

Combustion System Repair Kit

Overview

The GTR-COMBUST-MAJOR-002 Combustion System Repair Kit is a comprehensive maintenance package designed for major combustion system overhauls. With a total weight of 650 pounds and a lead time of 12-14 weeks, this kit contains all essential components required for complete combustion system restoration.

Critical Components

Primary Combustion Elements

The combustion system's core functionality relies on several critical components manufactured to the highest standards. The **Combustion Liner (CB-LNR-001)** serves as the primary combustion chamber, with 18 units constructed from Hastelloy X material. These liners undergo cold formed sheet fabrication with welding, followed by solution heat treatment at 2,150°F for 0.5 hours with air cooling. An oxidation-resistant surface treatment ensures durability in high-temperature environments.

Supporting the combustion process are 18 **Transition Pieces (CB-TRN-001)** made from Inconel 625. These components utilize hot forming and machining processes, with solution heat treatment at 2,000°F for one hour. The stress relief and passivation surface treatment provides enhanced corrosion resistance and structural integrity.

Fuel Delivery System

The fuel delivery system centers around 18 **Fuel Nozzle Bodies (CB-FUL-001)** precision-machined from 316L stainless steel bar stock using CNC processes. These critical components receive solution annealing at 1,900°F and electropolished surfaces for optimal fuel flow characteristics and cleanliness requirements.

Ignition capability is provided by 2 **Silicon Carbide Igniters (CB-IGN-001)** manufactured from reaction-bonded silicon carbide through ceramic molding and sintering processes. Sintered at 2,200°C, these igniters maintain their as-sintered surface finish for reliable spark generation.

Combustion Chamber Integration

The combustion chamber's structural integrity depends on 18 **Crossfire Tubes (CB-CFD-001)** fabricated from Inconel 625 seamless tubing with welded ends. Mill annealing and passivation treatments ensure proper metallurgical properties and corrosion resistance for cross-combustor flame propagation.

Sealing between combustion components is achieved through 36 **Combustor Gaskets (CB-GSK-001)** die-cut from Inconel 625 sheet material. These important-level components undergo soft annealing with oxide scale removal to maintain proper sealing characteristics under thermal cycling conditions.

Important Support Components

Thermal Protection Systems

Thermal management within the combustion system relies on 14 **Refractory Tiles (CB-REF-001)** composed of 85% aluminum oxide and 15% silicon dioxide. These tiles are dry-pressed and fired at 1,650°C with a glazed surface finish to provide thermal barrier protection and heat reflection properties.

Additional thermal protection is provided by 12 **Insulation Blankets (CB-INS-001)** made from aluminosilicate ceramic fiber. The needle-punched manufacturing process creates a flexible insulation medium, with organic binder burnout and refractory coating application ensuring high-temperature performance stability.

Mechanical Support Elements

Mechanical support and vibration control are managed by 72 **Combustor Springs (CB-SPR-001)** manufactured from Inconel X-750. These springs undergo cold coiling and grinding, followed by solution treatment at 2,050°F and aging at 1,300°F for 20 hours. Shot peening surface treatment provides enhanced fatigue resistance for extended service life.

Temperature monitoring capability is integrated through 18 **Thermowell assemblies (CB-THW-001)** hot-forged and machined from Inconel 600. Solution heat treatment at 2,150°F for one hour, combined with pickling and passivation, ensures accurate temperature measurement and corrosion resistance in the combustion environment.

Standard Assembly Materials

Joining and Sealing Materials

Assembly of the combustion system components requires specialized joining materials. The kit includes 2 pounds of **Braze Alloy (CB-BZE-001)** consisting of BNi-2 composition (Ni-7Cr-3B-3Si-3Fe) in gas-atomized powder form. This vacuum-melted alloy is provided in -325 mesh size for precise brazing applications requiring high-temperature joint integrity.

Final assembly and sealing operations utilize 12 tubes of **Ceramic Adhesive (CB-CER-001)** based on aluminum phosphate chemistry. This ready-to-use adhesive undergoes chemical mixing and air drying processes, providing reliable ceramic-to-metal bonding for combustion system assembly completion.

Manufacturing and Quality Standards

All components in this repair kit are manufactured to strict aerospace and industrial gas turbine standards, with critical components receiving the highest level of quality control and inspection. The combination of advanced materials, precision manufacturing processes, and specialized heat treatments ensures reliable performance in demanding combustion environments. The 12-14 week lead time reflects the complex manufacturing requirements and quality assurance procedures necessary for these high-performance components.