

# JIS

**JAPANESE INDUSTRIAL STANDARD**

**Terminology and Commercial  
Specifications on Loaders**

**JIS A 8421—1990**

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In the event of any doubt arising,  
the original Standard in Japanese is to be final authority.

## JAPANESE INDUSTRIAL STANDARD

J I S

Terminology and Commercial Specifications  
on Loaders

A 8421-1990

1. Scope

This Japanese Industrial Standard specifies the terminology and commercial specifications on loaders and their working apparatus of mobile crawler type and wheel type used mainly for earth work, hereafter referred to as the "loaders".

2. Definitions

For the purposes of this Standard, the following definitions apply.

- (1) loader A machine of mobile crawler type or wheel type which has at the front part the bucket, link mechanisms and the structure to support it, and carries out the works of digging or loading, lifting, transport and discharge of earth, sands, etc. by travelling of machine.
- (2) base machine A loader specified individually according to commercial specifications of manufacturer, which is provided with a stand seat for equipping the working apparatus shown in 4.
- (3) equipment A set of components <sup>(1)</sup> to be equipped with the body for the purpose of using for ordinary use.

Note <sup>(1)</sup> Those mean the body and parts of working apparatus or their assembly.

3. Base Machine

3.1 Types of Loaders Types of loaders shall be divided according to structure as follows:

(1) Division by undercarriage

- (1.1) Crawler loader (Refer to Fig. 1)
- (1.2) Wheel loader (Refer to Fig. 2)

(2) Division by Engine Location

- (2.1) Front engine (Refer to Fig. 3)
- (2.2) Rear engine (Refer to Fig. 4)

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Applicable Standards, Corresponding International Standards and Reference Standards: See page 26.

(3) Division by Steering System

- (3.1) Front wheel steer (Refer to Fig. 5)
- (3.2) Rear wheel steer (Refer to Fig. 6)
- (3.3) All wheel steer (Refer to Fig. 7)
- (3.4) Articulated steer (Refer to Fig. 8)
- (3.5) Wheel skid steer (Refer to Fig. 9)
- (3.6) Wheel independent steer (Refer to Fig. 10)
- (3.7) Crawler skid steer (Refer to Fig. 11)
- (3.8) Crawler independent steer (Refer to Fig. 12)

(4) Division by Drive System

- (4.1) Front wheel drive (Refer to Fig. 13)
- (4.2) Rear wheel drive (Refer to Fig. 14)
- (4.3) All wheel drive (Refer to Fig. 15)

(5) Division by Position of Cab (in the case of articulated base machine)

- (5.1) Front cab (Refer to Fig. 16)
- (5.2) Rear cab (Refer to Fig. 17)

Fig. 1. Crawler Loader

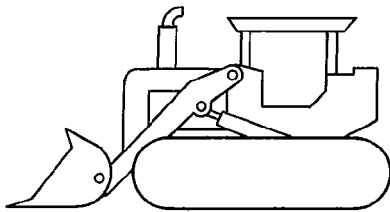


Fig. 2. Wheel Loader

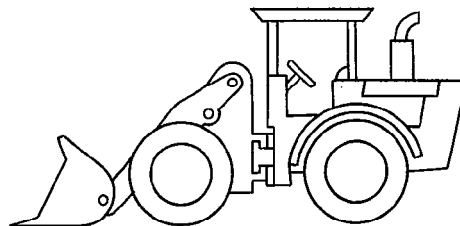


Fig. 3. Front Engine

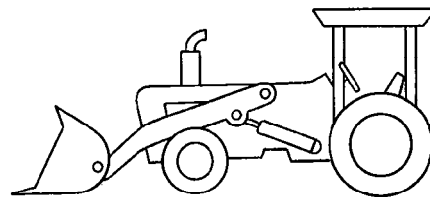
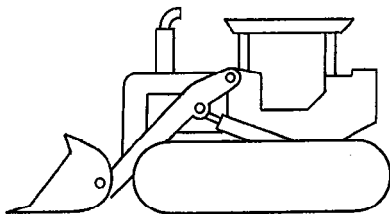


Fig. 4. Rear Engine

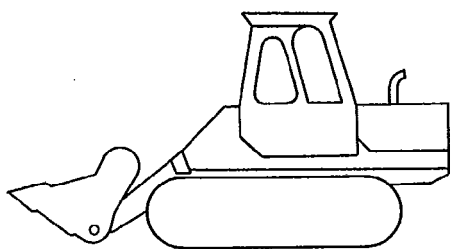


Fig. 5. Front Wheel Steer

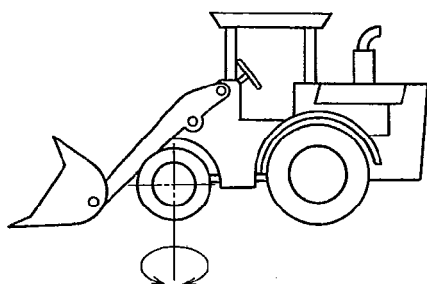


Fig. 6. Rear Wheel Steer

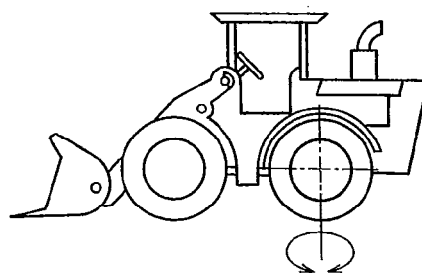


Fig. 7. All Wheel Steer

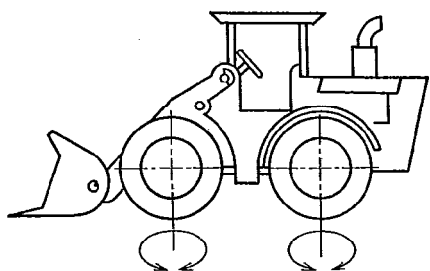


Fig. 8. Articulated Steer

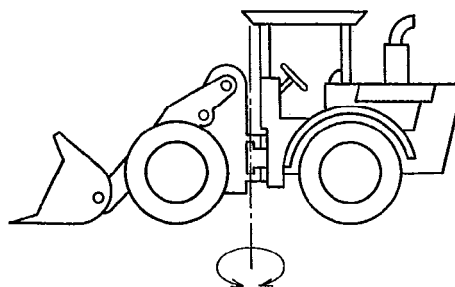


Fig. 9. Wheel Skid Steer

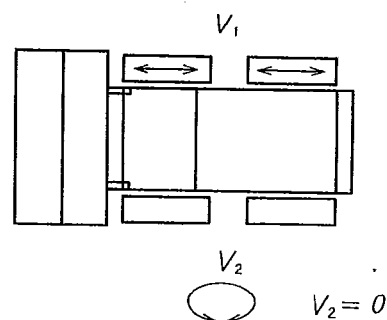
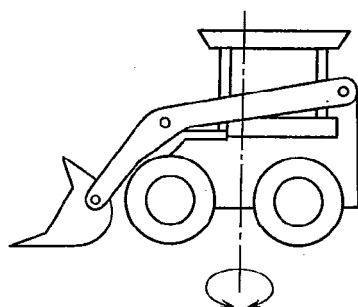
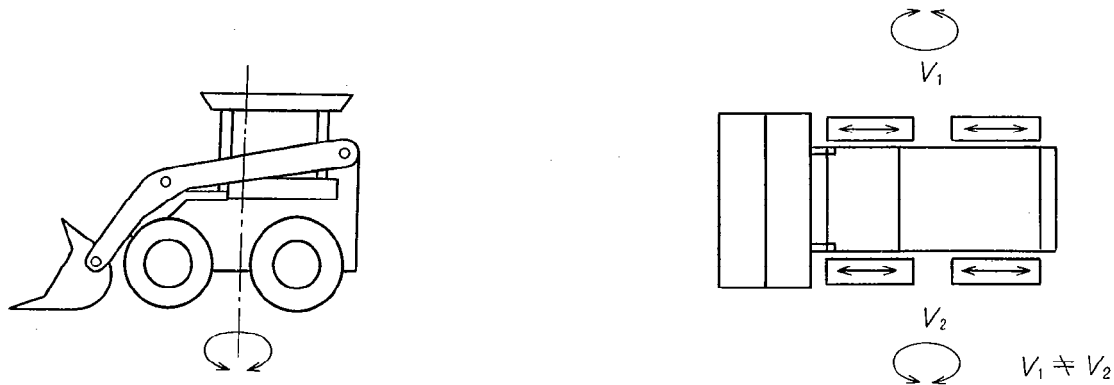


Fig. 10. Wheel Independent Steer



Remark:  steer wheel, steer center, etc.

Fig. 11. Crawler Skid Steer

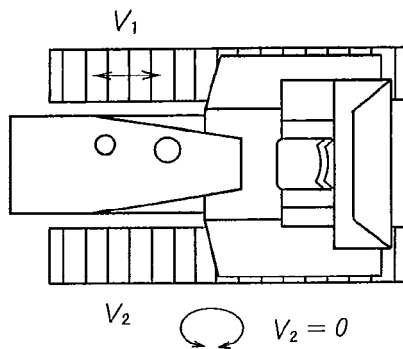


Fig. 12. Crawler Independent Steer

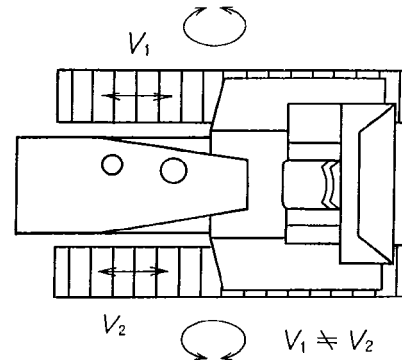


Fig. 13. Front Wheel Drive

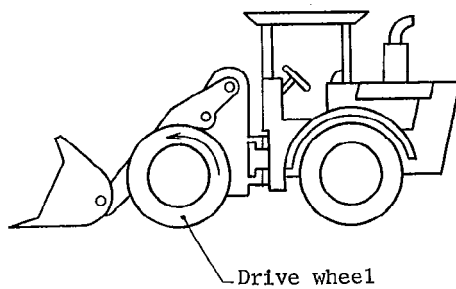


Fig. 14. Rear Wheel Drive

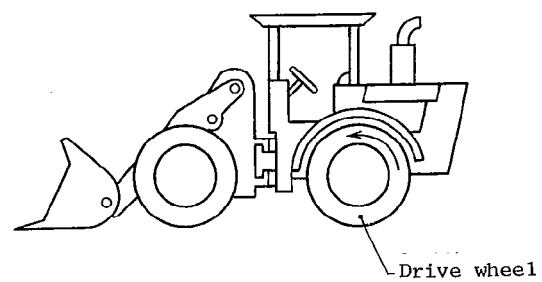


Fig. 15. All Wheel Drive

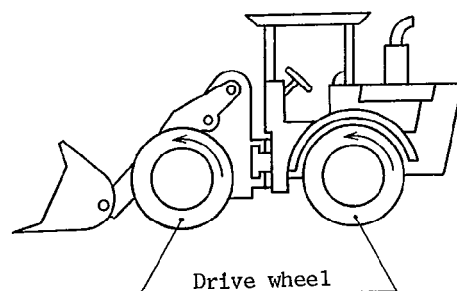


Fig. 16. Front Cab

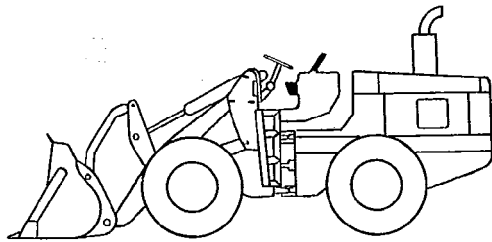
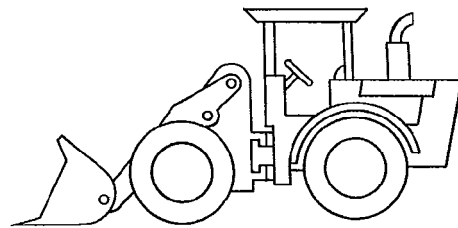


Fig. 17. Rear Cab



Remark:  steer wheel, steer center, etc.

3.2 Dimensions For dimensions of base machine, mark at least those shown in Figs. 18 and 19.

Further, for definitions of ground reference plane (hereafter referred to as the "GRP") and dimensions, refer to Annex.

Fig. 18. Dimensions of Base Machine (Crawler Loader)

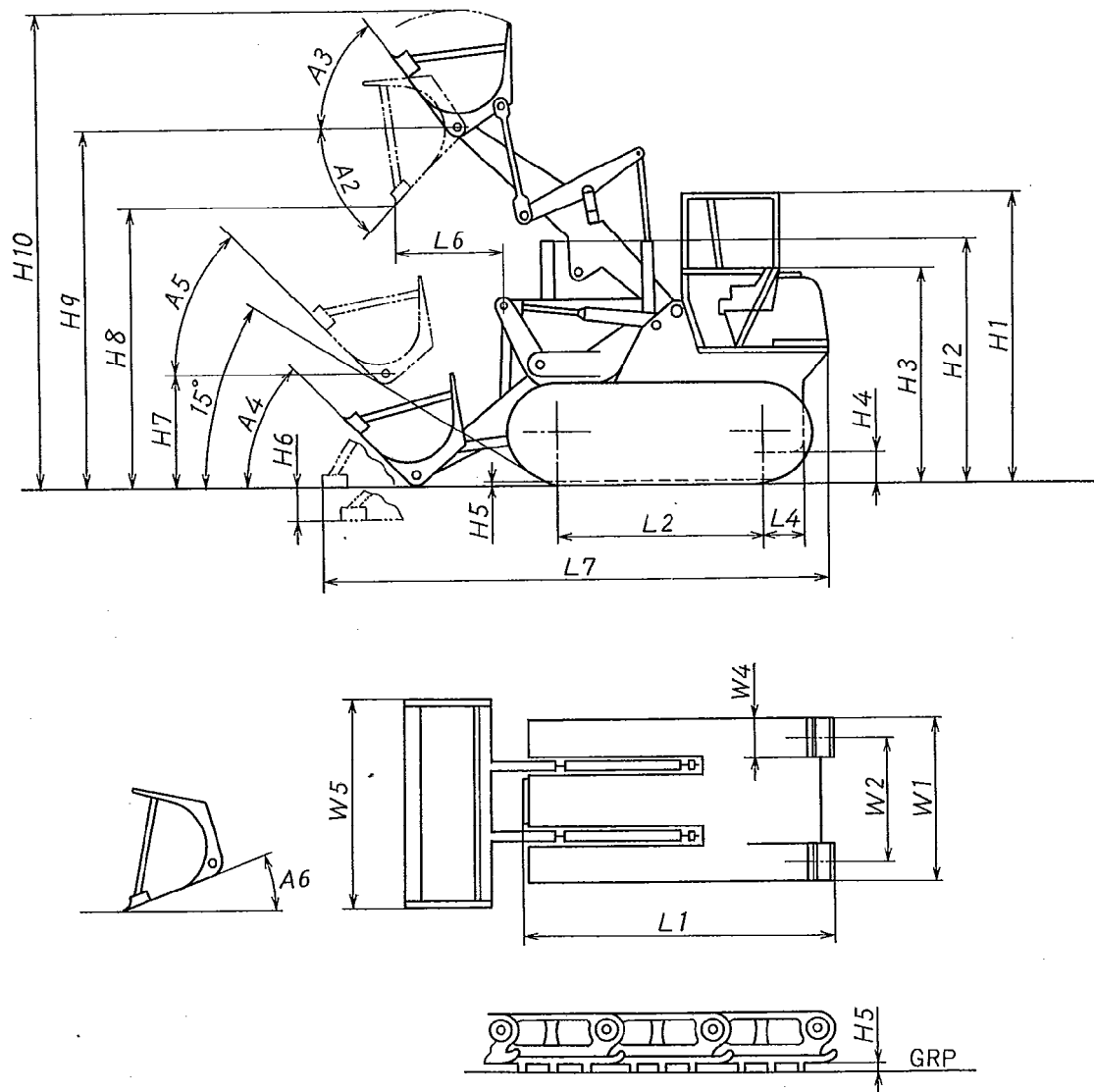
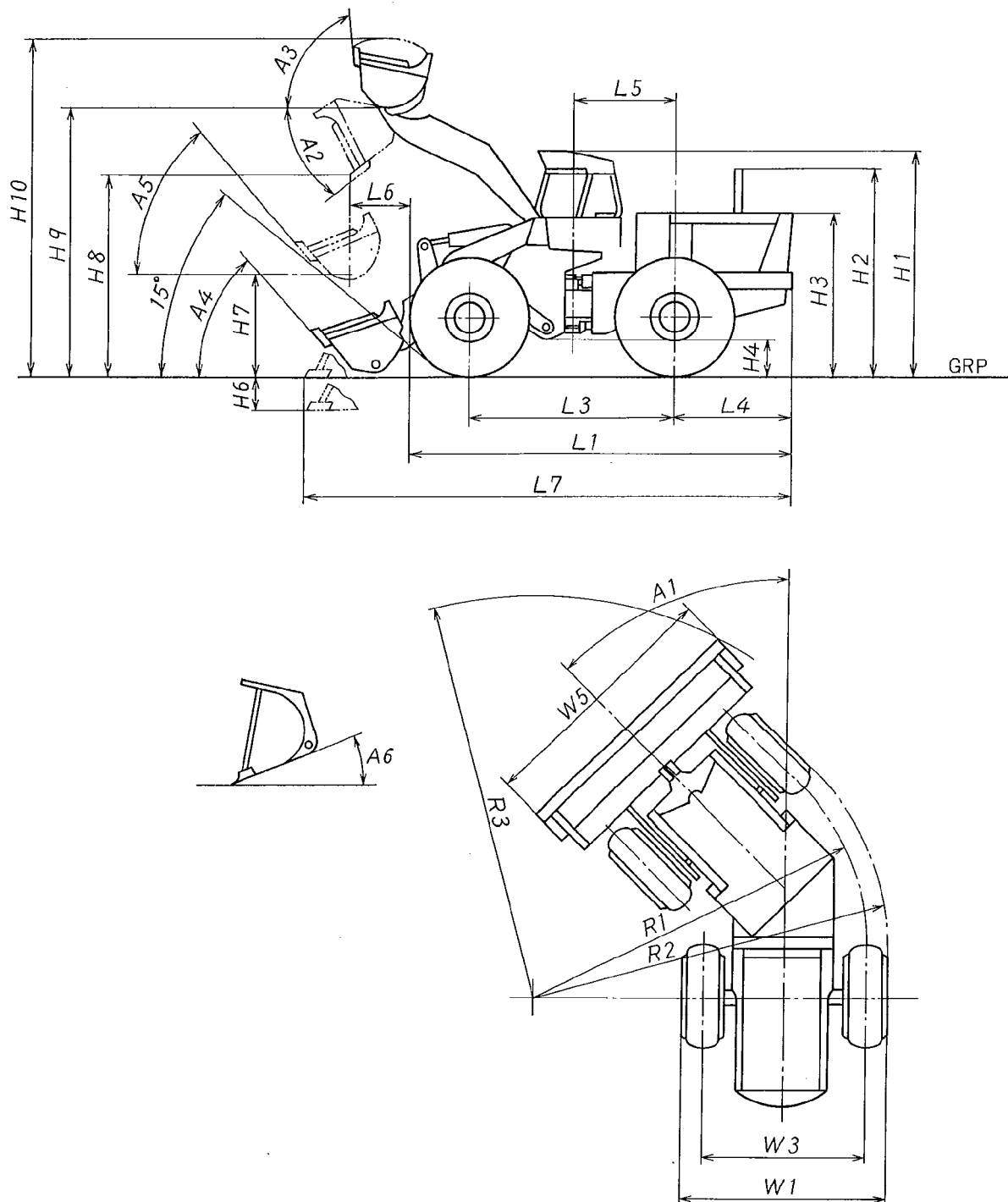


Fig. 19. Dimensions of Base Machine (Wheel Loader)



### 3.3 Masses

**3.3.1 Operating Mass** The mass of the base machine with all equipment designated by the manufacturer, full fuel, lubricating, hydraulic and cooling systems, and operator (75 kg).

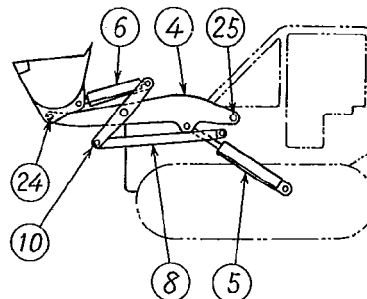
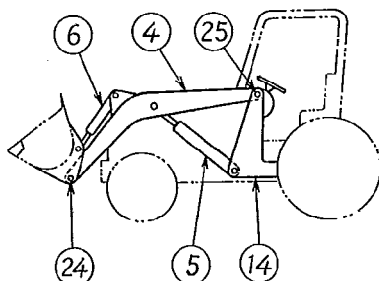
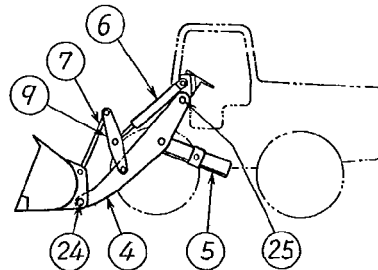
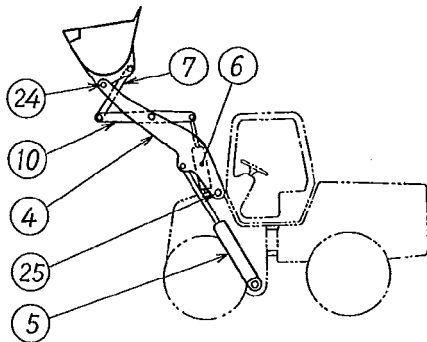
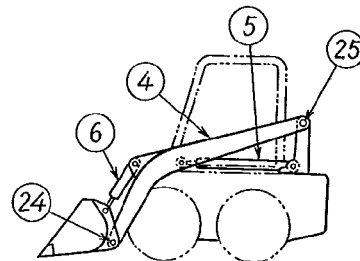
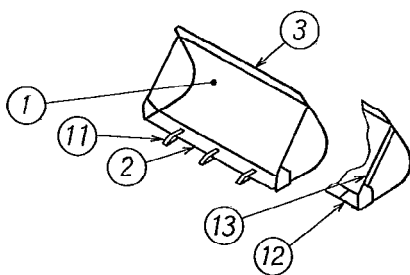
**3.3.2 Shipping Mass** The mass of the base machine without operator, with full lubricating, hydraulic and cooling systems, 10 % of fuel tank capacity and with equipment designated by manufacturer, cab, roll-over protective structure [hereafter referred to as "ROPS (<sup>2</sup>)"] or falling object protective structure [hereafter referred to as "FOPS (<sup>3</sup>)"].

Notes (<sup>2</sup>) Roll-over protective structure

(<sup>3</sup>) Falling object protective structure

**3.3.3 Cab, Canopy, ROPS and FOPS Mass** The mass of cab, canopy, ROPS and FOPS with all their components and mountings required to secure these to the base machine.

**3.4 Component Nomenclature** Nomenclature of main each part of base machine shall be as follows (Refer to number in Figure).



- |                 |                 |                      |
|-----------------|-----------------|----------------------|
| ① Bucket        | ⑥ Tilt cylinder | ⑪ Bucket tooth       |
| ② Cutting edge  | ⑦ Tilt link     | ⑫ Bucket corner      |
| ③ Spill guard   | ⑧ Guide link    | ⑬ Side cutter        |
| ④ Lift arm      | ⑨ Tilt lever    | ⑭ Loader frame       |
| ⑤ Lift cylinder | ⑩ Bell crank    | ⑮ Bucket hinge pin   |
|                 |                 | ⑯ Lift arm hinge pin |