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Machinery for forestry — Forestry mulching equipment — Terms, definitions and commercial specifications

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Foreword

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Introduction

The figures in this document are intended to illustrate machine concepts for rather than any existing machines or all possible configurations (see Annexes A and B).

Machinery for forestry — Forestry mulching equipment — Terms, definitions and commercial specifications

1 Scope

This document identifies and defines terms, specifies a means of classification, provides dimensional characteristics and commercial specifications, and gives a nomenclature of components for mulching equipment (in other words, mulching attachment carriers and mulching attachments) used in forestry and related operations. Its aim is to establish a uniform method of describing the various configurations of these types of forestry machines.

Machines for mulching which have been designed for feeding by hand are not covered by this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 General terms

3.1.1
mulching attachment carrier
self-propelled machine for carrying a *mulching attachment* (3.1.2)

Note 1 to entry: Mulching attachment carriers are defined by their design configuration and operational purpose.

EXAMPLE Skid-steer loader, excavator, tractor with forestry application features.

3.1.2
mulching attachment
device affixed to and propelled by a *mulching attachment carrier* (3.1.1) and designed for the purpose of *mulching* (3.1.3)

3.1.3
mulching
reduction of trees, brush, or parts of trees on site with a grinding or shredding action, leaving the resulting material on the forest or worksite floor

[SOURCE: ISO 6814:2009, 2.16, modified to add: or worksite]

3.1.4
mulching equipment
mulching attachment carrier (3.1.1) equipped with a *mulching attachment* (3.1.2)

Note 1 to entry: Mulching equipment can be classified by how they are configured (for example, drive type, rotor type, tool type, mount type) and combination of these types. See 3.4

3.2 Terms related to mulching attachment carrier

3.2.1
undercarriage
base of the *mulching equipment* (3.1.4) that provides mobility

Note 1 to entry: An undercarriage typically has endless tracks or wheels, or a combination of both.

3.2.2
maximum ground speed
maximum forward speed able to be obtained on level ground based on the nominal design capacity of the *mulching attachment carrier* (3.1.1) with tyres or endless tracks

Note 1 to entry: The tyre size will be the largest diameter drive tyres as specified by the mulching attachment carrier manufacturer for the *mulching attachment carrier* (3.1.1).

3.3 Terms related to to mulching attachment

3.3.1
rotor
rotating component with *tools* (3.3.2) that strikes and reduces material it comes in contact with

Note 1 to entry: The rotor typically has an axis that is either horizontal (drum type) or vertical (disc type).

3.3.2
tool
material engaging element mounted to the *rotor* (3.3.1) that grinds, shreds, tears, or cuts material

EXAMPLE Tooth, hammer.

3.3.3
anvil
reaction element or elements located close to the *rotor* (3.3.1) which restrains engaged material while it is struck and reduced by the *tools* (3.3.2)

3.3.4
rotor housing
enclosure containing the *rotor* (3.3.1) and reactionary elements which limit and direct material discharge

3.3.5
debris sizing door
adjustable element mounted on the *rotor housing* (3.3.4) that contributes to material reduction and directs material discharge

3.3.6
push bar
pushover bar
rigid or adjustable structure mounted on top of the *rotor housing* (3.3.4) for manipulating and directing material that is standing or on the ground

3.3.7
skid shoe
adjustable or rigid mounted element mounted at the bottom of the *mulching attachment* (3.1.2) outside of the *rotor housing* (3.3.4) that regulates distance between the cutting element and the ground

3.3.8
mount
mechanical interface that connects the *mulching attachment* (3.1.2) to the *mulching attachment carrier* (3.1.1) typically by welding, bolting, or pinning

Note 1 to entry: Quick couplers and quick attach systems are other types of interfaces.

3.3.9
debris guard
devices affixed to the lower section of the *mulching attachment* (3.1.2) that absorbs or deflects thrown debris

EXAMPLE Chains, protective skirt.

3.3.10
tool holder
device that affixes the *tool* (3.3.2) to the *drum* (3.4.2.1) or the *disc* (3.4.2.2)

3.4 Terms related to mulching equipment type

3.4.1 Drive type

3.4.1.1
PTO drive
configuration where the *mulching attachment* (3.1.2) is powered by the power take-off of the *mulcher attachment carrier* (3.1.1)

3.4.1.2
hydraulic drive
configuration where the *mulching attachment* (3.1.2) is powered by hydraulic fluid supplied by the *mulching attachment carrier* (3.1.1) to single or dual hydraulic motors of the *mulching attachment* (3.1.2)

3.4.1.3
self-powered drive
configuration where the *mulching attachment* (3.1.2) is configured with an on-board power source (for example, engine, electric motor, hydraulic motor), and is independent of any power from the *mulching attachment carrier* (3.1.1) to the *rotor* (3.3.1) of the *mulching attachment* (3.1.2)

3.4.2 Rotor type

3.4.2.1
drum
configuration where the rotor of the *mulching attachment* (3.1.2) is cylindrical and typically mounted with a horizontal shaft orientation within the *rotor housing* (3.3.4)

3.4.2.2
disc
configuration where the rotor of the *mulching attachment* (3.1.2) is a disc or disc-like assembly, and typically mounted with a vertical shaft orientation to the ground within the *rotor housing* (3.3.4)

3.4.3 Tool type

3.4.3.1
fixed
configuration where a *tool* (3.3.2) is rigidly mounted to the *rotor* (3.3.1)

3.4.3.2
swing
flail
configuration where a *tool* (3.3.2) that can swing or pivot independent of the *rotor* (3.3.1)

3.4.4 Mount type

3.4.4.1
limited reach
mount (3.3.8) configuration with a vertical lift capability typically less than 1,75 m

3.4.4.2
boom
mount (3.3.8) configuration intended for *mulching attachment carriers* (3.1.1) with lift and reach typically more than 4 m

Note 1 to entry: This configuration can include tilting and rotational elements for *mulching attachment* (3.1.2) positioning.

3.4.4.3
loader
mount (3.3.8) configuration intended for *mulching attachment carriers* (3.1.1) with loader arm geometry that typically provides vertical lift less than 4 m

Note 1 to entry: Reach is typically fixed and cannot be adjusted in or out, but the loader can include tilting elements to independently position the *mulching attachment* (3.1.2)

3.5 Terms related to dimensional characteristics

3.5.1
ground reference plane
GRP
hard, flat, horizontal surface on which the *mulching attachment carrier* (3.1.1) and *mulching attachment* (3.1.2) are placed for taking measurements

[SOURCE: ISO 13862:2022, modified — replaced "machine is" with "*mulching attachment carrier* (3.1.1) and *mulching attachment* (3.1.2) are".]

3.5.2 Mulching attachment carrier

3.5.2.1
height
H_1
distance from *ground reference plane* (3.5.1) to the top of the highest *mulching attachment carrier* (3.1.1) element with the attachment lowered to the ground

3.5.2.2
width
W_1
linear distance between each side-most *mulching attachment carrier* (3.1.1) element

3.5.2.3
length
L_1
linear distance between the forward-most *mulching attachment carrier* (3.1.1) element and the rearward-most *mulching attachment carrier* (3.1.1) element

3.5.2.4
ground clearance
H_2
vertical distance measured from the *ground reference plane* (3.5.1) to lowest point of the *mulching attachment carrier* (3.1.1) centre portion

3.5.2.5
average ground contact pressure
average ground contact pressure of the *mulching attachment carrier* (3.1.1), in kilopascals, determined in accordance with ISO 16754

[SOURCE: ISO 15143-2:2010, 3.3.1.6, modified — "of the mulching attachment carrier" added.]

3.5.3 Mulching attachment

3.5.3.1
height
H_3
distance from the *ground reference plane* (3.5.1) to the top of the highest *mulching attachment* (3.1.2) element

3.5.3.2
width
W_2
linear distance between each side-most *mulching attachment* (3.1.2) element

3.5.3.3
length
L_2
linear distance between the forward-most *mulching attachment* (3.1.2) element and the rearward-most *mulching attachment* (3.1.2) element

3.5.3.4
mulching width
W_3
width of the opening to the *rotor* (3.3.1) where mulching is effective on a drum-type *mulcher attachment* (3.1.2)

3.5.3.5
rotor diameter
D_1
radial dimension of the cutting *disc* (3.4.2.1) or cutting *drum* (3.4.2.2) including *tools* (3.3.2) and *tool holders* (3.3.10)

3.5.3.6
disc diameter
D_2
radial dimension of the cutting *disc* (3.4.2.1) less *tools* (3.3.2) and *tool holders* (3.3.10)

3.5.3.7
drum diameter
D_3
radial dimension of the cutting *drum* (3.4.2.2) less *tools* (3.3.2) and *tool holders* (3.3.10)

3.5.4 Mulching equipment

3.5.4.1
lift height
H_5
vertical distance measured upward from the *ground reference plane* (3.5.1) to the lowest point of the *rotor* (3.3.1) when lifted to maximum height

3.5.4.2
reach
L_3
horizontal distance measured from the forward-most edge of the wheels or tracks to the forward-most point of the *rotor* (3.3.1)

3.5.4.3
below-grade depth
H_6
vertical distance measured downward from the *ground reference plane* (3.5.1) to the lowest point of the *rotor* (3.3.1) when lowered to maximum depth

3.6 Terms related to masses

3.6.1
overall mass
<mulching attachment carrier**>** mass of the *mulching attachment carrier* (3.1.1), without the *mulching attachment* (3.1.2) in the most usual configuration as specified by the manufacturer, and with the operator (75 kg), full fuel tank and all fluid systems (in other words, hydraulic oil, transmission oil, engine oil, engine coolant) at the levels specified by the manufacturer

Note 1 to entry: Adapted from ISO 6016:2008, 3.2.

3.6.2
overall mass
<mulching attachment> mass of the *mulching attachment* (3.1.2) in the most usual configuration as specified by the manufacturer with all available options affixed

4 Commercial specifications

4.1 Mulching attachment carrier

4.1.1 Internal combustion engine

The following information shall be specified:

a) engine manufacturer	(name)
b) engine model and type	diesel, internal combustion
c) net power (per ISO 9249, ISO 14396, or other)	kW
d) rated revolutions	r/min
e) fuel type	(specify)
f) fuel tank capacity	l

4.1.2 Electric motor

The following information shall be specified:

a) type	(for example, induction, direct current)
b) power	kW
c) rated current	A
d) voltage and frequency	V and Hz
e) revolutions	r/min

4.1.3 Undercarriage

The following information shall be specified:

a) wheelbase (if equipped)	cm
b) track type (if equipped)	rubber, steel, other
c) track length (if equipped)	cm
d) track width (if equipped)	cm
e) ground clearance	cm
f) overall mass	kg
g) average ground contact pressure	kPa
h) maximum ground speed	km/h
i) maximum slope	degrees

4.1.4 Mulching attachment carrier mass

The following information shall be specified:

a) overall mass	kg

4.2 Mulching attachment

4.2.1 Drive type

The following information shall be specified:

a) configuration	PTO drive, hydraulic drive, self-powered

4.2.2 Rotor type

The following information shall be specified:

a) drum	
1) number of teeth	(number)
2) tool type	fixed, swing
3) rotor diameter	mm
4) drum diameter	mm
b) disc	
1) number of teeth	(number)
2) tool type	fixed, swing
3) rotor diameter	mm
4) disc diameter	mm

4.2.3 Dimensional characteristics

The following information shall be specified:

a) height (H_3) mm

b) width (W_2) mm

c) mulching width (W_3) mm

d) length (L_2) mm

e) rotor diameter (D_1) mm

4.2.4 Mulching attachment mass

The following information shall be specified:

a) mass kg

4.3 Mulching equipment

a) lift height (H_5) m

b) reach (L_3) m

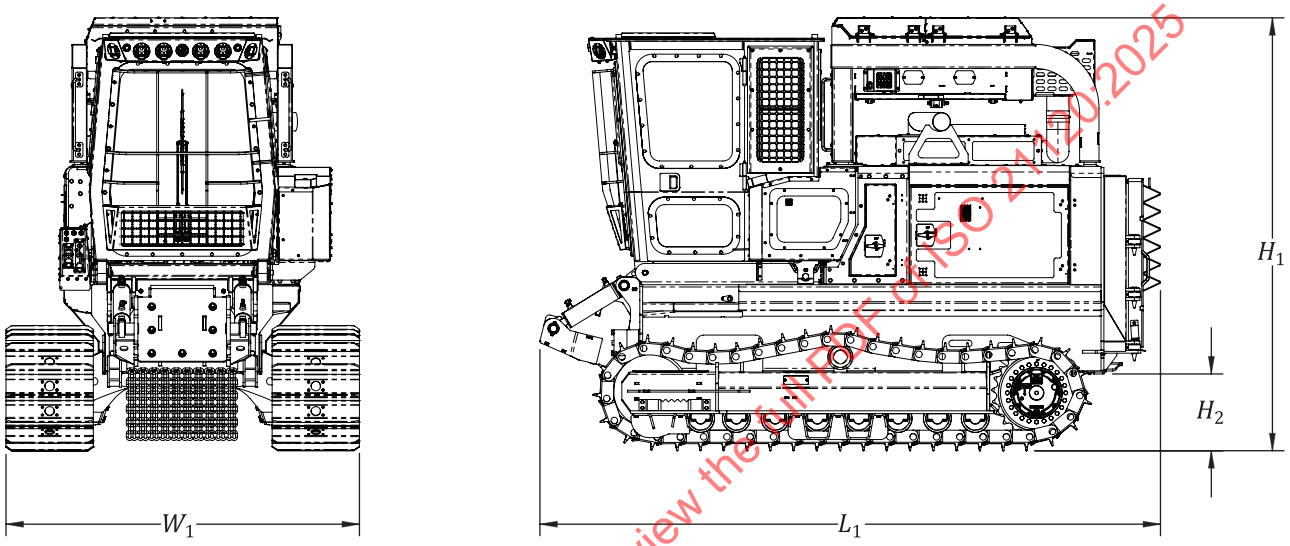
c) below-grade depth (H_6) m

Annex A
(informative)

Dimensional characteristics of forestry mulching equipment

A.1 Dimensional characteristics of mulching attachment carrier

See Figure A.1.



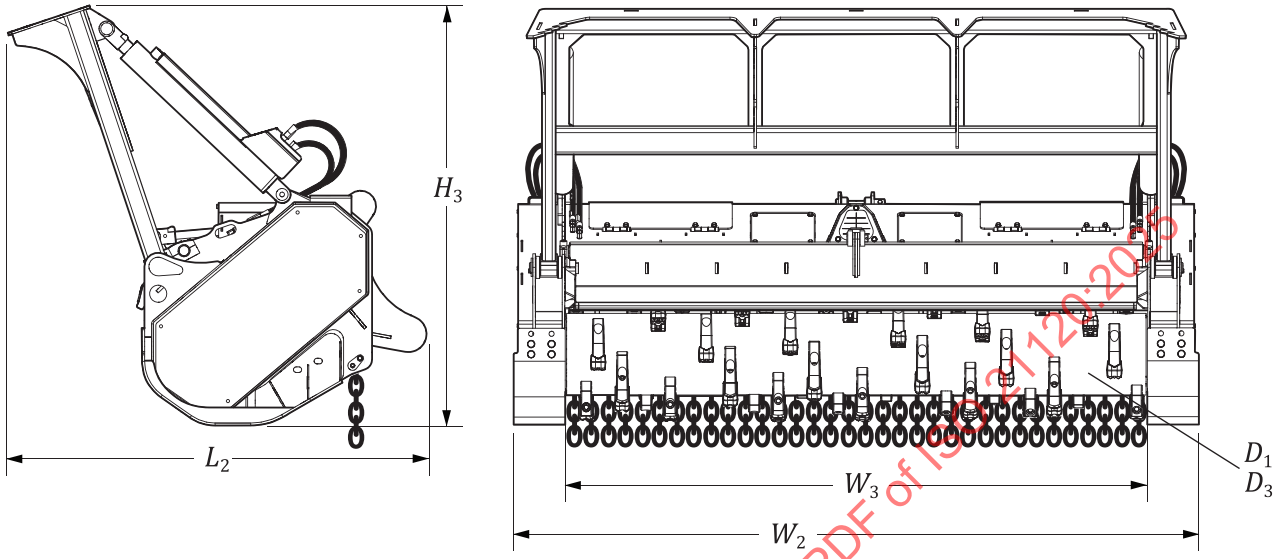
Key

H_1 height (3.5.2.1)
H_2 ground clearance (3.5.2.4)
W_1 width (3.5.2.2)
L_1 length (3.5.2.3)

Figure A.1 — Dimensional characteristics of mulching attachment carrier

A.2 Dimensional characteristics of drum-type mulching attachment

See Figure A.2.



side view **front view**

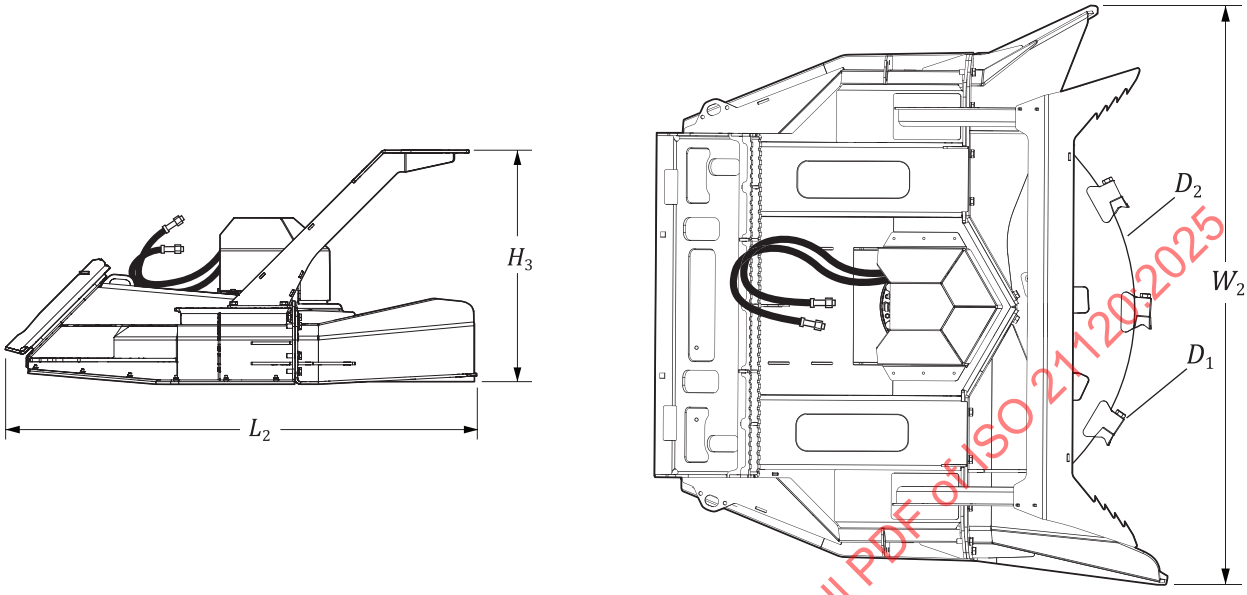
Key

H_3 height with push bar (3.5.3.1)
W_2 width (3.5.3.2)
W_3 mulching width (3.5.3.4)
L_2 length (3.5.3.3)
D_1 rotor diameter (3.5.3.5)
D_3 drum diameter (3.5.3.7)

Figure A.2 — Dimensional characteristics of drum-type mulching attachment (shown with push bar)

A.3 Dimensional characteristics of disc-type mulching attachment

See Figure A.3.



side view **top view**

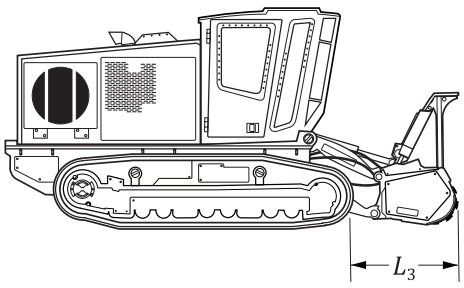
Key

H_3 height (3.5.3.1)
W_2 width (3.5.3.2)
L_2 length (3.5.3.3)
D_1 rotor diameter (3.5.3.5)
D_2 disc diameter (3.5.3.6)

Figure A.3 — Dimensional characteristics of disc-type mulching attachment

A.4 Dimensional characteristics of forestry mulching equipment for engagement with materials

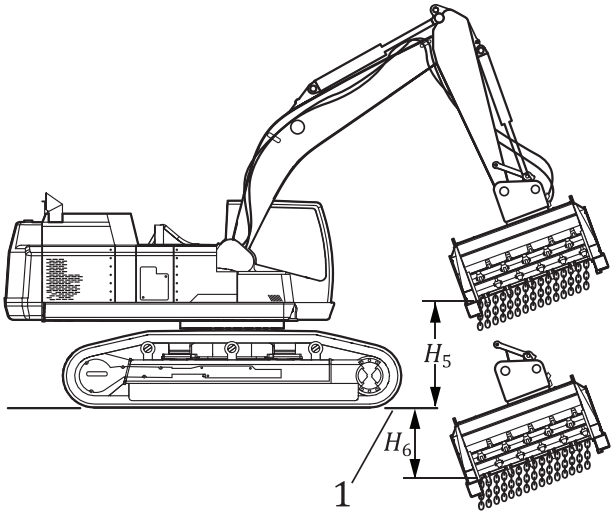
See Figure A.4 and Figure A.5.



Key

L_3 reach (3.5.4.2)

Figure A.4 — Example of reach measurement



Key

1 ground reference plane (3.5.1)

H_5 lift height (3.5.4.1)

H_6 below grade depth (3.5.4.3)

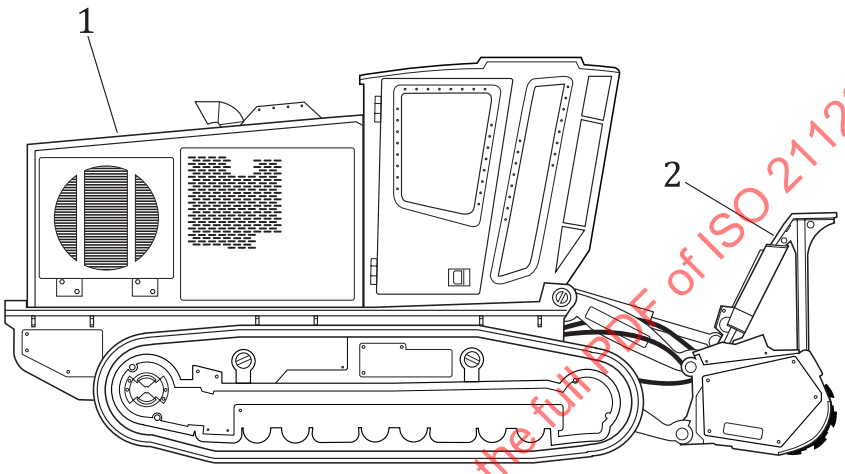
Figure A.5 — Example of lift height and below-grade depth measurements

Annex B
(informative)

Nomenclature of forestry mulching equipment

B.1 Forestry mulching equipment

See Figure B.1.



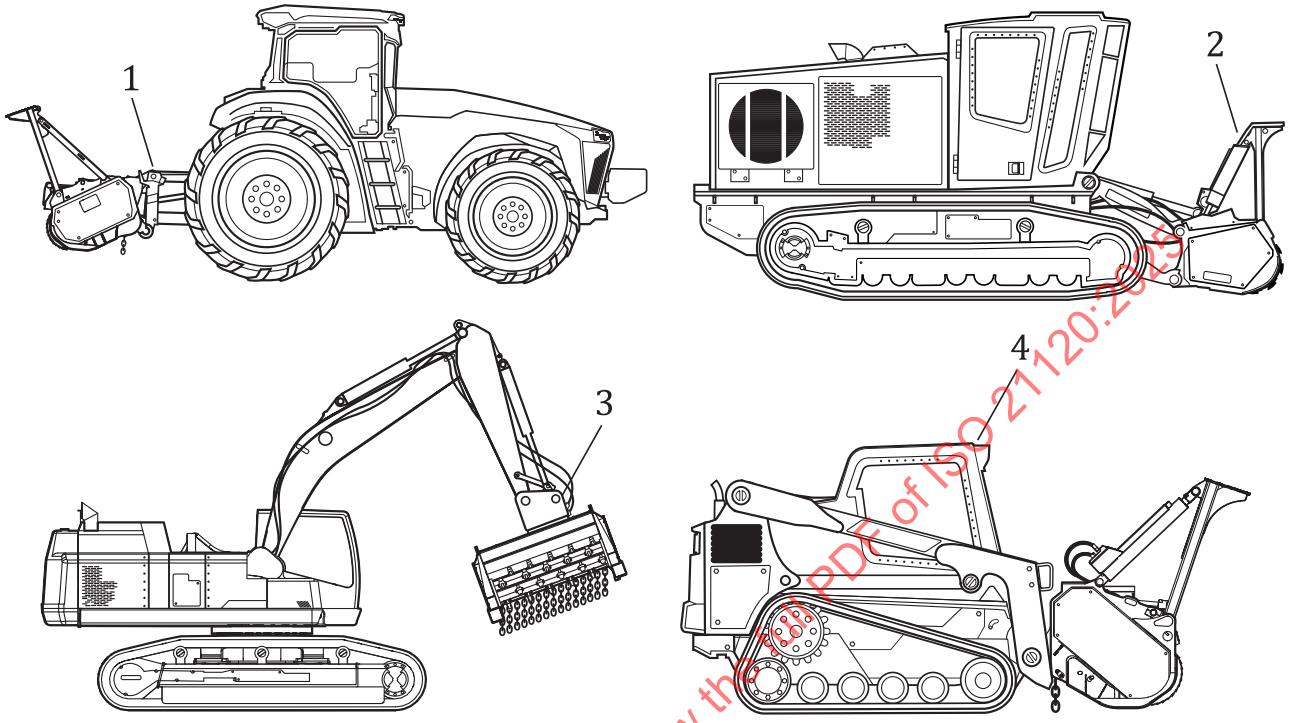
Key

1 mulching attachment carrier (3.1.1)
2 mulching attachment (3.1.2)

Figure B.1 — Nomenclature of forestry mulching equipment

B.2 Forestry mulching equipment mount types

See Figure B.2.



Key

1 limited reach (rear mounted shown) (3.4.4.1)
2 limited reach (front mounted shown) (3.4.4.1)
3 boom (3.4.4.2)
4 loader (3.4.4.3)

Figure B.2 — Nomenclature of forestry mulching equipment mount types