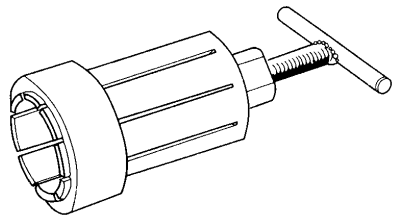
WORKSHOP MANUAL

GP 1
GP SERIES
ATLANTIS

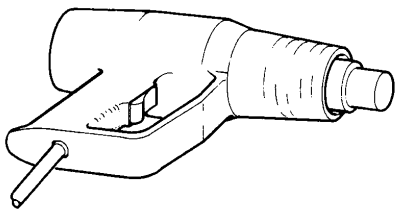
* 50 C.C. ENGINE PIAGGIO

3

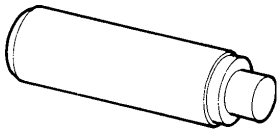
SPECIAL TOOLS



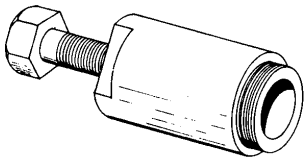
1



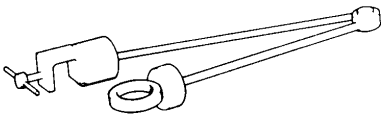
2



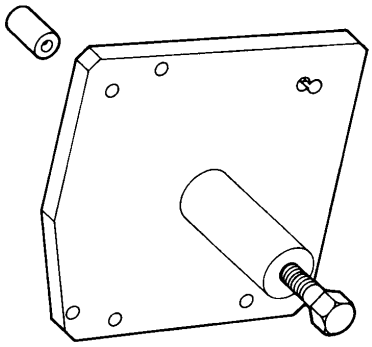
3



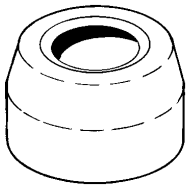
4



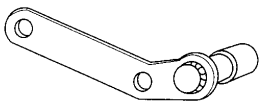
5



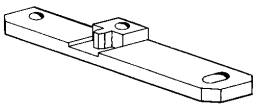
6



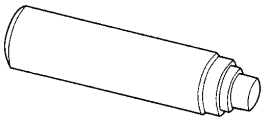
7



8



9

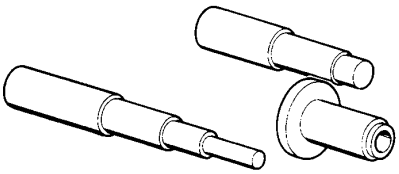


10

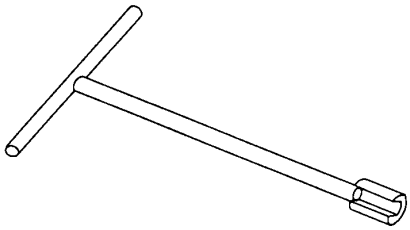
Description **Reference**

1 - Bearing extractor **004499Y**
2 - Heat gun **020151Y**
3 - Needle bearing punch **020080Y**
4 - Magneto extractor **020162Y**
5 - Heat gun holder **020150Y**
6 - Crankcase separator **020163Y**
7 - Semi-pulley assembly sleeve **020164Y**
8 - Water-pump impeller retaining tool **020167Y**
9 - Starter crown wheel retaining tool **020165Y**
10 - Crankcase-half water-seal assembly punch **020168Y**

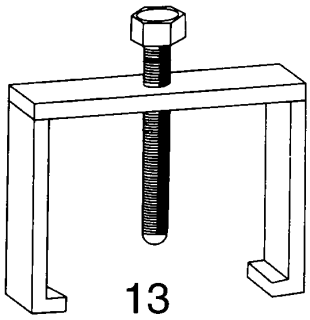
SPECIAL TOOLS



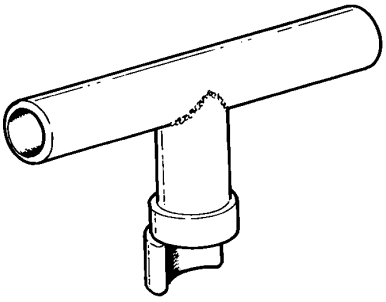
11



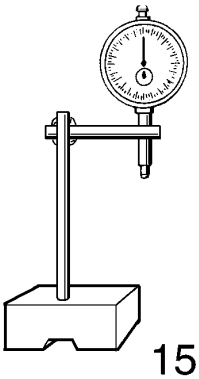
12



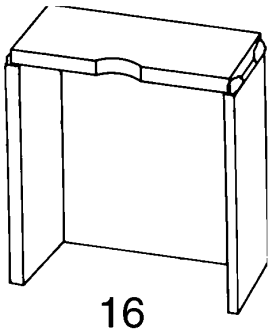
13



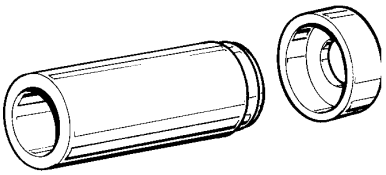
14



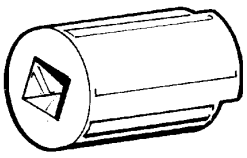
15



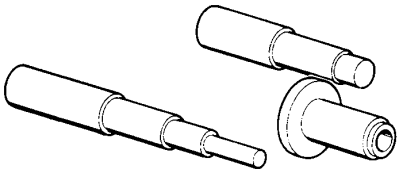
16



17



18

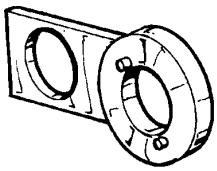


19

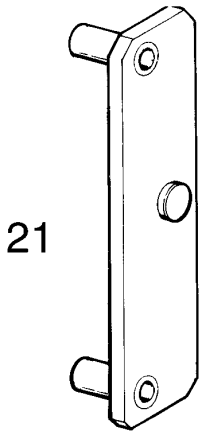
Description **Reference**

11 - Spring clip assembly tool **020166Y**
12 - Water-pump drive shaft (dis)assembly wrench **020169Y**
13 - Mixer drive gear extractor tool **020361Y**
14 - Starter spring assembly tool **020261Y**
15 - Comparator and holder **020335Y**
16 - Crankshaft support **020163Y**
17 - Crankshaft seal punch **020340Y**
18 - Valve separation tool **020341Y**
19 - Piston ring assembly tool **020344Y**

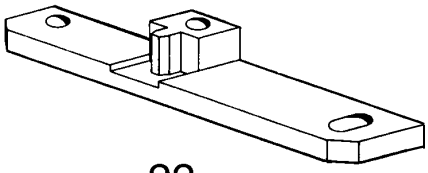
SPECIAL TOOLS



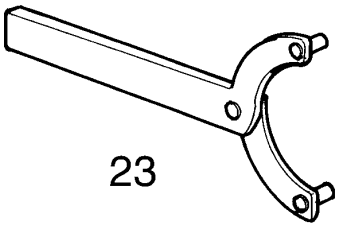
20



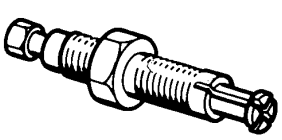
21

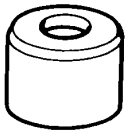


22

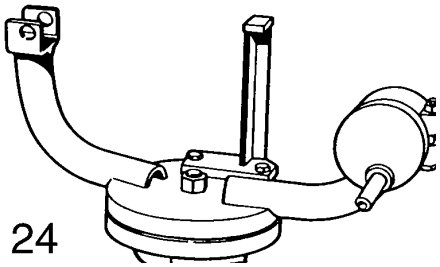


23





25



24

Description	Reference
20 - Compressor crankshaft pulley retaining tool	**020342Y**
21 - Magneto retaining tool	**020346Y**
22 - Starter crown wheel retainer	**020343Y**
23 - Crown wheel retainer	**020565Y**
24 - Engine support	**005095Y**
25 - Extractor tool	**001467Y**

REGULAR MAINTENANCE CHART

GP1 - GP Series O2 - ATLANTIS

Period: this period can be calculated by kilometres run or by time in months								
	Km	1000	2500	5000	10000	15000	20000	25000
	Months	2	6	12	24	36		
Reduction gear or crankcase oil		Replace	Check	Check	Replace	Check	Replace	Check
Check cylinder air							Clean	
Suspensions				Check	Check	Check	Check	Check
Tighten fastenings		Check	Check	Check	Check	Check	Check	Check
Electrical Connections		Check	Check	Check	Check	Check	Check	Check
Spark plug		Clean	Adjust	Replace	Replace	Replace	Replace	Replace
Battery			Check	Check	Check	Check	Check	Check
Carburettor		Adjust / Clean	Adjust / Clean	Adjust / Clean	Adjust / Clean	Adjust / Clean	Adjust / Clean	Adjust / Clean
Oil pump / Fuel valve Variable speed rollers /		Adjust	Adjust	Adjust	Adjust	Adjust	Adjust	Adjust
Transmission belt						Check Replace		
Oil Filter				Check	Replace	Check	Replace	Check
Air Filter				Clean	Clean	Clean	Clean	Clean
Secondary Air Filter				Clean	Clean	Clean	Clean	Clean
Brakes / Pads				Check	Check	Check	Check	Check
Brake equipment					Check		Check	
Brake fluid		EVERY 2 YEARS					EVERY 2 YEARS	
Tyres				Check	Check	Check	Check	Check
Tyre pressures		Check	Check	Check	Check	Check	Check	Check
Fuel or oil hoses		Check			Replace	Check	Replace	Check
Transmission				Lubricate	Lubricate	Lubricate	Lubricate	Lubricate
Starter gears to pedal				Clean and grease	Clean and grease	Clean and grease	Clean and grease	Clean and grease

TORQUE SETTINGS

DESCRIPTION			TORQUE SETTING Nw x m	
CALIPER ROTATION SHAFT	8M125		17 - 19	LOCTITE
CYLINDER STUD	6M100	STUD	10 - 12	
CRANKCASE HALVES JOINT	6M100	SCREW	12 - 13	
CYLINDER HEAD	6M100	NUT	10 - 11	
INLET MANIFOLD VALVE SUPPORT		SCREW	1 - 2	LOCTITE
CRANKCASE INLET MANIFOLD		SCREW	9 - 10	LOCTITE
OIL PUMP	5M80	SCREW	3 - 4	
COIL TO BASE PLATE		SCREW	8 - 10	
BASE PLATE TO CRANKCASE		SCREW	8 - 10	
MAGNETO		NUT	40 - 44	LOCTITE
PICK-UP SCREW		SCREW	4 - 5	
STARTER MOTOR	6M100	SCREW	12 - 13	
FAN TO MAGNETO		SCREW	3 - 4	
LEFT-HAND CRANKCASE HALF		NUT	40 - 44	
REDUCTION GEAR COVER	6M100	SCREW	12 - 13	
PULLEY SHAFT		NUT	40 - 44	LOCTITE
CLUTCH		NUT	50 - 60	
PLASTIC OIL FILLER CAP		CAP	3 - 5	
LEFT-HAND CRANKCASE COVER	6M100	SCREW	12 - 13	
OIL DRAIN PLUG	8M125	SCREW	17 - 19	
CYLINDER SLEEVE COVER	6M100	SCREW	4 - 5	
FRONT WHEEL	12M150	NUT	35 - 50	
REAR RIM SECURING NUT		NUT	17 - 19	
HUB TO REAR WHEEL AXLE	16M150	NUT	115 - 125	
ENGINE SUPPORT TO FRAME	10M150	NUT	30 - 40	
SHOCK ABSORBER UP/ DOWN	10M150	NUT	30 - 40	
HANDLEBAR	8M125	SCREW	15 - 19	
EXHAUST PIPE TO CYLINDER	6M100	SCREW	9 - 12	
EXHAUST PIPE TO CRANKCASE	10M150	SCREW	15 - 19	
FORK LEG SECURING NUT	6M100	NUT	8 - 10	
STEERING	25M100	NUT	90 - 130	
FRONT BRAKE CALIPER	8M125	SCREW	17 - 19	
BRAKE CALIPER TO CRANKCASE	8M125	SCREW	17 - 19	
STARTER PEDAL	6M100	SCREW	8 - 12	
SILENCER PROTECTOR	4M70	SCREW	1 - 2	LOCTITE
HANDLEBAR COUNTERWEIGHT		SCREW	4 - 5	LOCTITE
ENGINE TO SUPPORT	10M150	SCREW	30 - 40	
BRAKE DISC FRONT / REAR	8M125	SCREW	17 - 19	LOCTITE
CENTRE STAND TO CRANKCASE		SCREW	17 - 19	

PAIOLI FRONT FORKS

FOR PROPER MAINTENANCE AND REPAIR OF THE PAIOLI FORKS, IT IS RECOMMENDED THAT THEY SHOULD BE REMOVED FROM THE FRAME.

TO REMOVE THE FORKS FROM THE FRAME:

- Remove the fairing.
- Loosen off the screws in the upper casing.
- Disconnect the connections in the instrument panel, Speedometer sleeve, instrument connectors, grip lighting switch connectors, stop light, indicators, and cut the rear brake clip,
- Remove upper casing.
- Remove the shield backing plate.
- Loosen and remove the 2 handlebar screws.
- Loosen the front forks nut.
- Loosen and remove the 4 mudguard screws.
- Loosen the wheel shaft nut, remove the washer,
- Loosen the 2 front brake caliper screws.
- Loosen the locking screw, remove the wheel shaft, the wheel spacer, and leave the speedometer cable hanging free.
- Remove the forks.

STRIPPING THE LEFT / RIGHT FORK LEG

Suspension stroke ..... 80 mm.
Diameter of fork bars.....32 mm.
Oil capacity in each bar .....100 C.C.
Type of oil .....Agip FORK
SAE 7,5 W

REAR SUSPENSION:

GP 1 - GP SERIES

Hydraulic shock absorber

Length of shock absorber.....297 mm.
Shock absorber stroke .....64 mm.
Length of spring.....235 mm.
Spring compression at 36 mm.....127 kg.m
Spring compression at 64 mm.....254 kg.m
Stud .....10 mm.

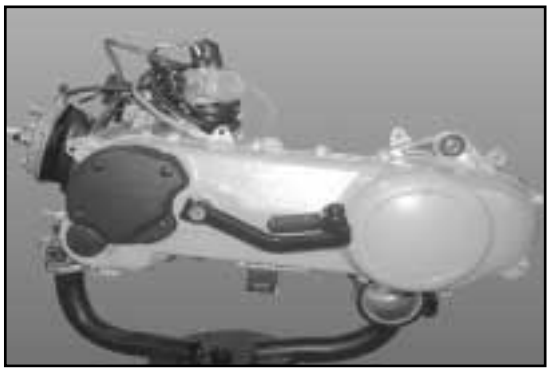
ENGINE

- Place the complete engine on the special stand.

Warning !!! take extreme care when working with petrol

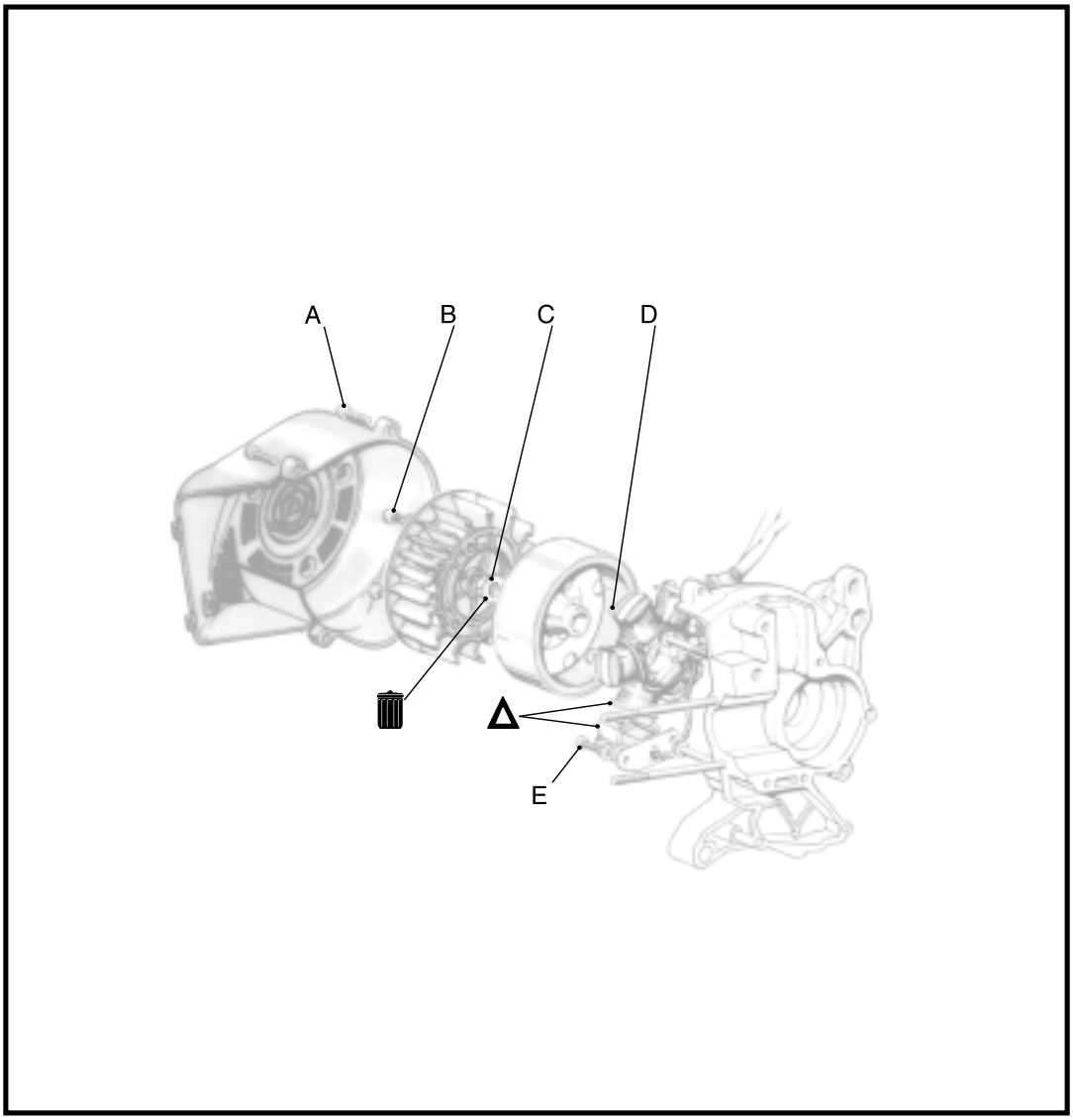
Caution! when installing the battery, connect the positive cable first, and then the negative cable.

Caution! The use of protective glasses is recommended when using percussion tools.



Tool: 19.1.25095

MAGNETO



LUBRICATE

APPLY THE PRODUCT

CAUTION HANDLE WITH CARE

GREASE

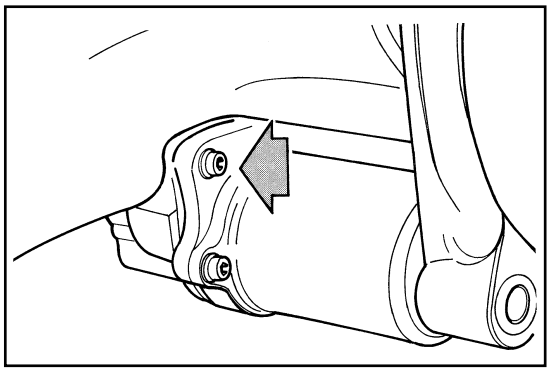
CLEAN WITH CARE

ALWAYS REPLACE

SYMBOL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
QUANTITY	4	3	1	3	2										
TORQUE N.M.	1÷2	3÷4	40÷44	3÷4	3÷4										

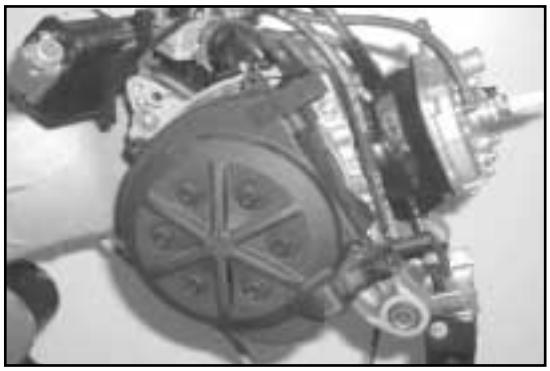
Starter motor

- The securing nuts are the one indicated in the drawing and the one diametrically opposite.



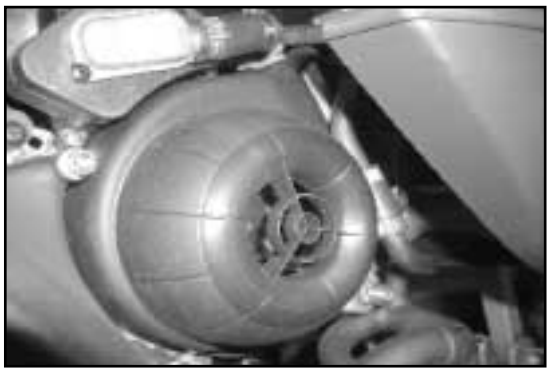
Flying cover

- Remove the four screws covers steering wheel.
- Models cooled by liquid.



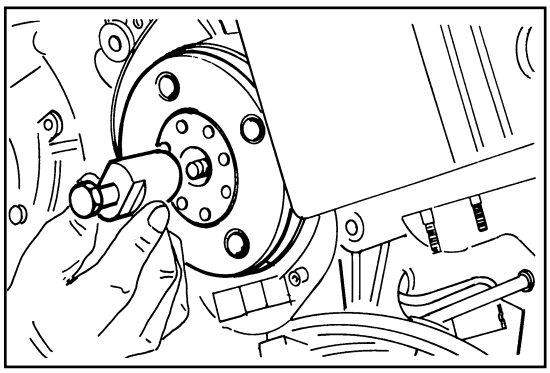
Fan Cover

- Remove the four screws and disengage the two lugs inserted in the cylinder cooling jacket.
- If the vehicle is used for off-road duty, it is advisable to remove the outer part of the cover and clean the silencer element with compressed air and/or water.



Magneto

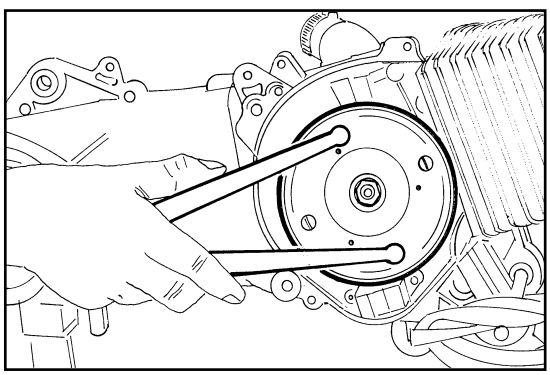
Extractor: 19.1.20162



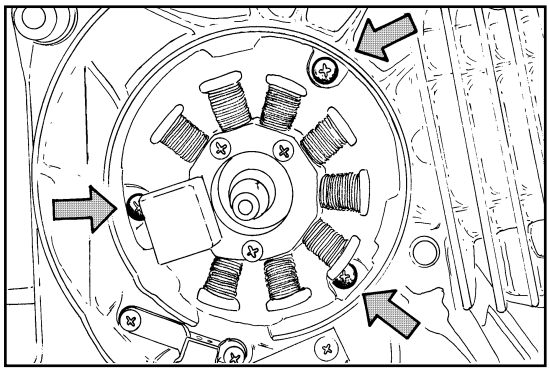
Magneto securing nut

- During this operation, secure the magneto using the special tool for this purpose.

Special tool: 19.1.20565



Stator pick-up



N.B. Assemble the parts by following the stripping procedure in reverse.

- Use a new nut to ensure proper adjustment.

N.B. It is good practice after assembling the magneto to protect the extractor tool screw with Agip GR MU 3 grease.

Magneto nut torque setting 40 ± 4 N x m.

ELECTRONIC IGNITION

All operations to check the wiring which involve disconnecting cables (checking connections and devices which form part of the ignition circuit) must **be performed with the engine switched off:** otherwise the central unit may suffer irreparable damage.

These checks should be performed if the ignition is irregular, or if there is no spark at the spark plug.

1) Check the spark plug (clean with wire brush, remove soot, blow clean with compressed air, if necessary replace).
2) Without stripping the stator, perform the following check:

After visual examination of the electrical connections, measure the characteristics of the coil and the pick-up (see table).

If any anomalies appear when checking the coil and the pick-up, replace the stator and the damaged parts.

Remember that in order to replace the central unit, cables must only be disconnected with the engine switched off.

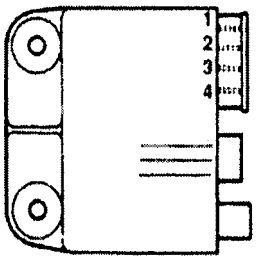


Fig. 1

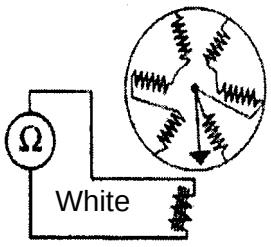


Fig. 2

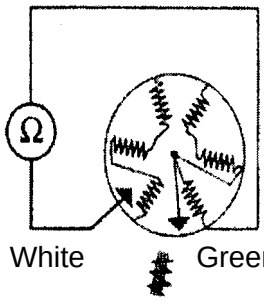


Fig. 3

CHECKING THE PICK-UP (Fig. 2)

Instrument connected between:	Value (Ω)
1) Red and White Cables	90 ± 140 Ω

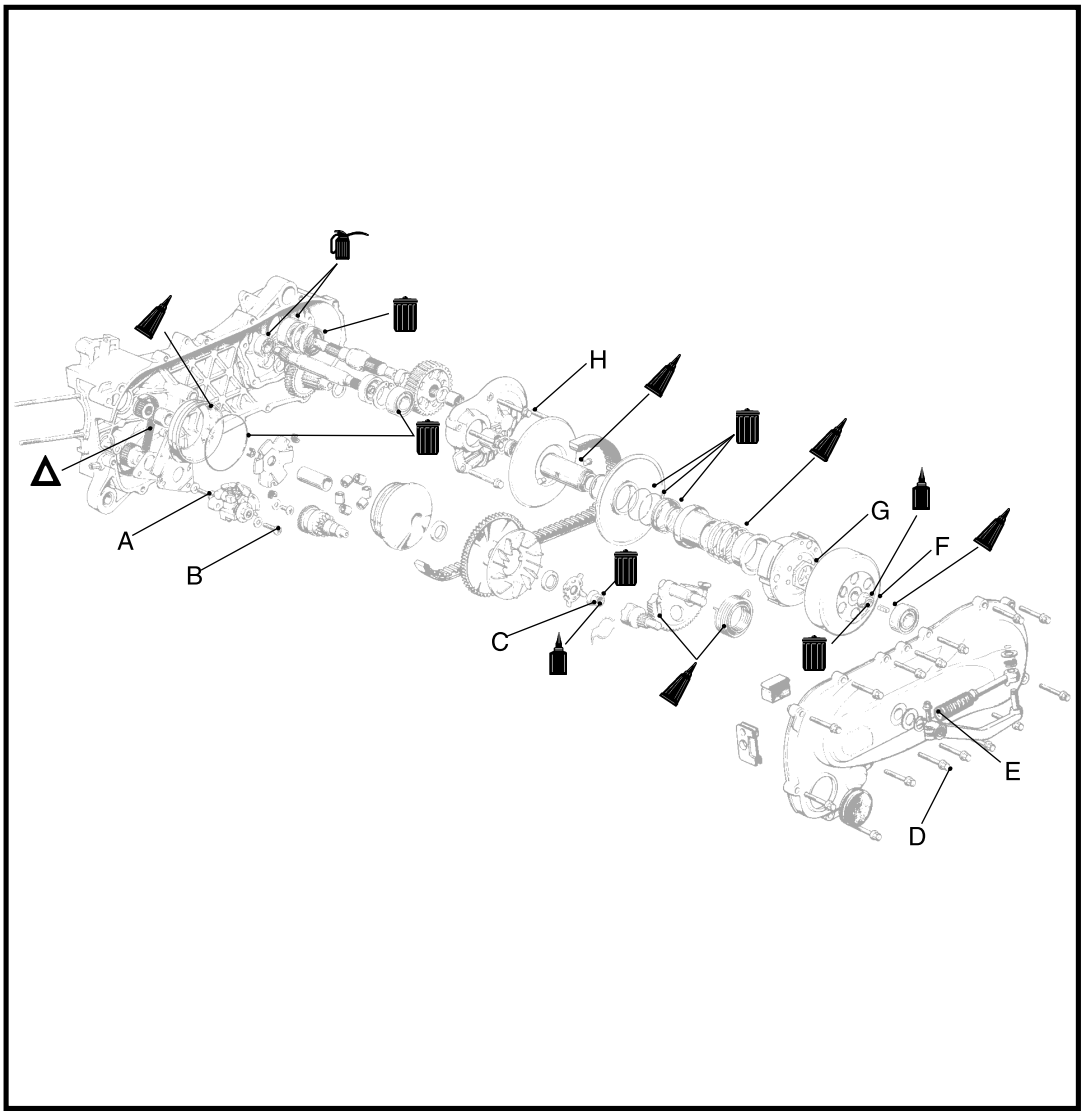
CHECKING THE Coil (Fig. 3)

Instrument connected between:	Value (Ω)
1) White and Green Cables	800 ± 1100 Ω

CHECKING for Continuity

Instrument connected between:	Value (Ω)
1) White Cable and Frame	Continuity
2) White Cable and Engine	Continuity

TRANSMISSION - MIXER



LUBRICATE

APPLY THE PRODUCT

CAUTION HANDLE WITH CARE

GREASE

CLEAN WITH CARE

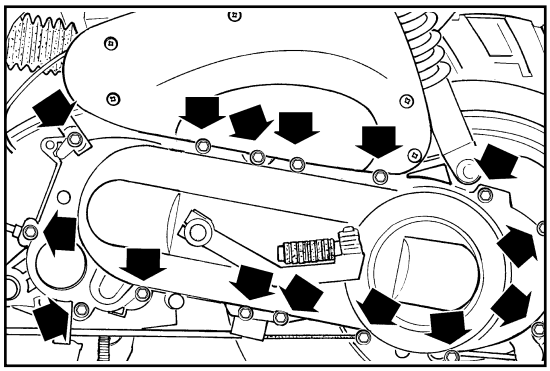
ALWAYS REPLACE

SYMBOL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
QUANTITY	1	2	1	15	1	1	1	5							
TORQUE N.M.	3÷4	3÷4	40÷44	12÷13	12÷13	40÷44	50÷60	12÷13							

Transmission Cover

- Unscrew the 15 screws, and remove the transmission cover using a raw-hide hammer.

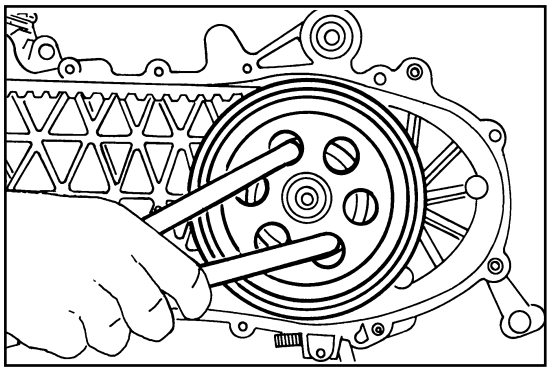
N.B. the crankcase remains lightly secured by the driven semi-pulley shaft in the bushing fitted into the crankcase itself.



Follower Pulley

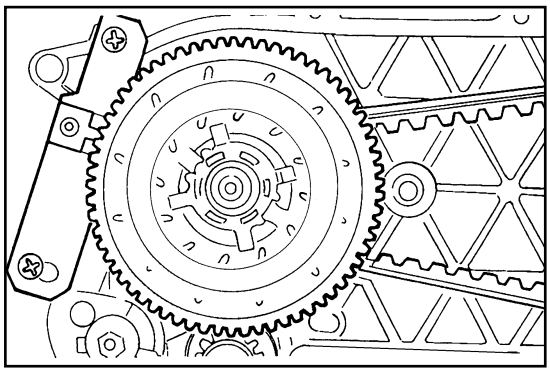
- Remove the nut.
- Withdraw the complete unit.

Special tool: 19.1.20165



Starter gearing – Drive pulley

Special tool: 19.1.20165



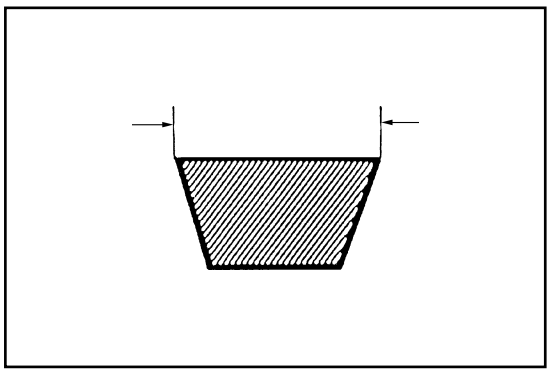
Controls

Drive belt

- Verify that the drive belt is not deteriorated
- Control the width of the drive belt

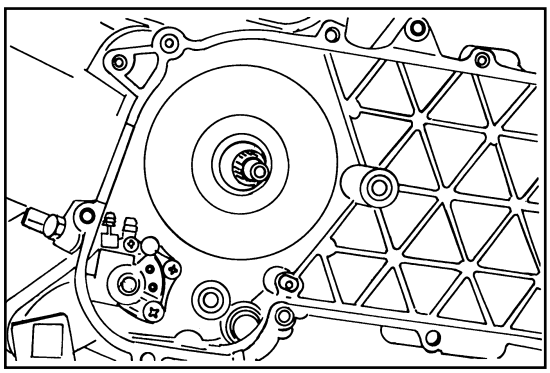
Minimum permissible 17,5 mm.

N.B. to control the drive belt and the container of rollers each 20,000 km



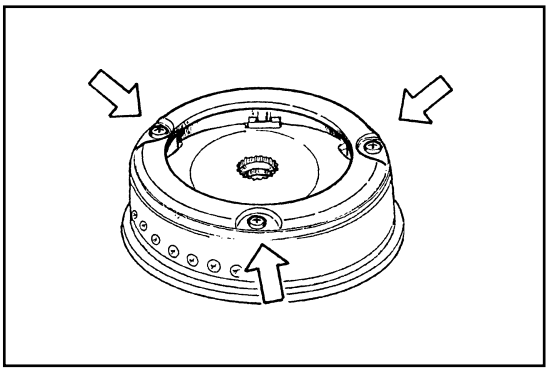
Belt - Starter cable - Variable speed unit

Mixer



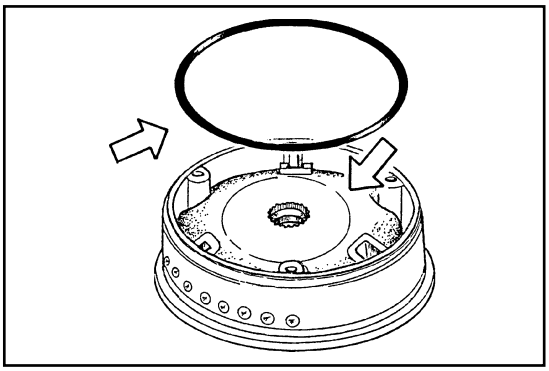
Movil semi pulley

- Remove the three screws and the cover.



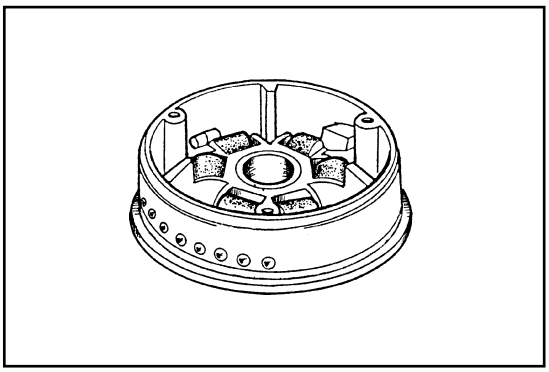
Variable speed plate

- Remove the O-ring and the variable speed plate.



Rollers

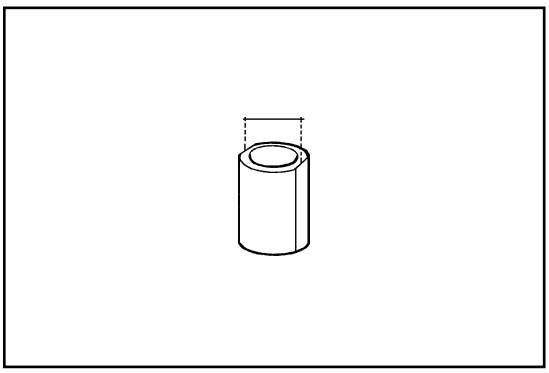
- Withdraw the rollers. Lift out the rollers, marking them with a felt pen to ensure correct re-assembly.



Rollers

- Check that the rollers are not damaged or worn.

Limit of wear 18.5 mm minimum diameter.

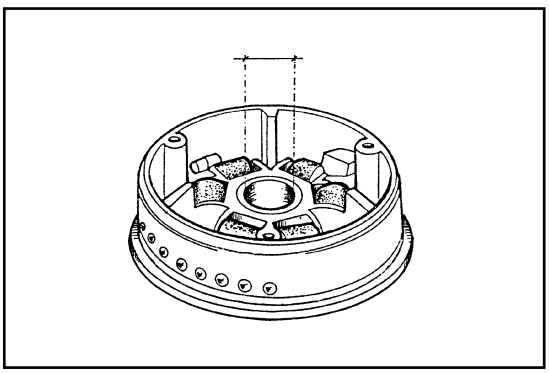


Transmission - mixer variable speed unit

- Check that the interior bushing shows no sign of unusual wear and measure the interior diameter.

Maximum permitted diameter 20.12 mm max.

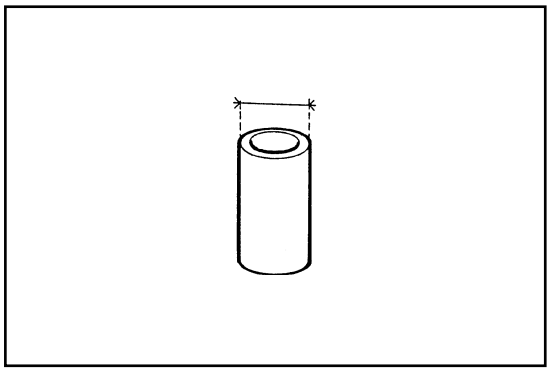
N.B. Do not lubricate or clean the anti-friction bushing.



Pulley displacement bush

- Measure the external diameter of the sliding pulley bush.

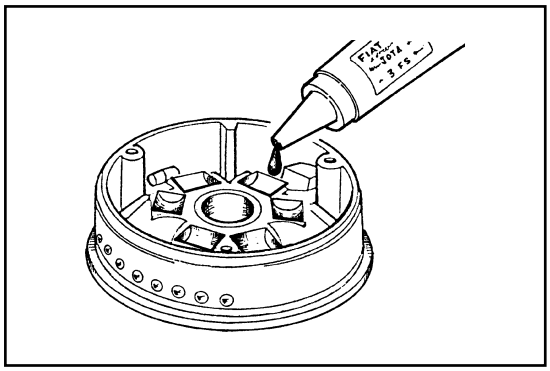
Minimum permissible diameter 19.95 mm



Variable Speed unit roller ramps

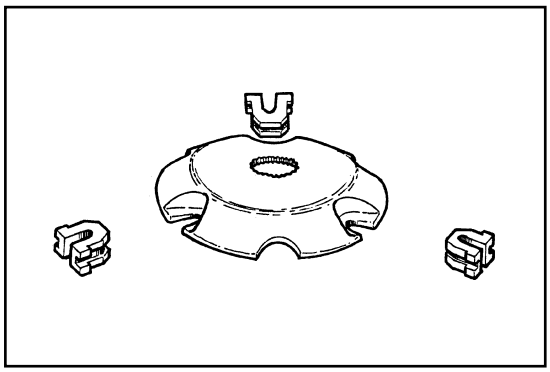
- Grease the working surfaces of the rollers using Agip GR MU 3 grease, and re-assemble the rollers.

N.B. For correct assembly, if the rollers are not being replaced, re-fit them into their original seatings.

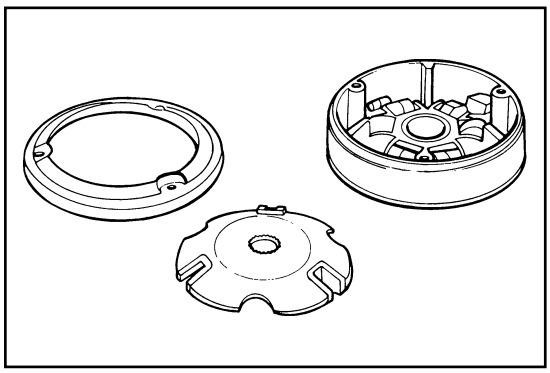


Variador guide

- Assemble the roller cover, the oil plate, and the cover, securing with the three screws.



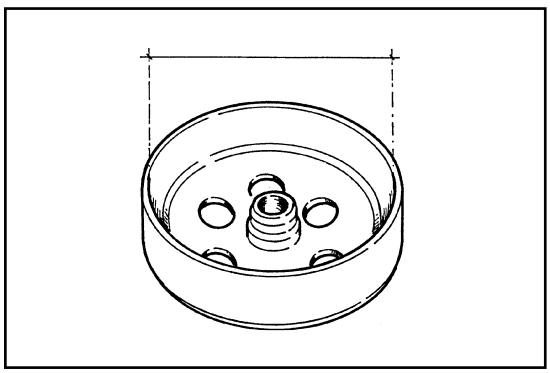
- Assemble the roller backing plate, the oil seal, and the cover, securing with the three screws.



Follower Pulley

- Check that the clutch casing is not worn or damaged.
- Measure the internal diameter of the clutch casing. Maximum diameter value 107.5 mm.

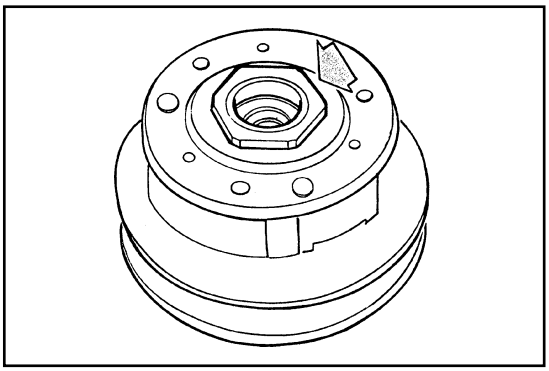
N.B. Mount it on the appropriate shaft and check for eccentricity: maximum value 0.20 mm.



Clutch

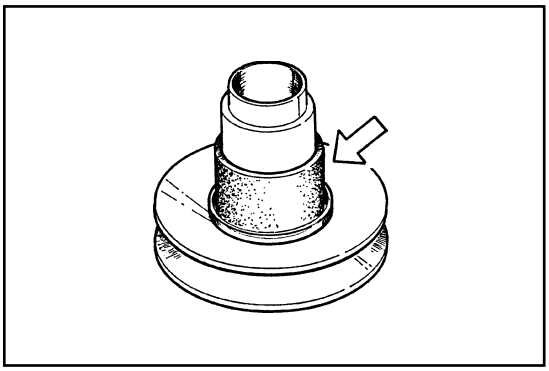
- Remove the central nut while holding the pulley rigid using the special tool.

Caution! During the stripping operation on the clutch unit securing nut, take care to keep the unit itself in its housing; it may be ejected by the force of the clutch spring.
Special tool: 19.1.20565



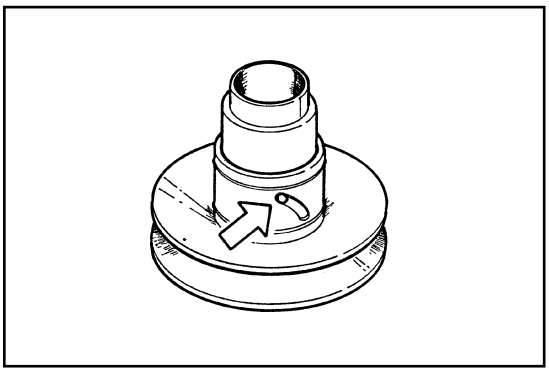
Stud retaining collar

- Withdraw the retaining collar.



Guide roller studs

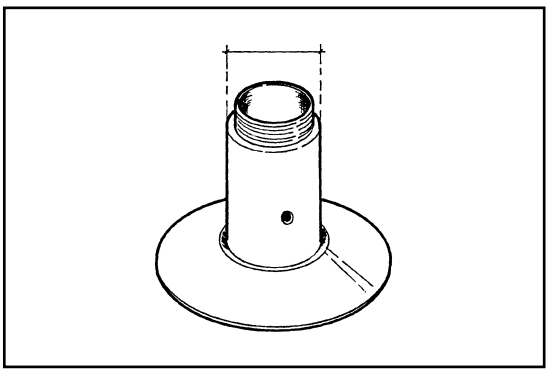
- Extract the guide roller studs, and withdraw the mobile follower semi-pulley from the fixed follower semi-pulley.



Fixed follower semi-pulley

- Measure the external diameter of the pulley bush.

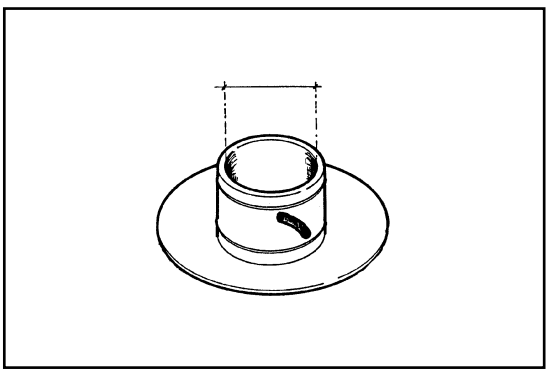
Minimum permissible diameter 33.96 mm.



Mobile follower semi-pulley

- Measure the internal diameter of the moving semi-pulley bush.

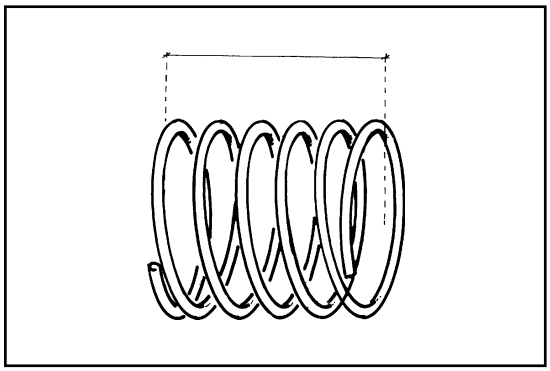
Maximum wear limit 34.08 mm.



Spring

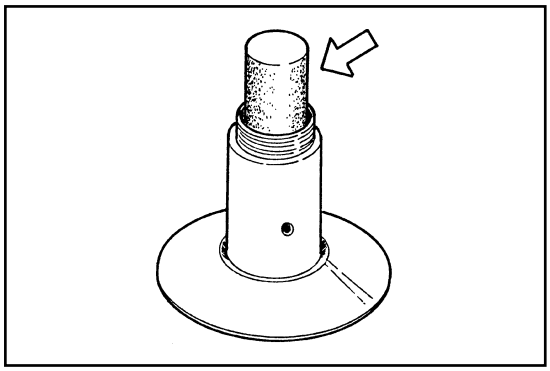
- Measure the length of the moving follower semi-pulley spring.

Minimum permissible length limit 110 mm.



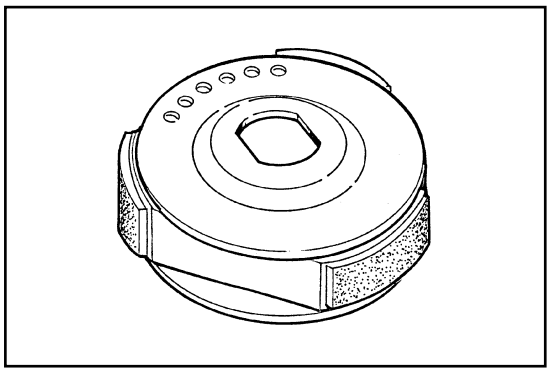
Fixed follower semi-pulley bushing

- Extract the old bushings and insert new replacements, using a piece of tubing of the right diameter as a punch.



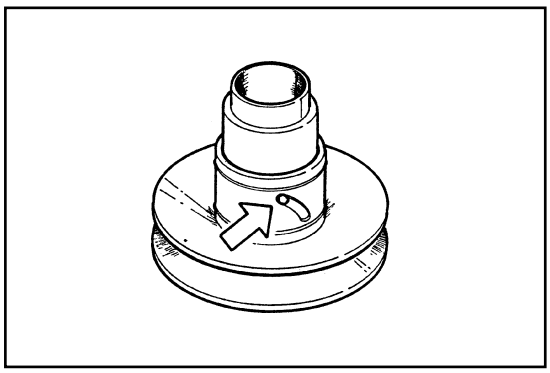
Checking the Clutch

- The clutch assembly should be replaced when the joint is less than 1 mm at its thinnest part.
- This assembly should be replaced as a complete unit, because it is balanced after assembly of the clutch weights.



Re-assembly of the semi-pulley

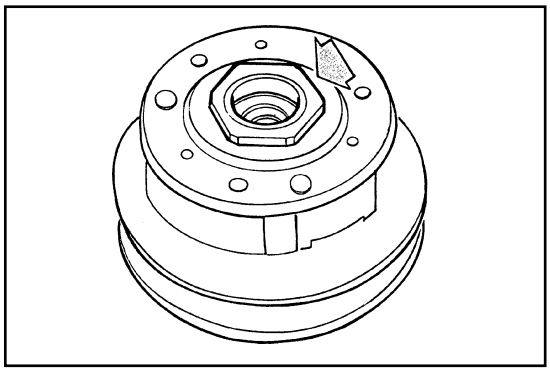
- Insert the mobile semi-pulley into the fixed semi-pulley using the protective sleeve, after replacing the sealing rings and the O-rings, fit the studs with their respective rollers using a small quantity of Agip GR MU 3 grease.
- After completing this operation it is necessary to apply, using a curved point syringe, a sufficient quantity of grease such that when it is injected through one of the holes situated in the interior of the bushing, it squeezes out of the opposite hole.



Special tool: 19.1.20164

Re-assembly of the clutch

- Refit the stud retaining collar, the spring, the clutch assembly, and lock the clutch nut.

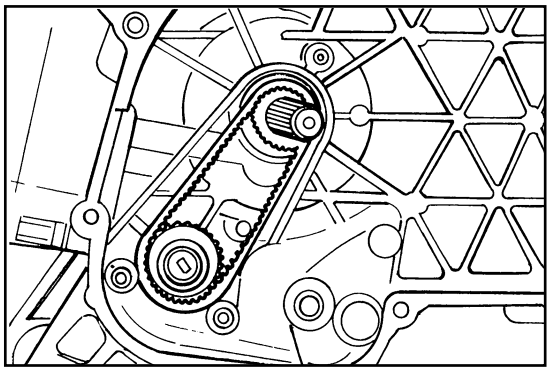


Caution! During the stripping operation on the clutch unit securing nut, take care to keep the unit itself in its housing; it may be ejected by the force of the clutch spring.

Special tool: 19.1.20565

Torque setting: 40 ÷ 44 N x m

Loctite 242 Nut sealing paste

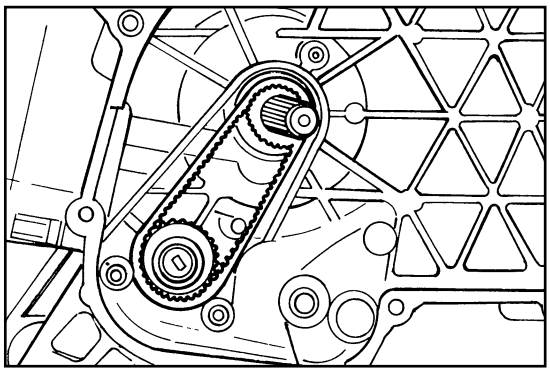


Mixer drive gear and belt

- Withdraw the gear and the belt.

Caution! Do not twist or fold the belt during assembly.

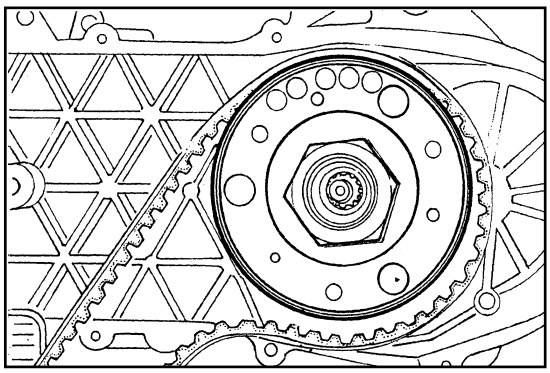
Caution! During assembly, carefully lubricate the mixer drive stud and bush, using only CONSTANT GLY 21000 oil, and make sure that it is free to move.



N.B. Replace the belt every 20,000 kilometres.

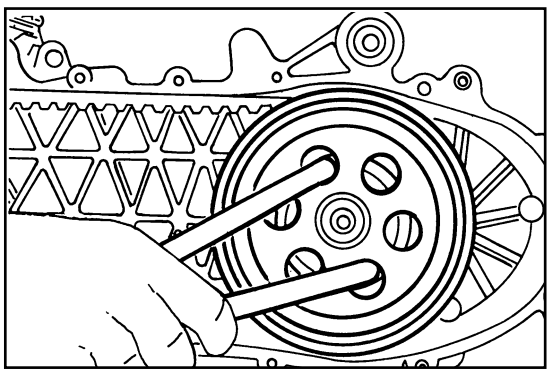
Follower pulley, clutch, belt

- Assemble the follower pulley - clutch - belt assembly.



Clutch hub

- Assemble the clutch hub and tighten the nut while holding the hub itself rigid by means of the special tool.

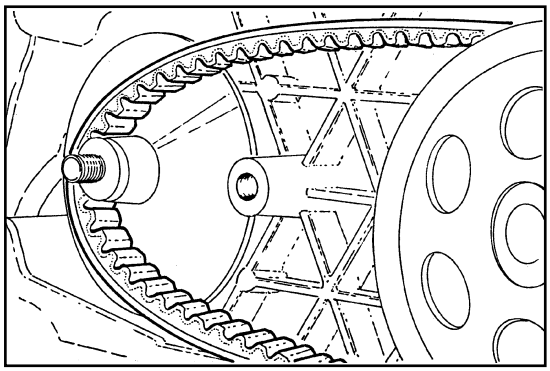


N.B. On assembly, use new nuts and apply Loctite “Super Fast” type 242 E.
Special tool 19.1.20565

Torque setting 40 ÷ 44 N x m

Bushing and mobile semi-pulley

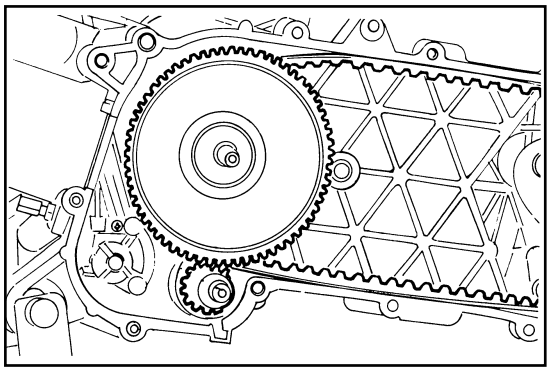
- Fit the assembly while taking care not to damage the transmission belt.
- It is essential to open out the rear pulley in order to fit the belt. It is vitally important when tightening the front pulley assembly to ensure that the belt is free to move inside it, otherwise the semi-pulley may not be tightened correctly.



Mixer - Starter cable - Belt

Fixed semi-pulley

- Handle with care so as to avoid twisting the belt.



Fan - Fan securing disc - Washer - Nut

- Apply recommended thread sealer

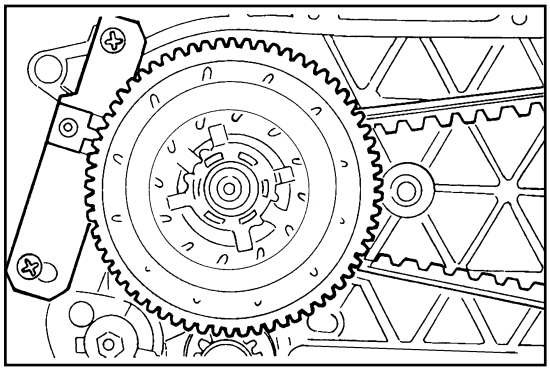
Caution! use only nuts supplied as original spare parts.

N.B. When assembling use new nuts in order to ensure correct engagement.

Torque setting: 40 ÷ 44 N x m

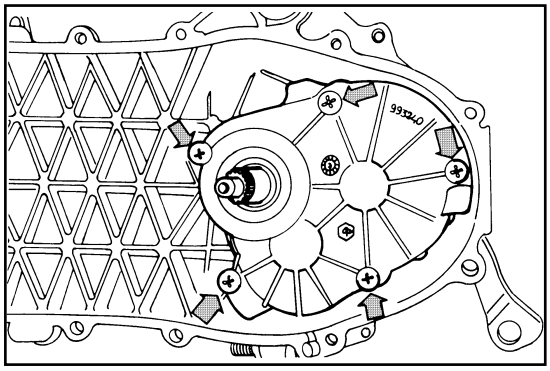
Special tool: 19.1.20165

Loctite 242 E



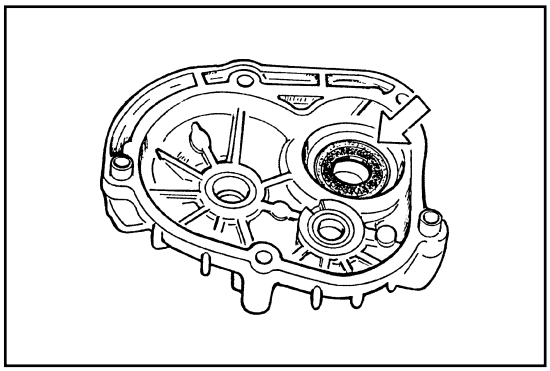
Reduction gear cover

- Before carrying out this operation, drain the oil from the reduction gear by means of the drain plug.



Follower pulley shaft oil seal

- Strip the oil seal.

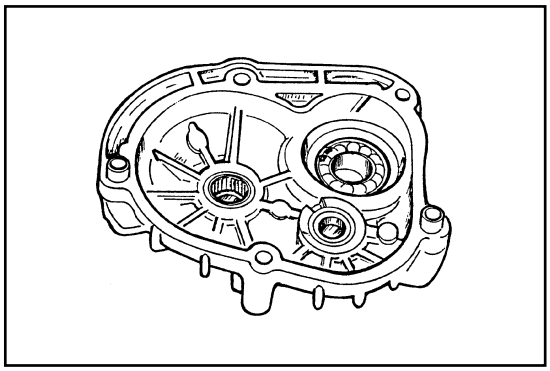


Reduction gear cover bearings

- After removing the Seeger ring, withdraw the bearing.
- When stripping the wheel shaft bearing, use the special tool.

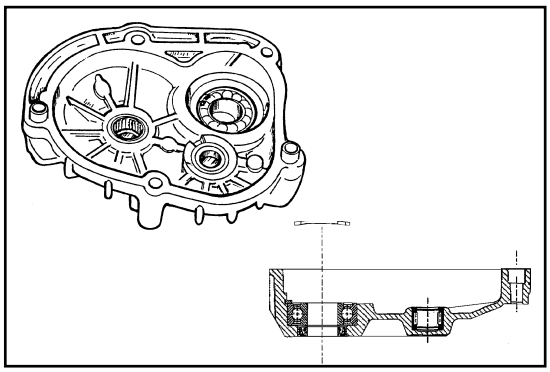
Special tool: 12.1.21467

13/17 for wheel shaft



Reduction gear housing bearing

- Heat the cover using the heat gun on its stand, and fit the bearing, let the cover cool down, and then fit the oil seal and the needle bearing using the appropriate punch. Fit the follower pulley shaft bearing Seeger ring ensuring that it is positioned correctly.
- The concave side of the Seeger ring must face the bearing.



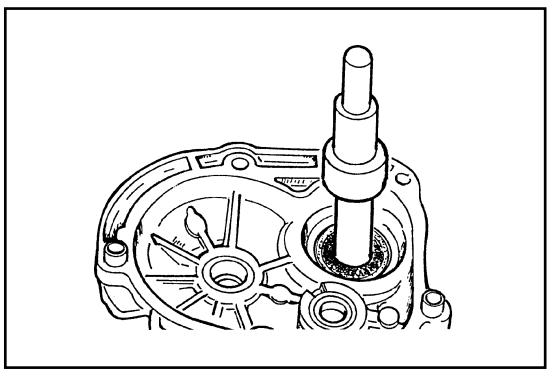
Special tool: 19.1.20151 (heat gun)

Special tool: 19.1.20150 (holder)

Special tool: 19.1.20080

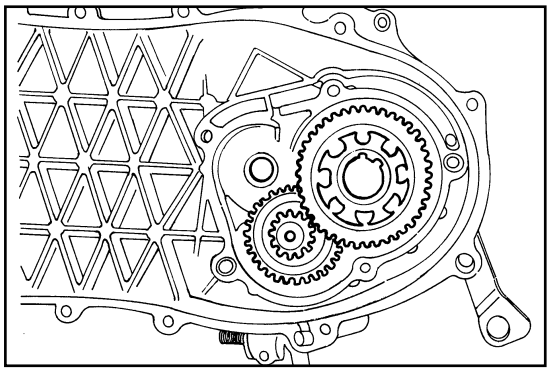
Assembly of follower pulley shaft

- Assemble the pulley shaft onto the bush cover by tapping lightly with a rawhide hammer.



Reduction gearing

N.B. If necessary when withdrawing the reduction gearing, use a plastic hammer, tapping lightly on the opposite side to that shown in the figure.

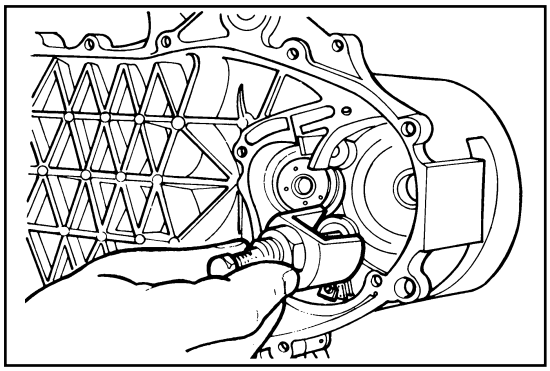


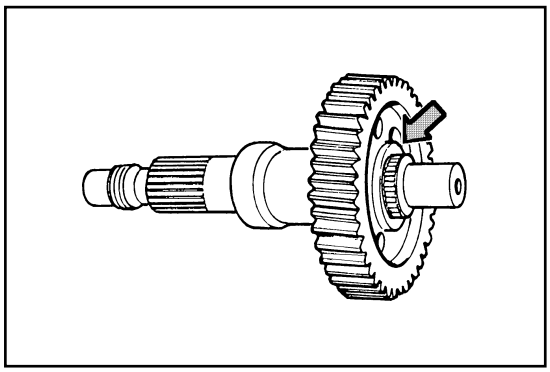
Crankcase bearings

- Wheel shaft bushing:
- Withdraw the oil seal and the Seeger ring, extract the bushing.
- Follower pulley shaft bushing.
- Use the special tool.

N.B. Perform the same operations on the bearings in the crankcase cover.

Extractor tool 19.1.21467/21/17



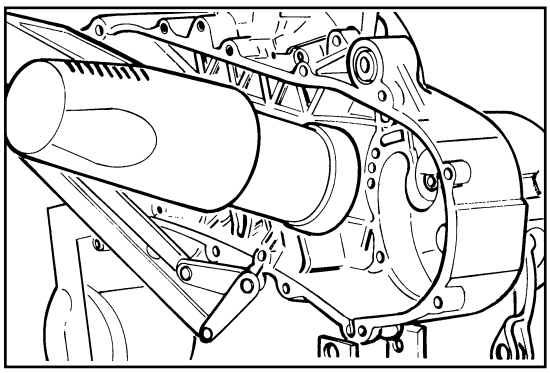


Crankcase bearings

- Heat up the crankcase halves to approximately 80ºC, and then assemble the bearings.

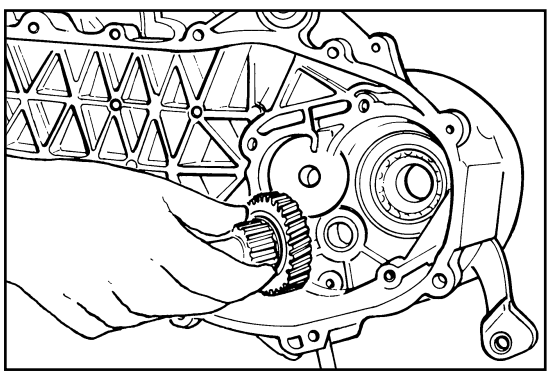
Support 19.1.20150

Heat gun 19.1.20151



Crankcase bearings

Caution! place the stop washers correctly on the intermediate shaft.

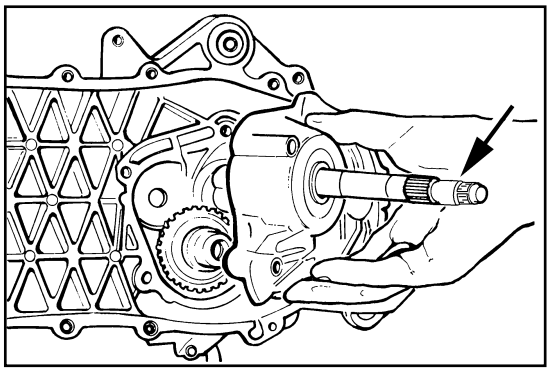


Mating the crankcase halves

- Apply Loctite 510 to the mating surfaces.
- Tighten the screws to the prescribed torque setting.

N.B. Always check that the compensator ring is correctly in place and well-greased.

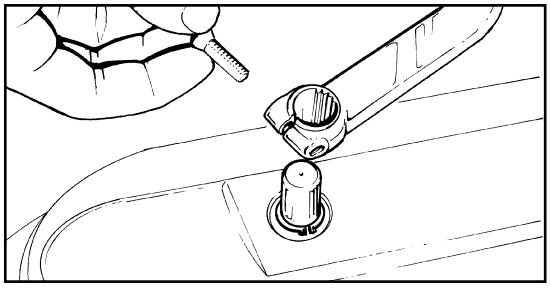
Torque settings 12 ÷ 13 N x m



Replacing the starter pedal

- Remove the screw as shown in the figure and withdraw the starter pedal.
- For re-assembly follow the same operation in reverse, and tighten to the specified torque setting.

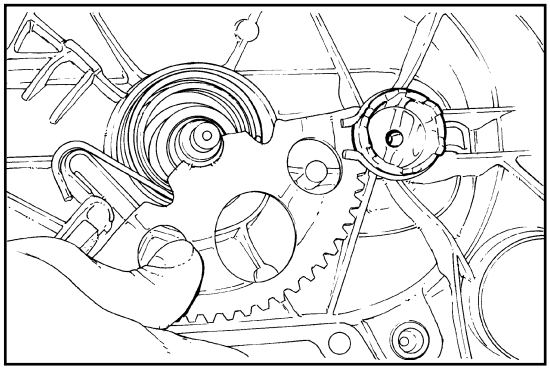
Torque setting: 12-13 N·m



Replacement of the toothed segment and starter-crankshaft gearing

- Remove the Seeger ring situated on the outside of the crankcase.
- Strip the starter gearing from its housing, relaxing the pressure exerted by the toothed segment through the spring; in order to do this, it is necessary to rotate the toothed segment slightly (see figure).

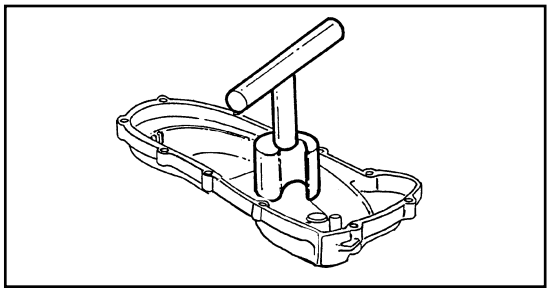
Caution! During the stripping operation on the toothed segment, take extreme care over the tension exerted by the spring: this could injure the operator.



Assembling the toothed segment and starter gearing into the crankcase

- When assembling, apply Agip GR MU to the bush, to the spring, and along the toothed segment.
- To load the spring, use the special tool as shown in the figure.
- Fit the Seeger ring after checking that it is in perfect condition.

Special tool: 19.1.20261

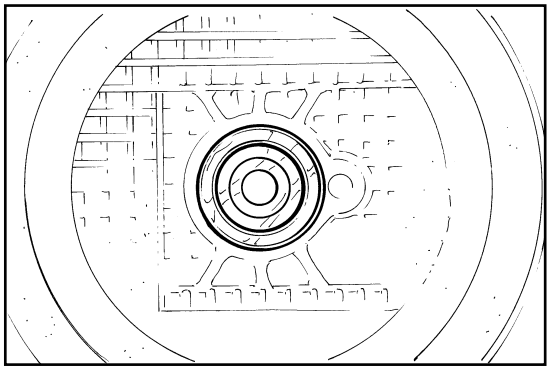


Replacing the reduction gear cover bearing

- In order to replace the bearing in the reduction gear cover, heat up the crankcase and extract the bearing by tapping with gentle blows from a rawhide hammer.

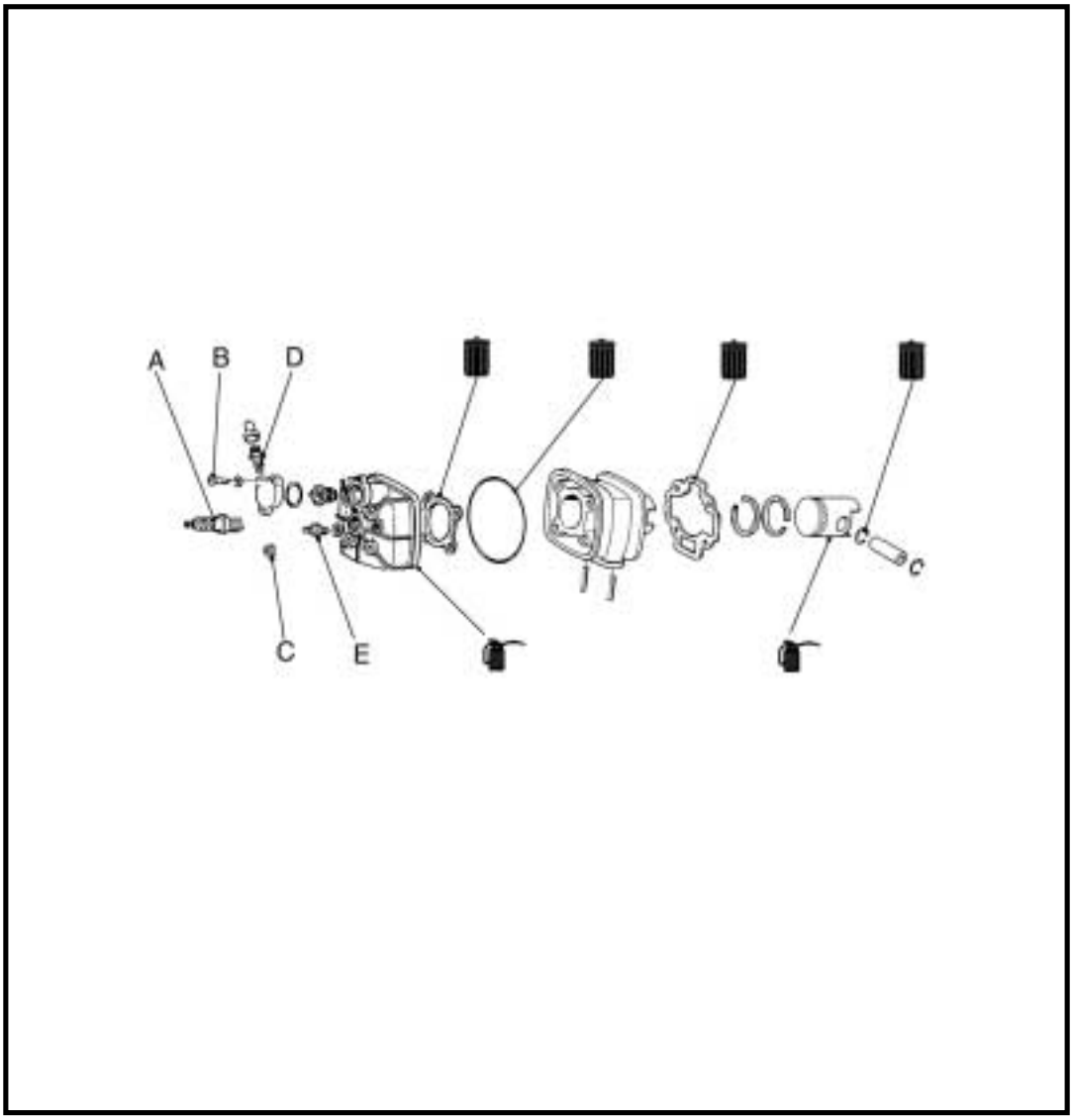
Special tool: 19.1.20150

Special tool: 19.1.20151



CYLINDER HEAD - CYLINDER - PISTON

Liquid cooled models



LUBRICATE

APPLY THE PRODUCT

CAUTION HANDLE WITH CARE

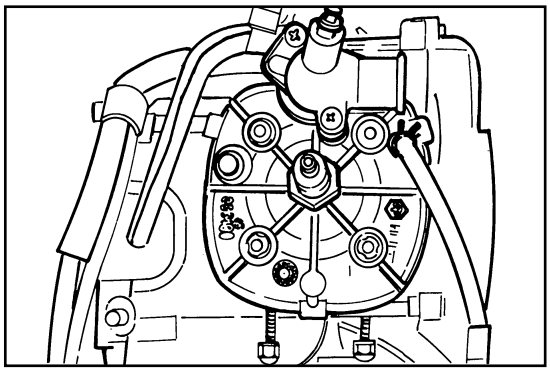
GREASE

CLEAN WITH CARE

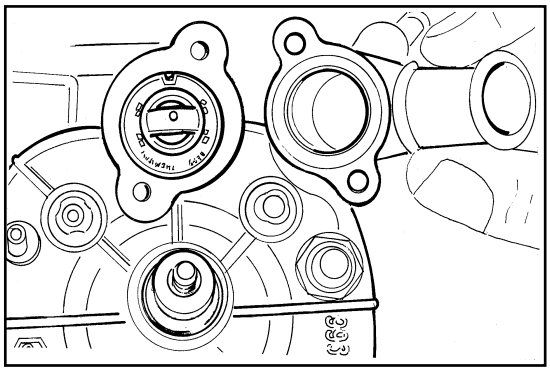
ALWAYS REPLACE

SYMBOL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
QUANTITY	1	2	4	1	1										
TORQUE N.M.	25÷30	3÷4	10÷11	6÷7	6÷8										

Thermostat - cylinder head - by-pass tube

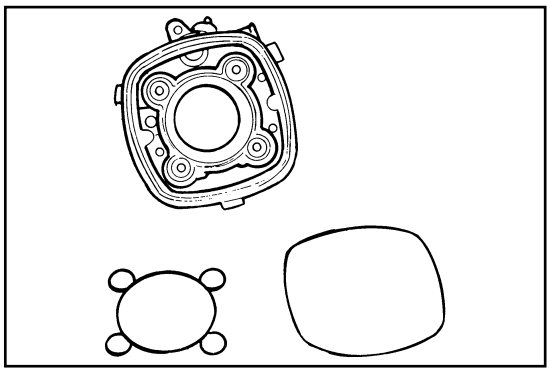


Detail of the thermostat

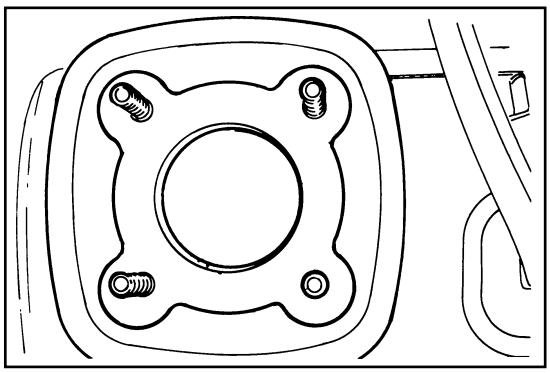


Cylinder head - Cylinder

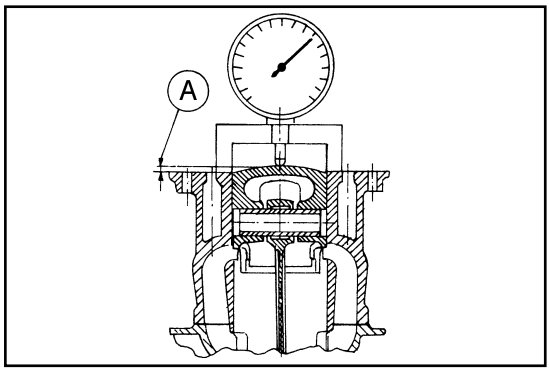
Caution! Every time the cylinder head is stripped down, replace the two seals and the cylinder head gasket.



Cylinder



Cylinder



Checking the thickness of the cylinder base gasket

- Assemble the cylinder without using the cylinder base gasket.
- Fit a hundredths comparator on special tool 19.1.20268 and bring the needle to zero on a rectified surface.
- Fit the tool to the upper part of the cylinder and secure it with two nuts to the studs, observing the torque setting of 10-11 N·m, and bring the piston to TDC.
- The thickness of the gasket which is required will vary according to the value observed.
- For this reason 3 gaskets are supplied in the following thicknesses:

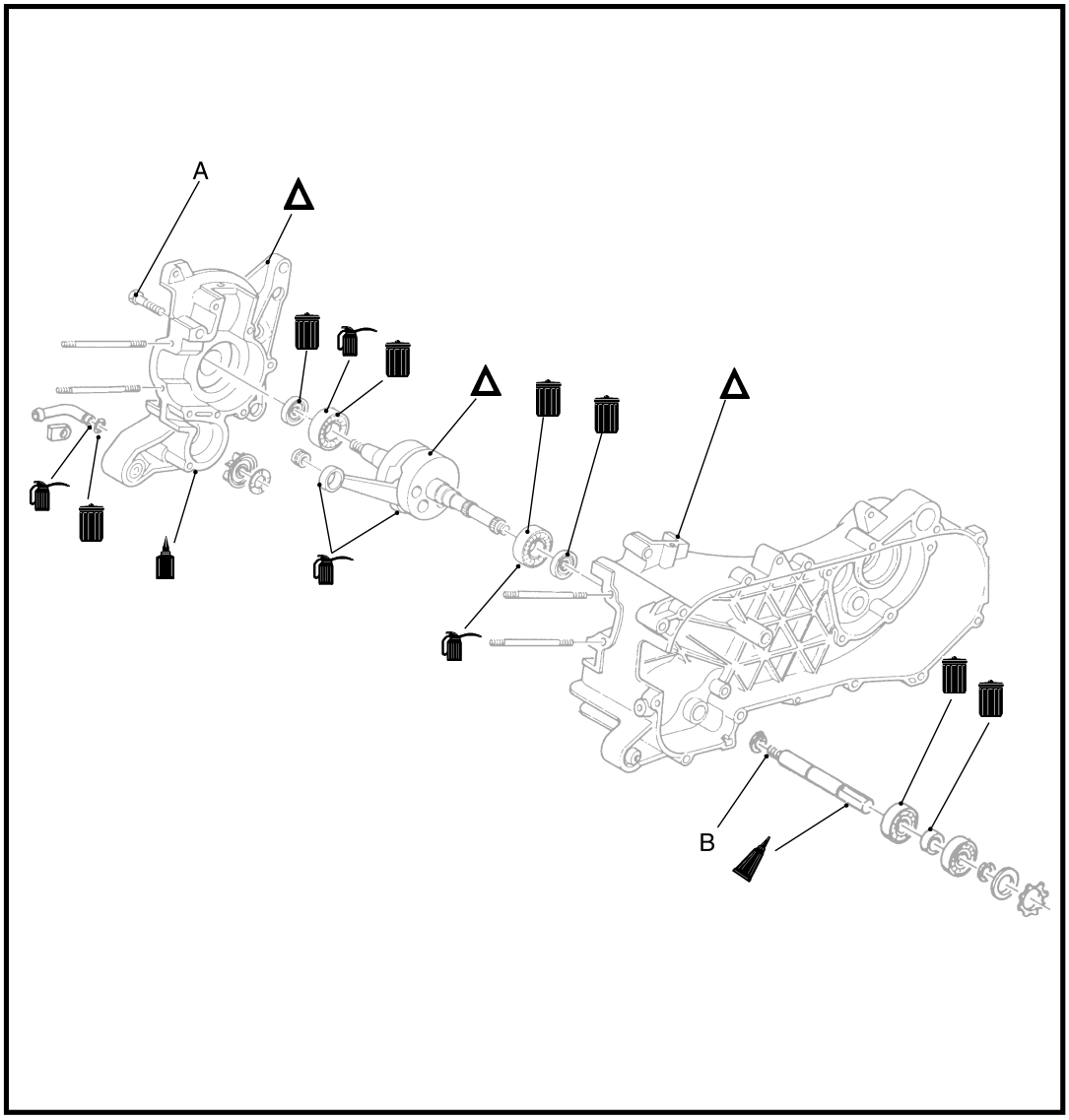
  0.75 mm. – 0.5 mm. – 0.4 mm.

Cylinder head torque setting: 10 ÷ 11 N x m

Special tool: 19.1 20268

VALUE OF “A” (mm)	Thickness of gasket	Reference No.
2,85 ÷ 3,10	0,4	435602
3,10 ÷ 3,25	0,5	289499
3,25 ÷ 3,45	0,75	435603

CRANKCASE HALVES - CRANKSHAFT



LUBRICATE

APPLY THE PRODUCT

CAUTION HANDLE WITH CARE

GREASE

CLEAN WITH CARE

ALWAYS REPLACE

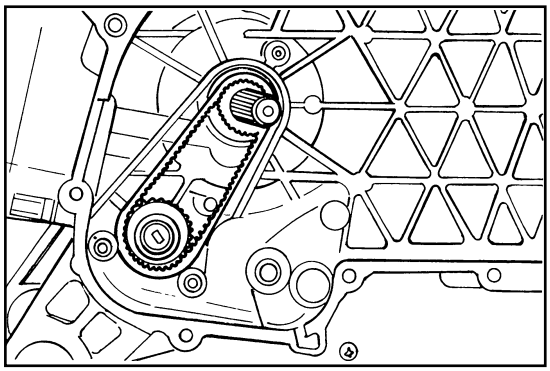
SYMBOL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
QUANTITY	8	1													
TORQUE N.M.	12÷13	4÷5													

Automatic mixer drive gearing and belt

- Strip the gearing and belt.
- If it is difficult to remove the mixer gearing use the special tool.

Caution! Do not twist the belt

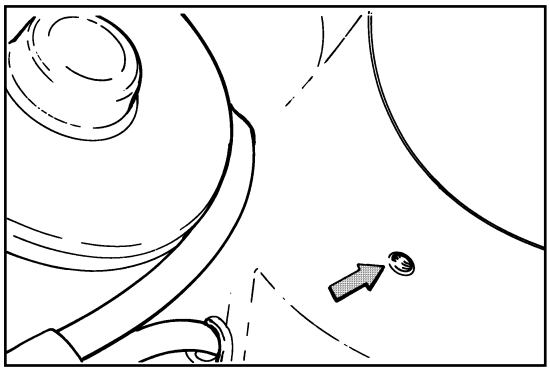
Special tool: 19.1.20170



Drain hole

(Transmission side crankcase half)

N.B. In the event of loss of fluid through the drain hole, carry out a revision of the pump as shown below.

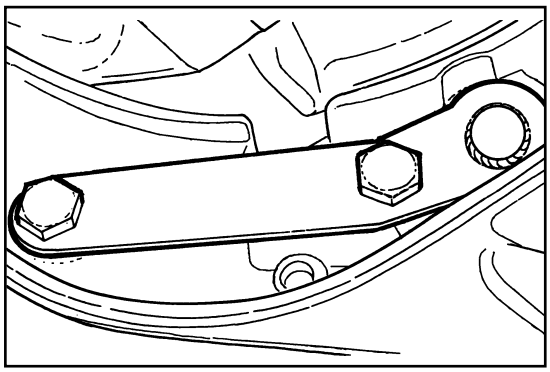


Replacing the water pump seal in the clutch side crankcase half

- Strip the pick-up and remove the water feed hose to the pump.
- Fit the special tool in the pick-up securing holes.

Caution! when re-assembling the pump feed water hose, use a new seal.

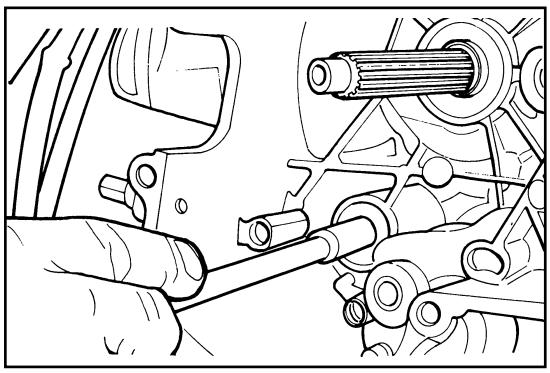
Special tool 19.1.20167



Unscrew the pump drive shaft and withdraw the unit.

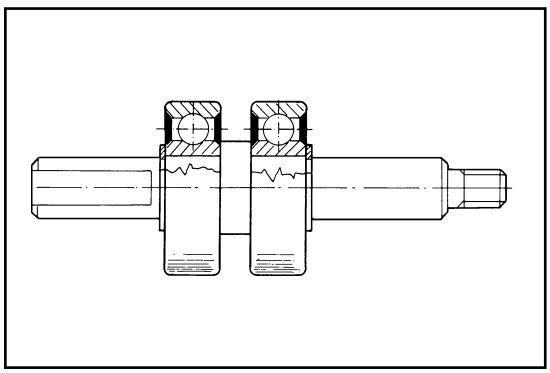
Caution! The water pump drive shaft has a left-hand thread.

Special tool: 19.1.20169



Water pump drive shaft

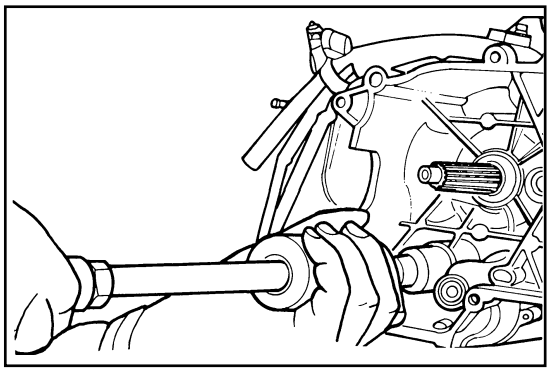
- **Note on spare parts:** The shaft is supplied complete as shown in the figure.



Disassembling the seal

Common tools

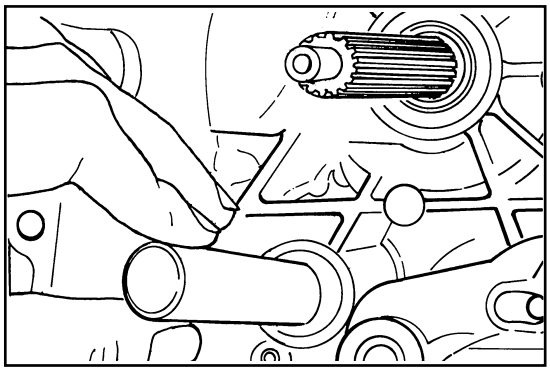
- Frame type ABC 3065 / 8
- Extractor type USAG A / 17 -10



When assembling, clean the surface scrupulously

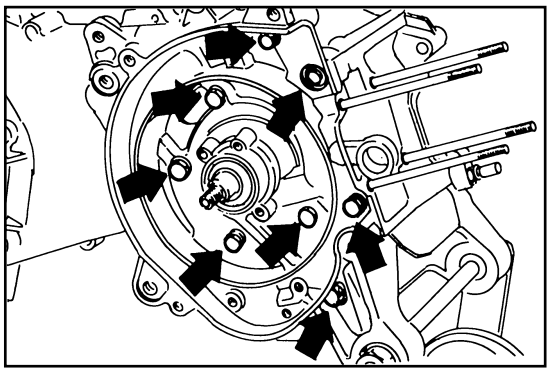
- Lubricate the surface and the seal, and check that the seal is correctly inserted and that the drain hole is not blocked.

Special tool: 19.1.20168



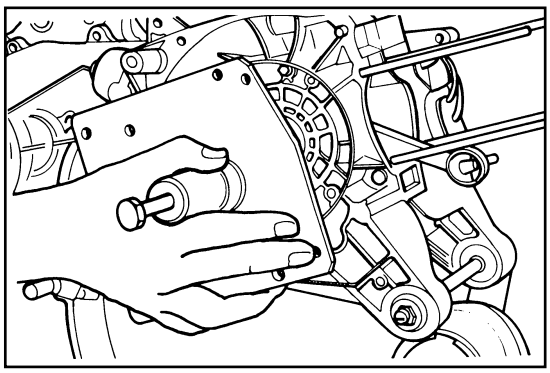
Remove the joint screws

- Remove the eight crankcase half joint securing screws.



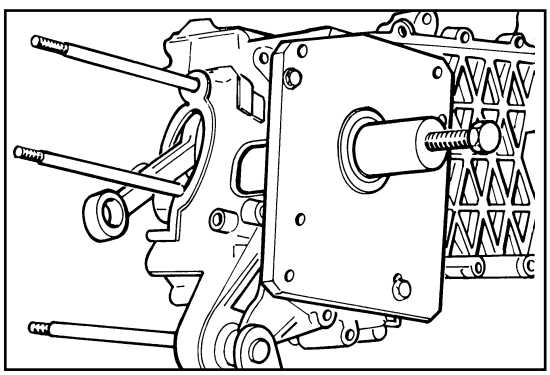
Separating the crankcase halves

Special tool: 19.1.20163



Extracting the Crankshaft

Special tool: 19.1.20163

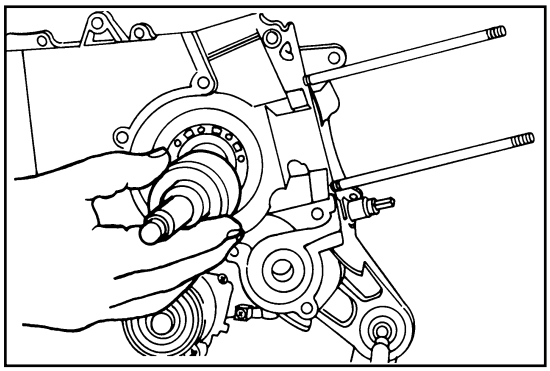


Crankcase bushings

N.B. The same procedure is used to remove the magneto-side main bushing.

Caution! In the event that the main bushings were to remain fitted to the crankshaft, use special tool 19.1.14499/7.

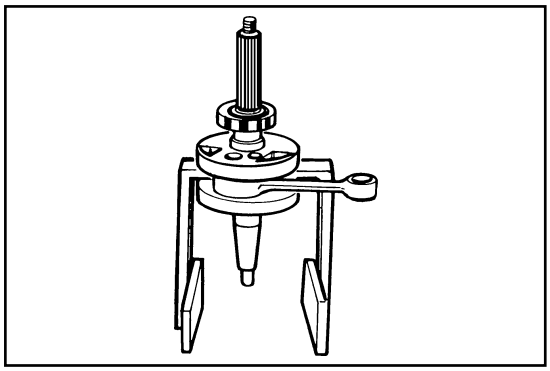
Special tool 19.1.21467/6/7



Main bushings on the crankshaft

- Heat up the bushings to approximately 100ºC in an oil bath, and fit them onto the crankshaft; if necessary use a piece of tube to exert pressure on the internal track of the bushing.
- In the event that it is necessary to replace the connecting rod, when assembling, it must be fitted with the lubrication hole (situated on the head of the connecting rod) towards the transmission side.

Base 19.1.20265



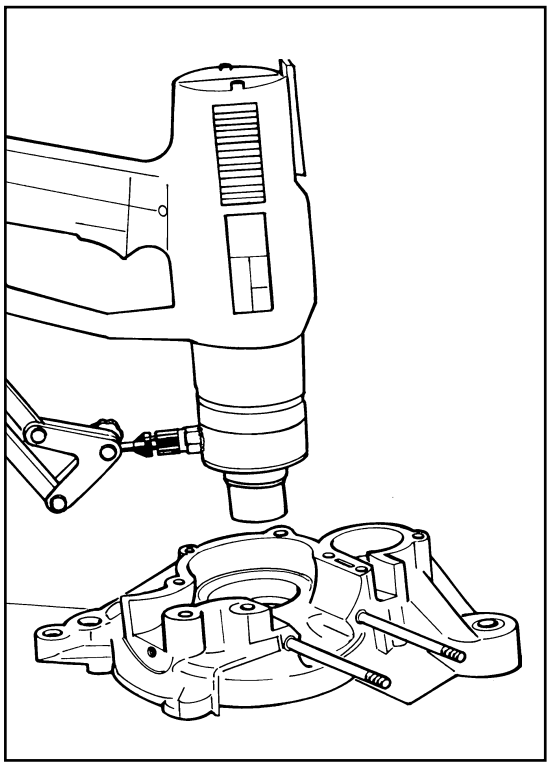
Joining the crankcase halves

- Heat up the transmission side crankcase half around the area where the main bushing is to be fitted.
- Fit the crankshaft.
- Allow the crankcase half to cool.
- Fit the special tool to the transmission side crankcase half and push the crankshaft gently to recover axial play.
- Apply joint sealer Loctite 510 to the mating surfaces.
- As before, heat up the magneto side crankcase half.
- Join the crankcase halves.

Support 19.1.20150

Heat gun 19.1.20151

Special tool 19.1.20163

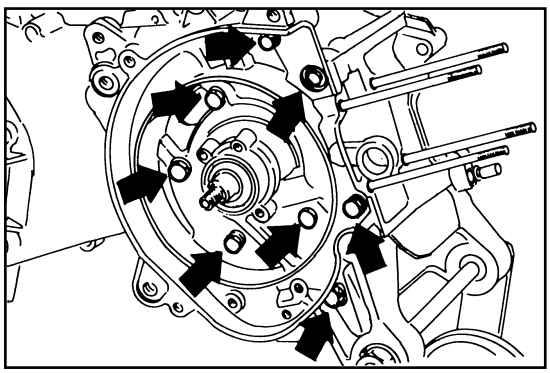


Closing the crankcase half - Magneto side oil seal

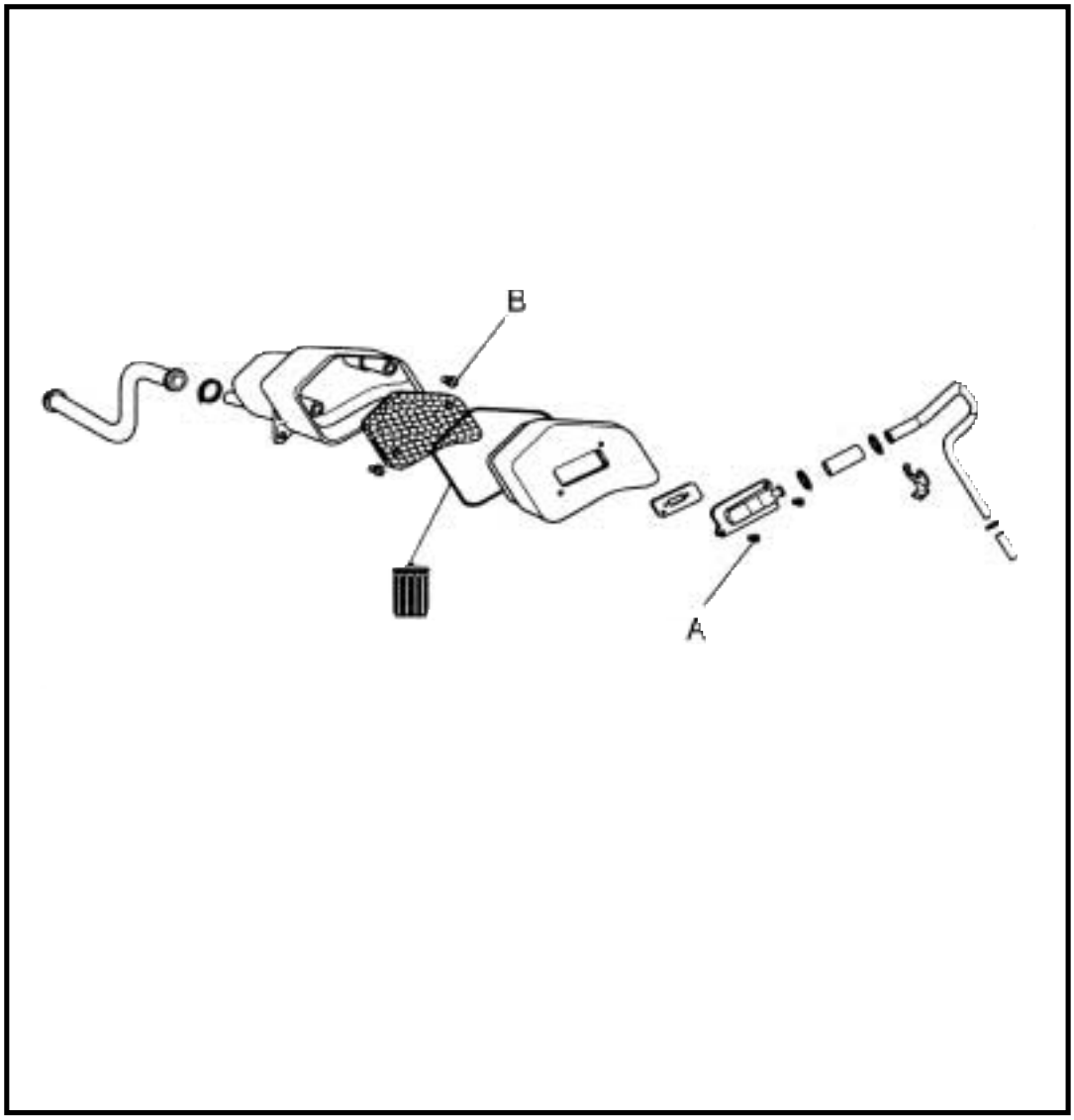
- 8 off securing nuts
- Remove special tool 19.1.20163
- Allow the crankcase to cool, and check that the axial play of the crankshaft is 0.03 ÷ 0.09 mm.
- Use tool 19.1.20340 when fitting the magneto side seal, and tool 19.1.20340 part 2 for the transmission side seal.

Torque setting 12 ÷ 13 N x m

Comparator and comparator holder base 19.1.20335



SECONDARY AIR SYSTEM



LUBRICATE

APPLY THE PRODUCT

CAUTION HANDLE WITH CARE

GREASE

CLEAN WITH CARE

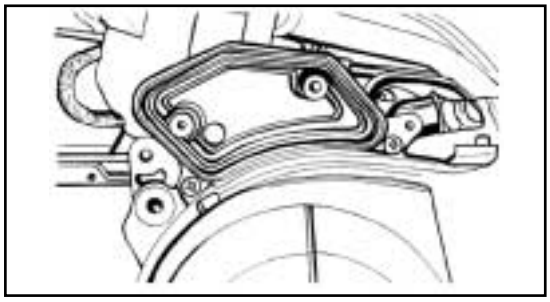
ALWAYS REPLACE

SYMBOL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
QUANTITY	2	2													
TORQUE N.M.															

Disassembly of Secondary Air System Cover

- To disconnect the metallic tube, indicated in the figure, of the rubber seat on the cover, without unplugging the same tube of the cover.
- Remove screws of cover "SAS" in aluminum.
- Remove the plastic cover, the lamina and the foam.

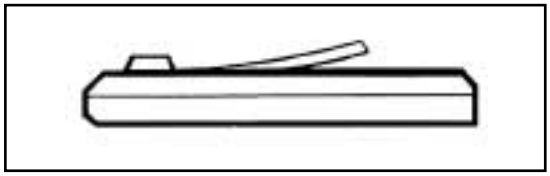
Atención To each assembly to replace the O–Ring lodged in its own lodging in the cover.



Disassembling the Secondary Air System (SAS) housing

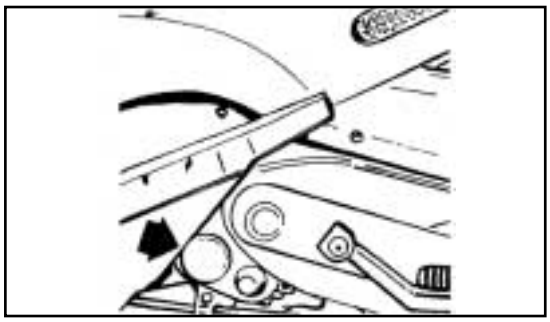
- Remove the two screws securing the SAS housing to the crankcase, loosen the clip from the hose and withdraw the hose without cracking it.

Checking the SAS reed

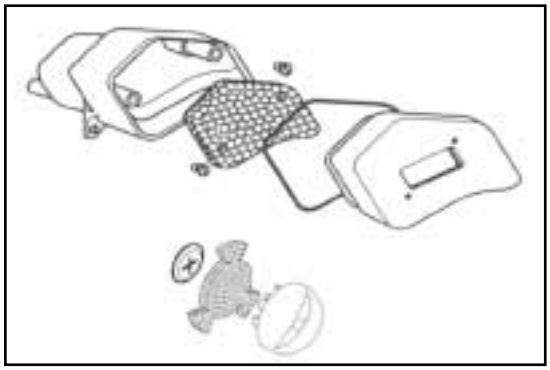


Caution! Verify that the steel reed seals hermetically. If it does not seal correctly, it must be replaced.

- In order to check the oil pump, withdraw the rubber cover, levering off by means of a screwdriver.

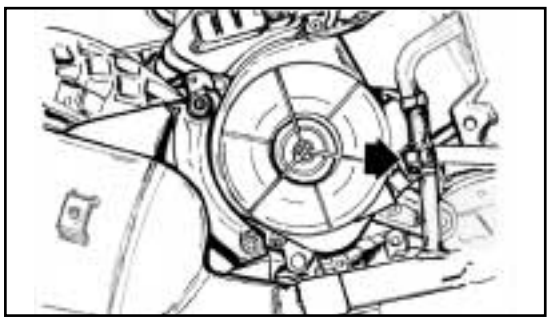


Cleaning the filter



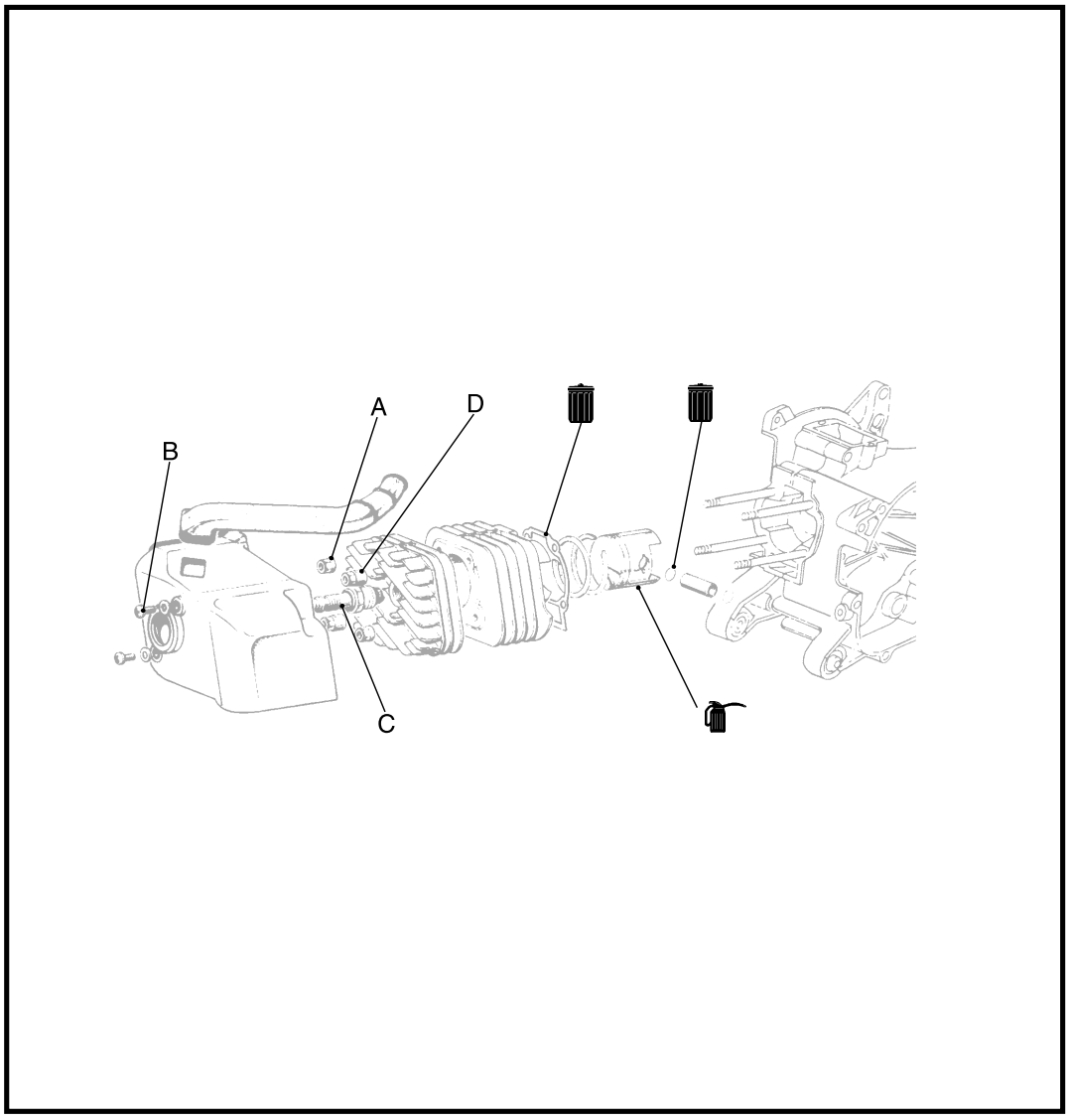
- Wash both filters with soap and water.
- Dry using compressed air before re-installing.

- Remove the securing clamp, and then withdraw the hose from the secondary air filter to the exhaust pipe.



CYLINDER HEAD - CYLINDER - PISTON

Models air cooled



LUBRICATE

APPLY THE PRODUCT

CAUTION HANDLE WITH CARE

GREASE

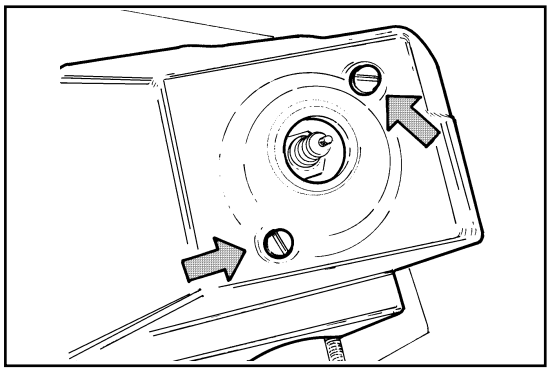
CLEAN WITH CARE

ALWAYS REPLACE

SYMBOL	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
QUANTITY	2	2	1	2											
TORQUE N.M.	10÷11	3,5÷5	25÷30	10÷11											

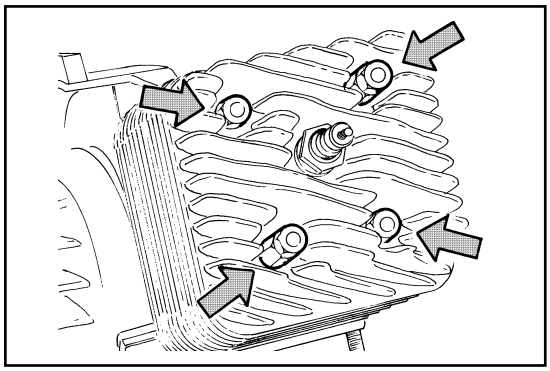
Cylinder cooling cover

- Withdraw the screws shown in the figure.



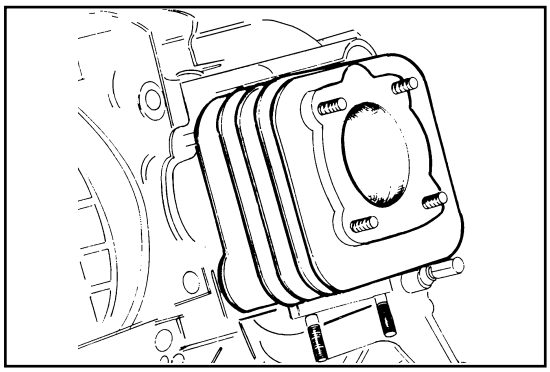
Cylinder Head

- Remove the 4 nuts indicated in the figure.



Cylinder

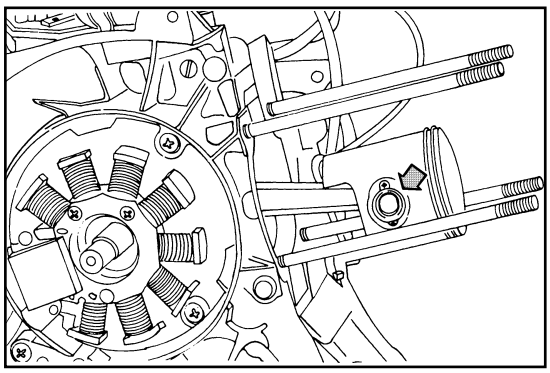
- Exercise great care when withdrawing the cylinder.



Piston

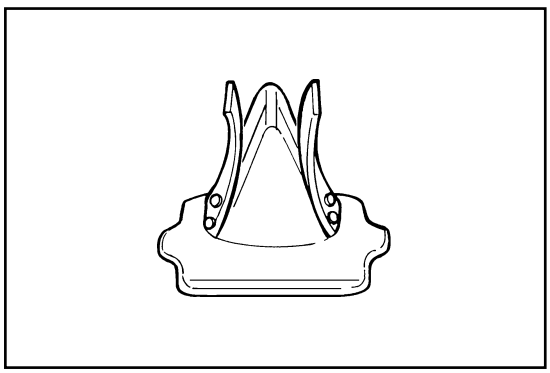
- Remove the spring clips and withdraw the gudgeon pin.

Caution! Replace the spring clips securing the gudgeon pin every time the assembly is stripped.

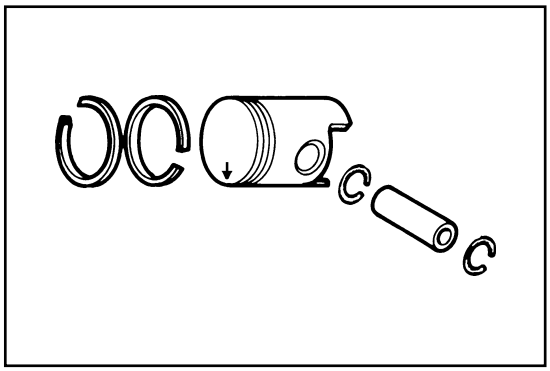


Reed Valve

Caution! Check that the reed assembly closes correctly; no light should be seen between the reeds and the valve body.



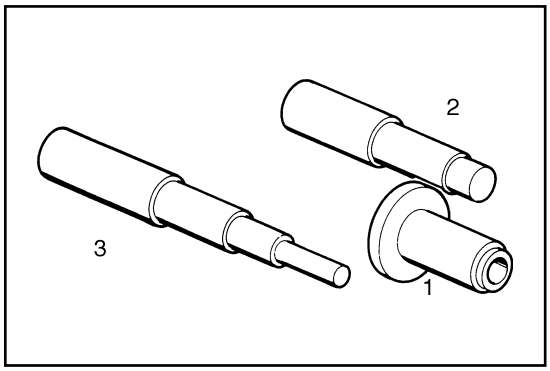
Piston



Caution! Position the arrow stamped on the crown of the piston so that it faces towards the exhaust port.

Caution! The gudgeon pin spring clips should be fitted into the piston using the special tool.

Gudgeon Pin spring clips in the piston



- Place the spring clip in part 1, fitting it over the arrow stamped on the tool.
- Push part 2 into part 1 fully and withdraw part 2.
- Fit part 3 into part 1, place the assembly over the spring clip seating area in the piston and push part 3 fully home.

Special tool 19.1.20166

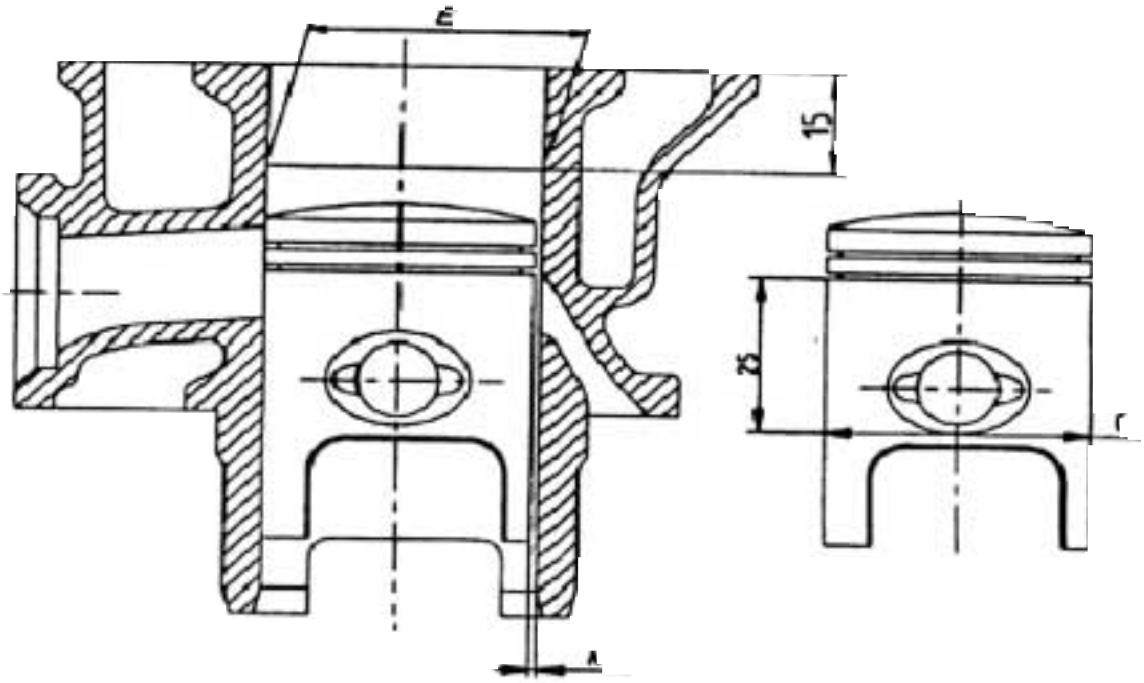
N.B. Re-assemble all remaining parts following the stripping procedures in reverse order.

- Use new gudgeon pin spring clips.
- Use a new cylinder base gasket.
- Before re-assembly clean all surfaces scrupulously.
- Use mixing oil Agip City 2T when re-assembling the cylinder and the piston.

Cylinder head nuts 10 ÷ 11 N x m

VEHICLE SERVICE DATA

Assembly tolerances



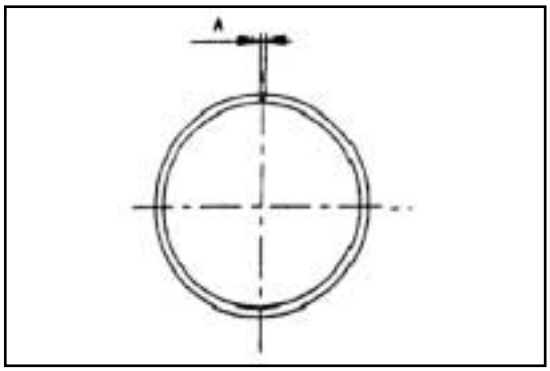
N.B. The cylinder diameter should be checked at a level 15mm below the cylinder head mating surface.

Table of cylinder and piston tolerances

DESCRIPTION	Dimension	Letter	Fitting tolerances		Assembly tolerance "A"
			Cylinder "E"	Piston "C"	
Cylinder	Ø 40 - 0,01 + 0,018	M	39,990 ÷ 39,997	39,943 ÷ 39,950	0,040 0,054
		N	39,997 ÷ 40,004	39,950 ÷ 39,957	
Piston	Ø 40 - 0,029 + 0,057	O	40,004 ÷ 40,011	39,957 ÷ 39,964	
		P	40,011 ÷ 40,018	39,964 ÷ 39,971	
Cylinder 1st Oversize	Ø 40,2 - 0,01 + 0,018	M 1	40,19 ÷ 40,197	40,143 ÷ 40,15	
		N 1	40,197 ÷ 40,204	40,15 ÷ 40,157	
Pistón 1st Oversize	Ø 40,2 - 0,029 + 0,057	O 1	40,204 ÷ 40,211	40,157 ÷ 40,164	
		P 1	40,211 ÷ 40,218	40,164 ÷ 40,171	
Cylinder 2nd Oversize	Ø 40,4 - 0,01 + 0,018	M 2	40,39 ÷ 40,397	40,343 ÷ 40,35	
		N 2	40,397 ÷ 40,404	40,35 ÷ 40,357	
Pistón 2nd Oversize	Ø 40,4 - 0,029 + 0,057	O 2	40,404 ÷ 40,411	40,357 ÷ 40,364	
		P 2	40,411 ÷ 40,418	40,364 ÷ 40,371	

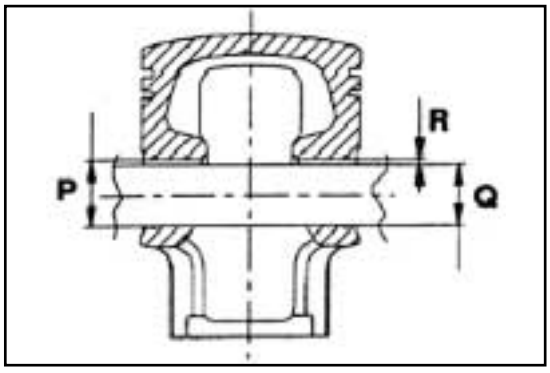
Piston Rings

- The verification of assembly tolerance should be carried out by inserting the piston ring into the cylinder at 15 ÷ 20 mm from the cylinder head mating surface, and measuring the gap between the opposite ends of the ring using a set of feeler gauges.



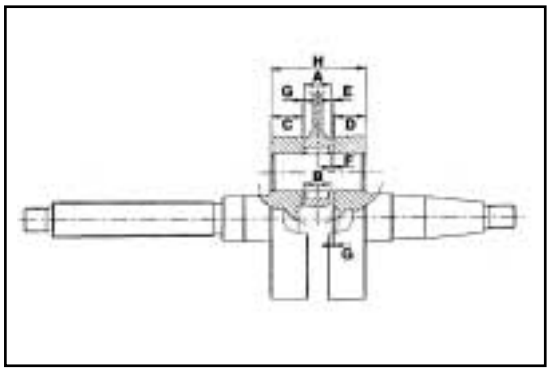
DESCRIPTION	DIAMETER	PLAY	ASSEMBLY TOLERANCE
Piston Ring Std	Ø 40	A	0.10 ÷ 0.25
Piston Ring 1st Oversize	Ø 40.2		
Piston Ring 2nd Oversize	Ø 40.4		

Checking the Gudgeon Pin



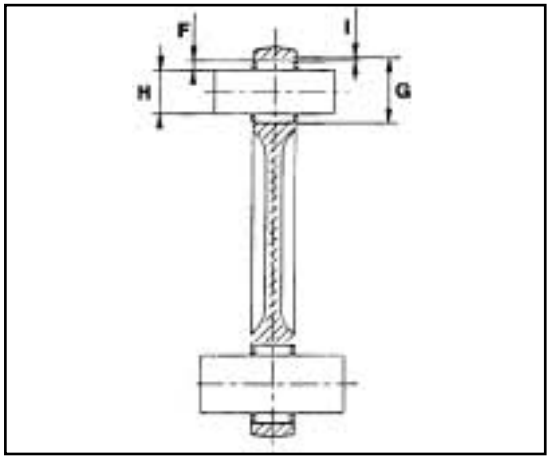
DESCRIPTION	DIAMETER	PLAY	ASSEMBLY TOLERANCE
Piston	P = Ø 12 $^{+\ 0,007}_{-\ 0,012}$	R	0,002 ÷ 0,011
Gudgeon Pin	Q = Ø 12 $^{+\ 0,005}_{-\ 0,001}$		

Axial tolerance between crankshaft and connecting rod



DESCRIPTION	DIMENSION	PLAY	ASSEMBLY TOLERANCE
Connecting rod	A = 11 .75 $^{0}_{-0,05}$	E	0.25 ÷ 0.50
Stop washer	G = 0.5 $^{\pm 0,03}$		
Half-shaft transmission side	C = 13.75 $^{+0,04}_{0}$		
Half-shaft magneto side	D = 13.75 $^{+0,04}_{0}$		
Distance tool	H = 40.64		
Bearing cage	B = 11.8 $^{0}_{-0,35}$	F	0.20 ÷ 0.75
Stop washer	G = 0.5 $^{\pm 0,03}$		
Half-shaft transmission side	C = 13.75 $^{+0,04}_{0}$		
Half-shaft magneto side	D = 13.75 $^{+0,04}_{0}$		
Distance tool	H = 40.64		

Connecting rod big end - bearing cage gudgeon pin



CONNECTING ROD BIG END - BEARING CAGE - GUDGEON PIN								
DESCRIPTION	DIMENSIONS	PLAY	ASSEMBLY TOLERANCE	Fitting Categories (in thousandths of mm)				
				Con. Rod. big end	Cage			Gud-geon pin
				CAT	ø 17 mm	CAT	ø 2.5 mm	Option ø 2.5 mm
Connecting Rod	G = Ø 17 $^{+0,011}$	I	0.002 ÷ 0.012	1	+11 +7	1 Roja	0 -2	-1 -3
Cage	F = Ø 2.5 ^{0}			2	+7 +3	2 Azul	-2 -4	-3 -5
Gidgeon pin	H = Ø 12 $^{+0,005}$			3	+3 –1	3 Gris	-4 -6	-5 -7

Crankshaft alignment check

- Using the special tool indicated, check the surface of diameters “A” “B” “C” for eccentricity: they should fall within 0.03 mm (maximum limit of reading on comparator dial). Also check eccentricity of diameter “D” for which the maximum permitted reading is 0.02 mm. Where the eccentricity is slightly greater than specifications, true the crankshaft between the counterweights by shim bushing, or by pressing in a screw press fitted with aluminium bushes, as required. In the event that it is impossible to true the shaft, or where eccentricity is excessive, replace the crankshaft.

Axial assembly tolerance:

- Measure the axial tolerance of the crankshaft in the crankcase, with the engine cold.
- Push and pull the crankshaft from one side, and measure the value using a comparator on the other side.

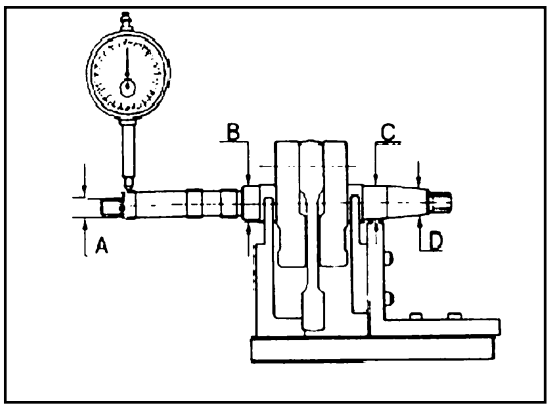
Assembly tolerance under load ± 3 kg:

0.03 ÷ 0.12 mm

Special tools:

Comparator with magnetic support: 020335Y

Crankshaft alignment tool: 020074Y



CARBURETTOR

Adjustment Table

MAKE	CARBURETTOR	MODEL	JET MAXIM	NEEDLE POSITION	JET MINIMUM	EMULSIFIER	IDLE JET	CHOKE JET	FLOAT LEVEL
DELL'ORTO	PHVA 17, 5 ID	GP 1 (E) GP SERIES (E) Atlantis 2002 (E) Atlantis 2002 LC(E)	62	A 22 – 1º	32	209 HA	1 ¾ **Turns**	50	14,3 ± 0,5
DELL'ORTO	PHVA 17, 5 ID	GP 1 (WVTA) GP SERIE (WVTA) Atlantis 2002 (WVTA) Atlantis 2002 L.C(WVTA)	56	A 22 – 1º	32	209 HA	1 ¾ **Turns**	50	14,3 ± 0,5

Checking the fuel indicator

- The fuel indicator needle operates on the moving magnet principle.
- Check carried out with voltage at 13 V DC.

Marking	1/1	1/2	0
Tolerances	+ 4,5 - 3	-	+ 3 - 4,5
Resistance	10	38	90

Checking the temperature indicator

- The temperature indicator needle operates on the moving magnet principle.

Value in at the probe	Index Position	Tolerance
82	120° C	+5°C - 0°C
190	80° C	
511	40° C	+5°C - 0°C

Checking the thermistor

Temperature	Resistance
60° c	600 ÷ 470 Ω
90° c	215 ÷ 175 Ω
120° c	93 ÷ 73 Ω

Checking the fuel sensor

FUEL SENSOR		
Reserve Indicator	FULL	A/V – BL/AZ = ∞ ± 10%
	EMPTY	A/V – BL/AZ = 33 ± 10%
Analogue level indicator	FULL	A/V – BL/RO = 2,7 Ω ± 10%
	EMPTY	A/V – BL/RO = 96 Ω ± 10%

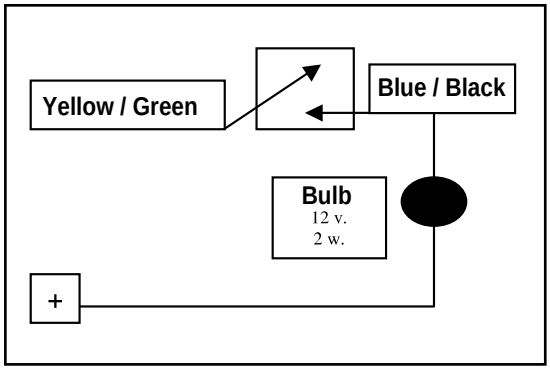
Checking the oil sensor

Check

- Check that the oil sensor pilot light lights up for about 10 seconds and then switches off.

Sensor

- After carrying out the check function, the light goes out for approximately 1 minute. Then it should light up again.
- Once the device is active, it should not deactivate until power is shut off.



Checking the voltage regulator

- Breakdown of the voltage regulator may lead, depending on the type of breakdown, to the following types of failure:

1) Burnt-out bulbs in the lighting circuit.
2) Lighting circuit fails to operate.
3) Excessive battery charging.
4) Battery fails to charge.
5) Direction indicators fail to operate.

FAILURE 1

- Replace the regulator as it is certainly ineffective.

FAILURE 2

a) Check for proper distribution of current from the stator: disconnect from the regulator terminal and insert alternating current tester 020331Y between the blue/green terminal and the black cable, and check that the voltage distributed at 3,000 rpm falls between 25 ÷ 30 VAC (Fig. 1)

b) If there is no abnormality, replace the regulator.

c) If correct operation is impossible even with a new regulator, carry out a check of the connections in the wiring circuit.

FAILURE 3

- After checking that there are no short-circuits from the wiring circuit to ground with the engine stopped and with the regulator terminal disconnected, replace the regulator, because it is certainly ineffective; also replace the protection fuse.

- After replacement, measure charging current and voltage at the battery terminals (Fig. 2).

FAILURE 4

a) Connect an ammeter between the stator (blue cable) and the battery and check using tester 020331Y that the current distributed at 3,000 rpm and with the battery at 13 V is approximately 1.5 ÷ 2 Amps (Fig. 3).

If measured values are lower than specified, replace the regulator.

b) If replacing the regulator does not re-establish correct operation, set the tester 020031Y for alternating current voltage, connect between the regulator yellow cable terminal and the black cable (Fig.4) and check that the voltage distributed by the generator at 3,000 rpm falls between 26-30V (this test should be carried out with the battery disconnected).

N.B. Before carrying out any checks on the regulator and the related wiring, it is recommended that a continuity check is run between the black cable and ground.

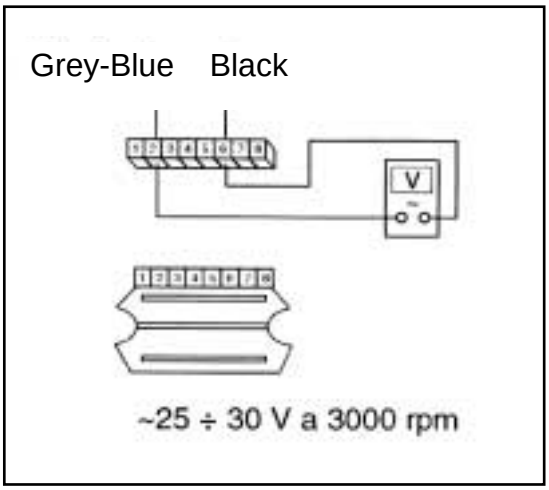


Fig. 1

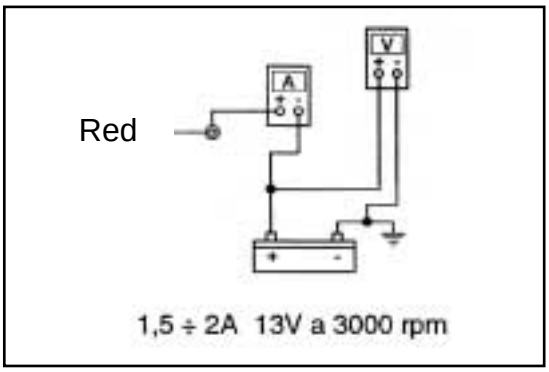


Fig. 2

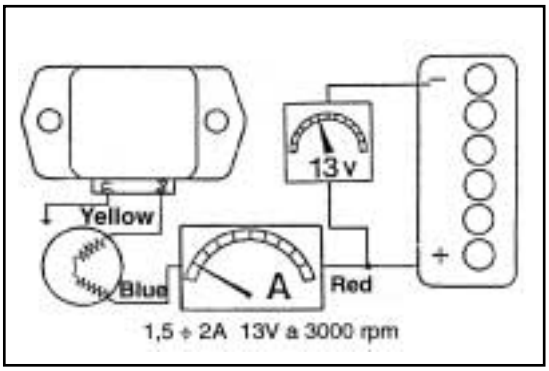


Fig. 3

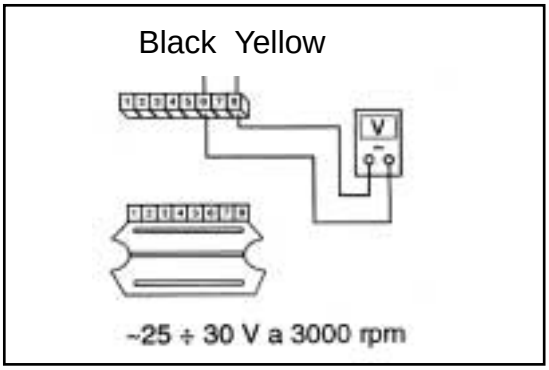


Fig. 4

ECHEMA ELECTRIQUE ATLANTIS

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI

ECHEMA ELECTRIQUE GP1

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI

ECHEMA ELECTRIQUE GP1 (USA)

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI

D	F	UK	I	E	
Orange	Orange	Orange	Arancio	Naranja	O
Grün	Vert	Green	Verde	Verde	GR
Schwarz	Noir	Black	Nero	Negro	B
Braun	Marron	Brown	Marrone	Marron	BR
WeiB	Blanc	White	Bianco	Blanco	W
Grau	Gris	Gray	Grigio	Gris	G
Gelb	Jaune	Yellow	Giallo	Amarillo	Y
Blau	Blau	Blue	Azzurro	Azul	BL
Rot	Rouge	Red	Rosso	Rojo	R
Rosa	Rosa	Pink	Rosa	Rosa	P
Violett	Violet	Violet	Viola	Violeta	VI