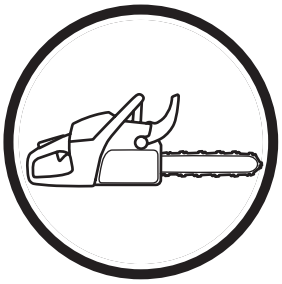
Husqvarna

Workshop manual

390XP



English

Workshop Manual

390XP

Contents

1 Introduction and safety regulations

1.1 General

This Workshop Manual provides a comprehensive description of how to troubleshoot, repair and test the chainsaw. A description of different safety measures that should be taken during repair work is also given.

1.2 Safety

Note! The section dealing with safety should be read and understood by all who do repair and service work on the chainsaw.

Warning symbols and decals can be found in this Workshop Manual and on the chainsaw. If a warning symbol or decal on the chainsaw has been damaged or is missing, replace it as soon as possible to make sure the greatest possible safety when using the chainsaw.

1.3 Target Group

Personnel using this manual must have general knowledge of the repair and service of small engines.

The Workshop Manual must be read and understood by personnel who are to carry out repair work and service on the chainsaw. The Manual is also suitable for use when training new employees.

1.4 Modifications

In case of modifications made after the publication of this Workshop manual the Manual should be read together with all service information issued concerning the chainsaw in question.

1.5 Layout

This Workshop Manual can be used in two different ways:

- For the repair of a particular system on the chainsaw.
- Disassembly and Assembly of the entire chainsaw.

Repair of a particular system

When a particular system on the chainsaw is to be repaired, proceed as follows:

1. Look up the page for the system in question.

2. Do the steps:
- Disassembly
- Cleaning and inspection
- Assembly

Disassembly and Assembly of the entire chainsaw

1. Find the starter chapter and do the steps in **Disassemble.**

2. Do the steps in **Cleaning and inspection**.

3. Make sure you have the required spare parts.

4. Find the **Crankcase chapter** do the steps in **Assembly**.

To help with understanding, some chapters provide a **Description**. Some chapters also have specific instructions that explain how to repair or replace a certain component.

1.1 General instructions

The workshop where chainsaw repairs are to be done must be equipped with safety equipment as set out in local regulations.

To be allowed to do repair the chainsaw you must have read and understood the contents of this Workshop Manual.

This Workshop Manual contains the following types of warning texts. Warning texts are positioned before the procedures they refer to.

WARNING! The warning text warns of the risk of personal injury if the instructions are not followed.

CAUTION! The caution text warns of the risk of machine damage if the instructions are not followed.

NOTE! This text warns of material damage if the instructions are not followed.

1.2 Special instructions

WARNING! Read and understand the following instructions to avoid personal injury

The fuel used in the chainsaw has the following hazardous properties:

- The fluid and its fumes are poisonous.
- Can cause skin irritation.
- Is highly inflammable.

The bar, chain and clutch cover (chain brake) must be fitted before the saw is started otherwise the clutch can come loose and cause personal injury.

Wear hearing protection when test running.

Do not use the saw until it has been adjusted so that the chain remains still when idling.

After test running, do not touch the muffler until it has cooled. Risk of burn injuries.

Insufficient lubrication of the chain can result in the chain breaking, which can cause serious or even life-threatening injury.

Make sure that the spring in the starter does not fly out and cause personal injury.
If the spring tension is activated on the starter pulley when it is to be taken up, the spring can fly out and cause personal injury.

Make sure that the brake is applied when removing the pressure spring on the chain brake. Otherwise the pressure spring can fly out and cause personal injury.

After repair, the chain brake must be examined in accordance with the instructions in the chain brake chapter.

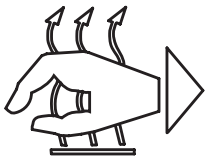
When replacing the crankshaft bearings note that the crankcase halves are hot. Wear protective gloves

Do not direct the compressed air jet towards your body or any person when using compressed air. Air can go through the skin into the blood and result in mortal danger.

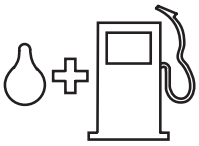
1.3 Symbols on the chainsaw

The following symbols are found on the chainsaw casing.

Choke



Switch for hand grip heater

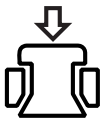


Fuel filler

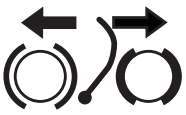
Stop switch

Screw to adjust chain lubrication

Chain oil filler



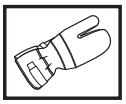
Decompression valve



Chain brake

1.4 Symbols in this Workshop Manual

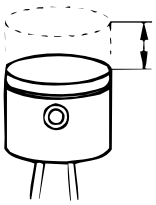
This symbol indicates a risk of personal injury if instructions are not followed.

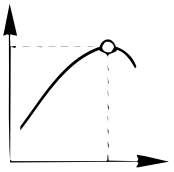


Use protective gloves.

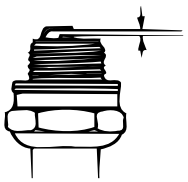
Use protective goggles.

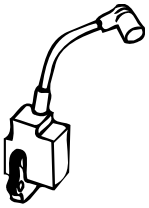
2 Technical data

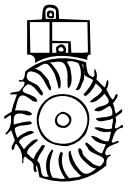


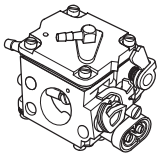


	Displacement cm³/ cubic inch	Bore Ømm/Øinch	Stroke mm/inch	Max. power/rpm kW/hp / rpm
390	88 cm3/5.4	55mm/2.2”	3,7/1,5	4,8kW, 9600rpm

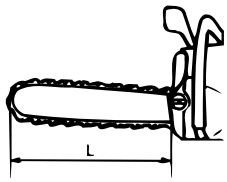


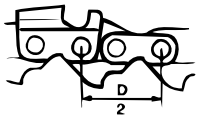


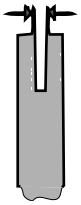




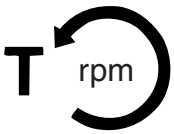
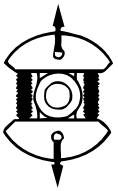
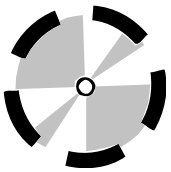
	Spark plug gap mm/inch	Ignition system	Air gap mm/inch	Carburettor type
390	0,5/0,02	AM50	0.30mm/X	WJ-116

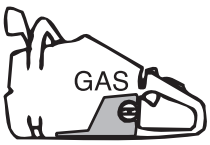
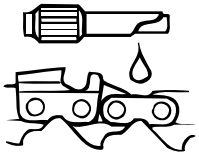
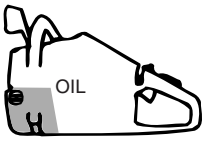
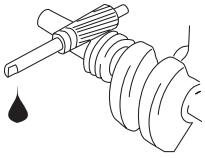


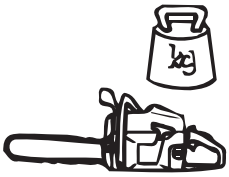
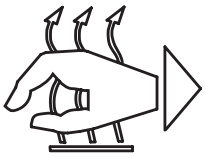




	Guide bar length cm/inch	Maximum chain speed at maximum power, m/s	Chain pitch mm/inch	Drive link mm/inch
390	46-90/18-36	21,4 m/s at 9600 rpm	9,52/3,8	1,5/0,058

				
	Idling speed rpm	Engage speed rpm	Max. speed rpm	Spark plug
390XP	2 700	3500	13000	NKG BPMR7A

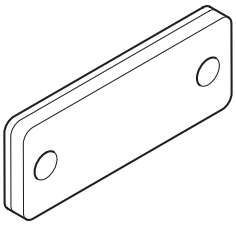
				
	Fuel tank volume Litres/US pint	Oil pump capacity	Oil tank volume Litres/US pint	Automatic oil pump
390XP	0,90/1,9	4 - 20 cm3/min	0,50/1,1	YES

				
	Weight without bar and chain kg/lbs	Weight with bar and chain kg/lbs	Hand grip heater Watts/rpm	Electric carburettor heater Watts/rpm
390XP	XP 7.1/15.6	XP20” 8.5kg/18.6	65/10000	YES

3 Service tools

1

2a



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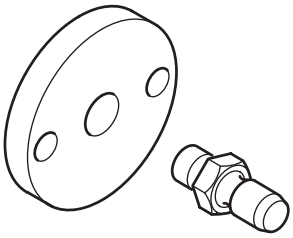

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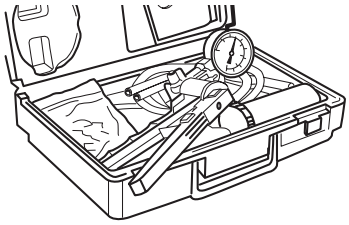

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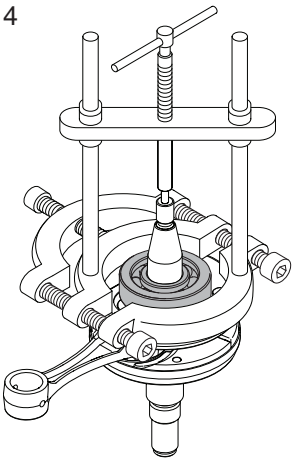

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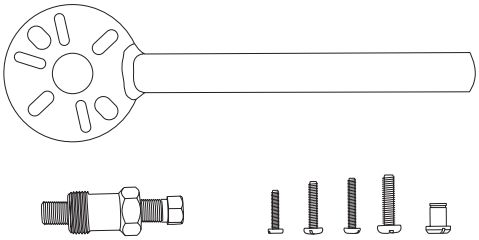

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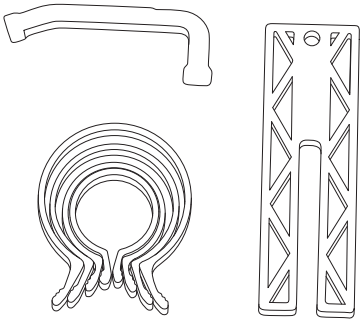

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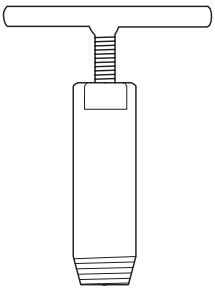

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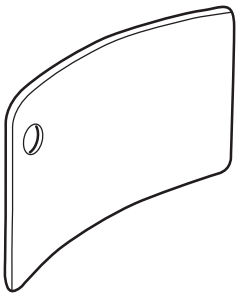

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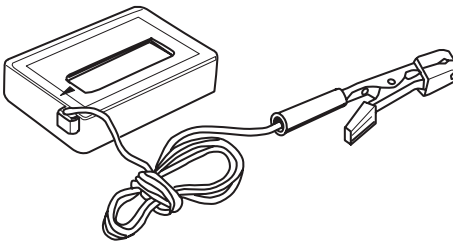

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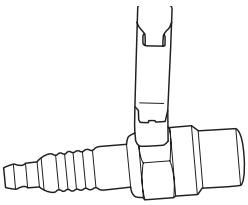

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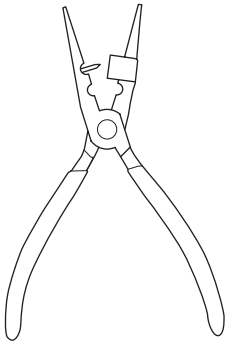

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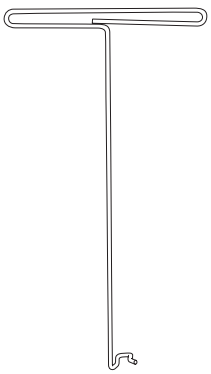

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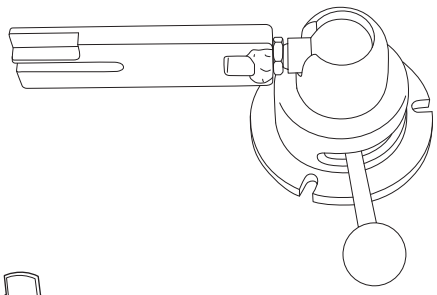

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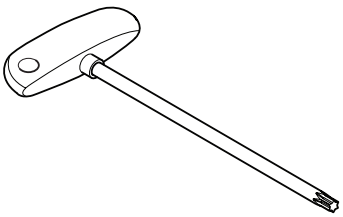

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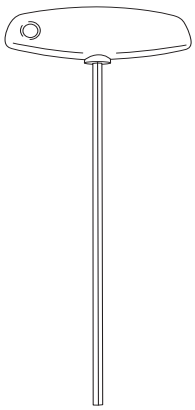

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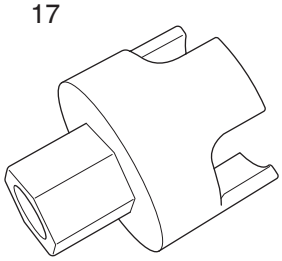

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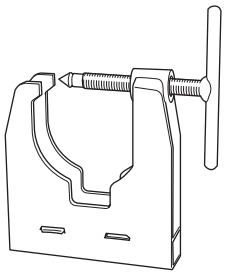

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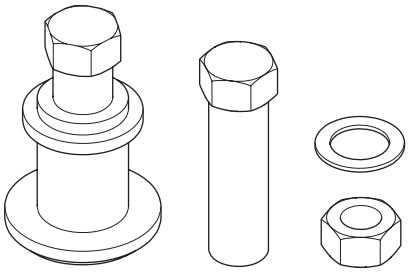
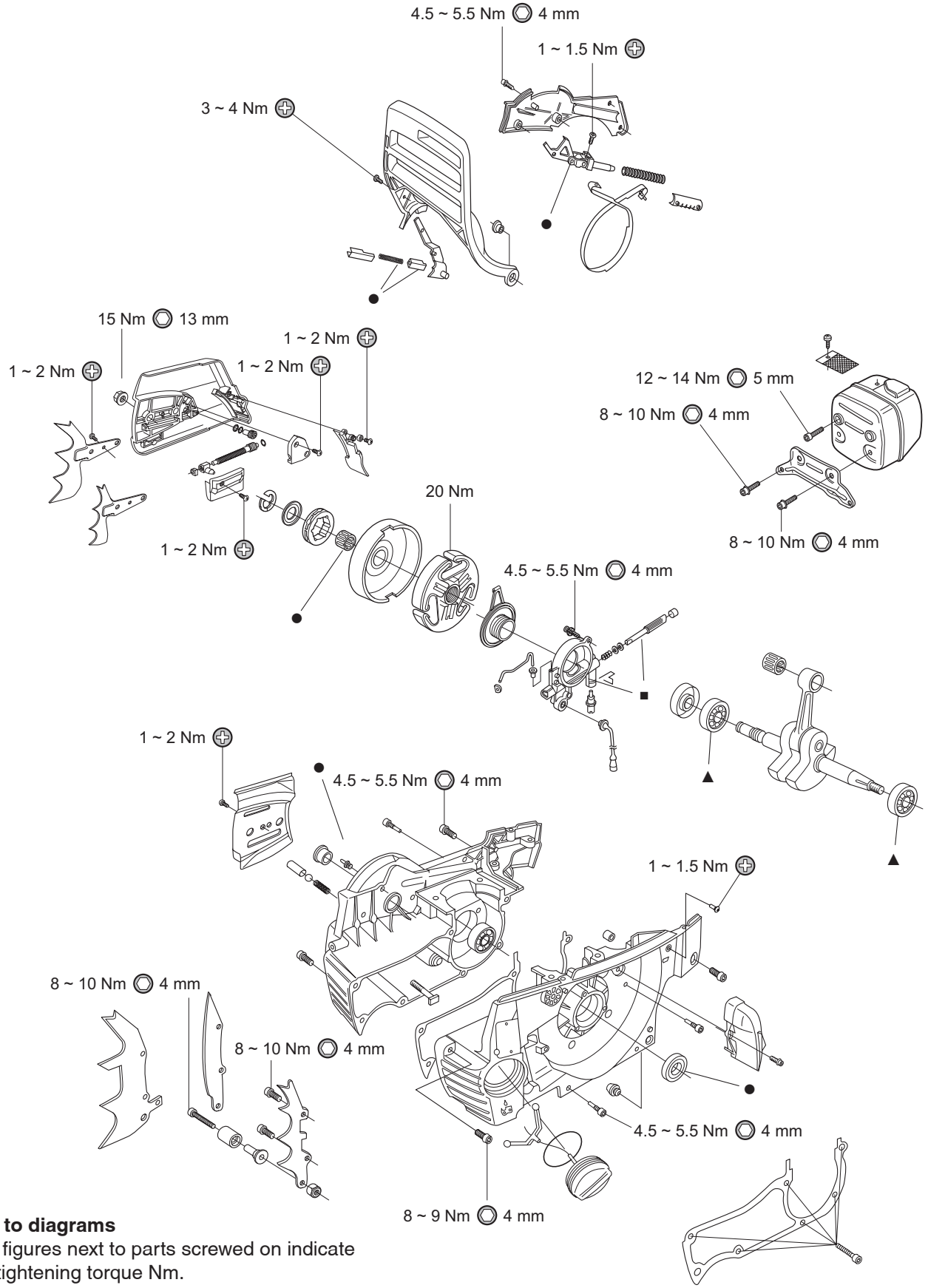


The tools listed here are service tools intended for use on the chainsaw in question. In addition to these tools, a standard set of hand tools is required.

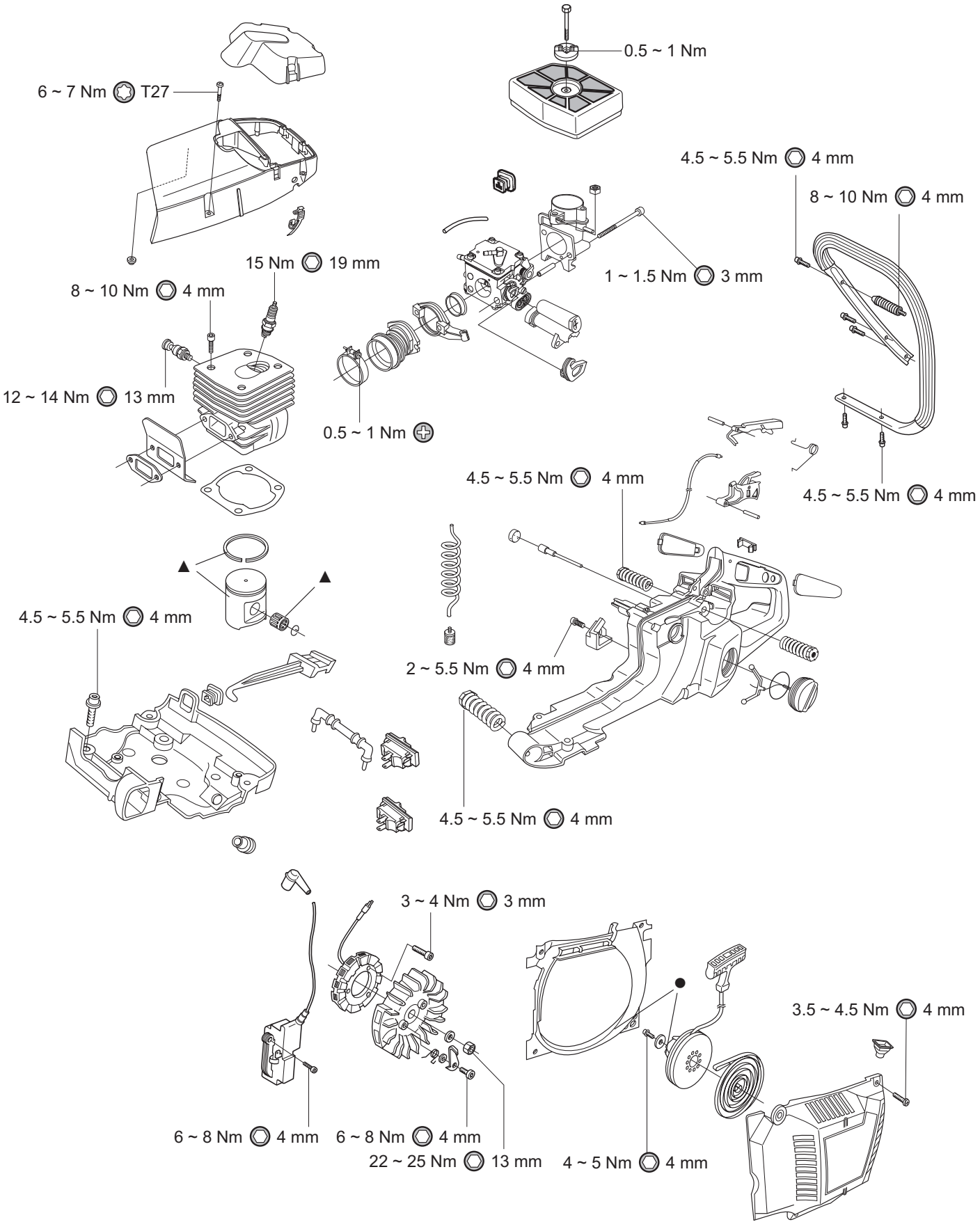
Item	Description	Used for	Article number
1	Piston stop	Locking the crankshaft	502 54 15-01
2a	Cover plate, exhaust	Sealing the exhaust port	502 71 39-01
2b	Cover plate, inlet	Sealing the intake system	502 54 05-01
3	Pressure testing device	Produce pressure when leakage testing	531 03 06-23
4	Puller	Pulling bearing of crankshaft	531 00 48-67
5	Flywheel puller kit	Dismantling of the flywheel	502 51 49-02
6	Piston assembly kit	Assembling the piston	502 50 70-01
7	Seal ring extractor (flywheel side)	Pulling of seal ring	504 91 40-01
8	Feeler gauges ignition gap	Air gap tool	502 51 34-02
9	Tachometer	Checking engine rpm	502 71 14-01
10	Test spark plug	Checking the ignition module	502 71 13-01
11	Assembly pliers	Assembly of spark plug cap	502 50 06-01
12	Hook for fuel filter	Removing fuel filter	502 50 83-01
13	Assembly fixture	Dismantling/assembling of the chainsaw	502 51 02-01
14	Clutch tool	Removing the clutch	502 52 22-01
15	T-handle Torx T10	Dismantling/assembling of the chainsaw	588 52 41-01
15	T-handle Torx T20	Dismantling/assembling of the chainsaw	588 59 27-01
15	T-handle Torx T25	Dismantling/assembling of the chainsaw	502 71 27-01
15	T-handle Torx T27	Dismantling/assembling of the chainsaw	502 71 27-03
15	T-handle Torx T30	Dismantling/assembling of the chainsaw	502 71 31-01
16	T-handle Allen key	For M4 bolts	502 50 18-01
16	T-handle Allen key	For M5 bolts	502 50 18-01
17	Special tool clutch	Removing the clutch	504 00 23-01
18	Crankshaft/crankcase splitter	Dismantling of the crankcase	502 51 61-01
19	Crankshaft installation tool	Installing the crankshaft	502 50 30-17

4 Service data



Key to diagrams
The figures next to parts screwed on indicate the tightening torque Nm.

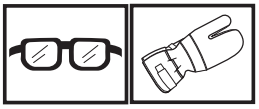
▲ = Lubricate with two-stroke oil.
■ = Lubricate with chain oil.
● = Lubricate with grease.


6 ~ 7 Nm T27
0.5 ~ 1 Nm
4.5 ~ 5.5 Nm 4 mm
8 ~ 10 Nm 4 mm
15 Nm 19 mm
8 ~ 10 Nm 4 mm
1 ~ 1.5 Nm 3 mm
12 ~ 14 Nm 13 mm
0.5 ~ 1 Nm
4.5 ~ 5.5 Nm 4 mm
4.5 ~ 5.5 Nm 4 mm
4.5 ~ 5.5 Nm 4 mm
2 ~ 5.5 Nm 4 mm
4.5 ~ 5.5 Nm 4 mm
3 ~ 4 Nm 3 mm
3.5 ~ 4.5 Nm 4 mm
6 ~ 8 Nm 4 mm
6 ~ 8 Nm 4 mm
22 ~ 25 Nm 13 mm
4 ~ 5 Nm 4 mm

5 Chain brake

5.1 Disassembly

WARNING!
Make sure the spring does not fly out and cause injury. Wear eye protection



1. Disassemble the chain and bar. Refer to the Operator's manual.
2. Disassemble the centrifugal clutch. Refer to chapter *Centrifugal clutch* in the Workshop manual.
3. Push the hand guard forward so that the chain brake is engaged. See fig. 1.

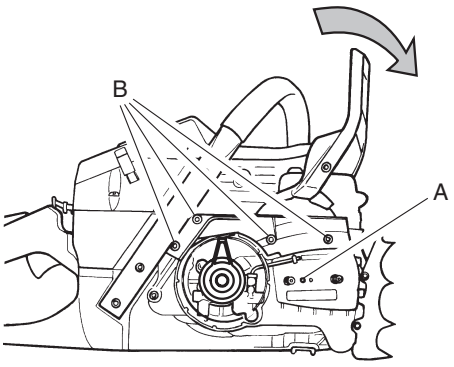


Fig 1

4. Remove the hand guard, two screws. Note the sleeve on the starter side. See fig. 2.

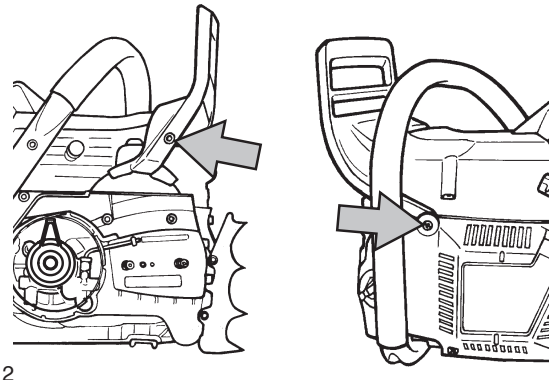


Fig 2

5. Remove the chain guide-plate (A). See fig. 1.

6. Remove the locking ring (C) with washer (D) and lift up the clutch drum (E) with needle bearing (F) and chain drive sprocket (G). See fig. 3.

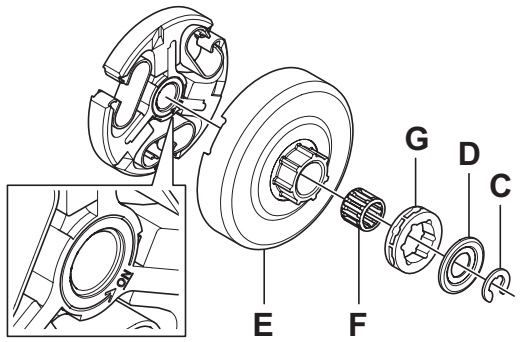


Fig 3

7. Remove the spark plug and fit the piston stop.

   Remove the clutch with the clutch tool. Note the left-hand thread. Screw in the direction of the arrow. See fig. 5.

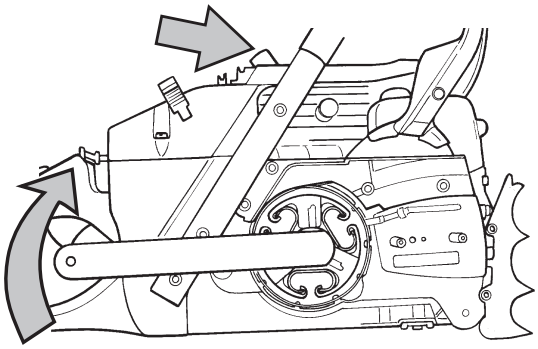


Fig 5

8. Remove the four screws (B) and the cover over the chain brake mechanism. See fig. 6.

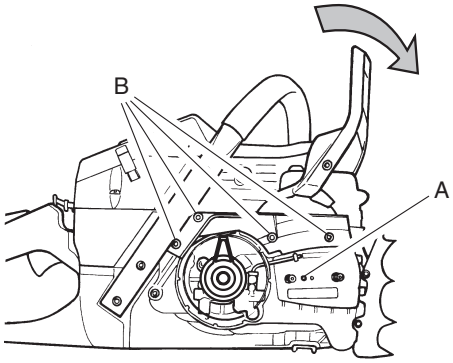


Fig 6

9. Press down the retaining bush (H) while releasing the lever (I) with a screwdriver. See Fig 7.

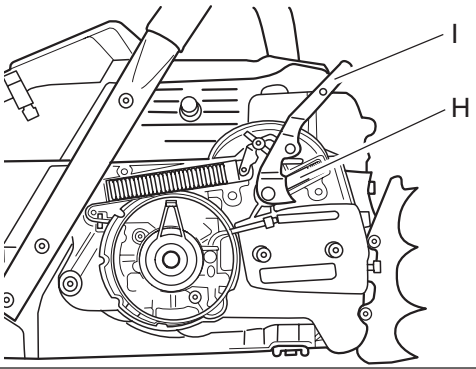


Fig 7

10. Remove the pressure spring by freeing the back end with a screw driver. See fig. 8.
11. Remove the toggle joint (J) with attached brake strap. See fig. 8.
12. Remove the brake strap from the toggle joint.
13. Take out the retaining bush (H) with spring. See fig. 5.

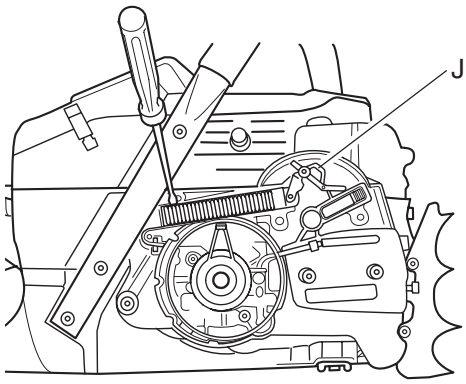


Fig 8

5.2 Cleaning and inspection

- Carefully clean and examine all parts. Parts must be replaced if cracked or show signs of other defects. Always use original spare parts.
- Measure the thickness of the chain brake band. It must not be less than 0.8 mm at any point. See Figure 9.
- Lubricate the knee joint with grease.

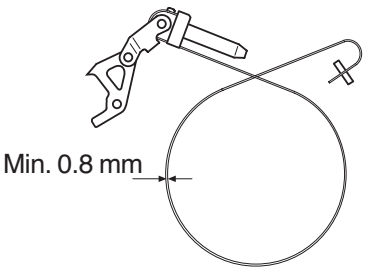


Fig 9

5.3 Assembly

WARNING!
Make sure the spring does not fly out and cause injury. Wear eye protection

Assemble the chain brake:

1. Fit the toggle joint and brake strap. See fig. 9.
2. Grease the moving parts of the toggle joint (J) and fit the unit on the chain saw. See fig. 10.
   Compress the spring and press it in place.
3. Grease and fit the lever (I). See fig. 7.
4. Grease and fit the retaining bush (H) withspring. See fig. 7.
5. Fit the cover over the chain brake mechanism. Four bolts (B). Tighten the bolts to 4 Nm. See fig. 1.
6. Fit the chain guide-plate with bolt (A). See fig. 1.
7. Fit the hand guard with the sleeve on the starter side. See fig. 2.
8. Push back the hand guard so that the chain brake is in the off position.
9. Check that the brake strap is correctly positioned in the recess (K) in the crankcase. See fig. 10.
10. Fit the clutch hub on the crankshaft and tighten with the clutch tool. Note – left-hand thread! See fig. 11.
11. Remove the piston stop and fit the spark plug and put on the ignition cable.
12. Grease in the needle bearing before fitting. Fit the clutch drum (E) with needle bearing (F) and chain drive sprocket (G). See fig. 3.
13. Fit the washer (D) and locking ring (C). See fig. 4.
14. Fit the cylinder cover, chain and bar. See Operators Manual.

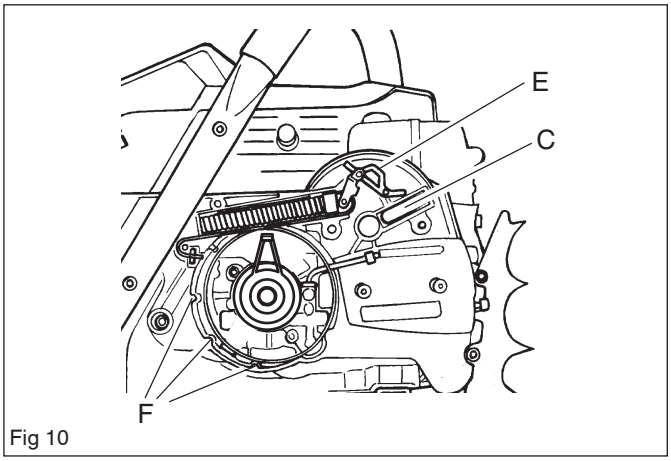


Fig 10

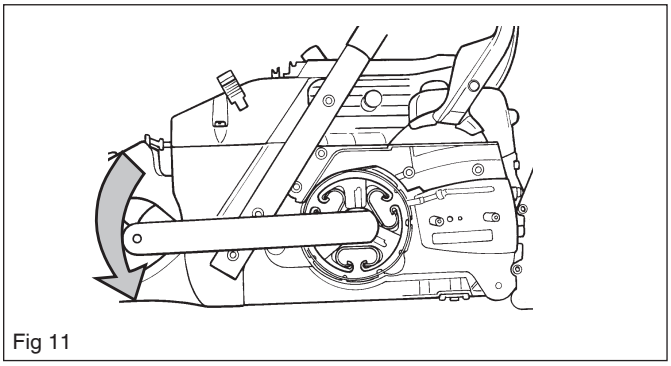


Fig 11

NOTE!

After repair of the chain brake. The chain brake must be tested as described in Function check.

5.4 Function test

For this test, the engine must not be running. Check that the chain brake engages as follows:
Hold the chainsaw over a stable surface as shown in fig 12. The distance between the bar and surface is given in the table below.

Bar length, L	Height, H
15 - 20 Inches	50 cm
21 - 28 Inches	70 cm
29 - 32 Inches	80 cm

Let go of the front handle and let the chainsaw pivot round on the rear handle.

1. When the bar hits the surface the chain brake should engage..

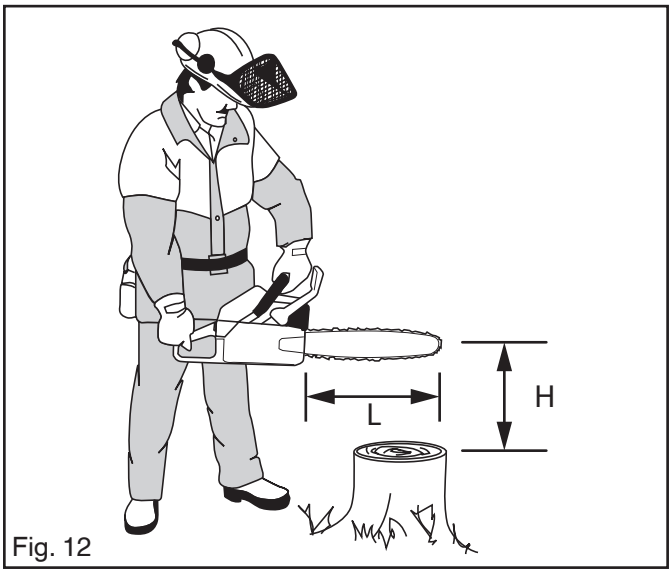


Fig. 12

6 Chain catcher

6.1 Disassemble the chain catcher

1. Remove the clutch cover.
2. Disassemble the bar and chain.

6.2 Cleaning and inspection

Inspect the chain catcher and replace it if it is damaged. See figure 1.

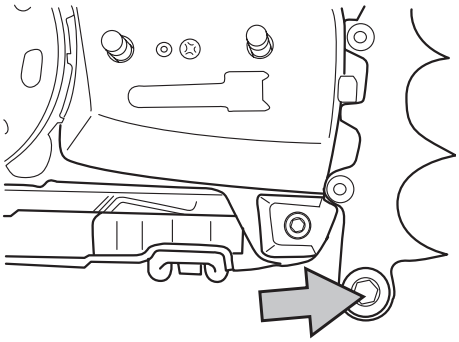


Fig. 1

6.3 Assembly

1. Fit the bar and chain.
2. Adjust the tension of the chain.
3. Fit the clutch cover. See “4 Service data” on page 10.

7 Muffler

7.1 Disassembly

WARNING!
Do not touch the muffler until it has become cool. Risk of burn injuries.

1. Remove the two lower M5 bolts and the two M6 bolts on the muffler. See fig. 1
2. Remove the gasket and cooling plate. See fig. 1
3. If the saw is fitted with a spark-arrester, remove it. See fig. 1.

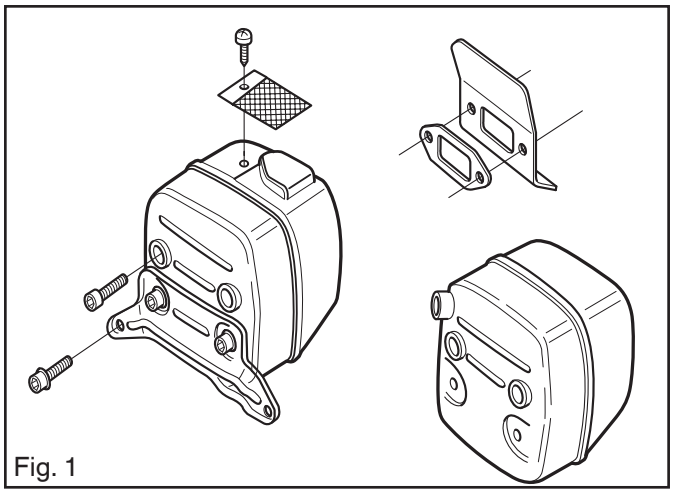


Fig. 1

7.2 Cleaning and inspection

Clean all components and do a check of:
1. That the spark-arrester is intact.
2. That the muffler and muffler mounting are not cracked or in any way defect.
3. That the gasket is undamaged.

CAUTION!
Replace the gasket if it is damaged. The gasket has to be fitted correctly against the muffler.

7.3 Assembly

1. Clean the contact surfaces of the gasket, cooling plate and cylinder.
2. If the chainsaw is fitted with a spark-arrester, refit it. See fig 1.
3. Fit the cooling plate, gasket and muffler to the cylinder. See fig 1.
4. Tighten the two bolts to the cylinder and tighten the four bolts.
   Retighten the screws after warm running.

8 Start/stop switch

8.1 Disassembly

1. Remove the stop switch with a screwdriver and detach the leads. See fig. 1.

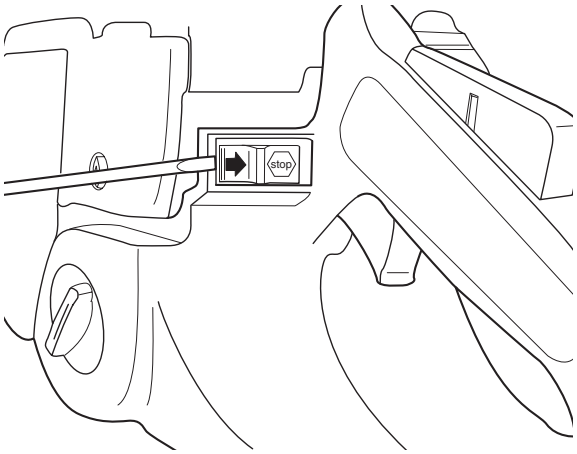


Fig. 1

8.2 Cleaning and inspection

Carefully clean and check all components. Parts must be replaced if cracked or if they show signs of other defects. Always use original spare parts.

Measure the resistance by connecting an ohmmeter to the stop switch. See fig. 2. The resistance should be as follows:
”0” pressed in - less than 0.1 ohm.
”1” pressed in - more than 1000 ohm.

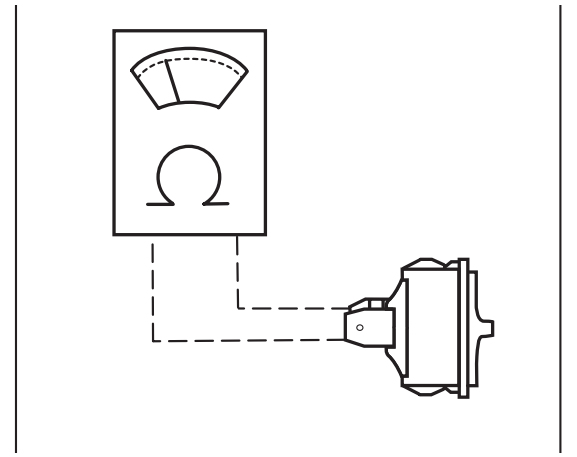


Fig. 2

8.3 Assembly

The symbol/stop marking should be mounted to the rear hand grip during assembly. The earth lead is fitted in the upper or lower connection. See fig. 2.

8.4 Function check

Clean the mating surfaces and do a check of the resistance as follows:

Measure the resistance by connecting a multimeter to the blue cable and the cylinder (earth).
NOTE! The switch must be in the “on” position to give the correct reading.

The resistance must not be higher than 0.5 Ω when the switch is in the on position.

The stop switch is in the ON-position when the button is held down and in the OFF-position the button is neutral.

9 Throttle trigger lockout, throttle trigger and spring

9.1 Disassembly

1. Remove the hand grip insert (C). See fig. 1.
2. Remove the throttle lock pivot (A) with the help of a driver. See fig. 1.
3. Press apart with a screwdriver or the like the throttle lock/control and take out the throttle lock from the recess in the hand grip. Now remove the spring. See fig. 2.
4. Remove the stop switch. Press out the throttle lever pivot (B) with a driver. See fig. 1 and 4.
5. Remove the throttle cable and lever. See fig. 4.

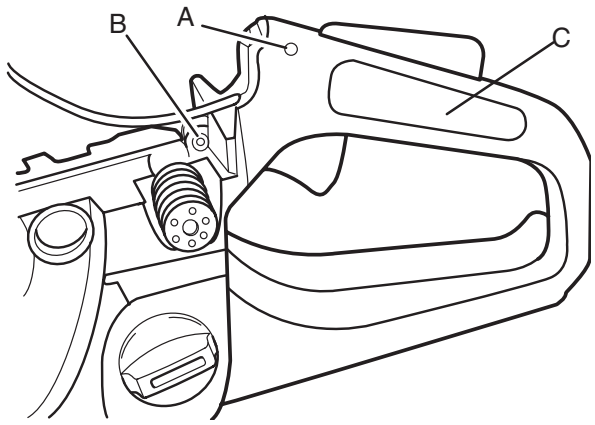


Fig. 1

9.2 Cleaning and inspection

Clean all components and do a check of the following:
1. That the throttle cable and lever are undamaged and run easily.
2. That the lock activation mechanism is not worn. See fig. 2.

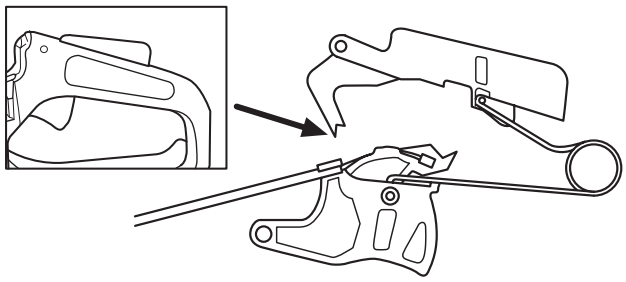


Fig. 2

9.3 Replace a defect throttle cable

Attach the wire to the throttle trigger. Pull the wire through the handle.

9.4 Assembly

1. Fit the throttle cable and lever. Fit the throttle lever with pivot (B). See fig. 1 and 4.
2. Fit the spring in the recess in the throttle lock. Hold the spring in place and locate the throttle lock in the recess in the hand grip.
3. Fitting of the throttle lock is simplified by using a screwdriver or the like to lock the spring. See fig. 3.
4. Fit the throttle lock pivot (A) with the help of a driver. See fig. 1.
5. Fit the switch and hang grip insert.

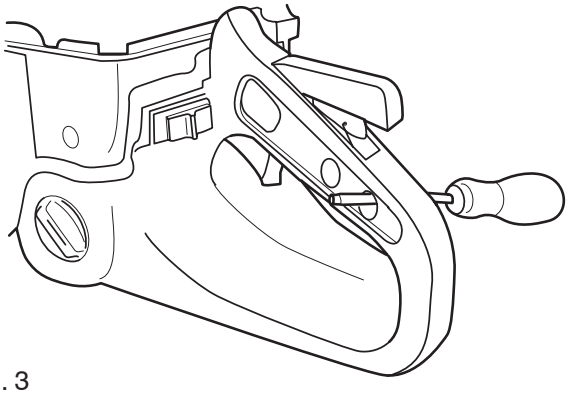


Fig. 3

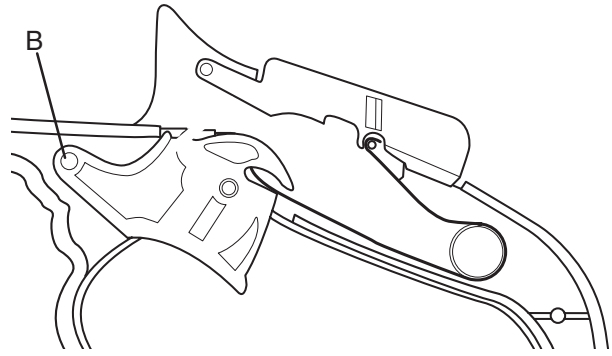
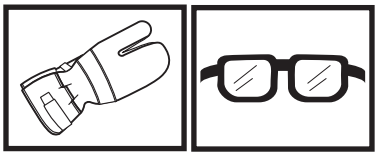


Fig. 3

10 Starter

10.1 Disassembly



WARNING!
Make sure the the spring is released on the starter pulley. it can come loose and cause personal injury.

1. Remove the four bolts holding the starter to the crankcase and remove the starter. See fig. 1.
2. Pull out the handle 20-30 cm and take out the cord from the slot in the starter pulley. See fig. 2.
3. Rotate the starter pulley anticlockwise until the tension on the pulley is released.

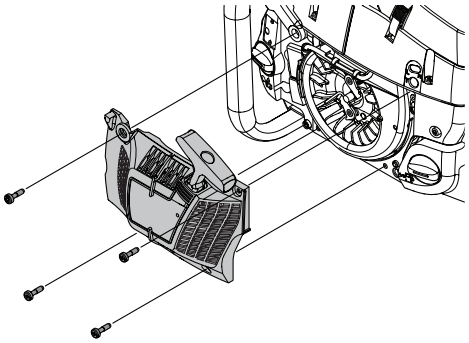


Fig. 1

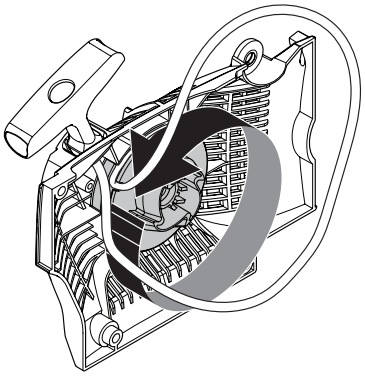


Fig. 2

4. Remove the central bolt and take out the washer and starter pulley. See fig. 3.
5. If the starter cord is to be replaced, cut it off and pull out the ends from the handle and starter pulley with pointed pliers.
6. If the spring is to be replaced, remove the old spring.

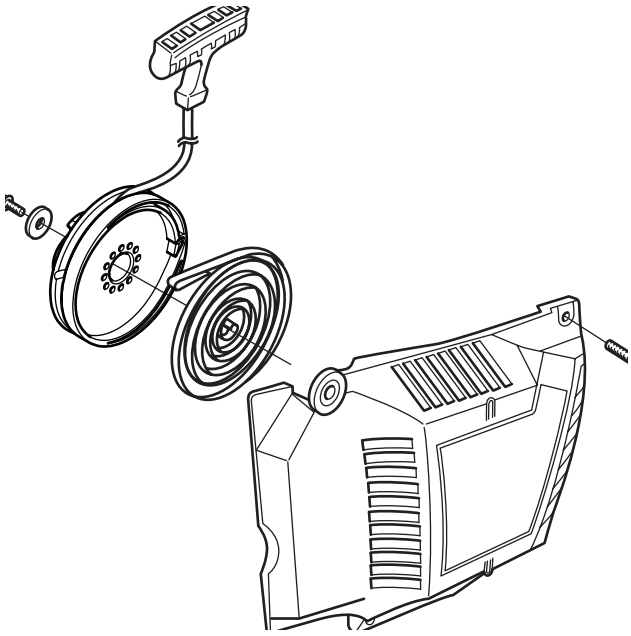


Fig. 3

10.2 Cleaning and inspection

1. Clean all components.
2. Do a check of the following:
   - Starter cord is not damaged.
   - The dogs on the starter pulley is not damaged .
   - That the pawls on the flywheel are intact and that the spring is back towards the centre and moves freely.
3. Grease the spring in the starter pulley

10.3 Assembly

1. If a new spring is to be fitted, place the new spring with steel wire so that the end loop comes over the peg (A) in starter pulley. See fig. 4.
2. Press the spring down in the starter pulley and remove the wire.

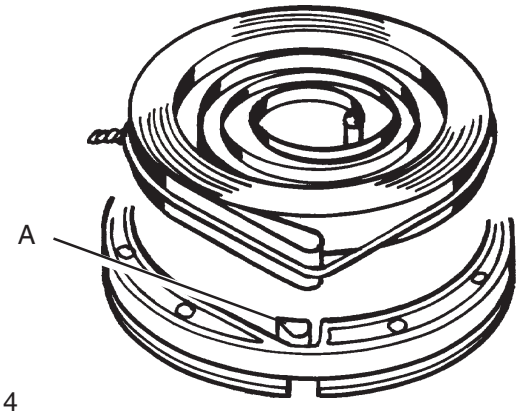


Fig. 4

3. If a new cord is to be fitted, push the free end in the hole in the starter pulley. Take hold of the end with pointed pliers inside the pulley and pull up the cord. See fig. 5.
4. Grease the starter pulley bearing and spring, and fit the pulley on the spindle. Turn gently backwards and forwards until the spring catches on the stop in the housing.
5. Fit the washer and bolt (See fig. 3.) and tighten it with the coorect torque *(Refer to "4 Service data" on page 10)*.
6. Pull out the cord through its hole in the housing and fit the handle and secure it with a double knot. See fig. 5

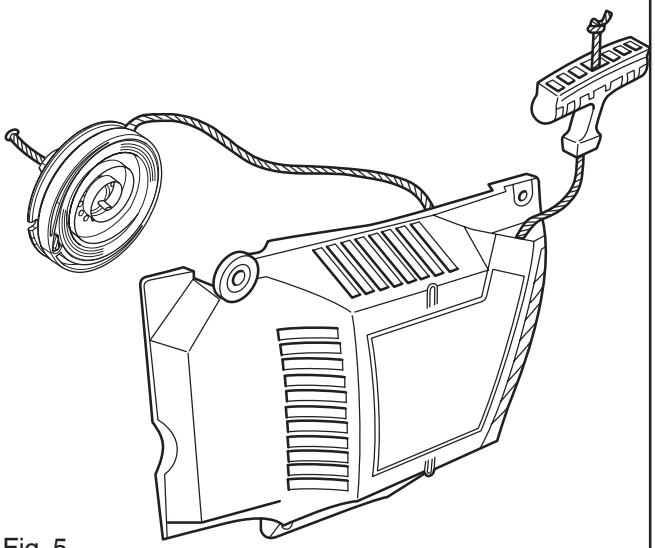


Fig. 5

7. Wind the cord onto the starter pulley and rotate the pulley clockwise until the cord is correctly tensioned. See fig. 6.

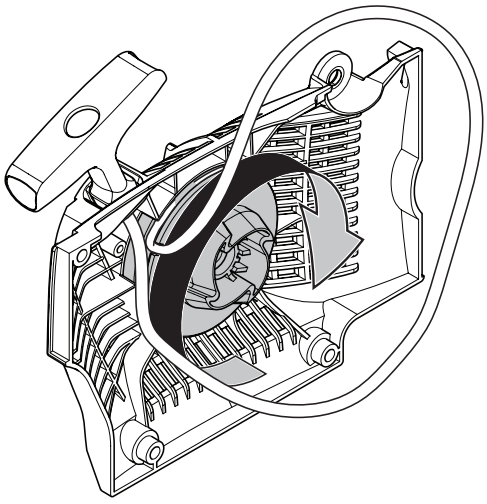


Fig. 6

10.4 Cord tension check

1. Pull out the cord completely.
2. In this position it should be possible to turn the pulley by hand an additional 1/2 - 3/4 turn.
3. Put the starter on the crankcase and tighten the bolts. See fig. 1.

11 Electrical system

11.1 Ignition system

11.1.1 Disassembly

1. Remove the cylinder cover and starter unit.
2. Release the blue lead (A) (which connects to the stop button) from the ignition module (B). See fig. 1.
3. Remove the ignition cable (C) from the spark plug and release both cables from the cable guide (D), and remove the cable guide. See fig. 1.
4. Remove the two M5 bolts and lift off the ignition module (B). See fig. 1.
5. Remove the two pawls (E) for the starter. See fig. 1 and fig. 6.
6. Remove the spark plug and fit the piston stop *(Refer to "3 Service tools" on page 8)* in the spark plug hole. See fig. 2.

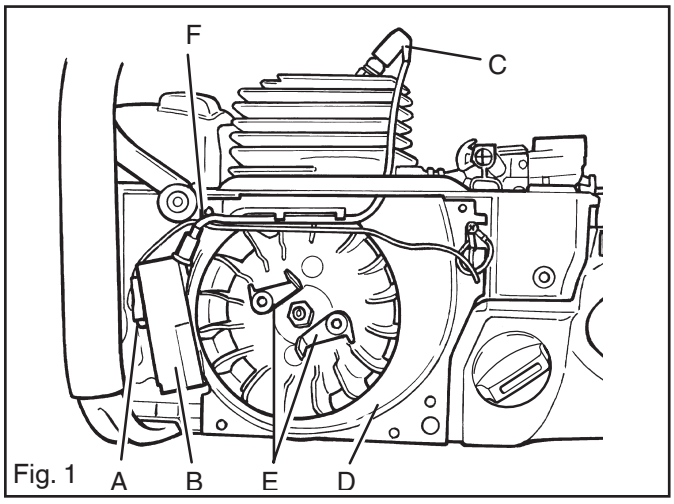


Fig. 1

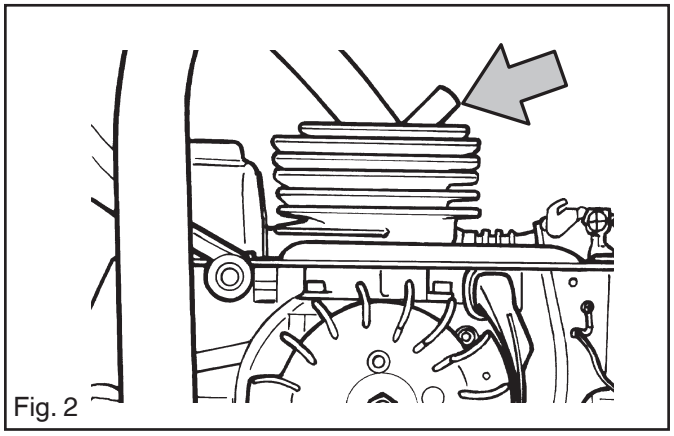


Fig. 2

7. Release the flywheel nut. Unscrew the nut until it comes level with the outer end of the shaft thread See fig. 3.

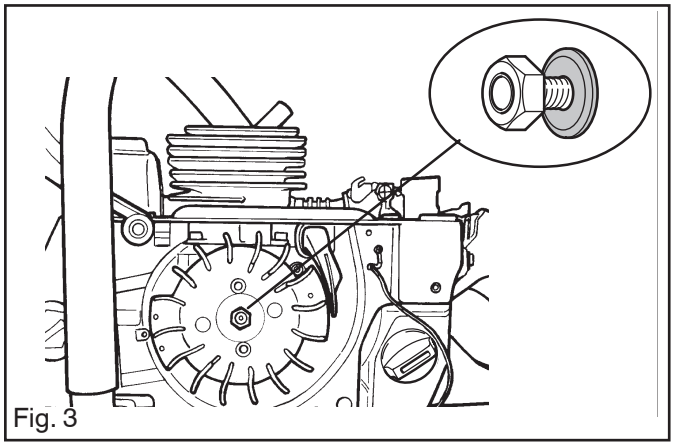


Fig. 3

8. Fit the flywheel puller *(See "3 Service tools" on page 8)*. Tighten down the two M5x25 bolts approx. 10 turns. Tighten the centre bolt, while preventing rotation with the holding tool until the flywheel releases. See fig. 4.
9. Remove the puller, nut, washer and flywheel.

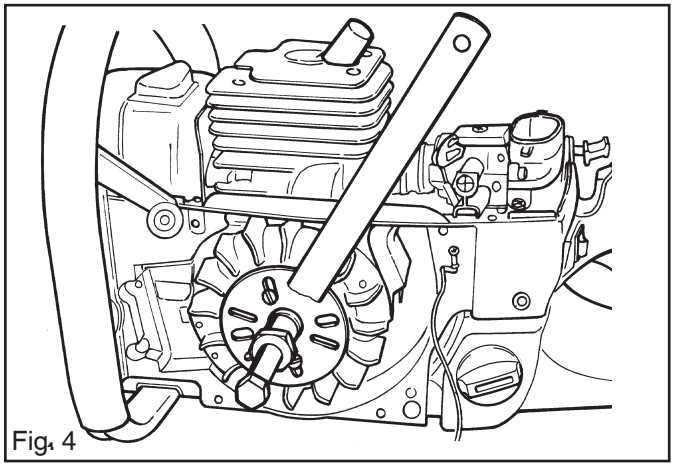


Fig. 4

11.1.2 Cleaning and inspection

Clean all parts, especially the tapers on the flywheel and shaft.
Examine the flywheel for cracks or any other signs of damage.

11.1.3 Assembly

To assemble the ignition system:

1. Fit the flywheel on the spindle. Turn it gently until the key on the flywheel mates with the recess in the shaft.
2. Fit the flywheel washer and nut (See fig. 5). Tighten the nut *(Refer to "4 Service data" on page 10)*

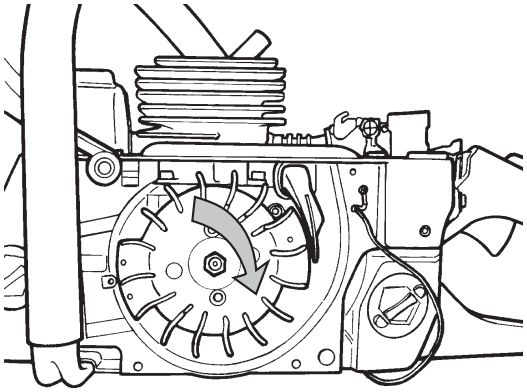


Fig. 5

3. Fit the two pawls on the flywheel. See fig. 6.
4. Remove the piston stop.
5. Fit the ignition module (B) without tightening its bolts. See fig. 8.

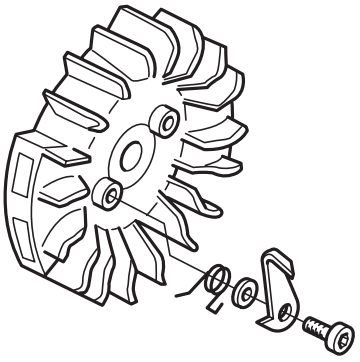


Fig. 6

6. Turn the flywheel so that its magnet (G) comes opposite the ignition module. See fig. 7.
7. Insert the feeler gauge (H) (0.3 mm) between the ignition module and the flywheel magnet. The clearance only applies to the two lower pegs on the ignition module. See fig. 7 and 8.
8. Push the ignition module against the flywheel and tighten the bolts *(Refer to "4 Service data" on page 10)*.
9. Fit the cable guide (D) See fig. 1 and install the ignition cable. Connect the ignition cable to the spark plug.
10. Pull out the cable and install the cable clip (F) on the ignition module. See fig. 1.
11. Fit the remaining parts on the saw.

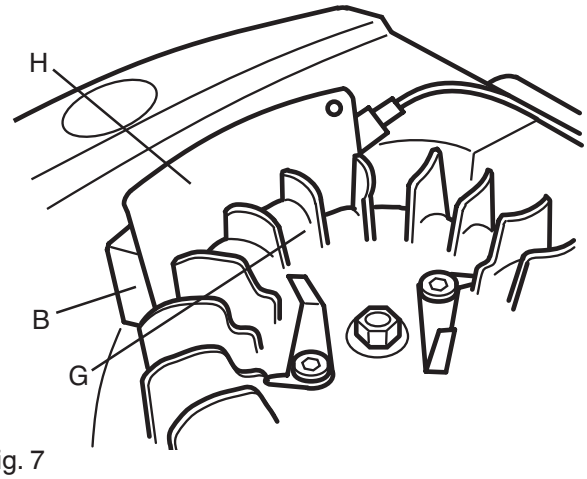


Fig. 7

11.1.4 Cleaning and inspection

Clean and examine all parts carefully. If there are any cracks or other damage replace the damaged parts with new ones. Always use original parts.

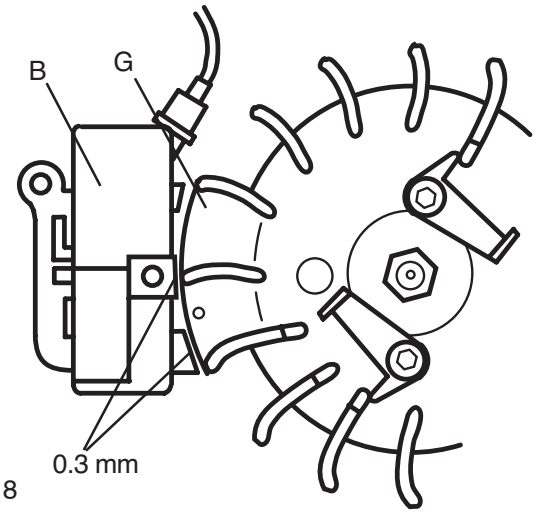


Fig. 8

11.2 Hand grip heater and carburettor heater 390

Some chainsaws are fitted with hand grip heaters and carburettor heaters, and consist of the following parts:

- Generator.
- Switch.
- Heating element in rear hand grip.
- Front hand grip with heating element.
- Carburettor heating element.
- Thermostat.

11.2.1 Trouble shooting

Trouble shooting can be done with most components fitted on the saw. Trouble shooting require:

- ammeter
- ohmmeter
- cooling spray

The most common fault is oxidisation of the heating element contacts in the rear hand grip and the switch contact. To trouble shoot:

Heating element in rear hand grip.
Separate the cable connection at B. See fig. 10. Remove the switch with a screwdriver. See fig. 9. Set the switch to position “0”.Clean the contacts D, E, F and G. See fig. 10. Measure the resistance between point B and F, between D and C and between E and C. See fig. 10. The resistance for both heating elements should be 0.6-2.4 ohms. Between D and C and between E and C the resistance should be 0.3-1.2 ohms. Replace the element if the values deviate.

Front hand grip with heating element
Measure the resistance in the front hand grip element between points A and B. See fig. 10. The ohmmeter should show 3-4 ohms. If the value is higher, replace the hand grip.

Generator
Measure the resistance in the generator between the points G and H. See fig. 10. The ohmmeter should show 0.3-1.3 ohms. If the value is higher, replace the generator.

Switch
Release one of the connections to the switch and connect the ohmmeter between the points F and G. See fig. 10. The ohmmeter should show more than 1000 ohms with the switch in position “0”. The ohmmeter should show at least 0.1 ohms with the switch in position “1”. Replace the switch if the values deviate.

Carburettor heating element
Measure the resistance for the heating element on the carburettor at L and J. The ohmmeter should show 3-10 ohms. Replace the heating element if the value deviates.

Thermostat
Release the earth cable J. Measure with the ammeter between J and K. Start the saw and run at approx. 10,000 rpm. The ammeter should show 0 at an air temperature of 15 C or higher. Cool the thermostat with a cooling spray. The ammeter should show 2 A at 10,000 rpm. Replace the thermostat if the values deviate.

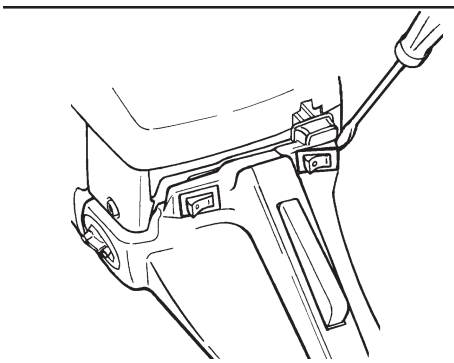


Fig. 9

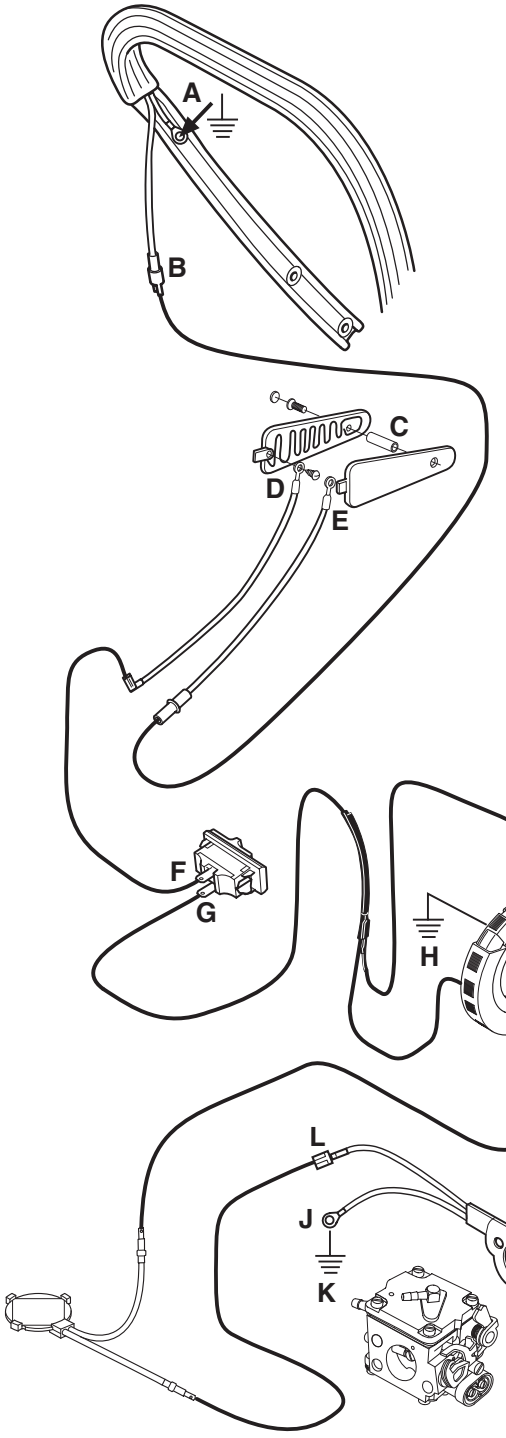


Fig. 10

11.2.2 Replacing the generator

The following components must be removed before the generator can be replaced:

A. Starter. Refer to *Starter* chapter.
B. Flywheel. Refer to *Flywheel* chapter.

1. Remove the bolts for the rear damper element (A) and the travel inhibiting bolts (B). See fig. 11.

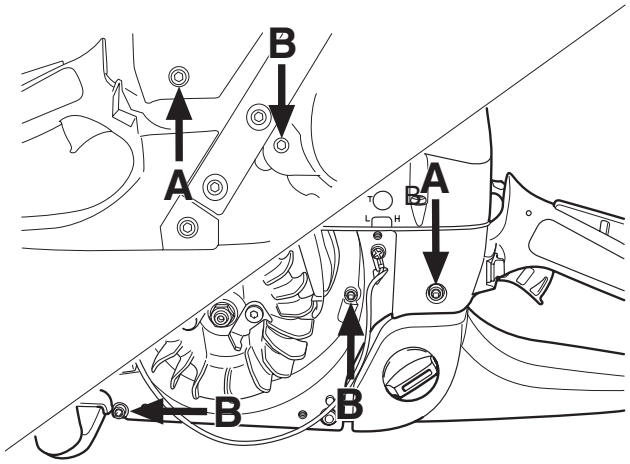


Fig. 11

2. Remove the generator by unscrewing the three bolts. See fig. 12.
3. Release the cable from the switch and remove the generator.

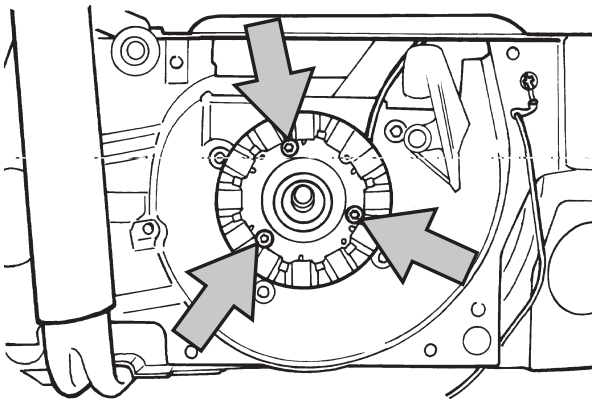


Fig. 12

4. Fit the new generator as shown in fig. 13 and tighten the bolts *(Refer to "4 Service data" on page 10).*
5. Position the cable as shown in fig. 13 and connect it to the switch.
6. Refit the flywheel and the starter.

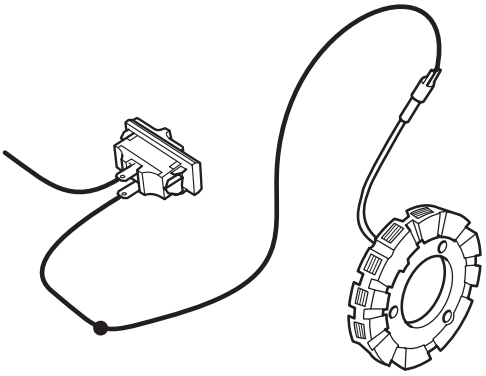


Fig. 13

11.2.3 Replacing the switch

1. Remove the switch and disconnect the cables. See fig. 9.
2. Fit the cables on the new switch and press in the switch.

11.2.4 Replacing the heating element in the tank unit

1. Remove the rear hand grip insert. See fig. 14.
2. Remove the cable connections. See fig. 14.
3. Fit the heating element and cable connections.

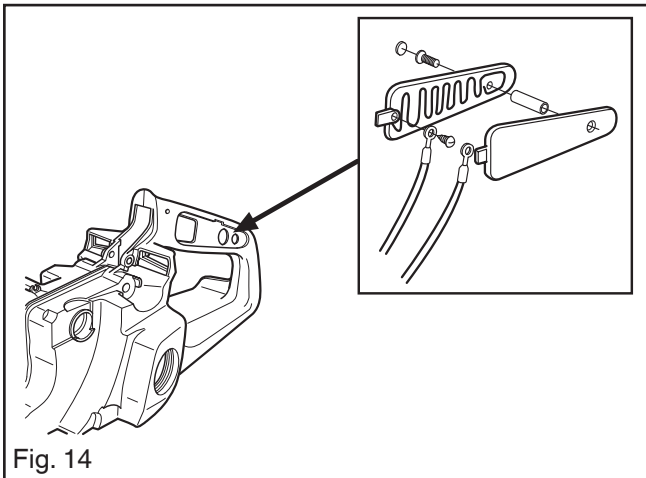


Fig. 14

11.2.5 Replacing the front hand grip

1. Release the two cable clips beside the spring. See fig. 16.

2. Remove the five bolts (A, B, C and D) which hold the front hand grip. See fig. 15.

3. Fit the new front hand grip by screwing in the five bolts (A, B, C and D). Tighten the bolts. See fig. 15 and also refer to “4 Service data” on page 10.

4. Connect the two cables. See fig. 16.

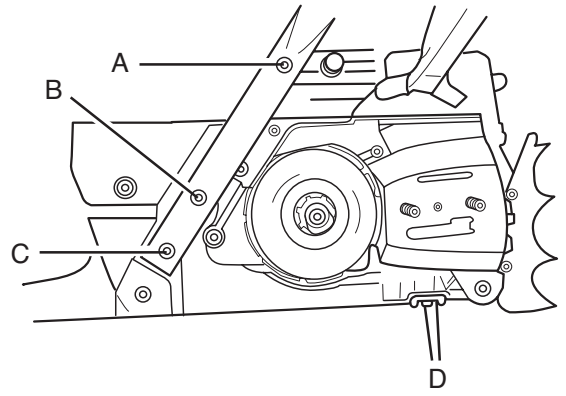


Fig. 15

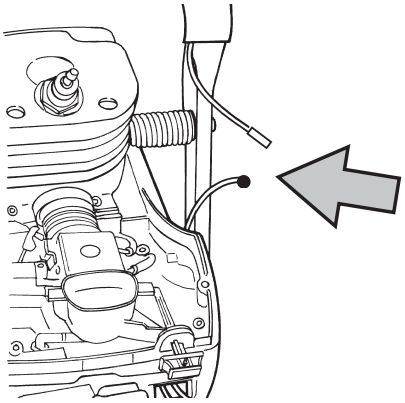


Fig. 16

12 Centrifugal clutch

12.1 Disassembly

When dismantling the centrifugal clutch the chain brake must be in the off position.

1. Remove the cylinder cover and chain and bar. Refer to the Operators Manual.
2. Remove the chain guide plate by unscrewing the bolt (A). See fig. 1.

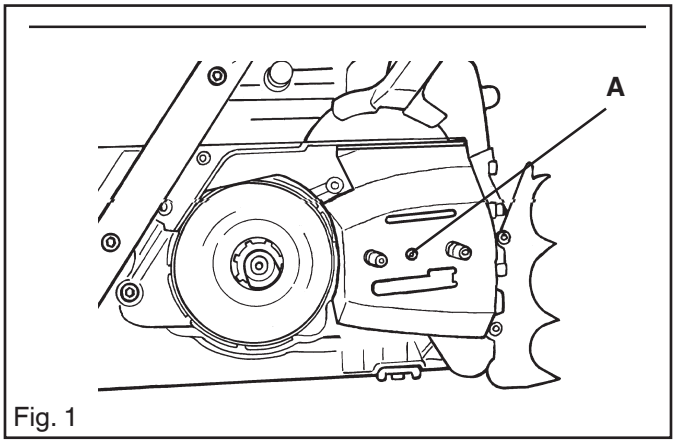


Fig. 1

3. Remove the locking ring (B) with washer and lift up the clutch drum (C) with needle bearing (D) and chain drive sprocket (E). See fig. 2.

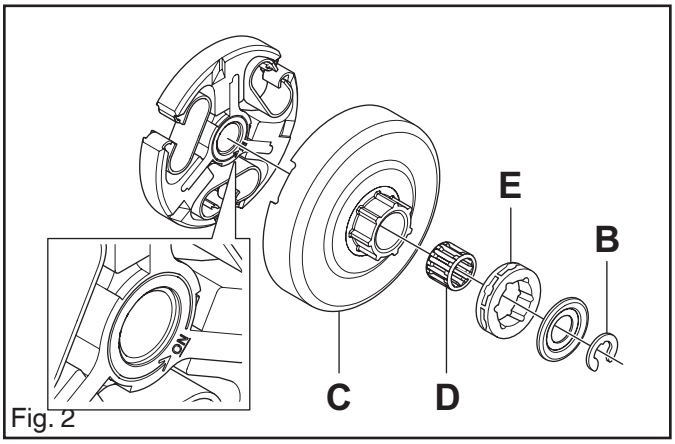


Fig. 2

4. Remove the spark plug and fit the piston stop. Remove the clutch with the clutch tool. *(Refer to "3 Service tools" on page 8)*

   Note – left-hand thread. Screw in the direction of the arrow as shown in fig. 3.

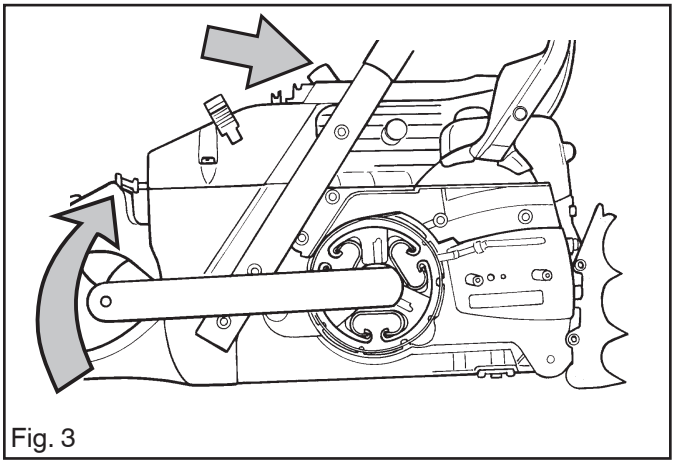


Fig. 3

To disassemble the clutch hub

5. Stretch out the springs with circlip pliers and press them out from the clutch hub.
6. A complete clutch or springs are available as spare parts.

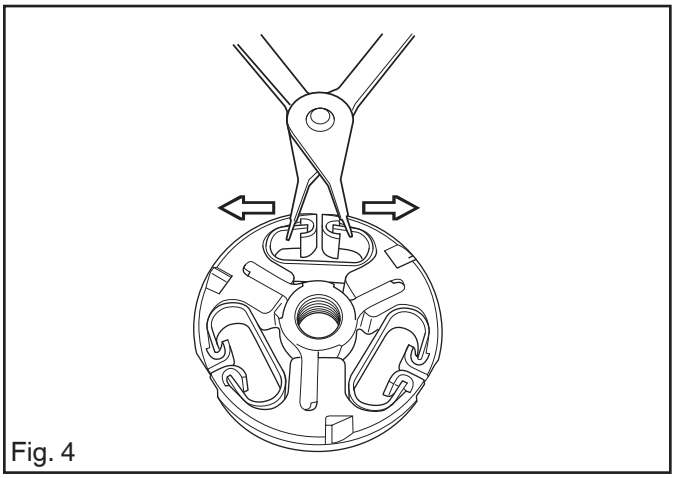


Fig. 4

12.2 Cleaning and inspection

Clean all components and do a check of the following:

1. The lining thickness on the clutch shoes must not be less than 3.5 mm at the most worn point. See fig. 5. To avoid imbalance all the clutch shoes must be replaced at the same time.
2. There must be no play between the clutch shoes and the clutch hub.
3. Examine the chain drive sprocket for wear or damage.
4. The needle bearing must be in good condition and the journal surface on the crankshaft undamaged.
5. The friction surface on the clutch drum should be intact and the bearing surface undamaged.

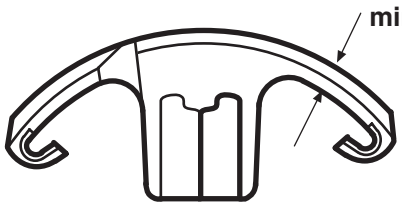


Fig. 5

12.3 Assembly

When assembling the centrifugal clutch the chain brake must be in the off position.

1. Fit the clutch shoes on the hub and fit the springs with circlip pliers. See fig. 4.
2. Fit the clutch hub on the crankshaft and tighten with the clutch tool.
   Note: Left-hand thread! See fig. 6.
3. Remove the piston stop and fit the spark plug and put on the ignition cable.
4. Grease in the needle bearing before fitting. Fit the clutch drum (C) with needle bearing (D) and chain drive sprocket (E). See fig. 2 page 24.
5. Fit the washer and locking ring (B). See fig. 2.
6. Fit the cylinder cover, chain and bar. Refer to the Operators Manual.

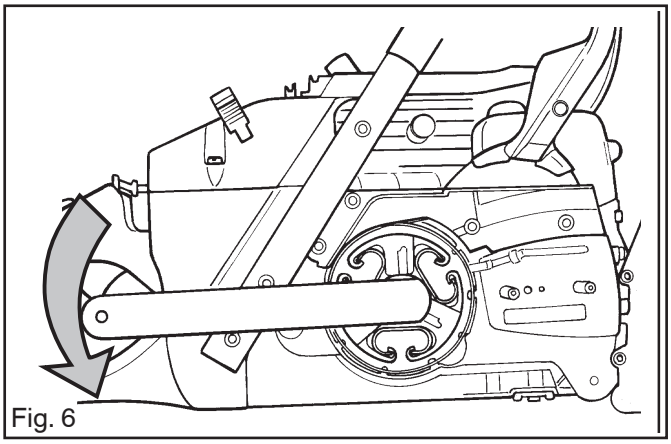


Fig. 6

13 Lubrication system

WARNING!
Insufficient lubrication of the chain can result in the chain breaking, which can cause serious or even life-threatening injury.

The lubrication system consists of the following parts:
- Oil pump
- Suction hose with filter
- Oil hose with integrated filter.

13.1 Disassemble the oil pump and pipe.

1. Empty and clean the oil tank.
2. Disassemble the following parts:
- Chain and bar. Refer to the Operators Manual.
- The centrifugal clutch. Refer to “12.1 Disassembly” on page 26.
- Disassemble the drive wheel. See fig. 1

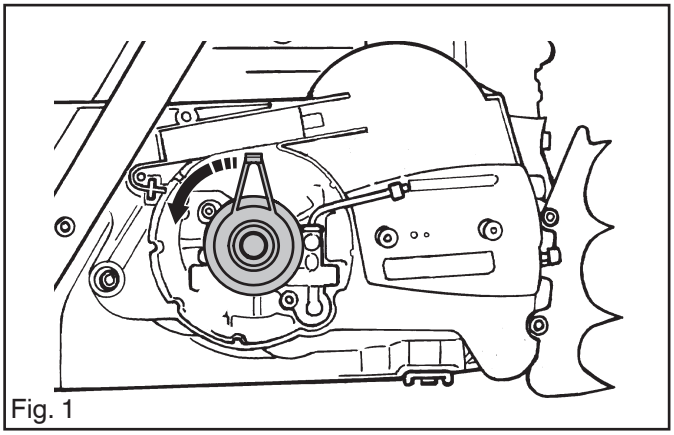


Fig. 1

3. Remove the two bolts (B) and lift the oil pump from the crankcase. See fig. 2.
4. Use a screwdriver to push up the oil pipe at (A). Lift the pipe and pull it out of the oil pump. See fig. 2

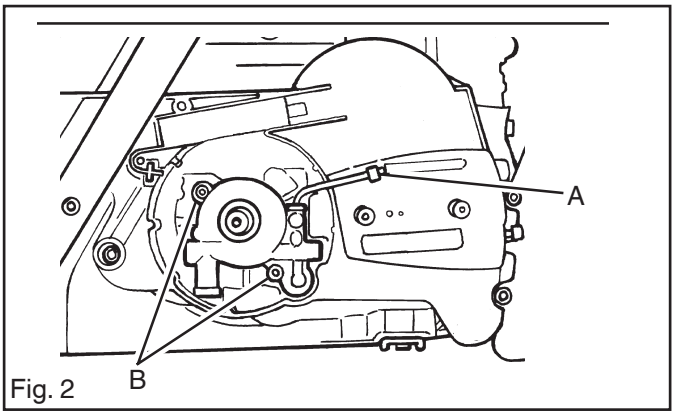


Fig. 2

5. Use pointed pliers and pull up the suction pipe (C) with filter. See fig. 3.

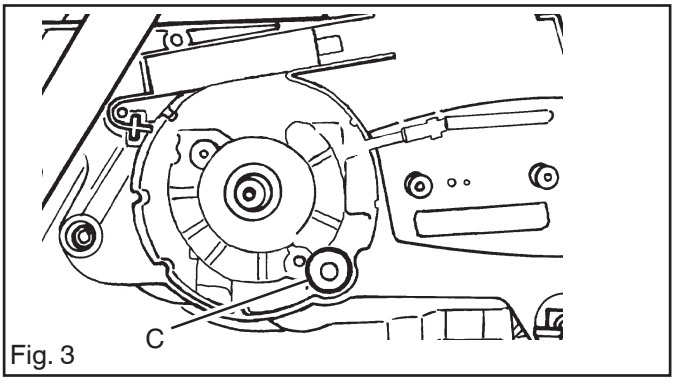


Fig. 3

6. Remove the clip (D) and unscrew the adjuster screw (E). See fig. 4.
7. Use a pair of pliers and push on the pump piston at (F) so that the cover plug (G) and pump piston (H) can be removed. See fig. 4.
8. Use a pair of pliers and pull out the spring (I) and the 2 washers (J). See fig. 4.

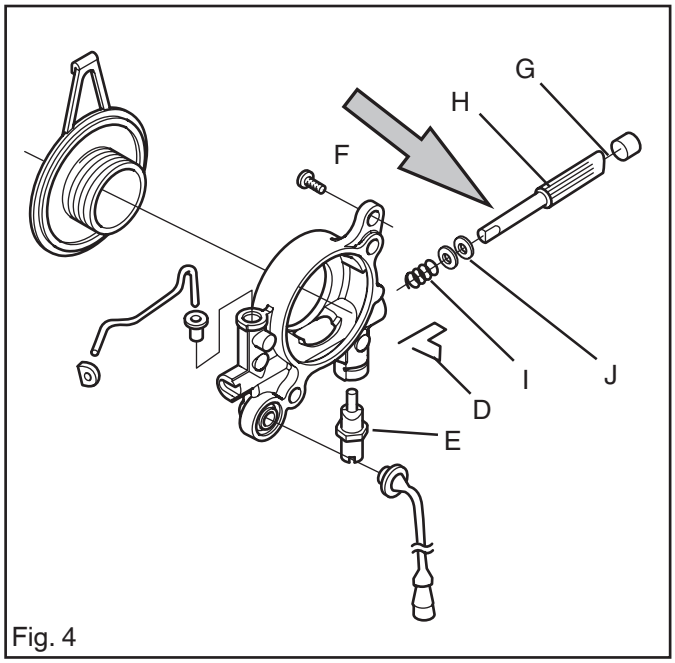


Fig. 4

13.2 Cleaning and inspection

Clean all parts, including the pump and oil pipe mounts in the crankcase, and do a check of the following:

1. The taper on the adjuster screw (E) should not have any wear marks. See fig. 5.
2. The eccentric face on the pump piston should not have any wear marks. See fig. 5.
3. The gear on the pump piston should be undamaged. See fig. 5.

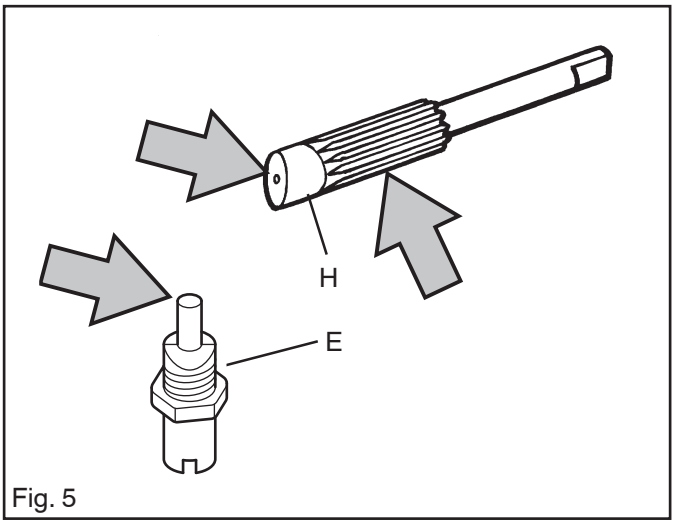


Fig. 5

4. The worm gear of the oil pump drive should be undamaged. See fig. 6.
5. The oil pipe should be free from unwanted materials and the filter clean.
6. The oil pipe should be free from unwanted materials and its seals undamaged.

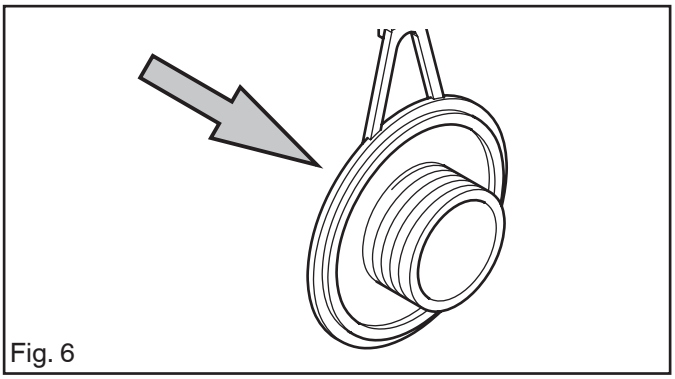


Fig. 6

13.3 Assembly

1. Insert the suction pipe (C) in the hole in the crankcase. See fig. 3
2. Place the spring (I), the 2 washers (J) and pump piston (H) in the pump housing. Oil all parts with chain oil. See fig. 8
3. Use a screwdriver to press in the pump piston and adjust the adjuster screw to its home position (E). See fig. 8
4. Fit the cover plug (G). See fig. 8
5. Fit the clip (D). See fig. 8.
6. Fit the oil pump in the crankcase. Fit the oil pipe with seals. See fig. 2 .
7. Tighten the bolts to 5 Nm. See fig. 2.
8. Fit the drive wheel. See fig. 7.
9. Assemble the following parts:

- The centrifugal clutch. Refer to *Centrifugal clutch* chapter
- The other parts of the saw. Refer to the Operators Manual.
- Adjust the pump feed rate. Refer to *Adjusting the pump feed rate* chapter
- Refill with chain oil and check the lubrication. Refer to the Operators Manual.

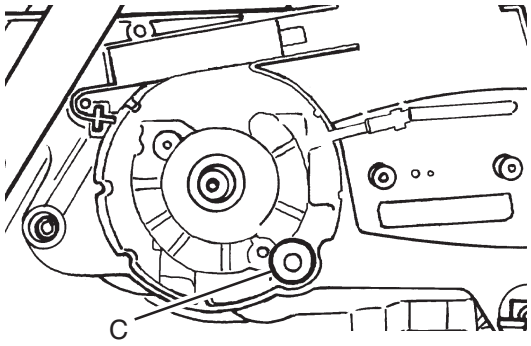


Fig. 3

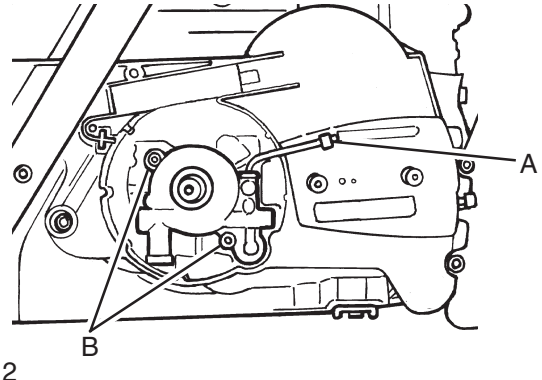


Fig. 2

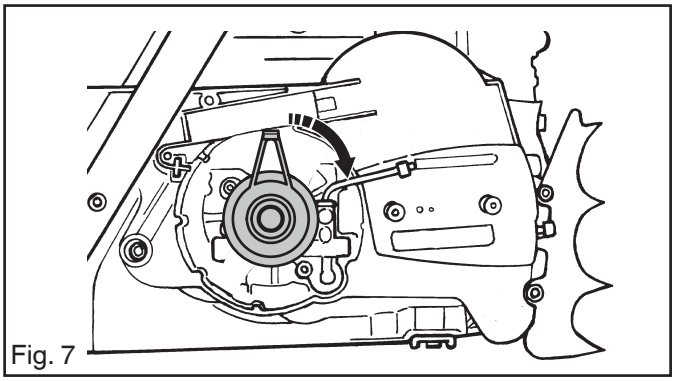


Fig. 7

13.4 Adjusting the pump feed rate

The pump feed rate is adjusted with the adjuster screw (E) in fig 8. The table shows the number of turns from the home position for respective bar lengths. The table applies to Husqvarna chain oil.
If a different oil is used the screw should be unscrewed an additional turn in the first two cases.

Bar	Number of turns from home position
-18”	2
18”-24”	3
24”-	4

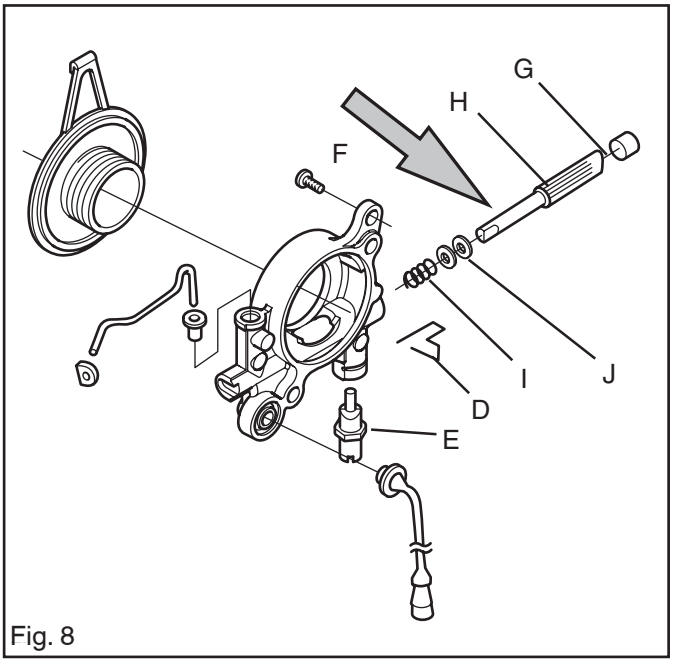


Fig. 8

14 Carburettor

WARNING!
The fuel used in the chainsaw has the following hazardous properties:
1. The fluid and its fumes are poisonous.
2. Can cause skin irritation.
3. Is highly inflammable.

14.1 Description

The illustrations in this description do not look like the carburettor on the chainsaw. They only show the principle for the design and function.

14.2 Design

The carburettor is based on three sub-systems:

- The metering unit, A in fig. 1.
- The mixing venturi, B in fig. 2.
- The pump unit, C in fig. 3.

The jets and the fuel control functions are located in the metering unit (A). Here the correct quantity of fuel is adjusted for the actual speed and power output.

The mixing venturi (B) contains the choke, throttle valve and diffuser jets. Here air is mixed with the fuel to give a fuel/air mixture that can be ignited by the ignition spark.

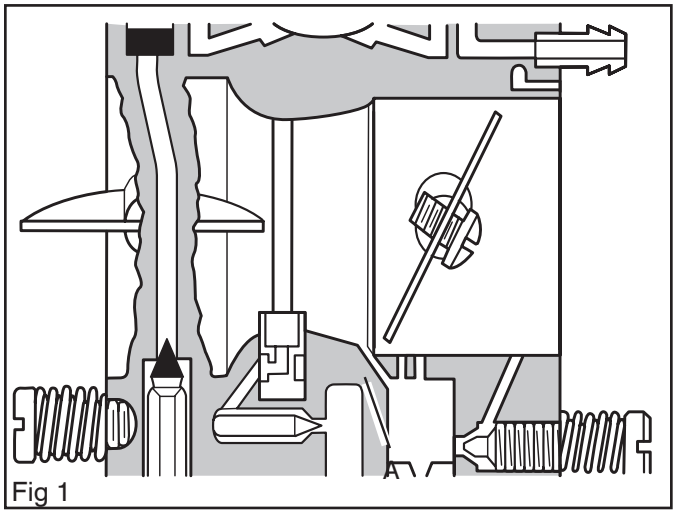


Fig 1

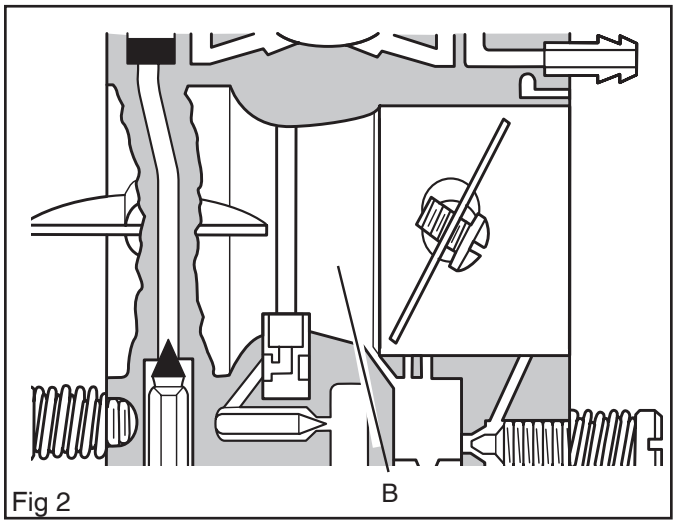


Fig 2

In the pump unit (C), fuel is pumped from the fuel tank to the metering unit. One side of the pump diaphragm is connected to the crankcase and pulses in time with the pressure changes in the crankcase. The other side of the diaphragm pumps the fuel.

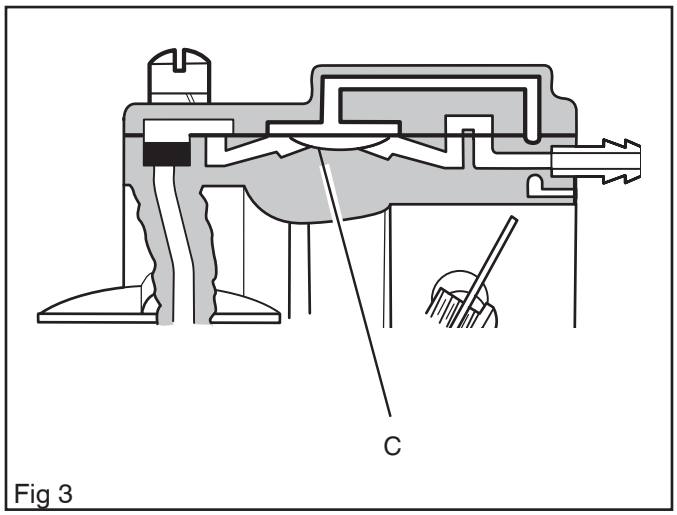


Fig 3

14.3 Function

The carburettor operates differently in the following modes:

- Cold start mode
- Idling mode
- Part throttle mode
- Full throttle mode

In the cold start mode (fig. 4) the choke valve (D) is fully closed. This increases the vacuum in the carburettor so that fuel is sucked more easily from all the diffuser jets (E, F and G). The throttle valve (H) is partly open.

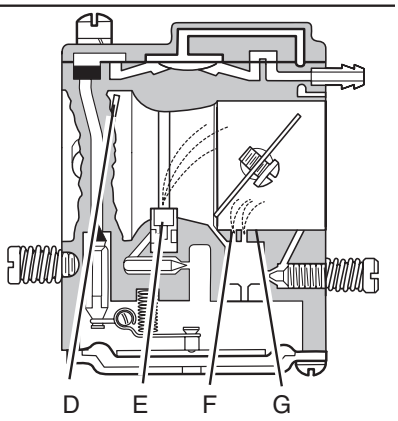


Fig 4

In the idling mode (fig. 5) the throttle valve (H) is closed. Air is sucked in through an aperture in the throttle valve and a small amount of fuel is supplied through the diffuser jet (G).

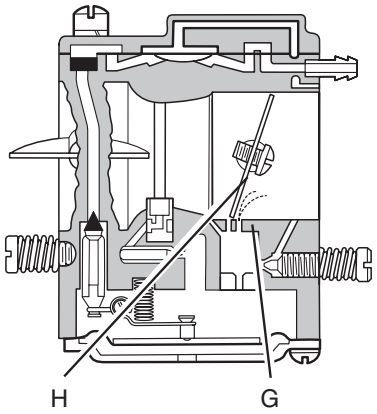


Fig 5

In the part throttle mode (fig. 6 the throttle valve (H) is partially open. Fuel is supplied through the diffuser jets (F and G).

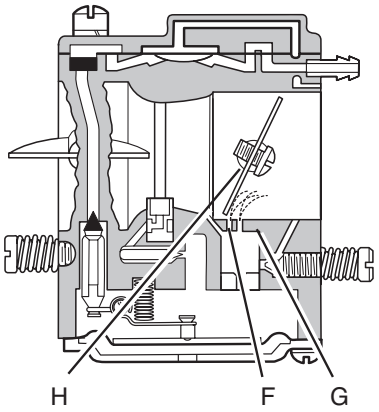


Fig 6

In full throttle mode (fig. 7 both valves are open and fuel is supplied through all three diffuser jets (E, F and G).

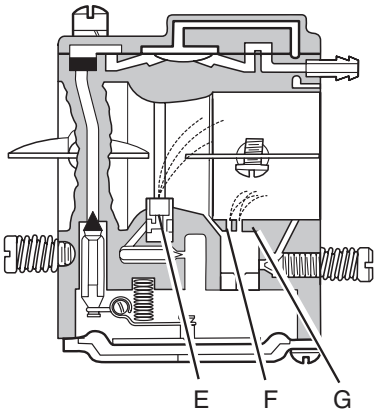


Fig 7

14.4 Disassemble the carburettor

1. Remove the cylinder cover and air filter.
2. Remove the carburettor control (A) by pushing it towards the carburettor and lifting.
3. Unhook the throttle cable and remove the choke control.
4. Remove the fuel pipe (B) and the impulse channel (C).
5. Remove the bolts (D) which secure the filter holder, carburettor and intake tube.
6. Loosen the filter holder and lift off the carburettor. Leave the filter holder in the carburettor space.

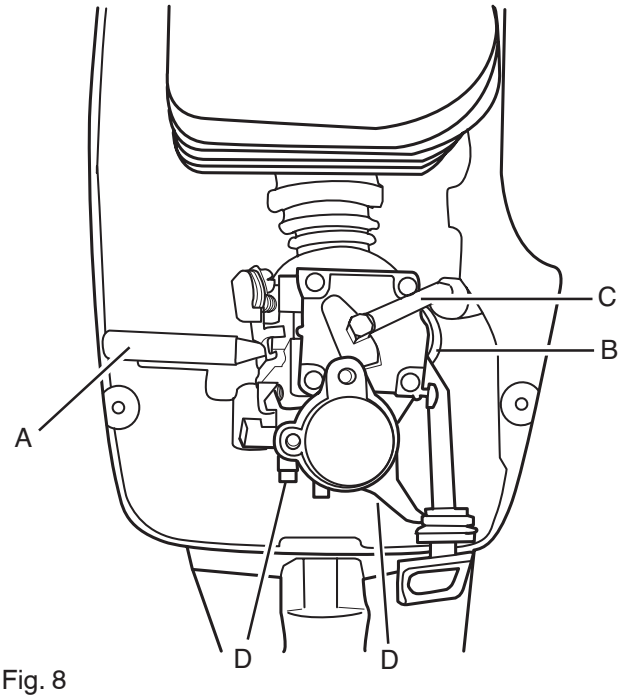


Fig. 8

7. Remove the cover (E) over the metering unit and carefully remove the metering diaphragm (F) and gasket. See fig. 9.
8. Remove the screw (G) and take out the needle valve (H) with lever, spindle and spring. See fig. 9.

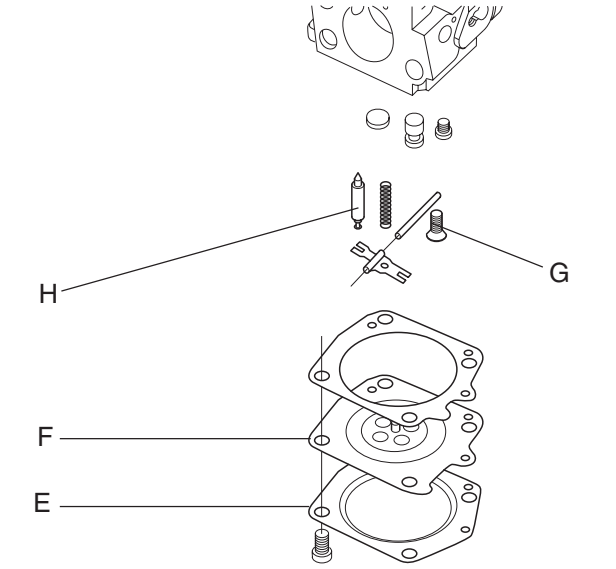


Fig. 9

9. Remove the cover (I) over the pump unit and carefully remove the gasket (J) and pump diaphragm (K). See fig. 10.
10. Use a needle or the like to carefully remove the fuel filter (L). See fig. 10.
11. Remove the high and low speed screws. See fig. 11.
12. If necessary, remove the throttle and choke valves and remove the spindles together with levers and springs. See fig. 11.

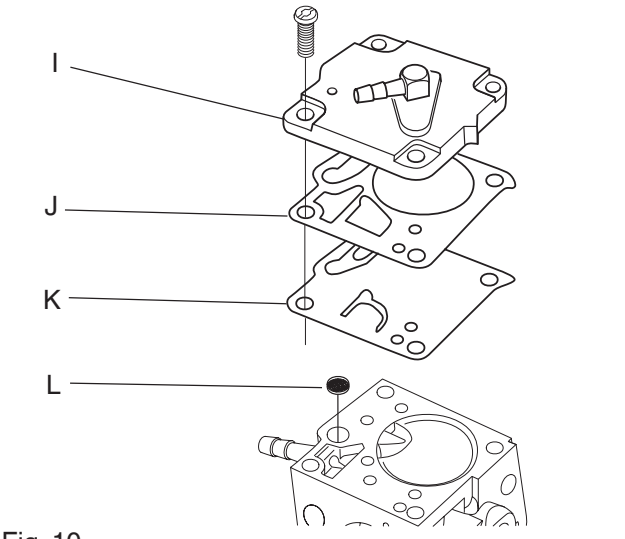


Fig. 10

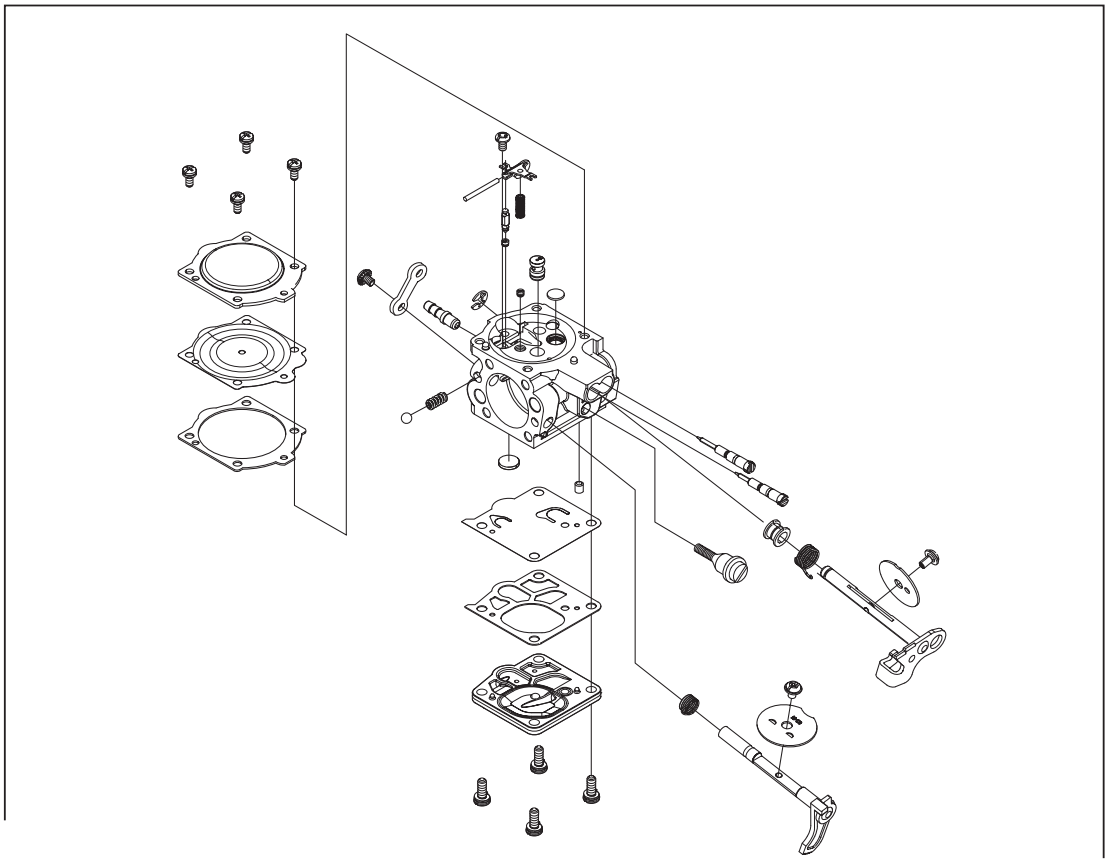


Fig. 11

14.5 Cleaning and inspection

Clean all units with clean petrol.

WARNING!
Do not direct the compressed air jet towards your body or any person when using compressed air. Air can go through the skin into the blood and result in mortal danger

Use compressed air to dry the petrol on the components. Direct the air through all channels in the carburettor housing and ensure that they are not blocked.

Do a check of the following:

- That the gasket, pump and control diaphragms are undamaged, as well as the gasket between the carburettor body and the autotuner.
- That there is no play on the throttle valve and choke valve shafts.
- That the needle valve and its lever arm (M) are not worn. See Figure 12.
- That the fuel screen is intact and clean.
- That the inlet manifold is undamaged.

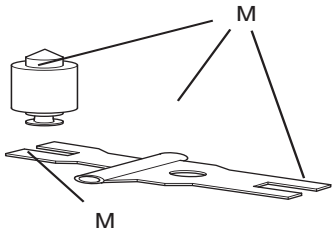


Fig. 12

14.6 Assembly

Where no figure is referred to, see fig 11 in *Disassemble the carburettor*

Maintain a high level of cleanliness when assembling the carburettor. The slightest contamination can result in operating problems.

1. If the throttle and choke valves, together with levers and springs are removed, they must be refitted. Lubricate the spindle bearings with light oil.
2. Fit the high and low speed screws and springs. Note! Do not fully tighten the screws. This will damage the seats and needle tips.
3. Fit the fuel filter (L) by using the handle of a small screwdriver. See fig. 13.
4. Fit the pump diaphragm (K), gasket (J) and cover (I) on the pump unit. See fig. 13.

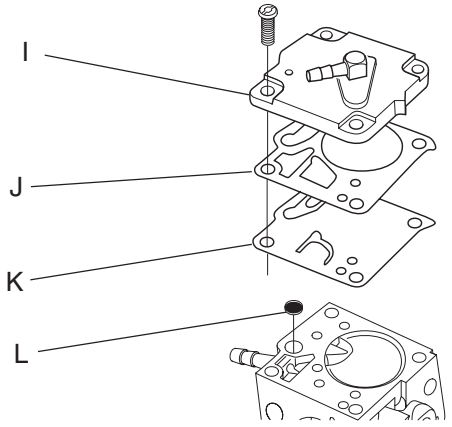


Fig. 13

5. Fit the needle valve (H) with lever, spindle and spring and tighten the screw (G). See fig. 14.

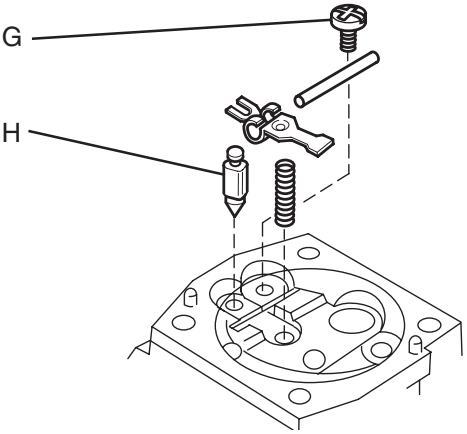


Fig. 14

6. Do a check with a flat object that the lever is level with the cover face. See fig. 15. If necessary, the lever can be bent slightly.

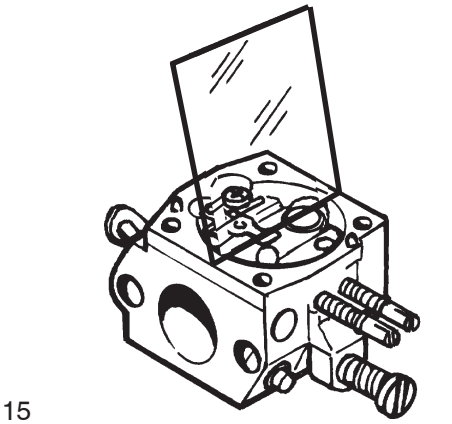


Fig. 15

7. Fit the control diaphragm (F) with packing and cover (E) on the metering unit. See fig. 16.
8. Do a pressure test.

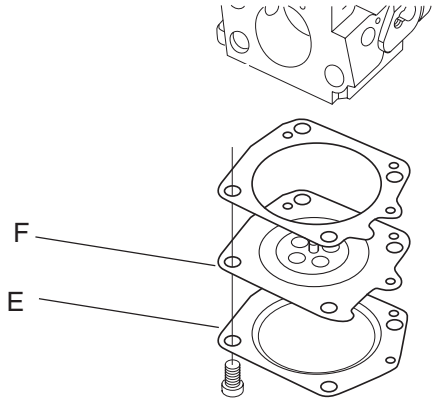


Fig. 16

14.7 Pressure testing the carburettor

Pressure testing must be done with the carburettor fully assembled. Testing must always be done after the carburettor has been repaired, but it can also be done as trouble shooting before disassembling the carburettor. See fig. 17 and do the test as follows:

1. Unscrew the high and low speed screws one turn from home position.
2. Connect pressure tester *(Refer to "3 Service tools" on page 8)* to the fuel intake of the carburettor.
3. Lower the carburettor into a beaker of water.
4. Pump up the pressure to 50 kPa (0.5 bar) and squeeze together the tube.
5. No leakage is permitted. If there is a leak, refer to the table below.

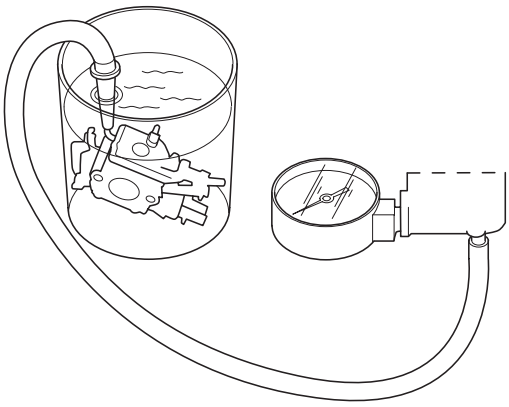


Fig. 17

Leakage at	Fault with
Diffuser jets Leakage in impulse tube Ventilation hole on metering unit.	Needle valve Pump diaphragm Control diaphragm

14.8 Assemble on the chainsaw

See fig. 18.

1. Loosen the filter holder and put the carburettor in place on the chainsaw.
2. Fit the filter holder, carburettor and intake manifold. Tighten the bolts *(Refer to "4 Service data" on page 10)*.
3. Fit the fuel pipe (B) on the fuel nipple and the tube (C) on the impulse nipple.
4. Fit the throttle cable and choke control.
5. Fit the carburettor control (A).
6. Fit the cylinder cover and air filter. Refer to the Operators Manual.

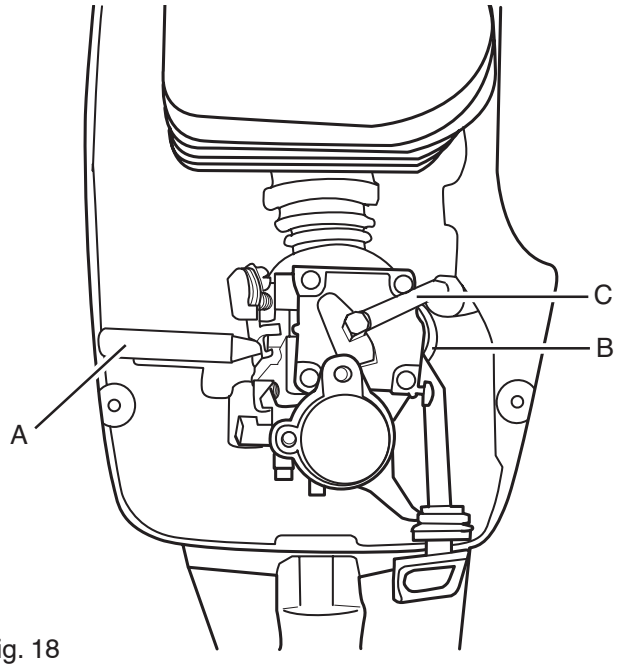


Fig. 18

14.9 Carburettor adjustment

WARNING!
The guide bar, saw chain and clutch cover must be fitted before the chain saw is started, or the clutch can come loose causing personal injury.

WARNING!
Wear ear protection when making adjustments with the engine running.

WARNING!
Do not use the chainsaw until it has been adjusted so that the saw chain is still during idling.

NOTE! For optimal setting, a tachometer should be used. The recommended maximum over-speed should not be exceeded.

NOTE! If the saw chain turns when idling, the T-screw should be turned anti-clockwise until the saw chain stops.

Adjusting the carburettor involves adjusting the engine to the local conditions for example climate, altitude, fuel and type of 2-stroke oil.

The carburettor is equipped with three adjustment options:

- L = Low speed jet
- H = High speed jet
- T = Idling adjustment

The L- and H-jets adjust the fuel flow to match the airflow that the throttle valve opening allows. Turning them clockwise makes the fuel and air mixture weaker (less fuel) and turning them counter-clockwise makes the fuel and air mixture richer (more fuel). A weaker mixture increases the engine speed and a rich mixture decreases the engine speed.

The T- screw controls the throttle position when idling. Turning the T-screw clockwise gives faster idling, turning it counterclockwise gives lower idling speed.

Run the chain saw for approx. 10 minutes before adjusting the carburettor.

15 Tank unit

WARNING!
The fuel used in the chainsaw has the following hazardous properties:
1. The fluid and its fumes are poisonous.
2. Can cause skin irritation.
3. Is highly inflammable.

15.1 Disassembly

NOTE! Fluted pliers may not be used with the fuel hose. They can cause material damage resulting in damage to the fuel hose.

1. Drain the fuel from the tank.
2. Remove the cylinder cover, chain and bar. Refer to the Operators manual.
3. Unhook the throttle cable (A) from the carburettor and push out the cable casing from its attachment. See fig. 1.
4. Remove the fuel pipe (B) from the carburettor. See fig 1.
5. If the chainsaw is fitted with hand grip heating, release the cable at (C). See fig. 2.
6. Remove the bolts (C, D, E and F). See fig. 2.
7. Remove the bolts (H, J and K) from the flywheel side. See fig. 3.
8. Remove the stop switch and the disconnect the leads.

If the chainsaw is fitted with hand grip heating, disconnect the switch and leads.

CAUTION! Take care not to damage the fuel hose, return hose, tank vent hose or throttle cable.

9. If the tank guard (chain deflection/break) (G) is damaged, it must be replaced. See fig. 2.
10. If necessary, lift out the fuel pipe and pull off the fuel filter. *(Refer to tool at pos13 "3 Service tools" on page 8.)*
11. If the chainsaw is fitted with hand grip heating, release the connector to the heating element. See fig. 10 page 23.
12. If the springs are to be removed, see AV-system, page 41.

15.2 Cleaning and inspection

Clean all parts and do a check of the fuel hose to make sure it is not damaged.

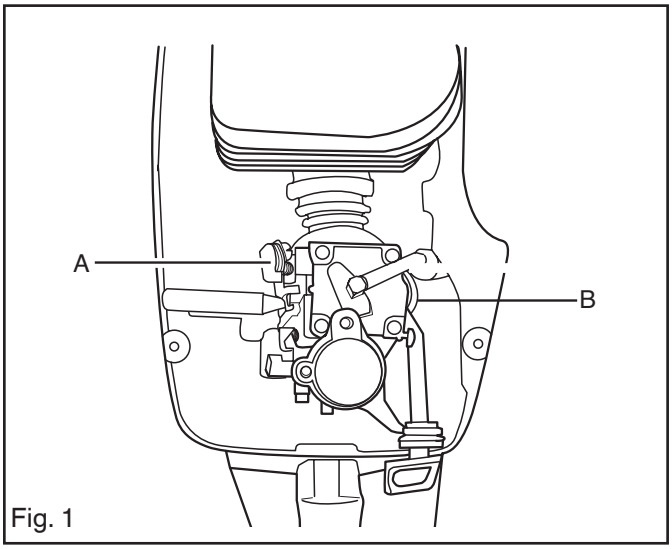


Fig. 1

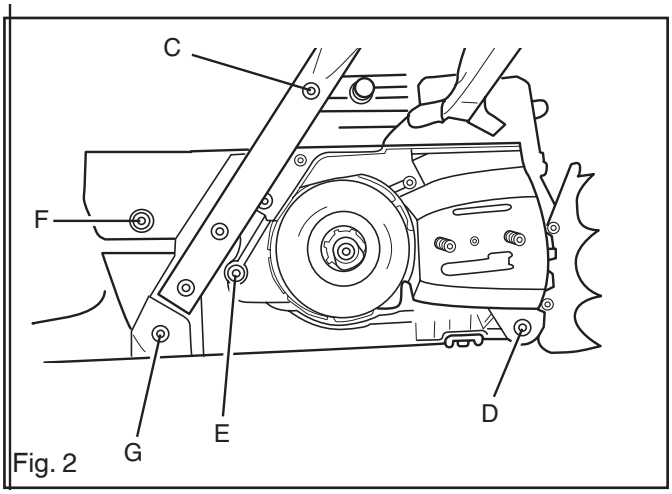


Fig. 2

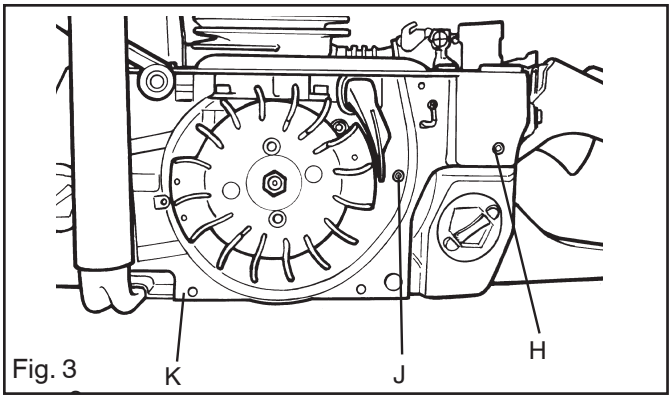


Fig. 3

15.3 Assembly

1. If the chainsaw is fitted with hand grip heating, fit the heating element if it has been removed.
2. To fit a new fuel pipe:

- Lightly oil in one half of the new fuel pipe.
- Press the oiled part through the hole in the tank unit. Allow 80-85 mm to protrude on the outside. See fig. 4.
- Turn the pipe so that it bends upwards. See fig. 4.
- Cut off the angled ends at both ends so that it protrudes 80-85 mm on the outside.
- Remove the pipe from the tank and fit the fuel filter. Push on the pipe as far as it will go

3. If the throttle lock has been removed, it should be refitted before the tank unit and engine unit are assembled *(Refer to fig. 2 ”9 Throttle trigger lockout, throttle trigger and spring” on page 18)*.
4. Lift the engine over the tank and push the fuel pipe and throttle cable into their holes in the bottom of the carburettor space.

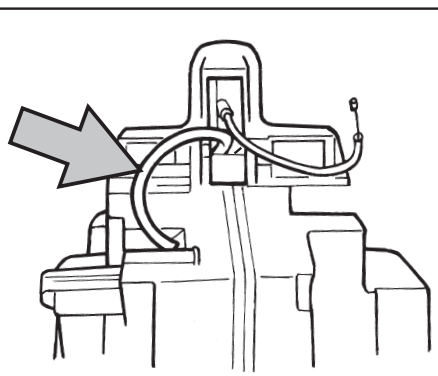


Fig. 4

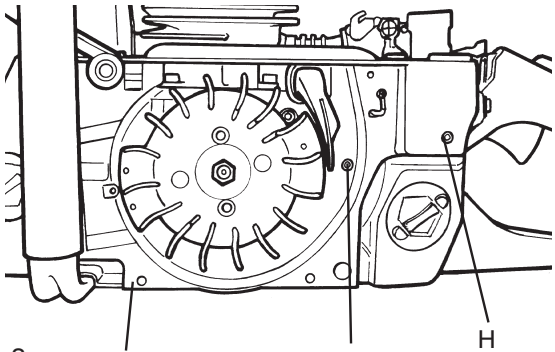


Fig. 3

5. The vent for the fuel tank is placed on the right-hand side of the tank. See fig. 6.
6. When changing the tank vent use screws of the “self-threading 6 mm” type to pull out the tank vent.
7. Fit the leads on the stop switch.
8. Fit the bolts (H, J and K) on the flywheel side. See fig. 3. Tighten the bolts with the correct torque (see Service Data).
9. Fit the bolts (C, D, E and F). See fig. 2. Tighten the bolts with the correct torque (see Service Data).
10. If the chainsaw is fitted with hand grip heating, fit the lead at C.
11. Fit the fuel pipe (B) on the carburettor. See fig. 7.
12. Insert the throttle cable casing in the attachment and hook on the throttle cable (A) on the carburettor. See fig. 7.
13. Fit the cylinder cover, chain and bar. Refer to the Operators Manual.

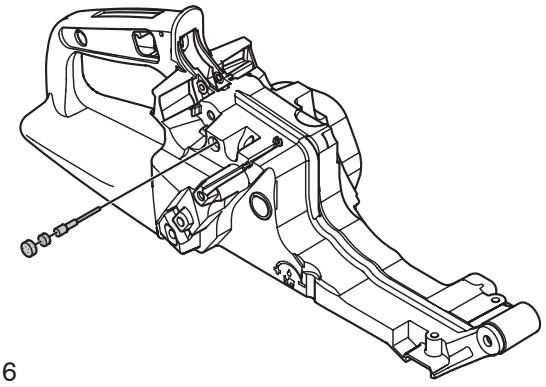


Fig. 6

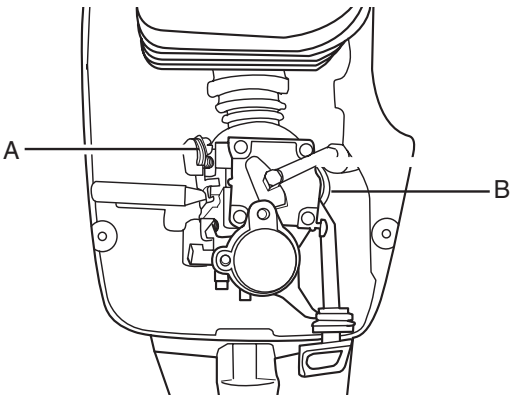
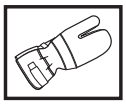


Fig. 7

16 Anti-vibration system




WARNING! The fuel used in the chainsaw has the following hazardous properties:
1. The fluid and its fumes are poisonous.
2. Can cause skin irritation.
3. Is highly inflammable.

16.1 Disassembly

1. Dismantle the following parts:
   - Chain and bar. See the Operators Manual.
   - Cylinder cover. See the Operators Manual.
   - Tank unit. Refer to *"15 Tank unit" on page 39*
2. Remove the spring on the cylinder with a 4 mm Allen key. See fig. 1.

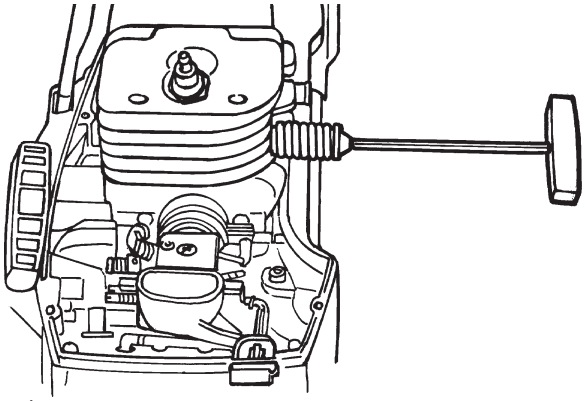


Fig. 1

3. Remove the springs on the tank unit with a 4 mm Allen key. See fig. 2.

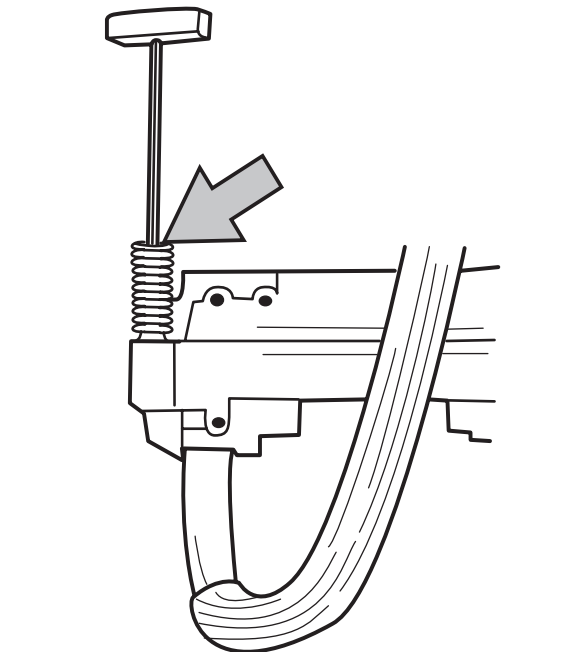


Fig. 2

16.2 Cleaning and inspection

Clean and inspect all parts.

16.3 Assembly

1. Remove the springs on the cylinder with a 4 mm Allen key. See fig. 1.
2. Assemble the following parts:

- Tank unit. Refer to *"15 Tank unit" on page 39*
- Cylinder cover. Refer to the Operators Manual.
- Chain and bar. Refer to the Operators Manual.

17 Piston and cylinder

17.1 Disassembly

CAUTION! Be careful so that dirt and unwanted materials do not get into the crankcase.

1. Disassemble the following parts:
   - Cylinder cover.
   - Spark plug.
   - Carburettor.
   - Muffler.
2. Unscrew the anti-vibration spring (B) from the cylinder. See fig. 1.
3. Unscrew the four bolts on the cylinder (C). See fig. 1.
4. Carefully lift up the cylinder.

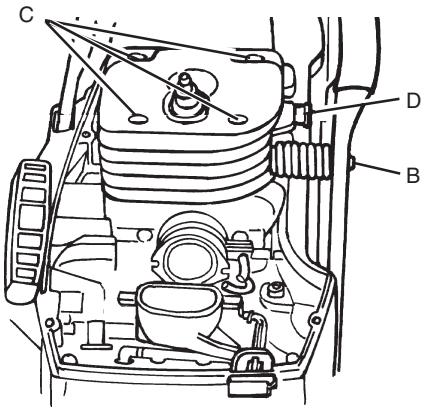


Fig. 1

5. Cover the crankcase opening immediately with a sheet of paper or a cloth. See fig. 2.
6. Remove one of the piston's circlips, press out the gudgeon pin, and remove the piston. See fig. 2.
7. Remove the needle bearing from the connecting rod's smallest end.
8. Unscrew the decompression valve (D). See fig. 1.
9. Unscrew the intake manifold.

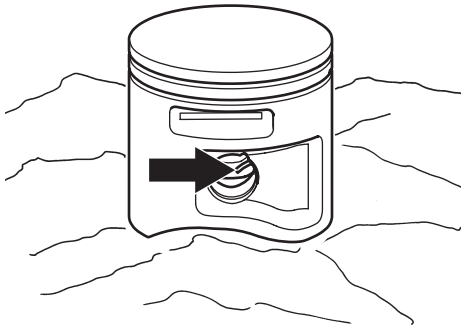


Fig. 2

17.2 Cleaning and inspection

Clean all parts, scrape off all the remains of any gasket material and scrape off carbon deposits from the following surfaces:

1. The piston crown.
2. Top of the cylinder bore (inside).
3. The cylinder exhaust port.
4. The decompression valve.
5. Base of the cylinder and/or crankcase

Do a check of:

1. Make sure that the surface coting of the cylindersurfa is not worn. Especially in the upper end of the cylinder.
2. That the cylinder is free of score marks. See figure 3.
3. That the piston is free of score marks. Minor scratches can be polished off with fine emery paper.

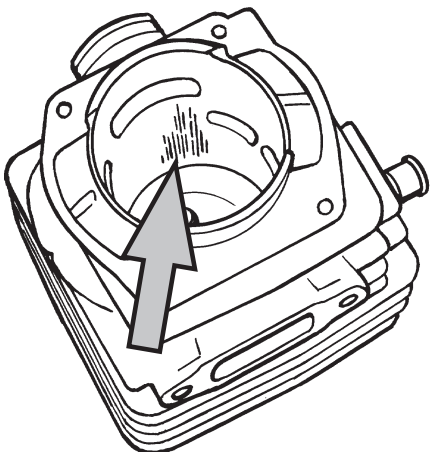


Fig. 3

4. That the piston ring is not burnt into its groove.

5. Measure the wear on the piston ring by placing it in the cylinder and measuring the gap. See figure 4. The gap must not exceed 1 mm.

6. That the needle bearing is undamaged.

7. That the intake manifold and it's rubber seals are undamaged

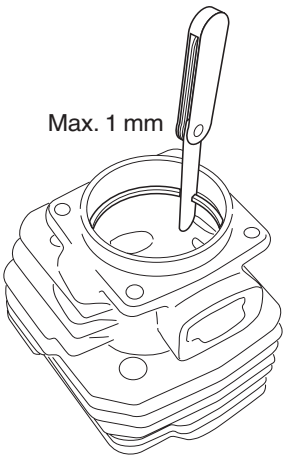


Fig. 4

8. Pressure test the decompression valve.
   A. Connect the pressure testing device *(Refer to pos 3 "3 Service tools" on page 8)* to the decompression valve.
   B. Pressurize to 80 kPa (0.8 bar).
   C. Wait 30 seconds.
   D. The pressure must not fall below 60 kPa (0.6 bar).

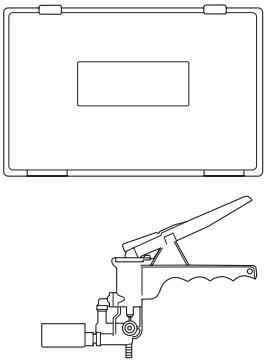


Fig. 5

Faults and causes

Score marks on the piston. See Figure 6.
1. Incorrect carburettor setting. Too high over-speed.
2. Too low octane fuel.
3. Too low or incorrect oil in the fuel.

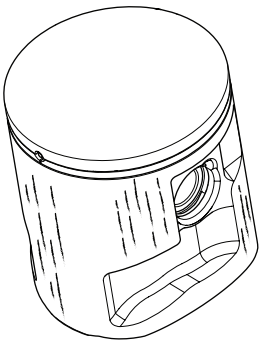


Fig. 6

Carbon build-up. See Figure 7.
1. Incorrect carburettor setting. Too low over-speed.
2. Too much or incorrect oil in the fuel.

Piston ring breakage
1. Excessive engine speed.
2. Piston ring worn out.
3. Oversized piston ring groove.

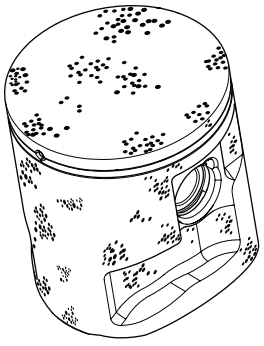


Fig. 7

17.3 Assembly

To assemble the piston and cylinder.

1. Lubricate the needle bearing and fit it in the connecting rod's smallest end.
2. Replace the piston with the arrow facing the exhaust port. See fig. 8. Slide in the gudgeon pin and fit the circlip.

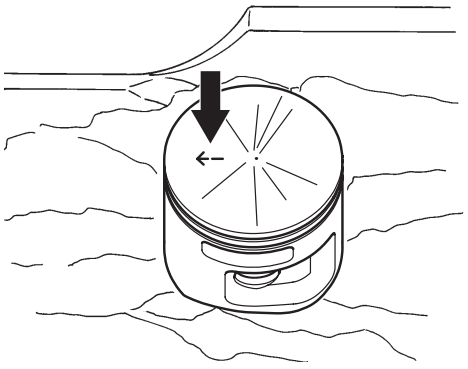


Fig. 8

3. Fit the intake manifold on the cylinder. The clamp bolt should be upwards. See fig. 9.
4. Fit the decompression valve (D). See fig. 11. Tighten the bolt with correct torque *(Refer to "4 Service data" on page 10)*.
5. Fit the gasket on the cylinder base. Press it up so that it fastens on the sleeve of the cylinder.
6. Oil in the piston ring and sides of the piston.
7. Compress the piston ring (See fig. 10), either by hand or with special tool (Refer to "3 Service tools" on page 8). Carefully fit on the cylinder.
8. Install the cylinder base gasket with the four bolts (See fig 11 pos. C) and tighten them alternately (See fig. 11) with correct torque (See Service Data).
9. Fit the anti-vibration spring (B) on the cylinder. See fig. 11. Tighten the bolt with correct torque (See Service Data).
10. Insert the spark plug and do a pressure test. Refer to the *Leakage testing* chapter.

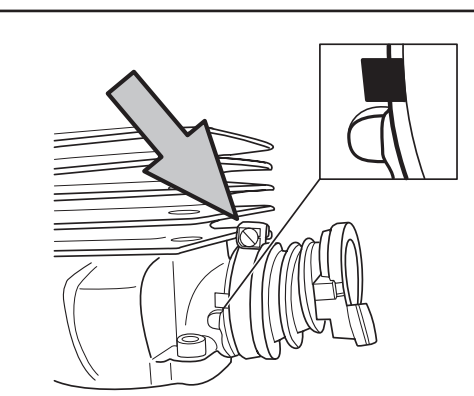


Fig. 9

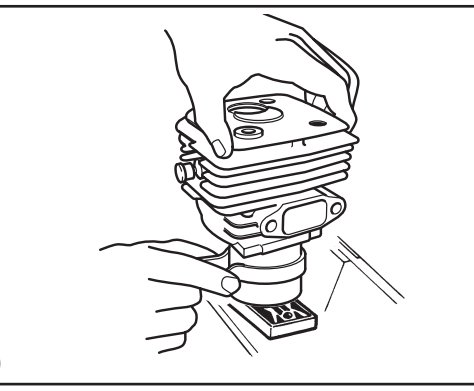


Fig. 10

Assemble the following parts:

- Muffler.
- Carburettor.
- Cylinder cover. See the Operators Manual.

11. If a new piston and/or cylinder is installed in the chainsaw should be run-in for 3-4 hours with the carburettor set at its basic settings (H=1/4 and L=1/4 turn). See carburettor settings.

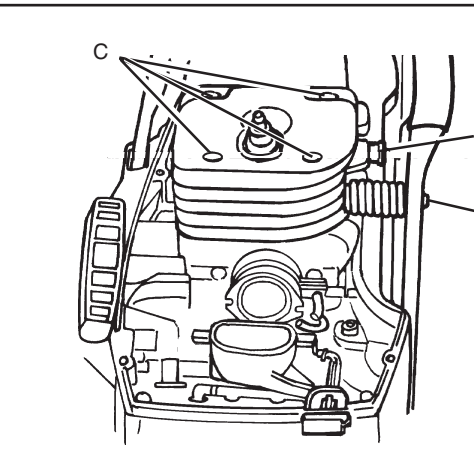


Fig. 11

17.4 Leakage testing

The following parts must be removed to pressure test the crankcase and cylinder:

- Carburettor.
- Muffler.

To do a pressure test:

1. Remove the support ring in the intake manifold.
2. Fit cover plate *(Refer to pos. 2a "3 Service tools" on page 8)* with M4x15 mm bolt on the intake manifold. See fig. 13.
3. Fit cover plate *(Refer to pos. 2b "3 Service tools" on page 8)* with M6x20 mm on the exhaust port. See fig. 12.

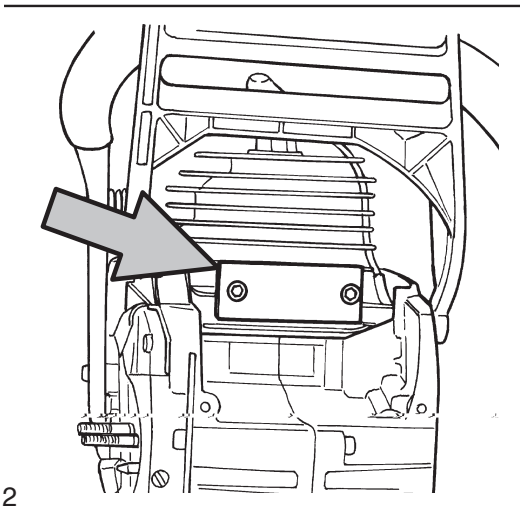


Fig. 12

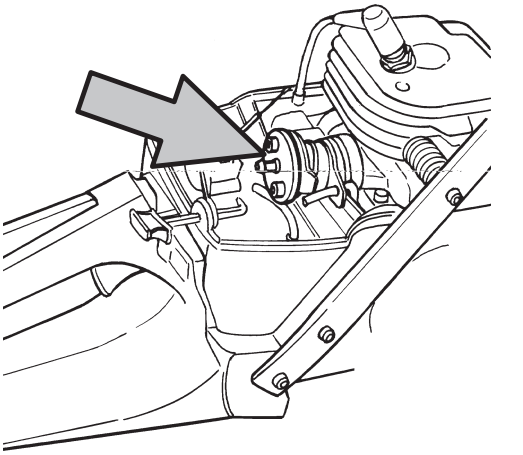


Fig. 13

4. Connect pressure testing tool *(Refer to pos. 3 "3 Service tools" on page 8)* to the cover plate on the intake manifold. See fig. 14. The decompression valve should be closed.
5. Plug the hose to the impulse channel.
6. Pressurize to 80 kPa (0.8 bar).
7. Wait 30 seconds.
8. The pressure must not fall below 60 kPa (0.6 bar).
9. Leakage can occur in the decompression valve and crankshaft seals.
10. Assemble:
    - Carburettor.
    - Muffler.

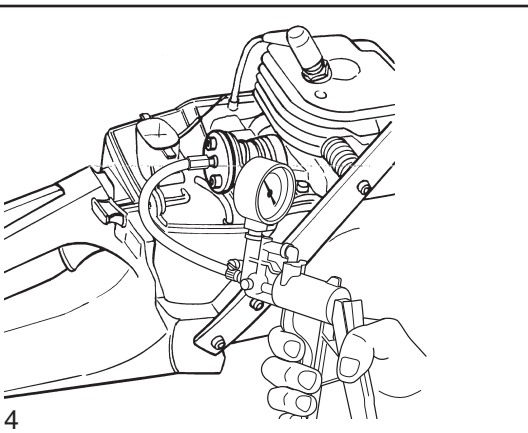


Fig. 14

18 Crankcase and crankshaft

18.1 Disassembly

CAUTION! Be careful so that dirt and unwanted materials do not get into the crankcase.

WARNING!
The crankcase halves are hot and can cause burn injuries. Wear protective gloves.

1. Before the crankcase can be separated the following parts must be disassembled:
   - Chain and bar. Refer to the Operators manual
   - Starter
   - Electrical system
   - Centrifugal clutch
   - Lubrication system
   - Carburettor
   - Muffler
   - Piston and cylinder.
   - Tank unit.
2. Remove the carburettor space bottom by unscrewing the four bolts. See fig. 1.

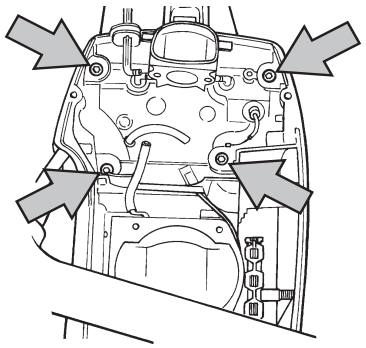


Fig. 1

3. If necessary, remove the seal on the flywheel side. See fig. 2, pos. A.
   Use flywheel removal tool *(Refer to pos. 7 "3 Service tools" on page 8)* . See fig. 2.

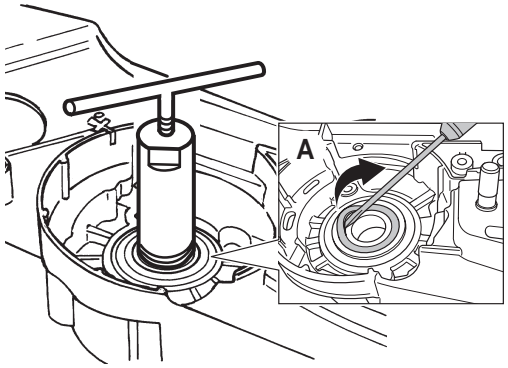


Fig. 2

4. Remove the six bolts on the flywheel side. See fig. 4.

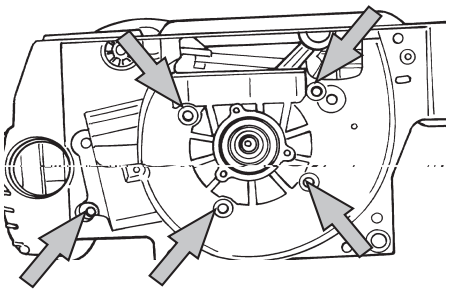


Fig. 3

5. Fit tool 4310048-67 as shown in fig. 4 and remove the crankcase half on the clutch side.
6. Remove the crankcase half on the flywheel side in the same way as item 4 above.

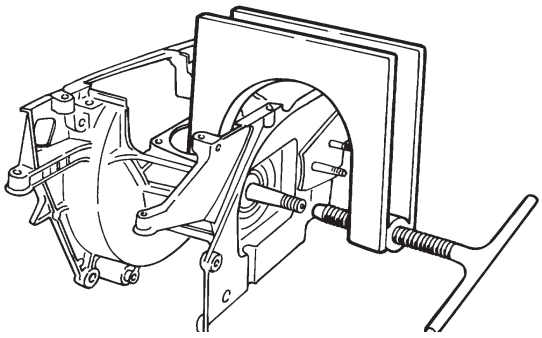


Fig. 4

7. If necessary, remove the crankshaft bearing from the crankcase.
   To remove the crankshaft bearing:
   A. Remove the oil filler cap.
   B. Heat the relevant crankcase half to 200°C.
   C. Use protective gloves and press the bearing out from the crankcase half.
8. If the crankshaft bearing should remain on the crankshaft remove it with puller *(Refer to pos. 4 "3 Service tools" on page 8)*
9. If necessary, remove the following parts:
   A. Bark gripper
   B. Rubber stop (A). See fig. 5.

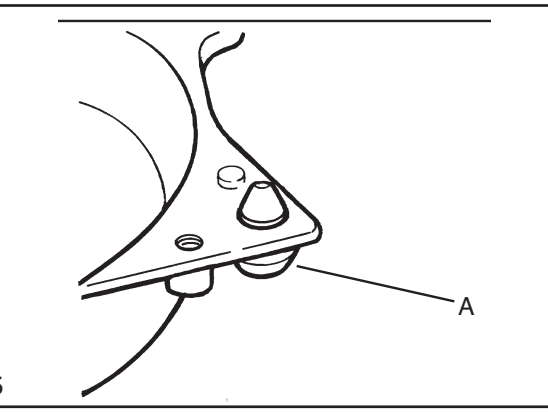


Fig. 5

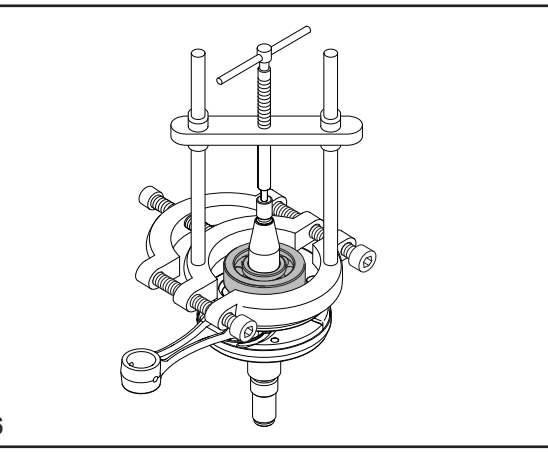


Fig. 6

18.2 Cleaning and inspection

NOTE! If the bearings are mounted in the crankcase, be careful to avoid dirt and unwanted materials getting in.

Clean all parts and scrape of the remains of gasket material from the mating surfaces of the crankcase halves. Do a check of the following:

1. That the big-end bearing does not have any radial play. Axial play is acceptable.
2. That the big-end bearing does not have any score marks or is discoloured on the sides. See fig. 7.

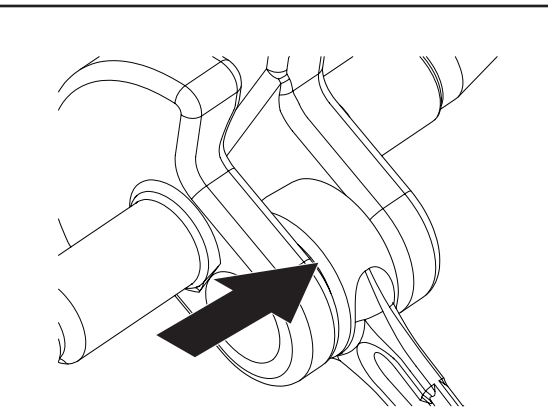


Fig. 7

3. That the bearing surfaces for the little-end do not have any score marks or are discoloured. See fig. 8.
4. That the crankshaft bearings do not have any play or dissonance.
5. That the surfaces of the seals to the crankshaft are not worn and that the rubber has not hardened.
6. That the crankcase is not cracked.

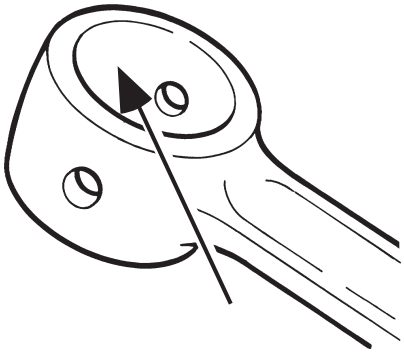


Fig. 8

18.3 Assembly

To install the crankcase and crankshaft:

1. If bearings are to be fitted:
   A Heat the relevant crankcase half to 200°C.
   B. Use protective gloves and fit the bearing in the crankcase side on the flywheel side. When fitting the bearing in the crankcase half of the clutch side the bearing should be fitted flush with the inside of the crankcase (B). See fig. 9.
   C. Allow the crankcase half to cool before continuing work.
   D. Fit the rubber stop (A). See fig. 5.
   E. Fit the oil filler cap.

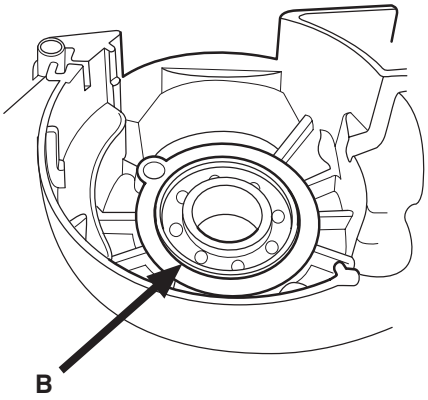


Fig. 9

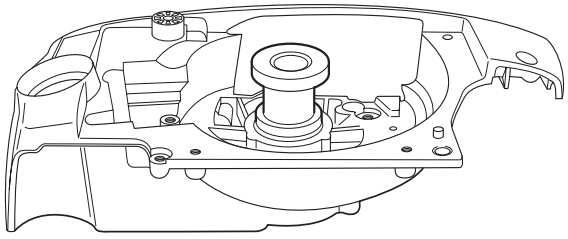


Fig. 10

2. When fitting new seals the sealing surfaces should be greased in. When fitting the seal on the flywheels side use tool *(Refer to pos. 20 "3 Service tools" on page 8)*. The seal on the clutch side is fitted in the ball bearing. See fig. 10. The seals can also be fitted when the crankshaft is in place.

   NOTE! Make sure that the connecting rod does not jam against the crankcase when the crankcase and crankshaft are reassembled.

   NOTE! The crankshaft should be fitted in the crankcase half of the clutch side first.

3. Use tool (Refer to "3 Service tools" on page 8, Pos. 20) and pull the crankshaft into the crankcase half of the clutch side. See fig. 11. Pull until the crankcase shoulder mates with the bearing.

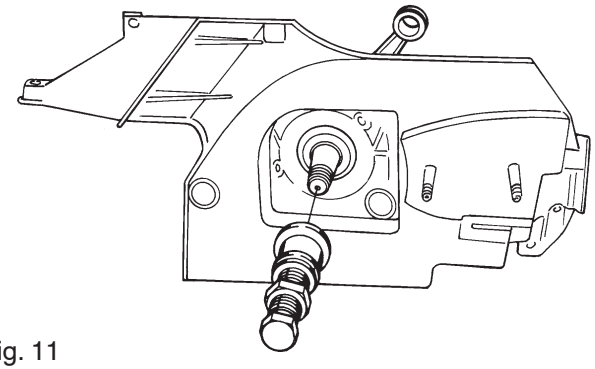


Fig. 11

4. Place the guide pegs in the crankcase half of the clutch side, and grease in and insert the gasket. See fig. 12.

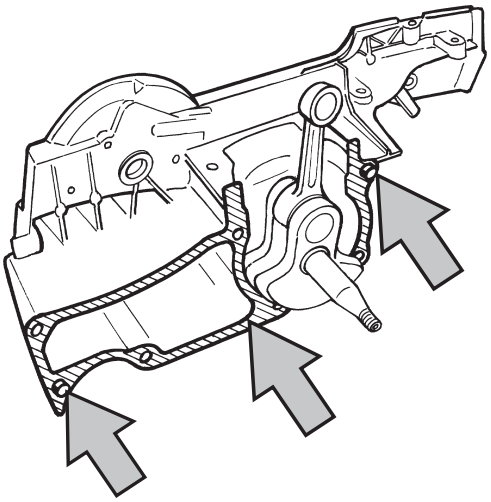


Fig. 12

5. Use tool (Refer to “3 Service tools” on page 8, Pos. 20) and pull on the crankcase half of the fly-wheel side. Pull until the gasket is clamped between the crankcase halves. See fig. 13.

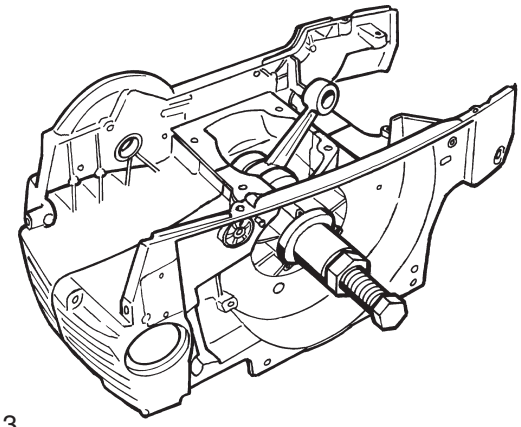


Fig. 13

6. Fit the six bolts. Tighten them alternately. Tighten them finally to 8 Nm. See fig. 14.

7. Cut the gasket at the level of the cylinder’s seating plane.

8. Fit the carburettor space bottom with the four bolts. Tighten the bolts with correct torque (Refer to “4 Service data” on page 10).

9. Assemble the following parts:
   A. Tank unit
   B. Piston and cylinder
   C. Muffler
   D. Carburettor
   E. Lubrication system
   F. Centrifugal clutch
   G. Electrical system
   H. Starter
   I. Chain and bar. See Operator’s manual.

10. If a new crankshaft is fitted the chainsaw must be run for 3-4 hours with the carburettor set to its basic settings (H=1/4 and L=1/4 turn). Refer to *Carburettor* chapter.

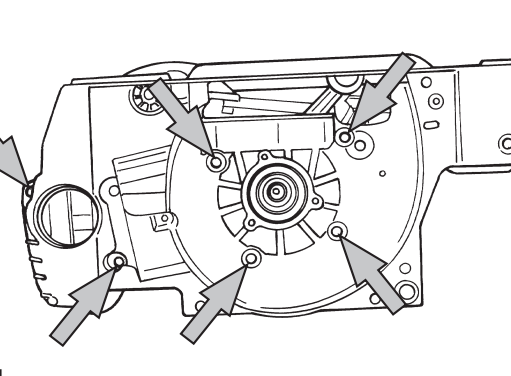


Fig. 14

18.4 Seals

1. To replace the seals on the crank shaft, remove the following parts first:

   On the flywheel side:
   - Starter
   - Flywheel
   - Generator, where appropriate

   On the clutch side:
   - Chain and bar. Refer to Operators manual.
   - Chain guide plate
   - Centrifugal clutch
   - Oil pump

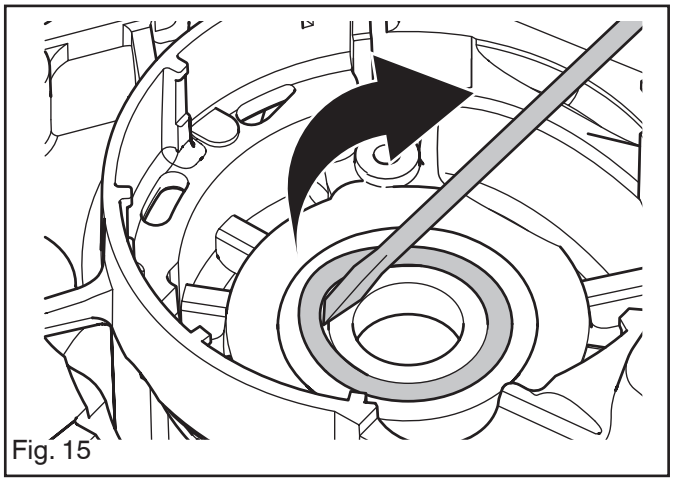


Fig. 15

2. Pull out the seal with the seal ring extractor tool *(Refer to pos. 7 "3 Service tools" on page 8)* or using a flat screwdriver. See fig. 15 and 16.

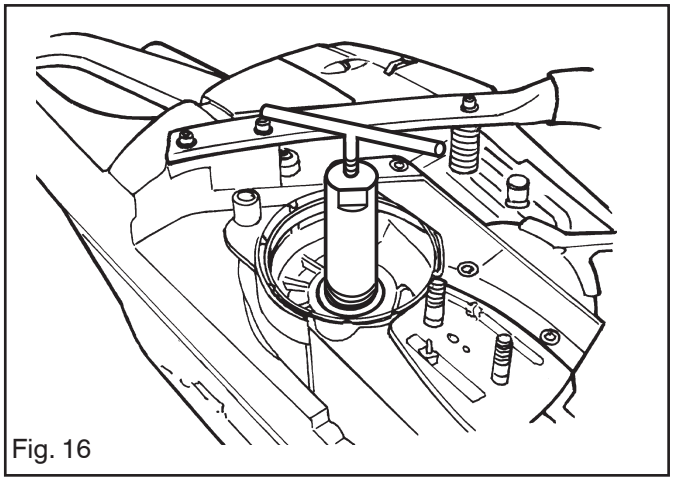


Fig. 16

3. Tap in the new seal with the drift. See fig. 17.

Install the parts. Refer to the disassembly instructions in the chapter *"Crankcase and crankshaft".*

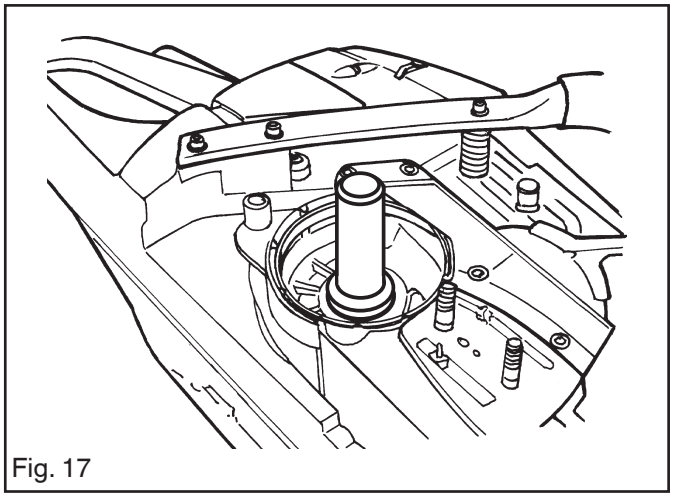


Fig. 17

19 Bar bolts

19.2 Disassembly

1. Drain the chain oil.
2. Push in the old bar bolt from outside so that it drops in the oil tank.
3. Remove the bolt from the oil tank.

19.3 Cleaning and inspection

Clean and inspect all parts.

19.1 Assembly

1. Fix a piece of steel wire on the end of the new bolt, and thread it through the oil tank and out through the bolt hole in the crankcase. See fig. 1.
2. Pull the steel wire so that the bolt comes into its hole.
3. Pull out the bolt with its nut and shim between the nut and crankcase.
4. Make sure that the square head of the bolt comes in its recess in the crankcase. If needed, turn the bolt.
5. Refill with chain oil.

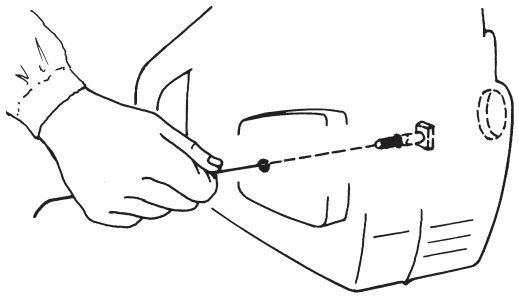


Fig. 1

20 Troubleshooting

20.1 General troubleshooting

The different faults which can occur on the chainsaw are divided into four groups. Within each group possible operating faults are listed to the left while the probable fault alternatives are listed to the right. The most likely fault is listed first.

Starting

Difficult to start	Air filter blocked Choke does not work Worn choke axle Worn choke valve Blocked fuel filter Blocked fuel line Piston ring is stuck Blocked impulse channel
The carburettor leaks fuel	Loose or faulty fuel hose Hole in diaphragm Worn needle/needle tip Control system sticking Control system set too high Leaking control system (air or fuel) The cover on the carburettor pump side is loose
Floods when the engine is not running	Worn needle/needle tip Control system set too high Control system sticking

Idling (low speed)

Does not idle	Leaking inlet hose (rubber) Loose carburettor mounting Loose or faulty fuel hose Blocked fuel filter Blocked fuel line Tank ventilator blocked The throttle valve shaft is inert Throttle stay is binding Defective throttle return spring Bent valve axle stop Faulty diffuser jet
Too rich idling	Worn needle/needle tip Worn lever arm in the control system Leaking diaphragm/cover plate Worn needle/needle tip Leaking diaphragm/cover plate Worn lever arm in the control system Faulty diffuser jet
Uneven idling	Blocked fuel filter Blocked fuel line Leaking inlet hose (rubber) Loose carburettor mounting Worn throttle valve axle Loose throttle valve screw Worn throttle valve Leaking control system (air or fuel) The control system's centre knob is worn Hole in diaphragm Leaking diaphragm/ cover plate Leaking crankcase
L screw requires constant adjustment	Blocked fuel line Leaking control system (air or fuel) Leaking diaphragm/cover plate Faulty diffuser jet Leaking crankcase
Too much fuel at idle speed	Worn needle/needle tip Leaking diaphragm/ cover plate

High speed

Will not run at full throttle	Blocked air filter Tank venting clogged Blocked fuel filter Blocked fuel line Loose or faulty fuel hose Impulse channel leaking Blocked impulse channel The cover on the carburettor pump side is loose Faulty pump diaphragm Leaking inlet hose (rubber) Loose carburettor mounting Control system set too low Damaged control system Control system incorrectly assembled Leaking diaphragm/cover plate Control system sticking Blocked muffler

Low power	Tank venting clogged Blocked fuel filter Impulse channel leaking Blocked impulse channel The cover on the carburettor pump side is loose Faulty pump diaphragm Blocked air filter Control system sticking Leaking control system (air or fuel) Control system incorrectly assembled Loose diaphragm Hole in diaphragm Leaking diaphragm/cover plate
Will not “four stroke”	Tank venting clogged Blocked fuel filter Blocked fuel line Loose or faulty fuel hose Impulse channel leaking Blocked impulse channel The cover on the carburettor pump side is loose Faulty pump diaphragm Leaking inlet hose (rubber) Loose carburettor mounting Control system set too low Leaking control system (air or fuel) Control system incorrectly assembled Loose diaphragm Hole in diaphragm Leaking diaphragm/cover plate

Acceleration and retardation

Does not accelerate	Blocked air filter Tank venting clogged Blocked fuel filter Blocked fuel line Loose or faulty fuel hose Blocked impulse channel The cover on the carburettor pump side is loose Faulty pump diaphragm Leaking inlet hose (rubber) Loose carburettor mounting Control system set too low Control system incorrectly assembled Control system sticking Faulty diffuser jet Blocked muffler
The engine stops when releasing the throttle	Faulty pump diaphragm Control system set too high Control system sticking Faulty diffuser jet Blocked air filter Faulty pump diaphragm Faulty diffuser jet
Too rich acceleration	Adjust the L-screw Adjust the H-screw Blocked air filter Faulty pump diaphragm Faulty diffuser jet

20.2Troubleshooting methods

In addition to faults given in the above schematic, trouble shooting can be carried out on a specific component or specific chainsaw system. The different procedures are described in respective sections and are as follows:

1. Pressure testing the carburettor.	See page XX.
2. Pressure testing the crankcase and cylinder.	See page XX.
3. Pressure testing the decompression valve.	See page XX.
4. Checking of the chain brake.	See page XX.

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