



## ENGINE STARTUP AND BREAK-IN PROCEDURE

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Congratulations! You have purchased the finest, most reliable remanufactured engine on the market, engineered and built to provide you with miles of trouble-free motoring.

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What comes next is in your hands – ignition! Please follow our guidelines in this critical step of starting your engine and taking it to operational level. Doing so will help minimize headaches, heartaches, and financial loss. How you prep, start, adjust, and drive and perform maintenance will determine largely the smoothness, efficiency, power and longevity of your new S&J engine. Read our recommendations thoroughly before proceeding.

***You've got this!***

### ***Pre-Startup Inspection:***

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#### **Intake and exhaust manifolds:**

**We recommend strongly to use all new peripherals components, using new fasteners and gaskets per OEM manufacturers recommendation.** Make certain that the intake manifold is in place: new gaskets and fasteners secured exactly according to your engine's specific tightening order and torque readings. Same with the exhaust manifolds (or headers). Some engines (i.e., certain Mopar engines) require a new, OEM intake manifold: failing to comply to this requirement can void your warranty.

Never attempt to start the engine without exhaust manifolds in proper place!

### **Drive belts:**

Use only new drive belts for your engine. This includes water pump, fan, air conditioning, and any ancillary items. Verify that all are properly installed, aligned, and tensioned.

### **Engine cooling system:**

Ensure that the engine cooling system is fully functional and is filled with the prescribed amount of coolant mixture. We recommend strongly new radiator, water pump and hoses.

As your engine is being started for the first time leave the radiator cap off or use a vented cap, as there will likely be trapped air. We recommend filling the cooling system several hours before startup to allow some of the air to travel to the surface. During the initial startup, air will likely be exiting the cooling passages. Watch for this and the engine temperature readings that may fluctuate during the process.

### **Ignition system:**

Use only new coil packs, injectors, sparkplugs, sparkplug wires, distributors, etc. for the engine ignition system. Ensure that all components are matched to your engine type and application before starting.

### **Engine oil:**

Use the oil supplied with your engine. It is designed specifically for the break-in phase. Use only the finest oil filter. Your new engine will be **seating** during the initial break-in phase, and **residual machining material** will be entering the oil system. Oil filter choice and performance is essential. When installing the oil filter, fill with oil at least halfway to help prevent starvation and engine metal-to-metal contact of internal moving parts.

### **Engine priming:**

It is vital to prime your engine with oil before starting, as the engine is “dry.” Internal surfaces and oil galleys require an adequate amount of lubricant before ignition. **The oil pump and oil galleys (passageways) must be filled and pressurized to prevent oil starvation and metal-to-metal contact, a primary source of engine damage and failure.**

### **Ignition Timing:**

**Set initial timing** for first ignition as per factory recommendations. Given the vast variety of engine configurations and internals, determine your preset by referring to OEM specifications and recommendations.

## ***Get Your Motor Running***

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### **Initial Startup:**

Do not let the engine run at idle speed. Internal fluids need to fill the galleys and become pressurized.

As soon as the engine begins running, bring the rpm to between 1500- 2000 for 15 – 20 minutes while checking coolant temperature and oil pressure. Do not excessively rev or “redline” the engine during this time, nor allow the engine to idle at too low of speed.

During this time monitor closely the cooling system, oil pressure and temperature readings. Verify belt-driven components are operating properly and all wiring is not in harm’s way.

After approximately 20 minutes of run time adjustments, turn off the engine. Allow for adequate time for engine cooling to check fluid levels (water and oil). Again, make a thorough inspection of all aspects of the engine and its ancillary parts. Restart the engine and perform final adjustments.

## ***Head Out On the Highway***

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### **Initial driving:**

For the engine’s first 500 miles of driving use extreme care and be deliberate in the way you operate your vehicle. Do not take the engine to high rpms, and do not subject the engine to extreme stresses, such as towing, excessive revving or driving in extreme high or low ambient temperatures. Vary the rpms instead of a constant engine speed. It is during this critical phase the engine is setting in, with many parts coming into tolerances which will ensure trouble-free driving for the years ahead. No extended idling nor extended high speeds.

### **Between each use:**

Check all fluids (oil, coolant, fuel) for levels and condition before every cold engine start. Visually inspect the entire engine for oil, coolant or fuel seepage or leaks. Verify that wires, hoses, and belts are sound and are in working order and condition.

Use caution when inspecting the engine after use, as temperatures will be high, and fluids will be pressurized.

Allow for adequate engine cooling before you perform the inspections.

## ***Post-500 Miles***

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### **First Oil Change:**

After 500 miles of driving your engine is ready for the first oil change. Change the oil when it is hot/warm as this will remove excess material from the engine. Be careful and take precautions to prevent injury. Do not simply drain the oil and replace it. Removal and cleaning of the oil pan, oil pick up screen, timing cover and valve cover/s, unless prohibitively labor-intensive. These places may have collected metal debris from engine parts bedding in. This is to be expected and this waste must be removed completely. Of course, change out the old oil filter for a brand-new replacement.

Continue to use correct OEM-recommended weight engine oil for your application S&J Engines recommends Lucas Engine Break-In Oil for the initial startup and break-in and Lucas Performance oils for the long run care of your engine.

### **Second Oil Change:**

Due to the vast varieties of engine designs, configurations, and applications, engine-specific, OEM (Original Equipment Manufacturer) becomes your information source. Consult your local, trusted mechanic, dealership or directly sourced manufacturer recommendations.

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Thank you for choosing S&J Engines, the most trusted source for remanufactured engines. Happy motoring!



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