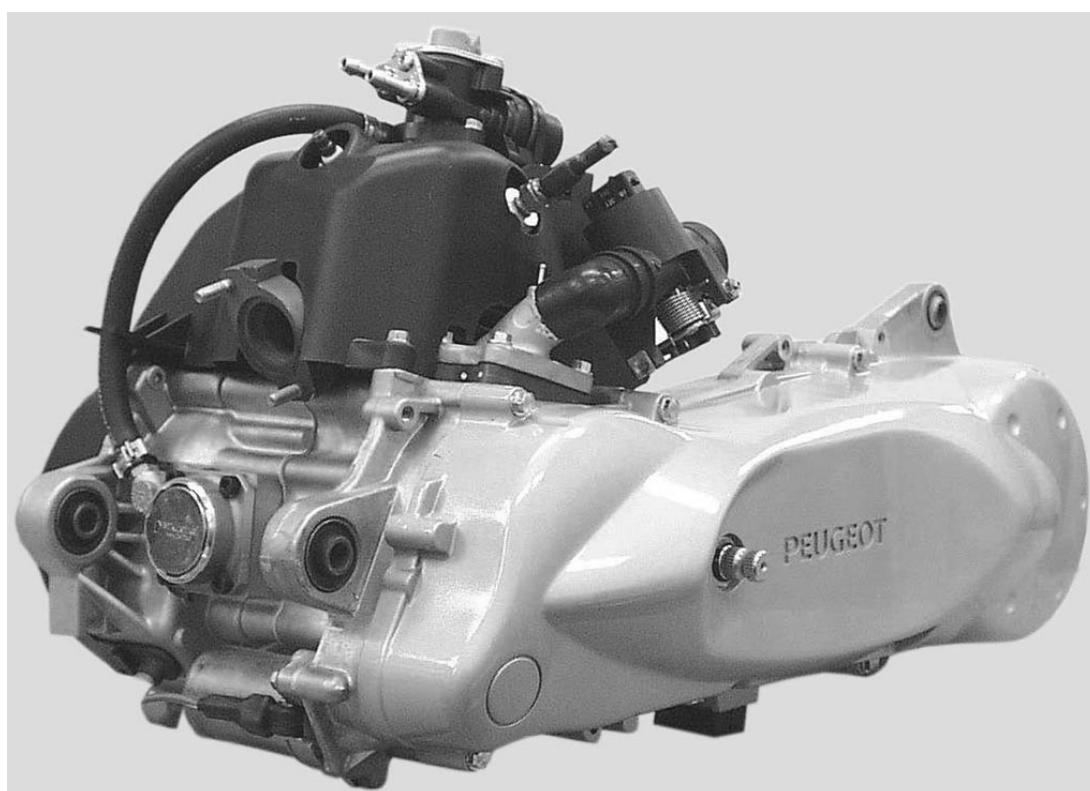


WORKSHOP MANUAL



50 cc INJECTION ENGINE

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CHARACTERISTICS

CHARACTERISTICS

Characteristics

| | |
|-----------------------------------|---|
| Engine | Air-cooled, single-cylinder 2-stroke injection |
| Bore x stroke | 40,3 x 39,1 |
| Cubic capacity | 49.1 cc |
| Max. power output | 3.4 kW at 6900 rpm |
| Maximum torque | 4.7 Nm at 6800 rpm |
| Gross compression ratio | 11.4 |
| Ignition / Carburation | Synerject ECU |
| Petrol injector | Siemens green 37.028 |
| Air injector | Synerject blue 37.073 |
| Pressure regulator | Synerject |
| Petrol pump | Synerject |
| Throttle unit | Bing 235 011 |
| Temperature sensor | Synerject |
| Oil pump | Mikuni ESOP-03 |
| Spark plug | NGK CPR8E |
| Magneto flywheel | Mitsuba 180W |
| Starter motor | Mitsuba 150 W |

Capacities

| | |
|--------------|---------|
| Transfer box | 0.12 L. |
|--------------|---------|

Engine markings

| | |
|-------------------|------|
| Long type engine | FC5J |
| Short type engine | FB5 |

SPECIAL IMPORTANT POINTS

SPECIAL IMPORTANT POINTS

Oil and fuel:

This engine is designed to run on 95 or 98 **unleaded** fuel only

The oil used for the separate lubrication system is Esso 2T special, approved by the machine manufacturer. The oil is injected directly into the inlet manifold as the engine requires.

Never run the machine with a petrol/oil mixture.

Starting:

Bleed of the oil circuit must be tested with the diagnostic tool: check if there are fault codes and clear them where necessary.

Starting should not be with a 2-stroke **mixture**, as the fuel pump and injectors are not designed to operate with oil.

Do not accelerate when hot or cold starting

Electricity:

All components of the electrical system are powered with 12 volts DC.

The battery is essential to operate the petrol pump and the ECU which are used for engine starting.

The battery must not be disconnected while the engine is running.

The battery voltage must be a minimum of 8.5 volts for the ECU to be able to function and authorise starting.

Special features

The ignition is controlled by the ECU which determines the advance based on the information given by:

- the engine speed sensor located opposite a pulse wheel fitted to the magneto flywheel
- the quantity of air intake into the engine, measured by the throttle unit, is transmitted to the ECU which will define just the right quantities of oil and petrol necessary for engine optimum running.

The throttle unit must be re-initialised after disconnecting or changing the ECU.

The oil pump controlled by the ECU must be bled before restarting the engine using the procedure described in the relevant chapter.

The fuel pump controlled by the ECU must be bled before restarting the engine using the procedure described in the relevant chapter.

The ECU has a diagnostic function enabling the mechanic to test the injection system using the LED on the instrument panel or the diagnostic tool.

The fuel inlet and injection manifold return pipes must only be replaced by genuine service parts. The fuel pressure of 8 bars requires special pipes.

The fuel pipes must be changed if they show signs of wear, cracks, etc.

The fuel pipe clips are also specific, other clips must never be used.

Note:

Before carrying out any work, leave the engine to cool for a minimum of 2 hours.

Petrol is highly inflammable, do not smoke in the working area and avoid proximity to flames or sparks.

Work in a clear and well-ventilated area.

TIGHTENING TORQUES


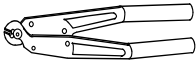


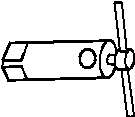
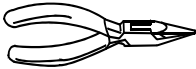
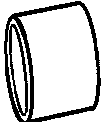
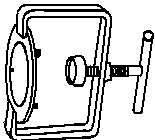
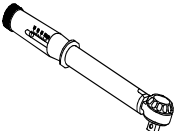
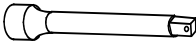
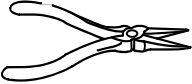
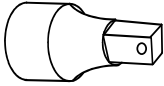
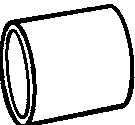


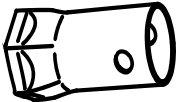

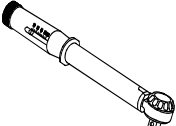
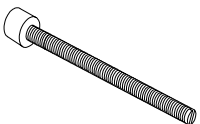

TIGHTENING TORQUES

Tightening torques:


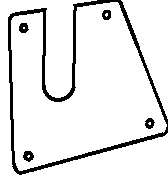
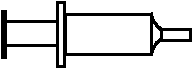
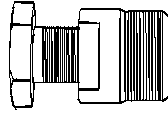
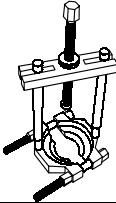
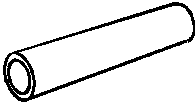
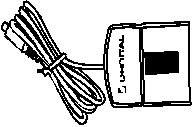
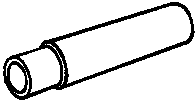
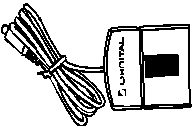

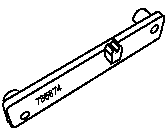
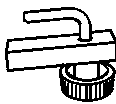
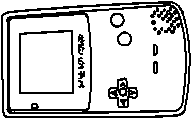

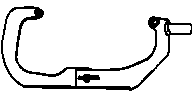

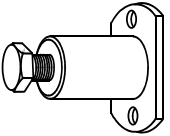
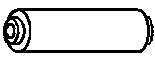
| | |
|----------------------|------------|
| Cylinder head | 1.2 m.daN |
| Cylinder casings | 1 m.daN |
| Covers | 1 m.daN |
| Inlet manifold | 1 m.daN |
| Starter motor | 1 m.daN |
| Rotor | 4 m.daN |
| Stator | 1 m.daN |
| Engine speed sensor. | 1 m.daN |
| Turbine | 1 m.daN |
| Drive pulley | 4 m.daN |
| Driven pulley | 4.5 m.daN |
| Spark plug | 1 m.daN |
| Compressor | 0.65 m.daN |
| Injection rail | 0.65 m.daN |

SPECIAL TOOLS

SPECIAL TOOLS

| | Tool N° | Designation | Used with | | | | |
|---|---------|-----------------------------------|---|--|--------|-----------------------------|------------------------------------|
|  | 64706 | Casing extractor and opening tool | casing opening plate + pin |  | 750539 | Tie-wrap pliers | |
|  | 64710 | Shoulder locator | 64706 |  | 750808 | Thrust washer | 64706 |
|  | 64765 | Engine support | engine support bracket |  | 752000 | Piston circlip pliers | |
|  | 68007 | Protective cap small model | 69254 |  | 752127 | Clutch compression tool | 752361 |
|  | 68994 | Torque wrench 8 Nm to 54Nm | extension 752235 adapter 752236 |  | 752235 | 1/2 extension | 69802 or 753977 |
|  | 69092 | Interior circlip pliers | 103 old generation |  | 752236 | 1/2-3/8 adapter | 69802 or 753978 |
|  | 69098 | Protective cap large model | 754003 |  | 752237 | Adjustable pin wrench | |
|  | 69104 | Wing nut | 750069 + 64711 + 64712 + 64754 |  | 752361 | 39 mm box wrench | 752127 |
|  | 69117 | Exterior circlip pliers | |  | 753977 | Torque wrench 30 Nm to 54Nm | extension 752235 adapter 752237 |
|  | 750069 | Stud Ø10 pitch 125 | 69104 |  | 754086 | Steering tool | |

SPECIAL TOOLS

| | | | | | | | |
|---|--------|---------------------------------|--------------------|--|--------|---------------------------------------|----------------------------|
|  | 754171 | Battery charger | |  | 755984 | Casing cover plate | 64706 |
|  | 754306 | bleed syringe | 061764 + 752410 |  | 755985 | flywheel extractor | 68007 |
|  | 755585 | bearing extractor tool | |  | 755986 | air injector setting tool | |
|  | 755806 | French cartridge | 755878 |  | 755989 | air injector drift | |
|  | 755807 | Export cartridge | 755878 |  | 755990 | diagnostic tool update software | 755878 755806 755807 |
|  | 755874 | fixed flange locking tool | |  | 755996 | hose clamp | |
|  | 755878 | diagnostic tool (Color Gameboy) | |  | 756017 | petrol injection power supply harness | |
|  | 755982 | Engine support adapter | 64765 |  | 756056 | Tank ring spanner | |
|  | 755983 | Casing opening tool | 64706 |  | 756057 | Crank assembly lip seal tool | |

DISASSEMBLY

Introduction

The injection system is composed of precision components and cannot withstand impurities. Perfectly clean working conditions are therefore essential.

DISASSEMBLY

To remove the engine from the machine

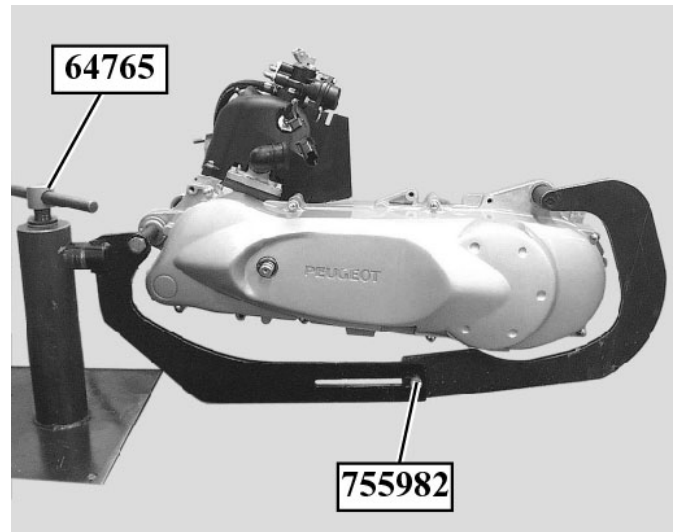
Compulsory: wash the power unit

- Disconnect and remove the battery
- Remove the saddle/locker assembly, the grab handle, mud-flap and rear panelling assembly
- Remove the injection manifold soundproofing
- Raise the fuel tank in order to withdraw the injection manifold soundproofing.
- Remove the injection manifold without disconnecting the fuel supply pipes (see relevant chapter),
- Move the injection manifold clear and protect from impurities with a clean rag.
- Disconnect the air injector
- Put a clean rag over the air injector to protect it from impurities
- Remove the upper handlebar fairing, the rear panel and floor panel
- Disconnect the flywheel output harness and the starter motor
- Remove the air intake, the air filter box with the throttle unit
- Disconnect the throttle unit
- Move the air filter box clear with the throttle valve without disconnecting the throttle cable
- Disconnect the temperature sensor
- Disconnect the **inlet manifold** oil inlet pipe
- Unclip the harness assembly from the cylinder cover
- Disconnect the suppressor and rear brake cable
- Remove the exhaust
- Slacken the rear wheel nut
- Suspend the machine
- Remove the shock absorber lower mount and the engine linkrod fixing bolt
- Remove the power unit
- Remove the rear wheel
- Remove the stand with its bracket

DISASSEMBLY

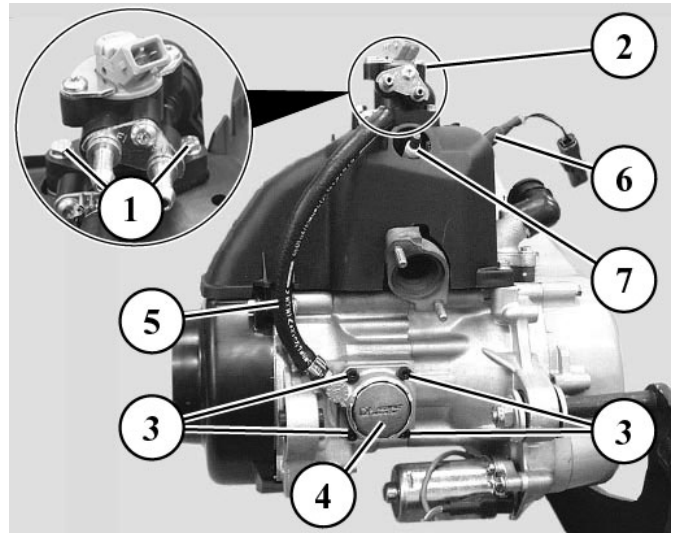
Putting the engine on the stand

- Fit the engine to adapter P/N 755982
- Put the assembly on stand P/N 64765 clamped in the jaws of a vice

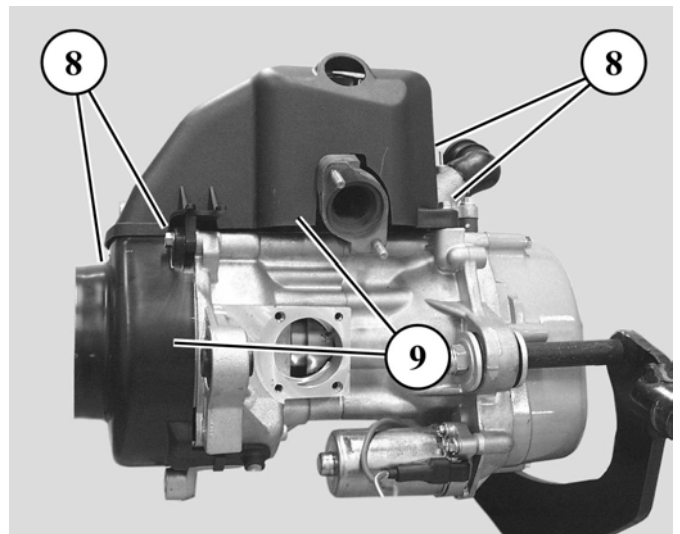


To remove the cooling system

- Remove the 2 bolts (1) from injection manifold (2) and the 4 bolts (3) from the compressor (4)
- Remove the injection manifold and compressor (with its 2 centring dowels and its O-ring) without disconnecting the pipe linking them together (5)
- Remove the temperature sensor (6)
- Remove the spark plug (7)

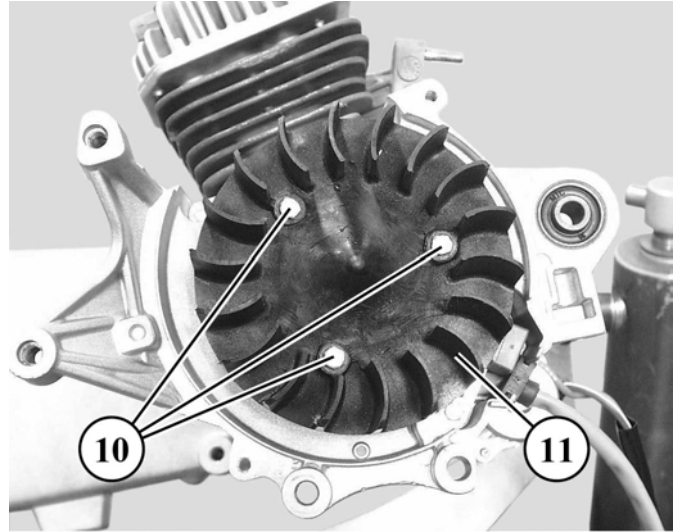


- Remove the 4 bolts (8) from the cooling volute and the cylinder cover
- Remove the 2 parts (9) the cooling volute and the cylinder cover



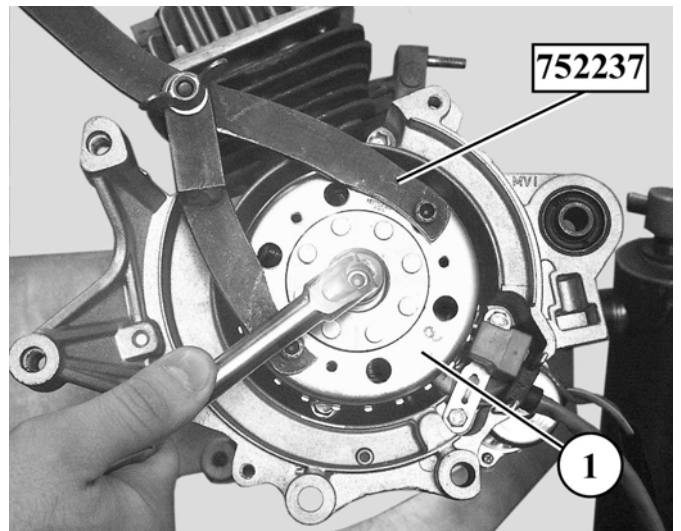
DISASSEMBLY

- Remove turbine (11) three (10) fixing bolts
- Remove the turbine

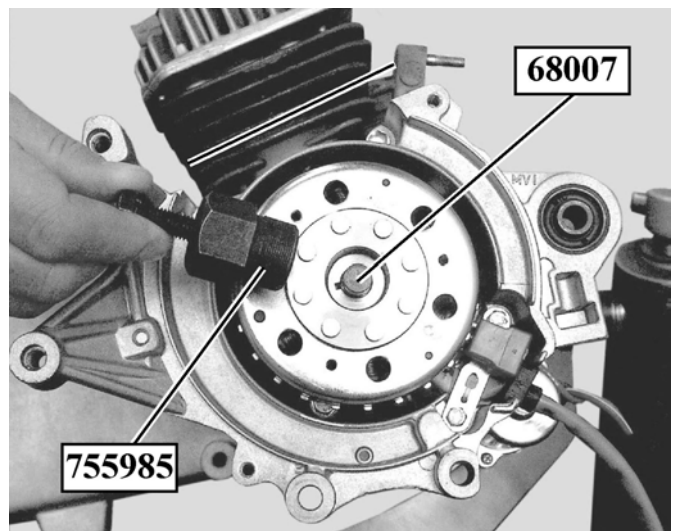


To remove the magneto flywheel

- Hold the rotor (1) with the pin wrench P/N 752237
- Remove the nut



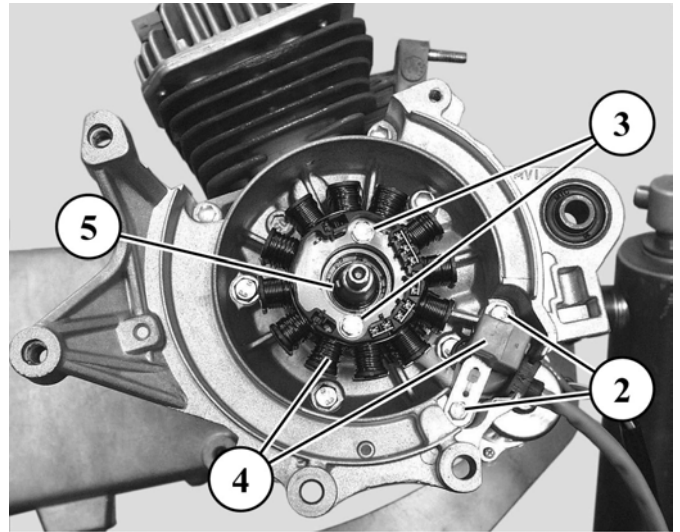
- Fit protective cap P/N 68007 to the end of the crank assembly
- Tighten flywheel extractor P/N 755985 on the rotor
- Lock the flywheel extractor and turn the thrust bolt until the rotor is released



DISASSEMBLY

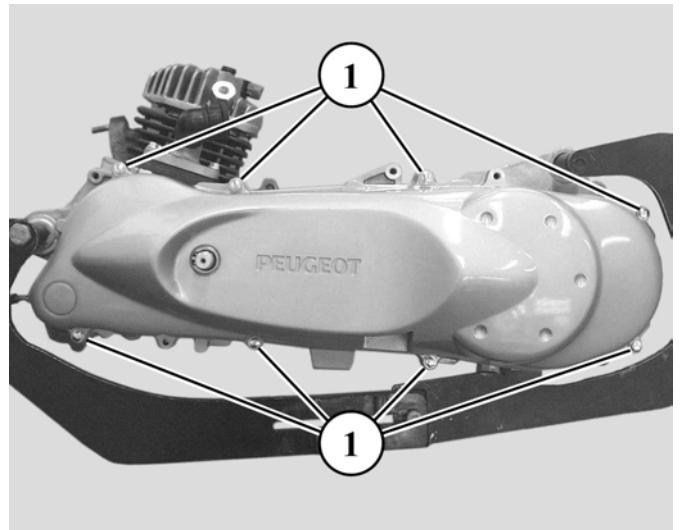
To remove the stator and sensor assembly

- Remove the engine speed sensor 2 fixing bolts (2) and the stator assembly 2 fixing bolts (3)
- Remove the stator and sensor assembly (4)
- Remove the key (5) from the crank



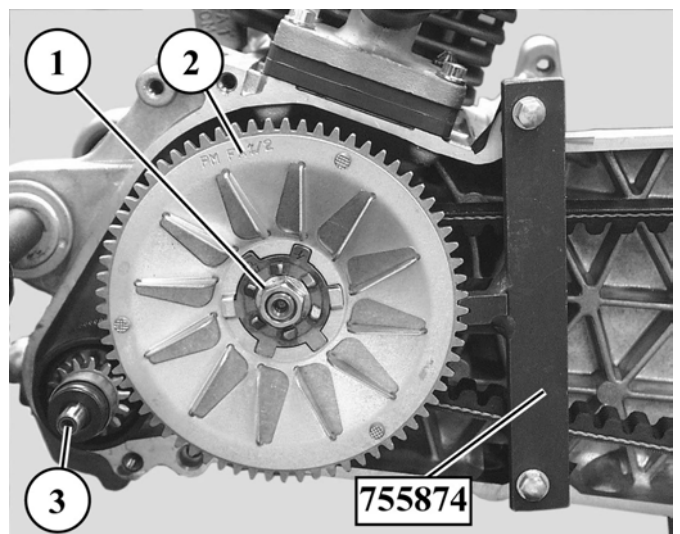
To remove the primary transmission cover

- Remove the transmission cover 8 fixing bolts (1)
- Remove the cover and its locating pin



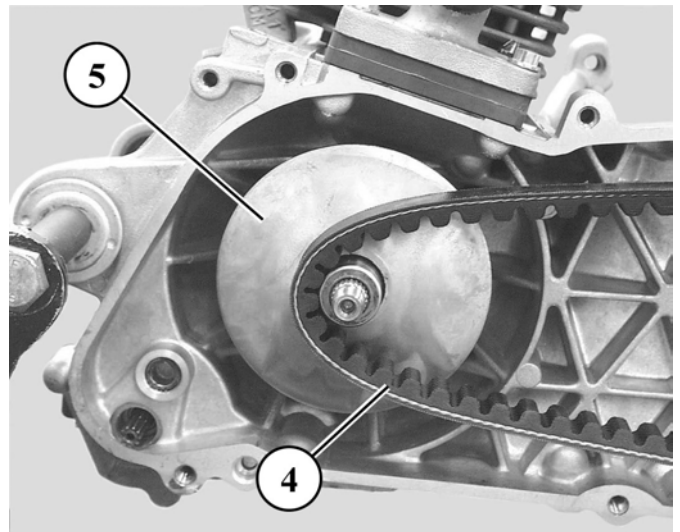
To remove the drive pulley

- Lock the fixed flange (2) with tool P/N 755874
- Remove the fixed flange nut (1)
- Remove the fixed flange
- Remove the starter dog (3)



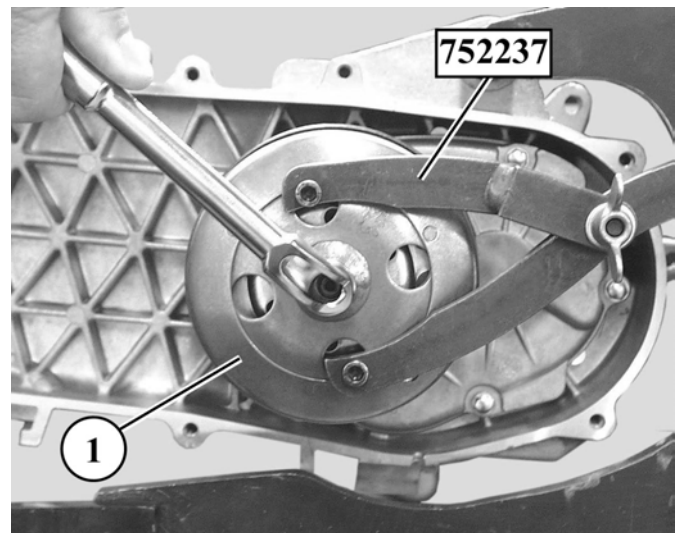
DISASSEMBLY

- Remove the belt (4)
- Remove the drive pulley (5)



To remove the driven pulley

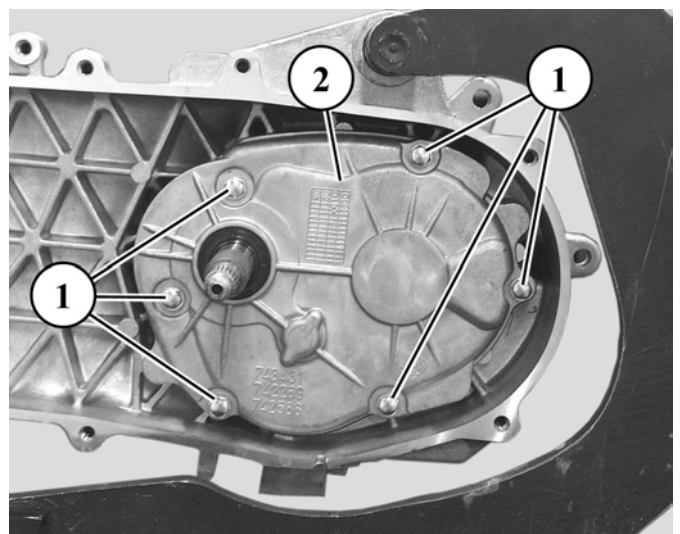
- Lock the clutch drum (1) with the pin wrench P/N 752237
- Remove the nut
- Remove the clutch drum (1) and the clutch-drive pulley assembly



To remove the secondary transmission cover

Note: use a container to catch the transfer box oil when the cover is removed

- Remove the cover (2) six fixing bolts (1)
- Remove the cover with the primary shaft



DISASSEMBLY

To remove the secondary transmission

- Remove the paper gasket (3) and the 2 locating pins (4)
- Remove the first thrust washer (5) (14x27x0.5) from the intermediate shaft (6)
- Remove the secondary shaft (7)

Note: take care not to damage the seal on the wheel side when removing the secondary shaft, as the oil could leak out through a drain hole in the casing located between the seal on the wheel side and the bearing

- Remove the intermediate shaft (6) and its second thrust washer (14x27x0.5) located behind it

To remove the starter motor

- Remove the starter motor (2) two fixing bolts (1) and washers
- Remove the starter motor and its O-ring

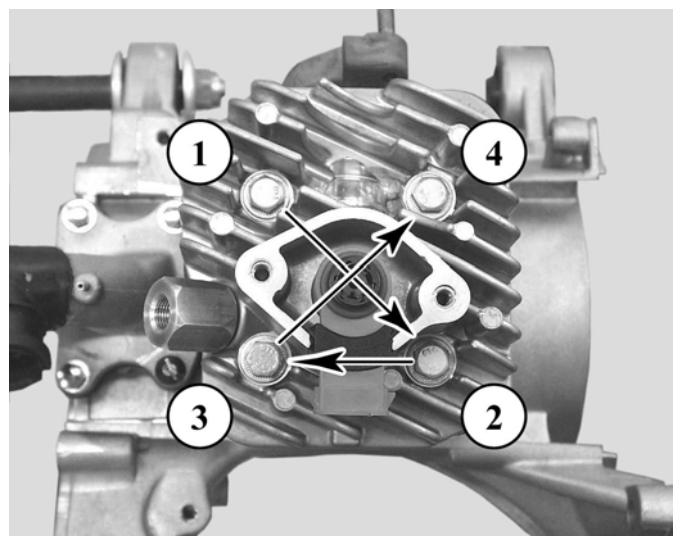
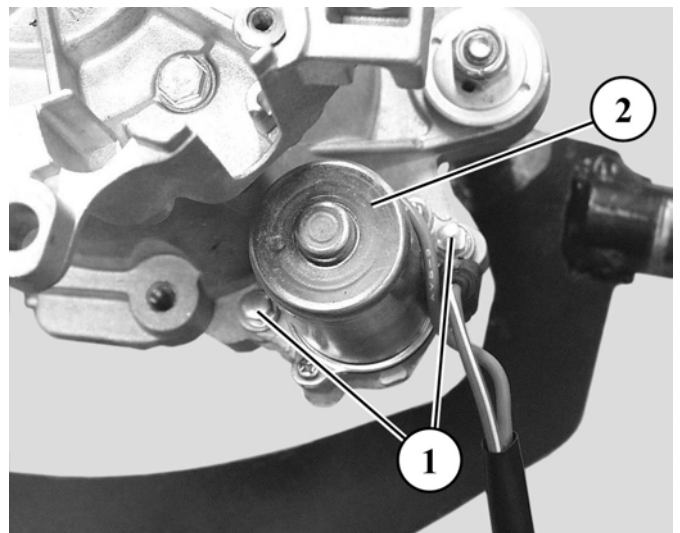
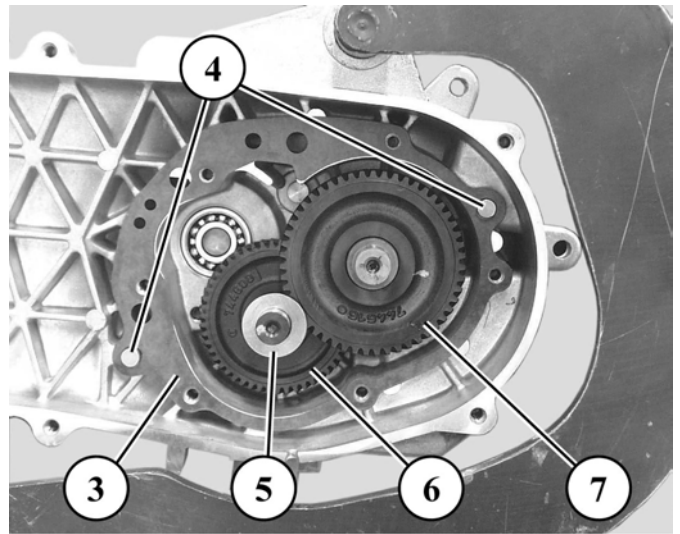
Note: the bottom bolt is used to earth the battery to the engine (green wire)

The upper bolt is used to mount the harness clamp

To remove the cylinder head/cylinder assembly

- Slacken off the cylinder head/cylinder 4 mounting bolts in the order shown, in 2 or 3 stages
- Remove the 4 bolts
- Remove the cylinder head and its gasket
- Remove the cylinder and the bottom seal

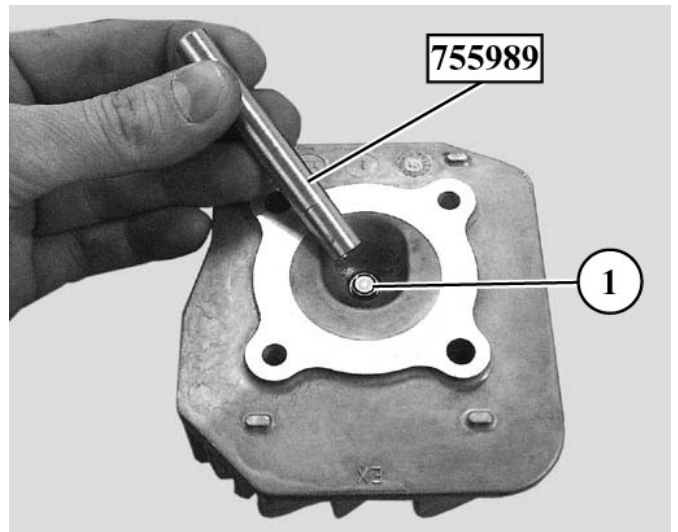
Note: do not remove the air injector if this is not necessary



DISASSEMBLY

To remove the air injector

- Drift out the air injector (1) with drift P/N 755989
- Remove the O-ring from under the air injector (the O-ring must be renewed each time it is removed)



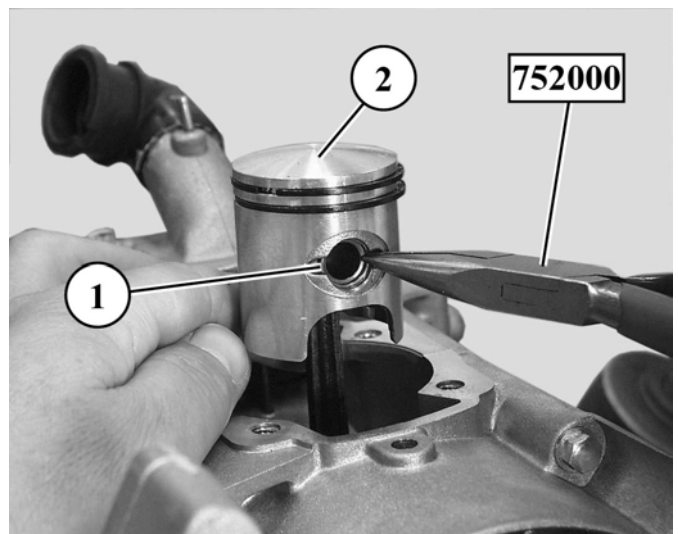
Compulsory: Put the injector in the holder tool P/N 755986 until ready for refitting

Note: The air injector can only be extracted for a short instant from its housing in the cylinder head, as the air injector has a Teflon seal which expands if it is not kept compressed



To remove the piston

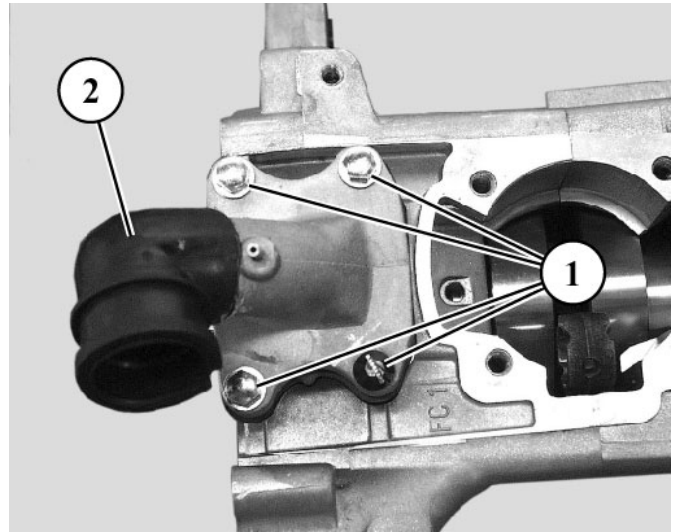
- Remove the circlips (1) with pliers P/N 752000
- Remove the gudgeon pin
- Remove the piston (2)
- Remove the needle bearing race from the connecting rod end



DISASSEMBLY

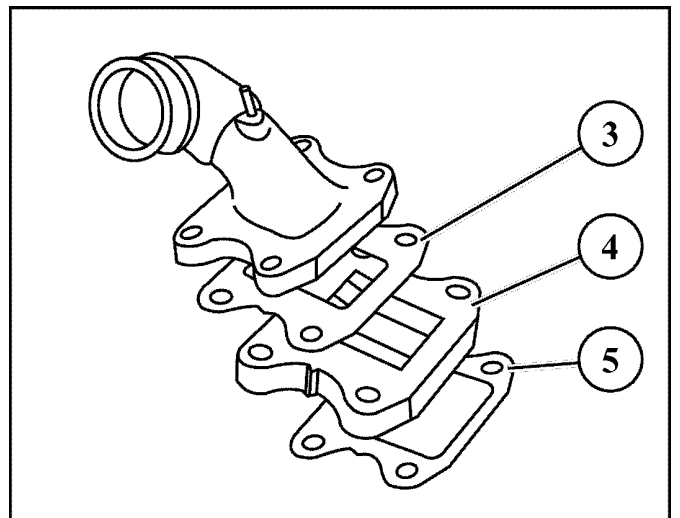
To remove the inlet manifold and valve

- Remove the 4 fixing bolts (1) (one is of the tamper-proof type)
- Remove the inlet manifold (2)



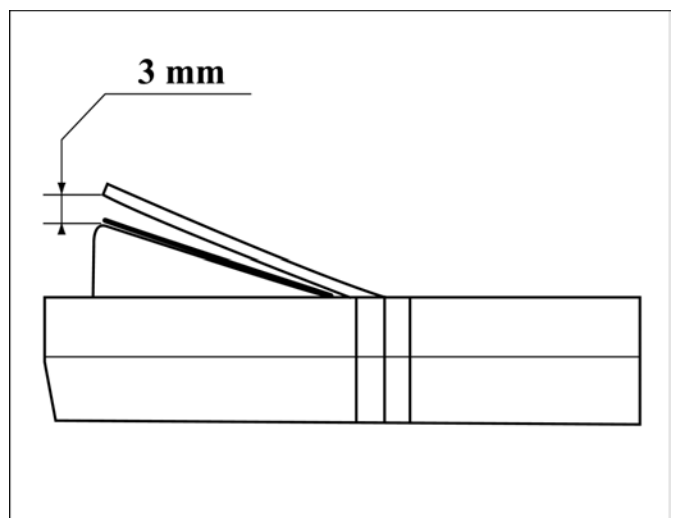
- Remove the first paper gasket (3)
- Remove the valve assembly (4)
- Remove the second paper gasket (5)

Note: The gaskets must be renewed each time they are removed



- Check that the valve assembly blades and support are in perfect condition

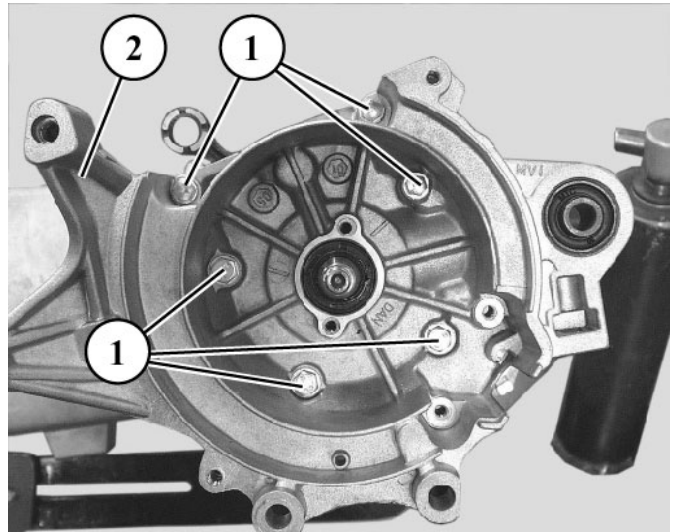
Note: the position of the limiter must be 3 mm from the valve support



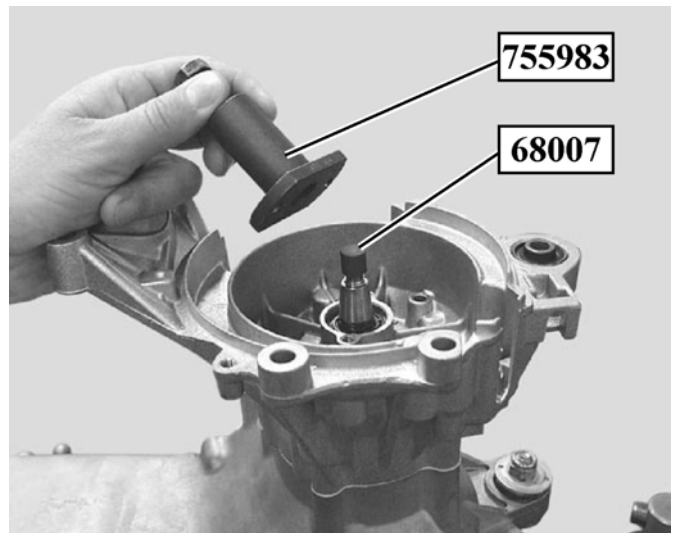
DISASSEMBLY

Opening the casings

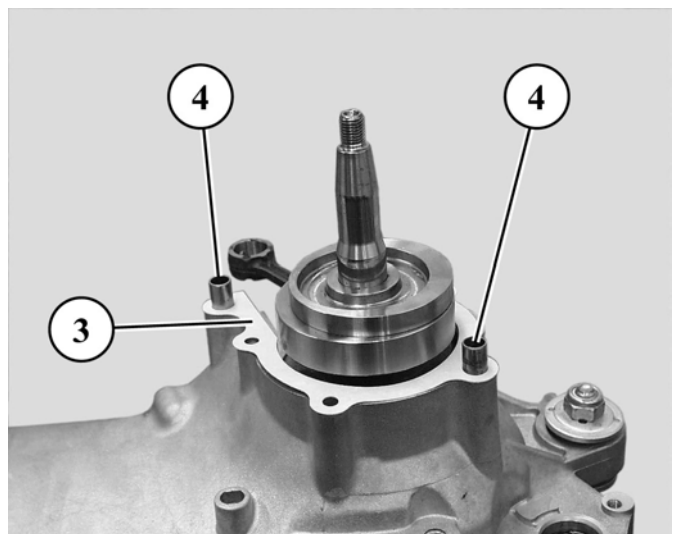
- Remove the RH casing (2) six fixing bolts (1)



- Fit the protective cap P/N 68007 to the crank
- Fit to the RH casing tool P/N 755983 secured by 2 bolts
- Hold the connecting rod to prevent it from coming into contact with the casings
- Tighten the tool centre screw until the casings separate



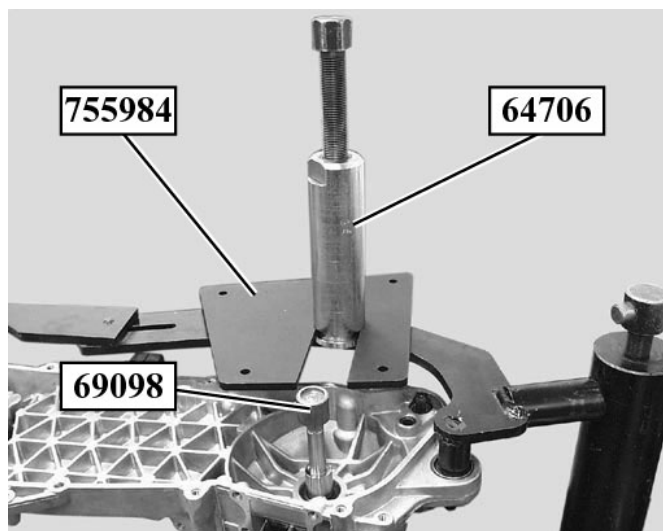
- Remove the RH casing
- Remove the paper gasket (3) and the 2 locating dowels (4)



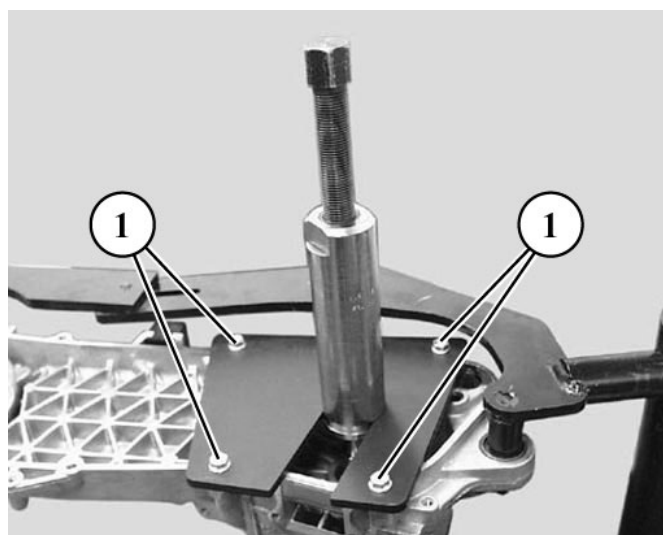
DISASSEMBLY

To remove the crankshaft

- Fit the crank end fit protective cap P/N 69098
- Fit to the casing tool P/N 64706 fitted with plate P/N 755984



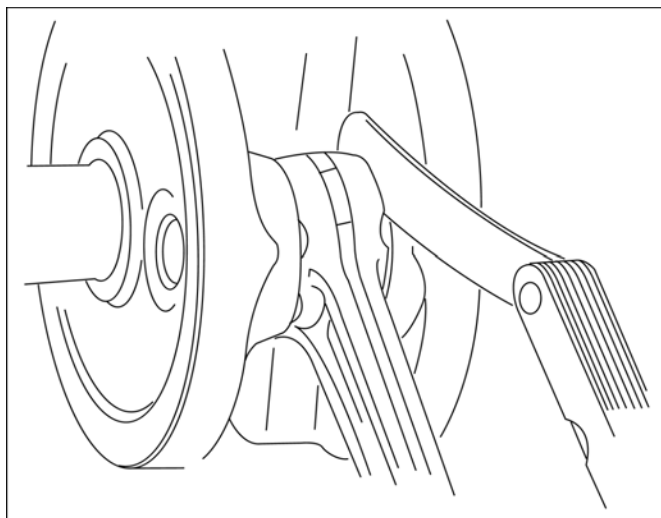
- Fit the assembly to the casing with 4 bolts (1) (the plate opening facing the cylinder side)
- Tighten the tool centre screw holding the crank with one hand on the other side until it is fully extracted



DISASSEMBLY

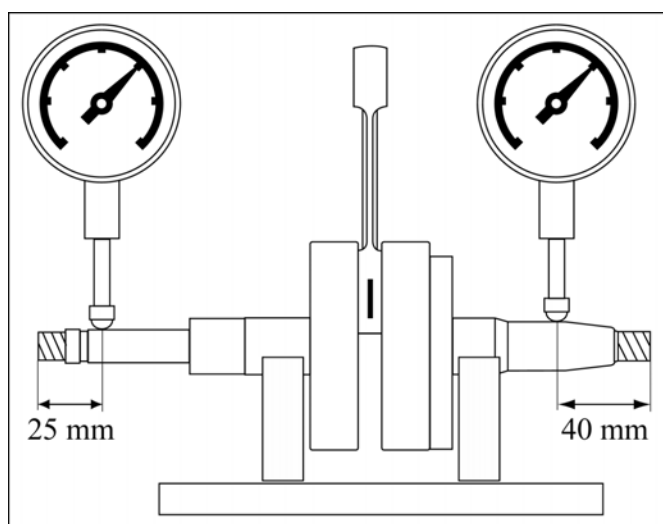
Checking the crank

- The maximum side float on the connecting rod end must not exceed: 5/10 mm



- The out-of-round values measured on the ends of the crank should not exceed 1/10 mm and must be measured:

- 25 mm from the transmission side end
- 40 mm from the magneto flywheel end



REFITTING SPECIFIC COMPONENTS

To fit bearings

Note:

- the bearings and crank seals must be changed each time the casings are opened
- when the casings are opened, if the bearings stay on the crank, use tool P/N 755585 to remove them
- if the bearings stay in the casings, the casings should be heated with a heat gun to remove them

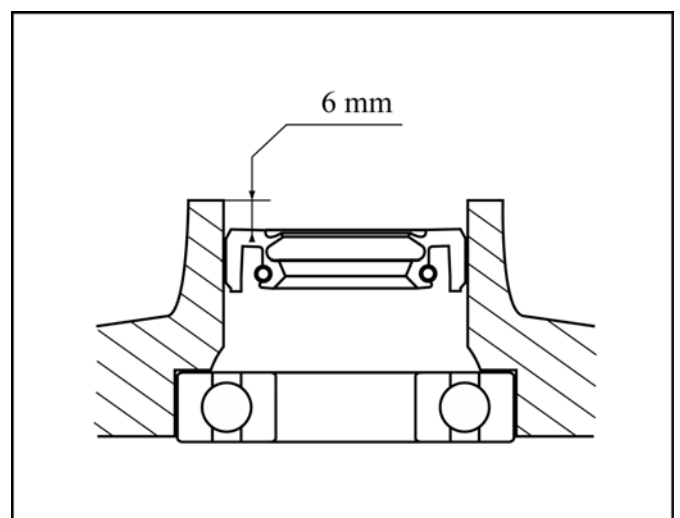
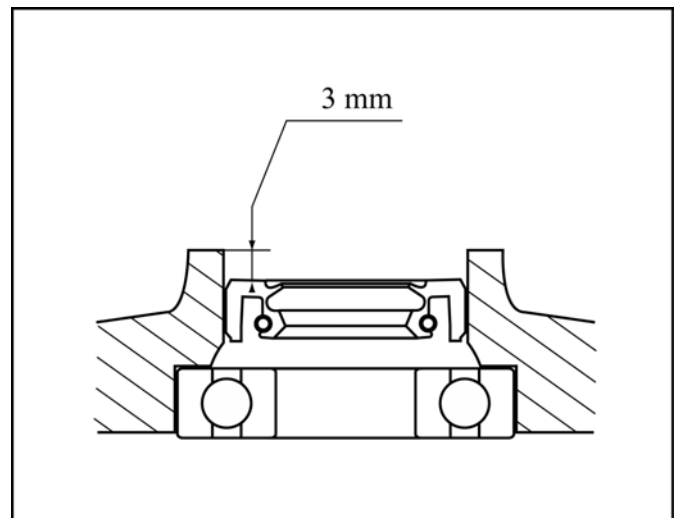
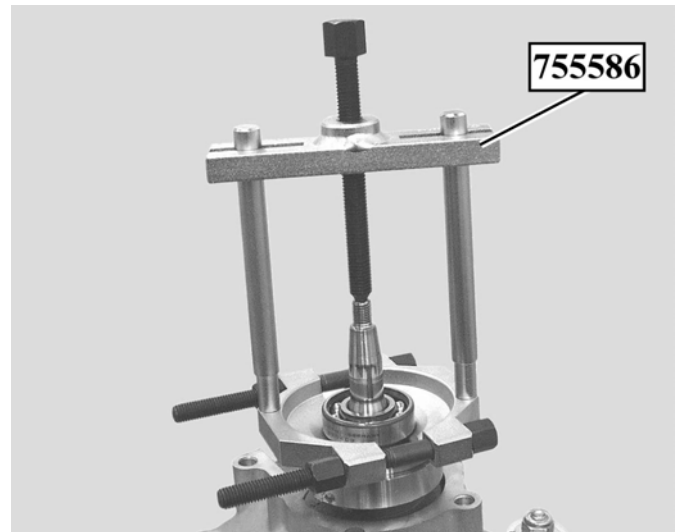
This operation should be done quickly in order to remove and refit a bearing to each casing

- Set one of the casings on its mating surface, heat it (80 to 90°C) until the bearing drops out of its own accord
- Remove the seal
- While the casing is expanded fit the new bearing fully home in its housing
- Fit the new seal with tool P/N 756057

Proceed in the same way for the other casing

The seals should be positioned as follows:

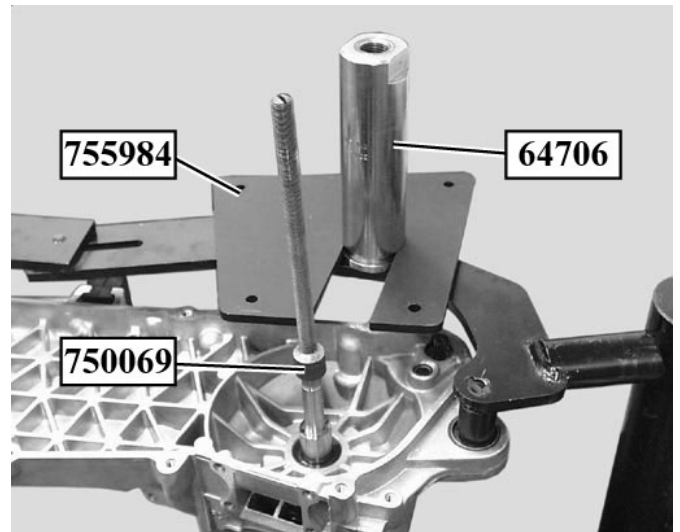
- the seal on the drive pulley side 3 mm from the outer edge of the casing
- the seal on the magneto flywheel side 6 mm from the outer edge of the casing



REFITTING SPECIFIC COMPONENTS

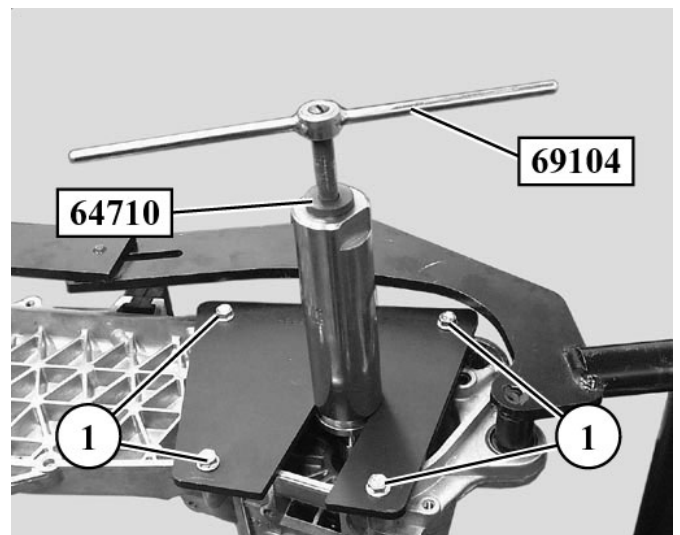
Assembling the casings

- Insert the crank into the LH casing bearing
- Tighten pin P/N 750069 on the end of the crank
- Fit tool P/N 64706 fitted with plate P/N 755984 to the pin and centre the assembly on the casing with the 4 bolts (1)

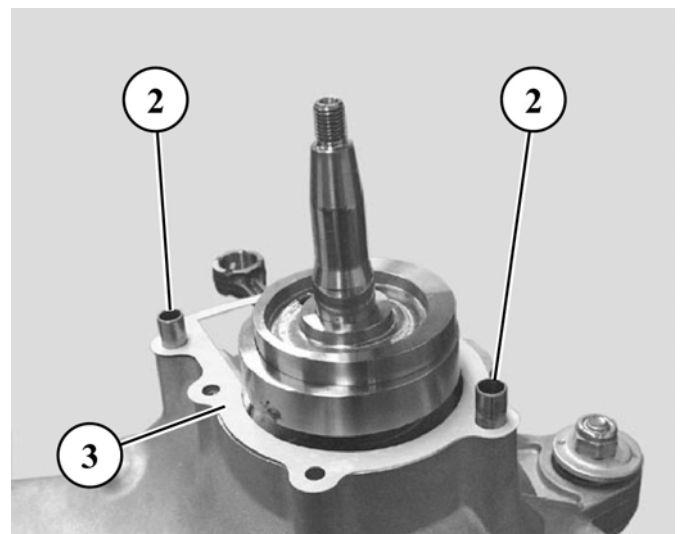


- Fit centring tool P/N 64710 to tool P/N 64706
- Tighten pin nut P/N 69104 on pin P/N 750069 in order to bring the crank into contact with the bearing ensuring that the connecting rod is facing towards the top of the engine

Note: hold the crank on the RH side with the rotor fitted over the key



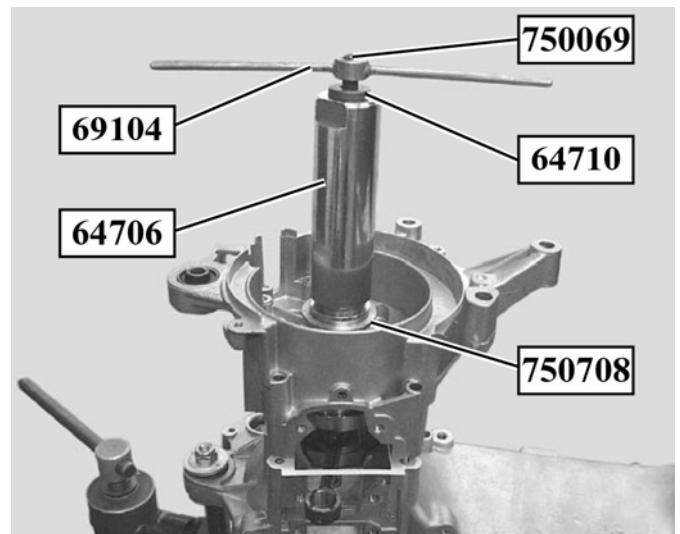
- Fit the two locating dowels (2) and a new paper gasket (3) with no oil or grease to the LH casing



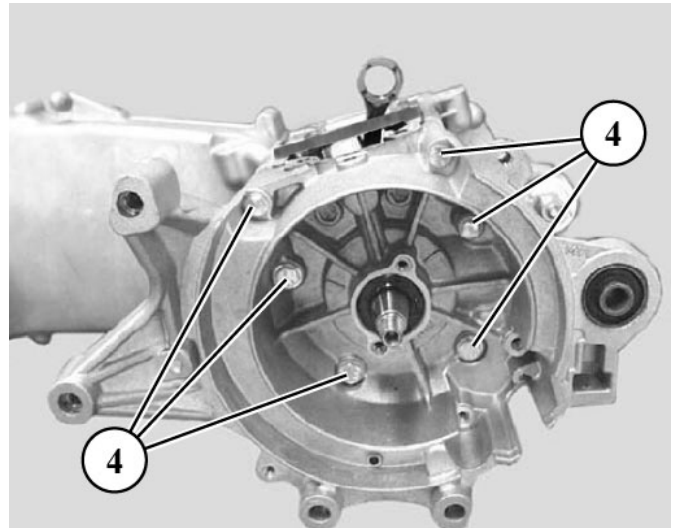
REFITTING SPECIFIC COMPONENTS

- Fit the RH casing to the LH casing and crank assembly taking care not to damage the seal, over the key if the key has stayed on the crank
- Tighten pin P/N 750069 on the end of the crankshaft
- Fit the following in order to the casing:
 - washer P/N 750808 (50x29x3mm)
 - tool P/N 64706
 - centring tool P/N 64710
- Tighten pin nut P/N 69104 until the casings are fully closed

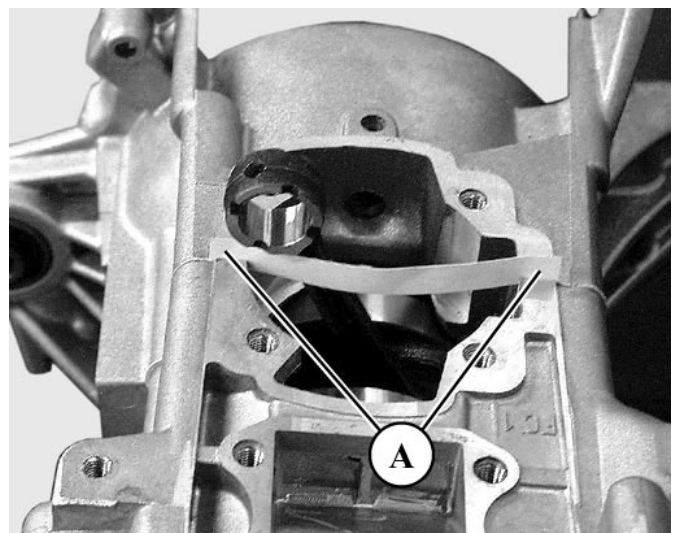
Note: hold the crank by the fixed flange fitted to the splines



- Fit the 6 fixing bolts (4)
- **Check the crank turns freely in the casings**



- Cut the casing seal flush at (A)
- Grease the crank and bearings with 2-stroke oil



REFITTING SPECIFIC COMPONENTS

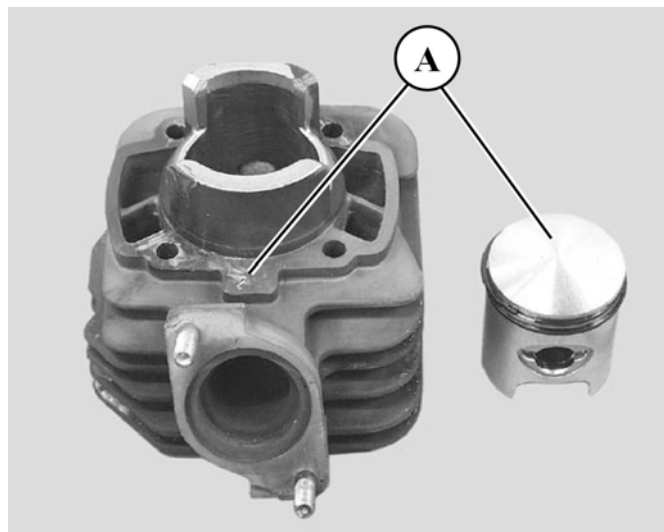
To fit the piston

- Check the cylinder/piston assembly pairing (A)

There are two possible types, A and B

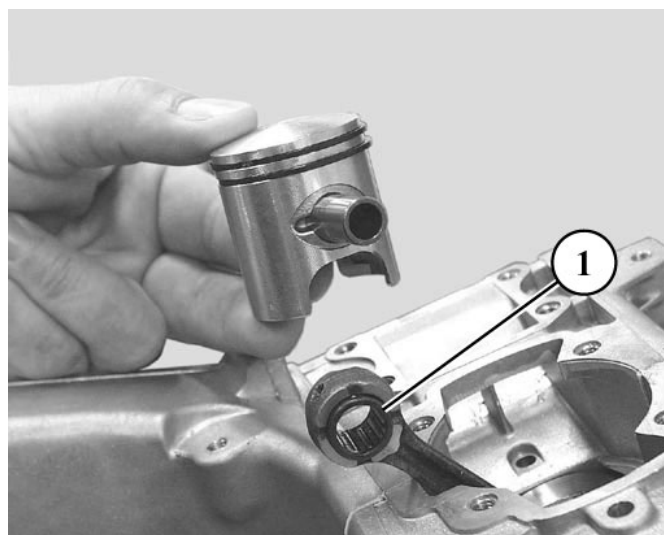
Cylinder A with piston A

Cylinder B with piston B



- Fit the needle bearing race (1) into the connecting rod end after lubricating it with 2-stroke oil

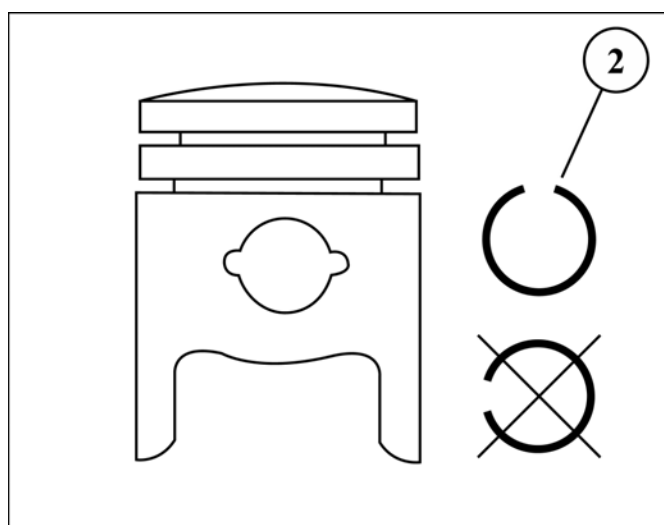
- Fit the piston to the connecting rod, the positioning spigots on the piston rings facing the inlet side



- Fit the gudgeon pin and circlips

Imperative: the circlips must be renewed each time they are removed

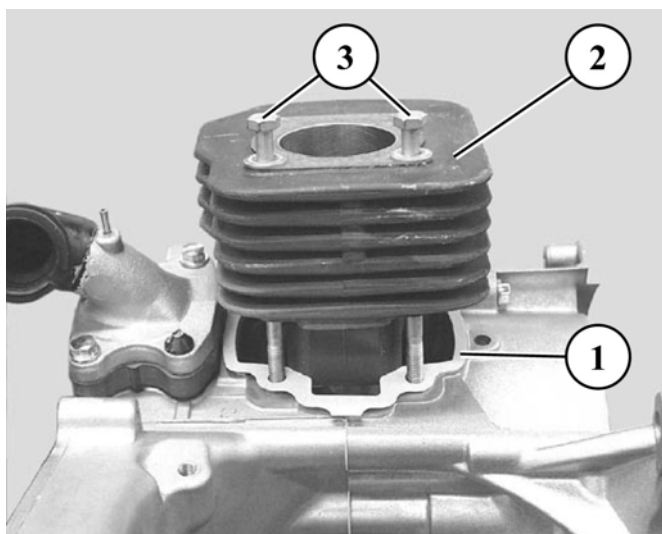
The circlip gaps must face upwards or downwards, but under no circumstances to the side (2)



REFITTING SPECIFIC COMPONENTS

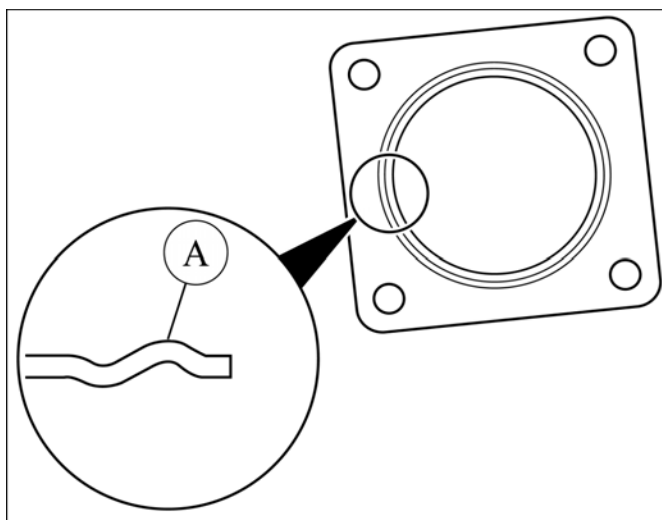
To fit the cylinder

- Fit a new bottom gasket (1) without grease or oil to the casing which has been previously cleaned of all impurities
- Ensure that the piston ring gaps are opposite the piston positioning spigots
- Fit the cylinder (2) and lower it while compressing the rings by hand
- Check the bottom seal is properly positioned on the casing using the 2 cylinder head fixing screws (3)

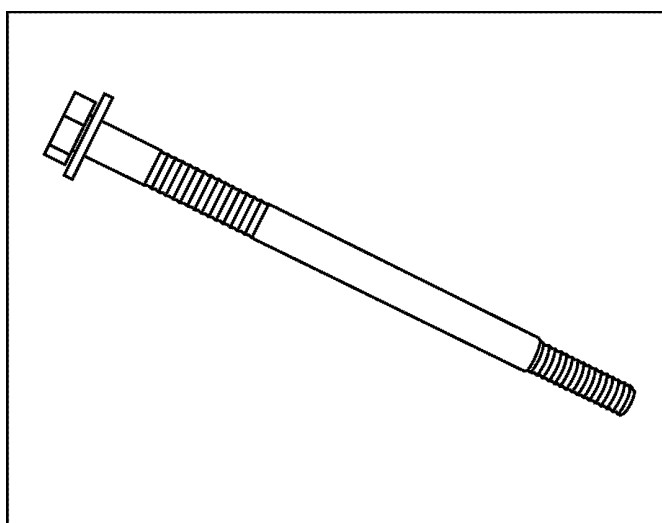


To fit the cylinder head

- Check the cylinder head mating surface is in perfect condition
- Fit the 4 fixing bolts to the cylinder head with their washers
- Fit a new gasket to the cylinder head, with the bead (A) on the cylinder head side



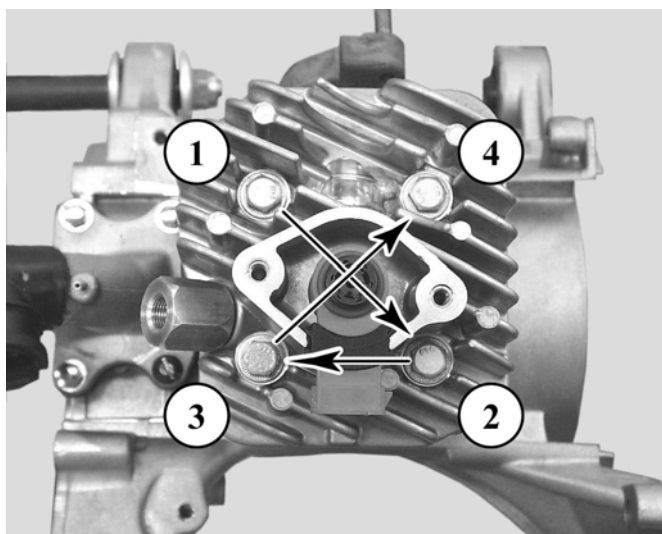
Important: if one or more bolts are changed, genuine original parts must be used
Their design guarantees a constant tightening torque whatever the cylinder/piston assembly temperature



REFITTING SPECIFIC COMPONENTS

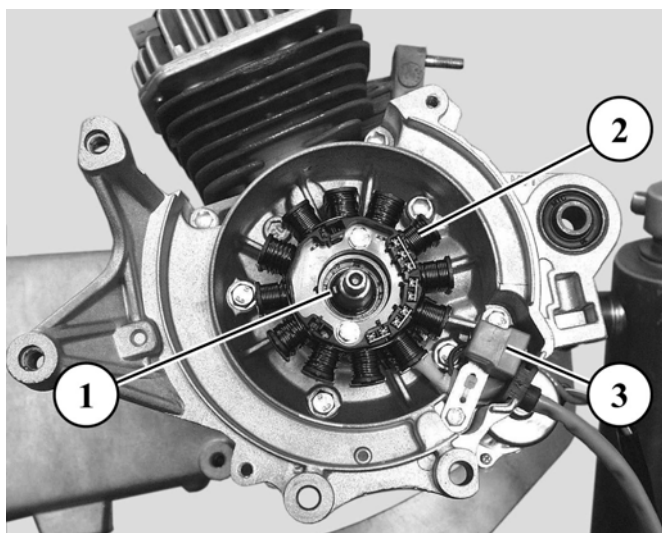
- Fit the bolt-washer, cylinder head and gasket assembly to the cylinder
- Tighten the 4 bolts in 2 or 3 steps in the order shown

Note: this operation is carried out without removing the air injector



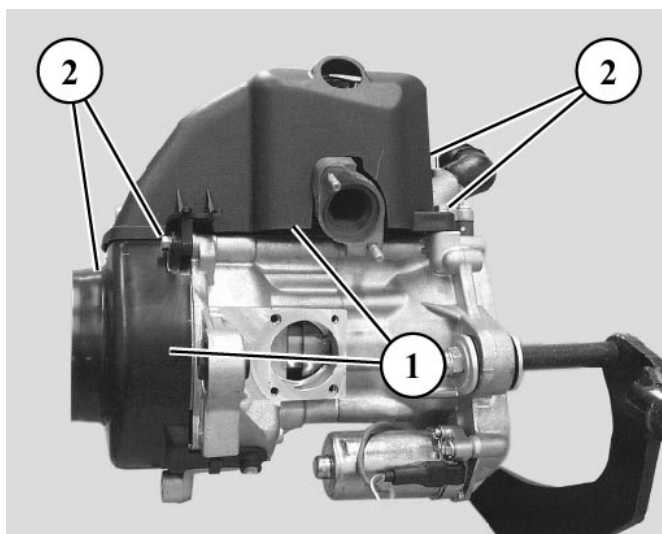
To fit the magneto flywheel

- Fit the key (1) to the crank
- Fit the stator (2) and engine speed sensor (3) assembly
- Fit the 2 fixing bolts for each of the parts
- Fit the rotor to the crank ensuring it is perfectly positioned on the key
- Lock the rotor with the adjustable pin wrench P/N 752237
- Fit and tighten the rotor nut



To remove the cooling system

- Fit the cooling turbine and its 3 bolts
- Fit the volute and cylinder cover (1) with the 4 bolts (2)

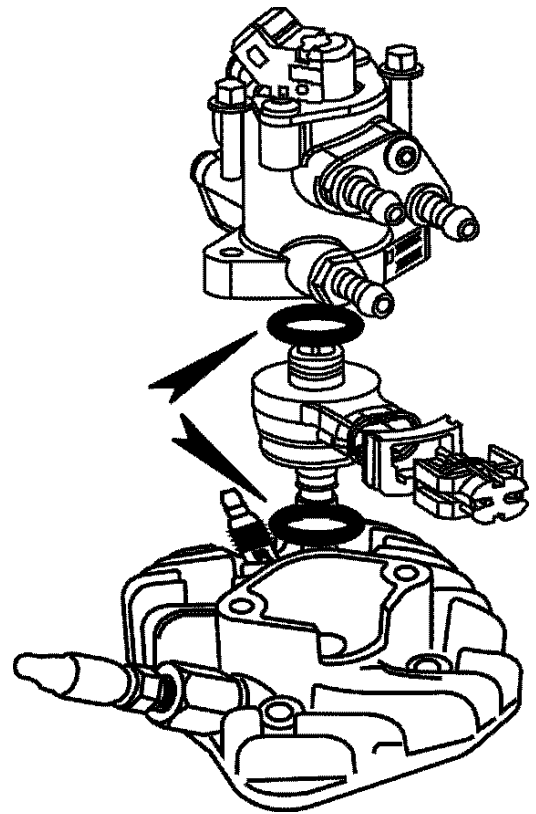
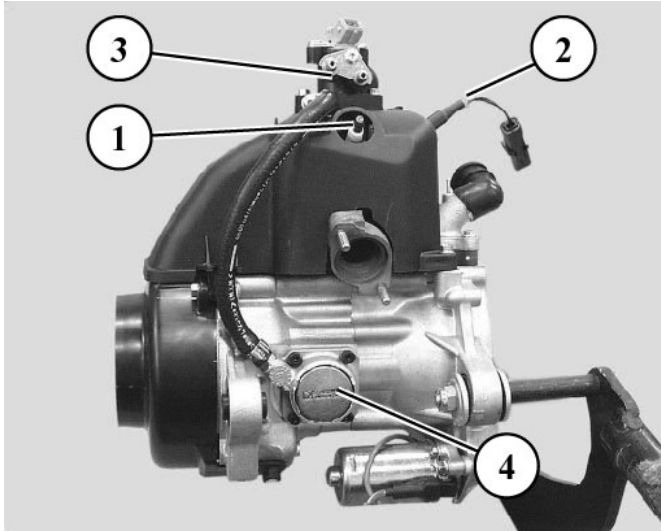


REFITTING SPECIFIC COMPONENTS

To fit the injection manifold and compressor

(If they were removed together)

- Fit the spark plug (1)
- Fit the temperature sensor (2)
- Fit the injection manifold (3) (2 bolts) checking the gaskets are correctly fitted
- Fit the compressor (4) (4 bolts) with its two locating dowels and a new **lightly** greased O-ring



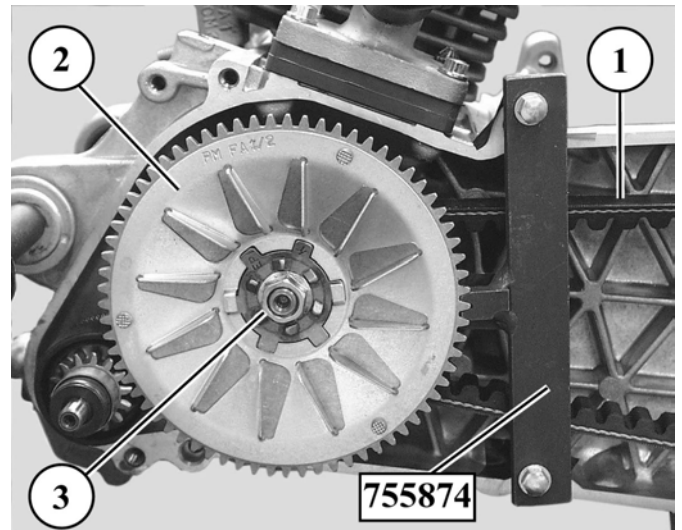
To fit the drive pulley assembly

- Fit the drive pulley with its guide hub onto the crank
- Fit the belt (1) to the guide hub
- Fit the fixed flange (2) to the crank checking it is properly positioned on the crank splines
- Fit the nut (3) and tighten finger tight
- Fit locking tool P/N 755874
- Tighten the nut with a torque wrench to the required torque

Note: it is forbidden to use a power driver, this may upset the crank position

Imperative: Precautions when refitting the drive pulley

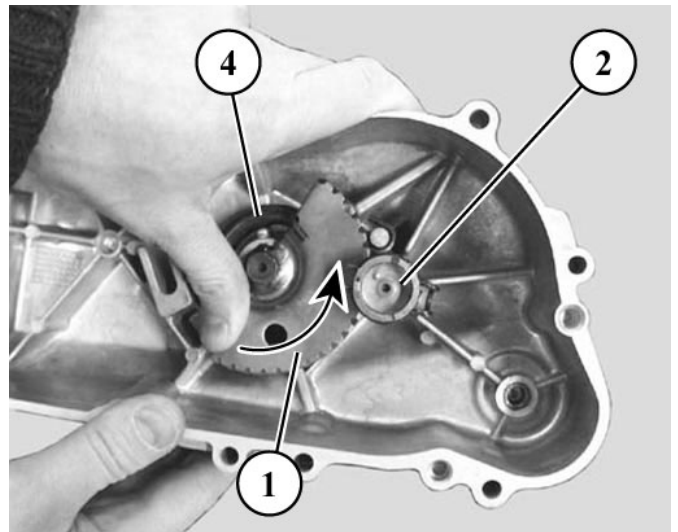
Certain parts of the drive pulley must not be discarded or cut down to a smaller size. Any modifications may cause the nut to tighten against the crank splines instead of the fixed flange and damage the crank splines



MISCELLANEOUS OPERATIONS

To remove the starter system

- Operate the starter quadrant (1) by hand and remove the kick start drive gear (2) and its washer

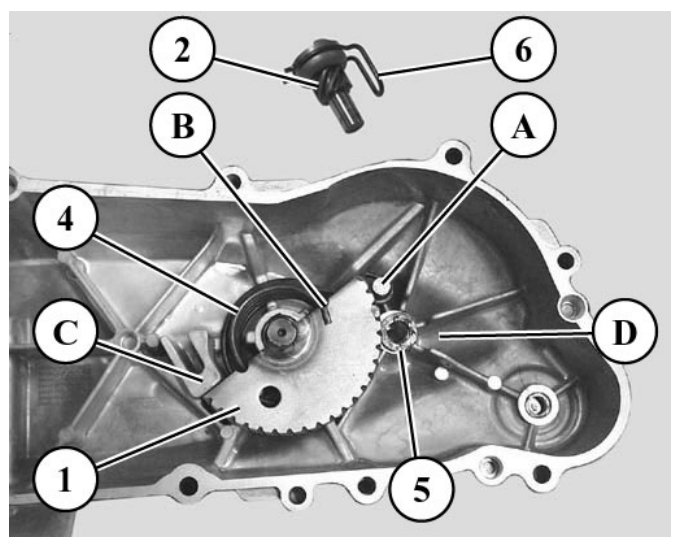


- Turn the cover over and remove the circlip (3) with circlip pliers P/N 69117
 - Remove the washer, the starter quadrant (1) and the spring (4) from the transmission cover



To fit starter system

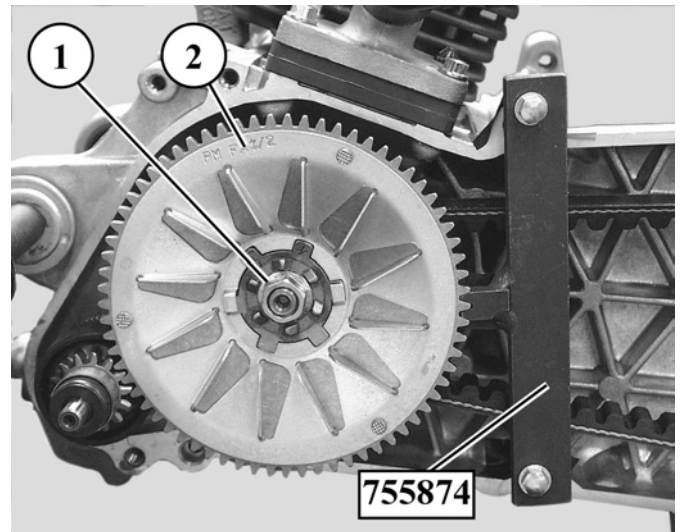
- Fit the return spring (A), with the longest loop on peg (A) in the cover
 - Fit the starter quadrant (1) into the bearing bush
 - Hook the second loop (B) of the spring onto the starter quadrant
 - Set the spring so that the starter quadrant is positioned against its stop (C) in the cover
 - Turn the cover over and fit the washer and circlip to the quadrant shaft
 - Fit the washer (5) into the ratchet shaft housing
 - Set the quadrant at around 1/8 turn in order to be able to fit the kick start drive gear
 - Fit the kick start drive gear pin (6) in the cover housing (D)



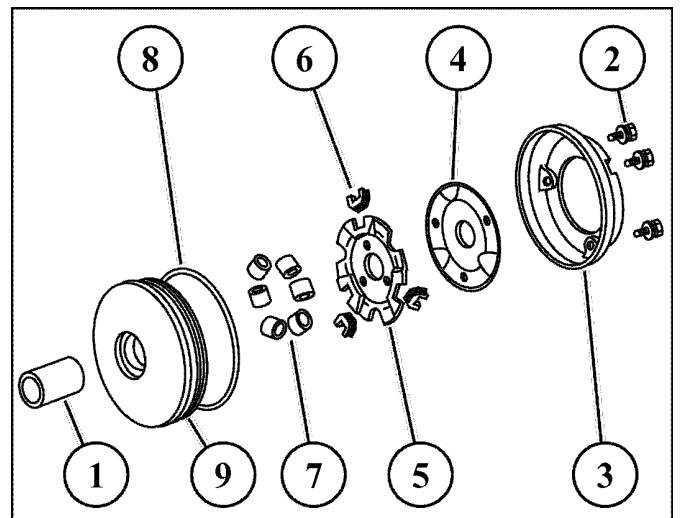
MISCELLANEOUS OPERATIONS

To remove/refit the drive pulley rollers

- Remove the transmission cover 8 fixing bolts
- Remove the cover and its locating pin
- Lock the fixed flange (2) with tool P/N 755874
- Remove the fixed flange nut (1)
- Remove the fixed flange



- Remove the guide hub (1)
- Remove the cover three fixing bolts (2)
- Remove the cover (3)
- Remove the coil (4)
- Remove the holder (5) and its 3 plastic guides (6)
- Remove the 6 rollers (7)
- Remove the O-ring (8) from the rotating flange (9)



After cleaning, check the condition of the rollers, they must be changed if they show flats due to excessive wear

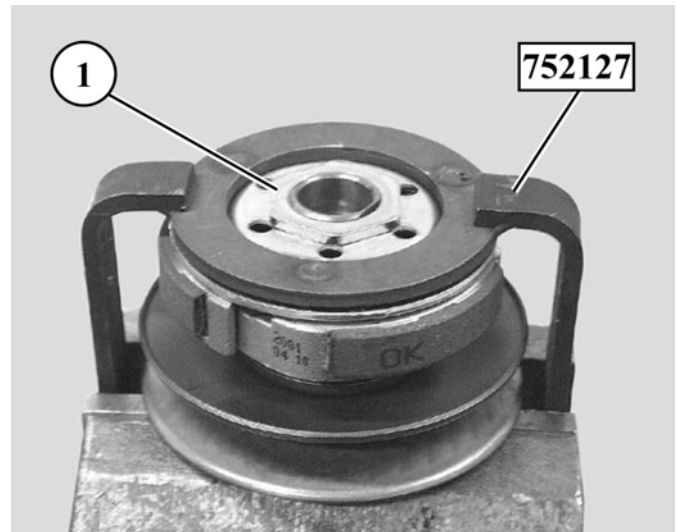
To re-assemble, proceed in reverse order to disassembly after lightly greasing the rollers and rotating flange inside (high temperature grease)

Note: Do not over-grease to avoid splashing the belt

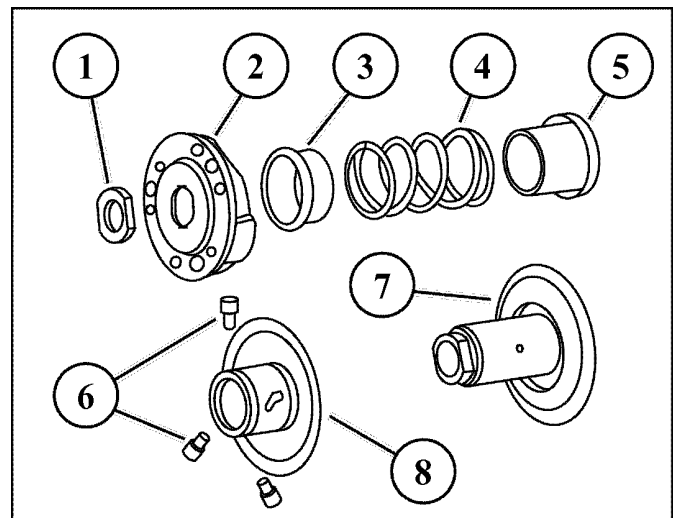
MISCELLANEOUS OPERATIONS

To remove the clutch lining assembly

- Remove the transmission cover 8 fixing bolts
- Remove the cover and its locating pin
- Lock the clutch drum (1) with the pin wrench P/N 752237
- Remove the nut
- Clamp the two strands of the belt to lower it between the flanges
- Remove the clutch drum and the clutch-drive pulley assembly
- Lock the assembly with tool P/N 752127 clamped in the jaws of a vice
- Remove nut (1) using spanner P/N 752361
- Decompress tool P/N 752127



- Remove the clutch lining assembly (2)
- remove the upper centring sleeve (3) from the spring
- Remove the spring (4)
- Remove the lower centring sleeve (5) from the spring
- Remove the 3 pins (6) from the governor seat
- Separate the fixed (7) and rotating (8) flanges



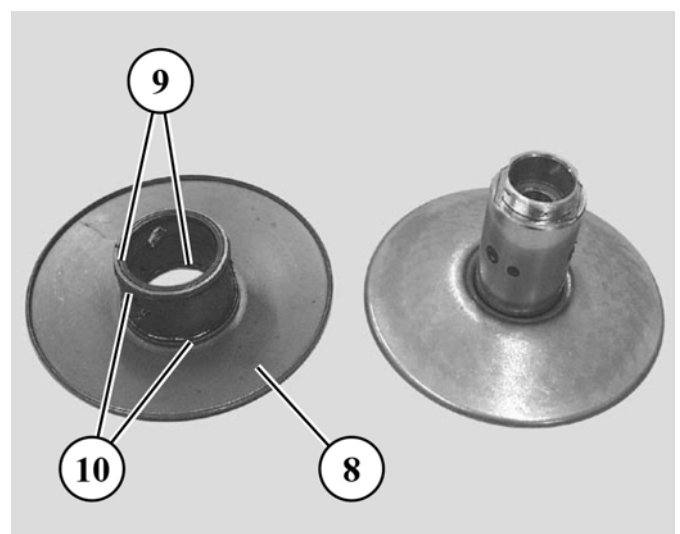
To refit the clutch lining assembly

After checking the 2 lip seals (9) and the 2 O-rings of the rotating flange (8) are in good condition, grease the governor seat 3 pins (6) (high temperature grease) and assemble the parts in reverse order to removal

- Compress the assembly with tool P/N 752127
- Tighten the nut (1) to the recommended torque

Note: Before fitting the drive pulley to the input shaft, fit the belt into the pulley bottom by opening the flanges by hand

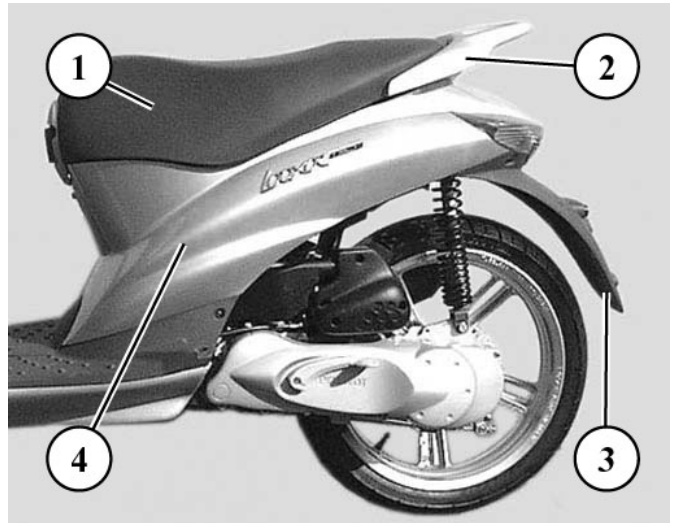
- Fit the clutch cover
- Fit and tighten the nut to the recommended torque
- Fit the cover with its locating pin
- Fit the cover 8 fixing bolts



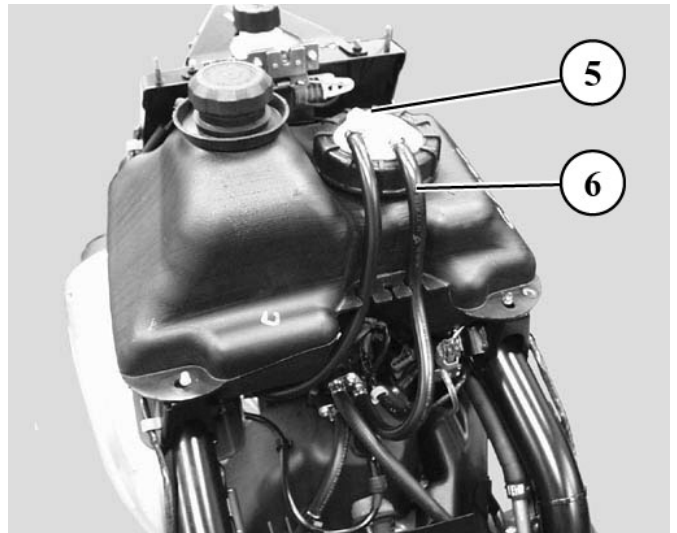
SPECIAL WORK AND PROCEDURES

To remove the fuel tank

- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly (1)
- Remove the grab handle (2)
- Remove the mud flap (3)
- Remove the rear panel assembly (4)



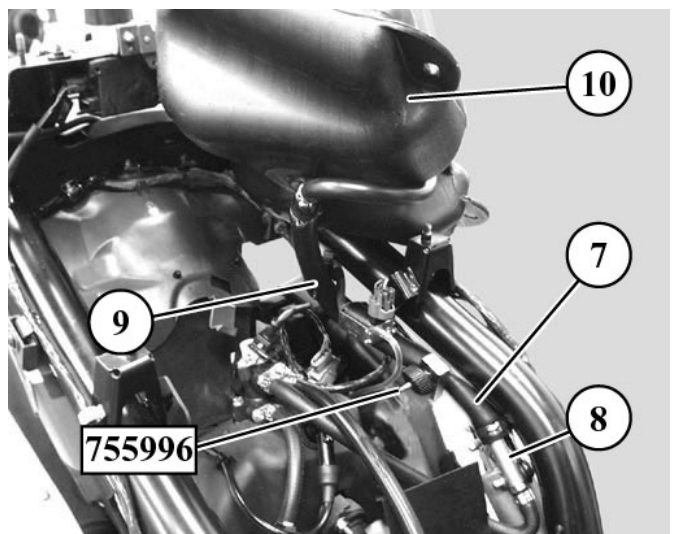
- Disconnect the fuel gauge (5)
- Disconnect the fuel return pipe (6)



- Clamp the fuel inlet hose (7) with hose clamp P/N 755996
- Disconnect the fuel inlet pipe (7) from the pump (8)
- Unclip the fuel pipe from the plastic clip (9)
- Remove the tank (10)

Note: Before carrying out any work, leave the engine to cool for a minimum of 2 hours. Petrol is highly inflammable, do not smoke in the working area and avoid proximity to flames or sparks.

Work in a well ventilate area

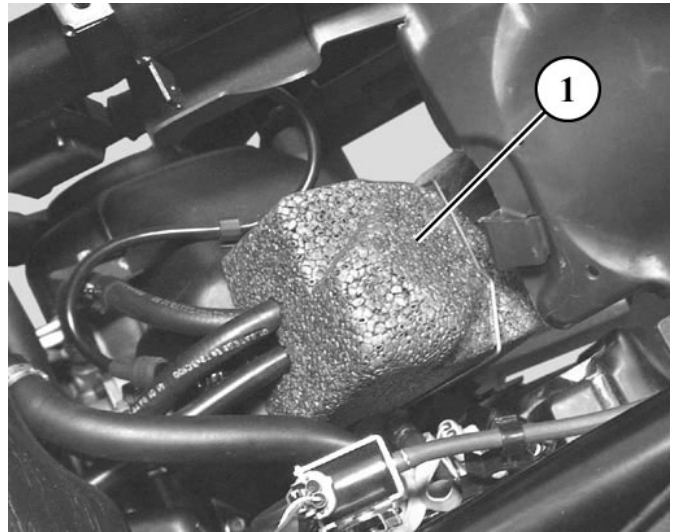


SPECIAL WORK AND PROCEDURES

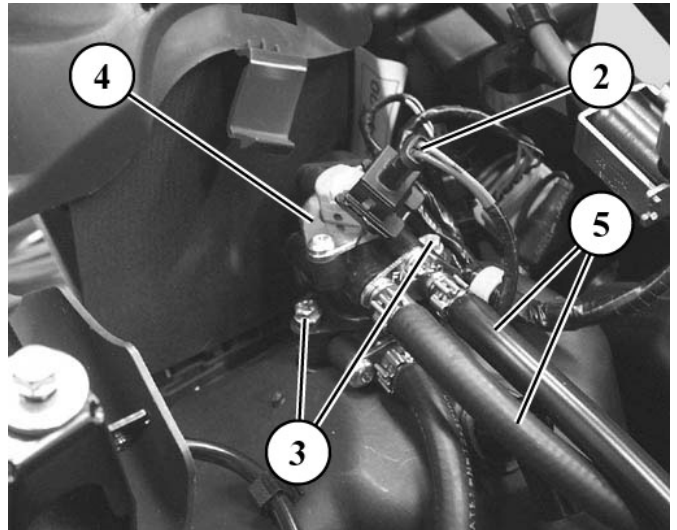
*Procedure used to lower the pressure in the fuel system **instruction 1***

Imperative: wash the power unit

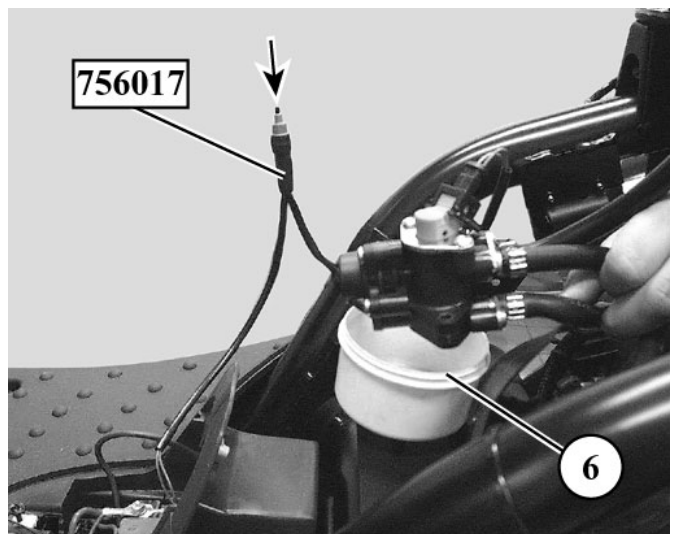
- Remove the saddle/locker assembly
- Raise the fuel tank in order to withdraw the injection manifold (1) soundproofing.



- Disconnect the fuel injector (2)
- Remove the 2 bolts (3) from the injection manifold (4)
- Remove the injection manifold without disconnecting the feed pipes (5)



- Connect the fuel injector harness tool P/N 756017 to the fuel injector and the battery
- Put the manifold into a container (6) to catch the fuel
- Operate the tool contactor 5 times stopping for 5 seconds between each operation in order to lower the pressure in the injection manifold feed pipe



⚠ Correctly secure the injection rail in the container as the pressurised fuel jet may be dangerous for the skin, do not expose the hands to the petrol jet when the injector is opened

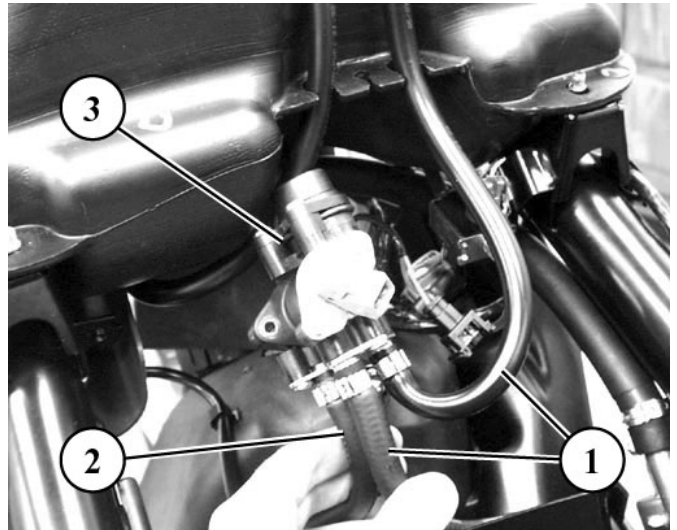
Fuel circuit bleeding procedure instruction 2

- After refitting the assembly, operate the fuel pump by turning on the ignition key (turning on the ignition operates the fuel pump for 3 seconds)
- Carry out this operation twice

To remove the Injection rail

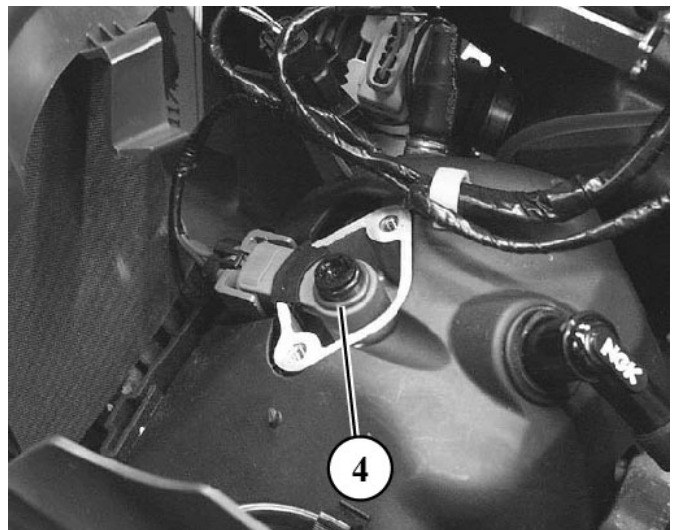
Imperative: wash the power unit

- Carry out the procedure used to lower the pressure in the fuel system (see instruction 1)
- Remove the clips from the 3 pipes (1 and 2)
- (if changed, these clips must not be replaced by screw-type clips)**
- Disconnect the 2 fuel pipes (1)
- Disconnect the air pipe (2) from the compressor
- Remove the injection manifold (3)



- Remove the O-ring (4) from under the injection manifold (the O-ring must be renewed each time it is removed)

Re-assembly: Proceed in reverse order to disassembly and bleed the fuel system (see instruction 2)



To remove the air injector

Imperative: wash the power unit

- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Remove the grab handle
- Remove the mud-flap
- Remove the rear panel assembly
- Disconnect the fuel gauge
- Remove the fuel tank fixing nuts and move it clear as shown
- Remove the injection manifold soundproofing from the injection manifold
- Remove the 2 bolts from the injection manifold (1)
- Withdraw the injection manifold without disconnecting it

- Remove the O-ring (2) from under the injection manifold (the O-ring must be renewed each time it is removed)
- Disconnect the air injector (3)
- Remove the air injector (4)

Imperative: Immediately put the air injector in the holder tool P/N 755986 if it is to be re-used

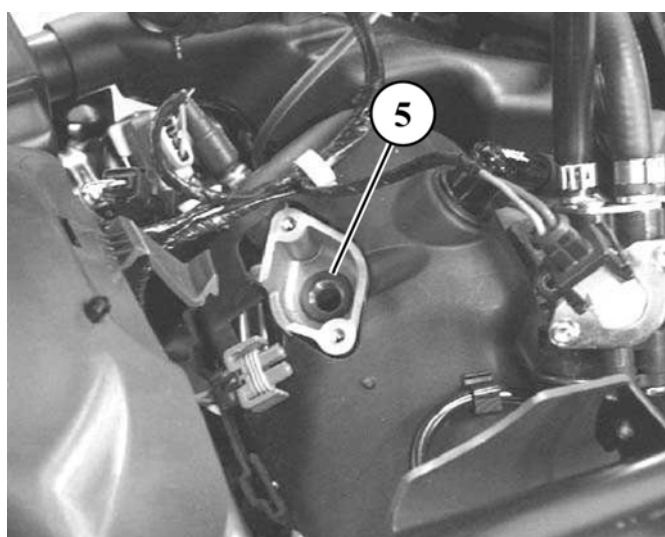
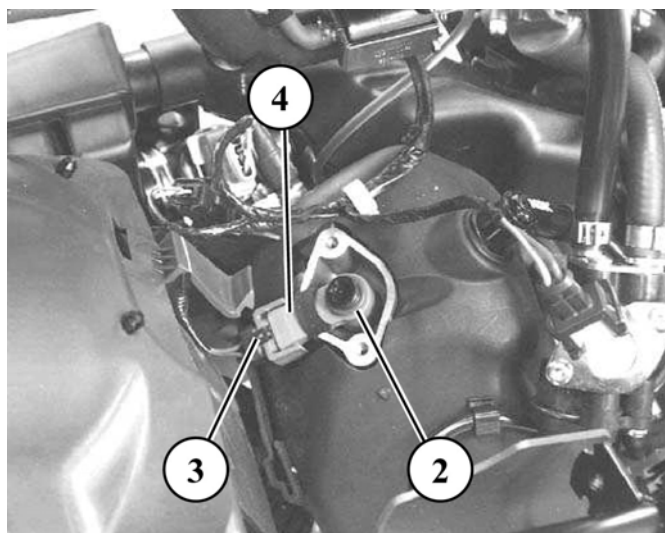
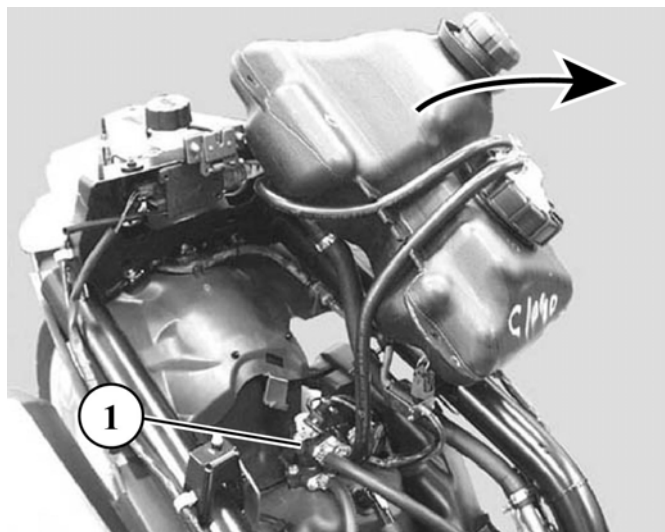
Note: Removal of the air injector from a machine which has already been driven may need the cylinder head removing to drift out the injector with drift tool P/N 755989 (see relevant chapter)

- Remove the O-ring (5) from under the air injector (the O-ring must be renewed each time it is removed)

Note: The injector may be extracted for only a very short instant from its housing in the cylinder head, since the expansion of its seal makes it unusable

Re-assembly: Re-assemble in the reverse order to dismantling

Check: Using the diagnostic tool, check for fault codes, clear them if necessary

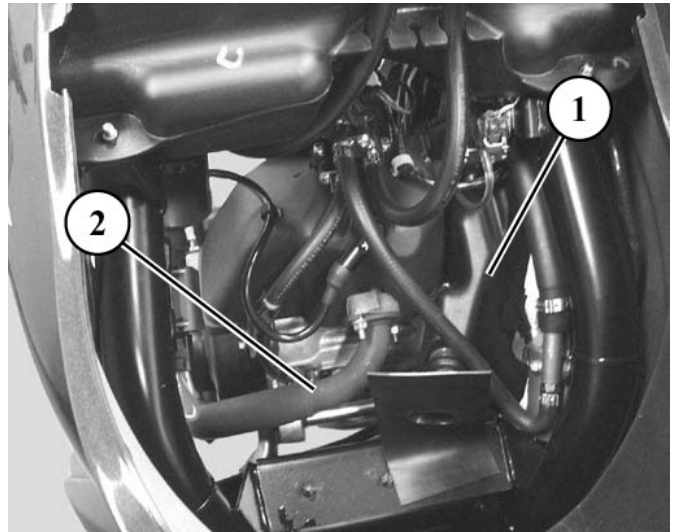


SPECIAL WORK AND PROCEDURES

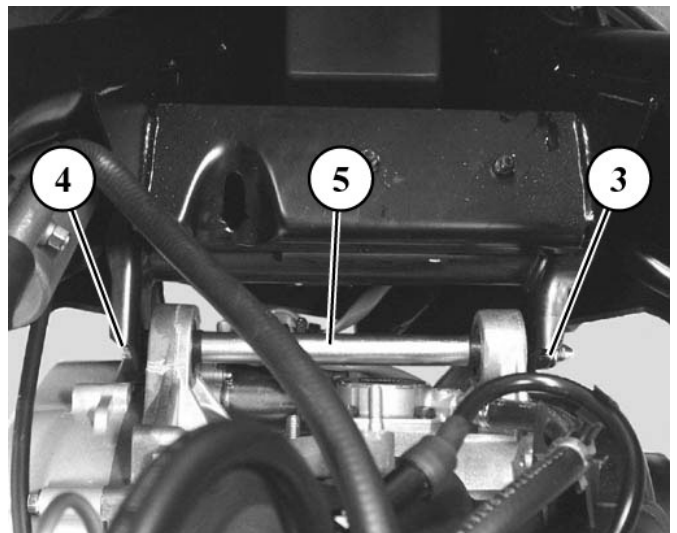
To remove the air compressor

Imperative: wash the power unit

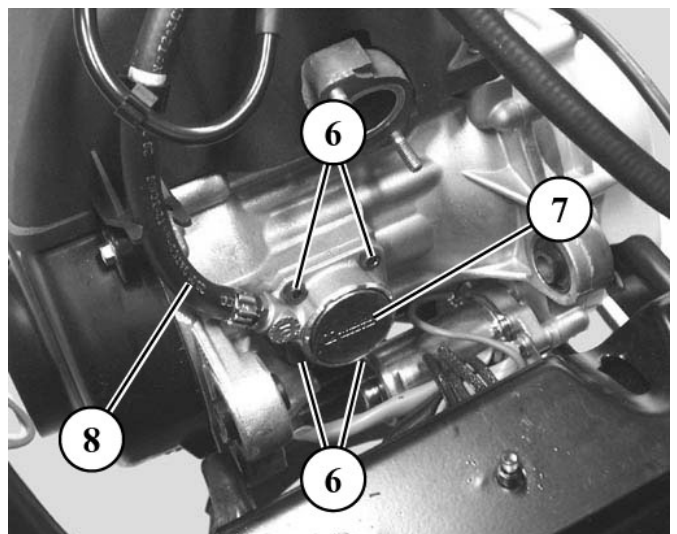
- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Remove the air intake (1)
- Remove the exhaust (2)



- Remove the motor to rod fixing nut (3)
- Suspend the machine
- Remove the motor to rod fixing bolt (4)
- Remove the spacer (5)



- Remove the motor from the chassis
- Remove the compressor (7) 4 fixing bolts (6)
- Remove the compressor with the 2 locating dowels and the O-ring
- Disconnect the air pipe (8)



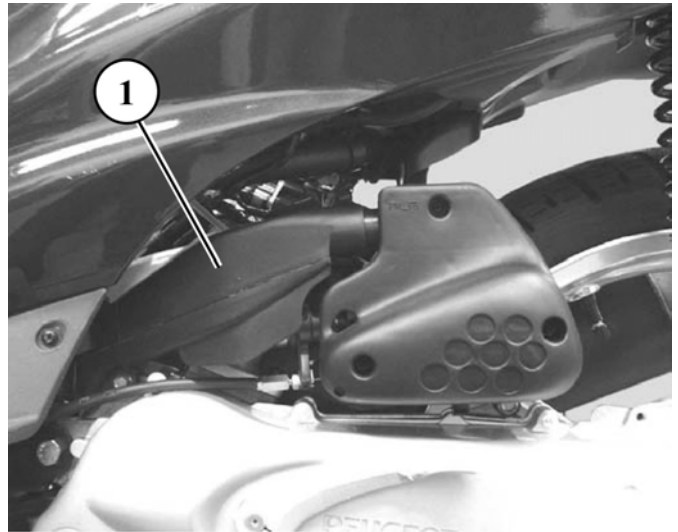
Re-assembly: Re-assemble in the reverse order to dismantling

Note: The compressor O-ring must be renewed each time it is removed and refitted **lightly** greased

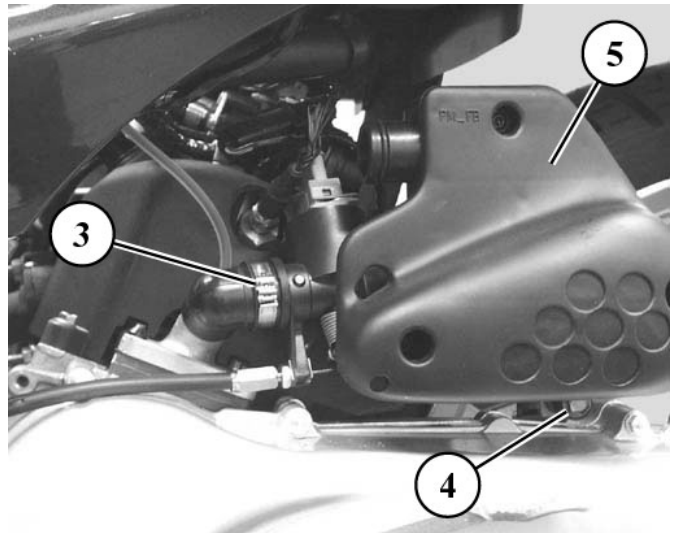
SPECIAL WORK AND PROCEDURES

To remove the throttle unit

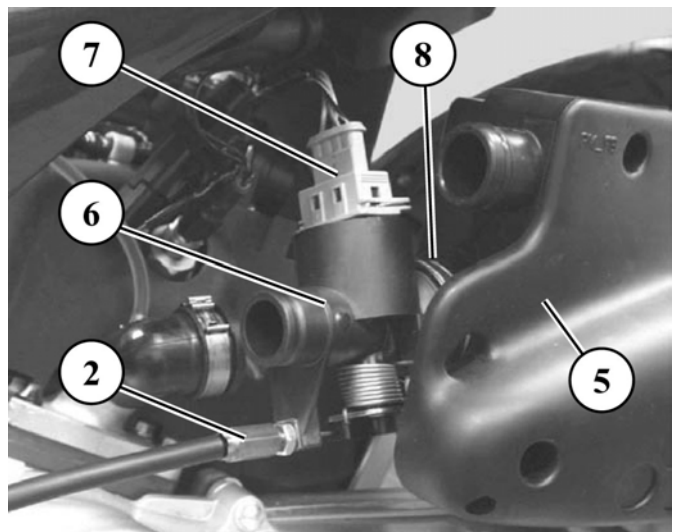
- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Remove the air intake (1)



- Remove the from the throttle unit to inlet manifold clip (3)
- Remove the air filter box (5) mounting bolt (4)



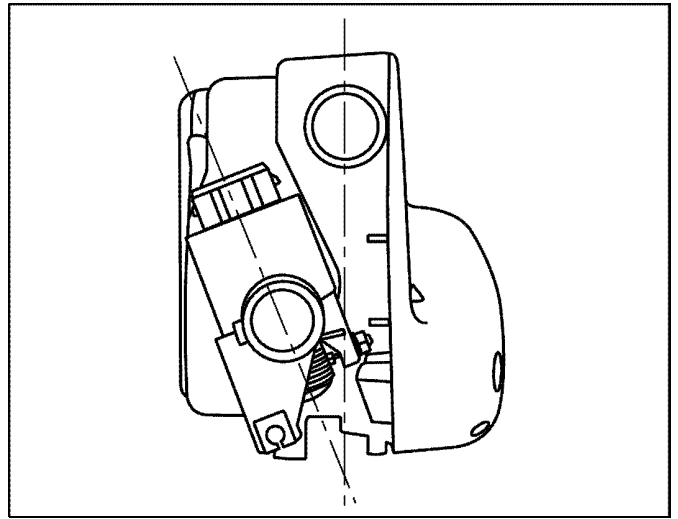
- Remove the air filter box (5) and throttle unit (6) assembly
- Disconnect the throttle unit (7)
- Disconnect the accelerator cable (2)
- Cut the plastic tie (8) holding the throttle unit to the air filter box
- Remove the throttle unit (6)



SPECIAL WORK AND PROCEDURES

Re-assembly: Proceed in reverse order to disassembly ensuring:

- the throttle unit is properly positioned on the air filter box

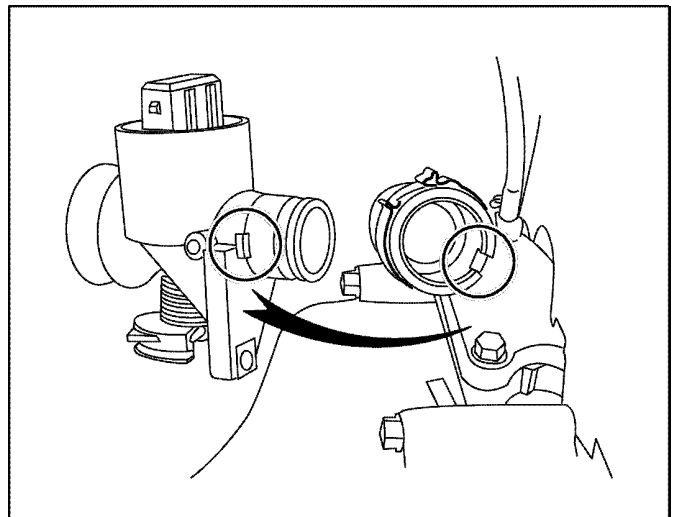


- the throttle unit positioning point is properly located in its housing on the inlet manifold

- the throttle cable is properly tensioned

- Use the diagnostic tool to initialise the throttle unit (refer to the documentation "Using the Diagnostic Tool for the Injection Engine")

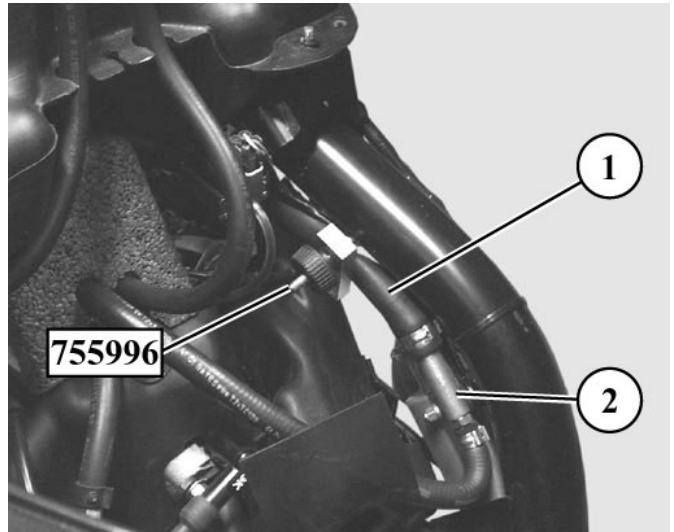
Check: Using the diagnostic tool, check for fault codes, clear them if necessary



SPECIAL WORK AND PROCEDURES

To remove the fuel pump

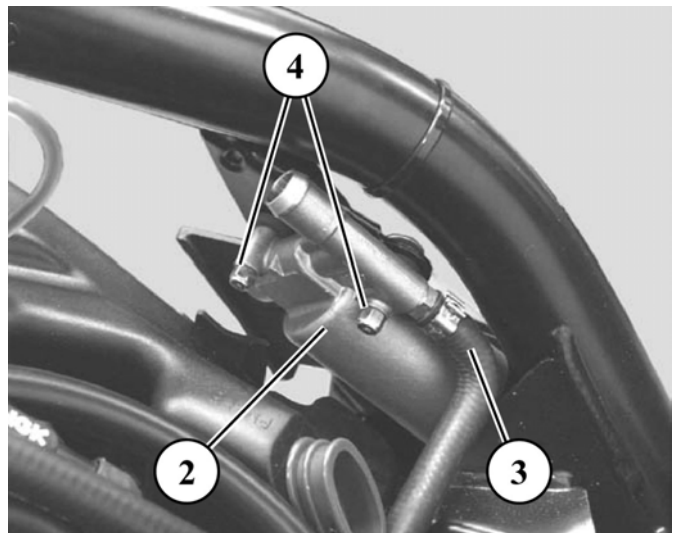
- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Remove the grab handle
- Remove the mud-flap
- Remove the rear panel assembly
- Clamp the fuel inlet hose (1) with hose clamp P/N 755996
- Disconnect the fuel inlet pipe (1) from the fuel pump (2)



- Carry out the procedure used to lower the pressure in the fuel system (see instruction 1)
- Disconnect the fuel inlet pipe (3) from the fuel pump (2)
- Remove the fuel pump 2 fixing bolts (4)
- Remove the fuel pump
- Disconnect the fuel pump

Re-assembly: Proceed in reverse order to disassembly and bleed the fuel system (see instruction 2)

(if changed, these clips must not be replaced by screw-type clips)

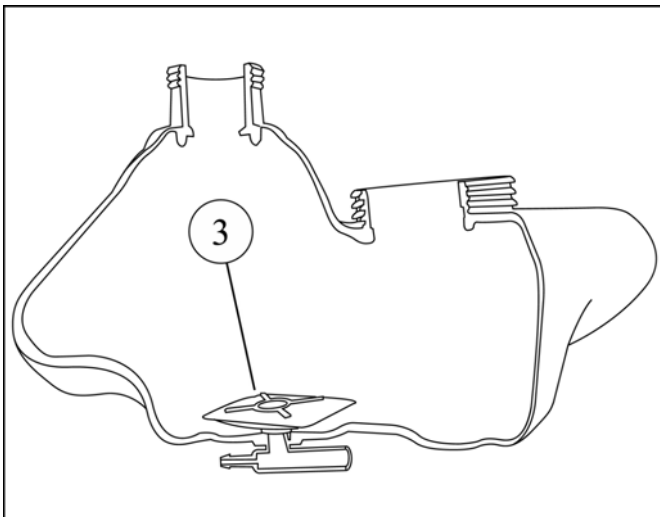
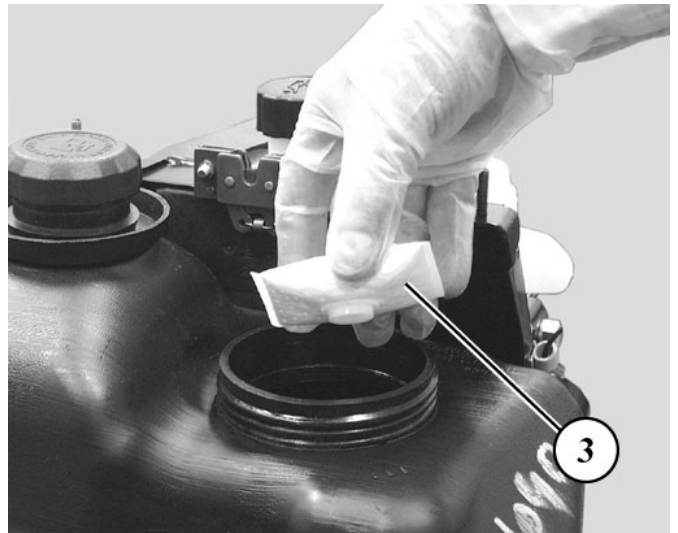
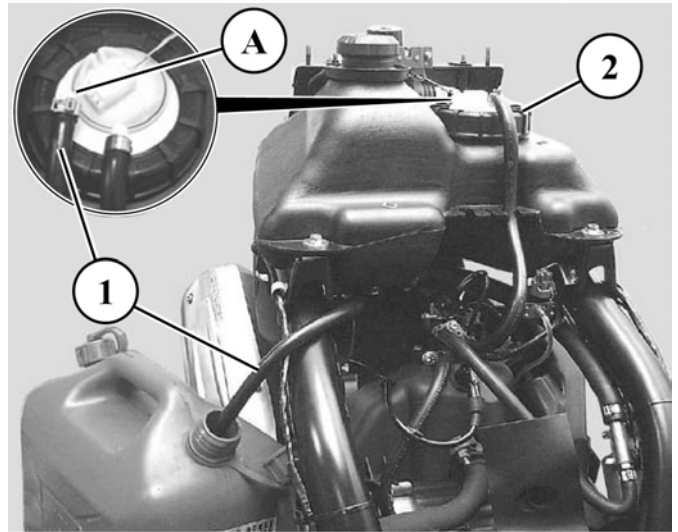


Check: Using the diagnostic tool, check for fault codes, clear them if necessary

SPECIAL WORK AND PROCEDURES

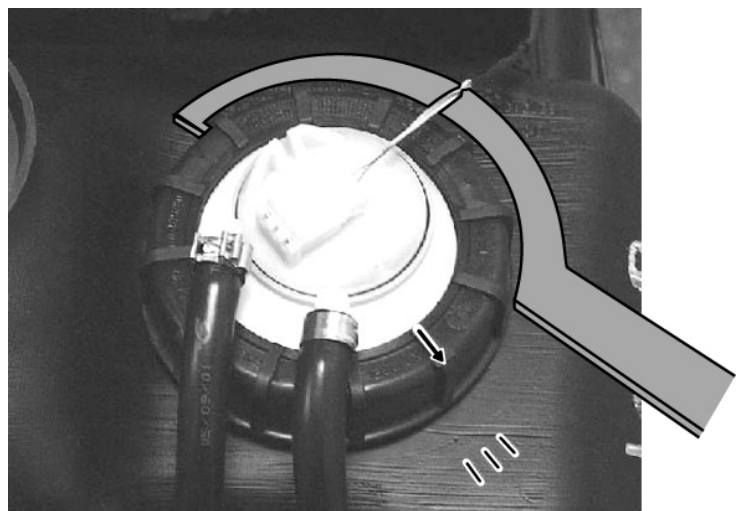
To remove the strainer

- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Empty the fuel tank proceeding as follows:
 - Disconnect the vent (A) pipe (1) from the gauge (2) and put into a container in order to drain out the fuel
 - Reconnect the pipe (1) once the tank is empty
 - Disconnect the fuel gauge
 - Unscrew and remove the fuel gauge (2) with its seal using tool P/N 756056
- Remove the strainer (3) by passing one hand inside the gauge well, wearing a protective glove
- Clean or change the strainer in accordance with the service instructions



Re-assembly: Re-assemble in the reverse order to dismantling

- Tighten the fuel gauge with the ring spanner P/N 756056 in order to line up the arrow with the centring mark on the tank



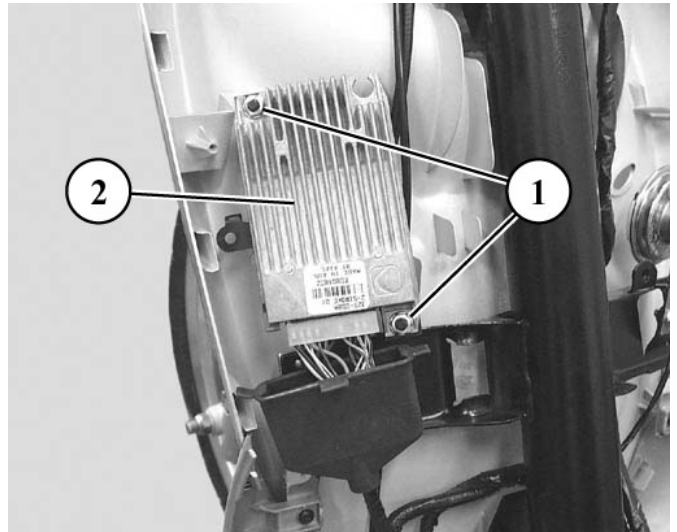
SPECIAL WORK AND PROCEDURES

To remove the ECU

- Remove the ignition key
- Remove the instrument cluster upper fairing
- Remove the rear leg shield panel
- Remove the ECU 2 fixing bolts (1)
- Disconnect the ECU
- Remove the ECU

Re-assembly: Re-assemble in the reverse order to dismantling

Note: If the ECU is changed, the diagnostic tool must be used to initialise the throttle unit (see documentation Use of the Diagnostic Tool for the Injection Engine)

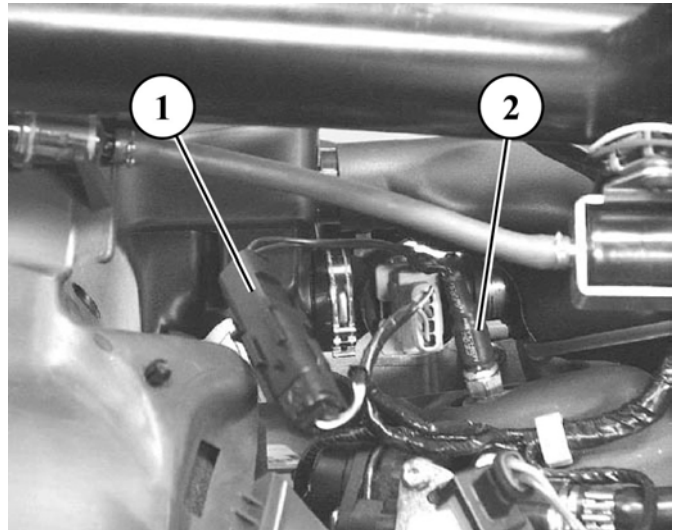


To remove the temperature sensor

- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Raise the fuel tank in order to withdraw the injection manifold soundproofing.
- Disconnect temperature sensor (connector 1)
- Remove the temperature sensor (2)

Re-assembly: Re-assemble in the reverse order to dismantling

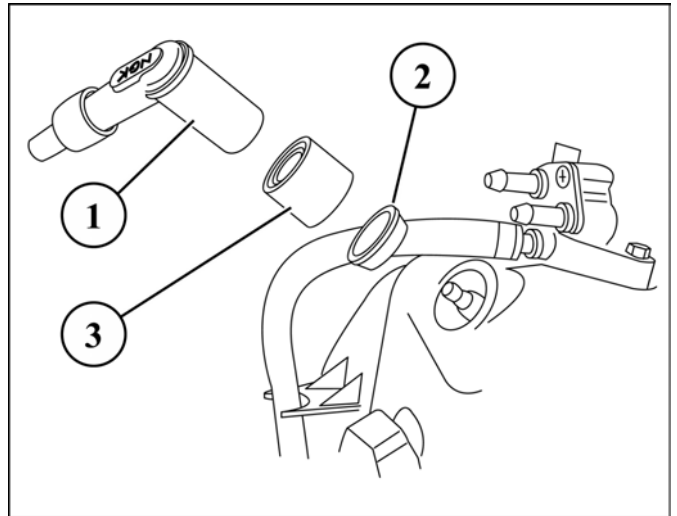
Check: Connect the diagnostic tool and check there are no fault codes, erase them if necessary



SPECIAL WORK AND PROCEDURES

To remove the HT coil

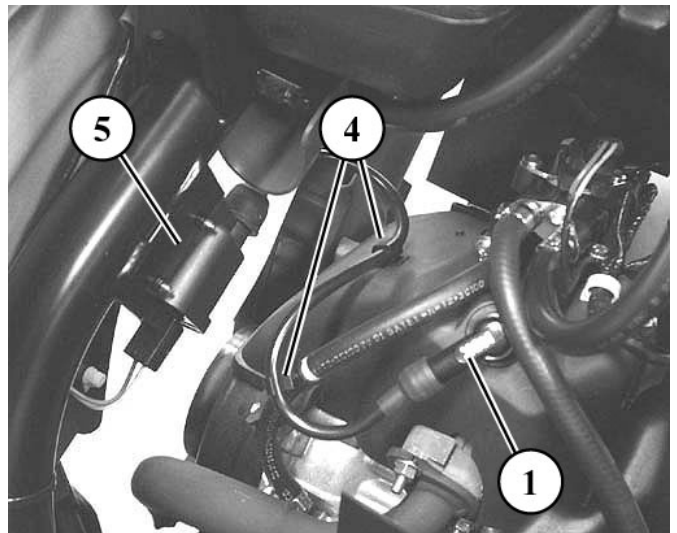
- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Disconnect the suppressor (1)
- Remove the rubber washer (2) and the suppressor rubber cap (3)



- Remove the spark plug lead from the 2 plastic clips (4)
- Remove the high tension coil 2 bolts from the right-hand side of the machine
- Disconnect the high tension coil
- Remove the coil (5)

Re-assembly: Re-assemble in the reverse order to dismantling

Check: Connect the diagnostic tool and check there are no fault codes, erase them if necessary



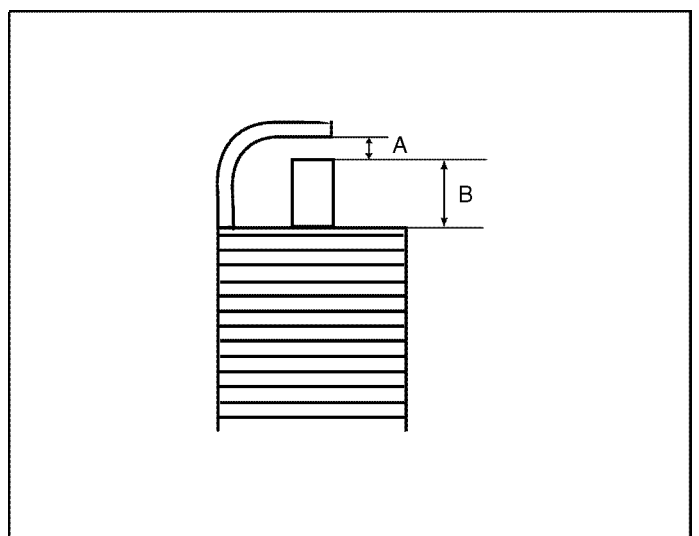
Setting the spark plug electrode gap

The spark plug electrode gap setting is between 0.5 and 0.6 mm

Spark plug protrusion check

$$B = 3,5^{+0,4} \text{ mm}$$

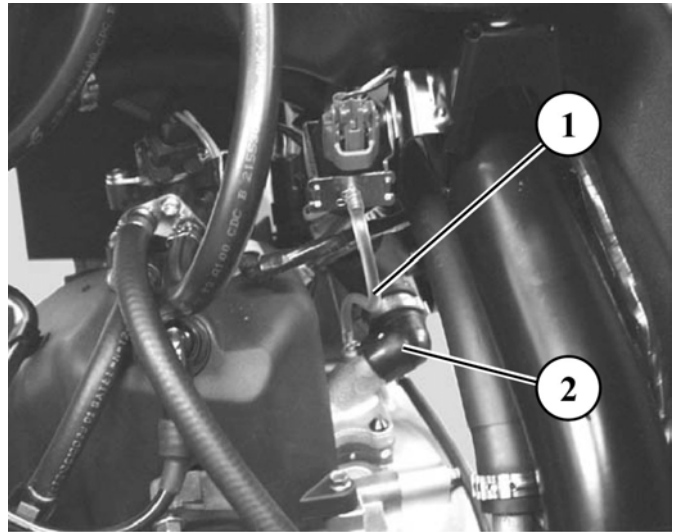
The position of the spark plug electrode in the combustion chamber is important therefore it is essential that the spark plug setting is correct. If one of these values cannot be obtained, the plug must be changed



SPECIAL WORK AND PROCEDURES

To remove the oil pump

- Remove the ignition key after unlocking the saddle
- Remove the saddle/locker assembly
- Remove the air intake
- Disconnect the oil delivery pipe (1) from the inlet manifold (2)



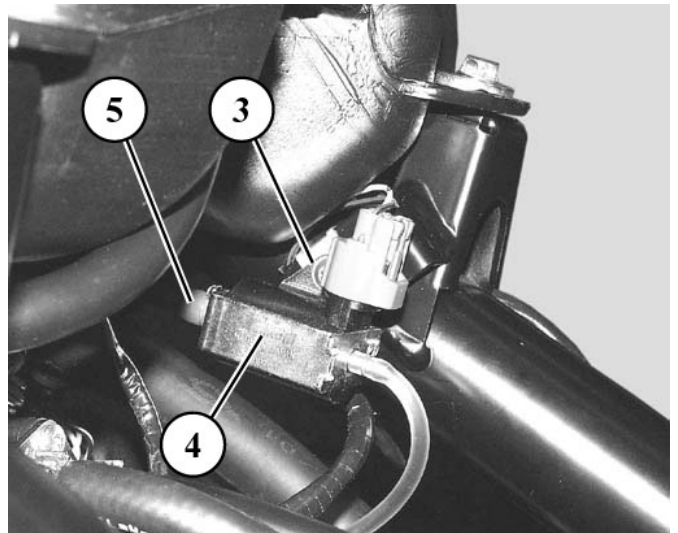
- Disconnect the oil pump
- Remove the pump (4) fixing bolts (3)
- Disconnect the oil inlet pipe (5) from the pump
- Remove the oil pump

Imperative: never operate the oil pump without oil

Re-assembly: Re-assemble in the reverse order to dismantling

Imperative: Bleed the oil pump using the diagnostic tool (see documentation Use of the Diagnostic Tool for the Injection Engine)

Check: Connect the diagnostic tool and check there are no fault codes, erase them if necessary





PARAMETER MEASUREMENT SHEET

SALES DIVISION
NETWORK TECHNICAL INFORMATION

Parameter reading

| | |
|---------------------------|--|
| MACHINE DATA | |
| VIN | |
| Mileage/Kilometres | |
| ECU N° | |
| Software | |
| Calibration | |

Fault codes found during check:

| | |
|--|--|
| | |
| | |
| | |
| | |

| PARAMETER | Meas. 1 engine stopped | Meas. 2 idling | Standard values Cold | Meas. 1 engine stopped | Meas. 2 idling | Standard values Hot |
|-------------------------|------------------------------|-------------------|-------------------------|------------------------------|-------------------|------------------------|
| Engine speed | | | 1800 to 10000 rpm | | | 1600 to 10000 rpm |
| Battery voltage | | | 13.8 to 15 volts | | | 13.8 to 15 volts |
| Throttle valve position | | | 0 to 100% | | | 0 to 100% |
| Potentiometer track 1 | | | 0.5 to 4.5 volts | | | 0.5 to 4.5 volts |
| Potentiometer track 2 | | | 4.5 to 0.5 volts | | | 4.5 to 0.5 volts |
| Engine temperature | | | -10 to +40°c | | | +40 to +200°c |
| Petrol injection time | | | 0 to 20 ms | | | 0 to 10 ms |
| Air injection time | | | 0 to 20 ms | | | 0 to 10 ms |
| Ignition advance | | | 0 to 50 ° | | | 0 to 50 ° |
| Sensor power supply | | | 4.95 to 5.05 volts | | | 4.95 to 5.05 volts |
| Temperature sensor | | | 3 to 4.20 volts | | | 4.10 to 5 volts |
| Petrol pump | | | On | | | On |
| Oil pump | | | On | | | On |
| Immobiliser | | | Unlock | | | Unlock |
| ECU locking | | | Unlock | | | Unlock |

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RECOMMENDS



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