

Focus on BIA's work

Berufsgenossenschaftliches Institut für Arbeitsschutz

No.: 0143 Hand-arm vibrations from impact screw and nut drivers

○ Problem

Pneumatic impact screw and nut drivers are used in tyre mounting in vehicle repair shops. Particularly in mechanic's shops that mount lorry tyres, very powerful drivers are needed that can cause considerable vibration exposure to the user's hand and arm. Vibration was measured under real conditions of use with the aim of analysing the potential hazards and developing preventative measures.



Illustration: Pneumatic drivers in use for mounting tyres

○ **Activities**

The measurements were taken under typical working conditions and under the consideration of the influence that the operator has on the effects of the device. The exposure values for the "frequency-weighted hand transmitted vibration acceleration" were analysed separately for the conditions "loosening the nut" and "tightening the nut" with their respective periods of exposure.

○ **Results and Application**

The frequency-weighted r.m.s.-acceleration values (a_{hw}) recorded were in a range of 15.1 – 23.7m/s², which varied considerably from the stated value of the manufacturer (12.2m/s²), which is in conformity to the EC machine directive. The cause of this variation was identified in the operating pneumatic pressure commonly found in everyday use. A related study conducted by the Institution for statutory accident insurance and prevention in the vehicle operating trades found that the operating pressure of around 10 bars for filling tyres was not particularly reduced in practice for using the pneumatic impact drivers. The obligatory manufacturer information on the amount of hand-arm vibration can only be used as a basis for hazard assessment if the given parameters for use are observed. In all other situations, new measurements are necessary under real conditions.

○ **Area of Application**

Metal-working, fine mechanics, motor vehicle repair and maintenance

○ **Additional Information**

- DIN EN ISO 8662-7: Handgehaltene motorbetriebene Maschinen – Messung mechanischer Schwingungen am Handgriff – Teil 7: Schrauber, Schraubendreher und Mutterdreher mit Schlag-, Impuls- oder Ratschenantrieb (10.97). Beuth, Berlin 1997
- DIN V 45 695: Hand-Arm-Schwingungen – Leitfaden zur Verringerung der Gefährdung durch Schwingungen – Technische und organisatorische Maßnahmen. Beuth, Berlin 1996

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○ **“Focus on BIA’s work”**

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