Workshop Manual

WRE 125 2011
SMS 125 2011

Ed. 05-2011

Husqvarna

1st edition (05-2011)

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WRE 125 2011
SMS 125 2011

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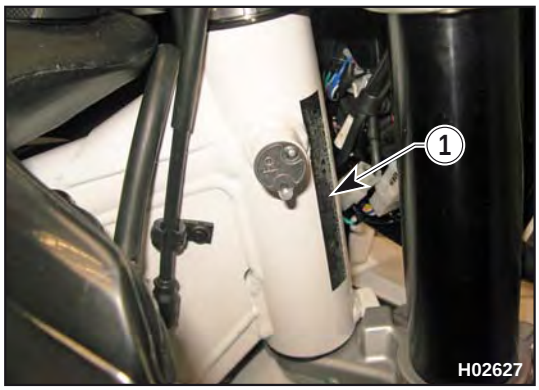
MODELS COVERED (from serial number onwards)



1. Chassis serial number

WRE 125: ZKHH200AABV000000
SMS 125: ZKHH200ABBV000000

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

WRE and **SMS** models are STREET LEGAL motorcycles; they are guaranteed exempt from functional defects and covered with legal guarantee, as far as the STANDARD CONFIGURATION IS MAINTAINED and the suggested maintenance table, shown in Section B, is observed.

* 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;

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

IGNITION

Type ..... electronic C.D.I.
Spark plug type..... CHAMPION QN 84/NGK BR9EG
Spark plug gap ..... 0,6 mm (0.0236 in.)

FUEL SYSTEM

Type ..... Carburettor DELL'ORTO VHST 28
Venturi diameter ..... mm 28 (1.10 in.)
High speed jet..... 142
Low speed jet 38
Starting jet 60
Main nozzle ..... HN 268
Floater ..... g 6,5
Throttle valve 55
Metering pin..... D 48
Metering pin slot ..... 2nd (*)
Idle mixture adjusting screw ..... 1+1/2 turns

PRIMARY DRIVE

Drive pinion gear ..... Z 22
Clutch ring gear ..... Z 72
Transmission ratio 3,272

CLUTCH

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

TRANSMISSION

Type ..... constant mesh gear type

Transmission ratio

1st gear..... 2,692 (Z 35/13)
2nd gear ..... 1,800 (Z 27/15)
3rd gear ..... 1,333 (Z 24/18)
4th gear..... 1,100 (Z 22/20)
5 th gear..... 0,954 (Z 21/22)
6 th gear ..... 0,869 (Z 20/23)

(*): with washer between retainer and throttle valve

SECONDARY DRIVE (WRE)
Transmission sprocket ..... Z 13
Rear wheel sprocket..... Z 49
Transmission ratio 3,769

SECONDARY DRIVE (SMS)
Transmission sprocket..... Z 14
Rear wheel sprocket..... Z 49
Transmission ratio 3,500

Transmission chain dimensions ..... 5/8”x1/4”

FINAL RATIOS (WRE)
1st gear.....33,211
2nd gear 22,204
3rd gear 16,447
4th gear 13,569
5th gear 11,775
6th gear 10,727

FINAL RATIOS (SMS)
1st gear.....30,839
2nd gear 20,618
3rd gear 15,273
4th gear 12,600
5th gear 10,934
6th gear 9,960

FRAME
Type..... single frame, in circular sectioned tubes, in steel; rear steel chassis.

FRONT SUSPENSION
Type..... ”Upside-down” telescopic hydraulic front fork with advanced
axle; .....stanchions tubes Ø 1.57 in. / ø 40 mm
Legs axis stroke..... 260 mm (10.24 in.)

REAR SUSPENSION
Type..... progressive with hydraulic single shock absorber
(spring preload adjustment)
Wheel stroke ..... 272 mm (10.71 in.)

FRONT BRAKE
Type..... fixed disc Ø 260 mm (10.24 in.) with hydraulic control and floating calliper

REAR BRAKE
Type..... fixed disc Ø 220 mm (8.66 in.) with hydraulic control and floating calliper

RIMS
Front (WRE) .....in light alloy: 1,6x21”
Front (SMS)..... in light alloy: 2,50X17”
Rear (WRE).....in light alloy: 2,15x18”
Rear (SMS).....in light alloy: 1,85x19”

TIRES
Front
(WRE)..... 90/90-21”
(SMS) .....110/70-17”
Rear
(WRE)..... 120/90-18”
(SMS) ..... 140/60-17”

Cold tire pressure

Front

Rider only ..... 1,2 Kg/cm^2 (17.07 Psi)

Rider and passenger ..... 1,5 Kg/cm^2 (21.33 Psi)

Rear

Rider only ..... 1,5 Kg/cm^2 (21.33 Psi)

Rider and passenger ..... 1,8 Kg/cm^2 (25.60 Psi)

Electrical components location

The ignition system includes the following elements:

- Generator, on the inner side of L.H. crankcase cover;
- Electronic ignition coil under the fuel tank;
- Electronic control unit under the saddle;
- Voltage regulator on the left side of the chassis, near the steering tube.
- Spark plug on cylinder head;

The electrical system includes the following elements:

- 12V-4Ah Battery under the saddle;
- Turning indicator flasher on left side of rear chassis;
- Fuses located on services bracket on left hand side of subframe;
- Oil pump located on right hand side of rear subframe;
- Air temperature sensor located inside filter box, near oil pump.
- Engine temperature sensor;
- Headlamp with twin halogen bulb of 12V-35/35W and parking light bulb of 12V-3W;
- LED taillight;
- Turning indicators 12V-10W bulb;
- Horn up front on right side, near the radiator.

Overall dimensions

Wheelbase A
(WRE)..... mm 1462 (57.56 in.)
(SMS) ..... mm 1462 (57.56 in.)
Overall length B
(WRE)..... mm 2208 (86.93 in.)
(SMS) ..... mm 2145 (84.49 in.)
Overall width C ..... mm 825 (32.48 in.)
Overall height D
(WRE)..... mm 1245 (49.01 in.)
(SMS) .....mm 1175 (46.26 in.)

Saddle height E
(WRE)..... mm 944 (37.16 in.)
(SMS) ..... mm 929 (36.57 in.)
Minimum ground clearance F
(WRE)..... mm 330 (13.00 in.)
(SMS) ..... mm 265 (10.43 in.)

Weight

Kerb weight, without fuel (WRE):..... 108 Kg (238,01ß lb)
Kerb weight, without fuel (SMS): ..... 111 Kg (244,71 lb)

Capacities	Type	Quantity
Fuel tank capacity (reserve included)	98 octane unleaded fuel	9,5 l - 2.09 Imp. Gall 2.51 U.S. Gall
Fuel reserve		2 l - 0.44 Imp. Gall 0.53 U.S. Gall
Oil tank capacity		0.176 Imp. Gall 0.211 U.S. Gall
Coolant capacity		0.22 Imp. Gall 0.26 U.S. Gal
Transmission oil		0.143 Imp. Gall 0.172 U.S. Gall
Engine lubricating oil	CASTROL POWER 1 RACING 2T	
Gearbox and primary drive lubricating oil	CASTROL POWER 1 RACING 5W-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	CASTROL SYNTHETIC FORK OIL 5W	520 cm^3
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

WRE - SMS 125	SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)							
	ENGINE							
PART	EVERY 500 km (310 mi)	AFTER THE FIRST 1000 Km (621 mi)	EVERY 5000 Km (3106 mi)	EVERY 10000 Km (6213 mi)	EVERY 15000 Km (9320 mi)	EVERY 20000 Km (12427 mi)	REPLACE AS REQUIRED	
TRANSMISSION OIL		C	S	S	S	S		
ENGINE OIL	C							
COOLANT		C	C	S	C	S	X	
SPARK PLUG		C	S	S	S	S		
PISTON/CYLINDER			C	C	C	C	X	
EXHAUST VALVE DECARBONIZING			P	P	P	P	X	
CLUTCH DISC			C	C	C	C	X	
AIR FILTER		P	P	S	P	S		
CARBURETOR:IDLE/CO				C		C		
CARBURETOR		C/P	C/P	C/P	C/P	C/P		
EXHAUST VALVE CLEANING / OIL DRAINAGE	P							

LEGENDA
C: CHECK
P: CLEAN
C/P: CHECK / CLEAN
S: CHANGE

WRE - SMS 125	SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)							
	CHASSIS							
PART	EVERY 3 HOURS	AFTER THE FIRST 1000 Km (621 mi)	EVERY 5000 Km (3106 mi)	EVERY 10000 Km (6213 mi)	EVERY 15000 Km (9320 mi)	EVERY 20000 Km (12427 mi)	REPLACE AS REQUIRED	
BRAKE FLUID		C	C	S	C	S		
BRAKE HYDRAULIC CONTROLS		C	C	C	C	C	X	
BRAKE PADS WEAR		C		C		C	X	
BOWDEN CABLES		C	L	L	L	L	X	
THROTTLE		C	C	C	C	C	X	
TYRE PRESSURE AND WEAR		C	C	C	C	C		
OIL AND FUEL TANKS				P		P		
FUEL HOSES AND FILTERS		P	P	S	P	S		
HEADLAMP BEAM HEIGHT		C	C	C	C	C		
LIGHTS/INDICATIONS/HORN		C	C	C	C	C		
BATTERY		C	C	C	C	C		
WHEEL SPOKES TENSION		C	C	C	C	C		
STEERING BEARINGS PLAY		C		C		C		
SECOND.DRIVE CHAIN/CHAIN TENS.ROLLERS	C	C	C	C	C	C		
GEARB.OUTPUT SPROCKET/REAR SPROCKET			C	S	C	S		
SIDE STAND SCREWS		C	C	C	C	C		
WHEEL HUB BEARINGS				C		C	X	
FRONT FORK FLUID				S		S		
OVERALL TIGHTENING OF NUTS AND BOLTS		C	C	C	C	C		
LUBRICATION/GREASING		L	L	L	L	L		

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.

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	Replace
	5. High-tension cables open circuit or shorted	Check
	6. Key-operated switch faulty	Replace
	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 lubrication	
	1. Electric oil pump faulty or dirty	Check
Engine stalls easily	1. Fouled spark plug	Clean
	2. Electronic control unit faulty	Replace
	3. Carburettor jets clogged	Clean
	4. 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
	4. Countershaft not correctly installed	Install correctly
	5. Crankshaft and countershaft gears 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

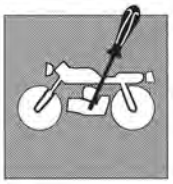
Trouble	Cause	Remedy
Gear shift pedal does not return to original position	1. Weak or broken selector return spring	Replace
	2. Worn shifter forks	Replace
Transmission jumps out of gear	1. Worn sliding gear dogs	Replace
	2. Worn gear grooves	Replace
	3. Worn dog slots in gears	Replace
	4. Worn selector 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	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

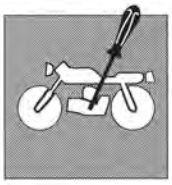
Trouble	Cause	Remedy
The handlebar is hard to turn	1. Insufficient tyre pressure	Inflate
	2. Bearing adjuster ring nut or steering stem nut overtightened	Adjust
	3. Bent steering stem	Replace bottom yoke
	4. Worn or seized steering bearings	Replace
Handlebar vibration	1. Bent fork legs	Replace
	2. Bent 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
Damping is too soft	1. Insufficient oil in fork legs	Top up
	2. Fork oil viscosity too low	Replace
	3. Damping cartridge inside fork legs is not working properly	Replace
	4. Weak rear shock absorber spring	Replace
	5. Improperly set rear shock absorber	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
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	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	1. Voltage regulator faulty	Replace
Battery does not hold charge	1. Battery terminals dirty	Clean
Battery sulphation	1. Charge voltage too high or too low (when they are not used, batteries should be recharged at least once a month)	Replace battery



Section D




WRE 125
H02628


SMS 125
H02630


SMS 125
H02629


SMS 125
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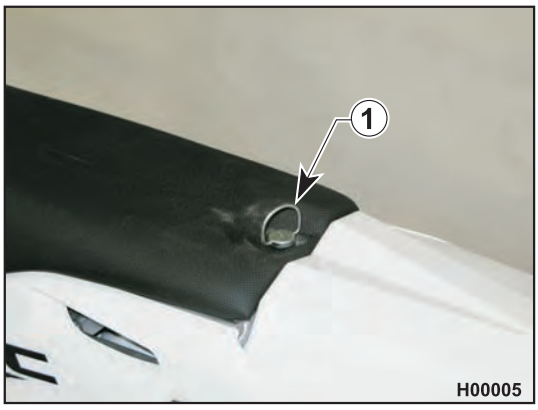
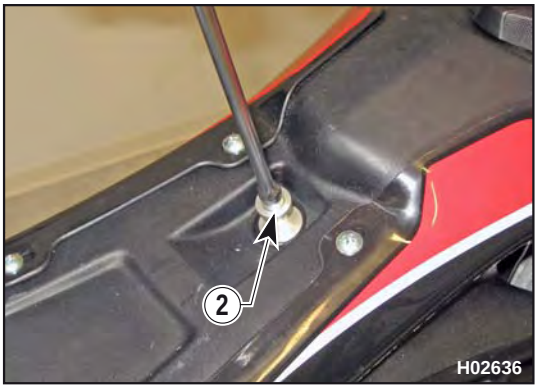


Saddle removal

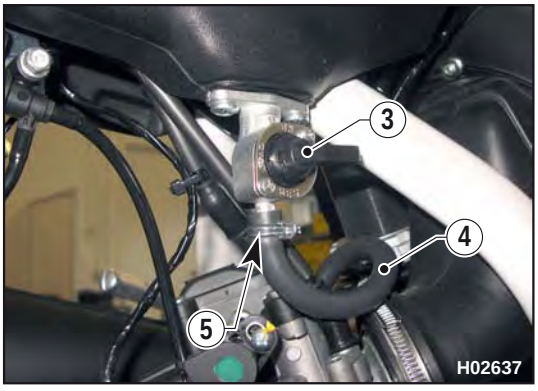
Turn the rear fixing (1) counter clockwise, remove it and extract the saddle.

Tank removal

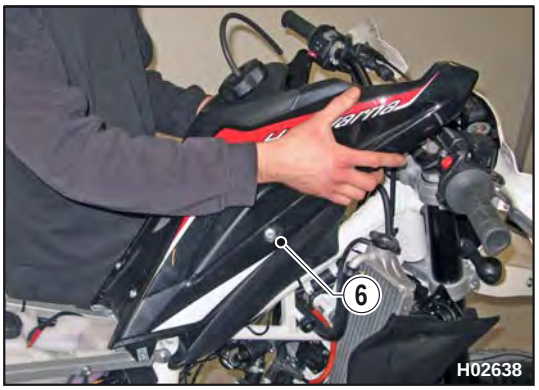
Remove the saddle as described in the relevant paragraph.
Remove the screws (1) and the side panels.
(8 mm Allen wrench)



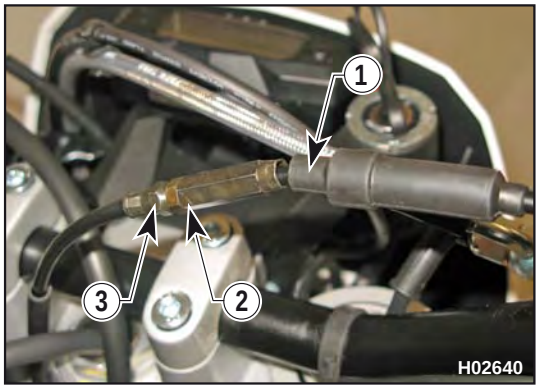
Remove the tank retaining screw (2).
(8 mm Allen wrench)



Release the clamp (5), close the cock (3) and disconnect the hose (4).



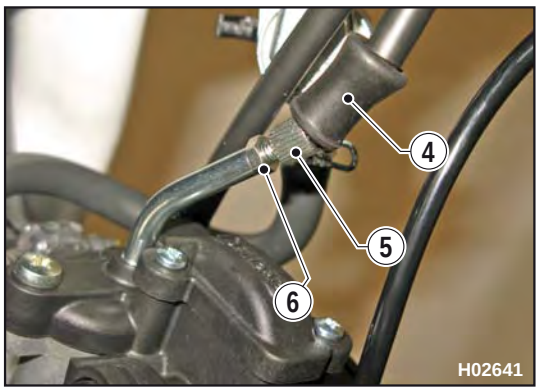
Lift the front part of the tank (6) and remove it from the bike with the scoops.



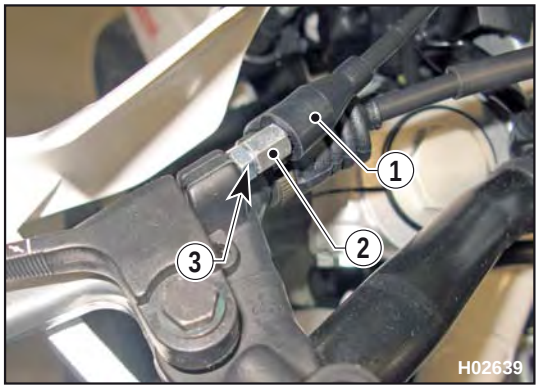
Throttle cable adjustment

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

- move the rubber cap (1) aside;
- move transmission sheath to and fro to ensure a play of approx. 1 mm;
- should play be greater than 1 mm (0.04 in.), loosen lock nut (2) and register (3); should play less than 1 mm (0.04 in.), then tighten lock nut and register;
- if register (3) should not provide sufficient movement to allow for correct adjustment, then adjust register placed on carburetor.
  There should be approx. 1 mm (0.04 in.) play on latter register; otherwise, move the rubber cap (4) aside and, after loosening the check nut (6), loosen or tighten the adjuster screw (5) to reduce or increase free play.

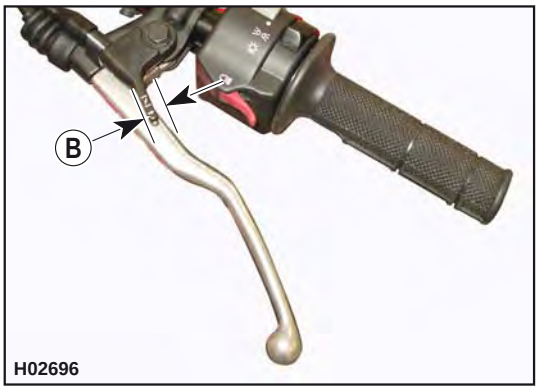


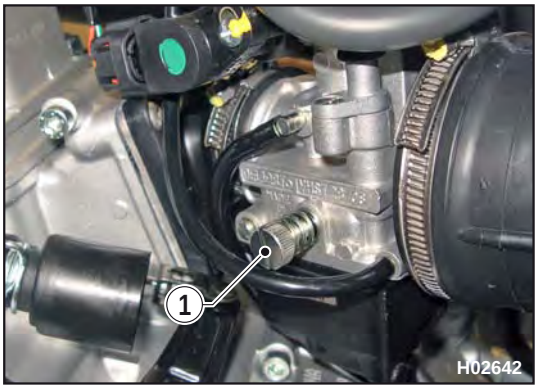
Operation with damaged throttle cable could result in an unsafe riding condition.



Adjustment of the starter lever

- Remove the rubber protection (1).
- Loosen the check nut (2) and turn the tensioner (3).
  Free play (B) must be at least 5 mm (0.2 in.).
- When through with the adjustment, tighten the check nut (3) and refit the rubber protection (1).



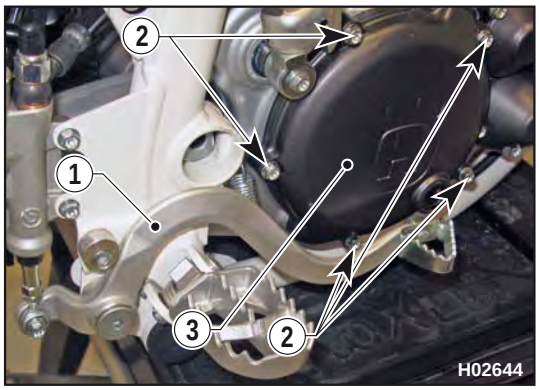


Idle adjustment

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.



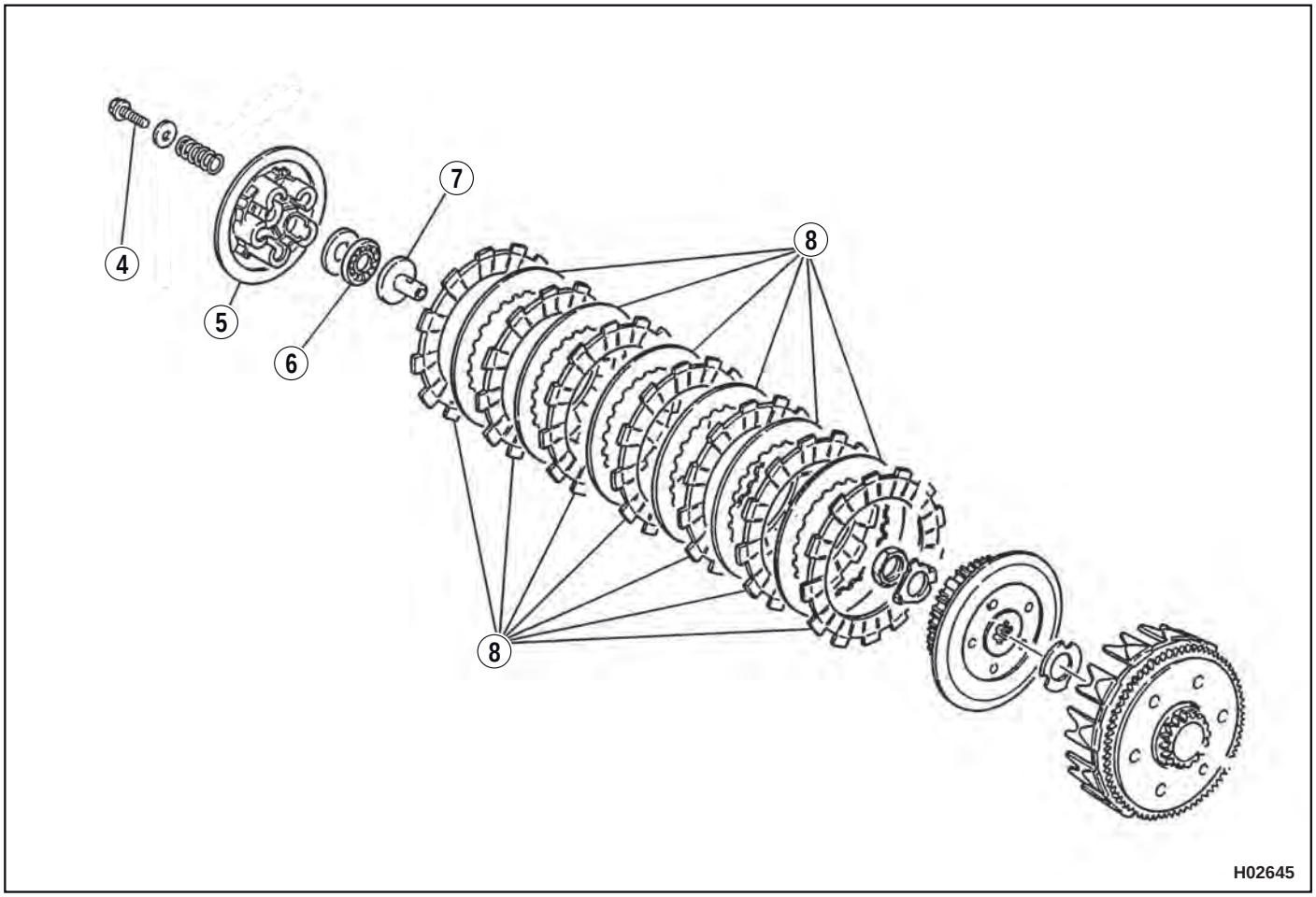
Clutch plate replacement

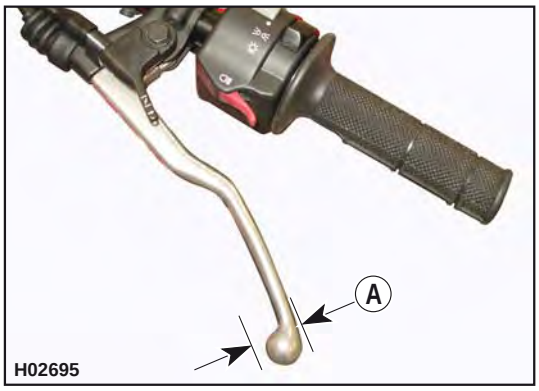
Drain transmission oil as outlined in the relevant paragraph.

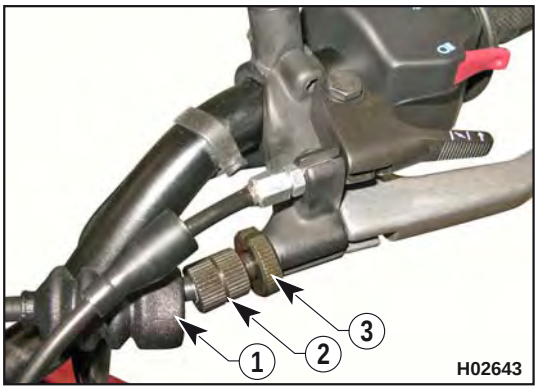
- Remove the brake pedal (1).
- Remove the five retaining screws (2) and the clutch cover (3).
- Using an 8 mm wrench, unscrew the five screws (4) securing the clutch springs. Remove springs, pressure plate (5) with bearing (6) and clutch actuator plate (7).
- Remove the plates (8), lubricate the new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



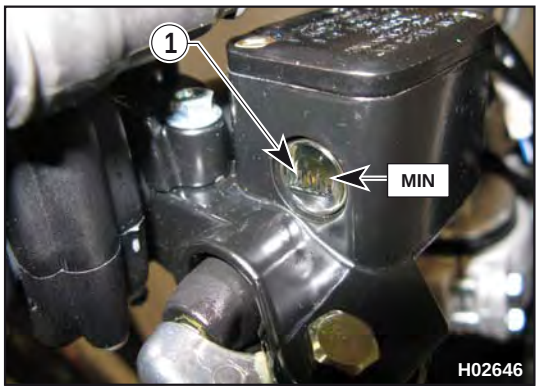




Adjustment of the clutch control lever

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

- Remove the rubber protection (1).
- Loosen the lock ring nut (3) and turn the tensioner (2).
  There should be at least 10 mm (0.39 in.) free play (A) before the clutch begins to disengage.
- When through with the adjustment, tighten the lock ring nut (3) and refit the rubber protection (1).



Front brake fluid level check

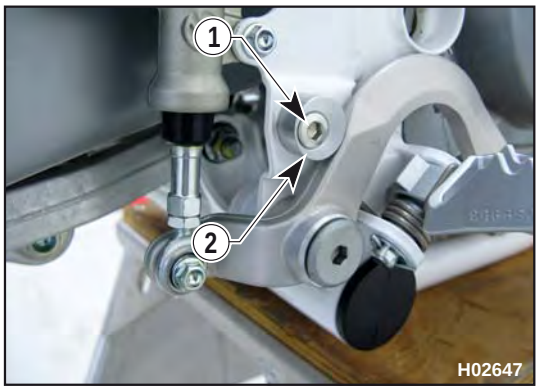
The level of the fluid in master cylinder reservoir must never be below the minimum value, which can be checked from the sight glass (1) on the side of master cylinder body.
A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.

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.

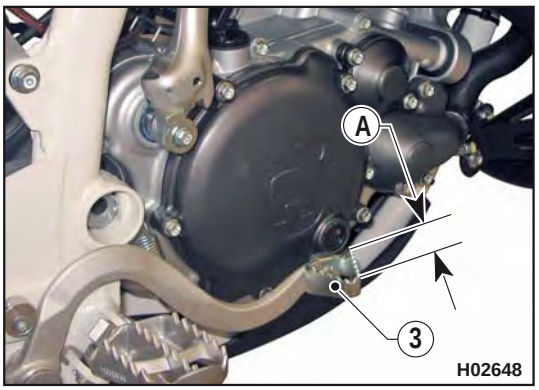
Brake fluid may cause irritation. Avoid contact with skin or eyes. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.

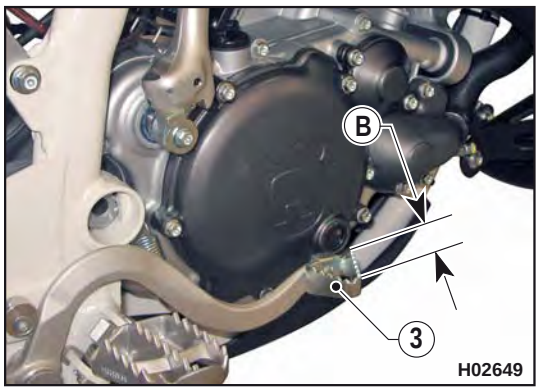


Rear brake pedal position adjustment

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".



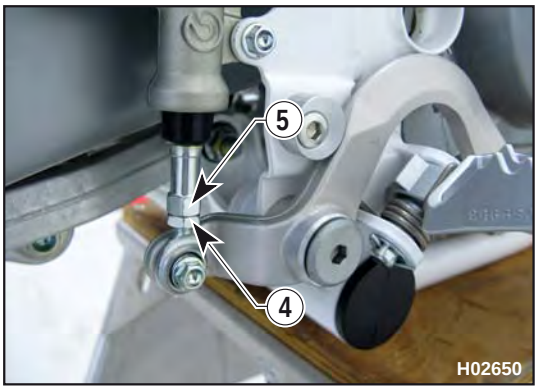


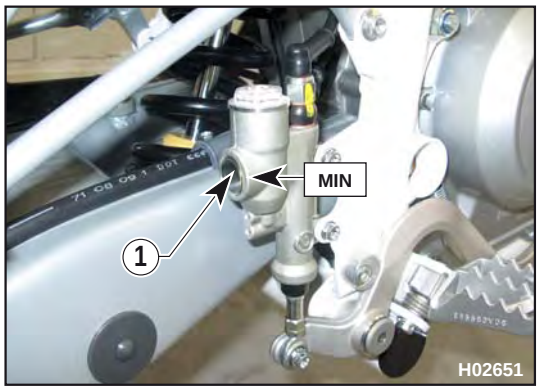
Rear brake pedal free play adjustment

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

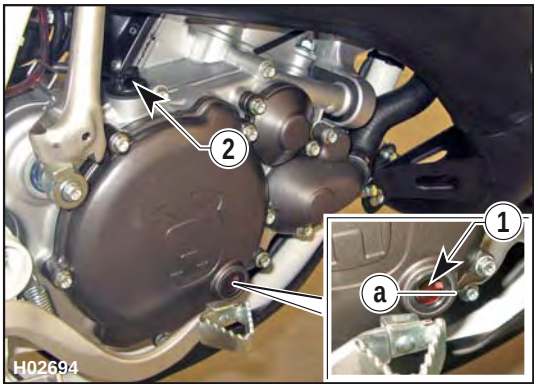
Master cylinder fluid level - visible through sight glass (1) - must be above the minimum notch on master cylinder reservoir.
A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.

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.

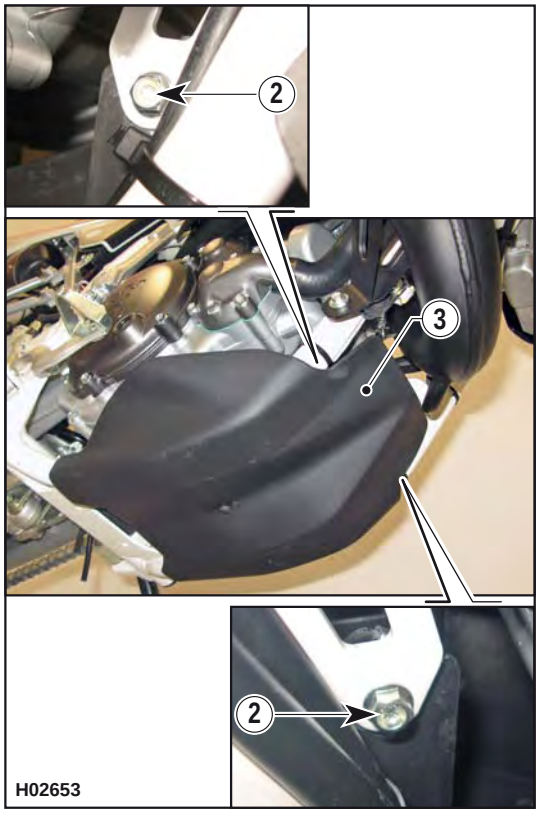


Checking the oil level

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

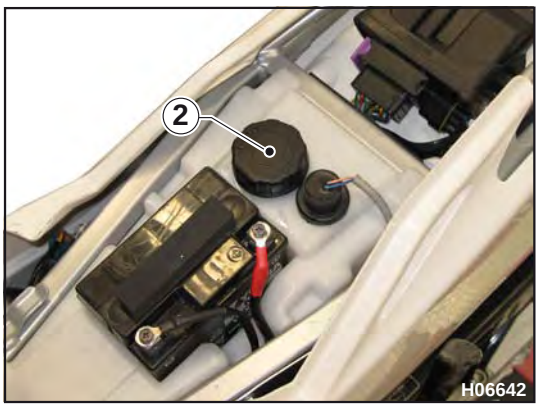
Remove the engine guard (1) by undoing the screws (2).

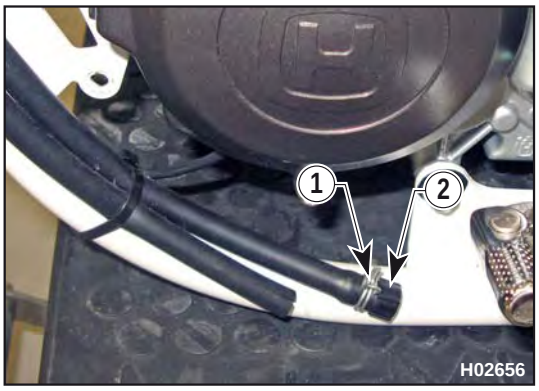
To completely replace the oil, unscrew the plug (3) under the oil sump and let oil come out, then screw the plug again with its gasket and pour fresh oil from the hole of the loading plug.
Use only the prescribed quantity and type of oil.

Have this operation made with warmed-up engine.

Engine lubrication oil level

Remove the saddle, turning the rear pin (1) counterclockwise.
Remove the cap (2).
Visually check that the oil level in the tank is sufficient; if necessary, top up with the oil type indicated in the lubricant table.





Exhaust valve cleaning / oil drainage

Open the clamp (1) and remove the cap (2), draining all the residual oil from the secondary air circuit inside a container.

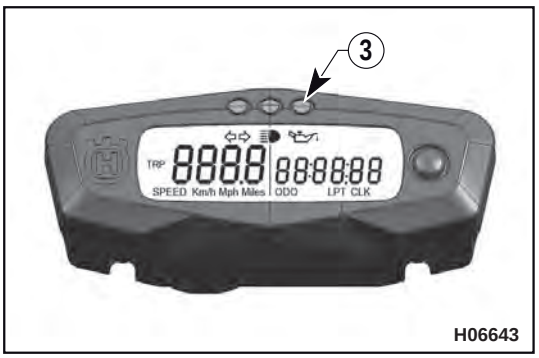
Lubricating oil pump drainage

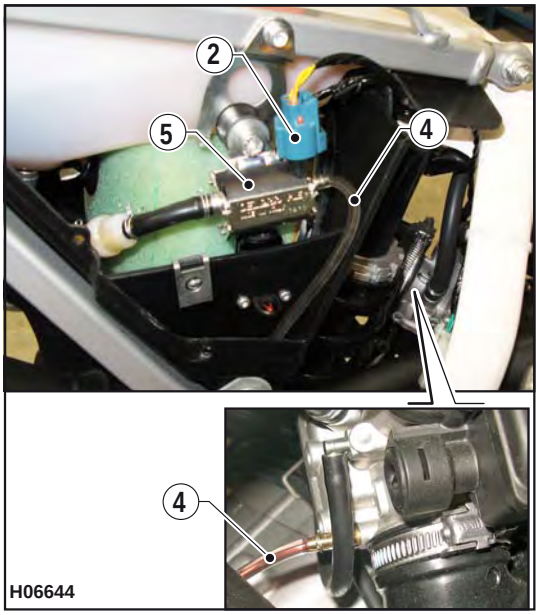
- Remove the saddle and side panel, as outlined in the relevant paragraph.

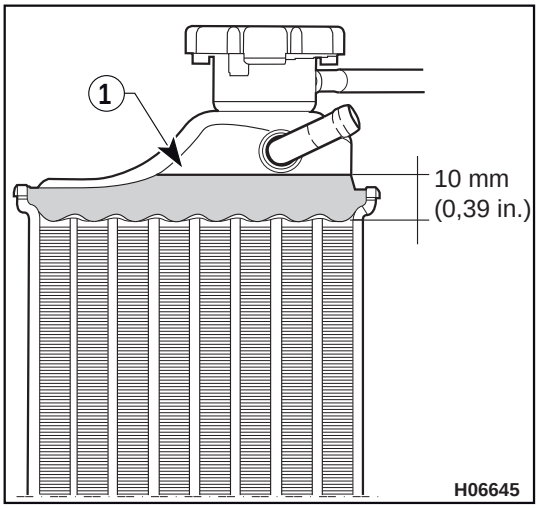
Drainage is to be done with the engine off.
Using the special pliers, loosen clamp onto pump (5) to carburettor pipe (4), and disconnect pipe. place a container under it and check that the ignition key (1) is in OFF:

- disconnect oil pump connector (2);
- rotate the ignition key (1) to ON and reconnect the connector (2).

A five minute pump cycle will be carried out, during which the warning light (3) will flash every 0.5 sec.
After this operation, connect the hose to the carburettor again.
Lubricating oil pump does not require any overhaul intervention, and its parts do not have to be removed or checked.





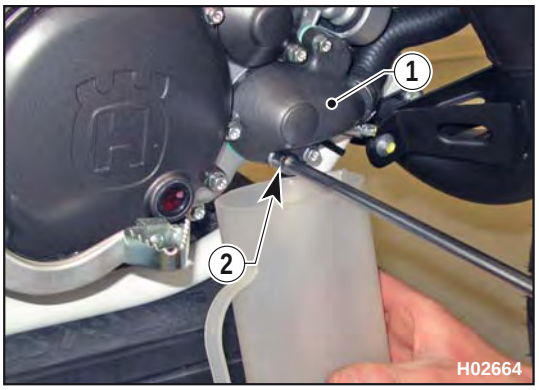


Coolant level check

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.



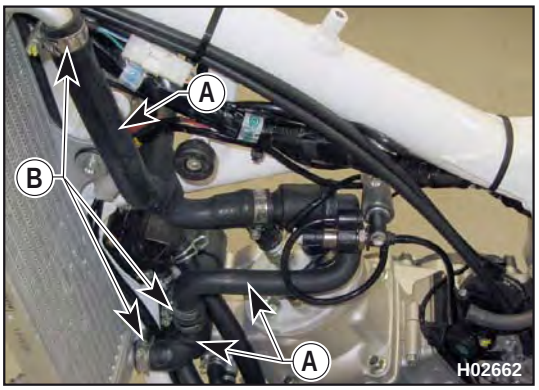
Coolant replacement

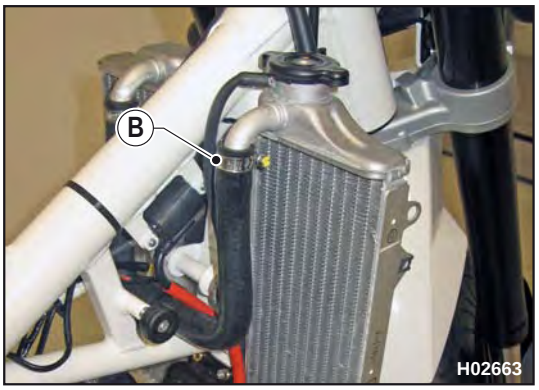
- Place the vehicle on a flat ground and in horizontal position.
- Place a vessel of adequate capacity on the right side of the vehicle under the water pump (1).
- Loosen the exhaust screw (2) using an 8 mm wrench.
- Slowly open the RH radiator cap (3) and let the liquid drain.
- After drain, tighten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

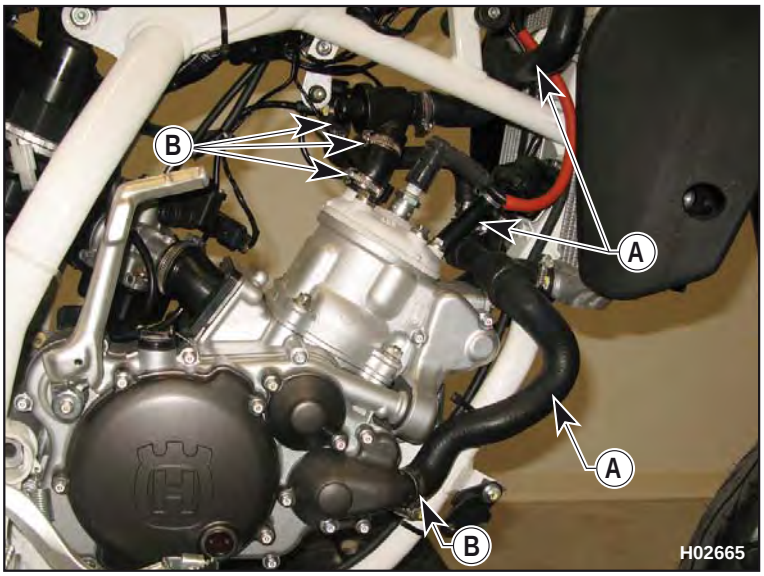
Avoid removing radiator cap when engine is hot, as coolant may spout out and cause scalding.

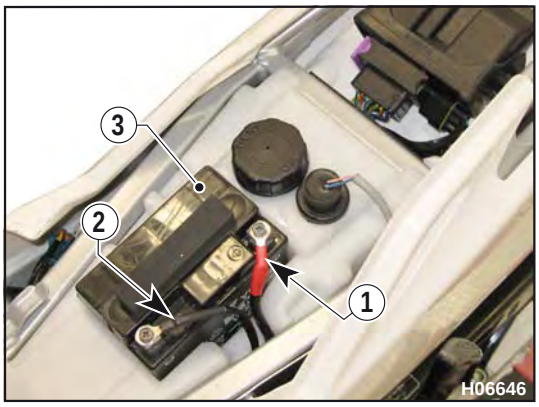
Difficulties may arise in eliminating coolant from painted surfaces. If this occurs, wash off with water.

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).





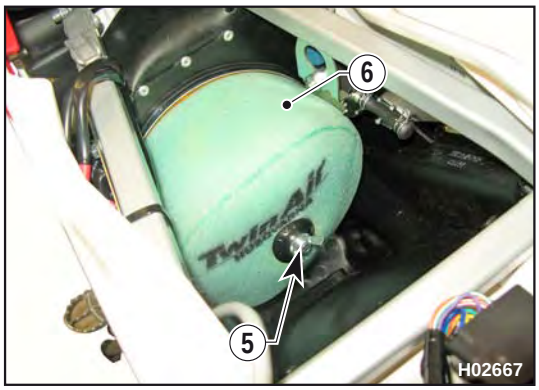


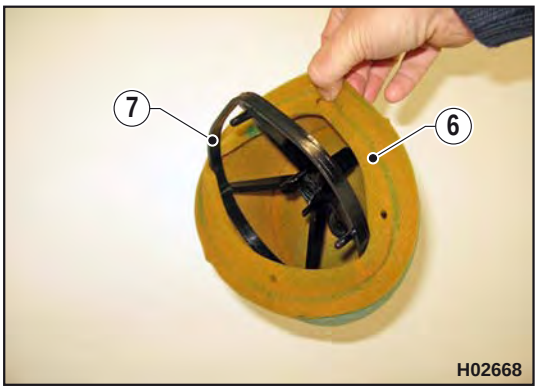


Air filter check

- Remove the saddle as outlined in the relevant paragraph.
- Disconnect the battery cables (1) and (2) and remove the battery (3).

- Lift the engine oil reservoir (4).
- Undo the screw (5) and remove the filter (6).
- Detach the filter (6) from the subframe (7).



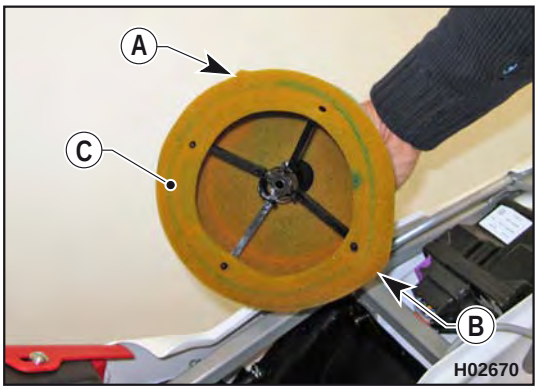


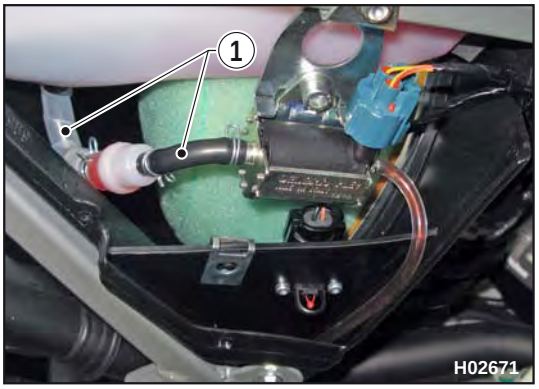
Air filter cleaning

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.



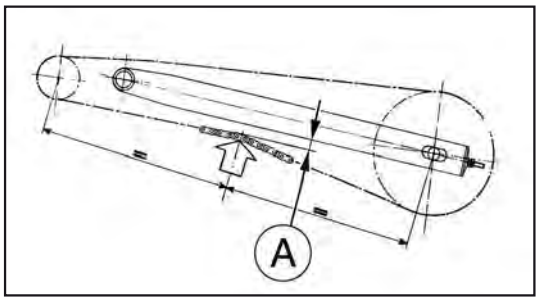


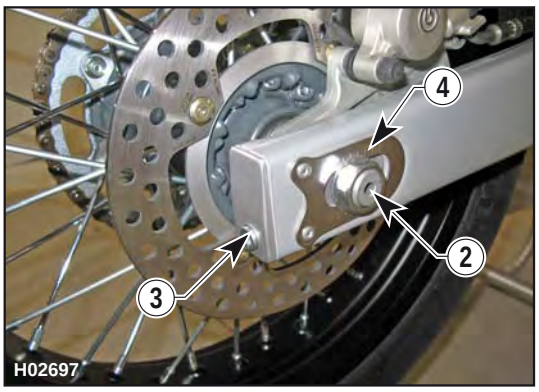
Assembly

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.

When positioning the engine oil bowl, take care to correctly reposition pump intake hose (1), making also sure that it is not kinked.

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.





Chain adjustment

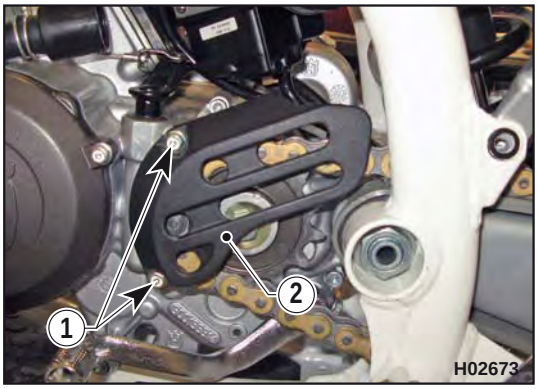
Chain should be checked, adjusted and lubricated as per the Maintenance Chart to ensure safety and prevent excessive wear. If the chain becomes badly worn or is poorly adjusted (i.e., if it is too loose or too taut), it could escape from sprocket or break.

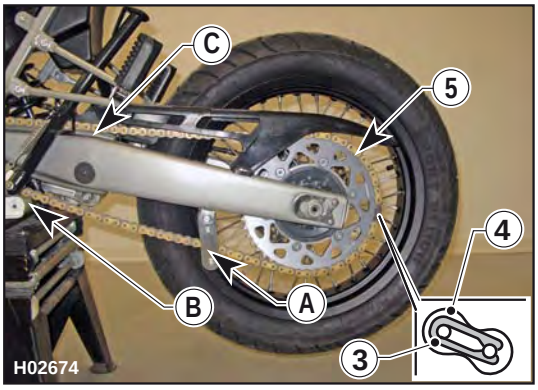
Make sure that the chain features a slack (A) measuring approximately 12 mm (0.47 in.), as shown in the nameplate (1) on chain cover.

Incorrect chain tension involves excessive and early wear of the chain slider lower part; periodically check for wear and replace it if worn out.

If it is not, proceed as follows:
- on the right side, with a 25 mm. Allen wrench, loosen the locking nut (2) of the wheel axle;
- adjust the linkages (3) on both sides of the swinging arm using a 6 mm. Allen wrench;
- make sure the wheel axle is properly aligned using the graduated scale (4) for reference;
- the operation done, tighten the wheel axle locking nut (2).

After adjustment, always make sure that chain has a slack of 12 mm (0.47 in.).





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

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

Lubricating a chain without O-rings

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.

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.

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

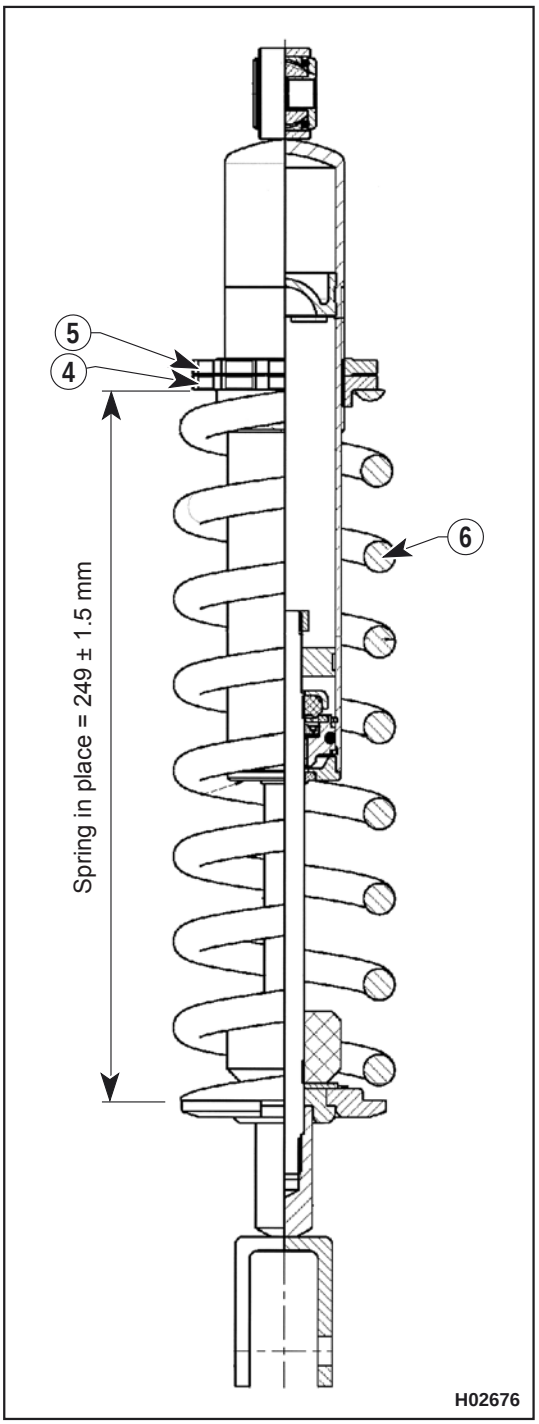
Shock absorber adjustment

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). Recommended rider sag is 100 mm with a cold shock absorber and 95 mm with a warm shock absorber.
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.

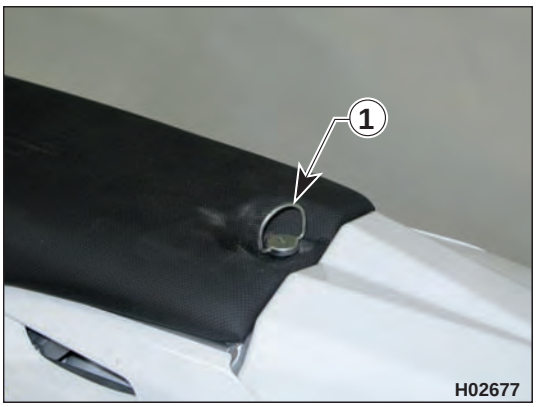


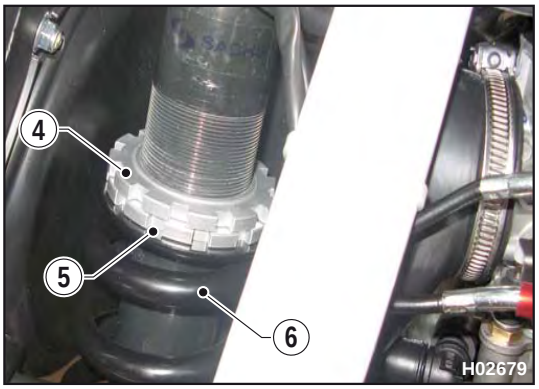
Shock absorber spring preload adjustment

Proceed as follows:

1. Turn the rear fixing (1) counter clockwise and remove the saddle, unscrew the retaining screws (2) and remove the right-hand side panel (3).
2. Clean lock ring nut (4) and adjuster ring nut (5) of the spring (6).
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).
6. Reassemble the R.H. side panel and the saddle.

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





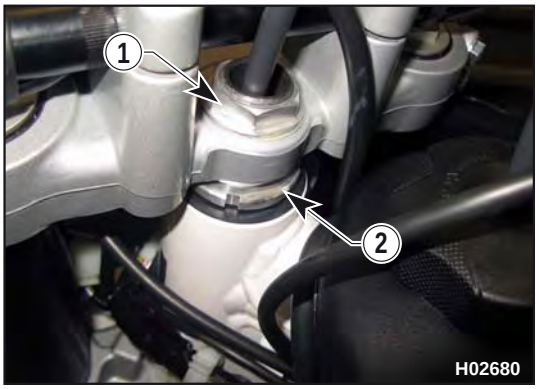
Front fork adjustment

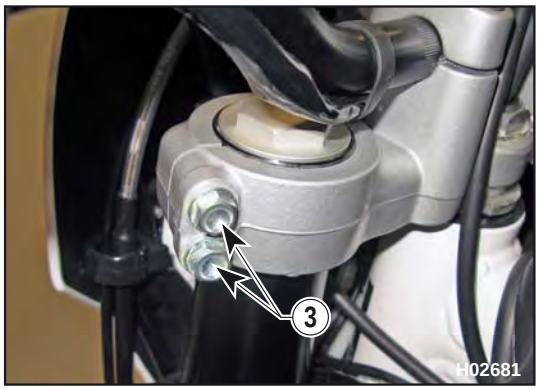
Front fork has no adjustment.

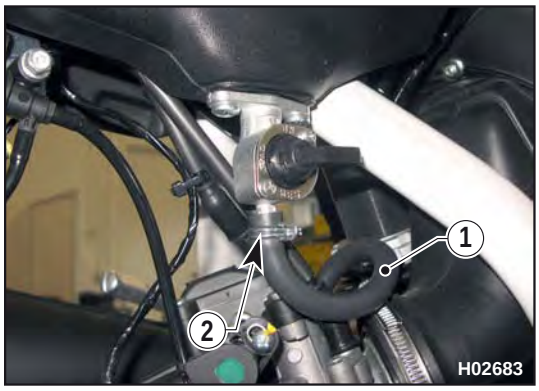
Steering bearing clearance adjustment

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 four bolts (3) that secure the fork legs to the steering head; - 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 four bolts (3) on the steering head to 22,5÷26,5 Nm, 2,3÷2,7 Kgm, 16,59÷19,55 ft/lb.

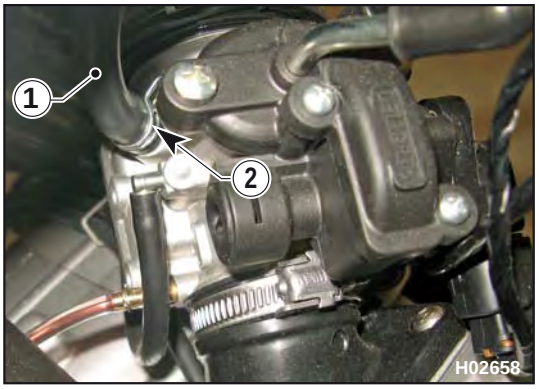


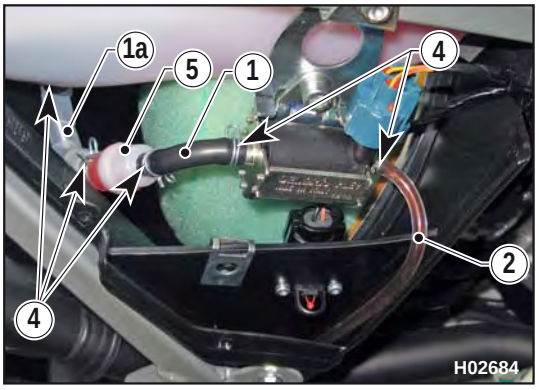




Fuel supply hose inspection

- Check the pipe (1) starting from tank cock and reaching the carburettor. If cracked, replace it by releasing the two clamps (2).



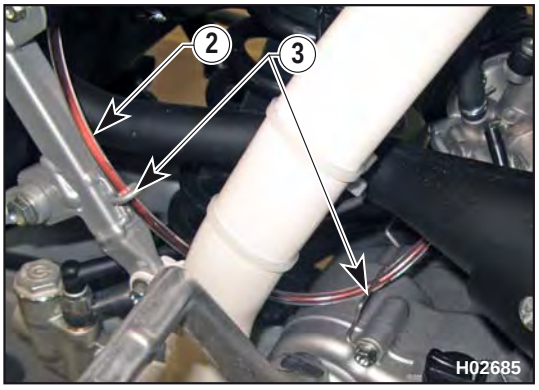


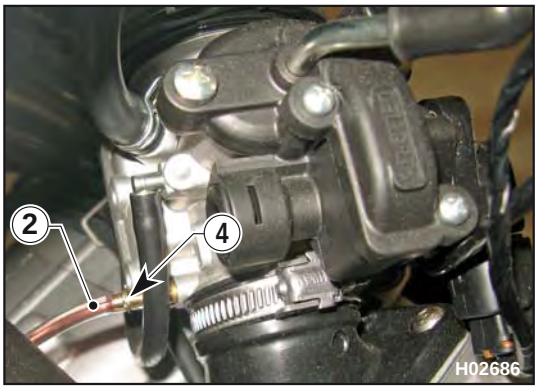
Engine lubrication oil piping check

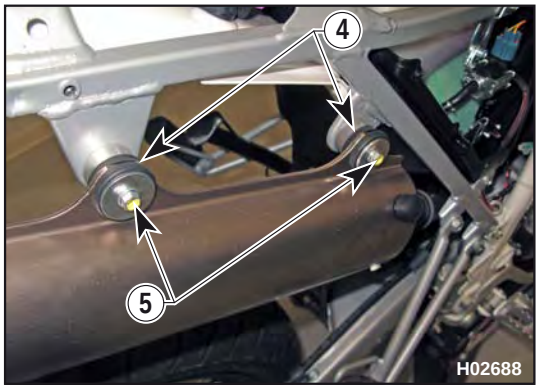
- Remove the saddle and right-hand side panel, as outlined in the relevant paragraph.
- Check that the pump intake hose (1) and the delivery hose (2) slide freely and are not kinked.
- Check that hose (2) is correctly fitted into its supporting clips (3) and that it does not rest on the engine.
- If the hoses have cracks or are too stiff, bleed al oil inside them into the bowl, then replace them.
- To replace hose, release clamps (4).

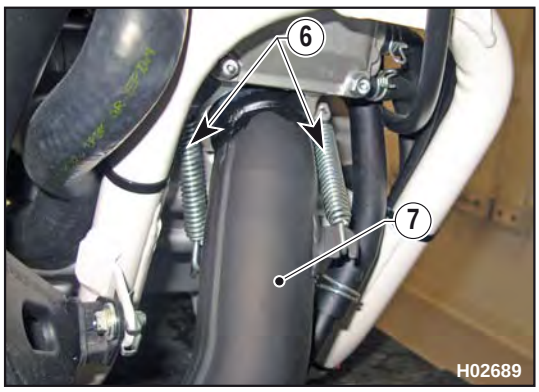
On reassembly, check that the plastic spiral allowing hose (1a) correct sliding and preventing it from kinking has been correctly positioned in place.

Check that the filter (5) is not clogged. Replace it if necessary.







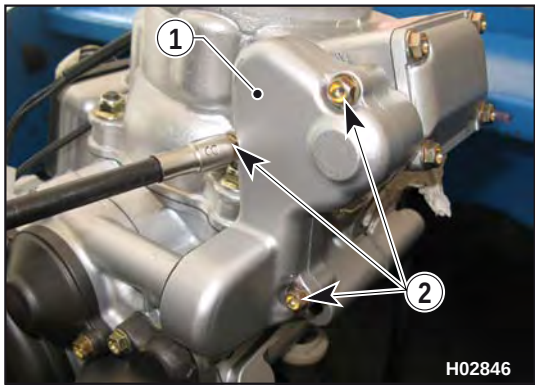


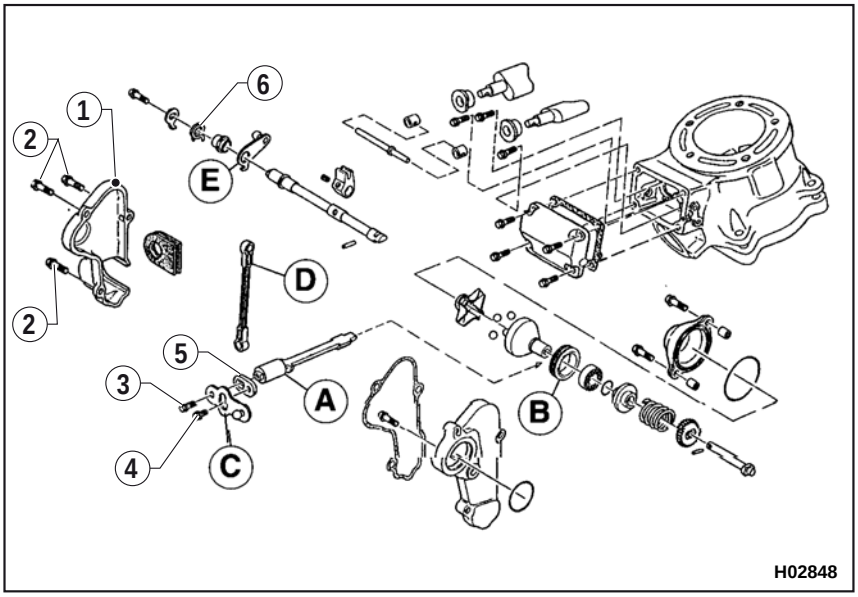
Exhaust system check

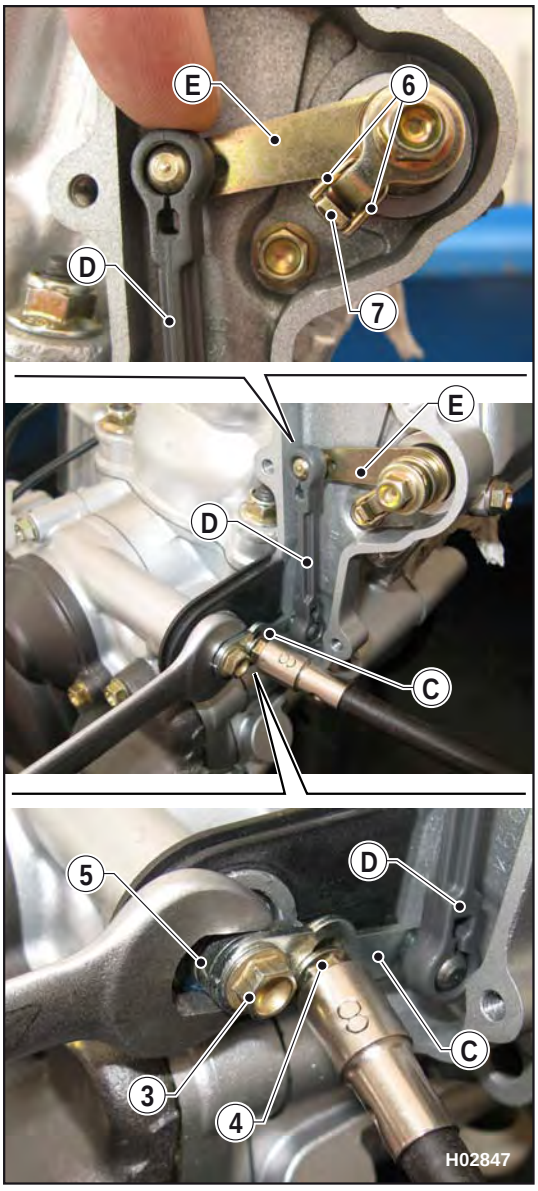
Remove exhaust system components as described in Section "E". Ensure that pipe (1) and silencer (2) do not show any sign of failure or damage: replace if cracked or damaged.

- Remove the right-hand side panel (3) and check the conditions of the silent-blocks (4). If damaged, replace them by loosening screws (5) (7 mm wrench).
- 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.

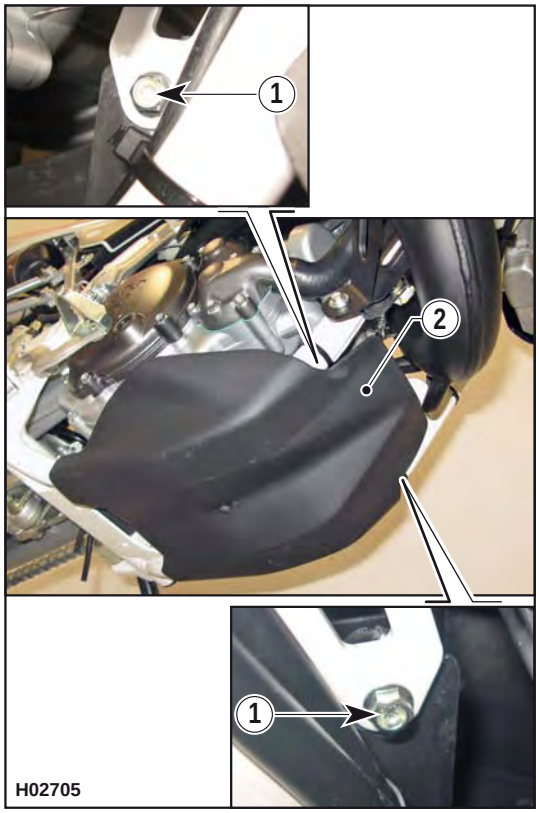
Section E

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.

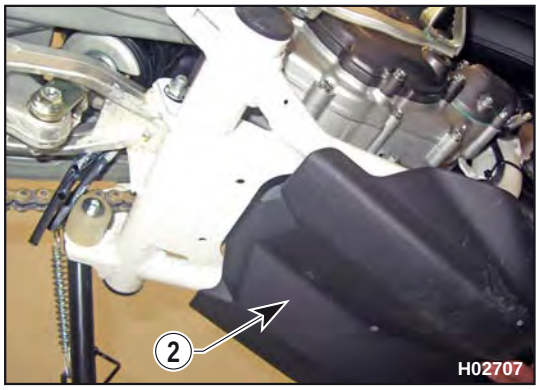
RIGHT-HAND SIDE

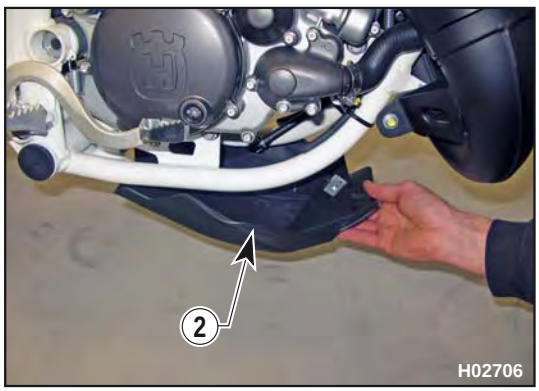
LEFT-HAND SIDE



Engine guard removal

- Using an 8 mm wrench, loosen screws (1)
- Remove engine guard (2) releasing it from the rear support.



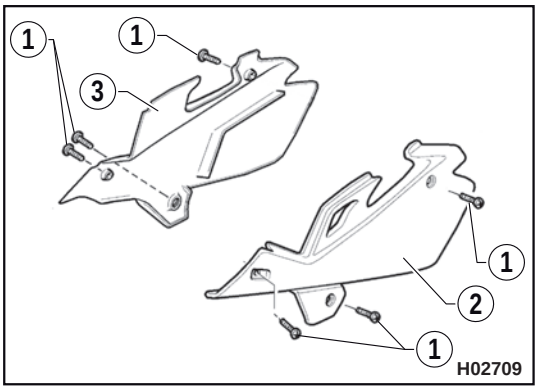


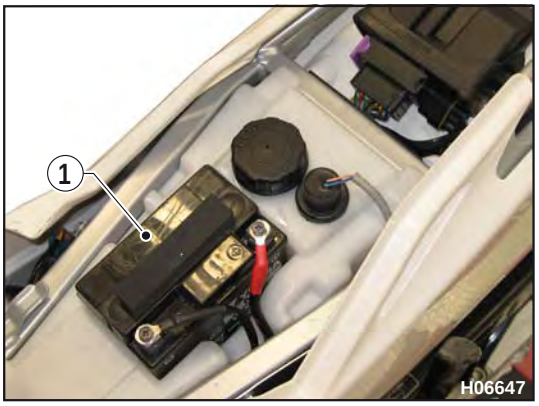
Saddle removal

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

Side panel removal

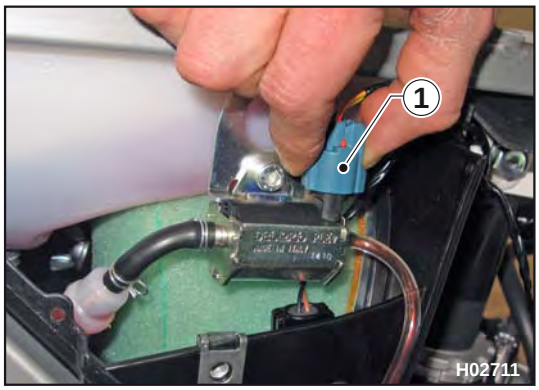
- Remove the saddle as described in the relevant paragraph.
- Using an 8 mm wrench, loosen retaining screws (1) and remove side panels (2) and (3).





Battery removal

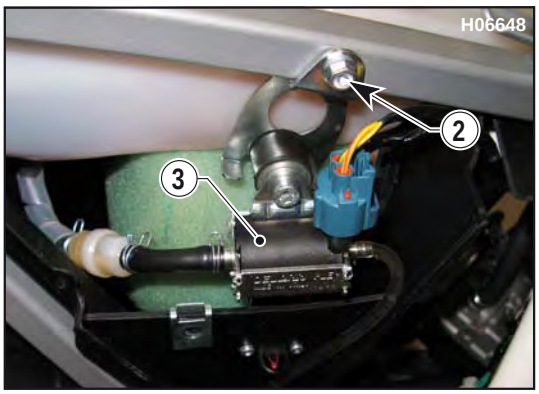
- Remove the saddle as outlined in the relevant paragraph.
- Using an 8 mm Allen wrench, first remove the BLACK negative cable, then the RED positive cable (when reassembling, first connect the RED positive cable, then the BLACK negative cable); remove the battery (1) from its housing.

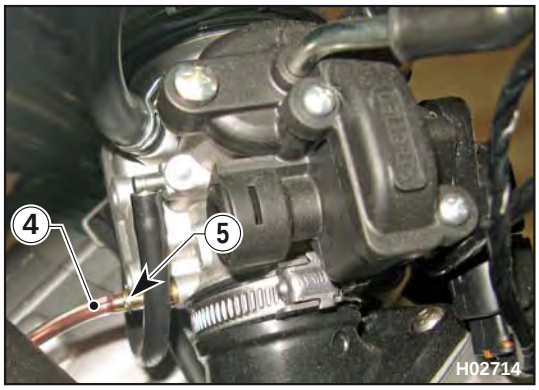


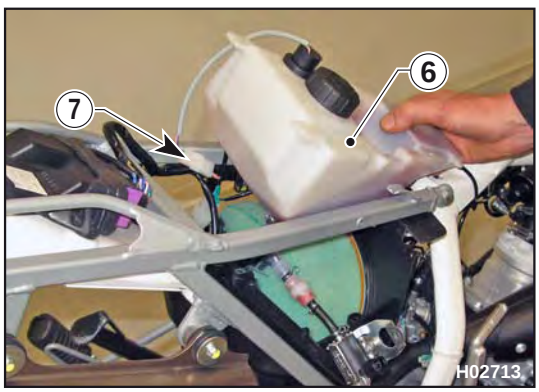
Oil reservoir removal

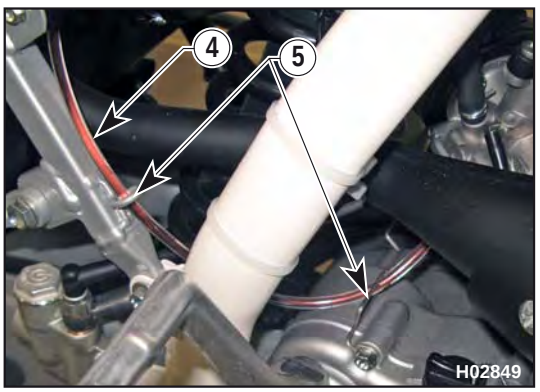
- Remove saddle, side panels and tank as outlined in the relevant paragraphs.
- Disconnect the oil pump supply connector (1).
- Using an 8 mm wrench, loosen screw (2), and remove oil pump (3) with its mount.
- Disconnect oil delivery pipe (4) to carburettor, releasing the relevant clamp (5).
- Plug pipe (4), and slide it out of the special supporting clips.
- Lift oil reservoir (6), and disconnect level sensor connector (7).

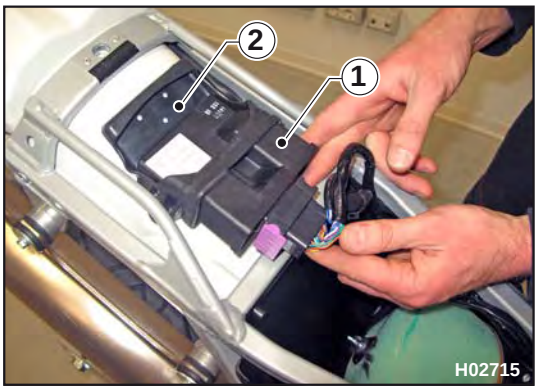
On reassembly, take care to correctly position oil pump intake pipe, checking that it is not kinked and that the plastic spiral allowing its correct sliding and preventing it from kinking has been correctly positioned in place.
Delivery pipe (4) shall be correctly positioned onto special supporting clips (5), and shall not rest onto engine.





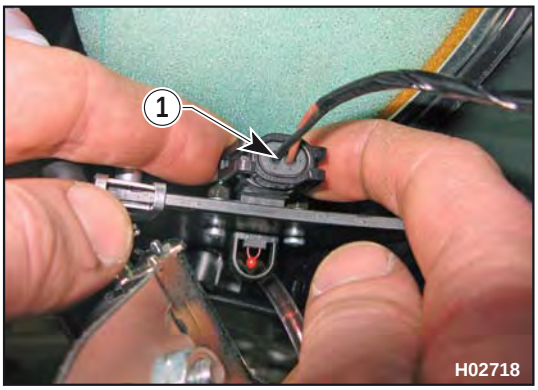






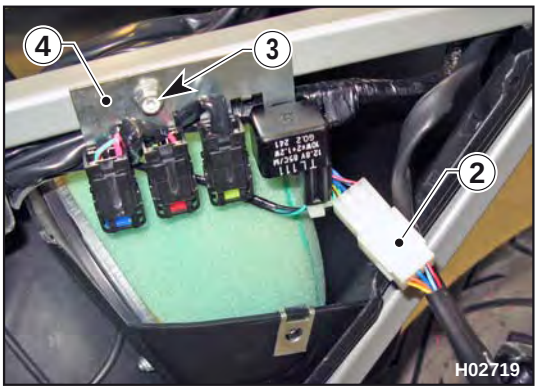
Electronic control unit removal

- Remove the saddle as outlined in the relevant paragraph.
- Remove control unit (1) from the special vibration mount (2).
- Release connector (3) from control unit (1)

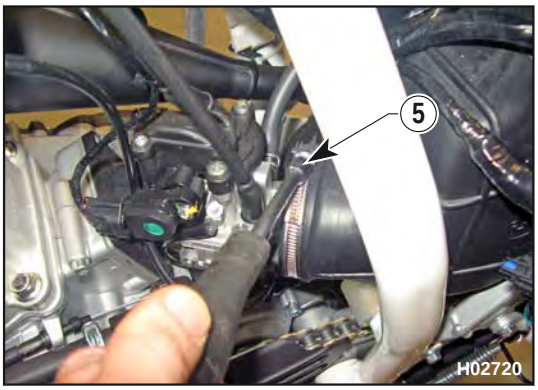


Rear chassis complete with mudguard and air box removal

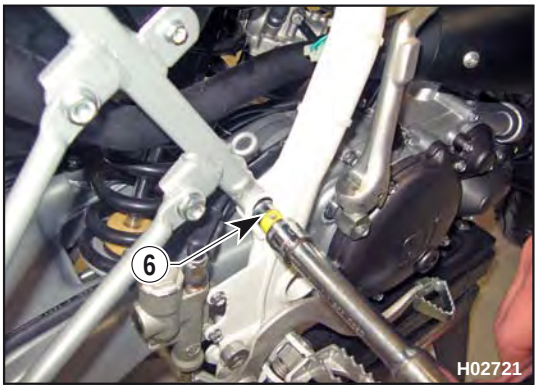
- Remove saddle, side panels, tank, silencer, battery, oil reservoir and control unit (in this order), as outlined in the relevant paragraphs.
- Shear the plastic clips securing wiring to rear chassis.



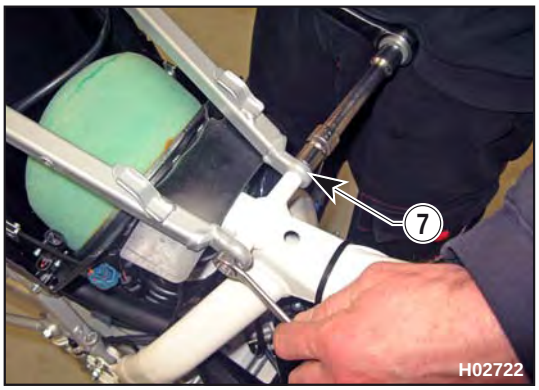
- Disconnect air temperature sensor connector (1) positioned inside filter box (widen tabs, and pull).
- Disconnect the connector (2) between main wiring harness and rear wiring harness.
- Using an 8 mm wrench, loosen screw (3), and remove bracket (4) from fuse and flasher support.



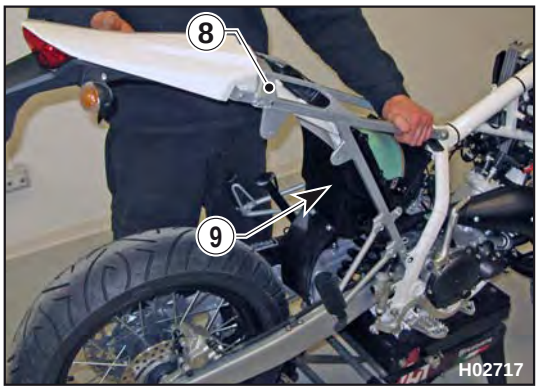
- Loosen clamp (5) securing filter box to carburettor.



- Using a 10 mm wrench, loosen screws (6) on both sides of chassis.

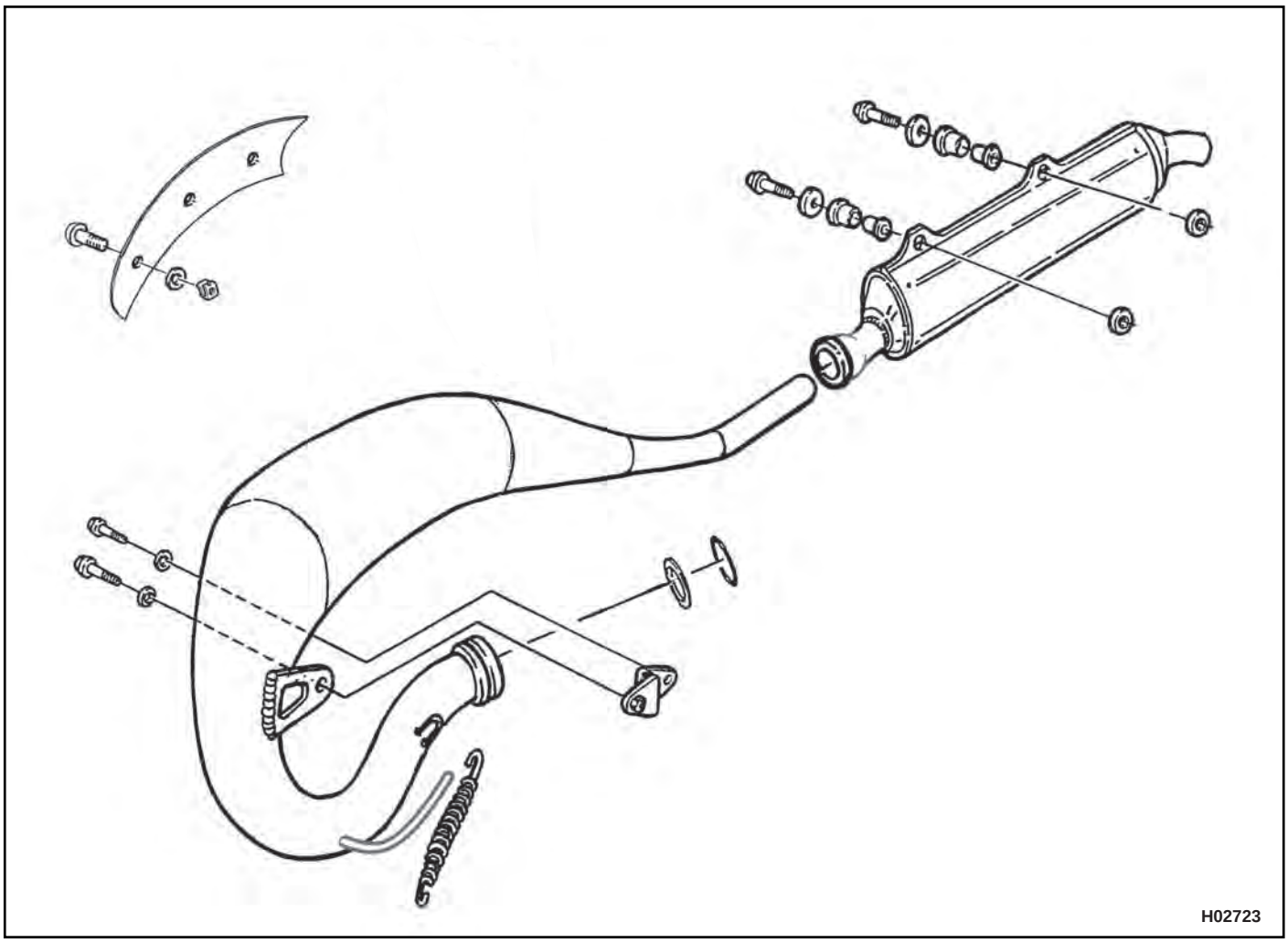


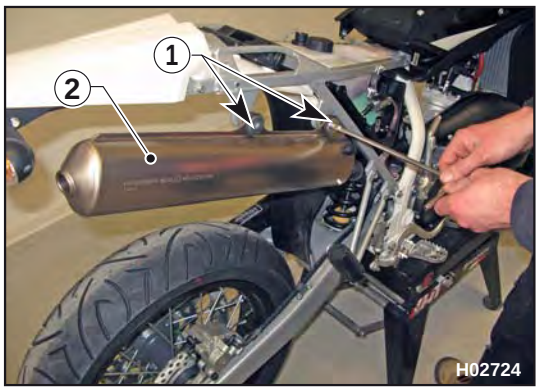
- To remove upper pin (7), loosen nut with a 12 mm wrench and pin with a 13 mm wrench.



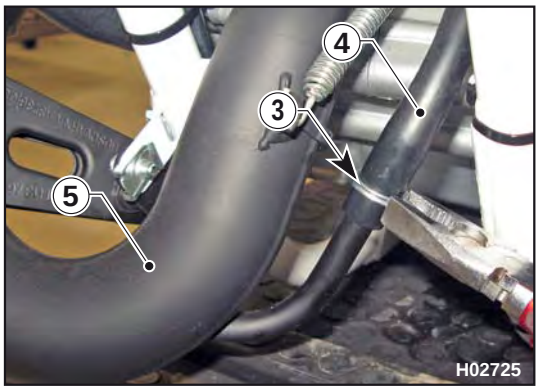
- Lift chassis (8) complete with filter box (9).

Exhaust system removal

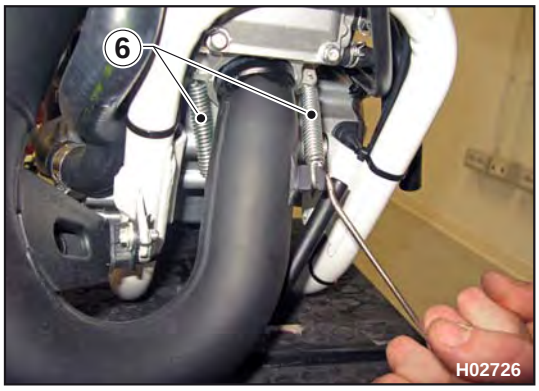




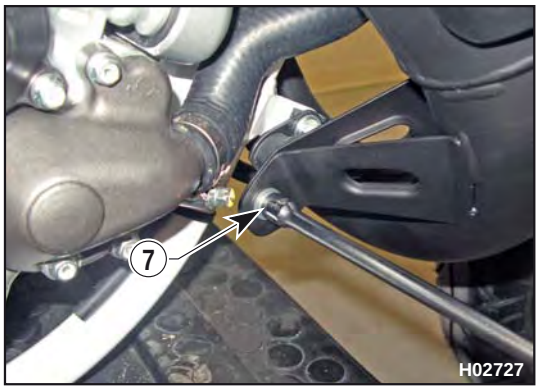
- Remove the saddle as described in the relevant paragraph.
- Remove the right-hand side panel as described in the relevant paragraph.
- Using an 8 mm T-wrench, remove silencer (2) retaining screws (1), and remove silencer from vehicle.



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

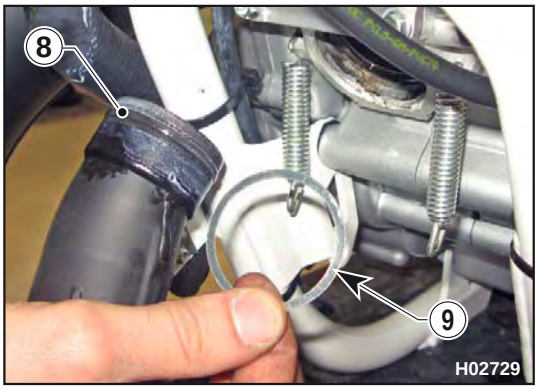


- Release the two springs (6).

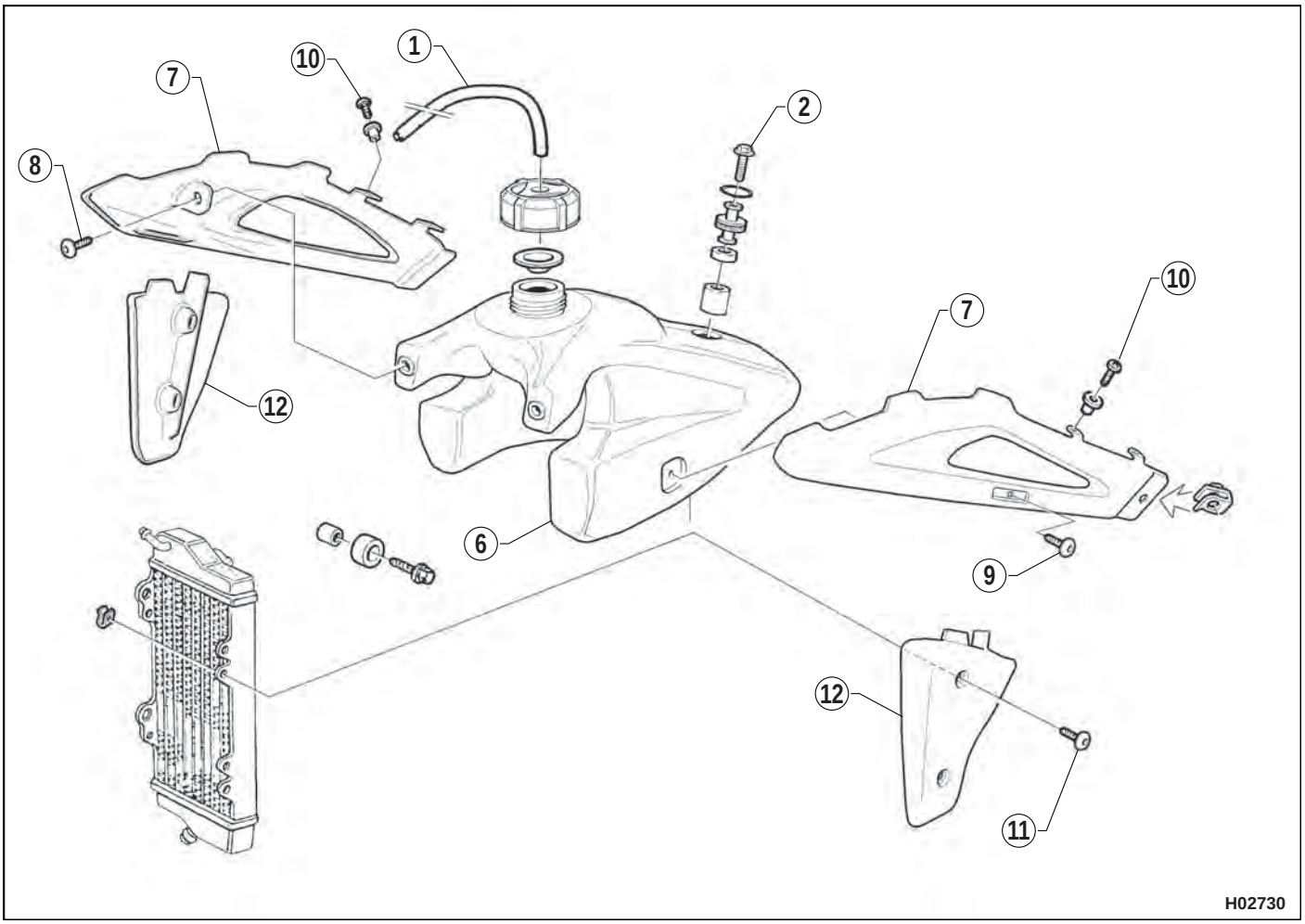


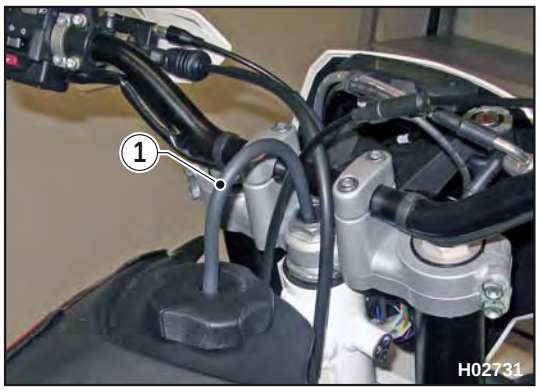
- To remove manifold (5), loosen screw (7) with an 8 mm wrench.

Check seal (8) and metal gasket (9) for wear. Change, if damaged.

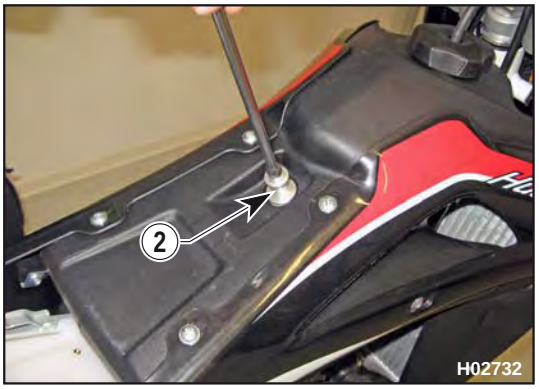


Fuel tank and scoop removal

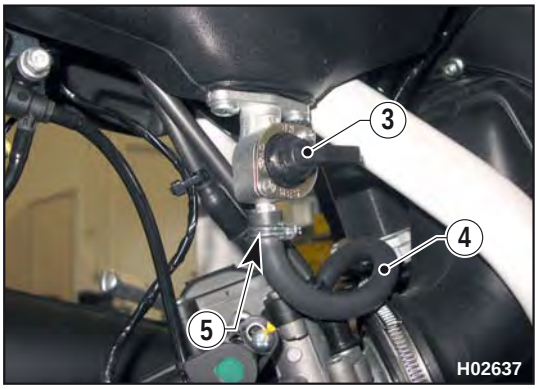




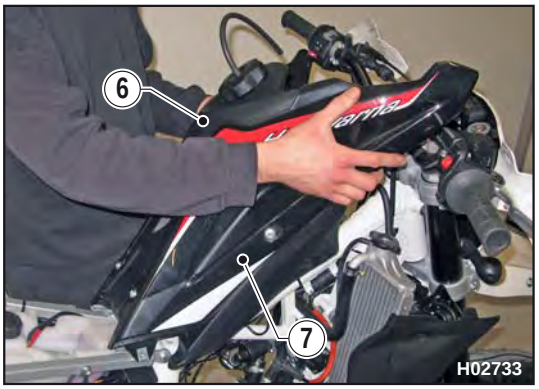
- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Remove the breather hose (1).



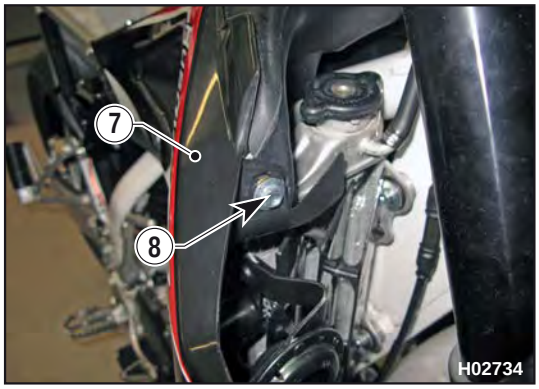
- Loosen tank retaining screw (2) (with an 8 mm Allen wrench).



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

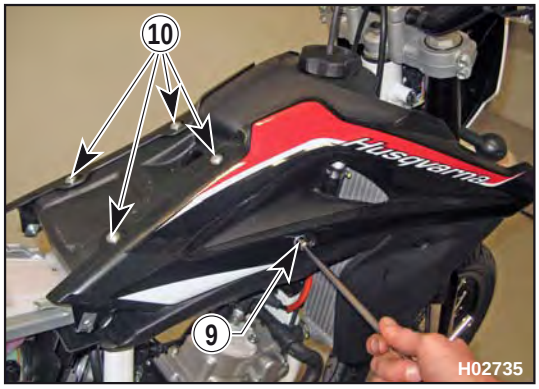


- Raise the tank (6) from the front end, and remove it from bike complete with scoops (7).

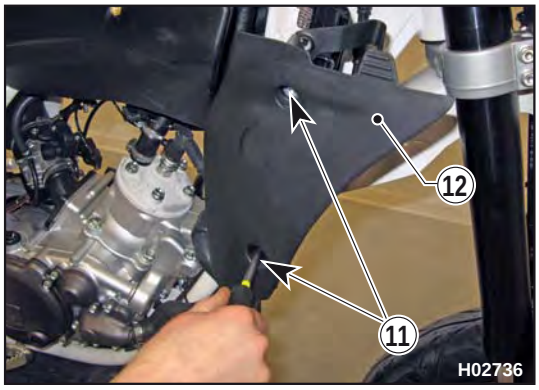


Scoop removal

- Remove the saddle and side panels, as outlined in the relevant paragraphs.
- Using an 8 mm wrench, loosen front screw (8) between scoop (7) and tank.

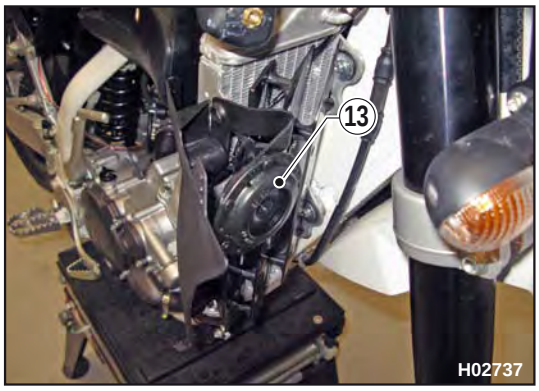


- Using an 8 mm wrench, loosen side screw (9) and upper screws (10) with a Phillips screwdriver; then remove scoop (7).

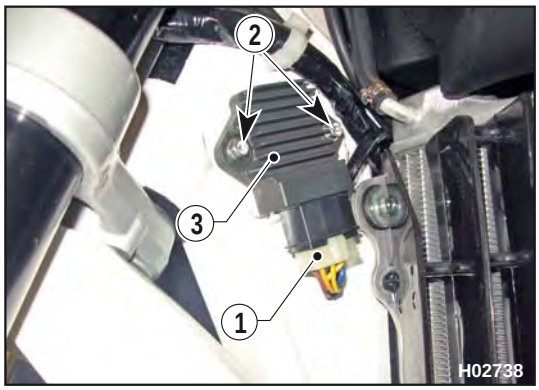


Spoiler removal

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



On reassembly, check that horn (13) is correctly positioned and secured in place.

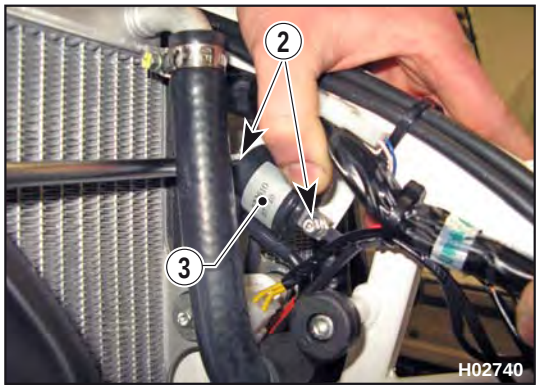


Voltage regulator removal

- Disconnect the connector (1).
- Loosen the two retaining screws (2) and remove the regulator (3). (8 mm wrench)

Ignition coil removal

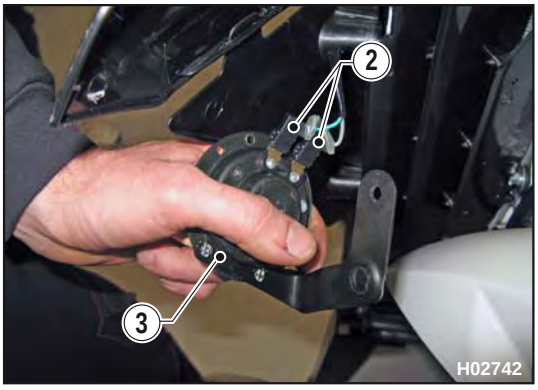
- Remove: saddle and fuel tank as described in the relevant paragraphs.
- Remove the spark plug cap (1).



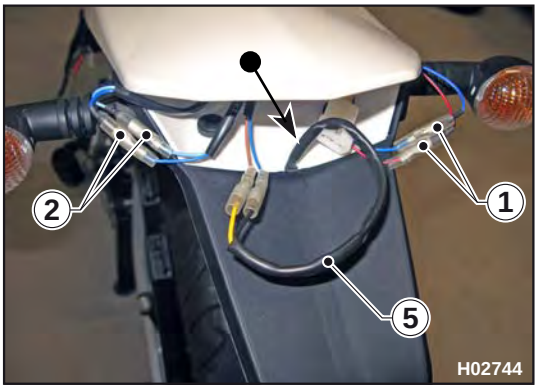
- Remove the retaining screws (2) and then the coil (3). (8 mm wrench)

Horn removal

- Loosen the upper screw (1) securing the spoiler to the right-hand radiator.

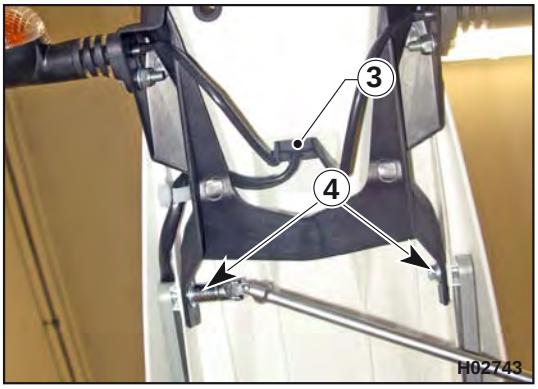


- Disconnect the two connectors (2) and remove the horn (3) with its bracket.



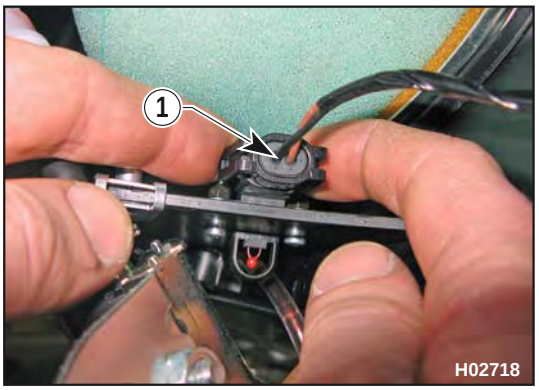
Number plate holder removal

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



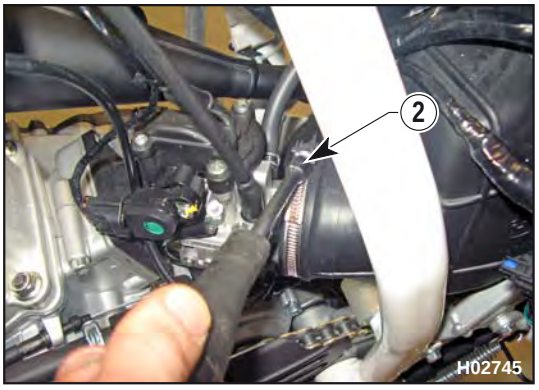
- Slide turning indicator cables out of rubber gaiter (3).
- Using an 8 mm wrench, loosen screws (4), and remove number plate holder complete with turning indicators.

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

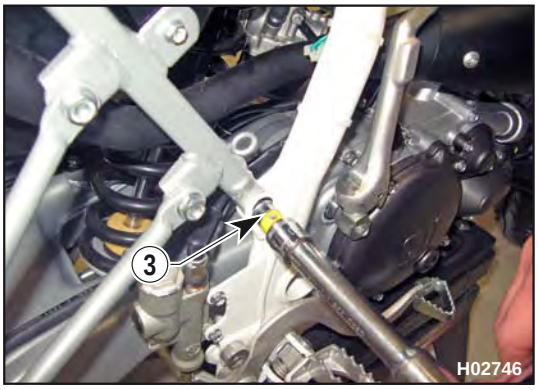


Air box removal

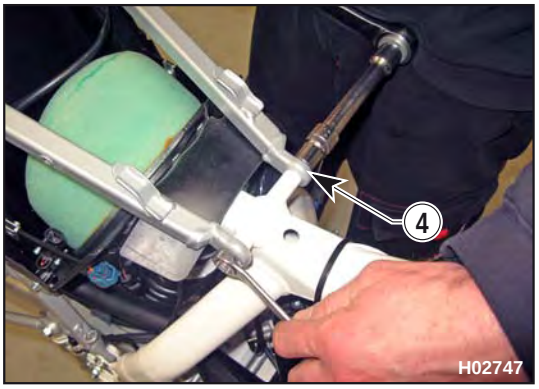
- Remove saddle, side panels, fuel tank, oil reservoir and silencer (in this order), as outlined in the relevant paragraphs.
- Disconnect air temperature sensor connector (1) positioned inside filter box (widen tabs, and pull).



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

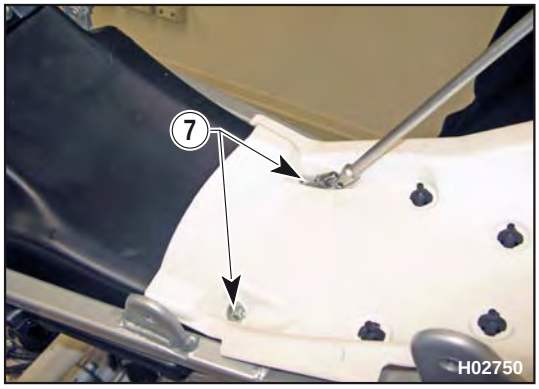


- Loosen the screws (3) using a 10 mm wrench.

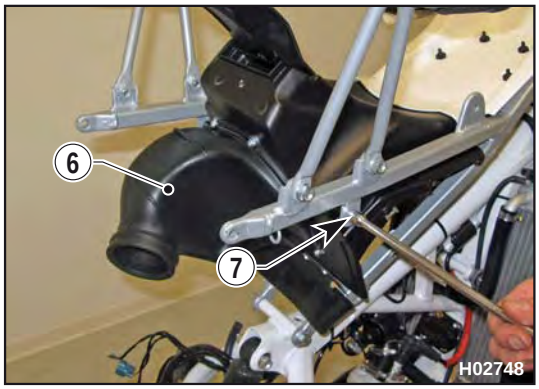


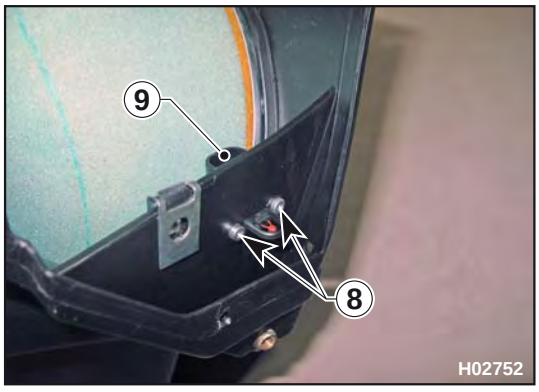
- Loosen upper pin (4) using a 12 mm wrench on nut, and a 13 mm wrench on pin.

- Overturn chassis (5) with filter box (6) without removing control unit and fuse and flasher holder bracket.

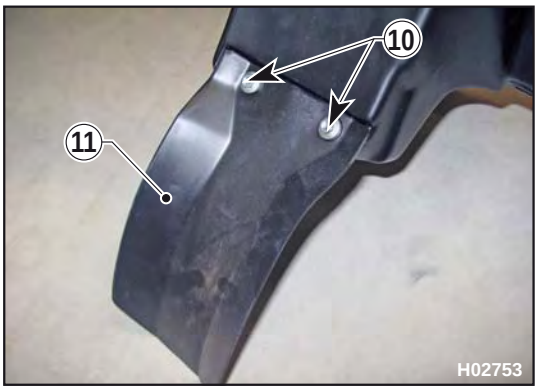


- Using an 8 mm wrench, loosen the four screws (7), and remove filter box (6) from chassis.

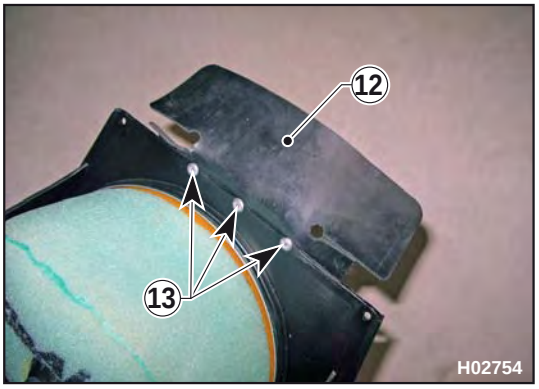




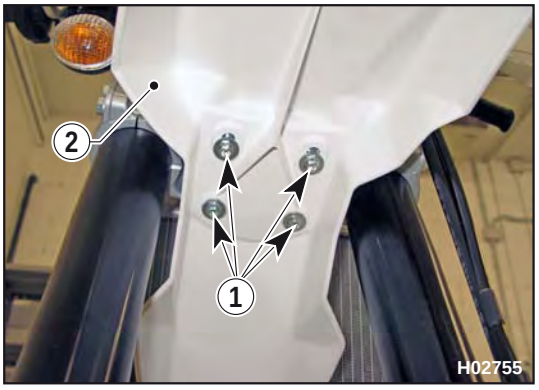
- Using a 2.5 mm Allen wrench, loosen the two screws (8), and remove temperature sensor (9).



- Using an 8 mm wrench, loosen the two screws (10), and remove shock absorber protection (11).

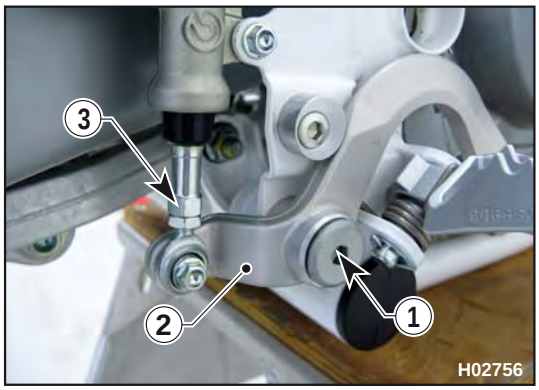


- Remove rivets (13), and remove upper rubber protection (12).
- Remove the air filter.



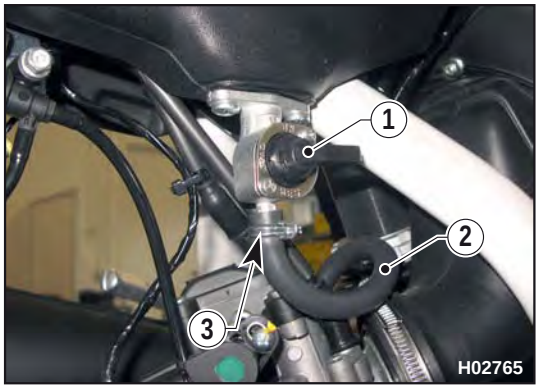
Front mudguard removal

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



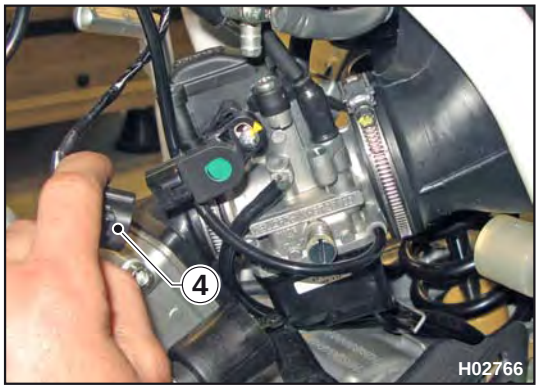
Rear brake removal

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



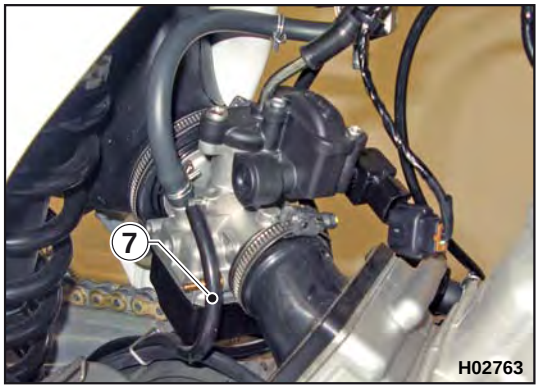
Carburettor removal

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

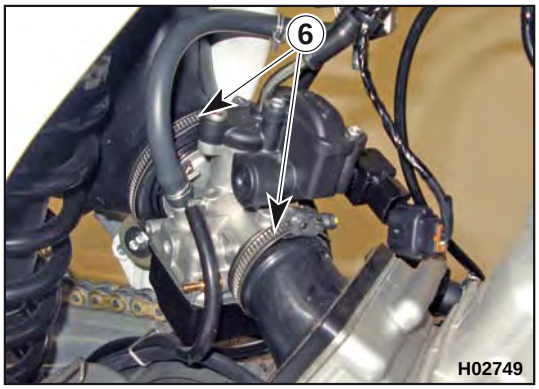


- Disconnect TPS sensor connector (4).

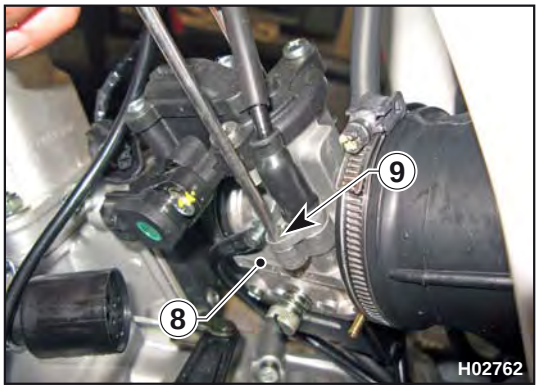
Important - Do not remove TPS from carburettor in order not to lose calibration.



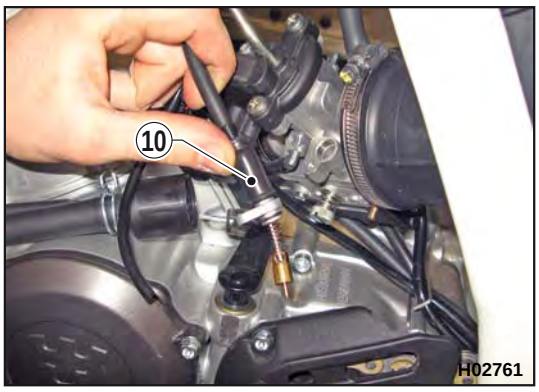
- Disconnect secondary air circuit hose (7).



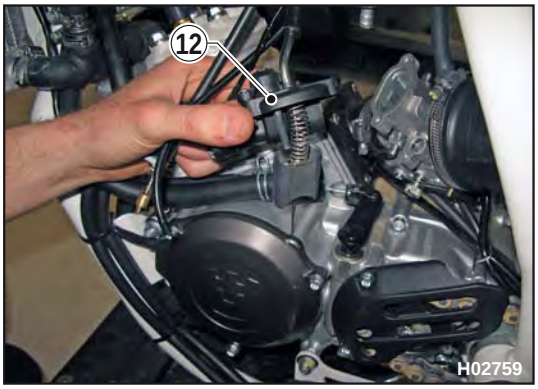
- Loosen clamps (6), and disconnect mixture oil hose (5).

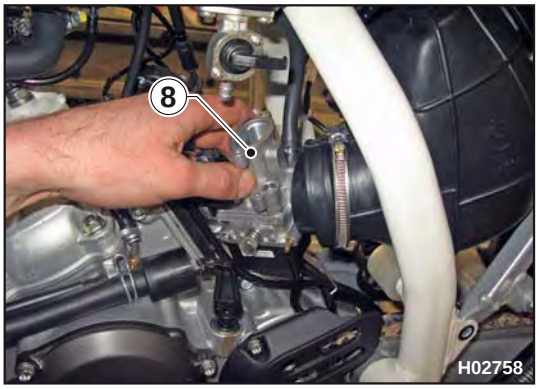


- Slightly turn carburettor (8) to the left, loosen screw (9), and remove starter control (10).

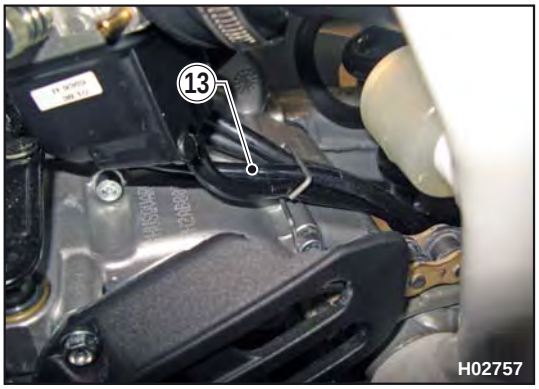


- Loosen the two screws (11), and remove carburettor valve cover (12).

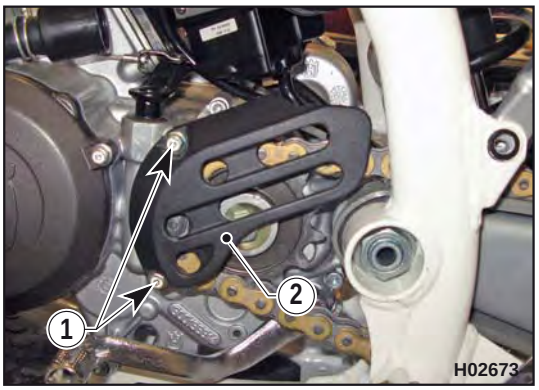


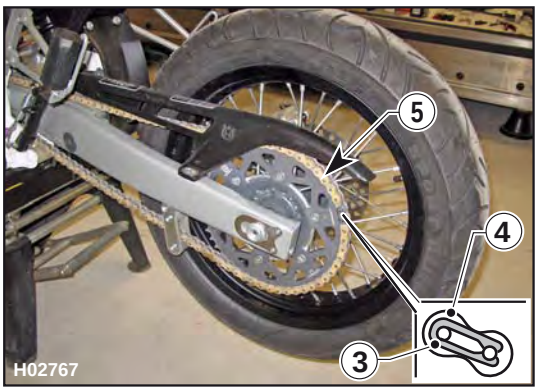


- Detach carburettor (8), and remove it.



On reassembly, take care that carburettor breather hoses (13) are correctly positioned inside their seats and that they are not kinked.





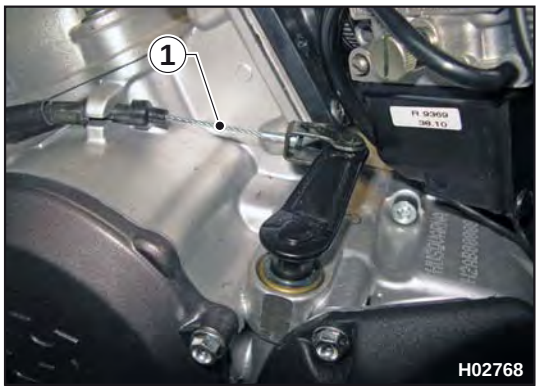
Secondary drive chain removal

To remove chain, proceed as follows:

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

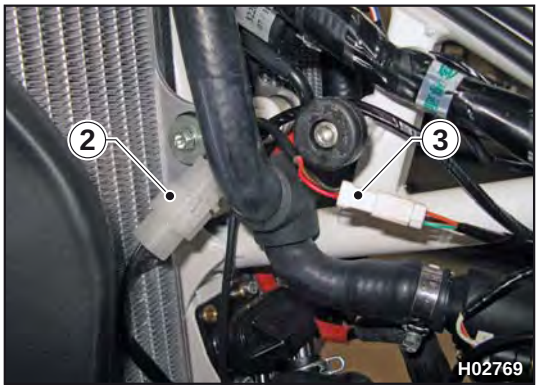
Engine removal

- 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.

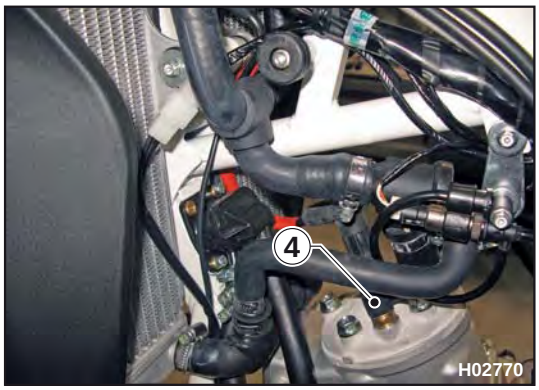


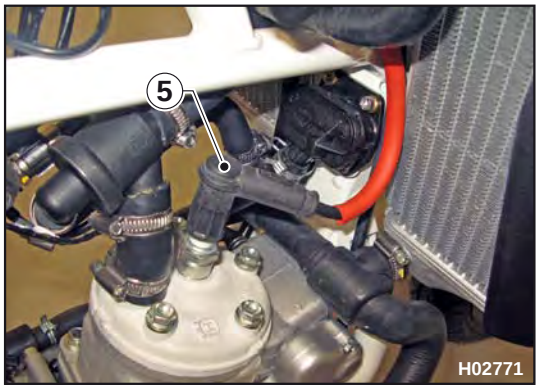
Engine removal

- Lift retaining tab, and disconnect clutch cable (1).

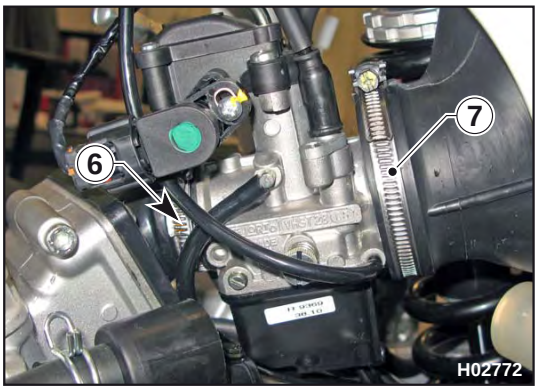


- Disconnect ignition connector (2), PICKUP connector (3), and coolant temperature sensor (4).

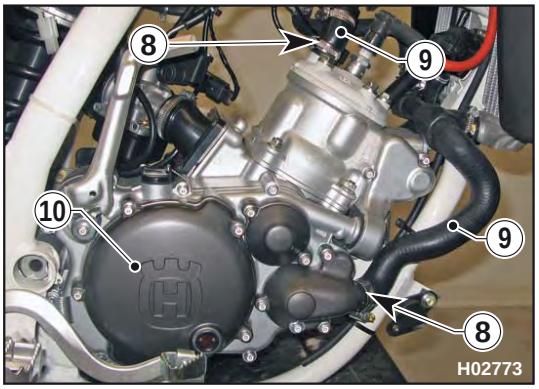




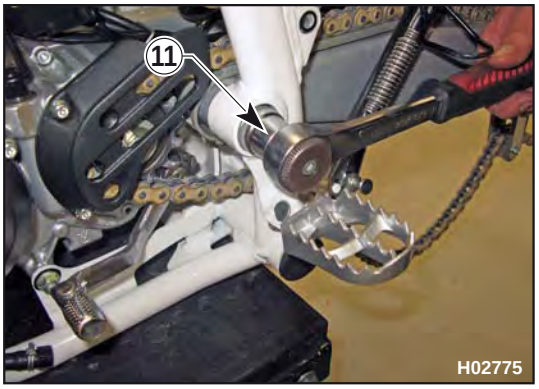
- Take off the spark plug cap (5).



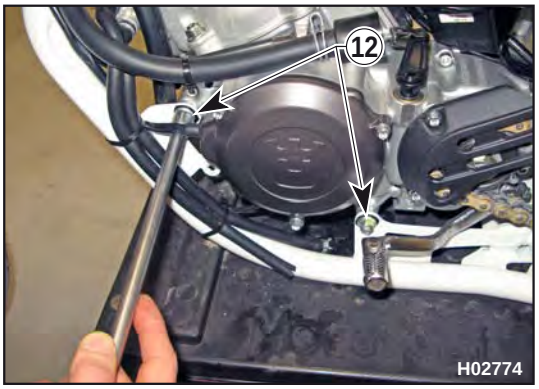
- Loosen clamp (6), and praise carburettor (7) off the intake duct.



- Open clamps (8), and disconnect pipes (9) from engine (10).



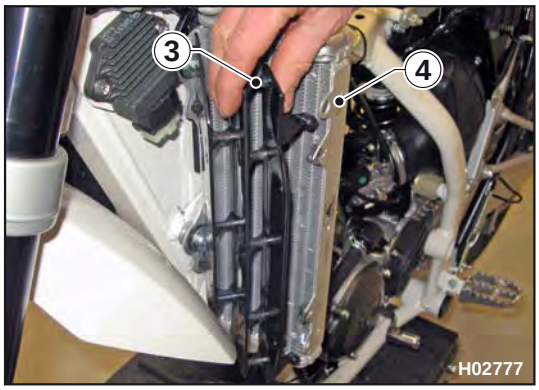
- Using a 27 mm wrench, loosen nut (11) on swinging arm shaft then, working on the right side, remove swinging arm shaft until releasing engine, but without removing swinging arm.



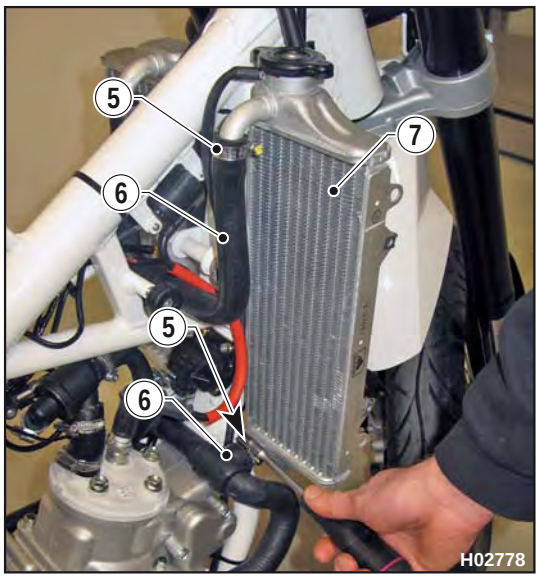
- Using a 12 mm wrench on the left side and a 10 mm wrench on the right side, loosen nuts (12), then remove engine retaining screws.
- Slightly raise engine, and remove it from bike right side.

Radiator removal

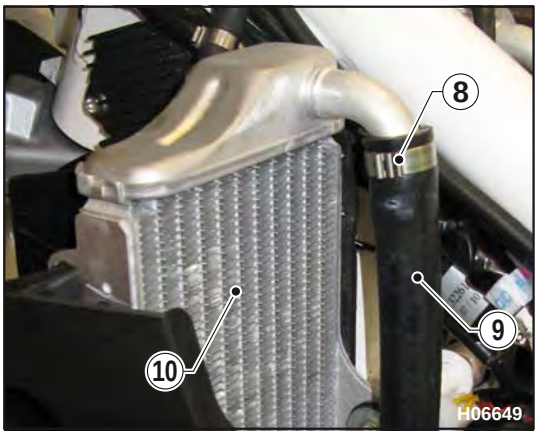
- Remove the fuel tank together with scoops and spoilers as outlined in the relevant paragraphs.
- Drain all coolant as outlined in the relevant paragraph.
- Using an 8 mm wrench, loosen screws (2), and remove radiator protections (1).



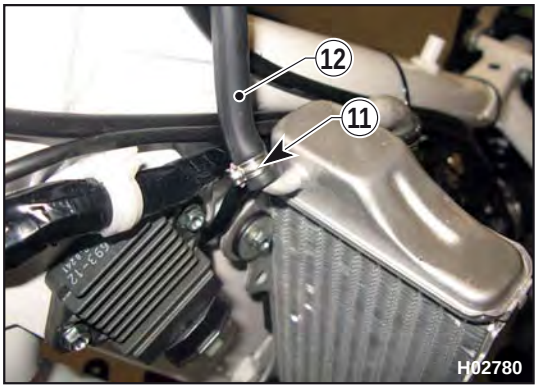
- Remove the plastic grids (3) from the radiators (4).



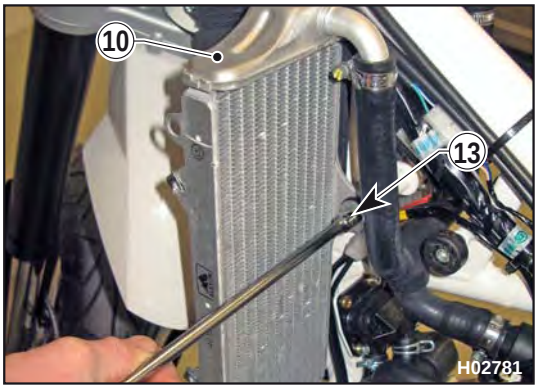
- Open clamps (5), and disconnect hoses (6) from right-hand radiator (7).



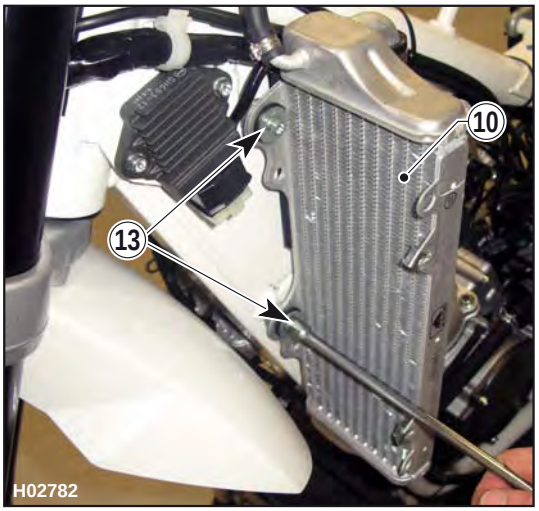
- Open clamps (8), and disconnect hoses (9) from left-hand radiator (10).

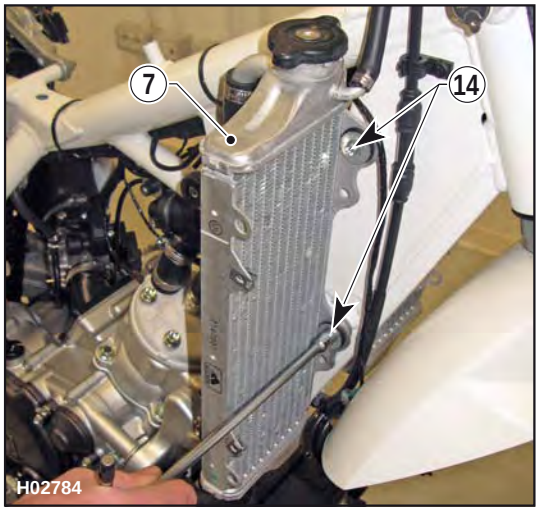


- Open clamp (11), and disconnect the radiator connecting hose (12).

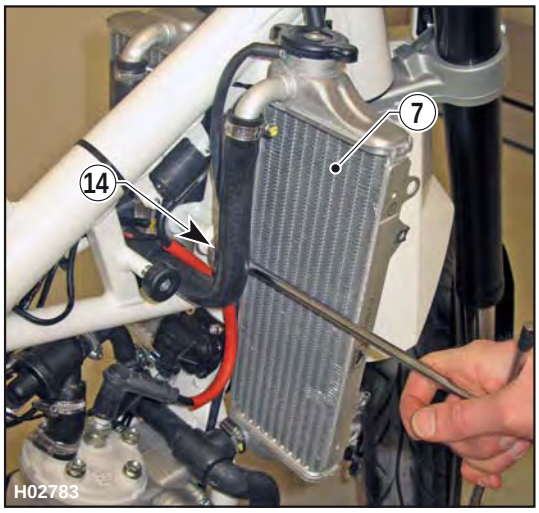


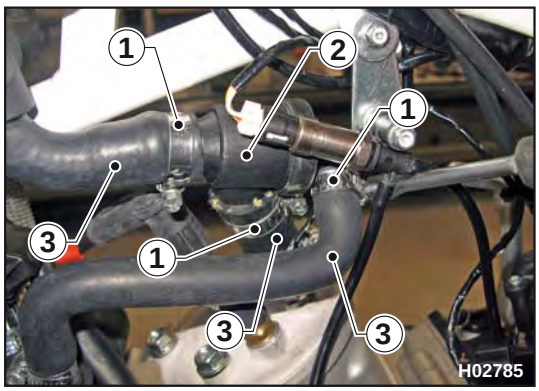
- Using an 8 mm wrench, loosen screws (13), and remove left-hand radiator (10).





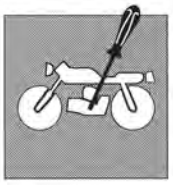
- Using an 8 mm wrench, loosen screws (14), and remove right-hand radiator (7).



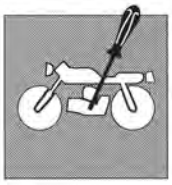


Thermostat removal

- 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).

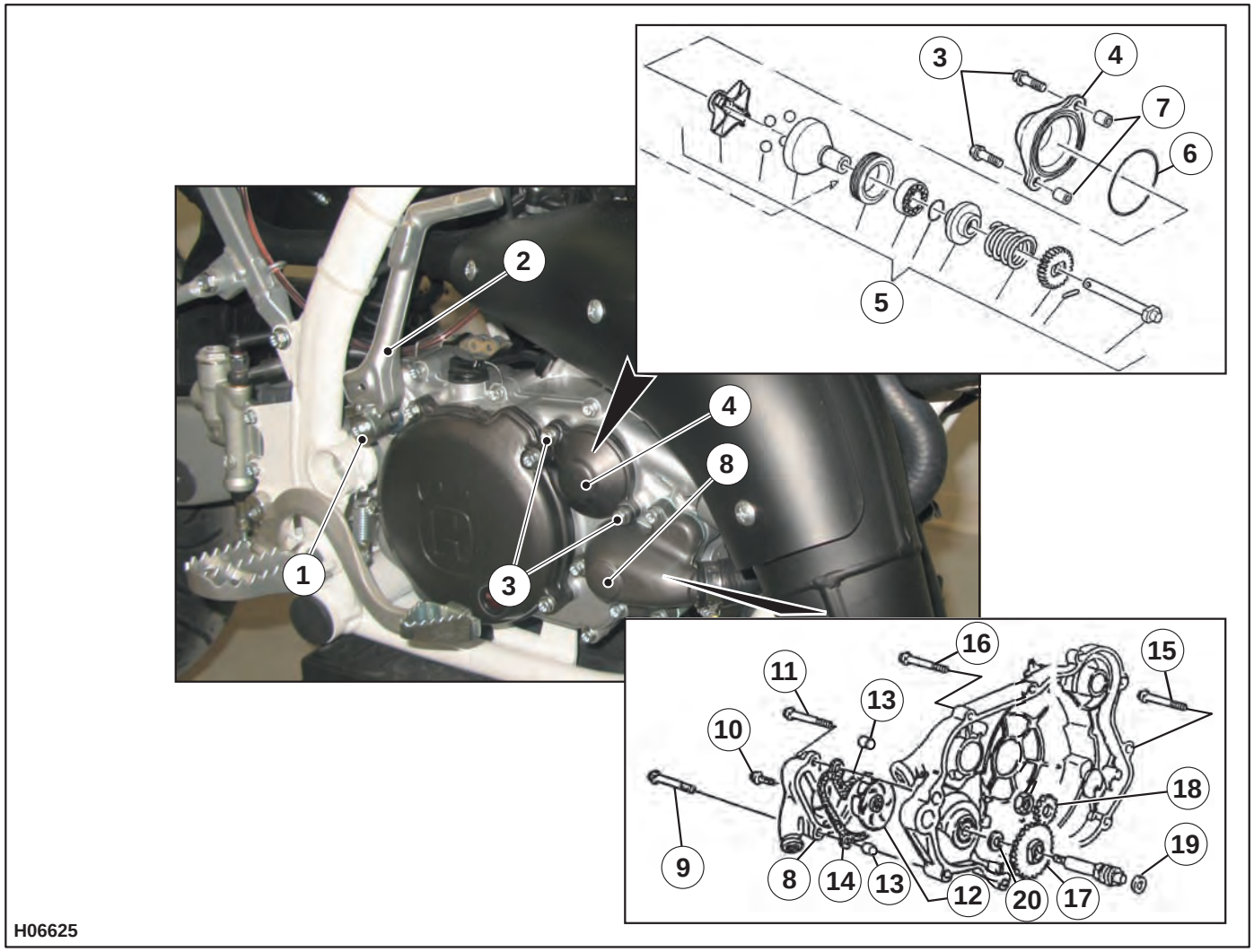


Section F



ENGINE DISASSEMBLY

Right-hand side component and cover disassembly



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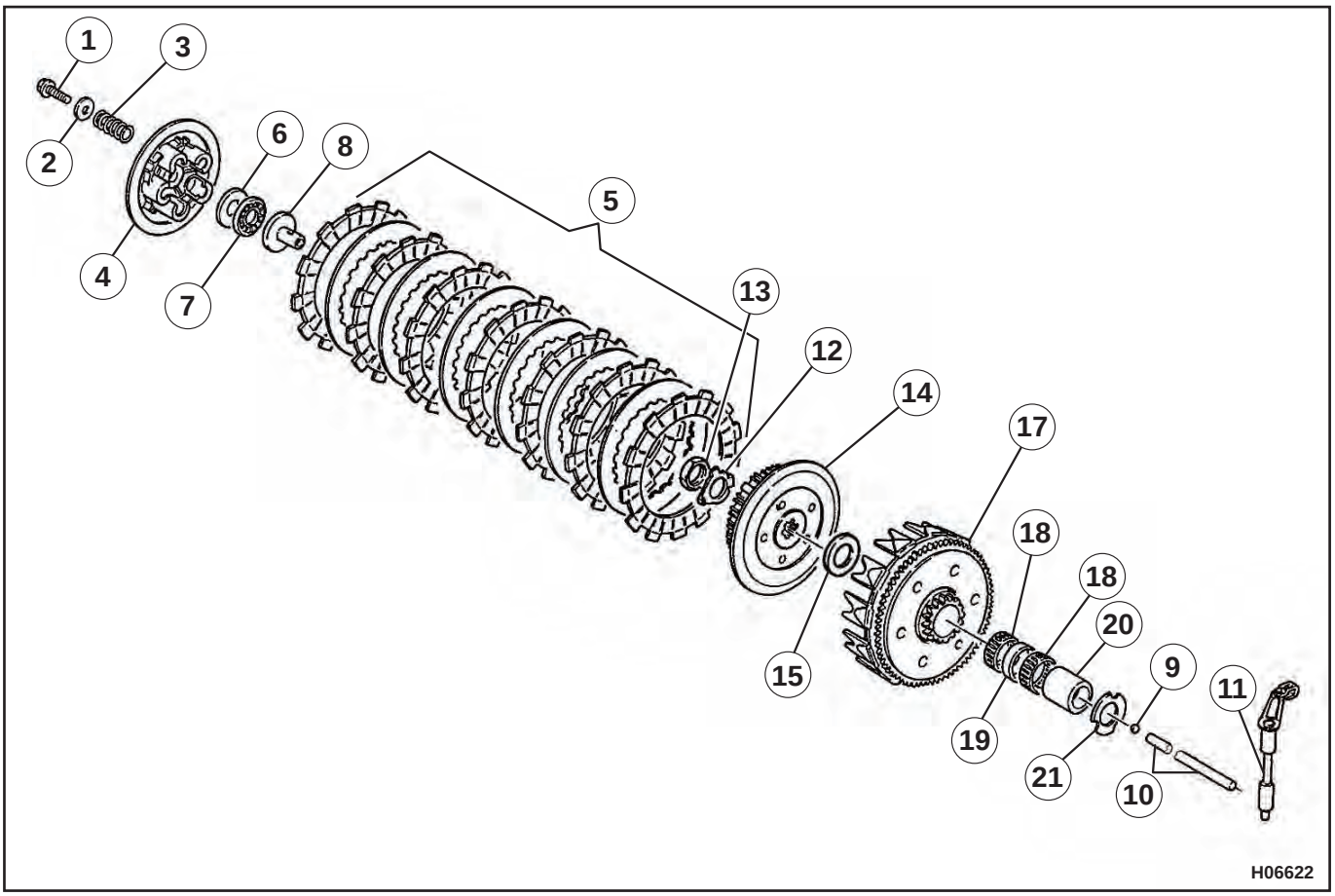
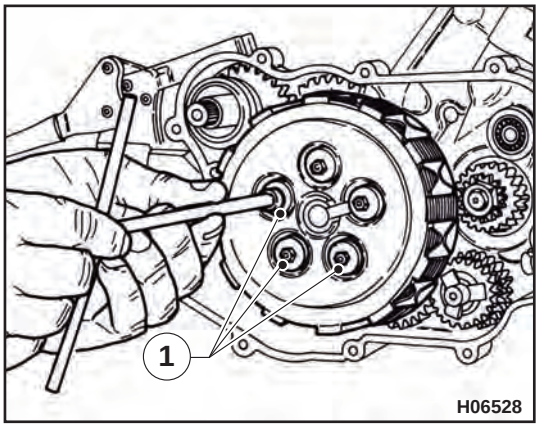
To make disassembly operations easier, it is recommended to place engine block onto a rotating support, securing it on the upper side.
Loosen screw (1), and remove the kick start lever (2). (8 mm wrench)
Loosen the two screws (3), and remove regulator cover (4).
- Remove the complete regulator (5); on 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

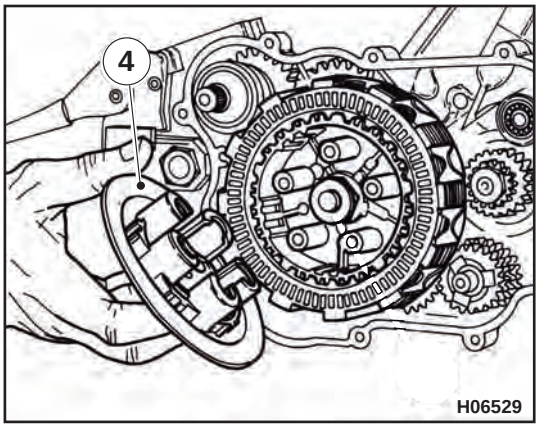


1 Screw
2 Washer
3 Spring
4 Pressure plate
5 Clutch assembly
6 Thrust washer
7 Needle roller bearing
8 Retainer
9 Ball
10 Pushrod
11 Clutch control shaft
12 Lock washer
13 Nut
14 Clutch hub
15 Washer
17 Clutch housing
18 Needle roller bearing
19 Spacer
20 Spacer
21 Washer

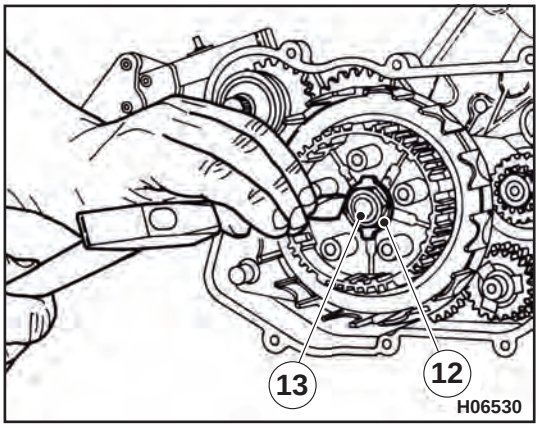


Clutch-side crankcase half component disassembly

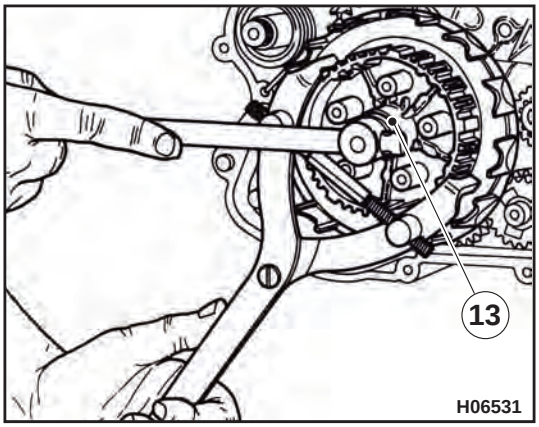
Working crossways, loosen the five retaining screws (1) on clutch springs, and remove them together with the relevant washers (2) and springs (3).



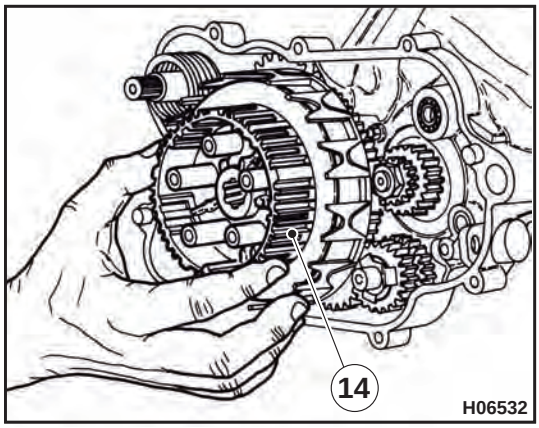
Remove pressure plate (4) and clutch plates pack (5) from hub.
Slide thrust washer (6), axial roller bearing (7) and retainer (8) out of primary shaft end. Tilt engine block on the right side, and slide out ball (9) and pushrod (10).
Working on the opposite side, slide out clutch control lever (11) together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



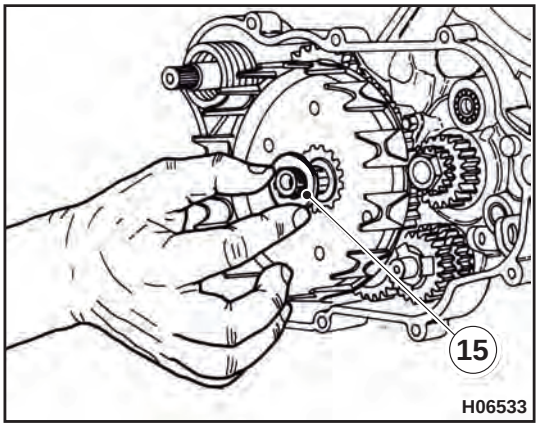
Using a chisel and a hammer, straighten the bent sections of lock washer (12) on clutch hub sealing nut (13).



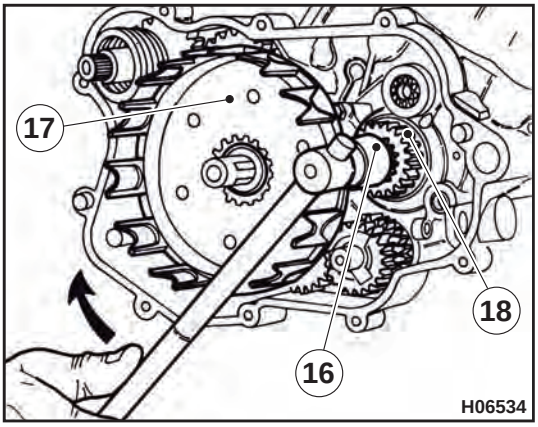
Carry out this operation using special tool part no. **8000 79015** with the ends inserted inside the two opposite grooves on clutch hub.
Lock clutch hub in place with tool, and loosen locking nut (13) with a 22 mm socket wrench.



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

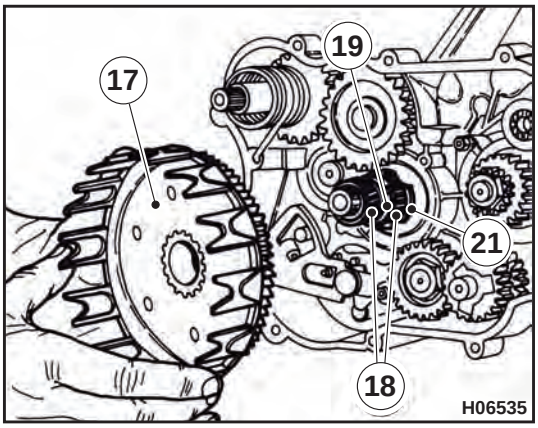


Slide washer (15) out of primary shaft.

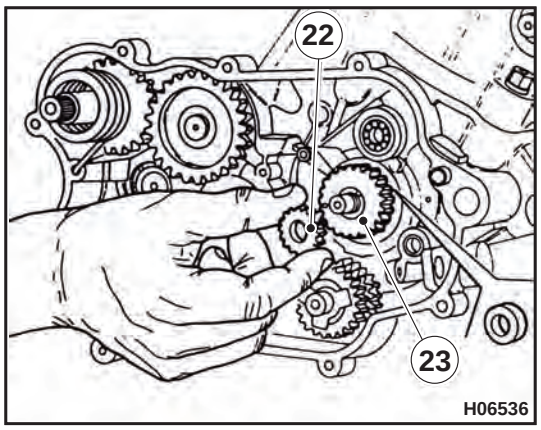


Countershaft nut (16) has a left-hand thread.

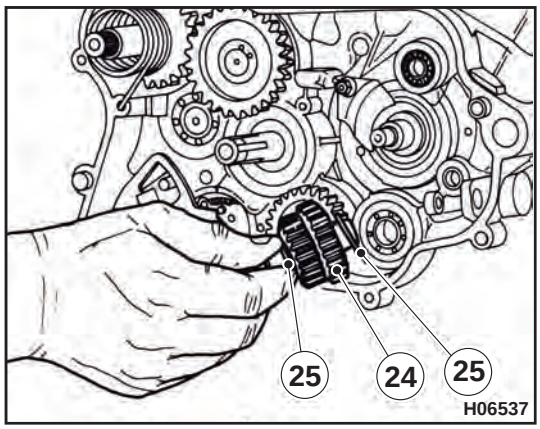
Loosen countershaft nut (16) placing a 1/2 gear or an aluminium shim between clutch housing gear (17) and countershaft gear (18).



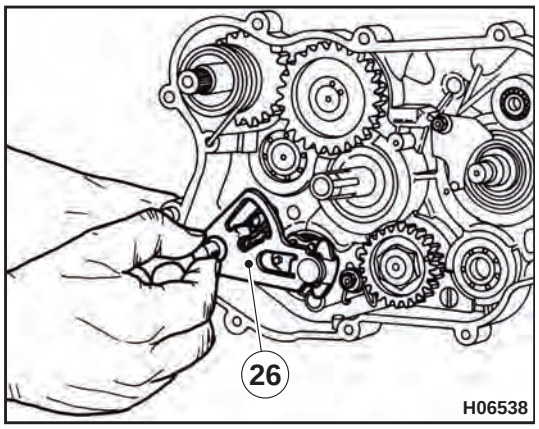
Slide clutch housing (17), the two needle roller cages (18) with spacer (19), the inner spacer (20) and three-tab washer (21) out of primary shaft.
Slide water pump control gear (22) and primary drive gear (23) out of crankshaft.



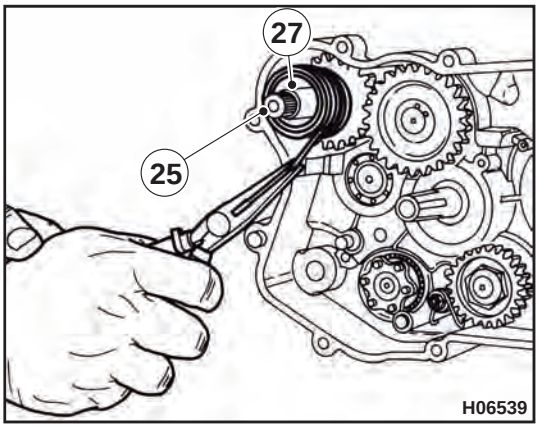
Remove the Woodruff key from crankshaft.



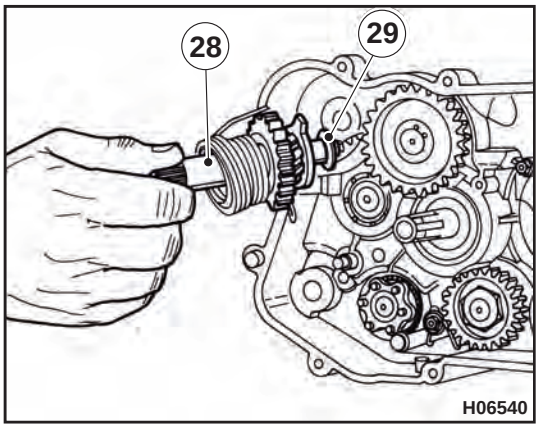
Slide countershaft idle gear (24) with the relevant shims (25) out of right crankcase half.



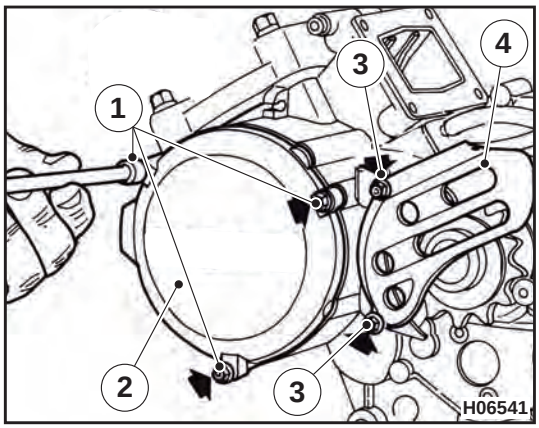
Slide selector shaft (26) out of right crankcase half rear side.



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



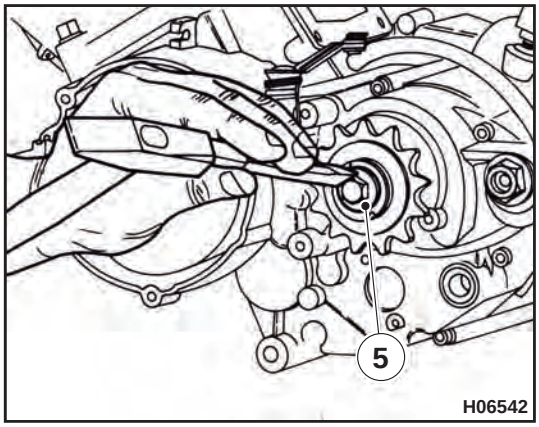
Working on the inner side, slide out starter shaft (28) assembly complete with control gear, and collect washer (29).



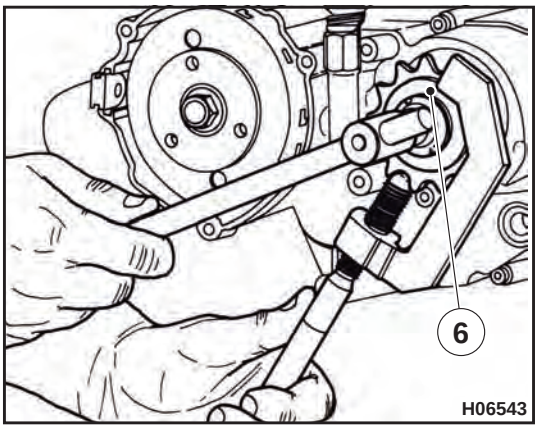
Sprocket-side component and cover disassembly

Loosen the three retaining screws (1), and remove cover (2). Collect gasket.

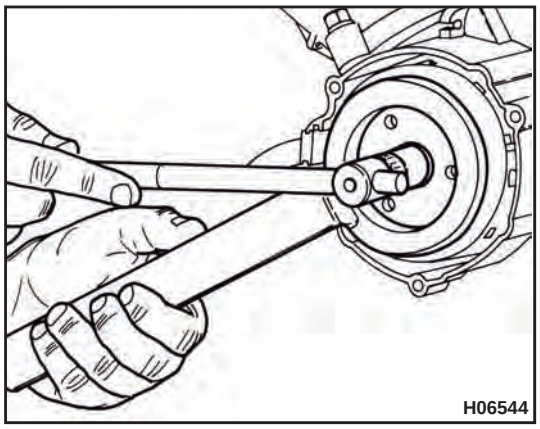
Loosen the two retaining screws (3) on sprocket cover (4), and remove it together with the protective plate and spacers.



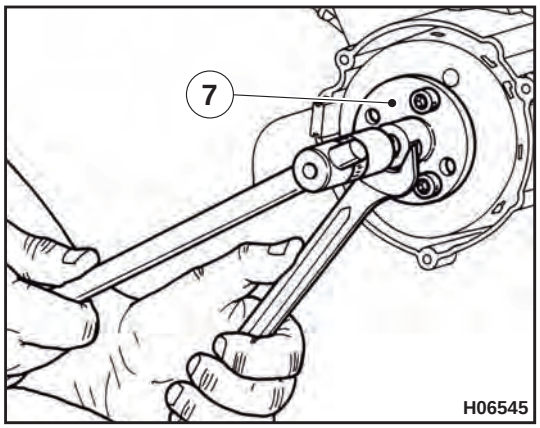
Using a chisel and a hammer, straighten the bent sections of lock washer (5) on sprocket sealing screw.



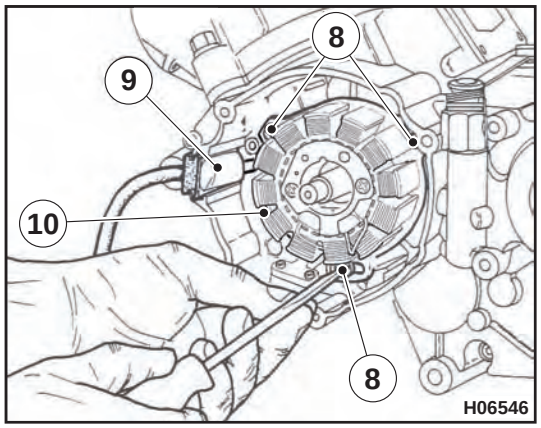
Lock sprocket (6) in place using tool part no. **00YA2273** and then, with a 13 mm socket wrench, loosen sprocket sealing screw on output shaft. Slide out this screw, lock washer, large washer and sprocket.
On reassembly, take care to correctly position the large washer: the two caulked ends shall be pointing the sprocket.
Remove also spacer with the O-ring.



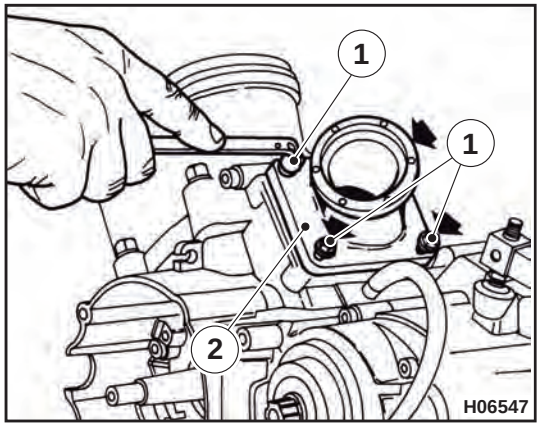
Prevent rotor rotation using a suitable tool.
Using a 17 mm socket wrench, loosen rotor sealing nut.
Remove lock washer.



Use tool (7) part no. **8000 51614**, and secure it onto rotor with three screws having a suitable length.
Holding the tool in place with a 19 mm Allen wrench and working clockwise on the central screw, remove rotor from crankshaft with a 17 mm Allen wrench.

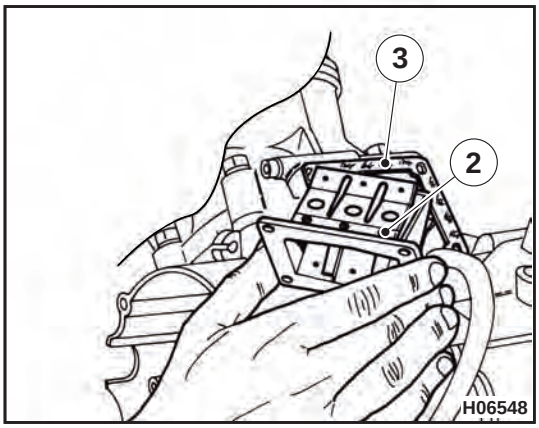


Loose the three retaining screws (8) on stator. Slide rubber block and plate (9) out of left crankcase half, and remove the complete stator (10).
Remove the Woodruff key from crankshaft.



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.

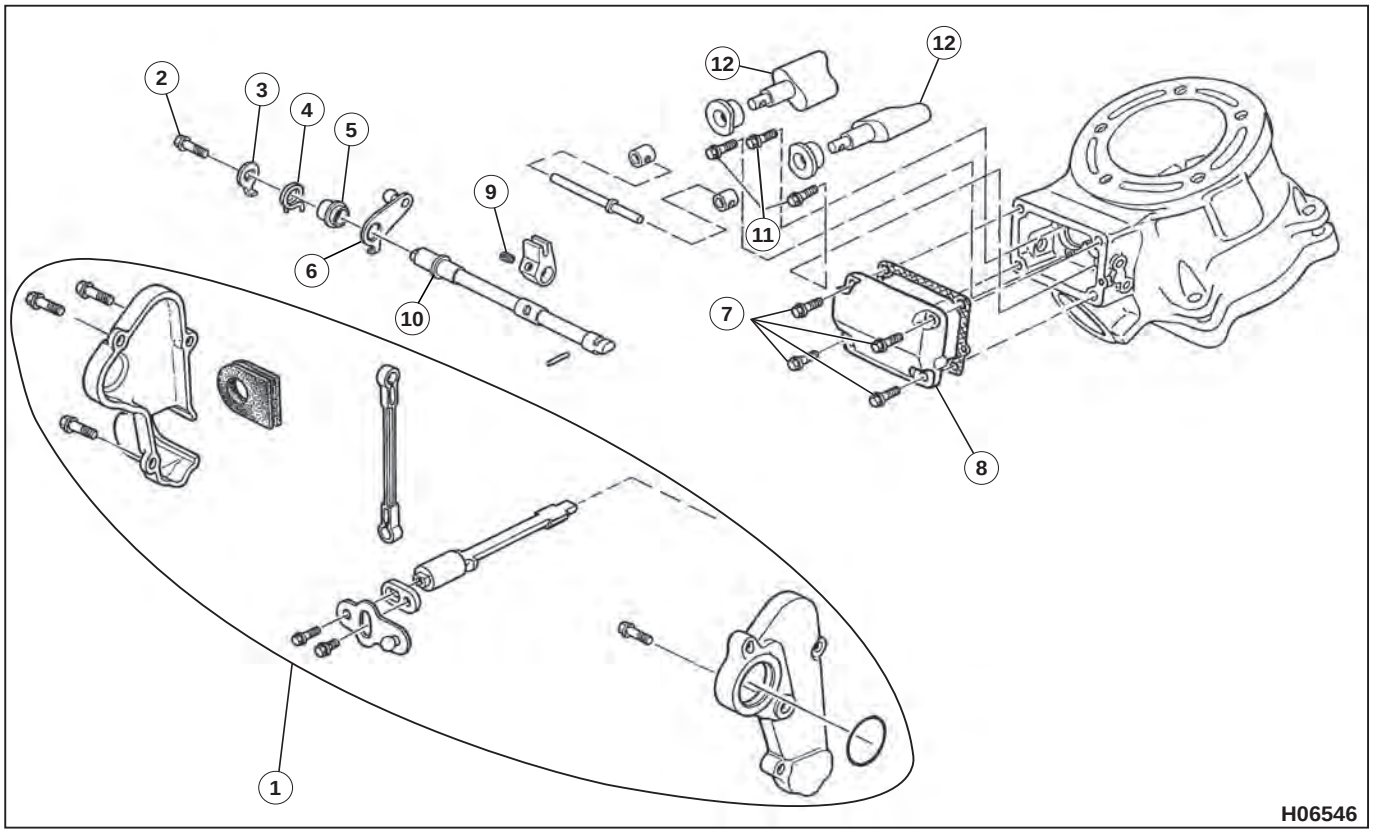


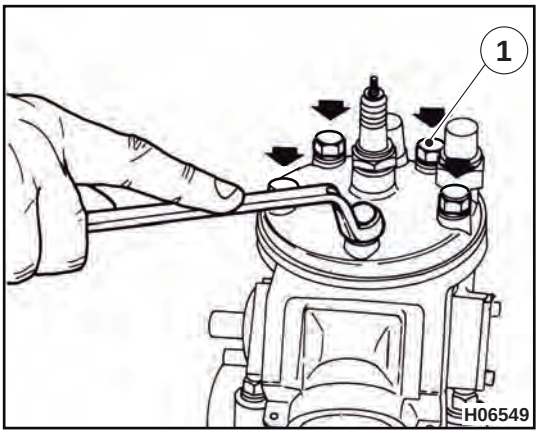
Remove intake valve (2) from crankcase, and collect gasket (3).

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).

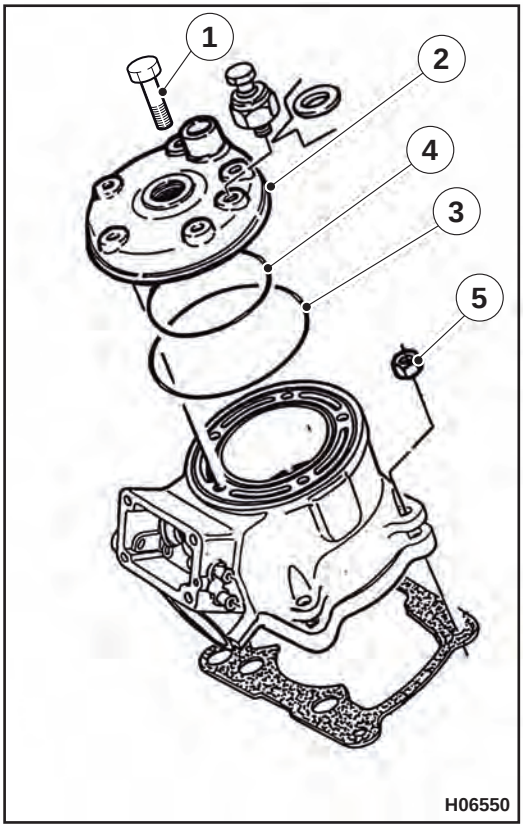
Remove screws (7) and cover (8). Loosen grub screw (9), duly turn shaft (10), and remove if from its seat on cylinder. Remove screws (11) and exhaust valves (12).





Piston-cylinder-and-head assy disassembly

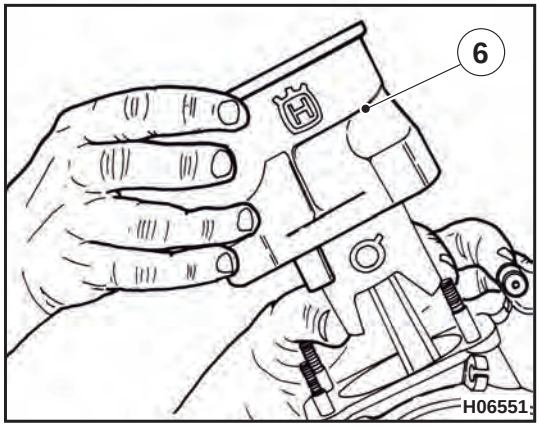
Head, cylinder and piston can be disassembled also at an earlier stage, as this procedure is independent of the disassembly operations carried out so far.
The piston-cylinder-and-head assy removal proves now necessary in order to separate the crankcase halves.
Loosen the five head sealing screws (1)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



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

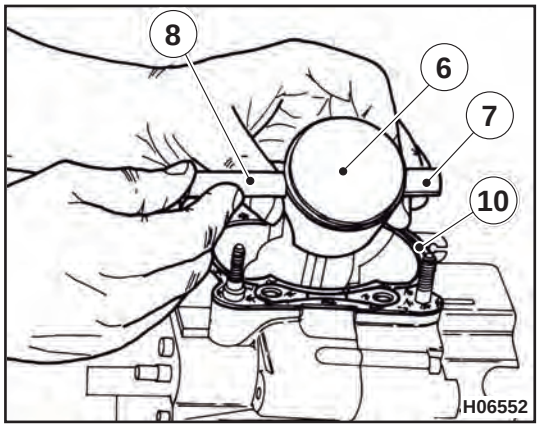
NOTE: The O-rings between head and cylinder shall be changed upon each reassembly.

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

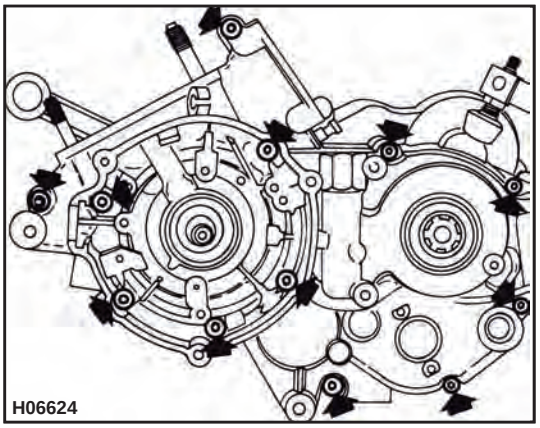


Slide cylinder (6) out of crankcase stud bolts, by duly supporting piston with your hands when it is separated from cylinder.

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.

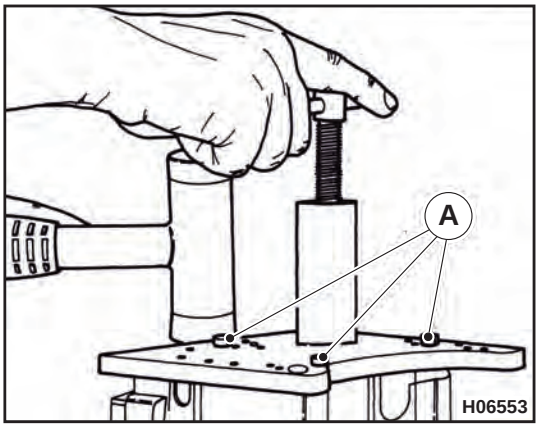


Remove one of piston pin (7) retainers, duly support piston and partially slide out piston pin using a cylindrical pin (8) until piston is free.
Remove piston (9) with piston pin.
Slide roller cage out of connecting rod.
On reassembly, replace gasket (10).

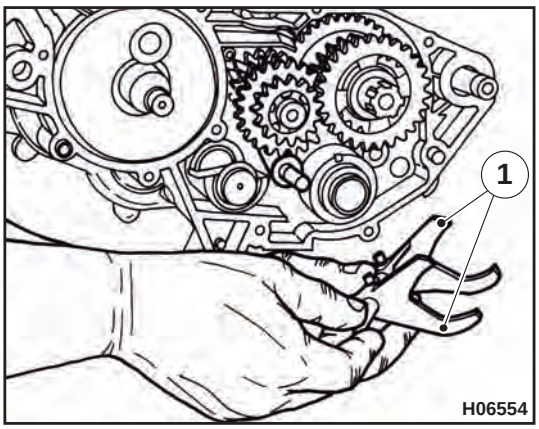


Splitting the crankcase

Loosen the 12 retaining screws on left crankcase half.

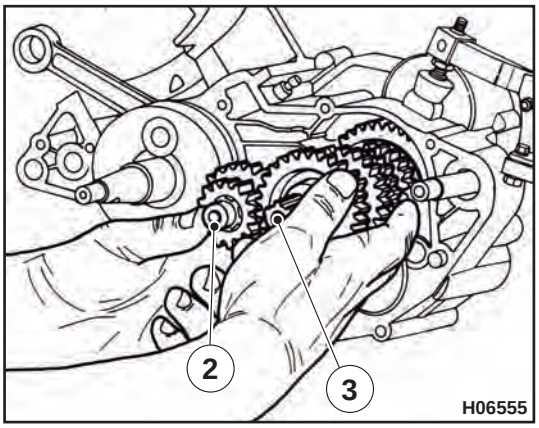


With the gearbox in neutral position, fit tool part no. **8000 79016** on left crankcase half (with 3 duly-sized "A" screws), work on the central pin and separate crankcase halves.
To make this operation easier, tap output shaft end with a mallet while working with tool pin.
Remove shims from crankshaft,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

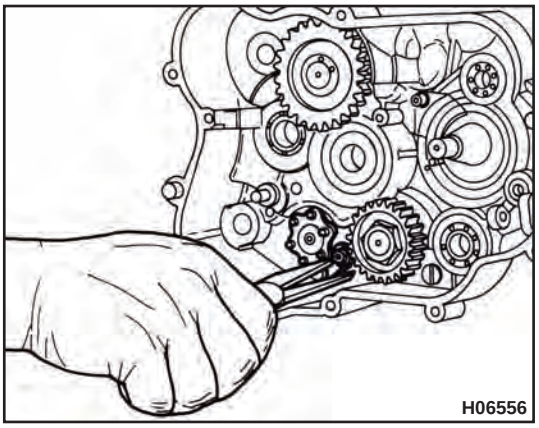


Gearbox removal

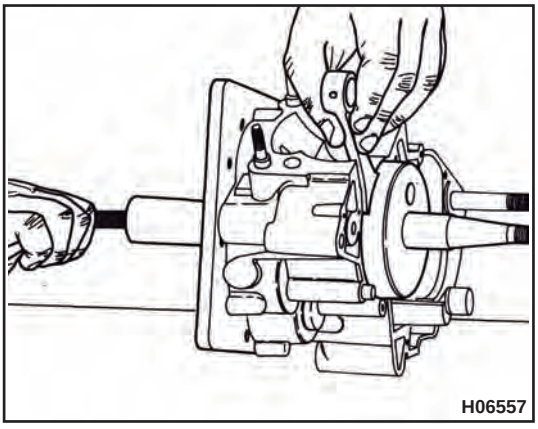
Slide counter roller out of balance shaft.
Remove the two pins (1) with shifter forks.



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.

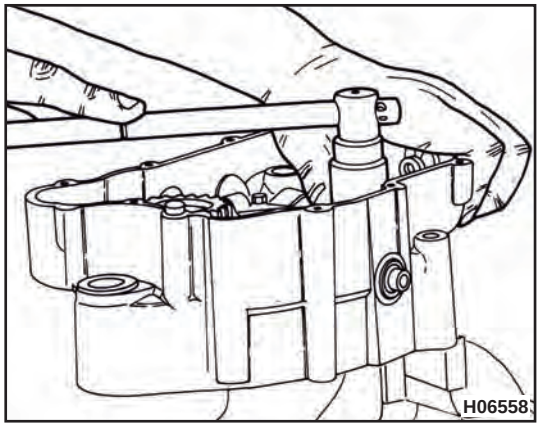


Crankshaft removal

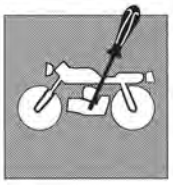
Should it be necessary to remove crankshaft from right crankcase half, use the same tool part no. **8000 79016** already used for crankcase splitting.
Align tool holes with those on right crankcase half outer side, and secure tool with three screws of a suitable length. Duly support crankshaft, and work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

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

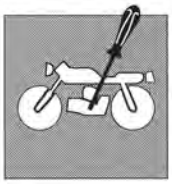
To remove bearing, that will remain integral to the crankshaft on the left side, use tool part no. **8000 89030**. On reassembly, take special care to position shim between shaft and bearing.

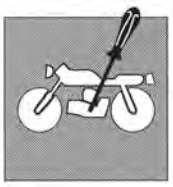


To remove countershaft, use a vice with aluminium jaws, and loosen nut with a 22 mm socket wrench. Slide out gear, collect key, and slide out shaft from the opposite side.



Section G

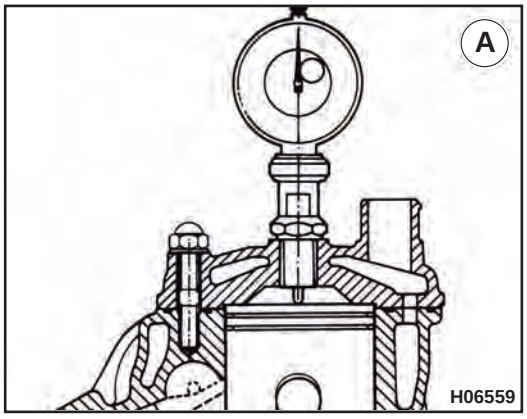


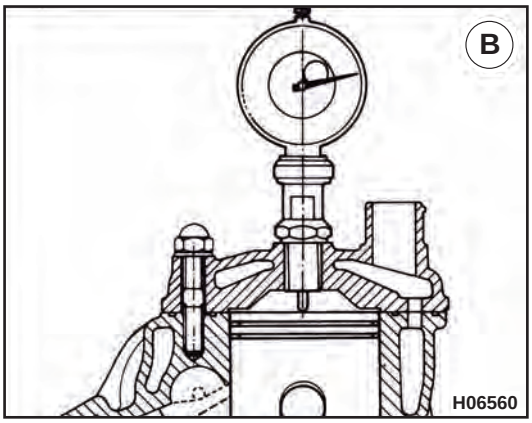


Cleaning parts

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.

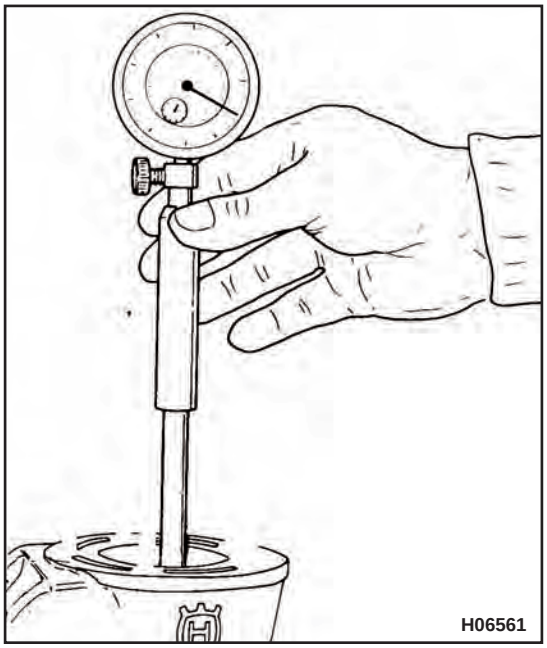
Compression ratio check

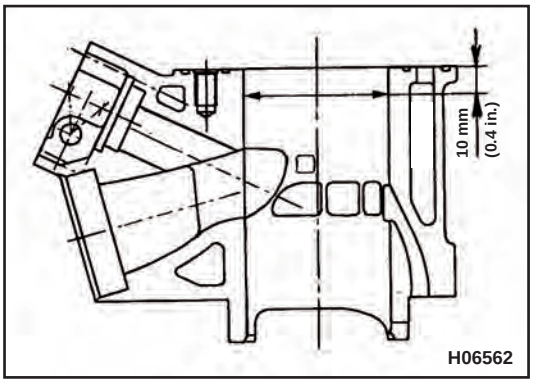
To check if the compression ratio is correct, proceed as follows:

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.

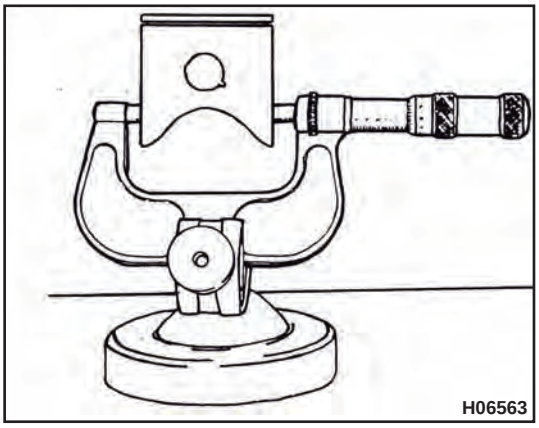
Cylinder measuring

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

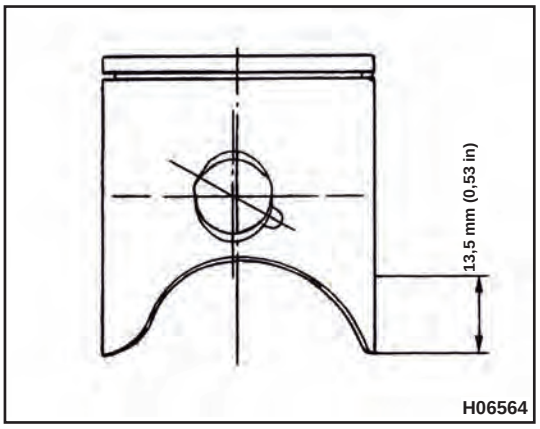
To ensure the best operating conditions and maximum performance, all clearances must be within the specified tolerance. A tight fit will lead to seizure as moving parts heat up; whereas a loose fit will cause annoying vibration resulting in early wear of moving parts.

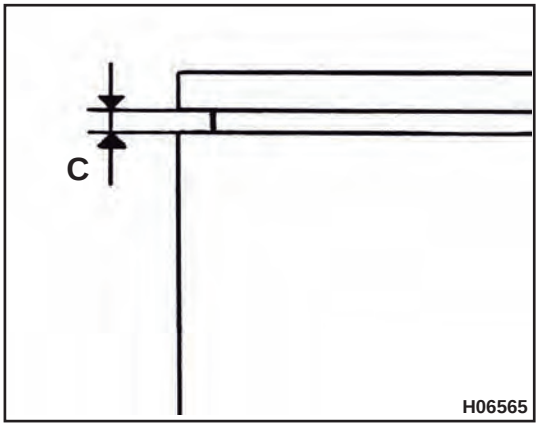
Piston



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.

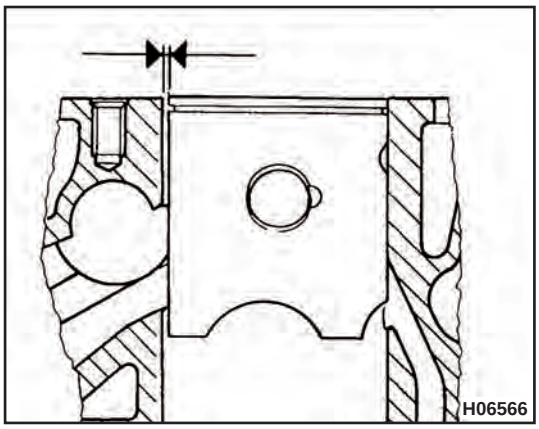
The piston diameter (D) shall be measured 13.5 mm (0.53 in.) from the skirt bottom, perpendicularly to the piston pin axis.





Piston groove height (C)

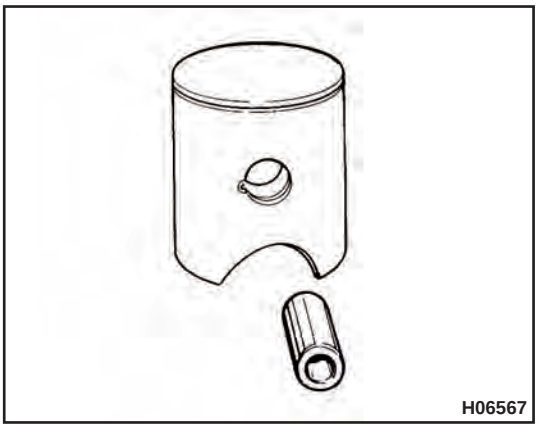
Standard	Max. size limit
1.02 ÷ 1.04 mm (0.0401÷0.0409 in.)	1.1 mm (0.043 in.)



Cylinder to piston clearance

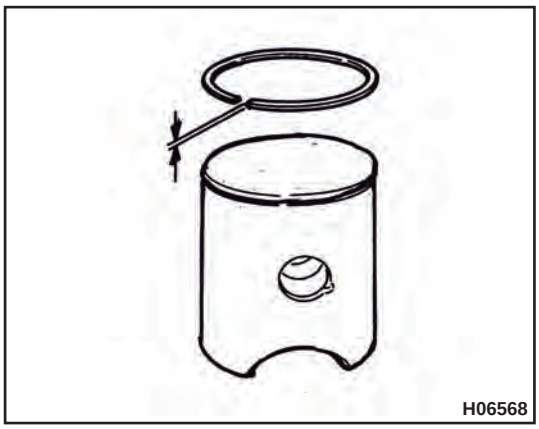
The piston-cylinder units are supplied already coupled; should the cylinders and pistons of some units have been accidentally mixed up, it will be necessary to measure the diameters as outlined in the previous paragraphs.
Take these measurements at a stabilised temperature of 20°C.
Preferential clearance 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").

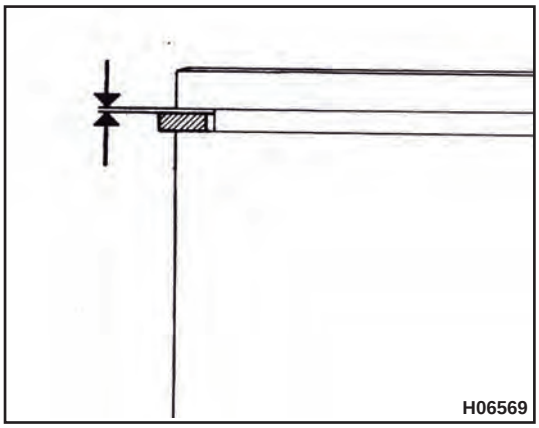


Piston rings

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

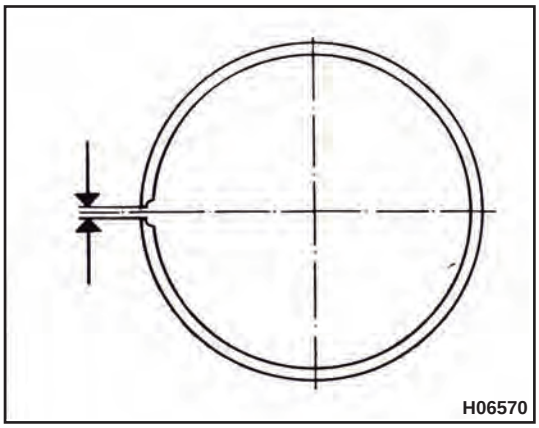
Standard	Max. size limit
0.978÷0.990 mm (0.0385÷0.0390 in.)	0.96 mm (0.038 in.)



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

Piston ring to groove clearance

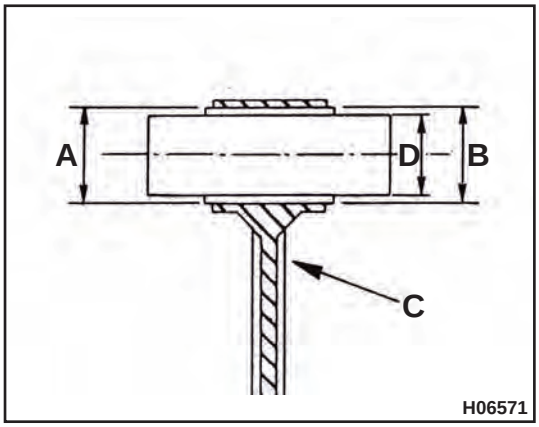
Standard	Max. size limit
0.030÷0.062 mm (0.00118÷0.00244 in.)	0.18 mm (0.0071 in.)



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.)

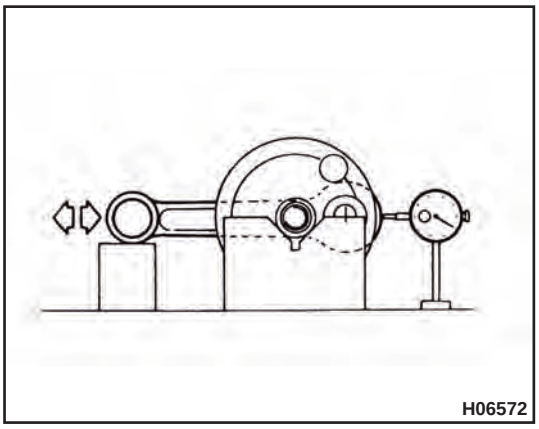


Piston pin-piston-connecting rod small end clearance

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.

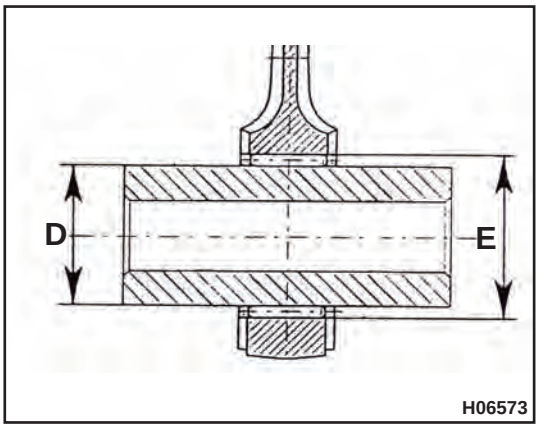
"A" connecting rod small end hole diameter colour selection - mm (in.)	"D" piston pin diameter colour selection - mm (in.)	"B" needle roller bearing cage diameter selection
White 18.998÷19.000 (0.7479÷0.7480)	White 14.998÷14.996 (0.5904÷0.5903)	-1÷-3
Black 19.000÷19.002 (0.7480÷0.7481)	Black 15.000÷14.998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


H06572

Pin-flywheel-connecting rod big end clearance

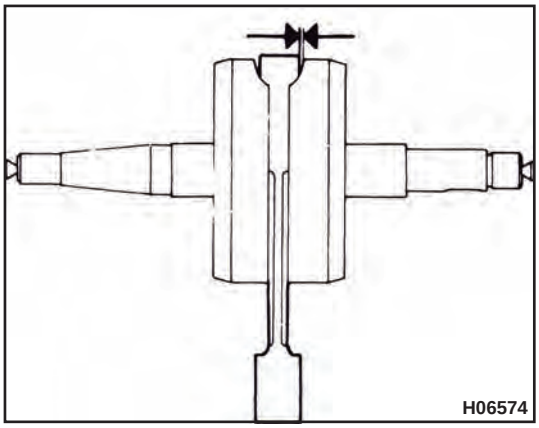
The table below is a list of the possible clearances allowing to reach the right radial clearance of 0.20÷0.028 mm. If, during engine overhaul, a radial clearance higher than the max. allowed value of 0.050 is found, it will not be necessary to measure the diameter "E" of connecting rod big end and the 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.



H06573

"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

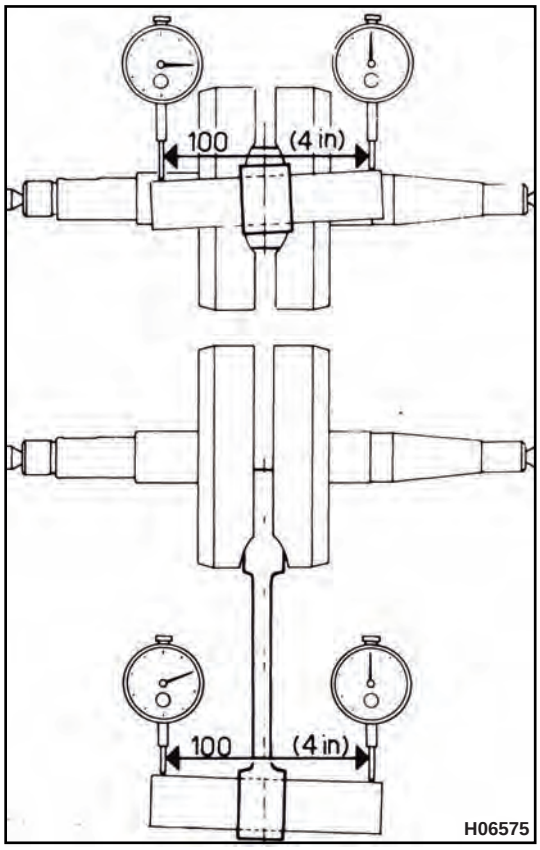


Connecting rod

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.

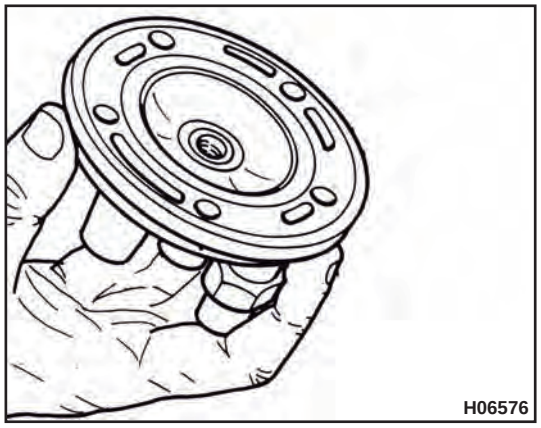
Big end axial clearance

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



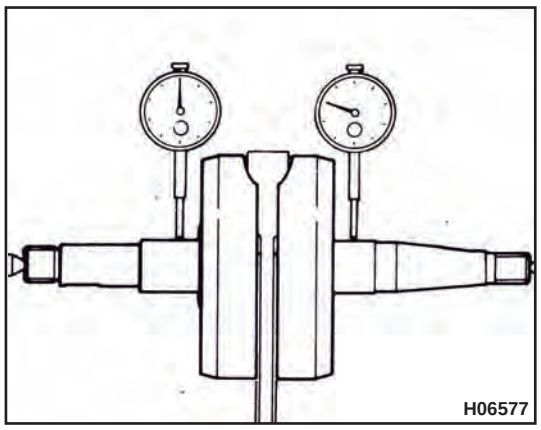
Connecting rod twist, warping

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.

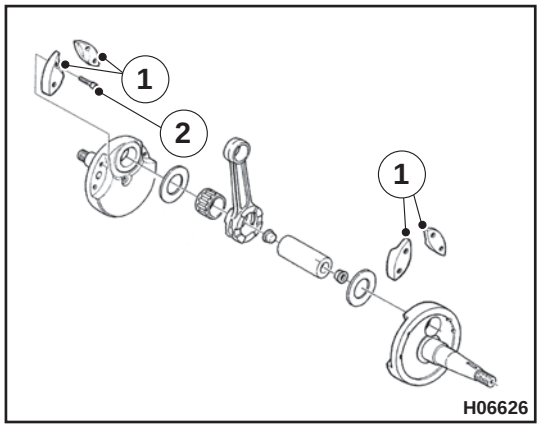


Crankshaft

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.)

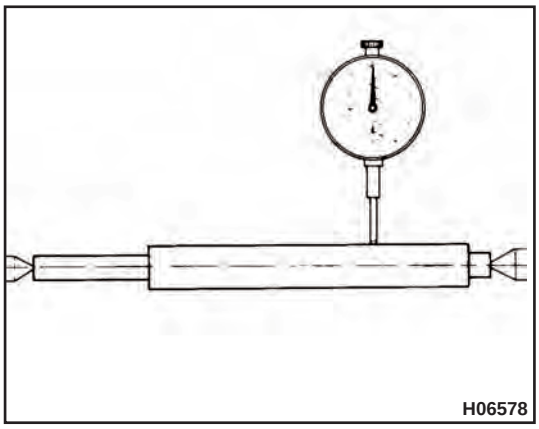


To disassemble crankshaft, use a support and suitable punches.
On reassembly, comply with the specified tolerances.

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).

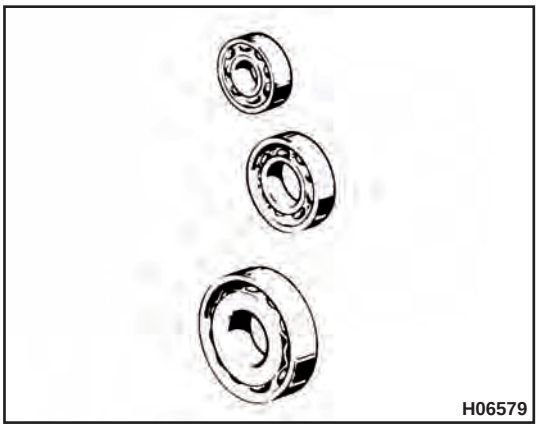
Loosen screw (2) and remove the pads (1).

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.).

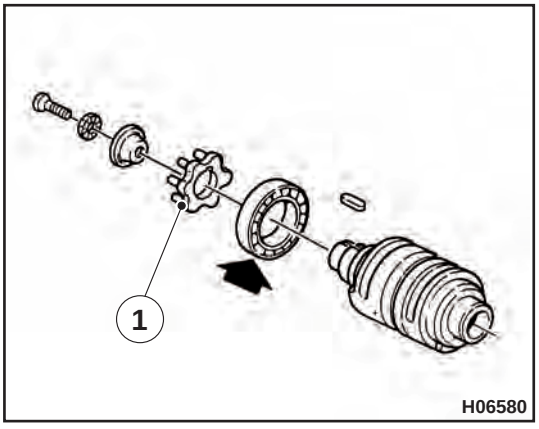


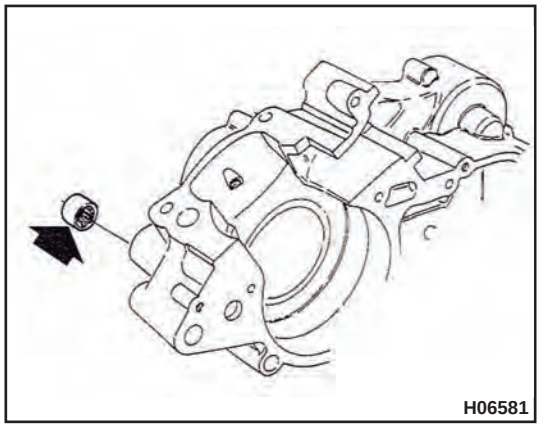
Bearings

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**.

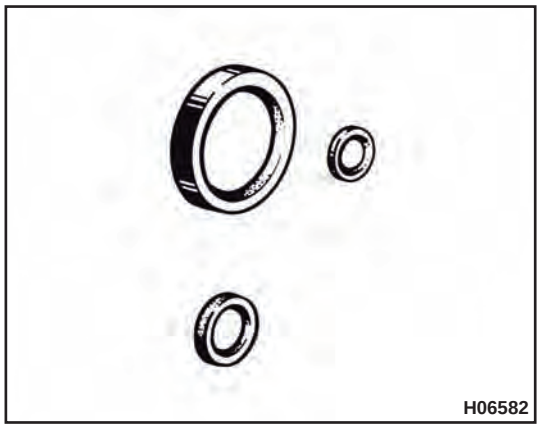
Make sure that the sector gear (1) is not loose; if necessary,replace the key, the screw and the washer, and reassemble with Loctite 648.





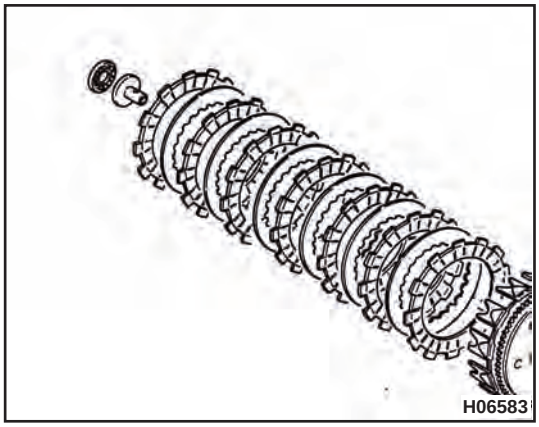
Needle roller bearing replacement

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



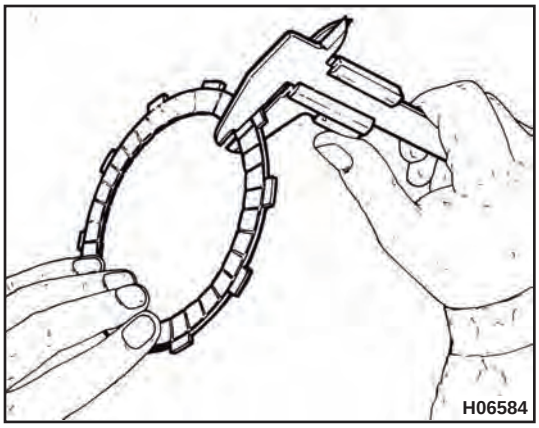
Oil seal replacement

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.



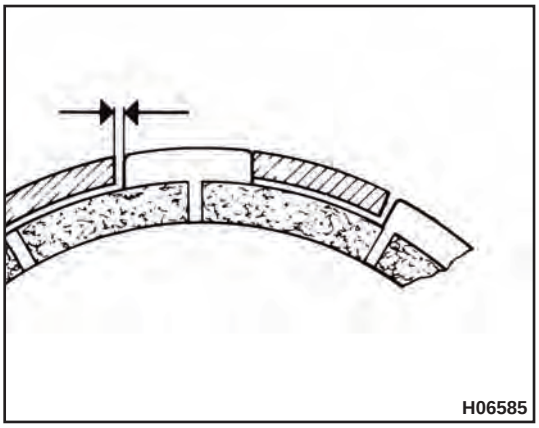
Clutch unit

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.



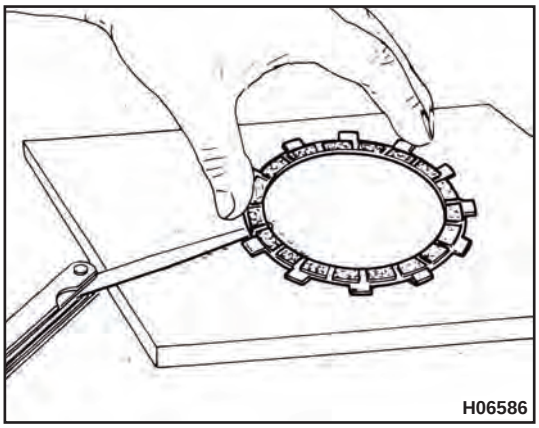
Friction plate thickness

Standard	Max. size limit
3.05÷2.95 mm (0.120÷0.116 in.)	2.8 mm (0.11 in.)



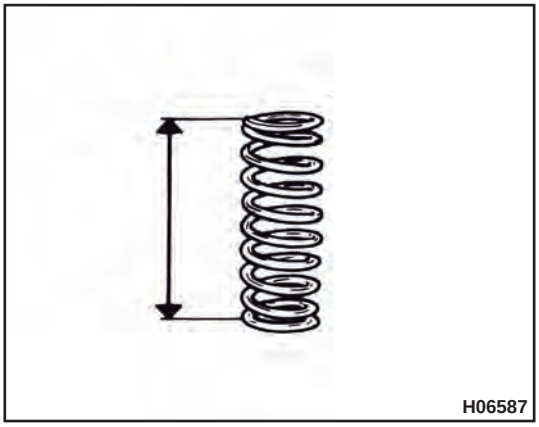
Friction plate to clutch housing clearance

Standard	Max. size limit
0.25÷0.35 mm (0.0098÷0.0138 in.)	0.8 mm (0.031 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.)



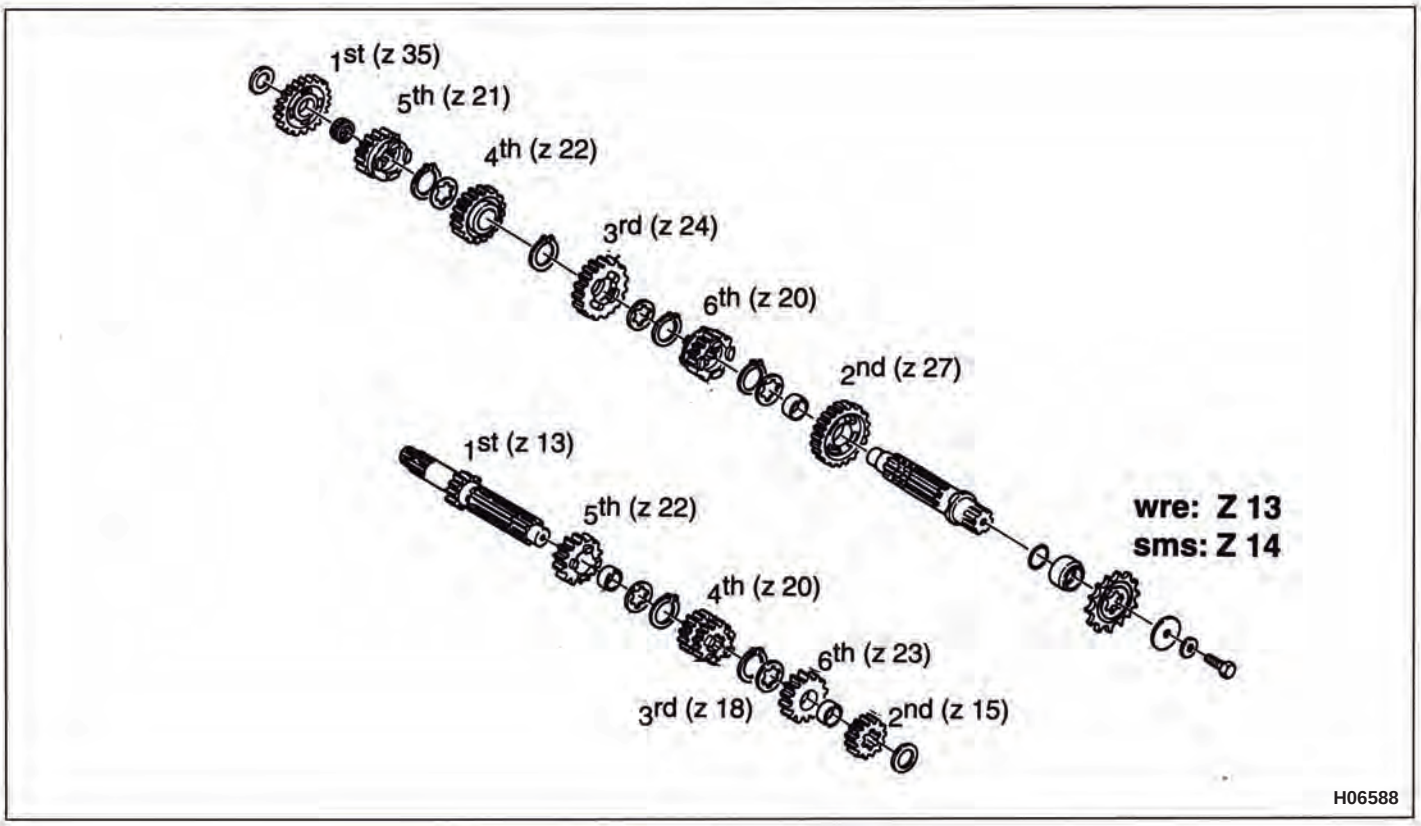
Clutch spring

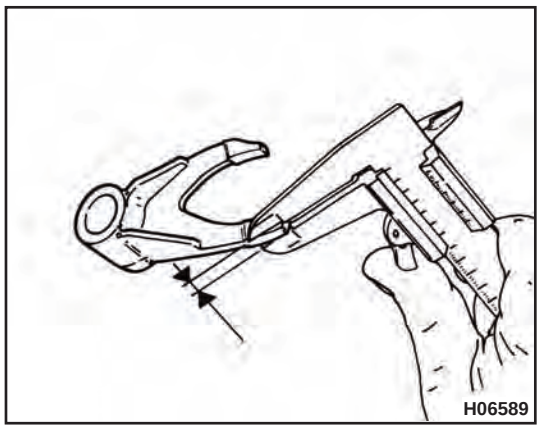
Two types of springs can be used on the engine: they have similar features, but are different in length. When checking them, the free length shall not be lower than the value specified below.

Free check length	
Standard	**Max. wear limit**
45 mm (1.77 in.)	42,5 mm (1.67 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.



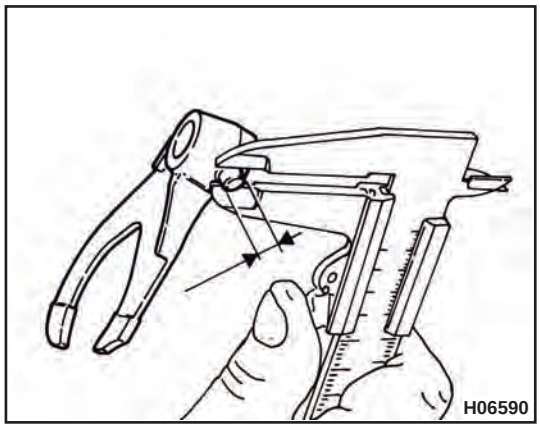


Shifter forks

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.

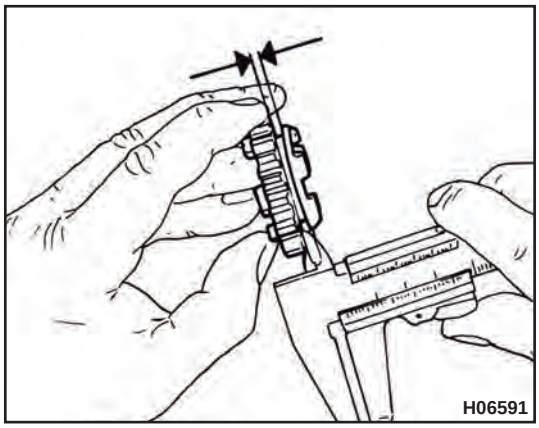
Fork slider thickness

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



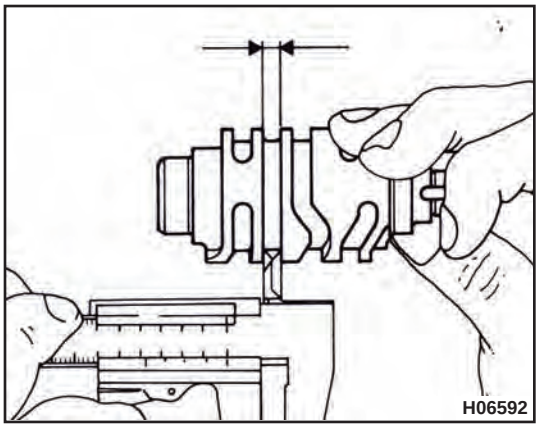
Fork guide pin diameter

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



Gear groove length

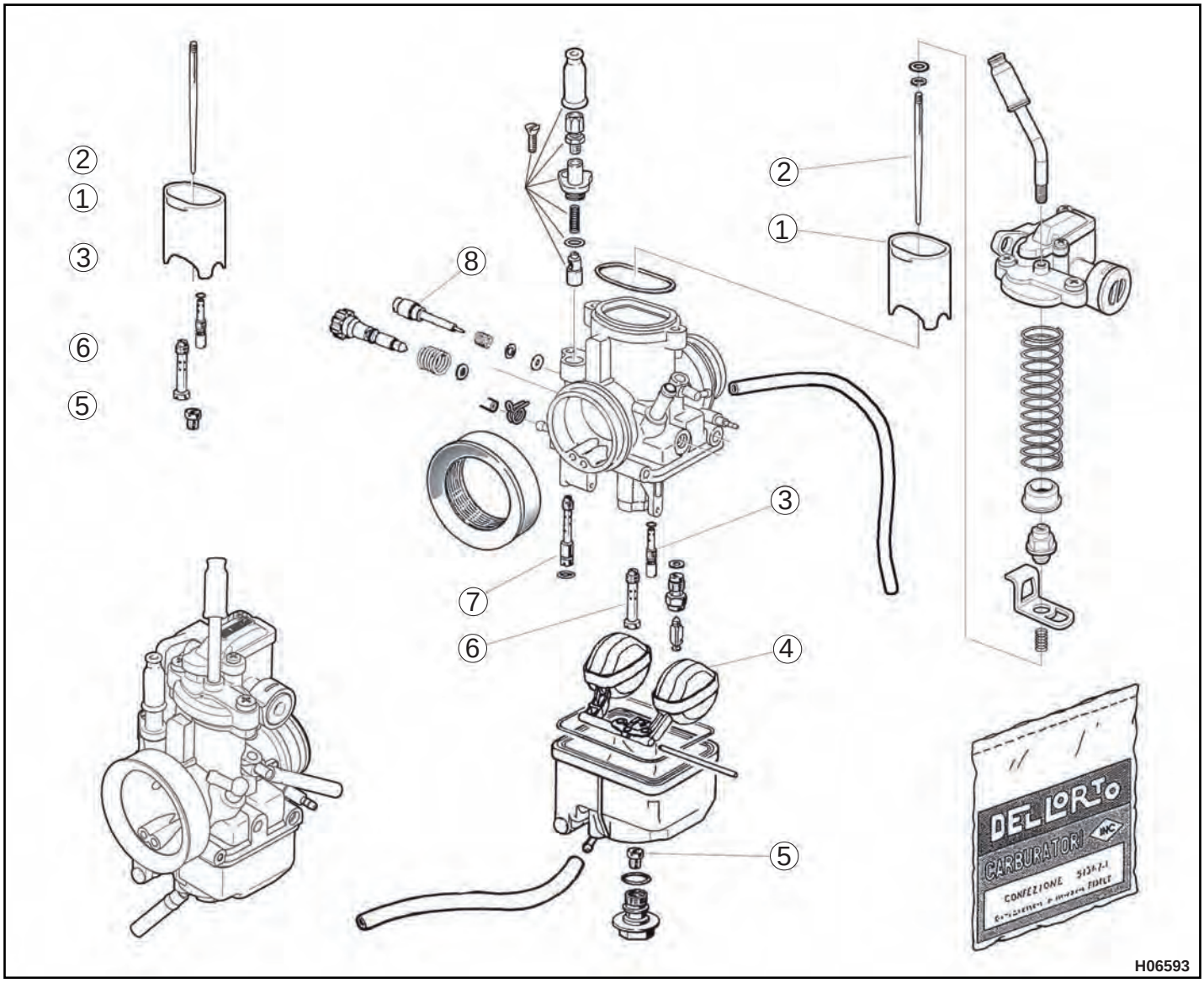
Standard	Max. size limit
3.65÷3.72 mm (0.143÷0.146 in.)	3.8 mm (0.150 in.)



Control shaft groove width

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

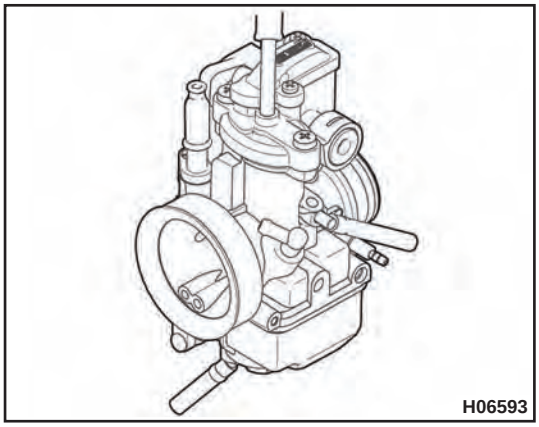
Carburettor



NOTE: adjuster screws are on the left side of the motorcycle.

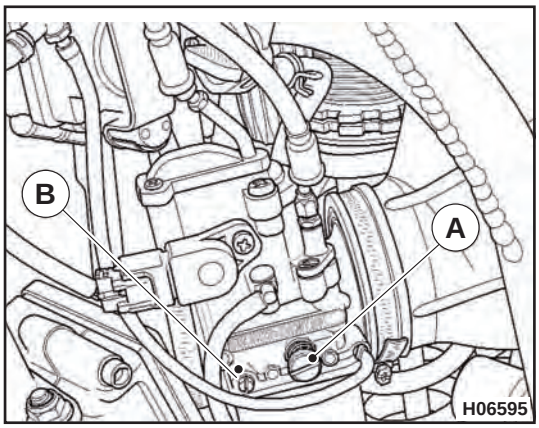
Description Ref.	Dell'Orto PHBH 28
1 Throttle valve	55
2 Taper needle	D 48/2nd groove (*)
3 Idle diffuser	U 38
4 Floater	N° 2 6.5 gr
5 Jet at maximum	142
6 Main nozzle	HN 268
7 Start jet	60
8 Air screw turned out	1 and 1/2
- Venturi diameter (mm)	28

(*) with washer between retainer and throttle valve



Carburettor overhaul

Clean all carburettor components thoroughly with gasoline and dry them with compressed air. Clean all jets and holes thoroughly blowing them with compressed air. Never use tool bits or metal wire. Check that the slide valve is in good condition. It should slide freely in its housing, without too much play. Check that taper needle and main nozzle are in good condition. Check the needle valve for proper sealing.



Mating face

Adjustment

a) - Idle

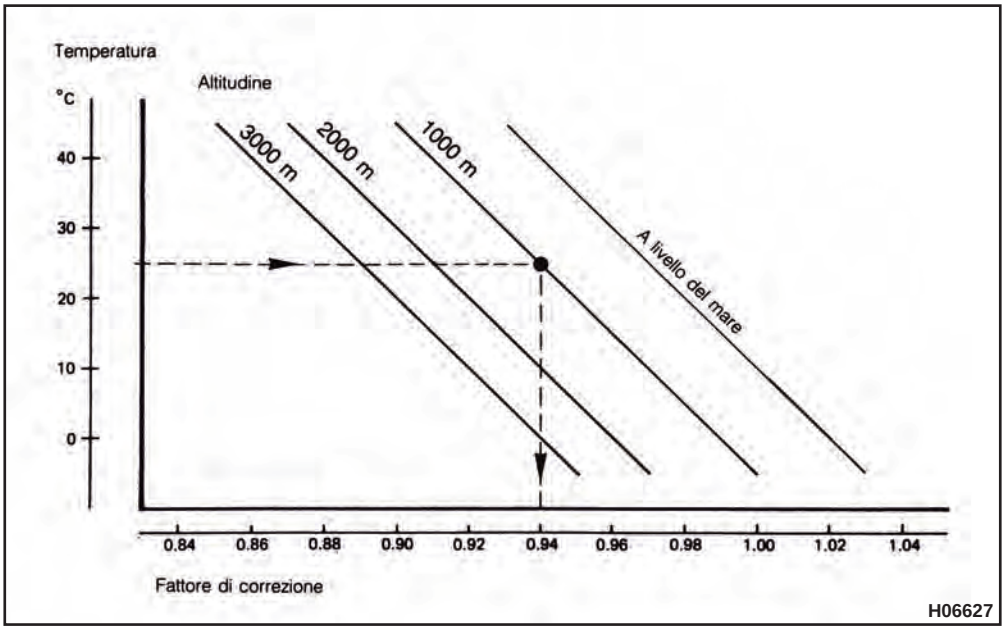
Idle adjustment shall be always carried out with engine warmed up.
Loosen the air adjuster screw (b) of 1 1/2 turns from the fully closed position , then gradually act on the idle speed adjuster screw (a) until reaching the idle speed of 1,500 -1,700 rpm.

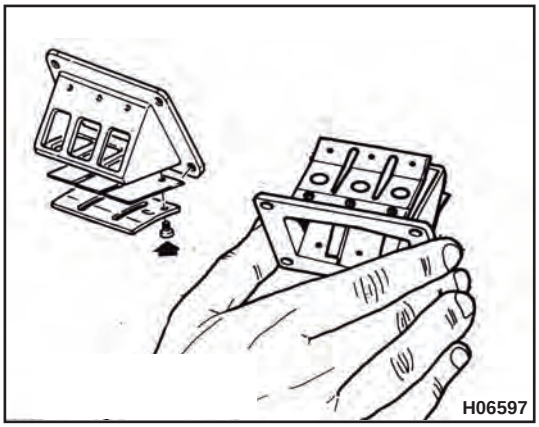
b) - Throttle intermediate position

Should it be necessary to modify mixture ratio, from the idle position at about 1/5 of throttle valve opening, fit a valve with a smaller front drain side to enrich it, and with a bigger one to lean it.
From approx. 1/5 to 4/5 of throttle valve opening, mixture is mainly adjusted by the taper needle fitted on the valve itself and anchored by a retainer inside an intermediate groove. Should it be necessary to modify mixture ratio, lower the taper needle to make lean it and raise it to enrich it, by adjusting the groove.

Main jet correction factor

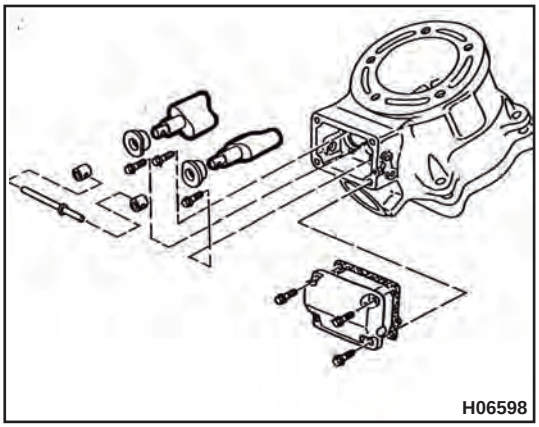
The main jet strongly affects carburetion, hence the general performance of the engine. Climate factors such as external temperature and altitude greatly affect the behaviour of the air-fuel mixture within the carburettor. It is thus necessary to modify the original jet size, inferring the correction factor on the graph below.
EXAMPLE:
With a temperature of 25 °C and an altitude of 1000 m, a correction factor of 0.94 is obtained. Therefore, the main jet to be used to replace the original one (142) will be: 142x0.94= 133.5; 134 jet available.





Washer valve

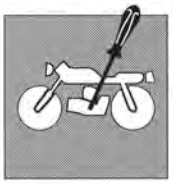
Make sure that plates are neither worn nor broken.
Should this be the case, replace the plates and the plate stops. When refitting the removed parts, apply **Loctite** on the screws.



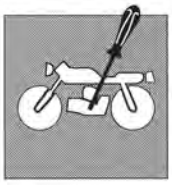
Exhaust valve

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".

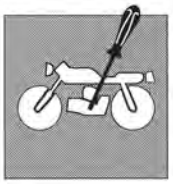
Do not use scrapers or tool bits which may damage the external surfaces of the valve, affecting its sealing capacity against the cylinder.



Section H

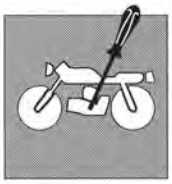


ENGINE ASSEMBLY



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.



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
Countershaft	Check roller bearing clearance on ignition side

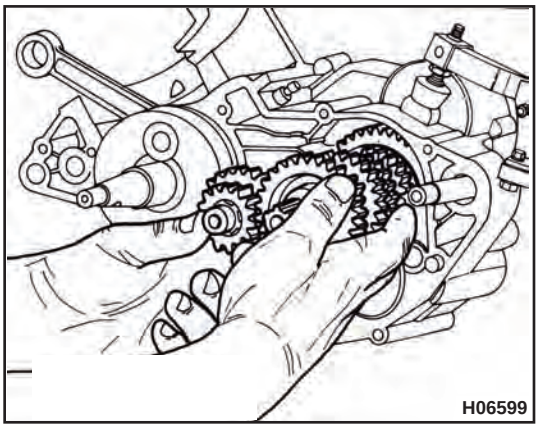
LUBRICATION POINTS	LUBRICANT
Pin - Connecting rod small end	•Oil
Roller bearing - Pin - Connecting rod big end	•Oil
Piston - Cylinder liner	•Spray oil
Clutch housing roller bearing	•Oil
Shaft gears	•Oil
O-rings	•Oil and grease
Starter and gearbox drive shaft sleeves	Molicote
Mating parts - Gearbox	Molicote
Engine sealing rings	•Grease
Clutch drive shaft	•Grease

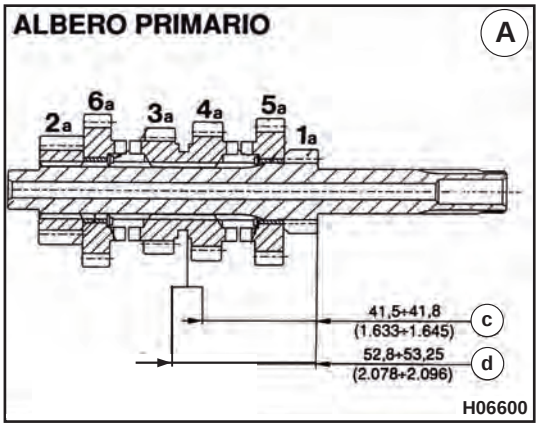
• See "SUPPLIES" table (Section A).

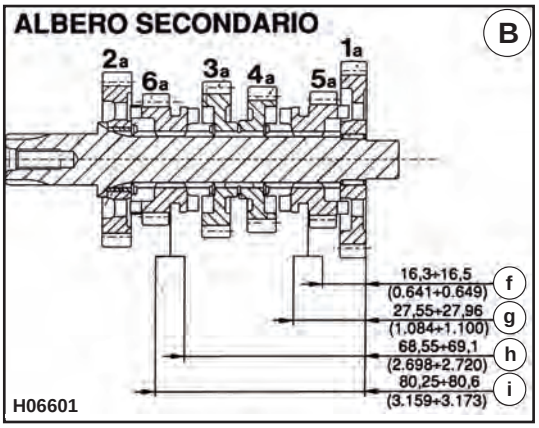
Crankshaft reassembly

Fit the crankshaft on the pre-heated bearing on the right crankcase.

Before fitting it, lubricate contact surfaces with engine oil.



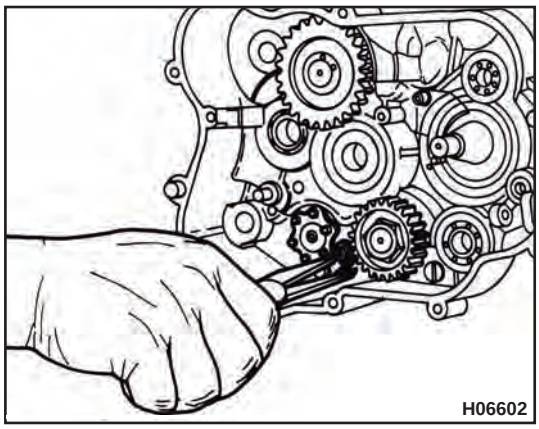




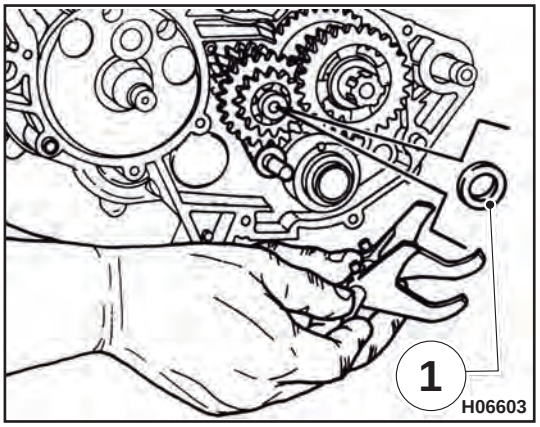
A Primary shaft
B Output shaft
c 5th gear pressing on 1st gear
d 6th gear pressing on 2nd gear
f Fully against the shaft
g 4th gear pressing on circlip
h 3rd gear pressing on circlip
i 2nd gear fully against the shaft

Gear shift part reassembly

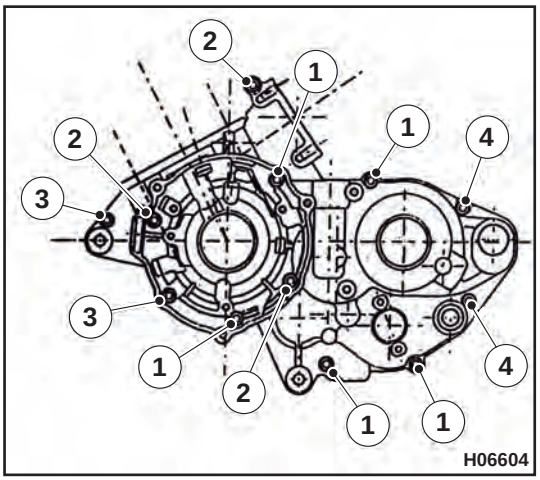
Fit the original shim at the end of the output shaft. If the selector shaft or the gear shafts are replaced, it will be necessary to determine the thickness of the shims to be fitted in order to achieve the correct axial clearance.
Selector shaft and gear shafts axial clearance: 0.3÷0.4 mm (0.012÷.015 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.



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.

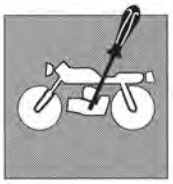


Fit the gearbox forks into their seats on the sliding gears; Engage the forks control pins into the selector shaft grooves. This operation is easier if the gear is in "neutral". Assemble the well lubricated fork sliding pins into their seats in the right crankcase half: both have the same length. Fit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

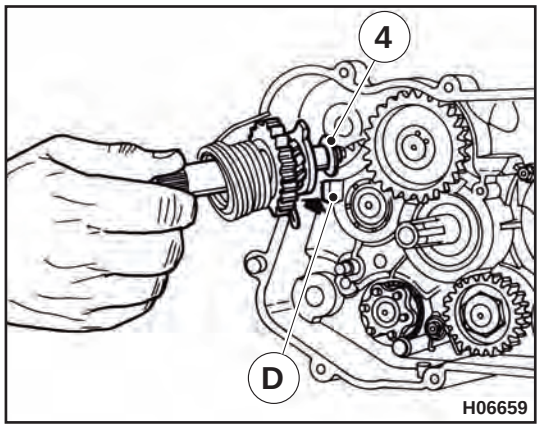


Check the position of the centring bushings and place a new gasket on the right crankcase half. Close the crankcase halves with the suitable retaining screws, see relevant diagram.

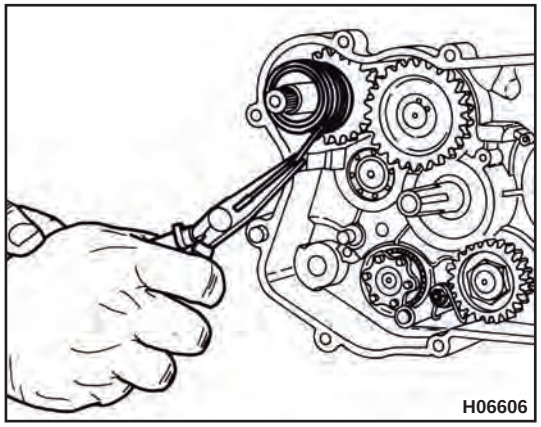
1 - M6X35 screw - No. 5 pieces.
2 - M6X45 screw - No. 3 pieces.
3 - M6X50 screw - No. 2 pieces.
4 - M6X65 screw - No. 2 pieces.

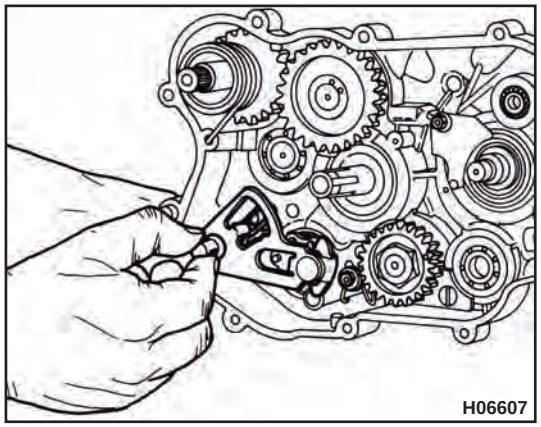


WARNING - In case of incorrect sealing, the following operating failures may occur:
Air seepage causing a leaner mixture and possible engine seizure.
Oil leak from gearbox area to crankshaft area; this may lead to a fast consumption of lubricant causing gearbox overheating and seizure.
When closing the 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.

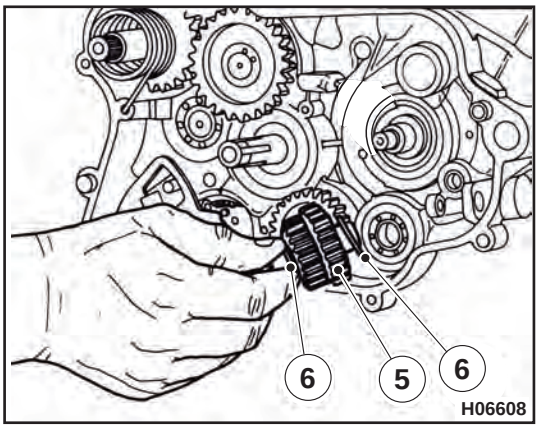


Fit the original shim (4) on starter shaft end, and insert it in the right crankcase half seat. Mind the positioning of the clutch spring end, it must be fitted between the rear end of the crankcase half and the protruding tooth (D).
Pre-charge the lever return spring by turning its end clockwise until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

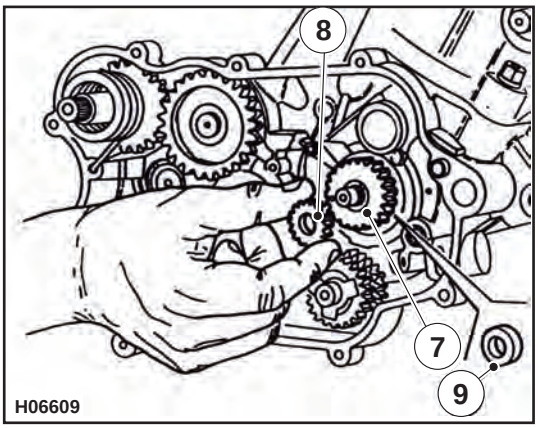




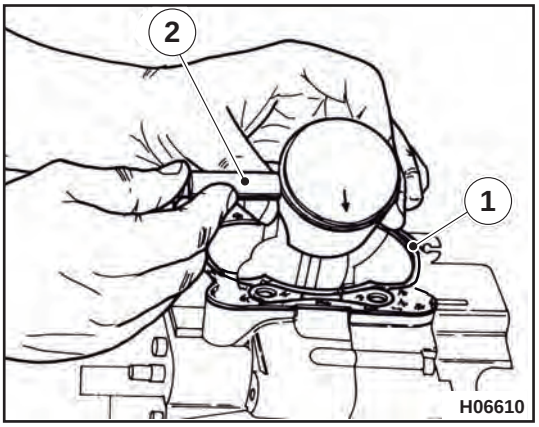
Fit the selector shaft with spacer spring inside the crankcase half. Position it so that the pin on the crankcase half can be inserted between the ends of the selector shaft spring and that the two pins of the selector shaft are between the selector teeth.



Fit the countershaft drive gear (5) with the original shims (6).



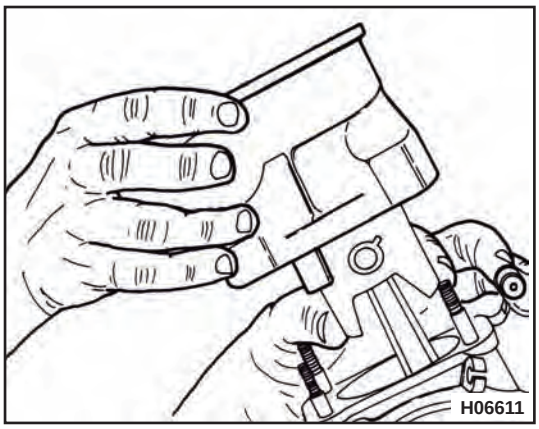
Fit the spacer (9) and the tab in the crankshaft seat, and install the primary drive gear (7) and the water pump control gear (8).



To correctly line up the primary drive and countershaft gears, the position of the crankshaft gear must correspond to that of the piston at TDC. Therefore, it is necessary to proceed to piston-cylinder-and-head reassembly to determine this condition.

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.



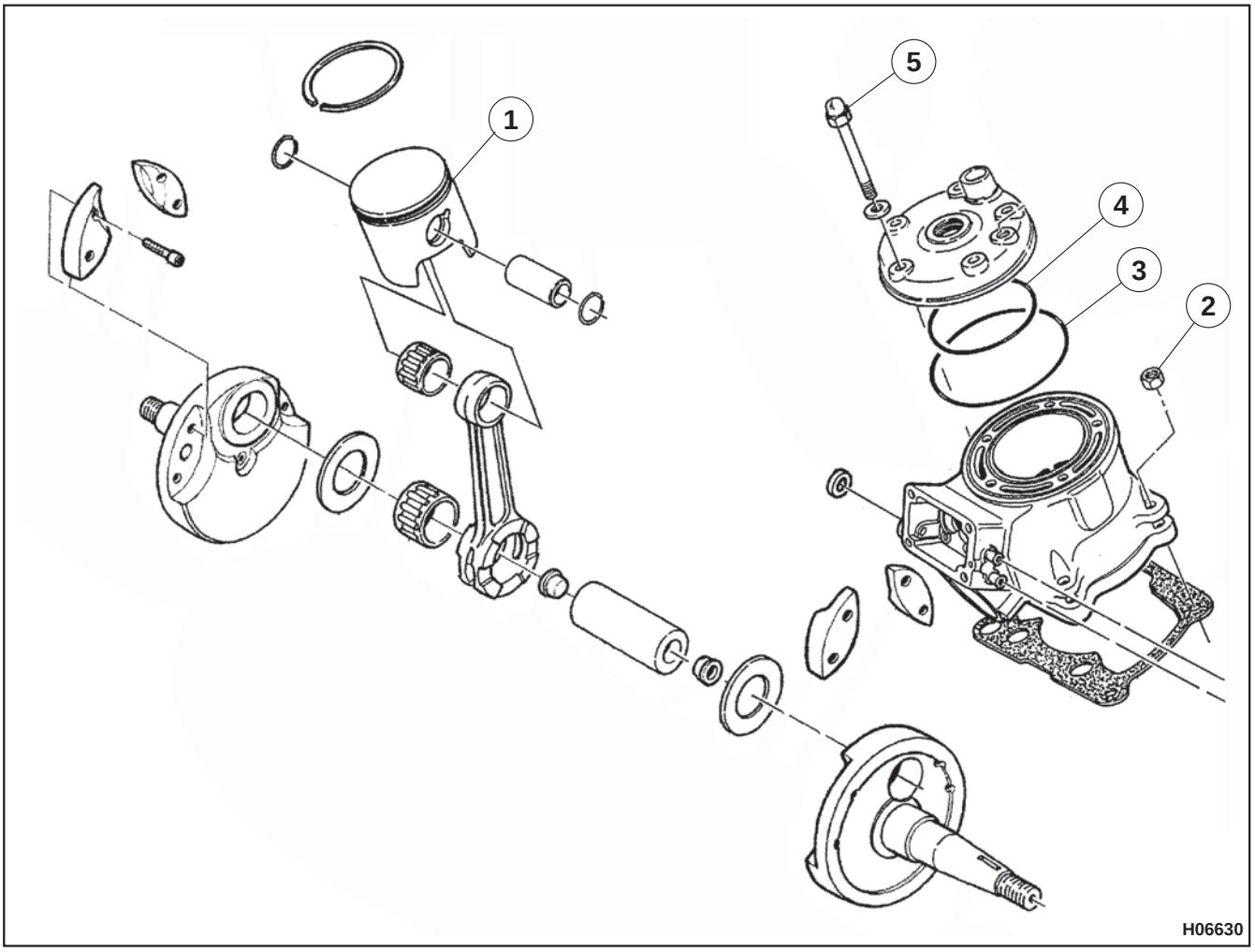
Lubricate all the parts to be assembled with engine oil and fit the cylinder into the piston by compressing the ends of the piston rings with your fingers (or using a universal piston installation tool).

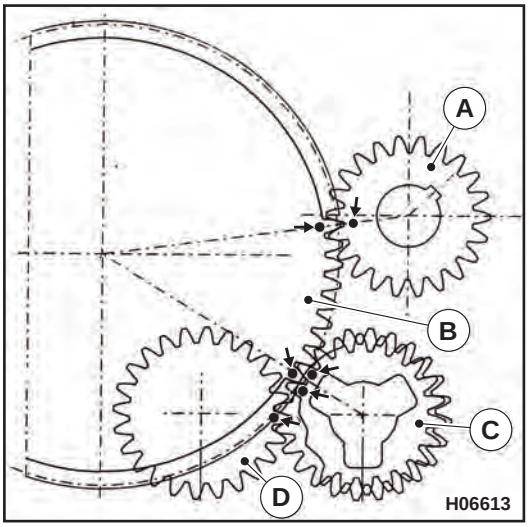
During installation, avoid rotating the cylinder since piston ring ends could enter ducts.

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.

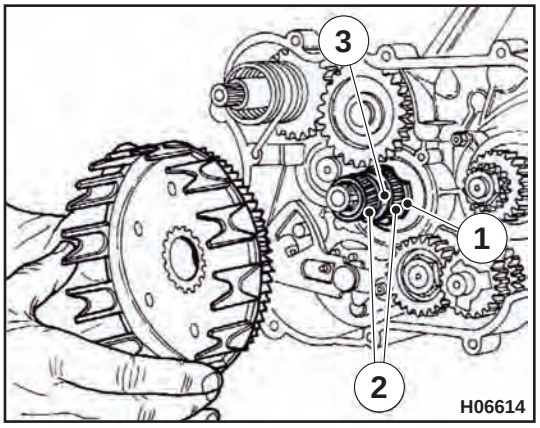
Fit the duly greased external (3) and internal (4) O-rings in the cylinder seats and insert the head inside cylinder stud bolts.

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



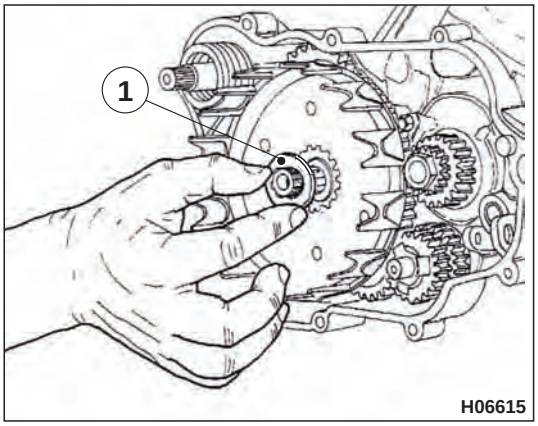


A primary drive gear on crankshaft
B primary drive gear on clutch housing
C Countershaft idle gear
D Countershaft gear



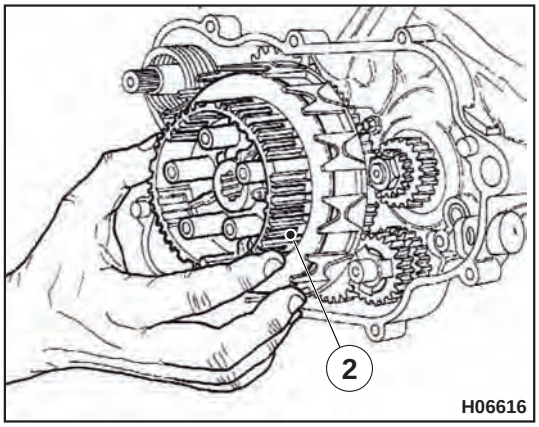
Primary drive and countershaft gears line up

Fit a dial gauge on the head to determine the condition of the piston at the top dead centre.
Insert on the primary shaft the three-tab washer (1), the inner spacer and the two roller cages (2) with spacer (3). Then, with piston at top dead centre, fit the clutch housing so that the punched references on gears are positioned as shown in the figure.

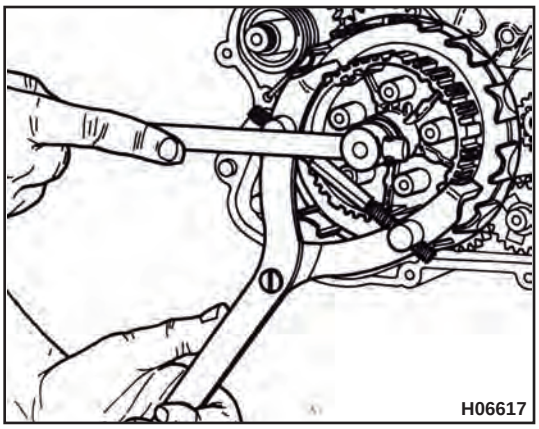


Clutch reassembly

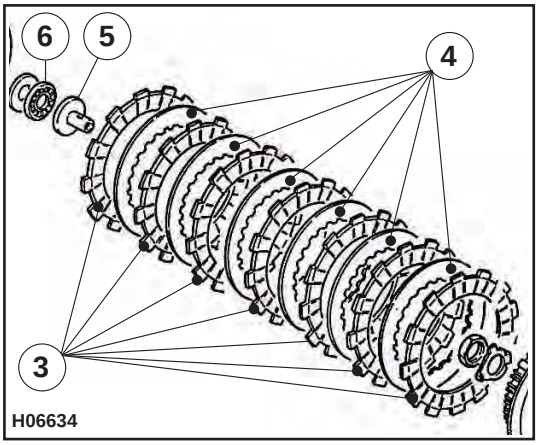
Fit bushing, spring and clutch control lever shaft inside L.H. crankcase half seat. Fit the washer (1) and the disengagement group into the primary shaft in the following order: the fist rod and the ball. All these parts must be greased before reassembly.



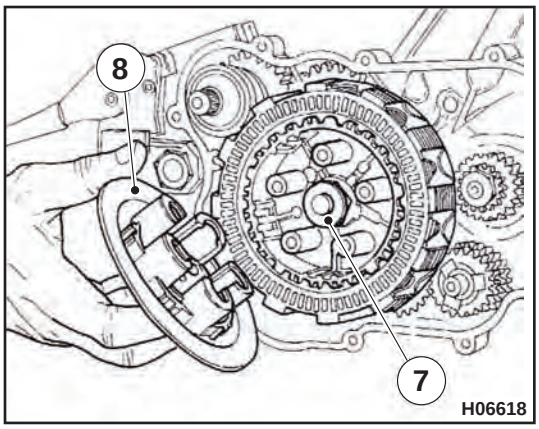
Insert the clutch hub (2) in the primary shaft.



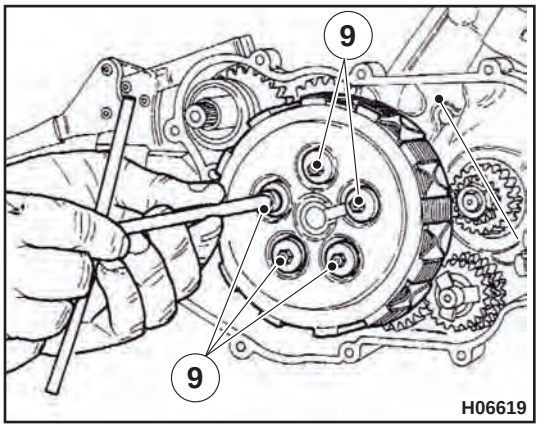
Install the lock washer and hub locking nut.
While locking the hub with tool part no. **8000 79015,** lock the nut with a 22 mm socket wrench to the specified tightening torque. Rivet washer onto nut.



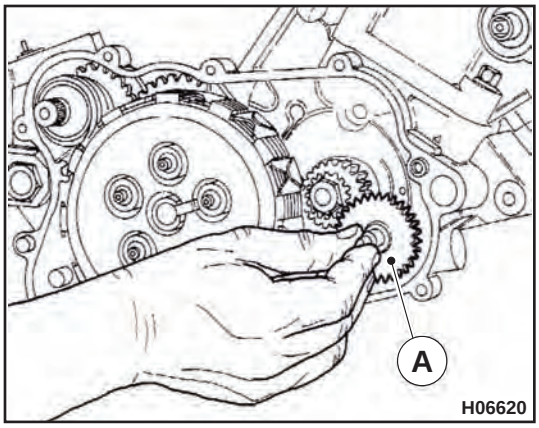
Fit the friction plates starting by one of the seven line steel plates (3) and alternate it with one of the six friction plates (4); the last friction plate (3) will complete the pack.
Insert the spring retainer (5) and the axial needle roller bearing (6) on primary shaft end.



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

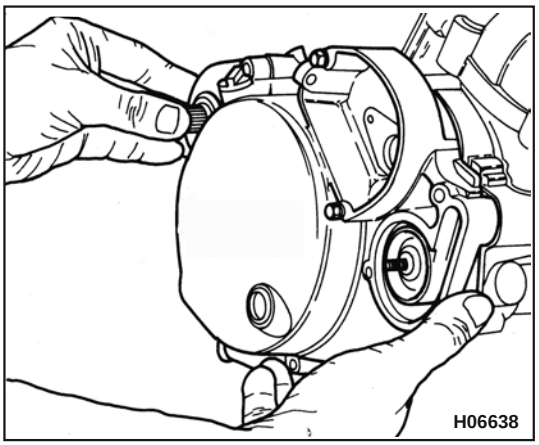


Fit the clutch springs (9) and lock them onto hub with the suitable washers and screws.

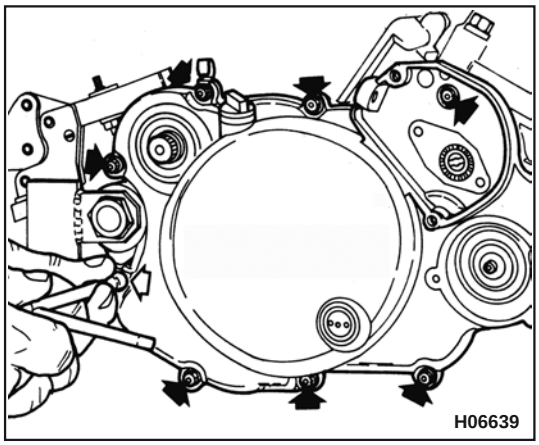


Right cover reassembly

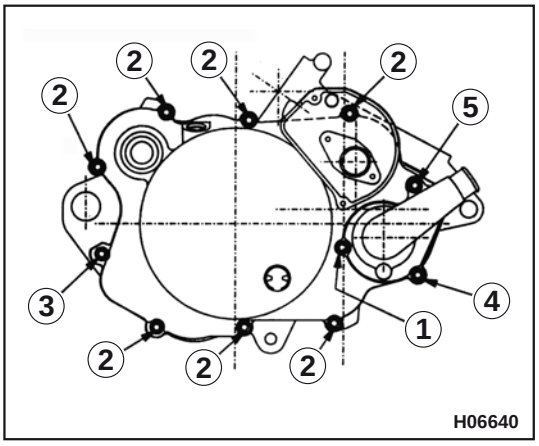
Install the original shim at the ends of water pump control shaft (A) and introduce it inside its seat on RH crankcase half.



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.

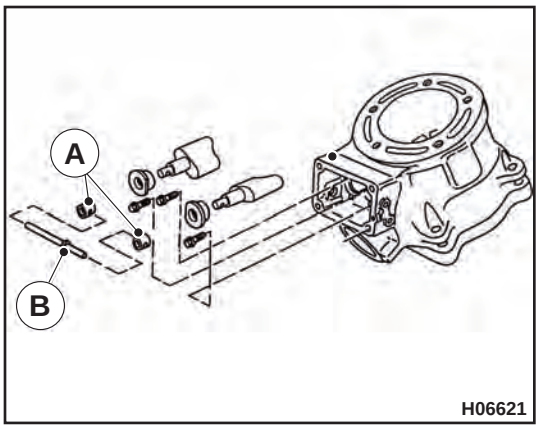


Insert the eight retaining screws, taking care that the one at the rear centring bushing (white arrow) is longer than the other ones. Moreover, the oil pump pipe retaining bracket must be installed under the screw placed on top of the kick start lever.



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.

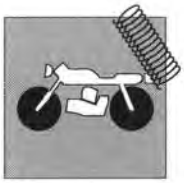


Exhaust valve reassembly

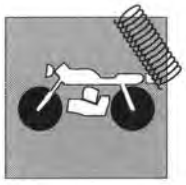
To reassemble the exhaust valves, simply reverse the removal procedure minding that with completely closed valves, the min. distance from the piston must be equal to or grater than 0.4÷0.5 mm (0.0157÷0.0197 in.).
On bushings (A), check the wear of the seats holes for pin (B); if worn, replace the parts.

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 I



FRONT SUSPENSION


WRE 125
H02628

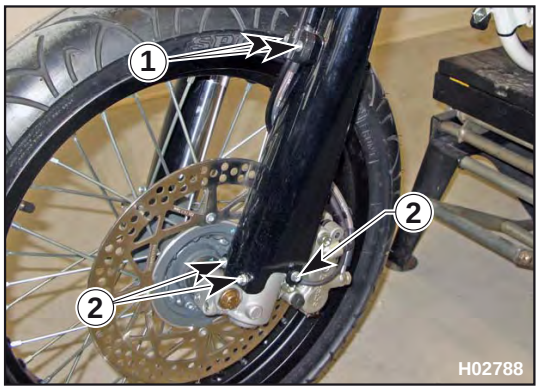

SMS 125
H02630


SMS 125
H02629

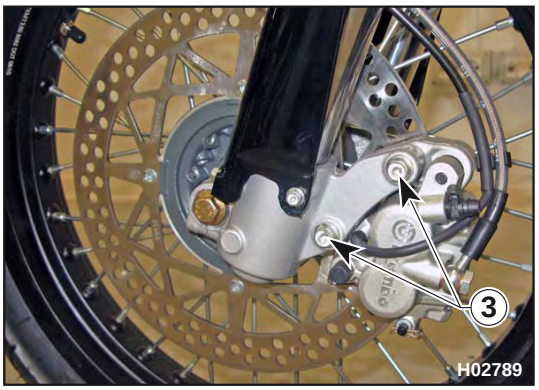

SMS 125
H02631

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);

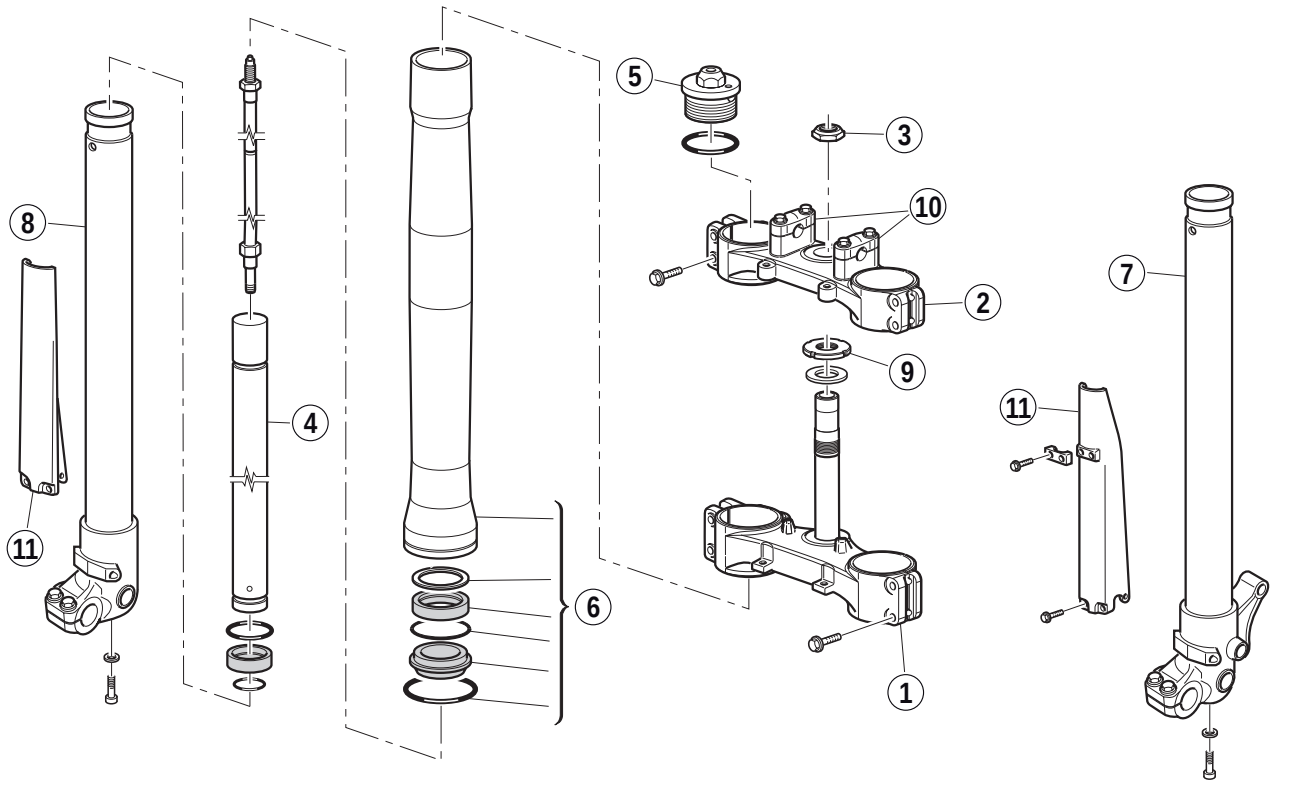
- remove the front wheel as described in Section "Y";

- 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".

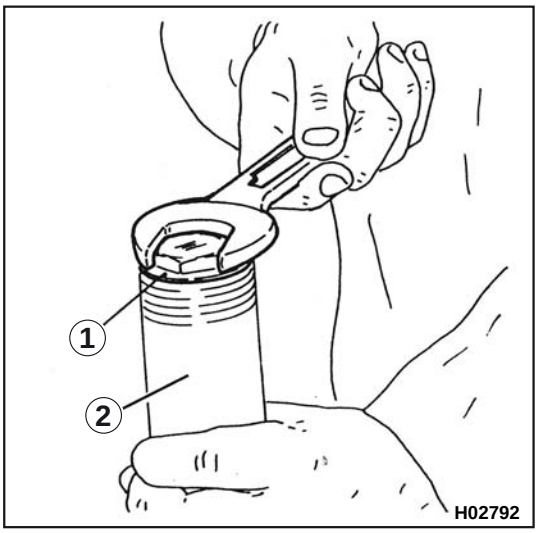
Set height "A" back to original value.

Front fork overhaul



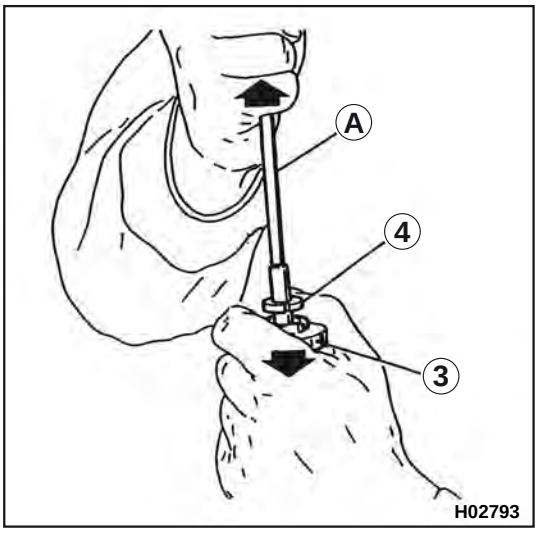
Key

1) Bottom yoke with pin
2) Steering head
3) Nut
4) Tube spacer
5) Cap
6) Outer tube
7) LH damper unit
8) RH damper unit
9) Ring nut
10) Clamp
11) Leg protection

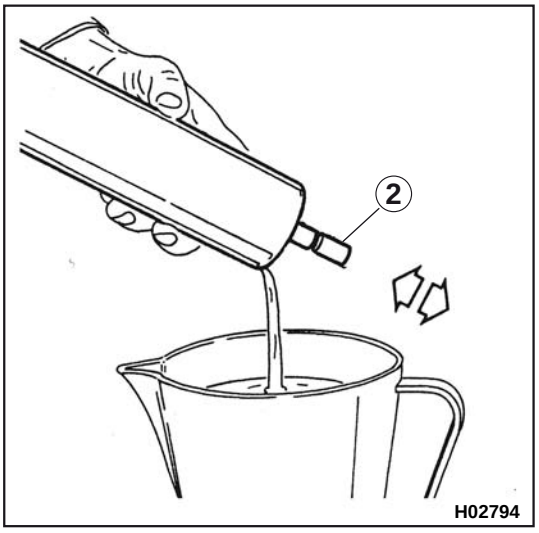


Disassembly

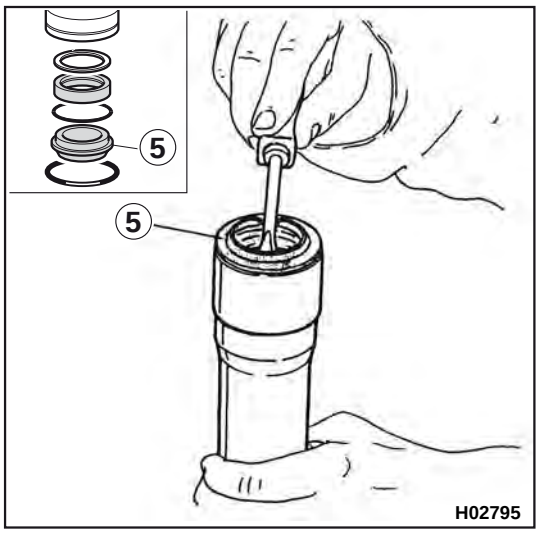
- Using a 30 mm Allen wrench, loosen upper cap (1)
- Completely loosen cap and remove it.
- Push slider (2) downwards onto inner tube.



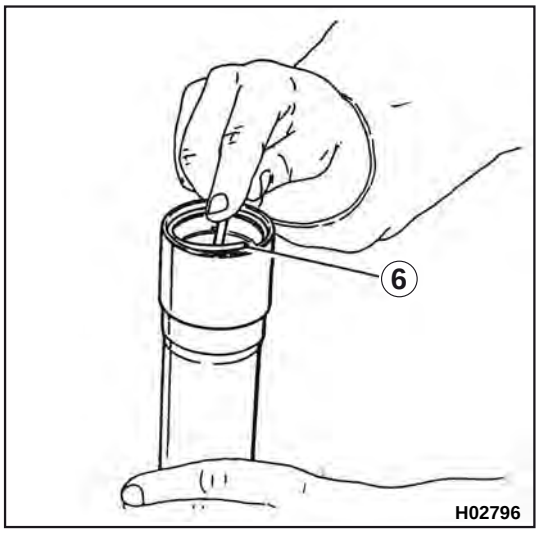
- Screw a threaded bar (A) onto inner shock absorber rod.
- Pull absorber rod upwards using the bar and, at the same time, push upper retainer (3) downwards with your hand so as to slide out the two split rings (4).
- Remove bar.
- Slide out upper retainer.



- Drain all exhausted oil out of inner tube pumping the rod to full travel several times.
- Take slider (2) out of inner tube.

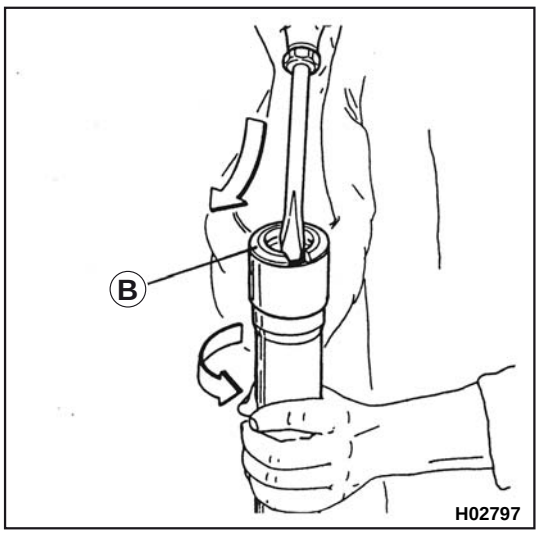


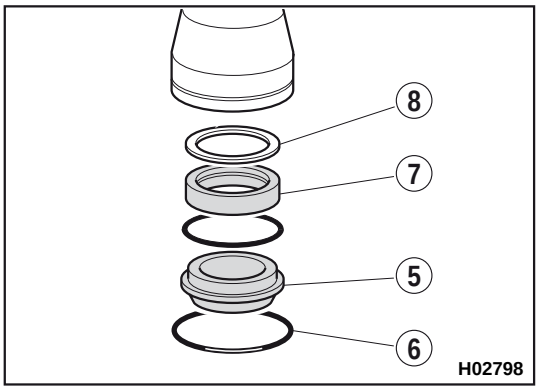
- Remove dust seal (5) prising it off with a screwdriver (take care not to damage inner seal lip).

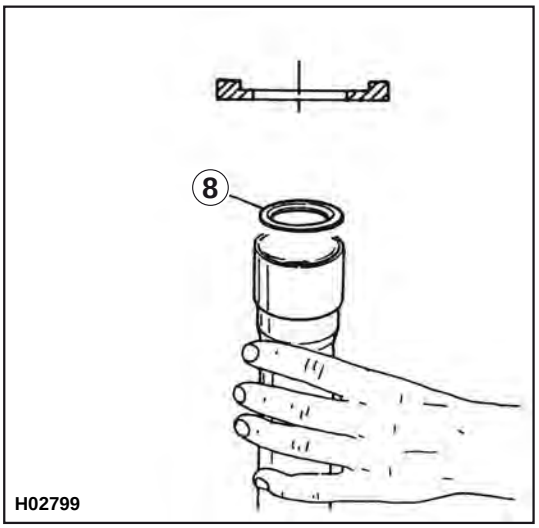


- Using a thin screwdriver, remove slider inner retaining ring (6).

- When removing the sealing ring (7), it is advisable to protect its lip with a special bush (B).
- Using a large tip screwdriver, press under sealing ring and, at the same time, turn slider to make its removal easier.
- Slide out lower retainer (8).

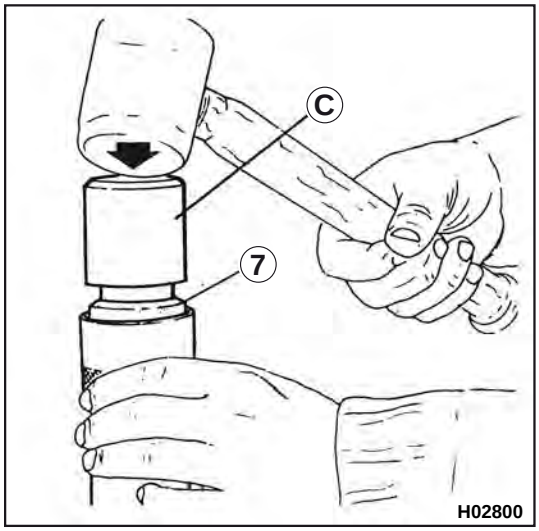




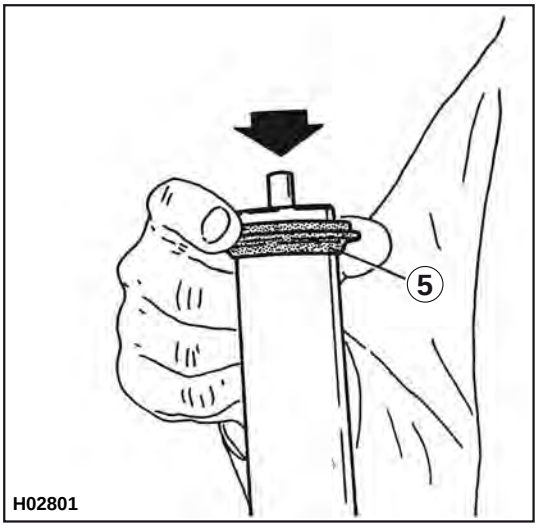


Assembly

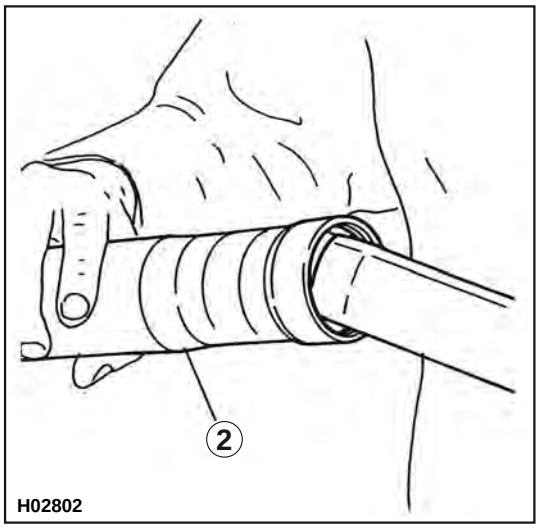
- Install lower retainer (8), with the discharged side pointing outwards.



- Slide sealing ring (7) inside the special bumper (C), and drive it fully home inside slider.
- Lock it inside slider with the retaining ring (6).

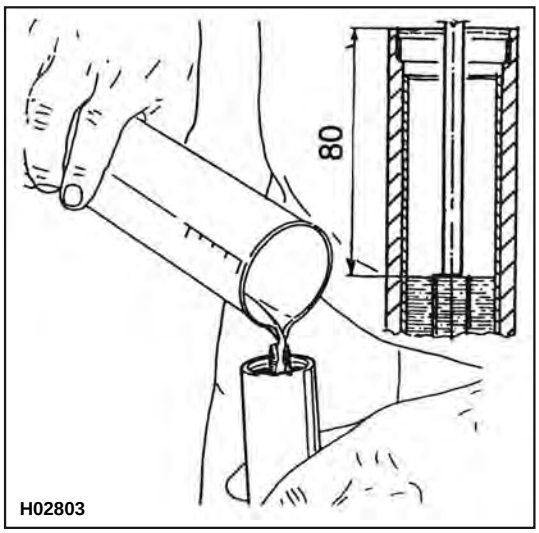


- Install it on the duly-lubricated dust seal tube (5), and move it downwards along tube.



H02802

- Lubricate inner tube and insert it inside slider (2). This operation is made easier thanks to pipe tapered end.
- Install the previously-assembled dust seal onto slider, and drive this latter fully home onto tube.

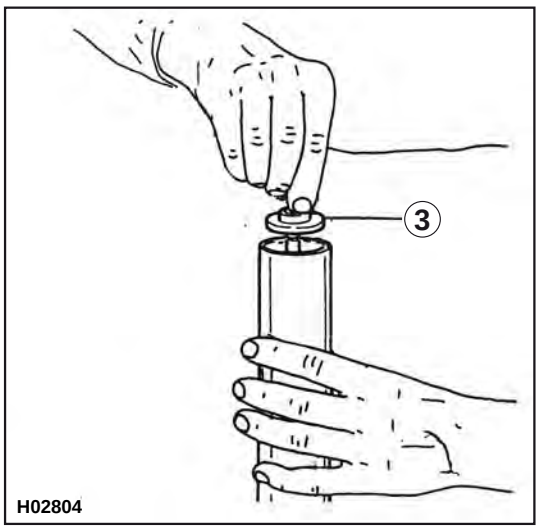


H02803

Oil replacement

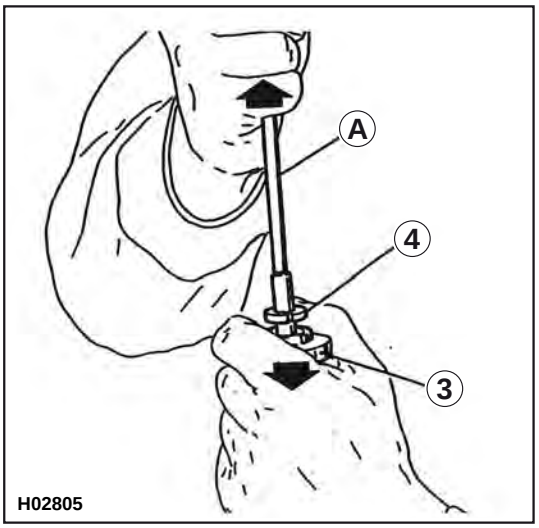
- Pour 520 cc of recommended oil inside inner tube, pumping rod to full travel several times to allow oil distribution inside shock absorber.
- Check that, with the leg fully closed, between slider top and oil level an air volume of 80 mm is present.

After emptying, some oil can still be present inside damping cartridge inner galleries.
If the recommended quantity of oil is introduced, the level will be too high. Whenever replacing oil, always refer to the air volume.



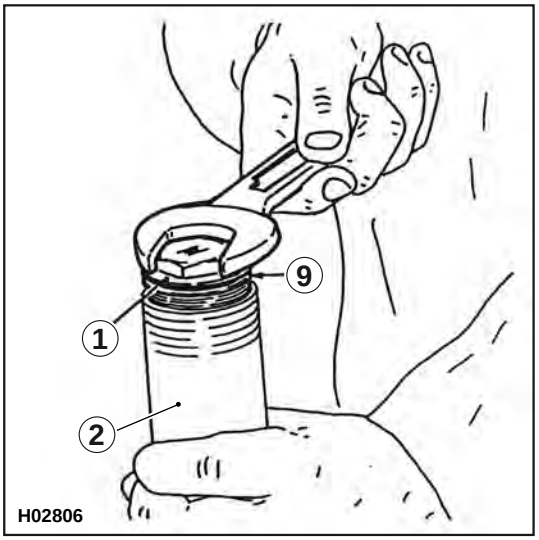
H02804

- Insert upper retainer (3) inside shock absorber rod, with the flat side pointing the rod.
- Screw the previously-used bar onto rod end.

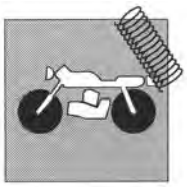


Pull rod outwards and, at the same time, push retainer (3) downwards so as to allow split rings (4) correct insertion.

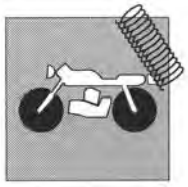
- Leave bar and retainer, and check that split rings are correctly installed onto rod.



- Grease the O-ring (9) positioned onto cap (1)
- Screw cap (1) onto slider (2).



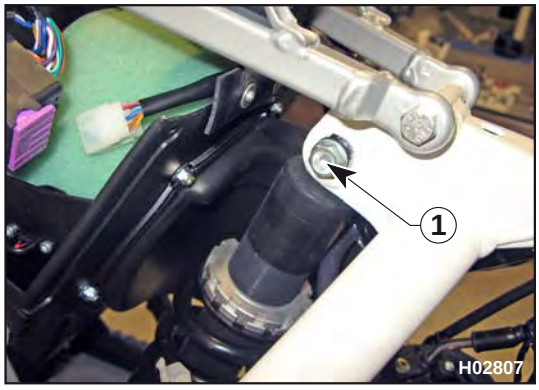
Section J

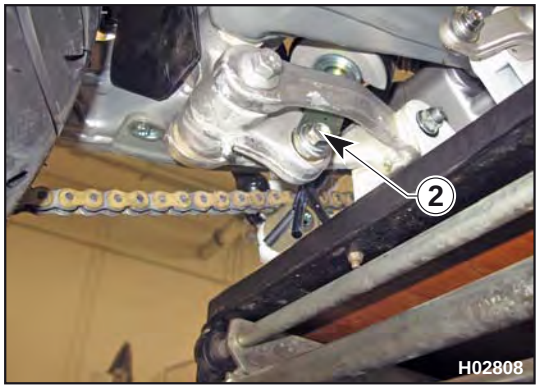


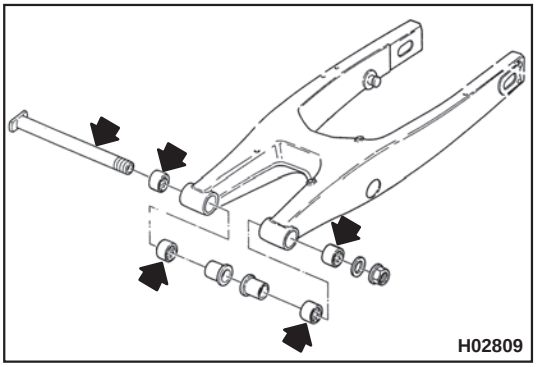
REAR SUSPENSION

Rear shock absorber

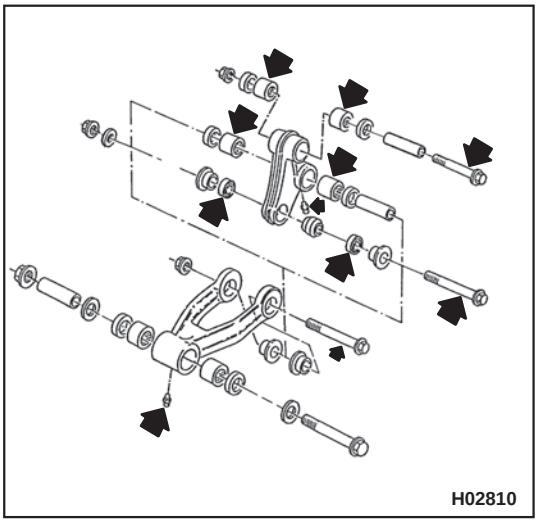
TIGHTENING TORQUE FIGURES
44 ÷49 Nm/ 4.4 ÷4.5 Kgm/ 32.5-36.2 H/Lb

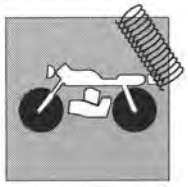






Lubrication points (grease)





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.

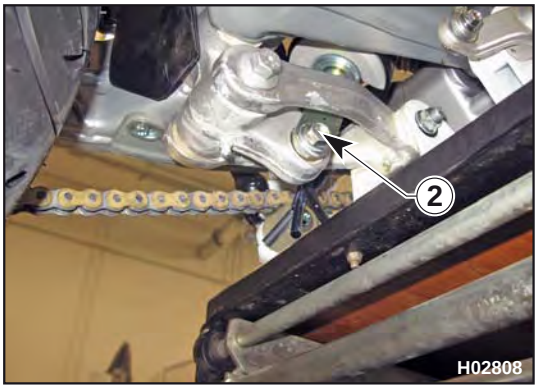
Periodically check all components for wear.

Type of suspension

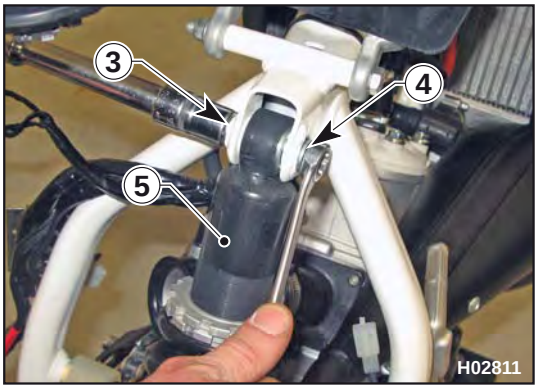
Steel swinging arm suspension with hydraulic single shock absorber. Swinging arm shaft is fitted on chassis side and swinging arm pivots onto shaft; this system ensures bike greater stability. The shock absorber, driven by a series of progressive link rods (SOFT DAMP), features a spring preload adjuster based on the weight and on the type of terrain.

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, loosen nut (1) on bike left side.

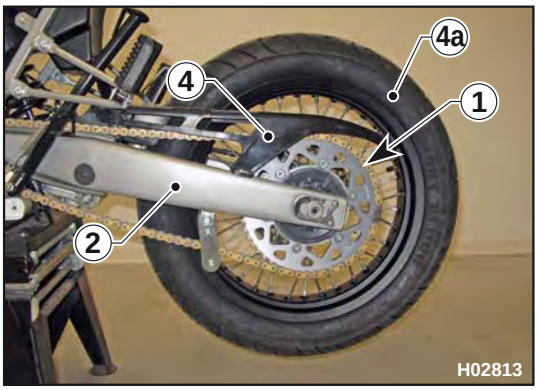


- Slightly raise rear swinging arm, and remove lower pin (2) from the right side.



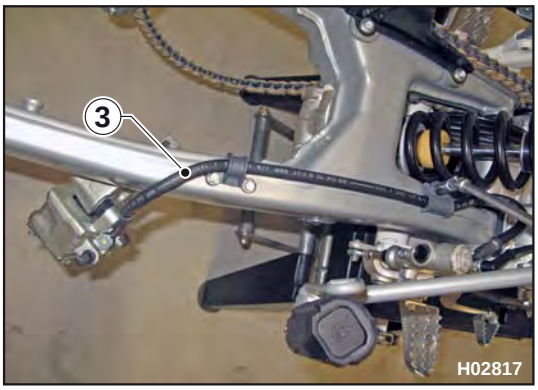
- Using a 14 mm wrench, loosen upper nut (3); then remove upper pin (4) and shock absorber (5) from the left side.

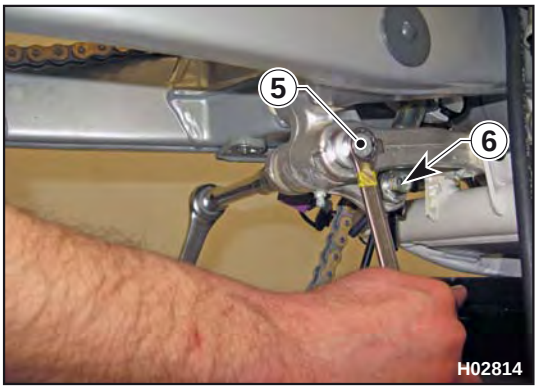
On reassembly, position nut (3) and nut (1) on the left side of shock absorber retaining pins.



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) as outlined in the relevant paragraphs (see section E).
- Remove rear wheel (4a) as outlined in the relevant paragraph (see section Y).

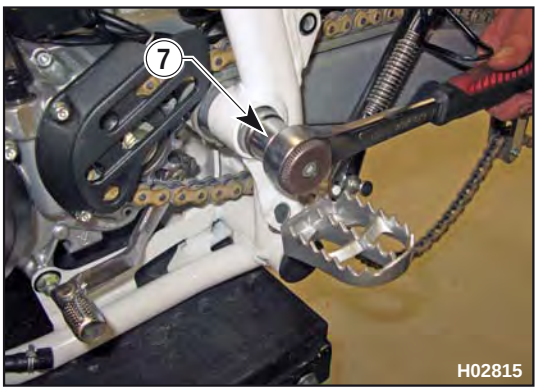


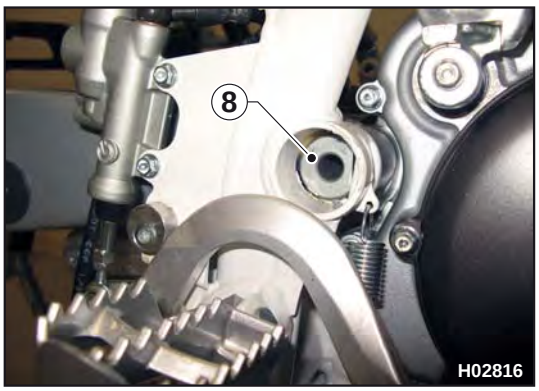


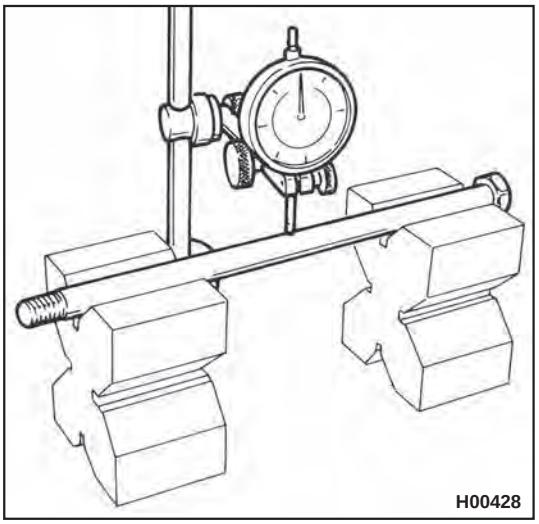
- Using a 17 mm Allen wrench on the left side and a 15 mm Allen wrench on the right side, loosen and remove pin (5).
- Using two 14 mm wrenches, loosen and remove shock absorber bottom retaining pin (6).

On reassembly, make sure that pin (5) and (6) heads are positioned on bike right side.

- Using a 22 mmm wrench, loosen nut (7) on the left side, and remove pin (8) on the opposite side.
- Remove swinging arm.

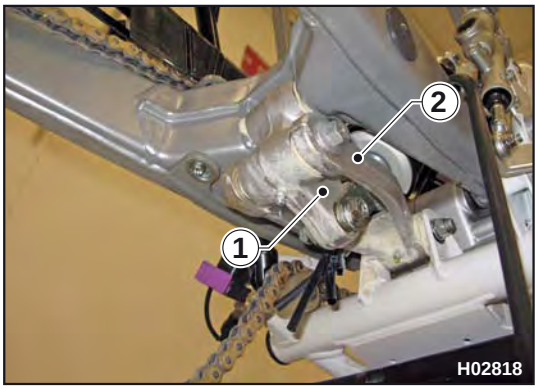






Servicing the swinging arm shaft

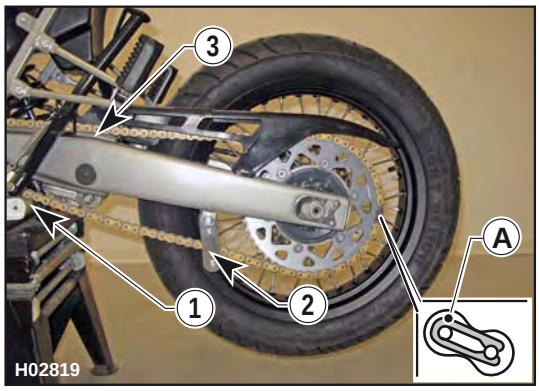
Check shaft taper using a dial gauge. Place the shaft on two identical reference blocks. Turn the shaft and move the dial gauge horizontally to determine the amount of distortion.
Service limit: 0.30 mm.



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.

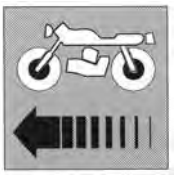
Check the chain guide alignment, and remember that a bent element can cause chain early wear. In this case, chain might unwrap from the sprocket.

1 Chain roller

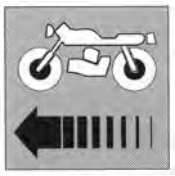
2 Chain guide

3 Chain slider

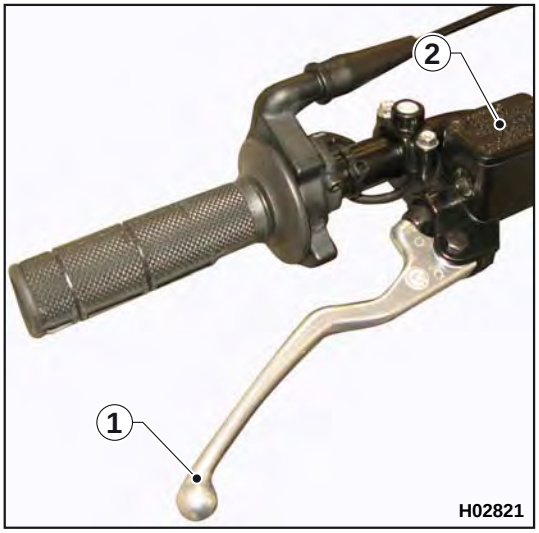
A Master link clip

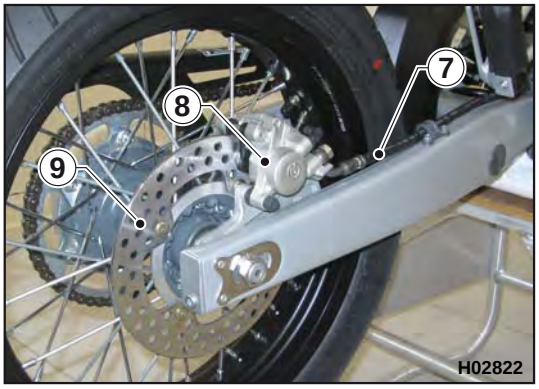


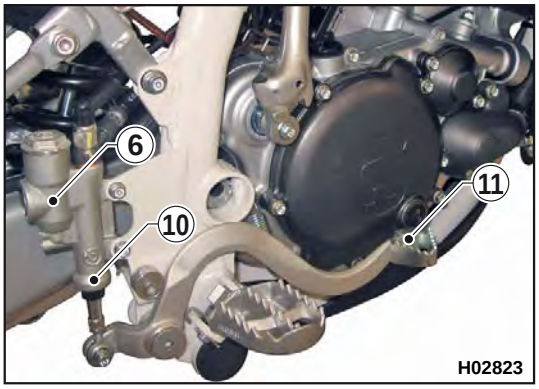
Section L



BRAKES







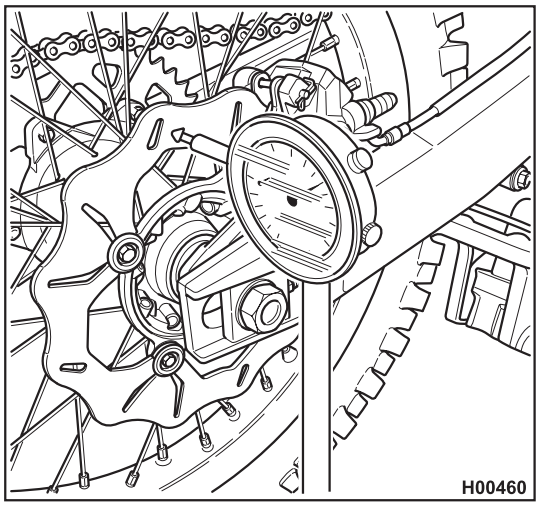
Braking system

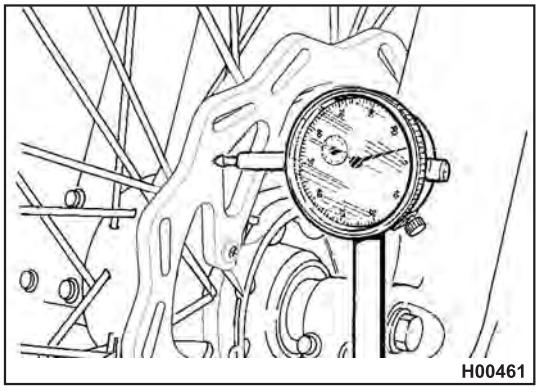
The braking system uses two independent circuits. Each system is equipped with a brake calliper connected to a master cylinder with a fluid reservoir.

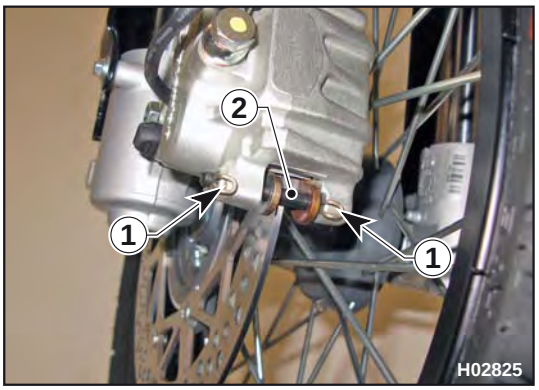
1. Front brake lever
2. Front brake master cylinder with fluid reservoir
3. Front brake line
4. Front brake calliper
5. Front brake disc
6. Rear brake fluid reservoir
7. Rear brake line
8. Rear brake calliper
9. Rear brake disc
10. Rear brake master cylinder
11. Rear brake control pedal

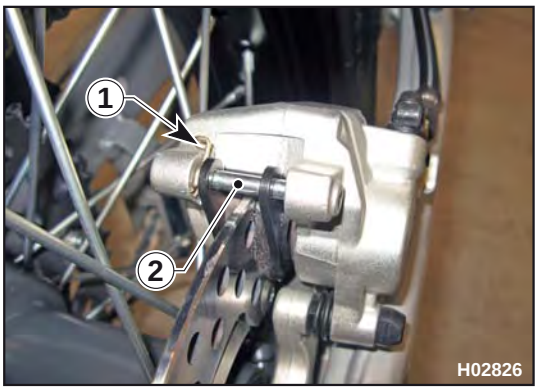
Brake disc

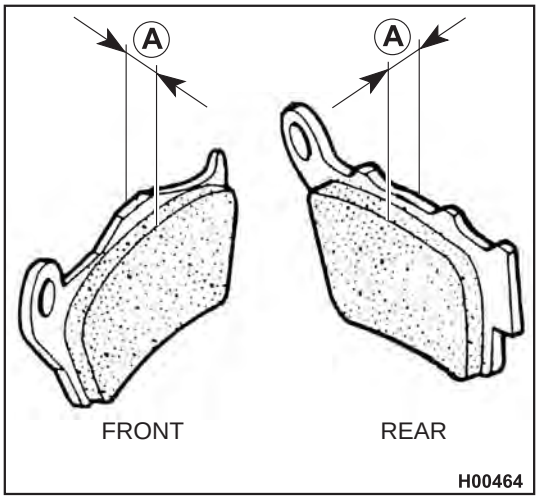
Checking the brake disc is an important safety procedure; the disc must be spotless, i.e. free from corrosion, oil or other dirt or deep scoring.
Front brake disc diameter: 260 mm
Front brake disc thickness (when new): 3.0 mm
Wear limit: 2.5 mm
Rear brake disc diameter: 240 mm
Rear brake disc thickness (when new): 4.0 mm
Wear limit: 3.5 mm
Disc warpage must not exceed 0.15 mm (check disc mounted on the rim with a dial gauge).
To remove the disc from the wheel rim, you need to loosen the four retaining screws. On assembly, clean all mating surfaces thoroughly and tighten the screws to the specified torque.











Checking brake pads for wear / replacing the pads

Check brake pad wear.
Service limit "A"
- 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).

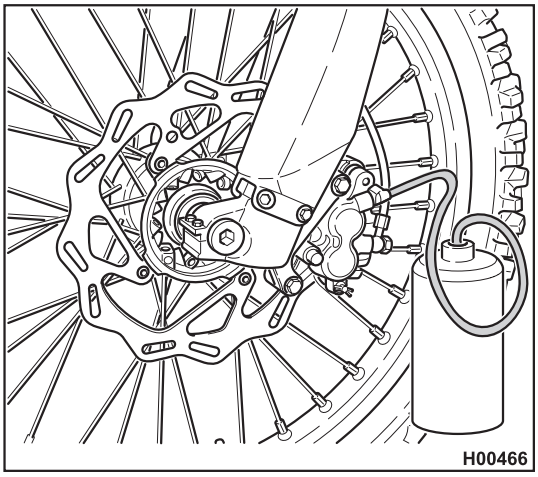
The above procedure eliminates the need to bleed the braking system after replacing the pads. Simply operate the control lever several times until bringing the pistons back to their normal position.

Drain some fluid from the reservoir when replacing the pads, or the pistons backing up into the cylinders might cause fluid to spill out of the reservoir.

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:

- Take the rubber cap off the bleed valve (1).
- 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).
- Remove the reservoir plug (2) and the rubber gaiter and fill fresh fluid into the reservoir.
- Slacken the bleed valve and operate the lever (3) repeatedly until the fluid flowing out of the hose looks clear and free of air bubbles: now tighten the bleed valve.
- Top up fluid level (A) and refit rubber gaiter and reservoir cover (2).

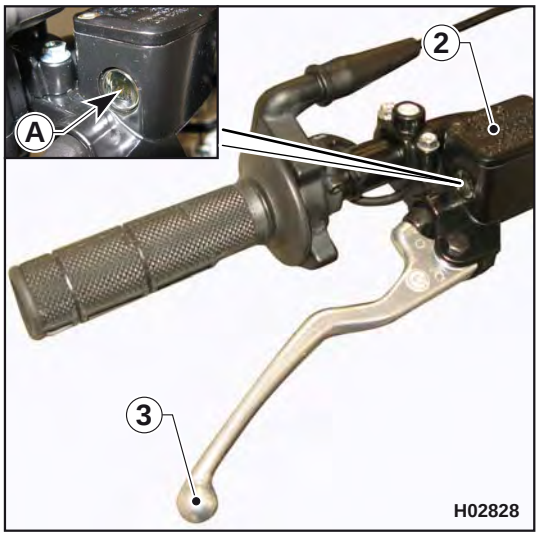


Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.

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

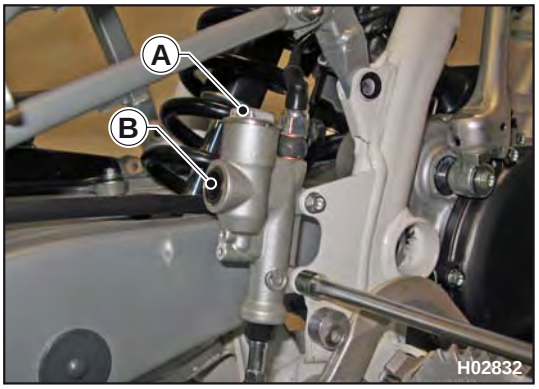
Motorcycle handlebar must be turned to the left during the bleeding procedure. This will keep the master cylinder reservoir higher, making bleeding easier.

The bleeding procedure does not remove all air from the circuit; any small amounts of air left in the circuit will disappear after a short period of usage; this will eliminate the mushy feel of the lever and restore its travel to proper length.



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

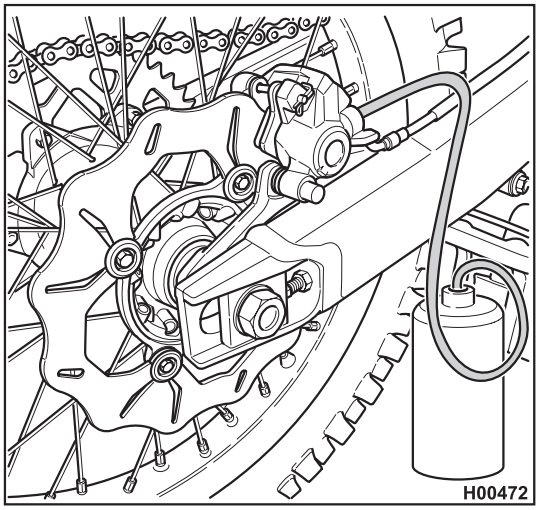
A long travel and mushy feel of the brake pedal indicate that there is air in the system and the brake needs bleeding.
Bleeding procedure is as follows:

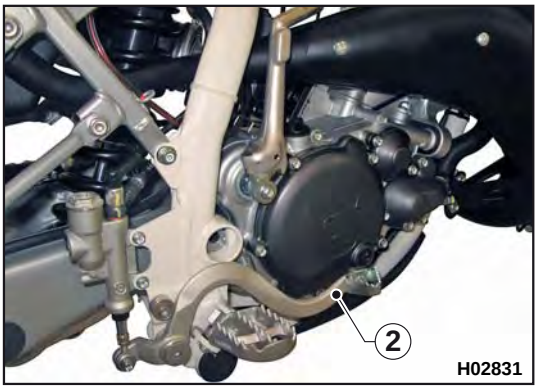
- Remove reservoir cap (A) (21 mm wrench) and diaphragm and fill with fluid (DOT 4).
- Attach a clear plastic hose to the calliper bleed valve (1) and place the other end of the hose in a vessel.
- Press the pedal (2) fully down.
- Loosen the bleed valve and drain the fluid (only air at first), then slightly close the valve.
- Release the pedal and wait a few seconds. Repeat the process until you see only fluid coming out of the hose.
- 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.

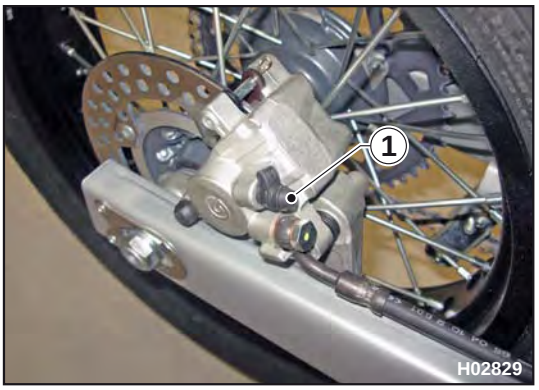
Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.

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 taken from a sealed container (DOT 4). Never reuse brake fluid.

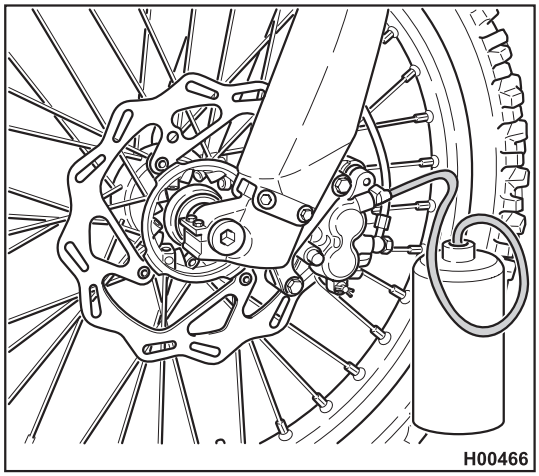
Avoid the ingress of contaminants such as dirt, water, etc. into the reservoir.

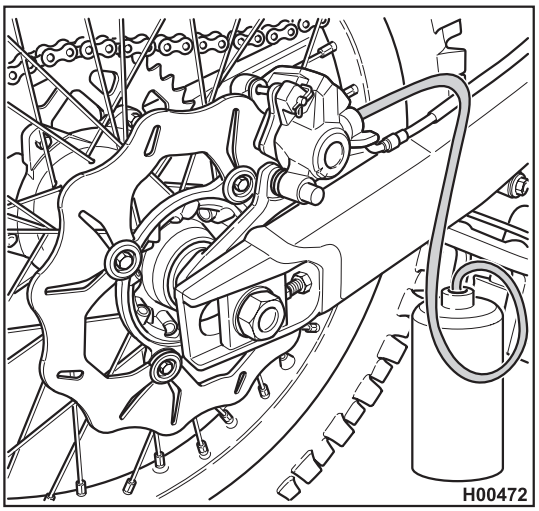
Do not keep the reservoir open without its cover longer than necessary; this would increase the risk of contamination.

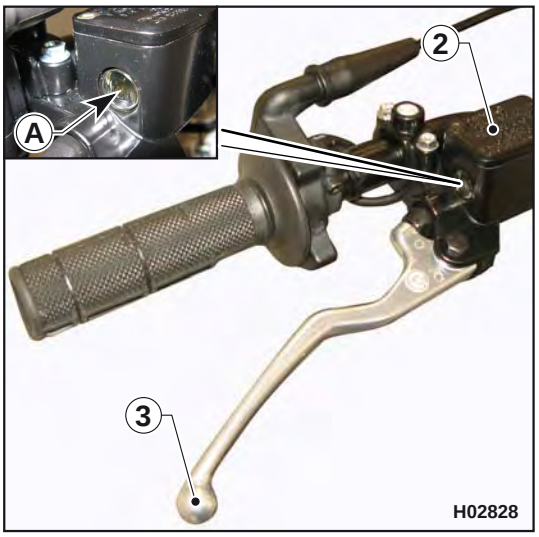
Handle the fluid with care to avoid damage to painted parts.

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

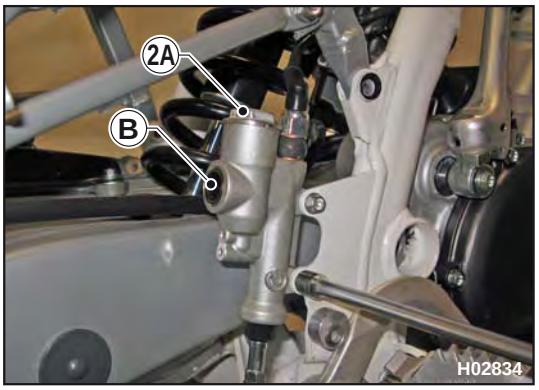
Replacement procedure is as follows:
- Take the rubber cap off the bleed valve (1) or (1A).
- Attach a clear plastic hose to the calliper bleed valve and place the other end of the hose in a vessel.

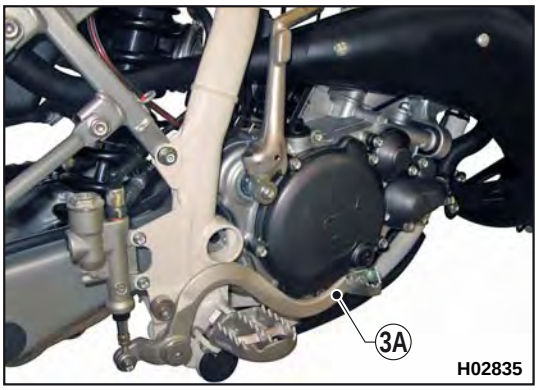




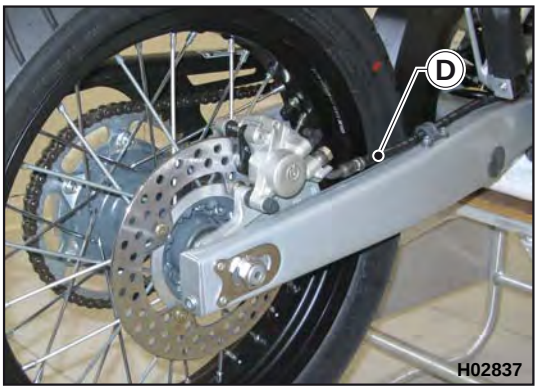


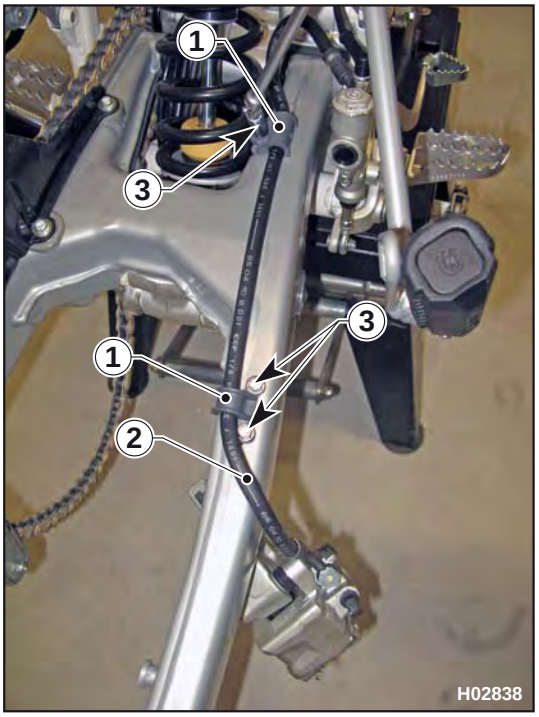
- Remove the reservoir cap (2) or (2A) 21 mm wrench and the rubber gaiter.
- Loosen the bleed valve on the calliper.
- Pump the brake lever (3) or the brake pedal (3A) until draining all fluid.
- Tighten the bleed valve and fill the reservoir with fresh fluid.
- Loosen the bleed valve, operate lever or pedal, tighten the valve keeping lever or pedal pressed and then release quickly.
- Repeat the process until the circuit is full and you can see clear fluid coming out of the plastic hose: now tighten the bleed valve.
- 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.





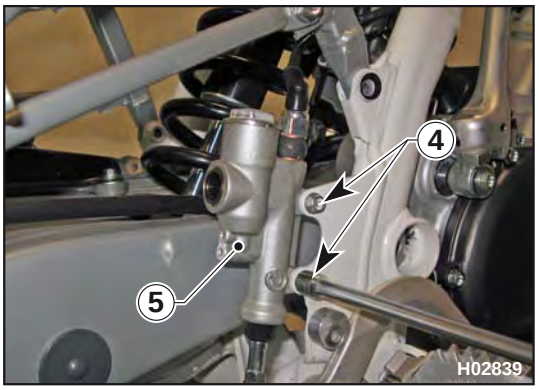
Periodically check the connecting hoses (C) and (D) (see Scheduled Maintenance Chart, Section B): replace worn or cracked hoses.



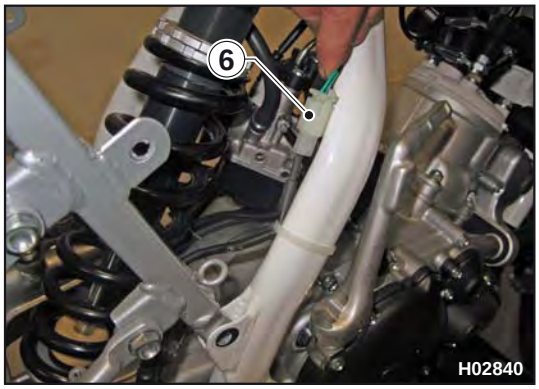


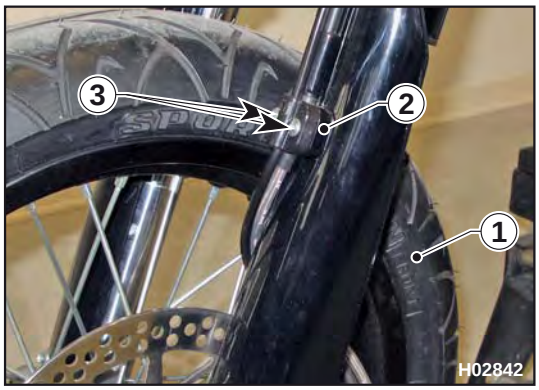
Removal of the rear braking system

- 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 STOP micro switch connector (6).

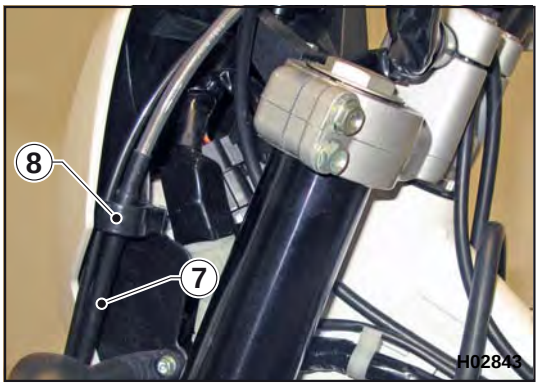




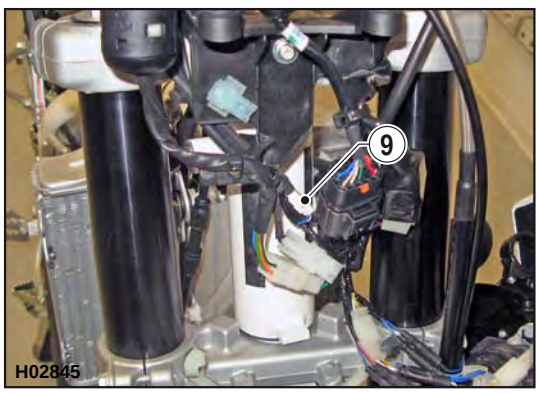
Removal of the front braking system

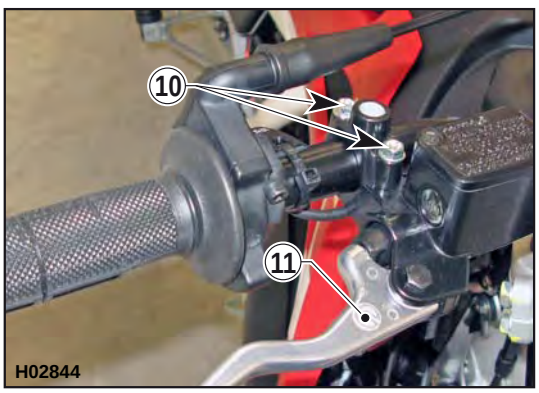
- Remove the front wheel (1) as outlined in the relevant paragraph (see section Y).
- Loosen the screws (3) and remove the block (2).

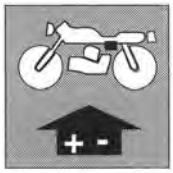
- Loosen the two screws (5) and disconnect the brake calliper (6).



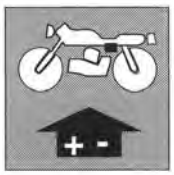
- Release the hose (7) from the support (8).
- Disconnect the STOP microswitch connector (9).
- Loosen the two screws (10) (6 mm wrench) and remove the brake lever (11) complete with pump and tank.



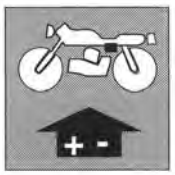




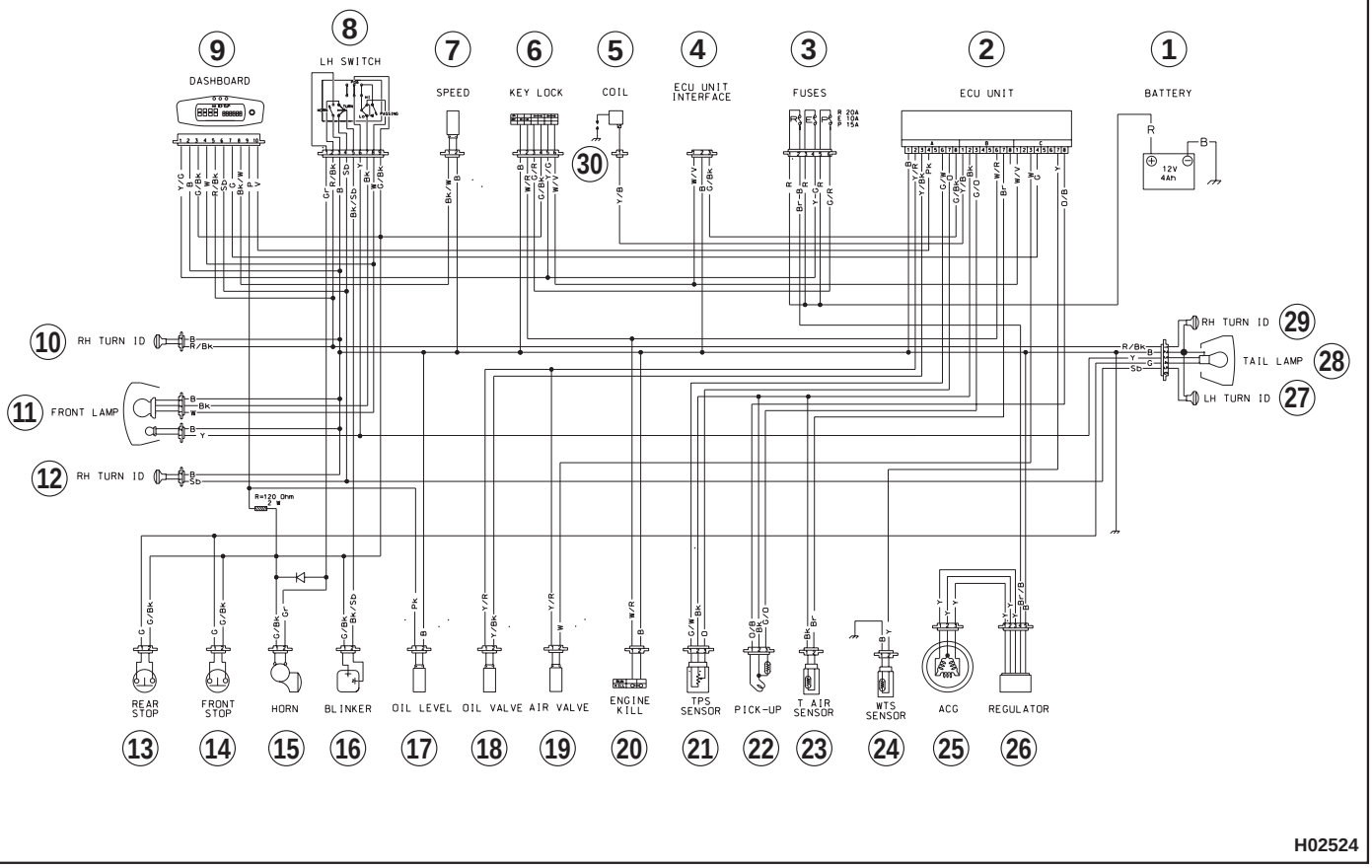
Section M



ELECTRICAL SYSTEM



Wiring diagram

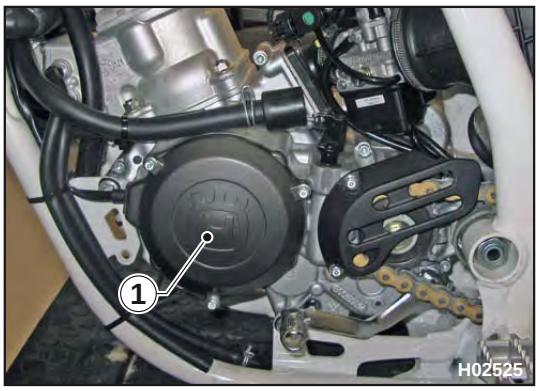


Key to wiring diagram

1. Battery
2. Electronic control unit
3. Fuse
4. Control unit interface connector
5. Coil
6. Ignition switch
7. Speed sensor
8. L.H. switch
9. Dashboard
10. Front R.H. turning indicator
11. Headlamp
12. Front L.H. turning indicator
13. Rear stop light switch
14. Front stop light switch
15. Horn
16. Turning indicators flasher
17. Oil level switch
18. Oil pump
19. Air valve
20. R.H. switch
21. Carburettor throttle position sensor (TPS)
22. Pick-up
23. Air temperature sensor
24. Water temperature sensor
25. Alternator
26. Voltage regulator
27. Rear L.H. turning indicator
28. Tail light
29. Rear R.H. turning indicator
30. Spark plug

Colour coding key

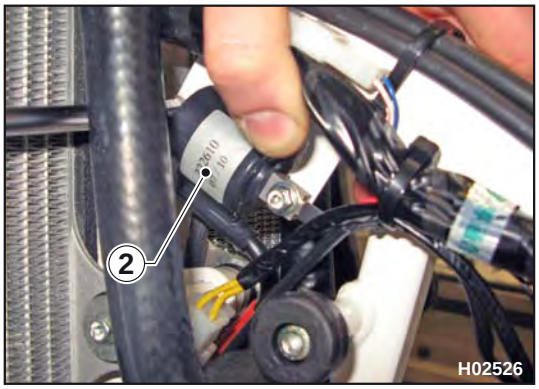
B ..... Blue
Bk ..... Black
Bk/Sb ..... Black/Sky blue
Bk/W ..... Black/White
Br ..... Brown
Br/B ..... Brown/Blue
Br/Bk ..... Brown/Black
Br/W ..... Brown/White
G ..... Green
G/Bk ..... Green/Black
G/Gr ..... Green/Grey
G/O ..... Green/Orange
G/R ..... Green/Red
G/W ..... Green/White
Gr ..... Grey
Gr/B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



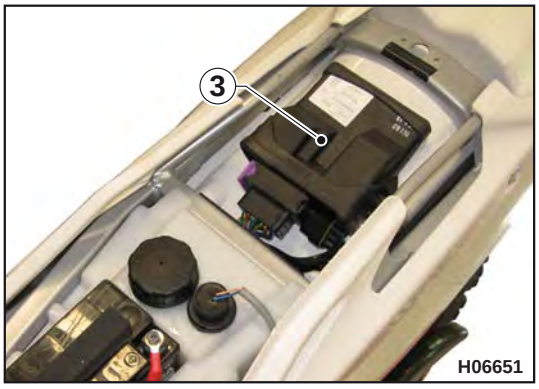
Electrical component location

The ignition system includes the following elements:

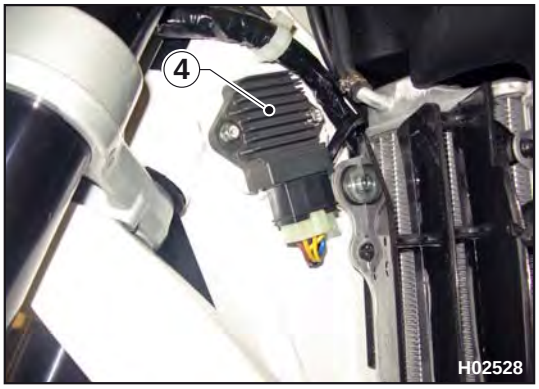
- Generator (1), on the inner side of L.H. crankcase half cover;



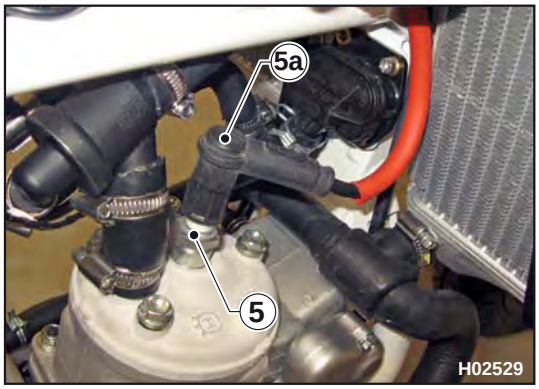
- Electronic ignition coil (2) under the fuel tank;



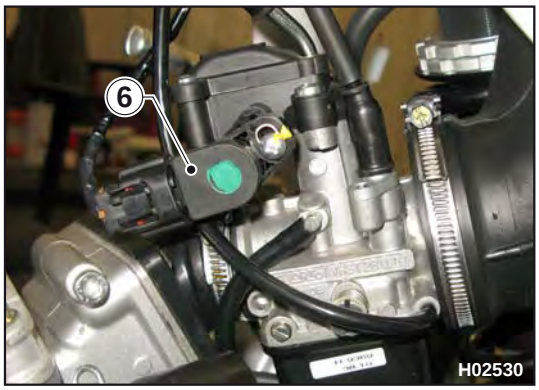
- Electronic control unit (3) under the saddle;



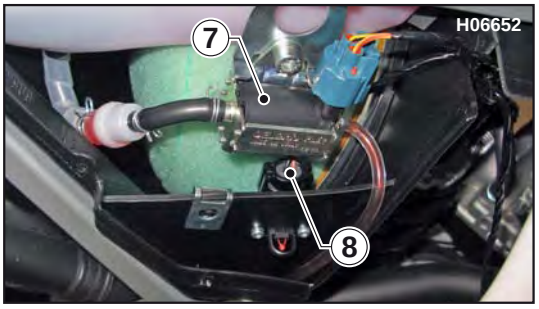
- Voltage regulator (4) on steering tube left side;



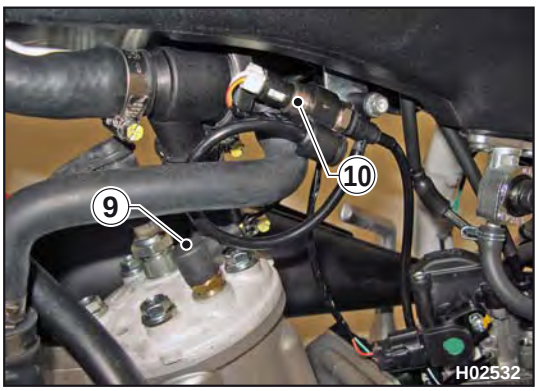
- Spark plug (5) on cylinder head;
- Spark plug cap (5a);



- TPS sensor (6) on carburettor;



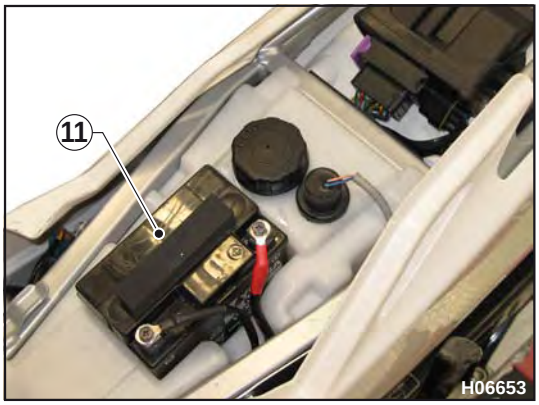
- Oil pump (7) positioned on right-hand rear chassis;
- Air temperature sensor (8) positioned inside filter box, close to oil pump;

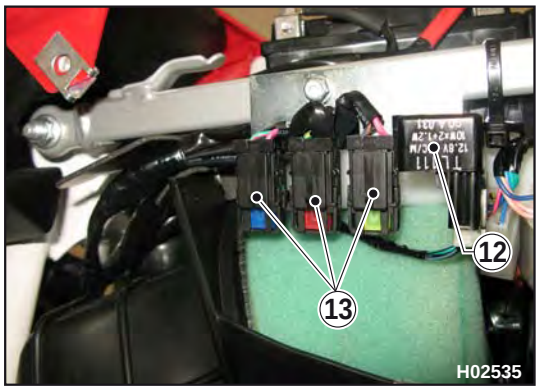


- Coolant temperature sensor (9);
- Carburettor additional air solenoid valve (10) positioned on left-hand side, close to thermostat.

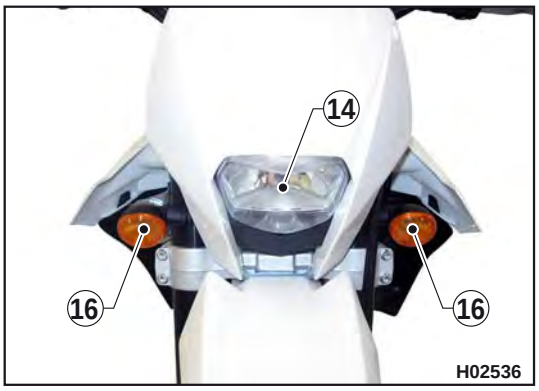
Electrical component location

The electrical system includes the following elements:
- 12V-4Ah Battery (11) under the saddle;

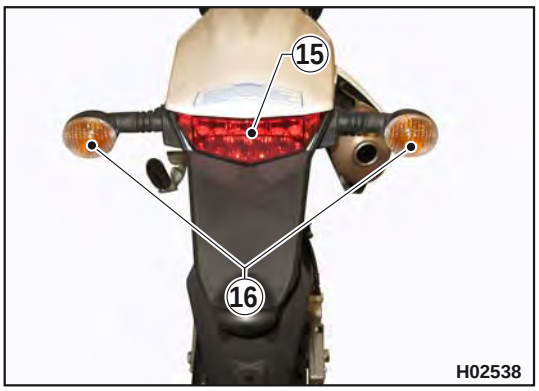


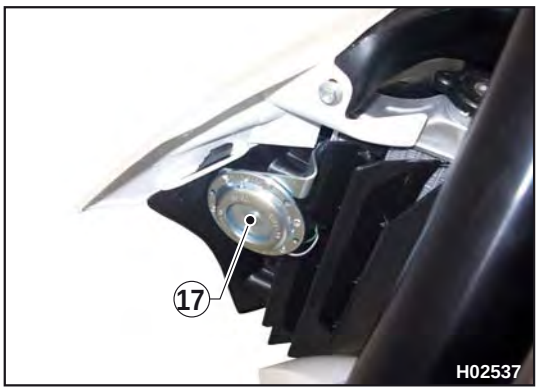


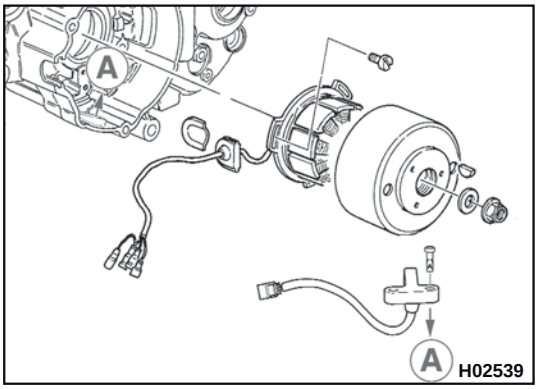
- Turning indicator flasher (12) on left side of rear chassis;
- Fuses (13) on utilities holder plate, on left side of rear chassis;



- Headlamp (14) with 12V-35/35W twin halogen bulb and 12V-3W parking light bulb;
- LED tail light (15);
- Turning indicators (16), 12V-10W bulbs;
- Horn (17) up front on right side, near the radiator.

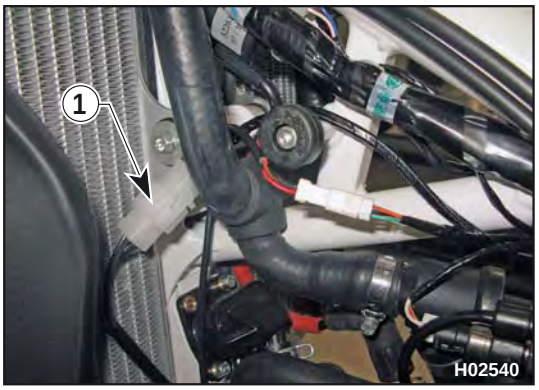






Checking generator stator windings resistance

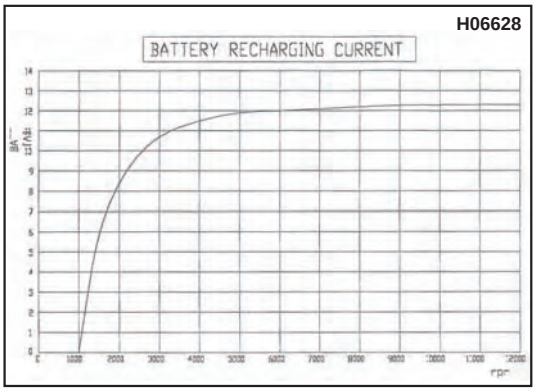
The generator consists of a 12 V alternator with a power of 160 at 6,000 rpm, positioned inside engine left side cover.
Ignition current start (spark): approx. 350 rpm.



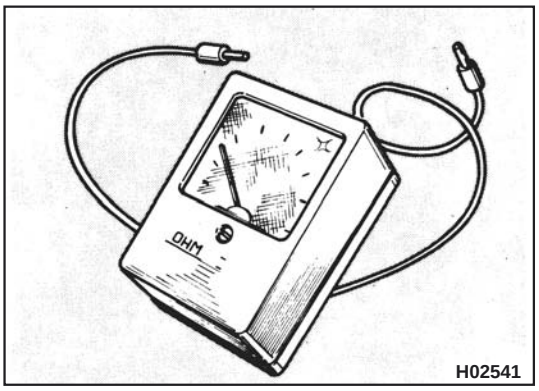
Measure across the terminals of the connector (1); correct value is about 0.6 **Ω**.

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

Generator performance



RPM	A D.C. (typical)
1500	5.6
2000	8.4
3000	10.8
4000	11.5
5000	11.9
6000	12.0



H02541

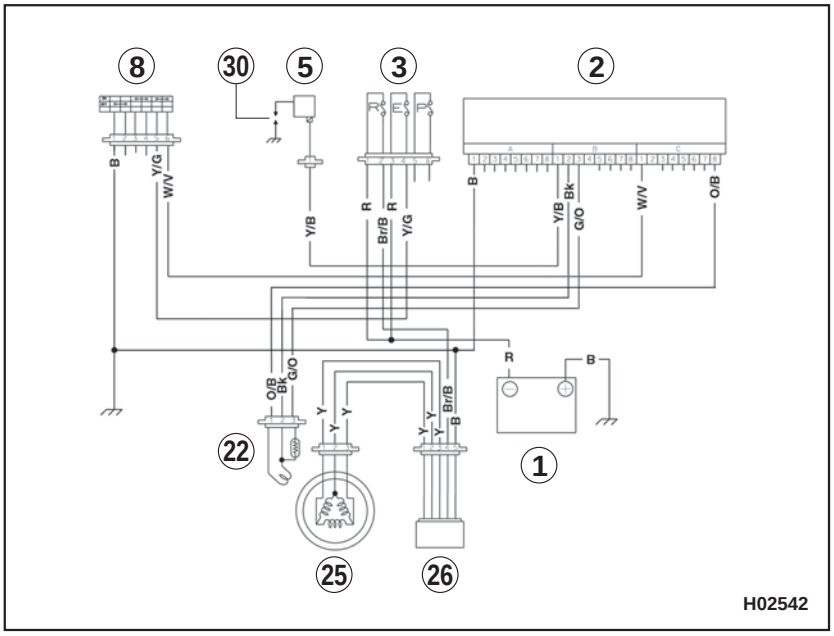
Alternator inspection

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

The electronic ignition system includes the following elements:
- 12V-120W generator (25)
- Electronic coil (5)
- Electronic control unit (2)
- Voltage regulator (26)
- Spark plug (30)
- Battery (1)
- Pick-up (22)
- Fuses (3)
- Ignition switch (8)



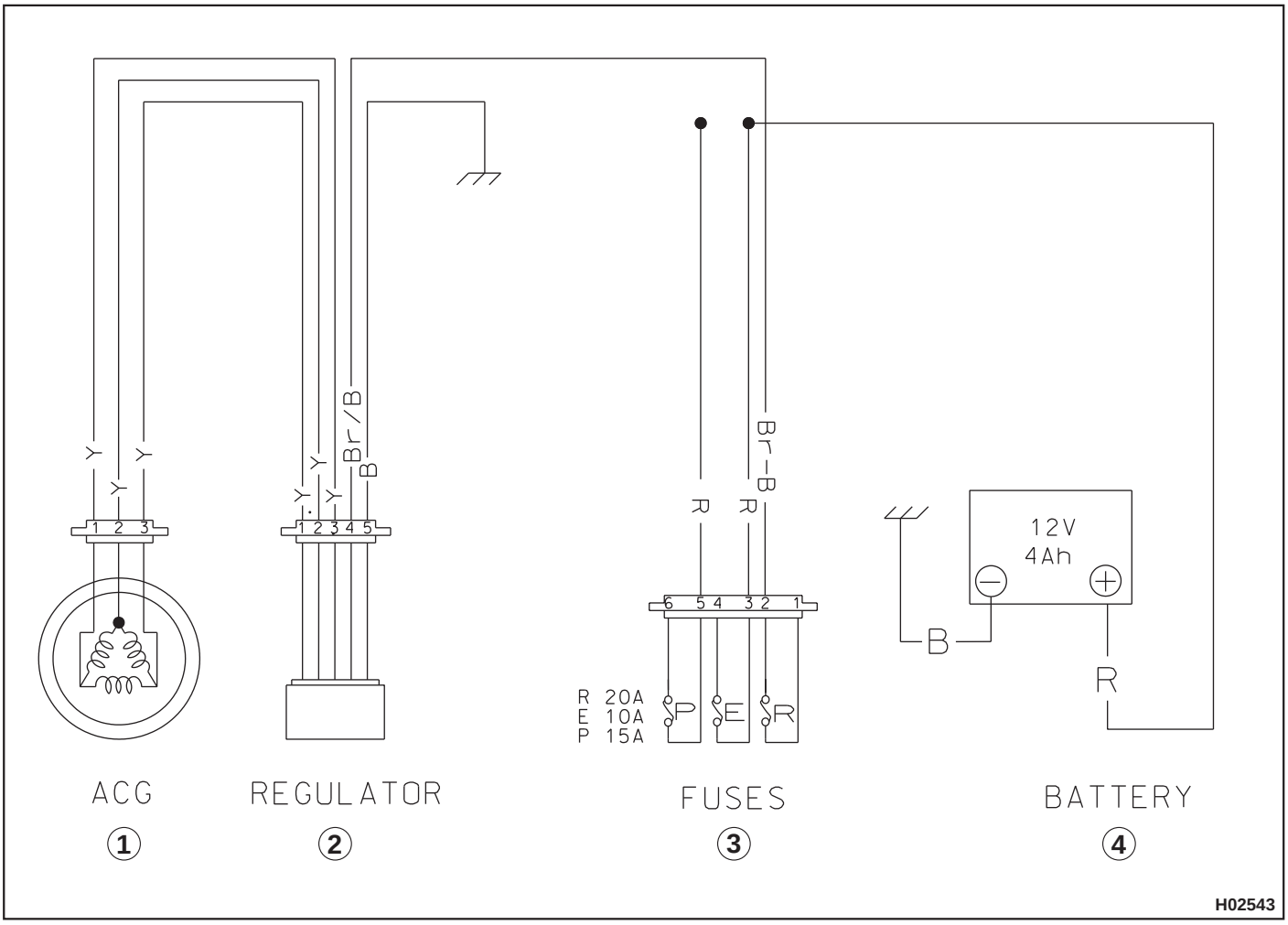
H02542

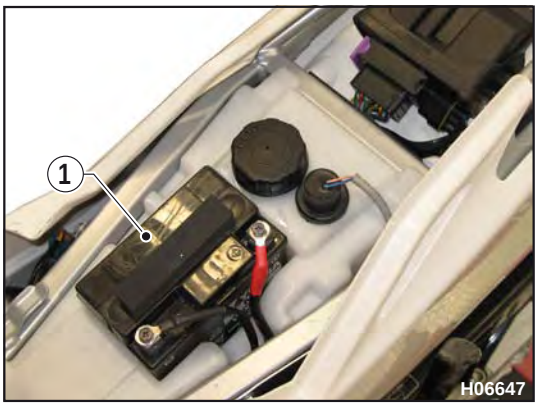
CHARGING SYSTEM

The charging system is composed of:
- Alternator (1);
- Voltage regulator/rectifier (2);
- 20A fuse (3);
- Battery (4).

The alternated current generated by the alternator is converted into direct current by the voltage regulator/rectifier. The voltage regulator/rectifier serves a dual purpose: it provides overvoltage protection for the battery and converts alternated current into direct current. All components listed above help keep voltage constant and protect the battery against overloading.

CHARGING SYSTEM WIRING DIAGRAM





CHARGING SYSTEM INSPECTIONS

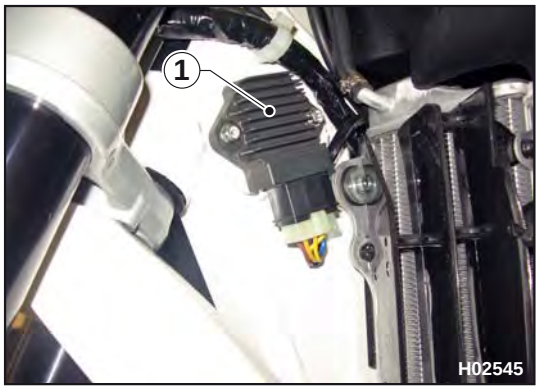
Current loss at the battery

Remove the saddle (as outlined in the relevant paragraph) to gain access to the battery (1).
Disconnect the BLACK negative cable from the battery.
Measure current across the negative terminal of the battery and the negative cable using a meter. A reading greater than 1 mA indicates current loss.

If the vehicle is to remain unused for long periods, it is recommended to disconnect the battery from the electrical system and store it in a dry place.

Regulated voltage

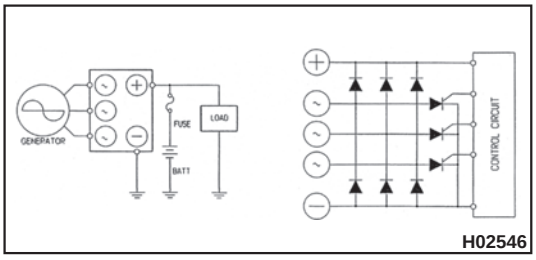
Remove the saddle (as outlined in the relevant paragraph) to gain access to the battery.
With the engine warmed up and running at slightly above 3,000 rpm, measure voltage across the positive and negative terminal of the battery using a meter (the battery must be charged when performing this test). If reading is outside a 12.5-14.5 V range, check generator and voltage regulator/rectifier as described in the relevant paragraph.



Voltage regulator/rectifier inspection

With the lights off, keep engine running at 6,000 rpm. Battery voltage shall progressively increase until reaching regulator (1) calibrated value (approx. 14-14.5 V), while charging current shall progressively decrease until reaching a value of 0.5 A.

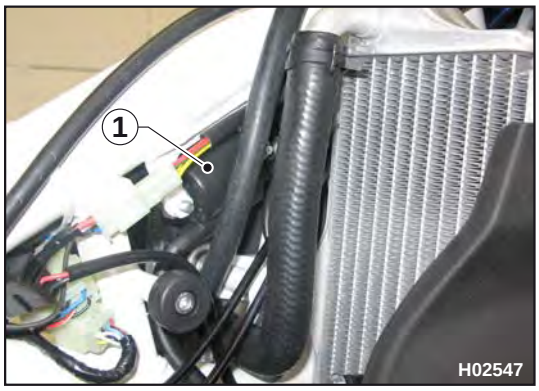
- If current does not decrease and voltage increases above the 15 V limit, regulator (1) is faulty and must be replaced.
- If, on the other hand, voltage stays below approx. 13 V and current is always high, battery could be flat or faulty. Charge battery, and check battery charge level.
- If voltage does not increase until reaching the above-specified values and current is very low, check alternator efficiency.
  To check alternator efficiency, disconnect the 3 yellow cables from regulator, check that yellow cables or winding are not grounded using a tester or a current indicator lamp. If the check result is OK, regulator is faulty and must be replaced.

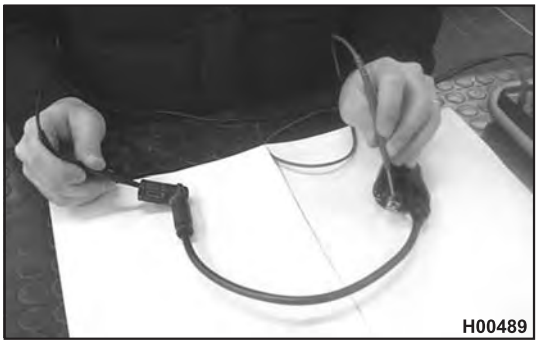


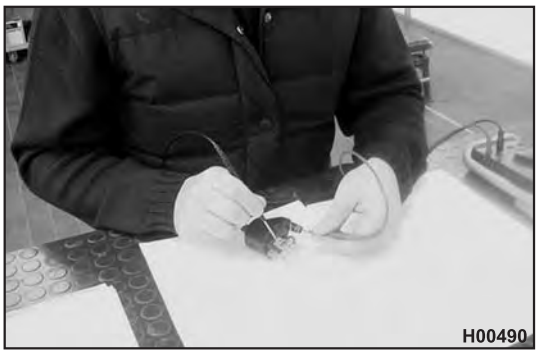
Voltage regulator

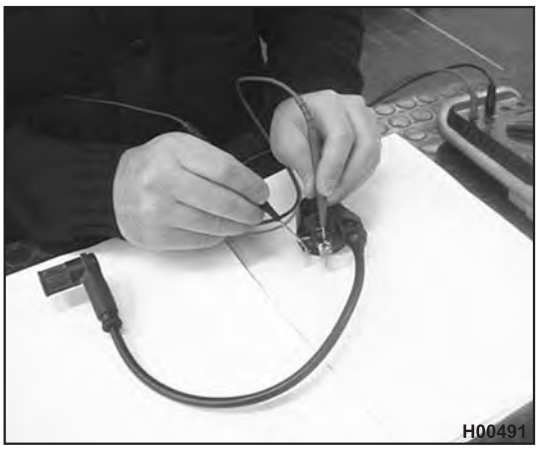
The voltage regulator (1) incorporates the diodes used to rectify the generator current output.
It also incorporates an electronic device that adjusts charging voltage to battery charge: if battery charge is low, charging voltage will be lower.

Do not disconnect the battery cables while the engine is running, or the regulator will suffer irreparable damage.









Checking coil windings resistance

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.

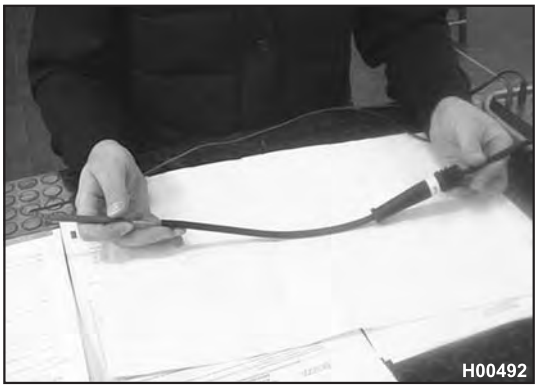
Induction coil:
- Primary winding resistance: 4.5 Ω ±15% at 20°C.
- Secondary winding resistance: 19.5 KΩ ±20% at 20°C (without spark plug cap cable).

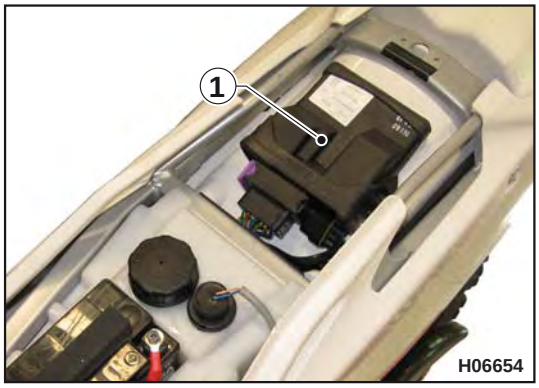
  If resistance is outside the specified limits, replace the coil. Also check the resistance of the terminal cap contacting the spark plug.

- 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.



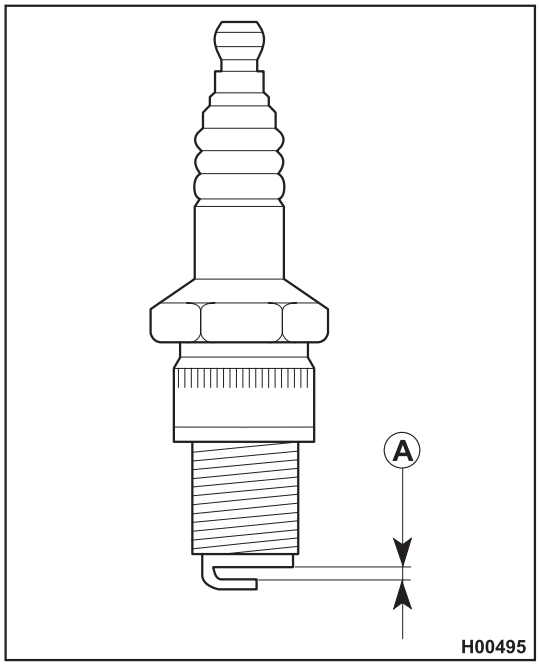


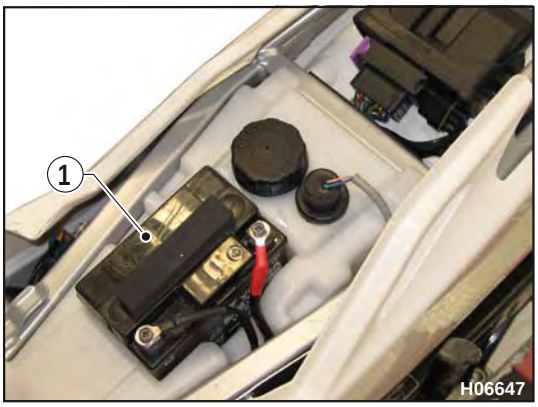
Electronic control unit (ECU)

Remove the saddle as described in Section E to gain access to the electronic control unit (1).
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 and throttle position.

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.





BATTERY

The battery (1) is a sealed-for-life, maintenance-free battery. If the vehicle remains unused for long periods, it is recommended to disconnect the battery from the electrical system and store it in a dry place. After an intensive use of the battery, it is advisable to carry out a standard slow charging cycle (12V-4Ah battery: 0.6A for 8 hours).
Quick charging is advised only in situations of extreme necessity since the life of lead elements is drastically reduced by such cycle (12V-4Ah battery: 6A for 0.5 hours).

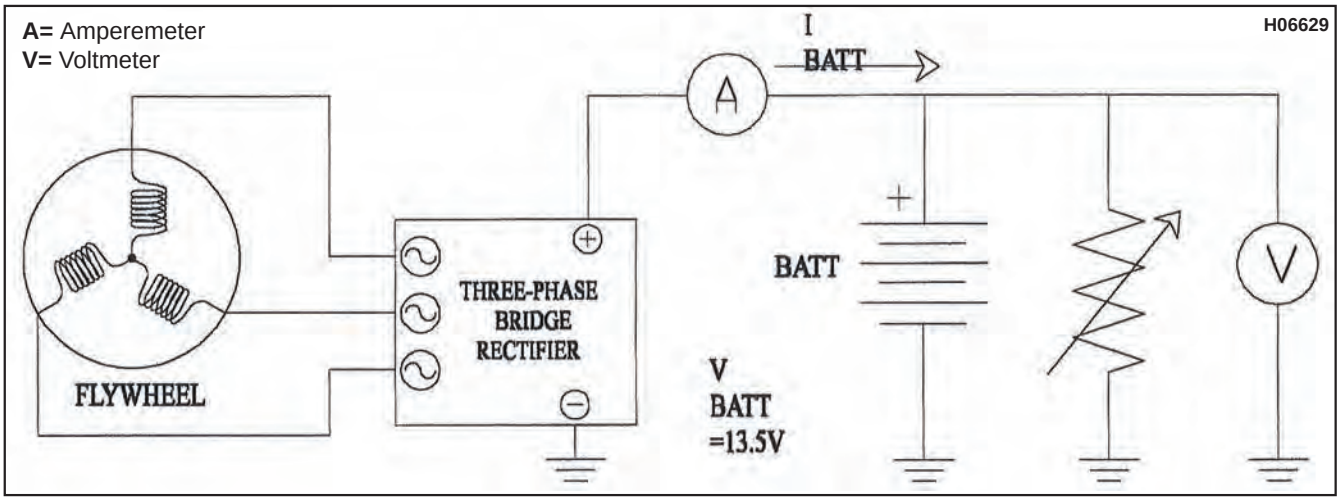
Battery charger

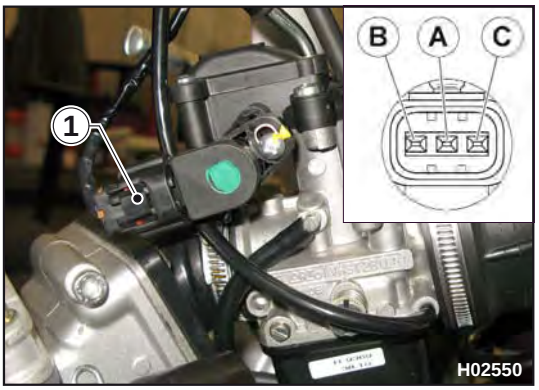
To gain access to the battery (1):
- remove the saddle (as outlined in the relevant paragraph);
- first remove the BLACK negative cable, then the RED positive cable (when reassembling, first connect the RED positive cable, then the BLACK negative cable);
- remove the battery (1) from its housing.

Check, using a voltmeter, that battery voltage is not less than 12.5 V. If it is not so, the battery needs to be charged. Using a battery charger with a constant voltage, first connect the RED positive cable to the battery positive terminal then the BLACK negative cable to the battery negative terminal. At a constant voltage level of 14.4 V, apply “x” Amps according the battery's charge percentage as indicated in the table below. The voltage reaches a constant value only after a few hours, therefore it is suggested NOT to measure it immediately after having charged or discharged the battery. Always check the battery charge before reinstalling it on the vehicle. The battery should be kept clean and the terminals coated with grease.

INDICATIVE CHARGE TIMES DEPENDING ON BATTERY CHARGE STATUS		
AT-REST VOLTAGE * (V)	% OF CHARGE	CHARGE TIME (RATED CURRENT IN AMPS TO BE APPLIED: 0.1x BATTERY RATED CAPACITY)
> 12.7	100	–
~ 12.5	75	4h
~ 12.2	50	7h
~ 12.0	25	11h
~ 11.8	0	14h

Charging system check

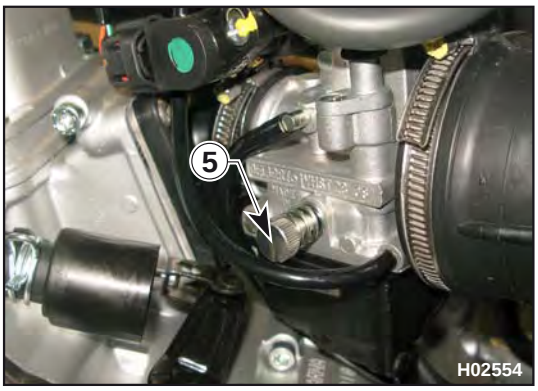


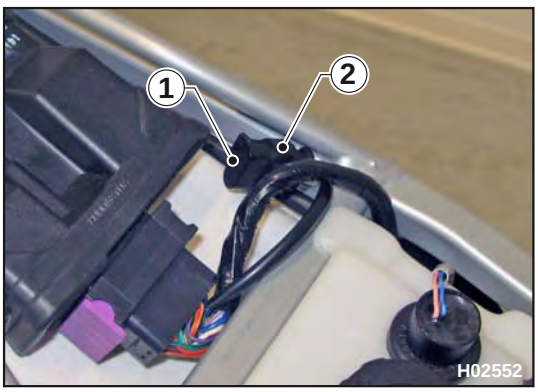


Carburettor throttle position sensor (TPS) inspection

Disconnect pipe from TPS on carburettor and, with the tester in OHM mode, position terminals across poles B and C on sensor, turn throttle twistgrip from the fully closed to the fully open position. Check that the resistance value corresponds to the one specified in the table.

Position THROTTLE twistgrip	Resistance value
CLOSED	~0 KOhm
FULLY OPEN	~5 KOhm

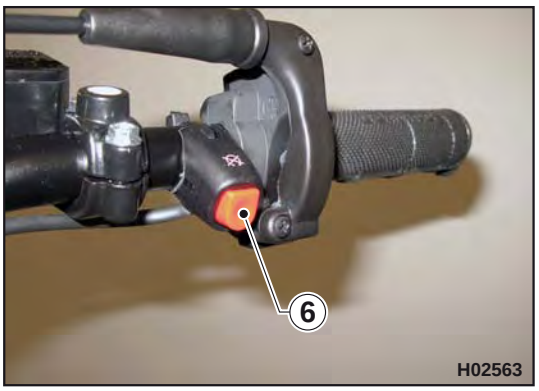




Carburettor throttle valve sensor (TPS) calibration

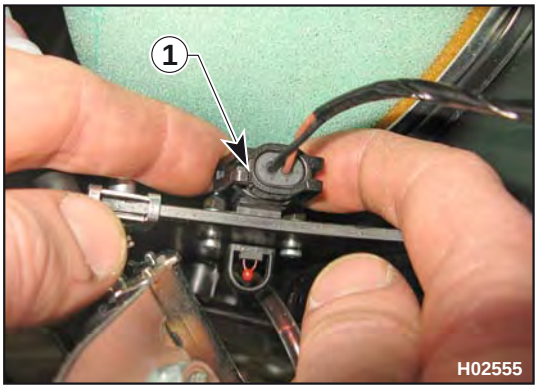
Throttle valve sensor shall be calibrated in case it is replaced or if any operation is carried out on throttle control.

- Remove saddle as indicated in the relevant paragraph (see section E).
- Using a tester, check that battery voltage is above 11 V.
- Fully loosen idle screw (5).
- Remove cap (1) from connector (2).
- Connect control unit programming connector part no. 8000A9751 to connector (2) positioned close to control unit.



The following operations must be carried out with the engine off.

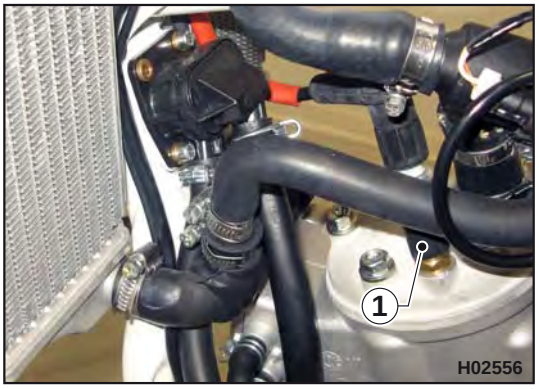
- Turn the ignition key (3) to "ON", oil warning light (4) will flash to indicate that the self-learning mode is active.
- With the throttle control released, press Engine Stop key (6), and keep it pressed: oil warning light (4) will start flashing more quickly. When light flashing will slow down, release key (6).
- Fully turn throttle twistgrip until throttles are fully opened. Keeping twistgrip turned, press Engine Stop key (6), and keep it pressed. Lamp flashing will increase, to indicate that the value has been adjusted. As soon as light flashing slows down, release Engine Stop key (6), and release throttle control.
- Turn ignition key (3) back to OFF.
- Disconnect control unit programming connector from connector (2), and refit cap (1).
- Adjust idle speed as indicated in the relevant paragraph (see section D).

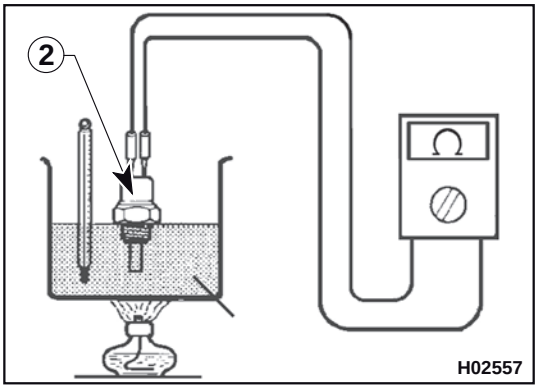


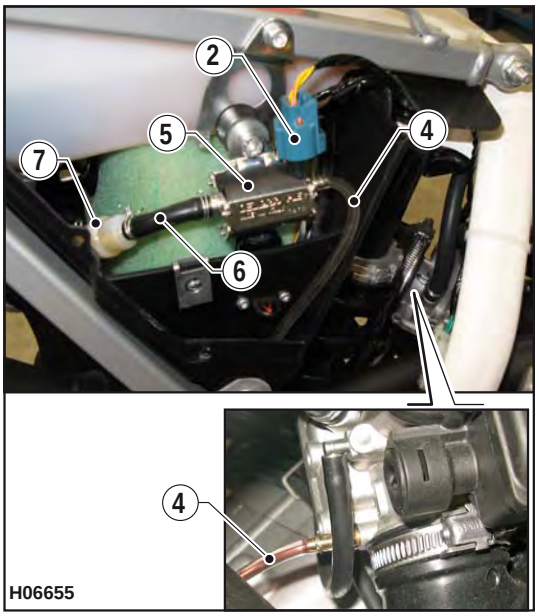
Checking air temperature sensor

Remove right rear panel as described in the relevant paragraph (see section E).
Disconnect connector (1) and, with the tester in OHM mode, check that the resistance value between the two sensor poles changes based on the ambient temperature, according to the data specified in the table below.

Temperature	Resistance value
-40°C	~100.950 KOhm
-30°C	~53.100 KOhm
-20°C	~29.121 KOhm
-10°C	~16.599 KOhm
0°C	~9.750 KOhm
10°C	~5.970 KOhm
20°C	~3.747 KOhm
25°C	~3.000 KOhm
30°C	~2.417 KOhm
40°C	~1.598 KOhm
50°C	~1.080 KOhm
60°C	~0.745 KOhm
70°C	~0.526 KOhm
80°C	~0.377 KOhm
90°C	~0.275 KOhm
100°C	~0.204 KOhm
110°C	~0.153 KOhm
125°C	~0.102 KOhm







Checking coolant temperature sensor

Remove cap (1), disconnect electric contacts, and remove thermostat from head.

Connect coolant temperature sensor (2) to an ohmmeter, and dip it inside the oil contained inside a pan. Heat up oil to slowly increase its temperature, and observe the values shown by the thermometer and ohmmeter. If coolant temperature sensor resistance does not change as shown in the table, sensor shall be replaced.

Temperature sensor specifications		
Temperature (°C)	Resistance (kQ)	Current (mA)
-43±0.2	below 86	max. 0.1
-20±0.2	17.90±15%	max. 0.2
+40±0.2	1.16±10%	max. 0.5
+100±0.2	0.156±5%	max. 1.0
+150±0.2	above 0.030	max. 2.0

Checking lubricating oil pump operation

- Remove saddle and right-hand side panel as outlined in the relevant paragraph.

This check shall be carried out with the engine off.

Checking the supply system

Turn ignition key (1) to ON, disconnect connector (2) from oil pump (warning light (3) will stay on). Using a tester, check that the voltage between chassis ground and connector yellow/black wire is above 11 V.

Checking the pump

Using the special pliers, loosen clamp onto pump (5) to carburettor pipe (4), and disconnect pipe. Position a container under carburettor and make sure that the ignition key (1) is set to OFF:

- disconnect oil pump connector (2);
- turn ignition key (1) to ON, and reconnect connector (2).

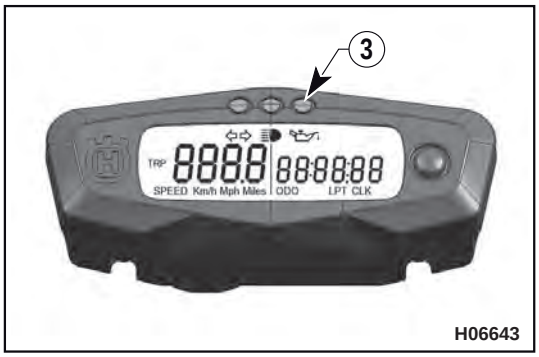
A 5-minute pumping cycle will start with the warning light (3) flashing every 0.5 seconds. Check that oil comes out of tube spacer (4), then turn ignition key (1) to OFF to stop pump operation.

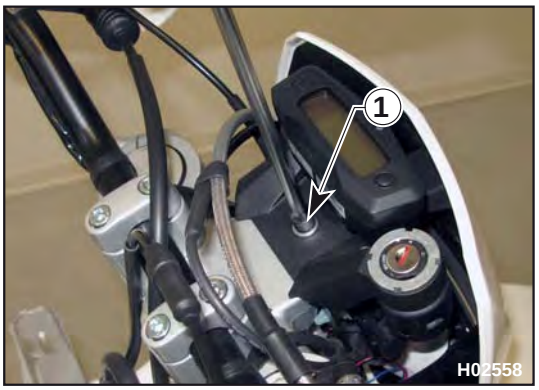
If oil does not come out, check in the following sequence:

- that tube (4) and tube (6) are not kinked;
- that filter (7) is not clogged.

If tubes (4) and (6) are not kinked and filter is not clogged, replace pump and reassemble all parts, in the reverse order compared to disassembly.

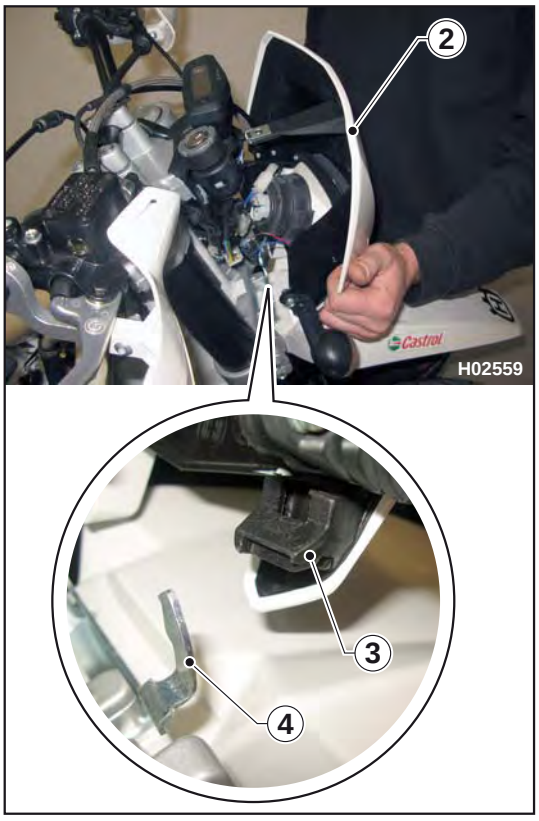
Lubricating oil pump does not require any overhaul intervention, and its parts do not have to be removed or checked.





Headlight unit with front fairing removal

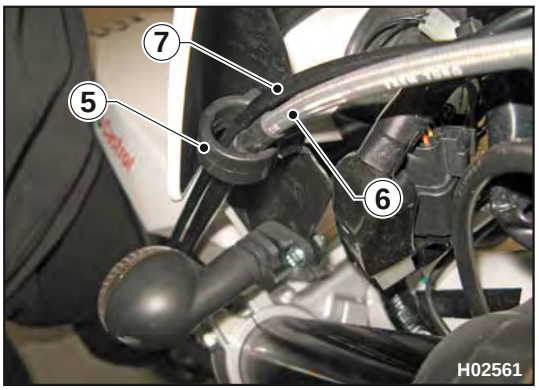
- Using an 8 mm wrench, loosen screw (1).

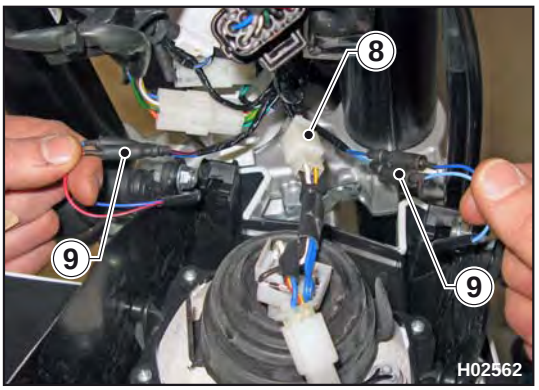


- Move headlamp fairing (2) forward, and lift it to release damping pads (3) from their mounts (4).

- 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).

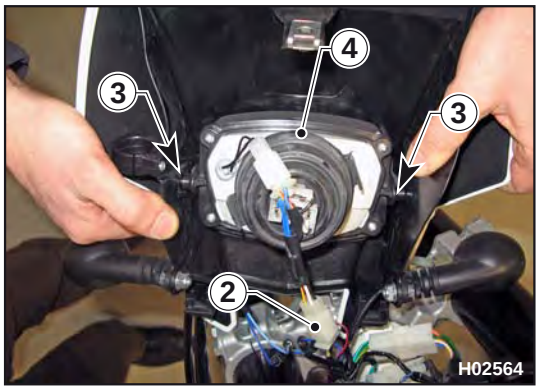
ON REASSEMBLY, MAKE SURE THAT DAMPING PADS (3) ARE CORRECTLY INSTALLED INSIDE SUPPORTS (4).



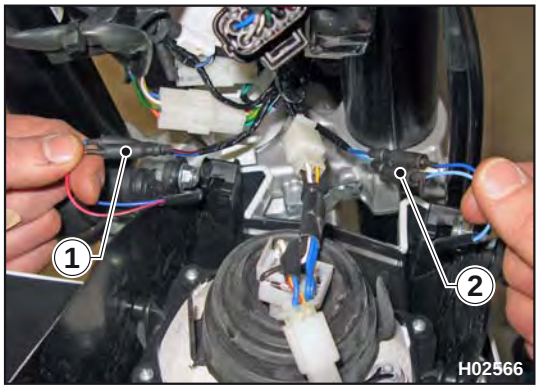


Removing headlight from front fairing

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

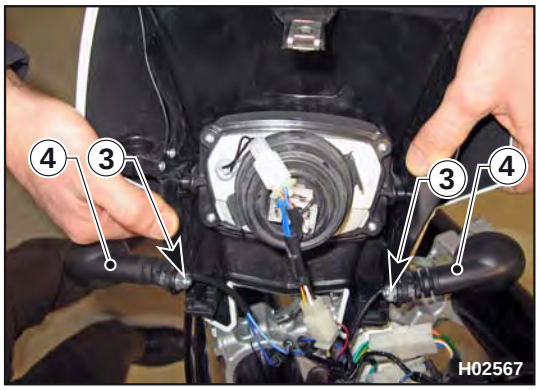


- Disconnect headlight connector (2).
- Widen the supporting tabs (3), and remove headlight (4) from the inside.

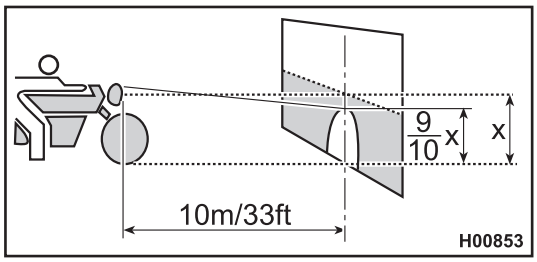


Front turning indicator removal

- 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).

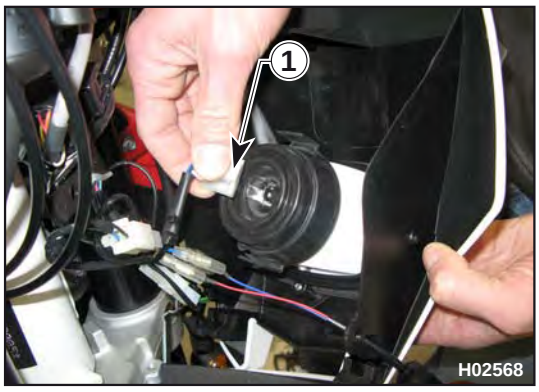


HEADLAMP, TAIL LIGHT

Headlamp adjustment

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:

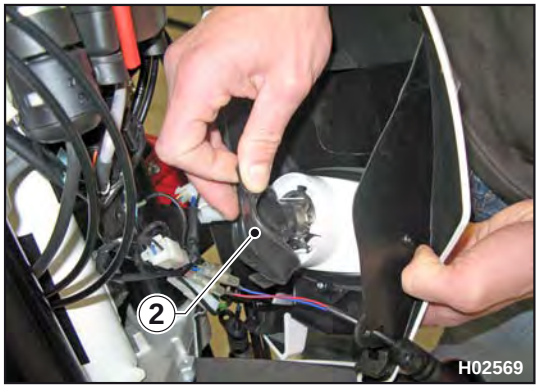
- Place the motorcycle 10 metres away from a vertical wall;
- the motorcycle must be on level ground and the optical axis of the headlamp must be perpendicular to the wall;
- the motorcycle must be upright;
- measure the height from the ground to the centre of the lamp and draw a cross on the wall at 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).



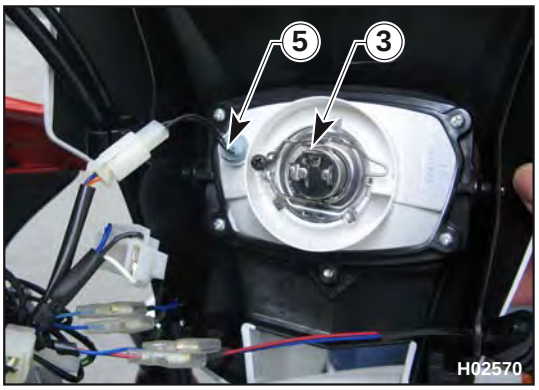
Headlamp bulbs replacement

Proceed as follows to reach the headlamp bulbs:

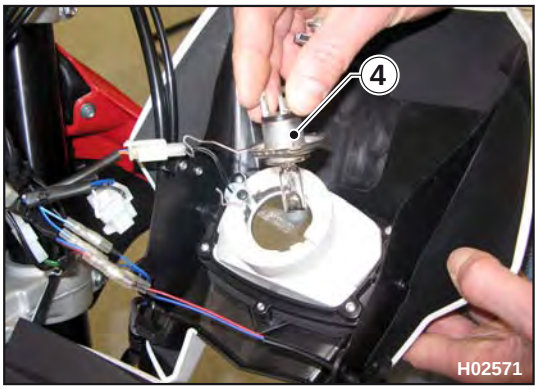
- remove the headlamp fairing as outlined in the relevant paragraph;
- detach connector (1) from the bulb;



- slide off the rubber gaiter (2);

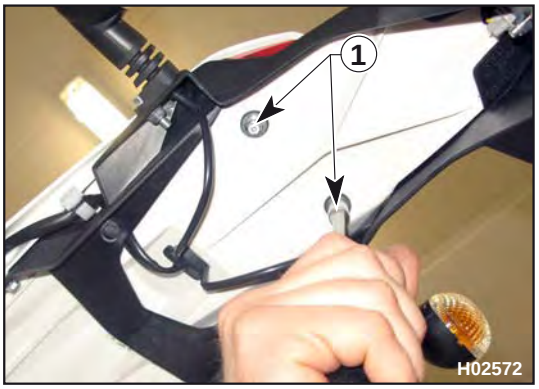


- release the bulb holder clips (3) and take out bulb (4);



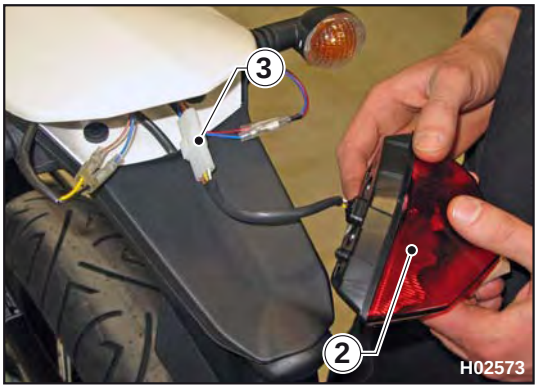
Headlamp bulb (4) is of the halogen type (H4); be careful when replacing it since the glass part shall not be touched with bare hands.

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

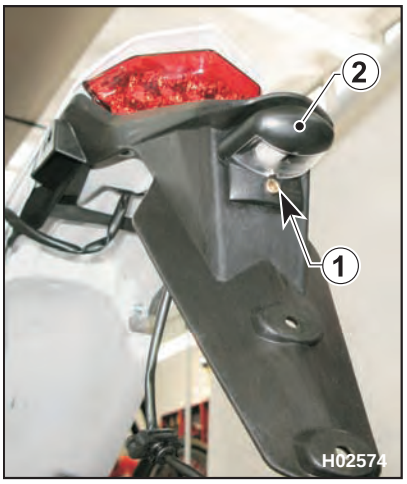
Remove the tail light as follows:
- Loosen the two screws (1) under the rear mudguard.



- 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.

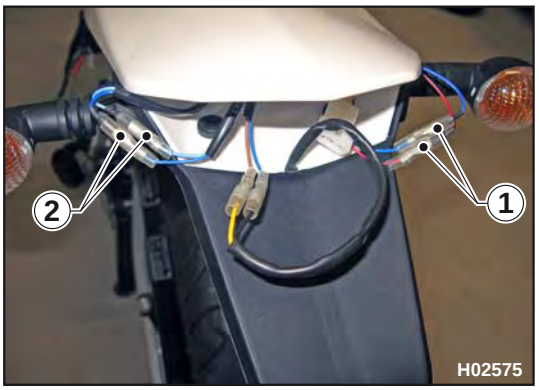


Number plate bulb replacement

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

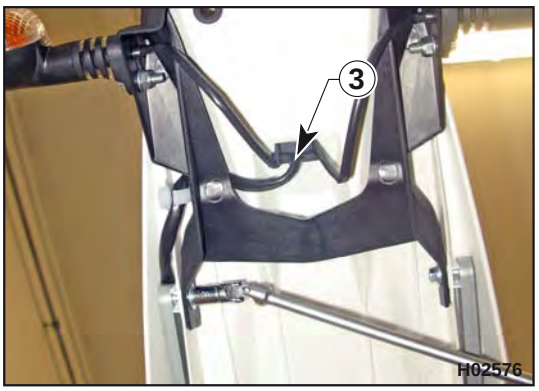
- Extract the bulb holder (3) with the bulb (4) from the housing.
- Pull the bulb (4) to detach it from bulb holder.

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

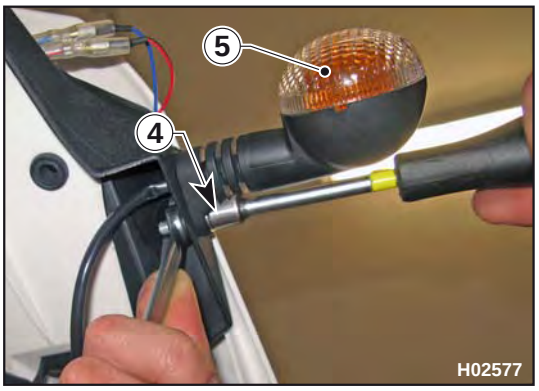


Rear turning indicator removal

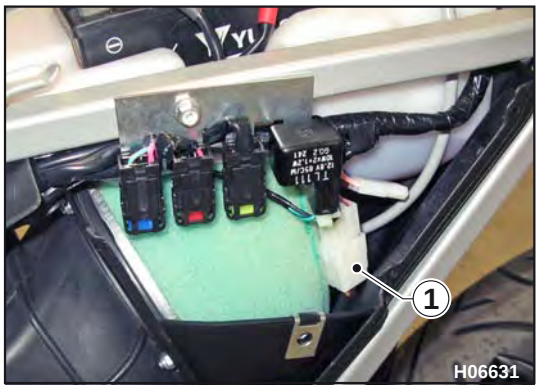
- Remove the tail light as outlined in the relevant paragraph.
- Disconnect connectors (1) and (2) of right and left turn indicators, respectively.



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



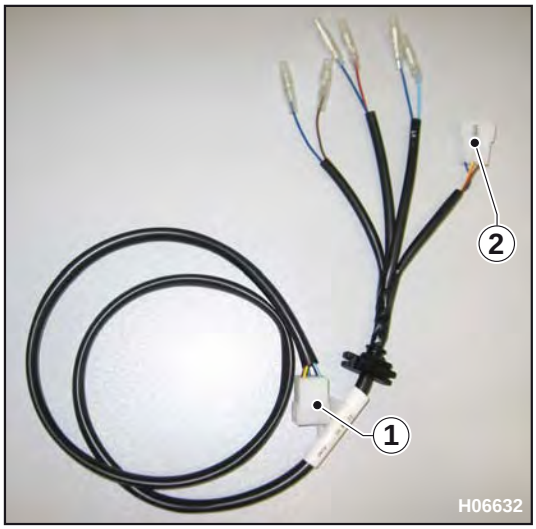
- Using a 10 mm wrench on the inside and an 8 mm wrench on the outside, loosen screws (4) and remove turning indicators (5).



Rear wiring harness replacement

- 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.

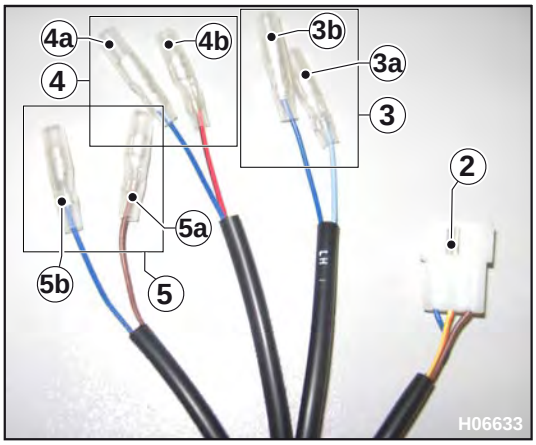
TWO TYPES OF EQUIVALENT, FULLY INTERCHANGEABLE WIRING HARNESSES, BUT WITH A DIFFERENT SHAPE, ARE AVAILABLE.



Type "A" wiring harness

1= Main wiring harness connector

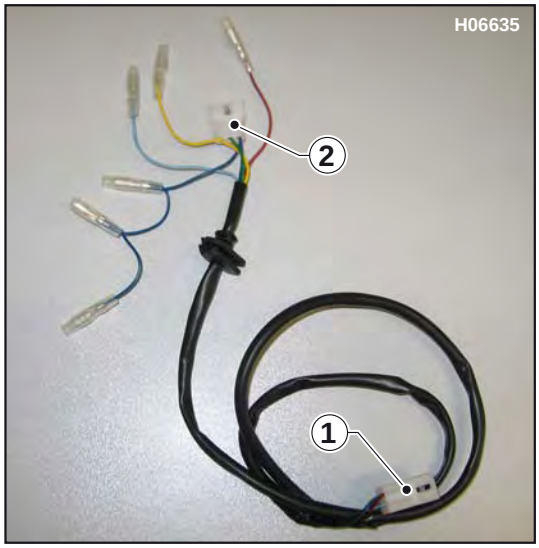
2= Tail light connector



3= LH turning indicator signal
- **3a=** SKY BLUE cable (signal)
- **3b=** BLUE cable (ground)

4= RH turning indicator signal
- **4a=** RED/BLACK cable (signal)
- **4b=** BLUE cable (ground)

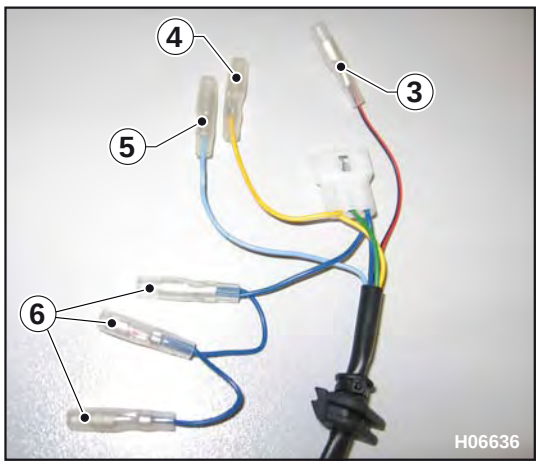
5= Number plate light signal
- **5a=** BROWN cable (signal)
- **5b=** BLUE cable (ground)



Type "B" wiring harness

1= Main wiring harness connector

2= Main wiring harness connector

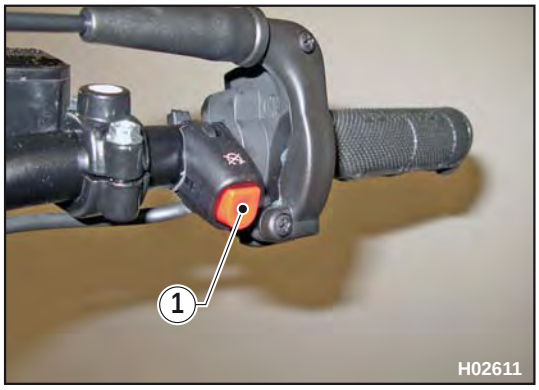


3= LH turning indicator signal (RED/BLACK)

4= RH turning indicator signal (YELLOW)

5= Number plate light signal (SKY BLUE)

6= Ground cables



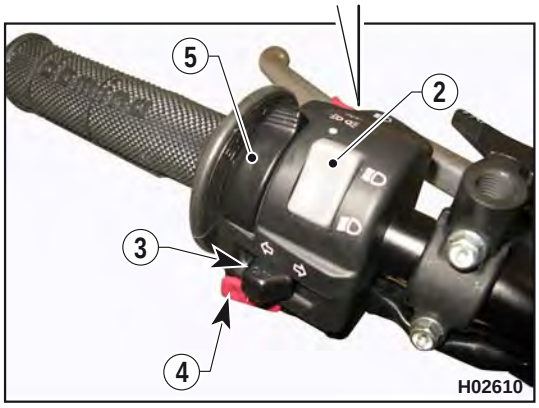
Handlebar switches

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

Right-hand switch

1 Engine stop button

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



Left-hand switch

1. High beam flasher (self-cancelling)

2. High beam switch

   Low beam switch

3. Left-hand turning indicators (self-cancelling)

   Right-hand turning indicators (self-cancelling)

To deactivate the turning indicators, press the control lever after it is returned to the centre.

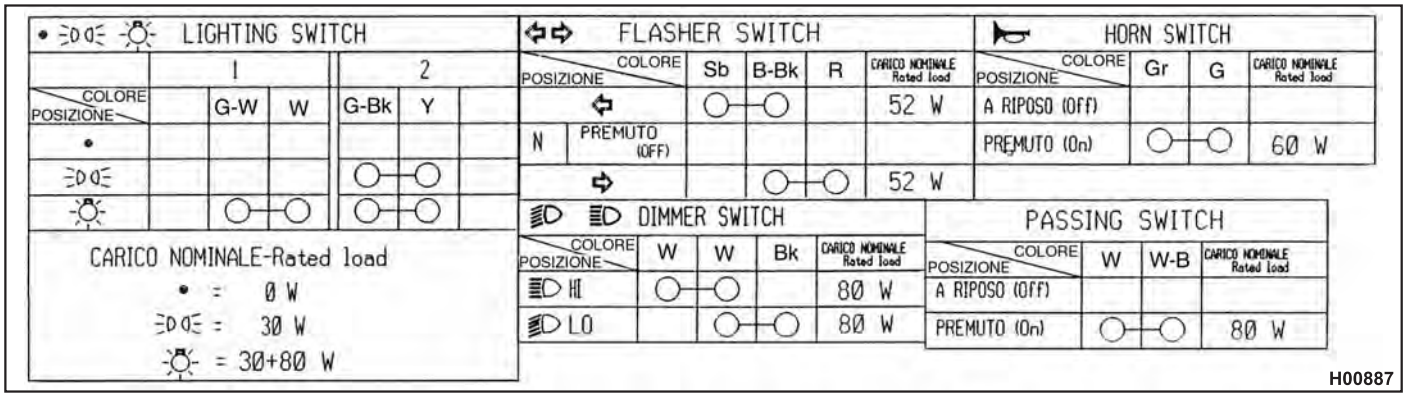
4. Horn.

5. Light main switch

= On/Off switch for low beam and high beam

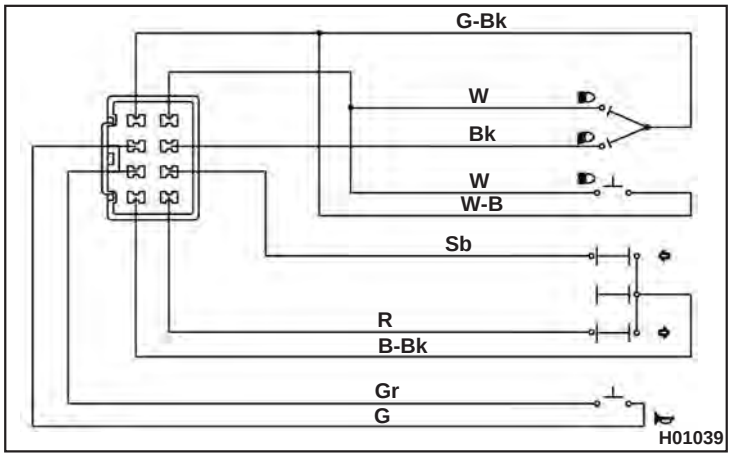
= On/Off switch for position lights

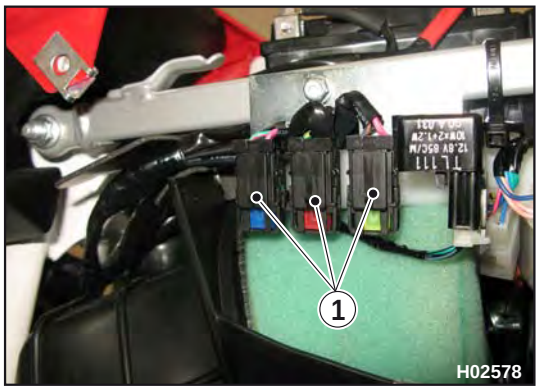
● = Off



Colour coding key

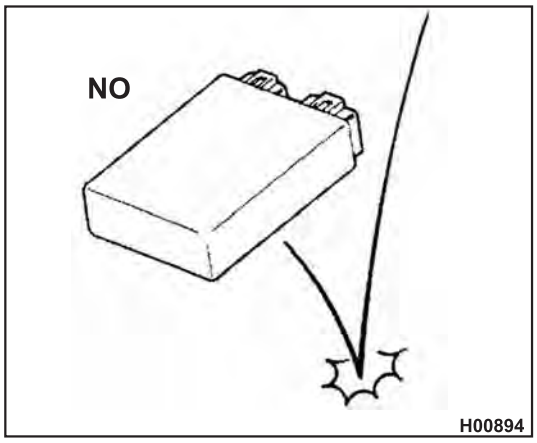
B ..... Blue
Bk ..... Black
B-Bk..... Blue-Black
B-W..... Blue-White
G..... Green
G-Bk ..... Green-Black
G-W ..... Green-White
Gr..... Grey
Y ..... Yellow
R..... Red
Sb ..... Sky blue
W ..... White
W-B..... White-Blue
W-Bk..... White-Black





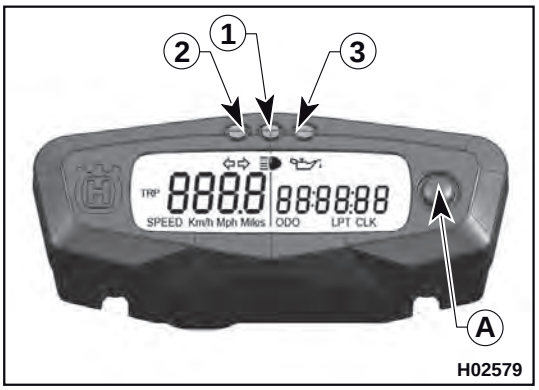
FUSES

- When you find a blown fuse (1), always investigate and eliminate the cause before replacing it.
- Never replace a fuse with another fuse with a different rating.
- Never use a wire or other makeshift repair techniques instead of installing a new fuse.



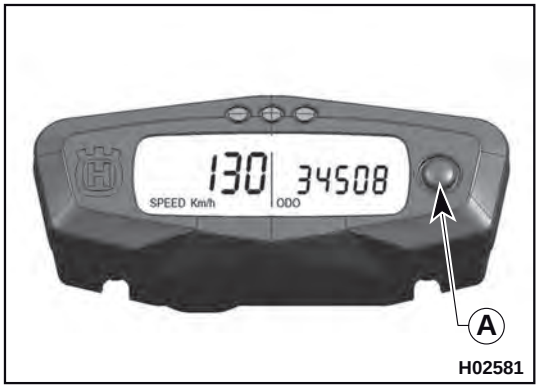
SEMICONDUCTOR PARTS

- 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.



H02579

H02580



H02581

DIGITAL DASHBOARD, WARNING LIGHTS

The motorcycle is fitted with a digital dashboard on which 3 warning lights are also available: high beam, turning indicators and fuel reserve.

1 - BLUE warning light “High beam”
2 - GREEN warning light “Turning indicators”
3 - RED warning light "Engine lubricating oil reserve" + FAIL LAMP

When the ignition key is turned to the IGNITION position, the dashboard display lights up (amber colour).

NOTE:
- At every connection with the battery, the dashboard shows the version of the test SW for the first 2 seconds; after the check routine, the dashboard shows the last planned function.
- When the engine is turned off, the dashboard does not show any functions.
- To select dashboard functions and reset functions, use the SCROLL button (A)

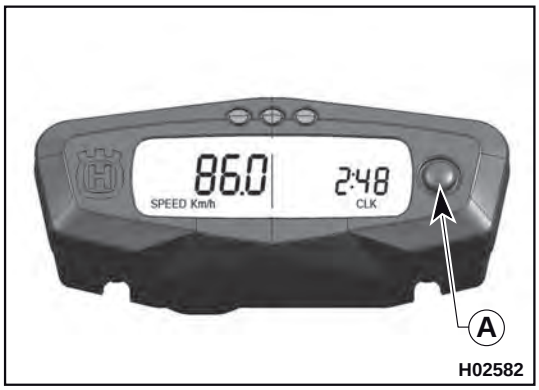
The functions, which can be selected in this sequence, are as follows:
1- SPEED / ODO
2- SPEED / CLOCK
3- SPEED / TRIP
4- SPEED / LAP TIMER
5- SPEED / HOUR COUNTER
1- SPEED / ODO

IMPORTANT: in the event of a MALFUNCTION, the FAIL wording followed by a number will be shown on the tester DISPLAY.
For alarm list, see point 6 diagnostic.

1- SPEED (Kmh or mph) / ODO

- SPEED: vehicle speed - maximum value: 299 Km/h or 299 mph;
- ODO: odometer - maximum value: 99999 Km.

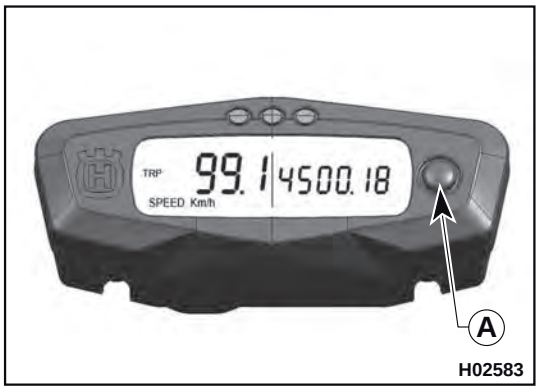
To change unit from kilometres to miles or miles to kilometres, proceed as follows:
1) set to figure 1, turn the key to OFF and push SCROLL (A);
2) place the ignition key in the IGNITION position and hold down the SCROLL button (A) until the word “Km/h” is displayed;
3) the display will now alternate between “Km/h” and “Mph Miles”, push the SCROLL button (A) again while the desired unit is displayed.



H02582

2 - SPEED / CLOCK
- SPEED: speed - maximum value: 299 Km/h or 299 mph;
- CLOCK: clock - reading from 0:00 to 23:59:59.

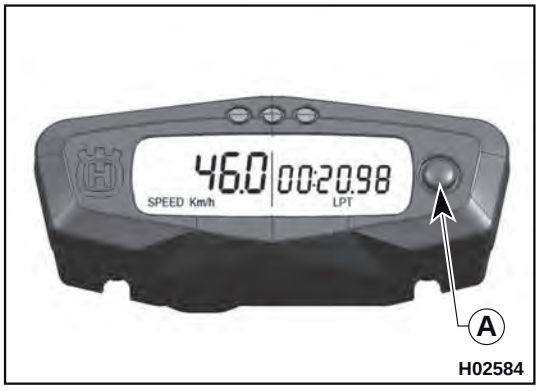
To reset the clock, push the SCROLL button (A) and hold for more than 3 seconds in order to increase the hour value; release the button then, after 3 seconds, it is possible to increase the minutes value;



H02583

3 - SPEED / TRIP 1
- SPEED: speed - maximum value: 299 Km/h or 299 mph
- TRIP 1: distance - maximum value: 999.9 km or 621.31 mi (data will be lost after disconnecting the battery).

To reset TRIP, push the SCROLL button (A) and hold for more than 3 seconds.



H02584

4 - SPEED / LAP TIMER (STP)
- SPEED: speed - maximum value: 299 Km/h or 299 mph;
- STP 1: miles/kilometres covered time
- Reading from 0:00 to 99:59:59 (data will be lost after disconnecting the battery).

To activate the function STP, push the SCROLL button (A) and hold for more than 3 seconds.

- 1st step: activate function;
- 2nd step: stop counters.
- 3rd step: reset STP;
- 4th step: activate function;
- 5th step: stop counters.

.....
and so on.

5- SPEED / HOUR COUNTER

- It counts engine operating hours every 30 minutes up to a max. of 30 hours (the figure will be lost once battery is removed).
- To delete the stored data, push the SCROLL button (A) and hold for more than 3 seconds.

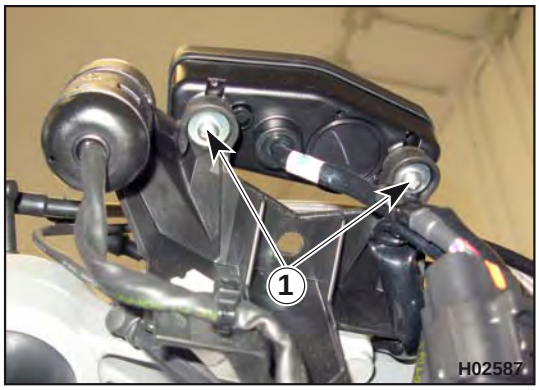
6- DASHBOARD DIAGNOSTIC

The electronic control units records operating failures. Every type of failure appears on dashboard display with the FAIL wording followed by a numerical code The following table shows a failure priority list with the relevant error codes. If several failures are present at the same time, the one with a greater priority will be signalled and, after it is remedied, the other one will be indicated, always in compliance with the following priority list.

WARNING LIGHT FLASHING SEQUENCE	FAILURE	CODE
oil pump code: on / off — 3s, 0.5s × 10, blinking until the power-off *	Oil pump	FAIL 1
TPS code: on / off — 3s, 1s, 1.5s, 0.5s × 3, 3s	TPS	FAIL 2
on / off — Air valve open or short circuit code: 3s, 1s, 1.5s, 1s, 1.5s, 1s, 1.5s, 1s, 1.5s, 1s, 1.5s, 0.5s × 12, 3s	Air valve	FAIL 3
Engine temperature sensor code: on / off — 3s, 1s, 1.5s, 1s, 1.5s, 0.5s, 3s	Water temperature sensor	FAIL 4
Air temperature sensor code: on / off — 3s, 1s, 1.5s, 1s, 1.5s, 0.5s × 3, 3s	Air temperature sensor	FAIL 5

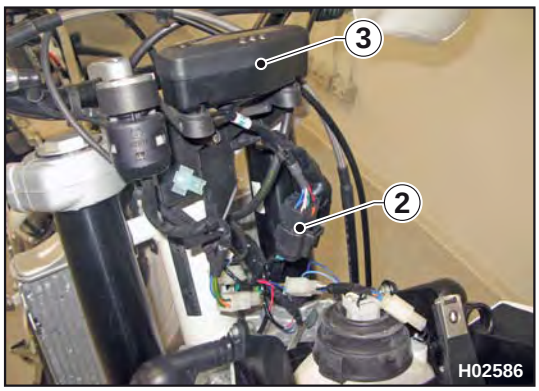
*With this alarm:

- if engine is running at >3,000 rpm, FAIL warning light will flash as indicated;
- if engine is running at <3,000 rpm, warning light will flash as indicated and engine will turn off.

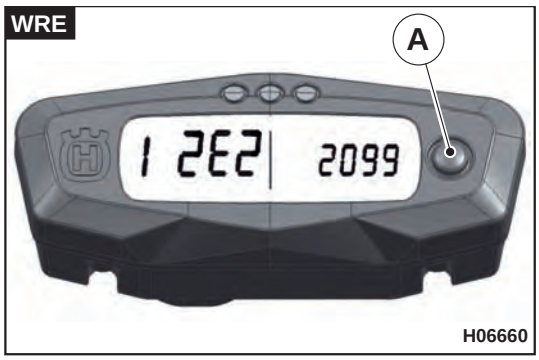


Dashboard replacement

- Remove the headlamp fairing as outlined in the relevant paragraph.



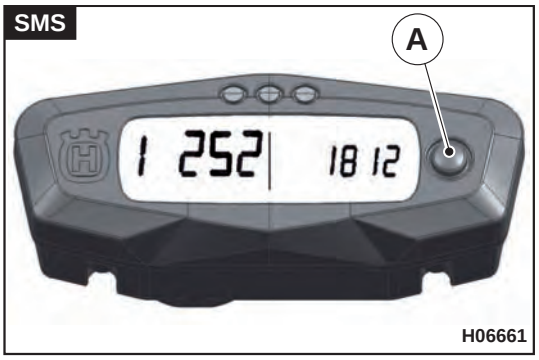
- Remove the two retaining screws (1) securing the dashboard to its bracket, disconnect the connector (2) and remove the dashboard (3).
- To refit the dashboard, reverse the disassembly procedure.

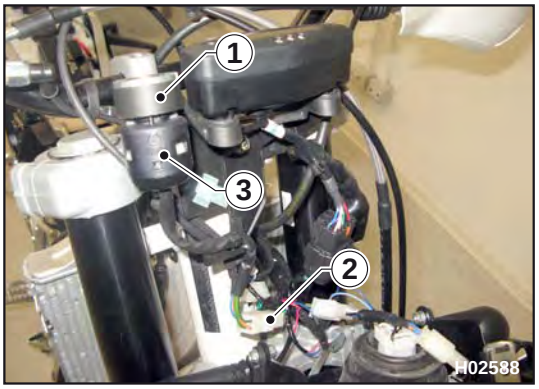


Instructions for the instrument setting

Upon turning on the instrument, **if the operation DID NOT already take place,** it is necessary to set the instrument associating it with the relative motorcycle by selection of the codes illustrated in the figures shown.The identification codes appear on the display of the instrument at 2 second intervals: **when the required code appears, press the button (A) on the instrument.**

BE VERY CAREFUL WHEN SELECTING. THE OPERATION CAN ONLY BE EXECUTED ONCE.





Ignition switch removal

- Remove the headlight unit complete with front fairing as outlined in the relevant paragraph.
- Loosen ring nut (1)
- Disconnect connector (2) and remove ignition switch (3).

TROUBLESHOOTING

CHARGING SYSTEM

A battery that does not hold charge might be a symptom of:
1) current loss (see paragraph "Current loss at the battery");
2) incorrect voltage (see paragraph "Regulated voltage");
3) no continuity in generator (see paragraph "Checking generator stator windings resistance");
4) incorrect no-load performance of generator (see paragraph "Generator no-load performance")
5) voltage regulator malfunction (see paragraph "Voltage regulator/rectifier inspection")

- a battery overload indicates:
1) faulty voltage regulator (see paragraph "Voltage regulator/rectifier inspection");
2) faulty battery (see paragraph "Current loss at the battery").

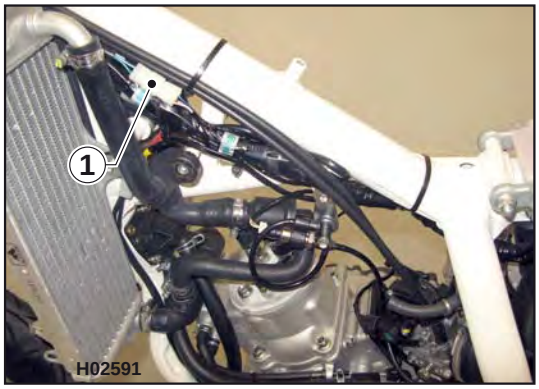
ELECTRONIC IGNITION SYSTEM

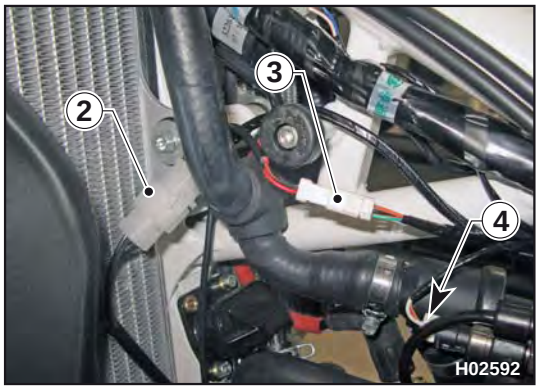
A weak or missing spark might be a symptom of:
1) incorrect connections in the electrical system;
2) faulty spark plug or wrong heat rating or incorrect spark plug gap (see paragraph "Spark plug");
3) faulty ignition coil (see paragraph "Checking coil windings resistance");
4) faulty spark plug cap (see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

Connector positioning

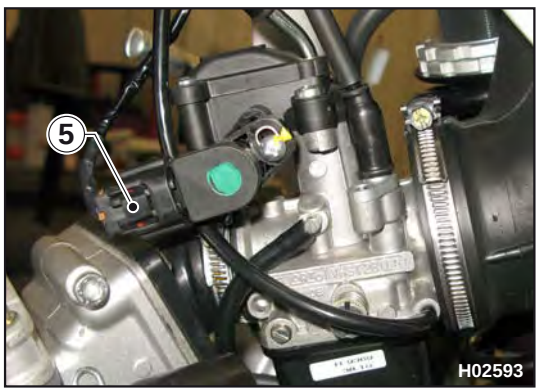
Bike left-hand side

- Engine stop button connector (1) positioned under tank on chassis upper left-hand side, close to coil.

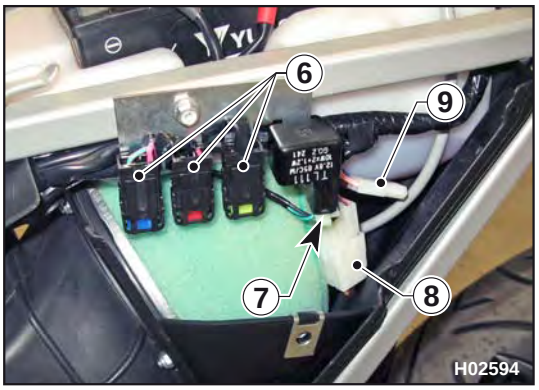




- Generator connector (2) positioned under tank on chassis upper left-hand side, close to coil.
- Pick-up connector (3) positioned under tank on chassis upper left-hand side, close to coil.
- Secondary circuit valve connector (4) positioned on chassis central part, above head, close to thermostat.

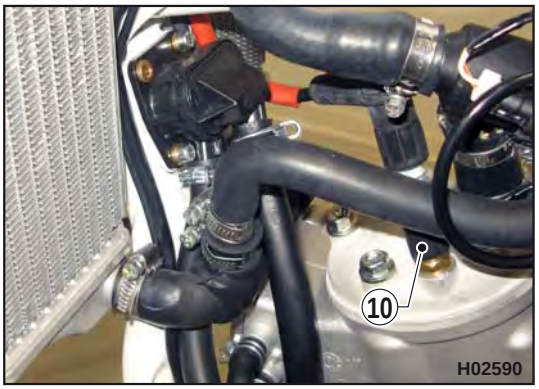


- TPS connector (5) positioned on carburettor left-hand side.

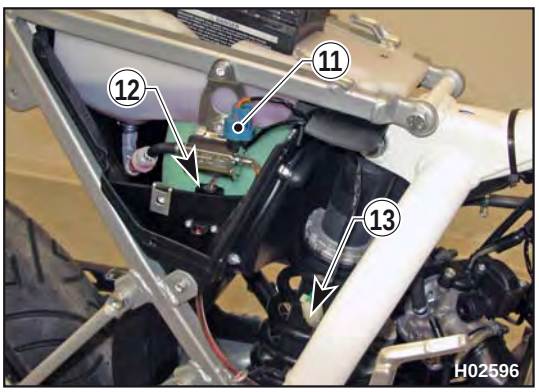


- Fuse connectors (6) positioned on rear chassis left-hand side.
- Turning indicator flasher connector (7) positioned on rear chassis left-hand side.
- Main wiring harness to rear wiring harness connector (8) positioned on rear chassis left-hand side.
- Oil level sensor connector (9) positioned on rear chassis left-hand side.

- Voltage regulator connector (9a) positioned on steering tube left-hand side.

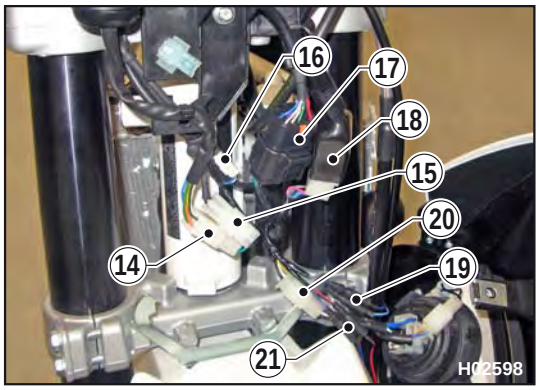


- Coolant temperature sensor connector (10) positioned on head left-hand side.



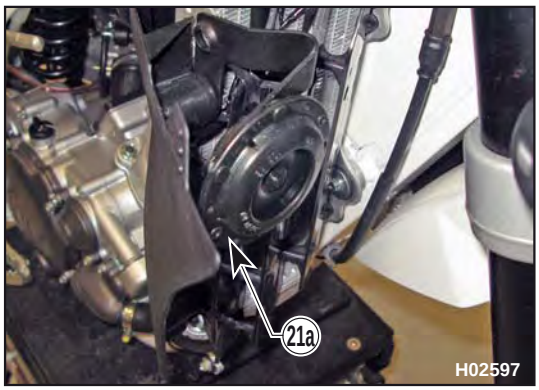
Bike right-hand side

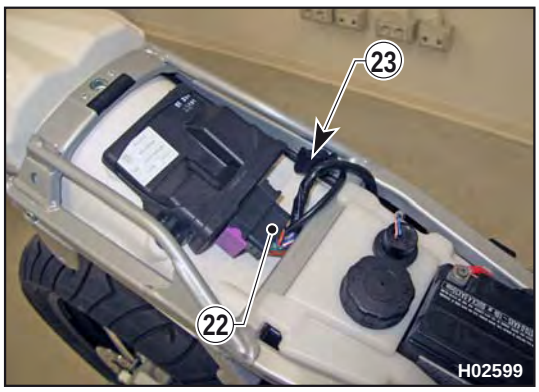
- Oil pump connector (11) positioned on rear chassis right-hand side.
- Air temperature sensor connector (12) positioned on rear chassis right-hand side.
- Rear stop microswitch connector (13) positioned close to right-hand stanchion.



Front side, under headlamp fairing

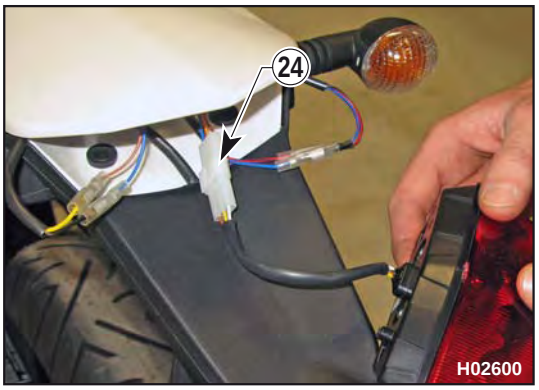
- Ignition switch connector (14)
- Front stop sensor connector (15)
- Speed sensor connector (16)
- Dashboard connector (17)
- Left-hand switch connector (18)
- Front left-hand turning indicator connectors (19)
- Headlight connector (20)
- Front right-hand turning indicator connector (21)
- Horn connector (21a)





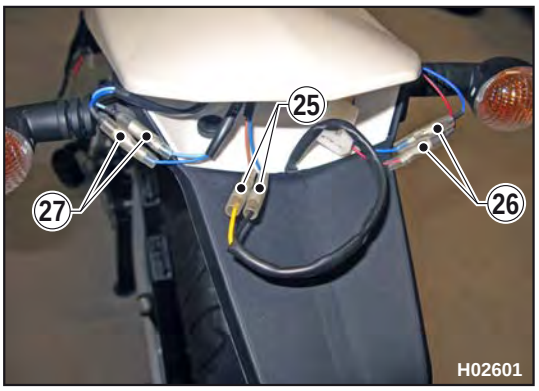
Under the saddle

- Electronic control unit connector (22)
- Diagnostic connector (23)

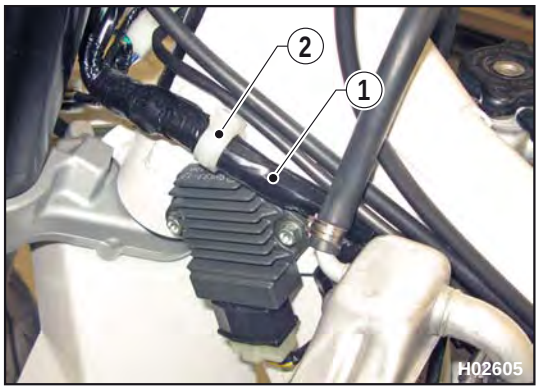


Rear side, under tail light

- Tail light connector (24)



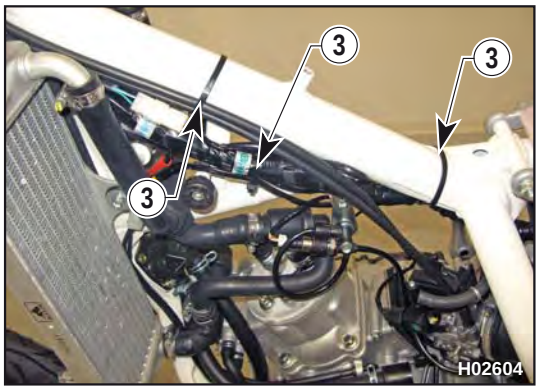
- Number plate light connector (25)
- Rear right-hand turning indicator connectors (26)
- Rear left-hand turning indicator connectors (27)

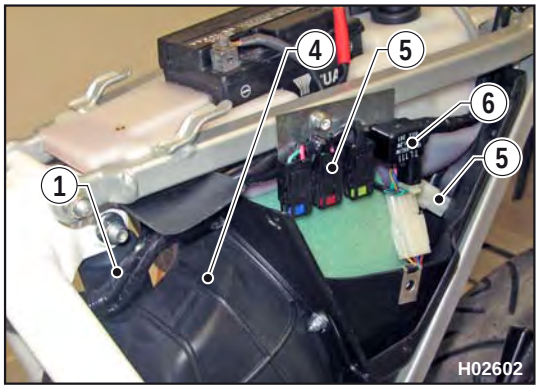


Securing the wiring harness

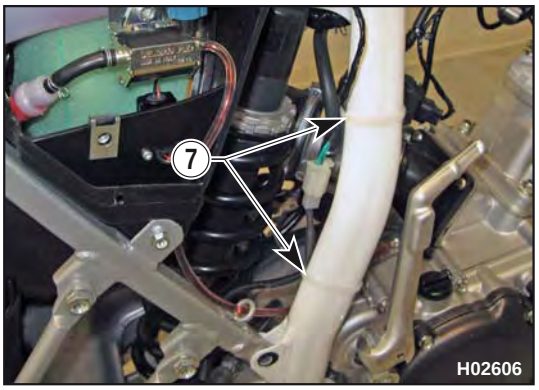
Bike main wiring harness consists of a main branch connecting control unit, fuses, oil pump, flasher, dashboard, switches, TPS, generator and the various available (air, water, stop, etc...) sensors and of a rear branch connecting tail light, number plate light and rear turning indicators.

- 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).

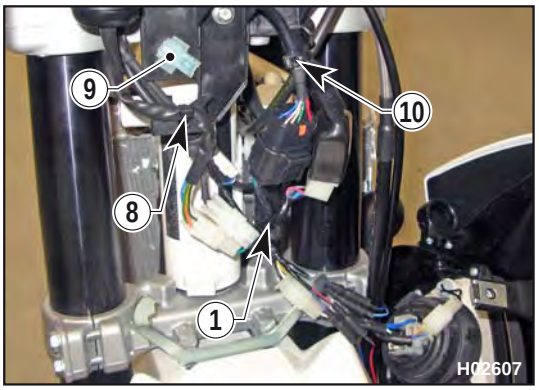




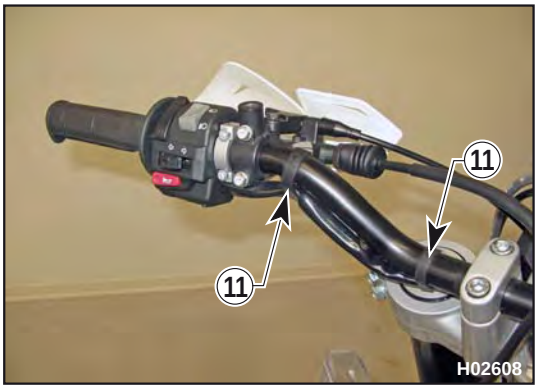
- On chassis rear side, wiring harness (1) passes above air filter fitting (4) to connect to fuses, control unit and flasher, to air temperature sensor and oil level sensor, and connects to rear wiring harness (5). Wiring harness is secured in place with a clamp (6).



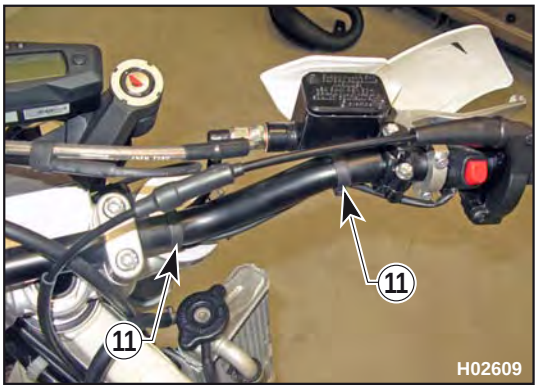
- The wiring harness reaching stop microswitch is secured to chassis through clamps (7).

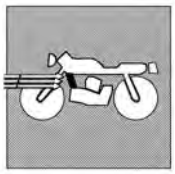


- On the front side, wiring harness (1) is secured to clips (8) and (9) to holder plate, and with clamp (10).

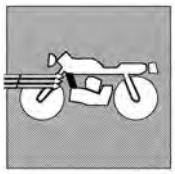


- On handlebar, left-hand switch, right-hand switch and stop microswitch wiring harness is secured on handlebar through rubber straps (11).

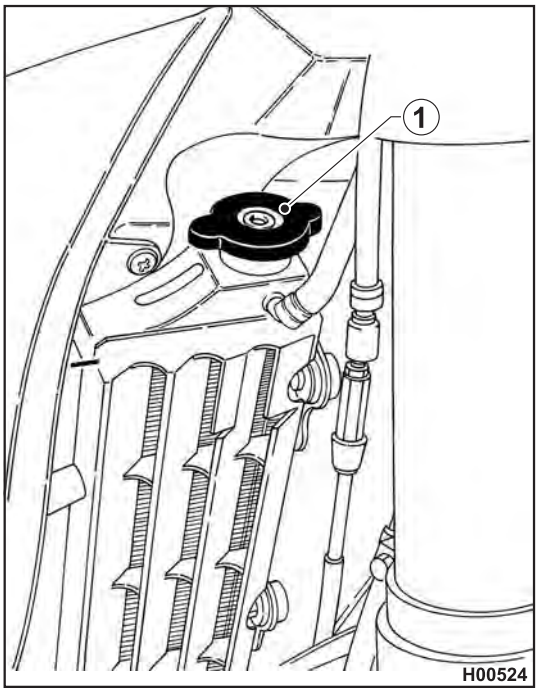


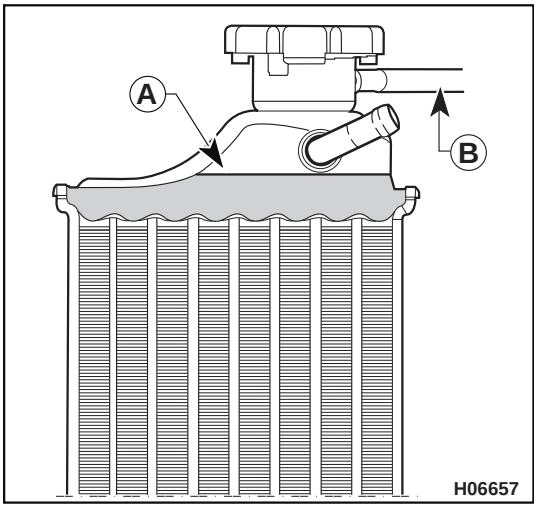


Section N



ENGINE COOLING





Coolant level check

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

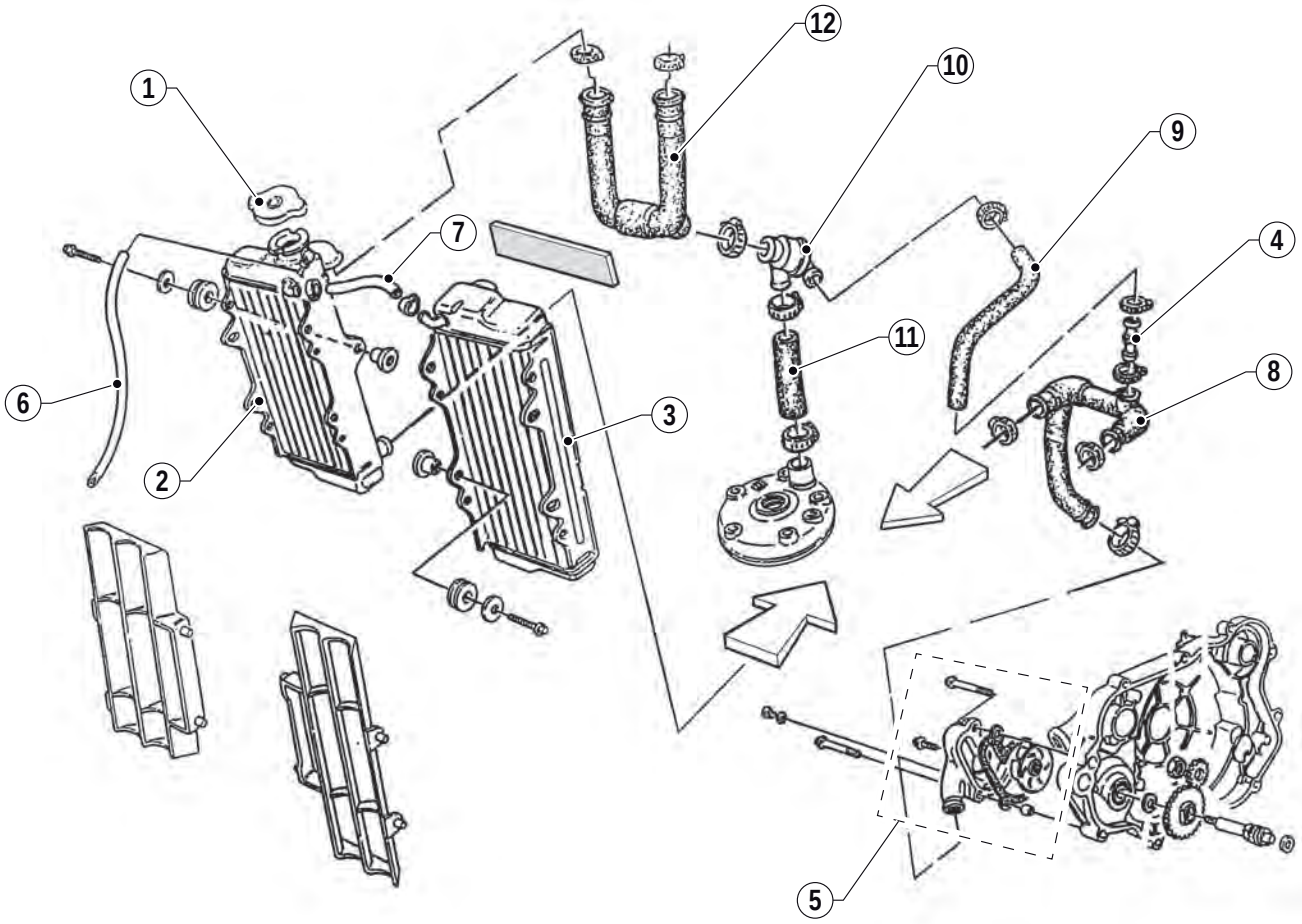
Without cooling medium (water), no heat exchange occurs between cylinder head and radiator. The cylinder and piston assembly will overheat and seize and in the worst scenario, crankshaft damage may result.

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

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

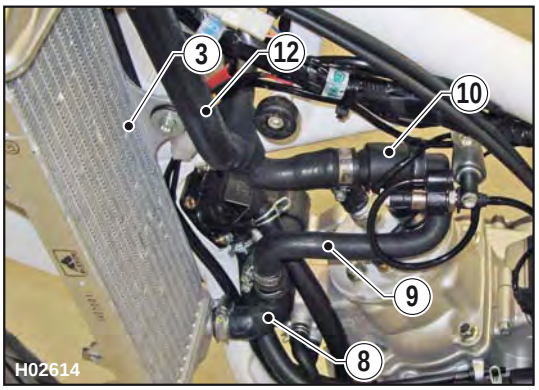
A. Coolant level
B. Breather hose

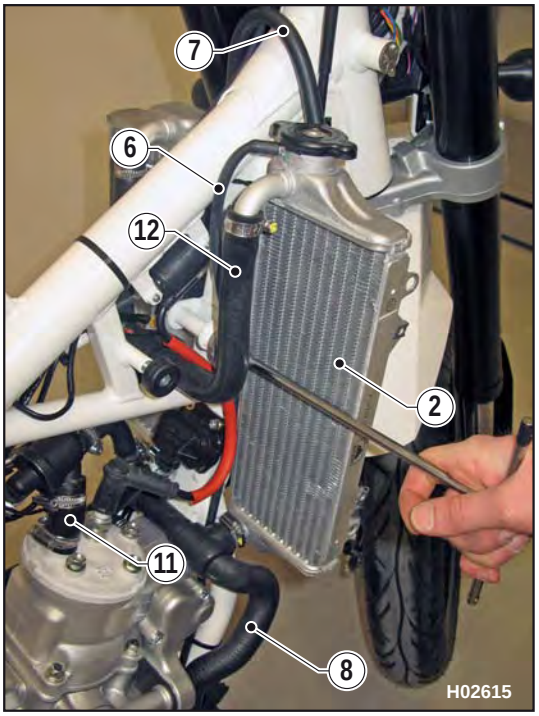
Cooling circuit



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

1 Radiator cap
2 Right-hand radiator
3 Left-hand radiator
4 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





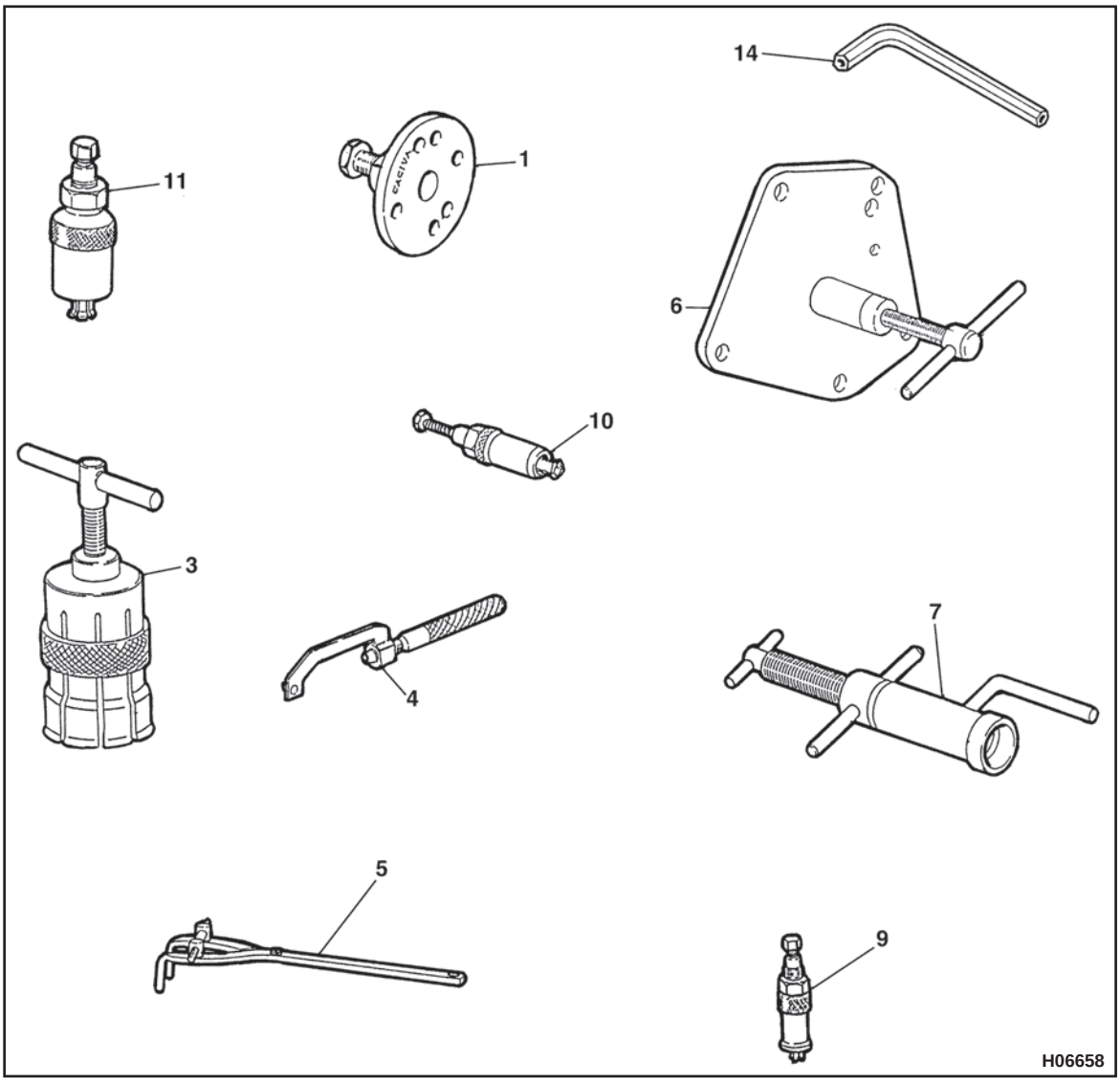
Engine cooling system overhaul

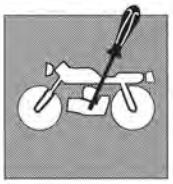
If the coolant runs too hot, check the radiators. Any foreign matter trapped between the fins (such as leaves, bugs, mud, etc.) will obstruct air flow and must be removed carefully to avoid damage to radiator. Straighten any bent fins to ensure free flow of air. If the cooling mass is clogged or damaged, 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

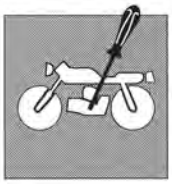
1	**(8000 51614)**	Flywheel puller
3	**(8000 89030)**	Crankcase bearing puller
4	**(000Y A2273)**	Sprocket tool
5	**(8000 79015)**	Clutch hub tool
6	**(8000 79016)**	Crankcase half puller and crankshaft removal tool
7	**(8000 79017)**	Tool to install crankshaft inside crankcase
9	**(8000 43824)**	Valve drive gear needle roller bearing, water pump bearing and valve control puller
10	**(8000 33054)**	Oil pump shaft needle roller bearing puller
11	**(8000 43720)**	Gearbox shaft bearing puller
14	**(8000 98431)**	Anti-tampering screw wrench





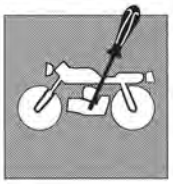
Section X

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
Countershaft sprocket lock. nut	M14x1.25	51÷57	5.2÷5.8	37.6÷41.9
Pulley ret. screw	M5x0.8	5.1÷5.7	0.52÷0.58	3.8÷4.2
Countershaft bearing plate ret. screw (+LOCTITE 243)	M6x1	7.8÷8.8	0.8÷0.9	5.8÷6.5
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	M5x0.8	3.9÷4.4	0.40÷0.45	2.9÷3.2
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



TIGHTENING TORQUE FIGURES

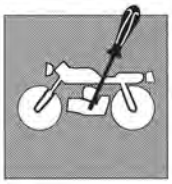
Application	Thread	Nm	Kgm	ft/lb
Rear chassis upper ret. screw	M8x1.25	24.5÷26.5	2.5÷2.7	18.1÷19.5
Rear chassis lower ret. screw	M8x1.25	24.5÷26.5	2.5÷2.7	18.1÷19.5
Chain roller ret. screw	M8x1.25	25.5÷28.5	2.6÷2.9	18.8÷21
Engine front ret. screw	M8x1.25	33.3÷37.3	3.4÷3.8	24.5÷27.5
Engine lower ret. screw	M8x1.25	33.3÷37.3	3.4÷3.8	24.5÷27.5
Side stand rot. screw	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 line on master cylinder ret. screw	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8
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 light switch	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8
Front wheel axle ret. screw	M6x1	9.3÷10.3	0.95÷1.05	6.9÷7.6
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



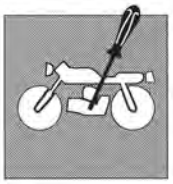
Application	Thread	Nm	Kgm	ft/lb
Chain guide upper ret. screw	M8x1.25	23.3÷26.5	2.4÷2.7	17.3÷19.5
Chain guide rear ret. screw	M6x1	14÷15.4	1.43÷1.57	10.3÷11.3
Chain guide front ret. screw	M8x1.25	12.2÷13.3	1.24÷1.36	9÷9.8
Slider ret. screw	M5x0.8	5.6÷6.2	0.57÷0.63	4.1÷4.5
Horn ret. screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Headlight unit ret. screw	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
Headlamp fairing ret. screw	M6x1	10.3÷11.3	1.05÷1.15	7.6÷8.3
Chain guard rear ret. screw	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

(*): "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
Chain guard front ret. screw	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	M10x1	18.1÷20.1	1.85÷2.05	13.4÷14.8

(•): "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	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Turning indicator ret. screw	M6x1	5.6÷6.2	0.57÷0.63	4.1÷4.5
Rear wheel axle	M 20x1.25	135÷145	13.5÷14.5	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



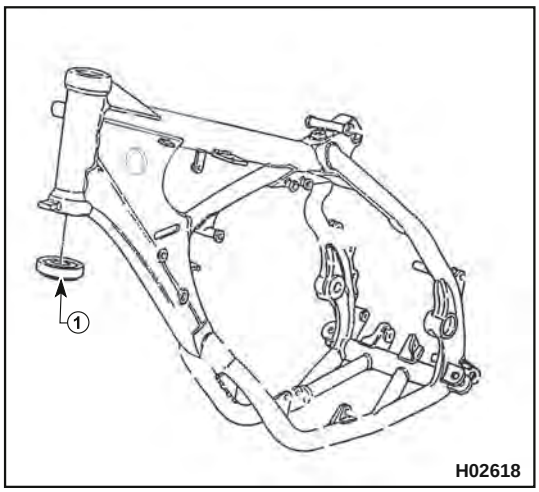
Steel screws on plastic, with metal spacers	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on brass, copper, aluminium	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on iron, steel	M4 3 Nm	0.3 Kgm	2.2 ft/lb	
Steel screws on plastic, with metal spacers	M5	4 Nm	0.4 Kgm	3 ft/lb
Steel screws on brass, copper, aluminium	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

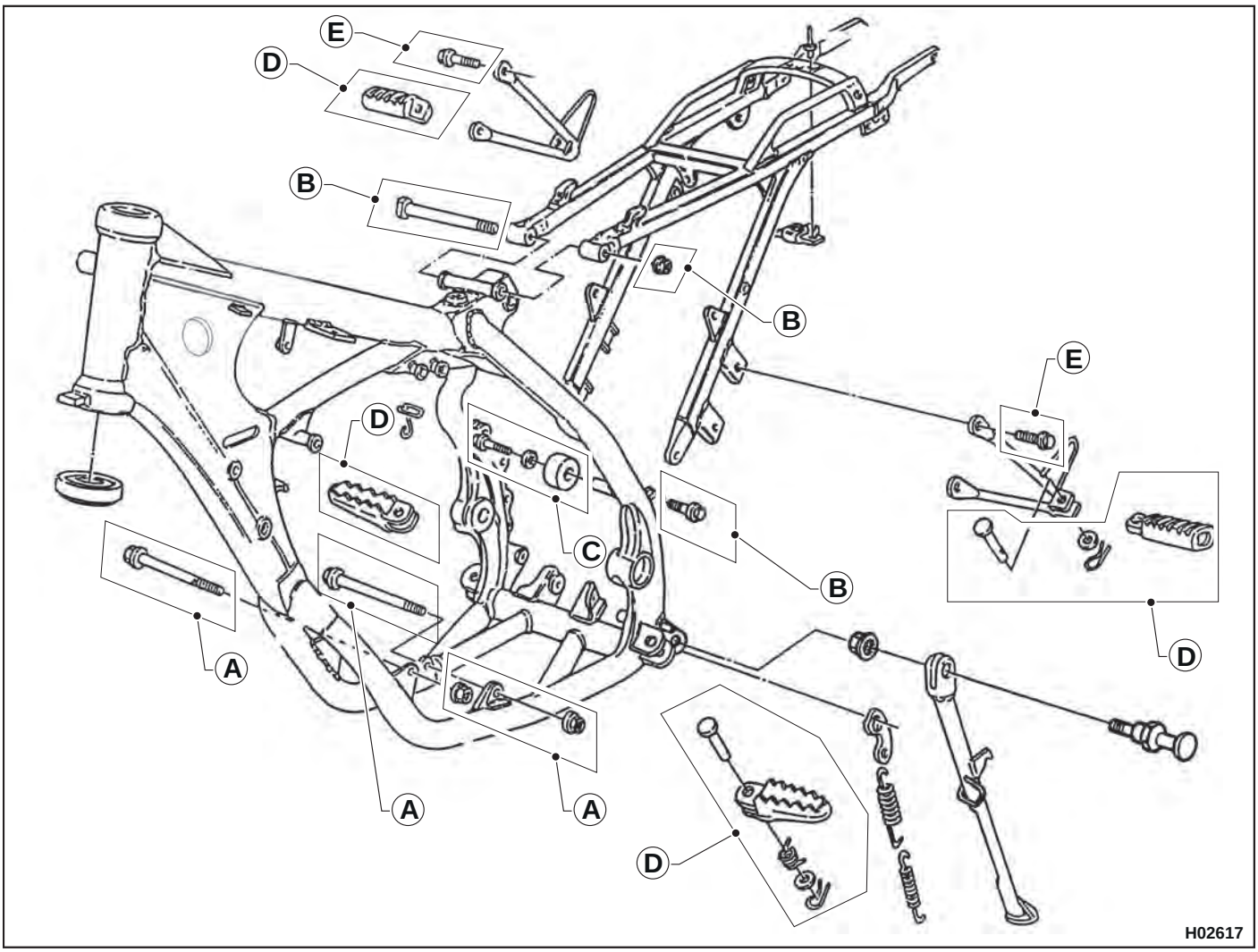
The single frame branches off at the exhaust and is made of steel tubes with circular, rectangular and ellipsoidal section; the rear chassis is made from light alloy.

A badly damaged chassis must be replaced.



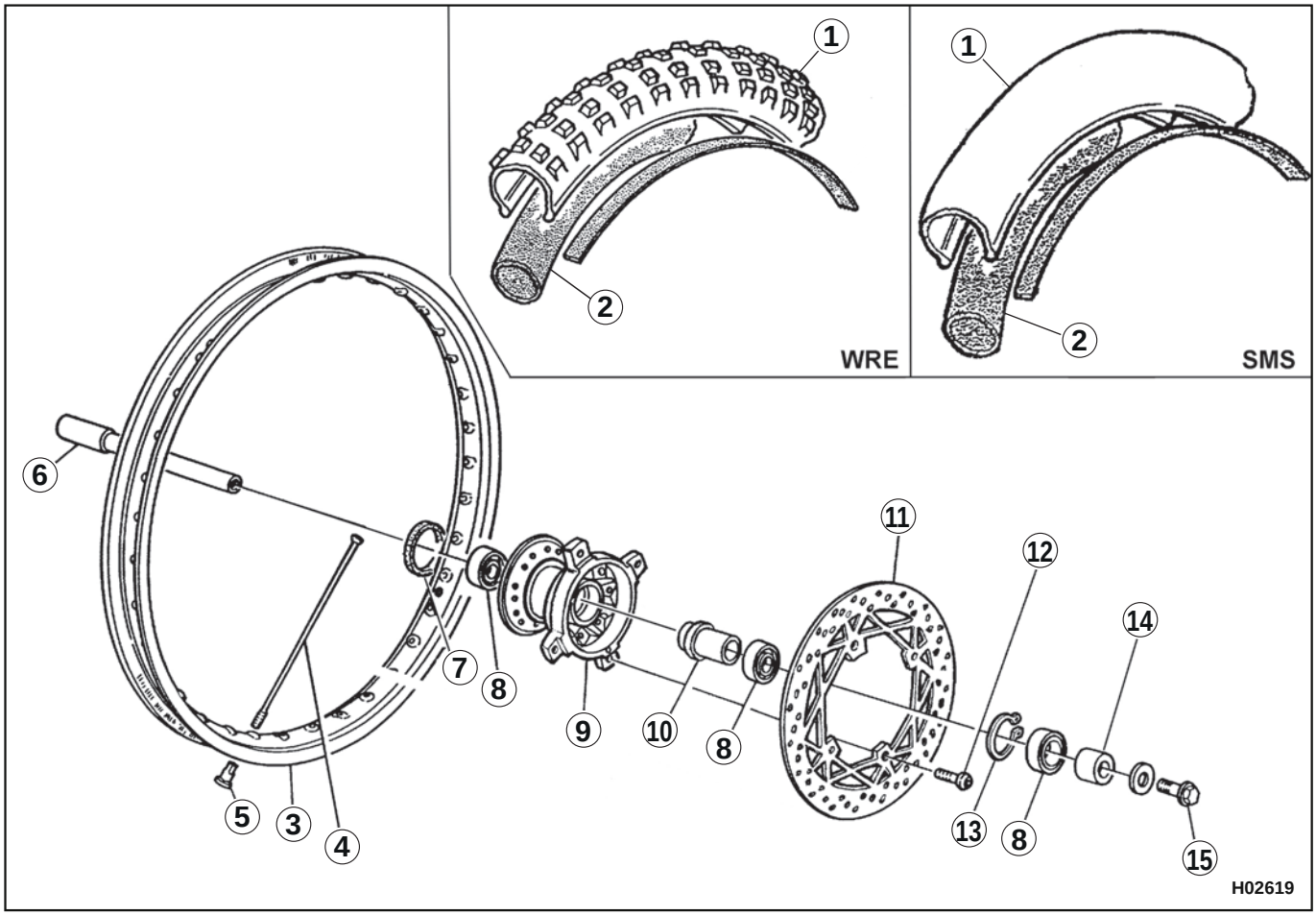
Lubrication points (lubricant)
1 Steering bearings (grease)

Chassis parts check



Controllo componenti telaio 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
E PASSENGER FOOTREST CHASSIS RETAINING SCREW

Front wheel



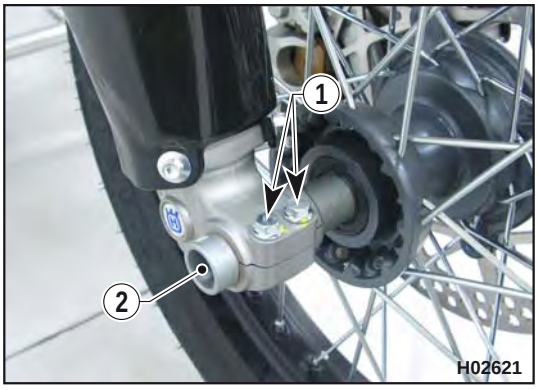
LEGEND

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

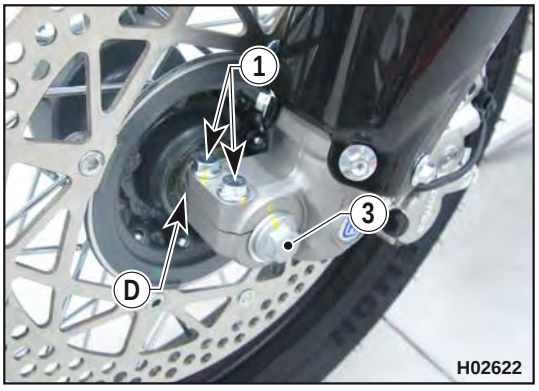
For technical characteristics regarding the front wheel, see section “A” General Information of this manual.

Removing the front wheel

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



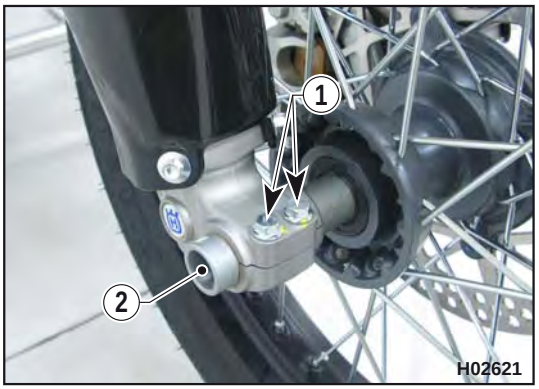
Loosen the bolts (1) holding the wheel axle (2) to the front fork mounts.



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

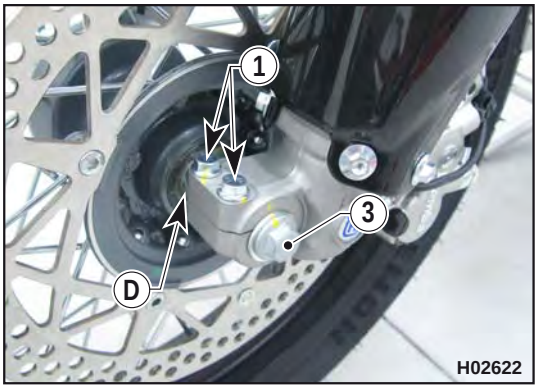
Do not operate the front brake lever when the wheel has been removed; this causes the calliper pistons to move outwards.

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



Reassembling the front wheel

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

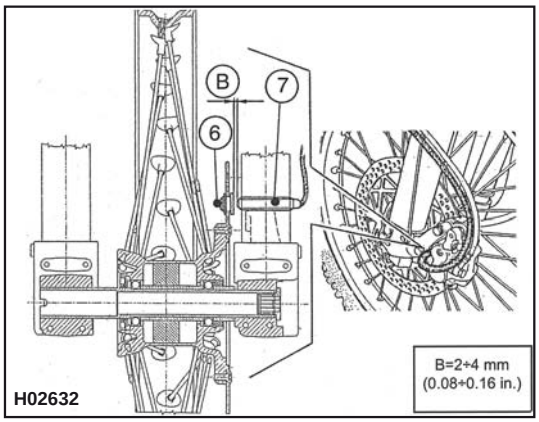


Fit the wheel between the fork legs so as to set the brake disc into the calliper.

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).

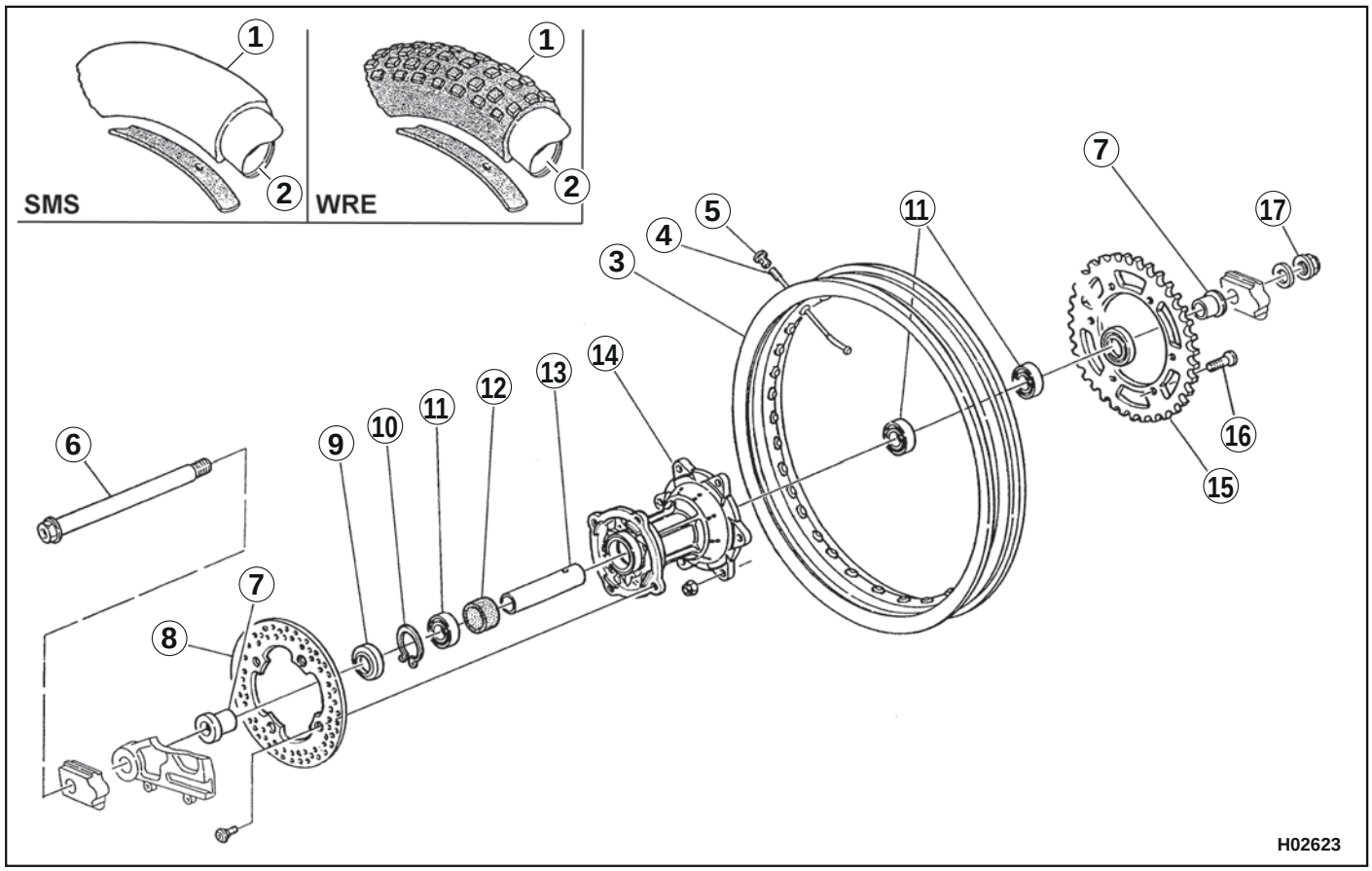
After reassembly, pull the brake control lever until the pads are against the brake disc.



Speed sensor

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

Rear wheel



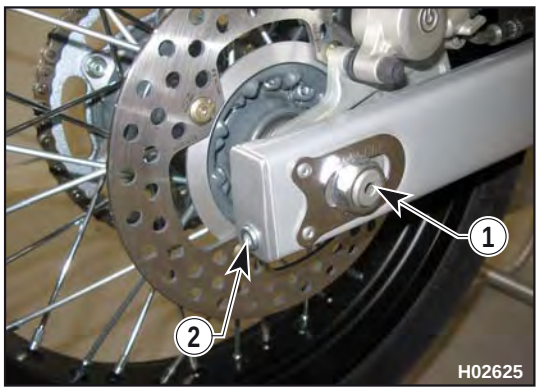
KEY

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) Spacer holder
13) Inner spacer
14) Hub
15) Sprocket
16) Sprocket retaining screw
17) Wheel axle locking nut

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.

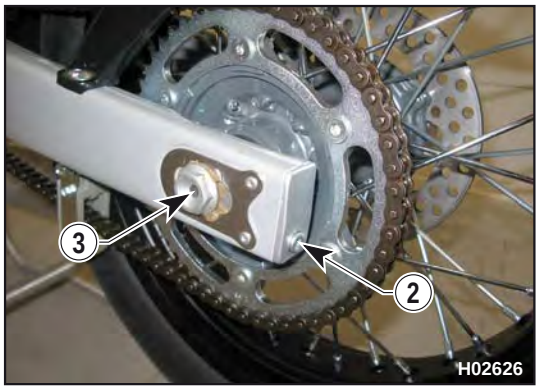


Unscrew the nut (1) of the wheel axle (3) and extract it. It is not necessary to loosen the chain tensioners (2); in this way, the chain tension will remain unchanged after reassembly. Extract the complete rear wheel, keeping the spacers located at the hub sides. To reassemble, reverse the
above procedure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

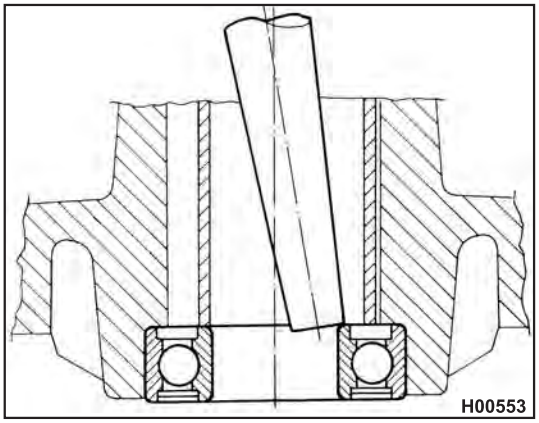
Do not operate the rear brake pedal when the wheel has been removed; this causes the calliper pistons to move outwards.

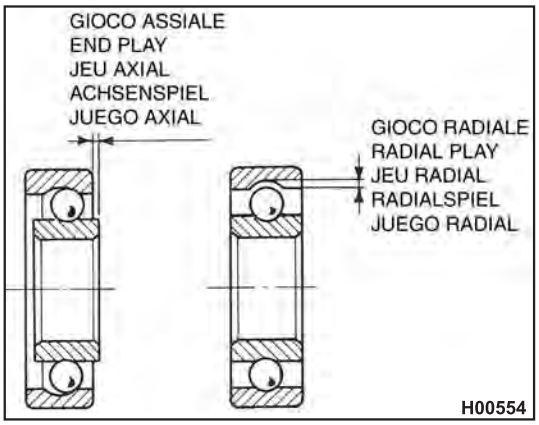
After removal, lay down the wheel with brake disc on top.

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

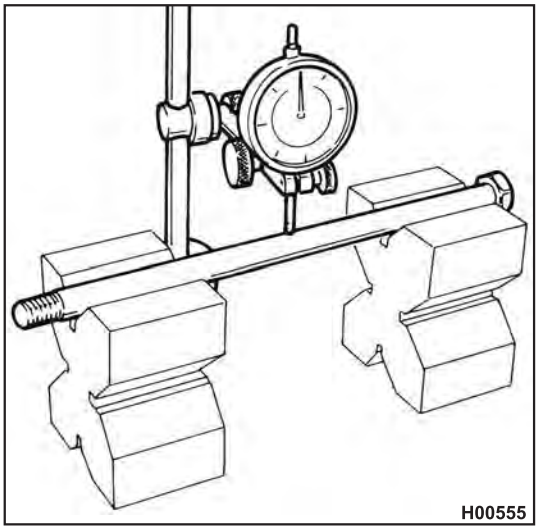
Check the wheel hub bearings for wear. If you find too much (radial or axial) clearance, replace the bearings as follows:

- 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.

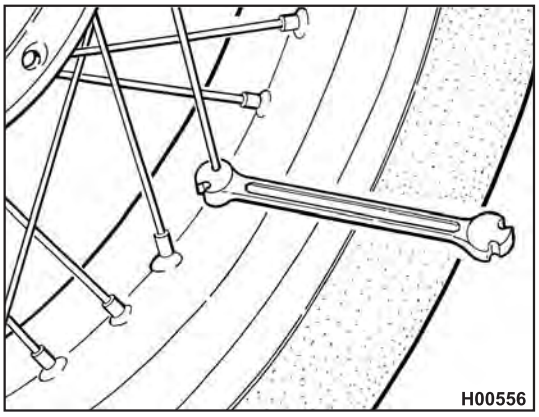


Wheel axle warpage

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.

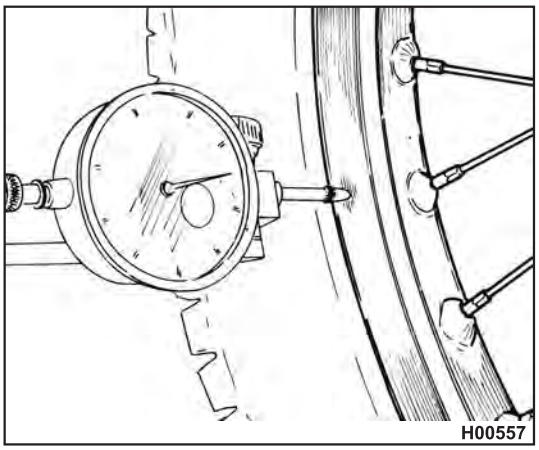
Axle runout over 100 mm

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



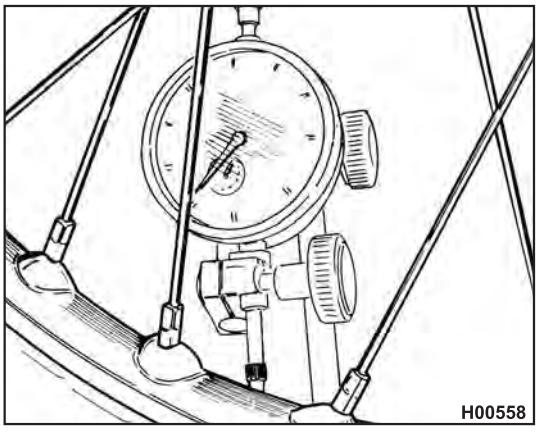
Wheel spokes

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.

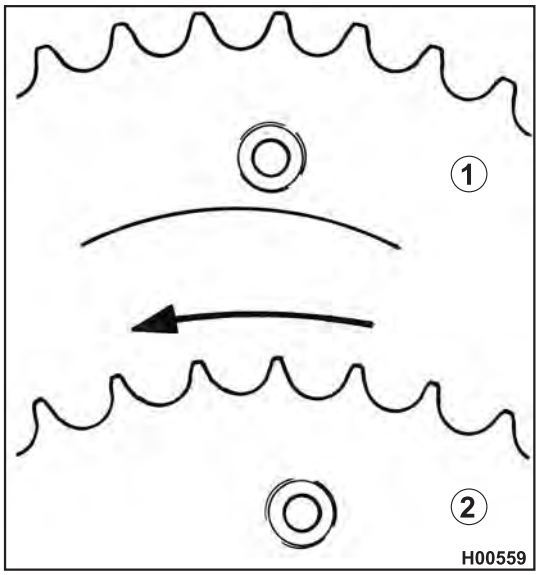


Wheel rim warpage

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	

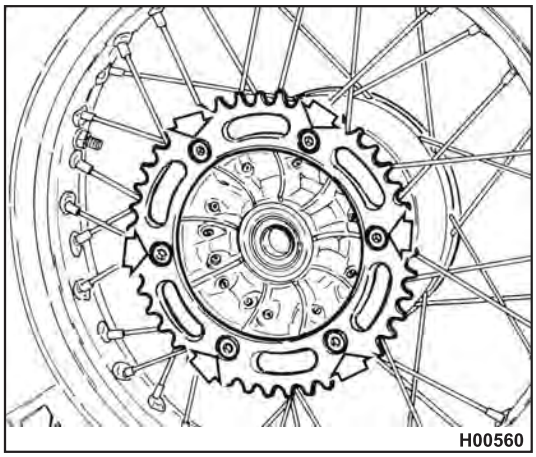


Rear chain sprocket, secondary drive sprocket and chain

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

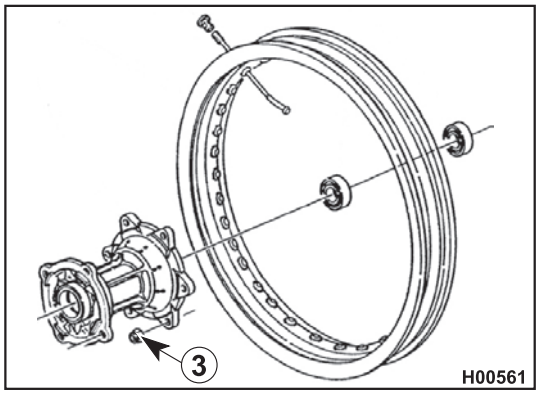
1 Normal wear

2 Exceeding wear



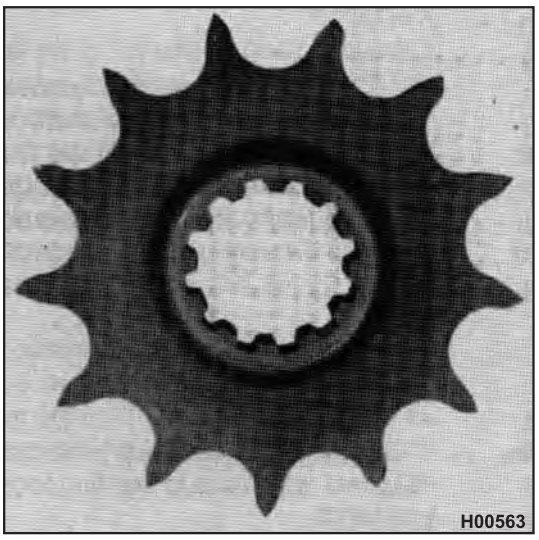
If the sprocket is exceedingly worn, replace it after loosening the six screws that retain it to the hub.

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.