FS-276S

OPERATION MANUAL
SELF PROPELLED AERIAL PLATFORM
MODEL RZ150/IRZ500

MICHI
CORPORATION

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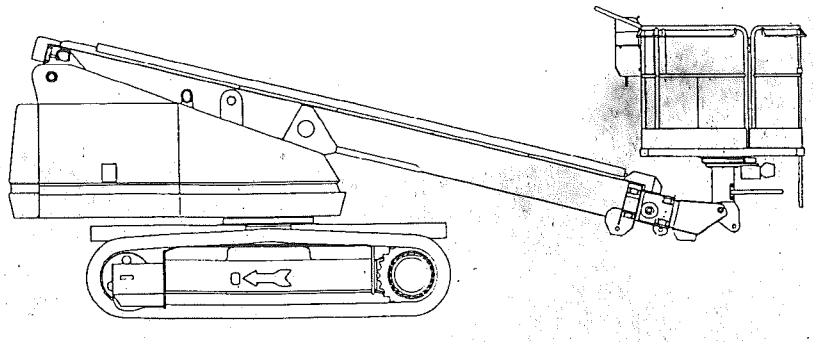
MODEL RZ150/IRZ500



* Important : Please read this manual before operating the machine.

IICHI
CORPORATION

1152 RYOKE, AGEO, SAITAMA, JAPAN

Introduction

Thank you very much for making your purchase from Aichi Corporation.

This manual describes the correct operation and handling procedures for the self propelled aerial platform (RZ150/IRZ500). Reading and reference to this manual will ensure the maximum operational efficiency of this machine.

Operation of this machine not in accordance with the instructions in this manual may lead to problems, resulting in damage and increasing risk of danger. Please, be sure to read and understand this manual before using this machine.

* Always keep this manual and the record of Aichi pre-delivery functional tests with the machine.

* When you transfer the use or ownership of the machine, please attach this manual to the machine for the next user.

* For any doubts you may have about handling, inspection or spare parts, please do not hesitate to contact our business offices or the authorized service shop nearest to you. In this case, you are requested to quote the model, serial number, manufactured date marked on the serial number plate.

* Use only the spare parts approved by the manufacturer, particularly for load-supporting and safety-related components.

* Do not make any modifications to the machine without obtaining the manufacturer's approval. The design check, the manufacturing check as well as the practical tests should be conducted by the approved agent, if a modification which would affect the stability, strength or performance of the machine is made. Detail of major alterations or repairs must be recorded in the service manual.

* The user of this machine shall obtain the guidance and approval of the manufacturer, in the event of any special working method or conditions which are outside those specified by the manufacturer.

* Your attention is called on certain changes in illustration or contents which may be made without notice.

INDEX

I Qualification of Operator

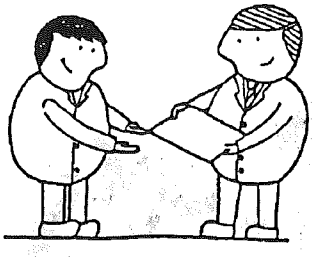
The operator of this machine must receive safety training to ensure safe operation.

Safety training

Incorrect use of the machine may cause serious danger.

All personnel who operate this machine are requested to receive safety training, and only the trained and authorized personnel are allowed to operate this machine.

(For safety training, use this manual.)



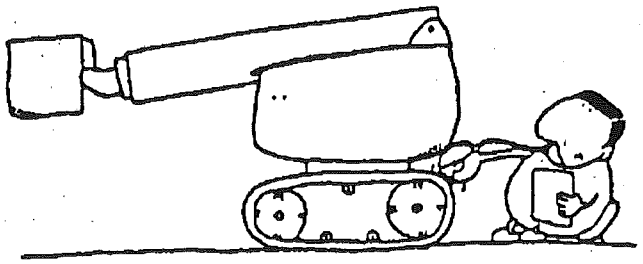
Certificate of training course completion

Let's implement safety education!

III Regular Inspection

To ensure safe operation, conduct the inspection regularly.

LET'S CONDUCT
OUR REGULAR
INSPECTION !

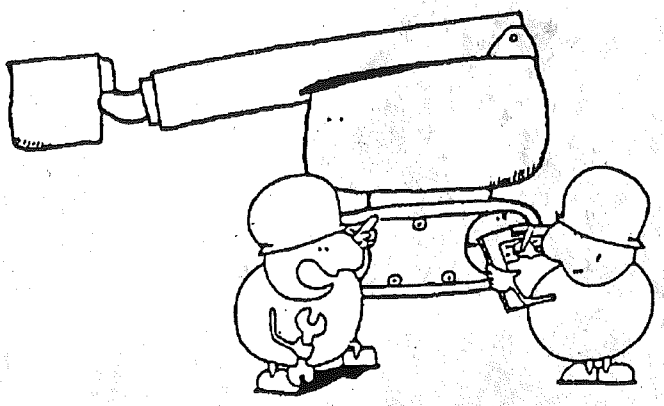


Conduct the monthly and yearly inspection and keep all the records for three years.

Note: Use the service manual for recording the inspection results.

Note: For inspection, consult our office or service shop.

RECORD
INSPECTION
RESULTS !



Caution: When the inspection is conducted under the boom and the platform, use safety support to prevent the platform and boom from unexpected descent.

IV For Safety Purpose

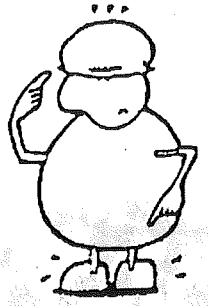
1. Before starting operation

(1) Only the trained and authorized personnel are allowed to operate the machine.

ONLY SOMEONE WHO HAS
COMPLETED A SPECIALIZED
TRAINING COURSE SHOULD
OPERATE THE MACHINE !

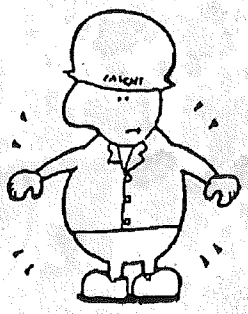
(2) Always wear safety gears e.g. helmet, safety shoes, safety belt, etc.

WEAR HELMET AND
SAFETY SHOES !



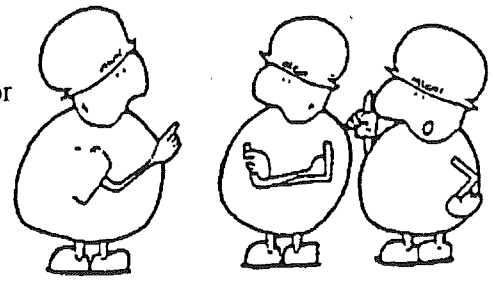
(3) Wear neat and fitting clothes to avoid snagging.

OPERATE WITH
RIGHT CLOTHES !



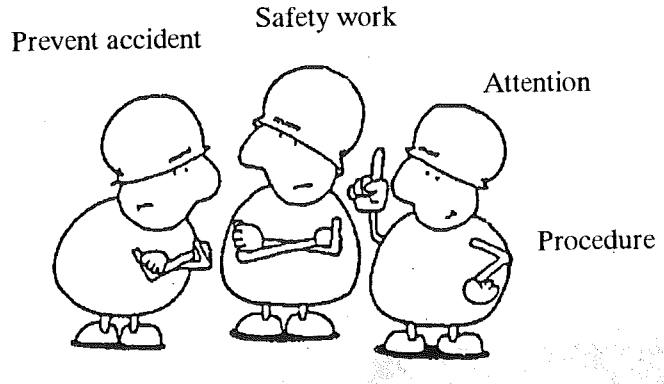
(4) Nominate a supervisor and operate the machine according to his/her instruction.

FOLLOW THE SUPERVISOR'S INSTRUCTIONS !



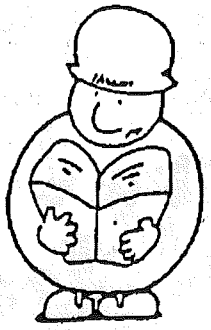
(5) Observe the guidelines for safe operation and follow them. Always follow the correct procedures and safety rules outlined in this manual, and also by your supervisor.

OBSERVE THE RULE !

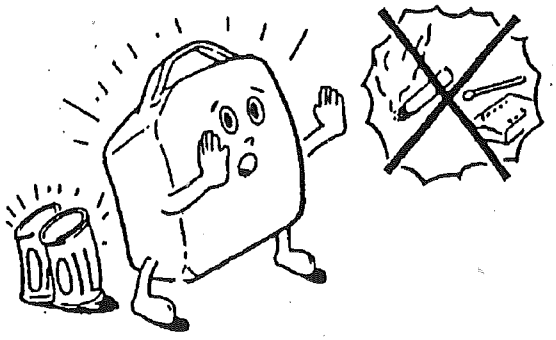


(6) Be sure to heed the matters regulated by the law.

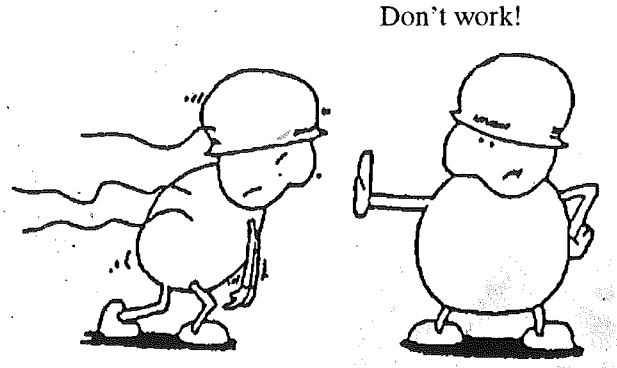
OBSERVE THE LOW !



(7) Keep inflammable substances (fuel, oil, etc.) away from fire.



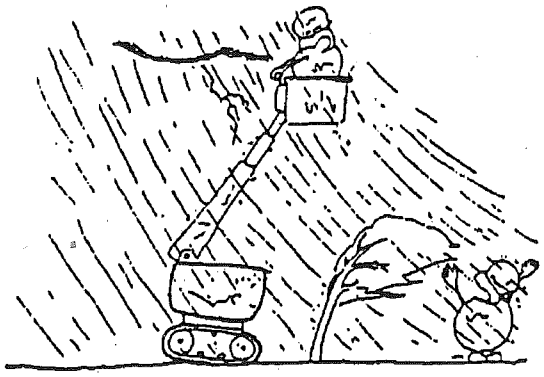
(8) Do not operate the machine when you are intoxicated or exhausted.



Warning: In the interest of your own health and safety, exercise care when operating this machine.

(9) Stop operation in bad weather.

STOP OPERATION
IN BAD WEATHER !



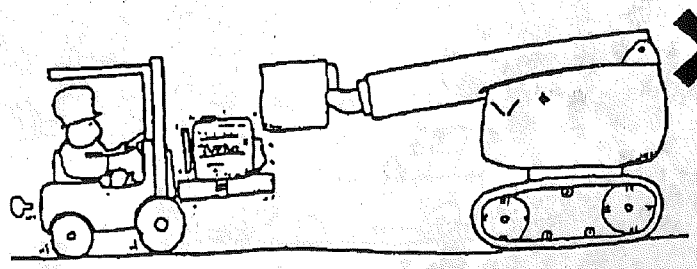
Note: Standard of bad weather beyond which operation should cease.

- Strong wind . . . . When average wind velocity per 10 minutes is over 12.5 m/sec (28 MPH)
- Heavy rain . . . . When rainfall is over 50 mm (2.0 in)
- Heavy snow . . . . When settled snow is over 25 cm (9.8 in) deep
- Thunder
- It is advisable to operate the machine in the atmospheric temperature range: $-20° \sim +40°$.

Warning: Even in conditions less than the standards outlined above, follow the instructions of your supervisor.

(10) Do not make any modifications to the machine without obtaining the manufacturer's approval.

MODIFICATION IS
PROHIBITED.

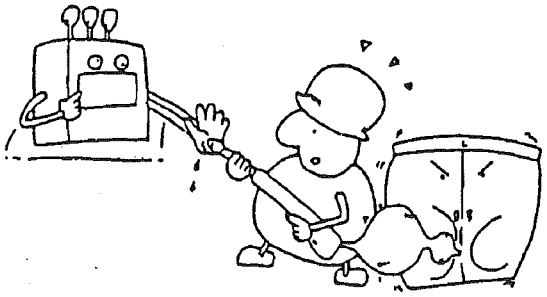


Do not add anything to the machine which could increase the wind load e.g. "Notice boards" on the platform.

(11) Do not wash the electric components of the machine.

(In particular, do not use pressurized water)

Don't wash

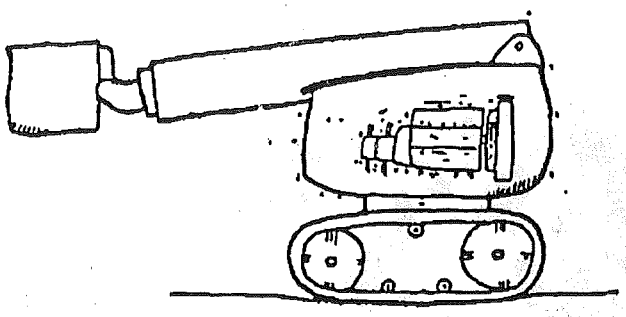


Note: Wipe off dirt with a dry cloth, etc.

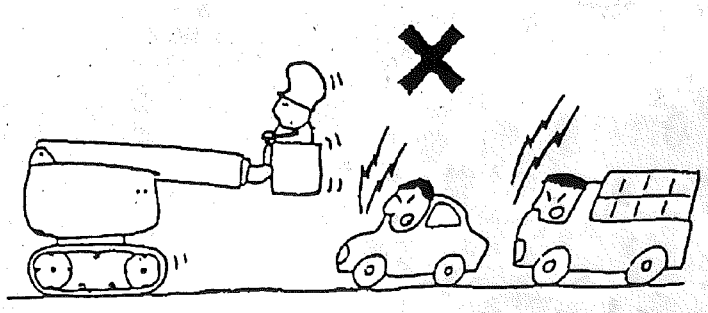
2. During operation

(1) After starting the engine, warm up the machine without loading the engine.

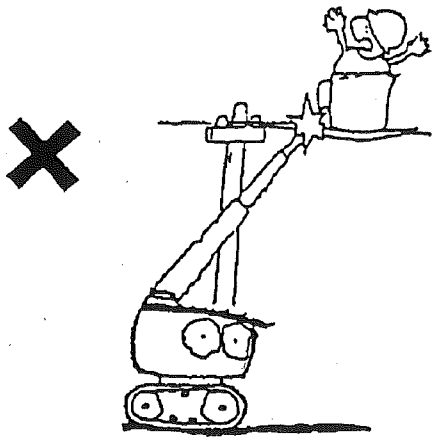
WARM UP BEFORE OPERATION!



(2) This machine is not allowed to travel on the public highway.



(3) Do not use the machine near electrical conductors.

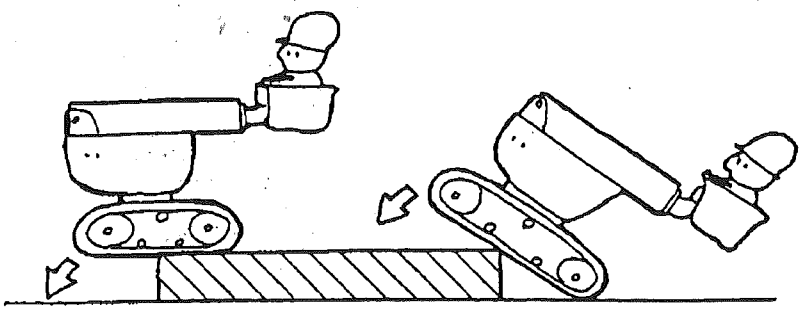


Warning:
- This machine is not insulated. Do not approach or make contact with power lines.
- Keep a safe distance from electric conductors. Failure to do so may result in death or serious injury.

For safe distance, check the national or local regulations. If no national or local regulation is available, use the table below.

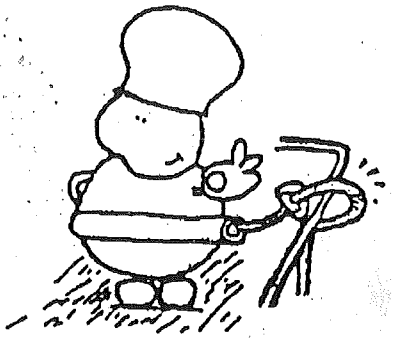
Voltage range		Minimum safe approach distance
Low voltage	0 – 600 V	1 meter (3ft 3in)
High voltage	600 – 7,000 V	1.2 meter (4ft)
Extremely high voltage	7,000 – 60,000 V	2 meters (6ft 7in)
	Over 60,000 V	Additional 0.2 meter (7.9 in) distance for each additional 10,000 V

(8) When travelling over a curb, retract the boom fully and set it under the horizontal, then move the machine very slowly. When the machine's center of gravity passes over the curb, the machine will incline suddenly. So, it is important to conduct this type of operation slowly and carefully.

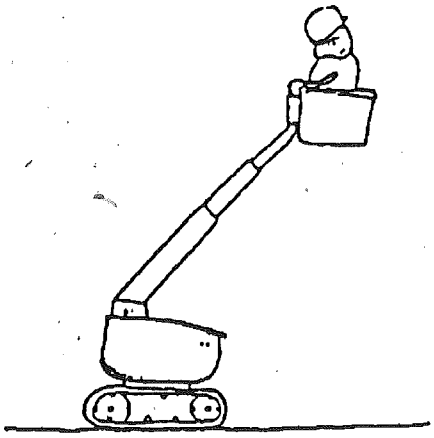


(9) Be sure to wear a safety belt, and fasten it to the specified position of the platform.

BE SURE TO WEAR
A SAFETY BELT !



10) Check the surroundings before travelling, and make sure that no obstacle is around the machine.

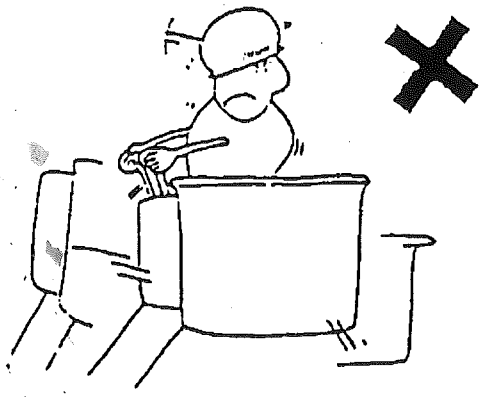


11) Check the surroundings before operating the boom, and make sure that no obstacle is around you nor around the machine.

Warning:

- Make sure that no obstacle is around the turntable before rotating the boom.
- Be careful not to put your hand between platform handrail and any other obstacles.

(12) Do not operate control levers or switches roughly.

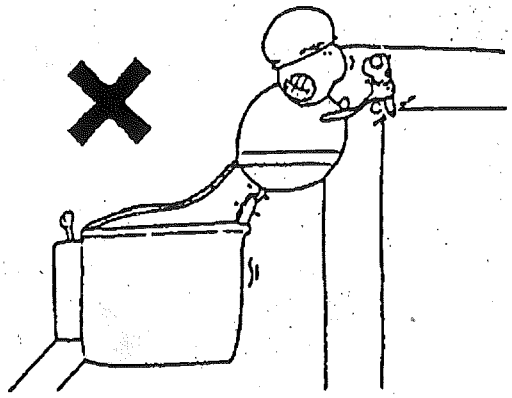


Note: When you reverse the operating direction, bring the machine to a stand-still, and start again.

(13) If any malfunction is in the platform levelling system, stop using immediately and check the machine.

Warning: Do not use the machine, if there is a fault in the platform levelling system.

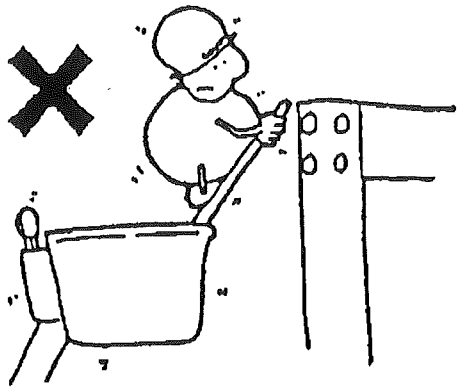
(14) Do not reach out of the platform.



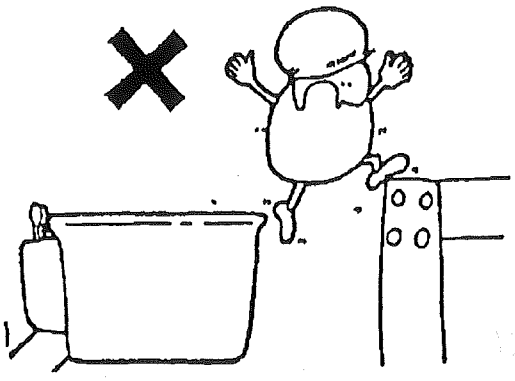
Danger:

- Always keep your feet firmly on the platform floor and conduct operation with stable posture.
- Do not step on the handrail.

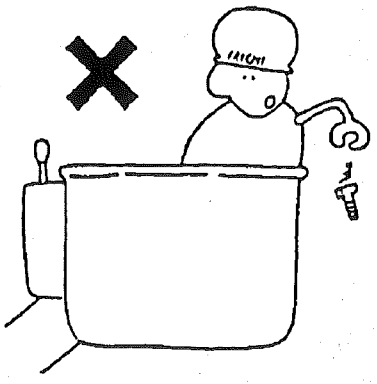
(15) Do not use a ladder or step on the platform.



(16) Do not jump from the platform onto any other structures.

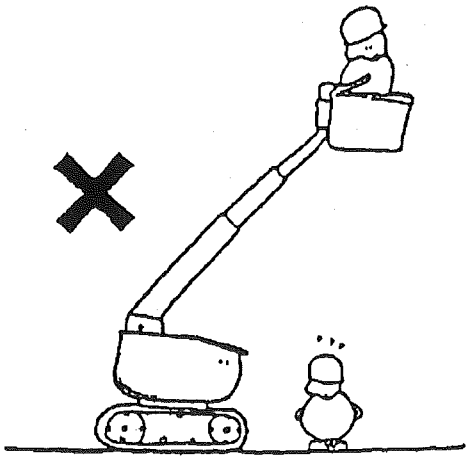


(17) Do not drop any objects from the platform.



(18) Do not allow any person to enter the area under the boom and the platform.

KEEP OUT OF
WORKING AREA !



(19) Do not use fire in the platform.

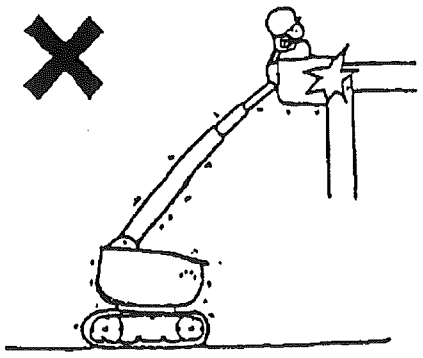
Warning: Do not put any combustible material in the platform.

(20) When gas cutting or arc welding is conducted, cover the machine so that any loose fragments do not hit the machine especially the batteries and the hydraulic hoses.

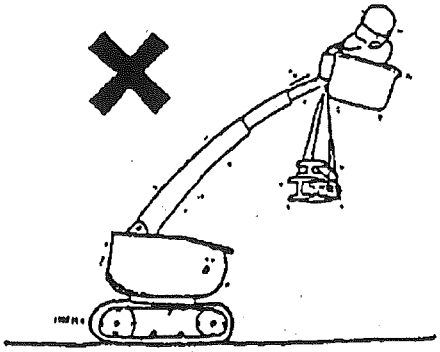
Warning: If a spark enters the machine, it may cause a fire.

1) Do not conduct the following operations, which may cause the tipping over or serious damage to the machine.

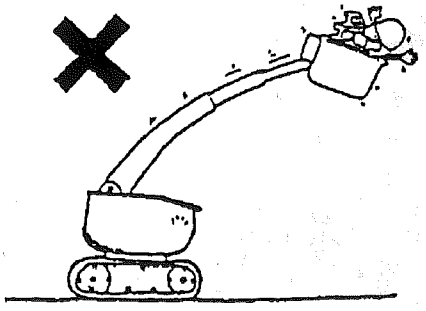
(a) Do not hit any structure or moving object by driving the machine and/or moving the platform.



(b) Do not hoist any object with a hook or a rope fixed to the boom and the platform.

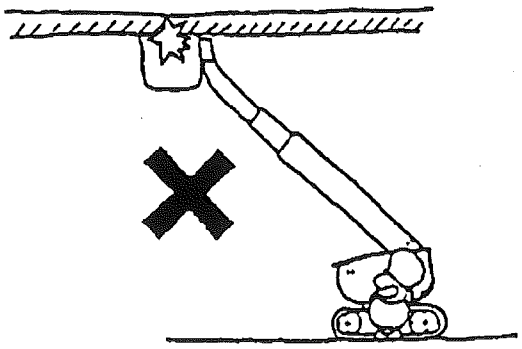


(c) Do not overload the platform. The specific working load is marked on the platform.

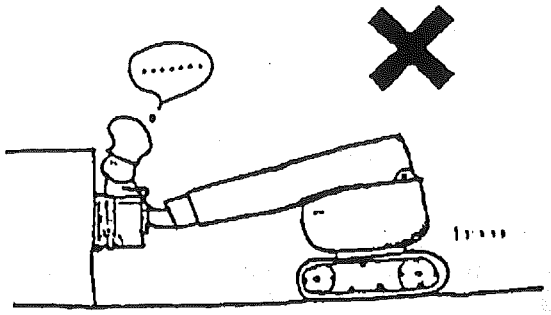


(22) In order to avoid damaging the platform levelling system, observe the following warnings.

(a) Do not press the platform against any overhead structure by elevating the platform.

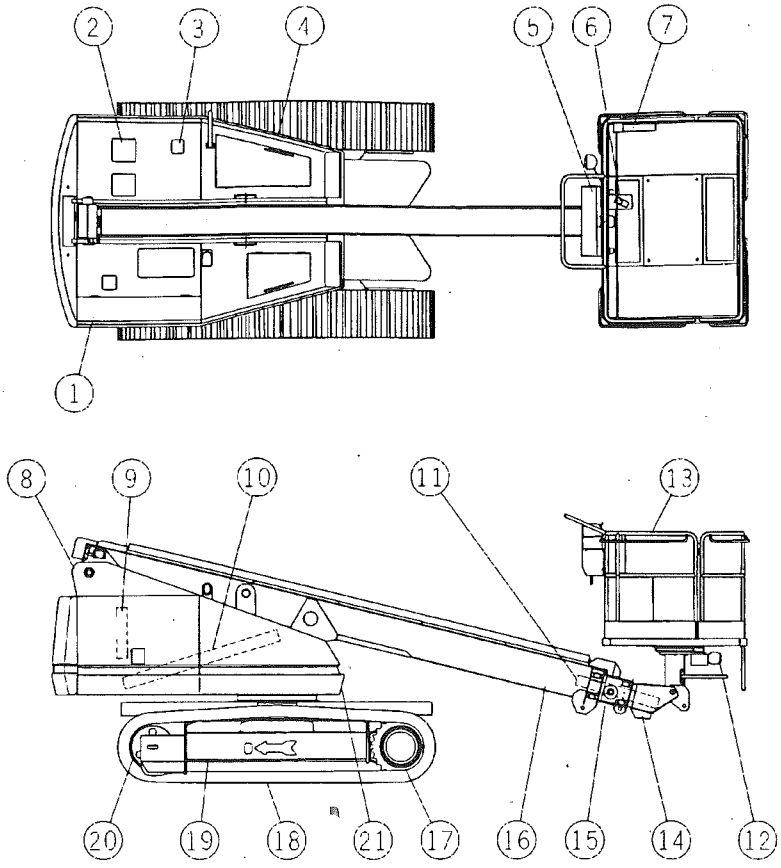


(b) Do not hit the platform while travelling.



Caution: If either of the situations shown above occur, stop using and check the machine.
If not, it could result in a serious accident.

V Name of Each Part

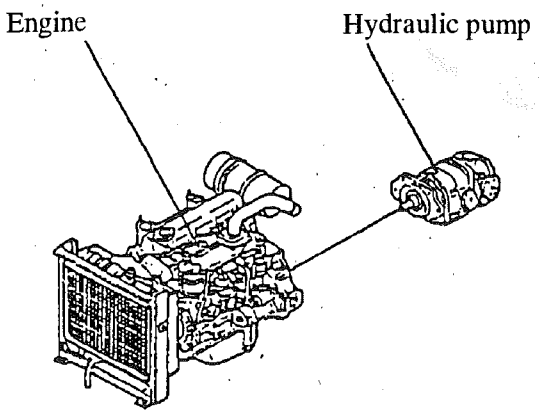


No.	Name	No.	Name
1	Engine room	12	Platform rotation device
2	Hydraulic oil tank	13	Platform
3	Fuel tank	14	3rd boom
4	Lower control	15	2nd boom
5	Upper control	16	1st boom
6	Foot switch	17	Driving sprocket
7	Instruction manual storage	18	Track
8	Turntable	19	Chassis
9	Platform levelling cylinder (Lower)	20	Idler wheel
10	Elevation cylinder	21	Manufacturing name plate
11	Platform levelling cylinder (Upper)	—	—

VI Components

1. Hydraulic pressure generating device

The hydraulic pressure generating device consists of such major components as the engine and the hydraulic pump. When the engine starts, the pump is driven and generates hydraulic pressure.

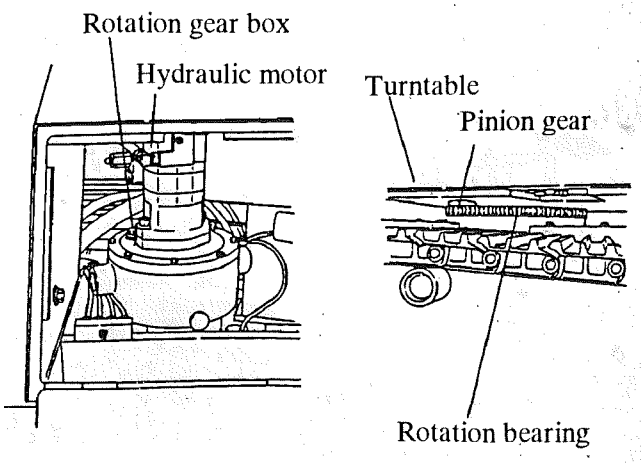


2. Boom rotation device

The boom rotation device consists of the hydraulic motor, the rotation gear box, the rotation bearing and the turntable.

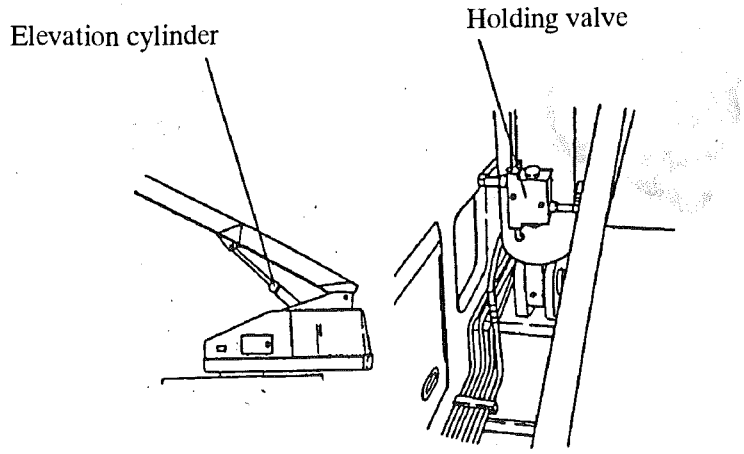
The hydraulic motor is driven by the hydraulic pressure from the hydraulic pump, and drives the rotation gear box.

The rotation gear box decreases the hydraulic motor revolution and rotates the turntable through the rotation bearing.



3. Boom elevation device

The elevation cylinder is connected to the 1st boom and the turntable at both ends and is extended or retracted by hydraulic pressure in order to raise or lower the boom. The holding valve prevents the boom descent when the hydraulic hose is damaged.

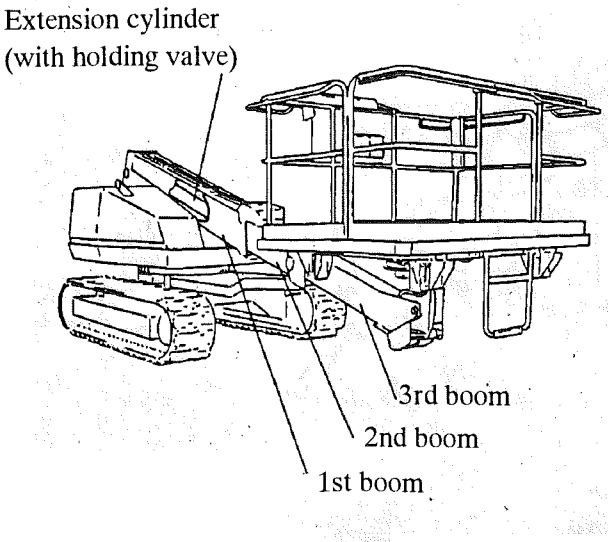


4. Boom extension device

The boom extension device consists of the extension cylinder, the holding valve, four wire ropes and the three stage boom.

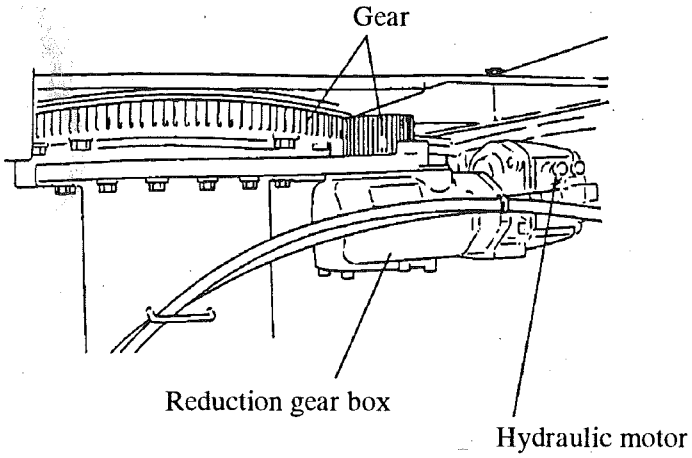
The extension cylinder is connected between the 1st and the 2nd booms at both ends, and the 2nd boom extends with hydraulic pressure, while the 3rd boom extends simultaneously with the 2nd boom by means of the wire ropes.

The holding valve prevents the boom from being naturally extended or retracted when the hydraulic hose is damaged.



5. Platform rotation device

The platform rotation device consists of a hydraulic motor and reduction gear box, and it rotates the platform 200° to both the left and right.

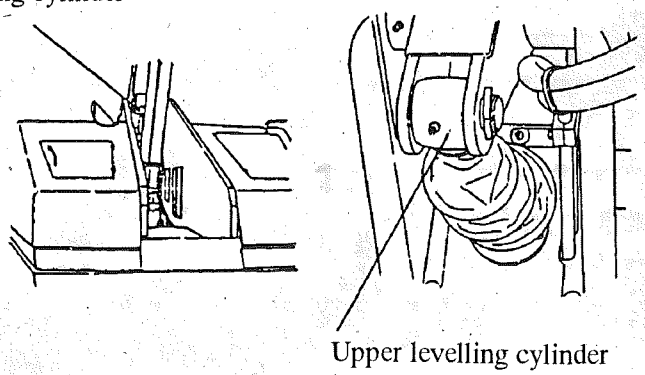


6. Platform levelling device

The levelling device consists of the lower levelling cylinder which is installed between the 1st boom and turntable, and the upper levelling cylinder with double pilot check valve which is installed between the 3rd boom and platform, and hydraulic hoses which are connected between both cylinders.

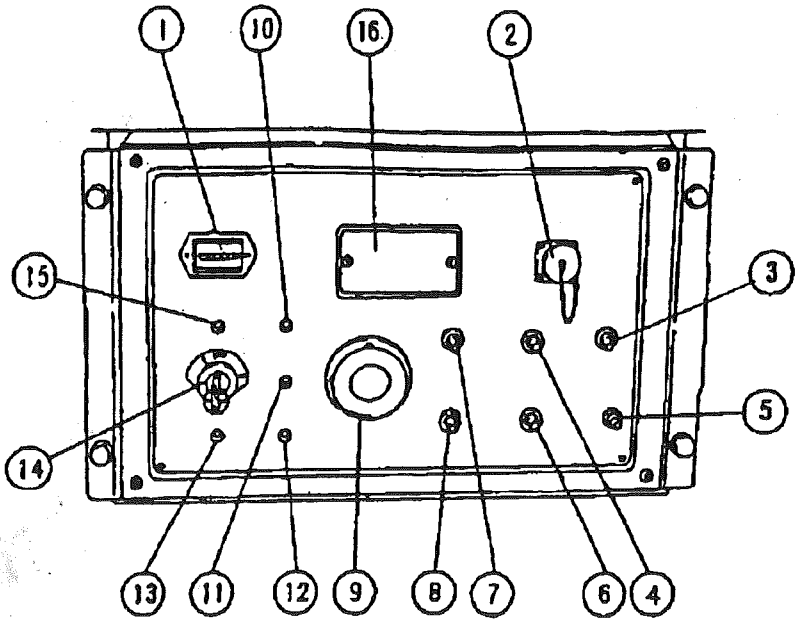
Double pilot check valve installed on upper levelling cylinder prevents the platform tipping when the hose is damaged.

Lower levelling cylinder



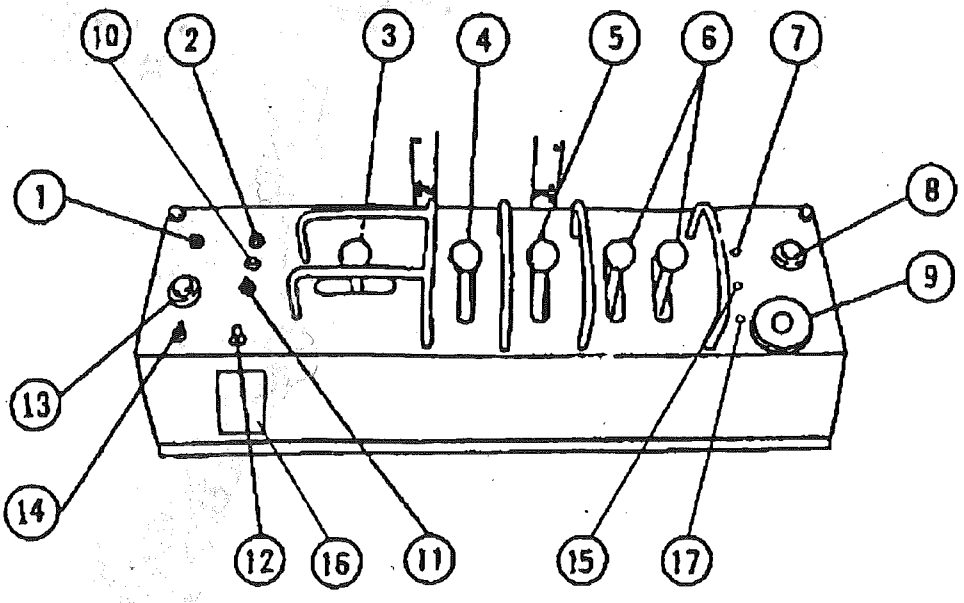
VII Control Panel

1. Lower control panel



No.	Name
1	Hour meter
2	Socket for optional travel remote control box
3	Platform rotation switch
4	Emergency pump switch
5	Boom elevation switch
6	Boom extension switch
7	Accelerator switch
8	Boom rotation switch
9	Emergency stop switch
10	Charge warning lamp
11	Overheat warning lamp
12	Engine oil pressure warning lamp
13	Preheating indicator lamp
14	Engine key switch
15	Power indicator lamp
16	Fuse holder

2. Upper control panel



No.	Name
1	Work light switch
2	Accelerator switch
3	Boom rotation control lever
4	Boom extension control lever
5	Boom elevation control lever
6	Travel control levers
7	Power indicator lamp
8	Engine start switch
9	Emergency stop switch
10	Platform rotation indicator lamp
11	Platform rotation switch
12	Emergency pump switch
13	Horn switch
14	Platform level adjust switch
15	Fuel level warning lamp
16	Fuse holder
17	Tilt warning lamp

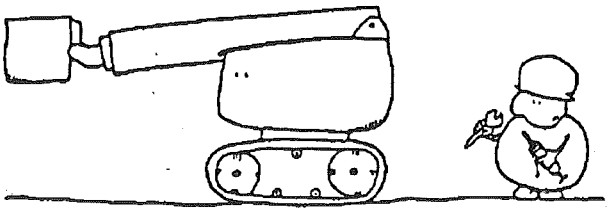
VIII Pre-start Inspection

Always conduct the pre-start inspection before using the machine.

This inspection must be conducted before operating the machine which:

- has been stored for a long time.
- is a new machine.
- has been serviced or repaired.

CARRY OUT PRE-START INSPECTION !



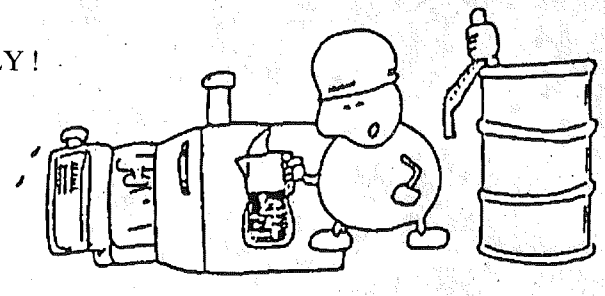
Inspection should be conducted on firm level ground. Check thoroughly the following points, and do not use the machine, if any defect is found out.

Caution: When inspecting the machine under the platform or boom, use safety support to prevent the platform and boom from unexpected descent.

Warning: Use only the AICHI genuine parts for repairs.

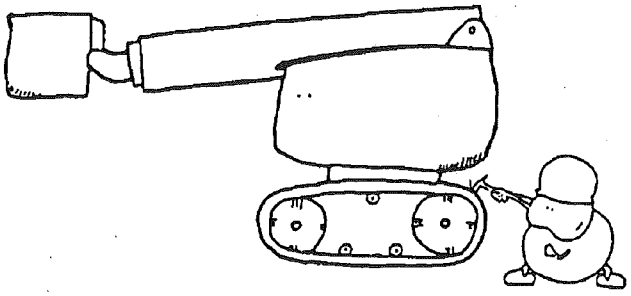
(1) Check engine oil, cooling water and hydraulic oil and refill, if necessary.

SUPPLEMENT ANY SHORTAGE IMMEDIATELY !



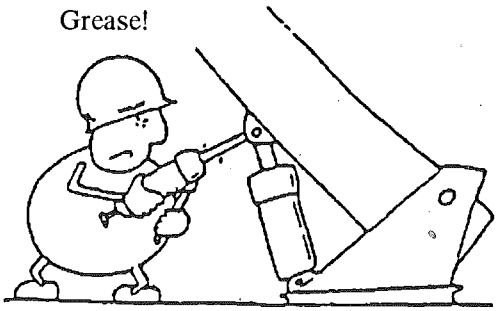
(2) Check the boom, the platform and the chassis for cracks, deformation. Also check each bolt and nut for looseness.

CHECK EACH PART !



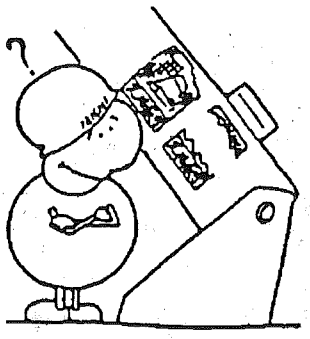
(3) Check that the greasing points are lubricated sufficiently.

Grease!



(4) Check that all of the decals are readable.

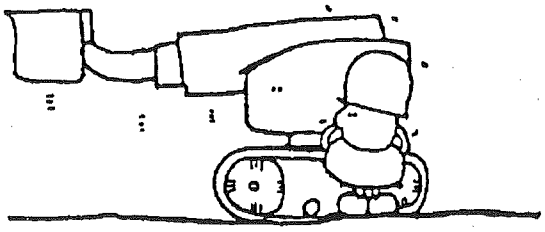
CHECK DECALS !



Warning: The damaged decals should be replaced.

(5) After starting and warming up the engine, operate the machine thoroughly and make sure that all of the movements are smooth without any abnormal noise.

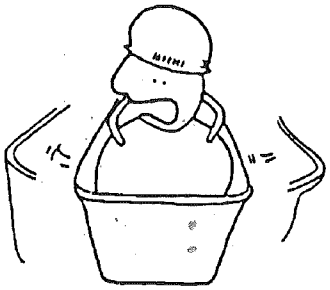
AFTER WARMING UP,
CHECK OPERATION
WITHOUT LOAD !



Note: Check the movements by operating the machine from the lower control first, then from the upper control.

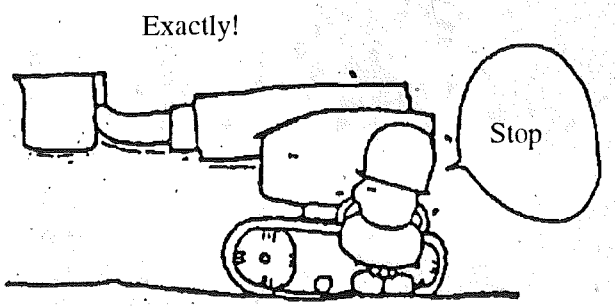
(6) Rotate the platform and make sure that the platform rotates smoothly without excessive free play.

CHECK PLATFORM
ROTATION !

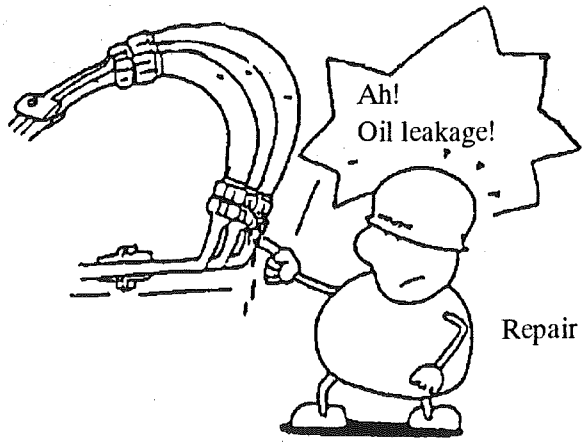


(7) Check the safety devices and make sure that all of the safety devices are working normally.

CHECK SAFETY DEVICE !



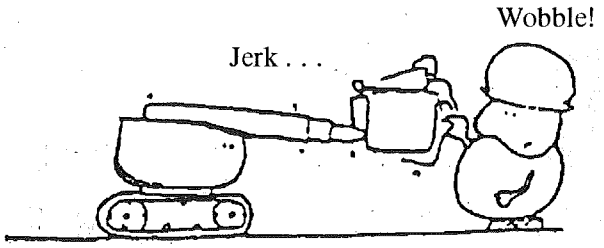
(8) Check the hydraulic components, hoses and pipes for oil leakage.



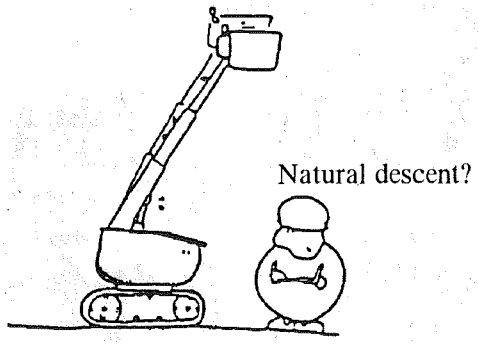
(9) Check the boom extension wire ropes for any damage.

(a) Is there any pause while extending or retracting the boom?

(b) Is there any damage in the wire rope terminal ends?



(10) Elevate the platform, then make sure that the platform does not descend naturally.



IX Safety Device

Safety devices are fitted for safe operation and for protecting the machine from damages.

Safety device	Function
Relief valve	Protects the hydraulic components by relieving abnormally high pressure in the hydraulic system.
Boom elevating safety device (Holding valve)	Prevents the natural descent of the boom when the hydraulic hose is damaged.
Boom extension safety device (Holding valve)	Prevents the boom from natural retraction or extension when the hydraulic hose is damaged.
Platform levelling safety device (Pilot check valve)	Keeps the platform level when the hydraulic hose is damaged.
Motion alarm buzzer	The motion alarm buzzer sounds while the machine is in motion.
Foot switch	The boom, travelling and platform rotating operations from the platform is disabled unless the foot switch is pressed.
Emergency stop switch	Stops all of the movements of the machine when this switch is pressed.
Tilt warning buzzer	When the machine tilts more than 5°, the tilt warning buzzer sounds.
Emergency pump	Auxiliary hydraulic pump driven by the battery is used in an emergency, e.g. engine failure.
Alarm horn	Before starting operation, sound the alarm horn to warn the personnel near the working area.
Travelling and boom simultaneous operation protection device (for CE only)	Travelling and boom operations cannot be operated simultaneously. If both of the operations are attempted simultaneously, both of the movements stop.
Travel speed limit device	The high speed travelling is disabled, if the boom is extended or set over the horizontal.
Boom wire rope failure detecting device (for CE only)	Stops the boom extending movements in the event of the wire rope failure.
Engine protection device	Stops the engine automatically, if the engine oil pressure is abnormally low.
Platform rotation/Boom elevation interlock system	The boom can not be lowered under the horizontal when the platform is rotated from the central position, and the platform can not be rotated when the boom is lowered under the horizontal.

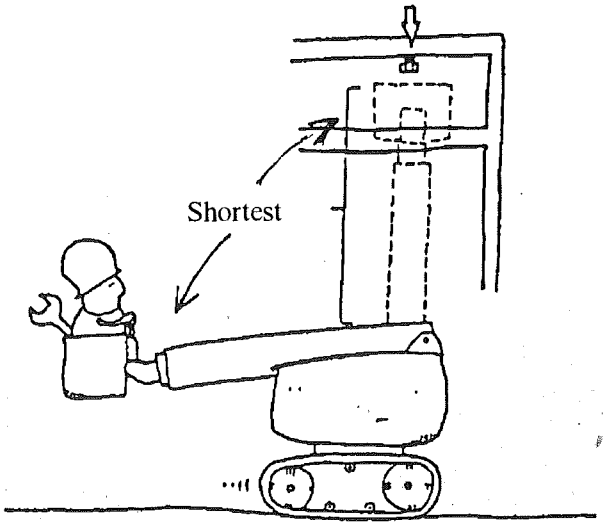
X Positioning of Machine

(1) Set the machine on firm level ground.

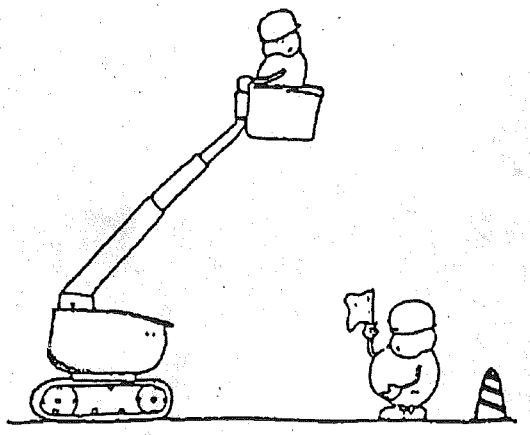
Warning: Do not elevate the platform on soft or uneven ground, as the machine may tip over.

Note: The maximum ground contact pressure of this machine is 0.80 kgf/cm^2 (11.4 PSI).

(2) Place the machine near the working target.



(3) Do not obstruct the transit of other vehicles and passers-by, and do not permit any unauthorized person to enter the working area.



Note: Place warning signs to warn personnel of the working area.

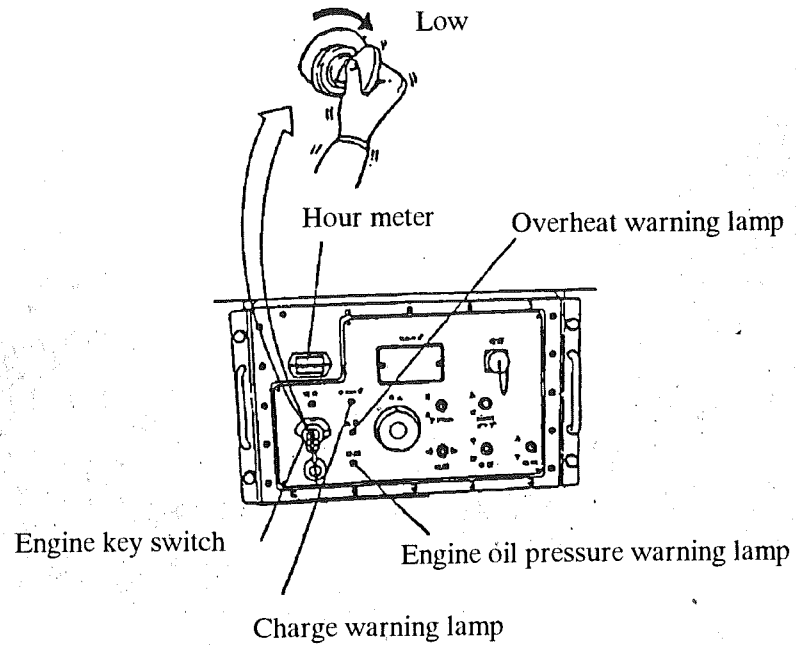
XI Operation Method

1. Engine start operation

1.1 Engine start operation from lower control

Start the engine from the lower control as follows.

(1) Turn the engine key switch of the lower control to "LOW" position. Then, make sure that both of the engine oil pressure warning and the charge warning lamps turn on.



(1.1) Engine oil pressure warning lamp

After the engine is started, the lamp turns off. If the lamp turns on during the engine is in motion, it indicates the failure in the engine lubrication system such as low oil level, oil leakage or filter blockage.

(1.2) Overheat warning lamp

If this lamp turns on during operation, it indicates the failure in the engine cooling system such as shortage of cooling water and damaged fan belt.

Danger: When the engine is heated, do not remove the radiator cap. The heated water may splash out and cause danger.

Note: This lamp turns on only when the cooling water temperature is abnormally high.

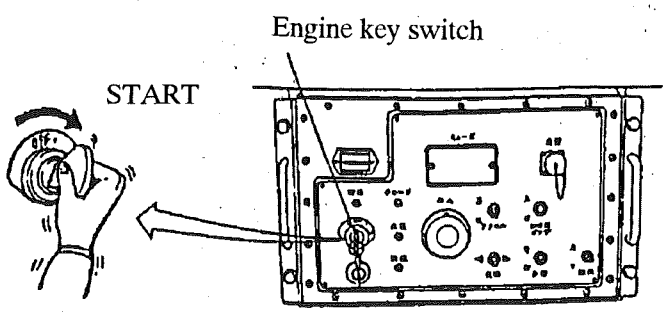
(1.3) Charge warning lamp

After starting engine, this lamp turns off. If the lamp turns on during the engine is in motion, it indicates the failure in the charging system.

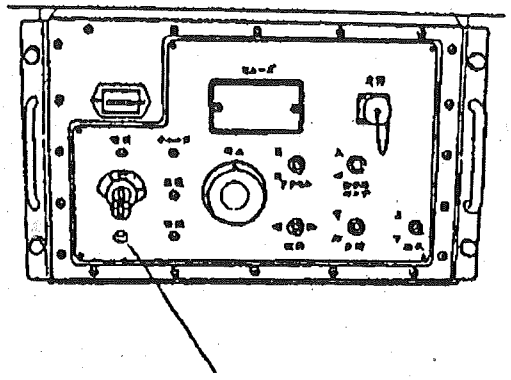
(1.4) Hour meter

The hour meter works only when the engine is in motion.

(2) Turn the engine key switch to "START" position to start the engine.



Caution: Once the engine is started, immediately release the key from the start position. Do not hold the key in the start position for more than 10 seconds continuously, as this may cause the damaged starter motor.



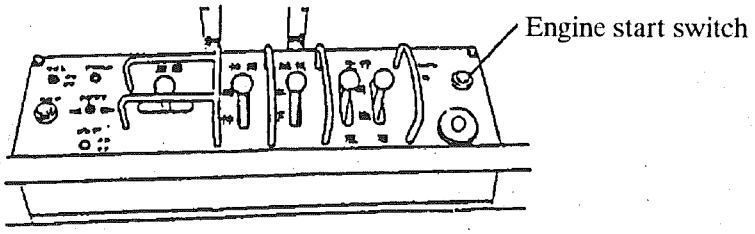
Note: When you start the engine for the first time for the day, or when the engine has been stopped for a long period of time, turn the engine key switch to "GLOW," then start the engine. (This is especially important in winter.)

(3) After starting the engine, warm up the engine for about 5 minutes without loading.

1.2 Engine start operation from upper control

(1) Turn the engine key switch to "UP" position.

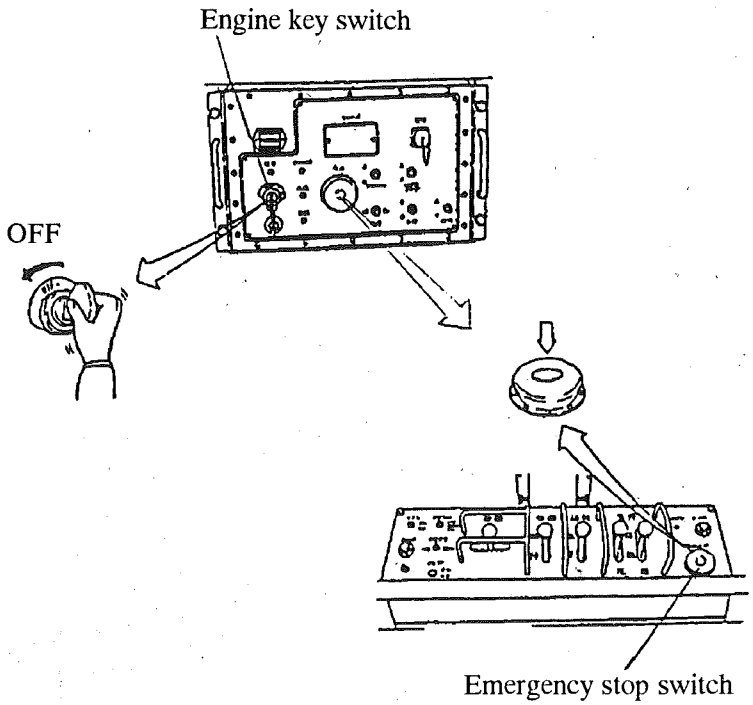
(2) Step on the platform, then press the engine start switch without pressing down the foot switch.



2. Engine stop operation

To stop the engine from the lower control, either press the emergency stop switch or turn the engine key switch to "OFF" position.

When stopping the engine from the upper control, press the emergency stop switch.



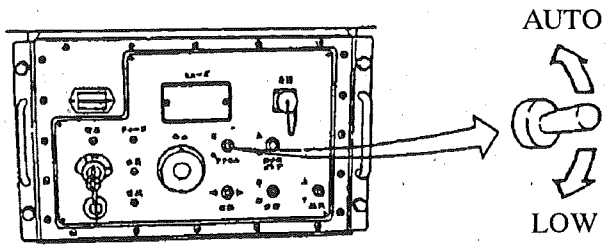
3. Lower control (operation from ground)

Be sure to set the engine key switch in LOW position to operate the machine from the lower control.

3.1 Accelerator operation

The engine rpm is controlled by the Accelerator switch as follows.

- If the switch is set in LOW position, the engine rpm is always maintained at LOW speed (1,200rpm).
- If the switch is set in AUTO position, the engine rpm is automatically increases from LOW speed (1,200 rpm) to High speed (2,300rpm), when Elevation, Rotation, Extension or Travelling operations is conducted.

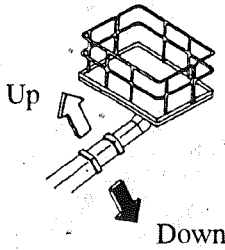


3.2 Boom elevating operation

Use boom elevation switch.

The boom can not be lowered under the horizontal when the platform has been rotated from the central position.

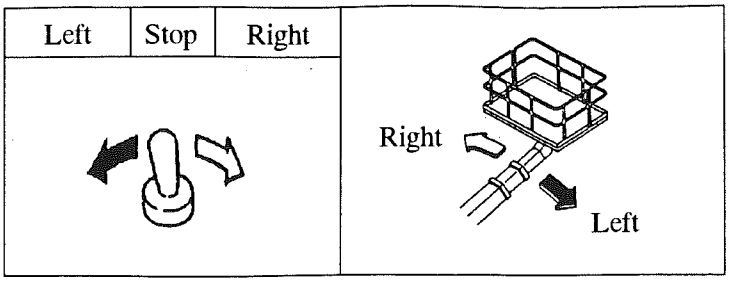
To lower the boom under horizontal, return the platform to the central position.

Boom up		
Stop		
Boom down		

Warning: Do not press the boom against ground by lowering the boom.

3.3 Boom rotation operation

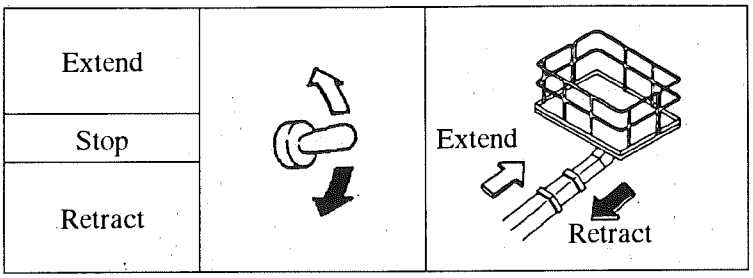
Use boom rotation switch.



Warning: Before starting operation, make sure that no personnel or obstacles are around the turntable.

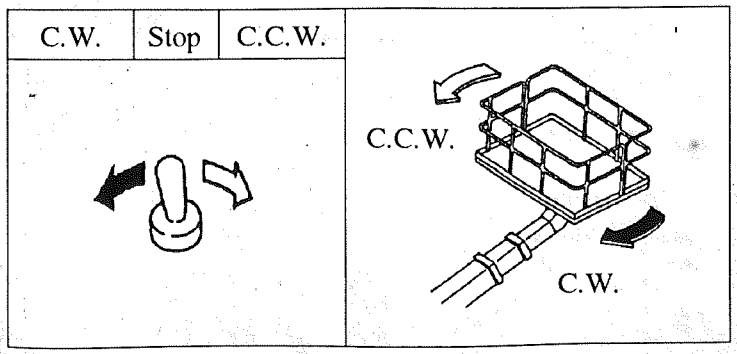
3.4 Boom extension operation

Use boom extension switch.



3.5 Platform rotation operation

Use platform rotation switch.
The platform can not be rotated when the boom has been lowered under the horizontal.
To rotate the platform, elevate the boom over the horizontal.



3.6 Emergency stop operation

Use the emergency stop switch.

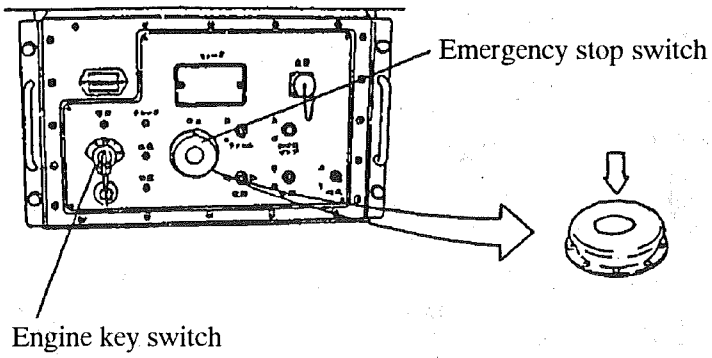
By pressing the emergency stop switch, the upper and lower power indicator lamps turn off, and the engine stops, making all of the operations unavailable.

Use the emergency stop switch in the following cases.

(1) When stopping the engine.

(2) When a person on the ground judges that the operation from the platform is dangerous.

(3) When the machine is uncontrollable.



Note: To reset the main power, pull the emergency stop switch, and make sure the power indicator lamp turns on.

Danger: If the boom descends gradually even with the emergency stop switch pressed, this may indicate cylinder natural descent.

In this case, lower the platform using the following procedures:

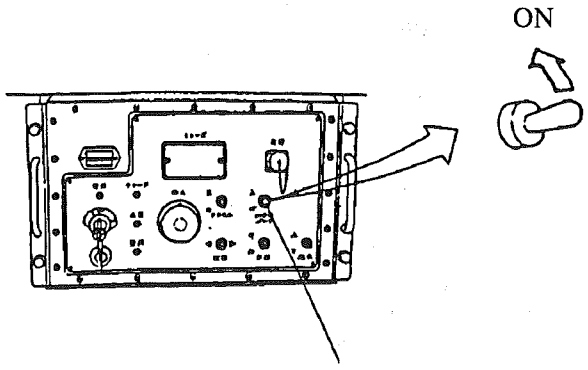
- Pull the emergency stop switch and make sure the power indicator lamp turns on.
- Start the engine with the engine key switch.
- Operate the machine to prevent the boom and the platform from coming into contact with the obstacles.
- Lower the platform down to the ground and stop operation.

Warning: When an emergency stop operation has been conducted due to malfunction, stop using the machine immediately and contact our designated service shop for inspection.

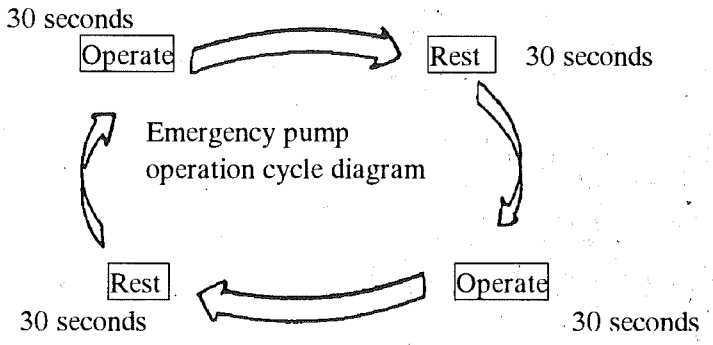
3.7 Emergency pump operation

Use the emergency pump switch.

If the machine does not work due to engine or main pump failure, use the emergency pump to lower the platform. The emergency pump is driven only when the emergency pump switch is operated.



Emergency pump switch



Caution:

- Operate the emergency pump every other 30 seconds, and take interval of 30 seconds until the next operation. Continuous operation in excess of 30 seconds may cause damage to the emergency pump.
- Do not attempt travelling by operating the emergency pump.

Note: If the emergency stop switch has been pressed at the upper control with no operator on the platform, the boom can be lowered by operating the emergency pump switch and the boom control switches simultaneously from the lower control.

3.8 Platform level adjustment method

When the platform is inclined, adjust it by following the procedures outlined below.

(1) Place the machine on firm level ground, then unload the platform.

Warning: Do not adjust the platform level with any person or an object loaded on the platform.

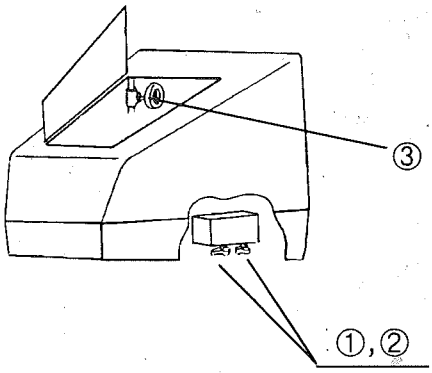
(2) Retract the boom fully, set the boom horizontally, then rotate the platform and return it to the central position.

Warning: Be sure to rotate the platform to the central position. The rotated platform will interfere the boom resulting in damaged platform.

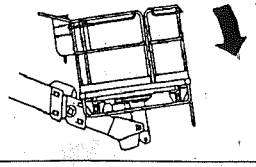
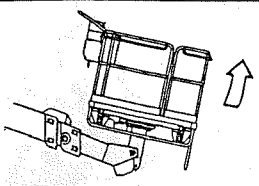
(3) Open or close the valves located at the turntable as follows.

Platform level adjusting valves ① and ② : Turn both of the valves C.C.W. and open them fully.

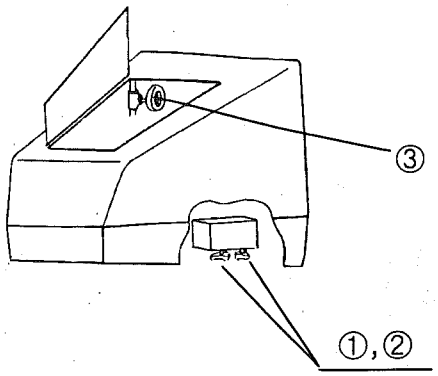
Extension stop valve (White) ③ : Turn the valve C.W. and close fully.



(4) Operate the boom extension switch to OUT when the platform is tilted backward, and to IN when forward.

Tilted backward		Extension (OUT)  Retraction (IN)
Tilted forward		

(5) After adjusting the platform level, close both of the platform level adjusting valves ① and ② securely.



(6) Open the extension stop valve (white) ③ fully.

Caution: The boom extension is not operative, if the valve ③ is not opened fully.

(7) Raise and lower the boom several times to make sure that the platform stays level.

3.9 Air bleed method from platform levelling device

If the platform does not stay level even after adjustment, air may have entered the platform levelling device. In this case, bleed air following the procedures outlined below.

(1) Place the machine on firm level ground, then unload the platform.

Warning: Do not bleed air with any person or object loaded on the platform.

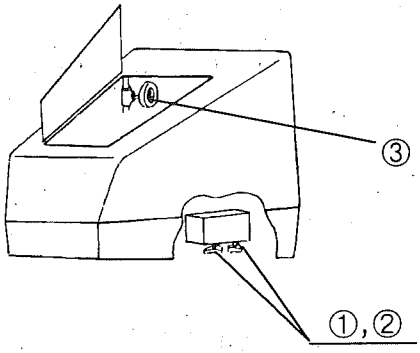
(2) Retract the boom fully, set the boom horizontally, then rotate the platform and return it to the central position.

Warning: Be sure to rotate the platform to the central position. If it is not rotated back to the central position, the platform will interfere with the boom and cause damage to the platform.

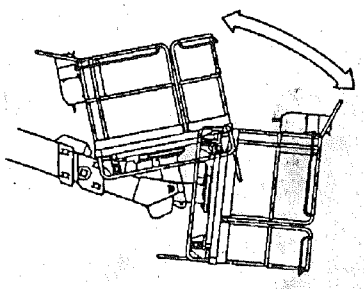
(3) Open or close the valves located at the turntable as follows.

Platform level adjusting valves ① and ② : Turn both of the valves C.C.W. and open them fully.

Extension stop valve (white) ③ : Turn the valve C.W. and close it fully.



(4) Operate the boom extension switch to tilt the platform to all the way back and then all the way forward.



Note: Repeat the above procedure three to four times.

(5) Adjust the platform level as referring the previous clause "3.8. Platform level adjustment method."

4. Upper control (operation from platform)

Prior to operating the machine from the platform, set the key switch in UP position and remove the key. (This will activate the upper control.)

UP OFF LOW

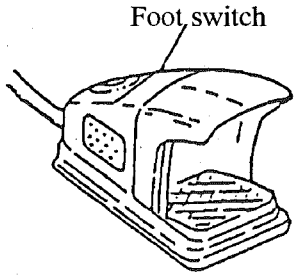
The operator must take this key with him/her.

The spare key should be kept by an authorized person on the ground.

4.1 Foot switch

The only operations which are available without pressing the foot switch are:

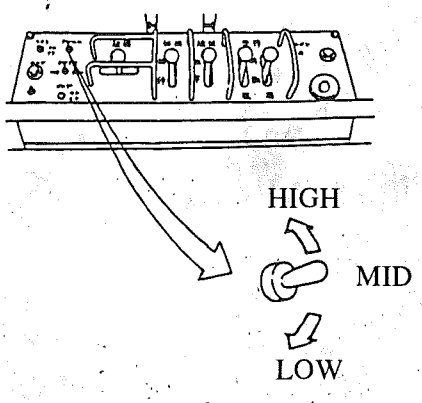
- Engine start operation
- Emergency stop operation
- Horn operation
- Work light operation



4.2 Accelerator operation

The engine rpm is controlled by the Accelerator switch as follows.

- If the switch is set in LOW position, the engine rpm always stays in LOW speed (1,200rpm).
- If the switch is set in MID or HIGH position, the engine rpm automatically increases to MID speed (1,800 rpm) when the boom is operated or to HIGH speed (2,300rpm) when the Travelling is operated.

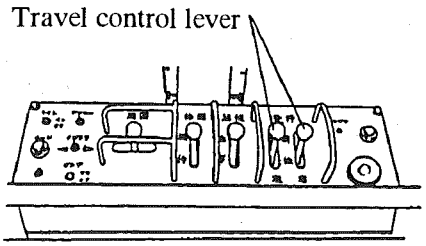


4.3 Travelling operation

Use the two travel control levers.

If the boom is fully retracted and is lowered under the horizontal, three travelling speeds (LOW, MID and HIGH) are available by setting the accelerator switch to LOW, MID or HIGH position.
However, the machine travels only in LOW speed regardless of the accelerator switch position, if the boom is extended or raised over the horizontal.

Caution: The turning is sometimes not available when travelling in HIGH speed, because the traction of the travel motor is not high enough in high speed travelling. Set the accelerator switch to MID or LOW position when turning.



4.3.1 Matters that demand special attention

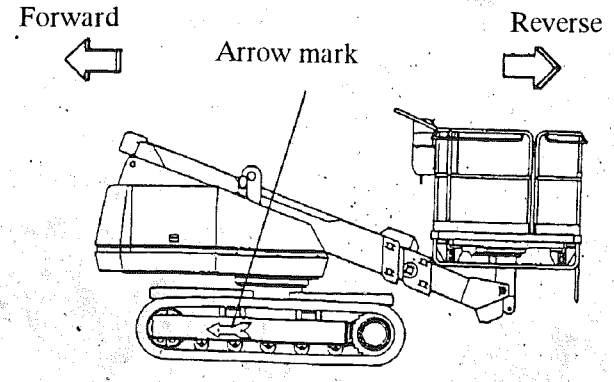
(1) Check the surroundings and make sure that no person is in the travelling direction.

(2) If travelling on the slope greater than 5 degrees, retract the boom fully and set the boom under the horizontal.

(3) When commencing travelling, be sure to operate the travel control levers gradually and start slowly.

(4) To increase the speed, incline the travel control levers more.
To adjust the speed, accordingly adjust the control levers.

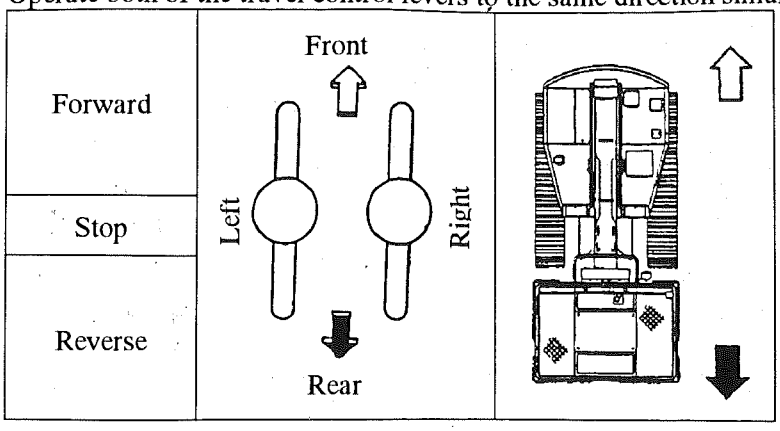
(5) When the turntable has been rotated 180°, the travelling direction becomes the opposite of the control lever direction. Before travelling, make sure the travelling direction by checking the arrow marks attached on the chassis.



4.3.2 Operation method

(1) Straight forward or reverse travelling

Operate both of the travel control levers to the same direction simultaneously.

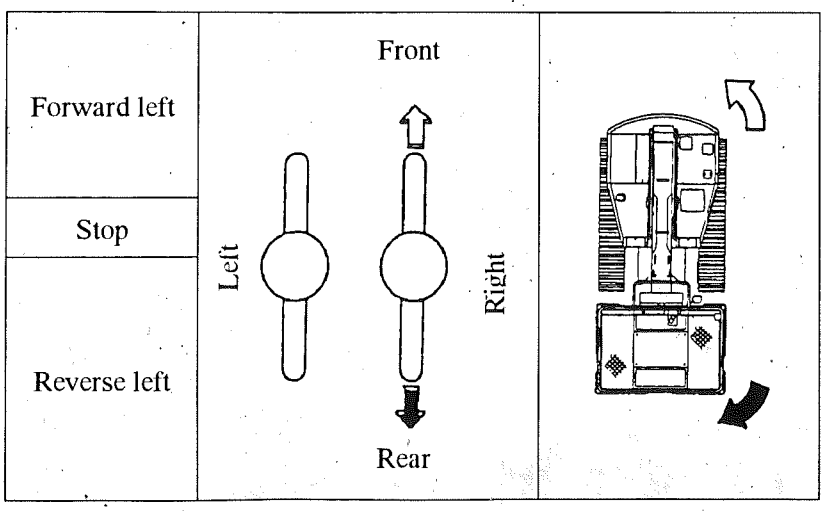


Note: Before travelling, check the travelling direction by the arrow marks attached on the chassis.

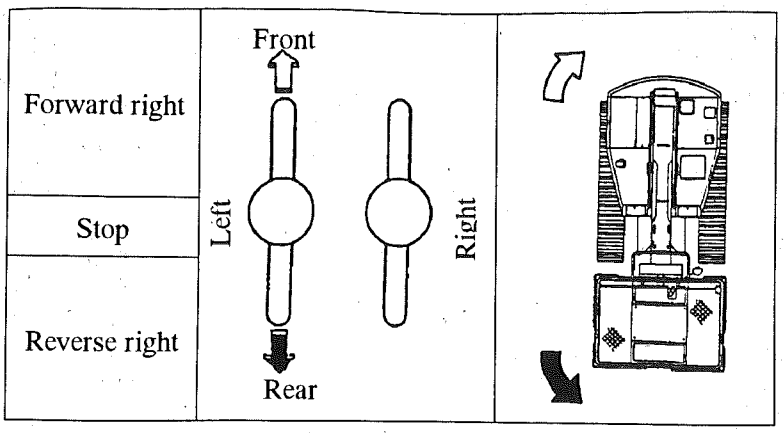
(2) Turning operation

1) Turning from stationary position (Pivot turn)

(a) Forward/Reverse turn to the left



(b) Forward/Reverse turn to the right

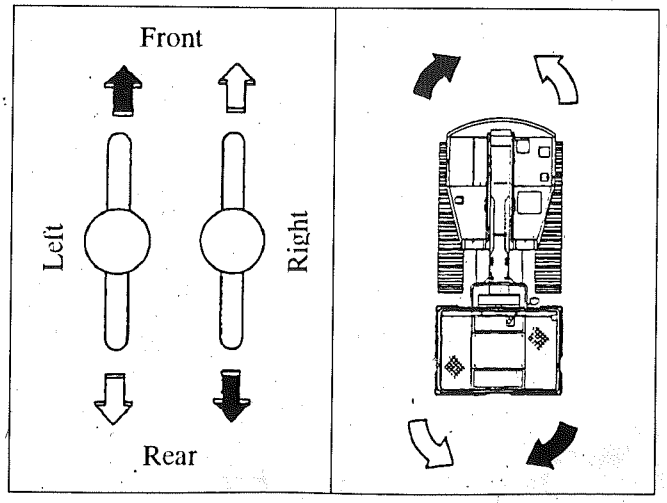


2) Turning while travelling

Left turn · · · Return only the left travel control lever to the neutral position.

Right turn · · · Return only the right travel control lever to the neutral position.

3) Turning with the minimum radius (Spin turn)



⇧ · · · Spin turn: CCW

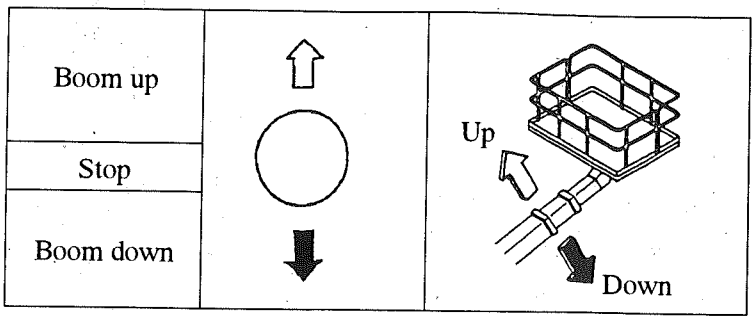
⇑ · · · Spin turn: CW

Caution: Spin turn should only be conducted after stopping the machine.

4.4 Boom elevating operation

Use boom elevation control lever.

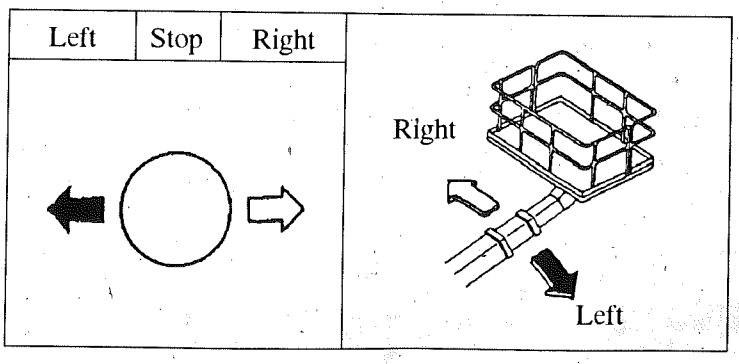
The boom can not be lowered under the horizontal when the platform has been rotated from the central position. To lower the boom under horizontal, return the platform to the central position.



Danger: Be careful not to press the boom or platform against the ground.

4.5 Boom rotation operation

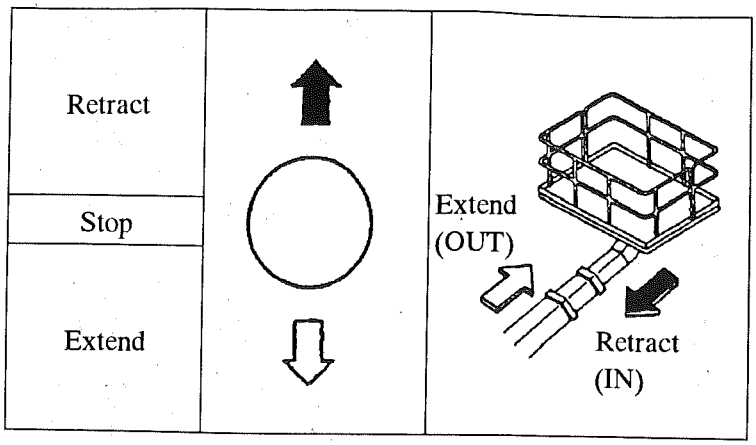
Use boom rotation control lever.



Danger: Make sure that no obstacle is around the turntable.

4.6 Boom extension operation

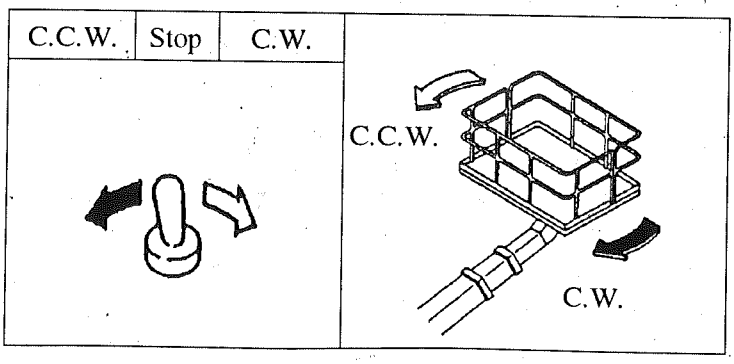
Use boom extension control lever.



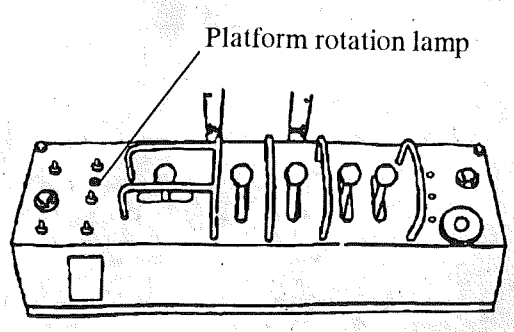
4.7 Platform rotation operation

Use platform rotation switch.

The platform can not be rotated when the boom has been lowered under the horizontal. To rotate the platform, elevate the boom over the horizontal, and make sure the platform rotation lamp turns on.

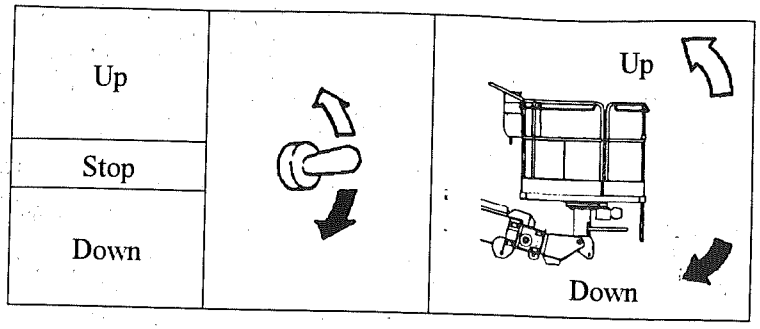


Caution: When travelling, rotate the platform to the central position.



4.8 Platform level adjusting operation

The platform level is adjusted by the platform level adjustment switch.



4.9 Emergency stop operation

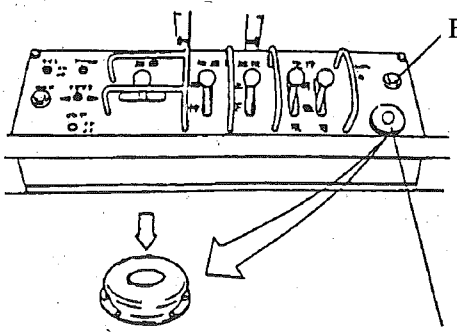
Use the emergency stop switch.

By pressing the emergency stop switch, the power indicator lamp turns off, and the engine stops, making all of the operations unavailable. The emergency stop switch should be pressed in any of the following situations.

(1) When stopping the engine.

(2) When the operator on the platform wants to stop operation, and avoid danger.

(3) When the functions of any control levers or switches become abnormal.



Note: To reset the power, pull the emergency stop switch, and make sure the power indicator lamp turns on.

Danger: If the boom descends gradually even with the emergency stop switch pressed, this may indicate cylinder natural descent.

In this case, lower the platform using the following procedures:

- Pull the emergency stop switch and make sure the power indicator lamp turns on.
- Start the engine by the engine start switch.
- Operate the boom to prevent the boom and the platform from coming into contact with obstacles.
- Lower the platform down to the ground and stop operation.

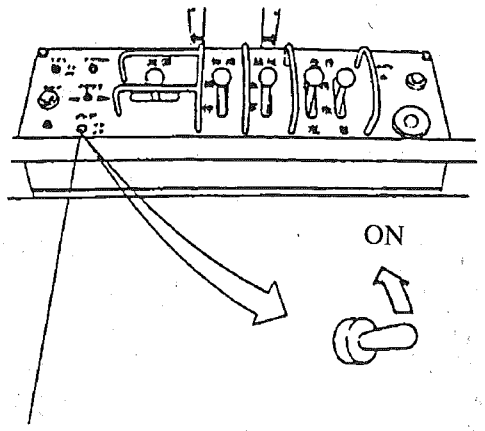
Warning: When an emergency stop operation has been carried out due to malfunction, stop using the machine immediately and contact our designated service shop for inspections.

4.10 Emergency pump operation

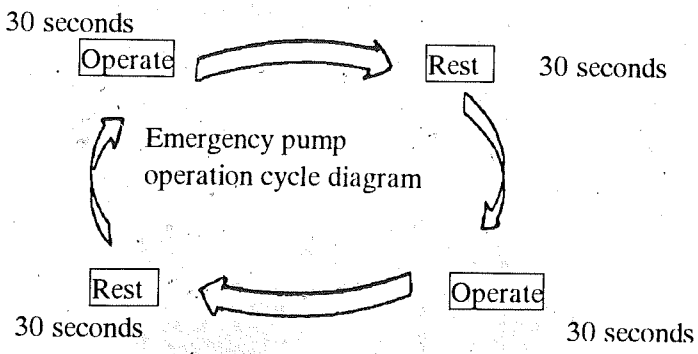
Use the emergency pump switch.

If operation fails due to the main pump or the engine failure, use the emergency pump to lower the platform.

Emergency pump is driven only when the emergency pump switch is operated.



Emergency pump switch



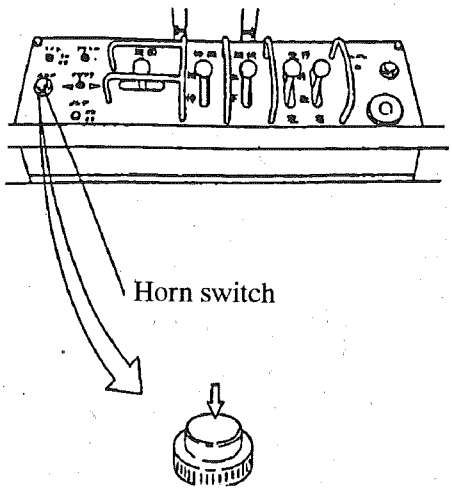
Caution:

- Operate the emergency pump every other 30 seconds, and take interval of 30 seconds until the next operation. Continuous operation longer than 30 seconds may cause damage to the emergency pump.
- Do not attempt travelling by operating the emergency pump.

4.11 Alarm horn operation

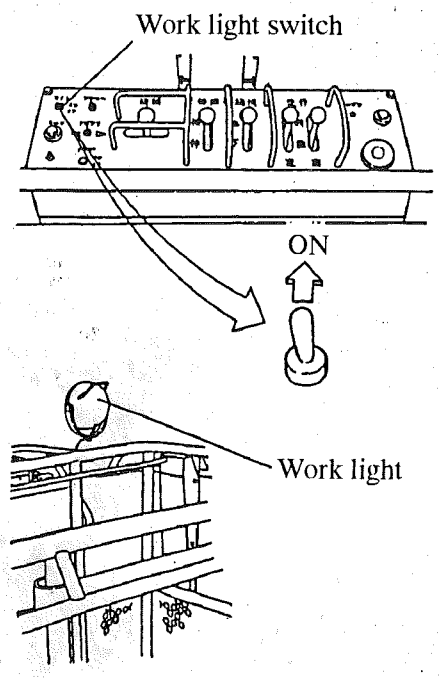
Use the horn switch.

An alarm horn sounds, when the switch is pressed. Sound the alarm horn before starting operation to warn personnel in working area.



4.12 Work light operation

Use the work light switch to turn on the light.

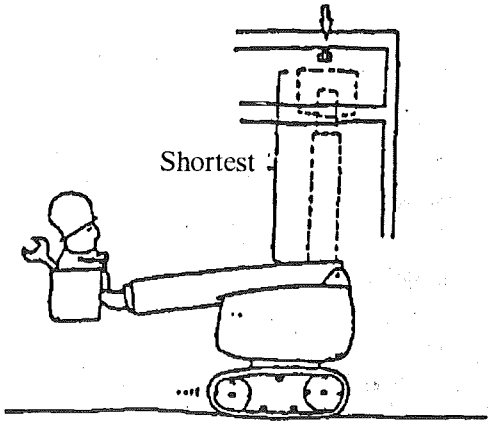


XII Operation Points

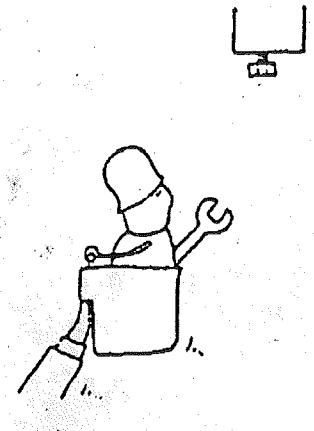
Park the machine on firm level ground before elevating the platform. The machine may tip over, if parked on soft or uneven ground.

* The maximum ground contact pressure of this machine is 0.80 kgf/cm^2 (11.4 PSI).

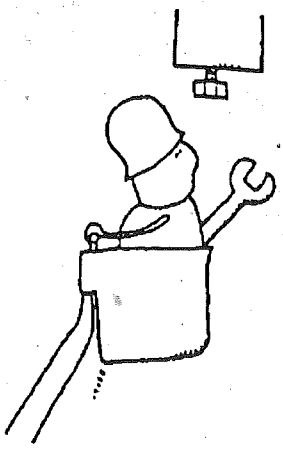
(1) Set up the machine close to the working target.



(2) Rotate, and elevate the boom until the working target is in line with the boom extending direction.



(3) Extend the boom till the working target is within a comfortable working range.



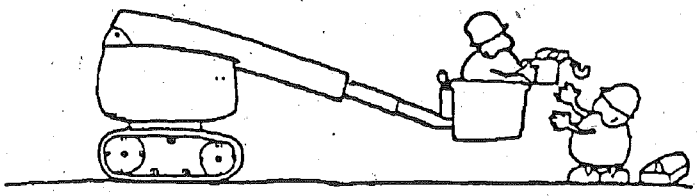
Note: Rotate the platform, if necessary.

(4) After finishing the work, reverse the above procedures to lower the platform.

XIII Caution After Finishing Work

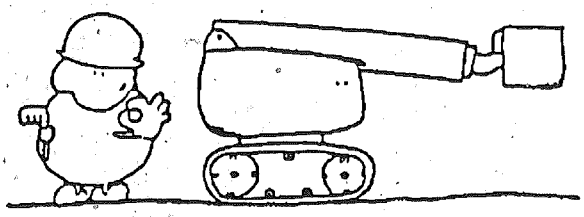
1. When the work is finished

(1) Take all tools and materials out of the platform.



(2) Retract and lower the boom fully and rotate the platform to the central position.

(3) Stop the engine by turning the engine key switch to "OFF."



Caution: Remove the key to prevent any possible danger caused by unauthorized use.

2. Transportation

2.1 Loading transport vehicle

To ensure safe transportation of the machine by transport vehicle, follow these procedures.

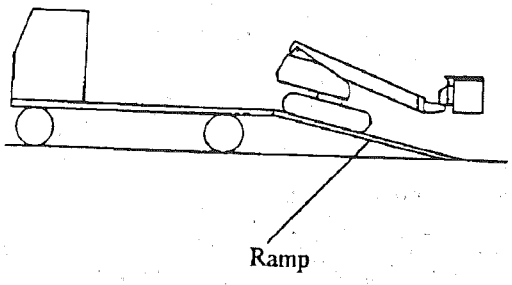
(1) Lower the platform to ground and remove all tools and materials from the platform.

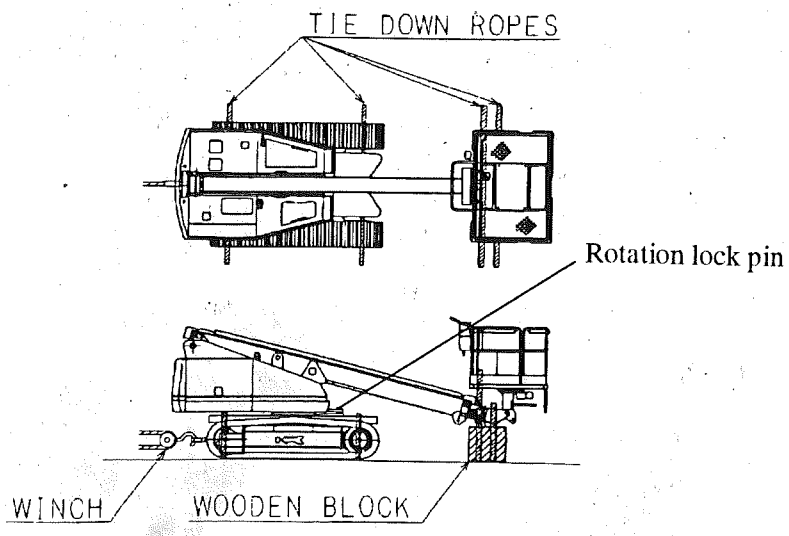
(2) Make sure the machine is in line with the loading ramp of the transport vehicle.

(3) Drive the machine slowly with the boom fully retracted when climbing up the loading ramp.

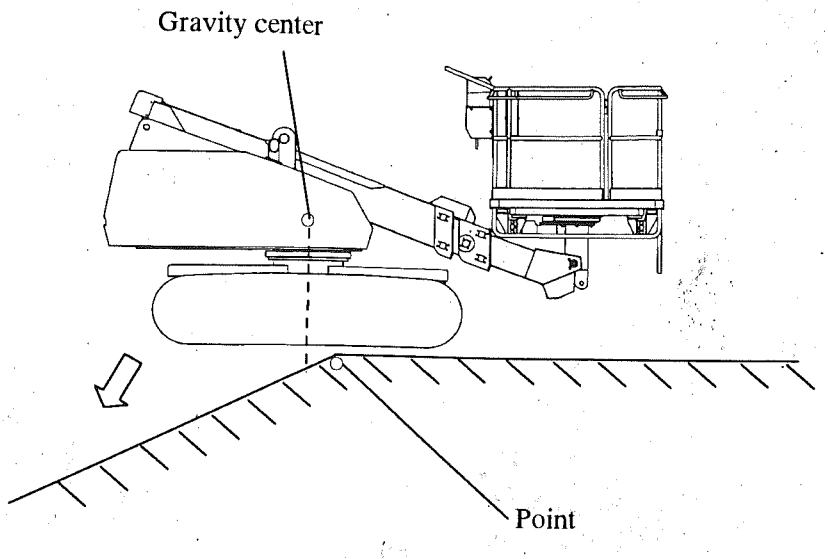
(4) After loading, engage the rotation lock pin, then tie down the machine on the vehicle bed securely as shown in the figure below.

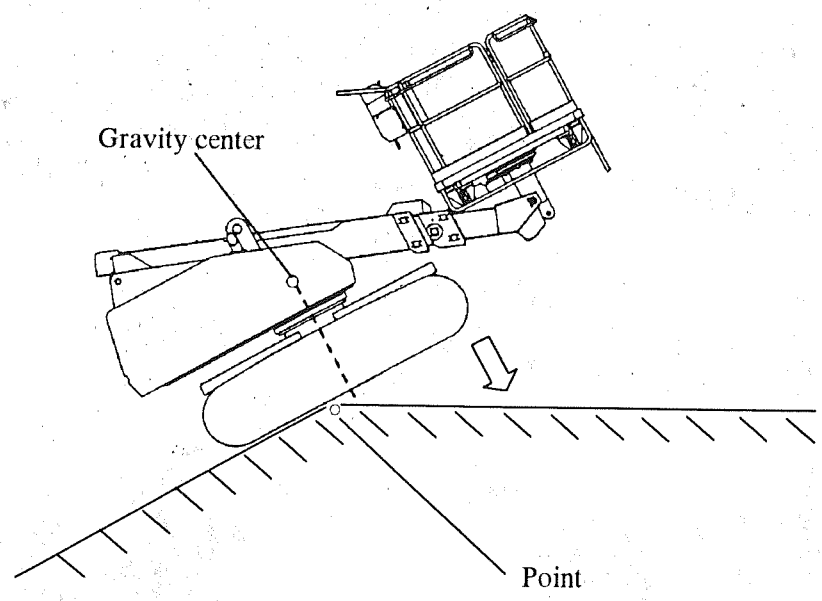
Note: To unload the machine from the transport vehicle, reverse the above procedures.





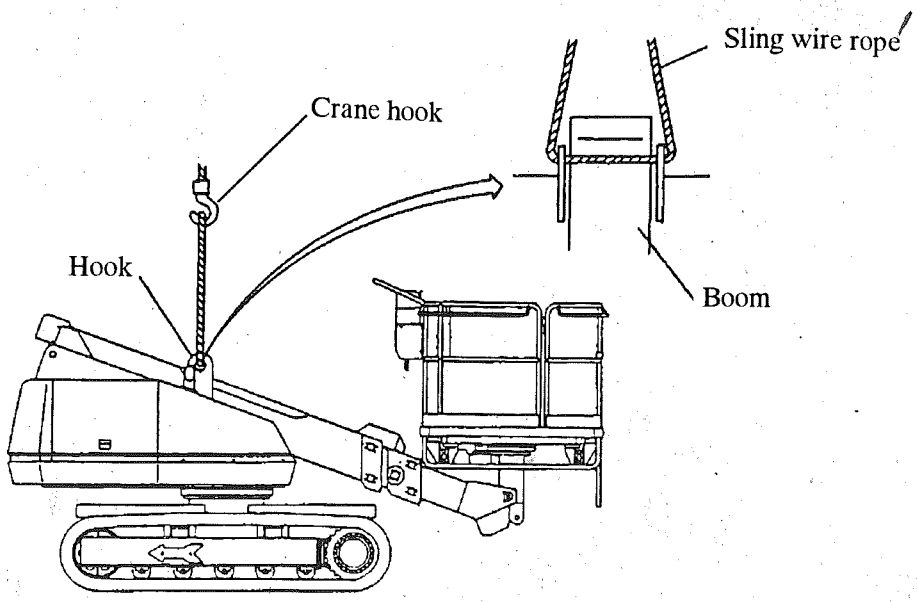
Caution: When passing the point shown in the figure below the machine will incline suddenly. For this reason it is important that the machine is moved very slowly and cautiously with the boom fully retracted.





2.2 Hoisting method of machine

Install the sling wire rope as shown in the figure to hoist up the machine.



Caution:

- Be sure to unload the platform, retract and lower the boom fully as shown in the figure before hoisting up the machine.

  The machine will incline if hoisted up in the other machine position than the above.

- Use an adequate sling wire rope. The overall weight of the machine is 14,500 kg (31,967 lbs).

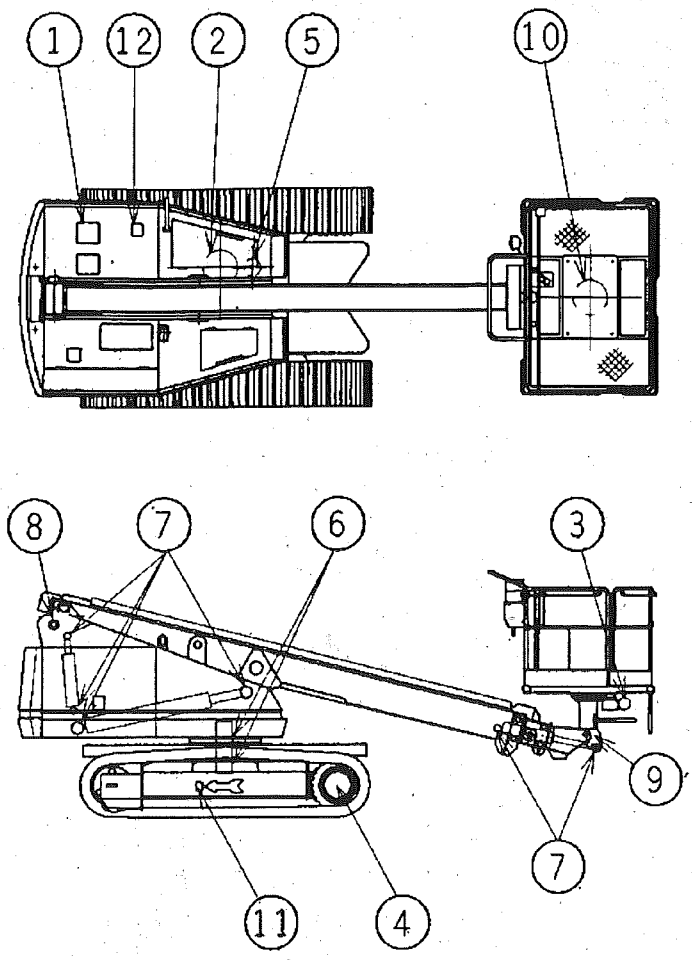
XIV Lubrication

1. List of recommended lubricants

Manu-facturers	Hydraulic oil		Gear oil		Grease		
	General purpose	For cold region	Rotation gear box	Travel gear box	General	Gear compound	Molyb-denum
Shell oil	Tellus oil 32 or k32	Tellus oil T15	Omala oil 460	Spirax EP 90	Alvania EP grease 2	Cardium compound A or D	Retinax AM
Esso oil	Nuto H32	—	Spartal EP460	Standard gear oil 90 Esso gear oil GP80	Lithtan EP2 Beacon EP2 Nidok EP2	JWS2563 Spartal EP2200	Beacon Q2
Mobil oil	DTE 24	—	Gear 634	Pegasus gear oil 90 Mobilube GX90	Mobilux EP2	Mobiltac QQ	Mobil grease special
Nippon oil	Super highland 32	Highland wide 15	Bon knock AX460	Gearlube SP 90	Epiknock AP2	Cranoc compound 1	New molynick
Idemitsu kosan	Daphne super hydraulic oil 32	Daphne super hydro WR15	Daphne super gear oil 460	Apoloil gear HE 90	Daphne coronex grease EP No.2	Daphne open gear oil No.1	Daphne grease M No.2
Cosmo oil	Cosmo hydro AW32	—	Cosmo gear SE460	Cosmo gear GL-4 90	Cosmo grease diner Max EP No.2	Cosmo gear compound No.2	Cosmo molybdenu m grease No.2
Japan energy	Hydrax 32	—	Reductus 460	Gear 4-90	Resonics grease EP-2	Gear compound No.2	Resonics grease M-2
Mitsubishi oil	Hydro fluid EP32	—	Super gearlub SP460	Diamond hypoid gear oil 90	Diamond multipurpos e EP grease 2	Mitsubishi gear compound 2	Diamond multipurpose M grease 2
General oil	Panol 32	—	SP gearol 460	G-gear 4-90	Gemico grease ME-2	General gear compound 2	Gemico grease AD-1

1. Supply proper amount of machine oil to the hinges.

2. Lubrication chart and interval



No.	Name	Name of oil and grease	Oil change or greasing interval			
			30 hrs or 1 week	100 hrs or 1 month	800 hrs or 6 months	1200 hrs or 12 months
1	Hydraulic oil tank	Hydraulic oil		△		◎
2	Rotation gear box	Gear oil		△		◎
3	Platform rotation gear box			△		◎
4	Travel gear box			△		◎
5	Rotation bearing	Grease (general)	○			
6	Swivel joint				○*	
7	Anchor pin for hydraulic cylinder		○			
8	Boom pivot		○			
9	Platform pivot		○			
10	Platform rotation bearing		○			
11	Grease cylinder			(Rubber track shoe specification) ○	(Steel track shoe specification) ○	
12	Fuel tank	Gas oil	Fill when required.			
13	Engine	Refer to engine manufacturer's manual.				
○ Greasing ◎ Change △ Change for new unit						

*Supply grease 2-3 shots by hand pump.

Note: For No. 4 and No. 11, two locations left and right are provided.

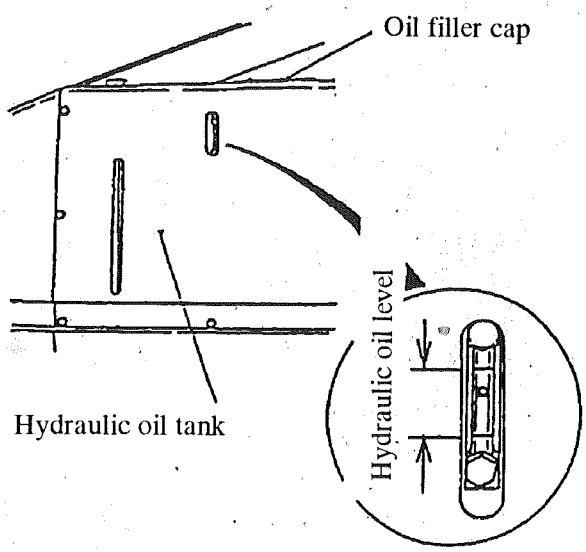
XV Daily Care

Various materials are used in the construction of this machine and these materials wear or deteriorate gradually. Some parts may be difficult to check for safety, so those parts should be replaced periodically according to the predetermined serviceable life time.

1. Hydraulic oil

1.1 When replenishing

Check oil level with the oil level gauge equipped on the hydraulic oil tank, and refill to the level through the oil filler cap.



Note: Retract and lower the boom fully, before checking the oil level.

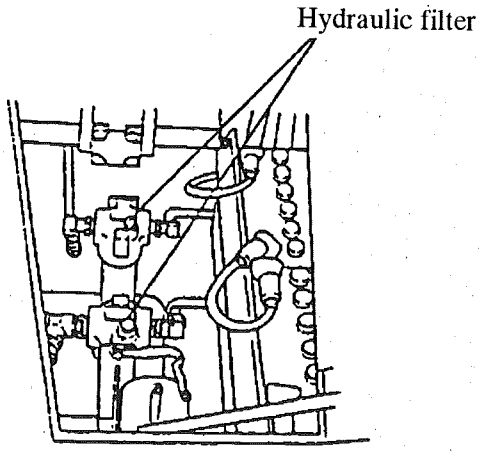
1.2 Hydraulic oil change (once a year)

(1) Lower and retract the boom fully.

(2) Remove the oil drain plug installed on the bottom of the tank and drain the hydraulic oil thoroughly, then reinstall the oil drain plug.

(3) Refill the tank with new hydraulic oil with checking the oil level.

(4) Replace the hydraulic oil filters at the same time.



Note:
- Hydraulic oil tank capacity: 250 liters (66 gallons)
- When changing hydraulic oil, contact our designated service shop.

2. Gear oil for "Rotation gear box"

2.1 Inspection

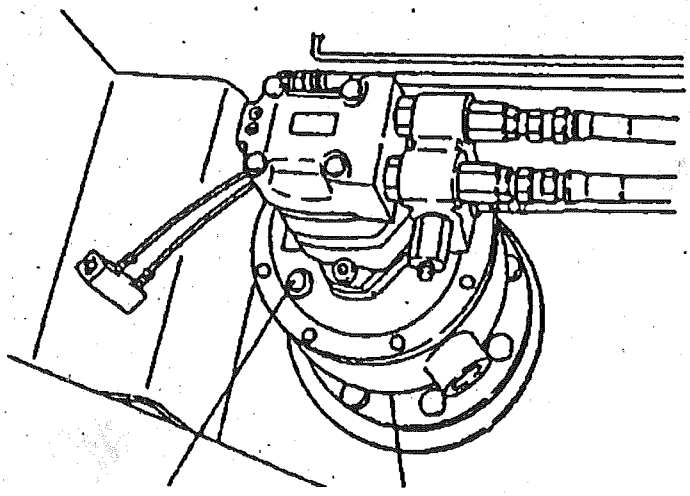
Check the gear box for oil leakage.

2.2 Gear oil change (once a year)

(1) Remove both of the oil drain and filler plugs and drain gear oil thoroughly.

(2) Reinstall the oil drain plug, and refill the gear box with new gear oil.
Oil capacity: 1.1 liters (0.3 gallons).

(3) Reinstall the oil filler plug.



Oil filler plug Oil drain plug

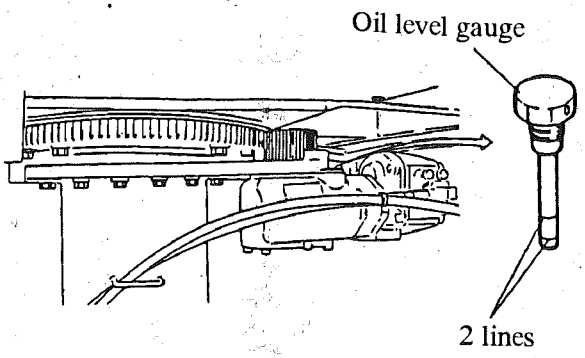
Note: • Oil capacity: 1.1 liters (0.3 gals)

• For oil change procedures, contact our designated service shop.

3. Gear oil for "Platform rotation gear box"

(1) Check the oil level by the oil level gauge and replenish if necessary.

Note: To check the oil level, screw in the level gauge fully. Then, make sure the oil level is between the two lines on the level gauge.



(2) To change the oil, drain the oil and refill to the specific level.

Oil capacity: 0.6 liters (0.16 gals)

4. Gear oil for "Travel gear box"

Change gear oil by following these steps.

(1) Set the oil filler, level and drain plugs as shown in the figure below.

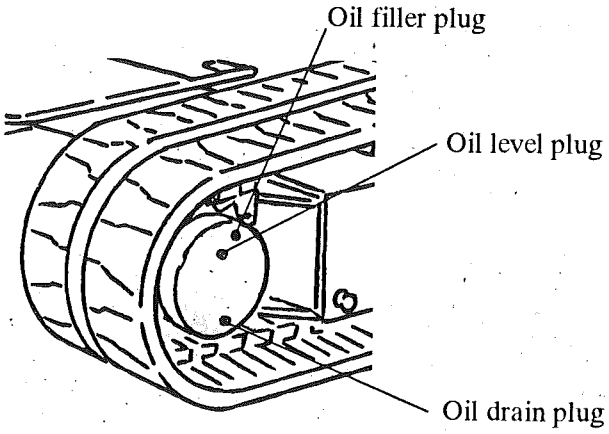
(2) Remove all of the plugs, and drain the oil thoroughly.

(3) Reinstall the oil drain plug.

(5) Refill the gear box with new gear oil from the oil filler port till the oil level reaches the oil level port.

(6) Reinstall the oil level and filler plugs.

Note: Oil capacity: 4.7 liters (1.2 gallons) for one side

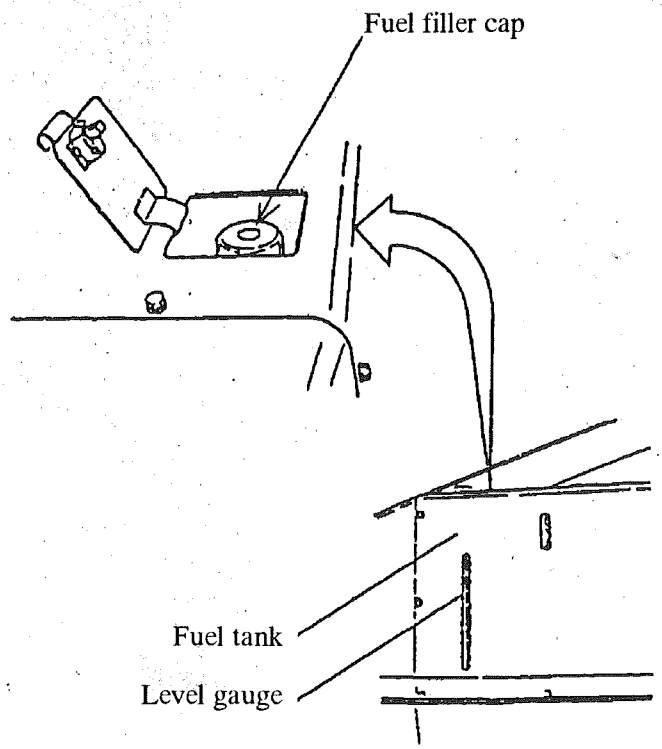


5. Fuel

Use gas oil as a fuel.

Check fuel level with the fuel level gauge, and refill to level.

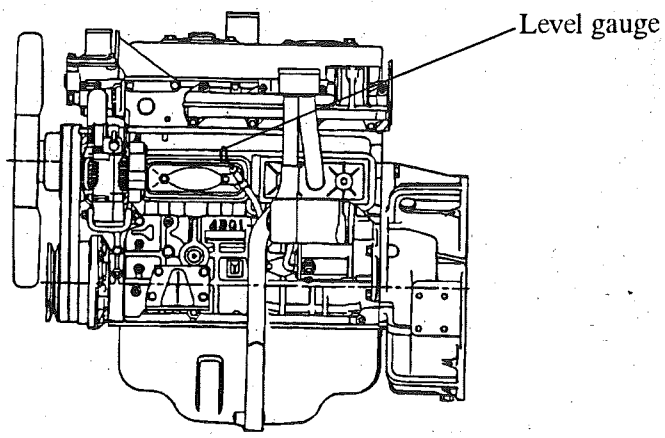
Note: Tank capacity: 230 liters (60.8 gallons).



6. Engine

(1) Engine oil

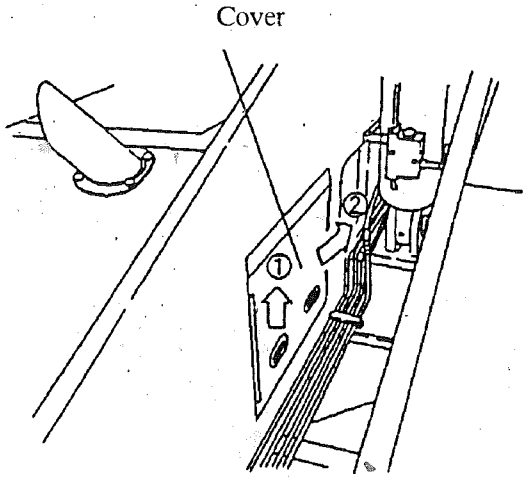
Check oil level with the oil level gauge, and refill to the level.



Note: • Keep the oil level in between the two lines on the dip stick.

(2) For engine oil change procedures and other engine related maintenance, refer to engine manufacturer's manual.

Caution: To replace engine oil filter, remove the cover on the turntable.



7. Wire rope

Replace the wire rope, when any defects listed below are observed.

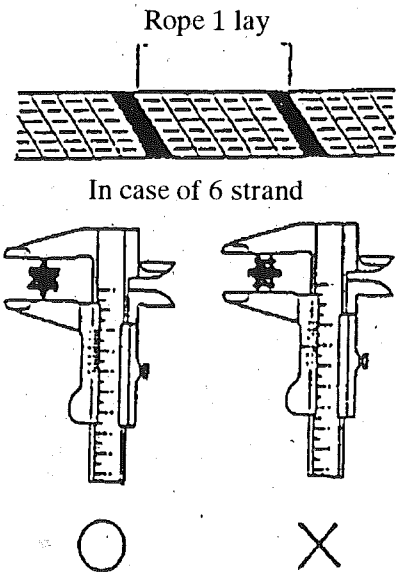
(1) Kinked rope.

(2) Stretched or corroded rope.

(3) Cut rope.

(4) If the decrease of the rope diameter exceeds 3% of the nominal diameter. See the figure below to check the rope diameter.

Note: For replacement procedure, contact our designated service shop.



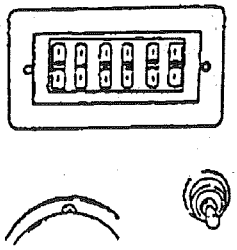
8. Fuse

Fuse holders are located in both the lower and upper control boxes.

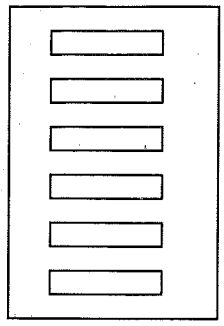
If the machine does not work, the fuse may have been blown.

Lower control box

Fuse



Upper control box



Engine stop	Accelerator	Limit switch	Emergency pump	Power supply	Engine start
30A	5A	10A	10A	20A	10A

10A	Spares
5A	Work light
3A	Accelerator
10A	Platform rotation & level Emergency pump
3A	Engine start
10A	Horn

Warning: When replacing fuse, be sure to set the engine key switch in "OFF" position.

9. Hydraulic hose

If oil leaks from the hydraulic hose, stop using the machine immediately and contact our designated service shop.

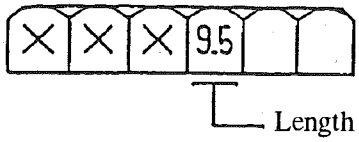
When ordering parts, please let us know the following:

(1) Classification of hose: rubber or nylon

(2) Location on the machine

(3) Length of hydraulic hose: the dimension between the tips of both hose fittings.

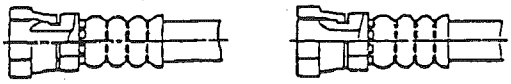
Note: The length is indicated on the "hose fitting" as shown in the figure below. (Rubber hose only)



Example: 9.5 → 950 mm (37.4 in)
12 → 1,200 mm (47.2 in)

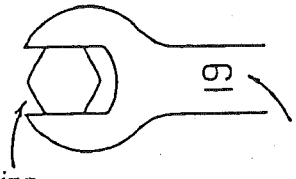
(4) Classification of "Hose fittings"

Hose fitting (male) Hose fitting (female)



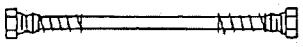
(5) Size of hydraulic hose

Please let us know wrench size to be used.

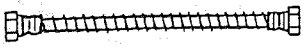


(6) Existence of armour

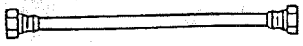
① Both side armoured



② All armoured



③ Non armoured

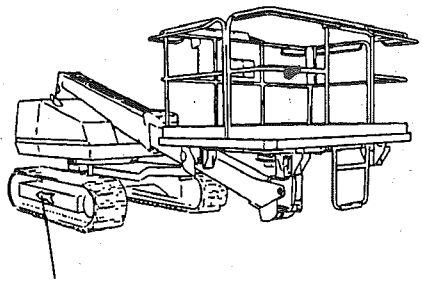


10. Crawler

Sagging may occur on the tracks due to wear, so you are requested to adjust the track tension periodically. If the tension is not appropriate, the track risks detachment.

10.1 Adjustment method

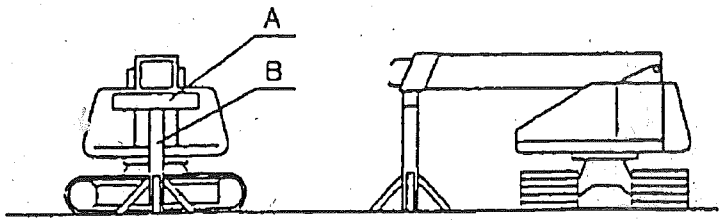
(1) Remove the travelling direction arrow plates from both sides of the chassis. The grease fitting for the track tension adjustment will appear inside.



Direction indicating plates

(2) Retract the boom fully, then rotate the boom and set it to right or left side of the machine as shown in the figure below.

(3) Set "Boom stand B" and "Wood block A" under the top of the 1st boom as shown in the figure below.



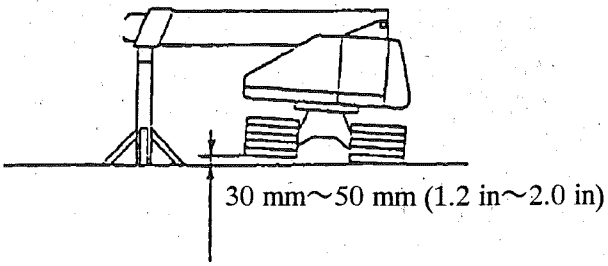
A : ☐ 90 mm (3.5 in) × 600 mm (23.6 in) (wood block)

B : ☐ 90 mm (3.5 in) × 1400 mm (55.1 in) (stand)

Caution: "Wood block A" shall be longer than the width of the 1st boom apex, and arrange it so that the boom comes to the center of the wood block.

Warning: In the interest of safety, make sure the stand is stable.

(4) Press the boom against the wood block by lowering the boom slowly, and allow the clearance 30～50 mm (1.2～2.0 in) between the track and the ground.



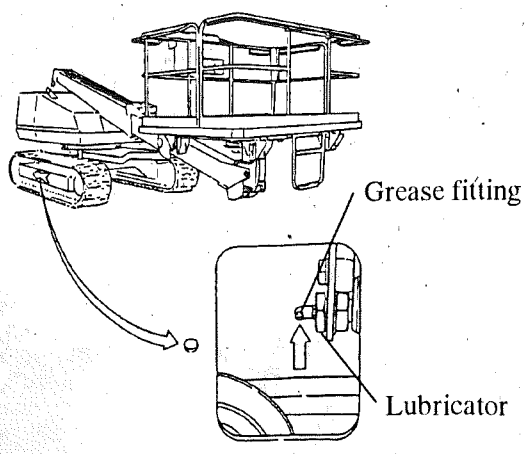
Danger:
- Be sure to conduct the boom operation from the "Lower control."
- Do not lift up the track more than 50 mm (2.0 in) above the ground. If the track is lifted up beyond what is necessary, the machine may become unstable.

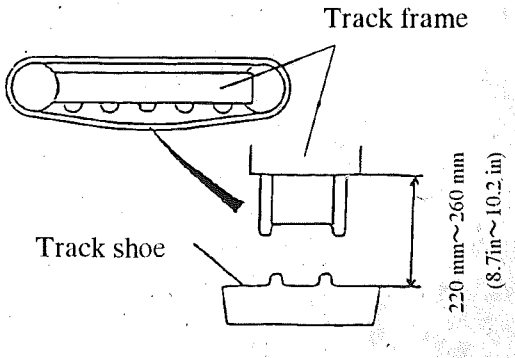
(5) Supply grease to the "Grease cylinder" through the "Grease fitting" to apply more tension to the track.

Adjust the dimension between the track shoe and the track frame to 220～260 mm (8.7～10.2 in).

If the track is too tight, unscrew the "Lubricator" part away till the grease exudes.

Warning:
- Do not loosen the grease fitting as it may pops out resulting in serious injury.
- Do not unscrew the "Lubricator" more than one full turn as it may pops out resulting in serious injury.





(6) After adjusting one side, rotate the boom 180°, and adjust the other side in the same manner.

Note: It is important to adjust the tension of left and right tracks equally.

10.2 Adjustment interval

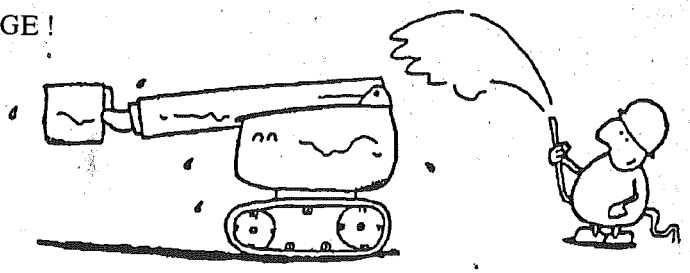
Adjust the track tension at the intervals mentioned below.

	Interval
First time on new machine	After 10 ~ 20 hours
Thereafter	Every 800 hours

XVI Caution for Long Term Storage

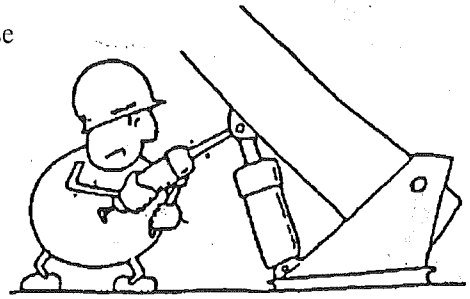
(1) Clean up the machine.

WASH BEFORE STORAGE !



(2) Lubricate each part as referring "Lubrication chart and table."

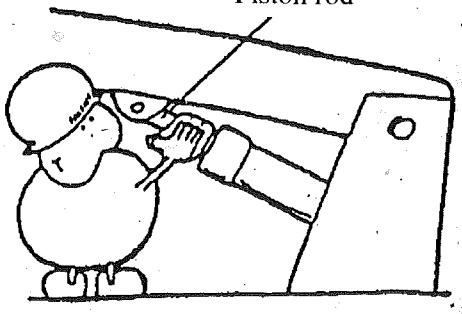
Apply grease



(3) Apply sufficient rust prevention oil to the piston rod of the hydraulic cylinder.

APPLY RUST
PREVENTION OIL !

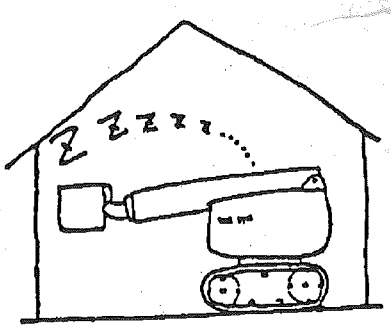
Piston rod



(4) Store in a dry room

If storage outside is unavoidable, park the machine on firm level ground and cover with a water proof sheet.

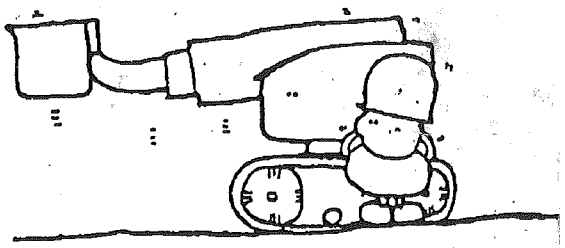
STORE INDOORS !



(5) During long term storage, conduct the following operation periodically.

- Operate the boom to prevent corrosion of lubricated portion.
- Drive the machine regularly to prevent rust forming on the track links.

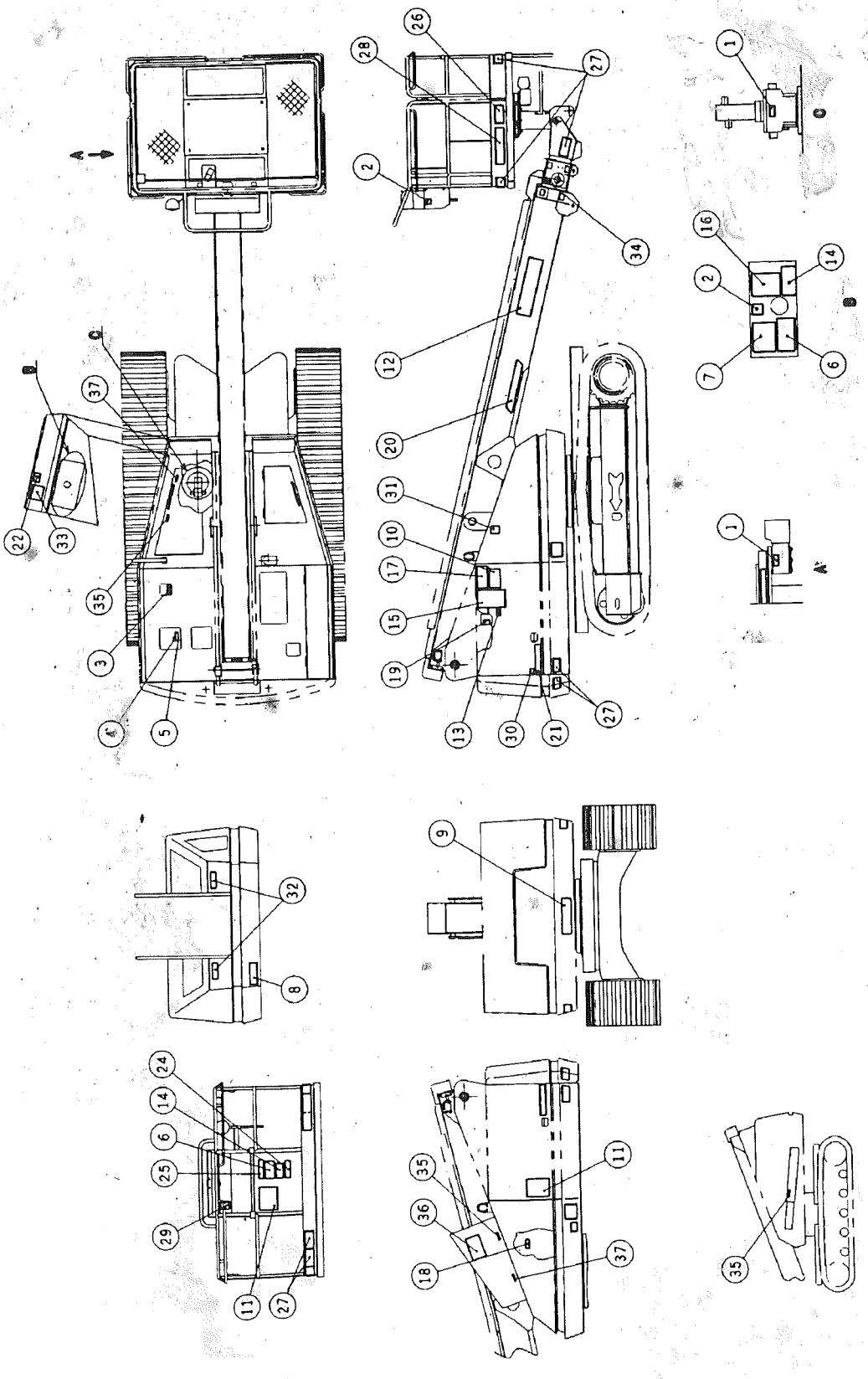
CARRY OUT RUST PREVENTION OPERATION !



Note: Wipe off the rust prevention oil applied on the cylinder rod before operating the boom.

XVII Decals

For CE



No.	Part number	Description	Q'ty
1	494-01497	Decal, Shell Omala oil 460	2
2	491-04088	Decal, No wash	4
3	494-01936	Decal, Diesel fuel	1
4	494-01937	Decal, Shell Tellus oil 32	1
5	494-02876	Decal, Hydraulic oil	1
6	491-04793	Decal, Emergency pump operation	2
7	Z15-Y6207	Decal, Platform level adjustment procedures	1
8	493-04675	N.P. Serial number	1
9	491-00848	Decal, Danger keep out of turning area	1
10	Z15-Y6203	Decal, Transportation method	1
11	491-04788	Decal, Caution. Ensure safety	2
12	182-01004	Decal, AICHI logo.	2
13	494-01967	Decal, Recommended oil (engine)	1
14	Z09-Y6014	Decal, Platform rotation restriction	2
15	491-04790	Decal, Engine instruction	1
16	Z15-Y6204	Decal, Working range diagram	1
17	Z15-Y6202	Decal, Lubrication	1
18	R12-Y6157	N.P. Fuse (lower)	1
19	491-00891	Decal, Anti-freeze	1
20	494-03507	Decal, SKYMASTER	2
21	S493-2164	Decal, RZ150	2
22	R18-Y6042	Decal, Platform level adjusting valve	1
23	340-00132	Rivet for Serial number plate	6
24	491-04848	Decal, Do not step on the platform	1
25	491-04649	Decal, Electrocution hazard	1
26	494-04433	Decal, Manual load, wind speed	2
27	494-04735	Warning stripes	14
28	494-04730	Decal, Rated load	2
29	R12-Y6156	N.P. Fuse (upper)	1
30	494-04720	Decal, CE mark	1
31	491-04791	Decal, Pictorial (do not touch)	1
32	491-04689	Decal, Be careful not to be caught by boom	2
33	R18-Y6048	Decal, Gross weight and floor loading pressure	2
34	491-04792	Decal, Pictorial (not to be caught)	2
35	V06-Y6134	N.P. Valve (Option)	3
36	5Y6-0060000	Decal, Emergency platform descent (Option)	1
37	Z15-Y6206	N.P. Valve (Option)	2