

**Nomenclature and Dimensions for Hydraulic Excavators**

1. **Scope**—This recommended practice applies to hydraulic excavators as defined in SAE Standard J1057.
  - 1.1 **Purpose**—The purpose of this recommended practice is to establish a uniform method of providing dimensional specifications and nomenclature for mobile hydraulic excavators.
2. **References**
  - 2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.
    - 2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.
      - SAE J695—Turning Ability and Off Tracking—Motor Vehicles
      - SAE J1057—Identification Terminology of Earthmoving Machines
      - SAE J1234—Specification Definitions—Off-Road Work Machines
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.
4. The numbered terms are nomenclature and apply to Figures 1 to 7, as applicable.
5. The single letter dimensions apply to Figures 1, 2, and 3 and are primarily to define machine size.
6. The double letter dimensions apply to Figures 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 machines, refer to SAE J695.
8. All dimensions are based on machines setting on a groundline that provides firm level support. Rubber tired machines are on manufacturers specified tires inflated to specified pressure, crawler track shoes do not penetrate groundline.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790  
SAE WEB ADDRESS <http://www.sae.org>

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
32. CLAM CYLINDER
33. ROTATOR
34. SCOOP PIVOT
35. SCOOP

SAENORM.COM : Click to view the full PDF of j1193\_200103

SAE J1193 Cancelled MAR2001

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
- N 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

SAE J1193 Cancelled MAR2001

DIMENSIONS

AA	MAXIMUM RADIUS AT GROUNDLINE
AB	MAXIMUM DIGGING DEPTH
AC	MAXIMUM DEPTH FOR 8 ft (2.5 m) LEVEL CUT
AD	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)
AY	BUCKET ROTATION ANGLE
BA	MAXIMUM RADIUS OF WORKING EQUIPMENT
BB	MAXIMUM HEIGHT OF WORKING EQUIPMENT
BC	MAXIMUM BUCKET TOOTH HEIGHT
BD	MINIMUM CLEARANCE OF BUCKET TEETH, WITH BUCKET PIVOT AT MAXIMUM HEIGHT
BE	MINIMUM CLEARANCE OF FULLY CURLED BUCKET AT MAXIMUM BOOM HEIGHT
BF	MINIMUM CLEARANCE OF BUCKET TEETH AT MAXIMUM BOOM HEIGHT
BG	MAXIMUM HEIGHT OF WORKING EQUIPMENT WITH BUCKET BELOW GROUNDLINE
BH	RADIUS OF BUCKET TEETH AT MAXIMUM HEIGHT
BJ	MINIMUM RADIUS OF BUCKET TEETH AT MAXIMUM BUCKET PIVOT HEIGHT
BK	MAXIMUM WORKING EQUIPMENT RADIUS WITH BOOM AT MAXIMUM HEIGHT AND WITH ARM FULLY RETRACTED
BL	MAXIMUM HEIGHT OF WORKING EQUIPMENT WITH ARM RETRACTED
BM	BUCKET HEIGHT CLOSED
BN	MAXIMUM TOOTH OPENING
BP	BUCKET HEIGHT OPEN
BQ	MAXIMUM BUCKET PIVOT RADIUS
BR	MINIMUM CLEARANCE OF OPEN BUCKET AT MAXIMUM BOOM HEIGHT
BS	BUCKET PIVOT TO MAXIMUM SCOOP RADIUS

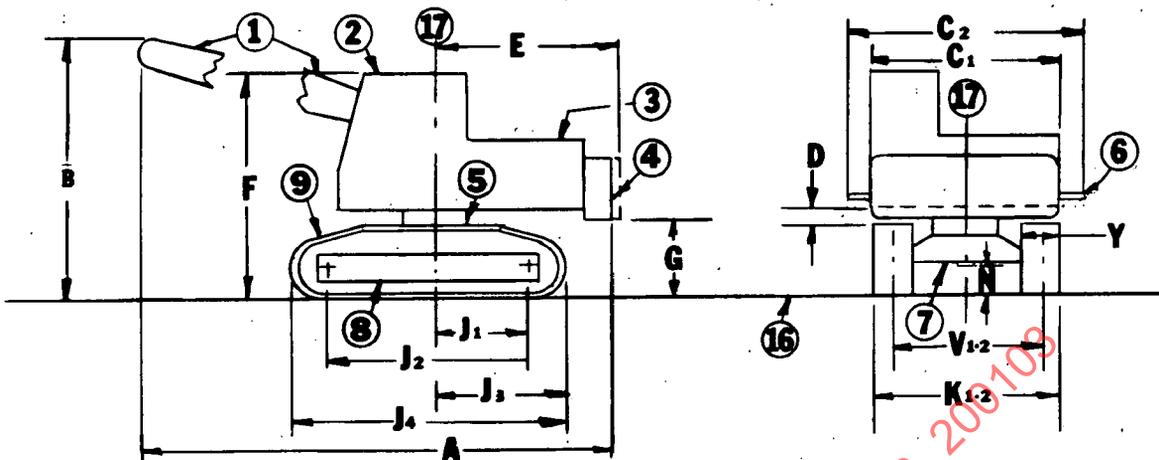


FIGURE 1—CRAWLER MOUNTED

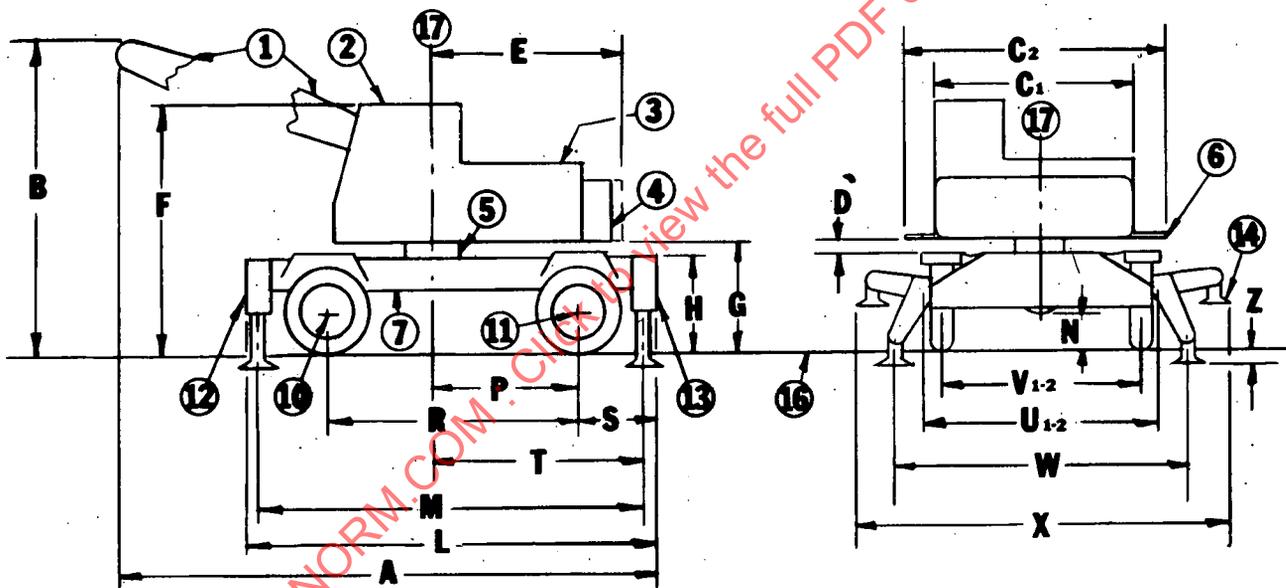


FIGURE 2—WHEEL MOUNTED, SINGLE OPERATOR STATION



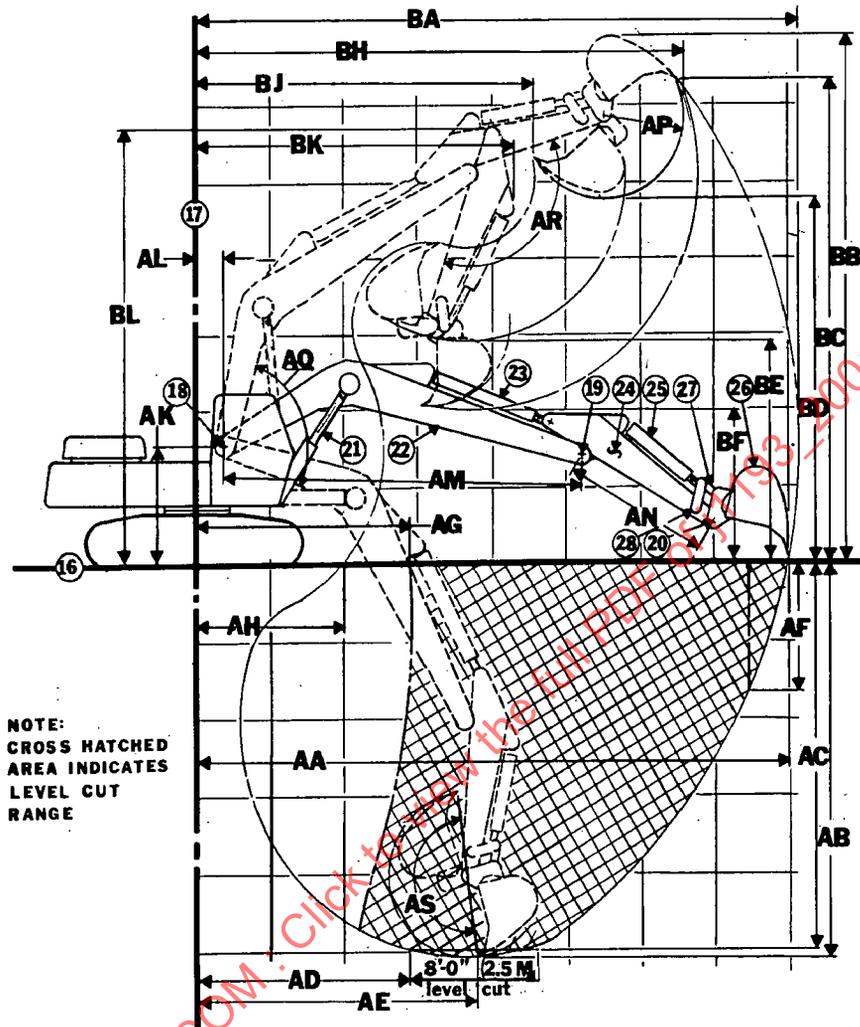


FIGURE 4—HOE TYPE EXCAVATOR

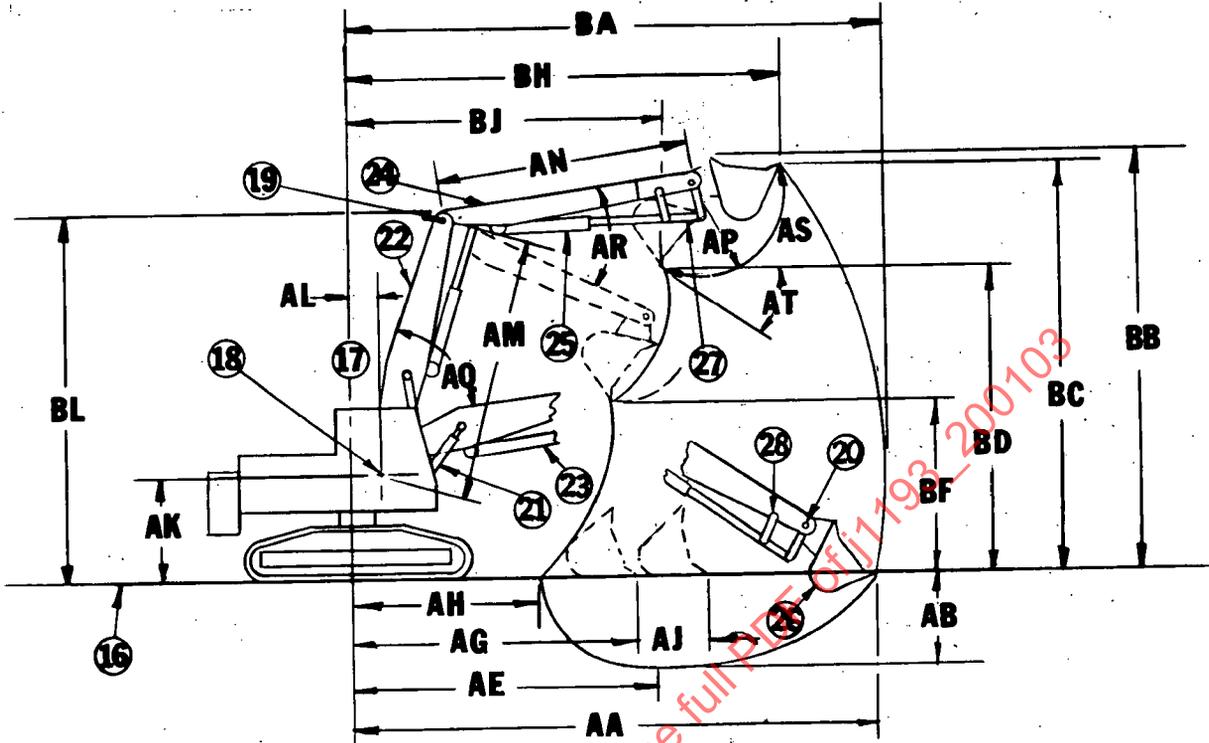


FIGURE 5—SHOVEL TYPE EXCAVATOR

SAENORM.COM : Click to view the full PDF of J1193-200103