

NOBLES ELECTRONICS LOAD PINS



NOBLES

YOUR TRUSTED LIFTING
& RIGGING SPECIALISTS

Nobles electronics division has been designing and manufacturing Load Cells and load monitoring equipment for over 30 years



NOBLES LOAD PINS

Load Pins are shear-pin type Load Cells which use strain gauges to measure forces exerted upon the shear planes of a pin, shaft or axle between closely placed supports. These load measuring pins offer a means to convert real mechanical stresses into electronic signals which are accurately calibrated so that user's can learn about and monitor their processes, machinery and production. With the right Load Pin the safety and productivity of plant and equipment can be enhanced. With a complete offering of Load Cell types and solutions Nobles can ensure that customers can install the 'right pin' every time.



PURPOSE BUILT

Nobles Load Pins are offered as bespoke, application specific designs. Naturally, every customer's needs differ and Nobles marries our capabilities in mechanical design with our extensive knowledge of Load Cell electronics to provide solutions which are fit for the job.

Nobles are able to offer Load Pins (shear pin Load Cells) that are designed, manufactured and tested in Australia with rated loads from 2 to 500 tonnes within a broad dimensional and operational framework.

Nobles Load Pins are field-proven and exhibit the following advantages:

- Simple interchange with existing shafts or pins within a piece of machinery
- Placement of transducer elements within protective structures such as sheave bearings
- No reduction in lifting headroom

Unlike many load measuring devices which are not purpose designed machine elements, Nobles Load Pins can be retrofitted with limited need for modification to plant and equipment. Nobles Load Pins are manufactured from materials which meet the intent and rigours of recognised lifting equipment standards and are offered from alloy high tensile steels and precipitation hardened stainless steels in a state of temper which provides the ductility and toughness required for safe operation married with careful design to ensure that Load Cell aims of linearity and sensitivity of measurement are maintained.

The special stainless steel's from which we construct our Load Pins offer excellent mechanical properties. Together with our weatherproofing designs and bespoke fitment options we offer a unique capability in providing Load Cells which are resistant to harsh environments.

READY FOR LIFTING

In addition to our high standard of electronic design, Nobles Load Pins are professionally engineered mechanical components.

Nobles Load Pins are built with:

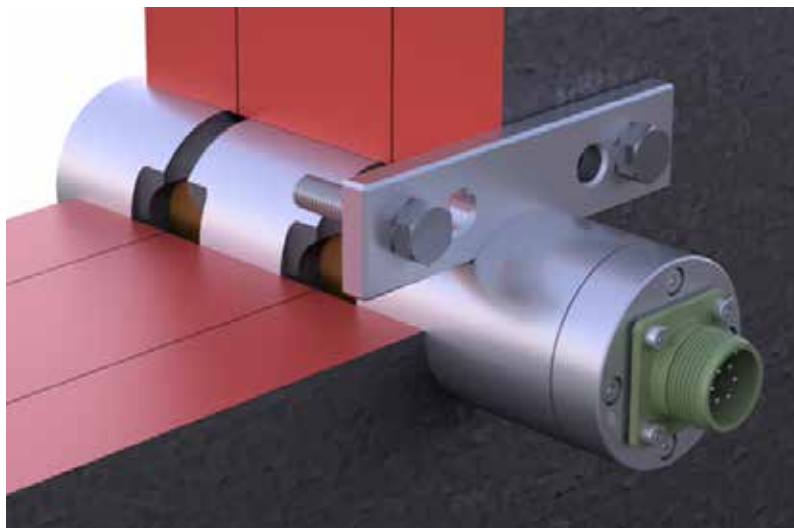
- Tough and ductile steels
- Breaking load factors to match recognised lifting tackle standards
- A Working Load Limit (WLL)
- Attention to stress concentrations whilst retaining sensitivity within the Working Load Limit
- Proof loading to improve linearity and fatigue life

Nobles offer Load Pins with a mechanical duty rating equivalent to AS1418.1 C3/M3. Fatigue design to higher crane class is also available. Nobles can custom design your Load Pin with shaft tolerances, lubrication and pin retention means to match fitment needs. A wide variety of pin keeping arrangements can be accommodated and engineered including keeper plates, headed pins, threaded end and through hole configurations.

LOAD ORIENTATION

Nobles Load Pins can be proof loaded and calibrated for measuring loads which act within a single plane. Where customers specify load measurement calibration in the positive and negative sense this can also be accommodated. It is important with any Load Pin that they are rotationally constrained so that the calibrated plane of force aligns closely with the force that must be measured.

Nobles offer a wide variety of solutions for rotational constraint of Load Pins, with keeper plates tailored to match original pin fitments being the most common type offered.



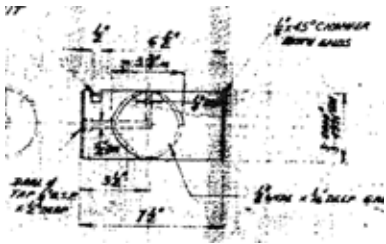
WORKING WITH YOU

Nobles always works to ensure that our customers get the best, safest and most reliable lifting equipment and Nobles Load Pins are no exception.

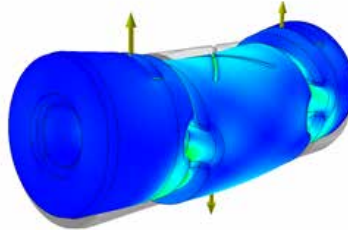
Armed with information about the customer's installation we can provide the simplest fit-up into existing machinery and electronics, design advice for new equipment or professionally engineered modification designs to get the best from a Load Pin application.

Nobles operates a certified ISO 9001 quality system for design and processes every manufacture via rigorous design control and contract review processes. Customers are able to ensure that no mis-steps are taken since each bespoke design is held for customer sign-off of critical parameters, ensuring that everyone gets a Load Pin which precisely meets specification.

Customer drawing



Finite Element Analysis



Final render



OUTPUT CONSIDERATIONS

We can offer various force measurement options for Load Pins, such as an mV/V output that can compatibly connect to a new or existing display, or a standard 4-20mA signal conditioned output.

A standard 4-20mA output is generally the most common and widely used across most industries for load sensors, often used in conjunction with PLC (Programmable Logic Controller) systems.



Our Load Pins can also be optionally calibrated 'bi-directional' to account for both negative and positive forces that are applied within a certain load measuring application.

CONNECTOR & COVER MOUNTINGS

Pictured below are some various styles of connector and cover mountings for Load Cell pin heads.



Counterbored recess for M12 connector fitting



Blanking plug, with 4-20mA electronics behind



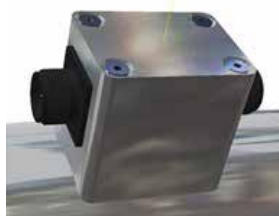
Connector in underside of Load Cell head



Bespoke end cap (sealed with o'ring inside) with MIL-spec connector



Countersunk bespoke end cap



Billet machined external housing with mil-spec connectors



Connector set at 90 degrees to head against milled flat, cover on end to access internal wiring

PROTECTION AGAINST THE ELEMENTS

A good Load Pin is a reliable one and that means one which is well protected from ingress of water, dust and other perils.

For each of our Load Cells we can offer a variety of IP rated connection componentry, rugged MIL-SPEC hardware and purpose-built engineered sealing arrangements.

Our process offers complete flexibility in production of integrated electronics housings and accessory shrouds. These can provide the sort of inherent protection against pressure washdown, process materials, dirt, rocks and other debris which goes beyond that provided by standard components.



LOAD PIN SELECTION & APPLICATIONS

Nobles Load Pins find many uses across industry, including:

- Axle pin replacements – machinery for general industry
- Equaliser sheave pin replacement - overhead cranes for warehouses & factories
- Sheave axles and actuator clevis pins – shipping
- Sheave axles, torque arms & more – stacker/reclaimer & crushers for minerals processing
- Pin joints, sheave axles – mobile cranes
- Load shackle systems – construction
- Hinge pins – emergency exit doors for mines
- Centralising pins – tensiometers systems for forestry & logging
- Hinge and actuator pins – weir gates for local government and water authorities.
- Hydraulic ram and actuator clevis pins – machinery for agriculture/mining/shipping/scientific
- Pins for bin supports – processing machinery for agriculture and food manufacturers

Nobles Electronics can custom design and manufacture complete Load Cell systems to suit specific customer applications. Nobles also designs and supplies strain gauged Load Cells of other types including Tension, Compression, Beam, Tensiometer systems and more.





PROOF TESTING & CALIBRATIONS

Nobles Electronics is a NATA accredited Metrology Laboratory public testing facility. Our accreditation is in accordance with Australian & International standards for the calibration & classification of force measuring systems - AS2193 & ISO17025. All Load Pins we manufacture are proof tested and calibrated in accordance with Australian Standards. Our calibrations can be performed in any units of force including kN, kg, tf, lbs etc.



NOBLES ELECTRONICS

Nobles electronics division has been designing and manufacturing Load Cells and load monitoring equipment for over 30 years, providing complete solutions as an industry leader. Products offered range from off-the-shelf ready to use products, to bespoke designs & engineered Load Cell/Load Pin solutions to meet specific customer requirements.

Nobles broad electronics product range also includes:

- Overhead and mobile crane safety systems
- Weighing/load measuring systems and monitoring/displays
- ECAM underground mine shaft safety systems
- Scotload Smartload® product range
- Static/dynamic wire rope measurement systems
- Hire systems including:
 - Pad-eye testers
 - 4x50t compression (200t)
 - 6x150t compression (900t)



NOBLES
YOUR TRUSTED LIFTING
& RIGGING SPECIALISTS

1300 711 559

sales@nobles.com.au

www.nobles.com.au

SA

Adelaide
Roxby Downs
Whyalla

VIC

Melbourne

NSW

Sydney
Newcastle

QLD

Brisbane
Mackay
Mt Isa

NT

Darwin

WA

Perth
Karratha
Port Hedland