JCM Load Monitoring load shackles

Installation and Operation

To ensure safe and trouble-free installation of the load cell measuring device, the load shackle must be properly transported and stored, professionally installed and commissioned.

Unpacking

Before removing the load shackle, inspect the packaging for signs of damage and immediately inform the supplier if any damage is found. Unpack the load shackle carefully, taking special care with cables and be aware to the possibility of damaging low range devices by mishandling. Ensure that calibration and instruction information is not inadvertently discarded.

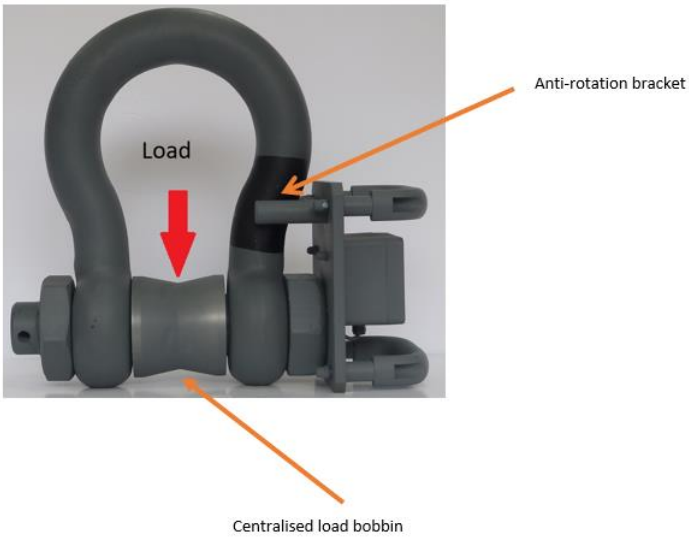

FIGURE 2

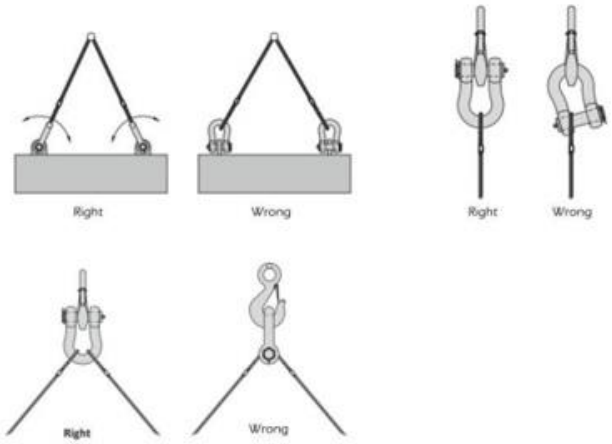

FIGURE 3

Installation

Load shackles are normally classified as portable devices, and as such correct installation is critical to ensure product life cycle.

To avoid damage or loss of accuracy during installation the following points should be followed:

- The direction of the load applied to a shackle should be linear, as shown in figure 2.
- Ensure the shackle pin does not experience torque or bending forces during operation.
- For optimal performance the load should be central to the pin. The use of a load bobbin is recommended.
- If the load shackle is fitted with a cable, it must be installed in such a way as to avoid damage from impact, abrasion or movement. The installer must ensure the cable meets the operational requirements of the application.
- If the load shackle is fitted with a telemetry module, ensure that there is clear line-of–sight between the transmitter and receiver, and that objects or structures are kept at least one metre away from the antennae wherever possible.
- If the Load Shackle is fitted with a telemetry module, the installer should first read the Telemetry User Manual

All load shackles supplied by JCM Load Monitoring are sold with the express understanding that the purchaser is thoroughly familiar with the safe and proper use and application of the product.

Responsibility for the use and application of the product rests with the user.

Our engineering personnel are readily available to answer any technical questions. Failure of the product can occur due to misapplication, abuse, or improper maintenance.

Product failure could allow the load to become out of control, resulting in possible property damage, personal injury or death. Load limit ratings indicate the greatest force or load a product can carry under usual environmental conditions.

Shock loading and extraordinary conditions must be taken into account when selecting products for use in a system. In general, products are used as parts of a system being employed to accomplish a task. Therefore, we can only recommend within the Working Load Limits (WLL), or other stated limitations.

The Working Load Limit (WLL) of each product may be affected by wear, misuse, overloading, corrosion, deformation, intentional alteration, and other use conditions. Regular inspection must be conducted to determine whether use can be continued at the assigned WLL, a reduced WLL, or whether the product must be withdrawn from service.

Side loading must be avoided, as it exerts an additional force or loading which the product is not designed to accommodate. Ensure the nut is screwed onto the shackle pin (finger tight only) and held in position by the split pin provided. Incorrect seating of the pin may be due to a bent pin, too

tight-fitting thread or misalignment of the pin holes. Do not use the shackle under these circumstances. The forged and hand-made nature of shackles invariably means there are

inconsistencies in the finished manufacture. This can have an effect on the performance/accuracy of the shackle load pin; for example, if the shackle pin is inserted into the opposite side of the shackle to which is was calibrated, or if a different shackle is used. Select the correct type of shackle and its WLL for the application.

Should extreme circumstances or shock loading be applicable, this must be taken into account.

Make sure that the shackle is supporting the load correctly, i.e. along the axis of the shackle body centreline; avoid introduction of bending loads, unstable loads and do not apply overloads. Avoid eccentric loading of the shackle by either using loose spacers or a centralizing bobbin.

Inspection

Inspection should take place at least every six months, and more frequently when the shackles are used in severe operating conditions.

The load shackle should be inspected before use to ensure that:

- All markings are legible.
- The shackle body and pin are both identifiable as being of the same size, type and make.
- The threads of the pin and the body are undamaged.
- The body and the pin are not distorted or unduly worn.
- The body and pin are free from nicks, gouges, cracks and corrosion.
- Never use a safety bolt type shackle without using a securing pin.
- Shackles may not be heat treated as this may affect their WLL.
- Never modify, repair or reshape a shackle by machining, heating or bending, as this will affect the WLL.
- Welding on shackles body and pins is not allowed. This instruction manual assumes good rigging practices and does not advise on actual in the field use.

Terminology

Working Load Limit (WLL): The maximum mass or force which the product is certified to support in service.

Proof Load Test: A test applied to a product solely to determine injurious material or manufacturing defects.

Ultimate Strength: The average load or force at which the product fails or no longer supports the load. Design (Safety) Factor: Denotes a products theoretical reserve capability; computed by dividing the Ultimate Load by the Working Load Limit, and expressed as a ratio.

Wiring and Electrical Checks

The correct connection of the load shackle to an instrument is critical to achieving and maintaining its performance and reliability:

- Wiring connections are given on the calibration certificate supplied with each load shackle.
- If a screened cable is fitted, the screen should be connected as specified by the manual of the instrument or signal conditioning board (including internally mounted boards) to which the load shackle is connected to.
- If a screened cable is fitted, the screen should be connected as specified by the manual of the instrument or signal conditioning board (including internally mounted boards) to which the load shackle is connected to.
- Cable length should not be added to, or removed from the load shackle, as this could alter the outputs from the calibration figures issued.
- If a junction box is to be used, check the connections are of good quality, secure, clean and the enclosure is free of moisture.
- Load shackle cabling must be kept away from high power cables and equipment, high output RF equipment, inductive loads and generators. Cables must not be run alongside power cables.

Checks after Installation

With the load shackle installed, check the displayed output is not negative, as this may indicate either a fault, or that a compressive force is being applied to the load shackle. See Figures 2 and 3 for details of correct loading.

When applying a load to the shackle the output should increase in the positive direction. Use the calibration certificate for reference, to compare the output observed at certain loads.

If these are not the same, check the following:

a) All electrical connections are correct, i.e. to an instrument or a junction box etc.

b) If a connector is fitted, ensure that it is fully mated.

c) The pin is fitted as calibrated. d) The load shackle is properly loaded.

Warnings/Hazards

Load shackles are highly stressed devices, and commonly have safety factors between three and five times the rated capacity under static conditions.

Fatigue applications and environmental factors can contribute to reducing this margin. The user should determine the effect of any substance to the exposed load pin materials. Where a corrosive environment is present, load shackle pins can often be manufactured from corrosion resistant materials, or alternatively, isolation barriers can be employed between the corrosive environment and the load shackle pin.

The following points should be followed to avoid potentially hazardous situations:

- Do not weld near to installed load shackles. Leakage currents may destroy the load shackle pins circuits.
- Load shackle pins are sealed units and must not be dismantled. Damaged load shackle pins should be returned to JCM Load Monitoring for any repairs and re-calibration.
- The accuracy of the system is dependent upon the correct installation of the load shackle.
- Load shackles must not be handled or carried by the cable.
- Load shackles must not be subjected to shock loads, such as using a hammer to force an assembly on to the pin.
- Avoid using within 20-30 minutes of a rapid change in temperature, as this can affect the accuracy of the device. The operating temperature is -20°C to +70° C.
- The load shackle must never be placed in a potentially explosive environment, unless the product is suitably certified (ATEX or IECEx).

Inspection

All JCM Load Monitoring load shackles should be subject to periodic inspection, which should include, but is not exclusive to the following checks:

- Completion of the checks after installation.
- Inspect to see if the load shackle has been damaged/worn or chemically attacked (from a corrosive environment or lubricants etc.).
- For cabled versions, verify the integrity of the cable.
- After any serious operating incident, repeat first three checks above.
- For load shackles fitted with a telemetry module, check that the batteries are correctly installed. The battery holder shows pictorially the correct orientation.
- For load shackles fitted with a telemetry module, check for any signs of water ingress to the battery compartment and for any battery corrosion.
- In the unlikely event of this device failing, fit new batteries (if applicable) and re-test. Only when this has been done should you report the fault. When reporting the fault, give a full description of the problem and the type of application the device is being used for.

Warranty

All Telemetry products from JCM Load Monitoring (JCM) are warranted against defective material and workmanship for a period of (1) one year from the date of dispatch.

If the JCM product you purchase appears to have a defect in material or workmanship or fails during normal use within the period, please contact your Distributor, who will assist you in resolving the

problem. If it is necessary to return the product to JCM please include a note stating name, company, address, phone number and a detailed description of the problem.

Also, please indicate if it is a warranty repair. The sender is responsible for shipping charges, freight insurance and proper packaging to prevent breakage in transit. JCM warranty does not apply to defects resulting from action of the buyer such as mishandling, improper interfacing, operation outside of design limits, improper repair or unauthorized modification.

No other warranties are expressed or implied. JCM specifically disclaims any implied warranties of merchantability or fitness for a specific purpose. The remedies outlined above are the buyer's only remedies. JCM will not be liable for direct, indirect, special, incidental or consequential damages whether based on the contract, tort or other legal theory. Any corrective maintenance required after the warranty period should be performed by JCM approved personnel only.