

SHACKLES



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Application information

Shackles are used in lifting and static systems as removable links to connect (steel) wire rope, chain and other fittings.

Chain or Dee shackles (H9, D15, H11 and D10 shackles) are mainly used on one-leg systems.

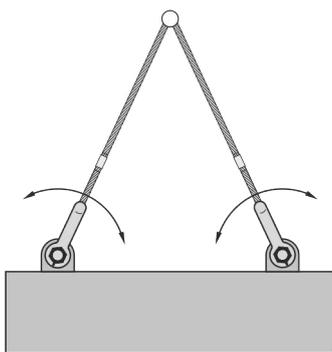
Anchor, Bow or Wide body shackles (H9, H10 and H14 shackles) are used on one leg and multi-leg systems.

End-Joining, Joining and Anchor shackles (D14, D16 and D17 shackles) are used in mooring or anchor lines.

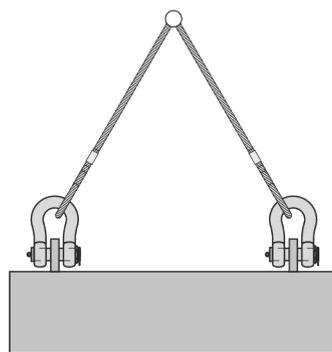
Instructions for use

For screw pins 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. 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.

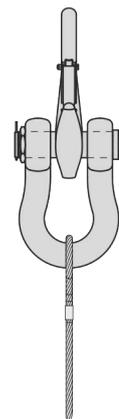
Select the correct type of shackle and its Working Load Limit for the particular application. Should extreme circumstances or shock loading be applicable, this must be well taken into account on selecting the correct shackle. Make sure that the shackle is supporting the load correctly, i.e. along the axis of the shackle body centre line, avoid introduction of bending loads, unstable loads and do not apply overloads. To avoid eccentric loading of the shackle a loose spacer may be used on either end of the shackle pin.



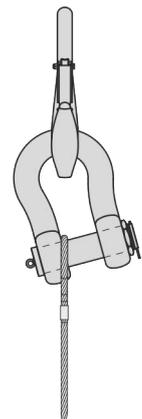
Right



Wrong



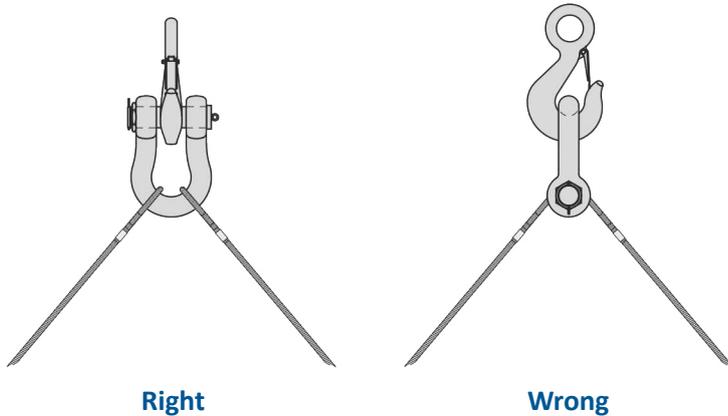
Right



Wrong

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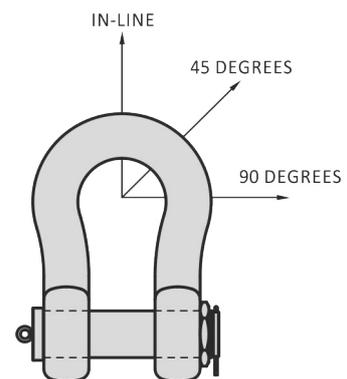
Avoid applications where due to movement (e.g. of the load or the rope) the shackle pin can rotate and possibly be unscrewed. If such an application is necessary or when the shackle is to be left in place for a prolonged period or where maximum pin security is required, use a shackle with a safety bolt, nut and pin cotter pin.



Loads

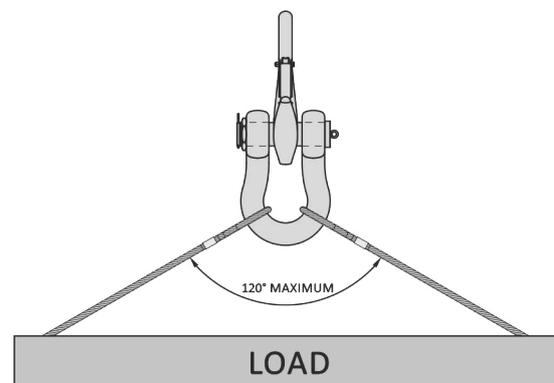
Point loads: Most of the time the load bearing component that is in connection with a shackle is of a rounded shape. Point loading of shackles is allowed but the minimum diameter of a rounded component should be equal or bigger than the bow size of the shackle being used. Bigger diameters and/or flat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

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 reduction factors from below table must be taken into account: 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.



Angle of Side Load from vertical in-line of shackle	Reduction for side loading New Working Load Limit
0° In-Line	100% of Rated Working Load Limit
45° from In-Line	70% of Rated Working Load Limit
90° from In-Line	50% of Rated Working Load Limit

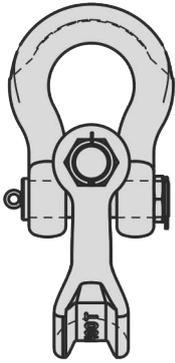
When using shackles in connection with multi-leg slings, due consideration should be given to the effect of the angle between the legs of the sling. As the angle increases, so does the load in the sling leg and consequently in any shackle attached to that leg. When a shackle is used to connect two slings 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°. If symmetrically loaded the shackle may be used to the full WLL.



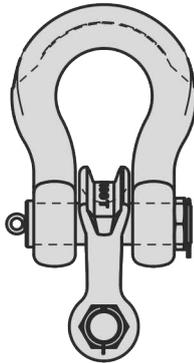
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Shackle-to-shackle connection

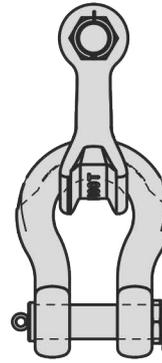
GN shackles can also be used according to below configurations. The maximum load of the configuration is limited by the component with the lowest WLL.



Pin - Pin



Bow - Pin



Bow - Bow

Temperatures

If extreme temperature situations are applicable, the following load reduction must be taken into account:

Temperature	Reduction for elevated temperatures New Working Load Limit
up to 200°C	100% of Rated Working Load Limit
200°C - 300°C	70% of Rated Working Load Limit
300°C - 400°C	50% of Rated Working Load Limit
> 400°C	not allowed

On request we can inform you about low temperature impact values, -20, -40 and -50 degrees Celsius.

Inspection

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

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 a securing 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 machining, heating or bending as this will affect the Working Load Limit
- Welding on shackles body and pins is not allowed, with exception of the crown pin shackles D10

Markings

As minimum the following markings must be hard stamped in the shackle:

- Applicable Working load or Proof load
- Brand mark
- Production number