

IMPORTANT – Please Read

The following information will be important for you to understand before the installation of your 24x system.



24x Small-Block Chevy Hardware Installation Guide

About the Firing Order

The LS1 engine has a different firing order than the early small-block Chevy and LT1 engines. Specifically, cylinders 2&3 and 7&4 have been swapped. If you are building your own engine harness, be sure that you swap injectors and coils 2&3 and 7&4 at the PCM. If you have ordered a new engine harness from EFI Connection, the harness has been built in this way. GM also did this for the 2001-2002 Express Van. The Express Van used an early (Vortec) small-block engine, but was operated with the 12200411 (LS1) PCM.

For proper Closed Loop operation, bank-to-bank fueling can be corrected through the PCM calibration by assigning the appropriate injector to each bank. The easiest solution is to load a calibration from a 2001-2002 Express Van and then copy/paste the injector to bank assignment table values into your LS-based calibration.

Knock Sensor(s)

The LS1 PCM accepts up to two knock sensors. EFI Connection has been using the 96-97 LT1 Camaro/Firebird knock sensor with 24x conversions on both early Small-Block Chevy and LT1/LT4 conversions. While a knock sensor is not required, it is strongly recommended. Knock sensor settings can be configured/reconfigured within the PCM calibration.

Installing the 24x Crankshaft Reluctor

The crankshaft reluctor simply installs on the snout of the crankshaft and is indexed by the crank timing sprocket key. After final assembly, the reluctor is held firmly in place between the crank timing sprocket and harmonic balancer. The crankshaft reluctor adds about 2.5mm of thickness, causing misalignment of the accessory belt. Be sure to either install a 96-newer Vortec balancer or mill the thickness of the reluctor from your balancer before final installation.

Installing the Vortec Timing Cover

When GM began using the plastic Vortec timing cover, the sealing face of the block was slightly changed. Be sure to test fit the Vortec timing cover to your engine to observe any areas where you will need to generously apply RTV silicone sealant. Engine blocks prior to 1996 WILL seal if sealant is applied correctly. Some have applied JB Weld to the face of the block for an additional sealing surface. JB Weld is not required.

Installing the Distributor (Camshaft Signal Adjustment)

If your distributor contains a hold down, it must be removed and replaced with a standard distributor hold down if you are not using a production GM Vortec intake manifold.

1. Before camshaft sensor installation, rotate the engine to align the timing mark on the timing cover and crankshaft balancer to 0 degrees top dead center (TDC). Also be sure that the number 1 cylinder is on the compression stroke, or that the intake and exhaust valves are closed.
2. Remove the cover from the camshaft sensor (Vortec distributor).
3. Before installation, align reluctor wheel as pictured on right so that the reluctor wheel cutout is in approximately the two o'clock position. This is not the proper alignment for final installation, but should help to provide proper alignment after the distributor is inserted into the engine.



4. Allowing the reluctor wheel to rotate freely, install the distributor into the engine until the distributor is seated on the intake manifold. The reluctor wheel will turn clockwise as the distributor gear engages with the camshaft gear.
5. Once seated, you can turn the distributor housing to change camshaft position. When properly installed, the reluctor wheel cutout should be in approximately the four o'clock position as pictured below.



Additional notes on camshaft sensor installation and alignment:

The camshaft position is used by the PCM to determine, for a given cylinder, whether the piston is on the intake or exhaust stroke. With the ignition key in CRANK or ON, the PCM will monitor engine RPM (the crank sensor signal). If, after several seconds of cranking, the PCM does not see an increase in RPM (engine has not started), it will assume an improper cam position (engine stroke) and assume the opposite stroke in an attempt to start the engine.

An improper installation may...

- set a P1345 DTC - Cam Sensor Alignment
- cause extending cranking before starting
- cause the engine to backfire while cranking

Questions?

Please contact us at troubleshooting@eficonnection.com with any questions.