

FORCE SENSING CLEVIS PINS/BOLTS

The Load Sensing Clevis Pin or Bolt is another unique strain gage transducer developed by Strainsert (U.S. Patent No. 3,695,096). It utilizes the internal strain gage process perfected by Strainsert over the last 40 years and used so successfully in Strainsert Bolts, and Flat Load Cells®. The Force Sensing Clevis Pin offers precision force measurement by simply replacing existing shear pins, clevis bolts, shear axles, etc. and many other types of pinned joints.

The internally gaged clevis pin is typically a double-shear arrangement with two shear planes as shown in figure 1, however, cantilever load pins with a single shear plane are also available.

Typically, force P is applied at the center of the pin and the pin is supported at each end (P/2) by the Clevis.

The strain gages are sealed inside small axial holes and are positioned at two locations at the Clevis to Clevis Eye interfaces. In order to sense only those strains which are induced by the shear forces at these two sections, the gages are positioned and oriented with great precision, at a neutral plane relative to one specific direction of pin force. The four strain gages (two at each location) are electrically connected to form a full bridge, the signal from each gage being additive so that the bridge output is proportional to the sum of the forces transmitted by the shear planes of the pin. The circuit typically includes temperature compensation, signal trim (optional) and balance resistors terminating in a suitable connector socket or integral cable, and potted with a sealing compound inside the gage hole for enhanced environmental protection.

If the force F is applied to the pin at other than the specified direction, the theoretical bridge output will be due to the component of the force along the sensitive direction, i.e. $F \cos X$ (Figure 2). Therefore, typical pins incorporate an anti-rotation device for proper alignment (See Clevis Pin Installation).

FIGURE 1

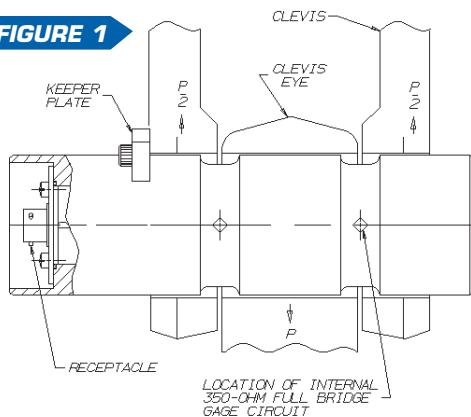
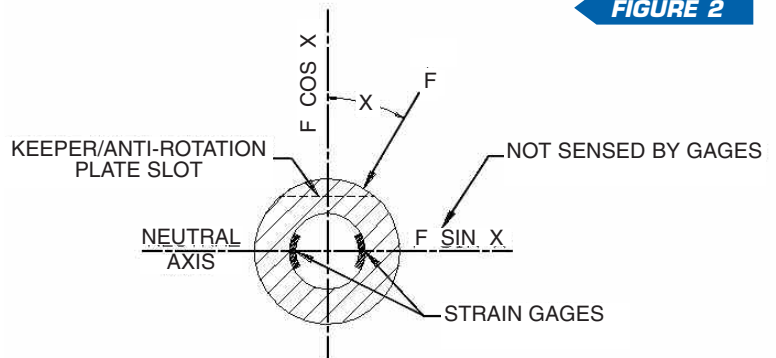


FIGURE 2



STANDARD CPA, CBA, SPA, RCP AND SPHC PERFORMANCE & SPECIFICATIONS*

Overload:	150% without zero shift 300% without failure (Minimum)	Hysteresis:	±0.50% FS (Nominal)
Bridge:	Full bridge 350 Ohm (Nominal)	Service Temp Range:	to 150 °F
Excitation:	12 V ac or dc (Maximum)	Temp Effects:	0.005% FS / °F (On Zero) (Nominal) 0.008% load / °F (On Output) (Nominal)
Output Signal:	2-mv/V (Nominal)**	Zero Balance:	±2% FS (Nominal)
Non-Repeatability:	±0.15% FS (Nominal)	Material:	17-4 Stainless Steel
Non-Linearity:	±0.50% FS (Nominal)	Electrical Connection:	6-Pin receptacle or built-in cable

* Custom Pin design performance and specification may vary with design requirements.

** Exact output provided with calibration data. In place calibration check is recommended. (Standardized outputs are optional)

Receptacle:	PTIH-10-6P	Cable:	#20(26x34) AWG., rubber insulation, shielded, rubber jacket, 4-Conductor (Standard Cable)
Mating Plug:	PT06A-10-6S (SR)	Function	Wire Code
Function	Pin	(+) Excitation	Red
(+) Excitation	A	(-) Excitation	Black
(-) Excitation	D	(+) Signal	Green
(+) Signal	B	(-) Signal	White
(-) Signal	C		