

JIS

JAPANESE INDUSTRIAL STANDARD

Standard Form of Specifications of
Shovel Type Excavators
(Hydraulic Cylinder Type)

JIS A 8404—1984

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Shovel Type Excavators (Hydraulic Cylinder Type)

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1. Scope

This Japanese Industrial Standard specifies the standard form of specifications of shovel type excavators, hereinafter referred to as the "excavators", of oil hydraulic cylinder type and whose travel device is crawler mounted, truck mounted or wheel mounted, hereinafter referred to as the "standard form of specifications", and inscription gist of specifications.

This standard form of specifications may be applied to excavators mounted with front attachment of not specified herein type, as appropriate.

Remark: In this standard, the units and numerical values given in { } are in accordance with the International System of Units (SI), and are appended for reference.

2. Definitions

For the purpose of this standard, the main definitions are in accordance with JIS A 8403.

3. Standard Form of Specifications

3.1 The specifications shall indicate the outlines of performance of excavators and of various dimensions. The excavators, unless otherwise specified, shall be of new car state adjusted regularly according to standard specifications and standard equipment specified by the manufacturer.

3.2 The specifications shall be in accordance with the form of Attached Table 1. In inscription, the items may be selected adequately depending upon the purpose, but the main specification items indicated in Attached Table 1 with mark ○ are desirable to describe in catalogue for trade and the table is shown in Attached Table 2. Furthermore, the construction of each part, materials and test methods may be attached as required.

3.3 The drawings such as full section, working range drawing, etc. shall be appended to the specifications.

4. Inscription Gist of Specifications

4.1 General Inscription Gist The general inscription gist of specifications shall be as follows:

- (1) The numerical values to be inscribed in specifications, unless otherwise specified, shall be integral values. In the case of inscribing decimal value, the number of places of significant numerals shall be in accordance with specifications of each item.

Applicable Standards: See page 49.

- (2) The method of rounding-off of numerical values, unless otherwise specified, shall be as follows:
- (a) For the mass, fraction of 10 kg shall be rounded off to unit of 10 kg.
 - (b) For the force, fraction of 100 kgf shall be counted of 50 kg and over as 100 kgf and cut away the rest to make 100 kgf {in the case of kN unit, it shall be integer value}.
 - (c) For the completed machine dimensions, body dimensions and working dimensions, fraction of 10 mm shall be counted of 5 mm and over and cut away the rest to make 10 mm unit. However, the dimensions less than 1000 mm shall be round off to 5 mm unit.
 - (d) In other cases, for the numerical value of the next place of inscription value, count fraction of 5 and over as a unit and cut away the rest.

4.2 Name of Machine The manufacturer's name and type name shall be inscribed.

4.3 Type of Machine

4.3.1 Type of Machine and Standard The division of travel type of under carriage according to JIS A 8401 such as crawler mounted, truck mounted, wheel mounted (in the case of truck mounted or wheel mounted, describe the designation of wheel arrangement), and furthermore the division of diesel engine and electric motor for prime mover shall be inscribed.

4.3.2 Kind of Working Device Kind of front attachments according to JIS A 8401 and existence of blade and the like shall be inscribed.

4.3.3 Capacity of Bucket The capacity of bucket of front attachment according to JIS A 8401 shall be inscribed with the unit of cubic meter (m^3) to two places of significant figures. Provided that in the case of back hoe-face shovel and loading shovel, the capacity shall be indicated by heaped capacity, and the struck capacity shall also be appended.

4.3.4 Working Dimensions The working dimensions of front attachment in accordance with JIS A 8401 shall be inscribed.

4.4 Completed Machine Dimensions

4.4.1 Figure of Completed Machine The dimensions of completed machine shall be values in the following figure:

(1) Crawler Mounted

- (a) In the case of having back hoe attachment, fold the arm and boom to the maximum limit in the range where the bucket does not contact with boom, and lower the boom to the figure where the front attachment is in contact with ground.
- (b) In the case of having loading shovel attachment, make the figure at the time of measuring the minimum radius of floor surface finishing.

- (c) In the case of others, the figure specified by the manufacturer in accordance with (a) and (b) as appropriate.
- (2) Truck Mounted and Wheel Mounted The travelling figure at the time of specifying the type of car based on Chapter 5, Article 75, Item 1 of the Road Vehicles Act. Provided that the dimensions removed of back mirror, under mirror and flexible type antenna. Further, in the case where the working lamp and gas-discharge tube are protruded and these are detached at the time of transportation based on the dimensional regulation, the names of parts to be detached and the dimensions when detached shall be appended.

4.4.2 Overall Length The overall length at the time of completion shall be be inscribed.

4.4.3 Overall Width In the case of having crawler extending mechanism, the dimensions when extended and also the dimensions at the time of shrinkage shall be appended.

4.4.4 Overall Height In the case of crawler mounted, the dimension from the lower end of shoe including grouser shall be inscribed.

4.5 Mass and Others

4.5.1 Total Working Mass The total working mass in accordance with JIS A 8401 shall be inscribed.

4.5.2 Machine Mass The machine mass in accordance with JIS A 8401 shall be inscribed.

4.5.3 Mass Distribution Concerning the truck mounted and wheel mounted, the masses distributed to each axle at the travelling figure under working condition and its ratio to total working mass shall be inscribed.

4.5.4 Ground Pressure In the case of the crawler mounted, the ground pressure in accordance with JIS A 8401 shall be inscribed to two places of decimals in the unit of gravimetric kilogram per square centimeter (kgf/cm²) {kPa} {in the unit of kPa, to the whole number}.

4.5.5 Base Machine Mass In the case of large type machine in which the front attachment is detached when transporting, the base machine mass in accordance with JIS A 8401 shall be inscribed.

4.6 Performance

4.6.1 Swing Speed The swing speed in accordance with JIS A 8401 shall be inscribed by the unit of revolution per minute (rpm) {min⁻¹}.

4.6.2 Travel Speed The number of steps of travel speed and the travel speed in accordance with JIS A 8401 shall be inscribed by the unit of kilometer per hour (km/h). In the case of 2 or over in number of speed steps, the maximum speed step and the minimum speed step shall be inscribed. The inscribed value of travel speed shall be to one place of decimal in crawler mounted and wheel mounted, and to the whole number in truck mounted.

4.6.3 Maximum Tractive Force The tractive force capable of putting out on horizontal hard soil shall be inscribed by the unit of gravimetric kilogram (kgf) {kN}. Provided that the influence due to sliding between the excavator and the road surface is not considered.

4.6.4 Climbing Ability The climbing ability in accordance with JIS A 8401 ($\tan \theta$) shall be inscribed by percentage (%). Provided that the influence due to sliding between the excavator and the road surface is not considered, and it shall be the maximum ability to be able to climb continuously.

4.6.5 Steering Ability

- (1) **Spin Turn** Concerning the crawler mounted, the ability of spin turn shall be inscribed.
- (2) **Minimum Turning Radius** Concerning the truck mounted and the wheel mounted, the minimum turning radius and the radius of trace described by the most outside part of the base machine (clearance circle) in accordance with JIS A 8401 shall be inscribed by the unit of meter (m) to one place of decimal.

4.6.6 Noise The peripheral noise level at the no load engine maximum rotation in accordance with JIS A 8402 (the maximum value at 30 m from the outside surface of upper machinery in 4 directions) and the noise level at the ear of operator shall be inscribed by the unit of decibel [dB (A)].

4.6.7 Stability The stability in accordance with JIS A 8401 shall be inscribed:

- (1) **Stability** The stability at working in the state where the direction of front attachment is most unfavorable concerning the stability shall be inscribed by percentage (%). For the excavator having crawler extending mechanism the value at the extended time, and that having outrigger the values at the time of using and of not working shall be inscribed.
- (2) **Left and Right Stable Inclination Angle** Concerning the excavators of truck mounted and wheel mounted, the left and right stable inclination angle at travelling figure shall be inscribed in degree (°) unit with discarding the value less than one degree.

4.7 Dimensions of Base Machine The dimensions of base machine shall be those excluding back mirror, under mirror and flexible antenna.

Further, in the type of machine in which working lamp, discharge gas tube, etc. are protruded and these are detached at the time of transporting based on the dimensional regulation, the name of parts to be detached and the dimensions when these are detached shall be appended.

4.7.1 Crawler Mounted

- (1) **Overall Length of Base Machine** The overall length of base machine combined with the upper machinery and lower machinery shall be inscribed (A of Fig. 1).
- (2) **Overall Width of Base Machine** The distance between the both outside ends of base machine shall be inscribed. In the case of machine having crawler extending mechanism, the dimensions at the time of shrinkage shall be inscribed in combination (B, and B' of Fig. 1).

- (3) Overall Width of Upper Machinery The distance between the both outside ends of upper machinery shall be inscribed. The distance from the center of base machine to both outside ends in left and right shall be inscribed together (C , C' , and C'' of Fig. 1).
- (4) Width of Cab The outside dimensions of both side walls of cab shall be inscribed (D of Fig. 1).
- (5) Overall Height of Base Machine The height from the ground surface to the highest part of base machine shall be inscribed. This dimension shall include the height of grouser of crawler shoe (E of Fig. 1).
- (6) Rear End Radius The maximum radius of rear part of swing body at the time of swinging shall be inscribed (F of Fig. 1).
- (7) Rear End Distance The horizontal distance from the center line of rotation to the rear end of swing body shall be inscribed (F' of Fig. 1).
- (8) Ground Clearance of Rotating Upper Structure Rear End The height from the ground surface to rotating upper structure rear end shall be inscribed. This dimension shall be the dimension from the lower surface of shoe excluding the height of grouser of crawler shoe. In the excavator equipped with swamp type shoe, it shall be the height from the end point of inclined part of lower surface of crawler shoe (G of Fig. 1).
- (9) Crawler Base The distance between the centers of the drive tumbler and the idler tumbler shall be inscribed (H of Fig. 1).
- (10) Overall Length of Crawlers The horizontal distance between the front and the rear ends of crawler belt adjusted at the specified tension. This dimension shall be that including the height of grouser of shoe (J of Fig. 1).
- (11) Overall Width of Crawlers The horizontal distance between the both outside ends of left and right crawlers shall be inscribed. For the machine having extending mechanism for crawler, the dimension at the time of shrinkage shall be appended (K , K' of Fig. 1).
- (12) Track Gauge The horizontal distance between the left and right centers of crawlers shall be inscribed. For the machine having extending mechanism for crawler, the dimension at the time of shrinkage shall be appended (L , L' of Fig. 1).
- (13) Track Shoe Width The track shoe width shall be inscribed (M of Fig. 1).
- (14) Ground Clearance of Undercarriage The height from the center of undercarriage to the ground surface at the lowest part within each 25 % of track gauge in left and right shall be inscribed, and the place shall be appended. This dimension shall be the dimension from the under surface of shoe excluding the grouser height of crawler shoe. In the case of undercarriage equipped with swamp type shoe, it shall be the height from the end point of inclined part of under surface of crawler shoe (N of Fig. 1).

4.7.2 Truck and Wheel Mounted Where there is no special description, the dimension shall be that at the time of recovery of outrigger.

- (1) Overall Length of Base Machine The dimension according to 4.7.1 (1) shall be inscribed (A of Fig. 2 and Fig. 3).
- (2) Overall Width of Base Machine The dimension according to 4.7.1(2) shall be inscribed. In the case of machine with outrigger, the overall width at recovery, that at extending, and the maximum trace width shall be appended (B , B' of Fig. 2 and Fig. 3, B'' of Fig. 2).
- (3) Overall Length of Chassis The overall length of chassis shall be inscribed (J' of Fig. 2 and Fig. 3).
- (4) Overall Width of Chassis The overall width of chassis shall be inscribed. It shall be the maximum width of chassis at the time the outrigger recovery (K'' of Fig. 2 and Fig. 3).
- (5) Overall Width of Upper Machinery The dimension according to 4.7.1 (3) shall be inscribed (C , C' , C'' of Fig. 2. and Fig. 3).
- (6) Width of Cab The dimension according to 4.7.1 (4) shall be inscribed (D of Fig. 2 and Fig. 3).
- (7) Overall Height of Base Machine The dimension according to 4.7.1 (5) shall be inscribed (E of Fig. 2 and Fig. 3).
- (8) Rear End Radius The dimension according to 4.7.1 (6) shall be inscribed (F of Fig. 2 and Fig. 3).
- (9) Rear End Distance The dimension according to 4.7.1 (7) shall be inscribed (F' of Fig. 2 and Fig. 3).
- (10) Ground Clearance of Rotating Upper Structure End The dimension according to 4.7.1 (8) shall be inscribed (G of Fig. 2 and Fig. 3).
- (11) First Wheel Base The horizontal distance between centers of front and rear axles shall be inscribed. For the machine having three axles, it shall be the horizontal distance between the front and intermediate axles. In the case of bogie axle, it shall be the horizontal distance between the central positions of front and bogie axles (H' of Fig. 2 Fig. 3).
- (12) Second Wheel Base The horizontal distance between the intermediate and rear axles shall be inscribed (in the case of two axles, the inscription is not required).
- (13) Remotest Wheel Base The horizontal distance between the centers of front and most rear axles shall be inscribed (R of Fig. 2 and Fig. 3).
- (14) Width of Outrigger Extended Pad Center The horizontal distance between centers of outrigger floats when the outrigger is extended to the maximum shall be inscribed (L'' of Fig. 2 and Fig. 3).

- (15) Tread (Front) The horizontal distance between centers of contact surfaces of front wheel left and right tire tread face with road surface shall be inscribed. In the case of dual tires, it shall be the horizontal distance between centers of distances between center lines of twin tires shall be inscribed (*S* of Fig. 2 and Fig. 3).
- (16) Tread (Rear) The same matters as in 4.7.2 (15) shall be inscribed concerning the rear wheel (*S'* of Fig. 2 and Fig. 3).
- (17) Distance between Center of Rotation and Rear Axle or Bogie
The horizontal distance between center of rotation and bogie axle center (in the case of two axles, the rear axle) shall be inscribed (*T* of Fig. 2 and Fig. 3).
- (18) Rear Overhang of Chassis The horizontal distance from bogie axle center (in the case of two axles, the rear axle) to the rear end of chassis shall be inscribed. It shall be the dimension including float of outrigger excepting the detachable type float (*U* of Fig. 2 and Fig. 3).
- (19) Front Overhang of Chassis The horizontal distance from the most front axle center to the most front part of chassis shall be inscribed. The dimension shall include all fixed parts to chassis such as bumper, hook and the like (*V* of Fig. 2 and Fig. 3).
- (20) Rear Overhang The horizontal distance from bogie axle center (in the case of two axles, the rear axle) to the rear end of completed machine in travelling figure shall be inscribed (*W* of Fig. 2 and Fig. 3).
- (21) Ground Clearance of Undercarriage The height from the center of chassis to the ground surface of the lowest part within each 25 % of tread in left and right shall be inscribed and the place shall be appended. Exclud the lower part of brake drum from the measurement of this ground clearance of undercarriage (*N* of Fig. 2 and Fig. 3).

Fig. 1. Base Machine (Crawler Mounted)

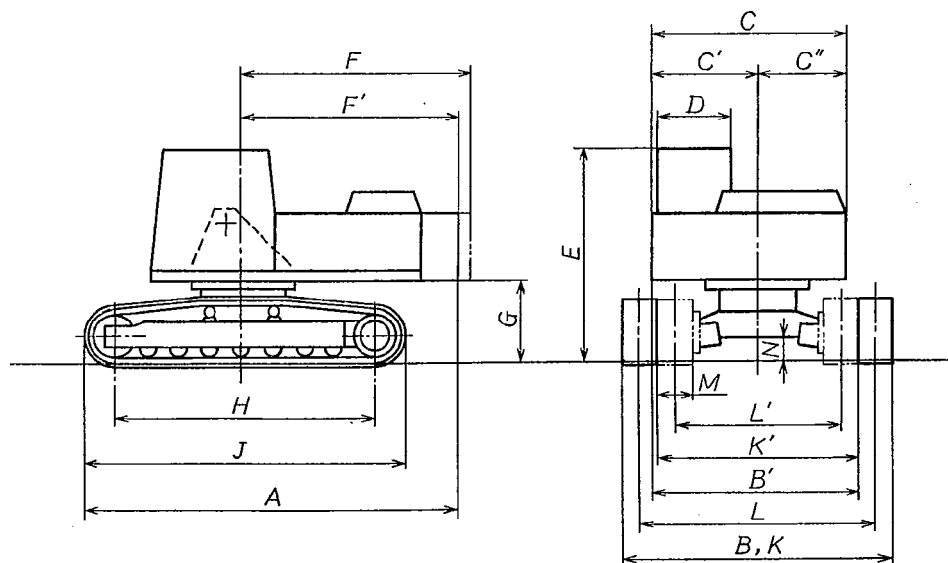


Fig. 2. Base Machine (Wheel Mounted)

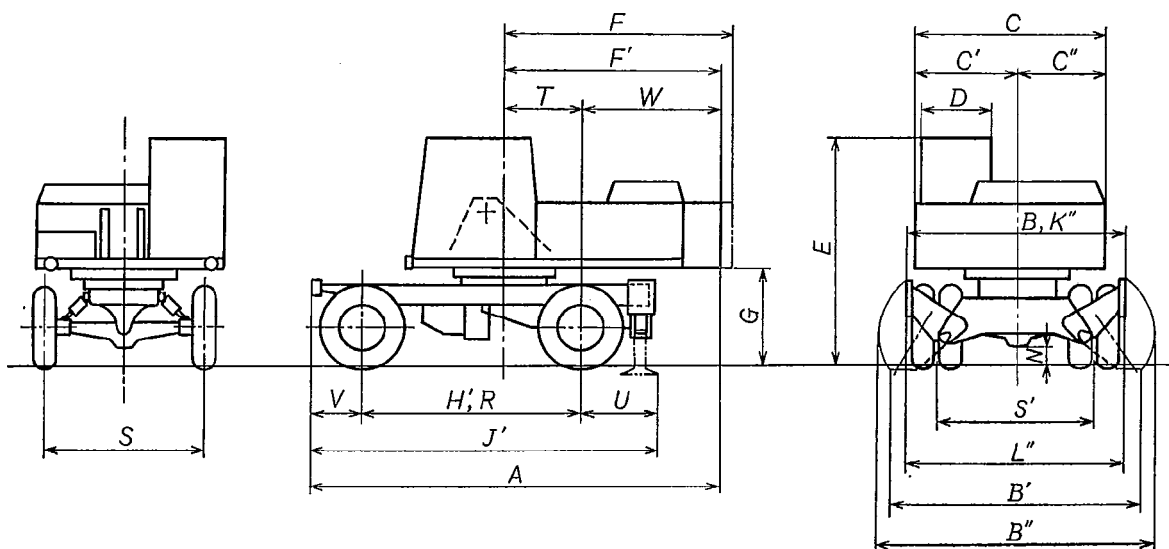
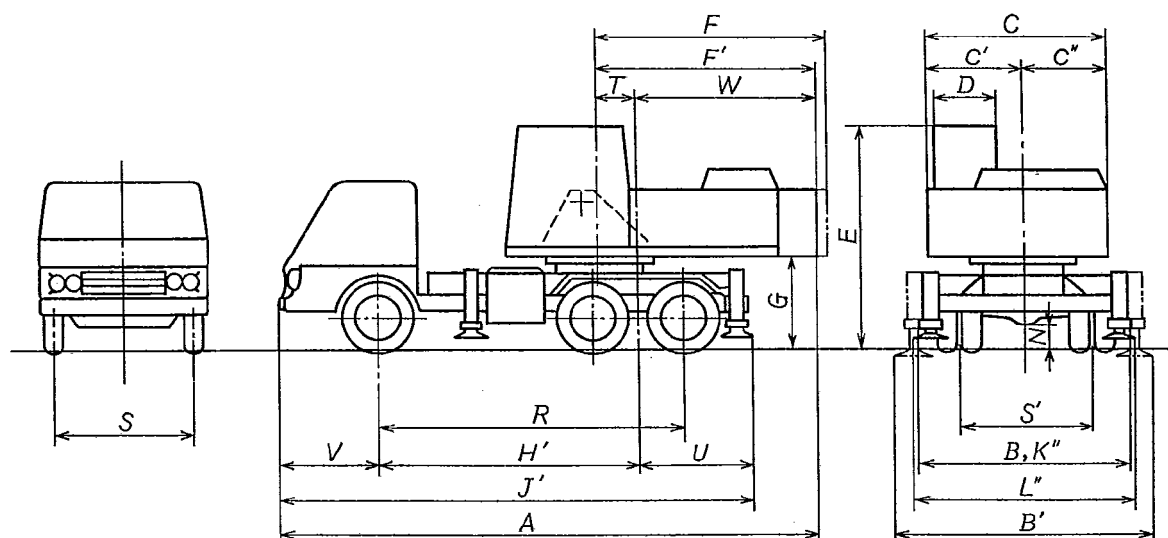


Fig. 3. Base Machine (Truck Mounted)



4.8 Prime Mover

4.8.1 Diesel Engine Type In the case of the machine of truck mounted and provided with engine for working and the engine for travelling independently, it shall be inscribed concerning respective engines.

- (1) Name The name of manufacturer (or abbreviation) and the name of type shall be inscribed.
- (2) Type The cycle, cooling type, arrangement of cylinders, combustion chamber type shall be inscribed. In the case of attaching super charger and aftercooler, the effect shall be inscribed.
- (3) Number of Cylinders - Bore × Stroke The bore and stroke shall be inscribed by unit of millimeter (mm).
- (4) Overall Stroke Volume The overall stroke volume shall be inscribed by the unit of liter (l) to two places of decimals.
- (5) Rated Output The rated output in accordance with JIS D 1005 and the number of engines shall be inscribed.
- (6) Rated Engine Speed The rated engine speed shall be inscribed by the unit of revolutions per minute (rpm) $\{\text{min}^{-1}\}$.
- (7) Maximum Torque The maximum torque according to JIS D 1005 shall be inscribed by using the unit of gravimetric kilogram meter (kgf·m) $\{\text{N} \cdot \text{m}\}$ to one place of decimal $\{\text{integer value}\}$ and the engine speed at that time shall be appended.

- (8) Starting Device The division of starting electric motor, starting engine and gasoline change starting shall be inscribed. In the case of starting electric motor the voltage and output shall be inscribed and in the case of starting engine the name, type, maximum output and engine speed at that time, starting method and the like shall be inscribed.
- (9) Charging Generator Division of alternating current or direct current, voltage and current shall be inscribed.
- (10) Storage Battery The voltage, capacity and number of storage batteries shall be inscribed.

4.8.2 Electric Motor Type

- (1) Power Source Number of phases, division of alternating current or direct current, voltage and frequency shall be inscribed.
- (2) Electric Motor Names [name of manufacturer (or abbreviation) and name of type] type, number of poles, rated output and rated engine speed shall be inscribed.
- (3) Starting Type Division of star-delta, starting compensator, thyristor control and the like shall be inscribed.
- (4) Electric Receiving Apparatus The position and type (for example, existence of cable reel and the like) of electric receiving apparatus shall be inscribed.

4.9 Oil Hydraulic Apparatus

4.9.1 Oil Hydraulic Pump Driving Apparatus

- (1) Driving Type Division of prime mover direct connection, with clutch, and existence of transmission device shall be inscribed.
- (2) Clutch Type Division of dry type and wet type, and the division of single plate, dual plates and multiple plates shall be inscribed.
- (3) Transmission Gear Type The division of gear type, belt type and the like shall be inscribed.

4.9.2 Oil Hydraulic Pump

- (1) Type Division of fixed capacity type and variable capacity type, division of gear type, vane type, piston type and the number of pumps shall be inscribed.
- (2) Discharge Quantity The discharge quantity at the time when the prime mover is at the rated engine speed and at no load shall be inscribed with a unit of liter per minute (l/min).

- (3) Pump Control Type For the variable capacity type pump, the output control type such as fixed horse power control and the like shall be inscribed.
- (4) Main Relief Valve Setting Pressure The main relief valve setting pressure shall be inscribed by the unit of gravimetric kilogram per square centimeter (kgf/cm^2) {MPa} in whole number {to one place of decimal}.
Furthermore, in the case where the setting pressure is different depending on the running circuit, swing circuit and working machine circuit, the value of each circuit shall be inscribed.
- (5) Working Fluid Tank Pressurizing Existence of working fluid tank pressurizing shall be inscribed.

4.9.3 Control Valve

- (1) Type Number of series and number of pieces shall be inscribed.
- (2) Operating Type The division of direct acting, oil hydraulic pilot, oil hydraulic servo, pneumatic pilot, pneumatic servo, electro-magnetic pilot, electromagnetic servo and the like shall be inscribed.

4.9.4 Oil Hydraulic Cylinder (Base Machine Relation) Uses, type and number of oil hydraulic cylinders belonging to base machine such as for attaching and detaching counter weight shall be inscribed.

For type, division of single acting and double acting, and telescopic type and others shall be inscribed.

4.9.5 Working Fluid Filter The type, filtering precision and the attaching position shall be inscribed.

4.9.6 Working Fluid Cooler The type shall be inscribed.

4.10 Operating Device For the machine of truck mounted, the operating devices for working and travelling shall be inscribed respectively.

4.10.1 Driver's Seat Division of position of left side and right side, division of fixed type and adjusting type of structure (in the case where the buffer device is provided between the seat and the floor, it shall be appended as "seat suspension is attached") and existence of reclining mechanism shall be inscribed.

4.10.2 Cab The division of steel sealed type and cloth covered type, etc. shall be inscribed. The specifications of window glass (division of ordinary glass and reinforced glass, etc.) shall be inscribed concerning the front face and others.

Furthermore, concerning that movable in front and rear, upwards and downwards the content shall be inscribed.

4.10.3 Levers and Pedals The name and operating system of levers and pedals required for driving operation shall be inscribed.

Furthermore, the operating direction of lever for working and the like shall be indicated by figure.

4.10.4 Instruments and Switches The names and numbers of thermometer, hourmeter, starting switches, etc. shall be inscribed.

4.10.5 Luminaires The names, voltage, capacity and number of pieces shall be inscribed.

4.10.6 Alarming and Safety Devices Names and number of pieces shall be inscribed.

4.10.7 Others Names and number of pieces of devices required for driving such as wipers, back mirrors, heaters, etc. shall be inscribed.

4.11 Swing Devices

4.11.1 Swing Circle Division of swing bearing type, swing roller type, roller path type and the division of internal gear attached and external gear attached shall be inscribed.

4.11.2 Swing Oil Hydraulic Motor The division of fixed capacity type and variable capacity type, division of gear type, vane type, piston type and number of pieces shall be inscribed. For the oil hydraulic circuit attached with brake valve or counter balance valve, the pursuit shall be described.

4.11.3 Speed Reduction Gear The type of gear, number of steps, etc. shall be inscribed.

4.11.4 Swing Brake The division of mechanical brake, oil hydraulic lock shall be inscribed. In the case of being provided with other mechanical brake to hold the upper machinery at an arbitrary position, the pursuit shall be appended.

4.11.5 Swing Lock Concerning the device to fix the upper machinery at the time of transportation, the division of pin type and spline type shall be inscribed.

4.12 Lower Machinery (Crawler Mounted)

4.12.1 Power Transmission Gear

- (1) Travelling Oil Hydraulic Motor The division of fixed capacity type and variable capacity type, division of gear type, vane type, piston type and number shall be inscribed. For the oil hydraulic circuit attached with a brake valve or counter balance valve, the pursuit shall be described.
- (2) Reduction Gear The division of gear type and chain type, type of gears, number of steps, etc. shall be inscribed.

4.12.2 Brake Device

- (1) Travel Brake The division of mechanical type brake and oil hydraulic lock type shall be inscribed.
- (2) Parking Brake The division of mechanical type, mechanical type lock and the division of travelling lever interlocking type and single lever operation type shall be inscribed.

Furthermore, oil hydraulic lock type travel brake of a small type machine combined with this action, the pursuit shall be appended.

4.12.3 Base Carrier Devices

- (1) Crawler Shoe The division of assembling type and integral type, tread surface type (division of flat, single grouser, double grouser, triple grouser, triangle for swamp, etc.) shall be inscribed.
Furthermore, number of sheets of shoe of one side crawler belt, shoe width, and grouser height shall be inscribed. In the case of shoe for swamp, the overall height of shoe plate shall be inscribed.
- (2) Drive Tumbler The division of sprocket type (link pin engaging type) and tumbler type (crawler shoe engaging type) shall be inscribed.
- (3) Roller, Idler Tumbler The division of single row type and double row type of tread shall be inscribed.
Furthermore, the division of floating seal and bellows seal etc. of lubricating oil sealing construction shall be inscribed. Number of pieces of upper and lower rollers on one side shall be inscribed respectively.
- (4) Crawler Belt Tension Adjusting Device The division of screw type and grease cylinder type, etc. and existence or absence of cushion spring and the like shall be inscribed.
- (5) Crawler Extension Mechanism For the device provided with a extension mechanism, the actuation type and the method for fixing shall be inscribed.

4.13 Lower Machinery (Truck Mounted and Wheel Mounted)

4.13.1 Name of Truck Carrier For the truck mounted, the name of manufacturer and name of type of the carrier shall be inscribed.

4.13.2 Power Transmission Gear

- (1) Driving Type The division of mechanical type and oil hydraulic type and the division of front wheel driving, rear wheel driving and front and rear wheels driving, etc. shall be inscribed.
- (2) Main Clutch The division of dry type and wet type and the division of single plate, dual plates, and multi plates shall be inscribed.
- (3) Speed Change Gear Type of gears and type of speed change gear (division of sliding engagement type, ordinary time engagement type, equispeed engagement type, planetary gear type, etc.), operating type (division of direct actuation, oil hydraulic action, etc.), speed change steps and speed change ratio shall be inscribed.
- (4) Travelling Oil Hydraulic Motor Concerning the oil hydraulic driving type, the division of gear type, vane type, piston type and the number shall be inscribed.

Concerning the oil hydraulic circuit attached with braking valve or counter balance valve, the pursuit shall be described.

- (5) Speed Reduction Gear Type of gear (division of helical gear, spiral bevel gear, hypoid bevel gear), number of steps and reduction ratio shall be inscribed.
- (6) Differential Gear Type of gear (division of helical gear, spur gear) shall be inscribed. For the gear with defrock, the pursuit shall be described.
- (7) Final Reduction Gear Type of gear, number of steps and reduction ratio shall be inscribed.

4.13.3 Wheels and Axles

- (1) Wheel Arrangement Total number of wheels x number of driving wheels shall be inscribed.
- (2) Axle Type For each axle, in steering axle, the type of connection of wheel axle with axle (division of grip type, snap type, etc.) and in driving axle, the supporting type (division of whole float, semi float and 3/4 float) and type of axle (division of axle tube, swing axle type, etc.) shall be inscribed.
- (3) Number of Tires Designation of tire according to JIS D 4201 and the pneumatic pressure shall be inscribed. The pneumatic pressure shall be expressed by the unit of gravimetric kilogram per square centimeter {kgf/cm²} {kPa}, for pneumatic pressure less than 3.0 kgf/cm² {300 kPa} by interval of 0.2 kgf/cm² {20 kPa} and for pneumatic pressure not less than 3.0 kgf/cm² {300 kPa} by interval of 0.25 kgf/cm² {25 kPa}.

4.13.4 Steering Apparatus

- (1) Types The division of front wheel steering, rear wheel steering, front and rear wheel steering, articulated and skid steering shall be inscribed.
- (2) Operation Types The division of attachments of oil hydraulic type, mechanical type and mechanical type oil hydraulic multiplication apparatus shall be inscribed.
- (3) Maximum Steering Angle The steering angle shall be inscribed by units of degree and minute (°).
- (4) Oil Hydraulic Cylinder The division of single acting type and double acting type and the number of cylinders shall be inscribed.

4.13.5 Brake Apparatus

- (1) Main Brake Type (division of front wheel brake, rear wheel brake and front and rear wheel brake), actuating type (division of direct acting oil hydraulic type, vacuum multiplication oil hydraulic type, pneumatic oil hydraulic type, pneumatic type, etc.) and the construction (division of internal expansion type, disc type, external contracting type, further for external contracting type, the division of leading trailing shoe, and two leading shoe) shall be inscribed. For the main brake having brake lock, the pursuit shall be described.