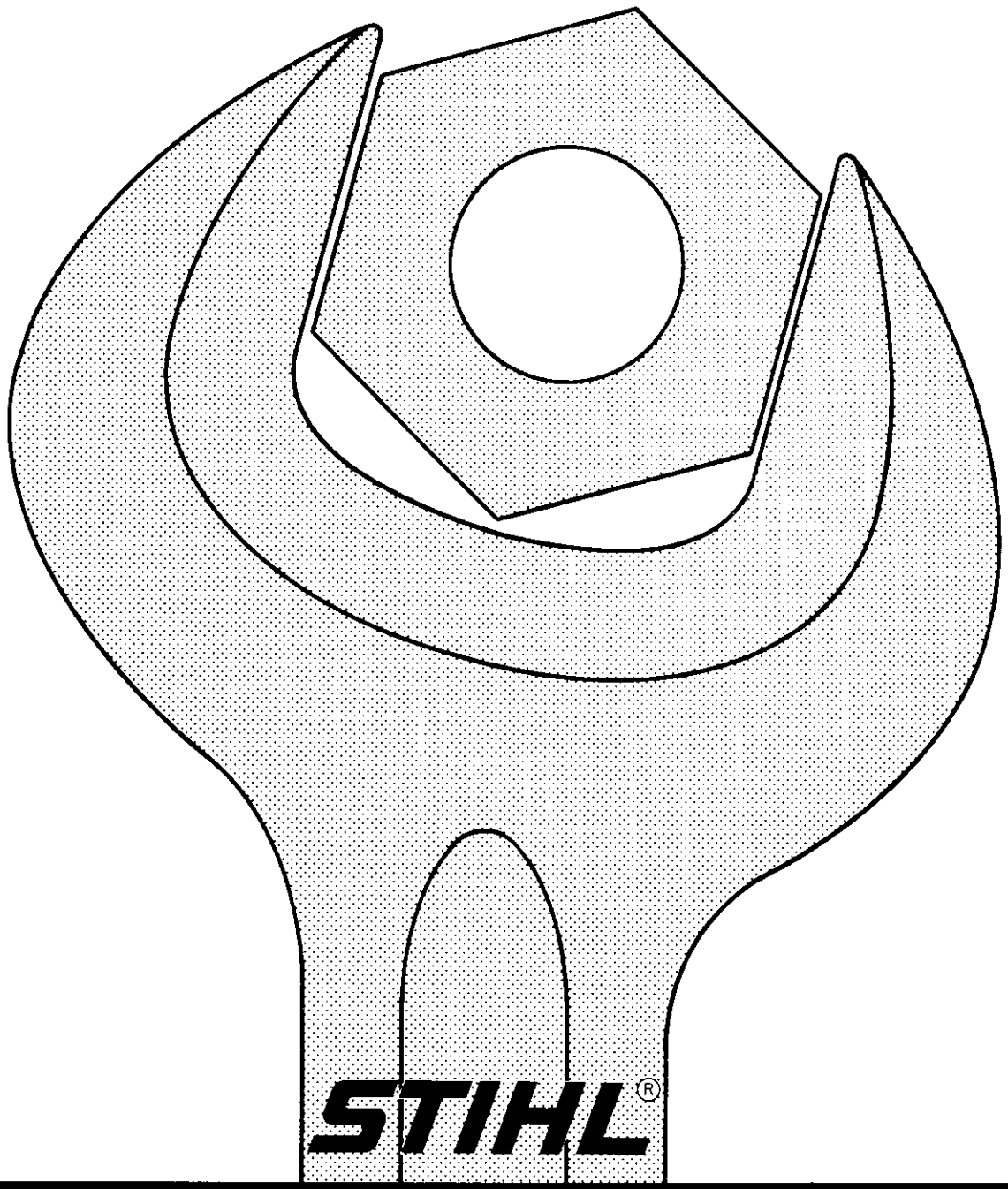

STIHL®

PREFACE

This service manual corresponds with the design features of the STIHL 08 S chain saw starting from machine number 4819800. Important modifications on machines before this number will be refered to so that this manual can be taken as a basis for proper repair work.

Any failure of the saw may have several trouble sources. When trouble shooting we recommend therefore to observe the "Trouble shooting chart" of all chapters and also to use the illustrated spare parts list.

Technical modifications which will become necessary after publication of this repair instruction will be brought to your attention by our "Technical Informations".

This service shop manual as well as all Technical Informations being subject to modifications shall only be handed to personell which is in charge of service and repair.

Handing over or lending this manual to other persons is prohibited.

STIHL®
Andreas Stihl
Postfach 1760
D-7050 Waiblingen

CONTENTS

SPECIFICATIONS

Specifications are subject to change without notice!

Engine:

STIHL single cylinder two-cycle engine with special chromium impregnated cylinder walls.

Piston displacement:	56 cm^3 (3.42 cu. in)
Cylinder bore:	47 mm (1.85 in)
Piston stroke:	32 mm (1.26 in)
Compression:	9,5:1
Max. torque:	3.58 Nm (2.64 lbf. ft) 5000 r.p.m.
Max. allowed revolutions:	10.000 r.p.m.
Mean idle speed:	2000 r.p.m.
Crankshaft:	Three-part
Crankshaft bearing:	Grooved ball bearing
Crank pin:	14,4 mm (0.57 in) i. diameter
Piston pin:	12 mm (0.47 in) i. diameter
Piston pin bearing:	Needle cage
Rewind starter:	Friction shoe system with automatic rewinding of starter rope Starting assistance by half throttle lock button
Starter rope:	4,5 × 1000 mm (0.12 × 40 in) i. d.
Sealing test of crankcase:	Testing pressure (positive pressure) 0.5 bar (7.25 lbf./in^2) Testing pressure (negative pressure) 0.2 bar (2.9 lbf./in^2)

Clutch:

Heavy duty centrifugal clutch with pressed-on linings 67 mm (2.64 in) in diameter

Clutch engagement at:	Approx. 2800 r.p.m

Fuel System:

Carburetor:	All position diaphragm carburetor with integral fuel pump
High speed adjustment screw H:	3/4—1 turn open
Low speed adjustment screw L:	3/4—1 turn open
(Basic carburetor adjustment from snug seat of adjustment screws)	
Pressure test of carburetor:	Testing pressure (positive pressure) 0.5 bar (7.25 lbf./in^2)

	Fuel tank capacity:	0,76 l (1.6 pt)
	Fuel mixture:	Fuel mix 1:40 with STIHL two-cycle engine oil; 1:25 for other branded two-cycle engine oils
	Air filter:	Round wire mesh filter

Ignition System:

Flywheel magneto with breaker points, fully enclosed		
Magneto edge gap:	6 . . . 9 mm (0.24 . . . 0.35 in)	
Air gap:	0,2 . . . 0,3 mm (0.008 . . . 0.012 in)	
Advanced ignition:	2,0 mm (0.08 in) before top dead center	
Advanced ignition angle:	26°	
Breaker point gap:	0,4 mm (0.016 in)	
Condenser:	Capacity 0,15 . . . 0,19 µF	
Armature coil:	Resistances	
	Primary winding	Secondary winding
Bosch no. 2204211 060 066 2204211 051	1,0 . . . 1,4 Ω	5,1 . . . 6,9 kΩ
up to Bosch manufacturing date 523	1,9 . . . 2,5 Ω	5,0 . . . 6,7 kΩ
starting from Bosch manufacturing date 524	1,2 . . . 1,7 Ω	5,0 . . . 6,7 kΩ
Spark plug	Bosch W 7 A Heat range 175 Electrode gap 0,5 mm (0.02 in)	
Spark plug thread:	M 14×1,25; 12,7 mm (0.5 in) long	

Tightening torques for screws and nuts:

for Crankshaft nut	
Ignition side	29.4 Nm (21.7 lbf. ft)
Sprocket side	29.4 Nm (21.7 lbf. ft)
Cylinder base screws:	9.8 Nm (7.2 lbf. ft)
Spark plug:	24.5 Nm (18.1 lbf. ft)
Countersunk screws M 4:	2.0 Nm (1.4 lbf. ft)
Cylinder head screws M 4:	2.5 Nm (1.8 lbf. ft)
Screws and nuts M 5:	4.9 Nm (3.6 lbf. ft)
Screws and nuts M 6:	6.9 Nm (5.1 lbf. ft)

Cutting Attachment:	Guide bars:	Duromatic guide bars with stellite tipping at the bar nose, Rollomatic guide bars with star shaped roller nose
	Bar lengths:	Duromatic 35, 43 and 53 cm (14, 17 and 21 in) Rollomatic 43 cm (17 in) only for $^3/_8$″ (9,32 mm) chain
	Chain:	$^3/_8$″ (9,32 mm) and 0.404″ (10,26 mm) pitch
	Chain speed:	Approx. 17 m/sec. (55.1 ft/sec.) at 7000 r.p.m.
	Chain lubrication:	Fully automatic oil pump with pump plunger governed by engine speed
	Oil tank capacity:	0,34 l (0.72 pt)
	Chain sprocket:	7 teeth for 0.404″ pitch 8 teeth for $^3/_8$″ pitch
Weight of saw:	with 35 cm (14 in) bar and chain	Approx. 8,3 kg (18.3 lb)
Extras:	STIHL emergency kit 1108 900 5002 (Assortment of the most frequent wearing parts) Set of gaskets 1108 007 1050)	

CLUTCH AND CHAIN DRIVE

Design and Function

The power from the engine is transmitted to the saw chain by means of a centrifugal clutch. This clutch is composed of clutch carrier, 3 clutch shoes, 3 clutch springs and clutch drum with chain sprocket. To guide the clutch shoes a washer is positioned in front of and behind the clutch.

With increasing engine speed due to the centrifugal force the clutch shoes are forced out and pressed against the clutch drum thus transmitting the engine power (torque) over the chain sprocket onto the saw chain.

Pretensioning and elasticity of the clutch springs are designed in such a way that the linings of the clutch shoes start frictioning at the clutch drum at an engine speed of approx. 2800 r.p.m. With increasing engine speed the clutch becomes force locked.

The carburetor therefore must be adjusted in such a way (see "carburetor adjustment") that the chain does not run when engine is idling.

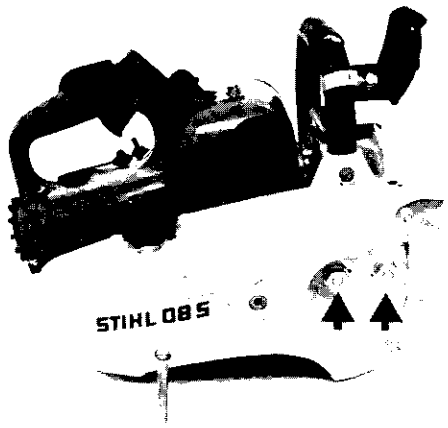
The clutch of the 08 S is maintenance free, it is set out, however, to normal wear and therefore should be checked for proper functioning at regular intervals.

Trouble shooting chart

Trouble	Cause	Remedy
Insufficient force lock, clutch slips-saw chain does not rotate at high engine speed	Clutch linings worn	Replace all clutch shoes
	Clutch linings and clutch drum are fouled (by oil)	Wash clutch in clean gasoline, roughen with emery cloth
Saw chain runs at idle speed	Engine speed too high	Readjust idle adjustment screw
Extraneous noises	Springs are stretched or fatigued; Spring hooks broken	Replace all springs
	Needle cage damaged	Replace needle cage
Extreme chain wear	Worn chain sprocket	Replace chain sprocket
	Incorrect chain tension	Tension saw chain properly

Disassembly and repair

Remove chain sprocket cover

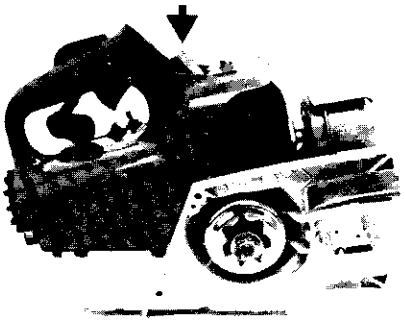


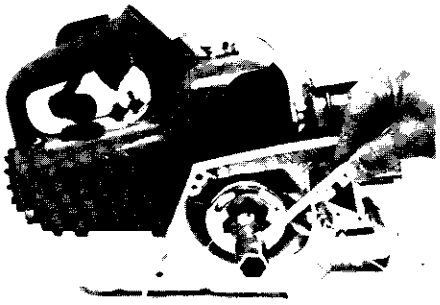
First remove chain sprocket cover with handle tube as well as bar and chain.

Screw out spark plug and replace it by the special locking screw. Put combination wrench onto the hex. nut and turn the crankshaft clockwise until the piston bottom rests against the locking screw thus locking the crankshaft. Now the hex. nut can be loosened.

Top:
Inserted locking screw

Bottom:
Loosening the hex. nut



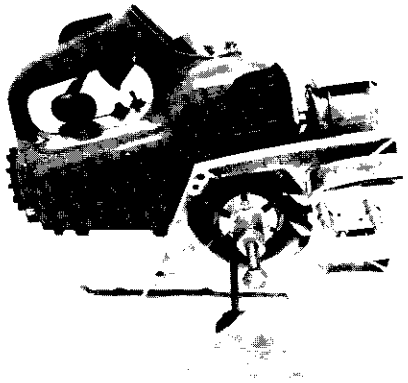


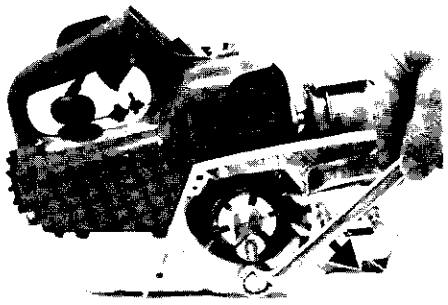
Attention! The hex. nut has a left hand thread — loosen in clockwise direction!

Washer, chain sprocket, needle cage and inner sleeve can now be removed from the crankshaft. If it is difficult or even impossible to remove the inner sleeve pry it off the crankshaft by means of a screw driver. Thereafter remove front guide washer.

Top:
Fastening the puller device

Bottom:
Removing the carrier





Insert thrust piece with its centering head first into the puller sleeve. Fasten puller device 1107 890 4500 with 3 cylinder head screws M 4 × 12 onto the carrier and screw in thrust screw until the carrier is detached from the crankshaft. Finally remove the rear guide washer.

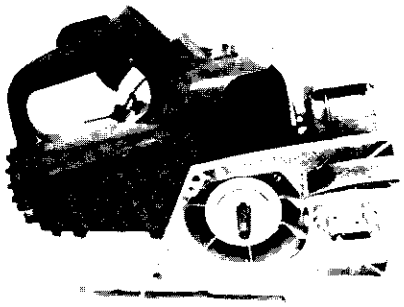
Wash all component parts of the clutch including clutch drum, inner sleeve and needle cage in clean gasoline and if available clean with compressed air. Roughen friction areas of the cleaned clutch linings with emery cloth.

Replace damaged or worn parts. Clutch shoes and clutch springs, however, must always be replaced **in sets!**

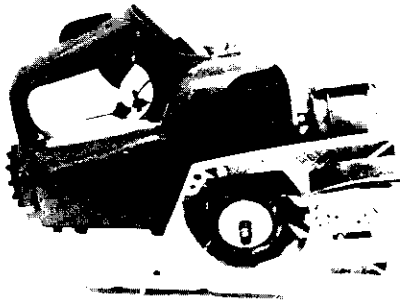
Reassembly

Top:
Mounted guide washer

Bottom:
Properly mounted clutch



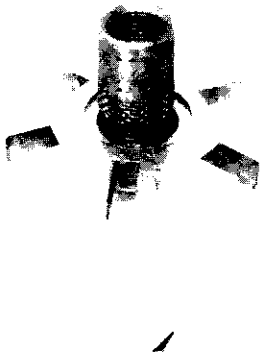
Mounted supporting washer

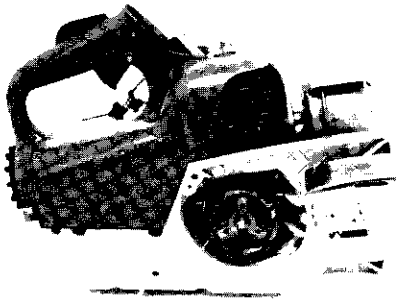


Top:
Screwed on threaded bushing

Center:
Threaded bushing and puller screwed onto crankshaft

Bottom:
Puller sleeve partly screwed in





The rear guide washer is put onto the crankshaft again in such a way that the indented side at its outer diameter points towards the crankcase.

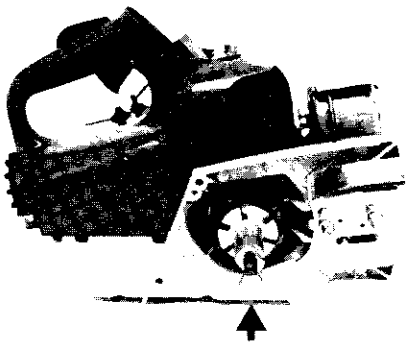
On saws with rear clutch washer of 45 mm (1.78 in) in diameter the washer must be mounted in such a way that the beaded edge points towards the crankcase.

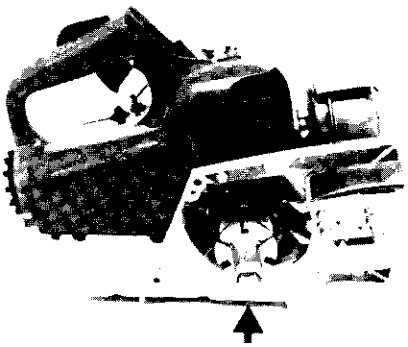
Thereafter slide clutch onto the crankshaft until the key groove of the carrier overlaps the radius of the key somewhat. Thereby care has to be taken that the 3 threaded borings in the carrier are visible!

For this reason the crankshaft is of different tolerance in this area. Should the seat, however, still be too tight support this mounting operation by light hammer blows whereby a piece of tube of non-ferrous material should be used. Now slide front guide washer onto the crankshaft.

The final press-sliding of the clutch is done again with the puller device 1107 890 4500 to which now the threaded bushing 1108 893 4500 is added.

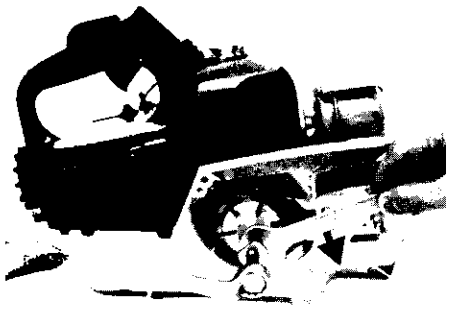
Screw thrust screw completely into the puller sleeve and screw on the knurled side of the threaded bushing until its tight fit.

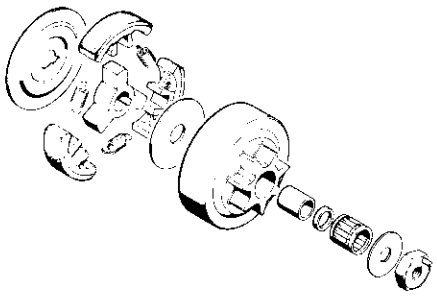




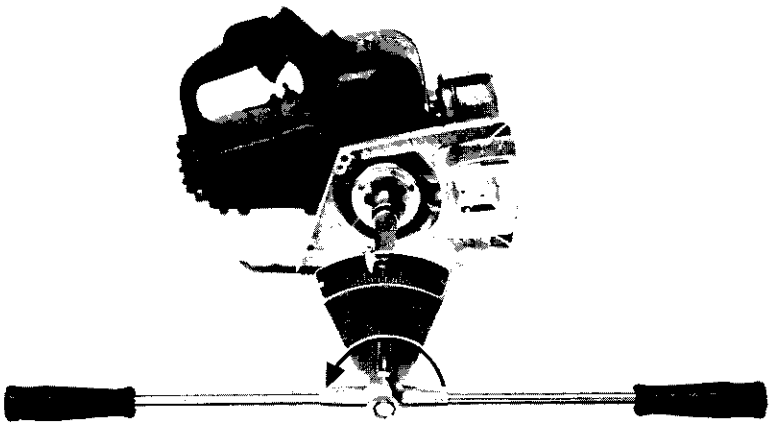
Top:
Press-s. a ng of clutch

Bottom
Component parts





Tightening the hex. nut with torque wrench



Thereafter screw threaded bushing onto the crankshaft until it has a snug fit; Thereby care has to be taken that the thrust screw does not turn itself out of the threaded bushing due to the countercurrent threads. Counterhold thrust bolt and turn puller sleeve clockwise until its flange rests against the supporting washer. Now turn puller sleeve further with fork wrench SW 17-still counterholding thrust bolt-until the threaded bushing comes to rest at the bottom of the boring of the puller sleeve. Now the carrier has the proper position on the crankshaft. Loosen thrust bolt again and remove puller device.

Grease inner sleeve and needle cage with ball bearing grease and slide it onto the crankshaft.

Before mounting the chain sprocket check it for proper condition. If the wearing at the sprocket teeth is deeper than approx. 0,5 mm (0.02 in) then the chain sprocket must be exchanged. A worn chain sprocket reduces the service life of the saw chain considerably.

Once the chain sprocket is mounted put on washer and hex. nut. If the pin is worn or broken first a new one must be pressed into the hex. nut. Tighten hex. nut with torque wrench counter-clockwise and at a torque of 29.4 Nm (21.7 lbf. ft). Remove locking screw and insert spark plug again. Finally mount chain sprocket cover with handle tube.

ENGINE

Design

The STIHL 08 S chain saw is driven by an air-cooled one-cylinder two-cycle engine.

The crankcase is made of two parts and is injection molded using a special magnesium alloy. The crankshaft — three-part, drop forged — is double supported in grooved ball bearings. Two oil seals which are inserted in the crankcase are sealing the crank chamber air-tight.

The connecting rod — also drop forged — is supported by needle cages on the crank pin and on the piston pin. After inserting the needle cage and the connecting rod both crankshaft halves are pressed together and secured against twisting. Only then the crankshaft is machine finished. Therefore the spare crankshaft can only be supplied **complete with connecting rod and needle cage.** Cylinder and piston are made of a special aluminum alloy.

Trouble shooting chart

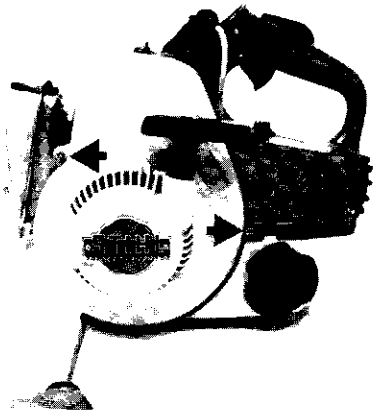
Before searching for trouble sources at the engine first check fuel system, carburetor, air filter and ignition system.

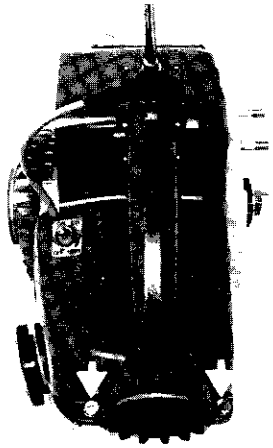
Trouble	Cause	Remedy
Engine cannot be started easily, stops when idling, however, operates normal at full throttle	Sealing rings in crankcase defective	Replace sealing rings
	Crankcase defective (cracks)	Replace crankcase
Engine does not reach full performance or runs erratic	Engine gets by-pass air by badly mounted carburetor	Mount carburetor correctly, if necessary replace flange gasket
	Piston rings leaky or broken	Replace piston rings
Engine overheating	Insufficient cylinder cooling. Air intake openings clogged or cooling fins at cylinder plugged	Clean all cooling passages thoroughly

Exposing the cylinder

Top:
Unscrewing the fan housing

Bottom:
Dismantling the handle shroud





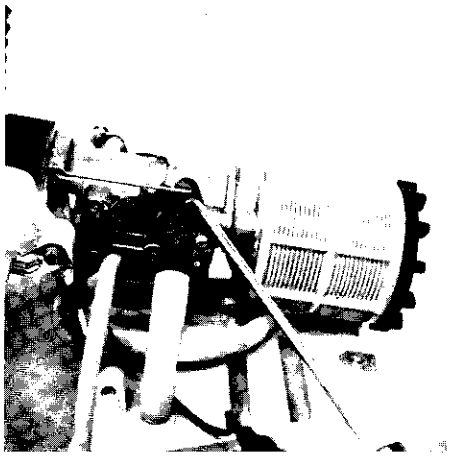
First empty fuel tank, now remove chain sprocket cover, fan housing, spark plug terminal and shroud. On machines starting from number **2 460 300** pull the circuit wire out of the ignition stop switch.

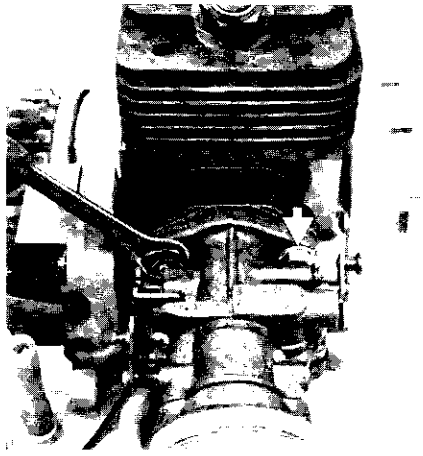
Thereafter pry off retaining washer from governor lever and unhook the governor rod. Loosen and screw out the two collar nuts M 6 with which the carburetor is fasten-

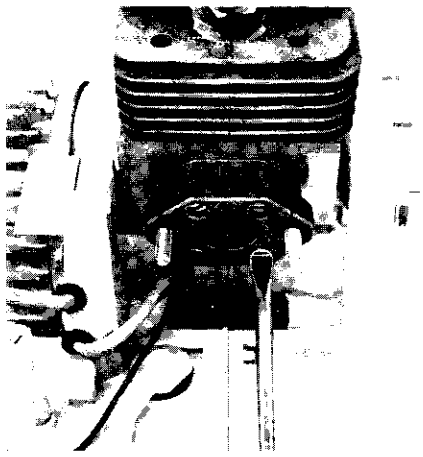
Top:
Prying off the retainer washer

Center:
Loosening the collar nuts

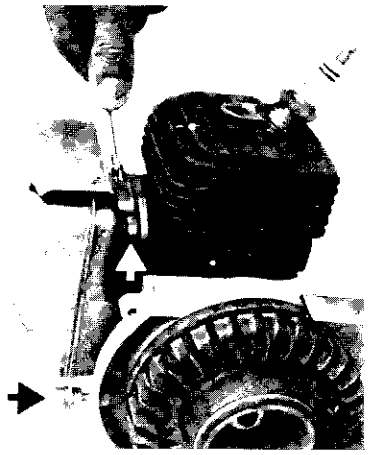
Bottom:
Loosening the intermediate flange







Loosening the muffler fixation



ed. Now remove the carburetor from the studs thereby pulling the fuel hose from the nipple at the carburetor cover.

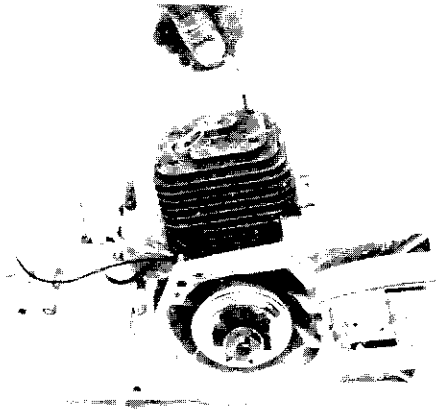
After removing the gaskets screw out the 4 cylinder head screws thus also loosening intermediate flange and cooling plate.

To remove the muffler unscrew the two retaining nuts from the studs in the cylinder and remove the front hex. nut from the stud in the crankcase.

The outer surfaces of the cylinder can now be cleaned thoroughly and checked for defects (cracks, broken cooling fins etc.).

Disassembly of cylinder and piston

Loosening the cylinder base screws



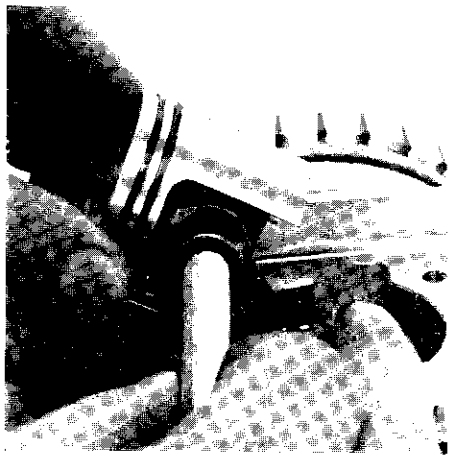
Unscrew spark plug and the 4 cylinder head screws with which the cylinder is fastened. Thereafter the cylinder can be removed from the piston.

Before removing the piston it must be decided whether or not the crankshaft must also be disassembled. This is necessary because to lock the crankshaft for removal of the flywheel of the chain sprocket and the clutch one must slide the special mounting wood between crankcase and piston.

To disassemble the piston first remove the two circlips which hold the piston pin and press the piston pin with the mounting bolt 1108 893 4700 out of the piston and the needle cage. If the piston pin sits tight due to carbonization drive out the piston by light hammer blows onto the mounting bolt. Thereby you must counterhold

Top:
Removing the circlips

Bottom:
Pressing out the piston pin



under all circumstances in order not to damage the connecting rod. Now the piston can be removed and the needle cage be taken out of the connecting rod.

Reassembly of cylinder and piston

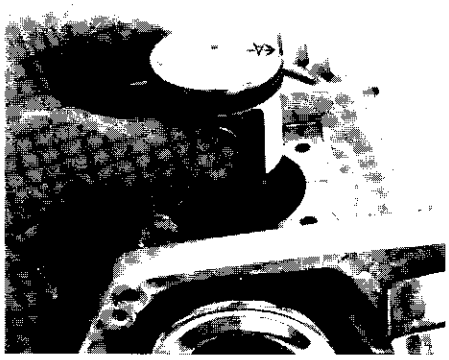
Cylinder and piston are divided in 5 tolerance groups by letters A—E. Thereby A marks the smallest and E the biggest nominal tolerance of the piston diameter respectively the cylinder bore. The tolerance groups are stamped into the top of the piston respectively the cylinder head. If the cylinder must be replaced always the piston belonging to the spare cylinder must be inserted. Spare cylinders are only supplied complete with piston.

When mounting a new piston care has to be taken that only cylinder with piston of the same tolerance group or cylinders with next smallest piston can be matched.

When repairing machines with broken-in cylinder it is possible to match cylinder with piston of the next smallest, the same or next bigger tolerance group.

New or not broken in cylinder		When repairing machines with broken in cylinder	
Piston for cylinder		Piston for cylinder	
A	AB	A	AB
B	BC	B	ABC
C	CD	C	BCD
D	DE	D	CDE
E	E	E	DE

»Arrow and A« pointing towards exhaust outlet



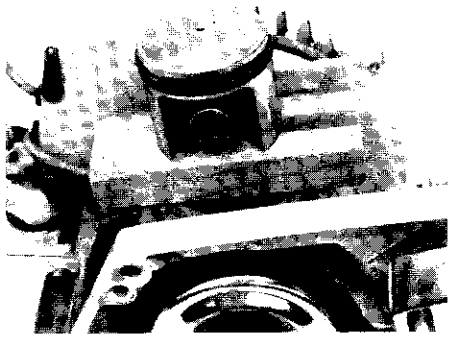
Before installing the piston, apply some oil to the needle cage and insert into the connecting rod eye. Put piston over the connecting rod in such a way that the stamped in marking (arrow and A) are pointing towards the exhaust outlet of the cylinder (towards the guide bar head).

Thereafter insert piston pin into piston and connecting rod, this is more easily done by using the mounting bolt 1108 893 4700. To do so slide mounting bolt through piston boring and connecting rod — thus aligning both borings concentrically towards each other. Put piston pin onto lug of mounting bolt and then slide it into the piston. Thereby move the piston slightly back and forth, this way the inserting of the piston pin is done easier.

The piston pin must be easy going. Do not mount piston pin forcibly.

Top:
Mounting sleeve and mounting wood

Bottom:
Installed piston

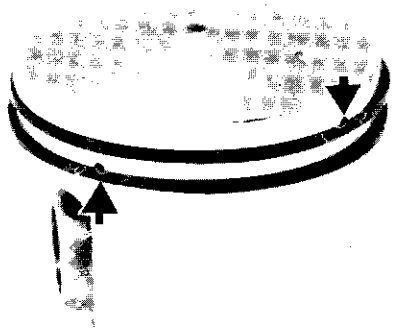


Finally insert both circlips and make sure that they are seated correctly.

The mounting of the cylinder which follows now is very easy when using the mounting wood and mounting sleeve.

First put a new cylinder gasket onto the crankcase. Then apply some oil to the piston and especially to the sealing ring and put the mounting wood onto the crankcase so that the piston is resting on top of it. Turn both piston rings in their groove in such a way that when pressing them together their ground radii at their ends are engaging the fixation pins in the ring groove properly.

Positioned piston rings

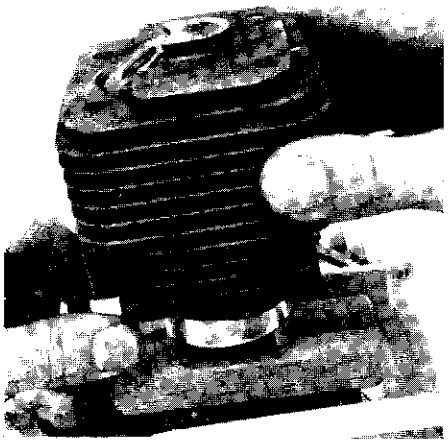


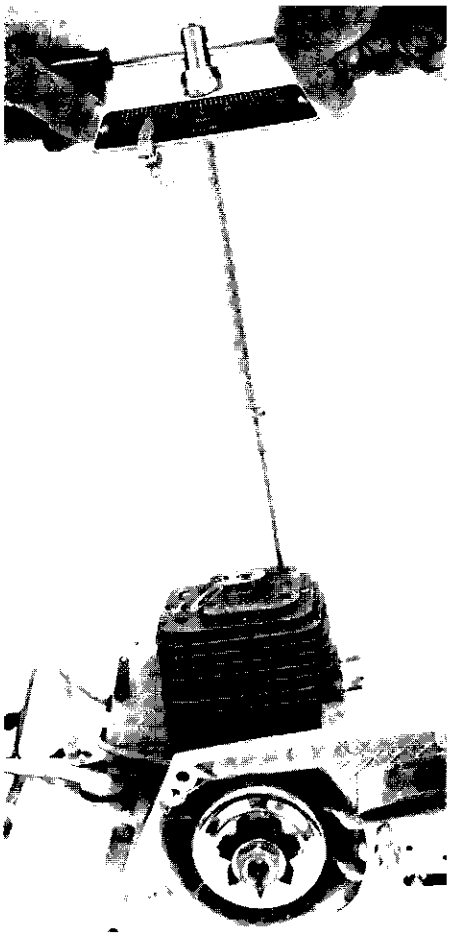
Now press special mounting sleeve around piston rings and sealing rings thereby taking care that the rings are properly positioned. Guide cylinder over the piston whereby the outlet orifice is pointing towards the guide bar head. Thereby the mounting sleeve is slid downwards, the sealing rings are inserted in the cylinder.

Remove mounting wood and mounting sleeve, align cylinder gasket and cylinder. Screw in the 4 cylinder base screws and tighten them with insert 5910 893 5606 and with a torque of 9.8 Nm (7.2 lbf. ft) crosswise.

Top:
Mounting the cylinder

Bottom:
Tightening the cylinder base screws with torque wrench





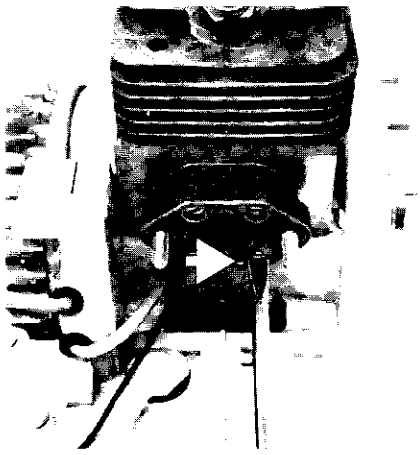
Mounting the studs

If a new cylinder was mounted then two new studs M 6×12 with the long threaded ends must be screwed into the thread next to the cylinder outlet and tightened by means of two countered hex. nuts.

The remaining hex. nut on the stud in the crankcase must be turned in completely. Put exhaust gasket and muffler onto the studs in the cylinder thereby guiding the fastening lug of the muffler over the stud in the crankcase. Insert spring washers and retaining nuts and tighten. Only now mount washer and hex. nut onto the crankshaft stud thereby setting the nuts from both sides by hand against the muffler eye and tighten.

Thereafter mount cooling plate and intermediate flange again. To do so assemble in the following sequence: Intermediate flange (with hex.

Mounting the intermediate flange



head screws), gasket, cooling plate (the heads of the rubber plugs must point against the hex. head screws and the edge of the plate in opposite direction) and gasket.

Now insert the 4 cylinder head screws and flange the complete assembled unit onto the cylinder (thereby the impulse boring must be exactly in line with the one in the cylinder) and tighten crosswise.

Now mount carburetor gasket and carburetor. When mounting the shroud care has to be taken that the choke shutter slide must be put to position "I". Finally mount fan housing and chain sprocket cover.

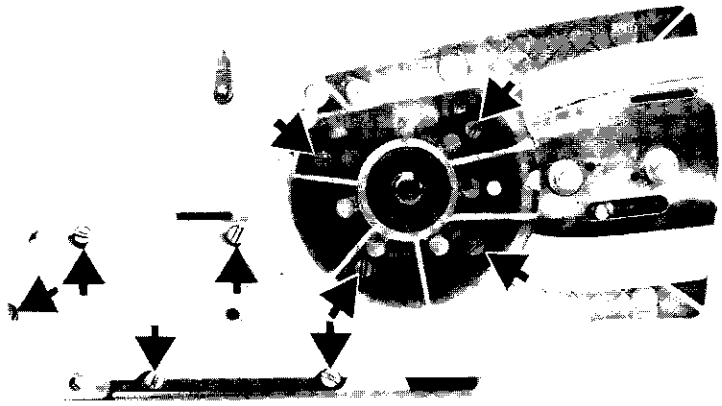
Disassembly of crankcase —

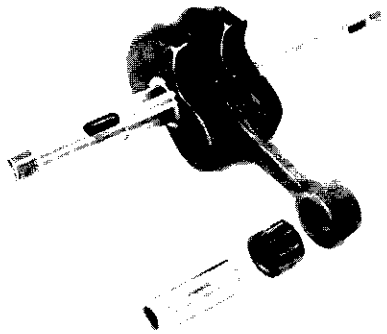
Removal of crankshaft

Top and Bottom.
Knocking out the cylindrical pins

Top:
Fastening screws of both crankcase halves

Bottom:
Crankshaft with needle cage and piston pin





To disassemble the crankshaft first remove chain sprocket cover, chain sprocket, clutch (page 6) fan housing, shroud (page 10), flywheel, armature plate (page 24), cylinder and piston.

The crankcase halves are centered by two cylindrical pins and screwed together with a cylinder head screw. Before disassembling the crankcase halves remove both keys from the crankshaft. Punch the two cylindrical pins completely back into the ignition sided crankcase half. Thereafter screw out all cylinder head screws. Should both crankcase halves not separate immediately because of a sticky gasket or should the crankshaft be seated too tight in the inner bearing races then use a nonferrous hammer and separate the parts by light blows onto one shaft end.

Crankshaft, connecting rod and needle bearing are one undetachable unit. This means that always the complete crankshaft must be replaced should one of these parts fail.

It is recommended when replacing the crankshaft also to always replace the ball bearings and sealing rings whereby the sealing rings should be replaced in any case.

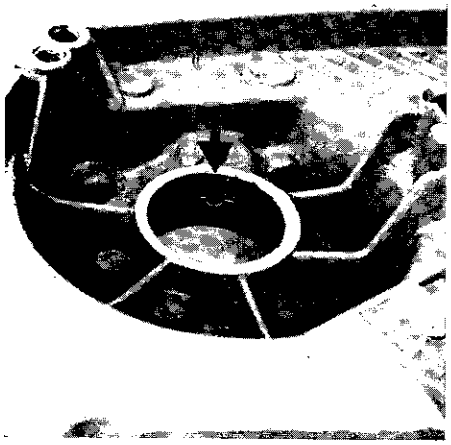
If the crankcase is defective it must be replaced as a **complete unit.** In such a case transfer all the remaining parts which are intact from the old to the new crankcase.

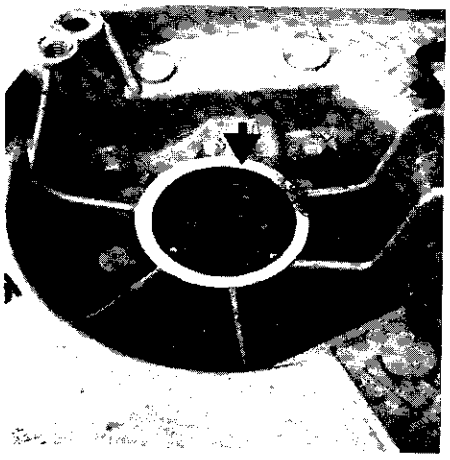
Reassembly of crankcase —

Installing the crankshaft

Top:
Correctly inserted retaining ring

Bottom:
Inserted ball bearing

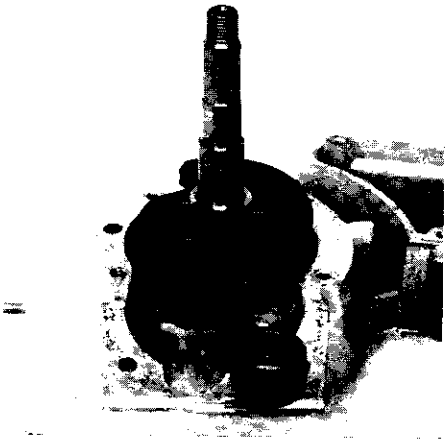




On a new crankcase first insert the circlips into the annular grooves of the bearing seats. Thereby care must be taken that the open end of the retainer ring does not plug the boring for the bearing lubrication.

Warm up both crank halves for instance on a stove — insert the ball bearings — without tilting- through the crankcase inner side so

Crankshaft inserted up to the shoulder of the web

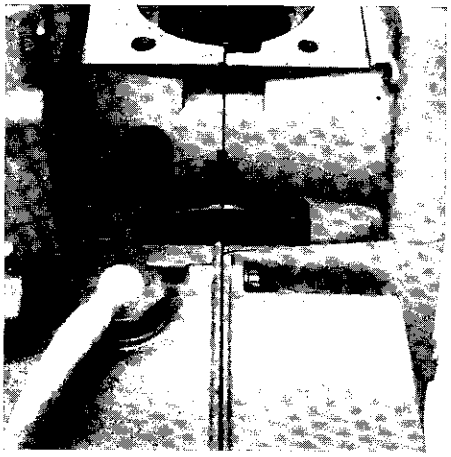


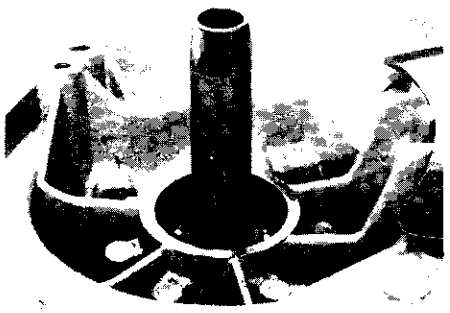
that the outer races rest against the circlips.

To insert the crankshaft into the inner races of the ball bearings they also must be warmed up. This is done most effectively with a soldering iron with a matching insert. Thereafter slide the crankshaft with the cylindrical shaft end into the bearing of the crankcase half sprocket side until the shoulder of the crank web rests against the inner race. Use new crankcase gasket-when using the old crankcase again remove gasket remainings thoroughly. Guide bearing of the crankcase half ignition side over the other crankshaft end, fit the crankcase halves together and align. Knock in cylindrical pins completely, turn in screws and tighten with a torque of 4.9 Nm (3.6 lbf. ft) crosswise. Insert the sealing rubber again in the provided recesses of both crankcase halves.

Top:
Inserted sealing rubber

Bottom:
Mounting sleeve put onto the crankshaft end



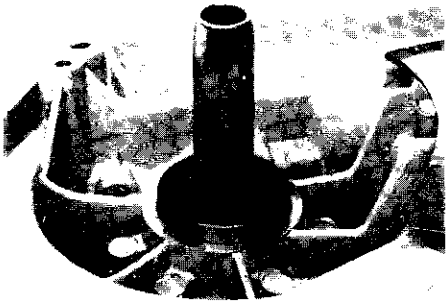


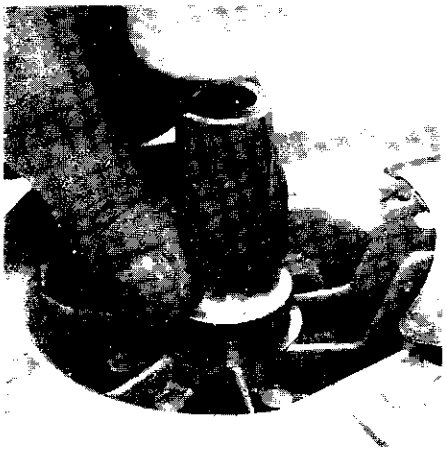
To insert the retaining rings put the mounting sleeve 1107 893 4600 onto the crankshaft end clutch side. Slide sealing ring with sealing lip ahead onto the sleeve and press it in with press-in sleeve 1108 893 2405 until it has a snug fit at the front edge of the boring. When inserting the sealing ring ignition side the mounting sleeve is not needed as this crankshaft end has no sharp edges which could damage the sealing lip.

Pressure test with positive pressure (tightness test)

Top:
Oil seal slid over mounting sleeve

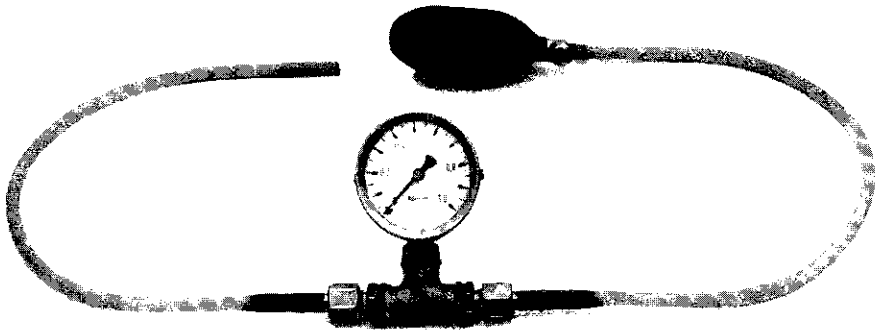
Bottom:
Installing the oil seal by means of pressing sleeve



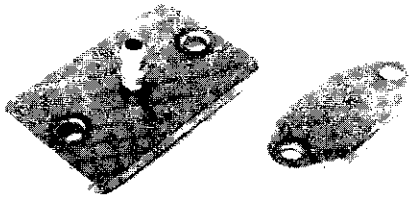


Mount the remaining parts in reverse sequence of disassembly.

Top:
Carburetor and crankcase testing device



Bottom:
Connecting and sealing flange

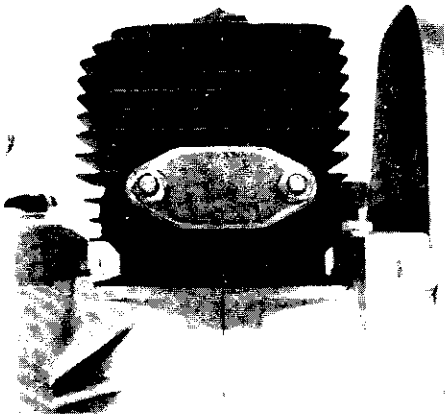


With the carburetor-crankcase testing device the crankcase can be tested for proper tightness.

Damaged oil seals and gaskets, cracks or shrinkage in the castings are mostly the reason for leakage. This can cause air to enter the engine thus influencing the recommended fuel-air mixture.

As a consequent reaction mostly the adjusting of the correct idling

Bottom:
Sealing flange on cylinder outlet opening

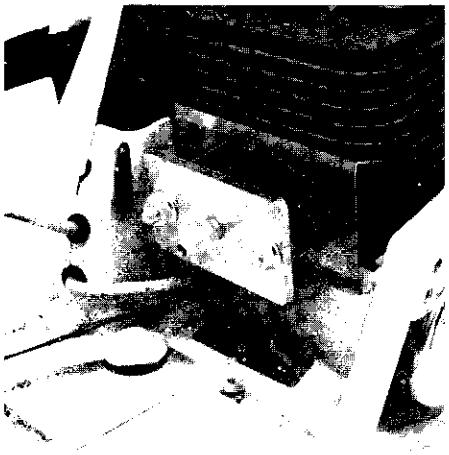


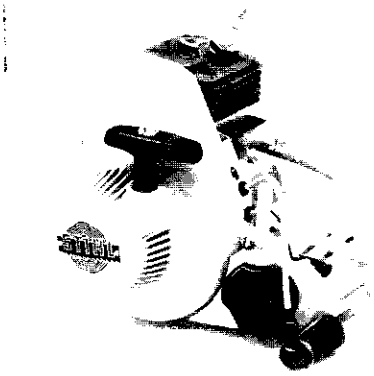
speed is troublesome if not entirely impossible. Moreover there is no proper change from idle to partial or full load.

For testing remove carburetor and muffler. Seal outlet opening of cylinder with the flange 1108 855 4200 thereby using the exhaust gasket for sealing.

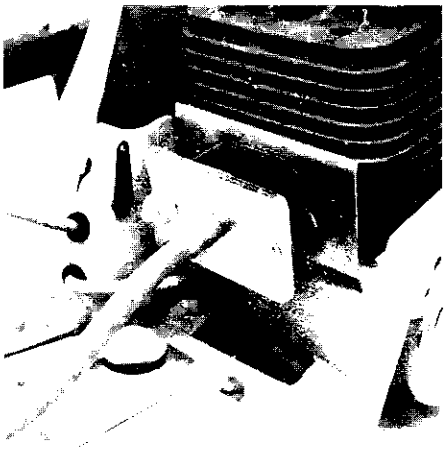
Top:
Connecting flange mounted

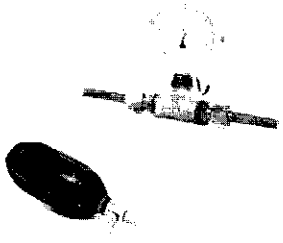
Bottom:
Pressure testing the crankcase



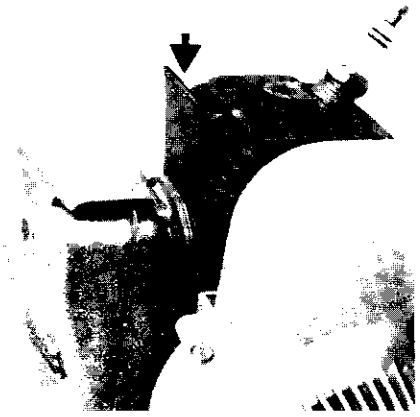


Connected pressure hose





Exhaust orifice sealed with rubber plate



Mount flange 1106 850 4200 onto the carburetor flange using the original gasket and connect pressure hose of testing device onto the nipple of the testing flange.

For pressure testing the spark plug must be screwed in tightly and the piston must be at top dead center position (see "Adjusting the ignition timing"). Close venting screw at the thrust ball and press in air until the manometer reading is at an overpressure of 0.5 bar (7.25 lbf/in²). If this pressure stays constant the crankcase is air tight. If the pressure drops, however, the leaky spot must be detected and the defective part must be replaced.

After finishing the testing open venting screw again and remove the hose. When using the new rubber plate 0000 855 8105 instead of the flange 1108 855 4200 for sealing of the exhaust orifice the muffler must not be removed completely. Just loosen the two nuts at the outlet and the front nut of the bottom fixation.

Insert rubber plate with the narrow side first starting between cylinder outlet and muffler flange from the top until both longitudinal sides rest against the studs. Thereafter moderately tighten the two nuts at the cylinder outlet.

The further testing is done as described before.

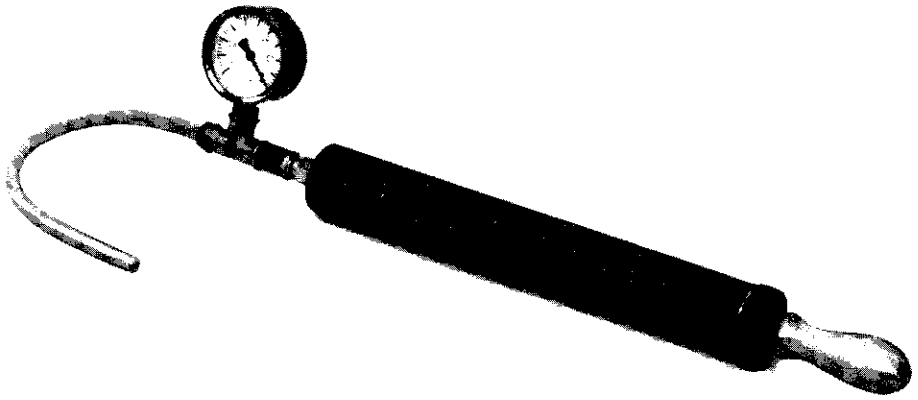
Pressure test with negative pressure

Top:
Low pressure pump

Center:
Pressure test with low pressure pump

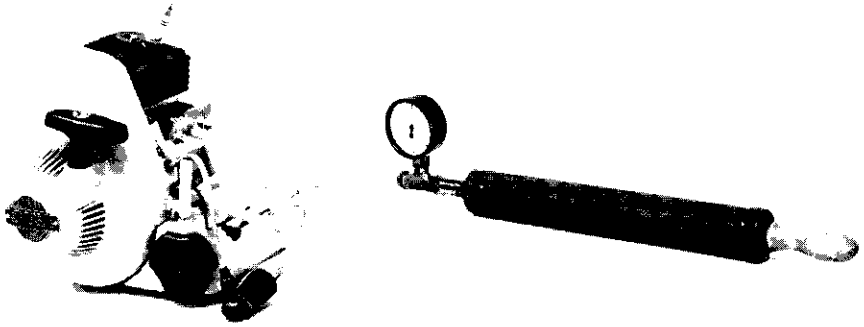
Bottom:
Oil seal ring removal

The oil seals fail mostly at negative pressure. During the suction process of the piston the sealing lip is lifted from the crankshaft due to missing counterpressure.



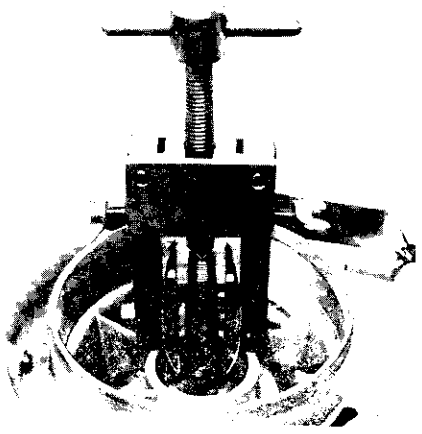
To detect this failure an additional test with the negative pressure pump 0000 850 3500 is recommended. For this test the same preparations are necessary as for the positive pressure test.

Connect suction hose of negative pressure pump to the nipple of the testing flange. Pull out sucker rod until the manometer reading shows a negative pressure of 0.5 bar (7.25 lbf./in²). When letting go the sucker rod the back-pressure valve closes the suction hose automatically.



If the negative pressure stays constant respectively if the pressure does not climb higher than 0.2 bar (2.9 lbf./in²) then the oil seals are in proper condition. If, however, the pressure increases then the oil seals must be replaced even though no leakage has been encountered during the preceding positive pressure test.

If only the oil seals are to be replaced it can easily be done without dismantling the complete engine. To do so remove chain sprocket, clutch and ignition system. Pry out sealing rings with universal oil seal puller 0000 890 4400.



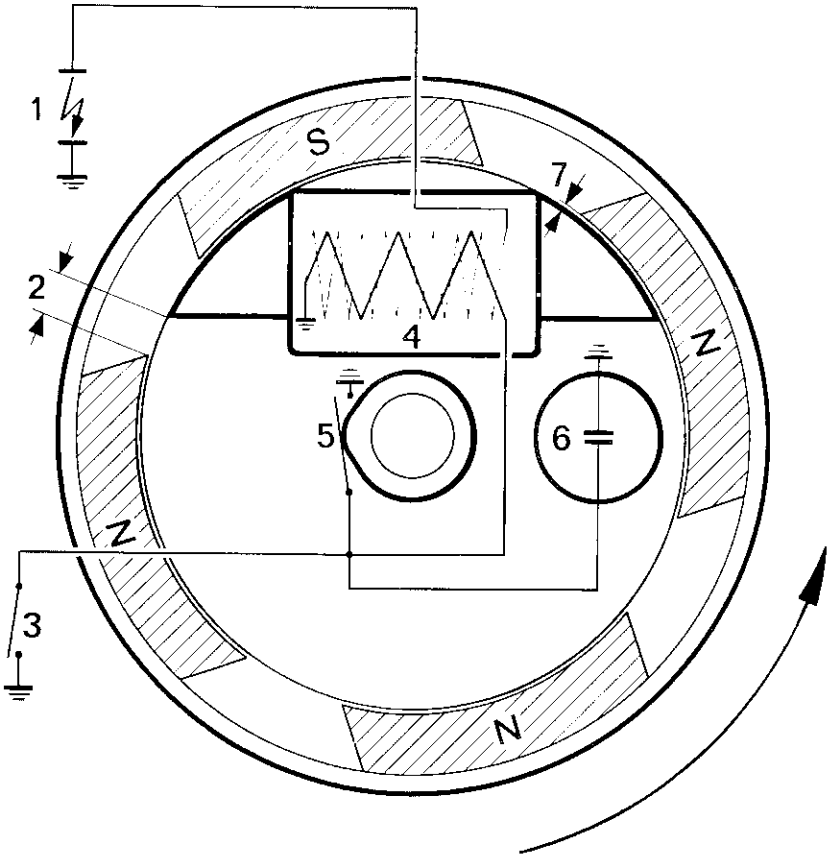
Mounting of the new oil seals is done as prescribed before.

IGNITION SYSTEM

Design and function of breaker point magneto ignition

Scheme of the breaker point ignition system

1 — Spark plug
2 — Edge gap
3 — Ignition stop switch
4 — Ignition coil
5 — Breaker points
6 — Condenser
7 — Air gap
N — North pole
S — South pole



Like all STIHL power chain saws the STIHL 08 S is equipped with a flywheel magneto ignition system needing neither a battery nor a dynamo. The ignition system consists mainly of the rotating part (flywheel with permanent magnets and pole shoes) and the stationary part (contact set, condenser, ignition coil) as well as high tension lead, spark plug, short circuit wire and ignition stop switch.

The magneto ignition operates on the principle of magnetic induction.

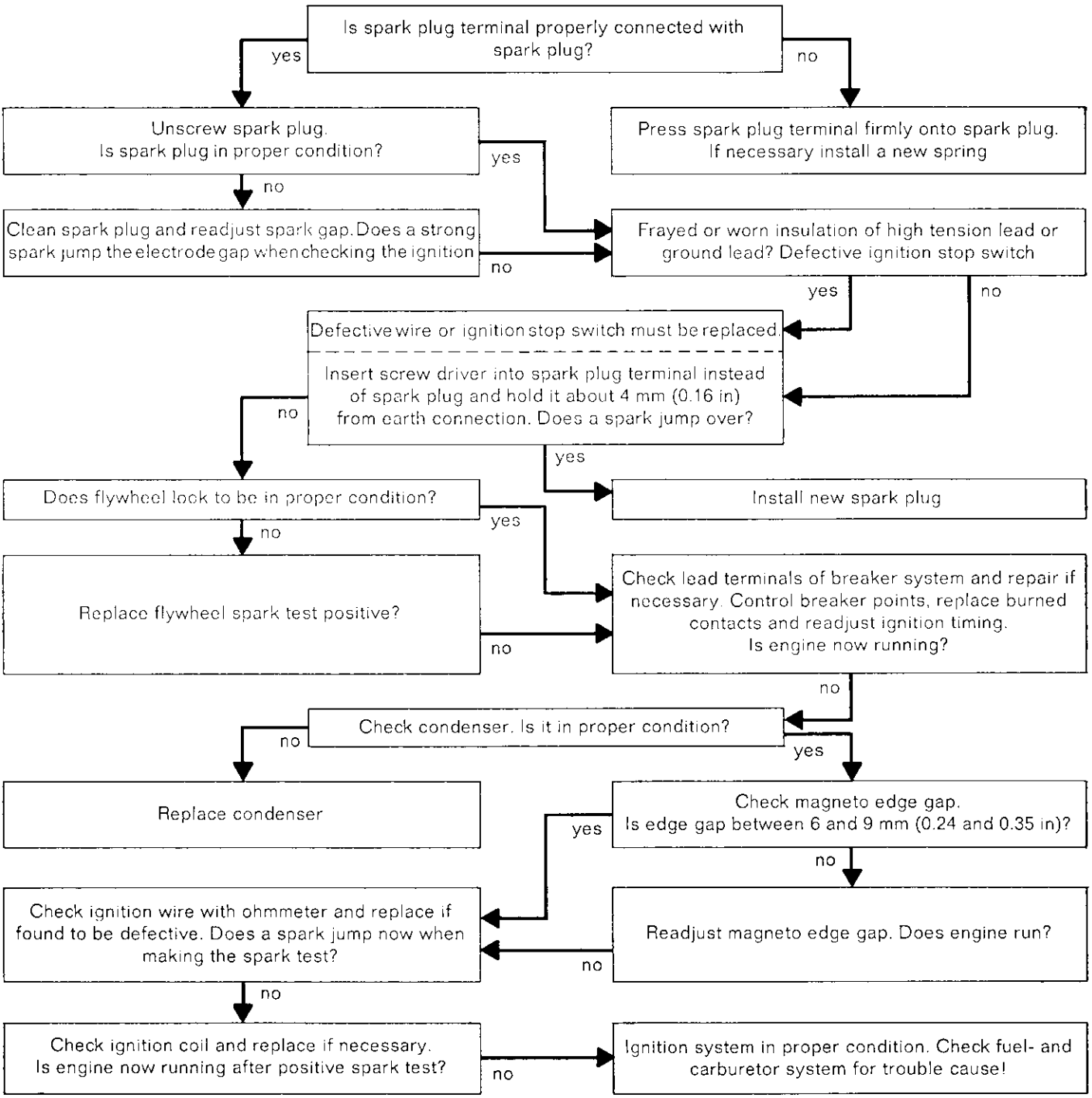
Electric current is produced in an electrical condenser which is moved across the flux lines of a magnetic field. When the flywheel is turning the lines of force between the permanent magnets which flow out at the north pole and flow in again at the south pole cut the wire windings of the primary winding of the ignition coil thereby inducing therein a low voltage current. At closed breaker points an induction current flows in the primary winding of the ignition coil which is interrupted by opening of the breaker points at its peak tension during ignition. Thereby the magnetic flow in the coil core changes its direction abruptly and induces a high voltage current in the secondary winding which is necessary for jumping of the spark at the spark plug electrodes.

The breaker points are opened by the cam which is ground to the flywheel hub and they are closed again by a spring.

The condenser which is connected parallel with the breaker points prevents upon their opening an excessive sparking (electric arc) between the contacts and therefore a loss of energy and premature wear.

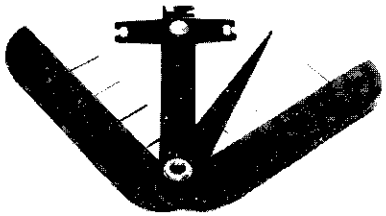
The ignition stop switch which is also connected parallel to the breaker points is short circuiting upon activating the primary winding of the ignition coil. No more high tension is induced — the engine stops.

Trouble shooting

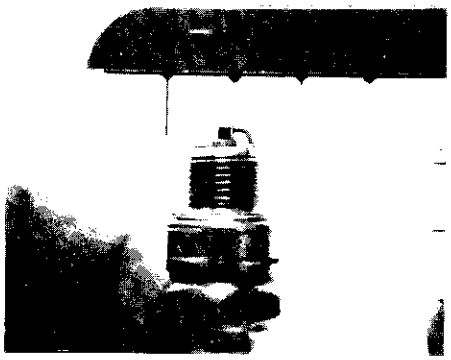


Spark plug

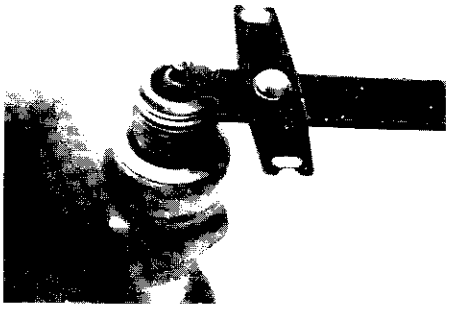
Bosch spark plug gauge



Checking the electrode gap at W 7 A



Readjusting the electrode gap at W 7 A



The spark plug is supposed to ignite the condensed air-fuel mixture by means of the spark jumping from the center to the ground lead.

Therefore in case of trouble with the ignition system trouble shooting should always begin at the spark plug.

If it is difficult to start the engine or if you notice a loss of power remove spark plug and check whether it has the correct range of 175. A fouled spark plug must not be cleaned with a steel brush.

Remove carbon deposit at the insulator nose of the plug with a brass brush and blow plug with compressed air. If spark plug is fouled by oil remove the fouling with a grease solvent and blow out spark plug with compressed air. Fouling of the plug may be caused by an improper fuel mixture ratio, a too rich carburetor adjustment, clogged air filter or a partly closed choke shutter.

As the electrode gap becomes wider by normal erosion the electrode gap must be checked regularly with a Bosch spark plug gauge and if necessary, readjusted. The electrode gap can be adjusted to the required distance of 0,5 mm (0.02 in) by bending the ground electrode. A new spark plug, however, must be used if electrodes are badly eroded.

An exact control of the spark plug is only possible with a spark plug testing device.

If no such spark plug testing device is available insert the unscrewed and cleaned spark plug into the spark plug terminal and connect it with ground.

A strong spark must jump the electrode gap when pulling the rewind starter.

If no spark jumps inspite of a functioning spark plug then as a next step check the wire connections. Polished insulations of the ignition and short circuit wires are causing short circuit. As a result the engine will not start or does not function properly.

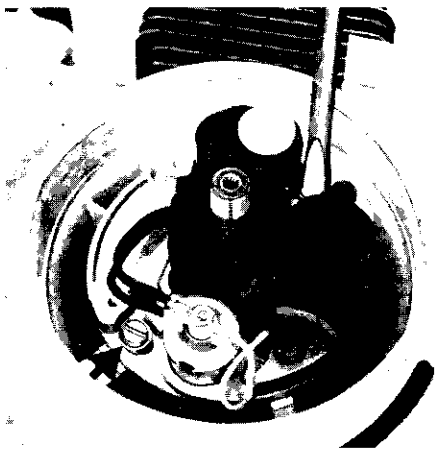
Before inserting the spark plug clean spark plug port and check gasket on proper condition. The spark plug must be tightened with a torque of 24.5 Nm (18.1 lbf. ft).

High tension lead

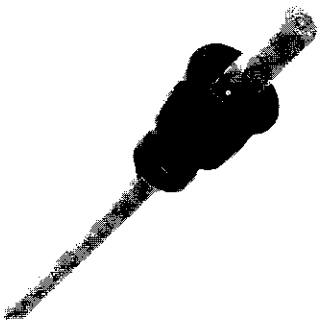
Removing the leg spring

Top:
Unscrewing the ignition coil

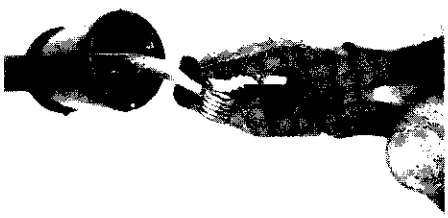
Bottom:
Removing the high tension lead



Top:
Installed grommet



Bottom:
Mounting the leg spring to high tension lead



Should the insulation of the ignition wire be brittle or otherwise damaged then it may happen that a spark jumps from the damaged area to ground — the ignition process is interrupted. In this case the high tension lead must be replaced.

To do so remove shroud and only on machines starting with machine number 2460300 the short circuit wire must be pulled out of the ignition stop switch. Thereafter unscrew fan housing and fan wheel and pull off flywheel (see paragraph "flywheel"). Now remove spark plug terminal from high tension lead. To do so catch and pull out leg spring in the spark plug terminal with suitable plyers. Unhook leg spring from high tension lead and remove lead from spark plug terminal.

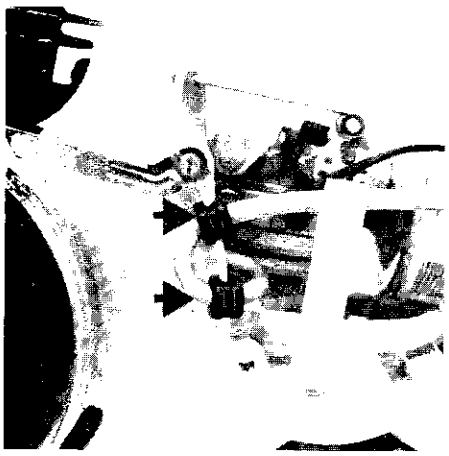
Unscrew and take off armature plate from crankcase thereby removing first the high tension lead and then the short circuit wire from the grommet in the crankcase. Now twist high tension lead out of the wood screw which is molded into the ignition coil.

The new ignition wire has a length of 315 mm (12.4 in). Slide grommet onto one end of the wire and turn it firmly onto the wood screw in the ignition coil. It is recommended to prepunch the wire with a pointed tool into the center of the wire cross section. Now first lead the short circuit wire then the ignition wire through the grommet in the crankcase and mount armature plate again. Thereby care has to be taken that no wire insulations are pinched.

Then slide two grommets onto the high tension lead. Apply some oil to wire end, lead it into the spark plug terminal, hold it with a suitable

Short circuit wire

High tension lead with grommets inserted into the crankcase



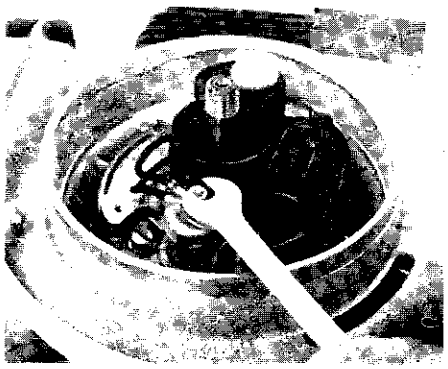
pair of pliers and pull it out of the spark plug terminal in forward direction. Thereafter press in the hook of the leg spring in a distance of approx. 10 mm (0.4 in) from the wire end into the center of the wire cross section thus making electrical connection to the molded in copper wire of the high tension lead.

Pull back ignition wire thereby the leg spring must be fitted into the recess provided in the spark plug terminal.

Now insert the two grommets at the high tension lead again into the recesses in the crankcase.

Finally adjust the ignition timing (see paragraph "Adjusting the ignition timing") and remount the remaining parts in reverse sequence of disassembly.

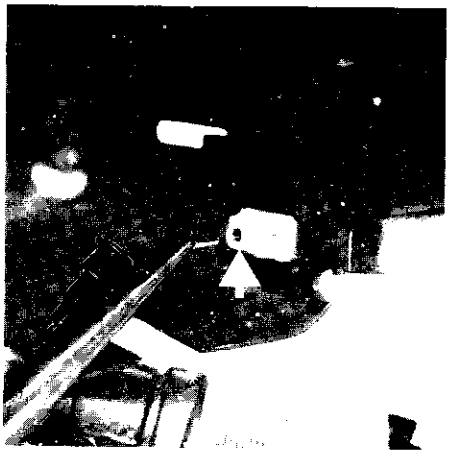
Loosening the wire connections



If the short circuit wire must be replaced remove first shroud, fan housing, fan wheel and flywheel as done when replacing the high tension lead. On machines up to number 4819889 short circuit wire and connecting wire are combined with a soldering lug and fastened at the breaker point set. The hex. nut M 3 must be removed and the connecting wire must be unsoldered from the condenser. To be able to take the connecting wire out of the recess the contact bank must be loosened and lifted. On machines starting with number 4819890 short circuit wire, connecting wire and primary connection of the ignition coil are screwed onto the condenser and can be loosened by removing the hex. nut M 3.

Now unscrew the armature plate from crankcase and pull the defect short circuit wire out of the grommet in the crankcase to the inside.

Plugging the short circuit wire into the ignition stop switch



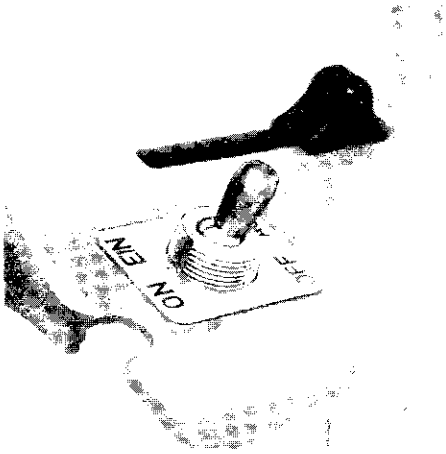
It is recommended to check the condenser at the same time (see "condenser").

Guide new short circuit wire with contact sleeve first through the grommet and mount armature plate again. Fasten short circuit wire again at condenser respectively at breaker point set (solder connecting wire to the condenser). Put new contact sleeve onto the free wire end on machines with short circuit button and flatten it, then insert wire end from the bottom into the wire support, lead it through completely, turn by 90 degrees and finally pull it downwards again until properly seated.

Finally adjust the ignition timing (see "Adjusting the ignition timing") and remount the remaining parts in reverse sequence of disassembly.

Ignition stop switch

Groove provided in thread pointing forward

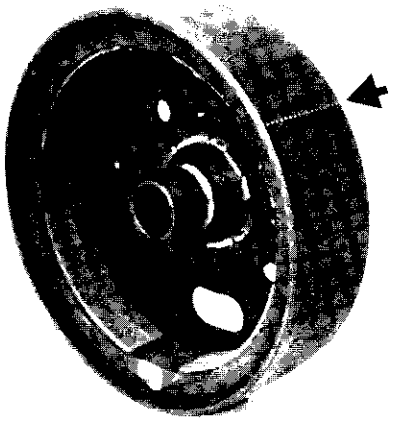


Chain saws STIHL 08 S are equipped with an ignition stop switch starting from machine no. 2460350 while older machines were only equipped with a simple stop button. The switch is properly functioning if it has only connection to ground in "OFF/STOP" position. If this is not the case the switch must be replaced.

To do so unscrew shroud and disconnect short circuit wire from switch. Remove defective switch and insert new one through boring so that the groove placed in the thread is pointing forward. Now put on the plate, adjust switch in such a way that it is correctly seated between the two casted-on ledges and finally tighten nut.

Flywheel

Markings on flywheel

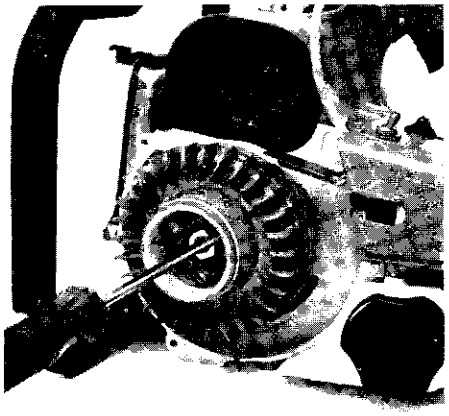


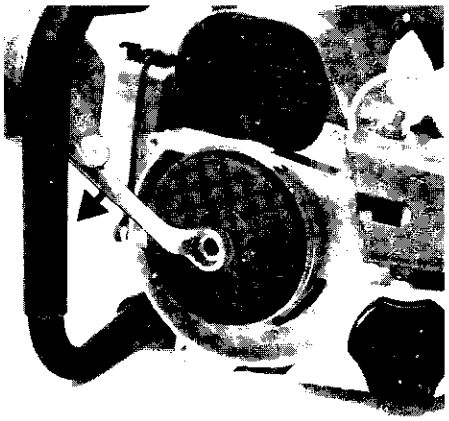
The flywheel is fastened on the ignition side of the crankshaft by means of a cone-seat and centered by a woodruff-key. At its outer periphery the flywheel is provided with dot-shaped markings for controlling the timing. At the inner side of the flywheel 4 permanent magnets are fastened consisting of a ring of plastoferrit-material. This ring — shaped magnet band is unsymmetrically magnetised — 1 south pole, 3 north poles. This avoids reverse rotation of the engine. To achieve optimum magnetic flux the magnets are equipped with pole shoes. The magnet material should not be damaged or cracked as otherwise the flywheel has to be replaced. The hub of the flywheel is ground excentrically as cam thus activating the breaker point.

In order to remove the flywheel first disassemble fan housing and fan wheel then unscrew spark plug and replace it by the locking screw.

Top:
Disassembling the fan wheel

Bottom:
Loosening the hexagonal nut



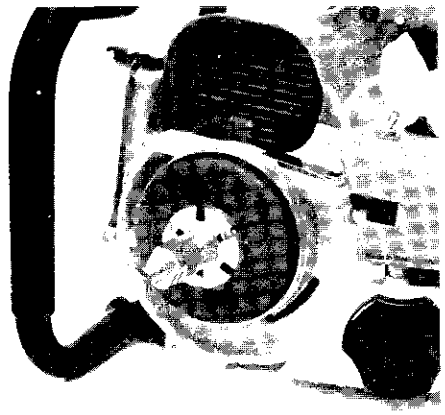


Turn crankshaft anti-clockwise until the piston butts against the locking screw. Thereafter loosen and remove hex. nut.

Place thrust piece 1107 894 1000 on crankshaft end (for thread protection), now fasten puller device 1107 890 4500 with 3 cylindrical head screws M 4×12 to the flywheel. Counterhold puller sleeve with fork wrench SW 17 and screw

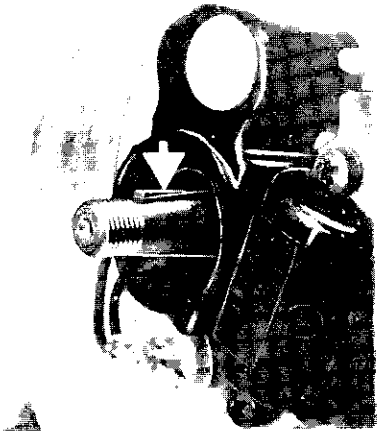
Top:
Mounted puller

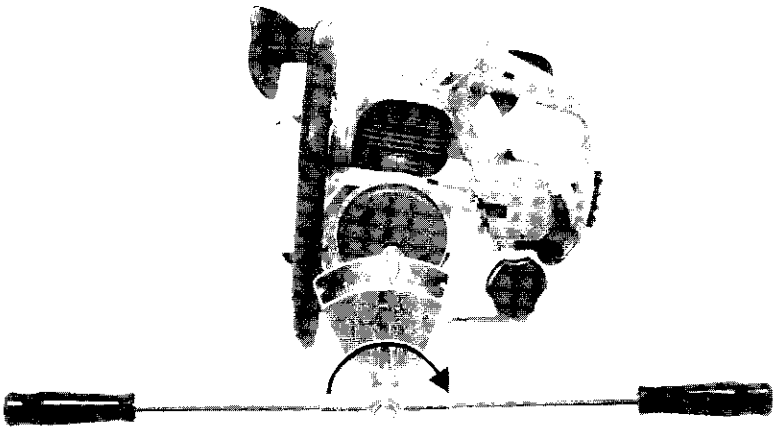
Bottom:
Pulling off the flywheel



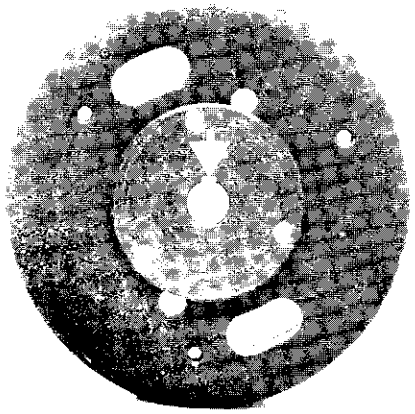
Top:
Woodruff key in place

Bottom:
Tightening the hex. nut with torque wrench





Groove in flywheel hub



in thrust screw with another fork wrench SW 17 until the flywheel loosens from its cone seat on the crankshaft.

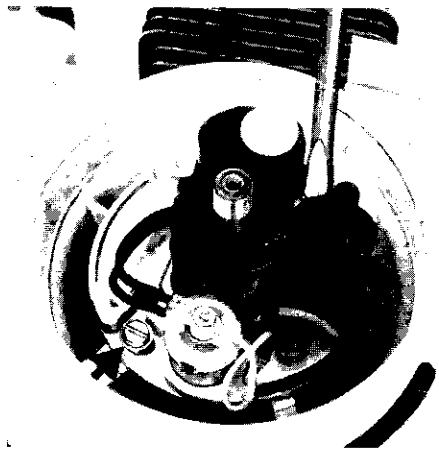
Before reinstalling the flywheel care has to be taken that no metallic particles are attached to the magnets. The boring of the flywheel hub and the cone of the crankshaft must be cleaned from grease.

Watch for correct seat of the woodruff key.

To relieve the woodruff key it is not important that all moments deriving from the flywheel are transmitted by the cone-connection between flywheel and crankshaft. Therefore the recommended tightening torque of the shaft nut of 29.4 Nm (21.7 lbf. ft.) must be observed under all circumstances.

Armature plate

Unscrewing the armature plate



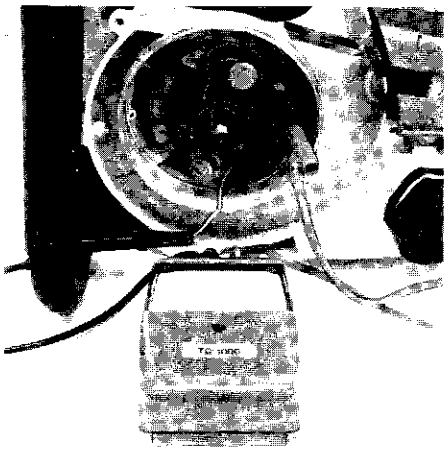
The armature plate is inserted in the crankcase in a recess concentrically to the crankshaft and fastened with two cylinder head screws. Ignition coil, contact set and condenser are mounted on the armature plate.

To disassemble the armature plate screw out the two cylinder head screws. Loosen short circuit wire from the screw connections at condenser and twist ignition wire from ignition coil.

After each reinstallation of the armature plate the ignition timing must be checked respectively newly adjusted.

Ignition coil

Resistance test of primary winding



The coil is fastened to the armature plate with 2 cross-slotted screws. For protection against dirt and humidity the windings are fully cast into plastic material.

There are two ways to test the ignition coil:

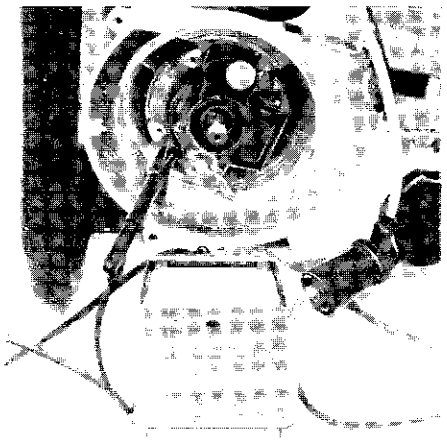
First the resistance test of the two windings can be carried out with an ohmmeter.

Then the exact testing is done, however, with the ignition coil testing device.

Resistance test of primary winding

Loosen connecting lead (yellow wire) from condenser respectively from contact set to test the primary winding. Connect one of the two test wires to the primary terminal, the other one is clamped to

Resistance test of secondary winding



the ground of the armature plate The ohmmeter must now show the following readings in the measuring range "Ω × 1":

On ignition coils with Bosch number 2 204 211 060, 2 204 211 066 and 2 204 766 0713 1,0 to 1,4 (Ω).

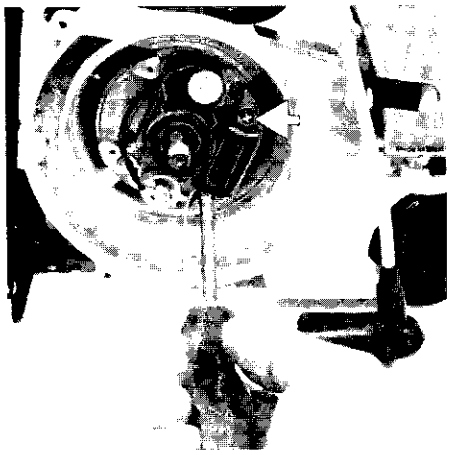
On ignition coils with Bosch number 2 204 211 051, up to Bosch manufacturing date "523" 1,9 to 2,5 (Ω), from Bosch manufacturing date "524" 1,2 to 1,7 (Ω). Should these readings not be reached replace ignition coil.

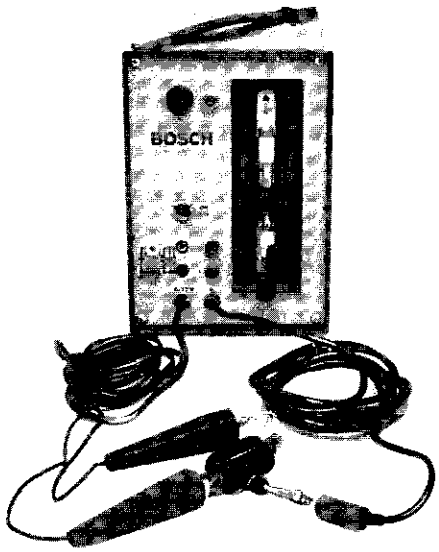
Resistance test of secondary winding

To test the secondary winding attach the spring contact plug of a testing wire onto the leg spring in the spark plug terminal, the other testing cable is clamped onto the ground of the armature plate. In

Top.
Unscrewing the ignition coil

Bottom:
Ignition coil test with ignition testing device





the measuring reach "Ω × 1000" (kΩ) now the resistance testing device must show a reading of 5,0 to 6,7 (kΩ). If this reading is not reached replace ignition coil.

Testing with ignition coil testing device

The test for spark jumping can be done for example with the coil tester Bosch EFMZ 1 a or EFAW 106 A. To do so the ignition coil must be removed from the armature plate.

Remove the two fastening screws, unscrew primary connection (yellow wire) from condenser and untwist high tension lead from coil.

At this testing method the spark distance must be 8 mm (0.31 in) at 2,1 A.

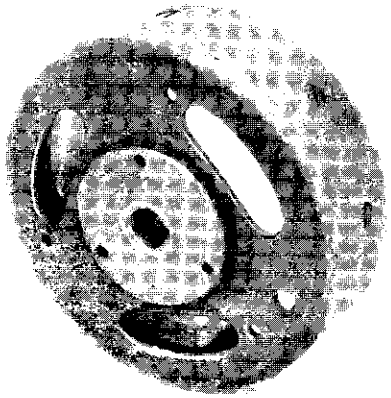
These values are true for all ignition coil versions which are used in the model 08 S.

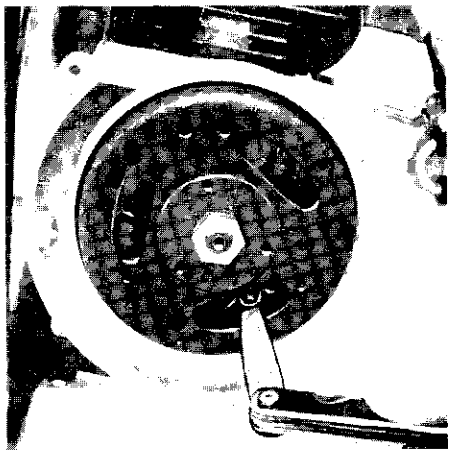
After each reinstallation of an ignition coil on the armature plate one must also control and readjust the air gap which is the distance between pole shoes of the flywheel and the ignition coil.

The recommended air gap must be 0,2 to 0,3 mm (0.008 to 0.012 in). A practical help for this adjustment

Top:
Older version of flywheel

Bottom:
Air gap testing with feeler gauge

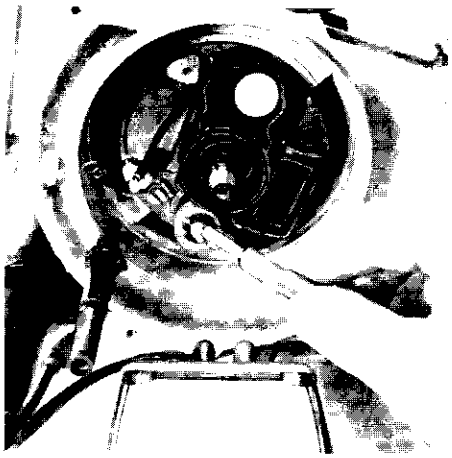




is a flywheel of older version with 3 long holes or another respectively prepared wheel. Slide this flywheel onto the crankshaft, control air gap with a feeler gauge and if necessary loosen coil and adjust it to obtain the recommended air gap.

Condenser

Checking the condenser with ohmmeter

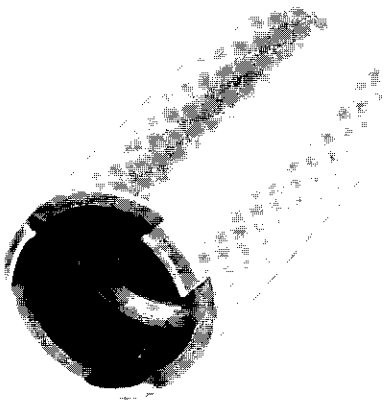


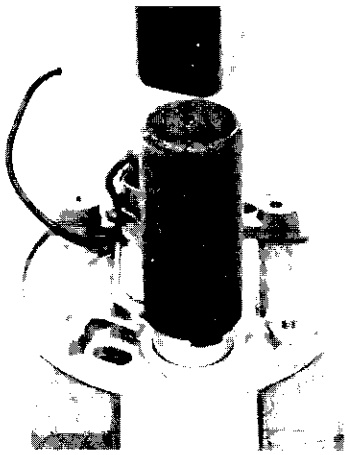
Top:
Discharging the condenser

Bottom:
Knocking out the condenser

Top:
Pressing sleeve for condenser

Bottom:
Inserting a new condenser





The condenser is connected parallel to the breaker point and avoids spark formation at the contacts while opening.

A defect condenser very often is the cause for preliminary burning of the breaker points. The storage capacity of the condenser is 0,17 μF, and can be checked with the ohmmeter 5910 850 4800.

To do so loosen all wire connections from condenser, connect one of the two test wires with ground and hold the other wire against the condenser terminal.

A properly functioning condenser is now charged thereby you can watch a short deflection of the indicator of the ohmmeter up to approx. 0,2 (μF) in the measuring range "μF × 1" (μF = microfarad). If this is not the case then the condenser must be replaced by a new one.

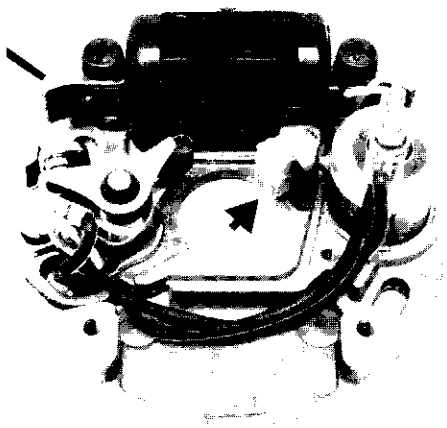
Each time after controlling the condenser must be discharged by short circuiting-connect ground with condenser terminal.

For replacing the condenser unscrew armature plate and press or knock out condenser from behind with a suitable tool.

Insert new condenser with pressing sleeve 1110 893 2400 into the armature plate and wedge the edge of the boring with light hammer blows. The condenser bottom must not protrude the armature plate bottom.

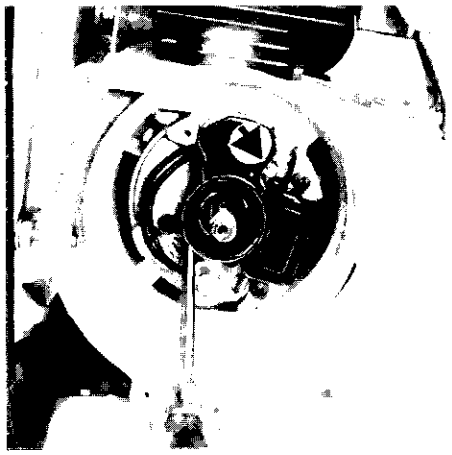
Breaker point set

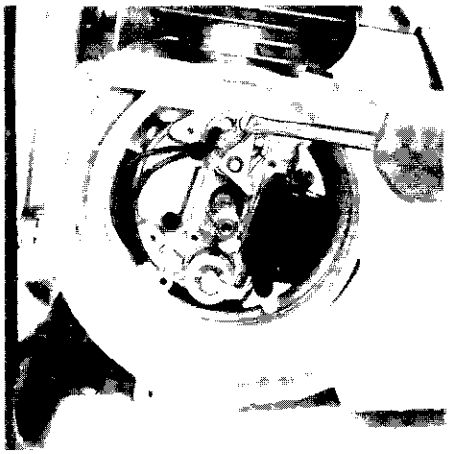
Lubricating felt in proper condition



Top:
Unscrewing dust cover

Bottom:
Unscrewing breaker point set





Setting the point gap with feeler gauge

The breaker point set is composed of the fixed contact bank (anvil contact) — which is connected to ground — and of the breaker lever which is isolated against ground and connected with the primary lead of the ignition coil by means of a wire.

The gliding piece of the breaker lever is forced by spring power into the excentric hub of the flywheel and is also actuated by this nut. In order to protect the gliding piece from premature wear care has to be taken that the lubricating felt in the armature plate is of proper condition at all times.

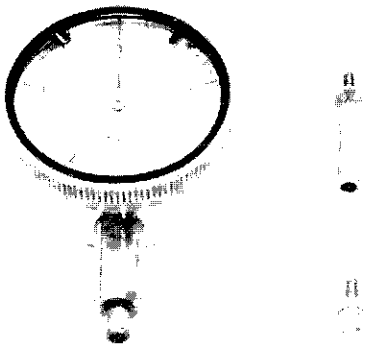
The breaker contacts are undergoing normal wear (burning off). Burned off breaker contacts are resulting in an increased breaker gap thus moving the ignition timing towards "advanced" setting. Partly burned breaker contacts can be readjusted while heavily worn ones must be replaced under all circumstances — always in sets. To do so loose wire connections from contact bank respectively loosen connecting wire from condenser. Take off dust protection cover and remove fastening screw of breaker point set.

Install new set of points, connect wire again and adjust point gap. To do so slide flywheel with 3 slotted holes onto the crankshaft and turn it in direction of engine rotation until the woodruff key has almost reached its highest position (top dead center position of crankshaft); now the flywheel hub has opened the point set at its maximum. In this position loosen fastening screw of the contact set somewhat and adjust the contact bank in such a way that you obtain a gap of 0,35 to 0,4 mm (0.014 to 0.016 in) which can be measured with a feeler gauge. Thereafter tighten fastening screw firmly and adjust respectively control the ignition timing.

Finally apply some grease which is packed with the new set of points to the lubricating felt.

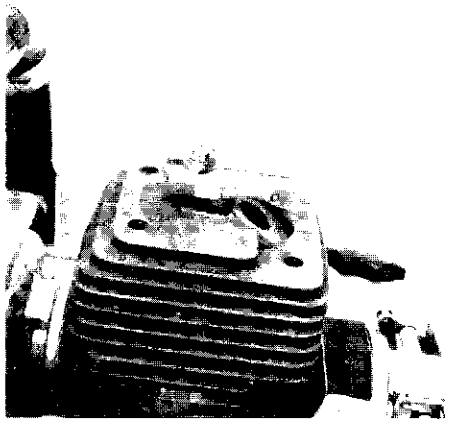
Controlling the ignition timing

Dial gauge with short and long feeler pin

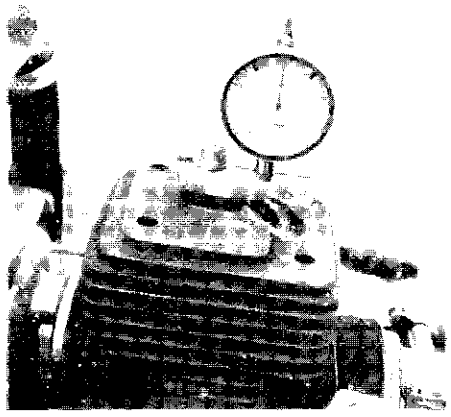


Top:
Mounted clamping piece

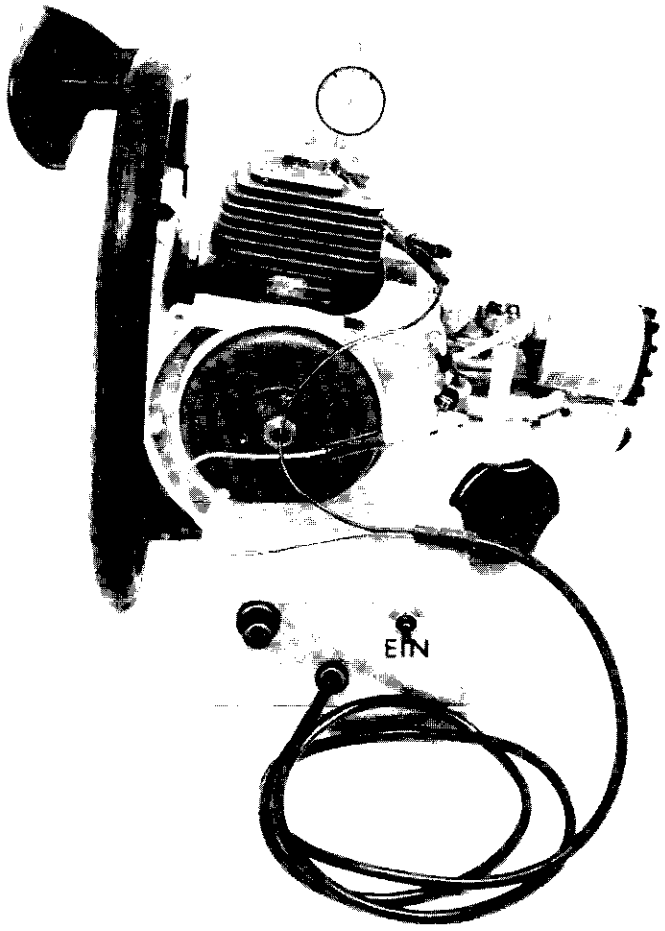
Bottom:
Connecting ignition timing apparatus



Inserted dial gauge



The ignition timing of the 08 S must be set at 2,0 to 2,2 mm (0.08 to 0.087 in) before top dead center. This means that the breaker lever just starts to lift from the contact bank at this crankshaft position. At top dead center position of the crankshaft the breaker points are fully opened and the opening gap must not exceed 0,35 to 0,4 mm (0.014 to 0.016 in).



To control the ignition timing first remove shroud, fan housing and fan wheel. Thereafter remove spark plug and mount clamping piece 1106 890 4200 with cylinder head screw M 6×20 onto the cylinder head. Before doing so, however, remove short feeler pin from dial gauge and screw in feeler pin of 20 mm (0.79 in) length first, only then use short one to screw into the long one. Insert dial gauge into the provided holder and adjust clamping piece in such a way that the feeler pin reaches into the

combustion chamber without touching the spark plug thread. Loosen dial gauge again, turn crankshaft to top dead center position and move dial gauge towards cylinder until the indicator can deflect by approx. 5 mm (0.2 in). Tighten cylinder head screw in clamping piece moderately. Attention- when tightening this screw too firmly the guidance of the feeler pin will get pinched and the feeler will not work. By turning back and forth bring crankshaft in top dead center position and adjust dial gauge by means of the adjusting ring to "0" position.

Now clamp one connecting terminal of the ignition timing apparatus 0000 890 8905 to ground (for instance cylinder fin) the other one to the contact sleeve of the short circuit wire.

Turn on timing apparatus and slowly turn crankshaft in direction of engine rotation (counter clockwise) until the pilot lamp flashes up. In this position the breaker points are opening. The indicator should now show a reading between 2,0 and 2,2 mm (0.08 and 0.087 in). If this is not the case readjust timing again.

Markings at flywheel and crankcase

The ignition timing is also indicated by markings at the flywheel and crankcase (see illustration). For control purposes therefore you need not to have a dial gauge but only a timing apparatus. The very moment both markings are in line the pilot lamp must flash. If not, readjust timing. If flywheel or crankcase have to be replaced the markings to control the timing must be punched into crankcase again. To do so insert dial gauge into the spark plug port and turn piston until it is positioned between 2,0 and 2,2 mm (0.08 and 0.087 in) before top dead center. Now transfer flywheel marking to crankcase.

First pull off flywheel and unscrew dust cover from armature plate, thereafter mount flywheel again. Now check the breaker point gap with a grease — free feeler gauge in the range of the top dead center position of the piston through the adjusting openings of the flywheel to see if it is between 0,35 and 0,4 mm (0.014 and 0.016 in). If such a reading is not obtained correct breaker point gap (see "breaker point set").

Turn on ignition timing apparatus and turn crankshaft in direction of engine rotation until the pilot lamp flashes. If the dial gauge shows now a reading which is not between 2,0 and 2,2 mm (0.08 and 0.087 in) loosen armature plate through adjusting opening of flywheel and rotate it correspondingly. Turn flywheel until dial gauge shows a reading of 2,1 mm (0.083 in). If the previous reading was higher than 2,2 mm (0.087 in) turn armature plate in direction of engine rotation. If the reading is below 2,0 mm (0.08 in) turn armature plate in opposite direction of engine rotation until the pilot lamp just starts to flash. After that tighten armature plate again.

The gap of the contacts of the breaker points and the position of the armature plate towards the flywheel position in the moment of the firing point are to be seen in a functional relation. None of these given quantities can be changed

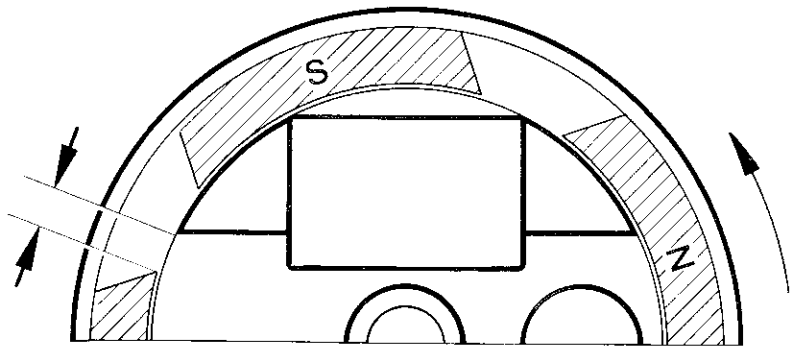
Magneto edge gap

without influencing the other one. Especially the predetermined tolerances must be kept as otherwise this will result in loss of ignition power and loss of engine performance.

The ignition timing is defered by enlarging or decreasing the breaker point distance; increased contact gap causes advanced ignition, decreased contact gap causes retarded ignition. Never change the ignition timing by decreasing or increasing the recommended gap. Heavily corroded contacts must be replaced.

After adjusting the ignition timing remove flywheel again and screw dust protecting cap onto the armature plate. Then mount parts in reverse sequence of disassembly. When replacing the crankshaft, the flywheel or the crankcase the markings at the crankcase for controlling the ignition timing should be checked in any case and if necessary renewed.

Schematic view of edge gap



Upon each checking or readjusting of the ignition timing also the edge gap must be controlled. At properly adjusted advanced ignition and correct breaker point gap the edge gap is given by the position of the woodruff key groove. Edge gap means the position of the magnets in the very moment of the circuit interruption. The edge gap therefore is the distance between the outgoing pole shoe edge of the flywheel and the adjoining pole shoe edge of the armature plate upon opening of the breaker points. This gap is 6 to 9 mm (0.24 to 0.35 in) on 08 S ignition. Consequently the gap must be measured from the outgoing edge of the N-pole which runs in front of the S-pole (see illustration).

If the edge gap is too big then the ignition is too weak when starting. If, however, the edge gap is too small misfiring of the ignition at high engine speed is caused.

To check the edge gap slide a feeler gauge of 0,05 mm (0.002 in) between the opened breaker points, turn flywheel in reverse direction of engine rotation until the feeler gauge can still be removed without too much pinching. Now check the edge gap. Should the edge gap not be within the permissable tolerance it can only be corrected by changing the breaker point gap. Decreasing the contact gap results in an increased edge and vice versa.

Instead of a feeler gauge the ignition timing apparatus can also be used. The edge gap must then be measured at the moment of the flashing of the control light.

REWIND STARTER

Design and function

The rewind starter is mounted on the starter shaft inside the fan housing directly in front of the flywheel. Starter rope with grip, rope rotor, friction shoe and brake spring are the main parts of it. These parts are held in position by a lock washer. The starter rope is wound onto the rope rotor by the pretention of the rewind spring and, therefore, rotates the pulley when being pulled out.

The friction shoe is inserted into a recess in the rope rotor. The braking effect of the brake spring turns the brake lever towards the rope rotor when starter rope is being pulled out. This causes the sharp edges of the friction shoe plates to move against the inside of the plastic ring which is pressed into the hub of the fan wheel. The torque produced by the starter rope is transmitted via the fan wheel which is flanged to the flywheel, and from there to the crankshaft where it causes the crankshaft to turn.

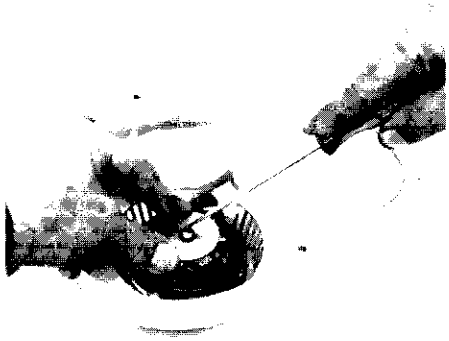
When guided back the unwound starter rope gets automatically rewound onto the rope rotor by the tension of the rewind spring.

The rewind starter does not need maintenance. Only the rope rotor should be greased with resin-free oil at regular intervals.

Trouble	Cause	Remedy
Starter rope broken	Rope was pulled out too vigorously or over the edge and not vertically	Replace rope rotor
Rewind spring broken	Excessive pretension of spring — it has no play any more when being pulled out completely	Replace rewind spring
Starter rope can be pulled out without feeling nearly any resistance (does not crank crankshaft any more)	Edges of friction shoe plates worn	Renew friction shoe plates
	Plastic ring worn or broken by the engagement of the friction shoe plates	Replace plastic ring
It is difficult to pull out starter rope and it glides back only slowly	Rewind starter heavily clogged (very dusty conditions)	Clean all parts of rewind starter
	The lubricating oil on the rewind spring gets stiff at very low temperatures (spring coils stick together)	Apply a little kerosene to rewind spring, then gently pull out starter rope several times until starter works properly again

Disassembly

Prying off the lock washer



First unscrew fan housing with rewind starter. To relieve tension of rewind spring pull the rope out a short way, hold the rope rotor from turning and unwind two turns of starter rope. Release rope rotor — it will turn back thus relieving the tension of the spring.

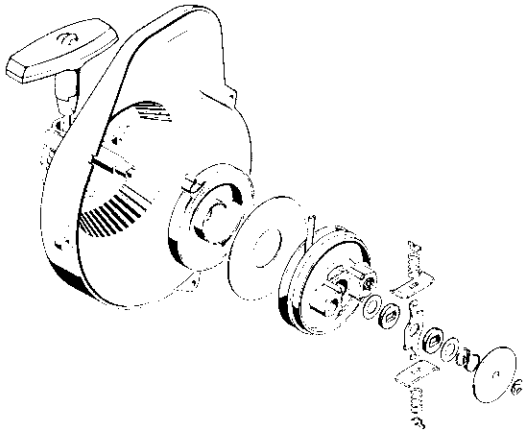
If starter rope is broken the pretension of the spring is removed already. Pry lock washer gently off the shaft with a screwdriver meanwhile holding the check plate with the other hand that brake spring underneath does not get lost. The individual parts of the rewind starter may now be removed from the starter shaft one after the other.

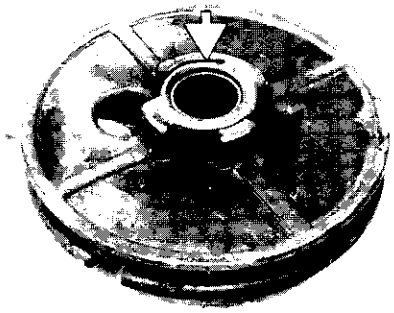
Attention: Prevent rewind spring from jumping out when removing the rope rotor.

Installation of a new starter rope

Top:
Individual parts of rewind starter

Bottom:
Lug in rope rotor





Remove remaining piece of starter rope from rope rotor, thread a new rope of 4.5 mm (.17 in) diam. and 1000 mm (40 in) length through rope rotor and tie a simple knot in the rotor end. Pass other end of rope through rope bushing in fan housing and secure it in the starter grip with a special knot. Do not wind rope onto rope rotor.

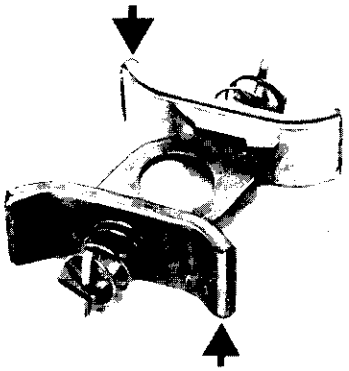
Lubricate rope rotor with a light film of oil when placing rotor onto starter shaft and make sure that lug of rotor is safely hooked into the loop of the rewind spring. Now replace the other parts of the rewind starter in the same sequence as illustrated above.

Be sure to position one of the two brake washers in front of and the other one behind the friction shoe system and to keep them clean of grease and oil.

The assembly of the friction shoe system is correct if the lugs of the spring retainer plates turn in clockwise direction. Secure rope rotor with the lock washer and tension rewind spring.

Worn friction shoe plates

Worn friction shoe plates



The edges of the friction shoe plates are subject to wear each time they are engaging the rewind starter. The result of this wear are dull edges which cannot positively engage the rewind starter any longer and the rewind starter, in turn, is slipping.

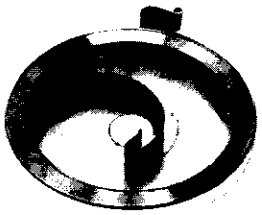
The friction shoe plates can be turned once as they have a symmetrical shape. To this purpose unhook spring retainer plates from brake lever and remove springs and friction shoe plates. Reassemble in reverse sequence.

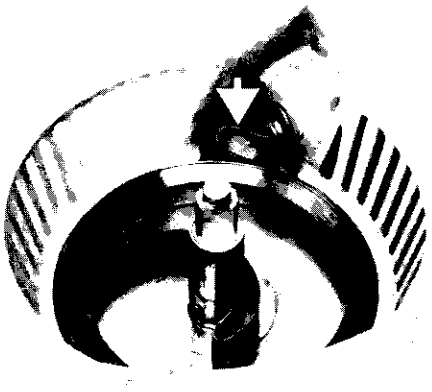
Install a new friction shoe system if second edge of friction shoe plates is worn, too.

Replacing the rewind spring

Top:
Rewind spring ready for assembly

Bottom:
Inserted rewind spring





Lubricate rewind spring with a light film of oil and insert spring with spring housing (with closed side at bottom) into fan housing and hook outer spring loop into the lug cast to the fan housing.
If spring should have uncoiled during assembly coil it into spring housing in clockwise direction starting with the outer loop and ending with the inner loop. Cover rewind spring with washer and mount rope rotor.

Tensioning the rewind spring

Tensioning rewind spring

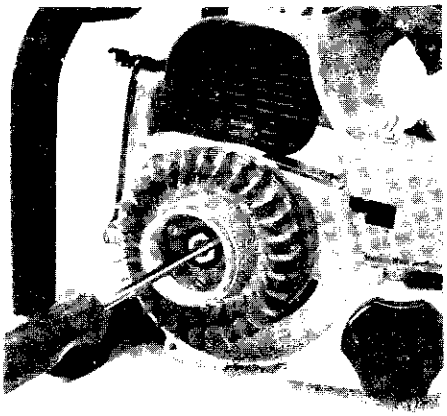
Grasp unwound starter rope close to the rope rotor end and place it into round-shaped groove of the rope rotor. By pulling the rope turn rope rotor 6 times in clockwise direction to tension the rewind spring. Hold rope rotor from turning, untwist rope and pull rope out to its full length. Release rope rotor and let starter rope rewind slowly onto the rotor by the tension of the rewind spring.

The tension of the rewind spring is correct if starter grip is tightly drawn up against the rope bushing and cannot tilt over the edge of the bushing. With rope pulled out to its full length it must be possible to further rotate the rope rotor at least half a turn until maximum spring tension is reached. Otherwise, pull out starter rope, hold rope rotor and unwind one turn of rope.

An excessively tensioned spring will get broken.

Replacing the plastic ring

Unscrewing the fan wheel



The plastic ring pressed into the hub of the fan wheel is subject to normal wear. Install a new plastic ring if the corrugation at the inner face of the ring, which improves the engagement of the friction shoe plates, is worn or if the ring is broken.

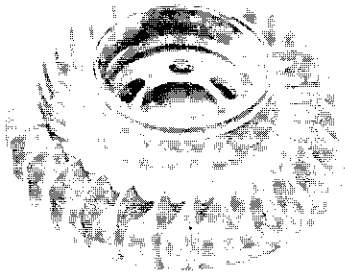
First pry old ring out with a screwdriver. Then place fan wheel on a level wooden support and insert new ring with gentle pressure or with light hammer blows.

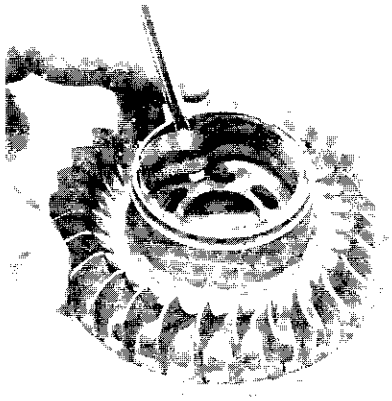
Make sure that ring is in correct position.

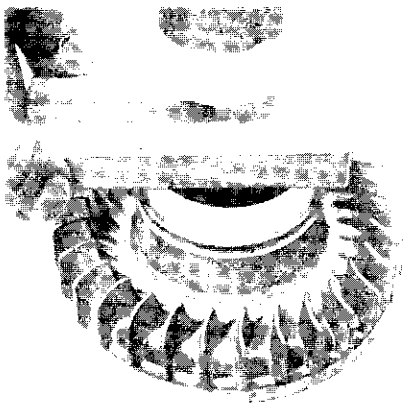
Top:
Worn plastic ring

Center:
Prying out the plastic ring

Bottom:
Inserting a new plastic ring







General repair

If it is very difficult to pull out starter rope and if it glides back only very slowly or not completely the rewind may not have any mechanical defect but may only be very dirty. In areas with very low temperatures the oil on the rewind spring may not be fluid any more, the spring coils may then stick together so that the rewind starter will not operate properly any more. In such a case the trouble can be eliminated by applying some kerosene to the rewind spring.

Then pull starter rope gently until the starter functions properly again. A starter which is full of dirt or resin, however, has to be disassembled completeley — including the rewind spring. Be careful when disassembling the spring! Wash all parts in kerosene or clean gasoline.

Lubricate the rewind spring and the shaft with oil when reassembling the parts.

OIL PUMP

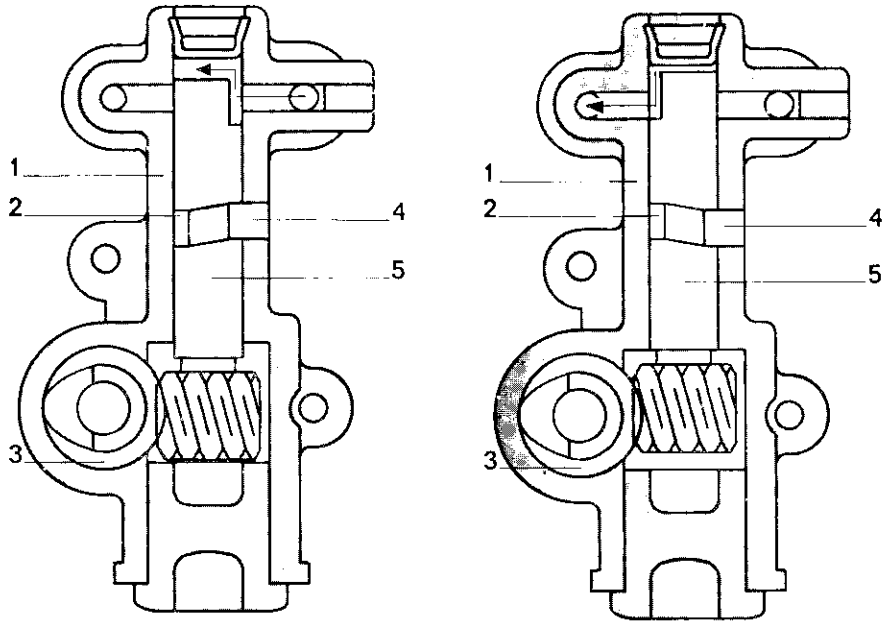
Design and function

Schematic view of the oil pump:

1 = pump housing
2 = control slot
3 = worm
4 = cylindrical pin
5 = pump piston

Intake stroke

Pressure stroke



Oil tank and oil pump are positioned in the chain sprocket cover. The oil pump pumps the chain lubricating oil from the oil tank to the guide bar and the saw chain. The oil pump must always work trouble-free to guarantee a proper lubrication of bar and chain.

The oil pump is driven by the dowel pin which is pressed into the crankshaft nut at the power take-off side. From there the power is transmitted via the adapter sleeve and the worm to the pump piston. A cylindrical pin inserted in the pump housing and catching the control slot of the pump piston actuates the pump piston. Due to the pitch of the control slot the pump piston is put into a constant pumping action while turning. The pump piston is priming while gliding back. In an oil pocket at its end the oil is carried from the intake port to the outlet port where it gets compressed by the forward stroke of the piston and pressed through the outlet hole.

The oil feed has a constant linear relation to the chain speed which guarantees proper lubrication of bar and chain at any speed.

The lubricating oil is filtered in the oil pickup body in the oil tank to prevent any dirt in the oil entering the oil pump.

Troubles with the oil pump are very seldom. In most cases other parts have got dirty and are causing an insufficient oil supply.

Trouble shooting chart

Trouble	Cause	Remedy
No lubricating oil at chain	Oil tank empty	Top up oil tank
	Oil inlet hole in guide bar clogged	Clean oil inlet hole
	Intake line or oil pick-up body (strainer) clogged	Wash intake line and oil pick-up body in clean gasoline and blow out with compressed air. Replace oil pick-up body, if necessary.
	Dowel pin in crankshaft nut broken	Insert new dowel pin
	Adapter sleeve in oil pump worm broken	Replace adapter sleeve
	Tank vent in oil filler cap clogged	Clean oil filler cap
	Gear at pump piston and worm worn	Replace pump piston and worm; to install a new oil pump will be even better
Chain saw looses chain lubricating oil	"O" ring between oil filler cap and chain sprocket cover worn	Insert new "O" ring
	Gaskets in oil pump worn	Install new gaskets

Removing oil pump

If all other possible trouble causes in the lubricating system are eliminated the trouble may be found in the oil pump.

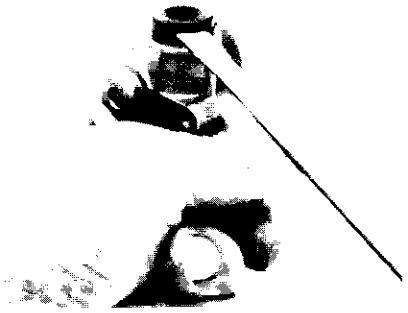
Empty oil tank before disassembling the oil pump. Take out the two countersunk screws and remove oil pump from chain sprocket cover. Intake and outlet channel of the oil pump and the oil channels in the chain sprocket cover are sealed by two rubber ring gaskets.

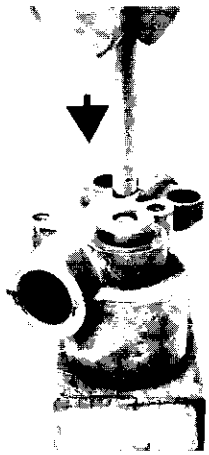
To remove the pump piston lever out rubber plug with a broad screwdriver, then pull out cylindrical roller with a magnet. If this should be difficult turn piston back and forth over worm a short way. Now the pump piston will fall out by itself or may be blown out of the housing. Take pump housing into the hollow of your hand with cylinder bore down and tap it against a firm support with the ball of your thumb until you can grasp the piston. To

Top:
Levering out rubber plug

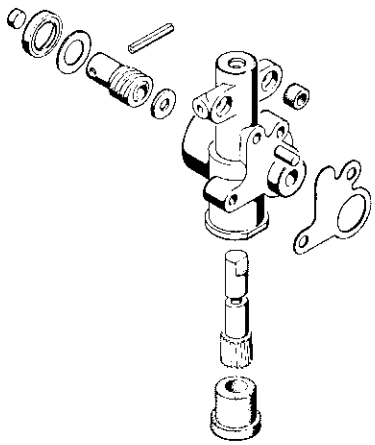
Center:
Pulling out cylindrical roller

Bottom:
Beating down worm shaft





Individual parts of oil pump



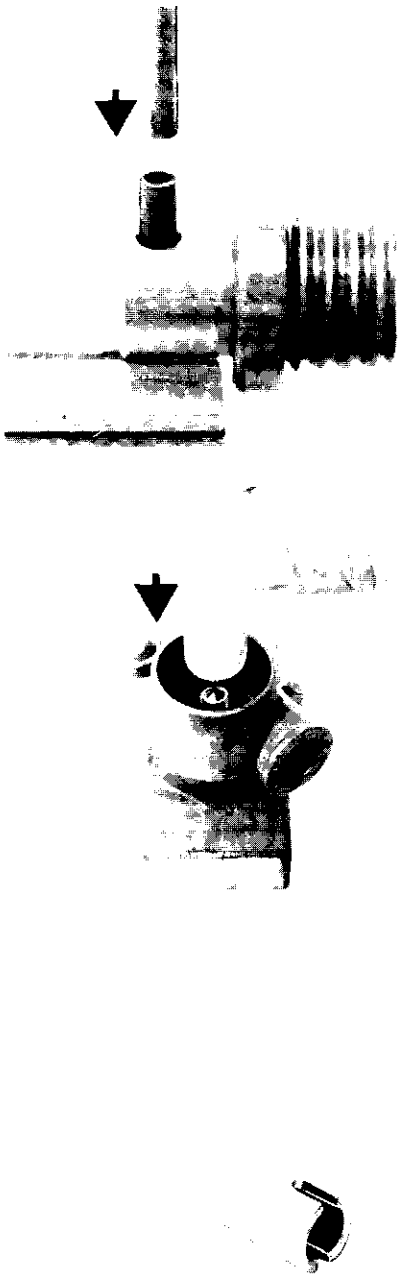
remove the worm beat back worm shaft in pump housing with a suitable punch abt. 6 mm (.24 in). In this way you drive out the worm together with the oil seal; the oil seal gets from its seat in the housing and the worm can be removed from the shaft.

Wash all parts of oil pump thoroughly in clean gasoline — especially the channels — blow out with compressed air and check on proper condition. Replace worn parts, especially the sealing parts.

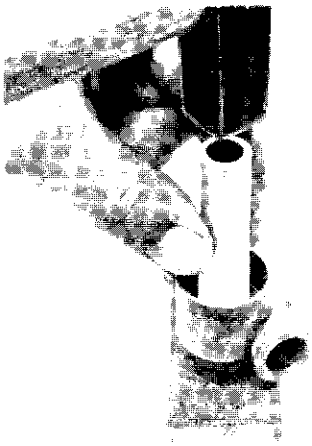
Top:
Punching out the adapter sleeve

Center:
Driving in the worm shaft

Bottom:
Mounting sleeve for oil seal of oil pump



Pressing in the oil seal



If oil seal has to be replaced, punch adapter sleeve out of worm shaft.

Lubricate all parts prior to assembly. Then punch worm shaft back into housing until shaft is flush with rear edge of housing. The end with the ground face must point toward the inside of the housing.

Slide worm onto shaft and install oil seal with mounting sleeve 1108 893 2400.

Install all other parts in reverse disassembly sequence.

When mounting the oil pump into the chain sprocket cover check to be sure that sealing is tight.

Do not replace dowel pin with nut still screwed onto the crankshaft but remove nut from crankshaft.

Top:
Pressing in a new dowel pin

Bottom:
Pulling out the oil pick-up body

To clean or replace pick-up hose or pick-up body empty oil tank, pull out pick-up body through oil filler hole, pull hose off the connector. When oil pick-up body is put back into tank check to be sure that hose in tank is not bent or twisted.

CARBURETOR AND AIR FILTER

Design and function of carburetor

The main parts of the all-position diaphragm carburetor are the pump housing and the carburetor body. Although the fuel pump is incorporated in the same body as the carburetor it is a fully separate and ndependently working unit.

Operating of fuel-pump

The crankcase is subject to alternate surges of pressure and vacuum at each stroke of the piston — with vacuum created by the upwards stroke and pressured by the downward stroke of the piston. The effect is used to actuate a fuel-pump. The chamber on top of the pump-diaphragm (impuls chamber) is connected to the engine crankcase through the impuls channel. Due to the alternate surges in the crankcase the pump-diaphragm will pulsate at each stroke of the piston. The pump-diaphragm has two flap valves punched out of it and still connected with it on one side.

The vacuum created by the upwards stroke of the piston draws the pump diaphragm into the impulse chamber thus enlarging the fuel chamber and creating a vacuum there, too. The inlet valve opens, the higher atmospheric pressure is pushing fuel from the tank into the fuel chamber and is pressing the outlet valve into its seat.

The downward stroke of the piston changes the pressure conditions. It creates pressure in the crankcase and in the impulse chamber thus pushing the pump diaphragm towards the fuel chamber and reducing the volume of fuel. The inlet valve is pressed into its seat whereas the outlet valve is opened allowing fuel to flow to the needle valve of the carburetor.

Operation of carburetor

The opening and closing of the needle valve and, therefore, the fuel supply to the carburetor is controlled by the metering diaphragm. The metering diaphragm is in position of rest if the atmospheric pressure in the diaphragm chamber (the chamber under the diaphragm is vented to the atmosphere) are identical.

The taper of the inlet needle is pressureforced into its seat. When engine is running the metering chamber is filled with fuel. During the suction cycle a vacuum is created in the venturi. As the venturi is wented to the diaphragm chamber through valve ports fuel is drawn into the venturi. This creates a vacuum in the diaphragm chamber, too, and an atmospheric pressure pushes upward on the metering diaphragm. The force, the strength of which is got from the difference between the vacuum and pressure multiplied by the size of the diaphragm surface, is transmitted through the pursed disc, the inlet control lever overcoming string pressure and unseating the inlet needle thus allowing fuel to flow from the fuel chamber in the diaphragm chamber. The inlet needle closes again as soon as atmospheric pressure is built up in the metering chamber again. In practical operation, however, the needle valve does not open and close constantly but balanced out on a medium level depending on engine speed causing the needle valve to remain open in a direct relationship to the position of the diaphragm.

The amount of fuel being drawn into the venturi is in a direct relationship to the vacuum conditions in the venturi which, in turn, are influenced by the condition of the choke shutter and the throttle shutter. To adapt the carburetor to different operating conditions the amount of fuel can be changed by the idle- and main adjustment screw.

Top:
Starting position

Bottom:
Idle position

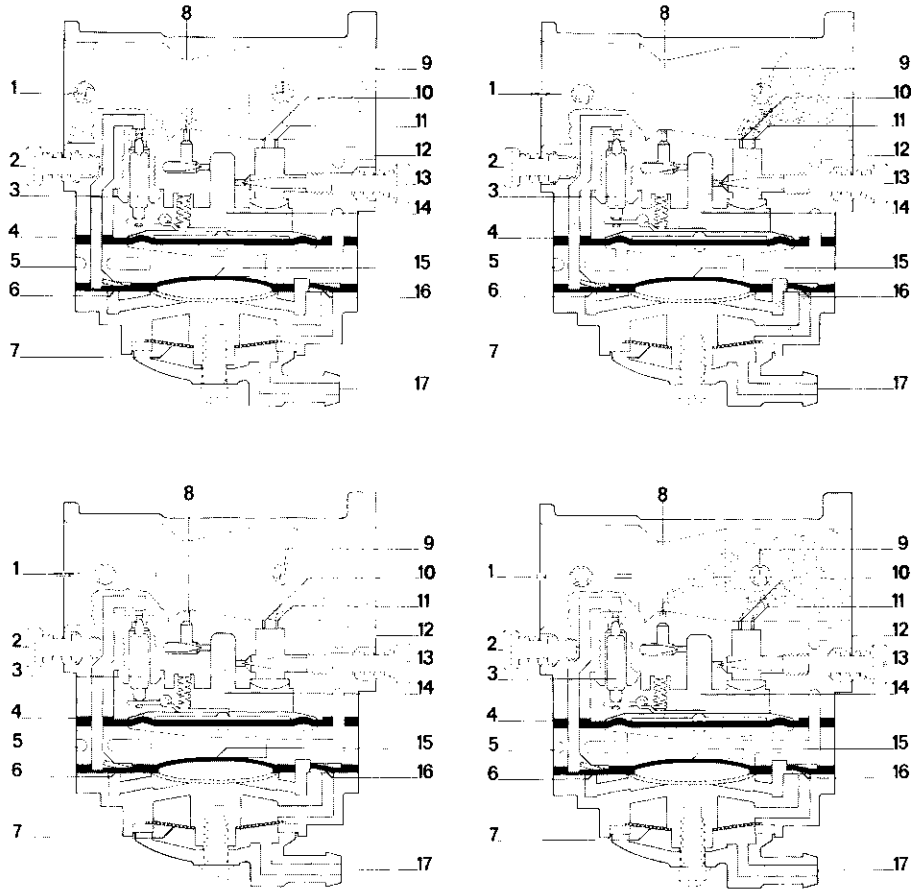
1 = Choke shutter
2 = Main adjustment screw
3 = Inlet needle
4 = Metering diaphragm
5 = Atmospheric vent
6 = Outlet valve closed
7 = Fuel strainer
8 = Valve jet
9 = Throttle shutter

Top:
Changing from idle to mean or full throttle position

Bottom:
Full throttle position

10 = Secondary idle jet
11 = Primary idle jet
12 = Impulse boring
13 = Idle speed adjustment screw
14 = Metering diaphragm chamber
15 = Pump diaphragm (sucking position)
16 = Inlet valve opened
17 = Fuel inlet connector

(both adjusting screws shown off set by 90 degrees)



To explain carburetion 4 differing operating conditions are of high interest:

1.
When **starting** an engine, the choke shutter is closed whereas the throttle is partly opened. A high vacuum is created in the venturi during the suction cycle as the outside air is almost completely kept out by the closed choke shutter. Under these conditions a lot of fuel is drawn through all jets into a relatively small amount of air resulting in a very rich fuel/air mixture which is necessary for starting. The choke shutter must, however, be opened immediately when the engine is running. Otherwise the rich fuel/air mixture would stop the engine again.

2.
Only a little fuel is needed for **idling.** The choke shutter is fully open whereas the throttle shutter is almost completely closed. A vacuum is created only at the **primary-idle-jet** and the fuel necessary for idling is drawn through that jet only. Due to the difference in pressure between venturi and the intake pipe behind the throttle shutter air would be drawn through the **main-jet** (valve-jet) into the diaphragm chamber thus causing a too lean fuel/air mixture and a stopping of the engine. Therefore, a ball in the valve-jet closes the jet if there is not enough vacuum in the venturi to prevent the air passing through the **main-jet.** The ball must be able to move freely in the valve body and should fall audibly when shaking the carburetor.

3.
To get enough fuel for speeding the engine from idling to partial or full load the throttle shutter must be opened to let more air enter the venturi and to create a vacuum at the secondary idle port so that fuel is drawn through that port to get the required richer and, therefore, ignitable mixture.

4.
Opening the throttle shutter further results in fuel also passing through the **main-jet (valve-jet)** at the narrowest point of the venturi thus getting the higher amount of fuel required at **full load.**

Trouble shooting chart

Trouble	Cause	Remedy
Carburetor flows over — engine gets flooded	Inlet needle does not seal. Foreign body in valve seat or latter damaged.	Remove, clean or renew inlet needle valve.
	Helical spring is not located properly on dimple of inlet control lever.	Remove inlet control lever and reinstall correctly.
	Pursed disc and diaphragm is out of shape and pushes constantly against inlet control lever.	Renew metering diaphragm.
	Inlet control lever in a too low position.	Set inlet control lever flush with bottom of diaphragm chamber.
Poor acceleration of engine	Idle jet too lean.	Turn out idle adjustment screw a little bit (see carburetor adjustment).
	Inlet control lever in a too high position.	Set inlet control lever flush with floor of diphragm chamber.
	Inlet needle sticks to valve seat.	Remove inlet needle clean and reinstall valve.
	Venthole to atmosphere plugged.	Clean hole.
	Diaphragm gasket not sealing properly anymore.	Renew diaphragm gasket.
	Metering diaphragm damaged.	Replace metering diaphragm.

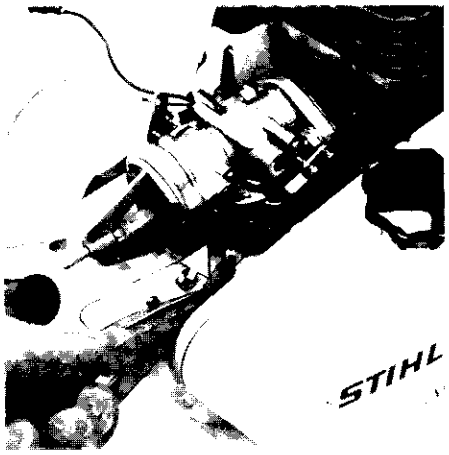
Trouble	Cause	Remedy
It is impossible to get the engine idling.	Throttle shutter opened too much by idle speed regulating screw.	Readjust idle speed regulating screw.
Engines stops when idling.	Idle jet ports or channels plugged.	Clean ports and blow out with compressed air.
	Idle jet "too rich".	Turn in idle adjustment screw a little bit (see "carburetor adjustment").
	Wrong adjustment of idle adjustment screw-throttle shutter completely closed.	Readjust idle adjustment screw.
Engine speed drops sharply under load — no full power.	Air filter plugged.	Clean air filter.
	Tankvent defective.	Clean or renew tankvent if necessary.
	Fuel line from tank to fuel pump leaking.	Seal or renew connections and line, if necessary.
	Pump diaphragm damaged.	Renew pump diaphragm.
	Cross section of valve jet narrowed.	Clean or replace valve jet.
	Fuel screen plugged.	Clean fuel screen.

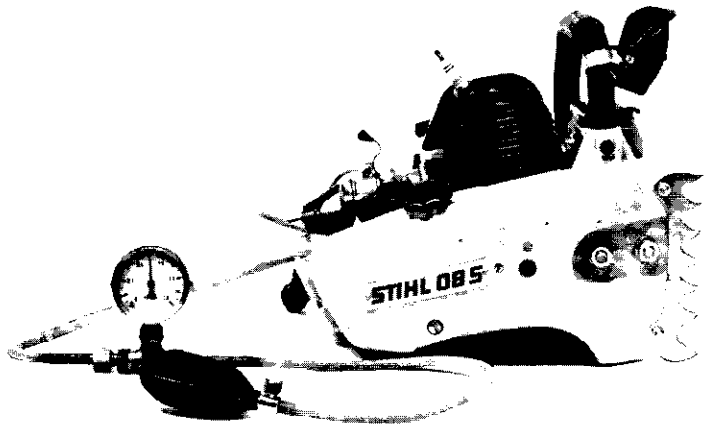
Pressure testing (tightness test) of carburetor

Top:
Pulling off the fuel line

Bottom:
Pressure testing the carburetor

Connecting the pressure testing device





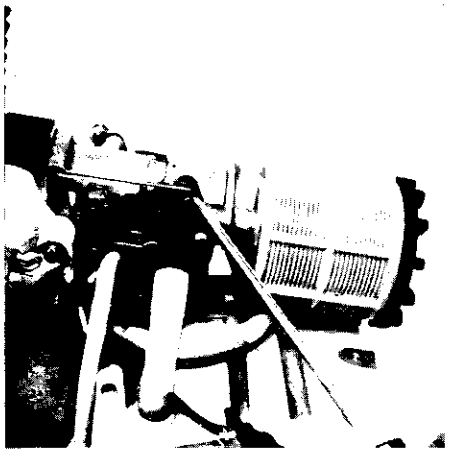
The carburetor can be tested on leakage with the carburetor crankcase pressure testing device 1106 850 2900.
Pull fuel line off the inlet fitting at fuel strainer cover of carburetor and connect hose end of pressure testing device with fitting. Close venting screw at pressure ball and pump air into carburetor by squeezing the ball until pressure gauge indicates a reading of 0.5 bar (7.25 lbf./in^2).

No drop in pressure is a proof that carburetor is tigth. If pressure changes, however, this may have two causes mainly:

1. The inlet needle valve does not seal properly (foreign particle in valve seat or valve seat damaged).
2. Metering diaphragm damaged.

If so, carburetor must be removed and repaired.

Prying off the retainer.



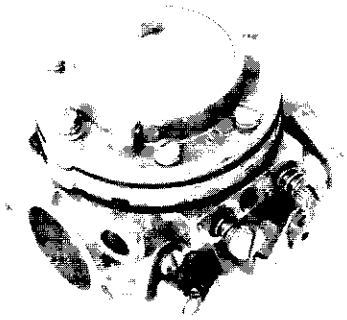
Remove shroud and air filter. Pry retainer off the governor lever and unhook governor rod. Unscrew the two collar nuts M 6 holding the carburetor. Take carburetor off the screws, at the same time pulling fuel line off fitting at fuel strainer cover of carburetor.

Unscrew the four cylinder-head screws to remove adapter and cooling plate. Replace damaged gaskets when reassembling the parts.

Repair

Top:
Removing the fuel strainer cover.

Bottom:
Unscrewing the fastening screws.



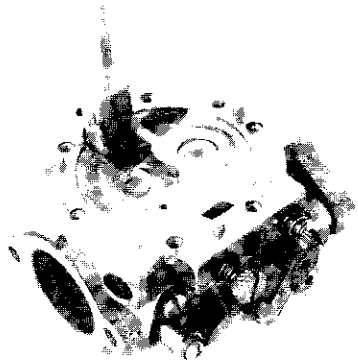
Unscrewing the stud

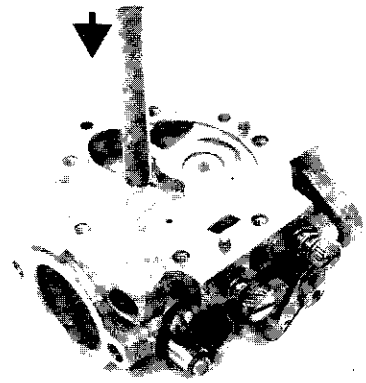
Diaphragm and gasket may often stick together and must be taken apart very carefully.

Diaphragms are the most delicate components of the carburetor. Due to the alternating strain the material of the diaphragm is subject to fatigue — the diaphragms get bulgy after some time not allowing a troublefree operation of the carburetor anymore. The diaphragms must then be replaced.

Top:
Unscrewing the valve body.

Bottom:
Punching out the valve jet.



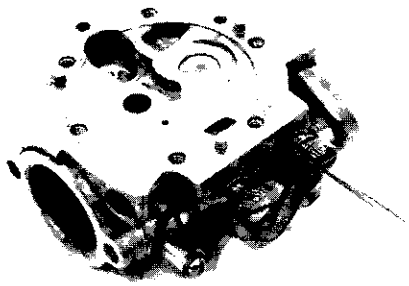


The maintenance of the carburetor has to be started at the pump part. To clean the fuel screen remove fuel strainer cover and take gasket and screen out of fuel pump body.

Wash screen in clean gasoline and blow out with compressed air. Renew screen if damaged. Unscrew the 6 screws to remove fuel pump body, fuel pump diaphragm, gasket, diaphragm cover, metering diaphragm and diaphragm gasket.

The inlet needle valve is positioned in a recess in the metering diaphragm chamber. The inlet control lever and the inlet tension spring can be removed after unscrewing the pinion screw locating the inlet control lever. Now the inlet needle may also be taken out of the valve body. If valve seat is damaged — which can be noted if carburetor gets flooded although valve seat was cleaned already — the valve body must be unscrewed with a thinwalled SW 8 socket wrench and the complete needle valve must be replaced.

Unscrewing the adjustment screws.



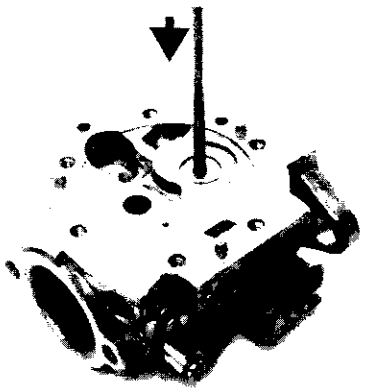
If plastic ball is not free in valve jet (main jet) and is jammed push or punch out jet with a suitable tool of 5 mm (.2″) diameter, pushing it from the diaphragm chamber towards the venturi. But do not forget to screw out main adjustment screw by at least one turn.

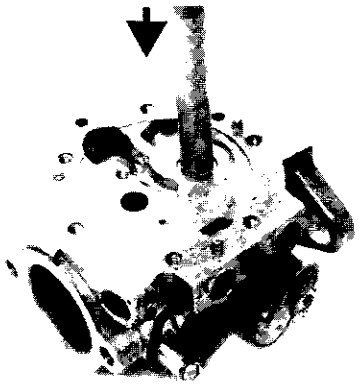
Wash all carburetor parts, especially all holes and channels in carburetor body, in clean gasoline and blow out with compressed air having removed the 2 adjustment screws before.

To check plug 6503 122 9410 on tightness drop oil on to it and blow with compressed air into the hole of the idle adjustment screw. If air bubbles get through the oil caulk plug lightly around its entire edge. Renew plug if it is still not sealing properly.

Top:
Removing the plug.

Bottom:
Getting the plug level.



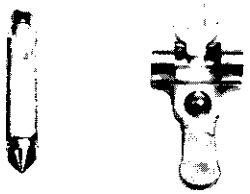


Beat against center of plug with a punch of about 3 mm (.12″) bulg the plug downwards thus releasing the tension between the plug and the hole wall. Take out plug and blow out idle discharge ports. Insert new plug into hole with convex side on top and get it level by applying light pressure with a punch of about 8 mm (.32 in) diameter.

When inserting the valve jet make sure that it is located in the hole in

Top:
Inlet needle and inlet control lever.

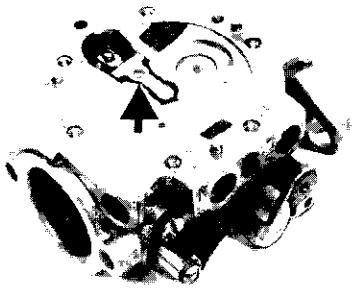
Bottom:
Inserted helical spring.

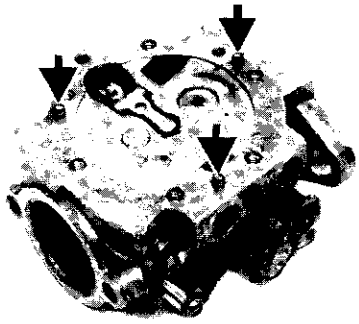


exactly vertical position and not tilted. The rear edge of the valve jet must be flush with floor of diaphragm chamber. Screw in tightly inlet valve body with socket wrench again and insert inlet needle. Mount helical spring into its boring seat, insert the fork of the inlet regulating lever into the ring groove at the head of the inlet needle and insert inlet control lever pinion screw into bore of inlet control lever. Make sure that inlet tension spring is located on the

Top:
Installed inlet control lever

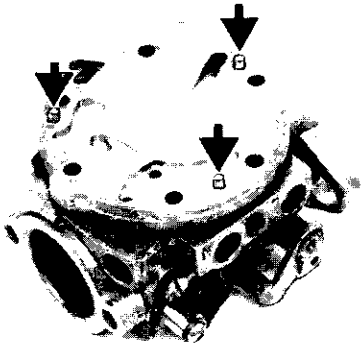
Bottom:
Guide pin at carburetor body.

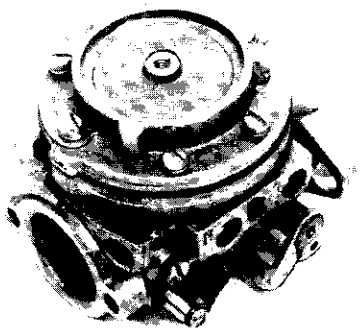




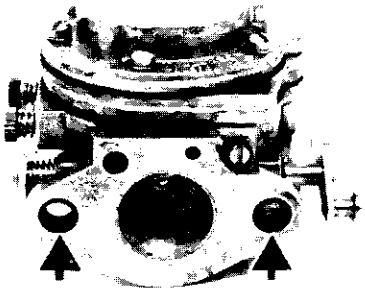
Top:
Guide pins at diaphragm cover

Bottom:
Inserted fuel strainer





Plastic bushings in the fastening holes



inlet control lever dimple. Tighten inlet control lever pinion screw firmly and check free movability of inlet control lever.

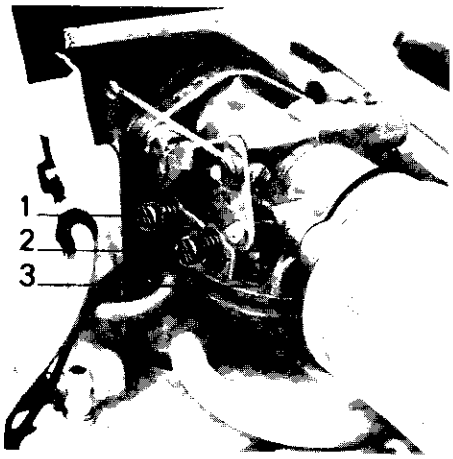
Both carburetor body and diaphragm cover have 3 cast pins to exactly a line gaskets, diaphragms, diaphragm cover and fuel pump body. Reassemble gasket, metering diaphragm, diaphragm cover, pump diaphragm and fuel pump body making sure that the lining holes of these parts locate on the proper cast pins at the carburetor body and the diaphragm cover. Put the 6 screws back into place and tighten them crosswise. Mount fuel strainer and screw in adjustment screws.

Before reassembling the carburetor make sure that each screw hole of the carburetor adapter is provided with a plastic bushing. These are required for a good heat protection of the carburetor.

Push fuel line over fitting at fuel strainer cover and place carburetor on the screws. Check to be sure that gasket is placed between carburetor adapter and carburetor. Screw on collar nuts and tighten securely. Hook governor rod into the governor lever and secure it again with circlip.

Carburetor adjustment

1 Idle adjustment screw
2 Main adjustment screw
3 Idle speed regulating screw
(You need not remove the shroud to adjust these screws)



The carburetor was adjusted at the factory for best operating, economy and power at local atmospheric conditions.

Working up in the mountains or near sea level necessitates a readjustment of the carburetor. Adjustment has to be made at the 2 adjustment screws and the idle speed regulating screw.

The normal settings of the adjustment screws are as follows:

Main adjustment screw H:
with knurled head and dull cone 3/4 to 1 turn open.

Idle adjustment screw L:
with knurled head and pointed cone 3/4 to 1 turn open.

Don't mix up these adjustment screws!

To make the readjustment turn the 2 adjustment screws gently in until both are seated. Check carburetor adjustment on warm engine and with clean air filter.

Hints for readjustment of carburetor.

Engine stops when idling:
With engine running turn idle speed regulating screw clockwise (chain should not turn).

Chain turns at idling speed:
Turn idle speed regulating screw counter clockwise a little bit.

Engine speed erratic when engine is idling:
Adjust idle adjustment screw. You get a leaner mixture by turning it clockwise and a richer mixture by turning it counter clockwise.

Attention:
Even a slight change in carburetor adjustment has substantial effects on engine operation.

Air filter

Unscrewing filter cover

Air filters are used to clean the intake air from dirt to reduce the ware of the engine parts. Dirty air filters are reducing engine performance, they are increasing fuel consumption and make starting difficult.

Before removing the air filter close choke shutter to prevent dirt entering into carburetor.

The air filter can be removed when filter cover is unscrewed. Hold filter upright and tap it gently onto the flat of your hand. Wash it in clean gasoline and blow carefully out with compressed air.

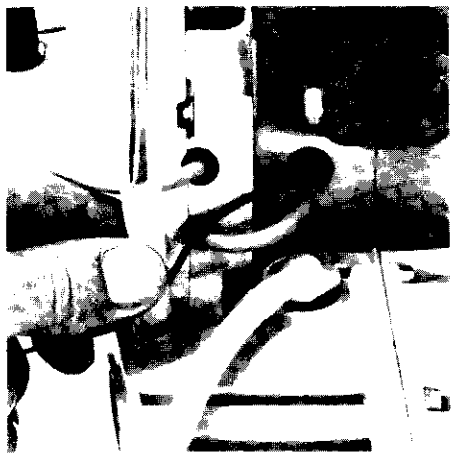
If wiremesh is defective renew air filter as it will permit dirt to be drawn into the engine and ruin it.

FUEL HOSE

Removing the cap.

Levering out the elbow fitting.

Unscrewing the threaded pin.



Through the fuel hose the diaphragm pump draws fuel from the fuel tank into the carburetor. Impurities in the fuel which may have got into the tank are kept back in the fuel pick-up body (filter and screen). Therefore, the fine wiremesh and the filter in the fuel pick-up body will get plugged with dirt after some time. The free passage of the fuel through the filter will be restricted causing an inadequate fuel feed.

Therefore check and clean fuel pick-up system when noticing improper fuel feed. Take fuel pick-up body out of tank through the fuel filler hole and pull off hose. Remove cap and take filter, strainer and insert out of fuel pick-up body. Clean all these parts. Be careful not to damage the wiremesh in the pick-up body.

The filter should be renewed rather than cleaned. Reassemble parts in a reversed disassembly sequence. You should take this opportunity to flush the fuel tank with clean gasoline.

To replace a defective hose unscrew carburetor, lever elbow fitting out of hose and fish hose out of tank. Install hose in reverse disassembly sequence.

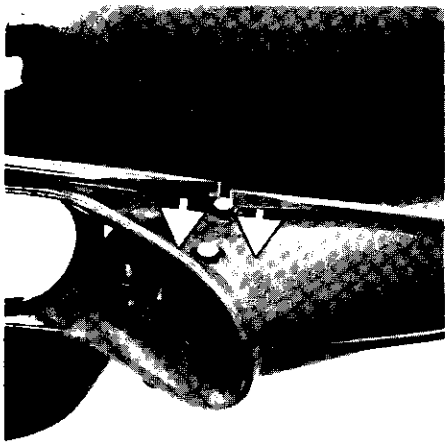
When putting pick-up body back into the tank be careful not to twist or kink the hose.

To guarantee a troublefree operation of the carburetor, the atmospheric pressure and the pressure inside the tank must always be the same for which reason the tank is vented to the atmosphere through the hole of the thread insert in the venting hose.

In case of troubles with the carburetor or the fuel feed check and clean tank vent, too. Renew tank vent if flanks of screw threads are cutting deeply into hose.

THROTTLE DEVICE AND CHOKE SHUTTER SLIDE

Prying off lock washer.



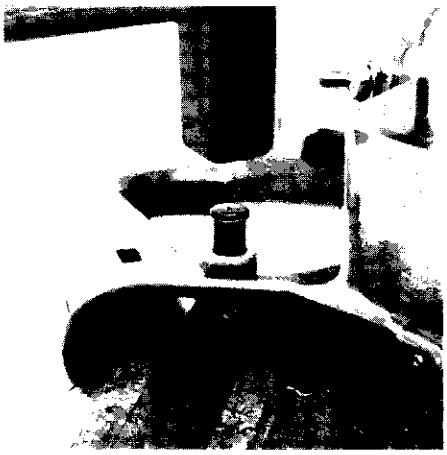
From machine No. 8.043.400 the standard STIHL 08 S power saws are equipped with a throttle trigger lock which prevents an unintentional throttling and is a very important safety device.

To repair a throttle control device the shroud has to be removed.

Both throttle trigger and lock lever are located on a different bolt being secured by a lock washer on either side.

To remove the 2 bolts pry off one each lock washer on 1 side only, push out bolts and then take lock lever (with hook — on spring) and throttle trigger out of handle. Tilting throttle trigger and unhooking throttle rod before.

Beating in throttle lock button.



If throttle lock button is defective pass new bolt through hole from inside of handle and place head of bolt onto a suitable support. Then put washer, helical spring and throttle lock button back onto bolt and, with gentle hammer blows, fasten throttle lock button to bold.

To reassemble throttle control system pass throttle trigger from below through rectangular recess in handle, tilt trigger, then introduce throttle rod from below and hook it into eye of throttle trigger. Get trigger into proper position, pass bolt through trigger and secure with lock washer.

Please hook on spring onto collar of lock lever that short hook end of spring is located on lock lever. Bend long end of spring rearwards and insert lock lever into handle. The long spring end must then rest in the groove of the throttle trigger.

Get lock lever into proper position, pass bolt through lever and secure with lock washer.

Now check throttle trigger system on trouble free operation.

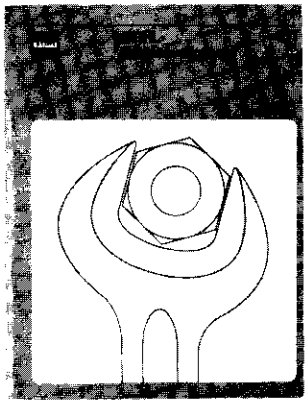
The choke shutter slide is located in a slot of the shroud where it can be pushed back and forth. It is secured, and, at the same time, stopped by a flat spring at any required position. Otherwise, the slide would always be pushed into "1" position by the tension of the spring by the choke shaft.

To repair the choke shutter slide set lever flat spring out of its seat in the slide with the screwdriver. Replace defective parts, insert slide into slot in shroud and flat spring into slide (make sure that spring is installed in correct position) and, with a screw driver, push slide into center position.

To mount the shroud get choke shutter slide in "1" position.

MANUAL FOR SPECIAL TOOLS

In addition to the special tools illustrated and mentioned (with part number) in this workshop manual other special tools are available.



In our manual for special tools all available special tools are illustrated and listed with part number — subdivided into groups for different chain saw models and another group for all chain saw models.

This manual for special tools is available in different languages under the following specification numbers:

German	0455 901 0023
English	0455 901 0123
French	0455 901 0223
Spanish	0455 901 0323
Yugoslavic	0455 901 0423
Swedish	0455 901 0523
Italian	0455 901 0723
Portugues	0455 901 1223