

## ENGINE INSTALLATION INSTRUCTIONS

Use the existing thermostat housing so that it will connect to your radiator. Use of a 180° or 185° thermostat is suggested.

Be sure the engine has plenty of crankcase ventilation. The minimum is two ½" tubes. Don't use a PCV valve, as they can be restrictive. For performance engines, venting these hoses into a catch bottle is recommended.

Set initial ignition timing to about 5° advance.

After engine is installed and ready to start – **STOP**

- Be sure battery is fully charged.
- Remove the banjo bolt where the oil line exits the rear of the block. Pour motor oil down the hole in the block to prime the oil pump. Reinstall bolt.
- Remove the oil filter and pour it full of motor oil and reinstall.
- Fill the engine with motor oil – NOT synthetic during break-in. A 30w oil will be fine
- When you are ready to start the engine, remove the spark plugs. Spin the engine with the starter until oil pressure goes up to normal on the oil pressure gauge, and stays. It may take a while.
- Let the starter cool periodically to prevent burning it out.
- Check for oil, coolant and fuel leaks during this spinning.

Reinstall the spark plugs and start the engine. Run it for several minutes, checking gauges frequently and checking for leaks. Keep RPMs between 1000 and 2000 during this initial run.

For break-in, we recommend keeping RPM's under 3500 for the first 200 miles, then under 4500 until 500 miles. Avoid long periods of steady speed/steady throttle position. Don't use the Interstate highways for the early break-in as they require steady speeds. Winding, secondary roads (the fun type) are best for break-in as they require the on throttle/off throttle driving that results in best break-in.

Leave break-in oil in for at least 800 miles, or until oil consumption is nearly zero. To assure very through break-in you may wish to change the oil at about 500 miles, using standard oil again. Change to synthetic when break-in is complete (may take up to 2000 miles – usually less).

Use 93 octane fuel if compression ratio is 9:1 or higher.

**Ignition Timing:** After engine is at least moderately broken-in, use the following procedure to get a precision ignition timing. Don't use the vacuum advance. Set the 'clicker' wheel on the distributor to the middle of its range. It can then be used for fine-tuning ignition timing. Eleven clicks of this thumbwheel equals one degree of ignition timing. Advance and retard directions are marked on the distributor housing.

The advance mechanism on these old Lucas distributors is too inaccurate to use with conventional timing procedures on a performance engine. This method assures accurate timing where it is most important – at RPM ranges where substantial horsepower is produced.

The first step to this method is: obtain a helper that you can trust to rev the engine high – but not too high.

Make extra marks on the crankshaft pulley so that you can identify 20° and 30° advance. Use the existing timing pointers to establish where to put these marks.

Next establish at what RPM the mechanical advance is fully advanced. Do this by observing the ignition timing with a timing light while the helper slowly increases engine speeds while you observe timing. This will vary, generally somewhere between 3000 RPM's and 5000 RPM's.

Finally adjust the timing by having your helper rev the engine to about 500 RPM's higher than the speed at which maximum mechanical advance occurs.

It is only necessary to keep the engine at this high RPM for a few seconds to read the timing. Adjust and recheck until timing is about 28° BTDC.

After engine is fully broken in recheck timing by this method. Timing of 29° BTDC may be used if it does not cause the engine to run at a higher temperature.

We find that Lucas distributors will result in ignition timing that is not the same on all four cylinders. It's rapid ignition point wear results in it being hard to maintain accurate timing. To fix this problem, we recommend use of the Crane XR700 electronic trigger ignition. Use of these for many years on street and race engines has shown them to be very reliable, and they give accurate, consistent ignition timing. They are rather easy to install. They are available at many aftermarket sources. Rivergate offers them for \$99.