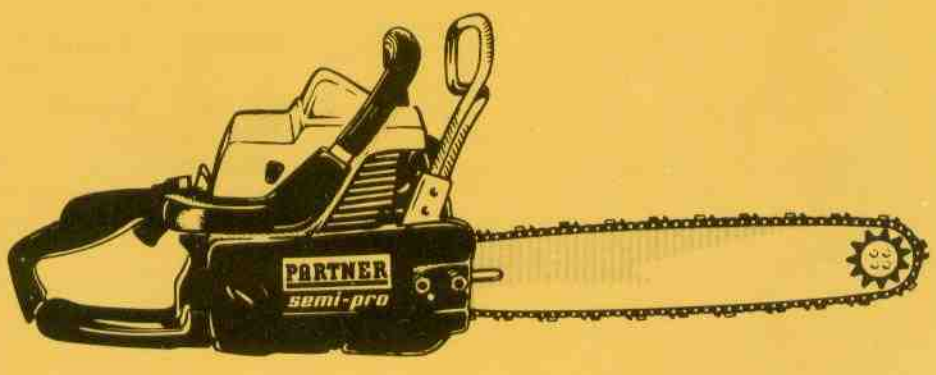
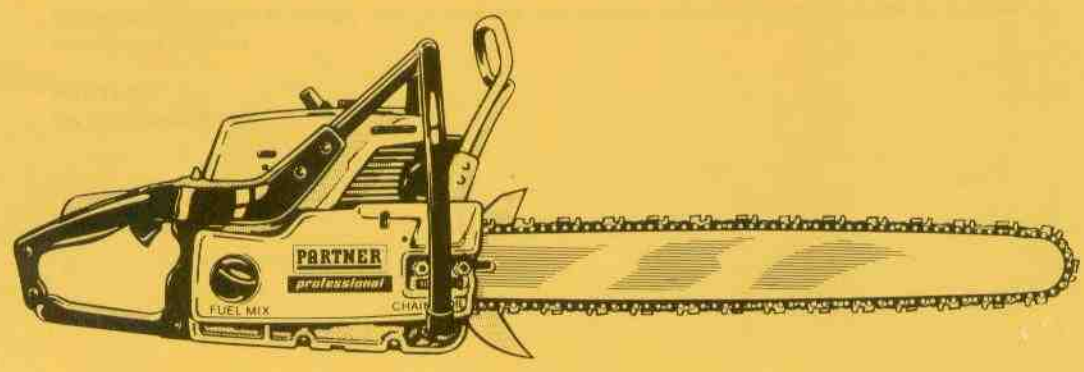
PARTNER®

SERVICE MANUAL FOR CHAIN SAWS





CONTENTS

Foreword

This Service Manual applies to PARTNER Semi-pro and professional saw models with engine capacity 55, 65, 70 and 100 c.c.
We are convinced that you will find these models very easy to work with. Certain instructions assume, however, that you have the necessary special tools and since it is in your interest to have repair work carried out thoroughly, we recommend you to study the instructions in this publication and follow them carefully.
We reserve the right to modify design and, for this reason, instructions in this book cannot be considered binding.

PARTNER
Service Department

TECHNICAL DATA

Engine				
Two-stroke (air-cooled)				
Capacity	55 cc (3.36 cu.in.)	65 cc (3.97 cu.in.)	70 cc (4.27 cu.in.)	100 cc (6.1 cu.in.)
Bore	44 mm (1.73″)	48 mm (1.89″)	50 mm (1.96″)	56 mm (2.20″)
Stroke	36 mm (1.42″)	36 mm (1.42″)	36 mm (1.42″)	40 mm (1.575″)
Compression ratio	9:1	9:1	9:1	9.7:1
Oil mixture ratio in fuel				
with two-stroke oil	1:25 (4 %)	1:25 (4 %)	1:25 (4 %)	1:25 (4 %)
with PARTNER oil	1:50 (2 %)	1:50 (2 %)	1:50 (2 %)	1:50 (2 %)
Ignition system				
Spark plug	Bosch WS 5 E or Champion CJ6	Bosch WS 5 E or Champion CJ6	Bosch WS 5 E or Champion CJ6	Bosch WS 5 F or Champion CJ6 Y
Electrode spark gap	0.5 mm(.020″)	0.5 mm (.020″)	0.5 mm (.020″)	0.5 mm (.020″)
Fuel system				
Tank capacity	0.75 litre (1.32 Imp. pints – 1.585 US pints)	0.75 litre (1.32 Imp. pints – 1.585 US pints)	0.75 litre (1.32 Imp. pints– 1.585 US pints)	1.0 litre (1.76 Imp. pints – 2.12 US pints)
Carburetor diaphragm	Walbro WS-18	Walbro WS-18	Walbro WS-18	Tillotson HS-172 B
Clutch				
Type	Centrifugal clutch	Centrifugal clutch	Centrifugal clutch	Centrifugal clutch
Clutch engages at	3.150 r.p.m.	3.150 r.p.m.	3.150 r.p.m.	3.100 r.p.m.
Saw chain				
Type	PARTNER Super-Chisel	PARTNER Super-Chisel	PARTNER Super-Chisel	PARTNER Super Chisel
Pitch	3/8″ (9.52 mm)	3/8″ (9.52 mm)	3/8″ (9.52 mm)	0.404″ (10.25 mm) alt. 3/8″ (9.52 mm)
Drive link thickness	1.5 mm (.060″)	1.5 mm (.060″)	1.5 mm (.060″)	1.5 mm (.060″)
Chain guide (bar)				
Slot width	1.5 mm (.060″)	1.5 mm (.060″)	1.5 mm (.060″)	1.5 mm (.060″)
Length	13″, 15″, 18″	15″, 18″, 22″	18″, 22″, 24″	22″, 26″, 30″, 36″
Chain lubrication				
Oil tank capacity	0.35 litre (0.617 Imp. pints – 0.741 US pints)	0.35 litre (0.617 Imp. pints – 0.741 US pints)	0.35 litre (0.617 Imp. pints– 0.741 US pints)	0.53 litre (0.935 Imp. pints – 1.092 US pints)
Oil pump				
Fully automatic	Not adjustable	Not adjustable	Adjustable between 5–15 cc/min	Adjustable between 8 – 20 cc/min

GROUP A

CHAIN BRAKE

Check the function of the chai brake every day. Also check wear on the brake band and mechanism once a week when the saw is in regular use.

The chain brake 505 303832 which can be used on all 55–70 cc saws differs from chain brake 505 303811 earlier used on these saws.

Chain brake 505 303828 is suitable for P100 Super and also for older models, type R30, R35, R40T, R435, R440T, P85 and P100. Once condition, however, is that clutch 505 303261 is fitted (see Service Bulletin A/43).

The older clutch with facing 505 303214 had a larger clutch drum. This means that there is not enough room for the brake band round the clutch drum if this clutch drum is used.

Function

The mechanism consists of an actuating plate (1) which is loosely carried in the actuating bar (2). The actuating bar has two rivets (3 and 4) which are used partly to keep the bar together and partly to tension and release the mechanism. The actuating plate is retained in its tensioned position by the tubular pin 505 206088 (5) and 505 206439 (6). The spring is always in contact with the actuating plate and presses it forwards. In the front, right-hand corner of the plate there is a recess (a). When the brake is applied, the plate is located in such a way that this recess rests against the front tubular pin (5). The force of the spring is not enough to press the plate out past the tubular pin (5).

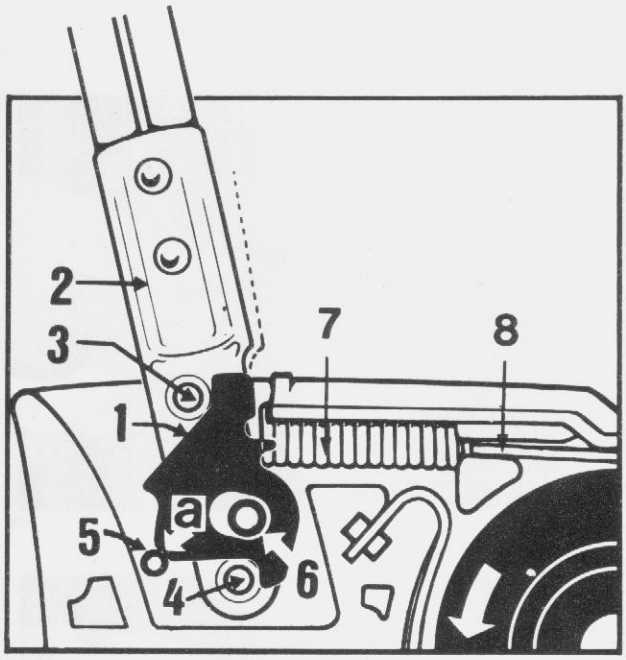


Fig. 1

The brake is actuated

When the actuating bar moves forward, the lower rivet on the bar touches the actuating plate and forces the plate past the tubular pin (5). The actuating plate can now move freely forwards and no longer keeps the spring pressed back. Then the spring applies the brake band round the drum. The chain stops.

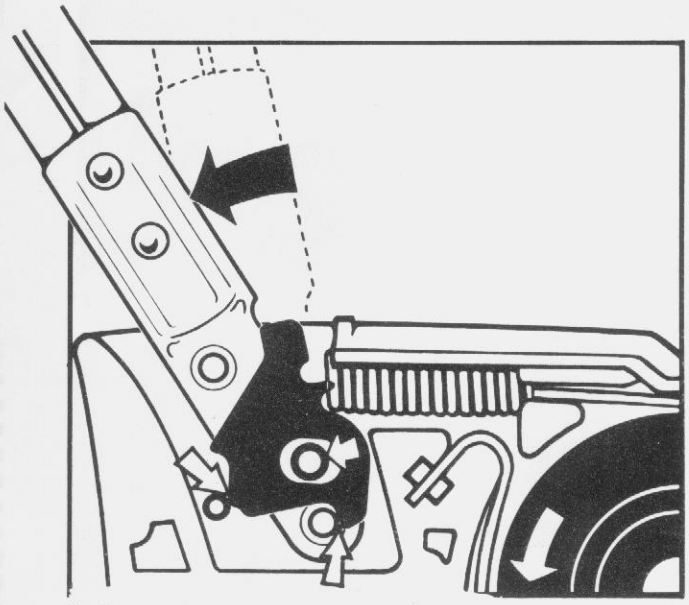


Fig. 2

The brake is tensioned

When the actuating bar (2) is moved rearwards (towards the front handle) the upper actuating bar rivet (3) contacts the actuating plate and, as it moves, it turns the actuating plate backwards until the recess in the plate (a) reaches a position against the tubular pin (5). At the same time, the brake spring and brake band are pressed back and the clutch drum is released.

The function of the actuating plate is made possible by the plate being carried very loosely round the tubular pin 505 206439 (6).

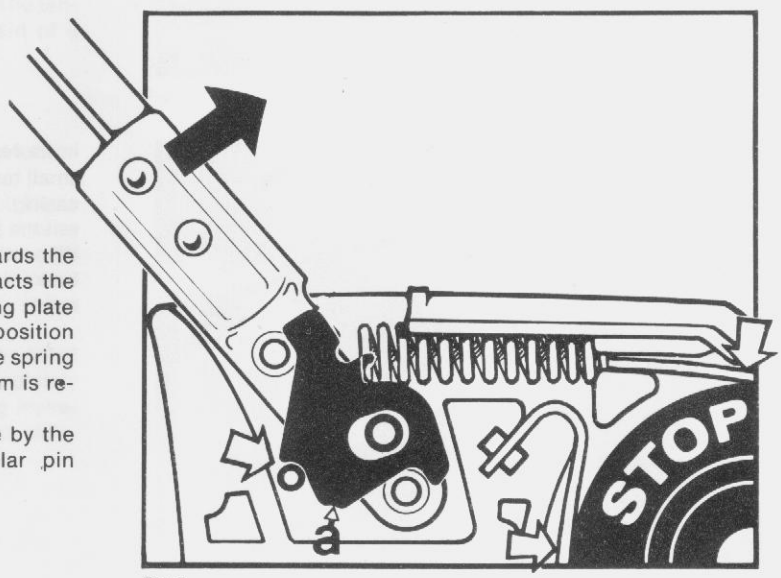


Fig. 3

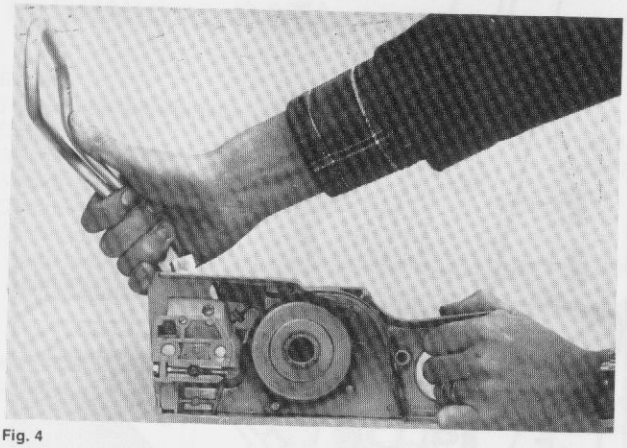


Fig. 4

Disassembling

The following tools are suitable for use when carrying out repair work on the brake;
1 clutch drum
1 drift, diam. 3.5 mm
1 drift, diam. 7 mm
1 large screwdriver
1 hammer

First move the brake actuating bar rearwards so as to tension the mechanism. Then insert the clutch drum. It is essential for the brake band to be kept pressed backwards when the mechanism is removed. That is why the clutch drum is fitted. Then actuate the brake mechanism by moving the bar forwards.
It is extremely important for the brake mechanism to be actuated at this stage otherwise there is great difficulty in removing the mechanism later.
Actuate the brake mechanism by moving the bar forwards.

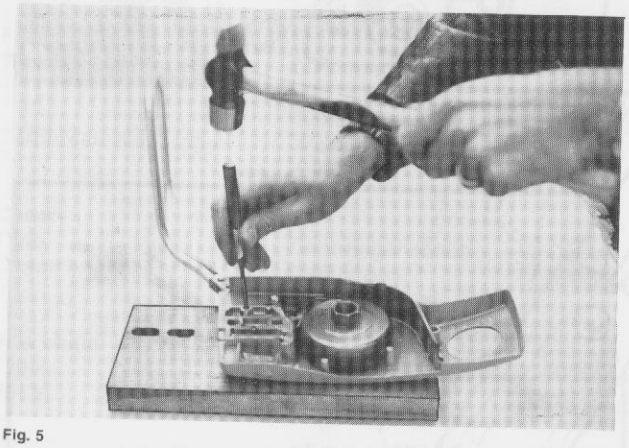


Fig. 5

Knock out tensioning pin 505 206439 with the aid of the large drift.
Then knock out tensioning pin 505 206088 with the aid of the small drift.
The actuating bar, the actuating plate and the spacer can now be lifted straight up of the clutch casing.

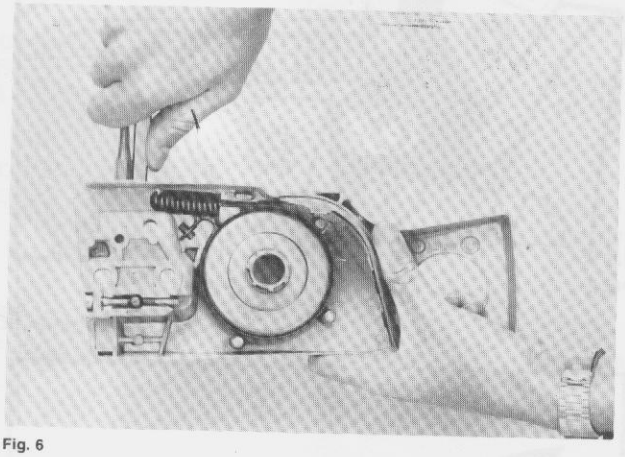


Fig. 6

The clutch drum must now be removed. Use a screwdriver and a drift. The drift in the picture is merely to provide the right angle for the screwdriver so that pressure is exerted against the brake spring at the correct angle. In principle anything can be used which fits into the space. It is important for the brake spring to be pressed straight rearwards. If only a screwdriver is used or some other narrow object, the spring will be pressed downwards instead of straight rearwards and will then lock in position.
Hold the clutch housing upside down and press back the spring. The clutch drum will then loosen and fall out.

Fig. 7

In its rear position the brake band is secured by means of a small tensioning pin which is pressed in position in the clutch casing. Turn the casing, as shown in the picture, and knock out the pin.
When the rear section of the brake band has loosened, the brake band and brake spring can be forced up out of their recess.

In connection with fitting, the brake spring must be screwed as far as possible on the brake band and, as shown in the picture, the end of the spring must stop against the wider section of the brake band.
When the brake spring is correctly screwed on, the brake band will project to some extent. If the brake spring is not completely screwed on, the spring will project further than the band. This makes it more difficult to fit the mechanism due to the lack of space.

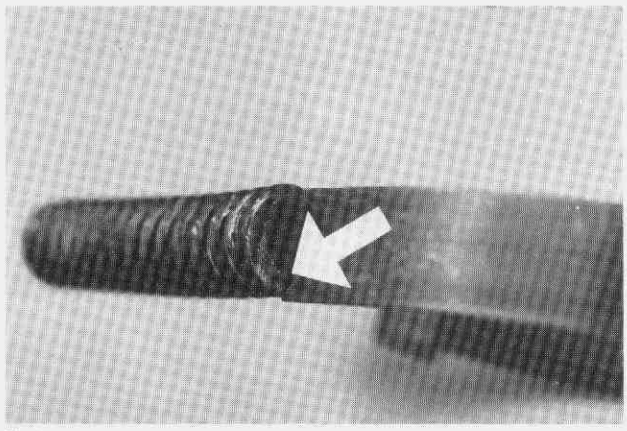


Fig. 8

Assembling
The brake band with brake spring can now be fitted. Start by inserting the brake spring in its recess.
Then use a drift to knock the brake band into its rear attachment. Do not forget the small tensioning pin which is to be inserted through the hole in the brake band.
Then once again tension the brake spring and fit the clutch drum.

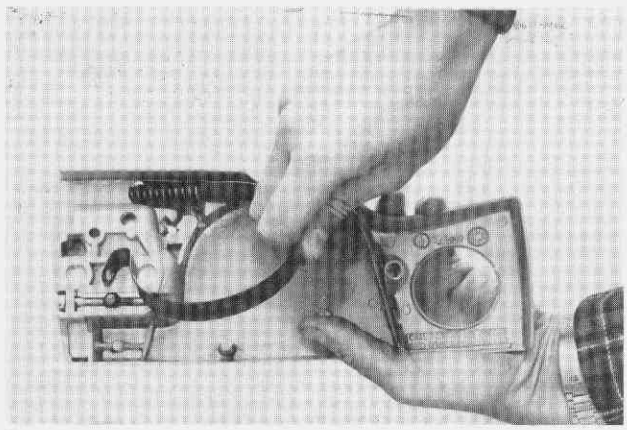


Fig. 9

Assemble the washer spring, spacer and actuating plate with the actuating bar. The washer spring must be located between the actuating bar and the spacer with the convex surface facing the spacer.
The spacer has two functions. One is to hold the actuating bar in its proper position when the brake has been tensioned and the other is to provide wear protection for the brake spring so that it does not exert wear on the clutch housing.

Centre the four parts: spacer, washer spring, actuating plate and actuating bar with the centering pin 505 381927. Fit the actuating bar into the cover. Slope it slightly backwards to start with and then press down the whole way.
Fit the tensioning pin with its joint pointing forwards. The tensioning pin can easily be knocked down with the aid of a hammer.

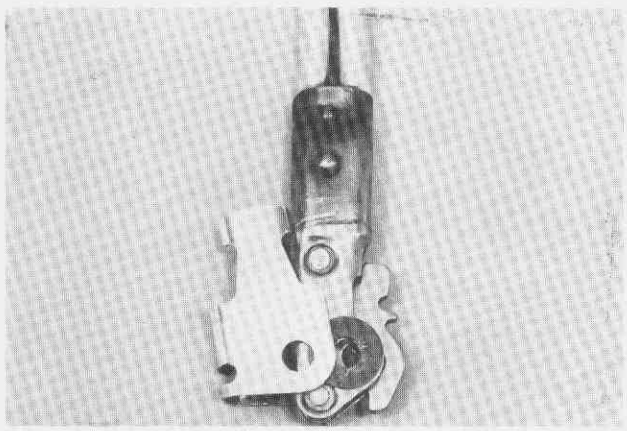


Fig. 10

Check that the actuating plate does not block the travel for the small tensioning pin. Knock in the tensioning pin.
It is absolutely vital for the small tensioning pin–which has a marked opening–to be fitted with the opening forward in relation to the actuating plate. If the actuating pin is fitted wrongly with its opening facing the actuating plate, this opening can engage in the plate. The result will be that the plate either cannot be tensioned or cannot be actuated.
For this reason the small tensioning pin must **always** be fitted with its opening facing forwards. The brake is now completely assembled. Carry out several tensioning and actuating movements in order to check that the mechanism functions satisfactorily.

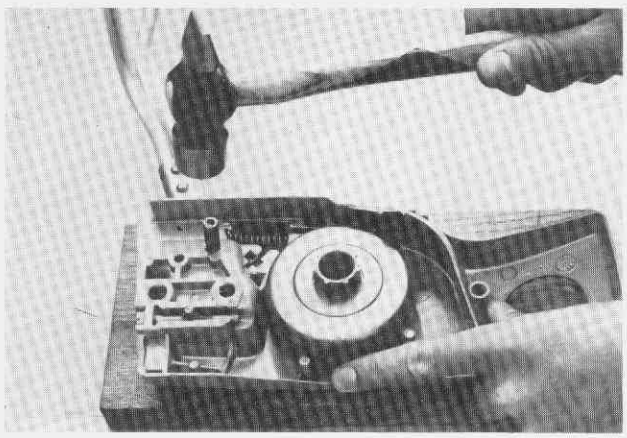


Fig. 11

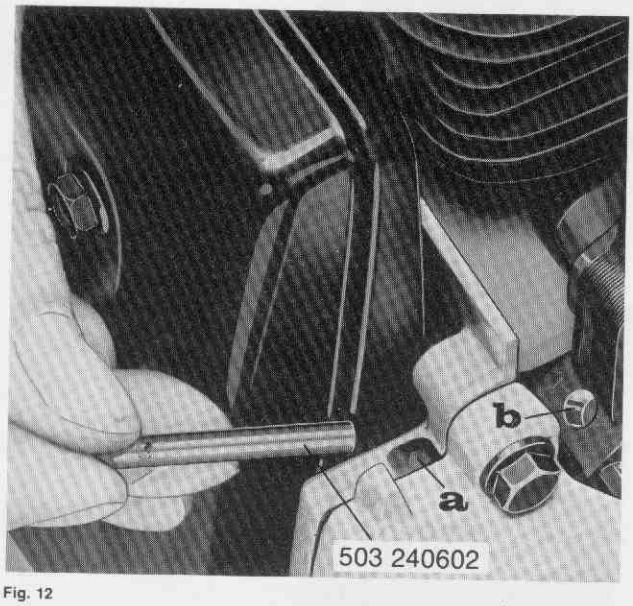


Fig. 12

Fig. 13

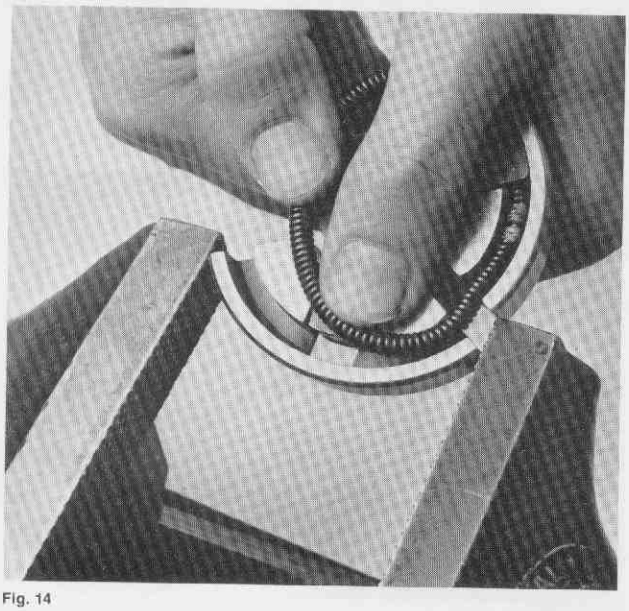


Fig. 14

CLUTCH

The clutch is of the centrifugal type. It consists of three shoes which are held together by a tension spring.
At engine speeds below 3000 rpm, the clutch shoes are held in position against the clutch centre by the tension spring. When engine speed exceeds 3000 rpm, centrifugal force exceeds the spring tension retaining the shoes which then come into contact with the clutch drum and rotate it. The clutch drum and sprocket are carried in needle bearings on the crankshaft. The needle bearing assembly is automatically lubricated from the crankcase through a drilling in the crankshaft through which the oil in the fuel can reach the bearing. The Semi-pro models have not got automatic lubrication.

Removing

Loosen the top casing. Bend up the front part of the fan casing shim and insert the steel pin included in the tool kit in the hole (a) on the left-hand half of the crankcase. Turn the flywheel with the help of the starter cord until the steel pin can be pressed into the hole (b) in the flywheel. The crankshaft is then locked and the clutch can be loosened (turn clockwise) by using socket wrench 505 381306.
NOTE. Never start a chain saw without first fitting the chain, chain guide (bar) and clutch.

Disassembling

1. Clamp one of the clutch shoes in a vice. Spread the clutch so far that the spring can be forced out. Use a screw driver or a similar tool to press out the spring.
2. Clamp one of the two remaining shoes in the vice and spread them in the same way as mentioned above so that the spring can be worked out of the slot by hand.
3. Pull out the hub so that the remaining clutch shoe and spring are loose.

Assembling

1. Lay the spring in its slot on one of the clutch shoes and push it onto the hub so that side with text on faces downwards.
2. Push the second clutch shoe onto the hub and clamp it in the vice so that the slot is open. Press the spring into the slot by using your thumbs. Loosen the vice and push the spring into position using a blunt tool.
3. Push the third shoe onto the hub and clamp it in the vice. Press the spring down into the slot by using your thumbs. If the spring tension is strong use a blunt tool. Take the clutch out of the vice.

Do not use a screwdriver or similar to press over the spring into the slot. This can easily cause a weak point which may be detrimental to the strength of the spring.

The clutch is fitted in the reverse way to that used when removed.

GROUP B

SILENCER (MUFFLER)

A silencer (muffler) which meets the USA standard SAE J335 b is fitted. The silencer (muffler) is equipped with a spark arrester, which must be cleaned regularly. The cleaning intervals depend to a great extend on the quality of the engine oil used and the fuel mixing ratio. A blocked spark arrester can considerably reduce engine output.

Cleaning the spark arrester
Remove the two screws on the silencer (muffler) and take out the stainless steel netting and clean it with a steel brush.

Removing
The silencer (muffler) is attached by means of three or four flange screws, which are loosened and the silencer can then be removed from the cylinder. Between the silencer and the cylinder there is sealing gasket.

Fitting is carried out in the reverse way to that described above.

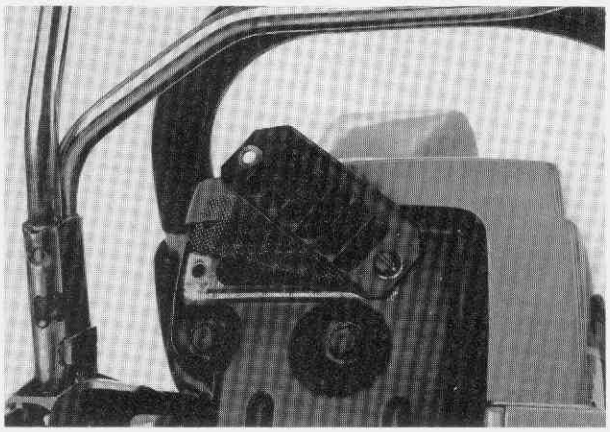


Fig. 15

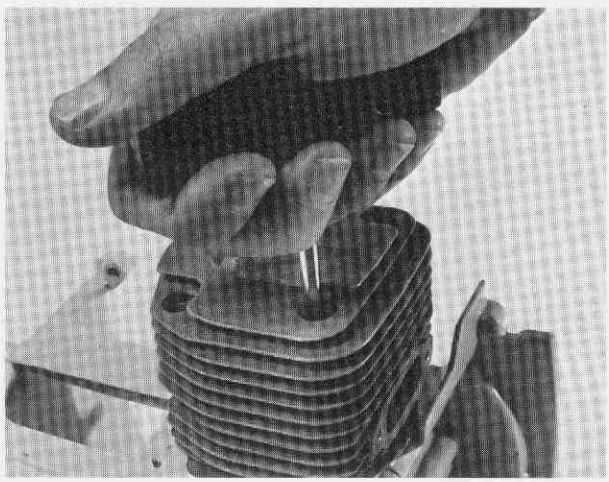


Fig. 16

CYLINDER AND PISTON

Removing the cylinder
Loosen in the following order: Top casing, tubular handle, silencer and carburetor. Then loosen the four screws which attach the cylinder to the crankcase after which it can be pulled up. When the cylinder has been loosened, the piston pin and connecting rod bearing can be checked for wear.
Hold the piston firmly and check for looseness lenghtwise in the direction of the connecting rod. If looseness is felt, first replace the piston pin bearing or the piston pin. Wear on these bearings is minimal in the case of normal operation.

Removing the piston rings
First push a clean rag into the crankcase hole to prevent impurities and small components from getting into the crankcase. Bend out the ends of the piston ring and slide the ring carefully over the piston using your fingers. Do not bend the piston rings more than necessary. Press the piston rings into the cylinder about 1 cm (.4") from the upper edge by using the piston to check for wear. The piston rings must not be diagonally located in the piston when this check is made. The gap between the ends of the rings must not be more than 0.8 mm (.031") at which point new rings must be fitted. The piston rings must not be worn round at the edges. When replacing the piston rings, do not forget to scrape out carbon and coke deposits from the ring grooves. Force out the old rings and use these when scraping clean.

Fitting the piston rings is carried out in the reverse way to that described above.

Removing the piston
Loosen the piston pin circlips. Knock out the piston pin using a hammer and drift 505 381705. The blows must be taken up by the connecting rod. For this reason hold the connecting rod and piston in a firm grip. The needle bearing assembly is now easy to push out.

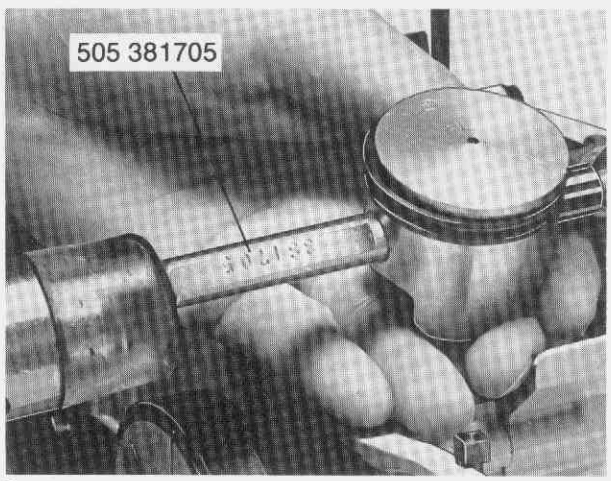


Fig. 17

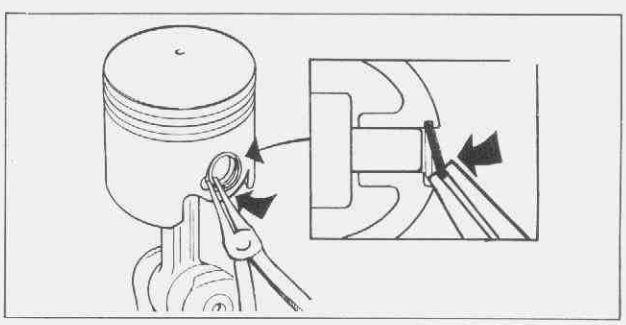


Fig. 18

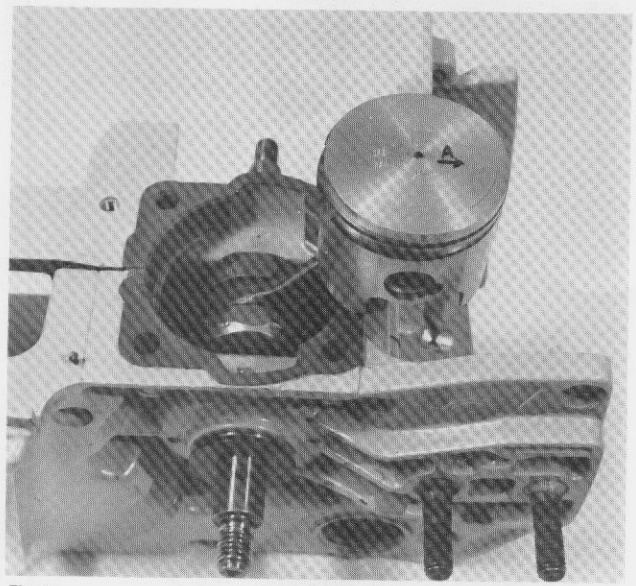


Fig. 19

Fitting the piston and cylinder
An arrow together with the letter "A" are stamped in the crown of the piston. The arrow must face the exhaust port. Press the piston pin into half of the piston, then push the piston over the crankshaft and press the piston pin in all the way.
Note. Do not forget the needle bearing.

This assembly work is very easy to carry out if the piston is heated slightly. Then fit the lock rings which will lock the piston pin.
Oil in the piston rings and fit in new cylinder head gasket on the crankcase sealing surface after all traces of old gaskets have been scraped off. Clamp the piston rings into the slots in the piston so that the cylinder can be pushed over the piston. Tighten the four cylinder bolts evenly so that they are all tightened by the same amount.

Fig. 20

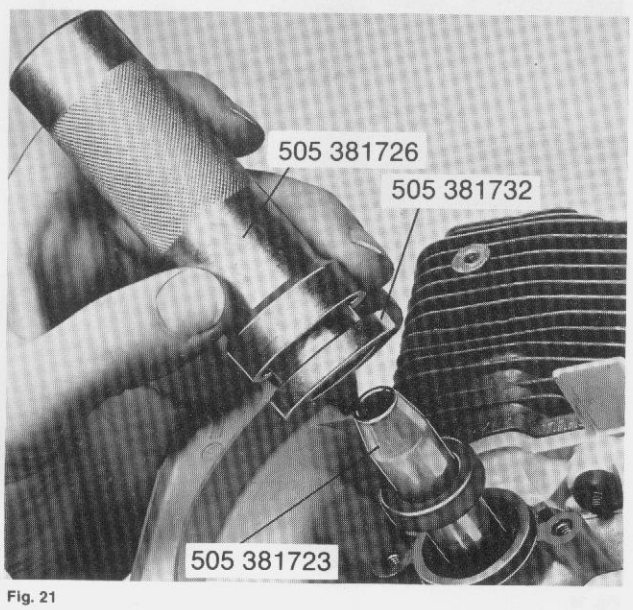


Fig. 21

CRANKCASE

Removing seal rings
Air leakage in the crankcase and seal rings is noticed primarily through changes in the idling setting of the engine, uneven idling or a tendency to race with the throttle closed.
First loosen the fan casing and the flywheel as well as the clutch. Inside the sprocket there is a seal washer pressed onto the crankshaft. This washer can be loosened by using puller 505 381811. The seal rings are removed by using puller 505 381809. The short sleeve is used for the magneto side and the long sleeve on the clutch side. Cut away the rubber in the seal ring by using a knife. Fit the sleeve in the puller and then screw the tapered threaded part of the puller into the seal ring until engages. Screw in the pressure screw towards the journal until the seal ring loosens.

Fitting the seal rings
Place the tapered sleeve 505 381723 on the journal to prevent the seal ring from being damaged when it is slid over the shaft. Drive it into position by using drift 505 381726 and assembly sleeve 505 381732 so that it projects about 1 mm (.04") from the surface of the crankcase. The above-mentioned is valid för the magneto side. On the clutch side, the seal ring must be knocked in until it is level with the crankcase surface.

Disassembling the crankcase
Remove the following parts in the order mentioned: Clutch, fan casing, flywheel, fuel tank cylinder with carburetor, tubular handle, possibly the ignition system, and the rear handle. The crankcase halves are attached together by means of 8 (55–70cc) and 11 (100 cc) flange screws which are loosened.
Do not heat the crankcase when disassembling. Use the puller 505 381811 on the magneto side when disassembling the crankcase. The crankshaft can now be knocked out from the clutch side crankcase half by using a plastic-faced hammer.
When disassembling the crankcase always replace the ball bearing and the seal rings.

Assembling the crankcase

This can be done in many different ways–both with and without the use of heat. The main thing is that the crankshaft does not become distorted and that it can easily be rotated after assembly.

A. Fit the ball bearings on the crankshaft by using drift 505 381709.

B. Heat up the bearing recess in the flywheel side crankcase half (to about 150°C). On pro saws 55–70 cc lay a 1 mm spacer between crankshaft and crankcase in connection with assembly. See fig. 24.

C. Place a new crankcase gasket on the sealing surface. Check that the oil lines are fitted and free from defects.

D. Heat up the bearing recess in the clutch side crankcase half and fit together both halves. (On 100 cc engines the bearing locking device is now to be fitted on the clutch side.)

E. Hold the halves firmly together and fit the bolts and tighten them with a torque of 10 Nm (85 lbf. in.)

If you have assembled the crankcase correctly then it should be possible to turn the crankshaft without it chafing. Slight chafing can be adjusted by knocking lightly on the ends of the crankshaft.

NOTE. There is a closer fit between the bearing outer race and the crankcase bearing race than between the bearing inner race and the crankshaft.
For heating we primarily recommend an electric heating plate which can be combined with a lathe-turned metal pin which concentrates heating to the bearing seat and the ball-bearing inner race. A gasol burner flame can also be used for heating. Do not heat up the ball bearing so much that it is miscoulered.

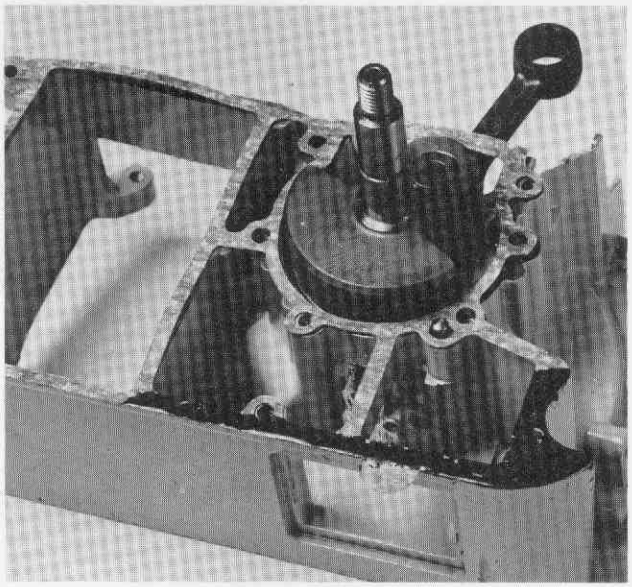


Fig. 22

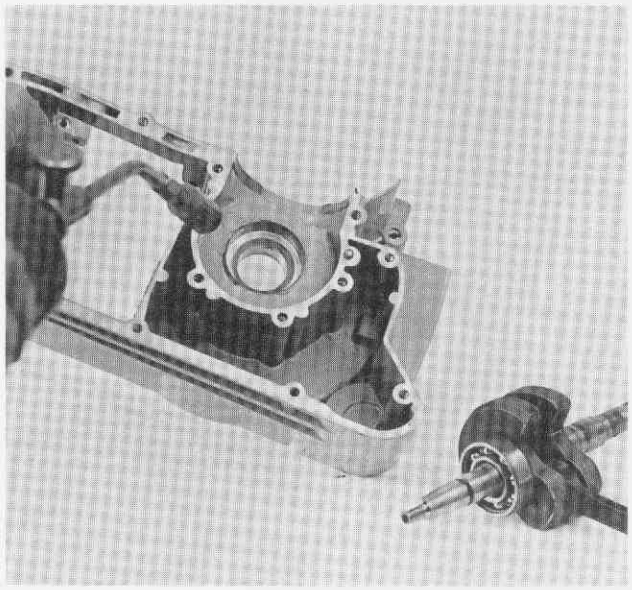


Fig. 23

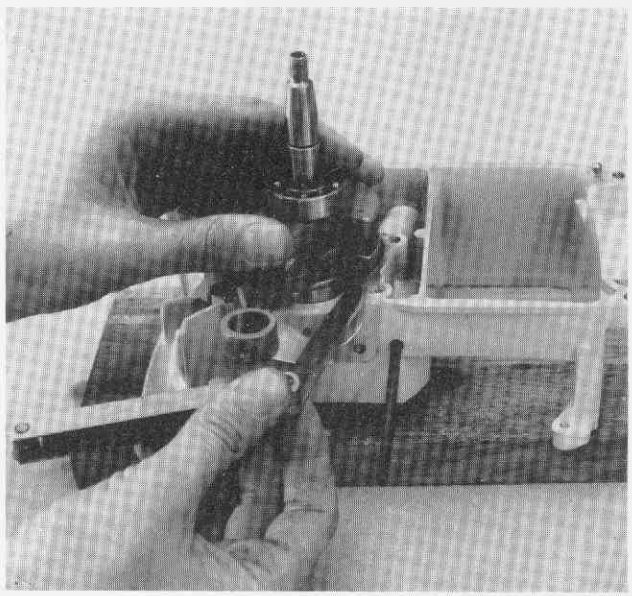


Fig. 24

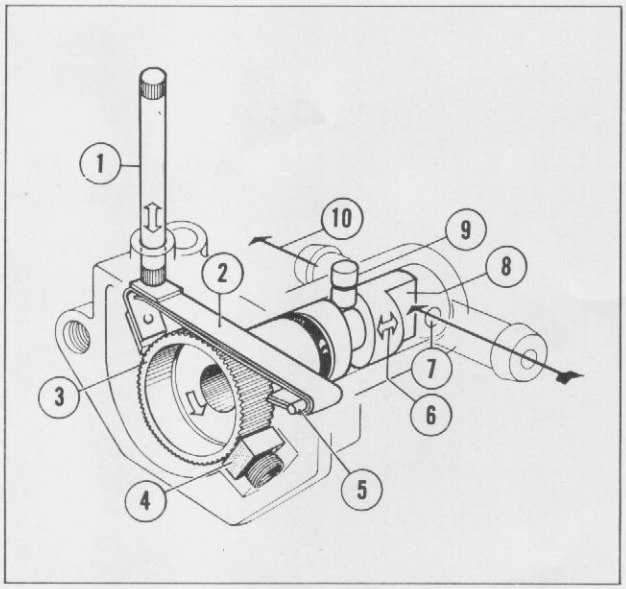


Fig. 25

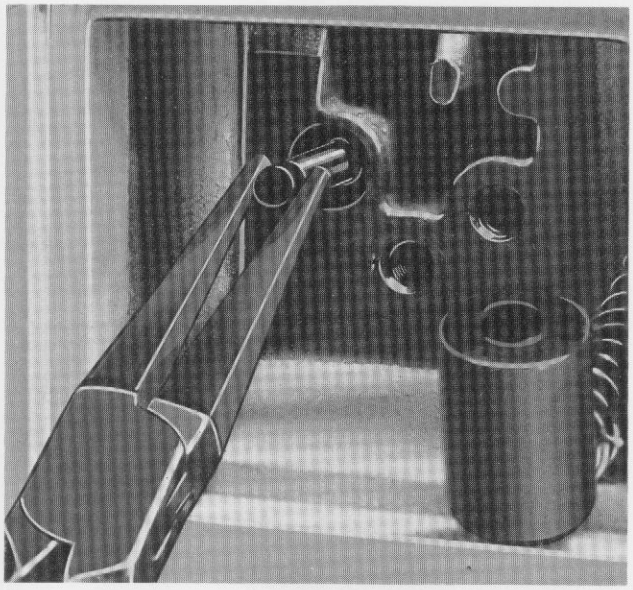


Fig. 26

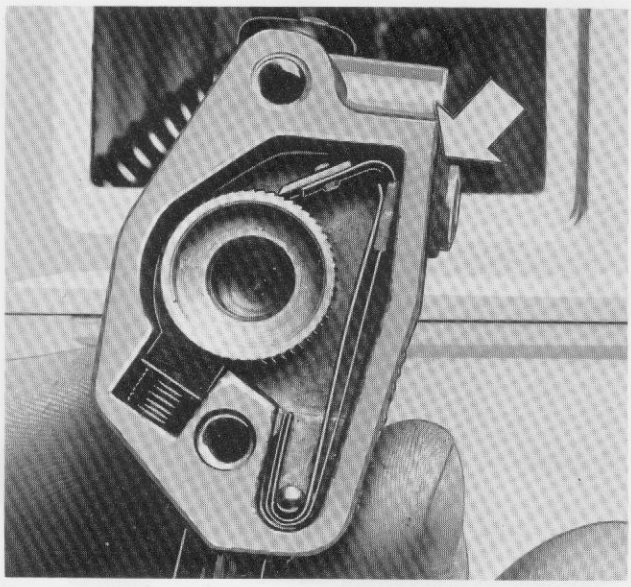


Fig. 27

GROUP C

CHAIN LUBRICATION SYSTEM

Semi-pro saws

Oil is sucked by the pump from the tank through a strainer in the end of the suction holes. The reciprocating motion of the pump plunger forces the oil to the chain guide (bar) attachment.

The oil pump is driven through a pump rod (1) by aneccentric cam on the crankshaft. Inside the pump the pump rod operates a leaf spring (2) which actuates the pump plunger cog (3) so that it rotates. The cog is rotated one tooth for each crankshaft revolution and is braked so that the oil quantity is correct by means of a spring-loaded lock (4). The drive spring together with the return spring is carried on a pin (5). In the pump plunger there is a slot in which a cylindrical pin (9) is located. The diagonally position of the slot forces the plunger to make a reciprocal motion during rotation (6). There is a shoulder (8) in one end of the plunger. When the plunger is forced outwards, this shoulder exposes the inlet drilling (7) from the oil tank and oil is sucked into the pump chamber. When the plunger is on its inward travel, the shoulder blocks this inlet and opens the outlet-drilling (10). The pressure resulting from the inward travel of the plunger presses the oil to the chain guide (bar).

The oil tank is air-vented through a small hole with a cotter pin located at the highest point of the oil tank (to the right behind the cylinder).

OIL PUMP

Removing

Loosen the cover in the bottom of the oil tank. Turn the crankshaft so that the engine piston goes down to its bottom position. With the piston in this position, the pump can be taken out of the oil tank without it being necessary to remove the suction or pressure lines. Avoid disconnecting the pressure line at the clutch crankcase half unless the pressure hose is being replaced. The pump rod can now be carefully removed by using flat pliers. Check that it operates easily and is not worn. The length of the rod should be 35.25–35.45 mm (1.38"–1.39"). Check with a vernier gauge and replace if necessary. In the crankcase there is a bushing which guides the pump rod. Check that the O-ring which seals between the oil pump and the crankcase is undamaged.

Disassembly

Loosen the screws in the pump cover and then lift off the cover and gasket. Remove the pump spring set. Loosen the interlock block with spring. Pull out the cylindrical pin using flat pliers. Fig. 28. The pump plunger can then be pulled out.

Assembly

Clean all parts in petrol (gasoline). The pump is assembled in the reverse way to that used when disassembling. Check that the part of the cylindrical pin which guides the plunger is free from burs. Ensure that the pump plunger and the cylindrical pin O-rings are not damaged during fitting. Check that the drive spring engages in the teeth on the cog. Fill the pump housing at the drive mechanism up to 2/3 with ball bearing grease. There must be no sign of damage on the gasket between the pump cover and the pump housing.

If you wish to increase the amount of oil to the chain this can be done by fitting a special pump plunger, 505 317158, which has a longer stroke. This will increase the capacity of the pump. This plunger is suitable when cutting in thick timber and hard sort of wood when the chain requires more lubrication.

Fitting is carried out in the reverse way to that used when removing. Fitting is facilitated if the engine piston is in its bottom position during fitting.

Capacity
Standard equipment includes a pump plunger with a stroke of 1.0 mm. The pump stroke—and thus also the quantity of oil—can be changed by replacing the pump plunger.

The following pump plungers are available:

Part no.	Stroke
505 317156	1.0 mm Standard
505 317145	0.8 mm 20 % less than standard plunger
505 317158	1.5 mm 50 % more than standard plunger

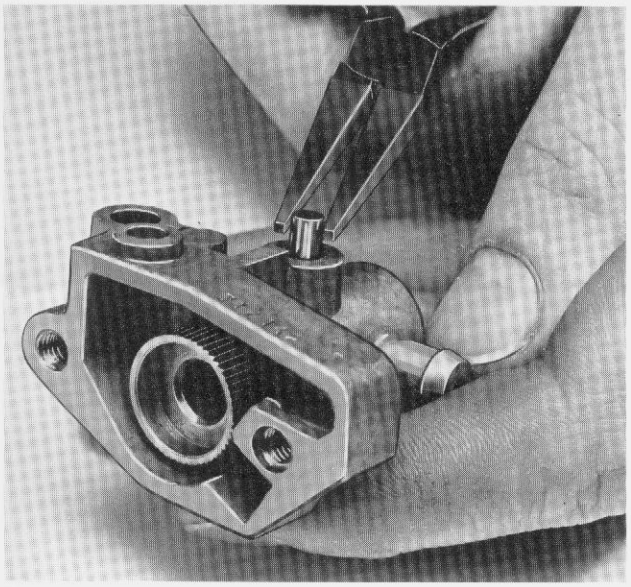


Fig. 28

Fault-tracing scheme

FAULT:	POSSIBLE REASON:	REMEDY:
Oil pump feeding too little or no oil at all to chain guide (bar).	Faulty braking of oil pump cog.	Replace spring and brake block.
	Faulty pump rod length.	Check or replace.
	The cylindrical pin controlling plunger reciprocating motion is damaged.	Replace the cylindrical pin or polish off the burs.
	Suction hose strainer blocked by impurities.	Clean strainer.
	Suction hose wrongly fitted or bent thereby blocking oil feed.	Fit the hose so that the strainer is against the bottom of the oil tank.
	Oil tank air-venting blocked.	Clean.
	Pump spring damaged.	Replace spring.
	Suction or pressure hose blocked.	Check, clean.
Oil pump feeds too much oil with high oil consumption as consequence.	Poor braking of oil pump cog.	Replace spring and brake block.
	Faulty pump rod length.	Check or replace.

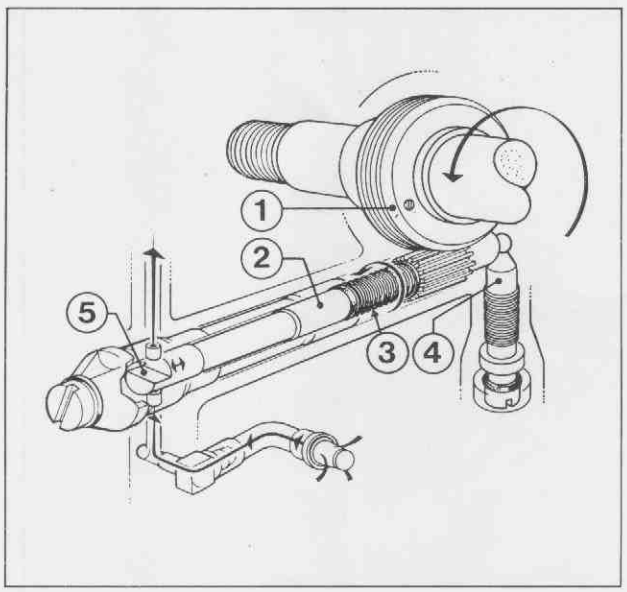


Fig. 29

CHAIN LUBRICATION SYSTEM

Professional saws

Oil is sucked by the pump from the tank through a strainer in the end of the suction line. The reciprocating movement of the pump forces oil to the bar attachment. The gear (1) on the crankshaft rotates the pump plunger (2). The thrust spring (3) forces the plunger against the point (4) of the control screw. Since the pump plunger spindle pin in the end of the gear is diagonally milled, rotation forces the plunger to make a reciprocating movement. There is a shoulder (5) in the other end of the plunger. When the pump plunger is forced out of the pump cylinder under the effective spring pressure, this shoulder exposes the inlet to the pump cylinder and oil is sucked in from the tank. When the plunger rotates, the inner channel closes and the outer channel opens. The pressure caused by the plunger moving inwards forces the oil to the bar attachment. Pump plunger travel, and thereby the amount of oil, can be changed by setting the control screw (4) in different positions.

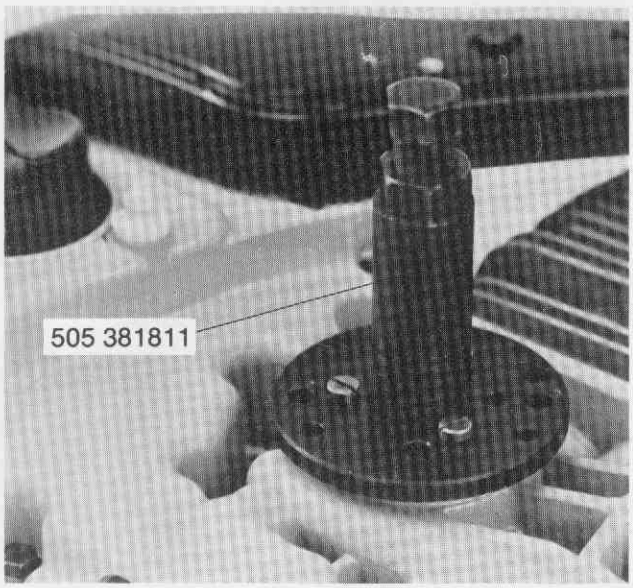


Fig. 30

OIL PUMP

Removing

Loosen the filler cap and drain off the oil. The pump cylinder and pump plunger are placed in the front of the saw under the silencer or the front handle. They can be pulled out of the crankcase after the slotted screw retaining the pump cylinder to the crankcase has been loosened.

In order to reach the pump drive gear on the crankshaft you will have to remove the seal ring on the flywheel side on 55–70 cc saws and the seal ring on the clutch side on 100 cc saws. The drive gear can be removed from the crankshaft by using a gear puller. See page 24 for the puller.

The pump adjuster screw is loosened by unscrewing it from the crankcase. After about two turns, increased resistance is felt. Continue to unscrew and the stop sleeve loosens. Concerning adjustment of the oil feed, however, you should never continue to screw when you have reached the increased resistance.

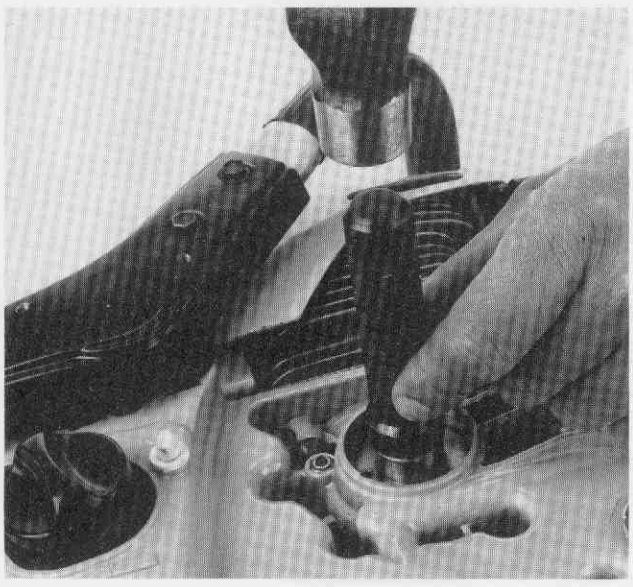


Fig. 31

Fitting

First screw the adjuster screw with O-ring into the crankcase. The stop sleeve is driven in with the help of a drift.

Always insert the pump cylinder and plunger without the thrust spring and check that the plunger can be turned easily before fitting the drive gear. This gear is heated up in boiling oil and is pressed onto the crankshaft with the aid of drift 505 381709.

NOTE. It is necessary to heat up the drive gear in order to avoid the risk of crankshaft displacement during assembly. The pump cylinder, pump plunger and other parts can then be fitted. Do not tighten the slotted screw attaching the pump cylinder to the crankcase so hard that the cylinder is pressed askew.

Always use new seal rings. Drive them into position by using drift 505 381726 and assembly sleeve 505 381732. The assembly sleeve ensures a correct position of the seal rings. Before fitting the clutch side seal ring on 100 cc saws, the sealing surface in the crankcase should be coated with Loctite, grade A to ensure more dependable attachment.

Replacing the suction hose
The suction hose can be replaced through the oil tank filler hole. On the 100 cc saw there is a nipple screwed into the crankcase close to the pump cylinder. When this nipple is loosened, the suction hose comes out and can easily be replaced by a new unit.

Manual oil pump (only on 100 cc saws)
The manual oil pump is used to provide the chain with more oil when required. The steel diaphragm pump, which is fitted behind the bar attachment, then sucks up oil from the oil tank and forces it out to the bar. To remove the manual oil pump, loosen the two screws retaining the pump. Clean the pump components and make sure that you blow through the drillings in the crankcase until they are clean.

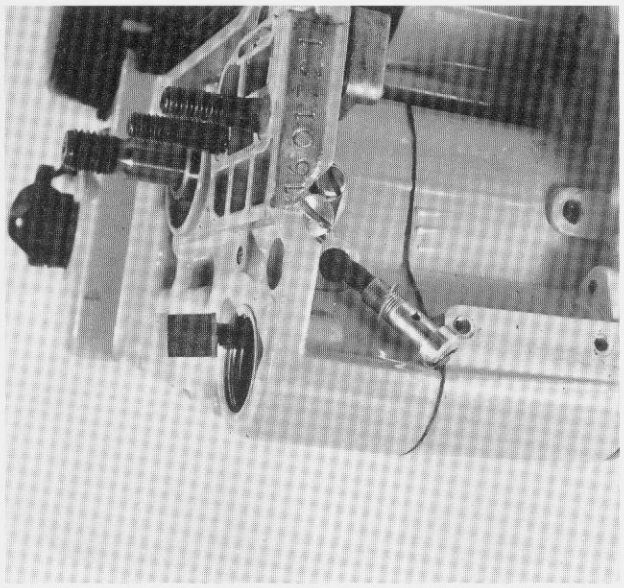


Fig. 32

Fault-tracing scheme

FAULT	POSSIBLE REASON	REMEDY
Oil pump feeding too little oil or none at all	Adjuster screw too far in	Screw out adjuster screw
	Suction hose strainer blocked by impurities	Clean strainer
	Suction hose wrongly fitted or raised so that oil feed is blocked	Fit the hose so that it is against the bottom of the tank without sharp bends
	Oil tank air-venting system blocked	Clean air-venting system
	Pump spring damaged or worn	Replace spring
	Oil valve blocked by impurities	Clean or replace
Oil pump feeding too much oil	Adjuster screw too far out	Screw in adjuster screw

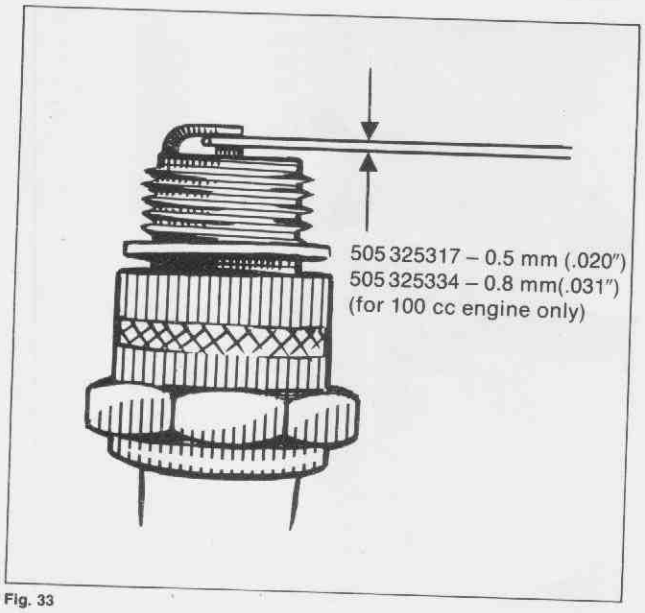


Fig. 33

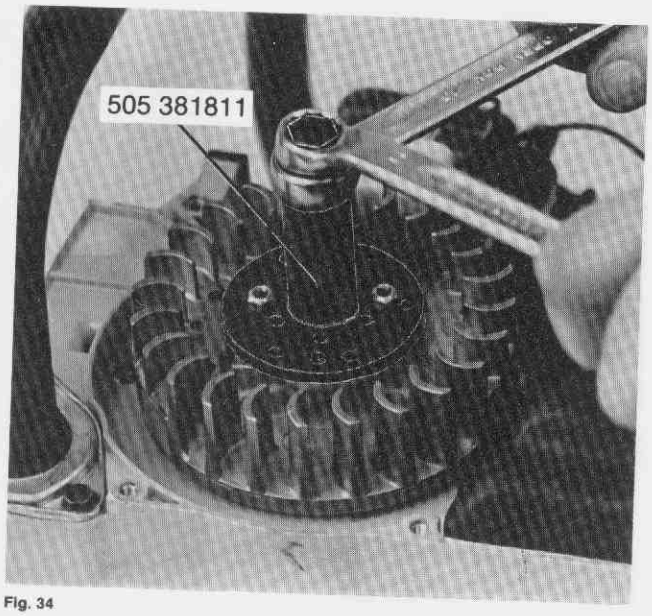


Fig. 34

GROUP D

IGNITION SYSTEM

Concerning the function of the ignition system, see our book about the chain saw ignition system. This book includes a detailed description of the way in which the different ignition systems work.

SPARK PLUG

Spark plug for normal operation: Bosch WS 5 E or Champion CJ-6. For the 100 cc engine with thyristor ingition system we recommend Bosch WS 5 F. The electrode gap is normally 0.5 mm (0.020") but for Bosch WS 5 F the electrode gap is 0.8 mm (.031"). Saws equipped with Ignitron ignition system should not have a larger gap than 0.5 mm (.020").

Checking and servicing
Check and adjust the spark plug after 30 litres (7 gallons) of fuel have been used up. Replace when required. Tighten the spark plug properly (tightening torque 25 Nm=210 lbf. in).

Removing the flywheel
Loosen the top casing, the fan casing and the starting pawls. Lock the flywheel by using steel pin 503 240602 and loosen the nut and washer.
Screw the puller (505 381811) pressure section onto the crankshaft journal. Attach the puller to the starting pawl pins. Screw in the puller pressure section at the same time as you are holding the puller by using a 17 mm fixed wrench. When the flywheel has loosened, the puller must be removed before the flywheel can be lifted.

Fitting is carried out in the reverse order to that described above. Check that the woodruff key which retains the flywheel in position on the crankshaft is undamaged. The starting pawls and their return springs are to be fitted as shown in fig. 35.

The various states of the spark plug

CORRECT APPEARANCE

Medium brown insulator foot, dark grey base with grey soot coating.
Electrodes not abnormally burnt.

Correctly selected spark plug.
Correct carburetor and ignition settings.
Condition of engine otherwise normal.

VARIOUS FAULTY APPEARANCES

Melt drops on insulator foot which is white-burnt.
Electrodes, particularly centre electrode, blued.

POSSIBLE FAULTS

Heat range too low.
Fuel-air mixture too lean.
Timing too advanced.
Spark plug badly tightened.
Heat range too high.

Centre electrode badly burnt.
Insulator foot, base and electrodes coated with oil and coke.

Too much oil in fuel.
Possible wear in engine.
Heat range too high.
Fuel-air mixture too rich (for example due to blocked air filter).

Insulator foot, base and electrodes covered with black, dry soot.

THYRISTOR IGNITION SYSTEM

The thyristor ignition system consists of an ignition coil and an electronic section. These are fitted on an armature attachment which is attached on the cylinder. Between the electronic section and the armature attachment there are two insulating washers which insulate the ignition system from the cylinder heat.

Ignition setting
All that needs adjusting is the space between the electronic section and the flywheel which must be 0.35–0.45 mm (.014–.018").

Testing of the ignition system
A Prüfrex test apparatus type ZW6 220 V or another type of test apparatus fed with at least 110 V is to be used when testing the ignition coil. Note that the ignition coil cannot be checked by using a battery-fed test apparatus since the ignition coil requires a higher test voltage.
The cables are to be checked by using a buzzer or a test lamp. The ignition coil is also to be checked by using a buzzer or a test lamp. The high voltage used in the test apparatus means that the spark can jump over a small break inside the ignition coil. Connect the buzzer or the test lamp between the spade contact and the coil iron core (earth). If the primary circuit is in good condition, the buzzer functions in the same way as when the buzzer contacts are held against each other.

If the ignition coil or the cables are found to be intact the fault is to be found in the electronic section that is to be replaced.

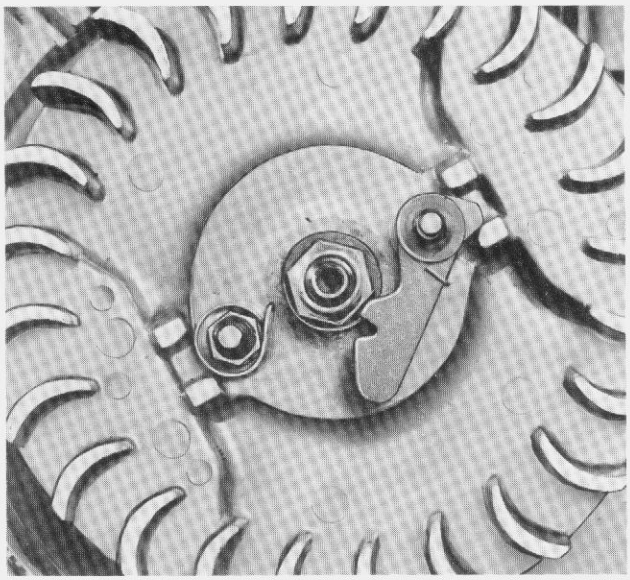


Fig. 35

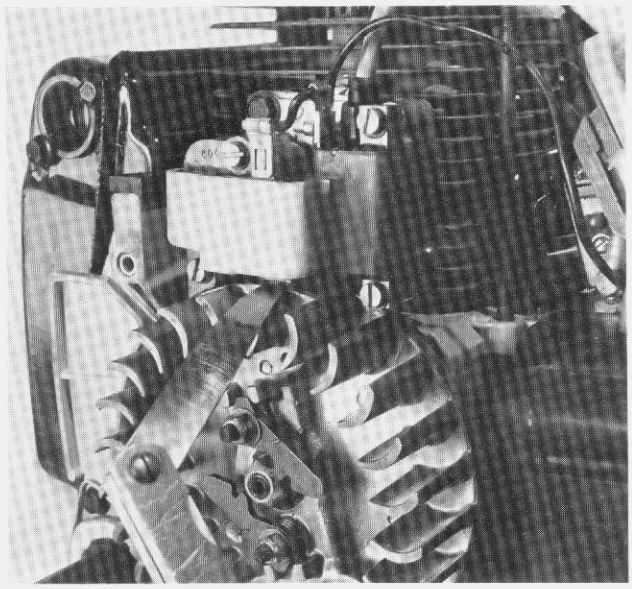


Fig. 36

Fault-tracing scheme

If there is no spark or the engine misfires, check the ignition system as follows:

1. Check the spark plug gap. If the spark plug is worn, replace it with a new unit.
2. Check the cables for breakage or strike-over. Replace if necessary.
3. Check the ignition coil. Replace if necessary.
4. Check the distance between the electronic assembly and the flywheel.
5. If there is still no spark, replace the electronic assembly.

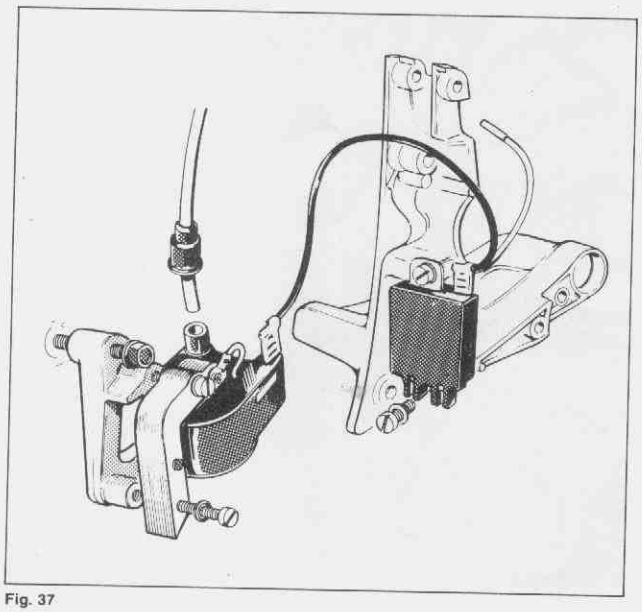


Fig. 37

THE PARTNER IGNITRON IGNITION SYSTEM

The Partner Ignitron ignition system is transistorized and consists of two units, a coil and an electronic unit. The Ignitron ignition system has many practical advantages compared with our earlier Thyristor system. The Ignitron system is considerably lighter and more compact. The separate electronic unit can be located in an easily accessible place and, in the event of defects, the faulty part can be replaced without influenced other components.

Fault-tracing and disassembly

The simplest way to test the function of the ignition system is by using the measuring instrument. This instrument can be used to test the coil, cables and electronic unit together or individually without needing to remove them from the machine.

Concerning the test instrument, test values, etc, see the instructions provided by the respective instrument manufacturer since there are certain variations between the different instruments.

Fault-tracing can be carried out by the elimination method which has been described in connection with removal of the various components.

First remove the cylinder casing and loosen the spark plug. Clean the plug, adjust the electrode gap and test it to ensure that there is a spark when the engine is turned over.

Then check to ensure that the ignition current is reaching the plug through the ignition cable. Also check the switch for any possible earthing defect.

Remove the fan casing and take out both the screws retaining the ignition coil to the armature attachment. Fit a new coil with a setting of 0.35–0.45 mm (.014–.018″). Tighten in position and then check the gap with a feeler gauge.

The electronic unit is located in the handle bracket. Remove the air filter and disconnect the choke rod. Then loosen the three screws in the bracket and fold forward the inside of the bracket so that the electronic unit is accessible.

The electronic unit is secured to the bracket by means of two slotted screws.

When fitting a new electronic unit, it is important to ensure that there is good contact between the electronic unit and the bracket and also between the bracket and the crankcase.

GROUP E

STARTING DEVICE

When the starter cord is pulled out, the cord drum hub engages with two starting pawls on the fan rotor. After the engine has started, these pawls are thrown out from the hub by centrifugal force. When the engine stops, the spring-loaded starting pawls re-engage in the cord drum hub. The cord drum is spring-loaded to ensure automatic return of the starter cord.

Removing the starter cord and starter spring
Loosen and remove the top casing, air filter and plastic spacer. Unscrew the flange screws retaining the fan casing so that the starter device is accessible. Pull out the starter cord about 20 cm (8"). Prevent the cord drum from rotating back at the same time as the cable is placed in the recess on the cord drum as shown in fig. 38. Allow the cord drum to rotate slowly backwards with the cord in the recess until spring tension is released. Loosen the lock spring from the cable drum hub and lift up the cable drum. The spring cassette with starter spring can be released when the slotted screw retaining the cassette against the casing has been loosened.

Removing the starting pawls
Loosen the two screws which retain the starting pawls. Note the location of the springs to facilitate re-fitting later.

Assembling
After cleaning, lubricate the starter spring, the starter pawls and the cord drum bushing with a few drops of oil. During the winter, when there is risk of frost, silicon oil of the same type as that used for car door locks should be added. The starting pawls are fitted in the reverse order to that used when removing. The starter cassette is located in the fan casing and screwed into position.
If a new starter cord is to be fitted, a knot must first be made in one end. Pull the other end through the cord attachment and the rubber handle and insert the end through the cord hole on the fan casing. Insert the end of the cord in the slot on the cord drum and with the help of a screwdriver pick out the end of the cord through the hole (h) at the cord drum hub. Secure the cord by means of a simple half-hitch in the right direction around the cord drum hub and then wind the cord onto the drum. Tension the spring by turning the cord drum two revolutions clockwise with the cord in the recess. Finally check the function of the starting device and cord drum.
A correctly tensioned starter spring means that it should be possible to turn the cable drum even further when the starter cord is fully extended. This protects the spring from overloading.

Before screwing the fan casing into position, the starting pawls must be engaged in the cord drum hub. Check that the engine is turned over when the starter handle is pulled out. If the fan casing is not easy to place into position, either the starting pawls are not properly in engagement or the fuel tank is slightly displaced.

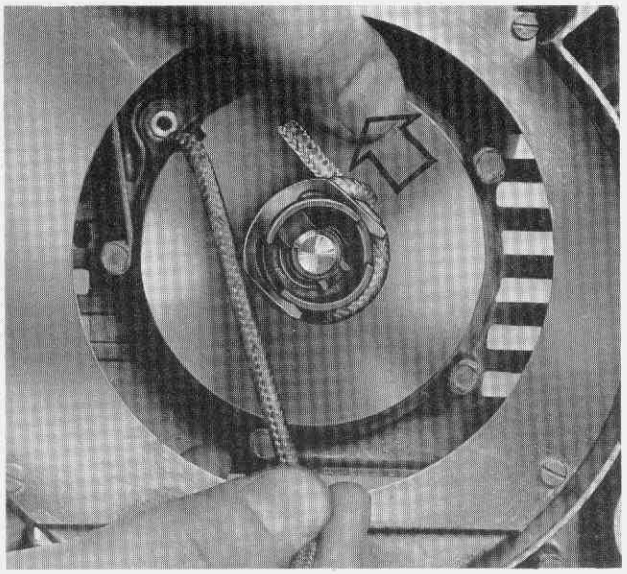


Fig. 38

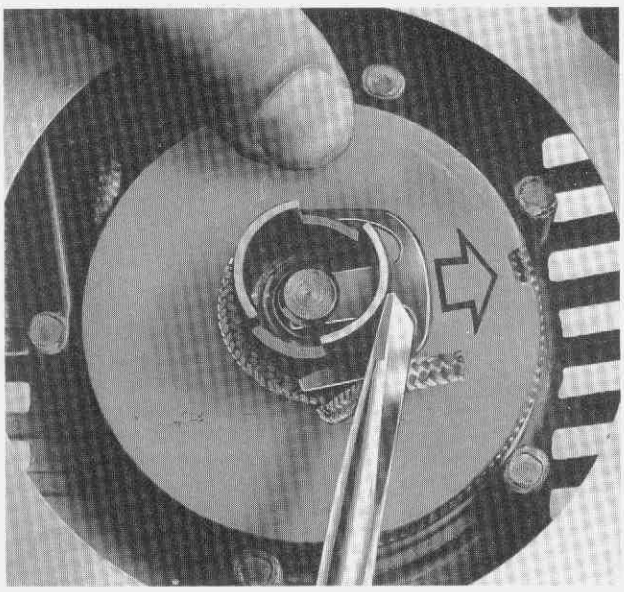


Fig. 39

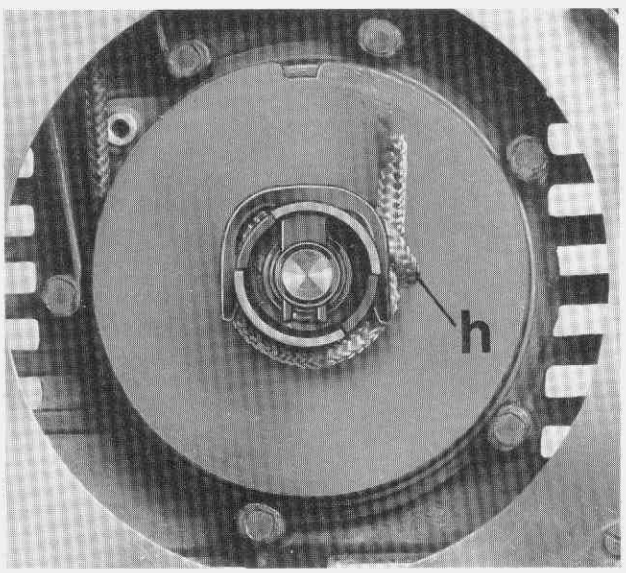


Fig. 40

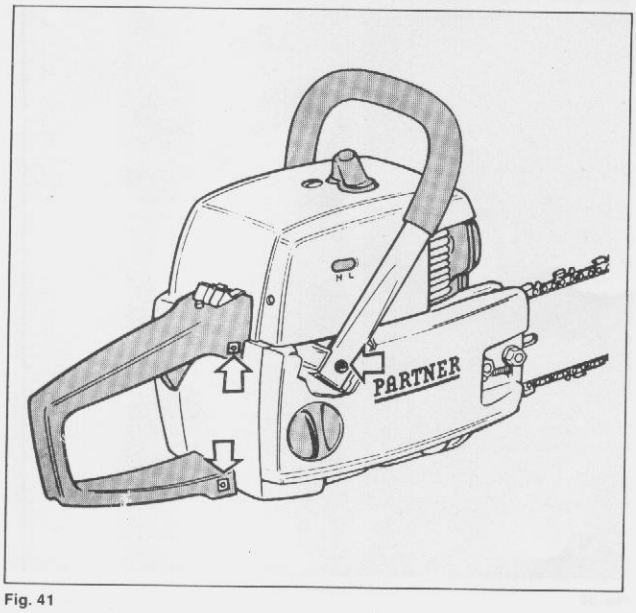


Fig. 41

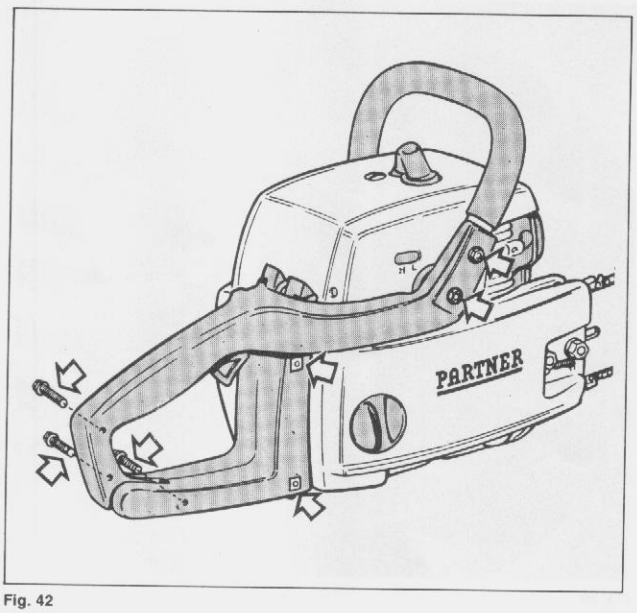


Fig. 42

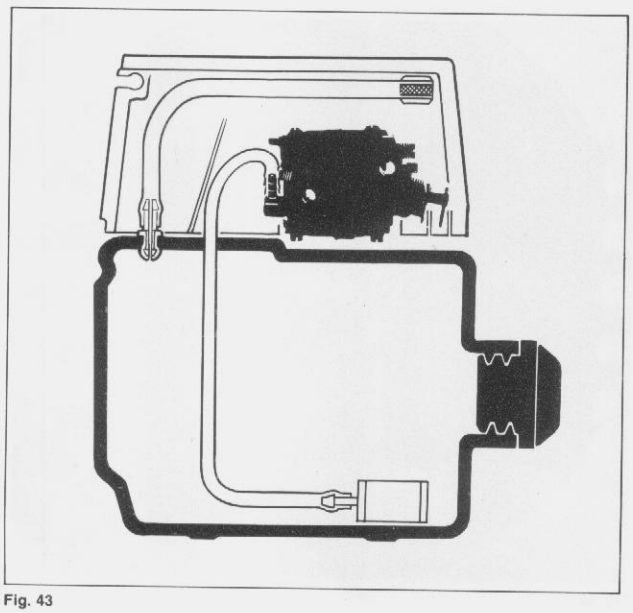


Fig. 43

GROUP F

HANDLES

Removing the carrying handle (non devibrated handles)
The carrying handle is attached by means of a screw below the silencer (muffler) and a screw at the attachment on the clutch side and these screws are removed.

Removing the carrying handle (devibrated handles on 55, 65 and 70 cc engines)
The carrying handle is attached by means of three screws which are removed. One screw is located under the silencer (muffler), the other two at the connection to the rear handle on the clutch side.
The vibration-damping rubber elements must not be cleaned with petrol (gasoline), paraffin (kerosene) or other strong solvents or detergents.

Removing the carrying handle (devibrated handles on 100 cc engines)
The carrying handle is attached by means of two screws at the connection to the rear handle and two screws attaching the front damper element to the crankcase. In order to reach these first loosen the fan cover.

Removing the rear handle (non devibrated handles)
Unscrew the two screws retaining the handle to the crankcase halves. Disconnect the throttle and choke rod from the carburetor and the short-circuiting cable from the slot in the stop button.

Removing the rear handle (de-vibrated handles)
Loosen the top cover and the air filter. The handle is attached by means of four screws which are removed. Two screws retain the brackets to the crankcase halves and the other two retain together the rear handle and the carrying handle at the vibration-damper on the clutch side. Finally the throttle and choke rod is removed from the carburetor and the short-circuiting cable is removed from the stop button.
The vibration-damping rubber elements must not be cleaned with petrol (gasoline), paraffin (kerosene) or other strong solvents or detergents.

GROUP G

FUEL TANK

The fuel filter is accessible for replacement through the filter hole after the fuel has been drained off. **The filter cartridge must not be cleaned but is to be replaced when it has become blocked.**

Removing
The tank can be pressed out when the fan casing and the fuel hose to the carburetor have been loosened. If the tank is difficult to get out, strike carefully with a plastic mallet against the tank cap which should be well tightened.
The fuel hose is to be inserted through the tank wall and will tighten without any special tightening.

Fitting is carried out in the reverse way to the removal process. The plastic tank is characterized by the fact that it swells up when it is in contact with fuel. This is to ensure that it fills up the space in the crankcase halves and does not vibrate and cause wear between the tank and the crankcase. If the tank has swelled up so that it is difficult to install, it decreases in volume if you lay it on a radiator for an hour or so.
The fuel tank air-venting consists of a Vernay valve fitted in a hose which connects the tank with the valve.
This valve admits air into the tank without restriction but, when under pressure, does not release anything through the valve until a pressure of 20 kPa (0.2 kp/cm²–3 lb/sq.in.) is reached. On both sides of the valve there is a sintered filter which prevents the valve from being put out of function due to dirt.

AIR FILTER

Removing
Remove the top casing. Loosen the screw nuts which retain the filter to the carburetor. Insert your thumb in the induction hole and press the filter halves from each other. Clean the filter with paraffin (kerosene) or petrol (gasoline) without any oil in it.

Fitting
Check before fitting the filter halves together that there is no dirt between the halves. Press together the filter halves until a click is heard. Screw the air filter into position. The air filter must be dried before it is fitted.

CARBURETOR

The chain saw models described in this service manual can, as an alternative, be fitted with Tillotson or Walbro carburetors. Both carburetor types have equivalent functions but differ in certain design features.
The carburetor is specially designed for use in chain saws. It has a built-in fuel pump of the diaphragm type which permits sawing to be carried out in all positions without running interruptions. The adjuster screws for high speed and low speed as well as idling are located on the right-hand side of the carburetor (the clutch side of the engine).

The engine crankcase is connected to the carburetor by means of an impulse channel Pressure variations in the crankcase through this channel influence the pump diaphragm (19) in the bottom of the carburetor so that it moves at the same rate as the pressure in the crankcase varies. Two flap type valves (19A, 19B) in the fuel pump diaphragm function in such a way that when the diaphragm moves upwards the inlet valve (19A) opens and fuel is sucked from the fuel tank into the pump housing the outlet valve (19B) being closed. When the pump diaphragm is pressed downwards, the inlet valve closes and the outlet valve opens, fuel being pressed through the strainer (15) to the needle valve (10). The needle valve is influenced by the main diaphragm (2) which, on its upper surface, is subjected to the atmospheric pressure of the air through the air-venting hole (4) and, on the under side, of the degree of vacuum in the engine during induction. The degree of vacuum in the engine during induction is transferred through the carburetor unit jets to the diaphragm chamber (29) and this causes the main diaphragm to go down and press up the lever (9) whereby fuel pressure from the fuel pump clears the valve needle and fuel passes into the diaphragm chamber. The fuel is then forced through the jets for high speed and low speed to the carburetor inlet pipe where it is mixed with air.

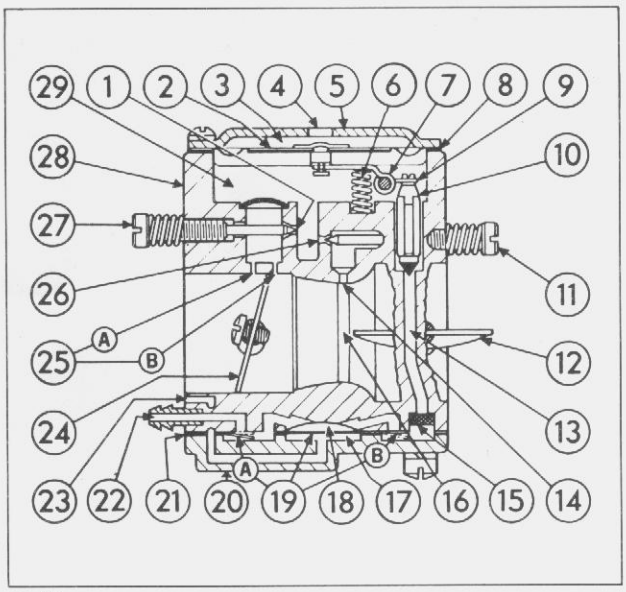


Fig. 44

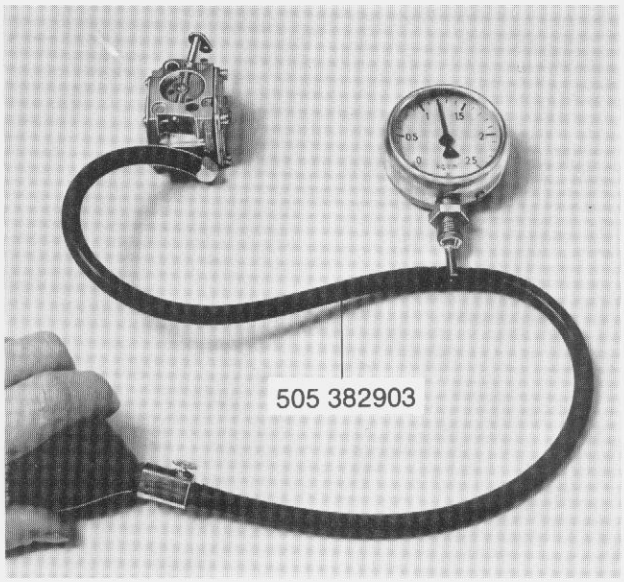


Fig. 45

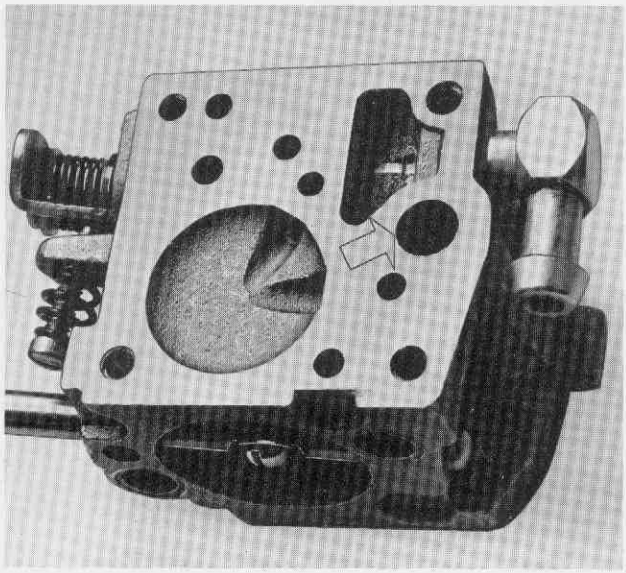


Fig. 46

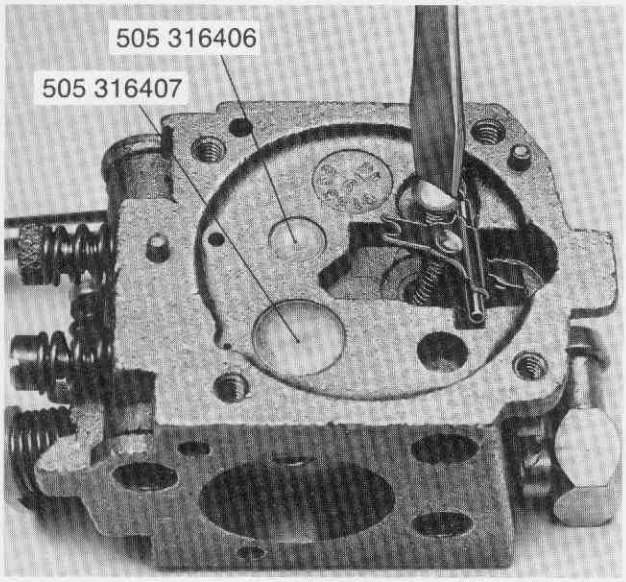


Fig. 47

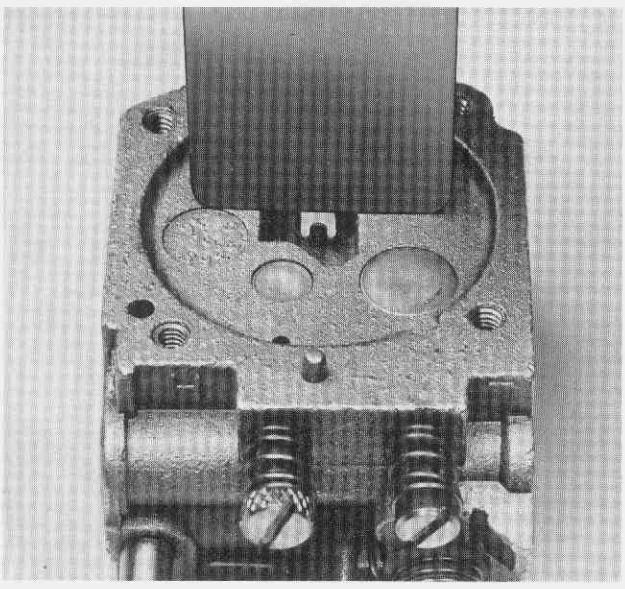


Fig. 48

Carburetor with speed governor
Certain saw models have a carburetor fitted with a speed governor. This governor consists of a spring-loaded ball valve which has a connection between the main diaphragm chamber and the carburetor venturi. Engine vibrations at high speed influence the governor which opens the ball valve and admits more fuel to the engine than that being fed by the jets. The governor contributes to a lower engine temperature and also prevents the engine from running at excessively high speed.

1. Low-speed jet
2. Main diaphragm
3. Atmospheric chamber
4. Air-venting hole
5. Main diaphragm cover
6. Lever spring
7. Lever spindle
8. Diaphragm gasket
9. Lever
10. Valve needle
11. Adjuster screw, high-speed
12. Choke flap
13. Fuel feed channel
14. High-speed channel
15. Strainer
16. Venturi
17. Impulse chamber
18. Pump chamber
19. Pump diaphragm
19a. Inlet valve
19b. Outlet valve
20. Fuel pump unit
21. Fuel pump gasket
22. Fuel inlet
23. Impulse channel
24. Throttle flap
25a. Idling channel
25b. Acceleration channel
26. High-speed jet
27. Adjuster screw, low-speed
28. Carburetor unit
29. Diaphragm chamber

Checking the needle valve for leakage
With the help of a special test apparatus 505 382903, which is connected to the carburetor fuel nipple (Fig. 45), it is possible to check whether the needle valve is sealing against its seat in the carburetor unit. It is not necessary to take off the carburetor for this test which can be carried out with the carburetor in position on the saw. Pump up the pressure to about 1 kg/cm² (14 lb./sq.in) with the help of the rubber ball. If the pointer stops when pumping ceases, then the needle valve is sealing properly. If the pressure decreases by less than 0.5 kg/cm² (7 lb.sq.in.), then the valve is leaking and the valve seat must be knocked flat or the valve needle must be replaced. See below.

Removing
Loosen the top casing and air filter. Unscrew the two screws which retain the carburetor. Pull off the fuel hose and unhook the throttle and choke control at its levers on the carburetor so that the carburetor can be lifted up.

Disassembling (Tillotson)
Loosen the four slotted screws which retain the pump cover and the pump diaphragm with gasket so that these units can be removed. Check that the strainer (Fig. 46, arrow) is not blocked. Otherwise it is to be removed from the channel to the needle valve and cleaned or replaced. Loosen the four slotted screws retaining the main diaphragm cover and the lever for the warm start device will follow. The main diaphragm is removed by carefully loosening the diaphragm with gasket in the sealing surface against the carburetor unit and then pulling it towards the adjuster screw side so that it loosens from the needle valve lever. If leakage has been detected at the needle valve, the valve seat is to be knocked flat using drift 505 381729 and the needle valve replaced. The spring and needle valve can be removed after the slotted screw retaining the lever spindle has been unscrew. See Fig. 47. When the springloaded screws for high-speed and low-speed adjustment have been screwed out, the carburetor channels are free and the carburetor unit can be cleaned. If compressed air is available, the carburetor can be blown clean. Otherwise it can be washed in petrol (gasoline) with the help of a suitable brush. Compressed air must not be used when the main diaphragm and pump diaphragm are fitted. **Steel wire or similar must**

never be used to clean the carburetor channel and flow holes since this damages the carburetor.
If the idling and low-speed channels are very dirty, it may be necessary to remove expansion washer 505 316407 which covers these channels. Drill a 3 mm (0.12") hole in the washer so that the drill just penetrates the washer. Then lever up the washer so that channels can be cleaned. Expansion washer 505 316406 which covers the high-speed channel can be loosened for cleaning in a similar way. Under the expansion washer there is a lock ring 505 316169 and a gauze 505 316422 which are to be cleaned or replaced.
On later model Tillotson carburetors, instead of expansion washer 505 316406, lock ring 505 316169 and net 505 316422 there is a ball check valve which prevents air from flowing through the high-speed drilling when the engine is running at idling speed.

Disassembly (Walbro)
On the Walbro carburetor there is only one screw securing the pump cover. Instead of expansion washers over the outlet drillings in the main diaphragm chamber, the Walbro carburetor has a cover the drillings. See fig. 49.
Other disassembly instructions are identical with those for the Tillotson carburetor.

Assembling is carried out in the reverse order to that described above. Before screwing in the adjuster screws, check that they are not distorted or worn.
When fitting new expansion washers use drift 505 381734 and 505 381735 with which the washers can be knocked flat so that they become firmly located in the carburetor unit.
When the needle valve, spring and lever are fitted, check that the part of the lever in contact with the diaphragm is level with the surface of the material in the carburetor. See Fig. 48. To adjust, bend the lever carefully so as not to damage the needle valve. Before fitting the main diaphragm and cover, check that the diaphragm appears to seal well and is not loose in the centre or wrinkled. If so, it must be changed. The same applies to the pump diaphragm where a check is also to be made to ensure that the valve flaps are not damaged.
The throttle flap spindle must not be so worn that it is loose in its bearing point in the carburetor unit since this can easily cause air leakage.

Fitting is carried out in the reverse way to that used when removing. Use new gaskets and check that the insulating flange is flat before fitting.
Also check that the impulse channel is open so that the fuel pump can operate free from interruptions. Use a ø 2.5 mm (0.10") drill.

Basic setting
The high-speed screw (H) unscrewed 1 turn from its bottom position.
The low-speed screw (L) unscrewed 1 turn from its bottom position.
The idling screw (T) screwed in half a turn after coming into contact with the throttle flap spindle lever.

Fine adjustment
It is seldom necessary to turn the adjuster screws more than 1/4 of a turn from the basic setting.
Start the saw and run it warm.
Adjust the idling screw so that engine speed is rather lower than that required to start the chain rotating.
1. Turn the saw quickly from the cross-cutting to the felling position and listen to hear whether engine speed changes.
2. Quickly press the throttle control and note whether the engine accelerates rapidly from idling speed to top speed.
3. Carry out cutting with the saw and test its lugging capacity.
4. Give full throttle and allow the engine to "run out". Listen to engine speed.
   When you are sure of your observations, the setting can be adjusted in the following way:

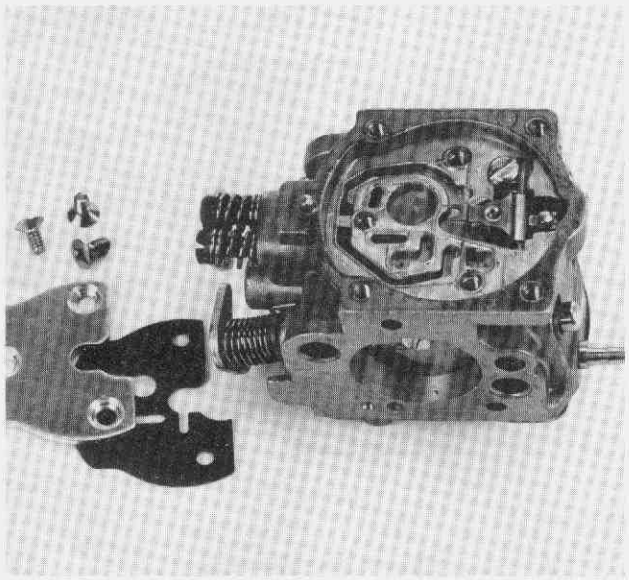


Fig. 49

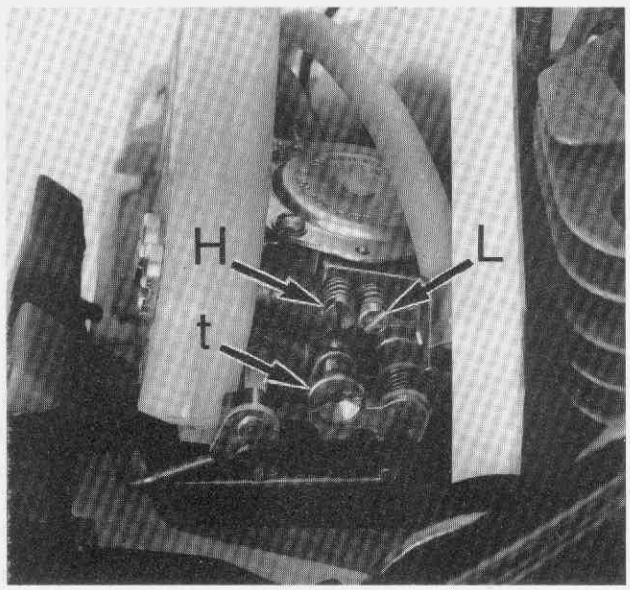
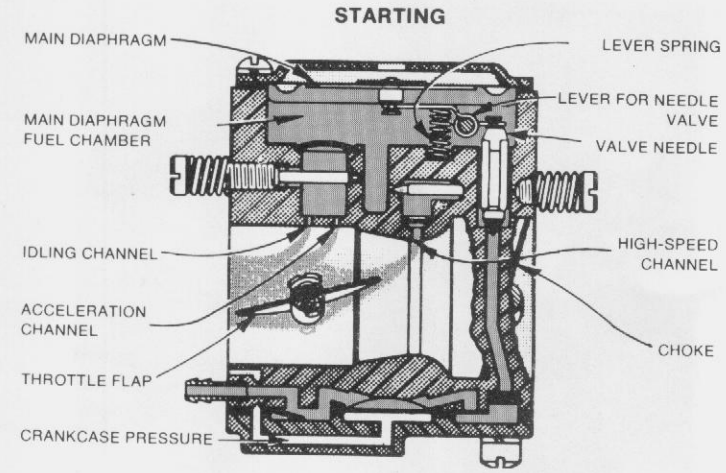


Fig. 50

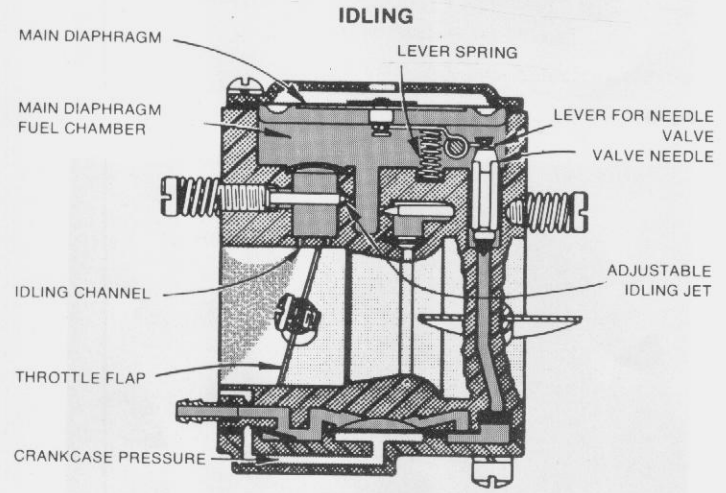
A. The low-speed screw "L" is to be set so that the engine does not stop when the inclination of the saw is changed with the engine running at idling speed and so that the engine rapidly accelerates from idling to top speed when the throttle trigger is pressed in. In the first-mentioned case, screw in the low-speed screw "L" if the engine stops when quickly changing over from cross-cutting to felling position. In the second-mentioned case, unscrew the low-speed screw if the engine accelerates slowly.
B. If the engine output feels low after the low-speed screw has been adjusted, first test by screwing out the high-speed screw "H" a little. If this does not help, the high-speed screw is to be screwed in rather more than its setting.
C. IMPORTANT! When the adjuster screws are screwed in, the engine receives less fuel. There is then risk of the engine attaining excessively high speed which results in a poor working result (low output, insufficient lugging capacity) and can also result in engine failure.
   If you think that the engine "screamed" when you let it "run out", then you should give it more fuel by screwing out the high-speed screw slightly.



Starting

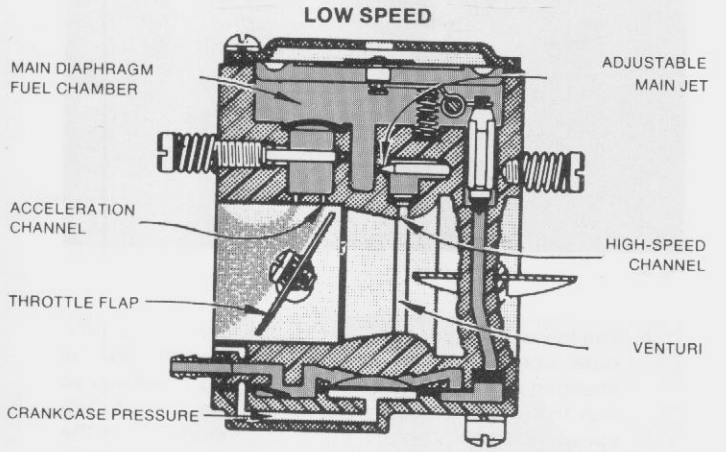
An engine fitted with an HS carburetor is started in the same way as an engine fitted with a conventional float type carburetor.

When a cold engine is started, the choke flap should be closed and the throttle flap should be half-open or fully open. When the engine is turned over, the degree of vacuum in the crankcase is evened out through the idling, acceleration and high-speed channels. A low pressure is then obtained on the fuel side of the main diaphragm. Atmosperic pressure on the opposite side then presses the main diaphragm downwards resulting in the fact that the diaphragm button presses down the lever since the pressure is higher than that of the lever spring. Fuel is then pumped in through the needle valve to the main diaphragm fuel chamber, up through the high-speed and idling channels and out through the flow channel to the engine.



Idling

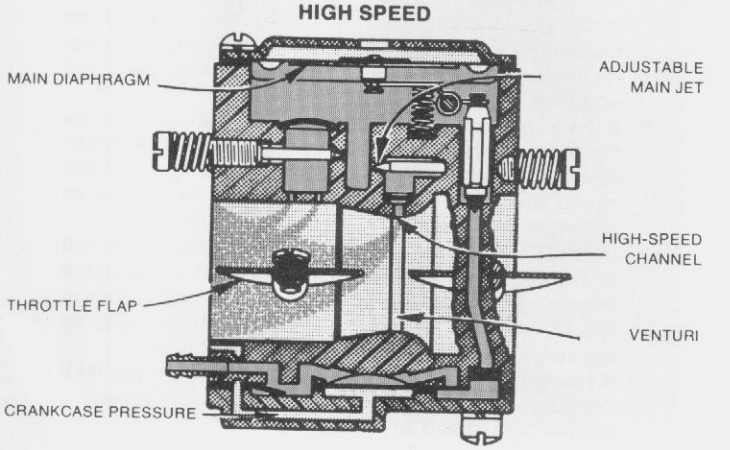
When the engine runs at idling speed, the throttle flap is partly open. The degree of partial pressure in the engine is transferred through the idling channel to the fuel chamber side of the main diaphragm through the idling fuel channel. This turn to the main diaphragm is forced downwards by the atmosperic pressure, presses down the lever since its pressure exceeds that of the thrust spring and thereby permits fuel to enter through the inlet valve and fill the fuel chamber. The fuel is then drawn up through the jet and delivered to the engine through the idling channel.



Low-speed running

The fuel is fed into and through the carburetor in the same way as when the engine is running at idling speed. When the throttle is opened, however, and engine speed increased, the engine is fed with more fuel since the acceleration channel for low-speed running which is located immediately behind the throttle flap is also exposed.

When the throttle flap is opened further and engine speed increased even more, the air velocity through the ventury increases and an area with partial pressure in the narrowest part of the venturi results in less partial pressure on the engine side of the throttle flap. When the pressure in the venturi is less than that in the main diaphragm fuel chamber, the fuel is drawn up through the jet for high-speed and out through the flow channel for high-speed and mixed with the air flow in the carburetor barrel.



High-speed running

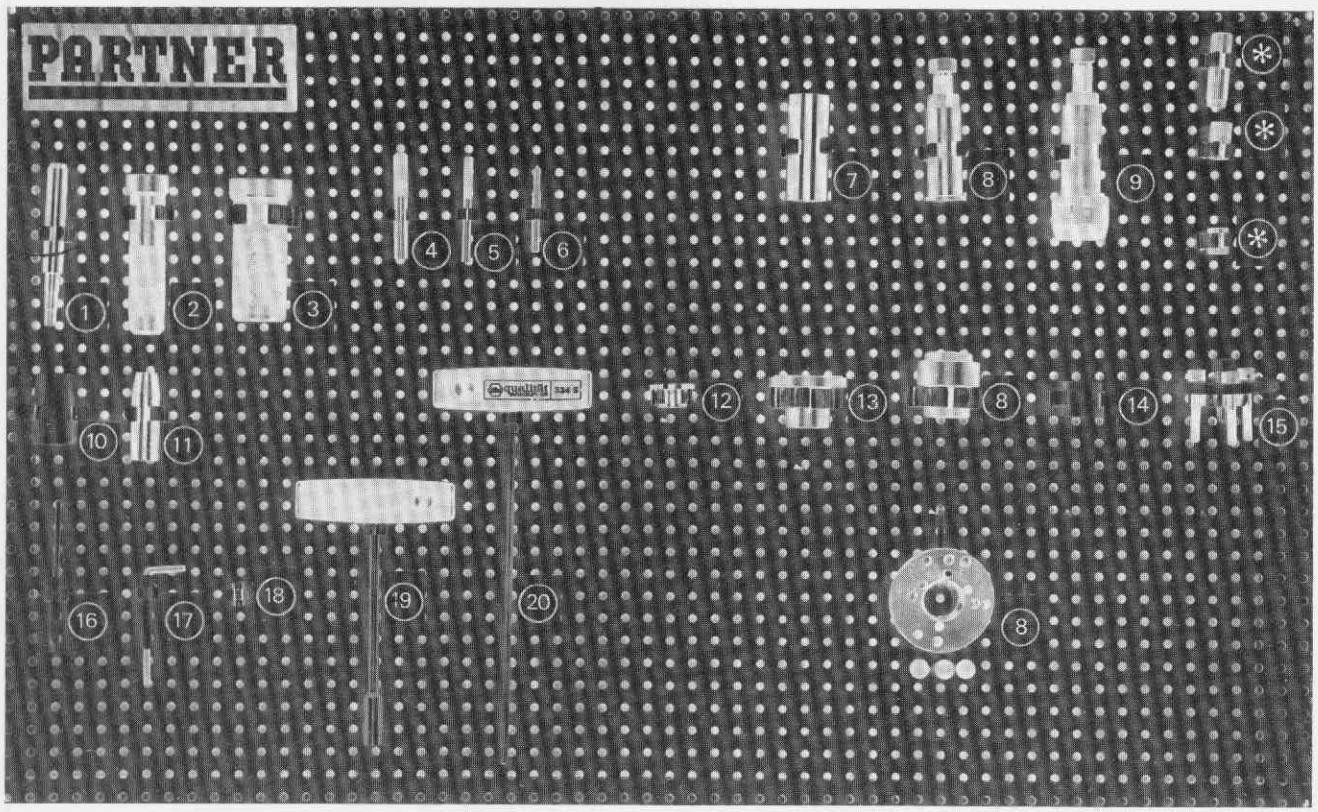
When the throttle is gradually opened from the half-open to the fully open position, there is an increase in air velocity through the venturi and fuel is sucked up through the high-speed jet and the flow channel for high-speed running in accordance with the output needed by the engine. The function of the main diaphragm is the same as that earlier described but the degree of partial vacuum needed is obtained through the flow channel for high-speed fuel.

Fault-tracing scheme

FAULT:	POSSIBLE REASON:	REMEDY:
A. Carburetor floods.	Particle of dirt or impurity preventing inlet valve at pump diaphragm from sealing.	Clean. In case of wear replace pump diaphragm.
B. The carburetor feeds too much fuel with the high-speed adjuster screw closed.	Lever spring not correctly located.	Fit spring in proper position.
	High-speed adjuster screw damaged.	Replace screw.
	Cover over high-speed channel or seat in carburetor unit not sealing.	Fit a new cower or a new carburetor unit.
The following faults can also depend on the electrical system.		
C. The engine accelerates badly or not at all.	The idling adjuster screw is screwed in too far.	Adjust.
	Faultily adjusted lever (level too low).	Adjust.
	Main diaphragm cover loose.	Tighten cover.
	Diaphragm gasket leaking.	Replace.
	Main jet blocked.	Disassemble carburetor. Clean by blowing through adjuster screw hole.
D. The engine runs badly at idling speed or does not run at all.	Faulty idling adjustment.	Adjust to obtain best idling.
	Flow channels for idling blocked.	Clean.
	Lever wrongly adjusted.	Adjust lever level with surface of material on diaphragm chamber.
	Dirty or leaking needle valve.	Clean or replace.
	The metal cover over the low-speed jet not sealing.	Replace the cover.
	Air leakage in crankcase or at carburetor.	Check seal rings, crankcase gasket, cylinder head gasket and carburetor.
E. The engine looses speed slowly.	Fuel tank air-venting blocked.	Clean.
	Leakage in fuel system from fuel tank to pump.	Tighten or replace parts or hose.
	Damaged fuel pump diaphragm.	Replace diaphragm.
	Main jet blocked.	Clean.

GROUP H

TOOLS



* Supplied together with parts 505 381809 and 505 381811

Tool panel 505 380218 with PARTNER service tools

No	Part no	Description designed for:	S50 S55 S65	P55 P70	P100	K65 K1200	5000	B400
1	505 381705	Gudgeon (piston) pin tool	X	X	X	X	X	
2	505 381709	Tool for ball bearings, etc	X	X	X	X	X	
3	505 381726	Tool for installation sleeves	X	X	X	X		
4	505 381734	Tool for expansion washer 505 316406	X	X	X	X		
5	505 381735	Tool for expansion washer 505 316407	X	X	X	X	X	
6	505 381729	Tool for carburetor valve seat	X	X	X	X	X	X
7	505 381816	Puller for pump gear					X	
8	505 381811	Puller for flywheel	X	X	X	X		
9	505 381809	Puller for seal rings	X	X	X	X	X	
10	505 381500	Tapered sleeve for seal rings	X	X	X	X		
11	505 381723	Tapered sleeve for seal rings	X	X	X	X		
12	505 381739	Installation sleeve for seal rings					X	
13	505 381732	Installation sleeve for seal rings	X	X	X	X		
14	505 267897	Flange for pump gear		X				
15	505 530219	Puller for flywheel						X
16	503 240602	Pin for flywheel	X	X	X	X	X	
17	505 381084	Wrench	X	X	X	X	X	
18	505 381927	Centering pin, chain brake	X	X	X		X	
19	505 381308	Socket wrench, 8 mm flange bolt	X	X	X	X	X	
20	505 381028	Hex wrench, 4 mm width across flats	X	X	X	X		

Besides the above mentioned tools we also supply at test apparatus 505 382903 for checking of the needle valve of the carburator.

TIGHTENING TORQUES

	Torque Nm	Torque lbf.in.
Crankcase bolts	10	85
Cylinder bolts	10	85
Spark plug	25	210
Ignition coil to armature attachment	3	25
Electronic unit to bracket	3	25
Flywheel nut	20	170
Locking device to crankcase (503 218001)	5	45
Oil pump to crankcase (723 136751)	4	35
Fan cover bolts	5	45
Silencer bolts	10	85
Carburetor bolts	5	45
Handle bolts	10	85
Clutch to crankshaft	40	350