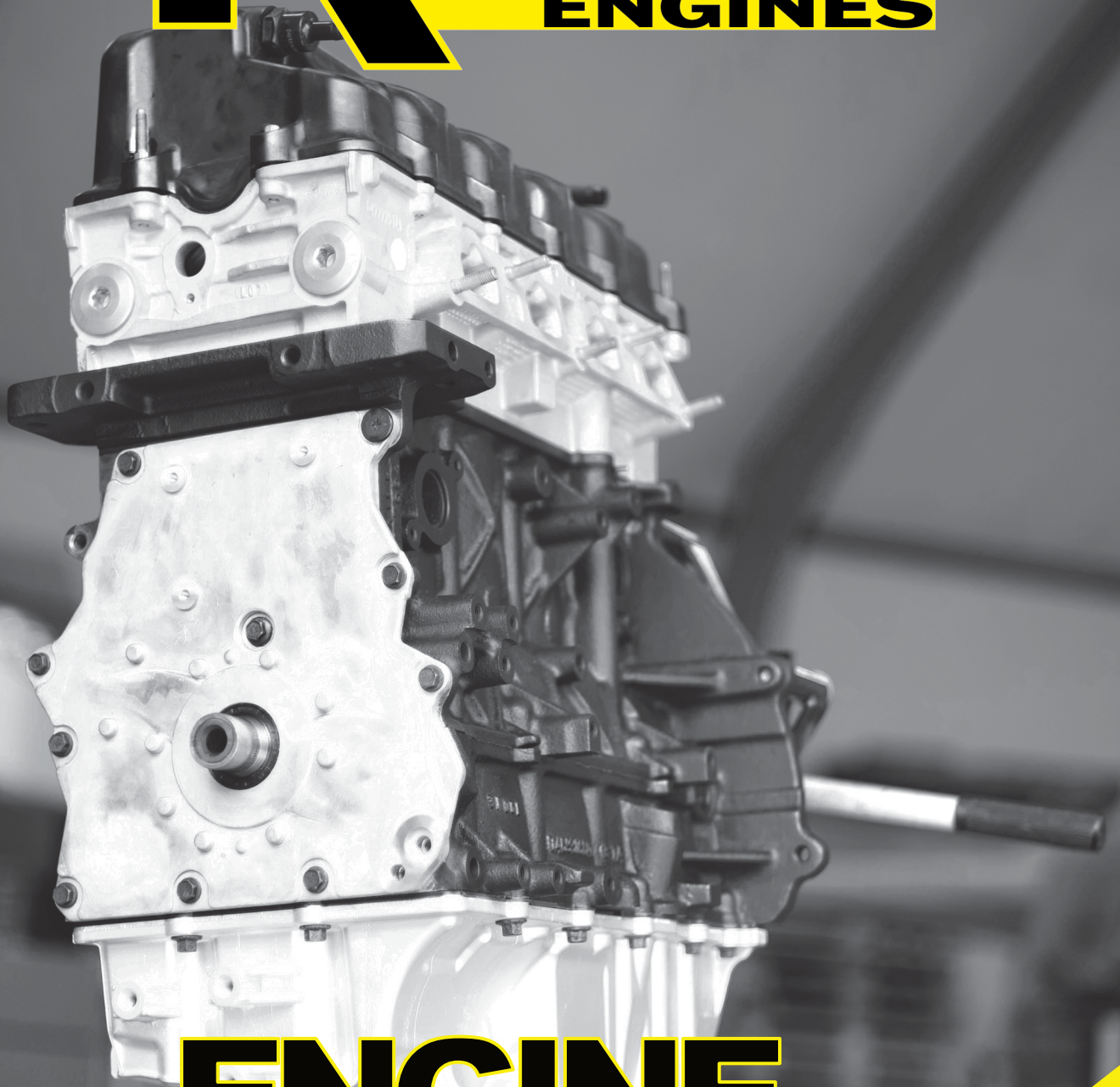


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**REVISION
ENGINES**



ENGINE INSTALLATION GUIDE

THANK YOU!

Thank you for choosing us for your engine purchase. In a marketplace full of options, we truly value the trust you've placed in our products and team.

This document is intended to highlight key considerations and general information for installing your new engine. It is not intended to be a full installation manual and must always be used in conjunction with the original factory service and operating manuals for your specific engine and vehicle.

If you have any questions during the process, you're welcome to reach out to us at support@4revisionengines.com

NOTE:

That our support is limited to our own products and services. We do not provide installation support for unrelated products or third-party components. We highly recommend that the installation is performed by a **QUALIFIED PROFESSIONAL**. Modern engines are intricate systems that demand the right tools, documentation, and prior experience to ensure proper and reliable installation.

IMPORTANT:

Failure to follow the procedures outlined in this guide, including oil choice, break-in process, and professional installation, may void your warranty.



REGISTRATION

We kindly ask you to register your engine by completing the online form at:

www.4RevisionEngines.com/register

Registering your engine allows us to maintain a full record of your specific build and enables us to provide better support in the event of future service, warranty inquiries, or technical issues.

PRE-INSTALLATION

Before starting the engine installation, it is important to make the necessary preparations to ensure a safe and efficient process.

Begin by making sure the work area is clean, dry, and free from dust or debris. A tidy workspace helps minimize the risk of contamination or installation errors.

Carefully inspect the engine and all included components for any signs of shipping damage. Check that all necessary parts and accessories, such as gaskets, hardware, and sensors, are present and in good condition. Also, verify that the engine type and its specifications match your intended application to prevent compatibility issues.

Before any work begins, make sure you have reviewed the relevant technical documentation and service manuals. Having the correct tools on hand, including any engine-specific specialty tools, is essential for a smooth installation process.

Don't forget to record the engine's serial number for registration and warranty tracking. Finally, always wear appropriate personal protective equipment (PPE), and keep in mind that professional installation is required for the warranty to be valid.



INSTALLATION PREPARATION

Before moving on to the initial startup of the engine, it is essential to verify several key aspects to ensure reliable performance and prevent potential damage.

Start by confirming that the engine is fully assembled using only clean, properly lubricated hardware and new gaskets or seals where required. The timing system must be correctly installed and timed, with proper alignment of the camshaft(s) and cam gear(s). Incorrect timing can cause severe internal engine damage upon startup.

All fluids, including engine oil and coolant, must be filled to the correct levels according to the manufacturer's specifications. To prevent dry start conditions, the oil system should be primed prior to startup. Inspect all sensors, hoses, and brackets to ensure they are securely mounted and properly connected. Always follow the torque specifications outlined in the official service manual unless stated otherwise.

In addition to proper installation, built engines require a range of high-quality supporting components to function reliably. These may include upgraded oiling components, hardware, air/oil separators, and more, depending on your specific setup. Your tuner may provide a base calibration map for the break-in process. However, professional tuning and engine calibration are absolutely required to ensure safe operation and long-term durability.

While built engines are significantly stronger than their OEM counterparts, they are not bulletproof. The longevity of your build depends heavily on the quality of supporting parts, proper installation and expert tuning. We highly recommend using certified professionals for both installation and calibration.



HOW TO PREVENT ENGINE FAILURE

To protect your investment and ensure the long-term reliability of your engine, it is critical to avoid common mistakes, especially when reusing old or incompatible components. The table below outlines frequent causes of engine failure and how to prevent them.

Common Cause of Failure:

How to Prevent It:

Oil Starvation

Oil starvation occurs when the engine is not supplied with sufficient oil pressure or volume, leading to accelerated wear or catastrophic bearing failure. To prevent this, always inspect and replace critical oiling components such as the oil pump, oil pickup, filter housing, oil cooler, and all associated lines and fittings. Do not reuse old or questionable parts.

Bearing Failure

Bearing failure is often the result of metal contamination or inadequate oil supply. If bearing damage has occurred or if there are any signs of metal in the oil, all related oiling components **MUST** be replaced. This includes the oil pump, oil cooler, oil pan, oil pickup, oil filter housings, oiling lines and fittings, and AVCS cam gears (if applicable).

External Debris Contamination

Contamination from external debris can quickly damage internal engine components. To prevent this, ensure all parts and surfaces are thoroughly cleaned before assembly. Pay special attention to intake-related components such as; intake manifolds, airboxes, vacuum lines, intercoolers, turbos, and intake hoses. Any debris introduced during assembly or from reused dirty components can cause severe damage.



Accessory Parts Installation

Supporting components such as lines, fittings, gaskets, timing belts, tensioners, rollers, and guides play a critical role in engine reliability. These parts must be carefully inspected for wear, damage, or age-related degradation and replaced if necessary. Always use high-quality, properly rated replacement parts.

Reusing Questionable Sensors

Faulty or worn sensors can lead to inaccurate readings, poor engine performance, or even failure. Components such as knock sensors, camshaft position sensors and crankshaft position sensors are critical to proper engine operation and should not be reused if their condition is uncertain.

Improper or Inadequate Tuning

Professional-level engine tuning is critical to the safe and reliable operation of a built engine. A proper base map should be used during the break-in period to ensure safe initial conditions. After break-in, in-person dyno tuning must be performed by an experienced tuner to calibrate the engine accurately.

Overheating

The cooling system must not only be in good working order, but also properly sized for the engine's intended power level and usage. Inspect all cooling components including radiator, water pump, hoses, thermostat, and fans for wear and functionality prior to installation. Replace any aged or insufficient parts. Make sure the system is fully bled of air and confirm that fan operation is reliable under load.

1. Fluids and Fuel Requirements

Before starting the engine, verify that all fluid levels are correct, and ensure that only break-in engine oil and manufacturer-recommended fluids are used. This includes engine oil, coolant, and any other applicable systems such as power steering or transmission (if equipped).

During the break-in period, pump gasoline must be used. Do not use ethanol blends (e.g., E85), race fuel, or alternative fuels at this stage. These fuels can negatively affect the oil's lubricating properties and interfere with proper piston ring sealing. This is a critical period in your engine's life!

2. Oil System Priming

Proper oil system priming is critical to prevent dry start damage. Follow the steps below carefully before allowing the engine to run continuously:

- 1 Fill the engine with break-in oil at the correct level. We highly recommend monitoring oil pressure using a manual oil pressure gauge during the priming process.**
- 2 Crank the engine with no spark plugs installed and no fuel supplied. To disable fuel, remove the fuel pump fuse or relay (see your vehicle's fuse diagram for location). Crank the engine in short intervals (e.g., 10 seconds at a time) until oil pressure is visibly registered on the gauge.**
- 3 Once oil pressure is confirmed, reinstall the spark plugs and reconnect the fuel pump fuse. Crank the engine again and allow it to start. Let it run for approximately 5 seconds, then shut it off immediately.**
- 4 Inspect the engine for any leaks (oil, coolant, fuel, etc.). If everything looks good, restart the engine and let it run for 30 seconds, while monitoring oil pressure. Shut it off again and inspect once more for any leaks or irregularities.**

- 5** For the final startup, allow the engine to idle and continue monitoring for abnormal noises, leaks, or fluctuations in oil pressure. If all is well, oil pressure should remain above the manufacturer's minimum specification for idle. At this point, you can proceed to the next step in the break-in process.

3. Initial Break-In Procedure

Slowly bring the engine up to 2,000 RPM and hold it there for 5 minutes. After 5 minutes, begin varying RPM in steps up to 4,500 RPM and back down to 2,500, 3,000, 3,500 RPM, etc. Hold steady throttle while transitioning between RPM levels every 30 seconds. Avoid sudden throttle inputs. This process should be done for a total of no more than 10 minutes.

While the engine comes up to operating temperature (monitor via coolant temp), carefully watch oil pressure. Oil pressure should gradually stabilize and decrease as the engine warms up. Let the engine run until the cooling fan activates at least twice (around 105°C coolant temperature), and confirm that the thermostat has opened. If all systems are functioning correctly, shut down the engine and allow it to cool completely.

4. Post-Heat Cycle Inspection

After the engine has completed several heat cycles and fully cooled down, it is important to perform a follow-up inspection. Check and top off all fluid levels, including oil and coolant, as levels may have changed during the initial break-in phase. Also, re-torque external fasteners such as manifold bolts, turbo hardware, and coolant fittings. It is not uncommon for fasteners to settle slightly after heat expansion and contraction during early run time.



5. Break-In Driving

- 1 Drive the vehicle gently for the first 100 km (60 miles). Keep RPM below 5,000 and avoid any boost (1–2 PSI max). Vary engine speed and load while accelerating and shifting. Do not cruise at a steady RPM for long periods. This controlled variation is important for proper piston ring seating and cylinder wall conditioning.**
- 2 After the first 100 km, it is time for the first oil and filter change. The initial startup and driving will generate a significant amount of fine metallic particles due to piston ring seating and component wear-in. Drain the oil, replace the filter, and refill with fresh break-in oil. Inspect for leaks and double-check all fluid levels after the oil change.**
- 3 Continue break-in driving until you reach a total of 750 km (approx. 465 miles). Maintain the same cautious driving behavior as before, using the break-in ECU map. Avoid cruise control and do not maintain steady RPM or load for extended periods. Continue to stay out of boost during this phase.**
- 4 At 750 km, it is time to change the oil and filter again. Even at this stage, fine metallic particles from ongoing piston ring seating will still be present in the oil. After this change, you may now switch to high-quality synthetic oil, as the engine is entering the final phase of break-in.**

Make it a habit to check your engine oil level every 100 km during the break-in period. Built engines, especially during early break-in, may consume some oil as the piston rings are still seating, this is normal. However, oil consumption should not exceed 0.5 liters per 2,500 km. If oil consumption deviates, please let us know.

6. Tuning & Full Load Operation

Once the engine has completed the 750 km break-in period and has passed all quality control checks, it is ready for professional tuning. At this stage, you may also switch to your intended long-term fuel (e.g., ethanol blend, race fuel, etc.), if applicable.

Proper and professional tuning is absolutely essential for long-term engine health and performance. Full-load tuning must be carried out in a controlled environment, with real-time monitoring of ECU parameters through data logging. This enables precise adjustment of fuel delivery, ignition timing, and boost control to suit the engine setup and the vehicle's intended application. Tuning must be performed by a qualified and recognized professional with experience in engine calibration.

After the dyno tuning session is complete, it is highly recommended to change the oil and filter once more. During tuning, the engine operates under full-load conditions and may be exposed to excessive fuel, elevated temperatures, and increased stress. This can degrade the oil and reduce its protective properties. Replacing the oil and filter at this stage removes any remaining contaminants and ensures a clean start for regular operation. From this point forward, the engine can follow a standard oil change interval.

IMPORTANT:

The customer or installer is solely responsible for verifying that all components, calibrations, and tuning strategies are suitable for the engine's intended use.

RECOMMENDED OILS

Setup & Fuel Type	Recommended Oil	Oil Type	Change Interval
Stock or Lightly modified - Euro 98 (RON 98)	- Motul 6100 Synergie+ 10W-40 - Ravenol HST 5W-40	Synthetic (Group III / PAO blend)	Every 8.000 - 12.000 km (Or once a year)
Mildly modified to Build engine - Euro 98 (RON 98)	- Motul 8100 X-cess Gen2 5W-40 - Ravenol VST 5W-40	Synthetic (high ZDDP / HC-synthese)	Every 5.000 - 8.000 km (Or once a year)
Build engine - E85	- Motul 300V Competition 10W-40 - Ravenol RSR 10W-50	Ester-based (Group V / PAO-ester)	Every 2.000 - 2.500 km
Break-in period (all builds)	Ravenol Break-in SAE 30 Mineral Oil		See pages 6 till 9

Note: For built engines running RON98 but used on track or in endurance conditions, a full ester-based race oil such as Motul 300V or Ravenol RSR 10W-50 is strongly recommended.

IMPORTANT:

All maintenance and service procedures not explicitly described in this guide must be carried out in accordance with the original factory service manual for your specific vehicle or engine type. This includes, but is not limited to, fluid intervals, coolant service, belt and chain tension, and other system inspections.

NOTE:

The recommended oils and change intervals are based on maximum engine protection. While modern engines may allow for extended service intervals, high-stress applications, especially with modified components or ethanol-based fuels, require more frequent oil changes. These specifications serve as a general guideline and are not binding.



SHOW US YOUR BUILD!

We love seeing our engines and components out in the real world!!

Share your build and tag us on social media @4revision_engines and show us what you've created.



Join our community on Instagram, Facebook, and YouTube for more engine-related content, behind-the-scenes footage, and updates from fellow builders.

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