

OPERATOR'S MANUAL

MOVING YOU FURTHER

WHEEL LOADER

HL660V
HL665V

 **HYUNDAI**
CONSTRUCTION EQUIPMENT

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SAFETY DECALS

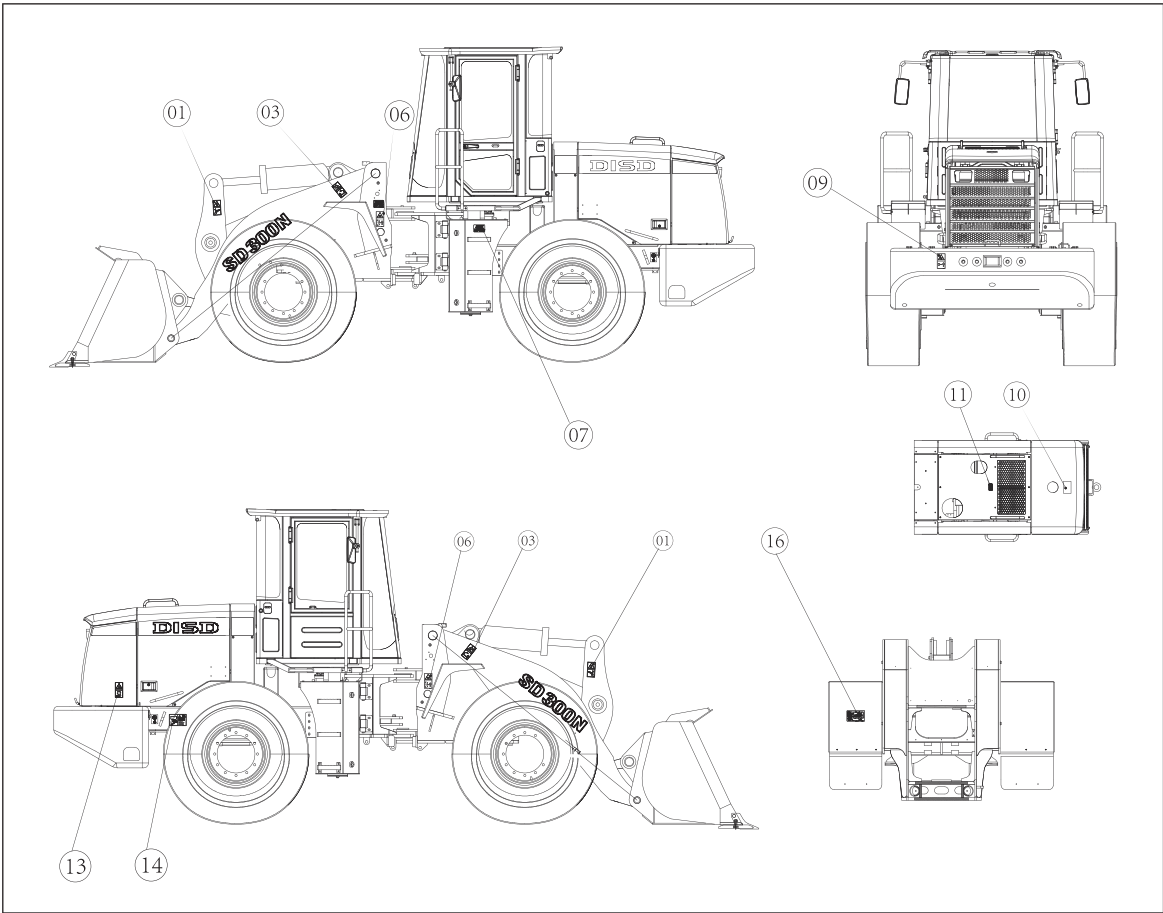


Figure 1

The safety decals are attached to the machine. In this Chapter, the locations and descriptions of these decals will be reviewed in the following section. Please become familiarized with all safety decals and their messages.

Make sure that all the decals are in correct locations and legible. Clean or replace the safety deals if the decals are missing or damaged, or the texts and pictorials are not legible. Use cloth, water and soap to clean the labels. Do not use solvent, gasoline or other harsh chemicals to clean the decals because they may lead the adhesive that secures the labels to the machine, thus causing the labels to come off.

Replace the damaged or lost labels. Remember, if a safety decal is attached to a part that is replaced, install a new safety deal on the replacement part.

Battery

- During operation, the battery can produce combustible gases which may cause explosion.
- Do not smoke while checking the level of electrolyte of the battery.
- The electrolyte is an acidic substance, and it will hurt the persons when it touches with skin or eyes.

Aether (if your machine is equipped with Aether cold starter)

- Aether is a toxic and combustible substance.
- Inhaling Aether vapor or frequent touching of skin with Aether will cause personal injury.
- There shall be adequate ventilation in the areas where Aether is used.
- Do not smoke while replacing the Aether tank.
- Pay attention to fire protection when using Aether.
- Do not put the replaced Aether tank in the living area or in the cab.
- Do not put the Aether tank in a place with direct sunlight or with an ambient temperature exceeding 39 °C (120 °F).
- Put the discarded Aether tank at a safety place. Do not drill hole in it or heat it up.
- Put the Aether tank far away from the place where the non-working persons are living.

Accidents can be avoided under correct and safe operation, please operate the braking system according to the following advises.

- Don't put your foot on the brake pedal except when it is necessary .Because the brake valve may be pressed by your foot when the loader is running on the rough road, which may put the loader into brake status, and accidents result from failure of the braking system, which is caused by the improvement of the temperature of the brake system, may happen if the loader is in brake status for a long time.
- Please don't press the pedal time and again except when it is necessary. Repeated brake will improve the temperature of the brake caliper and it may bring bad effect. When repeat brake is needed under serious conditions, it is suggested to stop for 10mins after continuous working for 2 hours or take other measures to cool down the brake caliper and the braking fluid.
- When the loader is travelling down a slope, please set the transmission on low speed gear, with which the engine can be used to brake. Never shift the gears or put set the transmission to neutral.
- When the loader is travelling up a slope ,keep the bucket above the ground at the height ranging from 200mm to 300mm and put the bucket to the ground immediately under emergency to stop the loader effectively.

Clean and tighten all cable connectors and check the cables for loose or wear every day. Tighten all loose cables and repair all worn cables before operating the machine.

Timely clear the combustible substances accumulated on the machine.

Do not weld the pipes containing the combustible liquids. Do not weld the pipes containing the combustible liquids. Please use anti-combustion solvent to thoroughly rub up the pipes before welding the pipes or cutting the pipes using flames.

Avoid burns

Stop the engine when checking the level of radiator to let the engine and radiator cool down.

Slowly open the cover to release the pressure before opening the cover of the radiator.

If the coolant in the recycling tank approaches the lower limit, add the coolant.

There is Alkali in coolant. First cool down the components of cooling system before draining out the coolant.

Hot components can cause personal injury. Do not let it contact the skin.

Slowly open the vent valve of hydraulic oil tank to release the pressure after engine stops operation, and ensure it is cooled down before screwing up the vent valve of hydraulic oil tank.

Release completely pressure in hydraulic oil system, fuel system or cooling system before disconnecting all pipes, connectors or connected components.

Battery can produce the combustible gases which may cause explosion.

Do not smoke while checking Battery electrolytes.

The electrolytes are acidic which may cause the personal injury. Therefore, do not let it contact the skin and eyes.

Be sure to wear goggles when performing the maintenance of battery.

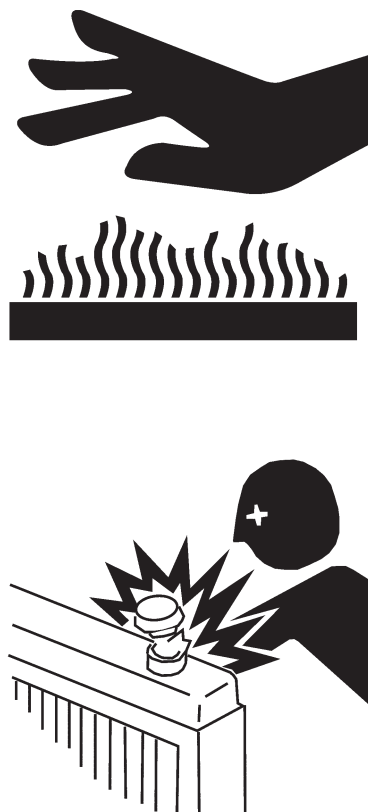


Figure 31

TRACTION

Matters needing attention on towing

If fault occurs during the selection or inspection of the traction string or during performance of traction, it will cause serious injury. Please obey the following items:

- Use the methods introduced in Operation and Maintenance Manual.
- Please wear the leather gloves for disposing string and ropes.
- When there are two or more persons to do the preparation, unify the signals and use them correctly.
- If there is fault in the machine or in the brake system, or the engine could not be started, please contact with the agent.
- When performing the traction operation, do not walk between the tractor and the towed machine.
- It is dangerous to perform the traction on slope, therefore, you should select a gentle slope. If there is no gentle slope, please reduce the slope angle before performing traction operation.
- Please use the string and ropes with enough traction force to tow the fault machine.
- Do not use the worn, kinked rope or the rope with too small cross-section.

Manipulating facility

Steering Wheel

1. The steering wheel rotation angle is not equal to the machine's rotation angle. Continuously rotate the steering wheel to increase the rotation angle until to the required position.
2. The quicker the steering wheel rotates, the quicker the machine rotates.
3. The steering wheel cannot restore to original position after rotation, and the machine rotation angle is kept unchanged. Therefore, after the machine finishes the steering, you should reversely rotate the steering wheel to make the machine drive along the straight direction.
4. The intermediate round button of the Steering Wheel is horn switch. (this switch can be automatically reset)



Figure 5



WARNING

Do not switch off the negative pole switch of the battery while the engine is still running, otherwise it will damage the whole electrical system!!

Shifting lever

Rotating the shifting lever can control the speed of the loader frontward or backward.

Note: *Before starting the engine, please confirm the negative pole switch is in "ON" state and the shifting manipulating handle is at "Neutral" position.*

When the engine is working ,the back buzzer will ring and the back lamp will light if the shift lever is on R position;



Figure 6

with ground surface. When the bucket manipulating handle is again pulled backwards to the extreme rear position, the bucket manipulating handle will not be stuck by Bucket Receive holding magnet (it will return back to the middle position under the force of spring when you release your hand) because the Bucket

Receive holding magnet is de-energized all the time due to the Limiting and Holding function of the bucket leveling limit switch. Only when you push bucket manipulating handle forwards and the tilting of bucket (unloading) exceeds the bucket leveling position, can the bucket leveling limit switch be reset and the bucket auto leveling function be restored. At this time, if the bucket manipulating handle is again pulled backwards to the extreme rear position, the bucket manipulating handle will be held at the Extreme Rear Position.

The bucket manipulating handle does not have holding function when it is at the front position. When the bucket tilts forwards from the maximum bucket receive angle to the unloading angle, you need, at all time, push the bucket manipulating handle in ahead(bucket manipulating handle will return back to the middle position under the force of spring when you release your hand), which will not stop even when the bucket passes the leveling position.

When shoveling and loading, you should fully use arm lifting limit, arm floating device and bucket leveling limit device, which will effectively reduce the labor intensity, thus improving the comfort of operation



Figure 19-2

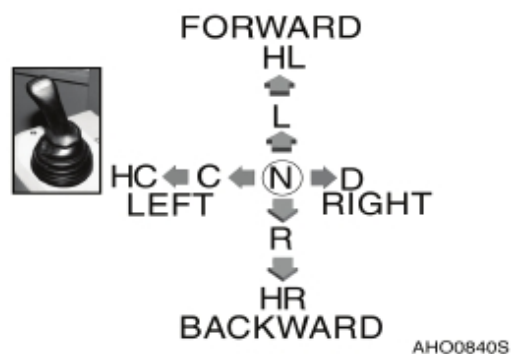


Figure 19-3

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5. Battery Voltage Gauge

This gauge displays the battery Voltage

caution:

When the pointer indicates red zone, it means the Battery or generator is abnormal.the engine should be shut down to check the charging system

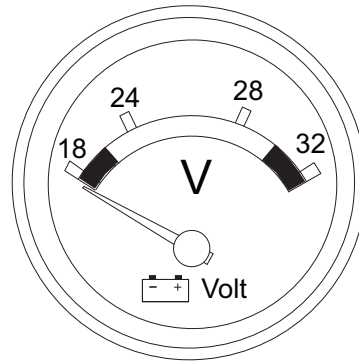


Figure 39

6. Hour meter

ALCD Meter that records total time. When engine is running,the hourglass icon blinks every four seconds.This shows that the hour meter is working.

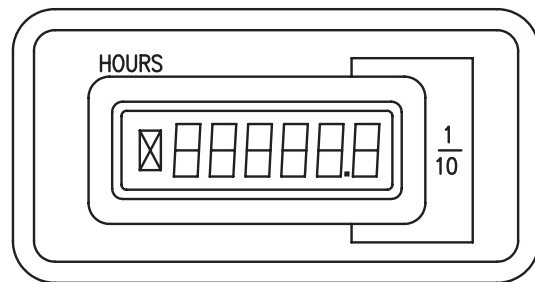


Figure 40

7. High Beam Indicator Light

This indicator light will turn "ON", when the headlights are turned to "HIGH BEAM".

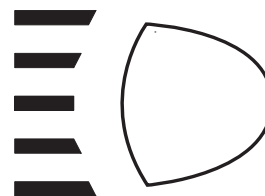


Figure 41

8. Preheat Indicator Light

This indicator light will turn "ON," when the engine preheatfunction is operating. Do not start engine as long as thislight is "ON."



Figure 42

Adjustment of driver seat

The driver seat equipped for this machine can be adjusted in aspects of soft and hard extent (i.e., height, front and rear direction, backrest angle and headrest height) to adapt requirements from different drivers and different work situations.

1. Adjustment of front and rear positions

There is a handle in front sections of low left side of the driver seat. If you toggle this handle towards the outside of the driver seat, the seat may move back and fro. During the movement, you will feel the obvious clamping positions at some places. Move the seat to the clamping position, release your hand and the seat will be fixed to the clamping position. This machine seat can be moved back and fro within the scope of 75mm, and the seat can only be fixed at the clamping position

2. Adjustment of height

This machine seat has 3 positions able to be adjusted and you will obviously feel that there are 3 clamping positions. The driver seat is adjusted to the middle position when the machine was delivered from the factory. The driver can adjust the height as required. When adjusting, you should hold the base beneath the seat with your hands, and pull up smoothly. There are several clamping positions to be met during the moving up of the seat, where you can release your hands, and then the driver seat will be fixed at this position

3. Adjustment of backrest angle

There is a handle in the middle on the right side of the driver. First you toggle the handle clockwise, then toggle the backrest forward or backward to a comfort position and release your hands. The backrest will be fixed at this position. The backrest of the driver seat for this machine can be folded forward, and adjusted backward within 28° .

The height of seat headrest can be adjusted by using hands holding seat headrest and forcibly pull it up or push it down.

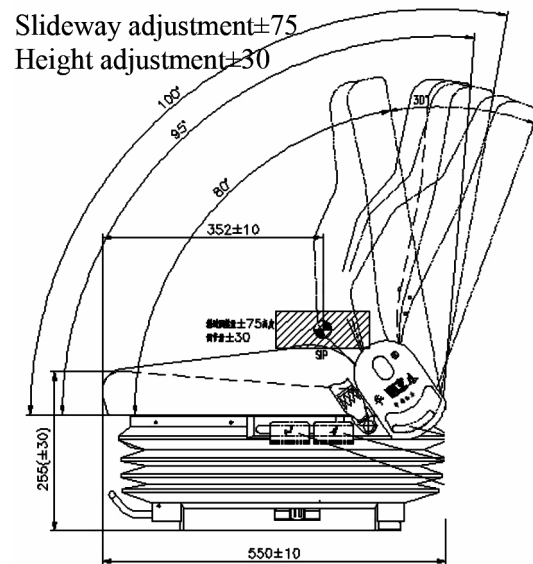


Figure 59

9. Check whether the air flow switch for A/C system is at “O” position and the transfer switch at “O” position. If not, please toggle it to corresponding position.
10. Insert the key into electric lock and rotate clockwise one increment. Switch on power supply and hoot the horn to warn that this machine is to be started and that other persons are not allowed to approach this machine.
11. Check fuel quantity.
12. Slightly depress the throttle pedal, and rotate clockwise for another one increment to switch on diesel engine starter motor. The engine will be started to work within 10s. Now it is necessary to immediately release your hand to let the starting electric lock reset.

Note: *The time for one start should not exceed 15s (the continuous working time for the starter motor should not exceed 15s). If the engine cannot be started now, it is necessary to immediately release the starter switch and wait a little time (over 30s) and then re start the engine again. This is jointly determined by the characteristics of starter motor and the battery. If it cannot be started for 3 times continuously, it is necessary to search for the causes. The engine cannot be re-started until the faults are removed and three minutes later.*

13. The engine, after starting up, shall be warming up at the idle speed (600—750r/min). The full load operation cannot be started until the cooling water temperature of the engine is 55°C and the hydraulic oil temperature is 45°C.
14. Listen to the engine at the low speed operation. Check the gearbox for abnormal sound and normal operation.
15. Check the instrument for normal operation and each lighting device, indicator, horn, wiper, braking lamp for normal operation.

Lift the boom to a certain height so that when the machine retreats, the bucket can avoid the stock pile. The driver holds the steering wheel with right hand and toggle, with left hand, the manipulating handle back to the Gear Reverse position to operate the machine to retreat.

After the machine retreats from the stock pile, the driver operate the arm control lever to lower down the boom to a height of 500 mm above the ground.

● **Transportation of materials**

Transport materials with the loader in following conditions:

- 1) The heavy-duty truck cannot be used for transportation due to the road surface is too soft or the site is not leveled.
- 2) The heavy-duty truck is not economical for transportation over such a short distance (The handling distance is within 500 m).

During handling, the boom lower hinged point should be kept at the transportation position (500 mm above the ground), and the bucket should be rotated backwards to the limit position (the limit stop on the bucket touches the boom) thus ensuring a smooth and safe handling, not easily scattering the materials.

The vehicle speed for handling is determined according to the handling distances and road surface conditions. When the machine is crossing the pits or juts, you should release throttle pedal. You can use service braking to conduct “snub” if necessary, to reduce the machine speed to slowly go across the obstacles, thus reducing the impact on the machine and material scattering.



WARNING

Prohibit lifting the bucket to a higher position to conduct the transportation operation; otherwise it will cause the tip-over of the machine

Operation in the dusty or sandy area

Dust will be produced in most places during operating machines. However, you must adopt the preventive measures in severely dusty or sandy places.

1. Keep the cooling system and cooling area clean. You can use compressed air to purge them for cleaning, and shall adopt this measure as much as possible.



WARNING

Wear protective goggles when using compressed air.

2. When maintaining the fuel system, you must be careful to prevent dust and sand from entering the oil way.
3. Frequently maintain air filter, check air control indicator everyday, and keep dust cover and dust screen clean. Prevent dust and sand from entering engine parts and components as much as possible.
4. Perform lubrication and maintenance according to the lubrication diagram attached on the machine and to the instructions in Section 4 of "maintenance Period Chart". Clean all lubrication oil connectors. The mixing of sand and lubrication oil will cause the wear and expedite the wear of parts.
5. Keep the equipment clean as much as possible. Put the loader under the shed to prevent the machine from being impaired by sand or dust.

Operation under rainy weather

Advice for operation under rainy weather is the similar to the under high temperature conditions.

1. Coat lubrication oil onto all naked surfaces. Be especially careful, as early as possible, for the damaged or unpainted surfaces. Coat lubrication oil on the damaged paint surfaces to prevent from being corroded.

Maintenance period

| N o. | Items To Check | Service | Qty | Service Interval (h) | | | | | | |
|---|-----------------------------|-----------------------|------------------|----------------------|---|-----|-----|-----|------|------|
| | | | | 10 | 50 | 100 | 250 | 500 | 1000 | 2000 |
| | | | | | | | | | | |
| 1 | Front Joint Pin | Grease | 13 | V | | | | | | |
| 2 | Articulation Pin | Grease | 2 | V | | | | | | |
| 3 | Stabilizer pin | Grease | 2 | V | | | | | | |
| 4 | Steer Cylinder | Grease | 4 | V | | | | | | |
| 5 | Shaft Bearing | Grease | 6 | V | | | | | | |
| 6 | Engine Oil | Engine Oil | 19L | V | F | | | ● | | |
| 7 | Engine Oil Filter | Cartridge | 2 | | F | | | ● | | |
| 8 | Fuel Pre-Filter | Cartridge | 1 | | | | | ● | | |
| 9 | Fuel Filter | Cartridge | 2 | | | | | ● | | |
| 10 | Transmission | Engine Oil | 49L | V | | F | | ● | | |
| 11 | Transmission Filter | Element(Primary) | 1 | | | | | C | | |
| | | Element(fine) | 1 | | | F | | ● | | |
| 12 | Hydraulic oil Tank Capacity | Hydraulic Oil ISO #46 | 260L | V | | | | | | ● |
| 13 | Oil Tank Return Filter | Element | 1 | | | | F | | ● | |
| 14 | Oil Tank Breather Filter | Element | 1 | | | | | | C | |
| 15 | Pilot Filter | Cartridge | 1 | | | | F | | ● | |
| 16 | Radiator | Coolant | 42L | V | | | | | | ● |
| 17 | Front Axle | Gear Oil | 27L | V | | F | | | ● | |
| 18 | Rear Axle | Gear Oil | 27L | V | | F | | | ● | |
| 19 | Air Filter | Element (Outer) | 1 | | C | | | ● | | |
| | | Element (Inner) | 1 | | | | | ● | | |
| 20 | Brake Pump | Brake Oil | 2.8L | V | | | | ● | | |
| 21 | Fuel Cap Filter | Element | 1 | | | | C | | | |
| 22 | Fuel Suction Filter | Element | 1 | | | | C | | | |
| V: Maintenance and Fill | | | Grease | | NLGI-3 or NLGI-2 | | | | | |
| C: Cleaning | | | Engine Oil | | API: CF-4, SAE: 15W40 | | | | | |
| F: First Time Exchange Only | | | Transmission Oil | | #8 T/M OIL | | | | | |
| ●:Replacement On Every Interval | | | Gear Oil | | API: GL-5, SAE: 85W/90 | | | | | |
| NOTE: For additional service items see list of“Maintenance Intervals” on page 4-9,4-10. | | | Hydraulic Oil | | ISO: VG46, HV46 | | | | | |
| | | | Coolant | | 50% Water + 50% (HOCH ₂) ₂ | | | | | |
| | | | Brake Fluid | | DOT 3 | | | | | |

TIRES

The proper charging of the tire (2. Fig 18) is the important factor to determine tire life and performance. If tire is inadequately charged (1. Fig 18), it will not support the equipment, and will be worn quickly; if tire is excessively charged (3. Fig 18), the friction is less and it is easily to be pierced. Use pressure gauge to measure the Tire pressure before operation of the equipment, refer to following table:

Determine the pressure of front/rear Tires when the machine is running. Check the Tire for damage and for the insertion of any objects

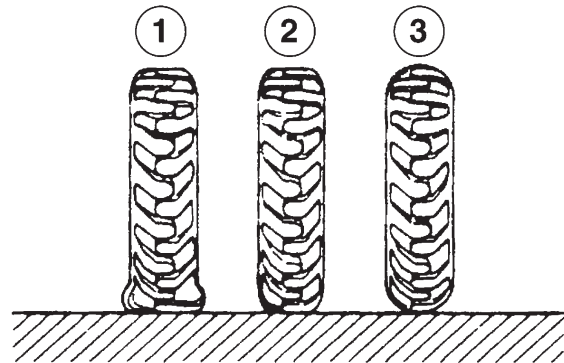


Figure 18

Recommended air pressure

| Tire | Operating pressure | | Remarks |
|------------------------------------|---------------------------------------|---------------------------------------|----------|
| | Front tires | Rear tires | |
| Bias Ply Tire (Tube Tire) | 3.8kg/cm ² (3.8bar(54psi)) | 3.4kg/cm ² (3.4bar(48psi)) | Standard |
| Radial Ply Tire (Tubeless Tire) | 4.3kg/cm ² (4.3bar(psi)) | 3.1kg/cm ² (3.1bar(44psi)) | |

4. *Keep the minimum angle of the supporting rope, and the angle between the tow rope and the right ahead should not exceed 30°*
5. *The too quick movement of the machine may cause the breakage of tow rope or tow bar. It is better to slowly and stably move the machine.*
6. *When towing the machine, all persons shall be far away from both sides off the rope to prevent the tow rope from injuring persons due to the breakage.*
7. *Under normal conditions, the trailer shall be of a size as the machine. It is necessary to ensure the trailer shall have adequate braking capacity, weight and power to control the slope ascending of two machines and the travel distance etc..*
8. *When the towed machine is descending the slope, in order to have adequate controlling and braking capacity, it is necessary to connect a bigger trailer or other machine to the back of the machine so as to prevent from out-of-control and rolling.*
9. *If the travel direction of the towed machine is controlled by the driver, the driver shall make the turn along the direction of tow rope. Check the regulations on the width, height, and load-restriction and traffic restriction for the roads you want to go through. It is possible to need special application or permit.*

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