



## Shackle Load Pin

# LB Series

**The LB Series is an extremely rugged, high performance load pin. The LB Series is designed to accurately measure compression and tension loads ranging from 0-12,000 lbs. to 0-65,000 lbs.**



The LB Series is an extremely rugged, high performance load pin. The LB Series load pins are designed to accurately measure compression and tension loads in capacities ranging from 0-12,000 lbs. to 0-65,000 lbs. The robust Shear Beam design readily tolerates angular, end loading and side loading effects. Proprietary, axial "gun-bore" gauging techniques produce the benefits of relatively compact size and excellent environmental sealing. The LB Series is Harsh Environment Sealed (IP67-Limited Immersion) by virtue of proprietary, multi-redundant barriers uniquely integrated to protect all internal components. The load pins are fitted with durable MS connectors. Companion cable/connector assemblies are available in a variety of lengths. The cable is a durable polyurethane-jacketed cable, with a tinned-copper braided shield for mechanical protection and to minimize the effects of RFI and EMI. The LB Series offers unique mounting capabilities to address application-specific requirements. The attributes of the LB Series make it ideal for clevis pin/shackle loading, as well as for O.E.M. situations where a versatile, rugged and high performance solution is needed. The LB Series reliability yields exceptional performance under extraordinary conditions in aerospace, automotive, steel processing, off-shore, power generation, mining, material handling, wood/pulp/paper, petrochemical and similarly demanding applications.



For more information call **1-888-545-8988**

SENTRAN, LLC 4355 LOWELL STREET, ONTARIO, CA 91761, U.S.A.

888-545-8988 T: 909-605-1544 FAX: 909-605-6305 [www.sentrانllc.com](http://www.sentrانllc.com)

### APPLICATIONS

- Tension/Compression Measurements
- Clevis Pin/Shackle Loading
- Replaces Crosby Shackle Bolts
- Replaces Skookum Shackle Pins

### FEATURES

- 12,000 to 65,000 lbs. Capacities
- Dual Shear Beam Technology
- Alloy or Stainless Steel Construction
- Application Versatility
- 0.5% Accuracy Class
- Excellent Overall Performance
- IP67 Environmental Sealing
- OEM and Custom Configurations
- Options and Accessories
- Two Year Warranty

# LB Series Specifications

Innovative Measurement Solutions



## PERFORMANCE

|  |  |
|--|--|
| Rated capacities <sup>(1)</sup> (lbs.) | 12K, 16K, 19K, 24K, 27K, 32K, 50K, 65K |
| Rated output (FSO)                     | 2 mV/V                                 |
| Output Tolerance                       | Nominal                                |
| Combined Error Band                    | ≤ 0.5 % FSO                            |
| Non-Linearity                          | ≤ 0.5 % FSO                            |
| Hysteresis                             | ≤ 0.5 % FSO                            |
| Non-Repeatability                      | ≤ 0.2 % FSO                            |
| Side Load Rejection Ratio              | 500:1                                  |
| Zero balance                           | ± 2 % FSO                              |
| Creep (20 minutes)                     | 0.05 % of Load                         |

<sup>(1)</sup> ("K" = thousand)

## MECHANICAL

|                   |  |
|-------------------|--|
| Material          | Alloy Tool Steel (LB1)<br>17-4ph Stainless Steel (LB3)           |
| Finish            | Natural  |
| Safe overload     | Compression 150 % FSO<br>Tension 150 % FSO<br>Side Load 100% FSO |
| Ultimate overload | Compression 300% FSO<br>Tension 300% FSO<br>Side Load: 200% FSO  |
| Deflection        | See Dimensions Table   |
| Weight            | See Dimensions Table   |

## ELECTRICAL

|                       |                           |
|-----------------------|---------------------------|
| Input Impedance       | 350 (nominal)             |
| Output Impedance      | 350 (nominal)             |
| Insulation Resistance | >5000 Megohms @ 50VDC     |
| Excitation Voltage    | 10 V AC/DC (15 V maximum) |

|                         |  |
|-------------------------|--|
| Connector Pin Functions | + Excitation (A)<br>- Excitation (D)<br>+ (Optional) Remote Sense (E)<br>- (Optional) Remote Sense (F)<br>+ Signal (B)<br>- Signal (C)<br>Shield (G) |
|-------------------------|--|

|                  |  |
|------------------|--|
| Cable Color Code | + Excitation (red)<br>- Excitation (black)<br>+ Signal (green)<br>- Signal (white)<br>Shield (natural) |
|------------------|--|

|            |   |
|------------|---|
| Cable Type | 4-conductor, 22 AWG, Polyurethane Jacket, Tinned Copper Braid, Diameter: 0.220" |
|------------|---|

|              |                      |
|--------------|----------------------|
| Cable Length | See Dimensions Table |
|--------------|----------------------|

|                   |                     |
|-------------------|---------------------|
| Cable Termination | Finished Conductors |
|-------------------|---------------------|

|            |                           |
|------------|---------------------------|
| Cable Seal | Compression Gland Fitting |
|------------|---------------------------|

## ENVIRONMENTAL

|                        |                                |
|------------------------|--------------------------------|
| Temperature, Operating | -65 to +250 °F (-54 to +120°C) |
|------------------------|--------------------------------|

|                          |                             |
|--------------------------|-----------------------------|
| Temperature, Compensated | 15 to +115 °F (-9 to +46°C) |
|--------------------------|-----------------------------|

|                      |                                |
|----------------------|--------------------------------|
| Temperature, Storage | -65 to +300 °F (-54 to +149°C) |
|----------------------|--------------------------------|

|                     |   |
|---------------------|---|
| Temperature Effects | Zero < 0.005% FSO/°F<br>< 0.009% FSO/°C |
|---------------------|---|

|                     |  |
|---------------------|--|
| Temperature Effects | Output < 0.008% of Rdg./°F<br>< 0.014% Rdg./°C |
|---------------------|--|

|         |  |
|---------|--|
| Sealing | IP67; Multi-redundant; Limited Immersion Tolerance |
|---------|--|

The temperature ratings provided do not include the companion cable/connector assembly. If PUR or PVC cable is employed, the maximum operating temperature is 180°F (82°C)

# LB Typical System Configuration

## SENSING LOAD CELL(S)



## SIGNAL CONDITIONING

Analog Transmitters



Serial Transmitters



Digital Indication



Process Control



Batch Control



Data Acquisition

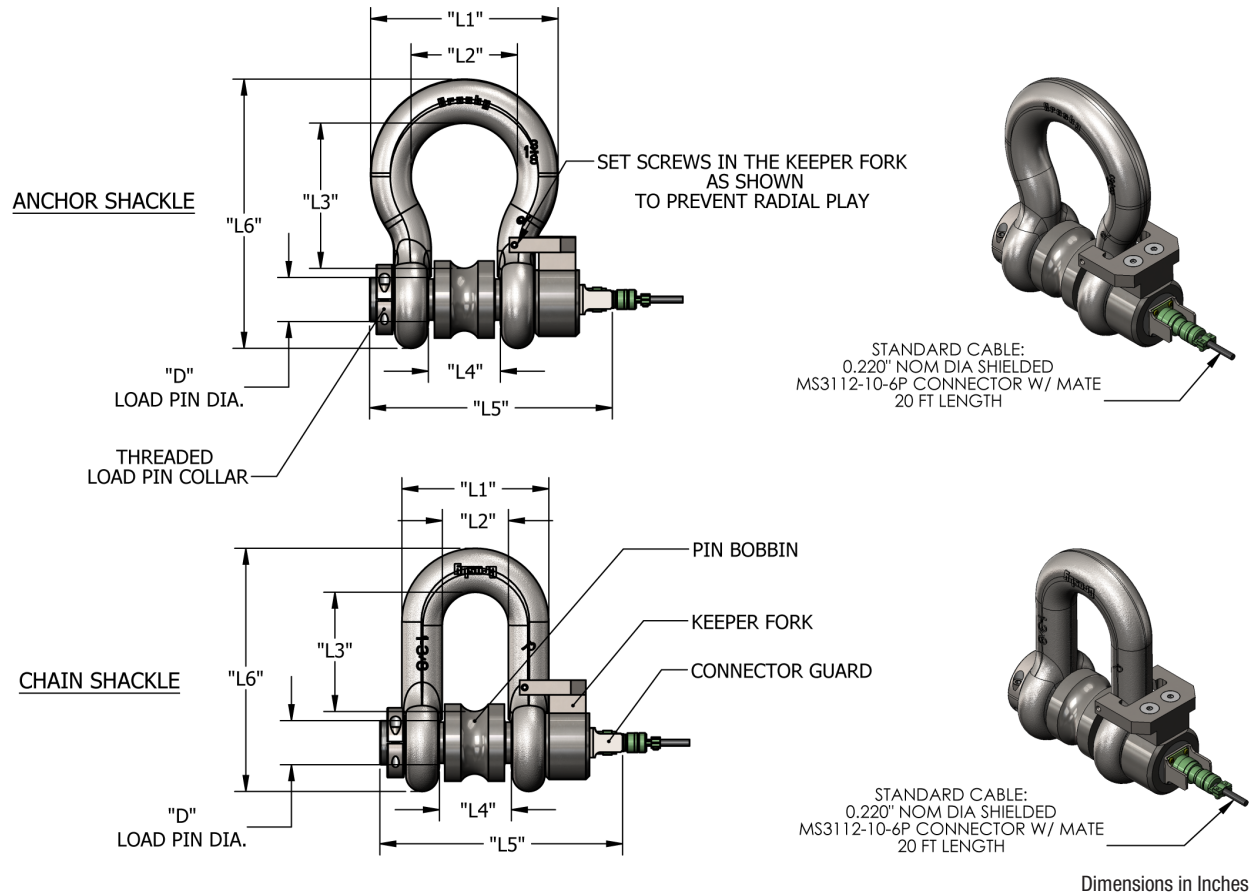


## OUTPUT OPTIONS

0-5 VDC  
0-10VDC  
±5 VDC  
±10 VDC  
4-20 mA  
0-20 mA  
RS-232  
RS-422  
RS-485  
20 mA Serial Loop  
Ethernet  
Profibus DP  
DeviceNet  
CANOpen  
ControlNet  
Modbus RTU  
Wireless

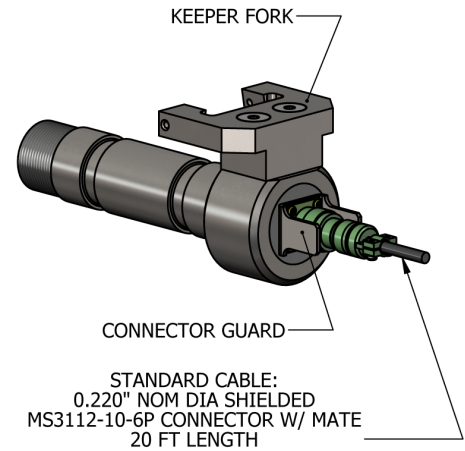
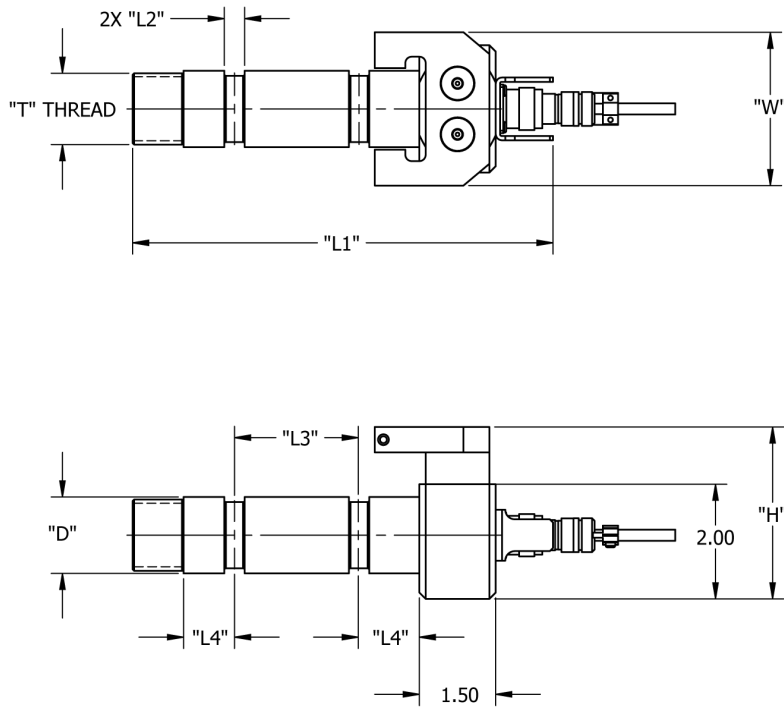
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DS-LB.00-156



| Anchor Shackle      |      |      |      |      |       |       |      |                     |            |          |
|---------------------|------|------|------|------|-------|-------|------|---------------------|------------|----------|
| Capacity (LBS)      | L1   | L2   | L3   | L4   | L5    | L6    | D    | Crosby Shackle Size | Deflect    | Weight   |
| DIMENSIONS (INCHES) |      |      |      |      |       |       |      |                     |            |          |
| 12K                 | 4.03 | 2.28 | 3.19 | 1.44 | 7.21  | 5.83  | 1.00 | 7/8"                | 0.005" NOM | 2.5 LBS  |
| 16K                 | 4.69 | 2.69 | 3.55 | 1.69 | 7.82  | 6.56  | 1.25 | 1"                  | 0.005" NOM | 3.0 LBS  |
| 19K                 | 5.16 | 2.91 | 4.25 | 1.81 | 8.69  | 7.47  | 1.25 | 1-1/8"              | 0.005" NOM | 3.0 LBS  |
| 24K                 | 5.75 | 3.25 | 4.32 | 2.03 | 9.30  | 8.25  | 1.38 | 1-1/4"              | 0.005" NOM | 3.5 LBS  |
| 27K                 | 6.38 | 3.63 | 5.00 | 2.25 | 9.88  | 9.16  | 1.50 | 1-3/8"              | 0.005" NOM | 3.7 LBS  |
| 32K                 | 6.88 | 3.88 | 5.69 | 2.38 | 10.40 | 10.00 | 1.63 | 1-1/2"              | 0.005" NOM | 4.2 LBS  |
| 50K                 | 8.86 | 5.00 | 6.50 | 2.88 | 11.26 | 12.34 | 2.00 | 1-3/4"              | 0.005" NOM | 5.7 LBS  |
| 65K                 | 9.97 | 5.75 | 7.75 | 3.25 | 13.13 | 13.68 | 2.25 | 2"                  | 0.005" NOM | 11.0 LBS |

| Chain Shackle       |      |      |      |      |       |       |      |                     |            |          |
|---------------------|------|------|------|------|-------|-------|------|---------------------|------------|----------|
| Capacity (LBS)      | L1   | L2   | L3   | L4   | L5    | L6    | D    | Crosby Shackle Size | Deflect    | Weight   |
| DIMENSIONS (INCHES) |      |      |      |      |       |       |      |                     |            |          |
| 12K                 | 3.20 | 1.44 | 2.74 | 1.44 | 7.21  | 5.33  | 1.00 | 7/8"                | 0.005" NOM | 2.5 LBS  |
| 16K                 | 3.69 | 1.69 | 3.04 | 1.69 | 7.82  | 5.94  | 1.25 | 1"                  | 0.005" NOM | 3.0 LBS  |
| 19K                 | 4.07 | 1.81 | 3.36 | 1.81 | 8.69  | 6.78  | 1.25 | 1-1/8"              | 0.005" NOM | 3.0 LBS  |
| 24K                 | 4.53 | 2.03 | 3.60 | 2.03 | 9.30  | 7.50  | 1.38 | 1-1/4"              | 0.005" NOM | 3.5 LBS  |
| 27K                 | 5.01 | 2.25 | 4.18 | 2.25 | 9.88  | 8.28  | 1.50 | 1-3/8"              | 0.005" NOM | 3.7 LBS  |
| 32K                 | 5.38 | 2.38 | 4.81 | 2.38 | 10.40 | 9.05  | 1.63 | 1-1/2"              | 0.005" NOM | 4.2 LBS  |
| 50K                 | 6.38 | 2.88 | 5.32 | 2.88 | 11.26 | 10.97 | 2.00 | 1-3/4"              | 0.005" NOM | 5.7 LBS  |
| 65K                 | 7.25 | 3.25 | 6.32 | 3.25 | 13.13 | 12.74 | 2.25 | 2"                  | 0.005" NOM | 11.0 LBS |

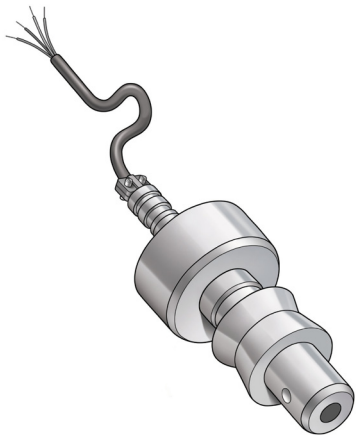


Dimensions in Inches

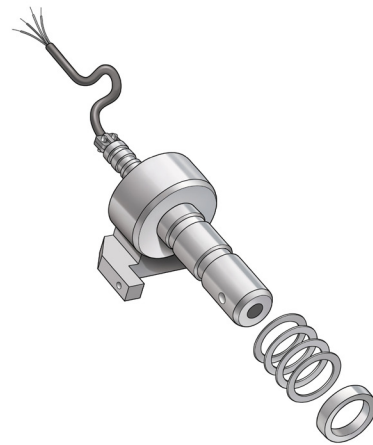
| Capacity (LBS)      | H        | W        | L1    | L2   | L3   | L4   | D    | T (Thread)   | Deflect    | Weight   |
|---------------------|----------|----------|-------|------|------|------|------|--------------|------------|----------|
| DIMENSIONS (INCHES) |          |          |       |      |      |      |      |              |            |          |
| 12K                 | 2.75 NOM | 1.12 NOM | 7.21  | 0.31 | 1.44 | 0.88 | 1.00 | 3/4-16 UNF   | 0.005" NOM | 2.5 LBS  |
| 16K                 | 3.13 NOM | 1.22 NOM | 7.82  | 0.31 | 1.69 | 1.00 | 1.25 | 7/8-14 UNF   | 0.005" NOM | 3.0 LBS  |
| 19K                 | 3.44 NOM | 1.41 NOM | 8.69  | 0.38 | 1.81 | 1.25 | 1.25 | 1-14 UNF     | 0.005" NOM | 3.0 LBS  |
| 24K                 | 3.75 NOM | 1.54 NOM | 9.30  | 0.50 | 2.03 | 1.38 | 1.38 | 1-14 UNF     | 0.005" NOM | 3.5 LBS  |
| 27K                 | 4.06 NOM | 1.66 NOM | 9.88  | 0.56 | 2.25 | 1.50 | 1.50 | 1-1/4-12 UNF | 0.005" NOM | 3.7 LBS  |
| 32K                 | 4.38 NOM | 1.78 NOM | 10.40 | 0.63 | 2.38 | 1.63 | 1.63 | 1-1/4-12 UNF | 0.005" NOM | 4.2 LBS  |
| 50K                 | 4.94 NOM | 2.41 NOM | 11.26 | 0.69 | 2.88 | 1.75 | 2.00 | 1-1/4-12 UNF | 0.005" NOM | 5.7 LBS  |
| 65K                 | 5.56 NOM | 2.56 NOM | 13.13 | 0.69 | 3.25 | 2.25 | 2.25 | 1-3/4-16 UNF | 0.005" NOM | 11.0 LBS |



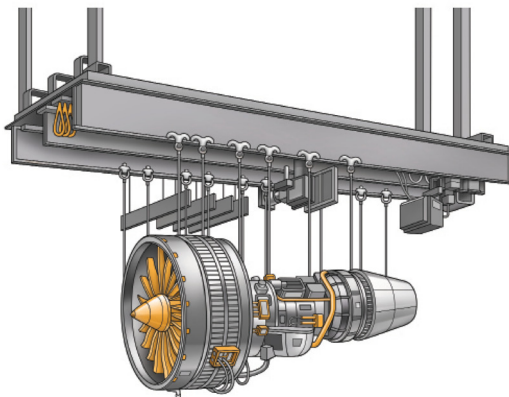
Load Pin with Centering Bobbin



Adjustable Keeper and Spacer Rings



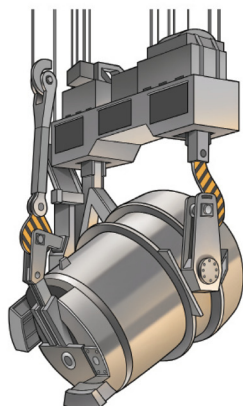
Engine Hoist



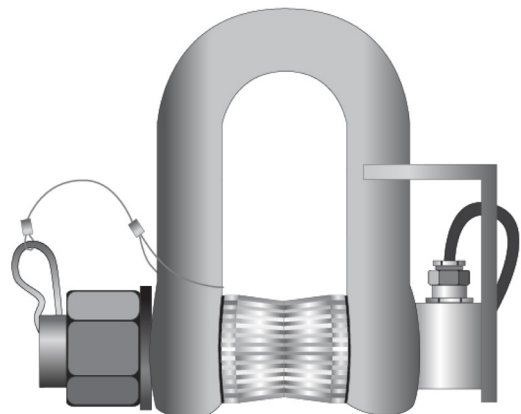
Hitch Sensing/Draft Control



Molten Metal Ladle



Clevis



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### SENTRAN, LLC

4355 LOWELL STREET  
ONTARIO, CA 91761-2225, U.S.A.  
T: 909-605-1544 F: 909-605-6305

[www.sentranllc.com](http://www.sentranllc.com)

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