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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Earth-moving machinery — Tractors — Terminology and commercial specifications

Engins de terrassement — Tracteurs — Terminologie et spécifications commerciales

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6747 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*.

This second edition cancels and replaces the first edition (ISO 6747 : 1982); it includes three new definitions, and classification of tractors by type, with additional and more detailed figures.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Earth-moving machinery — Tractors — Terminology and commercial specifications

1 Scope

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

2 Field of application

This International Standard applies to tractors for earth-moving machinery as defined in ISO 6165.

3 References

ISO 3450, *Earth-moving machinery — Wheeled machines — Performance requirements and test procedures for braking systems.*

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

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

ISO 6165, *Earth-moving machinery — Basic types — Vocabulary.*

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

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

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

ISO 7464, *Earth-moving machinery — Method of test for the measurement of drawbar pull.*

ISO 9249, *Earth-moving machinery — Engine test code — Net power.*¹⁾

4 Definitions

4.1 tractor : Self-propelled crawler or wheeled machine used to exert a push or pull force through mounted equipment.

4.2 base machine : Tractor without equipment, as described by the manufacturer specifications. The machine should be provided with the necessary mountings to secure equipment as shown in clause 6.

4.3 equipment : Set of components mounted on the base machine to fulfil the primary design function.

4.4 attachment : Optional assembly of components that can be mounted on the base machine for a specific use.

4.5 component : Part or an assembly of parts of a base machine, equipment or an attachment.

5 Base machine

5.1 Types of tractors

5.1.1 Undercarriage

5.1.1.1 Crawler tractor (figure 1)

5.1.1.2 Wheel tractor (figure 2)

5.1.2 Engine location

5.1.2.1 Front engine (figure 3)

5.1.2.2 Rear engine (figure 4)

5.1.3 Steering system

5.1.3.1 Front-wheel steer (figure 5)

5.1.3.2 Rear-wheel steer (figure 6)

5.1.3.3 Articulated steering [figure 7a)]

5.1.3.4 Wheel skid steer [figure 7b)]

1) At present at the stage of draft.

5.1.3.5 Crawler skid steer (figure 8)

5.1.3.6 Crawler independent steer (figure 9)

5.1.4 Drive system

5.1.4.1 Rear-wheel drive (figure 10)

5.1.4.2 All-wheel drive (figure 11)

5.1.5 Operator's position (concerns articulated machines)

5.1.5.1 Operator front (figure 12)

5.1.5.2 Operator rear (figure 13)

Undercarriage (see 5.1.1)

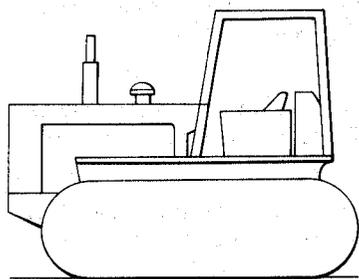


Figure 1 — Crawler tractor

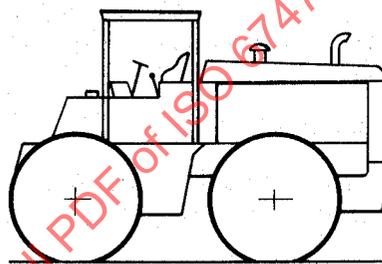


Figure 2 — Wheel tractor

Engine location (see 5.1.2)

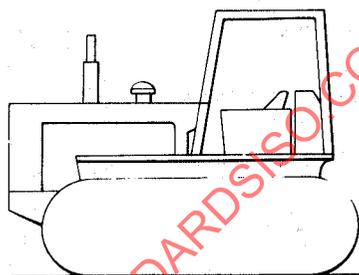


Figure 3 — Front engine

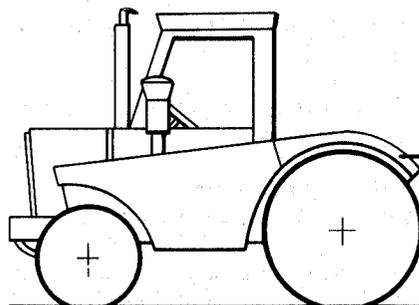


Figure 4 — Rear engine

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Steering system (see 5.1.3)

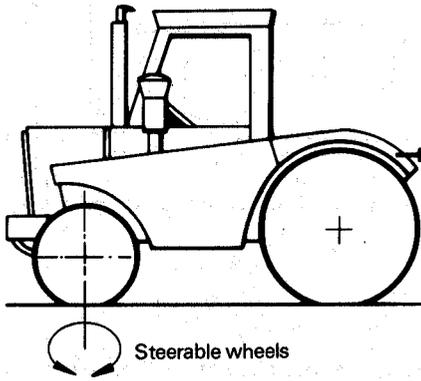


Figure 5 — Front-wheel steer

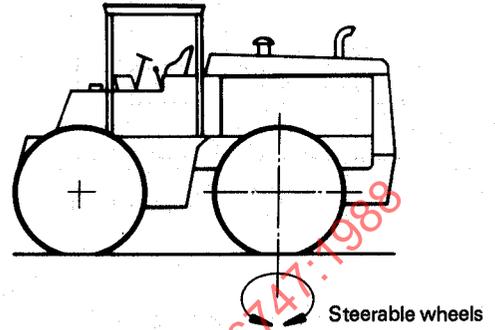


Figure 6 — Rear-wheel steer

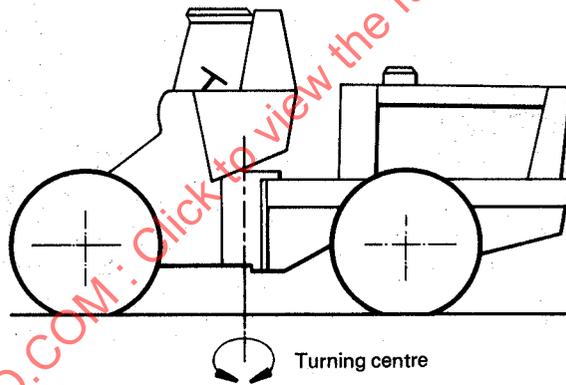


Figure 7a) — Articulated steer

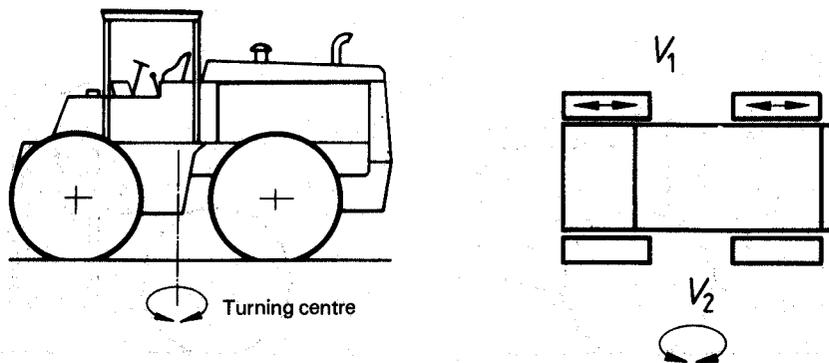


Figure 7b) — Wheel-skid steer ($V_2 = 0$)

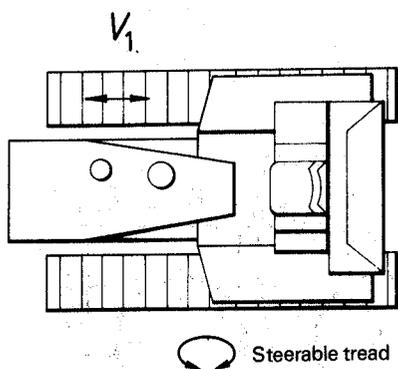


Figure 8 — Crawler skid steer

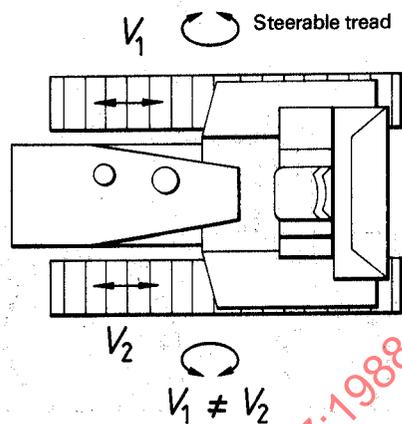


Figure 9 — Crawler independent steer ($V_1 \neq V_2$)

Drive system (see 5.1.4)

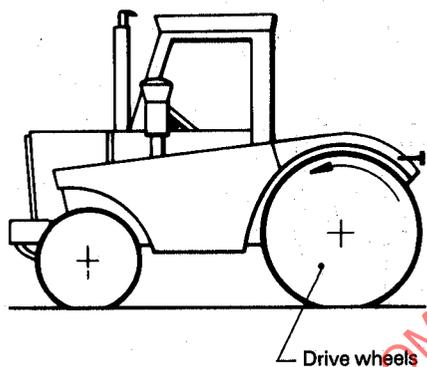


Figure 10 — Rear-wheel drive

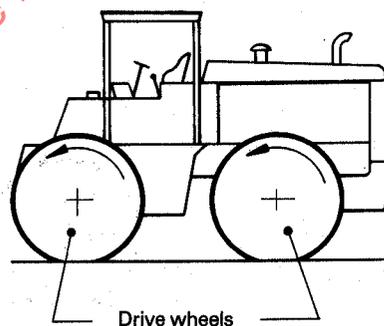


Figure 11 — All-wheel drive

Operator position (see 5.1.5)

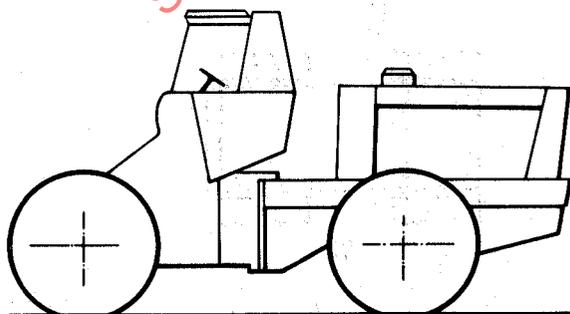


Figure 12 — Operator front

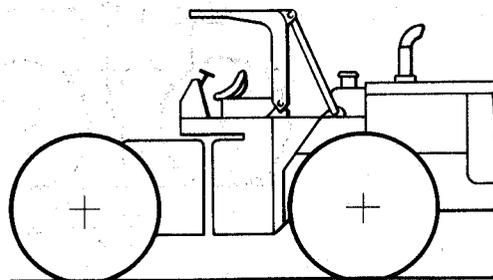


Figure 13 — Operator rear

5.2 Dimensions (see figures 14 and 15)

For definitions of dimensions, see ISO 6746-1.

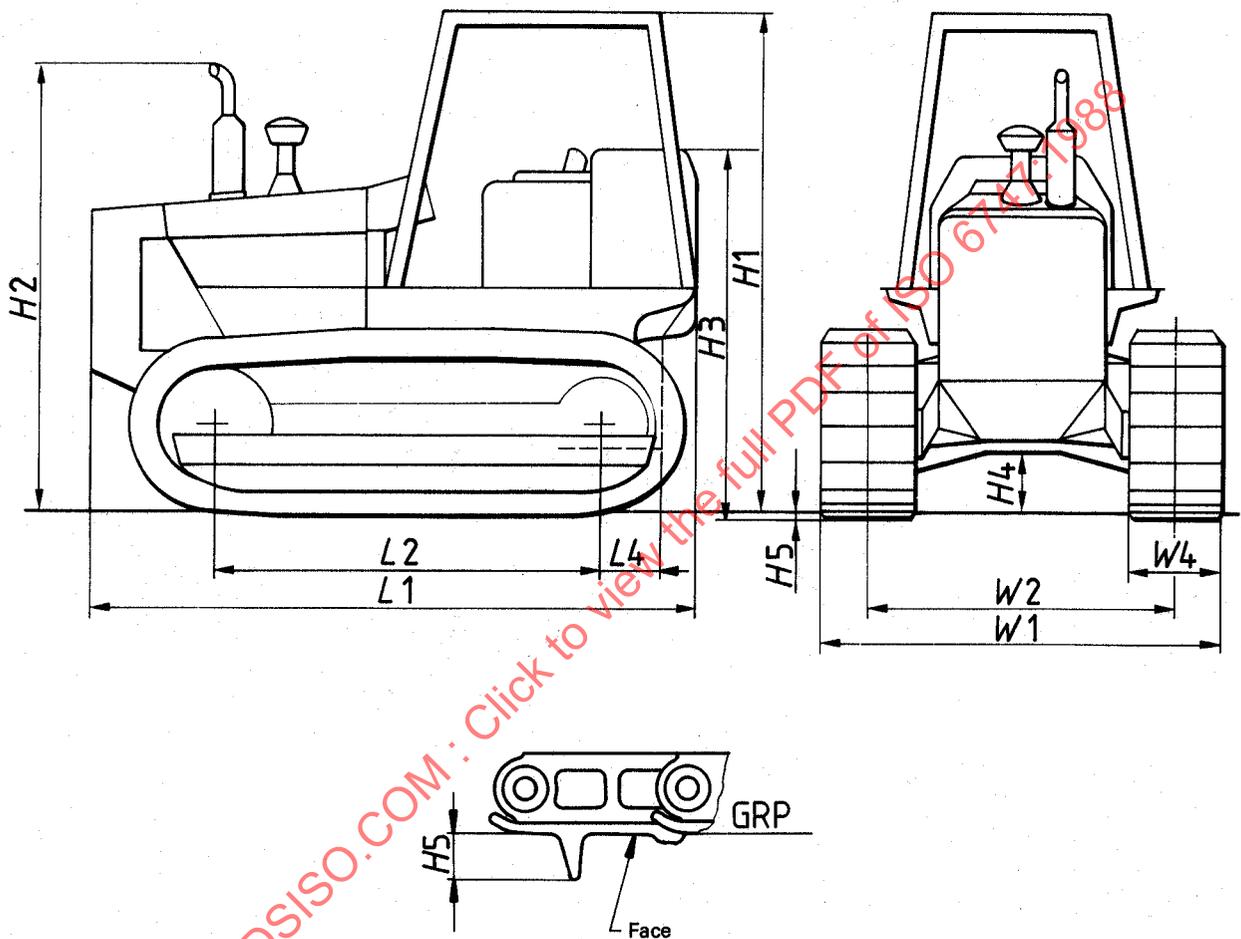


Figure 14 — Dimensions of base machine (crawler tractor)

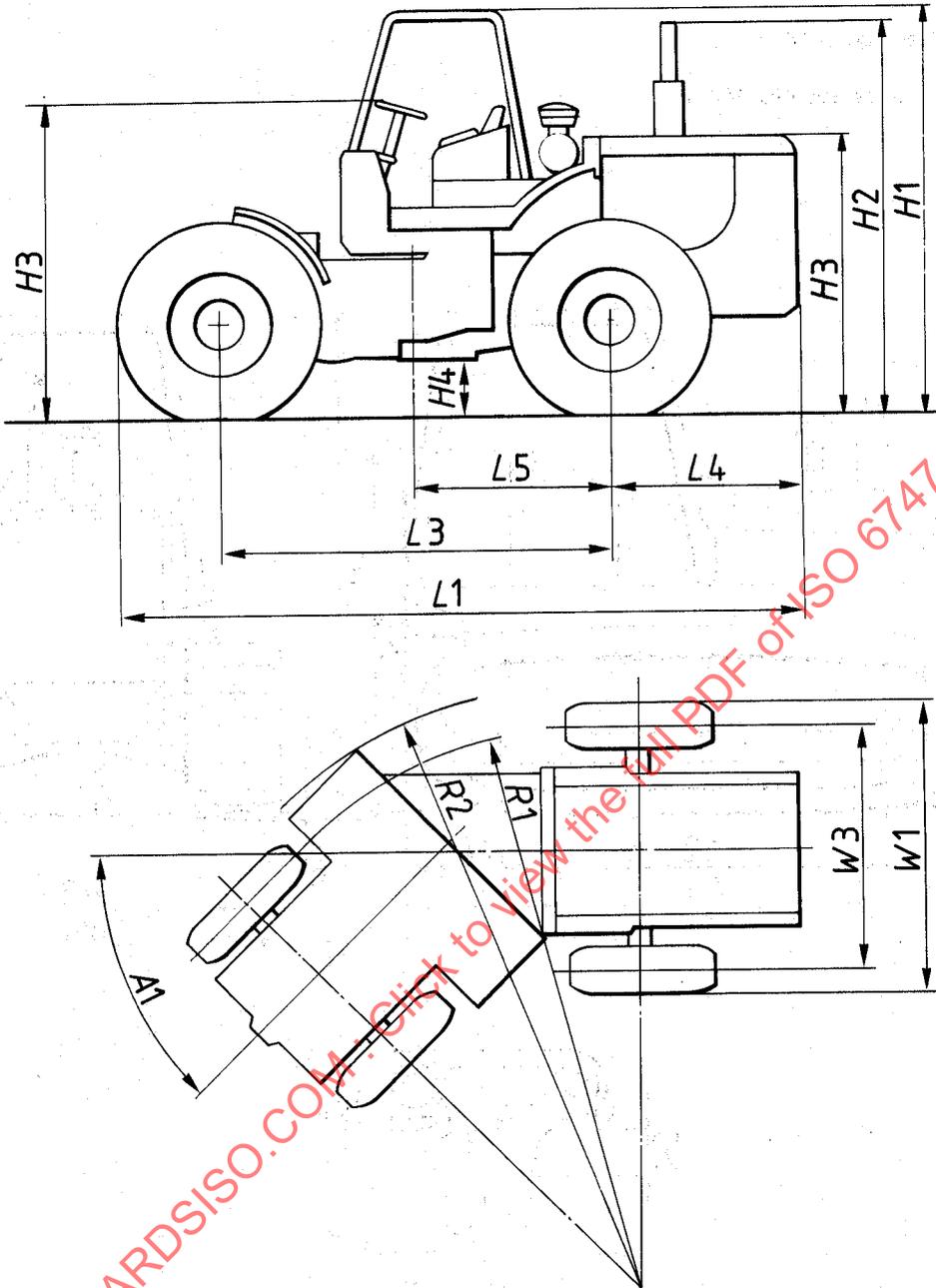


Figure 15 — Dimensions of base machine (wheel tractor)

5.3 Masses

5.3.1 operating mass : Mass of the base machine with equipment as specified by the manufacturer, operator (75 kg), full fuel tank and full lubricating, hydraulic and cooling systems.

5.3.2 shipping mass : Mass of the base machine without operator, with full lubricating, hydraulic and cooling systems, 10 % of fuel tank capacity and with or without equipment, cab, canopy, ROPS¹⁾ or FOPS²⁾, as specified by the manufacturer.

5.3.3 cab, canopy, ROPS or FOPS mass : Mass of cab, canopy, ROPS or FOPS with all their components and mountings required to secure these to the base machine.

1) ROPS : Roll-over protective structure.
2) FOPS : Falling object protective structure.

6 Equipment

6.1 Definitions

6.1.1 dozer : Front blade, its relevant frame, and controls for positioning the blade (see figures 16 and 17). For dimensions, see figures 23 and 24. The "X", "Y" and "Z" planes are defined in ISO 6746-1 and ISO 6746-2.

6.1.1.1 straight dozer : Dozer where the blade is maintained in a position where the cutting edge is parallel to an "X" plane.

6.1.1.2 angle dozer : Dozer where the blade position may be changed so that the cutting edge is at an angle to an "X" plane.

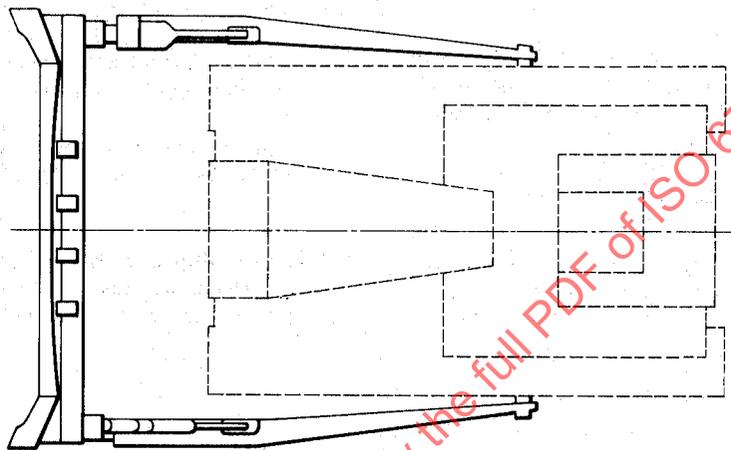


Figure 16 – Crawler tractor with straight dozer

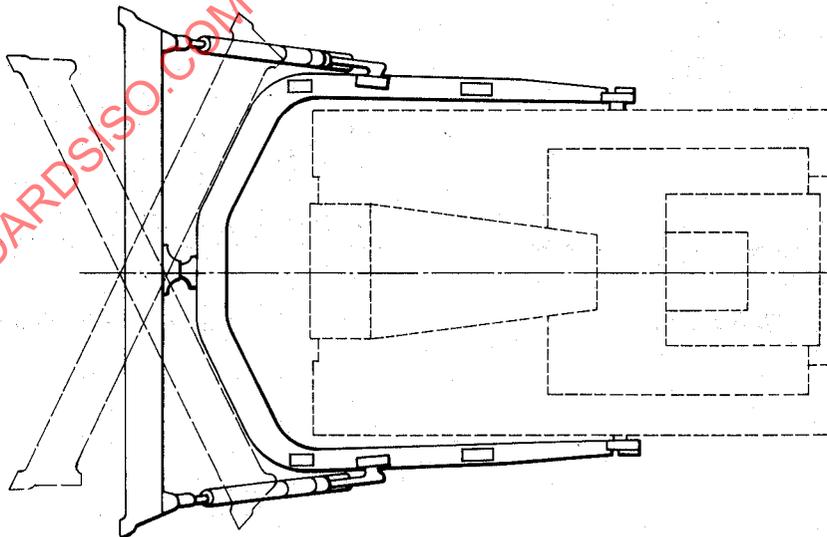


Figure 17 – Crawler tractor with angle dozer

6.1.1.3 The blade of either type of equipment referred to in 6.1.1.1 and 6.1.1.2 can have :

- tilt movement (see figure 18), where the blade position may be changed so that the cutting edge is at an angle to a "Z" plane;
- pitch movement (see figure 19), a blade movement in which the upper portion of the blade may be changed in angle by pivoting it around a line parallel to the cutting edge.

Blade operation is by hydraulic control, where the operation is performed by means of a hydraulic system.

6.1.2 **ripper** : Frame connected to the rear part of the base machine by means of a mounting bracket (see figures 20, 21 and 22). It is equipped with one tooth or more. For dimensions, see figure 25.

There are three types of rippers, as follows.

6.1.2.1 **radial type** : Ripping angle of the tooth tip to the ground varies according to change of the working depth (see figure 20).

6.1.2.2 **parallelogram type** : Ripping angle of the tooth tip to the ground remains constant regardless of variations in working depth (see figure 21).

6.1.2.3 **variable type** : Ripping angle of the tooth tip to the ground is variable and can be changed by the operator (see figure 22).

6.1.3 **winch** : Frame equipped with a drum and connected to the rear of the base machine. For dimensions, see figure 26.

As regards winch operation, there are two types, as follows :

- manually controlled, when the operation is performed by manually controlled clutch and brake;
- power-controlled, when the operation is performed hydraulically or by a power clutch and brake.

6.1.4 **swinging drawbar** : Frame, equipped with a swing selector bar and a drawbar, connected to the rear of the base machine. For dimensions, see figure 27.

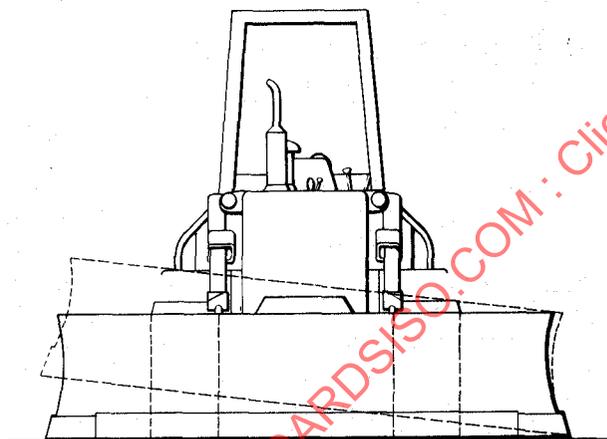


Figure 18 — Tilt movement

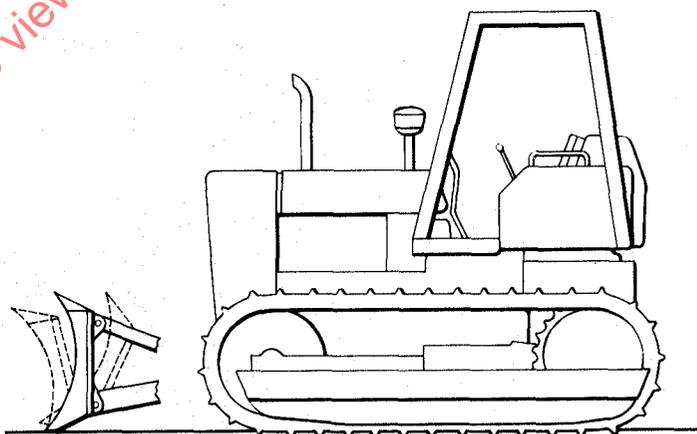


Figure 19 — Pitch movement

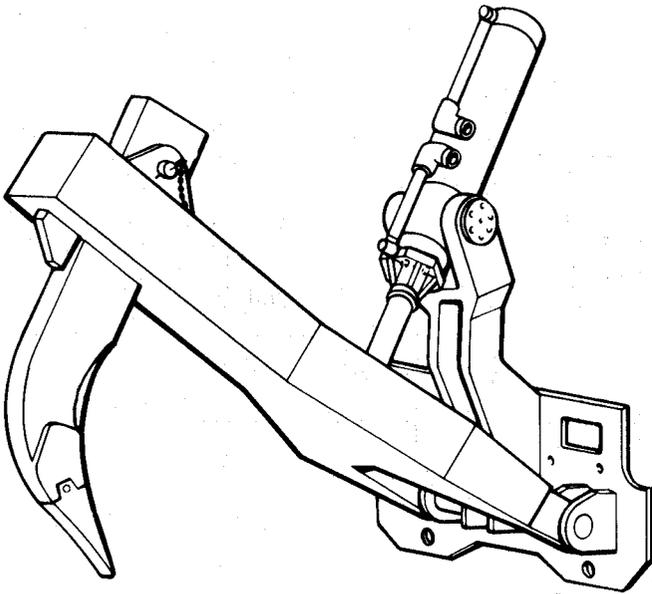


Figure 20 — Ripper — Radial type

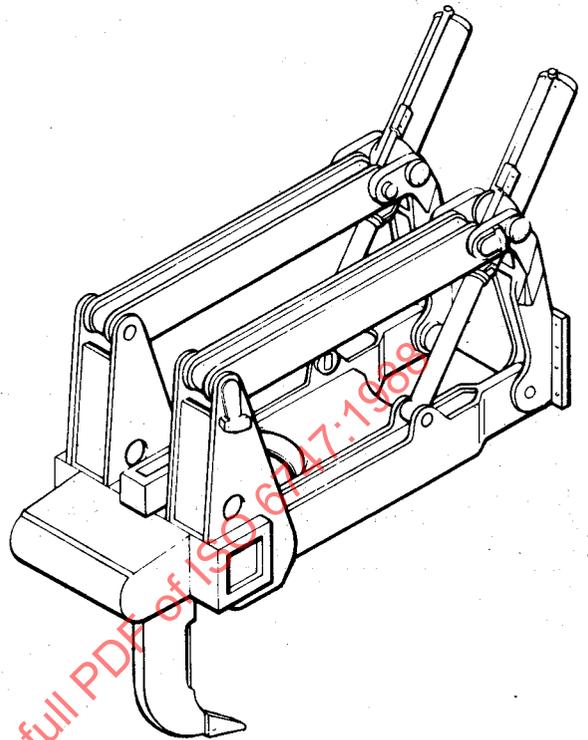


Figure 21 — Ripper — Parallelogram type

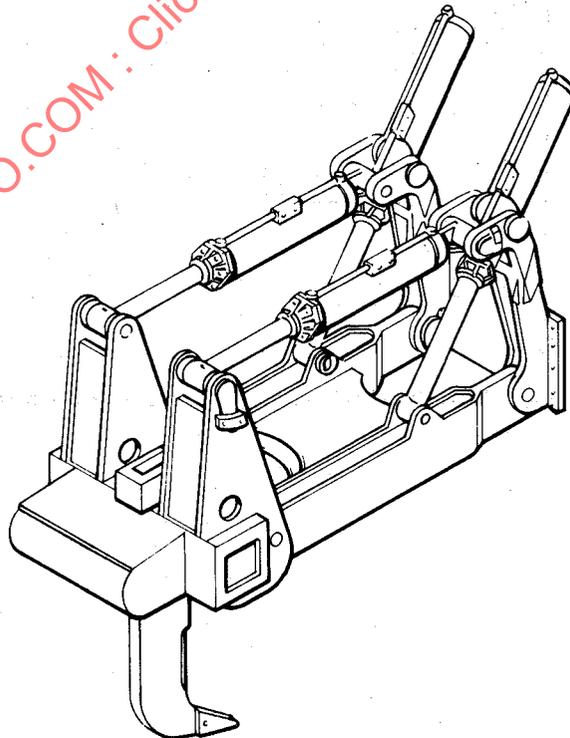


Figure 22 — Ripper — Variable type

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6.2 Dimensions

For definitions of dimensions, see ISO 6746-2.

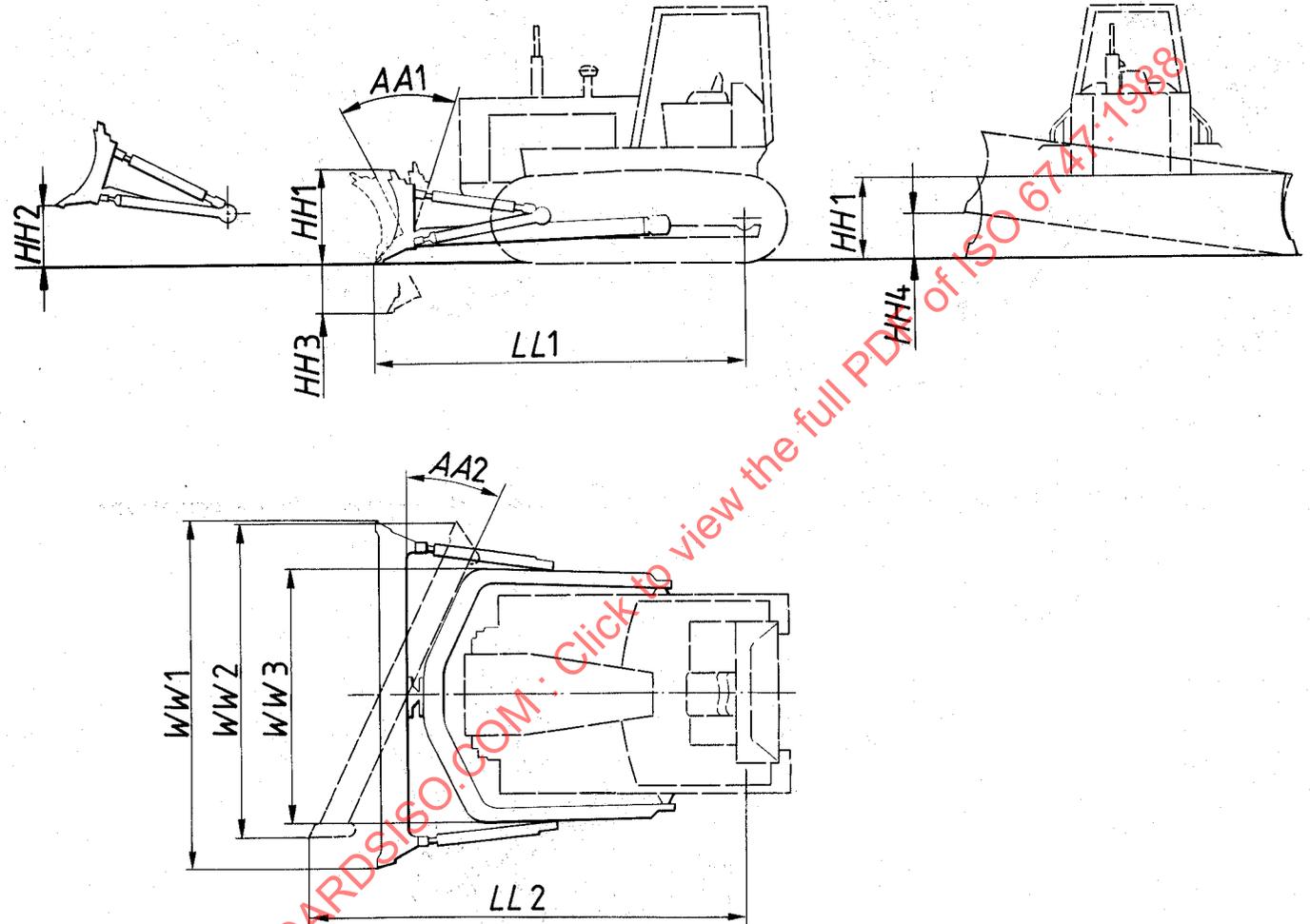


Figure 23 – Dimensions of dozer (crawler tractor)

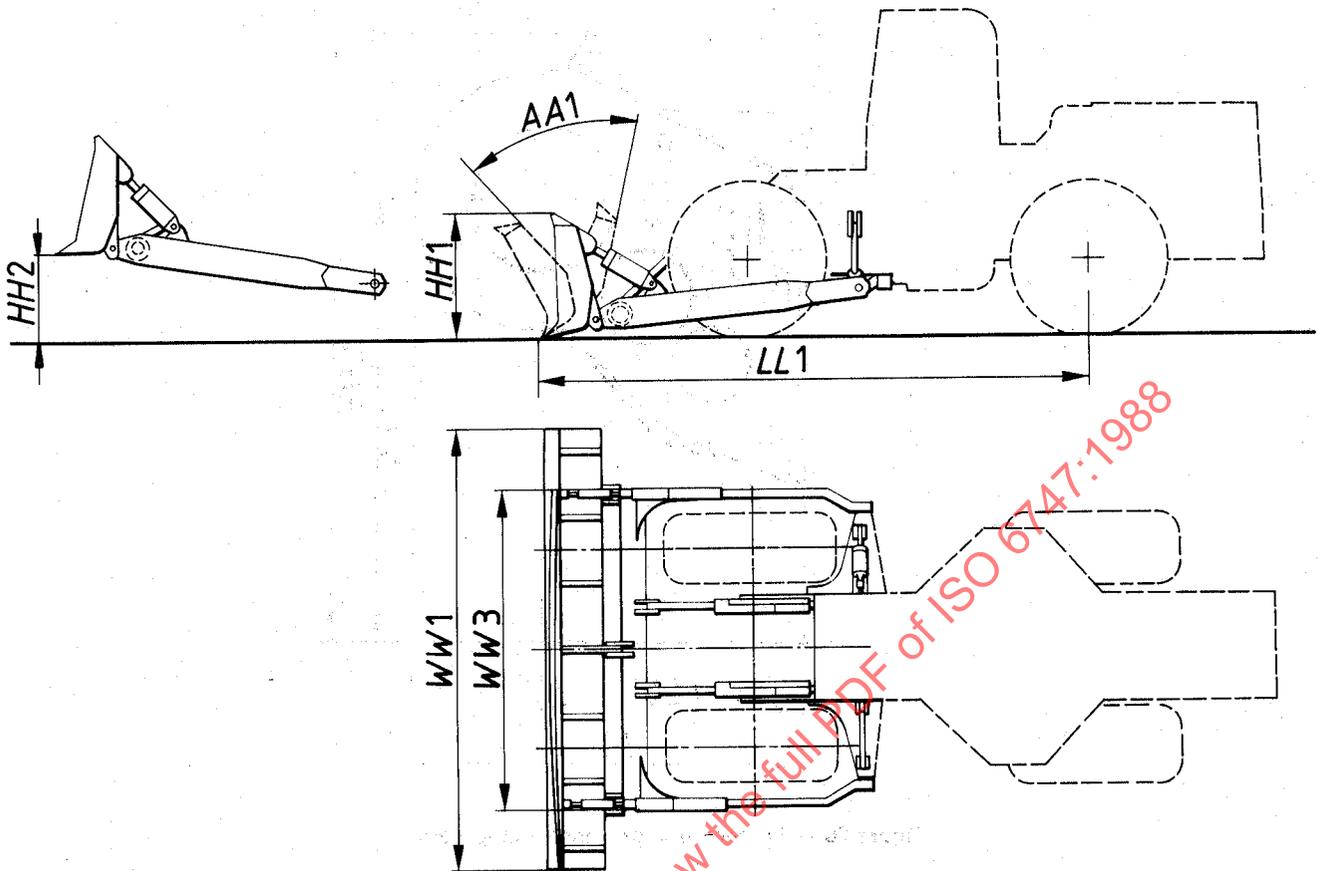


Figure 24 — Dimensions of dozer (wheel tractor)

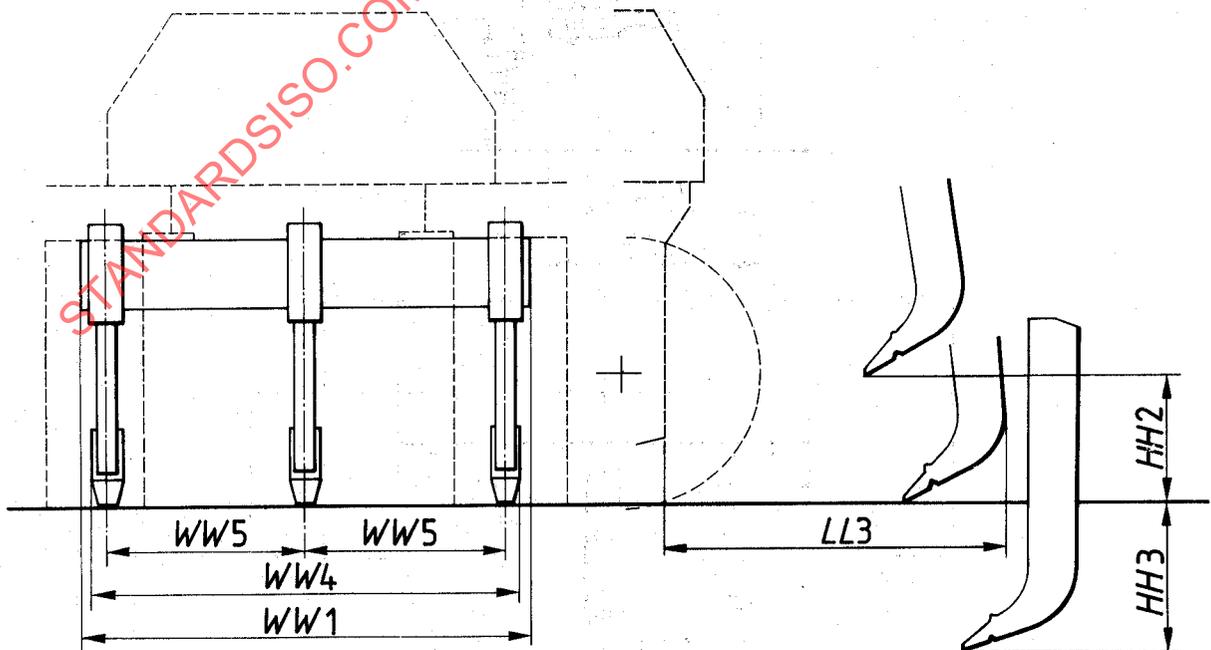


Figure 25 — Dimensions of ripper

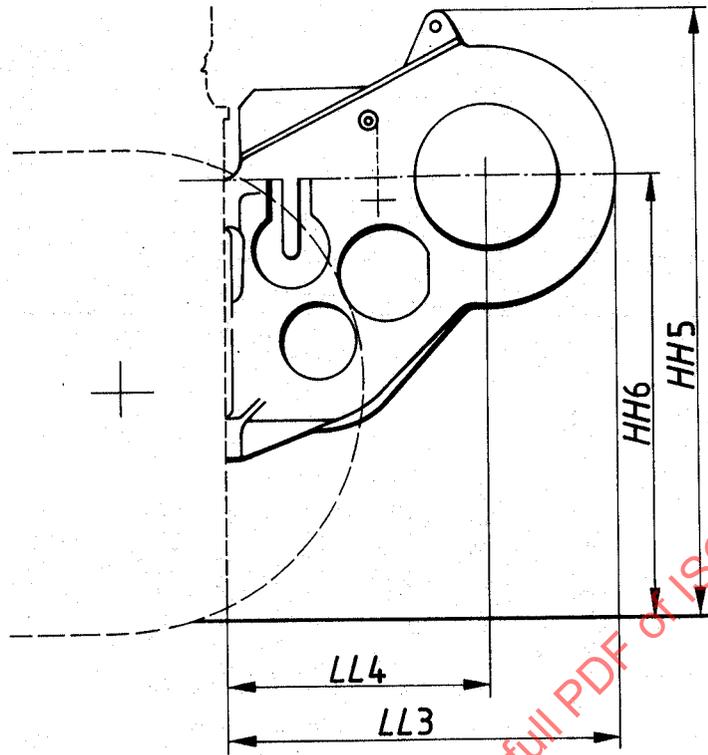


Figure 26 — Dimensions of winch equipment

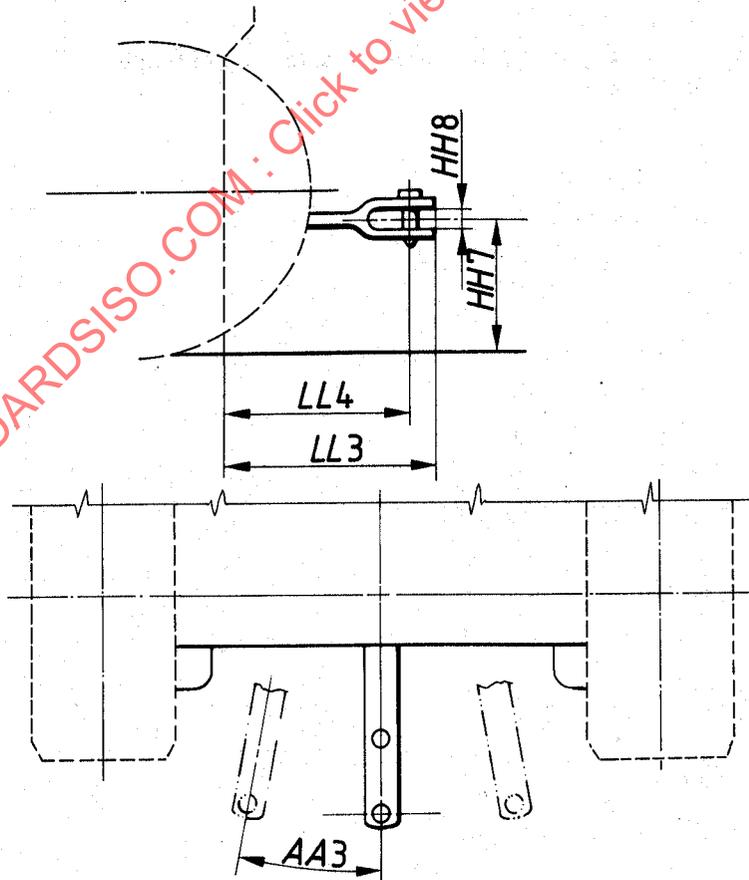


Figure 27 — Dimensions of swinging drawbar

6.3 Nomenclature (see diagram numbers)

6.3.1 Dozer (see 6.1.1)

- 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 and/or name-plate
- 23 Plough bolts

Definitions

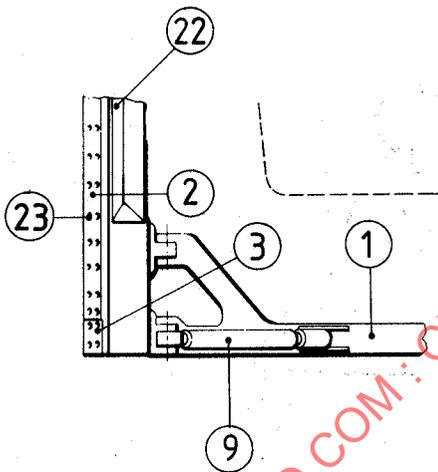
The following definitions are presented for a better understanding of terms included in dozer nomenclature.

jack : Mechanically adjustable member for pitching or tilting blade.

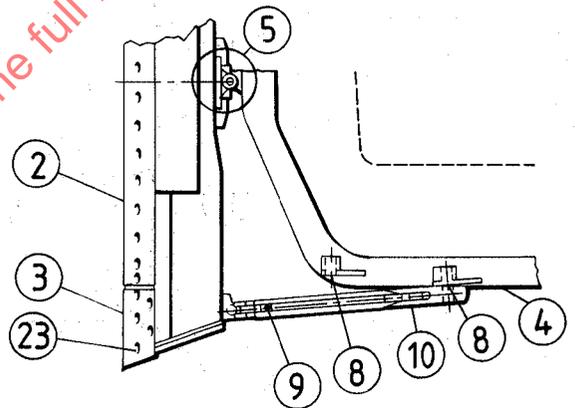
strut : Member which is fixed in length after assembly.

lift frame : Basic structure for mounting cylinders.

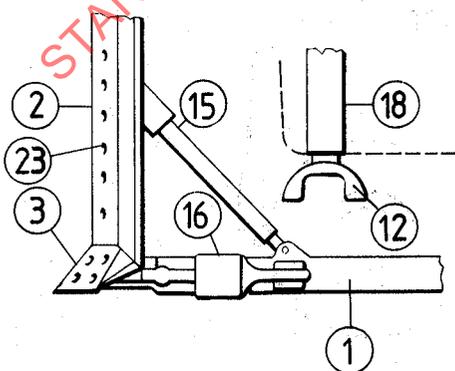
cylinder : Hydraulically adjustable member for pitching, raising, lowering or tilting a blade.



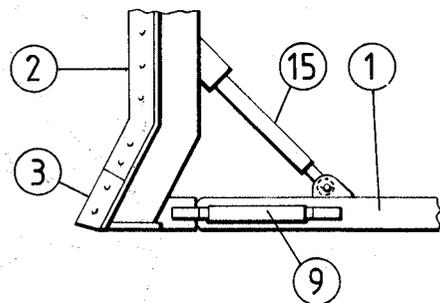
a) Straight blade



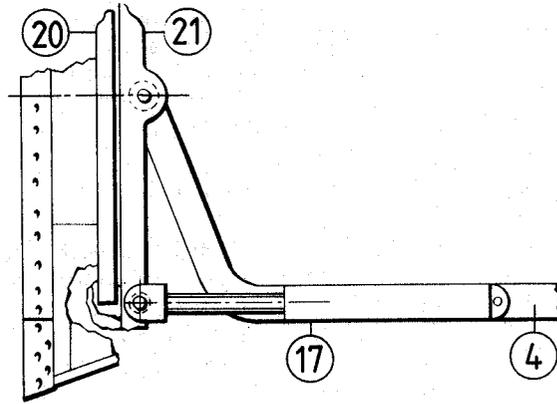
b) Angle blade



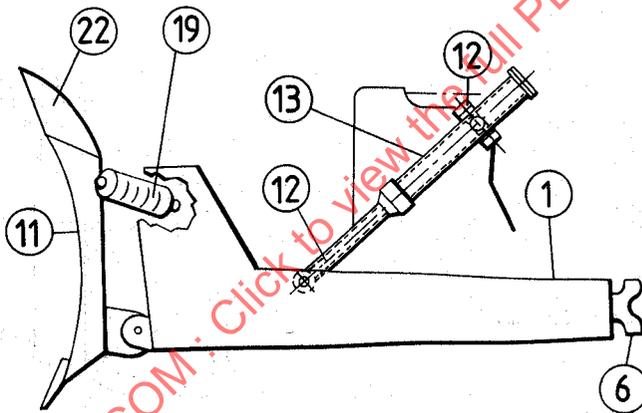
c) Semi-U-blade



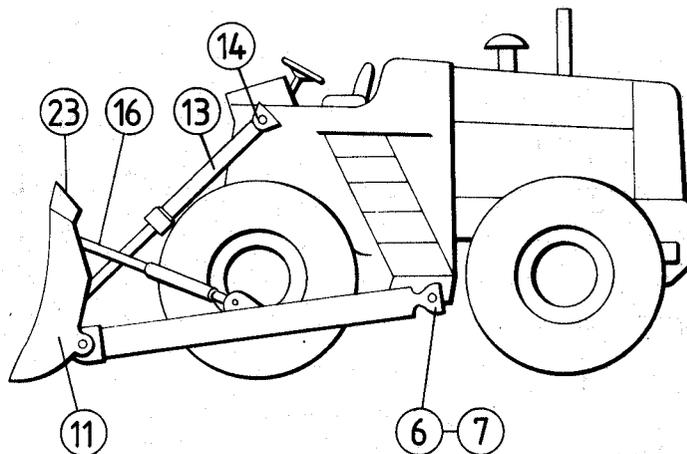
d) U-blade



e) Power (angle and tilt) blade



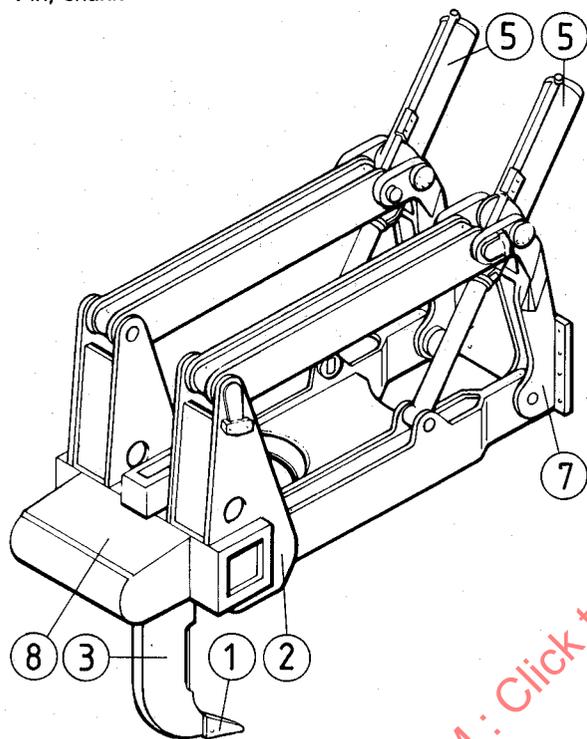
f) Cushion blade



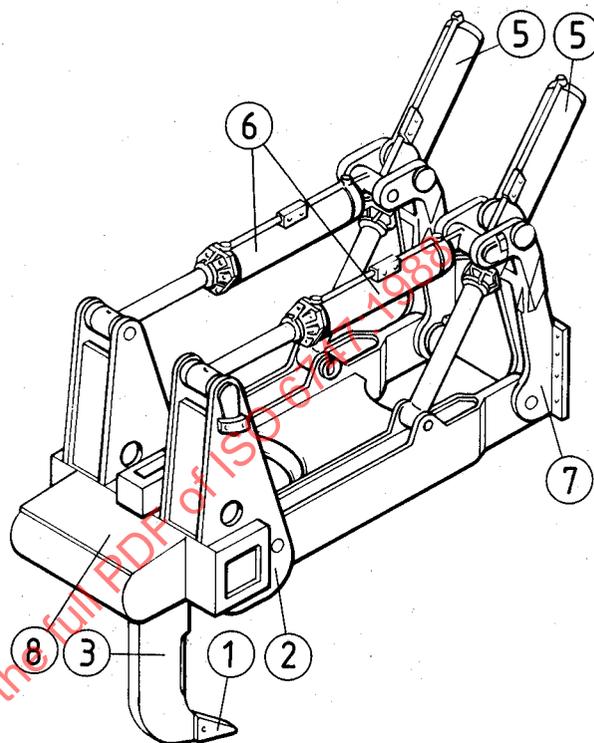
g) Dozer attachment

6.3.2 Ripper (see 6.1.2)

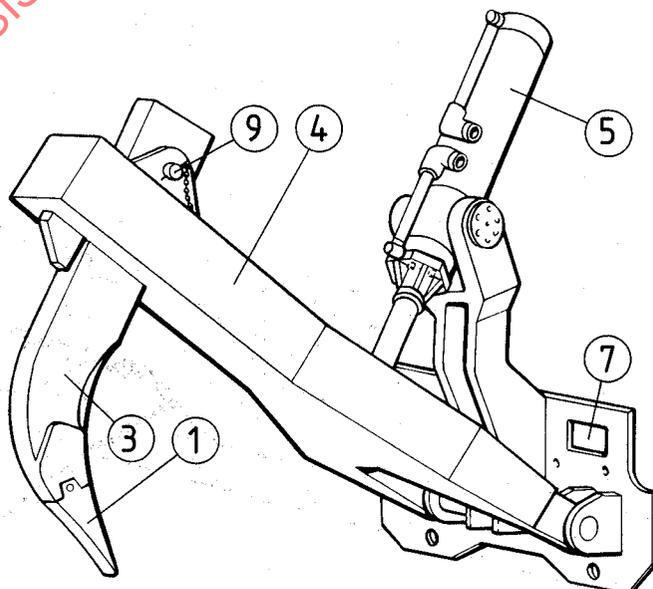
- 1 Point
- 2 Clevis
- 3 Shank
- 4 Bar, tool
- 5 Cylinder, lift
- 6 Cylinder, shank tilt
- 7 Bracket, mounting
- 8 Block, push
- 9 Pin, shank



a) Parallelogram



b) Variable



c) Radial

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