

Fachbereich AKTUELL

FBHM-108

Multirip Saws

Information for purchase, retrofitting and safe operation

Sachgebiet Holzbe- und -verarbeitung Date: 29.05.2020

Translation of the German version.

This “Fachbereich AKTUELL“ is focused on users of manually loaded multirip saws for lengthwise cutting (alternative term: multi-blade rip or multiblade trimming saws) and on interested parties who purchase or retrofit multi rip saws. The present information is supplemented by accident black spots at these machines to give support in the risk assessment for purchase, operation and retrofitting.

Table of contents

1	Multirip Saws	1
2	Purchase	2
3	Accident black spots / Retrofitting	3
4	Operation	7
5	Summary und limits of application	8
	Annexes	10

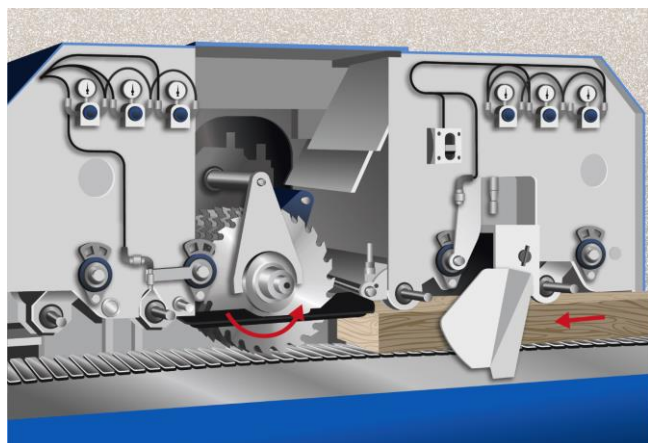


Figure 1: Multirip saw, schematically, shown with opened working area.

1 Multirip Saws

Multirip saws for longitudinal cutting are typically used for trimming raw wooden boards (lateral board processing) and for cutting beams or panels as well. They have one or more saw spindles (compare Figure 1), on which usually two or more saw blades are mounted.

After feeding the machine, the workpiece is mechanically fed to the saw blades and carried away. It has to be distinguished between:

- Cutting in line with feeding direction
- Cutting opposed to feeding direction

When cutting opposed to feeding direction, the saw blades cut against the feeding direction. This means that workpieces or parts of workpieces (splinters) are carried along in the direction of (manual) feeding (feeding area) if the workpiece or parts of it get caught at the saw blade (see Figure 1, (manual) feeding on the right, feeding direction of the workpiece from right to left).

When saw blades cut in line with the feeding direction, parts of the workpiece (splinters) may be carried along and ejected to the outfeed side.

There may also be several saw spindles which work partly in line with the feeding direction, partly opposed to it. In this case, the statements about carrying along the workpiece or its parts (splinters) apply, specifically to each individual saw spindle.

The main types of mechanical workpiece feeding mechanisms are:

- Feed system by conveyor belt
- Feed system by rollers

Figure 1 shows the feeding conveyor belt as linked chain. The pressure rollers push the workpiece on the feeding chain. This way the workpiece is carried along.

To imagine feeding by rollers (Figure 1), the feeding chain has to be virtually substituted by driven feeding rollers situated at the top and/or at the bottom.

Kickbacks of the workpiece opposed to the feeding direction are prevented by anti-kickback fingers (compare Figure 2), ejections of parts of the workpiece by splinter guards.

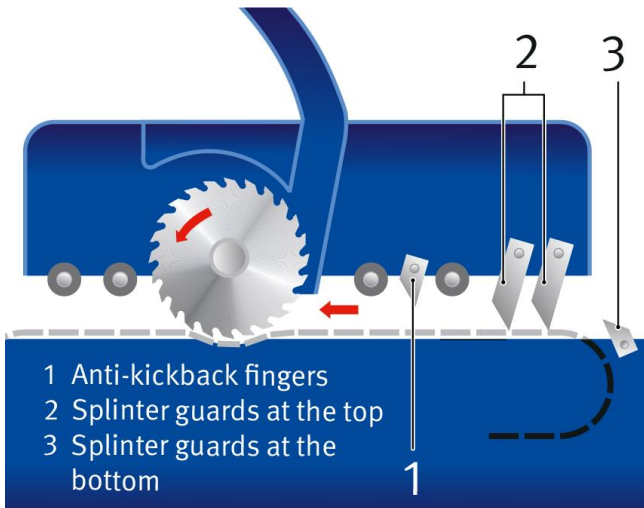


Figure 2: Multirip saw schematically with endless conveyor belt.

The mechanical feeding system guides the workpiece by force in the infeed area, within the machine and to the outfeed area.

That means workpieces in an inclined position in the infeed area will be pushed down (swivelling movement).

Once drawn-in, the workpieces can no longer change direction, neither upwards nor downwards and will be pushed through the machine by force in the outfeed direction. To avoid crushing

and shearing points at table edges, the tables have to be seamlessly fitted to the machine, so that the workpieces can be fed in or be removed in a flat way.

In roller conveyors without filling pieces, crushing points even occur at the contact points of non-driven rollers, both in the infeed and outfeed areas. This can be avoided by lining roller conveyors in the infeed and outfeed area if the filling pieces reach up to the machine.

Because of multiple saw blades during sawing operation, large quantities of saw dust are generated which have to be extracted. For details see TRGS 553 (Technical Rule on Hazardous Substances 553) [1]. If it cannot be avoided that some wood contains foreign metallic materials, the machine is considered to be spark emitting. The suitable wood dust extraction system for the machine must in addition be explosion-proof (spark detection and extinguishing system in the extraction line).

2 Purchase

When new multirip saws are placed on the market for the first time, they are subject to European regulations which are transposed into national law. In Germany, the corresponding transposition into national law is implemented by the "Produktsicherheitsgesetz" (ProdSG / Product Safety Act) [2] and the "9. Verordnung zum Produktsicherheitsgesetz" (9. ProdSV / 9th Ordinance to the Product Safety Act) [3]. The "9th ProdSV" refers to the annexes of the "EU Maschinenrichtlinie 2006/42/EG" (MRL / Machinery Directive 2006/42/EC / MD) [4] which define the essential and mandatory requirements for the design and

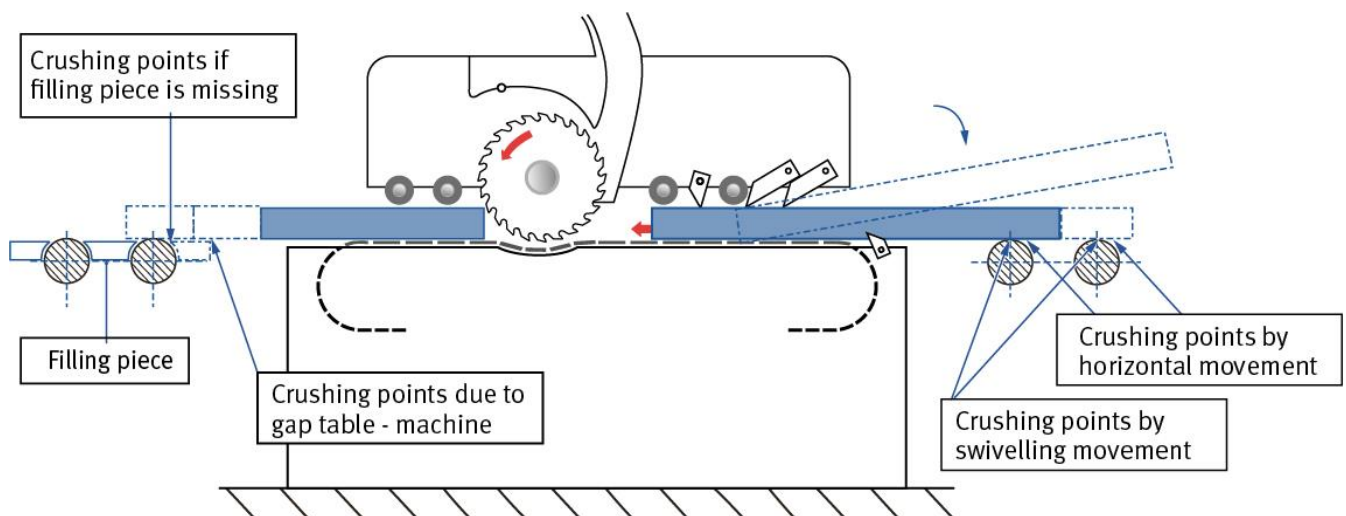


Figure 3: Shear- and crush points resulting from workpiece guided by force.

equipment of machines for the manufacturer. These requirements are specified in more detail in harmonized standards which can be used by the manufacturer. For the manually fed multirip saw, especially DIN EN 1870-4 [5] applies.

If the manufacturer designs completely according to the standard, this should be stated in the EC declaration of conformity. If the design is not completely in accordance with the standard, the EC declaration should indicate the external test body which certifies the EC type testing procedure according to Annex IX of the MRL or the full quality assurance procedure described in Annex X.

New machines must have the CE marking. The CE marking does not certify to what extent the machine can be considered minimized in dust emission in reference to TRGS 553.

According to the regulation “Betriebssicherheitsverordnung“ (BetrSichV / Ordinance for Industrial Safety and Health) [6], the risk assessment ought to be done prior to the purchase.

Useful aspects include:

- Necessary performance characteristics of the dust extraction system and the dust emission of the machine
- The stopping time of the machine until standstill for safe trouble-shooting. If frequent malfunctions have to be expected – for example when processing gnarled, twisted wood – a machine configuration providing a brake is reasonable.

If new or second-hand machines are delivered from countries outside the European Economic Area (EEA), the importer has to ensure that the legal requirements for machine safety and placing on the market are met in accordance with the European manufacturer's instructions (CE conformity at the time of placing on the market/importation). These regulations are also of importance in case of direct import by the future operating company.

When trading second-hand machines, the provisions of the ProdSG have to be considered.

Even if the manufacturer meets the requirements for placing on the market (for new machines) or met them in the past (for second-hand machines within the EEA), the future operating company must additionally carry out a risk assessment according to the BetrSichV prior to commissioning, regardless of the year of construction of the machine. In doing so, suitable protective measures have to be taken and it has to be determined whether the working device is safe.

Month/Year	Regulation
04/1977	VBG 7j [7]
04/1989	Current VBG 7j in conjunction with specific ZH 1/3.18 [8]
01/1993	Transition period MRL / MD: MRL / MD or current VBG 7j in conjunction with specific ZH 1/3.18.
01/1995	MRL / MD
03/2001	Current MRL / MD in conjunction with specific and current DIN EN 1870-4

Table 1: Essential regulations

Considering new machines, the assessment especially covers the (residual) hazards of the machine according to the current state of the art. In case of second-hand machines, the assessment additionally covers such hazards which result from the gap of the former state of the art and the current state of the art.

Depending on the year of construction, the manufacturer had to apply different rules with increasing requirements to safety (compare Table 1).

This gap in the safety requirements resulting from old and new regulations is also reflected in the occurrence of accidents.

3 Accident black spots / Retrofitting

Within the scope of this “Fachbereich AKTUELL“, accident data have been evaluated. On the base of accident black spots and hazards by the machine periphery, recommendations for retrofitting multirip saws are made in order to minimize or eliminate the resulting hazards.

3.1 Requirements of the „Betriebs-sicherheitsverordnung“

The BetrSichV specifies safety requirements (minimum requirements for the safety of machinery) in §§ 4, 7, 8 and 9. However, these requirements are usually insufficient for the respective machine category – here multi rip saws.

Further information how the aspects given above can be covered when carrying out the risk assessment:

- The state of the art has to be considered § 3(7).
- Findings of the occurrence of accidents have to be considered § 3(7).

- When taking protective measures, the TOP principle has to be applied (Technical before Organisational before Personal protective measures) § 4(2).

The risk assessment according to the „Betriebs-sicherheitsverordnung“ is clarified by the rule „Technische Regel für Betriebssicherheit 1111“ (TRBS 1111 / Technical Rule on Industrial Safety and Health 1111) [9], **with presumption of conformity** regarding the BetrSichV. For example, the following additions of the TRBS 1111 should be considered:

- Consideration of all phases of use – here: e.g. production, set-up, trouble-shooting, cleaning (point 4.2, item 2).
- Consideration of the instructions for use or operation manuals handed over by the manufacturer of the machine (point 4.2, item 6).
- Hazards which might result from the machine itself, here e.g. rotating machine parts like saw spindle or feeding rollers (point 4.3, item 1).
- If necessary, further regulations have to be included in addition to the BetrSichV, which are relevant for safe use.: For example the Gefahrstoff-Verordnung (GefStoffV / Ordinance on Hazardous Substances) [10] in conjunction with TRGS 553 or the Lärm- und Vibrations Arbeitsschutzverordnung (LärmVibrationsArbSchV / Ordinance on Occupational Safety with regard to Noise and Vibration) [11] (point 4.3, item 1).
- Information about specifying safety measures can be obtained from the hazard-related regulations, e.g. TRBS 2111 [12] (point 5).

Further clarifying information can be obtained from the „Empfehlungen zur Betriebssicherheitsverordnung 1114“ (EmpfBS 1114 / Recommendations to Industrial Safety and Health 1114) [13] – but in contrast to the TRBS-Rules, this information is **without presumption of conformity** with regard to the BetrSichV.

3.2 Evaluation of accidents

The evaluation of a main unit of 102 accidents on multirip saws shows the following main types of accidents:

- Contact to running/slowing machine part (saw blades, feeding rollers, etc.).
- Workpiece ejection or parts of it (splinters)
- Other accidents (falling machine part when adjusting machine, etc.).

The costs expressed as a percentage of the total costs of accidents point to the average of accident severity. The maximum severity of accident / injury shows the potential of the hazard. The first two main types of accidents are relevant.

Accidents	Percentage of accident figures approx.	Percentage of total costs approx.	max. severity of accident/ injury
Contact to running/slowing machine part, thereof	24 %	55 %	
Running/slowing saw blades	13 %	29 %	Amputation of hand
Feeding rollers or pull-out rollers	2 %	11 %	Severe injury of forearm
Others	9 %	15 %	
Ejections of workpieces or parts of them (splinters) thereof:	66 %	44 %	
Infeed side	52 %	40 %	Fatal
Other sides	14 %	4 %	Severe injury of face / jaw of a third party
Other accidents	10 %	1 %	

Table 2: Evaluation of accidents - overview

3.2.1 Accidents due to contact with running/slowing machine part

Accidents caused by contact with running/slowing machine parts are accounting for 24 % of the number of accidents (related to the accident main unit) but cause approx. 55 % of the total costs of all accidents.

Regarding to the accident main unit, about 13 % of accidents happen by contact with running/slowing saw blades with a dis- proportional part of approx. 29 % of the total costs of accidents. In a specific case, the contact with running/slowing saw blades resulted in a hand amputation.

a. Accidents due to contact with running/slowing saw blades

These accidents can be traced back to following causes:

- a1. Movable guards, intended to prevent access to the moving saw spindle (cover, machine enclosure) were not provided with guard locking. That means, the accidents can be traced back to missing current state-of-the-art guard locking.

- a2. This clause summarizes causes of accidents which led to accidents with contact to running/slowing saw blades and were due to the use and the drawing-in of an auxiliary item - (e.g. a rest of a wooden slat when performing trouble-shooting on a running saw). The cause can be traced back to a lack of protection due to too small lateral safeguards (existing safeguards, but inadequate).
- a3. On existing movable safeguards, intended to prevent the access to the moving saw spindle, the guard lockings were defect or manipulated.

b. Accidents due to contact with feeding or pull-out rollers

These accidents can be traced back to the following causes:

- b1. Defect position switch as technical cause.

3.2.2 Accidents due to ejection of workpieces or parts of it

Based on the total number of accidents, 66% were accidents caused by ejection. This is divided in approximately 52 % of ejections in direction of the infeed side and 14 % on other sides, including sideway ejections. The ejections resulted in 1 fatal accident and 1 severe face injury of an uninvolved third party. Their share to the total costs of accidents amounts to approx. 44 %. Ejection accidents can be traced back to the following causes:

- c1. The lifting and lowering of the kick-back device to adjust to the height of the workpiece could be carried out despite the moving saw spindle. This caused ejections of workpieces while saw blades were moving (no interlocking device with guard locking for the saw spindle present).
Lifting and lowering of the splinter guards while saw blades were running caused ejections of parts of the workpiece (splinters) – (no interlocking device with guard locking for the saw spindle present).
That means the accidents can be traced back to a missing current state-of-the-art interlocking device with guard locking.
- c2. Parts of workpieces (splinters) have been ejected through openings or gaps (several times on the side). That means, safeguards were present but they were insufficient. It also happened to newer machines of more recent years of manufacture.

- c3. Worn or defective anti-kickback devices and / or splinter guards led to ejection of workpiece parts (splinters).

3.2.3 Notes to accidents

This clause includes further notes on causes of accidents – on which the recommended measures for retrofitting and safe operation are based on.

- d1. A missing lateral guard at the workspace according to 3.2.1a2. led to an accident due to contact with a running/slowing machine part (saw blade) – similarly, several ejections were not held back according to 3.2.2 c2.
- d2. A defective or worn out anti-kickback device or splinter guard shows no black / white behaviour in form of complete failure or absolute error-free working. The structure of the entire system is also playing a crucial role. Multi-stage, fault-tolerant systems according to Figure 2 and Annex 1 were used with DIN EN 1870-4: 2001. The accident statistics show that accidents involving older machines are more frequent.
- d3. Evaluation of accidents due to contact with running/slowing saw blade when using an auxiliary item (wooden slat, hose, using personal protective equipment e.g. safety gloves): Their share on the accident main unit is 6 %, their share on the total cost of all accidents is 19 %. These accidents are characterized by a significant severity of injuries. They mainly occur during multirip saw operation.
- d4. Evaluation of accidents on the base of defect or manipulated guards, directly named. Their share on the number of all accidents is about 17 %. They are also characterized by a significant severity of injuries and occur usually together with missing upkeep and maintenance or missing testing of the multirip saw.

3.2.4 Notes to hazards by the machine-periphery

A high hazard exists by the force-guided workpiece through the machine. For explanation, compare Figure 3 and the respective notes.

3.3 Retrofitting

For the safe use of multirip saws, the following technical retrofitting measures are recommended to reduce significant hazards resulting from recorded accidents and from the machine periphery.

3.3.1 Retrofitting based on accident black spots.

Accident black spots resulting from the discrepancy between the former and the current state of the art emphasize the hazards and the special need for action on the machine, especially when protective devices are missing or are insufficient.

According to BetrSichV § 4, retrofitting has to be carried out in a technical way.

a. Measures against contact with running or slowing saw blades

It is recommended to protect the complete working area from access. The cover must still allow sufficient airflow to remove the sawdust. Furthermore, it is recommended that the guard locking provided for this purpose is of stable design. This is recommended according to observations in practice, as it is often checked by shaking the cover whether it can be opened.

If setting mode is frequently required or if the operation is prone to malfunction, e.g. because of processing gnarled, twisted wood – the option could be checked whether the guard locking is controlled by standstill monitoring (mandatory since the regulation ZH 1/3-18 from 1989) and turning saw-spindles are indicated by warning lights. This has advantages regarding enhanced safety against manipulation (3.2.1 a3.) or shorter braking time when few saw blades are mounted on the saw spindle. An even greater degree of manipulation safety and less time to standstill can be expected by a retrofitted brake. The precondition for retrofitting a brake is the suitability of the machine which has to be asked from the manufacturer. This involves particularly the attachment of the saw blades.

b. Measurements against contact with feeding or pull-out rollers

Accidents on feeding or pull-out-rollers (compare 3.2.1 b1.) are infrequent, but associated with severe injuries. Since the publishing of DIN EN 1870-4: 2001, the rolls must have a safety distance of 550 mm or must be technically secured with safety pendulum flap or safety sensitive edges.

It is recommended to design the infeed area of machines cutting against the feeding direction in such a way that, in addition to prevent access to the rollers, the angular range of ejected workpiece parts is limited as closely as possible. A tunnel-

shaped design offers additional protection while operating the machine, if the operating elements are arranged on the front side of the machine. This prevents access to the infeed and ejection area (compare Annexes 1 and 2).

To secure the rollers in the outfeed area where the workpieces are removed it is recommended to proceed in a similar way.

c. Measurements against ejections

Accidents with ejections of workpieces or workpiece parts include the potentially highest hazard (compare 3.2.2 c1. up to c3).

c1. The type of accident "ejection of workpieces" or "parts of it" (splinters) includes a high proportion in machines on which the lifting or lowering of the anti-kickback fingers or the splinter-guard was technically not prevented while the saw spindle was turning. A technical interlock which prevents the lifting and lowering of the kick-back guard while the saw-spindle is turning is recommended. Please note, that especially on old machines with manual adjustment - technical solutions for interlocking devices with guard locking can be costly.

c2. The accidents caused by sideways ejections (compare 3.2.2 c2.) are occurring on machines providing accessibility to the saw blades. An access preventing cover of appropriate design is recommended according to 3.3.1 a.

Openings and gaps in the area of the anti-kickback fingers and splinter guards provide an outlet for workpiece parts (splinters) to escape; this occurred in machines of more recent years of manufacture, too. To prevent ejection hazards, these openings have to be closed with solid metal sheets or the splinter guards have to be positioned directly and seamlessly at the lateral limiting metal sheets.

c3. In order to defuse the accident black spot „ejections“, it is recommended for machines which cut against the feeding direction – especially for **machines with conveyor belt as feed-system** – to retrofit multistage systems at least according to DIN EN 1870-4: 2001 (or more current) (compare Figure 2 and Annex 1). Because anti-kickback fingers and splinter guards are essential for the safety against ejections, they have to be kept in safe condition.

For **machines with a feed system by rollers** and a **closed casing** which cut against the feeding direction - the system, consisting of anti-kickback fingers and splinter-guards, should at least correspond to the state of the art of the regulation ZH 1/3-18 of 1989 or later and should be interlocked with guard locking against adjusting with turning saw spindle.

It should also be taken into account to maintain the safe condition (compare Annex 2).

3.3.2 Retrofitting based on hazards of the machine periphery

A high hazard exists due to the force-guided workpiece through the machine. For explanation, see Figure 3 and the respective notes. To avoid shearing and crushing points, the tables have to be seamlessly connected to the machine in which the workpieces can be fed in or be removed in a flat way. Alternatively, roller conveyors with fitting pieces in the infeed and outfeed area can serve the same purpose.

It is advisable to include such changes in the documentation of the machine or to prepare a new documentation if not yet available.

4 Operation

Safe operation is based on following measures:

- Safe machine
- Measures against residual hazards.
- Safe working process

4.1 Safe machine

Safe machine means that in case of new purchase the technical and company-related interests have been considered (compare 2).

In case of second-hand machines, it also means any necessary retrofitting.

The safe use of the machine requires an up-to-date machine documentation including information on the intended use.

To keep the machine in a safe working condition, regular repeated tests are necessary to prevent accidents. This particularly applies to safeguards – supplemented by weekly visual and functional tests in order to detect defect or manipulated safeguards.

Multirip saws have – **almost without any exception** – **no** riving knives which can prevent the ejection of workpieces or parts of them.

This is the task of the anti-kickback fingers and the splinter guards (compare Figure 2 and Annex 1 and 2). They can accomplish their task only, if they are complete, properly adjusted and easy moving.

The tip of the anti-kickback fingers (compare Figure 2 and Annex 1) must be at least positioned 5 mm below the workpiece surface when pressure rollers are decompressed.

The distance from the surface transporting the workpiece to the tip of the splinter guard must not exceed 1 mm maximally (compare Annex 1 and 2).

The splinter guards at the bottom for conveyor belt machines (compare Figure 2 and Annex 1) have to jut out over the conveyor belt for at least 30 mm.

4.2 Measures against residual hazards

A significant residual hazard – even with new multirip saws – is the hazard of „ejections“. To prevent from this residual hazard, the operator has to wear a protective splinter proof apron.

4.3 Safe working process

For further reduction of hazard, the working location should - whenever possible - be outside the ejection area of machines which cut against the feeding direction.

Working on the machine itself, i. e. troubleshooting of any kind – including the removal of remaining wood parts – should be carried out with the machine at a standstill.

Danger: The use of auxiliary items in combination with running machine e.g.:

- Slat to remove wood pieces
- Hose of vacuum cleaner for cleaning

This is dangerous because of fast drawing-in. It is documented by accidents.

Danger: Wearing protective gloves is associated with a higher risk of being drawn-in by rotating machine parts. Their use is dangerous at rotating machine parts. This is documented by accidents. **It must be ensured** that no rotating parts (e.g. rolls) can be accessed during the production process.

5 Summary und limits of application

This „Fachbereich AKTUELL“ is based on expert knowledge gathered by the expert committee woodworking and metalworking, subcommittee, woodworking and processing of DGUV in the field of woodworking machines.

It is particularly intended as information for users and interested parties who purchase, retrofit or operate multi rip saws. The information is completed by data and facts about accident black spots on these machines. It is intended as a guideline and supplement to carry out the risk assessment for purchase, retrofitting and use.

The provisions according to individual laws and regulations remain unaffected by this “Fachbereich AKTUELL”. The requirements of the legal regulations apply unrestrictedly.

In order to get complete information, it is necessary to consult the applicable regulations.

This „Fachbereich AKTUELL“ FBHM-108 replaces the version of the same name, published as draft 03/2020. This is the English translation of the German version FBHM-108 of 29.05.2020.

The expert committee woodworking and metalworking is composed of representatives of the German Statutory Accident Insurance, federal authorities, social partners, manufacturers, users and other stakeholders.

Further “Fachbereich AKTUELL” or information sheets of the expert committee woodworking and metalworking (Fachbereich Holz und Metall) are available for download on the internet [14].

German bibliography:

- [1] Technische Regel für Gefahrstoffe TRGS 553 „Holzstaub“, Ausgabe August 2008, BAUA
- [2] Gesetz über die Bereitstellung von Produkten auf dem Markt (Produktsicherheitsgesetz – ProdSG) vom 08.11.2011, (BGBl. Teil I S. 2179), zuletzt geändert durch Artikel 435 vom 31. August 2015 (BGBl. I S. 1474).
- [3] Neunte Verordnung zum Produktsicherheitsgesetz (Maschinenverordnung – 9. ProdSV) vom 12. Mai 1993 (BGBl. I S. 704), zuletzt geändert durch Artikel 19 des Gesetzes vom 8. November 2011 (BGBl. I S. 2178)
- [4] Richtlinie 2006/42/EG des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen (Maschinen-Richtlinie), Amtsblatt der Europäischen Union, Nr. L 157/24 vom 09.06.

2006 mit Berichtigung im Amtsblatt L76/35 vom 16.03.2007.

- [5] DIN EN 1870-4: Sicherheit von Holzbearbeitungsmaschinen – Kreissägemaschinen – Teil 4 Mehrblattkreissägen für Längsschnitt mit Handbeschickung und/oder Handentnahme. Ausgabe 2012- 06, Beuth Verlag GmbH, Berlin.
- [6] Verordnung über die Sicherheit und die Gesundheit bei der Verwendung von Arbeitsmitteln (Betriebssicherheitsverordnung – BetrSichV) vom 03. Februar 2015, (Bundesgesetzblatt I S. 49), zuletzt geändert durch Artikel 5 Absatz 7 der Verordnung vom 18. Oktober 2017 (BGBl. I S. 3584).
- [7] VBG 7j: Unfallverhütungsvorschrift Maschinen und Anlagen zur Be- und Verarbeitung von Holz und ähnlichen Werkstoffen. Ausgabe 1.4.1977 Zurückgezogen.
- [8] ZH 1/3.18: Sicherheitsregel für Mehrblatt-Besäum- und Zuschneidekreissägemaschinen. Ausgabe 1.4.1989. Zurückgezogen.
- [9] Technische Regel für Betriebssicherheit TRBS 1111 „Gefährdungsbeurteilung“, Ausgabe März 2018, BAUA
- [10] Verordnung zum Schutz vor Gefahrstoffen (Gefahrstoffverordnung – GefStoffV) Ausfertigungsdatum: 26.11.2010 (BGBl. I S. 1643, 1644), in der Fassung vom 15. November 2016, BGBl.
- [11] Verordnung zum Schutz der Beschäftigten vor Gefährdungen durch Lärm und Vibrationen (Lärm- und Vibrations-Arbeitsschutzverordnung – LärmVibrationsArbSchV) vom 6. März 2007 (BGBl. I S.261), zuletzt geändert durch Art. 5 Abs. 5 der Verordnung vom 18.10.2017 (BGBl. I 3584).
- [12] Technische Regel für Betriebssicherheit TRBS 2111 „Mechanische Gefährdungen – Allgemeine Anforderungen“, Ausgabe März 2014, BAUA
- [13] Empfehlungen zur Betriebssicherheit EmpfBS 1114 „Anpassung an den Stand der Technik bei der Verwendung von Arbeitsmitteln“, Ausgabe März 2018, BAUA
- [14] Internet: www.dguv.de/fb-holzundmetall Publikationen oder www.bghm.de Webcode: <626>

Picture credits:

The pictures mentioned in this “Fachbereich AKTUELL” have been kindly provided by:

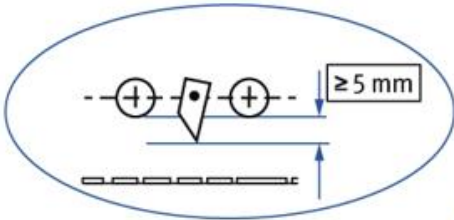
Figure 1, 2, 3: BGHM
Annex 1, 2 BGHM

Table credits:

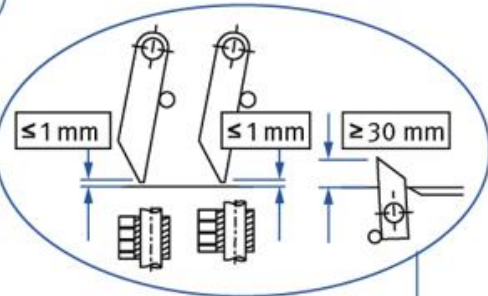
Table 1: Essential regulations
Table 2: Evaluation of accidents - overview

Annex 1: Sketch to recommended technical measures for retrofitting to reduce significant hazards from occurring accidents (with measures for checking) – especially machines with conveyor belt

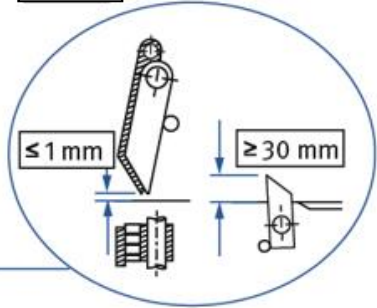
Anti-kickback fingers



Splinterguard



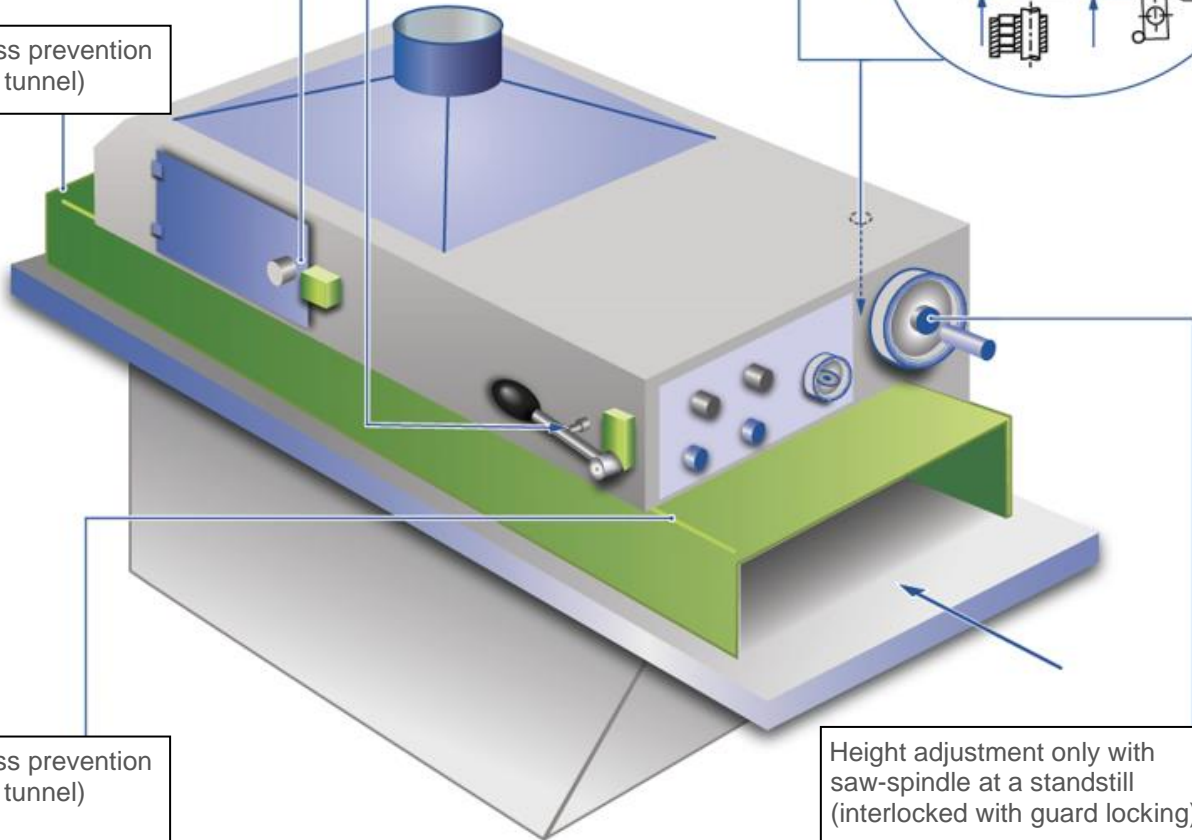
or



If hold up device for the splinter guard is available: to be interlocked with guard locking against lifting (*)

Access flap e.g. for change of saw-blades interlocked with guard locking (*)

Access prevention (here tunnel)

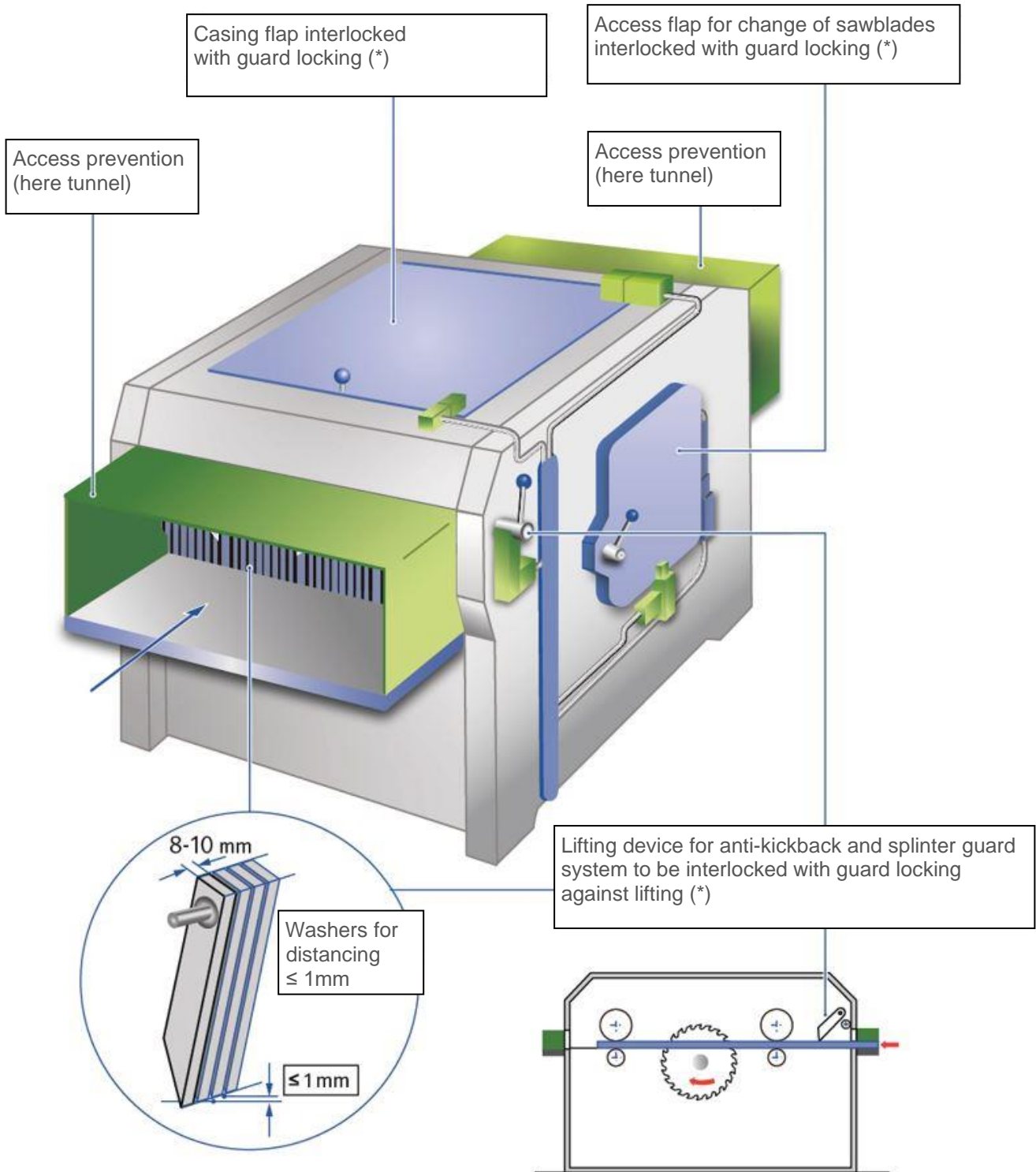


Access prevention (here tunnel)

Height adjustment only with saw-spindle at a standstill (interlocked with guard locking)
Alternatively with protected running saw-spindle and empty sawing workspace (sawing workspace monitoring)

(*) Position switch and guard locking shown only schematically

Annex 2: Sketch to recommended technical measures for retrofitting to reduce significant hazards from occurring accidents (with measures for checking) – machines with closed casing and feeding by rollers



(*) Position switch and guard locking shown only schematically

Publisher

Deutsche Gesetzliche
Unfallversicherung e.V. (DGUV)

Glinkastraße 40
10117 Berlin
Telefon: 030 13001-0 (Zentrale)
Fax: 030 13001-6132
E-Mail: info@dguv.de
Internet: www.dguv.de

Sachgebiet „Holzbe- und -verarbeitung“ im
Fachbereich „Holz und Metall“ der DGUV >
www.dguv.de Webcode: d544787

An der Erarbeitung dieser „Fachbereich AKTUELL“ FBHM-108 haben mitgewirkt:

- Fachbereich Holz und Metall der Berufsgenossenschaft Holz und Metall (BGHM)
- Deutsche Säge- und Holzindustrie Bundesverband e.V. (DeSH)