

**FOREWORD**

This service manual contains detailed descriptions of all servicing procedures on model 044 chain saws and can thus be used as a basis for professional overhauls and repairs to all versions of this machine.

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 chain saw is mounted on assembly stand 5910 890 3100 or 5910 850 3100. The saw can be quickly secured to the stand by means of the two bar mounting studs and nuts.

While on the assembly stand the saw 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.

## CONTENTS

<b>1.</b>	<b>Specifications</b>	3	<b>4.6</b>	Crankcase	31	<b>9.</b>	<b>Electric Handle Heating System</b>	65
1.1	Engine	3	4.6.1	Removing the Crankshaft	31	9.1	Troubleshooting	65
1.2	Fuel System	3	4.6.2	Installing the Crankshaft	36	9.1.1	Troubleshooting Chart	67
1.3	Ignition System	4	4.7	Leakage Testing the Crankcase	42	9.1.2	Test Connections and Test Values	68
1.4	Cutting Attachment	5	4.7.1	Preparations	43	9.2	Switch	69
1.5	Weights	5	4.7.2	Pressure Test	44	9.3	Heating Element in Rear Handle	70
1.6	Tightening Torques	6	4.7.3	Vacuum Test	45	9.4	Heating Element in Front Handle	71
1.7	Special Accessories	7	4.8	Replacing the Oil Seals	46	9.5	Generator	72
1.7.1	For User	7				9.5.1	Removal	72
1.7.2	For Service Shop	7				9.5.2	Installation	72
<b>2.</b>	<b>Troubleshooting Charts</b>	8	<b>5.</b>	<b>Ignition System</b>	48	<b>10.</b>	<b>Chain Lubrication</b>	74
2.1	Clutch, Chain Drive, Chain Brake and Chain Tensioner	8	5.1	Repairing Component Parts	48	10.1	Pickup Body	74
2.2	Engine	9	5.1.1	Spark Plug	48	10.2	Suction Hose	75
2.3	Ignition System	9	5.1.2	Spark Plug Terminal	50	10.3	Vent Valve	75
2.4	Rewind Starter	11	5.1.3	Ignition Lead	51	10.4	Removal and Installation of Oil Pump	75
2.5	Chain Lubrication	12	5.1.4	Wiring Harness	51	10.5	Servicing the Oil Pump	76
2.6	Fuel System	13	5.1.5	Stop Switch	53			
			5.1.6	Ignition Module	54			
			5.1.6.1	Ignition Timing	54			
			5.1.6.2	Removing and Installing Flywheel	55			
<b>3.</b>	<b>Clutch, Chain Drive, Chain Brake and Chain Tensioner</b>	15	<b>6.</b>	<b>Rewind Starter</b>	57	<b>11.</b>	<b>Fuel System</b>	77
3.1	Clutch Drum/Chain Sprocket	15	6.1	Routine Maintenance	57	11.1	Air Filter	77
3.2	Clutch	16	6.2	Rope Rotor/Pawls	57	11.2	Removal and Installation of Carburetor	78
3.3	Chain Brake	18	6.3	Replacing Starter Rope	58	11.3	Leakage Testing the Carburetor	79
3.3.1	Disassembly	18	6.4	Replacing Rewind Spring	58	11.4	Servicing the Carburetor	80
3.3.2	Assembly	20	6.5	Tensioning Rewind Spring	59	11.5	Carburetor Adjustment	84
3.4	Chain Tensioner	22	6.6	Replacing Starter Rope Guide Bush	60	11.6	Tank Vent	86
<b>4.</b>	<b>Engine</b>	23				11.7	Fuel Filter and Fuel Hose	86
4.1	Removing and Refitting Exhaust Muffler (also with Catalytic Converter)	23	<b>7.</b>	<b>AV Handle System</b>	61	11.8	Tank Housing	88
4.2	Catalytic Converter	23	7.1	Repair	61	11.8.1	Removal and Installation	88
4.2.1	Construction and Function	23	<b>8.</b>	<b>Master Control</b>	62	<b>12.</b>	<b>Special Servicing Tools and Aids</b>	91
4.3	Exposing the Cylinder	24	8.1	Removing and Installing Throttle Trigger/Interlock Lever	62	12.1	Special Servicing Tools	91
4.4	Cylinder and Piston	25	8.2		63	12.2	Servicing Aids	92
4.4.1	Removal	25						
4.4.2	Installation	26						
4.5	Piston Rings	30						

## 1. SPECIFICATIONS

1.1	<b>Engine</b>	STIHL single-cylinder two-stroke engine
	Displacement:	70.7 cm <sup>3</sup> (4.3 cu.in)
	Bore:	50 mm (1.97 in)
	Stroke:	36 mm (1.42 in)
	Power output:	3.8 kW (5.2 bhp) at 9,500 rpm
	Max. torque:	4.4 Nm (3.2 lb.ft) at 6,500 rpm
	Cylinder bore:	Impregnated for high wear resistance
	Max. permissible engine speed with chain and Rollomatic bar:	14,000 rpm
	Clutch engages at:	approx. 3,400 rpm
	Mean idle speed:	2,700 rpm
	Crankshaft:	Two-part, drop forged
	Crankshaft bearings:	2 deep groove ball bearings
	Crankpin diameter:	14.4 mm (0.57 in)
	Bigend bearing:	Needle cage
	Piston pin dia.:	10 mm (0.39 in)
	Small-end bearing:	Needle cage
	Conrod length:	62 mm (2.44 in)
	Rewind starter:	Pawl engagement (2 pawls) with automatic starter rope rewind mechanism
	Starter rope:	3.5 mm (0.14 in) dia. x 960 mm (37.8 in)
	Clutch:	Centrifugal clutch without linings, 76 mm (3.0 in) dia.
	Crankcase leakage test at gauge pressure: under vacuum:	0.5 bar (7.25 psi) 0.5 bar (7.25 psi)
1.2	<b>Fuel System</b>	
	Carburetor:	All position diaphragm carburetor with integral fuel pump
	Basic setting	
	High speed adjusting screw H:	ack off approx. 1 turn
	Low speed adjusting screw L:	Back off approx. 1 turn (Basic setting with screws initially tight against their seats)
	Carburetor leakage test at gauge pressure:	0.8 bar (11.5 psi)

Fuel tank capacity:	0.8 l (27 fl.oz)
Octane number:	min. 90 RON
Fuel mixture:	Regular brand-name gasoline and brandname two-stroke engine oil
Mix ratio:	50:1 with STIHL 50:1 two-stroke engine oil; 40:1 with STIHL 40:1 two-stroke engine oil; 25:1 with other branded two-stroke, air-cooled engine oils
Air filter:	Prefilter and bisectional box filter Special accessory: Heavy-duty (HD) air filter

1.3	<b>Ignition System</b>	Type:	Transistorized (breakerless) magneto ignition with trigger unit integrated in ignition module
		Air gap:	0.15-0.3 mm (0.006-0.012 in)
		Ignition timing:	2.0-3.0 mm (0.08-0.12 in) B.T.D.C. at 8,000 rpm
		Advance angle:	24.5-29.5° B.T.D.C. at 8,000 rpm
		Ignition module:	Coil winding resistances Primary:              Secondary: 0.7...1.0 Ω            7.7...10.3 kΩ
		Spark plug (suppressed):	Bosch WSR 6 F or NGK BPMR 7 A
		Electrode gap:	0.5 mm (0.020 in)
		Spark plug thread:	M14 x 1.25
		Length of thread:	9.5 mm (0.37 in)
		Heat range:	200

---

1.4	<b>Cutting Attachment</b>	Guide bars:	STIHL Rollomatic guide bars with sprocket nose STIHL Duromatic guide bars with stellite-stripped nose Both types with corrosion-resistant finish and induction hardened rails
		Bar tail:	3003
		Bar lengths:	Rollomatic: 37, 40, 45 and 50 cm (14, 16, 18 and 20 in) Rollomatic S: 40, 45, 50, 63 and 75 cm (16, 18, 20, 25 and 30 in) Duromatic: 40, 45, 50, 63 and 75 cm (16, 18, 20, 25 and 30 in)
		Oilomatic chain:	3/8" (9.32 mm) Rapid-Micro and Rapid-Super 3/8" (9.32 mm) Topic-Micro and Topic-Super
		Chain sprockets:	7-tooth, 3/8" rim sprocket 7-tooth, 3/8" spur sprocket Options: 8-tooth, 3/8" rim and spur sprockets
		Chain speed:	20.7 m/s (68 ft/sec) at 9,500 rpm (with 7-tooth, 3/8" sprocket)
		Chain lubrication:	Fully automatic speed-controlled reciprocating oil pump; no oil feed at idle speed. Additional manual oil flow control (with Economic mark)
		Oil delivery rate:	Adjustable 8 - 18 cm <sup>3</sup> /min (0.3 - 0.6 fl.oz/min) at 10,000 rpm
		Oil tank capacity:	0.33 l (0.7 US pt)

---

1.5	<b>Weights</b>	044	044 C	044 W
	Dry powerhead without bar and chain:	5.9 kg (13.0 lb)	6.2 kg (13.6 lb)	6.1 kg (13.4 lb)
	Dry powerhead with 37 cm (15 in) bar and chain:	7.3 kg (16.1 lb)	7.6 kg (16.7 lb)	7.5 kg (16.5 lb)

---

## 1.6 Tightening Torques

Fastener	Thread size	For component	Torque Nm	(lbf.ft)	Remarks
Spline screw	IS-M5x20	Crankcase	11.5	(8.5)	
Spline screw	IS-M5x20	Cylinder	11.5	(8.5)	
Spline screw	IS-M5x16	Muffler lower casing to cylinder	11.0	(8.1)	1)
Spline screw	IS-M5x6	Muffler upper casing (top)	8.5	(6.3)	1)
Spline screw	IS-M5x16	Muffler (bottom)	11.0	(8.1)	1)
Spline screw	IS-M5x20	Ignition module	9.0	(6.6)	2)3)
Nut	M8x1	Crankshaft (ign. end) (flywheel)	33.0	(24.3)	
Nut	M5	Carburetor	3.5	(2.6)	
Spline screw	IS-M4x16	Shroud	4.0	(3.0)	
	M12x1 left	Carrier (clutch)	50.0	(37.0)	
	M14x1.25	Spark plug	25.0	(18.5)	
Spline screw	IS-P6x26.5	Buffer, top	5.5	(4.0)	
Spline screw	IS-P6x19	Buffer, bottom	5.5	(4.0)	
Spline screw	IS-P6x19	Front handle, top	8.0	(5.9)	4)
Spline screw	IS-P6x19	Front handle, bottom	8.0	(5.9)	4)
Self-tap screw	B3.9x19	Handle molding (rear handle)	1.0	(0.7)	
Spline screw	IS-M4x16	Buffer plate	5.0	(3.7)	
Spline screw	IS-M5x16	Chain catcher to spiked bumper	6.0	(4.4)	
Spline screw	IS-M5x12	Spiked bumper to crankcase (top)	6.0	(4.4)	2)
Pan head screw	M3.5x12	Generator (heating)	2.0	(1.5)	1)
Pan head screw	M4x8	Cover of chain tensioner	3.0	(2.2)	
Spline screw	IS-M4x12	Oil pump	3.5	(2.6)	
Spline screw	IS-M4x12	Cover of chain brake	3.0	(2.2)	
Spline screw	IS-M4x 12	Brake band	3.0	(2.2)	1)
Spline screw	IS-M4x16	Fan housing	4.0	(3.0)	
Spline screw	IS-M4x16	Hand guard (left) to fan housing	4.0	(3.0)	
Pan head screw	M4x8	Inner side plate	3.0	(2.2)	
Collar stud	M8x21.5	Bar mounting	23.0	(17.0)	1)

**Remarks:**

- 1) Screw must be secured with adhesive 0786 111 1109 (Loctite 270)
- 2) Screw must be secured with adhesive 0786 111 1101 (Loctite 242)
- 3) A washer must be fitted under the screw head
- 4) Screw must be secured with adhesive 0786 111 1117 (Loctite 648)

**Note:** Screws secured with adhesive are easier to release if the adhesive is heated first with a hot air blower (hair dryer). **Exercise caution on polymer components.**

**1.7 Special Accessories****1.7.1 For user**

STIHL repair kit 044	1128 900 5000
3/8", 7-tooth rim sprocket kit*	1128 007 1000
3/8", 8-tooth rim sprocket kit*	1128 007 1001
3/8", 7-tooth spur sprocket*	1128 640 2000
3/8", 8-tooth spur sprocket	1110 353 1600
Valve (for fuel tank vent)	0000 792 9150
Chain scabbard extension	

**1.7.2 For service**

Gasket set 044	1128 007 1050
Carburetor parts kit	1128 007 1065

---

\* Part may be standard equipment

2. **TROUBLESHOOTING CHARTS**

2.1 **Clutch,  
Chain Drive,  
Chain Brake and  
Chain Tensioner**

Condition	Cause	Remedy
Saw chain turns at idle speed	Engine idle speed too high  Spring hooks) broken	Readjust at idle speed adjustment screw (counterclockwise)  Fit new springs)
Loud noises	Springs stretched or fatigued  Needle cage damaged  Clutch shoe retainer broken  Clutch shoes and carrier worn	Replace all clutch springs  Fit new needle cage  Fit new retainer  Fit new clutch
Chain sprocket wears rapidly	Chain not properly tensioned	Tension chain as specified
Chain wears rapidly	Chain not properly tensioned  Poor chain lubrication  Worn chain sprocket	Tension chain as specified  Check chain lubrication and rectify problem  Fit new sprocket
Chain does not stop immediately when chain brake is activated	Brake spring broken  Brake band stretched or broken	Fit new brake spring  Fit new brake band

## 2.2 Engine

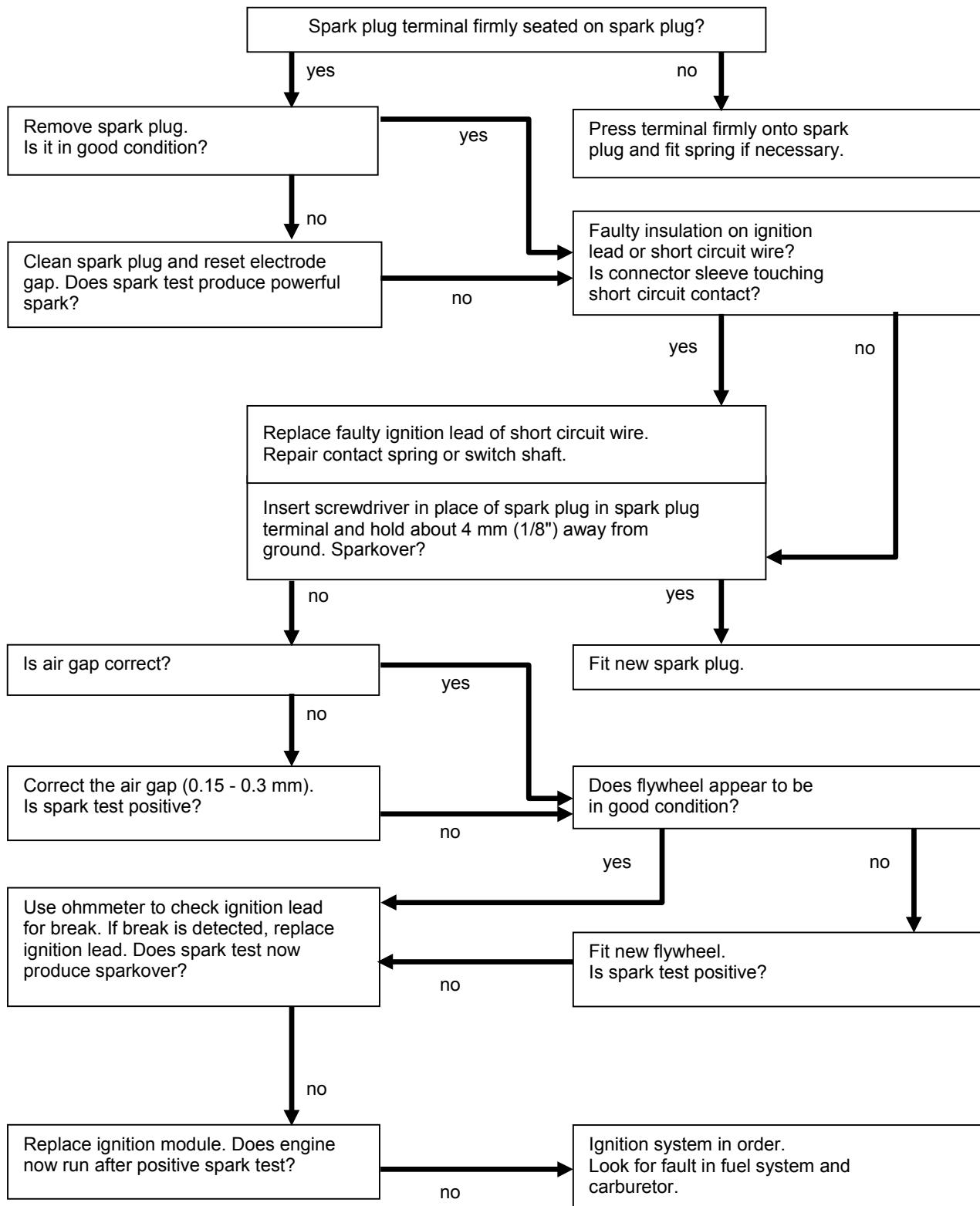
Always check and, if necessary, repair the following parts before looking for faults on the engine:

- 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
	Manifold leaking	Seal or replace manifold
	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 manifold	Mount manifold correctly or replace
	Piston rings leaking or broken	Fit new piston rings
	Muffler carbonized	Clean muffler (inlet and exhaust), replace spark arrestor screen (if fitted)
Engine overheating	Insufficient cylinder cooling. Air inlets in fan housing blocked or cooling fins on cylinder very dirty	Thoroughly clean all cooling air openings
	Intake air preheating being used at too high an outside temperature	Remove intake air preheating components; close rotary shutter

## 2.3 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!



2.4      **Rewind Starter**

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge - i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Rewind spring broken	Spring overtensioned - no reserve when rope is fully extended	Fit new rewind spring
	Heavily soiled or corroded	Fit new rewind spring
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide pegs on pawls or pawls themselves are worn	Fit new pawls
	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

## 2.5 Chain Lubrication

**Important:** In the event of trouble with the chain lubrication system, always investigate the other possible sources of faults before disassembling the oil pump.

Condition	Cause	Remedy
Chain receives no oil	Oil tank empty	Fill up with oil
	0-ring on oil line in crankcase seat faulty or oil line damaged	Remove oil pump, fit new O-ring and reinstall oil pump or fit new oil pump
	Oil inlet hole in guide bar is blocked	Clean oil inlet hole
	Intake hose or pickup body (strainer) clogged or intake hose ruptured	Wash intake hose and pickup body (strainer) in white spirit and blow out with compressed air; replace if necessary
	Valve in oil tank blocked	Clean or replace valve
	Teeth on pump piston and/or worm worn	Fit new pump piston and/or new Worm
Machine losing chain oil	0-ring on oil line in crankcase seat faulty or oil line damaged	Remove oil pump, fit new O-ring and reinstall oil pump or fit new oil pump
	Cylinder bore in pump housing worn	Fit new pump housing
Oil pump delivers too little oil	Control screw and/or control edge on pump piston worn	Fit new control screw and/or new pump piston
	Cylinder bore in pump housing worn	Fit new pump housing

## 2.6 Fuel System

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

See also 2.2

3. CLUTCH, CHAIN DRIVE,  
CHAIN BRAKE AND  
CHAIN TENSIONER

3.1 Clutch Drum and  
Chain Sprocket

Top:  
Sprocket cover nuts

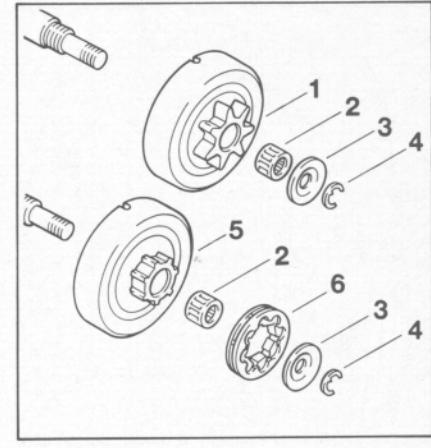
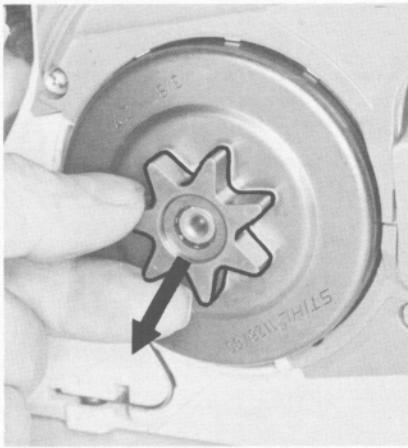
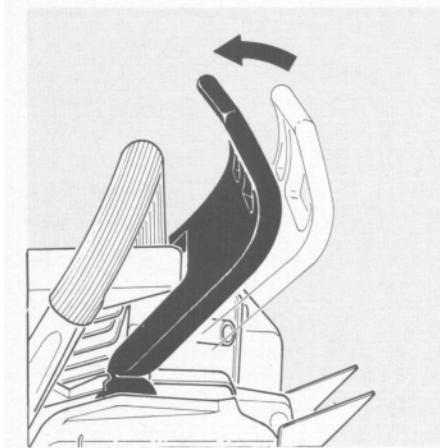
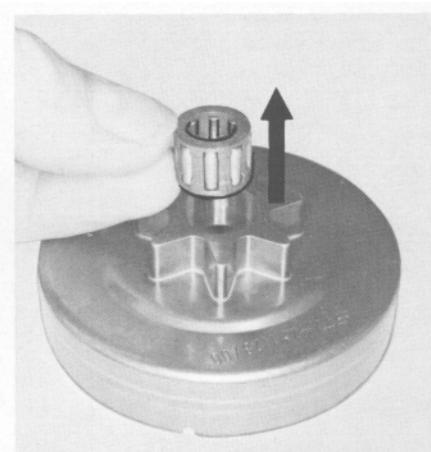
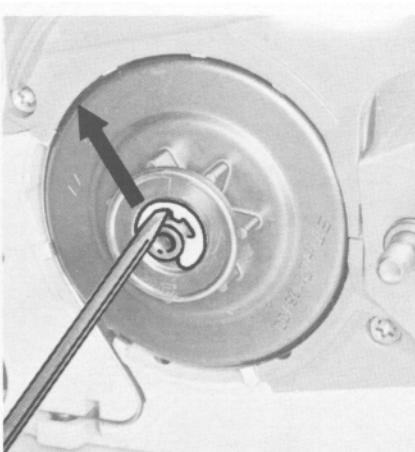
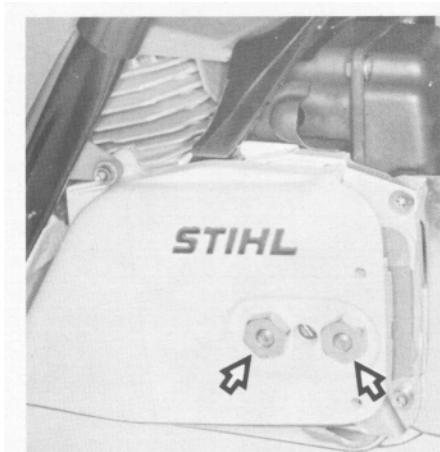
Bottom:  
Disengaging chain brake

Top:  
Removing E-clip

Bottom:  
Removing clutch drum or chain sprocket

Top:  
Removing needle cage

Bottom:  
Assembly sequence of chain drive  
1 = Spur sprocket (with clutch drum)  
2 = Needle cage  
3 = Washer  
4 = E-clip  
5 = Clutch drum (for rim sprocket)  
6 = Rim sprocket



- Unscrew sprocket cover nuts and remove sprocket cover.
- Disengage the chain brake by pulling the hand guard toward the front handle.

- Remove the E-clip from the clutch drum or chain sprocket.
- Pull off the rim sprocket with clutch drum or the spur sprocket.

- Take the needle cage out of the clutch drum or chain sprocket.

Reassemble in the reverse sequence.

**Note:** Clean stub of crankshaft. Replace the needle cage or wash it in clean white spirit and lubricate with STIHL multipurpose grease, see 12.2. Rotate the clutch drum or spur sprocket, apply slight pressure at the same time, until the oil pump drive spring engages the slot on the outside diameter of the drum.

## 3.2 Clutch

Top:  
Master Control in cold start position  
choke shutter closed

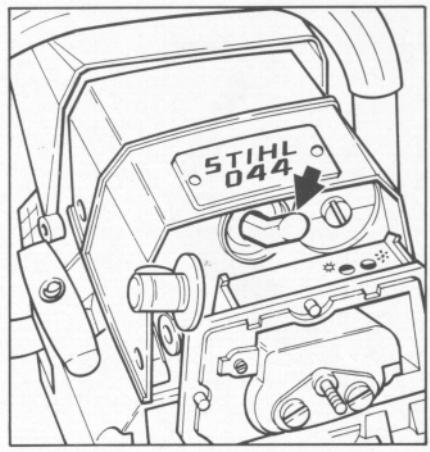
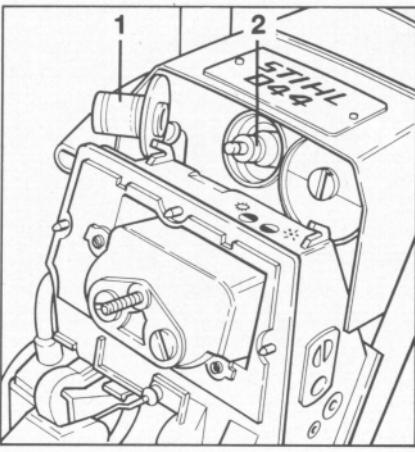
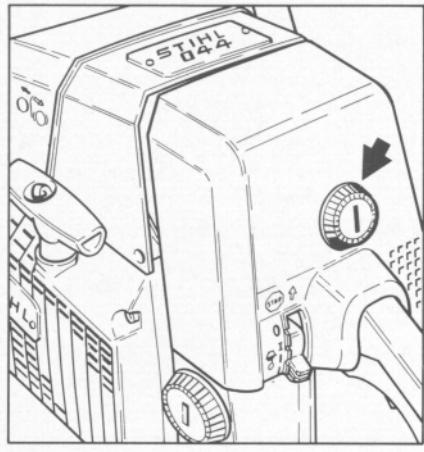
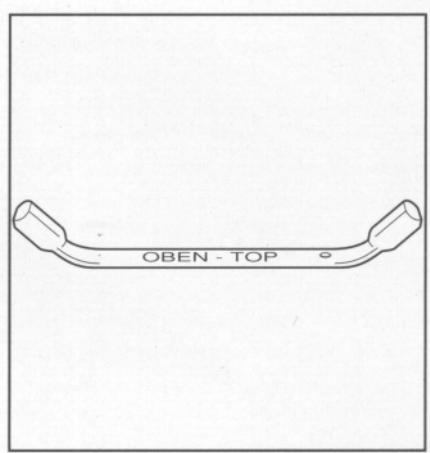
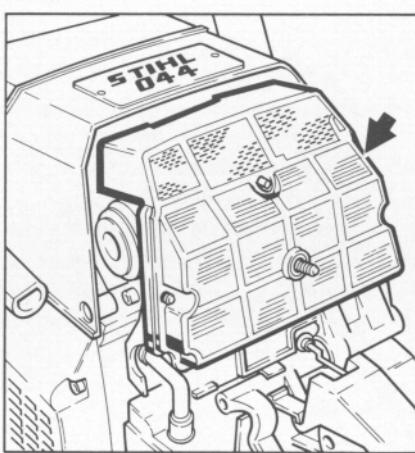
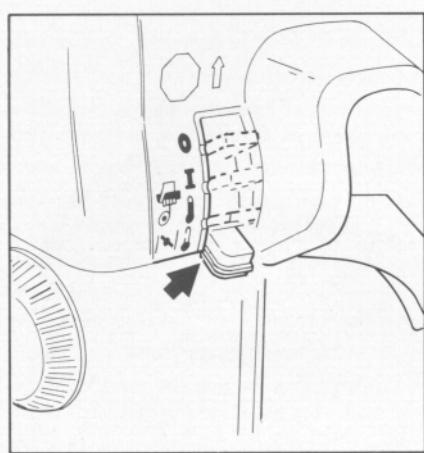
Bottom:  
Twist lock on carburetor box cover

Top:  
Outer half of air filter

Bottom:  
1 = Spark plug terminal  
2 = Spark plug

Top:  
Locking strip 0000 893 5901

Bottom:  
Locking strip in position



Troubleshooting chart - see 2.1.

To remove and disassemble the clutch:

- Close the choke - hold down throttle trigger interlock and move Master Control to lowest position.
- Release twist lock and lift away carburetor box cover.

- Pull outer air filter element off the filter base.

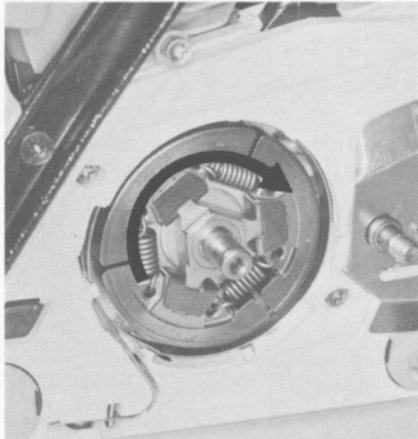
- Pull terminal off the spark plug and then unscrew the spark plug.

- 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.

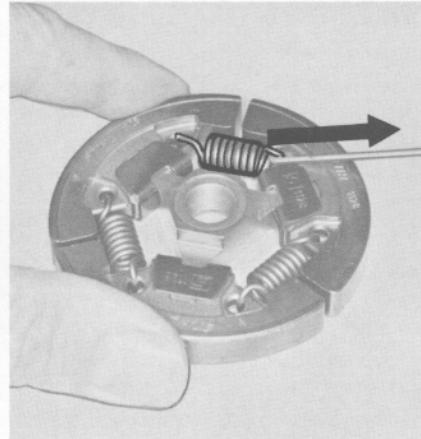
Top:  
Clutch

Bottom:  
Assembly hook 5910 890 2800



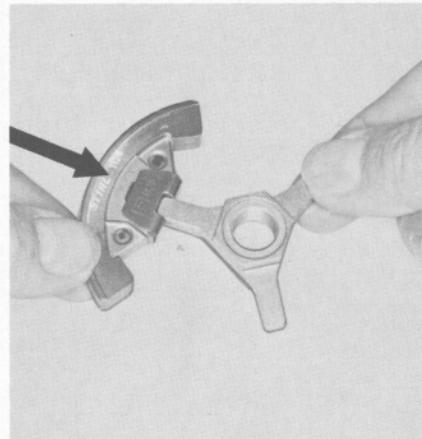
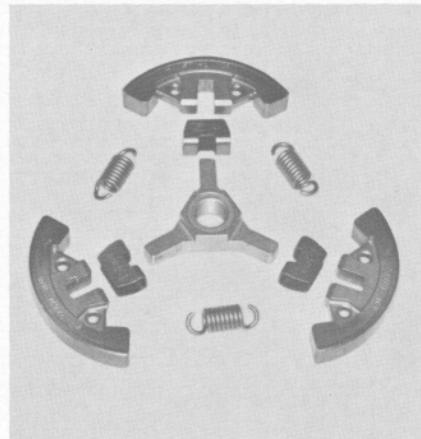
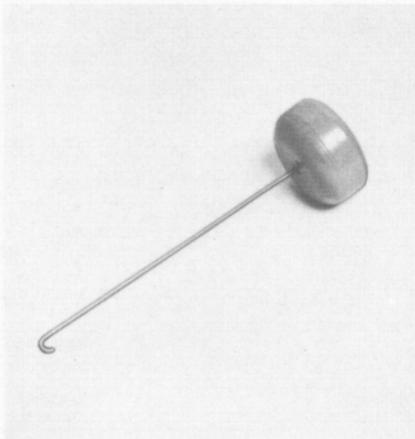
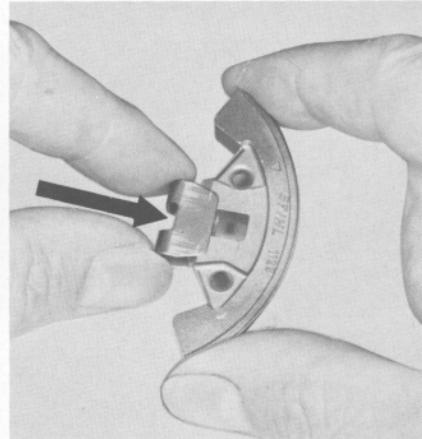
Top:  
Removing a clutch spring

Bottom:  
Component parts of clutch



Top:  
Fitting retainer on clutch shoe

Bottom:  
Pushing clutch shoe onto carrier



- Remove the clutch drum or chain sprocket, see 3.1.
- Unscrew clutch from stub of crank-shaft.

**Caution!** Clutch has left-hand thread.  
Unscrew it clockwise.

- Remove oil pump cover washer from stub of crankshaft.

- Use assembly hook to remove all the clutch springs.
- Pull the clutch shoes off the carrier.
- Pull the retainers off the clutch shoes.
- Clean all parts and stub of crank-shaft in white spirit. Replace any damaged or worn parts.

To reassemble and install the clutch:

- Push the retainers onto the clutch shoes.
- Fit the clutch shoes over the arms of the clutch carrier so that the series number, e.g. 1128, is on the same side as the carrier's hexagon.

### 3.3 Chain Brake

#### 3.3.1 Disassembly

Top:  
Clutch clamped in vise

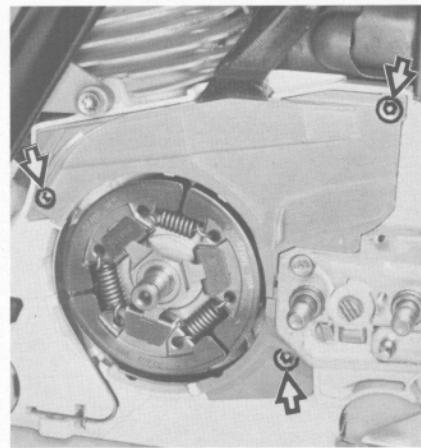
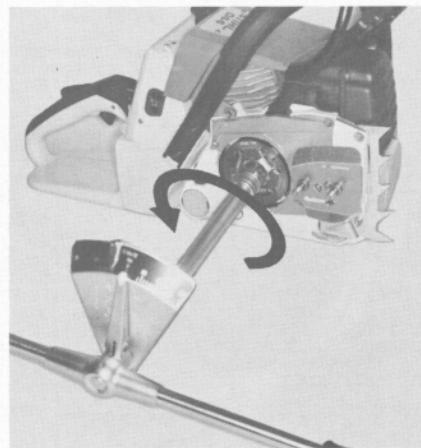
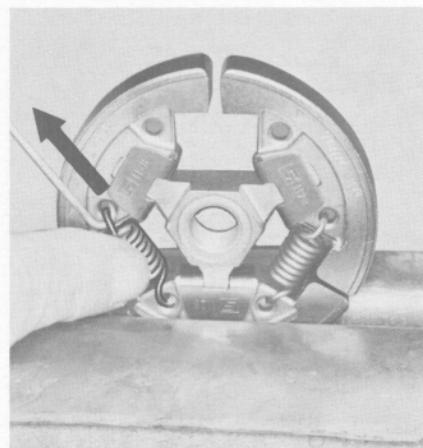
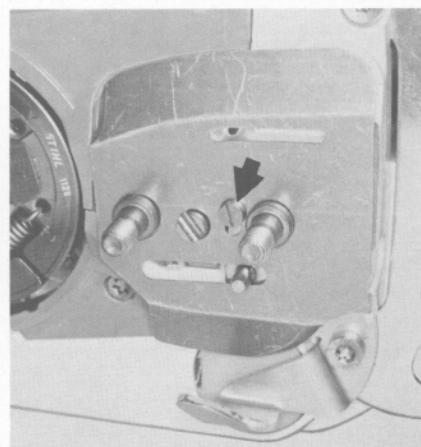
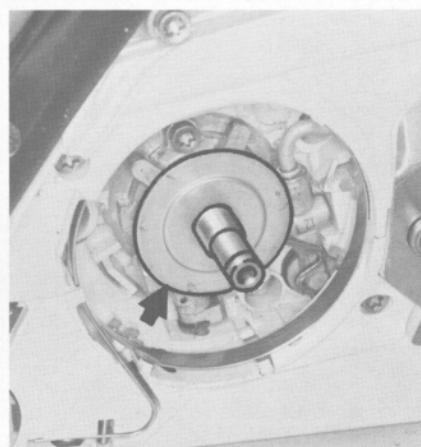
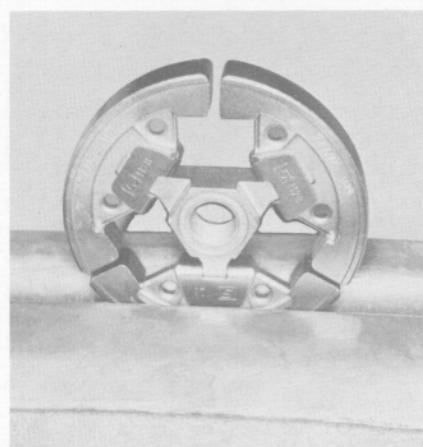
Bottom:  
Attaching clutch springs

Top:  
Cover washer

Bottom:  
Tightening the clutch

Top:  
Inner side plate mounting screw

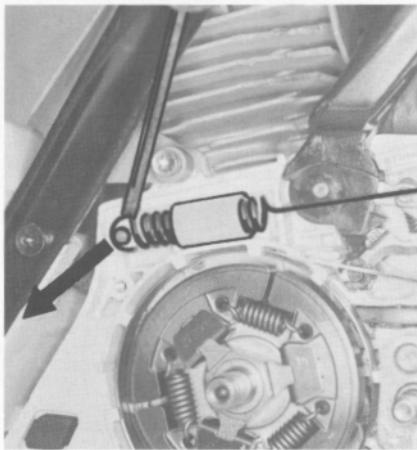
Bottom:  
Mounting screws of covers



- Clamp the clutch, e.g. one clutch shoe, in a vise.
- Attach one end of each spring to the clutch shoes by hand.
- Use the assembly hook to attach the other ends of the springs and press them firmly into the clutch shoes with one finger.
- Slip the cover washer, its raised center must face outward, over the stub of the crankshaft.
- Screw clutch onto crankshaft and tighten down to a torque of 50 Nm (37 lbf.ft).
- Install clutch drum with rim sprocket (or spur sprocket) - see 3.1.
- Remove locking strip from cylinder. Install spark plug and tighten down to a torque of 25 Nm (18.5 lbf.ft).
- Fit outer half of air filter.
- Remove the clutch drum with rim sprocket (or spur sprocket) - see 3.1.
- Remove mounting screw from inner side plate and lift side plate away.
- Remove mounting screws from covers and take out the two covers.

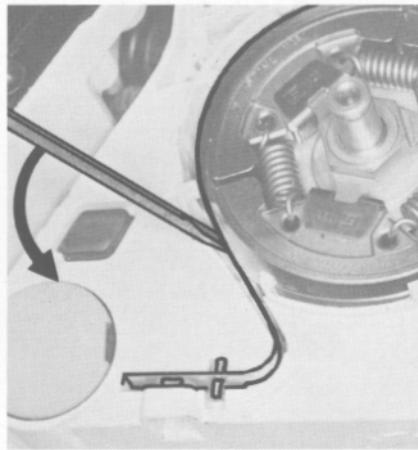
Top:  
Detaching brake spring

Bottom:  
Brake band mounting screw



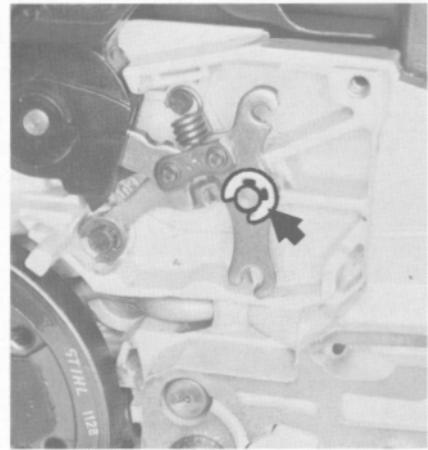
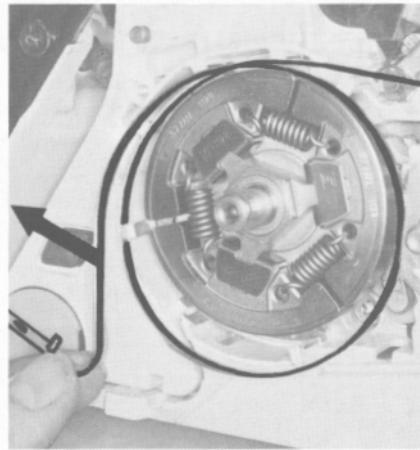
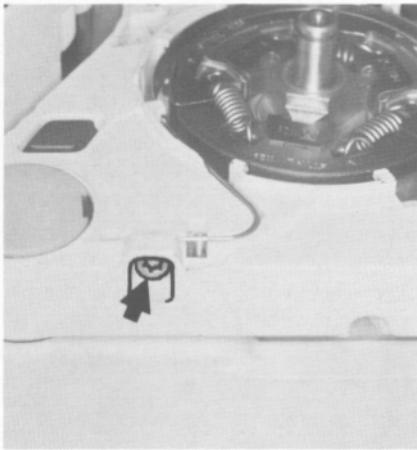
Top:  
Prying brake band out of recess

Bottom:  
Removing brake band



Top:  
Hand guard mounting screw

Bottom:  
E-clip on bell crank



- Carefully pry the brake spring off the bearing pin.
- Take out the brake band mounting screw.

- Pry the brake band out of its seat in the crankcase.
- Remove the brake band from the anchor lugs in the crankcase and the bell crank.

- Take out the hand guard mounting screw.
- Remove E-clip from bell crank pivot pin.

## 3.3.2 Assembly

Top:  
Pivot pins for hand guard and bell crank

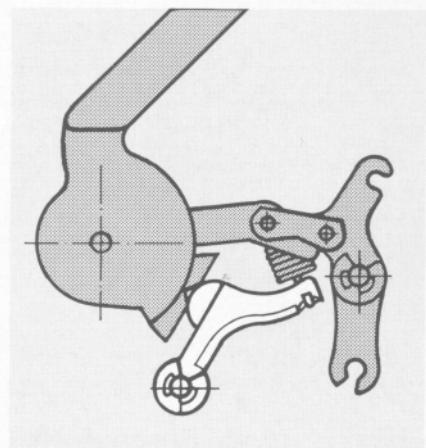
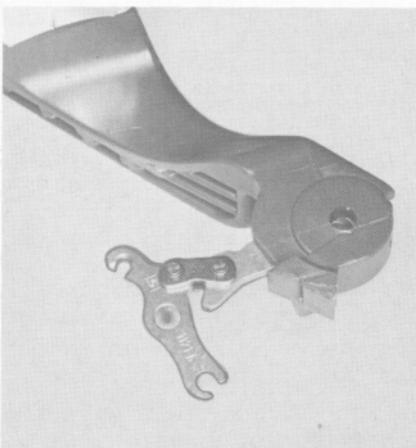
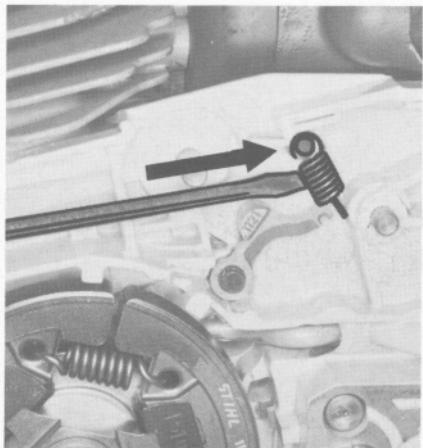
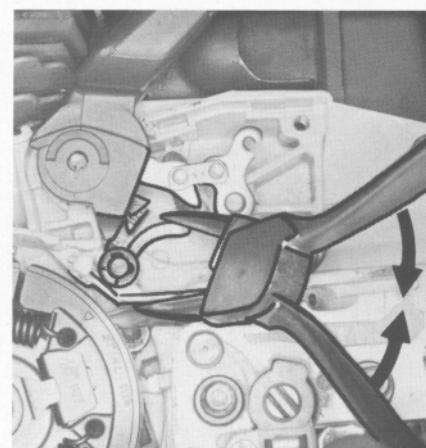
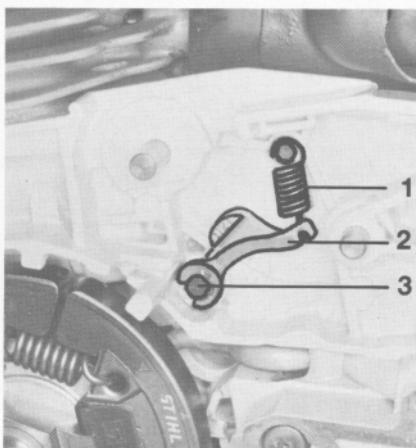
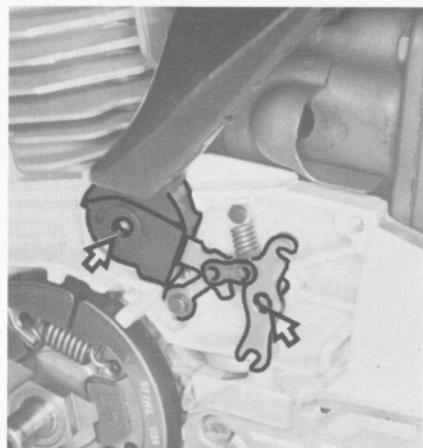
Bottom:  
Detaching spring

Top:  
1 = Spring  
2 = Cam lever  
3 = E-clip

Bottom:  
Bell crank inserted in hand guard

Top:  
Pressing cam lever downward

Bottom:  
Correct installed position of hand guard



- Carefully pry the hand guard and bell crank off their pivot pins and lift away.
- Remove the E-clip from the cam lever pivot pin.
- Remove the spring.

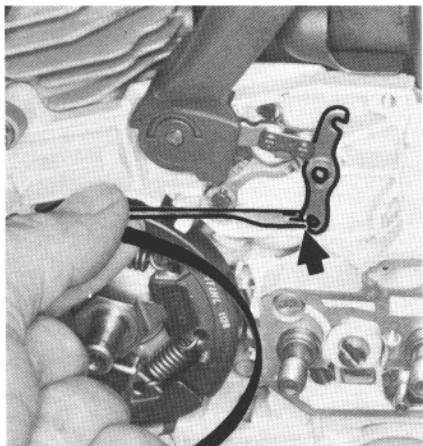
Inspect condition of all parts. Replace any damaged or worn parts.

- Slip cam lever over the pivot pin and secure it with the E-clip.
- Attach spring to pivot pin and cam lever.
- Insert bell crank in the side of the hand guard so that the short end of the lever points upward.

- Position bearing boss of hand guard against the pivot pin and fit the other side of the hand guard over the fan housing.
- Press the cam lever downward and push the hand guard and bell crank onto the pivot pins.
- Secure bell crank with E-clip.
- Fit hand guard mounting screw at fan housing side and tighten to a torque of 4 Nm (3.0 lbf.ft).

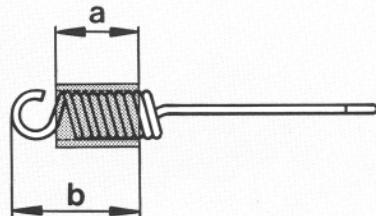
Top:  
Attaching brake band to bell crank

Bottom:  
Fitting brake band



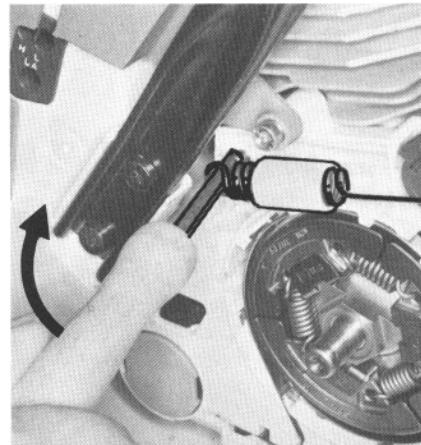
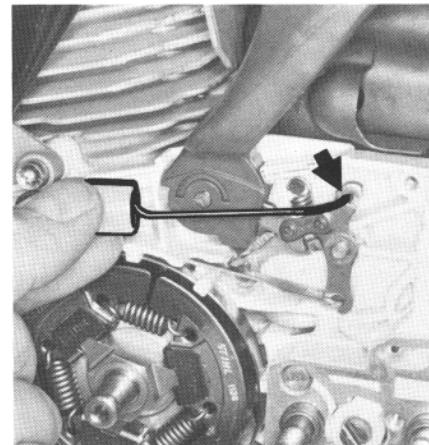
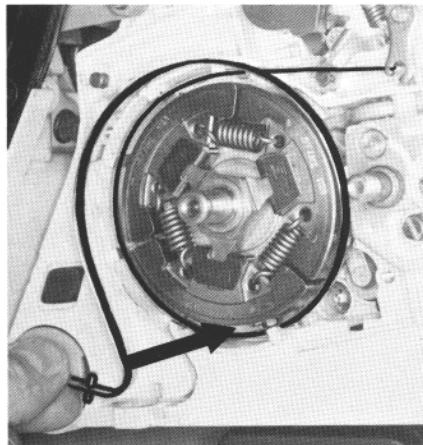
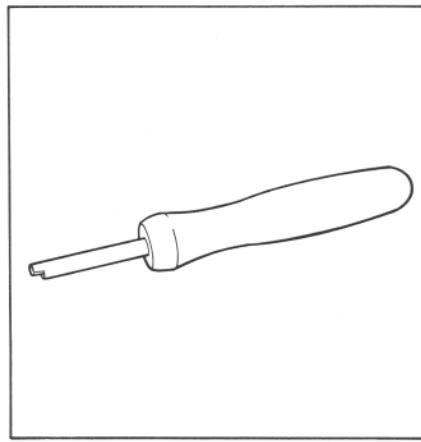
Top:  
Position of protective tube on brake spring  
 $a = 20 \text{ mm (} \frac{3}{4} \text{"})$   
 $b = 32 \text{ mm (} 1 \frac{1}{4} \text{")}$

Bottom:  
Brake spring attached to bell crank



Top:  
Assembly tool 1117 890 0900

Bottom:  
Attaching brake spring to bearing pin



- Attach brake band to bell crank.
- Position the brake band in the crankcase so that it is behind the retaining lugs and then push it into its seat in the crankcase.
- Fit the mounting screw and tighten it to 3 Nm (2.2 lbf.ft).

- Check that protective tube is correctly positioned on the brake spring.
- Attach the brake spring to the bell crank.

- Use the assembly tool to attach the brake spring to the bearing pin.
- Fit cover over the brake band.
- Fit the inner side plate.
- Install the clutch drum with rim sprocket (or spur sprocket) - see 3.1.

## 3.4 Chain Tensioner

Top:  
Inner side plate mounting screw

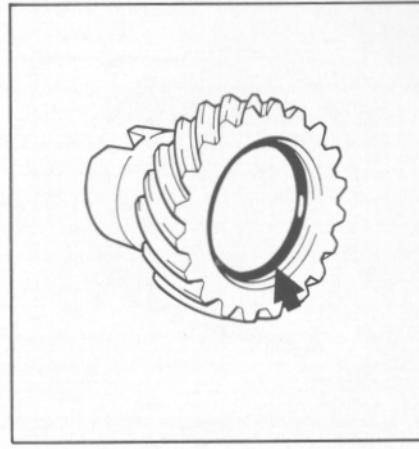
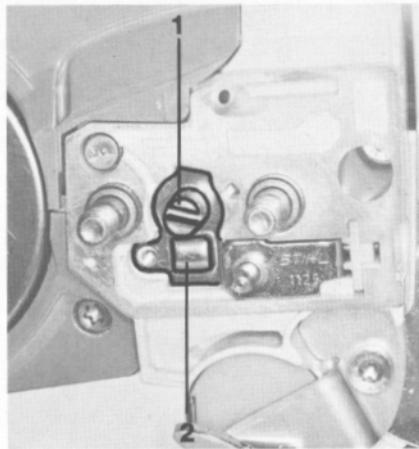
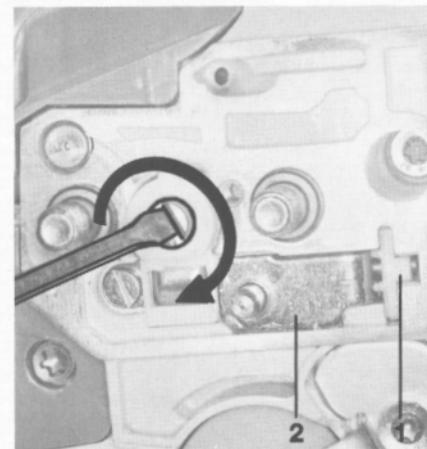
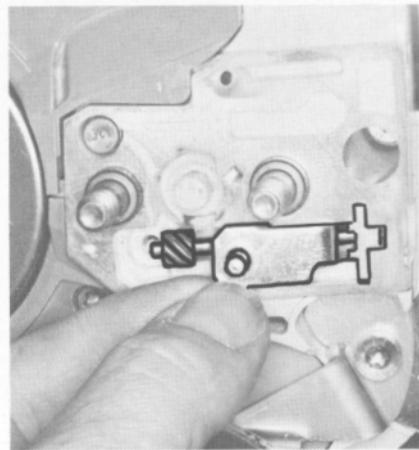
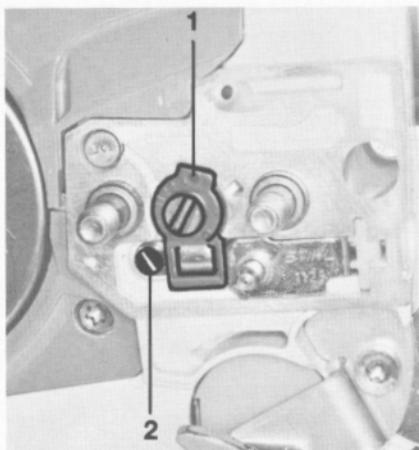
Bottom:  
1 = Thrust pad  
2 = Tensioner slide

Top:  
1 = Retainer  
2 = Mounting screw

Bottom:  
1 = Spur gear  
2 = Cover plate

Top:  
Removing tensioner slide with adjusting screw and thrust pad

Bottom:  
O-ring in spur gear



- Remove chain sprocket cover.
- Remove mounting screw from inner side plate and lift side plate away.
- Use a screwdriver to turn spur gear clockwise until tensioner slide is at the extreme right against the thrust pad.

- Pull out the retainer.
- Remove the cover plate mounting screw.
- Pull the cover plate off the spur gear.
- Pull out the spur gear.

- Take out the tensioner slide with adjusting screw and thrust pad.
- Inspect the teeth on the spur gear and adjusting screw. Replace both parts if necessary.

Reverse the above sequence to install the chain tensioner.

**Note:** Coat teeth of adjusting screw and spur gear with grease, see 12.2., before refitting.  
Check that O-ring is fitted in spur gear.

#### 4. ENGINE

##### 4.1 Removing and Refitting Exhaust Muffler (also with Catalytic Converter)

Top:  
Upper casing mounting screws

Bottom:  
Lower casing mounting screws

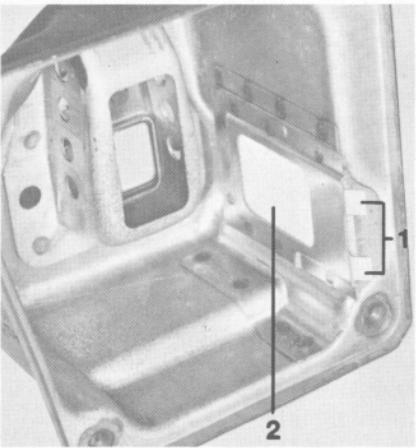
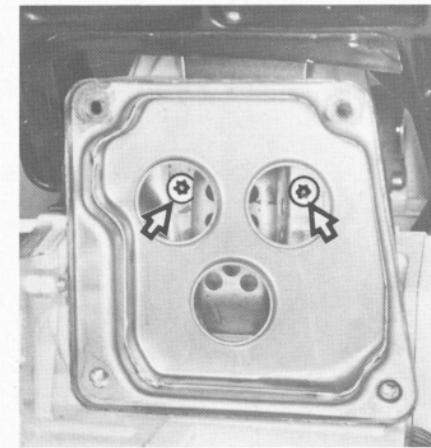
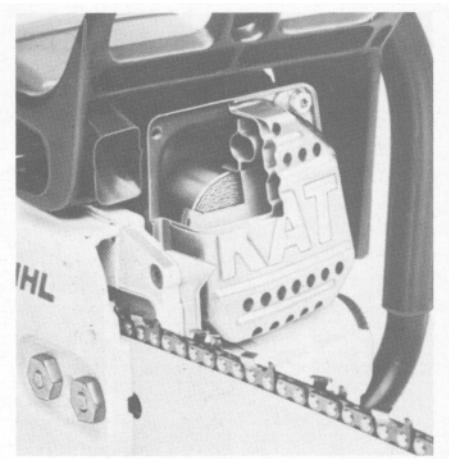
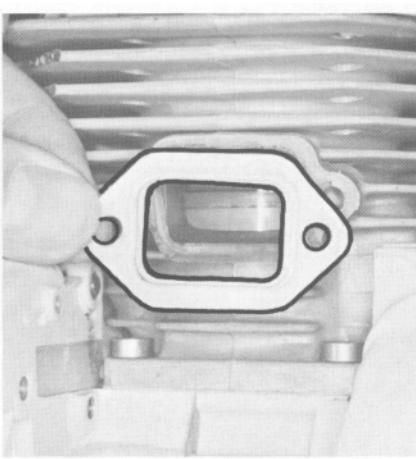
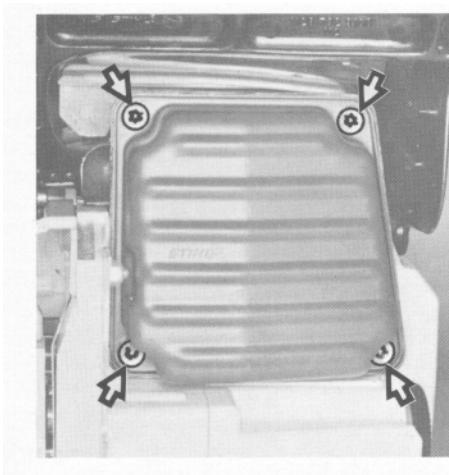
Top:  
Removing exhaust gasket

Bottom:  
1 = Retaining tabs  
2 = Spark arrestor screen

#### 4.2 Catalytic Converter

##### 4.2.1 Construction and Function

Lower casing with catalytic converter (cut open in this view)



Troubleshooting chart - see 2.2.

- Take out the upper casing mounting screws. If catalyzer is fitted, also remove the sleeve. Lift off the upper casing.
- Take out the lower casing mounting screws. Remove the lower casing and exhaust gasket.
- Inspect the spark arrestor screen, if fitted. If necessary, bend back the retaining tabs and pull out the screen.

- Clean the spark arrestor screen or fit a new one.

Reassemble in the reverse sequence.

**Note:** Fit a new exhaust gasket. Coat threads of screws with Loctite, see 12.2. Tighten screws of lower casing to 11.5 Nm (8.5 lbf.ft). Tighten the two top screws of upper casing to 9 Nm (6.6 lbf.ft) and the two bottom screws to 11.5 Nm (8.5 lbf.ft).

The catalytic converter is integrated in the upper casing of the muffler and helps reduce the amount of noxious elements in the exhaust gas by means of a chemical reaction (afterburning).

A metal carrier catalyzer is installed in the STIHL 044. The advantage of this type of construction is that there is no loss of engine power compared to machines without a catalyzer. Furthermore, this catalyzer is temperature resistant up to approx. 1,300 °C (2375 °F). Very thin corrugated stainless steel foil inside the catalyzer is rolled in an "S" shape to produce a honeycomb structure which is enclosed in a round steel jacket.

The honeycomb cells are coated with the noble metal platinum which acts as the catalyst. A chemical reaction takes place when hot exhaust gas flows through the catalyzer. Approximately 80% of the hydrocarbons (HC) and up to 20% of the carbon monoxide (CO) are transformed into water ( $H_2O$ ) and nonpoisonous carbon dioxide ( $CO_2$ ).

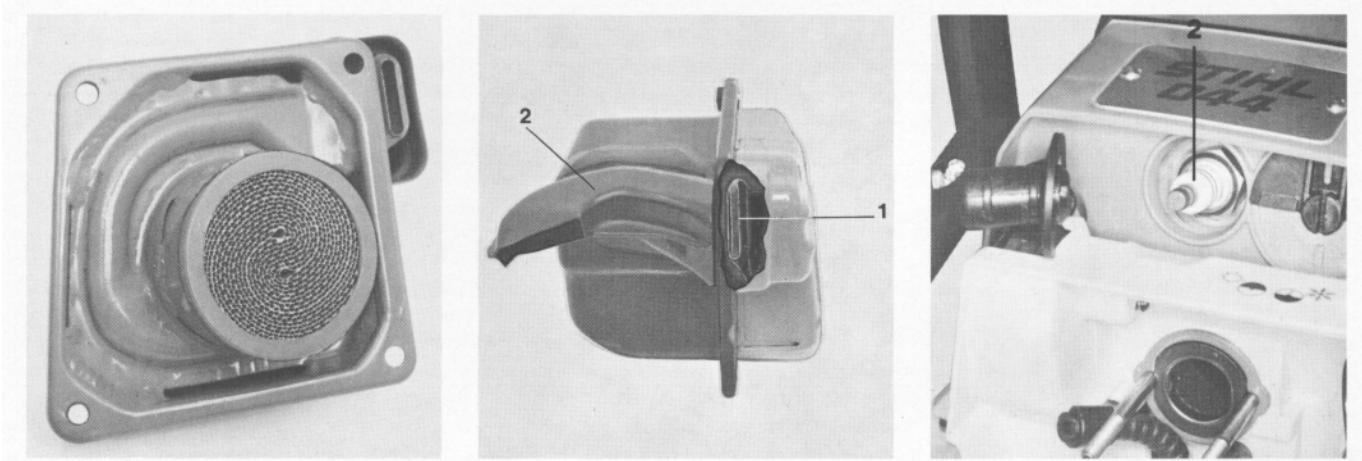
## 4.3 Exposing the Cylinder

Catalytic converter in upper casing

1 = Injector nozzle  
2 = Jet tube

Top:  
1 = Spark plug terminal  
2 = Spark plug

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



A catalyzer is a component which initiates chemical reactions **without** being consumed in the process.

The platinum coating of the honeycomb cells is sensitive to lead, i.e. lead collects on platinum. This inhibits the chemical reaction. If several tankfuls of leaded fuel are used, the catalyzer's function can be reduced by more than 50%. For this reason **only unleaded** gasoline may be used in chain saws with catalytic converters.

In order to avoid damage to the engine, the catalyzer must be replaced if cracks are found in the honeycomb structure or if the catalyzer's steel jacket is damaged in any way.

The special construction of the muffler brings the exhaust gas temperature down to about the same as that of a standard muffler. Exhaust gas leaving the injector nozzle in the upper casing flows into the jet tube located at the side of the lower casing. Owing to the high gas flow speed a relatively large volume of fresh air is sucked in and used for cooling at this point. The temperature of the gas leaving the jet tube (sideways above the chain sprocket cover) is reduced to approx. 350 °C (660 °F) in this way.

Never attempt to modify either the jet tube or the injector nozzle. In the event of damage to the jet tube, replace the lower casing. If the injector nozzle is damaged, fit a new upper casing. Damage to either of these parts can cause an increase in the temperature of the exhaust gas leaving the jet tube.



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 2.2.
- Remove the carburetor - see 11.2.
- Remove the lower casing - see 4.1.
- Pull terminal off the spark plug and then unscrew the spark plug.
- Remove shroud mounting screws and lift shroud away.

## 4.4 Cylinder and Piston

### 4.4.1 Removal

Top:  
1 = Washer  
2 = Sleeve

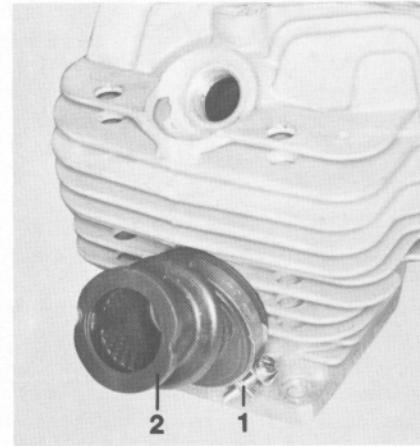
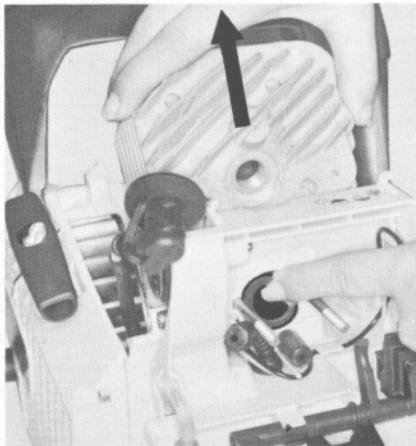
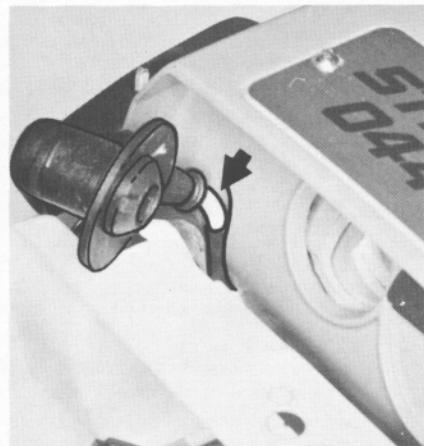
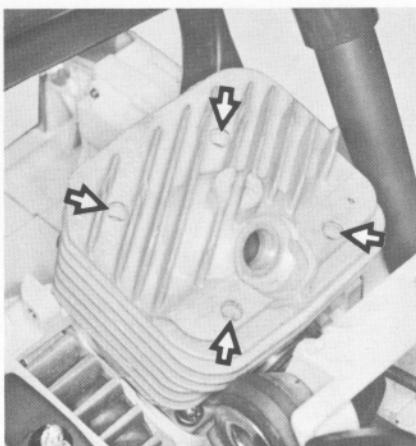
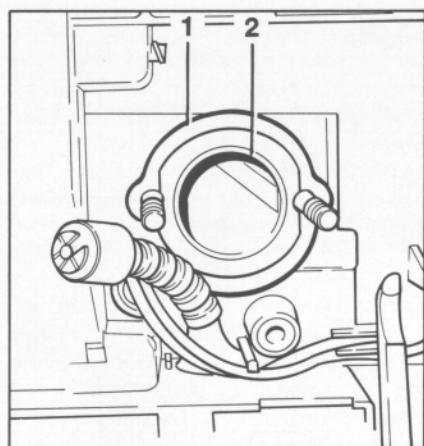
Bottom:  
Correct position of ignition lead

Top:  
Throughholes to cylinder base screws

Bottom:  
Removing cylinder and pushing manifold  
out of tank housing

Top:  
Removing cylinder gasket

Bottom:  
1 = Hose clamp  
2 = Manifold



- Pull the washer off the studs and remove the sleeve from the manifold.

Reassemble in the reverse sequence.

**Note:** When refitting the shroud, make sure the ignition lead is properly located in the shroud recess (see illustration).

For preparations see 4.3.

- Unscrew the cylinder base screws.
- Pull the cylinder off the piston and, at the same time, push the manifold through the tank housing opening.

**Caution!** Do not use pointed or sharp-edged tools for this job.

- Remove the cylinder gasket.

- Release the hose clamp on the manifold. Pull the manifold off the intake port.
- Inspect the cylinder and replace it if necessary.

**Note:** If a new cylinder has to be installed, always fit the matching piston. Replacement cylinders are only supplied complete with piston for this reason.

## 4.4.2 Installation

Top:  
Removing snap ring

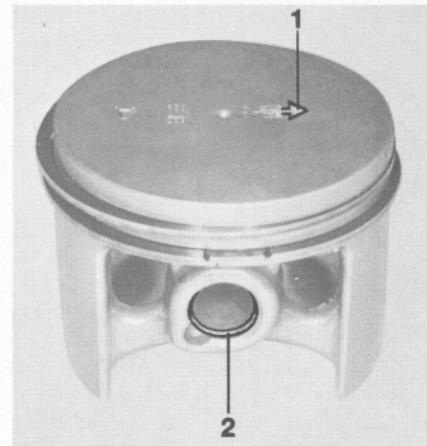
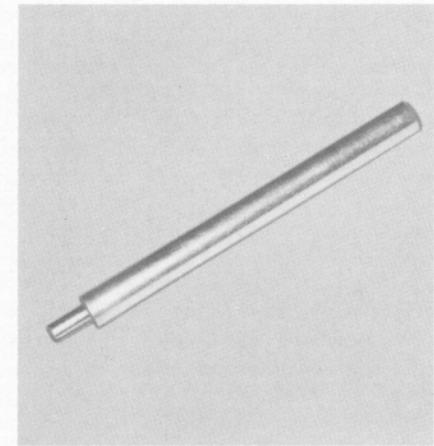
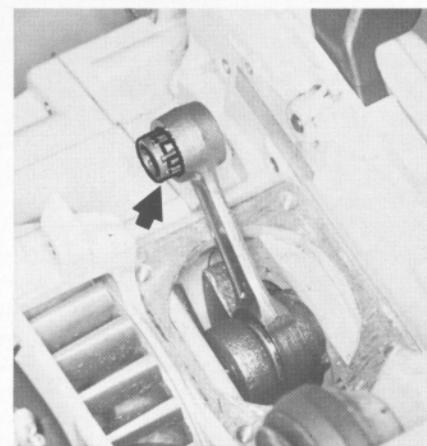
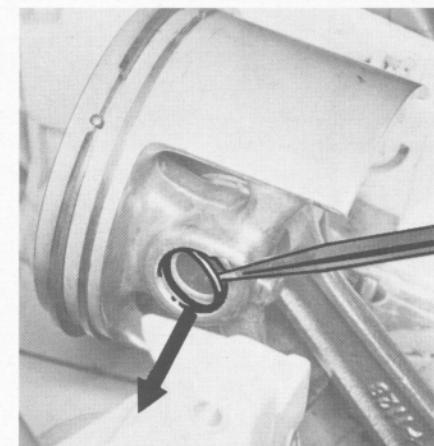
Bottom:  
Assembly drift 1110 893 4700

Top:  
Pushing out piston pin

Bottom:  
Piston rings

Top:  
Needle cage in small end

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



**Important!** Before removing the piston, decide whether or not the crankshaft has to be removed as well. To remove the flywheel, see 5.1.7, 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.

- Inspect piston rings and replace if necessary - see 4.5.

- 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 right).

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

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

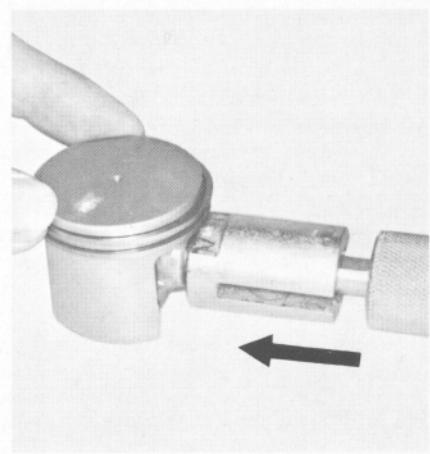
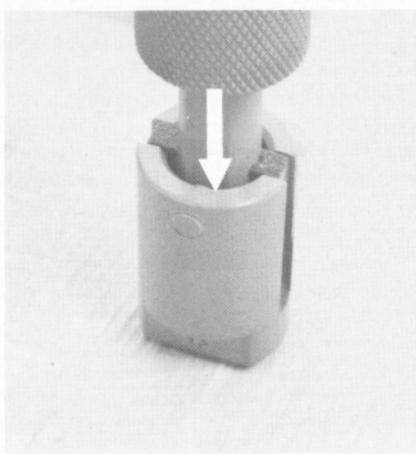
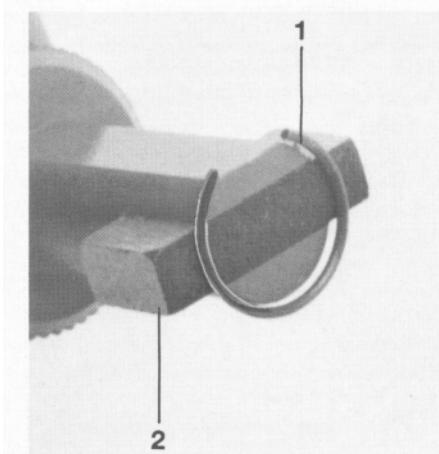
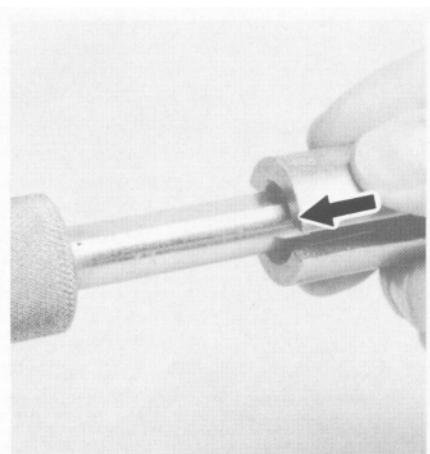
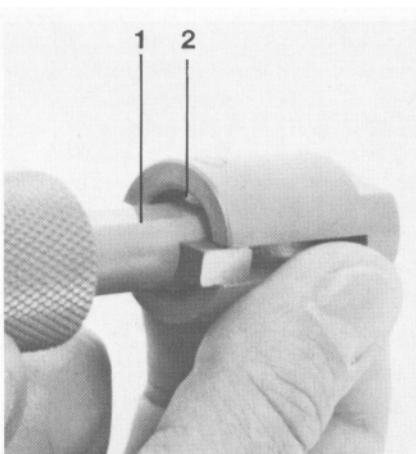
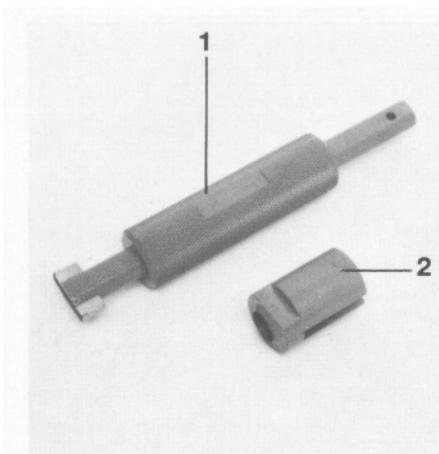
Bottom:  
1 = Snap ring (hookless)  
2 = Magnet

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

Bottom:  
Pushing installing tool into sleeve  
as far as stop

Top:  
Slipping sleeve onto other end  
of shank

Bottom:  
Inserting snap ring in piston boss



- Use the installing tool as follows:
- Remove the sleeve from the tool.
- 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 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), 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

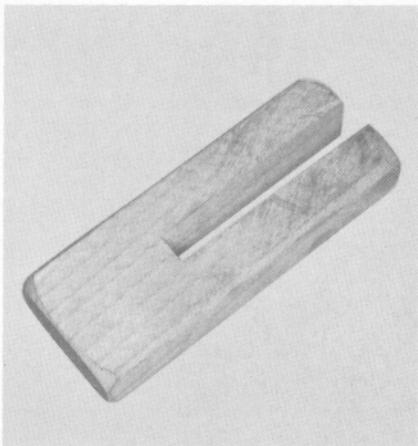
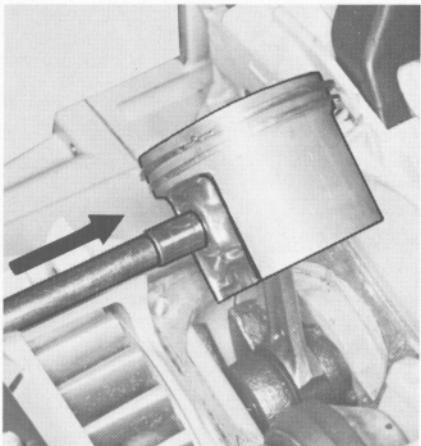
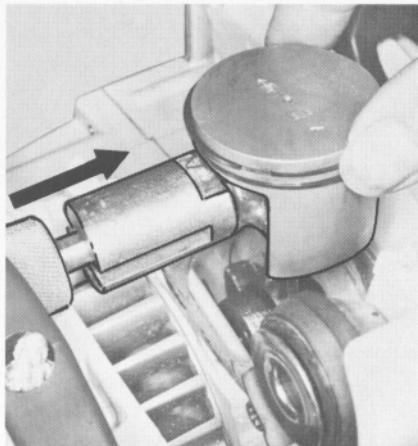
Bottom:  
Installing the piston pin

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: Upper piston ring correctly posi-  
tioned



- 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 590 890 2210 to fit the snap ring in the piston boss.

- Fit the cylinder gasket.

- Lubricate the piston and piston rings with oil and place 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.

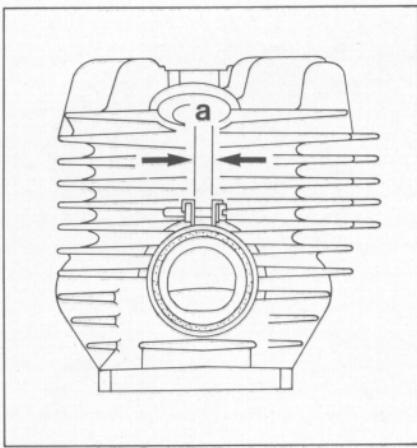
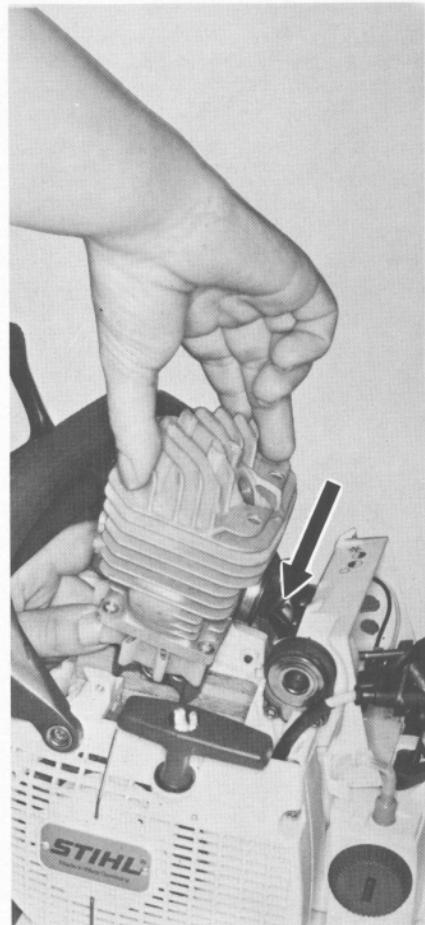
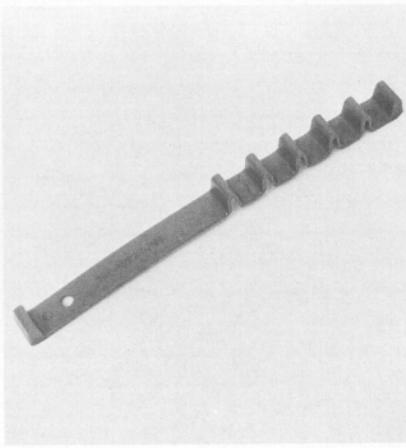
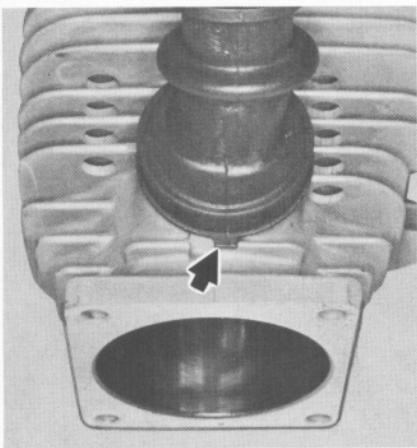
Top:  
Correct position of manifold

Bottom:  
Correct position of hose clamp  
 $a = 45^\circ \pm 10^\circ$   
 $b = 5.5 \pm 0.5 \text{ mm } (7/32" \pm 1/64")$

Top:  
Clamping strap 0000 893 2600

Bottom:  
Compressing piston rings  
with the clamping strap

Fitting aligned cylinder over the piston



- Push the manifold onto the intake port so that its integrally molded tab lines up with the rib on the cylinder (see illustration).
- Slide the hose clamp onto the manifold. The screw head must point to the right.
- Tighten the hose clamp so that its ends point to the right at an angle of  $45^\circ \pm 10^\circ$  (looking at intake port). Continue tightening the screw until the gap between the two ends of the hose clamp is  $5.5 \pm 0.5 \text{ mm}$  ( $7/32" \pm 1/64"$ ).

- 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.

## 4.5 Piston Rings

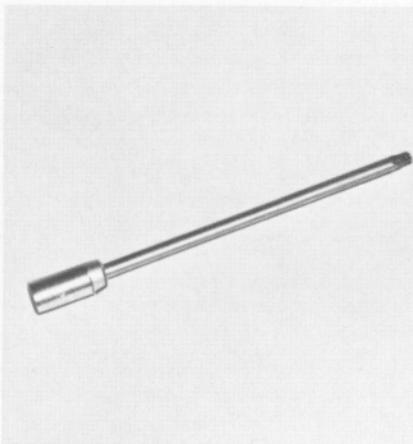
**Top:**  
Pressing the manifold downward

**Bottom:**  
Pulling manifold through intake opening in tank housing



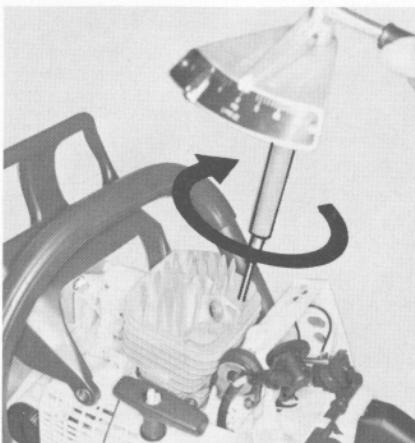
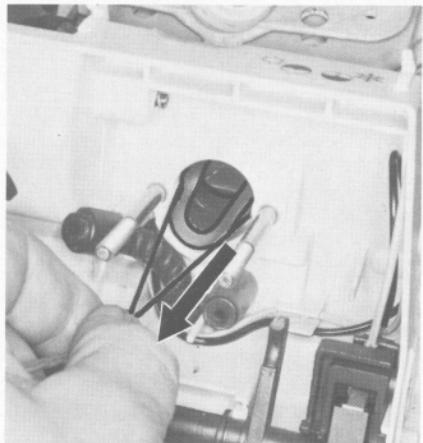
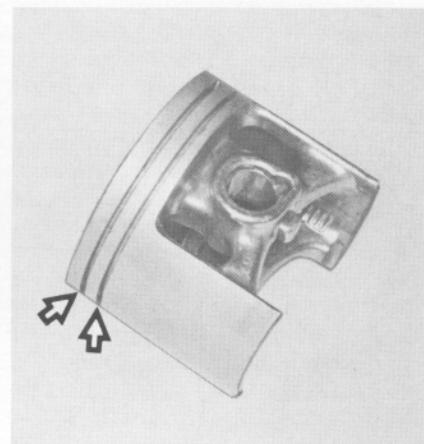
**Top:**  
Spline screwdriver bit 0812 542 2104

**Bottom:**  
Tightening the cylinder base screws



**Top:**  
Piston ring grooves

**Bottom:**  
Fitting piston ring



- Fit the manifold in the tank housing intake opening as follows: Wind a piece of string (about 15 cm / 6" long) around the back of the manifold flange, then press the manifold downward and pass the ends of the string through the intake opening.

- Pull the ends of the string outward. The manifold flange is thus pulled through the tank housing intake opening without damaging the manifold.

- 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 10.5 Nm (7.7 lbf.ft).

Assembly is now a reversal of the disassembly sequence. Always fit new gaskets as a matter of routine.

- Remove the piston - see 4.4.1.
- 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 face upward.
- Install the piston - see 4.4.2.

## 4.6 Crankcase

### 4.6.1 Removing the Crankshaft

Top:  
Fan housing mounting screws

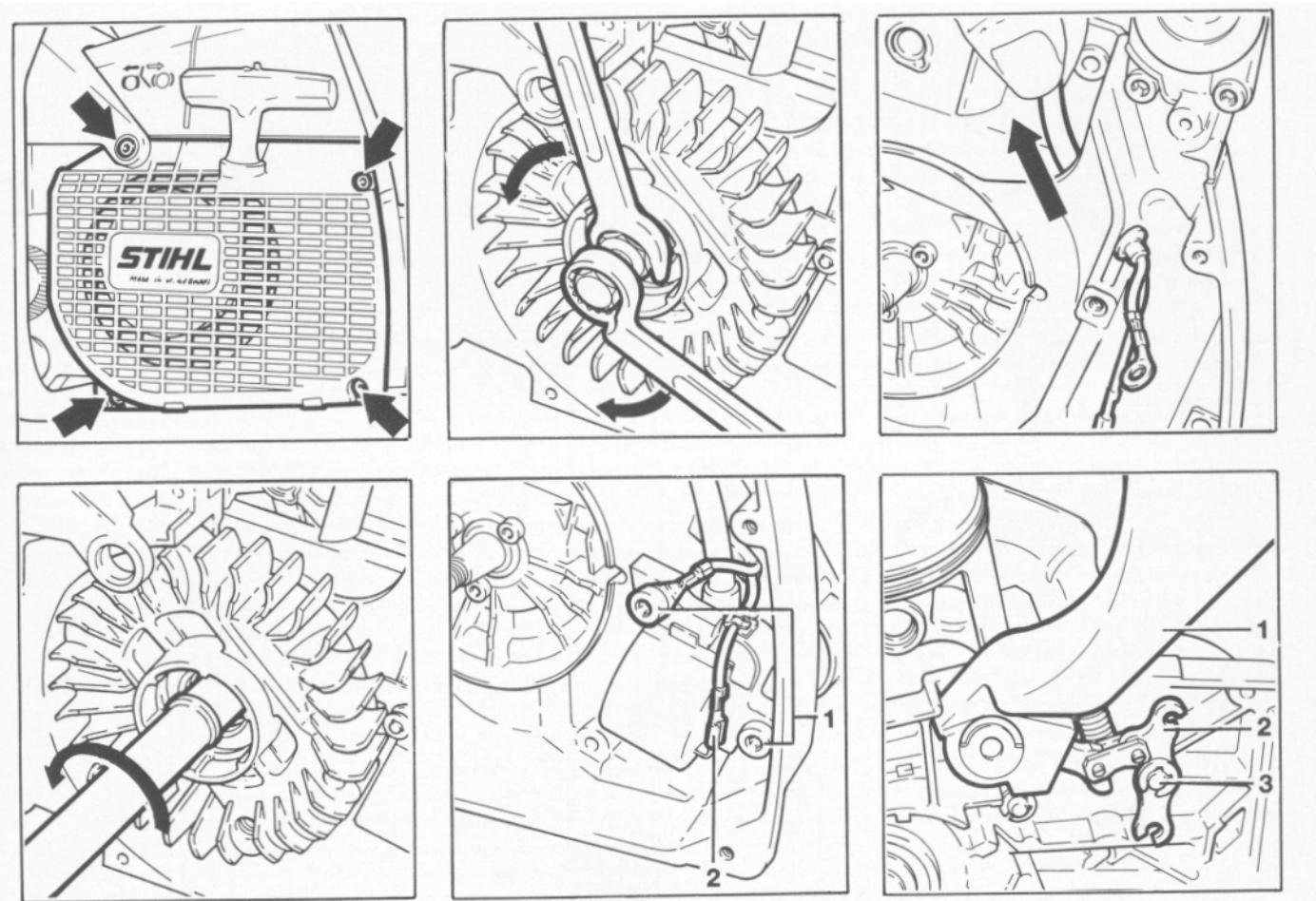
Bottom:  
Releasing flywheel nut

Top:  
Removing flywheel with puller  
1110 890 4500

Bottom:  
1 = Mounting screws  
2 = Short circuit wire

Top:  
Removing short circuit and ground wires

Bottom:  
1 = Hand guard  
2 = Bell crank  
3 = E-clip



- Drain the chain oil tank.

Remove the exhaust muffler -  
see 4.1.

- Remove the oil pump - see 10.4.
- Take out the fan housing mounting screws and lift away the fan housing.
- Remove the fan housing - see 11.8.1.
- Remove the cylinder - see 4.4.1.
- Unscrew the flywheel mounting nut from the crankshaft.

- Pull the flywheel off the crankshaft, see 5.1.7.

- Take the Woodruff key out of the slot in the crankshaft stub.

- Pull the short circuit wire off the connector.

- Remove the mounting screws from the ignition module and lift away the module.

- Pull the short circuit wire and ground wire out of the grommet in the housing.

- Remove the E-clip from the bell crank pivot pin.

- Carefully ease the hand guard and bell crank off the pivot pins and lift away.

Top:  
Piston resting on wooden assembly  
block

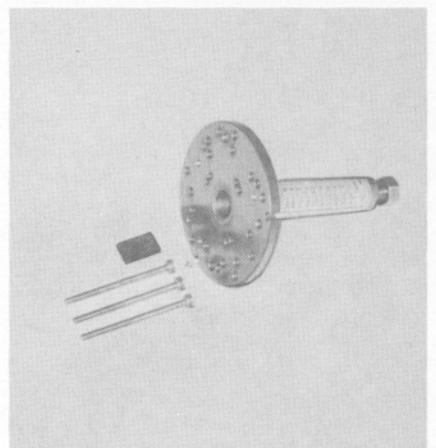
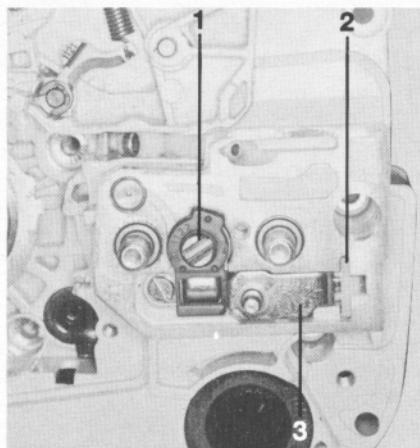
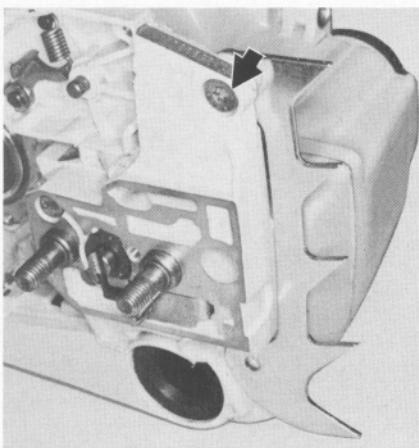
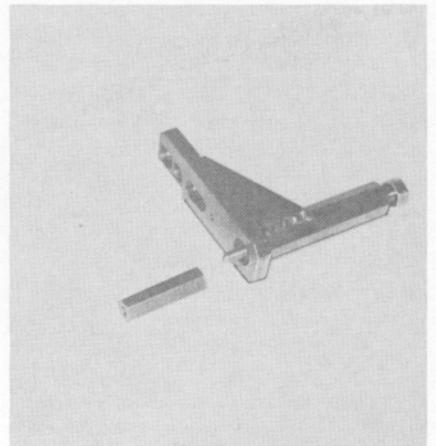
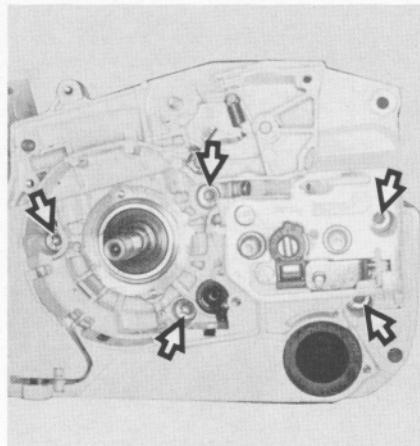
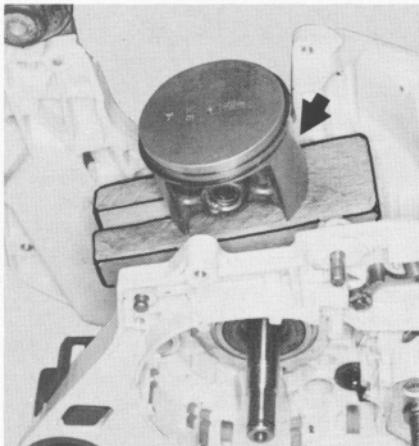
Bottom:  
Spiked bumper mounting screw

Top:  
Crankcase mounting screws

Bottom:  
1 = Spur gear  
2 = Thrust pad  
3 = Tensioner slide

Top:  
Service tool AS 5910 890 2205

Bottom:  
Service tool ZS 5910 890 2220



- Remove the piston - see 4.4.1.
- Hold the nut steady and remove the spiked bumper mounting screw. Lift away the spiked bumper.

- Unscrew the five mounting screws which join the two halves of the crankcase.
- Use a screwdriver to rotate spur gear clockwise until the tensioner slide butts against the thrust pad.

**Note:** Use service tools AS and ZS to remove the crankshaft. Follow the instructions supplied with the tool.

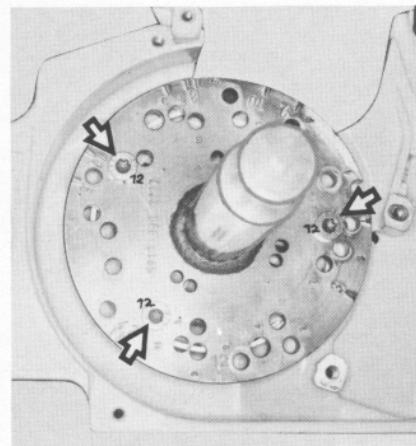
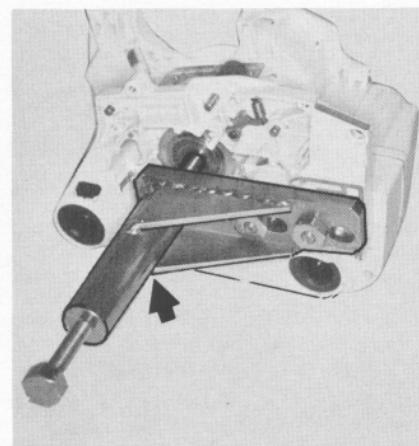
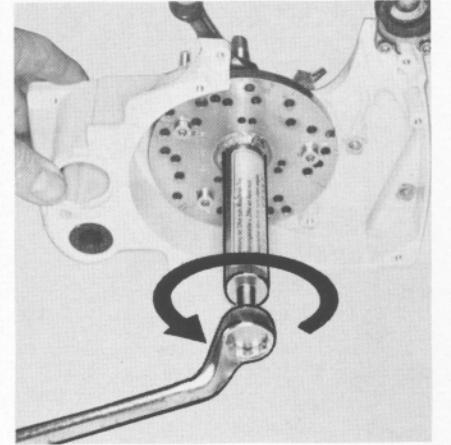
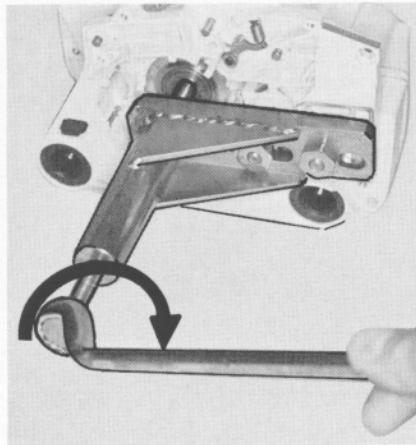
**Top:**  
Driving out dowel pin

**Bottom:**  
Service tool AS mounted in position

**Top:**  
Pressing crankshaft out of bearing seat at clutch side

**Bottom:**  
Service tool ZS mounted in position

Pressing crankshaft out of bearing seat at ignition side



- Use a suitable tool, e.g. 5 mm (3/16") drift, to drive the dowel pin (at chain tensioner side) out of the two halves of the crankcase.
- Back off spindle of service tool AS all the way.
- Slip service tool AS over the two collar studs, fit the hexagon nuts (for sprocket cover) and tighten them down by hand.

- Turn the spindle clockwise until the crankshaft is pressed out of the ball bearing. The two halves of the crankcase separate during this process.
- Fit service tool ZS against the outside of the crankcase (ignition side).

- Back off the spindle by turning it clockwise until the tool's drilled plate locates flat against the crankcase.

- With the crankcase horizontal (cylinder flange upward), rotate service tool until the number 12 on plate points downward.

- Secure the service tool to the crankcase with the three M5 x 72 mounting screws. Insert the screws in the holes marked "12" and tighten them down against the drilled plate.

- Turn spindle counterclockwise until it locates against the crankshaft.

- Use a 19 mm wrench to continue turning the spindle and thus push the crankshaft out of its bearing seat at the ignition side.

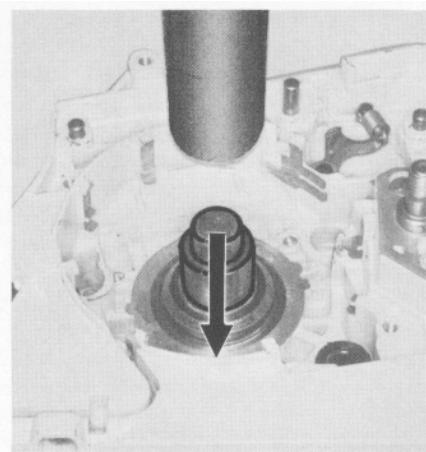
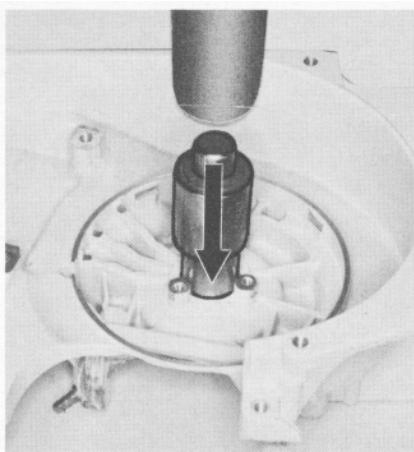
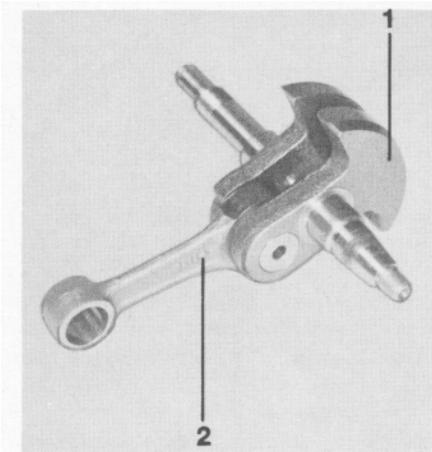
1 = Crankshaft  
2 = Connecting rod

Top:  
Pressing out ball bearing with  
arbor 1120 893 7200

Bottom:  
Prying out oil seal

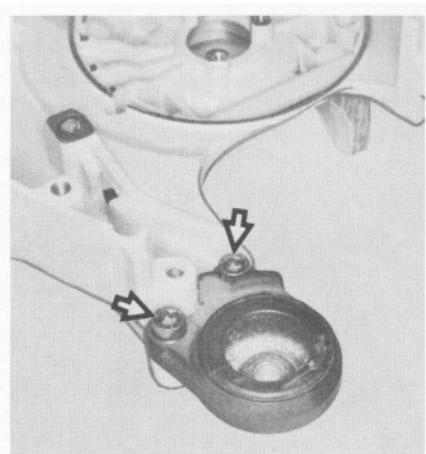
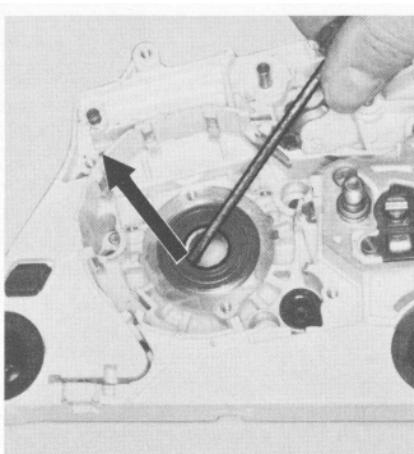
Top:  
Pressing out ball bearing with  
arbor 1118 893 7200

Bottom:  
Annular buffer mounting screws



- 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 crankshaft always install new oil seals and ball bearings.

- Remove the gasket from the crankcase sealing face.
- 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 at the clutch side.



- Use arbor to press the ball bearing out of the clutch side of the crankcase.
- Inspect the two halves of the crankcase for cracks and replace if necessary.

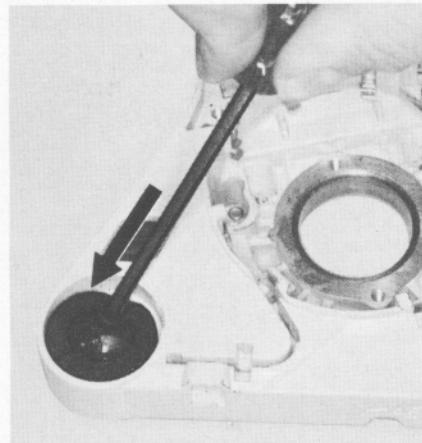
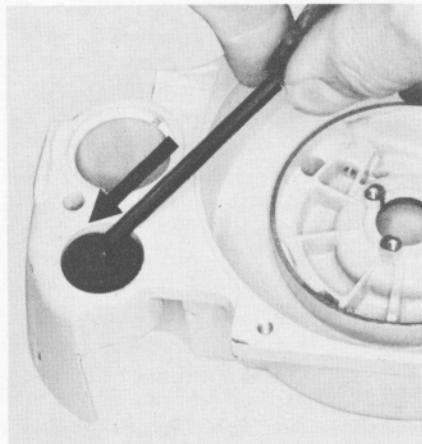
**Note:** The crankcase must be replaced as a complete unit even if only one half is damaged.

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.

- Remove the annular buffer mounting screws and take out the buffer.

**Top:**  
Prying out annular buffer (ignition side)

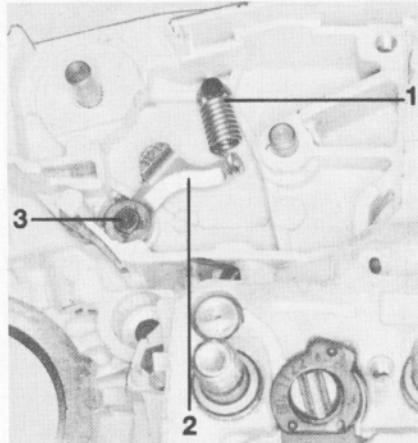
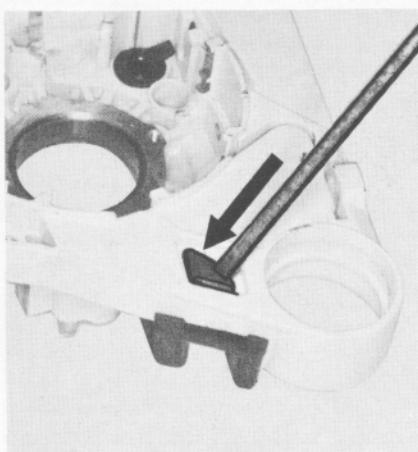
**Bottom:**  
Prying out annular buffer (clutch side)



- Pry the annular buffer out of the other side of the crankcase.
- Pry the two annular buffers out of the clutch side of the crankcase.

**Top:**  
Prying out stop buffer

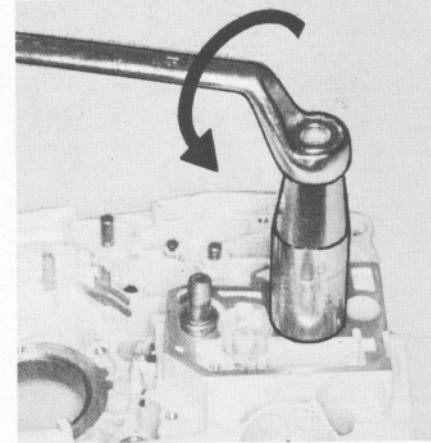
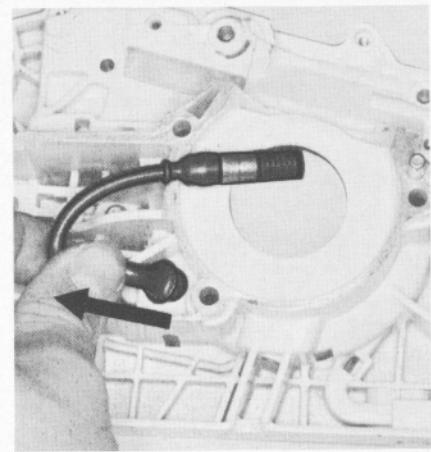
**Bottom:**  
1 = Spring  
2 = Lever  
3 = E-clip



- Pry the stop buffer out of its seat and remove it from the crankcase.
- Detach and remove the spring.
- Remove the E-clip from the lever's pivot pin and pull the lever off the pin.

**Top:**  
Removing oil pick-up hose

**Bottom:**  
Unscrewing collar stud with stud puller 5910 893 0506



- Pull the oil pick-up hose out of the bore in the crankcase.
- Remove the complete chain tensioner - see 3.4.
- If necessary, unscrew the collar studs. To do this, push the stud puller over the collar stud as far as it will go and use a 15 mm wrench to unscrew the stud counterclockwise.

#### 4.6.2 Installing the Crankshaft

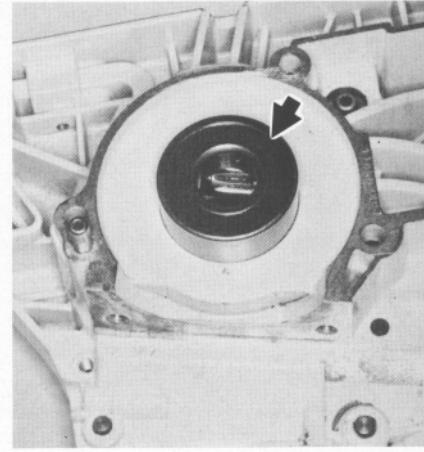
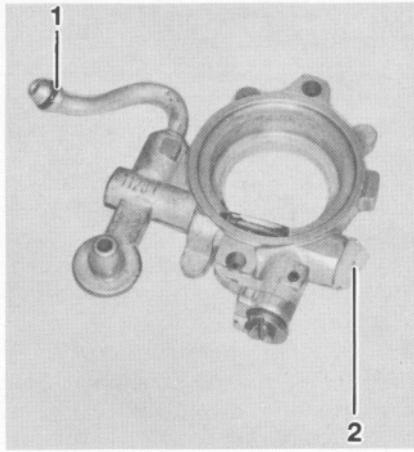
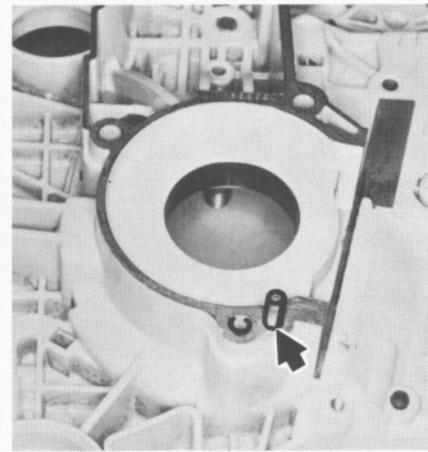
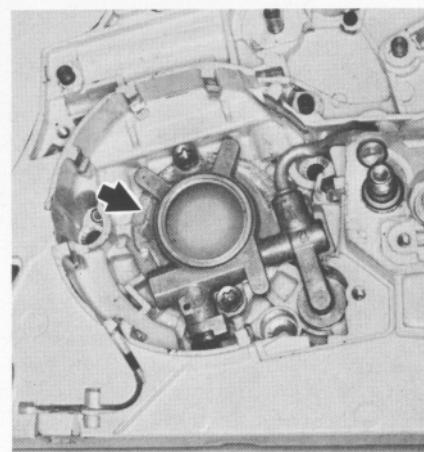
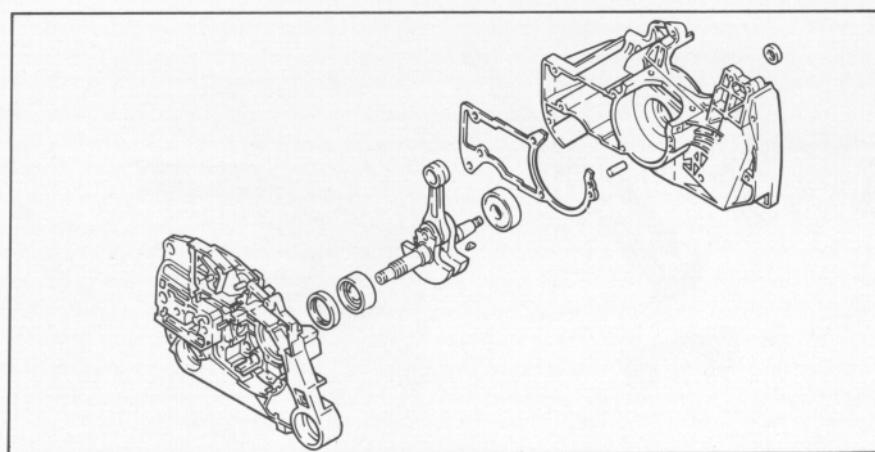
**Top:**  
Crankcase in correct assembly sequence

**Bottom:**  
Dowel pin

**Bottom:**  
1 = O-ring  
2 = Plastic plug

**Top:**  
Oil pump fitted in position

**Bottom:**  
Ball bearing in position (flat side facing upward)



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.

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

- Check that dowel pin is in position or fit it in the new crankcase.

- Pull the plastic plug out of the oil pump and take the O-ring out of the groove in the delivery line.
- Position the oil pump against the crankcase. Fit and tighten down the mounting screws.

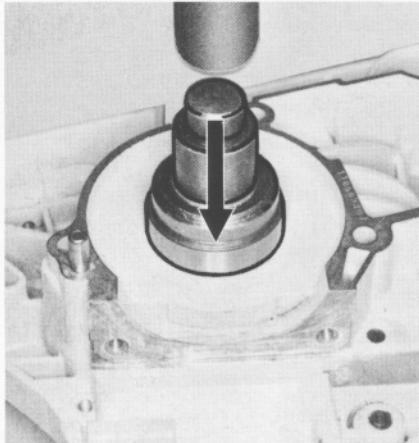
**Note:** Before heating the crankcase, remove all rubber and plastic components, such as oil pick-up and delivery hoses, grommets, annular buffers and levers (7.1, 10.2). Check condition of all parts and replace as necessary.

- Heat area of bearing seat on clutch side of crankcase to approx. 120 °C (250 °F).
- Place ball bearing with wider outer race in position so that its flat side faces upward and then press it in until it locates against the oil pump.

**Note:** The ball bearing can be fitted by hand if the crankcase is heated as specified. However, this operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.

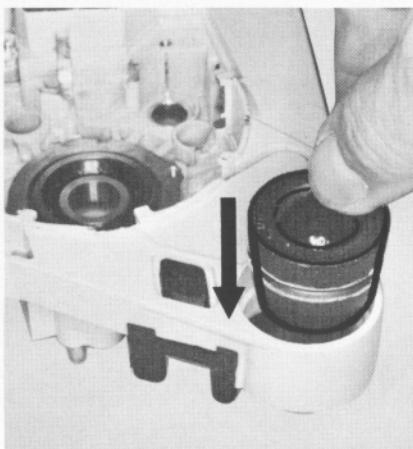
Top:  
Pressing in ball bearing with  
arbor 1118 893 7200

Bottom:  
Fitting stop buffer



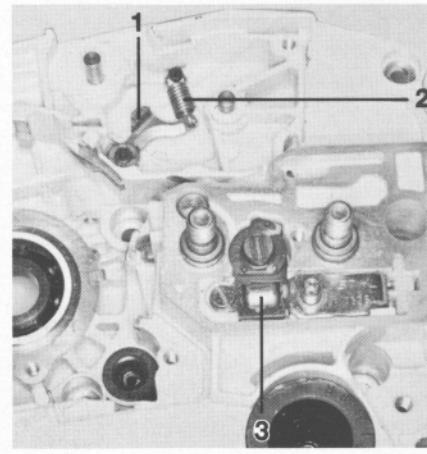
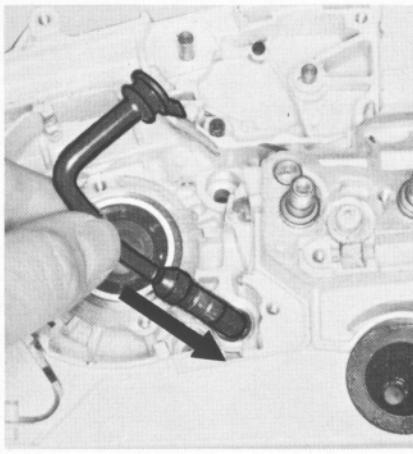
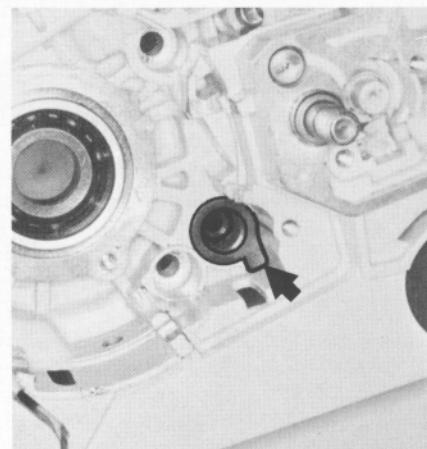
Top:  
Fitting annular buffer

Bottom:  
Fitting oil pick-up hose



Top:  
Correctly fitted oil pick-up hose

Bottom:  
1 = lever  
2 = Spring  
3 = Chain tensioner



If no facilities for heating the crankcase are available, use the press arbor to install the ball bearing.

- Remove the oil pump and refit the plastic plug and new O-ring.
- After the crankcase has cooled down, push the stop buffer into its seat. Make sure the tabs locate behind the housing face.

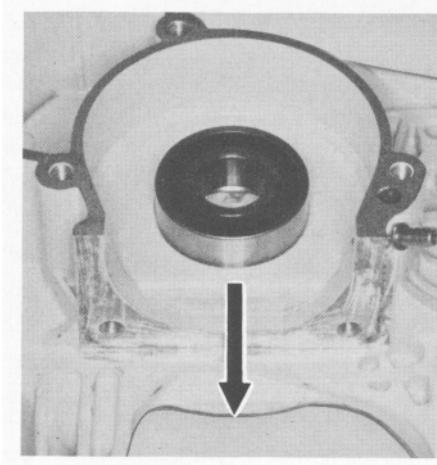
- Push the two annular buffers (tapered side first) into position until their annular grooves engage the inner rib.

- Slip the oil pick-up hose through the crankcase bore.

- Use a blunt tool to push the oil pick-up hose into the bore so that the tab locates in its seat at the bottom right (see illustration).

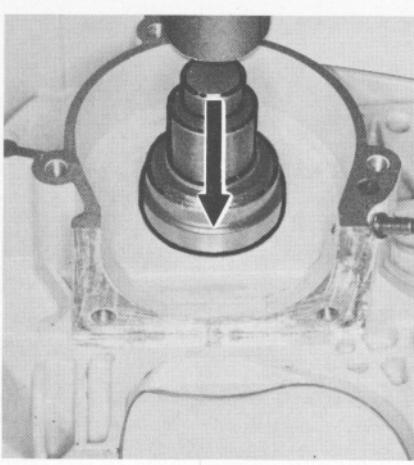
- Fit the lever over the pivot pin and secure it with the E-clip.
- Attach the spring.
- Install the chain tensioner - see 3.4.

Ball bearing in position



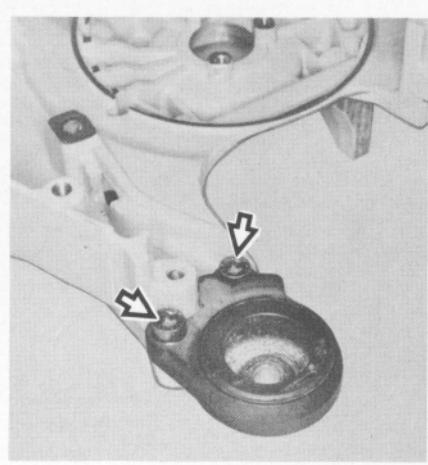
Top:  
Pressing in ball bearing with  
arbor 1118 893 7200

Bottom:  
Fitting annular buffer in ignition side  
of crankcase



Top:  
Annular buffer mounting screws

Bottom:  
Threaded sleeve 5910 893 2420 fitted  
on spindle of service tool ZS

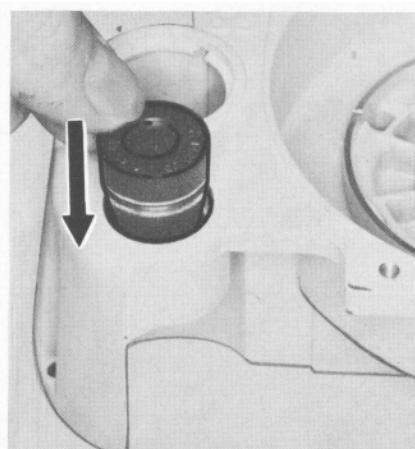


- Heat area of bearing seat on ignition side of crankcase to approx. 120 °C (250 °F).

- Press ball bearing fully home as far as stop. The open side of the bearing must face downward.

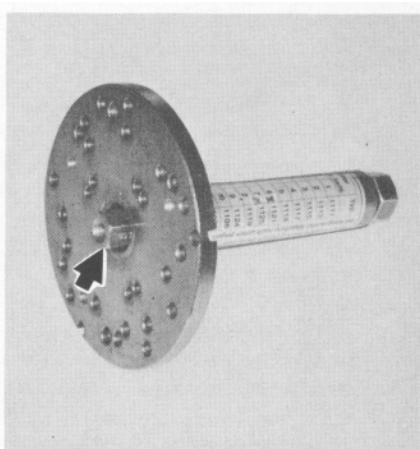
**Important!** The ball bearing is closed at one side. The closed side must be on the inside of the crankcase to guarantee proper protection.

**Note:** The ball bearing can be fitted by hand if the crankcase is heated as specified. However, this operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.



If no facilities for heating the crankcase are available, use the press arbor to install the ball bearing.

- Push the annular buffer into the crankcase bore, from the outside, until its annular groove engages the inner rib.



- Place the annular buffer in position the large bore must face outward. Fit the mounting screws and tighten them to 6.5 Nm (4.8 lbf.ft).

- Extend the spindle of service tool ZS fully and then screw the threaded sleeve onto the spindle as far as it will go.

Top:  
Fitting crankshaft

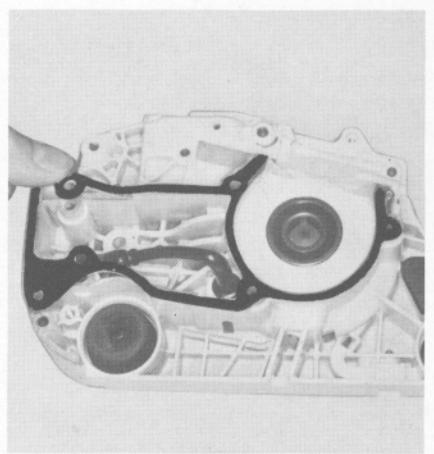
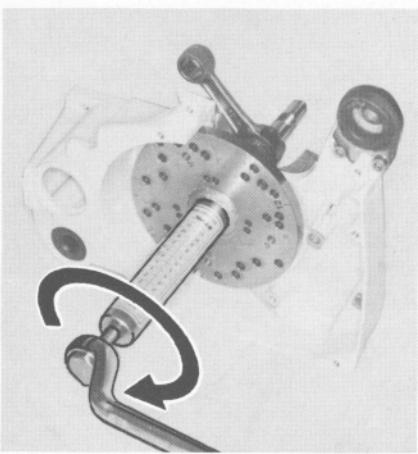
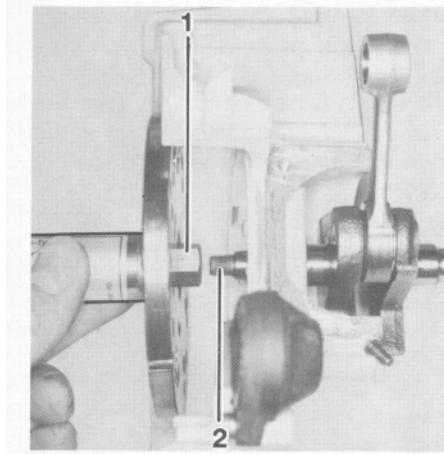
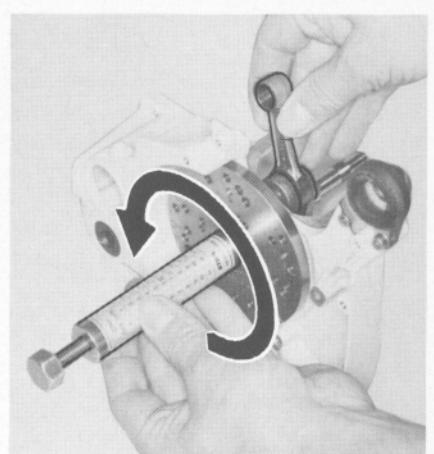
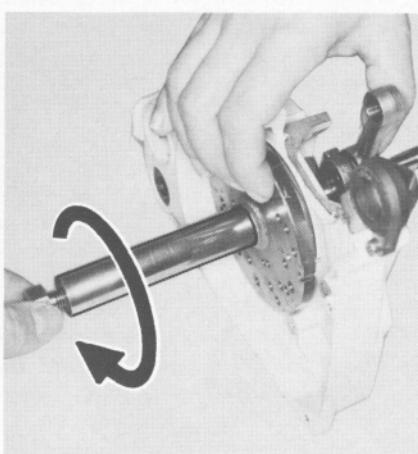
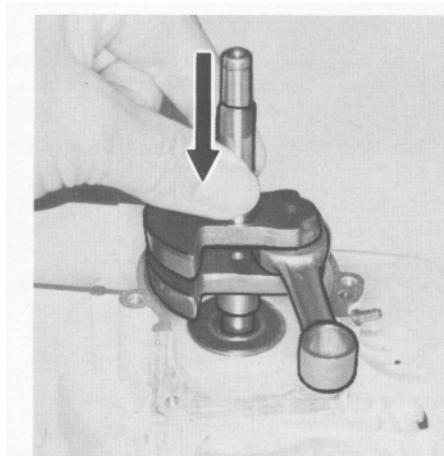
Bottom:  
1 = Threaded sleeve 5910 893 2420  
2 = Screw thread on crankshaft stub

Top:  
Screwing service tool into position

Bottom:  
Pulling crankshaft into ball bearing

Top:  
Unscrewing service tool ZS

Bottom:  
Fitting crankcase gasket



- Coat bearing seat of crankshaft stub at ignition end with oil and position it in the bearing from the inside of the crankcase.

- Screw the threaded sleeve onto the crankshaft stub.

- Hold the service tool and crankshaft steady and rotate the spindle clockwise until the service tool butts against the crankcase.

- Pull the crankshaft into the bearing as far as it will go by turning the spindle clockwise.

- Remove the service tool: Release the spindle by turning it counterclockwise and then unscrew the service tool counterclockwise.

- Fit a new gasket on the clutch side of the crankcase.

**Important!** The connecting rod must point toward the cylinder flange while the crankshaft is being installed.

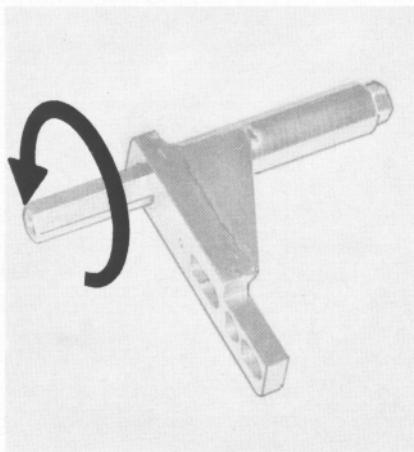
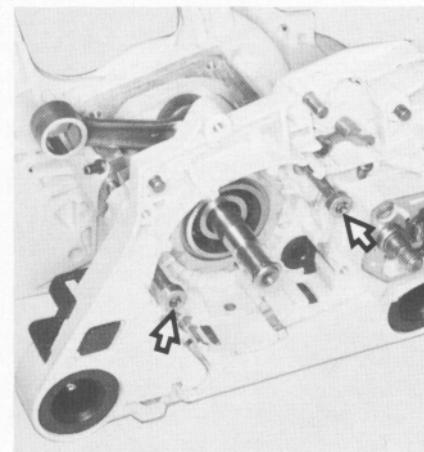
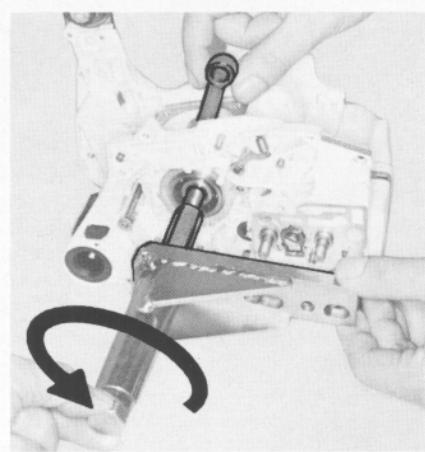
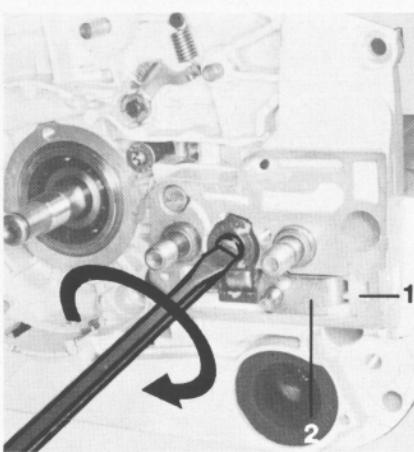
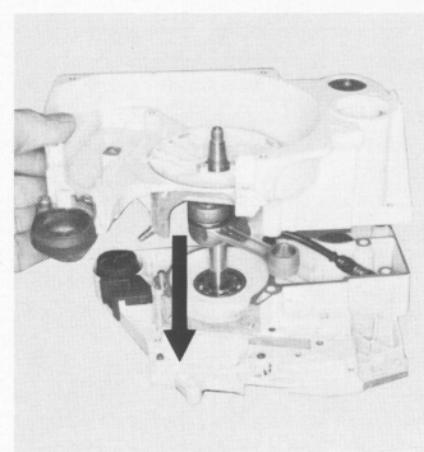
Top:  
Locating crankshaft stub

Bottom:  
Two screws fitted to prevent rotation

Top:  
1 = Thrust pad  
2 = Tensioner slide

Bottom:  
Threaded sleeve 5910 893 2409  
fitted on spindle

Mounting service tool AS



- Coat crankshaft stub at clutch end with oil and slide crankshaft into ball bearing as far as it will go.

- To prevent the crankcase and gasket twisting, fit M5x72 screws (from service tool ZS) in two crankcase holes.

**Important!** Screw the right-hand screw fully home to the end of the thread.

- Make sure that tensioner slide butts against the thrust pad. If necessary, rotate the tensioner's spur gear clockwise until the tensioner slide is against the thrust pad.

- Screw the spindle fully into service tool AS by turning it clockwise.

- Screw threaded sleeve onto the end of the spindle as far as it will go (left-hand thread).

- Slip the threaded sleeve over the crankshaft stub.

- Hold the crankshaft steady and screw the threaded sleeve onto the crankshaft stub by turning the spindle counterclockwise.

- Let go of the crankshaft. Hold the service tool steady and continue turning the spindle until the tool locates against the bar mounting face.

- Fit the two sprocket cover mounting nuts on the collar studs and tighten them down by hand.

Top:  
Pulling two halves of crankcase together

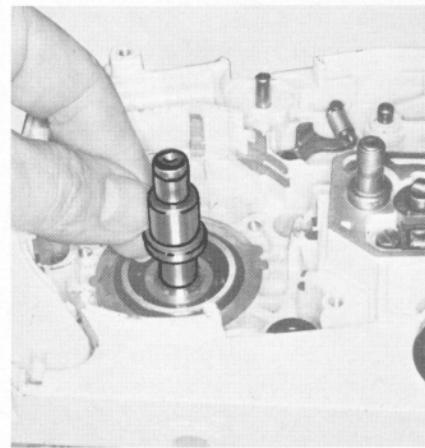
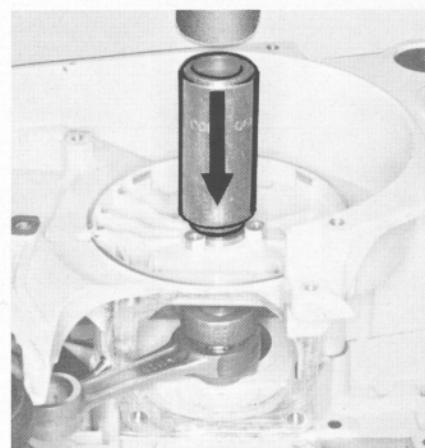
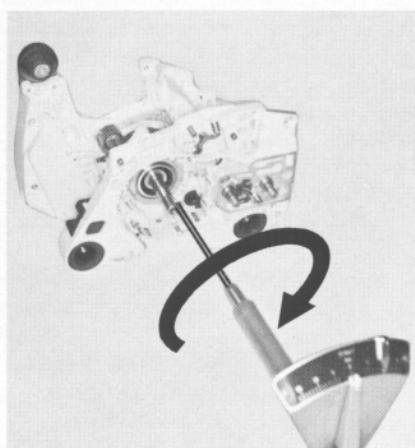
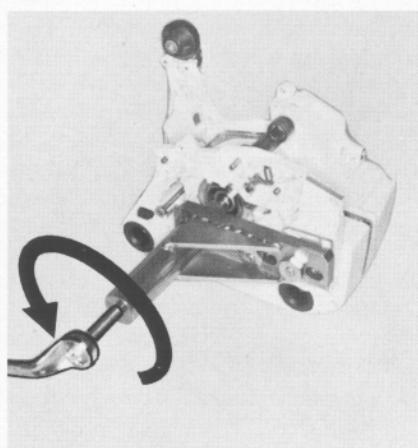
Bottom:  
Driving in dowel pin

Top:  
Tightening crankcase connecting screws

Bottom:  
Installing tool 1128 890 3900

Top:  
Pressing in oil seal at ignition side

Bottom:  
Fitting spacer bush over crankshaft stub



- Rotate the spindle counterclockwise and thus pull the crankshaft into the bearing as far as stop.
- Remove the hexagon nuts, unscrew the spindle clockwise and lift away the service tool.
- Take out the two M5x72 screws.
- Use a 5 mm (3/16") drift to drive the dowel pin into the two halves of the crankcase - from the chain tensioner side.

- Insert the crankcase connecting screws and tighten them down alternately in a diagonal pattern to 9 Nm (6.6 lbf.ft).

**Note:** Trim away any excess gasket material in the area of the cylinder mounting face. 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 12.2.

- Push the oil seal over the ignition end of the crankshaft (the open side of the seal must face the crankcase) and use the installing tool to press it home.

- Slip the oil pump spacer bush (large diameter first) over the clutch end of the crankshaft.

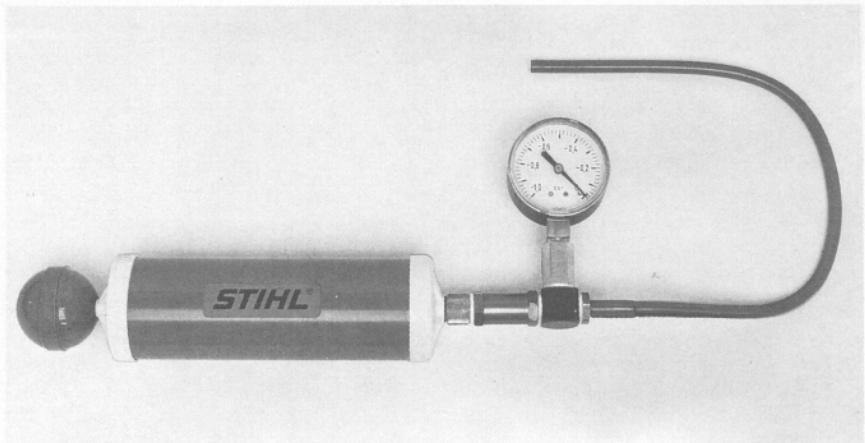
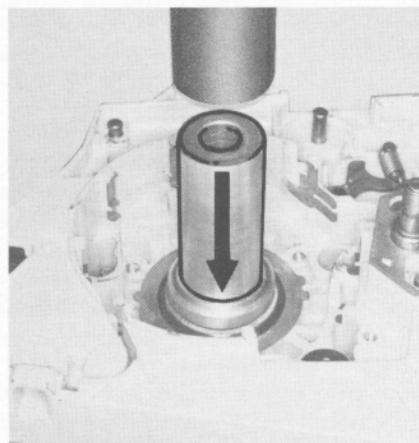
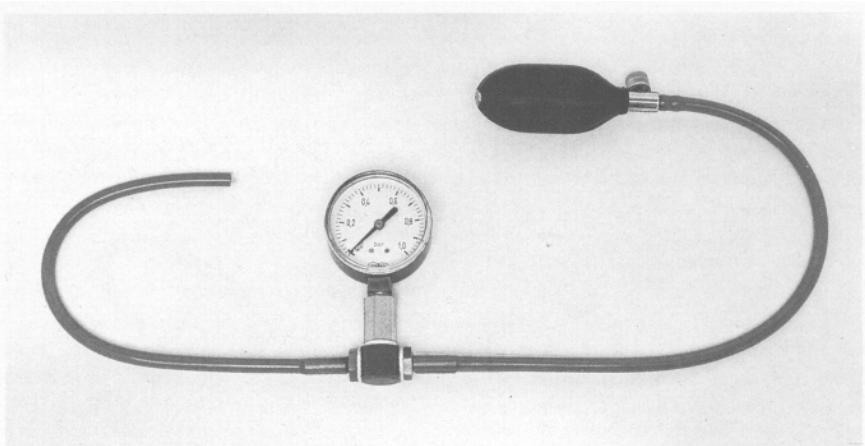
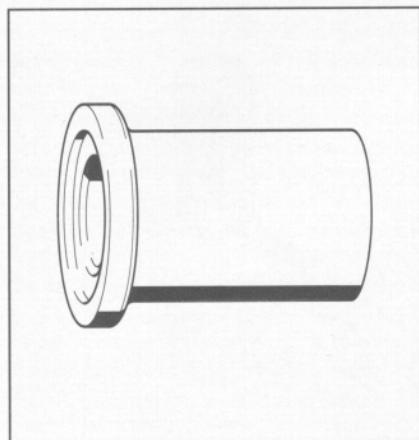
#### 4.7 Leakage Testing the Crankcase

Top:  
Press sleeve 1118 893 2401

Bottom:  
Pressing in oil seal at clutch side

Top:  
Carburetor and crankcase  
tester 1106 850 2905

Bottom:  
Vacuum pump 0000 850 3500



- Slide the oil seal over the spacer bush (the open side of the seal must face the crankcase) and use the press sleeve to press it home.
- Remove the spacer bush.

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

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.

#### 4.7.1 Preparations

Top:  
Muffler upper casing mounting screws

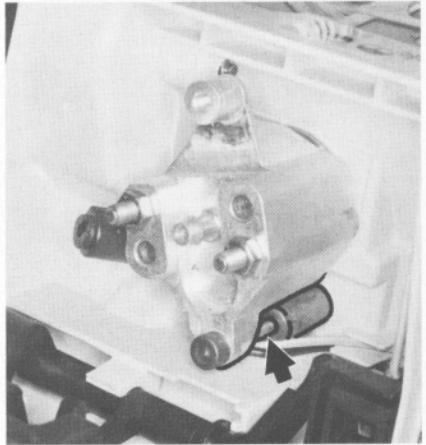
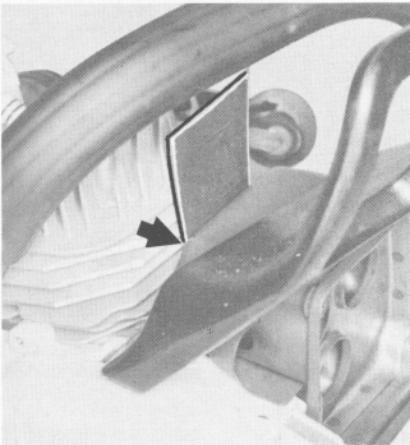
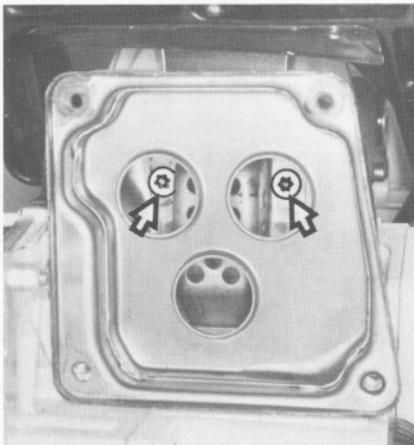
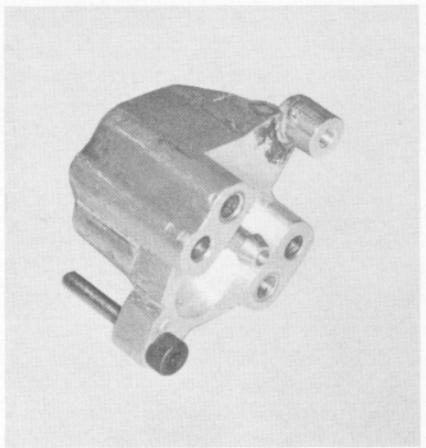
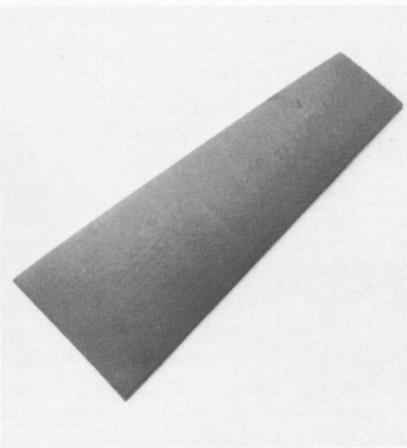
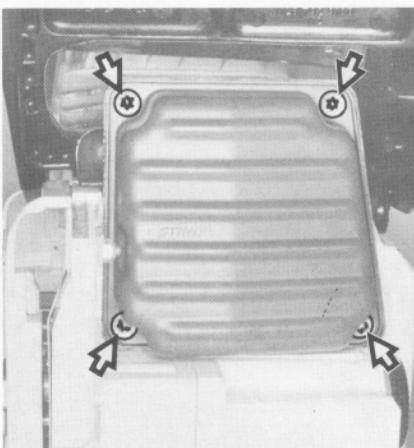
Bottom:  
Muffler lower casing mounting screws

Top:  
Sealing plate 0000 855 8105

Bottom:  
Sealing plate fitted in position

Top:  
Test flange 1128 850 4200

Bottom:  
Test flange fitted in position



- Remove the shroud.
- Take out the muffler upper casing mounting screws and remove the upper casing.
- Slacken off the muffler lower casing mounting screws about half way.

- Slide the sealing plate between the muffler lower casing 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 lower casing.

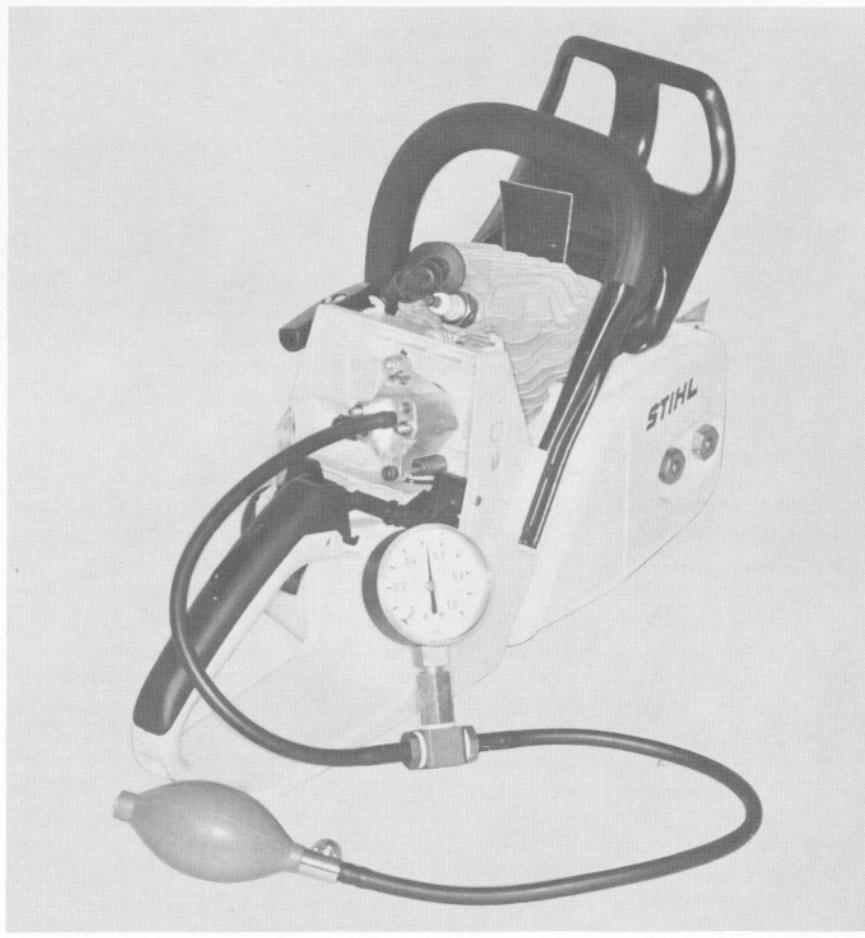
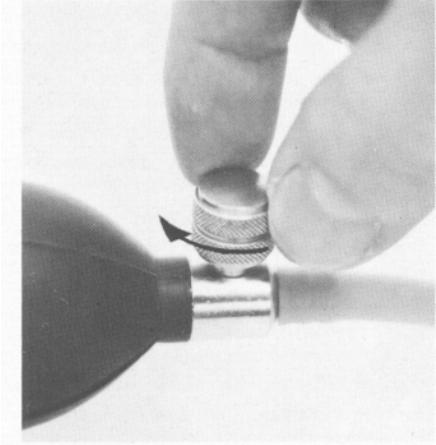
- Remove the carburetor - see 11.2.
- Set the piston to top dead center (T.D.C.). This can be checked through the inlet port.
- Fit the test flange in place of the carburetor.

**Important!** When fitting the test flange, make sure the pin locates properly in the impulse hose.

#### 4.7.2 Pressure Test

**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 4.7.3.
- After finishing the test, open the vent screw and disconnect the hose.

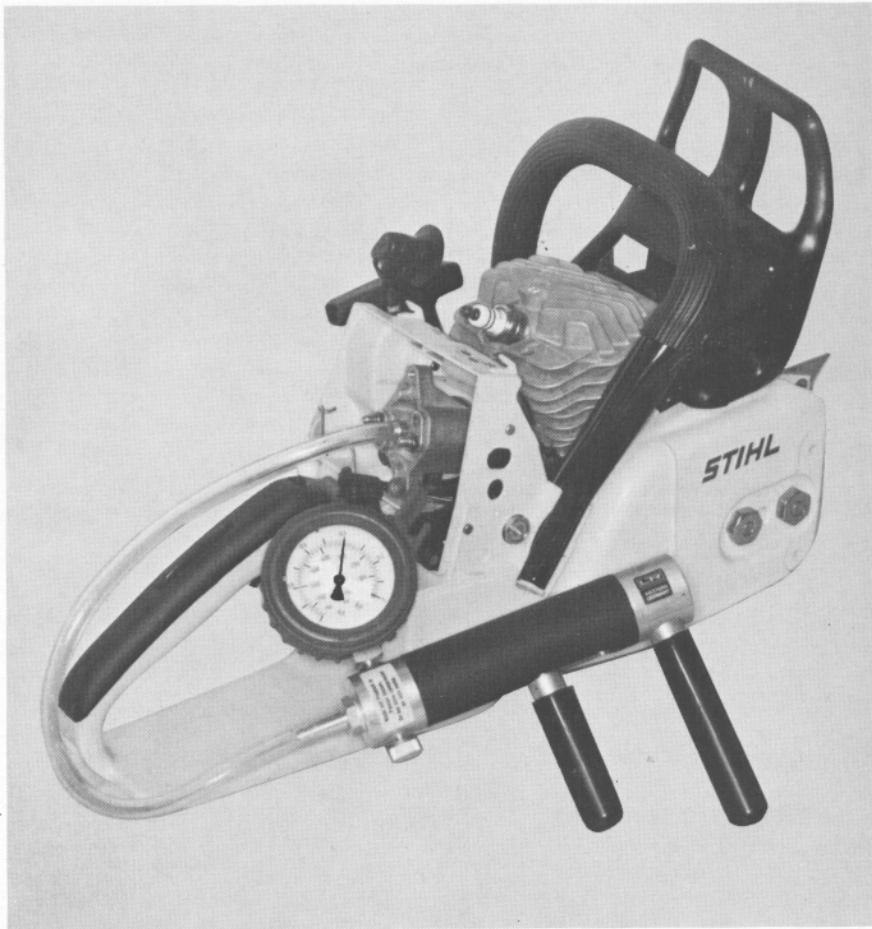
- Remove the test flange and refit the carburetor - see 11.2.
- Take out the muffler lower casing mounting screws.
- Remove the sealing plate from between the lower casing and cylinder.
- Coat the lower casing mounting screws with Loctite (see 12.2), refit them and tighten to a torque of 11.5 Nm (8.5 lbf.ft).
- Refit the muffler upper casing.

#### 4.7.3 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 4.7.2.

- 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 0.3 bar (4.25 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 11.2.
- Take out the muffler lower casing mounting screws.
- Remove the sealing plate from between the lower casing and cylinder.
- Coat the lower casing mounting screws with Loctite (see 12.2), refit them and tighten to a torque of 11.5 Nm (8.5 lbf.ft).
- Refit the muffler upper casing.

#### 4.8 Replacing the Oil Seals

Top:  
Flywheel

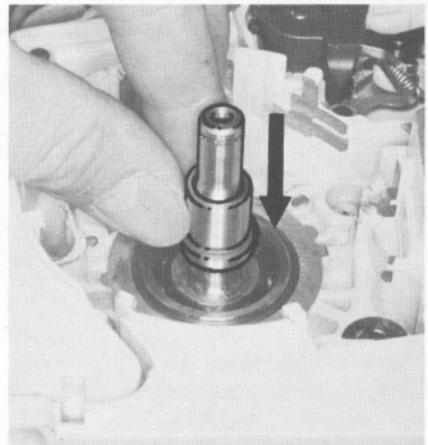
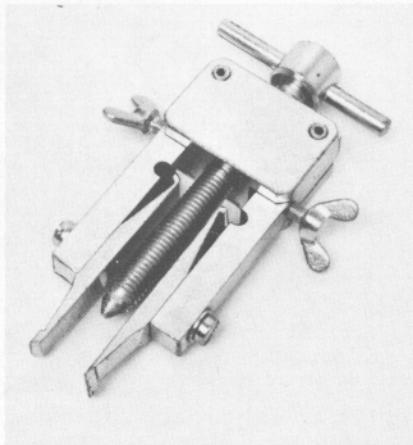
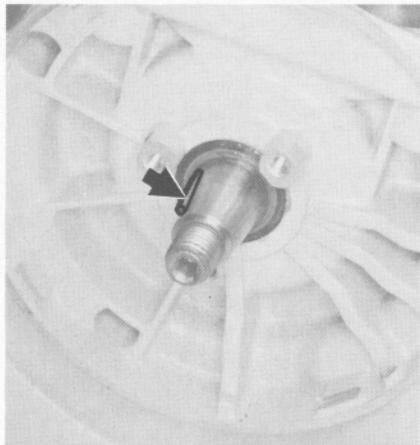
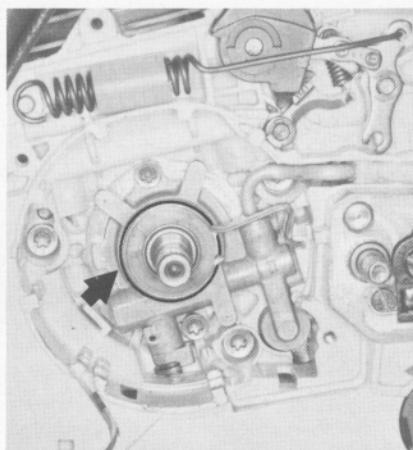
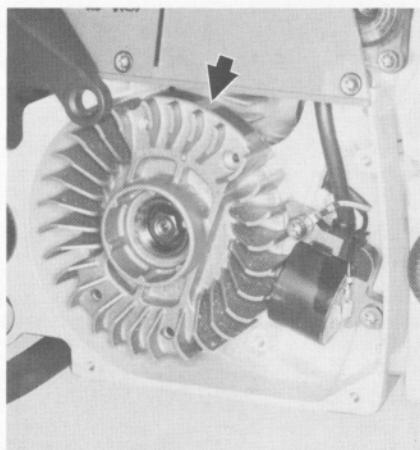
Bottom:  
Woodruff key for flywheel location

Top:  
Oil pump

Bottom:  
Puller 0000 890 4400 with jaws  
0000 893 3706 (No. 3.1+ 4)

Top:  
Removing oil seal at clutch side

Bottom:  
Fitting spacer bush



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

- Remove the flywheel - see 5.1.7.
- Remove the Woodruff key for the flywheel.

- Remove the clutch - see 3.2.
- Remove the brake band - see 3.3.1.
- Remove the oil pump - see 10.4.

**Clutch side:**

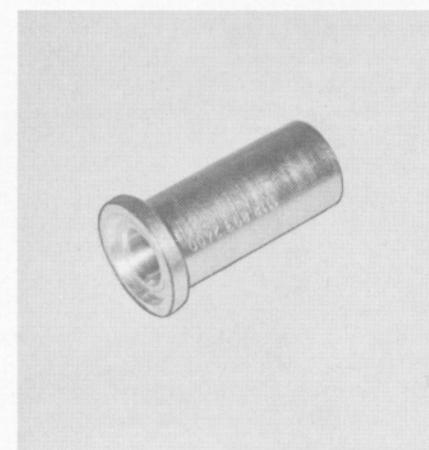
- Apply the puller (with jaws 3.1) and withdraw the oil seal at the clutch side.

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

- Slip the oil pump spacer bush without O-ring (large diameter first) over the crankshaft.

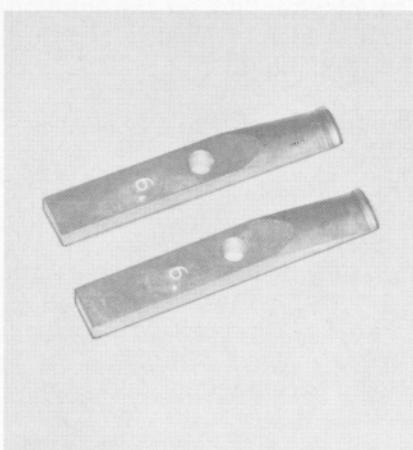
Top:  
Press sleeve 1118 893 2401

Bottom:  
Pressing in oil seal at clutch side



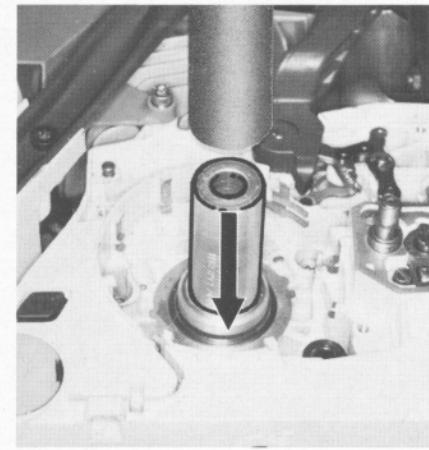
Top:  
Jaws 0000 893 3711 (No. 6) for  
puller 0000 890 4400

Bottom:  
Removing oil seal at ignition side



Top:  
Installing tool 1128 890 3900

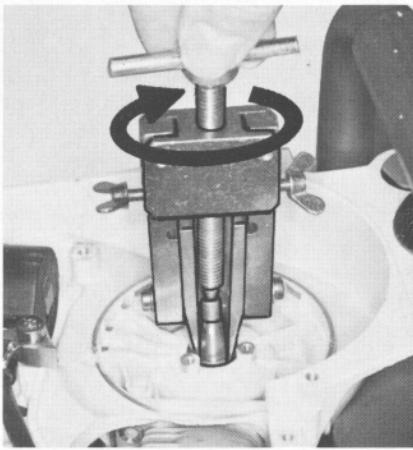
Bottom:  
Pressing in oil seal at ignition side



- Coat the sealing lip of the oil seal with lubricating grease - see 12.2.

- Push the oil seal over the spacer bush. Open side of oil seal must face the crankcase.

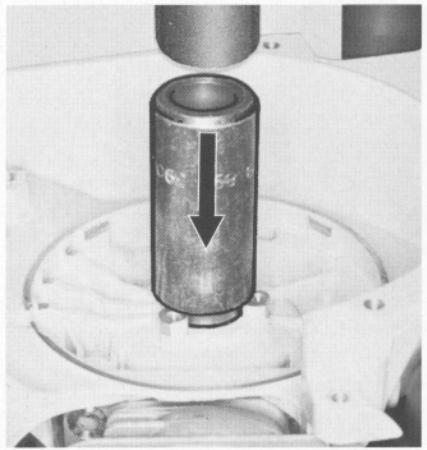
- Remove the spacer bush and press home the oil seal with the press sleeve.



**Ignition side:**

- Fit No. 6 jaws to the puller.
- Apply the puller and withdraw the oil seal at the ignition 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 12.2.

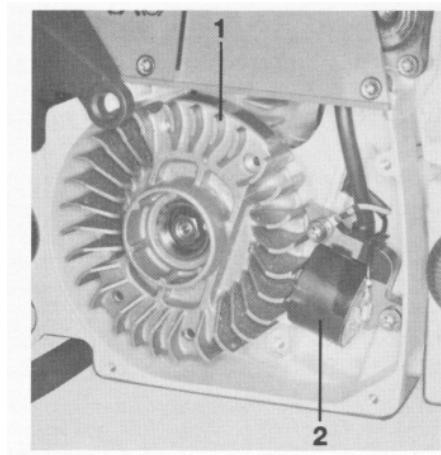
- Push the oil seal over the crankshaft stub (the open side of the oil seal must face the crankcase) and press it home with the installing tool.

- Fit the flywheel - see 5.1.7.
- Fit the oil pump - see 10.4.
- Fit the brake band - see 3.3.2.
- Fit the clutch - see 3.2.

## 5. 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!

1 = Flywheel  
2 = Ignition module



The STIHL 044 is 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 and is easily accessible.

**Note:** A special flywheel is installed in models with heated handles (with ring magnet for the generator).

### 5.1 Repairing Component Parts

#### 5.1.1 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.

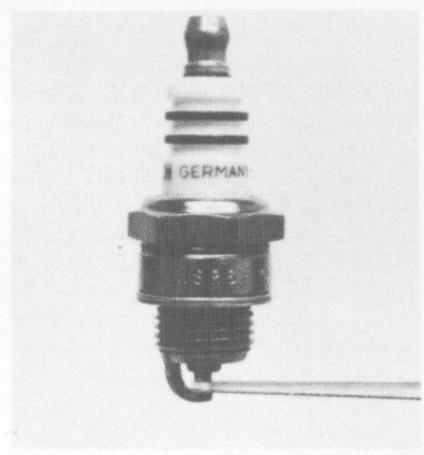
**Note:** Never use a steel wire brush for this job.

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.



- 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 25 Nm (18.5 lbf.ft).

### 5.1.2 Spark Plug Terminal

Top:

1 = Spark plug terminal

2 = Spark plug

3 = Shroud

Bottom:

Removing dust seal

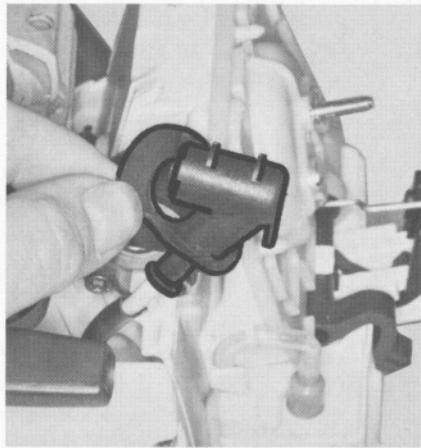
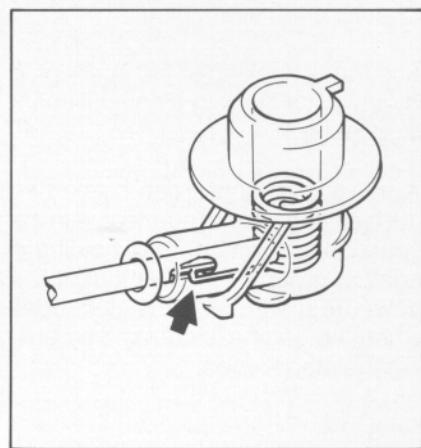
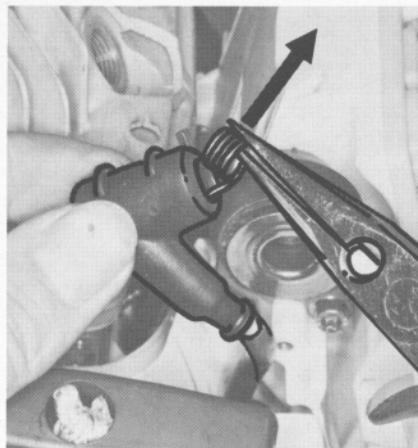
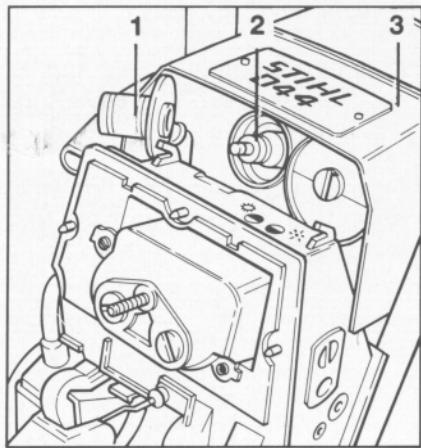
Top:

Pulling leg spring out of spark  
plug terminal

Bottom:

Attaching leg spring

Correct position of leg spring in spark  
plug terminal



- Remove the air filter - see 11.1.
- Pull off the spark plug terminal and unscrew the spark plug.
- Unscrew the shroud mounting screws and lift off the shroud.
- Pull the dust seal off the terminal and push it down the ignition lead.

- Use a suitable pair of pliers to grip the leg spring and pull it out of the spark plug terminal.
- Coat the end of the ignition lead and insulating tube with oil (about 200 mm/8" long).
- Fit spark plug terminal over the ignition lead.

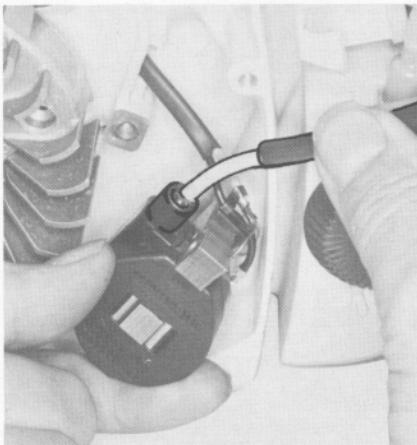
- Use a suitable pair of pliers to grip the end of the ignition lead and pull it out of the spark plug terminal.
- Pinch the hook of the leg spring into the center of the lead, about 15 mm (5/8") from the end of the lead.
- Pull the lead back into the terminal so that the leg spring locates properly inside it (see illustration).
- Slip the dust seal over the spark plug terminal.
- Refit the shroud. Fit spark plug and tighten it down to a torque of 25 Nm (18.5 lbf.ft).
- Push the terminal onto the spark plug.
- Refit the air filter - see 11.1.

## 5.1.3 Ignition Lead

## 5.1.4 Wiring Harness

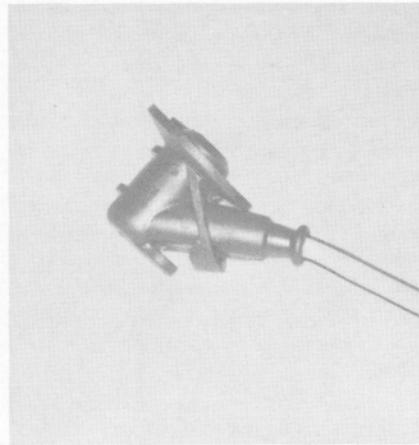
**Top:**  
Pulling unscrewed ignition lead  
out of ignition module

**Bottom:**  
Removing insulating tube



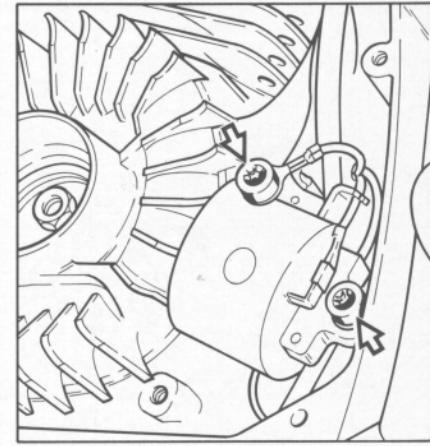
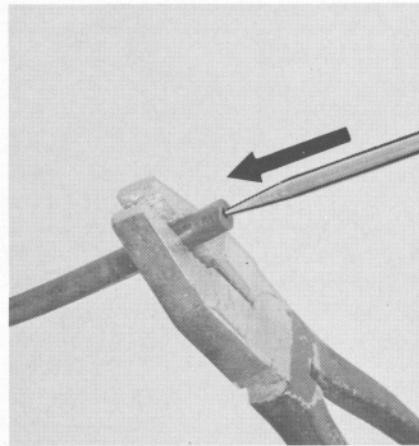
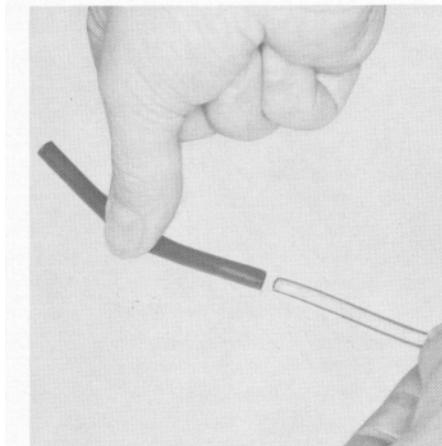
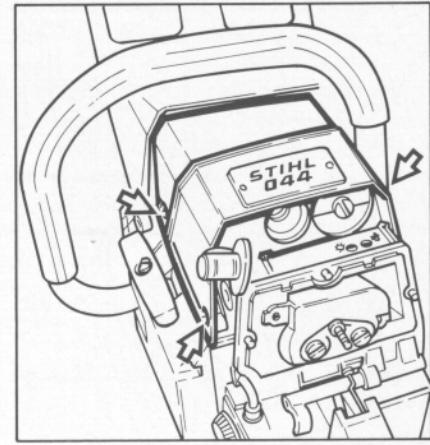
**Top:**  
Spark plug terminal

**Bottom:**  
Piercing center of ignition lead



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

**Bottom:**  
Ignition module mounting screws



- Remove the shroud - see 5.1.2.
- Remove ignition module - see 5.1.6.2.
- Unscrew the lead from the contact pin and pull it out of the ignition module.

- Remove the spark plug terminal see 5.1.2.
- 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).

- Remove the air filter - see 11.1.
- Pull off the spark plug terminal and unscrew the spark plug.
- Unscrew the shroud mounting screws and lift off the shroud.
- Remove carburetor - see 11.2.
- Remove fan housing.
- Remove ignition module mounting screws.

## Top:

1 = Short circuit wire

2 = Terminal pin

3 = Socket

## Bottom:

Grommet on wires

## Top:

Withdrawing wires

## Bottom:

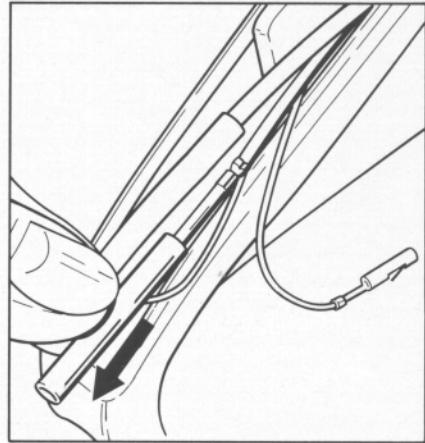
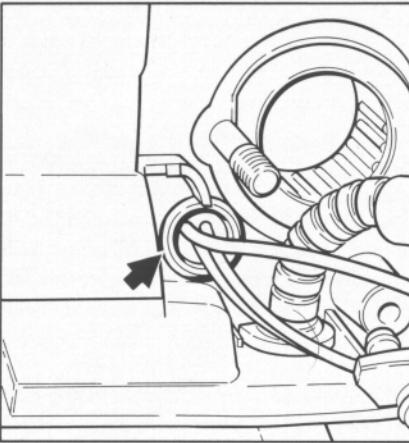
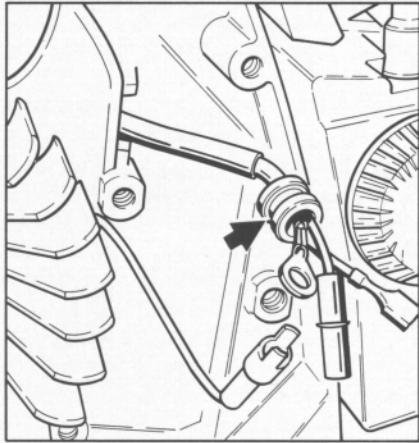
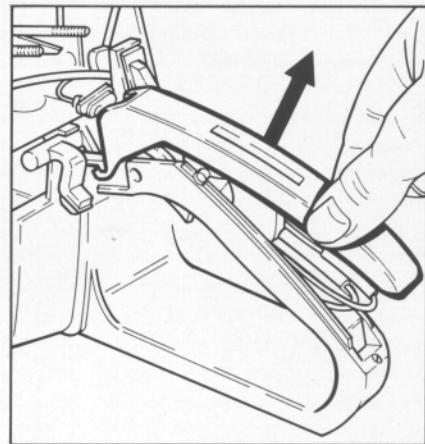
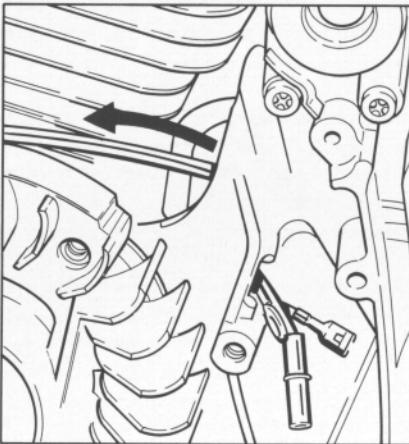
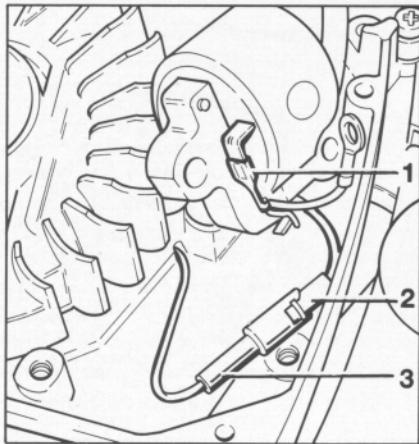
Grommet in tank housing

## Top:

Removing handle molding

## Bottom:

Removing insulating tube



- Disconnect the short circuit wire from the ignition module.
- Pull the terminal pin out of the socket.
- Pull the grommet out of the tank housing and off the wires.

- Pull the wires to the rear and out of the tank housing.
- Remove the front grommet in the tank housing and pull the wires forward and out of the housing.

- Take out the handle molding fastening screw and carefully remove the molding.
- Pull the throttle trigger interlock lever out of its seat.
- Slide the insulating tube off the plug connector of the wire from the generator to the handle heating element.
- Separate the plug connector and remove the insulating tube.

## 5.1.5 Stop Switch

Top:

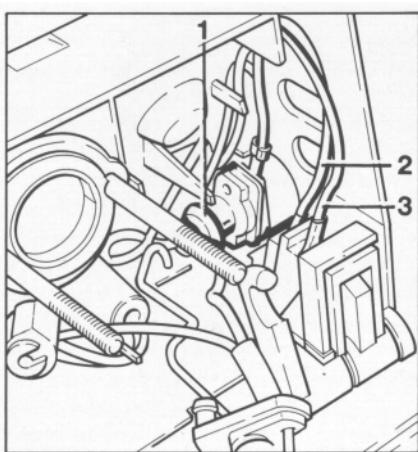
1 = Switch

2 = Short circuit wire

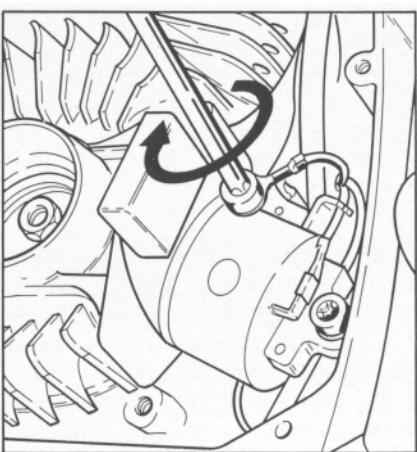
3 = Ground wire

Bottom:

Correct position of wires in rear handle



Tightening ignition module mounting screws

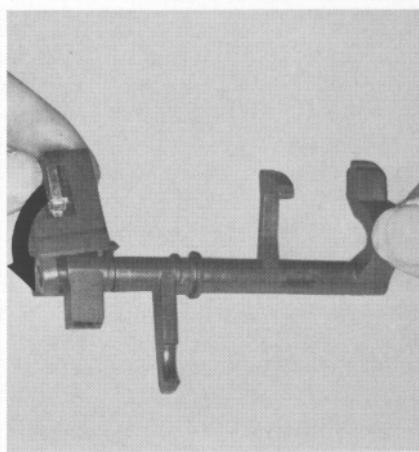
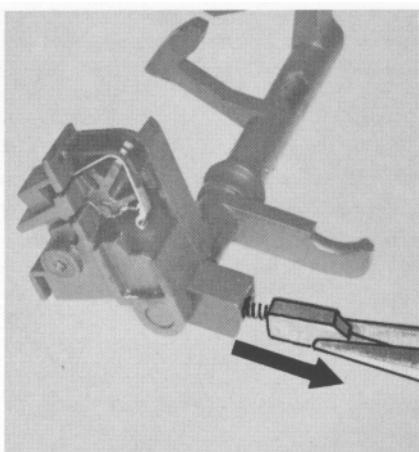


Top:

Withdrawing switch actuator

Bottom:

Removing switch housing from shaft



- After fitting the wiring harness, position the grommets correctly in their respective tank housing openings.

Coat the threads of the module mounting screws with Loctite (see 12.2). Place the ignition module in position, insert the screws with washers (fit ground wire under upper screw) but do not tighten down yet.

**Important!** A washer must be fitted under each screw head.

Slide the setting gauge between the arms of the ignition module and the flywheel magnets.

- Disconnect the short circuit and ground wires from the contact springs.

- Remove the switch - see 9.2.

- Remove the wiring harness.

Installation is a reversal of the removal sequence.

**Note:** Make sure the generator wire is properly located in the rear handle.

Press the ignition module against the flywheel. Tighten down the mounting screws to a torque of 9 Nm (6.6 lbf.ft) and withdraw the setting gauge.

- Remove the switch shaft - see 8.1.
- Rotate the switch housing until the switch actuator is exposed.
- Use suitable pliers to withdraw the switch actuator and remove the spring.
- Ease the switch housing sideways and remove it carefully.

Installation is a reversal of the removal sequence.

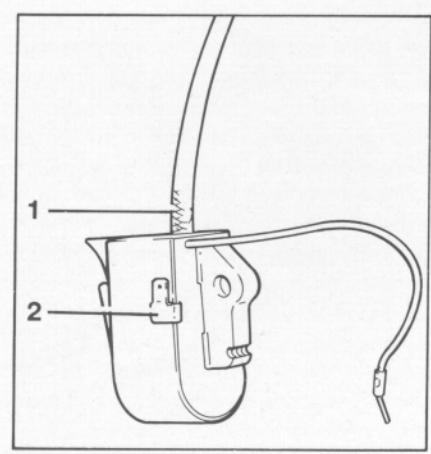
**Note:** The switch actuator must be pushed in until it snaps into position.

## 5.1.6 Ignition Module

## 5.1.6.1 Ignition Timing

## 5.1.6.2 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 8,000 rpm and cannot be adjusted. However, in view of the permissible tolerances in the electronic circuit, it may vary between 2.0 and 3.0 mm (0.08" and 0.12") B.T.D.C. at 8,000 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.

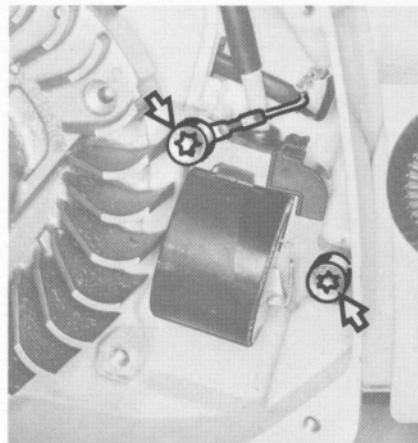
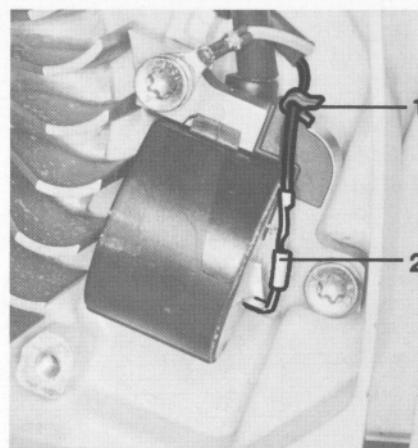
The ignition module accommodates all the components required to control ignition timing. There are only two electrical connections on the coil body, i.e.:

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 a 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).

Top:  
1 = Wire retainer  
2 = Short circuit wire

Bottom:  
Ignition module mounting screws

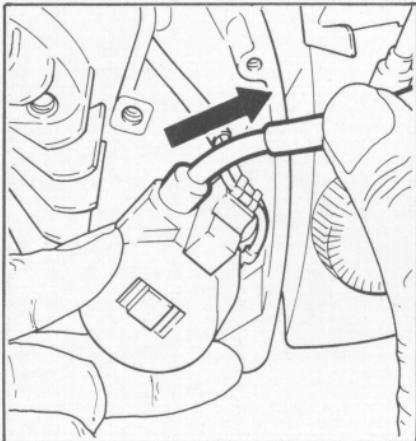


- Remove fan housing - see 4.6.1.
- Disconnect short circuit wire from tag on ignition module and take it out of the retainer.
- Remove the ignition module mounting screws.

## 5.1.7 Flywheel

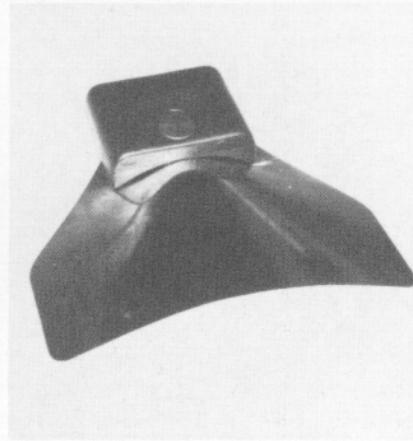
**Top:**  
Pulling unscrewed ignition lead out  
of ignition module

**Bottom:**  
Removing wire retainer from ignition  
module



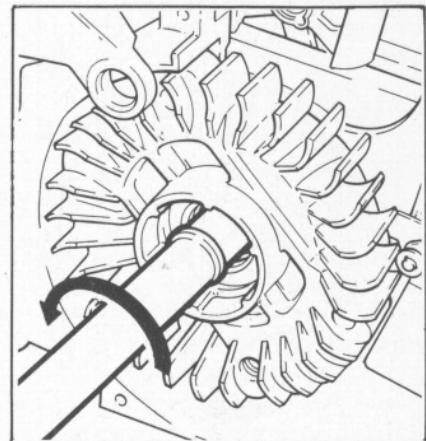
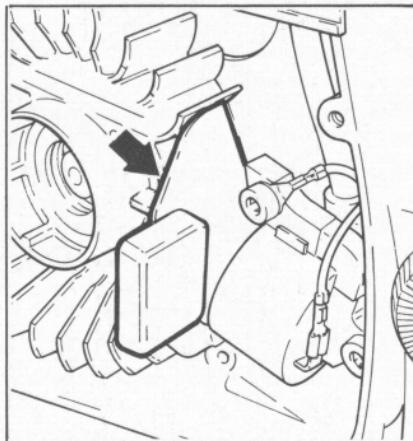
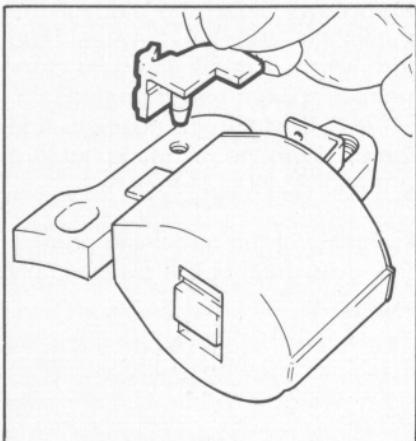
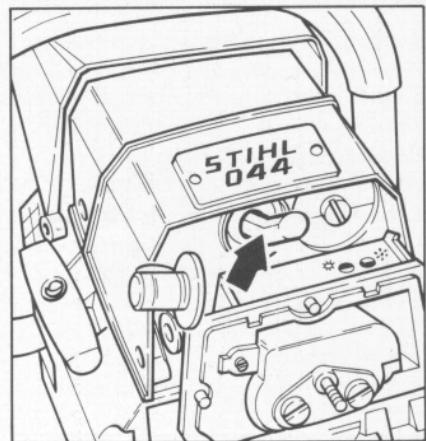
**Top:**  
Setting gauge 1111 890 6400

**Bottom:**  
Setting gauge inserted between  
flywheel and ignition module



**Top:**  
Locking strip 0000 893 5901  
in position

**Bottom:**  
Releasing flywheel mounting nut



- Unscrew the ignition lead from the contact pin and pull it out of the ignition module.
- If necessary, remove the wire retainer from the module.
- Refit the ignition lead by screwing it into the high voltage output.
- Coat the threads of the module mounting screws with Loctite (see 12.2). Place the ignition module in position, insert the screws with washers (fit ground wire under upper screw) but do not tighten down yet.

**Important!** A washer must be fitted under each screw head.

- Slide the setting gauge between the arms of the ignition module and the flywheel magnets.
- Press the ignition module against the flywheel. Tighten down the mounting screws to a torque of 9 Nm (6.6 lbf.ft) and withdraw the setting gauge.
- Fit the fan housing.

**To remove the flywheel:**

- Use the locking strip to block the piston - see 3.2.
- Take out the fan housing mounting screws and remove the fan housing.
- Rotate the flywheel so that the magnet poles are opposite the ignition module.
- Use 13 mm socket wrench to unscrew the flywheel mounting nut from the crankshaft.

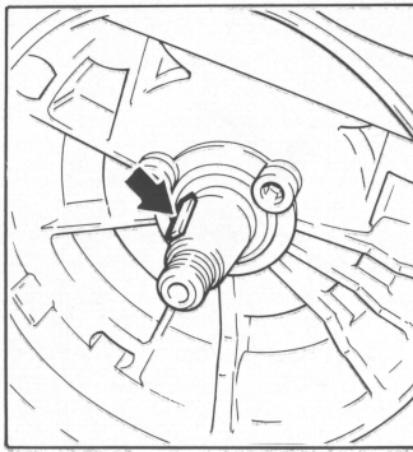
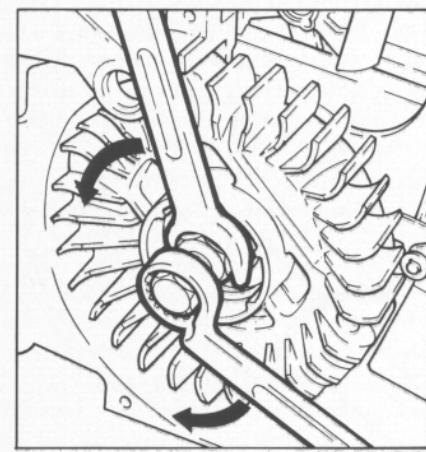
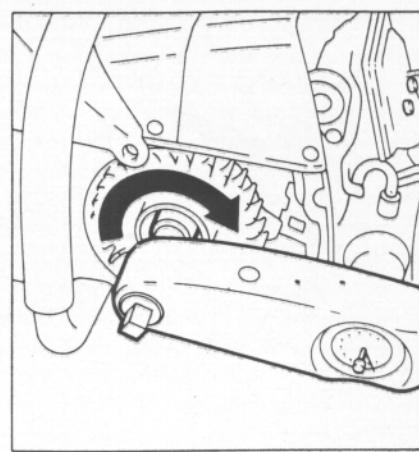
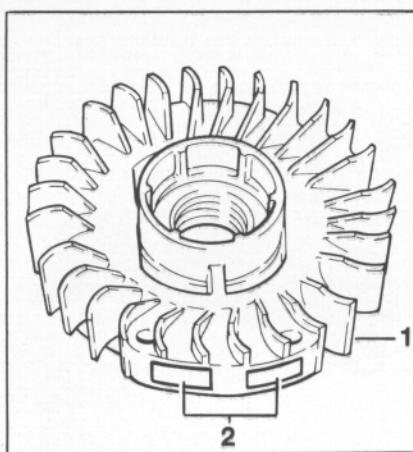
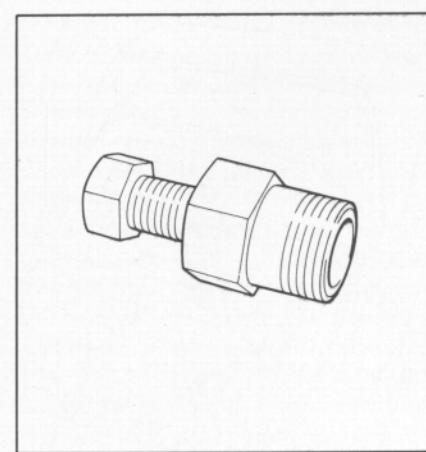
Top:  
Puller 1110 890 4500

Bottom:  
Removing the flywheel

Top:  
1 = Flywheel  
2 = Magnet poles

Bottom:  
Woodruff key for flywheel

Tightening flywheel mounting nut



- Screw the puller into the flywheel.
- Hold the puller steady with a 24 mm open-end wrench and tighten down the thrust bolt until the flywheel comes away from its seat on the crankshaft.
- Take off the flywheel.

- 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 crankshaft and the flywheel hub bore with a suitable standard commercial, solvent-based degreasant. Fit the flywheel in position and tighten down the mounting nut to a torque of 33 Nm (24.5 lbf.ft).

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

## 6. REWIND STARTER

## 6.2 Rope Rotor/Pawls

## 6.1 Routine Maintenance

Removing spring clip



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 or white spirit.

Lubricate the rewind spring and starter post with STIHL low temperature lubricant, see 12.2, before installing.

**Removing rope rotor**

Troubleshooting chart - see 2.4.

The fan housing has to be removed for access to the starter mechanism - see 4.6.1.

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.

**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.

- 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 pawls off the starter post.
- Remove the pawls and check to see if they are in good condition, replace if necessary.
- Replace the broken or worn starter rope - see 6.3.

**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 pawls.
- Fit the washer and install the spring clip in the starter post groove.

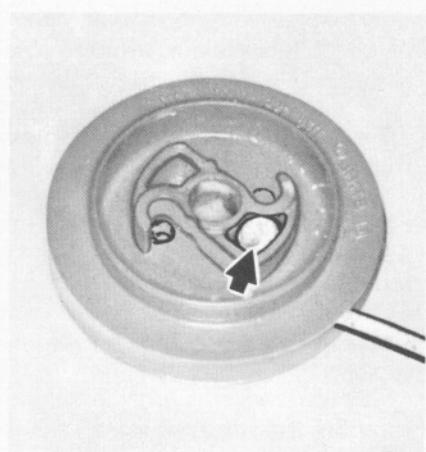
**Note:** Make sure the spring clip engages on the pawl guide pegs and points them in the clockwise direction.

- The spring clip must be treated very carefully. If it is bent during disassembly or assembly, the rewind starter might malfunction.
- Tension the rewind spring - see 6.5.

### 6.3 Replacing the Starter Rope

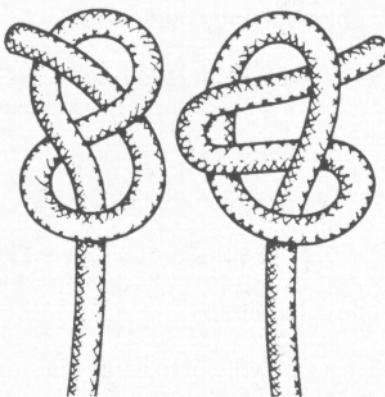
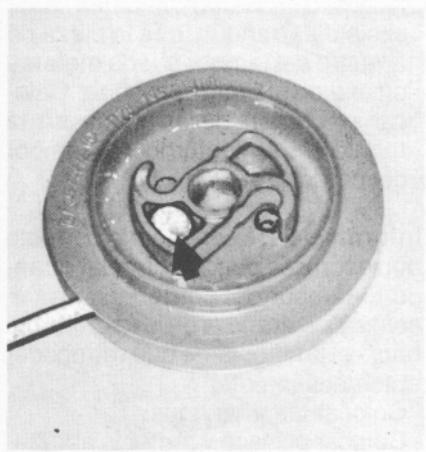
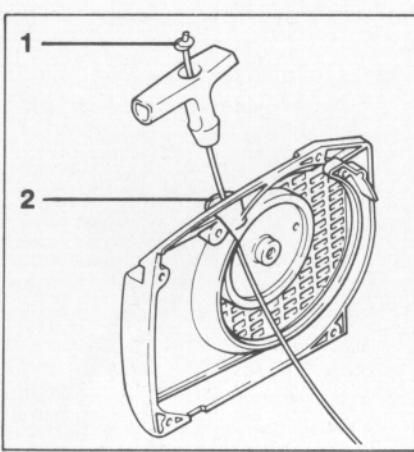
**Top:**  
Starter rope correctly positioned in rope rotor

**Bottom:**  
Starter rope secured in rope rotor with knot



**Top:**  
1 = Special knots  
2 = Rope guide bush

**Bottom:**  
Special knots used



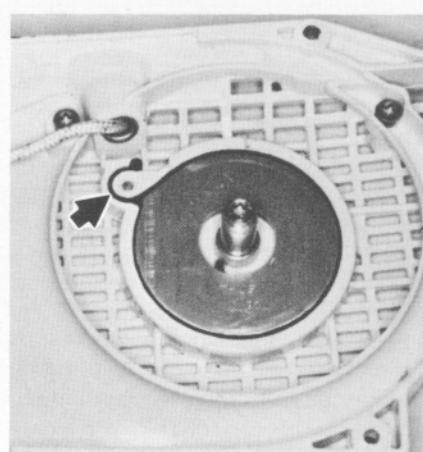
- Remove the rope rotor - see 6.2.

- 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.

### 6.4 Replacing the Rewind Spring

Rewind spring fitted in position



- Remove the rope rotor, see 6.2, 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:

- 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 6.2.

## 6.5 Tensioning the Rewind Spring

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

Top:

Winding starter rope onto rotor

Bottom:

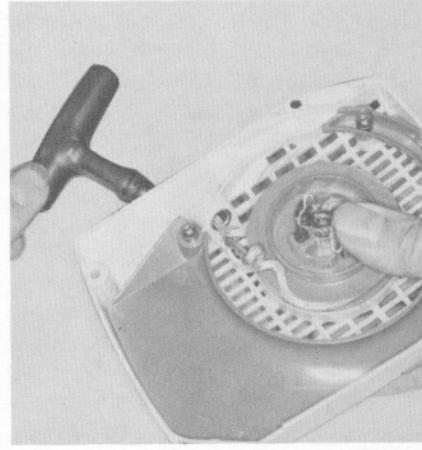
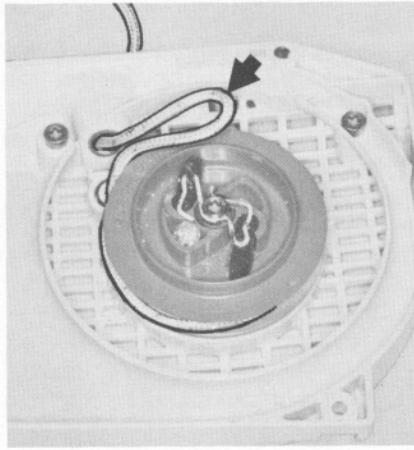
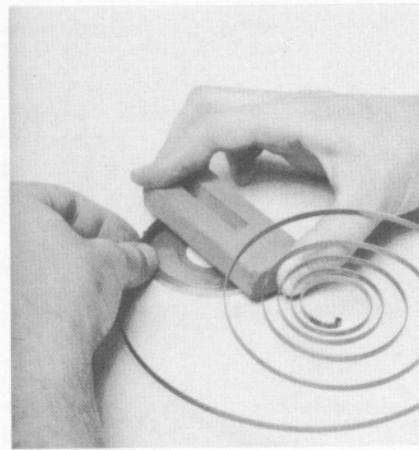
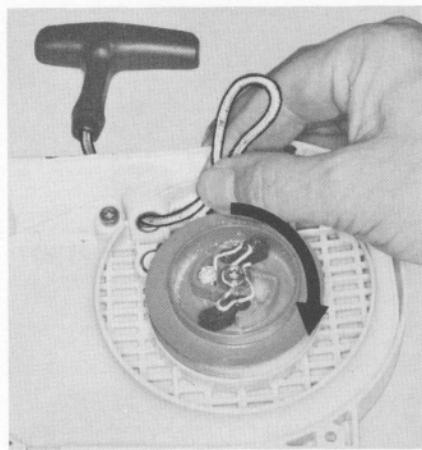
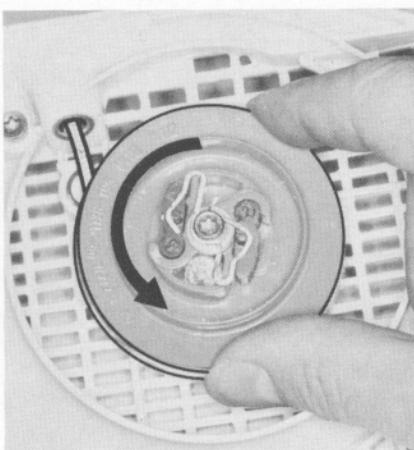
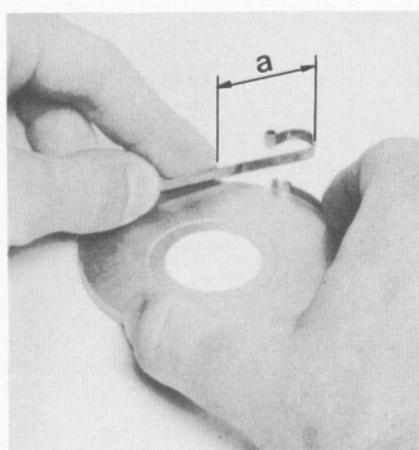
Loop in rope

Top:

Tensioning rewind spring

Bottom:

Straightening twisted rope



- 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 6.2.

- Pull the starter rope out to full length. Rotate the rope rotor counterclockwise to wind on the rope until the starter grip is about 20 cm (8") from the fan housing.

- Make a loop in the rope between the rope rotor and starter cover.

- Grip the rope **close** to the rotor and use it to turn the rope rotor three full turns clockwise.

- Hold the rope rotor steady.

- Pull out rope with starter grip and straighten it out.

- Hold the starter grip firmly to keep the rope tensioned.

- Let go of the rope rotor and slowly release the starter grip.

## 6.6 Replacing Starter Rope Guide Bush

Starter grip on fan housing



Starter rope guide bush



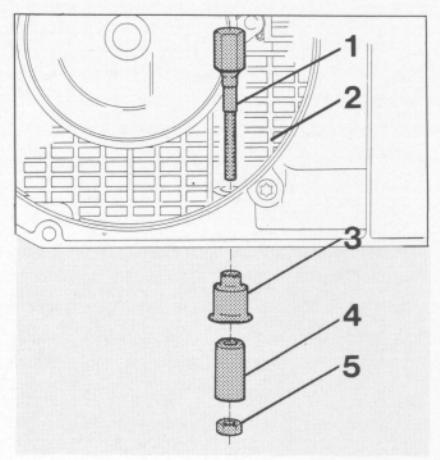
Top:

Fitting new rope bush with installing tool  
0000 890 2201 (schematic)

- 1 = Screw spindle
- 2 = Fan housing
- 3 = Rope guide bush
- 4 = Thrust sleeve
- 5 = Hexagon nut

Bottom:

Flaring the new rope 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, tension the spring 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.**

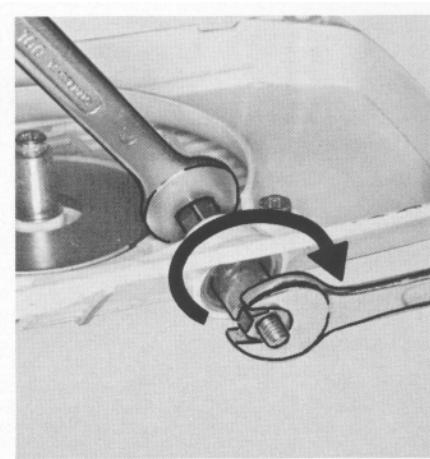
- Refit the fan housing.

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 fan housing.
- Relieve tension on rewind spring, see 6.5, and remove the starter grip.
- Use a suitable tool to pry the old bush out of the fan housing.

To install the new rope bush:

- Place the new bush in its seat in the fan housing.
- 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.
- 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 starter grip.
- Tension the rewind spring - see 6.5.
- Fit the fan housing.

## 7. AV HANDLE SYSTEM

### 7.1 Repair

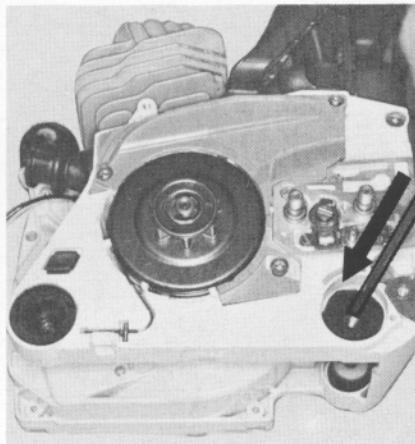
**Top:**  
Remove center screw

**Bottom:**  
1 = Annular buffer  
2 = Mounting screws



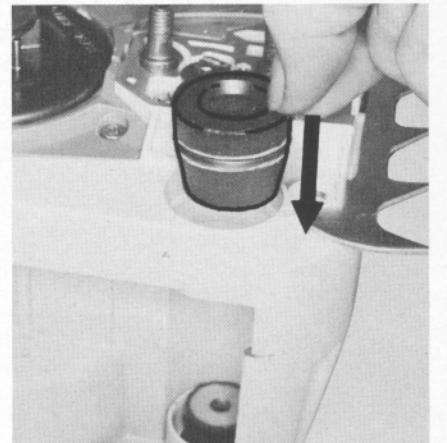
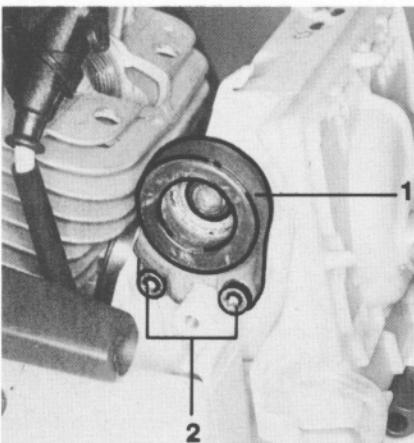
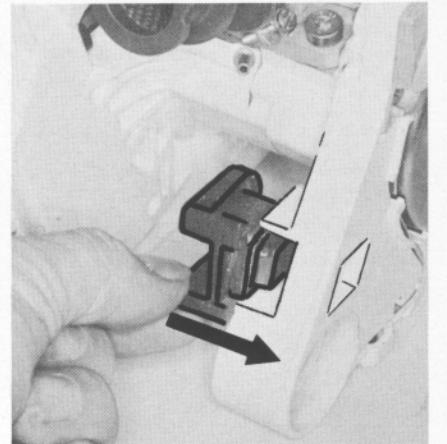
**Top:**  
Prying out annular buffer

**Bottom:**  
Prying out stop buffer



**Top:**  
Fitting stop buffer

**Bottom:**  
Fitting annular buffer



The crankcase and tank housing are connected by vibration damping rubber buffers. Damaged rubber buffers (annular buffers) must always be replaced.

- Remove the air filter - see 11.1.
- Remove the shroud - see 4.3.
- Unscrew the center screw and remove it along with the sleeve.
- Remove the mounting screws and lift away the annular buffer.

- Remove the tank housing, see 11.8.1, for access to the other annular buffers.

- Carefully pry all three annular buffers out of their seats and remove them from the crankcase.

Assembly is then a reversal of the disassembly sequence.

**Note:** Push the stop buffer into its seat. Make sure the tabs locate behind the housing face.

Push the annular buffers (tapered side first) into position until their annular grooves engage the inner rib.

## 8. MASTER CONTROL

### 8.1 Removing and Installing

Positions of Master Control lever:

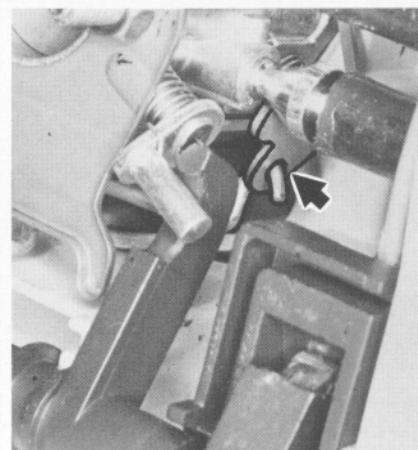
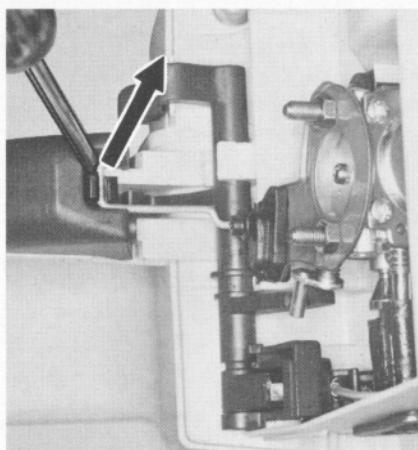
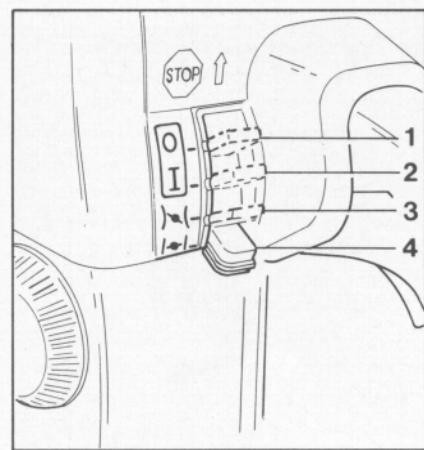
- 1 = STOP
- 2 = RUN
- 3 = START
- 4 = CHOKE

Top:  
Disengaging throttle rod

Bottom:  
Grommet

Top:  
Throttle rod in throttle shaft

Bottom:  
1 = Short circuit wire  
2 = Ground wire

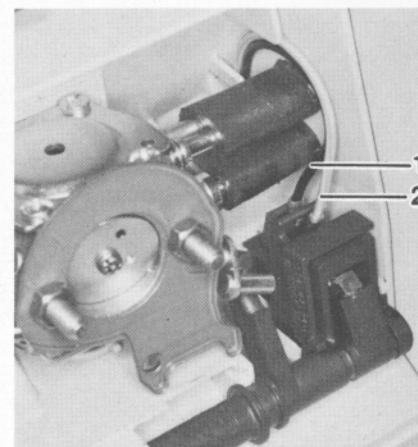
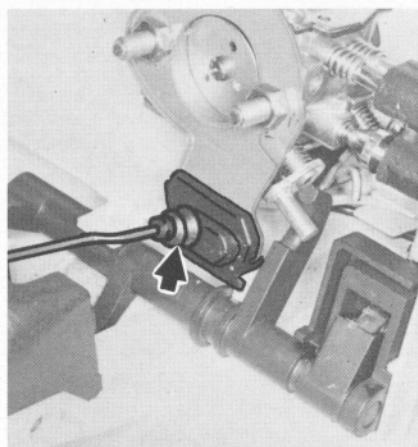


The main part of the Master Control is the switch shaft with an integrally molded multi-function operating lever, a molded seat for the switch actuator and two other levers.

The thumb-operated Master Control lever moves the switch shaft to select the required function.

The following positions can be selected with the Master Control lever (from bottom upward):

- CHOKER	(cold start/choke shutter closed)
- START	(warm start/choke shutter open)
- RUN	(normal operating position)
- STOP	(switch actuator touches contact spring/ignition interrupted)



- Remove the air filter - see 11.1.
- Disengage throttle rod from throttle lever.
- Pull the grommet out of the baffle plate.

- Detach throttle rod from throttle shaft and pull it out.
- Disconnect short circuit and ground wires from the contact springs.

## 8.2 Throttle Trigger/ Interlock Lever

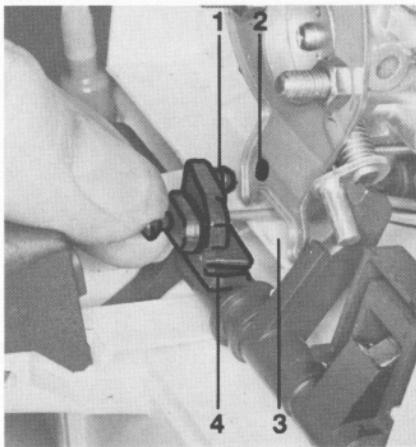
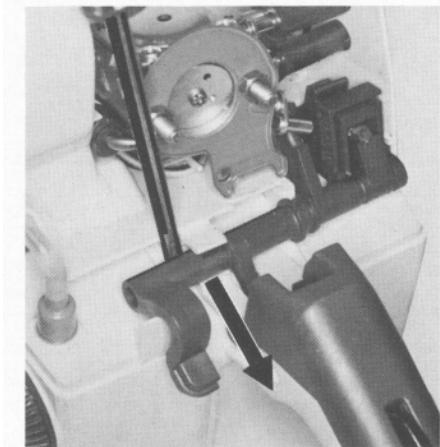
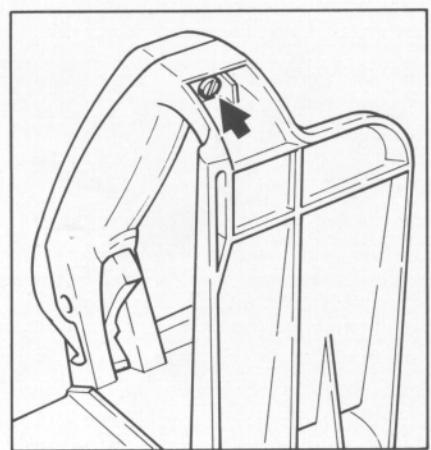
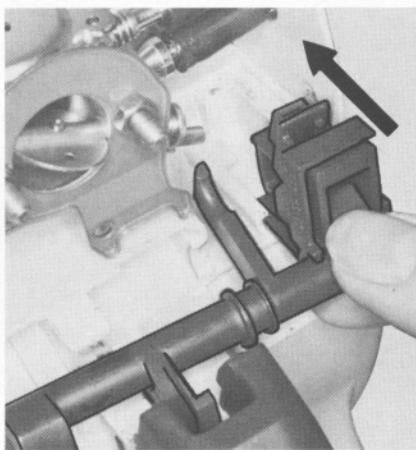
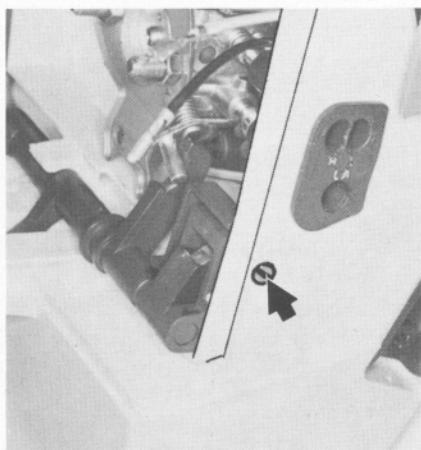
**Top:**  
Sliding switch housing into its guide

**Top:**  
Switch shaft mounting screw

**Bottom:**  
Prying switch shaft out of pivot mount

**Bottom:**  
1 = Nipple  
2 = Hole  
3 = Housing edge  
4 = Rubber tab

Handle molding fastening screw



- Remove the air filter - see 11.1.

- Take out the handle molding fastening screw. Lift away the handle molding.

- Remove switch shaft mounting screw.
- Carefully pry the switch shaft out of the left-hand pivot mount and pull the switch housing out of its guide on the right.

Installation is a reversal of the removal sequence.

**Note:** Slide the switch housing into its guide before fitting the switch shaft in its mount.  
Attach the throttle rod and then push the grommet into position so that its nipple fits in the hole in the baffle plate and its rubber tabs locate on the edge of the housing.

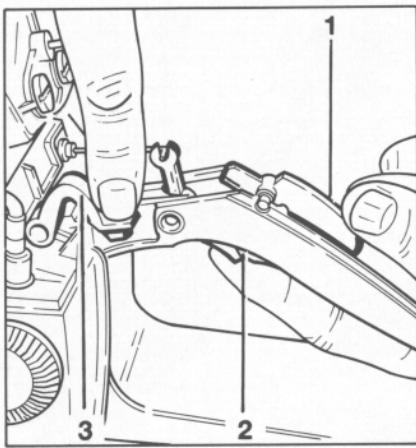
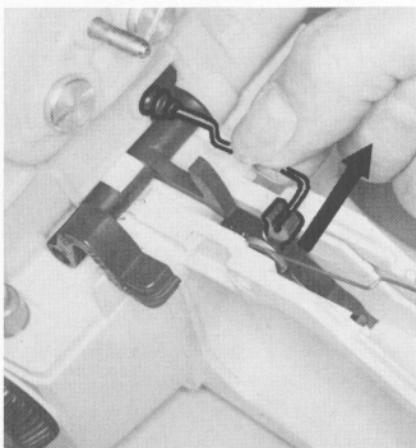
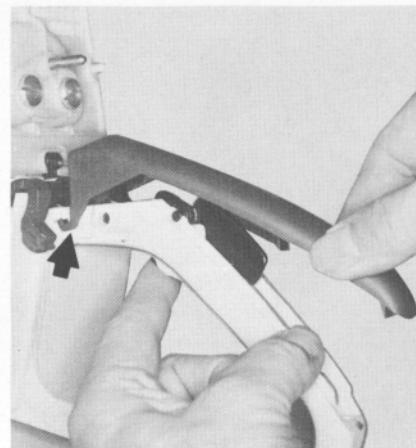
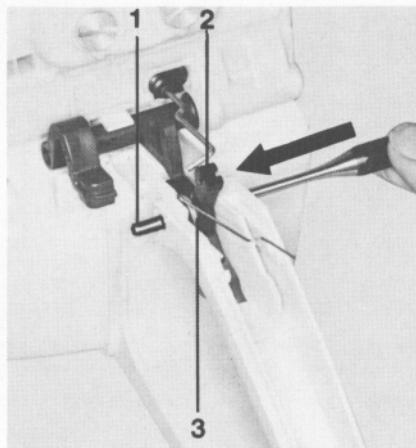
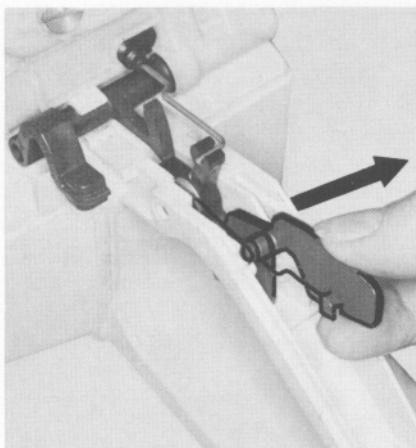
Top:  
Withdrawing interlock lever

Bottom:  
Detaching throttle rod from trigger

Top:  
1 = Cylindrical pin  
2 = Throttle trigger  
3 = Torsion spring

Bottom:  
1 = Interlock lever  
2 = Throttle trigger  
3 = Master Control lever

Fitting handle molding



- Move Master Control lever to "RUN" position.
  - Pull the throttle interlock lever out of its seat.
  - Detach the throttle rod from the trigger.
  - Use a 5 mm (3/16") drift to drive out the cylindrical pin. Remove the throttle trigger and torsion spring.
- Installation is a reversal of the removal sequence.

**Note:** The torsion spring must be under the interlock lever and engage the notch.

Press the interlock lever downward. Push the throttle trigger upward and move the Master Control lever to the "CHOKE" position.

Push the throttle trigger fully upward and position the handle molding so that engages behind the lugs as shown in the illustration.

## 9. ELECTRIC HANDLE HEATING SYSTEM

### 9.1 Troubleshooting

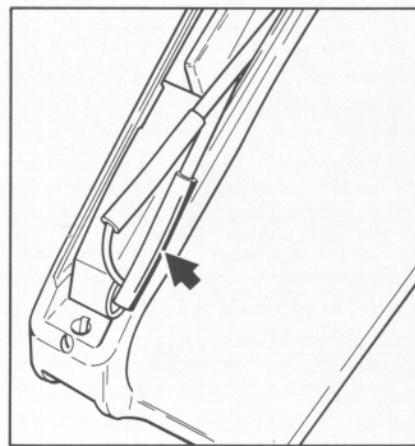
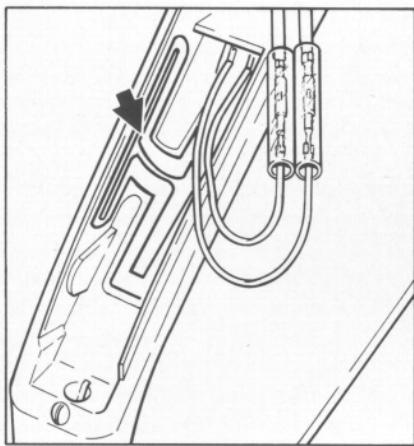
Heating element in rear handle  
(handle molding and pressure pad removed)

Top:  
Handle molding fastening screw

Bottom:  
Removing handle molding

Top:  
Insulating tube over connector

Bottom:  
Disconnecting wires

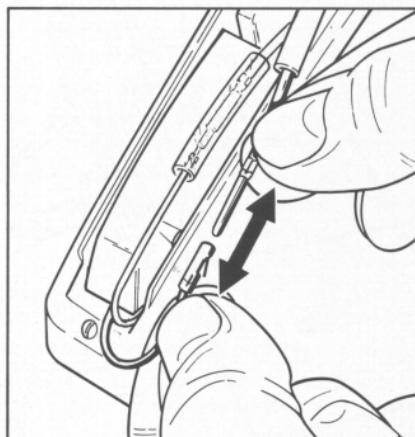
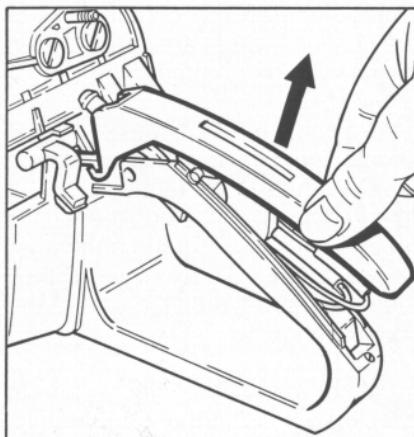


The entire handle heating system is maintenance-free and subject to practically no wear. Faults in the generator, heating elements and wiring are generally caused by mechanical damage from outside.

There are two reasons for failures in the heating system:

- A break in the circuit due to a faulty wire or component.
- A short circuit resulting from damage to the insulation.

**Important!** The heating element in the rear handle may fail as a result of overheating if it is not bonded firmly in position without creases.



To trace the cause of a fault:

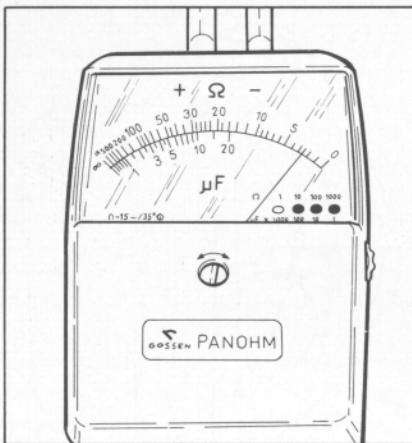
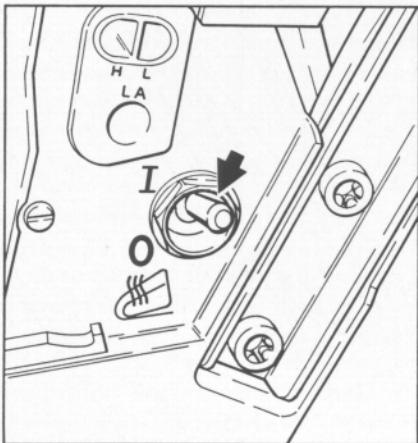
- Remove the air filter - see 11.1.
- Take out the handle molding fastening screw.
- Carefully lift the handle molding away from the rear handle.

- Slide the insulating tube off the plug connection of the wire from the generator to the handle heating element.
- Separate the plug connection between the two wires.

Top:  
Heater switch on "I"

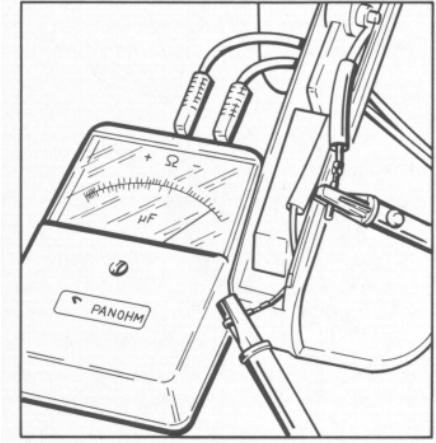
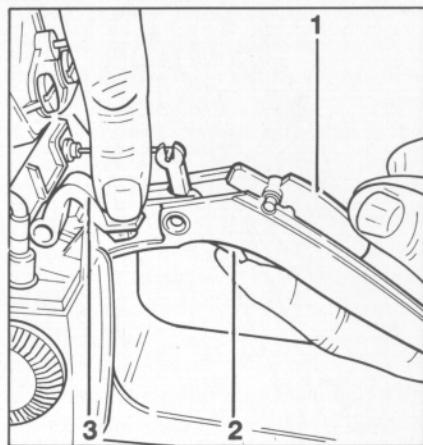
Bottom:  
Ohmmeter connected

Ohmmeter (reading 2.5 Ω)



Top:  
1 = Interlock lever  
2 = Throttle trigger  
3 = Master Control lever

Bottom:  
Fitting the handle molding

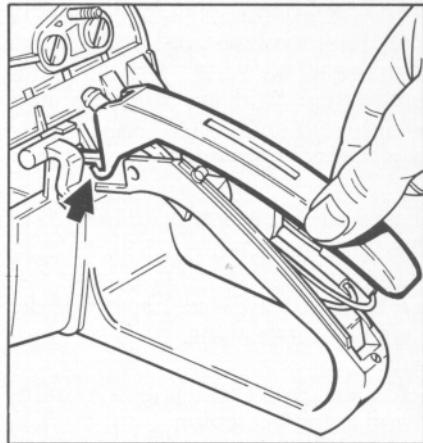


**Note:** All electrical components of the heating system are connected in series with the ohmmeter.

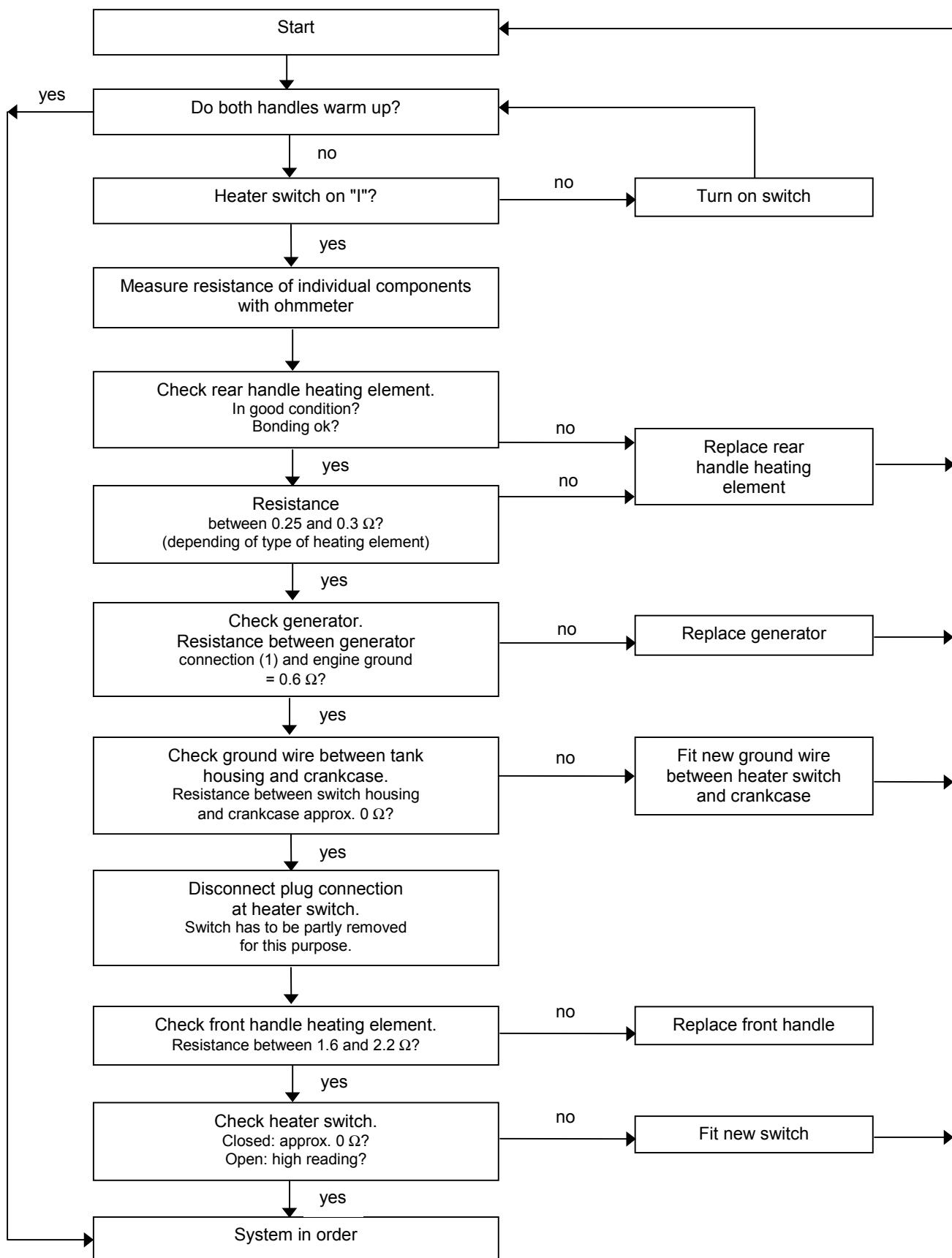
If the system is intact, the ohmmeter should indicate a value of around 2.5 Ω in measuring range "Ω x1". If no reading is obtained, there is a break in the circuit. If the ohmmeter shows a value of less than 2.5 Ω, there is a short circuit in one of the components.

In either case it is necessary to check each component separately. The generator wire remains disconnected from the heating element during this check.

- Set the heater switch to "I".
- Set the ohmmeter to "Ω x1".
- Clip one of the two test leads to the generator wire and the other test lead to the heating element wire.
- After completing the test, reconnect the wires and slide the insulating tube over the connector.
- The torsion spring must be under the interlock lever and engage the notch.
- Press the interlock lever downward. Push the throttle trigger upward and move the Master Control lever to the "CHOKE" position.
- Push the throttle trigger fully upward and position the handle molding so that engages behind the lugs as shown in the illustration.
- Fit the air filter - see 11.1.



## 9.1.1 Troubleshooting Chart



### 9.1.2 Test Connections and Test Values

The plug and socket connections of wires 1 to 4 must be disconnected to test the individual components.

Component	Ohmmeter connection (use either test lead)		Resistance $\Omega$		If faulty	
	Lead 1	Lead 2	Spec.	Actual (reading)	Cause	Remedy
Switch	Switch terminal <sup>1)</sup>	Ground	0	-	Switch faulty	Replace switch
Heating element in rear handle	Connector on wire 3	Connector on wire 4	0.25	approx. 0.25	Heating element okay  Break in wire, heating element damaged  Short circuit - damaged insulation	Replace heating element  Repair insulation
Heating element in front handle	Connector on wire 2	Ground	1.6	approx. 1.6  -	Heating element okay  Break in wire, heating element damaged  Short circuit - damaged insulation	Replace front handle  Repair insulation
Generator	Connector on wire 1	Ground	0.6	approx. 0.6  -	Generator okay  Break in wire, generator damaged  Short circuit - damaged insulation	Replace generator  Repair insulation

<sup>1)</sup> Remove wire for this purpose

## 9.2 Switch

Top:  
Withdrawing connector sleeve

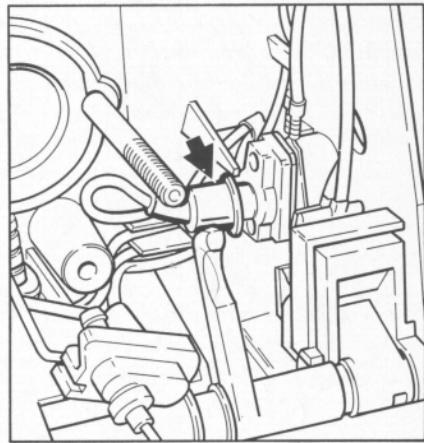
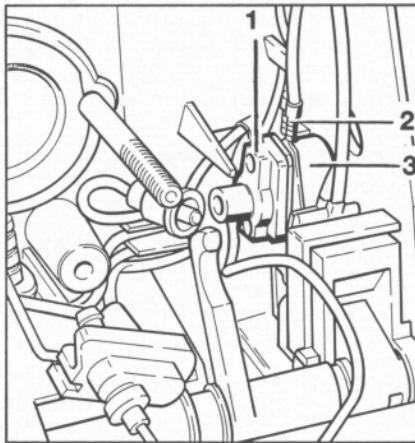
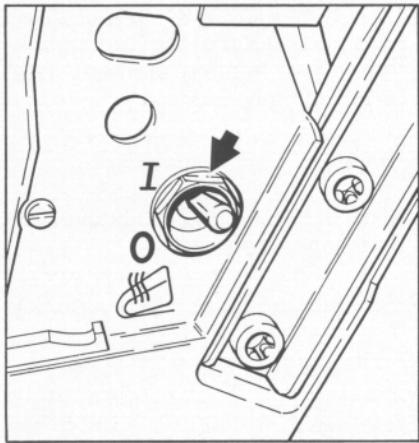
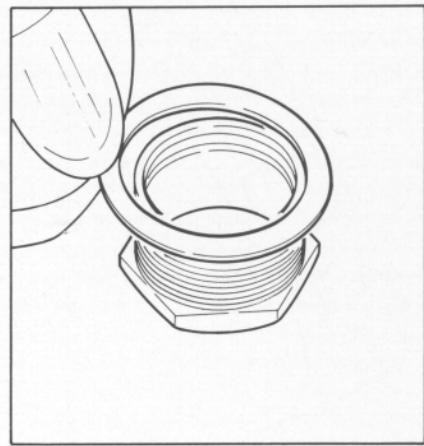
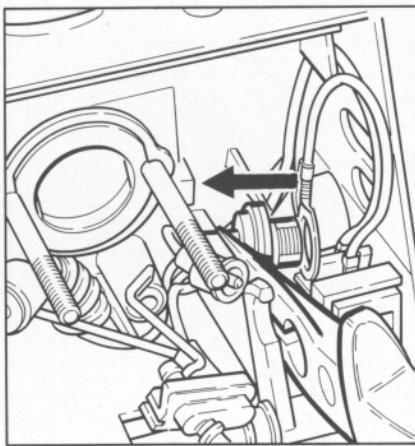
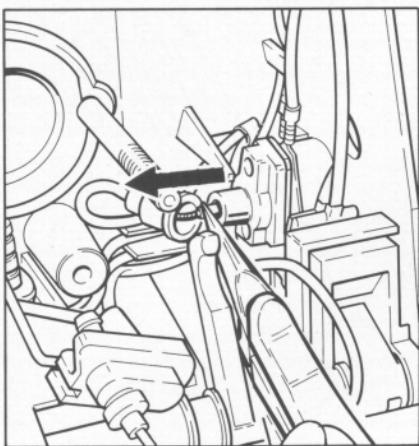
Bottom:  
Switch mounting nut

Top:  
Removing switch

Bottom:  
1 = Switch  
2 = Ring terminal  
3 = Ring

Top:  
Fitting washer

Bottom:  
Rubber boot



- Remove the carburetor - see 11.2.
- Push the rubber boot back a little and use pliers to pull the wire's connector sleeve out of the switch.
- Unscrew the switch mounting nut.

- Remove the switch from inside the carburetor box.
- Fit the new switch in the terminal and ring.

- Slip the washer over the nut. Secure the switch in position with the nut.
- Plug the wire's connector sleeve into the switch.
- Push the rubber boot back onto the switch.
- Install the carburetor - see 11.2.

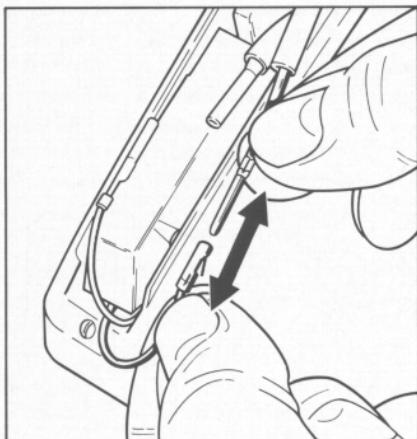
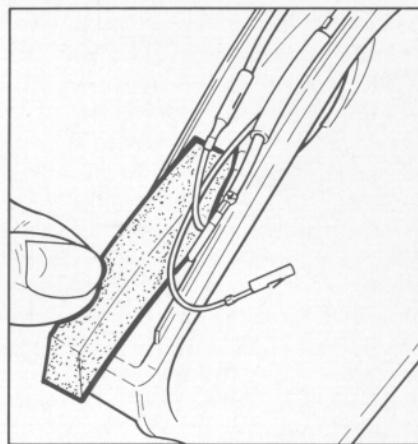
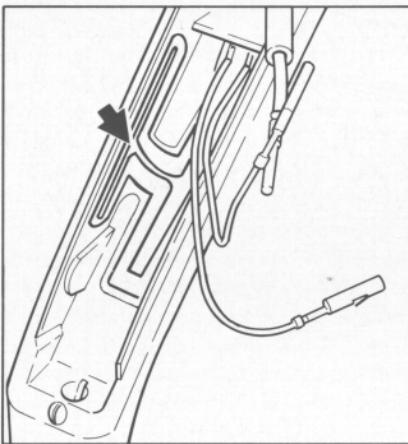
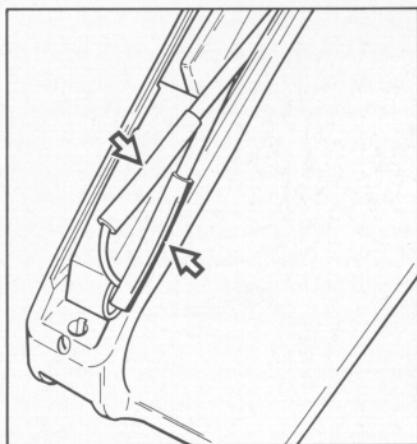
### 9.3 Heating Element in Rear Handle

Top:  
Insulating tubes

Bottom:  
Separating plug connectors

Heating element in rear handle

Fitting pressure pad



- Remove the handle molding - see 9.1.
- Slide the two insulating tubes off the plug connectors.
- Separate the plug connectors of the handle heating system.
- Take the pressure pad and heating element out of the handle recess.

**Important!** Before fitting the new heating element, clean the surface inside the handle so that it is free from grease, dirt and moisture.

- Remove the backing paper from the new heating element.
- Press the heating element firmly and uniformly into position, taking special care at the corners and along the edges.

**Important!** Creases must be avoided. If the heating element is not fitted perfectly flat, heat transfer will be interrupted and the element may fail as a result of overheating. The ambient temperature during installation should not be less than +15 °C (60 °F).

- Fit a new expanded rubber pressure pad on top of the heating element. The heating element must be completely covered.

- Reconnect the two wires.
- Slide the insulating tubes over the plug connectors.
- Refit the handle molding - see 9.1.
- Fit the air filter - see 11.1.

To check operation of heating element:

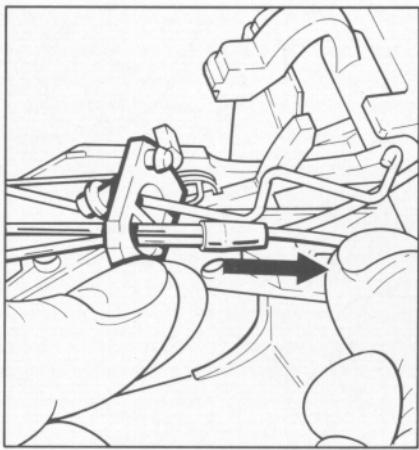
- Run the saw at maximum revs for no more than 30 seconds with the heating switched on.

**Note:** The heat generated during this process also helps the element's adhesive set faster.

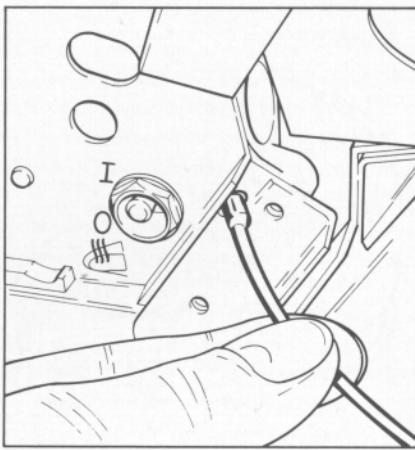
#### 9.4 Heating Element in Front Handle

**Top:**  
Pulling wire out of grommet

**Bottom:**  
Front handle mounting screws  
on side of tank housing

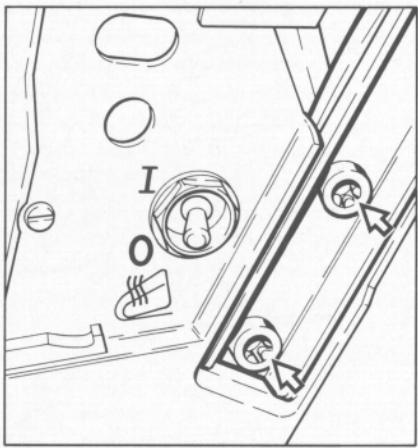
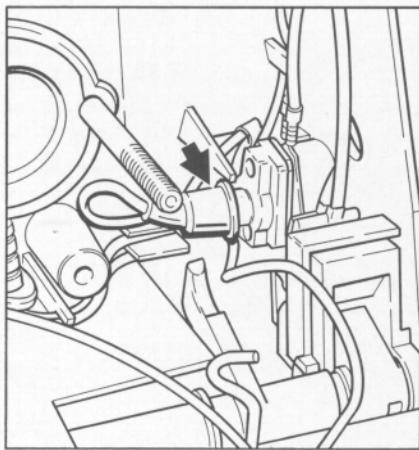


Withdrawing wire



**Top:**  
Rubber boot

**Bottom:**  
Wires correctly positioned in  
rear handle recess

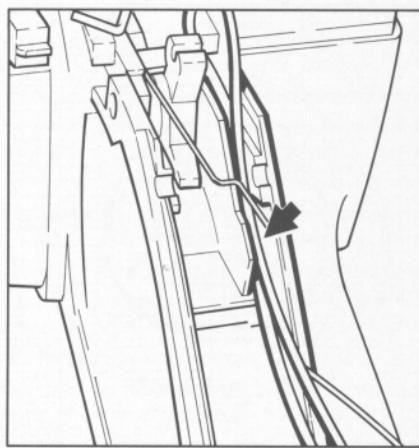


**Important!** The special screws used for polymer joints are secured with adhesive. Always heat the screwed joint before loosening, e.g. with a hair dryer. Take care not to overheat the polymer.

- Remove the mounting screws at the right side and underside of the front handle. Lift the handle away.
- Pull the two connecting wires out of the bore.

Reverse the above sequence to fit the new front handle.

**Note:** Secure the handle mounting screws with Loctite threadlocking adhesive - see 12.2.



- Plug the connector sleeve into the switch and then slide the rubber boot back into position.

Check that the wire of the front handle heating element and the generator wire are properly positioned in the rear handle.

- Fit the throttle trigger interlock lever and handle molding - see 8.2.

The heating element in the front handle (handlebar) is not replaceable. A new handle must be fitted if the heating element is faulty.

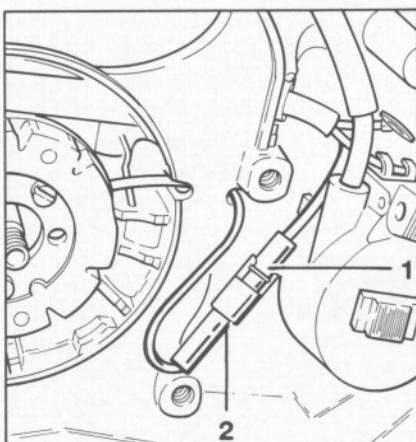
- Remove the carburetor - see 11.2.
- Separate the plug connectors - see 9.3.
- Pull off the insulating tube.
- Remove the throttle trigger interlock lever - see 8.2.
- Pull the wire out of the rubber grommet.
- Disconnect wire from the switch - see 9.2.

## 9.5 Generator

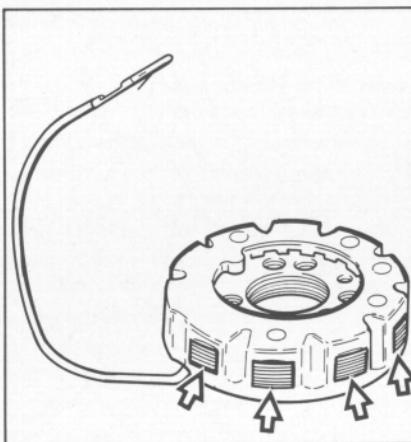
## 9.5.1 Removal

Top:  
1 = Terminal pin  
2 = Socket

Bottom:  
Generator mounting screws

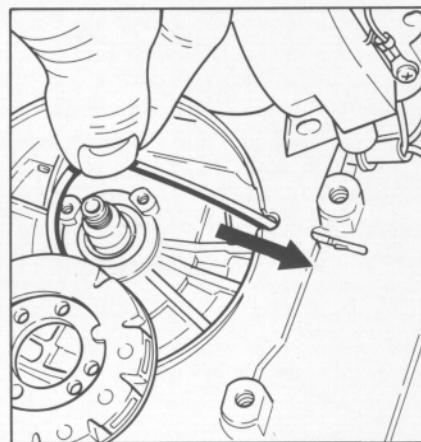


Generator poles



Top:  
Threading wire through crankcase

Bottom:  
Generator correctly positioned



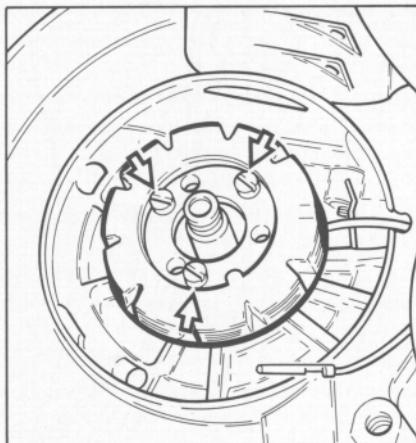
- Remove the generator mounting screws.

**Note:** The screws are secured with LOCTITE and may be difficult to remove.

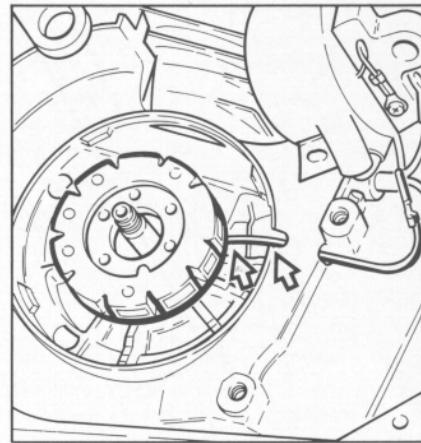
- Remove the generator and pull the connecting wire out of the crankcase.

- Inspect the generator and its poles. There should be no cracks or other signs of damage. If any damage is found, replace the generator.

- Inspect the magnet ring in the flywheel. There should be no cracks or any other signs of damage. If any damage is found, replace the flywheel.



- Remove the flywheel - see 5.1.7.
- Remove the ignition module mounting screws - see 5.1.6.2.
- Pull the terminal pin out of the socket.
- Use a small screwdriver to press the anchor hook of the terminal pin into the pin housing and pull the pin housing away.



- Thread the connecting wire through the crankcase opening.
- Fit the generator with its wire connection facing downward and then align so that the wire and the opening in the crankcase are next to one another.

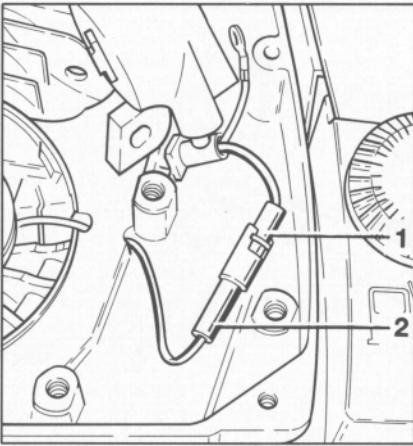
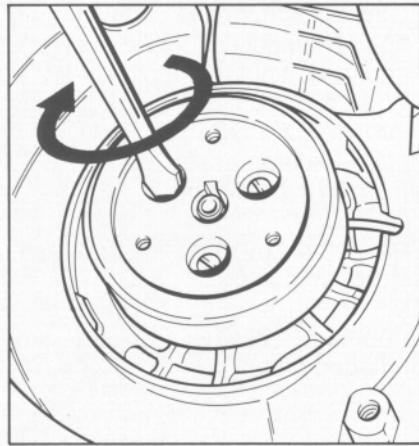
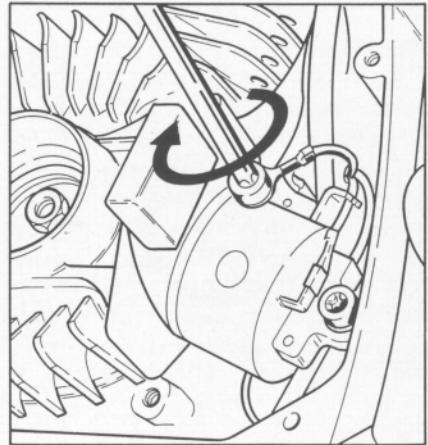
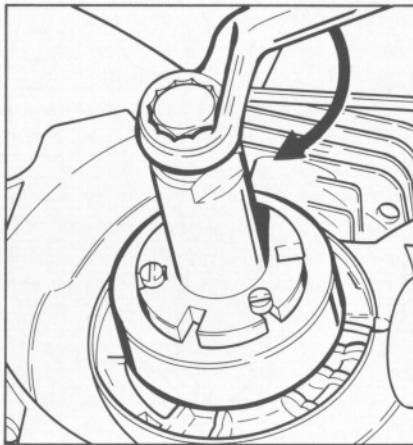
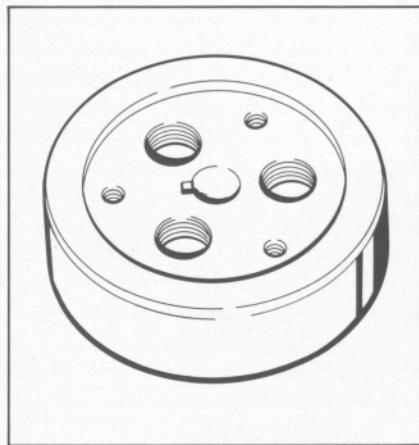
Top:  
Centering tool 1118 893 3500

Bottom:  
Tightening mounting screws

Top:  
Removing centering tool with  
puller 1107 893 4500

Bottom:  
1 = Socket  
2 = Pin terminal

Tightening ignition module mounting  
screws



- Coat threads of mounting screws with Loctite, see 12.2, fit them in the generator and tighten down temporarily.
- Fit the centering tool on the crankshaft so that its groove engages the Woodruff key.
- Finally tighten the three mounting screws to a torque load of 2 Nm (1.5 lbf.ft).

- Remove the centering tool. If necessary, use puller to remove the centering tool from the crankshaft.
- Push the pin housing onto the terminal pin until the anchor hook snaps into position.
- Push the pin housing into the socket housing.

- Install the flywheel - see 5.1.7.
- Coat threads of mounting screws with Loctite, see 12.2. Place ignition module in position and insert screws loosely at this stage.

**Important!** A washer must be fitted under each screw head.

**Note:** Secure ground wire with the upper screw.

- Slip the setting gauge between the arms of the ignition module and the flywheel magnet poles.
- Press the ignition module against the setting gauge. Tighten the mounting screws to 9 Nm (6.6 lbf.ft) and then withdraw the setting gauge.
- Refit the fan housing.

## 10. CHAIN LUBRICATION

### 10.1 Pickup Body

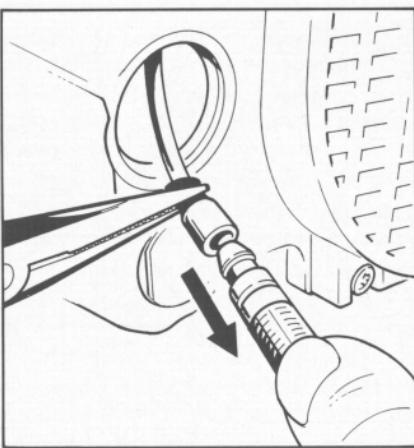
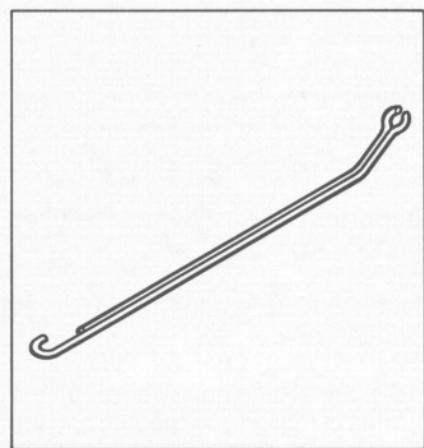
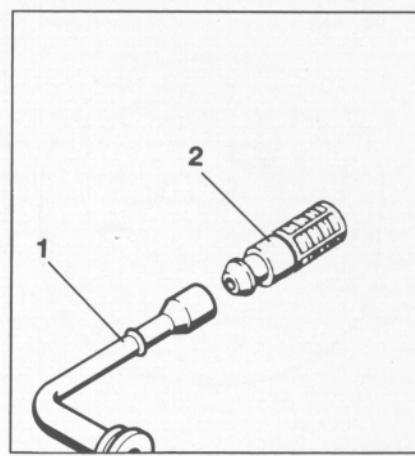
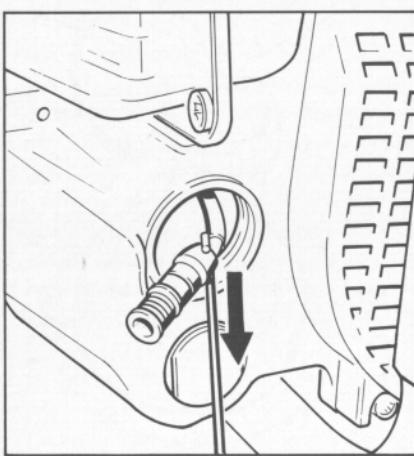
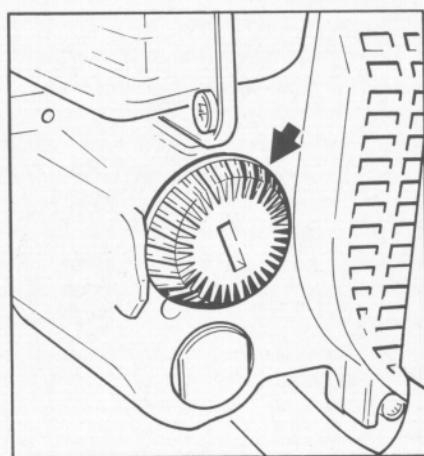
Top:  
Oil tank filler cap

Bottom:  
Assembly hook 5910 893 8800

Top:  
Withdrawing pickup body

Bottom:  
Pulling pickup body out of hose

1 = Hose  
2 = Pickup body



Impurities gradually clog the fine pores of the filter with tiny particles of dirt. This prevents the oil pump from supplying sufficient oil to the bar and chain. In the event of problems with the oil supply, first check the oil tank and the pickup body. Clean the oil tank if necessary.

- Remove the oil filler cap together with the cap retainer.
- Drain the oil tank.

- Use assembly hook to withdraw the pickup body from the oil tank.

**Note:** Do not stretch the oil hose too much when withdrawing the pickup body.

- Pull the pickup body out of the oil hose.

- Grip the strainer between thumb and forefinger, squeeze it slightly and work it out of the pickup body.
- Wash the strainer and pickup body in white spirit and, if possible, blow out with compressed air.
- Flush out the oil tank.

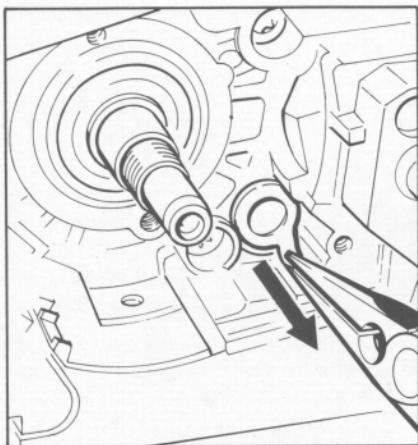
Reassemble by reversing the disassembly sequence.

**Important!** Always replace any damaged parts.

## 10.2 Suction Hose

Top:  
Withdrawing the suction hose

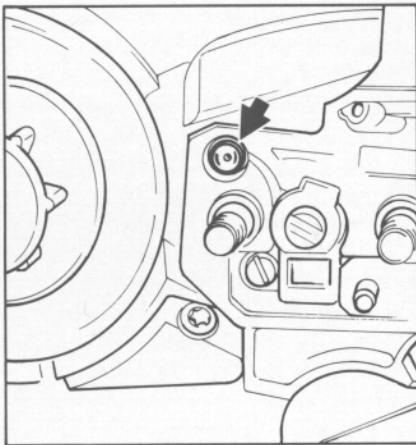
Bottom:  
Correct position of suction hose



## 10.3 Vent Valve

Top:  
Vent valve

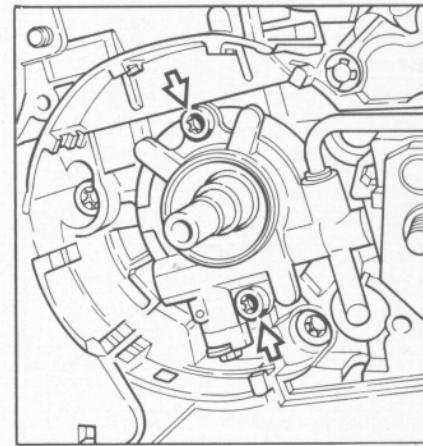
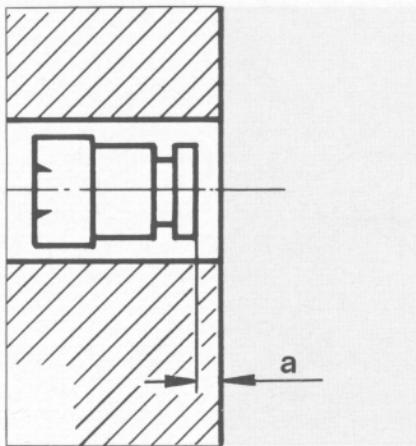
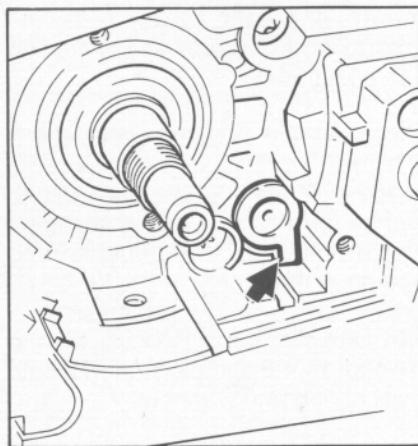
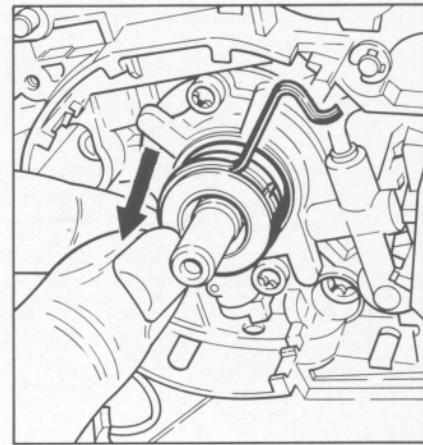
Bottom:  
Installed position of valve  
 $a = \text{approx. } 1 \text{ mm (} \frac{3}{64} \text{"})$



## 10.4 Removal and Installation of Oil Pump

Top:  
Removing worm with spring

Bottom:  
Oil pump mounting screws



- Pull off the pickup body - see 10.1.
- Remove the oil pump - see 10.4.
- Use pointed nose pliers to grip the tab of the oil hose and pull it out of the crankcase.
- Use a blunt tool to push the suction hose into the crankcase so that the tab locates it its seat at the bottom right.
- Fit the pickup body - see 10.1.
- Install the oil pump - see 10.4.

There is vent valve in the tank wall which keeps the internal pressure in the oil tank equal to atmospheric pressure.

- Remove the inner side plate.
- Drain the oil tank.
- Use a 7 mm (9/32") dia. drift to carefully drive the vent valve into the crankcase and then remove it from the oil tank.
- Carefully press in the new valve until it is about 1 mm (3/64") below the face of the crankcase.
- Refit the inner side plate.

- Remove the brake band - see 3.3.1.
- Remove the clutch - see 3.2.
- Rotate the worm and spring clockwise and pull them off the crank-shaft stub.
- Remove the oil pump mounting screws.

## 10.5 Servicing the Oil Pump

Top:  
Removing oil pump

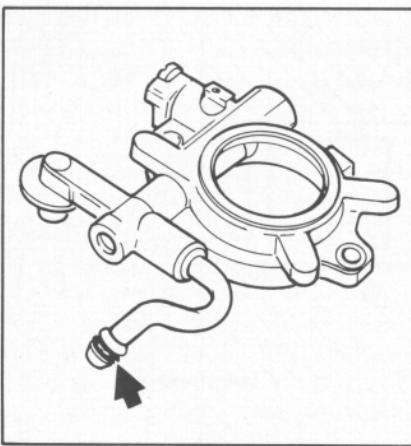
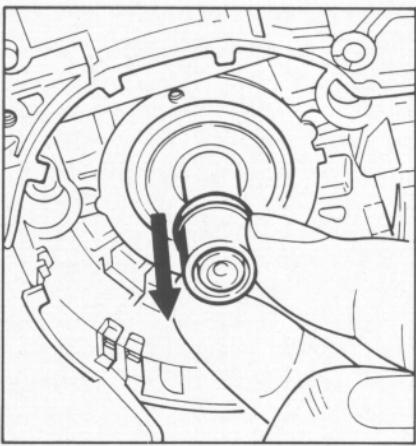
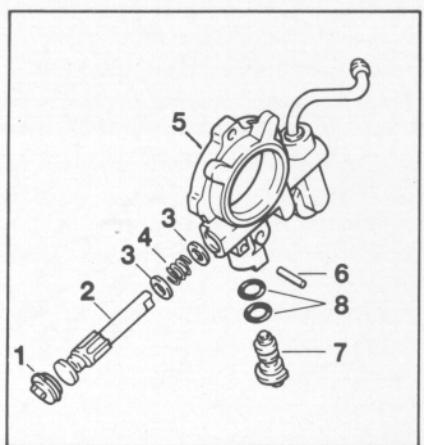
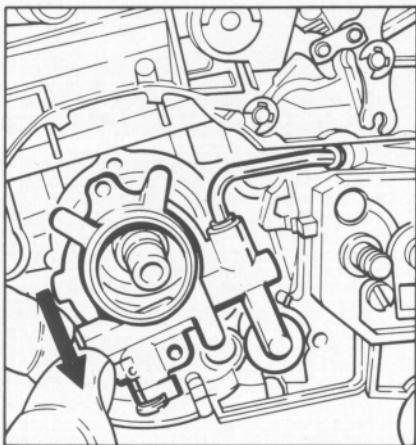
Bottom:  
Removing spacer bush

Top:  
Fitting O-ring in spacer bush

Bottom:  
O-ring in groove on oil delivery line

## Component parts of oil pump

- 1 = Plug
- 2 = Pump piston
- 3 = Washer
- 4 = Helical spring
- 5 = Pump housing
- 6 = Pin
- 7 = Adjusting screw
- 8 = O-ring



- Carefully pull oil pump out of its seat and lift away.

- Remove the spacer bush from the crankshaft stub and take the O-ring out of the bush.

Installation is a reversal of the removal sequence.

**Note:** Fit a new O-ring in the spacer bush and lubricate it with a few drops of oil.

- Fit a new O-ring in the groove on the oil pump delivery line. Coat the worm with grease, see 12.2. Tighten the oil pump mounting screws to 3.5 Nm (2.6 lbf.ft). Install worm with spring as far as stop (rotate counterclockwise).

Always check the suction hose and pickup body before disassembling the oil pump.

- Remove the oil pump - see 10.4.
- Use a 2 mm (5/64") dia. drift to drive out the pin. Pull the adjusting screw out of the housing and remove the O-rings.
- Pry the plug out of the housing and withdraw the pump piston with helical spring and washers.
- Wash all parts in white spirit. Inspect the parts for damage and replace as necessary.

Assembly is a reversal of the disassembly sequence.

**Note:** Always install new O-rings. Coat the pump piston and worm with grease, see 12.2, before installing.

## 11. FUEL SYSTEM

### 11.1 Air Filter

**Top:**  
Master Control lever in cold start position -choke shutter closed

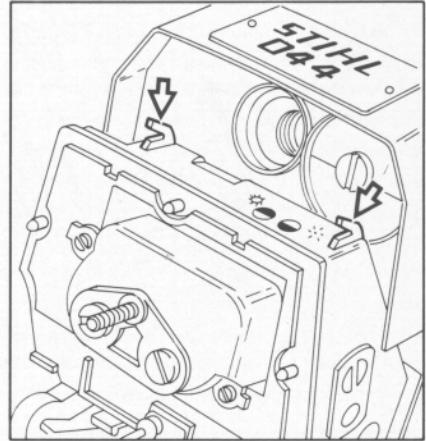
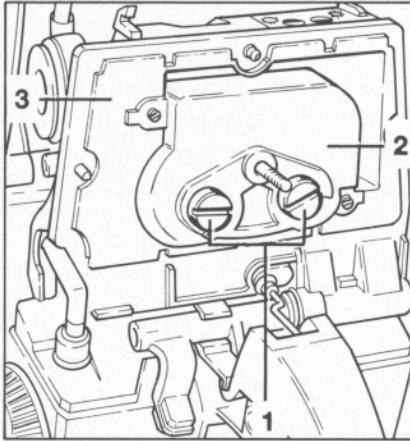
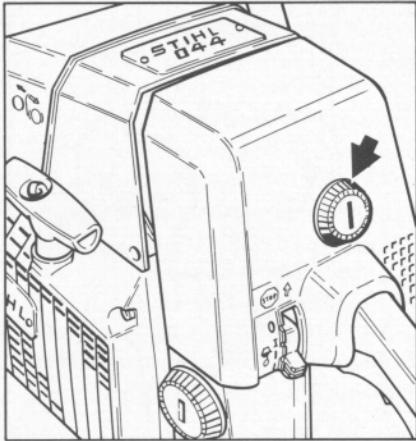
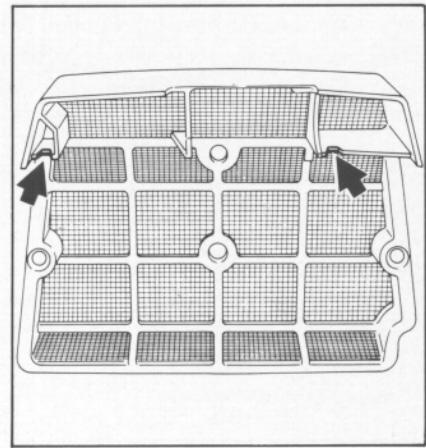
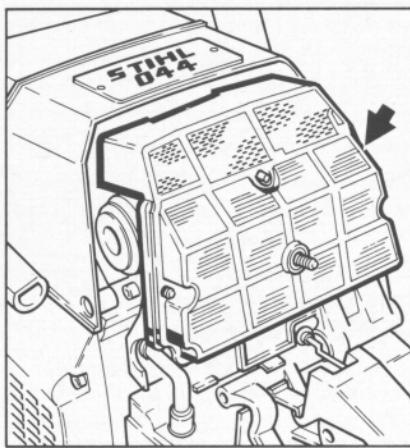
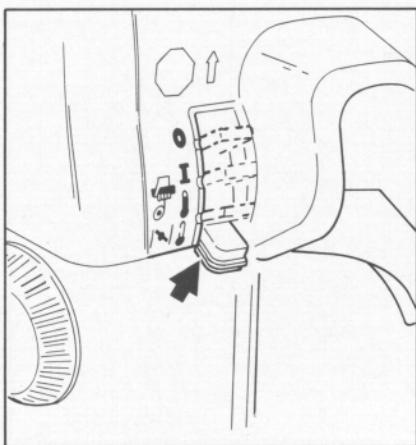
**Bottom:**  
Twist lock on carburetor box cover

**Top:**  
Outer filter element

**Bottom:**  
1 = Slotted nuts  
2 = Baffle  
3 = Inner filter element

**Top:**  
Ledges on outer filter element

**Bottom:**  
Retaining lugs on carburetor box



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 to prevent dirt falling into the carburetor.
- Take off the carburetor box cover.
- Pull off the outer filter element.
- Remove the slotted nuts and pull away the baffle and inner filter element.
- Thoroughly wash the two elements in a fresh, non-inflammable cleaning solution (e.g. warm soapy water). Carefully shake dry. Encrusted dirt should be softened by immersing the filter in the cleaning solution.

**Note:** If the filter fabric is damaged, replace the part concerned immediately.

Installation is a reversal of the removal sequence.

**Note:** When installing the outer filter element make sure that the integrally molded ledges on the element engage under the retaining lugs on the carburetor box.

## 11.2 Removal and Installation of Carburetor

**Top:**  
Pushing out lateral grommet

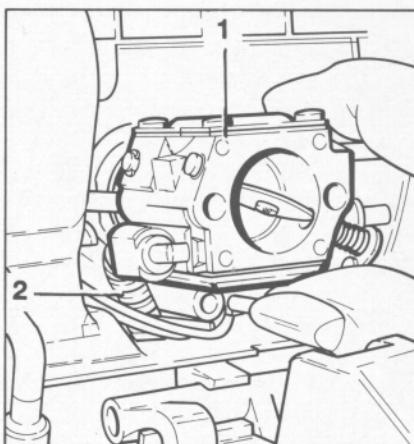
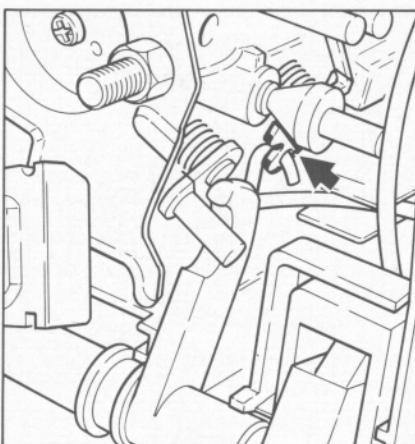
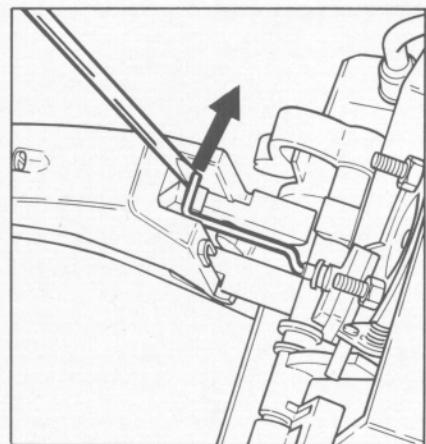
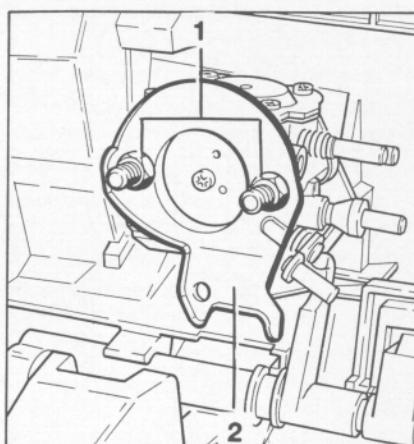
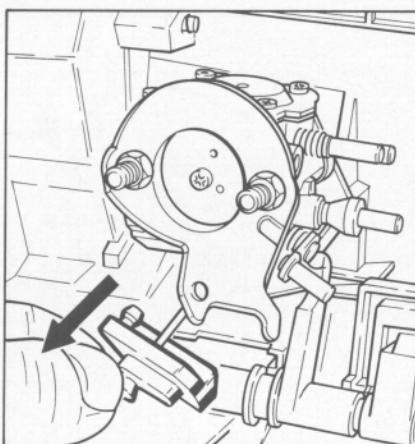
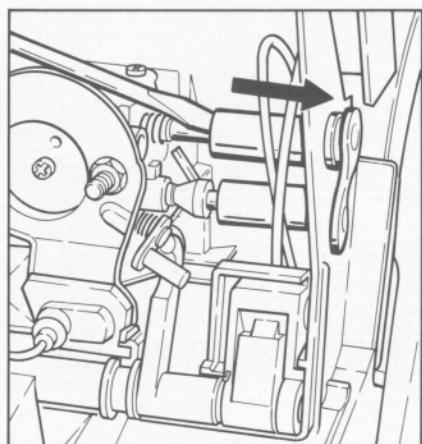
**Bottom:**  
Detaching throttle rod

**Top:**  
Removing front grommet

**Bottom:**  
Throttle rod in throttle shaft

**Top:**  
1 = Mounting nuts  
2 = Baffle

**Bottom:**  
1 = Carburetor  
2 = Fuel hose



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.

Troubleshooting chart - see 2.6.

- Remove the air filter - see 11.1.
- Push the lateral grommet off the adjusting screws and out of the carburetor box.
- Pry the throttle rod out of the throttle trigger.
- Pull the front grommet out of the baffle.
- Detach throttle rod from the throttle shaft and pull it out.
- Unscrew the carburetor mounting nuts.
- Pull the baffle off the studs.
- Pull the carburetor off the studs and remove the fuel hose from the elbow connector at the same time.

Installation is a reversal of the removal sequence.

### 11.3 Leakage Testing the Carburetor

Top  
1 = Washer  
2 = Sleeve

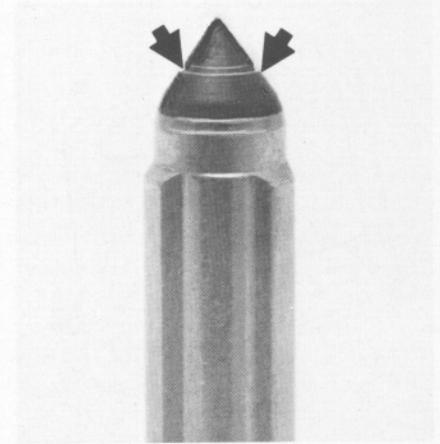
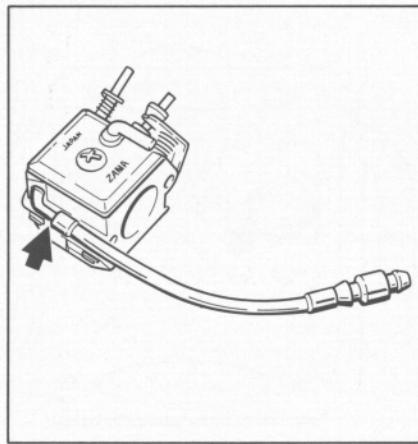
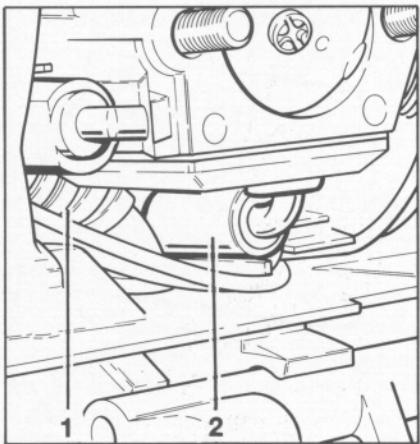
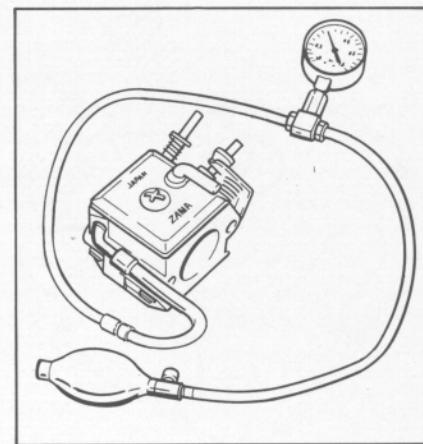
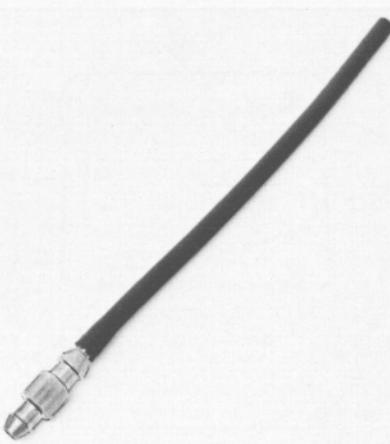
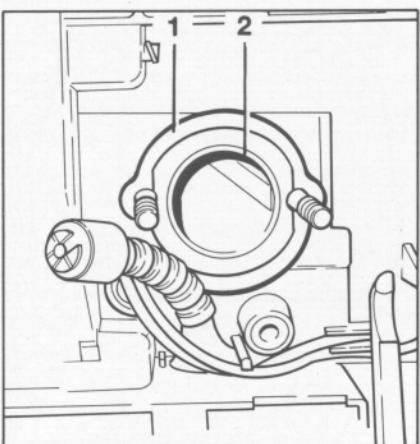
Bottom:  
1 = Fuel hose  
2 = Impulse hose

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

Bottom:  
Fuel line fitted on elbow connector

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

Bottom:  
Damaged inlet needle



**Note:** Before fitting the carburetor on the studs, check that the sleeve (in manifold) and washer are in position and push the fuel hose onto the elbow connector.

After fitting the carburetor, check that the elbow connector is properly positioned in the impulse hose.

- Tighten down the mounting nuts to a torque of 3.5 Nm (2.6 lbf.ft).

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

- Remove the carburetor - see 11.2.
- 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. 0.4 bar (5.7 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.

## 11.4 Servicing the Carburetor

Top:  
Fuel pump end cover fastening screw

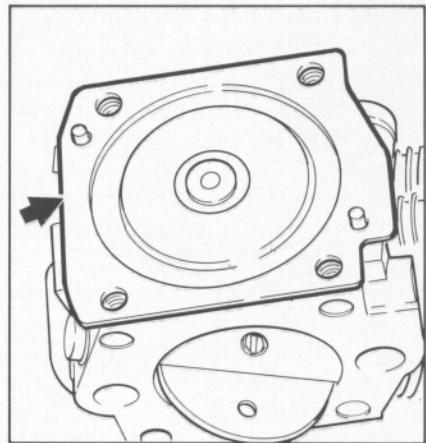
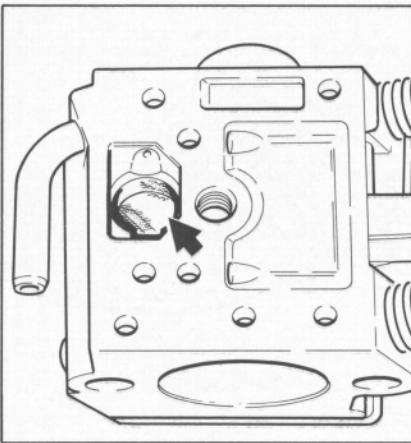
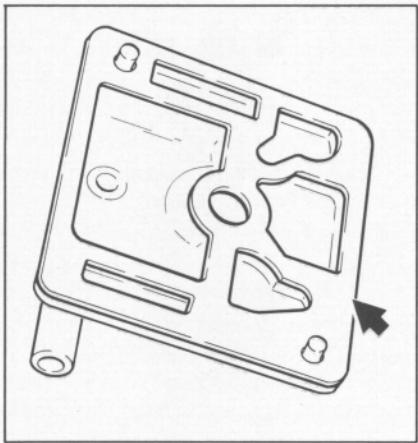
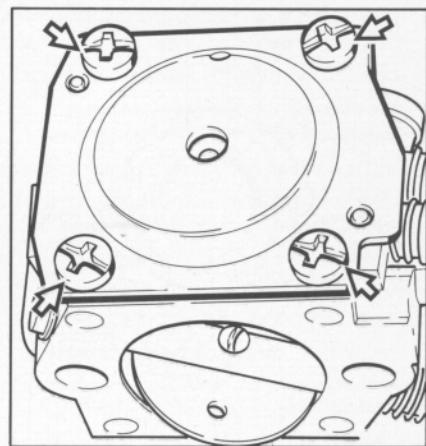
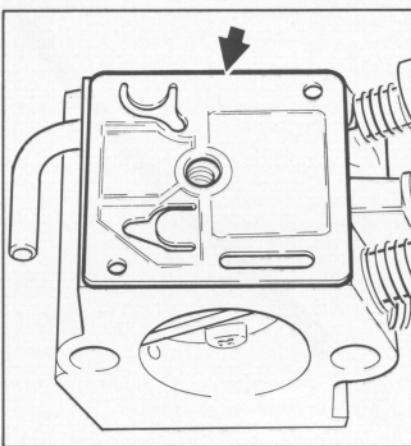
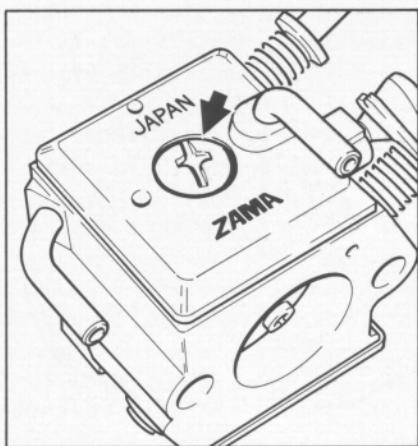
Bottom:  
Fuel pump end cover with gasket

Top:  
Pump diaphragm on carburetor body

Bottom:  
Fuel strainer in carburetor body

Top:  
Fastening screws of metering diaphragm end cover

Bottom:  
Metering diaphragm and gasket on carburetor



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

- Remove the carburetor - see 11.2.
- Unscrew the fuel pump end cover and 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 scribe to pry it out and then clean it.

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

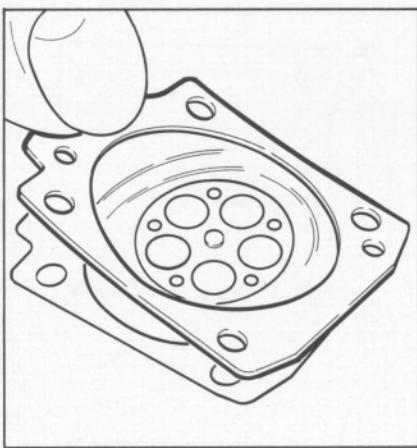
In such a case the fuel pickup head should also be inspected and replaced if necessary - see 11.7.

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

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

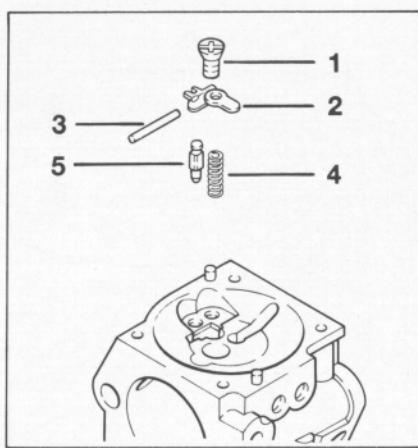
Top:  
Separating gasket and diaphragm

Bottom:  
Retaining screw on inlet control  
lever spindle



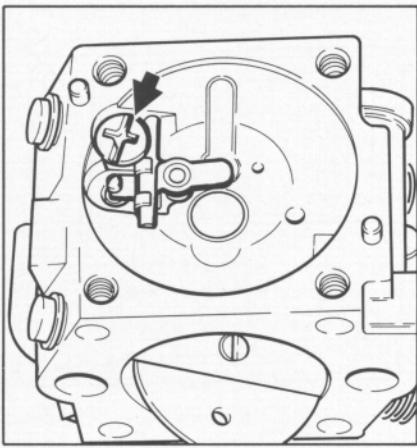
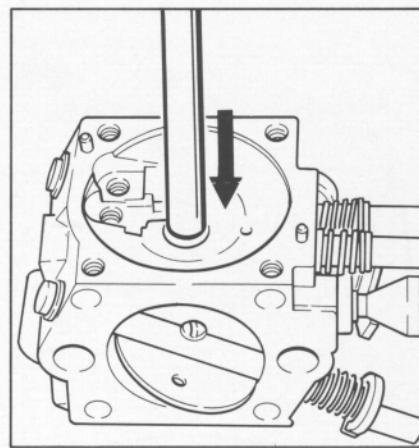
Top:  
1 = Round head screw  
2 = Inlet control lever  
3 = Spindle  
4 = Helical spring  
5 = Inlet needle

Bottom:  
Damaged inlet needle



Top:  
Pressing out valve jet

Bottom:  
Carburetor adjusting screws

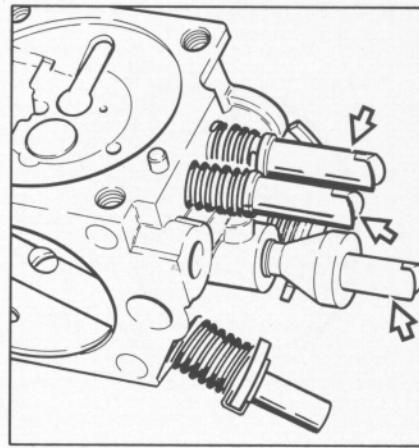


- Carefully separate the diaphragm and gasket.

**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.

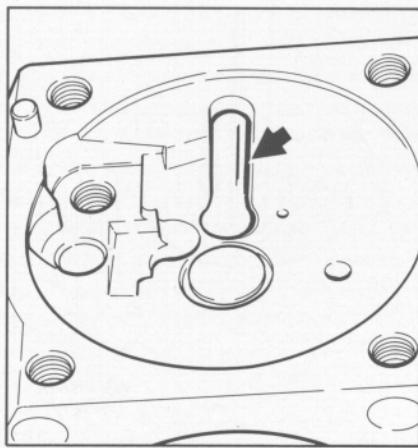
- Remove the inlet control lever with spindle, helical spring and inlet needle. If there is an annular indentation on the sealing cone of the inlet needle, it will be necessary to replace the inlet needle because it will no longer seal properly. This is indicated by constant flooding of the carburetor even though the needle is clean.



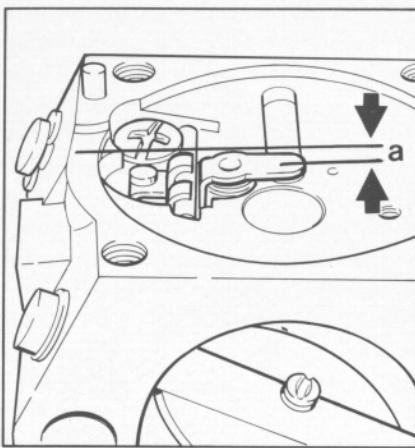
- Use a 5 mm (approx. 3/16") dia. drift to press the valve jet out of its seat in the direction of the venturi and wash it in white spirit.
- Remove the carburetor adjusting screws.

Top:  
Sealing plug

Bottom:  
Valve jet in position - lower edge of  
jet flush with venturi wall

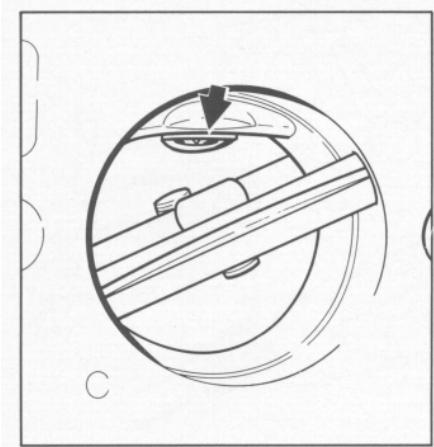
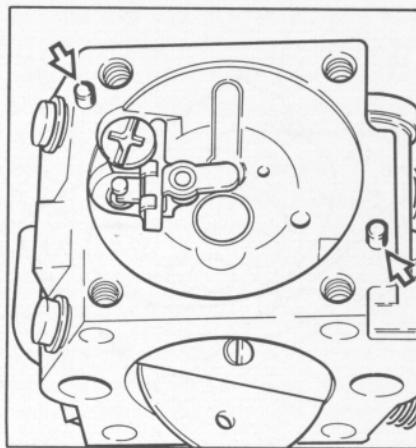


Correct position of inlet control lever  
"a" = approx. 0.8 mm (1/32")



Top:  
Locating pegs on body

Bottom:  
Locating pegs on cover



- 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.

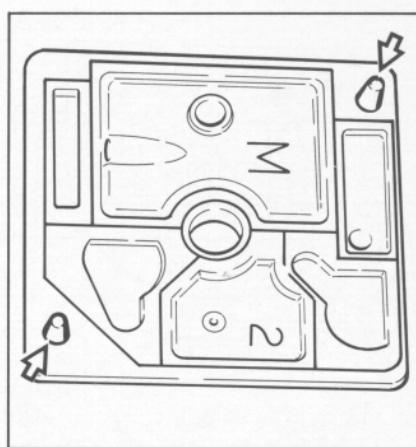
Wash the carburetor body and all serviceable parts in fresh white spirit and blow clear with compressed air, paying special attention to the bores and ports.

- When inserting the valve jet, make sure that it is exactly vertical in the bore. The lower edge of the valve jet must be flush with 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.

**Important!** The distance between the upper edge of the inlet control lever and the metering diaphragm seating face must be approx. 0.8 mm (1/32"). If necessary, use suitable pliers to carefully bend the lever.

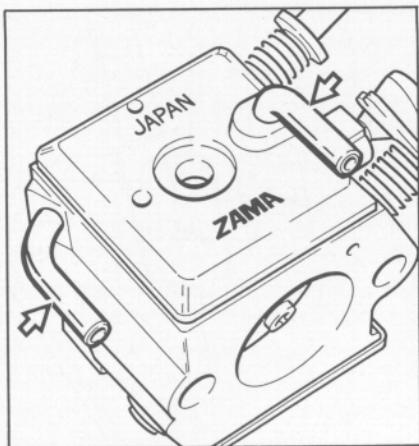


- Fit the gasket, metering diaphragm and end cover. The metering diaphragm and gasket are held in position by the integrally cast pegs on the body.

- 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.

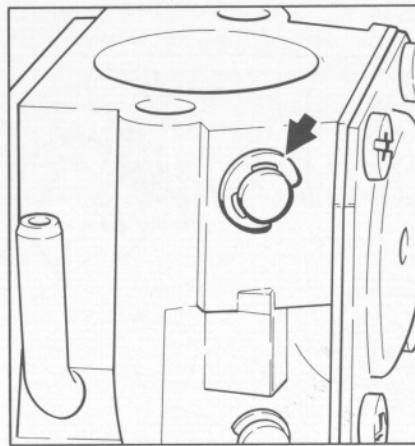
Top:  
Elbow connectors

Bottom:  
Throttle shutter fastening screw



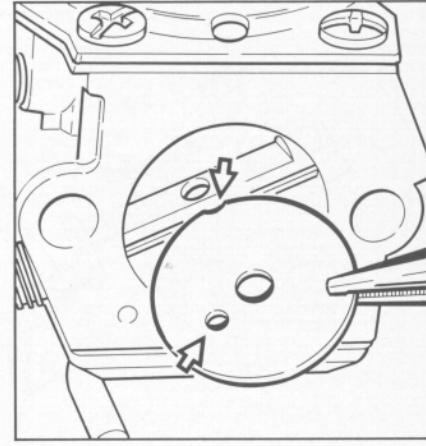
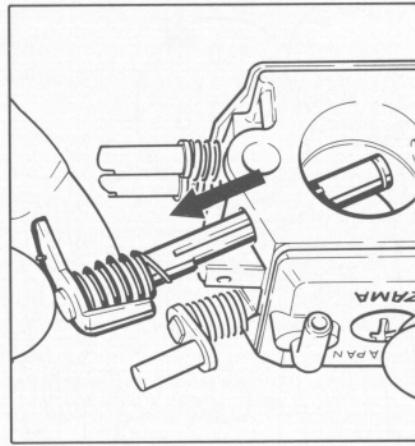
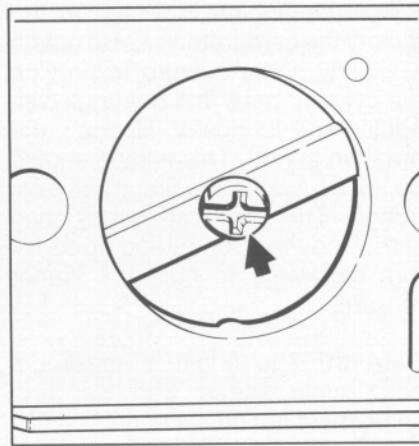
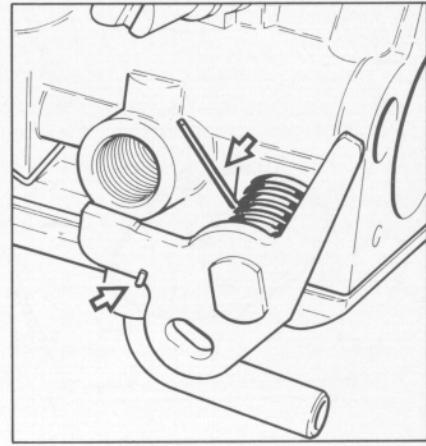
Top:  
E-clip

Bottom:  
Withdrawing throttle shaft



Top:  
Correctly positioned torsion spring

Bottom:  
Fitting the throttle shutter



**Note:** Fit end cover so that both the elbow connectors point in the same direction.

- Refit the carburetor adjusting screws.
- Carry out leakage test, see 11.3, before installing the carburetor.

#### To remove the throttle shaft:

- Remove the throttle shutter fastening screw.

- Use suitable pliers to pull the throttle shutter out of the throttle shaft.

- Take out the idle speed adjusting screw.

- Pry the E-clip off the throttle shaft.

- Withdraw the throttle shaft from the carburetor.

- Remove the torsion spring.

- Slide the throttle shaft into the carburetor and check that the torsion spring is correctly positioned.

- Fit the throttle shutter. Round notch must be forward and the small bore must face the throttle lever.

- Coat fastening screw with Loctite, see 12.2, and tighten down securely.

- Refit the idle speed adjusting screw.

## 11.5 Carburetor Adjustment

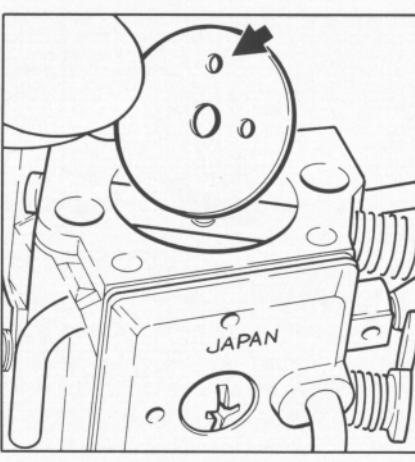
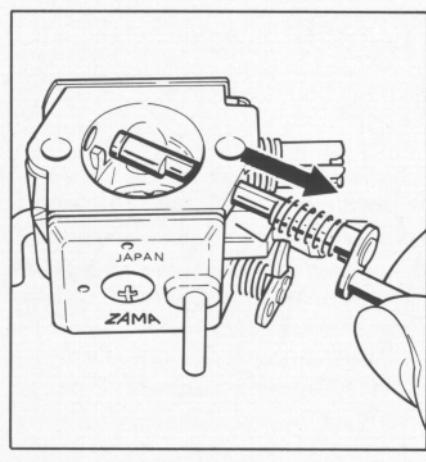
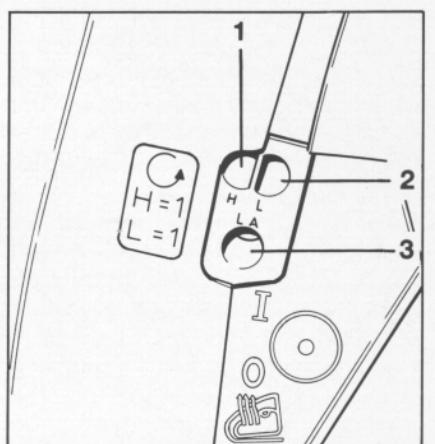
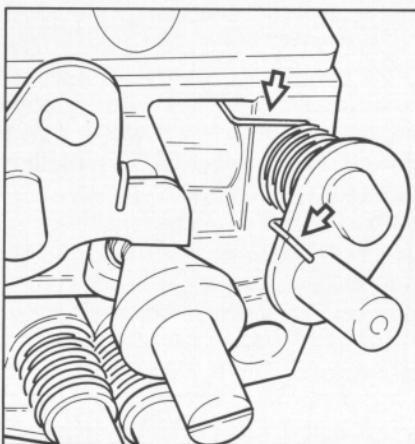
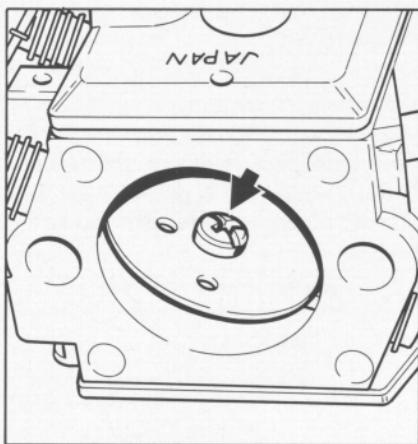
Top:  
Choke shutter fastening screw

Bottom:  
Withdrawing choke shaft

Top:  
Correctly positioned torsion spring

Bottom:  
Fitting the choke shutter

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

**To remove the choke shaft:**

- Remove the choke shutter fastening screw.
- Pry the E-clip off the choke shaft and withdraw the shaft from the carburetor.
- Remove the torsion spring.

- Slide the choke shaft into the carburetor and check that the torsion spring is correctly positioned.

Fit the choke shutter so that the outer hole faces upward (see arrow).

- Coat fastening screw with Loctite, see 12.2, and tighten down securely.
- Install the carburetor - see 11.2.

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 1/4 turn clockwise to obtain a leaner mixture.

**Caution!** The engine's maximum permissible speed with bar and chain must not be exceeded.

If the saw 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), the maximum permissible engine speed will be exceeded. This can result in damage to the engine being caused by a lack of lubricant and overheating.

Corrections to the high speed adjusting screw may only be carried out if the maximum permissible engine speed of 14,000 rpm (with bar and properly tensioned chain) can be checked with an accurate tachometer.

**Saws with catalytic converter:**  
Corrections may be carried out only if the engine speed at full throttle **does not fall below** a minimum of 13,000 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

The saw must be run with the basic carburetor setting ( $H = 1$ ,  $L = 1$ ) if an accurate tachometer is not available for checking the engine's maximum speed.

#### Notes for adjustment of idle speed

##### Engine stops while idling

- Turn idle speed adjusting screw clockwise until the chain begins to run.
- Then turn it back one quarter turn.

##### Chain runs while engine is idling

- Turn the idle speed adjusting screw counterclockwise until the chain stops running
- Then turn it about another quarter turn in the same direction.

#### 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

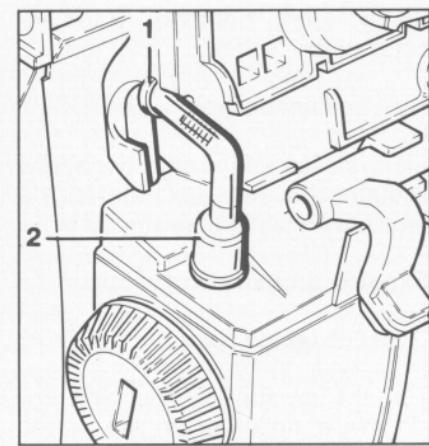
- Idle setting too rich.
- Turn the low speed adjusting screw clockwise until the engine speed drops.
- Turn screw back one quarter turn.
- Check that the engine accelerates smoothly when the throttle is opened.

**Note:** A correction at the low speed adjusting screw usually necessitates a change in the setting of the idle speed adjusting screw.

Specified engine idle speed:  
2,700 rpm  $\pm$  100 rpm

## 11.6 Tank Vent

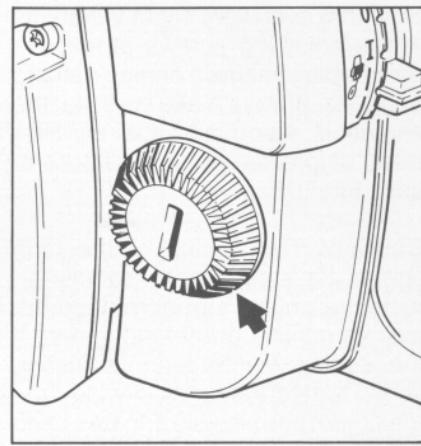
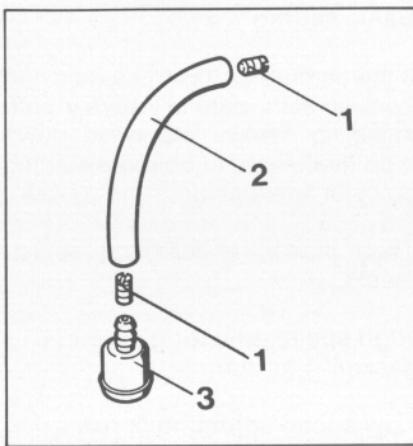
1 = Retainer  
2 = Vent connector



Top:  
1 = Grub screw  
2 = Vent hose  
3 = Vent connector

Bottom:  
Correctly positioned grub screws  
a = approx. 16 mm (5/8")

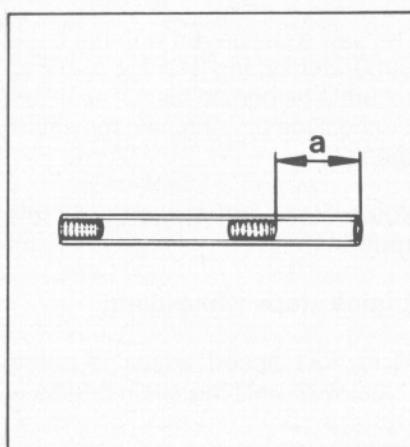
Fuel filler cap



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.

- Remove the air filter - see 11.1.
- Remove the vent connector from the stub on the tank housing.
- Pull the tank vent out of the retainer.



- Pull the vent hose off the vent connector.
  - Use a 3 mm (1/8") dia. drift to push the grub screws out of the hose.
  - Wash all parts in fresh white spirit and blow out with compressed air.
- Install the tank vent by reversing the disassembly sequence.

**Note:** Use a drift to position the grub screws as shown in the drawing.

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 saw vigorously.
- Open the tank again and drain it.

Top:  
Assembly hook 5910 893 8800

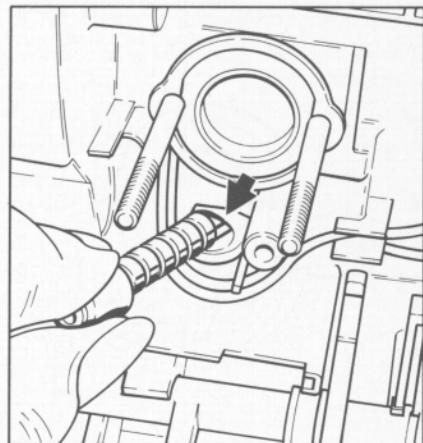
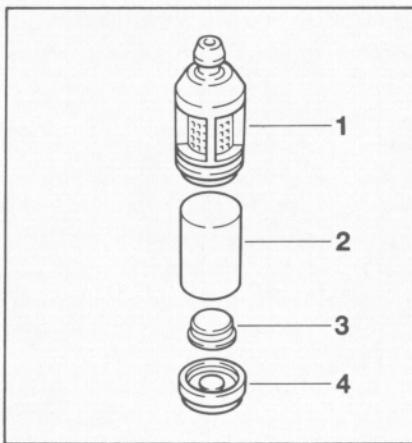
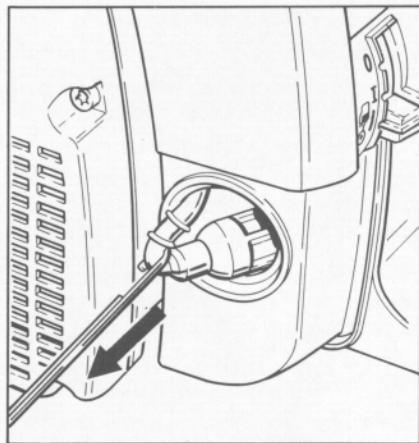
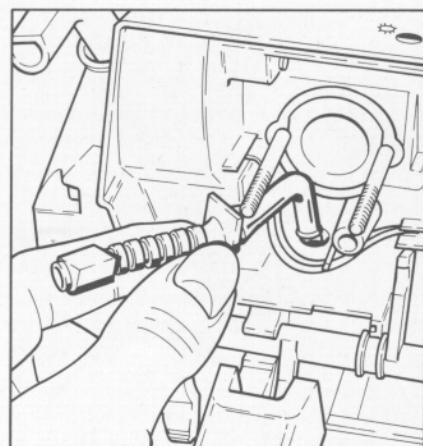
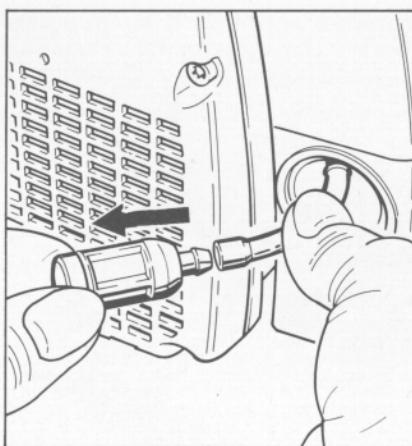
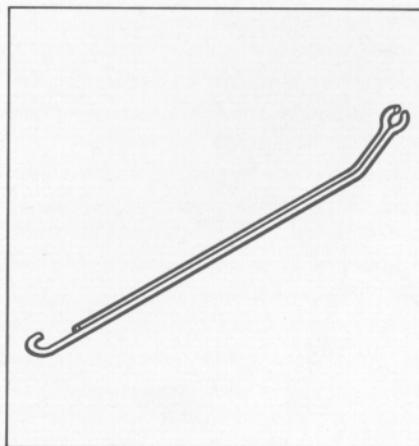
Bottom:  
Withdrawing the pickup body

Top:  
Removing pickup body

Bottom:  
1 = Pickup body  
2 = Filter  
3 = Weight  
4 = Cap

Top:  
Removing the intake hose

Bottom:  
Hose flange correctly positioned  
in tank housing



#### To remove and install the pickup body:

- Use the assembly hook to pull the pickup body out through the filler opening.
- Note:** Do not stretch the intake hose too much while pulling out the pickup body.
- Pull the pickup body off the fuel hose.
- Remove cap from pickup body and take out the weight.
- Take the filter out of the pickup body.

**Caution!** The fine mesh strainer on the pickup body must not be damaged. It may be washed in white spirit.

**Note:** It is not advisable to clean the filter - always fit a new one.  
Install by reversing the removal sequence.

**Important!** The foam filter must be fitted without being creased or twisted in any way.

#### To remove the intake hose:

- Remove the carburetor - see 11.2.
- Pull the pickup body off the intake hose.
- Pull the intake hose out of the tank housing.
- Note:** Coat the hose flange with a little oil to simplify installation. The straight face of the flange must locate against the tank housing.

## 11.8 Tank Housing

### 11.8.1 Removal and Installation

**Top:**  
Front handle mounting screws  
on side of tank housing

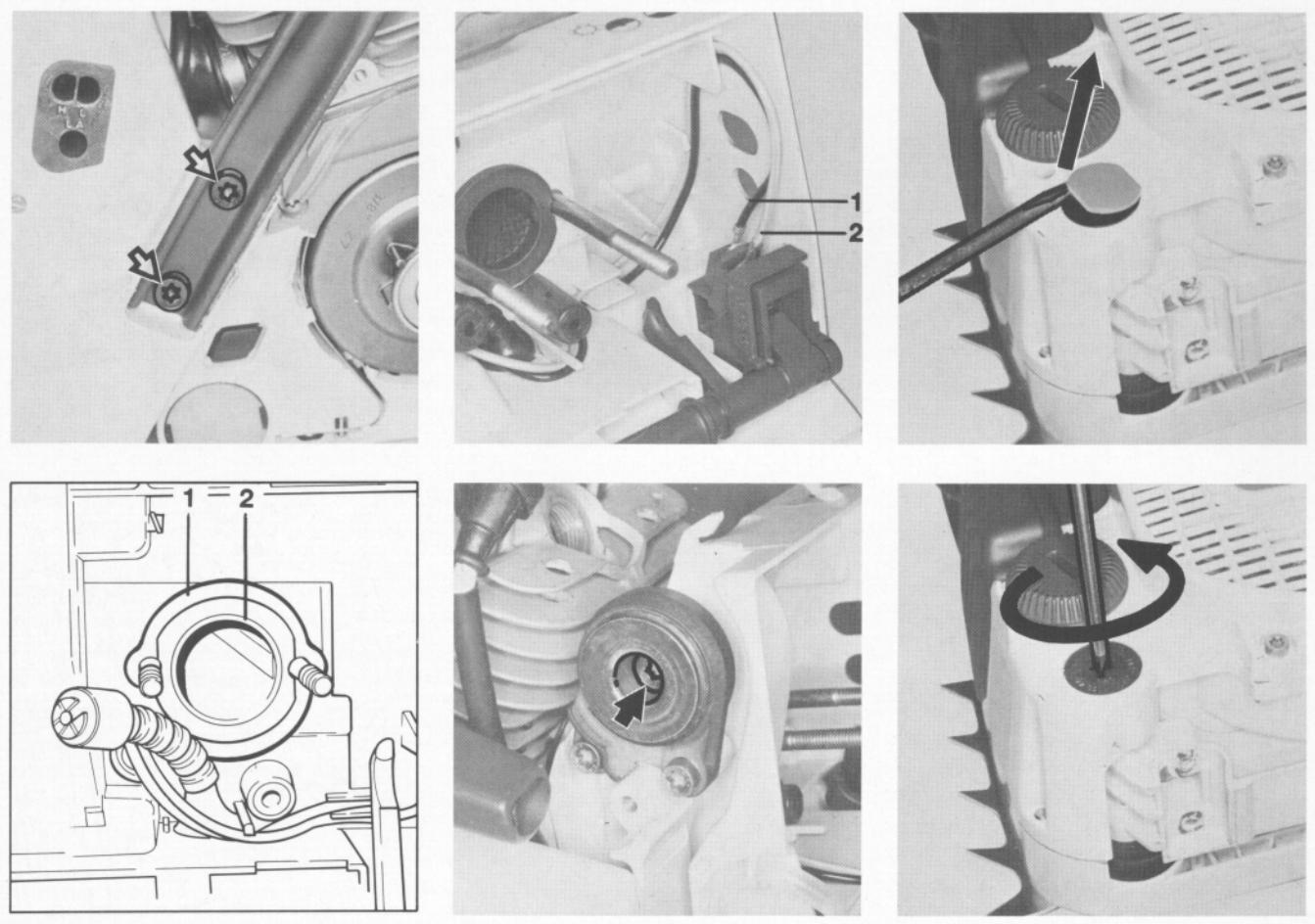
**Bottom:**  
1 = Washer  
2 = Sleeve

**Top:**  
1 = Short circuit wire  
2 = Ground wire

**Bottom:**  
Center mounting screw in upper  
annular buffer

**Top:**  
Prying out plug

**Bottom:**  
Removing mounting screw



- Drain the tank housing.
- Remove the shroud - see 4.3.
- Remove mounting screws at side and underside of front handle. Lift away the handle.

- Disconnect spade terminals from contact springs of short circuit and ground wires.
- Remove center mounting screw from upper annular buffer.

- Pry the plug out of the annular buffer at the ignition side.
- Remove the mounting screw from the annular buffer.

**Note:** To remove front handle on machines with handle heating see 9.4.

- Remove the carburetor - see 11.2.
- Pull the washer off the studs and remove the sleeve from the manifold.

Top:  
Inner side plate mounting screw

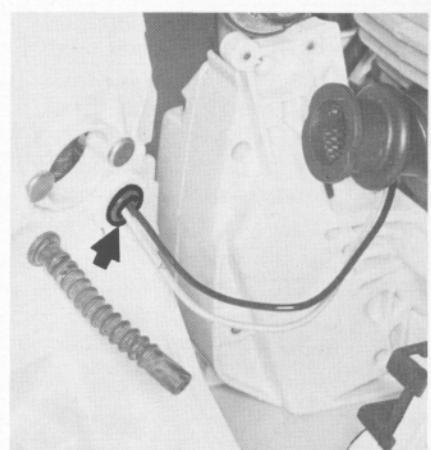
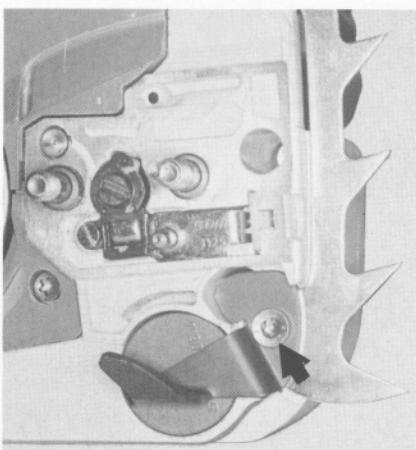
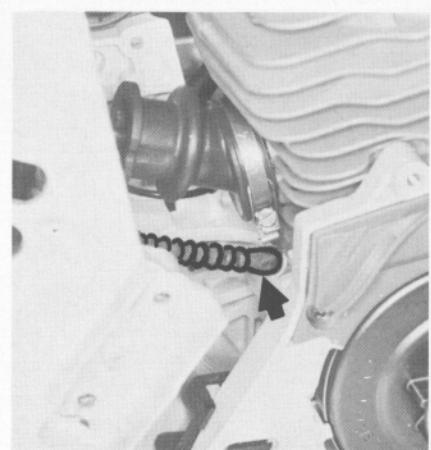
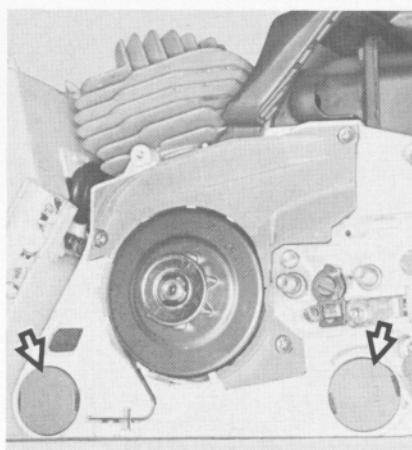
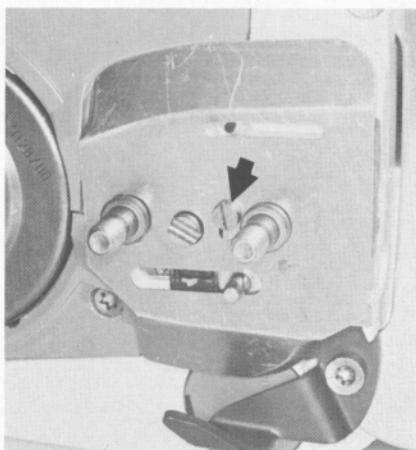
Bottom:  
Chain catcher mounting screw

Top:  
Plug in annular buffer at starter side

Bottom:  
Pushing out the manifold flange

Top:  
Impulse hose

Bottom:  
Grommet in tank housing



- Remove the chain sprocket cover.
- Take out the inner side plate mounting screw and remove the side plate.
- Take out the chain catcher mounting screw and remove the chain catcher.

- Pry the plugs out of the annular buffers at the starter side.
- Remove the annular buffer mounting screws.
- Pull the tank housing forward and push the manifold flange out of the tank housing intake opening at the same time.

- Pull the impulse hose off the nipple.
- Swing the tank housing to one side, push the grommet out of the housing and pull out the short circuit and ground wires.

Assembly is a reversal of the disassembly sequence.

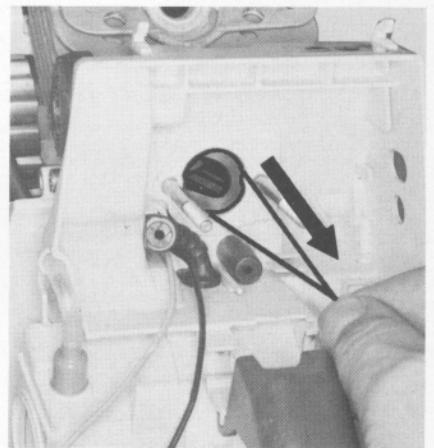
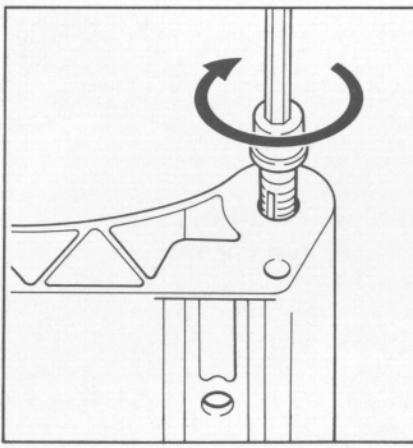
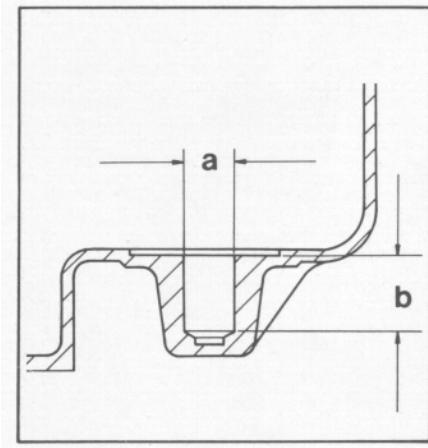
Bore size  
 a = 8.5 mm dia.  
 b = 15 mm (approx. 9/16")

Top:  
 Installing thread insert 9799 543 0900

Bottom:  
 Correct position of string for installing  
 manifold in tank housing

Top:  
 Pulling manifold into tank housing  
 intake opening

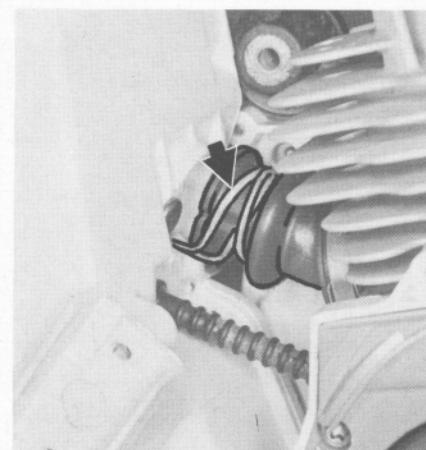
Bottom:  
 Retainers



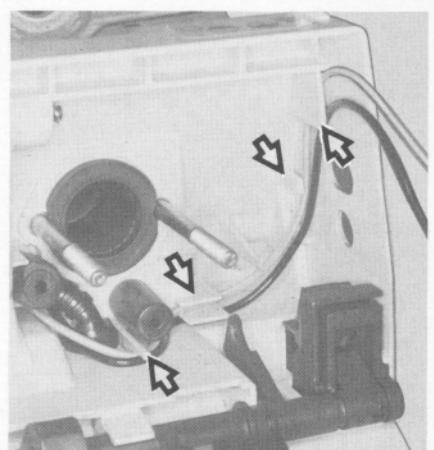
**Note:** If a screw thread is stripped in one of the mounting holes for special self cutting screws, the tank housing can be repaired by installing a thread insert. The stripped thread must be drilled out to a diameter of 8.5 mm and a depth of 15 mm.

**Important!** Do not exceed the specified hole depth of 15 mm.

- Fit M6 x 10 screw with washer in the thread insert.



- Screw the thread insert into the tank housing. An M6 x 18 pan head screw must then be used in place of the special self cutting screw.
- To install the manifold flange in the tank housing's intake opening, wind a piece of string (approx. 15 cm/6" long) around the back of the manifold flange and thread the ends of the string through the intake opening.



- Press the tank housing against the manifold and pull the ends of the string outward at the same time.

This procedure enables the manifold flange to be fitted in the intake opening without being damaged.

- Make sure the short circuit and ground wires are securely positioned under the retainers.

**12. Special Servicing Tools and Aids**  
**12.1 Special Servicing Tools**

No	Part Name	Part No.	Application
1	Locking strip	0000 893 5901	Blocking crankshaft
2	Press sleeve	1118 893 2401	Fitting oil seal (output side)
3	Press sleeve	1128 890 3900	Fitting oil seal (ignition side)
4	Puller	0000 890 4400	Removing oil seals
5	- Jaws (No. 3.1 + 4)	0000 893 3706	(output side only)
6	- Jaws (No. 6)	0000 893 3711	(ignition side only)
7	Puller	1110 890 4500	Removing flywheel
8	Crimping tool	5910 890 8210	Attaching connectors to electric wires
9	Assembly drift	1110 893 4700	Fitting piston pin
10	Clamping strap	0000 893 2600	Compressing piston rings
11	Wooden assembly block	1108 893 4800	Fitting piston
12	Carburetor and crankcase tester	1106 850 2905	Testing carburetor and crankcase for leaks
13	Vacuum pump	0000 850 3500	Testing crankcase for leaks
14	Sealing plate	0000 855 8105	Sealing exhaust port for leakage test
15	Test flange	1128 850 4200	For leakage test
16	Setting gauge	1111 890 6400	Setting air gap between ignition module and flywheel
17	Socket, 13 mm	5910 893 5608	Crankshaft nut
18	Socket, 19 mm	5910 893 5612	
19	Torque wrench	5910 890 0300	
20	Torque wrench	5910 890 0310	
21	Screwdriver bit I-5x150	0812 542 2104	For spline screws
22	Assembly hook	5910 893 8800	Removing pickup bodies
23	Installing tool	5910 890 2210	Fitting hookless snap rings in piston
24	Press arbor	1120 893 7200	Removing crankshaft bearing at ignition side
25	Press arbor	1118 893 7200	Installing crankshaft bearings
26	Assembly hook	5910 890 2800	Detaching springs from clutch shoes
27	Installing tool	0000 890 2201	Flaring rope guide bush
28	Assembly tube	1117 890 0900	Attaching the brake spring
29	Centering tool	1118 893 3500	Centering heating generator
30	Service tool AS	5910 007 2205	Removing crankshaft (output side)
31	Service tool ZS	5910 007 2220	Removing crankshaft (ignition side)
32	T-handle screwdriver QI-5 x 150	5910 890 2400	For all IS screws
33	Stud puller MS	5910 893 0501	Removing bar mounting studs
34	Puller	1107 890 4500	Removing generator centering tool

## 12.2 Servicing Aids

No.	Part Name	Part No.	Application
1	Lubricating grease	0781 120 1111	Oil seals, oil pump drive, chain sprocket bearing
2	Medium-strength threadlocking fluid (Loctite 242)	0786 111 1101	Securing screws, see 1.6. Ignition module mounting screws
3	High-strength threadlocking fluid (Loctite 270)	0786 111 1109	Securing screws, see 1.6. Fastening screws on choke and throttle shutters
4	High-strength threadlocking (Loctite 648)	0786 111 1117	Securing screws, see 1.6.
5	I Standard commercial, solventbased degreasant containing no CFCs		Cleaning crankshaft stub
6	Sealant	0783 810 1101	Manifold, crankcase gasket
7	STIHL low temperature lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring in starter
8	Ignition lead HTR, 10 m (33")	0000 930 2251	