BS ISO 6747:2013

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Earth-moving machinery — Dozers — Terminology and commercial specifications

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National foreword

This British Standard is the UK implementation of ISO 6747:2013. It supersedes BS 6914-6:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/513/1, Earth moving machinery (International).

A list of organizations represented on this committee can be obtained on request to its secretary.

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Engins de terrassement — Bouteurs — Terminologie et spécifications commerciales

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Foreword

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6747 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 4, *Terminology, commercial nomenclature, classification and ratings*.

This fourth edition cancels and replaces the third edition (ISO 6747:1998), which has been technically revised.

INTERNATIONAL STANDARD ISO 6747:2013(E)

Earth-moving machinery — Dozers — Terminology and commercial specifications

1 Scope

This International Standard establishes terminology and the content of commercial literature specifications for self-propelled crawler and wheeled dozers and their equipment.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5010, *Earth-moving machinery — Rubber-tyred machines — Steering requirements*

ISO 6014, *Earth-moving machinery — Determination of ground speed*

ISO 6746-1, *Earth-moving machinery — Definitions of dimensions and codes — Part 1: Base machine*

ISO 6746-2, *Earth-moving machinery — Definitions of dimensions and codes — Part 2: Equipment and attachments*

ISO 7457, *Earth-moving machinery — Determination of turning dimensions of wheeled machines*

ISO 9249:2007, *Earth-moving machinery — Engine test code — Net power*

ISO 15550:2002, *Internal combustion engines — Determination and method for the measurement of engine power — General requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General

3.1.1
dozer
self-propelled crawler or wheeled machine with equipment having either a dozing attachment which cuts, moves and grades material through forward motion of the machine or a mounted attachment used to exert a push or a pull force

[SOURCE: ISO 6165:2012, 4.1]

Note 1 to entry: See Figures 10, 11.

3.1.2
base machine
machine with a cab or canopy and operator-protective structures if required, without equipment or attachments but possessing the necessary mounting for such equipment and attachments

[SOURCE: ISO 6746-1:2003, 3.3]

3.1.3
equipment
set of components mounted onto the base machine that allows an attachment to perform the primary design function of the machine

[SOURCE: ISO 6746-2:2003, 3.4]

3.1.4
attachment
assembly of components that can be mounted onto the base machine or equipment for specific use

[SOURCE: ISO 6746-2:2003, 3.5]

3.1.5
component
part, or assembly of parts, of a base machine, equipment or attachment

[SOURCE: ISO 6746-2:2003, 3.6]

3.1.6
dozing equipment
front blade and its frame and relevant positioning devices

3.1.6.1
straight dozer
dozer where the blade is maintained in a position where the cutting edge is parallel to an X plane

Note 1 to entry: See Figure 1.

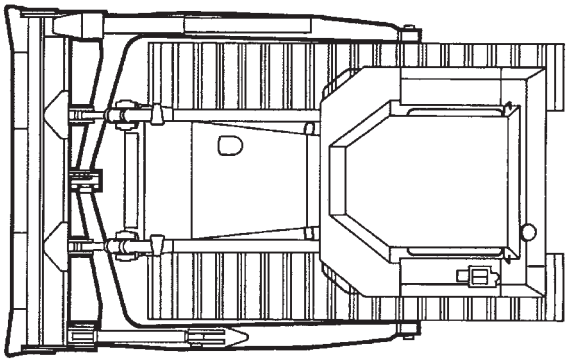


Figure 1 — Crawler-type straight dozer

3.1.6.2
angle dozer
dozer where the blade position can be changed so that the cutting edge is at an angle to an X plane

Note 1 to entry: See Figure 2.

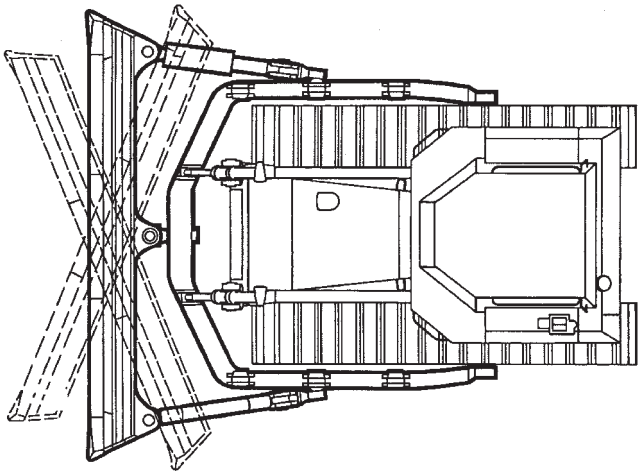


Figure 2 — Crawler-type angle dozer

3.1.6.3
tilt and pitch
type of movement of the blade of a straight dozer or angle dozer

Note 1 to entry: Blade operation is by hydraulic control where the operation is performed by means of a hydraulic system.

3.1.6.3.1
tilt movement
blade movement in which the position of the blade can be changed so that the cutting edge is at an angle to a Z plane

Note 1 to entry: See Figure 3.

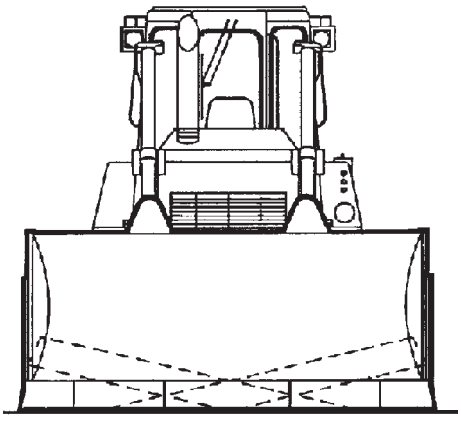


Figure 3 — Tilt movement

3.1.6.3.2
pitch movement
blade movement in which the upper portion of the blade can be changed in angle by pivoting it around a line parallel to the cutting edge

Note 1 to entry: See Figure 4.

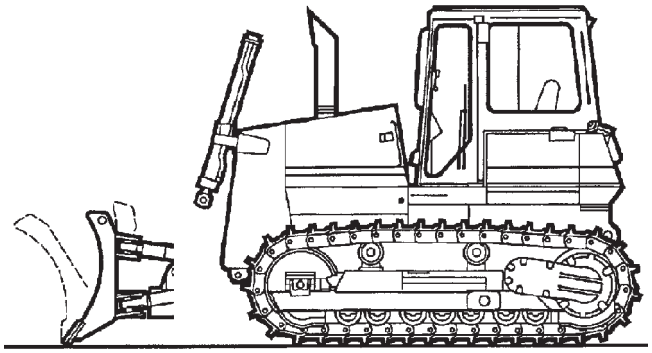


Figure 4 — Pitch movement

3.1.7
ripper
frame which is connected to the rear part of the base machine by means of a mounting bracket, and which is equipped with one or more teeth

Note 1 to entry: See Figures 5, 6 and 7. For dimensions, see Figure 19.

Note 2 to entry: There are four types of ripper, as defined in 3.1.7.1 to 3.1.7.4.

3.1.7.1
radial type
type of ripper in which the ripping angle of the tooth tip to the ground varies according to change of the working depth

Note 1 to entry: See Figure 5.

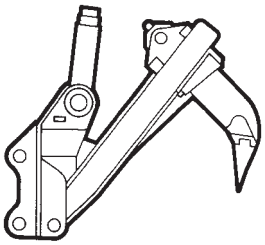


Figure 5 — Ripper — Radial type

3.1.7.2
parallelogram type
type of ripper in which the ripping angle of the tooth tip to the ground remains constant regardless of variations in working depth

Note 1 to entry: See Figure 6.

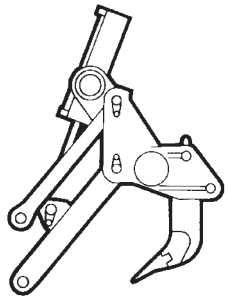


Figure 6 — Ripper — Parallelogram type

3.1.7.3
variable type
type of ripper in which the ripping angle of the tooth tip to the ground is variable and can be changed by the operator

Note 1 to entry: See Figure 7.

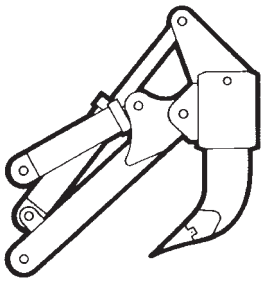


Figure 7 — Ripper — Variable type

3.1.7.4
impact ripper
ripper which exerts an additional impact force by a hydraulic pulsing system

3.1.8
winch
frame equipped with a drum and connected to the rear of the base machine

Note 1 to entry: See Figure 8. For dimensions, see Figure 20.

Note 2 to entry: There are two types of winch operation, as defined in 3.1.8.1 and 3.1.8.2.

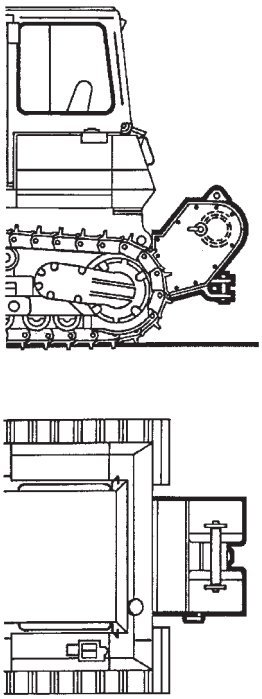


Figure 8 — Winch

3.1.8.1
manually-controlled winch
type of winch which is operated by a manually controlled clutch and brake

3.1.8.2
power-controlled winch
type of winch which is operated hydraulically or by a power clutch and brake

3.1.9
swinging drawbar
frame, equipped with a swing selector bar and a drawbar, connected to the rear of the base machine

Note 1 to entry: See Figure 9. For dimensions, see Figure 21.

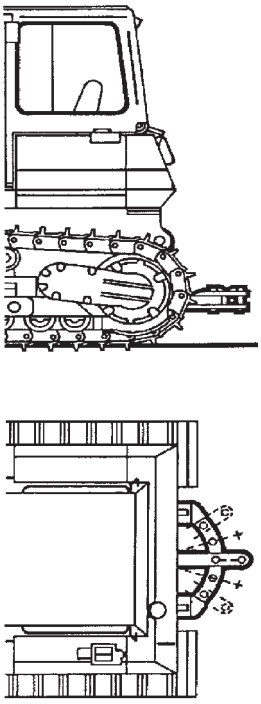


Figure 9 — Swinging drawbar

3.1.10
ground reference plane
GRP
plane on which the machine is placed for measurements: in the case of the base machine, a hard, level surface; in the case of equipment and attachments, either a hard, level surface or compacted earth

Note 1 to entry: The surface used depends on the intended use of the machine and its equipment and attachments. This needs to be defined when developing specific ISO terminology standards or commercial specifications.

[SOURCE: ISO 6746-1:2003, 3.3]

3.2 Masses

3.2.1
operating mass
OM
mass of the base machine, with equipment and empty attachment in the most usual configuration as specified by the manufacturer, and with the operator (75 kg), full fuel tank and all fluid systems (i.e. hydraulic oil, transmission oil, engine oil, engine coolant) at the levels specified by the manufacturer

[SOURCE: ISO 6016:2008, 3.2.1, modified — The expression "with sprinkler tank(s) half full" has been omitted.]

3.2.2 Axle distribution of masses of wheeled machines

3.2.2.1
axle load
mass on each axle at the operating mass (3.2.1)

[SOURCE: ISO 6016:2008, 3.2.5.1]

3.2.2.2
maximum axle load
maximum mass allowable on each axle, as specified by the manufacturer

[SOURCE: ISO 6016:2008, 3.2.5.2]

3.2.2.3
axle load force
product of axle load (3.2.2.1) and gravity acceleration

3.2.2.4
maximum axle load force
product of maximum axle load (3.2.2.2) and gravity acceleration

3.2.3
shipping mass
SM
mass of the base machine without an operator, with the fuel level at 10 % of tank capacity or with the minimum fuel level needed for machine shipping purposes as specified by the manufacturer, whichever is higher, with all fluid systems at the levels specified by the manufacturer and with or without equipment, ballast, attachment, cab, canopy, operator-protective structures, wheels and counterweights as stated by the manufacturer

Note 1 to entry: If the manufacturer intends that the machine be partially disassembled for shipping purposes, the masses of the disassembled items will also be stated.

[SOURCE: ISO 6016:2008, 3.2.6, modified — The expression "and with empty sprinkler tank(s), when applicable" has been omitted.]

3.3 Performance

3.3.1
net power
power obtained on a test bed at the end of the crankshaft or its equivalent, at the corresponding engine speed, with the equipment and auxiliaries listed in ISO 15550:2002, Table 1, column 2, and required in column 3

[SOURCE: ISO 9249:2007, 3.7]

3.3.2
maximum travel speed
maximum speed that can be obtained on a hard level surface in each of the forward and reverse gear ratios available with the machine at its operating mass, as determined in accordance with ISO 6014

3.3.3
drawbar pull
horizontal towing force exerted at the drawbar/hitch point, expressed in kilonewtons

[SOURCE: ISO 7464:1983, 3.2]

3.3.4
static slope capacity
<machine> maximum slope, expressed in degrees, that the machine fluid system(s) can operate on without malfunction or damage of any fluid system, at all machine orientations specified in 3.3.4.1 and 3.3.4.2

[SOURCE: ISO 10266:1992, 3.4]

3.3.4.1
longitudinal static slope capacity
<machine> maximum slope, expressed in degrees, that the machine can achieve longitudinally (i.e. orientated at 0° and 180°) during the static slope evaluation without exceeding performance parameters

[SOURCE: ISO 10266:1992, 3.5]

3.3.4.2
lateral static slope capacity
<machine> maximum slope, expressed in degrees, that the machine can achieve laterally (i.e. orientated at 90° and 270°) during the static slope evaluation without exceeding performance parameters

[SOURCE: ISO 10266:1992, 3.6]

3.3.5 Winch performance

3.3.5.1
line pull
winch pull force measured at engine rated speed with full drum and bare drum

3.3.5.2
line speed
winch speed measured at engine rated speed with full drum and bare drum

3.3.6
brake system
<wheeled machines> all components which combine together to stop and/or hold the machine, including the brake control(s), brake actuation system, the brake(s) themselves and, if the machine is so equipped, the retarder

[SOURCE: ISO 3450:2011, 3.1]

3.3.7
brake system
<crawler machines> all the components that combine to stop and/or hold the machine, including the control(s), the brake actuation system, the brake(s) and all parts connecting the brake to the track

[SOURCE: ISO 10265:2008, 3.1]

3.3.8
turning radius of wheeled machines
turning radius of wheeled machines as determined in accordance with ISO 7457

4 Base machine

4.1 Type of dozer

Dozers shall be classified according to the following attributes.

4.1.1 Undercarriage

4.1.1.1 Crawler type dozer

See Figure 10.

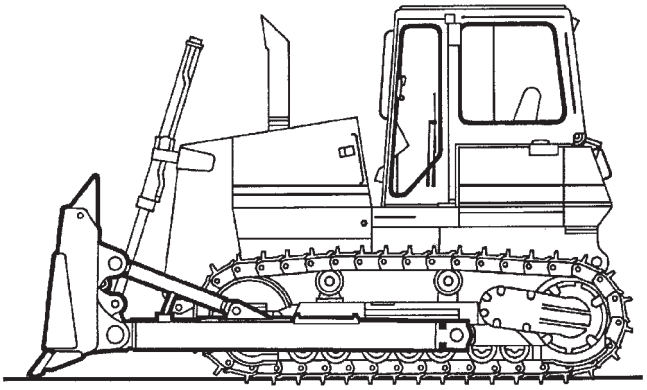


Figure 10 — Crawler-type dozer

4.1.1.2 Wheel-type dozer

See Figure 11.

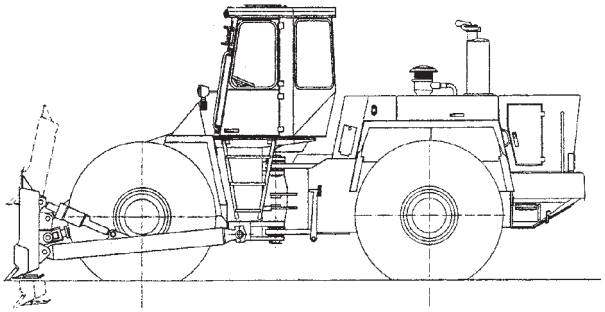
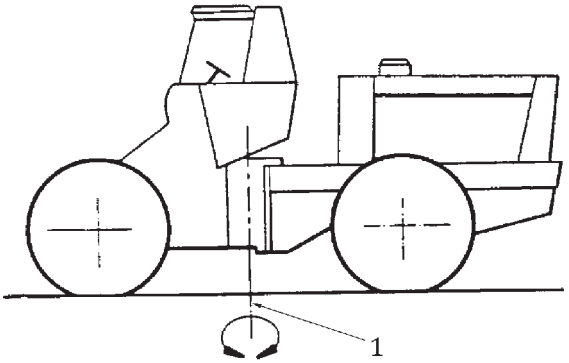


Figure 11 — Wheel-type dozer

4.1.2 Steering system

4.1.2.1 Articulated steering, wheeled machines

See Figure 12.



Key
1 axis of articulation

Figure 12 — Articulated steering

4.1.2.2 Crawler pivot steering

See Figure 13.

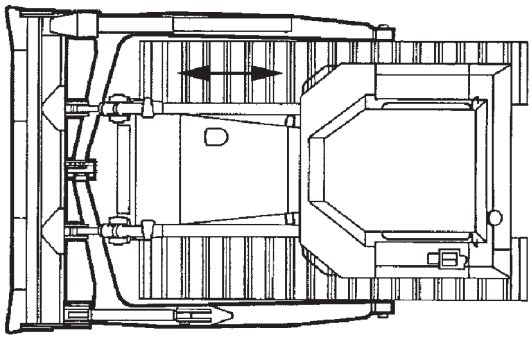
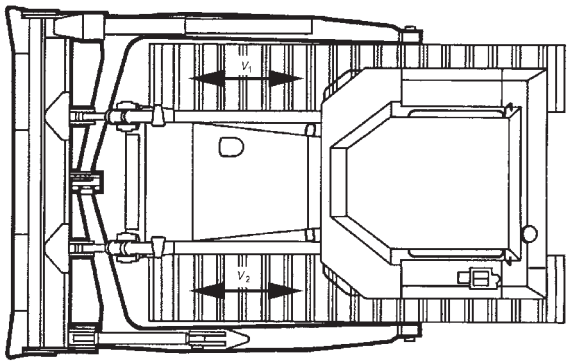


Figure 13 — Crawler pivot steering

4.1.2.3 Crawler independent steering or crawler skid steering

See Figure 14.



NOTE V_1 and V_2 are controlled independently of each other as to speed and direction.

Figure 14 — Crawler independent steering or crawler skid steering

4.1.3 Engine location

4.1.3.1 Front engine

See Figure 10.

4.1.3.2 Rear engine

See Figure 11.

4.2 Dimensions

4.2.1 Base machine

For definitions of dimensions, see ISO 6746-1.

For definitions of dimensions strictly related to dozers, see Annex A.

4.2.1.1 Crawler machines

See Figure 15.

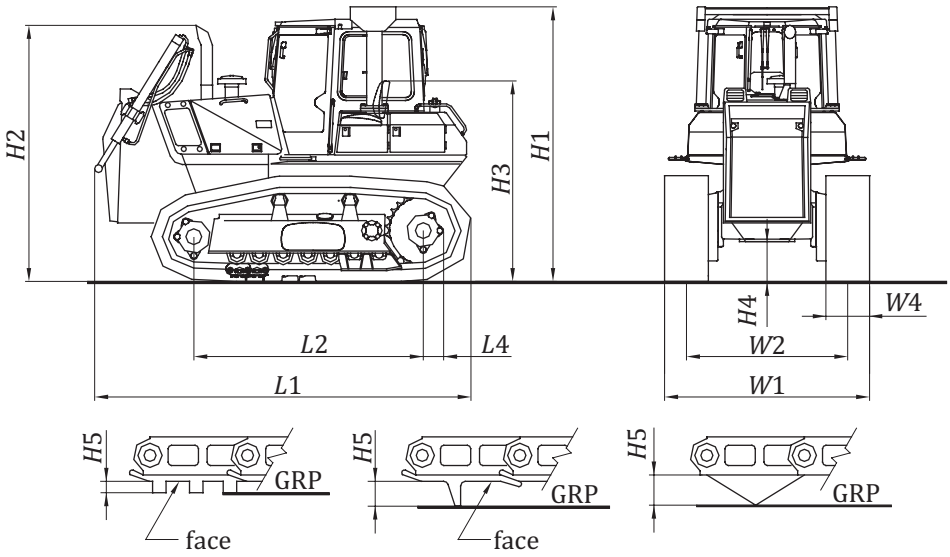


Figure 15 — Dimensions of base machine (crawler dozer)

4.2.1.2 Wheeled machines

See Figure 16.

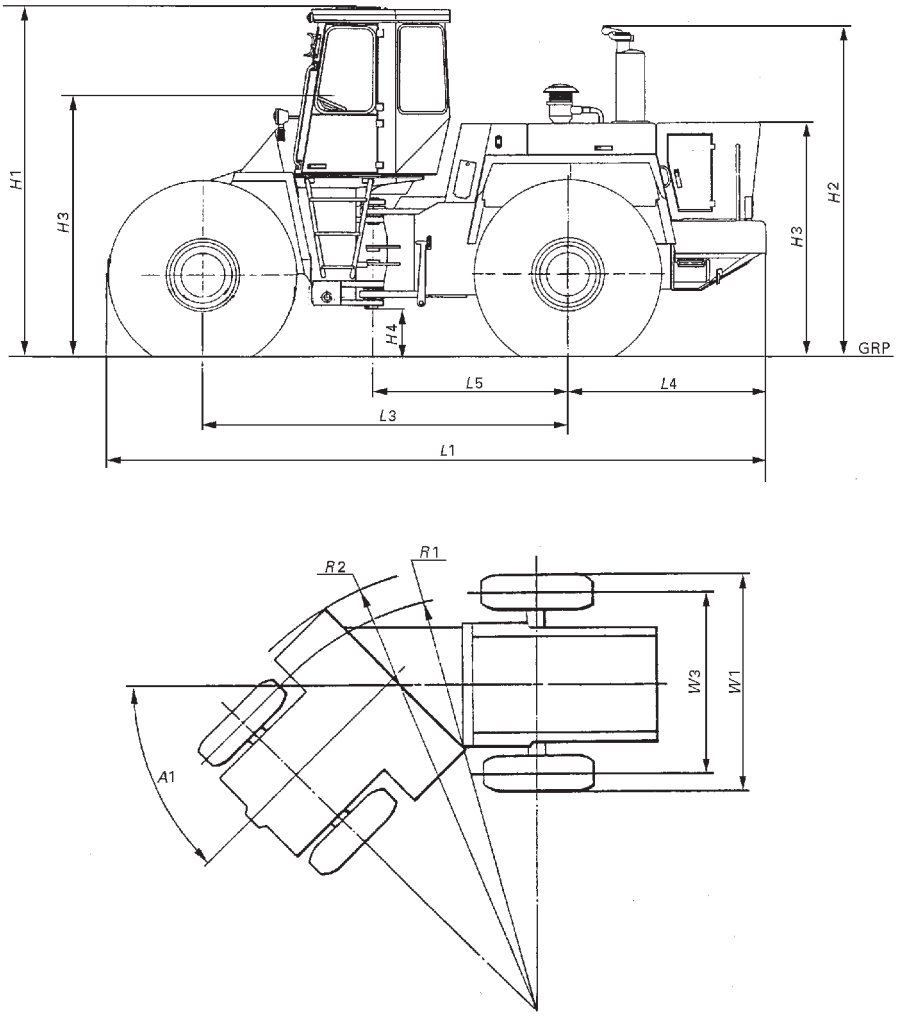


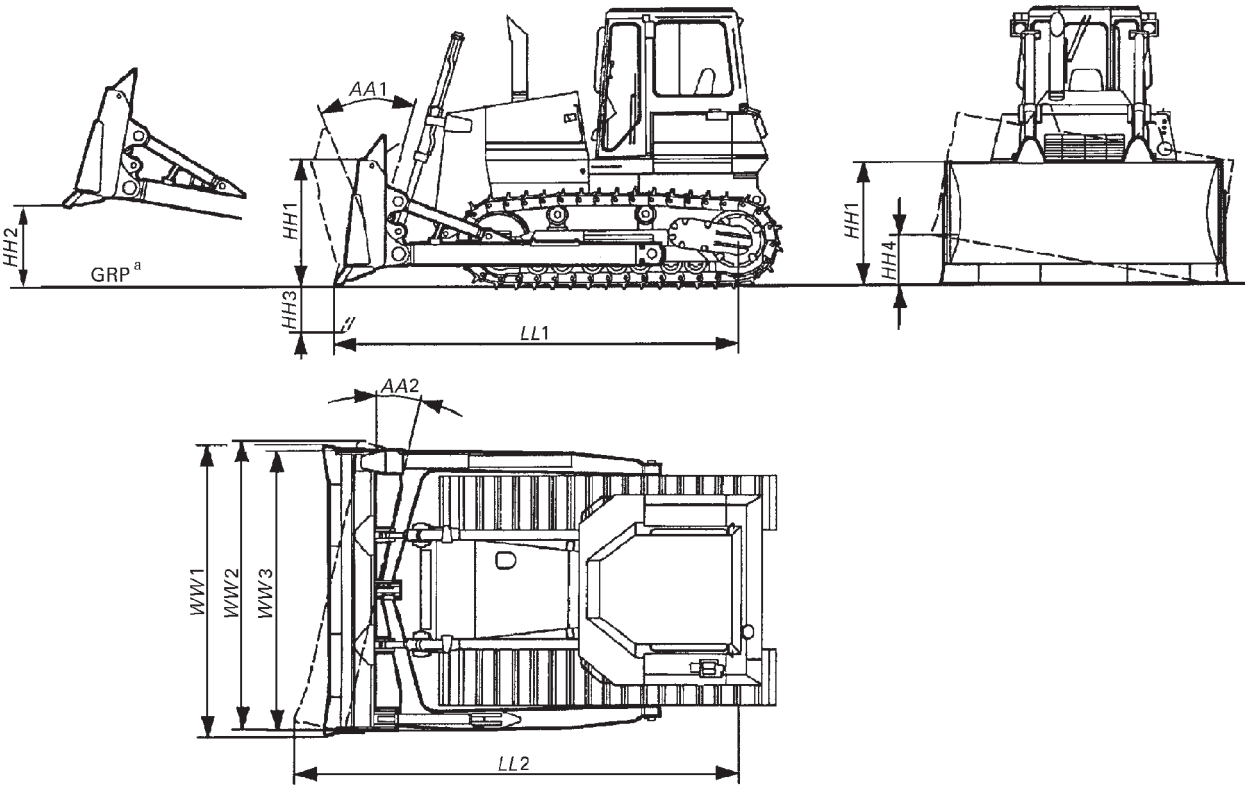
Figure 16 — Dimensions of base machine (wheeled dozer)

4.2.2 Equipment

See Figures 17, 18, 19, 20 and 21.

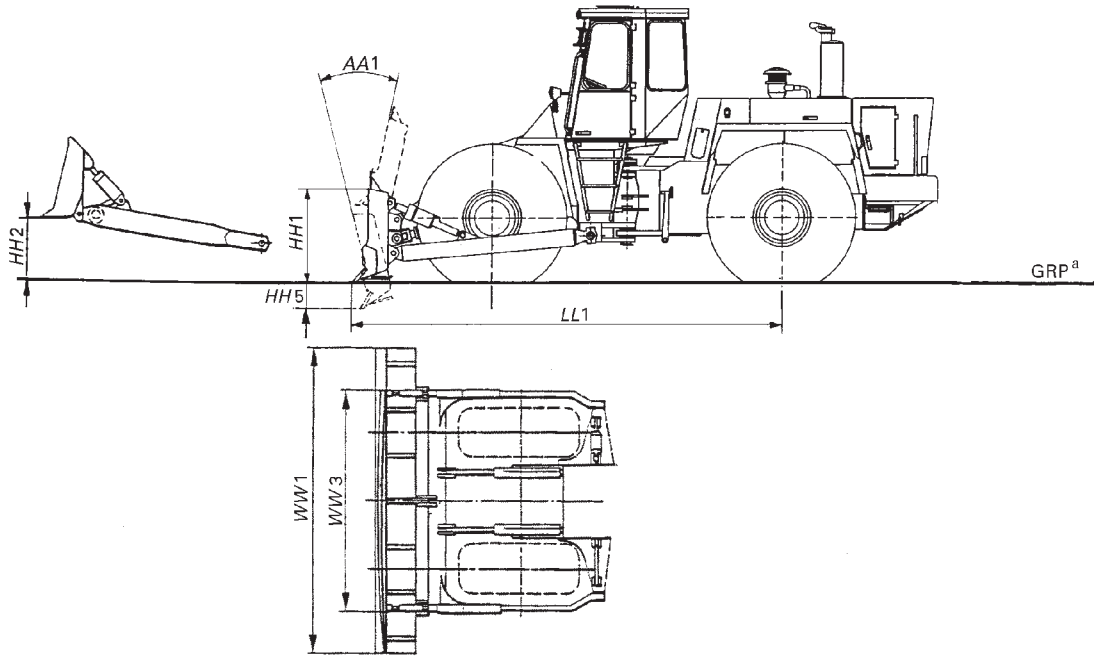
For definitions of dimensions, see ISO 6746-2.

For definitions of dimensions strictly related to dozers, see Annex A.



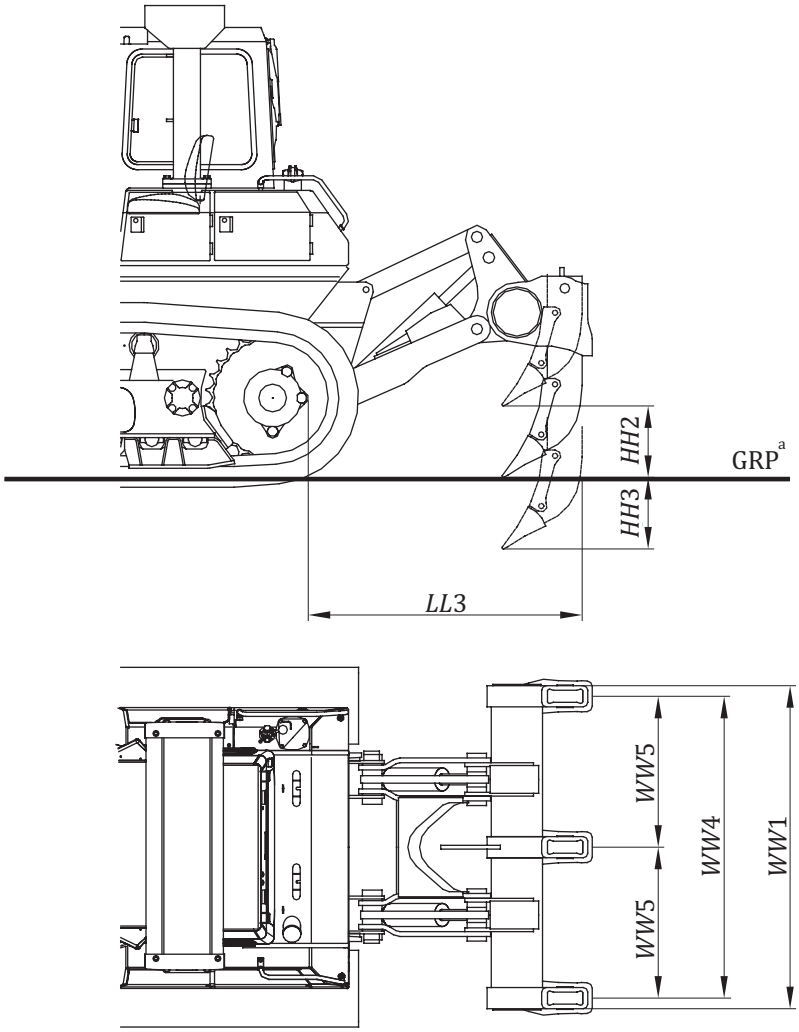
a See 3.1.10.

Figure 17 — Dimensions of dozer (crawler type)



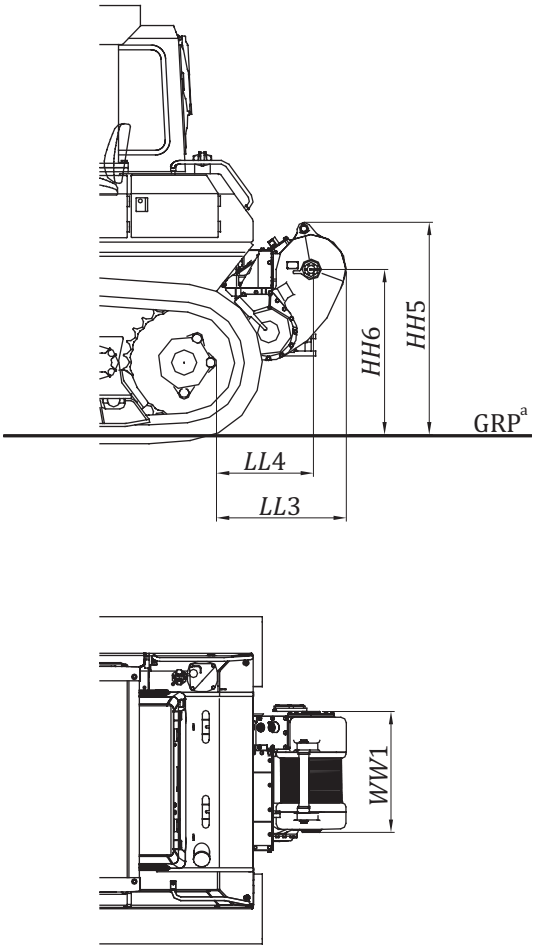
a For detail, see Figure 16.

Figure 18 — Dimensions of dozer (wheel type)



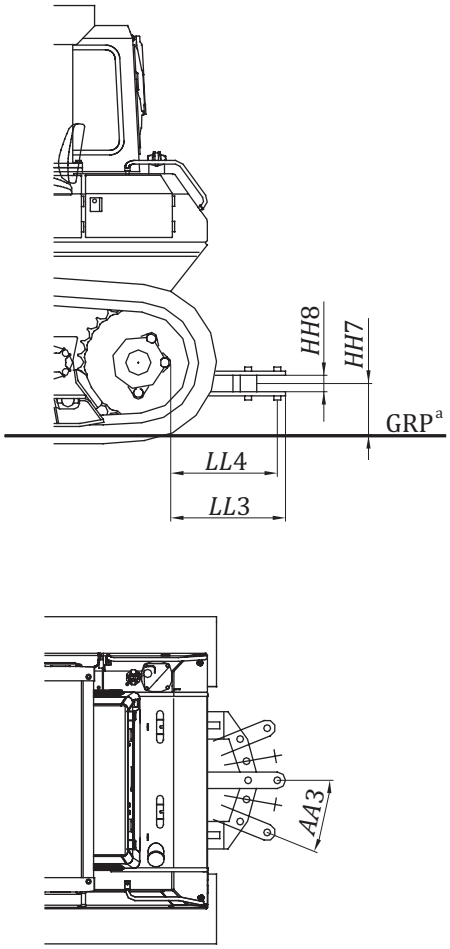
[a] See 3.1.10.

Figure 19 — Dimensions of ripper



[a] See 3.1.10.

Figure 20 — Dimensions of winch



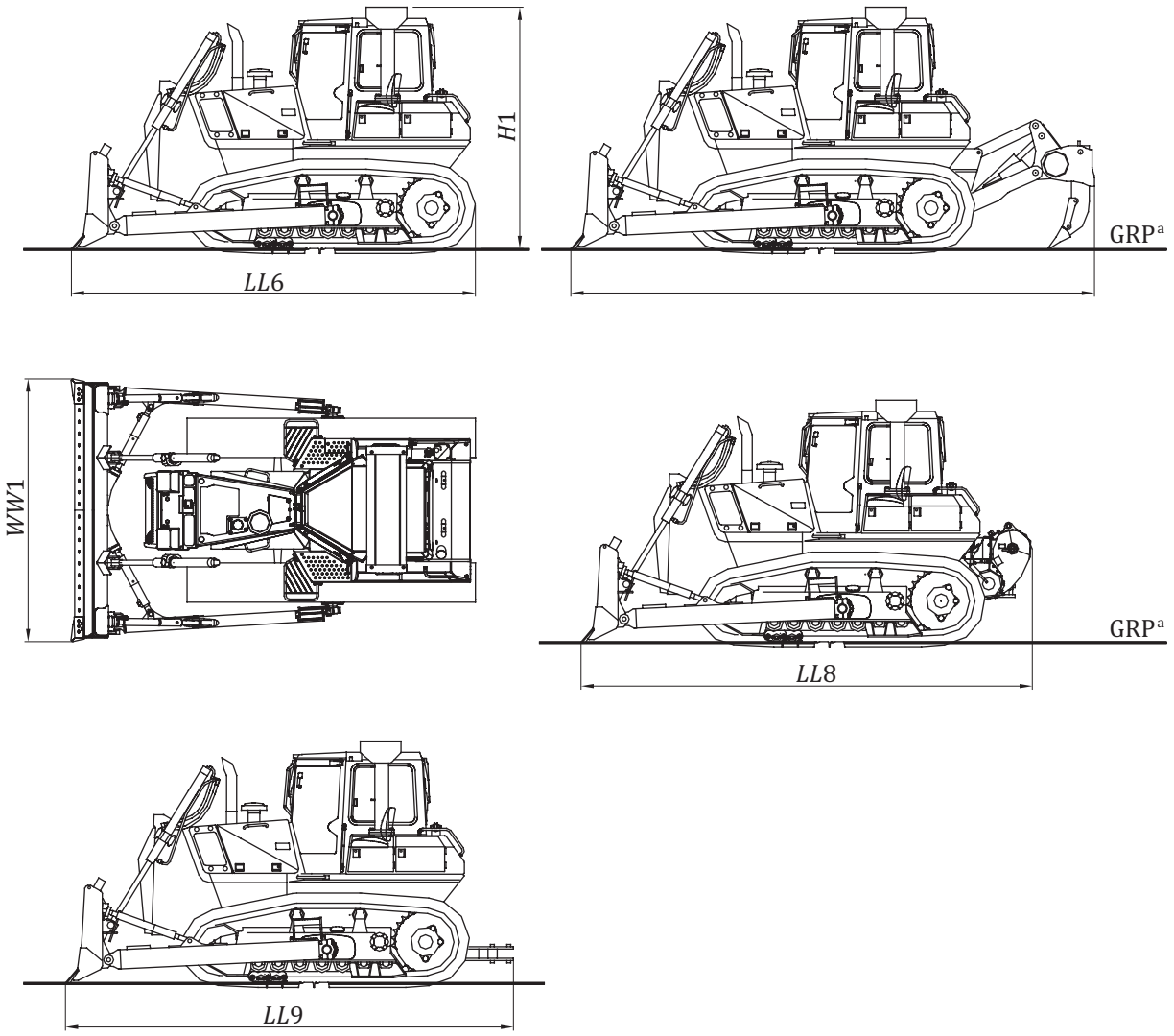
[a] See 3.1.10.

Figure 21 — Dimensions of swinging drawbar

4.2.3 Overall dimensions

See Figure 22.

For definitions of dimensions, see Annex A.



Key

LL6 with dozer blade
LL7 with dozer blade and ripper
LL8 with dozer blade and winch
LL9 with dozer blade and swinging drawbar
[a] See 3.1.10.

Figure 22 — Overall dimension crawler dozer

4.3 Nomenclature (see diagram numbers)

4.3.1 Terms and definitions

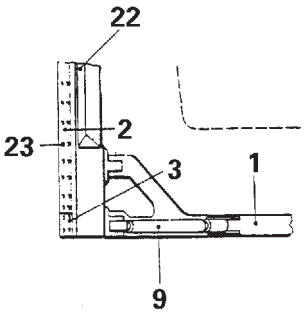
The following terms are defined here for a better understanding of dozer nomenclature.

4.3.1.1
jack
mechanically adjustable member for pitching or tilting the blade

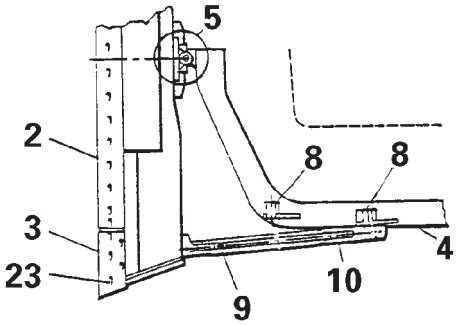
4.3.1.2
strut
member which is fixed in length after assembly

4.3.2 Dozing equipment

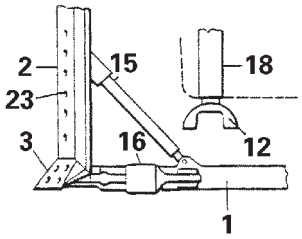
See 3.1.6 and Figure 23.



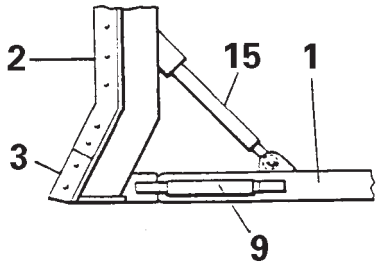
a) Straight blade



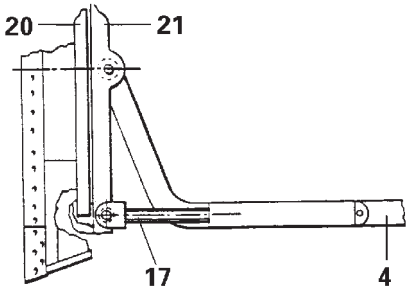
b) Angle blade



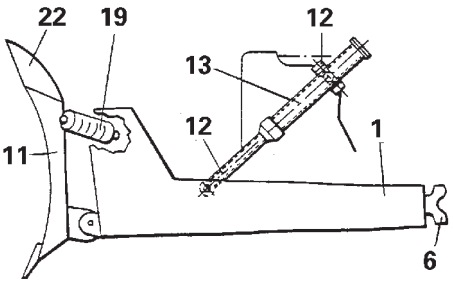
c) Semi-U-blade



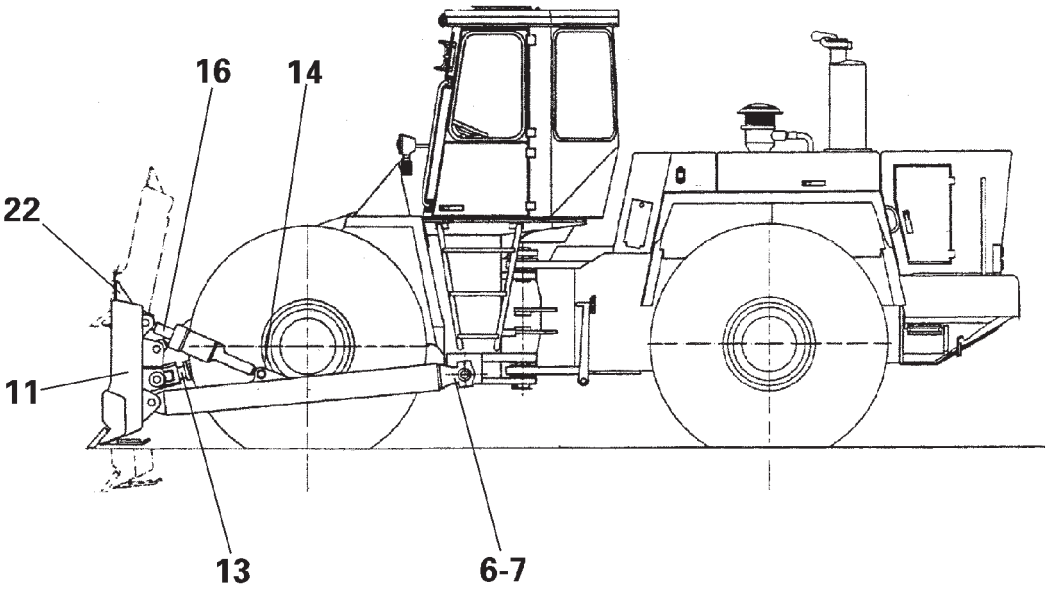
d) U-blade



e) Power (angle and tilt) blade



f) Cushion blade



g) Dozing equipment

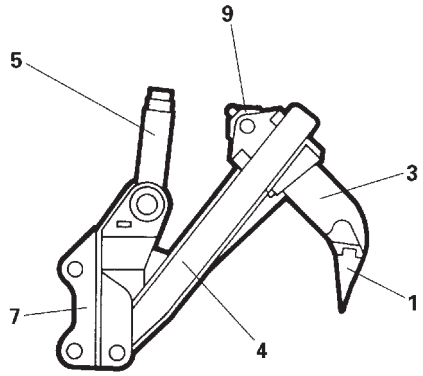
Key

1 beam, push
2 cutting edge
3 bit, end
4 c-frame
5 swivel, blade
6 trunnion
7 bearing, trunnion
8 bracket, angling strut
9 jack, adjusting
10 strut, angling
11 blade
12 yoke, cylinder
13 cylinder, lift
14 trunnion, cylinder
15 strut, horizontal blade
16 cylinder, tilt
17 cylinder, angling
18 tube, yoke or trunnion support
19 member, cushion
20 frame, tilt
21 frame, angling
22 spill guard
23 plough bolts

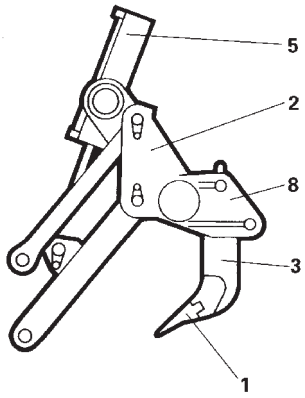
Figure 23 — Dozing equipment

4.3.3 Ripper

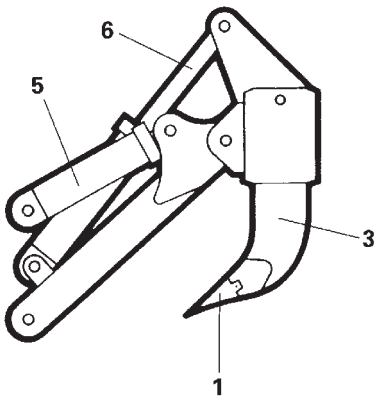
See Figure 24.



a) Radial



b) Parallelogram



c) Variable

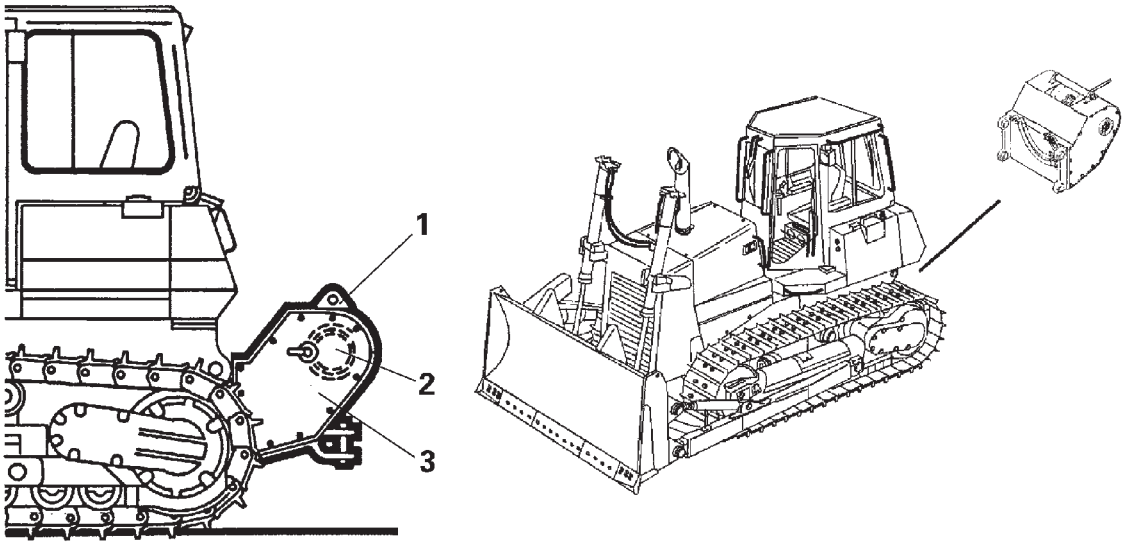
Key

1 tip (point)
2 clevis
3 shank
4 bar, tool
5 cylinder, lift
6 cylinder, shank tilt
7 bracket, mounting
8 block, bush (pocket, shank or socket, shank)
9 pin, shank

Figure 24 — Ripper

4.3.4 Winch

See Figure 25.



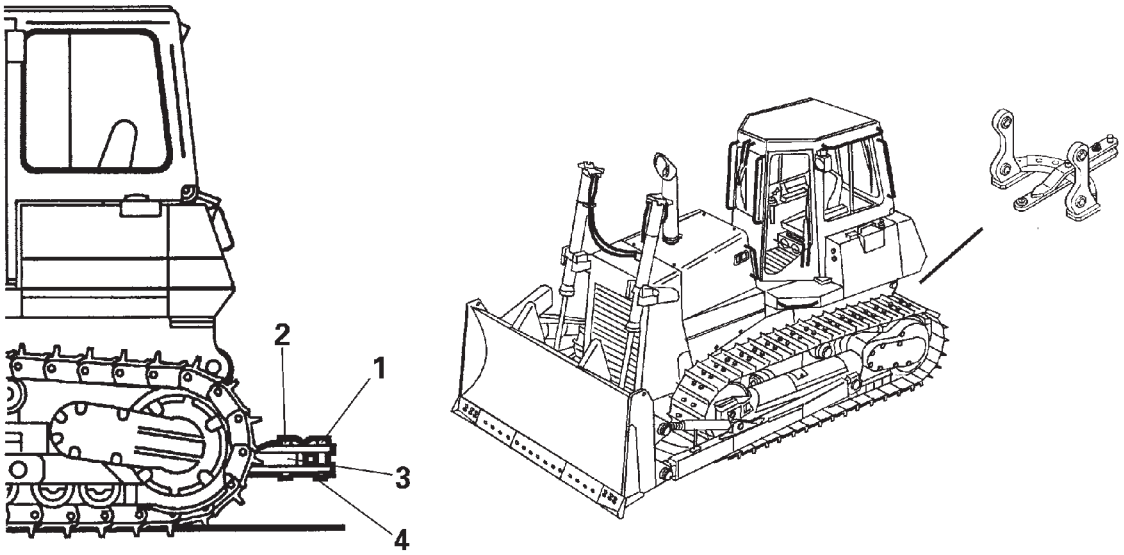
Key

1 guard, cable
2 drum, cable
3 housing, winch

Figure 25 — Winch

4.3.5 Swinging drawbar

See Figure 26.



Key

1 pin
2 pin, stop
3 swing selector bar
4 drawbar

Figure 26 — Swinging drawbar

5 Commercial literature specifications

The following is applicable for specification in commercial literature. Units of measure shall be expressed in SI units (International System).

5.1 Engine

The following shall be specified:

a) manufacturer and model;

b) ignition type (i.e. diesel or spark-ignition);

c) type of cycle (i.e. two or four stroke);

d) form of air aspiration (i.e. naturally aspirated, mechanically supercharged or turbocharged);

e) number of cylinders;

f) bore;

g) stroke;

h) displacement;

i) cooling system (i.e. air or water cooled);

j) type of fuel;

k) net power according to ISO 9249;

l) rated engine speed according to ISO 9249;

m) maximum torque at a given engine speed;

n) starter type;

o) electrical system voltage.

5.2 Transmission

The following shall be specified, as applicable:

a) type of transmission, for example:

— manual shift with flywheel clutch;

— powershift with torque converter;

— hydrostatic;

— electric;

b) number of speeds (forward and reverse);

c) maximum travel speeds (a graph of rimpull versus speed should be shown).

5.3 Hydraulic system

5.3.1 Working pumps

The following shall be specified:

a) type;

b) pump at a given pressure, at rated engine speed.

5.3.2 Motor(s)

The type and function of the hydraulic motor(s) shall be specified.

5.3.3 Hydraulic pressure

5.3.3.1 Working circuit pressure

That nominal pressure applied to the specific circuit by the pump(s) shall be specified.

5.3.3.2 Holding circuit pressure

The maximum static pressure in a specific circuit, limited by a relief valve at a flow no greater than 10 % of the rated circuit flow, shall be specified.

5.4 System fluid capacities

The following information shall be specified, as applicable:

a) fuel tank;

b) engine crankcase;

c) cooling system;

d) transmission;

e) differential;

f) final drive;

g) hydraulic system.

5.5 Blade specification

The blade type and dimensions shall be specified for

a) angle dozers, and

b) straight dozers.

5.6 Masses

The following masses shall be specified:

a) operating mass;

b) shipping mass.

5.7 Overall dimensions

The overall dimensions shall be specified.

5.8 Crawler machines

5.8.1 Steering and braking

For example:

— type (drum, disc, wet or dry);

— actuating system (hydraulic, mechanical).

5.8.2 Final drives

For example:

— type (single or double reduction, planetary);

— ratio;

— lubrication.

5.8.3 Track and roller

For example:

— track pitch;

— width of shoe;

— grouser height;

— ground contact area [$L2 \times 2$ ($W4$)];

— number of track rollers (each side).

5.8.4 Average ground contact pressure

Average ground contact pressure (ISO 16754) shall be specified.

5.9 Wheeled machines

5.9.1 Driving axle (specified type)

For example:

— fixed vs. oscillating;

— bevel gear and pinion;

— differential;

— hydrostatic;

— planetary final drive.

5.9.2 Steering (specified type)

According to ISO 5010. For example:

— manual, hydrostatic;

— articulated;

— emergency steering system;

— performance: turning radii, left and right, etc.

5.9.3 Brakes

5.9.3.1 Service brakes

For example:

— type (drum, disc, wet or dry);

— actuating system type (full air, full hydraulic, air over hydraulic, etc.).

5.9.3.2 Secondary brakes

For example:

— type;

— actuating system.

5.9.3.3 Parking brake

For example:

— type;

— actuating system.

5.9.4 Tyres

For example:

— size and type;

— tread;

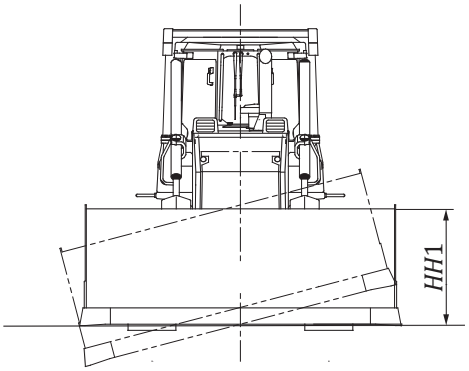
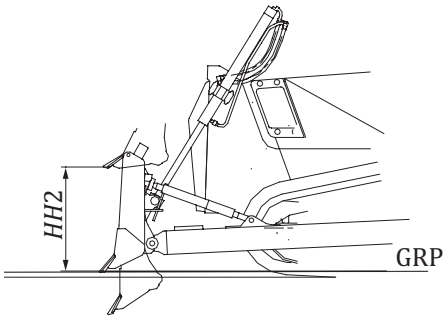
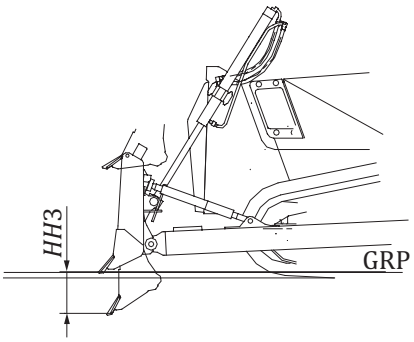
— ply rating;

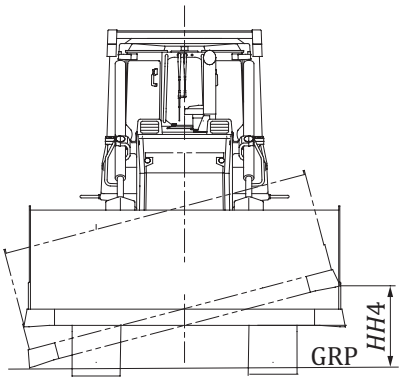
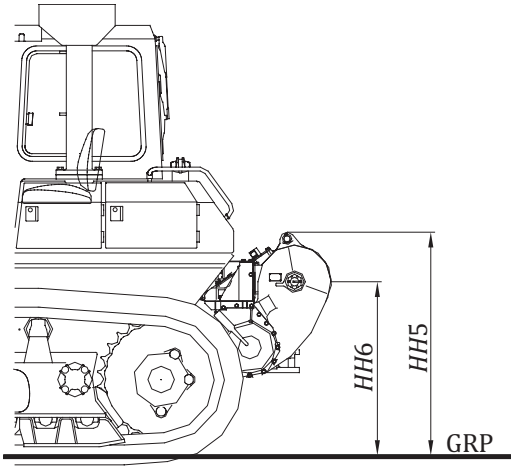
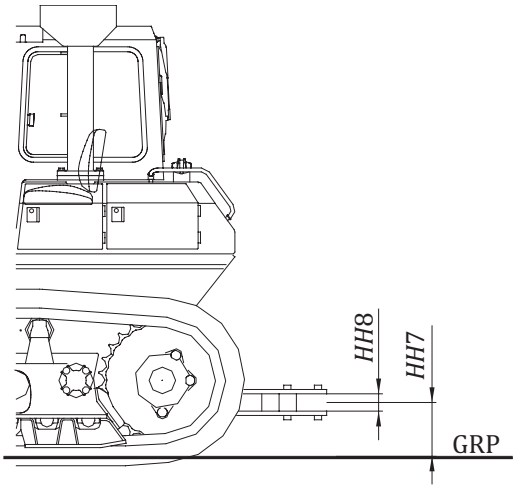
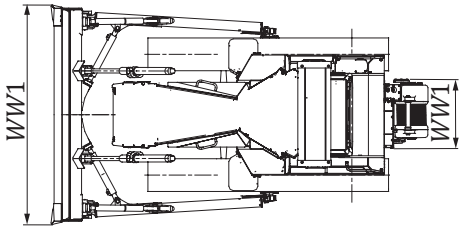
— rim size.

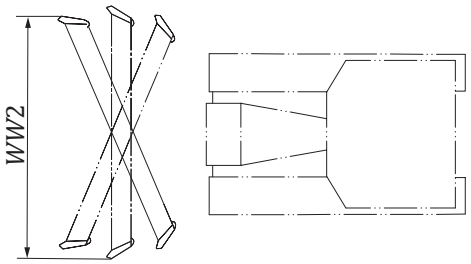
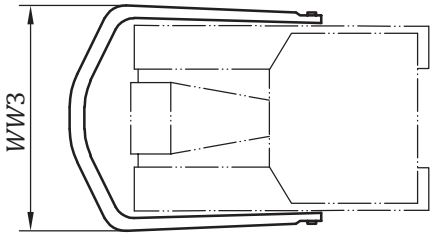
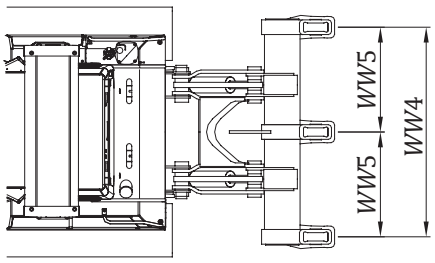
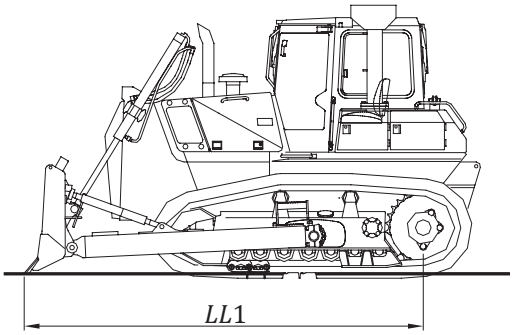
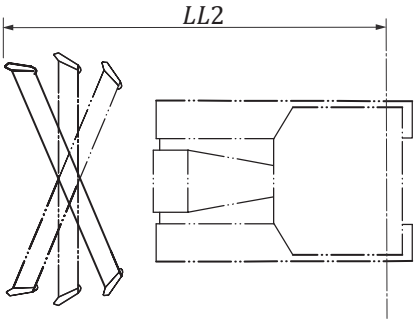
Annex A
(normative)

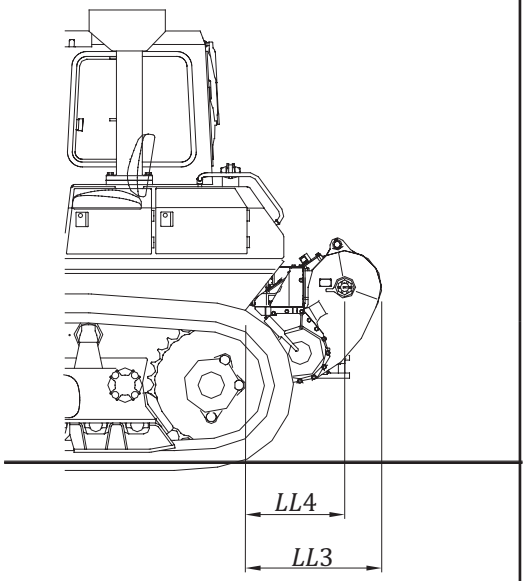
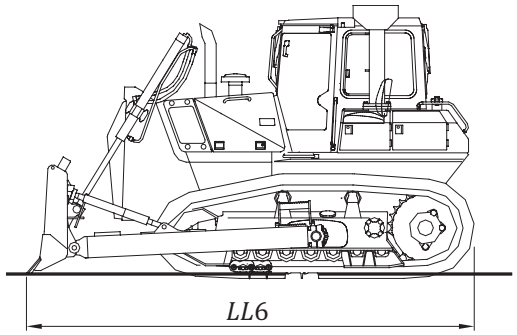
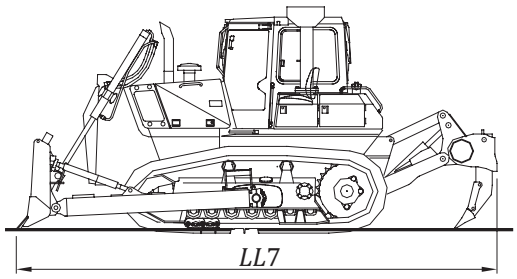
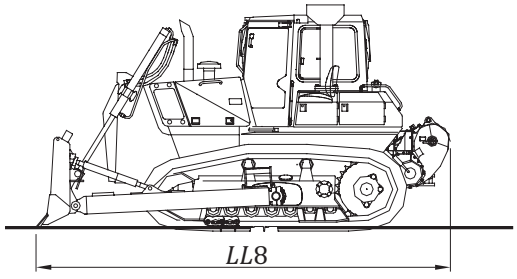
Dozer dimensions

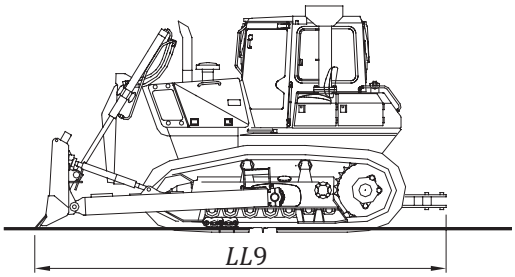
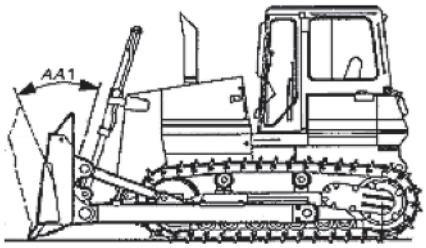
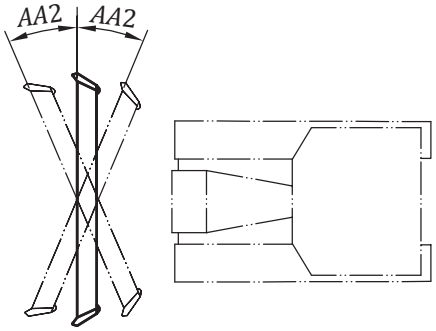
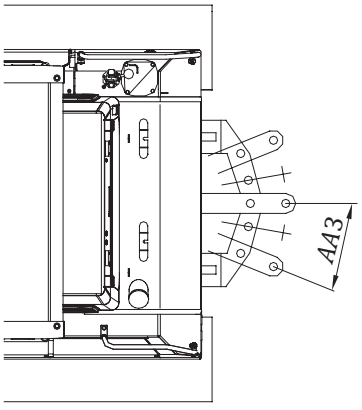
Annex A defines dozer dimensions and specifies their codes.

Code	Term and definition	Illustration
*HH*1	**blade height** distance on Z coordinate between GRP and the top of the blade (excluding name plate and spill guards) with the blade on the ground in mid-point position (where applicable) with no blade tilt or angle.	
*HH*2	**lift height** distance on Z coordinate between GRP and the lowest point of the cutting edge in mid-pitch position (where applicable) with no blade tilt or angle for blades, or the lowest point for the ripper with the tooth in lifted position	
*HH*3	**cutting depth** distance on Z coordinate between GRP and the lowest point of the cutting edge (in mid-pitch position with no blade tilt or angle) for blade or the lowest point for the ripper with the tooth below ground	

Code	Term and definition	Illustration
*HH*4	**tilt height** distance on Z coordinate between GRP and the raised end bit with the other end bit on GRP If opposite ends vary, specify both.	
*HH*5	**winch maximum height** distance on Z coordinate between GRP and the highest point of the winch	
*HH*6	**winch centre of drum height** distance on Z coordinate between GRP and the centre of the drum	
*HH*7	**drawbar height** distance on Z coordinate between GRP and the centreline of the drawbar clevis (fork)	
*HH*8	**clevis width** Distance on Z coordinate between two Z planes passing through the inside surfaces of the drawbar clevis (fork)	
*WW*1	**maximum width** distance on Y coordinate between two Y planes passing through the farthest points of the equipment	

Code	Term and definition	Illustration
*WW*2	**angle blade width** distance on Y coordinate between two Y planes passing through the farthest points of the blade when the blade is at the maximum angle and resting on the GRP	
*WW*3	**C-frame width** distance on Y coordinate between two Y planes passing through the farthest points of the C-frame	
*WW*4	**shanks working width** distance on Y coordinate between two Y planes passing through the outermost points of the teeth of the external shanks	
*WW*5	**shanks centre distance** distance on Y coordinates between the centreline of two shanks	
*LL*1	**front projection** distance on X coordinate between two X planes passing through the sprocket or rear idler axis of crawler machines or the rear wheels centre of wheeled machines and the front extreme point of equipment The blade is in the mid-point position with no blade tilt or angle, the equipment resting on GRP, and the extreme point is the end bit.	
*LL*2	**angle blade front projection** distance on X coordinate between two X planes passing through the sprocket or rear idler axis of crawler machines or the rear wheels centre of wheeled machines and the front extreme end bit of the blade, when the blade is at the maximum angle The blade is in the mid-point position with no blade tilt but maximum angle, the equipment resting on GRP.	

Code	Term and definition	Illustration
*LL*3	**rear projection** distance on X coordinate between two X planes passing through the rear mounting surface of the machine and the rear extreme point of equipment For the ripper, the tooth shall be on GRP and the dimension is the distance to the extreme rear of the ripper. *L*4 is a base machine dimension as defined in ISO 6746-1.	
*LL*4	**axis projection** distance on X coordinate between two X planes passing through the rear mounting surface of the machine and the centre of the winch drum or the vertical axis of the drawbar (fork) pin-hole *L*4 is a base machine dimension as defined in ISO 6746-1.	
*LL*6	**maximum length** distance on X coordinate between two X planes passing through the farthest points on the front and rear of the machine, with dozer blade	
*LL*7	**maximum length** distance on X coordinate between two X planes passing through the farthest points on the front and rear of the machine, with dozer blade and ripper	
*LL*8	**maximum length** distance on X coordinate between two X planes passing through the farthest points on the front and rear of the machine, with dozer blade and winch	

Code	Term and definition	Illustration
*LL*9	**maximum length** distance on X coordinate between two X planes passing through the farthest points on the front and rear of the machine, with dozer blade and swinging draw-bar	
*AA*1	**pitch angle** maximum angle in Y plane descried by the top of the blade or ripper shank during its extreme fore and aft movement around the blade or shank pivot, with the cutting edge or point of the shank on GRP	
*AA*2	**blade angle** maximum angle in Z plane described by the blade during its extreme left or right movement around the blade mid-position	
*AA*3	**swinging drawbar angle** maximum angle in Z plane described by the swinging drawbar during its extreme left or right movement around the centre position	

Bibliography

[1] ISO 3450:2011, *Earth-moving machinery — Wheeled or high-speed rubber-tracked machines — Performance requirements and test procedures for brake systems*

[2] ISO 6165:2012, *Earth-moving machinery — Basic types — Identification and terms and definitions*

[3] ISO 6016:2008, *Earth-moving machinery — Methods of measuring the masses of whole machines, their equipment and components*

[4] ISO 7464:1983, *Earth-moving machinery — Method of test for the measurement of drawbar pull*

[5] ISO 10265:2008, *Earth-moving machinery — Crawler machines — Performance requirements and test procedures for braking systems*

[6] ISO 10266:1992, *Earth-moving machinery — Determination of slope limits for machine fluid systems operation — Static test method*

[7] ISO 16754:2008, *Earth-moving machinery — Determination of average ground contact pressure for crawler machines*

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