International Standard 7134

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Earth-moving machinery — Graders — Terminology and commercial specifications

Engins de terrassement — Niveleuses — Terminologie et spécifications commerciales

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Descriptors : earth moving equipment, excavating equipment, graders, vocabulary.

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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 7134 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*.

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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Contents

Earth-moving machinery — Graders — Terminology and commercial specifications

1 Scope

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

2 Field of application

This International Standard applies to graders as defined in clause 4.

3 References

ISO 1585, *Road vehicles — Engine test code — Net power.*

ISO 3450, *Off-highway earth-moving machinery — Minimum performance criteria for brake systems.*

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

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

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

ISO 6746, *Earth-moving machinery — Definitions of dimensions and symbols —*

Part 1 : Base machine.

Part 2 : Equipment.

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

4 General definitions

4.1 grader : A self-propelled wheeled machine having an adjustable blade, positioned between front and rear axles, which cuts, moves and spreads materials usually to grade requirements. (See ISO 6165.)

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

4.3 equipment: A set of components mounted onto the base machine to fulfil the primary design function.

4.4 attachment: An optional assembly of components that can be mounted onto the base machine for a specific use.

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

5 Base machine

5.1 Types of graders

5.1.1 Undercarriage — Number of wheels

5.1.1.1 Four wheel (figure 1)

5.1.1.2 Six wheel (figure 2)

5.1.2 Number of engines

5.1.2.1 One engine (figure 3)

5.1.2.2 Two engine (figure 4)

5.1.3 Engine location

5.1.3.1 Front engine (figure 5)

5.1.3.2 Rear engine (figure 6)

5.1.4 Steering system

5.1.4.1 Front wheel steer (figure 7)

5.1.4.2 Front wheel and rear wheel steer (figure 8)

5.1.4.3 Front wheel and rear bogie steer (figure 9)

5.1.4.4 Front wheel and articulated frame steer (figure 10)

5.1.4.5 Double articulated frame steer (figure 11)

5.1.5 Drive system

5.1.5.1 Two wheel drive (figure 12)

5.1.5.2 Four wheel drive (figure 13)

5.1.5.3 Six wheel drive (figure 14)

Undercarriage — Number of wheels (see 5.1.1)

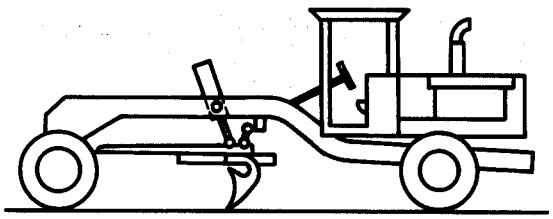


Figure 1 — Four wheel grader

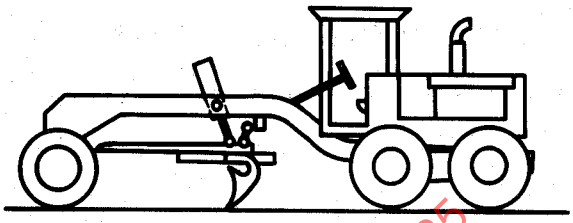


Figure 2 — Six wheel grader

Number of engines (see 5.1.2)

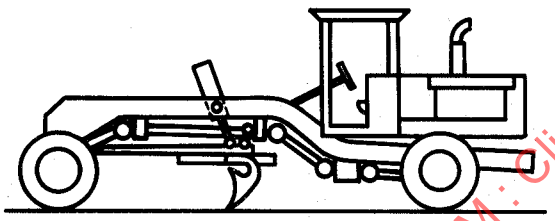


Figure 3 — One engine grader

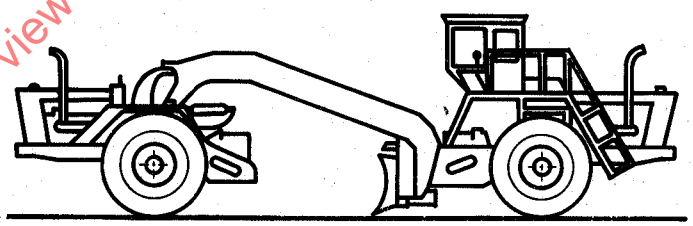


Figure 4 — Two engine grader

Engine location (see 5.1.3)

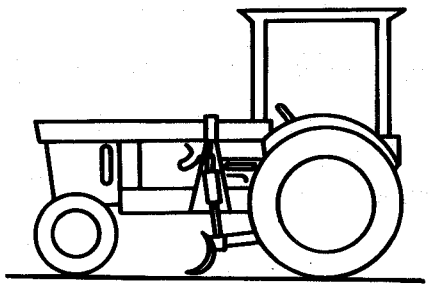


Figure 5 — Front engine grader

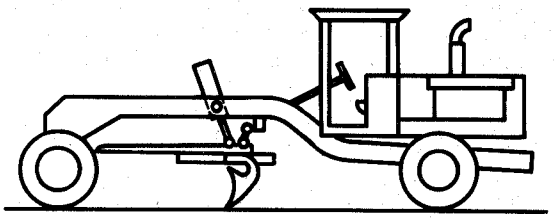


Figure 6 — Rear engine grader

Steering system (see 5.1.4)

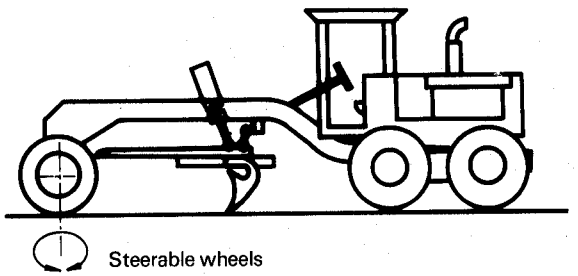


Figure 7 — Front wheel steer grader

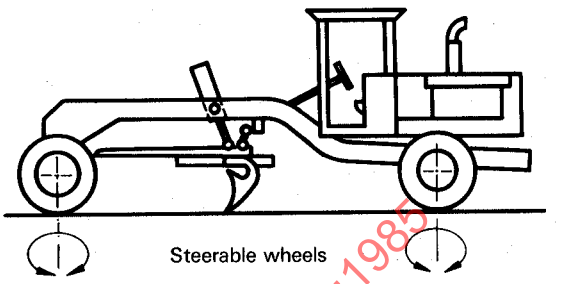


Figure 8 — Front wheel and rear wheel steer grader

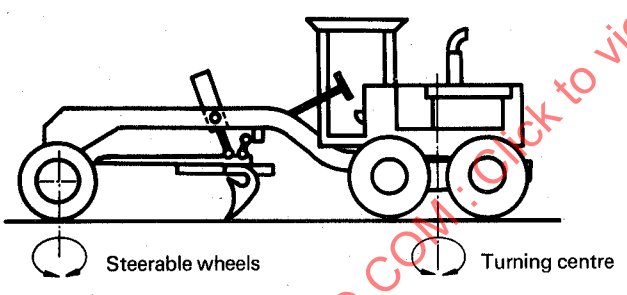


Figure 9 — Front wheel and rear bogie steer grader

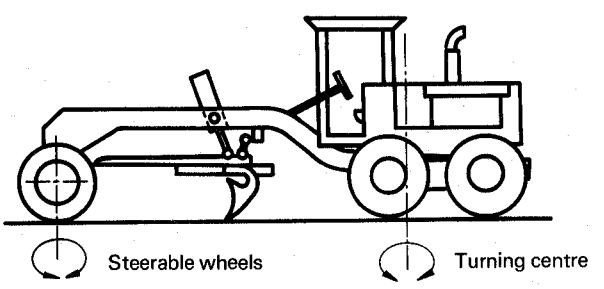


Figure 10 — Front wheel and articulated frame steer grader

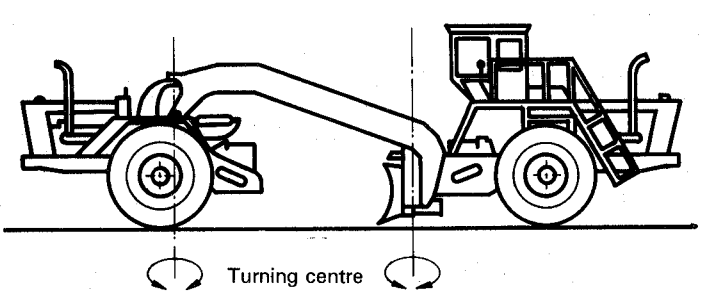


Figure 11 — Double articulated frame steer grader

Drive system (see 5.1.5)

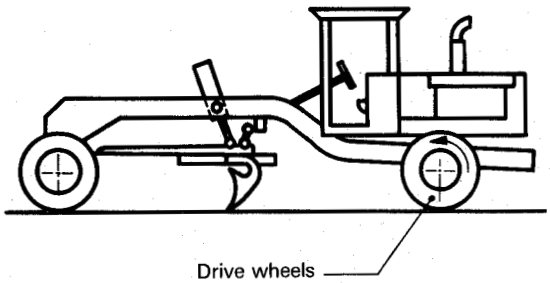


Figure 12 — Two wheel drive grader

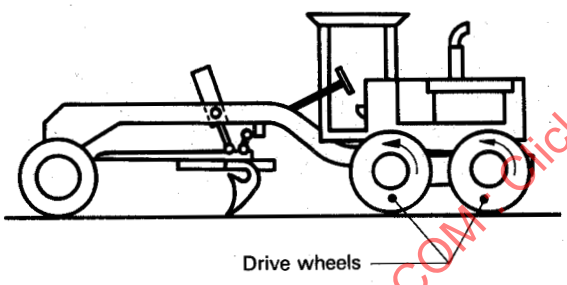


Figure 13a) — Four wheel drive grader

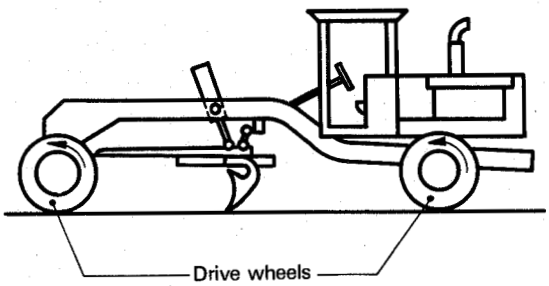


Figure 13b) — Four wheel drive grader

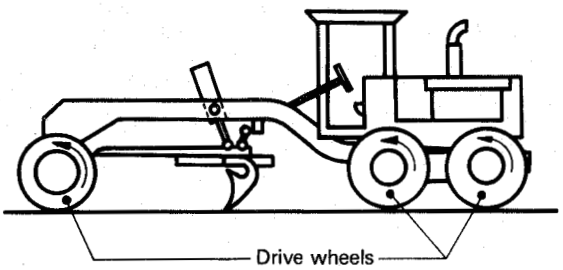
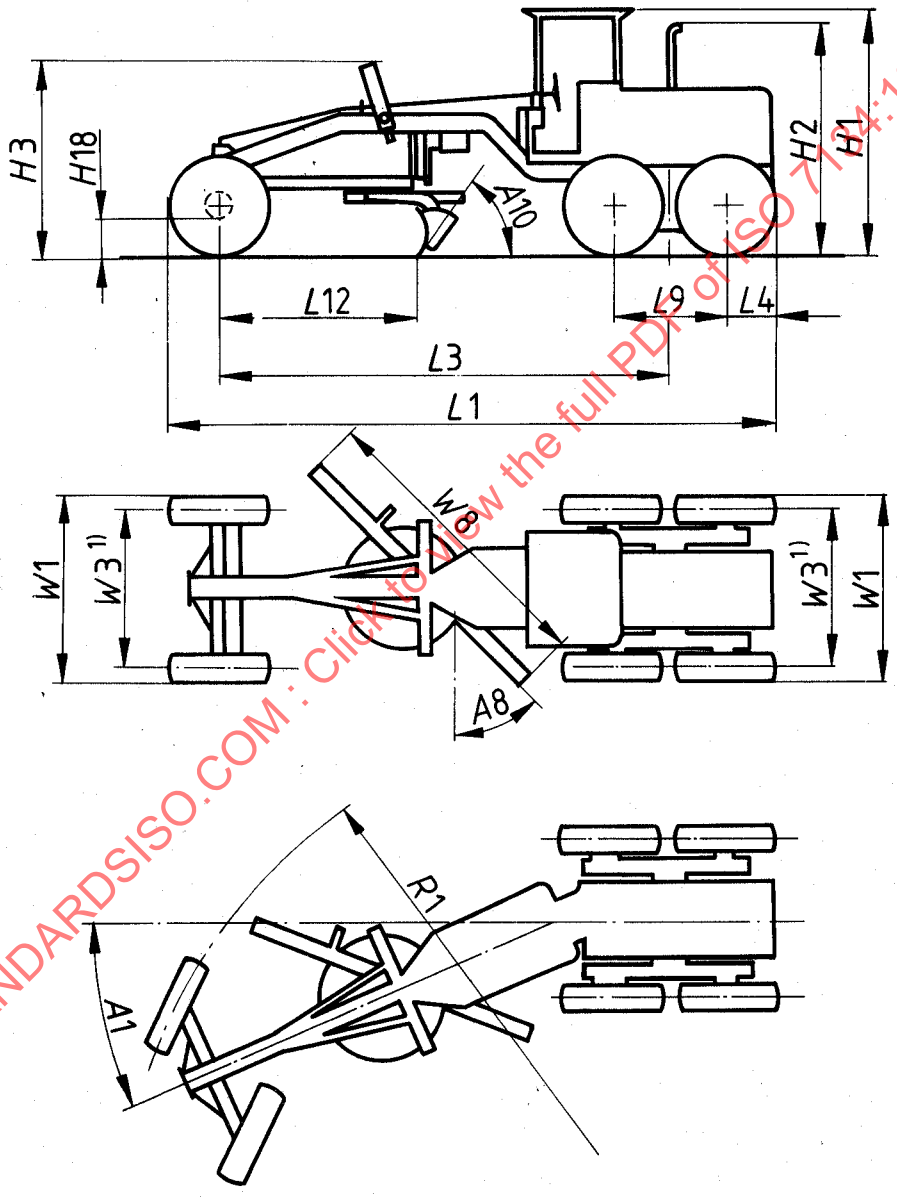


Figure 14 — Six wheel drive grader

5.2 Dimensions (see figure 15)

For definitions of dimensions, see ISO 6746/1.

For definitions of dimensions strictly related to graders, and dimensions *H*18, *H*19, *W*9, *W*14, *W*15, *A*9, *A*11, *A*12, see annex A.



1) Wheel tread (*W*3) can be different for front and rear tyres.

Figure 15 — Dimensions of base machine (grader)

5.3 Masses

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

5.3.2 shipping mass : The mass of the base machine without operator, with full lubricating, hydraulic and cooling system, 10 % of fuel tank capacity and with or without equipment, cab, canopy, ROPS[1] or FOPS[2], as stated by the manufacturer.

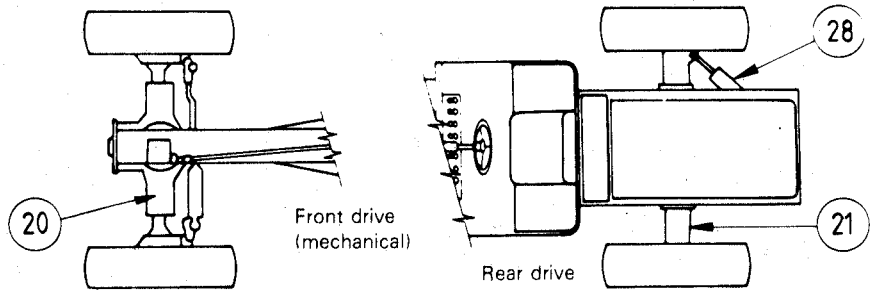
5.3.3 cab, canopy, ROPS or FOPS mass (if optional attachment) : The mass of cab, canopy, ROPS or FOPS with all their components and mountings required to secure these to the base machine.

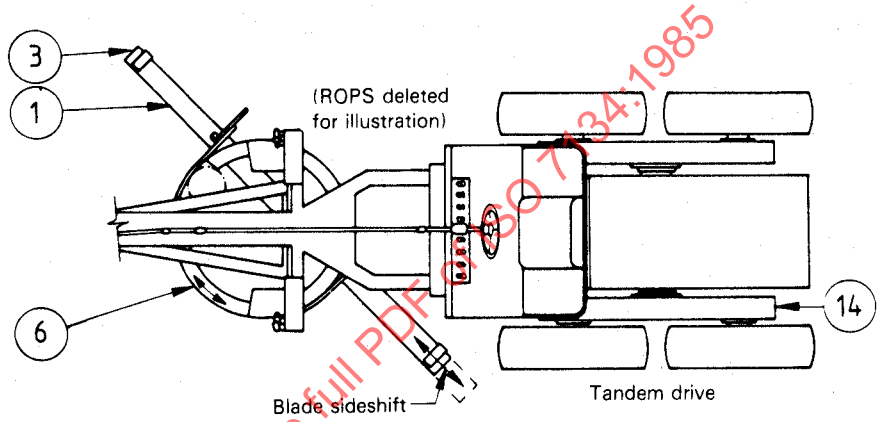
5.4 Component nomenclature (see diagram numbers)

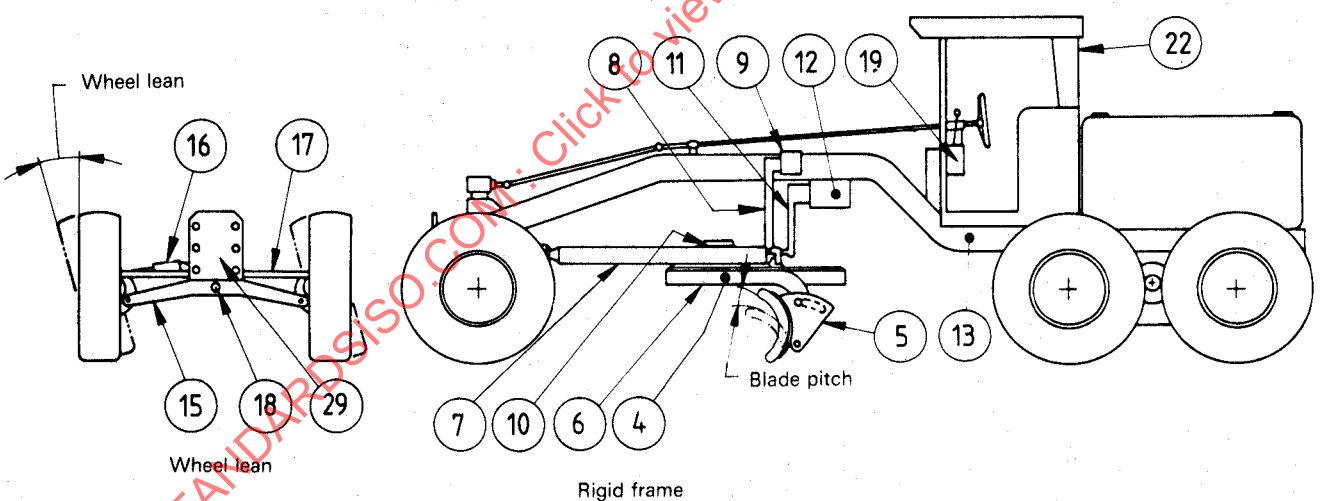
1 Blade
2 Cutting edge
3 Bit, end
4 Arm, blade
5 Bracket, blade pitch
5A Cylinder, blade pitch
6 Circle
7 Drawbar
8 Link, blade lift
8A Cylinder, blade lift
9 Lift, blade
10 Drive, circle
11 Link, circle sideshift
11A Cylinder, circle sideshift
12 Circle sideshift
13 Frame, main
14 Drive, tandem
15 Axle, front
16 Cylinder, wheel lean
17 Tie bar, wheel lean
18 Pin, axle pivot
19 Control, power
20 Drive, front, mechanical
20A Drive, front (hydraulic)
21 Drive, rear
22 Canopy, ROPS
23 Cab, ROPS
24 Frame, engine
25 Lock, lift arm
26 Arm, lift
27 Cylinder, blade sideshift
28 Cylinder, rear steer
29 Plate, attachment

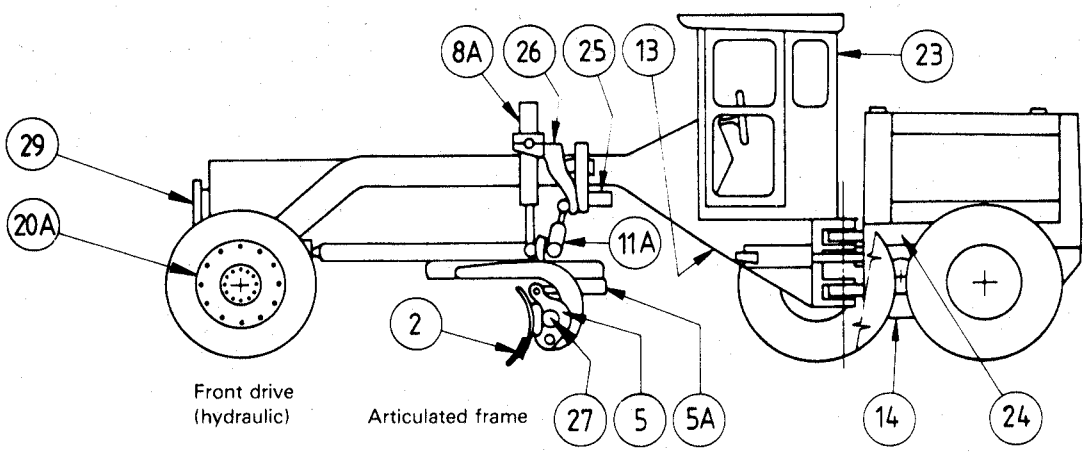
1) ROPS — Roll-over protective structure.

2) FOPS — Falling object protective structure.









6 Attachments

6.1 Definitions

6.1.1 scarifier : A mechanism having teeth for penetrating and loosening to shallow depths such materials as earth, asphaltic and gravel roads, and similar surfaces. The scarifier may be located on the grader ahead of the front wheels or between front and rear wheels (see figure 16).

6.1.2 ripper: An attachment which consists of a frame connected to the rear part of the base machine by means of a mounting bracket. It is equipped with one or more teeth (see figure 17).

6.1.3 snowplough : A structure located ahead of the front wheels, designed to move snow laterally by the ploughing action of a mould-board. The plough may be either one-way or V configuration (see figure 18).

6.1.4 front blade : A blade usually curved as a mould-board located ahead of the front wheels, designed to scrape and push earth and similar materials generally forward (see figure 19).

6.2 Dimensions

6.2.1 For definitions of dimensions, see ISO 6746/2.

6.2.2 For definitions of dimensions strictly relating to grader attachments, see annex B.

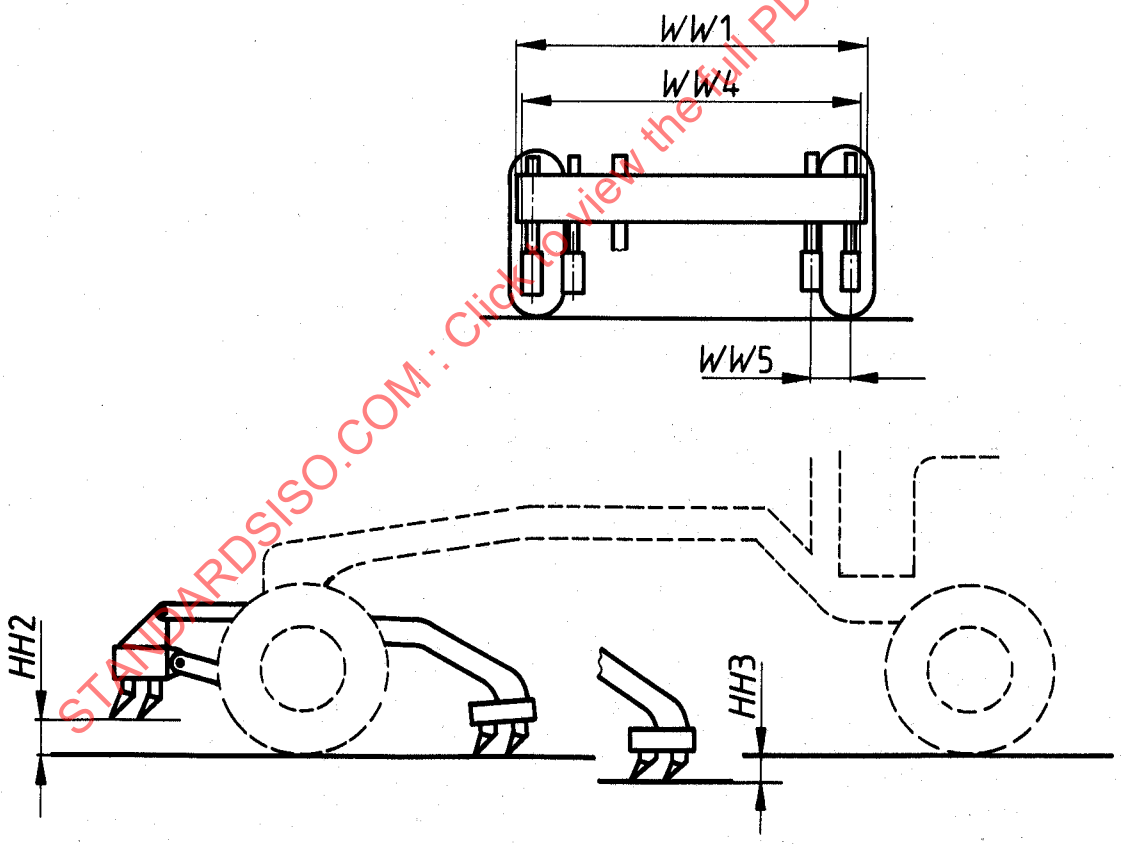


Figure 16 — Dimensions of scarifier

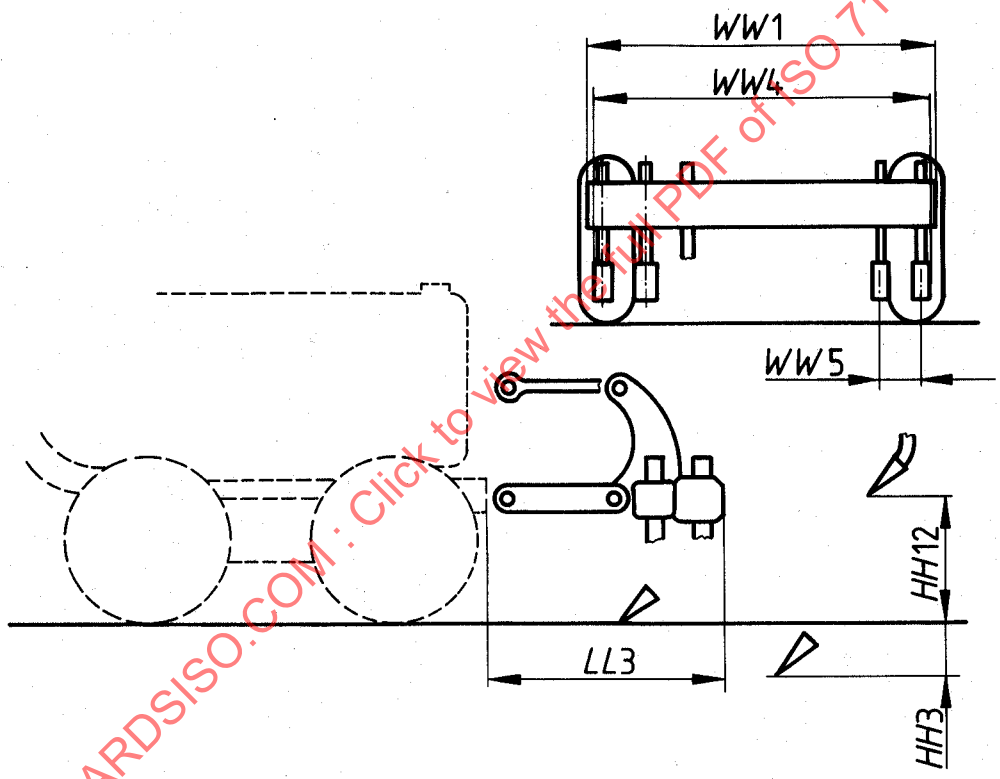


Figure 17 — Dimensions of ripper

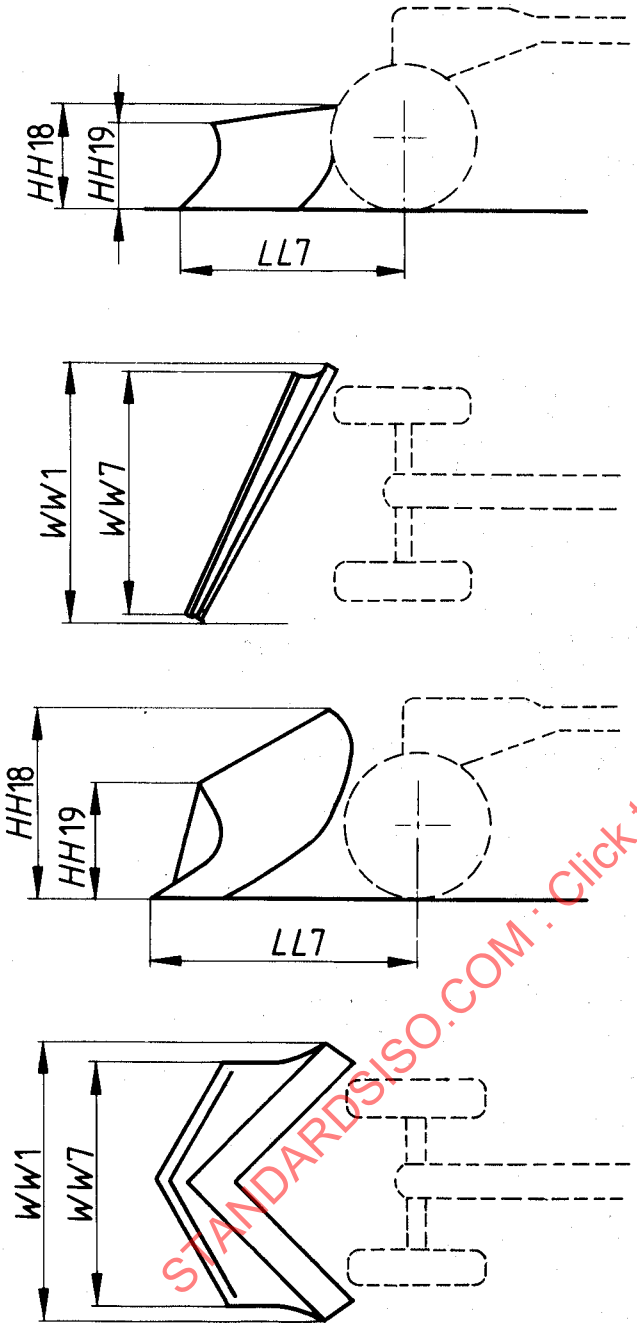


Figure 18 — Dimensions of snowploughs

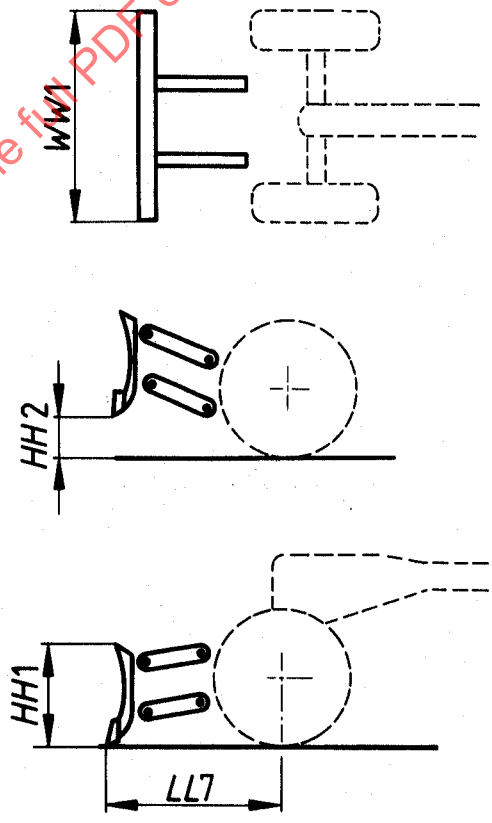
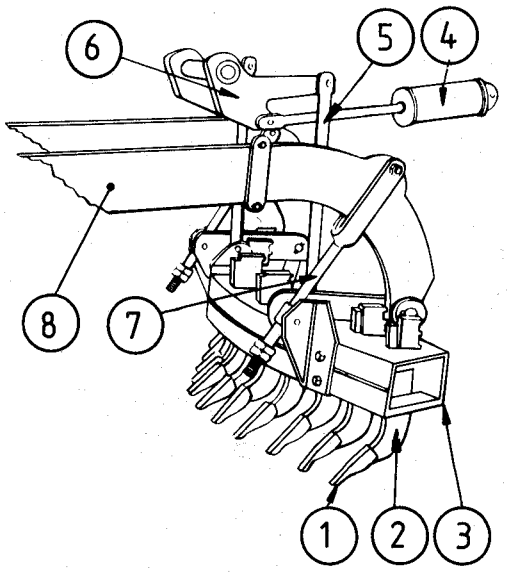


Figure 19 — Dimensions of front blade

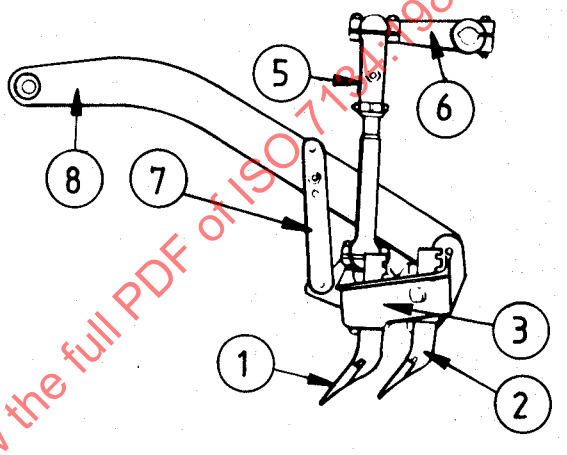
6.3 Nomenclature (see diagram numbers)

6.3.1 Scarifier

1 Point
2 Shank
3 Block, tool
4 Cylinder
5 Link, lift
6 Arm, lift
7 Pitch adjustment
8 Beam



a) Hydraulic type



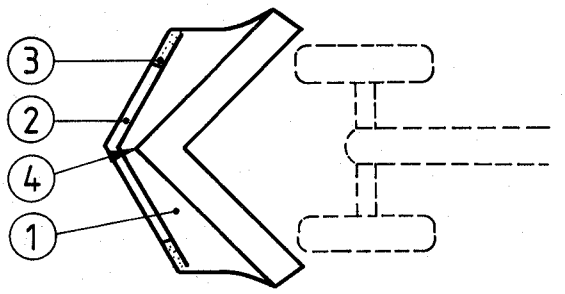
b) Mechanical type

6.3.2 Ripper

For nomenclature, see ISO 6747.

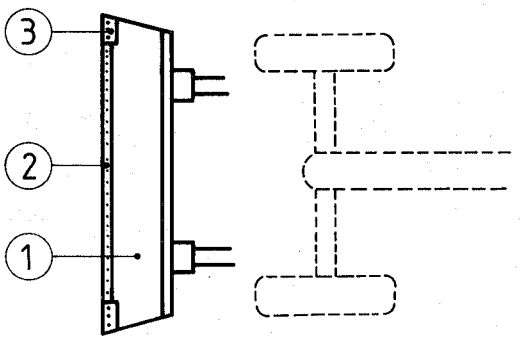
6.3.3 Snowploughs

1 Mould-board
2 Cutting edge
3 End bit
4 Nose piece



6.3.4 Front blade

1 Blade
2 Cutting edge
3 End bit



7 Performance terminology

7.1 ISO net power (engine) : See ISO 1585. [1)]

7.2 maximum travel speeds : Maximum speeds that can be attained on a hard level surface in each of the forward and reverse gear ratios available. (See ISO 6014.)

7.3 Steering capability

7.3.1 turning radius : See ISO 7457.

7.4 braking performance : See ISO 3450.

8 Commercial literature specifications — SI units (examples)

8.1 Engine (specify characteristics)

Manufacturer and model.
Diesel or spark ignition.
Type of cycle (2 or 4 stroke).
Naturally aspirated, mechanically supercharged or turbo-charged.
Number of cylinders.
Bore.
Stroke.
Displacement.
Cooling system (air or water cooled).
Type of fuel.
Power, flywheel net : ..... at ..... rpm.
Torque — maximum : ..... at ..... rpm.
Starter type.
Electrical system, ... V.

8.2 Transmission (specify type)

Examples :

Manual shift with flywheel clutch.
Powershift with or without torque converter.
Hydrostatic.
Electric.
Number of speeds (forward and reverse).
Travel speeds (forward, reverse).

8.3 Axles

8.3.1 Front (specify type)

Examples :

Powered, double reduction mechanical.
Powered, hydrostatic wheel.
Not powered.
Leaning wheel.

8.3.2 Rear (specify type)

Examples :

Single.
Single with planetary reduction in wheel.
Tandem (specify type and ratio).

8.4 Steering (specify type)

(See ISO 5010.)

Examples :

Articulated.
Front wheel steer.
Boosted, manual, hydrostatic.
Four wheel.
Manual.
Power.

8.4.1 Performance

Turning radius : .... without wheel lean.
Turning radius .... with maximum articulation and maximum wheel lean.

8.5 Brakes

8.5.1 Service brakes

Examples :

Type (drum, disc, wet or dry).
Actuating system type (mechanical, air, hydraulic, electrical, combination, etc.).

8.5.2 Parking brake (specify type)

8.5.3 Secondary brake (specify type)

8.5.4 Brake performance (specify)

(See ISO 3450.)

8.6 Tyres

Size and type.
Ply rating.
Rim size.

8.7 Hydraulic system

8.7.1 Working pumps

Type.
Pump flow : ..... at ..... pressure at ..... rated engine rpm.
Main relief valve opening pressure .....

1) ISO/TC 127 is currently drawing up an engine test code.

8.8 System fluid capacities

Fuel tank.
Engine crankcase.
Cooling system.
Transmission.
Differential.
Tandems.
Hydraulic system.

8.9 Operating mass

8.10 Shipping mass

8.11 Overall grader dimensions (supply outline drawings)