

# OPERATOR'S MANUAL

MOVING YOU FURTHER

WHEEL LOADER

**HL660VL**  
**HL665VL**

 **HYUNDAI**  
CONSTRUCTION EQUIPMENT

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4. Standing here is strictly prohibited while the machine is moving. Otherwise, it will cause serious injury or death accidents.



Fig. 5

5. Keep your hands away from the fan during operation. Entanglement in the fan can cause serious injury.

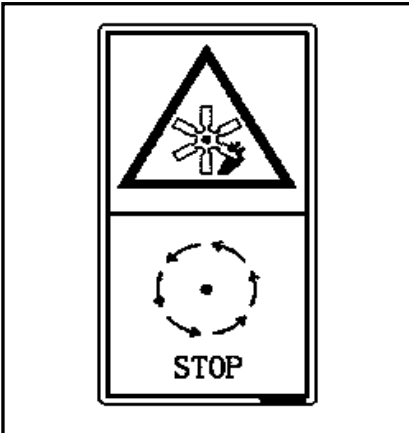


Fig. 6

6. High temperature, NO touch.

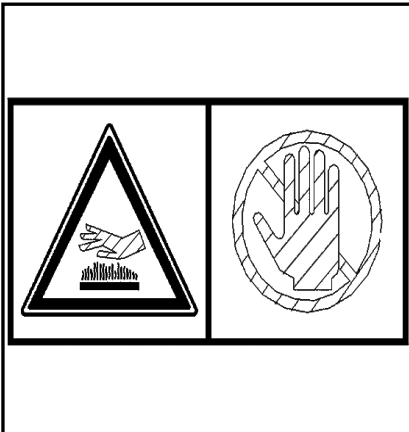


Fig. 7

# **BEFORE STARTING ENGINE**

## **Matters needing attention on site**

Before starting, completely check the working area for the abnormal conditions which may cause dangers.

Check the terrain and ground surface on site, and identify the best and the safest operation method.

Before operation, please make the ground hard and smooth as possible as you can. Please sprinkle some water on the ground before operation if there is a lot of dust or sand on site.

If it is needed to work on the street, please arrange one person to ensure the safe operation for the vehicles on the site or erect a fence and stick the labels on site such as "NO ADMISSION" as well as use other methods to prevent the pedestrians from getting near or entering the site. If somebody wants to approach the machine in operation, he (she) may be stricken or hooked so that he (she) may be caused serious injury or death.

There may water piping, gas piping, telephone cables or HV cables buried underground. Please contact with Utility Department and identify the positions where you are to avoid cutting any piping or lines.

Before conducting the operation or passing the river in water, please check the riverbed, the depth as well as flow of water. You must not work in the water with a depth greater than the allowed ones.

There is the potential danger for any objects around the moving arm where the accident easily occurs because there is little time for the driver to act. When you are working in the vicinity of bridge, telephone lines, site scaffoldings or other obstacles, the observer or signaler are needed for the assistance.

When the minimum standard or operation restrictions for barrier protection on site is less strict, the insurance responsibilities scope and the operation license or certificates can be issued by the institutions authorized by the Government; it may be needed to follow the restrictions on laws and regulations, policies, standards or equipment required by local authorities; Moreover, you may have to implement the regulations related to the special operations. Please contact with local authorities and related departments if you want to know whether your machine and the site environment comply with the laws and regulations.

Avoid entering the soft ground. Otherwise it is difficult for the machine to leave.

Avoid working on the edge of cliff, on the suspensory or in the deep pit, because the grounds in these areas are easily broken. If the ground surface is collapsed, the machine will fall or tip-over to cause serious injury or death. Please remember that the earth is very soft in this area after raining, explosion operation or earthquake.

The soils piled up on the ground or by side of the channels are very soft which will be collapsed

## Proper tools

Use tools which are proper for the operation. The use of damaged, low quality, unqualified or temporary tools may cause the personal injury. The scraps from chisel or hammer are very dangerous, and they will cause the persons to be blind.



Fig. 26

## Operation of lighting devices

The explosion-proof lighting devices should be used for checking fuel, oil, battery electrolyte or detergent. Otherwise, there will be the risk of explosion.

Working in dark without using lighting devices may cause persons to be injured. Therefore, it is necessary to use appropriate lighting devices.

Do not use lighter or flames to replace the lighting devices even it is dark in working area, otherwise, it will cause fire. Tourmaline (gas) lamp also has the risks on fire and of explosion.

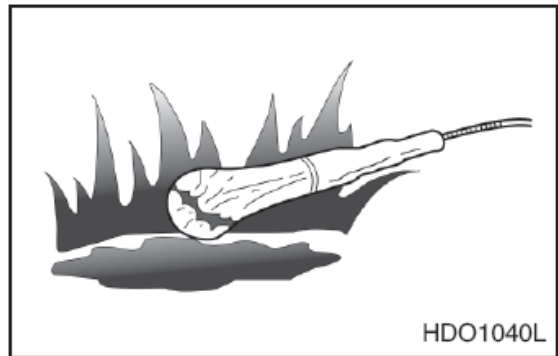


Fig. 27

## Fire protection and anti-explosion

All fuels, most lubrication oils and some coolant mixture are combustible. If the fuels are leaking or splashing onto the HT surface or on the electronic components, the fire will break out.

Put all fuels and lubrication oils at the specified places and make them far away from the unauthorized persons.

Put the oil foot and the combustible substances in the protective containers.

Prohibit smoking when the machine is oil-filled or is in the oil-filling area.

Prohibit smoking in the Battery Charging Area or in places where there are combustible substances.

Clean and tighten all cable connectors and check the cables for loose or wear every day. Tighten

## SHIPPING AND TRANSPORTATION

Investigate the height, width and the allowed carrying capacity in the passage of transportation line. The total height, total width and total weight should not exceed the related regulations. Please consult P<sup>^</sup> } aã for other agents for the solutions.

In order to prevent the safety accidents from being occurred during the shipment of the machine, clear the ice and snow as well as other slippery materials on the dock and wagon.

**Note:** *During shipping, please follow the laws and regulations about the shipment height, width, length and weight issued by State and local authorities.*

### **Perform the shipping according to the procedures shown below:**

1. Use wedges to stop the wheels of trailer or truck before shipping.
2. Do not allow the steering operation on the way for the machine being driven on to the trailer or the truck. You should back the vehicle to the flat ground, and then perform the steering operation
3. After the machine is fixed, use frame-fixed bumper to fix the front and rear frames.
4. Lay the bucket down to the transportation vehicle, put the shifting manipulating handle on “Neutral Gear” position, and put the neutral gear locking plate on “Locking” position.
5. Pull up the button of parking brake to apply parking braking.
6. The engine is switched off, and all switches are put to Middle position or “OFF position. Pull out the starter key.
7. Close and lock all doors, then take away the cab key.
8. When you use truck or trailer to transport the machine, you must use wedges to stop the wheels and use steel cables to fix the machine, so as to prevent the machine from moving during transportation.

## Operation of pre-heater system

The pre-heater system can be used in some regions and states where the cold weather may affect the starting ability of the engine. Please read the following specification carefully before operation.

1. Turn the starter switch to the position 'ON'

### Starter Switch ('ON')



Fig. 8

When the resistivity of the engine coolant sensor is less than  $2700 \pm 300 \Omega$  (which means that the engine coolant temperature is above  $0^\circ\text{C}$ ), the controller won't go to pre-heat status and the pre-heat indicator will be on for 2s before goes out.

### Pre-heat indicator



Fig. 9

2. When the resistivity of the engine coolant sensor is more than  $2700 \pm 300 \Omega$  (which means that the engine coolant temperature is below  $0^\circ\text{C}$ ), the controller will go to pre-heat status and the pre-heating time is associated with the voltage (please refer to the following table).

Voltage (V)	18	20	22	24
Time (S)	$55 \pm 5$	$41 \pm 4$	$30 \pm 3$	$26 \pm 2$

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this front lamp switch, and when you turn off this switch the front lamp including low beam and high beam is not available.

The state of the front lamp switch in the picture is "OFF", and both low beam and high beam are not available.



Fig. 25

Only when you turn on the front lamp switch can you get the state you want—low beam high beam by operating the level noted in Fig 26.

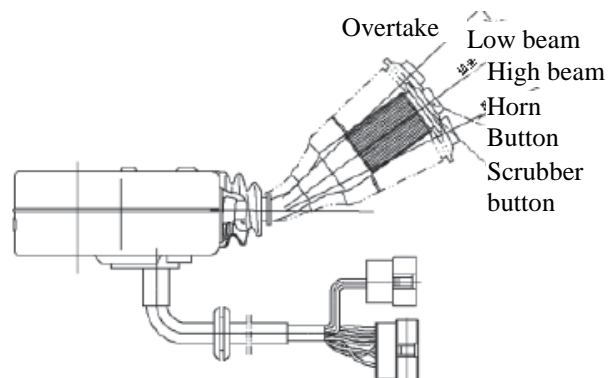


Fig. 26



## NOTE!

**Before driving, check all braking lamps, steering lamps, small lamps for damage or fault. If any, please repair and then begin driving.**

### \* Monitoring instrument and horn switch

Most of monitoring instrument and meters and indicators are integrated in the instrument assembly below the steering wheel. The Instrument include: totaling to 8 meters for cooling water temperature, gearbox oil level, timer, braking air pressure, engine oil pressure, torque converter oil temperature, power supply voltage; the indicators include: steering indicator, charging fault indicator, high beam indicator, stopping (parking) braking indicator etc.. In addition, there is LP alarm device in the empty paper box on the left side of the seat.

## Audio system

Audio system (optional): Audio system is located in the cab, including multimedia, speaker, and antenna. The multimedia speaker has many functions such as digital radio, USB / SD / MMC, MP3 / WMA, clock, adjustable volume.

### 1. Configuration

Digital radio, USB / SD / MMC, MP3 Player

### 2. Radio

The radio has both FM and AM.

6 channels can be stored respectively for FM1, FM2, FM3, AM1, AM2 and AM3, and they can be memorized after power off.

### 3. MP3

USB / SD / MMC played automatically.

### 4. Auto save channels function.

When the power is off, the channels can be saved automatically.

### 5. Others

24-hour clock. The mobile phone can be charged through USB port (cable is needed)



Fig. 64

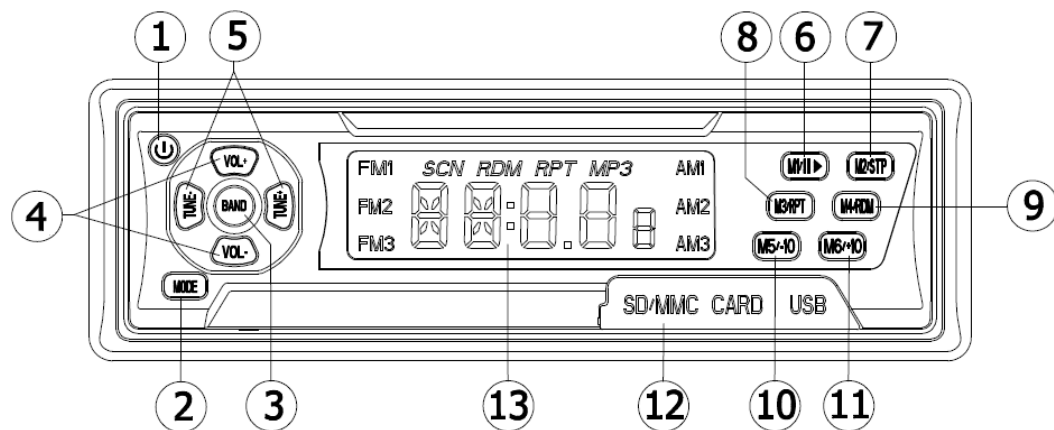


Fig. 65

## Adjust the lifting limit device for the arm



### WARNING!

Be careful for the personal safety when performing the adjustment of arm lifting height limit. Non-working persons shall not approach the machine, and nobody shall stand in the area near arm.

1. Place the machine on a flat ground and the shifting manipulating handle at the Neutral position. Pull up parking braking valve button, operate the pilot valve control lever to raise the arm to the required unloading height, shut off the engine and install frame-fixed bumper.
2. Switch the starter key to ON position and connect the power supply for the vehicle. Toggle the pilot valve arm manipulating handle backwards to the extreme rear position and stuck by the magnetic force.
3. Untighten Bolt "1" shown in diagram and rotate the limiting plate "4" towards approach switch "2", making the approach switch "2" in line with the rear end (left end) of the limiting plate "4". At this time, the magnetic force on pilot valve just disappeared (the approach switch "2" indicator is just OFF), and the pilot valve control lever auto returns to the middle position; and tighten bolt "1".
4. The distance between the approach switch "2" and the limiting plate "4" shall be kept within 4~6mm. When rotating the limiting plate "4", rotating it counterclockwise will decrease the limiting height, and rotating it clockwise will increase the limiting height.
5. After completion of the above operations, remove frame-fixed bumper, start the engine and check whether the accomplished adjustment is appropriate.

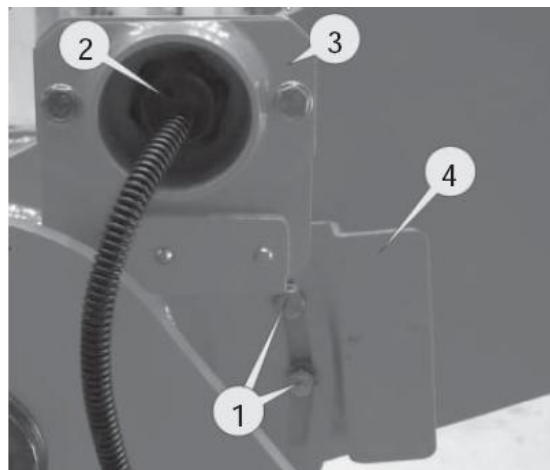


Fig. 3

- Scraping

Lift the arm and make bucket tip-over until the knife plate touches the ground. The included angle between the knife plate and the ground shall be kept to be about 60 °. For the hard road surface, the arm control lever shall be put at the Float position; while for the soft road surface, it should be put to the middle position. Toggle the shifting manipulating handle to the Retreat gear, depress the throttle pedal to make the machine retreat, and use knife plate to scrape the ground surface.

- Traction

It is possible to equip 20 ton trailer to perform traction transportation. The method is as follows:

- ① Connect securely the trailer to the traction pin of this machine.
- ② Trailer should equipped with good braking system
- ③ Put bucket at “Transportation” position.
- ④ Smoothly execute the starting and stopping operation of the vehicle, and pay attention to apply the braking before going down the slope.

**Note:** *When executing the braking, it is necessary to first apply braking for the trailer, and then for this machine.*

### 3. Operation method

- V-type operation method

Loader is dead against stock pile, and the included angle between truck and loader driving direction is 60 °, and it stops at a place 12-15m away from the stock pile. When the loader is fully loaded, it will retreat directly back to the place 12-15m away from the stock pile. It can make turn while driving, and lifting the bucket simultaneously. After unloading, it will retreat to the original place to perform the next shoveling and loading operation.

- Shuttling operation method

The Shuttling operation method is mainly used for the united operation between loader and fleet. When the loader is fully loaded, it will retreat back to the place with a distance of 2-3 times of the truck width. Then, one truck travels from one side of the loader to be in front of the loader and stops, and then the loader travels further forward and lifts the arm. After unloading, the loader retreats back to the original place. If the truck is not fully loaded, the truck will travel forward another truck space. After the loader accomplishes the next shoveling and loading operation, it will retreats to the original place, and the truck which has not been fully loaded then retreats to be in front of the loader, and the loader will perform the unloading. In this way, repeat the operations until the truck is fully loaded, then start the loading and unloading for the next truck. This operation method requires the loader driver and the truck driver to cooperate skillfully. They can use horns, lights or gesture to communicate if necessary.

## RECOMMENDED LUBRICANTS TABLE

Do not use un-recommended lubrication oil. Do not use unapproved products.

Note: *Refer to maintenance time interval table to make lubrication for the specified positions.*

### Matters needing attention on lubrication

- The oil must be cleaned and the diesel oil must be sedimented for 72 hours; hydraulic system cleanness must meet the requirements from 18/15(GB/T14039-93) or NAS10 (American Standard), otherwise, the failure of the hydraulic system or pump excess wear will be caused.
- The oil filling device and oil position must be clean.
- The machine must be kept to be horizontal during inspection of oil flow.
- For oil filling of front and rear axles, you should fill the oil into the oil filler on the left hub and the right hub, the oil filling quantity is subject to the overflow at the oil level plug of the axle.
- Oil filling for the gearbox: fill oil into oil filling pipe of the gearbox. Open the oil level switch, oil filling pipe of t/m, when the oil level switch overflow, the t/m is full-load. If filling t/m fist start the vehicle run for 5 minutes then check the oil level again.
- Filling of hydraulic oil tank: Open the cover of hydraulic oil tank, and fill oil into the tank. When the oil level reaches 10-15 on the tank scale label, this indicates the oil in the tank is to be about full; if this is the first time to fill oil into hydraulic oil tank, you should start the engine to run for 5 minutes, then check the oil level again.
- Do not mix using, replacing of various kinds of oils, otherwise it will cause aging and ineffectiveness of rubber parts and the premature wear of the parts.

3. Remove old O-ring seal and install new O-ring seal (1, Fig. 10) onto bushing (2). Confirm that the O-ring seal on connecting rod cover (4) and bucket bushing has been thoroughly cleared.
4. Align the bucket connecting rod cover and the bucket link pin hole, and install bucket pin (3, Fig. 8).
5. Install new O-ring seal 1(1, Fig. 9) into O-ring seal.

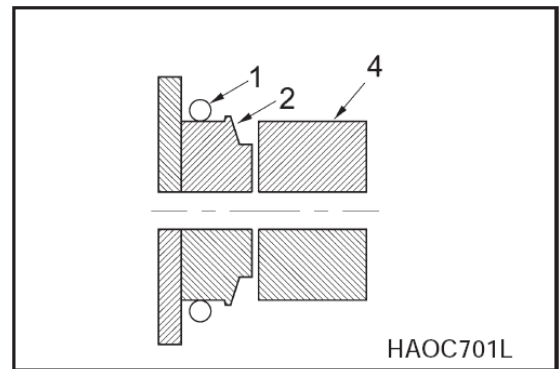


Fig.9

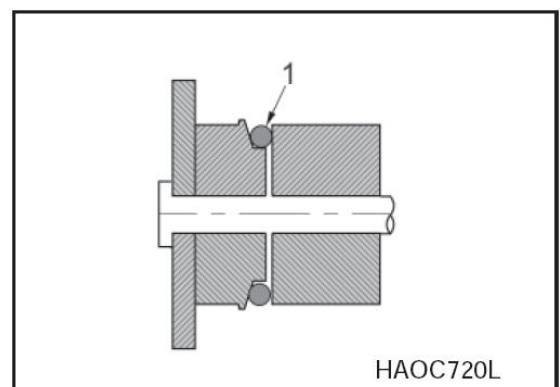


Fig.10



## DANGER!

**Warning to customers:** Removing from the machine the counterweights, the front devices or other accessories may affect the stability of the machine, thus causing the accidental movement and serious injury or death. Our company bears no legal responsibilities for the faults induced from misusing the equipment. The machine the counterweights or the front devices can be removed only when the upper structure and the bottom structure arrangement are consistent in direction.



## WARNING!

1. Loading and unloading machine is dangerous. Be especially careful for running engine at low speed and driving at low speed.
2. The inclined plate must withstand the weight of the machine. If necessary, you can add the cushion block to increase the support force.
3. Ensure there is no grease, mud etc on the inclined plate to prevent the slippery of the machine.
4. When you load or unload the machine, the trailer shall park on the solid flat ground.
5. When the machine is running on the trailer, you must keep the lowest engine speed and drives at the lowest speed.
6. Fix securely the machine onto the trailer according to the local laws and regulations.

### Tie Down (Securing)

- Block tires (B, Figure 2).
- Tie (lash) the wheel loader down using attaching points (A, Figure 2) intended for this purpose, so it cannot tip or begin to roll.

### Lifting

- Lift wheel loader using intended lifting eyes (see Figure 4) and "LOCK" articulated frame lock bar.

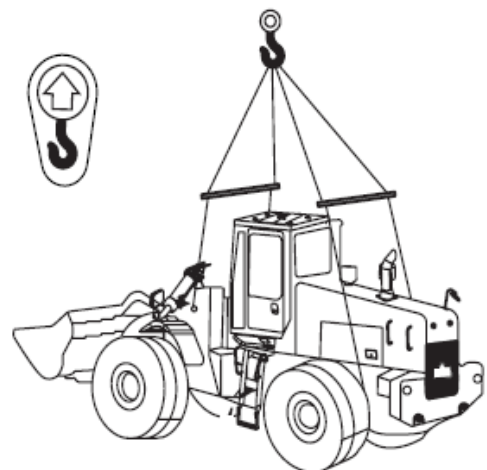


Fig.4

### Across Ramp

- First check that ramp is wide enough and has the required strength and that it will not move during loading operation

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