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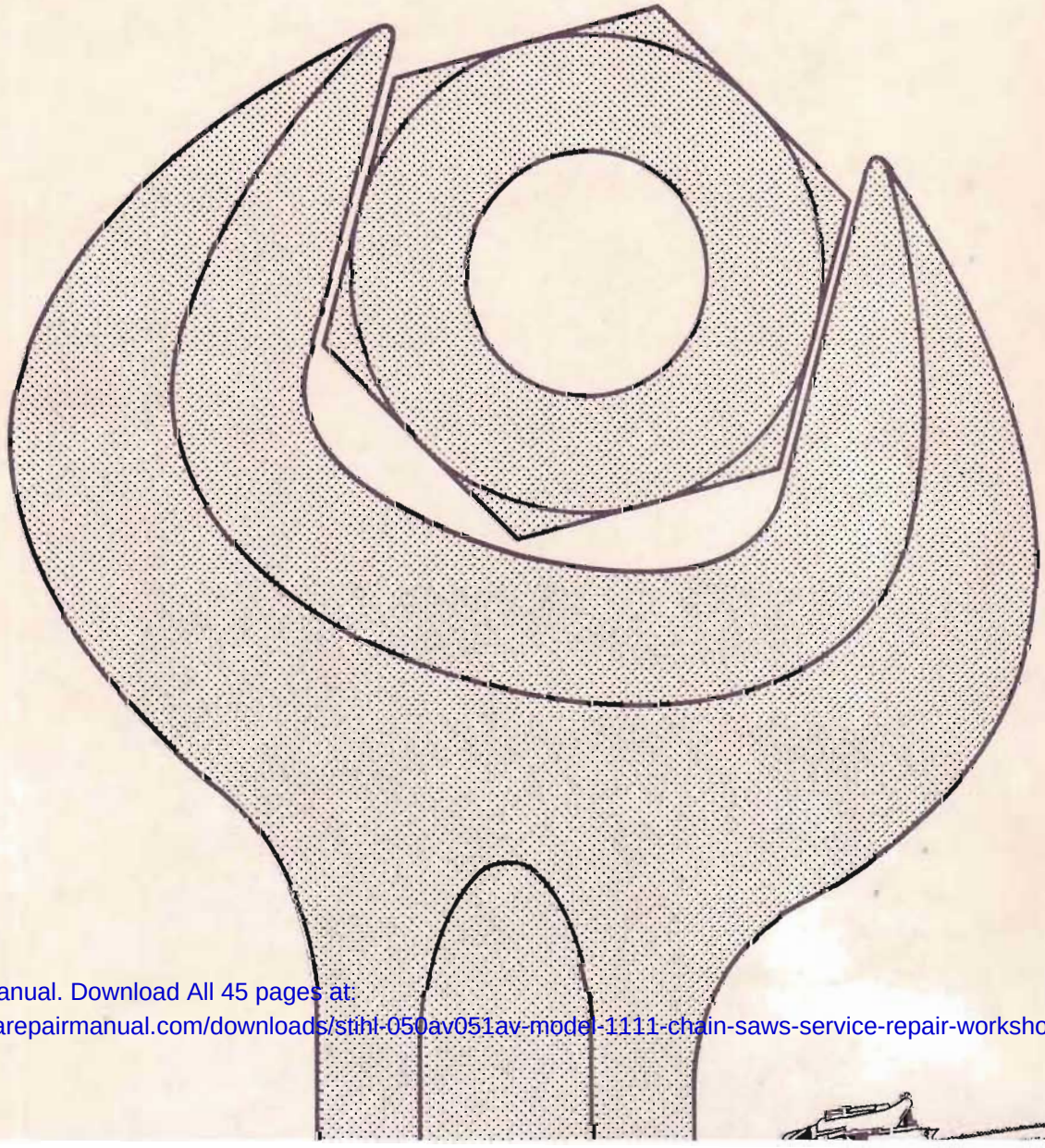
Chain Saw Service Manual

STIHL 050 AV, 051 AV Model 1111



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Service Shop Manual
STIHL 050 AV, 051 AV – model 1111

Contents

This service shop manual corresponds to the latest constructional datas of models STIHL 050 AV and 051 AV as of January 1, 1973.

In this connection we also refer to our technical information sheets, which you receive periodically.

This guide book should be used only for the instruction of our dealers and authorized service shops. Handing over or lending this manual to other persons is **prohibited.**

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SPECIFICATIONS 051 AV (050 AV) We reserve the right to change design if this is deemed advantageous or necessary.

Engine:	STIHL one-cylinder-two cycle engine	
	Piston displacement:	89 cm^3 (5.4 cu.in.)
	Cylinder bore:	52 mm (2.048 in.)
	Piston stroke:	42 mm (1.654 in.)
	Cylinder wall:	Heavy chromium impregnation
	Maximum speed:	10 000 r.p.m.
	Mean idling speed:	1800 r.p.m.
	Crankshaft:	Split
	Crankshaft bearing:	Cylinder roller bearing at power take-off side, grooved ball bearing at magneto side
	Crank pin:	⌀ 18 mm (0.709 in.)
	Piston pin:	⌀ 13 mm (0.514 in.)
	Piston pin bearing:	Needle cage
	Length of conrod:	78 mm (3.070 in.) (distances between axes)
	Rewind starter:	Forced engagement with automatic rewinding of starter rope
	Starter rope:	Length 1000 mm (39.790 in.) ⌀ 4,5 mm (0.177 in.)
	Clutch:	Centrifugal clutch with pressed-on linings ⌀ 86 mm (3.385 in.)
	Clutch starting to engage at:	about 2700 r.p.m.
	Full engagement at:	about 5500 r.p.m.
	Pressure test of crankcase:	Testing pressure 0.5 kp/cm^2 (7.1 lbf./$in.^2$)

Fuel System:	Carburetor:	All-position Tillotson diaphragm carburetor HS 60 A with integral fuel pump
	Venturi:	⌀ 17,6 mm (0.693 in.)
	High speed adjustment screw H; short (top):	$^3/_4$–1 turns open
	Low speed adjustment screw L; long (bottom):	$^7/_8$–1 turns open (basic adjustment of carburetor measured from tight seat of adjustment screws)
	Pressure test of carburetor:	0.4 kp/cm^2 (0.57 lbf./$in.^2$)
	Fuel tank capacity:	0,9 l (1.9 pints)

	Fuel mixture:	Mixing ratio 1:25 (1 part oil to 25 parts gasoline). SAE 30 engine oil. When using special STIHL two-cycle motor oil mixing ratio 1:40
	Air filter:	Flocked special wire gauze

Ignition System

Bosch flywheel magneto of separated construction	
Magneto edge gap:	12–16 mm (0.473–0.632 in.)
Advanced ignition:	1,9–2,1 mm (0.075–0.083 in.) before top dead centre
Advanced ignition angle:	22° before top dead centre
Breaker point gap:	0.35–0.40 mm (0.014–0.016 in.)
Condenser:	Capacity about 0,6–0,9 µF
Armature:	Primary winding about 1 Ω Secondary winding about 8700 Ω
Spark plug:	Bosch WKA 145 T 6 Heat range 145 Spark gap 0.5 mm (0.197″)
Armature air gap:	0.2–0.3 mm (0.008″–0.012)

Torques for Screws and Nuts

Crankshaft nut Magneto side M 8 x 1:	3,5 kpm (25.32 ft./lbf.)
Crankshaft nut Clutch side M 10 x 1 lefthand:	3,5 kpm (25.32 ft./lbf.)
Clutch carrier M 10 x 1 lefthand:	5,0 kpm (36.17 ft./lbf.)
Cylinder bottom M 5 x 20:	0,8 kpm (5.79 ft./lbf.)
Nut M 8 for starter axle:	2,0 kpm (14.47 ft./lbf.)
Spark plug:	3,0 kpm (21.70 ft./lbf.)

Cutting Attachment

Guide bars:	induction hardened with stellite tipping at the bar head; or star shaped roller nose

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Bar lengths:	35, 43, 53, 63 and 75 cm (14, 17, 21, 25 and 30 in.) 43 cm (17 in.) with roller nose only for $^3/_8$″ chain
Chain:	**.404″ pitch** STIHL chain models 3812 and 3837 **$^3/_8$″ pitch** STIHL chain models 3825 and 3845 for cutting lengths of 35, 43, 53 cm (14, 17, 21 in.)
Chain speed:	abt. 17 m/sec. (56 ft./lbf.) with .404″ chain
Maximum chain speed:	abt. 24 m/sec. (78 ft./lbf.) with .404″ chain
Chain lubrication:	Fully automatic oil pump with pump piston depending on engine revolutions. Pumps only when chain rotates. Additional quantity control by adjusting the control bolt.
Maximum oil feed:	19 cm³/min. (1.6 cu. in./min.) at 6000 r.p.m.
Minimum oil feed:	7 cm³/min. (0.43 cu. in./min.) at 6000 r.p.m.
Average oil pump adjustment:	12 cm³/min. (0.75 cu. in./min.) at 6000 r.p.m.
Oil tank capacity:	0,6 l (0.82 imp. pts.)
Chain sprocket:	7 teeth for .404″ pitch 8 teeth for $^3/_8$″ pitch

Weight of Saw — 10,5 kg (23 pounds) with 35 cm (14 in.) bar and chain

Extras — STIHL emergency kit 051 AV (set of the most common wearing parts)

CHAIN DRIVE AND CLUTCH

On the STIHL 050 and 051 AV power chain saws the power from the engine is transmitted to the saw chain by a centrifugal clutch. This clutch is composed of clutch carrier, clutch shoes and clutch springs; the two washers in front of and behind the clutch, as well as the chain sprocket with clutch drum riveted onto it are also functional parts of the clutch.

With increasing engine speed the clutch shoes held by the clutch springs, are forced to the outside. They are pressed against the clutch drum thus transmitting the engine power to the chain sprocket and the saw chain.

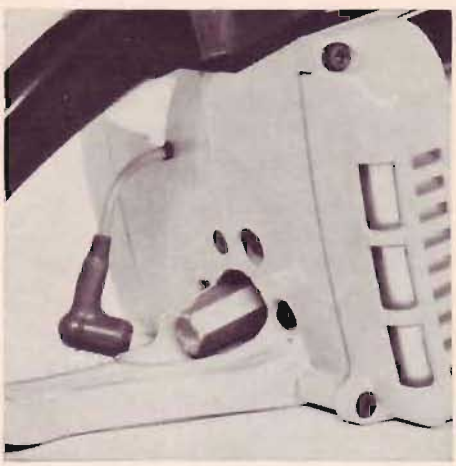
The clutch springs have a certain pretension so that the clutch will not engage before the engine speed of about 2.700 r. p. m. is reached. The carburetor has to be properly adjusted (see carburetor adjustment) so that chain does not rotate when engine is idling.

The clutch of the STIHL 050/051 AV needs almost no maintenance at all, but, of course, normal wear cannot be avoided. Therefore, the clutch and the chain sprocket must be checked on proper condition from time to time.

Trouble	Cause	How to correct
Bad engagement, clutch slips, chain does not rotate	Clutch linings worn	Replace the complete set of clutch shoes
	Clutch and chain sprocket dirty (oil)	Wash in clean gasoline, roughen clutch linings with emery cloth
Saw chain does not stop when idling, loud noises	motor speed too high when idling	Readjust idle speed adjustment screw
	Springs stretched or fatigued, Spring hooks damaged	Replace all springs
	Needle cage damaged	Replace needle cage
Chain lubrication does not function	Drive pins of cover plate broken	Install new cover plate
	Oil pick-up body or oil feed borings plugged respectively dirty	Clean

Top:
Locking screw

Bottom:
Inserted locking screw

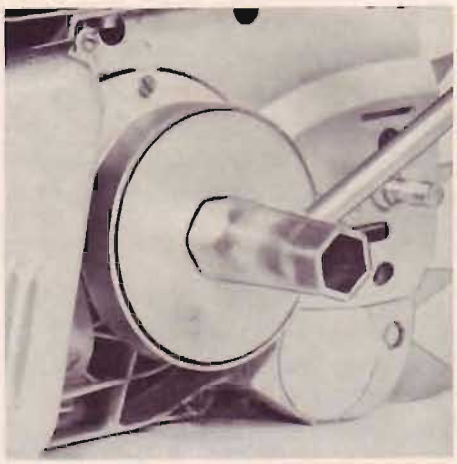


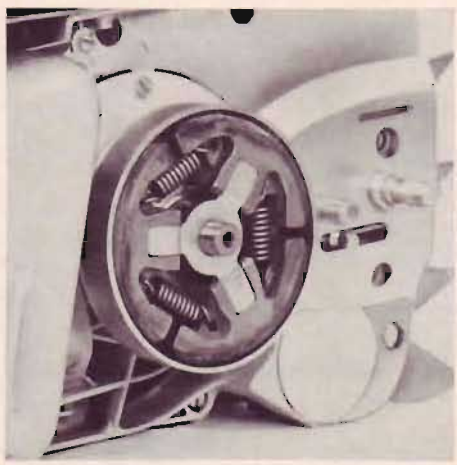
A dirty or improperly operating clutch must be disassembled or renewed. First loosen the two hexagonal nuts and remove chain sprocket cover from the studs.

Then unscrew spark plug with combination wrench and screw crankshaft locking screw 1107 191 1200 into spark plug port and tighten it by hand.

Top:
Loosening of crankshaft nut

Bottom:
Chain sprocket, clutch with carrier, clutch shoes and springs



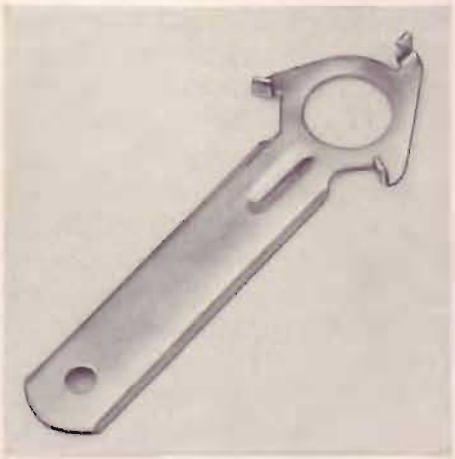


Note: Clutch carrier and hexagonal nut have left-hand thread! Therefore, unscrewing has to be done clockwise!

Insert combination wrench into hexagonal nut and turn clockwise till piston rests against locking screw. Now loosen and unscrew hex. nut.

At both sides of the clutch there is a clutch retaining washer holding the clutch shoes in position on the clutch

Clutch wrench

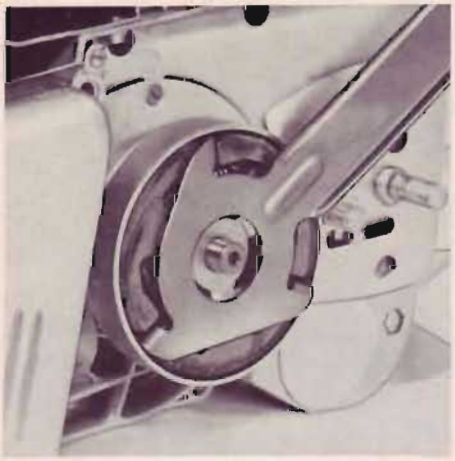


spider. These retaining washers are slightly arched in the middle and must be installed in such a way that they are resting against the spider with the arch. The diameter of the front washer is bigger so that the clutch is protected better against saw dust.

On the 050 AV these washers were slightly arched up to machine number 2 910 662. They have to be installed in such a way that they rest against the spider under pretension.

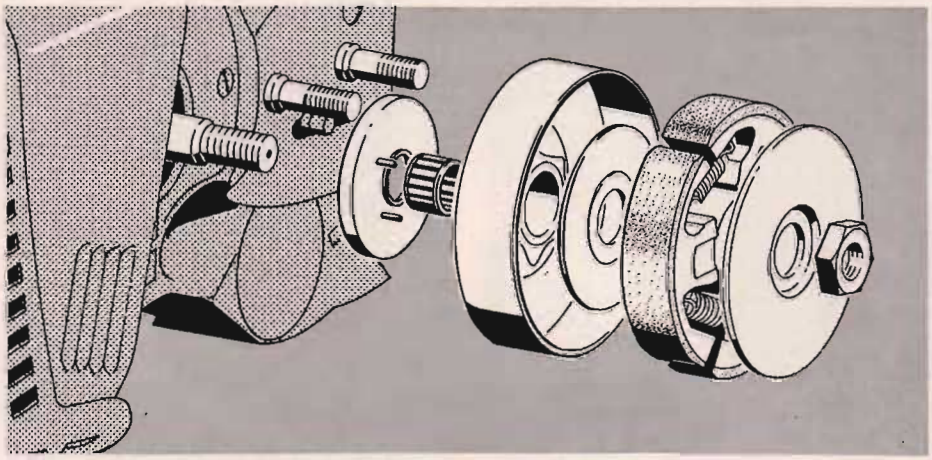
To disassemble the clutch remove the front washer, unscrew clutch with clutch wrench by turning it clockwise. Then remove second retaining washer, chain sprocket, needle cage and cover plate from the crankshaft. The cylindrical pins pressed into the cover plate are inserted at one side into the borings of the chain sprocket and on the other side in the oil pump worm.

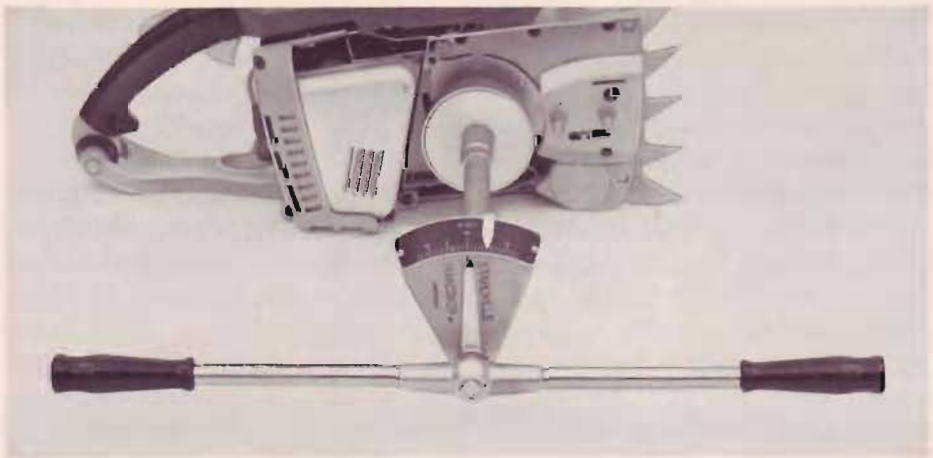
Unscrewing clutch



Top:
Disassembly of clutch and chain sprocket

Bottom:
Tightening of crankshaft nut





These cylindrical pins are driving the oil pump at engaged clutch.

Replacing damaged clutch parts; clutch shoes and clutch springs must always be replaced **as complete set** when repairing! If clutch is only extremely dirty all parts must be washed in clean gasoline and then cleaned with compressed air. Roughen surfaces of clutch linings with emery cloth. Clean the dirty inside of the clutch drum, which is fixed to the chain sprocket, with a clean, dry rag.

The chain sprocket should be replaced when two chains have been worn out as the sprockets are wearing at the flanks of the teeth. This wear should not exceed a depth of 0,5 mm (0.012 in.)! When chain sprocket has to be replaced use old cover plate for new sprocket. If old cover plate, however, is damaged or deformed then replace it by a new one.

When reassembling first put cover plate onto chain sprocket.

Slide chain sprocket together with greased needle cage onto crankshaft in such a way that the cylindrical pins of the cover plate are engaging the borings of the oil pump worm.

Then slide on rear clutch retaining washer (check correct mounting position). Screw on clutch counter-clockwise so that the countersunk side of the clutch carrier points towards the chain sprocket and tighten carrier with clutch wrench 1111 893 1300 with a torque of 5 kpm (36.17 lbf/ft.).

THE ENGINE

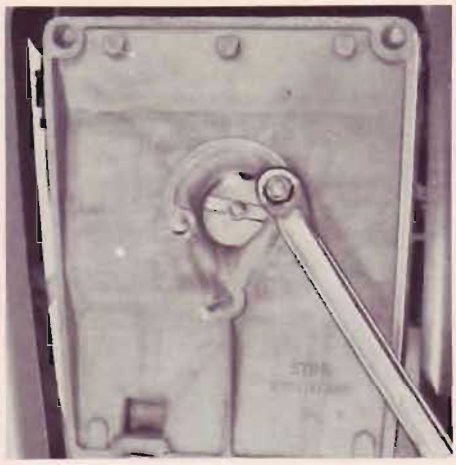
Cylinder and Piston
Crankshaft with Connecting Rod

Unscrewing of fan housing cover

The STIHL 050/051 AV power chain saws are driven by an air-cooled one-cylinder two-cycle engine. The split crankshaft is supported in the crankcase which is made of electron die-cast metal. The crankshaft and the connecting rod are die-forged, the crankshaft is rigidly pressed together after needle cage and connecting rod are installed. Cylinder and piston are made of a special aluminum alloy, the cylinder wall is heavy chromium impregnated.

Exposing the Cylinder

Disassembly of shim



For checking respectively disassembling, the following operations have to be carried out:

Screw off fan housing with starting device by loosening 4 socket head screws M 5 x 18 and remove fuel hose from angle connector. Remove chain sprocket cover, close choke shutter with choke lever, take off filter cover and air filter. Loosen two retaining nuts M 5 of the filter housing attachment and remove shim.

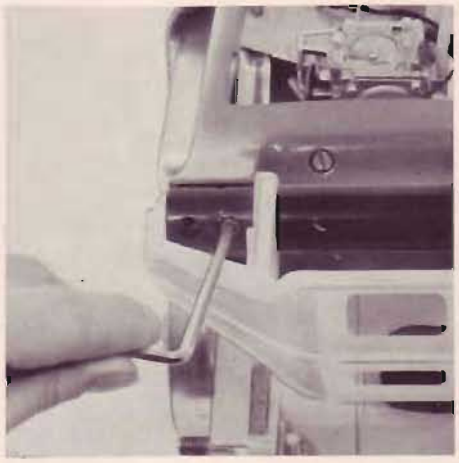
Lift off filter housing from studs, disconnect choke rod from choke shaft and carefully pull off ground lead from ignition switch (with flat tong).

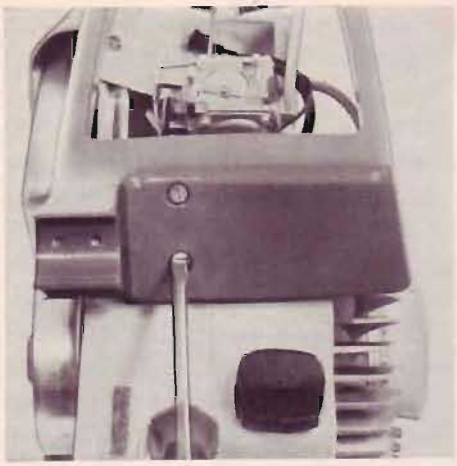
Unscrew the two socket head screws at the upper end of handle tube and the two cylindrical head screws at the front side of the handle frame as well as the cyl. hd. screws at the support, unhook throttle rod at the carburetor and take off handle

Top:
Loosening of cylinder head screws at the upper end of the handle bar

Centre:
Loosening of cylinder head screws at the front side of the handle frame

Bottom:
Loosening the flat head screw at the end of the handle bar



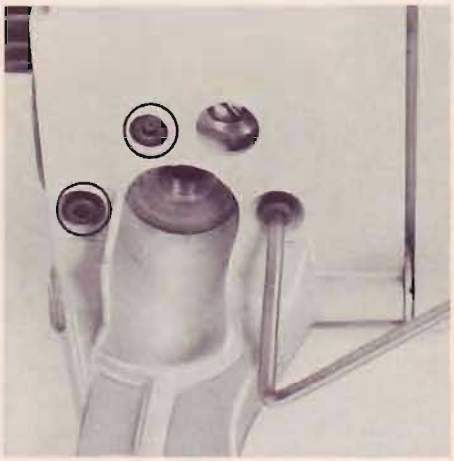


Disassembly of Cylinder and Piston

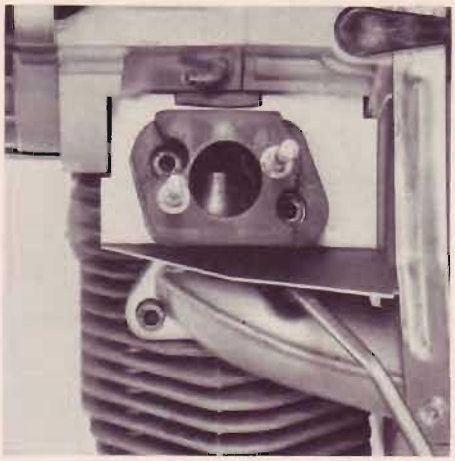
Top:
Loosening the cylinder head screws at the shroud

Centre:
Loosening the screws of the muffler guard

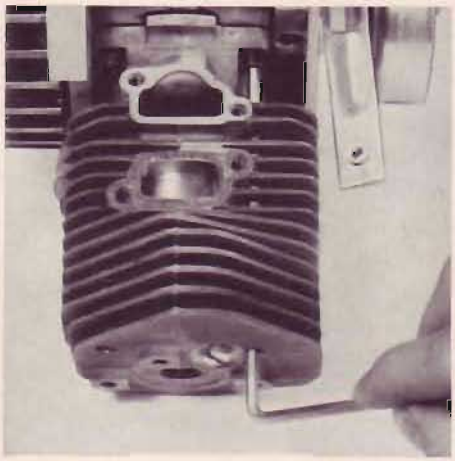
Bottom:
Loosening the cylinder head screw at the right half of the crankcase



Loosening the cylinder head screws at the carburetor and muffler flange



Unscrewing the cylinder



frame. Pull off spark plug terminal and unscrew spark plug. Then unscrew the 3 cylindrical head screws with inner hex which are holding the rear shroud to the cylinder, also the cylindrical head screw which connects the shroud with the bracket, and the 3 cylindrical head screws with inner hex with which the muffler guard is fastened as well as the screw with shim at the right side of the crankcase. Take off shroud prying off the bracket with a screw driver and pull off carburetor with impulse hose. Then remove muffler as well as carburetor flange and cover plate.

The outer walls and fins of the cylinder can now be cleaned thoroughly and can be checked for defectiveness.

To disassemble the piston unscrew the four socket head screws at the bottom of the cylinder. Pull cylinder off piston.

If the cylinder has to be replaced you must also exchange the piston because spare cylinders and piston assemblies are only supplied together.

After removing the snap rings which are securing the piston pin the latter one can be pushed out of the piston and the piston can be taken off. The piston pin is supported in the connecting rod by a needle cage and has a sliding fit and can be driven out of the piston by the mounting bolt 1111 893 4700. If the piston pin has a tight seat caused by wear or carbonization free pin with a light hammer blow thereby at the same time counterholding the piston.

Repair and Assembly of Cylinder and Piston

Cylinder and piston

Cylinder and piston were marked till 1971 from A to E by letters and were subdivided in five different tolerance groups which were not interchangeable. These markings are stamped into the bottom of the piston and into the cylinder head.

Because of rationalization in the stock keeping we are installing since 1971 only cylinders of tolerance groups A, B and C with the respective pistons. Therefore only pistons of group B can be supplied for spare parts supply. The piston B can therefore be mounted with any cylinder of group A, B or C.

The pistons C, D and E are still supplied as spare parts for saws of old execution.

Top:
Inserting the snap rings

Bottom:
Piston ring compressor and wooden support

Following cylinders and pistons can be supplied

for saws starting 1971:

Piston B	1111 030 200
Cylinder A, B, C	1111 020 1200

Additionally for saws of older assembly date:

Piston C, D	1111 030 2005
Piston E	1111 030 2010

Install the piston in such a way that

Mounting the cylinder

the arrow marked with an "A" on the top of the piston is pointing in the direction of the cylinder exhaust port.

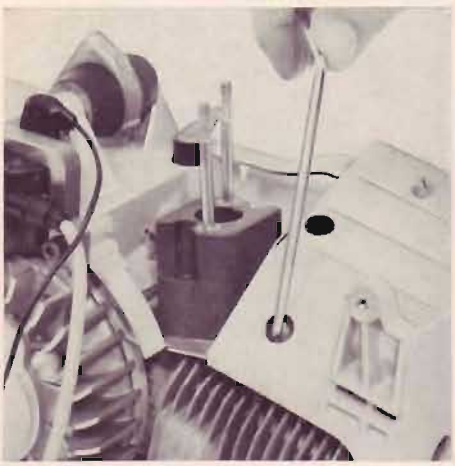
Before assembling the piston, place a new cylinder gasket on the cylinder and grease needle cage supporting the piston pin in the connecting rod. Then place piston on conrod, insert piston pin and install snap rings.

The assembly of the cylinder onto the piston is much easier when using the wooden support and the piston ring compressor (see illustration).

Place wooden support between crankcase and piston. Compress piston rings with the piston ring compressor 1107 893 4900 to mount the cylinder. Prior to mounting apply sufficient oil to the piston and cylinder walls and check to be sure that the piston rings are properly inserted. Torque socket head screws

Crankshaft and Crankcase

Tightening of the muffler



at bottom of cylinder to 0.8 kpm 5.79 ft./lbf.).

Then install parts in reverse sequence.

When reassembling the following has to be taken care of:

First only screw on muffler to cylinder fingertight. Then screw on shroud with the 3 cylinder head screws to the cylinder and then tighten muffler to cylinder. To do so tighten cylinder head screws with socket wrench through the openings in the shroud.

When mounting the filter housing throttle lever has to be brought to half throttle position.

To replace a defective crankshaft the crankcase has to be taken apart. First remove clutch and chain sprocket (page 6) flywheel (page 16), armature plate as well as cylinder and piston (page 9). Then unscrew and remove handle bar completely.

Worm of oil pump has now to be taken out of the crankcase by turning the cover plate with the cylindrical pins counter-clockwise and remove tin guard. Furthermore the retaining ring which holds the grooved ball bearing onto the crankshaft at the magneto side has to be removed.

The crankcase halves are aligned by two cylindrical pins and held together with ten cylinder head screws. Loosen the screwing of the crankcase and punch down cylindrical pins. If crankcase halves are still sticking together because of gasket loosen the parts by light blows with a wooden or rubber hammer. If the crankcase is damaged and has to be replaced remove all remaining parts still fastened to the crankcase such as oil pump, rubber buffers etc.

The crankshaft is supported at the magneto side by a grooved ball bearing and at the clutch side by a roller bearing. The roller bearing is fixed by a retaining ring which is

Above:
Unscrewing the worm of the oil pump

Below:
Removing the cylindrical pins

seated in a groove in the crankcase. The outer ring of the roller bearing rests against this retaining ring. However, the outer ring of the grooved ball bearing is provided with an annular groove in which a retaining ring is seated, securing the bearing in the crankcase. This bearing has an additional snap ring holding it on to the crankshaft.

Armature plate with sealing rings

The armature plate of the ignition system acts as a sealing crankcase cover plate at the magneto side. There is at the outer side of its case fitting an "0" ring provided, whereas the oil seal is pressed into the center boring of the armature plate. When mounting make sure that the "0" ring is correctly seated in its annular groove. We recommend to apply some oil to the "0" ring when mounting the armature plate.

The crankshaft is a split shaft with the crank pin forged to the shaft on the clutch side. The solid conrod is provided with lubricating pockets at the big end and with a lubricating boring at the small end.

As the final machining of the crankshaft is only done after its complete assembly, spare crankshafts can only be supplied with conrod and needle cage already installed.

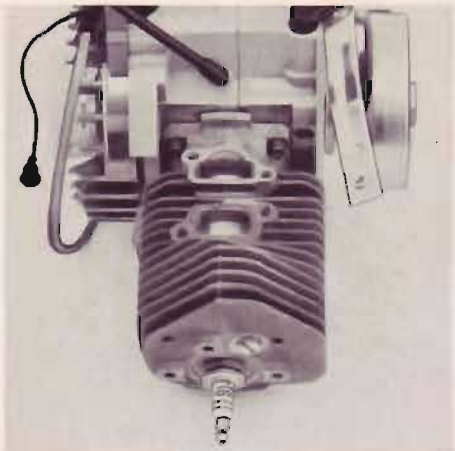
Crankshaft with piston pin and needle cage

Prior to installing new bearings heat the respective housing on a heating plate. Position the bearing without tilting so that it either butts the retaining ring or the rim of the bearing seat in the housing. **Do not interchange the bearings.** To install the crankshaft heat inner races of the bearings as well (soldering iron).

Use new gasket between crankcase halves. Then punch back cylindrical pins and tighten screws crosswise. Proceed with assembly by reversing sequence of disassembly.

Pressure testing of crankcase

Exposed cylinder



With exposed cylinder you can test the engine for leakage with the combined carburetor or crankcase pressure testing device.

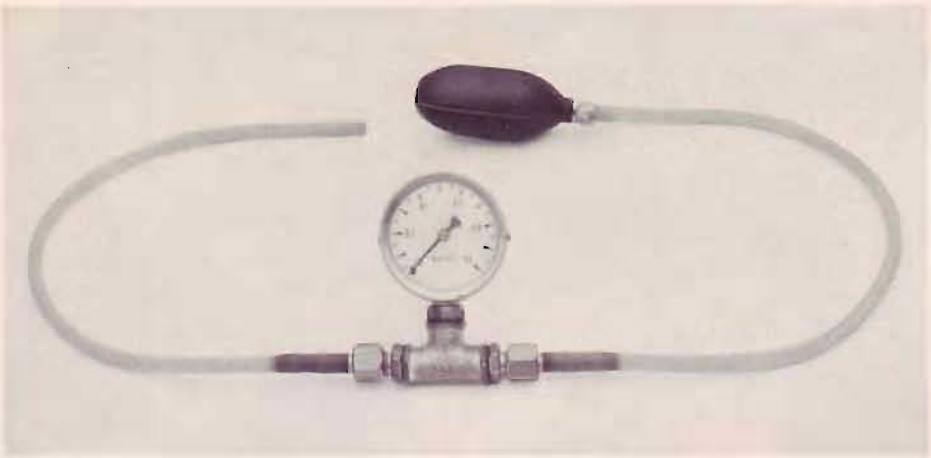
Faulty oil seals and gaskets, cracks or pipings in die cast parts are mostly the causes for leaks. Through such leaks additional air may enter the crankcase and may change the fuel air mixture. As a result the proper adjustment of the correct idling speed is rendered more difficult or even impossible. Moreover, no smooth running is granted any more when accelerating.

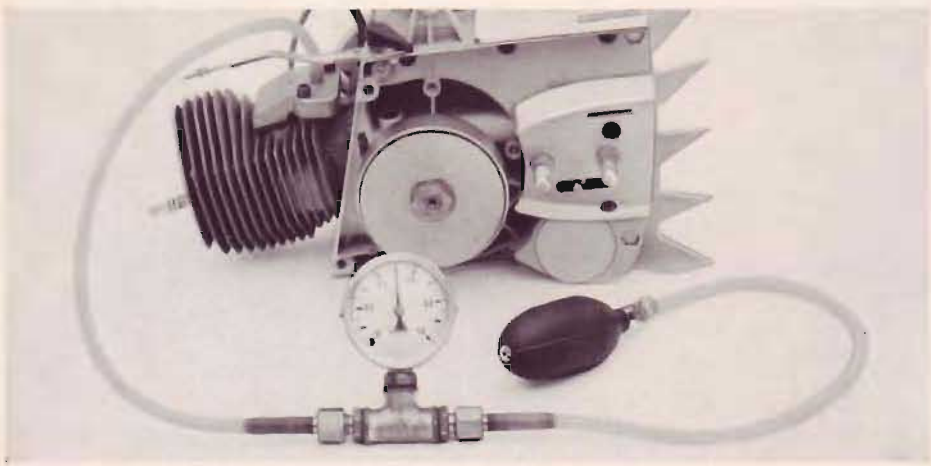
Therefore, you should pressure test the crankcase if you notice such trouble.

Disassemble carburetor set-up and muffler. Then screw on pressure flange 1110 850 4200 and gasket of

Top:
Carburetor and crankcase pressure testing device

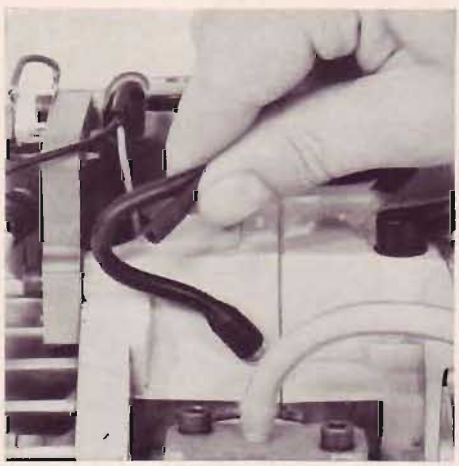
Bottom:
Pressure testing of crankcase





Top:
Sealing flange

Bottom:
Bending of the impulse hose



carburetor flange to cylinder. Connect pressure hose to fitting of pressure test flange and seal impulse elbow fitting at the crankcase, for example by bending.

Spark plug has to remain installed, cylinder and piston have to be raised to top dead centre position (see adjusting the ignition timing).

Close venting screw at pressure ball and pump air into the crankcase until pressure gauge indicates a reading of **0,5 kp/cm² (7 lbf./in²).**

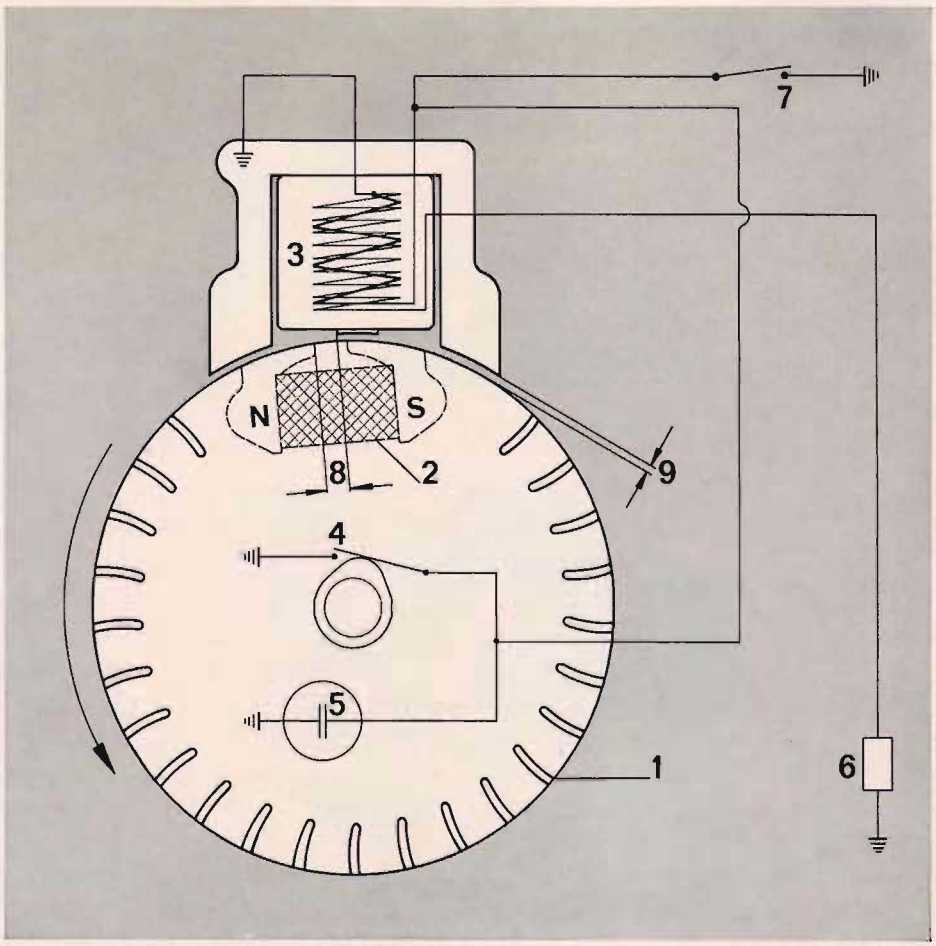
The crankcase is properly sealed if there is no drop in pressure. If this is not the case find out leaking spot and replace respective parts.

After testing open venting screw and pull off hose.

IGNITION SYSTEM

Design and Operation of the Flywheel Magneto Ignition System (Breaker Ignition System)

Schematic view of ignition system:
1 Flywheel
2 Permanent magnet with north-and south pole and pole shoes
3 Armature with primary and secondary coil
4 Breaker points
5 Condenser
6 Spark plug
7 Ignition switch
8 Magneto edge gap
9 Armature air gap



Like all power chain saws the STIHL 050 AV and 051 AV are also equipped with a flywheel magneto ignition system not needing a battery or a dynamo.

The Bosch ignition system with armature core and ignition coil positioned outside of the flywheel is mainly composed of the following parts: flywheel with magnets and pole shoes cast into it, contact points, condenser, armature, high tension lead, spark plug ground lead and ignition switch.

The flywheel magneto ignition system is based on the principle of electro magnetic induction. The electric current is produced in a conductor if this conductor is moved through a magnetic field. The lines of magnetic force of the permanent magnet cast into the flywheel are going from pole to pole. When by rotation of the flywheel that magnet is passing the armature, the lines of force of the magnet are cutting across the wire coils of the primary windings, where they induce a low voltage current. When the current in the primary windings is at the maximum rate the circuit is interrupted by the breaker point. This causes the magnetic field in the armature core to collapse and in the secondary windings induces the high voltage current needed for the ignition spark which flows to the spark plug.

The condenser which is connected parallel with the breaker points prevents the current from arching across the opened breaker points, which would result in a loss of energy and excessive wear.

The breaker points are opened by the action of the cam ground on the hub of the flywheel and closed by a spring. The running engine can be stopped by grounding the primary windings, which is done by pushing the ignition switch.

Spark Plug

The spark plug provides the means for igniting the compressed fuel air mixture caused by the spark jumping from the centre to the ground electrode.

Each trouble shooting at the ignition system should, therefore, start at the spark plug.

If the engine is difficult to start or if you notice a loss of power remove and check spark plug. Check to be sure that spark plug has the correct heat range of 145. Do not clean a fouled spark plug with a steel brush.

Remove carbon coating on a spark plug with a brass brush. Then blow out spark plug with compressed air. Remove the dirt of a fouled spark plug with a grease solvent fluid and blow out spark plug with compressed air as well. Incorrect fuel air ratio, rich carburetor mixture,a dirty air filter or a partly closed choke shutter will cause deposits to form on the spark plug.

The electrode gap must be checked with a feeler gauge and adjusted at regular intervals as the gap becomes larger by normal erosion of the electrodes. The electrode gap can be adjusted to the required distance of 0.02" (0,5 mm) by bending the ground electrode. A new

Carbonized spark plug

spark plug must be used, however, if electrodes are badly eroded.

An exact control of the spark plug is only possible with a spark plug testing device. If you do not have such a spark plug testing device 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 you pull the rewind starter.

Clean spark plug port and check gasket on proper condition prior to installing the spark plug. Torque spark plug to 21.70 ft./lbf. (3,0 kpm).

High Tension Lead, Ground Lead and Ignition Switch

Checking the electrode gap

If no spark occurs in spite of spark plug being in proper condition you should check the lead terminals. Frayed or worn insulation of high tension lead and ground lead will cause an accidental ground and the engine will not start or it will run irregularly.

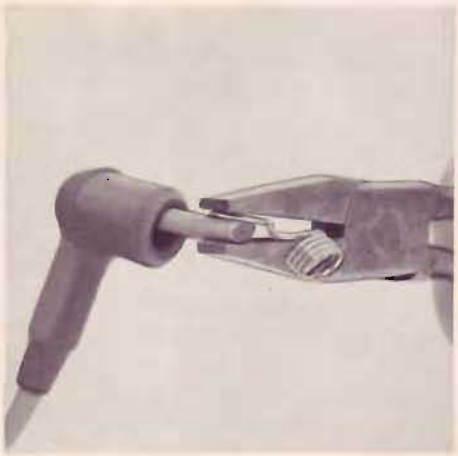
Remove air filter, handle bar, fan housing and handle frame (see page 8) to get access to the ignition system for repair. Remove flywheel if necessary.

A faulty high tension lead can be disconnected from the armature and be replaced. The high tension lead of the 050 and 051 AV has a length of 10.43" (265 mm).

In a new high tension lead the spark plug spring connector must be inserted as follows: oil or grease end

Flywheel

Connecting the spring to the high tension lead



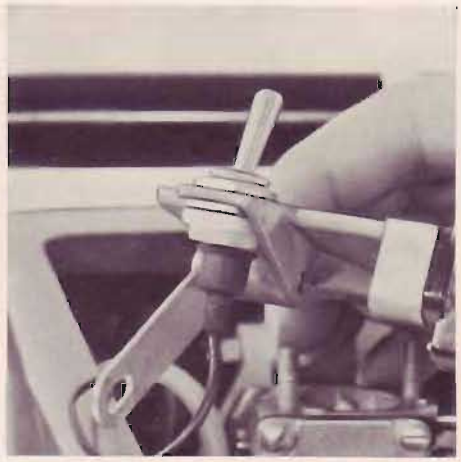
of lead, insert lead into spark plug terminal and pull it through terminal with flatnose pliers. Press hook of spring connector firmly and **exactly into the centre** of the lead end to get a conductive connection with the wire inside the lead. Then push lead with spring connector into spark plug terminal. Do not forget to slip hose 1111 405 8800 over the new high tension lead. Position all leads carefully so that the insulation cannot chaff against sharp edges!

With an Ohmmeter it can be checked whether the connection between the spark plug terminal and the high tension lead is conductive which means the Ohmmeter must show a reading of "Zero" Ohm.

Check to be sure that **ignition switch** is grounding only when switch is in "0" position. A faulty switch must be replaced. Moreover, it is very important that the ground lead with the contact pin tightly connects the ignition stop switch and that the insulator clamp of the ground lead has a proper contact with the armature.

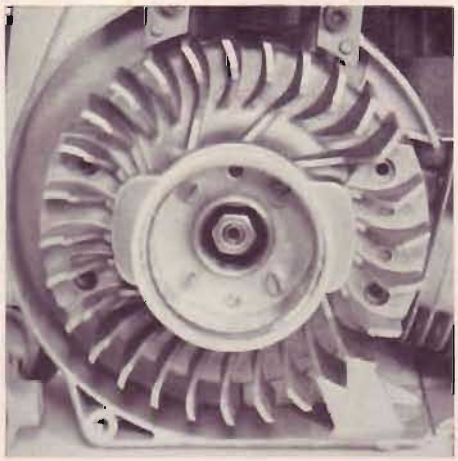
Top:
Ignition stop switch with inserted ground lead

Bottom:
Inserted high tension lead at the shroud



The ground lead is soldered to the ignition coil on saws of newer execution.

Flywheel with starter cup



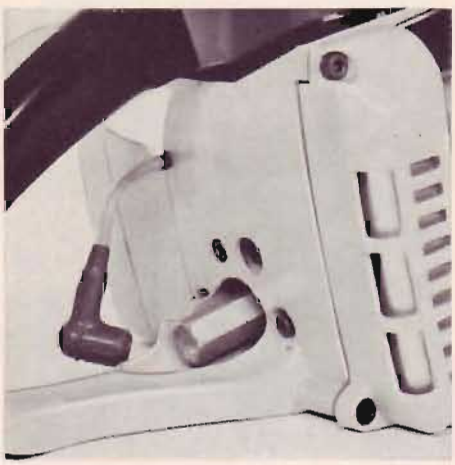
The flywheel of the STIHL 050 and 051 AV is at the same time the fanwheel for cooling the engine. The permanent magnet and the pole shoes are cast into the balanced flywheel which is made of non-magnetic material. This magnet determines the magneto edge gap and the ignition point. The position of the flywheel and, therefore, the position of the magnet to the crankshaft and the piston is exactly fixed by the keyway and the key in the crankshaft. The breaker points are opened by the cam ground to the hub of the flywheel. The cover plate which seales the adjusting openings of the flywheel protects the ignition system against dirt and humidity.

To **remove the flywheel** first take off fan housing and starter cup which is screwed onto the flywheel with 4 cylinder head screws M 4 and the cover plate. Further un-

Top:
Unscrewing the cover plate

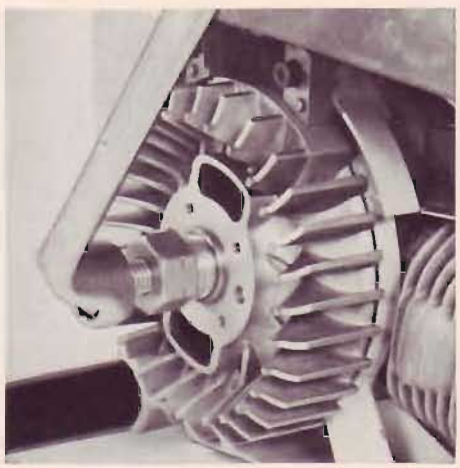
Centre:
Mounted locking screw

Bottom:
Flywheel puller



Top:
Inserted flywheel puller

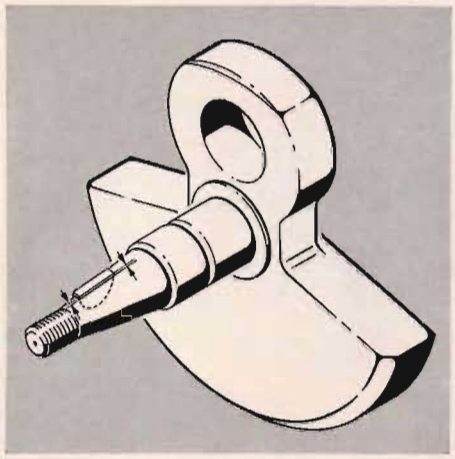
Bottom:
Loosening the flywheel



screw spark plug and screw crankshaft locking screw 1107 191 1200 into spark plug port. Unscrew M 8 x 1 crankshaft nut with combination wrench.

Turn flywheel puller completely into flywheel, turn flywheel clockwise until piston bottoms on the crankshaft locking screw. Screw in hexagonal thrust bolt of puller until flywheel pops loose from shaft taper

Schematic view of inserted key



and can be lifted off. If the flywheel is seated very tight on the crankshaft you can free it with a gentle hammer blow onto the thrust bolt of the flywheel puller.

A damaged flywheel cannot be repaired and therefore must be replaced. Prior to mounting the flywheel check to be sure that no magnetic parts are sticking to the flywheel. Flywheel and crankshaft taper must be absolutely free of grease. Also proper seat of key is very important. The recommended torque for the crankshaft nut is 3,5 kpm (27,4 lbf./ft.).

Checking the Ignition Timing

Top:
Loosening the cylinder head screw beside the spark plug port

Bottom:
Screwed on clamping piece

Top:
Ignition timing device with dial gauge and extension feeler

Bottom:
Mounted ignition timing device

Connected ignition timing device

The ignition timing of the 050 and 051 AV has to be set at 1,9–2,1 mm (0.7–0.95 in.) before top dead centre. To check or adjust the ignition timing take off fan housing, starter cup and cover plate. (See page 16.)

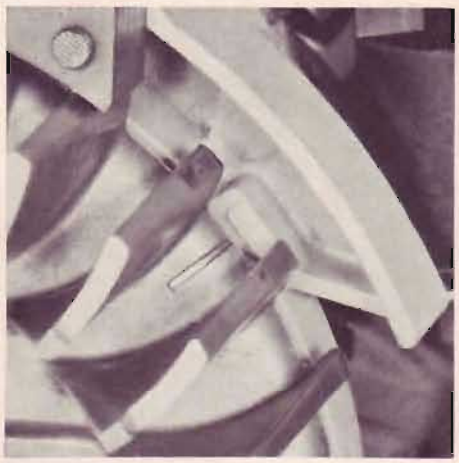
Further unscrew spark plug and cyl. head screw with inner hex located at the right side of spark plug port at the cylinder. Screw on clamping piece 1106 890 4200 with cyl. head screw M 5 x 30 – 9043 319 1070 and washer 0000 958 0600. Insert dial gauge and tighten it with cylinder head screw of clamping piece. The feeler pin of the dial gauge must be elongated by an extension piece.

Turn flywheel to bring up piston to top dead centre and adjust scale of dial gauge at this position of the piston so that indicator needle points to "0" position. The Bosch ignition timing device 0000 890 9805 has now to be connected with one pole clip to the contact pin of the ground lead and the other pole clip has to be connected to ground.

Now turn flywheel approx. $^1/_4$ of a turn in reverse direction of engine rotation, this way the piston is lowered somewhat. Switch on ignition timing device and turn flywheel slowly in direction of engine rota-

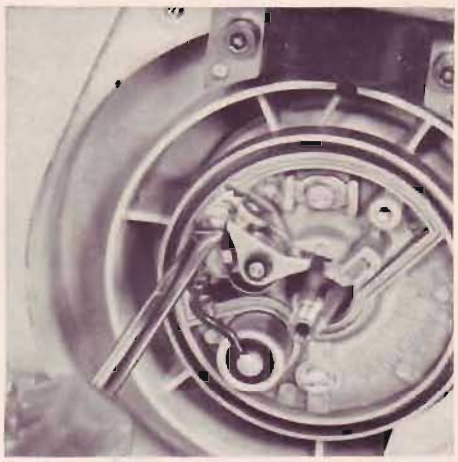
Adjusting the Ignition Timing

Marks at flywheel and crankcase



Top:
Loosening the breaker point set

Bottom:
Checking the breaker point gap with feeler gauge

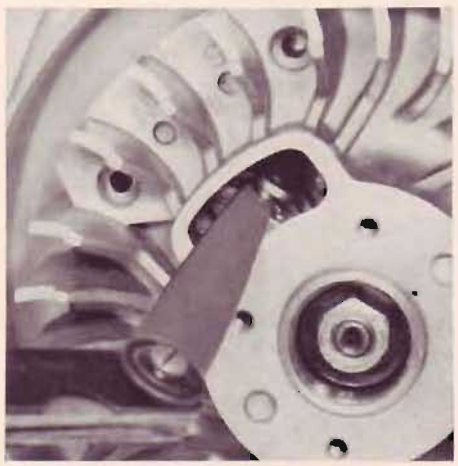


Burned breaker points

tion until control light of timing device lights up.

At this position the breaker points open. The indicator of the timing dial gauge must now read between 1.9–2.1 mm (0.7–0.85 in.) otherwise the ignition timing must be readjusted.

Machines of later design have a flywheel with a timing mark cast onto it. After the adjustment of the ignition timing in the factory the crankcase is provided with a notch matching this timing mark (see illustration). This way the piston position is marked before top dead centre. If flywheel and crankcase have these timing marks you don't need the timing dial gauge but only the ignition timing device.



For adjusting the timing the adjusting openings at the flywheel have to be opened by taking off the cover plate.

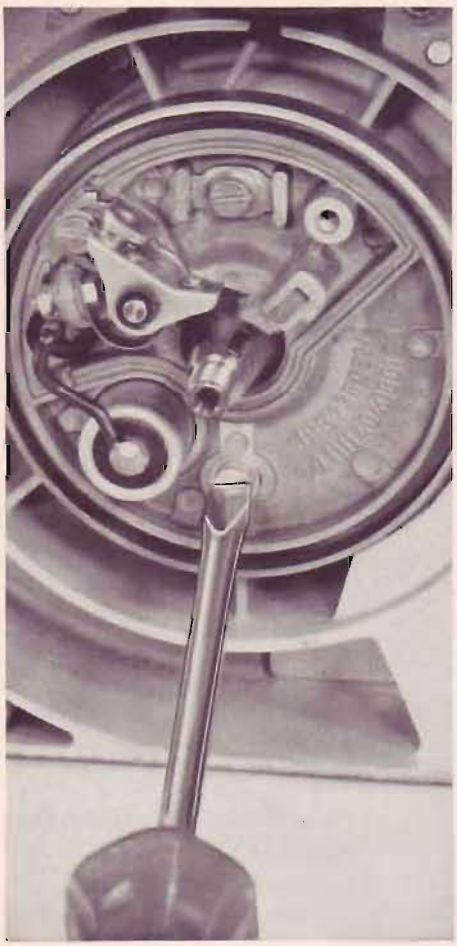
Turn piston to top dead centre position and check first breaker points with a feeler gauge for recommended gap of 0.014–0.015″ (0,35–0,4 mm). If gap must be adjusted loosen the two cylinder head screws at the breaker point assembly and adjust breaker base until the breaker points have the specified gap. Then tighten cylinder head screws and recheck ignition timing again.

Badly burned breaker points have to be replaced.

When breaker point gap is correctly adjusted loosen the two cylinder head screws attaching the contact plate to the crankcase through the slots in the flywheel. Turn flywheel in reverse direction of engine rotation to raise piston to 1,9 mm (0.7 in.) before top dead centre. The piston has this position if the dial gauge, which has been adjusted to "0" position before, indicates this reading or when the mark at the flywheel of machines of later design is exactly matching the timing mark on the crankcase. Turn contact plate clockwise if ignition timing is not advanced enough or counter-clock-

Magneto Edge Gap

Removing the contact plate



wise if ignition timing is advanced too far until pilot lamp of the switched-on ignition timing device lights up at a piston position of 1,9 mm (0.7 in.) before top dead centre. Recheck breaker point gap after tightening the contact plate.

At each checking or readjusting of the ignition timing it is imperative to also control the magneto edge gap. The magneto edge gap specifies the position of the flywheel magnet at the moment of interruption of current. That means that this gap is the distance between the trailing pole edge of the north pole of the magnet and the inner edge of the centre core of the armature.

The specified magneto edge gap of the ignition system of these machines is 12–16 mm (0.48–0.64 in.). The magneto edge gap is maintained at a proper dimension by the key in the crankshaft keyway if the contact breaker points are adjusted to the recommended gap and if ignition timing is correct.

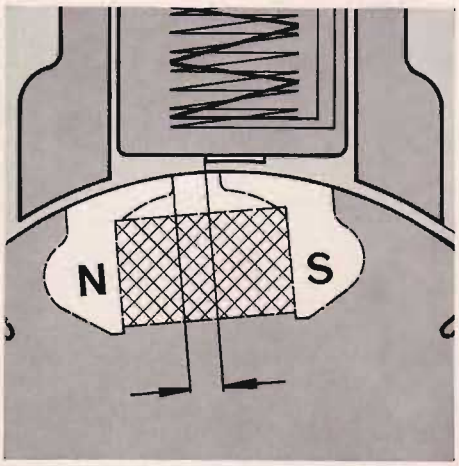
If the magneto edge gap is too large then the spark intensity is too weak when starting. If, however, the magneto edge gap is too small you will encounter misfiring at high engine speed.

If you have trouble starting the engine you must check the magneto edge gap!

If the magneto edge gap is not within specification you must adjust the breaker point gap or the ignition timing even if you found them correct when you checked them before!

Then you should also check to be sure that flywheel is properly positioned on key or that key has not been pushed out of the keyway when sliding the flywheel onto the crankshaft.

Schematic view of magneto edge gap



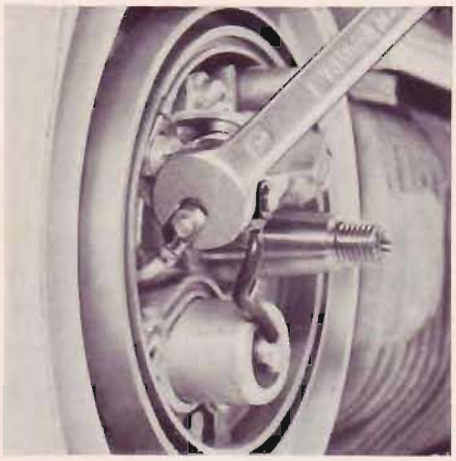
To check the magneto edge gap connect ignition timing device (see paragraph "Checking the Ignition Timing"). Adjust ignition timing with the ignition timing device. Lock flywheel in this position and check whether magneto edge gap is within the specified range of 12–16 mm (0.48–0.64 in.). Otherwise you must readjust the breaker point gap and the ignition timing.

Attention: Up to machine number 2 981 245 timing was set at 2,3–2,7 mm (0.01–0.07 in.) and the edge gap at 9–13 mm (3.5–0.5 in.).

Product: STIHL 050AV,051AV Model 1111 Chain Saws Service Repair Workshop Manual
Full Download: https://www.arepairmanual.com/downloads/stihl-050av051av-model-1111-chain-saws-service-repair-workshop-manual/

Contact Plate

Disconnecting the wiring



The contact plate is mounted with two cylinder head screws to the crankcase. The breaker point assembly and the condenser are fastened to the contact plate. To remove contact plate loosen cylinder head screws and hexagonal nut which holds the wire terminals. The contact plate is protected against dirt by an "0" ring and an oil seal.

However, if contact plate is dirty in spite of this protection clean it only with a brush, a dry rag or with compressed air. Never clean it with gasoline or similar cleaning solvents!

Replacing the Breaker Point Assembly

The breaker points are wearing during operation by burning. The contact set is composed of a grounded stationary part, the breaker base, and a movable breaker arm.

This breaker arm is insulated against ground and connected by leads with the armature and the condenser. The breaker point assembly is fastened to the contact plate with a cylinder head screw as well as with a retaining ring to the centre shaft and is activated by the cam which is ground to the hub of the flywheel.

For a long service life of the breaker arm it is very important that the lubrication felt is in proper condition.

You must replace the complete breaker point assembly if the breaker points are burned or damaged. To do so pull off flywheel.

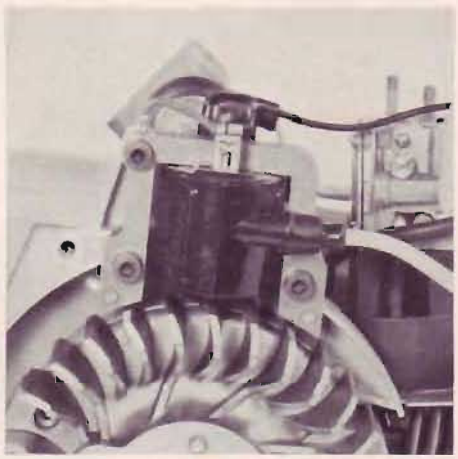
Cylinder head screw, retaining ring and hexagonal nut for fixation of wire terminals have to be loosened. Now replace breaker point set and tighten screws.

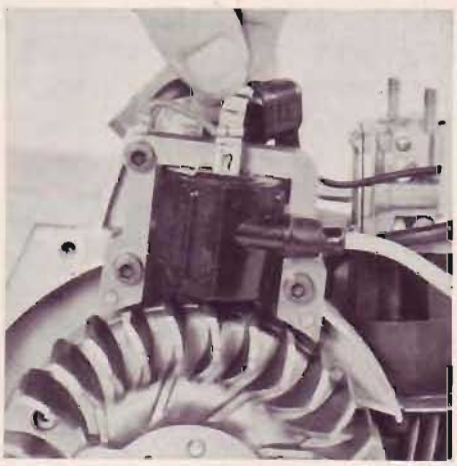
Fasten connecting lead to breaker base and then re-adjust ignition timing!

Armature

Above:
Exposed armature coil

Below:
Pulling off wire connections





To control the coil unscrew handle bar. To do so loosen 2 cylinder head screws at the handle frame and tilt frame back. Furthermore assemble the fan housing with starter device.

To disassemble the coil unscrew the 3 cyl. hd. screws with inner hex, pull off protection cover, wire connections and unscrew high tension lead.

Sample of manual. Download All 45 pages at:
https://www.arepairmanual.com/downloads/stihl-050av051av-model-1111-chain-saws-service-repair-workshop-manual/