Inlet Guide Vane Actuators for Frame 6 Applications

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Young & Franklin, Inc.

Cincinnati, OH
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Shop in the early 1930’s

*Est. 1918
Y&F History

- 1930’s  Corning Glass- production of light bulbs
- 1940’s  Link Avation- Gear boxes for flight simulators
- 1950’s  Corning- production of CRTs
- GE- Hydraulics for Combustion turbines
- 1980’s  Expansion into Aircraft hydraulics through multiple acquisitions (Tactair)
- Today  80 Y&F & 200 Tactair employees
Today- Final Assembly & Test
Inlet Guide Vane Actuators

- Y&F manufactured multiple designs
  - Actuator located under turbine is p/n GE 187C8362 with remote controller 973E0519
  - Located on the side of turbine p/n GE 142D4929
IGV Actuator 187C8362
NOTES:
1. UNLESS OTHERWISE SPECIFIED, WELD PER PSA-AQ1, FIG F1, COL A/B, CLASS III.
2. NUT, ITEM 11, TO BE TORQUED TO 10-14 IN.lb PRIOR TO INSTALLATION OF PIN, ITEM 10.
3. PRIOR TO TORQUING NUT, ITEM 6556, AND AFTER WELDING BRACKET, ITEM 4, TO CLEVIS, ITEM 8, CENTER LVDT, ITEM 2. FOR LVDT ARMATURE CLEARANCE WITH BORE THRU FULL CYLINDER STROKE. DIAMETRICAL CLEARANCE OF .073 MIN IS AVAILABLE BETWEEN MOUNTING BLOCK, ITEM 7, AND LVDT BORE AND ARMATURE FOR THIS ADJUSTMENT.
4. LVDT ADJUSTMENT PER ATP7645C004
5. ADJUST ITEM 16, ANTI-ROTATION PLATE, TO ACHIEVE THE GAP INDICATED BETWEEN ITEMS 16 AND 4.
IGV Actuator 187C8362

- LVDTs
- Guide block
Inlet Guide Vane Actuators

- Periodic Maintenance- 187C8362
  - Apply grease to linkage rod end bearings every 12 months per turbine manufacturers instructions
  - Visually inspect rod seal for leaking hydraulic fluid
  - Inspect guide for wear
    - Clearance 0.0100 +/- 0.005
  - Visually inspect LVDT rods for wear
    - LVDT adjustment per GE 286A6632
Inlet Guide Vane Actuators

• LVDT adjustment- 187C8362
  – Per 286A6632
    1. Retract the cylinder by pushing on the rod-end clevis until fully retracted
    2. Adjust LVDT rod guide block to obtain the 0.44 nom dimension by turning the adjusting bolt
    3. Connect power supply to both LVDT primaries (red & black) in parallel
    4. Turn on oscillator and set frequency to 3000 Hz. Using voltmeter, read and adjust the power supply voltage to 7.000 +/- 0.010 volts
    5. Connect voltmeter to the output (yellow & blue) of one LVDT
    6. Loosen the LVDT rod set screw and turn armature rod until the voltmeter reads 1.092 +/- 0.010 volts RMS. Tighten set screw.
    7. Repeat steps 5 & 6 for the remaining LVDT
    8. Check the excitation voltage to make sure it is still 7.000 +/- 0.010
Inlet Guide Vane Actuators

- Controller 973E0519
  - Contains trip solenoid, dump valve, servo, filter and accumulator

- Since 1990 Y&F sold
  - 870 new assemblies
  - 130 spare cylinders
IGV Actuator 142D4929

- Changes from previous model
  - Located on the side
  - Adds trip, junction box, servo, filter
  - Adds link w/turnbuckle
  - 6” cylinder (30K lb force)
  - Same as used on 7E, 9E
  - Similar to 7F, 9F (7” cyl)
  - Reduced system cost

- Since 1990 Y&F sold
  - 1,350 actuators
  - 80 spare cylinders
IGV Actuator 142D4929

• Periodic Maintenance
  – Check rod seals
  – Check LVDT rods for wear
  – Replace Filter element
  – Inspect & lubricate link spherical bearings

• Replace cylinder
  – Y&F does not recommend repairing cylinders
Inlet Guide Vane Actuators

• In summary

  – Y&F manufactured multiple designs of the frame 6 IGV actuators
  – Considering the whole GE product line, these are most reliable
  – Y&F continues to support the product
  – We have not seen any alternatives to improve reliability/accessibility
  – 7F IGV issues should not present here unless the control system is upgraded
Gas Skid
Combined Gas Fuel Control Valve

General Features

• Dual body: Fuel Stop/Speed Ratio and Control Valve
• NACE compliance and up to 3” internal trim
• ANSI B16.5 300# 3” flanges
• Low (55psig) and High (120psig) Control Oil for Trip
• Explosion Rating UL/CSA Class 1 Division II

Fuel Regulator Machines
• Hydraulic Position Servos (open loop operation)

Speedtronic Machines
• Electronic Servos (LVDT feedback)

• Lube Oil Tank Drain

9500E100
World’s “Worst” Returned Valve to Y&F (30 years of service w/NO R&O)
Questions?

Young & Franklin Inc. is available to assist you with diagnosing problems and replacement parts.

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