

# How to...

## Replacing Crankshaft Oil Seals on Modular-Style Engines

When servicing a modular style chain saw engine it may be necessary to replace the engine crankshaft oil seals, particularly when a leaking oil seal is found using the STIHL Engine Check Procedure outlined in the STIHL Silver Level. The STIHL Illustrated Parts List (IPL), Technical Bulletin, and Workshop Manual indicate the correct seal to use in the repair depending on the repair application – whether the engine is assembled or disassembled.

It is not necessary to disassemble the short block to replace an oil seal. Disassembly of the short block would depend on the nature of the repair, such as replacing a piston. The Workshop Manual also indicates the correct oil seal assembly tools to use. Using the correct assembly tools will ensure correct seal depth and reduce the risk of damage to the short block, crankshaft, motor housing, and the seal being installed.

Series	Model	Technical Bulletin	Engine Assembled Crankshaft Oil Seal	Engine Disassembled Crankshaft Oil Seal
1130 1123 1139 1133	MS 170; MS 180; MS 210; MS 230; MS 250; MS 270; MS 280	39.1990, 24.1996, 20.2007 (MS 211)	9638 003 1581	9639 003 1585
1137	MS 192; MS 192 T	2.2005, 7.2007	9639 003 1206	9639 003 1205
1127	MS 290; MS 310; MS 390	14.2000	9639 010 1743	9639 003 1743

Ensure the correct orientation of the oil seal when installing in the short block.



This photo indicates the correct orientation of an oil seal that is installed in an **assembled** short block. This side of the seal faces out.

This photo indicates the correct orientation of an oil seal that is installed in a **disassembled** short block. This side of the seal faces out.



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# Tech Service Tips

## Issue 7

Fall 2008

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# What's New?

## Stratified Engine Technology

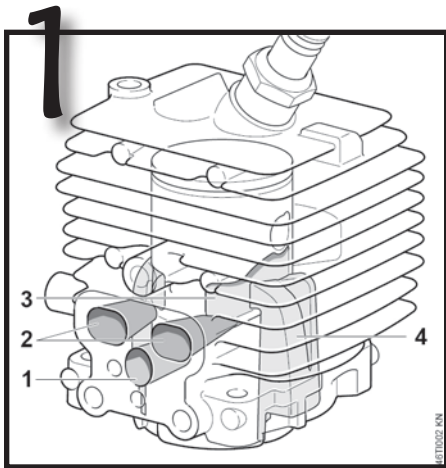
Andreas STIHL AG recently released a new Engine Technology called "Piston Controlled Stratified Scavenging." Currently, several product groups are equipped with this type of engine:

FS 56 - 4144

BG 56, BG 66, BG 86 – 4241

The previous Tech Tips Number 6 reviewed the tools necessary to troubleshoot this engine. This issue will review how the carburetor delivers the fuel and secondary air charges to the engine.

A detailed FS 4144 explanation is contained in STIHL Technical Bulletin T.I.23.2008 and a detailed BG 4241 explanation is contained in STIHL Technical Bulletin T.I.29.2008



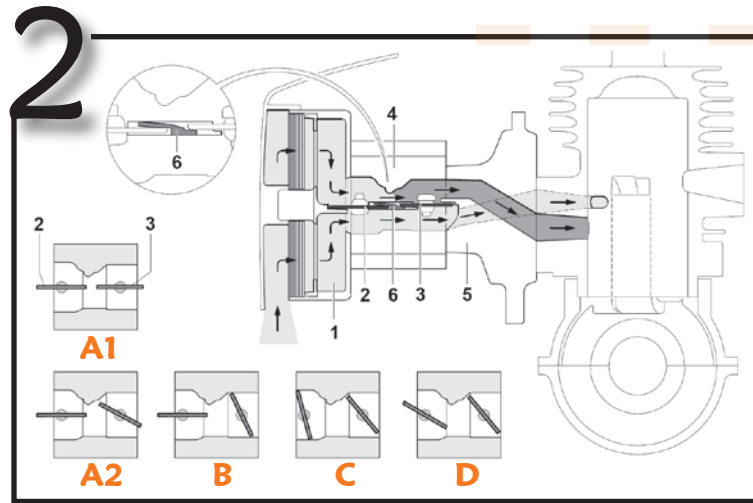
Fresh mixture (1) and clean air (2) are fed into different ports via the carburetor.

Integrally molded control channels (3) on both sides of the piston skirt Open and Close the connection between the clean air port and the transfer port (4).

No additional components are required for controlling the clean air.

An air cushion (air without fuel) separates the fresh mixture (fuel-air mixture) and exhaust. The air cushion is placed in front of the fresh mixture at the beginning of the "exhaust and transfer" stroke. The clean air flows from the transfer ports into the combustion chamber purging the exhaust gases and preventing the incoming fresh mixture from exiting the exhaust port.

This results in reduced emissions through the reduction of fresh mixture losses and lower fuel consumption.



A1) Full Load    B) Idle    C) Cold Start    D) Warm Start  
A2) Partial Load

### Full Load (A1) and Partial Load (A2)

The air filter (1) divides the intake air into two streams. The choke shutter (2) and throttle shutter (3) are open. The intake air flows above and below the choke and throttle shutters through the carburetor (4). The fuel is drawn into the top part of the carburetor and flows through the venturi – where the fresh mixture is formed.

The spacer flange (5) channels the fresh mixture into the crankcase and the clean air into the transfer ports. The baffle plate (6) in the carburetor, separates the fresh mix and clean air paths from one another.

### Idle (B)

The choke shutter is open. The throttle shutter is closed so far that only a small gap remains open at the carburetor housing. A rich mixture is drawn in through the idle circuit located at this gap. Air dilutes the rich mixture into an optimal idle mixture which is then drawn into the crankcase.

### Cold Start (C)

During a cold start, the choke shutter is closed. The throttle shutter is slightly open. The amount of air necessary for an optimal starting mixture is drawn in through the air bleed holes in the choke shutter; the necessary amount of fuel is drawn in from the idle and main jet circuit.

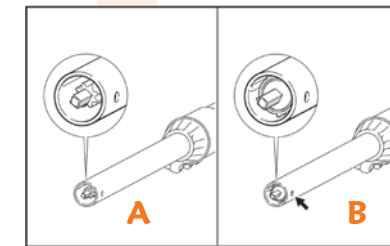
### Warm Start (D)

During a warm start, the choke and throttle shutters are opened to a defined angle so an ideal mixture of air and fuel is fed to the engine for starting.

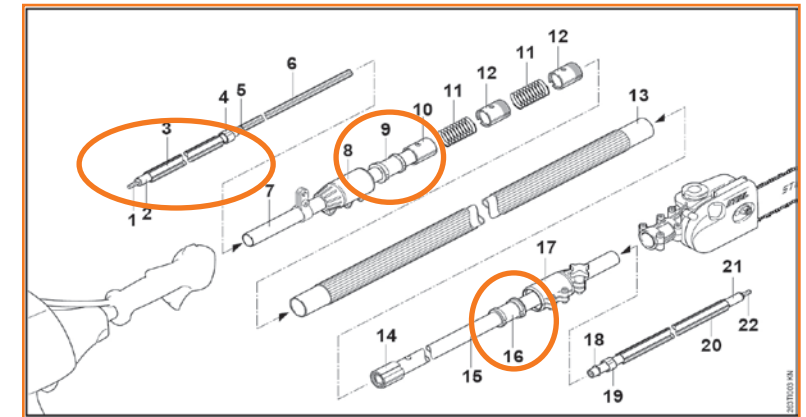
## ...this and that.....

### Repairing HT Drive Shafts

A change has been made in the design of the HT Drive Shaft. Therefore, it is important to ensure that the correct replacement parts are used when performing repairs on the drive shafts. Because the Drive Shafts are assembled with different components, it will be necessary to correctly identify which version is being serviced before ordering replacement parts. The previous and new drive shaft assemblies can be identified by simply retracting the extendable end. If the gearbox comes in contact with the clamp (17) it is the previous version. On the new shaft assembly there will be approximately 3/8" gap between the gearbox and the clamp.



A) Previous Drive Tube Assembly: the square drive shaft with external splines visible. 4138 710 7103  
B) New drive Tube Assembly: the square end of the drive shaft and the flexible liner are visible. 4182 710 7110



New Drive tube assembly: 4182 710 7110    ○ = Indicates new components

Reference the STIHL Illustrated Parts List (IPL) for correct replacement part numbers. For repair instructions reference the Workshop Manual, the Silver Manual, or [www.cdcastihl.net](http://www.cdcastihl.net)

These STIHL Technical Bulletins can be referenced for more technical information.  
T.I.42.2007 – HT75  
T.I.21.2006 – HT101  
T.I.32.2006 – HT131