



GENLYON

Use and Maintenance Manual

KINGKAN /M100



SAIC-IVCO HONGYAN COMMERCIAL VEHICLE CO.,LTD.

Introduction

Thank you for using the vehicle manufactured by SAIC-IVECO HONGYAN Commercial Vehicle Co., Ltd. (hereinafter referred to as SIH Company). Our Company takes this opportunity to sincerely congratulate your choice that let you have a vehicle with excellent performance, low fuel consumption, high reliability and high comfort.

Please carefully read this manual and strictly comply with all instructions in it before and during the use of vehicle. It can ensure the service life of the vehicle and to obtain good economic benefit.

We hope you and your vehicle can form a long-term and efficient cooperative partner and you can take good care of your vehicle. At the same time, we remind you that, wherever you are, the service network of SAIC-IVECO HONGYAN Commercial Vehicle Co., Ltd. will provide you with efficient and professional service and advice at any time.

When designing vehicles, the engineers from SAIC-IVECO HONGYAN Commercial Vehicle Co., Ltd. strictly comply with the technical specifications to ensure the greatest degree of safety and reliability and that each part of the system can play its design function and thus making your vehicle maintain the best performance.

In order to ensure your vehicle in good condition, please consult timely the service organization of SAIC-IVECO HONGYAN Commercial Vehicle Co., Ltd. once any fault occurs. More than 400 service providers of SIH Company spreading in the whole country can provide you timely, efficient and convenient technical services.

In order to ensure your vehicle always in good working condition, we hope that you take good care of your vehicle strictly according to the maintenance plan. This is a most reasonable regular maintenance plan that can ensure the overall performance of your vehicle and can effectively reduce the maintenance and repair costs.



Notice to Users

The instruction manual clarifies the assurance liability related to relevant product quality between SIH Company and users as well as the agreement on establishing and terminating the rights and obligations of after-sales service. Please be sure to read this manual carefully before using our products.

This manual includes the latest information up to the printing date of this manual. SIH Company is solely responsible for the revision and descriptions of this manual and reserves the right of updating products after printing this manual without further notice.

This manual mostly adopts schematic diagrams and is used for reference. If there is a discrepancy between the figure and the material object, the object prevails.

Considerations

1. Safety Warning

- When leaving the factory, the vehicle has been conducted the strict factory inspection according to the inspection specifications. The odometer sensor has been obtained lead sealing and limit. It's not allowed to remove the lead sealing arbitrarily, otherwise, our company won't implement the warranty. Pay attention, please.
- Personal injury, property loss, and other security risks and hidden dangers exist in maintenance. If the maintenance is needed, please go to the special service station authorized by our company and ask the professional personnel to deal with. In no event shall our company be liable for articles damage, personal accident and other damage or losses caused by repair, maintenance, inspection and other operation carried out by special service station without authorization of our company. Pay attention, please.
- The heavy vehicle is a product with high technology content, and the user is not allowed to maintain it. Under special circumstances where it needs to be maintained, please be cautious, and carry it out under the guidance of the appointed service support staff, but it must meet the basic requirements of the disassembly, maintenance and safety production.
- Be sure to check whether the steering and brake is safe and reliable before each driving.
- When driving down a long slope, you shall drive a certain distance and then park your vehicle in a safe place. Check the vehicle brake temperature and brake efficiency. You can't continue to drive until the brake temperature is normal to ensure that the vehicle has safe enough brake efficiency.
- When leaving the vehicle, the driver shall shut off and stop the vehicle, pull the hand brake valve handle, make the above valve in a braking state and the transmission in the neutral position of the low gear, remove the key to bring along, and turn off the general power supply switch.
- It is prohibited to close the key switch and pullout the key when driving. It is also prohibited to shut off to slide.
- Tire disassembly requirements: if you need to remove the tire from the vehicle, it is required to relief the tire pressure, loosen the wheel nuts in diagonal direction (this time a single nut can't be removed to prevent accidents), and unscrew all nuts after they are all loosened. When decomposing the tire, you must firstly let go all the compressed air of the inner tire before removing the retainer ring and steel ring.
- Remember not to weld, drill, grind, or conduct similar operations in the vicinity of the vehicle's cable lines and pipelines.
- The use of vehicles must comply with the safety requirements of the state and the region, such as traffic safety regulations.
- Tippers must be strictly operated according to above manual. When driving, you must ensure that PTO is completely disconnected, and the lifting oil pump is in a non-working state to prevent accidents.

Considerations

2. Considerations for Electrical System

- The rapid charger can't be used to start the engine, but the external battery can.
- The electrode fault of the power of the electronic control units (ECU for short, for example, the electrode of battery is incorrectly connected) will cause permanent damage to the parts.
- If the battery cable must be disassembled, please be sure firstly to remove the cable of battery negative wiring terminal.
- Confirm the part battery not put up iron before wiring the battery.
- Disassemble the battery cable before the recharging of the external device.
- The main power connecting the external charging device should be disconnected before disassembling the charging clamp from the battery wiring terminals.
- When the temperature exceeds 80°C (coating house), the ECU should be removed.
- When carrying out the operation of ECU, the plug connectors and related to the circuit connectors of components and parts, the measurement can only be performed through appropriate testing line and special plug and insert-type casing. It's prohibited to use the improper means such as metal wire, screwdriver, paper clips and other similar ones. In addition to the risk of a short circuit, it may damage the plug type contact and then lead to contact problems.
- It's not allowed to change circuit or connect the external electrical appliance without authorization. If the user or modified company needs to change circuit or connect the external electrical appliance, they should report to our technical center for approval and license, otherwise our company doesn't assume any possible consequences.
- The battery must be handled by the professional personnel from our special service station. It's not allowed to remove it to charge or conduct other operation without authorization; otherwise it easily leads to an explosion or leakage. Don't take apart the battery for safety.
- When connecting, fasten the flange nuts of connectors (temperature and pressure sensor, etc.) to the required torque value. When starting the engine by using the auxiliary truck, you should check whether the polarity of the battery wiring terminals is correct.
- Disconnect the positive electrode of the battery before operating the vehicle electrical and electronic systems.
- Disconnect the positive electrode of the battery before disconnecting the connectors of ECU.
- Don't check whether there is electricity by short-circuiting positive and negative electrode lines and checking the spark color.
- Don't use the test lamp to check the continuity of the circuit. You can only use an appropriate test device.
- Don't directly supply power to parts related to ECU with the rated current of the vehicle.
- Confirm the connecting lines of electronic devices (length, type, location, organization, the connection and grounding of the shielding layer, etc.) can be carefully restored in the repair or maintenance operations. In order to avoid the failure of the electronic system in the vehicle, the wiring mode of the attachment device must be different from the above system.
- Don't connect the negative terminal of the attachment system to the negative terminal of the electronic system.
- When carrying out the welding in the vehicle, please firstly disconnect the connecting line between the battery anode and cathode; secondly disconnect the connecting lines of all ECU; thirdly remove ECU and protect the three plugs of ECU to prevent the entry of foreign matters.

3. Other Considerations

- Be sure to carry out the strong maintenance according to requirements.
- Ensure that the clamp from the air filter to the air inlet pipe of engine to be fastened in place and that the pipeline is sealed to prevent non-filtered air directly into the engine cylinder.
- Ensure the normal operation of the air filter element, and adjust the replacement period according to the use situations.
- Parking on gear is not allowed. The gearshift lever should be in the neutral position when parking (the one with sub-box must be placed in the neutral position of the low gear area).
- Please use wood pad to plug the tire when parking on a ramp.
- A vehicle that is equipped with a brake drum cooling water spray should start spraying water for cooling before the brake drum is overheated, otherwise it will lead to the cracking of this drum.
- Overload can lead to the abnormal wear and tear of the vehicle load and driving parts, even early damage, or may cause traffic accidents. The vehicle overload will be deemed to automatically give up the quality assurance.
- Performing the regular maintenance plan on time is the guarantee of the normal use of the vehicle. If the user doesn't perform the regular maintenance, he/she will be deemed to automatically give up the "quality assurance".
- The same axle should use the same model of tires with the same pattern produced by the same manufacturers. Otherwise, it may lead to an abnormal wear to tires or brake deviation.
- Shift operation: There should be a certain delay between the high and low gear shifts for the gearbox with sub-box. After about 1 second, engage the corresponding gear to ensure that the sub-box achieve the complete gearshift.
- Try to choose a good road when driving. Check and clean timely the stones mixed in tires every day and remove foreign articles into the tire surface, avoiding a deflated tire or a flat tire.
- Highway transport vehicles or tractors with a long body may cause easily the tire sliding friction when turning slightly faster. In order to prolong the service life of the tire, be sure let the vehicle drive at a low speed before sharp turn.
- Tire inflation should be uniform within the standard range, so the tire wears out uniformly and normally, avoiding intensified wear-out and blowout of individual tire caused by uneven tire pressure.
- Check the air pressure of each tire in accordance with the tire pressure value specified in the "Use and Maintenance Manual" and inflate each tire to the specified value before the vehicle is running.
- For new vehicle or the vehicle whose tires are just replaced, please fasten again the tire bolts after the vehicle drives the corresponding mileage indicated in the relevant drawings in this Manual.
- Please check carefully whether the parking brake is in braking state and whether the cover in front of the cab is opened before flipping over the cab. Remove articles that may cause their own damage or damage other structural parts during the inherent rollover of the cab.
- Seriously following all kinds of instructions in "Use and Maintenance Manual" will not only improve the use efficiency of your vehicle but also provide you and your vehicle with more security.



Personal injury risk: If these precautions or rules are not performed or not fully performed, it may be a serious threat to the safety of human body.



Danger causing serious damage to vehicle: If these precautions or rules are not performed or not fully performed, you may encounter the danger causing serious damage to vehicle and meanwhile will lose the vehicle quality guarantee period.



Danger: the danger with above two features.



Environmental Protection: means that the good working habits shall be developed to protect the environment as much as possible.

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The installation of all accessories and auxiliary equipment of the vehicle and all modifications must be performed according to the latest and effective "Vehicle Modification Manual" of SIH Company. This manual can be obtained from the marketing and service system of SIH Company. You should pay special attention to the operation of electric system. In order to make the modification of the circuit of manufacturing factory become simplified and standardized, the vehicle is equipped with some electrical line interfaces as the standard or optional equipment.

Any project that is inconsistent with the latest and effective "Vehicle Modification Manual" of SIH Company must be licensed by SIH Company. Any vehicle modification that doesn't comply with above provisions will lead to the loss of the "quality assurance", and all consequences shall be borne by users and modified personnel.

Important Considerations!

It is absolutely forbidden to change or connect the wiring that affects the electronic control unit (ECU). In particular, the data interconnecting lines (CAN line) between ECU are not allowed to change. The authorized personnel using the approved equipment of SAIC IVECO HONGYAN COMMERCIAL VEHICLE CO., LTD can only operate the final diagnosis and maintenance.

The interior design of the cab is in accordance with the latest requirements of human engineering, and provides you with the best comfort in space, safety, and harmonious environment.

Now let's be familiar with the cab of GENLYON series:

Step Pedal

Vehicle Door

Instrument Panel and Display Screen

Control Switch of Instrument Panel

Adjustment of Exterior rearview mirror

Lift of Electric Glass

Top Glove box

Skylight

I. Vehicle Interior Facilities



Personal Injury & Accident Risk
Hold the handle firmly, and step the pedal stably.
Drop the air spring seat to the lowest (optional)
It isn't allowed to jump down from the cab directly;
Keep the pedal of cab clean.

Step Pedal



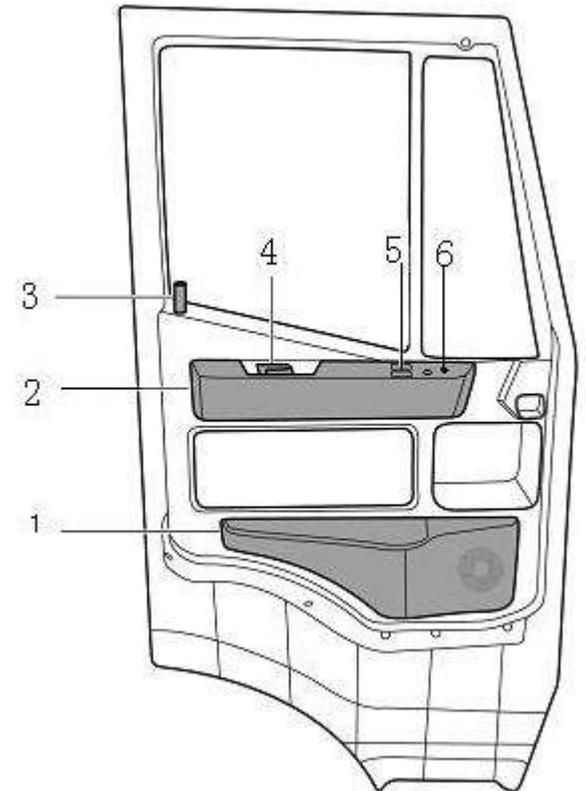


Windshield Handle & Pedal

Use the pedal and handle on the radiator mask to clean the windshield or downview mirror. Keep the pedal clean and hold the handle firmly.

Vehicle Door

1. Glove box
2. Door Handle
3. Door Inside Lock
4. Door Inside Handle
5. Lift Switch of Electric Glass
6. Adjustment Switch of Electric Rearview Mirror (Optional)



Instrument Panel & Display Screen



Instrument Panel

1. Speedometer
2. Mileage Reset Button
3. Fuel Gauge
4. Water Temperature Gauge
5. Dimming Button
6. Engine Tachometer
7. LCD Screen



Instrument Operation:

1. Adjust the brightness of background light of instrument signal lamp:

- ① Open the key switch;
- ② Open the light switch;
- ③ Short press the dimming key to enter the dimming interface;
- ④ Press the dimming key for adjustment;
- ⑤ Short press the reset button to exit.

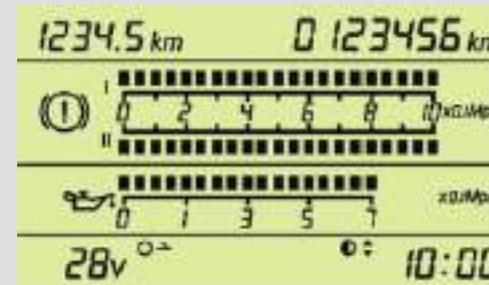
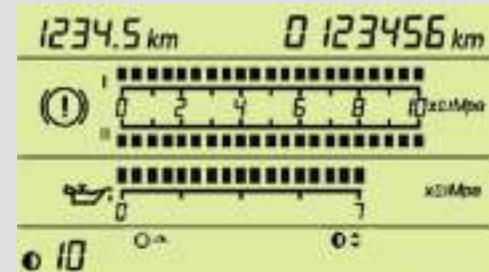
2. Adjust the brightness of background light of instrument LCD screen:

- ① Open the key switch;
- ② Short press the dimming key to enter the dimming interface;
- ③ Press the dimming key for adjustment;
- ④ Short press the reset button to exit.

3. Adjust the instrument time:

At the interface of the instrument displaying voltage and time:

- ① Open the key switch to enter the hour up adjustment while pressing the dimming key;
- ② Press the dimming key for adjustment;
- ③ Press the reset button to start the next adjustment (hour down, minute up, minute down);
- ④ Short press the reset button to exit.

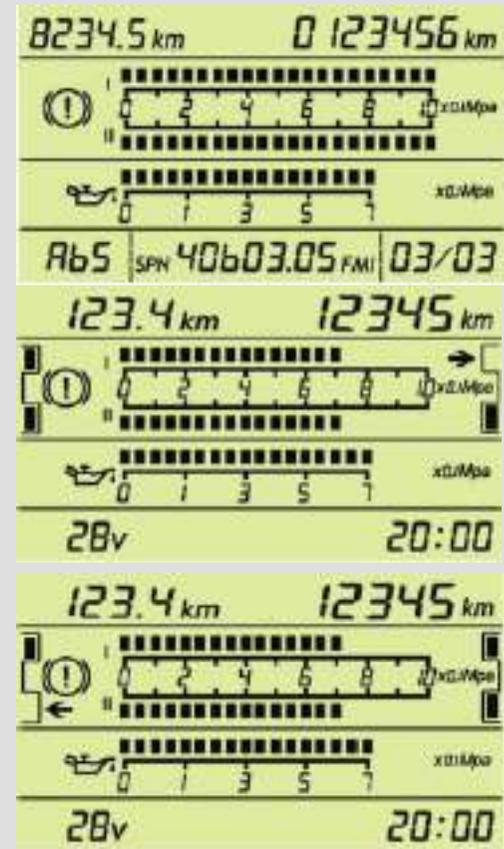


4. Read Fault Code

Press the reset button;
 Open the key switch;
 Short press the reset button, and read the next fault code.

5. Adjustment of Electric Rearview Mirror (Optional)

When adjusted, the electric rearview mirror will be displayed on the instrument panel as shown in Figure.



Vehicle Interior Facilities

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Description	Symbol	Description	Symbol
Program control speed limit		Minor fault warning indicator lamp	
Rearview mirror heating		Severe fault warning indicator lamp (parking)	
Differential lock between wheels		Brake system fault	
Rear PTO		Exhaust brake system work-on	
Left turn indicator lamp		Retarder work-on	
Side PTO		Tractor anti-locked braking system (ABS) fault	
Engine preheating		Trailer anti-locked braking system (ABS) fault	
Transmission low-shift indicator lamp		Engine system fault indicator lamp	
Clearance lamp		Right turn indicator lamp	
Rotating warning lamp		Parking brake work-on	
High beam lamp			
Emergency signal lamp			
Fault of instrument panel			
Front fog lamp			
Rear fog lamp			

Vehicle Interior Facilities

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Description	Symbol	Description	Symbol
Cab rollover		Light on	
Door open		Oil-water separator	
Tipper container lifting		ASR work-on	
Windshield defrosting		Fuel liquid level is too low	
Charging system fault		Oil quantity of steering system is too low	
Temperature of engine coolant is too high		Urea liquid level is low	
Air filter blocking		Engine cooling liquid level is low	
Cruise control		Double working conditions	
Oil pressure of engine is too low			

Display Screen

Turn the key switch to the first shift, and all indicator lamps of system detecting display screen shall be bright.

If not, the corresponding indicator lamps shall be checked.

Operational Indicator Lamp and Fault Signal Lamp on Display Screen

The corresponding indicator symbols will be displayed on the display screen when the following functions start or the following faults occur.

Yellow (minor fault):

If there is a minor fault, the warning lamp  and the corresponding fault-warning lamp will be bright.

- a) Carefully drive and go to the service station for check and repair as soon as possible.
- b) If the cooling water warning lamp is bright, check it and add the required cooling liquid.

Red (serious fault):

If there is a serious fault, the warning lamp  and the corresponding fault-warning lamp will be bright.

Attention:



: means an ordinary fault.

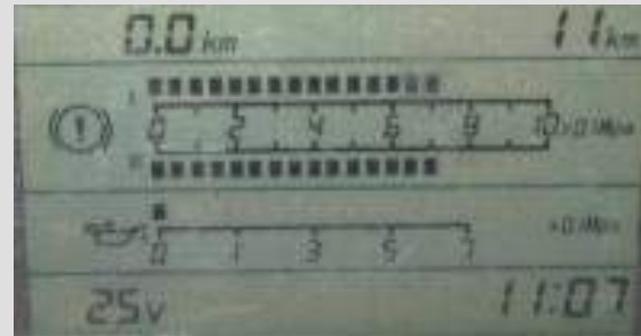


: means a serious fault.

Vehicle Interior Facilities

LCD Screen

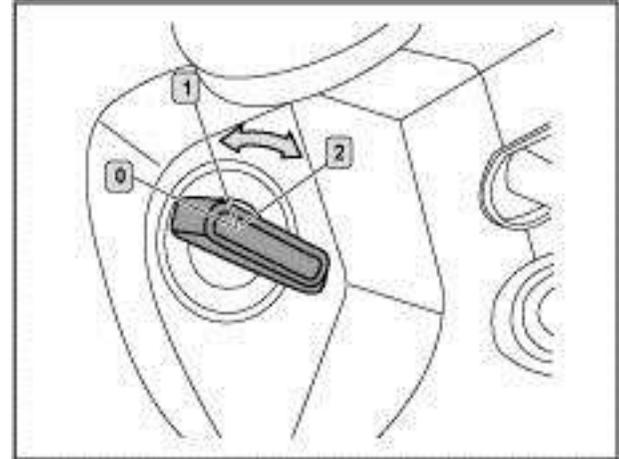
- Mileage
- Air Pressure of Brake System
- Oil Pressure of Engine
- Voltage
- Time



Instrument Desk

Key Switch

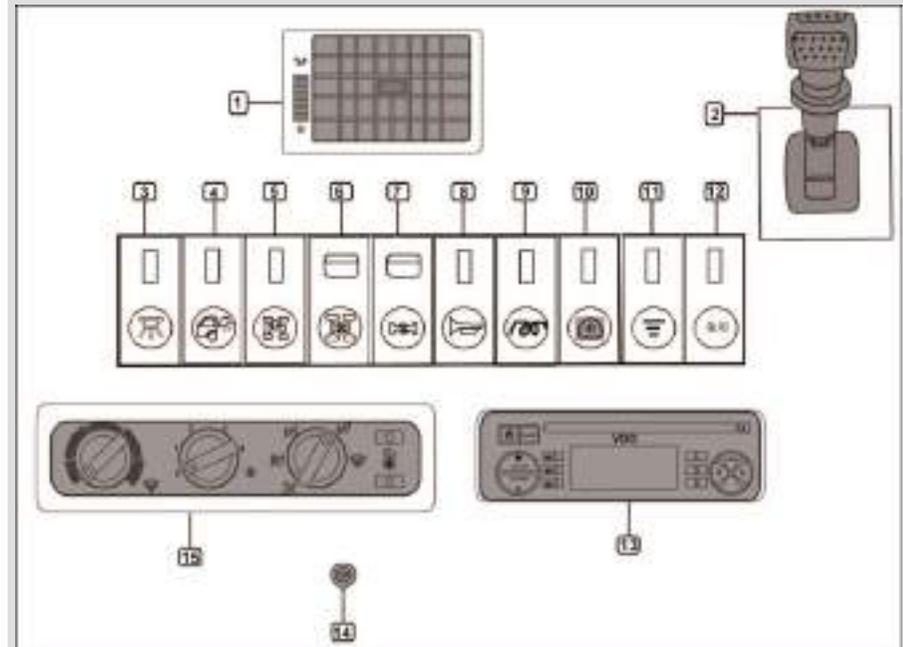
- 0 gear—— Close position;
- 1 gear ——Open the key to the first gear, it is the driving power position;
- 2 gear ——Engine starting position



Vehicle Interior Facilities

Middle Control Panel (Left)

1. Air Vent
2. Hand Brake
3. Interior Trim Lamp Switch
4. Working Lamp Switch
5. PTO Switch
6. Axis Differential Lock Switch
7. Wheel Differential Lock Switch
8. Electric Horn Change-over Switch
9. Air Inlet Heating Switch
10. Fog Lamp Switch
11. Polymorphic Switch
12. Spare
13. Radio
14. Cigarette Lighter
15. Air Conditioning Controller

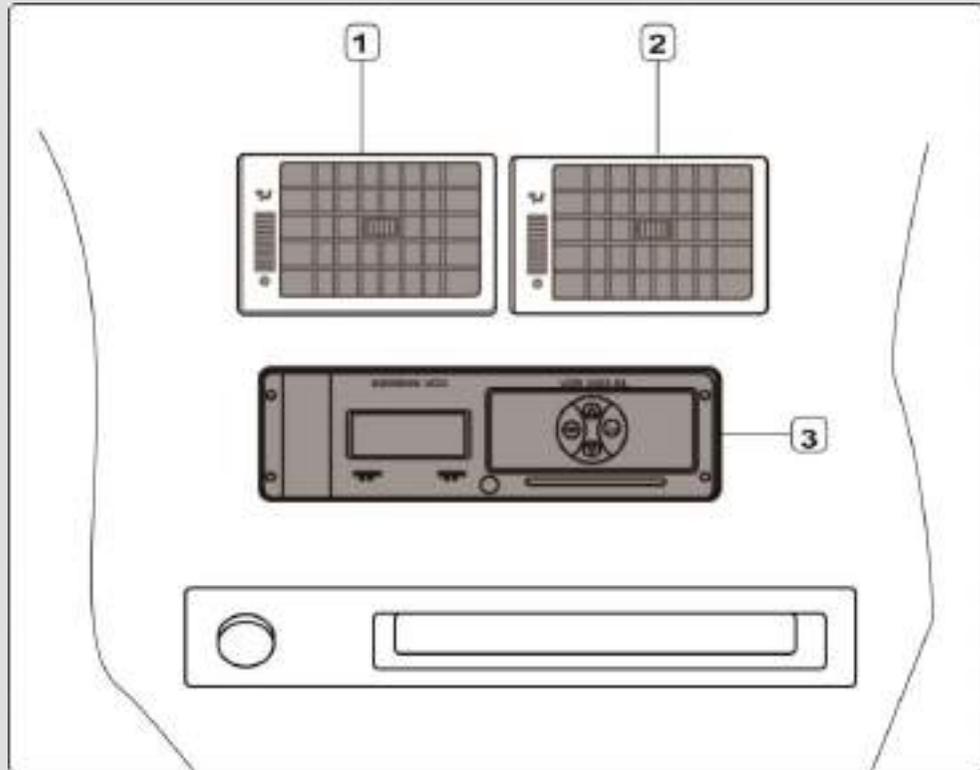


Attention:

For the safety of driver and vehicle, the hand brake valve shall be pulled up when the cab is lifted.

Middle Control Panel (Middle)

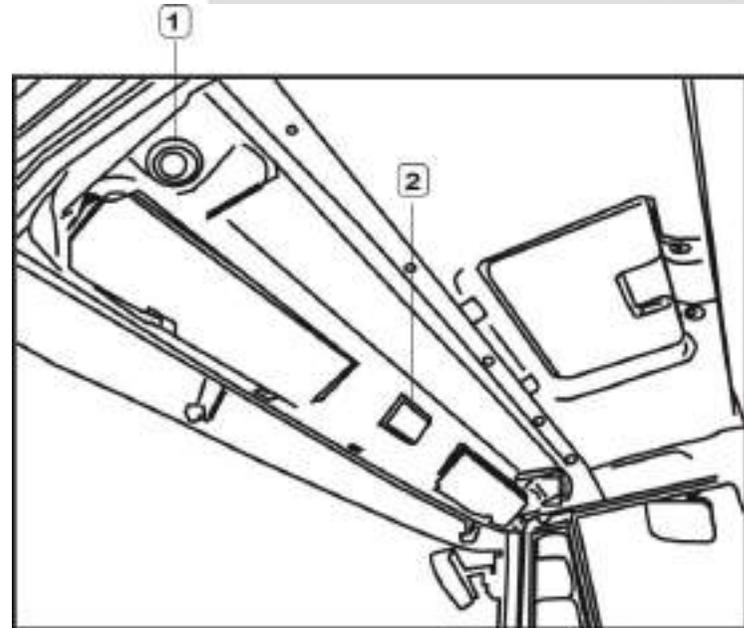
1. Air Vent
2. Air Vent
3. Driving Recorder (Optional)



Cab Top

Step Lamp (1): There are two lamps in the side. They can be bright to illuminate the pedal upon opening the door.

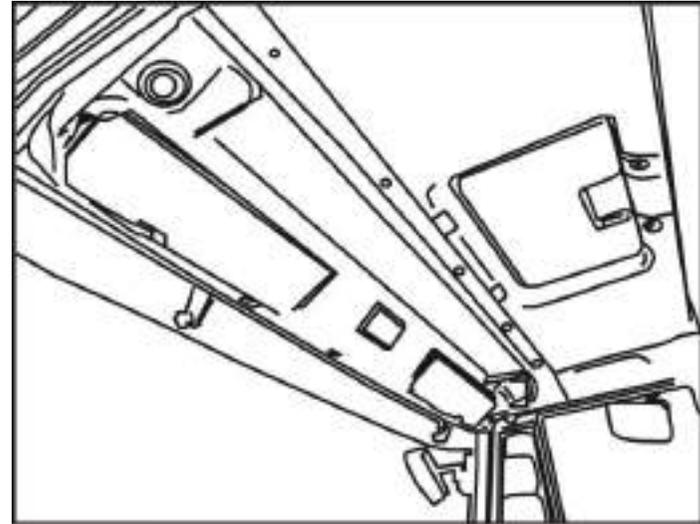
Dome Lamp (2): There is an intermediate lamp that is controlled by an indoor lamp switch. It can illuminate the driver and the passenger area.



Skylight (Optional)

1. Mounting Frame
2. Skylight
3. Skylight Locking Switch

Press down the skylight-locking button (red) to the interior. The skylight can be opened when the locking button is released, otherwise it may be damaged.



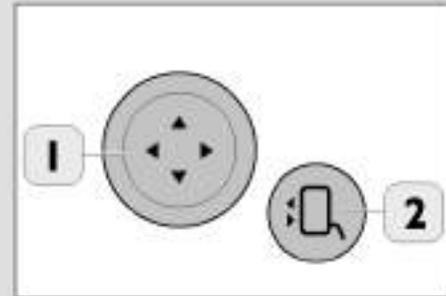
Use the adjustment button 1 of rearview mirror (**Optional**):

You can adjust the rearview mirror according to below four basic directions (up, down, left and right).

Press the selection button 2 of down-view mirror (optional):

You can adjust mirrors according to below order:

- Right wide-angle mirror
- Left main mirror
- Right main mirror
- Down-view mirror



4. Cruise Control (Optional)

(This function can be used in the range from the speed of 30Km/h to the maximum speed and is used only when the once brake pedal is used). This function automatically maintains the vehicle speed without using the accelerator pedal; the cruise speed control function shouldn't be used in busy traffic or on special road (such as mountain road) because the vehicle speed need to be controlled at any time under above conditions.

This function can be started only when the following conditions are met:

Release the accelerator pedal;

The engine brake and exhaust brake function is not started;

Speed is over 30Km/h;

Don't step on the brake pedal;

The vehicle transmission is the corresponding gear.

5. PTO State (Optional)

Set the engine rotational speed

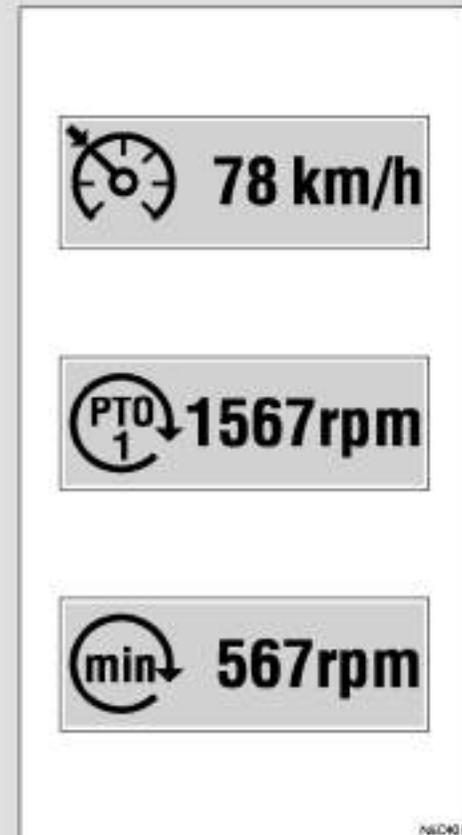
Start the engine

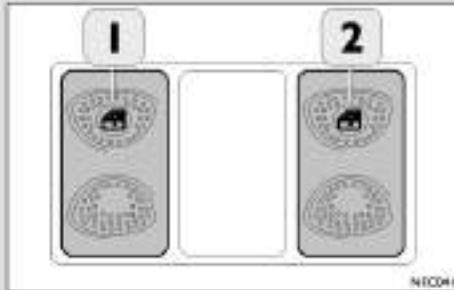
Step on the brake pedal

EDC warning lamp goes out

The engine rotational speed required by the “+”“-” adjustment of right handle of combined switch,

Press down the button of right handle for 5 seconds, and the system will record the engine rotational speed when the PTO function is opened.



**Warning!****Electric lift switch of door glass**

Electric window switches (1 & 2) are set on the right vehicle door, and they respectively control the left and right doors. There is only one switch on the left side, and it only controls the left door.

Personal Injury Risk:

It is dangerous to use an electric window incorrectly. Make sure that persons, animals, or other objects can't get injured because of window lift or dragged personal items or directly injured because of window impact before and during the window lift.

When getting off, you must take the ignition key so as to avoid causing injury to persons in the car due to wrong operation of electric window.

Use of Controller

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Seat	Air Inlet Heating
Seat Safety Belt	Electronic Accelerator Pedal
Pedal	Power Main Switch
Hand Brake Valve	Traction Device
Steering Wheel Adjustment	User-installed Accessories
Heating & Ventilation	
Combined Switch	
Light Switch	
Windshield Washing Liquid Reservoir	
Cab Rollover	
PTO Connection	
Differential Lock Joint	
Electronic Fuel Injection, EFI (ECU)	
Engine Brake	
Skylight	
Traction Device	
User-installed Accessories	

Use of Controller

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Seat

Seat Adjustment

Rotate the hand wheel according to road conditions and driver's weight. Clockwise rotate, and the stiffness decreases; anticlockwise rotate, and the stiffness increases

Adjustment range: 40kg—130kg

Attention: Don't adjust the scale value less than 40kg or more than 130kg.

1. Forward and backward adjustment handle of seat
2. Air inlet valve switch of pneumatic seat
3. Adjustment handle of seat front
4. Adjustment handle of seat rear
5. Adjustment handle of seat back



Forward and backward adjustment handles of seat

Move the handle 1 up, and the seat can be freely moved backward and forward. Release the handle and lock the seat when the seat reaches the desired position.

Adjustment of elevation angle of seat back

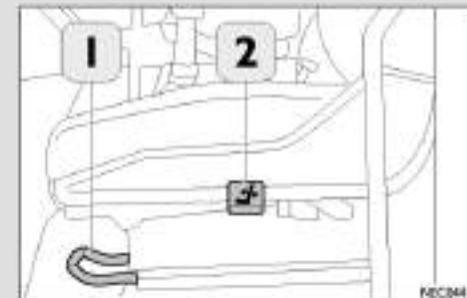
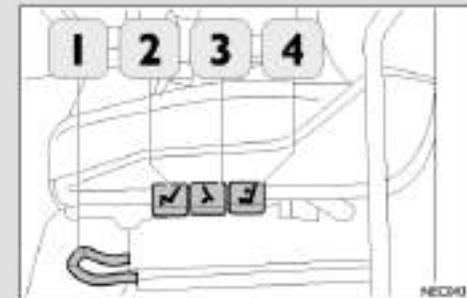
Move the handle 4 up, and the seat back can be freely moved to the desired angle position. Release the handle and confirm it moving back when the seat back reaches the desired position.

Attention: When operating, you add slightly the backward initial force to the seat back, and the operation will be more flexible. And it is not easy to damage the recliner, too.

Height adjustment and cushion angle adjustment

Operate the handle 2 and the handle 3, the seat become higher (when there is no driver load) or lower. (If there is part or whole driver's weight on it), loosen these two handles to lock the seat at the required height. As long as one handle is operated, the cushion angle can be changed.

Air cushion seat can be adjusted and controlled when the air pressure switch is opened.



Seat Safety Belt

To fasten the safety belt, seize the plug connector, and insert it into the buckle, and it is locked in place when you hear a click.

To release the safety belt, press down the red button on the belt buckle, and the metal connector will pop up. The safety belt doesn't need to be adjusted manually. It will automatically adjust to the most suitable length for the driver. If you don't make a sudden action, it can provide maximum freedom for each activity. This mechanism is very sensitive to the vehicle's balance changes. Facing a brake, a sudden acceleration, uphill driving or turning, it can lock the safety belt.

Warning:

- The seat back should be fixed in the most possible vertical position; the seat position that affects the normal activity of the seat belt is a risk, so it must be avoided.

Attention: the seat of the vehicle is not suitable for children, and the safety belt is only suitable for adults.

- The safety belt cannot be twisted, and should be put as some lower as possible. Don't put it on your waist, so as not to slide out from the safety belt. One of two arms must be placed above the safety belt, and the other is placed below the safety belt.
- You should regularly check whether the fixed screws are completely fastened and whether there is a cut or scratch on the safety belt.
- Once an accident occurs, the safety belt must be replaced even though it looks like no damage. In addition, the safety belt must also be replaced (the safety belt should be installed by the service station) when there appears a cut or traces of wear and tear.





Attention: For your safety, please fasten your safety belt when driving.

If you don't use the seat safety belt, the risk of injury will increase in the event of an accident.

- It isn't allowed to conduct modification that may weaken the role of safety belt.

- When cleaning the safety belt, wash it by hand with the neutral soap, rinse it with water, and then dry it in a cool place. It isn't allowed to use the strong detergent, bleach, dye and other chemical substances that may weaken the performance of fiber. Don't wet the roller whose performance can be ensured only in the dry conditions.

Use of Controller



Warning

In order to prevent serious personal injury, the parking brake must be used in the following conditions:

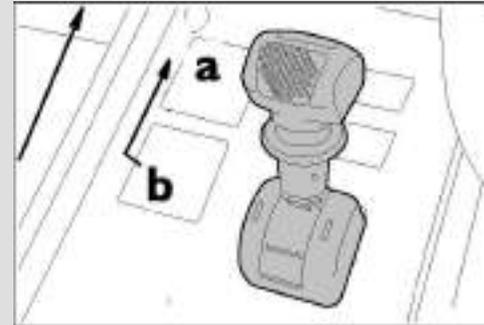
- Whenever to stop the vehicle
- When the trailer is connected to the tractor.

Hand Brake Valve

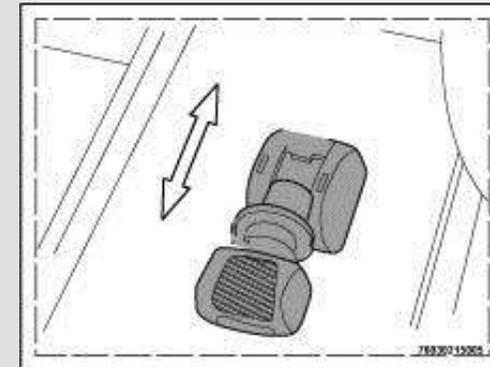
Brake Position

You must make sure the handle in a locking position when the vehicle stops and brakes.

Brake Release Position

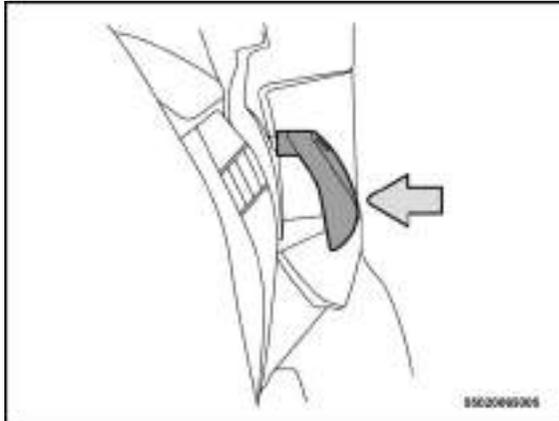


Brake Position



**Accident Danger!**

Only when the vehicle is completely stopped can the work be carried out and can the work of the locking mechanism be also checked.

**Steering Wheel Adjustment**

The height and angle of the steering wheel can be adjusted to fit the driver's shape.

Adjustment of Operating Handle of Steering Wheel:

The initial position is the locking position;

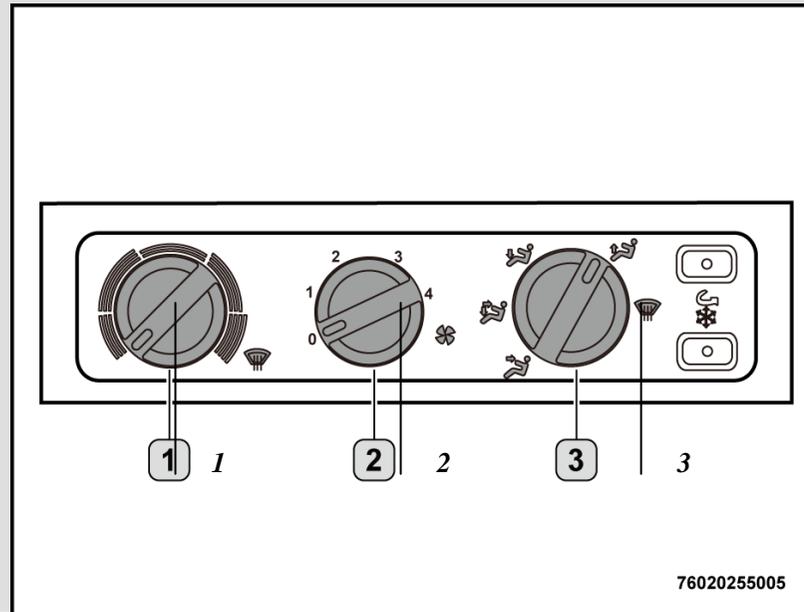
Adjust the handle to a comfortable position in a clockwise direction;

Move it to the locking position in an opposite direction.

Confirm that the steering wheel is fixed.

Heating and Ventilation

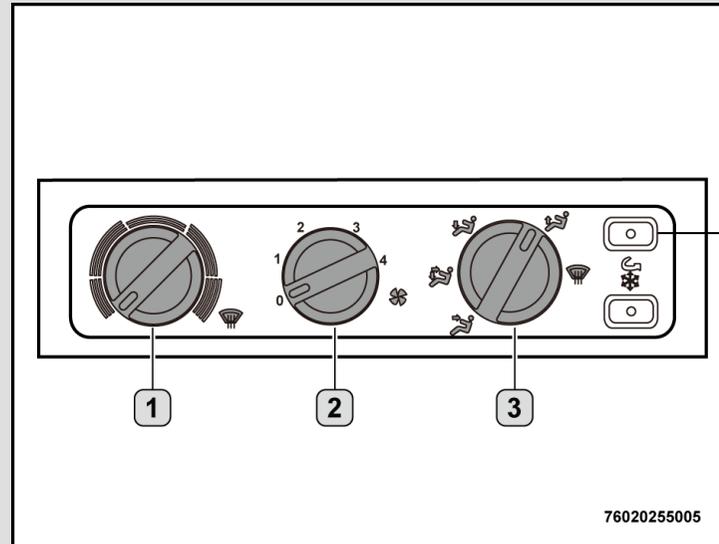
1. The air temperature control knob (cold and warm wind) is revolved to the left, and it is the cold wind; it is to the right, and the warm wind comes – windshield defrosting.
2. For blower knob, please select the operating speed and mode:
 - (0 gear) turn off:
 - (1-2-3-4 gear) manual control:
3. Air outlet position knob:
 - Front wind;
 - Front wind and foot wind
 - Foot wind
 - Foot and windshield defrosting
 - Windshield defrosting



4. Air internal circulating switch:

Prevent outside air from inflow. The excessive use of internal circulating air will make the cab air become foul and make the moisture appear on the window. If those occur, the internal circulating air switch should be closed. This feature is especially helpful when the outside is seriously polluted (in the vehicle queue and in the tunnel, etc.), and when you want the cab heated faster. So it is not recommended to use it too long, especially when you are not alone in the vehicle. Don't use this feature in a rainy/cold day because it will greatly increase the fog on the window.

Pressing down this switch means the internal circulation of the cab.



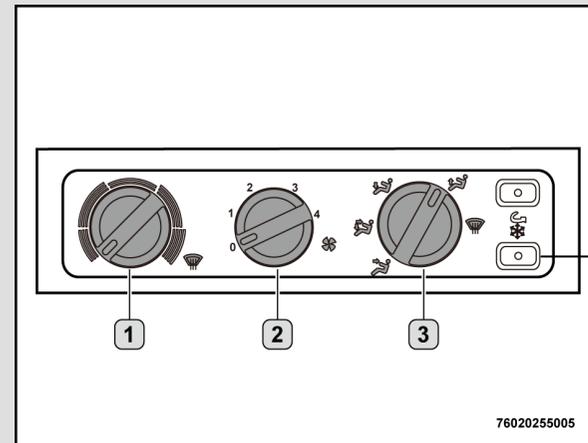


Don't contact the pipelines of an air conditioning system at random, or you will have the risk of personal injury: because the refrigerant has pressure, if it is sprayed out and contacts the skin, frostbite may happen to you.

5. Air conditioning system

The air conditioning system has air-dehumidifying effect. If you want to prevent the fog, it is suggested to use the air conditioner. In winter, the system needs to run at least once a month, and each for 10 minutes.

Pressing down this button means the air conditioning system in an open state.



Left Combined Switch

1. Horn Switch 

Press down the horn button on the steering wheel  to connect (air or electric) horn.

2. Light Switch 

Rotate the light switch of the left combined switch . When ◀ points to OFF gear, close all lights.

Rotate the light switch of the left combined switch . When ◀ points to  gear, the front and rear small lamp, instrument and switch lighting lamp become bright;

Rotate the light switch of the left combined switch . When ◀ points to  gear, the headlight, front and rear small lamp, instrument and switch lighting lamp become bright;

3. Steering Switch 

Push the operating lever forward, and the right steering lamp is bright; push the lever backward, and the left steering lamp is bright. This lamp is off when the lever is in the middle position.

4. Light Switch 

When the light switch is not opened (in OFF gear), lift the operating lever upward to 1 upper gear, and the high beam is bright. When relaxed, it automatically returns to the middle position and the high beam becomes dark.

When the light switch is opened to the  gear, lift the lever upward to 1 upper gear, and the high beam is bright. When relaxed, it automatically returns to the middle position and the high beam becomes dark.

When the lever is lifted to 2 upper gear, it is the light change gear (dipped beam ← → high beam).

When the light switch is opened to the  gear, 1 gear is the high beam and 2 gear is the dipped beam. When the lever is lifted to 1 upper gear, and the high beam is bright. When relaxed, it automatically returns to the middle position and the high beam becomes dark. When the lever is lifted to 2 upper gear, it is the high beam. Lift again, and it becomes the dipped beam. Repeatedly lift and loosen, given the high and dipped light alternating meeting and overtaking signal.





Right Combined Switch

1. Emergency alarm switch

Lift up the operating lever, open the emergency alarm, and the whole car steering lights flash.

2. Exhaust brake switch

The engine exhaust brake switch is closed when the operating lever is pushed forward, the exhaust brake electric solenoid valve obtains power, and the engine exhaust brakes.

The function of the exhaust brake switch is used to slow down on the flat and straight road surface.

To slow down on the flat and straight road surface, the transmission must be placed in an appropriate gear (according to vehicle load weight and gradient, speed, road conditions and curvature), and try to use it together with the vehicle brake. Observe the rotating speed of engine and the vehicle speed at any time when driving to prevent any fault resulting from the engine over speed operation. In the use of exhaust braking, it's not allowed to step down the clutch making it separated. And it's not allowed to leave the transmission in the neutral position; otherwise it will cause safety accidents.

3. Wiper Switch

Rotate the wiper switch  of right combined switch, ► points to OFF gear, and the wiper doesn't work;

Rotate the wiper switch  of right combined switch, ► points to INT gear, and the wiper works at intervals;

Rotate the wiper switch  of right combined switch, ► points to LO gear, and the wiper works at a low speed;

Rotate the wiper switch  of right combined switch, ► points to HI gear, and the wiper works at a high speed;

4. Water Spray Switch

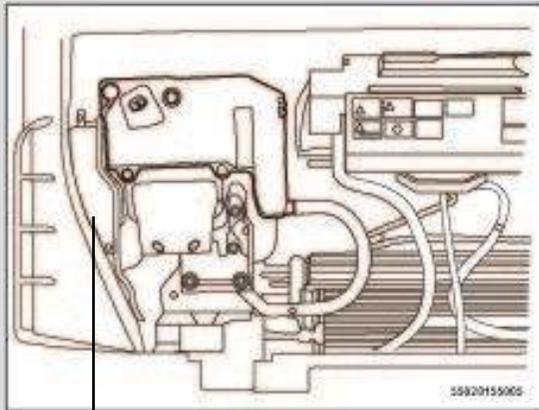
Press down the water spray switch , the water spray engine works, washing the windshield, and meanwhile the wiper wipes for 3-5 times.



Attention:

The engine brake is an auxiliary deceleration function for the vehicle, but not the vehicle braking function.

The gear of transmission must be determined according to the speed, load, road curvature and slope. And it should be used together with the brake pedal to slow down and brake, enabling the running safety of the vehicle.



Windshield Washer Tank

The reservoir 1 is located on the right side of the front cover grid of cab. The mixture of anti-freezing detergent and water is recommended to use.



Cab Rollover

Accident risk!

In front of the cab:

- Let the parking brake valve in the braking position, transmission in the neutral position and stop the engine.
- Take out all non-fixed or heavy articles in the cab.
- Leave enough space and activity area in front of the cab.
- Open the front cover of cab to avoid a bumper collision.
- It's not allowed to leave the cab in any intermediate position and the cab must be flipped over in place to the strap is tensioned when flipping over the cab.
- Confirm the door is closed.

Flip over

A. Manual Type:

Flip and insert the shaking rod into the oil pump hole. Shake the rod up and down, and the oil pressure makes the cab lock automatically open. After the cab lock hook is separated from the fixed beam, continue to shake the rod until the cab is flipped over to the upper stop point. The cab is slowly flipped over up to the limit belt tensioning through the damping of lifting cylinder.

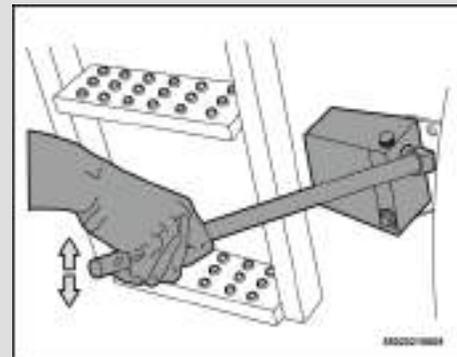
B. Electric Type:

Close the power supply control switch, open the key switch to ON gear, press the button of electric oil pump, and the oil pressure makes the cab lock automatically open. After the cab lock hook is separated from the fixed beam, continue to lift the cab until it is flipped over to the upper stop point. The cab is slowly flipped over up to the limit belt tensioning through the damping of lifting cylinder.

C. Manual lock-type lift cylinder:

The handle of unlocking structure is in the "locking" position. The locking tongue and insurance rack of locking structure of lift cylinder should be ensured to fully contact in this process, to prevent the cab fall because of the inner leakage of lift cylinder and the failure of hydraulic control valve.

If the hydraulic system has fault, it is necessary to unlock the locking mechanism of the cab, and then flip it over (if using a crane).





Cab's electric rollover



Personal injury risk:
 Make sure there is no one in front of cab during the rollover.
 If the cab door must be opened when the cab has been flipped over, the door weight **is not allowed to** be borne by a strap or a hinge.

Accident Risk!

In front of the cab:

- Engage the parking brake, and let the hand brake valve in the braking state.
- Let the transmission in the neutral position and stop engine.
- Take all non-fixed or heavy articles in the cab and open the front cover.
- Leave enough space and activity area in front of the cab.

When flipped over:

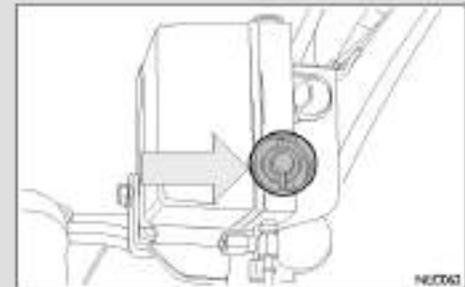
The cab must be flipped over to the bottom and it can't stay in any other position when flipping over the cab.

Cab fall

- Switch the knob to the close position.
- Like the rollover of cab, operate the lever until the cab completely falls down.
- Ensure that the cab rollover-warning lamp on the dashboard has been dark.

Vehicle model with the electric rollover of cab

- Switch the knob to the close position.
- Press down the button until the cab completely falls down.
- Ensure that the cab rollover-warning lamp on the dashboard has been dark.



Use of Controller

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Under the conditions of cab rollover and when the engine needs to be started, the vehicle must be in the neutral gear and the hand brake valve is in the braking position.

Personal Injury Risk:

When the cab is in rollover, the engine parts are very hot and be careful not to be scalded;
When the engine is in the running state, be careful not to be injured by the rotating parts;
Pay attention to the scarf, tie, cape or loose clothes of your own, and be sure that the rotating parts can't wrap them.
After the work finishes, the operating lever should be placed in a fixed position until next rollover.

Tipper Device

Operational Matters

Warning

You must ensure that the PTO is completely disconnected and the lifting oil pump is in non-working state to prevent accidents when the Tipper is running.

PTO must be connected under the idle state of engine.

PTO connection steps:

- 1 Let the gear lever in the neutral position of high gear area;
- 2 Pull the hand brake valve making the parking brake in the braking state;
- 3 Step on the clutch making it completely separated;
- 4 Press down the PTO switch;
- 5 Change the gear lever to the low gear area and in a certain gear;
- 6 Release the clutch to engage it;

PTO disconnection steps:

- 1 Step on the clutch making it completely separated;
- 2 Turn off the PTO switch;
- 3 Let the gearshift lever in the neutral position;
- 4 Release the clutch to engage it;

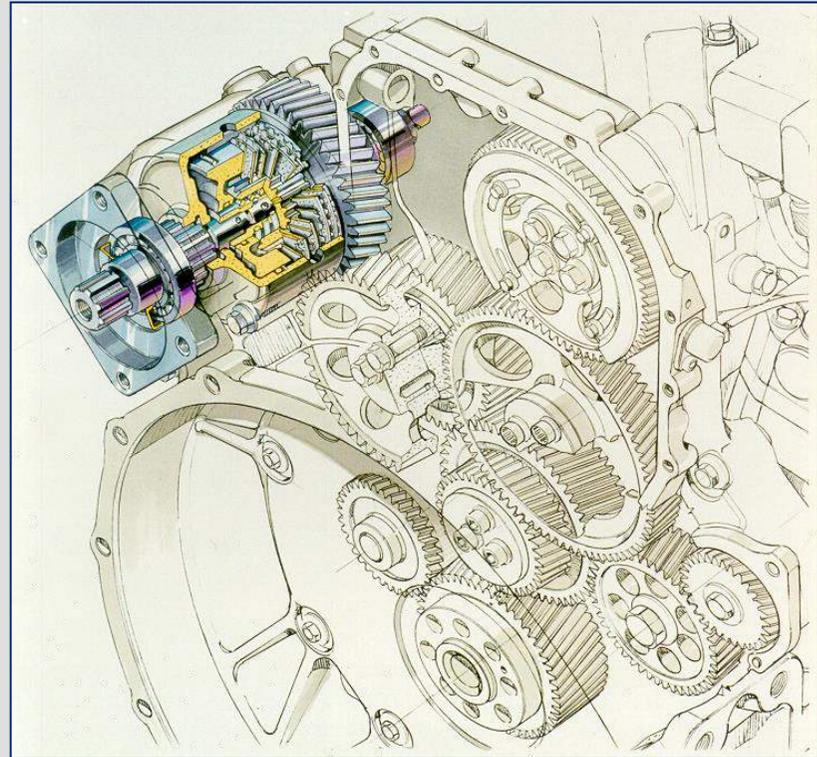
Full Power PTO

The engine PTO is directly driven by the timing gear;

The PTO is composed of a driving gear, a clutch (optional) and an output connecting mechanism.

The PTO without clutch is directly driven by the gear.

The PTO with clutch (optional) is engaged by the constant vent line to ensure that the engine and the PTO are operated at the same time.





Warning

Differential lock joint

The differential locks between wheel axles on the middle and rear axles are pneumatically controlled by the differential lock switch.

When the differential lock engages, the indicator light on the instrument panel becomes bright.

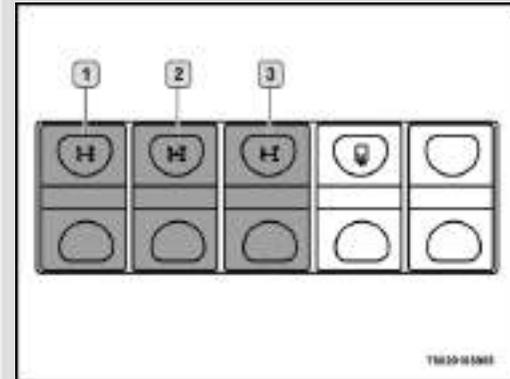
Attention! The differential lock can only be used in the straight driving on the muddy and wet slippery road. In order to ensure the normal operation, please notice the following:

- 1 The differential lock isn't engaged until the vehicle stops stably.
- 2 This operation should be carefully carried out. **It is prohibited to use in normal driving and in the bend!**

When the vehicle has passed through the muddy wet slippery pavement, you should pay attention to:

- 2.1 The wheel axle differential switch is closed when the vehicle stop stably.
- 2.2 Step lightly on the accelerator pedal.
- 2.3 Restart to drive.

If the differential lock cannot be immediately torn off, it is necessary to change the direction of travel to eliminate the meshing force of locking teeth.

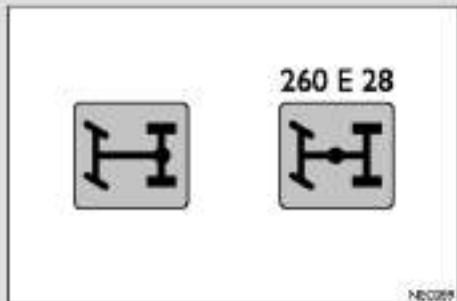
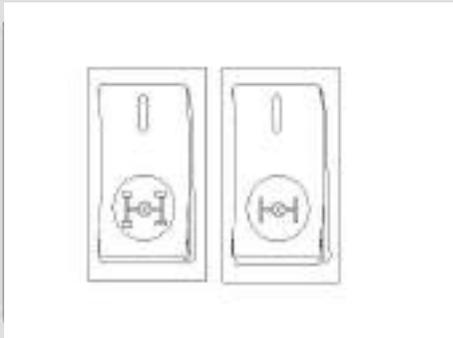




Warning

- When the differential lock is not engaged in the muddy or wet slippery road, it's not allowed to turn the wheel idly. It will result in the damage of middle and rear axle and tire (even for a few seconds, it's not allowed, too).
- With wheels in a side turns idly, it's not allowed to engage the differential lock. When the differential lock is engaged, it's not allowed to travel on a good road or a cobblestone road because it can seriously damage the drive device of gear.

Accident Risk: When the differential lock is engaged, the vehicle's control performance will be greatly affected and even lead to the damage of drive axle.



Polymorphic Switch:

According to different vehicle load, using this switch can transform the power of engine to save the fuel. Under the conditions that the engine doesn't start, open the key switch, press the polymorphic switch upward, and the engine enters into a semi-loading pattern; press the switch downward, and the engine enters into the idle mode; the switch in the middle position is the normal reloading mode.

The CURSOR9 engine enters into a semi-loading and idle mode, and the maximum rotating speed of engine is 1900rpm.

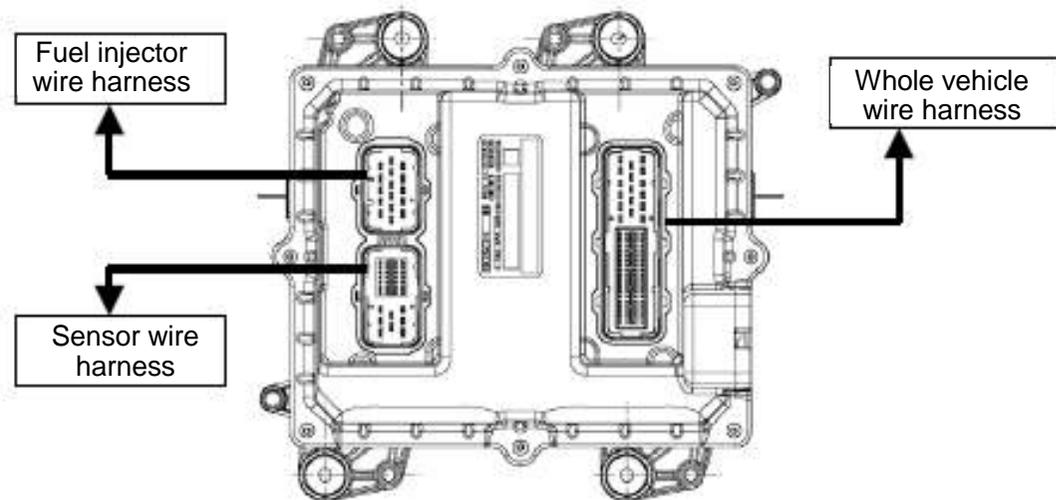


Attention: according to different vehicle loads and road conditions, reasonably use use the switch, otherwise it cannot achieve the fuel-efficient effect.

The high-pressure common rail engine's ECU adopts BOSCH electronic-controlled fuel injection common rail system, and is installed on the engine body.

There are three slots on the ECU, respectively, the engine sensor wire harness, fuel injector wire harness and the whole vehicle wire harness.

BOSCH Electronic Fuel Injection System ECU

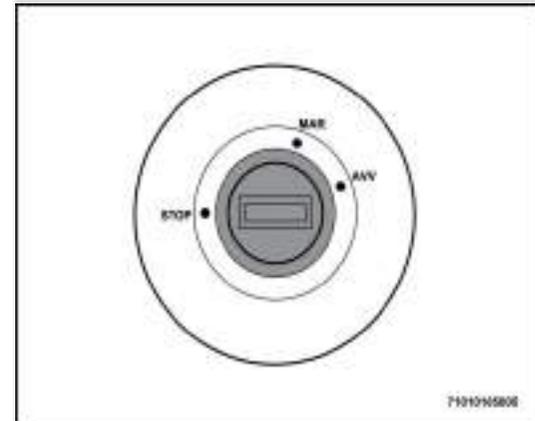


Key switch

The switch is also the ECU power switch.
The ECU will be in the working state after the switch is closed.
Turn off the key switch and the engine is off.

When the engine is off, the ECU power supply should be kept at least 1-2 minutes to write the driving cycle data (mileage, fuel consumption and other signals) into the ECU storage.

BOSCH Electronic Fuel Injection System



Inlet heating

The ECU senses the ambient temperature through the temperature sensor on the engine. Preheat the inlet temperature for cold start by heating the air inlet grid.

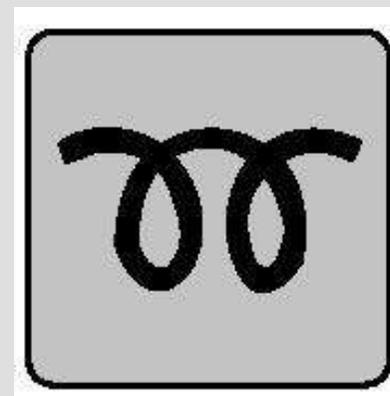
Heating

- a. Turn on the I gear of key switch;
- b. The preheating indicator light become bright and the preheating starts;
- c. The preheating indicator light flashes: the preheating ends and wait for the start; the above light will flashes for 3 times during the waiting process (indicating it can start-up).
- d. The preheating indicator light goes out
- e. Start-up
- f. Begin heating after the start-up ends (the preheating indicator light is not bright this time)

Attention: the air inlet heating functions below zero degree.

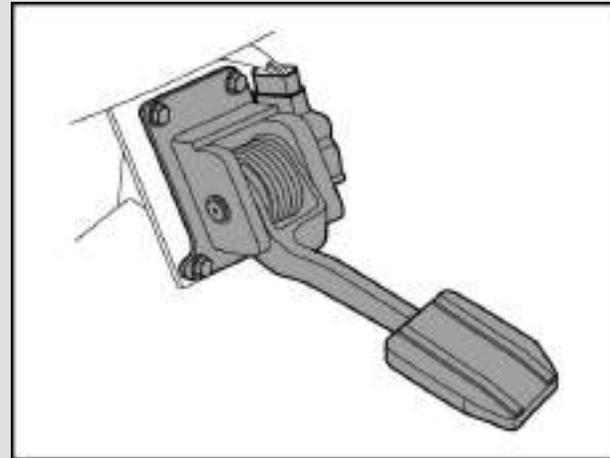
In essence, the heating for cold start is divided into two processes, “the preheating” before start and “the post-heating” after start. The driver can’t sense the latter process. The different ambient temperature needs different heating time. The preheating is generally within 1 minute, and the post-heating needs a longer time, usually within 2 minutes (at -10°C).

If the engine is started during the period when the cold start light becomes bright or flashes, the heating process shall be immediately interrupted.

BOSCH Common Rail System

Electronic accelerator pedal

The accelerator pedal is the key part of the electronic control system, and sends the signal to the ECU. If the accelerator and the line have fault, the engine will enter the failure mode, keep the idle rotating speed, and the advanced function cannot be realized.



Traction Device

Connection between the main vehicle and the trailer

1. Connection:

- 1.1 Fix the semi-trailer and make the wheel not roll.
- 1.2 Lift the handle 1, and compress the locking spring; let the handle 2 in the long hole of upper part, pull it outward, and then release it to return to the long hole.
- 1.3 Drive the trailer backward for docking, making the traction pin into the lock hook mouth, and thus promote the rotation of the lock hook; at the same time, the wedge automatically lock the lock hook, and the handle 2 returns to the original lock position along the spring pulling, indicating the docking is correct.
- 1.4 Firstly, connect the connectors (yellow) of control lines; secondly, connect the inflation connectors (red); thirdly, connect the seven-core cables.

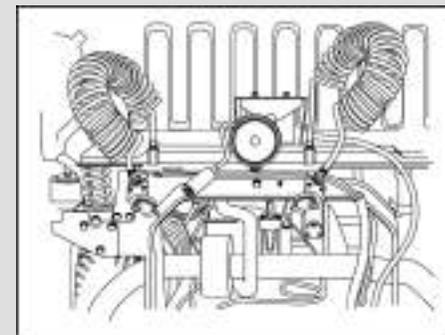
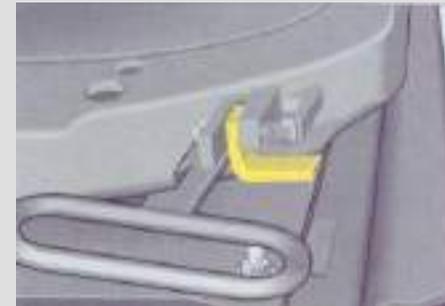
2. Separation

- 2.1 Fix and support the semi-trailer well and make the wheel not roll.
- 2.2 The inflation lines (red) must be separated; separate the control lines (yellow) and unplug the seven-core cables.
- 2.3 Pull out the handle 2 of the saddle until its positioning slot locks the saddle shell. This time, the wedge and the lock hook are separated. Drive the trailer forward, and the lock hook turns and loosens the traction pin, and finally is separated. If disconnected to the trailer for a long time, please reset the saddle handle.

Considerations

1. When connecting the trailer brake lines and electrical lines, you should ensure them not to be squeezed, kinked or without friction in the turning or the bounce of the vehicle.

2. When connecting the lines, the trailer is connected in the form of red to red and yellow to yellow. After connected, the handle of the trailer separation switch should be placed in the connecting position.





Accessories installed by user

SIH service network provides high-quality series products; please comply with the following suggestions:

- When you want to drill on the vehicle frame, cab and other cabs (such as the radio antenna installed outside the cab), you should coat the antirust paint on relevant areas to prevent rust corrosion in addition to obtaining the consent of SIH Company (such as strength inspection).
- Be careful when installing the accessories (using a screwdriver, reinforced articles, etc.). It's not allowed to cause permanent damage to the paint layer.

Assembling the accessories, additional parts or modifying the vehicle structure should strictly abide by the Modification Manual of SAIC IVECO HONGYAN Commercial Vehicle Co., Ltd.

Any modification that is not consistent with the manual must be approved by SIH Company. Any failure to comply with the above provisions will lead to automatic failure of the warranty period, and you will be solely responsible for the consequences.

Posted substance (decorative strip)

It's not allowed to use cutting tools (for example, blade, cutter, etc.) to remove or add decorative strips because it will cause serious scratch to the paint layer and thus causing earlier corrosion.

Radio transmitters and mobile phones

Mobile phones and other radio transmitters (such as CBs) cannot be used in the vehicle unless you use the antenna installed outside the vehicle. If you use the mobile phone in the cab, CB transmitter or similar devices (and without installation of outside antenna), it will produce the radio frequency electromagnetic field in the cab and it can be amplified by the resonance effect in the cab, which not only produces potential danger to the health of the human body, but also affects the normal operation of various engine control units, antilock brake system and a series of electronic systems in the vehicle. This may affect the normal operation of the vehicle and endanger your safety.

In addition, impacted by the body shield, the transmitting effect of this type of equipment will decrease.

Install additional electrical equipment

It isn't allowed to install additional electrical and electronic equipment that isn't provided or authorized by SIH Company (that is, Ham radio system with more than allowed 5W, otherwise it will produce magnetic noise or interference).

In order to make the vehicle performance reach the best effect and extend the vehicle's trouble-free service life, during the driving process within the first month, avoid the engine reaching the maximum speed as far as possible.

This section provides the relevant provisions to the following several operations:

Saving driving

Economic and environmental driving

Start-up of the engine

Inspection of the vehicle before driving

Brake (exhaust) operation of the engine

Anti-locked braking system (ABS)

Use of the parking brake

Stalling of the engine

Use of the transmission

Use in winter

Post-treatment system (optional, applicable to Europe IV emission standard)

Starting and saving



Safe driving

Before the vehicle starting

- Adjust the seat, steering wheel and rearview mirror to make drivers drive in the right position.
- Check whether there is obstacle affecting the pedal stroke.
- Check the service condition of the loudspeaker.
- Check the service condition of the vehicle exterior lamps; if necessary, clean all the lighting lamps.
- Check whether the illumination angle of the headlamps light is correct especially for the driving at night.
- Check whether the vehicle has oil or other liquid leakage.
- Check whether the load is correct.
- Finally check whether the hand brake valve is removed; check whether the alarm lamp signal of the instrument board is operated normally. In order to avoid the vehicle accidentally sliding, first stamp the brake pedal and then remove the parking brake.
- Fasten the safety belt correctly.

Safe driving

In the process of driving

- In the long distance driving, the driver shall have a good mental state and conduct the driving operations according to relevant regulations of the traffic administration department.
- The drinking of alcohol, anesthetic and some other drugs is extremely dangerous. If you have drunk, you shall not drive the vehicle.
- Non-fatty foods easy to be digested are helpful to the driver to have quick mind; the driver shall concentrate and drive safely.
- When driving on the highway, you shall drive with care; in other words, you shall be able to foresee bad or reckless behaviors of other drivers, pay attention to speed limit and drive according to the lane regulations.
- You shall open the turn signal lamp when changing direction.
- You shall keep a safe difference with other vehicles. The distance shall be confirmed according to the vehicle speed, climate, traffic and road condition.
- When it is not in service, do not put your foot on the clutch pedal, because the habit will make related parts occur premature wear.
- You shall avoid long time continuous driving and arrange parking for rest regularly.
- Do not use mobile phone when driving.
- Frequently adjust the heating and ventilation system or air-conditioning system to achieve the vehicle interior ventilation.
- Do not slide under the neutral position.
- When the steering wheel is turned to the maximum position, you shall not continue to turn to avoid damaging the steering system.





Safe driving

In the process of driving

- During the downhill driving, the shut-down sliding under the neutral position is prohibited.

The engine braking is not available under this circumstance. Therefore, stamping the pedal brake is required to achieve the braking. During the long downhill driving, after driving for a certain distance, park the vehicle at the roadside safety area (allowable parking position) for rest, thus to make the drum brake continue to be operated after the temperature drop.

In order to prevent the brake from overheating, use the engine braking under the downshift.

- When parking is allowed due to failure, park the vehicle at the roadside safety area. Turn on the hazard warning lamp and place red triangle warning signs in the corresponding safety distance to prompt other vehicles. Abide by the existing road traffic regulations.
- Do not pain patterns or other post other stickers on the vehicle window, because they may distract your attention and affect your sight.
- Throwing the cigarette end and other similar comburent out of the vehicle window may cause serious danger to the pedestrian, other vehicle, surroundings, cargo loaded and the vehicle itself.

When parking

Conduct the following operations when parking:

- Shut-down of the engine.
- Make the hand brake valve in the braking state.
- When parking, place the gear lever in the neutral position of downshift area. If the vehicle is parked on the ramp, the wedge block shall be padded in the wheel to prevent the vehicle from declining.
- After shut-down the engine, leave the ignition key in the LOCK position for fear of unnecessary current consumption to discharge the battery.

Safe driving

Nighttime driving

- You shall be especially careful when driving at night, especially on the road of no lights. You shall reduce the vehicle travel speed according to the road condition the vehicle lighting condition.
- When driving at night, you shall keep a large car distance. When you just see the light, actually it is difficult to determine the vehicle speed.
- When you feel sleepy, you shall stop for rest. If you drive in a fatigue state, it's very dangerous for yourself and other vehicle and pedestrians.
- You may use the high beam only outside the cities or towns and when you are sure not to disturb other drivers.
- When meeting other vehicles, you shall slow down even stop, and turn off the high beam according to the safety condition.

Driving in the rainy, foggy and snowy weather

- If the road is slippery, it will greatly reduce the adhesive force between wheel and road surface, making the braking distance increase and reducing the steering stability, therefore you shall reduce the vehicle speed and keep a large distance with the vehicle in front of you.
- As the visibility in heavy rain and heavy fog weather decreases, even in the daytime, you shall still turn on the dipped beam to make you have a better view in accordance with local applicable regulations.
- Do not drive at a high speed on the puddle or road surface with gathered water. Water sliding may make you lose the control on the vehicle. You'd better use the engine (exhaust) braking method to avoid emergency braking.
- If the vehicle exterior visibility decreases, the ventilation controller shall be adjusted according to the descriptions in related sections, thus to ensure effective fog removal of the vehicle window.





Safe driving

- Before the vehicle starting, check the scraper condition of the windshield wiper. If the temperature drops to 0°C below or it snows, check whether the wiper scraper is pasted on the windshield.
- You shall be especially careful when driving in the foggy weather, shall slow down and avoid the overtaking phenomenon as far as possible.
- Ensure the cleaning fluid in the windshield washer is anti-freezing and anti-scale.
- You may encounter the road section with icy surface in a cold climate. This may be because the sunlight is not sufficient and it is covered by the shadow of trees or rocks.

Tire

In order to achieve maximum comfort and safety when driving and ensure long service life of the tire, you are recommended to abide by the following descriptions:

- Although the performance of the vehicle allows you to take a sudden turn, you are still requested to slow down before the sudden turn.
- Avoid the emergency braking or abrupt acceleration to the greatest extent.
- Do not drive at a high speed and steady speed for a long time, especially on the bumpy road.
- Check whether the wheel position is correct.
- Avoid the vigorous collision on both sides of the tire (for example, during the parking).
- Absolutely do not block the tire valve.
- Do not insert any tools between rim and tire.
- Replace the rim in case of distortion.
- In case of abnormal tire step-down, check and replace the tire.

Safe driving

- The tire pressure includes the pressure of the spare tire, with the air admission according to the calibrated rated pressure value.
- Do not use the scrapped tire, the tire with unknown origin or the old tire.
- Do not add the inner tube on the vacuum tire.
- Do not park the vehicle on the road with step or other uneven road for a long time.
- Regularly check the depth of the tread pattern and abide by the regulation on the minimum limit value. The tires of some other types are equipped with the tire wear indicator. Once you see the wear indicator on the tread, you shall replace the tire. The tread pattern wear will increase the slipping danger.
- Regularly check whether the tread pattern has the phenomenon of uneven wear. If there is such situation, please contact the authorized service providers.

Tire chain

- The use of the tire chain shall obey the national and regional regulations.
- The tire chain shall only be used on the tire of the driving wheel.
- In order to avoid damage of the tire, do not equip with tire chain to travel on the road without ice and snow.
- After it is equipped with the tire chain, you shall drive at moderate speed, avoid any concave pit and shall not drive on the road with step or stone.
- The tire chain of some other type shall be checked of the tensioning situation of the tire chain after traveling for several decameters.
- Before purchasing or using the tire chain, you shall contact the authorized service provider. They will provide suggestions on how you purchase and use the nonskid device on the current market.





Economic and environmental driving

The operating conditions and driving mode will directly influence the fuel consumption and the effects to environment. With simply following some rules, avoiding driving the “fast car”, the drivers can protect the environment, and can also reduce fuel consumption.

Economic and environmental driving

- After the start, in order to reach the best engine operating temperature, conduct the idle running for 2-3 minutes and drive the vehicle slowly.
- When parking, shut down the engine after the idle running for 3-5 minutes.
- If possible, please close the vehicle window for driving. You'd better use air conditioning and ventilation system to obtain the ideal vehicle interior environment.
- Under the condition of admissible traffic and road condition, try to use the higher gear for driving if there is no unmatched gear.
- On the congested road or during the low speed driving, you may use the equipment with large energy consumption (for example, operate the ventilation equipment to the maximum speed) only when necessary.
- During the gear shift or before the engine shut-down, stamp the accelerator pedal for refueling. The vehicle equipped with the turbocharger is useless and even dangerous.
- To keep the engine speed within the green section (economic speed) of the speedometer can obtain the best economic fuel consumption.
- Strictly abide by the maintenance regulations: Periodic maintenance is the best guarantee for safe operation and reducing the operating costs.

Within the warranty period, enforce the periodic maintenance, otherwise you will lose the warranty for the vehicle.

Attention:

Please fill the qualified fuel, otherwise it may bring damage to the oil supply system parts due to strain.

Start and stop of the engine

Starting of the engine when the environment temperature exceeds 10°C

Position of the ignition switch

STOP gear: Insertion and pulling out position of the key, the engine shuts down in this position. After pulling out the key, turn the steering wheel; lock the steering wheel at a particular position;

MAR gear: For unstart of the engine, use cigar lighter, radio-cassette player and other accessory;

AVV gear: Start gear of the engine;

- Turn on the main power switch;
- Check the gearbox which shall be in the neutral position, and check the cab which shall be in the locking state;
- Insert the key into the switch and turn to MAR position clockwise; check whether the indicator lamp and instrument information of the instruments panel are correct;
- Then make the key turn right to start gear (**AVV** position) and start the engine. Once the engine is started, immediately release the key;
- If the engine is not started, after releasing the key, firstly return the key to STOP position, then twist the key to the starting position and start the engine (avoid starting by mistake).

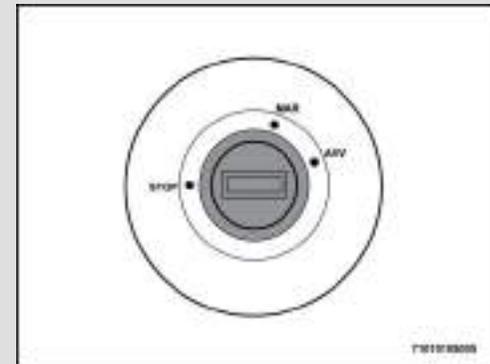
Attention:

When starting the engine, do not stamp the accelerator pedal.

During the vehicle running process, pulling out the key is prohibited.

Turn off the engine

Before turning off the engine, you are recommended to keep the engine in idle speed and no-load state for several minutes, which can make the temperature drop uniformly and avoid the harmful thermal shock.





When the ignition switch is in the I gear position, EDC warning lamp will lighten until the brake pedal is stamped.

The engine operating in the idle speed for a long time is prohibited whether it is cold-start vehicle or warm-up vehicle, thus to reduce the emissions of harmful substances.

The engine operating in the idle speed for a long time is prohibited whether it is cold-start vehicle or warm-up vehicle, thus to reduce the emissions of harmful substances, meanwhile, to protect the engine in the optimal operating condition.

- When you want to start the engine, it's not necessary to wait for going out of the warning lamp. If after the engine is started, the warning lamp is lit or flash all the time, it means there is failure and you shall contact with the service network of SIH company. If the warning lamp is not lit all the time, the inspection shall be conducted according to the following procedures:

- Waiting for the air pressure system to reach normal pressure

If the engine is not immediately started, the operating of the starter motor shall not exceed 15 seconds. After the engine is started, in order to reach the best operating temperature, drive the vehicle slowly to make the engine keep operating at an intermediate speed.

In this way, it has the following advantages:

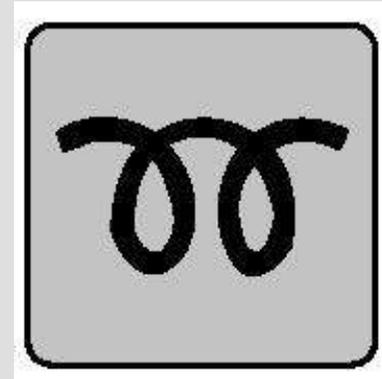
- Make the lubricating oil continuously and regularly flow through the lubrication circuit.
- Keep the exhaust emission within the limited range.
- Reduce the fuel consumption.

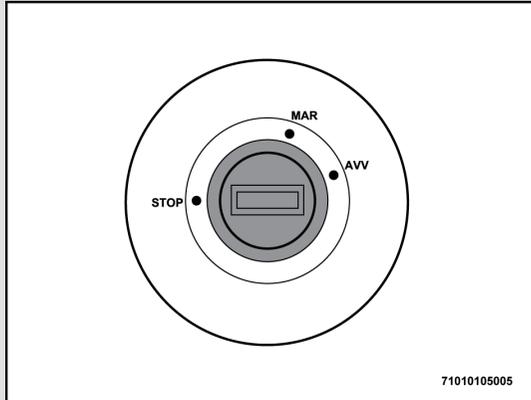
Start-up of the engine

Starting of the engine when the environment temperature is below 10°C

- The vehicle is equipped with preheat starting device to be preheated for air intake.
- Set the gearbox at the neutral position and stamp the clutch pedal.
- Insert the key in the ignition switch and turn the key clockwise to position 1.
- The preheating indicator lamp 3 is normally on until reaching the preheating temperature.
- Till the preheating lamp 3 starts glistening and the engine has completed the preparation for preheating, it may be started.
- Press the start button to start the engine. Once the engine is started, loosen it for automatic return.

Attention: If the engine is not started within several seconds since the lamp starts glistening, the preheating system and the warning lamp will be automatically turned off for fear of discharging the battery. Therefore, the procedures for preheating start shall be also operated repeatedly.





Warning

The engine operating in the idle speed for a long time is prohibited whether it is cold-start vehicle or warm-up vehicle, thus to reduce the emissions of harmful substances and extend the service life of supercharger.

If the engine is not started immediately, the operating of the starter motor shall not exceed 15 seconds. After the engine is started, do not drive immediately, but firstly conduct the idle running for 2-3 minutes to reach the best operating temperature. When you start driving, drive the vehicle slowly to make the engine keep operating at an intermediate speed.

It is helpful to the following:

- Make the lubricating oil continuously and regularly flow through the lubrication circuit.
- Keep the exhaust emission within the limited range.
- Reduce the fuel consumption.

Start-up of the engine (if there is a start button)**Key switch position**

LOCK = The insertion and pulling out of the key, the engine shuts down and the steering wheel is locked;

ACC = Radio-cassette player and cigarette lighter;

ON = Starting of the engine:

- Connect the power switch (if there is)
- Set the gearbox at the neutral position and stamp the clutch pedal
- Insert the key in the switch and turn the key right to ON gear
- Lighten the instrument lamp and the common warning lamp
- Press the start button (about 3 seconds) to start the engine, and once the engine is started, loosen the start button for automatic return. If the engine is not started at the first time, you shall start it for another time after 5 seconds. When starting the engine, do not stamp the accelerator pedal.

Inspection before the vehicle traveling

- Check whether the low pressure warning lamp goes out, and check whether the air pressure pointer is above $(5.5 \pm 0.3) \times 10^5 \text{Pa}$ through page turning with the button for confirmation;
- If the low pressure warning lamp can not go out, indicating the brake pressure of some primary circuit or secondary circuit fails to reach $(5.5 \pm 0.3) \times 10^5 \text{Pa}$, it means the braking system has failures. Therefore, you shall immediately call the locally Genlyon service provider. If the vehicle movement is required, you shall be very careful, because the vehicle has no longer completely effective braking ability.
- Get ready to drive when the water temperature is above 60°C .

During the use process, you shall check the following:

The cooling temperature of the engine does not reach the limiting temperature;

The oil pressure of the engine is kept within the normal duty range. If you think the temperature is too high, reduce the travel speed and rotational speed. In case of serious circumstance, stop running and check the line state of the cooling system.

Special warning**Cooling system**

When the engine occurs high temperature, the electronic fuel injection system will restrict the engine power. Under this circumstance, check the function of the cooling system components.

Attention

When the engine emits heat, the cooling system line will produce pressure, which may easily cause burning danger due to the spraying of hydrothermal fluid.

Lubrication system

When the signal lamp for low oil pressure of the engine alarms, check the oil level and fill up when necessary in accordance with the inspection and maintenance sections. If this state continues, please contact with the service network.

Fuel system

Avoid continuing to use the engine when there is a small amount of fuel left in the fuel tank, which may make the engine oil charging pipe inhale dust or air, thus causing the engine stop and even damaging the corresponding components of the engine, such as fuel pump, etc.

Air intake and exhaust system

Regularly check the cleanliness of the air intake system. The maintenance interval indicated in this manual may be changed according to the engine service condition; especially in the dust environment, it is necessary to conduct inspection and maintenance daily.

Anti-locked braking system (ABS) (optional)

When providing the best braking effect, ABS system can also guarantee the control on vehicles.

- When braking, no matter how the road adhesive force is, this system can prevent the single round locking.
- This system can make the drivers be able to maintain stability of the vehicle and feel relieved to drive normally on the road.

The operation and failure of ABS system (if there is) will be indicated by the warning lamp 1 and 2.

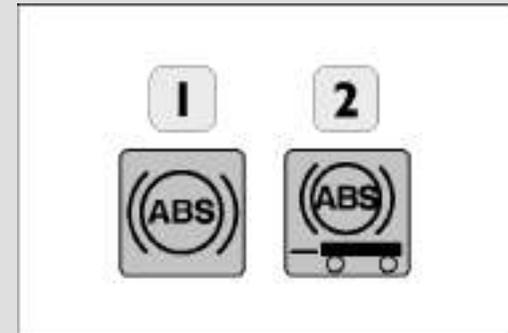
These two lamps will perform the following functions:

1. Tractor ABS warning lamp (red).

If the system is operated normally, the indicator lamp of this system will be lit after the ignition switch is powered on and will go out after two seconds.

2. Trailer ABS warning lamp (red).

Only when it is connected with the trailer and after the ignition switch is powered on, this system lamp can be lit. This lamp will go out when the travel speed exceeds 5/10 km/h; this lamp will still go out in the short parking process. The warning is used to show the failure of the trailer anti-locked braking system (ABS).



**Serious damage hazard:**

Unless the vehicle is in a state of fully stable stopping, and the brake valve handle is in the braking state, do not take out the key from the key switch. Before the driver leaves the vehicle, the hand brake valve shall be in the braking state.

Shut-down of the engine

Before parking, loosen the accelerator pedal and slightly stamp the brake pedal to reduce the travel speed. Stamp the clutch pedal; when the vehicle becomes stable, place the gear lever in the neutral position of the downshift area, and turn the parking brake to the parking position, then loosen the clutch pedal. After parking, the engine shall be operated at the idle speed for 3-5 minutes, which may shut down after the temperature drop.

Attention: The engine shut-down at high speed is prohibited, otherwise it may bring damage to the worm gear supercharger. The engine may shut down with the idle running for 3-5 minutes until the supercharger speed decrease. Pay special attention to avoiding fierce detonation of the accelerator before the shut-down. For the restarting of the engine stopped for a long time, firstly lubricate the supercharger; you may remove the supercharger fuel inlet pipe and pour into a moderate amount of clean lubricating oil from the oil inlet to achieve, otherwise the initial starting may cause early wear of the supercharger due to oil shortage.

Shut-down of the engine

To achieve the engine shut-down, turn the key to LOCK gear or ACC gear or S (START) gear, then the engine may shut down.



Main considerations!

Prohibit the downhill sliding under the neutral position or stamping the clutch pedal, otherwise there may be risks of the drive shafts fracture, people injury and even the accident involvement.

The gear shift shall be conducted gear by gear, which is extremely important to extend the service life of the clutch. That is when the vehicle is started, first start from the lowest gear (first gear / second gear), gradually change to the high gear.

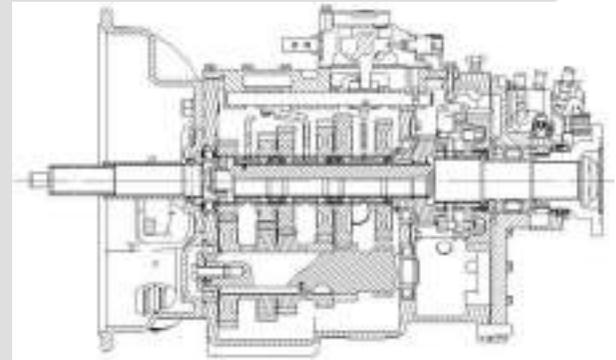
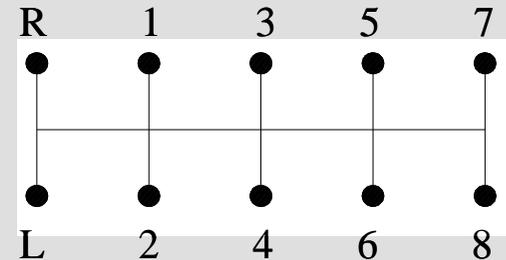
Use of the transmission

Vehicle start

- Stamp the clutch pedal and engage the first gear.
- Set the hand brake valve at the removal position and loosen the parking brake.
- Slowly loosen the clutch pedal and slowly step on the gas.
- The gear shift shall be conducted gear by gear. However, the rotational speed (even the downhill) of the engine shall never be more than the corresponding maximum speed.

Vehicle stop

- Loosen the accelerator pedal and slowly stamp the brake pedal.
- When the vehicle is going to stop, loosen the clutch and place the gear lever on the neutral position. When the vehicle is stopped, pull the hand brake valve to make the vehicle in the parking brake state.



**Warning**

Do not stamp the accelerator pedal to the bottom and do not operate the transmission shifting for more than 30 seconds when the engine is in the high speed running.

The long time operation will cause the transmission oil temperature is too high, then overheating, finally will bring huge damage.

Excess temperature of the engine will cause the engine itself to produce significant problems. In case of sustained high temperature in the engine and transmission, stop the engine and contact with professional staff of the service provider.

Considerations

1. In the gear shifting, the clutch shall be separated throughly and the gear lever shall be engaged in right gear.
2. The gear lever has high gear and low gear two neutral positions. The neutral position of high gear area is between 5 and 6 gear, while the neutral position of low gear area is between 3 and 4 gear. When parking, the gear lever shall be set in the neutral position of low gear area.
3. When the vehicle is engaged of low gear (creeper gear) or reverse gear, first stop the vehicle and then engage the gear for fear of damaging the transmission interior parts. When engaging the reverse gear, use large hand power to overcome the reverse lock resistance.
4. For shifting from 4 gear to 5 gear (or shifting from 5 gear to 4 gear), separate the clutch throughly and when making the gear lever pass through the neutral position of high gear area (the neutral position of low gear area), consciously pause for a moment (1-2 seconds), thus to make the auxiliary transmission complete the shift between low and high gear area.
5. When the transmission shifts from low gear area to high gear area (or conversely), do not operate with the trip stop, otherwise it may seriously affect the service life of the auxiliary box synchronizer.
6. Prohibit using the intermediate shaft brake during the gear shifting in traveling.
7. During the downhill of the vehicle, prohibit shifting the high and low gear position for fear of early damage of the auxiliary box synchronizer friction cone.
8. Adopt 1 gear or 2 gear for starting based on the road condition.
9. Before the vehicle starting, firstly remove the parking brake. After the vehicle that adopts the air-blocking brake is turned on of the brake valve, you may engage the gear for starting when the air pressure rises to the required pressure value.
10. In case of abnormal noise, obvious operating heaviness and other abnormality of the transmission in the use, immediately stop for inspection and continue to drive after the trouble shooting.

How to avoid major failure

Small failure may be changed to major failure only through close observation to operating conditions of the variable speed gear.

In case of one of the following circumstances:

- Overheating;
- Abnormal gear shifting;
- Abnormal noise;
- Oil leakage of gearbox;

Please contact with the service provider.



Warning

Failure in complying with the above considerations will bring serious damage to the transmission.

Vehicle dragging

When the engine is unable to be operated, firstly release the transmission shaft or lift the driving wheel from the ground, then drag or push defective vehicles. When the engine is operated, do not release the transmission shaft by carefully operate. **Do not start the engine through dragging or pushing.**

Use in winter

When the vehicle is used in the area with the environment temperature of below 5°C, replace the corresponding diesel fuel, cooling liquid, engine oil, lubricating oil, etc. for using in winter.

1. Winter fuel

Fill the fuel with the corresponding grade of the environment temperature

2. Cooling liquid

For drainage of the engine, firstly turn on the water outlet switch of the engine body, the water-cooled compressor and the water tank to drain all the water in the cooling system.

Do not allow the mixing of two different varieties of anti-freezing solutions; for replacement of different varieties of anti-freezing solutions, thoroughly clean the cooling system.

3. Engine oil

Replace the engine oil applicable to corresponding environment temperature according to the right chart.

4. Braking system

Please make sure to drain the ponding of the air cylinder.

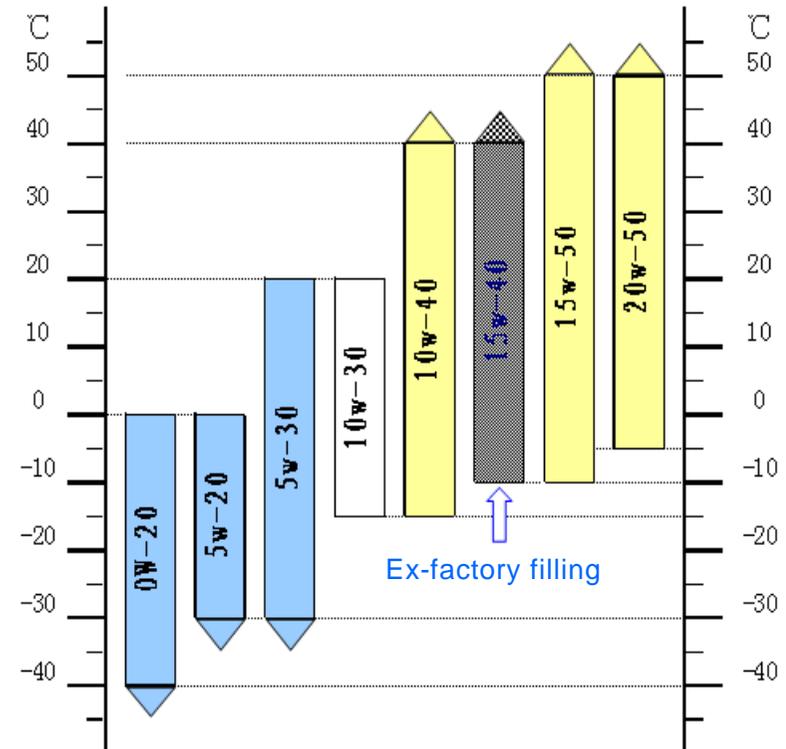
5. Windscreen washer

Drain all the water of the air cylinder and add the cleaning solution applicable to corresponding environment temperature.

6. Transmission and drive axle

Replace the lubricating oil of the corresponding environment temperature.

Attention: If the fuel grade is not consistent with the environment temperature, it may bring damage to the engine fuel supply system parts due to strain.



1. The breaking-in distance is specified as within one month after the receiving of the new vehicle. (Before the breaking-in, conduct the routine check to the vehicle to ensure the vehicle is under normal operating condition)
2. Do not speed up immediately after the engine is started, with idling for 3-5 minutes.
3. The engine shut-down under high temperature and high speed state is prohibited. Before the shut-down, the engine shall be idling for 3-5 minutes. It may shut down after the engine temperature drop.
4. The vehicle shall travel on the good and flat road in the breaking-in period.
5. Promptly shift during the gear shifting operation and combine with the clutch smoothly to avoid sudden acceleration and emergency braking.
6. Timely shift to low gear before the uphill to avoid the engine operating overload under very low speed.
7. The new vehicle is not prohibited to tow the trailer (except the tractor) within the first month. The capacity of carriage is lower than 70% of the rated loading capacity.
8. The breaking-in period shall properly shorten the lubrication and maintenance cycle.
9. Do not heavily stamp the accelerator in the breaking-in period. Frequently pay attention to checking temperature and noise of engine, transmission, transmission shaft, intermediate support, each wheel hub and brake drum of the intermediate (rear) axle. In case of overheating or abnormal noise, timely find out reasons and remove.
10. In the breaking-in period, frequently check the fastening situation of attachment bolt in each part, especially the fastening situation of attachment bolt, U-bolt, tire bolt, etc. of the engine supercharger exhaust pipe. Screw up according to the specified torque in case of looseness.
11. During the breaking-in period, carefully check whether the line of oil circuit, gas circuit, circuit, etc. has looseness or collision. Immediately remove in case of discovery.
12. Conduct the breaking-in maintenance after the expiration of the breaking-in period.

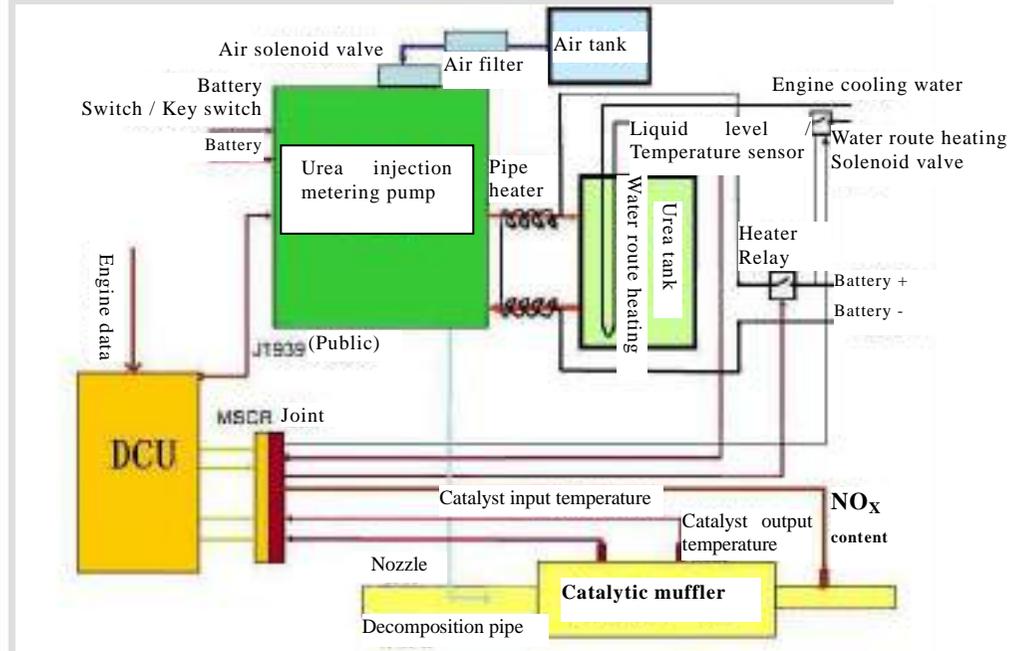
Considerations on breaking-in of new vehicle

Post-treatment system (optional, applicable to Europe IV emission standard)

1. Basic components of the post-treatment system
SCR system is mainly composed of urea tank, urea pump, urea nozzle, catalytic muffler, urea line and control unit, etc.

2. Operating principle

When SCR system is operating, after the electronic control unit collects the diesel speed and torque signals, the exhaust temperature signal in the exhaust pipe, the catalyst temperature signals, the electronic control unit will find the stored urea injection pulse spectra and calculate the urea amount required at this time according to the input parameters. Through the drive circuit, it will be transformed to the injection pulse signal to control the urea pump action.



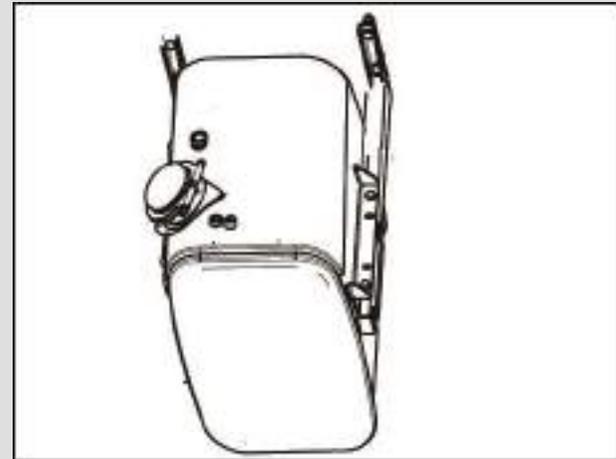
Use of the post-treatment system (optional)

SCR system is an automatic control system. When the vehicle key switch is at on gear, with normal vehicle voltage and correct connection of relevant piping, the system will operate under the control of controller, without human intervention.

As the urea pump will continue to purge for 30 seconds to blow out the residual ureas after the stop so as to prevent crystallization plugging, the vehicle power shall be disconnected after the key switch closing for 30 seconds.

The urea filling in winter shall not be too full, it may be proper when the level indicator shows just full. Because when the temperature is lower than -11°C , the urea will be icy and the volume will expand. If it is too full, without the expansion space, the urea may burst.

Repeated installation and demolition of temperature sensor and the nitrogen oxygen sensor are not allowed to avoid damaging this part.



OBD system (On-Board Diagnostics)

This system will monitor the car at any time whether it has exceeded exhaust according to its operating condition; it will immediately send warning in case of exceeding.

Under certain external environment and the vehicle environmental conditions, if the emissions of nitrogen oxides exceed the calibrated value, or the emission control monitoring system occurs failure, after a certain operation cycle, the engine ECU will activate the OBD lamp on the instrument through CAN line for normally on (for serious excessive emission or serious emission control monitoring system failure) or glistening (for non-serious excessive emission or non-serious emission control monitoring system failure) state, and activate the torque limiter.

Among which, the OBD lamp for the comfortable instrument is yellow alarm lamp , and the OBD lamp for the standard instrument is also yellow alarm lamp .

OBD system

Operating of OBD system

1) Self-inspection of OBD lamp

When the auto ignition switch is turned on but the engine is not started, OBD lamp shall also be activated. About 10s after the engine starting, in case of failure in discovering the post-treatment system failure, OBD lamp shall be removed of the activation.

2) Normally on of OBD lamp

When the post-treatment system (optional) occurs non-serious excessive emission or non-serious emissions control monitoring system failure, it will send the failure code UDS 00D21 00. This failure code will be displayed on the instrument. Meanwhile, the engine will lighten OBD lamp under certain environmental conditions (water temperature, altitude, environment temperature) after receiving this failure code.

3) OBD lamp glistening and torque limiting

When the post-treatment system (optional) occurs serious excessive emission or serious emissions control monitoring system failure, it will send the failure code UDS 00FFA 00. This failure code will be displayed on the instrument. Meanwhile, the engine will glisten OBD lamp under certain environmental conditions (water temperature, altitude, environment temperature) after receiving this failure code. The engine will perform limited torque. At this time, the engine can only reach 60% of the maximum torque.

OBD system

Failure torque limiting mode:

Under normal circumstance, when turning on T15 (Key switch), OBD lamp will be normally on. After the starting, if the post-treatment system has no failure, OBD lamp will automatically go out. When

there is failure, OBD lamp will lighten  or glisten. When starting the vehicle, OBD lamp (yellow) is still normally on, indicating the post-treatment system has failure. If OBD system fails to remove the failure after 50 hours, it will be transformed to serious failure and will occur limited torque. When the failure is removed, the vehicle shall be restarted. After every start, the vehicle shall operate to make the engine reach the water temperature of above 60°C, then restart, with such operation for three times, OBD lamp will automatically go out



For safety, regularly check the supporting structure for spare tire.

Warning

Spare tire

Process of removing the spare tire:

1. Firstly unscrew the fastening nut of spare tire with the sleeve;
2. Check the fixed device of the spare tire for reliability, thus to ensure the spare tire will not suddenly fall during removal of the fastening nut; then remove the fastening nut;
3. Fall of the spare tire
 - a. Mechanical spare tire rack:

Unscrew the spare tire lifter bolt with the special purpose spanner, with the spare tire slowly falling to the ground;

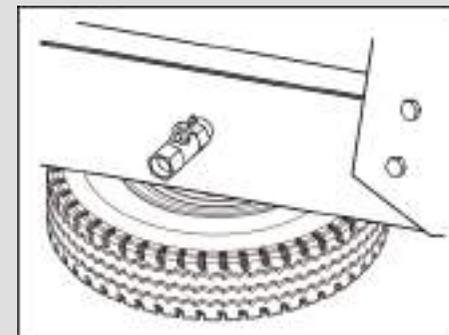
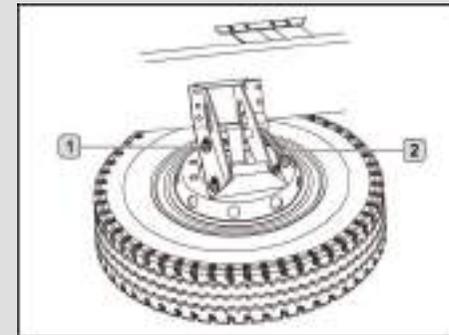
b. Pneumatic spare tire rack:

- ① Turn on the axle diff lock switch in the cab to make the spare tire lifting air circuit filled with air;
- ② Turn on the switch outside the spare tire rack; conduct the spare tire lifting according to the arrow direction on the switch. During the spare tire lifting, ensure the air tank of 0.8Mpa to make the spare tire slowly fall to the ground.

Refitting of spare tire (fixation of spare tire)

After the spare tire is installed on the proper position of the spare tire rack, screw up the fastening nut for spare tire with the spanner.

Attention: During the process of the spare tire falling, lifting and replacement, be careful to avoid occurring property damage and personal injury accidents.



Jack

For correct use of the jack, you shall strictly comply with the instructions.

For instructions to inspection and maintenance, please refer to the documents provided by the manufacturer and keep properly after using.

Remember:

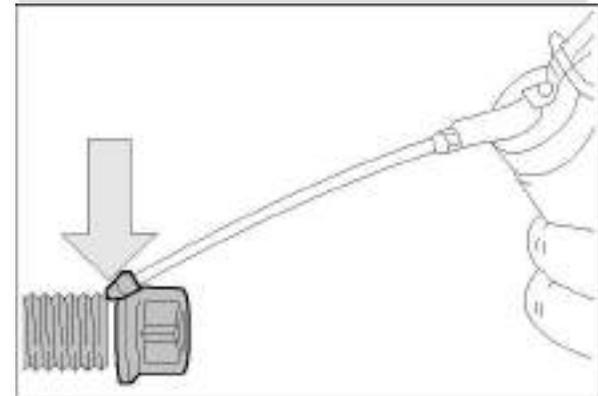
After pulling the hand brake valve and using the parking brake, use the cushion block to pad the wheel on the ground before jacking up the vehicle.

The function of the jack is just to jack up the heavy objects, so you shall use sole timber, security stool, etc. to be padded at the proper place for load bearing so as to conduct the repair, maintenance and other operation under the jacked vehicle.

If necessary, request the authorized service provider for help.

Attention:

Absolutely prohibit operating under the vehicle jacked only by the jack.



Considerations!

Prohibit using the tools provided from non-original vehicle.

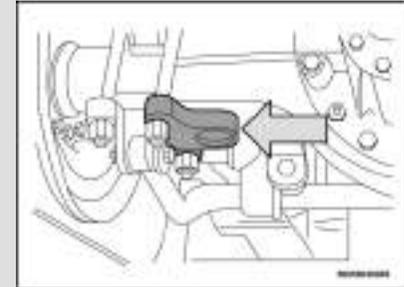
After the new vehicle is replaced with the wheel, the nut shall be screwed up again after 50km and screwed up for another time after the operating of 100km.

For the safety of you and others, do not use the tire or fastening components beyond the original factory.

Tire replacement

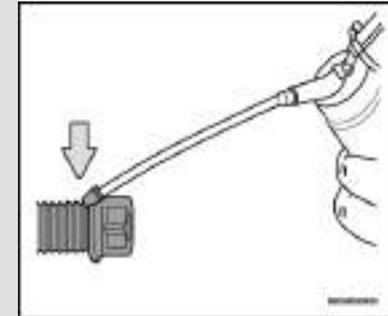
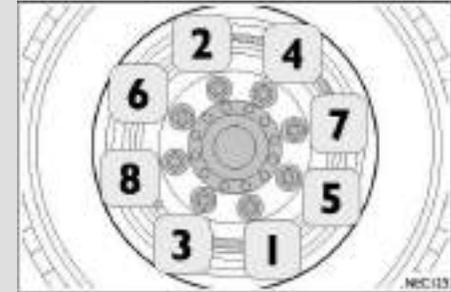
Replacement and tightening of the tire

1. Pay attention to not damaging the thread of wheel bolt when replacing the tire;
2. The brake drum and the rim fitting surface shall not be pasted of paint, lubricating grease and other dirt;
3. The seal face of the wheel nut shall be clean and free of dirt or oil dirt;
4. Place the vehicle on the flat ground;
5. For the vehicle jacked up by the jack, the jack shall be fixed on the front, rear axle steel plate seat; then use the security stool to be padded at the load bearing position;
- 6. Then deflate the tire required for removal to be lower than the specified tire pressure;**
7. The removal personnel shall not directly face the tire and shall stand at flank of the tire for removal;



8. Apply some grease, engine oil or anti-occlusion agent on the thread of wheel bolt and wheel nut, and then unscrew the nut along the diagonal. At this time, do not screw down the nut until all nuts are loosened.
9. Before installing the wheel, firstly clean up the matched excircle with the wheel positioning hole and the wheelhub reductor, and apply a little grease.
10. The thread of all wheel nuts is right-hand thread. After installing the wheel, under the condition of wheel dangling, screw up the nut according to the diagonal cross order; then put down the wheel to contact with the ground and screw up the nut with the torque of 550-600Nm.
11. After the tire reinstatement of every time, screw up the tire nut again after the traveling for 50km; check the re-tightened tire nut for traveling of every 5,000km.

After screwing the tire inflation hose in the air inflation, start the engine, then the compressed air can blow up a tire through the air cylinder. Blow up the tire according to the calibrated value.



Battery

① Check the liquid level height of the electrolyte solution

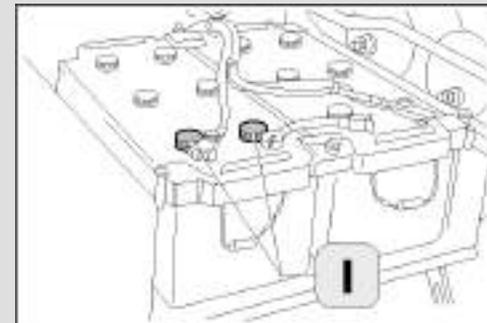
The battery of correct type requires little maintenance, therefore, under the regular service condition; it does not need to add the electrolytic solution. However, the regular inspection is required.

The liquid level height of the electrolyte solution shall be 10-15mm higher than the pole plate. Generally the liquid level height shall be checked monthly. In summer, it shall be checked every ten days. In case the liquid level height of the electrolyte solution is lower than the specified value, the distilled water shall be immediately filled for supplement. The dilute sulfuric acid shall not be added.

② When the car is parked without being used for along time, before parking, remove the battery to make it fully charged. Afterwards, it shall be conducted with the additional charge every other month.

③ Pay attention to keeping unobstructed venthole on the plug screw of the electrolyte solution filling hole.

Battery maintenance



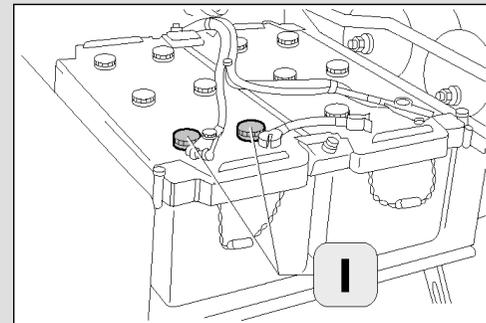
Safety considerations which shall be followed during the battery treatment

1. Smoking, ignition or open fire are strictly forbidden. When the component or the measuring instrument is connected to the battery, avoid occurring the spark. Before disconnecting the battery, firstly remove the fuse from the control unit to disconnect the components that supply power for a long time. Do not connect the reversed polarity and do not use wrong fixed spanner, which may have the danger of short circuit. If it is not absolutely necessary, do not screw out the terminal cap. During the wire connection, finally install the grounding wire.
2. Wear goggles or face mask!
3. Keep the battery and acid liquor away from children!
4. As the battery has acid liquor, wear gloves and protective clothing. Do not tilt or dump the battery, because the acid liquor may flow out from the hole.
5. Strictly abide by the instructions provided by the manufacturer.
6. Danger of explosion! You shall be especially careful after the battery charging or the end of long distance traveling. In the stage of charging, the explosive gas (mixed gas of hydrogen and oxygen) will be produced in the battery! Be especially careful for this gas.



**Warning**

- Batteries contain substances extremely harmful to the environment. When replacing the battery, you are recommended to call the waste liquor treatment equipment service organization that complies with the environmental application regulations.
- Incorrect electrical equipment assembly may cause serious damage to vehicles. After the vehicle purchase, if you want to install some auxiliary equipment, you shall call the service organization of SIH company. The organization will recommend you to use the most suitable equipment; meanwhile, it will tell you to use the battery of large capacity.
- The liquor in the battery contains toxic and corrosive substances that shall not contact with eyes and skin. Any operation shall be conducted under the well-ventilated environment and shall be far from open fire or possible spark (smoking and so on), otherwise there may be danger of explosion or fire.
- If the battery charging volume remains below 50%, the battery will be damaged by sulfuration to reduce its starting capability and be more likely to occur freeze (in this situation, the freeze will occur at -10°C).
- The above starting process shall be operated by skilled personnel, because incorrect operation may cause a lot of discharge.
- In order to avoid any damage to the vehicle electrical system, strictly abide by the instructions of cable manufacturers. The cable shall have enough cross section and appropriate length.
- It is forbidden to use the fast battery charger for emergency starting, which may damage the electronic system, especially may damage the start and the fuel supply control unit.
- Relevant operation of connecting and disconnecting the battery terminal will produce the pressure which may cause the electronic system and vehicle control unit failure. Therefore, these operations shall be carried out by skilled personnel.

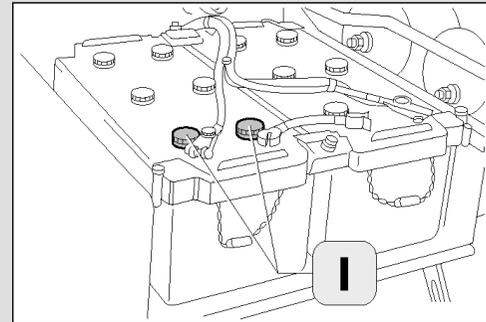
Battery maintenance

Practical tips

In order to prevent battery leakage and maintain its operation, you shall comply with the following suggestions:

- The battery terminals must be fastened properly.
- Common equipment (car radio, car lamp and other electrical equipment) shall not be turned on for a long time when the engine is not running.
- After the engine shut-down and the vehicles parking, before leaving the vehicle, you shall ensure the vehicle inside or outside lamps go out.
- Before any operation of the electrical system, you shall disconnect the battery negative terminal.

Battery maintenance



Protection of electronic control unit (ECU)

In order to prevent irreparable damage to electrical and electronic control device assembled on the vehicle, abide by the following instructions when conducting certain types of operation:

- Conduct the welding operation to the vehicle chassis according to the following regulations:

Turn off main power switch and remove negative, positive pole connecting line of the battery;

Take down the ECU wire harness connector; meanwhile, use the sheath to cover the ECU plug so as to prevent the entering of particle, spark caused from welding, etc. Do not touch ECU pin with hand.

Finally connect the negative, positive pole connecting line of the battery together and turn on main switch.

For welding near the electrical control unit, remove the electronic control unit from the chassis.

Adopt DC for welding operation.

Ensure the welding machine is close to the welding point as far as possible; ensure the battery cable is not in parallel connection with the vehicle electric cable.

- When plugging in or pulling out the plug of the electronic control unit;
Make sure to firstly disconnect the power of the electronic control unit for fear of burning out electronic control unit, or other components;
The plugging in or pulling out shall be operated properly. Prevent empty plugging in or improper plugging in or pulling out from causing pin bending of the electronic control unit, thus affecting the function;
Make sure to confirm the power positive and negative electrode for fear of burning-out of the electronic control unit;
- When the engine is running or the control unit is powered on, do not disconnect and / or reconnect the control unit connector.
- The power supply for the electronic control unit shall select stable power supply. The selection of inferior generator may bring fatal damage to the electronic control unit in case of the battery failure.
- After any maintenance operation when the battery needs to be disconnected, ensure firm connection to the terminal during the reconnection of the battery.

ECU maintenance

- Do not disconnect the main power switch when the engine is running.
- Do not use the fast charger to start the engine.
- When the battery needs to be charged, disconnect it with the vehicle electrical system.
- Do not check whether the line is electrified through the method that may cause spark.
- Do not use the test bulb to check the line conductivity. You can only use the appropriate test device.
- Do not directly supply the vehicle rated current to associated parts of the electronic control unit.
- If special operation needs the temperature above 80°C, remove the electronic control unit. When installing the electronic control unit / electronic components, it is forbidden to paint. If necessary, adopt the special compatible paint (inspection for every time) and protect some components according to technical specification of the components manufacturers. For more detailed instructions, please contact with the authorized distributors.

ECU maintenance

Instructions that shall be strictly followed

Before any maintenance operation to the electrical system control unit, especially before the replacement of the engine start relay, please focus on the following matters to prevent the danger of short circuit, etc.:

- Before taking down the relay from the control unit, ensure the battery switch is disconnected or disconnect the battery terminal.
- If in the process of the relay removal, the plastic case has been opened or the relay has been turned on for some reason, install new relay.
- In the vehicle assembly process, the electronic control unit must be powered on after the power-on test of all other electrical components, which can not only avoid the impact of unpredictable large current caused to electronic control unit or other system components due to improper operation in the power-on test, but also can avoid the electronic control unit storing some untrusted error information, thus causing the vehicle factory inspection.

ECU maintenance

Lighting

Bulb replacement requirements:

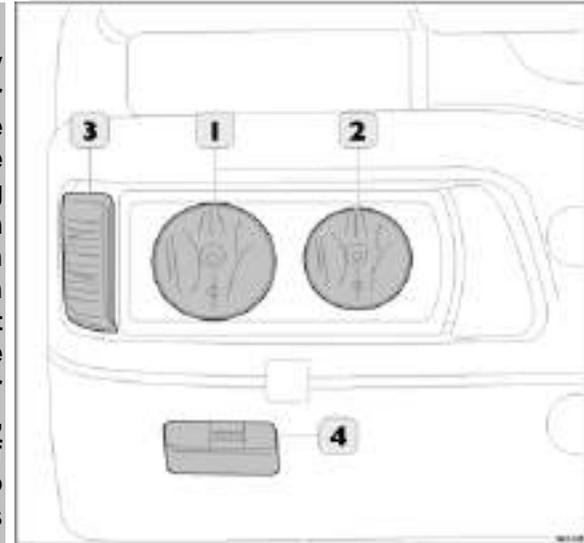
The bulb replaced in the maintenance process shall meet the calibration requirements of the original vehicle.

Headlamp

1. High beam and dipped beam
2. High beam
3. Front turn signal lamp and front width lamp
4. Front fog lamp

Attention:

It is forbidden to privately change the circuit or externally connect the electrical components! The user or refitting manufacturer shall obtain the approval and recognition of SIH technical section before changing the circuit or externally connect the electric appliance or electrical equipment, otherwise serious damage of burning may be caused to electronic / electric systems and even the vehicle.



Attention: The bulb and lamp holder may be very hot.

Vehicle front and side direction indicator lamp

When replacing the vehicle front and side direction indicator lamp, you need to:

- Clockwise or counterclockwise rotate the lamp holder to the looseness state;
- Remove the bulb;
- Replace the bulb;
- Put back to the original position;
- Clockwise or counterclockwise screw tightly.

Vehicle side lamp (if it is provided)

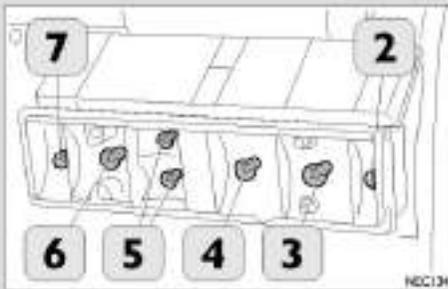
When replacing the bulb, you need to:

- Screw out the fixed screw;
- Replace the defective bulb;
- Screw back the screw.

Front width lamp (if it is provided)

When replacing the bulb, you need to:

- Clockwise or counterclockwise rotate the lamp holder 1 to the looseness state;
- Remove the bulb;
- Replace the bulb;
- Put back to the original position;
- Clockwise or counterclockwise screw tightly.



Combination tail lamp

Replace the combination tail lamp bulb according to the following steps:

- Screw out the fixed screw of the lamp cover
- Remove the lamp cover
- Replace the bulb

The bulb order is as follows:

2. Clearance lamp
3. Direction indicator lamp
4. Brake lamp
5. Tail lamp
6. Rear fog lamp
7. Backup lamp

- Reinstall the lamp cover
- Reinstall and screw the fixed screw of the lamp cover tightly.

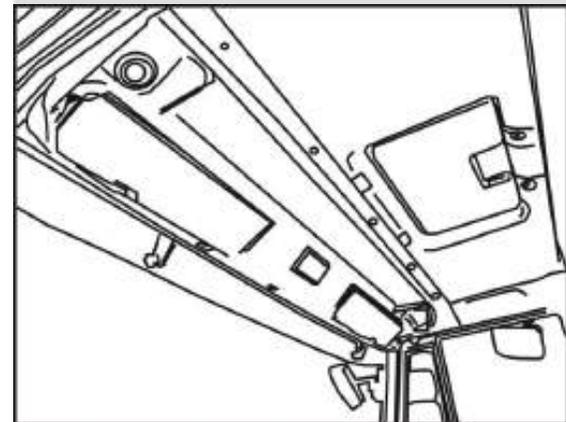
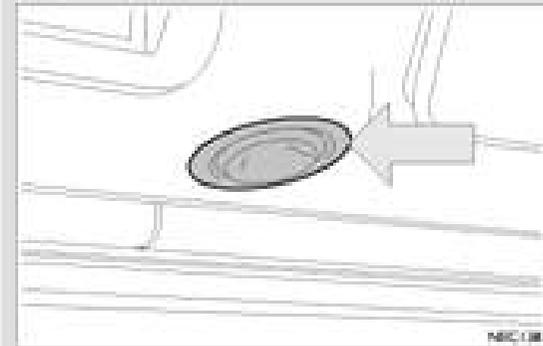
Courtesy lamp

When replacing the courtesy lamp bulb in the cab, you need to:

- Stretch two slotted screwdrivers into the courtesy lamp gap; remove them after flattening the lamp holder.
- Clockwise or counterclockwise rotate the lamp holder to the looseness state.
- Replace the bulb and screw it tightly.
- Install the lamp holder against the gap and flatten it.

Head lamp of the cab

- Remove the lamp cover screw
- Remove the lamp cover of the head lamp
- Remove the bulb and replace it
- Install the lamp cover
- Screw the lamp cover tightly





Warning

If the vehicle needs towing, you shall abide by the following instructions:

Screw the ignition key to the position ON gear and loosen the steering wheel lock. Use the helix traction pin in the toolbox to be inserted in the traction base to ensure the traction base is fixed well.

- Remove the transmission shaft from the rear axle and fix it
- Prohibit the trailer starting.

Vehicle traction

The traction shall be carried out only with the draw bar of recognized type and according to the specified guidance.

Do not remove the rear axle shaft for fear of causing serious leakage of the lubricating oil.

- Adopt the rigid draw bar to tow the full-loaded vehicles. Do not lift the vehicle.
- If for a special type of failure, it is necessary to lift the front axle in the towing operation, unload the vehicle or place the lifting trolley under the front axle.



Warning

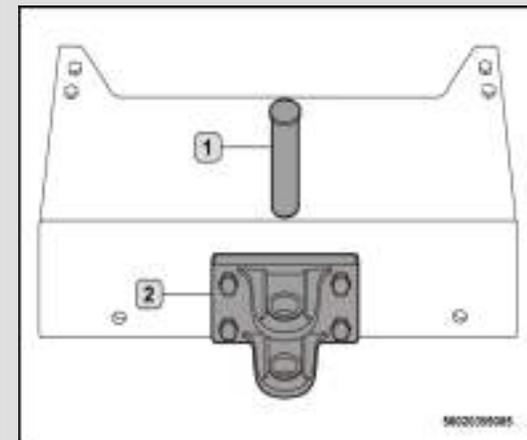
It is recommend that the front axle lifting type towing be carried out on the road with good condition, with the speed not exceeding 30 km/h and conformity to the provisions of the local regulations



Warning

Attention:

Before the vehicle towing, ensure that the reverse gear is loosened to avoid damage to transmission gear.



**Warning**

After unscrewing the bolts on the brake loosening device, you may only tow vehicles and do not drive vehicles in any case. At this time, there is no parking brake function.

If you want to make the braking system return to normal operation and effect, you shall contact with the authorized service provider.

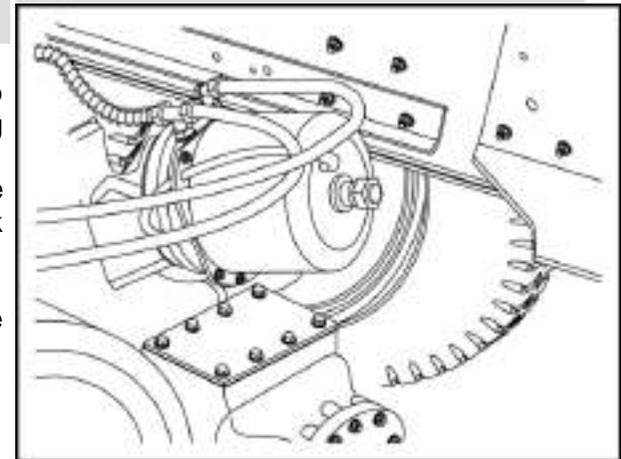
Parking brake – Emergency brake loosening device

The function of the spring parking brake is to automatically stop the vehicle when the compressed air can not reach the parking brake line.

In order to tow the vehicle, adopt the mechanical loosening device to loosen the brake. For this purpose, use the locking wedge block to plug the wheels and pull the parking brake.

Then conduct the following operations:

- Rotate the central screw behind the cylinder counterclockwise and unscrew the central bolts.
- Conduct the same operation on the relative wheel.

**Oil-bath type air filter (optional)**

Maintenance: Vehicle operation for 100-200 hours. Unpack the air filter; pour dirty oil out of the bottom shell; wash the shell and metal screen with kerosene or gasoline; after being dry in the air or being sucked dry by the compressed air, add a certain amount of new engine oil in the bottom shell; then soak the screen in the diluted engine oil and take out; after the engine oil flows up, install the whole air filter completely.

Points of attention: Do not add the used lubricating oil in the bottom shell to make the adhesive force insufficient.

Do not add too much oil in the bottom shell, because too much oil may cause the excessive oil is inhaled in the air cylinder to form carbon deposit and even produce “oil splashing”.

**Warning**

Regularly clean the air filter and inlet pipe, and replace the filter element with crack and perforation, otherwise early wear may be caused to the engine.

Air filter maintenance

When the air filter signal lamp goes on, clean up the dust cup and clear the dust on the filter element. Conduct frequent maintenance to the vehicles used in the construction site, while conduct daily maintenance for those under bad conditions.

Cleaning and inspection of the air filter

Irregularly pinch the dedusting valve with hand to clear the gathered dust.

Remove the primary filter element, and tap one end of the filter element on the tire to shake off the dust inside. With the dry compressed air of not more than 0.5bar, blow the primary filter element surface from inside to outside along the diagonal cross direction.

Put one operating lamp in the filter lamp; check externally whether there is crack, perforated filter element or other damage.

The security filter element can only be replaced but shall not be washed. After cleaning for every 5 times or damage of the primary filter element, the security filter element shall be replaced. If the indicator light immediately goes on again after cleaning of the primary filter element, it shall still be replaced.

The cleaning times shall be indicated on the security filter element after every cleaning of the primary filter element.

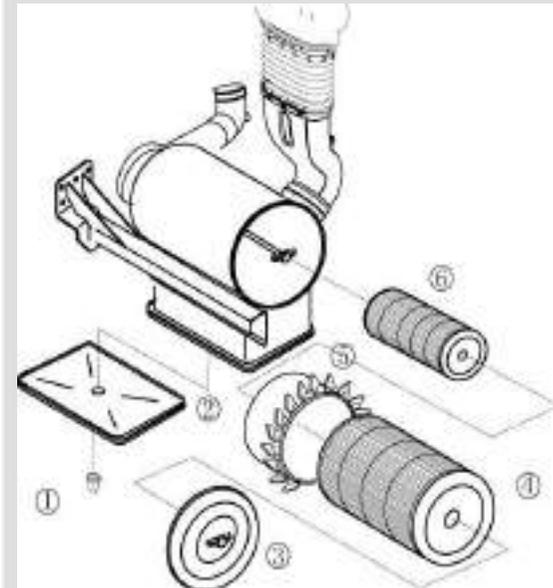
The dumper and the vehicle with poor service condition shall be replaced of air element and security filter element monthly to avoid early wear of the engine.

Maintenance of the air inlet pipe

Check the air inlet pipe and leakproofness of the whole engine, especially the coupling, to prevent the dust from entering the engine.

Attention:

Under poor service condition, the air filter element shall be conducted with the maintenance daily. The security filter element can only be replaced (when the first filter element completes the maintenance of more than 5 times).

Air filter maintenance



Fire danger!

When screwing the bleeder screw, you shall be especially careful to prevent the fuel leakage from causing danger.

Drainage and air emission in the fuel system

The filling of the fuel contaminated by foreign matter and water may bring damage to parts of the engine oil supply system. Therefore, conduct the following operation before the oil filling of every time:

Rotate a container under the filter for collecting the liquid;

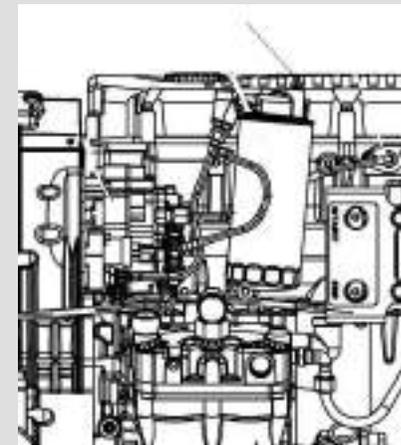
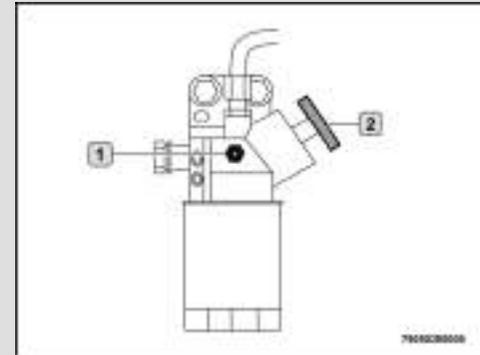
Turn on the water outlet switch at the filter bottom and drain the liquid until there is only fuel;

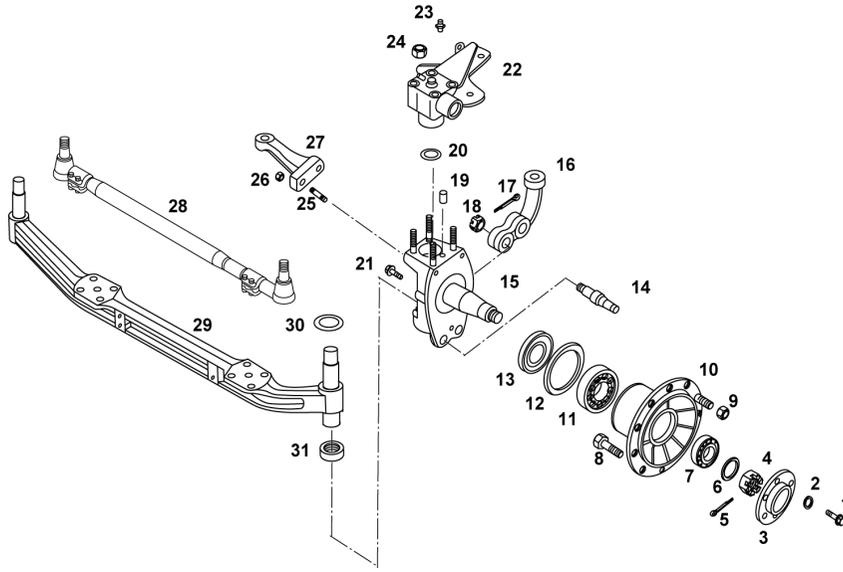
Then turn off the water outlet switch and screw tightly with hand.

Deal with the drained liquid according to the existing regulations.

Emit the air in the fuel system according to the following steps:

- Unscrew the bleeder screw of the fuel fine filter (or the screw 1 on the manual pump) and connect it to suitable pipe to discharge the rest of fuel to suitable container.
- Operate the manual fuel pump 2 until there is no air at all when the fuel flows from the bleeder screw.
- Screw up the bleeder screw again.
- Continue to operate the manual fuel pump until the oil pump can not be pumped.
- Start the engine and make the engine idling for several minutes in order to remove any residual air.

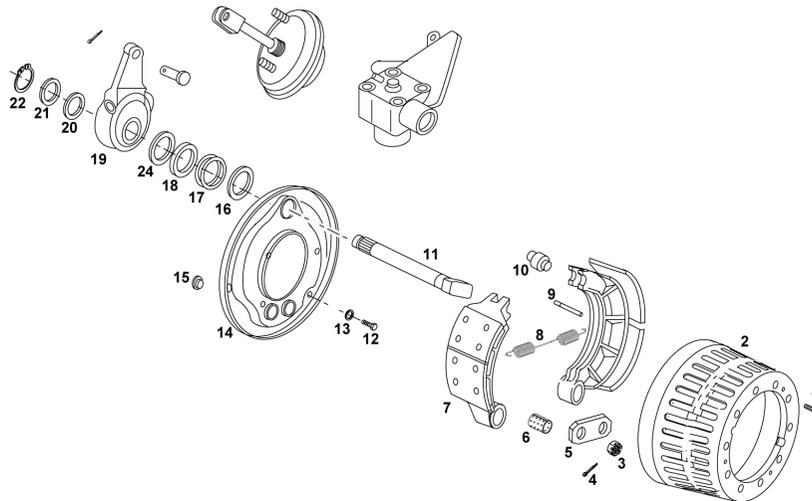




Steering driven axle

A Structure

1. Hexagon bolt 2. Spring washer 3. Cover 4. Hexagon slotted nut 5. Cotter pin 6. Shim 7. Single-row tapered roller bearing 8. Wheel bolt 9. Wheel nut 10. Front wheel drum assembly 11. Single-row tapered roller bearing 12. Sealing ring 13. Distance ring 14. Brake shoe anchor 15. Steering knuckle assembly 16. Steering tie rod arm 17. Cotter pin 18. Hexagon slotted flat nut 19. Column pin 20. O-ring 21. Adjusting screw 22. Support assembly 23. Metric taper thread grease nipple 24. Self-locking nut 25. Stud 26. Self-locking nut 27. Steering knuckle arm 28. Steering tie rod 29. Front axle subassembly 30. Adjusting shim 31. Damping bearing



1. Cross recessed countersunk head screw 2. Brake drum 3. Hexagon slotted flat nut 4. Cotter pin 5. Spacing board 6. Bush 7. Brake shoe assembly 8. Return spring 9. Return spring pin 10. Idler wheel 11. Brake camshaft 12. Hexagon bolt 13. Spring washer 14. Dust cover assembly 15. Sealing ring 16. Additional shim 17. O-ring 18. Spacer bush 19. Clearance adjustment arm 20. Washer 21. Adjusting shim 22. Spring collar for axis

B Maintenance

Daily maintenance: Check the nut operating condition for the steering rod, the tightening degree of tire nut, the leakage at the oil seal place, etc.

First-class maintenance: Check the thickness of the brake shoe

Breaking-in and second-class maintenance: Check the hub bearing tightness and lubricating grease and each movement clearance.

For adjustment of the steering stop screw, after the adjustment, the wheel steering angle inside / outside ($40/32^{\circ}$)

End of the adjustment

Toe-in of front wheel will make the toe-in value (B-A) through the tie rod length keep at:

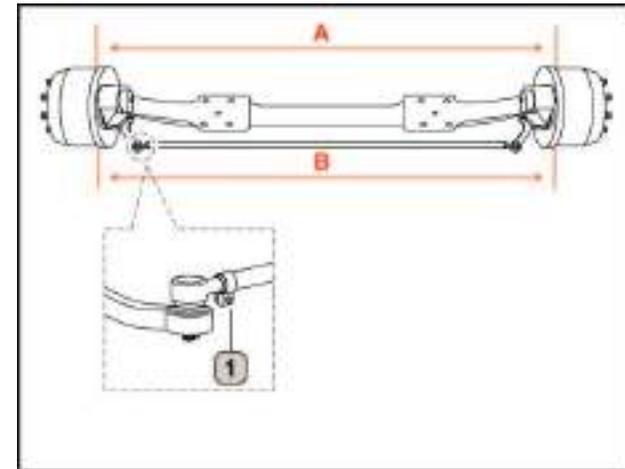
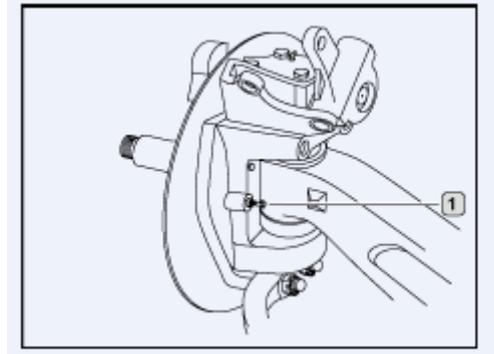
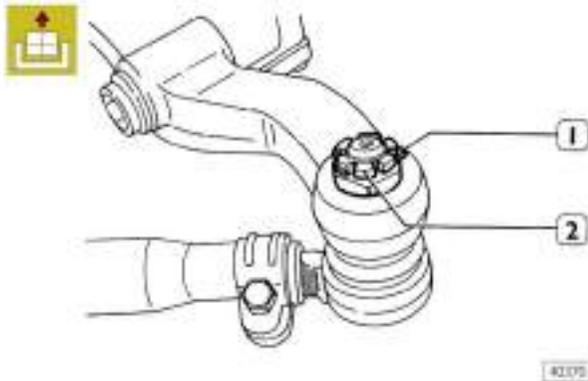
Bias tire: 2-4mm

Radial tire: 0-2 mm

Check whether the ball head nut for the tie rod is loose and whether the cotter pin locking is normal

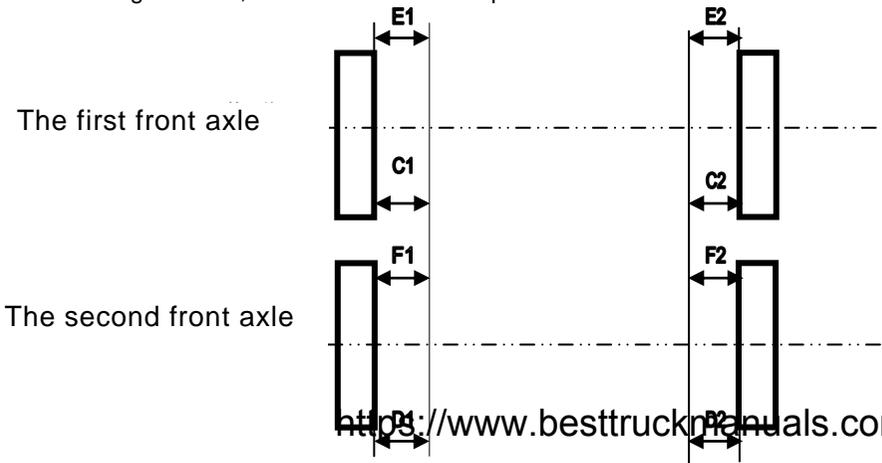
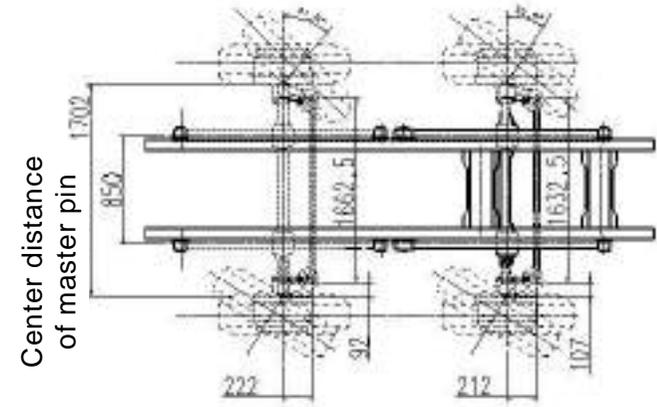
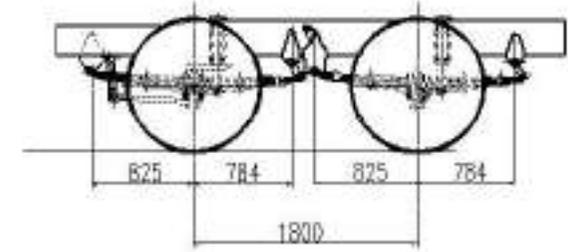
Check whether the left and right steering knuckle arm nut is loose, and whether the cotter pin falls off

Inspection of the friction plate thickness: Block the observation hole for removal of the brake dust cover and check the friction plate thickness at the most serious wear place. The minimum thickness shall not be less than 6.7mm, namely a distance of 0.5mm to the rivet head, otherwise replace the friction plate.

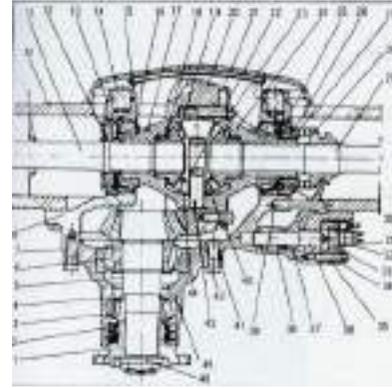
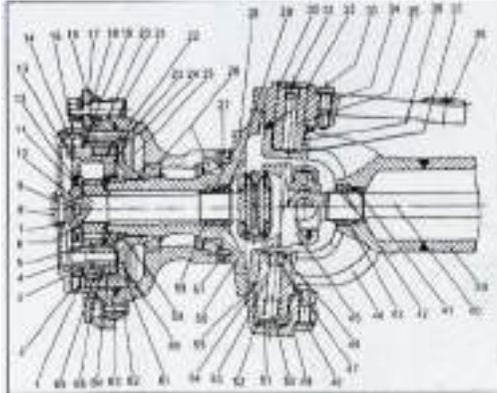


Requirements on adjustment of the double-front axle toe-in:

1. Firstly park the vehicle perfectly straight on the flat road according to the traveling direction.
 2. Check and ensure there is no clearance between steel plate spring and leaf spring ear-hinge base to guarantee the consistent distance between plate spring and frame on all sides.
 3. Measure the axle parameter according to the drawing. Main measurement parameter includes the tie rod length, the steering knuckle arm length, the measurement on whether the stop screw stops in advance in horizontal rotation (Pay attention to different parameter of the first axle and the second axle!) and the measurement on toe-in on the inside rim outer edge at the wheel center height. The bias tire is 2mm-4mm.
 4. Turn the steering wheel to make the mark on the steering gear input spline shaft in alignment with the mark on the steering gear shell. Measure the distance from the first front axle left, right rim to the plate spring. See E1, E2 and C1, C2 in Figure II, the difference between E1, E2 and C1, C2 is ± 3 , make the first front axle in the linear position. At this time, screw up the steering wheel screw and the first axle steering drag link.
 5. Ensure to connect the second axle steering drag link when the distance from the first front axle left, right rim to the plate spring is equal.
 6. When connecting the steering drag link, pay attention to slotted nut, if its opening is not in alignment with the cotter pin assembly hole after being screwed up, continue to screw up the nut without any looseness, finally install the cotter pin in the each fixed bolt and lock it.
- When connecting each bolt, pay attention to screwing up without any looseness and comply with the corresponding bolt tightening torque.
7. In case of inconsistency between each parameter, follow the principle of bilateral symmetry and ensuring the first, the second axle tire parallel.



Steering drive axle
A Structure



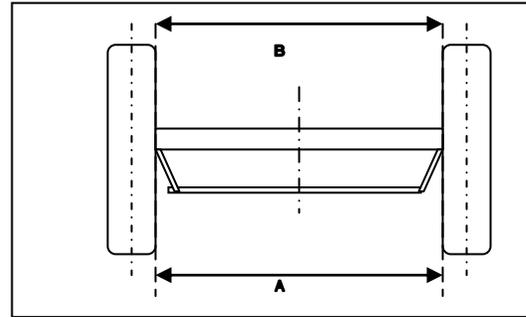
B Maintenance

Daily maintenance: Check the nut operating condition for the steering rod, the tightening degree of tire nut, the leakage at the oil seal place, etc.

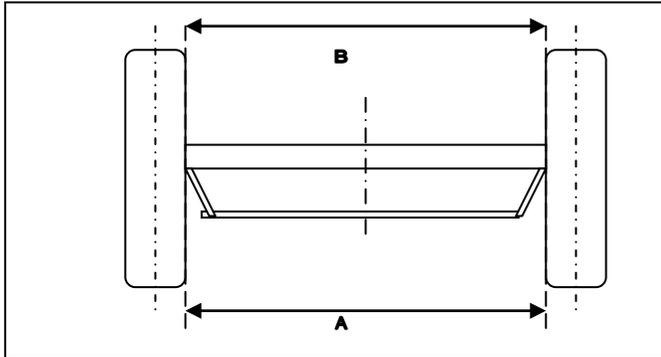
First-class maintenance: Check the thickness of the brake shoe

Breaking-in and second-class maintenance: Check the hub bearing tightness and lubricating oil volume, operating condition and each movement clearance.

For adjustment of the steering stop screw, after the adjustment, the wheel steering angle inside / outside ($40/32^{\circ}$)



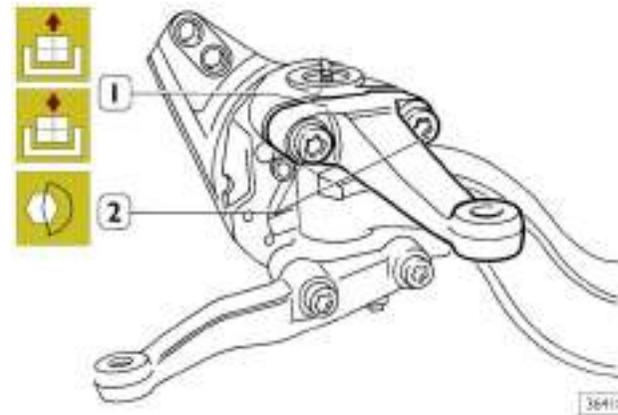
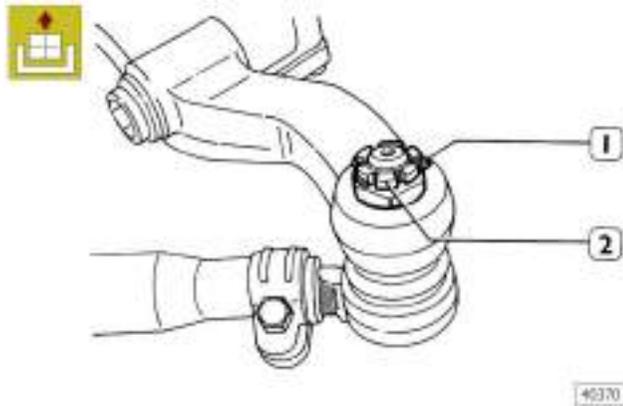
After end of the adjustment, toe-in of front wheel will make the toe-in value through the tie rod length keep at:
Bias tire: 0-5mm



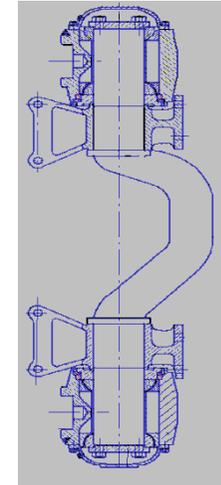
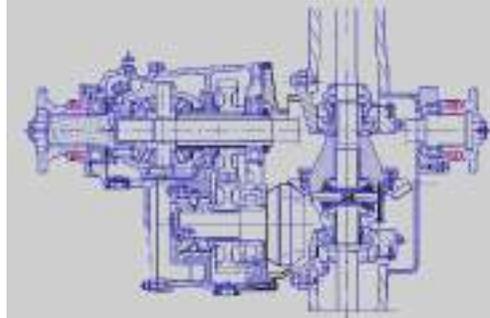
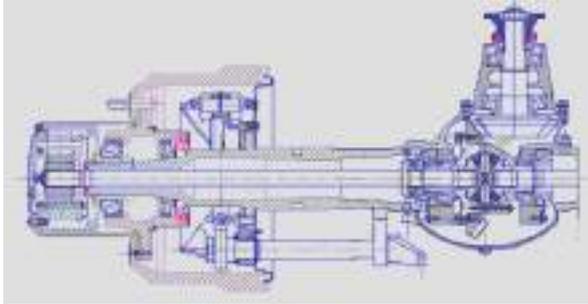
Radial tire: 0-2 mm

Check whether the ball head nut for the tie rod is loose and whether the cotter pin locking is normal

Check whether the left and right steering knuckle arm nut is loose, and whether the cotter pin falls off



Drive axle



Drive axle
balancing device

The drive axle is a two-stage reduction axle with the central level I reduction and the wheel edge planetary reduction.

Pay attention to the following aspects for use and maintenance of the drive axle:

1. Keep the lubricating oil volume; regularly check the oil volume for hub reduction gear and axle main reducer in the use process.

① Oil shortage may cause early wear of the moving parts, and serious shortage may cause ablation. However, too much lubricating oil is also not recommended, because excessive lubricating oil may cause high temperature and even oil leakage.

② When the new vehicle is conducted with initial maintenance and replacement of lubricating oil for the hub reduction gear, turn the wheel to the bottom of the oil screw plug when filling the new oil as specified, and when the oil filling plug is at the other half upper position, turn on the oil drain plug and drain the old oil, next install the oil drain plug, turn on the oil filling plug and fill the lubricating oil to level of this height, then screw in the oil filling plug. Turn the wheel repeatedly for several circles, then place the wheel on the highest position of the oil drain plug and the half position of the oil filling plug, and turn on the oil filling plug to make the excessive lubricating oil flow out until the liquid level at the oil filling plug position, finally install the oil filling plug properly.

③ The middle section for the intermediate rear axle has two screw plugs: Namely an oil drain plug at the gear package bottom and an oil filling at nearly half position of the gear package. The normal liquid level shall be always kept at the height of the oil filling plug.

④ The pass axle box of the intermediate axle has two oil drain plugs and oil filling plugs.

⑤ The main reducer for rear axle and the hub reduction gear shall adopt the gear oil with API GL-5 grade and viscosity grade of SAE85W/90.

⑥ The oil draining period for gear oil of the drive rear axle is 50,000km or one year. The gear oil shall be replaced for forced maintenance of the first 2,000-3,000km.

2. Correct use of the differential lock

The differential lock between wheels for the rear drive axle is to make the left and right wheel automatically differential so as to avoid the tire wear and the machine damage.

When the unilateral wheel of car travels on smooth or muddy road, causing slipping and failure to pull out the car, close the differential lock. At this time, the left and right axle shaft becomes the rigid coupling shaft, so the car will automatically travel out of the failure road.

3. Maintenance

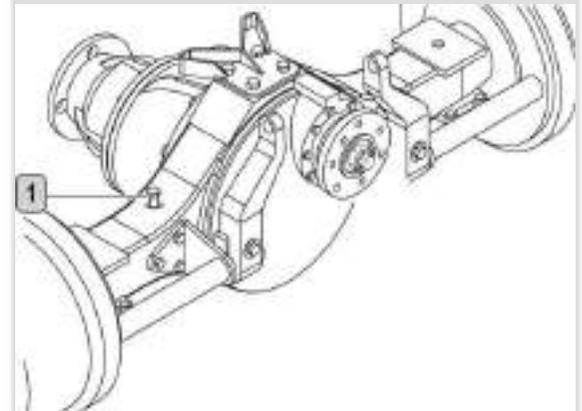
3.1. For 3,000km (forced maintenance) of the new vehicle, check the hub bearing clearance. If the clearance is oversized, adjust again, and check the hub nut tightness. If the nut is loose or the locking block for the locking plate fractures or occurs crack, replace the parts and reassemble (the locking plate shall be locked together with the inside and outside nut).

3.2. For every traveling of 10,000km, remove and check the hub bearing, the nut tightness and the locking status of the locking plate. In case of the parts wear or damage, replace it with new parts and reassemble.

Maintenance for the axle hub bearing

4. Cleaning of the ventilation plug

Clean the ventilation plug for every traveling of 10,000km.



Steering system

The steering operation system is composed of steering wheel, steering shaft, cardan joint and steering column assembly.

For the double-front axle, adopt the wheel alignment tester to make each front axle in the straight driving position, and adjust the toe-in to make the size between each axle wheel tire and frame basically consistent, then readjust the steering drag link.

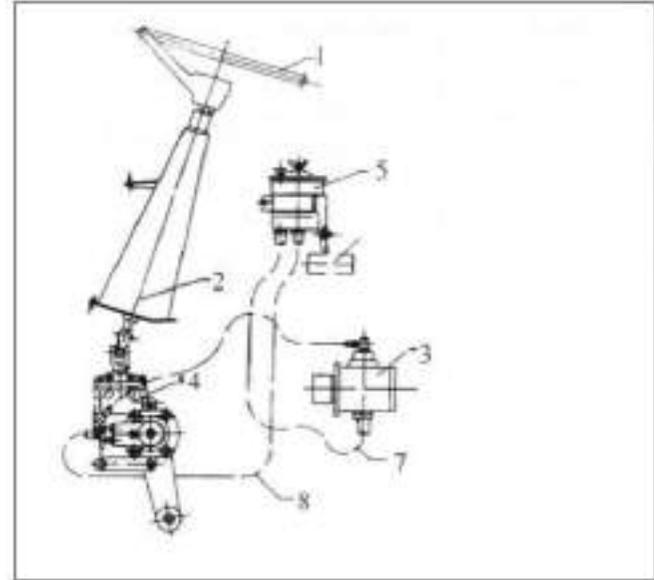
Maintenance

A Check the oil level of the steering oil tank. Firstly clean the oil tank and its surrounding to prevent the dirt entering. Pay attention to the scale on the oil gauge when checking. The oil level when the engine is operating shall be consistent with the oil gauge. When the engine is not operating, the oil level shall be slightly higher.

B Regularly (traveling for 5,000-6,000km or operating for 100-200 hours) check the oil level in the steering oil tank and timely fill the oil for supplement when the oil is lower than lower indication of the oil gauge. Immediately check the oil volume in case of leakage.

C: Oil filling, replacement and exhaust of the steering system

1. Regularly (traveling for 5,000-6,000km) check the oil level of the steering oil tank.
2. Timely fill the oil for supplement when the oil level is lower than lower marking of the oil gauge.
3. The oil adopted shall not only comply with requirements, but also shall be filtered through oil filter or copper wire filter screen. Prohibit using the cotton fabric filter or the fabric filter.
4. Exhaust air after the oil supplement and replacement, with the specific steps as follows:
 - ① Jack up the front axle;
 - ② Open the steering oil tank cap and fill the oil until 1-2cm higher than the upper marking of the oil gauge;
 - ③ Then start the engine for several times within a short time to make the whole hydraulic system filled with oil.



- ④ At this time, the oil level of the steering oil tank drops quickly, therefore during the engine operating process, continually fill the oil to the upper marking of the oil gauge and make sure to avoid the steering oil pump inhaling air.
- ⑤ Therefore, special attention shall be given in the above process not to inhale empty of the steering oil tank, because this may make new bubbles enter the steering system.
- ⑥ In addition, attention shall be given in the oil filling or air exhaust that the steering oil pump shall be operated at the lowest speed (speed of the steering oil pump when the engine is under idling), otherwise the oil flow is too large, then small bubbles may enter the oil pump again and break up into tiny bubbles when passing through the steering oil pump. These bubbles may produce foam and delay the air exhaust process.
- ⑦ Fill the oil until the oil level in the steering oil pump is kept at the upper marking of the oil gauge when the engine is operating.
- ⑧ Later, under the condition of the engine's operating and no obstruction, turn the steering wheel from one extreme position to another extreme position for several times (the residence time at the extreme position shall not exceed 5 seconds), thus to exhaust the air from the steering gear. Pay attention to the oil level in this process. If the oil level still drops, immediately fill the oil for supplement until the oil level remains still at the upper marking of the oil gauge, and until the oil in the steering oil tank does not bubble when turning the steering wheel, which is the mark for the whole hydraulic system to be filled with oil.
- ⑨ Finally, shut down the engine. The oil level in the steering oil tank at this time is allowed to be at most 1-2cm higher than the oil gauge upper marking. If exceeding this value, it indicates there is air mixed in the oil. Then check whether the oil seal and inlet nipple for the steering pump input shaft are mixed with air.

Braking system

1 Structure: The braking system has three sets of braking devices: travel braking (foot braking), stopping braking (hand braking) and auxiliary braking (engine exhaust braking). The tractor has also the trailer braking.

2 Travel braking

With pedal control, double circuit pneumatic braking, the operating pressure is 0.75Mpa. The first circuit acts on the rear drive axle, while the second circuit acts on the front axle. When the pressure of one air cylinder of the two circuits drops to less than 0.55Mpa, the air pressure indicator lamp of instrument board will be lit. The car shall be stopped immediately to find out the reason of pressure leakage. Consecutive and repeated overall braking within a short period may also lead to pressure drop below 0.55Mpa.

3 Stopping braking

The stopping braking can be concurrently adopted as emergency and parking braking. It works through the spring energy storage brake chamber on the rear drive axle. The stopping braking can be realized with the operation of the hand brake valve handle. In case of failure of the braking system, the emergency braking may be realized automatically relying on the drive of energy storage spring.

Only when the pressure of braking system is higher than 0.55Mpa, and the hand braking lamp goes out, the spring braking may be completely removed.

Hand braking removal: Pull down the handle; meanwhile, the indicator lamp on the instrument board will go out.

Attention: When the vehicle stops, the hand braking shall be pulled up;

Before the starting of engine, the handle of the hand brake valve shall be put in the braking position, otherwise the original stopping braking function may be removed after the rise of braking system pressure.

4 Auxiliary braking

This device shares the same set of device with the shut-down switch. The shut-down switch may be divided into foot push button switch type and combination switch type according to different cab types. When using, turn on the switch to make the engine shut down. The vehicle traveling at this time may adopt the engine energy as the auxiliary braking.

Attention

When adopting the auxiliary braking to slow down the vehicle, conduct the clutch engagement and set the transmission at the corresponding gear, otherwise the engine shut-down may cause accident.

If you are unfamiliar with the relationship of vehicle speed, engine speed and slope, do not use the exhaust brake, otherwise property damage or personal injury may be caused, such as out of control of the vehicle and accidents occurrence, etc.

5 Maintenance of braking line

Abide by the following regulations when welding, cutting or drilling near the braking plastic pipe:

1. Firstly exhaust the compressed air in the pipe;
2. Cover the pipe line to avoid damage from spark / flame and scorching hot swarf;
3. The maximum temperature allowed of the stress-free pipe is 130°C, and the time of duration is 5 minutes.

Warning:

Firstly disconnect the battery power and unplug the electrical connector clip connected with the electronic components (master control, drive, instrument and ECU of ABS).

4. The minimum thickness of brake shoe lining shall not be less than 6.7mm.

Inspection of the friction plate: Block the observation hole for removal of the brake dust cover and check the friction plate thickness at the most serious wear place. The minimum thickness shall not be less than 6.7mm, namely a distance of 0.5mm to the rivet head, otherwise replace the friction plate.

Transmission use maintenance

Correct and reasonable operation of the transmission and regular maintenance to the transmission are very important to ensure the safe and reliable traveling of cars and the service life extension of the transmission. Please follow the following operating requirements:

1. Grade of lubricating oil: Refer to the regular maintenance. Standard oil volume: Refer to the regular maintenance.
2. Operating temperature: The temperature of the transmission shall not be higher than 120°C during the continuous operating period. When the temperature exceeds 120°C, the lubricating oil will be decomposed and the service life of the transmission will be shortened.
3. Oil replacement period: Refer to the regular maintenance
4. Operating slant angle: When the operating slant angle of the transmission exceeds 12°, the lubrication may be insufficient. The operating slant angle shall be the sum of the established angle of the transmission on the chassis and the angle of slope. When it exceeds 12°, the transmission shall be installed with the lubrication pump or the cooling equipment to guarantee good lubrication.
5. Dragging or gliding: The dragging will lead to serious damage of the transmission. The same bad consequence will also happen when the transmission glides in neutral position. In order to avoid this damage, the vehicle dragging or sliding with the transmission in the neutral position is prohibited. When the vehicle needs dragging, the axle shaft may be pulled out or the drive shaft may be released; the driving wheel may also be separated from the ground for dragging.

The simple inspection stated in the following pages shall be executed for knowing the automobile better.

Inspect all kinds of items (for example: jack for locating, lighting, using the key provided so on) required for the correct tire replacement at the fixed interval;

These simple inspections shall check the best working condition of vehicle.

Warning:

In case of abnormal exhaust or engine noise, SIH service provider shall be contacted.

- Open the radiator grille of cab
- Before driving each time;
- One time each week;
- One time every six months;
- Cleaning and maintenance

Inspection Items of Driver

Inspection by driver

■ Before each driving

1. Check the engine fuel.
2. Check the cooling liquid of engine;
3. Check the cleaning liquid of windshield;
- 4 Check the fastening bolt of steering gear
5. Check the braking distance.
6. Check the free stroke of clutch.
7. Check the tire.
8. Check the filter of fuel and water;

■ One time each week

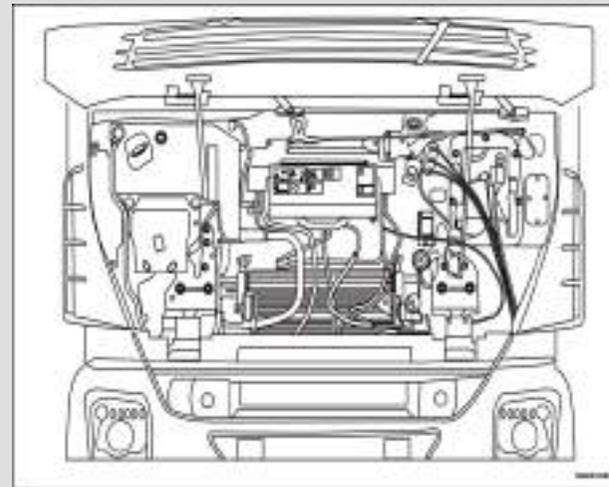
8. Check the air dryer
9. Check the battery accumulator
10. Check the tire
11. Check the steering liquid level
12. Check the clutch oil
13. Check the signal light of cab.
14. Check the gear liquid of transmission

■ One time each six months

15. Check the reservoir
16. Check the air filter

Open the radiator grille of cab

- Uplift and open the radiator grille of cab.



Before each driving

Check by the dashboard display

1. Check the amount of engine fuel
(Check after engine cooling or flameout for 30min at least)

Check if any fault signal in the display.

Inspection items by driver

**Warning****Fire danger:**

Buckle up the oil filling port after completing filling to avoid the fuel leakage resulting in danger during the driving

In case of the fault happening to the system, overturn the cab and check the oil level of engine by the dipstick; park the vehicle in the horizontal road, check the oil level of engine between the upper and lower scales. Refuel in case of lower than the lower scale.

Select the winter lubricant in case of the temperature lower than 5°C.

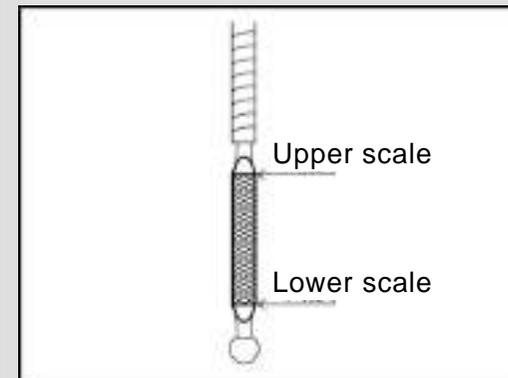
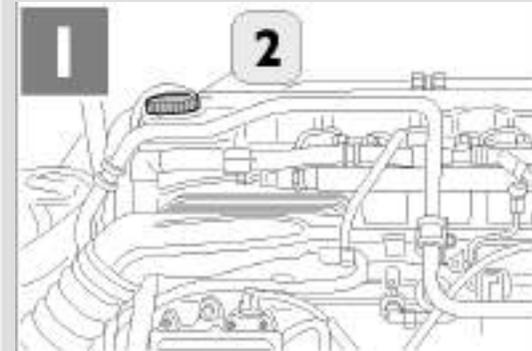
Attention:

Prohibit mixing the lubricants of different brands during refueling the engine oil.

The oil level lower than the lower scale to result in the engine damage;

The oil level higher than the upper level to result in the oil consumption and environment pollution;

When the oil level of engine is increased sharply without refueling, the vehicle shall be stopped immediately and the service station shall be contracted for disposal.

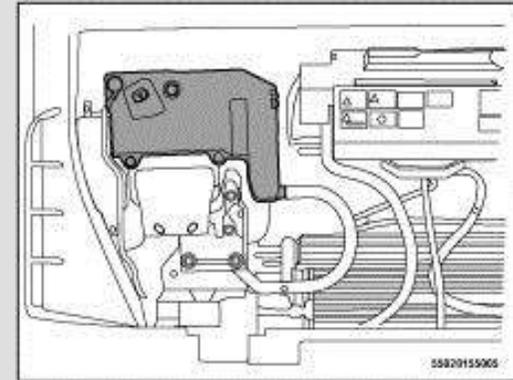


**Warning**

Before taking off the tank lid, flame out the engine and cool; or otherwise the hot water injected from the tank to cause scald.

2. Notes to replacement of anti-freezing solution:

- (1) Screw off the expansion tank lid; open the drain valve of tank and drain the anti-freezing solution.
- (2) Do clean the cooling system of vehicle during replacing the anti-freezing solution. If necessary, use the purified water for cleaning.
- (3) Open the lid of storage tank, refuel the anti-freezing solution to fill up the tank and reach the scale of FULL or MAX. Do not exceed the scale of FULL or MAX (see the details in the relevant regulations of vehicle repair and maintenance).
- (4) Cover the lid and tighten up.
- (5) Start up the engine with the idle running about 2~3min and turn on the lid of storage tank. At the moment, the level of anti-freezing solution will decrease because of the cooling system draining off the partial air. And then, refuel the anti-freezing solution to fill up the water tank.
- (6) Cover the tank lid and tighten up.
- (7) Prohibit opening the tank lid or drain valve in the condition of high temperature of anti-freezing solution to avoid the scald.
- (8) Do use the anti-freezing solution designated by the original automobile manufacturer during the anti-freezing solution being replace (it is tested the bad anti-freezing solution will result in the corrosion of heat radiating pipe of heat radiator about 20hr);
- (9) Do clean the cooling system of vehicle during replacing the anti-freezing solution. If necessary, use the purified water for cleaning.
- (10) Prohibit mixing the anti-freezing solutions of different brands; or otherwise, the mixture of two kinds of anti-freezing solutions will be reacted with each other. Meanwhile, the corrosion will happen to the aluminum part of whole cooling system of engine and heat radiator.
- (11) Do not add the tap water because of CL in the tap water corroding the heat radiator.
- (12) The bad anti-freezing solution will corrode the aluminum part of whole cooling system (such as the aluminum blade of water pump, lid of aluminum cylinder of engine and so on) due to the too thin wall thickness of water tube of heat radiator. Therefore, the corrosion and leakage of heat radiator shall be marked, namely in the heat radiator. Reaffirm to change the anti-freezing solution designated by the main engine plant.

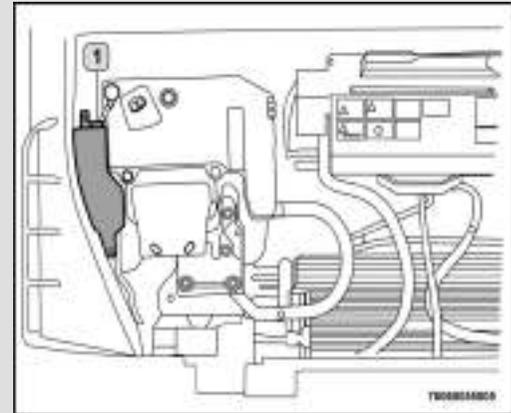


Check the level of cooling liquid
 Refuel the cooling liquid to the scale between the upper and lower limit of expansion tank. Do refuel through the filling port only.

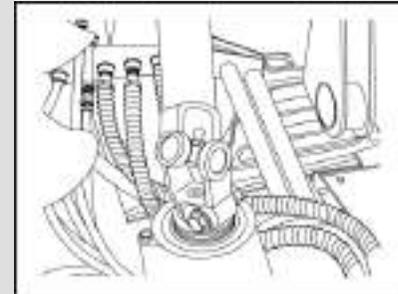
**Warning**

Prevent the cleaning solution of windscreen from being sprayed in the engine during the high temperature of engine because of some liquid additive having the flammability.

3. Check the level in the water tank of windscreen cleanser; meanwhile, check if the nozzle is blocked. If necessary, use the needle to clean the nozzle.



4. Check if the fastening bolt of steering mechanism is tightened or not;



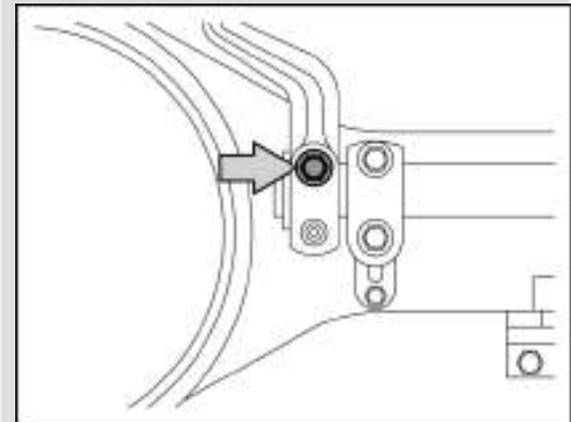
5. Check the braking distance (manual adjustment of brake arm)
 - (1) The free stroke at brake pedal: 10mm
 - (2) Check and adjust the distance of wheel brake (type of manual adjustment)

Park the automobile in the flat ground; block the front and rear wheels by the cleat and then execute the inspection and adjustment.

Rotate the brake arm of front wheel by the wrench in clockwise to adjust the screw and eliminate the gap between the brake shoe and the brake drum; finally loosen $1/3-1/4$ circles, namely 3-4 times;

Before adjusting the braking distance of rear wheel, check if the air pressure of whole vehicle is sufficient or not to keep the pressure more than $7.5 \times 10^5 \text{Pa}$; release the manual brake handle to check if normal operation of braking system or not; if the pipeline is wrong with air leakage and others; or otherwise, do adjustment after troubleshooting.

During adjustment, rotate the worm shaft of brake arm by the wrench in clockwise to disappear the distance between the brake shoe and brake drum, finally loosen $1/3-1/4$ circles, namely 3-4 times;

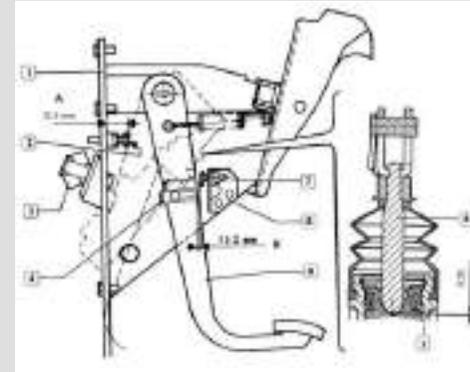


6. Check the free stroke of clutch pedal;
 The distance between the push rod of master cylinder and piston: 1mm;
 Check if the free stroke of clutch within the specific scope or not; and adjust in time in case of too large or too small.

Attention:

In case of the clutch without any free stroke, the clutch will be worn at the earlier stage.

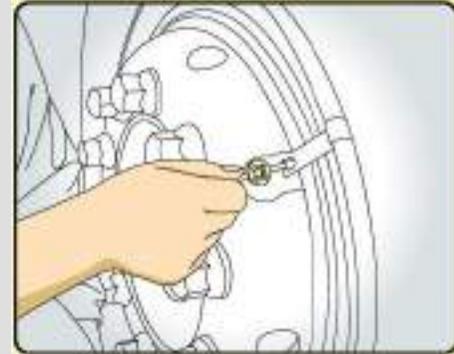
For the opposed-pulling clutch, the free stroke at the split bearing of clutch has been adjusted during the delivery and can be adjusted automatically during the usage course. **Only the free stroke at clutch pedal shall be checked.**



7. Check the tire

Check the tire pressure and the fastening condition of tire bolt;

All the pressures of tires shall be uniform and the tire shall be entrained with the air according to the nominal pressure to check if the tightening torque of tire bolt is reaching (550-600) N.m or not



8. Check the filter of fuel and oil

Check the filter of fuel and oil

Drain off the water and impurity in the filter bowl.

Check the fuel passage of engine:

Check the water in the fuel passage daily and drain off the water in the oil-water separator;

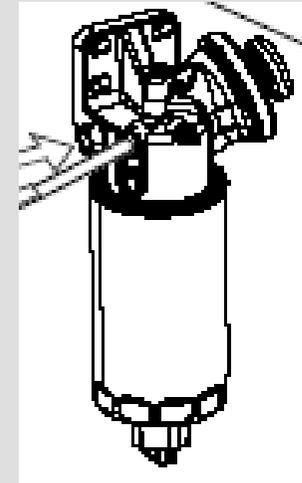
Drainage method:

- ① Rotate the drainage bolt in clockwise till the water drained being found;
- ② Observe the liquid drained till the fuel being appeared and then tighten the bolt by clockwise;

Attention: too much water contained in the fuel will result in the sever damage of fuel injector and high-pressure oil pump and the serious loss.

Attention:

Refuel the oil according to the ambient temperature to avoid the strain of spare part of engine oil system caused by the caused by freezing and emulsification.



To check:

The level of urea box; supplement in case of insufficiency (type of automobile conforming to European IV emission standard)

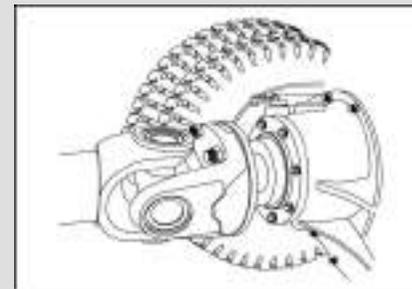
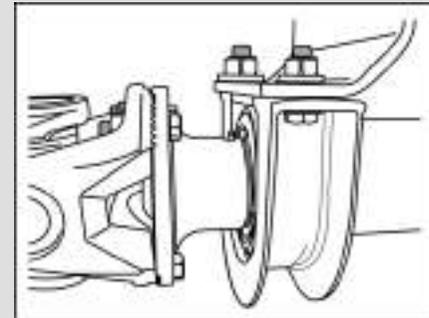
Check the connection condition of trailer (tractor)

Check the condition of lamp and signal indicator

Check if any leakage of each part of whole automobile.

Check the tightening condition of transmission shaft and central bearing and that of bolt of transmission shaft;

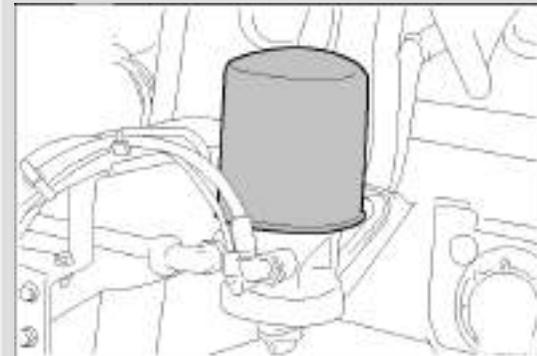
Check the tightening condition of nut of steering lever of front axle; if the ball nut of tie rod is loosen or not; if the cotter pin is locked normally or not;



Check one time each week**8. Check the air dryer**

Check the working condition of air dryer through operating the drain valve in the air cylinder (with the built-in vent hole). In case of the air vented from the air cylinder is dry without water stain or oil stain, it means the well performance of air dryer. In case of little moisture observed, check for several times in the short time to confirm this case resulting from the temporary overload of dryer or the malfunction.

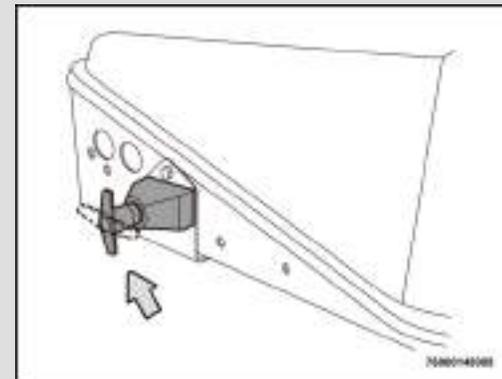
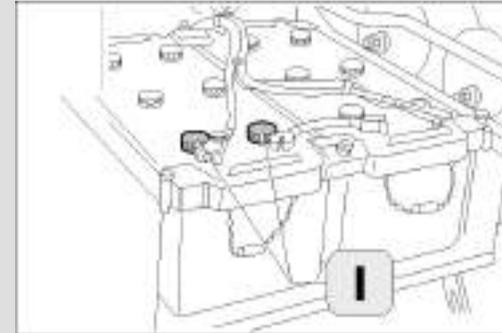
In case of the 1st reason is confirmed, the moisture will be disappeared as long as the pressure governor valve is active. Or otherwise, the new filter cement of air dryer must be replaced due to the pollution of oil containment. Thus, the water-vapor absorption capability of filter element has been decreased greatly.



9. Check the liquid level in electrolyte in the accumulator. In case of insufficient, refuel, namely filling the distilled water during the accumulator in cold state into port 1.

Main switch of accumulator

Attention: when the vehicle is out of use more than one week, the main switch of accumulator shall be disconnected and the grounding cable of negative pole of accumulator shall be disassembled.



10. Check the wearing condition of tire

If the pressure is too low, the outer side of tire surface will be worn. Or, in case of too high, the central part of tire surface will be worn easily. When the front tire is to be found be worn abnormally (no matter the inner side or the outer side), the toe-in of front wheel shall be inspected. The maximum load for each axle must be prohibited being exceeded.

In case of serious wearing, a pair of tires in one axle shall be replaced at best.

All the tires shall be of the indicating mark of wearing. When the indicating marks are satisfied by the tire, it shall be replaced compulsorily.



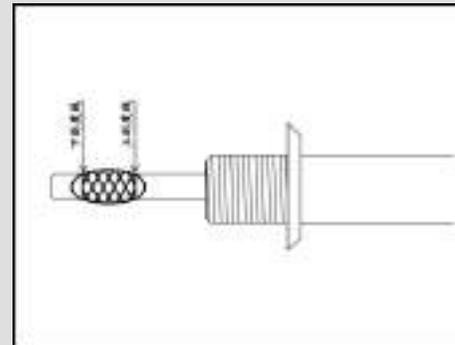
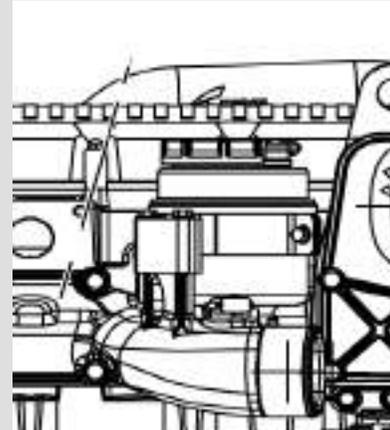
Inspection by driver

11. Check the level of steering fluid

Screw off the steering oil scale (pull off the sensitive piston) from the steering oil tank to check. The oil level must reach the scale in ruler during the engine operating and the tire in the straight-line driving position.

When the engine is in the outage state with the front wheel in the straight-line driving position, the oil level must be more than 1-2cm above the upper scale.

In case of insufficiency, do add.



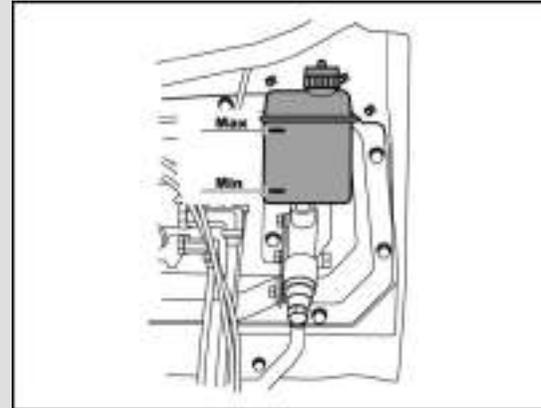
Inspection by driver



Warning

Avoid splashing the clutch fluid into the hand because of the fluid containing the poisonous and corrosive additives. In case of splashing to the hand, risen with the water and soft soap.

12. Check the level of oil tank of clutch
The fluid level of clutch between the upper and lower scales (as indicated in the Figure);



Inspection by driver

14. Check the transmission

① Check the oil level of transmission.

The fluid level of clutch in the lower plane of screw plug of oil plane (as indicated in the right Figure).

② Ventilation plug

Clean the ventilation plug at the fixed interval due to the ventilation plug in the seat of shift shaft; screw off the ventilation plug, and pump in the compressed air to smooth.

Check the level of transmission oil during the operation and the leakage condition at any time; please refuel in case of insufficiency.

③ Working temperature

The transmission temperature shall be no more than 120°C during the continuous operation. In case of the working temperature more than 120°C, the lubricant will be decomposed to reduce the transmission lifetime. It is prohibited working in the environment below -40°C. Or otherwise, the oil seal and other rubber seals will be damaged.

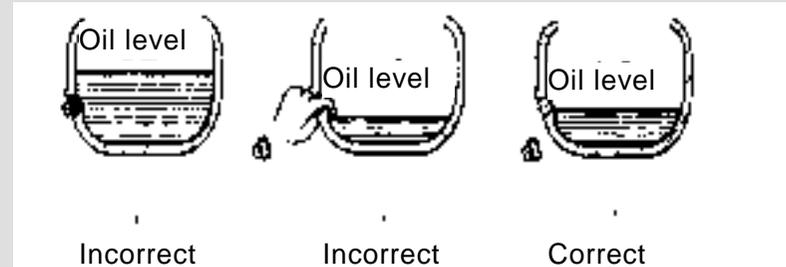
④ Working angle of inclination

The lubrication shall not be full when the working angle of inclination is more than 12°. So, the working angle of inclination shall be the angle of installation of transmission in chassis plus the slope angle. In case of more than 12°, the transmission shall be equipped with the lubricant pump or the cooling device to maintain the sound lubrication.

⑤ High and low-gear air circuits

Keep the normal regulating pressure of pressure reducing valve;

Maintain the cleanness of drain valve to ensure the operation of high and low-gears cylinders in place for the earlier wearing of high and low-gears synchronizers.



Continuous check

- The condition of connecting device of trailer (optional selection)
- The working conditions of master brake, parking brake and exhaust brake.
- The working conditions of light, warning indicators and windscreen wiper;
- Check if any oil leakage of transmission

Inspection

- If any crack, split and others in the connection to the tube of exhaust system;
- The cleaning condition of surface of heat radiator; and disassemble for cleaning if any necessary.

Inspection items by driver



Protect the eyes during the drainage to avoid splashing!

Check once each six months

Driver the blow-down valve of air tank and drain off the water stain (as indicated in the right Figure);

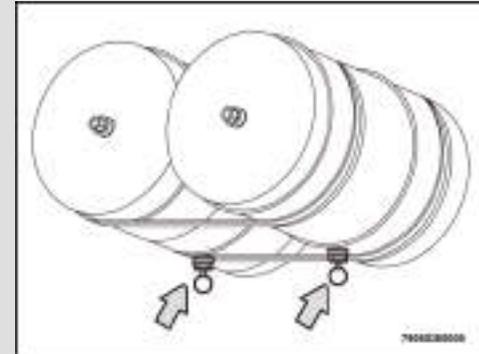
Usage condition

See the usage conditions of air tank of brake system (working pressure and temperature) in the nameplate of air cylinder. The application place must be applicable to these rules. During the operation, the air tank shall not bear any other pressures besides to the working pressure and own weight impacted normally. This air tank shall be used for the system of compressed air only.

Maintenance:

The maintenance shall be unnecessary to do in case of the following descriptions being followed:

- Do use the primer for coating;
- The surfaces of bolts and screw being treated with rust corrosion;
- Take care to avoid damaging the paint surface;
- Clean with the product containing none alcohol;
- Purge at the fixed interval;
- Profit heating and welding the tank body. In case of any dent, do replace at immediately;





In consideration of the detergent polluting the water source, the automobile must be cleaned in the area equipped with the

Warning collecting and handling device of detergent.

Maintenance and cleaning of automobile

Used the neutral detergent and water to clean the automobile at the fixed interval.

The cleaning interval shall be confirmed by considering the following factors:

- Serious environment pollution
- Run in the road being sprayed with the ice-removal salt.
- Park under the tree producing the resin material.
- Do not use the brush, or hard fiber or dirty clothes to clean the automobile to avoid the deep scratch resulting in the gloss lost.
- Clean carefully after rinse to eliminate the water spot totally;
- Do not clean after the automobile exposed to the sun for the long time; or otherwise.
- Do not drive the automobile into the sealed environment at once; park the automobile out door and vapor the water in the automobile.



Clean the plastics part

Clean the externally plastic part as per the step same as that for the automobile;

In case of the dirt failing to be cleaned, recommend the specific product for cleaning according to the specification provided by the manufacturer;

Moreover, this kind of product shall be used for cleaning the plastic part within the cab (dashboard, car door and others) rather than using the paint or the product containing the aromatic solvent, methanol or hydro carbon.

Clean the car window

Use the specific product, and clean wiping rag to avoid scratching the glass or change the glass transparency.

Clean the plastic sunvisor

Only the soft soap and water can be used for cleaning. In case of the stubborn dirt failing to be cleaned (such as the resin substance), brush with the edible oil and rinse with the soft soap and water. Do not wipe the sunvisor with the dry wiper to avoid scratching or damaging the surface.

Warning:

Do not use the product containing the following substances to clean the sunvisor, for example the denatured alcohol containing the aromatic solvent, esters ketone, methanol, and hydrocarbon. The reason is those shall be able to change the plastic nature and cause the tiny crack that may result in the further crack of sunvisor.



Clean the interior and fabric

The seat and cloth case can be cleaned with the soft brush. For example, using the dry bubble plastic and solvent for the totally cleaning. Be careful to use these products. The reasons are they are the inflammables containing the volatile gas. Therefore, the cab shall be ventilated till the totally drying. The chlorinated solvent containing the trichloro ethylene or the chloridate shall be avoided absolutely. Because it will damage the dashboard and/or the electronic parts under the seat. Thus, the preventive measures shall be taken to protect the normal operation of these parts.

Clean engine

The job shall be done by the specific shop. So, the engine cleaning shall be executed after the engine cooling.

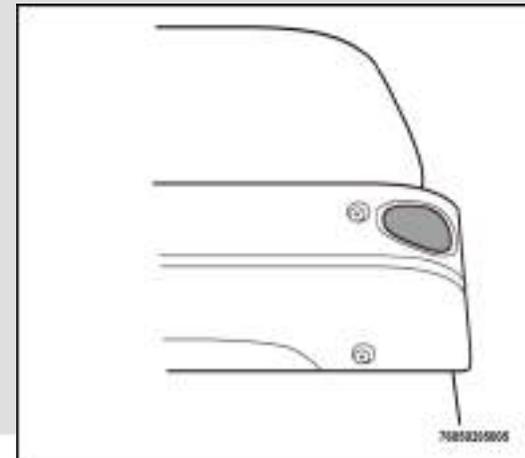
The engine shall be cleaned carefully to avoid the possible damage of electronic parts.

Decoration of plastic sunvisor

The paint or picture, tag, and sticker shall be used for decorating the sunvisor by observing the following conditions:

- Allow using the bi-component paint (polyurethane) suitable to the plastic sunvisor for coating;
- Do not paste the picture, tag, sticker or the similar objects made of PVC (polyvinyl chloride); recommend using the specific product suitable to the polyester polyvinyl or polymethyl methacrylate.

Warning: the sunvisor plastic will be deformed and cracked if the condition stated



Wiper and cleanser of windscreen

Check the wiper arm of windscreen; in case of being worn or dirty, the visibility will be worn greatly.

Clean the car door at the fixed interval to clear off the grease, dirt and tar.

Before starting up the windscreen wiper, clear off the snow or ice. In case of outdoor temperature below zero, keep the ice to prevent the rubber part from being frozen and adhered to the car door before starting up the windscreen wiper. Or otherwise, the anti-freezing product shall be used. In the dry car door, the windscreen wiper shall not be used. In case of the rubber wiper being deformed or worn, the wiper arm shall be replaced.

The injector of windscreen wiper shall be able to maintain the fluid with abundant transmission and correct injection direction. In case of the injector out of operation, the fluid supply circuit shall be checked to be block or not. If necessary, the pin shall be used for cleaning the outlet hole.

Clean the display

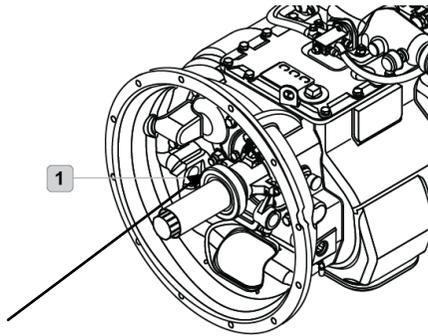
Handle the display carefully.

The sharp object will scratch or damage the display.

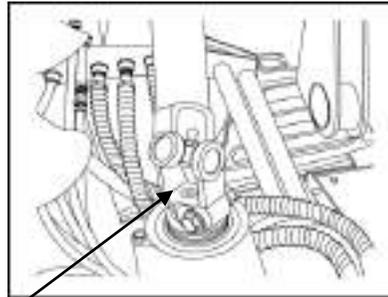
Use the clean and dry soft wiper to clean the display.

Do not use the solvent to clean because of the solvent possible to corrode and damage the display.

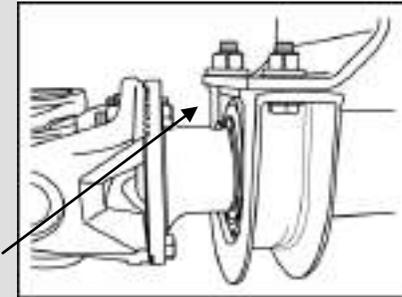
Lubricate the release bearing of clutch



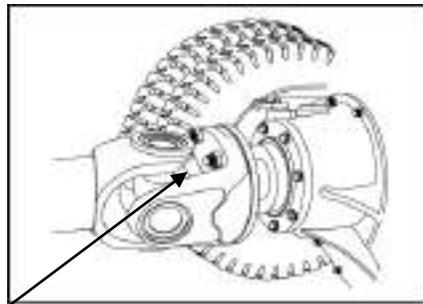
Lubricate the steering universal joint



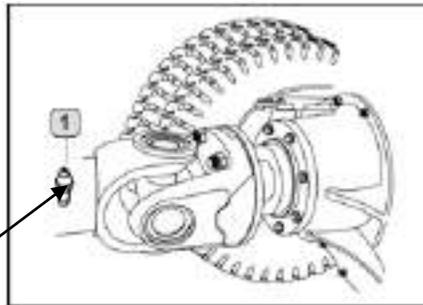
Lubricate the center bearing of transmission shaft



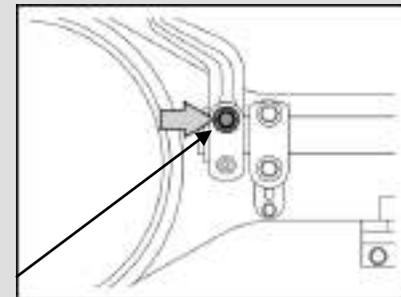
Lubricate the steering universal joint of transmission shaft



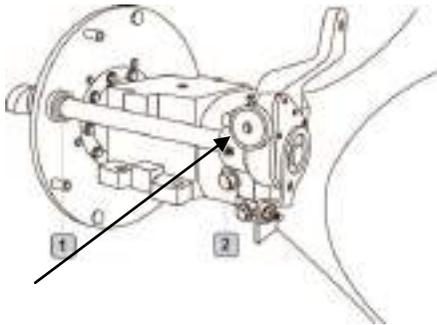
Lubricate the spline of transmission shaft



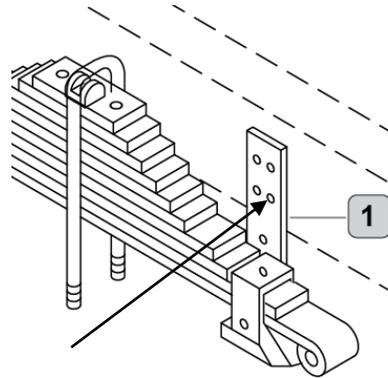
Lubricate the adjusting arm of front, intermediate and rear braking distances and the seat of brake camshaft



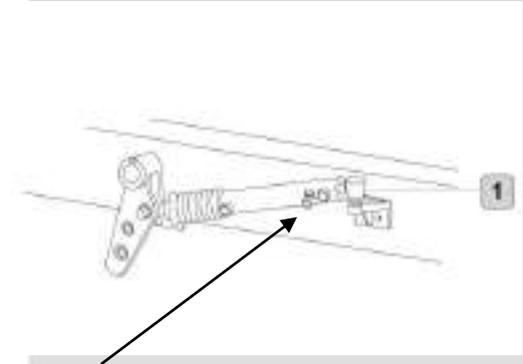
Lubricate the seat of camshaft of brake barrier



Lubricate the side spacing board of balance shaft



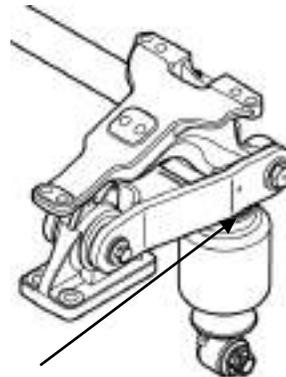
Ball heads at both ends of steering actuation cylinder



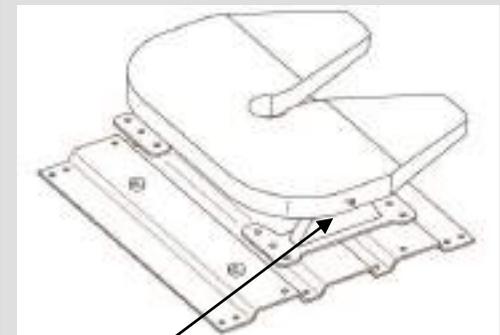
Lubricate the pins of leaf spring and rocker arm



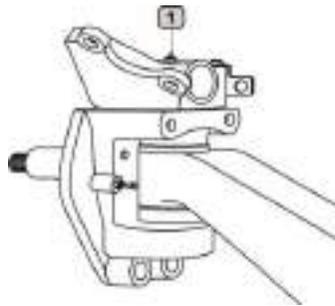
Lubricate the front suspension mechanism of cab



Lubricate the saddle

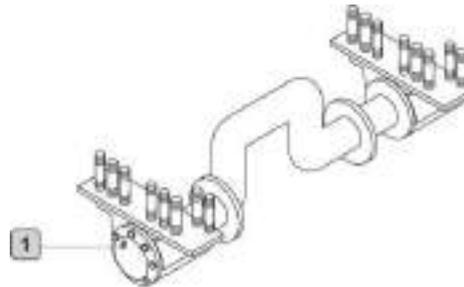


Lubricate the kingpin



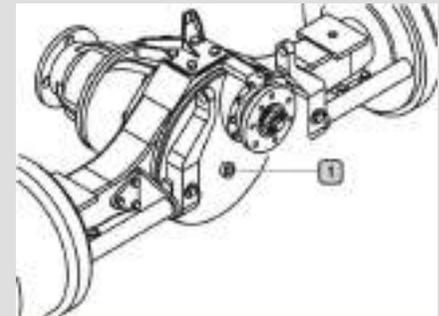
Refuel

Balance shaft



Refuel

Oil levels of intermediate section of front, intermediate and rear drive axles

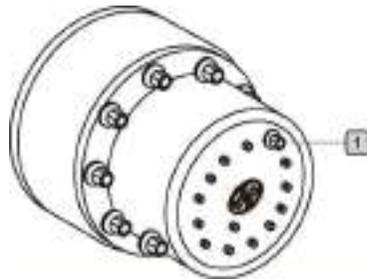


Refuel

Refuel

Refuel

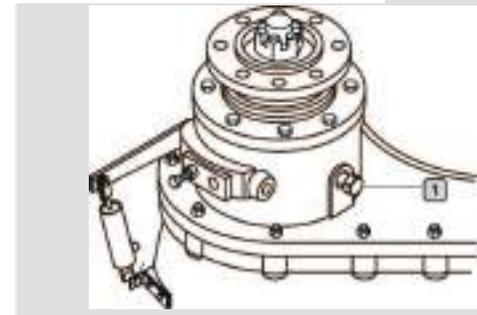
Hub reduction gear



Jack cylinder of cab



Oil level of cross-axle reduction gearbox of intermediate axle



Periodic maintenance: maintain the best operation performance of automobile and extend the lifetime of automobile;

- Fundamental concept of periodic maintenance
- Maintenance schedule
- Plan of service period
- Operation of maintenance planned
- General plan of maintenance and lubrication

Periodic maintenance

Periodic maintenance

In order to maintain the performance of automobile in the best status, the relevant recommendations stated in the following several pages for the inspection and adjustment;

Concept of periodic maintenance

The periodic maintenance shall be the best way to keep the safe operation and reduce the automobile maintenance cost;

The periodic maintenance within the warranty period shall be deemed as the compulsory. The violation against the regulations shall be the automatic waiver of automobile warranty.

The operation of repair and maintenance must be done by the authorized servicer as per the period of scheduled mileage and shall come into effective after the authorized servicer reaching the operation, affixing with the seal and signing at the place designated by the *Instruction of Warranty, Compulsory and Regular Maintenances*.

Advices:

The mileage for maintenance of engine shall be determined in case of the sulfur content in the fuel less than 0.5%.

Attention: if the sulfur content in the fuel is more than 0.5%, the mileage distance for the replacement of engine fuel shall be reduced correspondingly.

Maintenance plan

M: the standard maintenance operation to be done as per the period of normal mileage having the correlation.

EP: the additional maintenance operation as the supplementation for the standard service rather than execution as per the period of normal mileage having the correlation.

T: the timed maintenance operation as the special operation executed in the normal period inconformity with the specific season;

In order to minimize the parking time during the maintenance operation, the time schedule shall be done for the additional maintenance operation according to the annually average mileage to keep the conformity with the mileage period as much as possible.

Attention:

- In case of the low-grade engine fuel, reduce the replacement interval of engine fuel and filter correspondingly;
 - Do replace the engine fuel and filter once each year even few running mileages each year;
 - Do replace the gear oil of gearbox and axle once each two years.
 - Do replace the lubricating grease once each year even few running mileages each year;
 - As for the filter of air conditioner, do replace the filter at the beginning of the spring each year in case of the short-distance transportation;
 - Use the specific anti-freezing solution for the aluminum water tank; wherein the anti-freezing solution specific for the copper water tank shall be inapplicable to the aluminum water tank while the one for the aluminum water tank shall be applicable to the copper water tank.
 - It is recommended to the conduct the replacement and maintenance of anti-freezing solution for each 6 months. Replace DCA water filter for the automobile equipped with DCA water filter to drive each 20000 km.
 - Prohibit mixing the different brands of anti-freezing solution made by the different manufacturers; during changing the anti-freezing solution, do not refuel the new anti-freezing solution unless draining off the original anti-freezing solution and cleaning the water tank.
 - During the maintenance and repair, use the anti-freezing product (see in the form attached) inconformity with the original package used by the company
1. Use the other brands of anti-freezing solution prudently (especially after reading and understanding the product features and usage conditions in case of failing to buy the anti-freezing product of brand and manufacturer listed due to the condition limit.
Consider the climate condition of area where the automobile is used during selecting the brand of anti-freezing solution.

Periodic maintenance

Specification of fuel utilization

Assembly	Items	Model	Reference Dosage	Specification	Remarks	
Engine	Replacement of engine fuel	C9	25L	CI-4 or E4 15w/40	Compulsory warranty without the replacement of engine fuel	
		C13	30L	CI-4 or E4 15w/40	Compulsory warranty without the replacement of engine fuel	
		SC10E	32L	CI-4 or E4 15w/40		
		SC12E	37L	CI-4 or E4 15w/40		
		WP10	24L	CH-4 or CI-4 15w/40		
Transmission	Replacement of transmission lubricant	Gear 6/9/10	13L	GL-5 85W/90		
		Gear 12/16	17L	GL-5 85W/90		
Steering gear	Replacement of steering fluid	Steering fluid tank (single front axle)	4L	#8 hydrodynamic drive oil		
		Steering fluid tank (double front axles)	4.5L			
		Large steering tank (flow of steering oil pump: 25L/min)	6L			
Axle	Replacement of gear oil	STEERING axle	Intermediate axle	12.5L	85w/90 GL-5	Intermediate section: 8.5L Edges of right and left wheels: 2L
			Rear axle	10L		Intermediate section: 6L Edges of right and left wheels: 2L
		Torque of large axle	Intermediate axle	23L		Intermediate section: 15.5L Axle difference: 2.5L Wheel edge: 2.5
			Rear axle	19L		Intermediate section: 14L Edges of right and left wheels: 2.5L

		Hand e axle	Intermediat e axle	23L		Intermediate section: 16L Edges of right and left wheels: 3.5L
			Rear axle	20L		Intermediate section: 13L Edges of right and left wheels: 3.5L
		#485 axle	Intermediat e axle	22.4L		20+1.2*2
			Rear axle	Single: 19.4L Double: 24.4L		Intermediate section: 17 (single)/22 (double) Wheel edge: 1.2
		#457 axle	Intermediat e axle	20L		Intermediate section: 18L Axle difference: 2L
			Rear axle	13L		Intermediate section: 13

Attention:

- ①. In case of ACEA-E4 engine fuel being used, extend the replacement interval of Cursor9 engine fuel to 60000 km;
- ②. For the other engines except Cursor9, see the details of engine oil grade and amount in the maintenance instruction of engine;
- ③. The anti-freezing solution suitable to the material of water tank shall be required as the cooling fluid of engine.

Periodic maintenance

Maintenance items (road vehicle and non-road vehicle)

Procedures of Periodic Maintenance		Road Vehicle			Non-road Vehicle		
Operation Description		Maintenance Grade (M/T)	Running Mileage (Km)	Operation Period (Month)	Maintenance Grade (M/T)	Running Mileage (Km)	Operation Period (Month)
S/N	Contents						
Cursor engine							
1	Replace the engine fuel (CI-4)	M2	30,000	3	M2	10,000	2
	Replace the engine fuel (E-4)	M3	60,000	6	M3	20,000	
2	Replace the filter of engine fuel	M1	15,000	1.5	M1	5,000	1
3	Replace the filter of oil and gas of crankcase	M3	60,000	6	M3	20,000	4
4	Clean/replace the ventilation hose and ventilation control valve of crankcase	M3	60,000	6	M3	20,000	4
5	Clean/replace VGT air filter element	M3	60,000	6	M3	20,000	4
6	Clean the dust pocket of air filter (excluding the type of automatic dust removal)	M1	15,000	1.5	M1	5,000	1
7	Clean the main filter element of air filter	In case of indicator on			In case of indicator on		
8	Replace the main filter element of air filter	T2		6	T2		3
9	Replace the safe filter element of air filter	After the main filter element being cleaned for five times			After the main filter element being cleaned for five times		
10	Replace the diesel filter	M2	30,000	3	M2	10,000	2
11	Clean the cooler grid in the water tank	T1		3	T1		3
12	Check the concentration of anti-freezing solution	T2		6	T2		6
13	Replace the cooling fluid of engine (replace once each year at least)	T3		12	T3		12
14	Check/fasten the coupling and plug of inlet system	M2	30,000	3	M2	10,000	2
15	Check/adjust the valve gap	M3	60,000	6	M3	20,000	4
16	Check/adjust the engine belt	M2	30,000	3	M2	10,000	2
17	Check the belt tension pulley of engine	M2	30,000	3	M2	10,000	2
18	Check/replace the rubber suspension of engine	M1	15,000	1.5	M1	5,000	1

Periodic maintenance

19	Check/fasten the connecting bolt of engine suspension	M2	30,000	3	M2	10,000	2
20	Check the indicating light or indicator of air filter	M1	15,000	1.5	M1	5,000	1
Engine made by Weichai / SDEC							
1	Replace the engine fuel (CH-4)	M1	15,000	1.5	M1	5,000	1
	Replace the engine fuel (CI-4)	M2	30,000	3	M2	10,000	2
2	Replace the filter of engine fuel	M1	15,000	1.5	M1	5,000	1
3	Clean/replace the ventilation hose and oil-gas separator of crankcase	M3	60,000	6	M3	20,000	4
4	Clean the dust pocket of air filter (excluding the type of automatic dust removal)	M1	15,000	1.5	M1	5,000	1
5	Clean the main filter element of air filter	In case of indicator on			In case of indicator on		
6	Replace the main filter element of air filter	T2		6	T2		3
7	Replace the safe filter element of air filter	After the main filter element being cleaned for five times			After the main filter element being cleaned for five times		
8	Replace the diesel filter	M2	30,000	3	M2	10,000	2
9	Clean the cooler grid in the water tank	T1		3	T1		3
10	Check the concentration of anti-freezing solution	T2		6	T2		6
11	Check the concentration of anti-freezing solution (SDEC)	M2	30,000	3	M2	10,000	2
12	Replace the filter or filter element of cooling fluid (SDEC)	M1	15,000	1.5	M1	5,000	1
13	Replace the cooling fluid of engine (replace once each year at least)	T3		12	T3		12
14	Check/fasten the coupling and plug of inlet system	M2	30,000	3	M2	10,000	2
15	Check/adjust the valve gap	M2	30,000	3	M2	10,000	2
16	Check/adjust the engine belt	M1	15,000	1.5	M1	5,000	1
17	Check the belt tension pulley of engine	M1	15,000	1.5	M1	5,000	1
18	Check/replace the rubber suspension of engine	M1	15,000	1.5	M1	5,000	1
19	Check/fasten the connecting bolt of engine suspension	M2	30,000	3	M2	10,000	2
20	Check the indicating light or indicator of air filter	M1	15,000	1.5	M1	5,000	1
Clutch							
1	Check the amount of hydraulic oil for clutch operation	M2	30,000	3	M2	10,000	2
2	Replace of the hydraulic oil for clutch operation	M3	60,000	6	M3	20,000	4
Transmission							
1	Check the amount of gear oil of gearbox	M2	30,000	3	M2	10,000	2

Periodic maintenance

2	Replace the gear oil of gearbox	M3	60,000	6	M3	20,000	4
3	Clean/replace the ventilation plug of transmission	M2	30,000	3	M2	10,000	2
4	Clean/replace the rubber suspension of transmission	M1	15,000	1.5	M1	5,000	1
5	Check/fasten the connecting bolt of engine suspension	M1	15,000	1.5	M1	5,000	1
Dead axle							
1	Inspect/refuel lubricating grease of bearing	M2	30,000	3	M2	10,000	2
2	Check/adjust the toe-in of steering axle	M2	30,000	3	M2	10,000	2
3	Check/adjust the gap of ball head of steering lever	M2	30,000	3	M2	10,000	2
4	Check the abrasion loss of brake shoe lining and replace till the abrasion limit	M2	30,000	3	M2	10,000	2
5	Check the abrasion loss of brake drum and brake disc and replace till the abrasion limit	M2	30,000	3	M2	10,000	2
6	Check/adjust the gap of hub bearing	M2	30,000	3	M2	10,000	2
Drive axle							
1	Check the amount of gear oil of intermediate cross-axle case (middle part of axle), main gearbox of rear axle and wheel edge	M2	30,000	3	M2	10,000	2
2	Replace the gear oil of intermediate cross-axle case (middle part of axle), main gearbox of rear axle and wheel edge	M3	60,000	6	M3	20,000	4
3	Clean/replace the ventilation plug of drive axle	M2	30,000	3	M2	10,000	2
4	Check/adjust the gap of hub bearing	M3	60,000	6	M3	20,000	4
Transmission shaft							
1	Check/replace the rubber support of transmission shaft	M1	15,000	1.5	M1	5,000	1
2	Check/fasten the connecting bolt of transmission shaft	M2	30,000	3	M2	10,000	2
3	Check if any crack or defect in the support of transmission shaft	M2	30,000	3	M2	10,000	2
4	Check/fasten the connecting bolt of the support of transmission shaft	M2	30,000	3	M2	10,000	2
5	Check the gap and snap spring of universal joint of transmission shaft	M2	30,000	3	M2	10,000	2
Cab							
1	Check the amount of hydraulic oil of switching mechanism	M2	30,000	3	M2	10,000	2
2	Check the hydraulic oil of switching mechanism	M3	60,000	6	M3	20,000	4

Periodic maintenance

3	Check/fasten the connecting bolt of front and rear suspension of cab	M2	30,000	3	M2	10,000	2
4	Check/fasten the connecting bolt of switching mechanism in the cab	M2	30,000	3	M2	10,000	2
5	Check the function of lifting and warning of cab	M2	30,000	3	M2	10,000	2
Carriage, suspension, driving and accessories							
1	Check/fasten the connecting bolt of cross beam	M2	30,000	3	M2	10,000	2
2	Check/fasten the U bolt of leaf plate	M2	30,000	3	M2	10,000	2
3	Check/fasten the connecting bolt of accumulator box and fuel box	M2	30,000	3	M2	10,000	2
4	Check/fasten the fixed mechanism of spare tire	M2	30,000	3	M2	10,000	2
Pneumatic control system of brake							
1	Drain off the water logged in the air cylinder	M1	15,000	1.5	M1	5,000	1
2	Check the sealing performance of pneumatic control system	M1	15,000	1.5	M1	5,000	1
3	Check the function of valve	M2	30,000	3	M2	10,000	2
4	Replace the drying agent in the air dryer	M3	60,000	6	M3	20,000	4
Electronic and electric system							
1	Check the firmness of socket of electric equipment harness	M2	30,000	3	M2	10,000	2
2	Check/fasten the binding post of accumulator (the pole painted with the Vaseline)	M3	60,000	6	M3	20,000	4
3	Check the operation status of electronic and electric-control system	M2	30,000	3	M2	10,000	2
Steering system							
1	Clean the filter element of steering system	M2	30,000	3	M2	10,000	2
2	Replace the hydraulic oil and filter element of steering system	M3	60,000	6	M3	20,000	4
3	Check/fasten the connecting bolt of steering gear and fixed support	M2	30,000	3	M2	10,000	2
4	Check/fasten the connecting bolt of drop arm and drag link	M2	30,000	3	M2	10,000	2
Finished automobile							
1	Check if any leakage of mechanical assembly	M1	15,000	1.5	M1	5,000	1
2	Check if any leakage of pressure system of oil and fluid	M1	15,000	1.5	M1	5,000	1
3	Road test; automobile performance	M4	120,000	12	M4	40,000	8

Description of maintenance interval	Road Vehicle			Non-road Vehicle			Period (Month)
	Grade	Mileage (Km)	Period (Month)	Grade	Mileage (Km)	Period (Hour)	
Mileage interval	M1	15,000		M1	5,000	300	1
	M2	30,000		M2	10,000	600	2
	M3	60,000		M3	20,000	1,200	4
	M4	120,000		M4	40,000	2,400	8
Duration interval	T1		3	T1			3
	T2		6	T2			6
	T3		12	T3			12
Calculation relations of mileage/time	Calculate as per the mileage of <u>10000Km in one month</u>			Calculate as per the mileage of <u>10000Km and the operation duration of 300h in one month</u>			

Attention: the automobile driven in the sever conditions (sever cold or hot, heavy dust, construction site, municipal engineering car, snow removal car and firefighting truck) or the annual driving mileage less than 20000km shall be reduced by the maintenance interval.

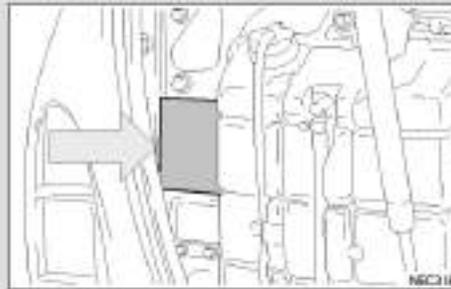
Technical specification and data

- Identification data of automobile
- Identification label of automobile
- Engine
- Transmission
- Rear axle
- Steering system
- Suspension
- Braking system
- Electrical system
- Accumulator battery
- AC motor
- Clutch
- Fuel
- Refueling number and capacity of each part

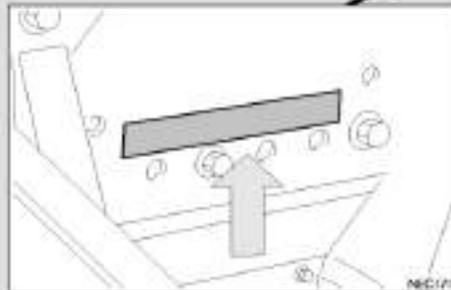
Technical specification and data

Technical specification and data

Nameplate of finished automobile
Rear cross beam of carriage

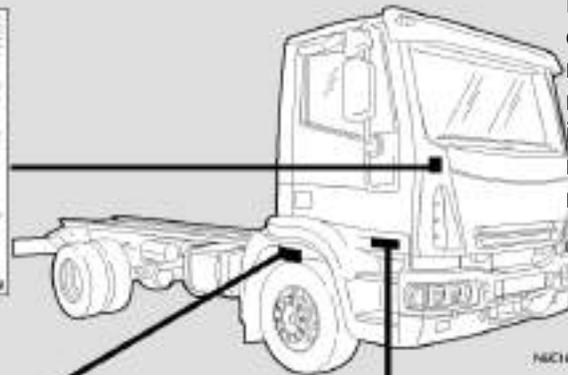


Chassis number
Print in the front part of right girder of carriage



Identification data of automobile

Details relevant to engine model and number, chassis model and number, identification nameplate of manufacturer



Engine number
Refer to the engine nameplate



Identification nameplate of automobile

- a) Identification code of automobile (VIN)
- b) Model
- c) Brand, rated power of engine
- d) Engine model
- e) Maximum total mass designed
- f) Maximum load mass designed
- g) Maximum traction tonnage designed
- h) Mass of finished automobile
- i) Maximally static load of traction seat designed
- l) Diameter of traction pinhole
- m) Origin and date of manufacture

SAIC-IVECO HONGYAN Commercial Vehicle Co., Ltd.	
VIN	<input type="text"/>
Model	<input type="text"/>
Brand <input type="text"/>	Maximum net power <input type="text"/> kW
Engine model	<input type="text"/>
G. A. M	<input type="text"/> kg
G. C. M	<input type="text"/> kg
Max. Towed Mass Road	<input type="text"/> kg
Unladen mass	<input type="text"/> kg
Max. design static traction	<input type="text"/> kg
Diameter of traction pin	<input type="text"/> mm
Made in <input type="text"/>	Date <input type="text"/>

Engine

National III/National IV emission standard
COSO high-voltage common-rail engine; WEICHAO high-voltage common-rail engine
and SDEC high-voltage common-rail engine

Transmission

FASTC transmission FAST-10MT/FAST-12MT

Rear axle

- CQ double reducer axle
- CQ single reducer axle

Steering

Hydraulic powered steering gear

Front suspension

Suspension of plate spring

Rear suspension

Balanced suspension of plate spring

Braking system

Front and rear drum brakes

Front, intermediate and rear axles as the pneumatic braking systems for two independent circuits.

Cutoff braking system of braking compartment functioning in the intermediate rear axle.

Braking in the engine equipped with the combined switch.

The filter of air dryer.

The air cylinder with the manual waterproof valve to discharge the water after being condensed in the air cylinder.

Electric system

Voltage: 24V

Accumulator:

2x12V 135/165/180Ah (as per the automobile type)

AC motor: 90A

Clutch:

Single plate, dry and pull-type clutch

Technical specification and data

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Bulb	Type of Bulb	Power (W)
Low beam of front headlight	Halogen lamp	70
High beam of front headlight	Halogen lamp	70
Front fog lamp	Halogen lamp	70
Front sidelight	Globe light	5
Front turning indicator	Globe light	21
Side turning indicator	Globe light	21
Rear sidelights (two)	Globe light	5
Rear turning indicator	Globe light	21
Brake lamp	Globe light	21
License plate lamp	Globe light	10
Back-up lamp	Globe light	21
Rear fog lamp	Globe light	21
Front width lamp	Cylinder light	4
Side width lamp	Cylinder light	3
Rear width lamp	Cylinder light	10
Side door light	Globe light	21
Interior reflector light	Halogen lamp	5



Fuel

No demand to use the lubricant additive.

- In case of the lubricant additive required being used, the warranty of product will be invalid.
- The usage of lubricant additive will harm your health.
- In case of the gas from these products being inhaled, see the doctor for inspection at once.
- Keep the fuel evaporant far away from the children.
- Handle the fuel and the spare part (such as: filter and so on) contacting with the fuel inconformity with the exiting relevant rules;

Refueling

Use the standard diesel

Recommend prohibiting using the fuel additive; in case of usage, the warranty of product will be invalid.

The refuel will be contaminated in case of refueling from the oil tank or oil drum to result in the irregular refuel supply of the fuel supply system. In case of this case, use the proper equipment to filter the fuel or subside the impurity.

Low-temperature fuel

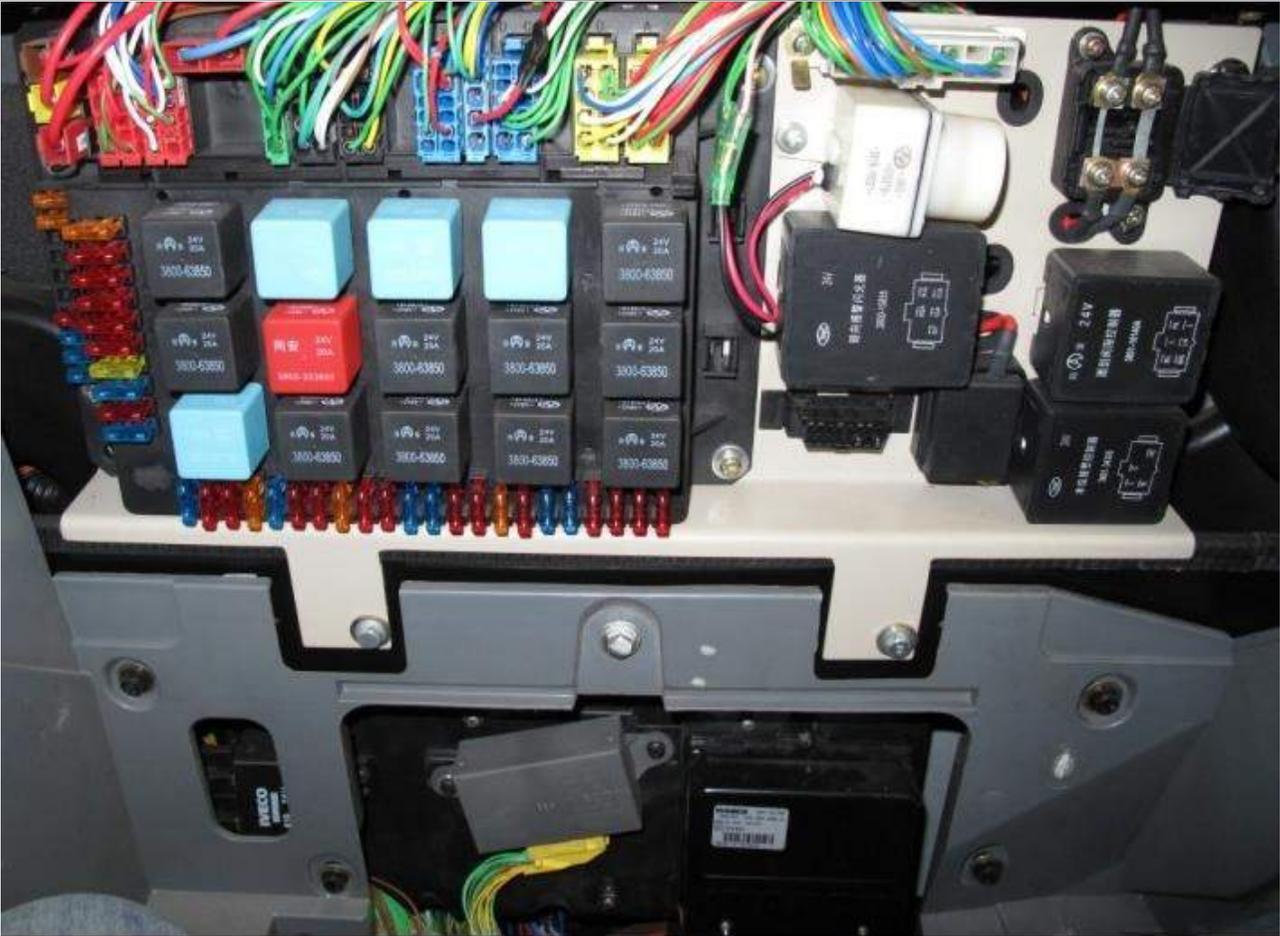
The flow rate of fuel will be less than the one stated due to the separation of paraffin in the condition of low temperature. So, this course can result in the filter blockage.

Recommend using the fuel grade corresponding to the conditions of environment and climate.

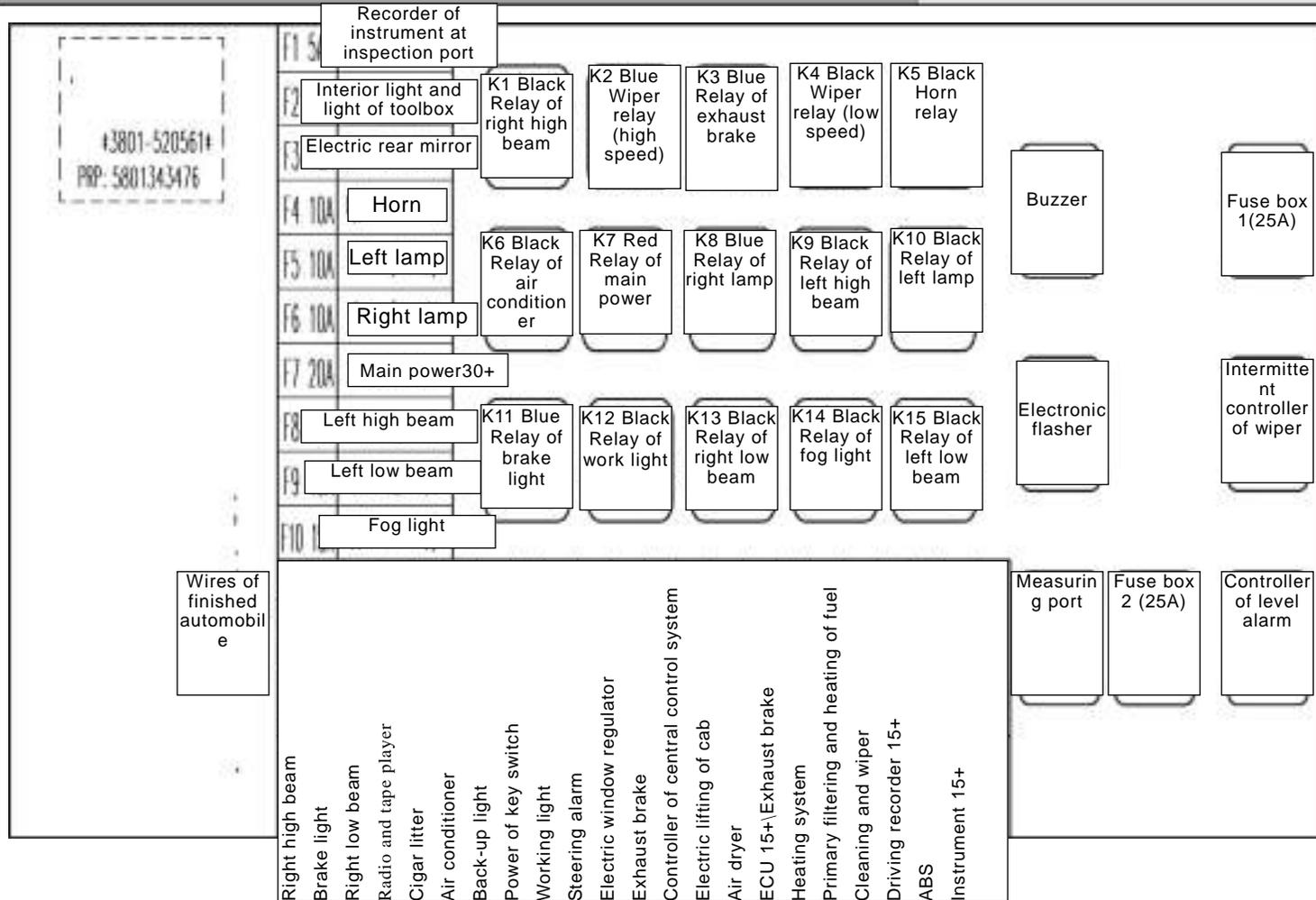
Fuse box

The fuse box and the main electric parts are concentrated in the right instrument operation console (in front of the seat of assistant driver). And the fuse and main electric components can be replaced and inspected conveniently by opening the cover.

Fuse and relay



Fuse and relay



Common faults and troubleshooting

Faults	Reasons	Troubleshooting
Impact during startup	1. Too large meshing clearance of bevel gear	Readjust the meshing clearance of bevel gear
High temperature of wheel edge	1. Insufficient lubricant	Refuel the lubricant fully
	2. Too small clearance between the friction plate and the brake drum	Readjust
	3. Too excessiveness of roundness of brake drum	Boring; roundness kept as 0.35mm
	4. Soft return spring of brake shoe	Replace the return spring
	5. Seizing by the fulcrum pin or camshaft of brake shoe	Replace the bushing after cleaning if necessary
	6. Excessive abrasion or crushing of friction plate	Replace the friction plate
Noise in the axle housing	1. Existence of metal powder or foreign particle in the lubricant	Replace the lubricant
	2. Gear damage	Replace the gear
	3. Excessive abrasion of each connecting spline	Repair the spline by the overlaying and replace if necessary
	4. Burnt of differential bearing	Replace the bearing
Oil leakage of hub, input (output) and flange	1. Blockage of vent cap	Clean or replace the vent cap
	2. Damage of each oil seal and seal ring	Replace the oil seal or seal ring
Heaviness of right and left steering	Too heavy load of front axle; excessive design load;	
	The level of steering oil tank less than the lower level of oil lever	Repair the leakage and refuel the oil tank to the upper level
	Abrasion of oil pump	Disassemble the oil pump for checking and replacement
	Air inhaled from the outlet of steering oil tank, inlet of steering oil pump, and connecting interface between the steering oil pump and engine	Replace the seal at air inlet
	Improper pipeline connection or pipeline blockage	Correct
Automatic steering	The slide valve of steering gear out of the middle position	Repair or replace the steering gear
Unstable steering wheel	The oil of steering oil tank less than the upper level	Repair the leakage and refuel the oil tank to the upper level
	Too excessive clearance at the ball lock of straight rod; loosen bolt of steel plate spring and locking bolt of steering knuckle	Tighten up the loosen bolt or replace the loosen spare part
	Too tightness of thrust bearing at both ends of distributing valve and sliding valve or the locking nut loosen	Check and readjust
Automatic steering	Too light load of front axle	Adjust and load
	The sliding valve of steering gear out of the middle part	Repair the steering gear and let the sliding valve in the middle position
Abnormal noise in the steering	Air inhaled into the oil pipe	Replace the seal at the part with air inhaled, refuel the oil tank

oil pump		and drain off the air
Abnormal noise in the steering oil pump	The level of steering oil tank less than the lower	Repair the leakage and refuel the oil tank to the upper level
Torsional vibration of steering gear	Unstable steering wheel or brake drum	Quiet and balance the steering wheel or brake drum
	Incorrect adjustment of orientation angle of steering wheel	Adjust the orientation angle of steering wheel to reach the integral design requirement;
	Air inhaled into the oil pipe	Replace the seal at the part with air inhaled, refuel the oil tank and drain off the air
	4. Contamination or burn of brake friction plate by oil stain or dirt	Air extraction or clean by the alkaline water; clear off the carbon deposit in the surface by #2 ripsaw or the saw blade
	5. Rust and corrosion of the fulcrum pin or camshaft of brake shoe	Lubricate and replace if necessary
	6. Air leakage of packing leather, pipeline and connector in the brake chamber	Check the pipeline, connector and brake chamber
Brake seizing to heat the brake drum	1. Too small clearance of friction plate of brake shoe and brake drum	Readjust
	2. Excessive out-of-roundness of brake drum	Boring; out-of-roundness no more than 0.35mm
	3. Deformation of brake shoe	Correct or replace
	4. Seizing by the fulcrum pin or camshaft of brake shoe	Replace the bushing after cleaning if necessary
	5. Excessive abrasion or crushing of friction plate	Replace
	6. Stretch or rupture of return spring of brake shoe	Replace
	7. Uncompleted release of spring brake	Replace and check the pipeline of spring brake
Sharp reduction of atmospheric pressure during braking	1. Accident rupture of brake pipeline or film	Replace and check
	2. Substance logged in the contacting surface between the valve of brake element and piston without any seal;	Check and clean
Brake deviation	1. Air pressure of tire inconformity with the regulations or model	Replace and check
	2. Improper adjustment of brake clearance	Readjust
	3. Different abrasion of friction plate	Replace or repair
	4. Contamination or burn of brake friction plate by oil stain or dirt	Air extraction or clean by the alkaline water; clear off the carbon deposit in the surface by #2 ripsaw or the saw blade
	5. Rust and corrosion of the fulcrum pin or camshaft of brake shoe	Lubricate and replace if necessary
	6. Air leakage of packing leather, pipeline and connector in the brake chamber	Check the pipeline, connector and brake chamber
Brake seizing to heat the brake drum	1. Too small clearance of friction plate of brake shoe and brake drum	Readjust
	2. Excessive out-of-roundness of brake drum	Boring; out-of-roundness no more than 0.35mm
	3. Deformation of brake shoe	Correct or replace

	4. Seizing by the fulcrum pin or camshaft of brake shoe	Replace the bushing after cleaning if necessary
	5. Excessive abrasion or crushing of friction plate	Replace
	6. Stretch or rupture of return spring of brake shoe	Replace
	7. Uncompleted release of spring brake	Replace and check the pipeline of spring brake
Air leakage	1. Accident rupture of brake pipeline or film	Replace and check
	2. Substance logged in the contacting surface between the valve of brake element and piston without any seal;	Check and clean
Brake deviation	1. Air pressure of tire inconformity with the regulations or model	Replace and check
	2. Improper adjustment of brake clearance	Readjust
	3. Different abrasion of friction plate	Replace or repair
Failure of timely release of braking after release (normal ventilation)	1. Rust, corrosion and seizing of brake camshaft	Disassemble, clean and lubricate
	2. Seizing by the fulcrum pin of brake shoe	Disassemble, clean and lubricate
Brake without snub	1. Improper adjustment of balance spring of air brake valve or spring softening	Readjust or replace
	2. Seizing by the fulcrum pin of brake shoe	Disassemble, clean and lubricate
Insufficient atmospheric pressure	1. Failure tightness of valve of air compressor	Repair or replace
	2. Seizing by the distributing valve of safety	Hit the protecting or conduct the necessary maintenance
	3. Air leakage of spare part, part or pipeline of air	Leakage blockage
Lifting failure of empty cargo compartment	Joint failure of power takeoff	Check and repair the power takeoff
	valve or control pipeline	Check and repair t and replace the lifting valve in case of necessity
	Without the hydraulic oil	Refuel
	Damage of oil pump and failure of oil supply	Repair or replace the oil pump
	Pneumatic lifting with seal failure	Control without pneumatic pressure or insufficient atmospheric pressure; check and recharge;
	The hydraulic oil being contaminated	Clean the working element of system and replace the lifting oil
Lifting failure of loaded cargo compartment	Refer to the above column	Refer to the above column
	Overloaded or too front load	Load as per the loading requirement and rated load
	Park the automobile in the uneven place during lifting	Park in the flat place during lifting
	The safety valve of pneumatic-control lifting valve being opened during the rated pressure being reached;	Replace the safety valve
Partial lifting of empty cargo compartment but failure of lifting the position of maximum rotation angle	Leakage within the pneumatic-control lifting valve or the insufficiency of pneumatic pressure of control pipeline	Replace the safety valve
	Insufficient oil amount	None air or insufficiently pneumatic pressure of control air circuit; check and recharge; check the sealing part and replace the new valve if necessary;
Trembling during lifting to the	Insufficient oil amount	Refuel

maximum position

Air in the oil pipeline

Drain off the air in the pipeline

Common faults and troubling of engine

1. Startup failure of engine

1.1. Malfunction of starter

- Power supply of key switch; neutral switch; start up relay and accumulator;
- Firstly, check if any fault code; eliminate the fault code in case of fault;
- Check if the neutral gear is in;
- Check if good starting reply and wiring;
- Check if the starter is burnt or not;

1.2. Failure of confirmation of rail pressure (normal operation of starter but failure of engine)

Due to the high requirement of common rail system for the fuel circuit, the tightness of low-pressure fuel circuits (oil tank-primary filtering-refined filtering) and high-pressure fuel circuits (high-pressure oil pump-high-pressure oil tube of common rail-oil atomizer) shall be maintained. Thus, the rail pressure cannot be confirmed in case of any one link incorrect;

- Check if too low level in the oil tank;
- Check if the normal operation of manual oil pump;
- Check if any air in the low-pressure fuel circuit and drain off the air;
Exhaust method: screw off the exhaust bolt in the refinery filter; pump the fuel by the manual pump till the exhaust screw is continuous;
- Check if the high-pressure oil pump is equipped with the pump;
- Check if the measuring valve of fuel amount and sensor of rail pressure are complete and pull up the connector for restarting;
- Check if any leakage of high-pressure oil tube;
- Check if any pressure leakage of common-rail pipe;
- Check if any pressure leakage of oil atomizer;

1.3. Lost of signal of crankshaft and camshaft

C9 engine shall be equipped with two sensors of rotation speed, in the middle part and upper of flywheel cover. The functions are as the sensors of crankshaft and cylinder detection respectively. Based on these two sensors, the oil atomizer of electric-operated control shall be operated.

- Check if any fault code; eliminate the fault code in case of fault;
- Pull off any one sensor to start;
- Check the sensor, harness or connector
- Unstable fastening of sensor to result in too large or small clearance between sensor and sensitive teeth;
- Foreign articles between sensor and contacting tooth

2. Difficult startup of starter

Reasons for difficult startup of starter and troubleshooting

- Few air in the low-pressure fuel circuit: exhaust
- Blockage of low-pressure fuel circuit: clean the fuel circuit;
- Signal of rotation speed of crankshaft; too weak signal of camshaft; lengthening of synchronous cylinder detection: adjustment
- Too low ambient temperature; malfunction of preheat device; diesel emulsification; and replacement of preheat device;
- Too bad quality of diesel failing to reaching the standard: replace with the standard diesel;
- Seizing of starter or flywheel ring gear: replace the starter or flywheel ring gear:
- Abrasion of piston ring and cylinder jacket or tightness failure of valve: replace the piston ring and cylinder jacket or valve seat and valve

3. Insufficient power of engine

3.1. Fault code existing

Refer to the fault code form and find out the countermeasures:

3.2. Fault of oil atomizer

- Fault of oil atomizer: mechanical fault and wiring fault
- Mechanical fault: jam by the needle valve; too many pollutant or water corrosion of diesel, the needle valve stuck in the oil atomizer without any movement (failure of error report by ECU)
- Wiring fault: bad contact of binding post or harness of oil atomizer; open circuit or short circuit in oil atomizer (error report by ECU)

The fault of oil atomizer will result in the idling and instability. In case of the normal noise of engine heard, the diagnostic instrument to check the large fluctuation of rotation speed of engine and test by the cylinder shutoff.

3.3. Too high temperatures of water, engine and air inlet

- Due to the too high temperatures of water, engine and air inlet, the function of overheat protection of ECU will be activated to limit the engine power.
- Check if the sensors of temperatures of water, engine and air inlet are normal or not; place the sensor in the air for testing the conformity with the ambient temperature;
- Reason of high water temperature and troubleshooting
Too water level in the water tank: check if any water leakage and water
Blockage of water tank: check the water tank; clean or repair
Bely slacking of water pump: adjust the tension as required;
Abrasion or damage of water pump: replace the water pump;
Fault of thermostat: replace
Damage of seal of water pipe, air leakage; check water pipe, connector, washer and others; replace the part damaged;
- Reasons for too high temperature of engine and troubleshooting
Low level or shortage of fuel case: check the oil level, oil leakage; repair and refuel;
High water temperature: check the reason for high water temperature and solve
Unsmooth flow of fuel cooler: check and clean
- Reasons for too high temperature of air inlet and troubleshooting
Check the capability of heat dissipation of inter-cooler

3.4. Default of accelerator pedal

- Check the position indicated in diagnostic instrument and the actual position of pedal (check by flooring)
- The voltage of accelerator pedal: the voltage of accelerator pedal and accelerator being opened fully 0.3-3.7V
- Check the responding speed of pedal voltage by pedaling and if any delay;

3.5. Insufficient pressure of supercharging system

- Pedal the accelerator of engine under the no-load condition; the inlet pressure of idling: about 1bar; stabilize about 1.3-1.4bar after pedaling accelerator (the valve for the reference only but variable due to the locally different atmospheric pressure)
- Heavy-load operation: variable change of atmospheric valve according to the change of accelerator; supercharge about 2.7 bar in case of the standard about 2000rpm;
- The temperature of air inlet in normal during the operation; check the sensor and circuit of air inlet pressure; and test the conformity of pressure and temperature of circuit in the air with the local atmospheric pressure and temperature.
- Check if any air leakage or blockage of air inlet system; check the pipe of each part of air inlet system, connecting part and intercooler;
- Check if any damage of booster; disassemble the front and rear connecting tubes of booster; check if the blade play (axial clearance and radial clearance of 0.025-0.127 and 0.406-0.610) and the blade damage.

3.6. If too high backpressure of exhaust;

- Check if any blockage of exhaust pipeline;

3.7. Dirty fuel, blockage of oil circuit or air in oil circuit

- Check the oil quality, clean the oil circuit and drain off the air in oil circuit

3.8. Abnormal rail pressure

- Few differences of fuel pressure and setting value by the diagnostic instrument; stable idling no more than 10bar; and the difference in the condition of stable speed of loaded cargo no more than 50bar.

4. Exhaust with heavy smoke

4.1. Check if any corresponding fault code;

4.2. Inlet blockage (blockage of air filter element) or too high backpressure of exhaust: check the air filter, air inlet pipe; clean or replace the filter element;

4.3. Bad refuel: clean and replace

4.4. Incorrect valve timing: adjust as per the regulations;

4.5. Bad atomization of oil injector: check by the cylinder shutoff

4.6. Insufficient pressure of supercharging system and malfunction of booster: check and repair the leakage at the connection of pipeline, intercooler and pipeline; check and replace the booster;

5. Exhaust with white smoke and blue smoke

5.1. Bad fuel with too much water: replace the fuel

5.2. Incorrect valve timing: adjust as per the regulations

5.3. Abrasion of seal ring of booster: check and replace

5.4. Abrasion of thrust bearing of booster: check and replace

5.5. Blockage of oil return pipeline of booster: check and replace

5.6. Low compression pressure: inadequate burning and cylinder expansion of piston: check the piston ring, cylinder liner and cylinder gasket and repair

5.7. Failure of stagger of opening mouth of piston ring: adjust and reassemble

5.8. Failure of oil ring of piston: replace

5.9. Too large matching clearance of piston cylinder liner: repair and replace

6. Oil pumping of booster

- Check the position of oil pumping, inlet, or outlet or both.

6.1. At the inlet only, check if any fuel in the ventilation system of crank box; if the fuel returned by the ventilation of crank box. If yes, check the centrifugal filter element.

6.2. In case of inlet and outlet, check if any blockage of centrifugal filter element at the rear end of camshaft; the blockage of filter element resulting in the high pressure of crankcase or the worsen case leading to the oil leakage of front and rear oil seals;

6.3. In case of the outlet only, check if any enough fuel in the exhaust manifold; check if the fault of cylinder lid resulting in the entry of fuel from the exhaust manifold;

7. Too low of fuel pressure

7.1. Too low level of oil sump or oil shortage: check the oil level or if any leakage; and refuel;

7.2. Malfunction of pressure sensor of fuel: replace

7.3. Blockage of suction filter, fuel circuit, coupling gasket and others: check the suction filter and connector of fuel circuit; if any casting porosity in the oil passage; if yes, repair

7.4. The disqualification of fuel brand or deterioration of fuel: replace the more applicable fuel

7.5. Too high temperatures of water and fuel in cooling system: check the cooling system

7.6. Too large resistance of fuel filter: replace the filter element of fuel

7.7. Blockage of fuel cooler: check and clean

7.8. Malfunction of fuel pump: replace

7.9. Too large clearance or damage of bearing pad: check and replace

Common faults and troubleshooting of rear process system (installation optional)

1. Large consumption of urea solution

1.1. Untightened seal of urea tank: check and repair

1.2. Pipeline leakage: check and tighten

1.3. Damage of quantitative injecting unit: ask the serviceman to check and solve

1.4. Software fault of SCR controllers: ask the serviceman to check and solve

2. SCR fault indicator on

2.1. Leakage of urea pipeline: check and solve

- 2.2. Freezing of urea solution: check the electromagnetic valve of cooling water to keep the smooth flow of heating pipeline
- 2.3. Urea shortage: add
- 2.4. Nozzle blockage: check and clean
- 2.5. Blockage of filter screen of urea: clean or replace
- 2.6. Wrong circuit wiring or bad contact: check if the wiring is correct and reliable
- 2.7. Sensor damage: ask the serviceman to check and solve
- 2.8. Internal fault of system: ask the serviceman to check and solve

3. Urea pump in the circle of pre-injection

- 3.1. Shortage of urea solution: add
- 3.2. Blockage of inlet of urea pump: clean the filter screen of inlet of urea pump
- 3.3. Blockage of inlet and outlet pipes: clean the inlet and outlet pipes
- 3.4. Heating fault of inlet and outlet pipes: check if the heating relay of pipeline is closed;
- 3.5. Failure of detection of compressed air of pump: check if any blockage, air leakage or pressure insufficiency of the pipe line of compressed air

4. Simple troubleshooting method for faults of rear process system (installation optional)

- 4.1. Check if any continuous operation sound of engine during the starter startup; if yes, the system power is normal; pull off the return pipe for check if any flow returned; in case of none, it is possible of pipeline or pump blockage; check if the inlet and outlet pipelines are blocked or not;
- 4.2. In case of any flow returned, pull off the injection pipe to check if any compressed air being purged out. If none any compressed air, check if the pipeline of compressed air is normal; in case of the above conditions normal but fault existing still, please contract with SIH serviceman for helping troubleshooting.

Main parameters of finished automobile of CROSS

Type and Grade of Fuel	1> fuel type	Diesel
	2> fuel grade	# 0
Atmospheric pressure of startup	Atmospheric pressure	5.5bar
Alignment value of wheel	1> Inclination inward of king pin	3°
	2> Inclination backward of king pin	3°
	3> Camber of front wheel	1°
	4> Toe-in of front 1 st axle	0-2mm
	5> Toe-in of front 2 nd axle	0-2mm (except the single front axle)
Wheel	Dynamic balance value	50g
Brake pedal	Free stroke	20-25mm
Brake	Usage scope of friction pair	11mm
ABS system	Function/usage	None for the dump truck; ASB functioning automatically

Main parameters of engine of CROSS

Engine		Model	Max Net Power	Rated Power/ Rotation Speed	Rated Power/ Rotation Speed
Series of European III emission standard	C9	C9 290	208kw	213kw/2100r	1145Nm/1500r
		C9 310	228kw	227kw/2100r	1250Nm/1270r
		C9 340	245kw	250kw/2100r	1300Nm/1500r
		C9 380	275kw	280kw/2100r	1500Nm/1500r
	WEICHAI	WP10 290	211	213kw/2200r	1160Nm/1200-1600r
		WP10 336	245	247kw/2200r	1250Nm/1200-1600r
		WP10 375	274	276kw/2200r	1460Nm/1200-1600r
		WP10 290E	209	213kw/2200r	1160Nm/1200-1600r
		WP10 310E	224	228kw/2200r	1250Nm/1200-1600r
		WP10 340E	246	247kw/2200r	1350Nm/1200-1600r
Series of European IV emission standard	WEICHAI	WP10N 300	216Kw	221Kw/1900r	1390Nm/1300-1600r
		WP10N 336	242kW	247kw/1900r	1500Nm/1300-1600r
	SDEC	SC10 E300	215kw	221kw/1900r	1350Nm/1200-1300r
		SC10 E320	229kw	235kw/1900r	1500Nm/1200-1300r
		SC10 E350	252kw	258kw/1900r	1600Nm/1200-1300r
		SC10 E380	273kw	279kw/1900r	1800Nm/1200-1300r
		SC12 E390	281kw	287kw/1900r	1900Nm/1300r
		SC12 E430	310kw	316kw/1900r	2000Nm/1300r
		SC12 E460	332kw	338kw/1900r	2150Nm/1300r
		SC12 E480	347kw	353kw/1900r	2200Nm/1300r

