Effect of Fuel Line Vibration on Engine Performance

In normal operation of a model piston engine (such as in a model boat, airplane or helicopter) fuel from the fuel tank is transferred to the engine through a flexible fuel line (usually made of silicone tubing). The fuel tank itself is normally located inside a body or framework of the model, so the fuel line generally must pass through a bulkhead or wall in order to reach the engine. Modelers typically seal the hole in the bulkhead or frame to prevent fuel from entering the body of the model, and often support the fuel line in some fashion to prevent the fuel tubing from chaffing against the framework.

If the fuel line is securely attached to the model body or framework, engine vibration transmitted to the fuel tubing can reduce the fuel flow through the tubing. This means that the engine may idle well (when the vibration level is low), but may not run at top speed (when the vibration level is high). The engine may also overheat at high throttle settings (at high vibration levels) because fuel flow is reduced and the fuel/air mixture set by the needle valve on the carburetor goes “lean”.

To reduce the possibility of fuel line vibration, do not attach the fuel line securely to the model body or framework. Instead, use oversize holes in bulkheads to allow the fuel line to slide easily relative to the body or framework. In addition, avoid securing the fuel tubing in an orientation parallel to the engine piston cylinder. Because piston engines produce a small explosion and shock on every piston stroke, vibration is highest in the direction of piston travel (parallel to the piston cylinder).

If you own a Lite Machines Model 110 helicopter, make sure the fuel line slides easily through the fuel line hole in the keel. If you are at all unsure of your fuel line installation, remove (and discard) the rubber grommet to allow the fuel line to slide more easily. After about every thirty flights inspect the fuel line for chaffing against the keel.