

# Honda F20C engine specs

|   |  |
|---|--|
| Manufacturer                                | Honda Motor Company  |
| Also called                                 | Honda F20  |
| Production                                  | 1999-2009  |
| Cylinder block alloy                        | Aluminum   |
| Configuration                               | Inline-4   |
| Valvetrain                                  | DOHC<br>4 valves per cylinder                                      |
| Piston stroke, mm (inch)                    | 84 (3.31)  |
| Cylinder bore, mm (inch)                    | 87 (3.43)  |
| Compression ratio                           | 11.0<br>11.7   |
| Displacement                                | 1998 cc (121.9 cu in)  |
| Power output                                | 176 kW (240 HP) at 8,300 rpm<br>183 kW (250 HP) at 8,300 rpm       |
| Torque output                               | 208 Nm (153 lb·ft) at 7,500 rpm<br>218 Nm (161 lb·ft) at 7,500 rpm |
| Redline                                     | 8,900  |
| HP per liter                                | 120<br>125   |
| Fuel type                                   | Gasoline   |
| Weight, kg (lbs)                            | –  |
| Fuel consumption, L/100 km (mpg)            | Honda S2k  |
| -City                                       | 13.9 (17)  |
| -Highway                                    | 7.8 (30)   |
| -Combined                                   | 10.0 (23.5)  |
| Turbocharger                                | Naturally aspirated  |
| Oil consumption , L/1000 km (qt. per miles) | up to 0.5 (1 qt. per 1200 miles)                                   |
| Recommended engine oil                      | 0W-40<br>5W-30<br>5W-40<br>5W-50<br>10W-30<br>10W-40               |
| Engine oil capacity, L (qt.)                | 4.8 (5.1)  |
| Oil change interval, km (miles)             | 5,000-10,000 (3,000-6,000)   |
| Normal engine operating temperature, °C (F) | –  |
| Engine lifespan, km (miles)                 | –  |
| -Official information                       | –  |
| -Real                                       | 300,000+ (180,000)   |
| Tuning, HP                                  | –  |
| -Max HP                                     | 600+   |
| -No life span loss                          | –  |
| The engine is installed in                  | <b>Honda S2000</b>   |

# Honda F20C engine reliability, problems and repair

Among the many various **F20A, F20B and F20Z engines**, you can find very unusual F20C engine. Formally, it belongs to the F-family, but technically it is closer to K20A engines.

This sporty inline-4 engine was launched in 1999 specifically for Honda S2000. It had been developed almost from scratch. It uses a new aluminum block of cylinders with the height of 224 mm. Inside there is a 84 mm piston stroke crankshaft; cylinder walls are made of FRM material.

People often ask the same question: Does the F20C have forged internals? Sure, it has forged pistons, and their compression height is 29 mm with the compression ratio of 11.7 for JDM S2000. For the rest of the world, compression ratio of Honda S2000 has been reduced to 11. Specially for F20C, new 153 mm long lightweight connecting rods were used. Thanks to all these mods, Honda engineers made an S2000 engine with short-stroke configuration; it reduced vibration and made it possible not to install balancer shafts.

The F20C head had also been re-designed, its head flow became much better than in the F20B engine. Here the VTEC system for intake and exhaust camshafts is used. This cylinder head has improved intake and exhaust ports, larger valves (intake 36mm, exhaust 31 mm), aggressive camshafts, and stiff valve springs.

Here are the stock F20C cam specs: duration 300/298 deg, lift 12.65/11.66 mm.

Here a timing chain is used, unlike in other Honda F20 engines.

For F20C, a small intake manifold, a lightweight flywheel (only 6.5 kg) and stainless steel 4-2-1 headers were used.

The F20C fuel injectors size is 360 cc/min. Throttle body diameter is 62.5 mm.

Comparing engines F20B and F20C, one can see that F20C is 8 kg lighter, and its dimensions are slightly smaller.

Thanks to all described above, as well as many other smaller parts, this naturally aspirated 2.0-liter engine can boast 250 HP @ 8,300 rpm, and the redline at 8,900 rpm. Honda engineers had got 125 HP from 1 liter of displacement, this record had held until 2009, then Ferrari 458 Italia beat it.

However, such a F20C was used only in JDM S2000, while the USDM S2000 and European version got a 240 HP @ 8,300 rpm engine.

In 2003, Honda S2000 AP2 (restyling) emerged, and for the USDM version, they created a **2.2-liter F22C engine**.

The Honda F20C engine had been made until 2009, and then it was discontinued.

## Honda S2000 engine problems and malfunctions

1. A problem with the timing chain tensioner. You can hear extraneous noise when starting the engine, and, in this case, at idle speed. Buy a new timing chain tensioner, and the problem will be solved. This noise is usually heard after 70,000-100,000 miles, but can sometimes appear earlier.
2. A problem with valve retainers. They may become destroyed, and your F20C will be destroyed as well. This happens due to oil starvation or too high revs. It is better to have them replaced, along with valve locks, for modified of the redesigned S2000 (made after 2003).
3. High oil consumption. It is usual for F20C, and sometimes it can reach 1 qt. per 600 miles (1 L per 1,000 km). Most likely, you have to replace the valve stem seals and piston rings, but specialists will be able to give a more details after diagnostics. High quality motor oil with timely replacement is most important for F20C engines, as this will postpone many problems. Reliability and longevity of the Honda S2000 engine are quite high, as for a high-rev naturally-aspirated engine, and may exceed 120,000 miles, if the engine is serviced in a timely manner.

## Honda S2000 engine tuning

### Naturally aspirated

Let's compile a small tuning guide for your S2000 engine. To get started, purchase a cold air intake system, a 4-2-1 header, a 3" performance exhaust system, and aggressively tune the ECU tuning. These performance parts will provide about extra 10 HP, and improve the sound of the engine.

To build an F20C with really impressive power, you'll need head porting with installation of bronze valve guides, 37 mm intake valves and 31mm exhaust valves, and valve springs and valve retainers.

A standard intake manifold should be replaced with 50 mm throttle bodies, and OEM exhaust manifold should be replaced with 4-2-1 headers, and a 3 inch performance exhaust system should be installed. You will need aftermarket camshafts, adjustable cam gears, high compression pistons (compression ratio ~14), a 3-row radiator, a Mishimoto oil cooler kit, an oil catch can, an AEM fuel rail, 550 cc fuel injectors, a TODA light flywheel, NGK 9 iridium spark plugs, AEM EMS ECU, and sports fuel. These mods will let you get more than 300 HP N/A at the flywheel.

To approach 300 HP at the wheels, you have to perform the most of head porting and install the 2.2-liter stroker kit (90.7 mm F22C crank + aftermarket **F22C** rods or a Spoon 2.2 stroker kit). These upgrades will let you get almost the most from your naturally aspirated engine.

Making your S2000 even more powerful is not an easy task; you will have to buy a 2.4 L stroker kit or make a sleeved block for 90 mm pistons and install a 106 mm crank, but these are very rare and individual projects.

# Turbo

This F20C engine is good for boost, and can withstand high loads. To get 300 HP, you only have to buy a supercharger kit, and install it on stock internals.

400+ horsepower can be added to S2000 with the use of a turbokit that can also be installed on stock pistons. As the practice shows, 600-700 HP is the maximum for stock internals, but this power can be achieved through proper ECU tuning.

If you decided to install a turbo kit, have head porting done, and install titanium valve retainers. A turbo kit based on Garrett GT3071R turbocharger (or something similar) will do for turbocharging. This will be enough for getting about 500 horsepower at the flywheel. However, you will need to buy NGK 9 spark plugs, 1,000 cc fuel injectors, Walbro 255 lph fuel pump and a 3" exhaust system. For tuning, you can choose AEM EMS ECU and use E85 fuel.

Building a S2000 with even more power involves using forged internals, otherwise you will not be able to reach high reliability.