



PRODUCT IMPROVEMENT NOTIFICATIONS GRADER

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Prepared for: Vehicle Owners
Prepared by: Bill Davidson

Objectives:

This intention of this document is to summarise the scope of product improvements available or in development for the AME Grader (formerly GE mining / Industrea). The product improvement opportunities have been reviewed from issues identified in the field or feedback from end users. The aim of this notification is to owners aware of solutions available and initiate dialogue on other potential improvement opportunities.

Improvement: Front Beam Structure



Figure 1: Bent Beam Grader

The beam assembly structural improvement significantly extends the fatigue life of the structure. Finite Element Analysis indicates upwards of 500% improvement to the original design.

Additional to the structural improvement, ball joints used for lift and lateral movement of the blade assembly have been changed to replaceable pin joints.

A significant visibility improvement is also evident on the high cab versions of grade due to the improvement to the line of sight for the operator.

Impacted Components

Front axle assemblies, turning circle and blade assembly remain unchanged. The existing drawbar connection is modified to convert the ball joint into a double clevis. New cylinders and pins are required for lift and lateral shift.

This improvement is done in conjunction with the articulation hitch upgrade. Reference Grader Bent Beam upgrade when requesting quotation on this improvement.

Improvement: Bolt on Ball Studs – Lift & sideshift cylinders
Applicable machines: Straight Beam Graders (serial number 014-038)

An improvement to the servicability of the ball stud attachment has been made by the design of a bolt on ball stud arrangement for side-shift & lift cylinder attachments



Figure 2: Bolt on ball stud arrangement

Components impacted

The fitment of the Bolt on ball stud requires a change to the beam attachment point and blade circle group attachment point by welding a tapping pad and spigot for the bolted ball stud to mount. The hydraulic cylinder design is unchanged.

Beam weldment P/N 7-023788-700

Bolt on ball stud P/N 7-023669-700

Drawbar modification P/N 7-023668-700

Improvement: Articulation Hitch Assembly bearing and seal arrangement

Applicable Machines: All mechanical Graders, straight or bent beam.

A improved Hitch assembly has been developed for the grader to improve bearing and hitch casting service life, as well as reduce ingress of foreign material. The former hitch design relies on an interference fit of the king pins and a single retaining bolt. The hitch bores are likely to be damaged during disassembly. The bearings also rely on an interference fit into the bore to be retained. If wear of the outer race or bore occurs, movement of the bearing and subsequent collapse are likely outcomes.



Figure 3: Upgraded Hitch Articulation

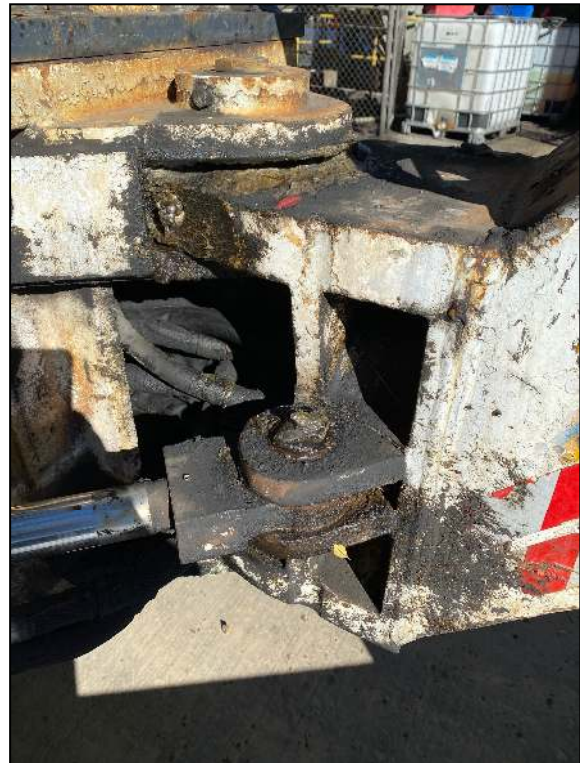


Figure 4: Old style hitch

The articulation king pins are now retained via counterbored socket head cap screws rather than a single bolt. This allows a reduced interference fit of the pin into the casting to help with assembly and disassembly. Additionally the upgraded spherical bearings are now held captive into the bore via a retaining plate, reducing bearing movement and wear between the hitch bores and outer bearing race. Additionally a more robust articulation stop has been designed to prevent damage to steering cylinders when the end of stroke is reached.

Scope of Change:

The fitment of the new hitch arrangement is retrofittable to existing hitch castings, with some machining required on both the prime mover hitch and the beam hitch casting.

Additionally, higher rated bearings, bearing spacers and pins are required. This upgraded hitch assembly has been proven in service and is distinguishable by the flanged articulation king pins.

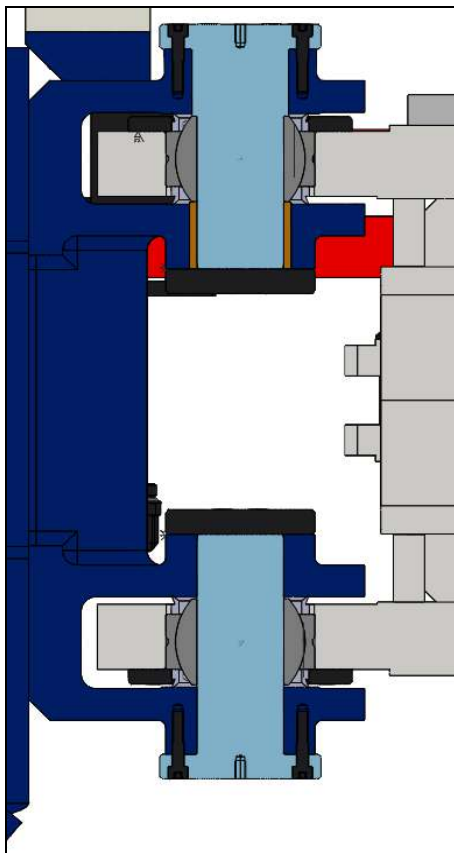


Figure 5: New Style Hitch X-section

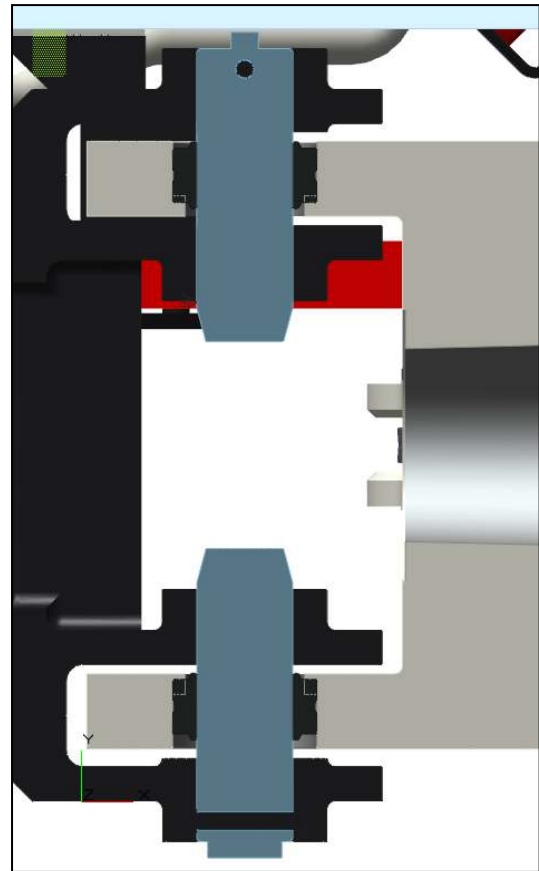


Figure 6 Old Style Hitch X-section

When requesting a quotation reference Grader Articulation Hitch upgrade

For retro fit of an old style hitch use bill of materials 7-025056-700

Beam machining P/N 7-025090-700

Hitch machining P/N 7-024825-700

Artic stop drawing refer engineering

Improvement: Straight Beam Grader Structural improvements

Instances of fatigue cracking have been detected in service on Grader Straight beam areas as indicated. If left un adressed, crack propagation may lead to catastrophic failure of the beam, particularly at the SHS transition plate.

The fatigue life of the original front beam structure has been analysed and design improvements have been implemented, greatly reducing the probability of crack initiation and propagation.

Design improvements are reflected in Grader front beam weldment part number 7-023788-700 revision D or later.

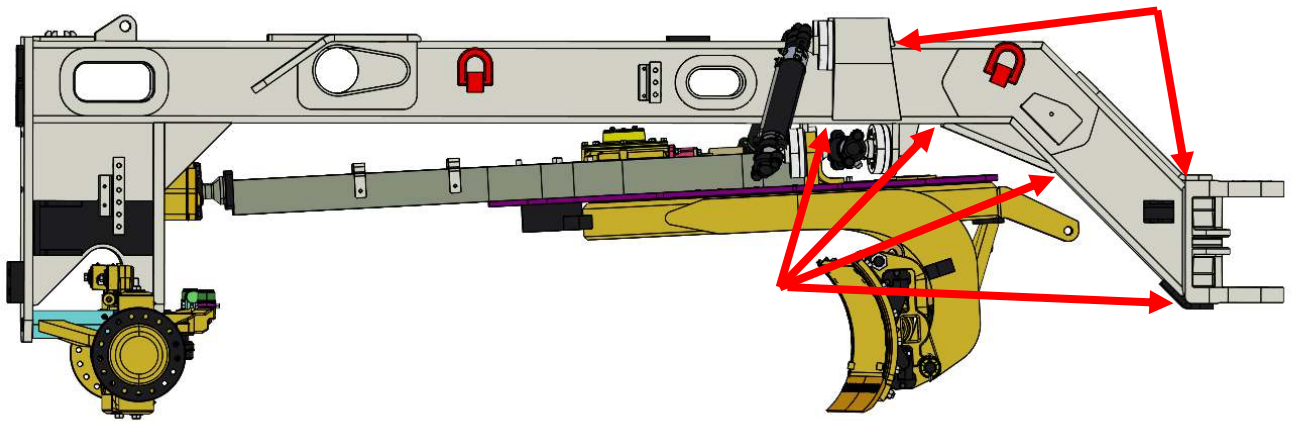


Figure 7: Straight Beam areas of detected cracking

Australian Mining Equipment Contacts in respect to this notification:

Product Support Engineer	Bill Davidson	0409562385	bill.davidson@amequip.com.au
NSW Workshop Manager	Garrad Latham	0407272296	garradl@amequip.com.au
QLD Workshop Manager	Doug Woodham	0437436939	doug.woodham@amequip.com.au