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Aviation

Safety through inspections of work equipment

Aviation Safety Information No. 12

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Contents

Preliminary remarks

Operational reliabiliorty is an essential factor for the safe operation of work equipment, e.g. aircraft ground support equipment.
In order to ensure that the equipment is maintained in a condition for safe operation throughout its service life, the employer is required to establish the type, scope and intervals of the tests / inspections and to ensure that these tests / inspections are executed as required.

This safety information leaflet provides advice with regard to inspection / test requirements and documentation related to the safety inspections to be carried out. Hazard-oriented examples are intended to help inspectors when conducting these inspections.

Additional aviation safety information leaflets are listed on the last page.

1 Definitions

Aircraft ground support equipment
is work equipment specifically built to respond to aviation-related requirements. Aircraft ground support equipment includes i. a.:

- Ground power and air-conditioning units
- Catering vehicles
- Container or pallet lifting trucks
- Passenger stairs
- Self-propelled and towable deicers
- Potable water and lavatory service equipment
- Towing equipment

Competent person
A competent person is a person who, through his / her professional training and experience has adequate knowledge e.g. in the field of aircraft ground support equipment and is familiar with the relevant government regulations relating to occupational safety, accident prevention regulations, generally accepted technological standards (e.g. technical rules, DGUV Rules, DGUV Principles and standards) and in particular with the manufacturer's maintenance guidelines to such an extent that he or she can assess whether the work equipment is safe.

DGUV (Deutsche Gesetzliche Unfallversicherung)
German Statutory Accident Insurance Association

Operational safety
Operational safety comprises road safety as well as work safety.

Significant modification
Any modification of work equipment that results in or may result in an increased risk and therefore requires a new safety concept including safety-relevant changes is regarded as a significant modification. A significant modification of aircraft ground equipment may require a new conformity assessment in accordance with the Machinery Ordinance (9. ProdSV). In this case the occupational ground safety officer should be consulted for advice.

Work equipment
Comprises installations, machinery or equipment provided by the employer. Work equipment includes aircraft ground support equipment (GSE).

2 General information

The obligation to perform inspections of work equipment is based, i. a., on the Industrial Safety Ordinance.

Within the scope of the risk assessment, the employer has to establish the type, scope and intervals of the required inspections.

Other checks required in accordance with official regulations, e.g. the German Road Traffic Licensing Regulation are not affected by these inspections.

The purpose of continuous visual observation and inspections is that safety deficiencies occurring during everyday operations can be discovered, documented and eliminated immediately.

The employer provides the employees with safe work equipment. The equipment is to be maintained in a condition for safe operation throughout its service life.

If the operating instructions provided by the manufacturer contain inspection requirements, these have to be taken into account.

3 Competent persons

The employer is responsible for the organization and performance of the inspections. He / she may delegate this task to subordinate supervisors.

The inspections may be performed by competent experts appointed by the employer. These experts may come from the company itself or from a manufacturing company (e.g. master mechanic) and must have the required specialist knowledge. They are designated as competent persons.

The employer remains responsible for selecting the competent persons and has to check their expertise and working methods.

4 Performance of inspections

4.1 Applicable ordinances, regulations and rules

When inspecting work equipment, the actual condition is determined and then compared to the desired condition. The desired condition is the safe condition of the work equipment determined by the employer, based on the risk assessment.

Inspections are designed, i. a., to ensure that the work equipment conforms to the applicable laws and regulations.

The employer can find information for determining the desired condition in the following publications:

- Operating instructions provided by the manufacturer
- National laws and regulations, e.g. Industrial Safety Ordinance and the Technical Rules for Industrial Safety
- Accident prevention regulations (DGUV Regulations), DGUV Rules, DGUV Informations and DGUV Principles
- EN standards
- Publications of the occupational safety and health administrations or the statutory accident insurance providers

Which regulations can be used for determining the desired condition depends on the year of construction of the work equipment.

Information on possible requirements for retrofitting old work equipment is contained in the publication "Adaptation to the state of the art when using work equipment" related to the Industrial Safety Ordinance.

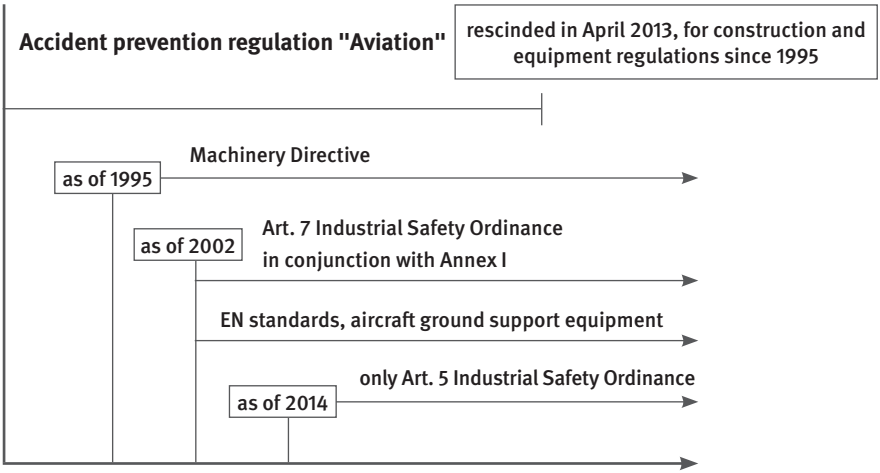


Figure 1: Timeline – Laws and regulations

Example 1: Conveyor belt vehicle, year of construction 2010

The desired condition is to be determined on the basis of the Directive 2006/42/EC on machinery (incl. annexes), implemented by the Machinery Directive, the Industrial Safety Ordinance, DIN EN 1915-1 (2002) in conjunction with DIN EN 12312-3 (2009) and the manufacturer's operating instructions.

Work equipment within the scope of the Machinery Ordinance	
	Applicable regulations
Work equipment, e.g. aircraft ground support equipment (definition of machine) placed on the market for the first time after 31/12/1994.	**Machinery Ordinance in conjunction with Annex I to the Directive 2006/42/EC on machinery**
Work equipment, e.g. passenger boarding bridges designated to lift persons, involving a risk of falls from a height of more than 3 metres, put into operation for the first time after 31/12/1996.	**Machinery Ordinance in conjunction with Annex I and Annex IV no. 16 of the Directive 2006/42/EC on machinery, EC type approval test**

Example 2: Conveyor belt vehicle, year of construction 1990
The desired condition is to be determined on the basis of the Accident Prevention Regulation "Aviation" (withdrawn in 2013) and the manufacturer's operating instructions.

Work equipment which does not fall within the scope of the Machinery Ordinance	
	Applicable regulations
All aircraft ground support equipment placed on the market for the first time prior to 01/01/1995	**Accident prevention regulation "Aviation"**
All work equipment which is not regarded as machinery within the meaning of the Machinery Ordinance, e.g. trailers, tow bars without height adjustment of the chassis	**Accident prevention regulations and Industrial Safety Ordinance**

4.1.1 Machinery Directive

A large part of the aircraft ground support equipment falls within the scope of the Machinery Directive, provided that the equipment was placed on the market after 31.12.1994.

4.1.2 Industrial Safety Ordinance

The Industrial Safety Ordinance applies to the use of work equipment (e.g. aircraft ground support equipment). The term 'use' describes all activities performed, from the assembly to the disposal of the work equipment. This includes assembly and installation, handling, switching on and off, adjustment, utilization, operation, maintenance, cleaning, checking, modification, testing, disassembly, transportation and monitoring.

Work equipment which does not fall within the scope of the Machinery Directive must conform to the laws and regulations (e.g. accident prevention regulations) applicable at the time when the equipment was made available for the first time.

4.1.3 Technical Rules for Industrial Safety

The Technical Rules for Industrial Safety provide further specification of the Industrial Safety Ordinance, e.g.:

- Inspection of work equipment and installations subject to monitoring
- Competent persons
- Mechanical hazards – general requirements
- Mechanical hazards – Measures for protection against hazards when using mobile work equipment

Application of these rules leads to a so-called presumption of conformity, i.e. the employer can presume that the protection objectives are achieved and the regulations of the Industrial Safety Ordinance are observed if the specified measures are taken.

4.1.4 Occupational safety and health regulations relating to noise and vibration protection

The employer shall implement protective measures in accordance with the state of the art in view of preventing or reducing exposure to noise and vibration. Emissions shall be eliminated at their source or reduced to a minimum. Technical measures are to be given priority.

4.1.5 Accident prevention regulations

Depending on the year of construction, design, intended use or operating conditions, the safety requirements set out in the accident prevention regulations listed below are to be taken into account:

- Basic principles of prevention
- Electrical systems and equipment
- Aviation
- Winches, lifting and towing equipment
- Vehicles
- Use of liquefied gas

4.1.6 Implementing instructions

Implementing instructions to the accident prevention regulations have been published, which contain technical solutions permitting to achieve the protection objectives defined in the accident prevention regulations.
The technical solutions given in the Implementing instructions do not preclude other, at least equally safe solutions.

4.1.7 Generally accepted technological standards

Generally accepted technological standards for work equipment, aircraft ground support equipment and aviation facilities include i. a.:

- Hydraulic hose assemblies and hydraulic fluids – Rules for the safe use
- Safety of machinery - Safety distances to prevent danger zones being reached by the upper and lower limbs (DIN EN 13857)
- Aircraft ground support equipment - General requirements - (DIN EN 1915)
  Part 1: Basic safety requirements
  Part 2: Stability and strength requirements, calculations and test methods
  Part 3: Vibration measurement methods and reduction
  Part 4: Noise measurement methods and reduction
- Aircraft ground support equipment - Specific requirements (DIN EN 12312)
  Part 1: Passenger stairs
  Part 2: Catering vehicles
  Part 3: Conveyor belt vehicles
  Part 4: Passenger boarding bridges
  Part 5: Aircraft fuelling equipment
  Part 6: Deicers and deicing / antiicing equipment
  Part 7: Aircraft movement equipment
  Part 8: Maintenance or service stairs and platforms
  Part 9: Container / Pallet loaders
  Part 10: Container / Pallet transfer transporters
  Part 11: Container / Pallet dollies and loose load trailers
  Part 12: Potable water service equipment

Part 13: Lavatory service equipment
Part 14: Disabled / incapacitated passenger boarding vehicles
Part 15: Baggage and equipment tractors
Part 16: Air start equipment
Part 17: Air conditioning equipment
Part 18: Nitrogen or Oxygen units
Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions
Part 20: Electrical ground power units

The above standards relating to aircraft ground support equipment further specify the requirements of the Machinery Directive.

4.2 Type and scope of inspections

Inspections are to be carried out by a competent person on the following equipment before putting it into service (first use):

- Work equipment which does not fall within the scope of the Machinery Ordinance
- Work equipment, e.g. aircraft ground support equipment, which is not delivered in a ready-to-use condition and whose safety depends on the installation conditions, e.g. passenger boarding bridges
- Installations subject to monitoring, e.g. lifts or pressure vessels

In this case, the inspection is limited to checking the correct assembly or installation and the safe function of the work equipment, identifying damage and assessing the effectiveness of safety measures taken.

4.2.1 Vehicles

In practice, roadworthy vehicles are not necessarily suitable for safe working.
When inspecting vehicles and the associated equipment, not only road safety but also work safety is to be assessed, because:

Operational safety = road safety + work safety

4.2.2 Inspections after significant modifications

Significant modifications: cf. clause 1 "Definitions"

Work equipment which falls within the scope of the Machinery Ordinance and has undergone significant modifications must be treated in the same way as "new machinery". This means that in accordance with the Machinery Ordinance the conformity of the machinery must be re-certified (hazards analysis, declaration of conformity, CE conformity marking, etc.). If significant modifications have been performed by the operator, the operator is regarded from the legislator's point of view as the manufacturer of the new machinery.

Significant modifications could be, for example:

- increase of the working load,
- enlargement of a platform,
- modification of a control system.

4.3 Recurrent inspections

If work equipment is subject to harmful influences, it is mandatory to carry out recurrent inspections in order to maintain the equipment in a condition for safe operation. Based on the risk assessment, the employer has to determine the type, scope and intervals of the inspections.

It is recommended to perform an inspection at least once per year. In case of constant use and high stress, shorter inspection intervals may be necessary in order to ensure that the equipment is always maintained in a condition for safe operation.

Prior to the inspection, work equipment must be prepared - and cleaned, where necessary - in such a way that the inspection can be carried out properly.

Periodic inspections essentially comprise a visual inspection and operational testing of the equipment. The following checks must be performed:

- the condition of components and equipment,
- whether any modifications have been made,

- completeness and effectiveness of safety devices,
- condition and function of control systems.

In the context of the recurrent inspections, there is also a requirement for the users to check the effectiveness of the controls and safety devices before the start of every work shift and to monitor the condition of the work equipment to detect apparent deficiencies.

A list of keywords for the execution of visual inspections and operational tests is provided in Annex 4. The operating instructions provided by the manufacturer must also be observed.
The development of device-specific check lists will facilitate the documentation of inspections.

4.4 Inspection records

The findings of the inspections are to be recorded in written or electronic form and the records are to be kept at least until the next due inspection.

The type of record can be freely chosen, e.g. an inspection booklet or card file can be kept. The format of the findings is also left open.
It is recommended to attach an inspection label to ensure that the next inspection date is not forgotten.

Example of an inspection label

Equipment		Next inspection: January 2019	Itemized record of inspection
Designation: **Aircraft jack Node A 330 Inspection**		**Inspection intervals:** 12 months	Place of use:
			Serial no:
		Carried out on:	Inventory no:
			Designation: Model DT 35
Marking / labeling	**Symbol**	**Description of deficiencies**	**Deficiencies rectified on / by**
Wheels / tyres:			
Lift cylinder / wheel lift cylinder:			
Function			
Lowering			
Filling levels			
Leaks			
Ascent:			
Stairs			
Platform			
Electr. component			
Pressure gauge Must also be recorded in the list for pressure gauge			
Cleanliness			
Lubrication			
Symbols: V = no deficiencies identified X = deficiencies found N/A = part not installed		Endorsement / comment Supervisor:	Inspection completed on: Name: Signature:

Example of an inspection file

Annex 1

Counterfoil

Specifications of work equipment

Designation of equipment _____

Manufacturer / Supplier _____

Type / Series _____

Year of construction _____

Manufacturing batch number / Serial number _____

Rated power (in kW) _____

Mass (in kg) / Maximum permissible weight _____

Load capacity / Load distribution _____

Permissible trailing load _____

Control systems _____

Drive systems _____

Lifting accessories _____

Lifting attachments _____

Electric equipment _____

Safety devices _____

Other information _____

Annex 2

Findings
of the initial inspection carried out by the competent person before putting the equipment into service (first use)

for work equipment _____

Manufacturer _____ Year of construction _____

Type _____ Manufacturing batch no. / _____
for further equipment details, see counterfoil Internal no.

The initial inspection before putting into service (first use)
of the work equipment / aviation facility was carried out on _____
and revealed no / the following deficiencies:

Inspection findings and necessary corrective action	Deficiencies rectified	
	on	by

Scope of inspection _____

_____

Checks still to be carried out _____
There are - no - objections against putting the equipment into service*
A verification test is – not – required**

_____ _____
(Place, Date) (Signature of competent person)

Name of competent person _____
(in block letters)

Address _____

Professional title _____

employed by _____

I have taken note of the deficiencies identified** _____

*Delete as appropriate!

** Confirmation by the operator or his / her authorised representative, incl. date, signature and name in block letters

Annex 3

Findings
of the periodic inspection/exceptional inspection / verification test carried out by the competent person

for work equipment _____

Manufacturer _____ Year of construction _____

Type _____ Manufacturing batch no. / _____
for further equipment details, see counterfoil Internal no.

The _____ inspection of the work equipment / aviation facility was carried out on _____
and revealed no / the following deficiencies*:

Inspection findings and necessary corrective action	Deficiencies rectified	
	on	by

Scope of inspection _____

_____

Partial check still to be carried out _____
There are - no - objections against putting the equipment into service*
A verification test is – not – required*

_____ _____
(Place, Date) (Signature of competent person)

Name of competent person _____
(in block letters)

Address _____

Professional title _____

employed by _____

I have taken note of the deficiencies identified** _____

*Delete as appropriate!

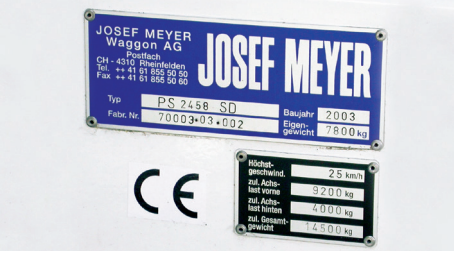
** Confirmation by the operator or his / her authorised representative, incl. date, signature and name in block letters

Annex 4

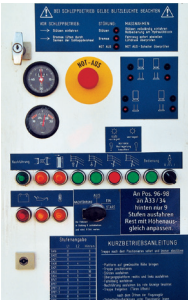
Keywords for inspections carried out by competent person at regular intervals in accordance with the Industrial Safety Ordinance
(visual inspection and operational testing)

Table of Contents

1. Characteristic data

Items to be checked	Requirements
Type plate • Manufacturer, Supplier, Importer • CE marking • Type, year of construction, serial number • Unladen weight • Permissible total weight (when transporting loads) • Maximum permitted axle load • Maximum permitted speed (maximum design speed) • Permissible towable mass (during trailer operation) • Working load (lifting devices) • Permissible load distribution	• Attachment, legibility, completeness  Equipment characteristics

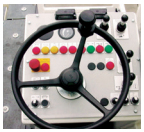
2. Marking

Items to be checked	Requirements
• Information on the lifting device • Operator positions on the main platform • Safety marking on protruding parts • Information on maximum wind speed at which safe operation is possible • Actuating controls, control devices • Concise operating instructions • Labelling (e.g. diesel, hydraulic oil) • Special marking of aircraft ground support equipment IAW DIN EN 12312	• Affixing of markings, legibility, clear assignment, completeness, perceptibility and logical arrangement  Control device markings

3. Driver's cabin

Items to be checked	Requirements
• Windows • Wipers • Rear view mirror • Windshield heater • Cab interior heating / ventilation	• Condition, effectiveness, wear, operability  Driver's cabin
• Driver's seat • Co-driver's seat • Passenger seats	• Space for movement, condition, layout, driver / passenger safety
• Steering control	• Smoothness of action, attachment, condition (steering play)
• Audible warning device	• Perceptibility, function
• Restraint system	• Minimising the risk of injuries

4. Controls

Items to be checked	Requirements
• Safety device preventing unauthorised use and accidental operation	• Condition, function
Control devices for • Lifting, lowering • Tilting, tipping • Rotating, swivelling • Moving of loads • Telescoping	• Accessibility, condition, clear assignment, safeguards against inadvertent operation, interlocking mechanism (in case of multiple control positions), no self-locking, clear markings  Controls

5. Monitoring and indicating devices

Items to be checked	Requirements
• Speedometer • Pressure gauge • Fluid level indicator Position indicators • Lifting accessories • Lifting mechanisms • Stabilizers • Horizontal position indicator	• Easy to read and clearly arranged, visibility, perceptibility, condition  Monitoring and indicating devices

6. Brakes

Items to be checked	Requirements
• Service brake • Parking brake • Securing device (against rolling away)	• Effectiveness, wear and tear

7. Wheels, tyre rims

Items to be checked	Requirements
• Pneumatic tyres	• Condition, tread depth
• Rims	• Condition
• Centre split rims	• Protection against accidental separation of rim halves

8. Exhaust gases

Items to be checked	Requirements
• Exhaust pipe	• Protection from burning, poisoning  Exhaust – Protection from burning

9. Lights and reflectors

Items to be checked	Requirements
• Headlamps • Rear lights • Reflectors • Brake lights • Direction indicators • Reversing lights • Side reflectors or retro-reflective markings • Work light	• Condition, effectiveness • Required light intensity available  Lights / reflectors of power-driven ground support equipment  Lights / reflectors of non-power-driven equipment

10. Electrical equipment

Items to be checked	Requirements
• Electrical wiring	• Damage, fastenings, strain relief
• Protective conductor	• Condition, fastening, damage
• IP rating	• Design, condition
• Insulation resistance	• Measurement in accordance with manufacturer's specifications
• Batteries	• Battery fixing elements, ventilation, battery acid drain, marking
• Battery charging system	• Condition, protection against inadvertent contact, main circuit breaker
• Undervoltage cut-off • Undervoltage indicator	• Functionability

11. Workplaces and walkways

Items to be checked	Requirements
• Walkways • Standing areas	• Slip resistance, clear assignment, dimensions, condition
• Working platforms	• Means of access, safety of personnel on the platform, fastening and securing of detachable parts
• Guard rails • Handholds	• Free motion of moving parts, effectiveness of locking devices, condition  Safety of walkways on the aircraft ground support equipment

12. Means of access (entries and exits, steps)

Items to be checked	Requirements
• Treads • Access points • Steps • Rungs	• Tread safety, slip protection, access height, dimensions, condition  Access to driver's cab
• Handholds • Fall protection (guard rails)	• Clear assignment, fastening and securing, condition

13. Protection against crushing and shearing hazards

Items to be checked	Requirements
• Pressure sensitive edges • Pressure sensitive mats • Optical barriers	• Function, clear assignment, effectiveness
• Covers • Barriers • Guards • Deflector devices	• Effectiveness, marking, condition  Safety marking of danger zones

13. Protection against crushing and shearing hazards *continued*

Items to be checked	Requirements
• Rubber covers	• Flexible rubber guards
• Hazard warning lights	• Clear assignment, perceptibility
• Creep speed	• Speed
• Mirrors	• Arrangement, clear view, condition

14. Securing of load, protective structure

Items to be checked	Requirements
• Anchor rails • Anchor points • Roll-off stops • Attachment fittings	• Clear assignment, operability, effectiveness, condition
• Tarpaulins • Nets	• Dimensions, condition
• Doors • Engine hood	• Protection against unintentional movement  Securing of hinged covers

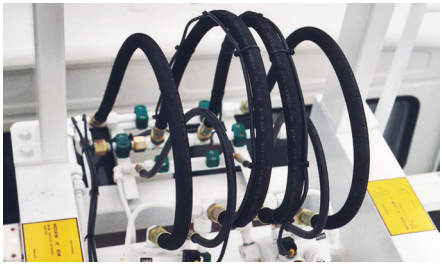
15. Drive assemblies for lifting accessories and stabilizers

Items to be checked	Requirements
• Self-locking gearbox • Automatic brakes • Automatic shut-off valves • Flow-limiting valves and shut-off valves	• Smooth movements, protection against unintentional movements, effectiveness, condition
• Slip clutches • Pressure relief valves	• Exceeding the specified load is prevented

16. Interlocking devices to prevent unintentional movement

Items to be checked	Requirements
• Chassis motor • Drive motor • Lifting gear	• Unintentional machine movements are prevented
• Tilt cabs • Height-adjustable cabs • Height-adjustable accessory equipment • Loading platforms	• Positive locking, unintentional movements are prevented, automatic safety devices
• Tilting movements • Swivel movements • Telescopic movements	• Exceeding the specified end position is prevented, interlocking against travel drive, for stability purposes

17. Hydraulic and pneumatic systems

Items to be checked	Requirements
• Hose assemblies • Pressure hoses • Hose connections	• Age, tightness, radius of curvature, condition, covers (in the working and traffic areas)  Status of hydraulic hoses
• Pipes • Joints	• Tightness, condition
• Lifting cylinder • Telescopic cylinder	• Attachment, connections, tightness
• Pressure limiting valves	• Effectiveness, protection against unintentional adjustment
• System venting	• Condition, function
• Test gauge connection	• Accessibility
• Hydraulic fluid reservoir	• Marking, minimum / maximum indicator  Indicators on hydraulic reservoir
• Filter contamination indicator	• Accessibility, effectiveness

18. Safety devices for lifting equipment

Items to be checked	Requirements
• For spindle drives: non load-bearing safety nut following the load bearing nut	• Dimensioning, guideway, smoothness of action, condition
• Safety switch for safety nut	• Arrangement, condition, operability
• Free moving chain / free moving rope	• Dimensioning, guideway, condition, wear
• Safety switch for free moving chain / free moving rope	• Arrangement, condition, operability
• Roll-off stops • Anti-skid safety devices • Locking clamps	• Effectiveness, operability, condition
• Compression springs	• Tension, guide, condition
• Extension springs	• Duplicate design
• Load-bearing parallel guide elements	• Dimensioning, effectiveness, condition
• Synchronized movement control in connection with mechanical parallel guidance / automatically controlled	• Emergency stop device, operability, condition
• Slack rope / slack chain safety switch • Protection against restarting	• Arrangement, condition, effectiveness

19. Supporting structures of lifting equipment

Items to be checked	Requirements
• Load bearing parts of lifting accessory	• Dimensioning, adequate strength, form-fit connections, securing of connections, fastening, forced form-fit parallel guidance, unintentional movements are prevented, condition

20. Lifting attachments for lifting equipment

Items to be checked	Requirements
• Steel wire ropes • Rope end fixings • Rope connections • Rope sockets	• Dimensioning, diameter, breaking force, galvanized version, cable guide, approved types, condition
• Beckets • Pulleys • Rope winding device • Tensioning device	• Inserted thimble, rope grooves, guard brackets against dislocation of rope, alignment of pulleys, safety devices, condition, operability
• Steel link chains	• Dimensioning, breaking force, chain guide, smoothness of motion
• Chain connections	• Dimensioning, breaking force, safety devices, condition
• Chain sprockets • Chain wheels	• Guides / bearings, wear, freedom of movement
• Tensioning device • Safety device (chain run)	• Condition, operability
• Spindles	• Bearing, condition of thread, covers

21. Control positions on lifting equipment

Items to be checked	Requirements
• Layout of control positions	• Layout, fall protection, monitoring of movements (lifting accessories, stabilizers)
• Several control positions	• Interlocking of control devices (only one control station enabled at a given time)

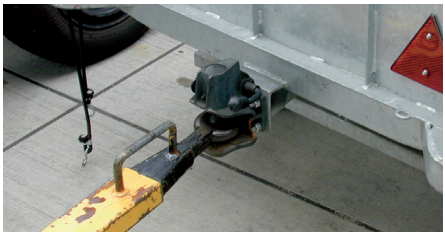
22. Emergency shut down, emergency lowering of lifting equipment

Items to be checked	Requirements
• Emergency shut down • Emergency lowering	• Operability, location, marking  Emergency stop button

23. Operating speeds

Items to be checked	Requirements
Driving speed • during pedestrian-controlled operation • when persons travel on lift / work platform • for GSE without a permanent on-board operator's station	• automatically limited to 6 km/h
• Lifting / lowering speed	• max. 0.4 m/s

24. Connecting devices

Items to be checked	Requirements
• Trailer couplings	• Condition, effectiveness
• Bolt couplings	• Condition, sufficiently sized guiding funnel  Coupling system at GSE
• Draw bars	• Condition, ground clearance, marking, form-fit locking device to prevent
• Support devices (two-wheeled trailers)	• Damage, height adjustment, condition
• Handles (AGSE intended to be moved by hand)	• Condition, location
• Tow bar (for aircraft)	• Height-adjustable chassis, marking, lighting devices

25. Passenger boarding bridges

Items to be checked	Requirements
• Passenger boarding bridges	• Ensure safe accessibility, protection against crushing and shearing hazards, safeguards against falling, run-over protection, marking, protection against unintended lowering, marking of driving areas, function of limit switches, firefighting systems
• Gates	• Easy and safe operation
• Access stairs	• Adequate guard rails, safe accessibility, slip protection, gradients

26. Preventive maintenance

Items to be checked	Requirements
• Safety systems (e.g. emergency lowering device) • Hydraulic oil filter • Fuel filter • Catch devices • Maintenance supports	• Arrangement, easy and safe monitoring possible • Fuel filter

27. Aerial glider towing equipment

Items to be checked	Requirements
• Control stand	• Condition, protection against falling ropes
• Towing equipment	• Tow rope release, protection against sudden movements, condition

5 Regulations and rules

The generally accepted safety and occupational health rules referred to in this safety information leaflet are listed below. Note that these rules are available in the German language only.

5.1 Laws / Regulations

! *Free download under gesetze-im-internet.de*

Product Safety Act (Produktsicherheitsgesetz)	**ProdSG**
9th Ordinance to the Product Safety Act (Machinery Ordinance)	**9. ProdSV**
Directive 2006/42/EC on machinery	
Industrial Safety Ordinance (Betriebssicherheitsverordnung)	**BetrSichV**
Occupational safety and health regulations relating to noise and vibration protection (Lärm- und Vibrations-Arbeitsschutzverordnung)	**LärmVibrationsArbSchV**
Technical Rules for Industrial Safety „Inspection of work equipment and installations subject to monitoring"	**TRBS 1201**
Technical Rules for Industrial Safety "Competent persons"	**TRBS 1203**
Technical Rules for Industrial Safety „Mechanical hazards – general requirements“	**TRBS 2111**
Technical Rules for Industrial Safety „Mechanical hazards – Measures for protection against hazards when using mobile work equipment“	**TRBS 2111 Part 1**
Technical Rules concerning the Noise and Vibration OSH Ordinance	**TRLV Lärm** **TRLV Vibrationen**

5.2 DGUV Regulations (DGUV Vorschriften)

Source of supply: the relevant employer's liability insurance association

! *Free download under publikationen.dguv.de*

Basic principles of prevention	**DGUV Vorschrift 1**
Electrical systems and equipment	**DGUV Vorschrift 3**
Aviation (withdrawn)	**BGV C10**
Winches, lifting and towing equipment	**DGUV Vorschrift 54**
Vehicles	**DGUV Vorschrift 70**
Use of liquefied gas	**DGUV Vorschrift 79**

5.3 DGUV Rules (DGUV Regeln)

Source of supply: the relevant employer's liability insurance association

! *Free download under publikationen.dguv.de*

Hydraulic hose assemblies and hydraulic fluids – Rules for the safe use	**DGUV Regel 113-020**

5.4 Standards

Source of supply: Beuth Verlag GmbH,
Burggrafenstraße 6, 10787 Berlin, Germany

! *Further information under www.beuth.de*

Safety of machinery	
Safety distances to prevent danger zones being reached by the upper and lower limbs	**DIN EN ISO 13857**
Aircraft ground support equipment - General requirements	
Part 1: Basic safety requirements	**DIN EN 1915-1**
Part 3: Vibration measurement methods and reduction	**DIN EN 1915-3**
Part 4: Noise measurement methods and reduction	**DIN EN 1915-4**
Aircraft ground support equipment - Special requirements	
Part 1: Passenger stairs	**DIN EN 12312-1**
Part 2: Catering vehicles	**DIN EN 12312-2**
Part 3: Conveyor belt vehicles	**DIN EN 12312-3**
Part 4: Passenger boarding bridges	**DIN EN 12312-4**
Part 5: Aircraft fuelling equipment	**DIN EN 12312-5**
Part 6: Deicers and deicing / antiicing equipment	**DIN EN 12312-6**
Part 7: Aircraft movement equipment	**DIN EN 12312-7**
Part 8: Maintenance or service stairs and platforms	**DIN EN 12312-8**
Part 9: Container / pallet lifting trucks	**DIN EN 12312-9**

5.4 Standards *(continued)*

Source of supply: Beuth Verlag GmbH,
Burggrafenstraße 6, 10787 Berlin, Germany

! *Further information under www.beuth.de*

Part 10: Container / pallet transfer transporters	**DIN EN 12312-10**
Part 11: Container / pallet dollies and loose load trailers	**DIN EN 12312-11**
Part 12: Potable water service equipment	**DIN EN 12312-12**
Part 13: Lavatory service equipment	**DIN EN 12312-13**
Part 14: Disabled / incapacitated passenger boarding vehicles	**DIN EN 12312-14**
Part 15: Baggage and equipment tractors	**DIN EN 12312-15**
Part 16: Air start equipment	**DIN EN 12312-16**
Part 17: Air conditioning equipment	**DIN EN 12312-17**
Part 18: Nitrogen or oxygen units	**DIN EN 12312-18**
Part 19: Aircraft jacks, axle jacks and hydraulic tail stanchions	**DIN EN 12312-19**
Part 20: Electrical ground power units	**DIN EN 12312-20**

The following aviation safety information leaflets have been published (only available in the German language):

Sicherheits-Information Nr. 01	Trinkwasserversorgung und Abwasserentsorgung
Sicherheits-Information Nr. 02	Strom- und Klimaversorgung
Sicherheits-Information Nr. 03	Betanken
Sicherheits-Information Nr. 04	Schleppen von Luftfahrzeugen
Sicherheits-Information Nr. 05	Catern
Sicherheits-Information Nr. 06	Be- und Entladen
Sicherheits-Information Nr. 07	Umgang mit Fluggast- und Servicetreppen
Sicherheits-Information Nr. 08	Umgang mit Fluggastbrücken (mit angebauter Servicetreppe)
Sicherheits-Information Nr. 09	Enteisen von Flugzeugen
Sicherheits-Information Nr. 10	Sicherer Vorfeldverkehr
Sicherheits-Information Nr. 11	Sicherheit auf Start- und Landeplätzen
Sicherheits-Information Nr. 12	Sicherheit durch die Prüfung von Arbeitsmitteln

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