



## Pro Series Engine Installation Instructions

Thank you for purchasing one of LC Engineering performance Toyota engines. Your Pro series long block has been custom built for your application. All LC Engineering long blocks have been started and tested on our engine dyno.

This engine was assembled with a performance camshaft. This higher lift & duration camshaft will emit slightly more valve train noise than the stock camshaft. This is normal. Follow the valve lash specification supplied on the cam card that came with these instructions. Check valve lash regularly at the recommended intervals.

LC Engineering technicians performed initial camshaft break-in. Your engine still needs a break-in period to achieve maximum engine life. Please read and follow the guidelines closely.

These instructions are intended to aid a professional mechanic in the installation of your engine. If you do not feel competent in doing the installation yourself, seek the assistance of a professional. Follow the break-in guidelines closely.

### Installing the Engine

This engine comes with forged aluminum pistons instead of the stock cast aluminum style pistons. This style piston will require you to re-locate your knock sensor on fuel injected applications. Your new engine has a small tag on it to show you the new location of your knock sensor. This location has already been tapped to accept your stock knock sensor. **Failure to re-locate your knock sensor can result in engine damage!**

Follow factory recommendations for installation of intake manifold & carburetor (EFI Intake), exhaust manifold or header system, clutch & flywheel assembly, crank pulley, starter, alternator, etc. A new pilot bearing has been installed in the end of the crankshaft. Install engine in vehicle.

Make sure you install the ground strap on the back of the cylinder head to the firewall. Failure to hook up this ground strap could cause electrolysis, damaging the aluminum cylinder head.

We suggest that the following items be cleaned, inspected and replaced if necessary:

- Carburetor or Fuel Injection System
- Fuel Pump, Fuel Filter & Fuel Lines
- Distributor, Distributor Cap & Rotor
- Coil, Plug Wires & Spark Plugs
- Radiator, Radiator Cap & Thermostat
- Fan Belts, All Hoses & Lines



- EGR & PCV Valves
- Harmonic Balancer
- Flywheel or Flex Plate
- Pilot Bearing & Clutch Assembly
- Engine and Transmission Mounts

### **Before Starting Your Engine**

Check fuel quality. If vehicle has been in storage or not running for more than 30 days drain fuel tank and add fresh premium grade gasoline. Purge old fuel from fuel lines before connecting to carburetor or EFI system. Check system for adequate fuel pressure.

Check battery condition. If vehicle has been in storage or if battery is low, place on battery charger or replace.

Double-check your ignition wiring and firing order. (Firing Order 1-3-4-2) Set the ignition timing to factory recommendations. Improper ignition timing can damage your new engine. Set the timing carefully.

Install oil filter and fill engine with the proper amount of petroleum based engine oil. **Do not use any synthetic oils or oil additives for the first 5000 miles.** Follow factory oil viscosity ratings for your area.

Fill cooling system with the proper amount of coolant. Do not start new engine without coolant in the system. Excessive heat build-up could result in damaging your engine.

Double-check all vacuum hoses. A vacuum leak could cause your new engine to run lean causing permanent engine damage.

### **Initial Startup**

Start engine. Follow procedures below:

**If engine fails to start immediately, stop and check Ignition Timing and Fuel Delivery. Prolonged cranking could cause premature engine failure.**

1. Run engine at 1500 rpm for 20 minutes
2. Turn on heater. Add coolant to radiator as needed.
3. After a 20-minute period, idle down and set idle at factory specifications.
4. Set the Ignition timing at this time to factory specifications.  
**Note:** When setting timing on an EFI engine, you have to jump the terminal in the diagnostic box. Follow shop manual for procedure.



### Break-In

Your LC Engineering engine requires a short break-in period to insure proper performance during the years to come. During the first 500 miles follow these guidelines:

- Do not drive over 65 mph.
- Do not drive for long periods at any single speed. Always vary your engine rpm.
- Do not drive slowly with the transmission in high gear.
- Do not rev the engine at high rpm's excessively.
- Do not tow a trailer or put other heavy loads on the vehicle.

Check the engine oil and coolant levels daily during this period.

After the first 500 miles of service the engine oil and filter must be changed. Check the valve lash and retorque the cylinder head. At this time it is a good idea to recheck the ignition adjustment. Look over the hoses for sign of leakage – water, fuel, and vacuum.

### Maintenance

Your LC Engineering Street Performer Engine requires only normal maintenance after the first 5000 miles. Recommended oil change is every 2500 miles.

**Cam Card and Valve Adjustment.** Included in this packet of instructions is the camshaft card for your engine. Keep this cam card. It contains information on the camshaft timing and valve lash requirements for your engine. On Street Performer engines, lash valves as per factory recommendations. Always check valve lash with the engine hot. Valve lash should be checked after initial engine break-in at 500 miles. Check valve lash again at first oil change or 2500 miles. Then follow factory recommendations.

Miles	Recommended Service
500	Check Valve Lash, Visual Inspection
2500	Oil & Filter Change
5000	Oil & Filter Change, Check Valve Lash
5000 +	Follow normal maintenance schedule as instructed in Owners Manual.

Follow factory recommendations for fuel, spark plugs, plug gap and oil viscosity. LC Engineering recommends NGK or Bosch spark plugs and Valvoline or Castrol oils. **Do not use any synthetic oils or oil additives for the first 5000 miles.**