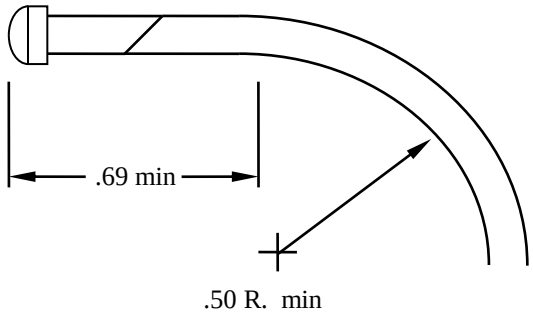
APPENDIX H

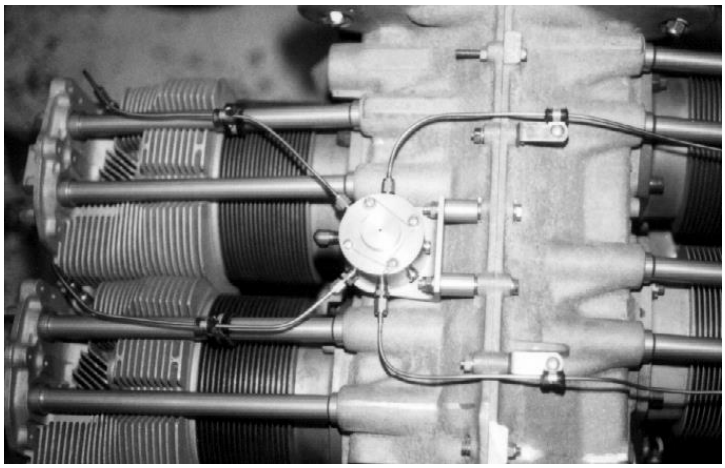
NOZZLE LINE INSTALLATION

The following deals with stainless nozzle line installations. The material can be easily bent by hand or with a small tube bender.

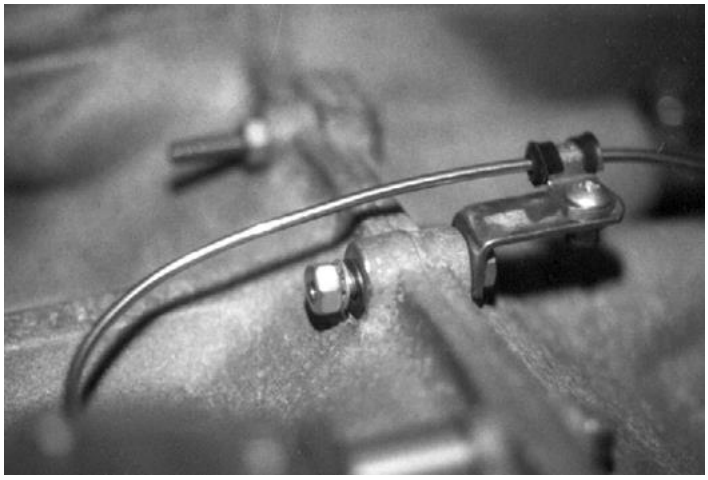


Use the above sketch as a guide for bending nozzle lines. Stainless lines will work harden. Do not attach to structures with relative motion (like the engine mount and the engine). Lines need to be supported every 6 to 8 inches. Use MS21919WDG2 clamps to clamp nozzle line to support structures.

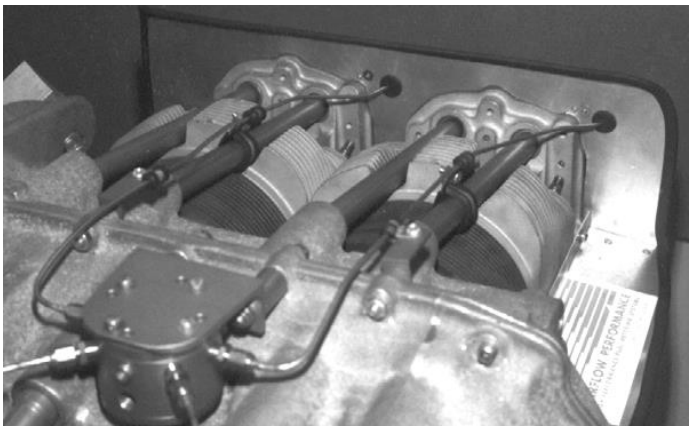
On down draft cooled Lycoming's the nozzle lines are routed and supported on the push rod tubes. 'L' brackets support the lines as they cross the center of the crankcase.



Attach “L” brackets to the crank case centerline bolts. Longer bolts 1/4-20 X 1 1/2” are used with a star lock washer MS35333-40. Use the existing 1/4-20 plain nut.

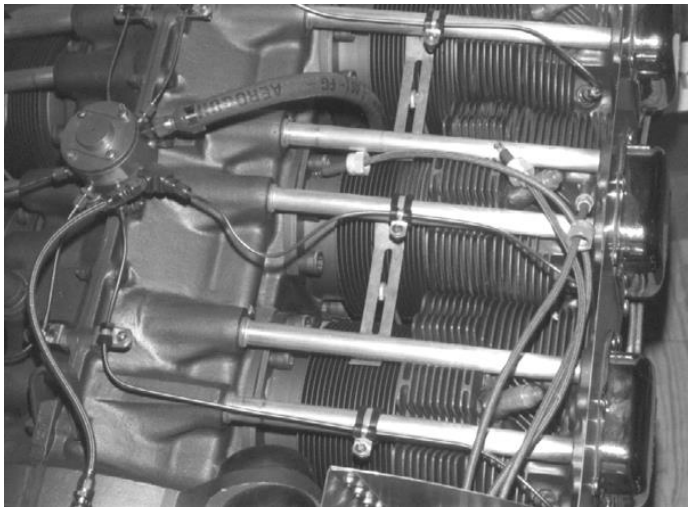


On installations using down draft cooling but the injector nozzles are installed in the primer ports, the nozzle lines are routed through the baffling as shown. Bore a 9/16” hole to install the MC-9307K41 grommet, which will support the nozzle line as it, passes through the baffle.

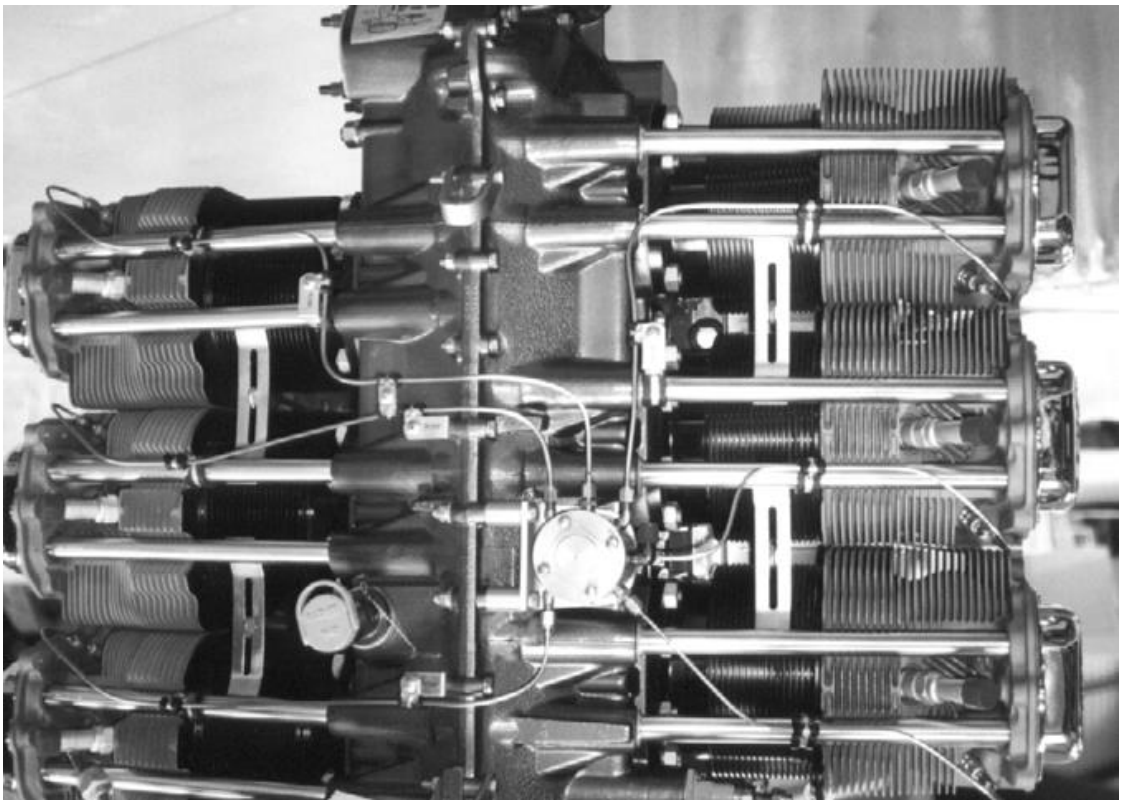


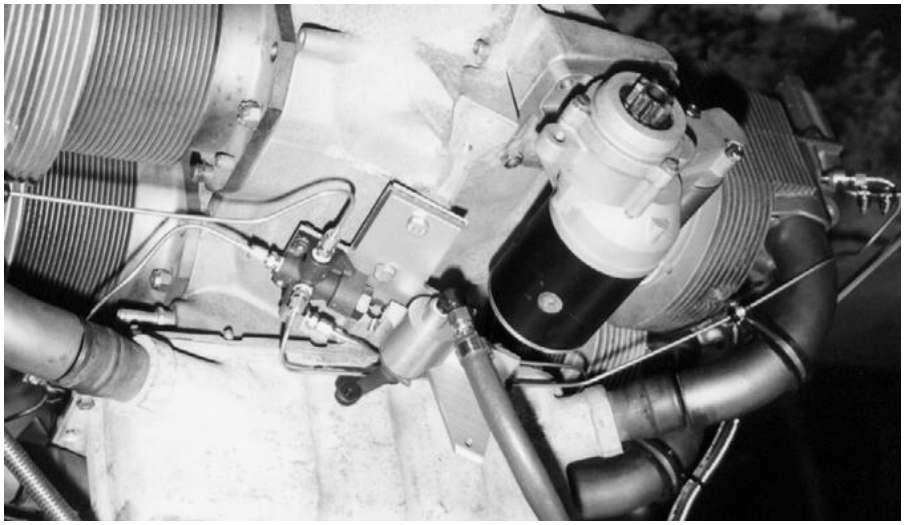
Route the nozzle line beside the valve cover and to the injector nozzle at the primer port.

For a center mounted flow divider on a Lycoming 540, there are 4 21" nozzle lines and two 17" nozzle lines. Route and clamp the lines as shown using the four "L" brackets on the 21" lines. Support the lines as they are routed down the push rod tubes with cushion clamps.



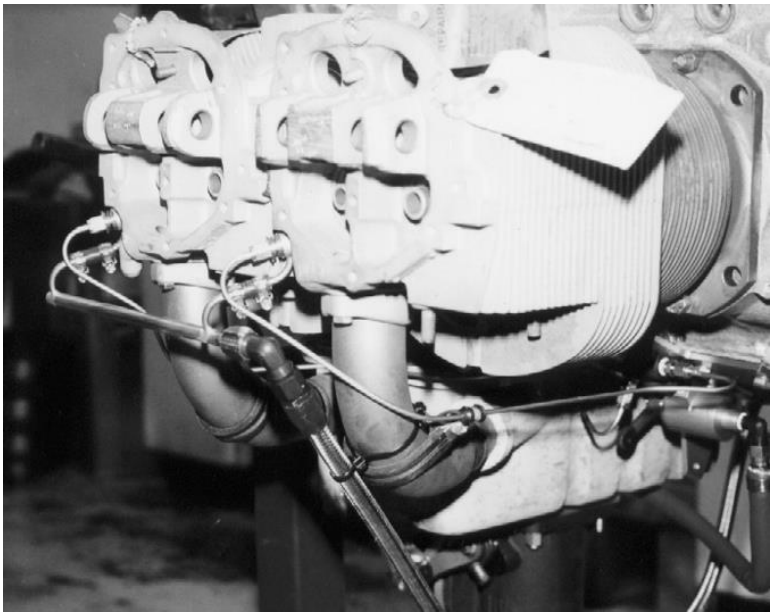
For Lycoming 540's with side mounted flow dividers, route and clamp the lines as shown.



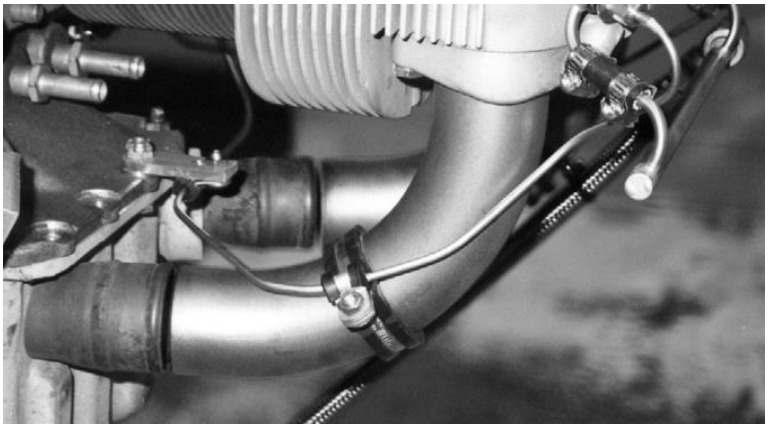


On up draft cooled engines, the line are routed under the engine and attached to injector nozzles in the primer ports. Keep lines away from the exhaust pipes. Route and clamp them to the intake pipe.

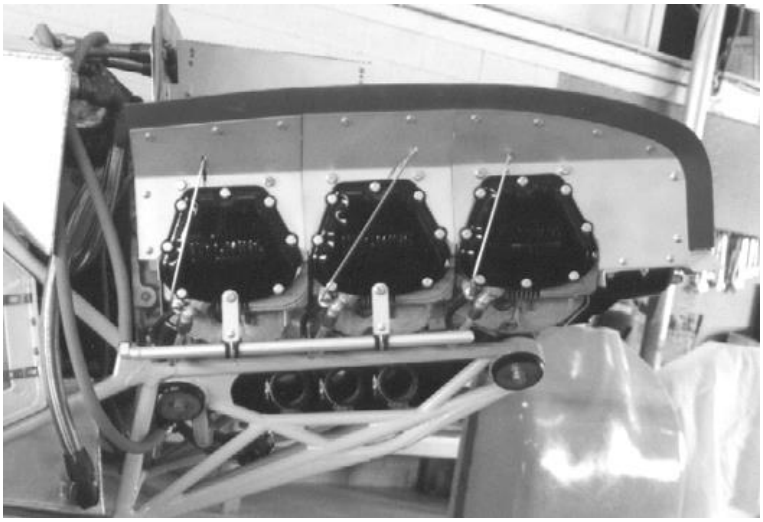
Support the lines along the oil sump using “L” brackets to provide stand offs from the oil sump mount bolts to the nozzle line clamps.



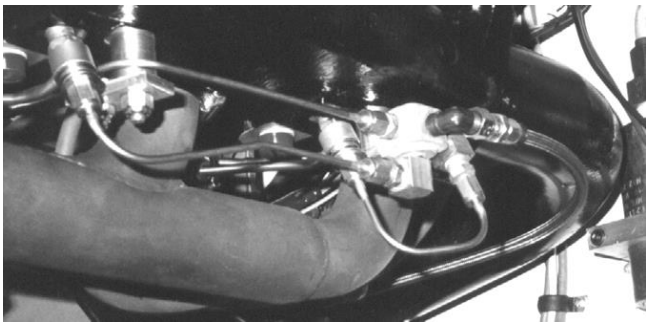
Another view of the clamping arrangement for securing the nozzle lines on an up draft cooled engine.



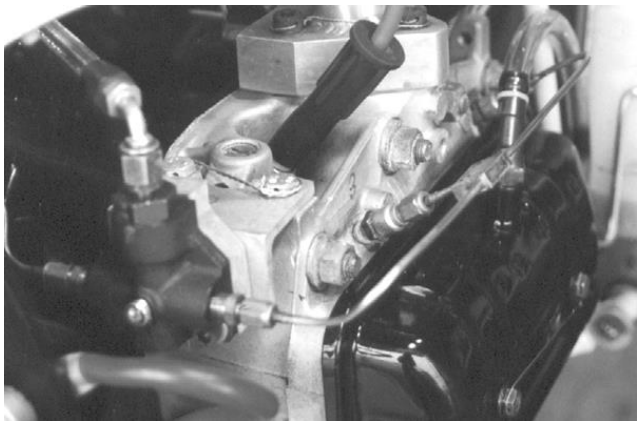
Routing of the nozzle lines through the baffle on a Lycoming IGSO-480.



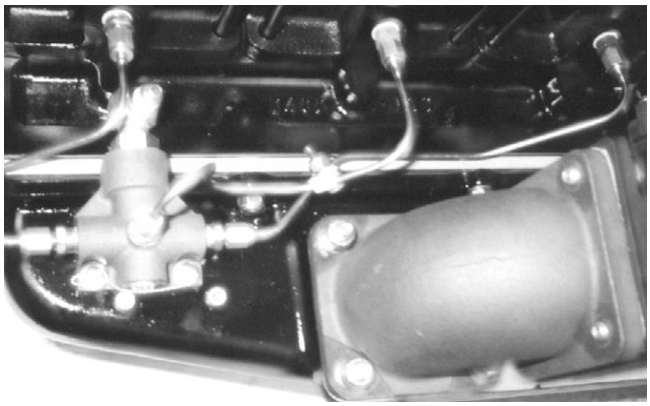
Nozzle lines routed on a six cylinder Franklin engine. With the lines in close proximity to the exhaust pipe, some kind of heat shield must be fabricated to keep the fuel from boiling in the lines.



This installation is on a Subaru EA 81 engine. Note how the nozzle line is teed to each injector nozzle. There is one line to each side of the engine, and then the line is teed of to each nozzle. This keeps the velocity of the fuel up in the nozzle line since the engine uses little fuel at idle and low power. This helps with fuel boiling in the lines and removes the air from the lines faster on start up.



This installation is on an AMW three cylinder two-stroke engine. The injector nozzles are installed in the boost port of the cylinder.



Injector nozzles mounted in the intake pipe of this four cylinder Franklin engine. Note the vent lines connected to the nozzle shroud tubes.