

The Restrictor

The job of any restrictor is to slow down the cold air transiting the heat exchanger allowing more time for the exhaust manifold to transfer its heat to the passing air molecules and eventually into the cockpit.

Most heat exchangers on the market today come with a fixed restrictor, i.e. a set of pre-drilled holes in the canister body. It is a “one size fits all concept”. This restriction, either fixed holes or my removable design, is always located at the heat/output side of the heat exchanger.

The heat exchanger you have received has the advantage of flexibility.

The copper windings surrounding the aluminum rods transfer the exhaust manifold’s heat to the surrounding air more efficiently than a fixed restrictor without reducing the flow to any measureable degree. In aircraft (usually tandem seating) where there is a long run of scat tubing to the back seat, some operators are electing not to use the removable restrictor at all in order to obtain maximum airflow. Those flying side by side aircraft with shorter scat runs and not needing the greater flow are installing the removable restrictor and adjusting the hole’s size to tailor their heat/airflow requirements.

With any type of heat exchanger of this basic design there is a direct relationship between available heat and airflow. Increasing the airflow (enlarging the holes in the restrictor) will reduce the heat available. Conversely reducing the airflow will cause the available heat to rise.

The removable restrictor comes with one 3/8th in. center hole and eight 1/4th in. holes. This restriction has proven to be a good starting point. After installation, fly the aircraft first with the supplied removable restrictor and note the heat output vs. airflow. On the second or subsequent flights, fly the aircraft without the removable restrictor and note the heat output vs. airflow. Try to perform these test flights with the same outside air temperature and cruise airspeed. Heat output measurements should be taken at the same location, i.e. firewall or eyeball vent, during your test phase. Based upon your test flights, you now know the upper and lower parameters of the heat exchanger for your aircraft. If you feel that the ideal (sweet spot) is somewhere in between the two initial test flights, you have the flexibility to progressively enlarge the holes in the removable restrictor, reinstall in the heat exchanger and resume your test program until satisfied with the heat output vs. airflow requirements. When satisfied with your “tuning” of the heat canister, I suggest you pop rivet the removable restrictor to the output tube.

There must be a flow of air through the heat exchanger at all times to prevent overheating the unit.

INSTALLATION INSTRUCTIONS

This heat exchanger has been machined for your specific exhaust system. The end caps are designed to capture the circumference of the exhaust tube and are rigidly held in place through the use of the two provided worm gear clamps.

When properly located over the exhaust tube you will find that there is an exposed seam i.e. the two halves do not touch each other. This is normal and allows for secure fit of the end caps to the exhaust manifold. Try to make the seam equal on both sides of the canister during installation. In addition, please notice that when properly installed the punch marks on each end of the canister are opposite each other. This insures that both halves are orientated in the same direction that they were machined.

The removable restrictor should be positioned in the out or hot side of the heat exchanger.

It is important to locate the worm gear clamps outboard of the intake/exhaust tubes and the end caps. As the end caps are machined specifically for the diameter of your exhaust tube, this is where you want the clamping force to be located.

Do not place additional worm gear clamps around the unit as this will tend to reduce the effectiveness of the end caps capturing the exhaust tube.

Check for security of the canister especially after a few initial flights and certainly during your Condition Inspections.