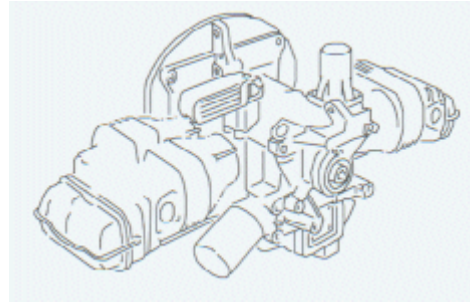


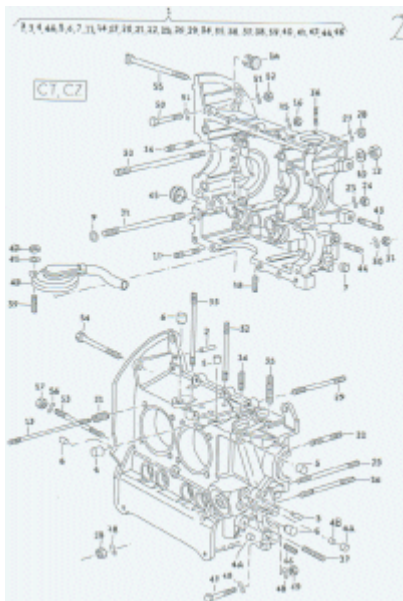
CT / CZ Engines



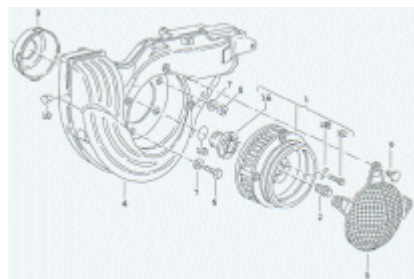
Occasionally I get asked about what size engine is the CT or CZ code VW engines. The owners believe they own a Type 4 but couldn't find any information. At first, I couldn't find this code in all of my references either. They said it looked like a Type 4 engine and it came out a 80-83 Vanagon.

After discussing this with my fellow contributor, [Rolf Christensen](#), he said that the CT code was indeed from the early Vanagon, but that it was a 1600cc (technically 1585cc, yep Type 1 size). From his description, it sounded like a weird low cost option for those early Vanagons.

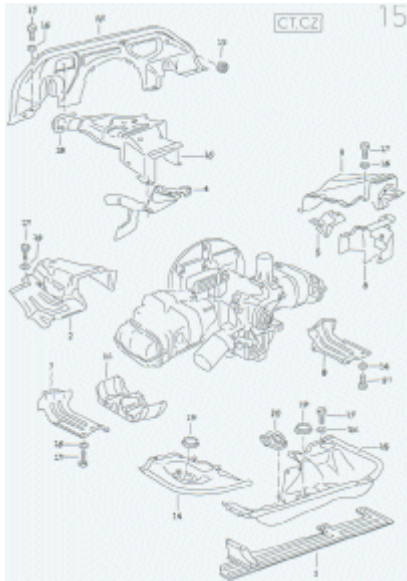
Just the facts....



The CT / CZ crankcase itself is very similar to a Type 1 crankcase. From these diagrams from the parts catalog, you can see the oil filter flange that is molded into the crankcase. The oil cooler flange is similar to the Type 1 flange, but you'll notice that it's closer to the distributor. You'll also notice the four studs on the shroud end of the case for the Type 4-style fan shroud. The oil pick up tube appears to be identical to a Type 1, and the flange on top of the case looks just like the one used for an alternator/generator stand on the Type 1.



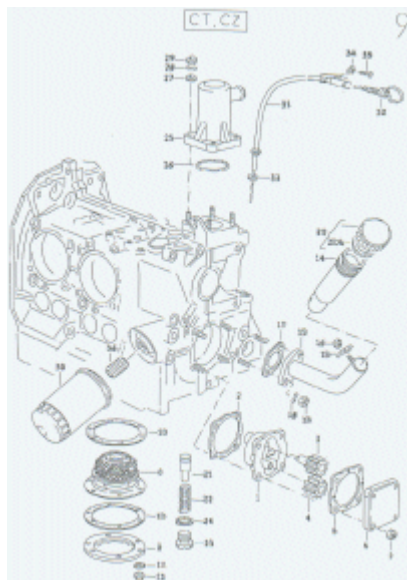
The CT and CZ engines used a "pancake" cooling system that looks similar to the Type 4, but is not interchangeable with the Type 4. The shroud is really similar to a Type 4, but the part number is a different series, so I'm assuming that it's different. The fan looks really similar to a Type 4, and my suspicion is it's the same. Check out the adaptor hub, number 14 on the drawing.



Here's a diagram of the engine tin pieces used with these engines. All of these pieces are unique to this engine, making finding replacements quite difficult.

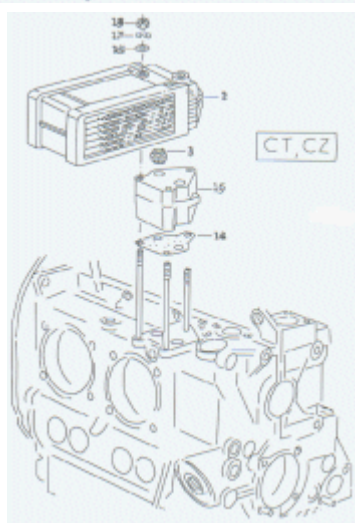
The oil cooler has it's own exit point for hot air, so the air blown across the oil cooler isn't dumped back on top of the cylinders and heads. The hole in the firewall tin is reminiscent of the doghouse setup on the later model upright 1600s.

Number 11 on this drawing looks really similar to the tin marketed as "Cool-tin" or "Super tin". So it was a factory part after all.



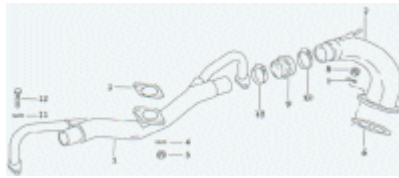
Here's a diagram with the oil accessories like the oil filter, oil filler, breather tower, dipstick, oil screen and oil pump. The oil pump and the oil screen appear identical to their Type 1 counterparts. The oil breather tower bolts to the same flange, in what appears to be the same location as the generator / alternator stand on the Type 1.

The oil filter mount is in about the same location as the wasserboxer engine and is cast into the case. The oil filler is similar to the Type 3, Type 4 or the Vanagon Wasseboxer engine. It bolts to the lower bottom of the back of the crankcase and extends upwards.



From this diagram we get a closer look at the cooler flange. Note that it is placed farther towards the back (away from the flywheel). This would make for some difficulty if you wanted to use this crankcase in a Bug. The standard upright shroud wouldn't encase the cooler.

VW used a spacer to place the cooler away from the cylinders and to provide it with it's own air flow. By the way, the oil cooler has a unique part number, so there's probably something about it that makes different from a Type 1 doghouse, Type 3, or Type 4 oil cooler. It may be the Type 4 oil cooler with a provision for the oil pressure sending unit.



Here's an oddity: the intake manifold. Check out the weird bends and the low rise of the carb flange. It's definitely not the same manifold as we are used to seeing. These engines used a Solex 34PICT4 single barrel carb, the same as used on the '74 Bug here in the US.

This engine used a lot of other unique parts that I haven't spoken about yet, including valve springs, and complete exhaust system. The crankshaft also has it's own part number, meaning it was unique to this engine. I don't know how it was different, as it uses Type 1 main bearings, Type 1 rod bearings, Type 1 gears, and 215mm Type 1 flywheel. It could have been a cast crank, whereas the previous cranks were forged. The valve springs could have been stronger that allow for the control of the valvetrain during operation. All of these unique parts will make restoration of this engine quite difficult (and expensive) to return it to original.

What was difficult to determine was the difference between the CT and the CZ code. The only difference I've been able to find between the CT and the CZ is that the CZ engine uses dished pistons, most likely to lower the compression ratio and the fuel octane rating requirement.

Both of these engines share parts from the Type 1 series, Type 4 series, and from the Wasserboxer. An example are the rocker arms. The early ones are the 8mm found in the Type 1; later they changed to the 9mm adjuster, same as the Wasserboxer. To my best judgement, the following parts are essentially the same as the later model dual port Type 1 engines: crankshaft (as noted above), connecting rods (standard 1600cc Type 1), and heads (with the exception of the small 30mm exhaust valve). Type 1 parts could probably be easily be interchanged on this engine to keep costs low during a rebuild and to get some more power.

The CT/CZ engine also used parts from the Wasserboxer, it's larger, younger brother. The camshaft, the 261mm pushrods, pushrod tubes, and oil filter were all borrowed from the watercooled flat four that VW used in the later Vanagons.

Not as many parts were pulled from the Type 4 parts bin. Hydraulic lifters (which were used for the Wasserboxers later) and the thermostat are the only obvious Type 4 parts used in these engines. There are a few hardware parts that are interchangeable, but not worth mentioning.

What all this means is that any experienced Type 1 builder can use off the shelf parts to get more power and life from this engine. They just need to realize that this engine is still a "Type 1", and it's limitations are the same.

It's problems.....

This engine was made available from May 1979 through January 1983 on the Vanagon, offering it as a low cost option for customers not requiring the Wasserboxer or diesel engine. The key part of this statement is "low cost". It's been reported that the dependability and power are marginal when compared to the Type 1 1600.

It's close resemblance to the Type 1 also means that a lot of the same problems with the Type 1 are true with the CT/CZ engine. The crankcase is made of the same magnesium/aluminum alloy as the Type 1 cases, so align boring is often necessary. The fragile material causes the lifter bosses to be fragile if driven hard or with a large camshaft. There are workarounds for these problems, like sleeving the lifter bores, but the problems do exist.

Finding a CT/CZ in good shape is quite a rarity. These engines were generally driven hard, as it was pushing the Vanagon around, quite a bit heavier than the earlier Type 2s. It was even rumored that fresh from the factory the crankcases weren't as good as the Type 1 cases, but this is still a rumor, so treat it as such.

Where to use it....

I've had reports that these engines have been converted to upright cooling systems and increased the displacement to 1776cc, and that they are quite reliable. These upright conversions used a stock Type 1 fan shroud, modified for an external oil cooler. They very well could have used one of the 911 fan style conversions.

More info....

After posting this article, I posted a message to the Type 4rum that's available in this [thread](#). There was a lot of great information posted there, so if you are looking for more CT/CZ info, check it out. There's also a [great article](#) on these engines at [Type2.com](#).

One of the regular contributors at the Type 4rum says that the Haynes manual for the '79-'82 Vanagons (Haynes #638, ISBN # 0 85696 638 x) has a lot of technical information on this engine. After glancing over the specs he posted, it confirmed my suspicion that it's internals are interchangeable with the Type 1 parts.

Thanks to [Rolf Christensen](#) and the posters at the [Type 4rum](#) for their assistance in learning more about these mystery engines.

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