Husqvarna

Workshop manual chain saw model

61
162

10 18 800-26 S 11-79

Bratts Tryckeri AB, Jkpg 459/56

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Technical Specification

162, 61

Technical Specification

Displacement	61.5 cm^3 (3.75 cu in)
Bore	48.0 mm (1.89")
Stroke	34.0 mm (1.34")
Power output	3.0 kW (4.1 hp) at 142 r/s (8.500 r/min), model 162 2.7 kW (3.7 hp) at 142 r/s (8.500 r/min), model 61
Ignition system	Make SEM type AM 2/114 or AM 4/114, model 162 Make Prüfrex CE/114, model 61
Ignition advance	25° before t.d.c. at 142 r/s (8.500 r/min)
Air gap	0.30 – 0.35 mm (0.012" – 0.014")
Spark plug types	Champion CJ 7Y, Bosch WKA 175 T6, WS 7F, WKA 200 TR6, WSR 6F, PAL P8Y
Electrode gap	0.5 mm (0.020")
Handle heating (162 SG, 162 FG)	76 watts at 142 r/s (8.500 r/min) approx. 20 volts at 142 r/s (8.500 r/min)
Carburettor	Diaphragm carburettor make Tillotson type HS 163A Basic setting: H = 3/4 L= 1.0
Fuel tank volume	0.75 litres (0.20 US gallon, 0.16 Imp gallon). Fuel mixture 4% (1:25) With Husqvarna Twostroke Oil 2% (1:50)
Oil tank volume	0.45 litres (0.12 US gallon, 0.10 Imp gallon)
Chain lubrication	Automatic. No supply during idling. Adjustable for 4 different delivery rates. Recommended positions: Bar 13" and 15": Pos. 2 Bar 18" and more: Pos. 3 – 4
Clutch drum/sprocket	Model 162: Standard 8 teeth. Optional 7 teeth. 3/8" pitch. Model 61: Standard 7 teeth. Optional 8 teeth. 3/8" pitch.

Weights

	Mod. 162 SE		Mod. 162 SG		Mod. 61	
	kg	lb	kg	lb	kg	lb
1. Weight sawbody (empty)	5.9	13.0	6.1	13.5	5.5	12.1
2. Weight sawbody incl. chain brake (empty)	6.1	13.5	6.3	13.9	5.8	12.8
3. Weight sawbody (empty) incl. bar (13") and chain (Oregon 73 LP 52 DL)	6.9	15.2	7.1	15.6	6.4	14.1
4. Same as 3 incl. chain brake	7.1	15.6	7.3	16.1	6.7	14.8
5. Same as 3 however with full tanks	7.8	17.2	8.0	17.6	7.3	16.1
6. Same as 4 however with full tanks	8.0	17.6	8.2	18.1	7.6	16.8

Classification table

Cylinder class	Piston class
A	A
B	B
C	C

PLEASE NOTE!
As "A" denotes smallest cylinder diameter and "C" the largest, piston grades should be matched or one grade smaller. Eg it is not permissable to use a grade B piston in a grade A cylinder.

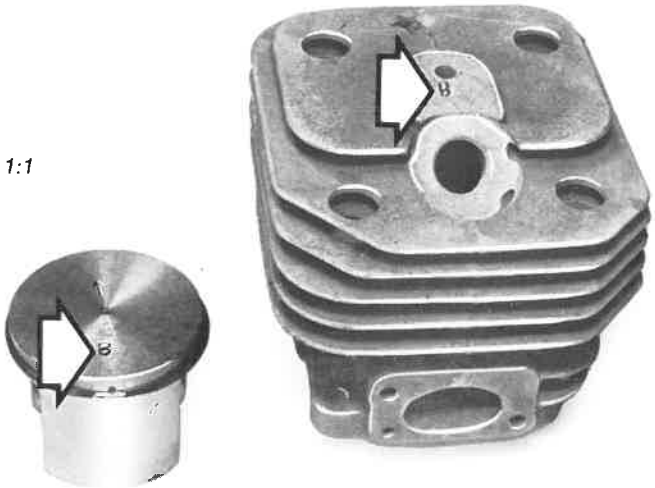


Fig 1:1

2

Service Data

Crankcase assy 2:1
Fuel tank 2:1
Starter 2:2
Carburettor 2:2
Chain brake 2:2
Oil pump 2:2
Fuel and oil 2:3
Torque 2:4
Lubrication 2:4

Crankcase Assy

Vacuum: 0.04 MPa (0.4 kp/cm², 5.7 psi)
Max. leakage: 0.01 MPa/1 min
(0.1 kp/cm², 1.4 psi per min)

Tools: 50 25 037-01 Vacuum gauge
50 25 068-01 Cover plate, crankcase

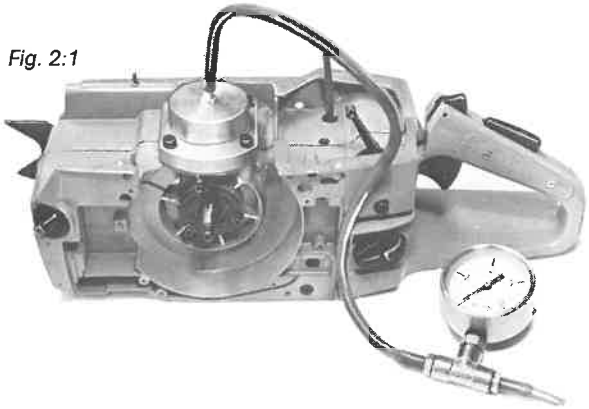


Fig. 2:1

Pressure: 0.08 MPa (0.8 kp/cm², 11.4 psi)
Max. leakage: 0.02 MPa/30 sec
(0.2 kp/cm², 2.8 psi per 30 sec)

Tools: 50 25 038-01 Pressure gauge
50 25 068-01 Cover plate, crankcase

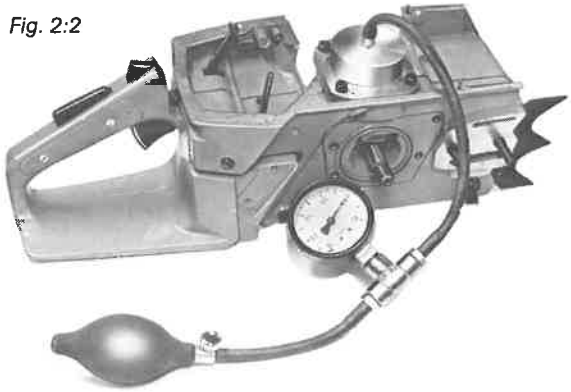


Fig. 2:2

Pressure: 0.08 MPa (0.8 kp/cm², 11.4 psi)
Max. leakage: 0.02 MPa/30 sec
(0.2 kp/cm², 2.8 psi per 30 sec)

Tools: 50 25 038-01 Pressure gauge
50 25 047-01 Cover plate, inlet port
50 25 048-01 Cover plate, exhuast port

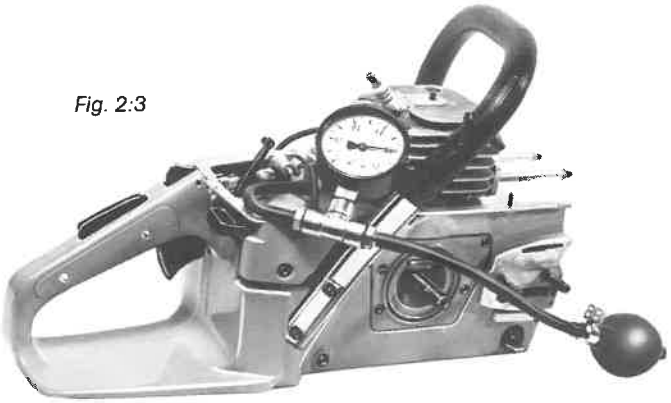


Fig. 2:3

Fuel tank

Pressure: 0.05 MPa (0.5 kp/cm², 7.1 psi)
Leakage: No leakage permitted

Tool: 50 25 038-01 Pressure gauge

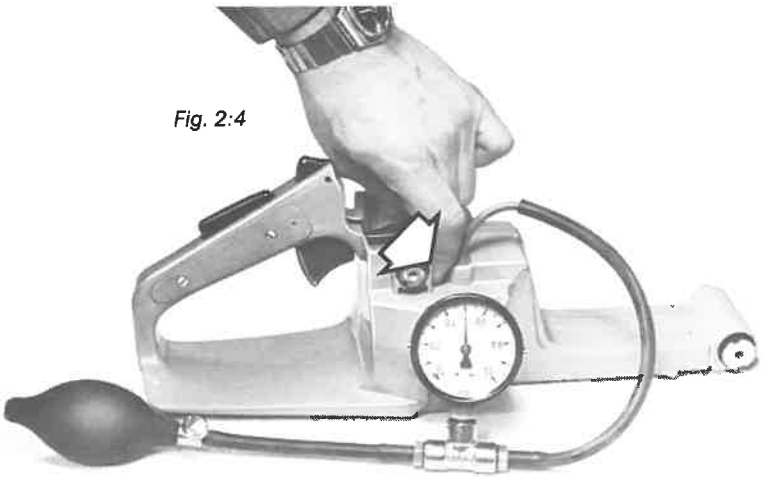
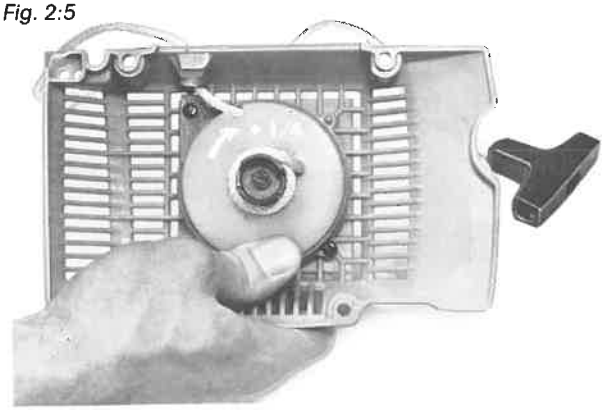


Fig. 2:4

Starter

Make sure that it is possible to turn the pulley at least about 1/4 turn further when the cord is pulled out completely.

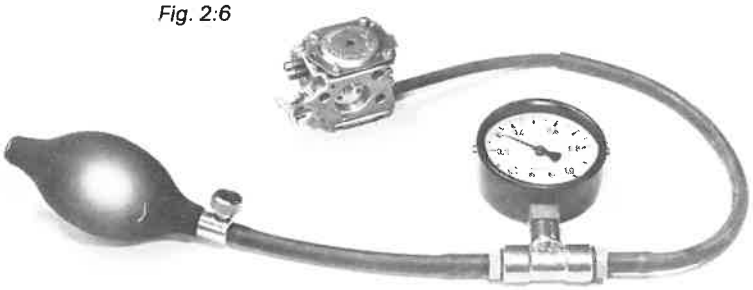
Fig. 2:5



Carburettor

Pressure: 0.03 MPa (0.3 kp/cm^2, 4.3 psi)
Leakage: No leakage permitted
Tool: 50 25 038-01 Pressure gauge

Fig. 2:6

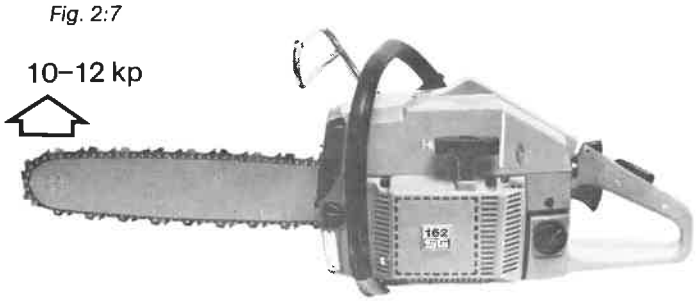


Chain brake

When used with a 13" guide bar the Swed-o-Matic should release at a load on the bar tip of 10 – 12 kp (22 – 27 lb).

Replace the brake band as soon as wear has reduced its original thickness by more than 25%, i.e. at least 0.75 mm (0.03") must be left of the original band thickness.

Fig. 2:7

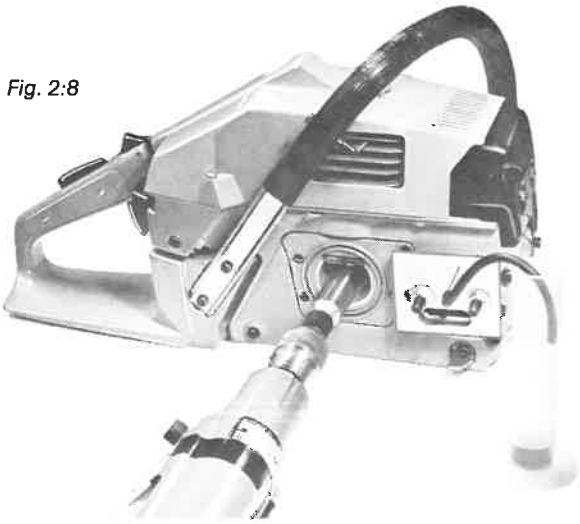


Oil pump

Pressure: 0.3 MPa (3 kp/cm^2, 42.7 psi)
Pump capacity at 6.000 r/min:
- Pos. 1: approx. 3 ml/min (0.18 cu in/min)
- Pos. 2: approx. 6 ml/min (0.37 cu in/min)
- Pos. 3: approx. 9 ml/min (0.55 cu in/min)
- Pos. 4: approx. 12 ml/min (0.73 cu in/min)

Tools: 50 25 085-01 Oil pump tester
Grad. measuring glass

Fig. 2:8



Fuel and oil

The twostroke engine is lubricated by oil mixed with petrol in various proportions depending on the type of oil used:

Ordinary twostroke oil 1:25 (4% oil)
"Pre-mixed" oil 1:20 (5% oil)
Husqvarna Twostroke oil 1:50 (2% oil)

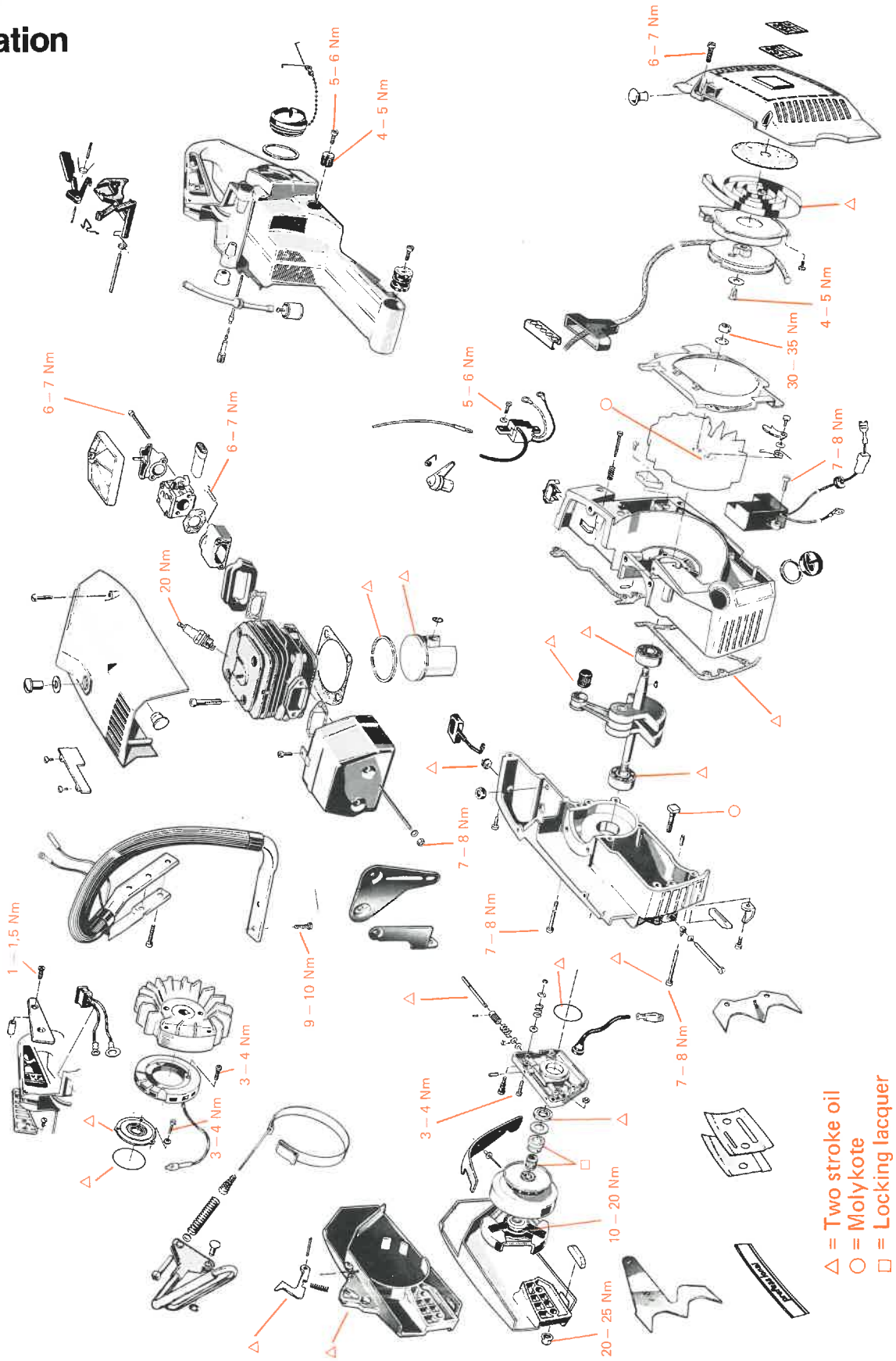
See also the mixing table below:

Fig 2:9

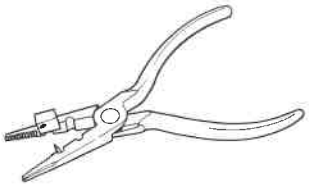
Mixing table

Mixing table		2%			4%			5%		
Litres of oil	Pints of oil	Litres of petrol	Petrol in Imp gallon	Petrol in US gallon	Litres of petrol	Petrol in Imp gallon	Petrol in US gallon	Litres of petrol	Petrol in Imp gallon	Petrol in US gallon
0.2	0.35	10	2.2	2.6	5	1.1	1.3	4	0.8	1.0
0.4	0.70	20	4.4	5.2	10	2.2	2.6	8	1.7	2.1
1.0	1.76	50	11.0	13.2	25	5.5	6.6	20	4.4	5.2

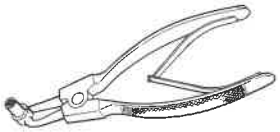
Torque
Lubrication



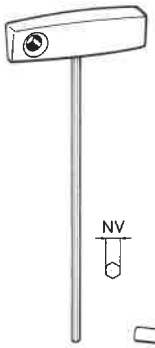
3
Special Tools



50 25 006-01
Assembling pliers, spark plug protector

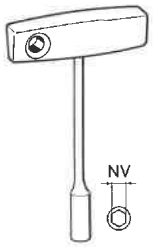


50 25 007-01
Assembling pliers, cable grommet

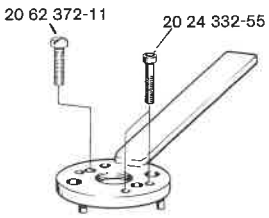


50 25 018-01 NV 4 mm
50 25 019-01 NV 3 mm
50 25 057-01 NV 3/16"
Allen key

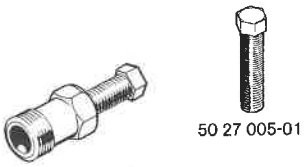
50 25 020-01 (M5)
Stud fitting tool



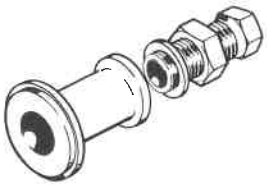
50 25 022-01 NV 8 mm
Socket spanner



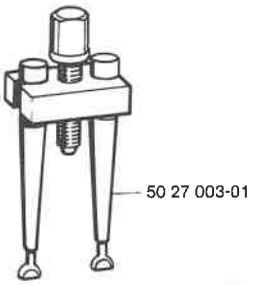
50 25 025-01
Holding bar compl.



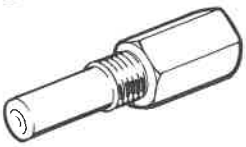
50 25 026-01
Puller compl. with screw



50 25 030-04
Fitting tool compl. for crankshaft



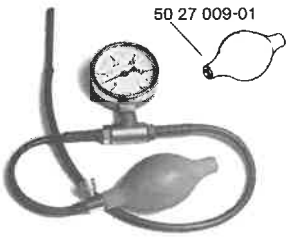
50 25 031-01
Ball bearing puller compl.



50 25 033-01
Piston stop

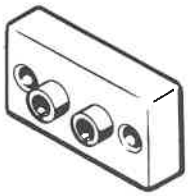
50 25 036-01
Revolution counter

50 25 037-01
Vacuum gauge compl.

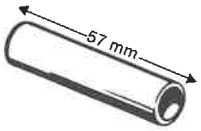


50 25 038-01
Pressure gauge compl.

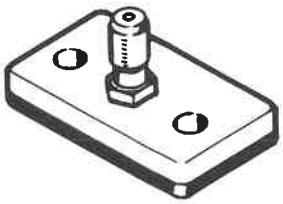
50 25 042-01
Lithium grease 250 g (0.55 lb)



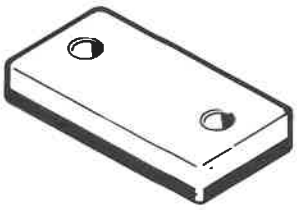
50 25 043-01
Drill template for stud, exhaust



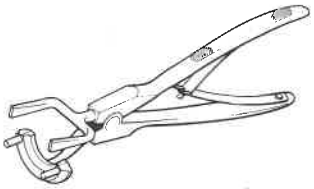
50 25 046-01
Distance sleeve (57 mm)



50 25 047-01
Cover plate, inlet port



50 25 048-01
Cover plate, exhaust port

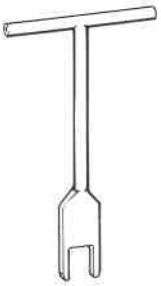


50 25 049-01
Assembling pliers, centrifugal clutch

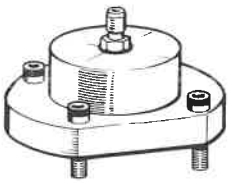
50 25 050-01
Repair kit for electric cables

50 25 051-01
Cable clip pliers

50 25 053-01
Fitting sleeve for sealing ring

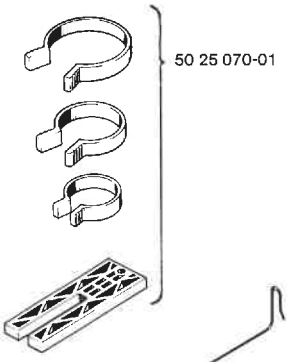


50 25 066-01 NV 22 mm
50 25 067-01 NV 15 mm
U-spanner for vibration damper

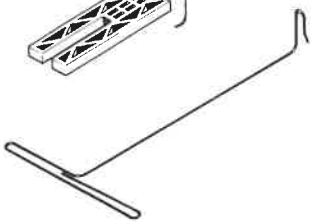


50 25 068-01
Pressure-testing set, crankcase

50 25 069-01
Fitting drift, piston pin

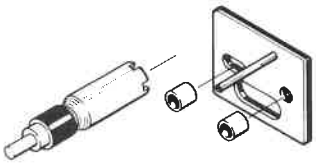


50 25 070-01
Piston mounting set compl.



50 25 083-01
Hook for oil filter

50 25 084-01
Electrotester



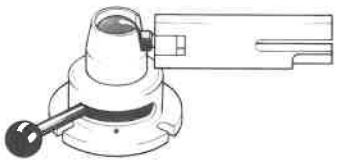
50 25 085-01
Oil pump tester compl.

50 25 086-01 NV 3 mm
50 25 087-01 NV 4 mm
Allen screwdriver with ball

50 25 090-01
Jet-Pac spray gun compl. incl. retouch paint

50 25 091-01
Retouch paint, orange 1/8 l

50 25 092-01
Pressure pack for Jet-Pac



50 25 102-01
Clamping device

50 25 106-01
Glue, adhesive

50 25 107-01
Glue, epoxy

50 25 108-01
Loctite AA (normal locking power)

50 25 109-01
Loctite AAV (strong locking power)

50 25 124-01
SEM electric system tester

4

Fuel system, Carburettor

Removal of carburettor 4:1

Carburettor check 4:2

A. Pumping section
B. Metering section
C. Mixing section

Assembly 4:2

A. Pumping section
B. Metering section

Adjustment of carburettor 4:3

A. Basic setting
B. Adjustment of L-needle
C. Adjustment of H-needle

Trouble shooting guide 4:5

Removal of carburettor

Remove the air filter and the fuel hose.
Remove the throttle push rod from the plastic lever with a pair of flat hose pliers.
Remove the stop switch in order to get at the left screw that retains the carburettor.
Push out the choke control from the lever on the carburettor.
Loosen the socket head screws that retain the carburettor (use the Allen key No. 50 25 018-01) and lift the carburettor off together with the air filter elbow and the screws.
Clean the carburettor on the outside.

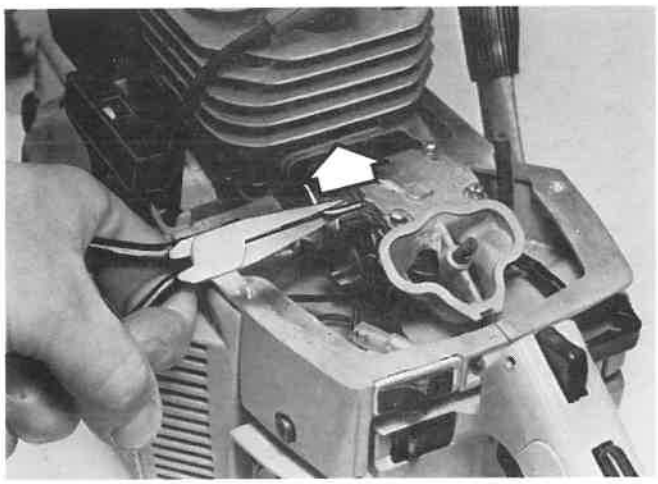


Fig 4:1

Remove the metering diaphragm cover and the metering diaphragm.
Note that the centre pin of the diaphgragm enters the forked end of the lever of the needle valve.
Connect the pressure gauge 50 25 038-01 to the fuel inlet of the carburettor and pump until a pressure of 0.03 MPa (0.3 kp/cm^2) is reached.
Check for any leakage at the needle valve or at the gasket on the pump side.
The easiest way of locating leakages is to pour some petrol where you suspect the leakages to be.

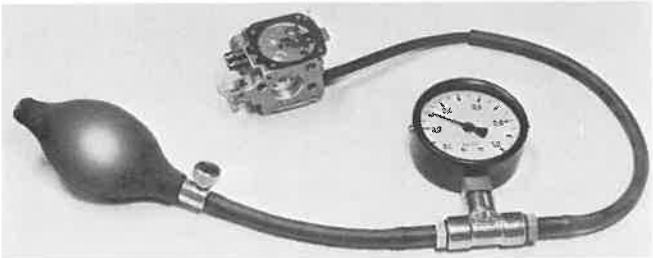


Fig 4:2

Loosen the screw that retains the bearing shaft of the lever and remove lever, shaft, spring and needle valve (see fig 4:3).

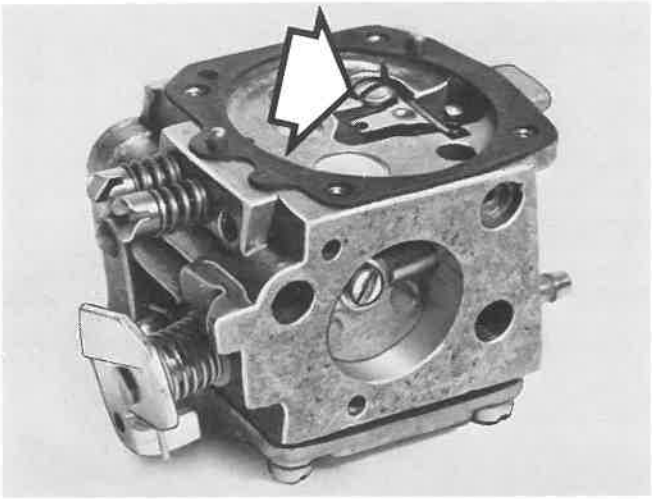


Fig 4:3

Drill a small hole in the welch plugs (approx. Ø 2 mm) and prise away the plugs by means of a pointed tool.

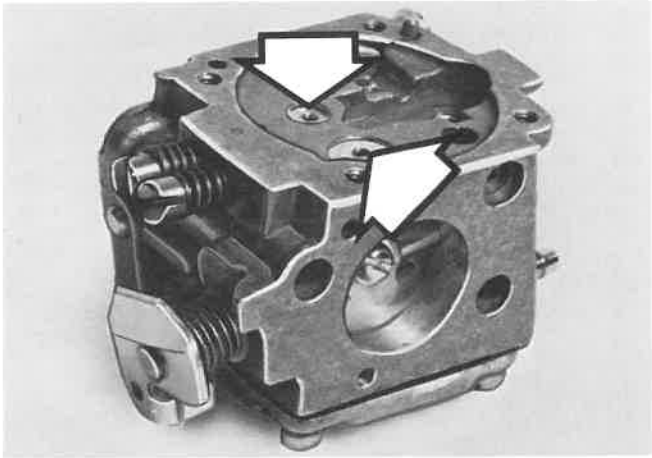


Fig 4:4

NOTE! Drill with care in order not to damage the carburettor housing.

Unscrew the two adjusting needles.
Remove the cover above the pump diaphragm and remove diaphragm and gasket.

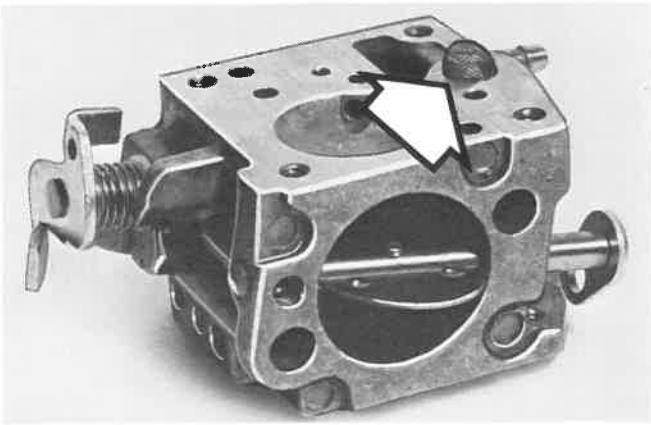


Fig 4:5

Lift off the fuel screen carefully by means of a pointed tool.

Carburettor check

A. Pumping section

Clean the fuel screen and -lines with compressed air. Check the gasket and the pump diaphragm for damage or wear.

B. Metering section

Check that the adjusting needles are straight and that their tapered ends are not damaged.

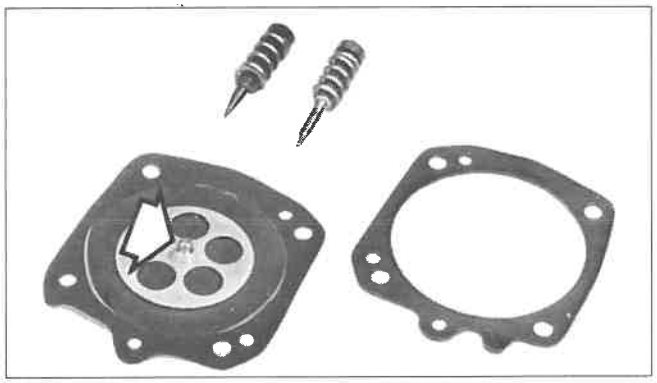


Fig 4:6

Check the gasket and the metering diaphragm for damage or wear.
Check with particular care the wear on the centre pin of the diaphragm.

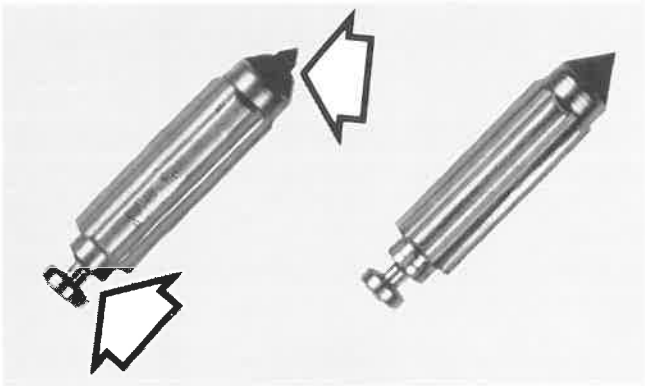


Fig 4:7

Check that the needle valve is not worn, neither on its seat, nor in the groove for the lever.

Check that the needle valve lever is not worn, neither at the connection to the needle valve nor to the metering diaphragm (see fig 4:8).

Check that the filter screen near the main jet is not dirty or damaged.

C. Mixing section

Clean all fuel lines and jets with compressed air.

Replace damaged or worn parts with new ones.

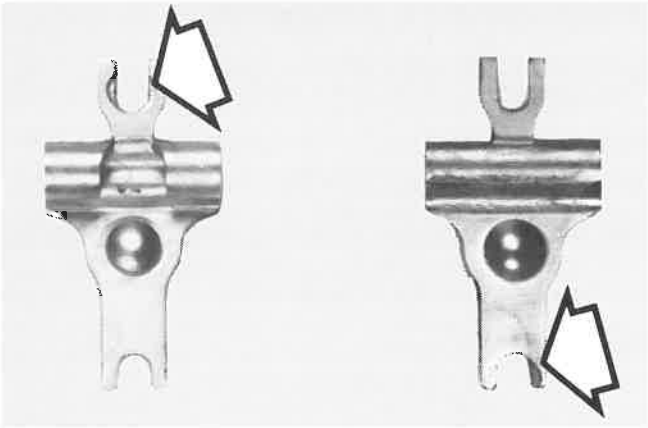


Fig 4:8

Assembly

A. Pumping section

Locate the fuel screen carefully in its seating. Locate the pump diaphragm next to the carburettor housing and then add gasket and cover.
Tighten the four screws of the cover diagonally and evenly.

B. Metering section

Fit new welch plugs. Install them with a suitable drift:

for the big plug: drift Ø 8 mm
for the small plug: drift Ø 4 mm

> *NOTE!*
> *Do not press in the plugs so that they bulge inwards!*

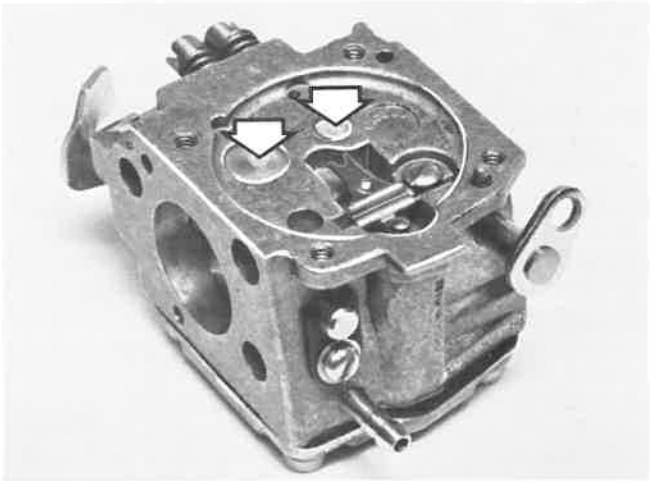


Fig 4:9

Mount needle valve, lever, spring and shaft. Locate the spring properly!

TIP

> The carburettor spare part kit has got No. 50 15 467-01.

When properly adjusted the lever of the needle valve shall be on a level with the carburettor housing surrounding it.
If the lever is located too high, the carburettor will be very sensitive as regards the adjustment of the adjusting needles.
A too low lever induces bad acceleration qualities.

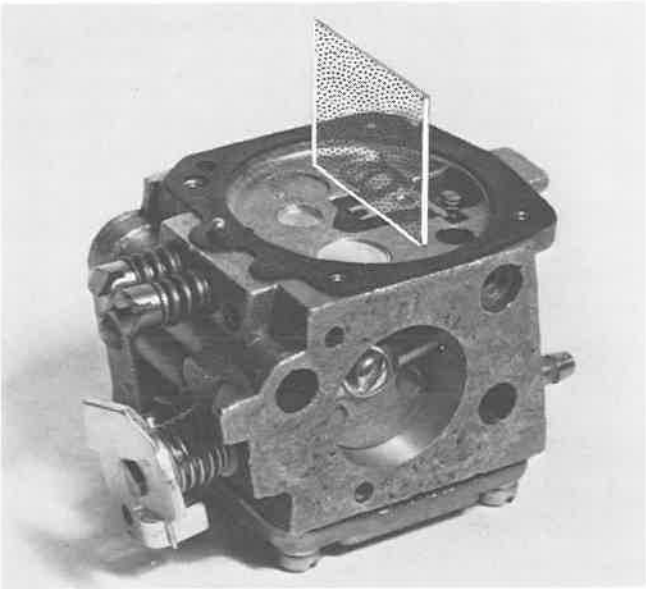


Fig 4:10

Check that the lever can move freely.
Make a pressure test of the carburettor. Proceed as mentioned above.
Then mount gasket, metering diaphragm and cover.

> *NOTE!*
> *Care should be taken to ensure that the centre pin of the diaphragm enters the fork in the lever!*

Install the adjusting needles and screw them out to the following basic position: H = 3/4 turn open. L = 1.0 turn open.

Adjustment of carburettor

A. Basic setting

Before adjusting the carburettor, proceed as follows:

Fig 4:11

Clean the air filter or, if necessary, replace it with a new one.
Check the spark plug and its electrodes.
Check that the fuel filter is not clogged.

Examine the fuel filter as follows:

Loosen the fuel hose from the carburettor and lay the chain saw on the clutch side. Open the tank cap. If there is enough fuel in the tank, some of it now ought to run out of the hose (see fig 4:11).

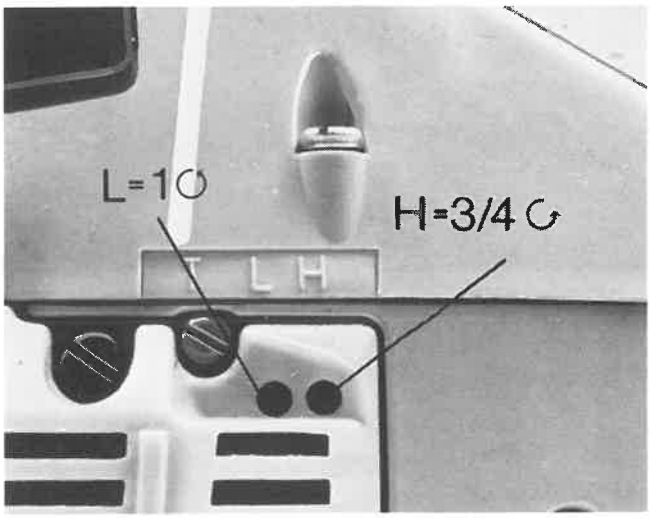


Fig 4:12

After having made the abovementioned checks you make a basic adjustment of the carburettor needles, i.e. H = 3/4 turn open and L = 1 turn open.

Start the chain saw and warm it up by applying full throttle and letting it cut into a log.
A constant speed for 10 – 20 sec indicates not only a good high speed function of the carburettor but also a good condition overall.
Should there be a sudden lean supply to the engine after approx. 10 – 20 sec full throttle running (big speed increase), this would indicate some fault in the fuel system.

The trouble may be caused by:

Leakage in the pumping section of the carburettor.
Crack in the insulating piece.
Loose carburettor bolts.
Incorrectly assembled or leaking gaskets.
Tank breather valve inoperative.
Fuel filter clogged.

> *NOTE!*
> *Too lean adjustment of the carburettor would cause a considerable loss of power. Adjust the carburettor in order to obtain maximum power and not maximum speed.*

B. Adjustment of L-needle

Adjust the idling speed by means of the throttle adjusting screw T. Try to reach a position where the chain is just beginning to rotate, that is at a comparatively high idling speed.

Fig 4:13

Put your right hand on the front handle and make a fine adjustment of the L-needle with your left hand. Use screwdriver No. 50 16 002-01.

Fine adjustment is made as follows:

1. Screw in the L-needle slowly and the speed will increase. Screw in the needle a little further and the speed will slow down again as the fuel supply becomes too "lean". Notice the position of the needle at the highest speed.
2. Open the L-needle again and notice the highest position. Note that the speed slows down at "richer" supply.
3. Adjust the L-needle to the highest speed position. Then open it equivalent to 10 min on a clock-face to obtain a somewhat "richer" supply to aid acceleration.
4. By means of the T-needle, adjust the idling speed to 2.300 – 2.500 r/min, ensuring that the chain does not rotate when engine is idling.
5. Give full throttle a couple of times to check that the engine "responds". If not, open the L-needle by abt 3 min. Check again.

C. Adjustment of H-needle

Adjust the high speed needle (H) as follows:

Fig 4:14

Apply full throttle by keeping a *constant* grasp of the throttle trigger. At correct adjustment of the H-needle the engine should be fourstroking.

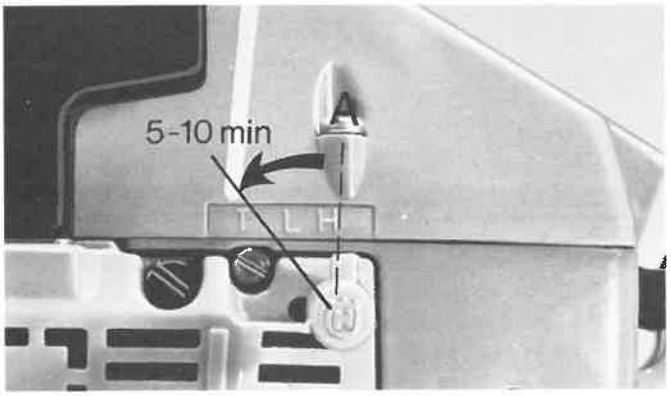


Fig 4:15

Screw in the H-needle slowly until there is no more fourstroking (position A).
Then screw the needle out equivalent to 10 min on a clock-face.

Fig 4:16

Check by means of eg revolution counter No. 50 25 036-01 that the high idle speed does not exceed 11.500 r/min.
Now the carburettor adjustment is completed and you may release your hold of the throttle trigger.

Trouble shooting guide

	Dirt in the fuel lines	Welch plugs loose	Weak impulse (leakage at intermediate piece, gasket)	Adjusting needles bent or broken	Needle seats damaged	Dirt in the screen	Worn details in metering section (needle valve)	Lever too high	Fuel filter clogged	Hole in fuel hose	Faulty tank breather	Leakage in pumping section	Fuel screen of pumping section clogged	Air filter clogged
Irregular idling speed							X	X						
Engine stops when accelerated (choke required)	X		X			X			X	X				
"Leaning out"			X						X	X	X	X	X	
No fuel supply			X						X					
Difficult adjustment		X		X	X									
Too "rich" supply							X							X
No idling speed		X												
Extreme needle position	X	X				X								X

5

Electric system

A. Ignition system, trouble shooting 5:1
B. Heating system, trouble shooting 5:2
Checking the complete heating system
Rear handle check
Front handle check
Generator check
C. Removal/assembly 5:4
Changing the starter pawls and springs
Fitting the spark plug protector

A. Ignition system, trouble shooting

In all ignition testing the plug must be firmly earthed against the cylinder in order to prevent damage to the system.

A 1. Remove the spark plug. Connect the ignition cable and "earth" the plug against the cylinder. Check for a spark between the electrodes when you rotate the engine by pulling smartly on the starting handle. The stop switch should be in position 1.

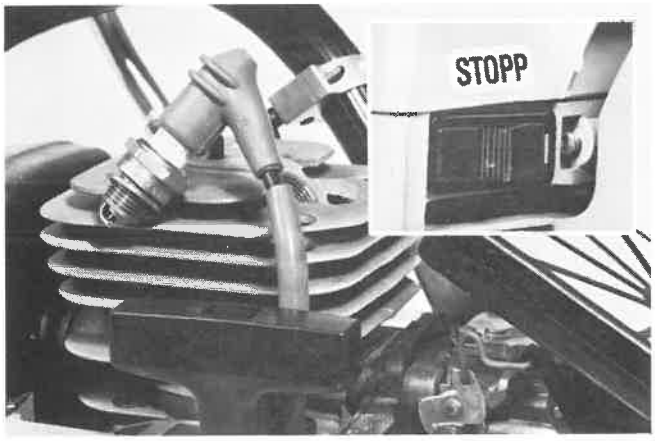


Fig 5:1

A 2. If no spark occurs, try a new plug. If still no spark, check the connection between ignition cable and spark plug protector.

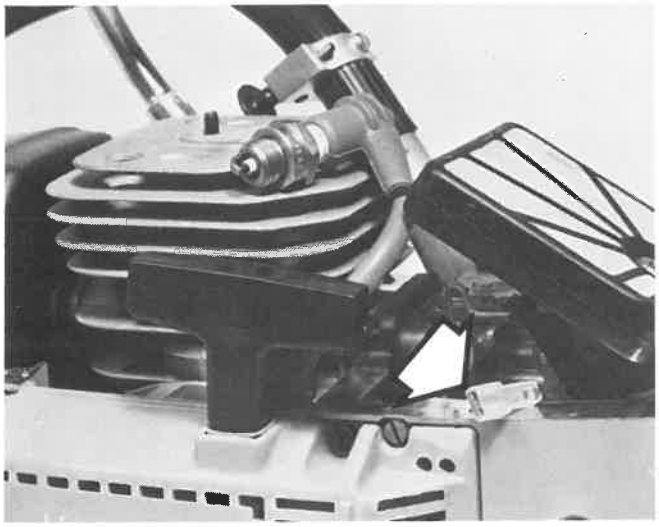


Fig 5:2

A 3. If still no ignition spark between the electrodes, disconnect the short circuiting cable from the switch. Check for a spark. In this case, the stop switch is faulty and should be exchanged.

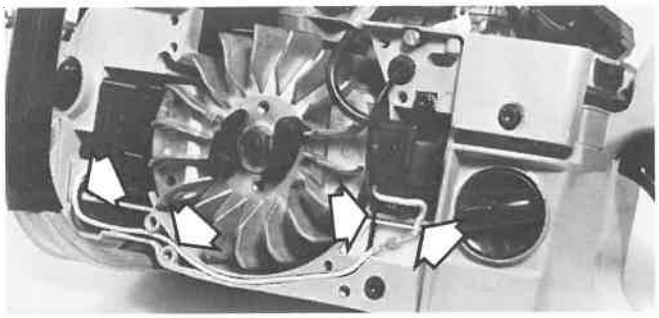


Fig 5:3

A 4. Should there still be no ignition, remove the starter and air conductor. Check all cables and connections. Cables that are squeezed or otherwise damaged should be exchanged. Check simultaneously the gap between the magnet of the flywheel and the core of the module. The gap should be 0.30 – 0.35 mm (see fig 5:4).

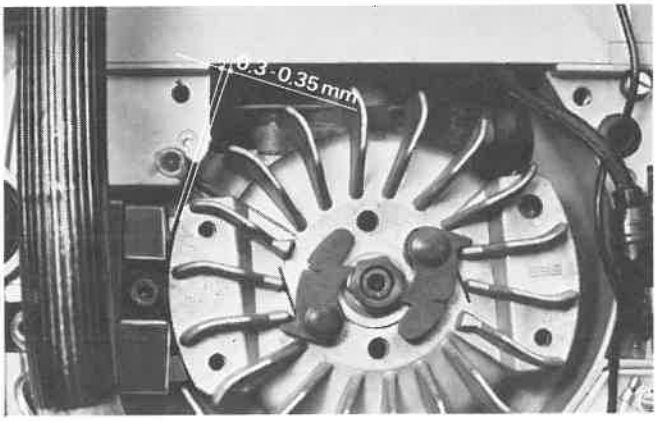


Fig 5:4

If no ignition after checks A 1 – A 4, the ignition coil should be exchanged and a new check made according to A 1.

The last step is to change the trigger module. Check that the gap is exactly as stated above (fig 5:4).

The ignition coil and trigger module may be checked by means of a special tester, eg our electric system tester No. 50 25 124-01 (see chapter 3).

B. Heating system, trouble shooting

This chapter refers only to models 162 SG and 162 FG. Use electrotester No. 50 25 084-01 for trouble shooting. Note: Set the tester to zero before use.

Checking the complete heating system

1. Remove the starter. Disconnect the black cable at the pin connection in the air conductor. Put the switch in the "on" position (red marking visible). Connect the red cable of the electrotester to the black cable mentioned above. Connect the black cable of the tester to "earth", eg the screw retaining the ignition coil.
   Test result: *4.6–5.5 ohm.*
   Probable error: *Interruption within the system if no measurement result obtained. Continue to point 2.*

2. Same connection as above, but the black cable of the tester should be connected to the tip of the screw situated before the front screw retaining the left cover on the rear handle.
   Test result: *4.6–5.5 ohm.*
   Probable error: *Switch defective.*
   Interruption in earth cable.
   Bad connection between switch and cable connection at left cover.

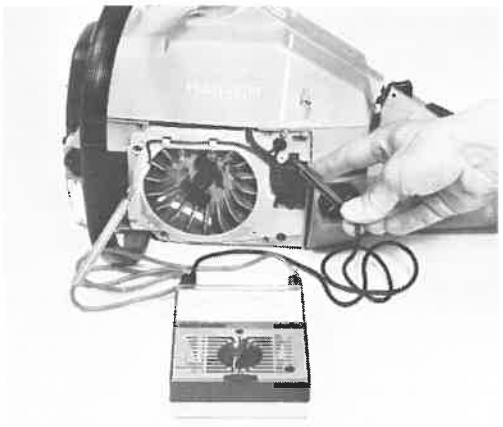


Fig 5:5

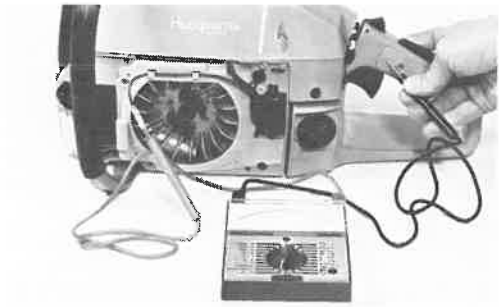


Fig 5:6

Rear handle check

Put switch in the "off" position.
Connect the red cable of the electrotester to the tip of the screw on the left cover, and the black cable to the tip of the screw on the right cover.
Test result: *1.2–1.4 ohm.*
Probable error: *Interruption in the foil element.*
Bad connections.

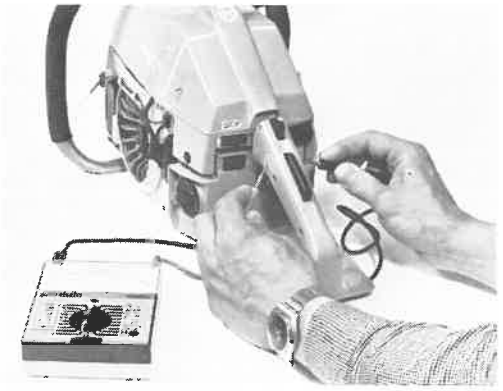


Fig 5:7

Front handle check

Put switch in the "on" position (red marking visible). Connect the red cable of the electrotester to the black cable with pin connection. Connect the black cable of the tester to the tip of the screw situated before the front screw retaining the right cover on the rear handle.
Test result: *3.4–4.2 ohm.*
Probable error: *Foil element on front handle damaged.*
Defective connections at both covers of the rear handle.
Bad contact between cable and foil element, or cable insulation damaged.

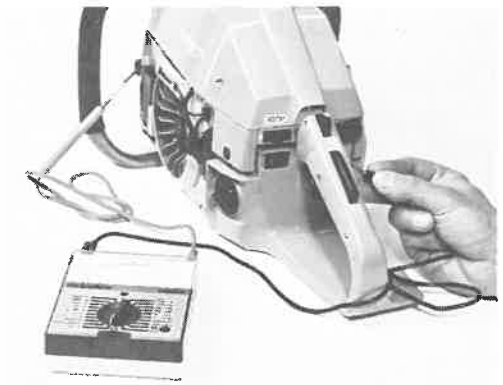


Fig 5:8

Generator check

This check is to be made after the above checks have been carried out. Connect the black cable with pin connection to the corresponding connection in the air conductor and fit the starter. The heating switch should be in the "off" position. Start the engine. Connect the black cable of the electro-tester to "earth", and the red cable to the tip of the screw situated before the front screw on one of the covers of the rear handle. Run the engine with throttle in starting position, and measure the voltage.

Test result: *abt 20 volts at 142 r/s (8.500 r/min).*

Probable error: *Defective cable from the generator.*
Interruption in the generator winding.
Insufficient magnetization of the flywheel.

Fig 5:9

C. Removal,assembly

Remove the starter and disconnect carefully the black cable from the air conductor and the pin. Lift off the air conductor (refers to models SG and FG). Fit holding bar No. 50 25 025-01 on the flywheel and loosen the nut with a box spanner (14 mm). Use a screw driver to push out the starter pawls, enable the sleeve to enter properly on the flywheel nut. Fit puller No. 50 25 026-01 on the holding bar and remove the flywheel.

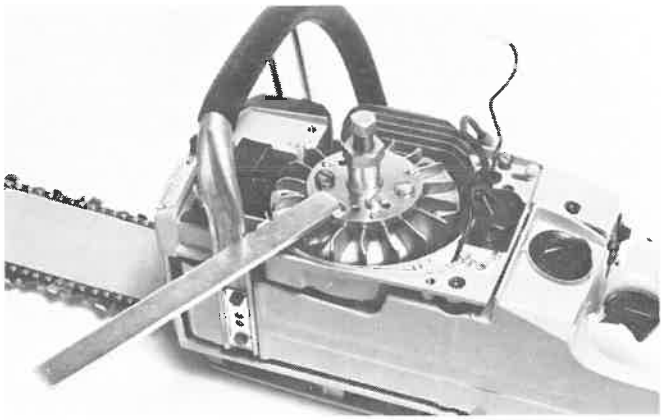


Fig 5:10

On models 162 SG and FG you can now get at the generator. Loosen the three screws by means of Allen key No. 50 25 019-01. Assembly is made in reverse order. The flywheel nut should be tightened by torque 30–35 Nm. Do not forget the washer under the flywheel nut! Check the gap between flywheel and electronic unit (see fig 5:4).

Changing the starter pawls and springs

Place the flywheel with starter pawls downwards.

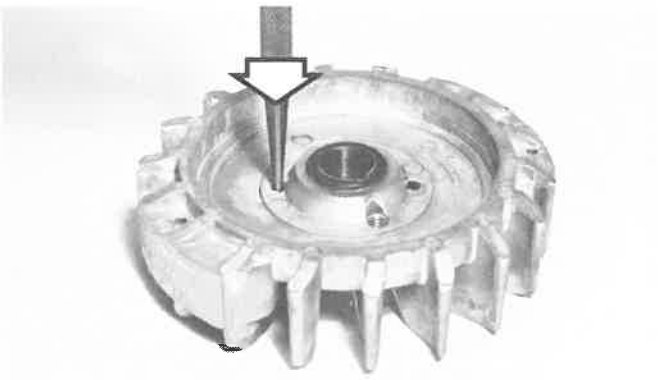


Fig 5:11

Push the bearing pins of the starter pawls out of the flywheel with a drift Ø3 mm. Change starter pawls and springs, and press back the bearing pins from the fan side. Use Loctite AA in the pin holes before putting the pins back.

Check that the pins reach the bottom and that springs and pawls work properly.

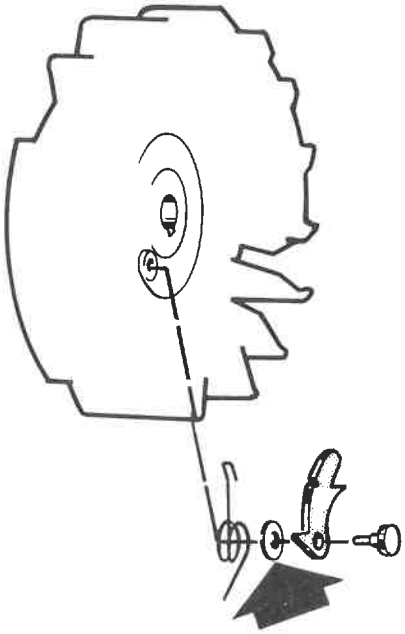


Fig 5:12

Be careful not to forget the washer between the starter pawl and spring (see fig 5:12).

Fitting the spark plug protector

To ensure proper connection between switch spring and ignition cable, use assembling pliers No. 50 25 006-01 for fitting the spark plug protector on the ignition cable.

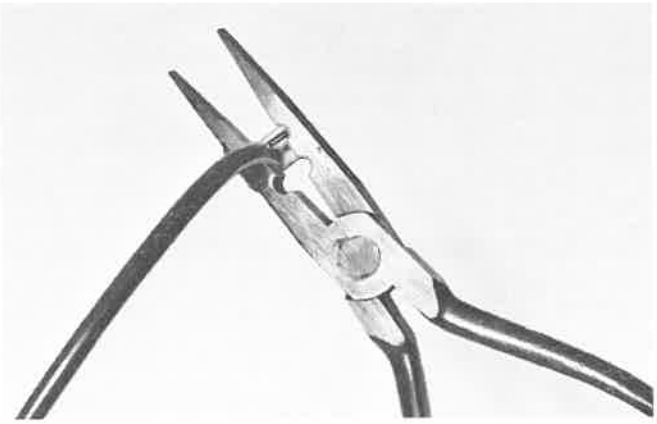


Fig 5:13

We recommend the use of Lithium grease No. 50 25 042-01 when connecting the ignition cable to the spark plug protector and the ignition coil, if any. In the latter case, the grease should be applied under the rubber cover.

Lubricating system, oil pump

Removal of oil pump 6:1
Assembly 6:2
Trouble shooting guide 6:3

Removal of oil pump

Remove the following parts in order to get at the oil pump:
Clutch cover, chain and bar, centrifugal clutch (left-hand threads), clutch drum. Note the washer between the oil pump drive gear and the main bearing seal.

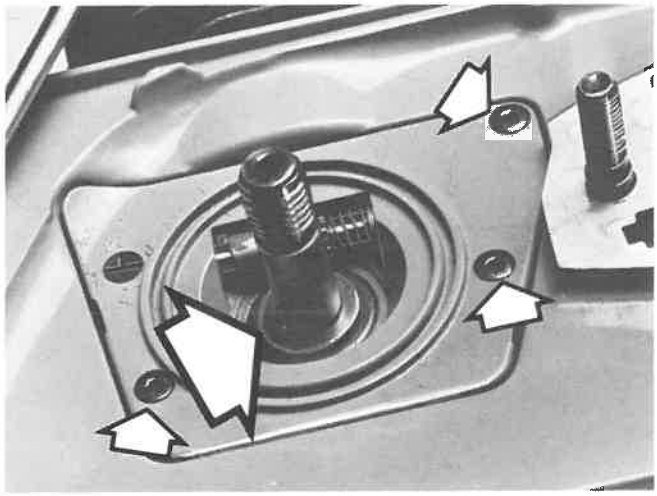


Fig 6:1

Loosen the socket head screws that retain the pump. Use Allen key No. 50 25 019-01.

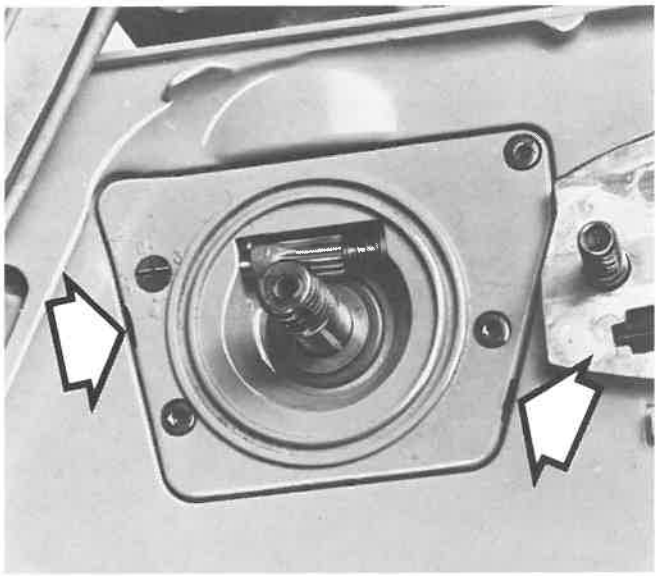


Fig 6:2

Remove the pump from the crankcase by levering around the edges of the housing with screwdrivers.

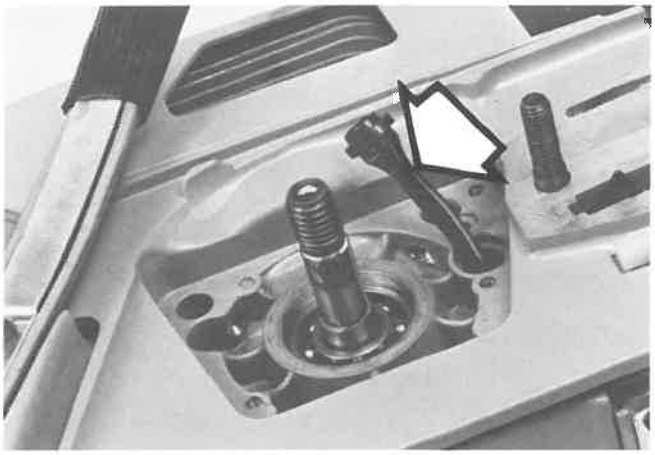


Fig 6:3

Lift the suction hose and oil filter out of the oil tank. Clean the parts and change any that may be damaged.

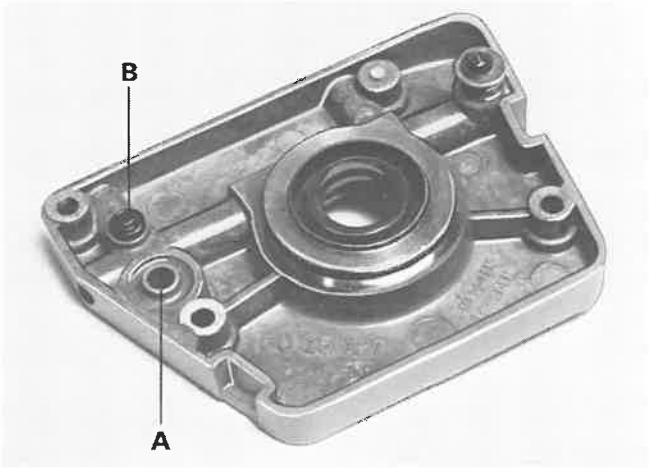


Fig 6:4

Check if there is dirt in the suction channel (A) by rotating the pump shaft in both directions. When the pump works properly and is filled with oil, the oil goes alternately through the suction channel and the compression channel (B).

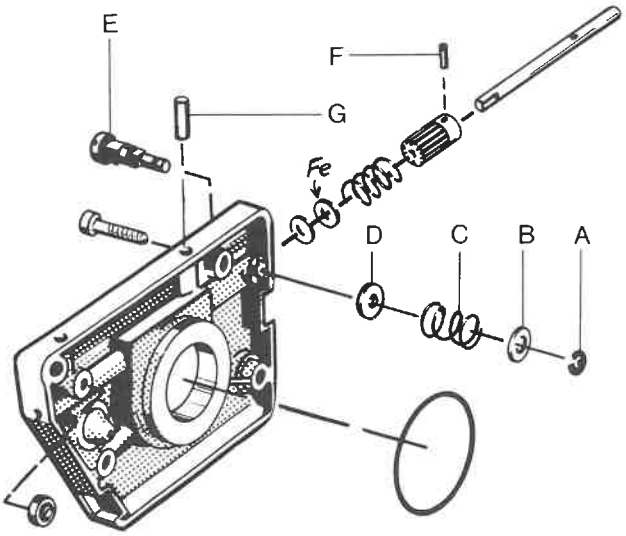


Fig 6:5

For cleaning, dismantle the pump as follows:

1. Remove clip A, washer B, spring C and plastic washer D.
2. Remove adjusting screw E.
3. Loosen locking screw F which retains the pump drive on the pump piston.

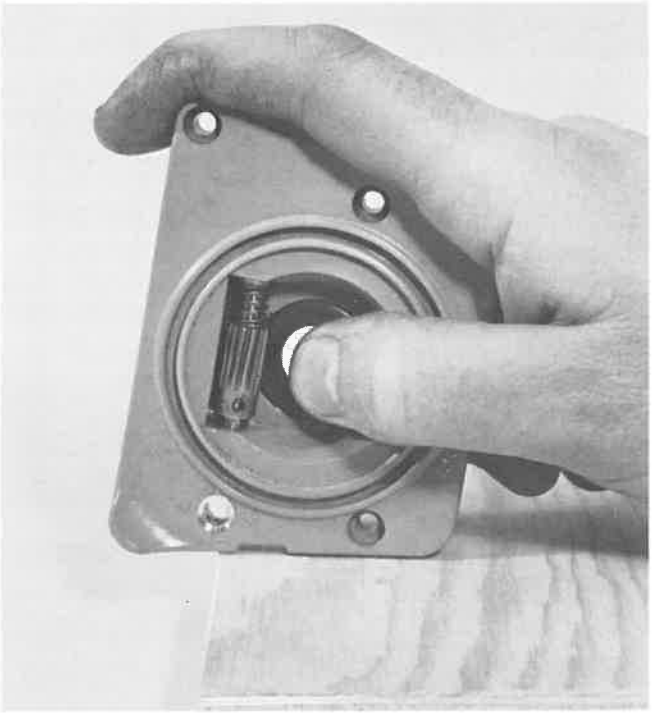


Fig 6:6

4. Knock the edge of the pump housing against a piece of wood to make the pump piston slide out of the casing.
5. Check the wear of pin G (fig 6:5) against which the cam curve of the pump drive runs.
   If worn, the pin should be removed from the housing, turned half and pushed back in its place.

Assembly

Assembly of the oil pump is made in reverse order to dismantling.

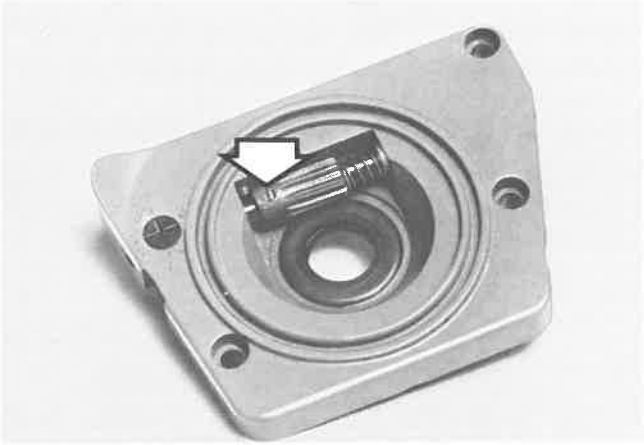


Fig 6:7

1. The locking screw that retains the pump drive on the pump piston should be locked by Loctite AA or locking lacquer.

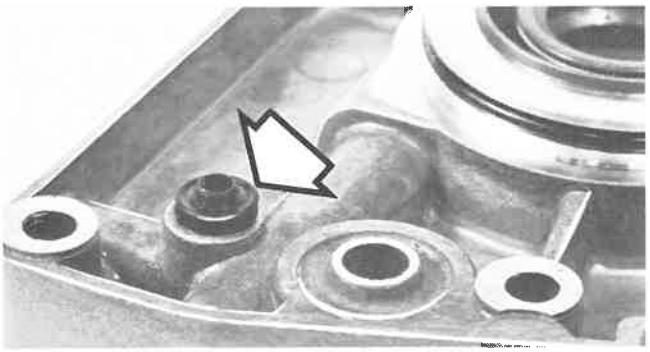


Fig 6:8

2. Check that the sealing ring on the pressure side is fitted, clean and undamaged.

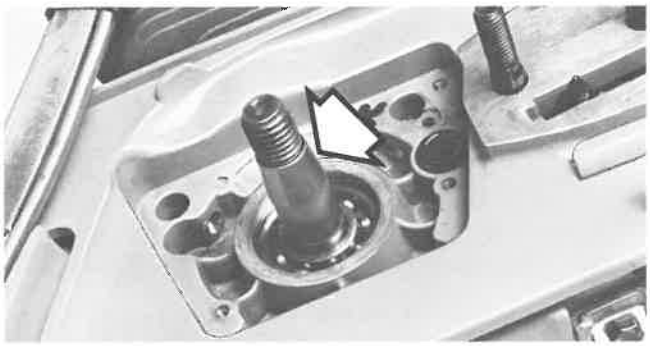


Fig 6:9

   Use sleeve No. 50 25 053-01 to protect the sealing ring when the pump is fitted into the crankcase.
3. After fitting the pump into the crankcase, check that the pump piston turns easily and that the return spring returns the pump drive towards the guide pin.

Trouble shooting guide

	Adjusting screw in too high a setting	Adjusting screw worn	Guide pin worn	Dirt in the suction hose and oil filter	Vacuum in the oil tank	Pump piston seized	Suction hose cracked or leaking	Oil channel of crankcase clogged	Plastic driving gear damaged	Sealing ring damaged or lost
Too much lubrication	X	X								
Insufficient lubrication			X	X	X			X	X	X
Plastic driving gear damaged						X				
Lubrication only in felling position							X			
Leakage										X

7

Cylinder, piston

Removal 7:1
Control 7:1
Damage, remedy
Assembly 7:2

Removal

Lift off the cylinder cover. Remove the throttle push rod, fuel hose and choke control from the carburettor. Remove the spark plug protector, and the spark plug from the cylinder.
Disconnect the felling cushion device, if any.
Loosen the four screws retaining the cylinder by means of Allen key No. 50 25 057-01.
Loosen also the lower screw retaining the silencer.

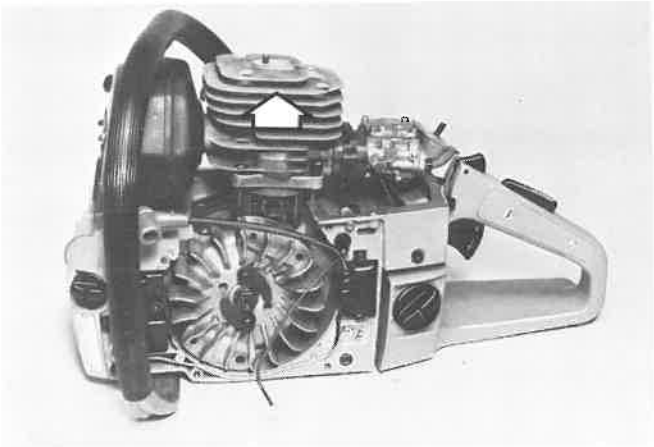


Fig. 7:1

Control

Check the following before assembly, and take the measures required:

Lift the cylinder with silencer and carburettor. To facilitate removal, the piston should be at the bottom dead centre.

Fig. 7:2

Put a clean rag into the crankcase opening to protect the crankcase from the ingress of dirt, etc.

Remove the circlips on the wristpin with a pair of flat hose pliers and push out the wristpin with fitting drift No. 50 25 069-01. Remove the silencer and the carburettor parts from the cylinder. Clean the external surface of the carburettor of dirt and sawdust. Scrape off carbon deposits from the exhaust port and combustion chamber.

Damage	*Remedy*
Broken cooling fins, damaged threads or broken stud at exhaust port.	*In case of severe damages, exchange the cylinder. Restore the thread by means of Heli-Coil inserts.* *Drill out the broken stud with drill template No. 50 25 043-01 and fit Heli-Coil, or thread the drilled hole by means of M6 and fit stud M5–M6 No. 50 16 865-01.*
Seizure marks in the cylinder wall (especially at exhaust port).	*Polish the marks with a fine emery clotch to remove aluminium deposits.* *If the marks are deep, exchange cylinder and piston.*
Surface of the cylinder wall worn (esp. at the top).	*Exchange cylinder and piston.*
Seizure marks on the piston	*Polish the marks carefully with a fine file or emery cloth. Before fitting the piston, polish the cylinder wall as stated above. If the marks are deep, exchange the piston and, if necessary, the cylinder.*
Piston ring stuck in the groove	*Remove the piston ring carefully and clean the groove completely before mounting the ring.* *Check the wear of the piston ring by placing it in the bottom of the cylinder. The gap between the ends of the ring should be 0.6 mm max.* *Check that the ring is still springy.*

Assembly

Check that piston and cylinder have the same classification marking (see fig 1:1 and the classification table). Fit the insulating piece and the carburettor to the cylinder. Check that the gaskets are in the correct positions.

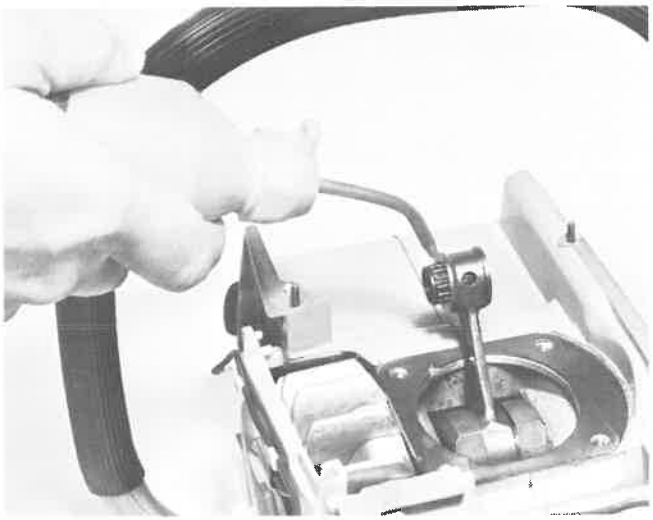


Fig. 7:3

Place the cylinder base gasket on the crankcase. Check that the needle bearing of the wristpin is not damaged. Fit it in the connecting rod and lubricate with a few drops of two-stroke oil.

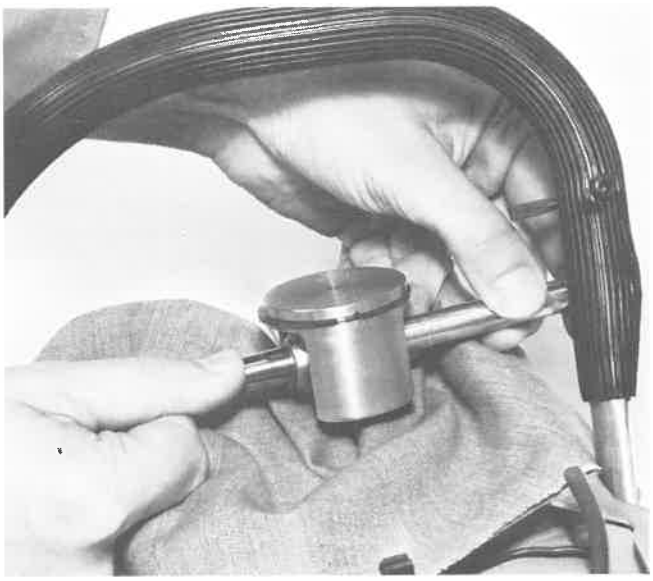


Fig. 7:4

Fit the piston on the connecting rod. Note that the arrow on the piston should point towards the exhaust port! Use fitting drift No. 50 25 069-01 to centre the piston against the needle bearing of the connecting rod. Push the wristpin in and fit the circlips. Turn them round with a pair of flat hose pliers to check that they run smoothly in the grooves.

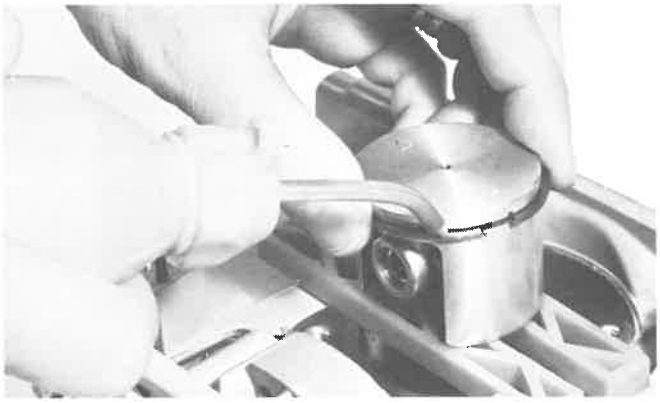


Fig. 7:5

Lubricate the piston with a few drops of oil. Fit the supporting piece in mounting set No. 50 25 070-01 below the piston.

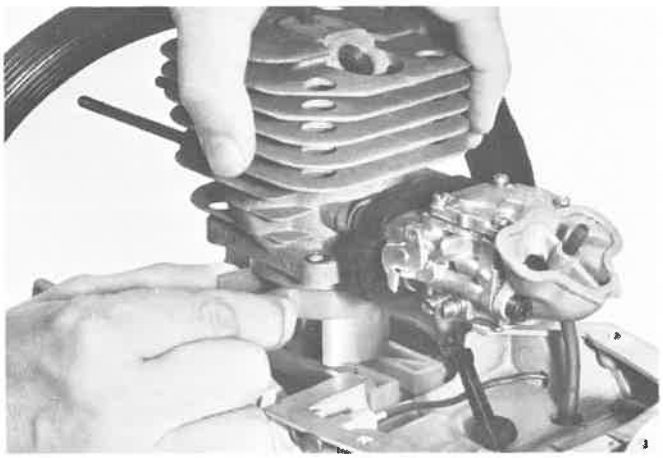


Fig. 7:6

Press the piston ring by means of the piston ring compressor in mounting set No. 50 25 070-01. Push the cylinder carefully down over the piston. To avoid breaking the piston ring, do not turn the cylinder. Turn the crankshaft and check that the piston moves easily in the cylinder. Tighten the four cylinder base screws diagonally and evenly. Fit the silencer.

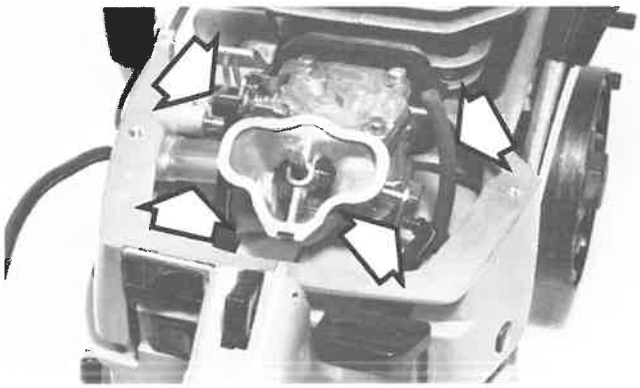


Fig. 7:7

Connect the choke control, fuel hose and throttle push rod to the carburettor and fit the plastic sleeve over the adjusting needles.

8

Crankcase, crankshaft

Removal of crankcase 8:1
Crankshaft check 8:2
Fitting the crankcase 8:2
Changing the vibration dampers 8:4
Assembly of crankcase — tank unit 8:4

Removal of crankcase

The following components will have already been removed: chain and bar, centrifugal clutch, flywheel, carburettor, cylinder and piston.

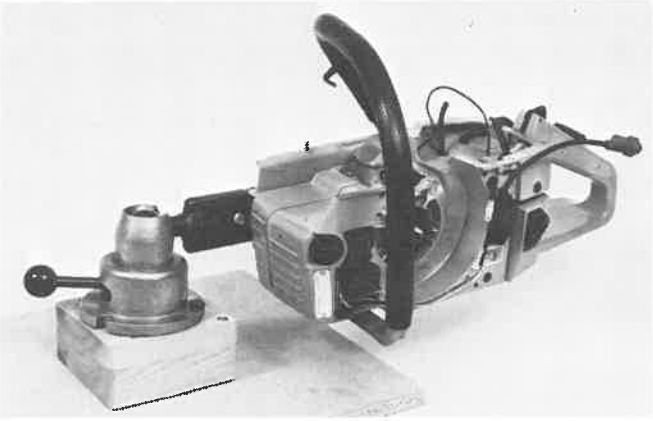


Fig 8:1

Drain the oil tank and fix the chain saw in the clamping device No. 50 25 102-01.
Remove the oil pump from the crankcase. Note the thrust!
Remove the cylinder base gasket.

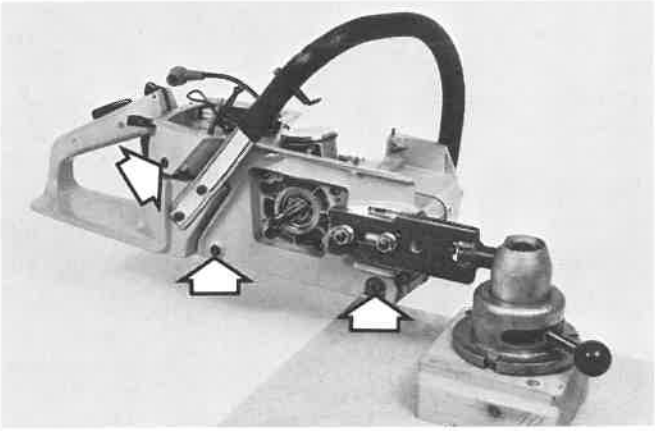


Fig 8:2

Remove the six screws (three on each side) that connect the crankcase to the tank unit.

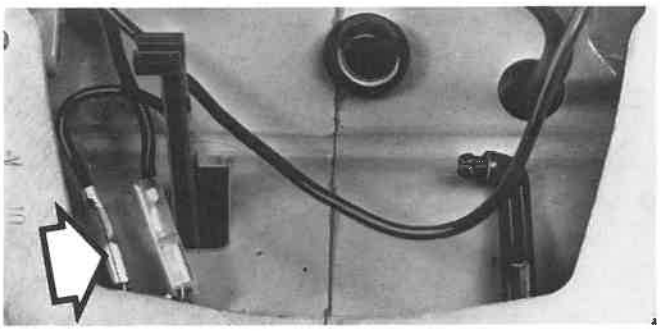


Fig 8:3

Disconnect the cable between stop switch and heating switch (only model SG and FG).

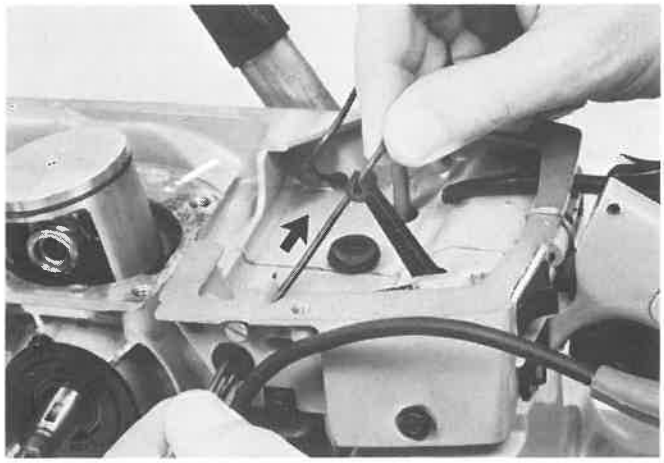


Fig 8:4

Pull the cable of the front handle through the rubber grommet without removing the pin connection.

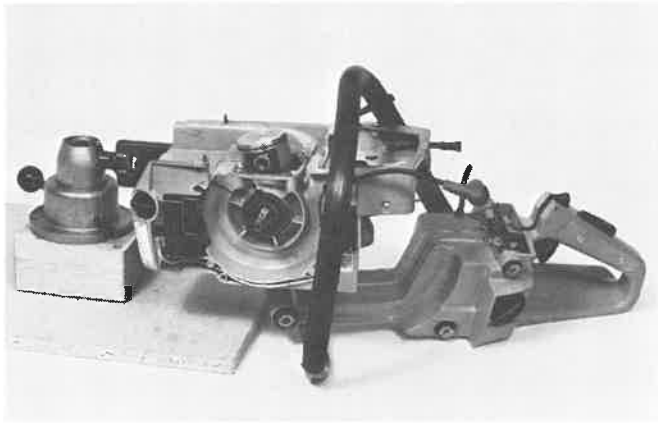


Fig 8:5

Separate the crankcase from the tank unit.

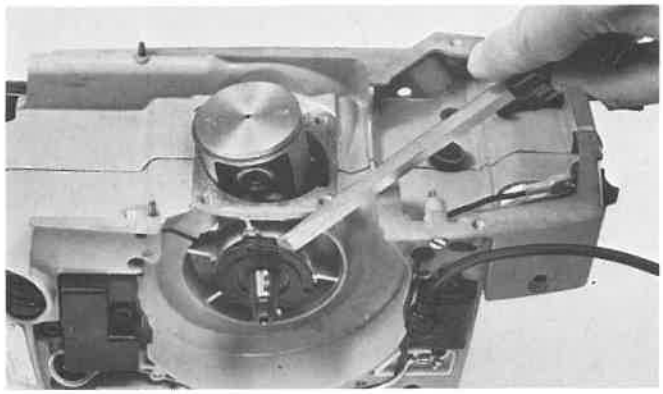


Fig 8:6

Remove the sealing ring retainer on the magneto side with a screw driver. Lift the oil hose and filter out of the oil tank.

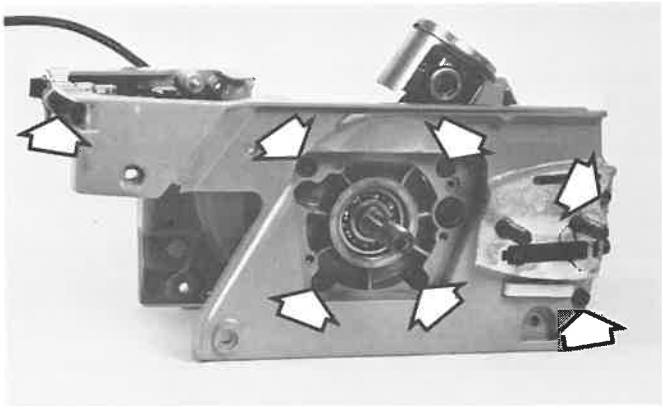


Fig 8:7

Remove the seven screws holding the crankcase halves together.

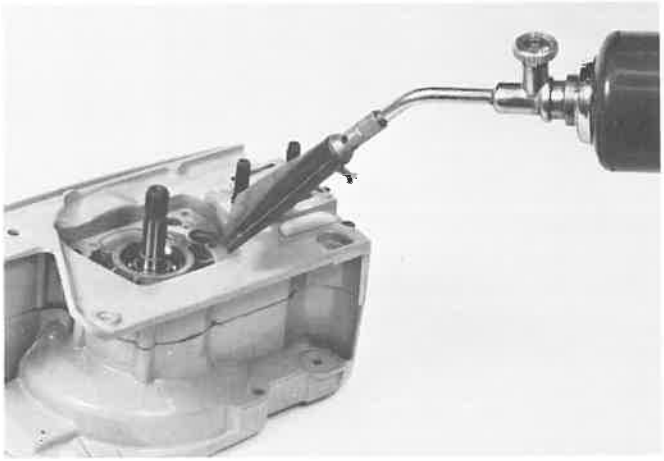


Fig 8:8

Warm up the bearing seats carefully with a gas burner, to abt 130° C. Warming up should be applied evenly to avoid thermal stress.

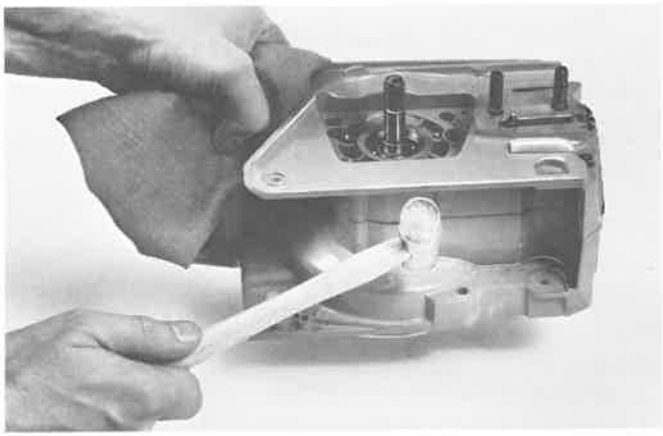


Fig 8:9

Separate the two crankcase halves by careful use of a plastic hammer.
Remove the ball bearings from the crankshaft with a ball bearing puller, eg No. 50 25 031-01.

Crankshaft check

A defective crankshaft must be replaced. Some crank webs may be blue coloured around the crankpin. This is, however, a normal result of the heat treatment around the crankpin hole. Check the big end of the connecting rod. Should there be seizure marks or discoloured spots on the sides, the crankshaft must be changed.

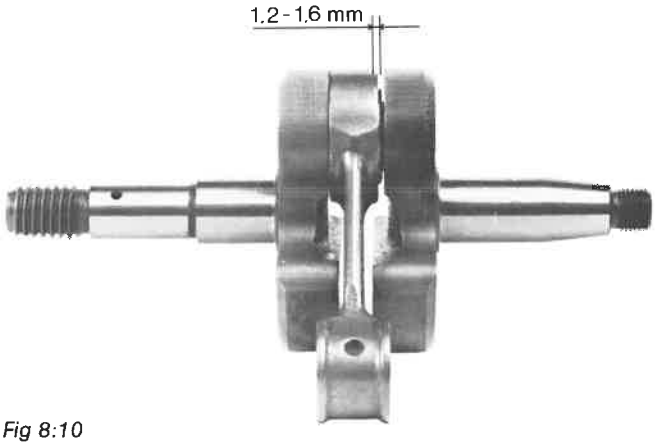


Fig 8:10

The connecting rod should not show any radial play (up and down). The axial play should, however, be 1.2 – 1.6 mm.

Assembling the crankcase

Fix the drive side of the crankcase in the clamping device. Warm up the bearing seats with a gas burner to abt 130° C.

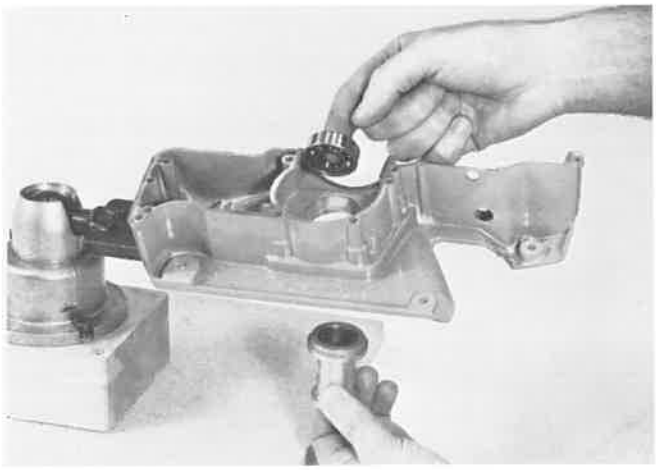


Fig 8:11

Fit the ball bearing in the seat and locate it properly with fitting tool No. 50 25 030-04. Leave the crankcase in the clamping device to cool down.

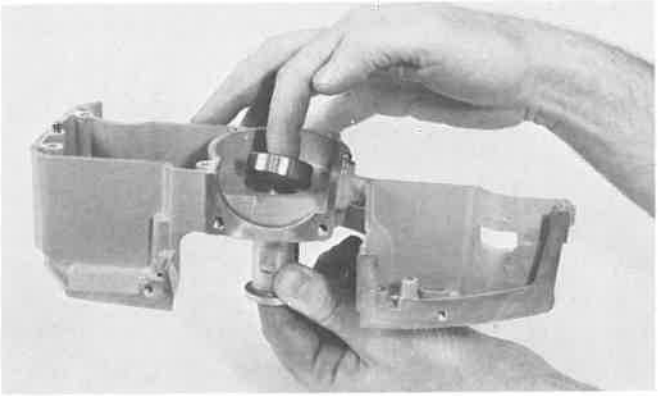


Fig 8:12

Fit the ball bearing in the magneto side of the crankcase as described above, but on the work bench. Let this part cool down, too.

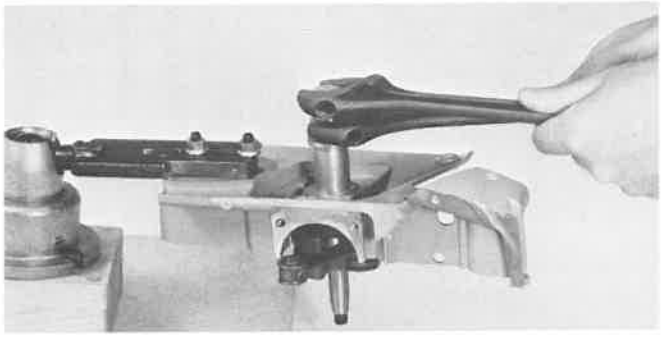


Fig 8:13

Grease the crankpins and fit the crankshaft, first in the drive side. Use fitting tool No. 50 25 030-04 to locate the crankshaft. Check that it reaches the bottom and that the connecting rod is properly located in the recess for the cylinder.

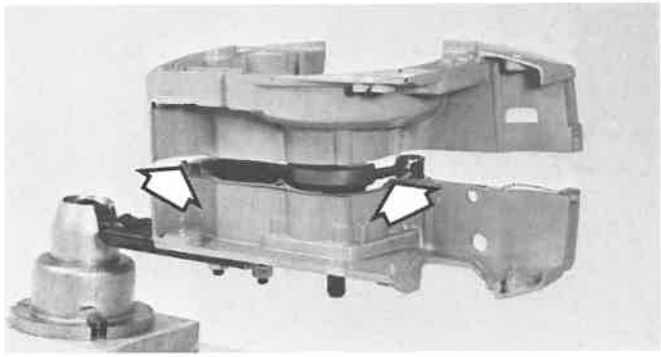


Fig 8:14

Turn the crankcase in the clamping device in order to get the crankshaft in an upright position. Grease the gasket face and fit a new gasket. Locate the magneto side of the crankcase ensuring that the gasket is not displaced.

Tighten the crankcase screws — but not completely.

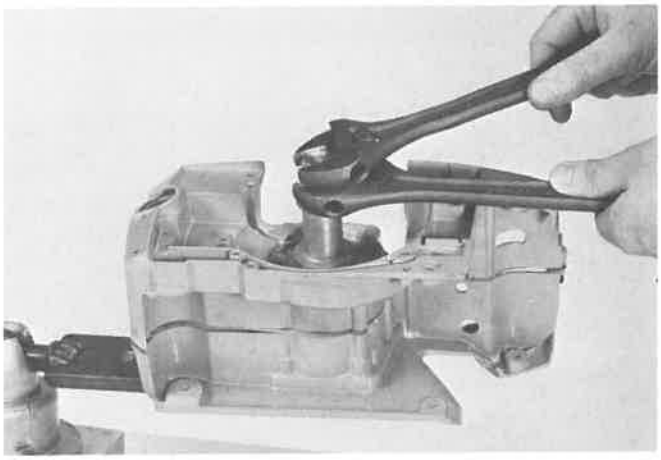


Fig 8:15

Pull the magneto side in position with fitting tool No. 50 25 030-04.
Check that the guide pins enter correctly (see fig 8:14).

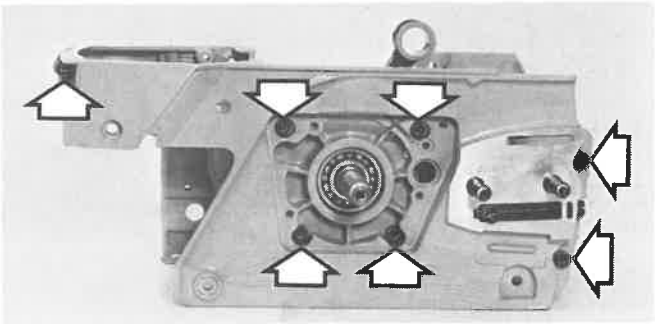


Fig 8:16

Tighten all screws, beginning nearest the crankshaft.
Check the position of the gasket and cut off its edges on the cylinder base surface.

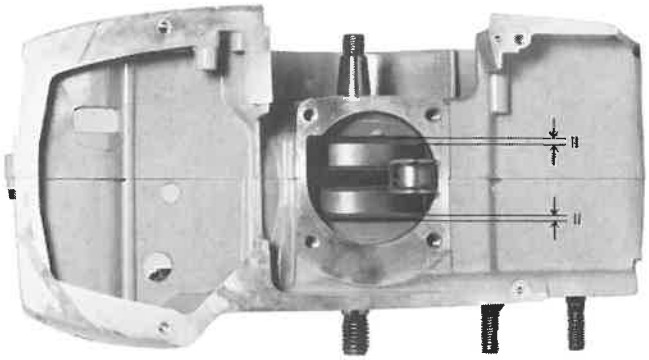


Fig 8:17

Check that the crankshaft rotates easily. If not, readjust it with the fitting tool.

The crankshaft must be properly centered in the crankcase!

Check the sealing ring on the magneto side for wear or damage (eg rubber cracked). Change if necessary.

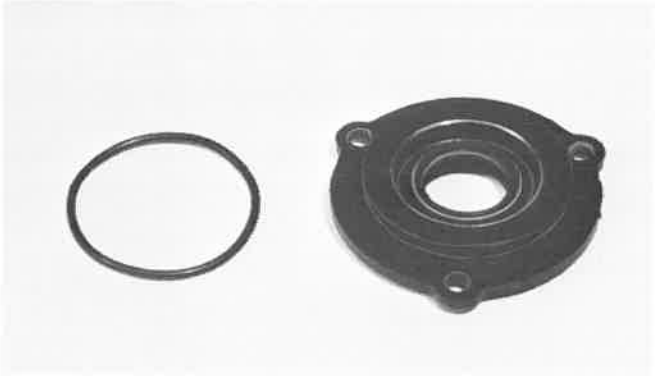


Fig 8:18

Always replace the O ring behind the magneto side main bearing seal holder. Grease it and fit the retainer in the crankcase. Apply Loctite AA on the screws. If the chain saw is provided with a generator, check the position of the cable.

Fit the oil pump (see chapter 6).

Pressure test the crankcase (see chapter 2).

Changing the vibration dampers

Check the vibration dampers before reassembling the tank unit and the crankcase. If they are limp or damaged they should be changed. Use U-spanner No. 50 25 066-01 for the front dampers and No. 50 25 067-01 for the rear dampers.

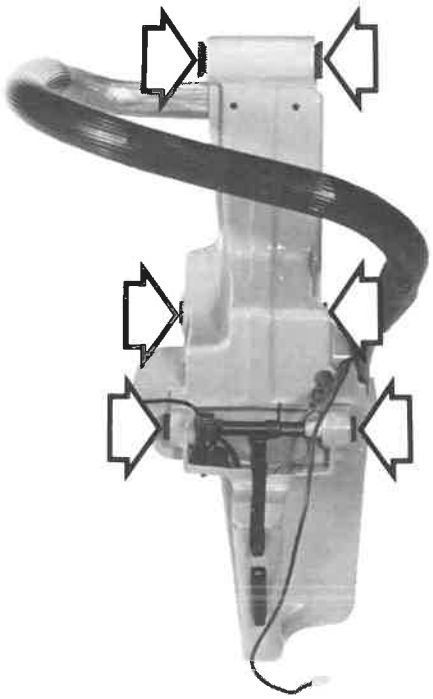


Fig 8:19

Assembly of crankcase — tank unit

Fit the rear part of the tank unit first, so that the cable from the front handle heating element may be pulled through the hole in the crankcase. Pull the cable from the heating switch through the same hole as the throttle lever and

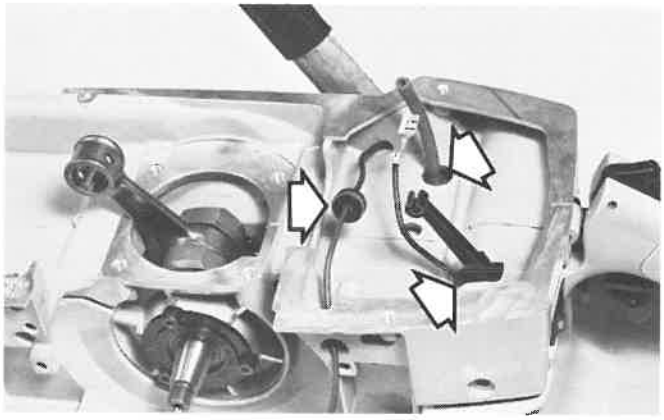


Fig 8:20

connect it to the left pin of the stop switch (seen from above, fig 8:3).

Adjust the front part of the tank unit and fit the vibration dampers. Pull the front handle cable through the rubber grommet and fit the grommet in the crankcase.

Starter

Removal 9:1
Assembly 9:1

Removal

Remove the screws that retain the starter. Set the return spring to zero by pulling out the starting cord by abt 30 cm, put it into the groove of the

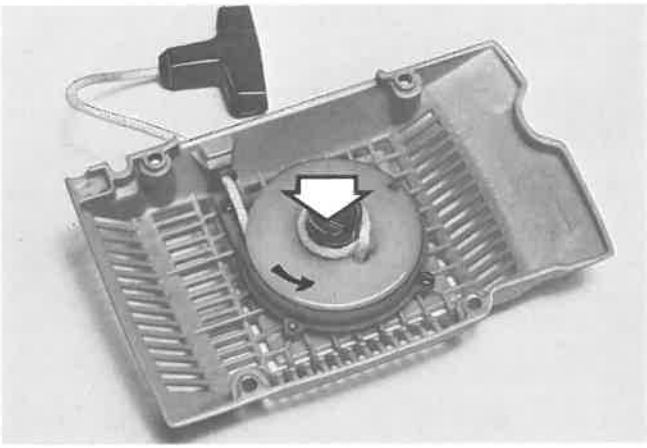


Fig 9:1

pulley rim and let the wheel turn slowly backwards (slow it down with your thumb). Loosen the screw and remove the washer in the centre of the pulley.

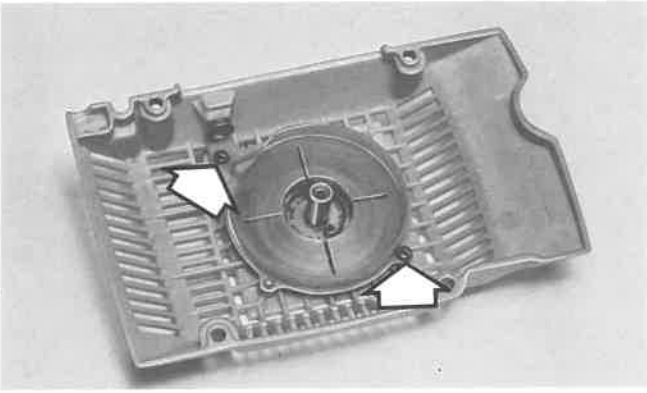


Fig 9:2

Lift off the pulley.
Remove the screws that retain the plastic cover over the return spring.
Remove the cover and the spring.

TIP

If the threads of the housing are damaged, you could squeeze the plastic pins together with a pair of warm flat hose pliers, and tighten the screws again.

NOTE!
It should be possible to turn the pulley a further 1/4 of a turn approx. with the cord pulled entirely out.

Assembly

Put the return spring, a new one if necessary, into the starter housing. Lubricate with a few drops of ordinary engine oil.

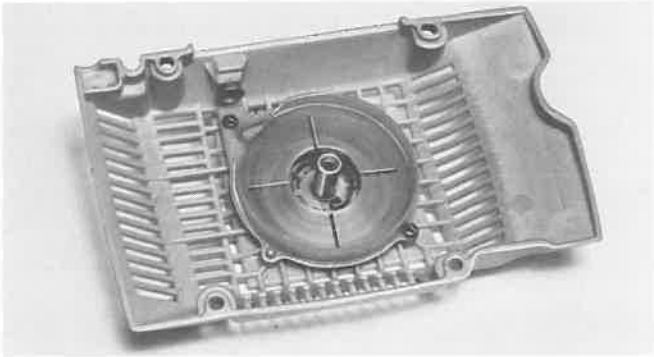


Fig 9:3

Put the plastic cover back and tighten the screws.

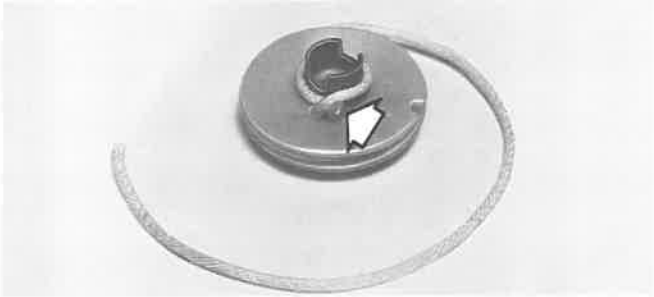


Fig 9:4

If necessary, exchange the starting cord and fit it on the pulley. Wind up the cord abt 3 turns on the pulley (Note! right direction) and put it in its place in the starter housing. Check that the spring grips the pulley, then fit the washer and the screw.

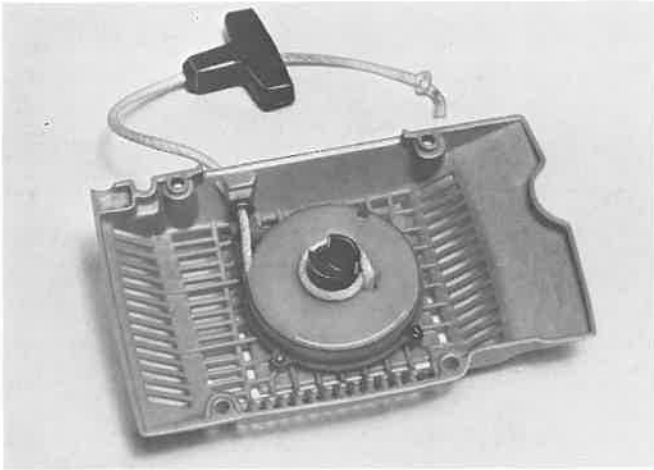


Fig 9:5

Pull the cord through the cord sleeve of the starter housing and through the starting handle. Make a knot in the cord and pull the knot completely into the handle. Put the cord into the groove of the pulley rim and tighten the spring enough to get 1/4 spare round. Fit the starter and check that no electrical cables are squeezed.

10

Centrifugal clutch

Removal 10:1
Changing the needle bearing 10:1
Changing the clutch spring 10:1
Changing the worm gear 10:2
Checking wear 10:2
Lubrication 10:2

Removal

Fit the piston stop No. 50 25 033-01 into the spark plug hole. Remove the clutch centre by means of combination tool No. 50 15 375-01. NOTE! Left-hand threads. Lift off clutch centre and clutch drum. Do not lose the washer placed behind the drum.

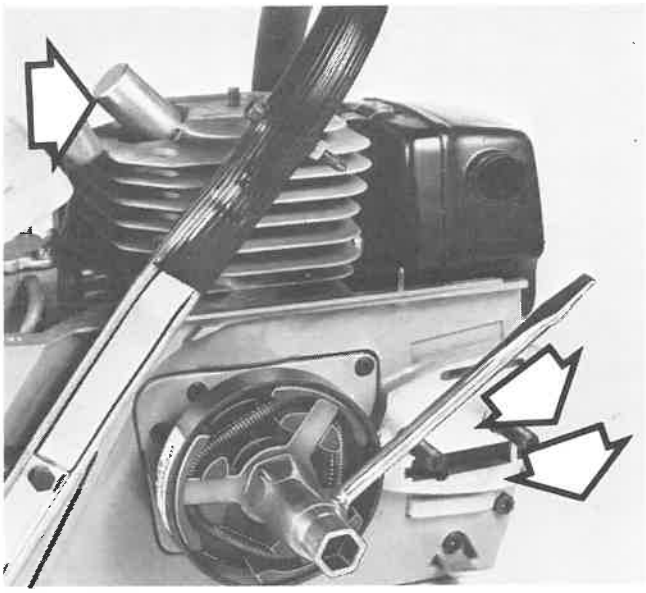


Fig 10:1

Changing the needle bearing

Lift off the worm gear of the oil pump drive and place the clutch drum, with the chain drive upwards, on a tube sleeve (eg No. 50 25 030-04) as close to the bearing as possible.

Fig 10:2

Push out the bearing with a suitable drift. The drift is to be centered by the inside diametre of the bearing (for instance use a rejected shaft). Use the drift to press a new bearing into the clutch drum. Check that the bearing is on a level with the drum hub.

Changing the clutch spring

The clutch spring should be exchanged if it has been overheated (blue coloured) or broken. It is easily exchanged with pliers No. 50 25 049-01 as shown in fig 10:3.

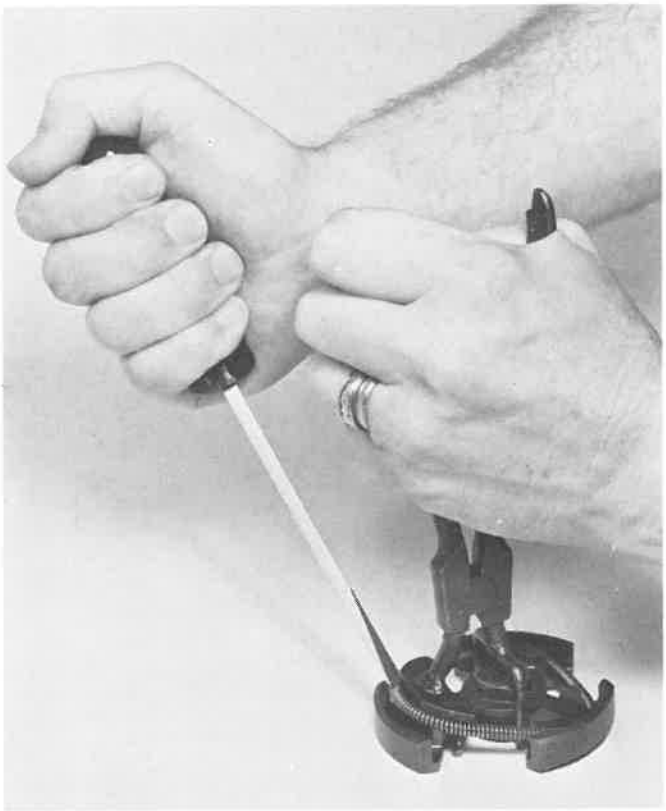


Fig 10:3

When fitting the new spring, check that its ends connect in the centre of a clutch shoe. Do not overstretch the spring!

Changing the worm gear

The worm gear of the oil pump drive is easily removed from the clutch drum. It has four dogs which fit into four corresponding grooves in the clutch drum.

Fig 10:4
When fitting a new gear, put it in the clutch drum and check that it fits exactly into the grooves of the drum. Then fit the drum with gear on to the crankshaft.

Do not forget the washer behind the worm gear!

Checking wear

Check the wear of the clutch centre and the clutch shoes. There should be a least 1 mm left on the friction surface of the shoes.

Fig 10:5
All the shoes have to be exchanged on the same occasion.

Lubrication

Lubricate the worm gear of the oil pump drive with Molykote before fitting the clutch drum. The needle bearing is to be lubricated with ball bearing grease. Two pumps with the grease gun into the hole of the clutch centre are sufficient.

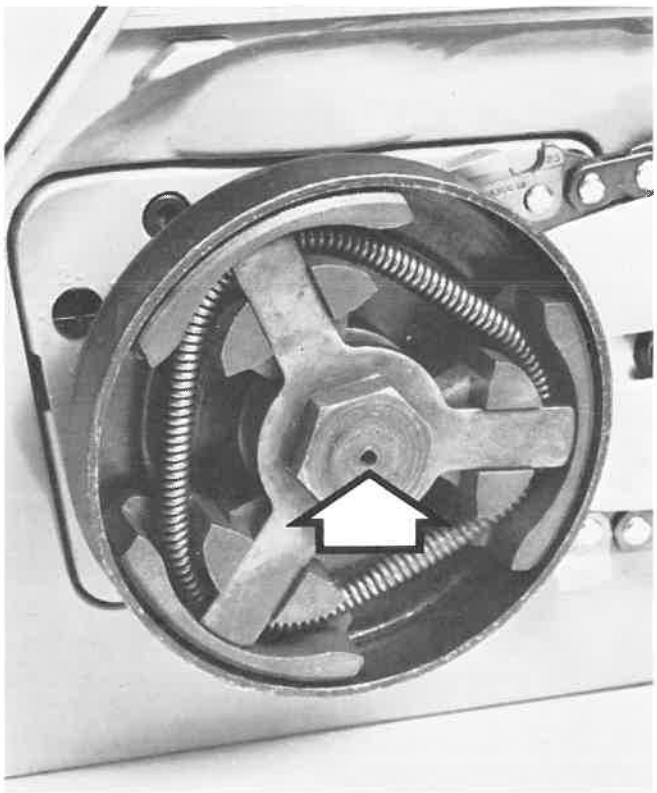


Fig 10:6

Safety equipment

A. Chain brake 11:1
Removal
Assembly
Adjustment of brake band
Adjustment of automatic chain brake actuator (Swed-O-Matic)
B. Changing throttle safety catch and throttle lever 11:4
C. Changing chain catcher 11:5

A. Chain brake

Removal

With the old model (No. 50 15 209-01) proceed as follows:

Remove the clutch cover and clean brake mechanism and brake band.

Fix the clutch cover in the clamping device No. 50 25 102-01 with two spare guide bar studs and nuts.

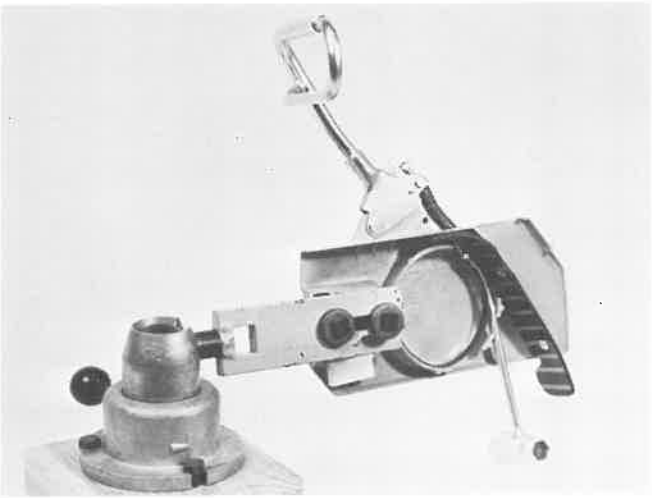


Fig 11:1

Push the brake band upwards (e.g. by inserting a combination key between the brake band and the two rear supports) in order to get at the adjusting nut (see fig. 11:1).

Remove the adjusting nut retaining the pull rod, and carefully release the brake mechanism with the hand guard.

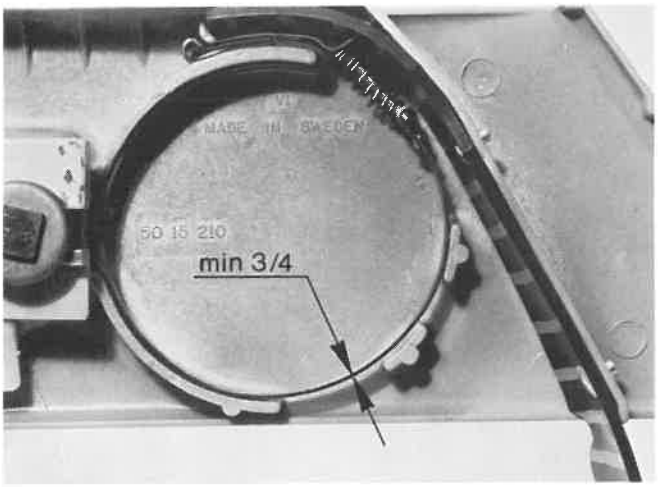


Fig 11:2

Remove brake spring and washer.

Check the band wear. The band should have at least 3/4 of its original thickness (1 mm) on its most worn part, otherwise it must be changed.

Dismantle the brake band as follows:

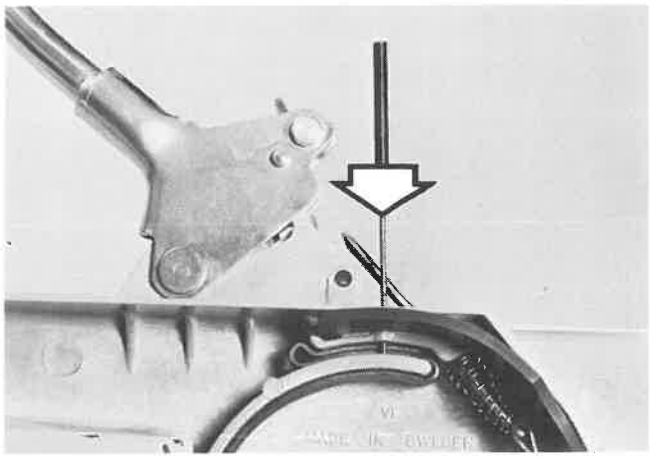


Fig 11:3

Use a drift Ø 1 mm to push out the roll pin that retains the brake band in the correct position.
The band with pull rod and spring may then be changed.

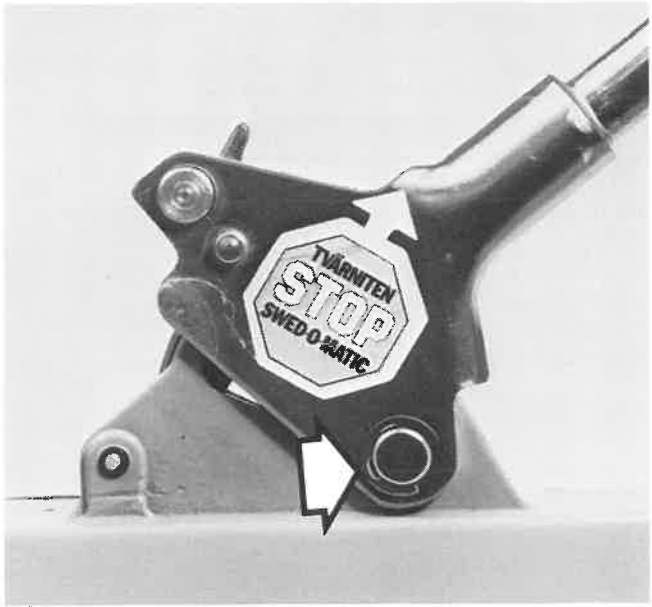


Fig 11:4

When replacing the hand guard, first remove the clip, then the pivot pin.

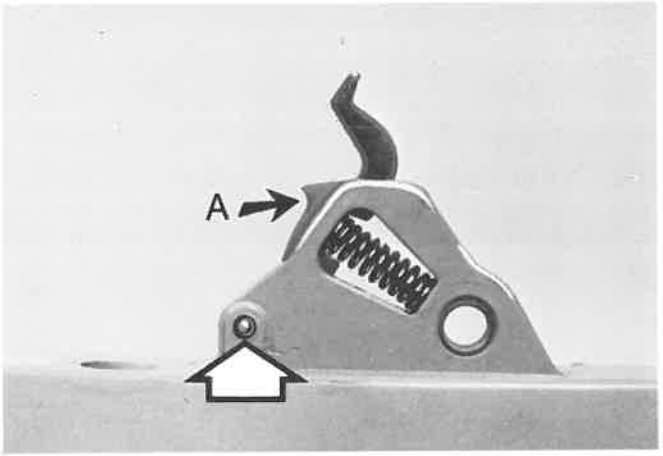


Fig 11:5

The catch may be removed after pushing out the roll pin functioning as a bearing. Use a drift Ø 4 mm.

Check the wear on the locking part of the catch (see A, fig. 11:5).

The catch spring is easily changed.

With the new Gun Action brake model (No. 50 15 360-01), proceed as follows:

Remove the clutch cover and clean brake mechanism and brake band.
Fix the brake in the clamping device (see fig. 11:1) and remove the Swed-o-Matic adjusting nut.
Release the brake.

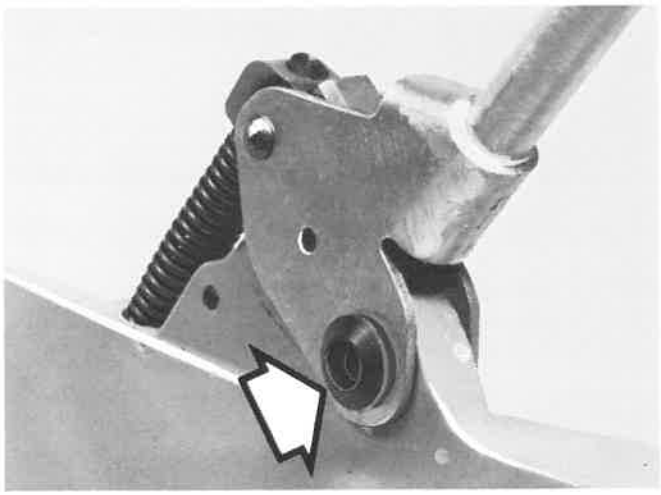
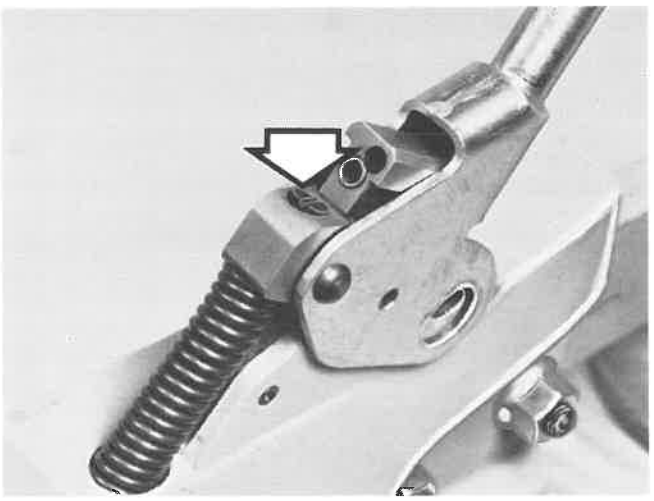


Fig 11:6

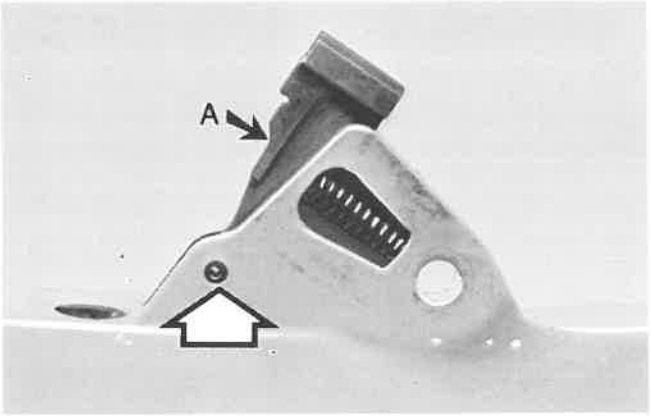
Remove the screw from the front support of the hand guard by means of Allen key No. 50 25 019-01. Remove the two sleeves with a screw driver.



11:7

Loosen the adjusting nut from the pull rod, and lift off the hand guard together with the nut. Remove spring and bushing from the clutch cover.

When dismantling brake band, safety catch and spring, see above instructions for the old chain brake model.



11:8

The catch may be changed after pushing out the roll pin with a drift Ø 4 mm.
Check the wear on the locking part of the catch (see A, Fig. 11:8).

Assembly

Both chain brake models are assembled in reverse order to dismantling.
Lubricate links and supports of the brake mechanism with twostroke oil before assembly.

Brake No. 50 15 360-01:

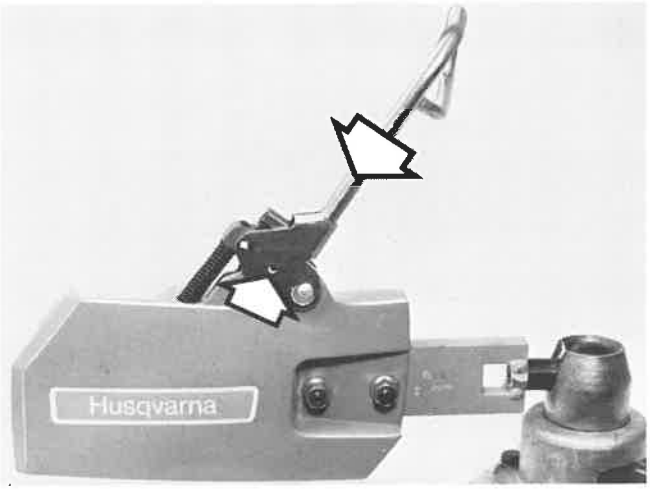


Fig 11:9

Before fitting the front sleeves, the hand guard must be locked (push it downwards).

The maintenance lubrication of the brake mechanism after reassembly is to be made through the two holes in the guide plates (see fig. 11:9).

Adjustment of brake band

Brake No. 50 15 209-01:
Make an initial adjustment utilising a spare clutch drum in the brake band.

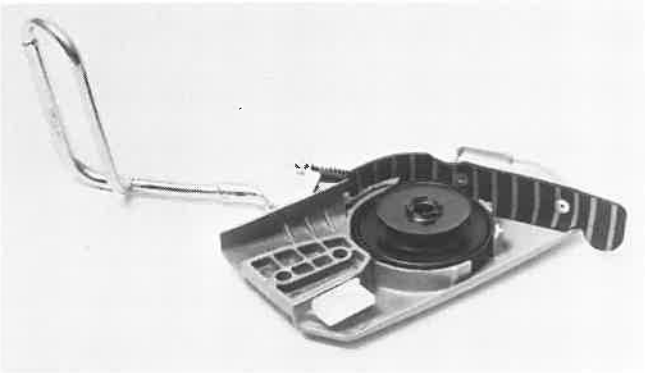


Fig 11:10

It should not be possible to rotate the drum when the brake is released, but in the unbraked position the drum should be easily rotated.

Fine adjustment is made with the clutch cover fitted on the saw. The gap between the catch and the head of the adjusting nut should be 4 mm when the brake is released (see fig. 11:11). Measure the gap with a calliper.

Note that in the unbraked position the brake band must not touch the clutch drum.

Release and lock the brake repeatedly to check that the mechanism works smoothly.

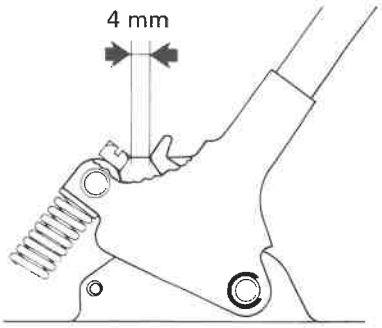


Fig 11:11

To check that the chain brake actuates correctly, proceed as follows:
Fit guide bar and chain.
Start the engine and let it idle.
Release the chain brake with the hand guard.
Operate the throttle trigger.
With a properly adjusted brake band the chain must not rotate as the engine accelerates.

Chain brake No. 50 15 360-01:

Make an initial adjustment utilising a spare clutch drum as described for chain brake 50 15 209-01. Fine adjustment is made with the clutch cover fitted on the saw. The gap between the catch and the release screw should be 8 mm when the brake is released (see fig. 11:12).
Measure the gap with a calliper.
Note that in the unbraked position the brake band must not touch the clutch drum.

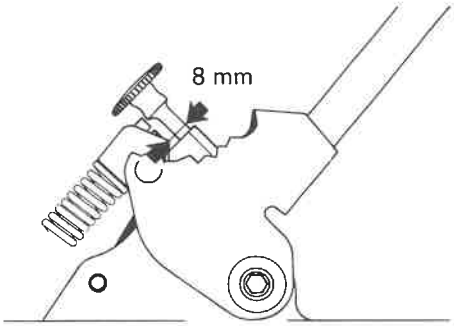


Fig 11:12

Release and lock the brake repeatedly to check that the mechanism works smoothly. Check the actuation of the chain brake as described for chain brake 50 15 209-01.

Adjustment of the Swed-O-Matic

Adjust the screw so that the brake actuates at a load of 10-15 kp (22 - 33 lb) on the guide bar nose. Check this e.g. by pushing the guide bar nose against a spring balance. The Swed-o-Matic should be adjusted so that it actuates too easily rather than not at all.

B. Changing the throttle safety catch and the throttle lever

Dismantle the tank unit as described in chapter 8, under the heading "Removal of crankcase".

Fig. 11:13

Remove the two upper rear vibration dampers with U-spanner No. 50 25 067-01. Remove the throttle lever shaft and the lever.

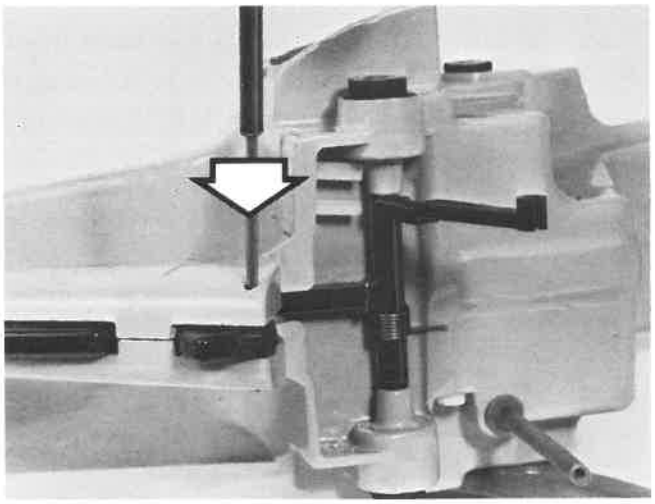


Fig 11:14

The safety catch is removed by pushing out the roll pin with a drift Ø 3 mm.

The safety catch can be removed and refitted without removing the throttle lever.

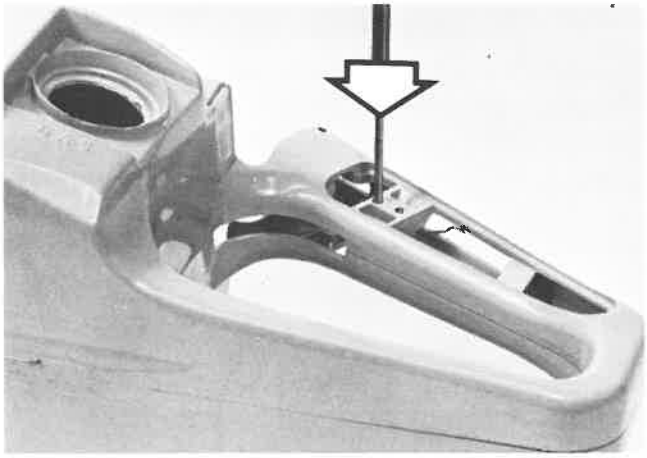


Fig 11:15

The safety catch spring may be removed after pushing out the roll pin with a drift Ø 3 mm.

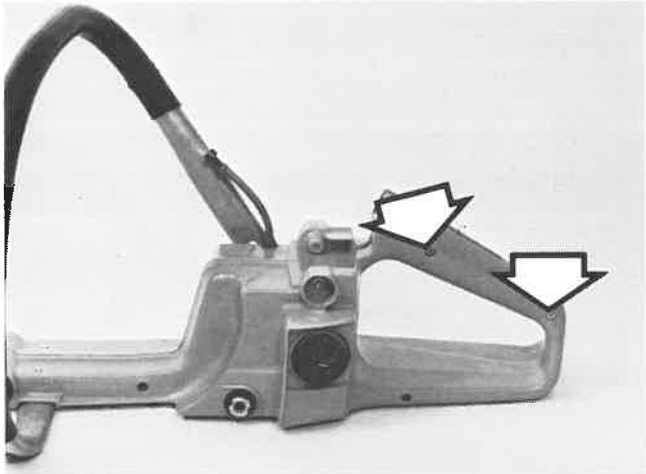


Fig 11:16

On model 61 the tank unit parts have to be separated before removing the spring. It is sufficient to loosen the two upper screws.

Reassembly is made in reverse order to dismantling.

Check that the spring enters the groove of the safety catch correctly and that the throttle lever works properly. The safety catch should be used both when starting the engine and when running the engine at a certain maximum speed.

C. Changing the chain catcher

Do not forget to check the chain catcher and change it when damaged.

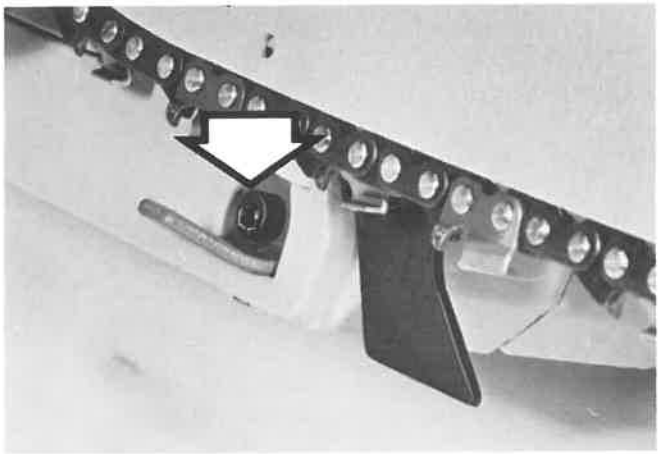


Fig 11:17

Remove the clutch cover. Use Allen key No. 50 25 018-01 to remove the screw retaining the chain catcher.

12

Optional Equipment Nordfeller

Working description 12:1
Pressure check 12:1
Leak check 12:2
Changing the teflon bushing 12:2
Grinding in the guide bushing 12:2
Grinding in the nonreturn valve 12:2
Leaking control valve 12:3
Trouble shooting guide 12:3

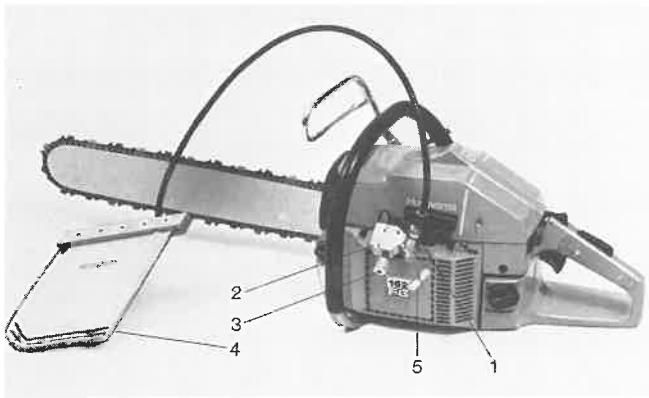


Fig 12:1

Working description

The felling cushion is connected to the combustion chamber of the engine via a hose, attached with a snap coupling (1) to the control valve (2). See fig 12:1.

When the control button (3) is pushed, the cushion (4) inflates. Apply full throttle in order to get maximum pressure. To deflate the cushion, pull out the button completely, then push it back again. The spring will automatically determine the neutral position.

NOTE!
Never unload the cushion by detaching the snap coupling!

When the felling cushion is not in use, put the ventilation plug (5) into the snap coupling to protect it from dirt.

If the felling cushion is not used regularly, the system should be ventilated several times a day. Otherwise, carbon deposits will accumulate and render it inoperative.

Ventilate the system as follows, with the engine running (see fig 12:1). Put the ventilation plug into the snap coupling, then push the button for 5—10 seconds.

Pressure check

To facilitate trouble shooting we can offer a pressure gauge, No. 50 25 117-01, to be connected to the snap coupling at the control valve (see fig 12:2). The pointer of the pressure gauge should indicate maximum pressure as long as the control button remains in neutral position. Should pressure decrease, the system is leaking.

Approx value, at load	*20 bar minimum*
Approx value, at free running	*15 bar minimum*

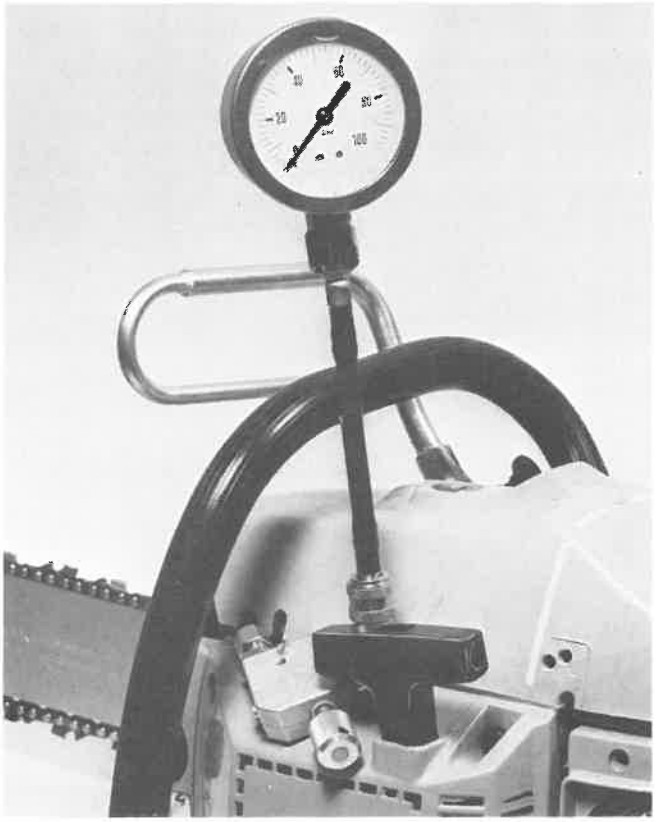


Fig 12:2

NOTE!
The above values refer to new valve components. Otherwise, pressure should be at least 10% higher.

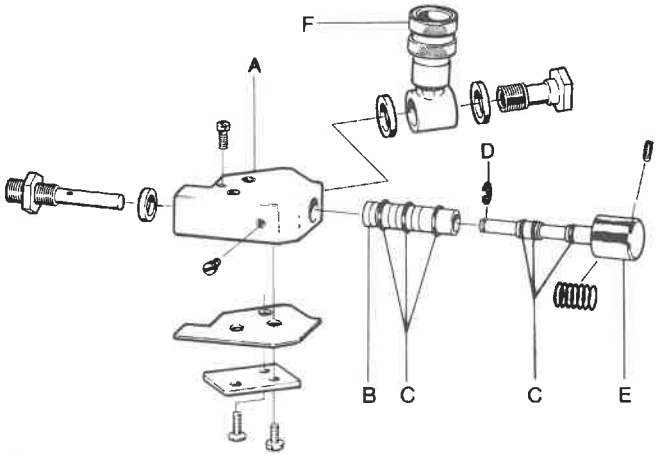


Fig 12:3

A. Valve housing
B. Teflon bushing
C. O-rings
D. Clip
E. Control button
F. Snap coupling

Leak check

In case of insufficient pressure in the cushion, first adjust the carburettor so that the engine responds to quick acceleration. Then check for leakage as follows (engine cold): Apply soapy water at connections and the valve housing. Pull the starting handle and rotate the engine. Where bubbles occure, a leak is indicated.

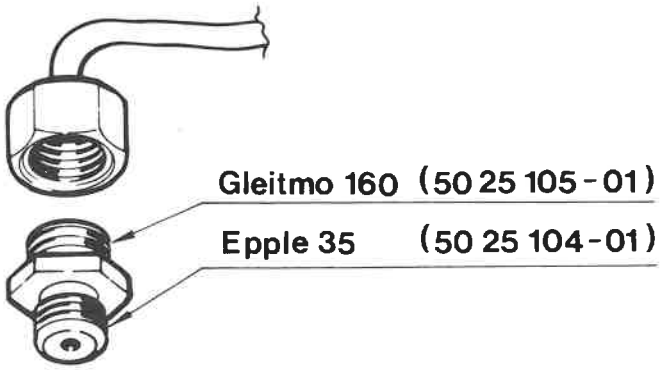


Fig 12:4

To avoid leakage between nonreturn valve housing and cylinder, apply a sealing compound at the valve housing before assembly. The compound hardens and seals as soon as it gets warm. It is called Epple 35 and has ref No. 50 25 104-01.
The threads of the tube nut at the pipe connection should be sealed as well, in order to prevent leakage and to keep the nut free from oxide. We recommend the hot-screw-compound Gleitmo 160 (ref No. 50 25 105-01).

Changing the teflon bushing

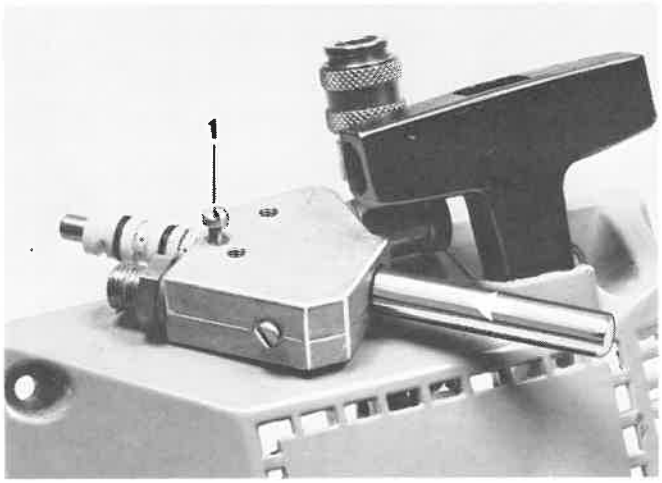


Fig 12:5

Remove the control button and the screw (1) retaining the bushing. Push the bushing out of the valve housing with a suitable drift (No. 50 25 116-01). Fit a new bushing and new O-rings. Lubricate richly with motor oil!

Grinding in the guide bushing

Remove the pipe from the cylinder (use a 17 mm key, No. 50 25 118-01).

> *NOTE!*
> *Should the valve housing in the cylinder also loosen when the pipe is to be disconnected, you will have to remove the front handle and the silencer before removing the pipe. Note that a sealing compound (Epple 35) has to be applied at the threads when fitting the valve housing in the cylinder.*

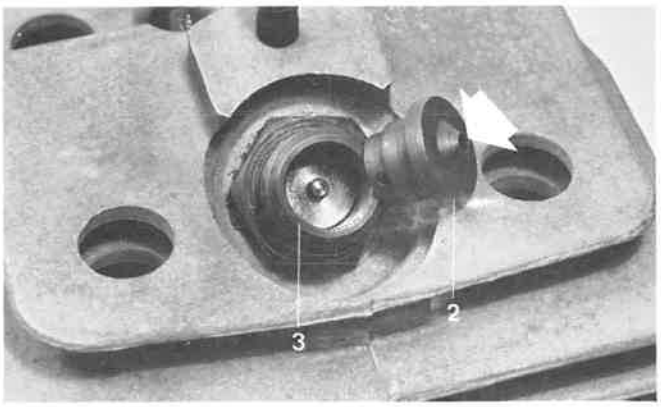


Fig 12:6

Lift off the guide bushing (2) and apply some grinding coumpound on its seat against the valve housing (3). Grind in the guide bushing and clean it carefully before reassembly. When fitting the pipe, check that its swaging fits exactly on the tapered end of the guide bushing (see arrow).

Grinding in the nonreturn valve

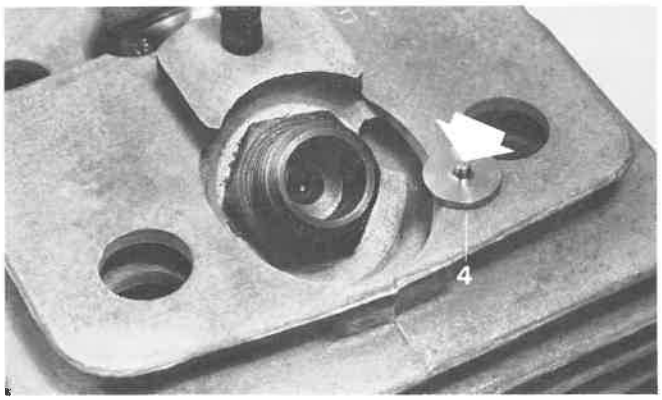


Fig 12:7

Remove pipe and guide bushing. Lift off the nonreturn valve (4) and clean off the carbon. Check the wear of its seat against the valve housing. If the wear is uneven, the seat has to be ground. Use a suitable drift (eg an oil pump piston from model 240) and fix a piece of abrasive cloth to its end. Grind the seat very carefully.

The washer of the nonreturn valve may also be ground with a fine, oiled, abrasive cloth. In this case, you will first have to grind the irregular surface (see arrow, fig 12:7). Clean all the components and assemble them. The nonreturn valve and the guide bushing have to be changed if the result of the grinding is not satisfactory.

Control valve leaking

A leak at the control valve may be caused by loose or otherwise defective O-rings on the spindle of the control button. Remove the clip and pull the control button out of the valve housing (see fig 12:8). Clean it with brush No. 50 19 042-01. Grease the spindle and fit new O-rings, if necessary. Tighten the screw retaining the snap coupling and check the pipe connection to the valve housing.

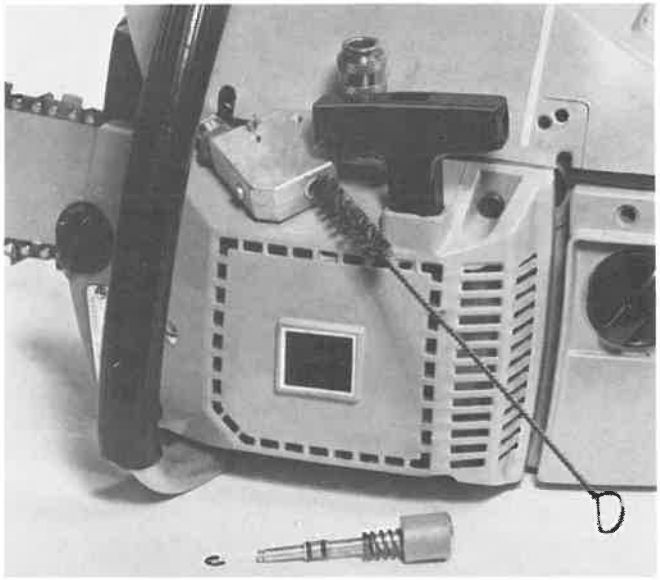


Fig 12:8

IMPORTANT

Mix the petrol with 2% Husqvarna Twostroke Oil to prevent carbon deposits at the nonreturn valve.

TIP

Pour 1–2 cl of carburettor spirit in the cushion to prevent condensation water from freezing.

Trouble shooting guide

PROBLEM	*DAMAGE*	*REMEDY*
1. Bad idling	*a) Leaking washer at nonreturn valve* *b) Leaking control valve and connections*	*a) Grind in the nonreturn valve and its seat* *b) Locate the leak with soapy water*
2. Low pressure	*See 1a), 1b)* *c) Piston ring defective* *d) Leaking felling cushion* *e) Carbon deposits at nonreturn valve and pipe*	*See 1a), 1b)* *c) Change piston ring* *d) Tighten all screws and check cushion* *e) Clean*
3. Slow inflation of cushion	*a) Carbon deposits at nonreturn valve and pipe* *b) Teflon bushing defective*	*a) Clean* *b) Change bushing*
4. Leak at nonreturn valve	*a) Cylinder threads defective* *b) No sealing compound between valve housing and cylinder* *c) Surface between guide bushing and nonreturn valve housing defective* *d) The tapered end of the pipe badly centered* *e) Loose nut*	*a) Change cylinder* *b) Apply Epple 35 at nonreturn valve threads* *c) Grind with grinding compound, eg carborundum paste.* *d) Remove the pipe and center the tapered end* *e) Tighten nut*
5. Leak at control valve	*a) O-rings on spindle defective* *b) O-rings on bushing defective* *c) Teflon bushing worn*	*a) Change O-rings* *b) Change O-rings* *c) Change bushing*
6. Snap coupling seized	*a) Dirt in coupling* *b) Coupling defective*	*a) Clean* *b) Change coupling*