

ES1008 501 water injection conversion

Reduce nitrous oxide emissions and increase power output

energy

Engineered solution purpose

This engineered solution reduces emissions and augments power by injecting de-mineralised water into the combustion system

Applicability

All gas fuel 501 engines not using Dry Low Emissions combustion technology

Technical description

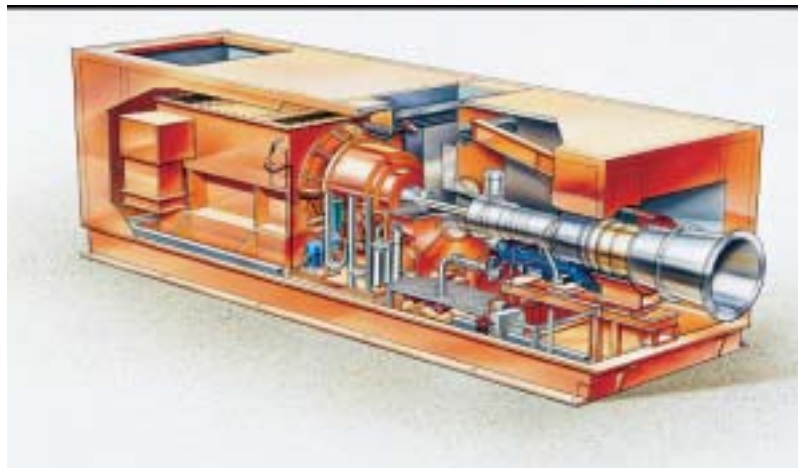
The de-mineralised water is directly injected through the fuel nozzles. The water must meet the requirements of Rolls-Royce water specification EMS124D and is consumed at an approximate rate of 6 gallons per minute. By injecting water, the firing temperature is reduced and lowers emissions for a given power setting. The added mass of the water provides additional power.

Benefits

Typical nitrous oxide reductions from 90 volumetric part per million to 25 vppm at 15% O₂, dry can be achieved. The expected power increase can be between 6% and 7%.

Experience

Water injection has been employed on hundreds of 501 engines and has accumulated millions of hours operational experience.



Scope of work

- Replace combustion liners (if required)
- Replace fuel nozzles
- Install water manifold
- Install water-fuel ratio controller
- Install misc. piping, check valves, fittings
- Install water treatment facility (if required) and necessary plumbing
- Modify or replace control system

Bill of materials

- Combustion liners (if required)
- Fuel nozzles
- Water manifold
- Water-fuel ratio controller
- Misc. piping, check valves, fittings
- Water treatment facility (if required) and necessary plumbing
- Control system modification

Undertaken

At site

Bundling opportunities

- 501 combustion liner upgrade [E1001]
- Controls upgrade [ES6006]
- De-mineralised water treatment skid

