

# Frame 7FA.03/.04 New Rotor

New manufactured rotor certified for 144,000 FFH of remaining life



The lifespan of heavy frame gas turbine components is limited. Experience indicates that age-related risk, including forced outages, increases exponentially when gas turbine components are operated beyond their design life.

EthosEnergy's new rotor offering is intended for rotors approaching or exceeding 144,000 Factored Fired Hours (FFH) or 5000 Factored Fired Starts (FFS) and is available as an exchange or fleet program.

EthosEnergy's 7F rotor is aligned to meet all pertinent OEM TILs including safety-critical TIL-1576,

Proven OEM design and materials are used for EthosEnergy Frame 7FA.03/.04 compressor and turbine rotor discs.

## KEY FACTS

### Expected Rotor Life

144k FFH,  
5k FFS

### Rotor Disc Materials

NiCrMoV,  
NiCrMoVNb alloy,  
IN718 alloy

## Specifications Overview

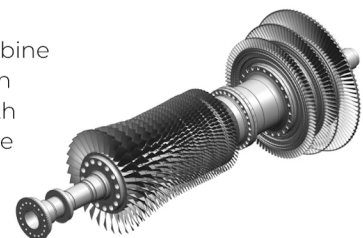
Rotor will be provided as fully bladed on compressor section and no buckets on turbine section. If requested, customer provided or EthosEnergy buckets will be installed on the turbine rotor prior to delivery. The compressor rotor will be interchangeable with frame 7FA.03/.04 flared compressor rotors. The turbine rotor will be interchangeable with enhanced cooling slot Gen 4 design equivalent.

Turbine rotor newly manufactured components:

- New stage IN718 1-3 turbine wheels and bolting hardware
- New stage IN718 1-2 and 2-3 spacer
- New distance piece and aft stub shaft

Compressor rotor newly manufactured components:

- New stages R0-R17 wheels
- Stages R12-R17 wheels with round bottom slots
- Stages R0-R17 blades with enhanced R0 design
- New compressor bolting
- New marriage hardware
- New compressor blades



Dimensions:  
28' 0" x 7' 6"

Approx.  
Shipping Weight:  
96,000 lb (rotor);  
10,000 lb (skid)

## COMPRESSOR ROTOR

EthosEnergy will provide a fully-bladed, balanced compressor rotor with following characteristics. The rotor will be compatible with Frame 7FA.03/.04 units subject to additional technical review by EthosEnergy Engineering:

- Compressor rotor will be interchangeable with frame 7FA.03/.04 flared compressor rotors.
- Compressor rotor will be fully inspected and balanced in accordance with prudent industry practice.
- Compressor rotor stages 12 through 17 compressor wheels will be of improved design and re-engineered to address issues as noted in OEM TIL 1971/1972. Compressor wheels will be machined and manufactured by EthosEnergy utilizing proven materials.
- EthosEnergy manufactured or OEM equivalent blades with round bottom design. EthosEnergy design has eliminated the need for spacers in stages R12-R17 to address various field issues.
- Compressor rotor will be optimally clocked in accordance with prudent industry standards and blades are staked by improved method developed by EthosEnergy.
- Individual stage bladed wheels are balanced prior to complete assembly. Bladed rotor will be assembled in EthosEnergy state-of-the-art repair shop and all applicable quality certifications will be made available for review upon request.
- A new bi-layer coating developed EthosEnergy will be applied on stage 17 wheel to provide better sealing for inner barrel HPP seal.
- Applicable OEM TIL's (1576, 1972, .1901, etc.) will be implemented and summary will be included with EthosEnergy detailed rotor assembly report.

## TURBINE ROTOR

The turbine rotor will be compatible with Frame 7FA.03/.04 units subject to additional technical review by EthosEnergy engineering and will be Gen 4 design equivalent:

- Stages 1-3 turbine wheels and Stages 1-2 and 2-3 spacers will be engineered to address issues as noted in OEM TILs.
- Other field issues such as cracking in lockwire tabs, cooling slot cracking have been eliminated by improved design.
- EthosEnergy turbine rotor wheels will come with enhanced contour and slots will be shot peened for improved durability.
- Turbine rotor distance piece will have reverse marriage joint for marrying to a robust back-end compressor rotor.
- Stages 1-3 turbine wheels and stages 1-2 and 2-3 spacers will be machined from IN-718 forgings.
- Turbine wheels will have similar firtree profile as OEM wheels for accepting either EthosEnergy-provided buckets or OEM/other third-party stags 1-3 buckets.
- EthosEnergy New Rotor includes the following components:
  - New stages 1-3 turbine wheels
  - New stages 1-2 and 2-3 spacer
  - New distance piece and aft stub shaft
  - New turbine bolting hardware
- EthosEnergy turbine rotor is assembled and fully balanced. As an option, customer-provided buckets or EthosEnergy buckets can be installed on the turbine rotor prior to delivery.
- Applicable TIL's (1539, 1540, 1576, 1742, etc.) will be implemented and a summary will be included in rotor assembly report.