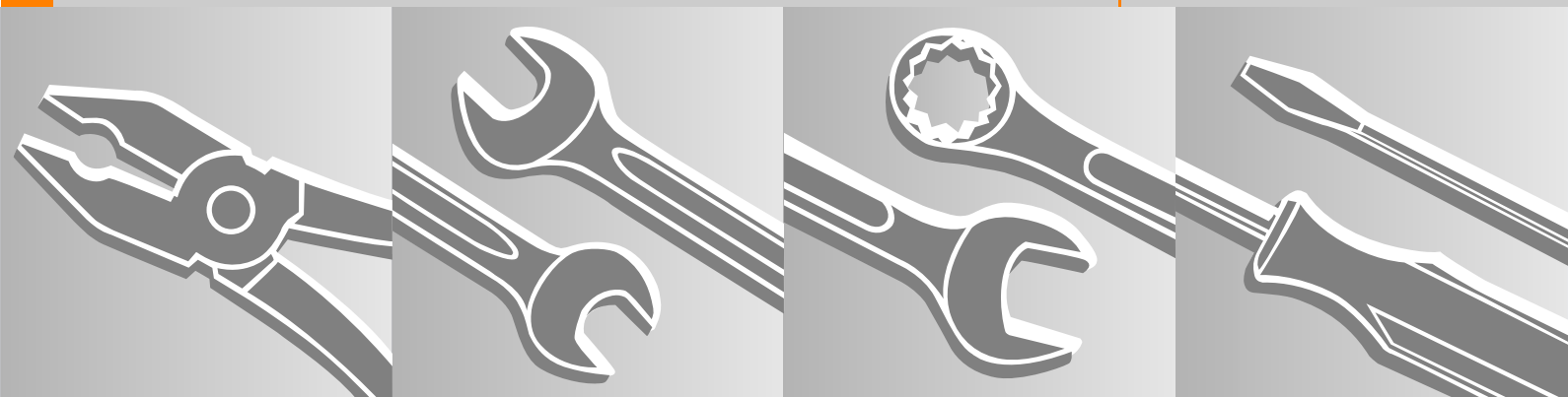


**STIHL Series 4144 Components**  
**FC, FS, KM**

2008-02



**FS 40, FS 50, FS 56**

**FC 56**

**KM 56**

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## 1. Introduction

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.

## 2. Safety Precautions

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 <sup>3</sup>	27.2 cm <sup>3</sup>
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 Fuel System

Carburetor leakage test at gauge pressure:	0.3 bar
Operation of tank vent at gauge pressure:	0.5 bar
Fuel:	as specified in instruction manual

---

#### 3.3 Ignition System

Air gap between ignition module and fanwheel:	0.30 mm
Spark plug (suppressed):	NGK CMR6H NGK 6H Bosch WSR 6 F
Electrode gap:	0.5 mm

---

### 3.4 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	P 6x14	Line limiting blade/deflector	2.5	
Screw	M 5x30	Control handle/handle/nut with washer	2.0	
Screw	P 5x14	Filter cover/filter housing	3.0	
Nut	M 5	Filter housing/carburetor/spacer flange	3.5	
Screw	P 4x12	Throttle cable/engine housing	1.5	
Screw	D 6x28	Gearbox/drive tube clamp (FS 56)	12.0	
Screw	D 5x20	Shroud/cylinder	6.0	
Screw	M 6x35	Clamp/clamp block/clamp	4.5	
Screw	M 6x25	Clamp/loop handle	4.5	
Screw	P 5x20	Engine housing/shroud	4.0	
Screw	M 5x20	Engine housing/crankcase	7.0	
Screw	P 5x20	Engine housing torsion lock/drive tube	4.0	
Screw	M 5x14	Deflector/gearbox (FS 56)	4.5	
Screw	M 6x30	Deflector/drive tube/nut /FS 40,50)	5.0	
Screw	M 6x14	Clamp/drive tube/harness ring	4.5	
Screw	D 5x20	Starter cover/crankcase	6.0	
Screw	D 5x20	Starter cover/engine pan	6.0	
Screw	M 4x9	End cover/carburetor	2.0	

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 <b>LA</b>
	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
Condition	Cause	Remedy



## 4.2 Rewind Starter

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Starter rope does not rewind	Very dirty or corroded	Clean rewind spring or replace rope rotor
	Insufficient spring tension	Check rewind spring and increase tension
	Rewind spring broken	Install new rope rotor
Starter rope cannot be pulled out far enough	Spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide pegs on pawls or pawls themselves are worn	Fit new pawls
	Spring clip on pawl fatigued	Fit new spring clip
Starter rope is difficult to pull or rewinds very slowly	Starter mechanism is very dirty	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Coat rewind spring with a little standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored

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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

---

#### 4.4 Carburetor

Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing – foreign matter in valve seat or cone	Remove and clean the inlet needle, clean the carburetor
	Inlet control lever sticking on spindle	Check inlet control lever, replace if necessary
	Helical spring not located on nipple of inlet control lever	Remove the inlet control lever and refit it correctly
	Perforated disc on diaphragm is deformed and presses constantly against the inlet control lever	Fit a new metering diaphragm
	Metering diaphragm deformed	Fit a new metering diaphragm
Poor acceleration	Setting of low speed screw too lean	Check basic carburetor setting, correct if necessary
	Setting of high speed screw too lean	Check basic carburetor setting, correct if necessary
	Inlet needle sticking to valve seat	Remove inlet needle, clean and refit
	Diaphragm gasket leaking	Fit new diaphragm gasket
	Metering diaphragm damaged or shrunk	Fit a new metering diaphragm
	Tank vent faulty	Replace tank vent
	Leak in fuel hose between tank and fuel pump	Install new hose

Condition	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw <b>LA</b>	Reset idle speed screw <b>LA</b> correctly
	Oil seals/crankcase leaking	Seal or replace oil seals/crankcase
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean the carburetor
	Setting of low speed screw too rich or too lean	Reset low speed screw <b>L</b> correctly
	Setting of idle speed screw <b>LA</b> incorrect – throttle shutter completely closed	Reset idle speed screw <b>LA</b> correctly
	Tank vent faulty	Replace tank vent
	Leak in fuel hose between tank and fuel pump	Install new hose

Condition	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Clean air filter or replace if necessary
	Throttle shutter not opened fully	Check throttle cable and cable adjustment and readjust if necessary
	Tank vent faulty	Replace tank vent
	Fuel pickup body dirty	Install new pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak in fuel hose between tank and fuel pump	Install new hose
	Setting of high speed screw <b>H</b> too rich	Check basic carburetor setting, correct if necessary
	Main jet bores or ports blocked	Clean the carburetor
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
Ignition timing wrong, flywheel out of adjustment, key on crankshaft has sheared off	Locate flywheel properly or install new flywheel	

## 4.5 Engine

Always check and, if necessary, repair the following parts before looking for faults on the engine:

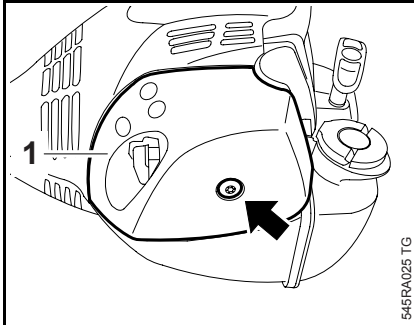
- Air filter
- Fuel system
- Carburetor
- Ignition system

Condition	Cause	Remedy
Engine does not start easily, stalls at idle speed, but operates normally at full throttle	Oil seals in crankcase damaged	Replace the oil seals
	Crankcase leaking or damaged (cracks)	Seal or replace the crankcase
Engine does not deliver full power or runs erratically	Piston ring worn or broken	Fit new piston ring
	Muffler / spark arresting screen carbonized	Clean the muffler (inlet and exhaust), replace spark arresting screen, replace muffler if necessary
	Air filter dirty	Replace air filter
	Fuel hose kinked or torn	Fit new hose or position it free from kinks
Engine overheating	Insufficient cylinder cooling. Air inlets blocked or cooling fins on cylinder very dirty	Thoroughly clean all cooling air openings and the cylinder fins

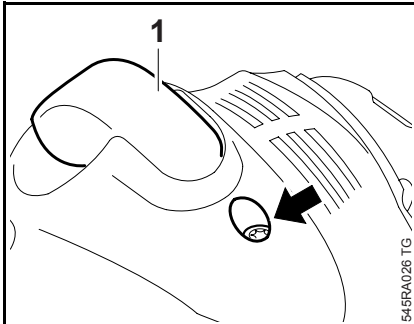
## 5. Engine

### 5.1 Removing and Installing

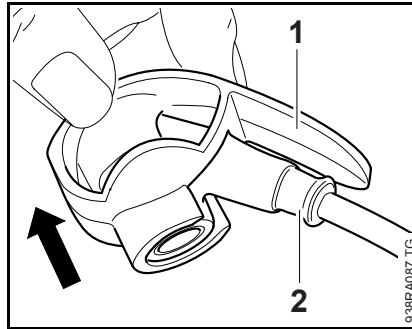
- Remove the drive tube, 9.1
- Remove the rewind starter, 6.2



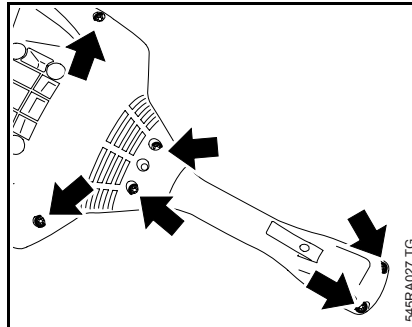
- Take out the screw (arrow).
- Remove the filter cover (1).



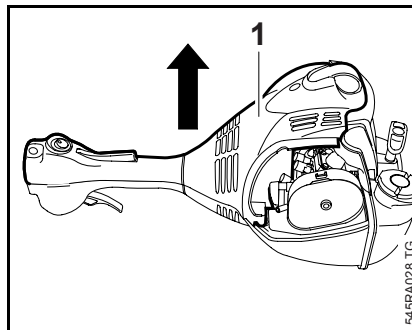
- Take out the screw (arrow).
- Pull boot (1) off the spark plug.



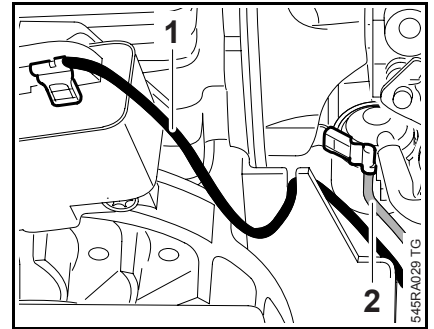
- Pull the protective cap (1) off the spark plug boot (2).
- Push the boot on to the spark plug.



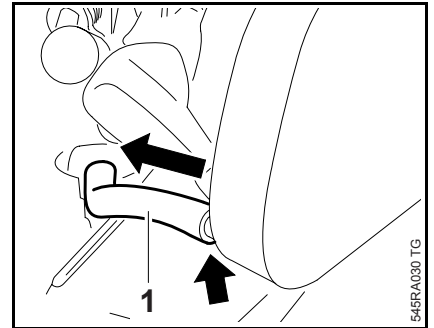
- Turn the machine over.
- Take out the screws (arrows).



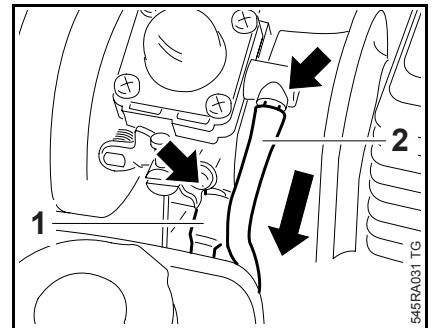
- Turn the machine over
- Remove the shroud (1).



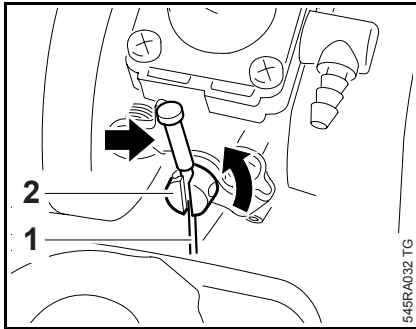
- Disconnect the short circuit wire (1) and ground wire (2).



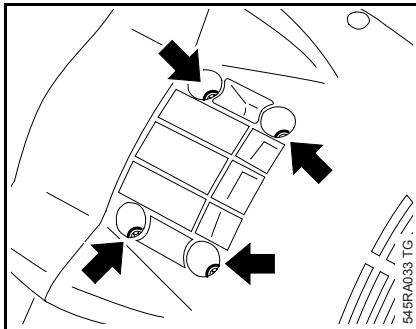
- Disconnect the tank vent hose (1) from the filter housing (arrow).



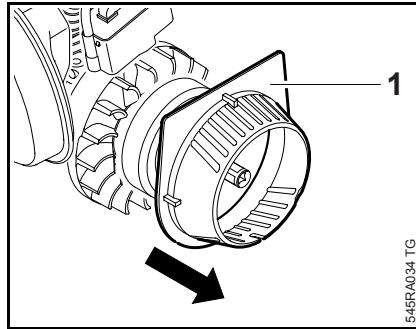
- Disconnect the fuel return hose (2) and fuel suction hose (1) from the stubs (arrows).
- Install new fuel hoses, 8.9.2



- Press down the throttle lever until the nipple (arrow) projects.
- Turn the pin (2) until the slot is in line with the throttle cable (1).
- Remove the throttle cable (1).



- Turn the machine over.
- Take out the screws (arrows).
- Turn the machine over again and lift the engine out.



- Remove the air baffle (1).
- Inspect the muffler and replace if necessary, [5.8](#)
- Check the air filter, carburetor and spacer flange, replace as necessary, [8.1](#), [8.2](#), [8.7](#)
- Troubleshooting, [4.4](#), [4.5](#)

All other operations are described in the service manual for the "Series 4144 Powerhead".

### 5.2 Leakage test

See service manual for "Series 4144 Powerhead"

### 5.3 Oil seals

See service manual for "Series 4144 Powerhead"

### 5.4 Ignition Module / Spark Plug Boot

See service manual for "Series 4144 Powerhead"

### 5.5 Clutch

See service manual for "Series 4144 Powerhead"

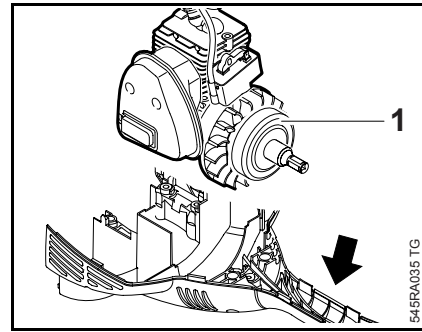
### 5.6 Flywheel

See service manual for "Series 4144 Powerhead"

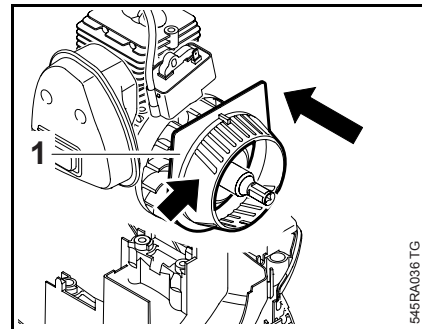
### 5.7 Motor

See service manual for "Series 4144 Powerhead"

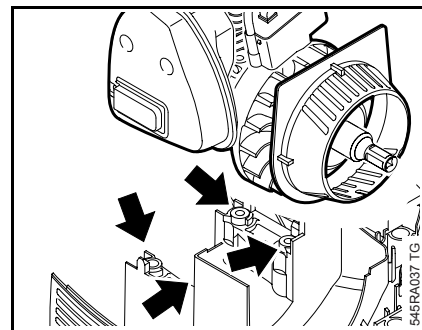
## Installing



- Position the engine so that the clutch (1) faces the drive tube mounting (arrow) in the engine housing.



- Fit the air baffle (1) over the clutch drum with its straight side facing up and the air slots (arrow) facing the drive tube mounting.



- Position engine with air baffle on the mounts (arrows) on the engine housing.





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