

# COLTS Replacement Load Cells

## SOW

NASA seeks to purchase ten replacement load cells for the Combined Loads Test Machine (COLTS). COLTS is a complex test machine capable of exerting combined axial, torsion, shear, and internal pressure loading to test articles up to 15 feet in diameter and 45 feet long. Eleven primary hydraulic actuators are used to manipulate the loading platen to apply combined axial, torsion, and shear simultaneously. Replacement load cells are required for four 300,000 Lbs actuators and six 450,000 actuators. The replacement load cells must be compatible with the existing equipment in the Combined Loads Test Machine. The specifications are:

### 300 Kip Load Cell Specifications:

- Capacity: 300,000 Lbs Tension or Compression
- Overload: 150% of capacity without damage; 300% without failure
- Sensing element: Dual bridge 350 ohm strain gages
- Output:  $\pm 3$  mV/V  $\pm 0.25\%$ ; exact output provided with calibration data; A2LA accredited tension and compression calibration
- Excitation: 10 volts DC maximum
- Calibration Error: Combined error of less than  $\pm 0.4\%$  of full scale ( $\pm 3$  mV/v) including hysteresis, repeatability and nonlinearity; based on best fit straight line
- Temperature range: -65F to +200F operating, compensated between =15F and +115F
- Temperature Effects: Less than  $\pm 0.01\%$   $\pm 0.005\%$  of full scale sensitivity shift per F and less than  $\pm 0.1\%$   $\pm 0.005\%$  of full scale zero shift per F
- Construction: 8" OD, 23" long, 5.0-8 thread 8.0" deep; replacement load cell must be consistent with original drawing and compatible with the existing loading fixtures in the Combined loads Test Machine.
- Electrical Connector: Bendix PTO2E-12-10P or equivalent with attached dust cap mating connector Bendix : PT01E-12-10S or equivalent
- Loading Points: Arrows indicate sensitive load axis for positive output (tension)
- Quantity: 4 required

### 450 Kip Load Cell Specifications:

- Capacity: 450,000 Lbs Tension or Compression
- Overload: 150% of capacity without damage; 300% without failure
- Sensing element: Dual bridge 350 ohm strain gages
- Output:  $\pm 3$  mV/V  $\pm 0.25\%$ ; exact output provided with calibration data; A2LA accredited tension and compression calibration
- Excitation: 10 volts DC maximum
- Calibration Error: Combined error of less than  $\pm 0.4\%$  of full scale ( $\pm 3$  mV/v) including hysteresis, repeatability and nonlinearity; based on best fit straight line
- Temperature range: -65F to +200F operating, compensated between =15F and +115F

- Temperature Effects: Less than  $\pm 0.01\%$   $\pm 0.005\%$  of full scale sensitivity shift per F and less than  $\pm 0.1\%$   $\pm 0.005\%$  of full scale zero shift per F
- Construction: 10" OD, 23" long, 7.5-8 thread 8.0" deep; replacement load cell must be consistent with original drawing and compatible with the existing loading fixtures in the Combined loads Test Machine.
- Electrical Connector: Bendix PTO2E-12-10P or equivalent with attached dust cap mating connector Bendix : PT01E-12-10S or equivalent
- Loading Points: Arrows indicate sensitive load axis for positive output (tension)
- Quantity: 6 required