

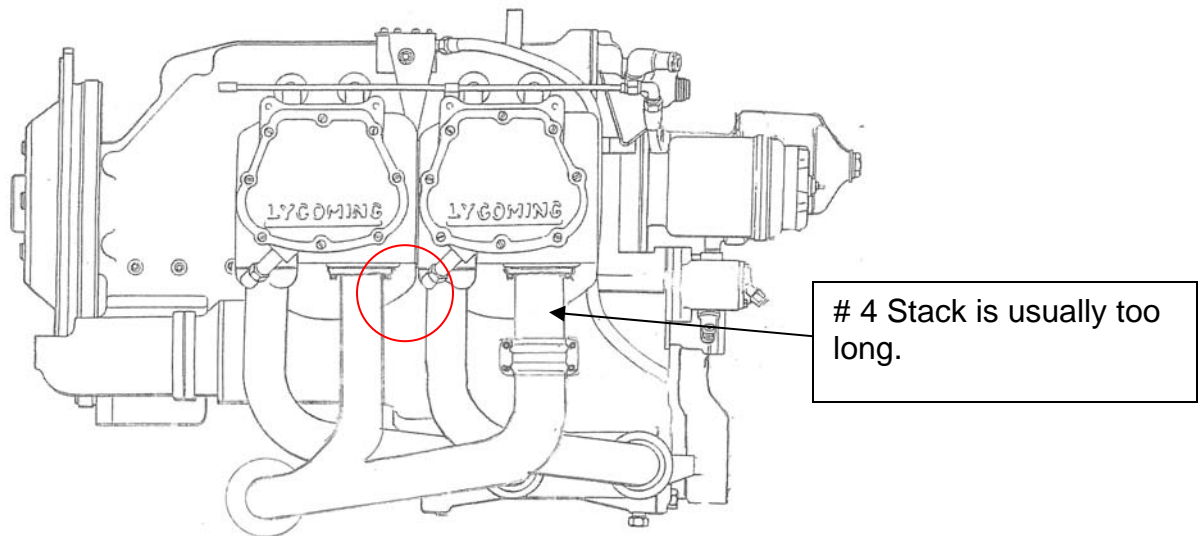


# ENSTROM HELICOPTER CORPORATION

## Piston Engine Exhaust Leaks

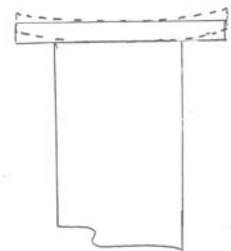
There are two primary causes of exhaust leaks, either the exhaust pipe flange is warped or the exhaust pipe flange is not fitting flat on the cylinder exhaust port.

Most exhaust leaks are found where the exhaust pipe is bolted to the #2 cylinder port and this usually indicates a fitting problem caused by the #4 exhaust stack being a bit too long.



If you are seeing indications of exhaust leakage in the area shown by the red circle, the issue most likely is caused by the 4 stack being too long. A second cause can be a warped flange on the exhaust pipe.

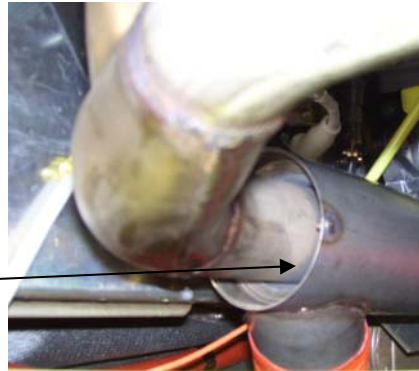
The warped flanges are usually caused by over-tourquing the retention nuts. This is because the center part of the gasket is thicker than the flange around the outside edge.



To repair the exhaust leak first you will have to determine which of these two problems is the issue (possibly both are!)

1. Loosen the four exhaust nuts on the pilot's side of the engine (the right side).
2. Remove the clamp on the #4 stack, and the nuts holding the #2 exhaust pipe to the cylinder.
3. Spray some lubrication oil into the area where the stack inserts into the muffler, this is a slip joint.

Slipjoint



4. Disconnect the wires for the EGT probes under the blue insulation tubes. **Do not try to remove the probes from the exhaust pipes.**
5. Remove the #4 exhaust stack and re-install it without the gasket.
6. Re-install the #2 exhaust stack without the gasket.
7. Use a .001" feeler gauge to measure the gap between the exhaust pipe flange and the cylinder exhaust port, especially around the back side of the exhaust port



8. if the feeler gauge can be inserted between the exhaust port and the exhaust pipe on the back side, but not on the near side, then the #4 exhaust stack is too long and is preventing the exhaust pipe from sealing against the exhaust port.
9. There is no way to adjust the length of the #4 exhaust stack so the only remedy is to adjust the relative length of the two exhaust pipes by shimming with gaskets.

## **NEVER INSTALL A COPPER EXHAUST GASKET ON A TURBOCHARGED ENGINE**

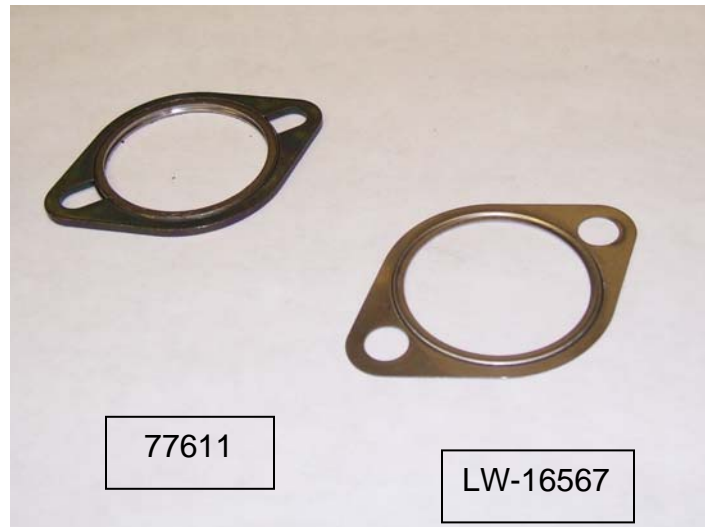
10. The first step is to check the exhaust pipe flanges for straightness and to repair them if they are not straight.
11. Place the flange on a flat surface such as the anvil surface of a vise.
12. If a .001" feeler gauge can be inserted between the flange and the flat surface, then the flange is warped.



13. A large punch and hammer can be used to tap the flange against the flat surface of the vise to straighten the flange. The stainless steel is quite soft and can normally be re-shaped to repair the warpage.



Lycoming makes two types of gaskets that can be used on the exhaust pipes of turbo-charged engine. By using a combination of these two gaskets, the problem of the #4 exhaust stack being too long can usually be fixed.



14. Clean the exhaust ports on the cylinders using a wire brush or sandpaper and reassemble the two exhaust stacks using two of the LW-16567 gaskets under the #4 exhaust pipe and one 77611 and one LW-16567 gasket under the #2 exhaust pipe.
15. Use anti-seize compound in the slip fit area of the heat exchanger and between the stack slip joints.
16. Use the feeler gauge to determine if the exhaust pipe flanges are sealing all the way around the exhaust port.
17. Correct gaps between the exhaust port and the exhaust pipe by varying the stack up of the two types of gaskets.
18. Torque all of the nuts to 90 in/lbs.
19. Connect the EGT Probes
20. Run the engine, check for leaks and re-torque the exhaust nuts.