

Service Manual 020 T Chain Saws

This manual contains detailed descriptions of all repair and servicing procedures for 020 T chain saws.

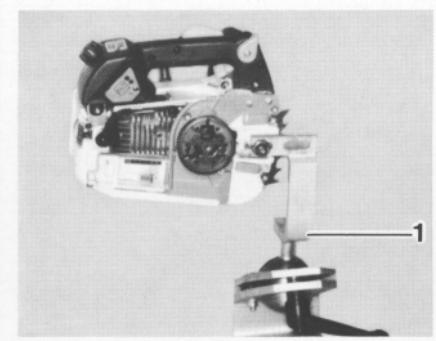
You should make use of the illustrated parts list while carrying out repair work. It shows the installed positions of the individual components and assemblies. Microfilmed parts lists are always more up to date than printed lists.

A fault on the machine may have several causes. Consult the "Troubleshooting Charts" when tracing faults.

Refer to the "Technical Information" bulletins for engineering changes which have been introduced since publication of this service manual. Technical information bulletins also supplement the parts list until a revised edition is issued.

The special servicing tools mentioned in the descriptions are listed in the last chapter of this manual. Use the part numbers to identify the tools in the "STIHL Special Tools" manual. The manual lists all special servicing tools currently available from STIHL.

Service manuals and all technical information bulletins describing engineering changes are intended exclusively for the use of STIHL servicing dealers. They must not be passed to third parties.



Always use original STIHL replacement parts.

They can be identified by the STIHL part number, the **STIHL** logo

and the STIHL parts symbol

The symbol may appear alone on small parts.

Servicing and repairs are made considerably easier if the machine is mounted on the assembly stand (1). This enables the machine to be swivelled to the best position for the ongoing repair and leaves both hands free.

The machine is secured to the stand by means of the guide bar mounting nut (after removing the sprocket cover).

STIHL[®]

© 1999, Andreas Stihl AG & Co., Waiblingen

CONTENTS

1.	Specifications	3	5.	Ignition System	29	10.	Fuel System	47
1.1	Engine	3	5.1	Spark Plug	29	10.1	Air Filter	47
1.2	Fuel System	3	5.2	Spark Plug Terminal	31	10.2	Carburetor	47
1.3	Ignition System	4	5.3	Ignition Lead	31	10.2.1	Removing and Installing	47
1.4	Cutting Attachment	4	5.4	Ignition Module	32	10.2.2	Leakage Testing	48
1.5	Special Accessories	4	5.4.1	Ignition Timing	32	10.2.3	Servicing	48
1.5.1	For User	4	5.4.2	Removing and Installing	33	10.3	Carburetor Adjustment	53
1.5.2	For Service	4	5.5	Flywheel	33	10.4	Pickup Body/ Fuel Hose	54
1.6	Tightening Torques	5	5.6	Ground Wire/ Short Circuit Wire	34	10.5	Tank Vent	55
2.	Troubleshooting Charts	6	6.	Rewind Starter	35	10.6	Tank Housing	55
2.1	Clutch, Chain Drive, Chain Brake and Chain Tensioner	6	6.1	Routine Maintenance	35	11.	Special Servicing Tools and Aids	57
2.2	Engine	7	6.2	Rope Rotor	35	11.1	Special Servicing Tools	57
2.3	Ignition System	8	6.3	Replacing the Starter Rope	36	11.2	Servicing Aids	58
2.4	Rewind Starter	9	6.4	Replacing the Rewind Spring	36			
2.5	Chain Lubrication	9	6.5	Tensioning the Rewind Spring	37			
2.6	Fuel System	10	6.6	Pawl	38			
3.	Clutch, Chain Drive, Chain Brake and Chain Tensioner	12	6.7	Starter Rope Guide Bush	38			
3.1	Disassembling Clutch	12	7.	AV Handle System	39			
3.2	Assembling Clutch	12	8.	Master Control/ Handle System	40			
3.3	Chain Sprocket	13	8.1	Master Control Lever	40			
3.4	Disassembling Chain Brake	13	8.2	Choke/Throttle Rods	40			
3.5	Assembling Chain Brake	14	8.3	Interlock Lever/ Throttle Trigger	41			
3.6	Chain Tensioner	15	8.4	Switch Shaft	41			
4.	Engine	16	8.5	Contact Springs	41			
4.1	Exhaust Muffler	16	8.6	Double Lever (Choke/Throttle)	42			
4.2	Leakage Test	16	8.7	Front Handle	42			
4.2.1	Preparations	17	8.8	Handle Housing	43			
4.2.2	Pressure Test	17						
4.2.3	Vacuum Test	18						
4.3	Oil Seals	19						
4.4	Cylinder and Piston	20	9.	Chain Lubrication	44			
4.4.1	Removal	20	9.1	Suction Hose/ Pickup Body	44			
4.4.2	Installation	21	9.2	Vent Valve	45			
4.5	Piston Rings	23	9.3	Oil Pump	46			
4.6	Crankcase	23	9.3.1	Removing and Installing	46			
4.6.1	Removing the Crankshaft	23	9.3.2	Servicing	46			
4.6.2	Installing the Crankshaft	26						

1. SPECIFICATIONS

1.1	Engine	STIHL single-cylinder two-stroke engine with special impregnated cylinder bore
	Displacement:	35.2 cm ³ (2.15 cu.in)
	Bore:	40 mm (1.57 in)
	Stroke:	28 mm (1.10 in)
	Compression ratio:	7.41:1
	Power output:	1.6 kW (2.2 bhp)
	Max. torque:	1.8 Nm (1.3 lb.ft) at 7,500 r.p.m.
	Max. permissible engine speed with bar and chain:	14,000 r.p.m.
	Mean idle speed:	2,800 r.p.m.
	Bearings:	Crankshaft supported in heavy-duty roller bearings, needle cages on small and big ends
	Piston pin diameter:	9 mm (0.35 in)
	Connecting rod length:	49 mm (1.93 in)
	Rewind starter:	Pawl system
	Reserve pull on rope rotor:	min. 1/2 turn
	Starter rope:	3.0 mm (0.12 in) dia., 800 mm (31.5 in) long
	Clutch:	Centrifugal clutch without linings
	Diameter:	66 mm (2.60 in)
	Clutch engages at:	3,900 r.p.m.
	Crankcase leakage test	
	at gauge pressure:	0.5 bar (7.25 psi)
	under vacuum:	0.5 bar (7.25 psi)
1.2	Fuel System	
	Carburetor:	Diaphragm carburetor
	Standard setting	
	High speed adjusting screw H:	Back off approx. 1 turn
	Low speed adjusting screw L:	Back off approx. 1 turn
	Carburetor leakage test	
	at gauge pressure:	0.4 bar (5.8 psi)
	Fuel tank capacity:	0.37 l (0.8 US pt)
	Octane number:	mind. 90 RON (USA/CAN: pump octane min. 87 unleaded)
	Fuel mixture:	Regular brand-name gasoline and two-stroke engine oil
	Mix ratio:	50:1 with Stihl two-stroke engine oil
	Air filter:	25:1 with other brand-name two-stroke, air-cooled engine oils
		Dual-ply synthetic fabric or flocked wire mesh element and foam element

1.3 Ignition System	Type:	Electronic magneto ignition (breakerless) with integral trigger unit
	Air gap:	0.25 mm (0.010 in)
	Ignition timing:	2.0 - 2.8 mm B.T.D.C. at 8,000 r.p.m.
	Advance angle:	24.7 -32.5° B.T.D.C. at 8,000 r.p.m.
	Spark plug (suppressed):	Bosch WSR 6 F or NGK BPMR 7 A
	Electrode gap:	0.5 mm (0.020 in)
	Spark plug thread:	M14x1.25
	Length of thread:	9.5 mm (0.37 in)
	Heat range:	200
1.4 Cutting Attachment	Guide bars:	Rollomatic
	Bar tail:	3005
	Bar lengths:	30, 35, 40 and 45 cm (12, 14, 16 and 18 in)
	Oilomatic chain:	3/8" (9.32 mm) Picco-Micro
		Optional: 1/4" (6.35 mm) Rapid-Micro
	Chain sprockets:	6-tooth spur sprocket for 3/8" Picco
		Optional: 7-tooth for 3/8" Picco 8-tooth for 1/4"
	Chain speed:	18.6 m/s (61 ft/sec) at 10,000 r.p.m. (with 6-tooth 3/8" P sprocket)
	Chain lubrication:	Speed-controlled reciprocating oil pump, no oil feed at idle speed. Additional manual oil flow adjustment
	Oil feed rate (adjustable):	4.0 - 10.5 cm ³ /min
	Oil tank capacity:	0.14 -0.36 fl.oz/min) at 10,000 r.p.m. 0.24 l (0.5 US pt)
1.5 Special Accessories		
1.5.1 For User	STIHL repair kit	1129 900 5000
	7-tooth 3/8" P spur sprocket	1129 640 2050
	8-tooth 1/4" spur sprocket	1129 640 2051
	Elastostart	1128 190 3400
	Air filter (flocked)	1129 120 1606
1.5.2 For Service Shop	Carburetor parts kit	1129 007 1060
	Gasket kit	1129 007 1050
	Spur gear/tensioning screw kit	1129 007 1000

1.6 Tightening Torques

Plastoform screws are used for polymer components and "DG" screws for lightmetal components. These screws form a permanent thread when they are installed for the first time. They can be removed and installed as often as necessary without detrimentally affecting the strength of the screwed assembly, providing the specified tightening torque is observed. For this reason it is **essential to use a torque wrench**.

Fastener	Thread size	For component	Torque Nm	Torque lbf.ft	Remarks
Spline screw	IS-P 4x14	Chain catcher	1.7	1.25	1)
Spline screw	IS-P 4x14	Insert, chain brake	3.2	2.4	1)
Spline screw	IS-P 4x14	Handle molding	1.6	1.2	1)
Spline screw	IS-DG 4x15	Muffler	4.0	3.0	
Spline screw	IS-M 5x12	Spiked bumper/crankcase	7.0	5.2	
Spline screw	IS-M 5x20	Muffler to cylinder	11.5	8.5	2)
Spline screw	IS-DG 4x15	Insert	3.2	2.4	
Spline screw	IS-M 4x12	Oil pump	3.5	2.6	
Spline screw	IS-M 5x12	Annular buffer/front handle	6.0	4.4	
Spline screw	IS-P 6x19	Ring on housing	7.0	5.2	1)
Spline screw	IS-P 5x20	Fan cover/tank housing	4.0	3.0	1)
Spline screw	IS-M 4x16	Fan cover/crankcase	4.0	3.0	
Spline screw	IS-P 4x10	Segment/fan cover	3.2	2.4	1)
Spline screw	IS-M 4x12	Cover/chain tensioner	2.4	1.8	
Spline screw	IS-M 4x12	Cover/oil pump	3.0	2.2	
Spline screw	IS-M 4x16	Crankcase	5.5	4.0	
Spline screw	IS-M 4x16	Tank housing	5.3	3.9	
Spline screw	IS-M 4x20	Ignition module	6.5	4.8	2) 3)
Spline screw	IS-M 5x12	Bar mounting flange/crankcase	7.0	5.2	2)
Spline screw	IS-M 5x16	Cylinder	11.5	8.5	
Nut	M 5	Carburetor	3.3	2.5	
Collar nut	M 8x1	Flywheel	25.0	18.5	
Collar nut	M 8x1 L	Clutch	32.5	24.0	
	M 14x1.25	Spark plug	25.0	18.5	
Screw assembly	IS-P 5	Annular buffer/handle housing	4.0	3.0	1)
Spline screw	IS-M 4x16	Annular buffer, front	5.5	4.0	
Spline screw	IS-P 4x14	Annular buffer, rear	1.7	1.25	1)
Screw	IS-P 6x21.5	Front handle/handle housing	5.5	4.0	1)
Screw	IS-P 4x10	Control lever/switch shaft	1.3	0.95	1)

Use the following procedure when refitting a P or DG screw in an existing thread:

- Place the screw in the hole and rotate it counterclockwise until it drops down slightly.
- Tighten the screw clockwise to the specified torque.

This procedure ensures that the screw engages properly in the existing thread and does not form a new thread.

1) Torque may be reduced by approx. 1 Nm (0.7 lbf.ft) when refitting a screw in an existing thread

2) Screw must be secured with adhesive 0786 111 1101 (Loctite 243).

3) A washer must be fitted under the screw head.

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.**

2. TROUBLESHOOTING CHARTS
2.1 Clutch, Chain Drive, Chain Brake and Chain Tensioner

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

2.2 Engine

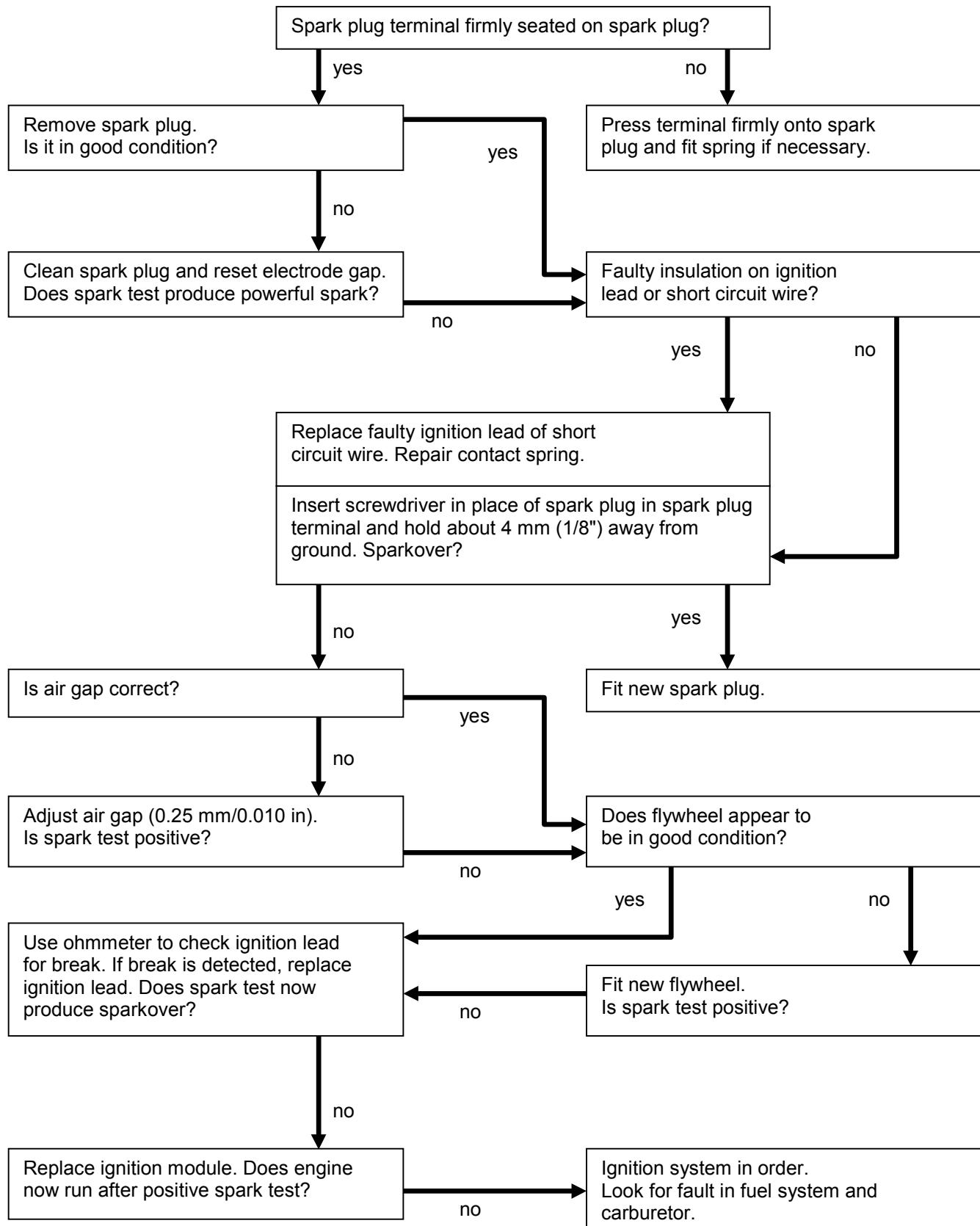
Always check and, if necessary, repair the following parts before looking for faults on the engine:

- 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 damaged	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 arresting 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 and cylinder fins

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
	Very dirty or corroded	Fit new rewind spring
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Fit new pawl
	Spring clip fatigued	Fit new spring clip
Starter rope is difficult to pull and rewinds very slowly	Starter mechanism is very dirty (dusty conditions)	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Apply a few drops of kerosine (paraffin) to spring, then pull rope carefully several times until normal action is restored

2.5 Chain Lubrication

Important: In the event of trouble with 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
	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

Condition	Cause	Remedy
Machine losing chain oil	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 pump piston
	Bore in pump housing	Fit new pump housing worn

2.6 Fuel System

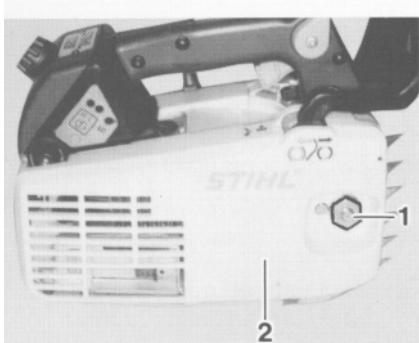
Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing. Foreign matter in valve seat or cone damaged	Remove and clean or replace inlet needle, clean fuel tank, pickup body and fuel line if necessary
	Inlet control lever sticking on spindle	Free off inlet control lever
	Helical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

Condition	Cause	Remedy
	Diaphragm gasket leaking	Fit new diaphragm gasket
	Metering diaphragm damaged or shrunk	Fit new metering diaphragm
Engine will not idle, idle speed too high	Throttle shutter opened too wide	Reset idle speed adjusting screw by idle speed adjusting screw correctly
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean jet bores and ports with compressed air
	Idle jet "too rich"	Screw down 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 dirty	Clean air filter
	Tank vent faulty	Clean or replace tank vent if necessary
	Leak in fuel line between tank and fuel pump	Seal or renew connections and fuel line
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
	Main jet bores or ports blocked	Clean bores and ports
	Fuel pickup body dirty	Clean pickup body, fit new filter
	Fuel strainers dirty	Clean fuel strainers

See also 2.2

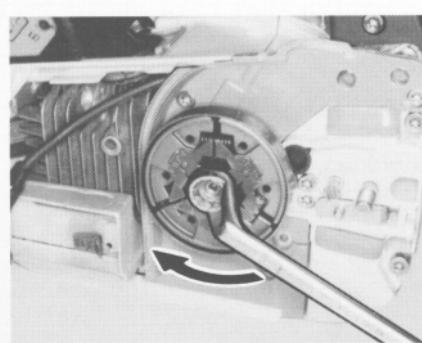
3. CLUTCH, CHAIN DRIVE, CHAIN BRAKE AND CHAIN TENSIONER

3.1 Disassembling Clutch



Troubleshooting chart - see 2.1.

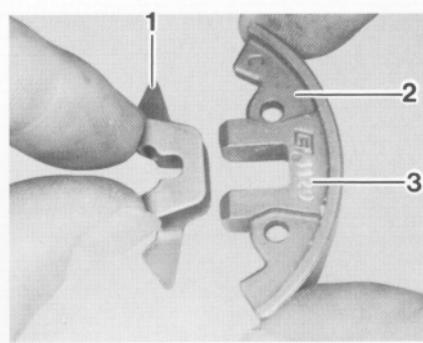
- Disengage the chain brake by pulling the hand guard toward the front handle.
- Unscrew collar nut (1) and remove the sprocket cover.



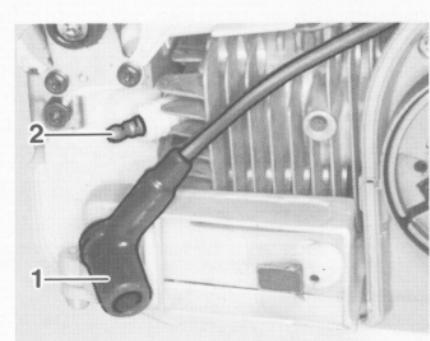
- Unscrew the clutch from the stub of the crankshaft.

Caution: Clutch has a left-hand thread.

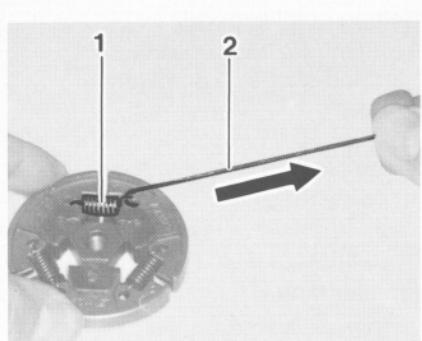
3.2 Assembling Clutch



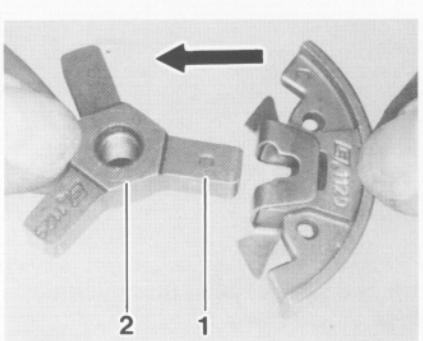
- Slip the retainers (1) onto the clutch shoes (2) so that the narrow side is next to the series number, e.g. 1129 (3).



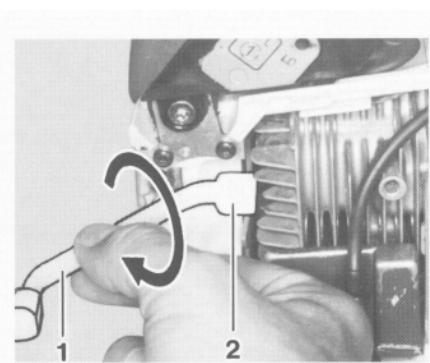
- Pull terminal (1) off the spark plug (2). Unscrew the spark plug.



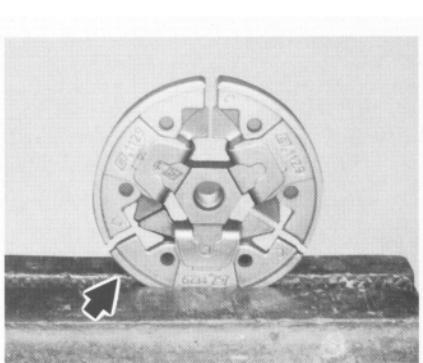
- Use assembly hook (2) to remove all the clutch springs (1).
- Pull the clutch shoes off the carrier.
- Pull the retainers off the clutch shoes.
- Clean all parts and stub of crankshaft in white spirit. Replace any damaged or worn parts.



- Fit the clutch shoes over the arms (1) of the clutch carrier so that the series number is on the same side as the larger hexagon (2).

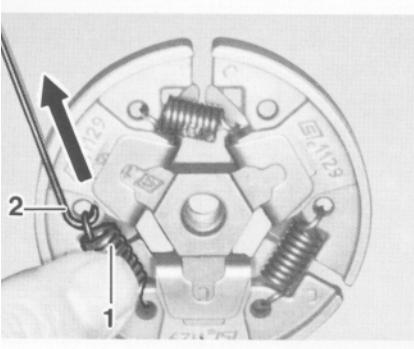


- Set piston to bottom dead center.
- Push the locking strip (1), thicker end (2) first, into spark plug hole and then rotate it 180°.

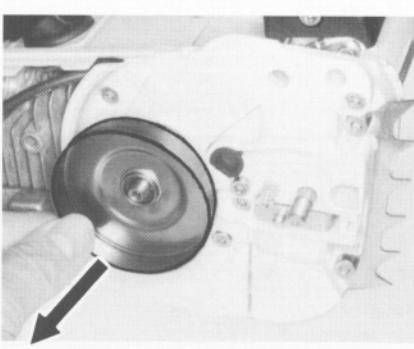


- Clamp the clutch, e.g. one shoe, in a vise.

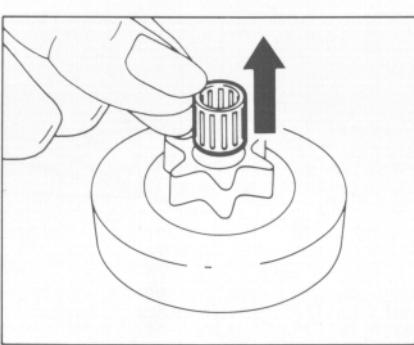
3.3 Chain Sprocket



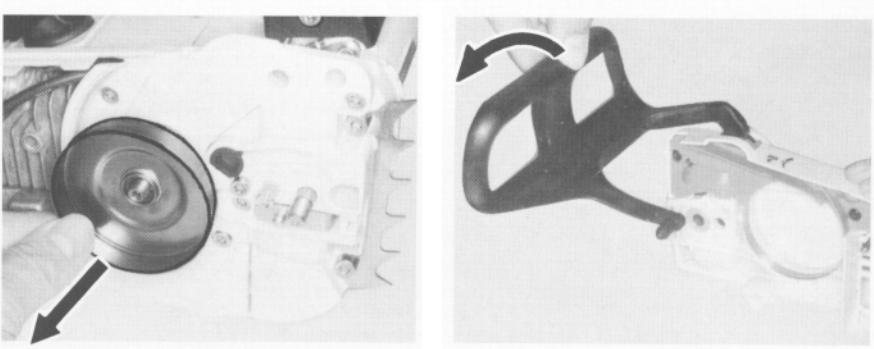
- Attach one end of each spring (1) to the clutch shoes.
- Use the assembly hook (2) to attach the other ends of the springs and press them firmly into the clutch shoes with one finger.



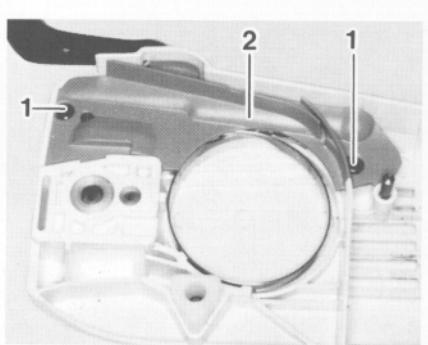
- Remove clutch - see 3.1.
- Pull chain sprocket off the crankshaft.



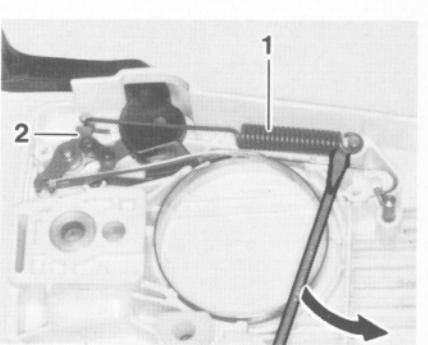
- Take the needle cage out of the sprocket.
- Clean stub of crankshaft. Wash needle cage in clean white spirit and lubricate with grease - see 11.2. Replace damaged needle cage.
- The chain sprocket must engage the worm properly.
- Install clutch - see 3.2.



- Remove sprocket cover – see 3.1.
- Engage brake band by pushing the hand guard away from the sprocket cover.



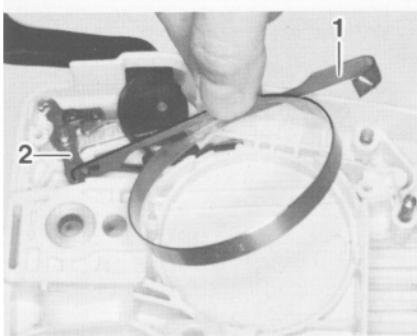
- Take out screws (1).
- Remove the segment (2).



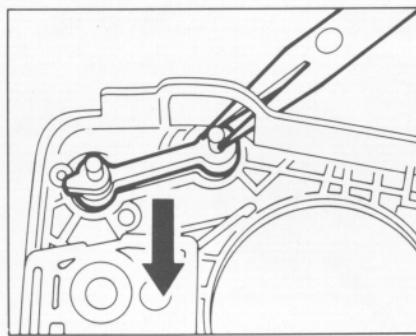
- Fit sprocket cover so that pin (1) engages hole (2).
- Fit the collar nut.

- Carefully pry the brake spring (1) off the anchor pin and unhook it from the bell crank (2).

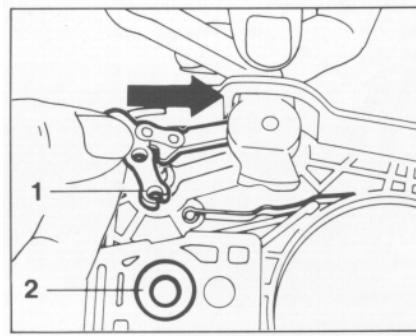
3.5 Assembling Chain Brake



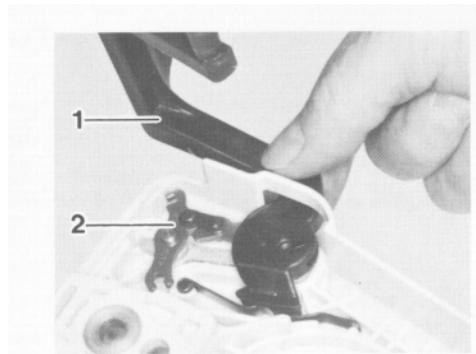
- Take the brake band (1) out of the sprocket cover and detach it from the bell crank (2) at the same time.



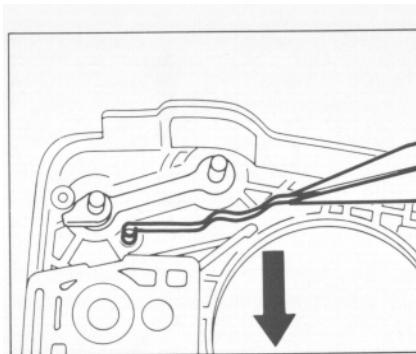
- Fit lever with pivot pin and press it home as far as stop.



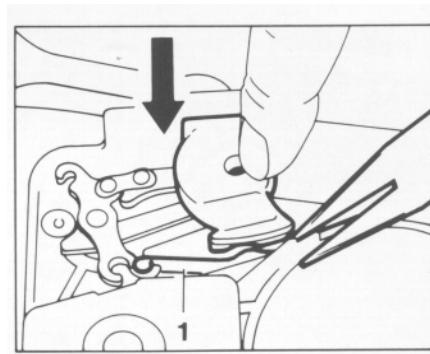
- Slide bell crank into end of hand guard. The long arm (1) of the bell crank must point to the hole (2)



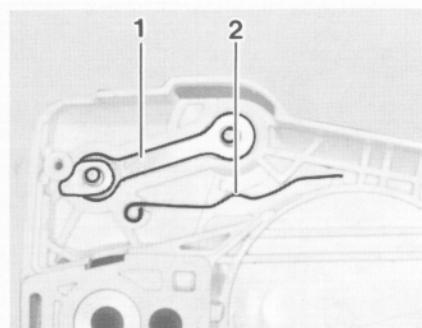
- Ease the hand guard (1) and bell crank (2) off the pivot pins.
- Pull the bell crank out of the hand guard and then take the hand guard out of the sprocket cover.



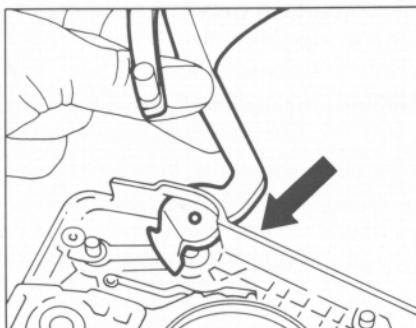
- Fit flat spring (1) in position.



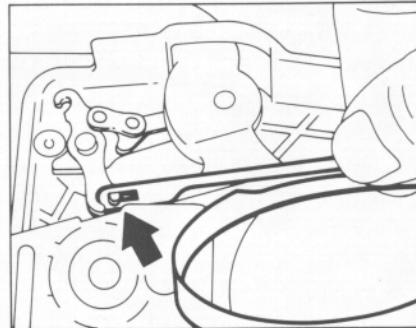
- Locate the hand guard and bell crank on the pivot pins.
- Now press the flat spring (1) down and push the hand guard and bell crank fully home.



- Remove lever (1) with pivot pin and flat spring (2).
- Inspect parts. Replace any worn or damaged parts.

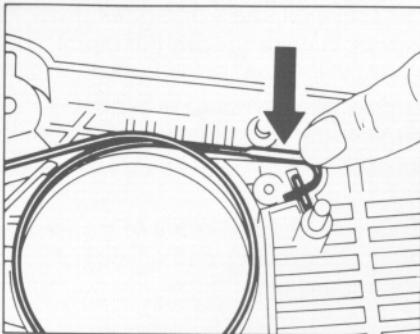


- Fit hand guard in the sprocket cover.



- Attach brake band to the bell crank.

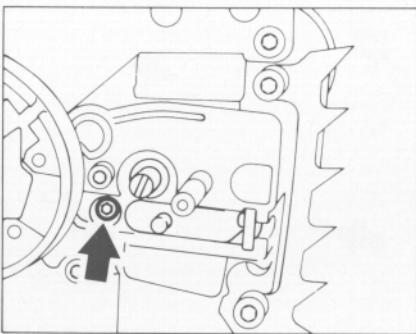
3.6 Chain Tensioner



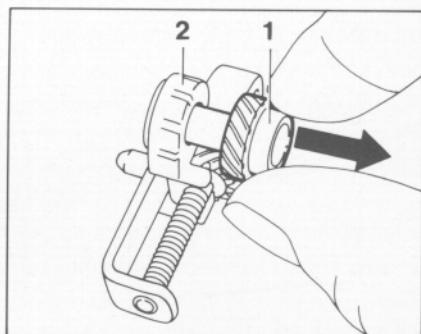
- Press the brake band into the sprocket cover.

Important: Coat sliding and bearing points of chain brake with Molykote grease - see 11.2.

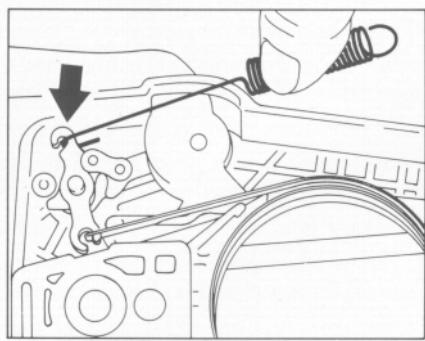
Do not lubricate the brake band.



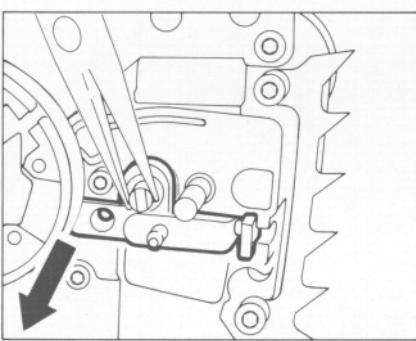
- Remove chain sprocket cover – see 3.1.
- Remove screw from cover.



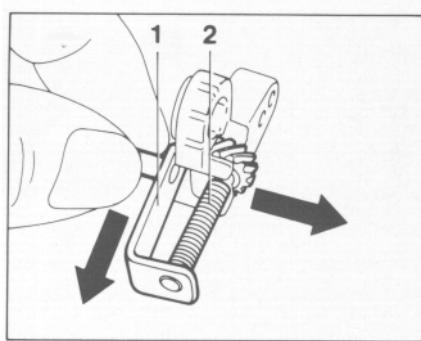
- Pull the spur gear (1) out of the cover (2).



- Hook the brake spring onto the bell crank.



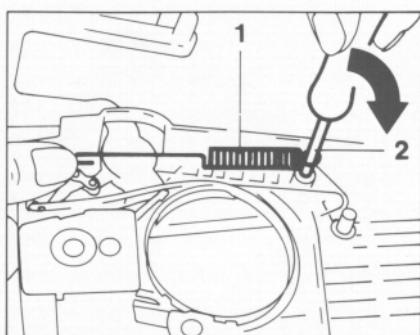
- Take out the complete chain tensioner.



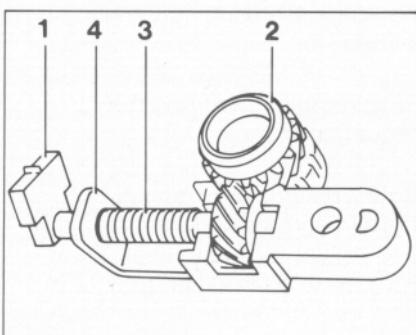
- Pull off the tensioner slide (1).
- Remove the adjusting screw (2).
- Inspect the teeth on the spur gear and adjusting screw. If the teeth are damaged, replace both parts.

Reverse the above sequence to install the chain tensioner.

Note: Coat teeth of adjusting screw and spur gear with grease, see 11.2, before refitting.

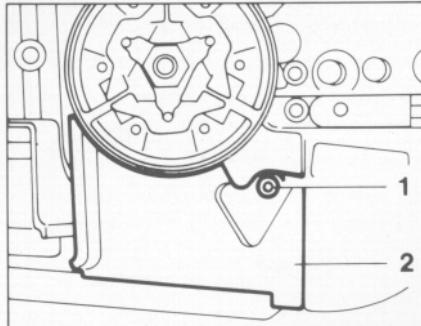


- Use the assembly tool (2) to attach the brake spring (1) to the anchor pin.
- Fit the segment and tighten screws to 3.2 Nm (2.4 lbf.ft).



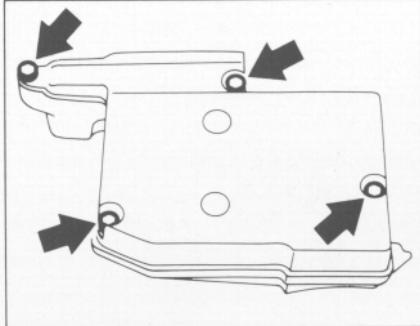
- Remove the thrust pad (1).
- Rotate the spur gear (2) to unscrew the adjusting screw (3) fully from the tensioner slide (4).

4. ENGINE 4.1 Exhaust Muffler

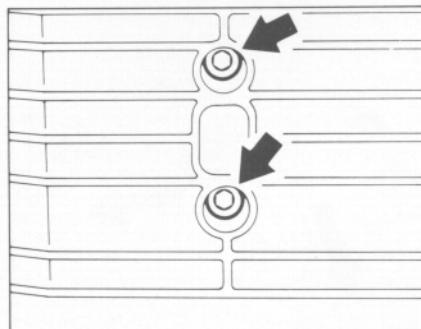


Troubleshooting chart - see 2.2.

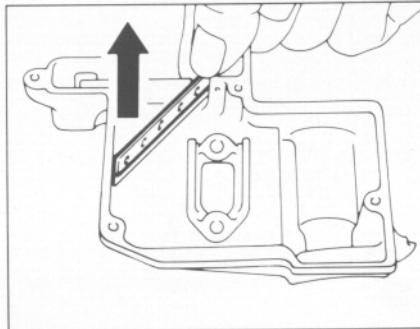
- Remove sprocket cover – see 3.1.
- Take out the screw (1).
- Remove the cover (2).



- Take out the screws.
- Lift lower casing away from upper casing.



- Remove mounting screws from underside of machine.

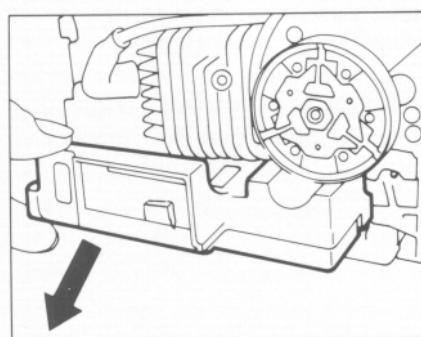


- Take out the screw.
- Remove baffle from guide in upper casing.
- Clean baffle or fit a new one.

Note: If baffle is equipped with spark arresting screen, make sure the spark arresting screen is refitted.

Reassemble in the reverse sequence.

Note: Install a new gasket. Tighten screws of upper casing to 4 Nm (3 lbf.ft) and muffler mounting screws to 11.5 Nm (8.5 lbf.ft).



- Pull out the muffler.
- Remove the gasket.

4.2 Leakage Test

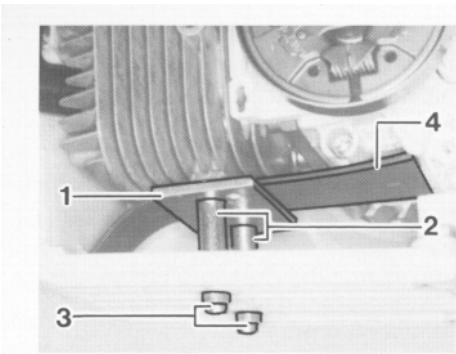
Defective oil seals and gaskets or cracks in castings are the usual causes of leaks. Such faults allow supplementary air to enter the engine and thus upset the fuel-air mixture.

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.

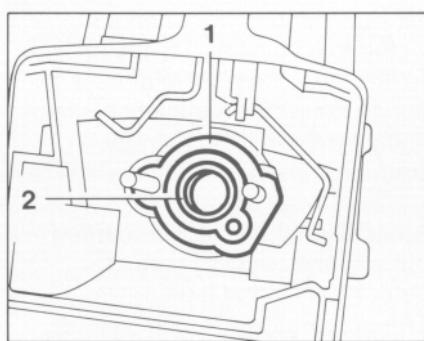
The crankcase can be checked thoroughly for leaks with the carburetor and crankcase tester and the vacuum pump.

4.2.1 Preparations



- Remove the muffler – 4.1.
- Set the piston to top dead center (T.D.C.). This can be checked through the exhaust port.
- Fit flange (1) with sleeves (2) and screws (3) on cylinder exhaust port. Do not tighten down yet.
- Slide the sealing plate (4) between the flange and cylinder and tighten down the mounting screws.

Note: The sealing plate must completely fill the space between the two mounting screws.

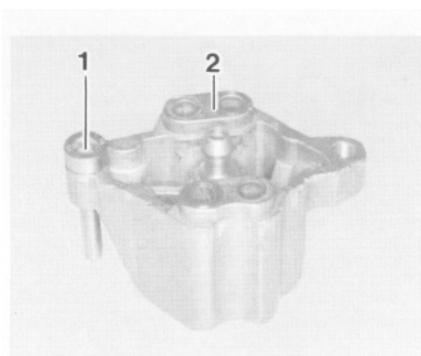


- Remove the carburetor – see 10.2.1.
- Check that washer (1) and sleeve (2) are in position.

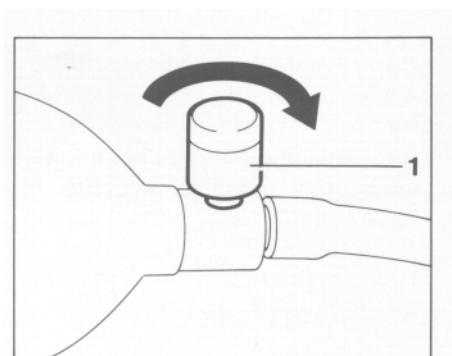
4.2.2 Pressure Test



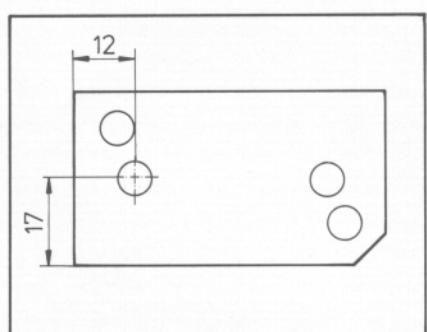
- Connect tester's pressure hose to nipple on test flange.
- Make sure the spark plug is properly tightened down.



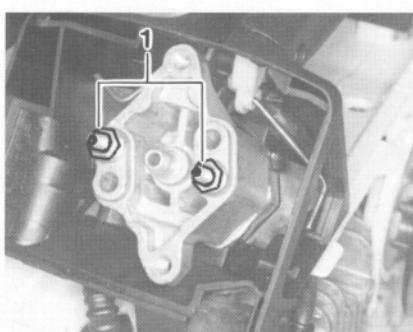
- Remove screw (1) from the test flange (2).



- Close the vent screw (1) on the rubber bulb.
- Use rubber bulb to pump air into the crankcase until the gauge indicates a pressure of 0.5 bar (7.25 psi). If this pressure remains constant for at least 20 seconds, the crankcase is airtight.

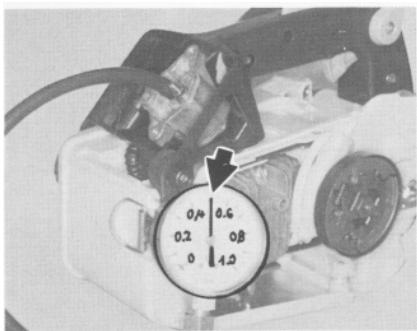


If the flange has only three holes, drill a fourth hole as shown in the drawing.



- Fit the test flange on the carburetor studs.
- Fit nuts (1) and tighten down firmly.

4.2.3 Vacuum Test



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 4.2.1.

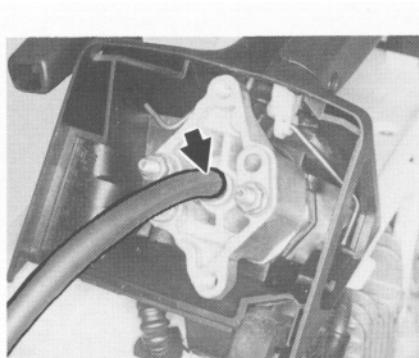
- However, if the indicated pressure drops, the leak must be located and the faulty part replaced.

Note: To find the leak, coat the suspect area with oil and pressurize the crankcase again. Bubbles will appear if a leak exists.

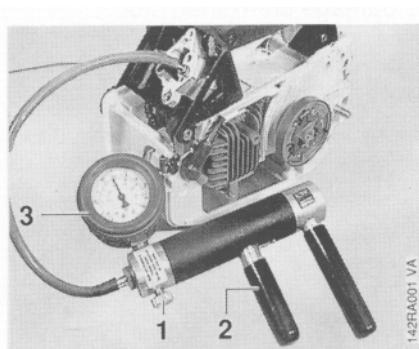
- Carry out the vacuum test – see 4.2.3.
- After finishing the test, open the vent screw and disconnect the hose.
- Remove the test flange and refit the carburetor - see 10.2.
- Remove the flange and sealing plate.
- Install the muffler - see 4.1.

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 0.4 bar (5.8 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 the crankcase), the oil seals must be replaced, even if no leaks were detected in the pressure test.

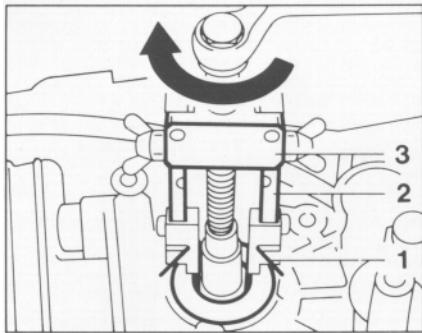
- Remove the test flange and refit the carburetor - see 10.2.
- Remove the flange and sealing plate.
- Install the muffler - see 4.1.



- Connect the vacuum pump's suction hose to test flange nipple.
- Make sure spark plug is tight.



- Pull out the pump piston several times until the gauge indicates a vacuum of 0.5 bar (7.25 psi).



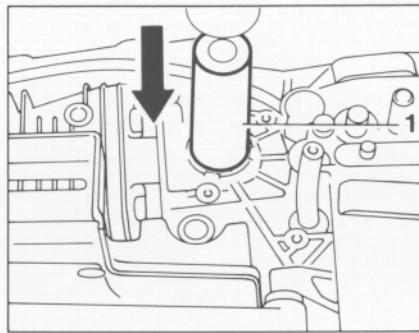
It is not necessary to disassemble the complete crankcase if only the oil seals have to be replaced.

Clutch side:

- Remove the oil pump - see 9.3.1.
- Rotate the angled ends on the hooks (1) of the puller (3) so that they are in line with the arms (2).
- Apply the puller, rotate hooks 90° (angled ends must locate under the oil seal). Clamp the arms and pull the oil seal out.

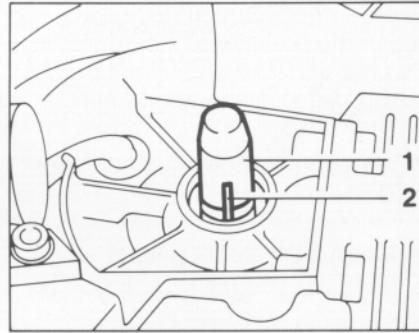
Important: Take special care not to damage crankshaft stub.

- Clean sealing face on crankshaft stub with standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons - see 11.2.
- Pack cavity between sealing lip and oil seal with grease – see 11.2.

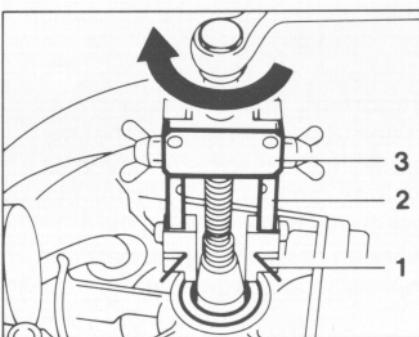


- Push the oil seal (closed side facing crankcase) over the crankshaft and use press sleeve (1) to press it home.

- Install the oil pump - see 9.3.1.



- Slip the installing sleeve (1) over the crankshaft. The slot must locate on the Woodruff key (2).

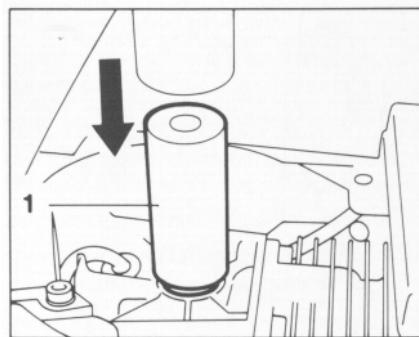


Ignition side:

- Remove the flywheel - see 5.5.
- Apply the puller as at the clutch side and pull out the oil seal.

Important: Take special care not to damage crankshaft stub.

- Clean sealing face on crankshaft stub with standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons - see 11.2.
- Pack cavity between sealing lip and oil seal with grease – see 11.2.



- Push the oil seal over the installing sleeve (closed side of seal facing crankcase) and use press sleeve (1) to press it home.

- Remove the installing sleeve.

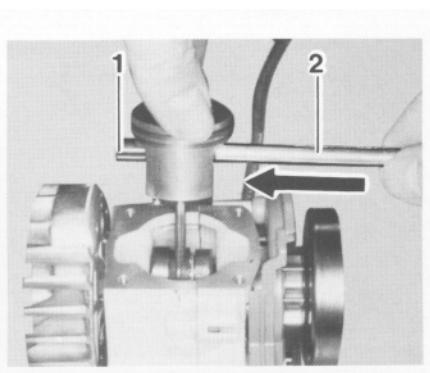
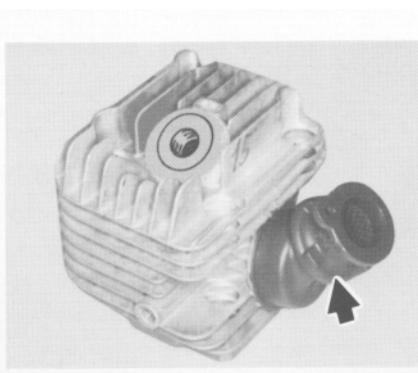
- Fit the flywheel - see 5.5.

4.4 Cylinder and Piston Removal

4.4.1 Removal

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

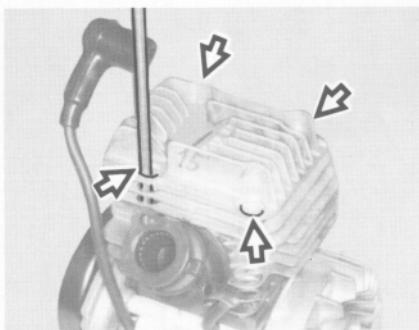
- Remove the tank housing - see 10.6.
- Remove the spark plug.



- Pull the manifold (1) 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.

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



- Release and unscrew the four cylinder base screws through the holes in the cylinder fins.
- Pull the cylinder off the piston.

- Now use the assembly drift (2) to push the piston pin (1) out of the piston.

Note: 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 piston and take the needle cage out of the connecting rod.

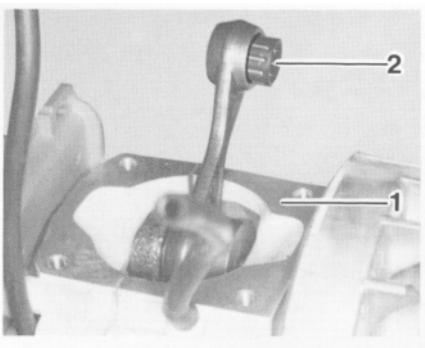


- Remove the cylinder gasket.

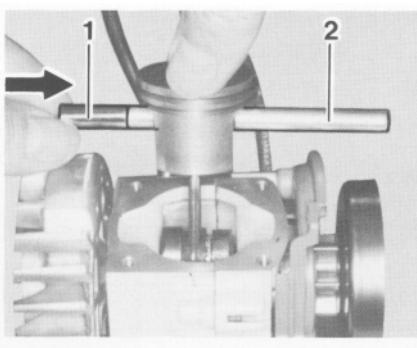
- Use a scribe or similar tool to ease the hookless snap rings out of the grooves in the piston bosses.

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

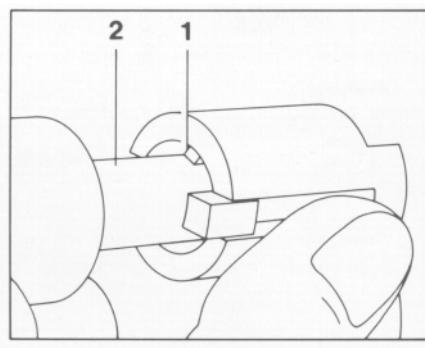
4.4.2 Installation



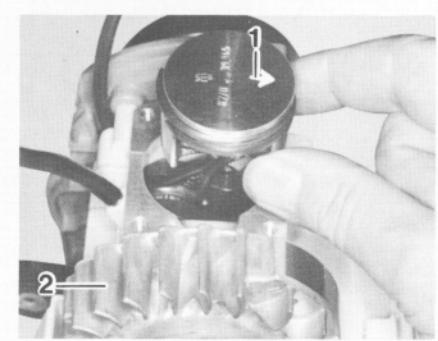
- Thoroughly clean the gasket seating surface (1).
- Lubricate the needle cage (2) with oil and fit it in the small end.



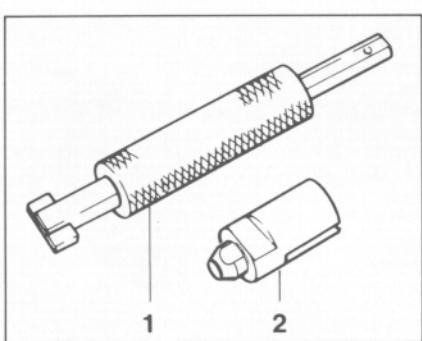
- Fit the piston pin (1) on the assembly drift (2) and slide it into the piston (the pin slides home easily if the piston is hot).



- Push the large slotted diameter of the sleeve over the magnet and snap ring. Position the sleeve so that the inner pin (1) points towards the flat face (2) of tool's shank.

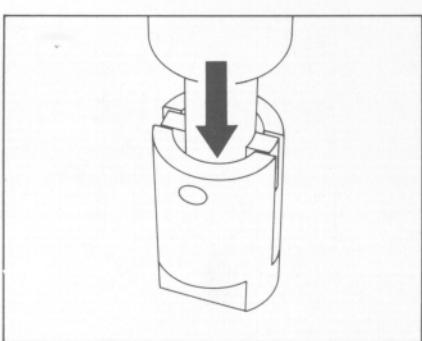


- Heat the piston on an electric heating plate to approx. 60°C (140°F) and slip it over the connecting rod. The arrow (1) the piston head must point to the right (looking at flywheel (2)).

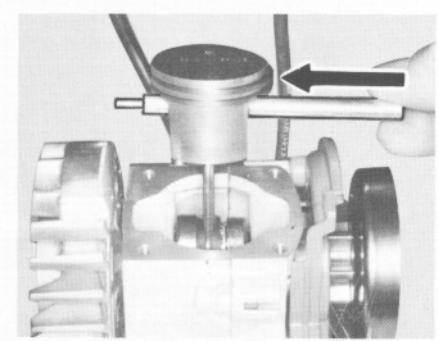


Note: Use the installing tool (1) to fit the snap rings.

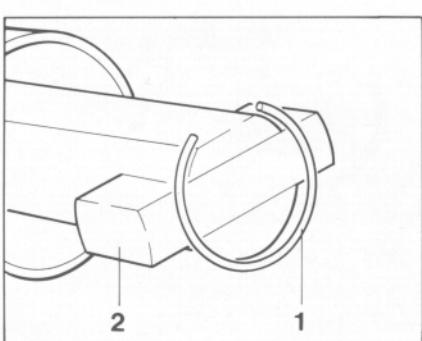
- Remove the sleeve (2) from the tool.



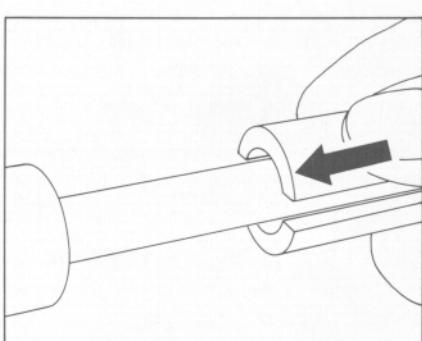
- Stand the installing tool, sleeve downward, on a flat surface (wooden board) and press vertically downwards until the sleeve butts against the tool's shoulder.



- Push the assembly drift, small diameter first, through the piston and small end (needle cage) and line up the piston.

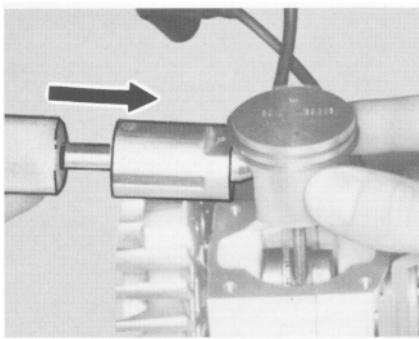


- Attach the snap ring (1) to the magnet (2) so that the snap ring gap is on the flat side of the tool's shank (see illustration).

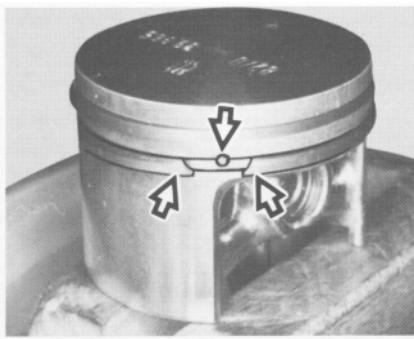


- Remove the sleeve and slip it onto the other end of the shank.

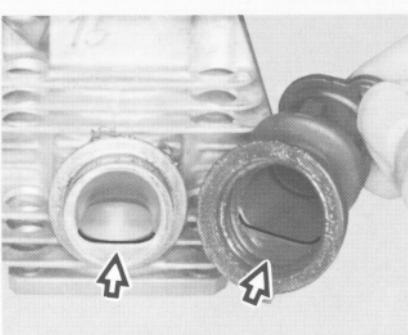
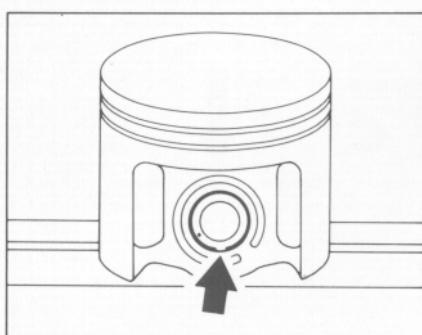
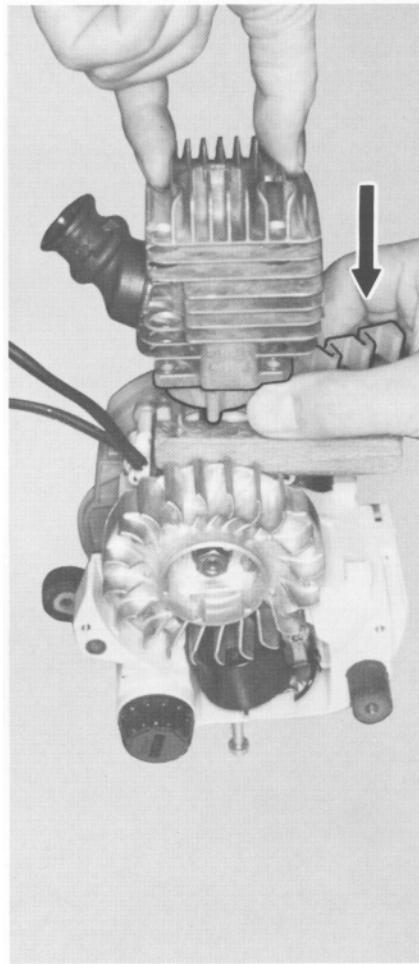
Note: Inner pin must again point towards flat face of tool's shank.



- Apply the installing tool to the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.



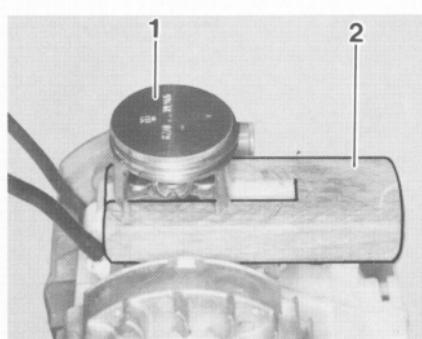
- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove when the rings are compressed.



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

- Push the manifold onto the intake port. Make sure that the straight faces (see arrows) on the manifold and port line up.

- Lubricate the inside of the cylinder with oil and line it up so that it is positioned as it will be in the installed condition. It is essential to observe this point as the piston rings might otherwise break.



- Fit new cylinder gasket.
- Lubricate piston and piston rings with oil. Rest the piston (1) on the wooden assembly block (2).

- Use the clamping strap (1) to compress the piston rings around the piston.
- Check that piston rings are correctly positioned.

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

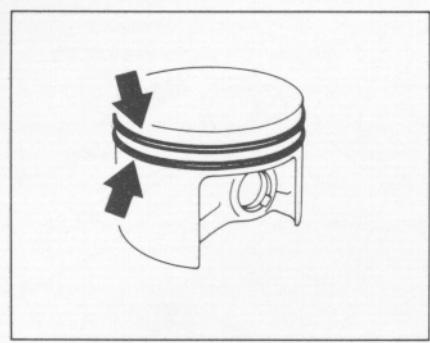
- Remove clamping strap and wooden assembly block.

- Carefully line up the cylinder gasket.

- Fit cylinder base screws and tighten them alternately to 11.5 Nm (8.5 lbf.ft) in a diagonal pattern.

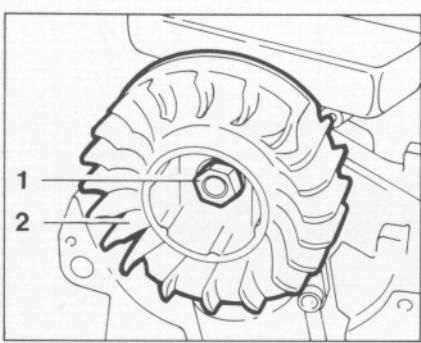
- Fit the fuel tank - see 10.6.

4.5 Piston Rings

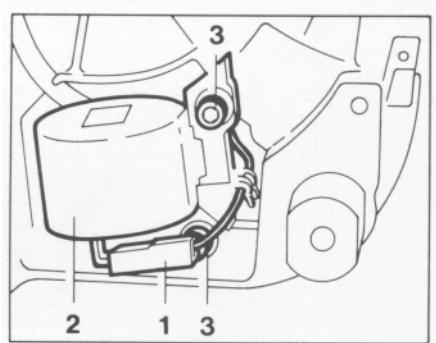


- Remove the piston - see 4.4.1.
- Remove rings from piston.
- Use a piece of old piston ring to scrape the grooves clean.

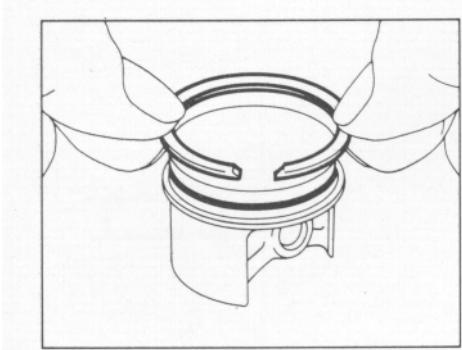
4.6 Crankcase 4.6.1 Removing the Crankshaft



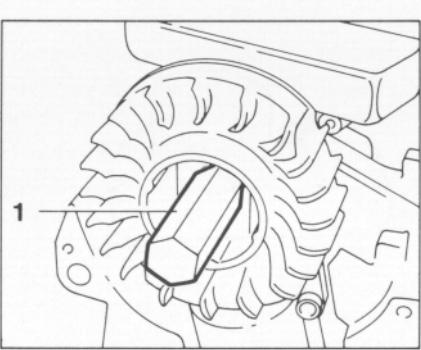
- Remove the cylinder - see 4.4.1.
- Drain the oil tank.
- Unscrew the mounting nut (1).
- Pull the flywheel (2) off the crankshaft.



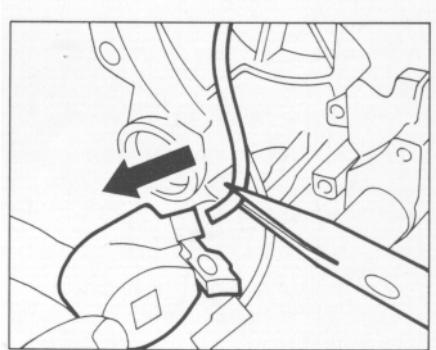
- Disconnect the short circuit wire (1) from the ignition module (2).
- Take out the screws (3).



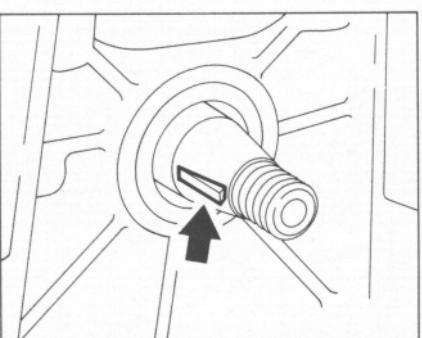
- Install the new piston rings in the grooves so that the radii face upward.
- Install the piston - see 4.4.2.



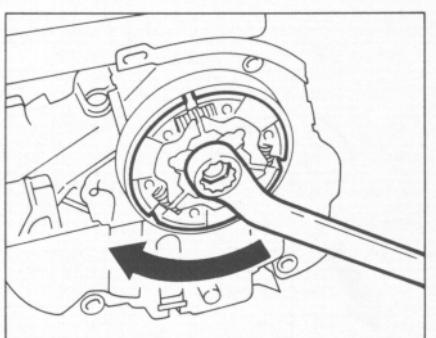
Note: If the flywheel is stuck, screw puller (1) onto the crankshaft and tap the end of the puller to release flywheel. Remove the puller.



- Pull the ignition module forwards.
- Unscrew ignition lead from contact pin and pull it out of the ignition module.

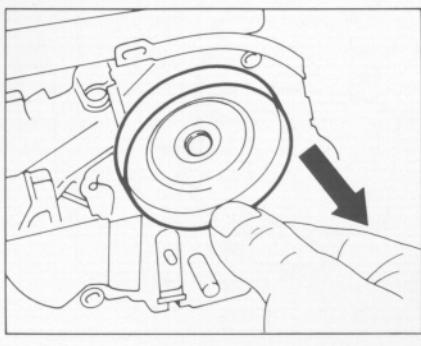


- Take Woodruff key out of slot in stub of crankshaft.

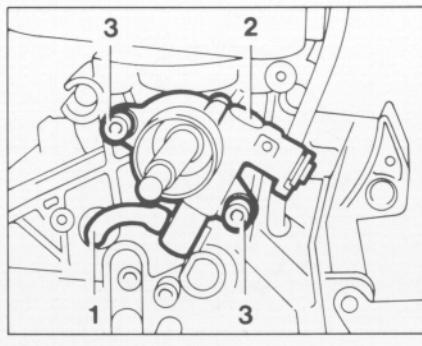


- Unscrew clutch from crankshaft.

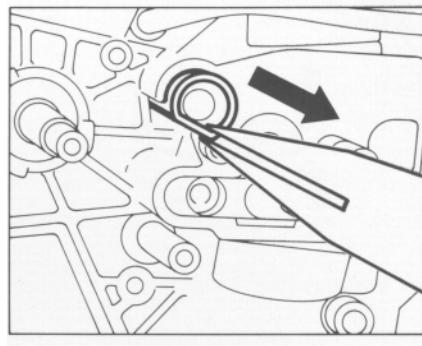
Caution: Clutch has left-hand thread.



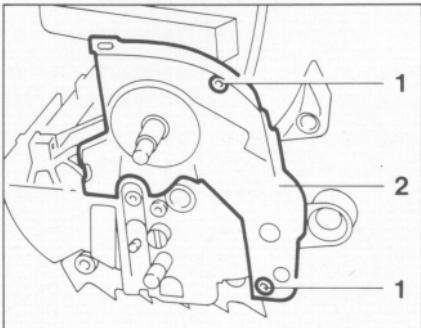
- Pull the chain sprocket off the crankshaft.



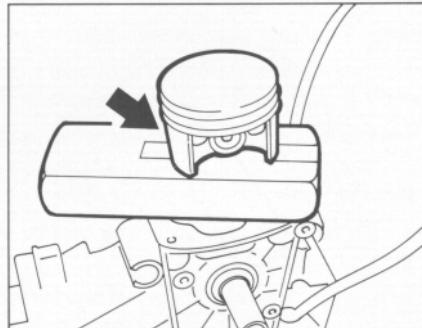
- Pull the suction hose (1) off the oil pump (2).
- Take out the screws (3) and remove the oil pump.



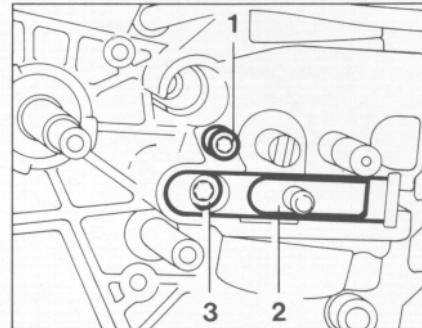
- Pull out the plug.



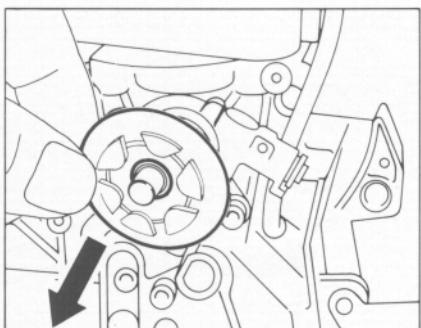
- Take out the screws (1).
- Remove the cover (2).



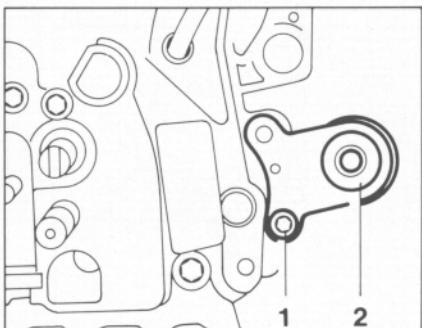
- Remove the piston - see 4.4.1.



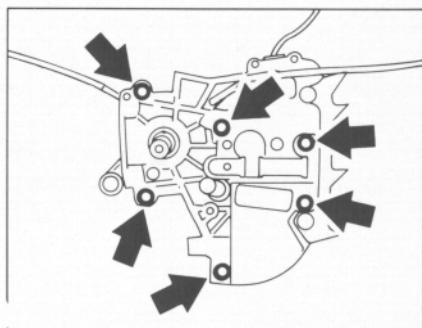
- Take out the screws (1 and 3).
- Withdraw the chain tensioner (2).



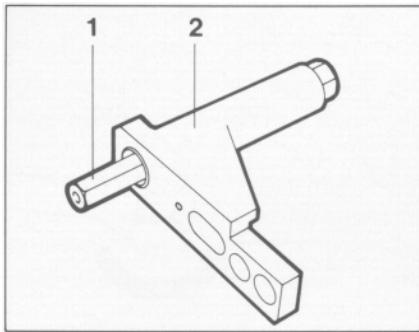
- Pull off the worm.



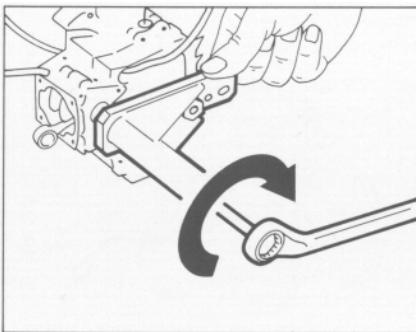
- Take out the screw (1).
- Lift away annular buffer (2).



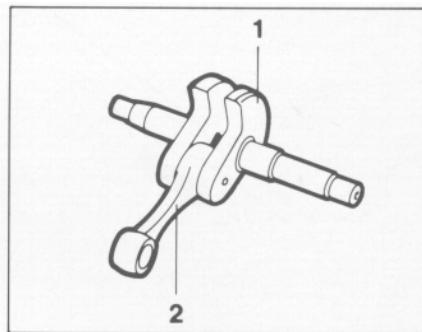
- Unscrew the six mounting screws which join the two halves of the crankcase.



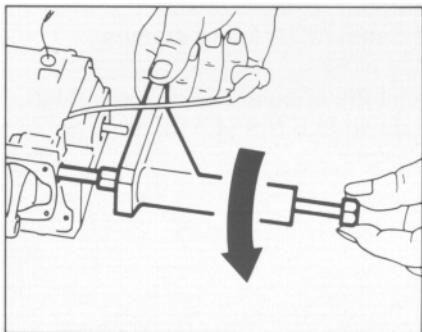
- Fit threaded sleeve (1) on the spindle of service tool AS (2) and screw it on counterclockwise as far as stop (left-hand thread).



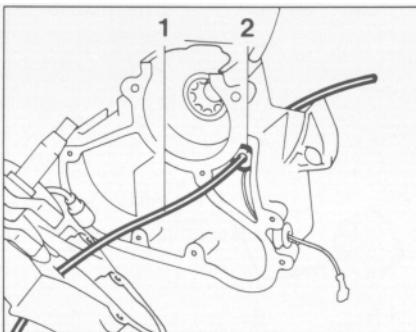
- Turn spindle of service tool clockwise until the crankshaft is pressed out of the roller bearing. The two halves of the crankcase separate during this process.



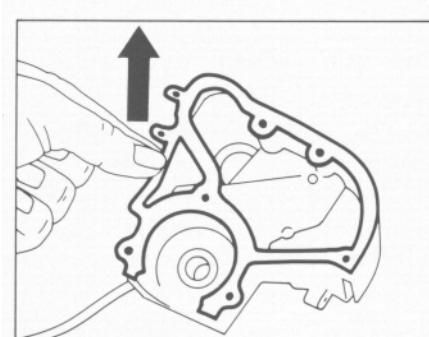
- Pull the crankshaft out of the roller bearing.
- The crankshaft (1), connecting rod (2) and needle bearing form an inseparable unit. This means that the crankshaft must always be replaced as a complete unit in the event of damage to any one of these parts.
- When fitting a replacement crankshaft always install new oil seals and roller bearings.



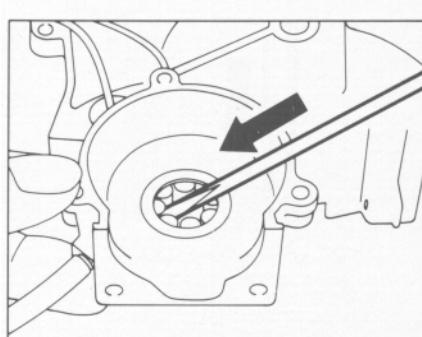
- Hold the crankshaft steady and rotate spindle to screw threaded sleeve onto crankshaft stub as far as it will go.
- Now release the crankshaft and hold service tool steady and continue turning spindle until service tool locates against the crankcase.
- Fit collar nut (for sprocket cover) on stud and screw on fingertight.



- Pull the ignition lead (1) out of the grommet (2).

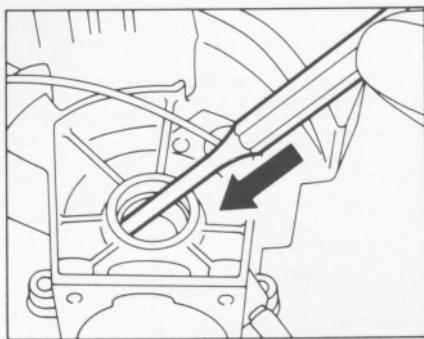


- Remove the gasket from the crankcase mating face.

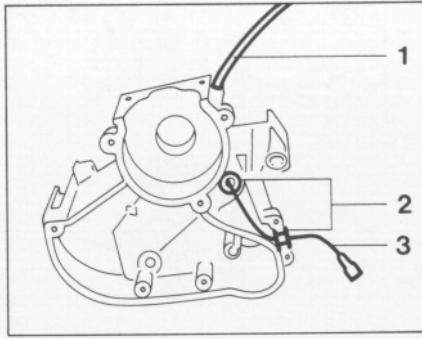


- Carefully drive the oil seals out of the two halves of the crankcase.

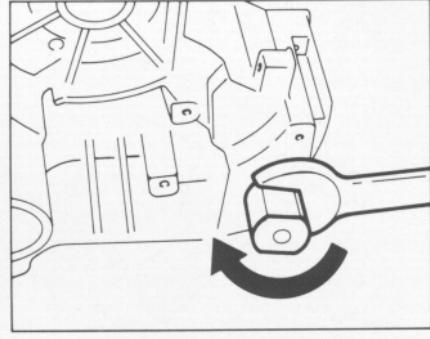
4.6.2 Installing the Crankshaft



- Carefully knock the roller bearings out of the two halves of the crankcase.
- Inspect both halves of the crankcase for cracks and replace if necessary.



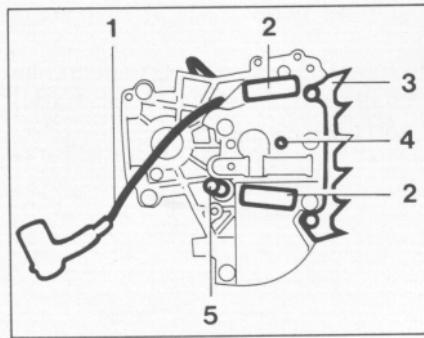
- To replace the ignition side of the crankcase, pull off the impulse hose (1). Push out the grommets (2) and remove the short circuit wire (3).



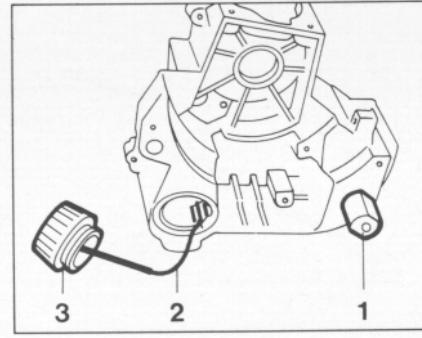
If the original crankcase is used again, remove the gasket residue and clean the mating surfaces - they must be cleaned very thoroughly to ensure a perfect seal.

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

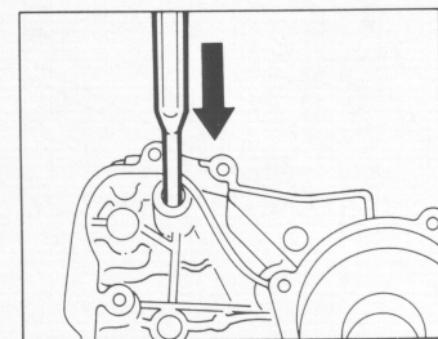
- Fit the annular buffer and tighten down to 6 Nm (4.4 lbf.ft).



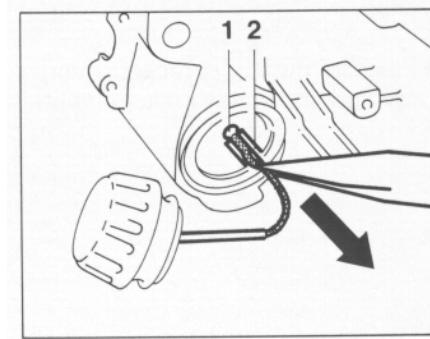
- To replace the clutch side of the crankcase, remove the ignition lead (1), bumper strips (2), spiked bumper (3), stud (4) and oil suction hose (5) with pickup body.



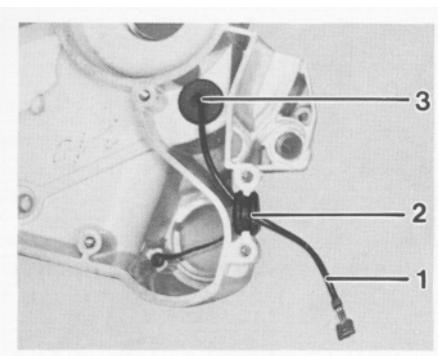
- Unscrew the annular buffer (1) and disconnect cord (2) of filler cap (3).



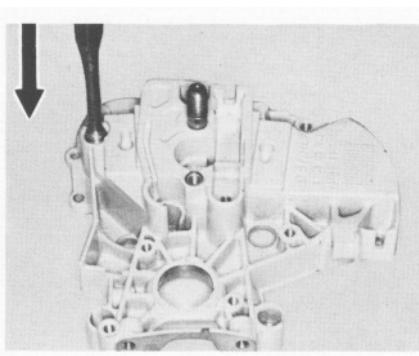
- Use a 5 mm (0.2") drift to push out the vent valve.



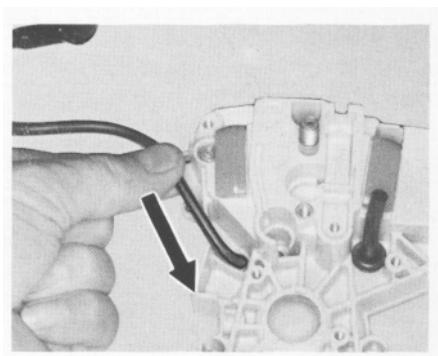
- Fit end of filler cap retainer cord (1) in groove (2) and pull forwards to secure in position.



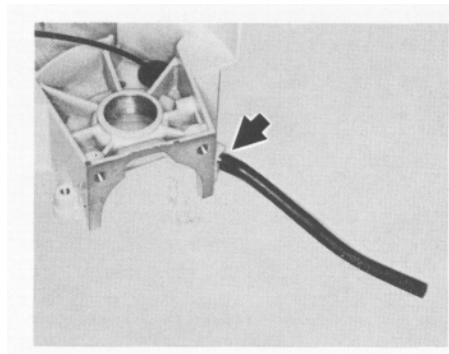
- Pass short circuit wire (1) through hole and fit the grommets (2 and 3).



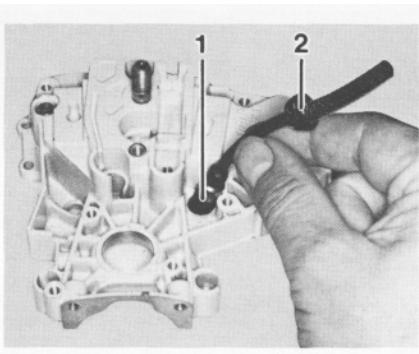
- Use a 7 mm (0.3") drift to carefully push home the valve (small diameter facing up) until it is recessed about 1 mm (0.04") below the housing face.



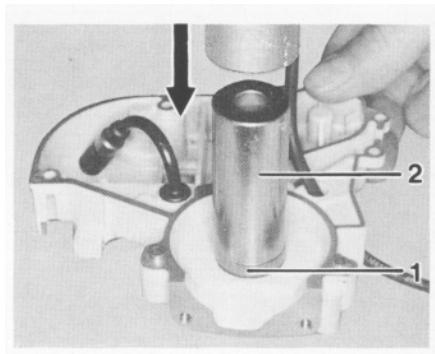
- Thread ignition lead through the hole.



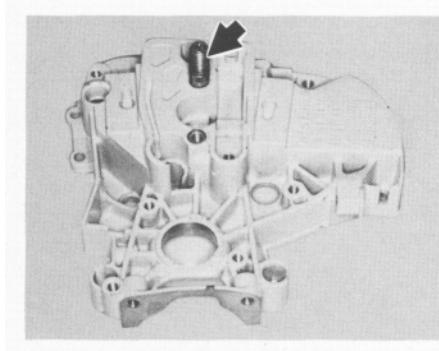
- Push the impulse hose onto the nipple.



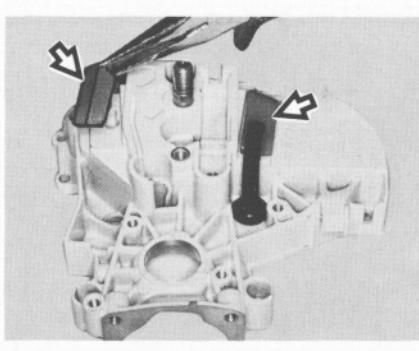
- Push pickup body (1) through the hole and locate the flange (2) on the suction hose in the hole.



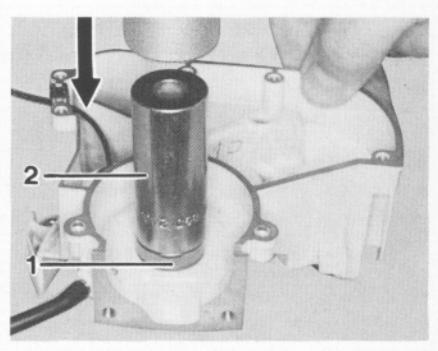
- Fit the spiked bumper (1).
- Tighten the screws (2) firmly.



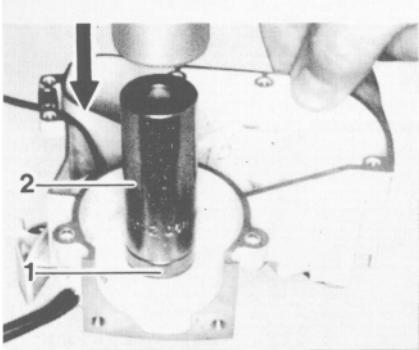
- Coat thread of stud with Loctite - see 11.2.
- Use M8 stud puller to screw in stud as far as stop.



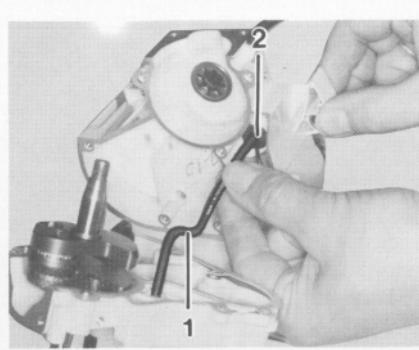
- Place bumper strips in position and press them home as far as they will go.



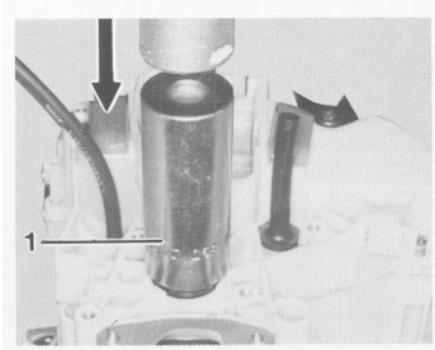
- Use press sleeve (2) to press roller bearing (1) as far as stop into clutch side of crankcase. Lubricate bearing with oil.



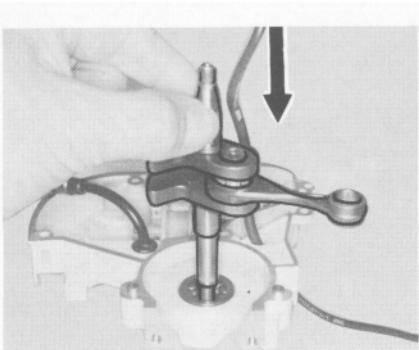
- Use press sleeve (2) to press roller bearing (1) as far as stop into ignition side of crankcase.
- Lubricate bearing with oil.



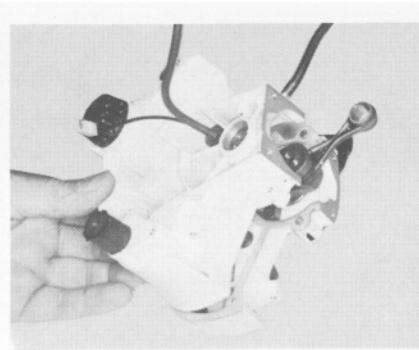
- Push ignition lead (1) through the grommet (2).



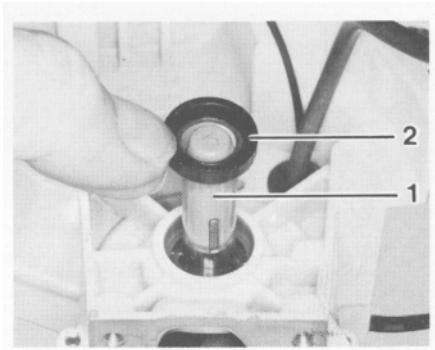
- Slide the oil seal, closed side facing the crankcase, over the clutch end of the crankshaft and use the press sleeve (1) to press it fully home.



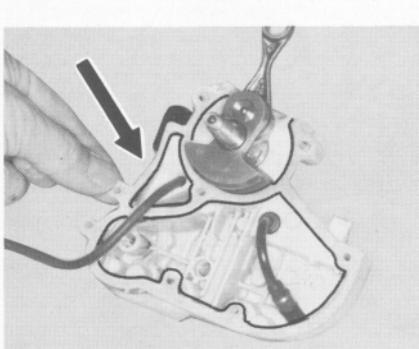
- Fit the straight stub of the crankshaft in the roller bearing at the clutch side of the crankcase.



- Lubricate roller bearing in ignition side of crankcase with oil and push the crankcase over the crankshaft stub.
- Fit screws and tighten down alternately in a diagonal pattern to 5.5 Nm (4 lbf.ft).



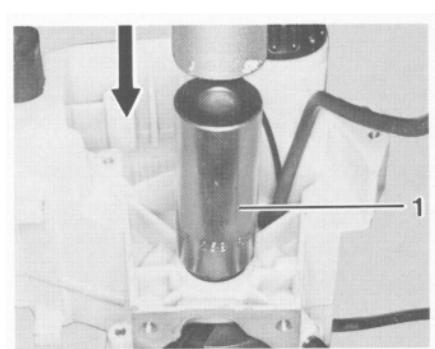
- Fit the assembly sleeve (1) over the ignition end of the crankshaft. Slide the oil seal (2), closed side facing the crankcase, over the assembly sleeve.



- Fit new gasket on mating face of clutch side of crankcase.

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

- Fit Woodruff key in the slot in the crankshaft stub.
- Before installing oil seals, coat sealing lips with grease - see 11.2.



- Press home the oil seal with the press sleeve (1).

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

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!

5.1 Spark Plug

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 longreach electrodes.

Sooted or carbonized spark plug:

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

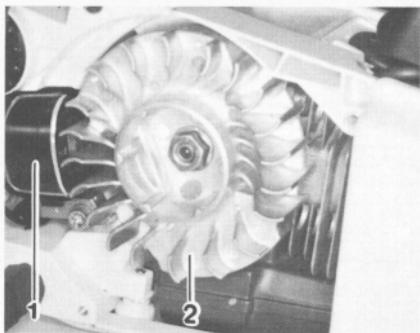
Note: Never use a steel wire brush for this job.

Spark plug smeared with oil:

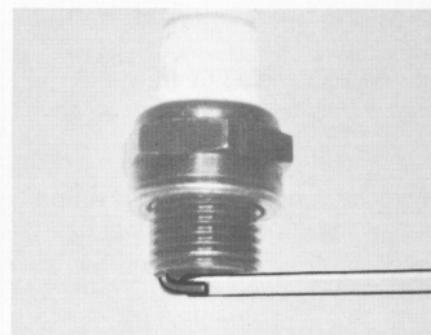
- Wash the insulator nose with a grease solvent and blow it clear with compressed air.

Electrode gap:

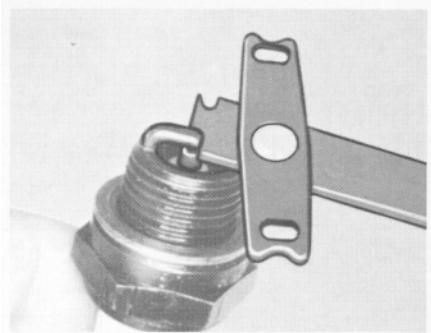
Electrode gap becomes wider as a result of normal erosion.



The electronic (breakerless) magneto ignition system basically consists of an ignition module (1) and flywheel (2) and is easily accessible.



- Check the electrode 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 eroded.

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 best to fit a new spark plug in all cases of doubt.

If there is no sparkover even though the spark plug is in good condition, first check the 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:

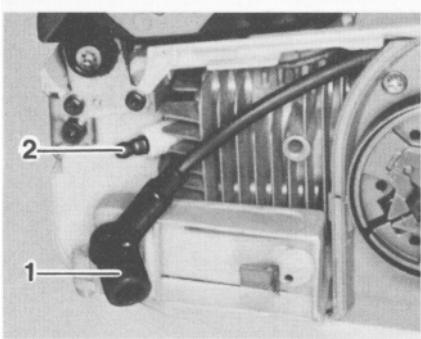
Clean the spark plug seat and inspect the sealing ring to make sure it is in good condition.

Fit the spark plug and tighten it down to 25 Nm (18.5 lbf.ft).

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

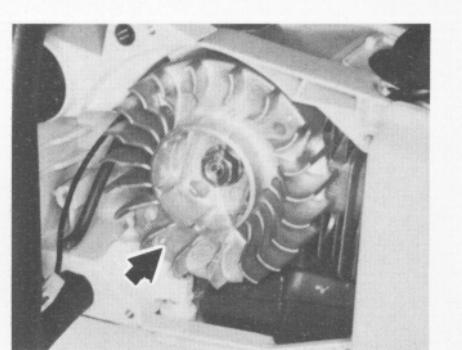
Condition of insulator nose	Meaning
Normal:	Grayish yellow to brown, dry
	Engine in order; correct spark plug (heat range as specified)
Sooted:	Velvet-like, dull black coating of soot
	Mixture too rich, lack of air (dirty air filter, choke shutter partly closed), electrode gap too wide, wrong spark plug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

5.2 Ignition Plug Terminal

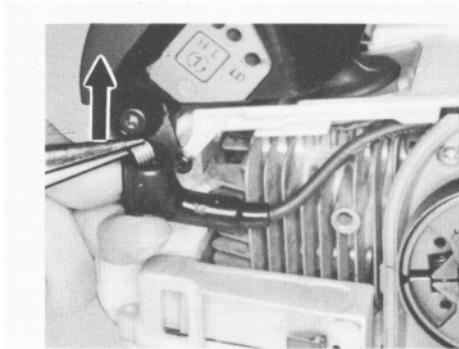


- Remove the chain sprocket cover.
- Pull terminal (1) off the spark plug (2).

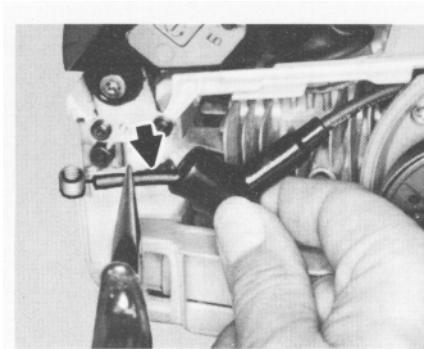
5.3 Ignition Lead



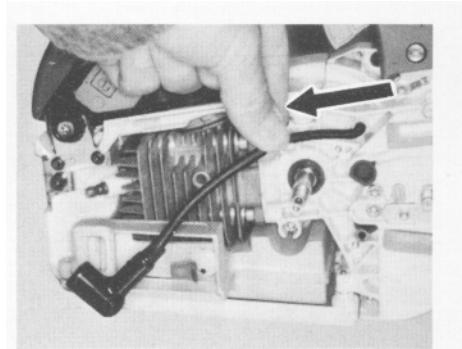
- Remove the ignition module - see 5.4.2.
- Remove the flywheel - see 5.5.



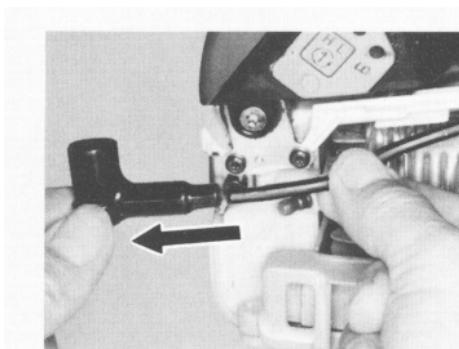
- Use a suitable pair of pliers to grip the leg spring and pull it out of the spark plug terminal.



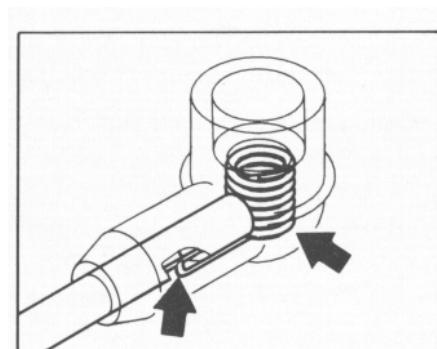
- Pinch the hook of the leg spring into the center of the lead, i.e. about 15 mm (5/8") from the end of the lead.



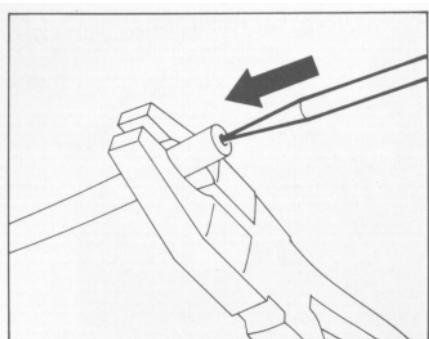
- Remove the oil pump - see 9.3.1.
- Pull terminal off spark plug.
- Pull ignition lead out of crankcase.
- Remove the spark plug terminal - see 5.2.
- Cut new ignition lead to length (see parts list or cut to same length as old lead).



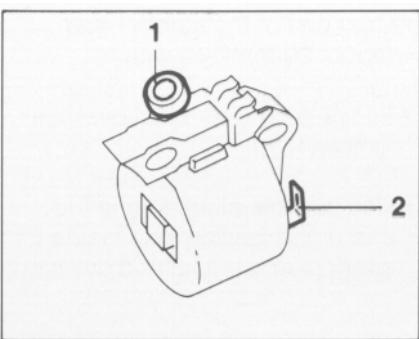
- Unhook the leg spring from the ignition lead.
- Slip the spark plug terminal off the lead.



- Pull the lead back into the terminal so that the leg spring locates properly inside it.
- Fit terminal on spark plug and refit chain sprocket cover.

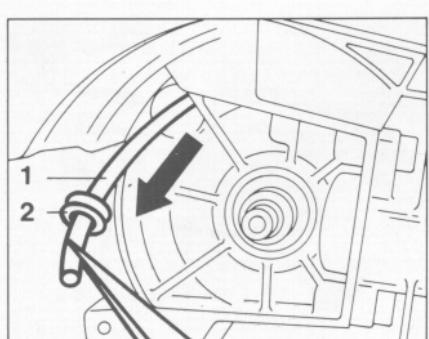


- Use a pointed tool (awl or gimlet) to pierce the center of the other end of the ignition lead which screws into the module.

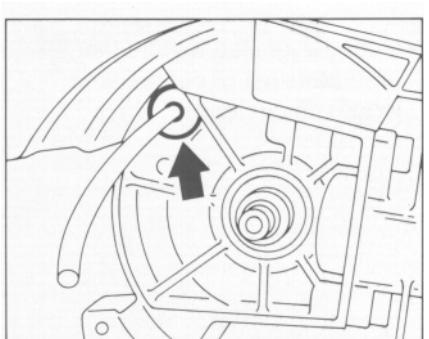


The ignition module accommodates all the components required to control ignition timing. There are two electrical connections on the coil body:

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



- Pull out the grommet at the ignition side.
- Starting from the clutch side, thread the ignition lead (1) through the crankcase bores and the grommet (2).



- Fit the grommet in the bore.

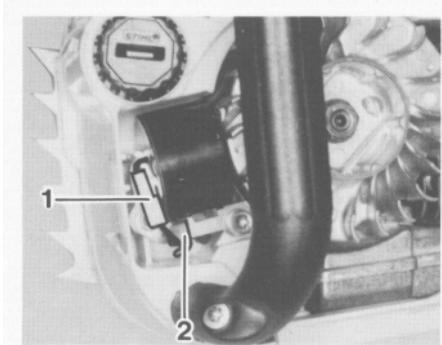
Assembly of the remaining parts is a reversal of the disassembly sequence.

Ignition timing on the electronic (breakerless) magneto ignition system is fixed at 2.4 mm (0.094") B.T.D.C. at 8,000 r.p.m. and is not adjustable.

However, in view of the permissible tolerances in the electronic circuit, it may vary between 2.0 and 2.8 mm (0.08" and 0.11") B.T.D.C. at 8,000 r.p.m..

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.

5.4.2 Removing and Installing

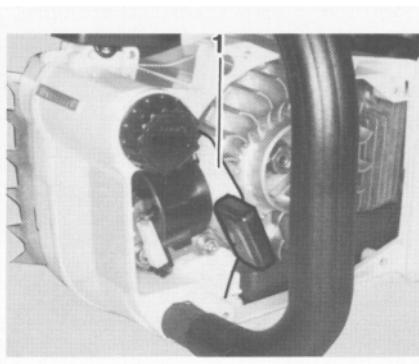


- Remove the fan housing - see 6.2.
 - Pull the short circuit wire (1) off the ignition module and out of the retainer (2).
 - If necessary, remove the wire retainer from the module.
- Note:** Before fitting the ignition lead, pack the high voltage output with STIHL multipurpose grease - see 11.2.
- Important:** Do not use graphite grease (Molykote) or silicone insulating paste for this job.

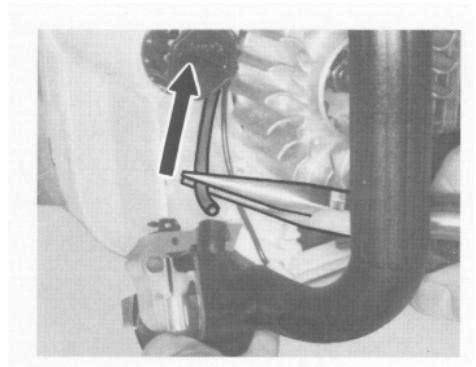
- Coat the threads of the mounting screws with Loctite, see 11.2. Place the module in position, insert the screws with washers but do not tighten them down yet.



- Remove the ignition module mounting screws.



- Slide the setting gauge (1) between the arms of the ignition module and the flywheel magnets.
- Press the ignition module against the flywheel and tighten down the mounting screws to a torque of 6.5 Nm (4.8 lbf.ft).

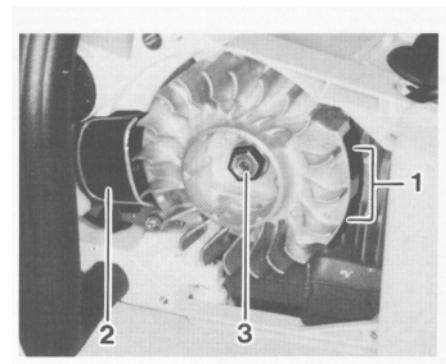


- Pull the ignition module forwards.
- Unscrew the ignition lead from the contact pin and pull it out of the high voltage output.

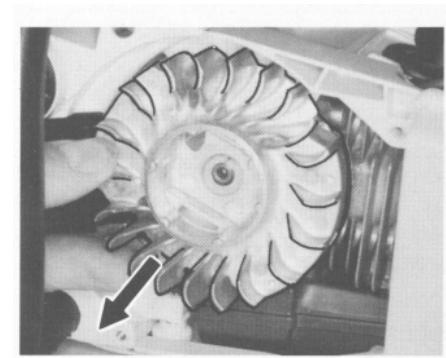
5.5 Flywheel

Removing the flywheel:

- Use the locking strip to block the piston - see 3.1.
- Remove the fan housing - see 6.2.

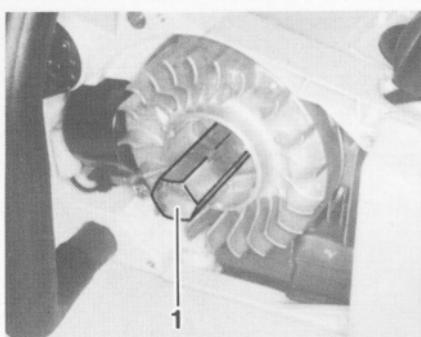


- Rotate the flywheel so that the magnet poles (1) are opposite the ignition module (2).
- Unscrew the flywheel mounting nut (3) from the crankshaft.

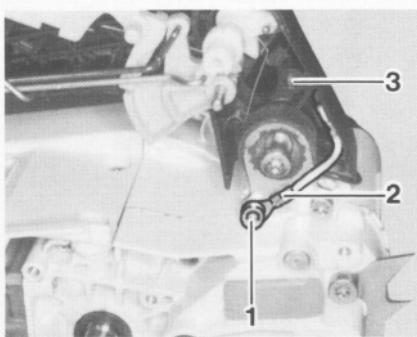


- Pull the flywheel off the crankshaft.

5.6 Ground Wire/Short Circuit Wire



Note: If the flywheel is stuck, screw puller (1) onto the crankshaft and tap the end of the puller to release flywheel. Remove the puller.



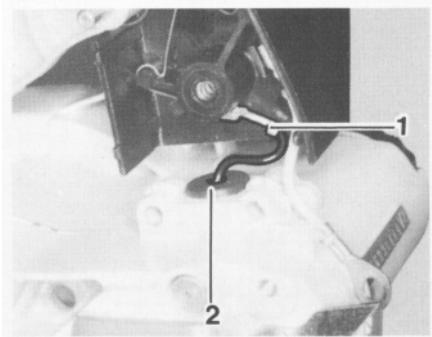
Ground wire:

- Remove the chain sprocket cover.
- Remove the handle molding - see 8.2.
- Remove screw (1) which secures ground wire (2) to annular buffer.
- Pull ground wire off the contact spring (3).

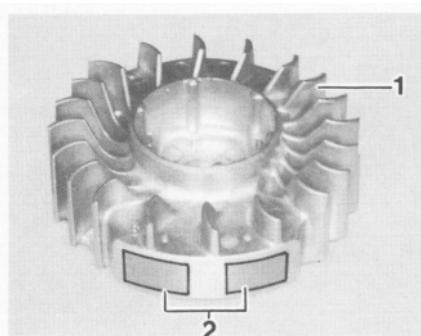
Assemble in the reverse sequence.

Short circuit wire:

- Remove the ignition lead - see 5.3.
- Remove the handle molding - see 8.2.



- Pull the short circuit wire (1) off the contact spring.
- Pull out the grommet (2) and slip it off the short circuit wire.



• Inspect the condition of the flywheel (1) and magnet poles (2). If you find any cracks or other damage, fit a new flywheel.

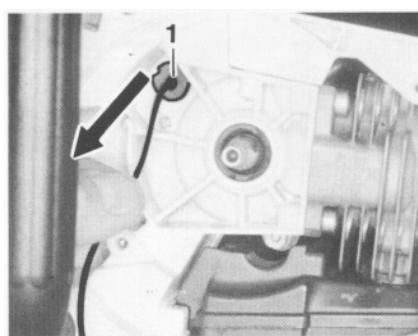
Installing the flywheel:

- Check that the Woodruff key is correctly positioned.

Important: Clean the stub of the crankshaft and the flywheel hub bore with a standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons - see 11.2.

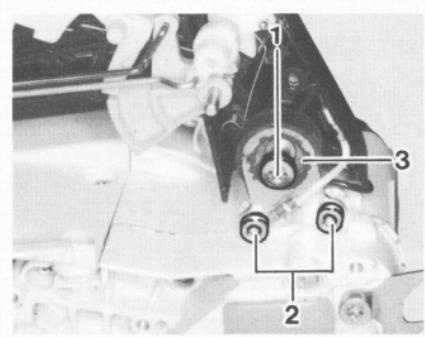
- Place the flywheel in position.
- Fit the mounting nut and tighten it down to 25 Nm (18.5 lbf.ft).

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

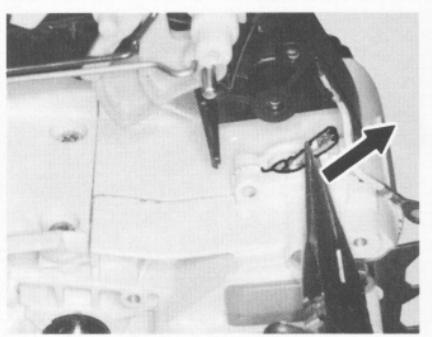


- Pull the short circuit wire out of the crankcase and grommet (1).

Install short circuit wire in the reverse sequence.



- Take out handle housing mounting screw (1) and screws (2) from annular buffer (3).
- Remove the annular buffer.



Note: Thread short circuit wire through the side of the crankcase and pull it up to the top.

6. REWIND STARTER

6.1 Routine Maintenance

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

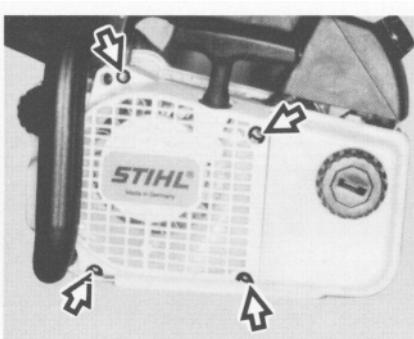
Then carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

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

Wash all parts in paraffin or white spirit.

Lubricate the rewind spring and starter post with STIHL special lubricant, see 11.2, before installing.

6.2 Rope Rotor



Troubleshooting chart - see 2.4.

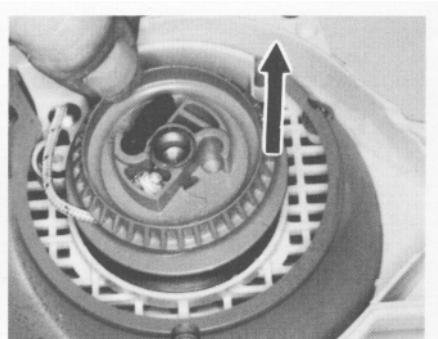
- Take out the fan housing mounting screws and remove the fan housing.

Relieving tension of rewind spring:

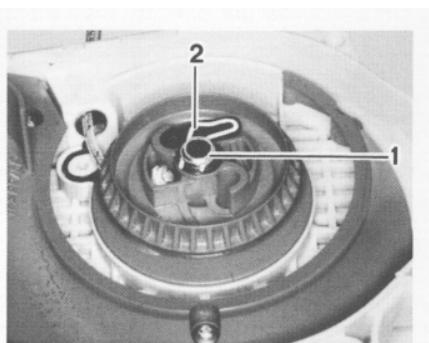
- Pull out the starter rope about 5 cm (2") and hold the rope rotor steady.
- While still holding the rope rotor steady, take three full turns off the rope rotor.
- Pull out the rope with the starter grip and then let go of the rope rotor.

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

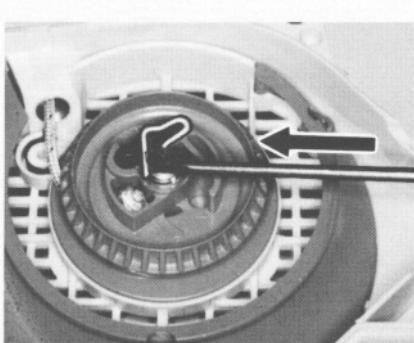
- Remove the rope from the rotor.



- Take the washer and rope rotor with pawl off the starter post.
- Replace the worn or broken starter rope - see 6.3.



- Coat the bore in the rope rotor with STIHL special lubricant - see 11.2.
- Fit the rotor on the starter post so that the inner spring loop slides into the lug on the rotor.



- Use a screwdriver or suitable pliers to carefully remove the spring clip from the starter post.

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

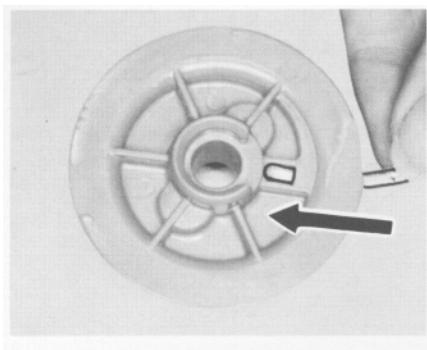
- Fit the washer (1) and install the spring clip (2) in the starter post groove.

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

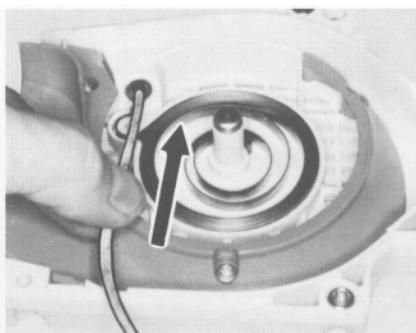
The spring clip must be treated very carefully. If it is bent or twisted during disassembly or assembly, the rewind starter might malfunction.

- Tension the rewind spring - see 6.5.

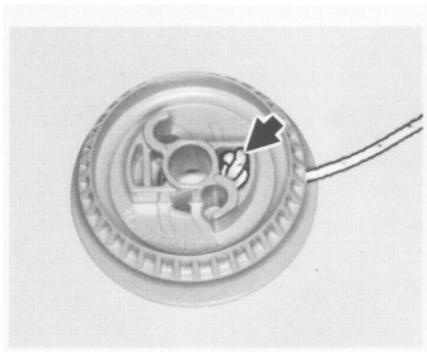
6.3 Replacing the Starter Rope



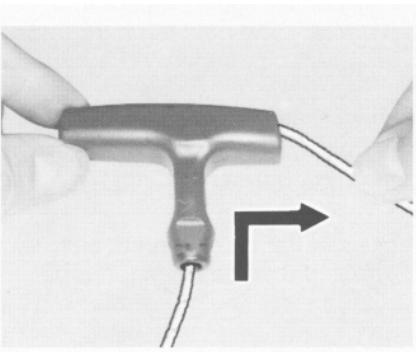
- Remove the rope rotor - see 6.2.
- Remove the remaining rope from the rope rotor.
- Thread end of new rope through hole in side of rotor.



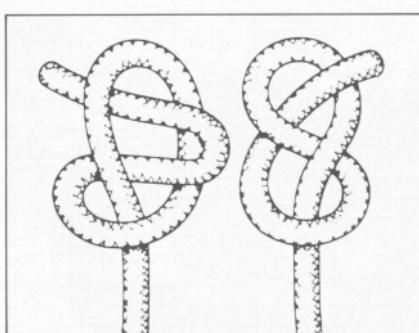
- Thread the other end of the rope through the guide bush from inside the fan housing.



- Push rope into inner bore from the underside of the rotor. Pull it through to the top and secure it with a simple overhand knot.
- Pull the rope back into the rotor so that the knot locates in the recess.

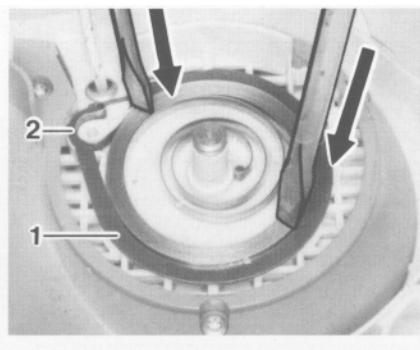


- Thread rope through the bottom of the starter grip and pull it out to the side.



- Tie one of the special knots shown and pull the rope back into the starter grip.
- Install the rope rotor - see 6.2.

6.4 Replacing the Rewind Spring



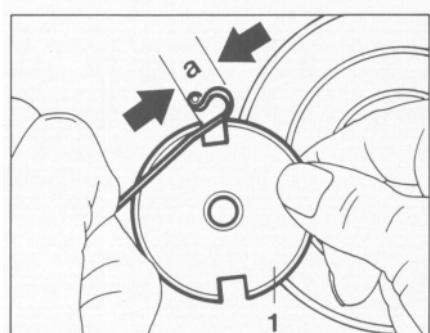
- Remove the rope rotor, see 6.2. Take out the spring housing. Use pliers to remove any remaining pieces of spring from the fan housing.

Note: The new rewind spring is supplied ready for installation with a retainer (1). It should be lubricated with a few drops of STIHL special lubricant before installation - see 11.2.

- The retainer (1) slips off as the rewind spring is pressed into the fan housing. Engage the anchor loop (2) over the lug in the fan housing.

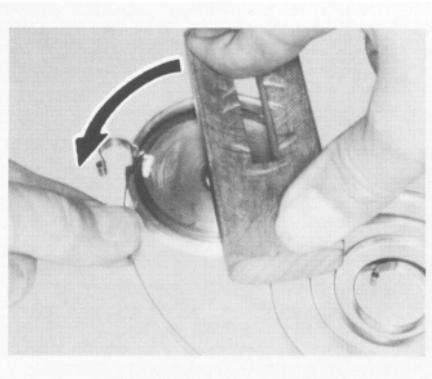
Caution: The rewind spring can pop out and uncoil during installation.

- If the rewind spring has popped out, it must be refitted as follows:



- Position anchor loop about "a" = 11 mm (0.4") from the edge of the assembly tool (1).

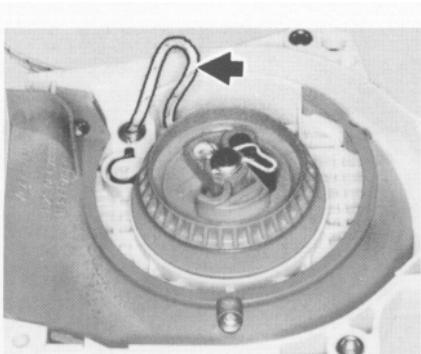
6.5 Tensioning the Rewind Spring



- Fit the rewind spring in the assembly tool in the counter-clockwise direction, starting outside and working inwards.

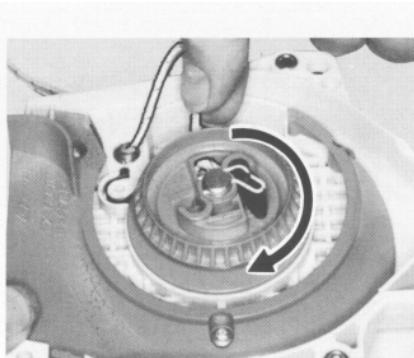
Note: The wooden assembly block can be placed over the assembly tool to simplify refitting.

- Slip the assembly tool with rewind spring over the starter post.



- Make a loop in the starter rope.

- Hold the starter grip firmly to keep the rope tensioned.
- Let go of the rope rotor and slowly release the starter grip so that the rope winds itself onto the rotor.



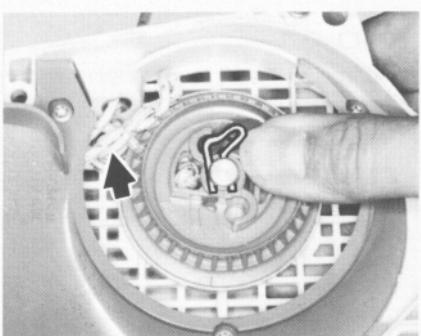
- Grip the rope **close** to the rotor and use it to turn the rope rotor seven full turns clockwise.



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.



- Push the rewind spring into the fan housing and then remove the assembly tool.
- Install the rope rotor - see 6.2.

- Hold the rope rotor steady.
- Pull out the rope with the starter grip and straighten it out.

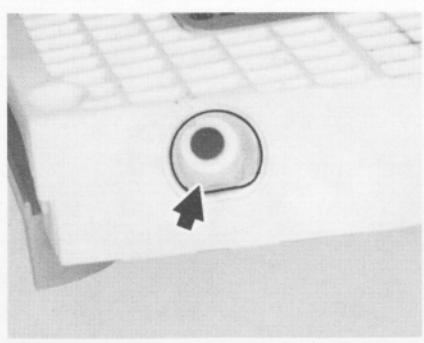
- Refit the fan housing.

6.6 Pawl

- Remove the fan housing.
- Remove the spring clip from the starter post - see 6.2.

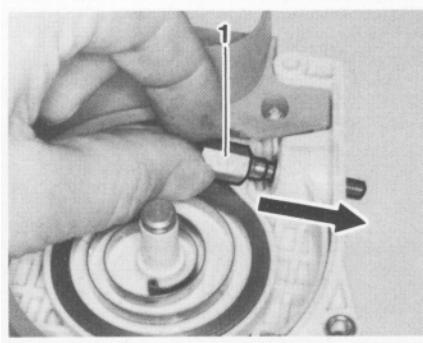
Note: Do not pull the rope rotor off the starter post.

6.7 Starter Rope Guide Bush

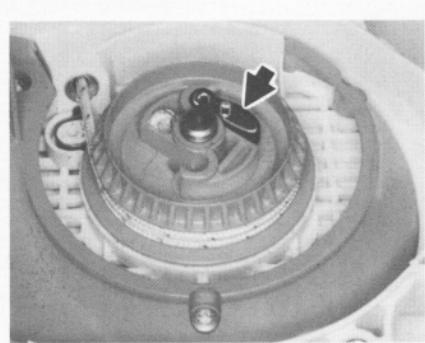


The wear on the guide bush is accelerated by the starter rope being pulled sideways. The wall of the guide bush eventually wears through, becomes loose and has to be replaced.

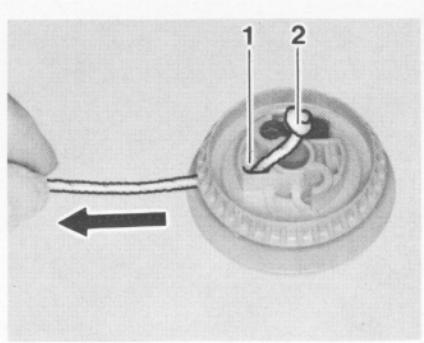
- Remove the rope rotor - see 6.2.



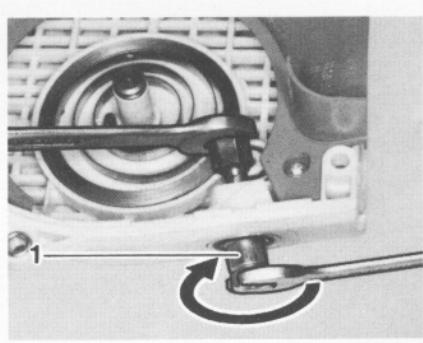
- Insert the screw spindle (1) of the installing tool through the bush from inside the housing.



- Pull the pawl out of the rope rotor.
- Coat peg of new pawl with graphite grease, see 11.2, and fit it in position.



- Pull starter rope out of recess (1) in rope rotor.
- Undo the knot (2).
- Pull starter rope out of rope rotor and guide bush.
- Use a suitable tool to pry the old bush out of the fan housing.



- Fit the thrust sleeve (1), tapered end first, and the hexagon nut.
- Tighten down the hexagon nut until the bush is firmly seated.

Installing the new rope bush:

- Place the new bush in its seat in the fan housing.

- Check that washer is fitted on starter post. Install the spring clip - see 6.2.
- Refit the fan housing.

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

- Remove the installing tool.
- Thread the starter rope through the guide bush from outside and fit it on the rope rotor - see 6.3.
- Refit the rope rotor - see 6.2.
- Refit the fan housing.

7. AV HANDLE SYSTEM

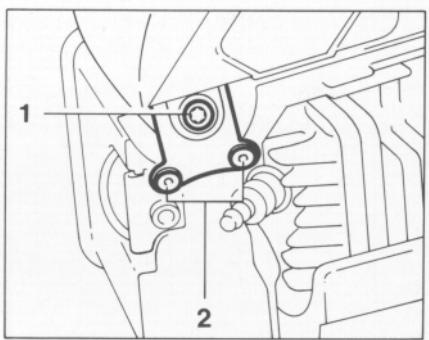
The crankcase and tank housing are connected by vibration damping rubber buffers. Damaged rubber buffers (annular buffers) must always be replaced in sets.

Front upper annular buffer

- Remove the chain sprocket cover - see 3.1.
- Remove the handle molding - see 8.2.

- Tighten lower screws to 5.5 Nm (4 lbf.ft) and center screw to 4 Nm (3 lbf.ft).

- Fit the handle molding - see 8.2
- Fit the chain sprocket cover - see 3.2.

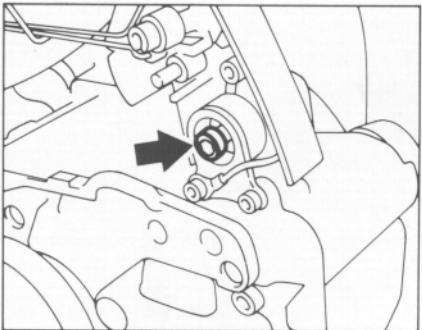


Front lower annular buffer

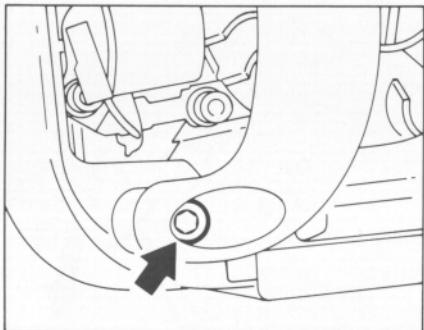
- Remove the fan housing - see 6.2.

Rear annular buffer

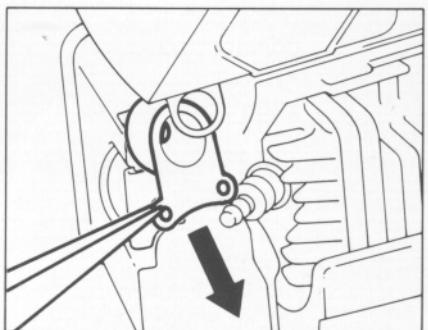
- Pull terminal off the spark plug - see 3.1.
- Take out the screws (1 and 2).



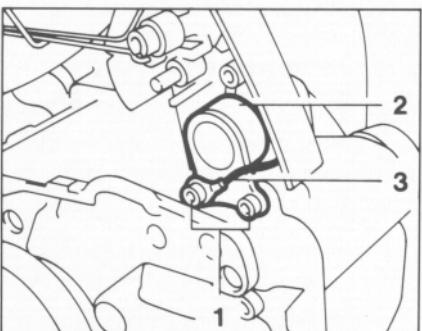
- Remove the center screw.



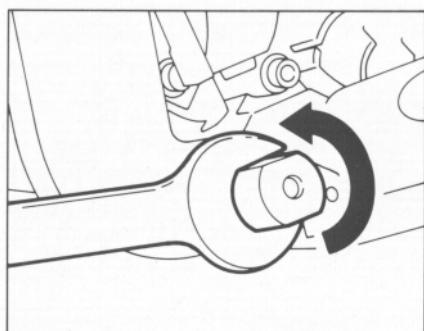
- Remove front handle mounting screw from annular buffer.



- Remove the annular buffer.
- Place annular buffer in position. Tighten lower screws to 1.7 Nm (1.25 lbf.ft) and center screw to 4 Nm (3 lbf.ft).
- Fit terminal on spark plug.
- Fit the chain sprocket cover.



- Take out the lower screws (1) and remove annular buffer (2).
- Note that ground wire (3) is secured with the lower rear screw.

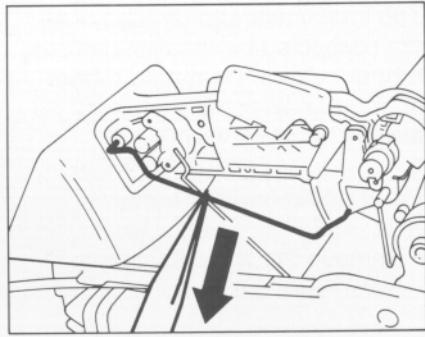
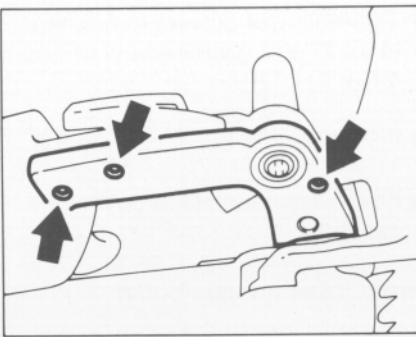
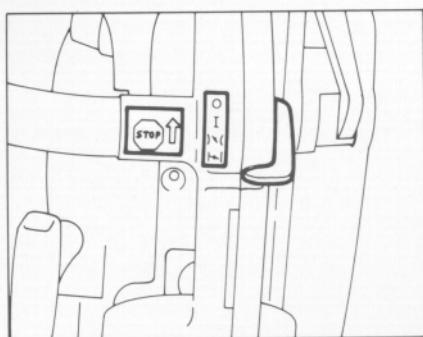


- Unscrew the annular buffer.
- Tighten front handle mounting screw to 6 Nm (4.4 lbf.ft).
- Refit the fan housing.

8. MASTER CONTROL/HANDLE SYSTEM

8.1 Master Control Lever

8.2 Choke/Throttle Rods



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:

STOP (short circuit contact closed, ignition interrupted)

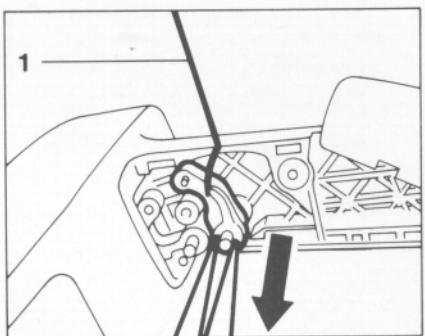
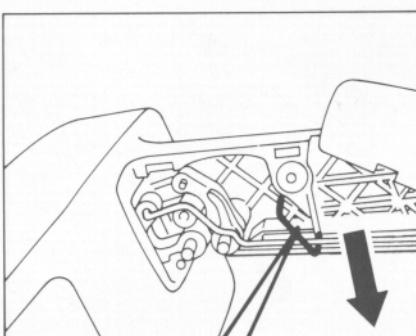
RUN (normal operating position)

START (warm start - starting throttle/choke shutter open)

CHOKE (cold start - starting throttle/choke shutter closed)

- Remove the Master Control lever – see 8.1.
- Take out the screws.
- Remove the handle molding.

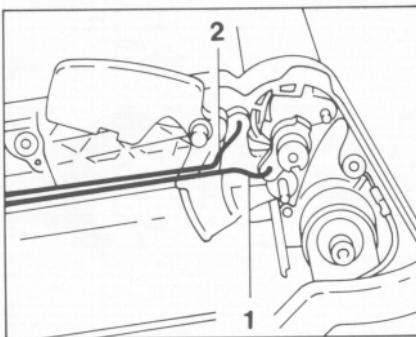
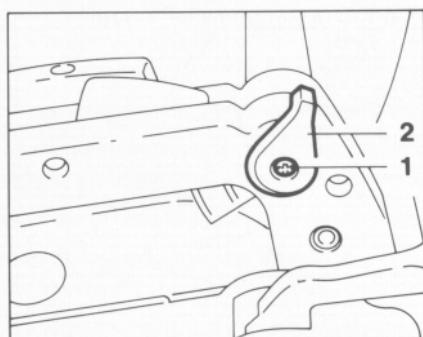
- Disconnect throttle rod from double lever (throttle).



- Pull out the retainer.

- Pull out double lever (choke) slightly, swing choke rod (1) upwards and disconnect.

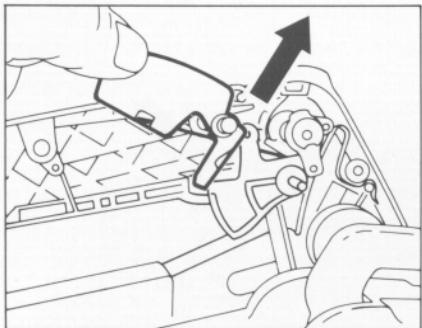
Assemble in the reverse sequence.



- Take out the screw (1).
- Pull the lever (2) off the switch shaft.

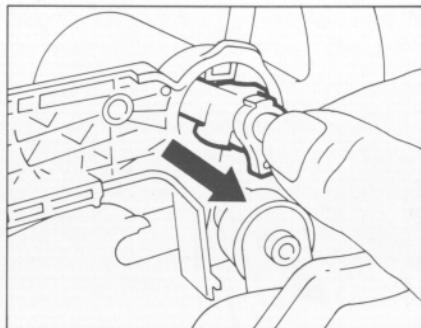
- Disconnect choke rod (1) from lever on switch shaft and throttle rod (2) from throttle trigger.

8.3 Interlock Lever/ Throttle Trigger



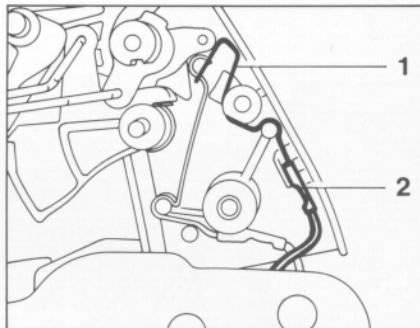
- Remove the choke/throttle rod – see 8.2.
- Take out the interlock lever.

8.4 Switch Shaft

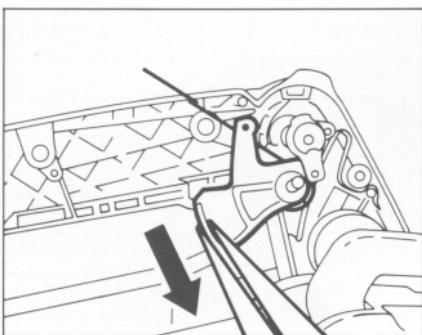


- Remove the throttle trigger – see 8.3.
- Pull out the switch shaft.

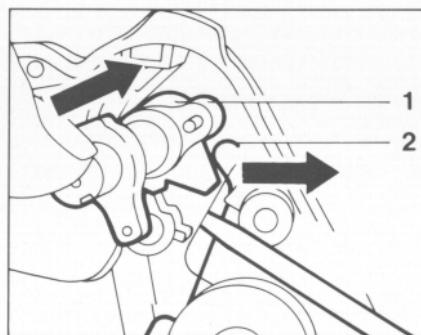
8.5 Contact Springs



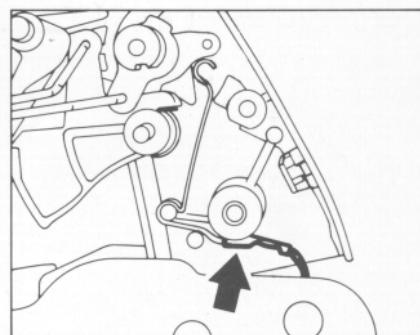
- Remove the front upper annular buffer - see 7.
- Pull out contact spring (1) for ground wire (2).
- Disconnect the ground wire.



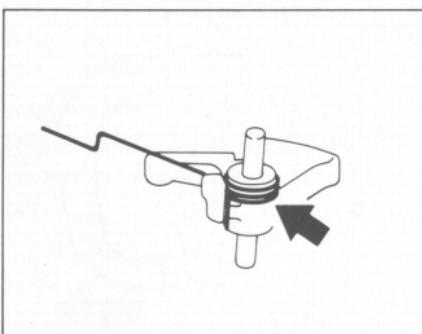
- Remove the throttle trigger.



- Push the contact spring (2) slightly to one side and fit the switch shaft (1).
- Install the throttle trigger – see 8.3.



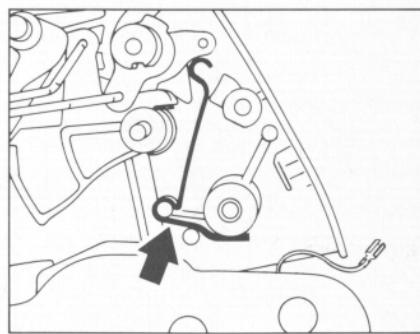
- Pull the short circuit wire off the contact spring.



- Take the torsion spring off the throttle trigger.

Assemble in the reverse sequence.

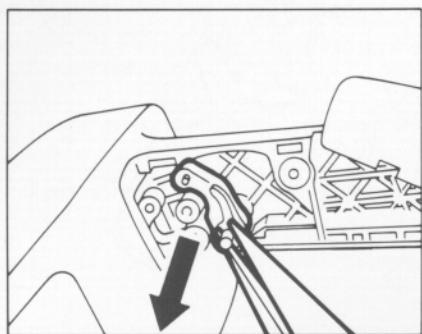
Note: Lubricate switch shaft with grease - see 11.2.



- Pull out the contact spring.

Assemble in the reverse sequence.

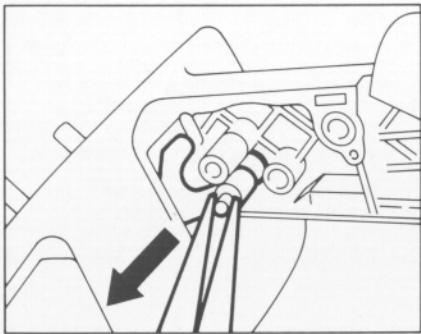
8.6 Double Lever (Choke/Throttle)



- Remove the choke/throttle rod – see 8.2.

Choke double lever:

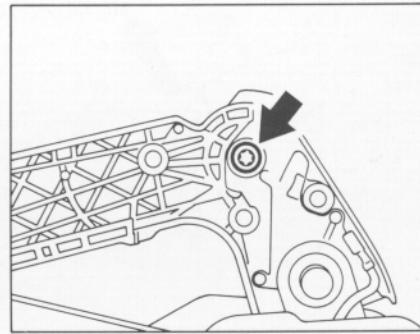
- Pull out the double lever.



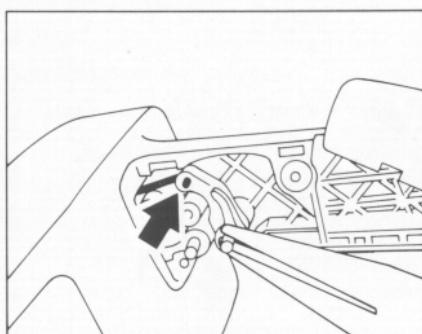
- Pull out the double lever.

Assemble in the reverse sequence.

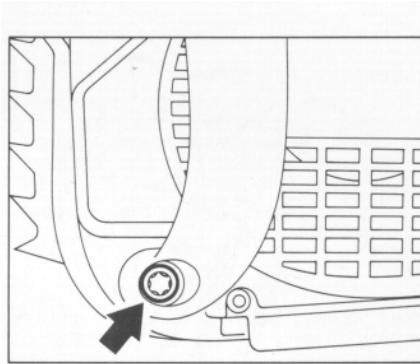
8.7 Front Handle



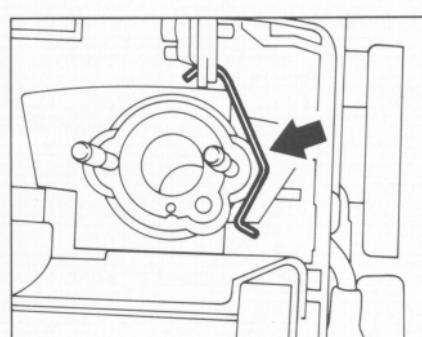
- Remove the switch shaft – see 8.4.
- Take out the upper front handle mounting screw.



Note: Note that short choke rod must be fitted in the upper hole.

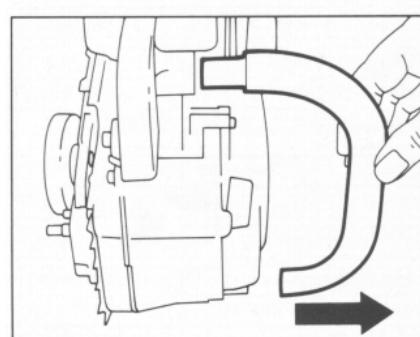


- Take out lower front handle mounting screw.



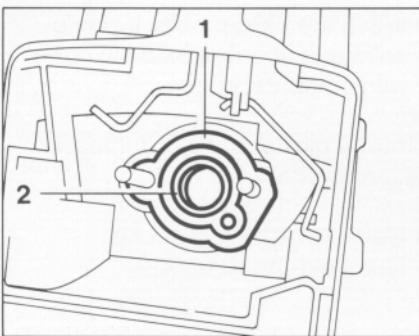
Throttle double lever:

- Remove the carburetor - see 10.2.1.
- Disconnect short throttle rod.

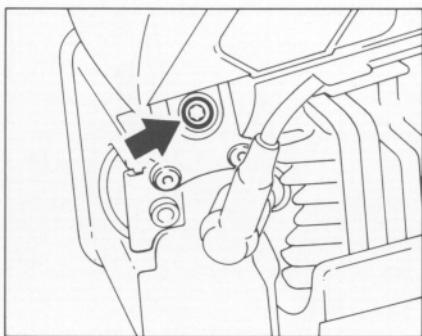


- Pull front handle out of handle housing.

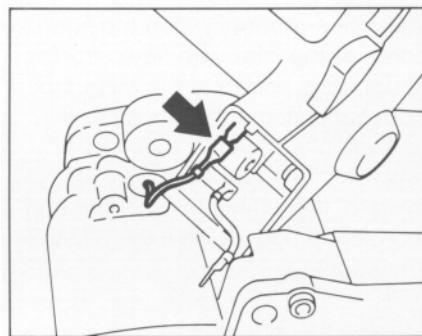
8.8 Handle Housing



- Remove the chain sprocket cover - see 3.1.
- Remove the carburetor – see 10.2.1.
- Remove the washer (1) and sleeve (2).



- Remove center screw from rear annular buffer.

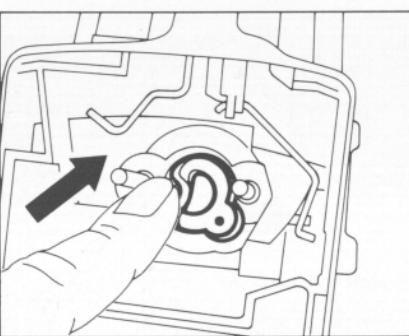


- Disconnect short circuit wire from the contact spring.

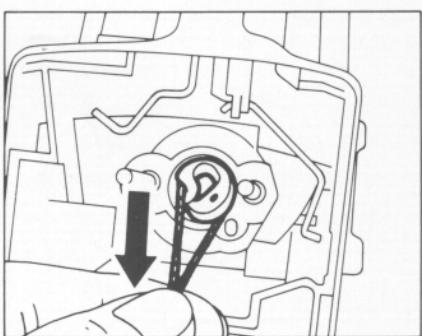
Install in the reverse sequence.



- Take out the lower front handle (1) mounting screw.
- Remove lower screw (2) from front annular buffer. Note that ground wire (3) is secured with this screw.



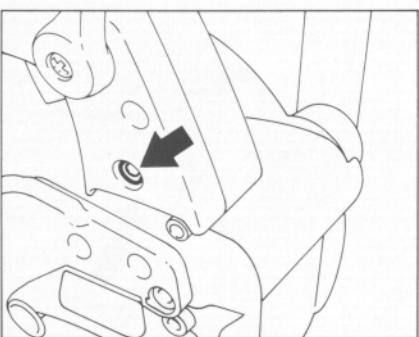
- Raise handle housing slightly and push manifold flange out of intake opening in handle housing at the same time.



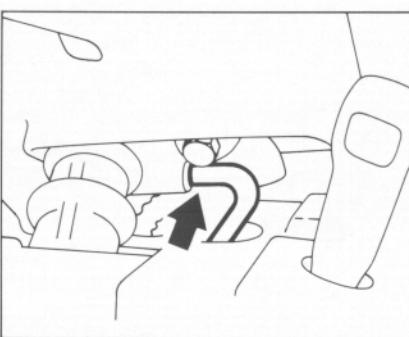
- Fit the manifold in the handle housing intake opening as follows: Wind a piece of string (approx. 15 cm / 6" long) around the back of the manifold flange and pass the ends of the string through the intake opening.

- Push the handle housing against the manifold and pull the ends of the string outward at the same time.

Note: The manifold flange is thus pulled through the handle housing intake opening without damaging the manifold.



- Remove center screw from front annular buffer.



- Pull the impulse hose off the nipple.

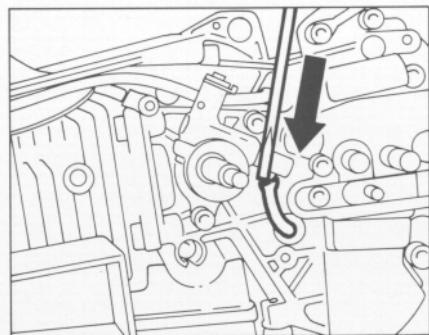
9. CHAIN LUBRICATION

9.1 Suction Hose/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 system, first check the oil tank and the pickup body. Clean the oil tank if necessary.

Troubleshooting chart - see 2.5.

- Remove the chain sprocket – see 3.3.

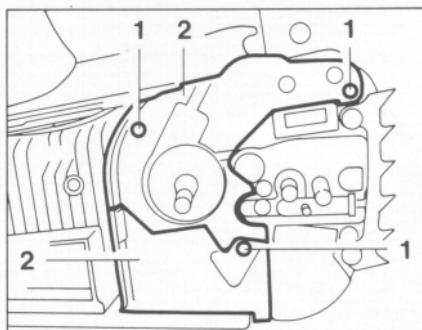


- Push suction hose off the nipple on the oil pump.

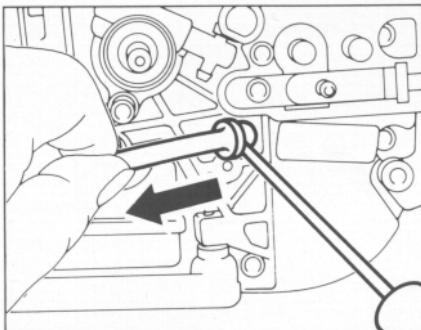
- Wash the pickup body in white spirit and, if possible, blow out with compressed air.

Note: If pickup body is damaged, fit a new one.

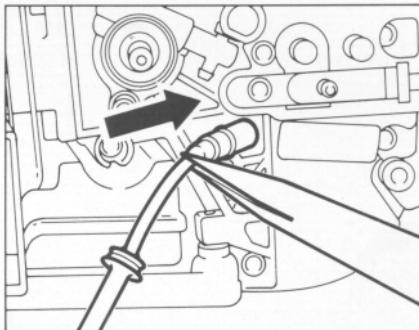
- Remove oil tank filler cap. Flush out the oil tank.



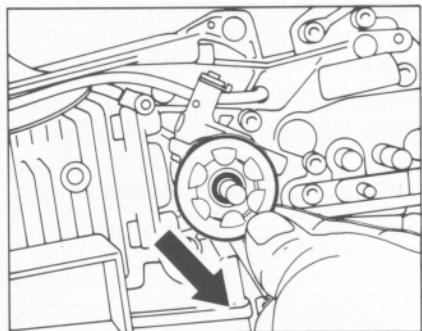
- Take out the screws (1).
- Remove the cover (2).



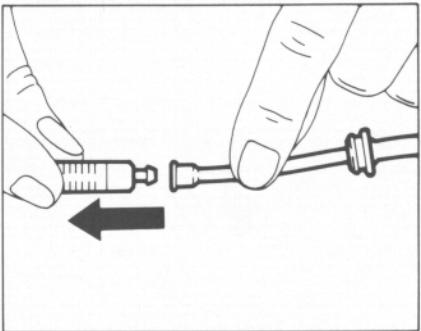
- Pry the hose flange out of the crankcase.
- Remove the suction hose with pickup body.



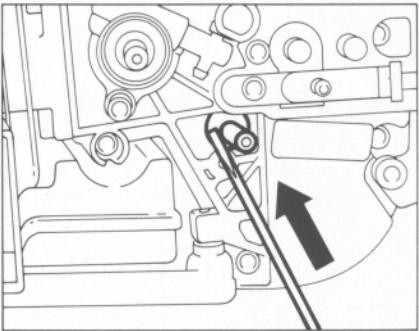
- Insert suction hose, pickup body first, in the crankcase.



- Pull the worm off the crankshaft stub.



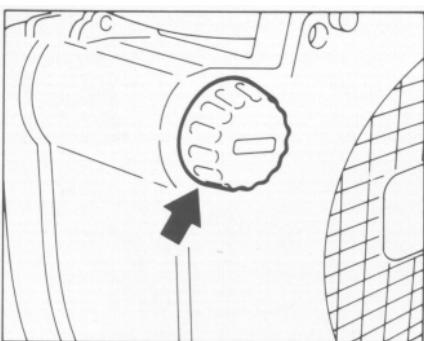
- Pull the pickup body out of the suction hose.



Note: Coat flange on hose with a little oil to simplify fitting.

Assembly is a reversal of the disassembly sequence.

9.2 Vent Valve



A valve is installed in the tank wall to keep internal tank pressure equal to atmospheric pressure.

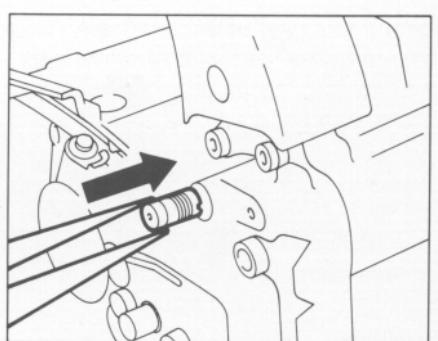
Cleaning the valve

- Unscrew the oil tank filler cap.
- Drain the oil tank.
- Remove the chain sprocket – see 3.3.

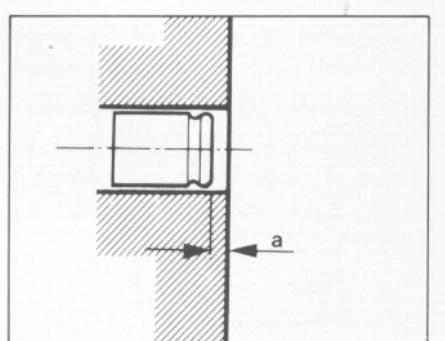
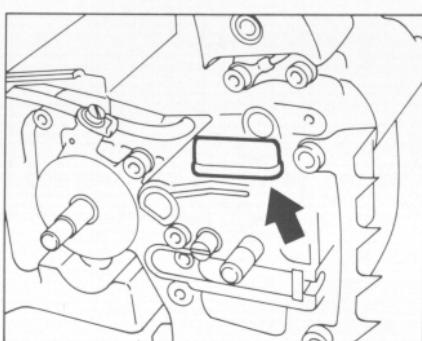
- Flush out the oil tank.
- Refit the cover.
- Fit the chain sprocket - see 3.3.
- Fit the oil tank filler cap.

Replacing vent valve

- Unscrew the oil tank filler cap.
- Remove the chain sprocket – see 3.3.
- Take out the screws.
- Remove the cover.



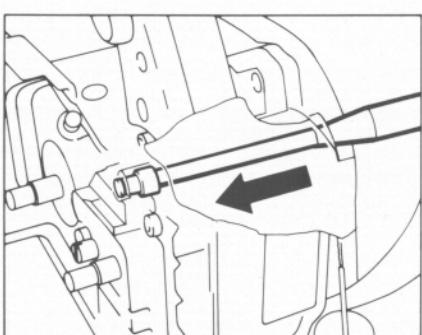
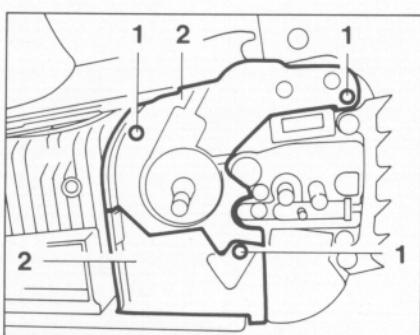
- Place vent valve in position with its smaller bore facing outwards.



- Pull out the upper bumper strip.

- Use a 7 mm (0.3") drift to carefully push home the valve until it is recessed about 1 mm (0.04") below the housing face.

- Fit the bumper strip.
- Fit the cover.
- Fit the chain sprocket - see 3.3.
- Fit the oil tank filler cap.

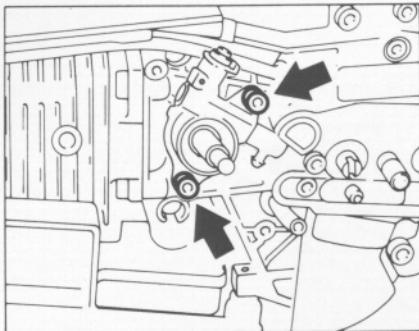


- Take out the screws (1).
- Remove the cover (2).
- Blow valve clear with compressed air (from outside).

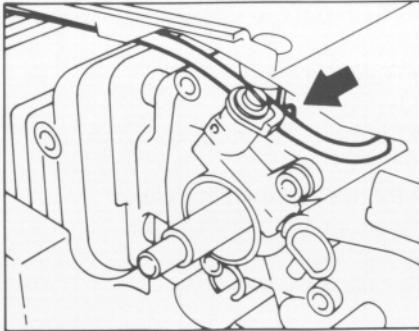
- Use a 5 mm (0.2") drift to carefully drive the vent valve out of the crankcase from inside the tank.

9.3 Oil Pump

9.3.1 Removing and Installing

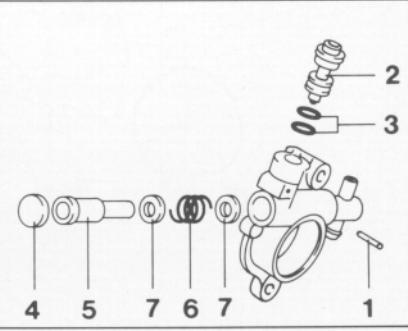


- Pull the worm off the crankshaft stub. Pull suction hose off nipple on oil pump - see 9.1.
- Take out the oil pump mounting screws.



- Note:** The ignition lead must be located in the crankcase recess behind the oil pump.
- Tighten down oil pump mounting screws to 3.5 Nm (2.6 lbf.ft).

9.3.2 Servicing

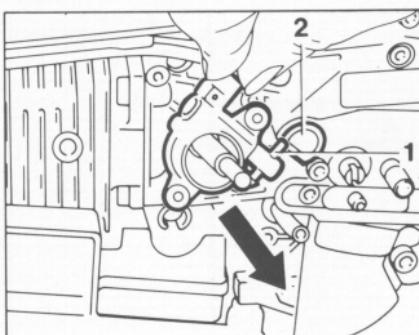


Check suction hose and pickup body before disassembling the oil pump.

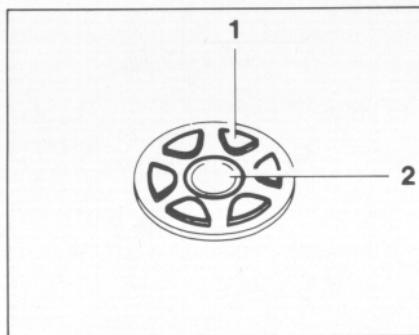
- Remove the oil pump - see 9.3.1.
- Drive out the roll pin (1) with a 2 mm (0.08") drift.
- Pull out the adjusting screw (2) and remove the O-rings (3).
- Remove the plug (4).
- Take out the pump piston (5) with spring (6) and washers (7).
- Wash all parts in white spirit. Inspect the parts for damage and replace as necessary.

Assembly is a reversal of the disassembly sequence.

Note: Always install new O-rings. Lubricate pump piston and worm with grease, see 11.2, before installing.

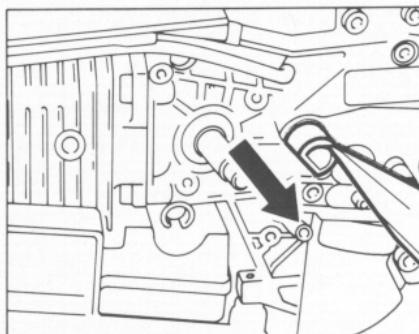


- Ease oil pump peg (1) out of plug (2) and remove the oil pump.



- Inspect the teeth (1) and bush (2) of the worm and replace worm if necessary.

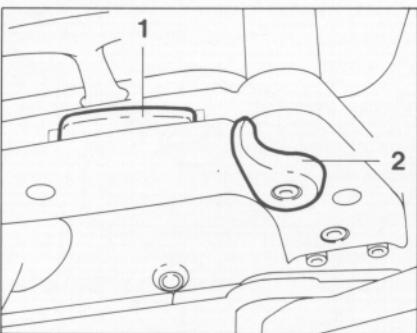
Note: The worm and chain sprocket must always have the same number of teeth.



- Remove the plug.
Install in the reverse sequence.

10. FUEL SYSTEM

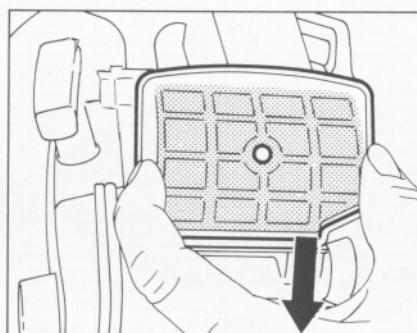
10.1 Air Filter



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.

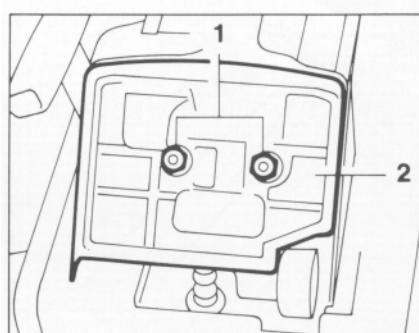
- Before removing the filter, close the choke shutter to prevent dirt falling into the carburetor - press down interlock lever (1) and move Master Control lever (2) all the way back to the cold start position.



- Clean away any loose dirt from around the filter.
- Remove the air filter.

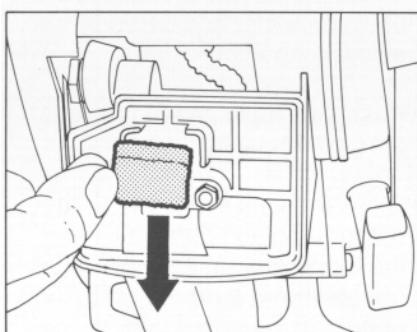
10.2 Carburetor

10.2.1 Removal and Installing

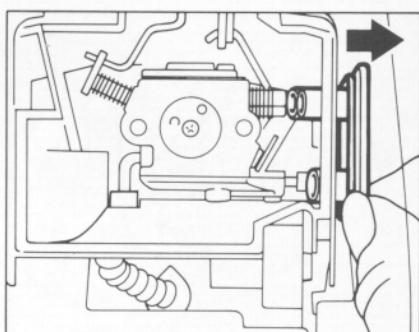


Troubleshooting chart - see 2.6.

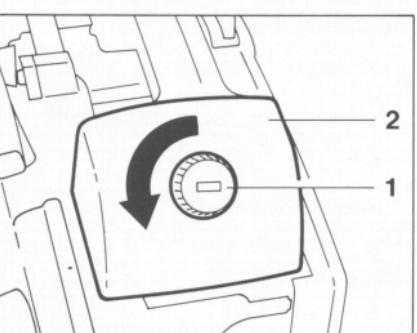
- Remove the air filter - see 10.1.
- Unscrew the carburetor mounting nuts (1).
- Remove the filter base (2).



- Take the foam element out of the filter base.
- Wash the air filter and foam element in a fresh, non-flammable cleaning solution (e.g. warm soapy water) and, if possible, blow out with compressed air. Soften encrusted dirt by soaking the parts in cleaning solution.



- Ease the grommet off the adjusting screws and pull it out of the handle housing.

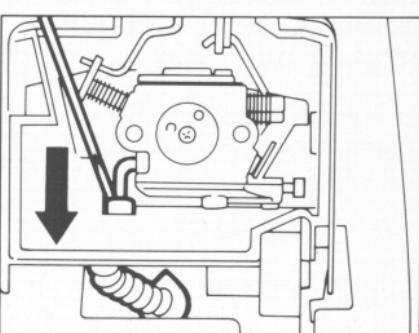


- Rotate twist lock (1) on carburetor box cover (2) one quarter turn counterclockwise and remove the cover.

Important: Flocked air filters must not be cleaned with compressed air, brushes or cloths.

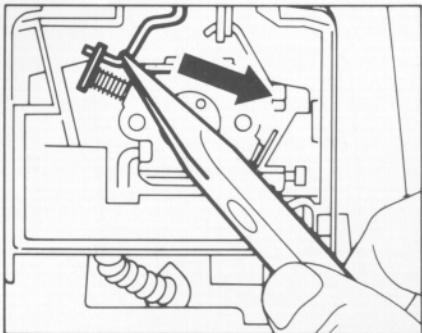
Note: If filter is damaged, install new part immediately.

Installation is a reversal of the removal sequence.

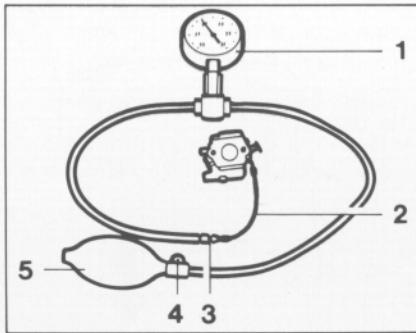


- Push the fuel hose off the elbow connector.

10.2.2 Leakage Testing



- Disconnect the choke rod from the choke shaft.



The carburetor can be tested for leaks with the carburetor and crankcase tester (1).

- Remove the carburetor - see 10.2.1.
- Use fuel line (2) with nipple (3) as adapter to make connection between tester and carburetor's elbow connector.
- Push the nipple into the tester's pressure hose.
- Close the vent screw (4) on the rubber bulb and pump air into the carburetor until the pressure gauge shows a reading of approx. 0.4 bar (5.8 psi).

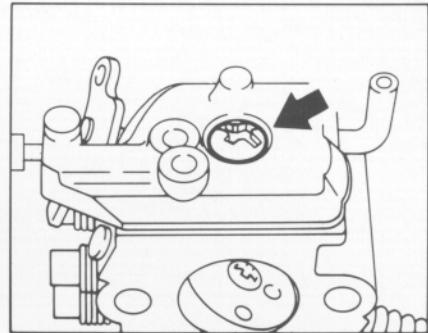
If this pressure remains constant, the carburetor is airtight. However, if it drops, there are two possible causes:

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 case the carburetor must be removed and serviced.

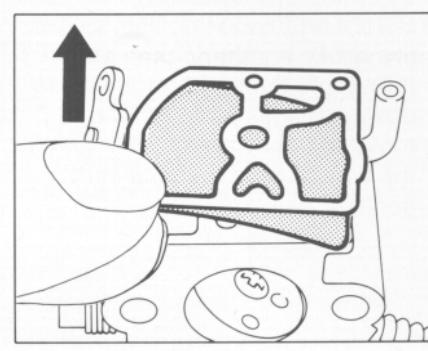
- After completing test, open the vent screw and pull the fuel line off the elbow connector.
- Install the carburetor - see 10.2.1.

10.2.3 Servicing



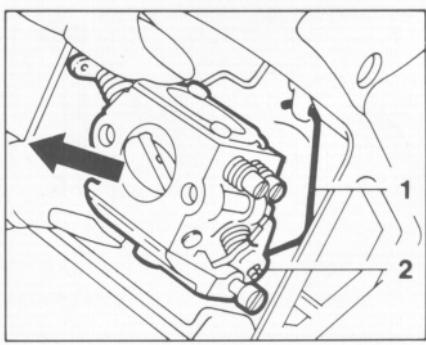
- Remove the carburetor see 10.2.1.

- Unscrew and remove the fuel pump end cover.



- Remove the gasket and pump diaphragm from the cover or carburetor body.

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

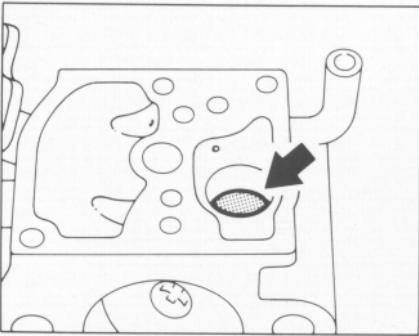


- Pull the carburetor off the studs and detach the throttle rod (1) from the throttle shaft (2) at the same time.

Installation is a reversal of the removal sequence.

Note: Check that sleeve (in manifold) and washer are in place before fitting the carburetor.

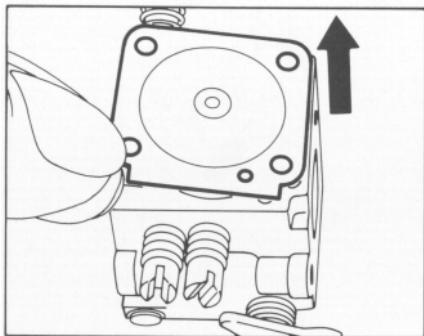
Fit new mounting nuts and tighten them down to 3.3 Nm (2.4 lbf.ft).



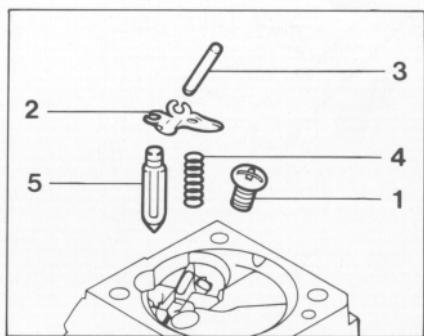
- If the fuel strainer in the pump side of the carburetor body is dirty, use a scriber to pry it out and then clean it.

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

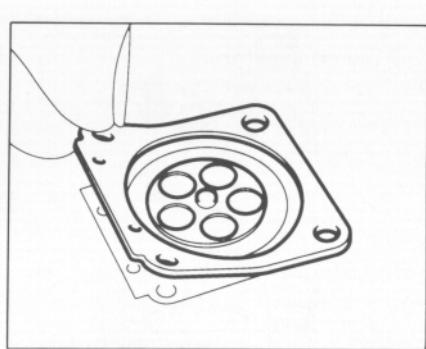
In such a case the fuel pickup body should also be inspected and replaced if necessary - see 10.4.



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



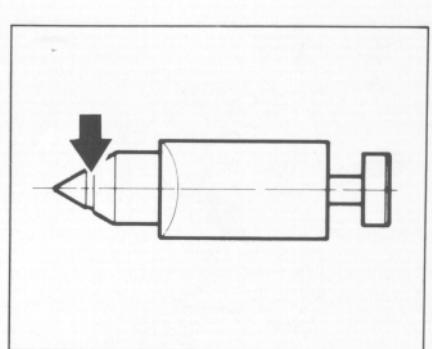
- Remove the round head screw (1).
- Remove the inlet control lever (2) with spindle (3), helical spring (4) and inlet needle (5).



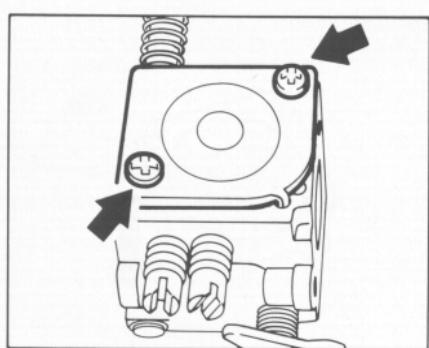
- Carefully separate the diaphragm and gasket.
- Inspect diaphragms and replace if necessary.

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 and have to be replaced.

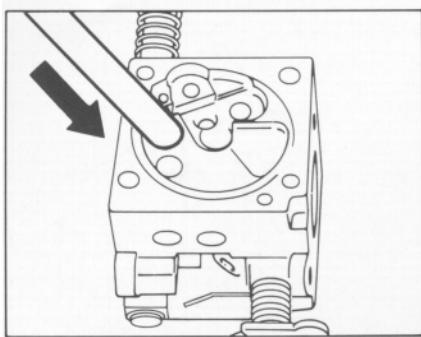
The inlet needle valve is located in a recess in the metering diaphragm chamber.



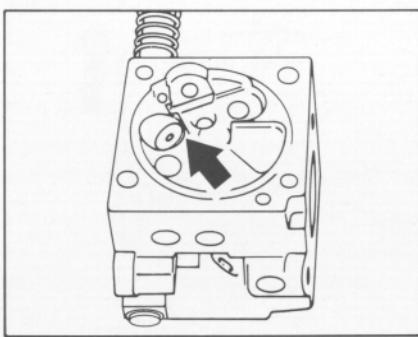
- If there is an annular indentation on the sealing cone of the inlet needle, it will be necessary to replace the inlet needle because it will no longer seal properly. This is indicated by constant flooding of the carburetor even though the needle is clean.
- Remove the carburetor adjusting screws.



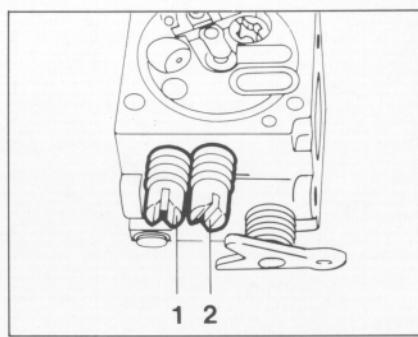
- Take out the screws of the metering chamber end cover and lift away the cover.



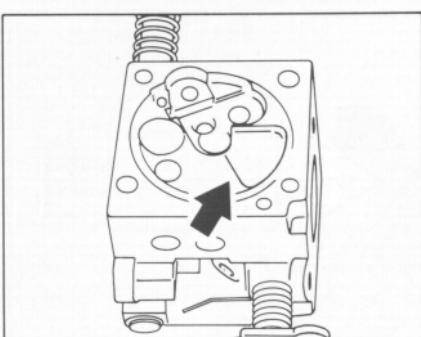
- Use a 4.5 mm (0.18") dia. drift to press the valve jet out of its seat in the direction of the venturi and wash it in white spirit.



- Insert valve jet so that it is exactly square in the bore. Press it home until it is flush with the bottom of the metering chamber.



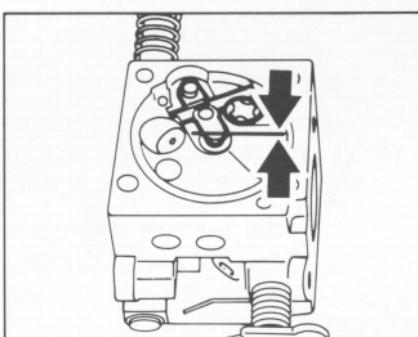
- Carefully screw the high speed (1) and low speed (2) adjusting screws down onto their seats and then back them off one full turn.



- Remove the sealing plug from the metering chamber.

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

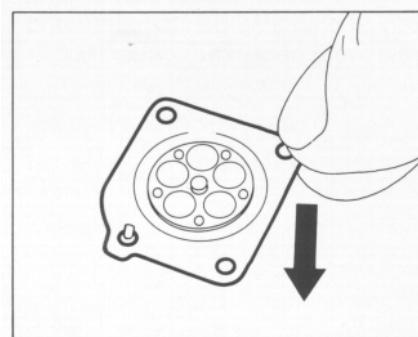
- Wash the carburetor body and all parts in fresh white spirit and blow clear with compressed air, paying special attention to the bores and ports.



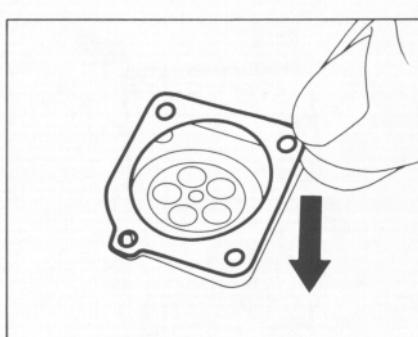
- Fit the inlet needle and the helical spring in their respective bores. Insert spindle in the inlet control lever, engage clevis in annular groove on the head of the inlet needle and tighten down the round head screw. Make sure that the helical spring locates on the control lever's nipple.
- Check easy action of the inlet control lever.

Important: The top of the inlet control lever must be level with the bottom of the metering chamber. If necessary, use suitable pliers to carefully bend the lever.

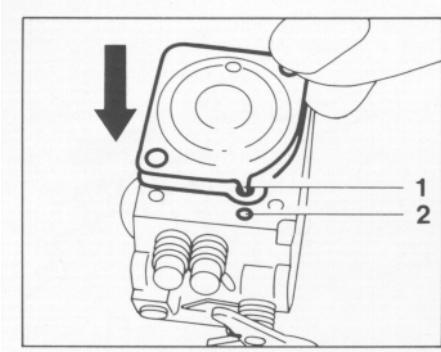
- After fitting new sealing plug, fill gap between carburetor body and plug with Loctite - see 11.2.



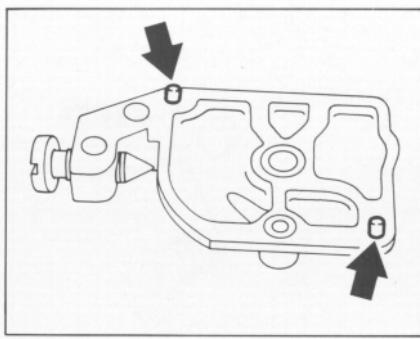
- Fit metering diaphragm on end cover.



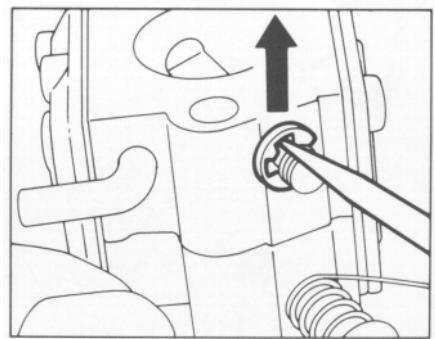
- Place gasket on metering diaphragm.



- Position end cover on carburetor body so that peg (1) engages the bore (2).
- Insert screws and tighten down firmly.

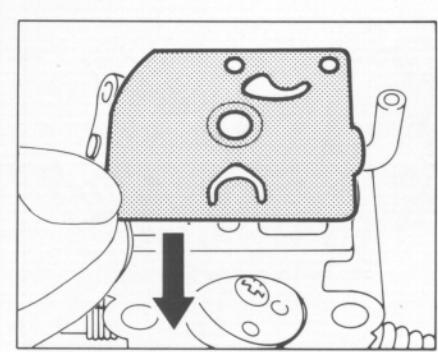


- Fit the end cover.
- Insert screws and tighten down firmly.

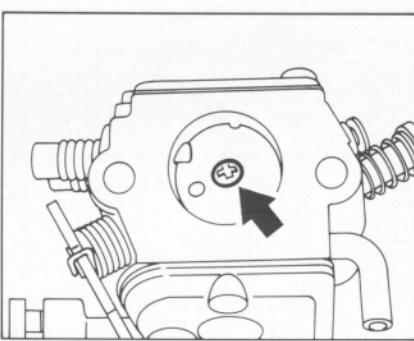


- Remove the E-clip.

Note: The pump diaphragm and gasket are held in position by integrally cast pegs on the end cover.

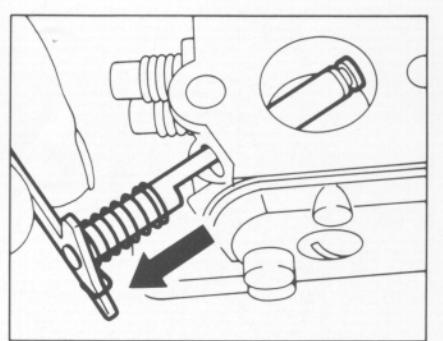


- Insert the fuel strainer at the pump side.
- Fit the pump diaphragm.

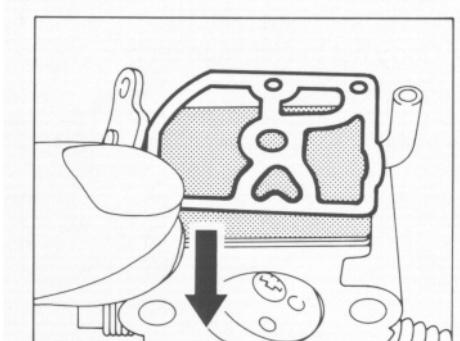


Removing the throttle shaft

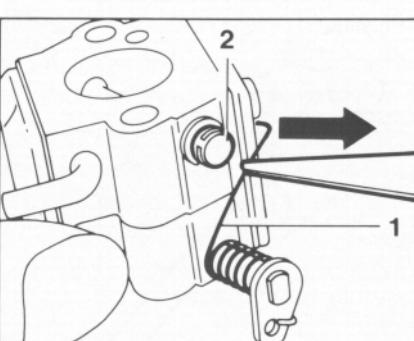
- Unscrew the throttle shutter fastening screw.
- Take out the throttle shutter.



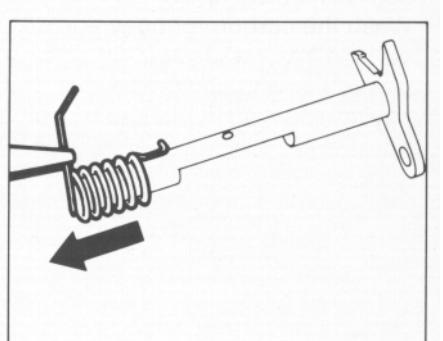
- Pull out the throttle shaft.



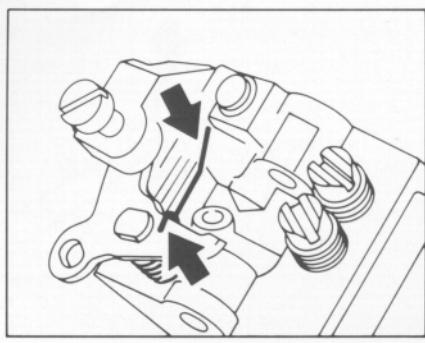
- Place gasket on pump diaphragm.



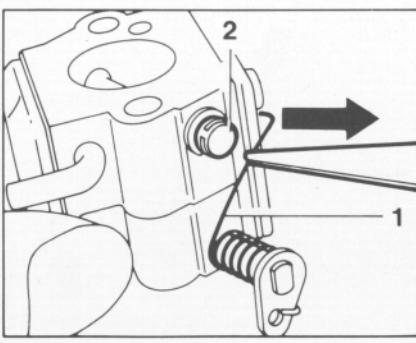
- Disconnect the torsion spring (1) from the groove in the throttle shaft (2).



- Remove the torsion spring.

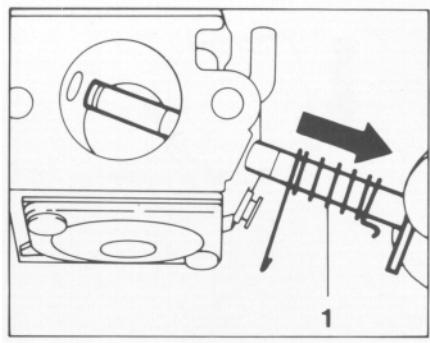


- After fitting the throttle shaft, check that the torsion spring is correctly positioned.

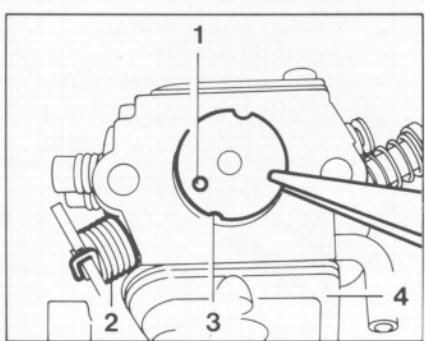


Removing the choke shaft

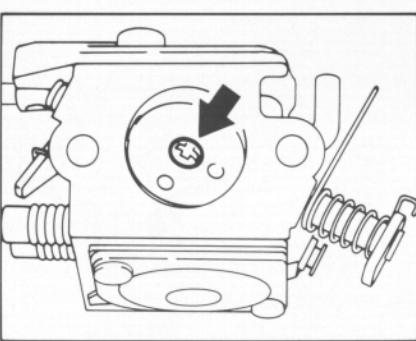
- Disconnect the torsion spring (1) from the groove in the throttle shaft (2).



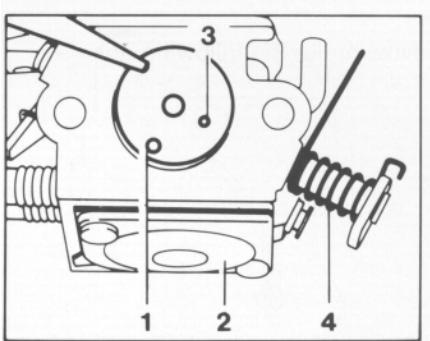
- Pull out the choke shaft.
- Remove the torsion spring (1).



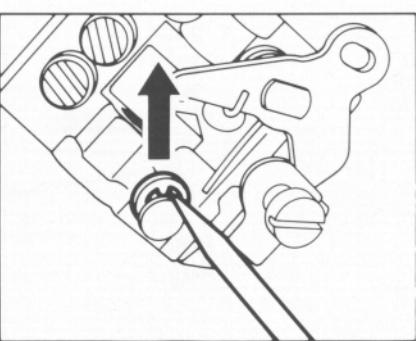
- Fit the throttle shutter so that the hole (1) is at the same side as the torsion spring (1) and the larger notch (3) points towards the fuel pump end cover (4).
- Coat thread of fastening screw with Loctite, see 11.2, and tighten it down firmly.



- Unscrew the choke shutter fastening screw.
- Remove the choke shutter.

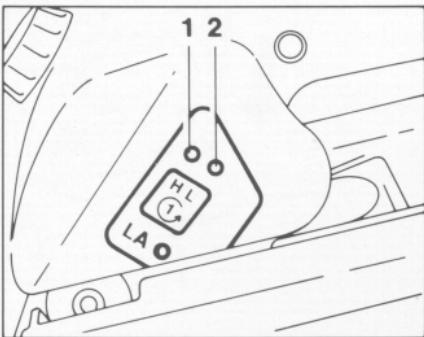


- Position the choke shutter so that the outer hole (1) points towards the metering end cover (2) and the inner hole (3) towards the torsion spring (4).
- Coat the fastening screw with Loctite, see 11.2, and tighten down firmly.
- Carry out the leakage test – see 10.2.2.
- Install the carburetor - see 10.2.1.



- Remove the E-clip.

10.3 Carburetor Adjustment



Standard setting

If the carburetor has to be adjusted from scratch, first carry out the standard setting.

- Carefully screw in both adjusting screws clockwise until they are hard against their seats.

Now make the following adjustments:

H =

High speed adjusting screw (1)
backed off 1 full turn

L =

Low speed adjusting screw (2)
backed off 1 full turn

Note: If no tachometer is available, do not turn the high speed adjusting screw beyond the standard setting to make the mixture leaner.

A minor correction may be necessary if the saw is used at high altitudes (mountains) or near sea level.

For corrections to high speed adjusting screw (H):

Use a tachometer - do not exceed max. permissible engine speed.

Engine can be damaged by lack of lubricant and overheating.

Maximum engine speed with bar and properly tensioned chain:

14,500 r.p.m.

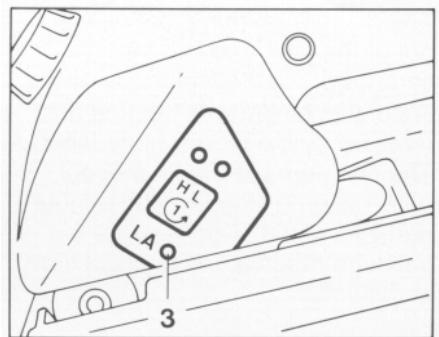
- Check chain tension.
- Check air filter and clean if necessary.
- Adjust idle speed correctly (chain must not rotate)
- Start the saw – warm up the engine.

Turn high speed adjusting screw (H) and low speed adjusting screw (L) clockwise for leaner mixture at high altitudes or counterclockwise for richer mixture at sea level.

Turn screws very slowly and carefully - even slight adjustments produce a noticeable change in engine running behavior.

Corrections to high speed adjusting screw:

The setting of the high speed adjusting screw (H) affects the maximum off-load engine speed. If the setting is too lean, the maximum permissible engine speed will be exceeded and increase the risk of engine damage.



Adjusting engine idle speed:

A correction at the low speed adjusting screw (L) usually necessitates a change in the setting of the idle speed stop screw (LA) (3).

Engine stops while idling

Check standard setting. Turn idle speed stop screw (LA) clockwise until the chain begins to run - then turn it back one quarter turn.

Chain runs while engine is idling:

Check standard setting. Turn the idle speed stop screw (LA) counterclockwise until the chain stops running - and 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 (L) counterclockwise until the engine runs and accelerates smoothly.

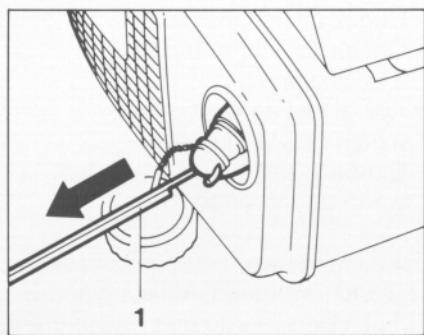
Exhaust smokes at idle speed:

Idle setting too rich. Turn the low speed adjusting screw (L) clockwise until the engine speed drops - and then turn it back one quarter turn - and check that the engine accelerates smoothly when the throttle is opened.

10.4 Pickup Body/Fuel Hose

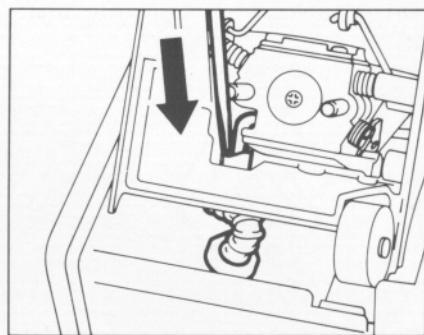
The diaphragm pump draws fuel out of the tank and into the carburetor via the fuel hose. Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in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

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



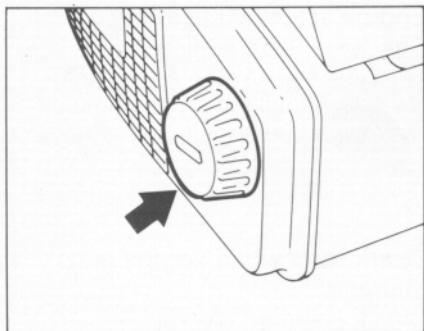
Pickup body

- Use the assembly hook (1) to pull the pickup body out through the fuel tank filler opening.



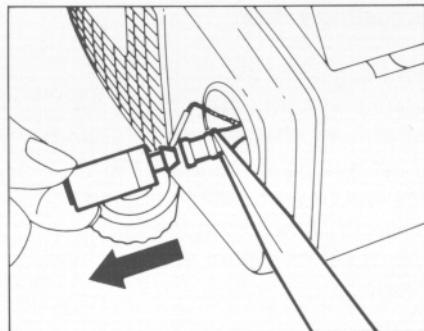
- Push the fuel intake hose off the elbow connector.

Note: Do not stretch the fuel hose while removing it.



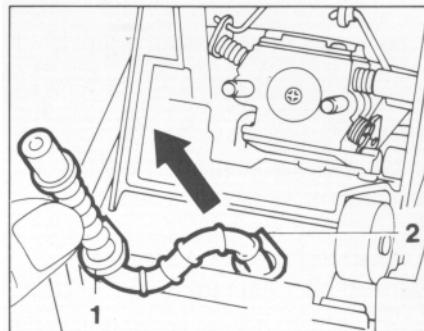
Cleaning the fuel tank

- 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.



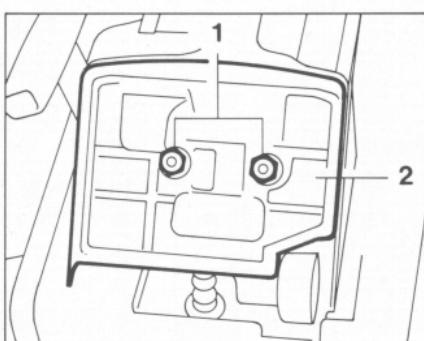
- Pull the pickup body off the fuel hose.

Install in the reverse sequence.



- Pull off the pickup body.
- Pry the fuel hose out of the fuel tank and lift it away.

Install in the reverse sequence.



Fuel intake hose

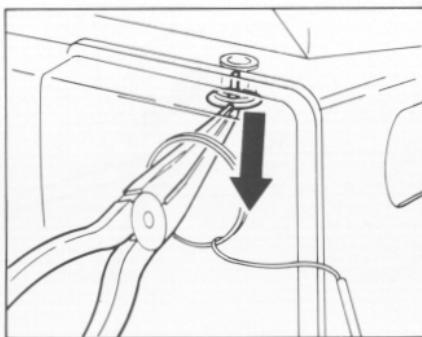
- Remove the air filter - see 10.1.
- Unscrew the carburetor mounting nuts (1).
- Remove the filter base (2).

Note: Coat the hose flange (1) with a little oil to simplify installation. The pointed tip of the flange must locate in the pointed recess (2) in the fuel tank.

10.5 Tank Vent

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.

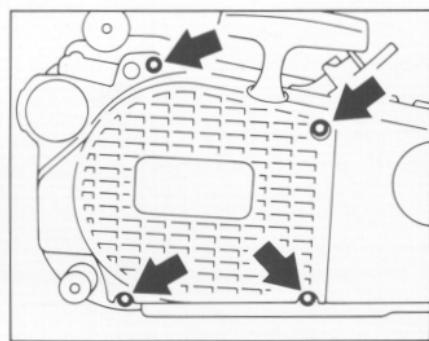
Important: In the event of trouble with the carburetor or the fuel supply system, always check and clean the tank vent.



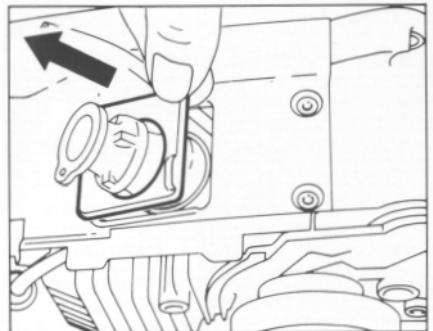
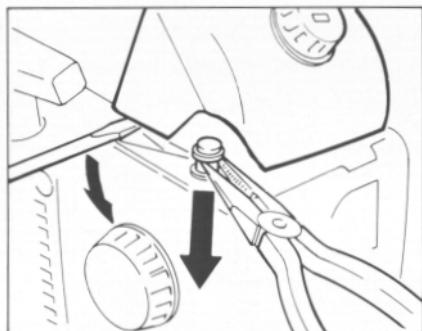
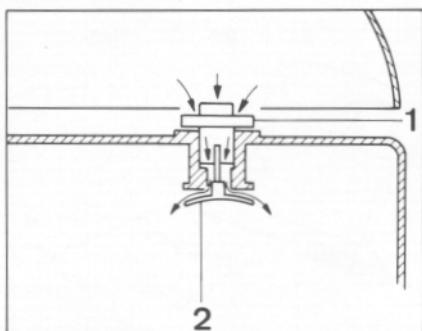
- Unscrew the tank filler cap.
- Pull the valve out of its seat in the tank.

Install in the reverse sequence.

10.6 Tank Housing



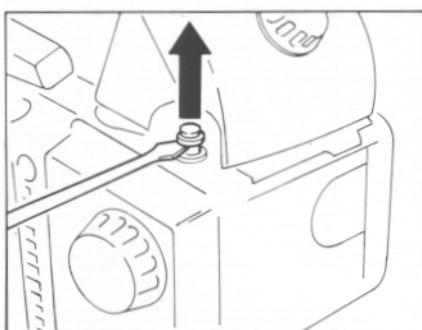
- Remove the handle housing – see 8.8.
- Take out fan housing mounting screws.
- Remove the fan housing.



Equalization of pressure from the outside inwards takes place via the filter element (1) and the valve (2). If pressure builds up in the tank, the valve closes and excess pressure is dissipated via the carburetor.

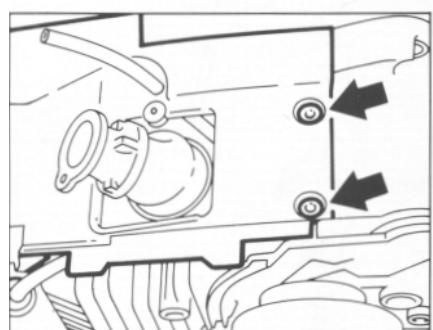
Note: Press in valve as far as stop.

Use a screwdriver to carefully raise the rear of the handle housing slightly. Position filter element in the bore and press it home as far as stop.

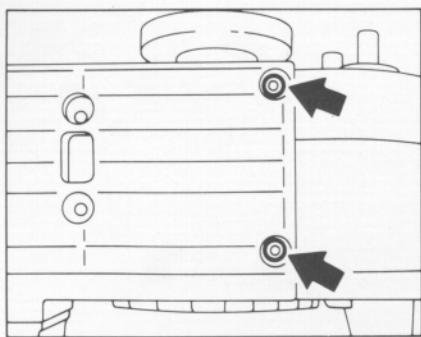


- Use suitable tool to remove filter element.

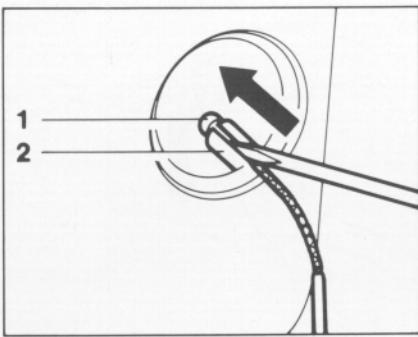
Note: Remove handle housing if necessary - see 8.8.



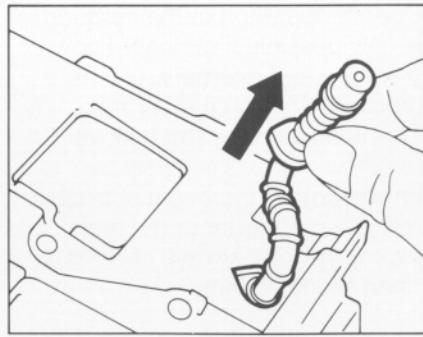
- Remove upper screws from tank housing.



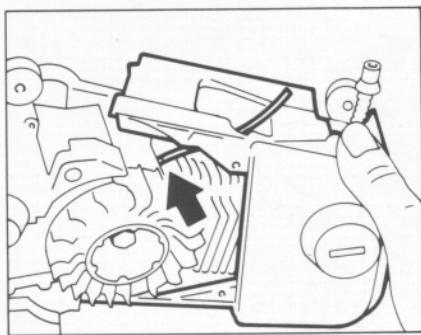
- Remove screws from underside of tank housing.



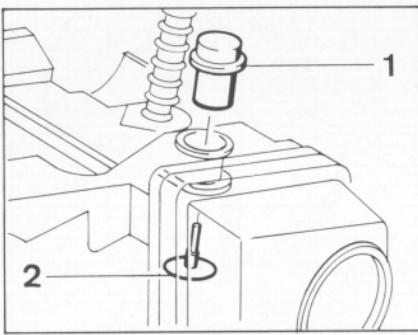
- Unscrew filler cap and push cord (1) out of groove (2).



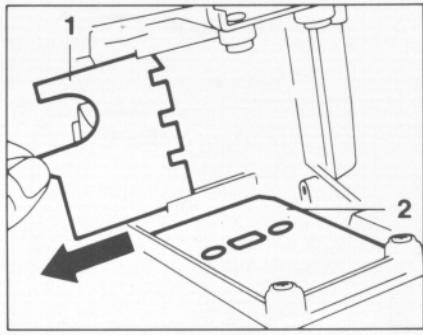
- Pry the flange of the fuel hose out of the tank and lift it away.



- Pull tank housing slightly forwards, disconnect impulse hose from nipple and then remove tank housing.



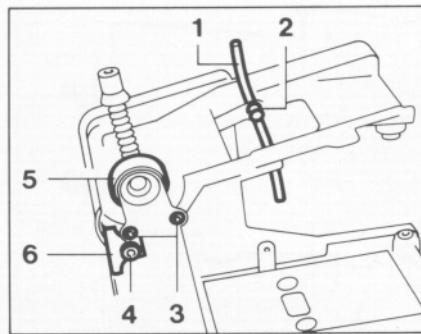
- Remove filter element (1) and valve (2) of tank vent.



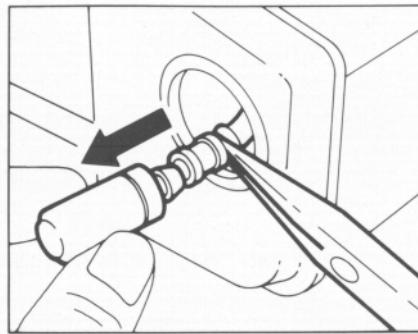
- Take out the insulating plate (1).

Reassemble and install in the reverse sequence.

Note: Bond a new heat reflecting foil (2) in the new tank housing.



- Pull out the impulse hose (1) and grommet (2). Take out screws (3 and 4). Remove annular buffer (5) and retainer (6).



- Pull the pickup body off the fuel hose.

11. Special Servicing Tools and Aids
11.1 Special Servicing Tools

No.	Part Name	Part No.	Application	Rem.
1	Locking strip for piston	0000 893 5903	Blocking the crankshaft	
2	Press sleeve	1129 893 2400	Installing oil seal and roller bearing in crankcase	
3	Assembly sleeve	1129 893 4600	Protecting oil seal at ignition side	
4	Assembly hook	5910 890 2800	Detaching springs from clutch shoes	
5	Assembly tube	1117 890 0900	Attaching the brake spring	
6	Assembly drift	1114 893 4700	Fitting piston pin	
7	Clamping strap	0000 893 2600	Compressing piston rings	
8	Wooden assembly block	1108 893 4800	Fitting piston	
9	Carburetor and crankcase tester	1106 850 2905	Testing carburetor and crankcase for leaks	
10	Vacuum pump	0000 850 3501	Testing crankcase for leaks	
11	- Nipple	0000 855 9200		
12	- Fuel line	1110 141 8600		
16	Sealing plate	0000 855 8106	Sealing exhaust port for leakage test	
17	Test flange	1128 850 4200	For leakage test	
18	Setting gauge	1111 890 6400	Setting air gap between ignition module and flywheel	
13	- Flange	1123 850 4200		
14	- Pin	0000 963 1008		
15	- Pan hd. screws	9043 319 8100		
19	Stud puller M8	5910 893 0501	Removing bar mounting stud	
20	Installing tool 9	5910 890 2209	Fitting hookless snap rings in piston	
21	Puller	1116 893 0800	Removing flywheel	
22	Service tool AS (set)	5910 007 2205	Separating crankcase halves	
23	- Threaded sleeve	5910 893 2407		
24	Screwdriver bit T27x125	0812 542 2104	For IS screws (5 mm)	
25	Socket, 13 mm	5910 893 5608	Crankshaft nut (ign. end) and clutch	
26	Torque wrench	5910 890 0301	Screw assemblies (0.5 to 18 Nm)	1)
		5910 890 0302		2)
27	Torque wrench	5910 890 0311	Screw assemblies (6 to 80 Nm)	1)
		5910 890 0312		2)
28	Assembly tool	1116 893 4800	Installing rewind spring	
29	Installing tool	0000 890 2201	Flaring rope guide bush	
30	Assembly hook	5910 893 8800	Removing pickup body	
31	Screwdriver T20x100	5910 890 2301	For all IS-P screws (4 mm)	
32	T-handle screwdriver			
	Q-SW 8x200	5910 890 2420	Carburetor nuts	
33	Crimping tool	5910 890 8210	Attaching connectors to electrical wires	
34	Assembly stand	5910 850 3100	Holding saw for repairs	
35	Screwdriver T27x150	5910 890 2302	For all IS screws (5 mm)	
36	Puller	0000 890 4400	Removing oil seals	
37	- Jaws	0000 890 3700		
38	Socket T20x125	0812 542 2041	Tightening IS-P screws (4 mm)	

Remarks:

- 1) Plastoform and DG screws must always be tightened with torque wrench.
- 2) Wrench has optical/acoustic signal.

11.2 Servicing Aids

No.	Part Name	Part No.	Application
1	Lubricating grease	0781 120 1111	Oil seals, oil pump drive, chain sprocket bearing, chain tensioner, switch shaft/contact spring
2	STIHL multipurpose grease (80 g/2 3/4 oz tube)	0781 120 1109	Packing high voltage output on ignition module
3	High-strength threadlocking (Loctite 270)	0786 111 1109	Screws for throttle shutter and choke shutter, sealing plug in carb
4	Threadlocking adhesive (Loctite 243)		Bar mounting stud
5	Standard commercial, solvent-based degreasant without chlorinated or halogenated hydrocarbons		Cleaning crankshaft stub
6	STIHL special lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring in rope rotor
7	Ignition lead HTR (10 m/33')	0000 930 2251	
8	Electrician's repair kit	0000 007 1013	
9	Graphite grease		Guide peg on starter pawl
10	Molykote grease		Sliding and pivot points of chain brake