Identification Terminology of Earthmoving Machines – SAE J1057 JUN81

SAE Standard
Last Revised June 1981

THIS IS A PREPRINT WHICH IS SUBJECT TO REVISIONS AND CORRECTIONS. THE FINAL VERSION WILL APPEAR IN THE 1982 EDITION OF THE SAE HANDBOOK.

PREPRINT

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

IDENTIFICATION TERMINOLOGY OF EARTHMOVING MACHINES—SAE J1057 JUN81

SAE Standard

Report of the Off-Road Machinery Technical Committee, approved July 1973, last revised by Subcommittee 13, June 1981. Rationale statement available.

1. Purpose—This standard sets forth accepted terminology to name and identify properly and uniformly types of earthmoving machines, and is based upon existing commercial earthmoving machines. Illustrations are used to identify functional characteristics.

ϕ The parts of the standard are: loaders, dumpers, tractor-scrapers, graders, tractors, excavators, and backhoe loaders. Additional parts on continuous diggers and augers will be developed if and when requested.

ϕ This terminology strives to establish a name for a basic work machine such that a basic machine is not renamed when it is equipped with an optional attachment. For example, a "tractor" as the basic machine may have a dozer available as normal dealer-installed or manufacturer-installed optional equipment. In this case, the basic machine still carries the name "tractor", and the equipped work machine can be referred to as "tractor with dozer" or "tractor equipped with dozer". As a further illustration of this principle, herein listed are some common working tool attachments. These are designed with the intention that they can be added (and removed) without modification to the basic machine, thereby enabling the machine to efficiently perform other work.

For Loaders	For Graders	For Tractors
Backhoe	Dozer	Backhoe
Sideboom	Scarifier	Dozer
Scarifier	Snow Plow	Sideboom
Pallet Fork	Snow Wing	Direct Burial Plow
Snow Plow		Ripper

2. Scope—This standard identifies earthmoving machines which are intended for use on unimproved surfaces. The machines are used for moving earth and other materials on projects such as road building, dams, open pit excavation, trenching, and buildings. Excluded are machines intended for use on improved surfaces such as "in-plant" material handling, highways, water, air transport, and for agricultural purposes.

3. Loader Definition—A self-propelled machine with an integral front-mounted bucket supporting structure and linkage that loads material into the bucket through forward motion of the machine and lifts, transports, and discharges material. Not included are tractors with front-end loader attachment.

3.1 Crawler Loaders

3.1.1 Front engine.

3.1.2 Rear engine.

3.2 Wheel Loaders

3.2.1 Rigid frame, with means of steering and propulsion as follows:

ϕ 3.2.1.1 **Vacated.**

3.2.1.2 Four wheel, front-wheel steer, rear-wheel drive, rear engine.

3.2.1.3 Four wheel, rear-wheel steer, four-wheel drive, front engine.

3.2.1.4 Four wheel, rear-wheel steer, four-wheel drive, rear engine.

3.2.1.5 Three wheel, rear-wheel steer, front-wheel drive.

3.2.1.6 Four wheel, rear-wheel steer, front-wheel drive.

3.2.1.7 Four wheel, front- and rear-wheel steer, four-wheel drive.

3.2.1.8 Four wheel, skid steer, four-wheel drive.

3.2.2 Articulated frame, with means of steering and propulsion as follows:

3.2.2.1 Four wheel, articulated steer, four-wheel drive, operator front.

3.2.2.2 Four wheel, articulated steer, four-wheel drive, operator rear.

4. Dumper Definition—A self-propelled vehicle, having an open cargo body, designed to transport and dump or spread material. Loading is done by means external of the dumper. Dumpers include the following types:

4.1 Rear Dump

4.1.1 Front-wheel steer

4.1.1.1 Two axles, rear-axle drive.

4.1.1.2 Two axles, rear-axle drive, two-way seat and controls.

4.1.1.3 Two axles, two-axle drive.

4.1.1.4 Three axles, center-axle drive.

4.1.1.5 Three axles, center- and rear-axle drive.

4.1.2 Articulated steer

4.1.2.1 Two axles, front-axle drive.

4.1.2.2 Two axles, two-axle drive.

4.1.2.3 Three axles, front- and center-axle drive.

4.1.2.4 Three-axles, all drive.

4.2 Side Dump

4.2.1 Front-wheel steer

4.2.1.1 Three axles, center-axle drive.

4.3 Bottom Dump

4.3.1 Front-wheel steer

4.3.1.1 Two axles, rear engine and drive.

4.3.1.2 Three axles, center-axle drive.

4.3.1.3 Four axles, single-axle drive, tandem trailing axles.

4.3.1.4 Five axles, tandem-axle drive, tandem trailing axles.

4.3.2 Articulated steer

4.3.2.1 Two axles, front-axle drive.

5. Tractor-Scraper Definition—A self-propelled machine, having a cutting edge positioned between front and rear axles, which loads, transports, discharges, and spreads material. Tractor-scrapers include the following types:

5.1 Open bowl, with means of steering and propulsion as follows:

5.1.1 Two axles, articulated steer, front axle drive.

5.1.2 Two axles, articulated steer, two axle drive.

5.1.3 Three axles, articulated steer, front and center axle drive (articulated tractor or four-wheel steer tractor).

5.1.4 Three axles, front wheel steer, center axle drive.

5.1.5 Three axles, front wheel steer, center and rear axle drive.

5.2 Self-Loading, with separately powered mechanism, with means of steering and propulsion as follows:

5.2.1 Two axles, articulated steer, front axle drive.

5.2.2 Two axles, articulated steer, two axle drive.

5.2.3 Three axles, front wheel steer, center axle drive.

5.2.4 Three axles, articulated steer, front and center axle drive (articulated tractor or four wheel steer tractor).

6. Grader Definition—A self-propelled machine having an adjustable blade, positioned between front and rear axles to cut, move, and spread material, usually to grade requirements:

6.1 Rigid frame with means of steering and propulsion as follows:

6.1.1 Four wheel, front wheel steer, two wheel drive (front engine).

6.1.2 Four wheel, front and rear wheel steer, four wheel drive.

6.1.3 Six wheel, front wheel steer, four wheel drive.

6.1.4 Six wheel, front wheel and rear bogie steer, six wheel drive.

6.2 Articulated frame with means of steering and propulsion as follows:

6.2.1 Six wheel, front wheel and articulated steer, four wheel drive.

6.2.2 Four wheel, double articulated steer, four wheel drive.

7. Tractor Definition—A self-propelled machine used to exert a push or pull force through a mounted attachment or drawbar to move objects or material. Tractors include both crawler tractors and wheel tractors.

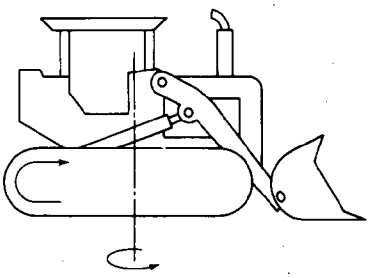

FIG. 3.1.1—FRONT ENGINE

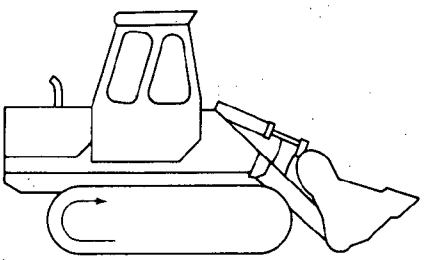

FIG. 3.1.2—REAR ENGINE

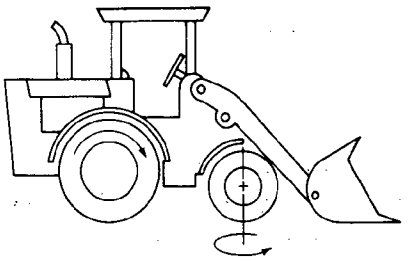

FIG. 3.2.1.2—FOUR WHEEL, FRONT-WHEEL STEER, REAR-WHEEL DRIVE, REAR ENGINE

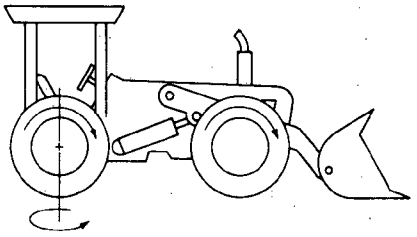

FIG. 3.2.1.3—FOUR WHEEL, REAR-WHEEL STEER, FOUR-WHEEL DRIVE, FRONT ENGINE

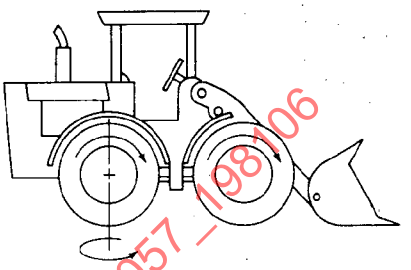

FIG. 3.2.1.4—FOUR-WHEEL, REAR-WHEEL STEER, FOUR-WHEEL DRIVE, REAR ENGINE

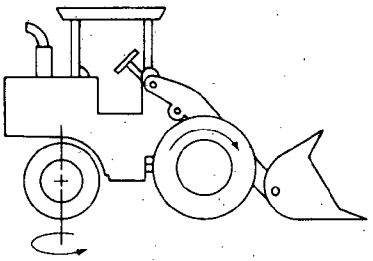

FIG. 3.2.1.5—THREE WHEEL, REAR-WHEEL STEER, FRONT-WHEEL DRIVE

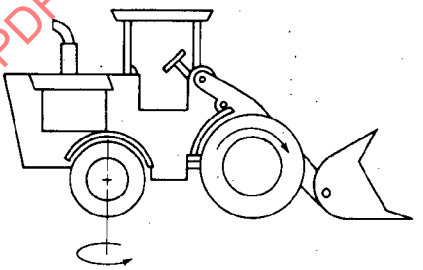

FIG. 3.2.1.6—FOUR WHEEL, REAR-WHEEL STEER, FRONT WHEEL DRIVE

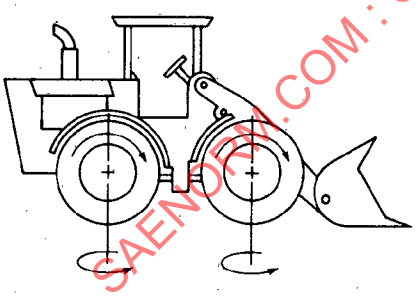

FIG. 3.2.1.7—FOUR WHEEL, FRONT- AND REAR-WHEEL STEER, FOUR-WHEEL DRIVE

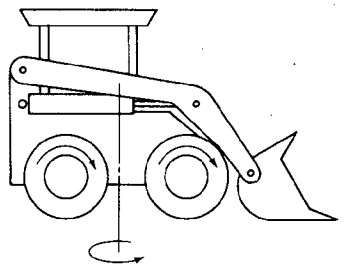

FIG. 3.2.1.8—FOUR WHEEL, SKID STEER, FOUR-WHEEL DRIVE

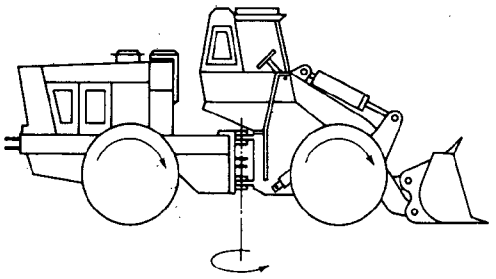

FIG. 3.2.2.1—FOUR WHEEL, ARTICULATED STEER, FOUR-WHEEL DRIVE, OPERATOR FRONT

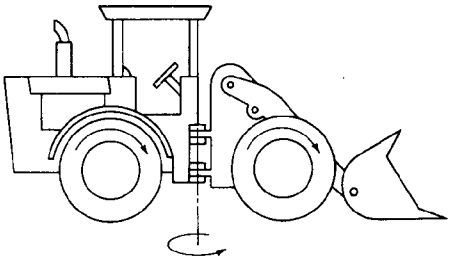

FIG. 3.2.2.2—FOUR WHEEL, ARTICULATED STEER, FOUR-WHEEL DRIVE, OPERATOR REAR

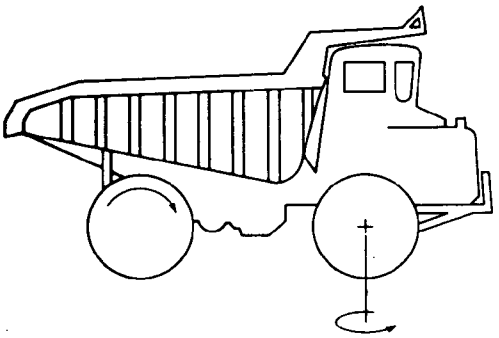

FIG. 4.1.1.1—TWO AXLES, REAR-AXLE DRIVE

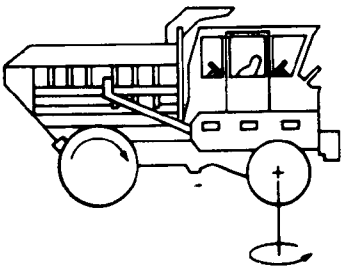

FIG. 4.1.1.2—TWO AXLES, REAR-AXLE DRIVE, TWO-WAY SEAT AND CONTROLS

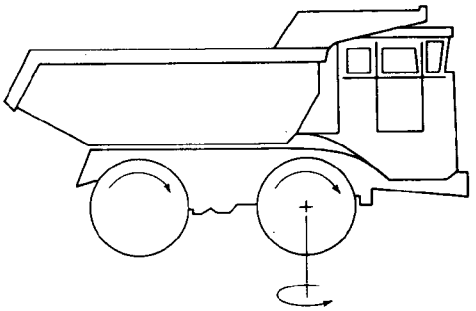

FIG. 4.1.1.3—TWO AXLES, TWO-AXLE DRIVE

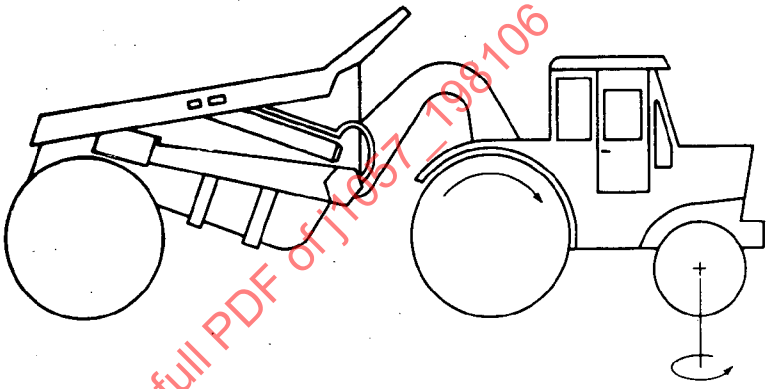

FIG. 4.1.1.4—THREE AXLES, CENTER-AXLE DRIVE

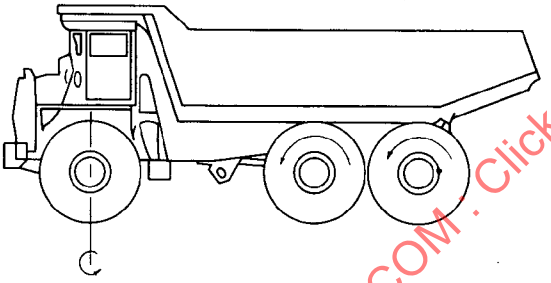

FIG. 4.1.1.5—THREE AXLES, CENTER- AND REAR-AXLE DRIVE

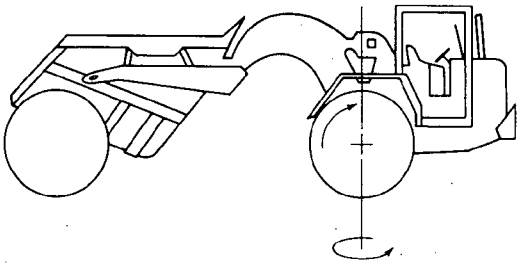

FIG. 4.1.2.1—TWO AXLES, FRONT-AXLE DRIVE

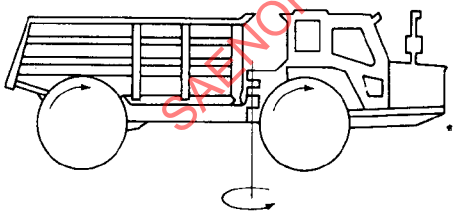

FIG. 4.1.2.2—TWO AXLES, TWO-AXLE DRIVE

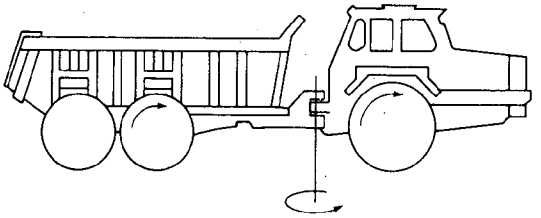

FIG. 4.1.2.3—THREE AXLES, FRONT- AND CENTER-AXLE DRIVE

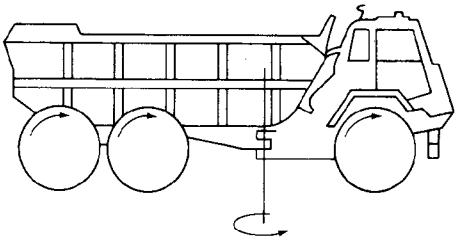

FIG. 4.1.2.4—THREE AXLES, ALL DRIVE

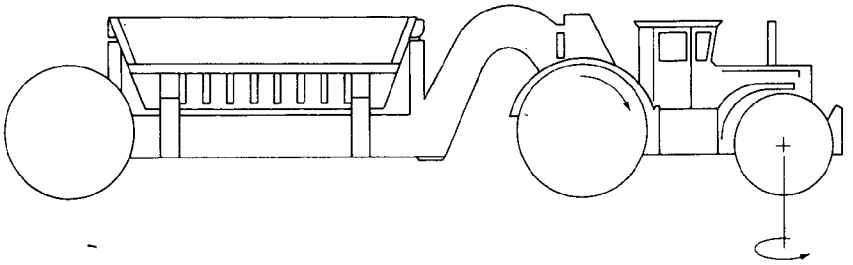

FIG. 4.2.1.1—THREE AXLES, CENTER-AXLE DRIVE

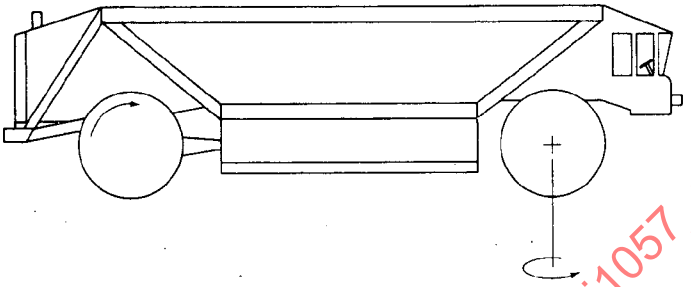

FIG. 4.3.1.1—TWO AXLES, REAR ENGINE AND DRIVE

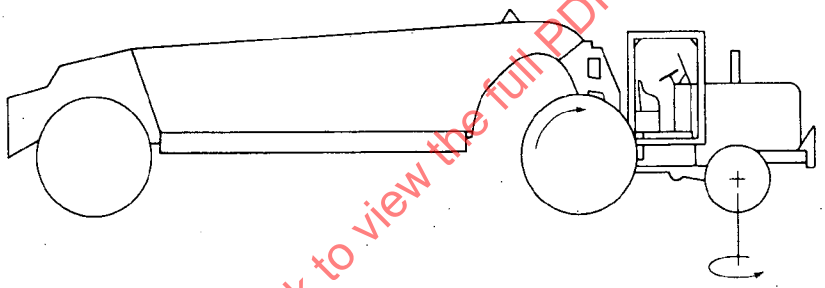

FIG. 4.3.1.2—THREE AXLES, CENTER-AXLE DRIVE

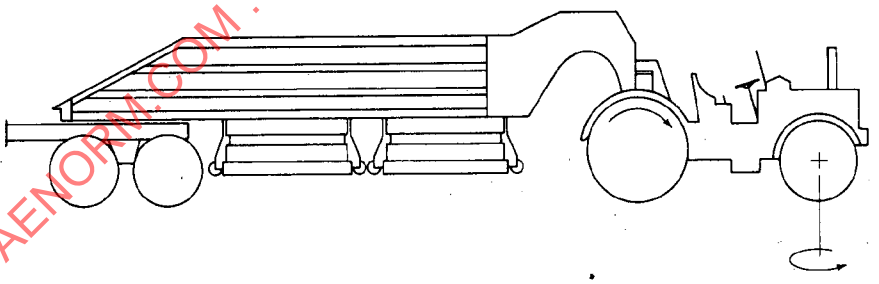

FIG. 4.3.1.3—FOUR AXLES, SINGLE-AXLE DRIVE, TANDEM TRAILING AXLES

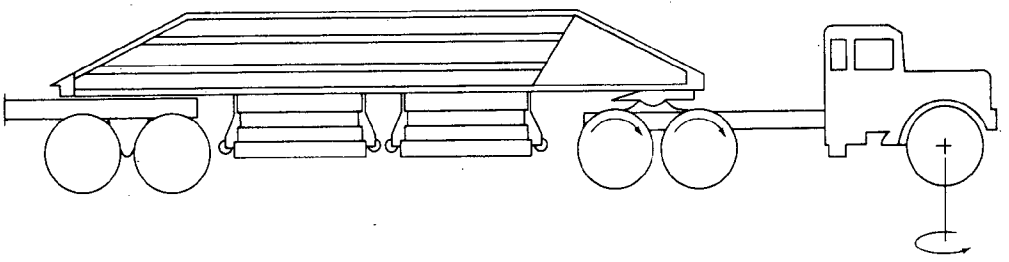

FIG. 4.3.1.4—FIVE AXLES, TANDEM-AXLE DRIVE, TANDEM TRAILING AXLES

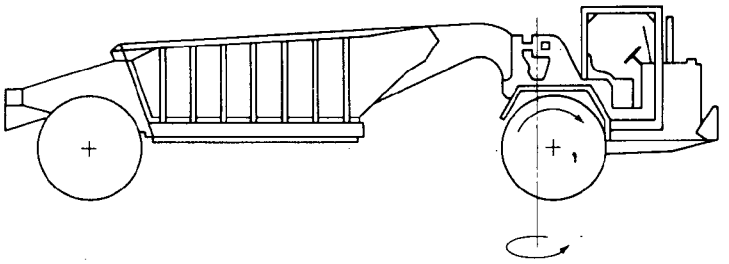

FIG. 4.3.2.1—TWO AXLES, FRONT-AXLE DRIVE

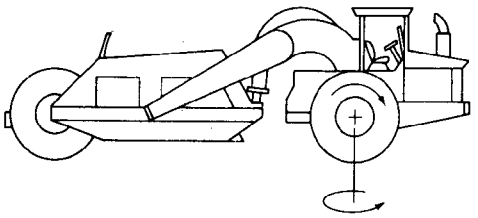

FIG. 5.1.1—TWO AXLES, ARTICULATED STEER, FRONT-AXLE DRIVE

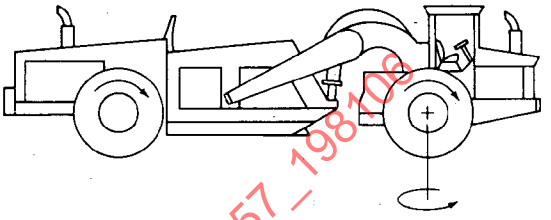

FIG. 5.1.2—TWO AXLES, ARTICULATED STEER, TWO-AXLE DRIVE

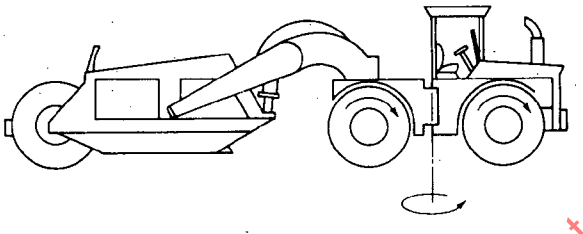

FIG. 5.1.3—THREE AXLES, ARTICULATED STEER, FRONT- AND CENTER-AXLE DRIVE (ARTICULATED TRACTOR OR FOUR-WHEEL STEER TRACTOR)

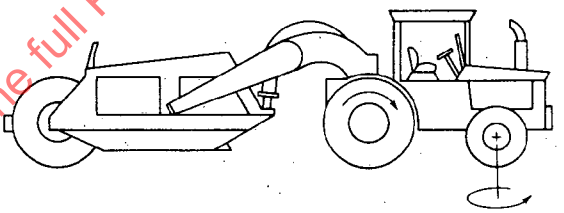

FIG. 5.1.4—THREE AXLES, FRONT-WHEEL STEER, CENTER-AXLE DRIVE

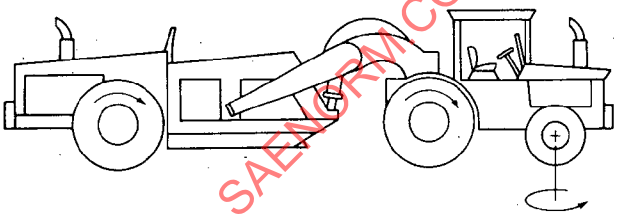

FIG. 5.1.5—THREE AXLES, FRONT-WHEEL STEER, CENTER- AND REAR-AXLE DRIVE

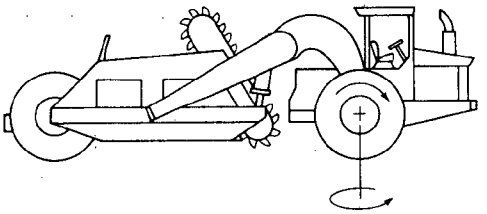

FIG. 5.2.1—TWO AXLES, ARTICULATED STEER, FRONT-AXLE DRIVE

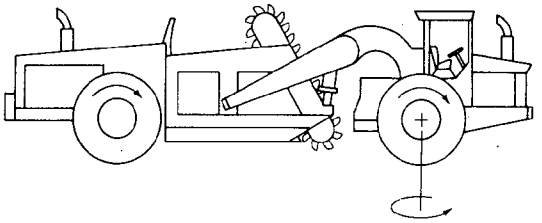

FIG. 5.2.2—TWO AXLES, ARTICULATED STEER, TWO-AXLE DRIVE

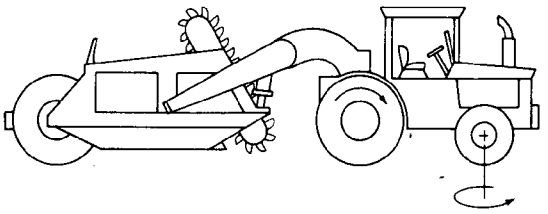

FIG. 5.2.3—THREE AXLES, FRONT-WHEEL STEER, CENTER-AXLE DRIVE

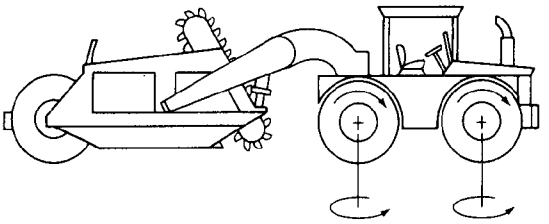

FIG. 5.2.4—THREE AXLES, ARTICULATED STEER, FRONT- AND CENTER-AXLE DRIVE (ARTICULATED TRACTOR OR FOUR-WHEEL STEER TRACTOR)

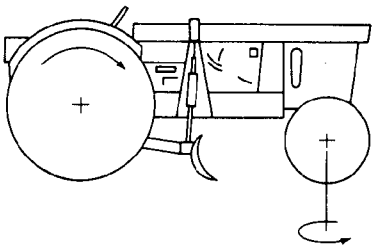

FIG. 6.1.1—FOUR WHEEL, FRONT-WHEEL STEER, TWO-WHEEL DRIVE (FRONT ENGINE)

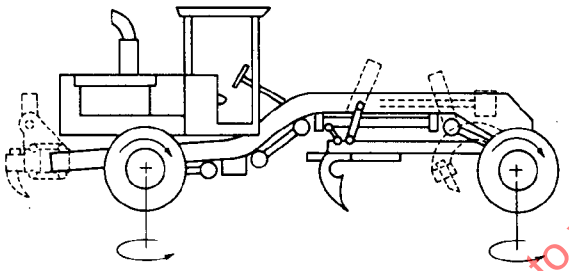

FIG. 6.1.2—FOUR WHEEL, FRONT- AND REAR-WHEEL STEER, FOUR-WHEEL DRIVE

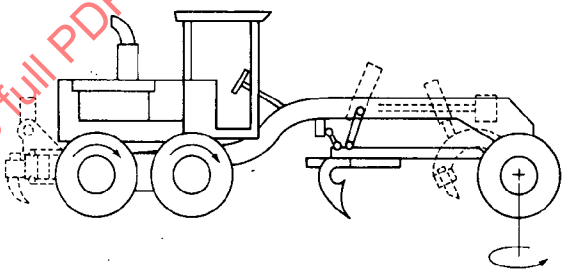

FIG. 6.1.3—SIX WHEEL, FRONT-WHEEL STEER, FOUR-WHEEL DRIVE

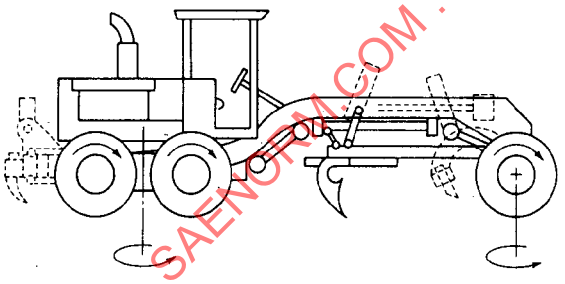

FIG. 6.1.4—SIX WHEEL, FRONT-WHEEL AND REAR BOGIE STEER, SIX-WHEEL DRIVE

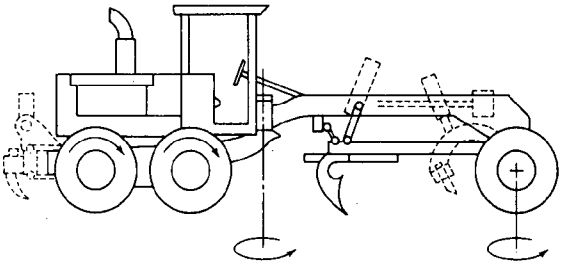

FIG. 6.2.1—SIX WHEEL, FRONT-WHEEL AND ARTICULATED STEER, FOUR-WHEEL DRIVE

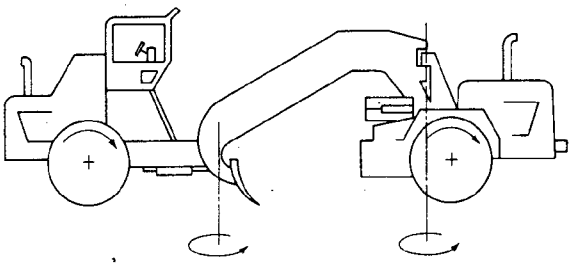

FIG. 6.2.2—FOUR WHEEL, DOUBLE ARTICULATED STEER, FOUR-WHEEL DRIVE