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Lifting - Shackles

Recommendations for Use

Shackles should be inspected before use to ensure that -

- all markings are legible
- the 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
- never use a safety bolt type shackle without using the split cotter pin
- the body and the pin are not distorted or unduly worn
- the body and pin are free from nicks, gouges, cracks and corrosion
- shackles may not be heat treated as this may affect their Working Load Limit
- never modify, repair or reshape a shackle by grinding, welding, heating or bending as this will affect the working Load Limit

Assembly

Ensure that the pin is correctly screwed into the shackle eye, i.e. tighten hand-tight, then secure using a wrench or other suitable tool so that the collar of the pin is fully seated on the shackle eye. Ensure that the pin is of the correct length so that it penetrates the full depth of the screwed eye and allows the collar of the pin to seat on the surface of the shackle eye.

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. Never replace a shackle pin except with one of the same size, type and make as it may not be suitable for the loads imposed.

Select the correct type of shackle and its Working Load Limit for the particular application. Should extreme circumstances or shock loading be applicable, this must be taken into account when selecting the appropriate shackle. Please note that commercial shackles are not to be used for lifting applications.

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.

Side Loads

Side loads should be avoided as well, as the products are not designed for this purpose. If side loads cannot be avoided, the following reduction factors must be taken into account -

0° Load Angle - 100% of original Working Load Limit
45° Load Angle - 70% of original Working Load Limit
90° Load Angle - 50% of original Working Load Limit

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Side Loads Cont…

In-line loading is considered to be a load perpendicular to the pin and in the plane of the bow. Load angles in the table are the deviating angles from the in line loads.

When using shackles in connection with multi-leg slings, due consideration should be given to the effect of the angle between the legs of the sling. As the angle increases, so does the load in the sling leg and consequently in any shackle attached to that leg.

When a shackle is used to connect two slings to the hook of a lifting device, a bow type shackle must be assembled with the slings in the shackle body and the hook engaged with the shackle pin. The angle between the slings should not exceed 120°.

Point Loading

In most instances the load bearing component in connection with a shackle is of a rounded shape. Point loading of shackles is allowed but the minimum diameter of a rounded component should be equal or bigger than the bow size of the shackle being used. Bigger diameters and or flat parts (at shackle pin side) to increase contact area can be beneficial. Sharp edges should be avoided.

Inspection

It is required that the shackles are regularly inspected and that the inspection should take place in accordance with the safety standards given in the country of use. This is required because the products in use may be affected by wear, misuse, overloading etc. with a consequence of deformation and alteration of the material structure.

Inspection should take place at least every six months and even more frequently when the shackles are used in severe operating conditions. Proof loading should be conducted at least every 4 years but more frequently when required by the safety standards given in the country of use or when the shackles are used in severe operating conditions.