
Workshop Manual

Chain Saws

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This manual covers models:

2036/2040

2041/2045/2050

2054/2055

625/630/670

2077/2083

2095

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General recommendations

Keep this in mind:

- Do not start the engine without the clutch and clutch drum fitted.
 - Do not touch hot parts such as the silencer and clutch before they have cooled sufficiently to avoid burn injuries.
 - Avoid getting petrol on bare skin or in the mouth.
 - Wipe up spilled oil immediately from the floor to avoid slipping and subsequent injury.
 - Do not use tools which are worn or fit badly, e.g. nuts and screws.
 - Never start the engine indoors. Exhaust fumes are toxic!
-
- + Always work on a tidy work bench.
 - + Always work methodically to be sure that all parts are correctly assembled and that screws and nuts are tightened.
 - + Use protective cream on your hands. It reduces the risk of infection and enables dirt to be more easily washed off. Prolonged contact with motor oil can be hazardous to health.
 - + Use special tools when so recommended in order to work correctly.

Fire hazard

Handle petrol with respect since it is highly inflammable.

Do not smoke and make sure that there are no naked flames or sparks in the vicinity.

Make sure that there is a functioning fire extinguisher in the vicinity.

Do not attempt to extinguish a petrol fire with water.

Toxic fumes

Read the instructions carefully when using cleaning liquids.

Make sure that there is adequate ventilation when handling petrol, trichloroethylene and other viscous liquids.

The engine exhaust fumes are toxic. Test run the engine only when there is good ventilation, preferably outdoors.



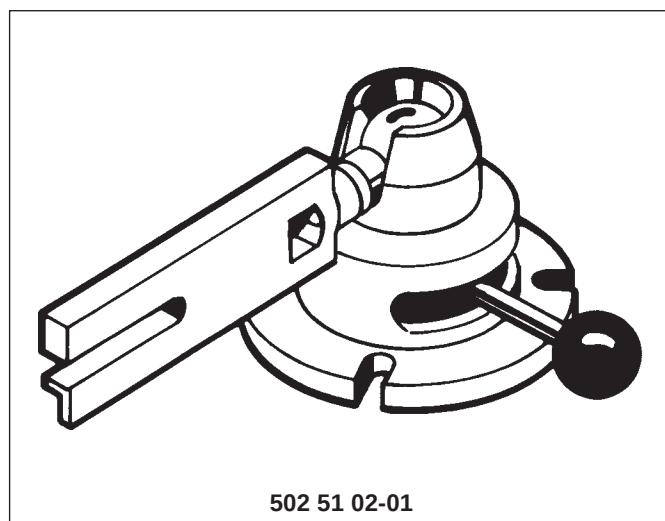
WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Special tools

Some work operations in this workshop manual require the use of special tools. In each section where this is appropriate the tool and order number are illustrated.

We recommend the use of special tools partly to avoid personal injury and partly to eliminate expensive damage to the components in question.



502 51 02-01

Sealing surfaces and gaskets

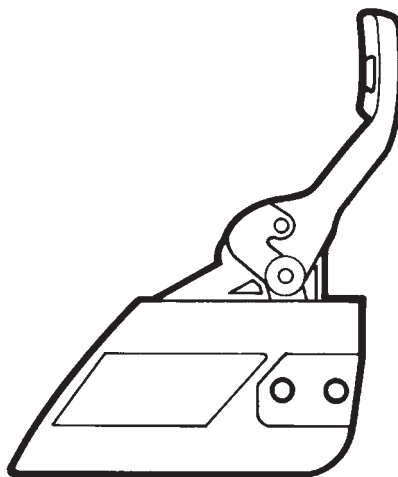
Make sure that all sealing surfaces are clean and free from the residue of old gaskets. Use a tool which will not damage the sealing surface when cleaning it. Scratches and irregularities are removed with a fine, float cut file.

Sealing rings

Always replace a sealing ring which has been dismantled. The sensitive sealing lip can easily be damaged and result in poor sealing capacity. The surface which the seal seals must also be completely undamaged. Lubricate the sealing lip with grease before it is fitted and make sure that it is not damaged, e.g. by shoulder and splines on a shaft. Use tape or conical sleeve as protection. It is important that the sealing ring is correctly turned for it to function as intended.

Safety equipment

1.



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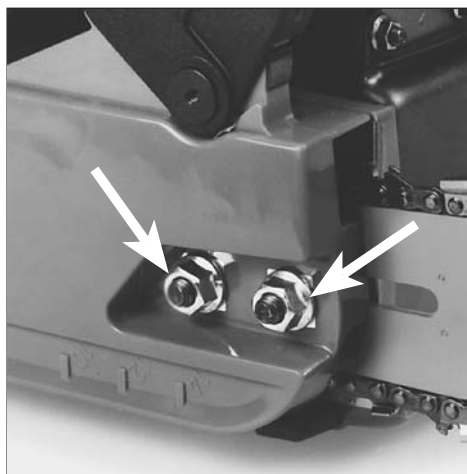
1 Safety equipment

In addition to the chain brake the chain catcher and right-hand guard on the rear handle are also considered part of the chain saw's safety equipment. It is obviously important that the chain brake functions as intended, but it is also important that the chain catcher is undamaged and in position. In the event of a chain break this will catch up the chain so that the hand will not be injured.



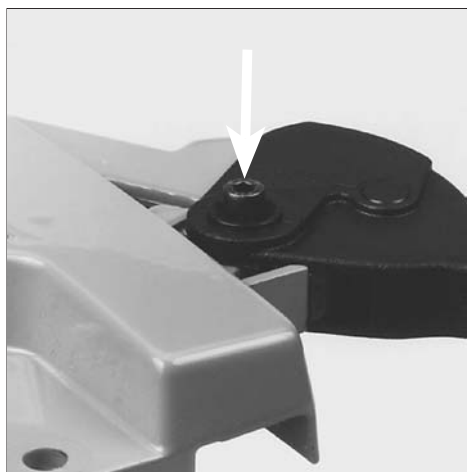
WARNING!

Protective goggles must be worn during all work on the chain brake to prevent personal injury if for some reason the brake spring should fly off.



Dismantling

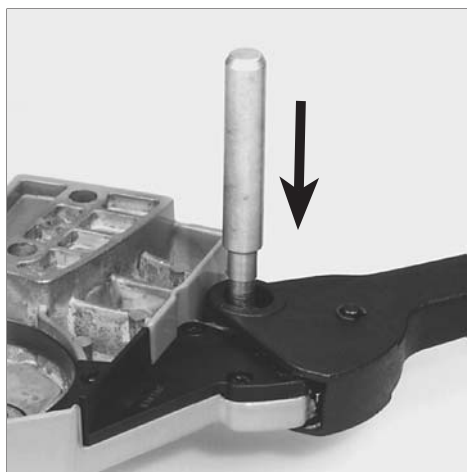
Dismantle the chain brake from the chain saw.



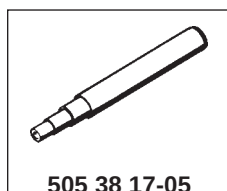
Disassembly

Release the chain brake.

Press out the one half of the hand guard's bearing.



Press out the other half of the hand guard's bearing.



505 38 17-05

Dismantling

Remove the guide bar's attachment nuts and lift off the clutch cover with the chain brake.

Clean from sawdust and dirt.



WARNING!

The brake spring is tensioned with a very large force and can cause personal injury if the brake is not released prior to further work.

Disassembly

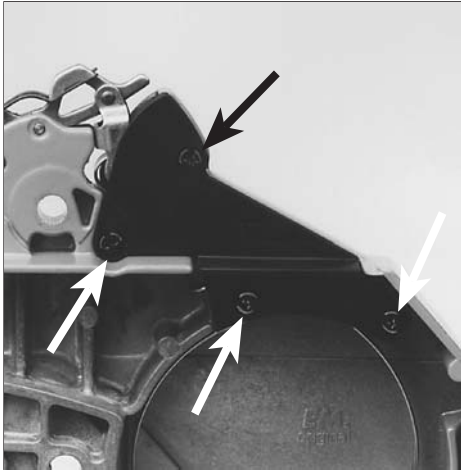
Release the chain brake.

Unscrew the screw to the hand guard's bearing completely, and then screw in approx. 2 turns.

Drive out the bearing by tapping the screw with a hammer.

Press out the other half of the bearing by means of suitable mandrel, e.g. 505 38 17-05.

Lift off the hand guard.



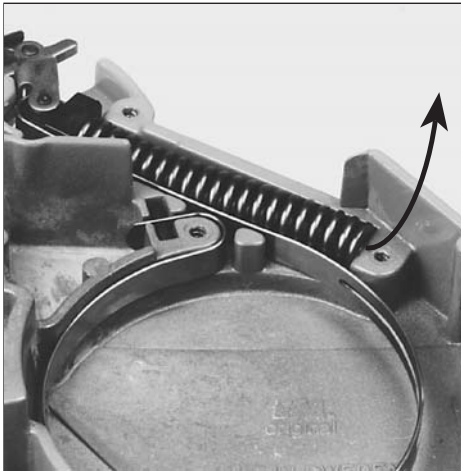
Remove the screws and the cover over the brake spring.

Remove the screws and lift off the cover over the brake spring.



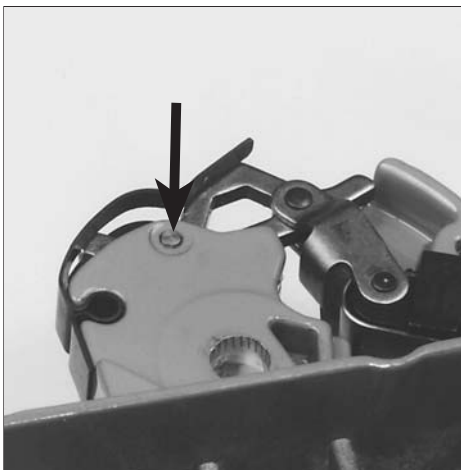
WARNING!

The brake spring is tensioned and can slip out of its position.



Bend up the brake spring.

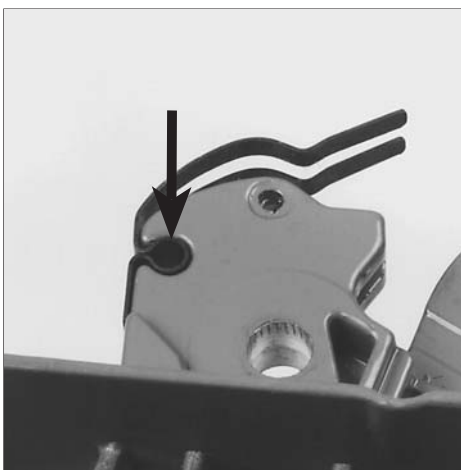
Use a screwdriver and carefully bend up the spring.



Press out the toggle-joint's bearing pin and lift off the complete brake mechanism.

Press out the toggle-joint's bearing pin by means of a suitable mandrel.

Lift off the complete brake mechanism.



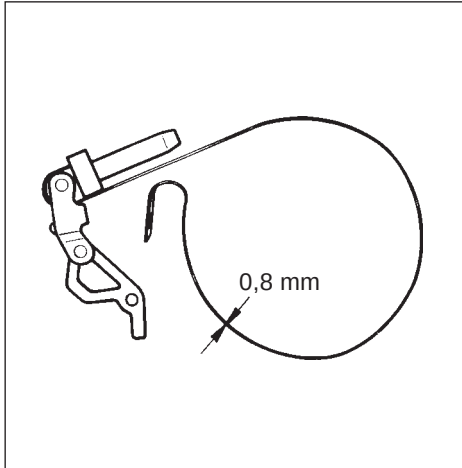
Press out the plate spring with a suitable mandrel.

Press out the plate spring with a suitable mandrel, and replace if necessary.

Clench the spring eye with a pair of pliers so that it is easier to fit the new spring.

1

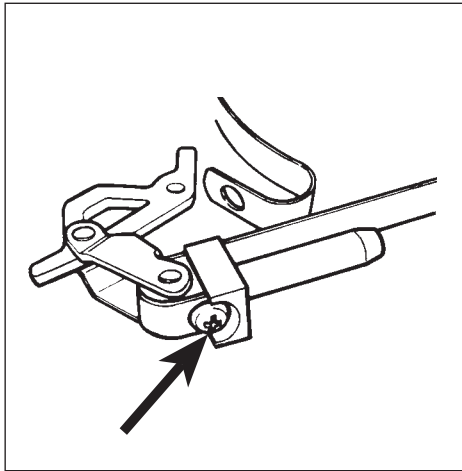
Safety equipment



The brake band must have a minimum thickness of 0.8 mm at the most worn point.

Check the wear on the brake band.

At the most worn point the band must have a thickness of at least 0.8 mm. Otherwise it should be replaced with a new band.



Remove the screw and replace the brake band.

Remove the screw and fit a new brake band.

Check after fitting that the brake band does not touch the toggle-joint and obstruct its movement.



Dismantle the lock-ring and the pin in order to replace the spring inside the hand guard.

Inside the hand guard there is a spring which is accessible for replacement after the lock-ring and pin are dismantled.

Use a small screwdriver to remove the lock-ring.

Assembly

Grease the spring and fit it in the hand guard.

Assembly

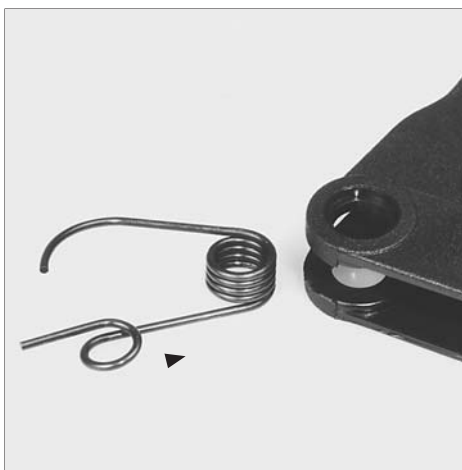
Grease the spring and push it in the hand guard as far as it goes.

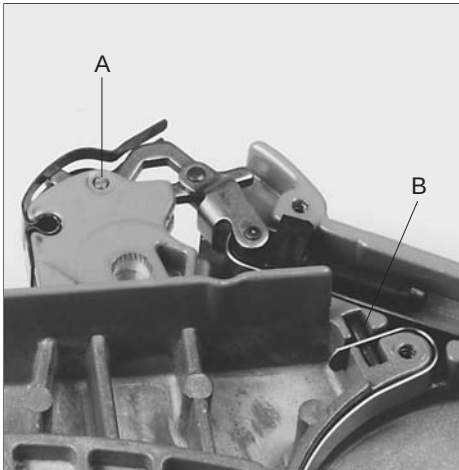
Fit the pin and lock-washer.

NOTE!

The pin should not go through the eye on the spring.

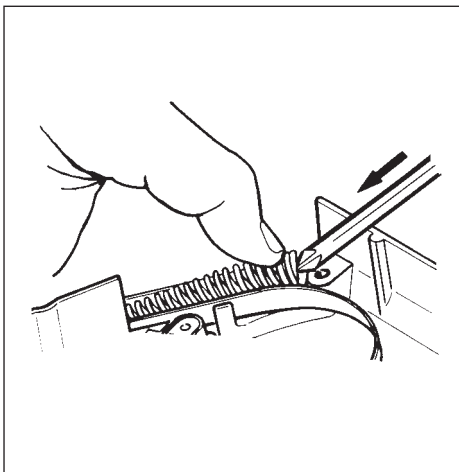
Check that the spring is turned correctly.





Fit the brake mechanism in the clutch cover.
Lubricate the bearing points with thin oil.

Place the brake mechanism in position on the clutch cover.
Press in the toggle-joint's bearing pin (A) and place the tubular pin (B) in position.
Lubricate the bearing points with thin oil.



Press down the brake spring by means of a Phillips screwdriver.
Fit the cover.

Press down the brake spring in the clutch cover by means of a Phillips screwdriver.

WARNING!

Observe care to avoid injury if the screwdriver slips.

Fit the cover over the spring mechanism.



Grease the bearing surfaces and fit the hand guard.
Check that the brake functions.

Grease the bearing points for the hand guard.
Press down the hand guard over the bearing and fit both bearing sleeves.

NOTE!

Check that the bearing sleeves are placed on the correct side.

Tension and release the chain brake a number of times to check that it functions.



Dismantling **Mod. 2054/2055**

Remove the screw, sleeve and washer for the hand guard's bearing on the starter unit side, including the clutch cover, guide bar and chain.
Clean!

Dismantling **Mod. 2054/2055**

On these models the chain brake's hand guard has an extra bearing point on the starter unit side.

Remove the screw, sleeve and washer for this bearing.

Remove the clutch cover, guide bar and chain.

Clean from sawdust and dirt.

1

Safety equipment



Dismantle the protective plate over the guide bar attachment and the chain brake.
Release the chain brake!



Remove the plate clamp over the brake spring and bend away the spring.



Remove the lock-ring round the hand guard's bearing pin and lift off the brake mechanism.



Replace the plate insert in the hand guard if the pins are worn by first pressing out the fitted pin.

Remove the protective plate over the guide bar attachment.

Remove the screws and lift off the chain brake.

Release the chain brake!



WARNING!

The brake spring is tensioned with a very large force and can cause personal injury if the brake is not released prior to further work.

Remove the screw and plate clamp over the brake spring.

Carefully bend away the spring by means of a screwdriver.

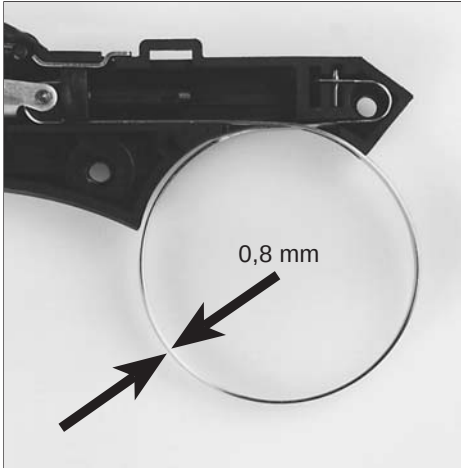
NOTE!

The spring has a certain tension even when the brake is released, and therefore it should be dismantled carefully.

Remove the lock-ring round the hand guard's bearing pin and lift off the brake mechanism.

If the pins on the plate insert in the hand guard are worn the complete insert can easily be replaced.

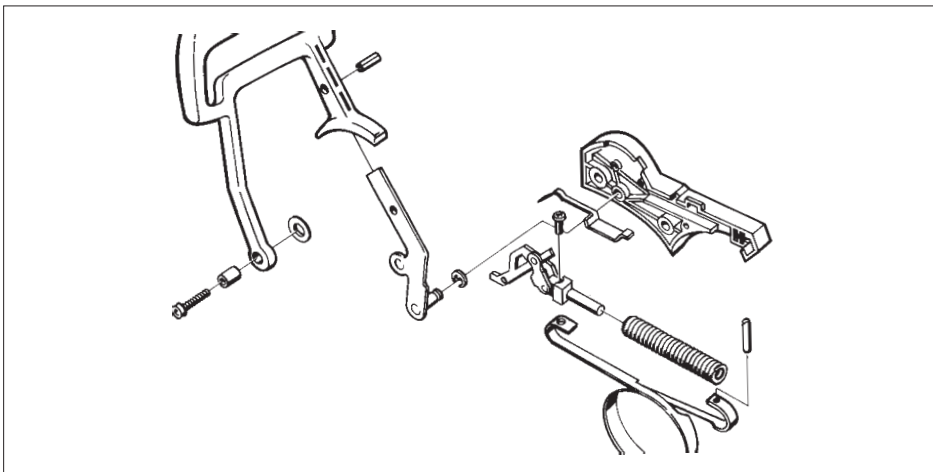
Press out the fitted pin with a suitable mandrel and replace the insert.



Dismantle the brake mechanism and replace worn or damaged parts.

Dissassemble the brake mechanism and replace worn or damaged parts.

The brake band should have a minimum thickness of 0.8 mm at the most worn place.



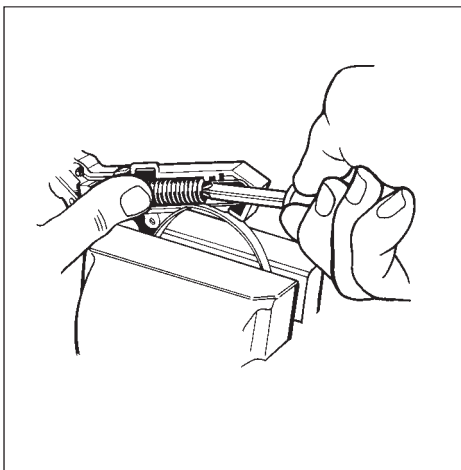
Assembly

Mod. 2054/2055

Fit the brake in the reverse order to dismantling.

Begin with by fitting the hand guard.

Lubricate all moving parts with thin oil.



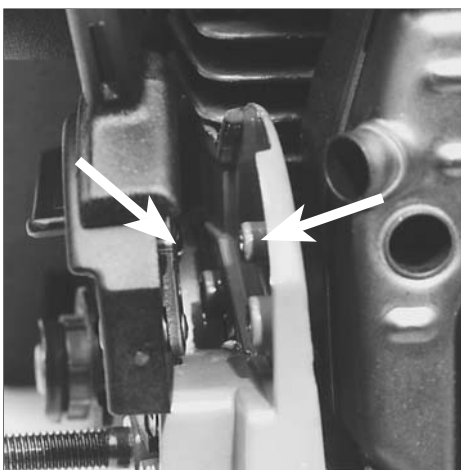
Fit the brake spring and plate clamp over the spring.

Fit the brake spring by means of a Phillips screwdriver.

WARNING!

Observe care to avoid injury if the screwdriver slips.

Fit the plate clamp over the spring.



Fit the chain brake on the crankcase.
Screw tight the cover plate over the guide bar attachment and fit the brake's bearing on the starter unit side.

Fit the chain brake on the crankcase.

NOTE!

Make sure that the guide pin on the brake fits into the hole in the crankcase before the screws are tightened.

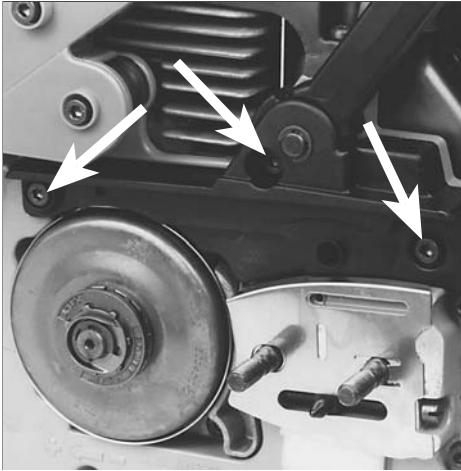
Fit the cover plate on the guide bar attachment.

Screw tight the screw for the brake's bearing on the starter unit side.

Do not forget the washer between the crankcase and brake!

1

Safety equipment



Dismantling

Mod. 2077/2083

Dismantle the chain brake's bearing on the starter unit side.

Remove the clutch cover, guide bar and chain.

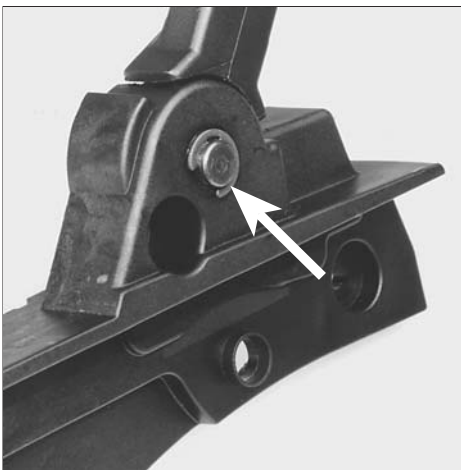
Clean!

Remove the screws and lift off the chain brake.



Release the chain brake!

Lift up the toggle-joint carefully by means of a screwdriver.



Dismantle the hand guard.



Press the hand guard out of the bearing.

Dismantling

Mod. 2077/2083

Remove the screw, sleeve and washer for the chain brake's bearing on the starter unit side.

Remove the clutch cover, guide bar and chain.

Clean from sawdust and dirt.

Remove the screws and lift off the chain brake.

Release the chain brake!



WARNING!



The brake spring is tensioned with a very large force and can cause personal injury if the brake is not released prior to further work.

Lift up the toggle-joint carefully by means of a screwdriver.

Hold your hand over.

NOTE!

The other end of the spring is controlled by a pin which goes into the centre.

For this reason do not try to lift up the spring there.

Dismantle the hand guard.

Remove the lock-ring by means of a small screwdriver.

Hold your thumb over so that the ring does not fly away.

Press out the hand guard from the bearing.



WARNING!

Observe care so that the spring loaded catch does not fly away.



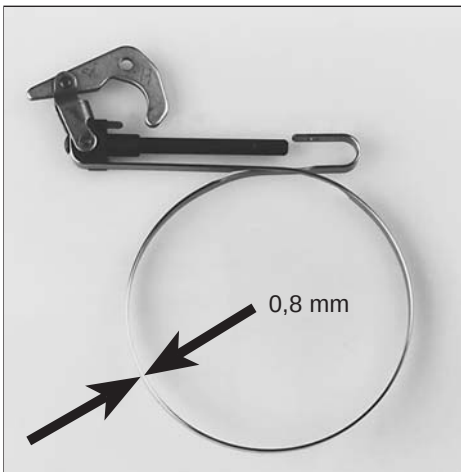
Replace the hand guard's bearing pin if it is worn.

Press out the sprung tubular pin and pull out the plate insert from the hand guard.

The hand guard's bearing pin can now easily be replaced.

Press out the spring tensioned tubular pin and pull out the complete plate insert from the hand guard.

Replace the insert if the bearing pin is worn.



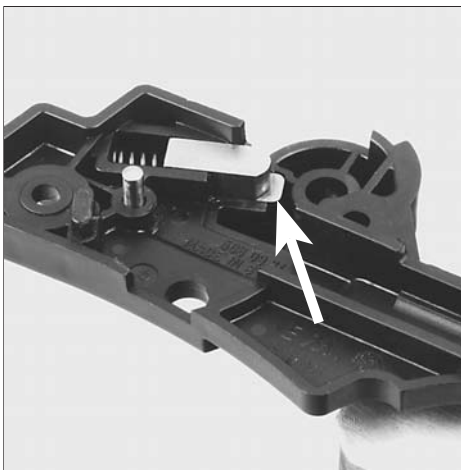
Clean and check all parts.

The thickness of the brake band should be at least 0.8 mm.

Clean all the parts of the chain brake and check them for wear or damage.

The brake band should have a minimum thickness of 0.8 mm at the most worn part.

Replace the brake band if it is worn more than this.



Assembly Mod. 2077/2083

Fit the brake in the reverse order to dismantling.

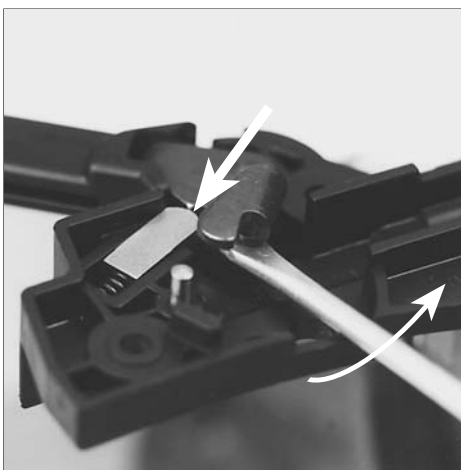
Assembly Mod. 2077/2083

Fit the brake in the reverse order to dismantling.

Begin by fitting the hand guard.

Lubricate the bearing pin and catch with oil.

Place the catch in position with the extruding part downwards.

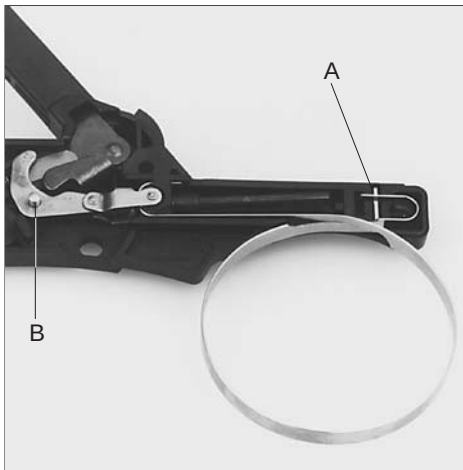


Press down the hand guard in the correct position.

Press away the catch by means of a screwdriver and press down the hand guard in the correct position.

Fit the lock-ring on the bearing pin.

1 Safety equipment

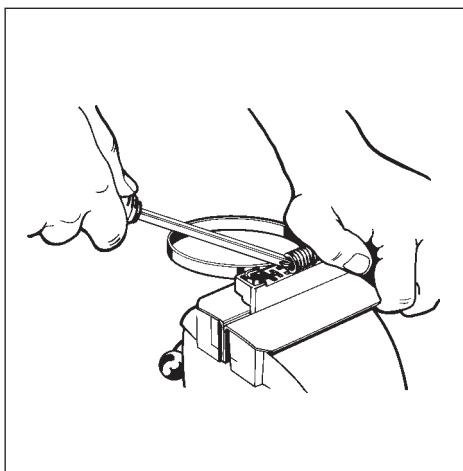


Fit the brake band (A) and place the toggle-joint in position over its bearing pin (B).

Press down the brake band in its rear attachment (A).

Place the toggle-joint in position over its bearing pin (B).

Make sure that it is correctly positioned.

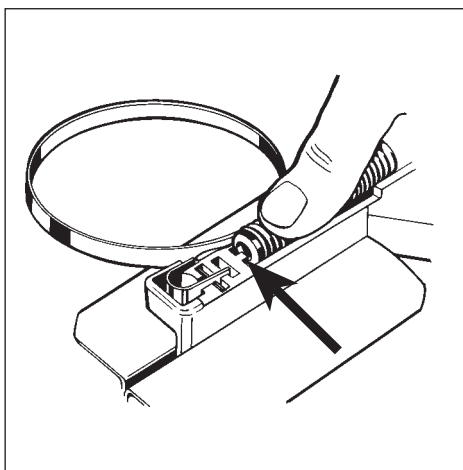


Press together the brake spring far enough so that the guide pin in the back of the spring housing is released.

Press the brake spring over the guide pin.

Push the guide sleeve in the spring and outside of the guide pin.

Press the spring together by means of a suitable Phillips screwdriver far enough so that the guide pin in the back edge of the spring housing is released.

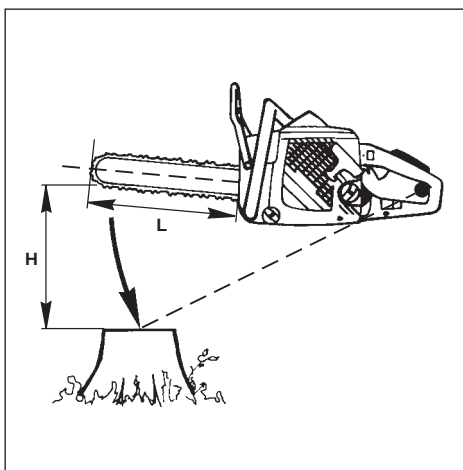


Press down the spring and check that the pin goes into the centre of the spring.

Press down the spring and check that the pin goes into the centre of the spring.

Fit the chain brake on the engine.

Check that the guide pin on the chain brake goes into the corresponding hole in the crankcase.



Checking of the automatic function

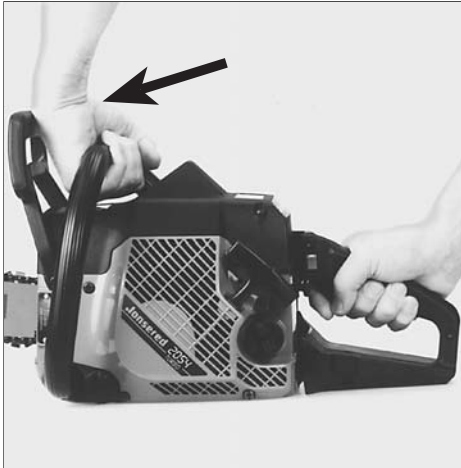
NOTE!

The engine should be switched off during this check.

Hold the saw approx. H mm over a stable object.

Release the front handle and allow the saw to turn round the back handle by virtue of its own weight. When the guide bar point hits the object the brake should be activated.

H, cm/inch	L, inch
45/14	11 – 16
55/22	18 – 22
65/26	24 – 28
80/32	30 – 36



Checking of the brake effect

Start the engine.
Hold the handle with both hands and rev up.
Release the chain brake by turning the left wrist towards the hand guard without releasing the grip round the front handle. The chain should stop immediately.

Checking of the brake effect

Place the saw on a stable surface and start the engine.
Hold the handle with both hands and rev up.
Release the chain brake by turning the left wrist towards the hand guard without releasing the grip round the front handle. The chain should stop immediately.



Chain catcher

Replace the chain catcher if it is deformed or cracked.

Chain catcher

The chain catcher has the purpose of catching the chain if it breaks.
It is therefore important that it is not deformed or cracked. Replace if this should be the case.



Throttle lock Dismantling

Remove the screws.

Throttle lock Dismantling

Remove the screws which hold the handle halves together and where appropriate also the screw which holds the spring for the vibration damper.



Remove the handle half, throttle control and lock.

Lift off the handle half and throttle control together with the lock.

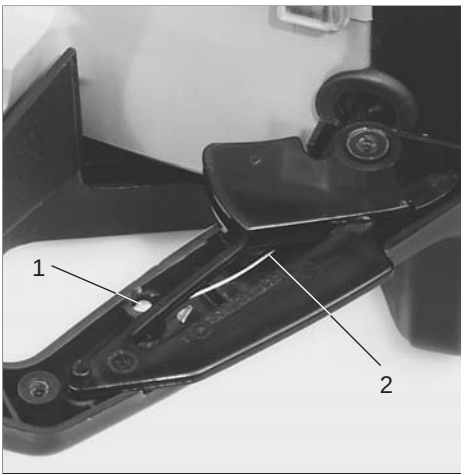
1

Safety equipment



Fitting, mod. 2036/2040

Fit in the reverse order to dismantling.



Check that the throttle cable is correctly fitted.

Do not lubricate!



Fitting mod. 2041/2045/2050

Check that the throttle cable is correctly fitted.

Do not lubricate!



Fitting mod. 2054/2055

Check that the spring and throttle cable are correctly connected.

Fitting mod. 2036/2040

Replace any damaged parts and fit in the reverse order to dismantling.

Note the following:

- Make sure that the spring comes on the correct side of the barrier in the throttle control.

- Check that the throttle cable's ball lug sits in the recess (1).
- Check that the throttle cable is flush with the cam curve on the throttle control (2).
- Do not lubricate!

Fitting mod. 2041/2045/2050

Note the following:

- Fit the throttle cable from the correct side in the throttle control.
- Check that the throttle cable is correctly positioned so that it is not clenched when the handle half is fitted.
- Do not lubricate!

Fitting mod. 2045/2055

Note the following:

- The positioning of the spring in the throttle control.
- The connection of the throttle cable from underneath to the throttle control catch.
- Do not lubricate!

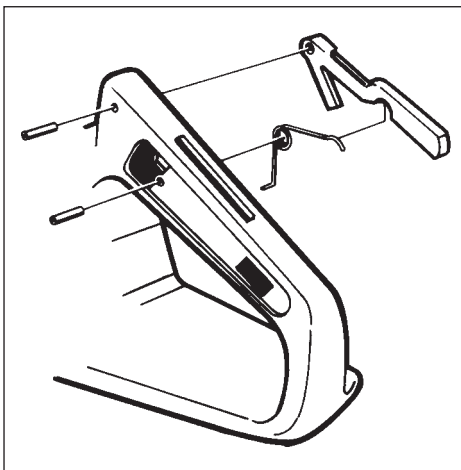


Dismantling mod. 625/630/670

Press out the fitted pin and dismantle the cover.

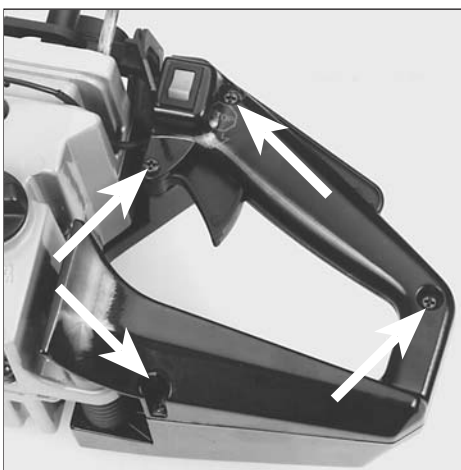


Dismantle the spring and throttle control lock.



Fitting mod. 625/630/670

Fit the throttle control lock in the reverse order to dismantling.



Dismantling mod. 2095

Dismantle the handle half.

Dismantling mod. 625/630/670

Press out the fitted pin approx. 13-14 mm so that the throttle control lock comes loose.

Dismantle the covers by means of pressing a screwdriver into the back edge of the covers.

If the handle is electrically heated see chap. 3 "Electrical system".

Press out the sprung tubular pin which is located behind the cover far enough so that the spring and the throttle control lock can be lifted off.

Fitting mod. 625/630/670

Replace damaged or worn parts and fit in the reverse order to dismantling.

NOTE!

The sprung tubular pin should go through the spring eyelet.

Dismantling mod. 2095

Remove the screws and lift off the handle half.

**Fitting mod. 2095**

Replace damaged or worn parts and fit in the reverse order to dismantling.

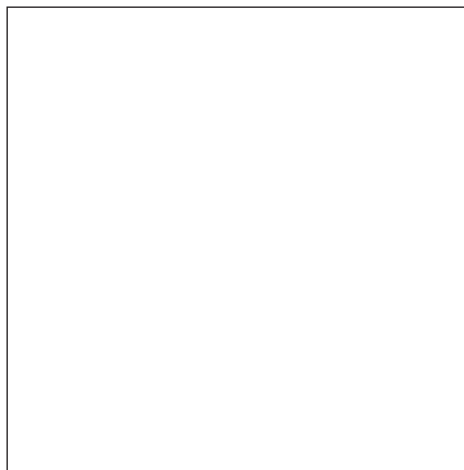
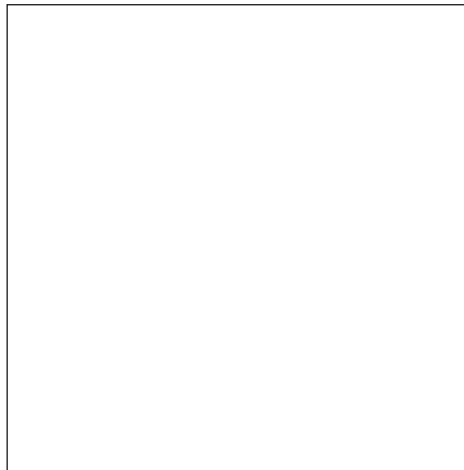
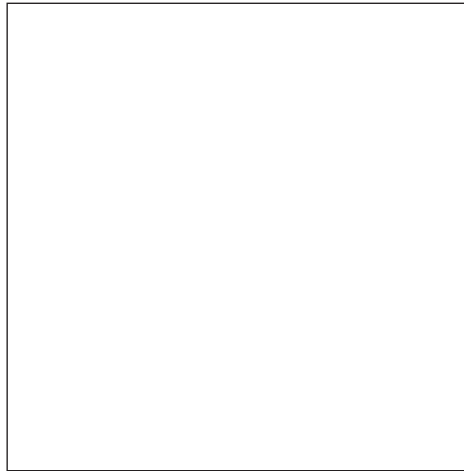
Fitting mod. 2095

Replace damaged or worn parts.

Fit in the reverse order to dismantling.

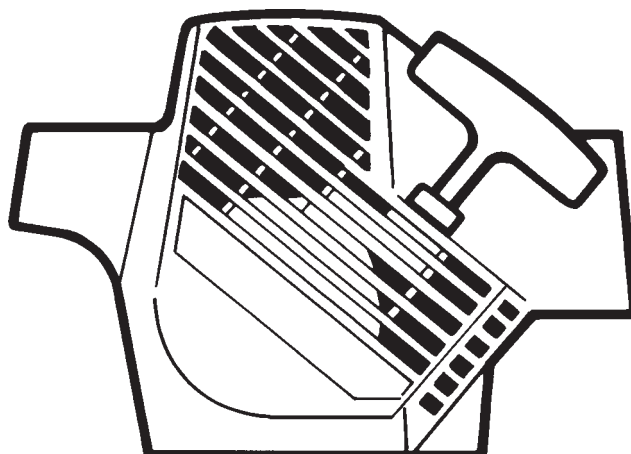
Pay attention to the following:

- The spring's straight shank should be fitted in the throttle control lock (1).
- Make sure the throttle wire housing is well pressed down in the recess (2).
- Check that the short-circuiting cable sits in the recess so that it is not clenched when the handle half is screwed tight.



Starter unit

2.



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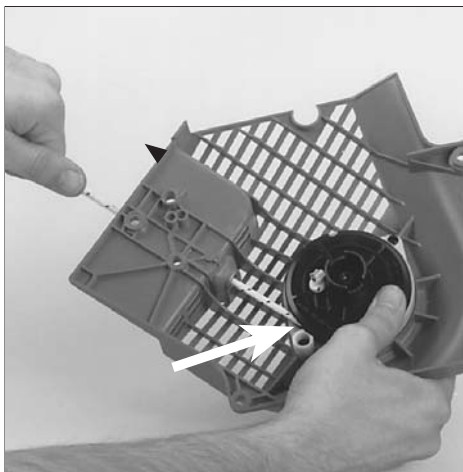
WARNING!

When working on the starter unit wear protective glasses to avoid eye injuries in the event that the return spring flies out.

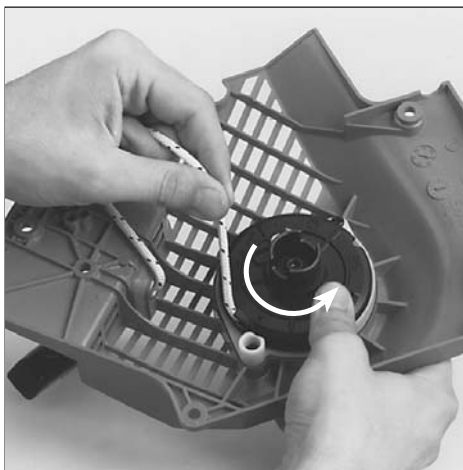


Dismantling

1. Dismantle the starter from the engine unit.



2. Release the spring tension.



3. Allow the pulley to slowly rotate backwards.

Dismantling

1. Remove all screws and lift off the starter.

2. Release the spring tension.

Pull out the starter cord approx. 30 cm. Brake the cord wheel with the thumb and place the cord in one of the recesses on the pulley.

3. Allow the pulley to slowly rotate backwards.

NOTE!

Brake the rotation with the thumb.



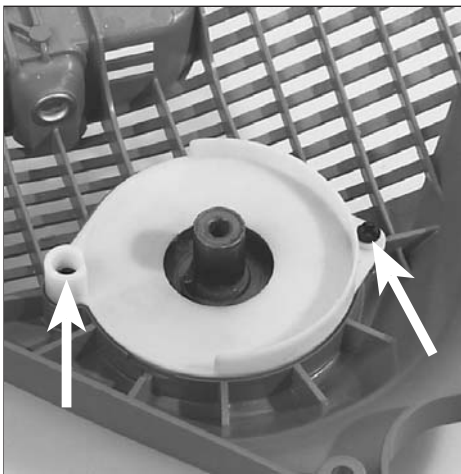
WARNING!

Observe care so that the thumb is not injured by the reinforcement ribs on the pulley or the cord's attachment screw.



4. Remove the screw and the washer.

4. Remove the screw and washer in the centre of the pulley.



5. Remove the pulley and spring cassette, and return spring.



WARNING!

Wear protective glasses.

5. Lift off the pulley carefully.

6A. Remove the screws which hold the spring cassette and lift off.



WARNING!

Wear protective glasses. The return spring can fly out and cause injury.



6. Dismantle the cover disc and return spring from the starter unit housing.



WARNING!

Wear protective glasses.

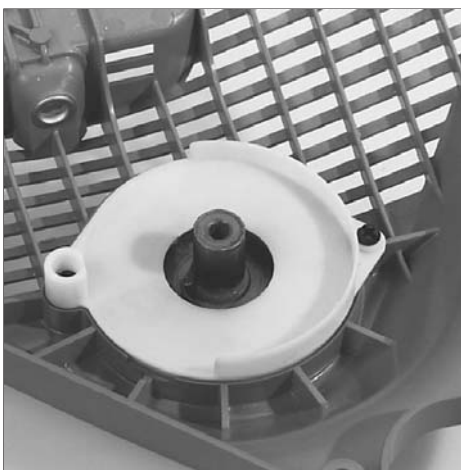
6B. Remove the screws which hold the cover disc over the return spring.

Dismantle the spring by giving the starter housing a sharp tap against the work bench with the spring turned downwards.



WARNING!

Wear protective glasses. The return spring can fly out and cause injury.



Replacing return spring

Dismantle the pulley as described above.

A. Fit a new spring cassette.

Replacing return spring

Dismantle the pulley as described above.

A. Place a new spring cassette in the starter housing and tighten the screw(s).

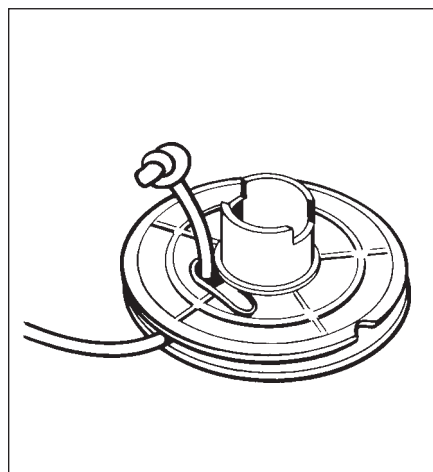
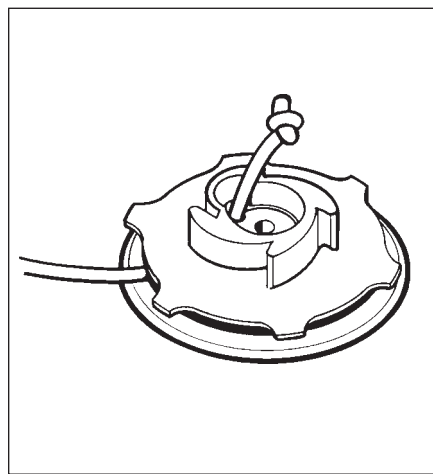
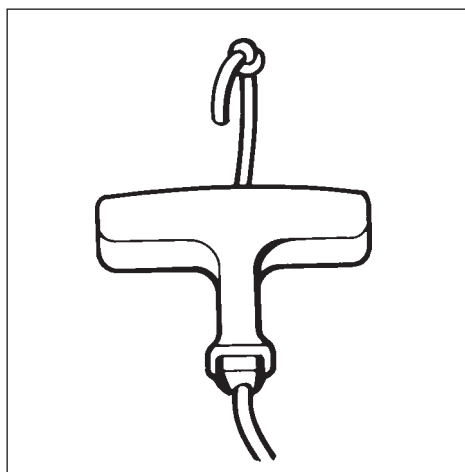
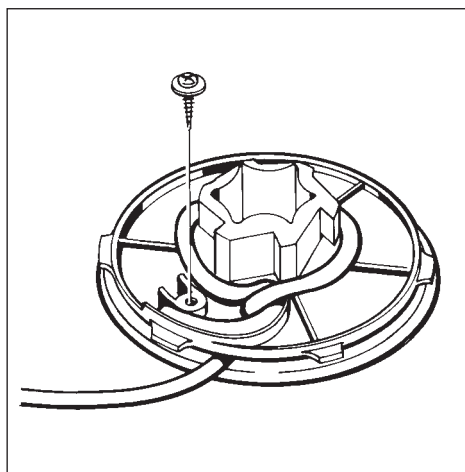
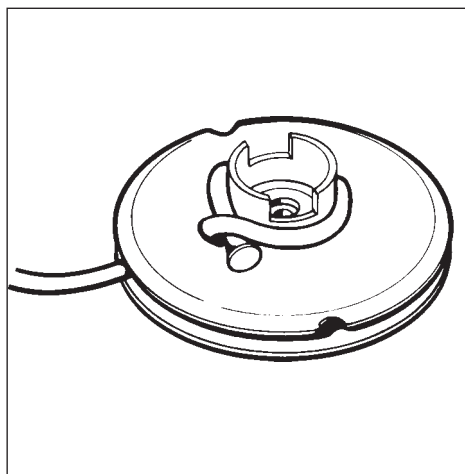


B. Press down a new spring in the starter housing.



WARNING!

Wear protective glasses.



2. Anchor the cord in the starter handle.

B. Return spring without cassette.

Leave the lock shackle round the spring in position.

1. Place the spring over its seat in the starter housing.
2. Press down the spring in the correct position by means of the thumbs and let the lock shackle slide over the spring.
3. Fit the cover plate off the spring.



WARNING!

Wear protective glasses.

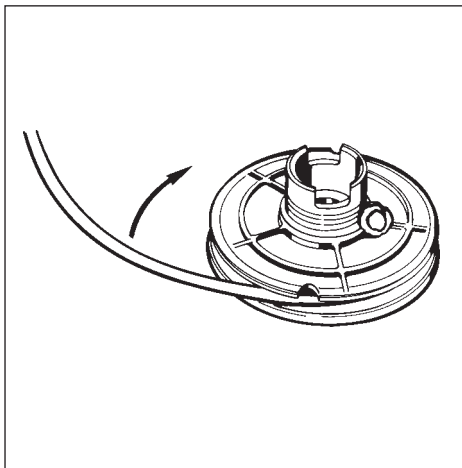
Replacing starter cord

1. Fit and lock the cord at the pulley as per one of the methods shown in the diagrams.

Tips!

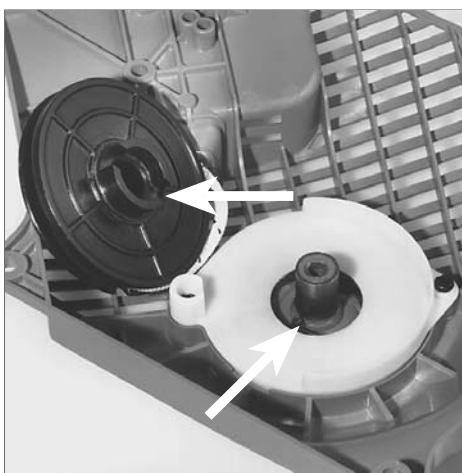
The knot on the starter cord in the starter handle may be difficult to untie. It is easier if the knot is first knocked with a hammer against a hard surface.

2. Enter the cord through the socket in the starter housing and anchor it in the starter handle by means of a knot. Fold down the free end and pull the knot securely into the handle.

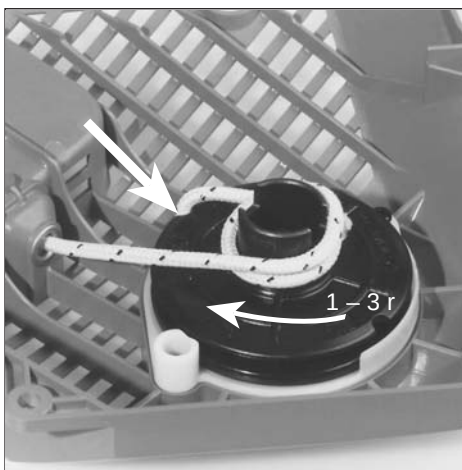


Assembly

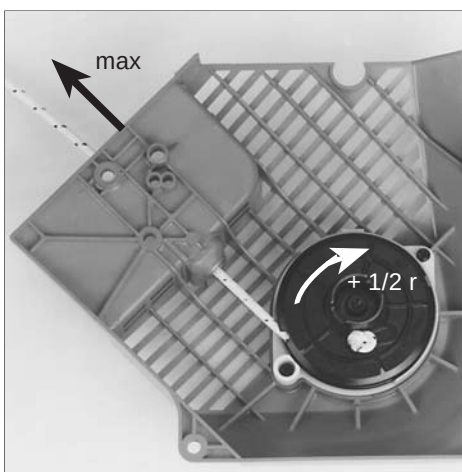
1. Wind the cord approx. 4 turns clockwise round the pulley.



2. Fit the pulley.



3. Increase the spring tension.



4. Check the spring tension.
With a fully withdrawn cord it should be possible to turn the pulley *at least another half turn*.

Assembly

1. Wind the cord approx. 4 turns clockwise round the pulley.

2. Lubricate the pulley's bearing pin and the return spring with a few drops of motor oil or non-freezing lubricant and fit the pulley.

Check that the return spring grips the pulley. The spring may require to be bent out further from the bearing pin.

3. Put the washer in place and tighten the screw.

4. Increase the spring tension.

With a fully withdrawn cord it should be possible to turn the pulley *at least another half turn*.

Tension the spring more by:

- Pulling the cord approx. 30 cm and braking the pulley with the thumb.
- Lift up the cord in one of the recesses on the pulley.
- Wind the cord 1-3 turns clockwise round the hub of the pulley.
- Pull out the starter cord fully.

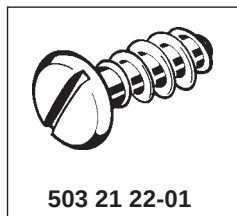
5. Check the spring tensions.

With a fully withdrawn cord it should be possible to turn the pulley *at least another half turn*.

Repeat the spring tensioning if necessary.



5. Assemble the starter in the reverse order to dismantling.



503 21 22-01

Replacing starter pawls

See chapter 3 "Electrical system".

6. Assemble the starter.

Pull out the starter cord a little. Put the starter in position. Release the starter cord and check that the pawls grip the pulley.

Tighten the screws.

NOTE!

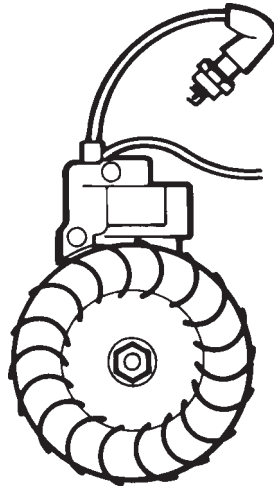
If the threads in the crankcase (made of plastic) are for any reason damaged an oversize screw (No. 503 21 22-01) is recommended.

Replacing starter pawls

See chapter 3 "Electrical system".

Electrical system

3.



Contents

Checking ignition spark	24
Replacing spark plug protection	26
Dismantling	28
Starter pawls	20
Assembly	30
Electrically heated handles	31
Replacing the generator	33

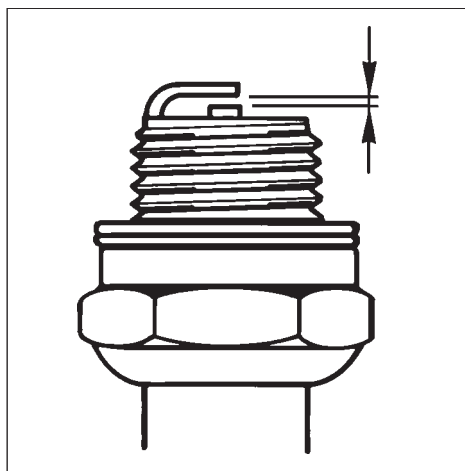
The chain saw is fitted with an electronic system consisting of flywheel, ignition coil, and trigger unit. Certain saw models are fitted with a generator system to heat the handles and carburettor.

The ignition system is electronic and completely without moving parts. A defective component cannot be repaired and must be replaced.

The ignition spark in an electronic ignition system has a very short burn time and may therefore be experienced as weak and sometimes difficult to see during trouble shooting.

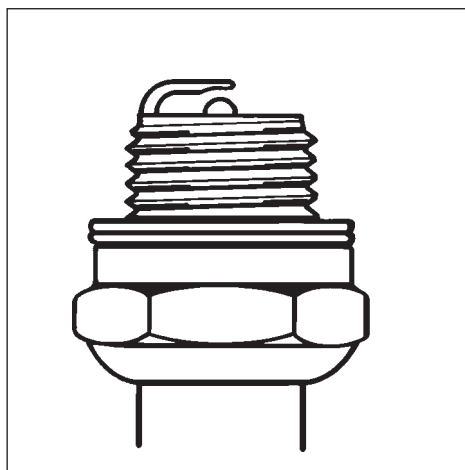
NOTE!

When testing the chain saw's heating system the guide bar, chain and clutch cover must be fitted before the engine is started!

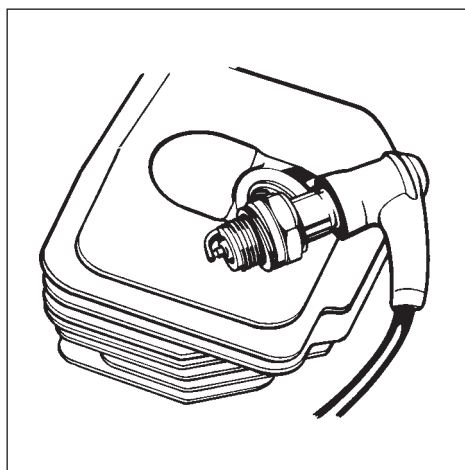


Checking ignition spark

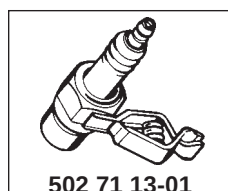
Clean the electrodes and check the electrode gap.



If the electrodes are worn down more than 50% the plug should be replaced.



Check if there is a spark when starting. Try with test plug No. 502 71 13-01 if there is no spark.



502 71 13-01

Checking ignition spark

Remove the plug and clean from soot by means of steel brush.

Check the electrode gap. It should be 0.5 mm – 0.7 mm (.020 – .028").

Adjust the gap to correct value with side electrode.

If the electrodes are worn down more than 50 % the plug should be replaced.

An overlarge gap implies stress on the ignition module and the risk of short circuiting.

Make sure that the stop contact is in start position.

Earth the plug to the cylinder and pull the start handle.

There should be a spark between the electrodes.

If there is no spark try with the test plug No. 502 71 13-01.

If there is a spark the fault lies in the plug. Replace plug.



Try with a new plug
If there is no spark disconnect the short circuiting contact.
Replace the contact if necessary.

Try with a new plug.
If there is still no spark remove the short circuiting cable from either the ignition module or short circuiting contact.
If there is no spark the fault lies in the stop contact.
Replace the contact.



Mod. 2077/2083

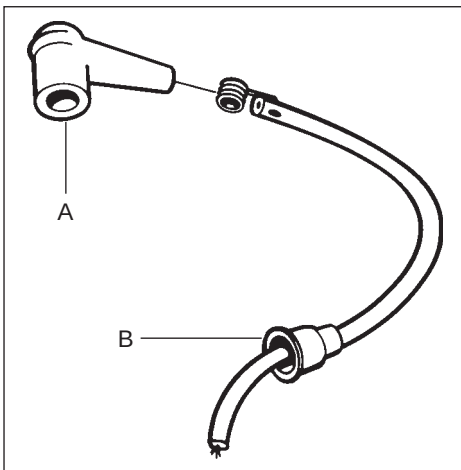
Check that the earth cable is undamaged and that it has metallic contact with the crankcase.

Mod. 2077/2083

Check that the earth cable between the crankcase and stop contact is undamaged and that it has metallic contact with the crankcase.

Use an ohm-meter and measure the resistance in the cable between the stop contact and connection at the crankcase.

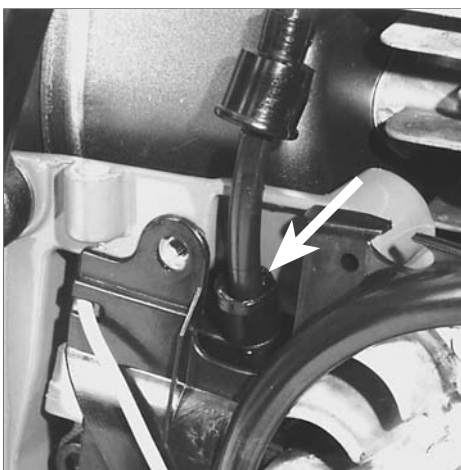
The instrument should give a full reading if the cable is in good condition.



Check the connections of the ignition cable.

Still no spark?
Check the plug connection.

Pull off the rubber protection at the plug (A) and ignition module (B) and check that the ignition cable is undamaged. Cut off a piece of the cable to ensure good contact.



Lubricate the cable ends with grease.

Lubricate the cable ends with a little grease to simplify fitting and prevent moisture from penetrating into the connections.



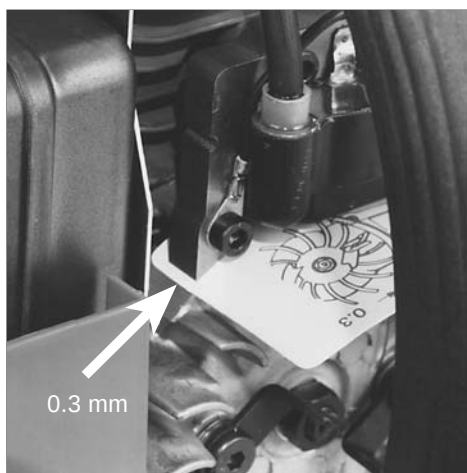
Check other cables and connections.

Still no spark?

Check the other cables and connections for poor contact (dirt, corrosion, cable break and damaged insulation).

Tips!

Use an Ohm-meter to check if there is a cable break, e.g. as a result of pinching.

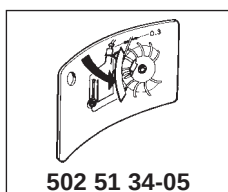


Check the air gap.

Still no spark?

Check the air gap between the flywheel permanent magnet and ignition module. The gap should be 0.3 mm (.012").

Use air gap measure 502 51 34-05.

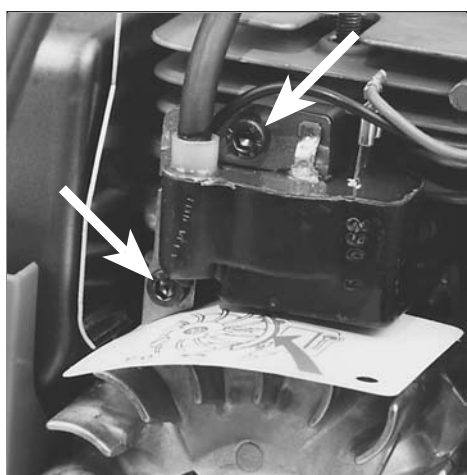


Adjust the air gap.

Adjust the air gap to correct size.

- Release screws.
- Place the feeler gauge and press the ignition module to the flywheel.
- Tighten the screws and check the air gap again.

If there is still no spark the ignition system should be replaced.

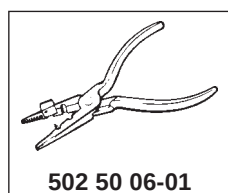
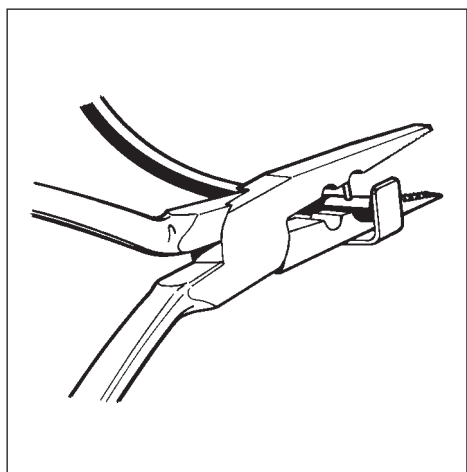


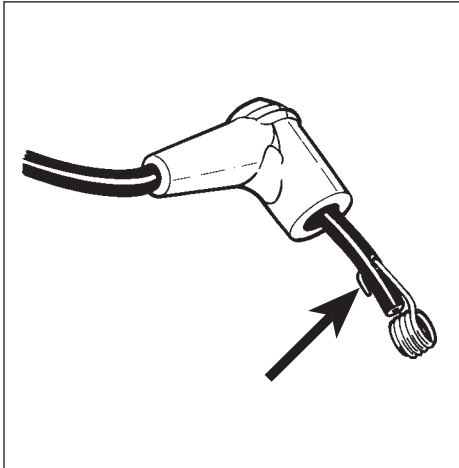
Replacing spark plug protection

1. Take ignition cable through the spark plug protection.
2. Make a hole in the ignition cable for the contact spiral.

Replacing spark plug protection

1. Lubricate the ignition cable with a little grease and take it through the plug protection.
2. Cut off a piece of the ignition cable (approx. 5 mm, .20") and make a hole in the cable for the contact spiral by means of pliers No. 502 50 06-01.





3. Fit the contact spiral on the ignition cable.

3. Fit the contact spiral on the ignition cable and make sure that the wire is folded along the cable.
4. Pull the contact spiral into the spark plug protection.

NOTE!

It is important that the point of the contact spiral meets the middle of the ignition cable to prevent sparking.



Dismantling

Dismantle the plug, cylinder cover, starter unit, and air bar.

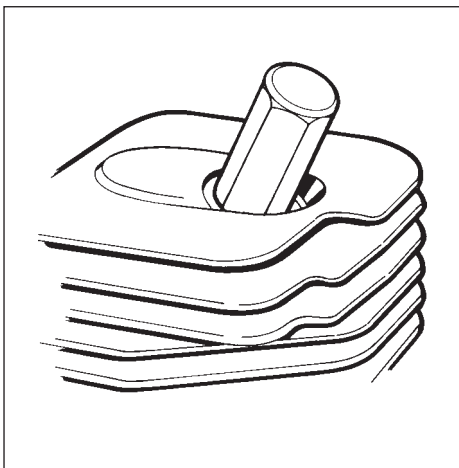
Dismantle the ignition module and release the other cable connections.

Dismantling

Dismantle the plug, cylinder cover, starter unit, and air conductor.

Dismantle the ignition module by removing the two screws.

Release the other cable connections and lift off the ignition module.



Fit a piston stop No. 504 91 06-05 alt. 502 50 33-01 in the spark plug hole.

Fit a piston stop No. 504 91 06-05 alt. 502 50 33-01 in the spark plug hole.

Make sure that the piston stop is screwed down to the bottom.



Dismantle the starter pawls.

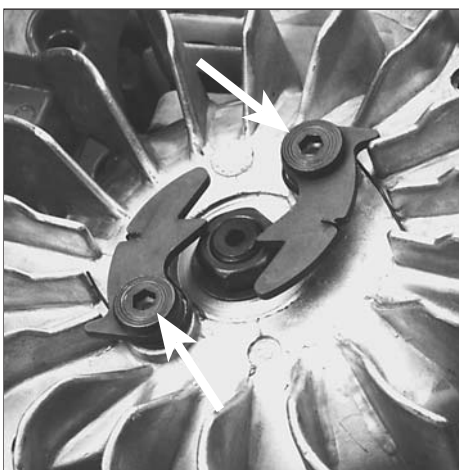
Mod. 2054/2055

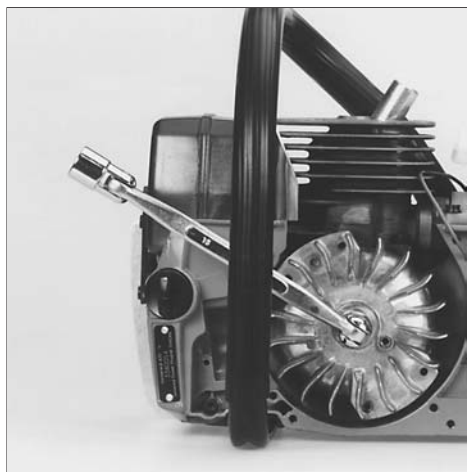
On earlier versions of these models the starter pawls sit on a bridge which can be lifted off when the flywheel nut is dismantled.

Dismantle the starter pawls by releasing the screws. Make sure that the small washer close to the flywheel is not mislaid.

Mod. 2054/2055

On earlier versions of these models the starter pawls sit on a bridge which can be lifted off when the flywheel nut is dismantled.

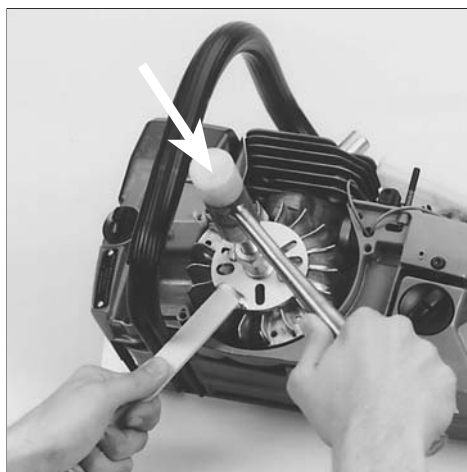




Remove the flywheel nut.



Pull off the flywheel.



Tips!

If the flywheel is tight give a few smart taps with a hammer on the extractor screw.



Mod. 2036/2040

Dismantle the flywheel by using a hammer.



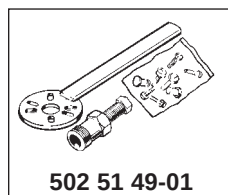
502 51 94-01

Remove the flywheel nut by means of a suitable socket wrench.

Pull off the flywheel by means of withdrawing tool 502 51 49-01 which is screwed in the hole for the starter pawls.

NOTE!

Centre the withdrawing tool over the shaft centre. Select suitable screws and tighten the withdrawing tool.



502 51 49-01

Tips!

The flywheel may sit very tightly on the shaft.

To simplify dismantling give a few smart taps with a hammer on the extractor screw. Hold the chain saw in the air with the handle on the withdrawing tool.

Mod. 2036/2040

Thread the nut on the shaft to protect the threads.

Snap the springs loose and fold down the starter pawls to leave space for the hammer.

Grip the flywheel and lift up the engine unit.

Give a few smart blows with the hammer on the flywheel nut until the flywheel releases from the shaft.

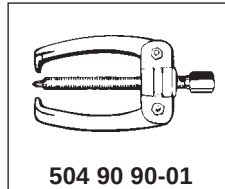
Tips!

Use a pressure piece to protect the threads on the shaft and so that it is also easier to use the hammer.



Mod. 2054/2055

Pull off the flywheel.



504 90 90-01

Mod. 2054/2055

Pull off the flywheel by means of ball bearing puller No. 504 90 90-01.

NOTE!

The claws on the tool should be placed on and opposite the permanent magnet on the flywheel so that this is not damaged.

Is the flywheel stuck?

Lift up the engine unit by holding the tool and hit the tool screw a few times with a hammer.



Starter pawls

Check the starter pawls for wear and damage.

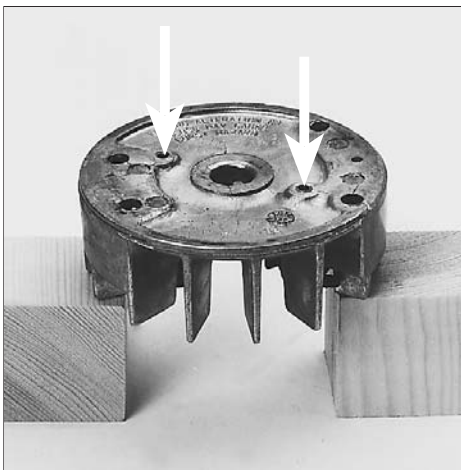
Replace damaged parts.

Starter pawls

Check the starter pawls for wear and damage.

Replace damaged parts.

For starter pawls which are mounted on a separate bridge the entire unit must be replaced.



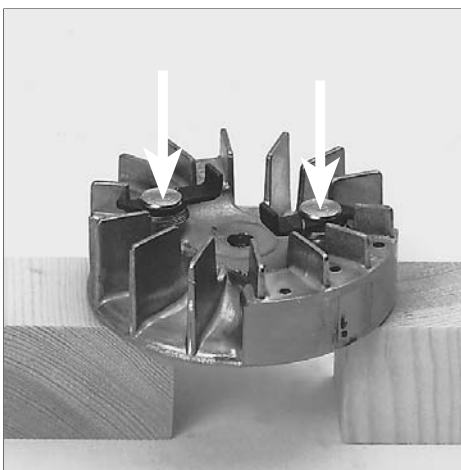
Mod. 2036/2040

Press out the journals by means of a suitable mandrel.

Mod. 2036/2040

Replace the starter pawls and springs in the following way if they are housed on a journal pressed in the flywheel.

Place the flywheel on support blocks and press out the journals by means of a suitable mandrel.

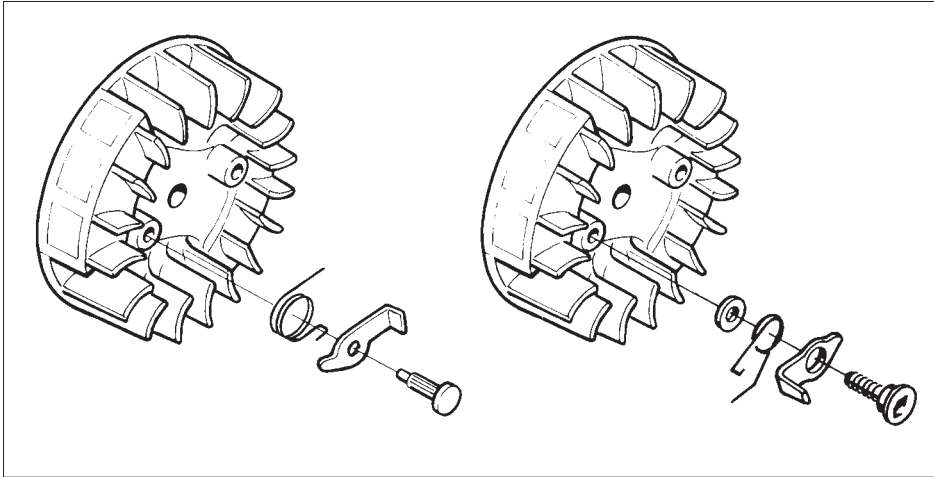


Replace damaged parts.

Replace damaged parts.

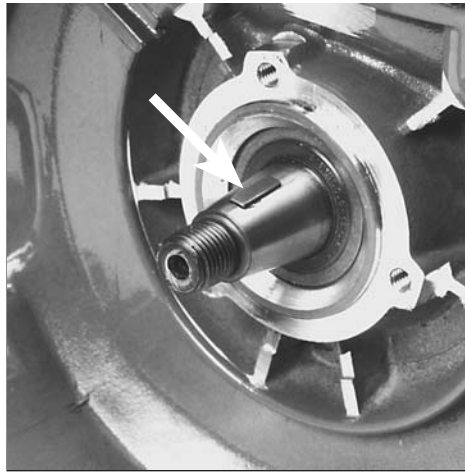
Make sure that the spring is not pinched when the journal is pressed into the flywheel.

Check that the starter pawls move easily.



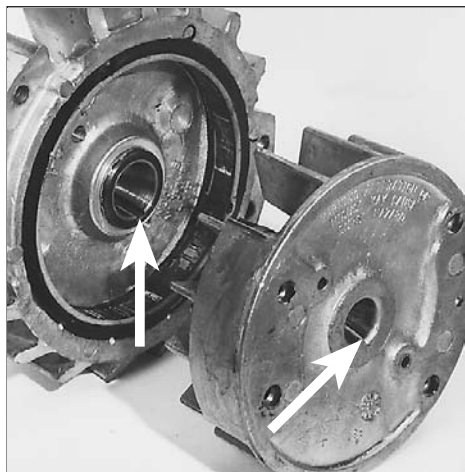
When fitting the starter pawls check the following:

- Washer between flywheel and starter pawls.
- The spring is not clenched.
- The starter pawls move freely.
- Use Locktite on the screw.



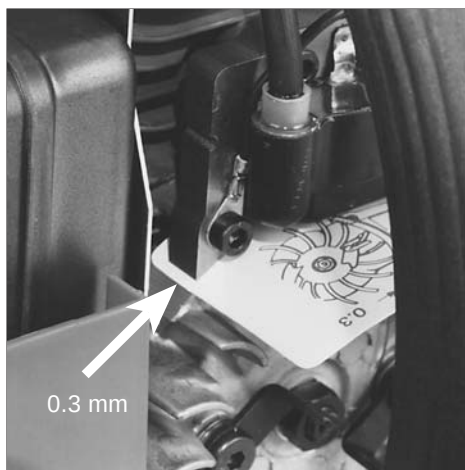
Assembly

Check that the keyway and key in the crankshaft are undamaged.



Check that the keyway and the cast key respectively in the flywheel are undamaged.

Fit the flywheel.



Fit the ignition module.

Adjust the air gap (0.3 mm, .012")

Fit the other cables.

Fit the other parts in the reverse order to dismantling.

Assembly

Check that the keyway and key in the crankshaft are undamaged.

Fit a new key and make sure that it fits correctly in the keyway.

Check that the keyway and cast key respectively in the flywheel are undamaged.

Fit the flywheel on the crankshaft and check that the key and keyway are correctly positioned before the flywheel nut is tightened.

Tighten the nut to a torque of 25–35 Nm

Fit the ignition module

Adjust the air gap to the correct size (0.3 mm, .012").

See also page 26.

Fit the other cables and make sure that they are correctly positioned in cable grooves etc. so that they cannot be damaged.

Fit the other parts in the reverse order to dismantling.



Electrically heated handles

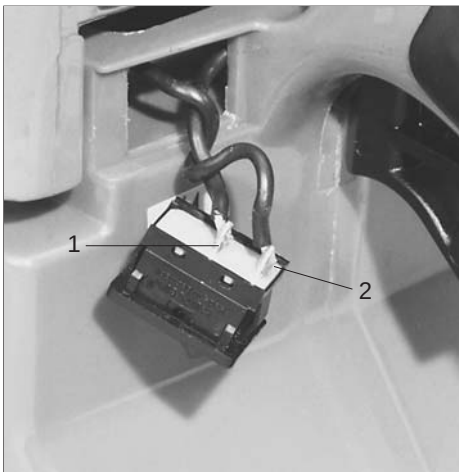
Certain of our chain saws are fitted with electric heating of both the front and rear handles.

Electrically heated handles

The requisite output is generated by a generator placed behind the flywheel.

The electrical system is maintenance free and is controlled by means of a switch on the left-hand side of the chain saw.

The generator's max. output is 80 W.



Trouble shooting in heating system

Use a universal tool set for resistance measuring during trouble shooting.

Trouble shooting in the heating system

Measure the resistance (Ohm) in the different heating coils.

Use a universal instrument set for resistance measuring.

Checking the switch

Dismantle the switch. Bend with a small screwdriver.

Connect the measuring instrument between the two connections on the switch (1) and (2).

When the heat is switched on the indicator should give a reading, and vice versa when switched off.



Mod. 625/630/670

Checking rear handle element

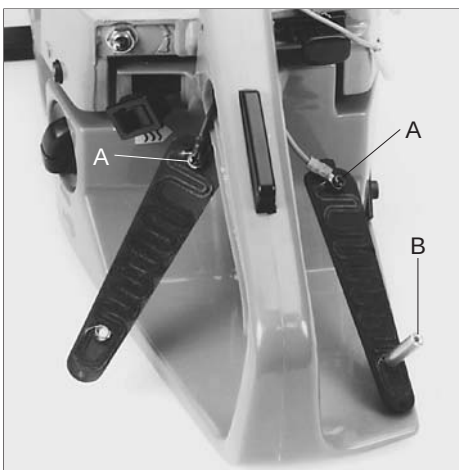
Dismantle the cover plate and screw on each side of the handle.

Mod. 625/630/670

Checking of rear handle element

In order to dismantle the handle element (for checking or replacement) the plastic cover plates over the screws must be removed.

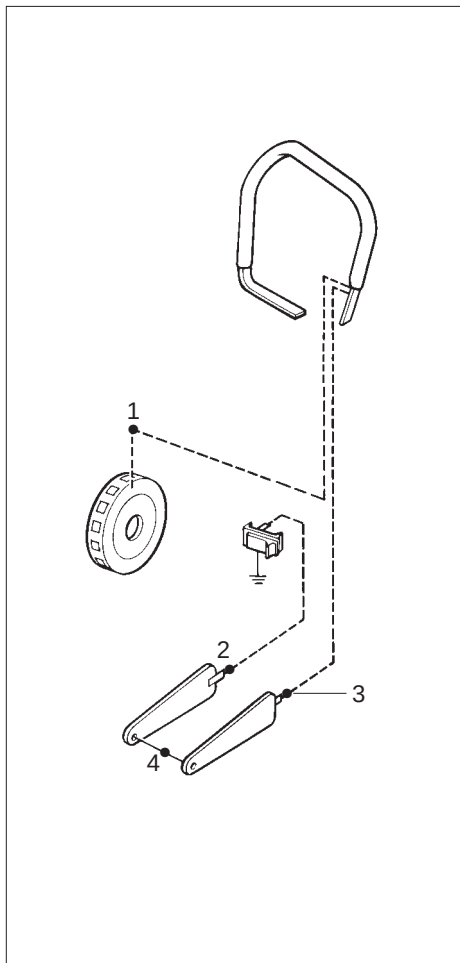
Carefully drill a small hole in the plate (so as not to damage the underlying screw heads) on each side of the handle and then bend off with a pointed object.



Fold out the heater element from the handle to check.

Fold out both heater elements from the handle so that they become accessible for checking.

The most common fault is oxidation at the cable connections (A) and in the rear socket-contact (B).



Clean and measure *both* handle inserts between points 2 and 3. The switch should be in the switched off position. Correct measurement value: 1.4 - 1.8 Ohm.

If the values measured differ from the recommended values measure each insert separately.

Connect the instrument between points 4 and 2, and 4 and 3.

Correct measurement value for one handle insert: 0.7 - 0.9 Ohm.

Checking of the front handle element

Connect the measuring instrument between the points 1 and 3. The heater switch should be switched off. Correct measurement value: 4 Ohm $\pm$ 0.5 Ohm.

If the heater element is defective the complete front handle must be replaced.

Checking of all heater coils

The two rear handle inserts and front handle are checked as follows:

Connect the measuring instrument between points 1 and 2. The switch should be switched off.

Correct measurement value: 5.1 - 5.7 Ohm.

Deviations in the values can be the result of defective components, oxidation, flash-over or a break in the circuit.

Checking of the generator

The voltage is measured when the chain saw is run at approx. 10.000 rpm. Measure between point 1 and the crankcase. The switch should be switched on and all heater coils connected. Correct measurement value: approx. 20 volts at 10.000 rpm.

Possible faults:

- Break in generator's windings.
- Weak magnetisation in the flywheel.
- Cable break.

WARNING!

The chain, guide bar and clutch cover must be fitted before the chain saw is started.

Mod. 2054/2055

Checking of the front handle element

Connect the measuring instrument between the points 2 and 3. The heater switch should be switched off. Correct measurement value: 5 Ohm $\pm$ 0.5 Ohm.

The complete front handle must be replaced if the heater element is defective.

Checking of the carburettor heating

Connect the measuring instrument between the points 4 and 5. The heater switch should be switched off. Correct measurement value: 5 Ohm $\pm$ 0.5 Ohm.

Checking of the rear handle element

The rear handle insert is checked as follows:

Connect the measuring instrument between points 2 and 6 (earth). The switch should be switched off.

Correct measurement value: 0 Ohm $\pm$ 0.1 Ohm.

Deviations in the value can be the result of defective components, oxidation, flash-over or a break in the circuit.

Checking of all heater coils incl. the carburettor element

Connect the measuring instrument between point 1 and earth.

Correct measurement value with switch in position handle heating: 5 Ohm $\pm$ 0.5 Ohm.

Correct measurement value with switch in position distributor heating: 5 Ohm $\pm$ 0.5 Ohm.

Checking of the generator

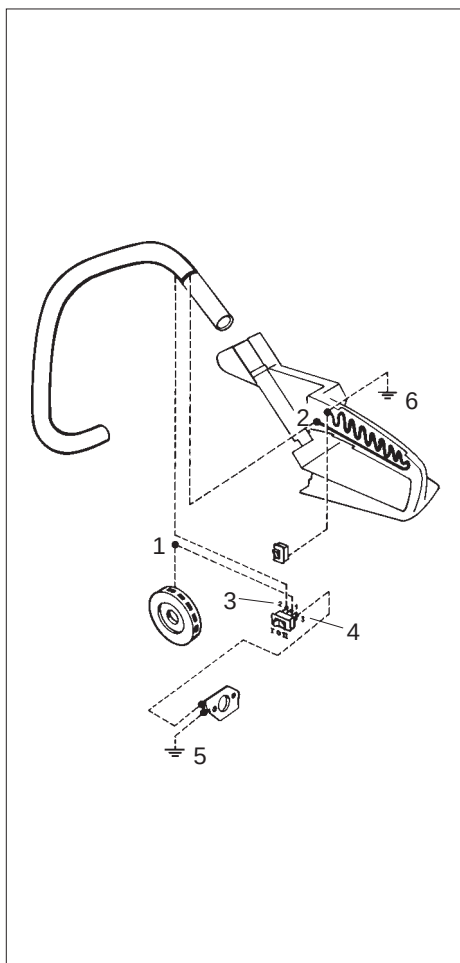
The voltage is measured when the chain saw is run at approx. 10.000 rpm. Measure between point 1 and the crankcase. The switch should be switched on and all heater coils connected. Correct measurement value: approx. 20 volts at 10.000 rpm.

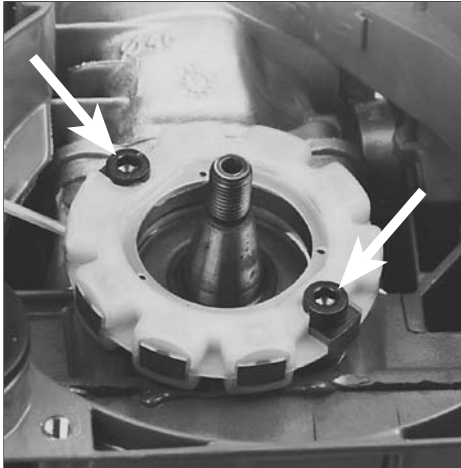
Possible faults:

- Break in generator's windings.
- Weak magnetisation in the flywheel.
- Cable break.

WARNING!

The chain, guide bar and clutch cover must be fitted before the chain saw is started.





Replacing the generator

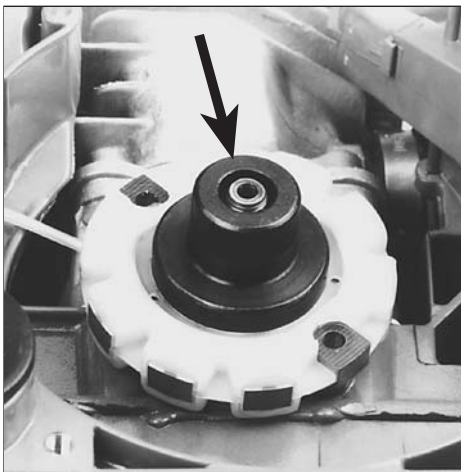
Replace the generator if it does not provide sufficient voltage.

Replacing the generator

The generator must be replaced if the voltage proves to be insufficient when checked.

The generator is placed behind the flywheel.

Remove the screws and lift off the generator.

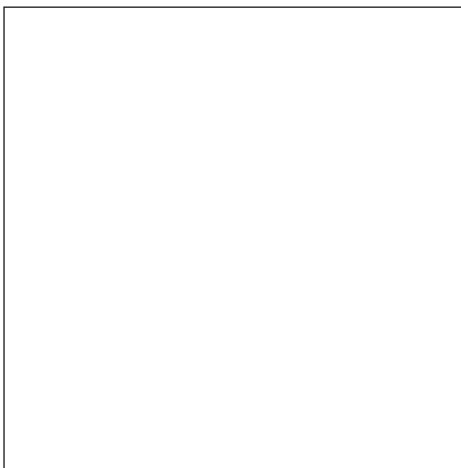
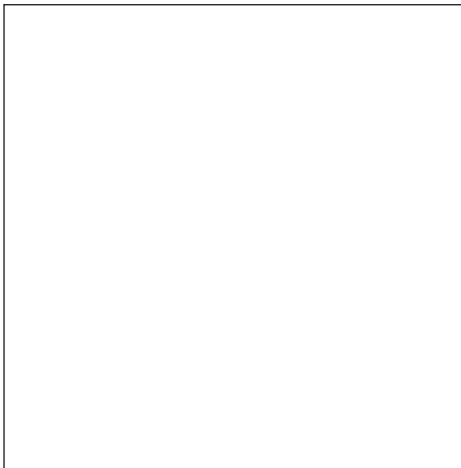


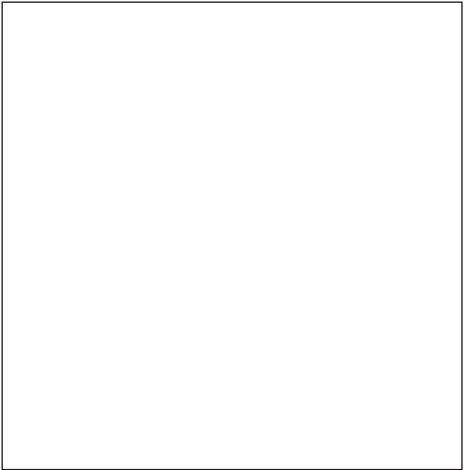
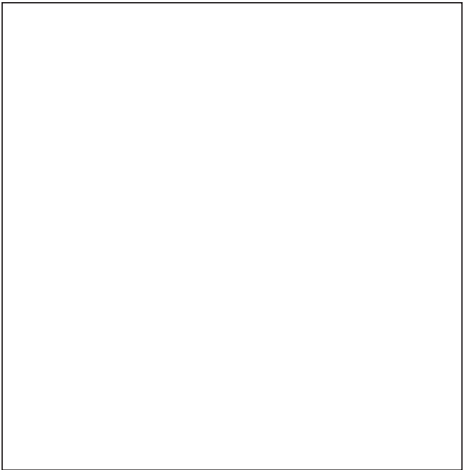
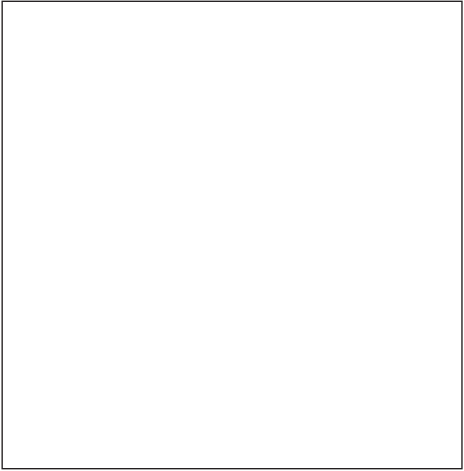
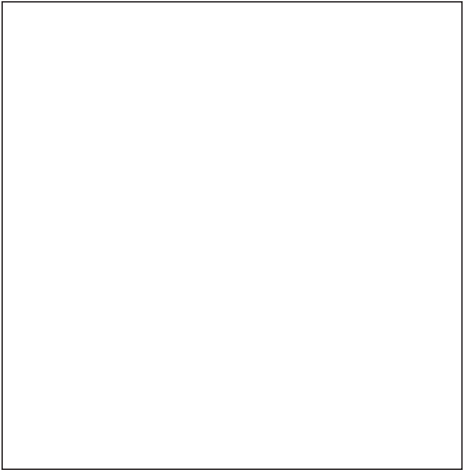
Place the new generator in position and centre it before tightening the screws.

Place the new generator in position against the crankcase. Check that the cable is not clenched.

Use mandrel No. 502 71 23-01 to centre the generator to the crankshaft.

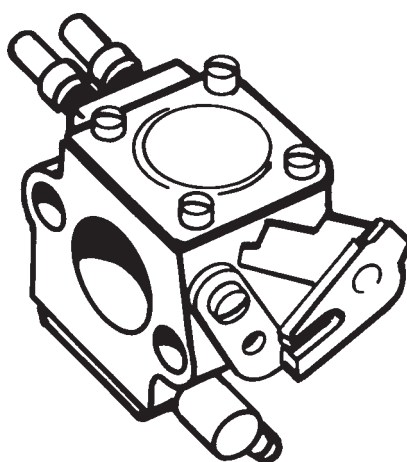
Tighten the screws.





Fuel system

4.



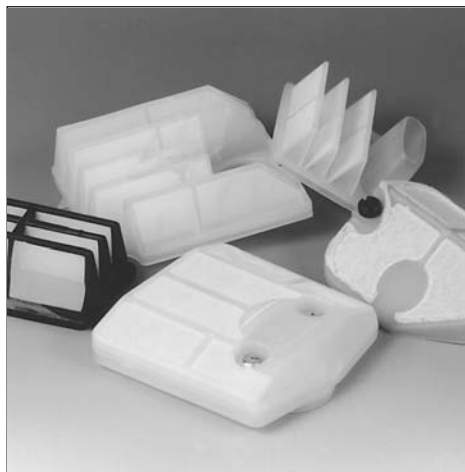
Contents

Air filter	36
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Carburettor	38
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Carburettor setting	49
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In addition to the fuel tank and carburettor, the fuel system also includes the air filter, fuel filter and tank vent.

All these components interact to ensure that the engine will have the optimum mixture of fuel and air to make it as efficient as possible. Very small deviations in the carburettor setting, or fouling of the air filter, have a great effect on the running and efficiency of the engine.

There are different makes of carburettors on our different models, but the function and repair techniques are basically the same.



Air filter

Dismantle the cylinder cover and air filter cover so that the filter is accessible.

The material in the air filter can be either felt or fine mesh nylon.

Both types are cleaned with lukewarm soapy water.

A damaged filter should be replaced with a new one.

Dismantle the air filter from either the carburettor or the holder.

Clean also the holder/cover before the cleaned filter is refitted.

Air filter

Dismantle the cylinder cover and air filter cover so that the filter is accessible.

The material in the air filter can be either felt or fine mesh nylon.

Both types are cleaned with lukewarm soapy water.

A damaged filter should be replaced with a new one.

WARNING!

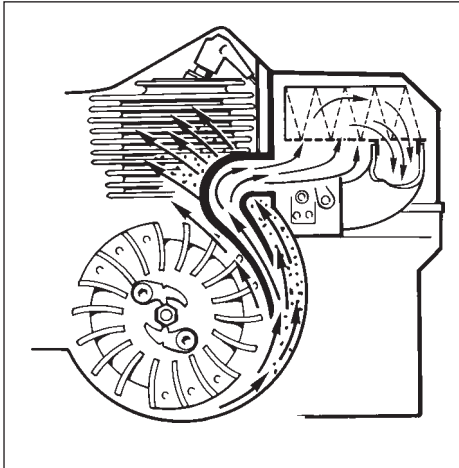
Do not clean the filter in petrol. Health hazard!

NOTE!

The filter must be dry when it is refitted.

The air filter can be fitted in different ways.

- With screws directly on the carburettor or in a special holder.
 - Snap fixture in a special holder.
- In the latter case a screwdriver can be placed between the pins on the filter and holder to separate both parts.
- Clean also the holder/cover before the cleaned filter is refitted.

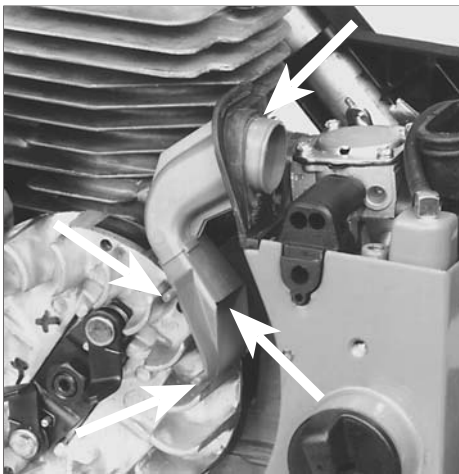


Centrifugal cleaning (Turbo)

By means of utilising the centrifugal power during the cleaning of the induction air to the carburettor the air filter is guaranteed much longer cleaning intervals.

By means of the centrifugal power the larger impurities are sorted out since they are thrown out to the periphery of the air shell and out past the cylinder.

The air to the carburettor is captured by the "turbo nozzle" and the finer impurities are effectively absorbed in the air filter.



In order for centrifugal cleaning to be as effective as possible it is important that:

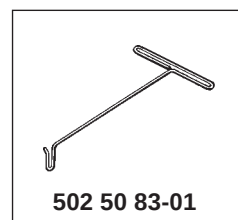
1. The turbo nozzle is clean from deposits.
2. The connection of the nozzle to the carburettor chamber is tight.
3. The nozzle's guide pins are not broken. The pins are important for the correct positioning of the nozzle in the air flow.
4. The fan shell and air conductor are cleaned.

The turbo nozzle is accessible for cleaning or replacement after the starter and air conductor have been dismantled.



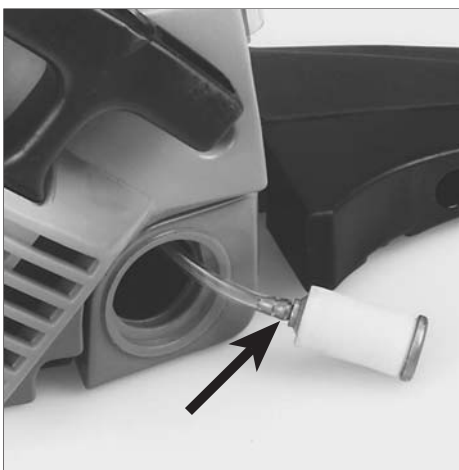
Fuel filter

The fuel filter can be taken out through the tank's filler hole.



Clean the filter externally if it is not too severely fouled.

Replace the filter if necessary.



Fuel filter

On the fuel pipe in the tank there is a fuel filter. This is accessible through the filler hole. Pull out the filter with your fingers or by means of tool 502 50 83-01.

Remove the tank cap completely.

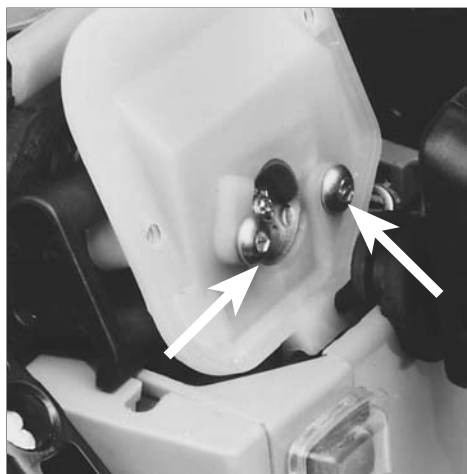
If the filter is not too severely fouled it can be cleaned externally by means of a brush.

Otherwise it must be replaced.

Check the fuel pipe for cracking and leakage.

NOTE!

Make sure that the filter's connecting collar is pressed as far as possible in the fuel pipe.



Carburettor

Dismantling, all models

Dismantle the cylinder cover and carburettor cover and blow clean the carburettor chamber with compressed air.

Dismantling mod. 2036/2040

Dismantle the carburettor.

Fitting mod. 2036/2040

Enter the throttle wire through the hole and the guide in the air filter holder.

Connect the fuel pipe and throttle wire.
Position the screws.
Connect the choke lever.

Carburettor

Dismantling, all models

- Dismantle the cylinder cover and carburettor cover.
- Close the choke valve to prevent dirt entering the engine.
- Blow clean the carburettor chamber with compressed air.

Dismantling mod. 2036/2040

Dismantle the air filter and air filter holder, fuel pipe, throttle wire and choke lever.
Lift off the carburettor.

Fitting mod. 2036/2040

Enter the throttle wire through the hole and the guide in the air filter holder as shown in the diagram.

NOTE!

Check that the throttle wire is put in the holder from the correct side.

Connect the fuel pipe to the carburettor.
Connect the throttle wire to the lever.
Push the screws (the right-hand first) through the air filter holder and carburettor body.
Connect the choke lever by pressing in the pin in the lever with a screwdriver.



Place the gasket on the carburettor and tighten the screws.
Connect the screwdriver guide.
Fit the air filter.

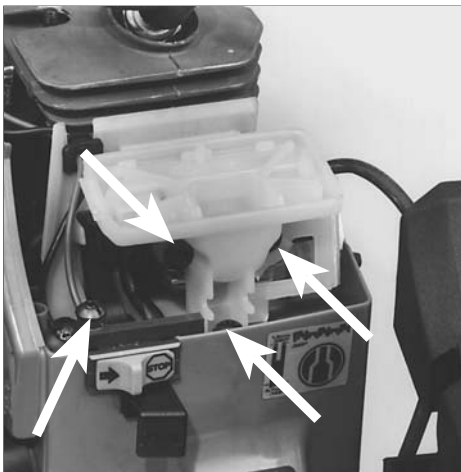
Tips!

Place the carburettor gasket, preferably with gasket paste, on the carburettor. Position the screws through the holes approx. 5 mm to centre the gasket.

Tighten the screws. Begin with the right-hand side.

Connect the screwdriver guide on the carburettor's adjusting screws.

Fit the air filter.



Dismantling mod. 2041/2045/2050

Fold back the handlebar and remove the air filter.

Dismantle the screws which hold the support over the stop switch respectively filter holder.

Dismantling mod. 2041/2045/2050

Dismantle the screws and fold away the handlebar to simplify dismantling and fitting of the carburettor.

Remove the air filter by prizing off with a screwdriver.

Fold away the pipe for the tank vent.

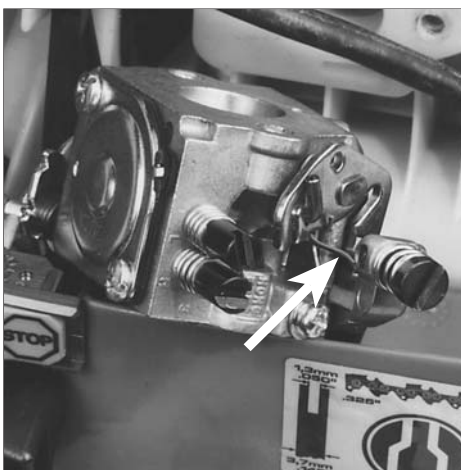
Dismantle the screws which hold the support over the stop switch respectively filter holder.



Lift off the air filter holder.
Disconnect the throttle wire and fuel pipe.

Fold the screwdriver support for the carburettor's adjusting screws to one side and lift off the air filter holder.

Disconnect the throttle wire and fuel pipe.



Fitting mod. 2041/2045/2050

Connect the fuel pipe and throttle wire.

Fitting mod. 2041/2045/2050

Connect the fuel pipe and throttle wire.

NOTE!

The throttle wire should be drawn between the carburettor body and the lever for the idling screw.



Fix the carburettor gasket on the carburettor.

Place the filter holder against the carburettor and push in the screws so that they stick out approx. 3 mm to simplify centring to the spacing piece.



Tighten the screws and make sure not to forget the earth cable.

Fit the air filter and handlebar, including the pipe for the tank vent.



Dismantling mod. 2054/2055

Lift up the nonreturn valve.



Dismantle the carburettor screws.

Fit the carburettor gasket on the carburettor with gasket paste. Make sure that it is turned the right way round so that the impulse channel is not blocked.

Place the filter holder against the carburettor and fold in the screwdriver guide over the adjusting screws.

Place the carburettor screws so that they stick out approx. 3 mm and centre the carburettor to the spacing piece.

NOTE!

Check that the choke lever goes into the groove on the lever.

Tighten the screws for the carburettor and the support over the the stop switch.

NOTE!

Do not forget the earth cable at the stop switch.

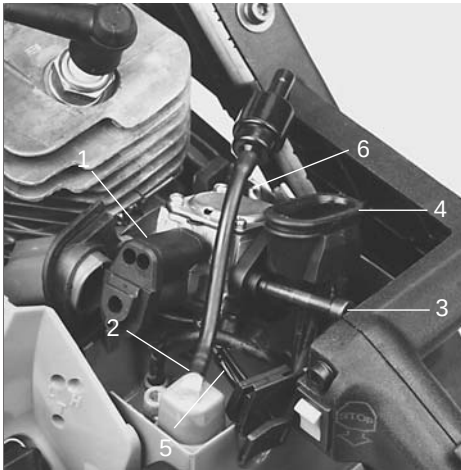
Fit the air filter and handlebar, including the pipe for the tank vent.

Dismantling mod. 2045/2055

Lift up the tank vent's nonreturn valve to improve accessibility.

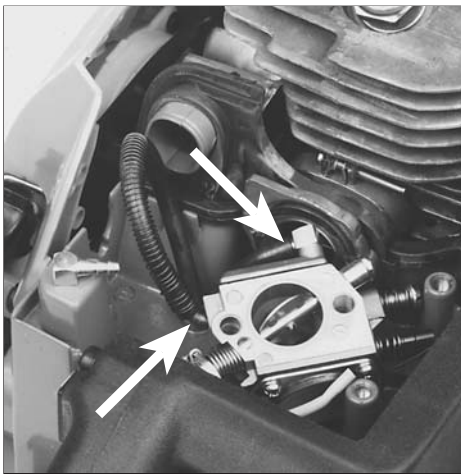
Place a screwdriver, or the like, to angle up the carburettor so that it is easier to get at the screws.

Unscrew the carburettor screws.



Lift up the carburettor and dismantle:

1. The screwdriver guide for the carburettor's adjusting screws.
2. The ventilation pipe from the nipple on the fuel tank.
3. The carburettor screws.
4. The air filter connection.
5. The choke lever.
6. The throttle wire.



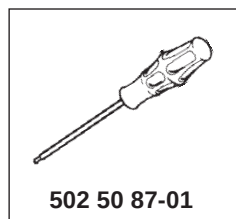
Dismantle the fuel pipe and impulse pipe.
Lift off the carburettor.



Fitting mod. 2054/2055

Fit the carburettor in the reverse order to dismantling.

Make sure the throttle wire is connected from the correct side.

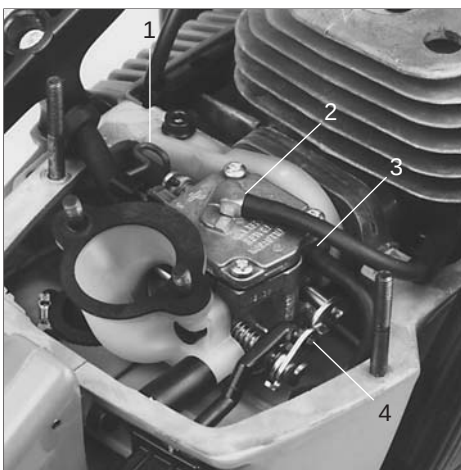


502 50 87-01

Dismantling mod. 625/620/670

Dismantle the air filter and following parts:

1. The throttle control's push rod.
2. The impulse pipe.
3. The fuel pipe.
4. The choke lever.



Lift up the carburettor and dismantle:

1. The screwdriver guide for the carburettor's adjusting screws.
2. The ventilation pipe from the nipple on the fuel tank.
3. The carburettor screws.
4. The air filter connection.
5. The choke lever.
6. The throttle wire.

Turn the carburettor and dismantle the fuel pipe and impulse pipe.

The fuel pipe is provided with a wire spiral to prevent it being bent and restricting the fuel flow.

Tips!

Turn the spring clockwise so that it is easier to move along the pipe.

Use a screwdriver to push the fuel pipe away from the nipple.

Fitting mod. 2054/2055

Fit the carburettor in the reverse order to dismantling.

Screw in the left-hand screw first. Use screwdriver No. 502 50 87-01.

Angle up the carburettor with a screwdriver and screw tight the right-hand screw.

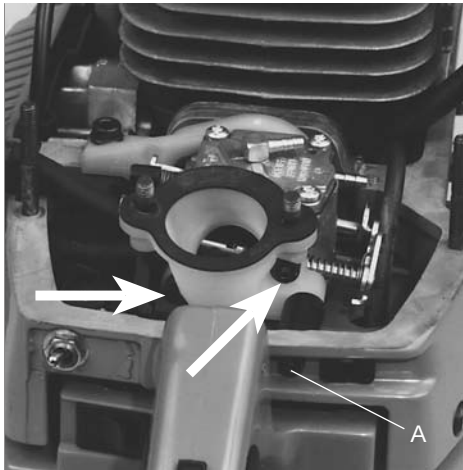
NOTE!

- The throttle wire should be connected to the lever from the inside and out. Otherwise the choke lever will not function satisfactorily.
- The pipe for the tank vent should lie *under* the fuel pipe.

Dismantling mod. 625/630/670

Dismantle the air filter and following parts:

1. The throttle control's push rod (use a screwdriver).
2. The impulse pipe.
3. The fuel pipe.
4. The choke lever (use a screwdriver).



Unscrew the carburettor screws and lift up the carburettor.

Unscrew the carburettor screws and lift up the carburettor.

NOTE!

The screw (A) which holds the vibration damper should not be dismantled.

Fitting mod. 625/630/670

Fit the carburettor in the reverse order to dismantling.

Place the air filter connection and carburettor screws on the carburettor.

Fit the screwdriver guide on the adjusting screws.

Push in the tap on the air filter connection in the vibration damper.

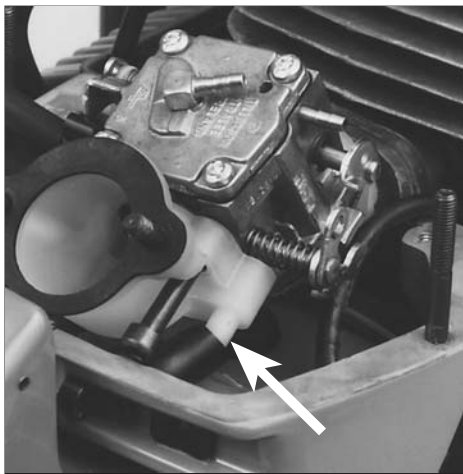
Fitting mod. 625/630/670

Fit the carburettor in the reverse order to dismantling.

Place the air filter connection and carburettor screws on the carburettor.

Fit the screwdriver guide on the adjusting screws.

Push in the tap on the air filter connection in the vibration damper.



Press down the carburettor and connect the screwdriver guide against the crankcase.

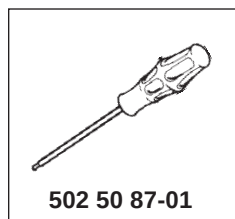
Screw tight the carburettor screws.

Use screwdriver No. 502 50 87-01 which permits a slight angular adjustment.

Press down the carburettor and connect the screwdriver guide to the crankcase.

Screw tight the carburettor screws.

Use screwdriver No. 502 50 87-01 which permits a slight angular adjustment.



Dismantling mod. 2077/2083

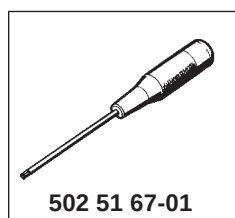
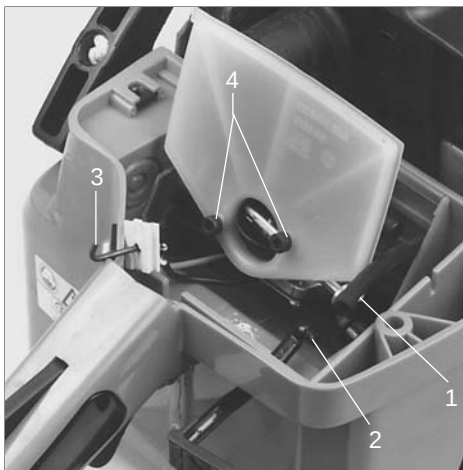
Dismantle the air filter holder.

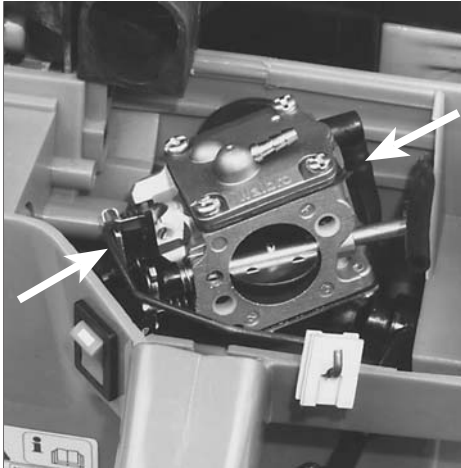
Dismantling mod. 2077/2083

Remove the impulse pipe (1) and choke lever (2).

Lift up the throttle push rod (3) and release the carburettor screws (4).

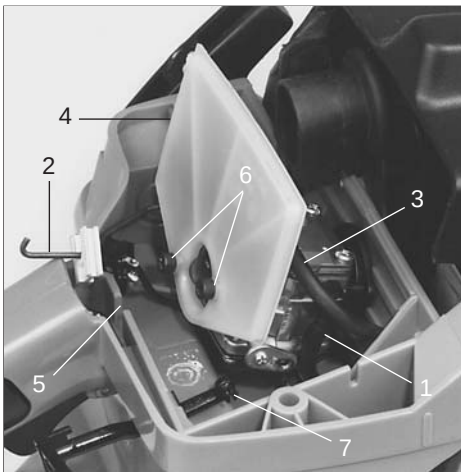
Use screwdriver No. 502 51 67-01 (Torx).





Lift up the carburettor and remove the air filter holder, throttle push rod and fuel pipe.

Lift up the carburettor and remove the air filter holder, throttle push rod, and fuel pipe.



Fitting mod. 2077/2083

Fit the carburettor in the reverse order to dismantling.

Fitting mod. 2077/2083

Fit the carburettor in the following order:

1. Connect the fuel pipe.
2. Connect the throttle push rod.
3. Connect the impulse pipe.
4. Place the air filter holder in position and push the carburettor screws completely in the carburettor so that they are visible and thereby simplifying centring to the suction pipe.
5. Press down the throttle push rod's guide in the crankcase.
6. Tighten the carburettor screws.
7. Connect the choke lever.
8. Fit the air filter.



502 51 67-01



Dismantling mod. 2095

Dismantle the covers so that the carburettor becomes accessible.

Dismantling mod. 2095

Dismantle the carburettor cover, air filter cover and cylinder cover, and then:

1. The impulse pipe.
2. Fuel pipe.
3. Choke lever.

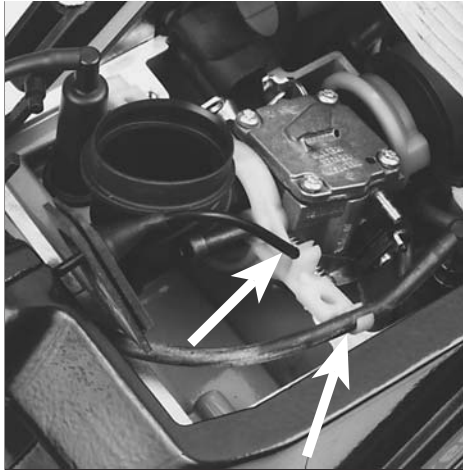


Unscrew the carburettor screws and pull them out approx. 15 mm.

Tilt and push the carburettor sideways to the right until the screwdriver guide releases from the carburettor's adjusting screws.

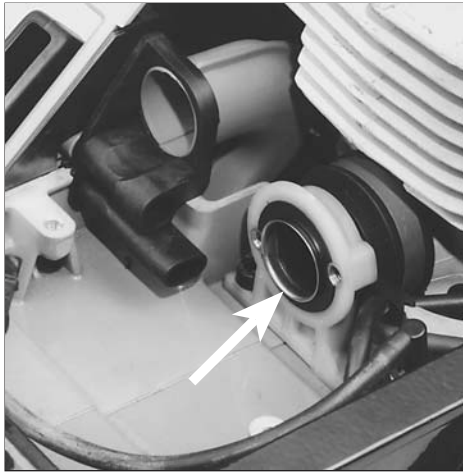
Unscrew the carburettor screws and pull them out approx. 15 mm.

Tilt and push the carburettor sideways to the right until the screwdriver guide (A) releases from the carburettor's adjusting screws.



Lift up the carburettor and release the throttle wire.

Lift up the carburettor and give full throttle by turning the throttle shaft. Lift up the throttle wire from the guide and release the tank vent pipe.



Fitting mod. 2095

Fit the carburettor in the reverse order to dismantling.

Fitting mod. 2095

Fit the carburettor in the reverse order to dismantling.

Pay attention to the following:

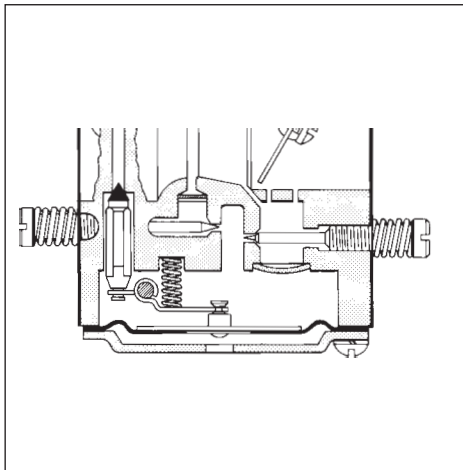
- Do not forget the brass ring in the suction pipe. Turn it the right way round!
- Observe care when screwing in the carburettor screws to avoid cross threading.

Design of the carburettor

The carburettor can be divided into three different functional sections: the metering section, mixing section, and pumping section.

The metering section

The nozzles and control function for the fuel are placed here.



Design of the carburettor

The carburettor can be divided into three different functional sections: the metering section, mixing section, and pumping section.

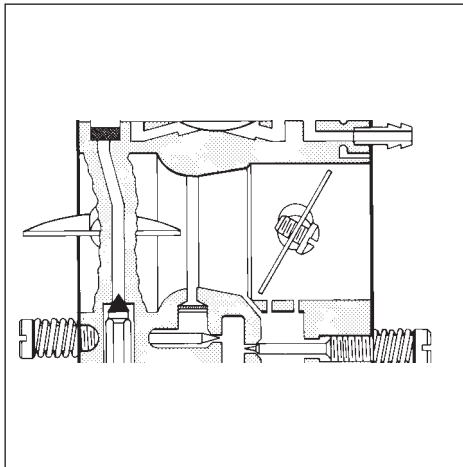
The metering section

The nozzles and control function for the fuel are placed here.

The needle valve and metering diaphragm are vital parts for the functioning of the carburettor.

The mixing section

The fuel and air are mixed here.

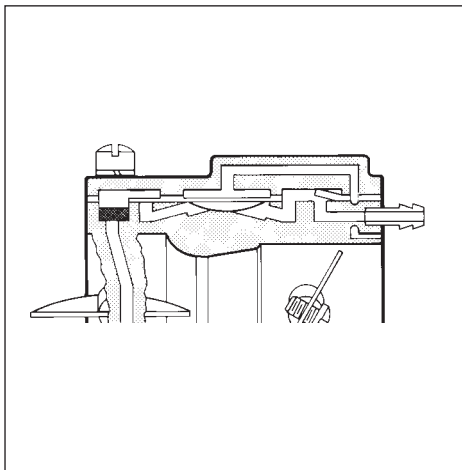


The mixing section

The fuel and air are mixed in this part of carburettor to the correct proportions.

The choke and throttle valves are placed here.

The main jet nozzle is located in the middle of the Venturi (the narrowest point on the inlet).



The pumping section

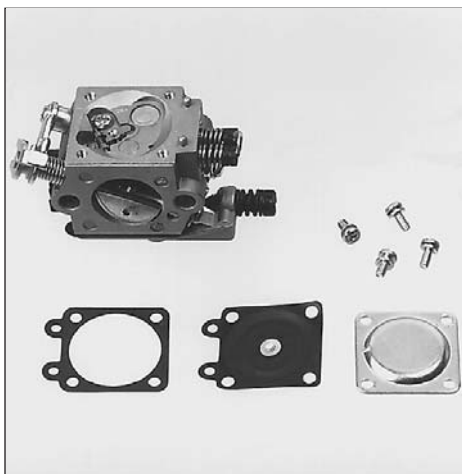
This pumps fuel from the tank to the carburettor.

The pumping section

The pump diaphragm which pumps fuel from the tank to the carburettor's metering section is placed here.

The diaphragm is activated by the pressure variations in the engine's crankcase via an impulse channel.

If the channel is blocked, e.g. by grease or an incorrectly positioned gasket, the pump will not function and it will not be possible to start the engine.



Disassembling the carburettor

Remove the metering diaphragm and check for damage.

Replace if necessary.

Disassembly of the carburettor

Remove the 4 screws which hold the metering diaphragm cover and lift off the cover.

Carefully remove the metering diaphragm and gasket.

Check the diaphragm for holes and wear on the pin.

Replace the diaphragm if necessary.



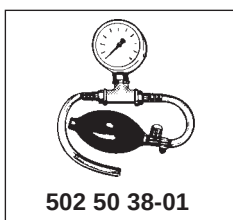
Pressure test the metering section.

Connect pressure tester 502 50 38-01 to the fuel pipe nipple.

Submerge the carburettor in a basin containing petrol in order to more easily discover leakage.

Pressure test with 50 kPa.

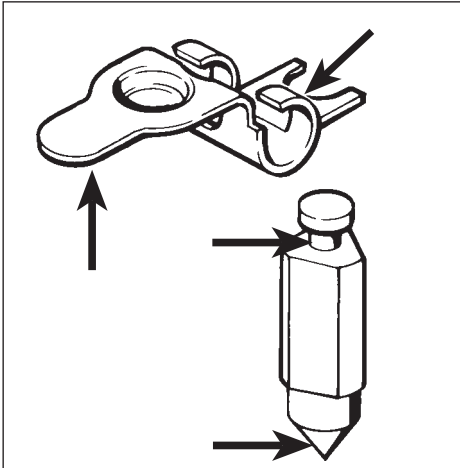
No leakage is permissible.



In the event of leakage - dismantle the needle valve.

If leakage occurs dismantle the needle valve.

Unscrew the screw and lift off the lever, shaft, needle valve and spring.

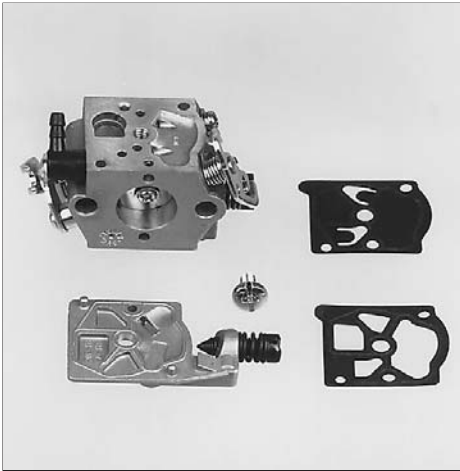


Check the needle valve and lever for wear.
Replace damaged parts with new ones.

Check the needle valve for wear on the point and in the groove for the lever.

Check the lever for wear on the groove for the lever and on the contact point to the metering diaphragm.

Replace damaged parts with new ones.

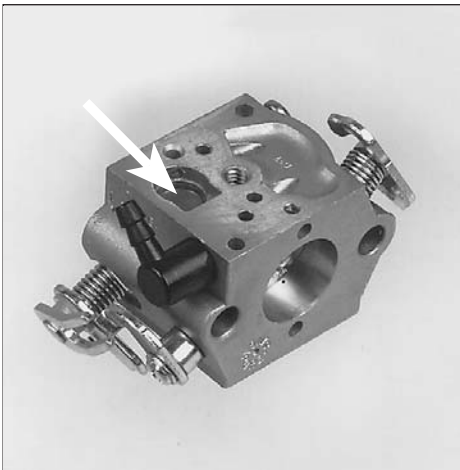


Remove the pump diaphragm.
Check the diaphragm for wear.

Remove the screw which holds the cover over the pump diaphragm.

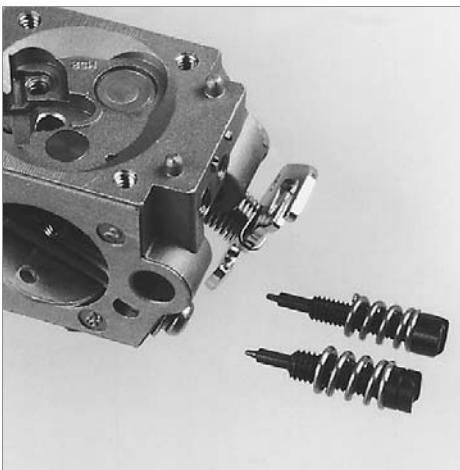
Lift off the cover, gasket and diaphragm.

Check the diaphragm for damage on the valve tongues. Hold it up to a light to check for holes in the material.



Remove the fuel filter.

Carefully remove the fuel filter, e.g. by using a needle.

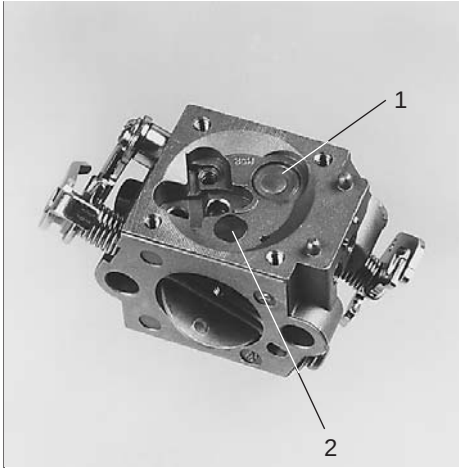


Unscrew both nozzle needles.

Unscrew the nozzle needles.

NOTE!

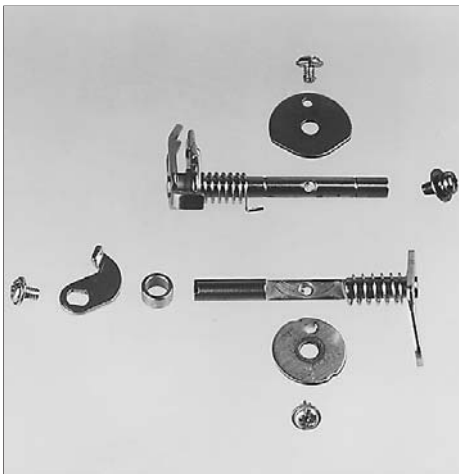
Notice how the needles are placed (e.g. the H-needle is slightly shorter than the L-needle).



Dismantle the welch plug (1) and main jet nozzle (2).

Drill a small hole in the welch plug (1) and carefully break it loose with a pointed object.

Press out the main jet nozzle (2) with a suitable mandrel.



Check the valve and valve shafts for wear.

Replace if necessary.

Dismantle the valve and valve shafts. If these parts are worn the engine will not idle correctly.

Always replace the valve and valve shafts at the same time.



Assembly of the carburettor

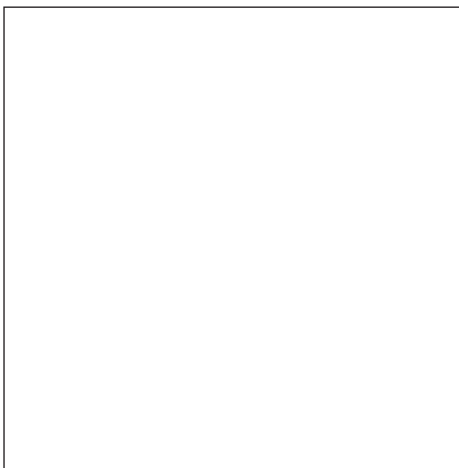
Blow clean the carburettor housing.

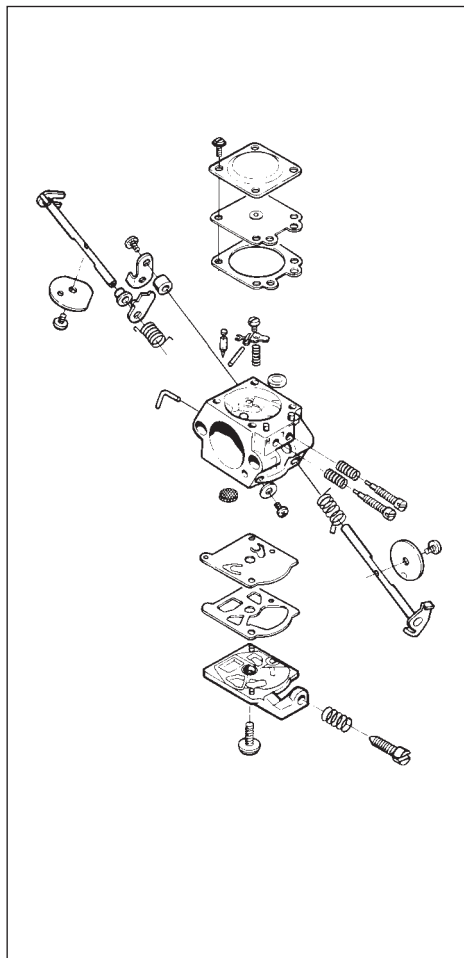
Fit a new welch plug.

Fit a new main jet nozzle.

Assembly of the carburettor

- Blow clean all channels in the carburettor housing.
- Fit a new welch plug.
Use a suitable mandrel to ensure complete tightness.
- Press in a new main jet nozzle. It should lie level with the carburettor housing.



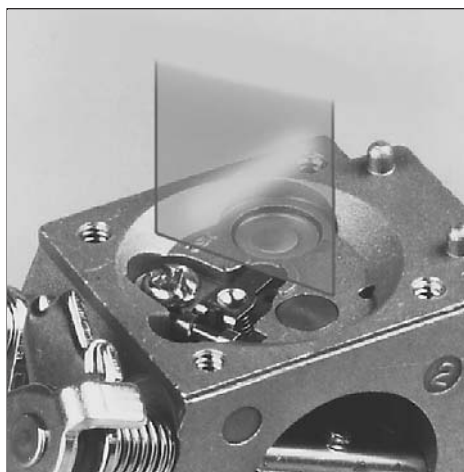


Fit the valve and valve shafts.

NOTE!

Use Locktite on the valve screws.

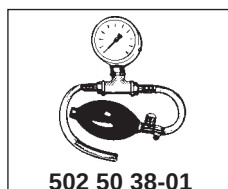
Fit the pump section parts in the reverse order to dismantling.



Fit the different parts in the metering section in the reverse order to dismantling.



Check that the carburettor is tight.
No leakage is permissible at 50 kPa pressure.



502 50 38-01

● Fit the valve and valve shafts.

NOTE!

Check that the valve and valve shafts are turned the right way round and that they seal completely tight in closed position.
Use Locktite on the valve screws.

Tips!

Any number designations on the valve should be able to be read from outside.

Replace the fuel filter if it is damaged or cannot be cleaned.

Place the pump diaphragm closest to the carburettor housing, followed by the gasket and cover.

Fit the different parts in the metering section in the reverse order to dismantling.

NOTE!

The H-needle is slightly *shorter* than the L-needle.

Check that the lever is level:

- With the carburettor housing (Tillotson).
- With the cast heads (Walbro, Zama).

Too high setting = too much fuel.

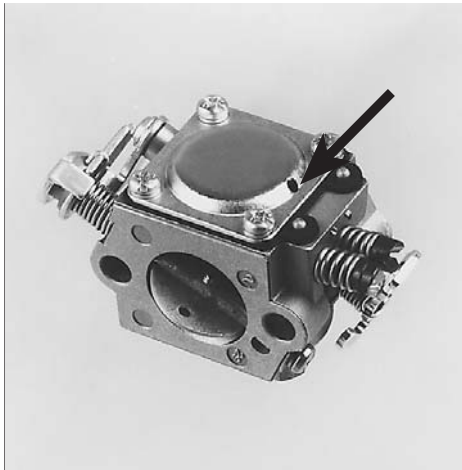
Too low setting = too little fuel,

Connect pressure tester No. 502 50 38-01 to the fuel intake in the carburettor.

Pump up to 50 kPa pressure.

Submerge the carburettor in a basin containing petrol to more easily discover leakage.

No leakage is permissible.



Fit the metering diaphragm.

Place the gasket on the carburettor housing followed by the metering diaphragm.

Check that the air hole in the cover is open and screw tight the cover.



Carburettor setting



WARNING!

When test running the engine in connection with adjusting the carburettor, the clutch and clutch cover must without exception be fitted.

Otherwise there is a risk that the clutch can come loose and cause serious personal injury.

Function

The purpose of the carburettor is to deliver a combustible mixture of air and fuel to the cylinder.

The quantity of this mixture is regulated with the throttle control.

The composition of the mixture of petrol and air is regulated by means of the adjustable nozzles "H" and "L".

In order for the engine to provide maximum power at different speeds, run smoothly at idling speed and respond quickly to the throttle, it is necessary for the nozzles to be correctly adjusted.

The adjustment of the carburettor can vary somewhat depending on humidity, temperature and air pressure.

L = Low speed nozzle

H = High speed nozzle

T = Adjuster screw for idling speed

- With the L- and H-nozzles the required fuel quantity is adjusted to the air flow which the opening of the throttle control permits. If they are screwed clockwise the air/fuel mixture becomes lean (less fuel), and if they are screwed anti-clockwise the air/fuel mixture will be rich (more fuel). A *lean* mixture gives *higher* speed and a *rich* mixture gives *lower* speed.
- The T-screw regulates the throttle control's position at idling speed. If the T-screw is screwed clockwise a higher idling speed is obtained, and if it is screwed anti-clockwise a lower idling speed is obtained.

Basic setting

The carburettor is given a basic setting during test running at the factory. The basic setting is "richer" than the optimum setting (the overspeed lies at 600-800 rpm below the recommended max. overspeed) and should be retained during the first hours the engine is in operation. After this the carburettor should be fine adjusted. The basic setting can vary between:

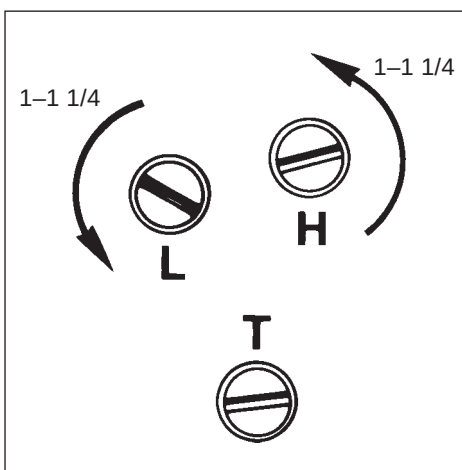
H = 1 to 1 1/4 turn.

L = 1 to 1 1/4 turn.

Fine adjustment

When the engine is "run in" the carburettor should be adjusted.

- During all adjustments the air filter should be clean and the cylinder cover fitted. The L-nozzle is adjusted first, followed by the H-nozzle and finally the idling screw T.



The following rpm are recommended:

Max overspeed

Model	During running in	After running in*
625	11.800 – 11.900	12.500
630	11.700 – 11.900	13.000
670	12.700 – 12.900	13.500
2036	12.200 – 12.400	13.000
2040	12.200 – 12.400	13.000
2041	11.700 – 11.900	12.500
2045	11.700 – 11.900	12.500
2050	11.700 – 11.900	12.500
2054	12.200 – 12.400	13.000
2055	13.700 – 13.900	14.500
2077**	12.700 – 12.900	13.500
2083	12.700 – 12.900	13.500
2095	12.200 – 12.400	13.000

* The speed refers to standard bar lengths and Jonsered two-stroke oil.

When using a longer bar or another quality of two-stroke oil use the recommended running in speed.

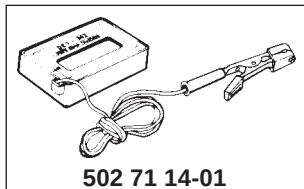
** Digital ignition system with speed limiter at 13.500 rpm.

Idling speed = 2.500 rpm.

NOTE!

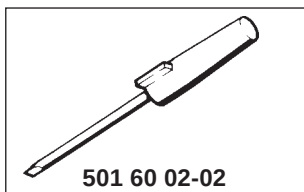
The maximum recommended rpm must not be exceeded.

Check the rpm with tachometer 502 71 14-01.



502 71 14-01

- Carefully screw in (clockwise) the L and H nozzles to the bottom and then unscrew (anti-clockwise) the nozzles one turn. The carburettor now has the setting H = 1 and L = 1. Use special screw driver 501 60 02-02.



501 60 02-02

- Start the engine and run warm for 10 minutes.

NOTE!

If the cutting equipment rotates at idling speed the T-screw should be turned anti-clockwise until it stops.

Low-speed nozzle L

Set the highest idling speed by slowly screwing the low-speed nozzle clockwise respectively anti-clockwise. When the highest revs have been found the L-nozzle is screwed anti-clockwise 1/4 turn.

High-speed nozzle H

The high-speed nozzle H influences the power output of the engine and the speed. A too lean set high-speed nozzle H (the H-nozzle screwed in too far) gives too little fuel to the engine and will result in damage to the engine.

Run the engine at full throttle for about 10 seconds. The H-nozzle is correctly adjusted when the engine "putters" slightly.

If a lot of smoke comes from silencer at the same time as the engine "putters" a lot the setting is too "rich". Turn the H-nozzle clockwise until the setting sounds right.

NOTE!

For optimum setting a tachometer should be used.

The recommended maximum overspeed should not be exceeded.

Idling screw T

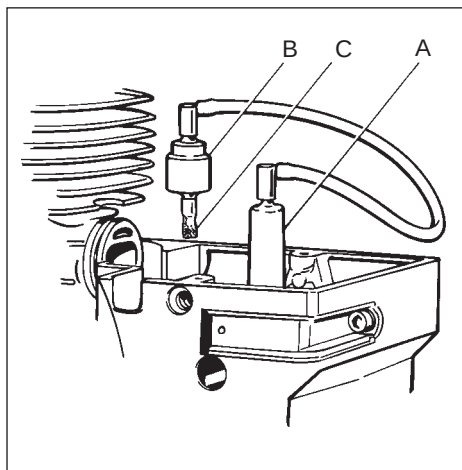
Let the engine idle for about 30 seconds or until the speed has stabilised. Adjust the set screw for the idling speed until the engine runs at idling speed without stopping.

- Turn the screw clockwise if the engine stops.
- Turn the screw anti-clockwise to reduce the speed.

Correctly adjusted carburettor

A correctly adjusted carburettor implies that the engine accelerates without hesitation and does not putter at full throttle.

- A too lean set L-nozzle implies that the engine can be difficult to start and gives poor acceleration.
- A too lean set H-nozzle gives a lower output, poor acceleration and/or engine damage.
- An over rich setting of both the L- and H-nozzles gives acceleration problems or an excessively low working speed.



Fuel tank vent

The tank air vent has a great effect on the function of the carburettor. If it is not functioning either an overpressure or underpressure can develop in the tank.

Overpressure results in flooding the carburettor.

Underpressure results in diminished or no fuel flow to the carburettor.

The purpose of the tank air vent is therefore to maintain atmospheric pressure in the tank during all operating conditions.

A = Expansion volume

B = Non return valve

C = Filter



Function check

Empty the fuel tank and tighten the tank cap.

Connect the pressure gauge to the fuel pipe (the carburettor may have to be dismantled to gain access to the pipe).

Overpressure

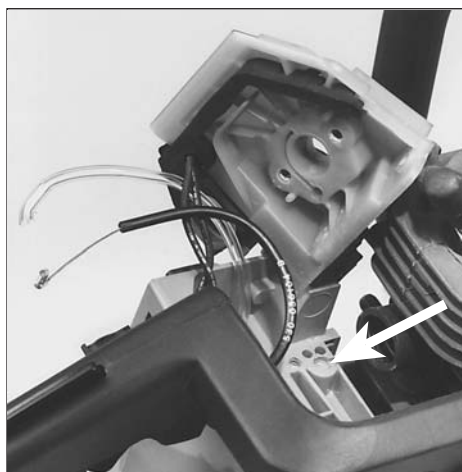
Pump up a pressure of 50 kPa (0.5 kp/cm²).

The pressure should fall to 20 kPa (0.2 kp/cm²) within 60 seconds.

Underpressure

Reduce the pressure to – 50 kPa (0.5 kp/cm²).

The pressure should increase to 20 kPa (0.2 kp/cm²) within 30 seconds.



Model 2036/2040

Dismantle the carburettor and spacing piece in order to access the valve for cleaning.

Model 2036/2040

The tank air vent here is a sintered bronze filter which is pressed secure in the fuel tank.

It is accessible for external cleaning when the carburettor and spacing piece are dismantled.

See chapter 8 "Crankshaft and crankcase" for information on replacing.



Model 2041/2045/2050

Clean the filter at the pipe end at regular intervals.

Model 2041/2045/2050

The tank air vent consists of a pipe. One end is connected to the top of the tank in the carburettor chamber.

The other end opens into the area between the handlebar and the clutch cover.

There is a sintered bronze filter in the pipe which must be cleaned from dirt at regular intervals.



Model 625/630/670

The valve is pressed in the tank on the right-hand side immediately behind the handlebar attachment.

NOTE!

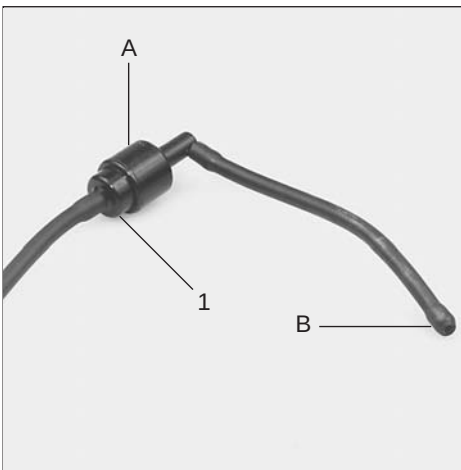
The valve is *not* screwed secure.



The valve can be replaced as follows:

1. Remove the tank cover completely.
2. Put a pair of flat pliers through the tank cover hole.
3. Grip the valve and break off the pipe.
4. Press out the valve with a suitable mandrel.

Press in a new valve with a suitable mandrel.



Other models

The tank air vent consists of a nonreturn valve (A) and a sintered filter (B).

The nonreturn valve is open in both directions but to a different degree. It is therefore important that it is positioned correctly. The short part 1) should be connected to the tank.

Pressure test the valve in both directions.

If there is overpressure in the fuel tank the valve opens quickly at approx. 20 kPa (0.2 kPa/cm²) and is completely open at 30 kPa (0.3 kPa/cm²).

If there is underpressure in the tank the valve opens immediately.

Replace the valve if it does not function as intended.

Model 625/630/670

The valve is pressed in the tank on the right-hand side immediately behind the handlebar attachment.

NOTE!

The valve is *not* screwed secure.

The valve can be replaced as follows:

1. Remove the tank cover completely.
2. Put a pair of flat pliers through the tank cover hole.
3. Grip the valve and break off the pipe.
4. Press out the valve with a suitable mandrel.

Press in a new valve with a suitable mandrel.

Trouble-shooting chart

[illegible]

Idle

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D	E	F	G	H	I	J			

Acceleration, deceleration

[illegible]

Acceleration and deceleration

High speed

[illegible]

Fuel system

3. Plugged tank vent
4. Plugged tank filter
5. Restricted fuel line
6. Dirt in fuel passage
7. Loose, damaged fuel line
8. Leak in pulse system
9. Restricted pulse channel
10. Loose pump cover screws
11. Defective pump diaphragm

Air system

12. Plugged air filter
13. Defective manifold gasket
14. Loose carburettor mounting screws
15. Worn throttle assembly
16. Incorrect throttle assembly
17. Loose throttle valve screw
18. Throttle shaft too tight
19. Bent throttle linkage
20. Defective throttle spring
21. Bent throttle stop lever
22. Choke not functioning properly
23. Worn choke shaft
24. Worn choke valve
25. Worn throttle valve

Metering system

26. Worn lever
27. Set too high
28. Set too low
29. Not free
30. Distorted
31. Improperly installed
32. Leaking (air/fuel)
33. Worn button
34. Improper assembly
35. Defective gasket
36. Loose diaphragm rivet
37. Hole in diaphragm
38. Loose cover screws
39. Foreign matter
40. Binding
41. Worn needle body or tip

Start

- A. Hard starting
- B. Fuel dripping from carburettor
- C. Floods when engine is not running

Idle (Low speed)

- D. Will not idle
- E. Rich idle
- F. Idles with L-needle closed
- G. Irregular idle
- H. "L"-needle needs frequent adjustment
- J. Loads up while idling

Acceleration and deceleration

- K. Will not accelerate
L. Engine stops when closing throttle
M. Over-rich acceleration

High speed

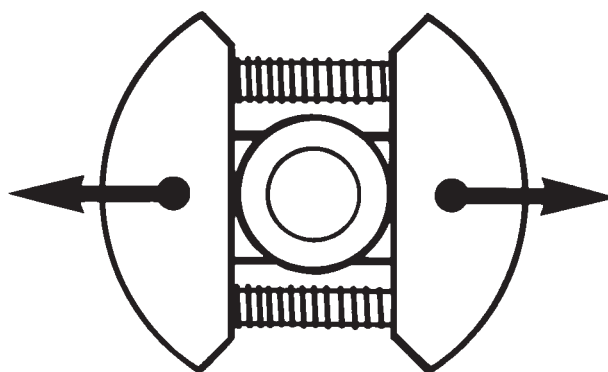
- N. Will not run at full throttle
- O. Low power
- P. Will not 4 cycle

Adjustments

1. Low speed needle (L)
2. High speed needle (H)

Centrifugal clutch

5.



Contents

Mod. 2036/2040

Dismantling 56

Fitting 57

Mod. 2041/2045/2050

Dismantling 57

Fitting 58

Mod. 2054/2055

Dismantling 59

Fitting 59

Mod. 625

Dismantling 60

Fitting 61

Mod. 630/670, 2077, 2095

Dismantling 61

Fitting 62

The centrifugal clutch has the purpose of transferring the power between the engine and the cutting equipment. As the name implies it works according to the centrifugal principle.

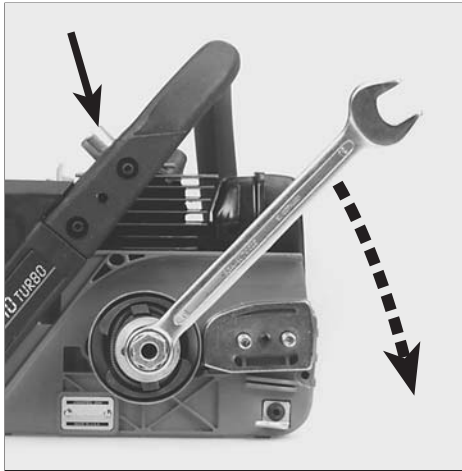
This principle implies that the clutch's friction shoes are slung outwards towards the clutch drum at a specific engine speed. When the friction against the drum becomes sufficient it is driven round at the same speed as the engine.

⚠ WARNING!

Never start or test run the engine if the clutch cover is removed. The clutch can come loose and cause personal injury.

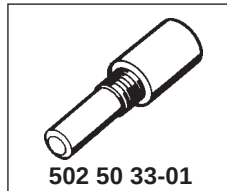
There is a certain degree of slip between the clutch and the clutch drum during acceleration, but also in the reverse case if the cutting equipment should stick. This avoids irregular load alternations on the crankshaft.

The engagement speed is carefully tested so that the engine can run at idling speed without the cutting equipment rotating.

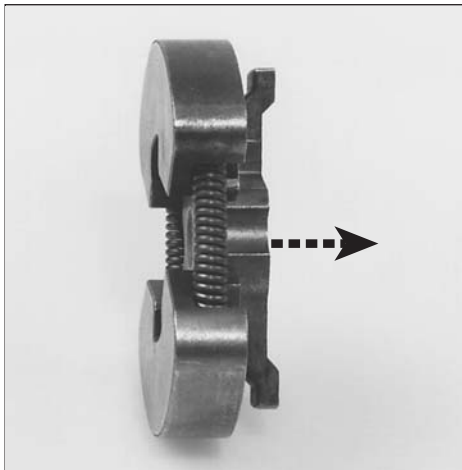


Dismantling mod. 2036/2040

Dismantle the clutch from the crankshaft.



Press the clutch apart with your thumbs



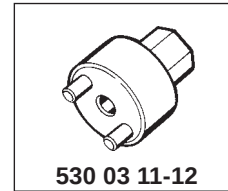
Check the wear on the clutch.

The clutch shoes must have a thickness of at least 1 mm at the most worn point.

Dismantling mod. 2036/2040

Remove the clutch cover, chain and bar. Fit piston stop No. 502 50 33-01 in the plug hole.

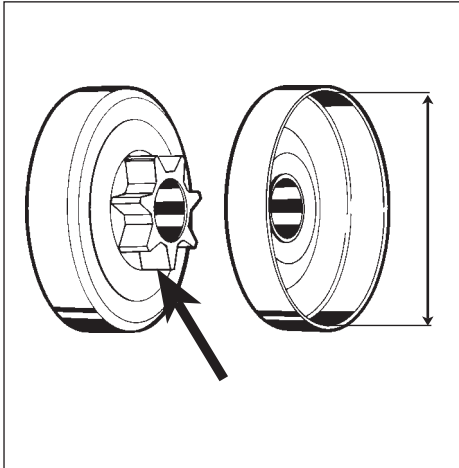
Use tool 530 03 11-12 and unscrew the clutch from the crankshaft.



Press out the clutch centre from the back of the clutch with your thumbs.

Clean and inspect the different parts for wear.

The clutch shoes must have a thickness of at least 1 mm at the most worn point. If they are more worn than this the complete clutch must be replaced.



Inspect the wear on the clutch drum.
The inner diameter must not exceed 64.4 mm.

Lift off the clutch drum and inspect it for wear on the drive wheel and friction surface on the clutch shoes.

The drum's inner diameter must not exceed 64.4 mm.

Otherwise replace the clutch drum.



Fitting mod. 2036/2040

Fit the clutch and lubricate the clutch drum's needle bearing with grease.

Fitting mod. 2036/2040

First place the clutch spring in position in one clutch shoe. The spring's coupling point should be in the middle of the shoe.

Place the other clutch shoe on the hub and fit the spring by using a screwdriver.

Lubricate the clutch drum's needle bearing with grease and fit the clutch on the crankshaft.

NOTE!

Do not overload the spring.



Dismantling mod. 2041/2045/2050

Dismantle the clutch from the crankshaft.

Dismantling mod. 2041/2045/2050

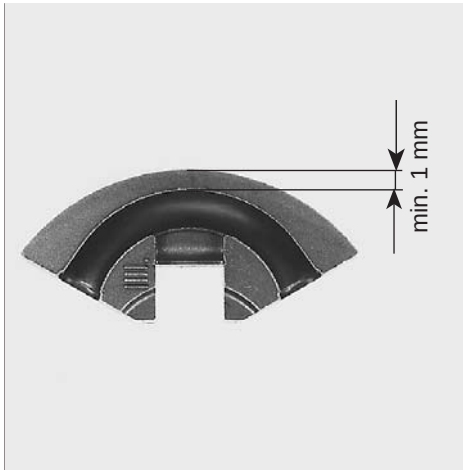
Replace the plug with piston stop No. 502 50 33-01 and dismantle the clutch from the crankshaft.



Take the clutch apart.

Take the clutch apart by pressing the clutch shoes backwards with your thumbs.

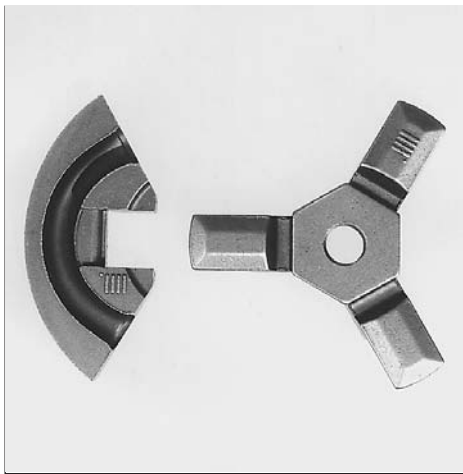




The clutch shoes must have a thickness of at least 1 mm.

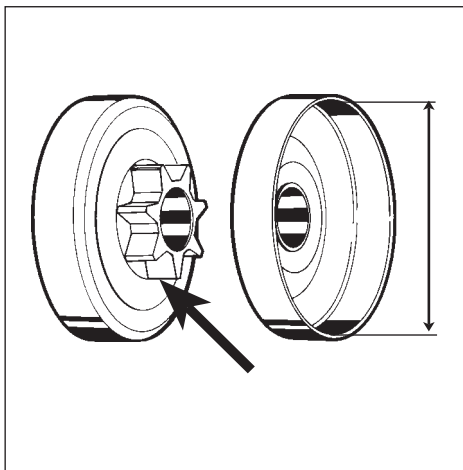
Check that the shoes have a thickness of at least 1 mm at the most worn point.

All three shoes must be replaced at the same time to avoid imbalance.



Check the spokes of the clutch centre and the shoe guide grooves for wear.

Check that the clutch centre's spokes are not severely worn or show signs of cracking, and that the guide groove in the clutch shoes is not worn. All the shoes and the clutch centre must be replaced at the same time.

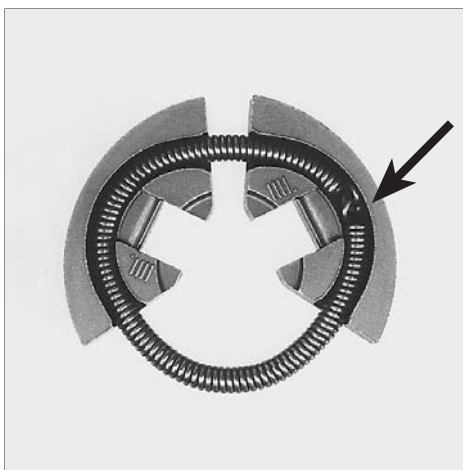


Inspect the clutch drum for wear. The inner diameter must not exceed 64.5 mm.

Lift off the clutch drum and inspect it for wear on the drive wheel and the clutch shoe friction surfaces.

The inner diameter of the drum must not exceed 64.5 mm.

Otherwise replace the clutch drum.



Fitting mod. 2041/2045/2050

The spring's coupling point should lie opposite the groove for the centre's spokes.

Fitting mod. 2041/2045/2050

When assembling the clutch the spring is first placed in position in one clutch shoe so that the spring's coupling point comes opposite the groove for the centre's spokes.

After this place a spring in another clutch shoe.



Place the clutch hub in position.
Brace the clutch in a vice and stretch out the spring with a screwdriver so that the third clutch shoe can be fitted.

Place the clutch hub in position and brace the clutch in a vice.

Use a screwdriver to stretch out the spring so that the third clutch shoe can be pressed in place.

If necessary use a pair of flat pliers to get the spring in place.

Lubricate the clutch drum's needle bearing with grease and fit the clutch on the crankshaft.

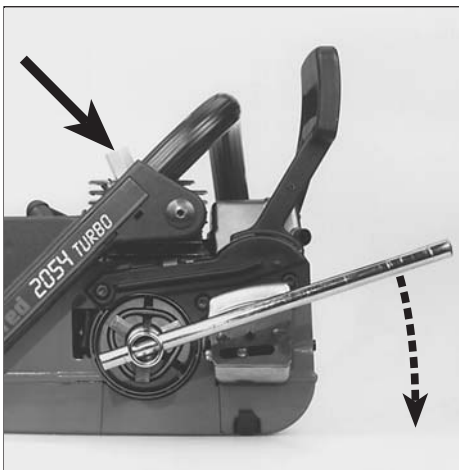


Dismantling mod. 2054/2055

Dismantle the locking and lift off the clutch drum.

Dismantling mod. 2054/2055

Dismantle the locking with a screwdriver.
Lift off the washer, chain gear and clutch drum.



Dismantle the clutch from the crankshaft.
Take apart the clutch and inspect the clutch drum in the same way as described for mod. 2041/2045/2050.

Replace the plug with piston stop No. 504 91 06-05 and dismantle the clutch from the crankshaft.

Take apart the clutch and inspect the clutch drum in the same way as described for mod. 2041/2045/2050.



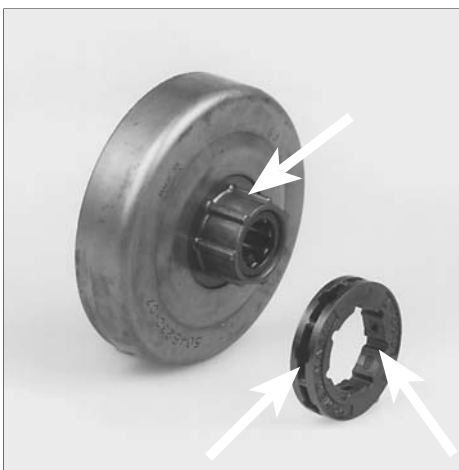
Fitting mod. 2054/2055

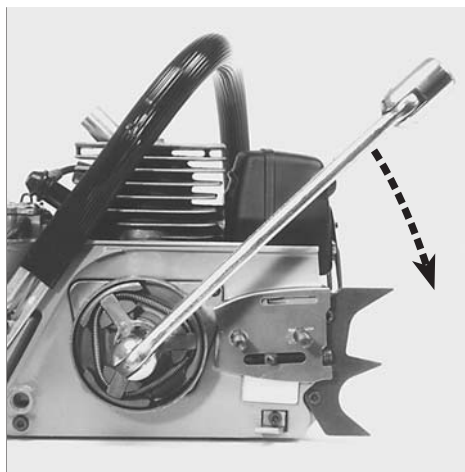
Inspect the clutch drum splines and the drive wheel for wear.
Replace parts if necessary.

Fitting mod. 2054/2055

The clutch drum splines and drive wheel must not be severely worn.
If this is the case replace both components.

Screw the clutch on the crankshaft.
Lubricate the clutch drum's needle bearing with grease and fit the washer and lockring.



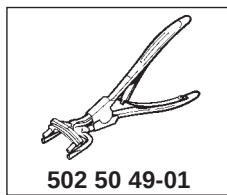
**Dismantling, mod. 625**

Dismantle the clutch from the crankshaft.



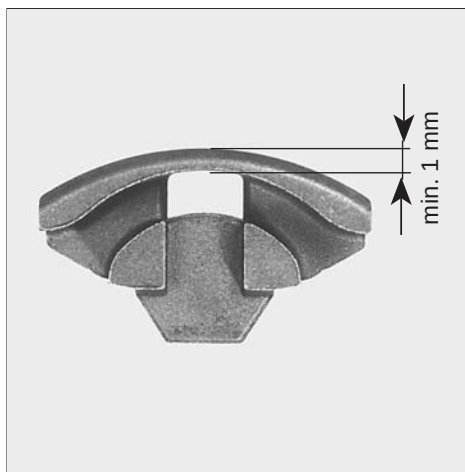
502 50 33-01

Remove the clutch spring.



502 50 49-01

Clean and inspect the clutch parts for damage and wear.



Inspect the chain gear and clutch drum splines for wear and damage.

Replace worn parts.

**Dismantling, mod. 625**

Replace the plug with piston stop No. 502 50 33-01 and dismantle the clutch from the crankshaft.

Remove the clutch spring by means of tool No. 502 50 49-01 and a screwdriver.

Clean and inspect the clutch hub's spokes and clutch shoes for wear.

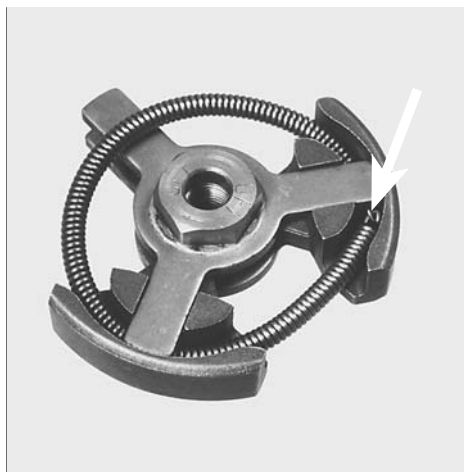
There must be a thickness of at least 1 mm left at the most worn point on the clutch shoes.

All the shoes must be replaced at the same time.

Inspect the chain gear and clutch drum splines for wear and damage.

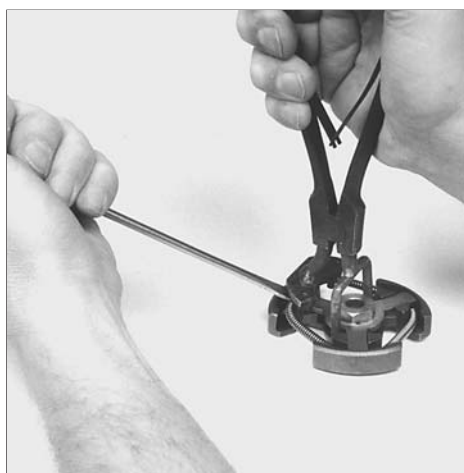
The inner diameter of the clutch drum must not exceed 79.8 mm.

Replace worn parts.

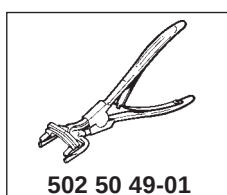


Fitting, mod. 625

Place two clutch shoes and the spring on the clutch hub.



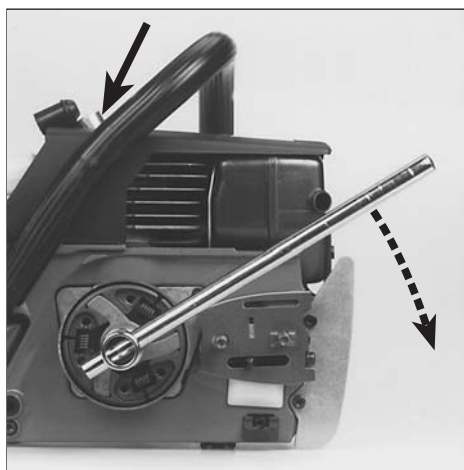
Fit the remaining clutch shoe.



502 50 49-01

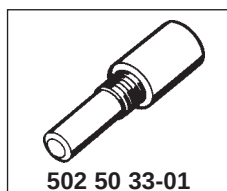


Lubricate the clutch drum's needle bearing by means of a grease gun.



Dismantling mod. 630/670 Mod. 2077, 2095

Dismantle the clutch from the crankshaft.



502 50 33-01

Fitting, mod. 625

Place two clutch shoes and the spring on the clutch hub.

NOTE!

The spring's coupling point should lie opposite one of the hub's spokes.

Fit the remaining clutch shoe. Use tool No. 502 50 49-01 and a screwdriver.

Lubricate the clutch drum's needle bearing by pressing in grease through the hole in the shaft end with a suitable grease gun.

Dismantling mod. 630/670 Mod. 2077, 2095

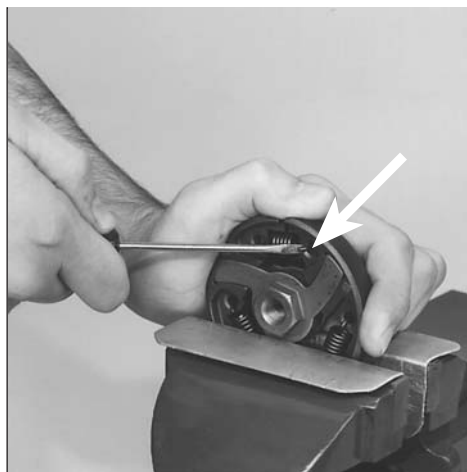
Replace the plug with piston stop No. 502 50 33-01 and dismantle the clutch from the crankshaft.

In order to release the clutch on mod. 2077 it is necessary to use tool No.

502 54 04-01.

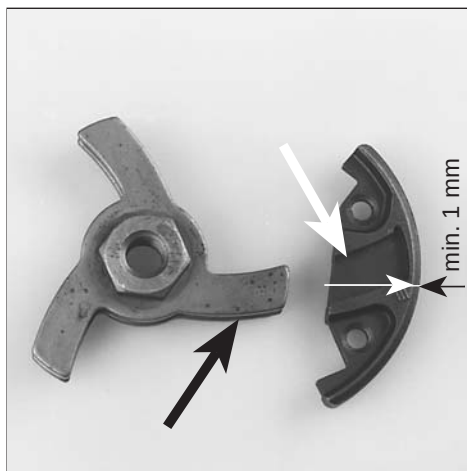


502 54 04-01



Remove the clutch springs with a small screwdriver.

Remove the clutch springs with a small screwdriver.

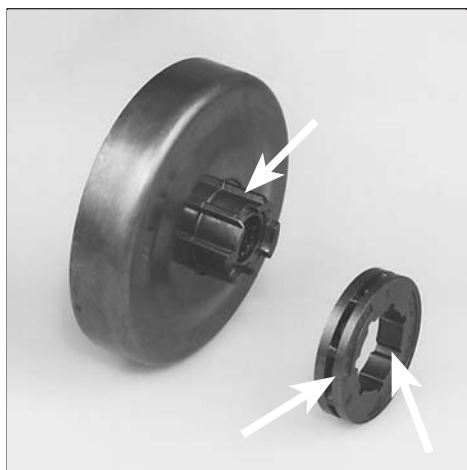


Clean and inspect the clutch parts for damage and wear.

Clean and inspect the clutch hub's spokes and clutch shoes for damage.

There must be a thickness of at least 1 mm left at the most worn place on the clutch shoes.

All the shoes must be replaced at the same time.

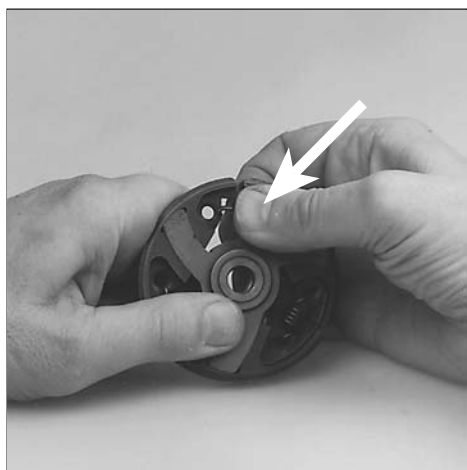


Inspect the chain gear and clutch drum's splines for damage.
Replace damaged parts.

Lift off the plastic washer (mod. 630/670) and inspect the chain gear and clutch drum splines for damage.

The clutch drum's inner diameter must not exceed 79.8 mm.

Replace damaged parts.



Fitting mod. 630/670 Mod. 2095

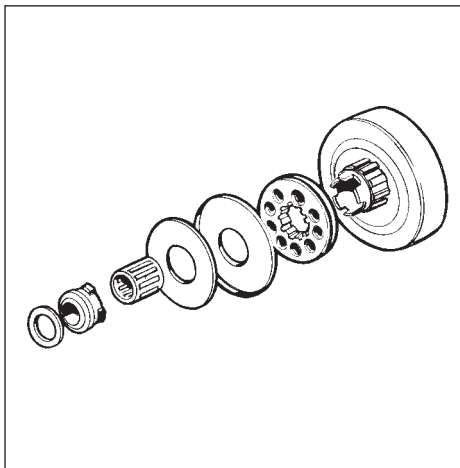
Fit the clutch shoes.

Fit the springs from the back of the clutch.

Fitting mod. 630/670 Mod. 2095

Fit the clutch shoes on the hub.

Fit the springs from the back of the clutch by pressing them in place with your thumbs or with a screwdriver.



Fit the centrifugal clutch on the crankshaft.
Do not forget the steel washer next to the
oil pump on mod. 630/670

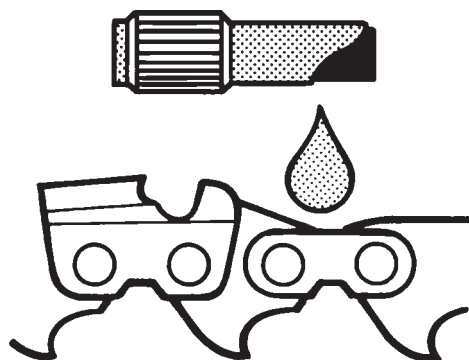
Lubricate the clutch drum's needle bearing with grease, including the connection to the pump pinion.

On mod. 630/670 the steel washer next to the oil pump should also be lubricated with grease.

Fit the clutch drum and clutch on the crankshaft.

Lubricating system

6.



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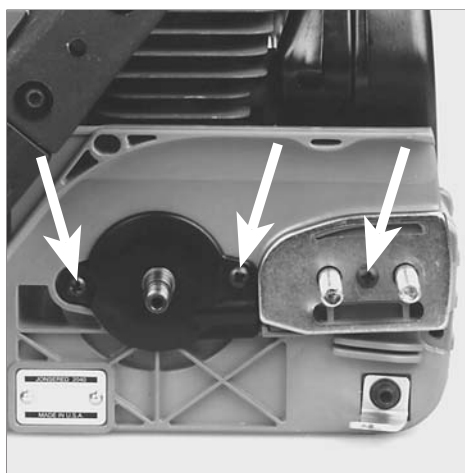
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The chain saw's lubrication system should ensure that the bar and chain receive an effective and adequate lubrication during different operating conditions and engine speeds.

The operation of the oil pump can take place either via the clutch drum or directly by the crankshaft. In the former case the pump is stopped during idling (no unnecessary oil consumption) and in the latter case it works continuously.

The lubrication system passages are small and sensitive to dirt, which can result in the stoppage of the oil flow. It is therefore of the greatest importance that the passages and filter are carefully cleaned during service work.

If the capacity of the oil pump is adjustable it is important that the pump setting is checked after service.

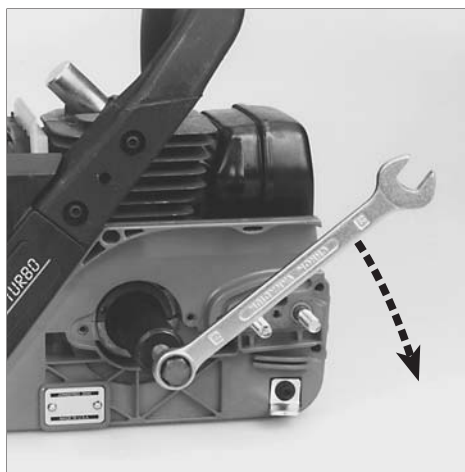


Dismantling, mod. 2036/2040 Mod. 2041/2045/2050

Dismantle the centrifugal clutch.



Lift off the pump shaft and rubber connection.



Dismantle the pump gear.



530 03 11-36

Mod. 2036/2040

Dismantling, mod. 2036/2040 Mod. 2041/2045/2050

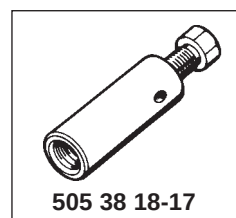
The design of the oil pump is basically the same for all these saw models.

Remove the screws which hold the oil pump and guard plate over the bar attachment.

Lift off the oil pump cover and pump shaft (1), and the rubber connection (2) at the bar attachment.

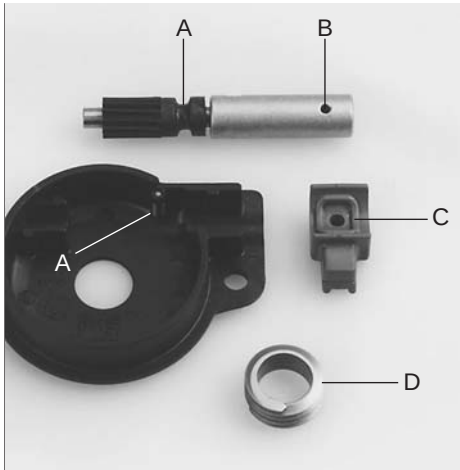
Dismantle the pump gear by means of extractor No. 530 03 11-36 and 505 38 18-17.

Screw the extractor on the pump gear as far as possible and pull off the wheel.



505 38 18-17

Mod. 2041/2045/
2050



Clean the different parts of the pump and inspect them for damage and wear.

Clean the different parts of the oil pump and inspect them for damage and wear. Pay attention to the following points:

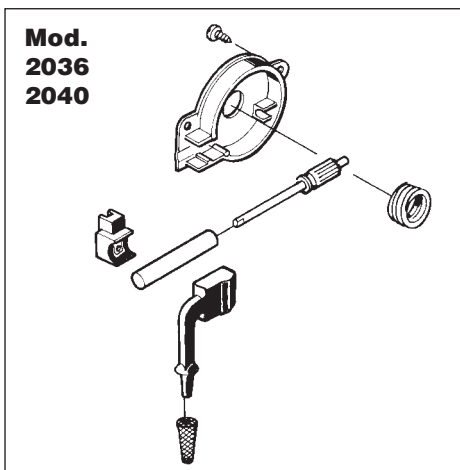
- A. Wear on the pump wheel's cam curve and guide pin in the pump housing.
- B. That the pump housing's inlet and outlet are not blocked.
- C. That the rubber connection's sealing ribs to the pump housing are undamaged.
- D. That the pump wheel cogs are undamaged.



Remove the oil pump's pick-up pipe from the oil tank.

Remove the oil pump's pick-up pipe from the oil tank by means of a screwdriver. Make sure not damage the pipe.

Clean the filter from dirt or replace it with a new one.



Fitting, mod. 2036/2040 Mod. 2041/2045/2050

Fit the oil pump and pick-up pipe in the reverse order to dismantling.

Fitting, mod. 2036/2040 Mod. 2041/2045/2050

Lubricate the different parts with oil and fit the oil pump in the reverse order to dismantling.

The pick-up pipe is easier to fit if it is lubricated first with oil or grease.

Check that the pipe is well pressed down into the crankcase.

Use extractor No. 530 03 11-36 again during fitting, when the pump gear is pressed on the crankshaft.



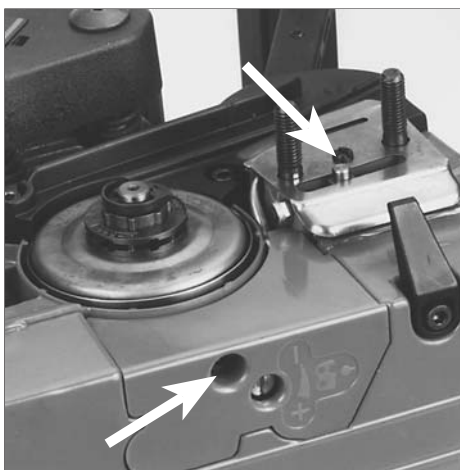
Dismantling, mod. 2054/2055

Dismantle the clutch cover and guard plate over the bar attachment and the cover over the oil pump.

Dismantling, mod. 2054/2055

Dismantle the clutch cover and guard plate over the bar attachment.

The oil pump becomes accessible after the screw and cover on the underside of the crankcase have been removed.

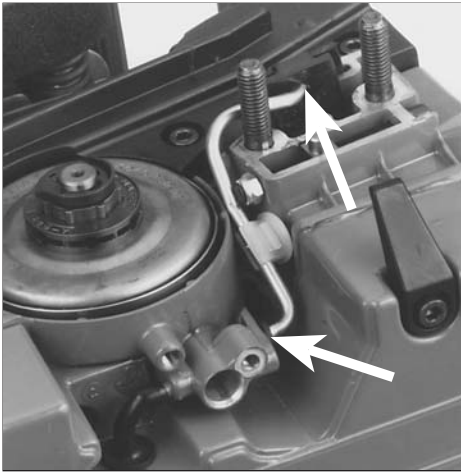




Remove the oil pump.

Remove the screw and clip which holds the oil pump in position.

Bend carefully with a screwdriver and pull out the oil pump from the pump housing.



Remove the oil pipe.

Remove the oil pipe, first at the bar attachment (note from which direction the pipe goes into the the rubber seal) and then at the pump housing.

Bend carefully with a screwdriver.

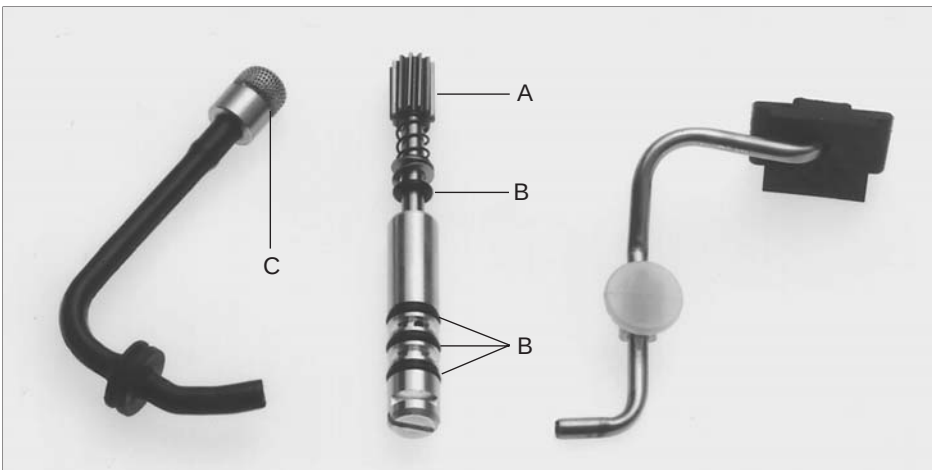


Dismantle the oil hose.

See chapter 8 "Crankshaft and crankcase" for the pump gear.

Release the oil hose from the pump housing by means of screwdriver and lift up the hose from the oil tank.

See chapter 8 "Crankshaft and crankcase" for the pump gear.



Fitting, mod. 2054/2055

Clean all parts and inspect them for damage and wear.

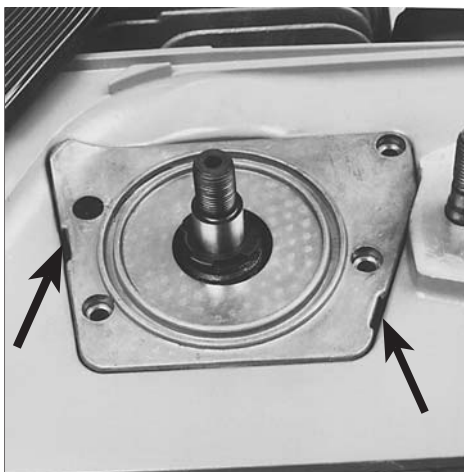
Pay attention to the following:

- A. Check that the cogs are undamaged.
- B. Check that the O-rings seal as intended.
- C. Replace the oil filter if it cannot be satisfactorily cleaned.
- D. Make sure that the oil passages are free from impurities.

Lubricate them with oil.

Replace damaged parts.

Fit the oil pump in the reverse order to dismantling.



Dismantling, mod. 625/630/670

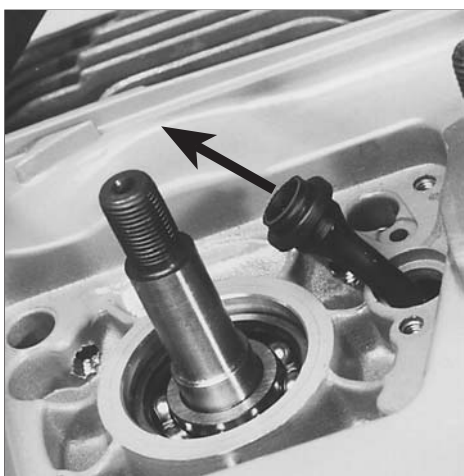
Bend up the oil pump from the crankcase by means of screwdriver.

Dismantling, mod. 625/630/670

Dismantle the clutch cover and centrifugal clutch. Remove the screws.

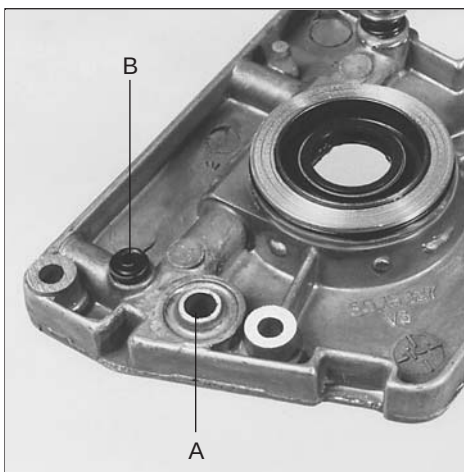
Remove the plate from the bar attachment.

Stick a screw driver in each recess and bend the oil pump.



Dismantle the oil hose and clean the filter.

Lift the oil suction hose out of the oil tank and clean the oil pick-up filter.



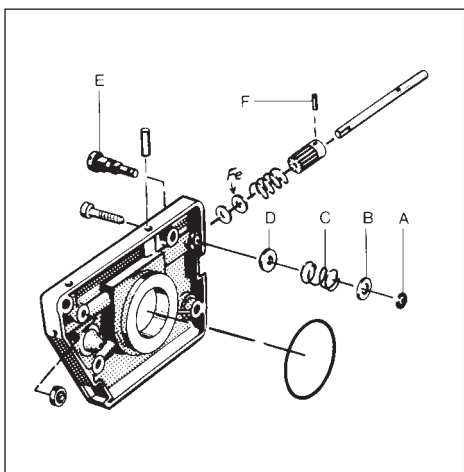
Check that the pick-up and pressure passages are open. Blow clean the passages with compressed air.

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).

If necessary blow clean the passages with compressed air.

NOTE!

Do not blow off the seal at the inlet to the pressure passage.

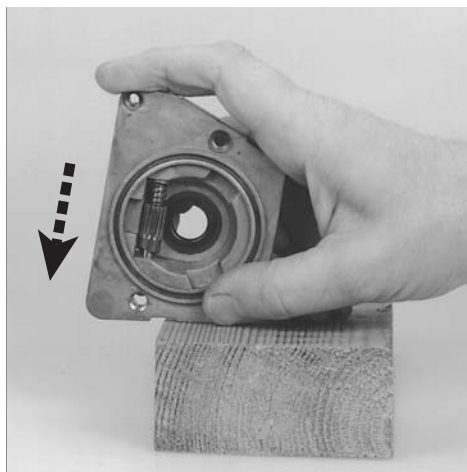


Dismantle the oil pump.

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. Remove locking screw (F) which retains the pump drive on the pump piston.

6 Lubricating system

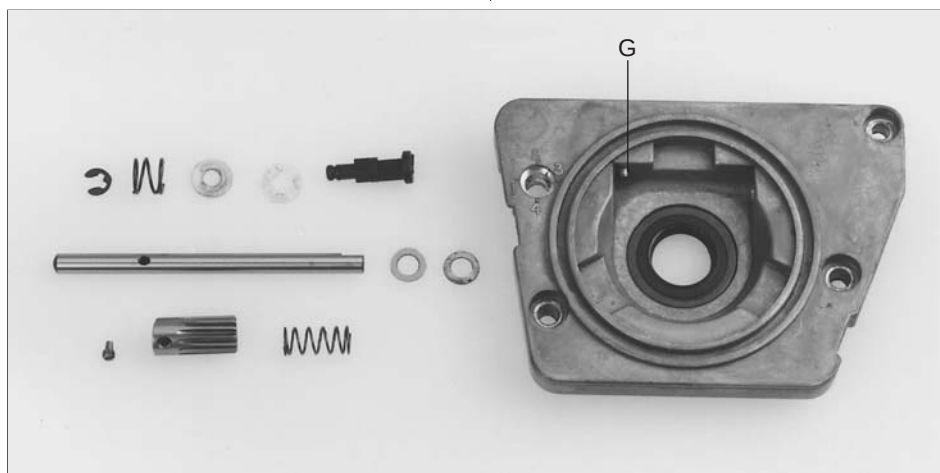


Dismantle the pump piston by tapping the pump housing on a wooden block.

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 the pin (G) against which the cam curve of the pump drive runs.

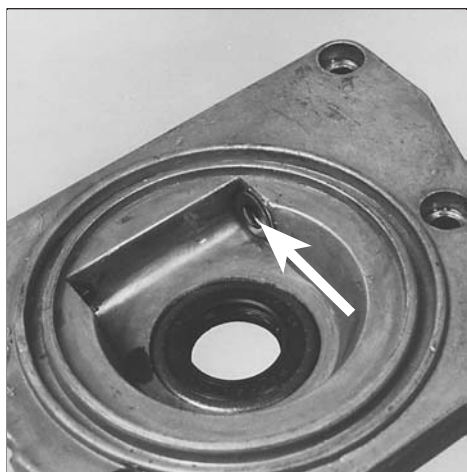
If worn, the pin should be removed from the housing, turned half and pushed back in its place.



Assembly, mod. 625/630/670

Clean and check all parts for wear and damage.

Assembly of the oil pump takes place in reverse order to dismantling.

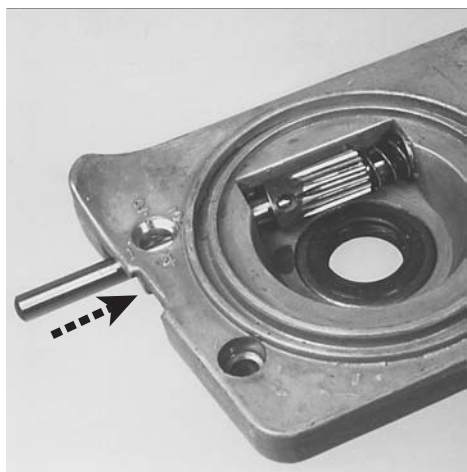


Attach the two washers with grease to the pump housing. The steel washer should be closest to the spring.

Place the two washers with the aid of a little grease in the pump housing.

NOTE!

The steel washer should be closest to the spring.

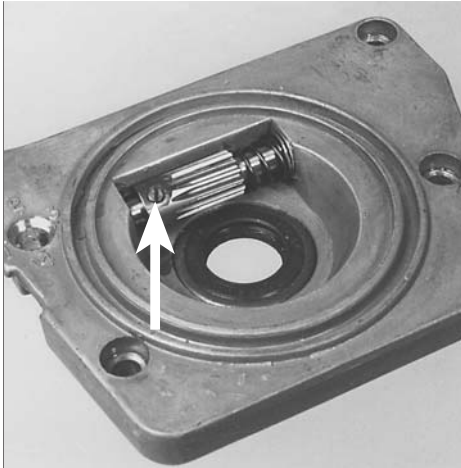


Put the pump gear in position and push the shaft into the pump housing.

Lubricate all parts in the pump with chain oil.

Press the spring together and put the pump gear in position.

Put the shaft into the pump housing (the flat milled end first) through the spring and washers.

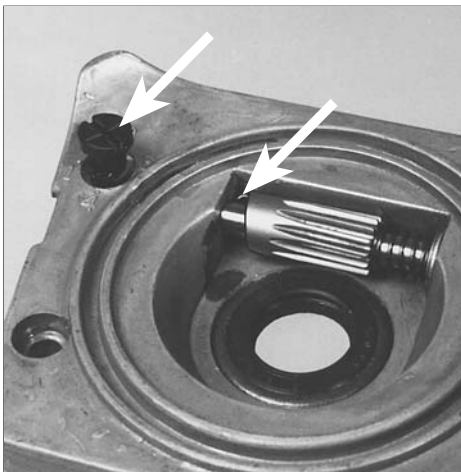


Screw tight the pump gear and lock the screw with Loctite or lock-paint.

Fit the lock screw and make sure that it fits in the recess in the axle.

Lock the screw with Loctite AA or lock paint.

Check that the pump can be rotated easily and that it is easy to move axially.



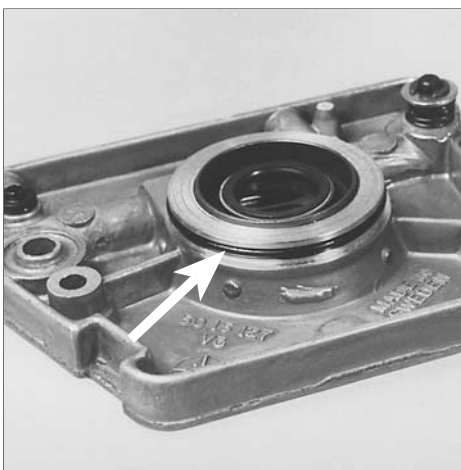
Fit the adjuster shaft.

Turn the pump gear so that the cam curve comes to its highest position against the control pin and fit the adjuster shaft.



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

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



Check that the O-ring is not damaged. Fit a new one if so required.

Check that the O-ring is not damaged. Fit a new one if so required.



Place the suction hose in the oil tank.

Place the suction hose in the oil tank.



Place protective sleeve No. 502 50 53-01 on the crankshaft.

Use sleeve No. 502 50 53-01 to protect the sealing ring when the pump is fitted into the crankcase.



Fit the oil pump in the crankcase and fit the other parts in the reverse order to dismantling.

Fit the pump in the crankcase and tighten the three screws.

Fit the steel washer closest to the sealing ring and drive wheel.

Lubricate with grease and finally place the large washer in place.

Fit the clutch and remaining parts.



Dismantling, mod. 2077/2083

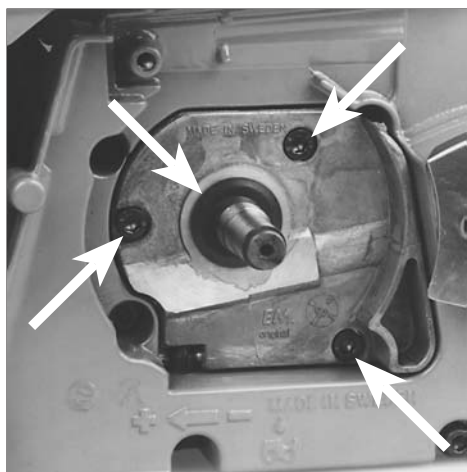
Dismantle the chain brake, centrifugal clutch and oil pump.

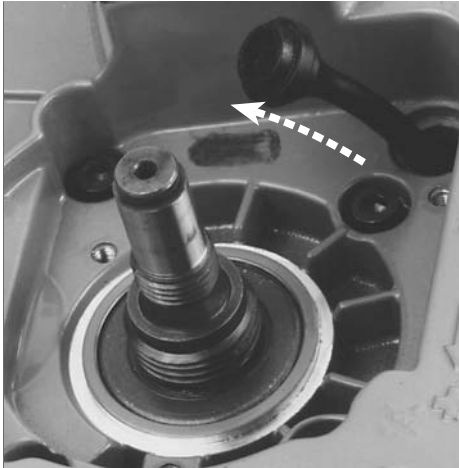
Dismantling, mod 2077/2083

Dismantle the chain brake and centrifugal clutch.

Remove the screws which hold the oil pump and remove the cup washer on the crankshaft.

Note how the washer is turned.



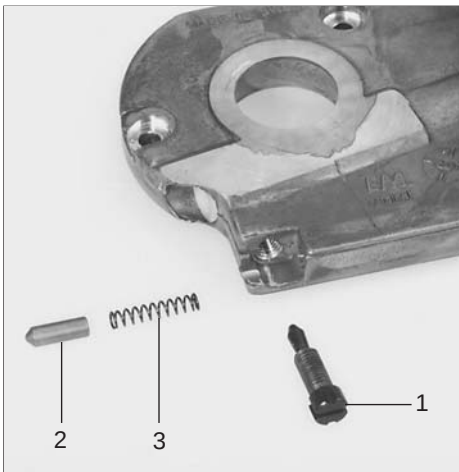


Lift up the oil pick-up hose and clean or replace the filter.

Lift up the oil pick-up hose from the oil tank. Use a screwdriver if necessary.

Clean the filter with a brush.

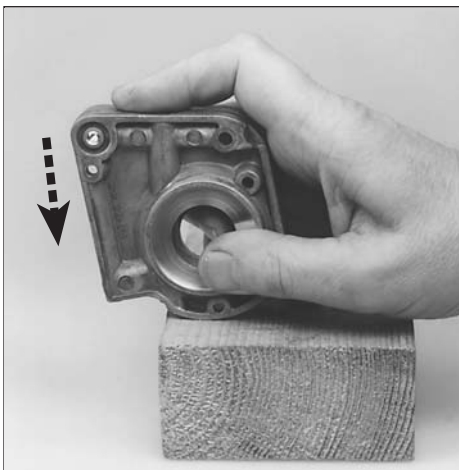
Fit a new filter if it cannot be cleaned or if it is damaged.



Remove the adjusting screw and its lock-pin.

Dismantle the oil pump.

Unscrew the adjusting screw (1) completely and remove the lock-pin (2) and spring (3).



Dismantle the plastic plug and the pump shaft by giving the pump housing a sharp tap on a wooden block.

Remove the plastic plug which covers the hole for the pump shaft by giving the pump housing a sharp tap on a wooden block.

Dismantle the pump shaft in the same way.



Fitting, mod. 2077/2083

Check that the oil passage between the inlet and outlet is open.

Replace damaged or worn parts.

Fitting, mod. 2077/2083

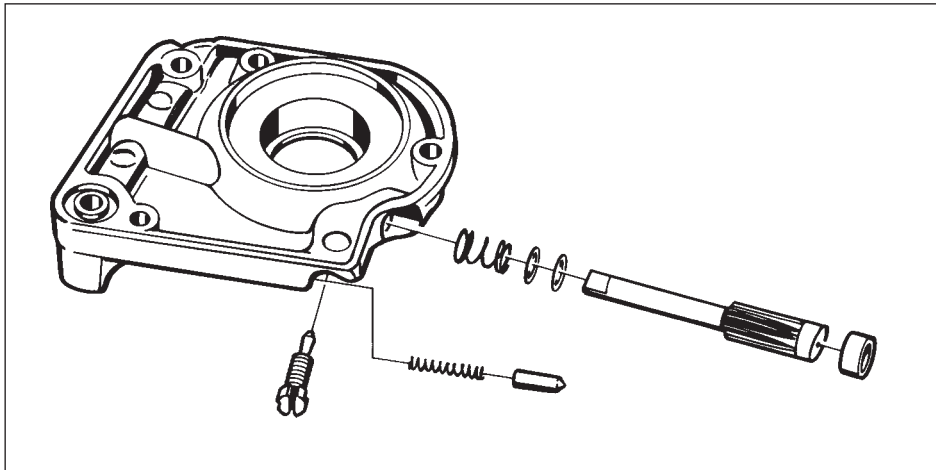
Clean all parts of the pump and inspect them for wear and damage.

Check that the oil passage between the inlet (A) and outlet (B) is open by using compressed air.

Replace damaged or worn parts.

Pay especial attention to the conical end of the adjusting screw where it is in contact with the pump shaft's cam curve.

6 Lubricating system



Fit the oil pump in the reverse order to dismantling.

Lubricate the pump shaft and gear with grease before it is pushed into the pump housing.

Press in the pump shaft as far as it goes and fit the adjusting screw.

Screw it in first as far as it goes and then unscrew it:

– 3 turns for mod. 2077/2083.

– 1 turn for mod. 2095.

The pump will now give maximum oil flow. If less oil flow is required turn the screw clockwise.

Press tight the plastic plug (flat end inwards) in the pump housing.



Fit the oil hose in the crankcase. Replace if it is damaged.

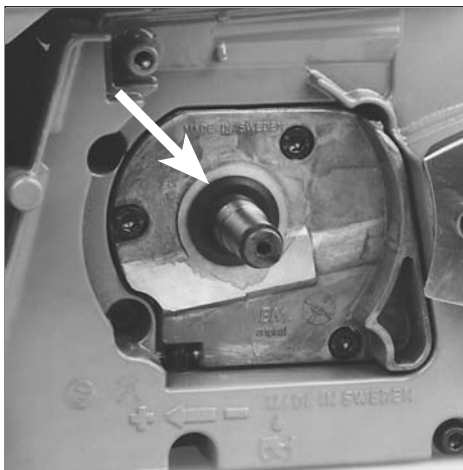
Check that the seal at the outlet is in position and that the oil passage to the bar is open.

Check the oil hose (1). If it is damaged it should be replaced.

Fit the hose in the crankcase.

Check that the small seal on the outlet (2) from the oil pump is in position in the crankcase (mod. 2077/2083) and on the pump housing (mod. 2095) and that it is not damaged.

Blow with compressed air to check that the oil passage to the bar is open.

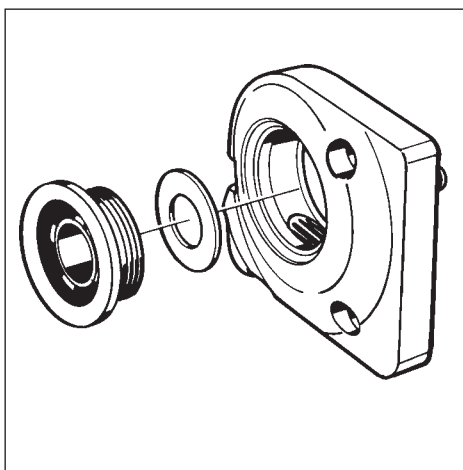


Screw tight the oil pump on the crankcase.

Screw tight the oil pump on the crankcase.

Mod. 2077/2083

Place the cup washer (the convex side upwards) in position and fit the centrifugal clutch and other parts.



Mod. 2095

Lubricate the oil pump drive and washer with grease.

Press the drive down into the crankcase. The washer should lie flush with the seal in the crankcase.

Mod. 2095

Lubricate the oil pump drive and washer with grease.

Press down the drive in the crankcase. The washer should lie flush with the seal in the crankcase.



Oil tank venting

Check that the ventilation functions by increasing the air pressure in the oil tank.

Oil tank venting

In order to avoid a vacuum developing in the oil tank when the oil is consumed, and thereby resulting in inferior chain lubrication, there is a ventilation passage built into the crankcase. There are different ventilation designs, see chapter 8 "Crankshaft and crankcase".

Check that the ventilation functions by increasing the air pressure in the oil tank.



Checking of pump function

Check that the chain lubrication functions by holding the bar against a light object while running the engine at 3/4 throttle.

Checking of pump function

Check that the chain lubrication functions. Run the saw at 3/4 throttle for about one minute.

Hold the bar against a stump or other light object (at a distance of approx. 20 cm). During this test a clear strand of oil should develop on the light object.

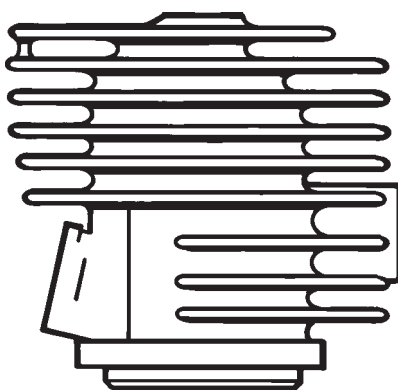
Adjust the oil pump setting to obtain the correct chain lubrication.

Trouble shooting system

Cause	Insufficient lubrication	Leakage
Blocked oil passage or lubrication hole in the bar	●	●
Blocked oil tank vent	●	
Defective pressure hose	●	●
Wear on pin/cam in pump piston	●	
Defective threads for fitting screws	●	
Wear on pump cylinder/piston	●	
Defective oil pick-up hose	●	●
Blocked oil screen	●	

Cylinder and piston

7.



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The cylinder and piston are two of the components which are exposed to the greatest tensions in the engine. They must withstand high revs, large heat variations and high pressure. They must also be resistant to wear. Despite these severe working conditions serious piston and cylinder malfunctioning is relatively unusual. A contributory factor to this is the new lining material in the cylinder barrel, new types of lubricants and refined technology during the manufacturing.

Cleanliness is of extreme importance during service work on these components. It is therefore to be recommended that the cylinder and the surrounding area are well cleaned before the cylinder is dismantled from the crankcase.



Dismantling

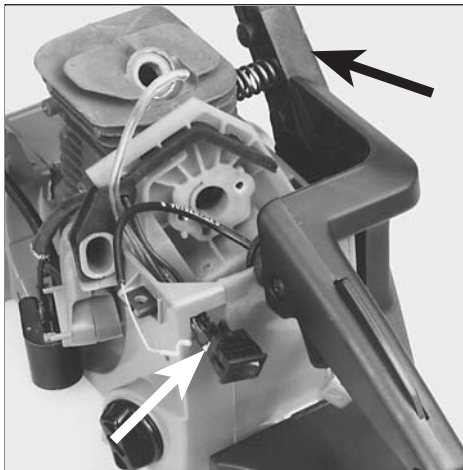
General

Dismantling work is basically the same for all saw models. In the event that the work method deviates for a particular model this is given special attention.

Dismantle the following:

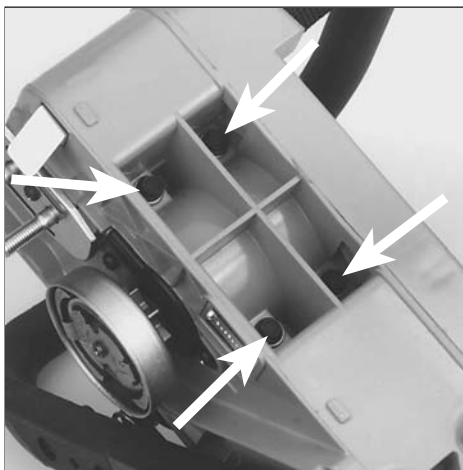
Cylinder cover, carburettor cover, chain brake, starter device, plug, air filter, carburettor, heat shield, pick-up pipe, muffler with heat shield, and on certain models ignition module, flywheel, oil pump and centrifugal clutch.

See respective section in the Workshop Manual for detailed instructions.



Mod. 2036/2040 Mod. 2041/2045/2050

Dismantle the cables from the short-circuiting contact and release the screw which holds the handlebar to the cylinder. Dismantle the centrifugal clutch and oil pump.



Remove the cylinder screws and lift off the cylinder and crankshaft from the crankcase.

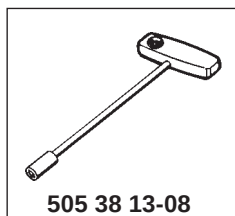
Mod. 2036/2040 Mod. 2041/2045/2050

Dismantle the cables from the short-circuiting contact and release the screw which holds the handlebar to the cylinder. Dismantle the centrifugal clutch and oil pump.

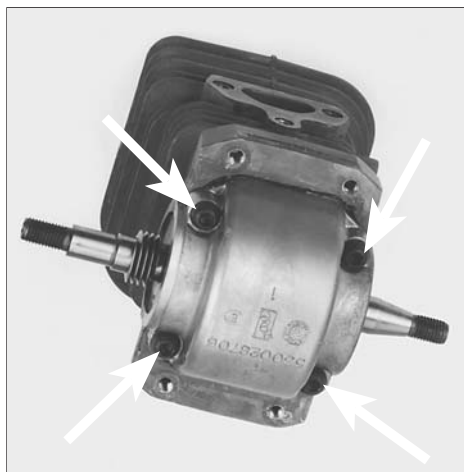
Lift off the carburettor's adapter with attached ignition module and turbo nozzle.

Remove the screws which hold the cylinder attached to the crankcase.

Lift off the cylinder and crankshaft from the crankcase.



505 38 13-08



Mod. 2036/2040

Remove the bearing holder.

Mod. 2036/2040

Remove the screws which hold the bearing holder to the cylinder.

Remove the bearing holder from the cylinder by carefully tapping it with a plastic mallet.

WARNING!

Do not use a screwdriver to prise off the bearing holder. The thin sealing surfaces can easily be damaged!



Lift off the crankshaft.

Lift off the crankshaft together with the piston.

Note how the crankshaft is positioned so that it can be re-fitted correctly.



Dismantle the piston from the connecting rod.

Remove the piston bolt's circlip with a pointed object. Stick the point under the circlip on the side which has a small recess under the piston bolt.

Note which direction the arrow on the piston head is pointing to simplify fitting. Press out the piston bolt from the piston.



Mod. 2041/2045/2050

Remove the crankshaft with bearing holder and piston from the cylinder.

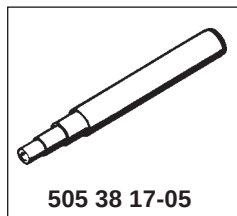
Mod. 2041/2045/2050

Remove the crankshaft with bearing holder and piston from the cylinder.

Note how the crankshaft is positioned so that it can be re-fitted correctly.



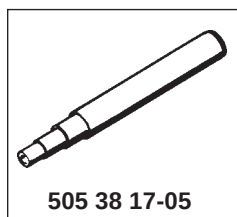
Dismantle the piston from the connecting rod.



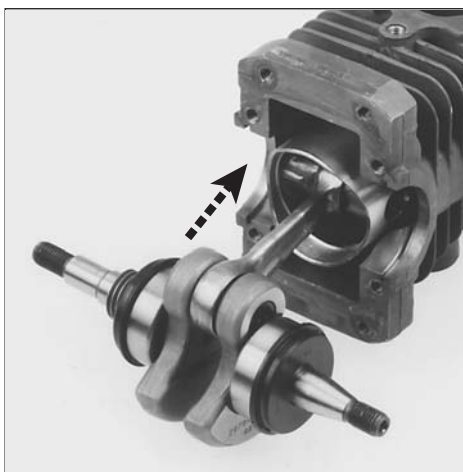
Fitting

Mod. 2036/2040

Fit the piston on the connecting rod. Make sure that the arrow on the piston head is turned towards the exhaust port.



Make sure that the arrow on the piston head points towards the exhaust port and push the piston in the cylinder barrel.



Fit the bearing holder over the crankshaft.



Remove the piston bolt's circlips by using a pair of flat pliers and press out the piston bolt from the piston with mandrel No. 505 38 17-05.

Note which direction the arrow points to on the piston head to simplify refitting.

Fitting

Mod. 2036/2040

Before fitting the piston and cylinder refer to chapters "Cleaning, inspection" and "Analysis and procedure".

Lubricate the piston bolt's needle bearing with a few drops of motor oil.

Align the arrow on the piston head to the exhaust port.

Press in the piston bolt and fit the circlip.

Check that the circlip fits completely down in the groove in the piston.

Lubricate the circlip and piston skirt with motor oil and push the piston in the cylinder barrel with a rocking movement.

Make sure that the arrow on the piston head points towards the exhaust port.

Do not twist the piston since there is a risk that the circlip will break off.

Clean the bearing holder and cylinder base from old sealing compound and apply a thin layer of new sealing compound on the sealing surfaces.

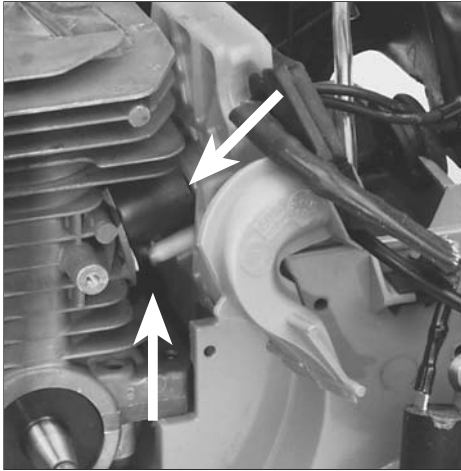
Press down the crankshaft bearing and seals well in the bearing seats on the cylinder.

Place the bearing holder over the crankshaft.

NOTE!

Turn it so that the clean turned surface comes opposite the oil pump drive.

Screw tight the screws crosswise.



Fit the cylinder with crankshaft in the crankcase.

NOTE!

Re-tighten the cylinder screws.

Fit the cylinder with crankshaft in the crankcase.

Use Locktite on the screws and tighten them crosswise. Tightening torque: 11 Nm.

Fit the other parts in the reverse order to dismantling.

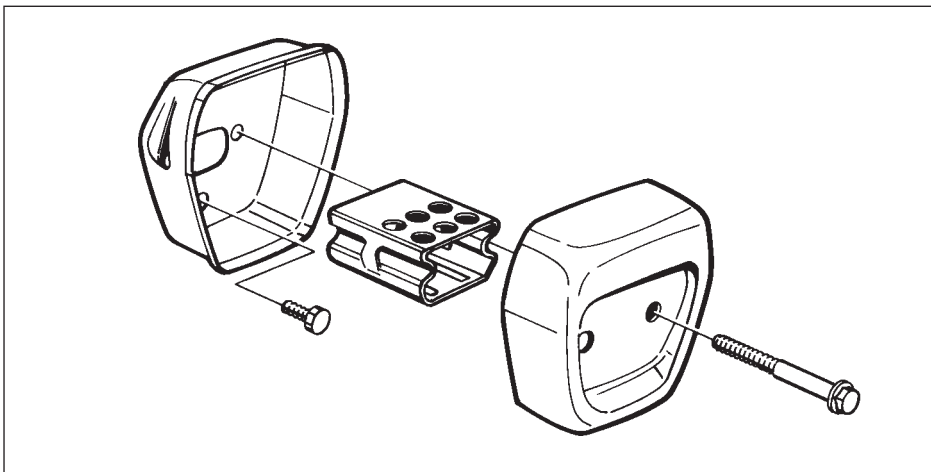
Check when fitting the adapter that the inlet pipe and impulse channel are correctly positioned and seal tightly.

NOTE!

The cylinder screws shall be re-tightened. Fit the bar and chain and run the saw warm for 2-3 minutes.

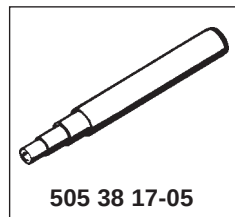
Allow the engine to cool and re-tighten the screws to the correct tightening torque.

When the muffler is fitted it is important that the exhaust pipe from the cylinder is turned with the round holes upwards and away from the cylinder.



Mod. 2041/2045/2050

Fit the piston on the connecting rod. Make sure that the arrow on the piston head is turned towards the exhaust port.



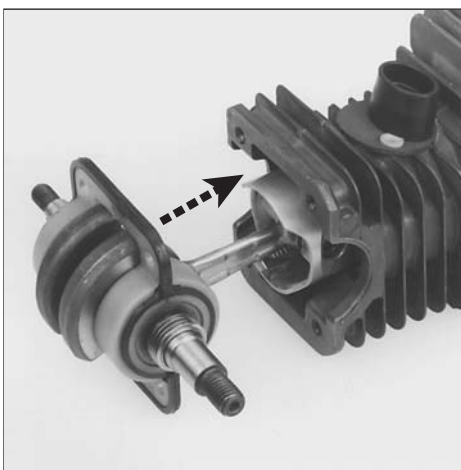
Mod. 2041/2045/2050

Before fitting the piston and cylinder refer to chapters "Cleaning, inspection" and "Analysis and procedure".

Lubricate the piston bolt's needle bearing with a few drops of motor oil.

Align the arrow on the piston head towards the exhaust port.

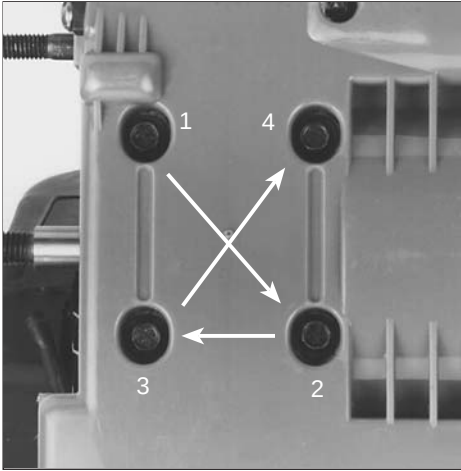
Press in the piston bolt and fit the circlips by using a pair of flat pliers. Check that the circlips are fitted well down in their grooves by turning them with the pliers.



Make sure that the arrow on the piston head points towards the exhaust port and push the piston into the cylinder barrel.

Lubricate the piston ring and piston with a few drops of engine oil and push the piston into the cylinder barrel with a rocking movement.

Make sure that the arrow on the piston head points towards the exhaust port. Do not twist the piston since there is a risk that the piston ring can be broken off.



Check that the bearing holder's rubber seals are undamaged.

Press down the crankshaft's bearing holder in the bearing seats on the cylinder and tighten the cylinder screws crosswise.

Fit the other parts in the reverse order to dismantling.

NOTE!

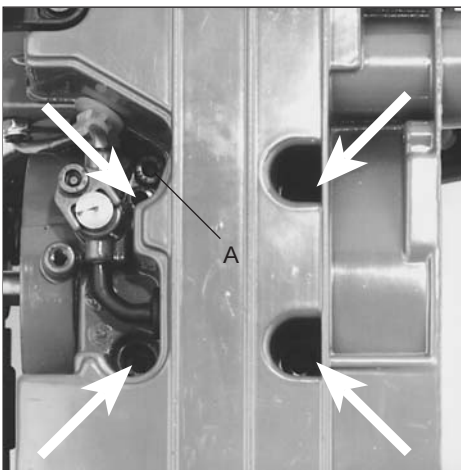
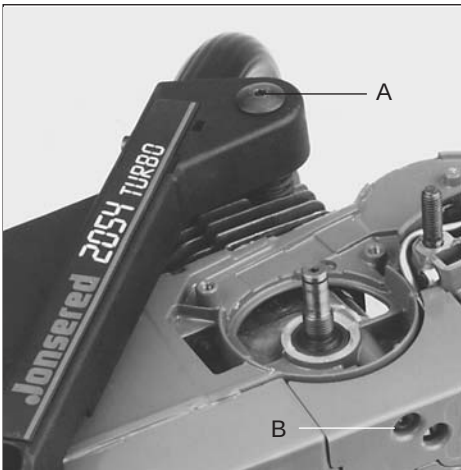
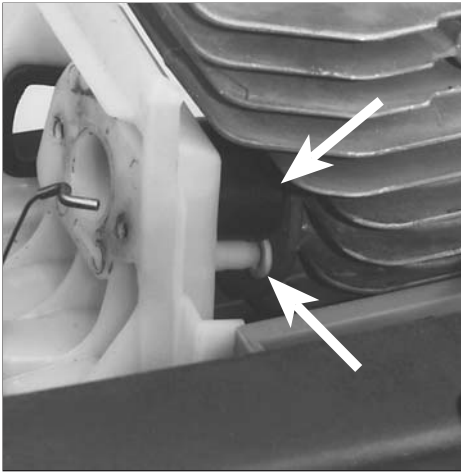
The cylinder screws should be re-tightened.

Dismantling

Mod. 2054/2055

Remove the screws (A) and (B), and the cover over the oil pump.

Remove the cylinder screws.



Check that the rubber seals on the bearing holder are undamaged.

Press down the crankshaft's bearing holder in the bearing seats on the cylinder. It is not necessary to use sealing compound.

Tighten the cylinder screws crosswise. Use Locktite on the screws.

Tightening torque: 11 Nm.

Fit the other parts in the reverse order to dismantling.

Check when fitting the adapter that the inlet pipe and impulse channel are positioned correctly and seal tightly.

NOTE!

The cylinder screws shall be re-tightened.

Fit the bar and chain and run the saw warm for 2-3 minutes.

Allow the engine to cool and re-tighten the screws to the correct tightening torque (11 Nm).

Dismantling

Mod. 2054/2055

Remove the screws (A) and (B), and the cover over the oil pump.

Remove the screws which hold the cylinder to the crankcase.

NOTE!

Four screws. The fifth screw (A) holds the crankshaft's bearing housing fixed in the crankcase when the cylinder is lifted off.



Dismantle the piston from the connecting rod.

Cover the crankshaft's bearing housing with a cloth and remove one of the piston bolt's circlips by using a pair of flat pliers. Press out the piston bolt from the connecting rod and lift off the piston.



Fitting

Mod. 2054/2055

Fit the piston on the connecting rod. Make sure that the arrow on the piston head points towards the exhaust port.

Fitting

Mod. 2054/2055

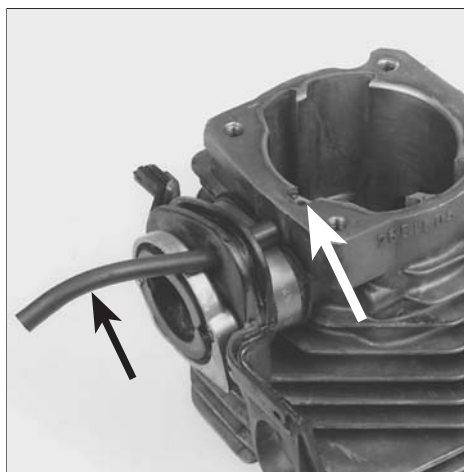
Before fitting the piston and cylinder refer to chapters "Cleaning, inspection" and "Analysis and procedure".

Lubricate the piston bolt's needle bearing with a few drops of engine oil.

Align the arrow on the piston head to the exhaust port.

Press in the piston bolt and fit the circlip.

Check that the circlip is fitted completely down in the groove in the piston by turning it with the pliers.



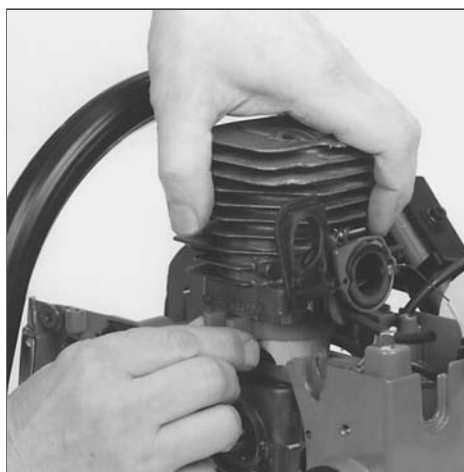
Inspect the impulse passage and hose for damage and to make sure that they are not blocked.

Check that the inlet pipe is not cracked or loose.

Check that the impulse passage in the cylinder and hose is open and that the hose is not cracked.

Check also that the rubber inlet pipe is not damaged, e.g. cracked, or that its clip has loosened.

Scrape off any remains of the gasket from the cylinder base.



Place a new cylinder base gasket on the crankshaft's bearing housing and fit the cylinder.

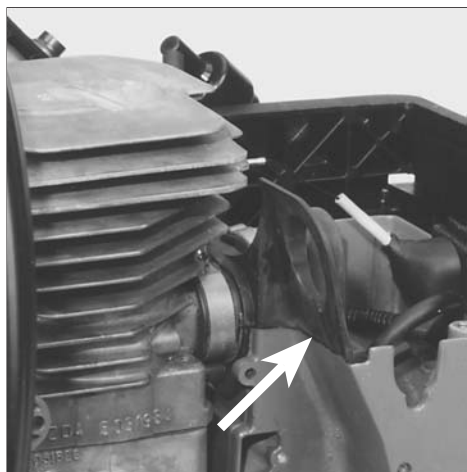
Scrape clean the crankshaft's bearing housing from any remains of the old gasket and place a new cylinder base gasket on the sealing surface. Position it with grease.

Lubricate the crankshaft bearing and piston with a few drops of engine oil.

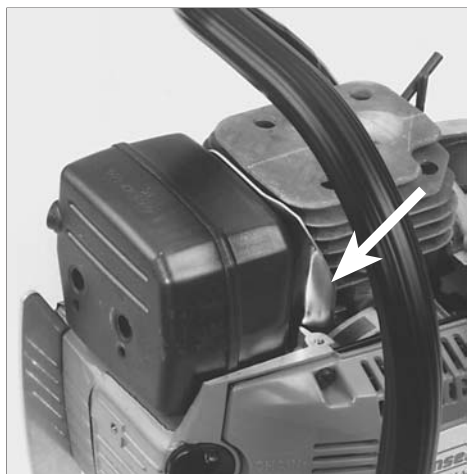
Fit the cylinder by using assembly set 502 50 70-01.



502 50 70-01



Press down the cylinder to the crankcase. Fit the cylinder screws and use Loctite on the threads.



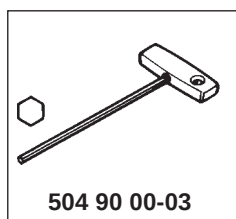
Dismantling

Mod. 625/630/670

Mod. 2077/2083

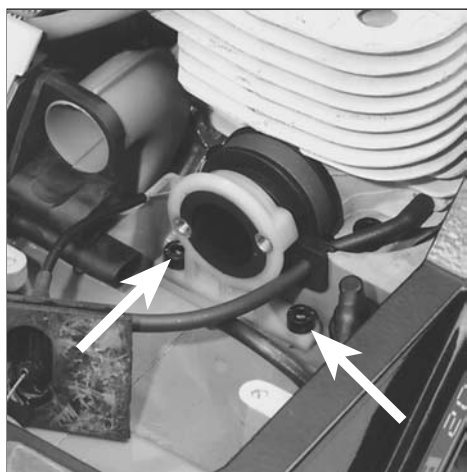
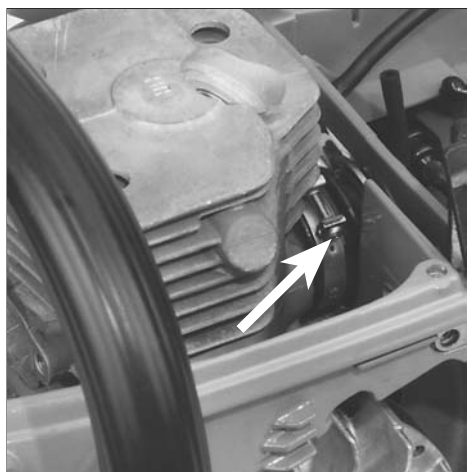
Mod. 2095

Dismantle all parts round the cylinder.



Mod. 2077/2083

Dismantle the turbo nozzle and inlet pipe from the cylinder.



Mod. 2095

Remove the screws for the adapter.

Press down the cylinder to the crankcase and make sure that the rubber seal to the carburettor chamber is positioned correctly and seals as intended.

Fit the cylinder screws. Use Loctite on the threads and tighten them crosswise.

Fit the other parts in the reverse order to dismantling. Refer to respective chapters if necessary.

Dismantling

Mod. 625/630/670

Mod. 2077/2083

Mod. 2095

Dismantle the cylinder cover, carburettor cover, chain brake, plug, air filter, carburettor and muffler.

Use tool 504 90 00-03 to release the muffler screws.

Lift off the muffler and heat shield plate.

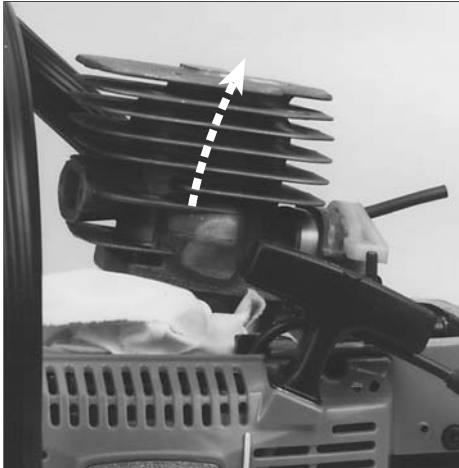
Mod. 2077/2083

Dismantle the turbo nozzle and release the clip which holds the inlet pipe to the cylinder.

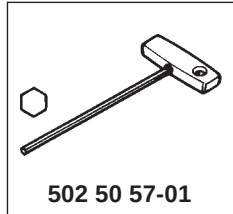
Use a screwdriver and carefully prise the inlet pipe away from the cylinder.

Mod. 2095

Remove the screws which hold the adapter attached to crankcase.



Release the cylinder screws and the screw which holds the spring element to the cylinder (mod. 2095).



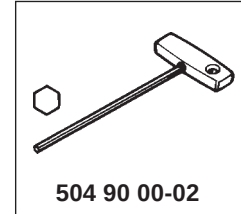
Dismantle the piston from the connecting rod.



Release the cylinder screws. Use tool 502 50 57-01 (3/16") for mod. 626/630/670 and mod. 2095.

Use tool 504 90 00-02 for mod. 2077/2083.

Lift the cylinder and place a cloth in the crankcase opening to prevent dirt from dropping down into the crankcase.



Dismantle the piston from the connecting rod.

Place a cloth in the crankcase opening to prevent the piston bolt's circlip from falling down if it should be dropped.

Use a pair of flat pliers to remove the circlip.



Fitting

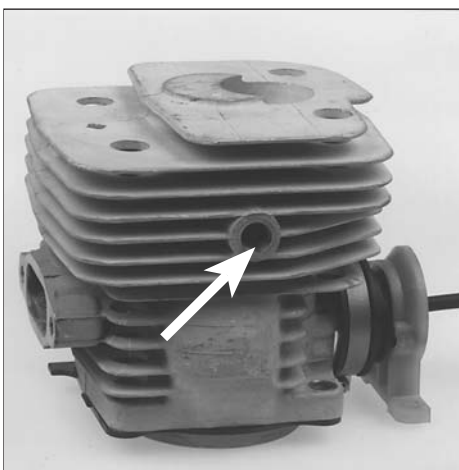
Mod. 625/630/670
Mod. 2077/2083
Mod. 2095

Inspect the piston and cylinder as per chapters "Cleaning, inspection" and "Analysis and procedure".

Decompression valve

Mod. 2083 and 2095 are fitted with decompression valves.

Check that the valve disc seals tightly. If necessary rub down with grinding paste.



Check that the outlet holes in the valve are open, including the hole in the cylinder wall.

Fitting

Mod. 625/630/670
Mod. 2077/2083
Mod. 2095

Before fitting the piston and cylinder refer to chapters "Cleaning, inspection" and "Analysis and procedure".

Decompression valve

Mod. 2083 and 2095 have a decompression valve fitted in the cylinder.

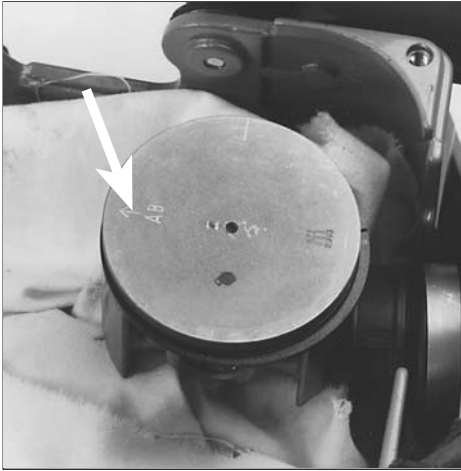
It is important that this is tight for the engine to provide full power.

Rub the valve disc with fine grinding paste if it is not tight.

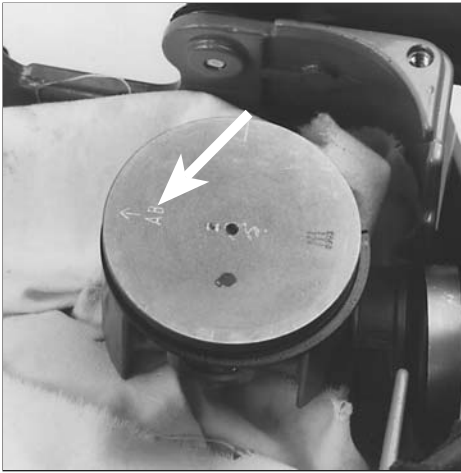
Wash the valve carefully to remove all the grinding paste after rubbing.

Check that the outlet holes in the valve are open, including the hole in the cylinder wall.

Clean if necessary.



Lubricate the piston bolt's needle bearing with a few drops of engine oil and fit the piston.



Check that the piston and cylinder have the correct classing to fit together.



Check before fitting the cylinder that the inlet pipe and impulse hose are undamaged and that they seal tightly at the connections.



Use a new cylinder base gasket and fit the cylinder.



Lubricate the piston bolt's needle bearing with a few drops of engine oil.

Align the arrow on the piston head to the exhaust port.

Press in the piston bolt and fit the circlips.

NOTE!

Place a cloth in the crankcase opening to prevent the circlip dropping down into the crankcase if it should fly off.

Check that the circlips are correctly fitted in the grooves by turning them with a pair of flat pliers.

Classing letters are stamped in the piston so that it can be fitted together with the correct cylinder.

A piston which is stamped with the same letter as the cylinder or a previous letter in the alphabet will fit in the cylinder.

A piston stamped AB will fit in a cylinder stamped A or B.

Before fitting the cylinder check that:

- The inlet pipe is not cracked.
- The inlet pipe is fixed on the cylinder and seals tightly (mod. 625/630/670 and mod. 2095).
- The impulse hose is not cracked and that it seals tightly to the cylinder (mod. 625/630/670 and mod. 2095).

Inadequate sealing at the above points can result in irregular idling and make the engine difficult to start.

Carefully scrape off the remains of old gasket from the cylinder base and crankcase and place a new gasket on the crankcase.

Fix it with a little grease.

Lubricate the piston and piston ring with a few drops of engine oil and fit the cylinder by using set 502 50 70-01.

Tighten the cylinder screws.

Tightening torque: 10-12 Nm.

NOTE!

Do not forget the insulation washer under the cylinder on mod. 2095.



Fit the other parts in the reverse order to dismantling.

Fit the other parts in the reverse order to dismantling.

Mod. 2077/2083

Observe care when fitting the inlet pipe so that it is not damaged. Lubricate with oil so that it will slide more easily on the induction sleeve on the cylinder.

Tighten the clip and check that the connection is tight.

Tighten the cylinder screws.

Tightening torque: 10-12 Nm.

Cleaning, inspection

The different parts are cleaned after dismantling:

1. Scrape off soot deposits on the piston head.
2. Scrape off soot deposits in the cylinder's combustion chamber.
3. Scrape off soot deposits in the cylinder's exhaust channel.

NOTE!

Scrape carefully with an object which is not too sharp so that the soft aluminium parts are not damaged.

4. Clean the decompression passage in the cylinder wall.
5. Wash all parts clean.
6. Inspect the different parts for damage and wear.
7. Check the adapter and inlet pipe for cracking and to see if leakage has occurred, etc.

See also the chapter "Analysis and procedure".

Check the piston and cylinder for seizing damage and wear.

See also the chapter "Analysis and procedure".

Check the piston ring for damage or fracture.

See also the chapter "Analysis and procedure".

Check the piston bolt.

– If it shows signs of bluing it should be replaced.

– If it runs too easily in the piston both the piston and piston bolt should be replaced.

Check the needle bearing. If it is discoloured or damaged it should be replaced.

Check the circlips. If they show signs of cracking or are discoloured they should be replaced.



New piston. Inlet side.



New piston. Exhaust side.

Analysis and procedures

The two adjacent illustrations show what a new piston looks like, on the inlet side and on the exhaust side. Note that the milling lines from manufacturing are clearly visible.

Use these illustrations as reference for the evaluation of wear and damage.

Experience shows that piston or cylinder malfunction as a result of manufacturing faults are unusual.

There are other reasons which dominate instead, as can be seen from the following.

Note the reasons for the malfunction, repair the damage and take the necessary corrective action to prevent repetition.



Small to medium sized scratches mainly opposite exhaust port.



Medium sized to deep scratches along full piston skirt on exhaust side.



Powerful scratches along the full piston skirt on the exhaust side.

Insufficient lubrication

The piston displays small to medium sized scratches usually opposite the exhaust port. In severe cases the heat development can be so great that material from the piston adheres along the piston skirt and also in the cylinder bore.

The piston ring is as a rule undamaged and can move freely in the piston ring groove. Scratches may also be found on the piston's inlet side.

Reasons:

- Incorrect carburettor setting. Recommended max. revs has been exceeded.
- Incorrect oil mixture in the fuel.
- Too low octane rating in the fuel.

Procedures:

Check and change the carburettor setting.
Change fuel.
Change to petrol with high octane rating.

The piston ring has begun to stick, or is completely stuck in its groove and has therefore not been able to seal to the cylinder wall, which has resulted in an additional powerful increase in heat in the piston.

Seizure scratches can be seen along the full piston skirt both on the exhaust side and inlet side.

Reasons:

- Incorrect oil mixture in the fuel.
- Too low octane rating in the petrol.
- Air leaks.
Cracked fuel pipe.
Untight inlet gaskets.
Cracked intermediate piece or inlet pipe.
- Air leaks in engine body.
Untight crankshaft seals.
Untight cylinder and crankcase gaskets.
- Unsatisfactory maintenance.
Dirty cooling fins on the cylinder.
Blocked air inlet on starter.
Blocked spark extinguishing net in muffler.

Measures:

Change to fuel with correct oil mixture.
Change to petrol with higher octane rating.
Replace damaged parts.

Replace untight gaskets and shaft seals.

Clean cooling fins and air intake.

Clean or change spark extinguishing net.

For best results Jonsered two-stroke oil is recommended, which is specially developed for air-cooled two-stroke engines.

Mixing ratio: 1:50 (2 %).

If Jonsered two-stroke oil is not available another high quality two-stroke oil can be used.

Mixing ratio: 1:33 (3 %) or 1:25 (4 %).



Medium to deep scratches on the exhaust side. The piston ring has stuck in its groove. Black discolouring under the piston ring resulting from so-called "blow through".



Inlet side. The piston ring has stuck in its groove. Black discolouring under the piston ring resulting from so-called "blow through".



The exhaust side damaged by a broken piston ring. The piston ring parts damage the head part of the piston and result in scratch marks.

Piston seizures resulting from severe carbon deposits

Excessive carbon deposits can result in damage similar to that caused by insufficient lubrication. The piston skirt, however, is darker in colour as a result of the hot combustion gases which are pressed past the piston ring.

This type of piston damage begins at the exhaust port where carbon deposits can loosen and stick between the piston and cylinder wall.

Typical for this type of piston damage is the brown and black discolouring of the piston skirt.

Reasons:

- Incorrect type of two-stroke oil and/or petrol.
- Incorrect oil mixture in the petrol.
- Incorrect carburettor setting.

Measures:

- Change the fuel.
- Change to fuel with correct oil mixture.
- Correct the carburettor setting.

Piston damage resulting from excessively high engine revs.

Typical damage resulting from excessively high engine revs include fracture of the piston ring, broken circlip for the piston bolt, defective bearings or the loosening of the guide pin for the piston ring.

Piston ring fracture

A too "lean" carburettor setting results in both higher revs and higher piston temperatures. If the piston temperature rises over the normal working temperature the piston ring can seize in its groove, which in turn can imply that it fails to go sufficiently deep in the groove. The edge of the piston ring may therefore hit the head edge of the exhaust port and become broken, also resulting in damage to the piston.

Excessive engine revs can also result in rapid wearing of the piston ring and play in the piston ring groove, primarily opposite the exhaust port. The ring is weakened by the wear and can stick in the port, resulting in serious damage to the piston.



The guide pin for the piston ring has been pressed up through the piston head.

Loose vibrated guide pin for piston ring

Excessively high engine revs can result in the piston ring ends hammering against the guide pin when the piston ring moves in its groove. The intensive hammering can drive out the pin through the head part of the piston and also result in serious damage to the cylinder.



Deep and irregular grooves caused by a loose circlip. Here on the piston's inlet side.

Damage on circlips for the piston bolt

Excessively high engine revs can cause the circlips for the piston bolt to vibrate. The vibrations cause the circlip grooves to wear out, which in turn results in a reduction of the tensioning of circlips. The circlips can therefore loosen and cause damage to the piston.



Irregular grooves on the piston's inlet side caused by a broken bearing cage.

Bearing malfunction

Malfunctioning of the crank shaft or connecting rod bearings is usually the result of excessively high engine revs, which result in overloading or overheating of the bearing. This in turn can imply that the bearing needles or balls slip instead of rotating, which can result in the bearing cage breaking up.

The broken parts can become jammed between the piston and the cylinder wall and result in damage to the piston skirt.

Damaged parts can also pass up through the cylinder's transfer ports and result in damage to the piston sides and head, and the cylinder's combustion chamber.



Small scratches and a dull, grey surface on the piston's inlet side resulting from fine dust particles.

Foreign objects

Everything that enters the engine through the inlet port, apart from clean air and clean fuel, results in some form of irregular wear or damage to the piston and cylinder.

This type of increased wear can be noticed on the piston's inlet side, beginning at the lower edge on the piston skirt.

The wear is caused by poorly filtered air which passes through the carburettor and into the engine.



Inlet side.

Dust and dirt particles from carbon deposits on the head of the piston and in the piston ring groove. The piston ring is stuck in the groove. Piston material is worn off.

The lower part of the piston skirt on the inlet side is thinner than on the exhaust side.



The piston is worn and scratched from the piston ring and downwards on the inlet side.



Severe damages to the lower part of the piston on the inlet side.

Reasons:

- Defective air filter. Small dust particles pass through the filter.
- The filter is worn out as a result of overcleaning, whereby small holes have been made in the filter material.
- Insufficient maintenance of the filter, e.g. the use of incorrect method or incorrect solvent. Flocculation material releases and holes are made in the air filter.
- The air filter is incorrectly fitted.
- The air filter is damaged or missing.

Procedure:

Fit a fine-mesh filter.

Check the filter carefully for holes and damage each time it is cleaned. Change the filter if necessary.

Carefully clean and use the correct solvent (e.g. lukewarm soapy water).

Change filter.

Fit the filter correctly.

Fit a new air filter.

Large, softer particles which have entered the engine result in damage to the piston skirt under the piston ring as shown in the illustration.

Reasons:

- The air filter is incorrectly fitted.
- The air filter is damaged or missing.

Procedure:

Fit the air filter correctly.

Fit a new air filter.

Large, hard particles which enter the engine result in more severe damage to the lower part of the piston skirt.

Reasons:

- The air filter is damaged or missing.
- Parts from the carburettor or inlet system have released and entered the engine.

Procedure:

Fit a new air filter.

Regular service and control.

Service tips

Defect:

Broken cooling fins, damaged threads or broken screw at exhaust port.

Seizure marks in the cylinder bore (especially at the exhaust port).

The surface lining in the cylinder bore is worn (primarily at the head of the cylinder).

The piston displays seizure scratches.

The piston ring is stuck in its groove.

Procedure:

In severe cases - replace the cylinder.

Repair the thread with Heli-Coil.

Rub the damaged part with fine emery cloth to remove adhered aluminium.

With deeper seizure scratches the cylinder and piston should be replaced.

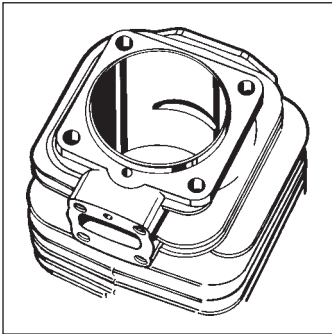
Replace cylinder and piston.

Rub the damaged part carefully with a fine file or emery cloth. Before the piston is fitted the cylinder should be rubbed as above. With deeper scratches the piston and where necessary also the cylinder should be replaced.

Carefully loosen the piston ring and clean the groove very carefully before replacing. Check the wear on the piston ring by placing it in the lower part of the cylinder.

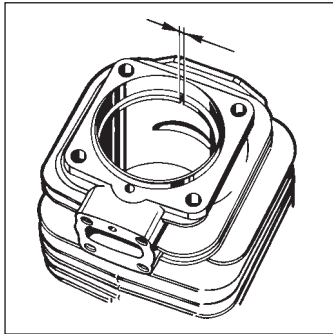
Wear tolerances

Cylinder bore



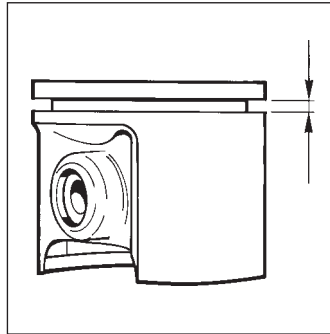
The surface finish is worn away revealing the aluminium.

Piston ring gap



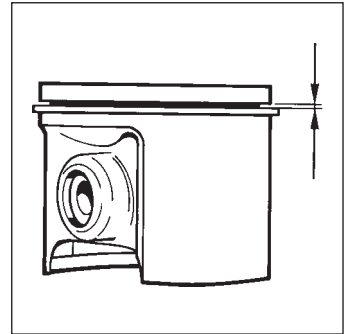
Max. 1.0 mm with the piston ring pushed into the lower part of the cylinder.

Piston ring groove



Max. 1.6 mm. Clean the groove carefully before checking the measurement.

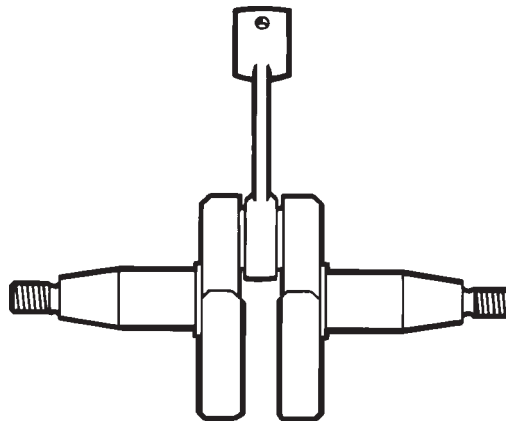
Piston ring play



Max. 0.15 mm. Clean the groove carefully before checking the measurement.

Crankshaft and crankcase

8.



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The purpose of the crankshaft in the engine is to convert the forward and backward movement of the piston to rotation. In order to do this a stable construction is required which can withstand high pressure, torsional and flexural stress, and also high rotational speeds. The connecting rod is also exposed to high accelerational and retarding tensions when it moves between the top and bottom dead centres. This sets special requirements on the bearings which must withstand rapid load alternations. In addition the bearing's roller cage must withstand high levels of heat and friction. During service work it is therefore important to check the roller cage for cracking, wear on the

sides, and discolouring as a result of overheating. The crankshaft is housed in the crankcase with heavy-duty ball bearings. In addition to being the bearing point for the crankshaft, the crankcase also functions as a pump for fuel/air mixing when this is "induced" from the carburettor and pressed up in the cylinder's combustion chamber. In order not to interfere with the pump function the crankcase must be completely tight and there must be no leakage at the crankshaft or between the crankcase halves, or between the cylinder and crankcase.

For this reason always replace gaskets and sealing rings during service work on the crankcase.



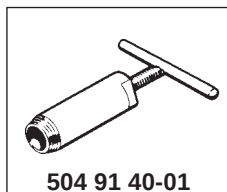
Replacement of sealing ring on magneto side

Mod. 625/630/670

Mod. 2077/2083

Mod. 2095

Screw down the sealing ring extractor as far as possible in the sealing ring and pull off the sealing ring.



504 91 40-01

Mod. 625/630/670
Mod. 2077/2083



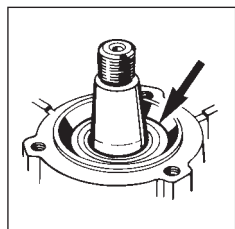
502 50 55-01

Mod. 2095

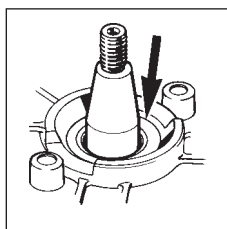
Lubricate the shaft with engine oil and fit a new sealing ring.



505 38 17-09



Mod. 625/630/670



Mod. 2077/2083

Replacement of sealing ring on magneto side

Mod. 625/630/670

Mod. 2077/2083

Mod. 2095

Dismantle all parts on the magneto side so that the sealing ring becomes accessible.

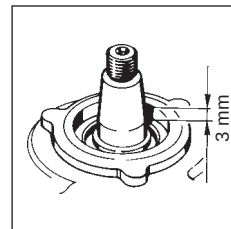
Remove the key for the flywheel by means of diagonal cutting pliers.

Screw down the sealing ring extractor as far as possible in the sealing ring and pull off the sealing ring.

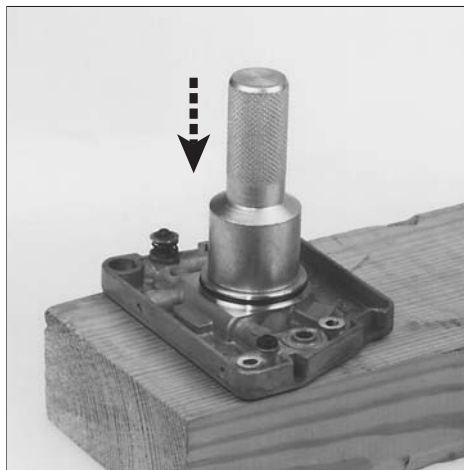
Lubricate the shaft with a few drops of engine oil and place a new sealing ring in position with the plate cover turned outwards.

Press down the sealing ring with a suitable mandrel to the correct position in the crankcase.

Fit the other parts in the reverse order to dismantling.



Mod. 2095



Replacement of sealing ring on the clutch side Mod. 625/630/670

The sealing ring is in the oil pump housing on these models.

Dismantle the oil pump and press out the sealing ring with a suitable mandrel.

Press in the new sealing ring from the back of the pump housing to approx. 0.5 mm above the surface of the housing.



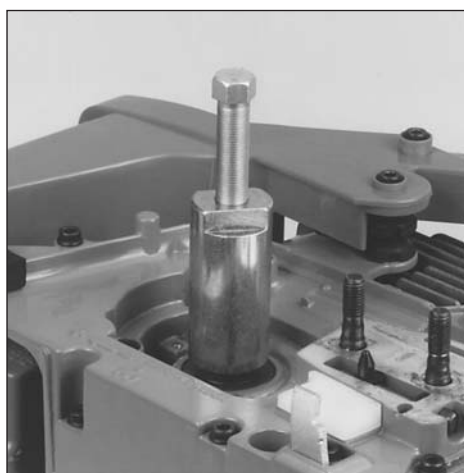
504 91 28-06



Use an assembling sleeve when the oil pump is fitted on the crankcase.



502 50 53-01



Mod. 2077/2083 Mod. 2095

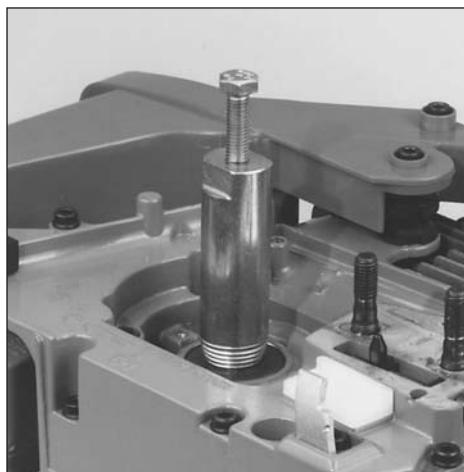
Dismantle the centrifugal clutch and the oil pump.

On mod. 2077/2083 the oil pump gear must also be dismantled.



502 54 09-01

Pull off the sealing ring by means of an extractor.



502 50 55-01

Replacement of sealing ring on the clutch side Mod. 625/630/670

The sealing ring is in the oil pump housing on these models.

Dismantle the centrifugal clutch and pump housing.

Press out the sealing ring with a suitable mandrel.

Fit the new sealing ring from the back of the pump housing to avoid dismantling the pump gear. Use mandrel 504 91 28-06 and press down the sealing ring to approx. 0.5 mm above the surface of the pump housing.

Turn the sealing ring so that the plate mantle comes outwards.

Place assembling sleeve 502 50 53-01 on the shaft to prevent the sealing ring from being damaged when the oil pump is fitted on the crankcase.

Mod. 2077/2083 Mod. 2095

Dismantle the centrifugal clutch and the oil pump.

On mod. 2077/2083 the oil pump gear on the crankshaft must also be dismantled. Use extractor 502 54 09-01.

Pull off the sealing ring by means of an extractor. Make sure that it is screwed into the sealing ring as far as possible before extracting.

Use extractor 502 50 55-01.



Fit the new sealing ring with the plate mantle turned outwards.



Mod. 2077

Fit the oil pump gear on the crankshaft.



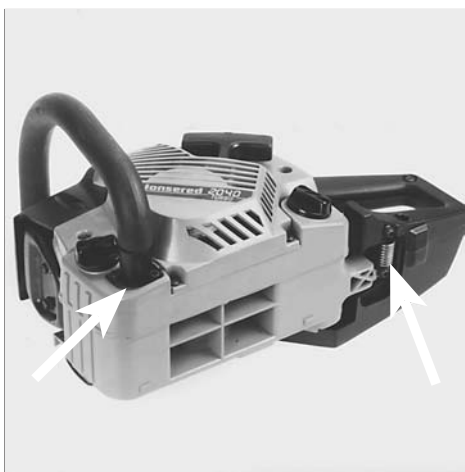
Replacement of bar attachment bolts

Mod. 2036/2040

Mod. 625/630/670

Tap the bolt in the oil tank.

Fit a new bolt by means of a thin steel wire.



Vibration dampers

The vibration dampers between the engine unit and handle section may either be springs or rubber elements, or a combination of both.

Lubricate the shaft with a few drops of engine oil and place the new sealing ring in position. The plate mantle should be turned outwards.

Press in the sealing ring to the crankcase plane with a suitable mandrel.

Mod. 2077

Fit the oil pump gear on the crankshaft.

The milled end of the gear should be towards the sealing ring.

Lubricate the milled part of the gear with grease and press it down on the shaft.

Use if necessary extractor 502 54 09-01 when fitting too.

Check that the gear goes into the sealing ring without damaging it.

Replacement of bar attachment bolt

Mod. 2036/2040

Mod. 625/630/670

Dismantle the chain and bar and empty the oil tank of oil.

Use a plastic mallet and tap one bolt into the oil tank.

Fit a new bolt by using a thin (0.3 – 0.5 mm) steel wire. Enter the wire through the hole in the bar attachment and out through the oil filler hole. Wind the wire round the threads on the bolt, pull it into place and then use a suitable mandrel to press it into the correct position.

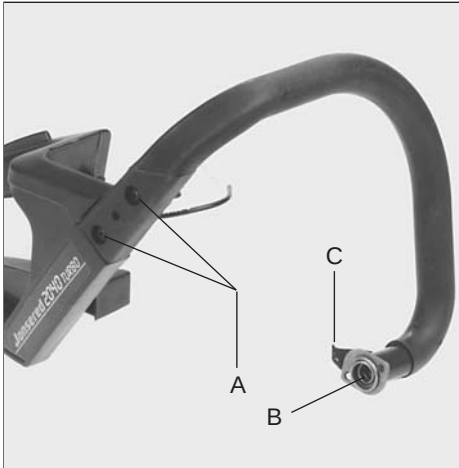
NOTE!

Replace one bolt at a time so that the reinforcement plate inside the tank does not fall off.

Vibration dampers

The engine unit and handle section on all the chain saw models are connected to each other via vibration dampers.

These may consist of springs or rubber elements, or a combination of both.



Mod. 2036/2040

Remove the screws (A) and separate the front handlebar from the rear handle. Fit a new damper.

Remove the screw (B) and fit a new damper.

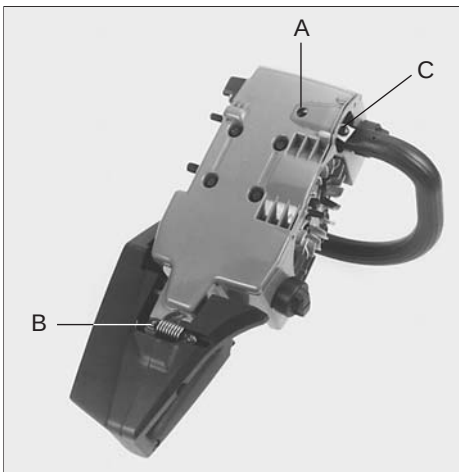
Mod. 2036/2040

The vibration damper to the cylinder can be replaced after the screws (A) have been removed and the front handlebar has been removed from the rear handle.

The vibration damper to the crankcase can be dismantled and replaced when the screw (B) inside the damper has been removed.

NOTE!

The safety band (C) must without fail be fitted when replacing the damper.



Mod. 2041/2045/2050

Release the screw which holds the vibration damper to the cylinder.

Remove the screws (A) and (B) and then lift off the complete handlebar section.

Remove the screws, separate the handlebar from the rear handle and replace the vibration damper.

Mod. 2041/2045/2050

Release the screw which holds the vibration damper to the cylinder.

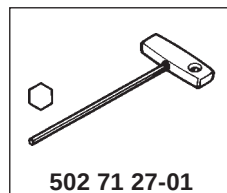
Remove the screws (A) and (B) and then lift off the complete handle section.

All the vibration dampers are now easily accessible for replacement.

Remove the screws and separate the front handlebar from the rear handle. The vibration damper to the cylinder can now be replaced.

NOTE!

The safety band (C) must without fail be fitted during replacement.



502 71 27-01

Mod. 2054/2055

Mod. 2054/2055

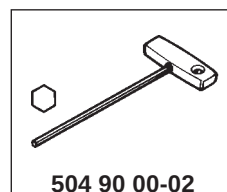
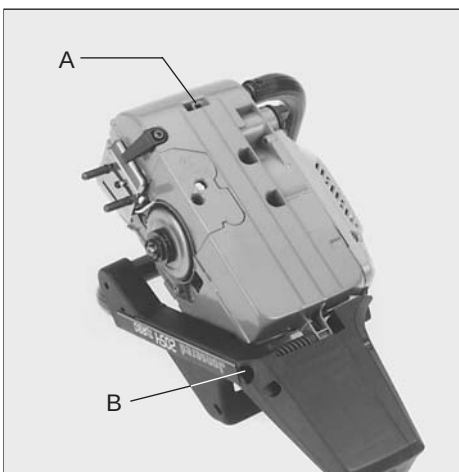
Replace the screw which holds the vibration damper at the cylinder.

Release the screws (A) and (B) and pull out the handlebar far enough so that the respective dampers can be replaced.

Remove the screw which holds the vibration damper between the cylinder and the handlebar.

Release the screws (A) and (B) and pull out the handle section far enough so that respective dampers can be replaced. The rear damper is attached with a hex screw inside the spring.

The vibration damper on the cylinder can be released by using a pair of universal pliers.



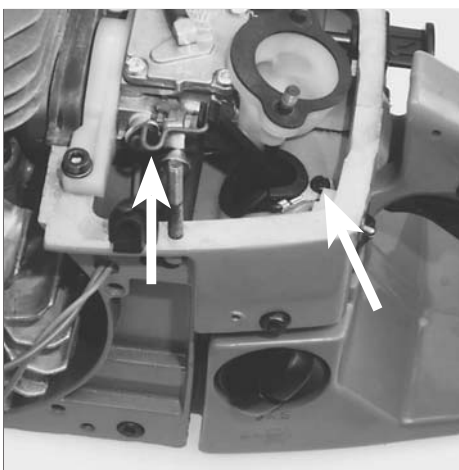
504 90 00-02

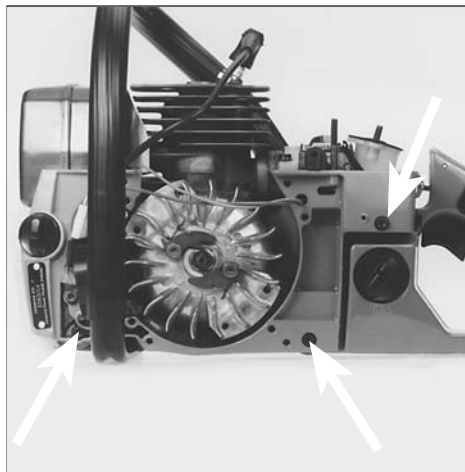
Mod. 625/630/670

Dismantle the chain brake, chain, bar, cylinder cover, air filter, the throttle lever's push rod, the fuel pipe from the carburettor, and the earth cable's connection screw.

Mod. 625/630/670

Dismantle the chain brake, chain, bar, cylinder cover, air filter, the throttle lever's push rod, the fuel pipe from the carburettor, and the earth cable's connection screw.





Remove the screws which hold the vibration dampers.

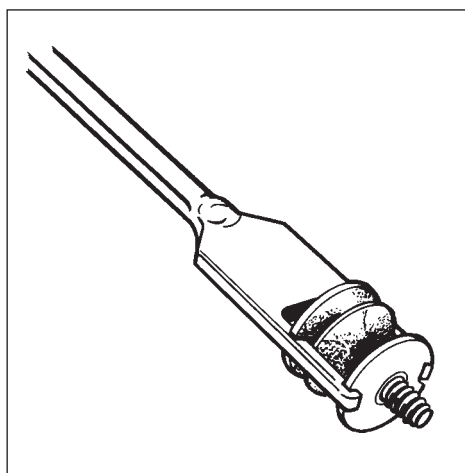
These models have 6 vibration dampers – 3 on each side.

Remove the screws which hold the dampers on both sides of the chain saw.



Separate the engine unit and tank unit so that the vibration dampers become accessible.

Separate the engine unit and the tank unit completely, or at least so that the damaged rubber element becomes accessible for replacement.

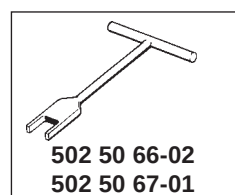


Dismantle the vibration dampers and fit new ones. We recommend that all the dampers are replaced at the same time and with same degree of hardness.

Use tool No. 502 50 67-01 for the rear vibration dampers and No. 502 50 66-02 for the front ones.

NOTE!

Press down the tool far enough over the vibration damper so that it also grips the inner metal plate in order to avoid damaging the rubber.



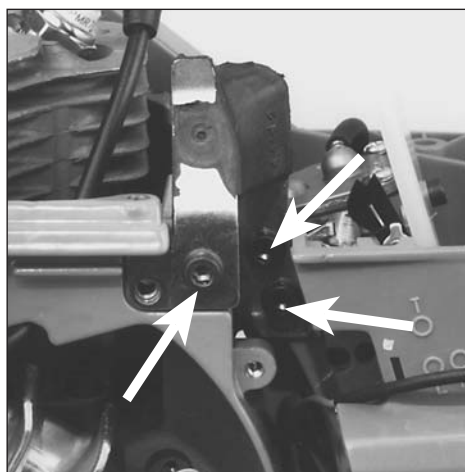
Mod. 2077

Dismantle and replace if necessary the upper damper element.

Mod. 2077

Dismantle the cylinder cover, clutch cover, chain and bar, and the starter device, short circuiting cable at the ignition module, and the earth cable.

Remove the screws which hold the upper damper element and replace if necessary with a new one.

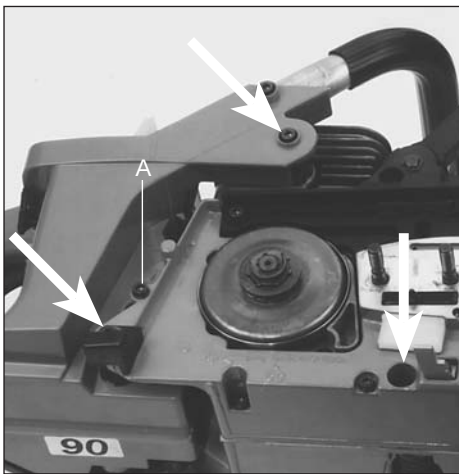




Remove the screws and bend away the connection bar far enough so that the screw for the damper element can be removed.

Remove the screws which hold the connection bar between the front and rear handles.

Press the handlebar forwards and bend out the bar for enough so that the screw for the damper element can be removed.



Remove the screws which hold the vibration dampers on the other side of the chain saw far enough so that the engine section and handle section can be separated.

Release also the screw (A) which functions as a movement limiter.

Remove the screws which hold the vibration dampers on the other side of the chain far enough so that the engine section and handle section can be separated.

Release also the screw (A) which functions a movement limiter.



Separate the engine section and handle section. Replace the vibration damper.

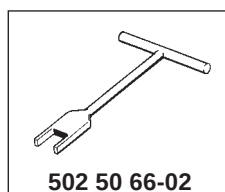
Release the impulse hose from the carburettor and the inlet pipe from the cylinder.

Separate the engine section and handle section.

Replace damaged vibration dampers (we recommend that all dampers are replaced at the same time).

Use tool 502 50 66-02 for rubber vibration dampers.

Press down the tool far enough over the vibration damper so that it also grips the inner metal plate in order to avoid damaging the rubber.



502 50 66-02

Mod. 2095

Release the throttle cable from the carburettor and dismantle the chain brake. Release the screw (A), bend away the handlebar, and remove the screw (B). Replace the vibration damper.

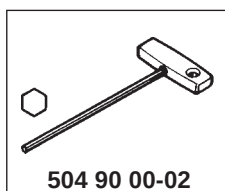
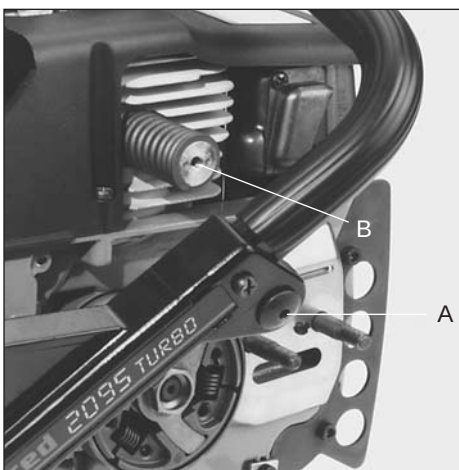
Mod. 2095

The vibration damper at the cylinder can easily be replaced when the chain brake is dismantled. Release also the throttle cable from the carburettor.

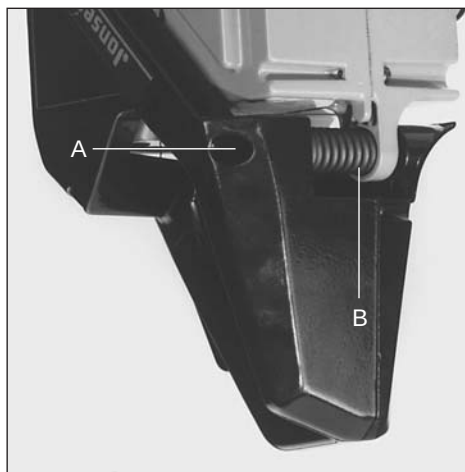
Release the screw (A) and bend away the handlebar so that the screw (B) inside the spring becomes accessible.

Use tool No. 504 90 00-02.

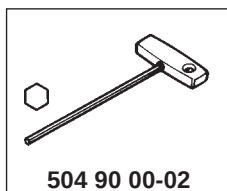
Fit a new vibration damper.



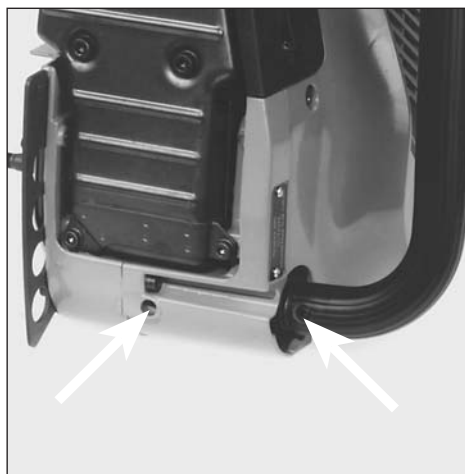
504 90 00-02



Remove the screw (A) and then release the inner screw (B).



Release both stop screws, bend away the handlebar, and pull out the vibration damper.



Dismantle the rear vibration damper by means of first removing the outer screw (A) and then enter the tool through the spring and release the inner screw (B). Hold tight the nut with a 10 mm U-key.

Use tool 504 90 00-02.

Fit a new vibration damper in the reverse order to dismantling.

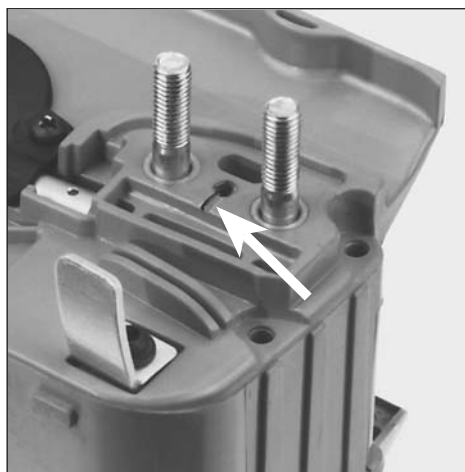
Dismantle the front vibration damper for replacement by releasing both stop screws.

Bend away the handlebar and pull out the vibration damper.

Make sure when fitting the new damper that it goes well down in the crankcase.

Mod. 2036/2040 Tank unit (crankcase)

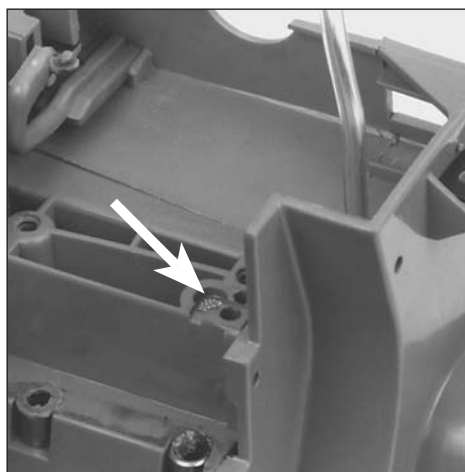
Check that the oil tank vent is not blocked. This is designed via the thread for the screw which holds the chain guide plate, and a notch in the bar attachment.



Replace the fuel tank vent if it does not function.

Drill a hole in the metal filter and pull it out of the crankcase.

Replace the filter and non return valve at the same time.



Mod. 2036/2040 Tank unit (crankcase)

Dismantle all parts of the chain saw so that only the tank unit (crankcase) remains.

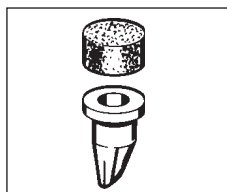
Check with compressed air that the oil tank vent is not blocked. (The oil pump must be fitted.)

Pressure equalisation in the tank takes place via the thread on the screw which holds the chain guide plate. Make also sure that the notch under the screw hole is not filled with dirt.

The fuel tank vent consists of a sintered filter and of a rubber non return valve.

In order to replace these parts it is necessary to drill a hole (approx. 3 mm) in the filter, after which it can be pulled out by using a steel wire hook. Press in a new filter in the tank unit.

Replace also the non return valve.





Crankshaft

Dismantle the crankshaft from the cylinder.

Remove the oil pump gear by means of an extractor, including the sealing rings.

Lift off the ball bearing.

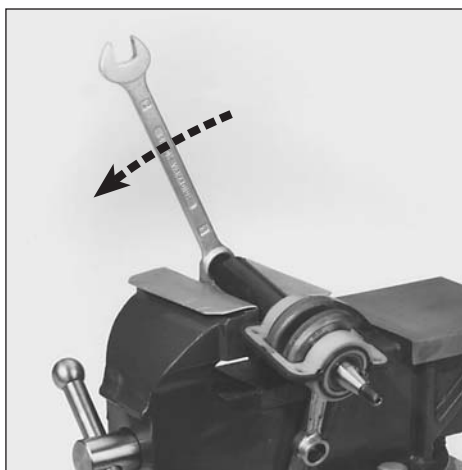
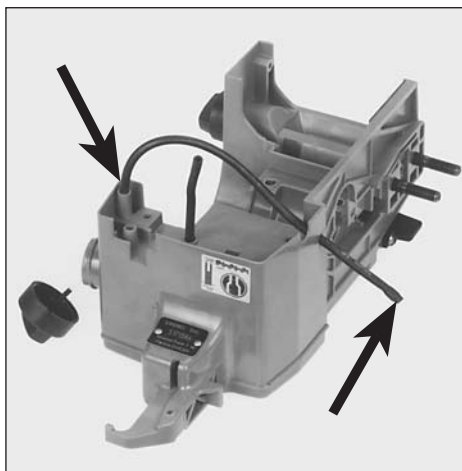


530 03 11-36

Mod. 2041/2045/2050 Crankcase

Check that the fuel tank vent is open.

Replace if necessary the filter in the end of the vent pipe respectively clean the hole in the crankcase.



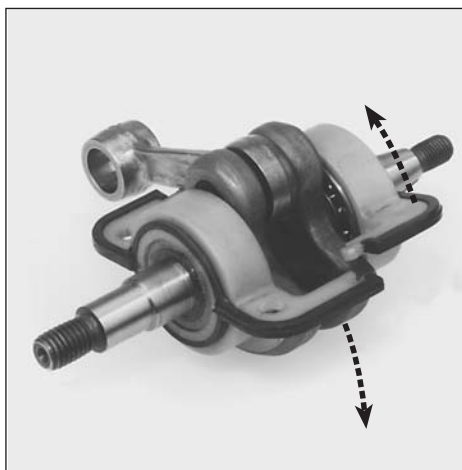
Crankshaft Dismantling

Dismantle the piston from the connecting rod and the pump pinion from the crankshaft.



505 38 18-17

Remove the bearing seats from the ball bearings.



Crankshaft

Dismantle the crankshaft from the cylinder. If necessary refer to chapter 7 "Cylinder and piston".

Remove the oil pump gear from the crankshaft by means of extractor 530 03 11-36.

Lift off the sealing rings and ball bearings.

Inspect the crankshaft. Refer to chapter "Checking of crankshaft".

Replace damaged parts and fit in the reverse order to dismantling.

Mod. 2041/2045/2050 Crankcase

Dismantle all parts on the chain saw so that only the crankcase remains.

Check that the fuel tank vent is open by blowing and sucking in the vent pipe when the tank cover is removed.

Replace if necessary the filter in the end of the ventilation pipe respectively clean the hole in the crankcase.

Crankshaft Dismantling

Dismantle the piston from the connecting rod and the pump pinion from the crankshaft by means of extractor 505 38 18-17.

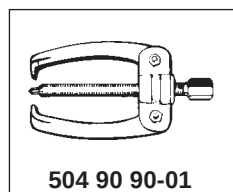
Brace the extractor in a vice since the pinion sits tightly on the shaft.

Twist apart the two halves of the bearing seats and remove them from the ball bearings by means of a screwdriver.



Dismantle the ball bearings from the crankshaft.

Inspect the crankshaft as per the section "Checking of crankshaft".



504 90 90-01

Dismantle the sealing rings.

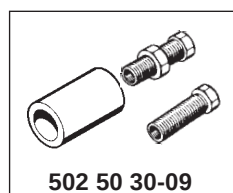
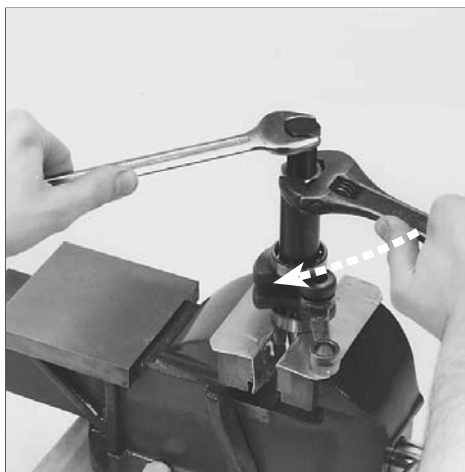


505 38 17-09

Fitting

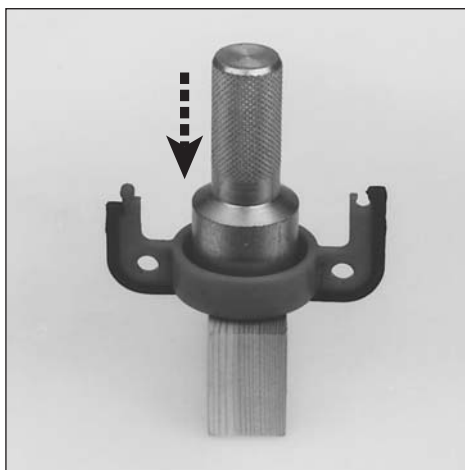
Fit the ball bearings on the crankshaft.

Fit the oil pump's drive gear.



502 50 30-09

Fit new sealing rings.



504 91 28-06

Dismantle the ball bearings from the crankshaft by means of extractor No. 504 90 90-01.

Inspect the crankshaft as per the section "Checking of crankshaft".

Press out the sealing rings from the bearing seats by means of mandrel No. 505 36 17-09.

Fitting

Fit the ball bearings on the crankshaft's magneto side by means of tool No. 502 50 30-09.

Fit the bearing on the crankshaft's clutch side in the same way.

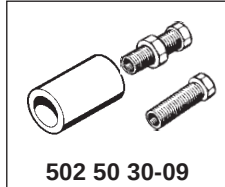
Fit new sealing rings in the bearing seats by means of mandrel 504 91 28-06.

NOTE!

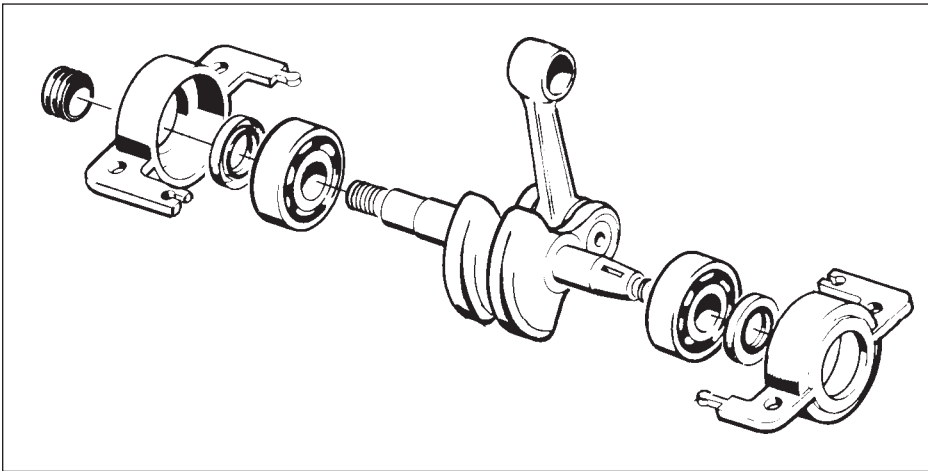
Turn the sealing rings so that the plate mantle faces outwards from the engine.



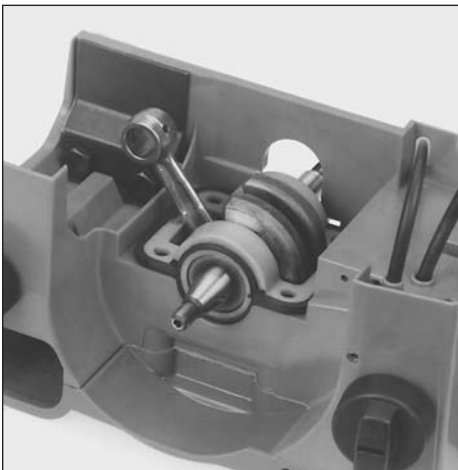
Lubricate the shaft journal on the clutch side with grease and place one bearing seat in position.
Fit the oil pump gear.



Lubricate the shaft journal on the clutch side with grease and place one bearing seat in position.
Fit the oil pump gear by means of tool 502 50 30-09



Lubricate the shaft journal on the flywheel side and fit the other bearing seat.
Turn both bearing seats so that they lock to each other.



Place the crankshaft in position in the crankcase and fit the piston, cylinder and other parts.
Pressure test the crankcase.

Check that the sealing surfaces on the bearing seats cylinder and crankcase are undamaged and clean. Place the crankshaft in position in the crankcase.

NOTE!

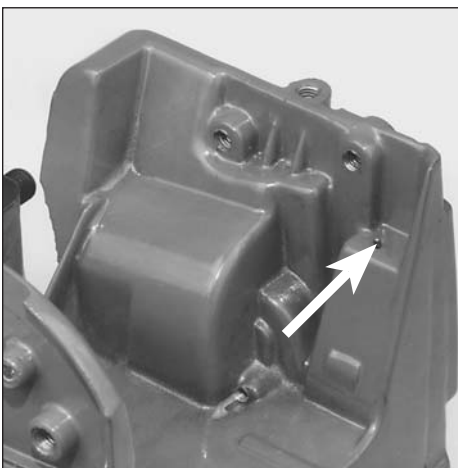
No sealing compound needs to be used.

Fit the piston, cylinder and other parts in the reverse order to dismantling.

Check that the crankcase is tight. See chapter "Tightness testing".

Mod. 2054/2055 Crankcase

Check the oil tank vent, that the split pin is in position, and that the hole is open.

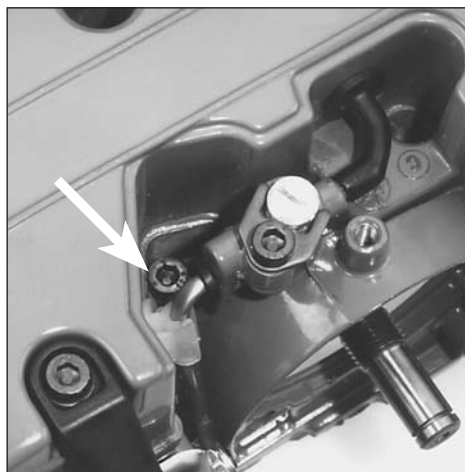


Mod. 2045/2055 Crankcase

Dismantle all parts on the chain saw so that only the crankshaft and crankcase remain.

The oil tank vent is placed in the front of the crankcase. It consists of a small hole in which a split pin is inserted to prevent dirt from penetrating into the tank.

Check that the split pin is in position and that the hole is open.



Crankshaft Dismantling

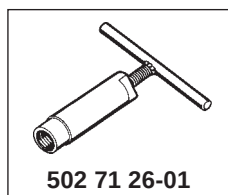
Remove the screw which holds the crankshaft's bearing housing.



Lift up the crankshaft and bearing housing from the crankcase.

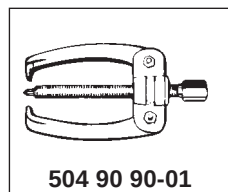
Separate the bearing housing and crankshaft.

Remove the sealing ring and the oil pump gear.



502 71 26-01

Pull off the ball bearings from the shaft journals.



504 90 90-01

Check the tip of the screw which goes against the oil pump. If the screw is worn it should be replaced with a new one.



Crankshaft Dismantling

The crankshaft's bearing housing is attached in the crankcase with a screw placed to the side of the oil pump. It is accessible from underneath the crankcase.

Lift up the crankshaft and bearing housing from the crankcase.

Separate the crankshaft and bearing housing. If necessary give a few light taps with a plastic mallet.

Remove the sealing ring on the clutch side.

Fit extractor 502 71 26-01 and pull off the oil pump gear.

Remove the sealing ring and washer on the magneto side.

Pull off the ball bearings by means of extractor 504 90 90-01.

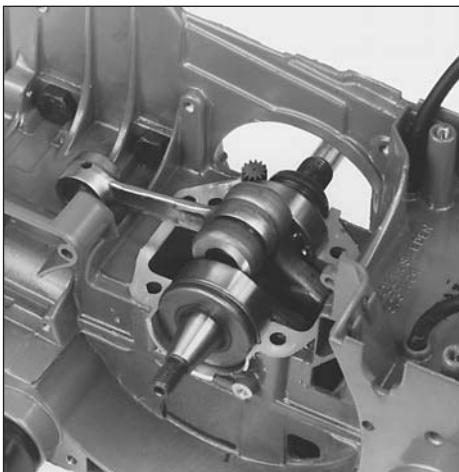
Inspect the crankshaft as per the section "Checking of crankshaft".

Check the tip on the screw which goes against the oil pump. If the screw is worn it should be replaced with a new one.

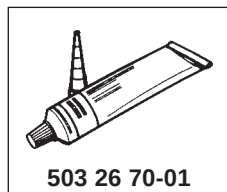


Fitting

Fit the ball bearings on the shaft journals.
Fit the oil pump gear and new sealing rings.



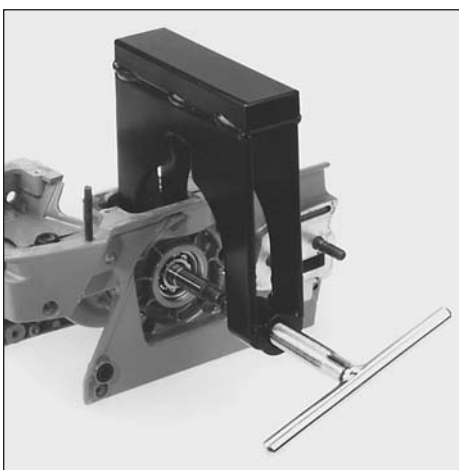
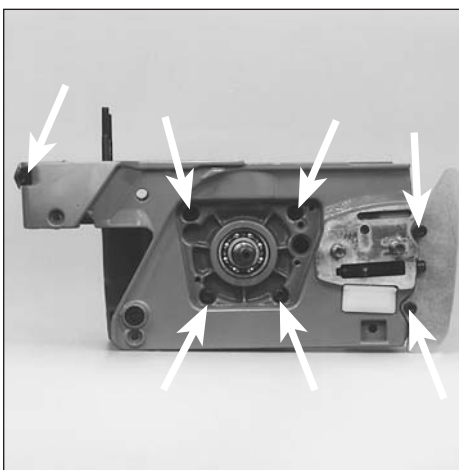
Clean the bearing housing and crankcase from old sealing compound.
Apply new sealing compound and fit the crankshaft and bearing housing.



503 26 70-01

Mod. 625/630/670 Crankcase Dismantling

Remove all the screws (7 pcs) which hold the crankcase halves together.



Press apart the crankcase halves.



502 51 61-01

Fitting

Fit the ball bearings on the shaft journals.
Heat the bearings with a heat gun to approx. 150–200° C and push them in position.

Heat the oil pump gear with the heat gun to approx. 150–200° C and then push it quickly on the shaft.

Lubricate the shaft journals with grease and fit new sealing rings turned with the plate mantle outwards.

Do not forget the plate washer between the ball bearing and sealing ring on the magneto side.

Clean the ball bearing seats, the sealing surfaces on the crankcase and bearing housing from old sealing compound.

Apply a thin strand of new sealing compound on the seats for the ball bearings and sealing rings.

Place the crankshaft in position in the crankcase.

Apply sealing compound in the same way on the bearing housing and put it over the crankshaft.

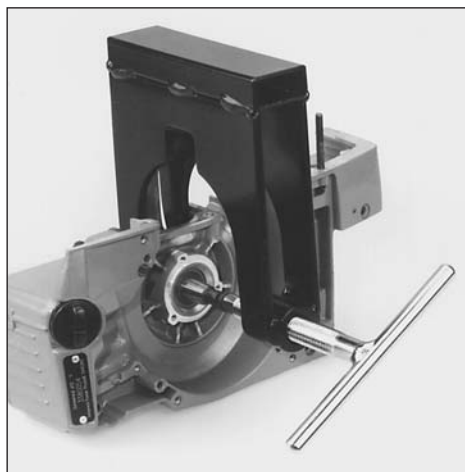
Tighten the screws from underneath.

Mod. 625/630/670 Crankcase Dismantling

Dismantle all parts on the chain saw so that only the crankshaft and crankcase remain.

Remove the cylinder base gasket and all the screws (7 pcs) which hold the crankcase halves together.

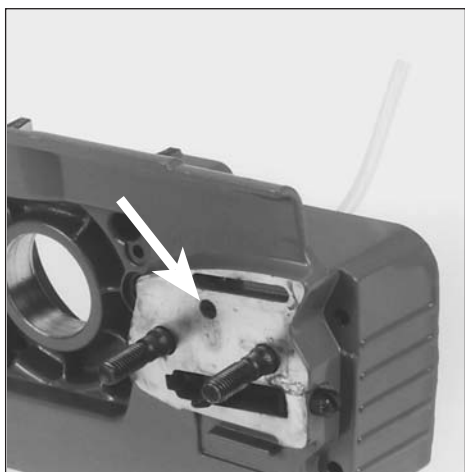
Fit tool 502 51 61-01 on the clutch side's crankcase half and press apart the crankcase halves.



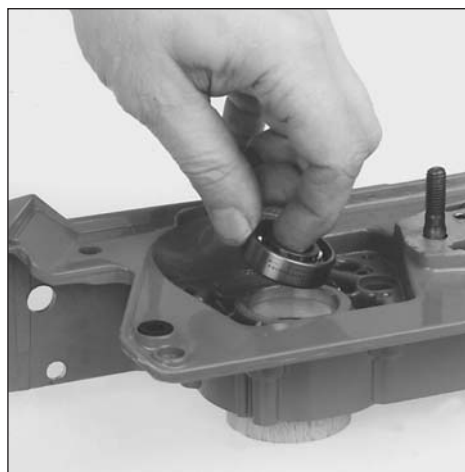
Press out the crankshaft from the flywheel side's crankcase half.



Heat each crankcase half so that the ball bearing can be removed.



Clean both crankcase halves.
Check that the oil tank vent is open.



Fitting

Fit new ball bearings and sealing rings.
Heat the clutch side's crankcase half and put the ball bearing in position.

Use the same tool and press out the crankshaft from the flywheel side's crankcase half.

Inspect the crankshaft as per the section "Checking of crankshaft".

Heat each crankcase half to 150–200° C by means of a heat gun.

Tap the crankcase half against a piece of wood so that the ball bearing falls out.

Press off the sealing ring from the flywheel side's crankcase half.

Clean both crankcase halves and carefully scrape off residual gasket from the sealing surfaces.

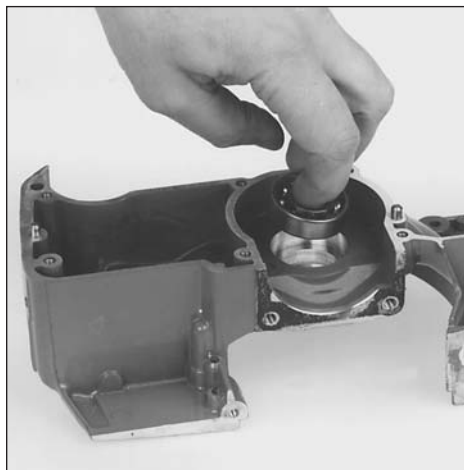
The oil tank vent is in the clutch side's crankcase half. Check that it is open by blowing in the plastic hose.

Fitting

Fit new ball bearings and sealing rings.

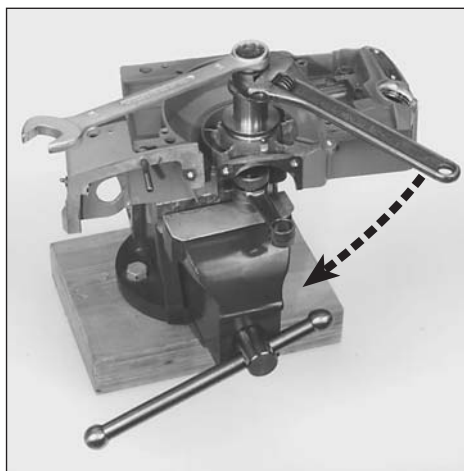
Heat the clutch side's crankcase half to 150–200° C and put the ball bearing in position from outside.

Use a wooden block as a stop so that the ball bearing comes level with the inner side of the crankcase.



Heat the flywheel side's crankcase half and put the ball bearing in position.

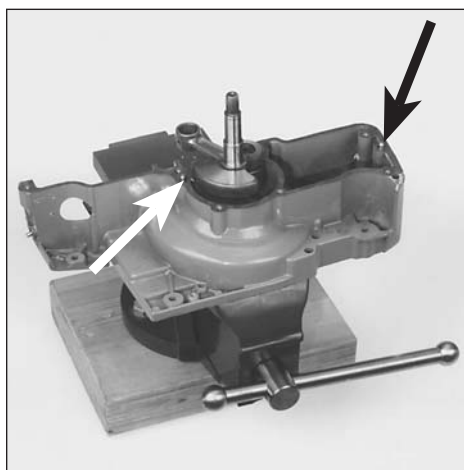
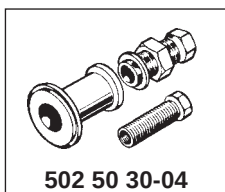
Heat the flywheel side's crankcase half to 150–200° C and place the ball bearing in position against the shoulder in the bearing seat.



Pull the crankshaft into the flywheel side's crankcase half by means of tool 502 50 30-04 (use the sleeve from 502 50 30-08).

Pull the crankshaft into the flywheel side's crankcase half by means of tool 502 50 30-04 (use the sleeve from 502 50 30-08).

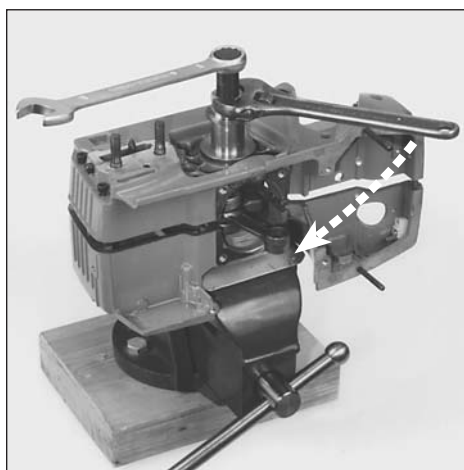
Make sure that the connecting rod is not jammed against the crankcase.



Check that the guide pins are in position. Place a new crankcase gasket on the sealing surface.

Check that the guide pins are in position on the flywheel side's crankcase half.

Apply grease on the sealing surface and place a new gasket over the guide pin.



Place the clutch side's crankcase half over the crankshaft and make sure that the plastic hose for the oil tank vent is positioned correctly.

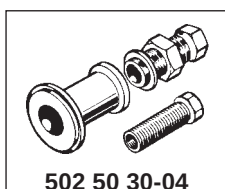
Pull the crankcase halves together and tighten the screws.

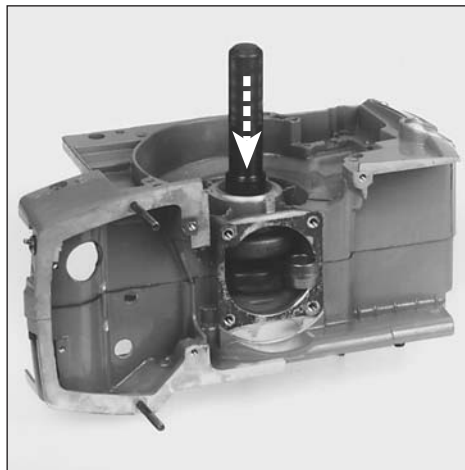
Place the clutch side's crankcase half over the crankshaft.

Make sure that the plastic hose for the oil tank vent leads to the top against the cylinder plane on the flywheel side's crankcase half.

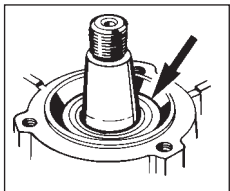
Place the crankcase screws in position to prevent the gasket from slipping.

Pull the crankcase halves together by means of tool 502 50 30-04 (use the sleeve from 502 50 30-08) and tighten the screws.





Check that the crankshaft rotates easily.
Fit the sealing ring on the flywheel side.

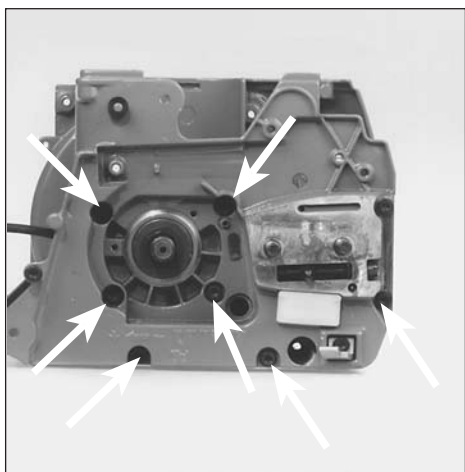


Mod. 2077/2083
Crankcase
Dismantling

Remove the oil pump gear from the crankshaft.



Remove the cylinder base gasket and crankcase screws.



Press apart the crankcase halves.



Check that the crankshaft rotates easily.
Lubricate the shaft journal with oil and fit the seal on the flywheel side by means of mandrel 506 38 17-09

The plate mantle should be turned outwards.

Press in the sealing ring far enough so that it lies level with the conical surface.

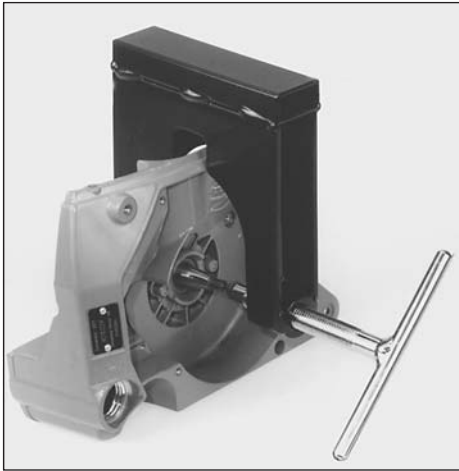
Mod. 2077/2083
Crankcase
Dismantling

Dismantle all parts on the chain saw so that only the crankcase and crankshaft remain.

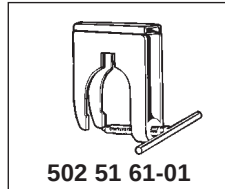
Pull off the oil pump gear from the crankshaft by means of extractor 502 54 09-01.

Remove the cylinder base gasket and all the screws (7 pcs) which hold the crankcase halves together.

Fit tool 502 51 61-01 on the clutch side's crankcase half and press the crankcase halves apart.

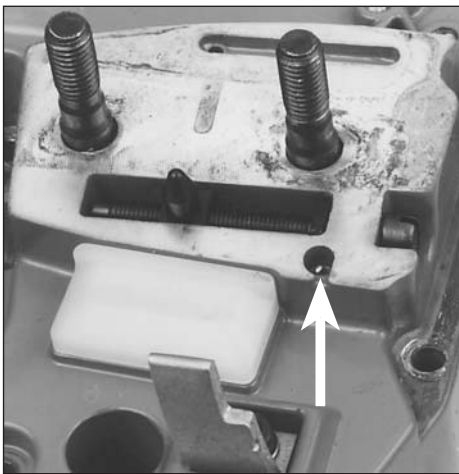


Press out the crankshaft from the flywheel side's crankcase half.



Press out the crankshaft from the flywheel side's crankcase half with tool 502 51 61-01.

Inspect the crankshaft as per chapter "Checking of crankshaft".



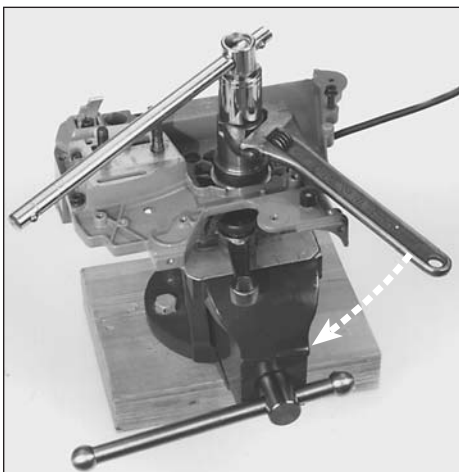
Dismantle the ball bearings and sealing rings.

Clean the crankcase halves and check that the oil tank vent functions.

Heat the crankcase halves and dismantle the ball bearings and sealing rings in the same way as described for mod. 625/630/670.

Clean the sealing surfaces of the crankcase halves from gasket residue.

Check that the hole for the oil tank vent is not blocked and that the split pin is in position.

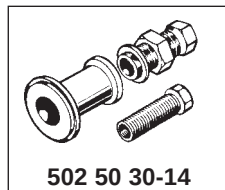


Fitting

Fit new ball bearings.



Mod. 2077



Mod. 2083

Fitting

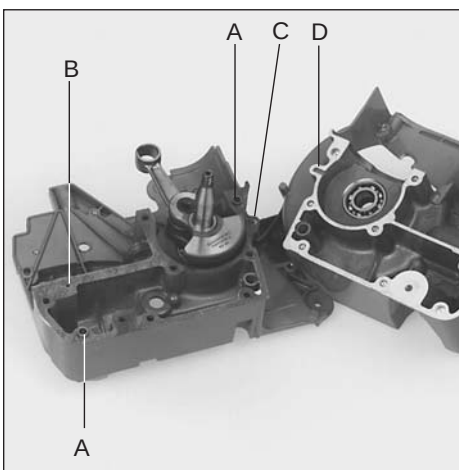
Fit new ball bearings.

Use the same method for both crankcase halves as described for mod. 625/630/670.

Push the crankshaft into the clutch side's crankcase half and put the sealing ring in position.

Press in the sealing ring and crankshaft by means of tool 502 50 30-13 (mod. 2077) and 502 50 30-14 (mod. 2083).

Make sure that the connecting rod is not jammed against the crankcase.



Place a new gasket on the clutch side's crankcase half and check that it has holes for the oil tank vent and impulse passage.

Place a new gasket on the flywheel side's crankcase half. If necessary fix it in position with a little grease.

Check that both guide sleeves (A) are in position.

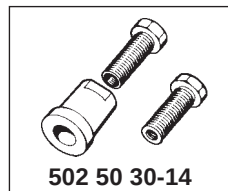
Check that the gasket has a hole (B) for the oil tank vent and a hole (C) for the impulse passage. Make sure that the groove (D) in the crankcase half is not blocked.



Press the crankcase halves together.

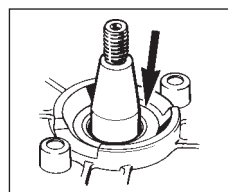


Mod. 2077

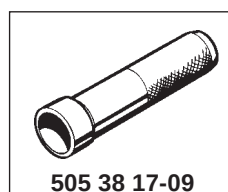


Mod. 2083

Check that the crankshaft rotates easily.
Fit a new sealing ring on the flywheel side.

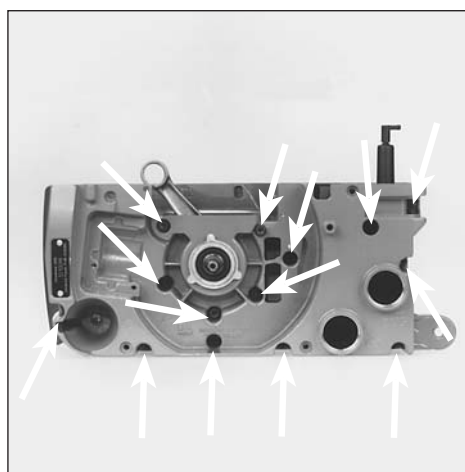
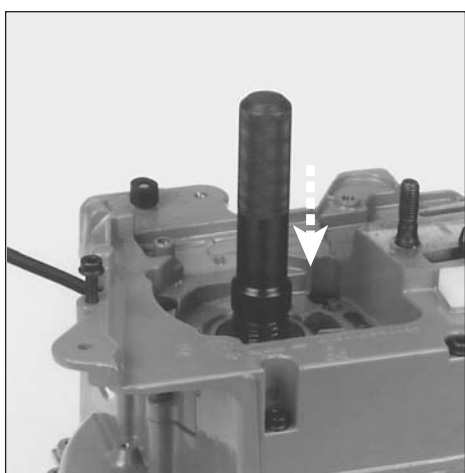
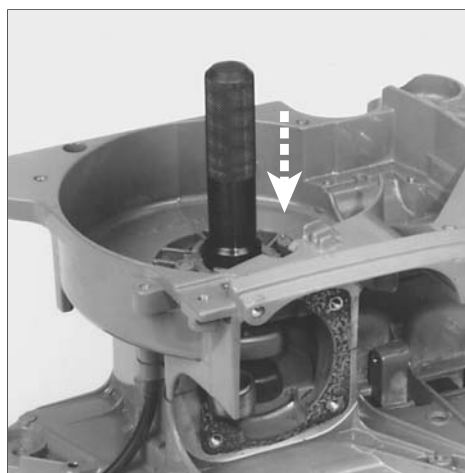


Fit the pump gear.



Mod. 2095 Crankcase Dismantling

Remove the cylinder base gasket and all the screws (14 pcs) which hold the crankcase halves together.



Put the flywheel side's crankcase half in position and press the crankcase halves together by means of tools 502 50 30-13 and 502 50 30-14.

Check that the crankcase gasket does not move out of position.

Tighten all the crankcase screws.

Check that the crankshaft rotates easily.
Lubricate the shaft journal and fit a new sealing ring on the flywheel side.

The plate mantle should be turned outwards.

Use mandrel 505 38 17-09.

Fit the pump pinion.

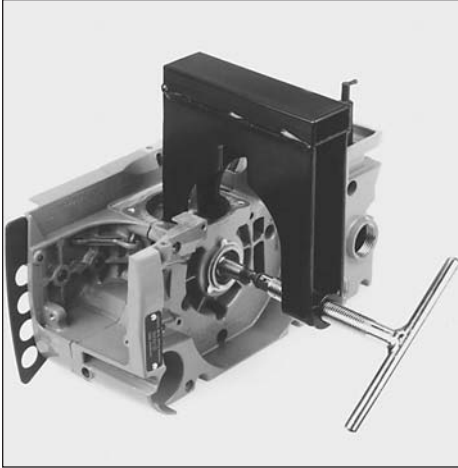
Apply grease on the ground part of the pinion and press it down over the shaft journal.

Use mandrel 505 38 17-09.

Mod. 2095 Crankcase Dismantling

Dismantle all parts on the chain saw so that only the crankcase and crankshaft remain.

Remove the cylinder base gasket and all the screws (14 pcs) which hold the crankcase halves together.



Press the crankcase halves apart.
Press out the crankshaft and inspect it for wear and damage.

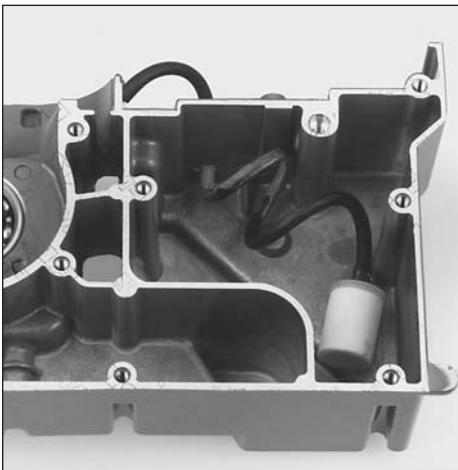
Press apart the crankcase halves and press out the crankshaft in the same way as described for mod. 625/630/670.
Inspect the crankshaft as per section "Checking of crankshaft".



Dismantle the ball bearings and sealing rings.
Clean the crankcase halves and check that the oil tank vent functions.

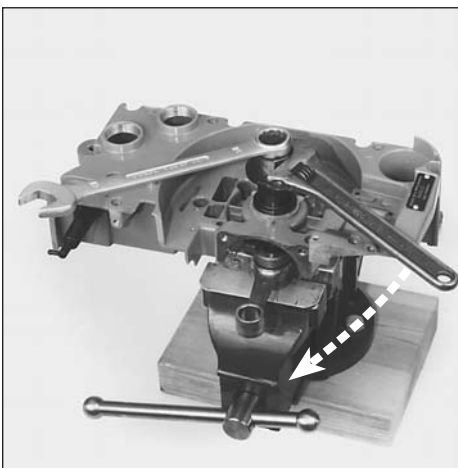
Heat the crankcase halves and dismantle the ball bearings and sealing rings in the same way as described for mod. 625/630/670.

Clean the crankcase halves' sealing surfaces from gasket residue.
Check that the hole for the oil tank vent is not blocked and that the split pin is in position.



Clean or replace the fuel filter.
Check that the fuel pipe is not damaged.

Clean or replace the fuel filter.
Check the fuel pipe for signs of cracking.
Replace the pipe if necessary.

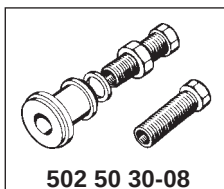


Fitting

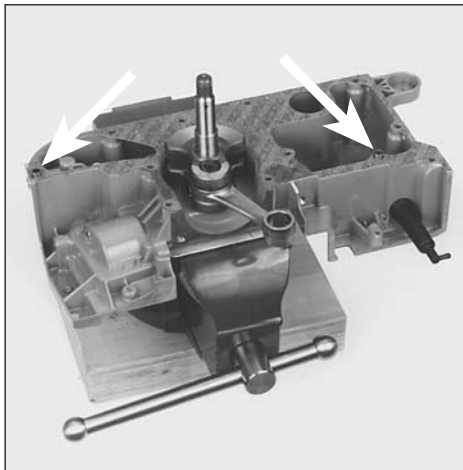
Fit new ball bearings.
Fit the crankshaft in the flywheel side's crankcase half.

Fitting

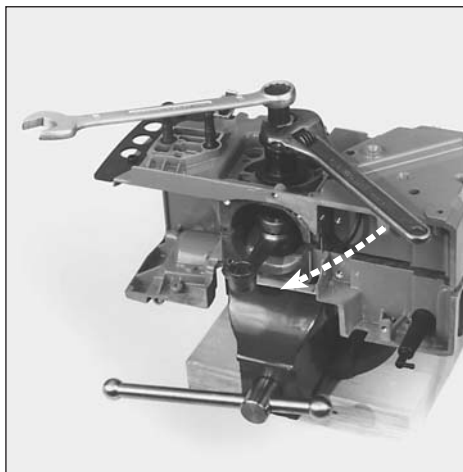
Fit new ball bearings.
Heat the crankcase halves to 150–200° C and put the ball bearings in position in the bearing seats.
Fit the crankshaft in the flywheel side's crankcase half by means of tool 502 50 30-08.
Make sure that the connecting rod is not jammed against the crankcase.



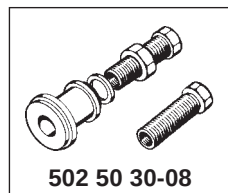
502 50 30-08



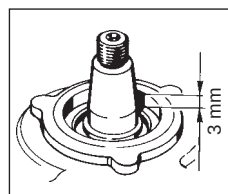
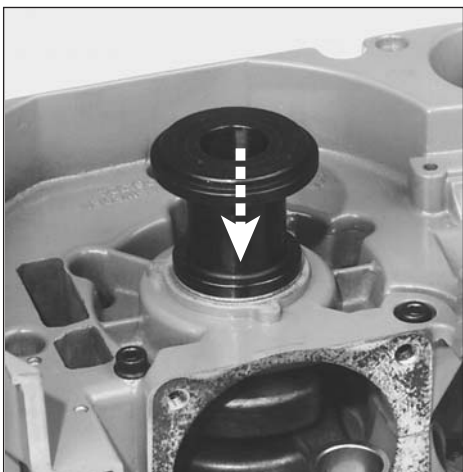
Check that the guide sleeves are in position and place a new gasket on the sealing surface.



Press the crankcase halves together and tighten the crankcase screws.



Fit new shaft seals.



Checking of crankshaft

Check the connecting rod big end.



Check that the guide sleeves in the flywheel side's crankcase half are in position and place a new gasket on the sealing surface. Fix it with a little grease.

Place the drive side's crankcase half in position and press the crankcase halves together by means of tool 502 50 30-08. Tighten the crankcase screws.

Place the 45 mm long screws at the cylinder base and the 35 mm long screws over the tank cover respectively in front of the front vibration damper attachment.

Lubricate the shaft journals with grease and fit new sealing rings turned with the plate mantle outwards.

On the flywheel side it should be pressed in until it is 3 mm below the milled surface. This measurement is obtained automatically if the sleeve in tool 502 50 30-08 is used during fitting.

Checking of crankshaft

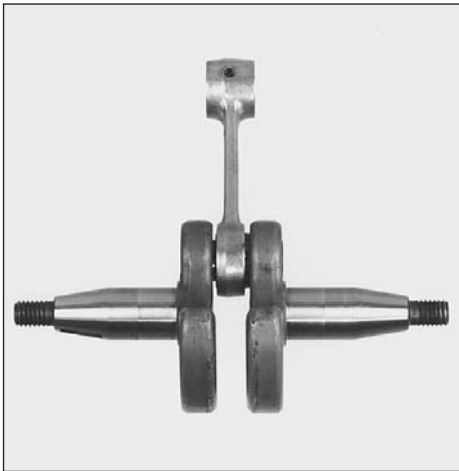
The crankshaft cannot be reconditioned and should be replaced with a new one if it is worn or damaged.

Check the connecting rod big end. If there are signs of seizure marks or discolouring on the side planes, or a damaged needle cage, the crankshaft should be replaced.



Check the connecting rod small end.

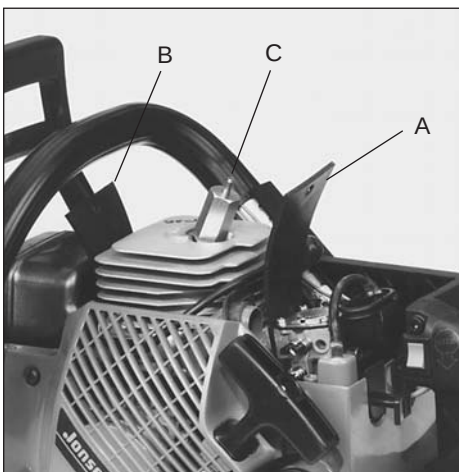
Check the connecting rod small end. If there are signs of seizure marks or discolouring on the bearing race, the crankshaft should be replaced.



Check the crankshaft bearing.

Check the crankshaft bearing. The connecting rod should not have any radial play (upwards and downwards).

It should, however, have axial play in order to ensure adequate lubrication of the crankshaft bearing.



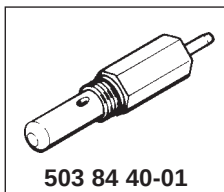
Tightness testing

Fit the sealing plates and pressure test the nipple.

Tightness testing

Clamp a sealing plate (A) between the carburettor and inlet pipe and a sealing plate (B) between the muffler and the cylinder. Tighten the screws to ensure tightness.

Fit the pressure test nipple (C) 503 84 40-01 instead of the plug.

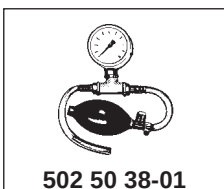
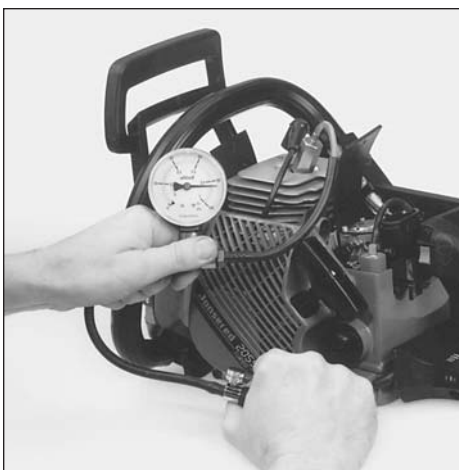


503 84 40-01

Connect the pressure gauge and check the leakage.

Connect pressure gauge 502 50 38-01 to the nipple and pump up a pressure in the crankcase of 50 kPa (0.5 kp/cm²).

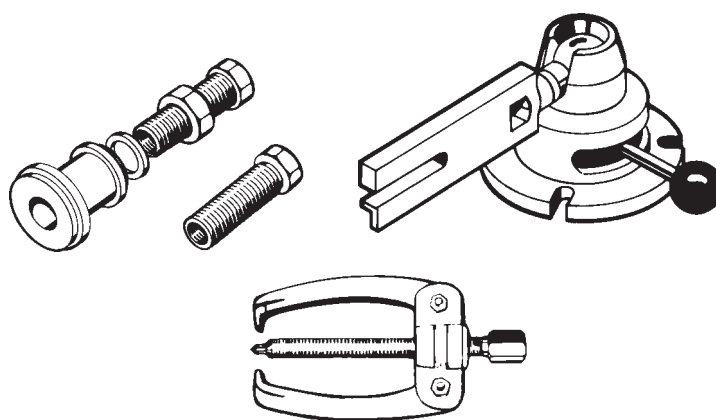
Max. permissible leakage: 20 kPa (0.2 kp/cm²) per 30 seconds.



502 50 38-01

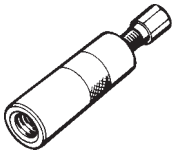
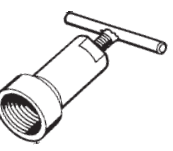
Tools

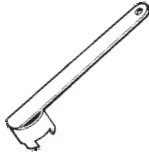
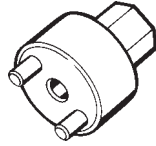
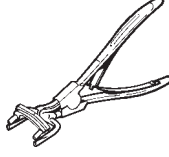
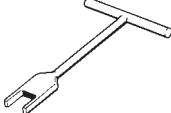
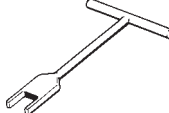
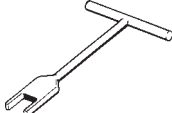
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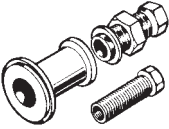
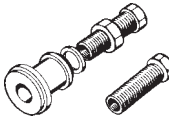
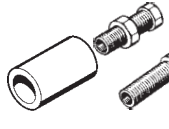
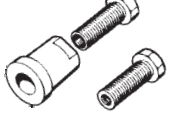
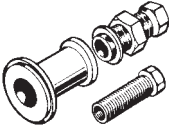
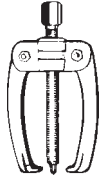


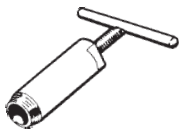
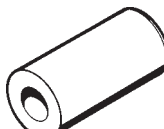
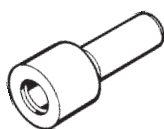
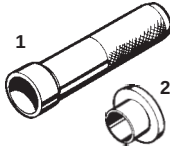
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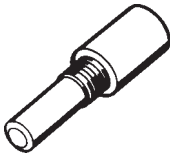
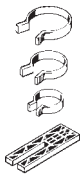
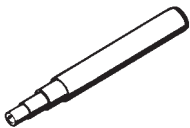
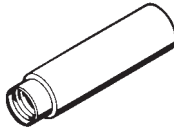
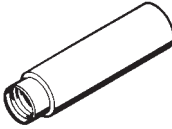
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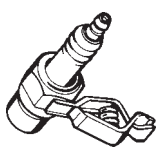
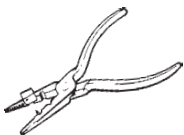
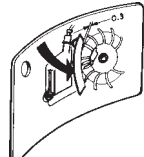
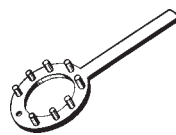
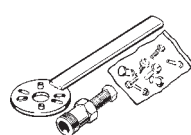
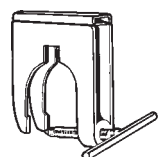
	Oil pump					Generator
	 530 03 11-36	 505 38 18-17	 502 71 26-01	 502 54 09-01	 502 71 35-01	 502 71 23-01
2036	●	—	—	—	—	—
2040	●	—	—	—	—	—
2041	—	●	—	—	—	—
2045	—	●	—	—	—	—
2050	—	●	—	—	—	—
2051	—	—	●	—	—	●
2054	—	—	●	—	—	—
2055	—	—	●	—	—	●
625	—	—	—	—	—	—
630	—	—	—	—	—	—
670	—	—	—	—	—	—
2077	—	—	—	●	—	—
2083	—	—	—	—	—	—
2094	—	—	—	—	●	—
2095	—	—	—	—	—	—

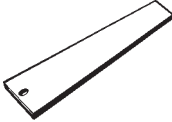
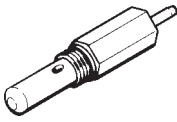
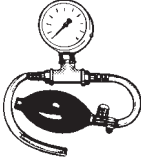
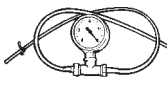
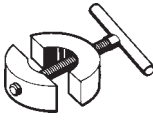
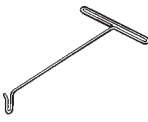
	Clutch			Vibration damper		
Model						
	502 54 04-01	530 03 11-12	502 50 49-01	18 mm 502 50 66-02	11 mm 502 50 67-01	14 mm 502 51 00-02
2036	—	●	—	—	—	—
2040	—	●	—	—	—	—
2041	—	—	—	—	—	—
2045	—	—	—	—	—	—
2050	—	—	—	—	—	—
2051	—	—	—	—	—	—
2054	—	—	—	—	—	—
2055	—	—	—	—	—	—
625	—	—	●	●	●	●
630	—	—	—	●	●	●
670	—	—	—	●	●	●
2077	●	—	●	●	—	—
2083	—	—	—	—	—	—
2094	—	—	—	●	—	—
2095	—	—	—	—	—	—

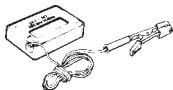
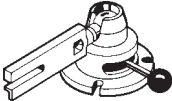
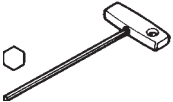
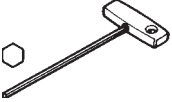
	Crankshaft					Ball bearing
	 502 50 30-04	 502 50 30-08	 502 50 30-09	 502 50 30-13	 502 50 30-14	 504 90 90-01
2036	—	—	—	—	—	●
2040	—	—	—	—	—	●
2041	—	—	●	—	—	●
2045	—	—	●	—	—	●
2050	—	—	●	—	—	●
2051	—	—	—	—	—	●
2054	—	—	—	—	—	●
2055	—	—	—	—	—	●
625	●	—	—	—	—	●
630	●	—	—	—	—	●
670	●	—	—	—	—	●
2077	—	—	—	●	—	●
2083	—	—	—	—	●	●
2094	—	●	—	—	—	●
2095	—	●	—	—	—	●

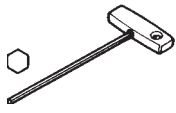
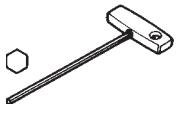
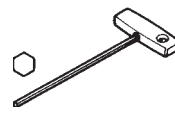
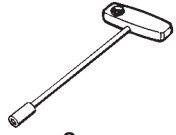
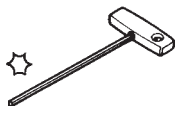
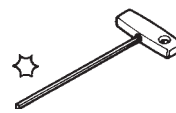
	Sealing ring					
	 504 91 40-01	 502 50 55-01	 502 50 53-01	 504 91 28-00	 504 91 28-06	 ¹ 505 38 17-09 ² 505 38 17-39
2036	—	—	—	—	—	—
2040	—	—	—	—	—	—
2041	—	—	—	—	—	●
2045	—	—	—	—	—	●
2050	—	—	—	—	—	●
2051	●	—	—	●	—	—
2054	●	—	—	●	—	—
2055	●	—	—	●	—	—
625	●	—	●	—	●	●
630	●	—	●	—	●	●
670	●	—	●	—	●	●
2077	●	●	—	—	—	●
2083	●	●	—	—	—	●
2094	●	●	—	●	—	●
2095	●	●	—	●	—	●

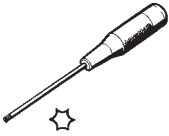
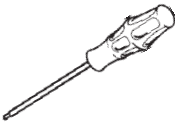
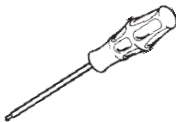
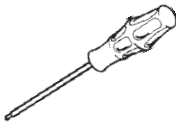
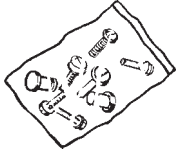
	Cylinder and piston				Ignition system	
	 502 50 33-01	 504 91 06-05	 502 50 70-01	 505 38 17-05	 502 51 94-01	 504 91 08-07
2036	●	—	●	●	●	—
2040	●	—	●	●	●	—
2041	●	—	●	●	—	●
2045	●	—	●	●	—	●
2050	●	—	●	●	—	●
2051	—	●	●	●	—	—
2054	—	●	●	●	—	—
2055	—	●	●	●	—	—
625	●	—	●	●	—	—
630	●	—	●	●	—	—
670	●	—	●	●	—	—
2077	●	—	●	●	—	—
2083	●	—	●	●	—	—
2094	●	—	●	●	—	—
2095	●	—	●	●	—	—

	Ignition system					Crankcase
	 502 71 13-01	 502 50 06-01	 502 51 34-05	 504 91 08-03	 502 51 49-01	 502 51 61-01
Model						
2036	●	●	●	—	—	—
2040	●	●	●	—	—	—
2041	●	●	●	—	—	—
2045	●	●	●	—	—	—
2050	●	●	●	—	—	—
2051	●	●	●	●	—	—
2054	●	●	●	●	—	—
2055	●	●	●	●	—	—
625	●	●	●	●	●	●
630	●	●	●	●	●	●
670	●	●	●	●	●	●
2077	●	●	●	●	●	●
2083	●	●	●	●	●	●
2094	●	●	●	●	●	●
2095	●	●	●	●	●	●

	Tightness testing				Chain brake	Fuel pick-up
	 502 54 11-01	 503 84 40-01	 502 50 38-01	 502 50 37-01	 502 71 30-01	 502 50 83-01
Model						
2036	●	●	●	●	—	●
2040	●	●	●	●	—	●
2041	●	●	●	●	●	●
2045	●	●	●	●	●	●
2050	●	●	●	●	●	●
2051	●	●	●	●	●	●
2054	●	●	●	●	●	●
2055	●	●	●	●	●	●
625	●	●	●	●	—	●
630	●	●	●	●	—	●
670	●	●	●	●	—	●
2077	●	●	●	●	—	●
2083	●	●	●	●	—	●
2094	●	●	●	●	—	●
2095	●	●	●	●	—	●

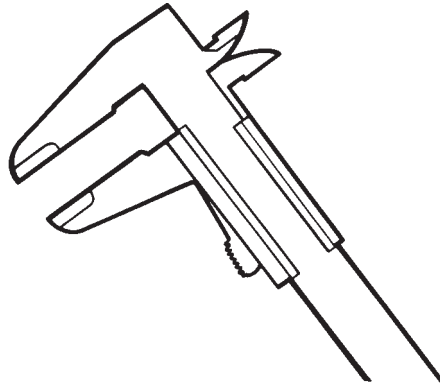
	Workshop equipment					
Model	 502 71 14-01	 502 51 02-01	 503 26 70-01	 504 90 00-01-04 + 505 38 13-08 = 504 90 00-06	 3/16" 502 50 57-01	 3 mm 504 90 00-04
2036	●	●	●	●	—	—
2040	●	●	●	●	—	—
2041	●	●	●	●	—	—
2045	●	●	●	●	—	—
2050	●	●	●	●	—	—
2051	●	●	●	●	—	—
2054	●	●	●	●	—	—
2055	●	●	●	●	—	—
625	●	●	●	●	●	●
630	●	●	●	●	●	●
670	●	●	●	●	●	●
2077	●	●	●	●	—	—
2083	●	●	●	●	—	●
2094	●	●	●	●	—	—
2095	●	●	●	●	●	—

	Workshop equipment					
Model	 4 mm 504 90 00-02	 5 mm 504 90 00-03	 6 mm 504 90 00-01	 8 mm 505 38 13-08	 25 x 150 502 71 27-01	 30 x 200 502 71 31-01
2036	●	—	—	●	—	—
2040	●	—	—	●	—	—
2041	●	—	—	●	●	—
2045	●	—	—	●	●	—
2050	●	—	—	●	●	—
2051	●	—	—	●	●	—
2054	●	—	—	●	—	—
2055	●	—	—	●	—	—
625	●	●	—	●	—	—
630	●	●	—	●	—	—
670	●	●	—	●	—	—
2077	—	—	—	●	●	●
2083	●	●	—	●	●	●
2094	●	●	—	●	●	●
2095	●	●	—	●	—	—

	Workshop equipment					
	 Model 502 51 67-01	 M6 502 50 88-01	 M5 502 50 87-01	 M4 502 50 86-01	 502 51 54-01	
	Size 46: 108 07 21 46 48: 108 07 21 48 50: 108 07 21 50 52: 108 07 21 52 54: 108 07 21 54 56: 108 07 21 56 58: 108 07 21 58					
2036	—	—	—	●	—	●
2040	—	—	—	●	—	●
2041	—	—	—	●	—	●
2045	—	—	—	●	—	●
2050	—	—	—	●	—	●
2051	—	—	—	●	—	●
2054	—	—	—	●	—	●
2055	—	—	—	●	—	●
625	—	—	●	●	●	●
630	—	—	●	●	●	●
670	—	—	●	●	●	●
2077	●	—	—	—	●	●
2083	●	—	●	●	●	●
2094	●	—	●	●	●	●
2095	●	—	●	●	●	●

Technical data

10.



Contents

Technical data	128
Tightening torque	128

	2036	2040	2041	2045	2050	2054	2055	625	630	670	2077	2083	2095
Capacity, cm ³	36.3	40.2	40.2	44.3	48.7	53.2	53.2	61.5	61.5	66.8	76.5	82.4	93.6
Cylinder diam., mm	38.0	40.0	40.0	42.0	44.0	46.0	46.0	48.0	48.0	50.0	52.0	54.0	56.0
Stroke length, mm	32.0	32.0	32.0	32.0	32.0	32.0	32.0	34.0	34.0	34.0	36.0	36.0	38.0
Compression ratio	8.0	8.0	10.5	10.5	10.5	10.5	10.5	10.1	10.5	10.5	10.1	10.1	10.0
Revs at max. power, rpm	8500	8500	9000	9000	9000	9300	9600	9000	8800	10000	9600	10000	8200
Max. rpm	13000	13000	12500	12500	12500	13000	14500	12500	13000	13500	13500	13500	13000
Idling speed, rpm	3000	3000	2500	2500	2500	2400	2400	2700	2700	2700	2800	2800	2400
Clutch engagement speed, rpm	4500	4500	3600	3600	3600	3500	3500	3700	3700	3700	3500	3500	3200
Ignition system, type	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD
Ignition system, manufacture	Phelon	Phelon	Phelon	Phelon	Phelon	EM	EM	EM	EM	EM	EM	EM	EM
Plug, Champion	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ7Y	RCJ6Y	RCJ6Y
Plug, NGK	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A	BPMR7A
Electrode gap, mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.7
Distance flywheel/ignition module, mm	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Carburettor, manufacture	Walbro	Walbro	Zama	Zama	Zama	Walbro	Walbro	Tillotson	Tillotson	Tillotson	Walbro	Walbro	Tillotson
Carburettor, type	WT289	WT289	CIQ-EL1	CIQ-EL1	CIQ-EL1	HDA119A	HDA119A	HS237A	HS256A	230D	WJ28B	WJ28B	265A
Carburettor setting, H/L	2.0/2.0	2.0/2.0	1.0/1.0	1.0/1.0	1.0/1.0	1.0/1 1/4	1.0/1 1/4	1.0/1.0	1.0/1.0	1.0/1.0	1.0/1.0	1.0/1.0	1.0/1.0
Fuel tank, litres	0.40	0.40	0.50	0.50	0.50	0.56	0.56	0.73	0.73	0.73	0.85	0.85	0.90
Oil tank, litres	0.20	0.20	0.25	0.25	0.25	0.38	0.38	0.40	0.40	0.40	0.40	0.40	0.70
Oil pump capacity at 6000 rpm, ml/min	7.0	7.0	6.0	6.0	6.0	3.0–7.0	3.0–7.0	3.5,7.0 9.0,13.0	3.5, 7.0 9.0, 13.0	3.5, 7.0 9.0, 13.0	4.0–20.0	4.0–20.0	9.0–22.0
Chain gear, number of cogs			7	7	7								
Chain pitch, inches	.325	.325	.325	.325	.325	.325 3/8	.325 3/8	3/8	3/8	3/8	3/8	3/8	3/8
Bar length, inches	13–16	13–16	13–18	13–18	13–18	13–18	13–18	15–24	15–24	15–24	15–24	15–28	15–28
Bar length, cm	33–41	33–41	33–46	33–46	33–46	33–46	33–46	38–61	38–61	38–61	38–61	38–71	38–71
Chain speed at max. power, m/s	15.5	16.3	17.3	17.3	17.3	18.0	18.5	22.9	24.4	24.4	24.4	21.3	21.5
Tightening torque, Nm													
Plug	20–22	20–22	20–22	20–22	20–22	20–22	20–22	20–22	20–22	20–22	20–22	20–22	20–22
Clutch	30–35	30–35	30–35	30–35	30–35	30–35	30–35	30–40	30–40	30–40	20–22	20–22	30–40
Flywheel	25–30	25–30	25–30	25–30	25–30	25–30	25–30	30–40	30–40	30–40	30–35	30–35	30–40
Starter device	2–3	2–3	2–3	2–3	2–3	2–3	2–3	3–4	3–4	3–4	2–3	2–3	2.5–4
Carburettor	3–4	3–4	3–4	3–4	3–4	3–4	3–4	4–6	4–6	4–6	1.5	1.5	5–6
Cylinder	10–12	10–12	10–12	10–12	10–12	10–12	10–12	8–10	8–10	8–10	8–10	8–10	10–12
Silencer	7–8	7–8	7–8	7–8	7–8	7–8	7–8	7–8	7–8	7–8	13–15	13–15	10–12
Crankcase	–	–	–	–	–	–	–	7–9	7–9	7–9	7–9	7–9	7–9
Decompression valve	–	–	–	–	–	–	–	–	–	–	–	12–14	12–14