

FOREWORD

- 1 = Blower/mistblower
 2 = Clamping plate
 3 = Assembly stand

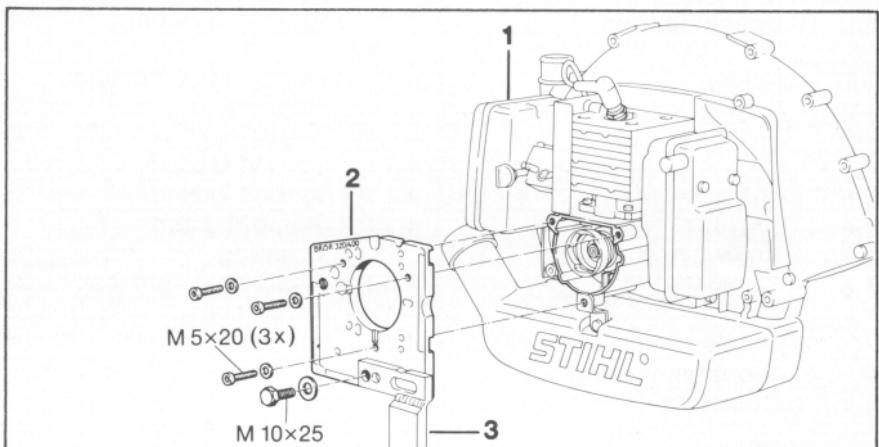
This service manual contains detailed descriptions of all servicing procedures on model BR 320, 400 and SR 320, 400 blowers/mistblowers and can thus be used as a basis for professional overhauls and repairs to all versions of these machines.

We recommend that you make use of the exploded views in the illustrated parts lists while carrying out repair work. Most of the illustrations show the installed positions of the individual components and assemblies.

Whenever possible you should refer to the latest edition of the parts list for the part numbers of any spares you may require. Microfilmed parts list are always more up to date than printed lists.

In the event of faults it is quite possible that **a particular condition may have several causes**. It is, therefore, advisable to consult the "troubleshooting charts" for all assemblies and systems when tracing faults. You will find these troubleshooting charts immediately after the specifications.

Engineering changes which have been introduced since publication of this service manual are announced in **"Technical Information Bulletins"**. Such bulletins should be treated as supplements to the service manual.



This service manual and all technical information bulletins describing engineering changes are intended exclusively for the use of STIHL servicing dealers and staff within the STIHL service organization and must not be passed on to third parties.

Servicing and repairs are made considerably easier if the blower/mistblower is mounted to assembly stand 5910 890 3100 or 5910 850 3100 with the aid of clamping plate 5910 894 2101. It is only necessary to remove the starter cover and use its mounting screws to secure the unit to the clamping plate.

While on the assembly stand the unit can be swivelled to any required position to suit the ongoing repair. This not only has the advantage of keeping the component in the best position for the repair but also leaves both hands free for the work and thus helps save time.

The "STIHL Special Tools" manual illustrates and lists the part numbers of all available model-related servicing tools as well as general-purpose tools for all machines.

STIHL®

Andreas Stihl
D-7050 Waiblingen

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1. SPECIFICATIONS

1.1	Engine	BR 320 / SR 320	BR 400 / SR 400
		STIHL single-cylinder two-stroke engine with special impregnated cylinder bore.	
Displacement:	44.9 cm ³ (2.74 cu.in)	56.5 cm ³ (3.45 cu.in)	
Bore:	41 mm (1.61 in)	46 mm (1.81 in)	
Stroke:	34 mm (1.34 in)	34 mm (1.34 in)	
Power output:	2.0 kW (2.7 bhp) at 6,700 rpm (BR 320)	3.5 kW (3.4 bhp) at 7,300 rpm (BR 400)	
Max. torque:	at 6,900 rpm (SR 320) 2.8 Nm (2.1 lb.ft) at 5,500 rpm	at 7,500 rpm (SR 400) 3.6 Nm (2.6 lb.ft) at 5,500 rpm	
Max. permissible engine speed:	Exact rpm limit cannot be given because power is constantly absorbed by the fanwheel.		
Crankshaft:	Two-part	Two-part	
Crankshaft bearings:	2 ball bearings	2 ball bearings	
Crankpin diameter:	16 mm (0.62 in)	16 mm (0.62 in)	
Big-end bearing:	Needle cage	Needle cage	
Conrod length:	62 mm (2.44 in)	62 mm (2.44 in)	
Piston pin dia.:	10 mm (0.39 in)	10 mm (0.39 in)	
Small-end bearing:	Needle cage	Needle cage	
Rewind starter:	Pawl system with automatic starter rope rewind	Pawl system with automatic starter rope rewind	
Starter rope:	3.5 mm (0.14 in) dia. x 960 mm (37.8 in)	3.5 mm (0.14 in) dia. x 960 mm (37.8 in)	
Crankcase leakage test at gauge pressure:	0.6 bar (8.7 psi)	0.6 bar (8.7 psi)	
under vacuum:	0.4 bar (5.8 psi)	0.4 bar (5.8 psi)	
Silencing:	Intake air silencer and exhaust muffler	Intake air silencer and exhaust muffler	

1.2 Fuel System

	BR 320 / SR 320	BR 400 / SR 400
Carburetor:	All position diaphragm carburetor with integral fuel pump	All position diaphragm carburetor with integral fuel pump
Adjustment: High speed adjusting screw H: Low speed adjusting screw L:	Back off approx. 1 turn Back off approx. 1 turn (Basic setting with screws initially moderately tight against their seats)	Back off approx. 1 turn Back off approx. 1 turn (Basic setting with screws initially moderately tight against their seats)
Carburetor leakage test at gauge pressure: Fuel tank capacity: Fuel mixture:	0.8 bar (11.6 psi) 1.5 l (53 fl.oz) Regular brand-name gasoline and brand-name two stroke engine oil	0.8 bar (11.6 bar) 1.5 l (53 fl.oz) Regular brand-name gasoline and brand-name two stroke engine oil
Mix ratio:	50:1 or 40:1 with STIHL two-stroke engine oil; 25:1 with other branded two-stroke, air-cooled engine oils	50:1 or 40:1 with STIHL two-stroke engine oil; 25:1 with other branded two-stroke, air-cooled engine oils
Air filter:	Foam element Paper filter cartridge (BR 320 only)	Foam element Paper filter cartridge (BR 400 only)

1.3 Ignition System

Type:	Electronic (breakerless) magneto ignition		
Air gap:	0.15-0.25 mm (0.006-0.010 in)	0.15-0.25 mm (0.006-0.010 in)	
Ignition timing:	2.2-2.9 mm (0.08-0.11 in) B.T.D.C. 26-30° B.T.D.C. at 7,000 rpm	2.2-2.9 mm (0.08-0.11 in) B.T.D. C. 26-30° B.T.D.C. at 7,000 rpm	
Ignition module:	Coil winding resistances Primary: 0.8-1.3 Ω	Secondary: 7.2-8.8 kΩ	Coil winding resistances Primary: 0.8-1.3 Ω
Secondary: 7.2-8.8 kΩ			
Spark plug (suppressed):	Bosch WSR 6 F		
Heat range:	200	200	
Electrode gap:	0.5 mm (0.020 in)	0.5 mm (0.020 in)	
Spark plug thread:	M14 x 1.25	M14 x 1.25	
Length of thread:	9.5 mm (0.37 in)	9.5 mm (0.37 in)	

1.4	Spraying Attachment	BR 320	BR 400	SR 320	SR 400
Air flow rate:		740 m ³ /h (435 cfm)	810 m ³ /h (476 cfm)	655 m ³ /h (385 cfm)	715 m ³ /h (420 cfm)
Air velocity:		72 m/s (236 ft/s)	80 m/s (262 ft/s)	92 m/s (302 ft/s)	101 m/s (330 ft/s)
Engine speed:		6,700 rpm	7,300 rpm	6,900 rpm	7,500 rpm
Container capacity:				14 l (3.7 USgal)	14 l (3.7 USgal)
Size of filler strainer mesh:				1 mm (3/64")	1 mm (3/64")
Liquid discharge rate (infinitely variable)					
without screen				0.25-3.6 l/min (1/2-7 1/2 pt/min)	
with screen				0.25-3.3 l/min (1 1/2-7 pt/min)	
Quantity left in container:				0.1 l (3 1/2 fl.oz)	
Spraying range:				10 m (33ft)	12 m (40ft)
Horizontal				9.5 m (31ft)	11.5 m (38ft)
Vertical					

1.5	Metering Unit	SR 320	SR 400
Discharge rate (without pressure pump and without screen) in metering knob position:			
1		0.25 l/min (0.5 pt/min)	0.25 l/min (0.5 pt/min)
2		0.8 l/min (1.7 pt/min)	0.8 l/min (1.7 pt/min)
3		1.65 l/min (3.5 pt/min)	1.65 l/min (3.5 pt/min)
4		2.4 l/min (5.1 pt/min)	2.4 l/min (5.1 pt/min)
5		3.1 l/min (6.5 pt/min)	3.1 l/min (6.5 pt/min)
6		3.6 l/min (7.5 pt/min)	3.6 l/min (7.5 pt/min)
Discharge rate (without pressure pump but with screen) in metering knob position:			
1		0.25 l/min (0.5 pt/min)	0.25 l/min (0.5 pt/min)
2		0.8 l/min (1.7 pt/min)	0.8 l/min (1.7 pt/min)
3		1.6 l/min (3.4 pt/min)	1.6 l/min (3.4 pt/min)
4		2.3 l/min (4.8 pt/min)	2.3 l/min (4.8 pt/min)
5		2.9 l/min (6.1 pt/min)	2.9 l/min (6.1 pt/min)
6		3.3 l/min (7.0 pt/min)	3.3 l/min (7.0 pt/min)
Discharge rate (with pressure pump) using metering nozzle:			
1		0.4 l/min (0.8 pt/min)	0.7 l/min (1.5 pt/min)
2		1.3 l/min (2.7 pt/min)	1.7 l/min (3.6 pt/min)
3		1.5 l/min (3.2 pt/min)	2.0 l/min (4.2 pt/min)

1.6 Weights

Dry powerhead, fuel tank
and container:

	BR 320	BR 400	SR 320	SR 400
Dry powerhead, fuel tank and container:	8.4 kg (18.5 lb)	8.4 kg (18.5 lb)	10.4 kg (22.9 lb)	10.4 kg (22.9 lb)

1.7 Special Accessories

Pressure pump kit (SR only)	4203 007 1000
Blower/mistblower conversion kit	4203 007 1001
Vacuum attachment	4203 007 1003
Spreading and dusting attachment	4203 000 1005
ULV rotary nozzle kit	4203 007 1010
Back padding	4203 790 8005
Hip belt	4203 710 9100
Repair kit	4203 900 5000

1.8 Tightening Torques

Fastener	Thread size	For component	Torque Nm	(lbf.ft)	Remarks
Spline screw	IS-M5x20	Crankcase	8.0	(5.9)	
Spline screw	IS-M5x20	Cylinder	8.0	(5.9)	
Hexagon nut	M8	Crankshaft (ign. end) (flywheel)	25.0	(18.5)	
		Crankshaft (starter end) (carrier)	25.0	(18.5)	
Spline screw	IS-M5x16	Fanwheel	8.0	(5.9)	
Spline screw	IS-M5x20	Starter cover	8.0	(5.9)	
Spline screw	IS-M5x25	Spacer flange	4.5	(3.3)	
Spline screw	IS-M5x48x22	Carb to air filter	4.5	(3.3)	
Spline screw	IS-M5x16	Air filter to crankcase	5.0	(3.7)	
Spline screw	IS-M5x20	Ignition module	8.0	(5.9)	
Spline screw	IS-M5x20	Fan casing to crankcase	8.0	(5.9)	
Spline screw	IS-M5x16	Heat shield to cylinder	5.0	(3.7)	
Spline screw	IS-M5x16	Muffler to crankcase	12.0	(8.8)	
Spline screw	IS-M5x72x35	Muffler to cylinder	12.0	(8.8)	
Spline screw	IS-M5x16	Throttle cable retainer to crankcase	4.0	(3.0)	
Spline screw	IS-P6x19	Throttle cable retainer to fan housing	4.0	(3.0)	
Spline screw	IS-P6x26.5	Two halves of fan housing	6.0	(4.4)	
Spline screw	IS-P6x19	Annular buffer to backplate	4.5	(3.3)	
Spline screw	IS-P6x26	Annular buffer to upper fan casing	6.0	(4.4)	
Spline screw	IS-P6x32.5	Annular buffer to lower fan casing	6.0	(4.4)	
Spark plug	M 14x1.25 9.5mm long	Starter cup	15.0	(11.0)	
			14.0	(10.3)	

2. TROUBLESHOOTING CHARTS

2.1 Engine

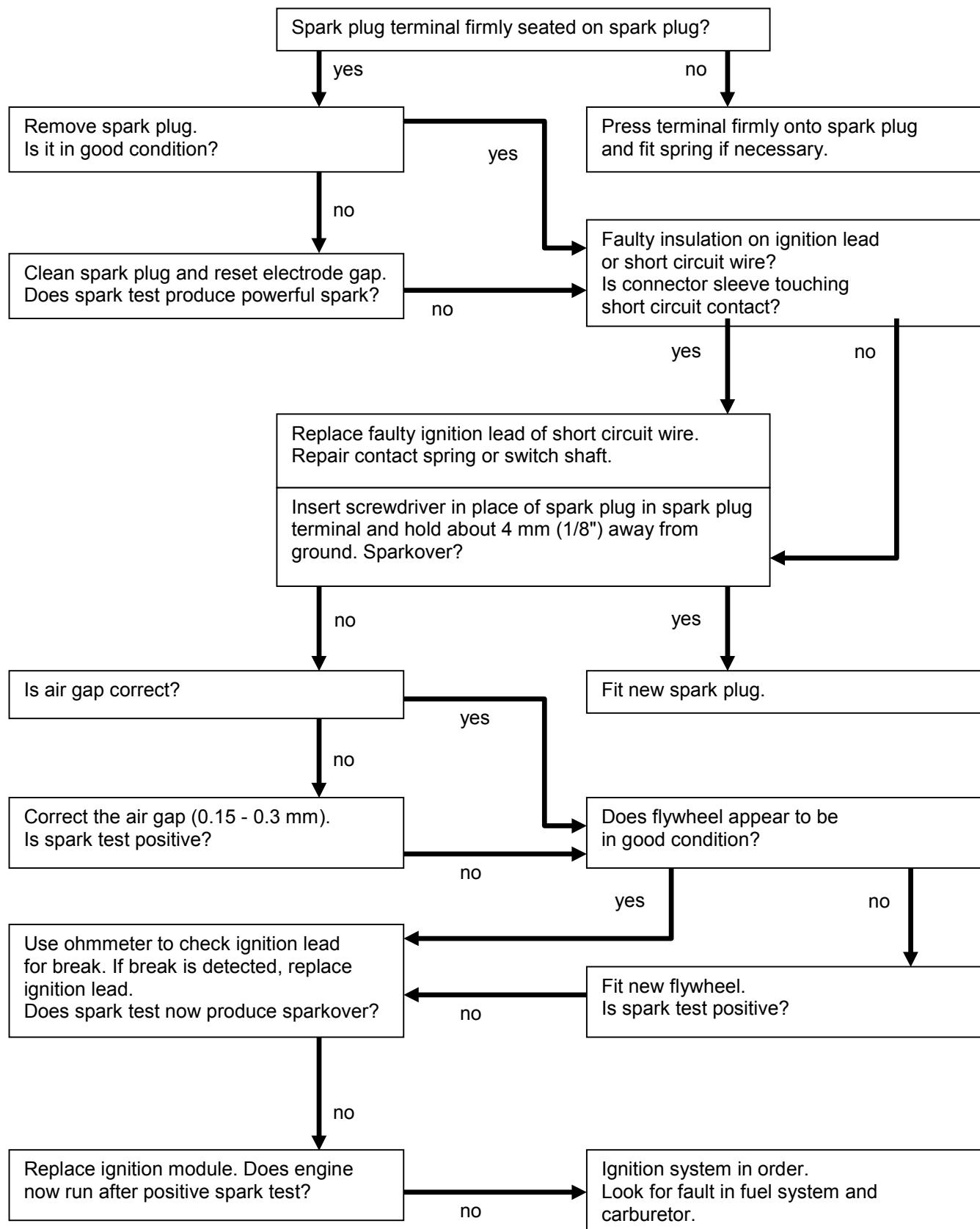
Always check and, if necessary, repair the following parts before looking for faults on the engine:

- Air filter
- Fuel system
- Carburetor
- Ignition system

Condition	Cause	Remedy
Engine does not start easily, stalls at idle speed, but operates normally at full throttle	Oil seals in crankcase leaking	Replace oil seals
	Spacer flange leaking	Seal or replace spacer flange
	Cylinder base gasket leaking	Replace gasket
	Crankcase damaged (cracks)	Replace crankcase
Engine does not deliver full power or runs erratically	Secondary air seepage through poorly mounted or faulty spacer flange or gaskets	Mount spacer flange correctly or replace, or replace gaskets
	Piston rings leaking or broken	Fit new piston rings
	Muffler carbonized	Clean muffler (inlet and exhaust)
Engine overheating	Insufficient cylinder cooling. Air inlets in fan housing blocked or cooling fins on cylinder very dirty	Thoroughly clean all cooling air openings

2.2 Ignition System

Warning: Exercise extreme caution while carrying out maintenance and repair work on the ignition system. The high voltages which occur can cause serious or fatal accidents!



2.3 Rewind Starter

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge - i.e. not vertically Normal wear	Fit new starter rope
		Fit new starter rope
Rewind spring broken	Spring overtensioned - no reserve when rope is fully extended	Fit new rewind spring
	Very dirty or corroded	Fit new rewind spring
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Fit new pawl
	Spring clip fatigued	Fit new spring clip
Starter rope is difficult to pull and rewinds very slowly	Starter mechanism is very dirty (dusty conditions)	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Apply a few drops of kerosine (paraffin) to spring, then pull rope carefully several times until normal action is restored

2.4 Fuel System

Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing. Foreign matter in valve seat or cone damaged	Remove and clean or replace inlet needle, clean fuel tank, pickup body and fuel line if necessary
	Inlet control lever sticking on spindle	Free off inlet control lever
	Helical spring not located on nipple of inlet control lever	Remove inlet control lever and refit correctly
	Perforated disc on diaphragm is deformed and presses constantly against inlet control lever	Fit new metering diaphragm
	Inlet control lever is too high (relative to design position)	Set inlet control lever flush with top of metering chamber face
Poor acceleration	Idle jet "too lean"	Back off low speed adjusting screw slightly (see carburetor adjustment)
	Main jet "too lean"	Back off high speed adjusting screw slightly (see carburetor adjustment)
	Inlet control lever is too low (relative to design position)	Set inlet control lever flush with top of metering chamber face
	Inlet needle sticking to valve seat	Remove inlet needle, clean and refit
	Connecting bore to atmosphere blocked	Clean bore
	Diaphragm gasket leaking	Fit new diaphragm gasket
	Metering diaphragm damaged or shrunk	Fit new metering diaphragm
Engine will not idle, idle speed too high	Throttle valve opened too far by idle speed adjusting screw	Reset idle speed adjusting screw correctly

Condition	Cause	Remedy
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean jet bores and ports and blow out with compressed air
	Idle jet "too rich"	Screw in low speed adjusting screw slightly (see carburetor adjustment)
	Setting of idle speed adjusting screw incorrect - throttle shutter completely closed	Set idle speed adjusting screw correctly
	Small plastic plate in valve jet does not close	Clean or renew valve jet
Engine speed drops quickly under load - low power	Air filter plugged	Clean air filter
	Tank vent faulty	Clean tank vent or replace if necessary
	Leak in fuel line between tank and fuel pump	Seal or renew connections and fuel line
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
	Main jet bores or ports blocked	Clean bores and ports
	Fuel pickup body dirty	Clean pickup body, fit new filter
	Fuel strainers dirty	Clean fuel strainers

See also 2.1

3. ENGINE

3.1 Removing and Refitting Exhaust Muffler

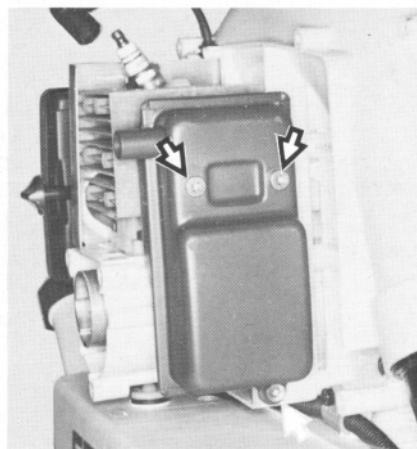
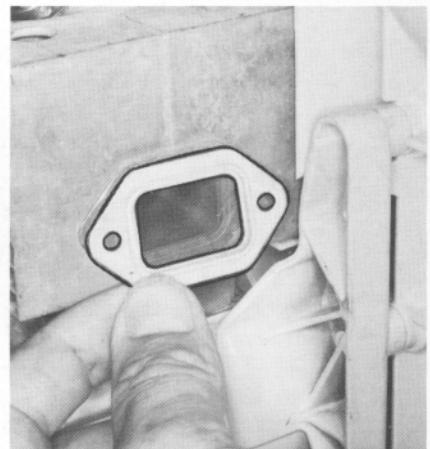
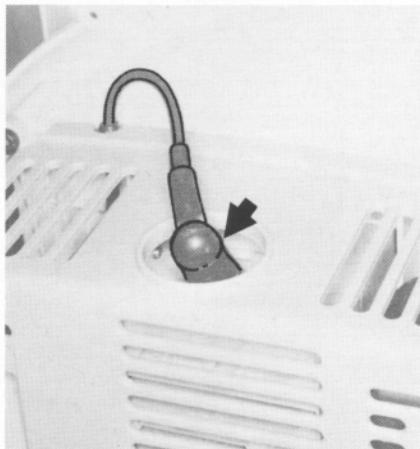
Top:
Spark plug terminal

Bottom:
Starter cover mounting screws

Top:
Shroud mounting screws
(fourth screw hidden in this view)

Bottom: Muffler mounting screws

Removing exhaust gasket



- Remove the exhaust gasket.

Reassemble in the reverse sequence.

Note: Fit a new exhaust gasket. Tighten the muffler screws to 12 Nm (8.8 lbf.ft) and the starter cover screws to 8 Nm (5.9 lbf.ft).

Troubleshooting chart - see 2.1.

- Pull the terminal off the spark plug.
- Take out the starter cover mounting screws and lift away the starter cover.
- Take out the shroud mounting screws and lift the shroud away.
- Take out the muffler mounting screws. Remove the muffler.

3.2 Exposing the Cylinder

Top:
Support frame with container

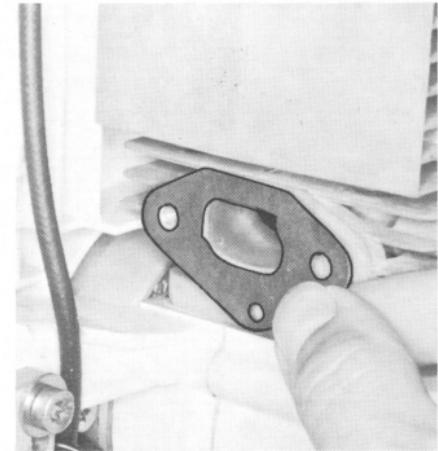
Bottom:
Spark plug

Top:
Screws on spacer flange

Bottom:
Removing gasket

Top:
Heat shield mounting screw

Bottom:
Removing gasket



Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

Troubleshooting chart - see 2.1.

- Disassemble the support frame and container from models SR 320/400 – see 9.1.
- Remove the carburetor - see 8.2.
- Remove the exhaust muffler - see 3.1.
- Unscrew the spark plug.

- Take out the spacer flange mounting screws. Remove the spacer flange.
- Remove gasket from spacer flange.

- Take out the heat shield mounting screw. Lift away the heat shield.
- Remove gasket from cylinder.

Reassemble in the reverse sequence.

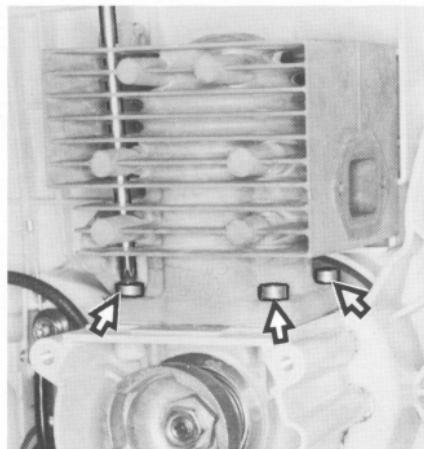
Note: Fit new gaskets. Tighten the screw on the heat shield to 5 Nm (3.7 lbf.ft) and the screws on the spacer flange to 4.5 Nm (3.3 lbf.ft).

3.3 Cylinder and Piston

3.3.1 Removal

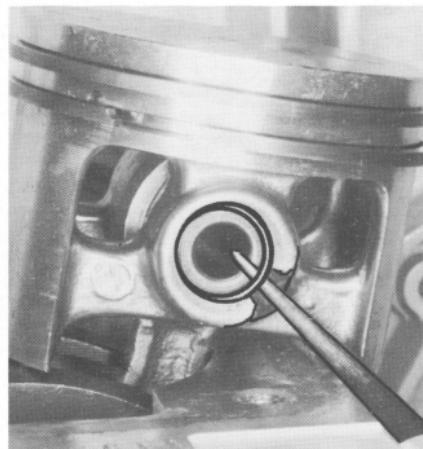
Top:
Cylinder base screws
(fourth screw hidden in this view)

Bottom:
Removing cylinder gasket



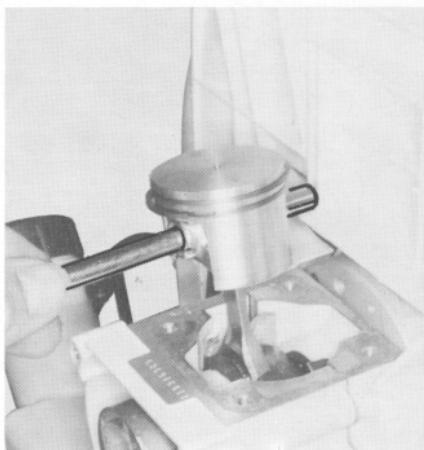
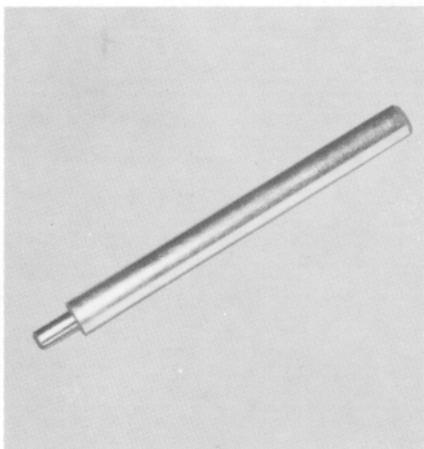
Top:
Prying out snap ring
(BR/SR 400)

Bottom:
Prying out snap ring
(BR/SR 320)



Top:
Assembly drift 1110 893 4700

Bottom:
Pushing out piston pin
(BR/SR 400)



For preparations see 3.2.

- Unscrew the cylinder base screws through the throughholes in the cylinder and then pull the cylinder off the piston.
- Inspect the cylinder and replace it if necessary.
- Remove the cylinder gasket.

Important: Before removing the piston, decide whether or not the crankshaft has to be removed as well. To remove the starter cup and the flywheel nut, block the crankshaft by sliding the wooden assembly block between the piston and crankcase.

Use a scribe or similar tool to ease the hookless snap rings out of the grooves in the piston bosses.

- Now use the assembly drift to push the piston pin out of the piston. If the piston pin is stuck, tap the end of the drift **lightly** with a hammer if necessary.
- Important:** Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.
- Remove the piston and take the needle cage out of the connecting rod.

3.3.2 Installation

Top:
Piston rings (BR/SR 400)

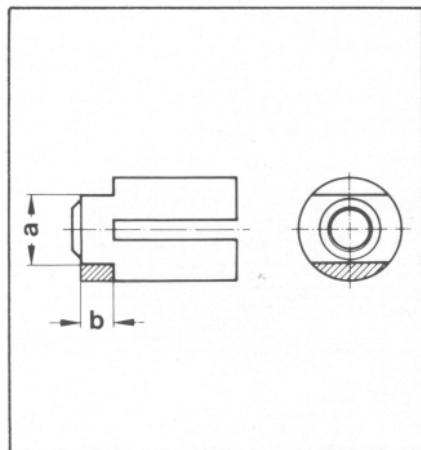
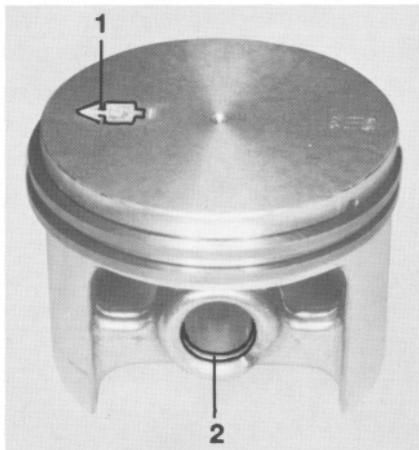
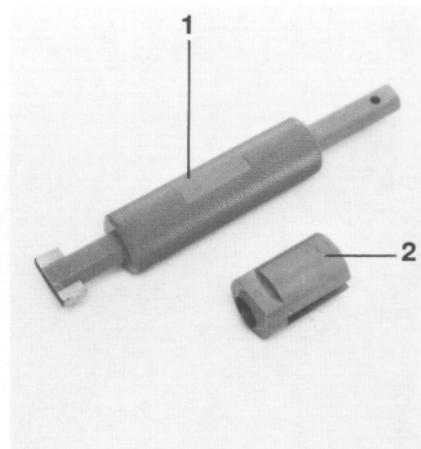
Bottom:
Piston rings (BR/SR 320)

Top:
Needle cage in small end

Bottom:
1 = Arrow on piston head
2 = Snap ring

Top:
1 = Installing tool 5910 890 2210
2 = Sleeve

Bottom:
Modified sleeve
a = 17 mm (11/16")
b = 8 mm (5/16")



- Inspect piston rings and replace if necessary - see 3.4.

- Thoroughly clean the gasket seating surface on the cylinder. Lubricate the needle cage with oil and fit it in the small end.
- Fit snap ring in the forward facing piston boss (arrow on piston head pointing to the left).

Note: Fit the snap ring with special installing tool 5910 890 2210.

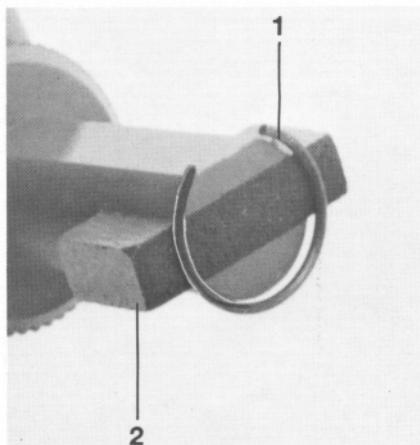
Owing to the special shape of the BR/SR 320 piston it is necessary to modify the sleeve of the installing tool as shown in the illustration.

Use the installing tool as follows:

- Remove the sleeve from the tool.

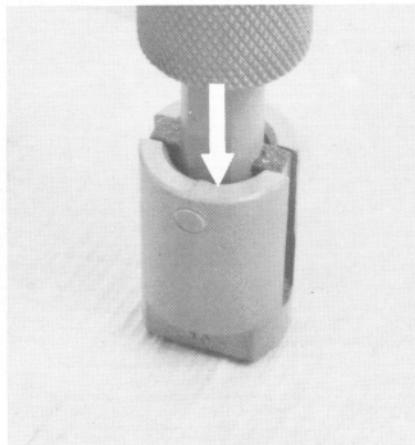
Top:
1 = Snap ring (hookless)
2 = Magnet

Bottom:
1 = Flat on end of shank
2 = Pin



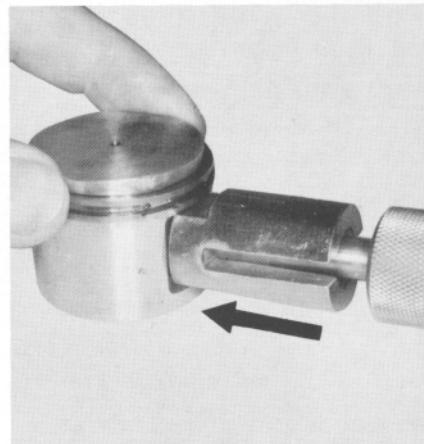
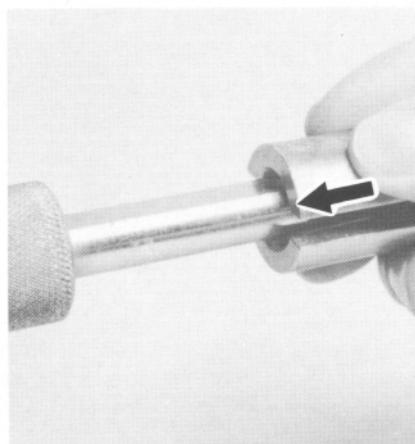
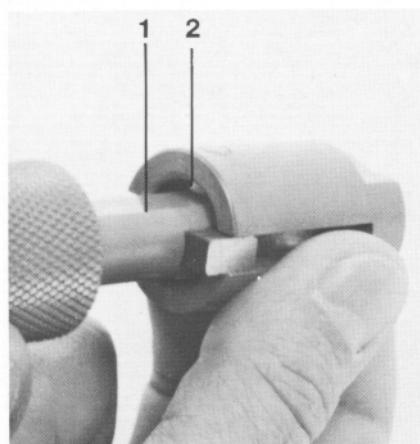
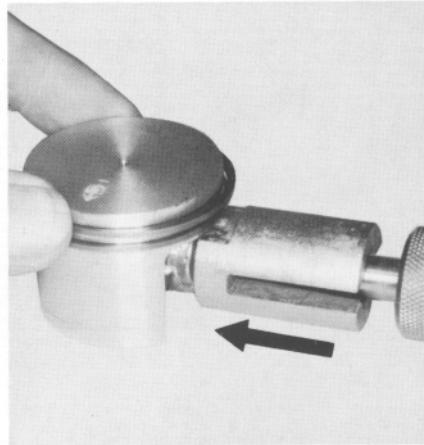
Top:
Pushing installing tool into sleeve as far as stop

Bottom:
Slipping sleeve onto other end of shank



Top:
Inserting snap ring in piston boss (BR/SR 400)

Bottom:
Inserting snap ring in piston boss (BR/SR 320)



- Attach the hookless snap ring to the magnet so that the snap ring gap is on the flat side of the tool's shank (see top illustration).
- Push the slotted diameter of the sleeve over the magnet and snap ring so that the inner pin slides on the flat face of the tool's shank.

- Stand the installing tool, sleeve downward, on a flat surface (wooden board) and press vertically downwards until the sleeve butts against the tool's shoulder.
- Remove the sleeve and slip it onto the other end of the shank.

Note: Pin must point toward flat face of tool's shank.

- Apply the installing tool to the piston boss (flat face on shank must point toward piston head on BR/SR 400), hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

Note: The snap ring must be fitted so that the ring gap is on the piston's vertical axis (it must point either up or down).

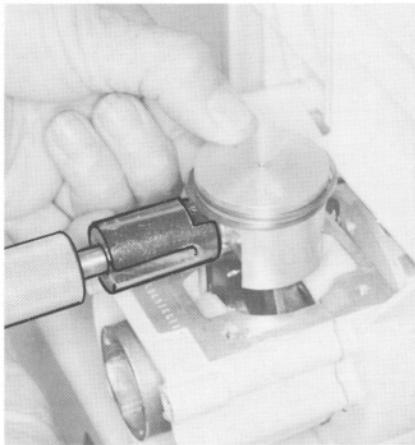
Top:
Arrow on piston head points toward muffler

Bottom:
Installing the piston pin



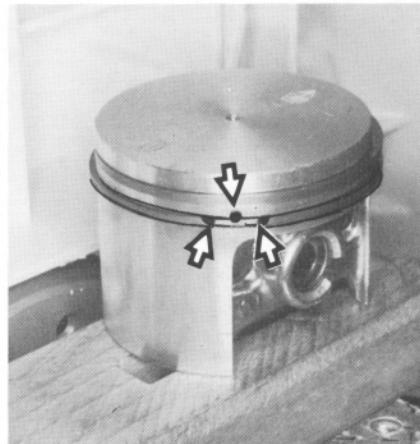
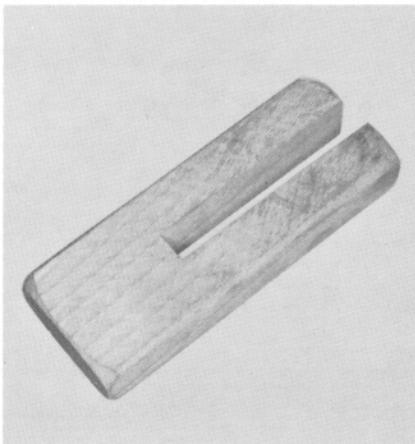
Top:
Inserting snap ring with installing tool
5910 890 2210

Bottom:
Wooden assembly block
1108 893 4800



Top:
Piston resting on wooden assembly block

Bottom:
Piston ring correctly positioned



- Heat the piston on an electric heating plate to approx. 60 °C (140 °F) and slip it over the connecting rod so that the arrow on the piston head points toward the muffler.

- Use the assembly drift to push the piston pin into the piston and needle bearing (the piston pin slides home easily when the piston is hot).

- Use the installing tool 5910 890 2210 to fit the snap ring in the piston boss.

Note: The piston ring must be fitted so that the ring gap is on the piston's vertical axis (it must point either up or down).

- Fit the cylinder gasket.

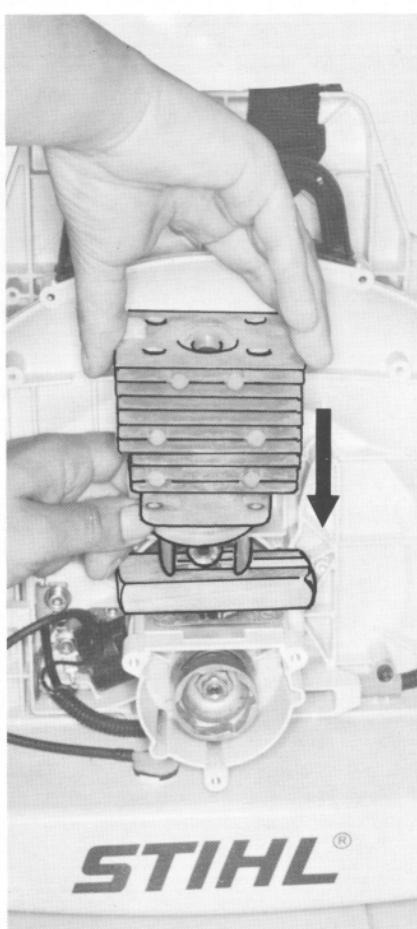
- Lubricate the piston and piston rings with oil and rest the piston on the wooden assembly block.

- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove when the rings are compressed.

Top:
Clamping strap 0000 893 2600

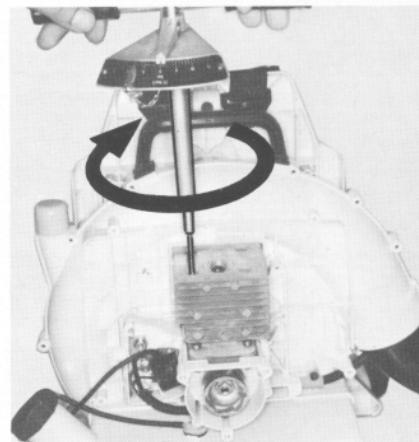
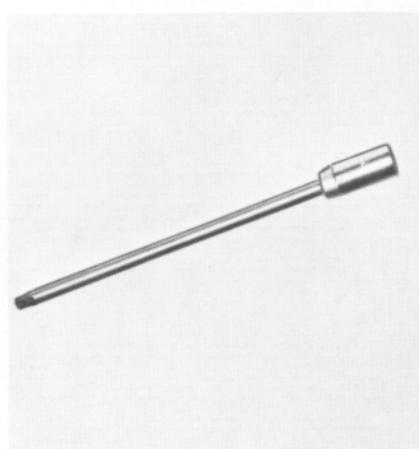
Bottom: Compressing piston rings
with the clamping strap

Fitting aligned cylinder over the piston



Top:
Spline screwdriver bit 0812 542 2104

Bottom:
Tightening the cylinder base screws



- Use the clamping strap to compress the piston rings around the piston (check again to see that they are correctly positioned).

- Lubricate the inside of the cylinder with oil and line it up so that it is positioned exactly as it will be in the installed condition (see illustration). If this point is not observed, the piston rings may break.

- Now slide the cylinder over the piston - the clamping strap is pushed downward as the piston rings slip into the cylinder.

- Remove the clamping strap and wooden assembly block and carefully line up the cylinder and gasket. Fit the cylinder base screws and tighten them down to a torque load of 8.0 Nm (5.9 lbf.ft).

Assembly is now a reversal of the disassembly sequence.

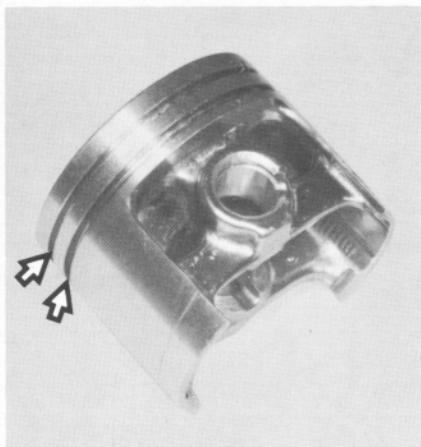
3.4 Piston Rings

3.5 Crankcase

3.5.1 Removing the Crankshaft

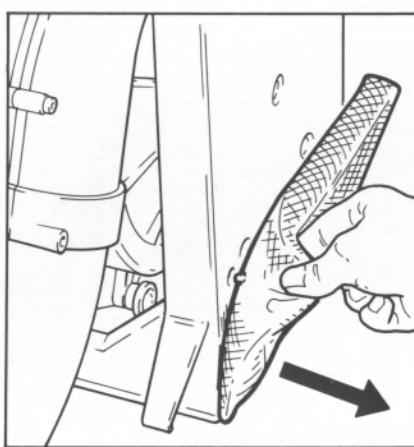
Top:
Piston ring grooves

Bottom:
Fitting piston ring



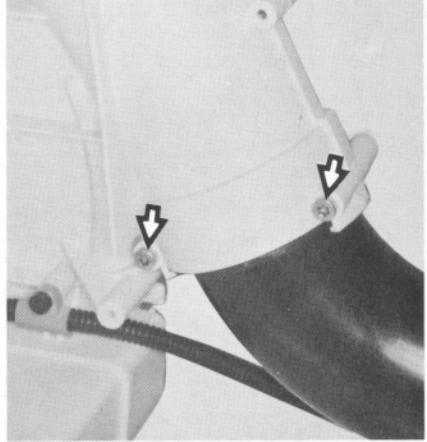
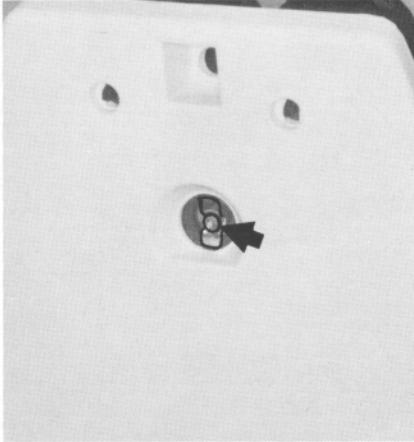
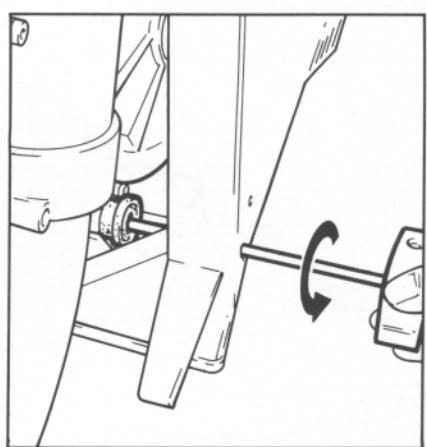
Top:
Removing back padding

Bottom:
Mounting screw of upper annular buffer



Top:
Removing screw from lower annular buffer

Bottom:
Screws on elbow



- Remove the piston - see 3.3.1.
- Remove rings from piston.
- Use a piece of an old piston ring to scrape the grooves clean.
- Install the new piston rings in the grooves so that the radii at the ring gap face upward.
- Install the piston - see 3.3.2.

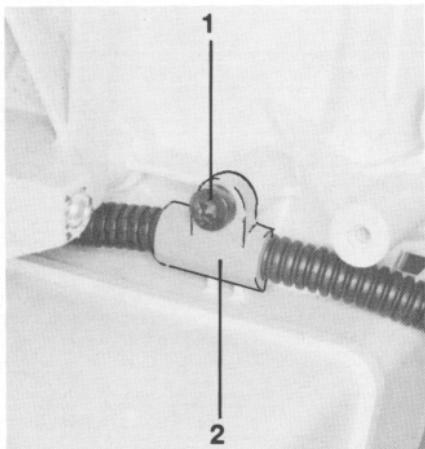
- Remove the cylinder - see 3.3.1 – and use the wooden assembly block to fix the piston in position.
- Pull the press studs out of the backplate and remove the back padding.
- Remove the mounting screw from the upper annular buffer.

- Remove the mounting screws from the lower annular buffers and take away the backplate.
- Remove the elbow fastening screws and pull the elbow out of the stub.

Note: The nuts will drop out of the stub when the fastening screws are removed.

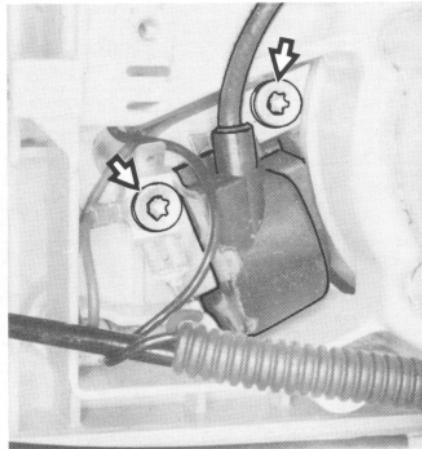
Top:
1 = Mounting screw
2 = Retainer

Bottom:
1 = Mounting screw
2 = Clamp



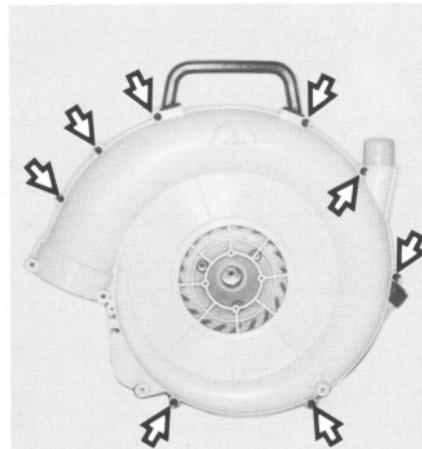
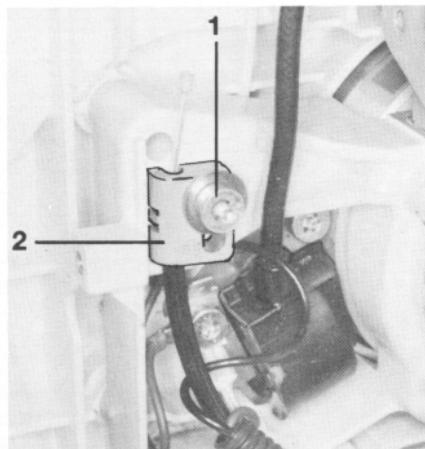
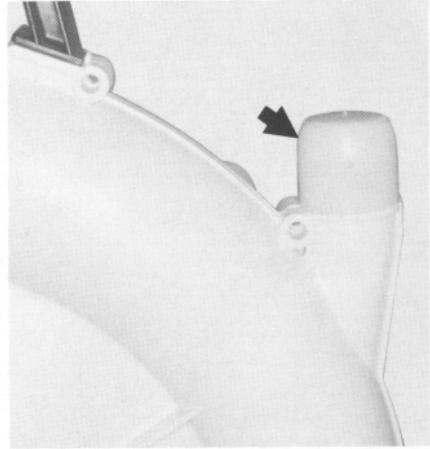
Top:
Ignition module mounting screws

Bottom:
Fan casing mounting screws



Top:
Cap

Bottom:
Removing handle (BR 320/BR 400)



- Remove screw from throttle cable retainer. Lift away the retainer.
- Remove screw from clamp. Lift away the clamp.

- Take out the ignition module mounting screws. Remove the ignition module.
- Remove the mounting screws from the outer fan casing, pull off the cap (BR 320/400 only) and then lift away the casing.

- Pull the handle out of the fan casing.

Top:
Fanwheel mounting screws

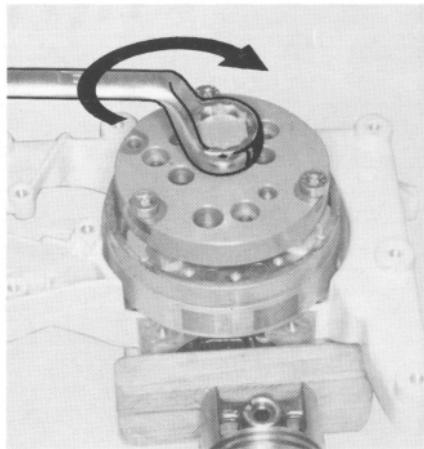
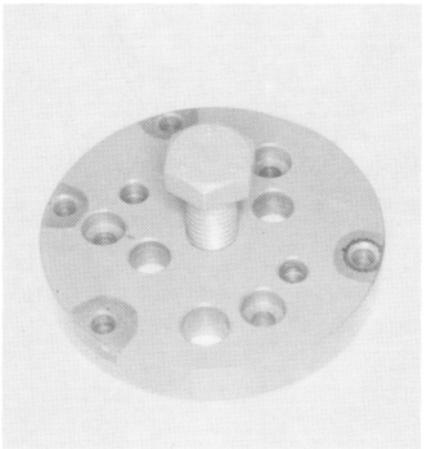
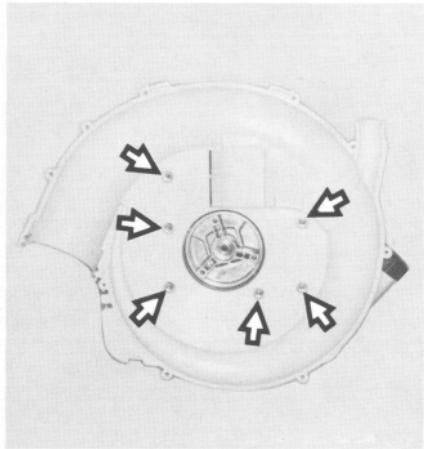
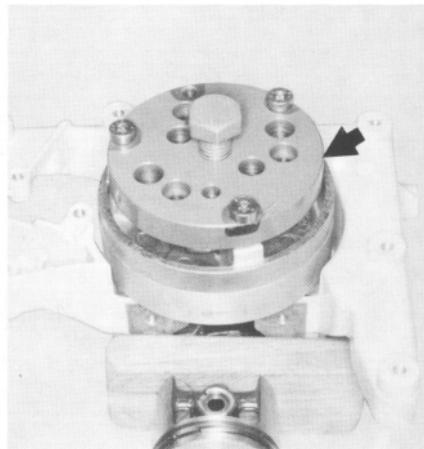
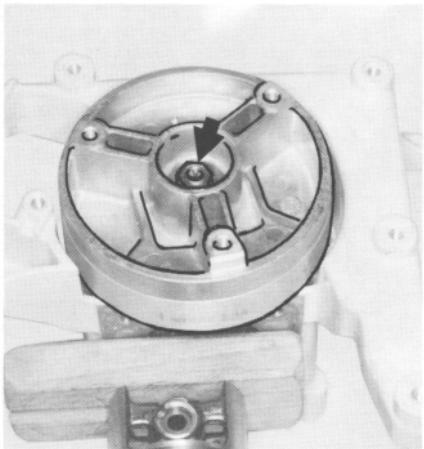
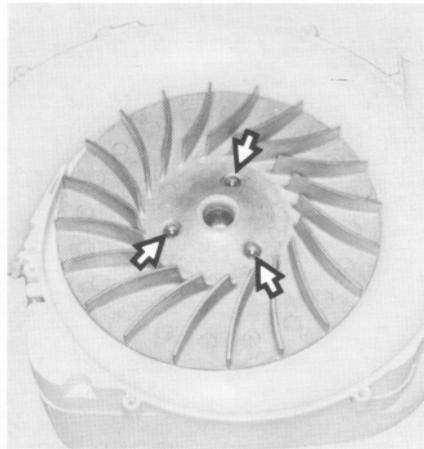
Bottom:
Fan casing mounting screws

Top:
Flywheel mounting nut

Bottom:
Puller 4119 890 4500

Top:
Puller fitted to flywheel

Bottom:
Removing the flywheel



- Unscrew the fanwheel mounting screws and remove the fanwheel.
- Unscrew the fan casing mounting screws and remove the fan casing.

- Unscrew the flywheel mounting nut from the crankshaft.

- Use the fanwheel mounting screws to attach the puller to the flywheel.
- Pull the flywheel off the crankshaft.

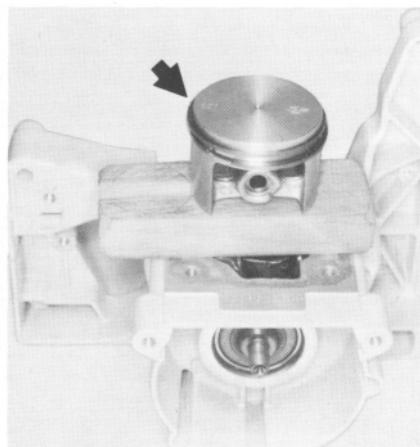
Top:
Woodruff key for flywheel

Bottom:
1 = Starter cup
2 = Locknut



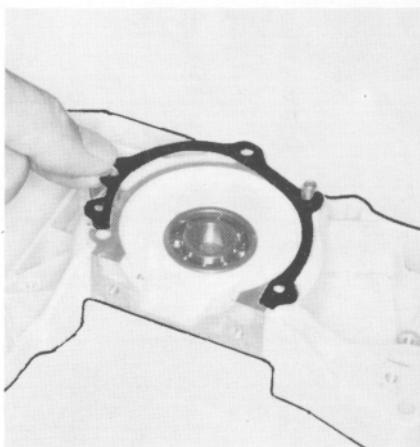
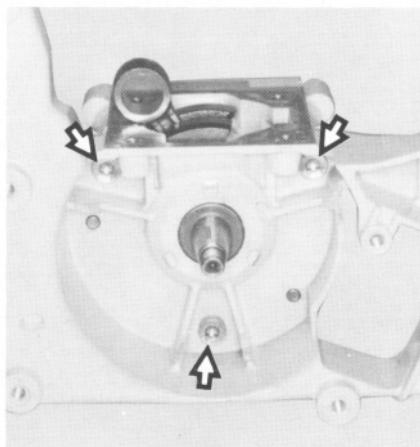
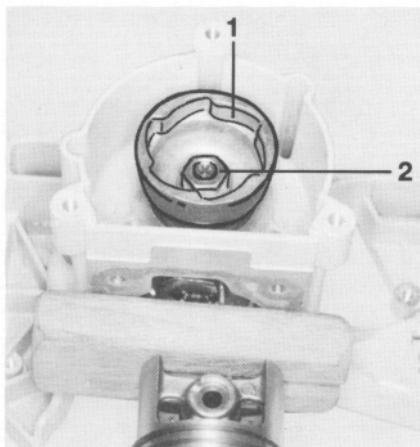
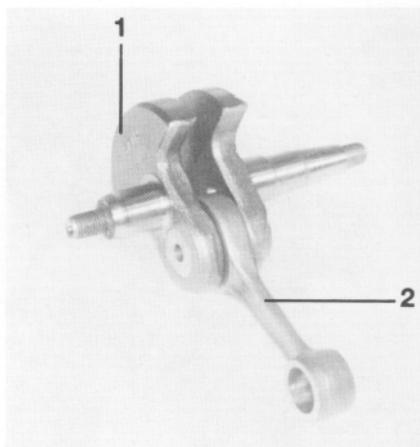
Top:
Piston resting on wooden assembly block

Bottom:
Crankcase mounting screws



Top:
1 = Crankshaft
2 = Connecting rod

Bottom:
Removing crankcase gasket



- Take the Woodruff key out of the slot in the crankshaft stub.
- Remove the locknut from the starter cup and then unscrew the starter cup from the crankshaft.
- Remove the piston - see 3.3.1.
- Unscrew the mounting screws which join the two halves of the crankcase.

- Fit special removing tool, see 10.1, to the crankcase and press out the crankshaft.

Note: If the special removing tool is not available, hold the crankcase half concerned and use a plastic mallet to gently knock the crankshaft out of its bearings. This separates the crankcase at the same.

The crankshaft, connecting rod and needle bearing form an inseparable unit. This means that the crankshaft must always be replaced as a complete unit in the event of damage to any one of these parts. When fitting a replacement crank-shaft always install new oil seals and ball bearings.

- Remove the gasket from the crankcase sealing face.

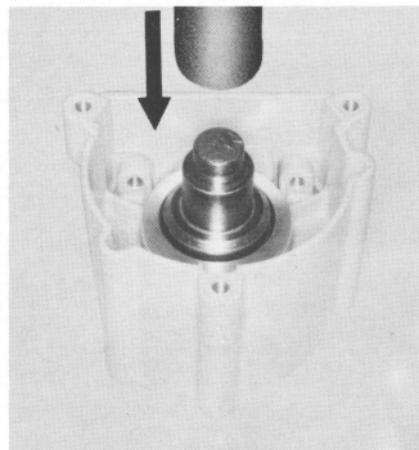
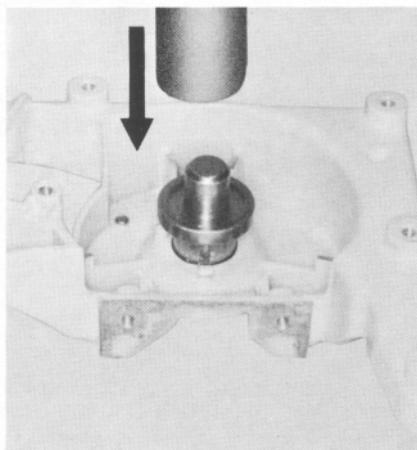
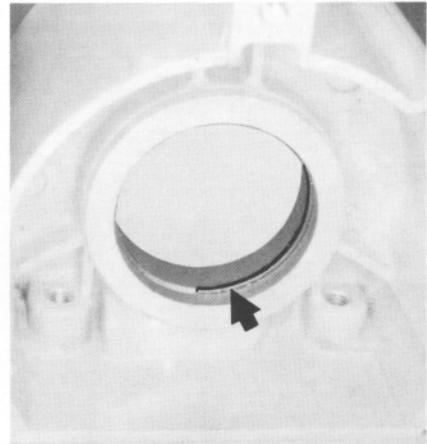
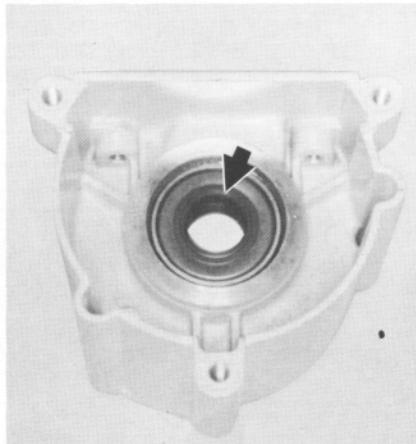
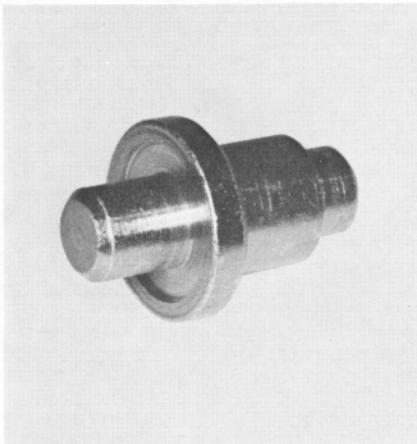
Top:
Press arbor 1118 893 7200

Bottom:
Pressing out ball bearing

Top:
Oil seal

Bottom:
Pressing out ball bearing

Snap ring in crankcase



- Pry the oil seal out of its seat at the ignition side.
- Use arbor to press the ball bearing out of its seat at the ignition side.

- Pry the oil seal out of the ball bearing.
- Use arbor to press the ball bearing out of its seat at the starter side.

- If necessary, remove the snap ring from the crankcase.

- Inspect the two halves of the crankcase for cracks and replace if necessary.

Note: The crankcase must be replaced as a complete unit even if only one half is damaged.

All other parts which are still serviceable can then be transferred to the new crankcase after the new bearings have been fitted, i.e. the crankcase has to be heated for this purpose.

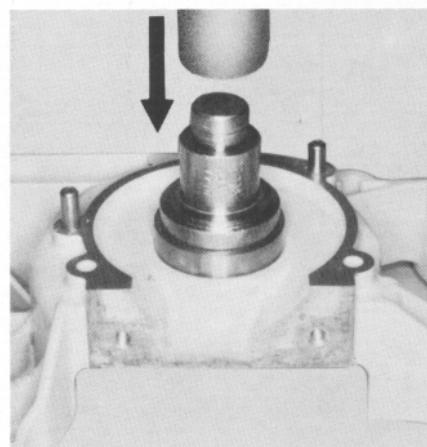
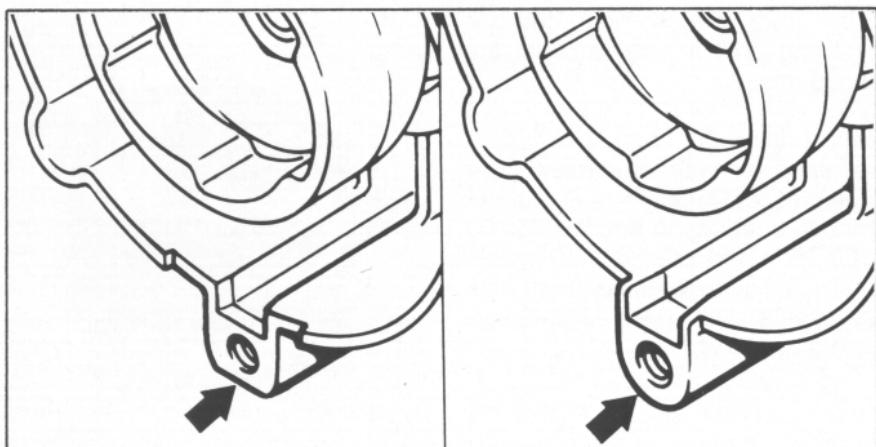
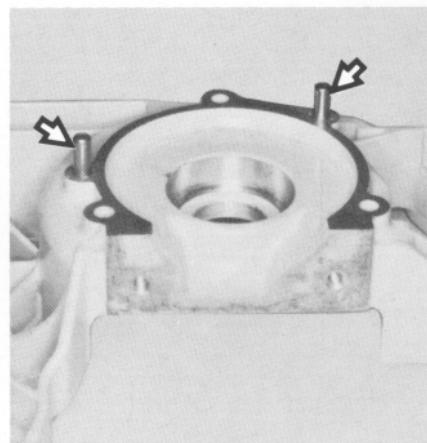
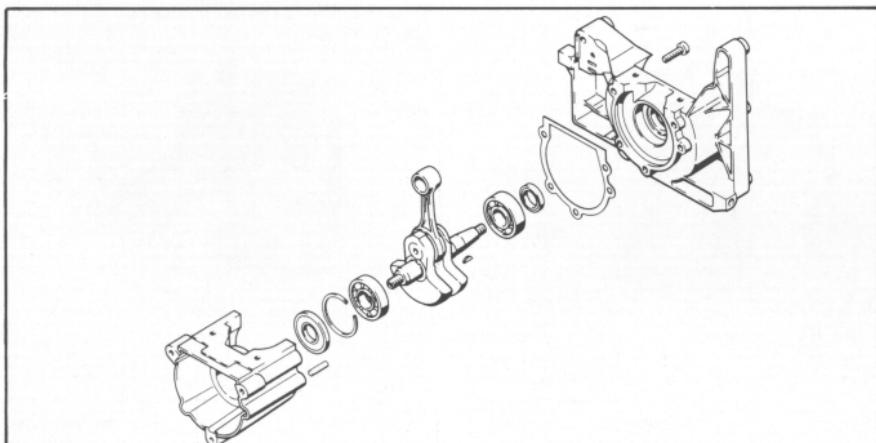
3.5.2 Installing the Crankshaft

Top:
Crankcase in correct assembly sequence

Bottom:
Left = crankcase with original mounting boss
Right = crankcase with modified mounting boss

Top:
Dowel pins

Bottom:
Installing ball bearing in ignition side of
crankcase



If the original crankcase is used again, remove the gasket residue and clean the mating surfaces - they must be cleaned very thoroughly to ensure a perfect seal.

Early production machines have a spacer washer between the starter mechanism and crankcase. Replacement crankcases and later production crankcases have a modified mounting boss for the starter mechanism and do not require a spacer washer.

The spacer washer must be refitted if nothing is changed on the crankcase of an early production machine.

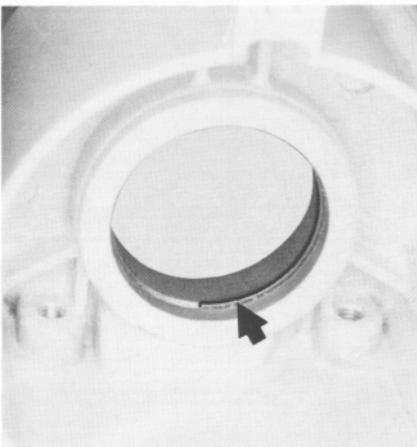
Note: If you install a new crankcase, stamp the machine number on the crankcase with 2.5 mm (0.1") figure stamps.

- Check that the dowel pins are in position or fit them in the new crankcase.

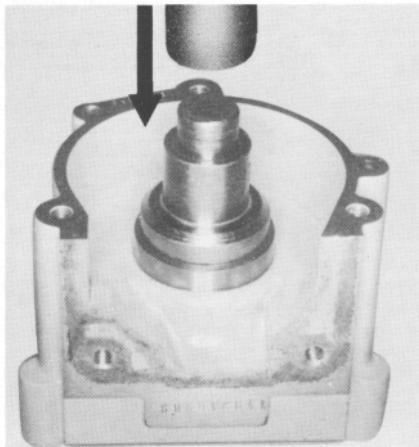
- Use arbor to press home the ball bearing as far as stop.

Top: Snap ring in crankcase

Bottom:
Positioning ball bearing at starter side
of crankcase

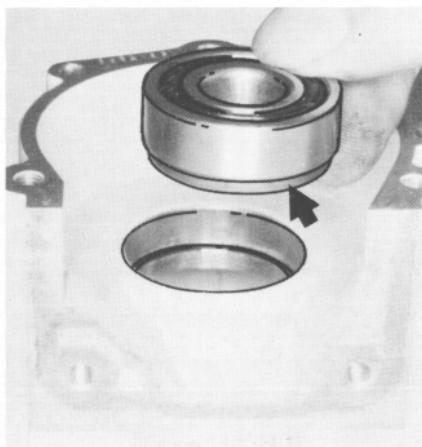
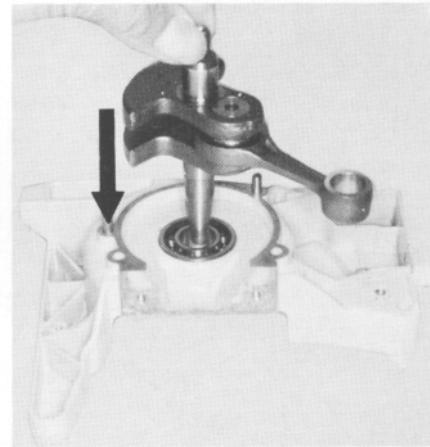


Pressing in ball bearing



Top:
Fitting crankshaft

Bottom:
Fitting crankcase gasket

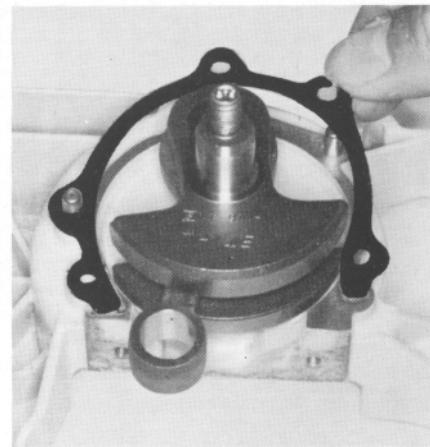


- Use arbor to press home the ball bearing until it butts against the snap ring.

Before fitting the crankshaft, use a soldering iron with a suitable copper attachment to heat the inner races of the ball bearings to approx. 150 °C (300 °F). This enables the crankshaft to be fitted in the bearings without special tools, even if tolerances are unfavorable.

- Refit the snap, if it was removed, in its groove in the starter side of the crankcase.

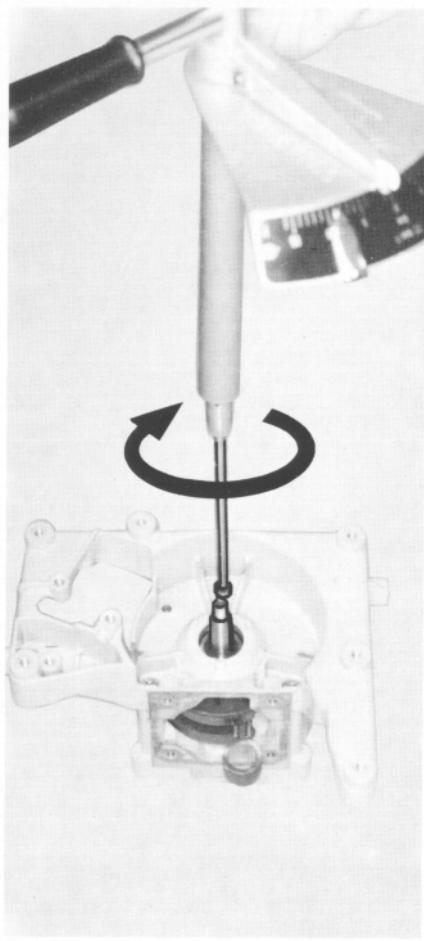
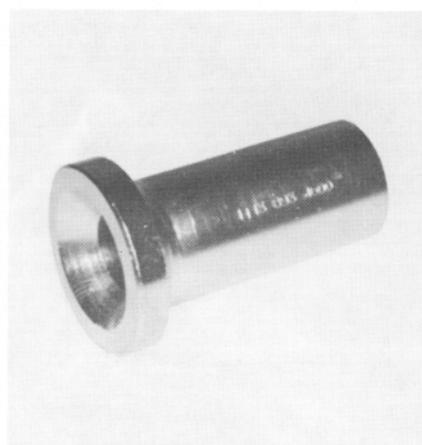
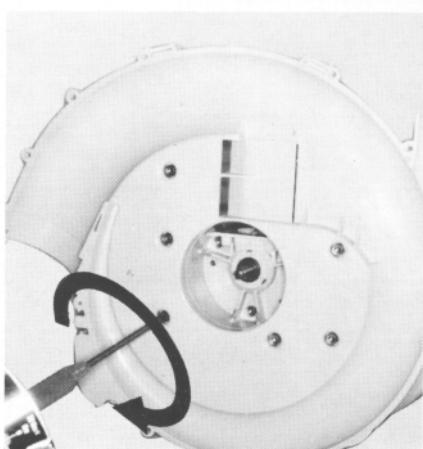
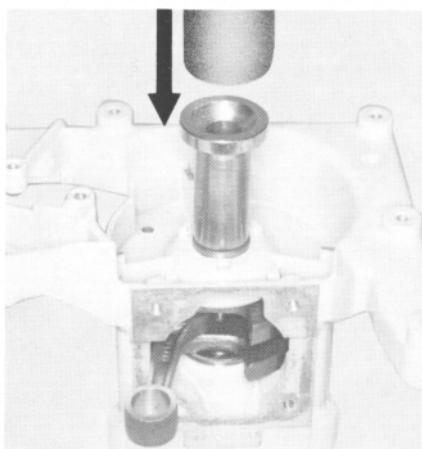
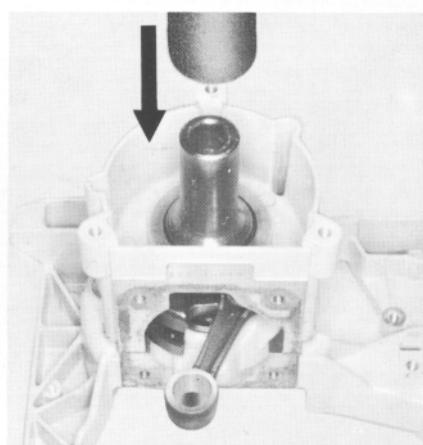
- Position the ball bearing so that its shoulder points toward the snap ring.



- Now slide the tapered stub of the crankshaft quickly into the bearing at the ignition side of the crankcase.

- Fit a new gasket on the crankcase sealing face.

Tightening crankcase mounting screws

Top:
Press sleeve 1113 893 4600Bottom:
Pressing home oil seal at ignition sideTop:
Pressing home oil seal at starter sideBottom:
Tightening fan casing mounting screws

- Heat the ball bearing inner race to approx. 150 °C (300 °F) and then slip the starter half of the crankcase quickly over the straight stub of the crankshaft. Insert mounting screws and tighten them down to a torque of 8.0 Nm (5.9 lbf.ft).

Note: Any excess gasket material on the cylinder mounting face must be trimmed away. If the crankshaft does not turn freely, it is sufficient to tap the end of the stub with a plastic mallet to relieve axial stresses.

- Coat sealing lips of the oil seals with lubricating grease - see 10.2.
- Push the oil seal over the crankshaft stub (the open side of the seal must face the crankcase) and use the press sleeve to press it home until it is flush with the crankcase.

- Push the oil seal over the spacer bushing (the open side of the seal must face the crankcase) and use the press sleeve to press it fully home.
- Place the fan casing in position, insert and tighten down the mounting screws to a torque of 8 Nm (5.9 lbf.ft).

Assembly of the remaining parts is a reversal of the disassembly sequence.

3.6 Leakage Testing the Crankcase

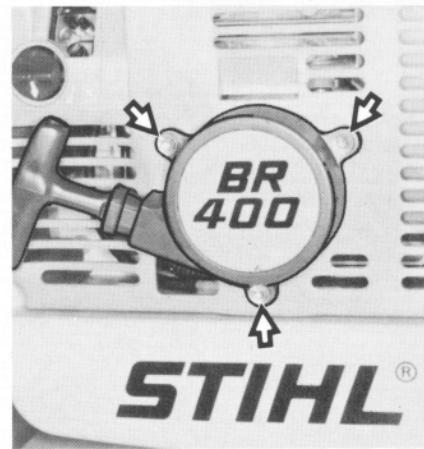
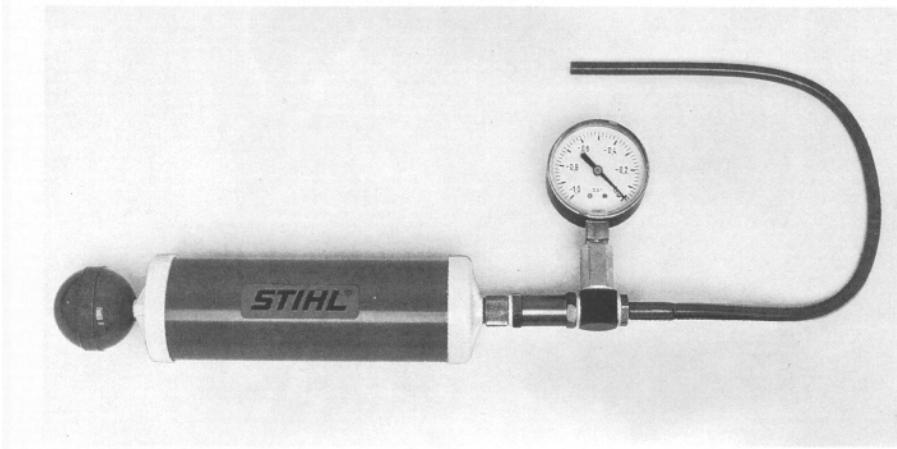
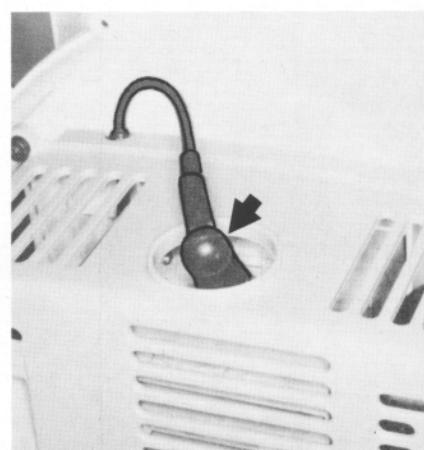
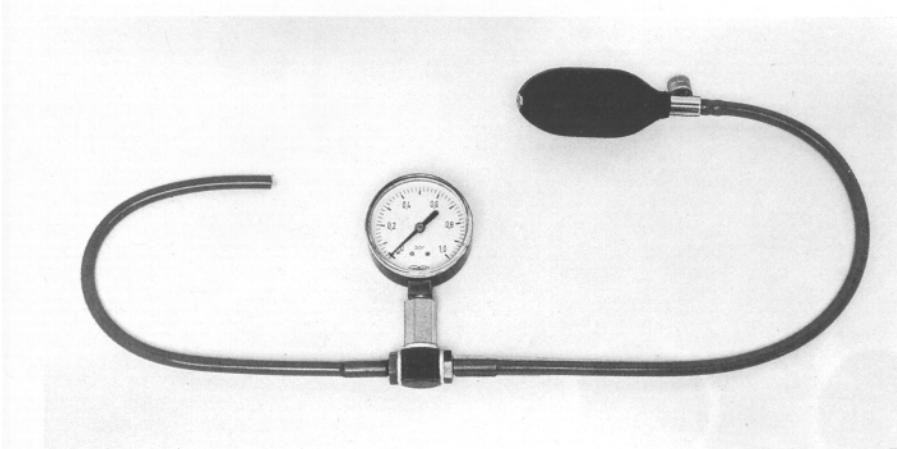
3.6.1 Pressure Test

Top:
Carburetor and crankcase tester
1106 850 2905

Bottom:
Vacuum pump 0000 850 3500

Top:
Spark plug terminal

Bottom:
Starter cover mounting screws



Defective oil seals and gaskets or cracks in castings are the usual causes of leaks. Such faults allow supplementary air to enter the engine and thus upset the fuel-air mixture.

This makes adjustment of the prescribed idle speed difficult, if not impossible.

Moreover, the transition from idle speed to part or full throttle is not smooth.

The crankcase can be checked accurately for leaks with the carburetor and crankcase tester and the vacuum pump.

- Pull the terminal off the spark plug.
- Remove the starter cover mounting screws and lift away the starter cover.

Top:
Shroud mounting screws
(fourth screw hidden in this view)

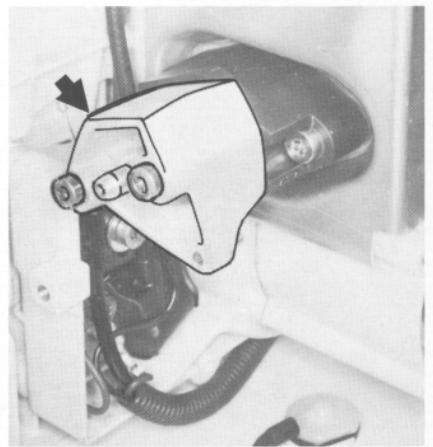
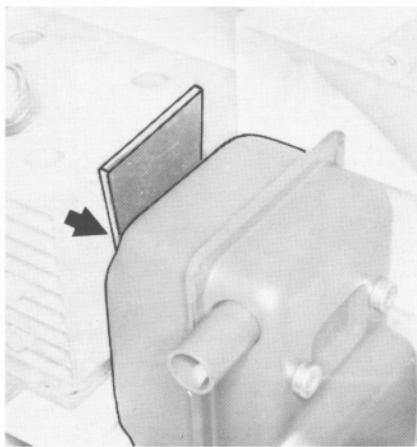
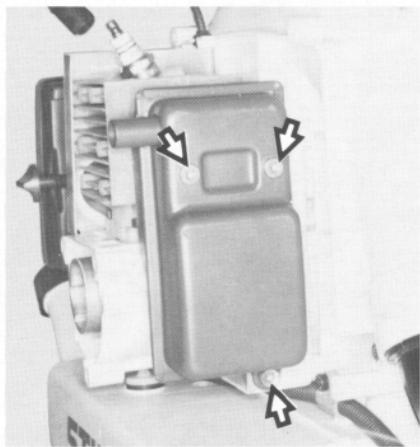
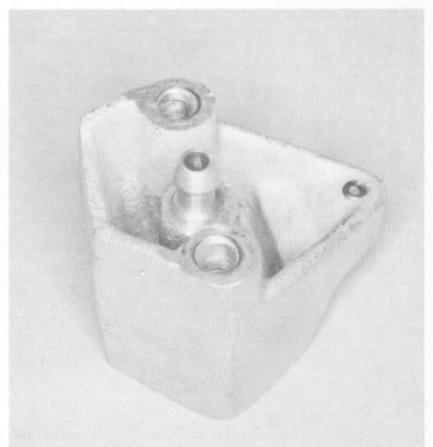
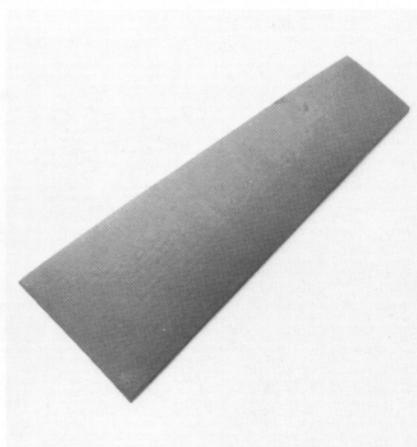
Bottom:
Muffler mounting screws

Top:
Sealing plate 0000 855 8105

Bottom:
Sealing plate fitted in position

Top:
Test flange 1118 850 4200

Bottom:
Test flange fitted in position



- Take out the shroud mounting screws.
Remove the shroud.

- Slacken off the muffler mounting screws about half way.

- Slide the sealing plate between the muffler and the cylinder exhaust port. Retighten the mounting screws moderately.

Note: The sealing plate must completely fill the space between the two mounting screws. Push the narrow end of the sealing plate home until it just locates under the muffler.

- Remove the carburetor - see 8.2.

- Set the piston to top dead center (T.D.C.). This can be checked through the inlet port.

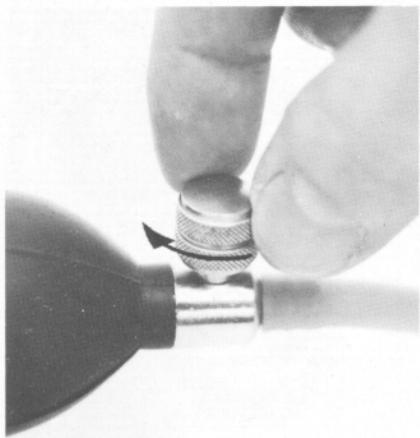
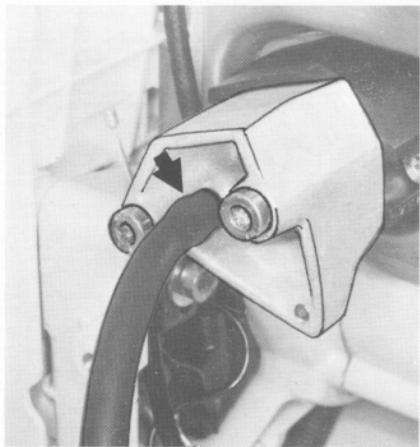
- Fit the test flange in place of the carburetor.

Important: Make sure the gasket is fitted between the test flange and spacer flange.

Top:
Tester's pressure hose fitted on test
flange nipple

Bottom:
Closing the vent screw

Pressure-testing the crankcase



- Connect tester's pressure hose to nipple on test flange.
- Make sure the spark plug is properly tightened down before starting the test.
- Close the vent screw on the rubber bulb.
- Pump air into the crankcase until the gauge indicates a pressure of 0.6 bar (8.7 psi). If this pressure remains constant for at least 20 seconds, the crankcase is airtight. However, if the indicated pressure drops, the leak must be located and the faulty part replaced.

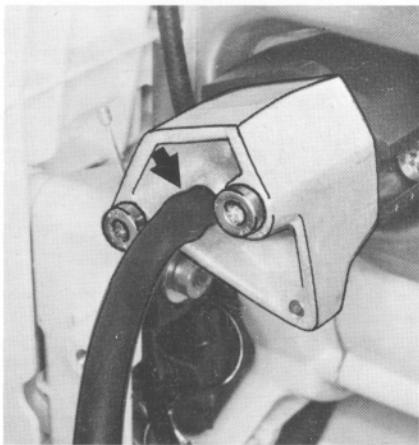
Note: Coat the suspect area with oil and pressurize the crankcase again. If bubbles appear in the oiled area, replace the faulty part.

- Now carry out the vacuum test - see 3.6.2.
- After finishing the test, open the vent screw and disconnect the hose.

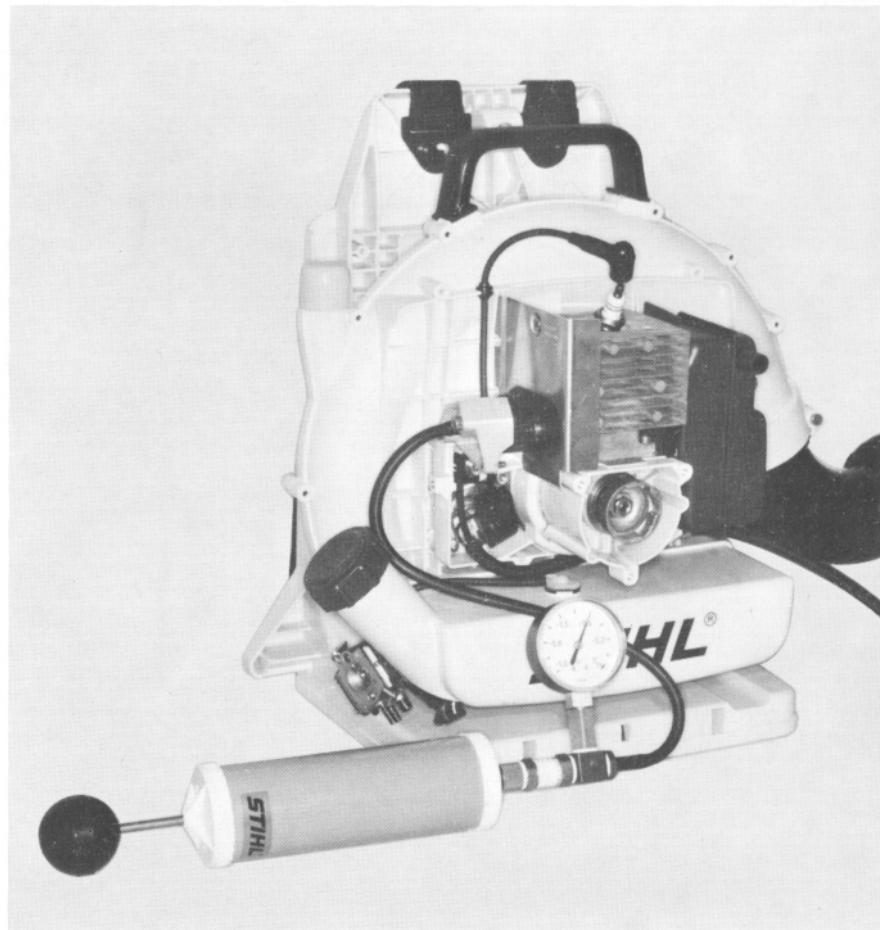
- Remove the test flange and refit the carburetor - see 8.2.
- Slacken off the muffler mounting screws.
- Remove the sealing plate from between the muffler and cylinder and tighten the screws to 7.5 Nm (5.5 lbf.ft).
- Refit the shroud.

3.6.2 Vacuum Test

Tester's suction hose fitted on test flange nipple



Leakage test with vacuum pump



Oil seals tend to fail when subjected to a vacuum, i.e. the sealing lip lifts away from the crankshaft during the piston's induction stroke because there is no internal counterpressure.

An additional test can be carried out with the vacuum pump to detect this kind of fault. The preparations for this test are the same as for the pressure test - see 3.6.1.

- Connect the vacuum pump's suction hose to test flange nipple.

Pull out the pump piston until the gauge indicates a vacuum of 0.4 bar (5.8 psi).

Note: When you release the pump piston the non-return valve automatically seals the suction hose.
If the vacuum reading remains constant, or rises to no more than 0.2 bar (3 psi) within 20 seconds, it can be assumed that the oil seals are in good condition.
However, if the pressure continues to rise (reduced vacuum in crankcase), the oil seals must be re-

placed, even if no leaks were detected in the pressure test.

- Remove the test flange and refit the carburetor - see 8.2.
- Slacken off the muffler mounting screws. Remove the sealing plate from between the muffler and cylinder.
- Tighten the screws to 12 Nm (8.8 lbf.ft).
- Refit the shroud.

3.7 Replacing the Oil Seals

Top:
Puller 0000 890 4400 with jaws 0000
893 3706

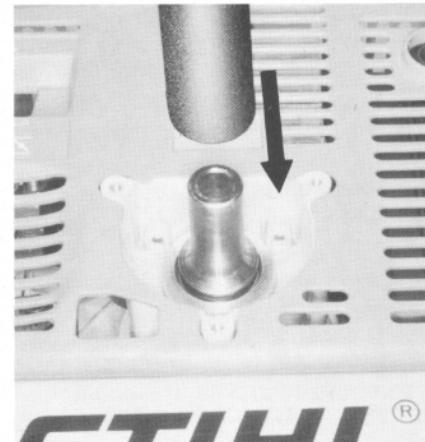
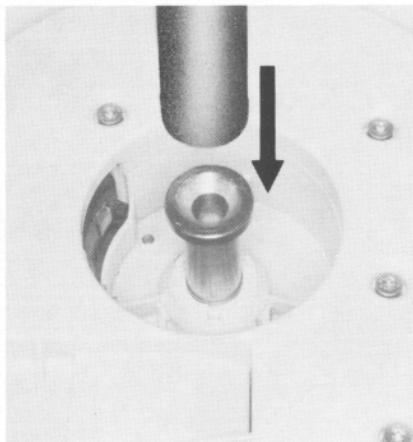
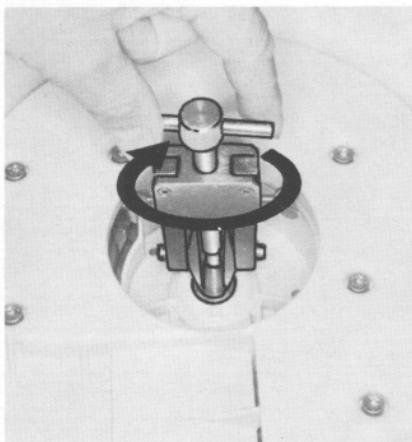
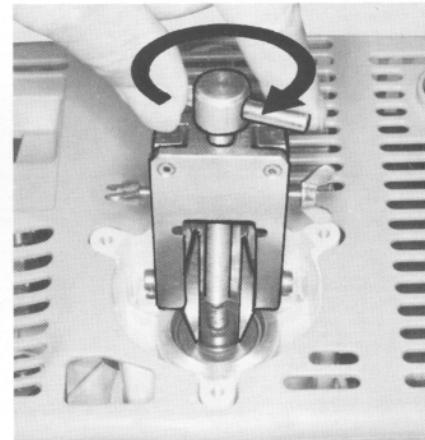
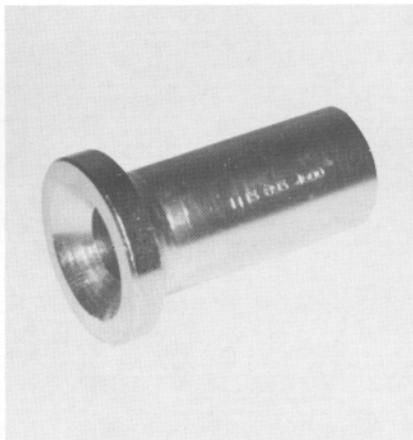
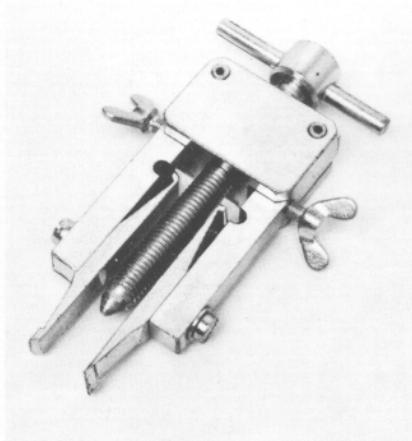
Bottom:
Removing oil seal at starter side

Top:
Press sleeve 1113 893 4600

Bottom:
Pressing in oil seal at starter side

Top:
Removing oil seal at ignition side

Bottom:
Pressing in oil seal at ignition side



It is not necessary to disassemble the complete crankcase if only the oil seals have to be replaced.

- Remove the flywheel - see 4.1.5.
- Remove the starter cup - see 5.8.
- Apply the puller and withdraw the oil seal at the starter side.

Note: When using the puller make sure that it does not damage the crankshaft surface, especially in the area of the oil seals.

- Coat the sealing lip of the oil seal with lubricating grease - see 10.2.

- Push the oil seal over the crankshaft stub. Open side of oil seal must face the crankcase. Use press sleeve to install the oil seal.

- Apply the puller and withdraw the oil seal at the ignition side.

- Coat the sealing lip of the oil seal with lubricating grease - see 10.2.

- Push the oil seal over the crankshaft stub. Open side of oil seal must face the crankcase. Use press sleeve to install the oil seal.

- Fit the flywheel - see 4.1.5.

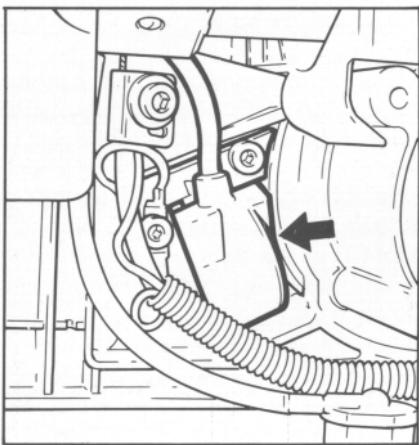
- Fit the starter cup - see 5.8.

4. IGNITION SYSTEM

Warning! Exercise extreme caution when carrying out maintenance and repair work on the ignition system. The high voltages which occur can cause serious or even fatal accidents!

Top:
Ignition module

Bottom:
Flywheel (fanwheel removed)

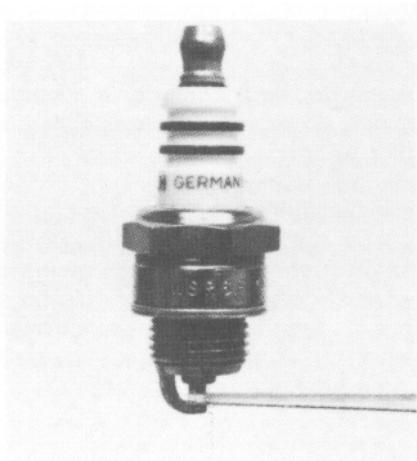


4.1 Repairing Component Parts

4.1.1 Spark Plug

Top:
Checking electrode gap with feeler gauge

Bottom:
Resetting electrode gap with Bosch spark plug gauge



Troubleshooting on the ignition system should always begin at the spark plug.

In the event of starting difficulties, low engine power, misfiring, etc., unscrew the spark plug and check that it is the approved type. Only the spark plugs listed in the specifications may be used. Other makes of spark plug are unsuitable because they have long-reach electrodes.

Sooted or carbonized spark plug:

- Use brass wire brush to clean the spark plug and then blow it clear with compressed air.

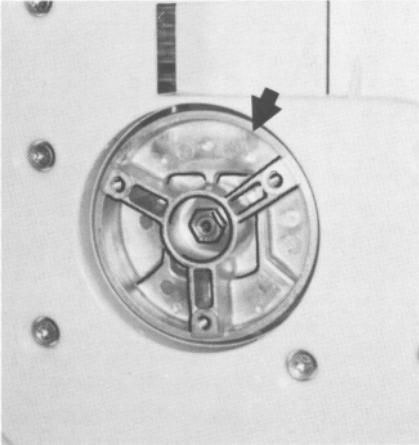
Note: Never use a steel wire brush for this job.

Spark plug is smeared with oil:

- Wash the insulator nose with a grease solvent and blow it clear with compressed air.

Electrode gap:

- Electrode gap becomes wider as a result of normal erosion.



BR 320/400 and SR 320/400 blowers and mistblowers are equipped with a transistor-controlled electronic (breakerless) magneto ignition system which requires no outside power source (battery or dynamo).

The system consists basically of an ignition module and flywheel.

- Check the gap at regular intervals with a feeler gauge. It should be 0.5 mm (0.02").

- Bend the ground electrode as necessary.

Important: Always fit a new spark plug if the electrodes are badly pitted.

Checking the spark plug:

Accurate checking of the spark plug is only possible with a special spark plug tester.

A provisional check can be carried out by fitting a clean spark plug in the spark plug terminal and holding it against ground. There should be a powerful sparkover at the electrodes when the engine is cranked by pulling the starter rope.

Warning: Do not touch any live parts - contact with high voltage can cause serious or fatal accidents!

Note: It is recommended that a new spark plug be fitted in all cases of doubt.

If there is no sparkover although the spark plug is in good condition, first check the lead connections.

Note: Chafed insulation on the ignition lead or short circuit wire will cause a short-circuit to ground. In this case the engine will either not start or only run erratically.

To install the spark plug:

- Clean the spark plug seat and inspect the sealing ring to make sure it is in good condition.
- Fit the spark plug and tighten it down to a torque of 15 Nm (11 lbf.ft).

The appearance of the spark plug's insulator nose gives valuable information with regard to the effects of various operating conditions:

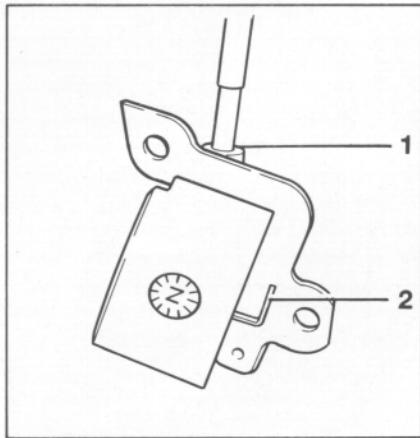
Condition of Insulator Nose	Appearance	Meaning
Normal:	Grayish yellow-to-brown, dry	Engine in order, correct spark plug (heat range as specified)
Sooted:	Velvet-like, dull black coating of soot	Mixture too rich, lack of air (dirty air filter, choke shutter partly closed), electrode gap too wide, wrong spark plug (heat range too high)
Smeared with oil:	Coating of damp oil carbon and soot	Too much oil in fuel mix
Overheated:	Welding beads on insulator nose, pitted electrodes (heat range too low)	Mixture too lean, spark plug loose, wrong spark plug (heat range too low)

4.1.2 Ignition Module

4.1.2.1 Ignition Timing

4.1.2.2 Removing and Installing

1 = High voltage output
2 = Connector tag



Ignition timing is fixed at 2.6 mm (0.10") B.T.D.C. at 7,000 rpm and cannot be adjusted. However, in view of the permissible tolerances in the electronic circuit, it may vary between 2.2 and 2.9 mm (0.09" and 0.11") B.T.D.C. at 7,000 rpm.

Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment. However, an internal fault in the circuit can alter the switching point in such a way that a spark test will still show the system to be in order although timing is outside the permissible tolerance. This will impair engine starting and running behavior.

Top:
Starter cover mounting screws

Bottom:
Shroud mounting screws
(fourth screw hidden in this view)



- The ignition module accommodates all the components required to control ignition timing. There are only two electrical connections on the coil body, i.e.:

1. the high voltage output
2. the connector tag for the short circuit wire

Accurate testing of the ignition module is only possible with sophisticated test equipment. For this reason it is only necessary to carry out an operational check in the workshop. A new ignition module must be installed if no ignition spark is obtained (after checking that wiring and stop switch are in good condition).



- Take out the starter cover mounting screws and remove the starter cover.

- Pull terminal off the spark plug.

- Take out the shroud mounting screws and lift away the shroud.

Top:
Ignition module mounting screws

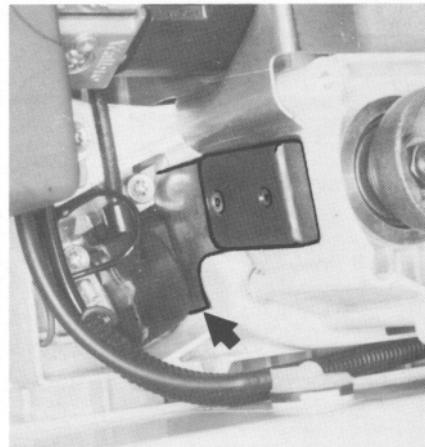
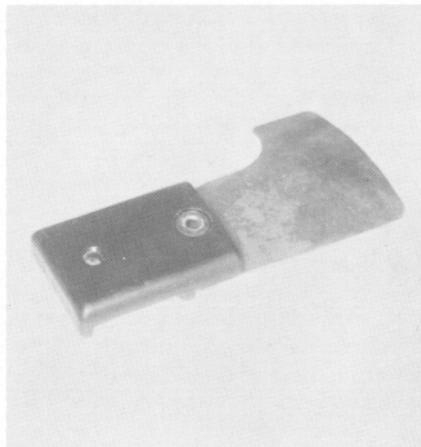
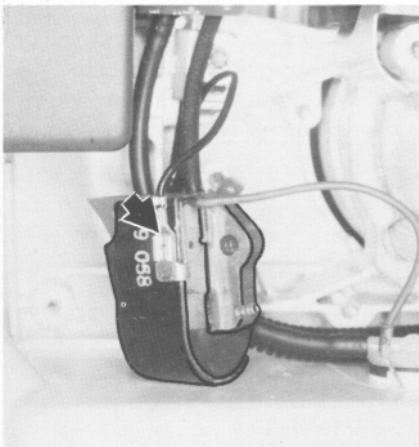
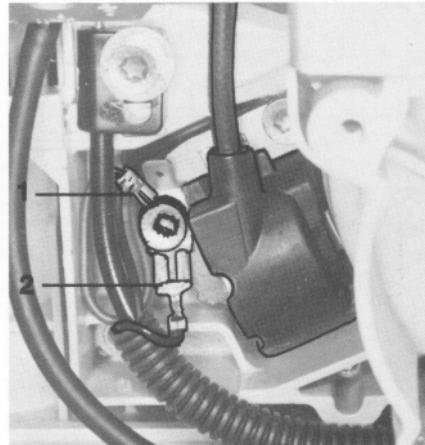
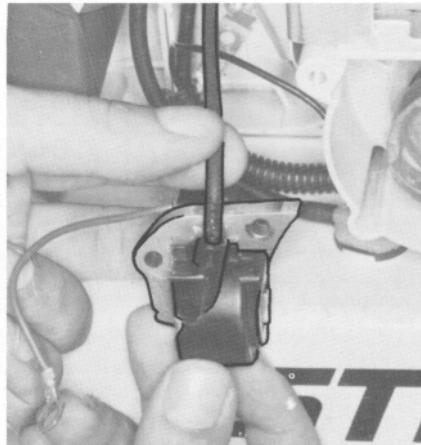
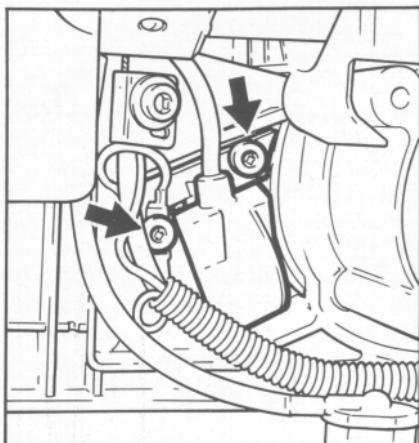
Bottom:
Short circuit wire

Top:
Pulling unscrewed ignition lead out of
ignition module

Bottom:
Setting gauge 4118 890 6400

Top:
1 = Ground wire
2 = Flat connector

Bottom:
Setting gauge fitted between flywheel and
ignition module



- Remove the ignition module mounting screws. Pull the ignition module forward.
- Pull the short circuit wire off the connector tag.

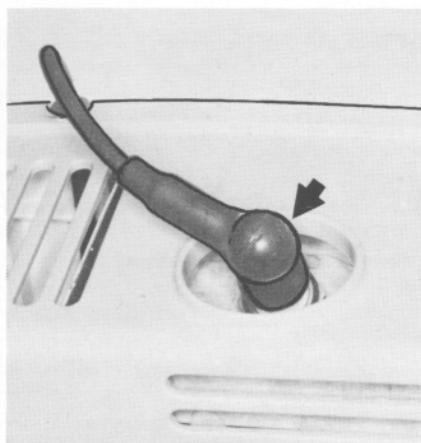
- Unscrew the ignition lead from the contact pin and pull it out of the ignition module.
- Refit the ignition lead by screwing it into the high voltage output. Place the ignition module in position (fit ground wire and flat connector under outer screw) but do not tighten down yet.

- Slide the setting gauge between the arms of the ignition module and the flywheel magnets.
- Press the ignition module against the setting gauge. Tighten down the mounting screws to a torque of 8 Nm (5.9 lbf.ft) and withdraw the setting gauge.
- Fit the shroud.

4.1.3 Spark Plug Terminal

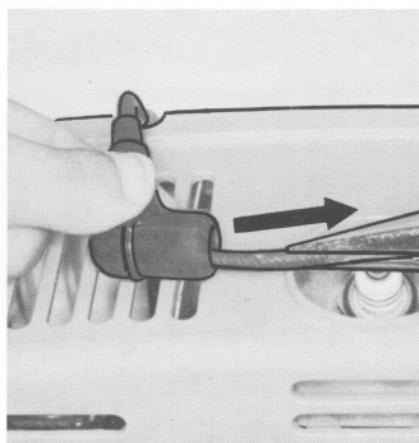
Top:
Spark plug terminal

Bottom:
Pulling leg spring out of spark plug terminal

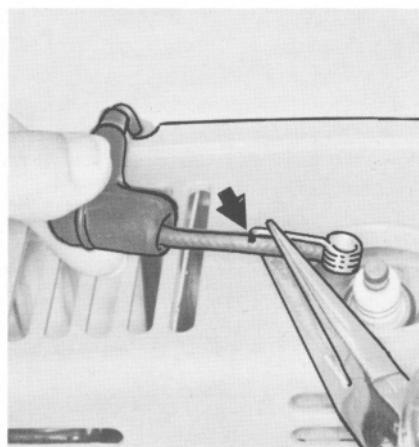
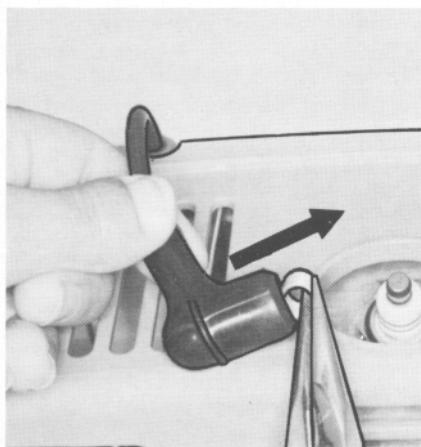
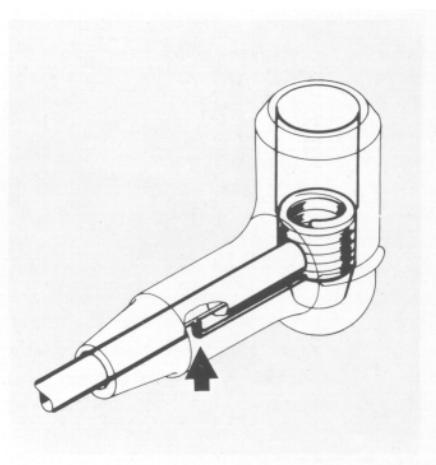


Top:
Pulling ignition lead through spark plug terminal

Bottom:
Attaching leg spring



Correct position of leg spring in spark plug terminal



- Pull the terminal off the spark plug.
- Use a suitable pair of pliers to grip the leg spring and pull it out of the spark plug terminal.
- Detach the leg spring from the ignition lead. Pull the terminal off the lead.

- Coat the end of the ignition lead with oil (about 200 mm/8" long).
- Fit spark plug terminal over the ignition lead.
- Use a suitable pair of pliers to grip the end of the ignition lead and pull it through the spark plug terminal.
- Pinch the hook of the leg spring into the center of the lead, about 15 mm (5/8") from the end of the lead.

- Pull the lead back into the terminal so that the leg spring locates properly inside it (see illustration).
- Fit the terminal on the spark plug.

4.1.4 Ignition Lead

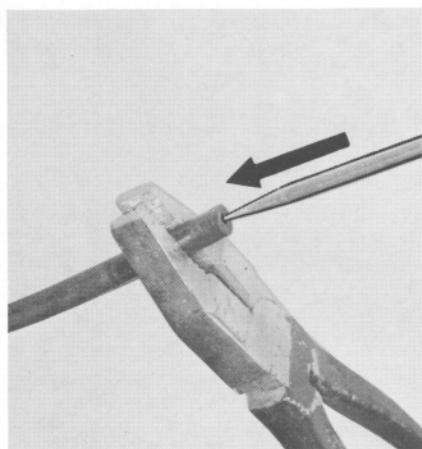
Top:
Pulling unscrewed ignition lead out of ignition module

Bottom:
Removing grommet



Top:
Piercing center of ignition lead

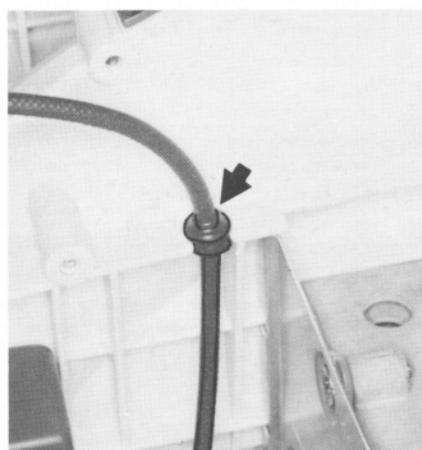
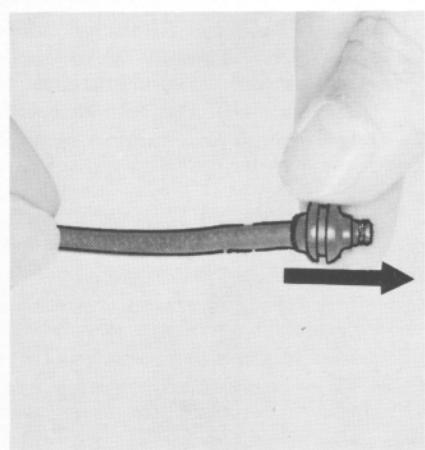
Bottom:
Correct position of grommet



4.1.5 Flywheel

Top:
Locking strip 0000 893 5901

Bottom:
Locking strip in position



- Remove ignition module - see 4.1.2.
- Unscrew the ignition lead from the contact pin and pull it out of the ignition module.
- Remove spark plug terminal - see 4.1.3.
- Pull the grommet off the ignition lead.

- Cut new ignition lead to length (see parts list or cut to same length as old lead).

Assembly is now a reversal of the disassembly sequence.

Note: The end of the ignition lead that screws into the module must be pierced with a pointed tool (see illustration).

- Fit the grommet in the fan casing recess.

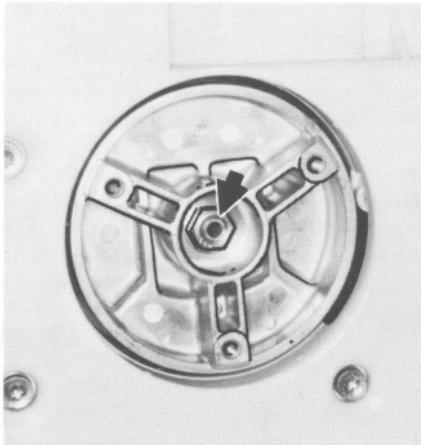
To remove the flywheel:

- Pull off the spark plug terminal and unscrew the spark plug. To block the piston, push the locking strip into the spark plug hole so that "TOP" or "OBEN" is facing upward.

Important: To avoid the risk of piston damage, use only the specified locking strip.

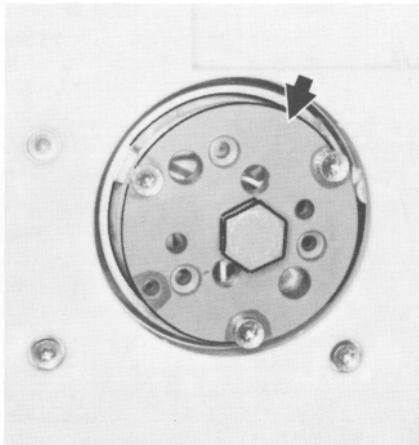
Top:
Flywheel mounting nut

Bottom:
Puller 4119 890 4500



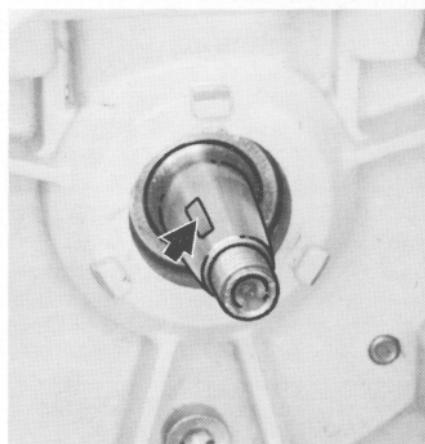
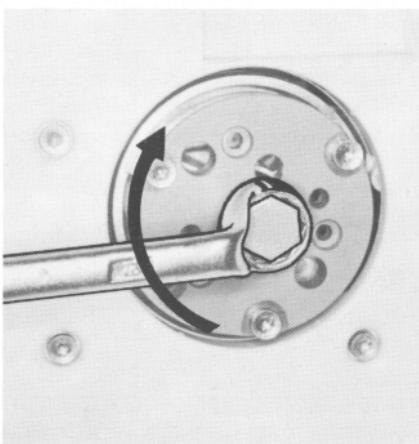
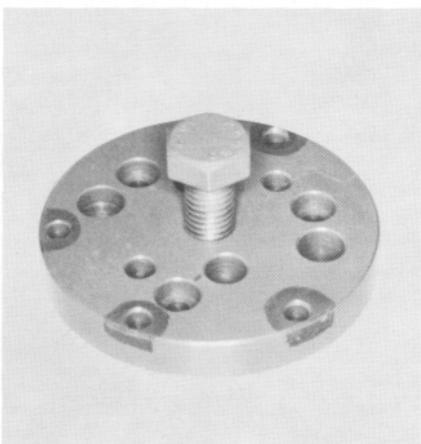
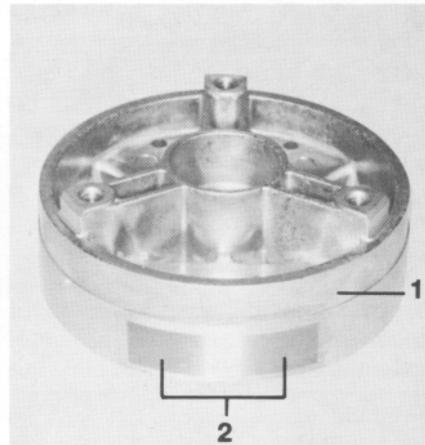
Top:
Puller fitted to flywheel

Bottom:
Removing the flywheel



Top:
1 = Flywheel
2 = Magnet poles

Bottom:
Woodruff key for flywheel



- Remove the fanwheel - see 9.3.
- Rotate the flywheel so that the magnet poles are opposite the ignition module.
- Unscrew the flywheel mounting nut from the crankshaft.

- Use fanwheel mounting screws to attach puller to flywheel.
- Pull the flywheel off the crankshaft.
- Inspect the flywheel and magnet poles for any signs of cracks or other damage. Fit a new flywheel if you find any damage.

To install the flywheel:

- Check that Woodruff key is correctly positioned.

Important: Clean the stub of the crank-shaft and the flywheel hub bore with a suitable standard commercial, solvent-based degreasant free from CFCs. Fit the flywheel in position and tighten down the mounting nut to a torque of 25 Nm (18.5 lbf.ft).

Assembly of the remaining parts is now a reversal of the disassembly sequence.

5. REWIND STARTER

5.2 Rope Rotor

5.1 Routine Maintenance

If the action of the starter rope becomes very stiff and the rope rewinds very slowly or not completely, it can be assumed that the starter mechanism is in order but plugged with dirt. At very low outside temperatures the lubricating oil on the rewind spring may thicken and cause the spring windings to stick together. This has a detrimental effect on the function of the starter mechanism. In such a case it is sufficient to apply a few drops of paraffin (kerosine) to the rewind spring.

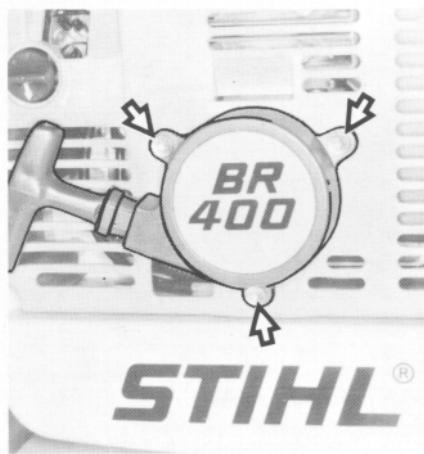
Then carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take special care when removing the spring.

Wash all parts in paraffin (kerosine) or white spirit.

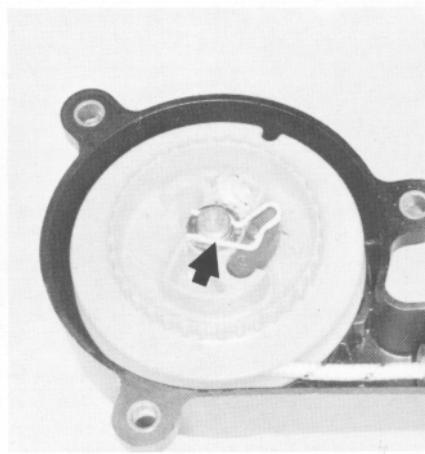
Lubricate the rewind spring and starter post with STIHL low temperature lubricant, see 10.2, before installing.

Abb.:
Starter cover mounting screws



Top:
Spring clip

Bottom:
Pulling rope rotor off starter post



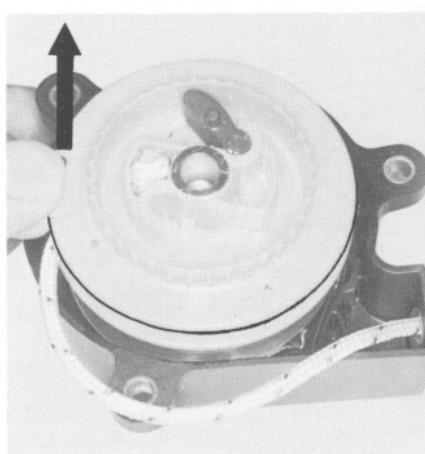
Removing rope rotor

Troubleshooting chart - see 2.3.

The starter cover has to be removed for access to the starter mechanism.

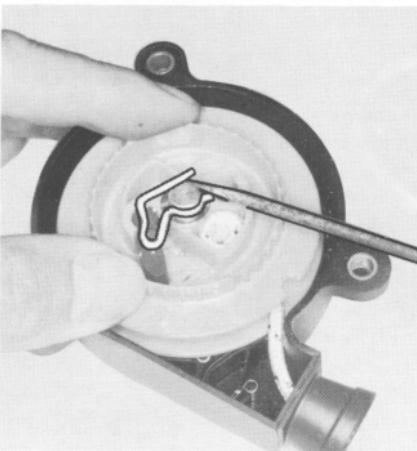
- Relieve tension of rewind spring:
- Pull out the starter rope to a length of approx. 30 cm (1 ft) and hold the rope rotor steady.
- Use a screwdriver to catch the starter rope between the rope guide bush and the rope rotor.
- While still holding the rope rotor steady, take three full turns off the rope rotor.
- Pull out the rope with the starter grip and then let go of the rope rotor.
- Use a screwdriver or suitable pair of pliers to carefully remove the spring clip from the starter post.
- Take the washer and rope rotor with pawl off the starter post.
- Replace the broken or worn starter rope - see 5.3.

Note: The rope rotor will spin back and thus relieve the tension on the rewind spring. The rewind spring will not be under tension if the starter rope is broken.



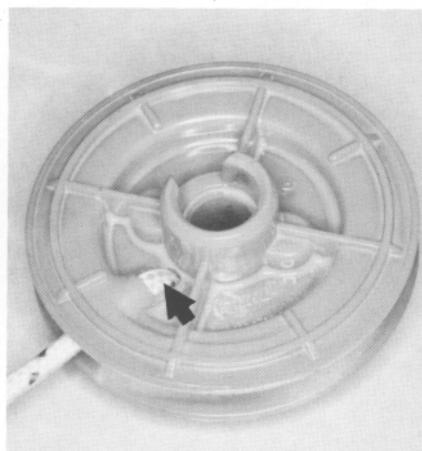
5.3 Replacing the Starter Rope

Fitting spring clip on starter post



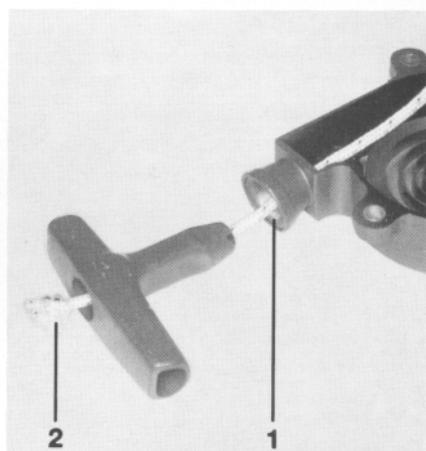
Top:
Starter rope correctly positioned in rope rotor

Bottom:
Starter rope secured in rope rotor with knot



Top:
1 = Rope guide bush
2 = Special knot

Bottom:
Special knots used



Installing the rope rotor

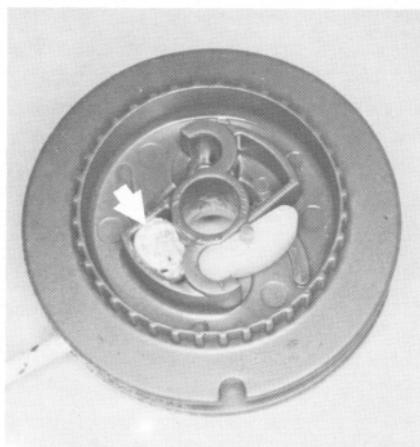
Coat the bore in the rope rotor with STIHL low temperature lubricate. Fit the rotor on the starter post so that the inner spring loop slides into the lug on the rotor.

Note: Check that the spring loop has engaged by turning the rope rotor slightly and letting it go - it must spring back.

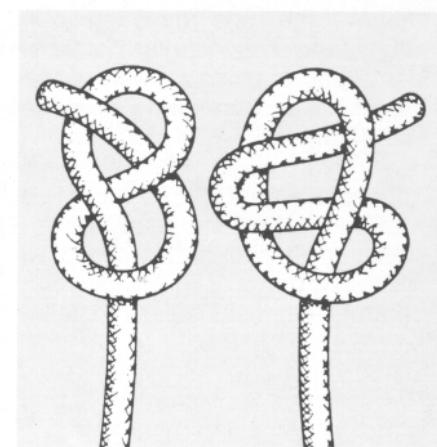
- Fit the washer and pawl. Install the spring clip in the starter post groove.

Note: Make sure the spring clip engages on the pawl guide peg and point it in the counterclockwise direction.

- The spring clip must be treated very carefully. If it is bent during disassembly, the rewind starter might malfunction.
- Tension the rewind spring - see 5.5.



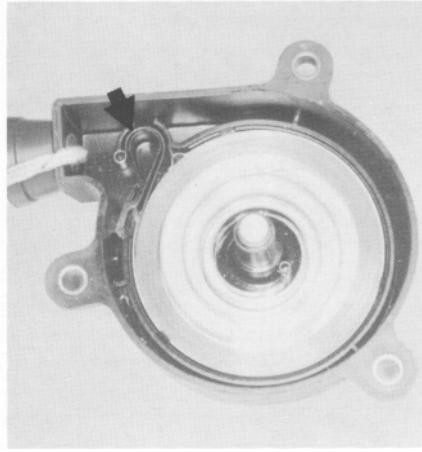
- Remove the rope rotor - see 5.2.
- Remove the remaining rope from the rope rotor. Thread one end of a new 3.5 mm (9/64") dia. and 960 mm (37 3/4") long rope through the side of the rope rotor and then, from the underside, into the inner hole and pull it up to the top side. Secure the rope with a simple overhand knot.
- Pull the rope back so that the knot locates in the recess in the rope rotor.



- Thread the other end of the rope through the guide bush from inside the starter cover and through the starter grip. Secure with one of the special knots shown.
- Install the rope rotor - see 5.2.

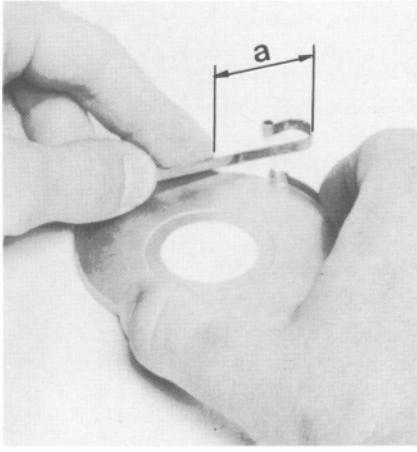
5.4 Replacing the Rewind Spring

Rewind spring fitted in position



Top:
Position of outer spring loop
 $a = 20 \text{ mm (3/4")}$

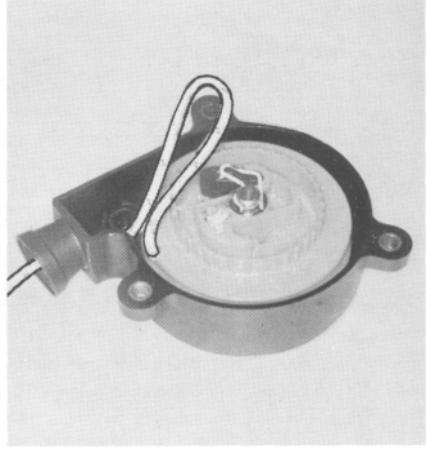
Bottom:
Fitting rewind spring with aid of wooden assembly block 1108 893 4800



5.5 Tensioning the Rewind Spring

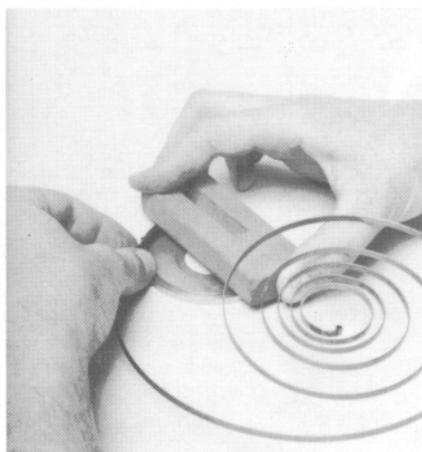
Top:
Loop for tensioning rewind spring

Bottom:
Tensioning the rewind spring



- Remove the rope rotor, see 5.2, and take out the spring housing. Use a pair of pliers to remove the bits of the broken spring from the starter cover.
- The replacement spring is supplied with spring housing ready for installation. It should be lubricated with a few drops of STIHL low temperature lubricant before installation.
- Position the replacement spring with spring housing (bottom facing upward) in the starter cover. Make sure the outer spring loop engages the recess in the starter cover.

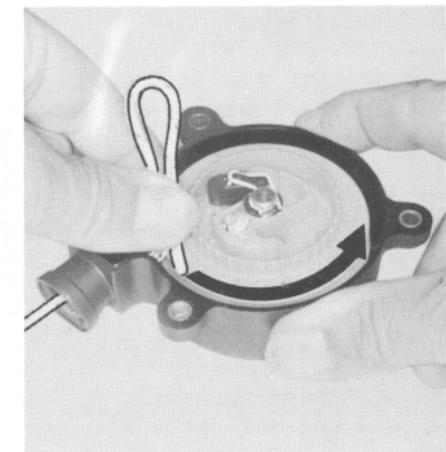
Important: If the rewind spring pops out and uncoils during installation, it must be refitted in the spring housing as follows:



- Position the outer spring loop about 20 mm (3/4") from the edge of the spring housing.
- Refit the rewind spring in the spring housing in the counterclockwise direction, starting from the outside and working inwards.

Note: The wooden assembly block can be placed over the spring housing to simplify refitting.

- Install the rope rotor - see 5.2.

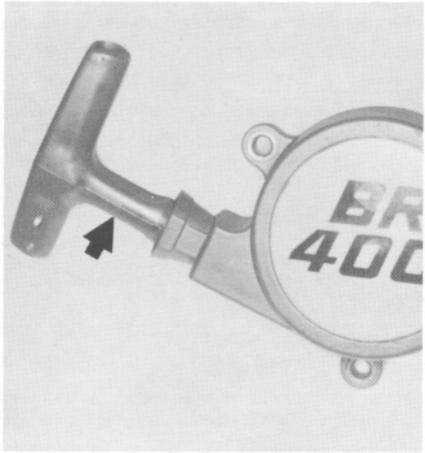
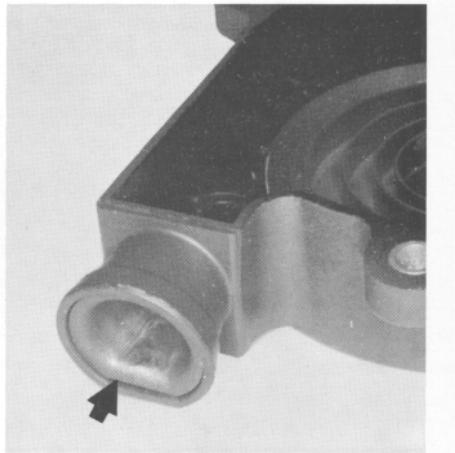
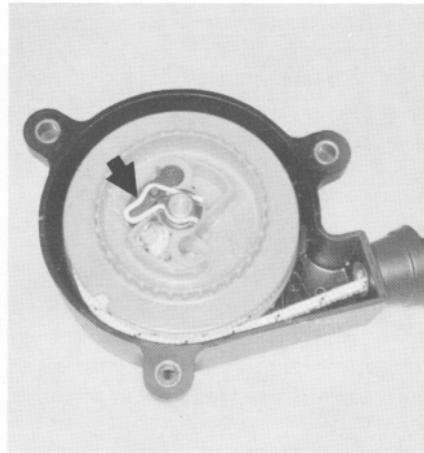


- Pull the starter rope out to full length. Make a loop in the rope between the rope rotor and the starter cover. Grip the rope close to the rotor and use it to turn the rope rotor seven times counterclockwise. Hold the rotor steady, straighten out the twisted rope and pull it out through the hole in the starter cover.
- Release rope very slowly so that it can wind itself onto the rotor.

5.6 Replacing the Pawl

5.7 Replacing Starter Rope Guide Bush

Handle at starter cover

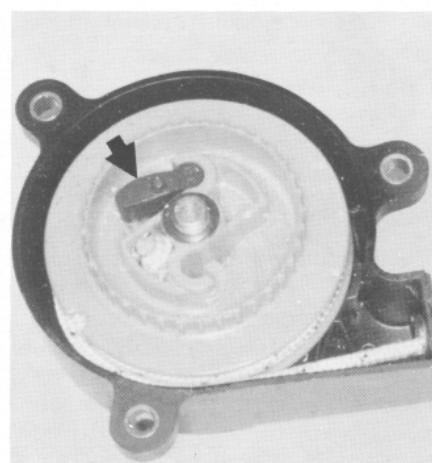
Top:
Spring clipBottom:
PawlAbb.:
Starter rope guide bush

Note: The rewind spring is correctly tensioned when the starter grip sits firmly in the rope guide bush without drooping to one side. If this is not the case, increase spring tension by one additional turn.

When the starter rope is fully extended it must still be possible to rotate the rope rotor at least another half turn before maximum spring tension is reached. If this is not the case, pull the rope out, hold the rope rotor steady and take off one turn of the rope.

Do not overtension the rewind spring as this will cause it to break.

- Refit the starter cover.



- Remove the starter cover.
- Carefully remove the spring clip from the starter post.

Note: Do not pull the rope rotor off the starter post.

- Pull the pawl out of the rope rotor and install the new one.

Note: Make sure the spring clip engages on the pawl guide peg and points it in the counterclockwise direction.

- Refit the starter cover.

The wear on the guide bush is accelerated by the starter rope being pulled sideways. The wall of the guide bush eventually wears through, becomes loose and has to be replaced.

- Remove the starter cover.
- Relieve tension on rewind spring, see 5.2, and remove the starter grip.
- Use a suitable tool to pry the old bush out of the starter cover.

To install the new rope bush:

- Place the new bush in its seat in the starter cover.
- Insert the screw spindle of the installing tool through the bush from inside the housing.
- Fit the thrust sleeve, tapered end first, and the hexagon nut.

5.8 Starter Cup

Top:

Fitting new rope bush with installing

tool 0000 890 2201 (schematic)

1 = Hexagon nut

2 = Thrust sleeve

3 = Rope guide bush

4 = Starter cover

5 = Threaded end

Bottom:

Flaring the new rope bush

Top:

Locking strip 0000 893 5901 in position

Bottom:

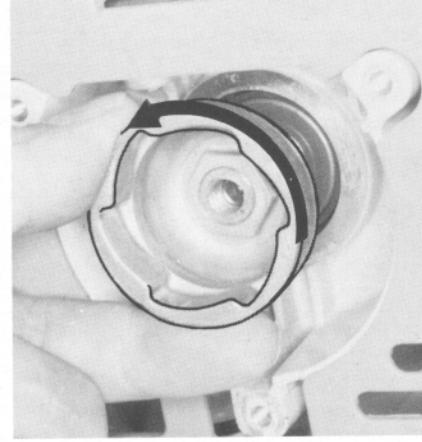
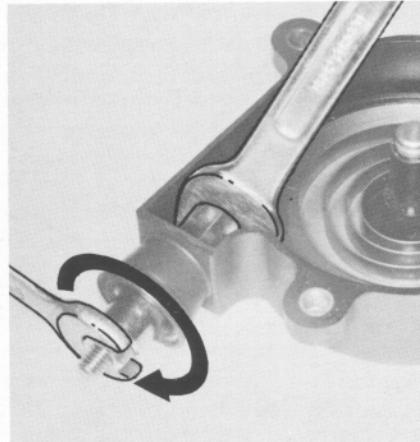
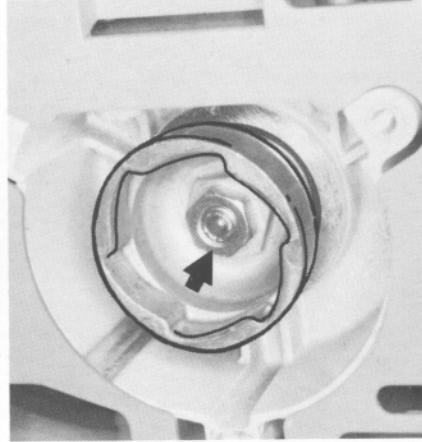
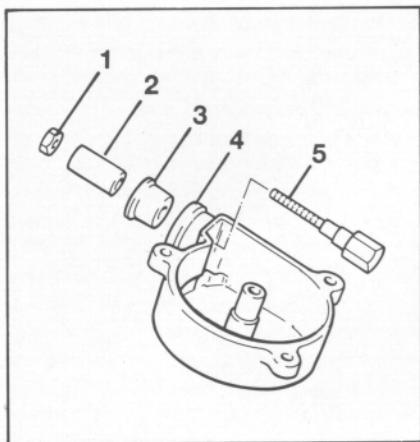
Starter cover mounting screws

Top:

Starter cup locknut

Bottom:

Unscrewing the starter cup



- Tighten down the hexagon nut until the bush is firmly seated.

Note: The installing tool flares the lower end of the rope bush.

- Refit the starter rope and the rotor – see 5.3.
- Tension the rewind spring - see 5.5.
- Fit the starter cover.

Pull terminal off the spark plug. Unscrew the spark plug and fit the locking strip to block the piston.

Note: Fit locking strip so that "OBEN" or "TOP" faces upward.

- Remove the mounting screws and lift away the starter cover.

- Unscrew the locknut.

- Unscrew the starter cup.

Reassembly is a reversal of the disassembly sequence.

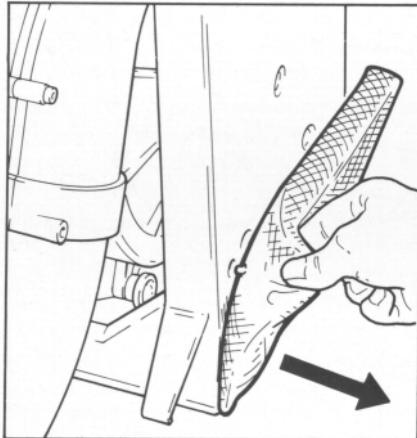
Note: Tighten down the starter cup to 14 Nm (10.3 lbf.ft) and the locknut to 25 Nm (18.5 lbf.ft).

6. AV-SYSTEM

6.1 Anti-Vibration Buffers

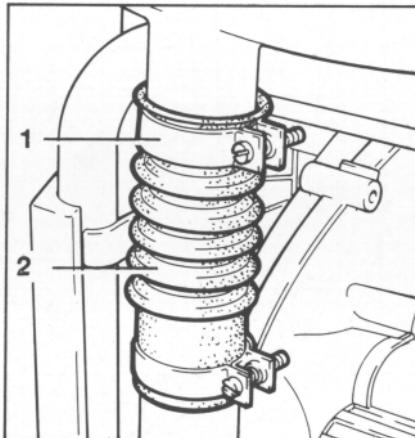
Top:
Removing back padding

Bottom:
Union nut



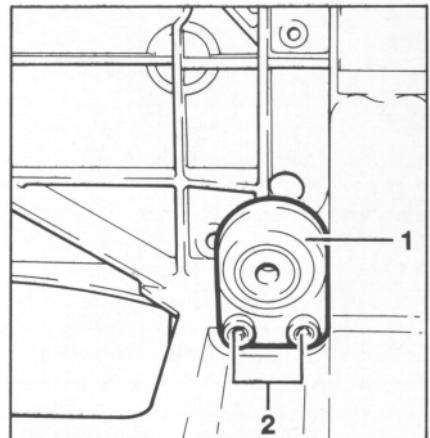
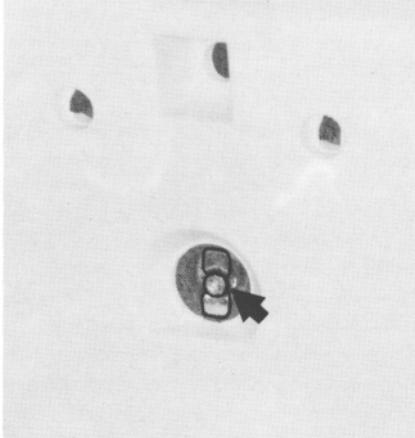
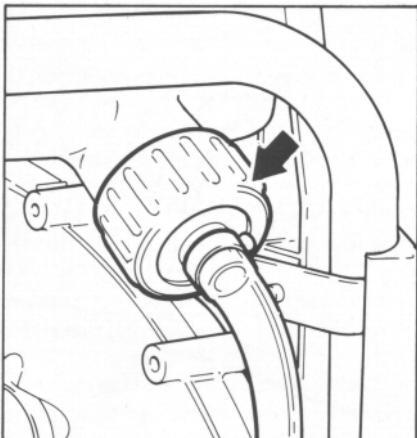
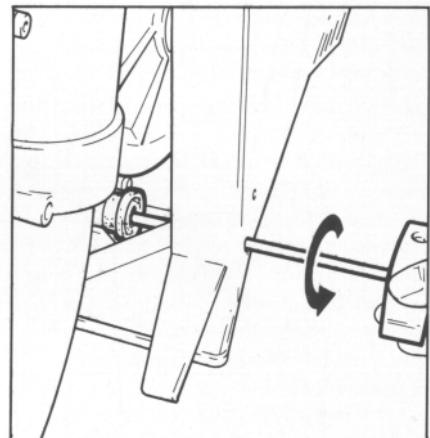
Top:
1 = Hose clip
2 = Bellows

Bottom:
Mounting screw of upper annular buffer



Top:
Removing the lower mounting screw

Bottom:
1 = Annular buffer
2 = Mounting screws



Annular buffers are installed between the crankcase and backplate to absorb vibrations. Damaged buffers must always be replaced.

- Pull the press studs out of the backplate and remove the back padding.

Note: Unscrew the union nut and hose from the container on models SR 320/SR 400.

Unscrew the hose clip and pull the bellows off the container stub.

- Remove the mounting screw from the upper annular buffer.
- Remove the mounting screws from the lower annular buffers. Lift the powerhead away from the backplate.

- Remove the annular buffer mounting screws. Take out the annular buffers.

Assembly is a reversal of the disassembly sequence.

Note: Fit the safety retainer under the backplate's upper mounting screw. Tighten annular buffer screws to 4.5 Nm (3.3 lbf.ft) and backplate screws to 6.0 Nm (4.4 lbf.ft).

7. THROTTLE CONTROL

7.1 Replacing Throttle Cable

Top:
1 = Throttle cable nipple
2 = Slotted pin

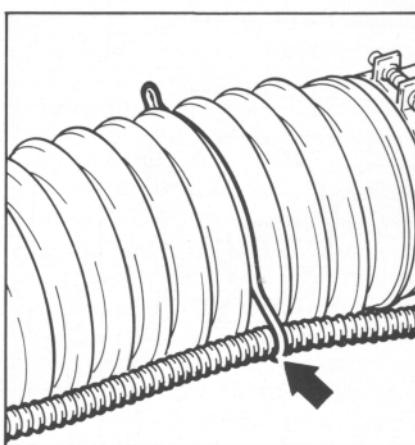
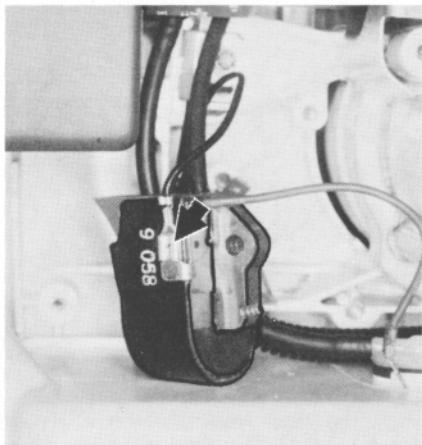
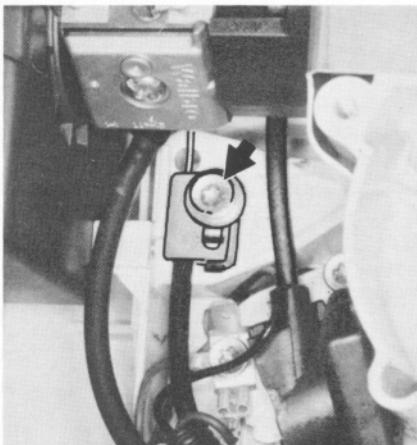
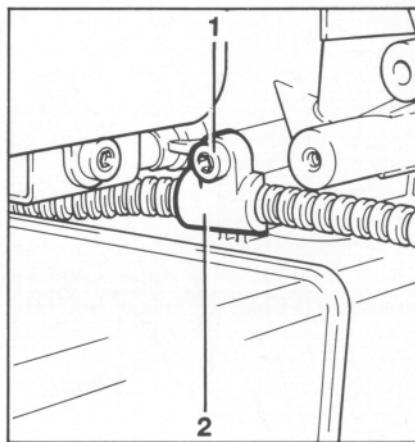
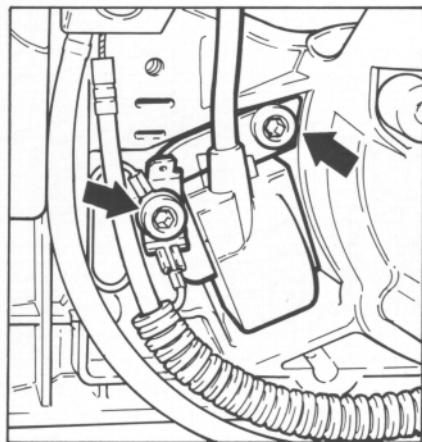
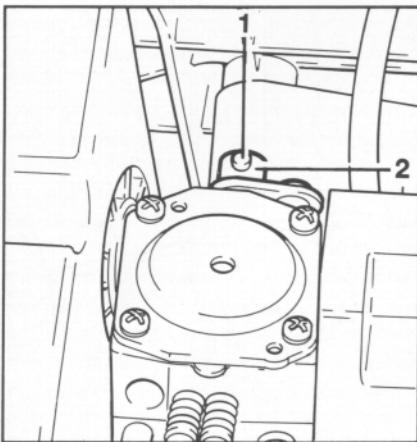
Bottom:
Clamp screw

Top:
Ignition module mounting screws

Bottom:
Short circuit wire

Top:
1 = Mounting screws
2 = Clamp

Bottom:
Retainer on pleated hose



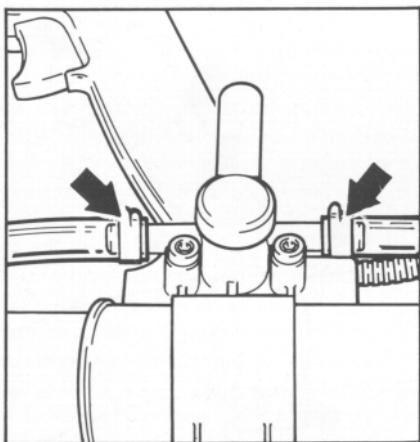
- Remove shroud - see 3.1.
- Disconnect throttle cable nipple from slotted pin on throttle lever.
- Unscrew and remove clamp from throttle cable.

- Remove ignition module mounting screws and pull module forward.
- Disconnect short circuit wire from ignition module.

- Unscrew and remove clamp.
- Pull the throttle cable out of the retainer on the pleated hose.

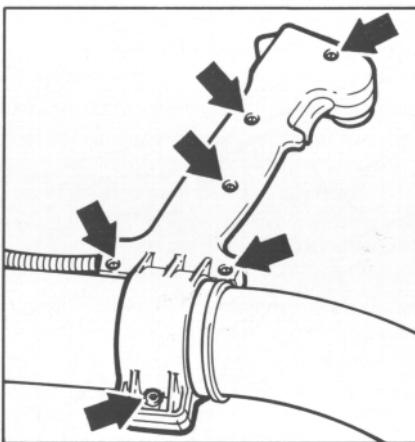
Top:
Hose clips on shut-off cock

Bottom:
1 = Shut-off cock
2 = Mounting screws



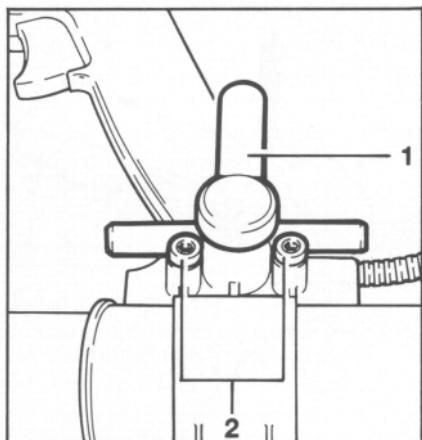
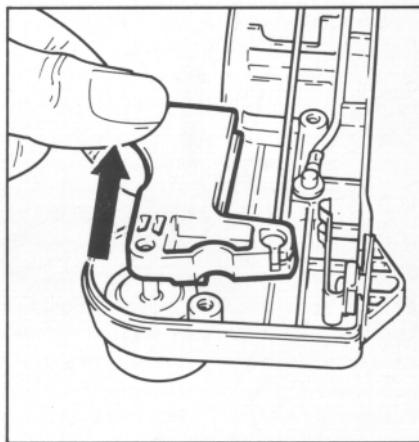
Top:
Handle molding fastening screws

Bottom: Removing outer handle molding



Top:
Removing the throttle trigger

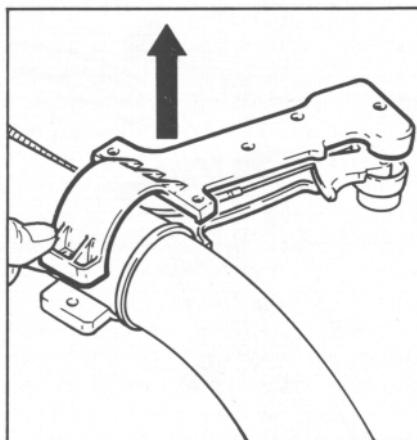
Bottom:
Disconnecting throttle cable from trigger



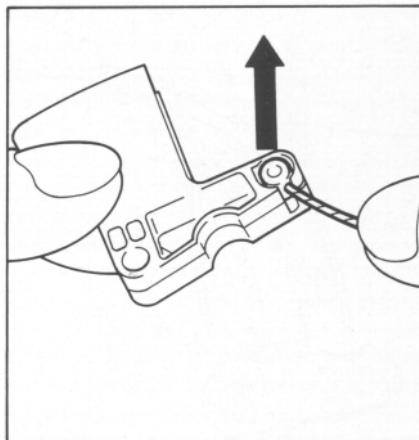
Note: Expand and remove hose clips on shut-off cock of models SR 320/SR 400.

Pull the hoses off the stubs.

Take out mounting screws and remove the shut-off cock.



- Remove the handle molding fastening screws.
- Lift away the outer handle molding.



- Pull the throttle trigger off its pivot pin.
- Disconnect throttle cable nipple from the trigger.

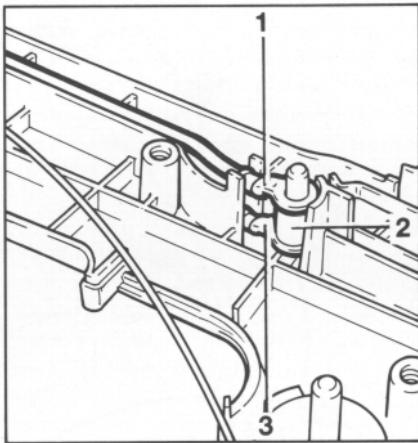
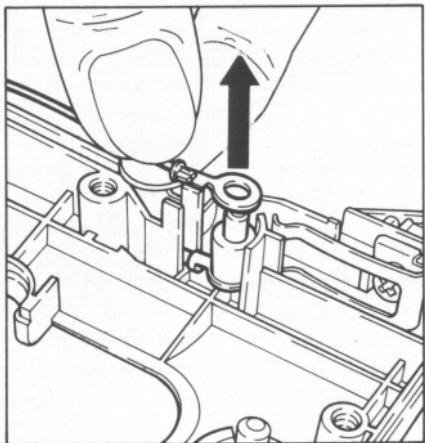
7.2 Contact Springs and Slide Control

Top:
Removing ground and short circuit wires

Bottom:
Removing throttle cable, ground and short circuit wires

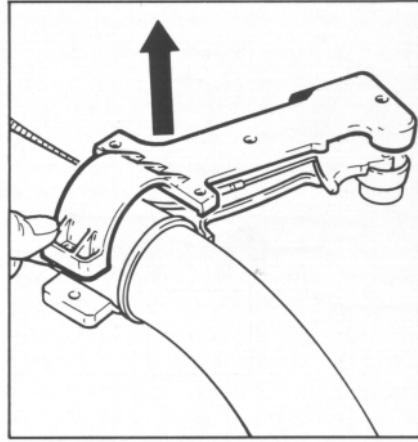
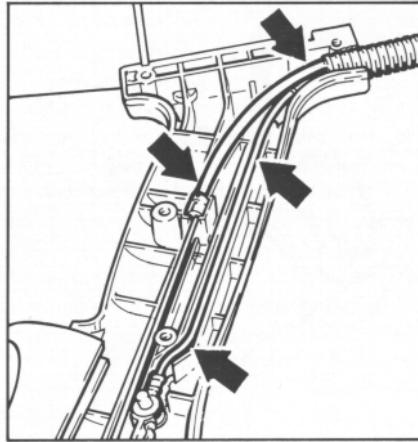
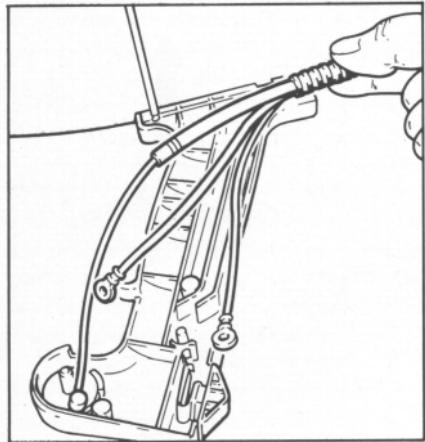
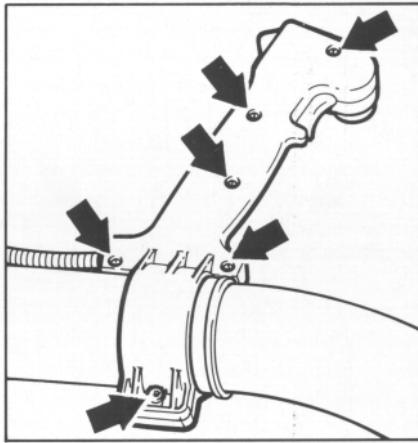
Top:
1 = Ground wire
2 = Spacer bush
3 = Short circuit wire

Bottom:
Correctly positioned throttle cable and wires



Top:
Handle molding fastening screws

Bottom:
Removing outer handle molding



- Pull the ground wire, spacer bush and short circuit wire off the peg.

- Take the throttle cable, ground and short circuit wires out of the inner handle molding.

Installation is a reversal of the removal sequence

Pay special attention to the following points:

- A plastic spacer bush must be fitted between the short circuit wire and ground wire.
- Take care to position the throttle cable, ground and short circuit wires correctly in the inner handle molding.

Note: The handle can be adjusted to suit individual users - see owner's manual.

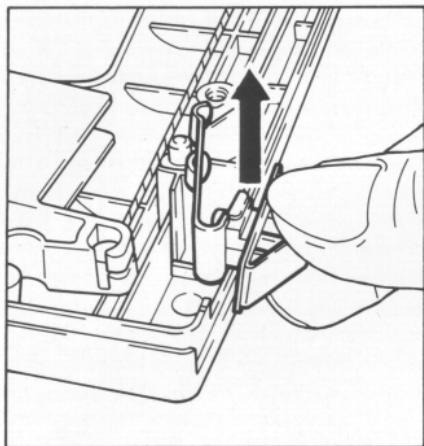
- Remove the handle molding fastening screws.

- Lift away the outer handle molding.

7.3 Setting Lever

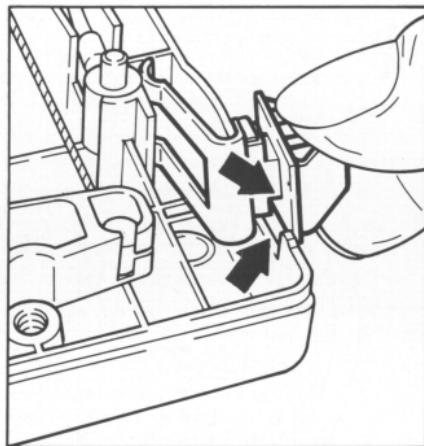
Top:
Removing the slide control

Bottom:
1 = Slide control
2 = Contact spring
3 = Screw



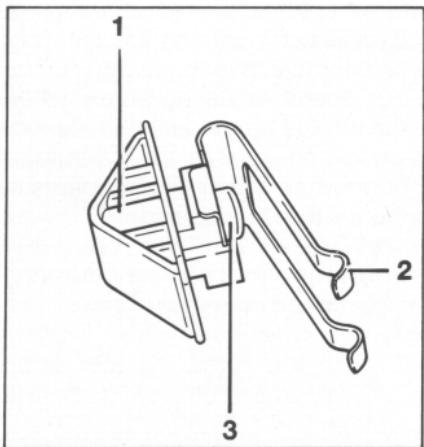
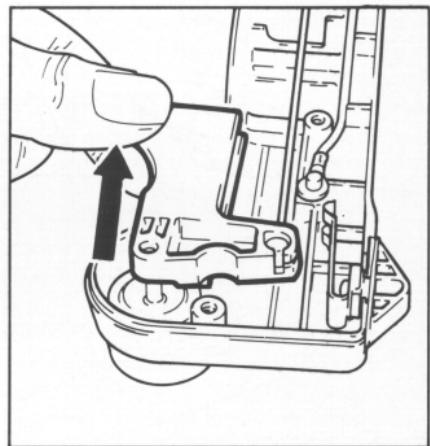
Top:
Fitting the slide control

Bottom:
Correct position of contact
spring arms



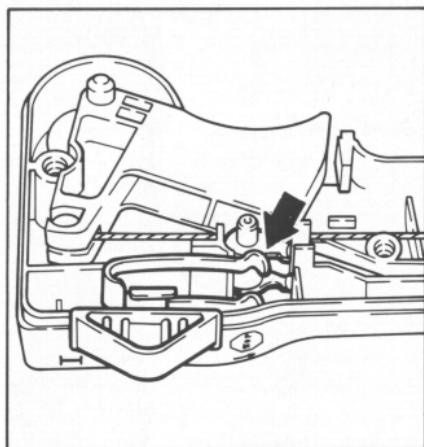
Top:
Removing the throttle trigger

Bottom:
E-clip



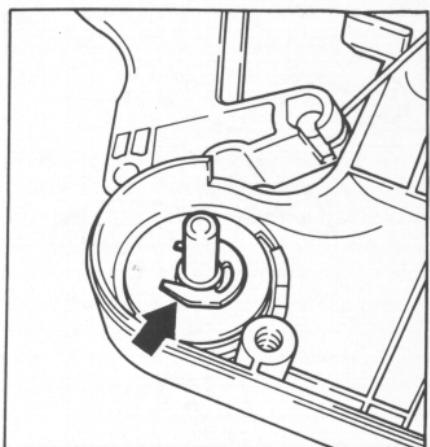
- Pull the slide control out of the inner handle molding.
- Take out the screw and remove the contact spring from the slide control.

Installation is a reversal of the removal sequence.



Note: The slot in the slide control must engage the outer edge of the handle molding.

When the slide control is pushed upward, the arms of the contact spring must touch the cable lugs of the ground and short circuit wires.



- Remove the outer handle molding – see 7.2.
- Pull the throttle trigger off its pivot pin.
- Remove the E-clip from the pivot pin.

7.4 Adjusting Throttle Cable

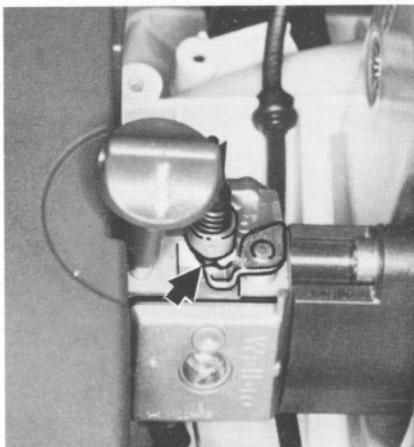
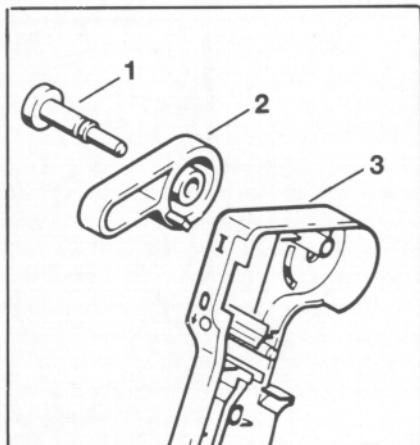
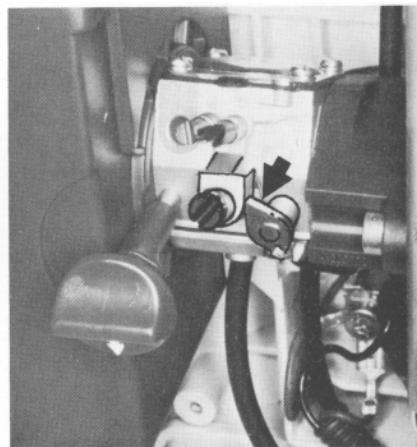
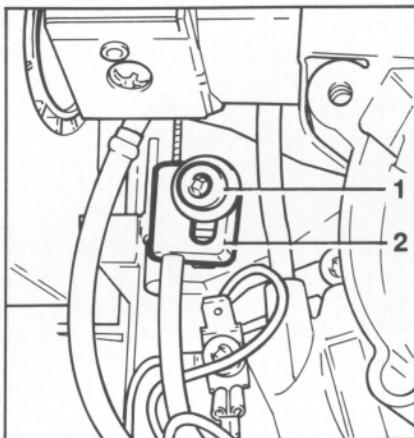
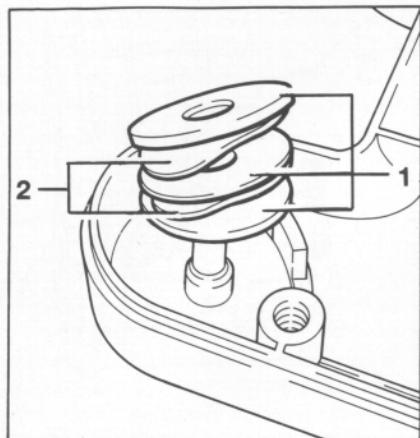
Top:
1 = Plain washers
2 = Spring washers

Bottom:
1 = Bolt
2 = Setting lever
3 = Inner handle molding

Top:
1 = Screw
2 = Clamp

Bottom:
Throttle lever butts against idle speed
adjusting screw (idle position)

Abb.:
Throttle lever butts against
carburetor body (full throttle)



- Remove the plain and spring washers from the bolt.
- Withdraw the bolt and take away the setting lever.

Installation is a reversal of the removal sequence.

Note: Make sure plain and spring washers are fitted in correct sequence.

- Remove shroud - see 3.1.

Note: Adjustment is effected by moving the clamp.

- Slacken off the screw on the clamp so that the clamp can just be moved.

- Move the clamp to adjust length of throttle cable so that the carburetor's throttle lever butts against the idle speed adjusting screw when the throttle trigger is in the idle position and against the carburetor body when the throttle trigger is in the full throttle position.

Important: Note adjustment range of idle speed adjusting screw.

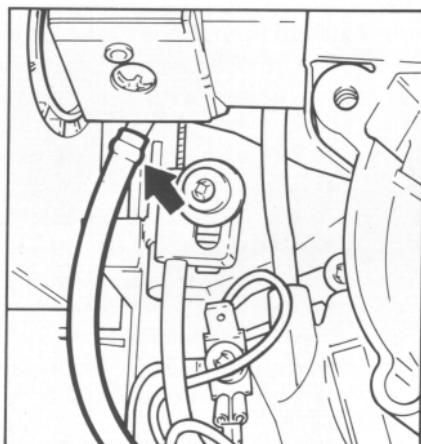
- Tighten the screw on the clamp securely after completing the adjustment.
- Fit the shroud - see 3.1.

8. FUEL SYSTEM

8.1 Leakage Testing the Carburetor

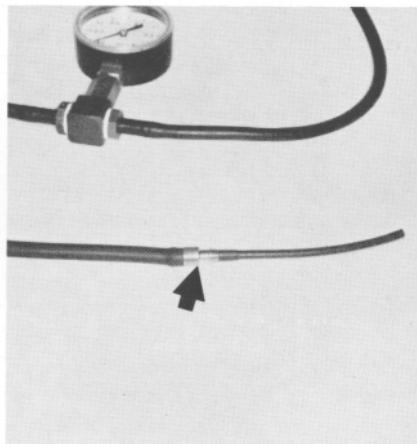
Top:
Fuel hose on elbow connector

Bottom:
Fuel line 1110 141 8600 fitted on
nipple 0000 855 9200



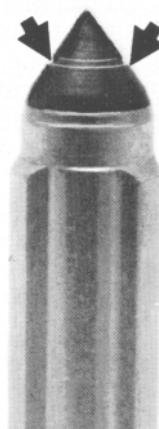
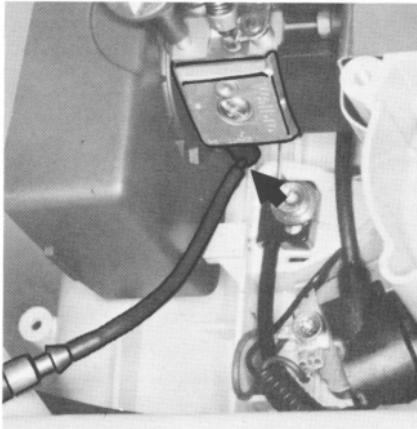
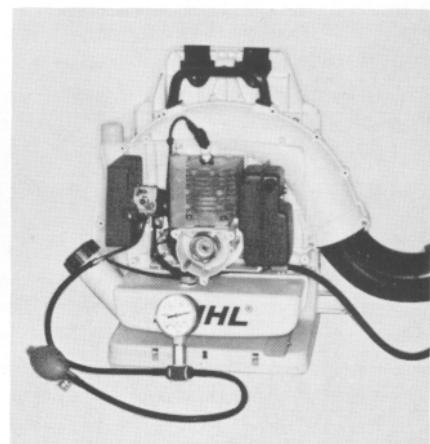
Top:
Nipple pushed into pressure hose

Bottom:
Tester's fuel line fitted on elbow
connector



Top:
Pressure testing carburetor with
carburetor/crankcase tester
1106 850 2905

Bottom:
Damaged inlet needle



Troubleshooting chart - see 2.4.

The carburetor can be tested for leaks with the carburetor and crankcase tester.

- Remove the shroud - see 3.1.
- Pull the fuel hose off the carburetor's elbow connector.

- Connect up the tester's pressure hose. Note that a separate nipple and a length of fuel line are required as an adapter to make this connection.

- Close the vent screw on the rubber bulb and pump air into the carburetor until the pressure gauge shows a reading of approx. 0.8 bar (12 psi).

If this pressure remains constant, the carburetor is airtight. However, if it drops, there are two possible causes:

1. The inlet needle is not sealing (foreign matter in valve seat or sealing cone of inlet needle is damaged or inlet control lever sticking).
2. The metering diaphragm is damaged.

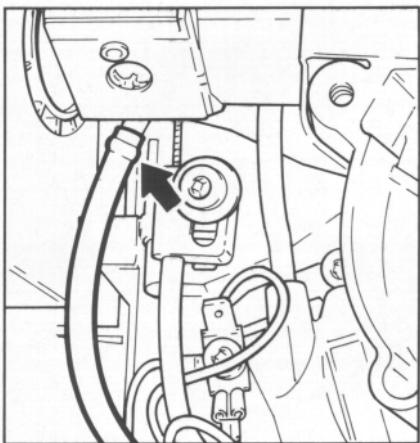
In either of these cases the carburetor must be removed and serviced.

8.2 Removing the Carburetor

Fuel hose on elbow connector

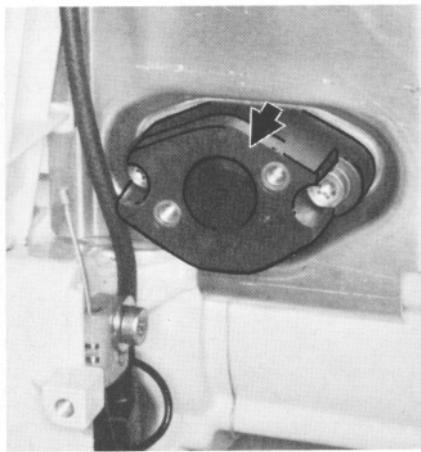
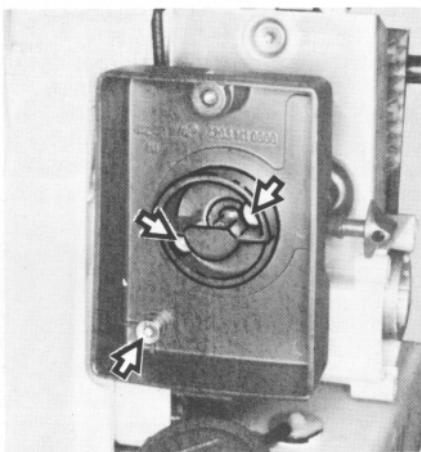
Top:
Carburetor and filter housing
mounting screws

Bottom:
Throttle cable in slotted pin



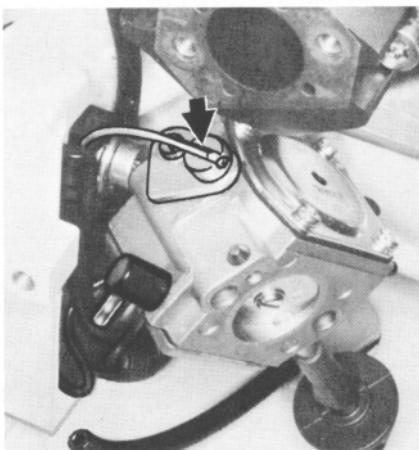
Top:
Gasket on spacer flange

Bottom:
Tightening carburetor screws

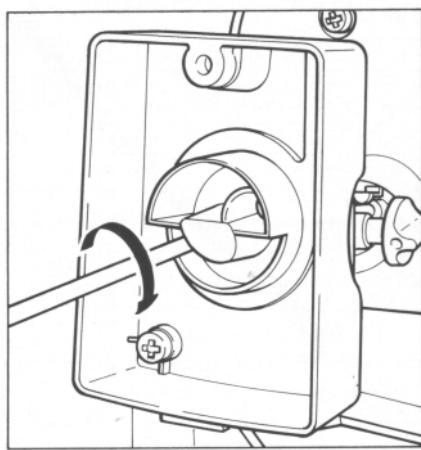


The all-position diaphragm carburetor consists of a fuel pump and the actual carburetor. Although the fuel pump shares a common housing with the carburetor, it operates as a completely separate and independent unit.

- Remove the shroud - see 3.1.
- Remove the air filter - see 8.5.
- Pull the fuel hose off the carburetor's elbow connector.



- Unscrew the lower filter housing screw and the carburetor mounting screws.
- Lift the filter housing and carburetor off the spacer flange.
- Disconnect the throttle cable nipple from the slotted pin on the carburetor's throttle lever.



- Remove the gasket from the spacer flange.

Installation is a reversal of the removal sequence.

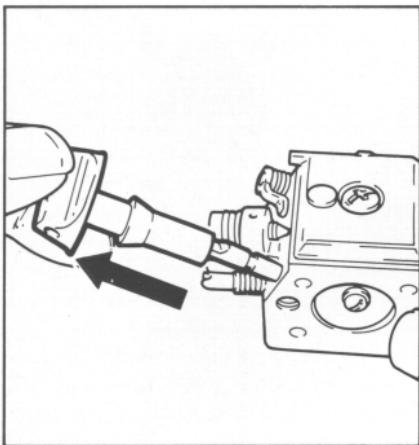
Note: Use a new gasket. Tighten screws to a torque of 4.5 Nm (3.3 lbf.ft).

Carry out leakage test after installing the carburetor - see 8.1.

8.3 Servicing the Carburetor

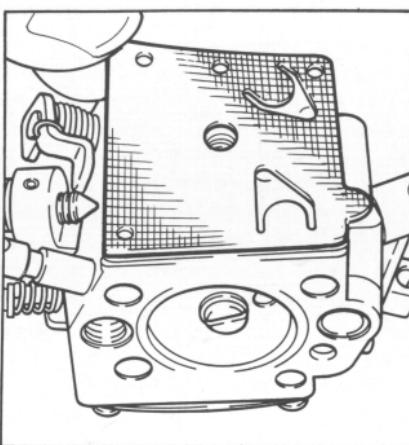
Top:
Pulling off choke knob

Bottom:
End cover fastening screw at pump side



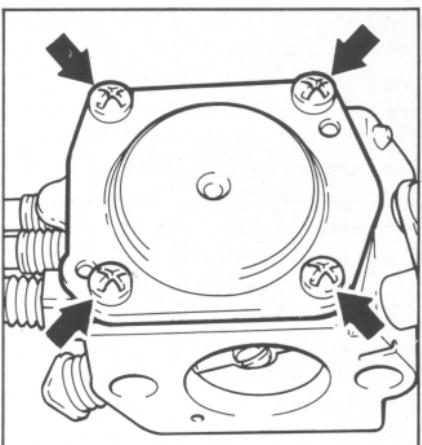
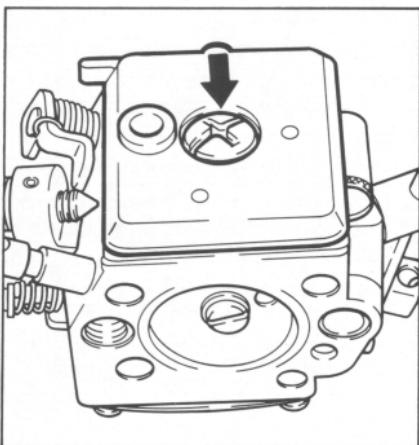
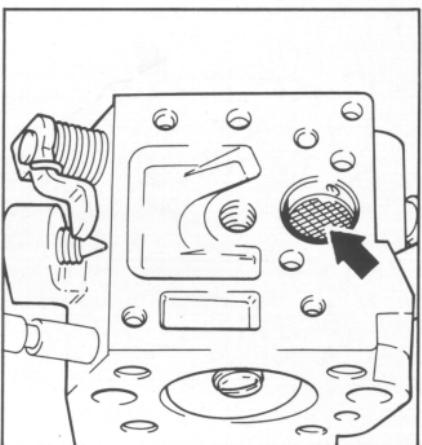
Top:
Pump diaphragm on carburetor body

Bottom:
Pump end cover with gasket



Top:
Fuel strainer in carburetor body

Bottom:
Fastening screws of metering chamber end cover



It is advisable to check the serviceability of the fuel pump whenever the carburetor is removed for repair.

- Remove the carburetor - see 8.2.
- Pull the choke knob off the shaft.
- Unscrew and remove the fuel pump end cover.

- Remove the gasket and pump diaphragm.

Note: The diaphragm and gasket often stick to the cover or carburetor body. If this is the case, take particular care when separating them.

- If the fuel strainer in the pump side of the carburetor body is dirty, use a scriber to pry it out and then clean it.

Important: If the fuel strainer is damaged, always fit a new one.

In such a case the fuel pickup head should also be inspected and replaced if necessary - see 8.6.

- To disassemble the carburetor, unscrew the metering chamber end cover and lift it away.

Top:
Metering diaphragm and gasket on carburetor

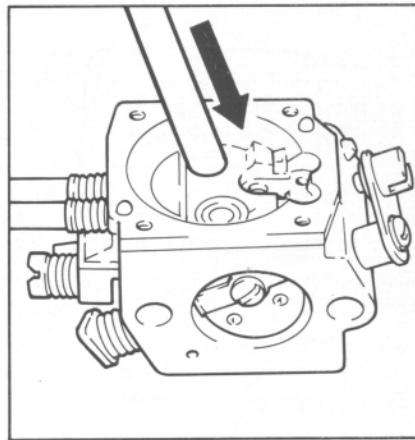
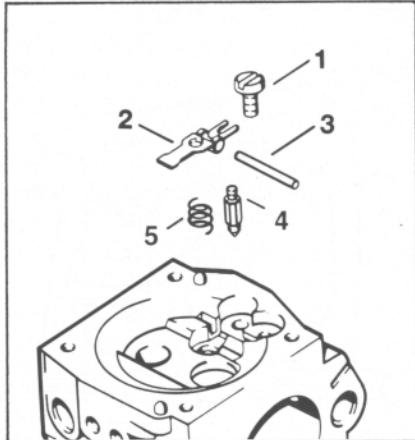
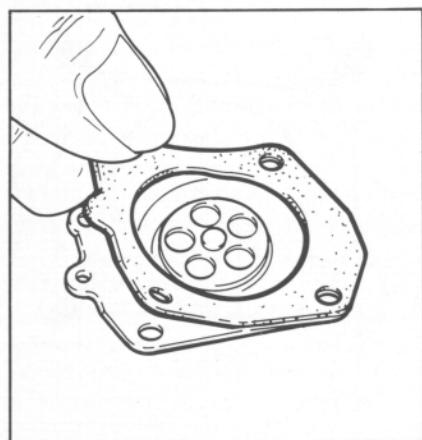
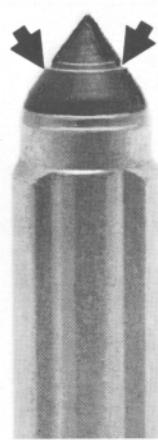
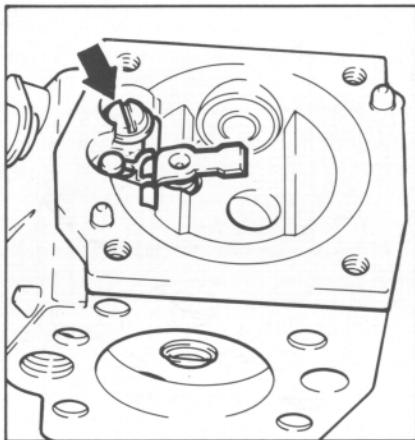
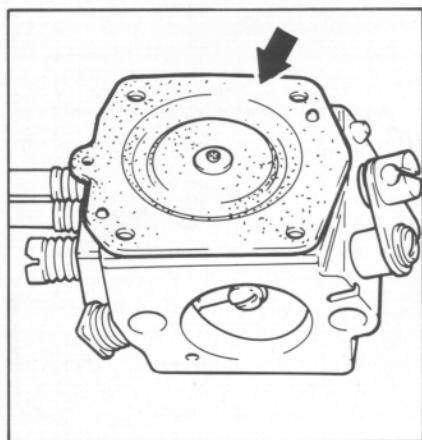
Bottom:
Separating gasket and diaphragm

Top:
Round head screw holds control lever spindle

Bottom:
1 = Round head screw
2 = Inlet control lever
3 = Spindle
4 = Helical spring
5 = Inlet needle

Top:
Damaged inlet needle

Bottom:
Pressing out valve jet



- Remove the metering diaphragm and gasket from the carburetor body and cover.
- Carefully separate the diaphragm and gasket.

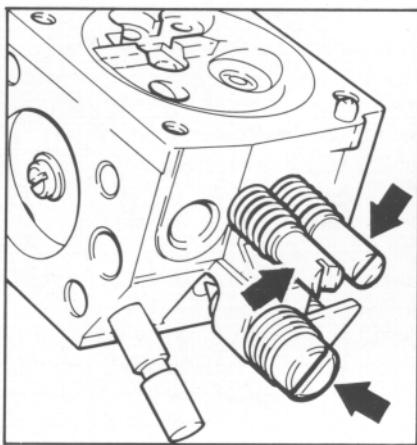
Note: The diaphragms are the most delicate parts of the carburetor. They are subjected to continuous alternating stresses and the material eventually shows signs of fatigue, i.e. the diaphragms distort and swell. They have to be replaced when this stage is reached.

- The inlet needle valve is located in a recess in the metering diaphragm chamber. Take out the round head retaining screw.
- Remove the inlet control lever with spindle, helical spring and inlet needle. If there is an annular indentation on the sealing cone of the inlet needle, it will be necessary to replace the inlet needle because it will no longer seal properly. This is indicated by constant flooding of the carburetor even though the needle is clean.

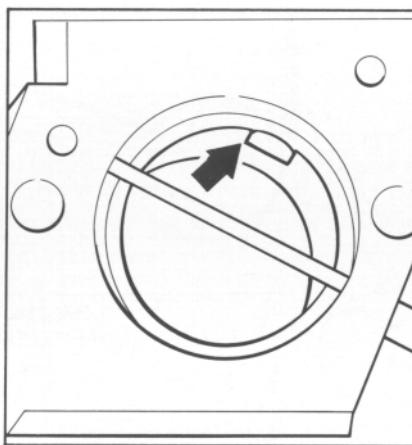
- Use a 5 mm (approx. 3/16") dia. drift to press the valve jet out of its seat in the direction of the venturi and wash it in white spirit.

Top:
Carburetor adjusting screws

Bottom:
Sealing plug

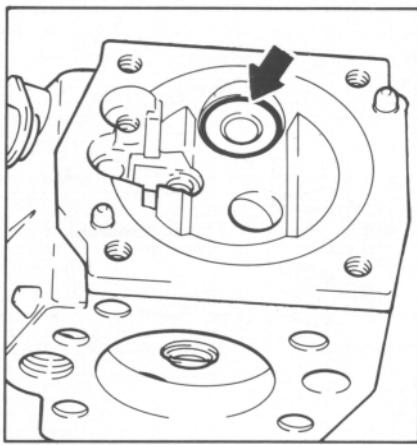
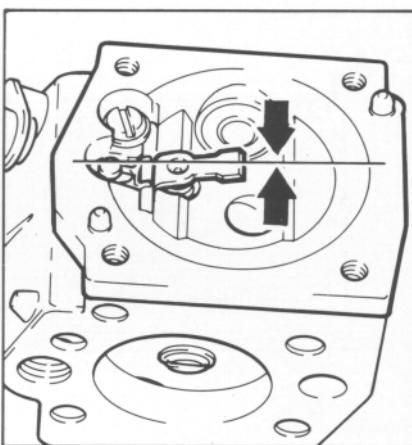


Correct position of valve jet



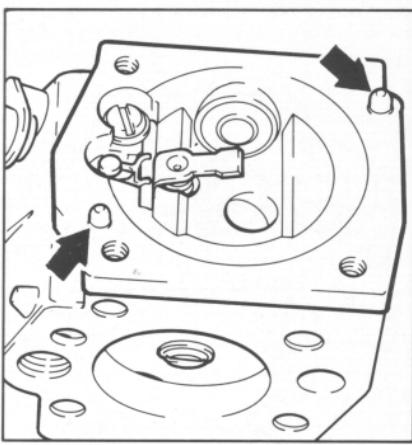
Top:
Correct position of inlet control lever

Bottom:
Locating pegs on carburetor body



Wash the carburetor body and all serviceable parts in fresh white spirit and blow clear with compressed air, paying special attention to the bores and ports.

- When inserting the valve jet, make sure that it is exactly vertical in the bore. The lower edge of the valve jet must be about 5 mm (3/16") below the venturi wall.
- Fit the inlet needle and the helical spring in their respective bores. Insert spindle in the inlet control lever, engage clevis in annular groove on the head of the inlet needle and tighten down the round head screw. Make sure that the helical spring locates on the control lever's nipple.
- Check easy action of the inlet control lever.



- Remove the carburetor adjusting screws.
- Pry the sealing plug out of the metering chamber.

Caution: The sealing plug is destroyed during removal. It should, therefore, only be removed if a replacement is available.

Important: The top edge of the inlet control lever must be exactly level with the metering diaphragm seating face. If necessary, use suitable pliers to carefully bend the inlet control lever into position.

- Fit the gasket, metering diaphragm and end cover. The metering diaphragm and gasket are held in position by the integrally cast pegs on the body.

Top:
Locating pegs on cover

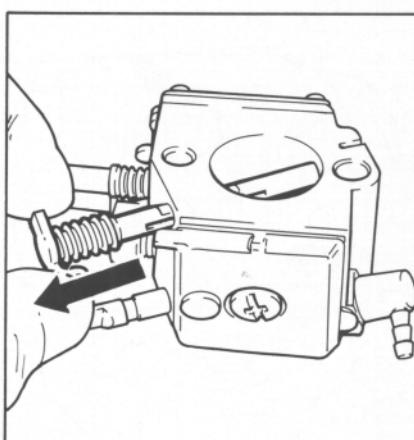
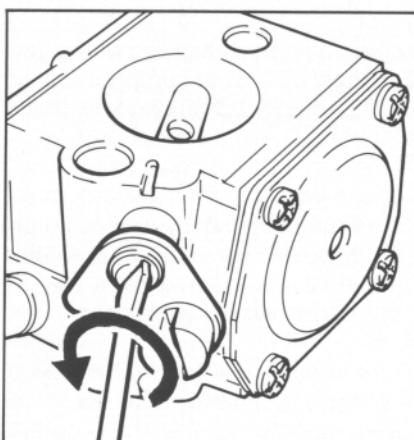
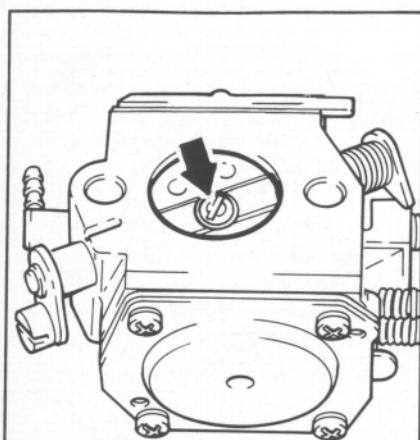
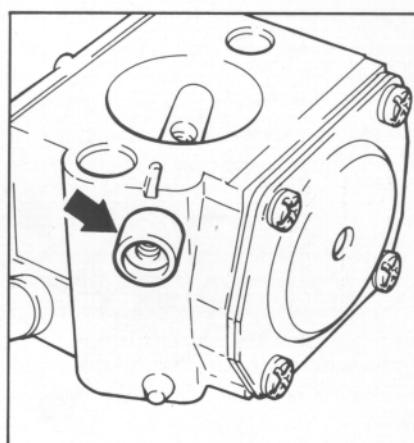
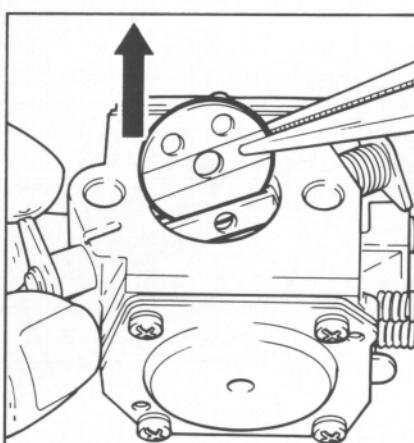
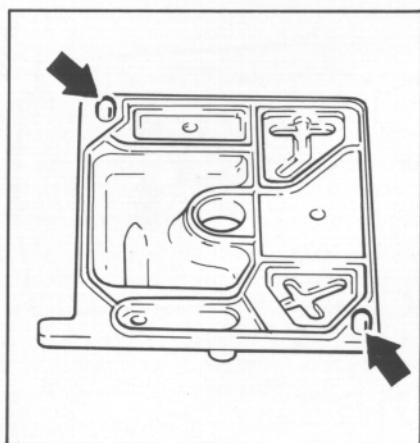
Bottom:
Throttle shutter fastening screw

Top:
Withdrawing throttle shutter

Bottom:
Removing throttle lever screw

Top:
Spacer sleeve

Bottom:
Withdrawing throttle shaft



- Insert the fuel strainer at the pump side. Fit the pump diaphragm, gasket and end cover and tighten down securely. The pump diaphragm and gasket are held in position by the integrally cast pegs on the end cover.

- Refit the carburetor adjusting screws.

To remove the throttle shaft:

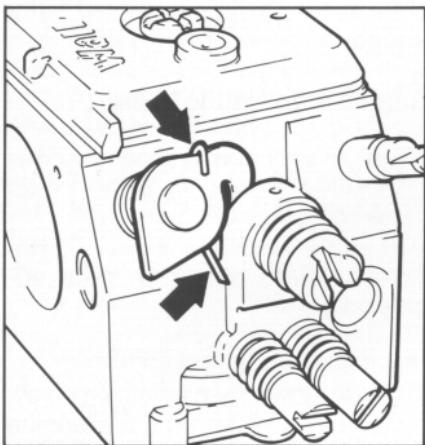
- Remove the throttle shutter fastening screw.

- Use suitable pliers to pull the throttle shutter out of the shaft.
- Remove the screw from the throttle lever. Take the lever off the throttle shaft.

- Pull the spacer sleeve off the throttle shaft.
- Withdraw the throttle shaft from the carburetor.
- Remove the torsion spring.

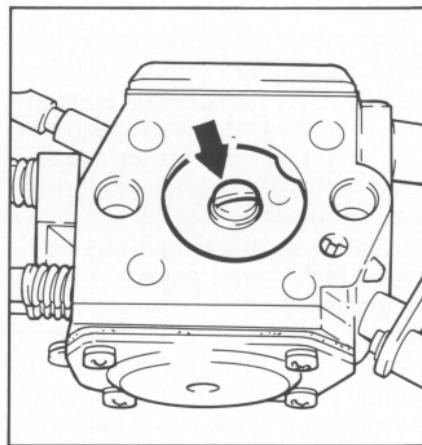
Top:
Correctly positioned torsion spring

Bottom:
1 = Lever
2 = Fastening screw
3 = Metering cover
4 = Slotted pin



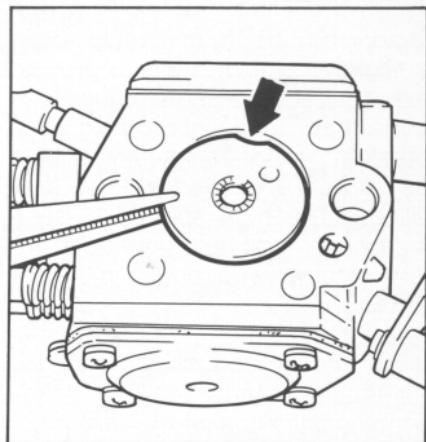
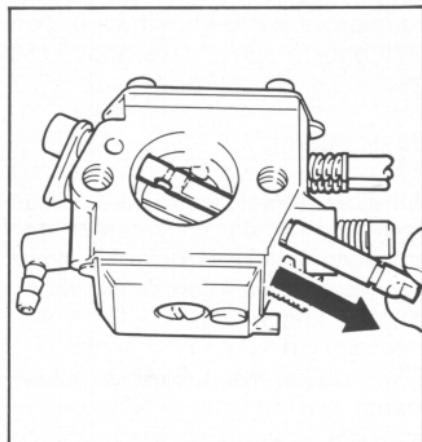
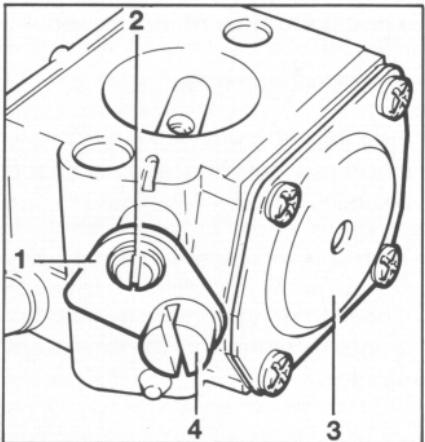
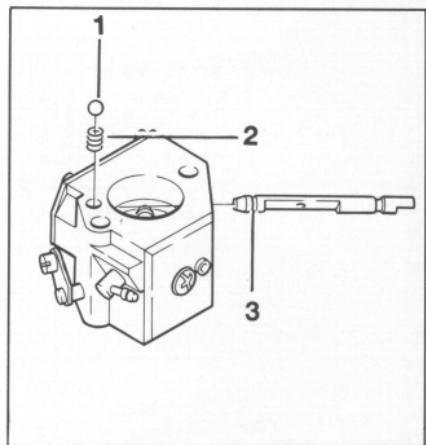
Top:
Choke shutter fastening screw

Bottom:
Withdrawing choke shaft



Top:
1 = Ball
2 = Spring
3 = Groove in choke shaft

Bottom:
Fitting the choke shutter



- Slide the throttle shaft into the carburetor and check that the torsion spring is correctly positioned.
- Slip the spacer sleeve over the shaft.
- Fit the throttle lever so that the slotted pin is at the same side as the metering cover.
- Fit the throttle shutter.
- Coat fastening screw with Loctite, see 10.2, and tighten down securely.

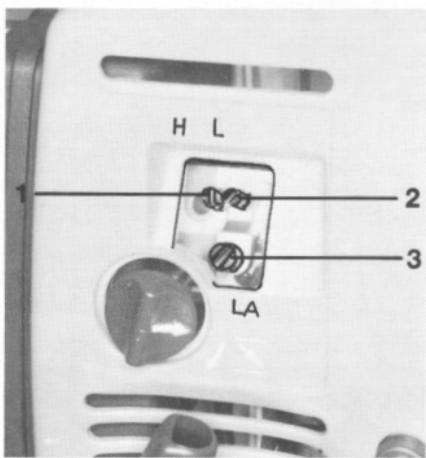
To remove the choke shaft:

- Remove the choke shutter fastening screw and take away the choke shutter.
- Carefully withdraw the choke shaft from the carburetor to ensure that ball does not pop out and be lost.
- Take the ball and spring out of the carburetor.

- Fit the spring and ball and then push in the choke shaft until the ball engages the groove in the choke shaft.
- Place the choke shutter in position so that the notch points toward the pump chamber end cover.
- Coat fastening screw with Loctite, see 10.2, and tighten down securely.

8.4 Carburetor Adjustment

Adjusting screws on carburetor
 1 = High speed adjusting screw
 2 = Low speed adjusting screw
 3 = Idle speed adjusting screw



When the engine is tested at the factory the carburetor is set to obtain a slightly richer mixture to provide the cylinder bore and bearings with additional lubricant during the break-in period. This setting should be left as it is for the first three tank fillings. The high speed adjusting screw may then be turned up to 1/8 turn clockwise to obtain a leaner mixture.

If the unit is used at high altitudes (mountains) or near sea level, it may be necessary to alter the carburetor setting slightly. This correction is made at the two adjusting screws (H and L) as follows: Turn clockwise for a leaner mixture (at high altitudes) or counterclockwise for a richer mixture (at sea level).

Note that even very slight variations at the adjusting screws produce a noticeable change in engine running behavior. Always make sure that the engine is warm and the air filter clean before carrying out carburetor adjustments.

Caution: The setting of the high speed adjusting screw not only affects the engine's performance but also its maximum off-load speed. If the setting is too lean (adjusting screw turned too far clockwise), there is a risk of damaging the engine as a result of insufficient lubrication and overheating. Corrections to the high speed adjusting screw may only be carried out if an accurate tachometer is available. Using the tachometer, run the engine at full throttle and turn the high speed adjusting screw clockwise to obtain the engine's maximum speed. Then turn the high speed adjusting screw counterclockwise from that position until engine speed falls about 150 rpm.

Basic setting

If the carburetor has to be adjusted from scratch, carefully screw both adjusting screws clockwise down onto their seats to obtain a starting point for fine tuning.

Then make the following adjustments:

High speed adjusting screw H: back off 1 full turn

Low speed adjusting screw L: back off 1 full turn

If an accurate tachometer is not available, do not turn the high speed adjusting screw beyond this basic setting to obtain a leaner mixture.

Notes for adjustment of idle speed

Engine stops while idling

- Turn idle speed adjusting screw clockwise until engine runs smoothly.

Erratic idling behavior, poor acceleration

Idle setting too lean:

- Turn the low speed adjusting screw counterclockwise until the engine runs and accelerates smoothly.

Exhaust smokes at idle speed

Idle setting too rich:

- Turn the low speed adjusting screw clockwise until the engine speed drops.
- Turn screw back one quarter turn.
- Check that the engine accelerates smoothly when the throttle is opened.

8.5 Air Filter

Top:
Choke shutter closed

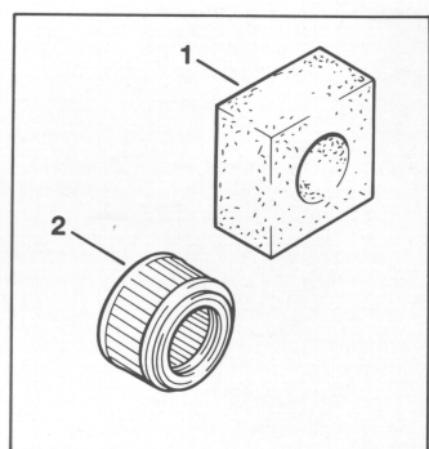
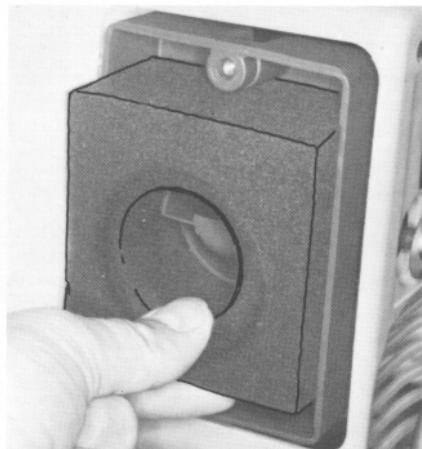
Bottom:
Air filter cover mounting screw

Top:
Removing foam element

Bottom:
Removing filter cartridge

Top:
1 = Foam element
(SR 320/SR 400 and BR 320)
2 = Filter cartridge
(BR 400, SR 320/400
with dusting attachment)

Bottom:
Engaging bottom of air filter cover



The air filter's function is to remove dust and dirt sucked in with the combustion air and thus help reduce wear on engine components to a minimum.

Dirty and clogged air filters reduce engine power, increase fuel consumption and make starting more difficult.

The air filter should always be cleaned when engine power begins to drop off.

- Before removing the air filter, close the choke shutter (turn choke knob in direction of arrow to choke) to prevent dirt falling into the carburetor.
- Remove the air filter cover mounting screw and lift away the cover.
- Remove the foam element or filter cartridge.
- Wash the foam element in a fresh, non-inflammable cleaning solution and allow it to dry.

Note: Always replace a damaged foam filter element.

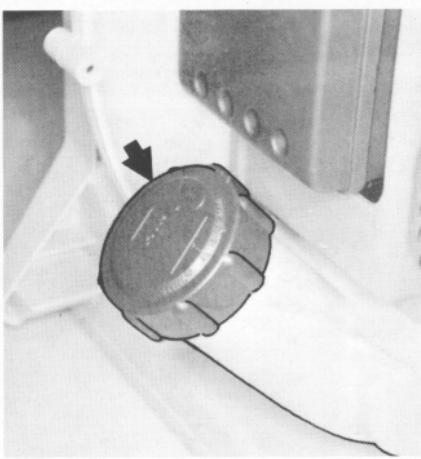
- Replace the filter cartridge if it is dirty.

Installation is a reversal of the removal sequence.

Note: When installing the air filter cover, engage the slot in the tab at the bottom of the cover over the housing lug.

8.6 Fuel Filter and Fuel Hose

Fuel filler cap

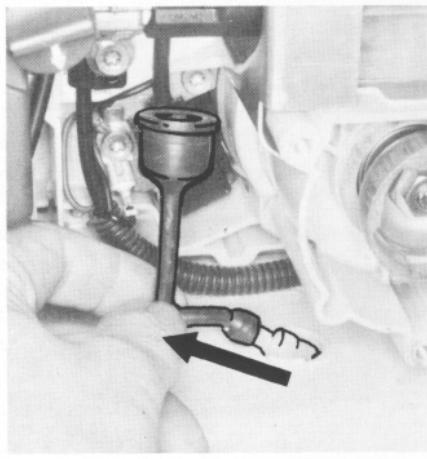
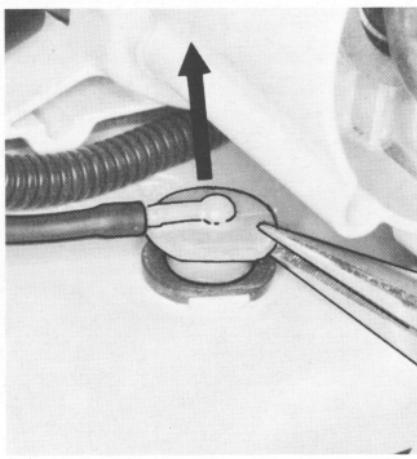


Top:
Removing plug with hose connector

Bottom:
Pulling connector off hose

Top:
Withdrawing the pickup hose

Bottom:
1 = Pickup body with filter
2 = Pickup hose

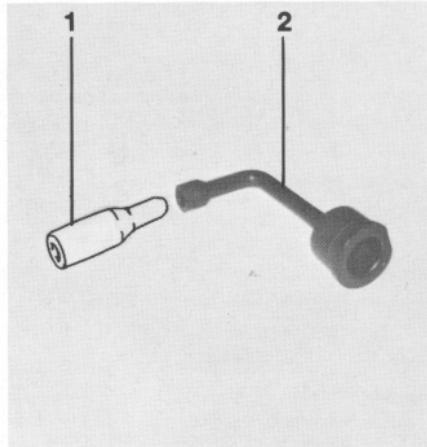
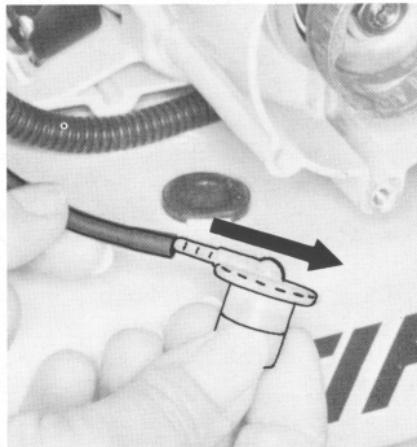


The diaphragm pump draws fuel out of the tank and into the carburetor via the fuel hose. Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

Important: In the event of trouble with the fuel supply system, always check the fuel tank and the pickup body first. Clean the fuel tank if necessary.

To clean the fuel tank:

- Unscrew the filler cap and drain the tank.
- Pour a small amount of clean gasoline into the tank.
- Close the tank and shake the blower/mistblower vigorously.
- Open the tank again and drain it.



To remove and install pickup body:

- Remove the shroud - see 4.1.
- Remove plug with hose connector from the pickup hose.
- Pull the connector out of the hose.

- Pull the pickup hose out of the fuel tank.

- Pull the pickup body and filter off the pickup hose.

Note: It is not advisable to clean the filter – always fit a new one.

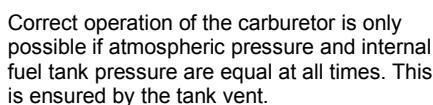
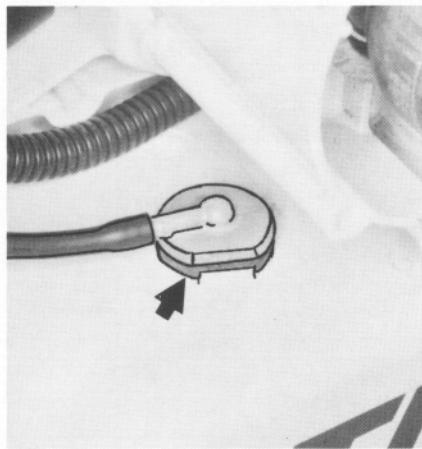
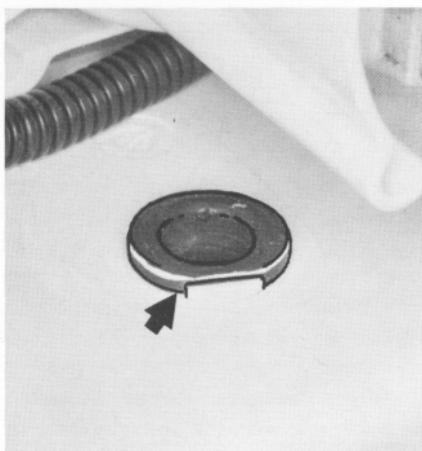
Installation is a reversal of the removal sequence.

8.7 Tank Vent

Top:
Correct position of pickup hose

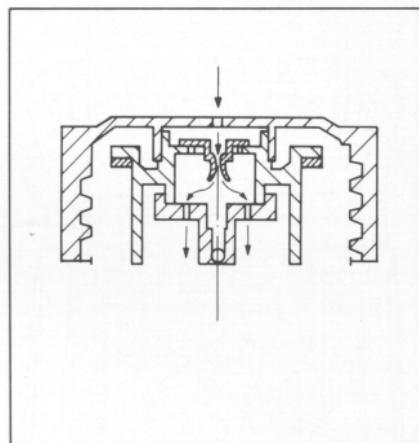
Bottom:
Correct position of plug with hose connector

Fuel tank vent



Top:
Fuel tank vent

Bottom:
1 = Retaining ring
2 = Diaphragm valve
3 = Valve
4 = Fuel filler cap
5 = Valve body
6 = Sealina rina

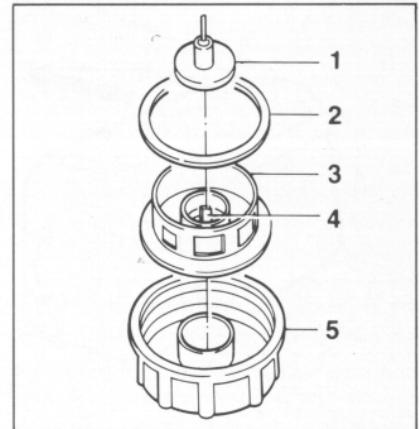


Correct operation of the carburetor is only possible if atmospheric pressure and internal fuel tank pressure are equal at all times. This is ensured by the tank vent.

Important: In the event of trouble with the carburetor or the fuel supply system, always check and clean the tank vent.

Equalization of tank pressure in both directions is effected via the diaphragm valve (inlet) and the valve in the valve body (outlet).

- Unscrew the fuel filler cap.
- Pry the valve body out of the filler cap.
- Wash the valve body in clean gasoline.



- Remove valve with a damaged diaphragm from the valve body and fit a new one.

- Fit sealing ring over the valve body.

- Fit the valve body in the filler cap and press it in. It must snap into position.

Note: Fit the pickup hose so that its flat side locates against the lug on the tank housing.

It is easier to fit the plug with hose connector if the bottom part of the plug is coated with a little oil. The flat side of the plug must line up with the lug on the tank housing.

9. SPRAYING ATTACHMENT

9.1 Container

Top:

1 = Mounting screws
2 = Retainer

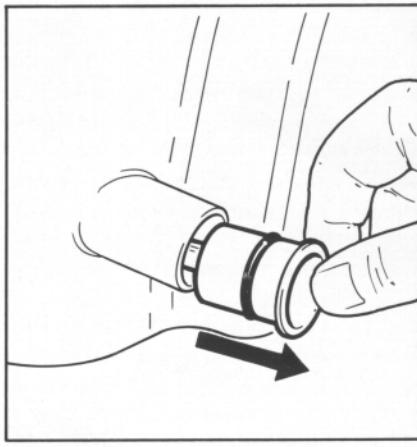
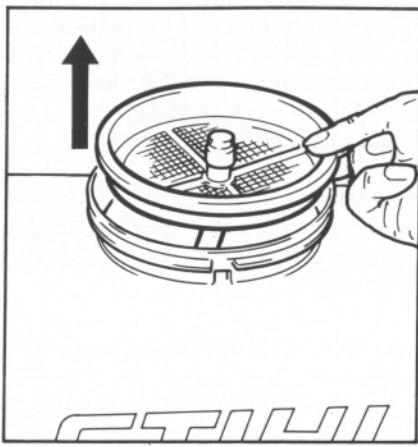
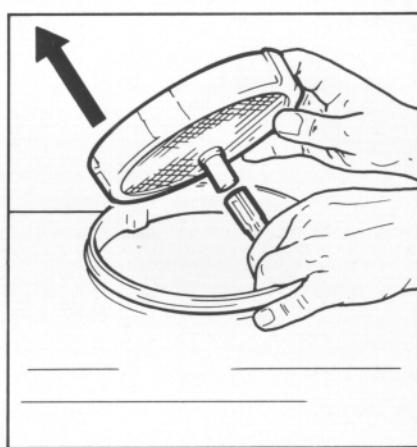
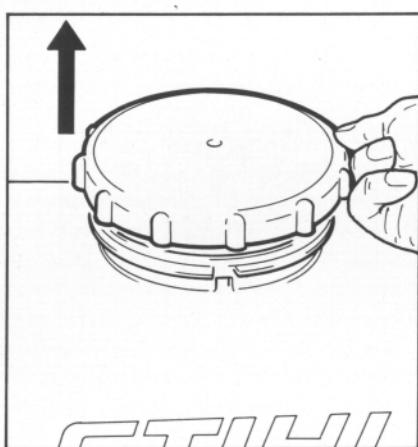
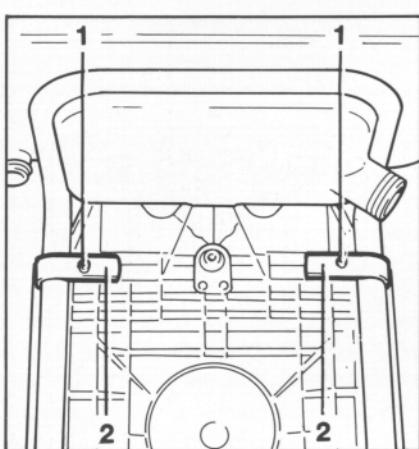
Bottom: Removing container

Top:
Removing container cap

Bottom:
Taking out strainer

Top:
Pulling hose off strainer

Bottom:
Withdrawn a reducer



- Remove powerhead from backplate – see 6.1.
- Unscrew and remove the retainers.
- Take the container out of the support frame.

- Unscrew and remove filler cap from container.
- Take the strainer out of the container.

- Pull the hose off the stub on the strainer.
- From inside the container, push the reducer out of the stub and then withdraw it together with the hose.

9.2 Pressure Pump (Special Accessory)

9.2.1 Removing and Installing

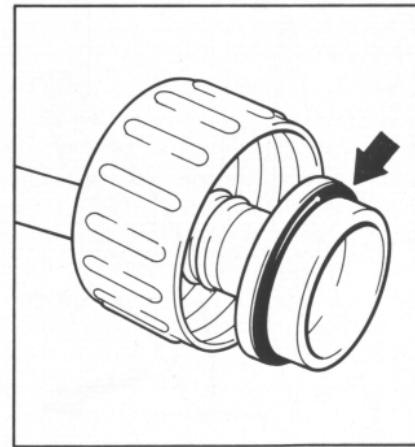
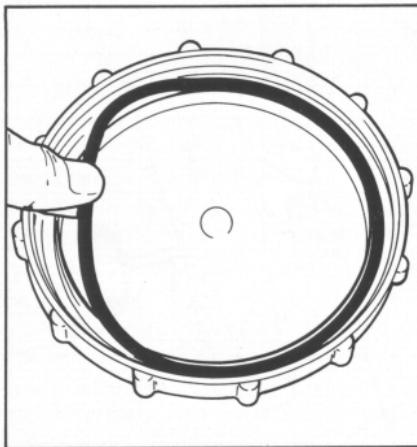
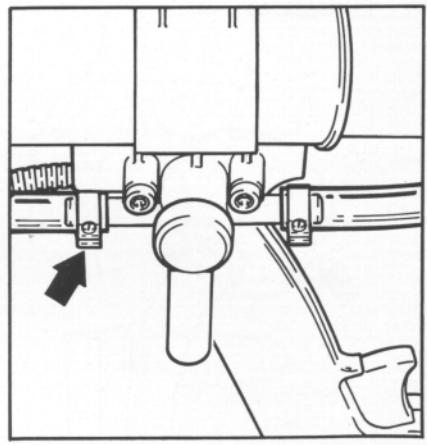
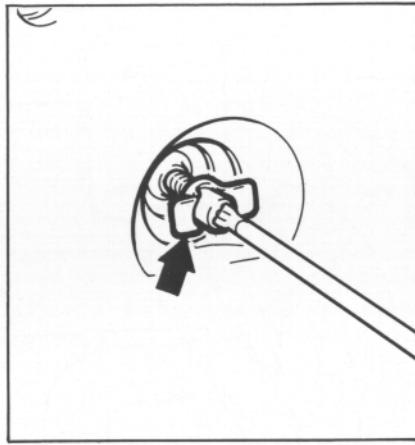
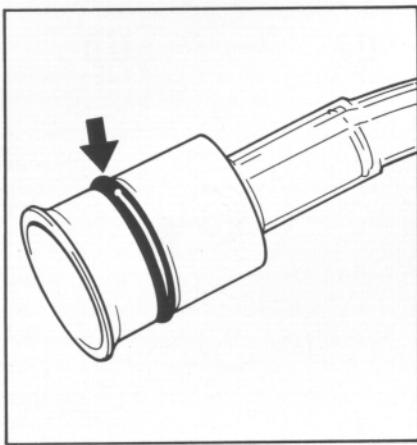
Top:
O-ring

Bottom:
Square-section sealing ring

Top:
Safety retainer

Bottom:
O-ring

Hose clip on shut-off cock



Installation is a reversal of the removal sequence.

Note: Pay special attention to the following points:

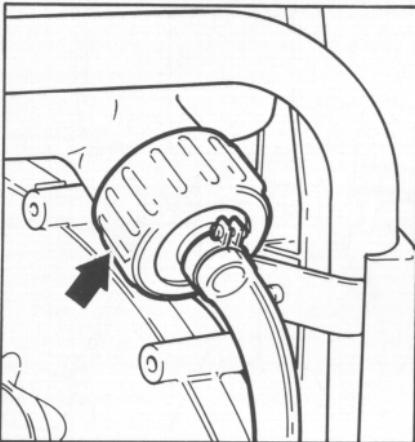
- Inspect the O-ring on the reducer and replace it if necessary.
- Inspect the square-section sealing ring in the container cap and replace it if necessary.
- Install the safety retainer under the upper mounting screw on the backplate.
- Tighten the screws to 6.0 Nm (4.4 lbf.ft).
- Inspect the O-ring in the reducer on the union nut and replace it if necessary.

The pressure pump constantly agitates the spray mix in the container and ensures a uniform spraying rate irrespective of the position in which the mistblower tube is held.

- Release the hose clip at the shutoff cock and pull the hose off the stub.

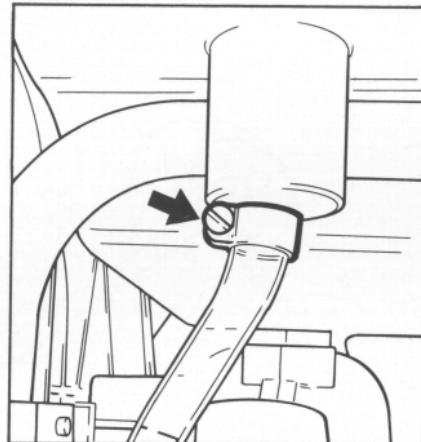
Top:
Union nut

Bottom:
Withdrawing strainer



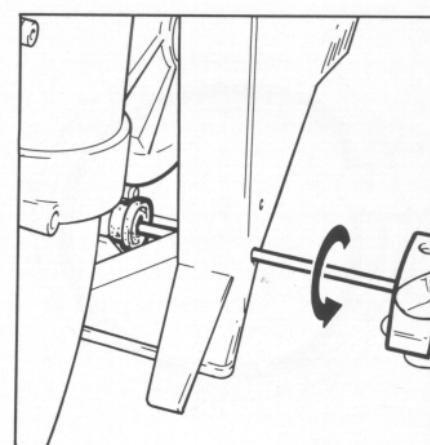
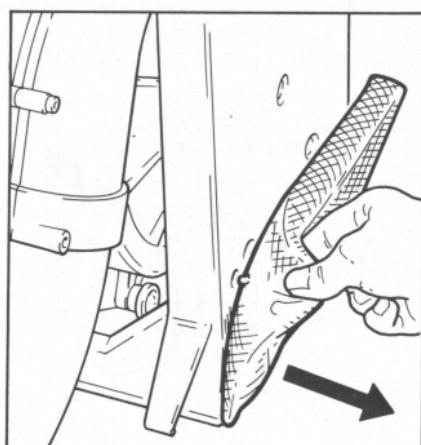
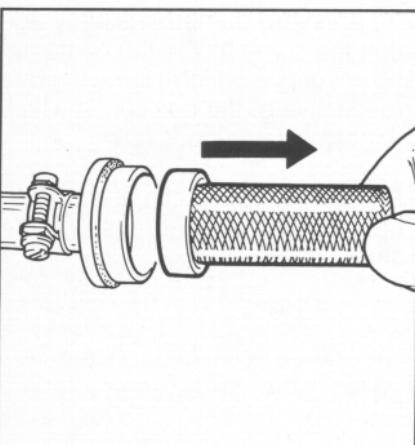
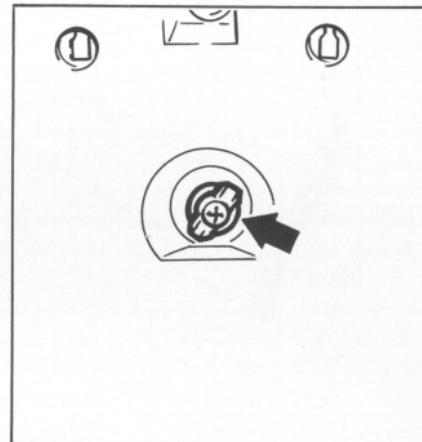
Top:
Hose clip on container

Bottom:
Removing back padding



Top:
Upper annular buffer mounting screw

Bottom:
Removing the lower mounting screws



- Unscrew union nut from container's stub.
- Remove the strainer from the union nut.
- Release hose clip at reducer on container and pull the hose off the reducer.
- Pull the press studs out of the backplate and remove the back padding.
- Unscrew the mounting screw from the upper annular buffer.
- Unscrew the mounting screws from the lower annular buffers. Lift the powerhead away from the backplate.

9.2.2 Disassembling and Reassembling

Top:
Pressure pump mounting screws

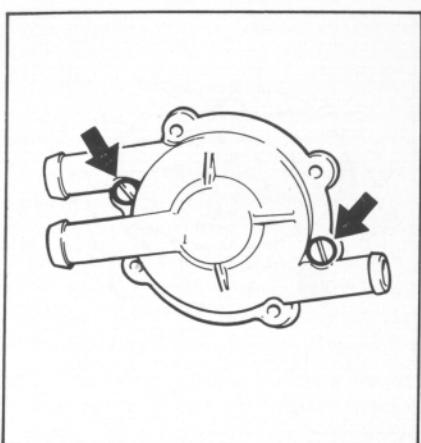
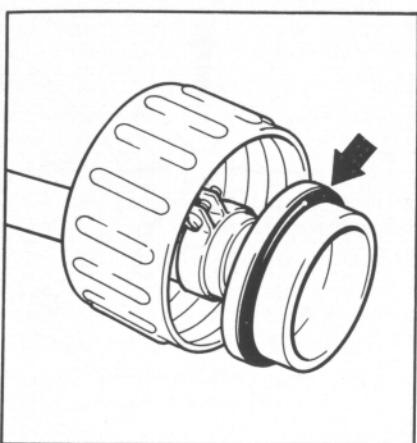
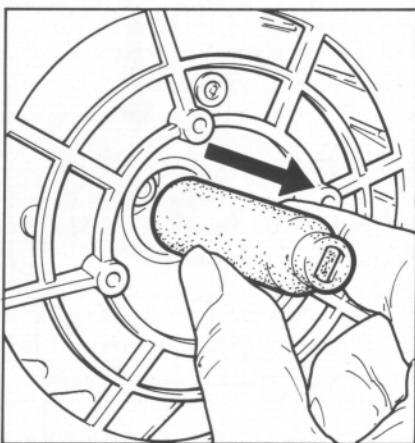
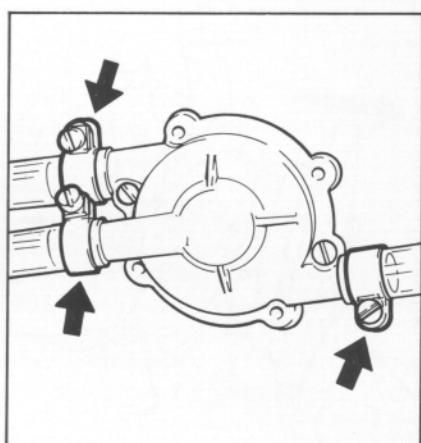
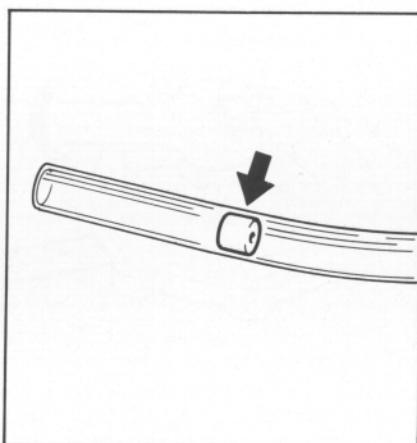
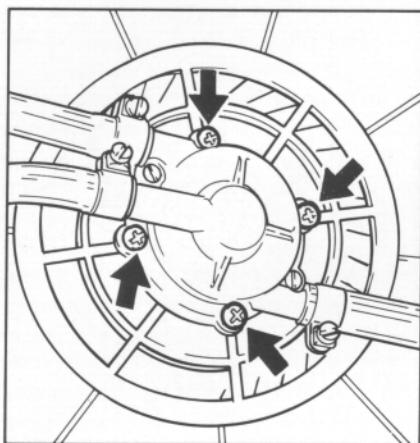
Bottom:
Removing coupling element

Top:
Restrictor

Bottom:
O-ring

Top:
Hose clips on pressure pump

Bottom:
Pump housing fastening screws



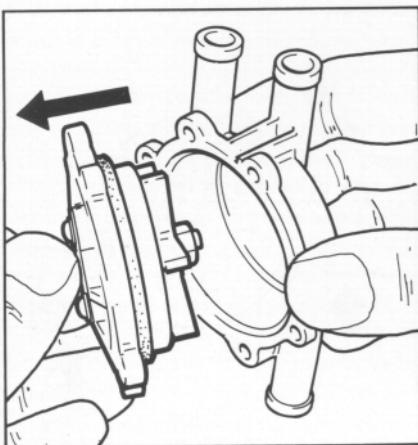
- Take out the pressure pump mounting screws. Remove the pressure pump.
- Pull the coupling element off the flywheel mounting nut.

Installation is a reversal of the removal sequence.

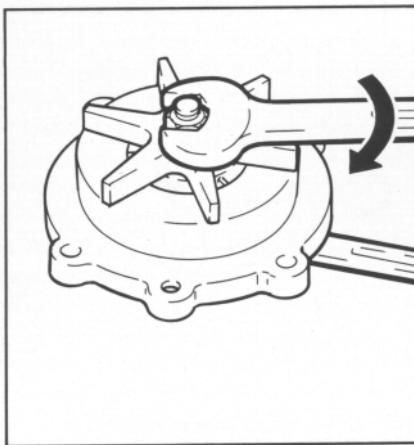
- Note:** Pay special attention to the following points:
- Make sure the restrictor is fitted in the return hose to the container.
 - Inspect the O-ring on the reducer and replace it if necessary.

- Remove the pressure pump - see 9.2.1.
- Release the hose clips at the pressure pump stubs and pull off the hoses.
- Take out the pump housing fastening screws.

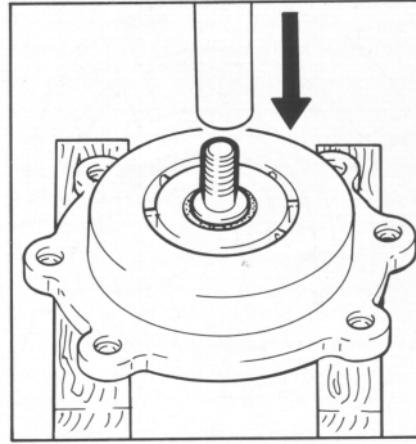
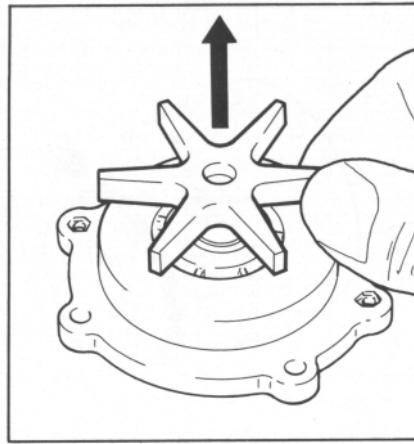
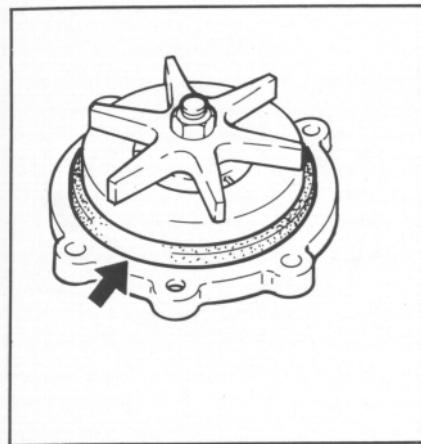
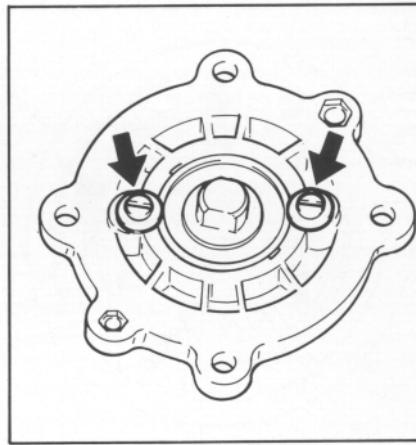
Top:
Separating pump housing
Bottom:
Sealing ring



Top:
Unscrewing nut
Bottom:
Pulling off impeller



Top:
Ball bearing retaining screws
Bottom:
Pressing out shaft



- Remove top of pump housing from base.
- Remove sealing ring from top of pump housing.

- Hold shaft steady and unscrew the nut.

Caution: Nut may have either a lefthand or right-hand thread.

- Pull the impeller off the shaft.

- Unscrew the ball bearing retaining screws from the top of the pump housing.

- Press the shaft out of the top of the pump housing.

Top:
Circlip pliers 0811 611 8200

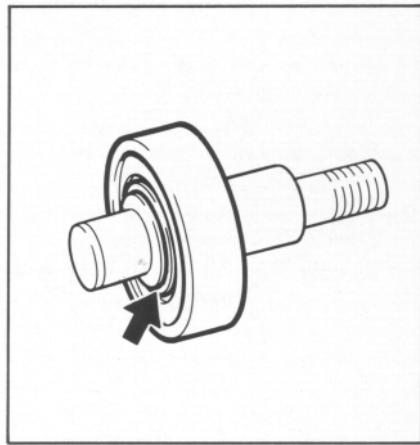
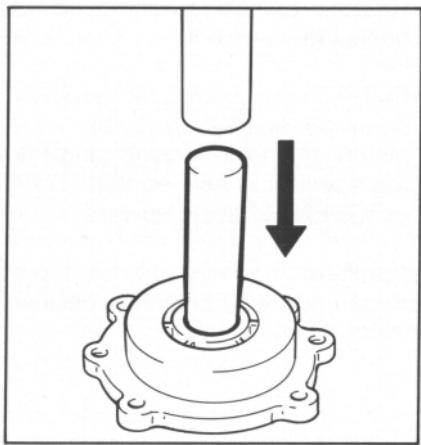
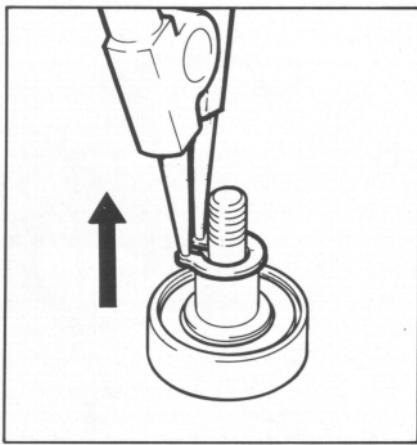
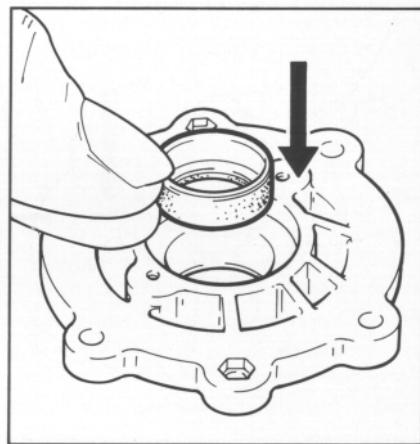
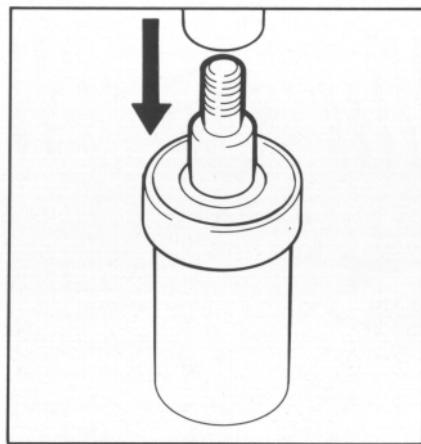
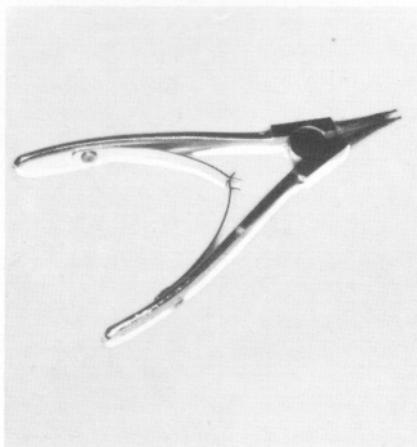
Bottom:
Removing circlip from shaft

Top:
Pressing out shaft

Bottom:
Pressing out the oil seal

Top:
Fitting the oil seal

Bottom:
Ball bearing on shaft



- There is a circlip in front of the ball bearing. Remove it from the shaft.

- Press the shaft out of the ball bearing.

- Press the oil seal out of the top of the pump housing.
- Clean all parts and inspect them for serviceability.

Reassemble by reversing the dis-assembly sequence.

Note: Pay special attention to the following points:

- Fit the oil seal with the large opening upward and then press it home as far as stop.
- Heat the ball bearing to approx. 50 °C (120 °F) and push it on to the shaft as far as it will go.

9.3 Fanwheel

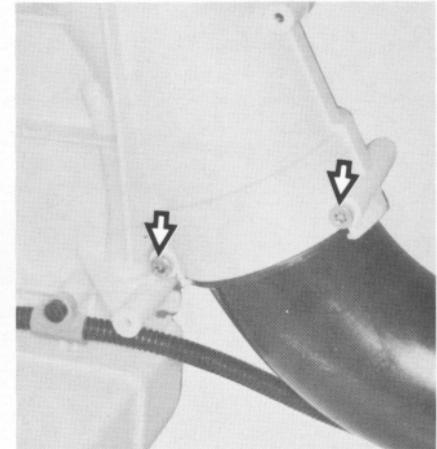
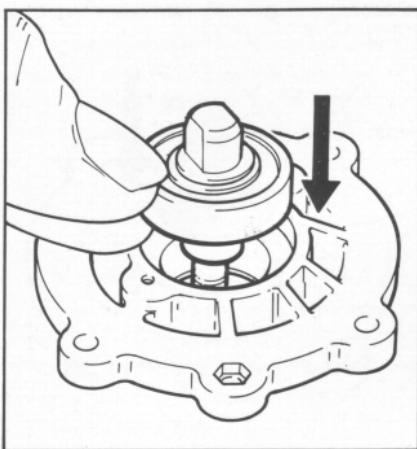
Top:
Fitting the shaft

Bottom:
Correct positions of hoses
1 = Feed to shut-off cock (830 mm)
2 = Feed from container (330 mm)
3 = Return to container (330 mm)

Locking strip 0000 893 5901 in position

Top:
Screws on elbow

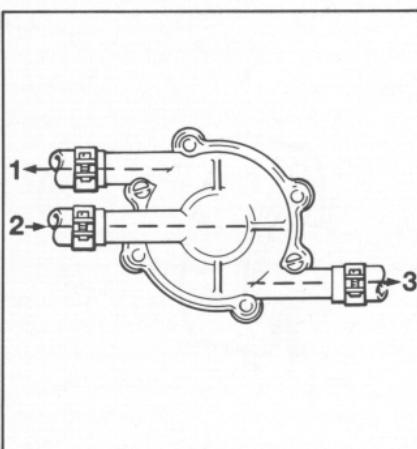
Bottom:
Fan casing mounting screws



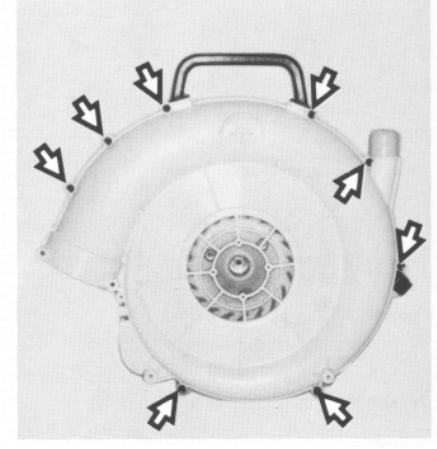
- Remove the powerhead from the backplate
- see 6.1.

- Pull off the spark plug terminal. Unscrew the spark plug. To block the piston, push the locking strip into the spark plug hole so that "TOP" or "OBEN" is facing upward.

Important: To avoid the risk of piston damage, use only the specified locking strip.



- Fit the shaft (threaded end downward) in the top of the pump housing and press it home as far as stop.
- Fit hoses on stubs of pump housing as shown above.

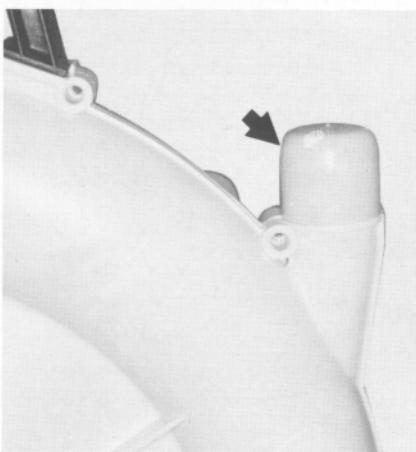


- Remove the elbow fastening screws and pull the elbow out of the stub.

Note: The nuts will drop out of the stub when the fastening screws are removed.

Top:
Cap

Bottom:
1 = Bellows
2 = Hose clip



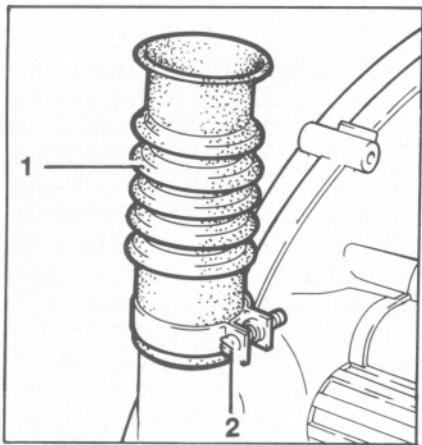
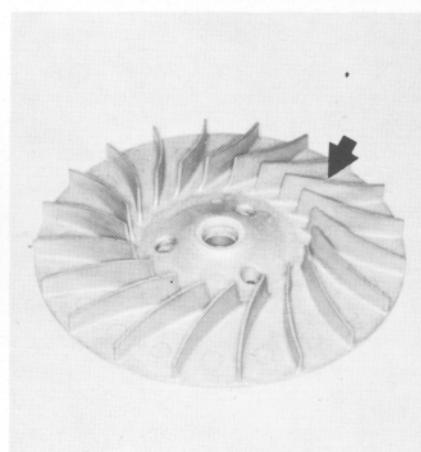
Top:
Handle

Bottom:
Fanwheel mounting screws



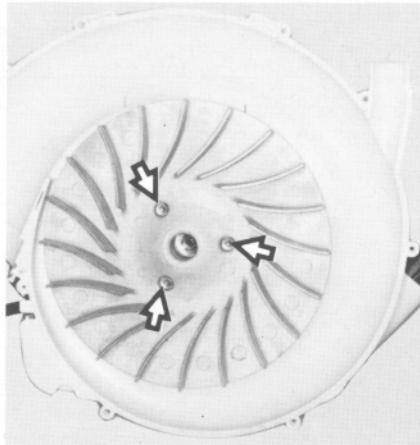
Top:
Blades on fanwheel

Bottom:
Tightening fanwheel mounting screws

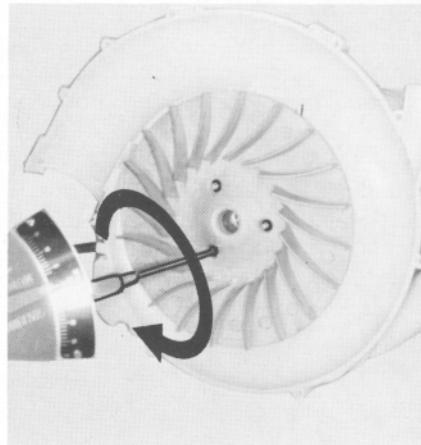


- Remove the mounting screws from the outer half of the fan casing, pull off the cap (BR 320/BR 400 only) and then lift away the casing.

Release the hose clip on models SR 320/SR 400 and pull the bellows off the casing stub.



- Pull the handle out of the fan casing on models BR 320/BR 400.
- Take out the fanwheel mounting screws and then pull off the fanwheel.



- Inspect all blades on the fanwheel for damage. Replace the fanwheel if necessary.

Installation is a reversal of the removal sequence.

Note: Tighten the fanwheel mounting screws to a torque of 8.0 Nm (5.9 lbf.ft).

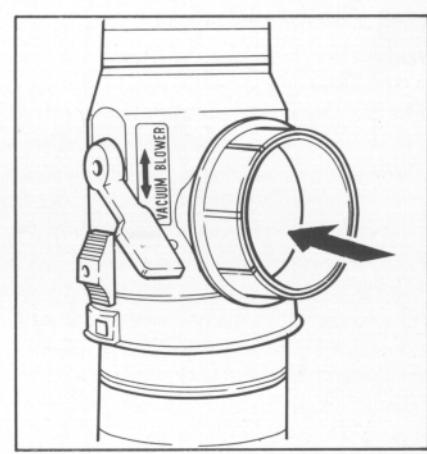
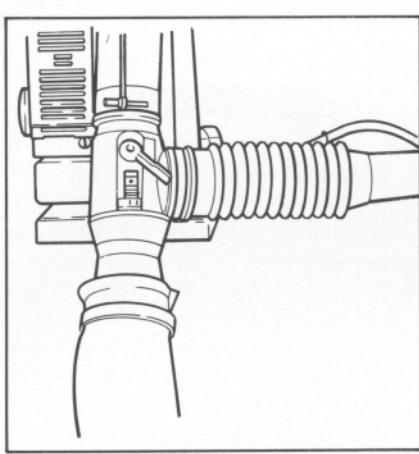
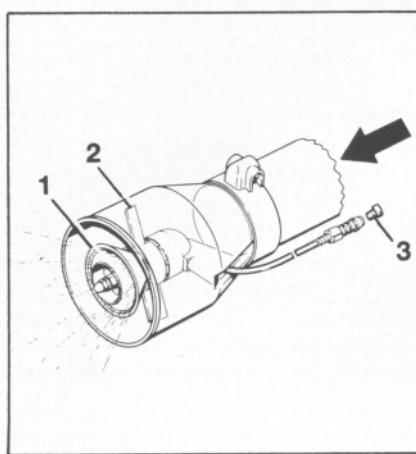
9.4 **ULV Rotary Nozzle
(Special Accessory)**

1 = Rotating atomizer
2 = Two-blade propeller
3 = Nozzle

9.5 **Vacuum Attachment
(Special Accessory)**

Vacuum attachment in position

Nozzle intake opening

**Function:**

The airstream produced by the unit drives a rotating atomizer via a twobladed propeller. The atomizer breaks down the spray mix into extremely fine droplets. Spray mix (chemical) is added via a nozzle incorporated in the feed line to the rotating nozzle. A choice of three different nozzle sizes is available, i.e. 0.6, 0.8 and 1.0 mm diameter (0.02, 0.03 and 0.04"), to suit the required spraying rate.

The vacuum attachment can be quickly installed in place of the elbow between the fan casing and pleated hose.

Function:

The fan's airstream is diverted via a nozzle into the air permeable catcher bag. The air flowing past the nozzle intake opening (arrow) at high speed creates a vacuum at that point which is used to pick up leaves or grass clippings. A changeover valve enables the airstream to be diverted so that the unit again operates as a blower. The catcher bag is removed for blower operation. The valve lever on the vacuum attachment is used to select either the "VACUUM" or "BLOWER" position.

9.6 Metering Unit (Mistblower)

1 = Metering knob
2 = Nozzle
3 = Molded lug

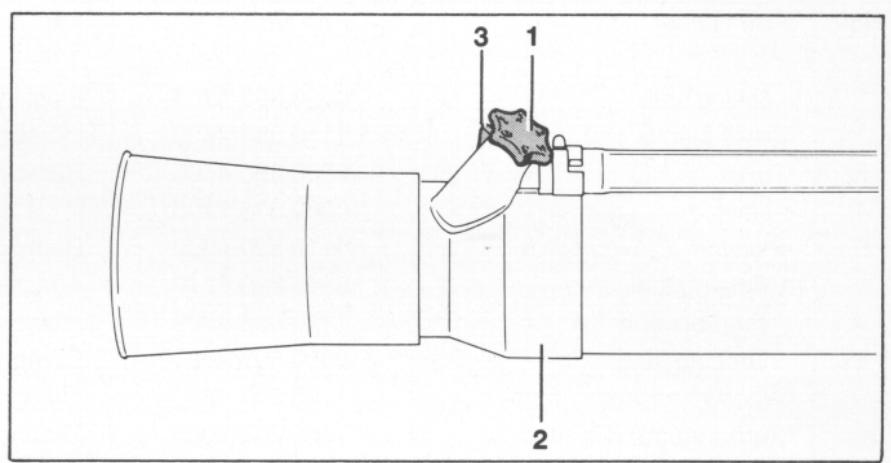
The metering knob on the nozzle provides infinitely variable adjustment of the liquid discharge rate. Metering knob position 1 is the minimum discharge rate and 6 the maximum.

The required number on the metering knob must be lined up with the molded lug.

The numbers on the metering knob represent the following discharge rates:

1. Discharge rate without pressure pump

Metering knob position	Discharge rate l/min (US gph)	SR 320, SR 400
	without baffle screen	with baffle screen
1	0.25 (4)	0.25 (4)
2	0.8 (13)	0.8 (13)
3	1.65 (26)	1.6 (25)
4	2.4 (38)	2.3 (36)
5	3.1 (49)	2.9 (46)
6	3.6 (57)	3.3 (52)



Checking the metering unit (without pressure pump)

The SR 320 and SR 400 should discharge 5 liters (1 gal) fluid within 80 to 100 seconds.

If the time required is longer, check the metering unit for contamination and clean it if necessary. Also check the carburetor setting and correct it as necessary.

2. Discharge rate with pressure pump (metering knob position 6)

Metering nozzle	Discharge rate l/min (US gph)	SR 320	SR 400
1	0.4 (6 1/2)	0.7 (11)	
2	1.3 (20 1/2)	1.7 (27)	
3	1.5 (24)	2.0 (32)	

- Place the unit on the ground.
- Fill the container with water up to the 10 liter (2 gal) mark.

- Set metering knob to position 6.

- Start the unit (baffle screen removed).

- Hold the spray tube horizontally, run the engine at full throttle, spray the contents of the container down to the 5 liter (1 gal) mark and make a note of the time taken.

10. SPECIAL SERVICING TOOLS AND AIDS

10.1 Special Servicing Tools

No.	Part Name	Part No.	Application
1	Locking strip	0000 893 5901	Blocking crankshaft
2	Press sleeve	1113 893 4600	Installing oil seals
3	Puller	0000 890 4400	Removing oil seals
4	-Jaws	0000 893 3706	
5	Puller	4119 890 4500	Removing flywheel
6	Crimping tool	5910 890 8210	Attaching connectors to electric wires
7	Assembly drift	1110 893 4700	Fitting piston pin
8	Clamping strap	0000 893 2600	Compressing piston rings
9	Wooden assembly block	1108 893 4800	Fitting piston
10	Carburetor and crankcase tester	1106 850 2905	Testing carburetor and crankcase for leaks
11	Vacuum pump	0000 850 3500	Testing crankcase for leaks
12	Sealing plate	0000 855 8105	Sealing exhaust port for leakage test
13	Test flange	1118 850 4200	For leakage test
14	Nipple - Fuel line	0000 855 9200 1110 141 8600	For carb leakage test
15	Setting gauge	4118 890 6400	Setting air gap between ignition module and flywheel
16	Socket, 13 mm	5910 893 5608	Crankshaft nut
17	Torque wrench	5910 890 0300	
18	Torque wrench	5910 890 0310	
19	Screwdriver bit I-5x10x6.3	0812 542 2104	For spline screws
20	Installing tool	5910 890 2210	Fitting hookless snap rings in piston
21	Press arbor	1118 893 7200	Removing and installing crankshaft bearings
22	Installing tool	0000 890 2201	Flaring rope guide bush
23	T-handle screwdriver QI-5 x 150	5910 890 2400	For all IS screws
24	Pliers A 10	0811 611 8200	For external circlip on pressure pump shaft
25	Removing tool	5910 890 4600	Pressing out crankshaft

10.2 Servicing Aids

No.	Part Name	Part No.	Application
1	Lubricating grease	0781 120 1111	Oil seals
2	High-strength threadlocking fluid (Loctite 270)		Securing screws, see 1.7.
3	Standard commercial, solvent-based degreasant containing no CFCs		Cleaning crankshaft stub
4	Sealant	0783 810 1101	Crankcase gasket
5	STIHL low temperature lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring in starter
6	Ignition lead 30.4 m (100')	0000 930 2206	
7	Gasket panel BR, SR	0457 281 1804	