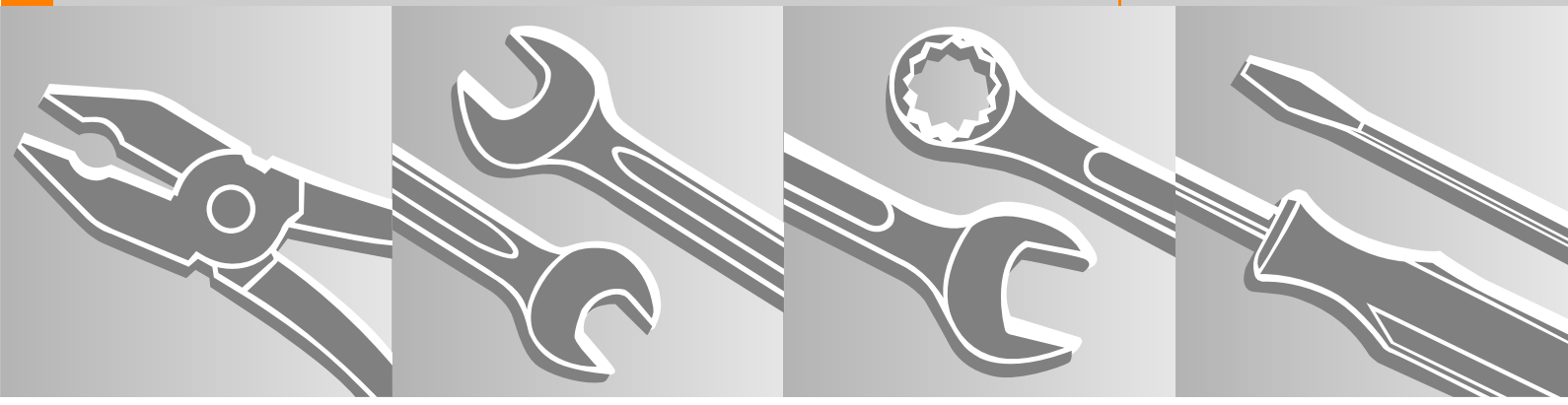
STIHL Series 4144 Powerhead

2008-01



FS 40, FS 50, FS 56

FC 56

KM 56

Contents

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STIHL®

This service manual contains detailed descriptions of all the repair and servicing procedures specific to this power tool.

You should make use of the illustrated parts lists while carrying out repair work. They show the installed positions of the individual components and assemblies.

Refer to the latest edition of the relevant parts list to check the part numbers of any replacement parts.

A fault on the machine may have several causes. To help locate the fault, consult the troubleshooting charts for all assemblies and systems in this manual and the "STIHL Service Training System".

Refer to the “Technical Information” bulletins for engineering changes which have been introduced since publication of this service manual. Technical information bulletins also supplement the parts list until a revised edition is issued.

The special tools mentioned in the descriptions are listed in the chapter on "Special Servicing Tools" in this manual. Use the part numbers to identify the tools in the "STIHL Special Tools" manual. The manual lists all special servicing tools currently available from STIHL.

Symbols are included in the text and pictures for greater clarity.
The meanings are as follows:

In the descriptions:

● = Action to be taken as shown in the illustration above the text

– = Action to be taken that is not shown in the illustration above the text

In the illustrations:

➔ Pointer

➔ Direction of movement

📖 4.2 = Reference to another chapter, i.e. chapter 4.2 in this example

Service manuals and all technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.

Always use original STIHL replacement parts.
They can be identified by the STIHL part number,
the STIHL logo and the
STIHL parts symbol
This symbol may appear alone on small parts.

Storing and disposing of oils and fuels

Collect fuel or lubricating oil in a clean container and dispose of it properly in accordance with local environmental regulations.

If the engine is started up in the course of repairs or maintenance work, observe all local and country-specific safety regulations as well as the safety precautions and warnings in the instruction manual.

Gasoline is an extremely flammable fuel and can be explosive in certain conditions.

Always wear suitable protective gloves for operations in which components are heated for assembly or disassembly.

Improper handling may result in burns or other serious injuries.

Do not smoke or bring any fire, flame or other source of heat near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped away immediately.

Always perform leakage test after working on the fuel system and the engine.

3. Specifications

3.1 Engine

	FS 40	FS 50, 56, FC 56, KM 56
Displacement:	27.2 cm^3	27.2 cm^3
Bore:	34 mm	34 mm
Stroke:	30 mm	30 mm
Engine power to ISO 8893:	0.7 kW (1.0 bhp) at 8,500 rpm	0.8 kW (1.1 bhp) at 8,500 rpm
Max. permissible speed (with cutting attachment):	10,000 rpm	10,000 rpm
Idle speed:	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Clutch engages at:	4,200 rpm	4,200 rpm
Crankcase leakage test		
at gauge pressure:	0.5 bar	
under vacuum:	0.5 bar	

3.2 Ignition System

Air gap between the ignition module and flywheel:	0.30 mm
Spark plug (suppressed):	NGK CMR 6 H NGK 6 H
Electrode gap:	0.5 mm

3.3 Tightening Torquese

DG and P (Plastoform) screws are used in polymer and light metal components. These screws form a permanent thread when they are installed for the first time. They can be removed and installed as often as necessary without impairing the strength of the screwed assembly, providing the specified tightening torque is observed.
For this reason it is **essential to use a torque wrench.**

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	UNC 8-32	Clutch drum/crankshaft	3,5	
Carrier	3/8“ -24	Carrier, clutch/crankshaft	20,0	5)
Carrier	M 8x1	Carrier, starter side/crankshaft	17,0	
Screw	D 5x20	Muffler/cylinder	9,0	
Screw	D 5x20	Spacer flange/cylinder	6,0	
Screw	D 4x20	Ignition module/cylinder with washer	4,5	
	M 10x1	Spark plug	12,0	
Screw	D 5x60	Engine pan/crankcase/cylinder	9,0	

Remarks:

1) Loctite 242 or 243, medium strength
2) Loctite 270, high strength
3) Loctite 649, high strength
4) Loctite 272, high strength up to 250°C
5) Degrease crankshaft/flywheel and mount oil-free

Use the following procedure when refitting a DG or P screw in an existing thread:

Place the screw in the hole and rotate it counterclockwise until it drops down slightly.
Tighten the screw clockwise to the specified torque.

This procedure ensures that the screw engages properly in the existing thread and does not form a new thread and weaken the assembly.

Coat micro-encapsulated screws with medium strength Loctite 242 or 243 before reinstalling.

Power screwdriver setting for polymer: DG and P screws max. 500 rpm
Do not use an impact wrench for releasing or tightening screws.

Do not mix up screws with and without binding heads.

4. Troubleshooting

4.1 Clutch

Condition	Cause	Remedy
Cutting attachment stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Cutting attachment runs at idle speed	Engine idle speed too high	Readjust idle speed screw **LA**
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs
Loud noises	Clutch springs stretched or fatigued	Replace all clutch springs
	Clutch shoe retainer broken	Install new clutch
	Clutch shoes and carrier worn	Install new clutch

4.2 Ignition System

Exercise extreme caution while carrying out maintenance and repair work on the ignition system. The high voltages which occur can cause serious or fatal accidents.

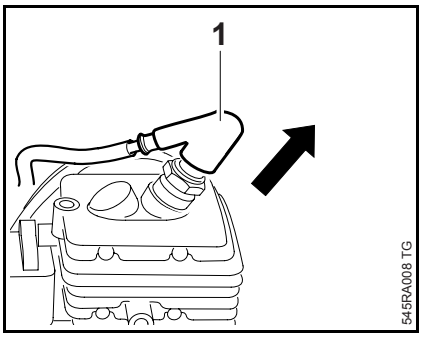
Condition	Cause	Remedy
Engine runs roughly, misfires, temporary loss of power	Spark plug boot is loose	Press boot firmly onto spark plug and fit new spring if necessary
	Spark plug sooted, smeared with oil	Clean the spark plug or replace if necessary. If sooting keeps recurring, check air filter
	Fuel/oil mixture – too much oil	Use correct mixture of fuel and oil
	Incorrect air gap between ignition module and flywheel	Set air gap correctly
	Flywheel cracked or has other damage or pole shoes have turned blue	Install new flywheel
	Ignition timing wrong, flywheel out of adjustment, key on crankshaft has sheared off	Locate flywheel properly or install new flywheel
	Weak magnetization in flywheel	Install new flywheel
	Irregular spark	Check operation of switch shaft/ contact springs and ignition module. Faulty insulation or break in ignition lead or short circuit wire. Check ignition lead/ignition module and replace ignition module if necessary. Check operation of spark plug. Clean the spark plug or replace if necessary.
	Crankcase damaged (cracks)	Install new crankcase

Condition	Cause	Remedy
No spark	Spark plug faulty	Install new spark plug
	Faulty insulation or short in short circuit wire	Check short circuit wire for short circuit to ground
	Break in ignition lead or insulation damaged	Check ignition lead, replace ignition module if necessary
	Ignition module faulty	Install new ignition module

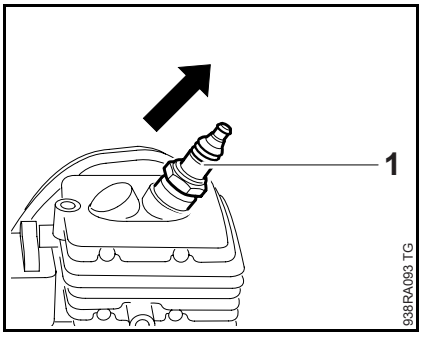
5.1 Clutch Drum

– Troubleshooting, 🕮 4.1

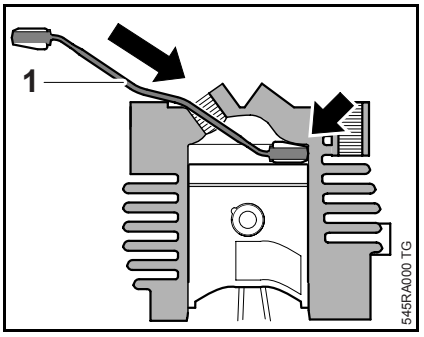
– Remove the engine – see service manual for "Series 4144 Components – FS, FC, KM"



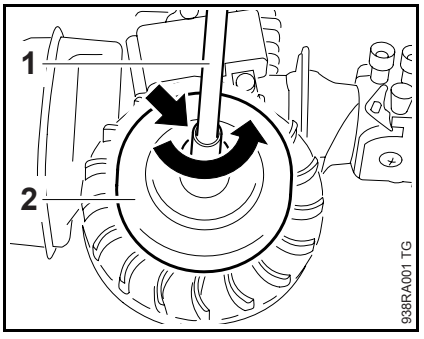
● Pull boot (1) off the spark plug.



● Unscrew the spark plug (1).



● Push the locking strip (1) 0000 893 5904 into the spark plug hole until it butts against the cylinder wall (arrow) as shown.

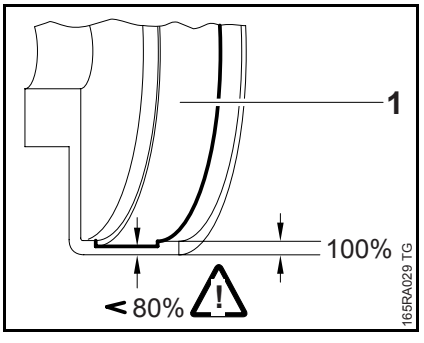


● Insert screwdriver bit (1) 0812 540 1112 through the clutch drum (arrow).

– Loosen the screw – take care not to damage the screw head.

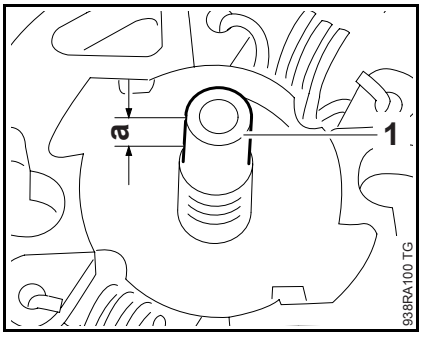
– Pull off the clutch drum (2).

The mounting screw is inside the clutch drum. If the screw is damaged, the clutch drum must be replaced.



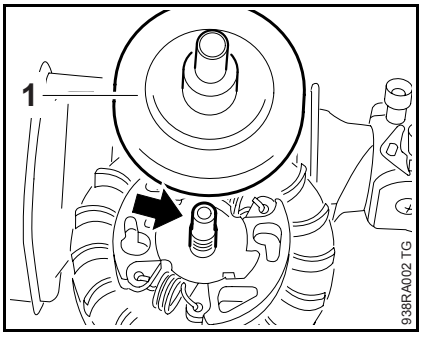
– Inspect the clutch drum (1) for signs of wear.

If there are signs of serious wear on the inside diameter of the clutch drum (1), check the remaining wall thickness. If it is less than about 80% of the original thickness, install a new clutch drum.



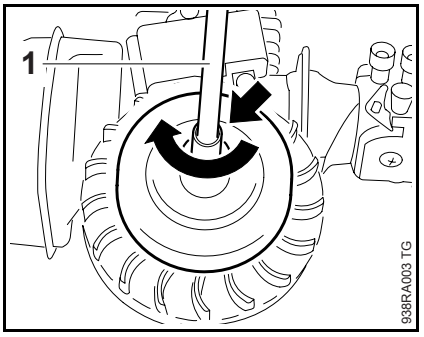
– Clean away old mounting paste.

● Coat crankshaft stub (1) with mounting paste, a = about 10 mm, 🕮 9



– Remove the clutch, 🕮 5.2

● Push clutch drum (1) onto crankshaft stub (arrow) at ignition side.



– Coat thread of mounting screw with Loctite, 🕮 9

● Insert screwdriver bit (1) 0812 540 1112 through the clutch drum (arrow).

– Insert and tighten down the screw firmly – take care not to damage the screw head.

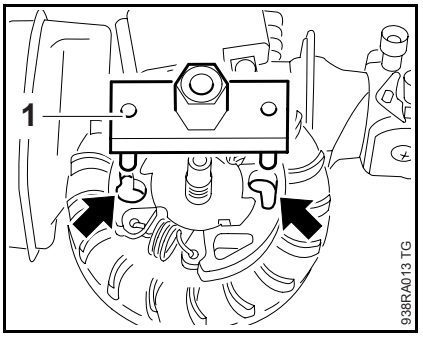
– Reassemble all other parts in the reverse sequence.

– Tightening torques, 🕮 3.3

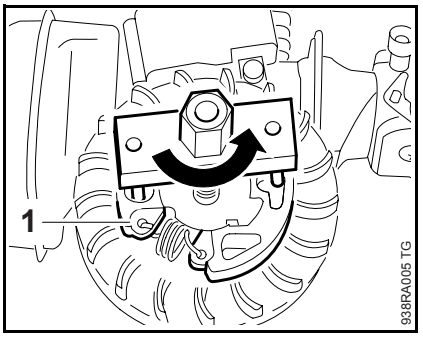
5.2 Clutch

– Block the piston, 🕮 5.1

– Remove the clutch drum, 🕮 5.1

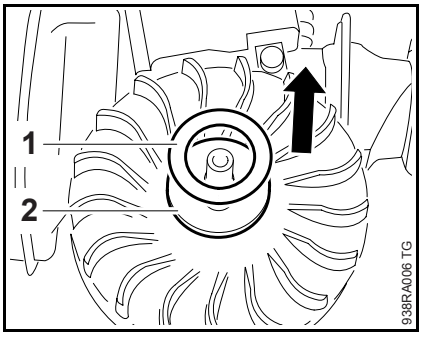


● Position the wrench (1) 4130 890 3600 on the crankshaft stub so that its pins engage the recesses (arrows).



● Unscrew the clutch (1).

The clutch has a right-hand thread.

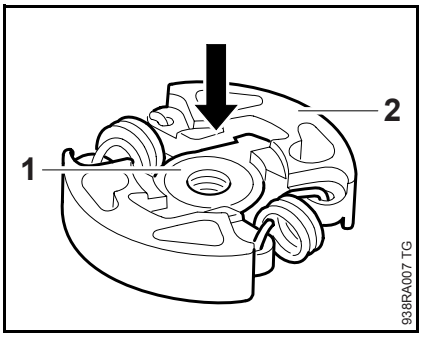


● Remove the cup spring (1) and washer (2).

– Check the individual parts and replace if necessary.

If the clutch shoes are worn or damaged, the entire clutch must be replaced together with the cup spring and washer – see parts list.

Always replace worn or damaged clutch springs in pairs.



● Push the carrier (1) out of the clutch shoes (2).