

HASTINGS DEERING (AUST) LTD

TIPS TO MINIMISE UNDERCARRIAGE INDUCED MACHINE VIBRATION.

A recently held Whole of Body Vibration (WBV) forum at Hastings Deering Brisbane office was well attend by representatives of the mining industry, government departments and Caterpillar dealer personnel. The forum was initiated to discuss on going research and development into the issues facing machine manufactures and owners in regards to the vibration that is placed upon operators in the normal application of heavy earthmoving equipment. The future design, maintenance and operation of heavy earthmoving equipment will undoubtedly be influenced by this issue.

Caterpillar has been involved with field research in cooperation with mining customers to obtain data that can be used to develop tooling to identify vibration issues on mobile equipment. The focus in this area has been primarily on track type tractors and so far the data being retrieved points to undercarriage maintenance as one of the biggest factors in controlling vibration on this type of equipment. Depending on the application, operation and maintenance levels applied to track type machine in general will have significant effects on the level of comfort experienced by operators.

An area of focus for undercarriage is the level of link rail scalloping that can develop in certain applications. The link rail scalloping wear pattern is a result of machine applications in highly abrasive environments and a combination of high speed operation. Continuing operation in this type of environment will require focus on correct undercarriage management procedures. Assistance with undercarriage management can be sourced from Hastings Deering Product Support. Minimising the impact of application related vibration can also be reduced by following basic management recommendations listed below:

Maintenance Tips:

- Maintain correct track tension for the under - Track tension that is tighter than Caterpillar recommendations will increase forces on undercarriage wear surfaces. When abrasives are present the increased track tension forces will accelerate wear on link rails which lead to scalloping and increased machine vibration.
- Balance undercarriage component life - This is achieved by replacing undercarriage together as a system. When components are replaced individually wear patterns are often different and as such these different patterns cause accelerated wear on undercarriage components when there is a mismatch.
- Limit high speed operation - High speed operation accelerates wear on undercarriage components and can increase levels of vibration absorbed by the operator.
- Ensure proper machine balance - Track type machines which are operated with improper machine balance can result in significant unbalanced wear occurring on the track frame components. An improperly balanced machine can also lead to exaggerated effects of vibration being felt by the operator. For assistance with proper machine balance consult Hastings Deering Product Support.
- Follow Caterpillar Operation and Maintenance Guide procedures for the relevant track type machine.

Further information regarding Whole of Machine Vibration can be found in the following Caterpillar publications:

SEBU5287 - Operation and Maintenance Manual - The European Union Physical Agents (Vibration) Directive.

HEGQ3339 - Driving Down Vibration - Pocket Guide.

HEGQ3338 - Driving Down Vibration - Booklet.

Bulletin No.	01	Issue Date:	01/03/2006	Revision Date	
Author	John Edwards	Revision No.	00	Total pages	1

Bulletin No.	01	Issue Date:	01/03/2006	Revision Date	
Author	John Edwards	Revision No.	00	Total pages	1