



BSI Standards Publication

Mining — Vocabulary

Part 10: Haulage

National foreword

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**Mining — Vocabulary —
Part 10:
Haulage**

*Exploitation minière — Vocabulaire —
Partie 10: Transport*

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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 General.....	1
3.2 Loading.....	2
3.3 Haulage.....	4
3.4 Dumping/Unloading/Discharging.....	45
Bibliography	47
Index	48

Foreword

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This document was prepared by Technical Committee ISO/TC 82, *Mining*.

A list of all parts in the ISO 22932 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 22932 series has been prepared in order to standardize and to co-ordinate the global use of technical terms and definitions in mining, for the benefit of the experts working on different types of mining activities.

The need for the ISO 22932 series arose from the widely varying interpretation of terms used within the industry and the prevalent use of more than one synonym.

Mining — Vocabulary —

Part 10: Haulage

1 Scope

This document specifies the commonly used terms in mine haulage.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological 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

3.1.1

automatic door

door which are actuated to open and close by the approach or position of a conveyance or vehicle

3.1.2

axle counter

mechanical counting device arranged to initiate a series of operations after the passage of a predetermined number of vehicles

3.1.3

brow

portion of roadway floor which has marked longitudinal convexity

3.1.4

checkweigher

check-docking boss

check measurer

one who checks, in the interest of miners, the weighing of ore in *mine cars* (3.3.2.5.6) or other containers by the company weighmaster

Note 1 to entry: See Reference [2].

3.1.5

creeper

feeder

slowly moving endless chain with provision for engaging the axles or *dummy axles* (3.3.2.6.3) of *tubs* (3.3.2.5.9) or *cars* (3.3.2.5.6) to move them

3.1.6

flame arrester

device fitted to the inlet and exhaust systems of diesel engines to prevent the emission of flames or sparks

3.1.7

main transport

conveying or *haulage* ([3.3.1.10](#)) of mined material from the mining area *subsidiary transport* ([3.1.9](#)) to the shaft bottom or surface

Note 1 to entry: See also *subsidiary transport* and *underground haulage* ([3.3.1.38](#)).

Note 2 to entry: See Reference [\[2\]](#).

3.1.8

chock

wedge shaped block placed in front of a wheel to brake a vehicle

3.1.9

subsidiary transport

conveying or *haulage* ([3.3.1.10](#)) of mineral along the working faces and outward to a junction or loading point

Note 1 to entry: See also *main transport* ([3.1.7](#)) and *underground haulage* ([3.3.1.38](#)).

Note 2 to entry: See Reference [\[2\]](#).

3.1.10

transportation

hauling ([3.3.1.16](#)), hoisting or moving from one place to another of material or people

3.1.11

transportation controller

person who by means of signals, is informed when and where vehicles or *cars* ([3.3.2.5.6](#)) are required and can instruct the lorry or *locomotive* ([3.3.2.5.3](#)) drivers accordingly

3.1.12

underground transportation

transporting of ore, rock, people, materials, and supplies through shafts and *haulage* ([3.3.1.10](#)) ways

Note 1 to entry: *Underground transportation* ([3.1.10](#)) is including the loading of ore or rock into *cars* ([3.3.2.5.6](#)) and carrying it to the surface.

Note 2 to entry: See also *main transport* ([3.1.7](#)) and *subsidiary transport* ([3.1.9](#)).

Note 3 to entry: See Reference [\[2\]](#).

3.1.13

gradient

inclination of profile grade line from the horizontal, expressed as a percentage

Note 1 to entry: See Reference [\[2\]](#).

3.1.14

ramp

incline connecting two levels in an open pit or underground mine

Note 1 to entry: See Reference [\[2\]](#).

3.2 Loading

3.2.1

bunker conveyor

long hopper having an integral conveyor(s) which is used to store the mineral and control its discharge

3.2.2

intermediate loading section

specially constructed section of *trunk conveyor* ([3.3.3.1.87](#)) structure sited at an intermediate *transfer point* ([3.3.1.36](#))

3.2.3

layer-loading

procedure for loading ore in *railroad* ([3.3.2.1.1](#)) *cars* ([3.3.2.5.6](#)) in horizontal layers

Note 1 to entry: Layer-loading is a simple and inexpensive method for smoothing out the irregularities in ore and consists in shuttling two to six *railroadcars*, hooked together, past the *loading boom* ([3.2.4](#)) two or more at a time. This results in a more uniform product.

Note 2 to entry: See Reference [\[2\]](#).

3.2.4

loading boom

hinged portion of a conveyor that is designed to receive materials at a fixed level and to discharge them at varying levels

Note 1 to entry: Usually employed for loading ore into wagons.

Note 2 to entry: See Reference [\[2\]](#).

3.2.5

loading conveyor

conveyor adapted for loading bulk materials, packages, or objects into *cars* ([3.3.2.5.6](#)), trucks, or other conveyors

Note 1 to entry: See Reference [\[2\]](#).

3.2.6

loading equipment

shovels or other machines singly or in combination used to load excavated or stockpiled materials into trucks, *mine cars* ([3.3.2.5.6](#)), conveyors, or other *transportation* ([3.1.10](#)) or *haulage* ([3.3.1.10](#)) units

Note 1 to entry: See Reference [\[2\]](#).

3.2.7

loading head

part of a loading machine that gathers the material and places it on the machine's *elevating conveyor* ([3.3.3.1.34](#))

Note 1 to entry: See Reference [\[2\]](#).

3.2.8

loading hopper

hopper used to receive and direct material to a conveyor

Note 1 to entry: See Reference [\[2\]](#).

3.2.9

loading pan

box or scoop into which broken rock is shovelled in a sinking shaft while the hopper is traveling in the shaft

Note 1 to entry: A small hoist is used to lift and discharge the *pans* ([3.3.3.1.64](#)) into the hopper on its return to the shaft bottom.

Note 2 to entry: See Reference [\[2\]](#).

3.2.10

loading point

point at which mineral is discharged from conveyors into *mine cars* ([3.3.2.5.6](#)), *tubs* ([3.3.2.5.9](#)) or skips

3.2.11

loading ramp

surface structure, often incorporating storage bins, used for gravity loading bulk material into transport vehicles

Note 1 to entry: See Reference [2].

3.2.12

loading shovel

mechanical shovel able to operate as a forklift truck, a crane, or a loader

Note 1 to entry: See Reference [2].

3.2.13

loading station

device consisting of one or more *plates* ([3.3.2.3.5](#)), or a hopper receiving and placing material on the conveyor belt for transport

Note 1 to entry: When such a loading station is located at the *tail end* ([3.3.3.1.82](#)), it is known as a tail-end loading station.

Note 2 to entry: When it is located along the intermediate section, it is known as an intermediate loading station.

Note 3 to entry: See Reference [2].

3.2.14

peak loading

maximum number of tons of a specified material to be carried by a conveyor per minute in a specified period of time

Note 1 to entry: See Reference [2].

3.2.15

scraper bar

flight

cross member fitted at intervals to the chain(s) of a *scraper conveyor* ([3.3.3.4.24](#)) or ore cutter to move the ore

3.2.16

self-loading dumper

dumper provided with a bucket, hinged by arms to the chassis, that scoops up the material and discharges it backwards into the hopper

Note 1 to entry: Hydraulic rams control the lift arms, bucket movement, and dumping operation.

Note 2 to entry: See Reference [2].

3.2.17

stage loader

feeder ([3.1.5](#)) conveyor used primarily between the face and *gate conveyors* ([3.3.3.1.41](#))

3.2.18

transverse loading

loading on a beam

Note 1 to entry: See Reference [2].

3.3 Haulage

3.3.1 General

3.3.1.1 circle haul

<strip mining> *haulage* (3.3.1.10) system in which the empty units enter the mine over one lateral and leave, loaded, over the lateral nearest the tippie

Note 1 to entry: This system is utilized where laterals are built into the mine from the main road, whether outside the outcrop or on the high-wall side of the mine workings. This system reduces the haul on the ore surface to a minimum, except where there are only two laterals, one at each end of the workings.

Note 2 to entry: See Reference [2].

3.3.1.2 clearance

clear space between any part of vehicles or conveyors and the sides or roof of the roadway, and between vehicles on adjacent tracks and/or conveyors

3.3.1.3 coupling coupler

attachment by which vehicles can be linked to each other or to *locomotives* (3.3.2.5.3), or to a *haulage* (3.3.1.10) rope

3.3.1.4 dual haulage

<strip mining> use of two types of *haulage* (3.3.1.10) at the same mine for transporting ore from the face to the preparation plant

Note 1 to entry: Usually, ore is transported from the loading shovel to a transfer station by motorized units, and rail *haulage* (3.3.1.10) is used to haul the ore from this point to the preparation plant.

Note 2 to entry: See Reference [2].

3.3.1.5 face haulage

transportation (3.1.10) of mined ore from the working face to an *intermediate haulage* (3.3.1.18)

Note 1 to entry: It is accomplished by *shuttle cars* (3.4.7), conveyors, *locomotives* (3.3.2.5.3), and *mine cars* (3.3.2.5.6), or by combinations of such equipment.

Note 2 to entry: See also *primary haulage* (3.3.1.27).

Note 3 to entry: See Reference [2].

3.3.1.6 gathering haulage

portion of the *haulage* (3.3.1.10) system immediately adjacent to the face

Note 1 to entry: In longwall mining, the face belt or *tubs* (3.3.2.5.9) and track along the face constitute the gathering *haulage* system.

Note 2 to entry: See Reference [2].

3.3.1.7 gravity haulage jig haulage self-act

system of *haulage* (3.3.1.10) in which the set of full *cars* (3.3.2.5.6) is lowered at the end of a rope, and gravity force pulls up the empty *cars* (3.3.2.5.6), the rope being passed around a *sheave* (3.3.3.1.77) at the top of the incline

Note 1 to entry: The speed of the *haulage* (3.3.1.10) is controlled by a band brake on the *sheave*.

Note 2 to entry: See Reference [2].

3.3.1.8

haul-cycle time

time it takes the scraper or truck to haul a load to the dumping area and return to position in the loading area

Note 1 to entry: See Reference [2].

3.3.1.9

haul distance

distance measured along the centreline or most direct practical route between the centre of the mass of excavation and the centre of mass of the fill as finally placed

Note 1 to entry: It is the distance material is moved.

Note 2 to entry: See Reference [2].

3.3.1.10

haulage

drawing or conveying, in *cars* (3.3.2.5.6) or otherwise, or movement of workers, supplies, ore, and waste both underground and on the surface

Note 1 to entry: In dividing the *transportation* (3.1.10) system according to the area served there is a) primary or *face haulage* (3.3.1.5), b) *secondary haulage* (3.3.1.31), and c) main-line *haulage* (3.3.1.10).

Note 2 to entry: See Reference [2].

3.3.1.11

haulage hand

person employed on *haulage* (3.3.1.10) operations

3.3.1.12

haulage plant

mechanical installation for the tramming of rock or ore, operated by ropes, compressed air, or electricity

Note 1 to entry: See Reference [2].

3.3.1.13

haulage road

underground *ropeway* (3.3.5.1.14) used primarily for the transport of mineral or supplies by vehicle

3.3.1.14

haulage stage

mine roadway along which a load is moved by a single form of *haulage* (3.3.1.10) without *coupling* (3.3.1.3) or uncoupling of *cars* (3.3.2.5.6) and without transfer from one form of *haulage* (3.3.1.10) to another

Note 1 to entry: See Reference [2].

3.3.1.15

haulageway

gangway, entry, or tunnel through which loaded or empty *mine cars* (3.3.2.5.6) are hauled

Note 1 to entry: See Reference [2].

3.3.1.16

hauling

movement of material from a loading point to dump point.

3.3.1.17

haul road

road designed to transfer heavy materials by haul trucks.

3.3.1.18

intermediate haulage

transportation ([3.3.1.10](#)) of mined ore from the *face haulage* ([3.3.1.5](#)) to that point where it is accessible to the main line

Note 1 to entry: See also *pass by* ([3.3.1.25](#)).

Note 2 to entry: See Reference [2].

3.3.1.19

lay-by

siding in an *underground haulage* ([3.3.1.38](#)) track having a *turnout* ([3.3.2.4.8](#)) at one end only

Note 1 to entry: See also *pass by* ([3.3.1.25](#)).

3.3.1.20

locomotive haulage

transport of ore, workers, and materials underground by means of *locomotive* ([3.3.2.5.3](#))-hailed *mine cars* ([3.3.2.5.6](#))

Note 1 to entry: The *locomotive* may be powered by battery, diesel, compressed air, *trolley* ([3.3.2.5.7](#)), or some combination such as battery-*trolley* or *trolley*-cable reel.

Note 2 to entry: See Reference [2].

3.3.1.21

main haulage

portion of the *haulage* ([3.3.1.10](#)) system that moves the ore from the *secondary haulage* ([3.3.1.31](#)) system to the shaft or mine opening

Note 1 to entry: See Reference [2].

3.3.1.22

main haulageway

principal *transportation* ([3.1.10](#)) road, drift, tunnel

Note 1 to entry: See Reference [2].

3.3.1.23

off-the-road hauling

hauling ([3.3.1.16](#)) that takes place off the public highways, generally on a mining or excavation site

Note 1 to entry: The *hauling* units used are generally higher and wider than those used in *over-the-road hauling* ([3.3.1.24](#)) since highway restrictions do not limit size, mass.

Note 2 to entry: Compare with *over-the-road hauling*.

3.3.1.24

over-the-road hauling

hauling ([3.3.1.16](#)) over public highways, usually by a dump truck

Note 1 to entry: Various restrictions, such as mass, width of vehicle, safety features, guard against spillage, etc. must be considered in the type equipment used.

Note 2 to entry: Compare with *off-the-road hauling* ([3.3.1.23](#)).

Note 3 to entry: See Reference [2].

3.3.1.25

pass by

<haulage track> siding in an *underground haulage* ([3.3.1.38](#)) track having a *turnout* ([3.3.2.4.8](#)) at both ends to the main line

Note 1 to entry: See also *lay-by* ([3.3.1.19](#)).

3.3.1.26

pass by

<shaft> loop of track around the shaft at the pit bottom

Note 1 to entry: See also *lay-by* ([3.3.1.19](#)).

3.3.1.27

primary haulage

short haul in which there is no secondary or mainline *haulage* ([3.3.1.10](#))

Note 1 to entry: For example a mine is started into a hillside, using *mine cars* ([3.3.2.5.6](#)), track, and hand loaders.

Note 2 to entry: An empty *car* ([3.3.2.5.6](#)) is placed for the loader, and the loaded *car* is taken to the dump manually or by machine, repeating the process for each loader.

Note 3 to entry: See Reference [2].

3.3.1.28

relay haulage

single-track, high-speed mine *haulage* ([3.3.1.10](#)) from one relay station to another

Note 1 to entry: Each operator has an exclusive track section between relay stations and can run at full speed since no other *haulage* equipment is operating on the section. Side track at each relay station permits the operator to pick up or drop off loads or empties, then make the return run.

Note 2 to entry: See Reference [2].

3.3.1.29

refuge hole

manhole

excavation at the side of a roadway in which persons can shelter while vehicles are passing

3.3.1.30

return wheel

terminal *sheave* ([3.3.3.1.77](#)) which reverses the direction of the rope in a *haulage* ([3.3.1.10](#)) system

3.3.1.31

secondary haulage

portion of the *haulage* ([3.3.1.10](#)) system that collects the ore from the various gathering-*haulage* delivery points and delivers it to the *main haulage* ([3.3.1.21](#)) system

Note 1 to entry: See Reference [2].

3.3.1.32

strap lift

overhead moving rope with a grip attachment, to assist men in walking along steeply inclined roadways

3.3.1.33

surge wheel

fleet wheel

narrow drum of appropriate profile which drives a *haulage* ([3.3.1.10](#)) rope by friction

Note 1 to entry: The drum carries turns of the rope which slide across the surface as the drum revolves.

3.3.1.34

swilly

portion of a roadway floor which has marked longitudinal concavity

3.3.1.35

track haulage

movement or *transportation* ([3.1.10](#)) of excavated or mined materials in *cars* ([3.3.2.5.6](#)) or trucks running on rails

Note 1 to entry: See Reference [\[2\]](#).

3.3.1.36

transfer point

place at which mineral is transferred from one conveyor to another

3.3.1.37

underchain haulage

haulage ([3.3.1.10](#)) in which the chains are placed beneath a *mine car* ([3.3.2.5.6](#)) at certain intervals with suitable hooks that thrust against the *car* ([3.3.2.5.6](#)) axle

Note 1 to entry: See Reference [\[2\]](#).

3.3.1.38

underground haulage

transportation ([3.1.10](#)) of minerals from the working face to the shaft bottom.

Note 1 to entry: See also *gravity haulage* ([3.3.1.7](#)), *haulage* ([3.3.1.10](#)), *locomotive haulage* ([3.3.1.20](#)), *main transport* ([3.1.7](#)), *subsidiary transport* ([3.1.9](#)).

Note 2 to entry: See Reference [\[2\]](#).

3.3.1.38.1

single-rope haulage

underground haulage ([3.3.1.38](#)) using a single rope which in empty *trip* ([3.3.2.1.7](#)) running in by gravity.

Note 1 to entry: See Reference [\[2\]](#).

3.3.2 Railway

3.3.2.1 General

3.3.2.1.1

railway

railroad

transport system for guided passage of *trains* ([3.3.2.1.7](#)) on rails

3.3.2.1.2

rail haulage system

materials *transportation* ([3.1.10](#)) system consisting of gondola *cars* ([3.3.2.5.6](#)), and the steel rails on which the *cars* ([3.3.2.5.6](#)) are moved about with a suitably powered traction unit as a *locomotive* ([3.3.2.5.3](#))

Note 1 to entry: See Reference [\[2\]](#).

3.3.2.1.3

rider

run rider

haulage ([3.3.1.10](#)) worker who travels with a *train* ([3.3.2.1.7](#)) of *tubs* ([3.3.2.5.9](#))

3.3.2.1.4

platelayer

rolleyway person

who maintains the underground track and generally ensures the efficient operation of the *haulage* ([3.3.1.10](#)) system

3.3.2.1.5

swing

extreme horizontal movement of a vehicle on a straight track produced by the cumulative effects of *clearances* ([3.3.1.2](#)) between wheel flanges and rails, play in axle boxes etc

3.3.2.1.6

tractive effort

force available at the treads of the wheels of a *locomotive* ([3.3.2.5.3](#)) or tractor to move itself and the *train* ([3.3.2.1.7](#)) of *cars* ([3.3.2.5.6](#))

3.3.2.1.7

train

journey

trip

number of *tubs* ([3.3.2.5.9](#)) or *cars* ([3.3.2.5.6](#)) coupled together

3.3.2.1.8

tram

vehicle designed to carry supplies on conventional rail track

3.3.2.1.9

trammer

drawer

putter

person who moves *tubs* ([3.3.2.5.9](#)) from the face to a gathering point on the *haulage* ([3.3.1.10](#)) system either

3.3.2.2 Types of Haulage through railway

3.3.2.2.1

funicular railway

railway ([3.3.2.1.1](#)) that negotiates a steep *gradient* ([3.1.13](#)); the *cars* ([3.3.2.5.6](#)) are operated by cables and winches

Note 1 to entry: See also *mountain railway* ([3.3.2.2.3](#)).

Note 2 to entry: See Reference [2].

3.3.2.2.2

main-and-tail haulage

single-track haulage ([3.3.1.35](#)) system operated by a *haulage* ([3.3.1.10](#)) engine with two drums, each with a separate rope

Note 1 to entry: The engine is usually located at the out end of the system. The main rope is attached to the out end of the set of *tubs* ([3.3.2.5.9](#)), and the tail rope passes around a *sheave* ([3.3.3.1.77](#)) in, and is then attached to, the rear end of the set. To draw the full set out, the main rope is wound in, the tail rope being allowed to run free. To draw the empty set in, the tail rope is wound in, the main rope being allowed to run free. The tail rope is equal to twice the length of the *haulage road* ([3.3.1.13](#)). The main-and-tail *haulage* is adopted when the *gradient* ([3.1.13](#)) is irregular and the empty set will not run in by gravity.

Note 2 to entry: See Reference [2].

3.3.2.2.3

mountain railway

railway ([3.3.2.1.1](#)) having such steep *gradients* ([3.1.13](#)) that *trains* ([3.3.2.1.7](#)) are hauled up them by ropes or by a rack *locomotive* ([3.3.2.5.3](#))

Note 1 to entry: See also *funicular railway* ([3.3.2.2.1](#)).

Note 2 to entry: See Reference [2].

3.3.2.2.4

self-acting incline

system of *haulage* (3.3.1.10) on an inclined roadway in which descending full *tubs* (3.3.2.5.9) pull up the ascending empty *tubs* (3.3.2.5.9)

3.3.2.3 Attachments of rail

3.3.2.3.1

back shunt

kick back

device in a rail system whereby the direction of vehicles is reversed, either by the reverse *gradient* (3.1.13) or by mechanical action

3.3.2.3.2

back stay

bar hook

drag

rod attached to the back of a *tub* (3.3.2.5.9) and dragging between the rails, which will arrest the *tub* in the event of run back

3.3.2.3.3

California crossing

arrangement of *plates* (3.3.2.3.5) and *ramps* (3.1.14) which is superimposed on a double track of rails, and which can be slid along them, to provide a cross over, enabling rail vehicles to be transferred from one track to the other without lifting

3.3.2.3.4

check rail

check plate

guide rail

rail or *plate* (3.3.2.3.5) to provide additional guidance for vehicles on rail track at curves and *crossings* (3.3.2.4.3)

3.3.2.3.5

flat sheet

plate

flat metal sheet on which *cars* (3.3.2.5.6) can be manipulated and guided on the desired track

3.3.2.3.6

jack catch

monkey

pivoted axle catch situated on a *haulage* (3.3.1.10) track to prevent *tubs* (3.3.2.5.9) running back

3.3.2.3.7

runaway switch

catch points

track *switch* (3.3.2.3.9) by means of which runaway *cars* (3.3.2.5.6) can be derailed

3.3.2.3.8

stop block

block, usually of hardwood, placed across or between the track to prevent *tubs* (3.3.2.5.9) over running

3.3.2.3.9

switch

that part of a *turnout* (3.3.2.4.8), comprising a pair of tapered movable rails and their linkage, which diverts a vehicle from one track to another

3.3.2.3.10

traverser

short length of rail track mounted on a low wheeled carriage so that it can be moved sideways to transfer vehicles from one track to another

3.3.2.3.11

warwick

safety device, used on inclined *haulage* ([3.3.1.10](#)) ropes, consisting of a long bar pivoted from the roof which is caused to fall or lie in the path of a runaway vehicle

3.3.2.4 Elements of rail route

3.3.2.4.1

bankhead

top of an inclined tracked *haulage road* ([3.3.1.13](#)) where the *gradient* ([3.1.13](#)) changes, thereby facilitating the handling of vehicles

3.3.2.4.2

centre throw

distance by which the midpoint of the wheelbase of a rail vehicle, on the vertical centreline, moves horizontally towards one side of the centreline of the track when the latter is curved

3.3.2.4.3

crossing

arrangement of rails by which one track crosses another

3.3.2.4.4

crossing vee

frog

fabricated or cast unit of rails forming the vee in a *crossing* ([3.3.2.4.3](#))

3.3.2.4.5

end throw

distance by which a point at the end of a rail vehicle, on the vehicle centreline, moves horizontally towards one side of the centreline of the track when the latter is curved

3.3.2.4.6

jazz rail

swan neck rail

short abruptly curved section of track designed to derail runaway *tubs* ([3.3.2.5.9](#))

3.3.2.4.7

landing

part of an inclined tracked *haulage* ([3.3.1.10](#)) rope where the *gradient* ([3.1.13](#)) has been reduced to facilitate the handling of vehicles; usually at a junction

3.3.2.4.8

turnout

arrangement by which one track (pair of rails) is caused to diverge into two separate tracks

3.3.2.5 Types of rail carrier vehicles

3.3.2.5.1

bogie

small four wheeled *trolley* ([3.3.2.5.7](#))

3.3.2.5.2

electric haulage mine locomotive

haulage mine locomotive

electric mine *locomotive* ([3.3.2.5.3](#)) used for *hauling* ([3.3.1.16](#)) *trains* ([3.3.2.1.7](#)) of *cars* ([3.3.2.5.6](#)), which have been gathered from the working faces of the mine, to the point of delivery of the *cars* ([3.3.2.5.6](#))

Note 1 to entry: See Reference [2].