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TECHNICAL REPORT

Subaru BRZ and Toyota GT86 upgrading the oil pan sealing

ajusa

INTRODUCTION

To report on the **development of the crankcase sealing** of these engines avoiding the problems encountered with the gasket former.

The 2.0 boxer engine, known as **FA20**, is an engine jointly developed by Subaru and Toyota for the Subaru BRZ and Toyota GT86 (also known as Toyota 86 in some markets and Scion FR-S in the US). This engine is a prime example of the collaboration between the two brands to create an **affordable, high-performance sports car**.

FA20 ENGINE SPECIFICATIONS

Configuration	4-cylinder boxer engine.
Displacement	2.0 litres
Power output	Approximately 200 horsepower at 7,000 rpm
Torque	Approximately 205 Nm (151 lb-ft) at 6,400-6,600 rpm
Injection	Toyota-developed direct fuel injection system (D-4S), combining direct and indirect injection to optimise efficiency and power
Compression ratio	12.5:1
Materials	Aluminium block and aluminium cylinder head to reduce weight
Valvetrain	DOHC (double overhead camshaft) with timing chain

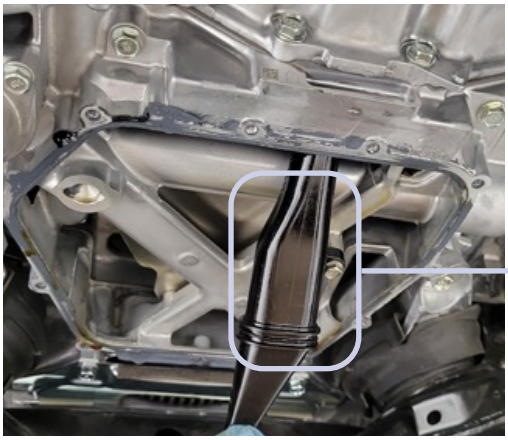
FA20 ENGINE PROBLEMS

Although the FA20 is considered a reliable engine, it is not without its problems. One of these issues is related to **engine lubrication**, which in itself is often more delicate in Boxer engines.

Boxer engines often suffer from low oil pressure, which can result in inadequate lubrication and potentially cause internal engine damage.

The main cause is oil pump problems, **faulty oil control valves** or clogged oil lines.

One of the main reasons for clogging is the **silicone that is used** in the crankcase for sealing. There have been many reports from customers indicating that after opening up oil pressure problems and removing the crankcase to check the suction filter, traces of the excess silicone bead have been found on the inside of the crankcase.



In these pictures you can see how **the excess silicone** in the crankcase has come loose and has been sucked into the lubrication system, clogging the pre-filter.

The way to mitigate these problems is based on:

> Check the oil pump and replace it if necessary.
>
> Clean the oil lines and ensure that there are no blockages in the lubrication system.
>
> Keep the oil system clean and use oils recommended by the manufacturer.

ALTERNATIVE TO SEALANT/GASKET FORMER

The problems observed due to excess sealant in the crankcase can be mitigated by applying a **smaller amount of sealant** (3 mm thick) to prevent these excesses from entering the interior.

Despite this solution, AJUSA offers an **alternative sealing** solution for this crankcase with a solid gasket, made of 1.2mm thick aramid fibre, which avoids 100% the problem of clogging the lubrication system.

The set part number is 59020200 and contains both the 14121200 x1 crankcase gasket and the 01300200 x2 gasket that fits the filter.

Ajusa reference

59020200