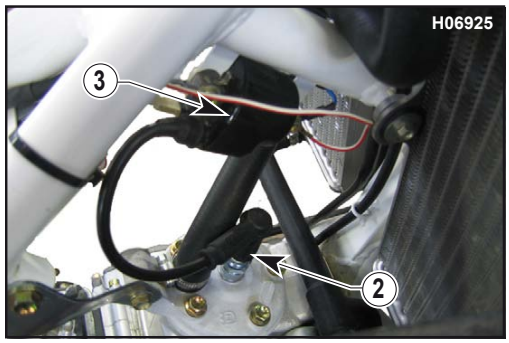
B	Blue
Bk	Black
Br	Brown
G	Green
Gr	Grey
O	Orange
P	Pink
R	Red
Sl	Sky blue
V	Violet
W	White
Y	Yellow



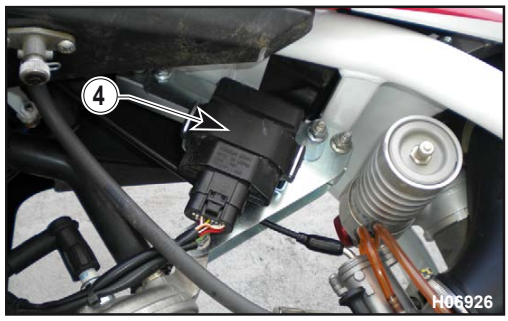
Electrical component location (CR)

The ignition system includes the following elements:

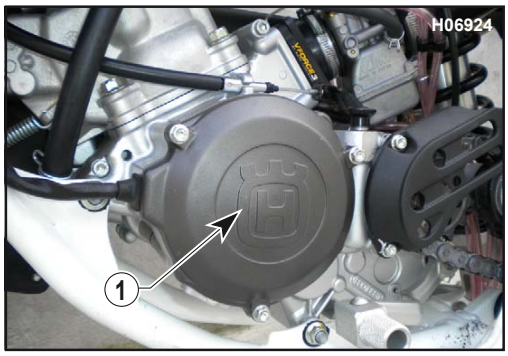
- Generator (1), in oil bath, on the inner side of L.H. crankcase cover;



- Spark plug (2) on the cylinder head;
- Electronic ignition coil (3) under the fuel tank;

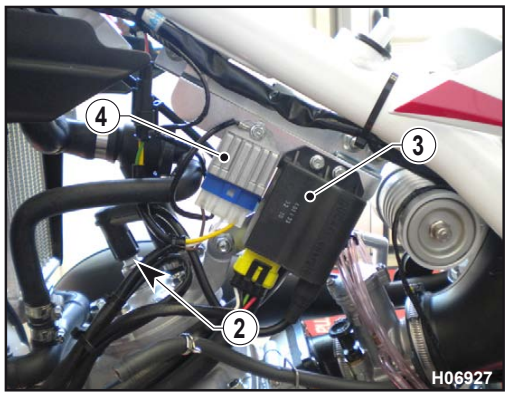


- Electronic control unit (4) positioned on left-hand side, under tank.

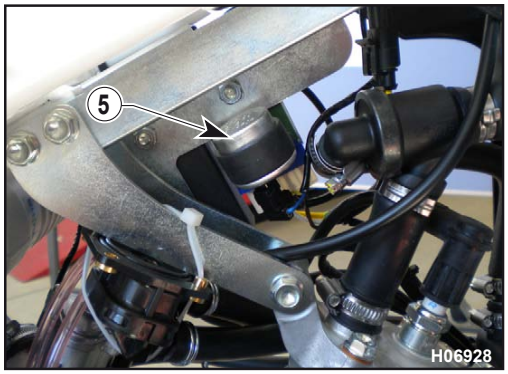


Electrical component location (WR)

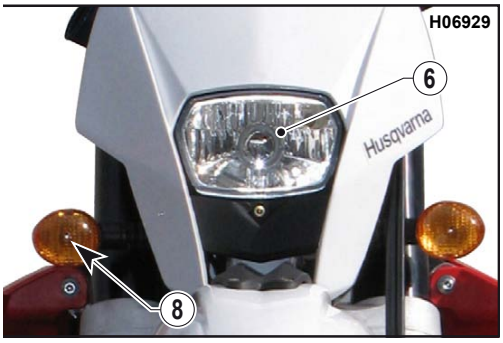
The ignition system includes the following elements:
- Generator (1), in oil bath, on the inner side of L.H. crankcase cover;



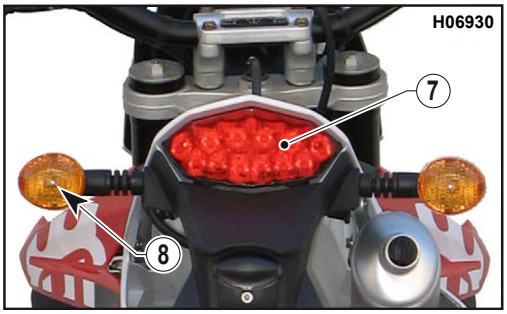
- Spark plug (2) on the cylinder head.
- Transducer (3) secured onto a bracket under fuel tank;
- Voltage regulator (4) secured onto a bracket close to transducer.



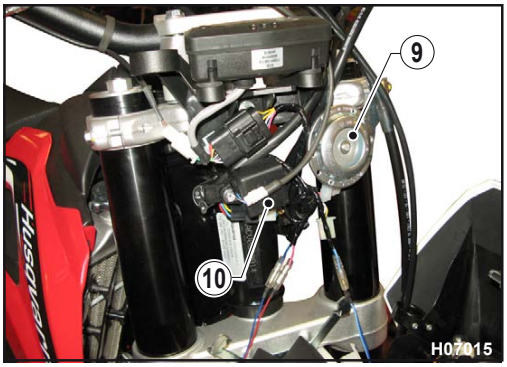
The electric system includes the following elements:
- Flashing indicator device (5) under the fuel tank;



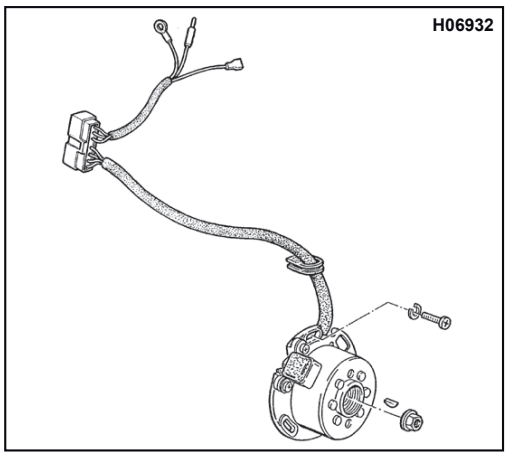
- Headlamp (6) with two filaments bulb of 12V-35/35W and parking light bulb of 12V-5W;



- Back light (7) LED type;
- Turn signals bulb (8) of 12V-10W;

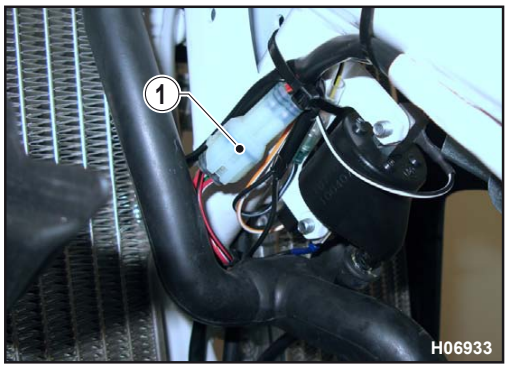


- Horn (9) and its control unit (10), positioned behind the front headlamp fairing.



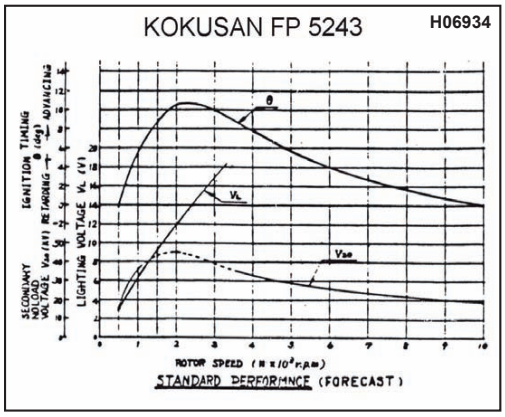
Checking generator stator windings resistance (CR)

The generator consists of a 12 V alternator with a power of 500 at 10.000 rpm, positioned inside engine left side cover.



Measure across Red/White and Black/Red wires of the connector (1); correct value is about 25,5 Ω.

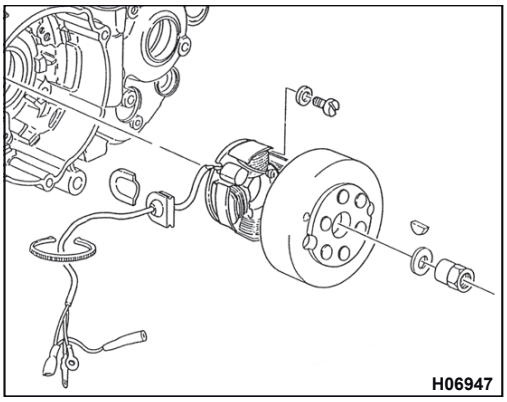
If resistance is outside the specified limits, replace the complete generator.



Generator performance

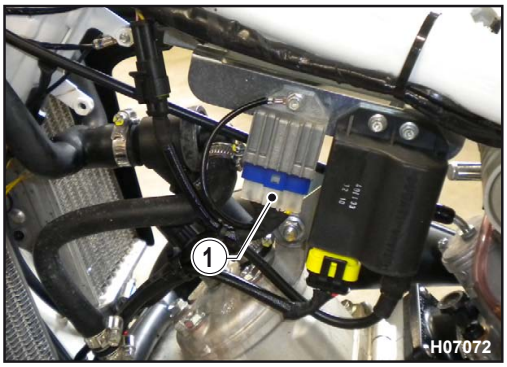
RPM	A D.C. (typical)
1000	5,8
1500	9,0
2000	10,9
3000	10,0
4000	8,0
5000	5,9
6000	4,0

AT EACH ENGINE OVERHAUL, CLEAN FLYWHEEL ROTOR TO REMOVE ANY DEBRIS CAPTURED BY THE MAGNETS.



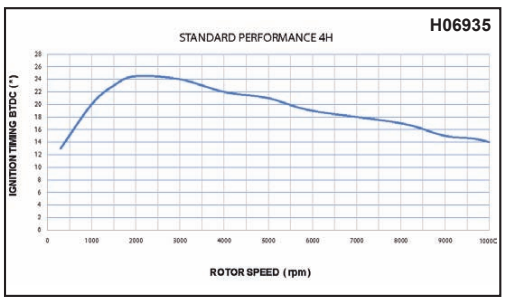
Checking generator stator windings resistance (WR)

The generator consists of a 12 V alternator with a power of 300 W at 10.000 rpm, positioned inside engine left side cover.



Measure across the Brown and Black wires of the connector (1); correct value is about 0,75 Ω.

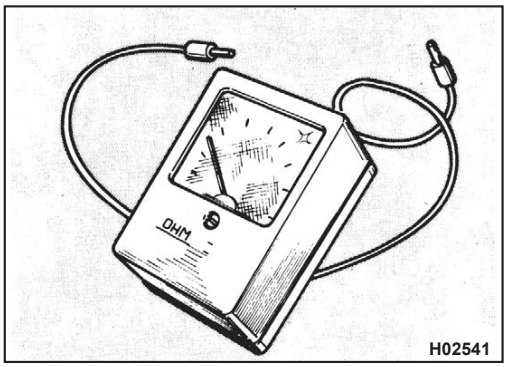
If resistance is outside the specified limits, replace the complete generator.



Generator performance

r.p.m.	BTDC
1000	20,0
1500	9,0
2000	10,9
3000	10,0
4000	8,0
5000	5,9
6000	4,0

AT EACH ENGINE OVERHAUL, CLEAN FLYWHEEL ROTOR TO REMOVE ANY DEBRIS CAPTURED BY THE MAGNETS.



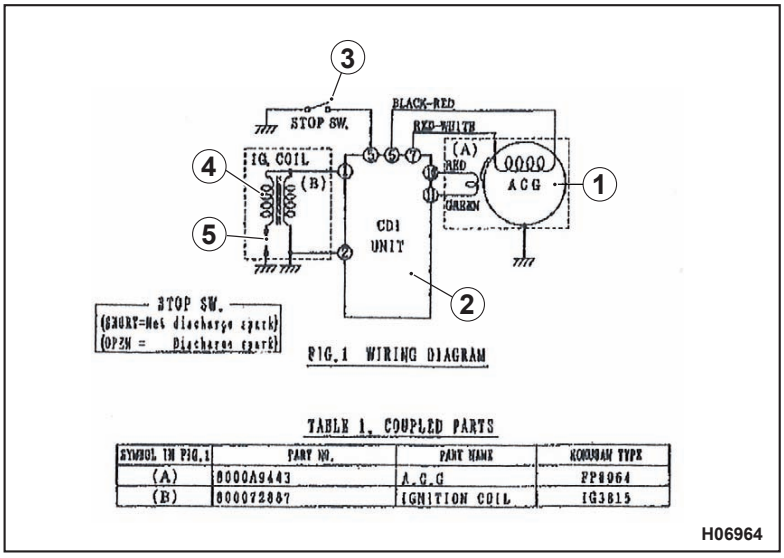
Alternator inspection

Disconnect the three yellow cables coming from the alternator from the regulator, taking care to properly insulate them so as not to let them contact each other. Take engine to approx. 3,000 rpm, and measure the open-circuit voltage using an alternate current voltmeter with a scale up to at least 50V.

Tester will show a certain voltage value (>20V <50V).
If no value is shown or in case a great voltage unbalance is present across yellow cables, then stator is faulty. It will thus be necessary make a further check using an Ohmmeter, measuring the insulation between the tested cable and ground. This insulation shall be total, i.e. with infinite resistance.

Electronic ignition system (CR)

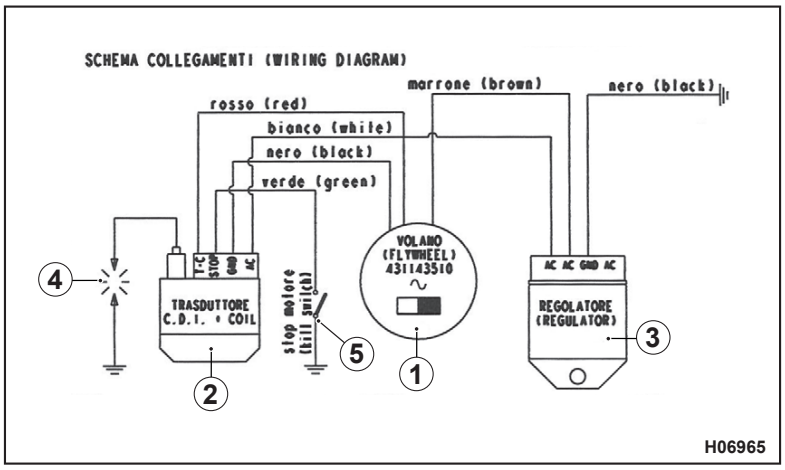
The electronic ignition system includes the following elements:
1) 12V generator - 500W
2) Electronic control unit
3) Stop switch
4) Electronic coil
5) Spark plug

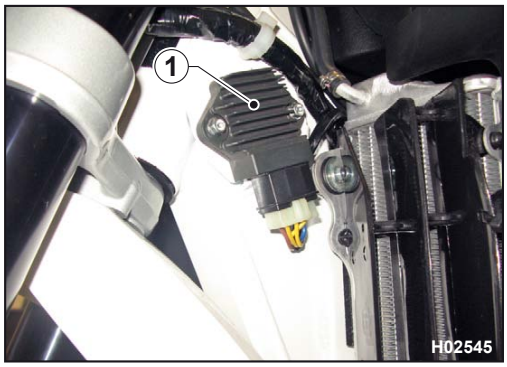


Electronic ignition system (WR)

The electronic ignition system includes the following elements:

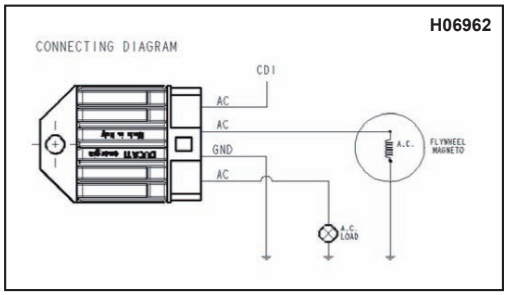
1) 12V generator - 300W
2) Transducer
3) Voltage regulator
4) Spark plug
5) Engine stop button

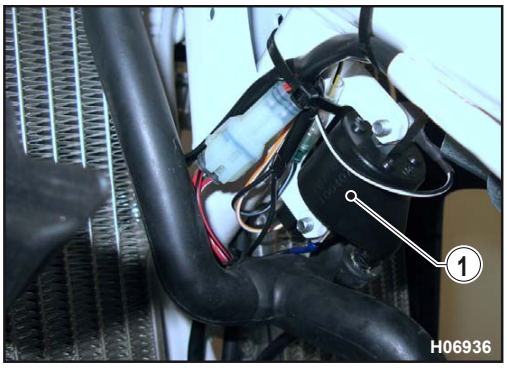




Voltage regulator

The voltage regulator (1) converts the alternated current generated by the flywheel-stator system into direct current at a constant voltage level of 12V.





Checking coil windings resistance (CR)

Remove saddle and fuel tank (see relevant paragraph) to gain access to the coil (1).
Disconnect the coil connector from the wiring, remove retaining screws and coil, and measure resistance in the primary and secondary windings with a meter.

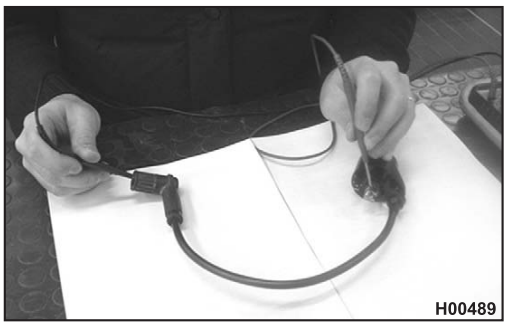
Induction coil:
- Primary winding resistance: 4.5 Ω ±15% at 20°C.
- Secondary winding resistance: 19.5 KΩ ±20% at 20°C (without spark plug cap cable).

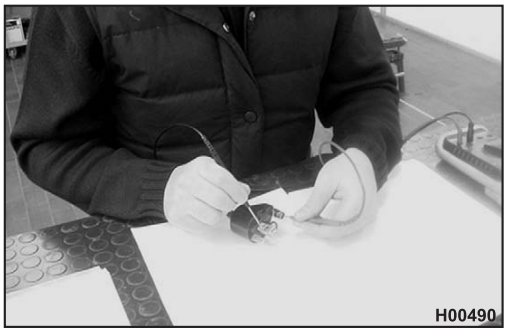
  If resistance is outside the specified limits, replace the coil. Also check the resistance of the terminal cap contacting the spark plug.

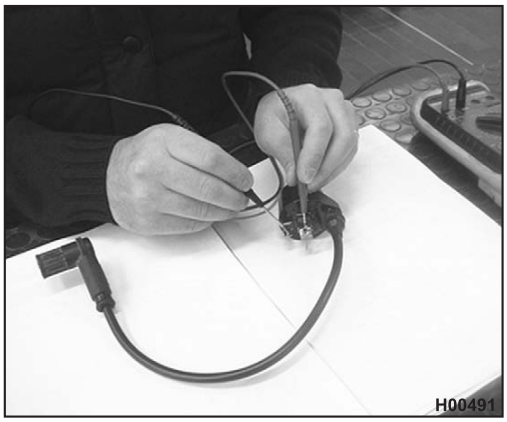
- Terminal cap resistance: 4.5-5.5 KΩ ±5% at 20°C.

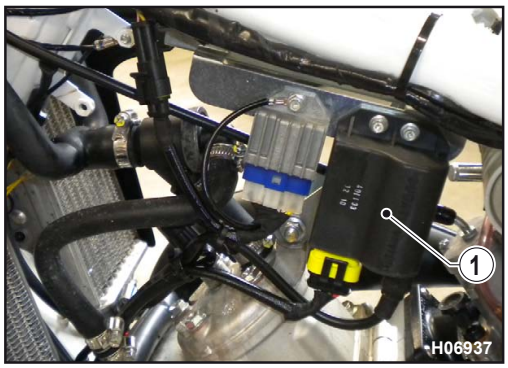
If resistance is outside the specified limits, replace the cap.

The area where the coil is secured must be totally free from oxide and paint. A faulty ground contact will damage the coil and cause ignition problems.



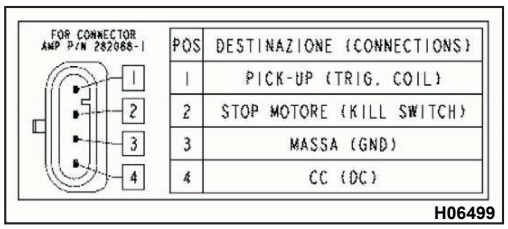


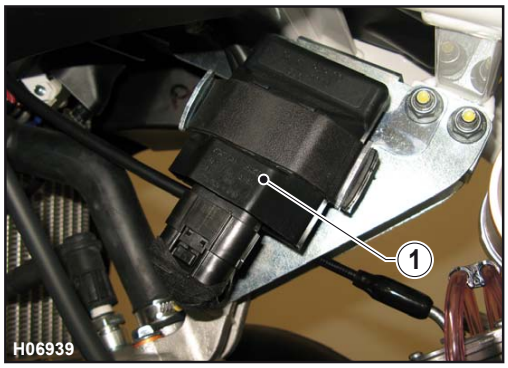




Transducer (WR)

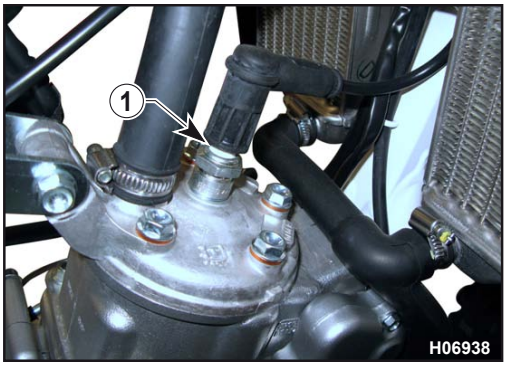
The transducer (1) is located on the left side, secured to a special bracket.





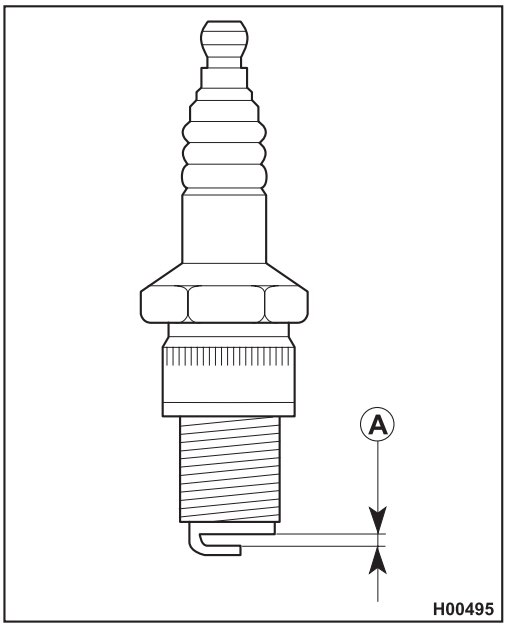
Electronic control unit (ECU) (CR)

The control unit (1) is located on the left side, under the fuel tank.
Capacitive injection, i.e the spark on spark plug is obtained thanks to the discharge of a condenser - positioned inside control unit - through a capacitive coil.
Spark ignites based on an advance table relating to the RPM values.



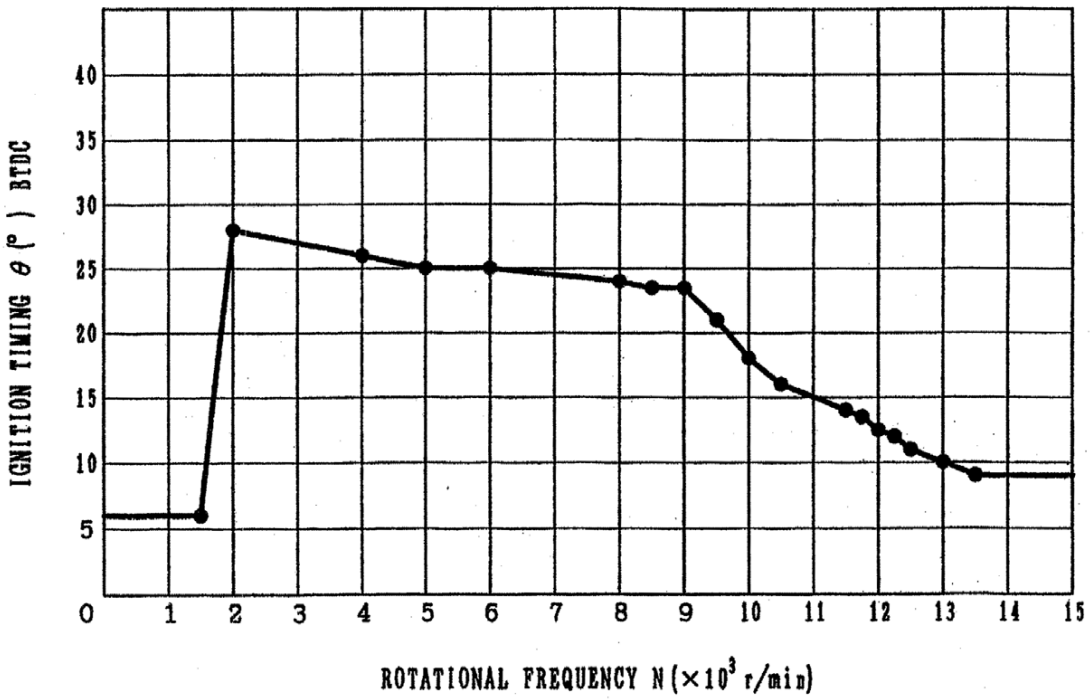
Spark plug

Spark plug (1) is a "CHAMPION QN84/NGK BR9EG". Check electrode gap "A" (0.6 mm). A wider gap may cause difficulties in starting the engine and overload the coil. A gap that is too narrow may cause difficulties when accelerating, when idling or poor performance at low speed. Clean off any dirt around spark plug base before removing the spark plug. It is good practice to closely inspect the spark plug after removal, as any deposits on it and the colour of the insulator provide useful indications on spark plug heat rating, carburetion, ignition and the general condition of the engine. Before refitting the spark plug, accurately clean the insulator with a wire brush. Smear some graphite grease on spark plug thread, do it fully home finger tight then tighten it to 10÷12 Nm torque. Loosen the spark plug then tighten it again to 10÷12 Nm. Spark plugs which have cracked insulators or corroded electrodes should be replaced.



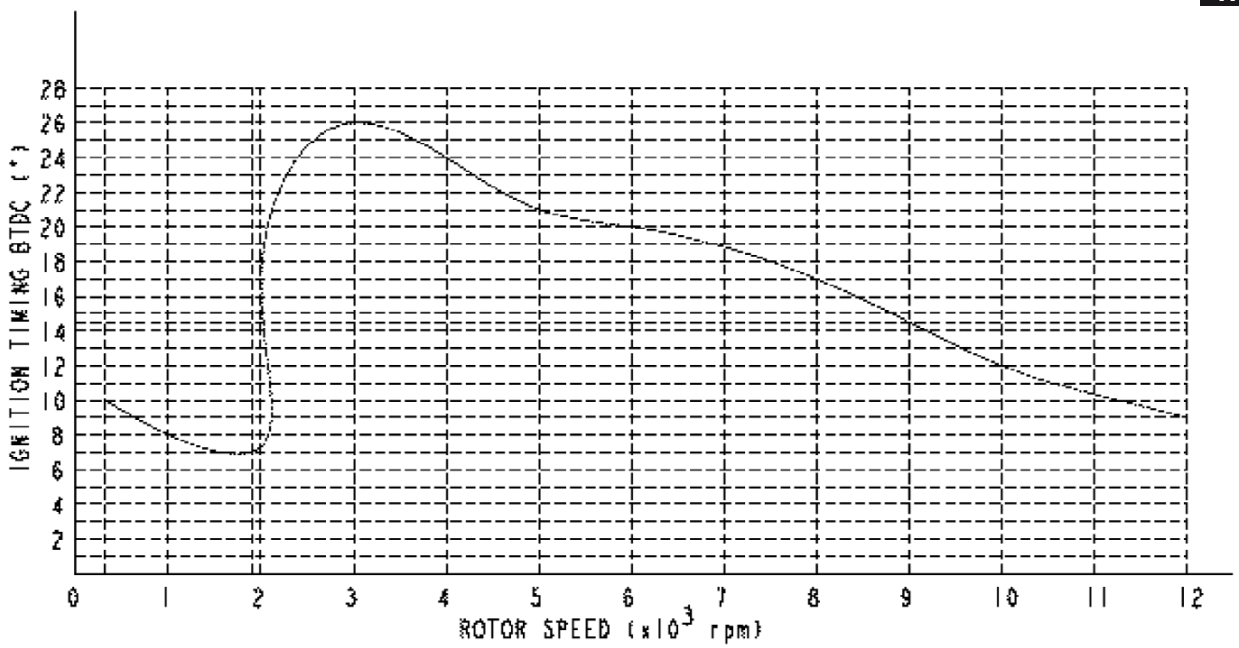
Timing curve

CR

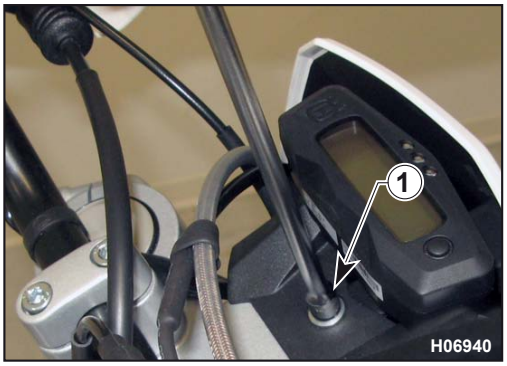


H06975

WR

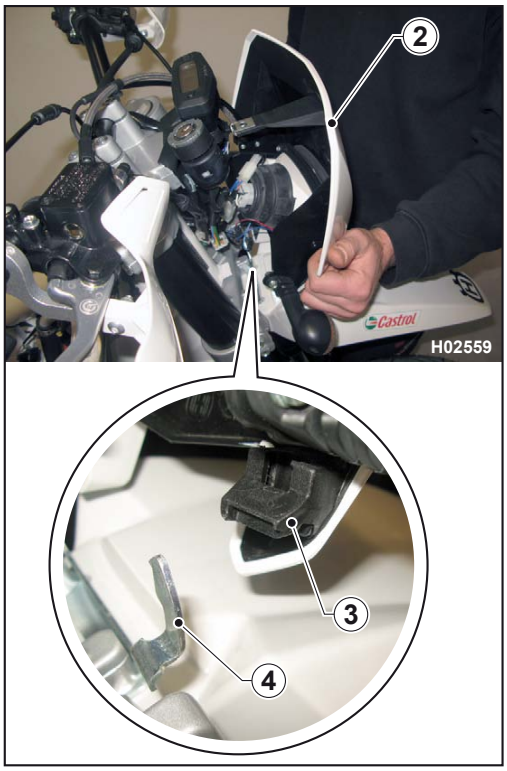


H06976



Headlight unit with front fairing removal (WR)

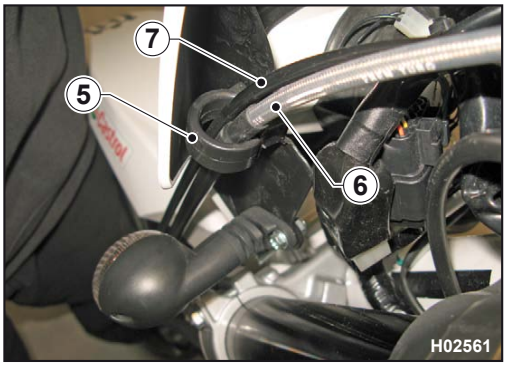
- Using an 8 mm wrench, loosen screw (1).

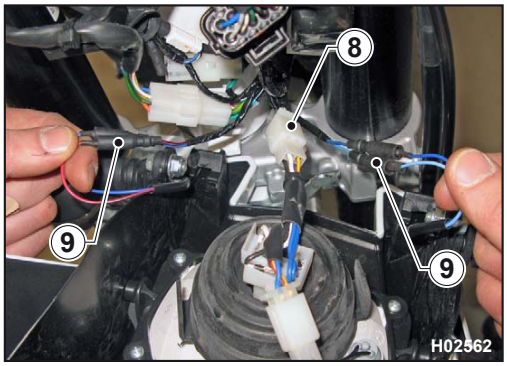


- Move headlamp fairing (2) forward, and lift it to release damping pads (3) from their mounts (4).

- Open pipe support (5), and slide out front brake pipe (6) and speed sensor cable (7).
- Disconnect headlight connector (8) and turning indicator connectors (9).

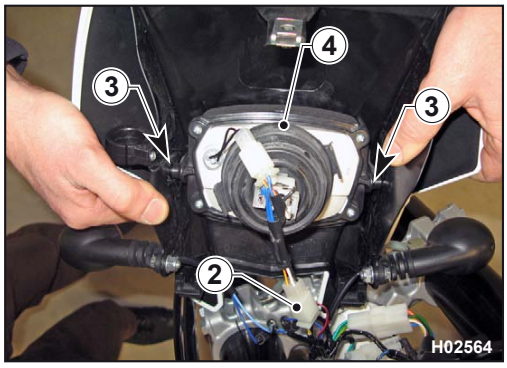
ON REASSEMBLY, MAKE SURE THAT DAMPING PADS (3) ARE CORRECTLY INSTALLED INSIDE SUPPORTS (4).



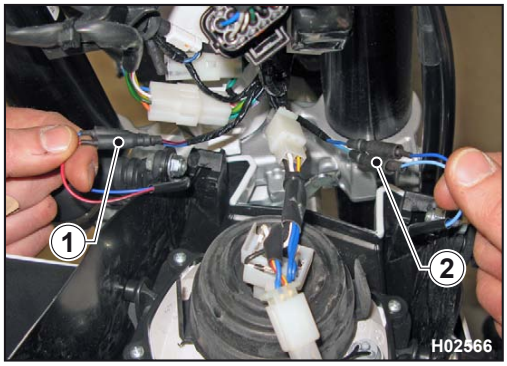


Removing headlight from front fairing (WR)

- Remove the headlight unit complete with front fairing as outlined in the relevant paragraph.
- Loosen beam adjuster screw (1).

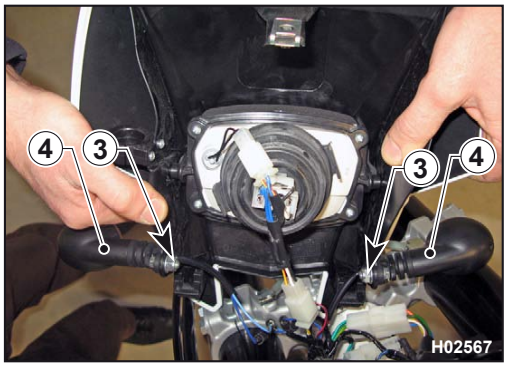


- Disconnect headlight connector (2).
- Widen the supporting tabs (3), and remove headlight (4) from the inside.

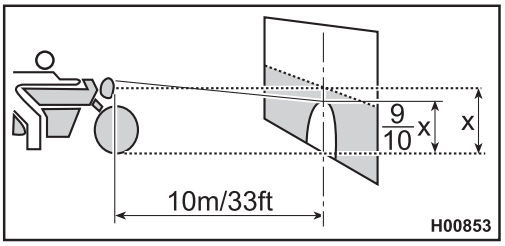


Front turning indicator removal (WR)

- Remove the headlight unit complete with front fairing as outlined in the relevant paragraph.
- Disconnect connectors (1) and (2) of right and left turn indicators, respectively.



- Using a 10 mm wrench on the inside and an 8 mm wrench on the outside, loosen screws (3) and remove turning indicators (4).

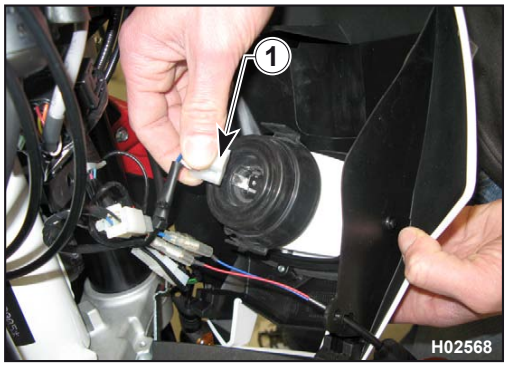


HEADLAMP, TAIL LIGHT (WR)

Headlamp adjustment (WR)

The headlamp features a twin bulb for low and high beam and a festoon bulb for the city or parking light. Beam setting needs to be performed accurately; proceed as follows:

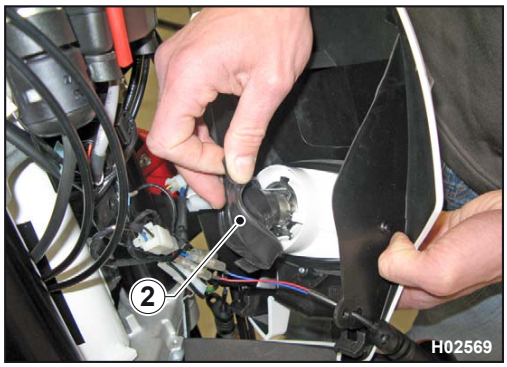
- Place the motorcycle 10 metres away from a vertical wall;
- the motorcycle must be on level ground and the optical axis of the headlamp must be perpendicular to the wall;
- the motorcycle must be upright;
- measure the height from the ground to the centre of the lamp and draw a cross on the wall at the same height;
- when the low beam is on, the upper edge between dark and lit zone should be at 9/10th of the height of headlamp centre from ground. Beam height can be raised or lowered turning the screw (1).



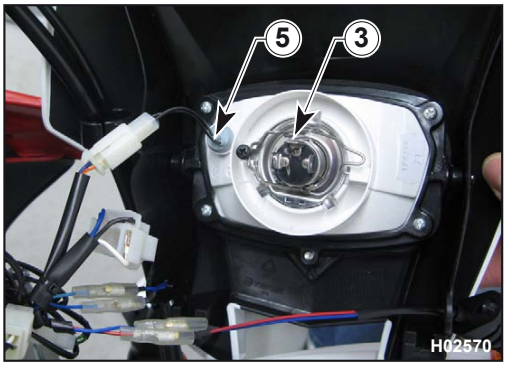
Headlamp bulbs replacement (WR)

Proceed as follows to reach the headlamp bulbs:

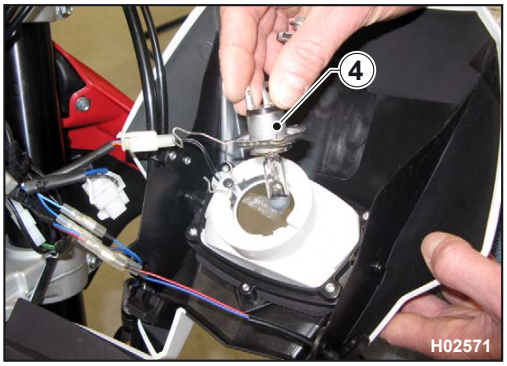
- remove the headlamp fairing as outlined in the relevant paragraph;
- detach connector (1) from the bulb;



- slide off the rubber gaiter (2);

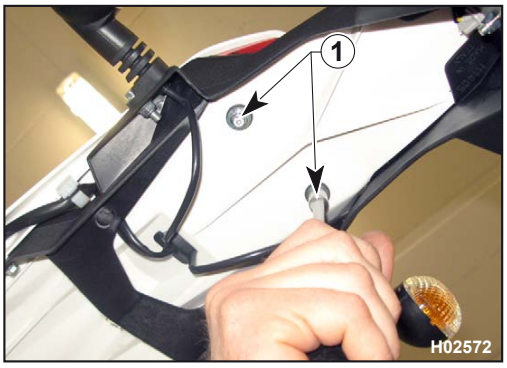


- release the bulb holder clips (3) and take out bulb (4);



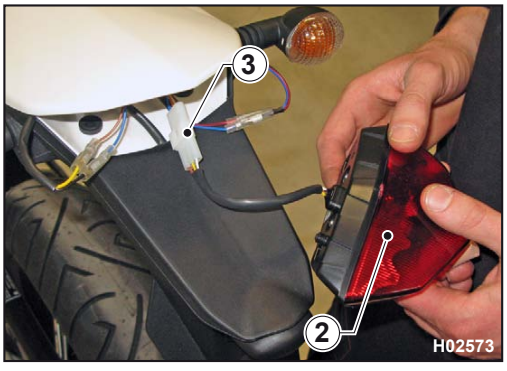
Headlamp bulb (4) is of the halogen type (H4); be careful when replacing it since the glass part shall not be touched with bare hands.

To replace the parking light bulb (5) extract it from the inside cover.
Once the bulb has been replaced, reverse the above procedure to reassemble.



Tail light replacement (WR)

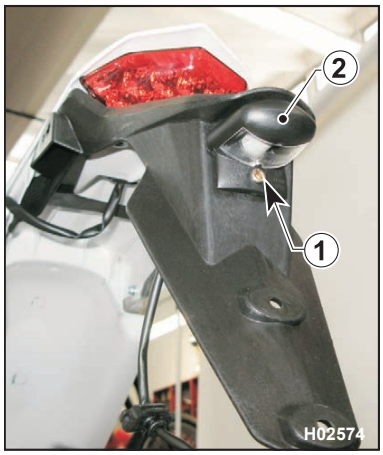
Remove the tail light as follows:
- Loosen the two screws (1) under the rear mudguard.



- Extract the tail light (2) and disconnect the connector (3).

Once the bulb has been replaced, reverse the above procedure to reassemble.

Be careful not to overtighten the screws.

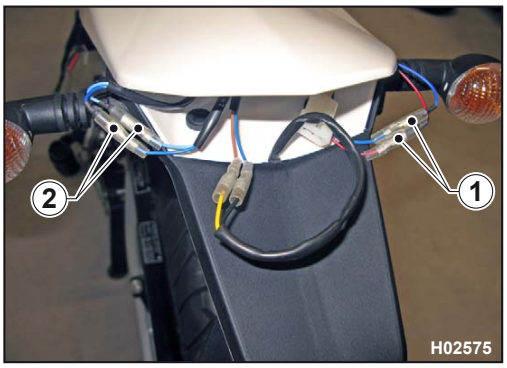


Number plate bulb replacement (WR)

- Loosen screw (1) and remove the number plate bulb (2) from the mudguard.

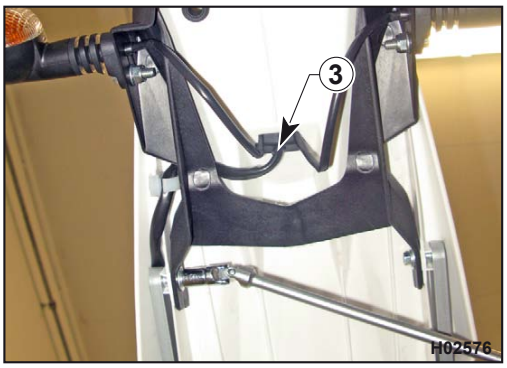
- Extract the bulb holder (3) with the bulb (4) from the housing.
- Pull the bulb (4) to detach it from bulb holder.

Once the bulb has been replaced, reverse the above procedure to reassemble.

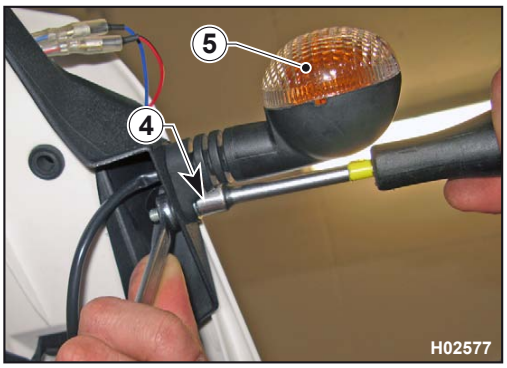


Rear turning indicator removal (WR)

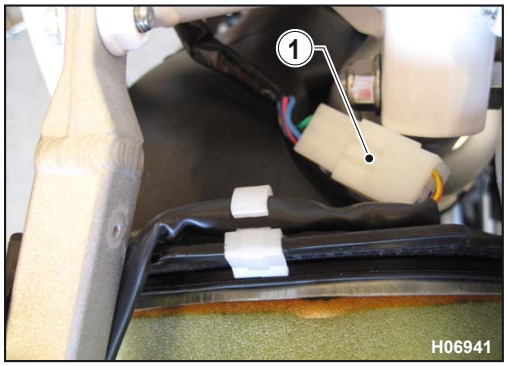
- Remove the tail light as outlined in the relevant paragraph.
- Disconnect connectors (1) and (2) of right and left turn indicators, respectively.



- Slide turning indicator cables out of rubber gaiter (3).

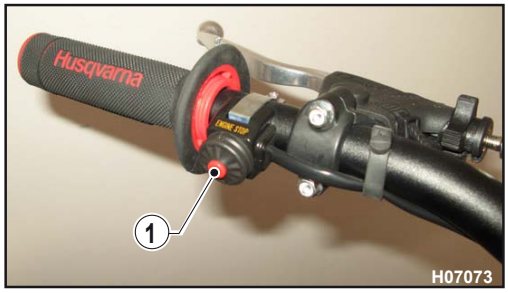


- Using a 10 mm wrench on the inside and an 8 mm wrench on the outside, loosen screws (4) and remove turning indicators (5).



Rear wiring harness replacement (WR)

- Remove the left body panel as outlined in section E.
- Remove the tail light as outlined in the relevant paragraph.
- Disconnect connector (1) and cut clamps securing wiring harness to chassis.
- Disconnect rear turning indicator connectors, and remove wiring harness.



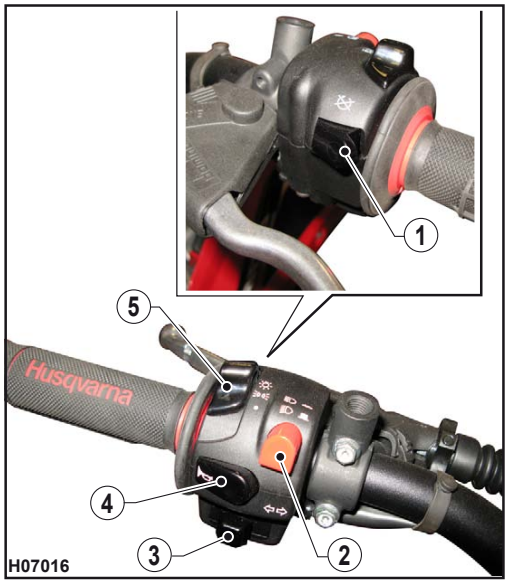
Handlebar switches

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

Left-hand switch (CR)

1 Engine stop button

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



Left-hand switch (WR)

The left commutator has the following controls:

1) Engine stop button ( ).

2) HI = ( ) Selection control High beam;

LO = ( ) Selection control of Low beam.

3) TURN

= Activation of left turn indicators (self cancelling);

= Activation of right turn indicators (self cancelling);

To deactivate the indicator, press the control lever after its returning to center.

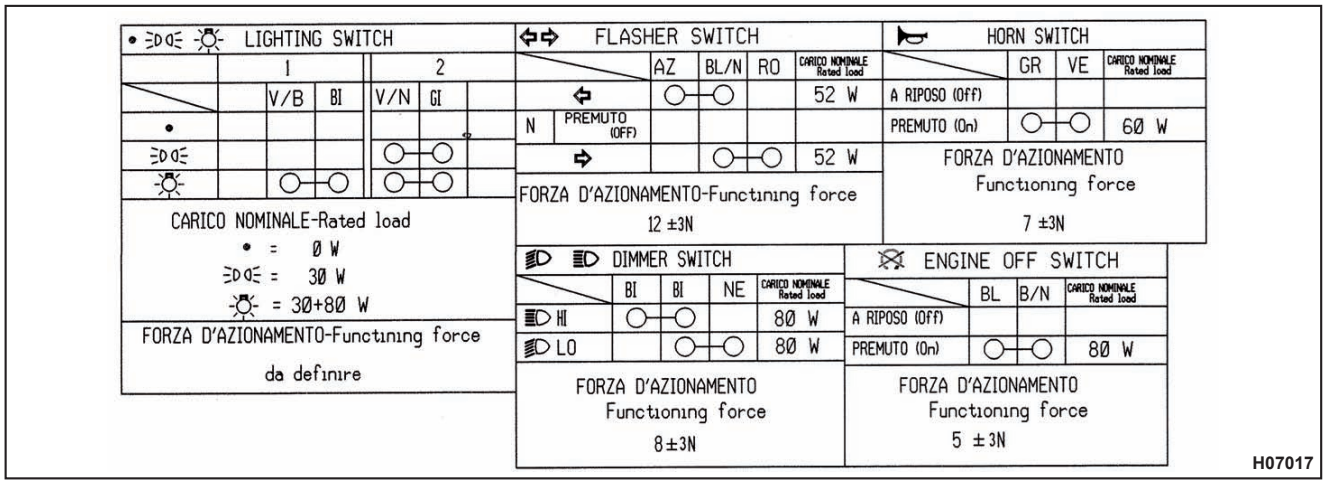
4) HORN = ( ) Warning horn.

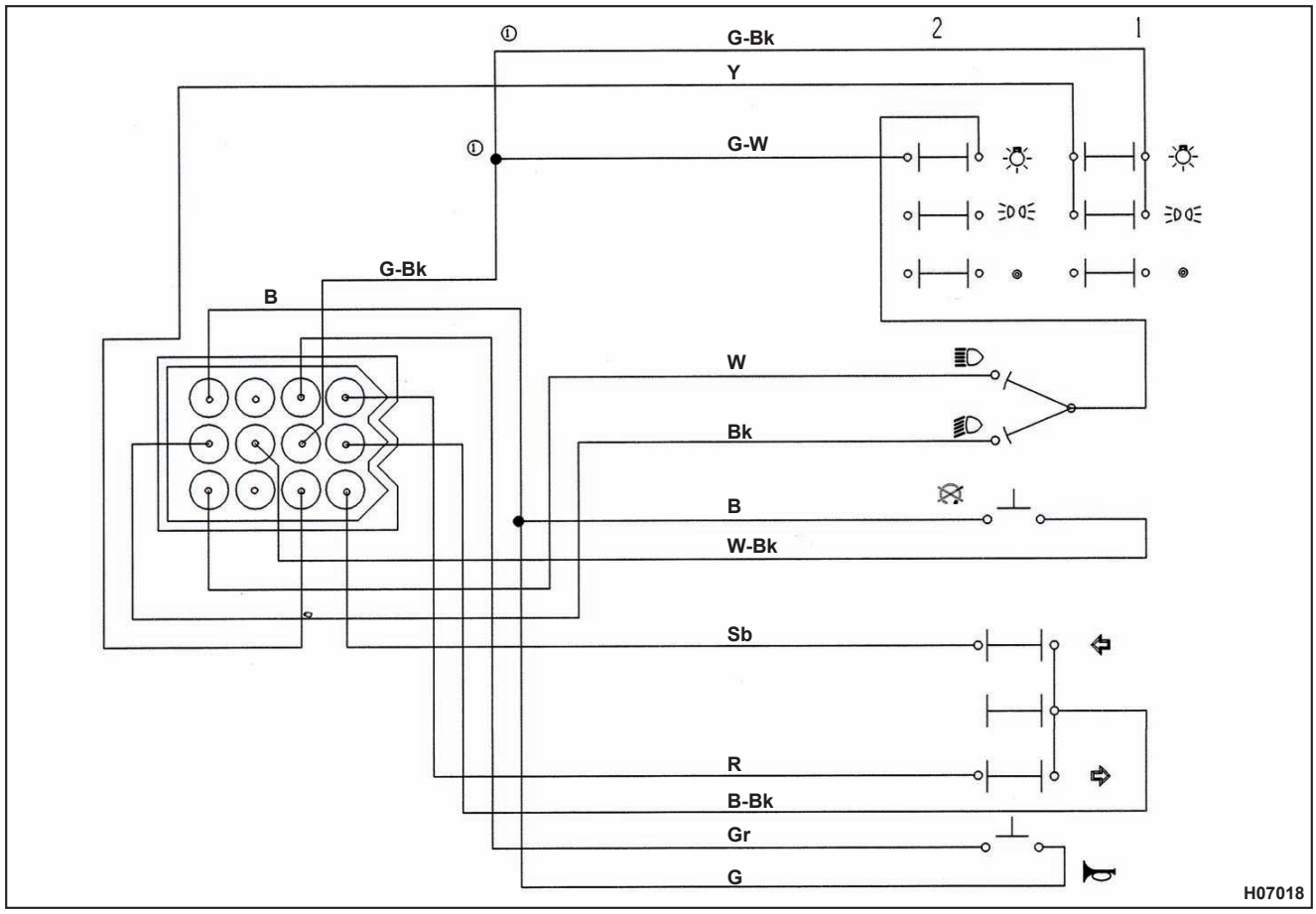
5) LIGHTS

= Lighting control of lowbeams and high beam;

= Lighting control of position lights;

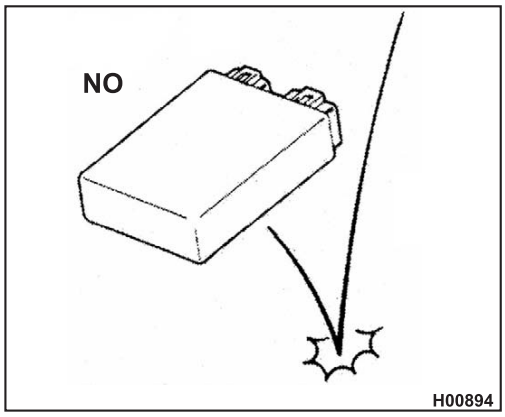
● = Off.





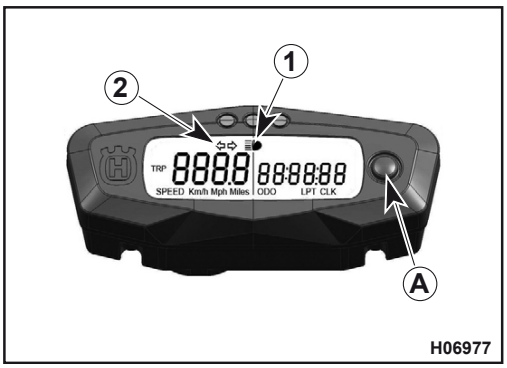
Colour coding key

B ..... Blue
Bk ..... Black
B-Bk..... Blue-Black
G..... Green
G-Bk ..... Green-Black
G-W ..... Green-White
Gr..... Grey
Y ..... Yellow
R..... Red
Sb ..... Sky blue
W ..... White
W-Bk..... White-Black



SEMICONDUCTOR PARTS

- Be careful to never drop parts that incorporate a semiconductor, such as the ECU or the voltage regulator/rectifier.
- Closely follow the relevant instructions when inspecting these parts. An improper procedure may lead to severe damage.



H06977

H06978

DIGITAL DASHBOARD, WARNING LIGHTS (WR)

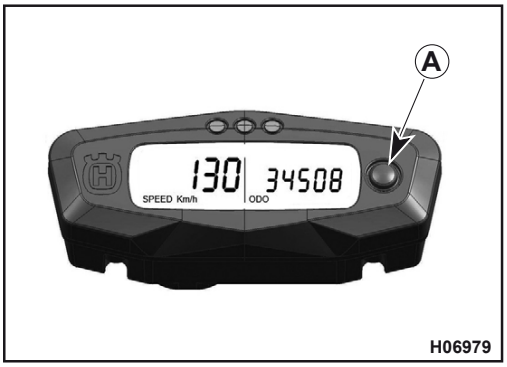
The motorcycle is equipped with a digital instrument; on the instrument are located 2 warning lights too: high beam and blinkers.

1- BLUE warning light “HIGH BEAM”
2- GREEN warning light “BLINKERS”

The instrument display illuminates (amber colour) when the engine started.

NOTES:
- Every time the engine starts, for the first 2 seconds, the instrument shows the version of the checking SW; after the check, the instrument shows the last planned function.
- When the motorcycle engine is OFF, the instrument doesn’t also show its functions.
- To select the instrument functions and to set to zero the functions, use the SCROLL knob (A).

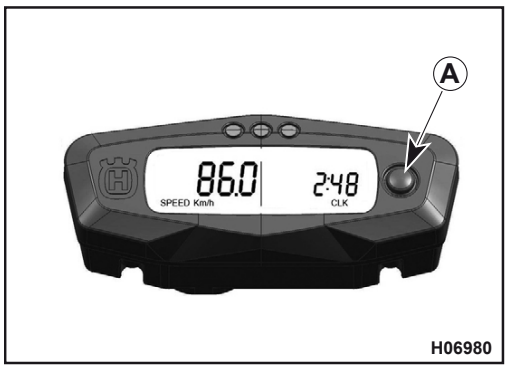
The instrument functions are the following, as shown below:
1- SPEED / ODO (figure 1)
2- SPEED / CLOCK (figure 2)
3- SPEED / TRIP (figure 3)
4- SPEED / CHRONO (figure 4)
1- SPEED / ODO (figure 1)
.....



H06979

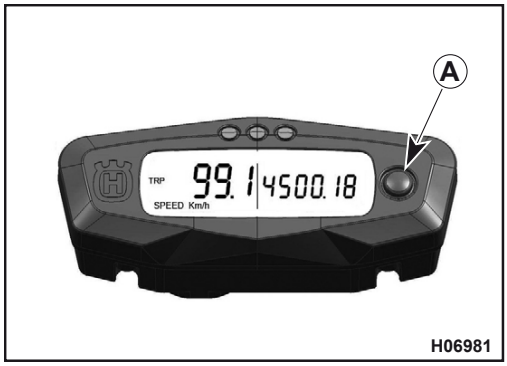
1- SPEED (Km/h or mph) / ODO (figure 1)
- SPEED: motorcycle speed- maximum value: 299 Km/h or 299 mph;
- ODO: odometer- maximum value: 99999 km.

To replace kilometers with miles or miles with kilometers proceed as follows:
1) set to figure 1, stop the engine and push the knob SCROLL (A);
2) start the engine holding pushed the button SCROLL (A) until the symbol “Km/h” will be displayed;
3) then the symbols “Km/h” and “Mph Miles” will be displayed alternatively. Push again the SCROLL (A) button when the unit you wish to use is displayed.



2- SPEED / CLOCK (figure 2)
- SPEED: motorcycle speedmaximum value: 299 Km/h o 299 mph;
- CLOCK: clock- Reading from 0:00 to 23:59:59;

To reset the clock, push the knob SCROLL (A) for more than 3 seconds in order to increase the hours; release the knob and then, after 3 seconds, it is possible to increase the minutes;



3- SPEED / TRIP 1 (figure 3)
- SPEED: motorcycle speedmaximum value: 299 Km/h o 299 mph
- TRIP 1: distance- maximum value: 999.9 km (the data will be lost with voltage lower than 6V).

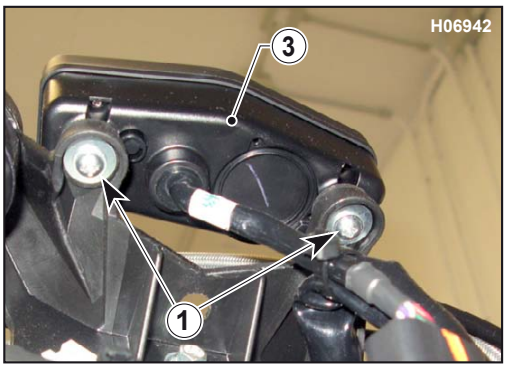
To setup the TRIP, push the SCROLL (A) button holding down more than 3 seconds.

4- SPEED / CHRONO (STP) (figure 4)
- SPEED: motorcycle speedmaximum value: 299 Km/h o 299 mph;
- STP 1: miles/kilometers covered time;
- Reading from 0:00 to 99:59:59 (the data will be lost with voltage lower than 6V).

To activate the function STP 1, push the knob SCROLL (A) for more than 3 seconds.

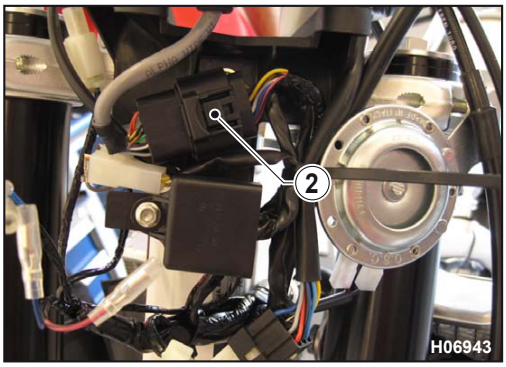
- 1st step: function ON;
- 2nd step: stop to the counters;
- 3rd step: STP 1 zero-setting; TRIP 1 and AVS 1 data zero-setting;
- 4th step: function ON;
- 5th step: stop to the counters;

.....
and so following.



Dashboard replacement (WR)

- Remove the headlamp fairing as outlined in the relevant paragraph.
- Remove the two retaining screws (1) securing the dashboard to its bracket, disconnect the connector (2) and remove the dashboard (3).

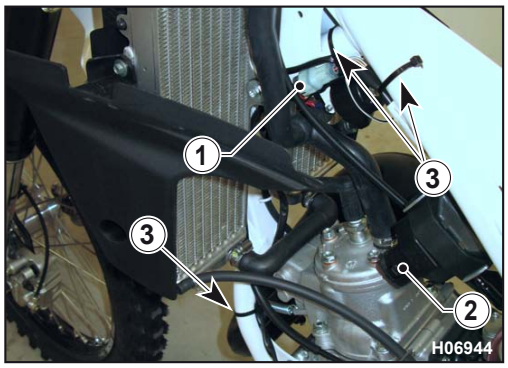


- To refit the dashboard, reverse the disassembly procedure.

TROUBLESHOOTING

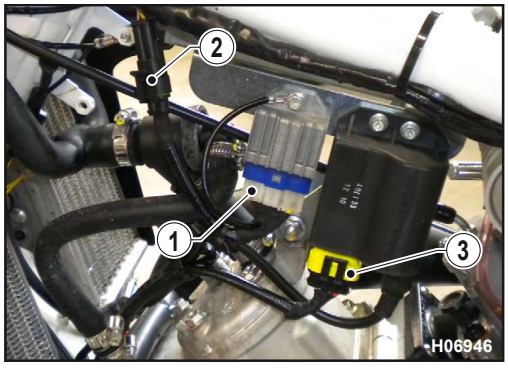
ELECTRONIC IGNITION SYSTEM

A weak or missing spark might be a symptom of:
1) incorrect connections in the electrical system;
2) faulty spark plug or wrong heat rating or incorrect spark plug gap (see paragraph "Spark plug");
3) faulty ignition coil (see paragraph "Checking coil windings resistance");
4) faulty spark plug cap (see paragraph "Checking coil windings resistance").



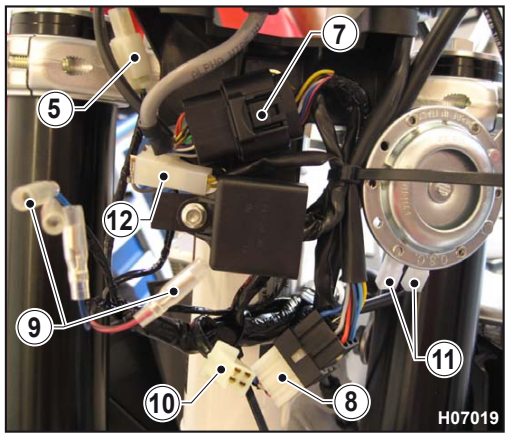
Positioning the connector/Securing the wiring harness (CR)

- Generator connector (1) located under the fuel tank near the coil.
- Electronic control unit connector (2) located on the left side of the chassis, secured to a special bracket.
- The wiring harness is secured to the chassis with clamps (3); The engine stop button wiring harness is secured to the handlebar with rubber clamps (4).



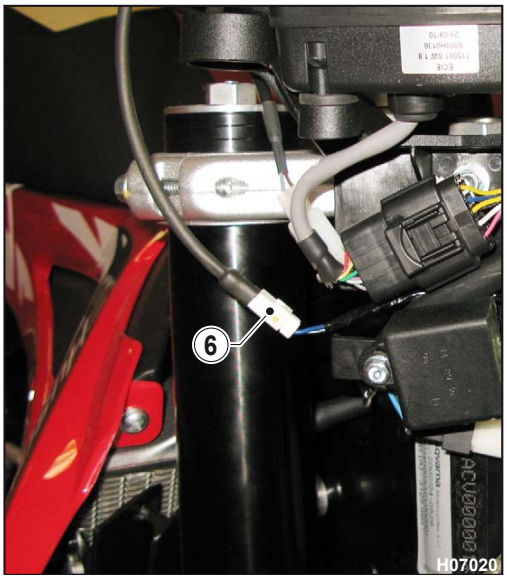
Connectors positioning (WR)

- Voltage regulator to interface connector (1).
- Main wiring harness interface connector (2).
- Transducer connector (3).



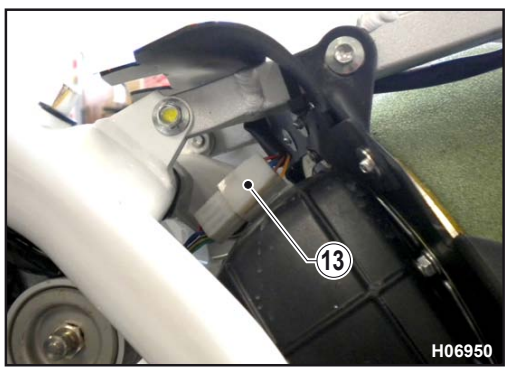
Front side, under headlamp fairing (WR)

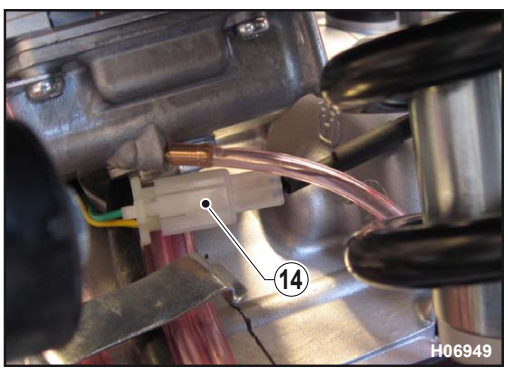
- Front stop sensor connector (5)
- Speed sensor connector (6)
- Dashboard connector (7)
- Left-hand switch connector (8)
- Turning indicator connector (9)
- Headlight connector (10)
- Horn connector (11)
- Control unit to horn connector (12)

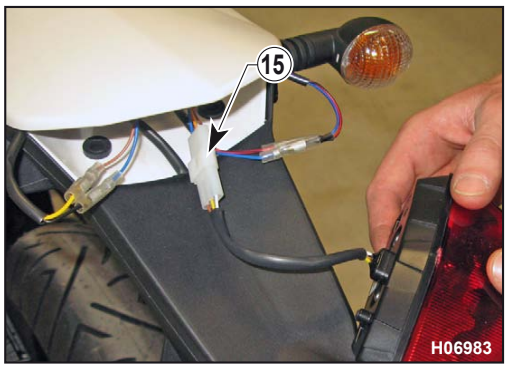


Rear (WR)

- Main wiring harness to rear wiring harness connector (13).
- Rear stop microswitch connector (14).

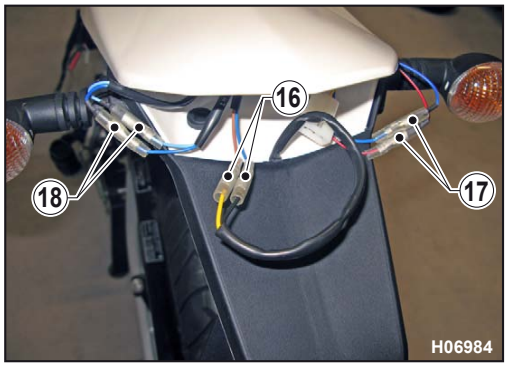




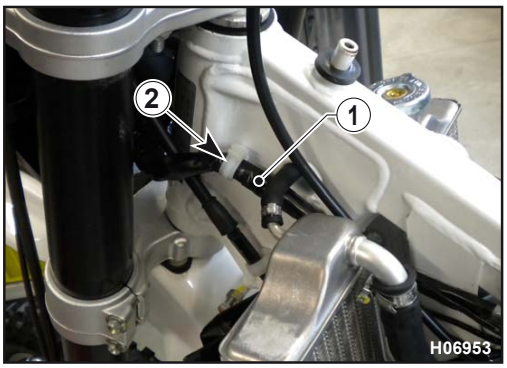


Rear side, under tail light (WR)

- Tail light connector (15)



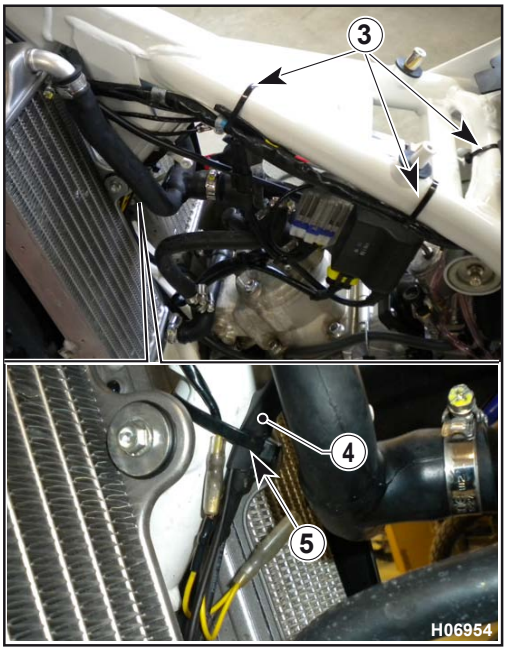
- Number plate light connector (16)
- Rear right-hand turning indicator connectors (17)
- Rear left-hand turning indicator connectors (18)



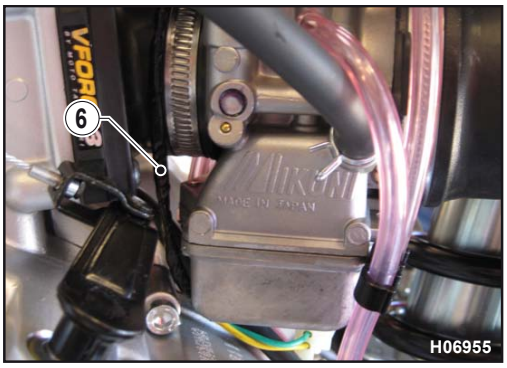
Securing the wiring harness (WR)

Bike main wiring harness consists of a main branch connecting transducer, voltage regulator, flasher, dashboard, switch, generator, the various available (speed, stop, etc...) sensors and of a rear branch connecting tail light, number plate light and rear turning indicators.

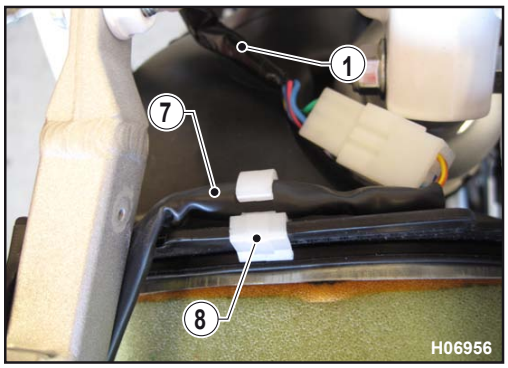
- Main wiring harness (1) starts on bike front side, passes through clip (2), slides along chassis slanted tube, and is hold in place by clamps (3).



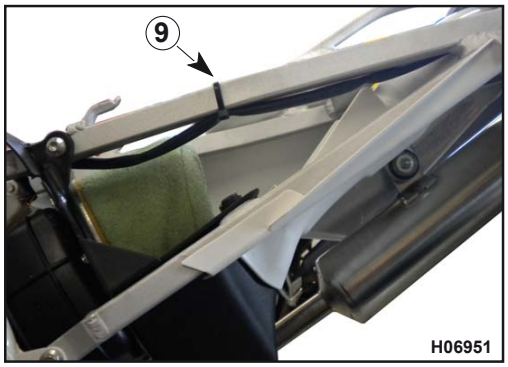
- Additional resistance (4) secured to the chassis with clamp (5).

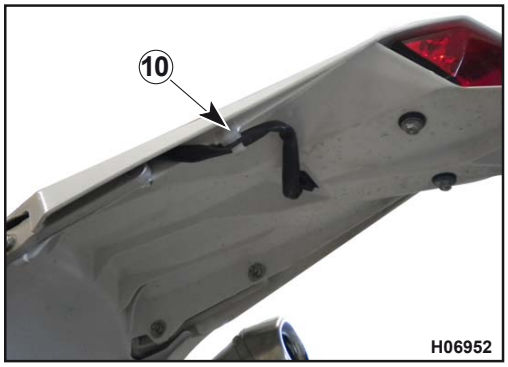


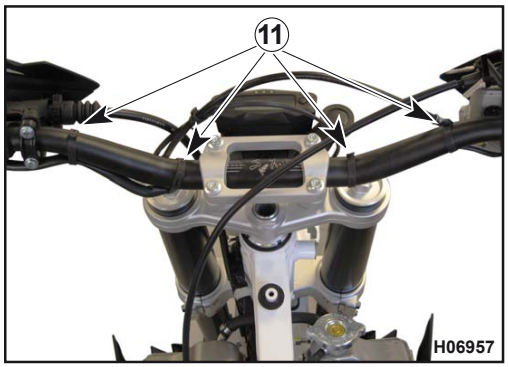
- Routing of the rear brake cable (6) on the left and under the carburettor.



- At the rear, main wiring harness (1) is connected to rear wiring harness (7), which is secured with a clip (8); then it is secured with a clamp (9) to the chassis and with a plastic clip (10).

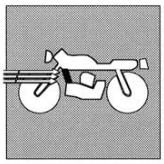


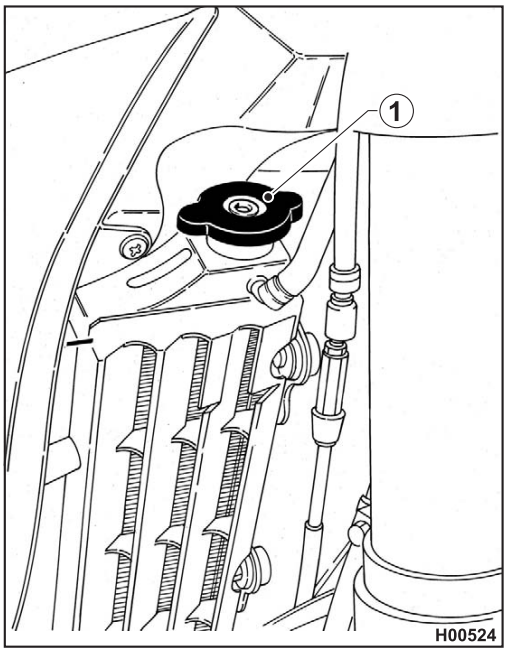




- On handlebar, left-hand switch and stop microswitch wiring harness is secured on handlebar through rubber straps (11).

Section N





Coolant level check

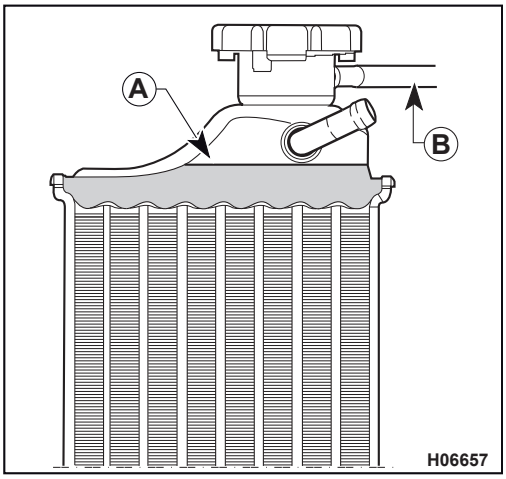
Coolant takes the heat from the piston-cylinder-and-head assembly and transfers it to the radiator, where it is released to the atmosphere. Checking coolant level at regular periods is critical to ensuring proper operation of the cooling system.

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

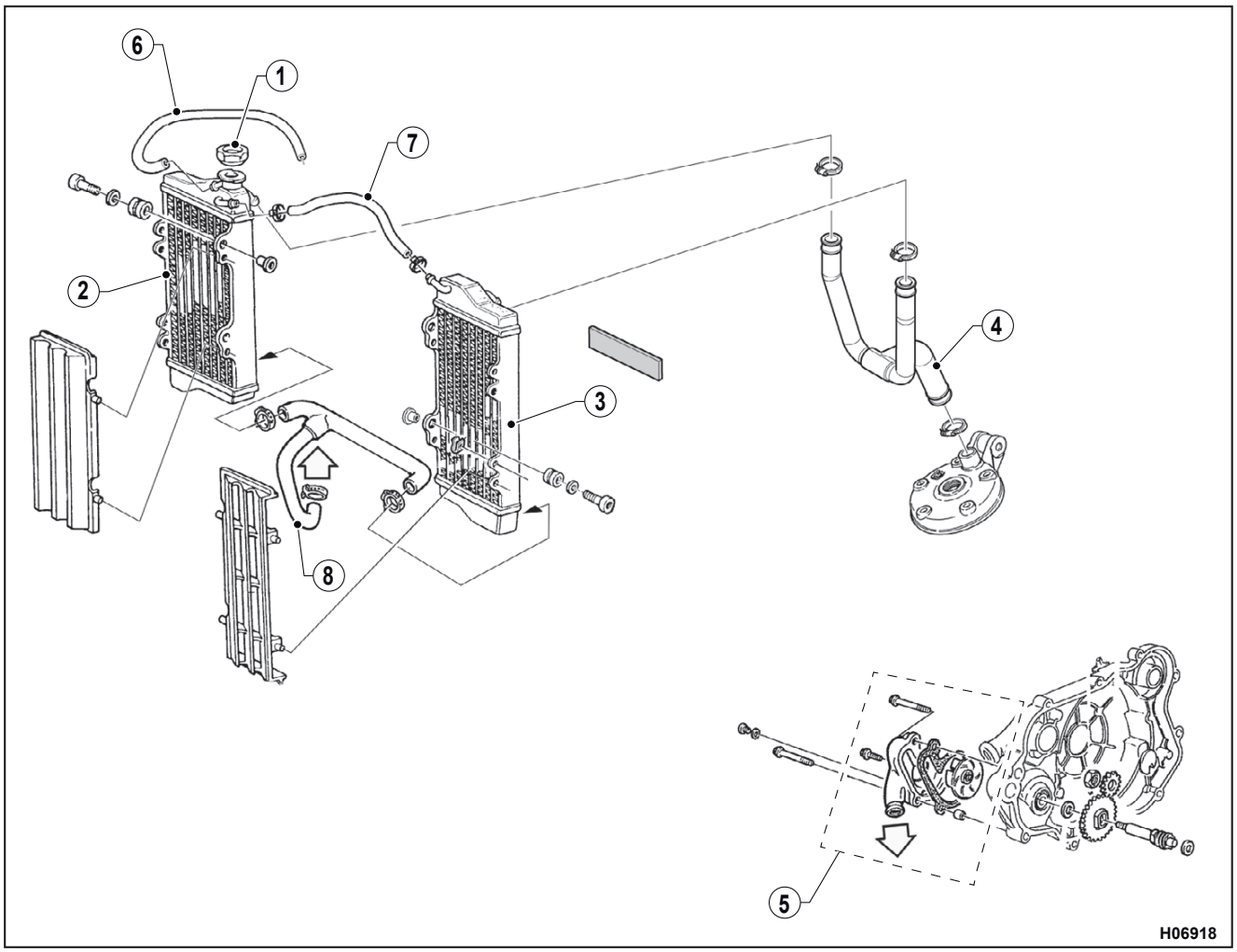
If the event of engine overheating, check that the radiator is full.
Level in the radiator must be checked from cold (see Section D).
In the event you need to check level when the engine is hot, be sure to discharge pressure gradually.
The radiator cap (1) has a pressure-relief position to depressurize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

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

A. Coolant level
B. Breather hose



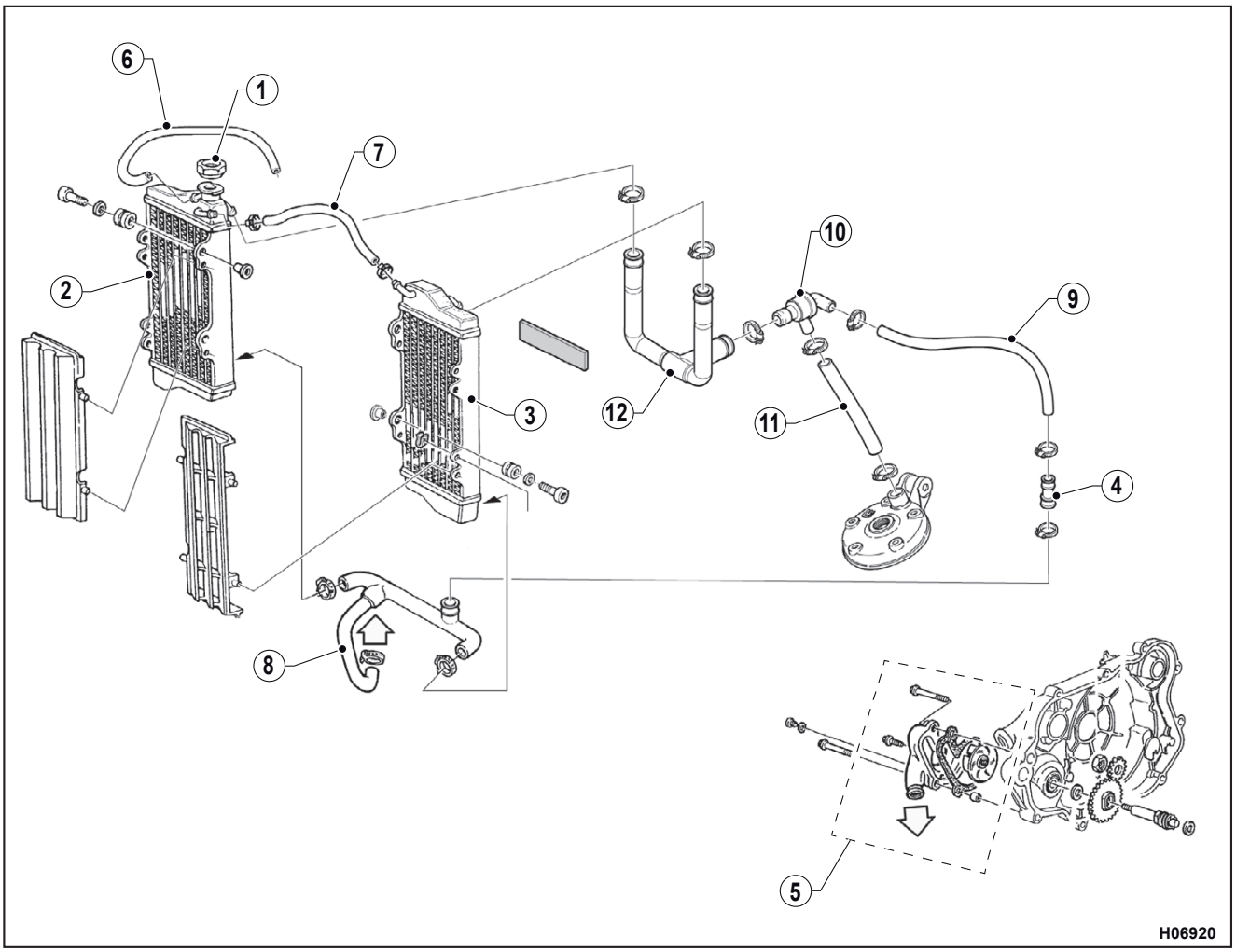
Cooling circuit (CR)



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

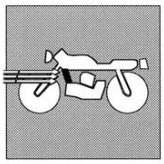
1 Radiator cap
2 Right-hand radiator
3 Left-hand radiator
4 Head/radiators upper pipe
5 Water pump
6 Breather hose
7 Radiator connecting pipe
8 Water pump / radiator lower pipe

Cooling circuit (WR)



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

1 Radiator cap
2 Right-hand radiator
3 Left-hand radiator
4 Fitting
5 Water pump
6 Breather hose
7 Radiator connecting pipe
8 Water pump / radiator lower pipe
9 Thermostat to connection pipe
10 Thermostat
11 Thermostat to head pipe
12 Thermostat/radiators upper pipe



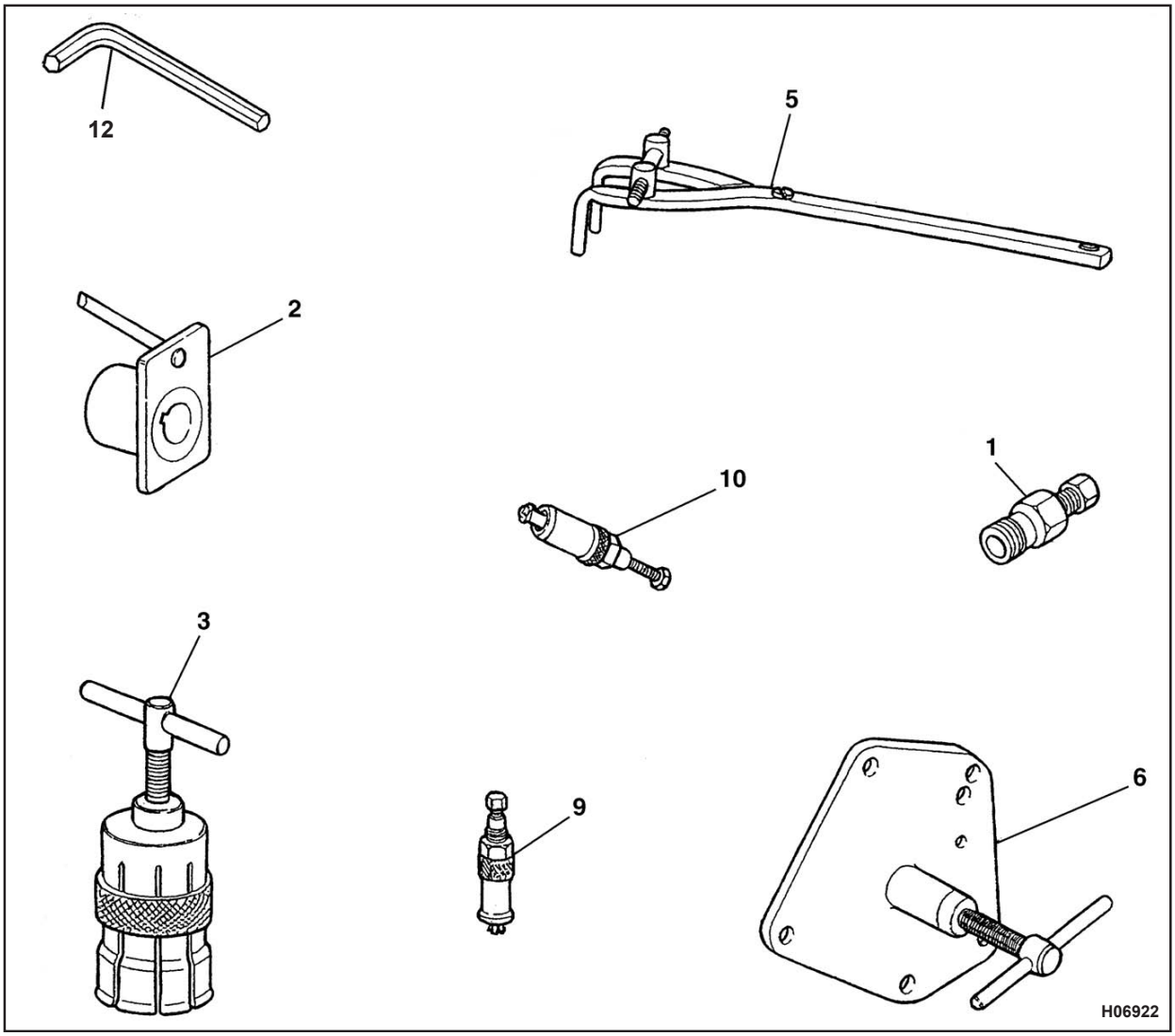
Engine cooling system overhaul

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

Section W

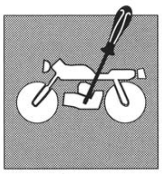
SPECIAL TOOLS

1	**(8000 46613)**	Flywheel puller (CR)
	(8000 60516)	Flywheel puller (WR)
2	**(8000 79831)**	Ignition phase control tool (CR)
	(8000 86950)	Ignition phase control tool (WR)
3	**(8000 89030)**	Crankcase bearing puller
5	**(8000 79015)**	Clutch hub tool
6	**(8000 79016)**	Crankcase half puller and crankshaft removal tool
9	**(8000 43824)**	Valve drive gear needle roller bearing, water pump bearing and valve control puller
10	**(8000 43823)**	Oil pump shaft needle roller bearing puller
12	**(8000 98431)**	Anti-tampering screw wrench (WR)



Section X

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



ENGINE

APPLICATION	THREAD	N.m.	Kgm	ft/lb
Cylinder ret. stud bolt (+LOCTITE 243)	M8x1.25	19.6÷21.6	2.0÷2.2	14.5÷15.9
Cylinder lock. nut	M8x1.25	17.6÷19.6	1.8÷2.0	13.0÷14.5
Head lock. nut	M8x1.25	17.6÷19.6	1.8÷2.0	13.0÷14.5
Pulley ret. screw	M5x0.8	5.1÷5.7	0.52÷0.58	3.8÷4.2
Cylinder ret. stud bolt (+LOCTITE 243)	M8x1.25	19.6÷21.6	2.0÷2.2	14.5÷15.9
Primary shaft plate ret. screw	M5x0.8	5.1÷5.7	0.52÷0.58	3.8÷4.2
Starter shaft ret. screw (+LOCTITE 270)	M6x1	9.3÷10.3	0.95÷1.05	6.9÷7.6
Oil drain plug	M14x1.25	23.5÷25.5	2.4÷2.6	17.3÷18.8
Intake valve ret. screw	M6x1	7.8÷8.8	0.8÷0.9	5.8÷6.5
Stator ret. screw (WR)	M4x0.7	3.0÷3.2	0.29÷0.33	2.1÷2.4
Stator ret. screw (CR)	M6x1	8.8÷9.8	0.9÷1.0	6.5÷7.2
Rotor lock. nut	M12x1.25	73.5÷83.3	7.5÷8.5	54.2÷61.5
Spark plug	M14x1.25	23.5÷25.5	2.4÷2.6	17.3÷18.8
Clutch hub lock. nut	M16x1	27.4÷30.4	2.8÷3.1	20.2÷22.4
Clutch spring ret. screw	M6x1	6.9÷7.8	0.7÷0.8	5.1÷5.8
Gear shift control sector gear ret. screw (+LOCTITE 270)	M5x0.8	5.1÷5.7	0.52÷0.58	3.8÷4.2
Ratchet bushing ret. screw (+LOCTITE 243)	M6x1	8.8÷9.8	0.9÷1.0	6.5÷7.2
Water pump sprocket lock. nut	M12x1	46.1÷52.0	4.7÷5.3	34÷38.3
Kick start lever ret. screw	M6x1	8.8÷9.8	0.9÷1.0	6.5÷7.2
Gear shift pedal ret. screw	M6x1	8.8÷9.8	0.9÷1.0	6.5÷7.2
Crankcase bearing plate ret. screw (+LOCTITE 243)	M6x1	7.9÷8.7	0.81÷0.89	5.8÷6.4
Rear cylinder ret. stud bolt (+LOCTITE 243)	M8x1.25	19.6÷21.6	2.0÷2.2	14.5÷15.9
Crankshaft insert ret. screw	M5x0.8	9.8	1	7.2
Timing system lever ret. screw	M5x0.8	5.9	0.6	4.3

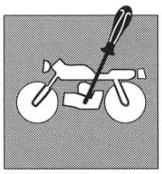
Application	Thread	Nm	Kgm	ft/lb
Upper rear chassis ret. screw	M8x1.25	24.5÷26.5	2.5÷2.7	18.1÷19.5
Rear chassis lower ret. screw	M8x1.25	24.5÷26.5	2.5÷2.7	18.1÷19.5
Chain roller ret. screw	M8x1.25	25.5÷28.5	2.6÷2.9	18.8÷21
Engine front ret. screw	M8x1.25	33.3÷37.3	3.4÷3.8	24.5÷27.5
Engine lower ret. screw	M8x1.25	33.3÷37.3	3.4÷3.8	24.5÷27.5
Side stand rot. screw (WR)	M8x1.25(•)	11.7÷11.9	1.19÷1.21	8.60÷8.75
Engine-to-chassis upper supp. plate ret. screw	M8x1.25	24.5÷26.5	2.5÷2.7	18.1÷19.5

(•) "LOCTITE 242"

Application	Thread	Nm	Kgm	ft/lb
Engine upper ret. screw	M8x1.25	24.5÷26.5	2.5÷2.7	18.1÷19.5
Front brake clamp ret. screw	M6x1	4.7÷5.1	0.48÷0.52	3.5÷3.8
Front brake lines ret. to master cylinder ret. screw (WR)	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8
Front brake lines ret. screw on the master cylinder (CR)	M10x1	23.5÷25.5	2.4÷2.6	17.3÷18.8
Clutch clamp ret. screw	M6x1	4.7÷5.1	0.48÷0.52	3.5÷3.8
Rear brake pedal ret. screw	M10x1.25(•)	39÷44	4.0÷4.5	29÷32.5
Rear brake pump ret. screw	M6x1	13.7÷15.7	1.4÷1.6	10.1÷11.6
Brake fluid reservoir ret. screw	M6x1	2.35÷2.55	0.24÷0.26	1.73÷1.88
Rear brake lines ret. screw	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8
Rear stop switch (WR)	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8
Front wheel axle ret. screw	M20x1,5	49÷55	5.0÷5.5	36.2÷39.8
Fork leg retaining screw	M8x1.25	23.5÷25.5	2.4÷2.6	17.3÷18.8
Steering bearing adjuster ring nut (1st screwing)	M25x1	3.2÷3.6	0.33÷0.37	2.4÷2.7
Steering stem nut	M24x1	79÷87	8.1÷8.9	58÷64
Brake pedal adjustment cam ret. screw	M6x1	12.1÷13.3	1.24÷1.36	9÷9.8

(•): "LOCTITE 242"

Application	Thread	Nm	Kgm	ft/lb
Handlebar support ret. screw	M10x1.5	19.6÷21.6	2.0÷2.2	14.5÷15.9
Handlebar clamp ret. screw	M8x1.25	19.6÷21.6	2.0÷2.2	14.5÷15.9
Fork leg protection screw	M5x0.8	7.4÷8.2	0.76÷0.84	5.5÷6.1
Fork leg protection ring ret. screw	M5x0.8	2.3÷2.6	0.24÷0.26	1.7÷1.9
Rear brake grommet ret. screw	M5x0.8	5.6÷6.2	0.57÷0.63	4.1÷4.5
Swinging arm shaft	M16x1.5	117.7÷127.5	12÷13	88.6÷94
Lubricator	M6x1	3.0÷3.04	0.29÷0.31	2.1÷2.2
Rear suspension drag link to chassis ret. screw	M10x1.25	54÷58.8	5.5÷6.0	39.8÷43.41
Rear suspension drop link to drop link ret. screw	M12x1.25	98÷108	10÷11	72.3÷79.5
Rear suspension drop link to swinging arm ret. screw	M12x1.25	98÷108	10÷11	72.3÷79.5
Shock absorber to drop link ret. screw	M10x1.25	44÷49	4.5÷5	32.5÷36.2
Shock absorber to chassis ret. screw	M10x1.25	44÷49	4.5÷5	32.5÷36.2
Chain guide ret. screw	M6x1	4.7÷5.1	0.48÷0.52	3.5÷3.8



Application		Thread	Nm	Kgm	ft/lb
Upper chain guide ret. screw (WR)		M8x1.25	23.3÷26.5	2.4÷2.7	17.3÷19.5
Rear chain guide ret. screw (CR)		M6x1	14÷15.4	1.43÷1.57	10.3÷11.3
Front chain guide ret. screw (CR)		M8x1.25	12.2÷13.3	1.24÷1.36	9÷9.8
Slider ret. screw		M5x0.8	5.6÷6.2	0.57÷0.63	4.1÷4.5
Horn ret. screw (WR)		M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Headlight unit ret. screw (WR)		M6x1 (•)	5.6÷6.2	0.57÷0.63	4.1÷4.5
Front mudguard ret. screw		M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Front headlamp fairing ret. screw (WR)		M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Rear chain guide ret. screw (WR)		M5x0.8	5.6÷6.2	0.57÷0.63	4.1÷4.5
Rear mudguard ret. screw		M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Shock absorber protection ret. screw		M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Front number holder ret. screw (CR)	lower	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
	upper	M5x0.8	5.6÷6.2	0.57÷0.63	4.1÷4.5

(*): "LOCTITE 242"

Application	Thread	Nm	Kgm	ft/lb
Air scoop ret. screw	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Front side panel ret. screw	M6x1	3.2÷3.6	0.33÷0.37	2.4÷2.7
Side number holder (rear) ret. screw	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Front chain guide ret. screw (WR)	M5x0.8	5.6÷6.2	0.57÷0.63	4.1÷4.5
Tank front bumper ret. screw	M8x1.25	21.6÷23.3	2.2÷2.4	16÷17.3
Rear tank ret. screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Front brake disc ret. screw	M6x1 (•)	17.6÷19.6	1.8÷2.0	13÷14.5
Front wheel axle ret. screw	M10x1.5	49÷54	5.0÷5.5	36.2÷39.8
Brake calliper ret. screw	M8x1.25	23.3÷26.5	2.4÷2.7	17.3÷19.5
Fuel cock ret. screw	ø 5.5	2.35÷2.55	0.24÷0.26	1.73÷1.88
Saddle front ret. screw	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Air box ret. screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Brake line to brake callipers ret. screw (WR)	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8
Brake line to brake callipers ret. screw (CR)	M10x1	23.5÷25.5	2.4÷2.6	17.3÷18.8

(•): "LOCTITE 242"

Application	Thread	Nm	Kgm	ft/lb
Wheel spoke ret. nipple	M4x0.75	4.2÷4.6	0.43÷0.47	3.1÷3.4
Rear brake disc ret. screw	M6x1 (*)	17.6÷19.6	1.8÷2.0	13÷14.5
Rear sprocket lock. nut	M8x1.25	32÷36	3.3÷3.7	2.4÷2.7
Exhaust pipe to chassis damping pad ret. screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Exhaust silencer retaining screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Damping pad to exhaust pipe retaining screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Odometer locking nut (WR)	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Turning indicator ret. screw (WR)	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Rear wheel axle	M20x1.5	135.3÷149	13.8÷15.2	100÷110
NOTE - If not otherwise specified, standard torque values for the different thread sizes are as follows:	M5x0.8 M6x1 M8x1.25	4.9÷6.9 8.8÷9.8 21.6÷23.3	0.5÷0.7 0.9÷1 2.2÷2.4	3.6÷5 6.5÷7.2 16,17,3

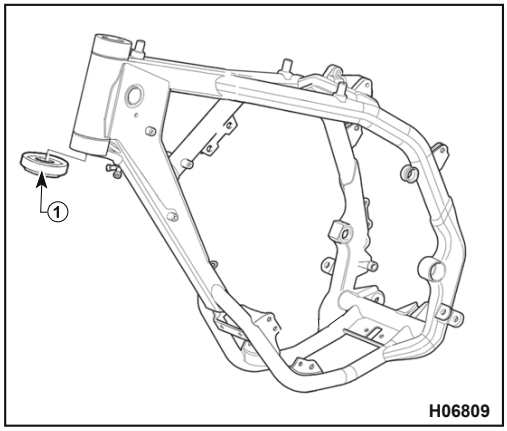
Steel screws on plastic, with metal spacers	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on brass, copper, aluminium	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on iron, steel	M4 3 Nm	0.3 Kgm	2.2 ft/lb	
Steel screws on plastic, with metal spacers	M5	4 Nm	0.4 Kgm	3 ft/lb
Steel screws on brass, copper, aluminium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

Section Y

Chassis

The single frame branches off at the exhaust and is made of steel tubes with circular, rectangular and ellipsoidal section; the rear chassis is made from light alloy.

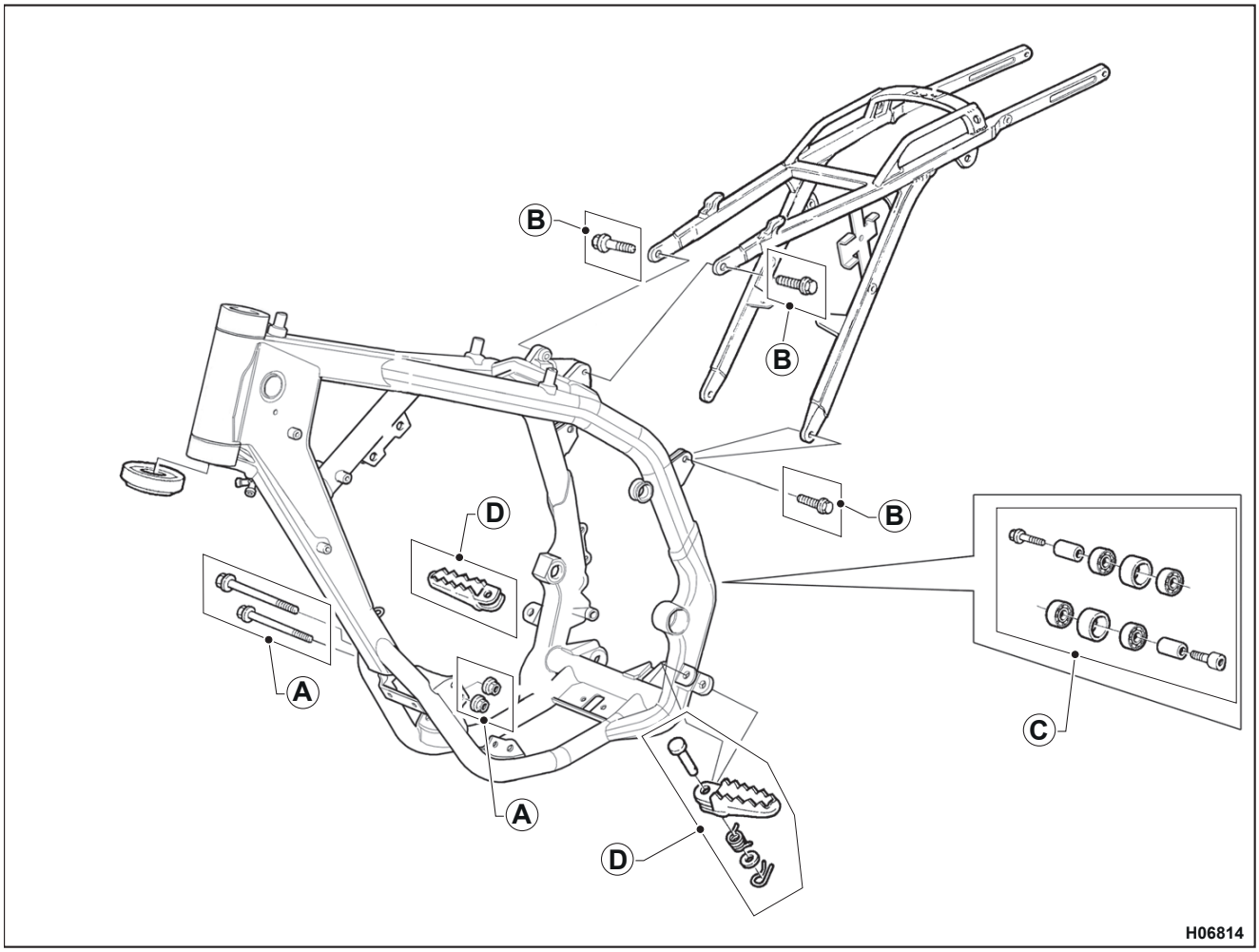
A badly damaged chassis must be replaced.



Lubrication points (lubricant)

1 Steering bearings (grease)

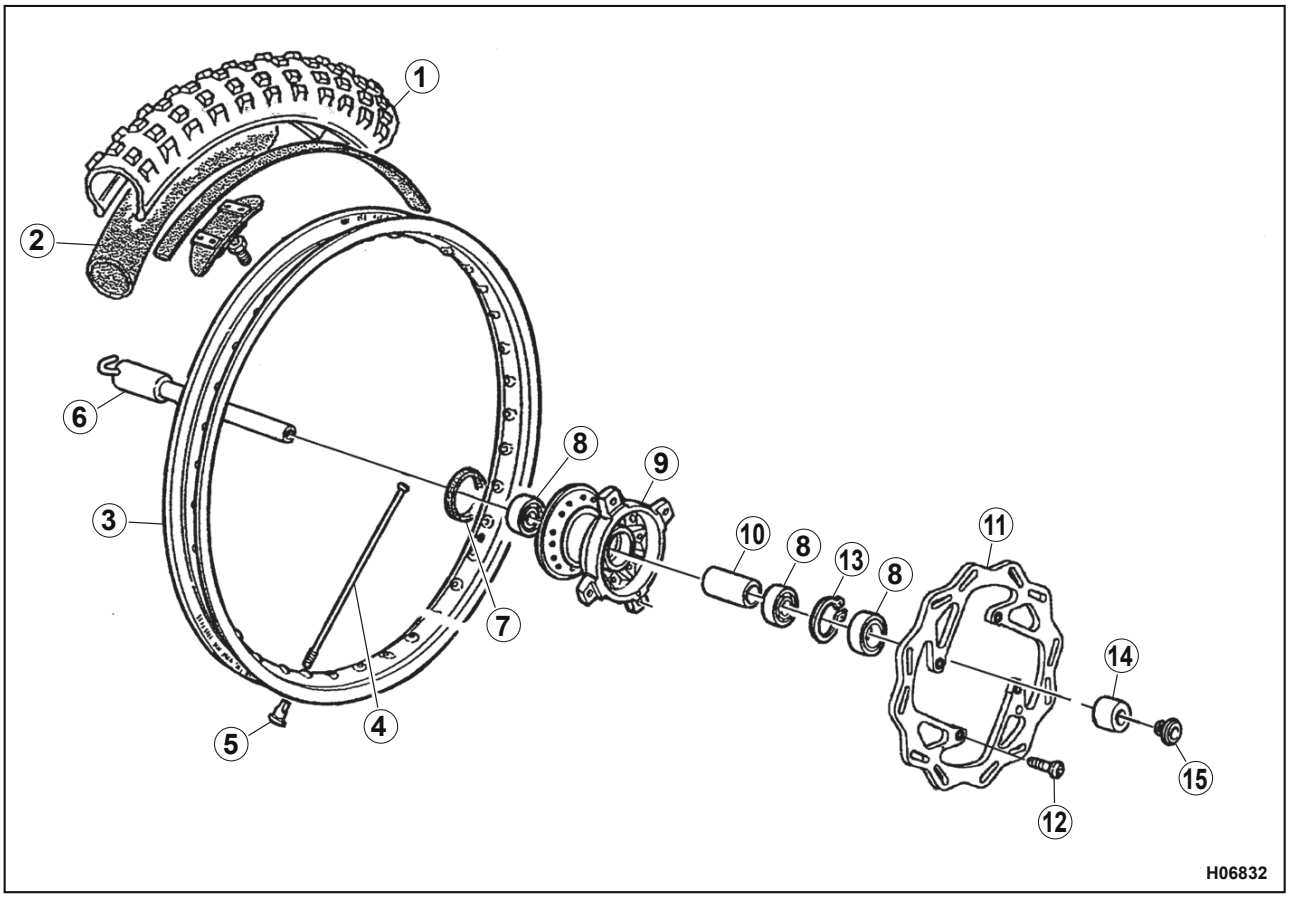
Chassis parts check



Check the assemblies shown in the figure for cracks or damage.
If any are found, replace the part.

A ENGINE MOUNTING BOLTS
B REAR CHASSIS MOUNTING BOLTS
C CHAIN GUIDE ROLLER/BEARING
D FOOTPEGS/PINS/SPRINGS

Front wheel



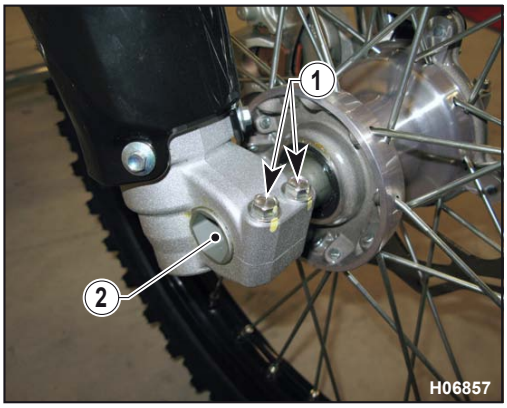
LEGEND

1) Tyre
2) Inner tube
3) Rim
4) Spoke
5) Nipple
6) Wheel axle
7) Seal
8) Bearings
9) Hub
10) Spacer
11) Brake Disc
12) Brake disc retaining screw
13) Circlip
14) Outer spacer
15) Pin retaining screw

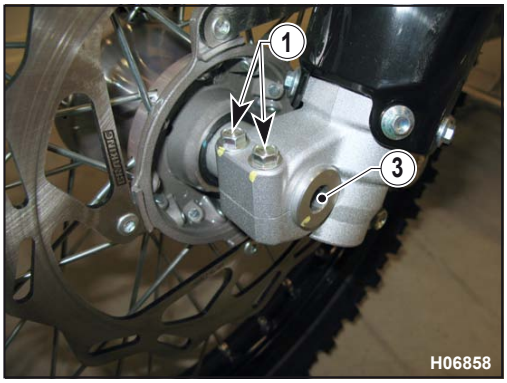
For technical characteristics regarding the front wheel, see section “A” General Information of this manual.

Removing the front wheel

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



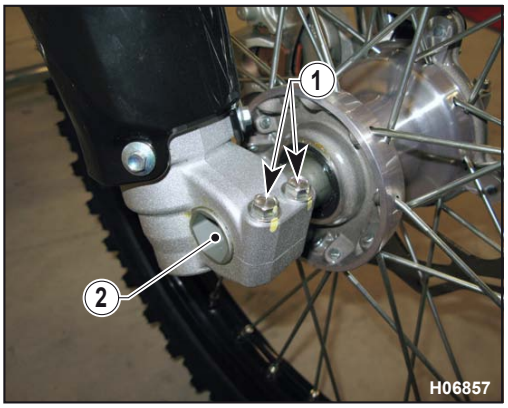
Loosen the bolts (1) holding the wheel axle (2) to the front fork mounts.



Hold the head of the wheel axle in place, and unscrew the bolt (3) on the opposite side; draw the wheel axle out.

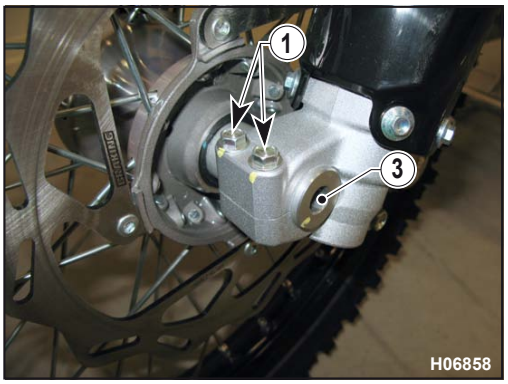
Do not operate the front brake lever when the wheel has been removed; this causes the calliper pistons to move outwards.

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



Reassembling the front wheel

Fit the L.H. spacer on the wheel hub.

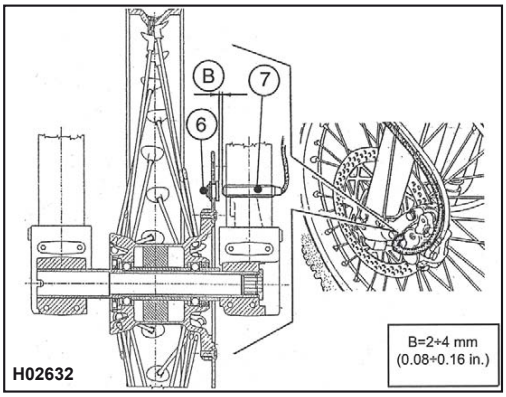


Fit the wheel between the fork legs so as to set the brake disc into the calliper.

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

Tighten the screw (3) on the fork L.H. side but DO NOT lock it. Now, pump for a while, pushing the handlebar downwards until you are sure that the fork legs are perfectly aligned. Lock: the screws (1) on the R.H. leg (10.4 Nm, 1.05 Kgm, 7.7 ft/lb), the screw (3) on the L.H. side (51.45 Nm, 5.25 Kgm, 38 ft/lb), the screws (1) on the L.H. leg (10.4 Nm, 1.05 Kgm, 7.7 ft-lb).

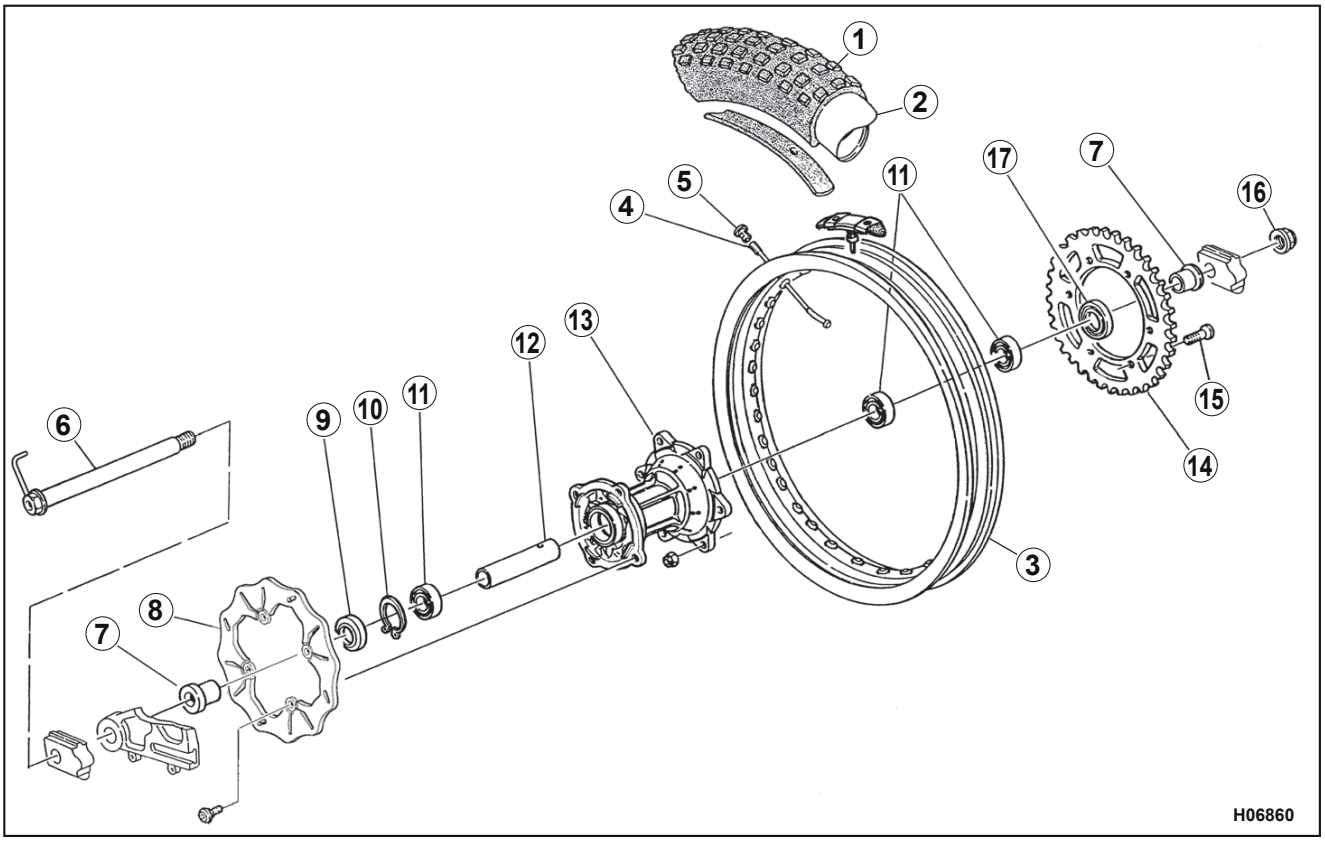
After reassembly, pull the brake control lever until the pads are against the brake disc.



Speed sensor (WR)

Check the gap “B” between magnet (6) on brake disc and sensor (7) on brake calliper.

Rear wheel



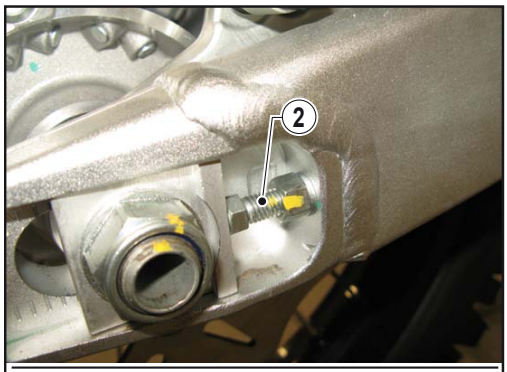
KEY

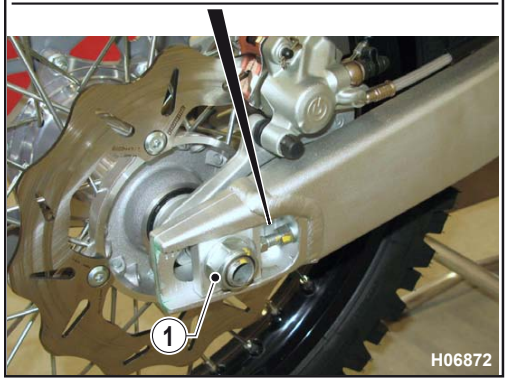
1) Tyre
2) Inner tube
3) Rim
4) Spoke
5) Nipple
6) Wheel axle
7) Spacer
8) Brake Disc
9) Seal
10) Circlip
11) Bearings
12) Inner spacer
13) Hub
14) Sprocket
15) Sprocket retaining screw
16) Wheel axle locking nut
17) Sealing ring

For technical characteristics regarding the rear wheel, see section “A” General Information of this manual.

Removing the rear wheel

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



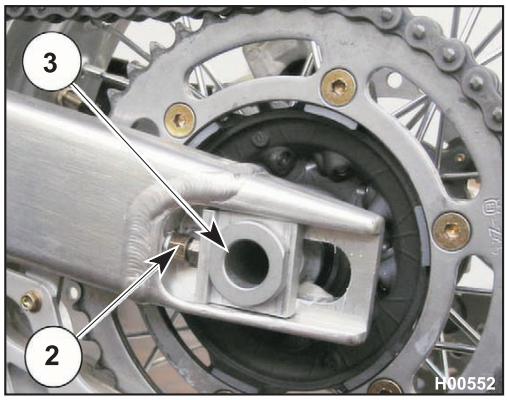


Unscrew the nut (1) of the wheel axle (3) and extract it. It is not necessary to loosen the chain tensioners (2); in this way, the chain tension will remain unchanged after reassembly. Extract the complete rear wheel, keeping the spacers located at the hub sides. To reassemble, reverse the above procedure remembering to insert the brake disc into the calliper.

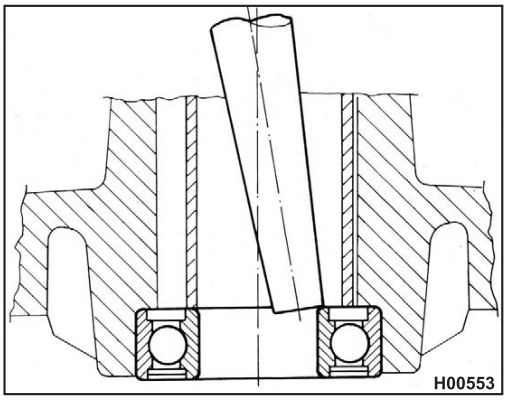
Do not operate the rear brake pedal when the wheel has been removed; this causes the calliper pistons to move outwards.

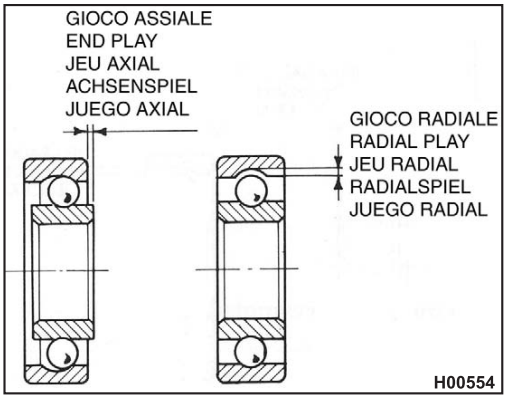
After removal, lay down the wheel with brake disc on top.

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



Tightening torque figures
1= 142.1 Nm, 14.5 Kgm, 104.8 ft/lb





Wheel servicing

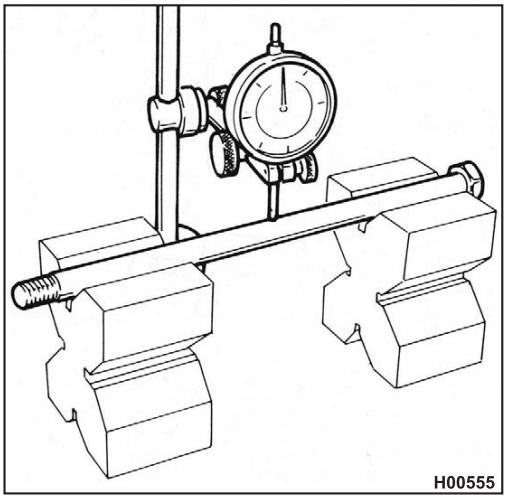
Check the wheel hub bearings for wear. If you find too much (radial or axial) clearance, replace the bearings as follows:

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

Discard the bearings after removal. Never reuse them.

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

Wheels should be balanced after each service.

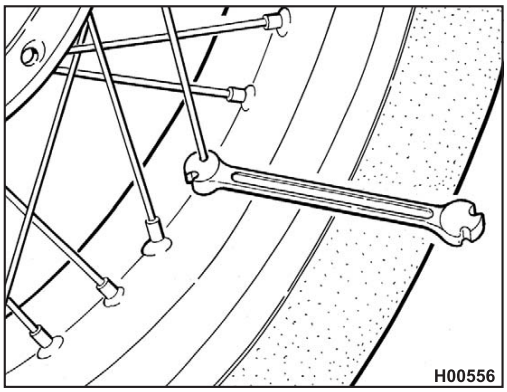


Wheel axle warpage

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

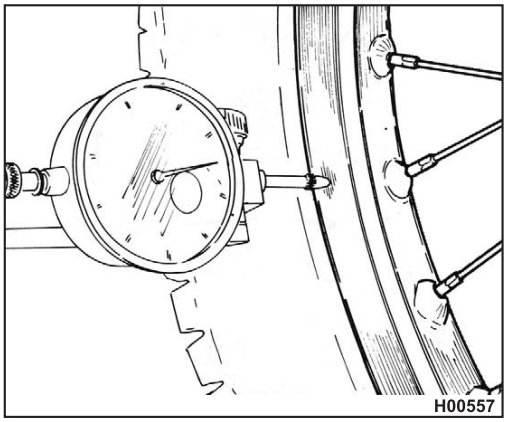
Axle runout over 100 mm

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



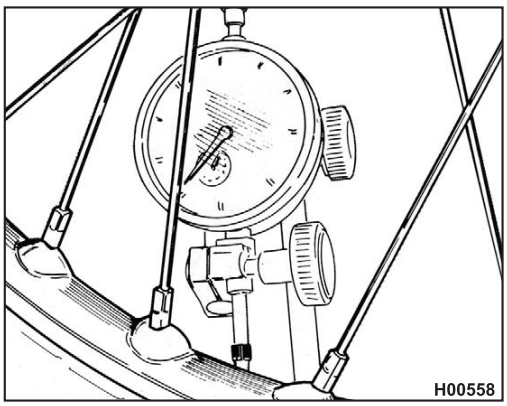
Wheel spokes

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

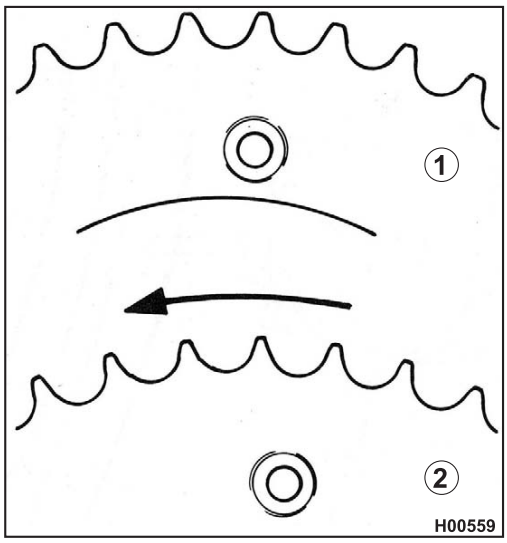


Wheel rim warpage

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



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

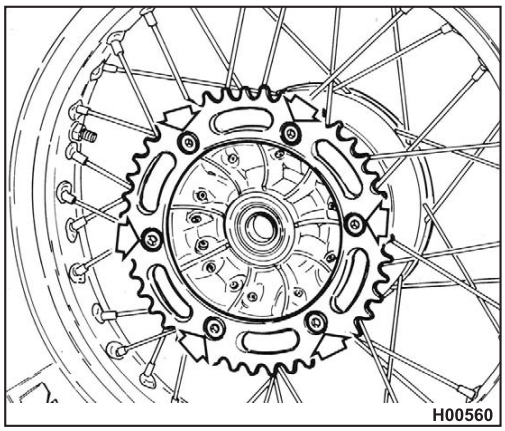


Rear chain sprocket, secondary drive sprocket and chain

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

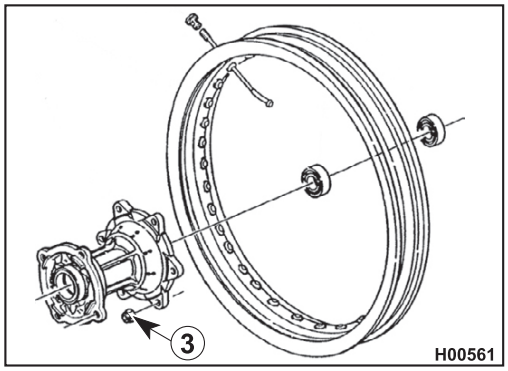
1 Normal wear

2 Exceeding wear



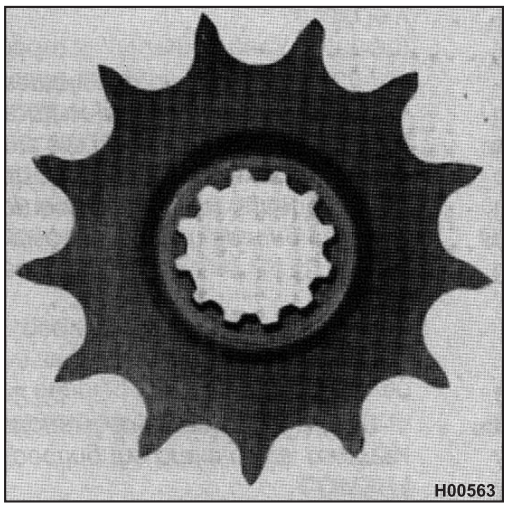
If the sprocket is exceedingly worn, replace it after loosening the six screws that retain it to the hub.

Chain and sprockets must always be replaced as a set.



Tightening torque figures

3: 34.3 Nm, 3.5 Kgm, 25.3 ft/lb + LOCTITE 243



Checking pinion and sprockets for wear

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

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

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