



## **FAQ G11 - Can I grind or weld steel components and accessories that are 'in use'?**

No, not without the permission of the OEM.

Grinding and welding can cause stress raisers. OEM's may permit grinding out minor surface defects outside of their control. If so, they should provide guidelines in their user instructions, but they will not permit welding or any other modification, without their knowledge and written consent.

Use of these methods may be classed as inducing stress raisers which can be detrimental to the integrity of the equipment. Stress raisers can be areas where fatigue cracking can initiate, dependent on the magnitude of the stress and location of the stress raiser.

This means that any such additions or changes to a product once placed on the market or in service, will need to be investigated and approved by the OEM and verified by a competent person following the work carried out and before use.

Effectively, this is the modification of lifting equipment after manufacture and once placed on the market or in service.

### **Grinding**

Grinding of forged or cast steel accessories and components, such as shackles for example, is not recommended due to the potential to weaken the material and introduce stress risers.

While grinding can remove surface imperfections, excessive grinding can disrupt the grain flow and introduce stress concentrations, which can lead to premature failure.

If grind marks are found, they should be treated as defects affecting the safety of the equipment and it is the Competent Person's decision as to whether they are severe enough to fail the equipment.

Examples of where grinding is seen, is in ad hoc sling assemblies of various accessories where numerous WLLs may be present. This is usually carried out to reduce the risk of misidentification of the sling assembly's WLL which should be identified by a sling tag.

This may also occur on a runway which may have been fitted with a hoist of higher WLL than that marked on the beam itself.

### **Welding**

Welding is also not recommended on components or accessories, as it can significantly alter the material properties of the metal being worked. It can potentially lead to reduced strength and increased risk of failure, especially in critical applications such as lifting operations.

Common examples of this in accessories, is seen where a shackle pin is welded to the body to create a permanent fitting. Where this has been carried out, LEEA would assume that a risk assessment identified that there was a risk of the pin unscrewing, hence the weld.

It should be noted that this may not reduce the risk sufficiently and the company in question carrying this out would be held accountable for not selecting equipment fit for the application. It is highly likely that the reasoning behind this may very well breach legislation due to demonstratable incompetence and poor selection of equipment.



A nut and cotter type pin or other type of mechanical securing component would be the appropriate choice. Therefore, should the weld result in failure and injury, the enforcing authorities may take a very dim view of this although it is a common practice.

For those looking to market a product with this, proof load testing alone is inadequate as it cannot identify fatigue cracking or the potential for fatigue cracking when put into service. Fatigue cracking is caused by stress cycles and is a variable based on geometry (stress raisers) and the number and magnitude of stress cycles. These defects can only be identified through visual and NDT techniques.

If components or accessories are welded after leaving the OEM, then the owner of the equipment will need to accept full responsibility and will also need to hold comprehensive documented evidence - including, but not limited to OEM's permission in writing, risk assessment, welder qualifications, welding specifications and procedures, test records and full traceability. Manufacturers doing this will need to be able to meet the supply legislation requirement for new products and be able to provide the evidence that the complete product is safe to use.

Therefore, grinding or welding carried out after initial manufacture is not recommended for the above reasons and because of their training, competent persons would normally quarantine or condemn components that have been modified. They would need to see evidence in writing to pass them.

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