Nomenclature and Dimensions for Hydraulic Excavators—SAE J1193a

SAE Recommended Practice
Last Revised June 1979

THIS IS A PREPRINT WHICH IS SUBJECT TO REVISIONS AND CORRECTIONS. THE FINAL VERSION WILL APPEAR IN THE 1980 EDITION OF THE SAE HANDBOOK.

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NOMENCLATURE AND DIMENSIONS FOR HYDRAULIC EXCAVATORS—SAE J1193a

SAE Recommended Practice

Report of Off-Road Machinery Technical Committee approved April 1978 and last revised June 1979. Rationale statement available.

1. Purpose—The purpose of this recommended practice is to establish a uniform method of providing dimensional specifications and nomenclature for mobile hydraulic excavators.

2. Scope—This recommended practice applies to hydraulic excavators as ϕ defined in SAE Standard J1057.

3. This recommended practice includes the nomenclature peculiar to and most commonly used to describe this type of equipment. The illustrations are not intended to be descriptive of any existing machine and are used only to clarify the meaning of this recommended practice.

ϕ 4. The numbered terms are nomenclature and apply to Figs. 1—7, as applicable.

5. The single letter dimensions apply to Figs. 1, 2, and 3 and are primarily to define vehicle size.

ϕ 6. The double letter dimensions apply to Figs. 4, 5, 6, and 7 which illustrate the functional range of the common types of hydraulic excavators.

7. For dimensions relative to turning radius of rubber tired vehicles, refer to SAE J695.

8. All dimensions are based on machines setting on a groundline that provides firm level support. Rubber tired vehicles are on manufacturers specified tires inflated to specified pressure, crawler track shoes do not penetrate groundline.

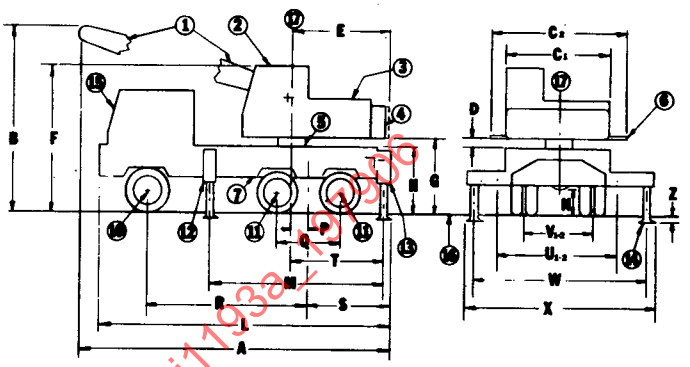


FIG. 3—WHEEL MOUNTED, SEPARATE OPERATOR AND TRANSPORT STATIONS

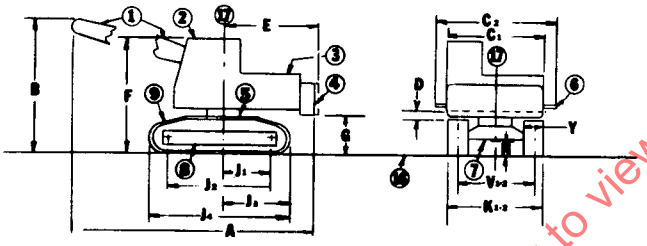


FIG. 1—CRAWLER MOUNTED

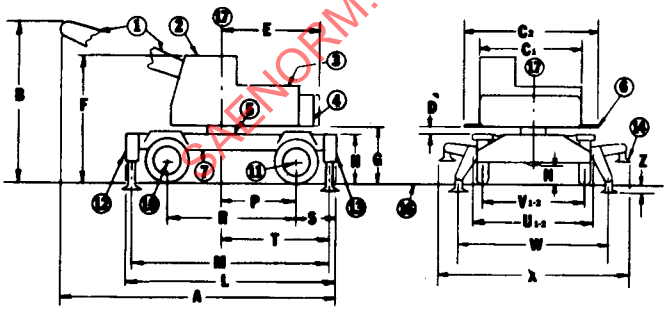


FIG. 2—WHEEL MOUNTED, SINGLE OPERATOR STATION

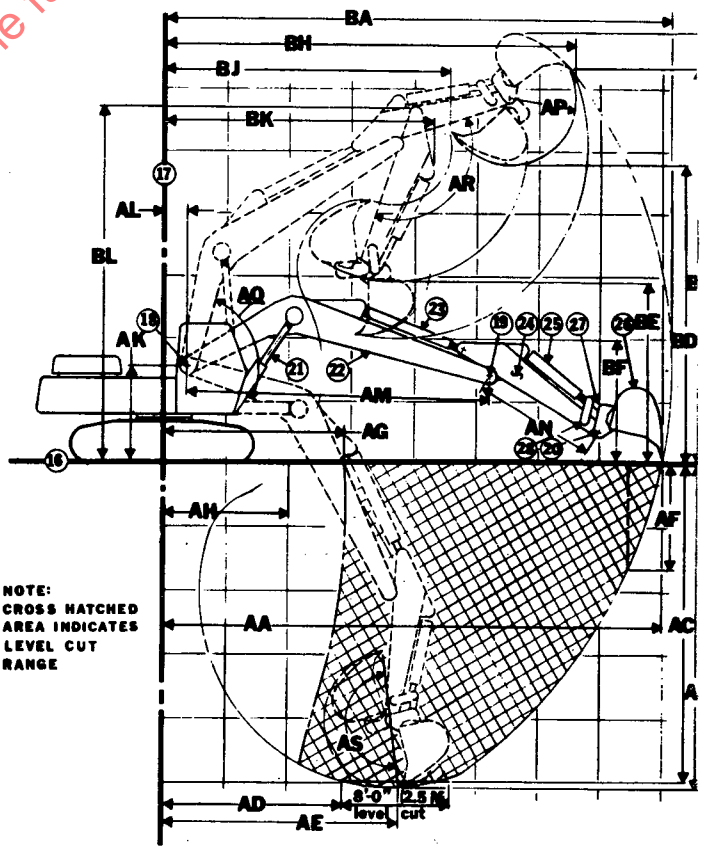


FIG. 4—HOE TYPE EXCAVATOR

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.

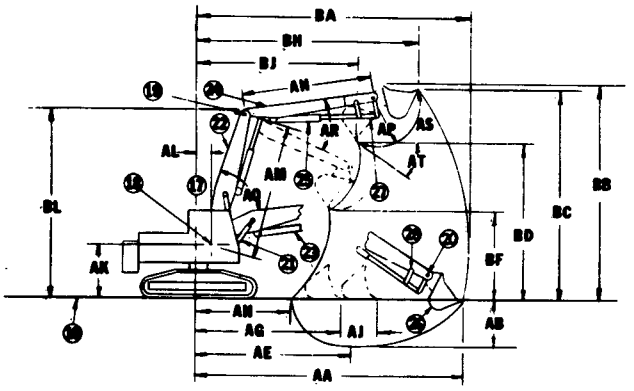


FIG. 5—SHOVEL TYPE EXCAVATOR

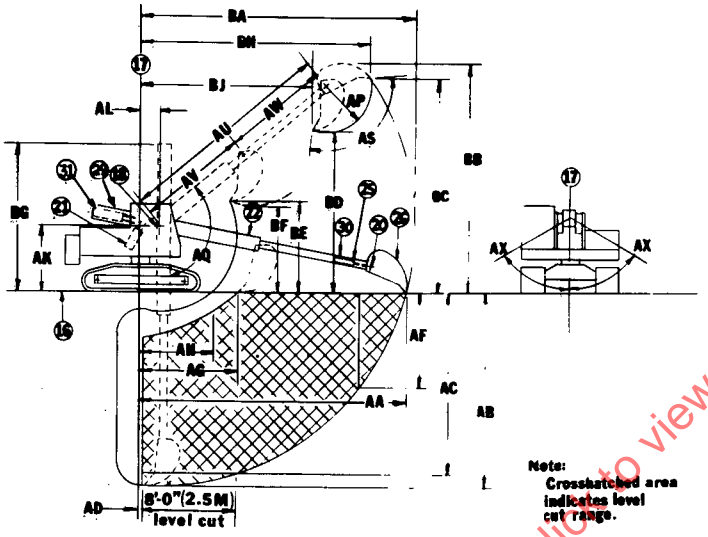
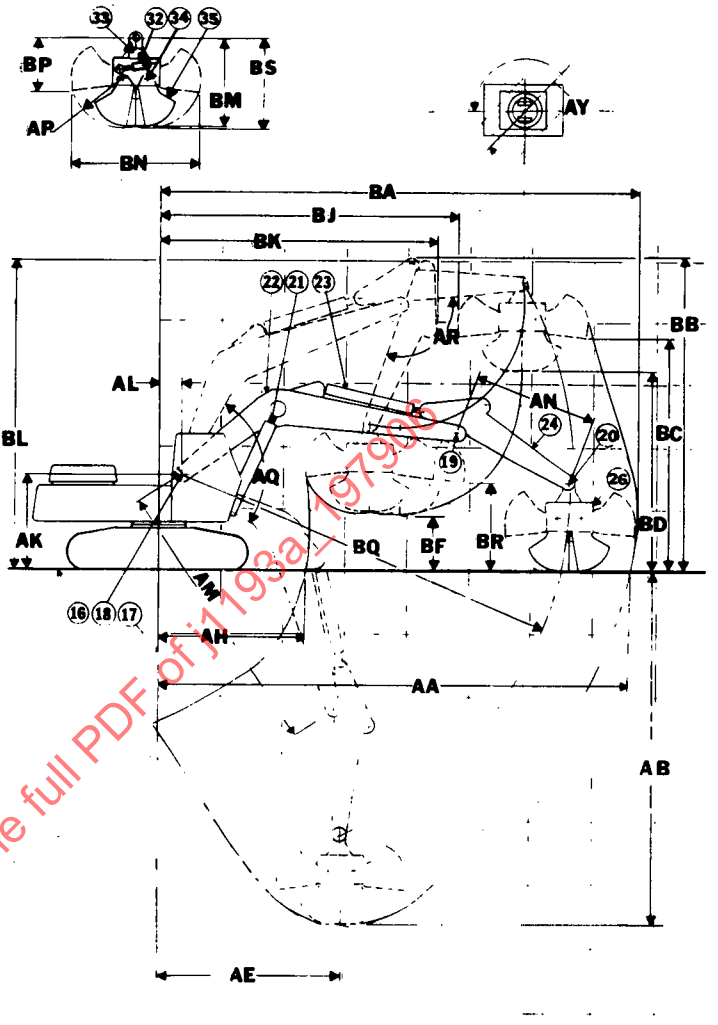


FIG. 6—TELESCOPING BOOM TYPE EXCAVATOR



φ FIG. 7—HOE TYPE EXCAVATOR WITH CLAMSHELL BUCKET

NOMENCLATURE

1. WORKING EQUIPMENT
2. CAB
3. UPPERSTRUCTURE
4. COUNTERWEIGHT
5. SWING BEARING
6. CATWALK
7. UNDERCARRIAGE FRAME
8. TRACK FRAME
9. TRACK ASSEMBLY
10. FRONT AXLE
11. REAR AXLE OR AXLES
12. FRONT OUTRIGGER ASSEMBLY
13. REAR OUTRIGGER ASSEMBLY
14. OUTRIGGER PAD
15. CAB, TRANSPORT STATION
16. GROUNDLINE
17. AXIS OF ROTATION
18. BOOM PIVOT
19. ARM PIVOT
20. BUCKET PIVOT
21. BOOM CYLINDER
22. BOOM
23. ARM CYLINDER
24. ARM
25. BUCKET CYLINDER
26. BUCKET
27. BUCKET LINK
28. GUIDE LINK
29. BASE BOOM SECTION
30. TELESCOPING BOOM SECTION
31. TELESCOPING CYLINDER
φ 32. CLAM CYLINDER
φ 33. ROTATOR
φ 34. SCOOP PIVOT
φ 35. SCOOP

DIMENSIONS

A	OVERALL LENGTH
B	OVERALL HEIGHT
C1	WIDTH OF UPPERSTRUCTURE
C2	WIDTH OF UPPERSTRUCTURE WITH CATWALKS
D	MINIMUM CLEARANCE, UPPERSTRUCTURE TO UNDERCARRIAGE
E	SWING CLEARANCE, REAR OF UPPERSTRUCTURE
F	TOP OF CAB TO GROUNDLINE
G	CLEARANCE, UPPERSTRUCTURE TO GROUNDLINE (OUTRIGGERS RETRACTED)
H	TOP OF WHEEL MOUNTED UNDERCARRIAGE FRAME TO GROUNDLINE
J1	AXIS OF ROTATION TO CENTERLINE OF DRIVE SPROCKETS
J2	NOMINAL DISTANCE BETWEEN CENTERLINES OF DRIVE SPROCKETS AND IDLERS
J3	AXIS OF ROTATION TO END OF TRACK ASSEMBLY
J4	NOMINAL OVERALL LENGTH OF TRACK ASSEMBLY
K1	OVERALL WIDTH OF CRAWLER (RETRACTED)
K2	OVERALL WIDTH OF CRAWLER (EXTENDED)
L	OVERALL LENGTH OF UNDERCARRIAGE
M	DISTANCE BETWEEN FRONT AND REAR OUTRIGGERS
ϕN	GROUND CLEARANCE (PER SAE J1234)
P	CENTER OF REAR AXLE OR TANDEM TO AXIS OF ROTATION
Q	DISTANCE BETWEEN CENTERS OF TANDEM AXLES
R	WHEELBASE (FOR TANDEM AXLES IS MEASURED TO TANDEM PIVOT POINT)
S	CENTER OF REAR OR TANDEM AXLE TO REAR OF FRAME
T	AXIS OF ROTATION TO CENTERLINE OF REAR OUTRIGGERS
U1	OVERALL WIDTH WITH RETRACTED OUTRIGGERS (PADS REMOVED)
U2	OVERALL WIDTH WITH RETRACTED OUTRIGGERS (PADS ATTACHED)

CRAWLER MOUNTED

V1	TRACK GAGE, ROLLER CENTERLINE TO ROLLER CENTERLINE (RETRACTED)
V2	TRACK GAGE, ROLLER CENTERLINE TO ROLLER CENTERLINE (EXTENDED)

WHEEL MOUNTED

V1	TREAD, REAR AXLE
V2	TREAD, FRONT AXLE

W	EFFECTIVE SPREAD OF EXTENDED OUTRIGGERS
X	OVERALL WIDTH OVER PADS WITH OUTRIGGERS EXTENDED
Y	WIDTH OF CRAWLER TRACK ASSEMBLY
Z	MAXIMUM EXTENSION OF OUTRIGGERS BELOW GROUNDLINE

DIMENSIONS

AA	MAXIMUM RADIUS AT GROUNDLINE
AB	MAXIMUM DIGGING DEPTH
ϕAC	MAXIMUM DEPTH FOR 8 ft (2.5 m) LEVEL CUT
ϕAD	MINIMUM RADIUS OF 8 ft (2.5 m) LEVEL CUT AT DEPTH "AC"
AE	RADIUS OF MAXIMUM DIGGING DEPTH
AF	MAXIMUM DEPTH OF VERTICAL WALL WHICH CAN BE EXCAVATED
AG	MINIMUM LEVEL CUT RADIUS WITH BUCKET FLAT ON GROUNDLINE
AH	MINIMUM RADIUS AT GROUNDLINE
AJ	LEVEL CUT WITH BUCKET FLAT ON GROUNDLINE
AK	BOOM PIVOT TO GROUNDLINE
AL	BOOM PIVOT TO AXIS OF ROTATION
AM	BOOM LENGTH (BOOM PIVOT TO ARM PIVOT)
AN	ARM LENGTH (ARM PIVOT TO BUCKET PIVOT)
AP	BUCKET TOOTH RADIUS
AQ	BOOM PIVOT ANGLE
AR	ARM PIVOT ANGLE
AS	BUCKET PIVOT ANGLE
AT	SHOVEL BUCKET DUMP ANGLE AT MAXIMUM HEIGHT
AU	MAXIMUM TELESCOPING BOOM LENGTH (BOOM PIVOT TO BUCKET PIVOT)
AV	MINIMUM TELESCOPING BOOM LENGTH (BOOM PIVOT TO BUCKET PIVOT)
AW	TELESCOPING TRAVEL
AX	BUCKET TILT ANGLE (BOTH SIDES OF CENTER)
ϕAY	BUCKET ROTATION ANGLE