INSTALLATION, MAINTENANCE & SERVICE BULLETIN

WELDING TO THE FKH AXLE

(Mechanical or Air Suspension)

FUWA K Hitch Axle beam is made of low alloy-steel and formed with integral hot forming technology. Hence, it has better fatigue life and superior welding qualities. The round axles provide an uniform section modulus no matter how the beam is rotated.

Brake spiders are positioned and welded to exacting specification requirements at our factory. Ring Welding the spider directly to the axle beam provides a higher and more reliable brake attachment over bolt-one versions.

In welding suspension component parts to *Fuwa* trailer axle, extreme care must be exercised to obtain correct location and ensure the spring seat load bearing are parallel to each other. Any welding of additional attachments to the axle should be approved by *Fuwa* engineering department.

Axle Beam Repair Welding

In the interest of safety and preserving the service life of trailer axle assemblies, *Fuwa* recommends that trailer axle beam NOT be repair welded. Repair welding can detract from the structural integrity of an engineered component, particularly on heat-treated parts where the benefit of the processing may be nullified by the welding. Therefore, a new replacement beam should be installed as soon as possible.

Preheating Requirements

Absolutely no welding should be done on axles that are below room temperature, about 20°C. Before welding on suspension components or any other part onto the axle, the area of the attachment point should be warmed slowly to 200~250°C. Immediately after checking the temperature, the part(s) should be tack welded in place. Recheck the temperature, if below 180°C, reheat to 200~250°C and complete welding per welding introductions.

How Welding Affects Axle Beam Material

All welds made on the beam create, in effect, an extremely localized heat-treatment of the metal. The heat generated during the welding process can cause the material in the HAZ (heat affected zone) to become hardened or brittle. This effect can impart an undesirable characteristic to the normally ductile structure. This small-hardened area becomes the weakest part of the beam and therefore is the area most susceptible to failure. The axle beam is no stronger than its weakest section. As evident from below, the welds should be horizontal and as near as possible to the front and rear horizontal centerline of the axle beam. Always avoid welds that are circumferential in nature below the horizontal centerline.

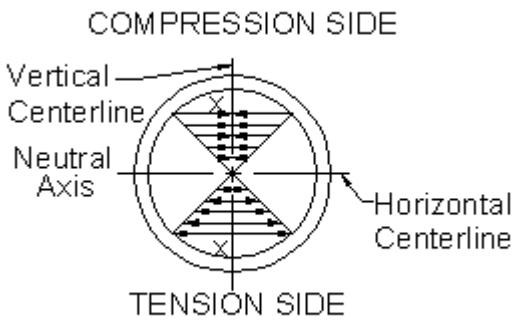
Welding Guide

Fuwa supplies axles to customers in all stages of assembly from the beam with spindles only, to the complete axle assemblies. In the final analysis and with few exceptions, we have little or no control over later assembly of incomplete units by the trailer fabricator and, therefore, we cannot be responsible for warranty on improperly processed components.

Stress of Axle Beams

The man-loaded stresses on a beam are expressed as three primary stress zones. The compression stress zone (top side), the tension stress zone (bottom side), and the neutral stress zone (front and rear horizontal center line commonly referred to as the neutral axis).

The below is a graphic representation of the degrees of stress in the wall of the tube when the bream is under load. The length of the arrows “x” represents the amount of stress at a given point. From this illustration, it is evident that the two opposite stresses diminish as the horizontal centerline of the beam is approached.



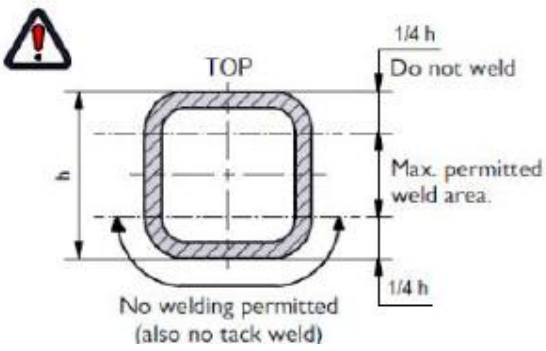


Figure 1 Degree of stresses on the axle beam

In addition, the torsional stress, imparted by braking action of the wheels, is taken into consideration in rating the axle capacity. An allowance of both stresses bending (beam load) and trosional is factored into the calculations to provide and acceptable design factor. The stresses are reapplied and reversed many times during normal axle beam life. For this reason, the beam material must have certain properties, such as impact strength, that permit it to absorb shock, to flex, and then to resume its original and normal, as manufactured condition.

It is necessary when welding to avoid the high stress areas on the tube top side (compression zone), and tube bottom side (tension zone). All welds should be made as close to the horizontal centerline as possible. When the axle tube is subjected to the heat from welding and then rapid cooling, the material adjacent to the weld loses its desirable ductile properties and becomes brittle. If this condition exists in the high stress areas under maximum load conditions, the life of the axle will be greatly reduced and premature fatigue failure can occur. Recommended locations for the welds are shown below.

For the installation information of the suspension brackets to the axle, check the following bulletins:

FUWA Mechanical:	**KPM-002-0310**
FUWA KT:	**KPM-001-0712**
Weweler:	**SIG-HD-FKH-EN-RFS**

For any other suspensions, check with the suspension manufacturer for the installation details.