

## LCM4503 Load Pin for Helicopter Cargo Hook

### Application

Helicopter Cargo Weight Indication

### Features

- 10,000lb load pins
- Manufactured from 17-4PH stainless steel
- Environmentally sealed to IP67
- Certified as a Grade A Airworthy Component
- Additional lockwire protection on connector
- 2.5 mV/V output

### Design Brief

A manufacturer of specialist equipment for the aerospace industry contacted us with a requirement for a bespoke load pin designed to fit within their new helicopter cargo hook. This keeperless hook is one of a new range of cargo hook products the company has designed, and has been based on a core design which has a far higher maximum operating load capacity of 10,000 lb and designed with a greater safety factor. This effectively increases the safety margin of the cargo hook significantly, boosting operator confidence. Also, due to increasing legislation and changes in the market that now demand products that offer new innovative features, the company decided to take on a more integrated systems approach, and hence the new design



offers many intrinsic features, one of which is weight indication.

To enable the company to offer a weighing solution, the new hook incorporates a load measuring pin. LCM Systems initially designed a prototype pin for testing purposes, which had a load rating of 10,000 lbf. Due to the application, extensive independent testing by a UKAS approved test house was required for

hardness testing, material testing and fluorescent penetration. Passivation process certification was also supplied.

Following successful evaluation, further orders were received for 20+ pins. The customer was extremely happy with both the load pin and the level of service received, stating "you have done a superb job and we are extremely happy with your product and the delivery time; in fact you are difficult to fault. All of your staff that we have had any dealings with have been most helpful. We feel that we definitely made the best choice when we chose LCM Systems."

### Main Criteria

- Load pins must be suitable for aerospace application
- Load pins to be certified and tested by an independent UKAS approved test house for the following:
  - \* Hardness test to ASTM E18
  - \* Charpy impact testing at room temperature in accordance with ASTM370
  - \* Charpy impact testing at -40°C in accordance with ASTM370
  - \* Chemical analysis in accordance with ASTM370
  - \* Tensile testing (yield and ultimate) in accordance with ASTM370
  - \* Fluorescent penetration inspection to ASTM E1417-TYP1
- Passivation Process certificate required
- Calibration certificate required



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# APPLICATION NOTE

## LCM4503 Load Pin for Helicopter Cargo Hook

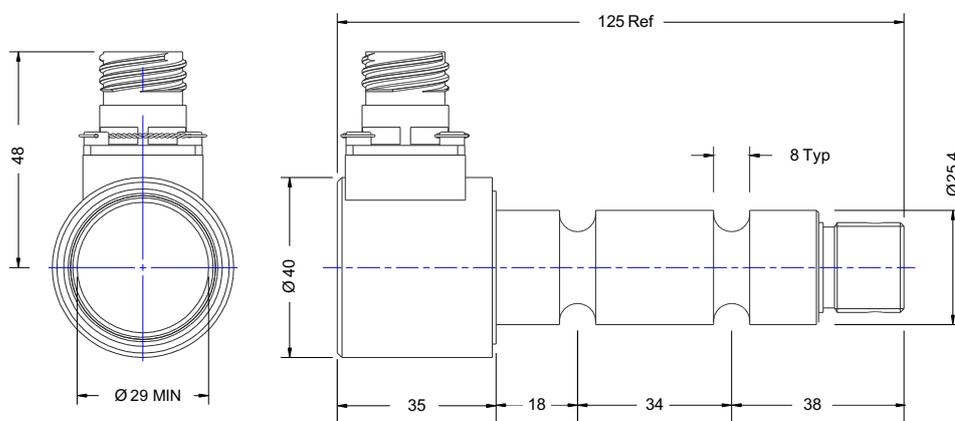


### Specification

Rated load (kN)	10,000 lbf
Proof load	20,000 lbf
Ultimate breaking load	>35,000 lbf
Output	2.5 mV/V ( $\pm 20\%$ )
Accuracy	$< \pm 5\%$ of rated load
Excitation voltage	5Vdc
Bridge resistance	350 Ohm c/w integral 100k Ohm 10ppm shun cal resistor
Insulation resistance	$> 500$ MOhm @ 500 VDC
Operating temperature range	-45 to +70°C
Storage temperature range	-54 to +85°C
Zero temperature coefficient	$< \pm 0.01\%$ of rated load/°C
Span temperature coefficient	$< \pm 0.01\%$ of rated load/°C
Environmental protection level	IP67 with connector mated

### Dimensions

All dimensions are in mm



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APPROVED

(unapproved if printed)