



SITRAK C7H VEHICLE DRIVER'S MANUAL

English version: Page 01-32 

中文版：第 33-62 页

TABLE OF CONTENTS

1

Basic introduction

- 1.1 Cab internal overview.....01
- 1.2 Instrument panel.....02
- 1.3 Rocker Switches and Buttons03
- 1.4 Detection lamp and alarm lamp.....04
- 1.5 Air pressure display.....06

2

Operation introduction

- 2.1 Engine start.....06
- 2.2 Air conditioning systems07
- 2.3 Traction preparation (trailer).....08
- 2.4 Transmission.....09
- 2.5 Differential lock operation.....18
- 2.6 Adjustment of rear-view mirror.....20
- 2.7 Operation of PTO.....20
- 2.8 Vehicle cruise control operation.....21
- 2.9 Exhaust brake operation.....22
- 2.10 Retarder operation.....22
- 2.11 Engine speed mode knob.....24
- 2.12 Fifthwheel/Saddle.....25
- 2.13 Cab Electrical tilting26

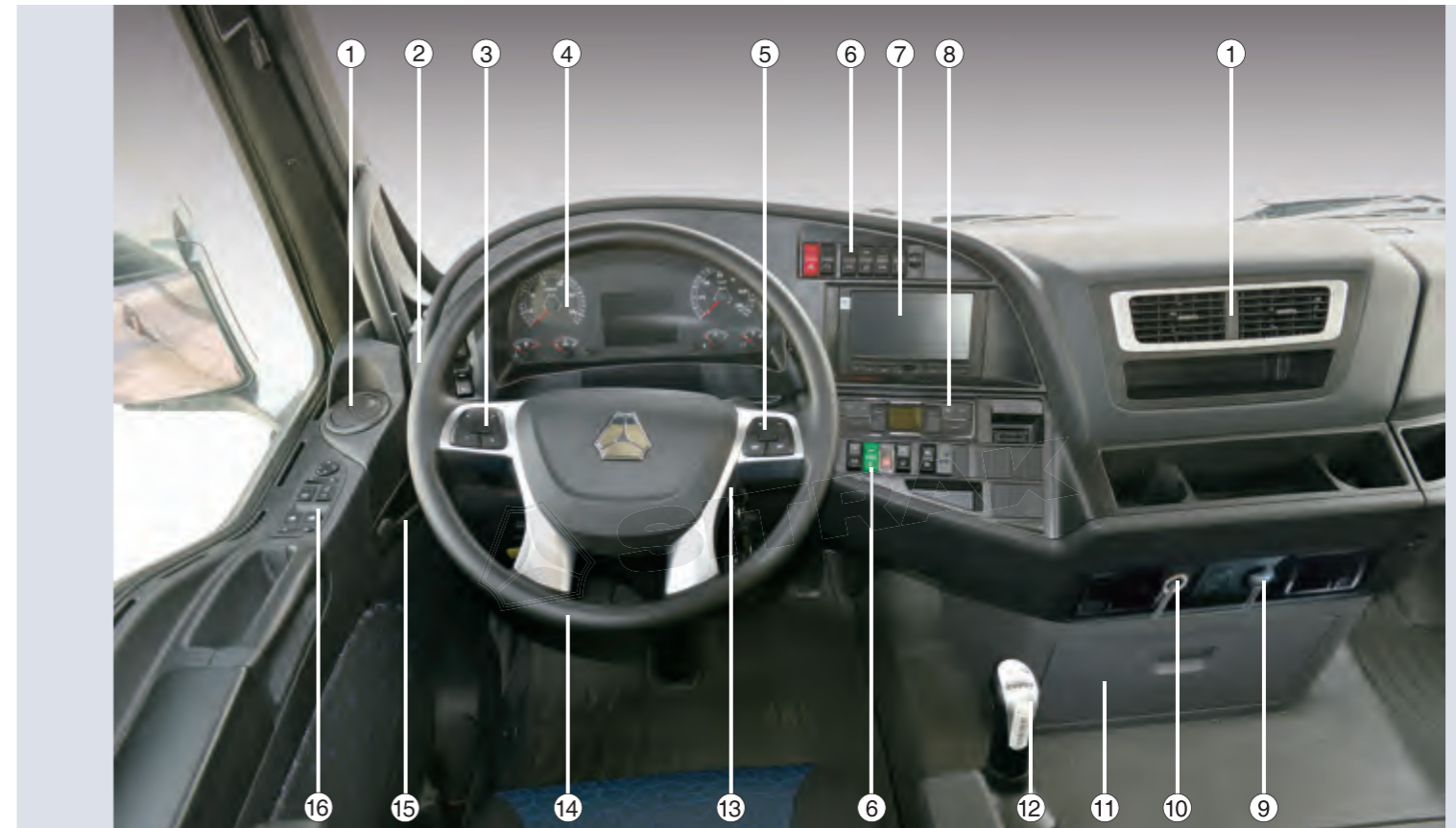
3

Check Introduction

- 3.1 Cooling system: Check daily.....27
- 3.2 Engine oil: Check daily.....27
- 3.3 Air dryer: check monthly.....28
- 3.4 Clutch: Check monthly.....30
- 3.5 Oil-bath type air cleaner.....31
- 3.6 Other notes.....32

1. BASIC INTRODUCTION

1.1 CAB INTERNAL OVERVIEW



1	Vent
2	Left combination switch
3	Left button of steering wheel
4	Instrument panel
5	Right button of steering wheel
6	Rocker switch
7	MP5 player / Intelligent Systems
8	Air conditioner control panel

9	24V plug
10	Cigarette lighter
11	Storage box
12	Transmission control lever
13	Right combination switch
14	Steering wheel
15	Door handle
16	Door control panel

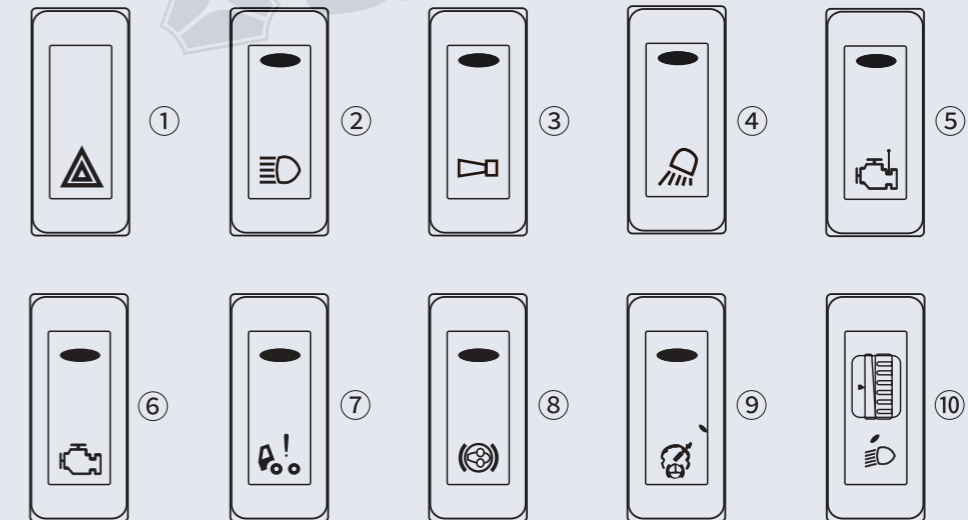
1.2 INSTRUMENT PANEL



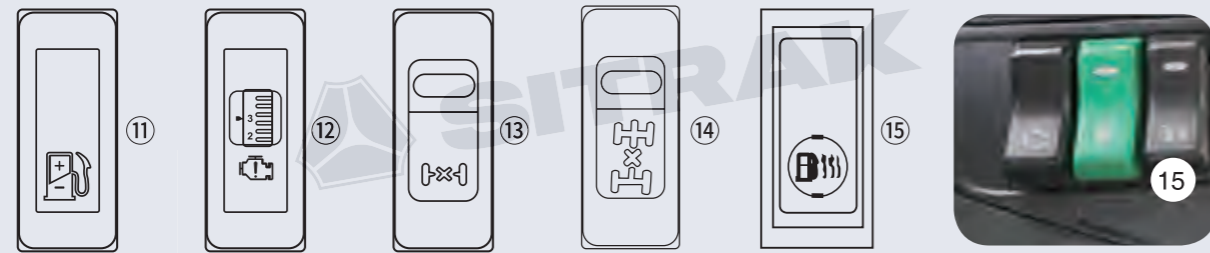
1	Engine tachometer
2	Detection and alarm indicator
3	Speedometer
4	Voltmeter
5	Fuel gauge

6	Button 1
7	Driver's display screen
8	Button 2
9	Air pressure meter
10	Coolant thermometer

1.3 ROCKER SWITCHES AND BUTTONS



- ① **Emergency alarm switch:** Press the switch, all turn lights will flash and turning indicator lamp on instrument panel will also flash.
- ② **Auxiliary high beam switch:** If the high beam is on, press the switch to turn on the auxiliary high beam.
- ③ **Horn change-over switch :** If the switch do not work, press the horn button on steering wheel and the electric horn will honk; after pressing this switch, press the horn button on steering wheel and the air horn will work.
- ④ **Working light switch:** Press the switch to open working light behind cab.
- ⑤ **Engine PTO switch:** Press the switch and you can adjust engine speed by adjusting PTO knob. At this moment, the accelerator pedal will not function any more.
- ⑥ **Engine diagnosis switch:** Press the switch and read the flash code of engine fault on instrument panel; find the fault code table, and you will know what fault occur in the current engine system.
- ⑦ **Cab tilting switch:** Press the switch, keep lifting oil pump in lifting or declining state, and then press tilting button outside of cab to achieve electrical self-lifting or declining of cab.
- ⑧ **Exhaust brake linkage isolating switch:** Press the switch to cut off the exhaust brake linkage. Press switch when the road is slippery on rainy or snowy condition.
- ⑨ **Intelligent brake request switch:** The intelligent brake is in the default active state, and the indicator light of the switch is on. At this time, the driver steps on the brake pedal. If the exhaust brake conditions are met, the exhaust brake will work at the same time as the driving brake. Press the intelligent brake switch to turn off the intelligent brake function, and the indicator light of the switch goes off.
- ⑩ **Headlamp light beam adjustment knobs:** Manually adjust the light beam irradiation position of the headlamp position as per the vehicle loading. There are four gears and the light beam height lowers step by step from 0-gear to 3-gear.



11 The fuel economy switch: Press the switch, the maximum driving speed can be automatically determined according to the vehicle configuration, the engine runs more softly, so that the vehicle maximum driving under economic conditions.

12 Engine speed mode knob: Press the switch, the engine speed can be adjusted within a certain range. For details of operation instructions, see 2.11 Engine Speed Mode Knob.

13 Inter-wheel differential lock switch: Press the switch and the cross-wheel differential lock will be engaged. For details of operation instructions, see 2.5 differential lock operation.

14 Inter-axle differential lock switch: Press the switch and the cross-shaft differential lock will be engaged. For details of operation instructions, see 2.5 differential lock operation.

15 Fuel heating switch : Press the switch to activate the heating function of the crude fuel filter.

1.4 DETECTION LAMP AND ALARM LAMP

NO.	Description	Symbol	Colour	NO.	Description	Symbol	Colour
1	Left-turn working indicator lamp of main vehicle		Green	11	Air suspension alarm indicator lamp		Red, Yellow
2	Left-turn working indicator lamp of trailer		Green	12	Retarder alarm		Red, Yellow
3	Right-turn working indicator lamp of trailer		Green	13	Low-beam lamp		Green
4	Right-turn working indicator lamp of main vehicle		Green	14	Low coolant level		Red
5	Engine oil pressure indicator lamp		Red, Yellow	15	Daytime running lamp		Green
6	Fault Warning		Red, Yellow	16	Cab locking		Red
7	General failure of engine		Red, Yellow	17	Power take-off 1		Red, Yellow
8	Emergency stop	STOP	Red	18	Power take-off 2		Red, Yellow
9	Parking brake		Red	19	Low urea level		Yellow
10	Brake system failure		Red	20	ASR working indicator lamp		Yellow

NO.	Description	Symbol	Colour	NO.	Description	Symbol	Colour
21	Lift axle		Green	39	Air filter blockage		White
22	Front fog lamp		Green	40	Exhaust brake		White
23	Cruise		Green	41	Air intake pre-heat		White
24	High-beam lamp		Blue	42	Water in fuel		White
25	ABS fault lamp of tractor		Yellow	43	Retarder working lamp		White
26	ABS fault lamp of trailer		Yellow	44	Adaptive cruise control		White
27	Rear fog lamp		Yellow	45	Service indicator		Yellow
28	Sidelights		Green	46	ESC worked		Yellow
29	Excessive emission alarm		Yellow	47	Slope start		Yellow
30	Engine speed is too high		Red	48	Tire pressure alarm		Yellow
31	Safety belt		Red	49	ESC close		Yellow
32	Vehicle overspeed		Yellow	50	Adaptive front light		Yellow
33	Low gear		Green	51	Adaptive cruise control fault		Red
34	High coolant temperature		Red	52	Collision emergency warning status activated		Red
35	Status indication of brake air pressure circuit 1		Green	53	Fuel filter clogged		Red
36	Status indication of brake air pressure circuit 2		Green	54	DPF carbon deposition indicator lamp		Yellow
37	Low fuel quantity		Yellow	55	DPF active regeneration indicator		Yellow
	Indicator light - low CNG		Yellow	56	Front axle brake wear alarm		Yellow
	Indicator light - low LNG		Yellow	57	Rear axle brake wear alarm		Yellow
38	Battery charging, low (high) voltage alarm		Red				

1.5 AIR PRESSURE DISPLAY



◆ The barometer shows the pressure value of the circuit with low air pressure; High air pressure of circuit will show by the air pressure switch button under the panel. After 10 seconds, it will automatically switch the pressure value displayed as the lower pressure loop.

- ◆ ① is the rear axle pressure indicator lamp, Brake circuit I pressure condition
- ◆ ② is the front axle pressure indicator lamp. Brake circuit II pressure condition
- ◆ If the barometer pointer show in the red area ③ : the air pressure is too low
- ◆ The barometer pointer show in the yellow area ④ : the air pressure is normal



WARNING!

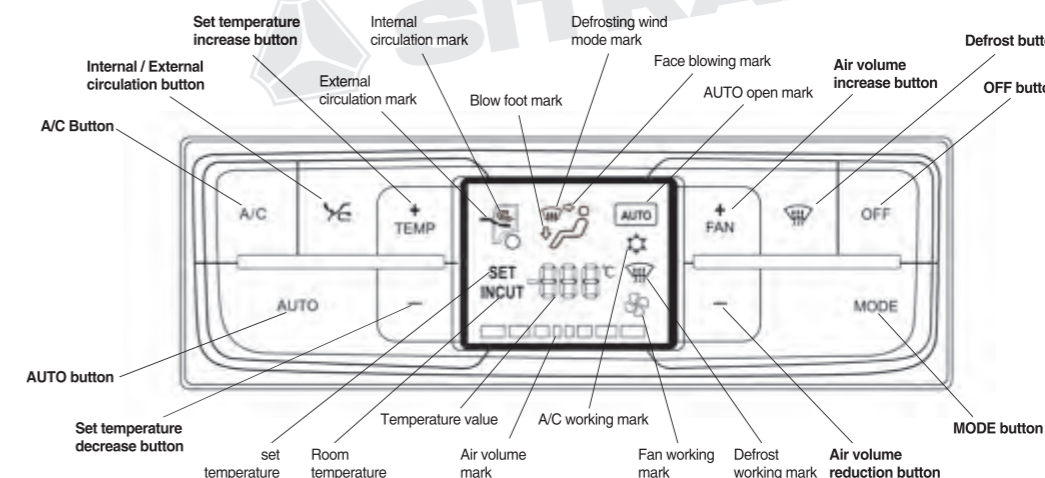
- If air pressure is too low (lower than 0.55MPa) and alarm lamp is on, Vehicle can only be started when alarm lamp is out and warning information disappears.
- After startup, test brake performance (service brake and parking brake) of vehicle on dry road surface with good adhesion!
- Ensure no foreign matter in the pedal manipulation area.

2. OPERATING INTRODUCTION

2.1 ENGINE START

1. At the first start, you need to reset the key switch to position 2 to restart if the engine is not started. Each starting time shall not exceed 15 seconds, and the interval between two starting shall not be less than 30 seconds.
2. It is not allowed for cold engine to run at high speed. It should stop engine immediately and to do service if the oil pressure is low.
3. After the engine is started, it should keep running in idle speed for 3-5 minutes and not hit the throttle. It can add load after the oil pressure and oil temperature in normal (especially in cold days). Otherwise, the supercharger bearings and seal rings will be worn out due to lack of oil.
4. It should be running in idle speed for 3-5 minutes before engine off. The engine can be stalled after the speed of turbocharger is reduced. It should be especially careful that it cannot hit the throttle before engine stalled. Hitting throttle will accelerate engine speed and the turbocharge will be in high speeding status. After engine stalled. The oil pump stops supplying oil immediately, and the turbocharger rotor continues to run at high speed due to inertia, and the rotor shaft, bearings and seal rings would soon be burned due to lack of oil.
5. The turbocharger must be pre-lubricated before restarting the engine which has been stopped for a long time. This can be achieved by disassembling the oil inlet pipe of the turbocharger and pour little of clean engine oil. Otherwise it will cause early wear due to lack of oil.
6. It is strictly forbidden to cut off the circuit connection between the battery and the central control unit when the key switch and other input power with wake-up function are not turned off. Otherwise, not only the electronic control unit, harness and electronic and electrical components of each system of the whole vehicle may be damaged in hardware, but also the system data may be lost, resulting in the serious consequences that the vehicle cannot be used
7. When the fault is very serious, the serious fault alarm indicator "STOP" lights up, and the buzzer will keep alarming to alarm when the engine is working. At this time, you should stop and check it immediately, and it is only allowed to move forward after the troubleshooting! Otherwise, it may cause loss of life and property!

2.2 AIR CONDITION SYSTEMS



Self-inspection and fault code display of the air conditioning control system

Self-inspection conditions:

- ◆ Within 3s after the air conditioning temperature is set to be 28°C , press MODEL case and AUTO button 3 times at the same time, and the control panel will enter the self-test program 3 seconds later.

Fault code display method:

- ◆ When the temperature sensor in the cab and outside fails, the screen flashes the fault code to indicate the driver that the sensor fails. The system can only work under HI and LO states.
- ◆ When the evaporator temperature sensor is faulty, if AC is working, the fault code will flash every 1.5 minutes for 30 seconds to remind the driver. At this time, the driver should turn off the air conditioner and drive to SINOTRUK workshop for maintenance to avoid freezing of the evaporator.

Automatic exit method of forced self-inspection:

- ◆ When the display is over, system will exit automatically.
- ◆ Restart vehicle or press the OFF switch.
- ◆ Work interface after exiting: set the temperature to 25°C and operate under the AUTO model.

Fault code definition:

00	Normal
01	Internal air temperature sensor errors (short circuit or open circuit)
02	External air temperature sensor errors (short circuit or open circuit)
03	CAN communication error (rotate speed) or engine D + signal line disconnection (no CAN)
04	Reserved

05	Mode motor 2 error (open circuit)
06	Hybrid motor error (open circuit)
07	Evaporator temperature sensor errors (short circuit and open circuit)
08	Water valve motor error (open circuit)
09	Mode motor 1 error (open circuit)

2.3 TRACTION PREPARATION (TOWING)

Before towing, disconnect drive shaft and cut off power.



WARNING !

- Do not try to steer a static vehicle as this action may damage its steering system due to absence of hydraulic power assistance!
- Steering without hydraulic power assistance is allowed only when the vehicle is moving.
- Steering wheel requires larger force when engine is shut down as then hydraulic power assistance will fail. In this case, the vehicle shall be towed slowly.
- If the air pressure of the brake system is insufficient, the external compressed air (at least 0.55MPa) or mechanical means can be introduced to remove the braking of the spring energy storage brake chamber. Refer to "spring energy storage brake chamber". Note that the vehicle will not brake after that!

Spring Energy Storage Brake Chamber-Emergency Release

◆ When the air pressure of the parking brake circuit is lower than 0.55MPa, the pressure of the diaphragm acting on the brake air chamber is less than that of the energy storage spring, and the spring energy storage braking functions. The "STOP" lamp, brake system fault lamp ① and parking brake lamp ② are lighted at the same time.

◆ Spring energy storage chamber can be released pneumatically or mechanically under emergency or at the workshop.



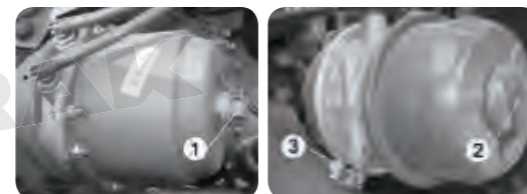
WARNING !

- Make sure the vehicle cannot move before release of spring energy storage brake chamber !
- Emergency release device of spring energy storage brake chamber can be used only for operation of the vehicle at the workshop or under emergency.
- Running of the vehicle after emergency release of spring energy storage chamber will cause accident as pressure of service brake circuit I and circuit II can hardly ensure braking effectively.
- Do not drive the vehicle before parking brake light on the driver's display screen disappears.

Spring energy storage brake chamber- emergency mechanical release

Diaphragm spring brake chamber

◆ When the air pipe of the connected spring energy storage brake chamber causes self-braking due to leakage, the brake can be released as long as the bolt ① at the rear end of the brake chamber is screwed out to the release position.



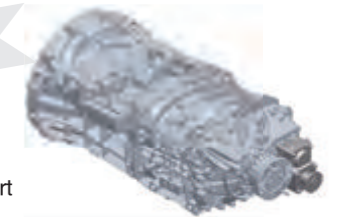
Dual diaphragm spring brake chamber

◆ Open the rear cover ② of the double diaphragm spring brake air chamber, insert it from the rear cover with bolt ③ and screw it out manually to release the brake.

2.4 TRANSMISSION

2.4.1 ZF16 Manual transmission

◆ ZF-Ecosplit The 16-gear transmission consists of a four-gear main box, a high-low gear part and a half-gear group part.



Four gears main box

- ZF Ecosplit series transmissions are synchronizer transmissions.
- Manual shift (rotary shaft control).
- Double H-shift,
- Servo shift

High and low gear, at the rear end of the transmission

- synchronizer transmissions.
- For double H-shift, there is a spring-return neutral position (idle) in the 3/4 gear range (low) and 5/6 gear range (high)(pneumatic).

Split gear, in the front of the transmission

- synchronizer transmissions.
- Pneumatically shift by operating the preselector valve on the shift handle and then operate the clutch.

◆ Transmission gear diagram

- ◇ Automatic switching R Reverse N Neutral
- 1 ~ 4 Low gear 5 ~ 8 High gear



2.4.2 ZF-TraXon Transmission

◆ Shift handle and knob switch



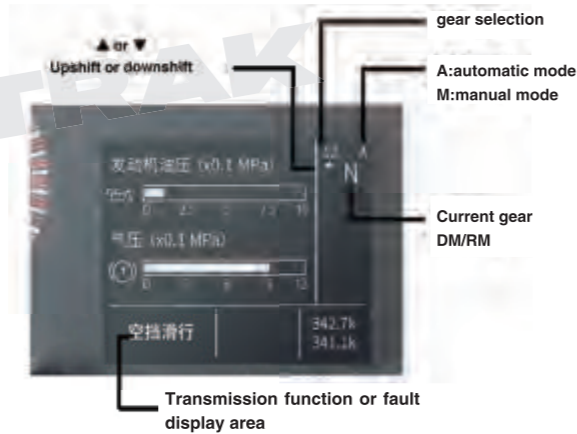
- + Add two gear
- + Add one gear
- S Search function
- Reduce one gear
- Reduce two gear
- M/A M/A model switch



- RM Reverse creep model
- R Reverse
- N Neutral
- D Forward
- DM Forward creep model

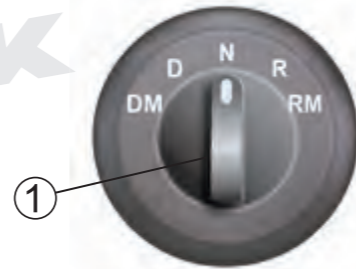
◆ Display

A/M	Automatic/Manual
N	Neutral
D/R	Forward/Reverse
DM/RM	Forward creep model /Reverse creep model
△	Upshift



Starting engine

- ◆ Trucks hand brake engage.
- ◆ Rotating switch ① located in "N" (Transmission neutral position)
- ◆ Key switch in ACC gear.
 - Transmission system self-check.
 - When the "N" is displayed on the driver information system, the self-check is completed. The transmission is in neutral position.
- ◆ Starting engine.



Start , Move

- ◆ Starting engine.
 - ◆ Turn the rotary switch from "N" to "D".
 - The driver information system shows the start gear that has been mounted. (The system selects the start gear by itself, and the clutch keeps the separation state).
 - ◆ Press down the accelerator pedal and release the parking brake.
 - Vehicle start up (clutch engaging automatically).
- During driving, the stop is digitally displayed in the driver's information system.

WARNING !

- When the engine stops, the gear cannot be shifted, but can be shifted to N.
- The driving/parking brake can only be released after the gear is in gear.

Hill Starting

Adjust start gear

- ◆ The driver can adjust the starting gear suggested by the system.
- ◆ Move the shift handle to "-/-" or "+/+".
 - The driver information system shows the start gear that has been mounted.

WARNING !

- When starting on a slope, the wheels may roll backward. Gear up first and release the parking brake only after pressing the accelerator pedal.

Creep mode (clutch semi-linkage)

- ◆ Creep mode can be used when driving slowly.
 - ◆ In creep mode the vehicle's accelerator pedal is more sensitive and the clutch control changes compared to normal mode.
- #### Creep through the accelerator pedal when the rotary switch is in the D or R position
- ◆ The system can recognize the need of creep according to the position of the running pedal and the slow running speed.
 - ◆ The first two forward gears and the first two reverse gears can be used in creep mode (depending on the model, only the first gear and one reverse may be available).
 - ◆ Creep status is invalid at other gears.

Downhill slide

Prerequisites: Engine running

- ◆ In the case of hanging into gear, remove the parking brake and the vehicle begins to slide, the clutch will be engaged automatically, as long as hanging into gear and the vehicle sliding direction, there is no need to operate the accelerator pedal.
- ◆ If it has been hung into gear and the sliding direction of the vehicle is not consistent, you can choose to make the clutch separated, or repeatedly make it slightly engaged and separated. The driver will be alerted by the driver information system.
- ◆ If, after releasing the brake - the transmission is in neutral - the vehicle coasting forward and the driver switches gears from "N" to "D", the system will select a gear suitable for the speed of travel.

Movement mode switch: automatic mode/manual mode

It can be switched over at any time even while driving

- ◆ For example, a fault response that prevents an operating mode (such as automatic mode) from being active.



The operation mode is switched from manual to automatic

- ◆ Press the shift handle to the left.



The operation mode is switched from automatic to manual

- ◆ Press the shift handle to the left or to "+/+ " or "-/-".
 - Depending on the model, it can be returned to automatic operation mode after a set period of time.



WARNING !

- If the vehicle is out of gear -- the rotary switch is at "N" — and coasts, the engine brakes are not working!
- Do not make the vehicle in the opposite direction of the gear.

Shift

Shift gears in automatic operation mode

- ◆ All up and down gears are carried out automatically
- ◆ This function depends on:

- Vehicle running resistance
- Accelerator pedal position
- Load
- Speed
- Engine speed

Shift gears in manual operation mode

- ◆ Move the shift handle to "-/-" or "+/+".

-/+ Shift one gear; -/+ Shift two gears.

- ◆ When the manual shift is carried out, the shift system exits the automatic operation mode. Press the shift handle to the left to reactivate the automatic operation mode.
- ◆ The driver can change from any gear to neutral at any time by using a rotary switch. The shift requirement has priority.
- ◆ There is no need to change the position of the accelerator pedal during the gear shift.
- ◆ If shifting will result in exceeding the maximum allowable engine speed, do not execute the shift instruction, or switch to (another) suitable gear.
- ◆ Only one gear can be mounted (select "D") to reconnect the drive line.



WARNING !

- It can also be switched to "neutral" during driving. If switched to "neutral", the driveline will be interrupted. The engine brakes are no longer functioning.
- If the vehicle is out of gear — the rotary switch is at "N" — and sliding, the engine brake does not work!

Reverse

Stop the vehicle immediately.

Shift to reverse gear

- ◆ The vehicle must be stationary.
- ◆ Turn the rotary switch to "R" or "RM".
 - R or RM displayed on the driver information system (clutch remains disengaged).
- ◆ Press down the accelerator pedal and release the brake (clutch engages automatically).
 - Vehicle reversing.



WARNING !

- The vehicle cannot switch into reverse gear while sliding !

Change moving direction

Backward "R/RM" to forward "D/DM" and the reverse process

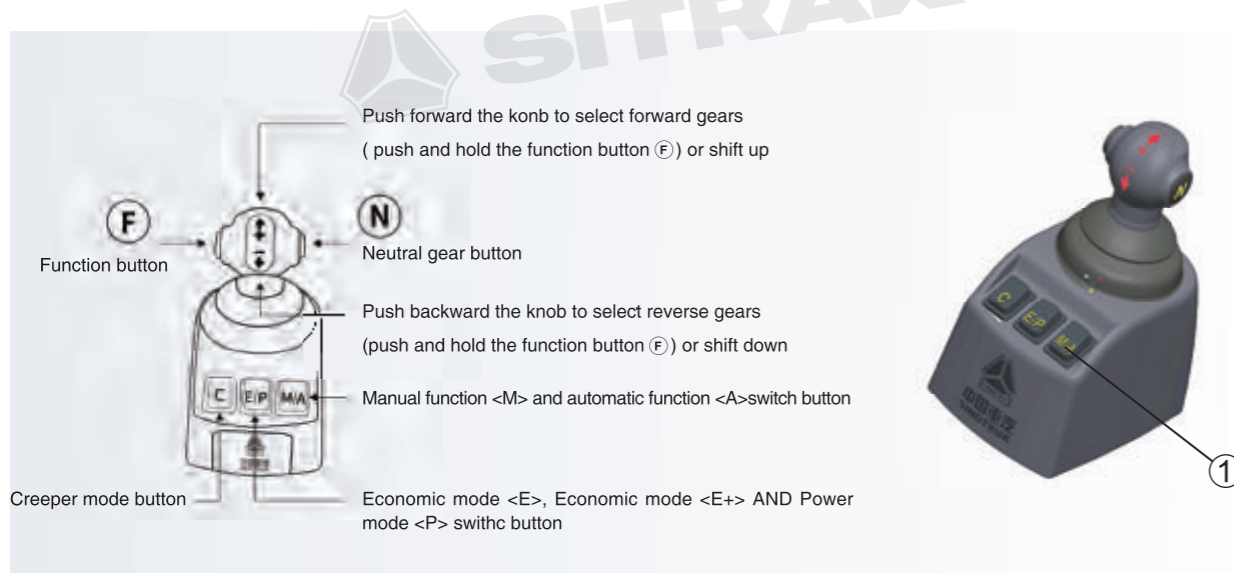
- ◆ Turn the rotary switch from "R/RM" to "D/DM".



WARNING !

- The change of driving direction can only be accomplished by changing the position of the rotary switch from R/RM to D/DM or vice versa when the vehicle is stationary, otherwise the transmission will be shifted to neutral according to the speed of the vehicle.

2.4.3 SINOTRUK Second Generation AMT Transmission



Auto-function (A function)

- ◆ Automatic function is the default operating function of the control system.
- ◆ Under the automatic function, the driver only needs to choose the starting gear through the shift handle. Start gear includes forward gear, reverse gear or neutral gear. The transmission control system will automatically select the most appropriate gear according to the current vehicle condition. The driver can also interfere with the shift through the handle under the automatic function.

Manual-function (M function)

- ◆ Gear shifting time of manual function is sent by the driver. The gear position number of gear shifts can be determined by the driver or by AMT system. The operation method is the same as the manual intervention of the automatic mode.

A/M mode selection

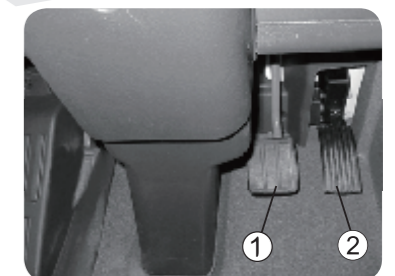
- ◆ The driver can realize switching between manual and automatic by button ① on the handle.
- ◆ The display screen on instrument panel displays the current working mode of transmission at real time.
- ◆ The default operation mode of system is automatic mode. The driver can finish switching of A/M pattern during starting and running.

Vehicle starting

- ◆ Select the appropriate starting gear position (The control system only allows to start from gear 1~8, it is recommended to start at gear 1~4)
- ◆ Slightly step on the accelerator pedal and the vehicle will start.
- ◆ Release parking brake.
 - When it is required to start under medium-idle mode, please keep at current neutral gear and then switch to starting gear; step on the pedal, release the parking brake and start running. During this mode, the vehicle can only run at 1-4 gears under this mode. If mode C is not required, please press C button to exit.
 - When you need to start in high idle mode, keep the current gear position at neutral gear, and then press C button for more than 5s. Then engage the starting gear, step on the accelerator pedal to the end, and then start running. After the vehicle starts normally, the high idle mode is automatic, no need to press the C button again.

Creeping mode

- ◆ The AMT system provides a creep mode that allows the vehicle to slow down in certain conditions.
- ◆ The driver switches to M mode by double-clicking the M/A button on the handle, and then presses on the brake pedal to hang the starting gear. After successfully hanging the gear, release the brake pedal and the vehicle moves slowly; In the creep process, the gear can be lifted manually (up to 5 gears); You can step on the accelerator pedal to accelerate during creep. Release the accelerator pedal to continue creep mode; You can also step on the brake pedal to slow down or stop, release the brake pedal to continue the creep mode.
- ◆ The creep mode supports 1-5 gear and R1 gear. The driver can choose gear by himself according to the working condition. Stepping on the accelerator pedal and switching gears will not exit the creep mode, Simply manually switching to A mode can exit creep mode.



Automatic mode operation during driving

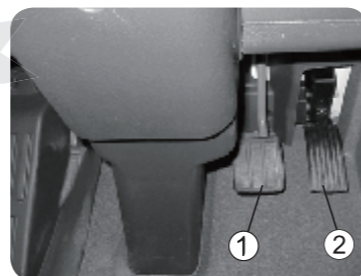
Up-shift and down-shift

- ◆ In the process of driving, the accelerator pedal ② affects the engine speed, torque and the speed of the whole vehicle. AMT will automatically based on the current engine speed and other information. When step on the accelerator pedal, the vehicle will slow down, and the control system will select the most proper gear for the vehicle running.

Acceleration

◆ To maximize vehicle acceleration, follow the following steps:

- Switch to mode P;
- Step the accelerator pedal ②;
- The control system will maintain the current gear position or select a lower gear position to operate;
- The vehicle will obtain enough power and the speed will increase rapidly.



Decelerate

◆ Step on the brake pedal ① or release the accelerator pedal ②, and the vehicle will slow down.

Manual gear shifting under automatic mode

◆ When the vehicle is running under automatic mode, the driver can intervene in automatic mode by handle operation. Push the handle ① forward to shift up and push the handle ① downward to shift down.

◆ Only if the running condition of the vehicle meets the gear shifting requirements, the handle operation in automatic mode can realize the gear shifting. In automatic mode, the handle action can affect the operation in automatic mode, but it will not release the automatic mode and switch the transmission operation mode to manual mode.



Manual mode operation during driving

- ◆ Any gear shifting action in manual mode is operated by the driver, but the clutch is automatically controlled by the system.
- ◆ Gear shifting cannot be realized unless the vehicle running condition meets the demand of gear shifting. If the current engine speed cannot reach the speed required by target gear, the control system will switch to a suitable gear but not the target gear necessarily according to current speed; if the control system does not allow to shift gears at current operating environment, a warning sound will be sent out to indicate that the gear shifting request of driver is refused.

Up-shift operation

◆ If there is no special situation when in gear shifting, do not change the current accelerator pedal position.

◆ When the driver pushes the handle forward, the request of up-shifting at least one gear will be sent out if the function button ① (round button F at left side of handle) is not pressed; the request of up-shifting one gear will be sent out if the function button is pressed. It indicates that gear shifting succeeds if the target gear lamp on display screen stops flashing.

◆ Only when the vehicle's operating environment meets the shift requirements can the shift be realized. If the current operating environment does not allow the shift, the vehicle will send out a warning sound to remind that the gear cannot be shifted up.



Down-shift operation

◆ If there is no special situation when in gear shifting, do not change the current accelerator pedal position.

◆ When the driver pushes the handle backward, the request of down-shifting at least one gear will be sent out if the function button ① (round button F at left side of handle) is not pressed; the request of down-shifting one gear will be sent out if the function button is pressed. It indicates that gear shifting succeeds if the target gear lamp on display screen stops flashing.

◆ Only when the vehicle's operating environment meets the shift requirements can the shift be realized.



Engage from the neutral gear to a proper gear position

◆ When the vehicle is sliding and the transmission is in a neutral gear position, the transmission may be directly engaged in a proper gear position through the Gear shifting handle.

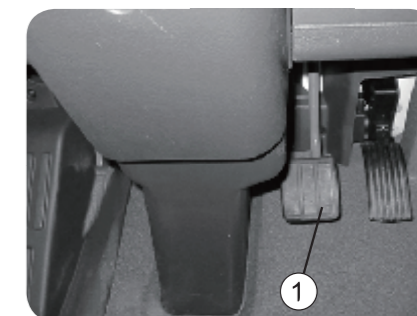
◆ If pushing the handle forward, AMT will switch to the higher gear position that is allowed under the current vehicle operating conditions. When the instrument display screen shows the target gear position and stops flickering, the gear shifting is completed.

◆ If pushing the handle downward, AMT will switch to the lower gear position that is allowed under the current vehicle operating conditions. When the instrument display screen shows the target gear position and stops flickering, the gear shifting is completed.

Deceleration and Stop

◆ When it is necessary to decelerate and stop, step on the brake pedal ①. The control system automatically shifts down when the brake pedal is released. After the vehicle is stopped stably, apply the parking brake.

◆ After the vehicle stops, the vehicle is still in the gear position, and will automatically return to neutral gear without any other action within 90s.



Switch to neutral-gear

◆ If it is required to park for a long time, please switch the transmission to neutral position to protect the clutch. Press the neutral-gear button ② (round button F at left side of handle), and it indicates the vehicle returns to neutral position if the display screen shows neutral-gear symbol N.



Switch to reverse gear

◆ The vehicle can only be switched from neutral gear to reverse gear at stoppage state. Operation steps:

- Firstly switch the transmission to neutral position.
- Press the function button ① (round button F at left side of handle) and push the handle ② backward. It indicates that gear shifting succeeds if the target gear lamp on display screen stops flashing. Push the handle ② once to gear 1; if other gears are required to reverse, the gear shifting method is the same as that of manual gear shifting.
- Release the brake pedal ③, brake the vehicle and slightly step on the accelerator pedal ④ to start reversing.



Creep gear mode (C)

- ◆ The system is equipped with a creep gear mode to meet the low-speed running requirements of the vehicle under certain special conditions.
- ◆ Press the handle key ① to start the creep gear mode and then press Key ① to cancel the creep gear mode.
- ◆ In the creep gear mode (C), the starting gear position is set as gear 1. It can be switched between gear 1~4 through the handle.
- ◆ The vehicle can only be switched between 1~4 gear position in either the manual mode or the automatic mode during the vehicle running. That is, the highest gear position in creep gear mode is limited to gear 4. If the gear is higher than 4 gear during driving, the control system will not allow to enter the creep gear mode.

2.5 DIFFERENTIAL LOCK OPERATION

When driving into bad road or abby pavement, to prevent single tire of rear axle from slipping, differential lock can be used for a short time. When engaging differential lock, vehicle shall be stopped or go straight slowly.

1. Differential lock can only be engaged when vehicle is stopped or drives in a straight line at low speed !

2. Engagement of cross-wheel differential lock - 4x2, 6x2 vehicle.

- ◆ Release accelerator pedal (deceleration), Reduce to a stop or walking speed.
- ◆ Press the lower part of cross-wheel differential lock switch ① .
- ◆ Rear axle inter wheel differential lock engages.
- ◆ The indicator lamp of inter-wheel differential lock is on.
- ◆ Carefully step on the accelerator pedal and accelerate slowly.



Disengagement of differential lock

- ◆ Loosen accelerator pedal and step on the clutch pedal.
- ◆ The upper wheel differential switch ① is pushed.
 - When the inter-wheel differential lock is disengaged, the instrument panel inter-wheel differential indicator lamp goes out.



3. Interwheel differential lock-6x4, 6x6, 8x4 vehicles

- ◆ **Operation rule for differential lock:** First of all, connect interaxle differential lock and then connect interwheel differential lock.
 - Engage interaxle differential lock (refer to engagement of interaxle differential lock for specific operation)
 - Release accelerator pedal to deceleration and Reduce to a stop or walking speed
 - Press the lower part of cross-wheel differential lock switch ①
- ◆ Rear axle inter wheel differential lock engages.
- ◆ The indicator lamp of inter-wheel differential lock is on.
- ◆ Carefully step on the accelerator pedal and accelerate slowly.

Disengagement of differential lock

- ◆ Loosen accelerator pedal and step on the clutch pedal.
- ◆ The upper wheel differential switch ① is pushed.
- ◆ When the inter-wheel differential lock is disengaged, the instrument panel inter-wheel differential indicator lamp goes out.

4. Differential speed lock between axles

- ◆ Differential speed lock between axles: Lock the inter-axle differential between the first and the second driving axle.

Engagement of inter-axle differential lock

- ◆ Release accelerator pedal (deceleration), Reduce to a stop or walking speed.
- ◆ Press the lower part of axle differential switch ② .
- ◆ After it is engaged, the instrument panel inter-axle differential lock indicator lamp is on.

Disengagement of differential lock

- ◆ Release accelerator pedal and step on the clutch pedal to reset the inter-axle differential lock switch ② .
- ◆ When the inter-axle differential lock is disengaged, the instrument panel inter-axle differential indicator lamp goes out.



2.6 ADJUSTMENT OF REAR-VIEW MIRROR

◆ Adjustment of rear-view mirror



- ◆ Check the rearview mirror Settings and adjust as needed.
- ◆ Clean the rearview mirror if necessary.
- ◆ Select the type of mirror (rear-view mirror and wide-angle mirror) rocker switch ② .
- ◆ Select the left and right mirrors by the rocker switch ④ .
- ◆ The rearview mirror control button ③ can be adjusted in different directions of front, rear, left and right.



WARNING !

- Rearview mirror can only be adjusted when key switch is at ON position.
- Ensure the driver seat is in a comfortable driving position.
- The control system can offer overheat protection to motors in order to prevent overheating due to frequent action of switches. After the rearview mirror motor starts and stops operation for 10 times within 5 seconds, the rearview mirror will no longer correspond to any operation command within 3 minutes.
- Do not to adjust rearview mirror during operation!

2.7 OPERATION OF PTO

- ◆ PTO controlled by clutch, It can be operated when vehicle is both running and stationary.
- ◆ Engagement/ disengagement
 - PTO engagement and disengagement are only allowed when the clutch is fully disengaged.
 - Clutch disengagement must be made at engine idle speed.
 - Tooth breaking may occur if PTO engagement is made when the countershaft is not stationary.
- ◆ Parking
 - Engage low gear(1-4 gear).
 - lift handbrake.

◆ For safety:

- Engage forward gear when vehicle is stopped uphill.
- Engage reverse gear when vehicle is stopped on slope.
- For safety, please put blocks behind the wheels if vehicle is fully laden.



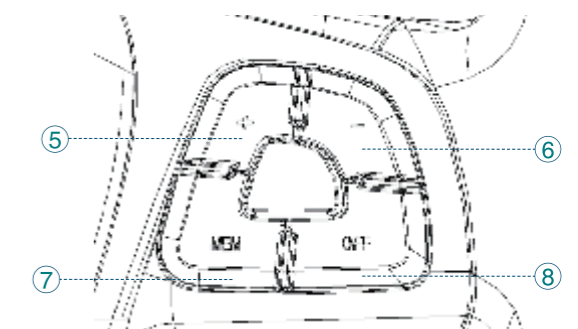
WARNING !

- Service lift differs for different operation methods, and may be shortened because of short synchronizing time. Therefore please use 1 gear for vehicle start.
- Tooth breaking noise is not allowed during engagement and disengagement of reverse gear. If necessary, please extend the time needed for clutch disengagement or check the clutch is completely separated or not.
- Slowly engage the clutch until PTO connect properly.
- Gear shift is not allowed when PTO is working.

2.8 VEHICLE CRUISE CONTROL OPERATION

Vehicle cruise control function condition:

- ◆ The vehicle speed is over 30km/h;
- ◆ Engine is not under the control of external torque;
- ◆ Transmission is in non-neutral state;
- ◆ Clutch pedal is not pushed;
- ◆ Brake pedal is not pushed;



- ◆ During driving, when the vehicle speed exceeds 30km / h, the driver can set the cruise speed by pressing the Set + / - button, so as to make the vehicle enter the cruise mode. The driver can release the accelerator pedal and the vehicle will drive at the set cruise speed. During cruising, the driver can change the cruise target vehicle speed value through Set + / -. When any condition is not met or the driver presses OFF button is pressed, cruise mode will exit automatically. When the conditions are met again, the driver can re-enter the cruise by pressing the MEM button, and the cruise target speed is the last cruise target speed.

2.9 EXHAUST BRAKE OPERATION

◆ Exhaust brake can make the vehicle continuously slow down or stabilize the speed. The exhaust brake can be used to decelerate ahead of time on long slope, car-meeting or passing a poor road section.

◆ The driver presses the rocker switch ①, when the following conditions are met, the vehicle will realize engine exhaust braking:

- Clutch is not pushed;
- Release the accelerator pedal;
- Non-neutral state;
- Engine rotate speed over 800rpm.



WARNING!

- Be careful to use engine exhaust brake on wet, dirty or frozen road, vehicle may slip and slide!
- When vehicle drives on a long slope, as transmission neutral position can not play an auxiliary brake role, exhaust brake shall be used.
- The exhaust brake falls into auxiliary braking other than vehicle parking device. It fails to replace the driving brake system of the vehicle and the driving brake (namely foot brake) shall be used for the vehicle completely stopping.

2.10 RETARDER OPERATION

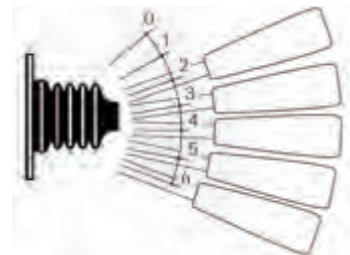
Operating instructions

The right combination switch is the retarder operation handle.

0-gear: Retarder closed.

1-gear: Downhill constant speed function, automatically adjust the braking torque with the vehicle speed.

2-6 gear: Manually set the retarder brake gear.



1-gear : Constant-speed of retarder

- ◆ When the vehicle is going downhill, you can use this function to keep driving at a constant speed (the speed can be set as required).
- ◆ The retarder electronic control unit automatically sets the braking torque required for constant speed driving.
- ◆ When the accelerator pedal is pressed, the downhill constant speed function automatically interrupts. When the accelerator pedal is released again, the current speed is automatically set to the speed at which the constant speed function is started again.

Enable 1-gear (downhill constant speed function):

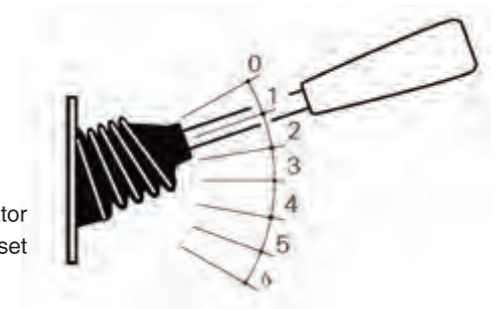
- ◆ Put the retarder handle in gear 1

Cancel 1-gear (downhill constant speed function):

- Press down the accelerator pedal in the first gear (when the accelerator pedal is released, the downhill constant speed function will start again and set at the current speed).

Or

- Turn the retarder handle to 0 or 2-6 (brake gear mode).



- ◆ If the braking force required for downhill driving is greater than the retarder's maximum braking force, use both engine exhaust braking and service braking.

- ◆ If the current speed is less than the set speed, the retarder will not work, once the speed reaches the set value, the retarder begins to work.

2-6 gear

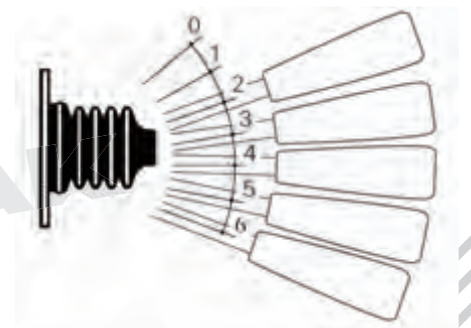
Different fixed braking torque is set in gear 2-6, and the braking force increases from 2-gear to 6-gear.

Enable 2-6 gear:

- ◆ Put the retarder handle in 2-6 gear.

Cancel 2-6 gear:

- ◆ Turn the retarder handle to gear 0 or gear 1 (constant speed downhill function).
- ◆ If the braking force required by the vehicle is greater than the maximum braking force of the retarder, use both engine exhaust braking and service braking.



2.11 ENGINE SPEED MODE KNOB

◆ Many engineering vehicles require the engine should run at a particular speed.

◆ When the vehicle is at rest, the driver can adjust the engine speed within a certain range via the engine speed mode knob ⑨.



◆ The engine speed mode knob ⑨ has 4 positions:

0 position is used to adjust the idling speed,

1 position is used to set the engine speed limit,

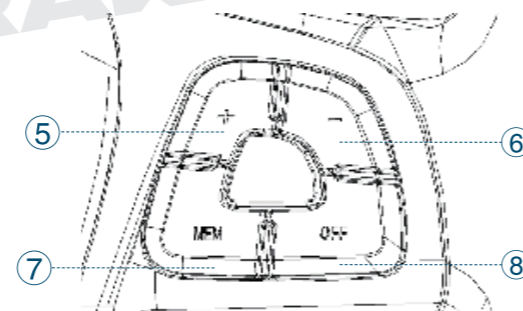
2 position is used to adjust the engine speed,

3 position is used to adjust the outdoor hand throttle speed.

The engine speed adjustment should satisfy the following conditions:

- The engine is running;
- The parking brake is applied;
- Neutral;
- The engine is not under the control of other external electronic control units;
- The vehicle is at a standstill;
- The accelerator pedal is not pressed.

◆ If the above conditions are satisfied, the driver can enter the engine speed adjustment mode via the speed mode knob and Set +/- button.



Adjustment of engine idle speed

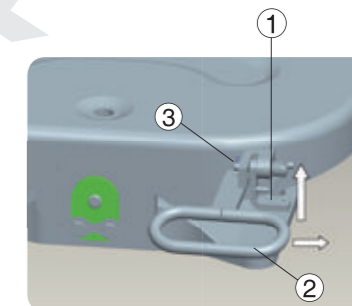
◆ In idle state, the engine speed will automatically increase by 100rpm when the air conditioning is on. When the speed mode knob ⑨ is in 0 position, the engine speed can be increased or decreased via Set +/- button. In 0 position, the maximum engine speed will be 800rpm.

◆ Pressing the MEM button can keep memory of the currently requested engine speed limit and recover the requested engine speed limit saved last time.

2.12 FIFTHWHEEL/SADDLE

Fifth-wheel opening operation

◆ As shown in the figure: rotate the pull bolt positioning block ① up to the horizontal position, and at the same time, rotate the handle ② forward to clamp its quadrilateral slot on the front side of the rectangular slot of the saddle plate.



Check after connection of the trailer

◆ Ensure that the bolt positioning stop ① is back to the shown state and the warning hole ③ is near the outside of the saddle plate, when the saddle is securely locked.

◆ If the positioning stopper ① does not fall to the locking position, or the warning hole ③ is far from the outside of the saddle plate, check whether the saddle is locked.

Connection of the semi-trailer

◆ Park Semitrailer to prevent sliding.

◆ Lift the saddle handle ① up, make the handle into the upper long hole and then pull it out, until the positioning slot on the handle rod is stuck on the saddle housing. At this time, the saddle is in the opening state ready for coupling.

◆ Reverse docking. When the traction pin enters the saddle interface, the lock hook and the lock block will automatically lock the traction pin and complete the docking. At this time, the handle will automatically return to its position, indicating that the docking is correct.

◆ Connect the brake line and electrical connector between the semi-trailer and tractor.

- Connect the compressed air pipeline, pay attention to the pipeline and wire should not be strained, friction and winding in the process of running.

◆ First connect the control line connector (yellow) and then the gas supply line connector (red).

◆ Check whether the function is normal.



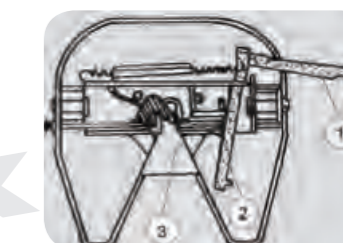
Disconnection of the semi-trailer

1. Check the road condition to prevent the semi-trailer from sliding.

2. Raise the semi-trailer leg (note the road load capacity) until it can support the load removed from the saddle, or use an air suspension to raise the semi-trailer, raise the semi-trailer leg, then lower the semi-trailer until the semi-trailer is fully supported by the leg.

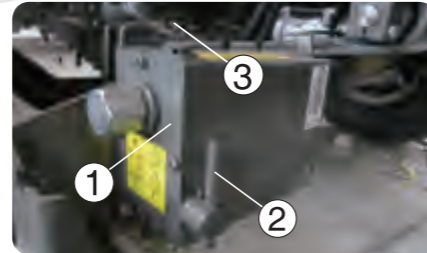
3. Before disconnecting the tractor, semi-trailer or full-trailer should disconnect the brake air supply pipe joint (red) and then the brake control pipe (yellow) in strict order, otherwise the brake of the trailer will be relieved.

4. Pull the saddle handle ① out until it gets stuck on the saddle housing. At this point, the block ② is detached from the lock hook ③. Move the tractor forward, the lock hook ③ rotates, and release the pull pin.



2.13 CABIN ELECTRIC TILTING

- ① Hydraulic hand oil pump
- ② reversing valve
- ③ Oil plug
- ④ Cab lifting tilt switch



Preparation before tilting cab

- ◆ Park your vehicle on a flat surface that does not interfere with other vehicles.
- ◆ Engage parking brake.
- ◆ Put the gear lever in neutral.
- ◆ Turn off engine.
- ◆ Secure loose objects in the cab.
- ◆ Make sure storage bins are empty.
- ◆ Open cab front cover.



Cab tilt operation

- ◆ Press the tilt switch ④ (only for electric lifting), and close the door.
- ◆ Turn the reversing valve ② of the hydraulic manual oil pump to the overturning position of the cab, shake the oil pump ① with the lever (or press the switch ⑤ / only for electric lifting) for tilting operation.

Cab back down

- ◆ Turn the reversing valve of the hydraulic manual oil pump to the back down position of the cab, shake the hand pump (or press the switch ⑤ / only for electric lifting) to turn the cab back.
- ◆ The rubber bellows connected to the upper inlet should be tightly fitted to the lower inlet when the cab falls to prevent dust from entering.
- ◆ Turn off the tilt switch in the cab (only for electric lift).
- ◆ Close cab front mask.
- ◆ Finally, check the lock signal light on the instrument panel. If the cab is not locked, the Lock signal light will be on.



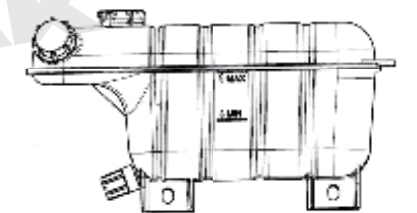
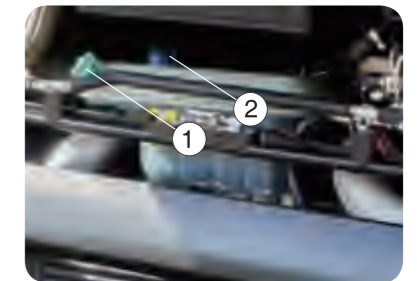
3. CHECK INTRODUCTION

3.1 COOLING SYSTEM: CHECK DAILY

- ◆ The vehicle is parked on the level road with the front mask open.
- ◆ Observe the liquid level of the expansion tank. The height of the coolant liquid level should be located between the high and low marks on the side of the expansion tank.

Refill coolant (if necessary)

- ① liquid filling cover ② pressure limiting valve cover
- ◆ Slowly unscrew the refueling cap counterclockwise to release the cooling system pressure and remove the refueling cap.
- ◆ Turn the warm air temperature regulating button switch to the maximum warm air position.
- ◆ Fill the coolant (see engine maintenance section for coolant type) to MAX
- ◆ Close the refueling cap and screw it tight.
- ◆ Start engine idle for 4 minutes.
- ◆ Check coolant level and replenish coolant if necessary.

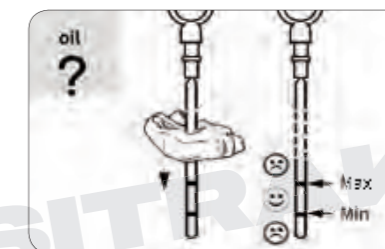


3.2 ENGINE OIL: CHECK DAILY

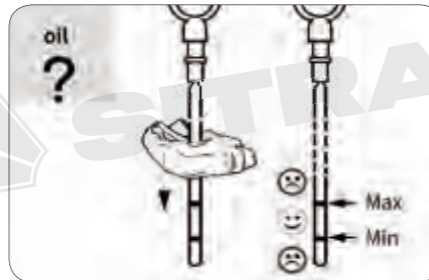
Before starting engine, check engine oil daily.

Engine oil

- ◆ Park the truck on a level road and turn off the engine for 20 minutes before checking the oil level.
- ◆ Open the front cover, pull out the oil ruler ①, wipe the oil ruler with a clean lint-free cloth, insert the oil ruler back into the oil ruler tube, and pull out the oil ruler again.



◆ The oil level of the machine should be between the maximum and minimum mark of the dipstick and not lower than the minimum scale. Multiple checks to determine the low oil level should be filled with oil if lower than minimum.

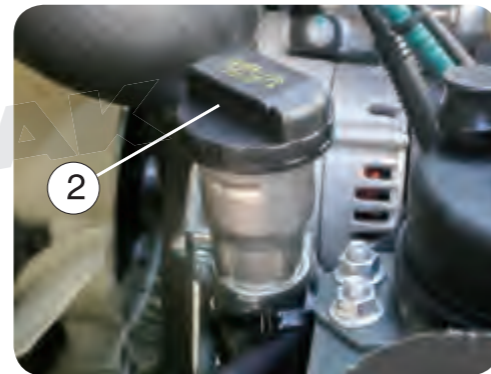


WARNING !

- Do not fill oil above the maximum scale. Too much oil can damage the diesel engine !

Refill the engine oil

1. Turn off the key switch.
2. Tilt cab.
3. Unscrew the refueling cap ② .
4. Fill the oil.
5. Tighten the refueling cover ② .



3.3 AIR DRYER: CHECK MONTHLY

◆ Check the air dryer once a month to see if it is working properly and effectively (or according to the local climate condition, vehicle usage and running condition to check regularly). Open the water discharge valve of the air storage cylinder to check.



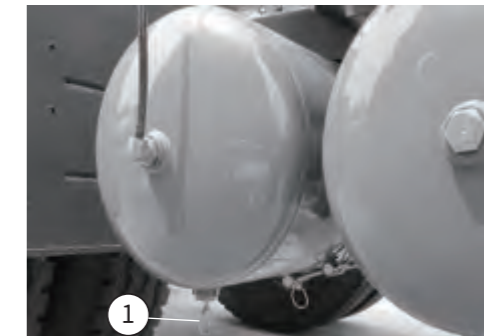
WARNING !

- Protect your eyes and hands when operating the drain valve.
- Check and remove moisture in the air container of brake system.

◆ When truck parked, pull the pull ring ① of the manual water drain valve at the lower part of the air storage tank laterally, the water condensed in the air storage tank can be eliminated.

◆ It is recommended to check the air storage cylinder farthest from the air dryer every day. If there is oil and water mixture discharged from the water discharge valve, it means that the air dryer is invalid. The upper drying tank of the air dryer should be changed immediately.

◆ Replace the drying tank on top of the air dryer at least every 2 years (recommended before winter).



Tire inflation

◆ The tire can be inflated through an inflatable joint installed in the air dryer (or air storage tank), step as followed:

1. Remove the dust cap ① of the inflatable joint.
2. One end of the tire inflating hose is connected to the valve mouth of the tire.
3. Screw the other end of the tire inflating hose to the inflating connector on the air dryer.
4. Speed up the engine.
5. Check tire pressure and adjust it as needed.



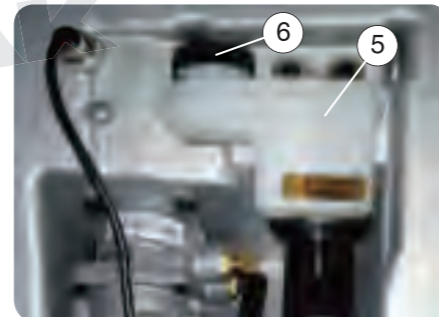
Auxiliary air module

◆ The auxiliary air module is installed at the frame (generally located inside the longitudinal) unscrew the ② or any blockage shown in the figure, and the quick plug is equipped to take air.

3.4 CLUTCH: CHECK MONTHLY

Check the level of brake fluid

- ◆ The vehicle should be parked on the level road, open the front mask of the cab, and check the brake fluid level in the clutch oil tank ⑤. The level should be between the MAX and MIN mark.
- ◆ If necessary, unscrew the tank cap ⑥ and add DOT3/DOT4 brake fluid.



WARNING !

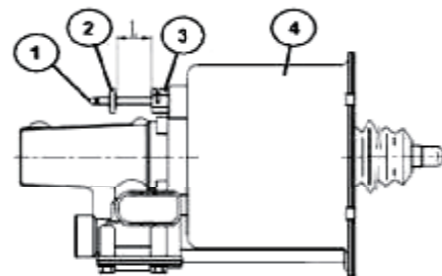
- If the oil level in the tank drops below the MIN mark, the clutch control device will not work properly.

Check the clutch system cable

- ◆ Check whether there is leakage of air and fluid in the clutch system cable.

Check wear indicator

- ◆ Check the wear indicator ② to determine whether the clutch driven plate needs to be replaced.
- ◆ Clutch wear indicator is located in the clutch power cylinder ④ above the valve body, by observing the indicator plate ② position can know whether the clutch driven plate is worn to the limit, so as to replace the driven plate in time. The clutch wear indicator is used to match the model of the pull clutch.
- ◆ With the wear of the clutch disc, the gap L between the measuring rod seat ③ and the indicator plate ② will gradually increase. When $L=23\text{mm}$, the driven plate needs to be replaced.
- ◆ After the initial installation of the clutch power booster cylinder ④ or the replacement of the clutch driven plate, the indicator plate ② shall be pushed along the measuring rod ① to contact the measuring rod seat ③, this is initialization. Do not move the indicator ② during normal use of the vehicle.



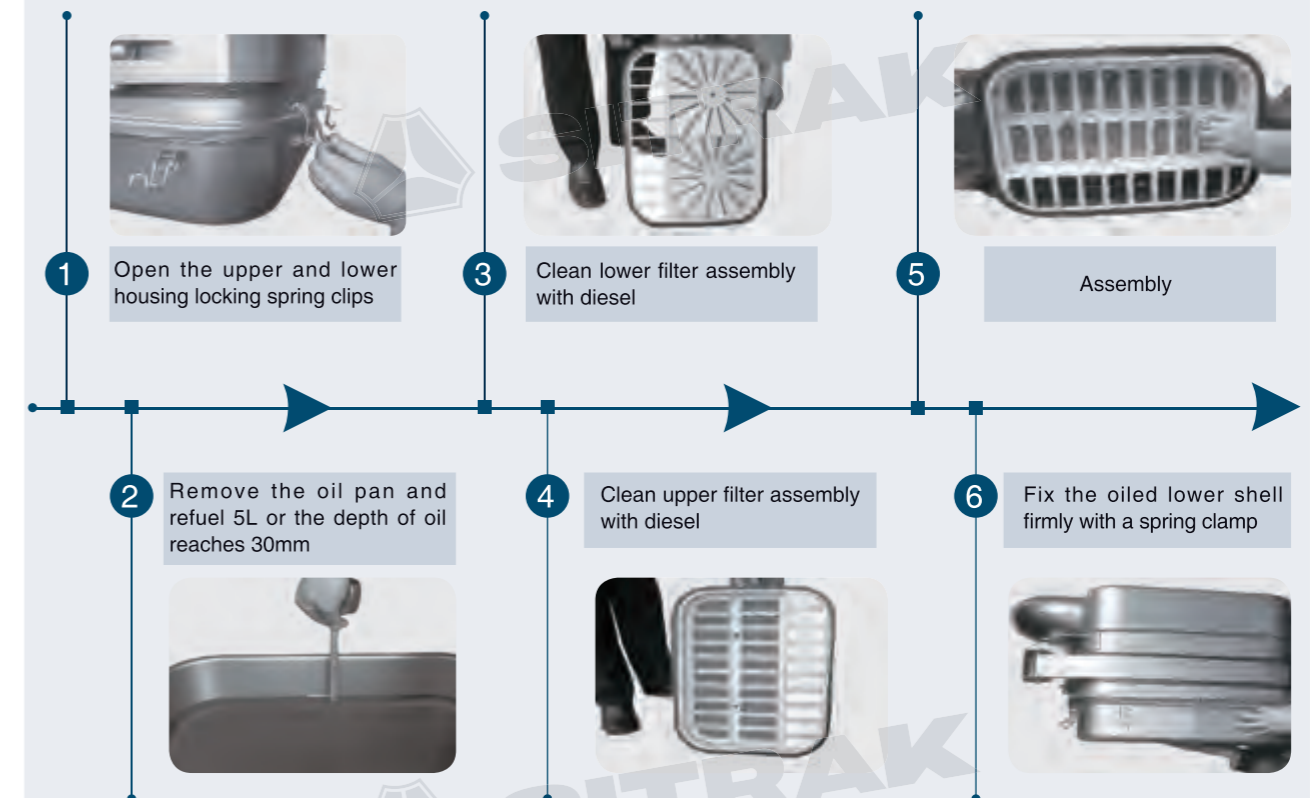
3.5 OIL-BATH TYPE AIR CLEANER



WARNING !

- Oil should be filled with the same as engine oil before vehicle used!
- When filling the oil, the oil depth shall not exceed 30mm or the filling amount shall be 5L, and shall not be excessive.
- When shaking the pan and the oil is not easy to flow, clean the filter and replace the oil.

Disassembly, inspection and cleaning steps:



3.6 OTHER NOTES

- ◆ Please do not slide in neutral when the vehicle is downhill. When taking braking deceleration better use exhaust brake at the same time. When the vehicle is loaded, exhaust brake can also be operated to assist vehicle deceleration.
- ◆ When parking for a long time, it should turn off the engine and should turn off the main power switch and use parking brake at the same time, to avoid accidents.
- ◆ Unauthorized modification and installation of all kinds of equipment are prohibited, especially the electronic, braking, steering and other safety related systems, otherwise it may affect the life and safety performance of the vehicle, resulting in accidents, fire, damage to the vehicle, our company will not be responsible for the consequences. Disassembly or replacement of the engine ECU is strictly prohibited, otherwise the vehicle may be damaged.
- ◆ Open the front cover before tilting the cab.
- ◆ Cut off the main power switch and unplug the plug of electrical components (BCU, instrument, engine ECU, ABS control unit) when welding work is performed in or near the vehicle.
- ◆ Do not flush the engine with water because this can short-circuit the engine electrical system and damage the ECU.
- ◆ The cooling system uses the antifreeze and antirust coolant. It is not allowed to mix the coolant of different grades/type. If different grades of coolant are applied, the engine cooling system components need to be thoroughly cleaned.
- ◆ The moisture condensed in the air cylinder should be discharged in time to prevent freezing. And pay attention to check the working condition of the air dryer. Under normal working condition, the using life of the desiccant in the dryer is two years. If it is found that there is polluted water discharged from the air storage cylinder, the desiccant has failed, and the desiccant should be replaced immediately.
- ◆ Check the level and specific gravity of battery electrolyte every three months. The electrolyte level should be 10-15mm higher than the battery lead plate, Specific gravity is above 1.24g/cm³. If the vehicle is not used for a long time, and the temperature is low, it is best to remove the battery and put it into a warmer room. Every time the vehicle travels 5000km, it should check whether the clamp between the electrode pile and the wire of the battery is loose and whether the battery works normally.
- ◆ Keep good driving habits, avoid long time or sudden braking of the vehicle, otherwise it will have bad affect to the using life and fuel economy of the vehicle.



汕德卡 C7H 车辆驾驶员手册

English version: Page 01-32

中文版：第 33-62 页 

目录

1

1、基础介绍

1.1 驾驶室概览	35
1.2 仪表盘	36
1.3 翘板开关和按钮	37
1.4 检测灯和报警灯	38
1.5 气压显示	40

2

2、操作介绍

2.1 发动机启动	40
2.2 空调系统	41
2.3 牵引准备 (拖车)	42
2.4 变速箱	43
2.5 差速锁操作	51
2.6 左右后视镜的调整	52
2.7 取力器的操作	53
2.8 巡航的操作	53
2.9 排气制动操作	54
2.10 缓速器操作	54
2.11 发动机转速模式旋钮	55
2.12 鞍座	56
2.13 驾驶室电动举升	57

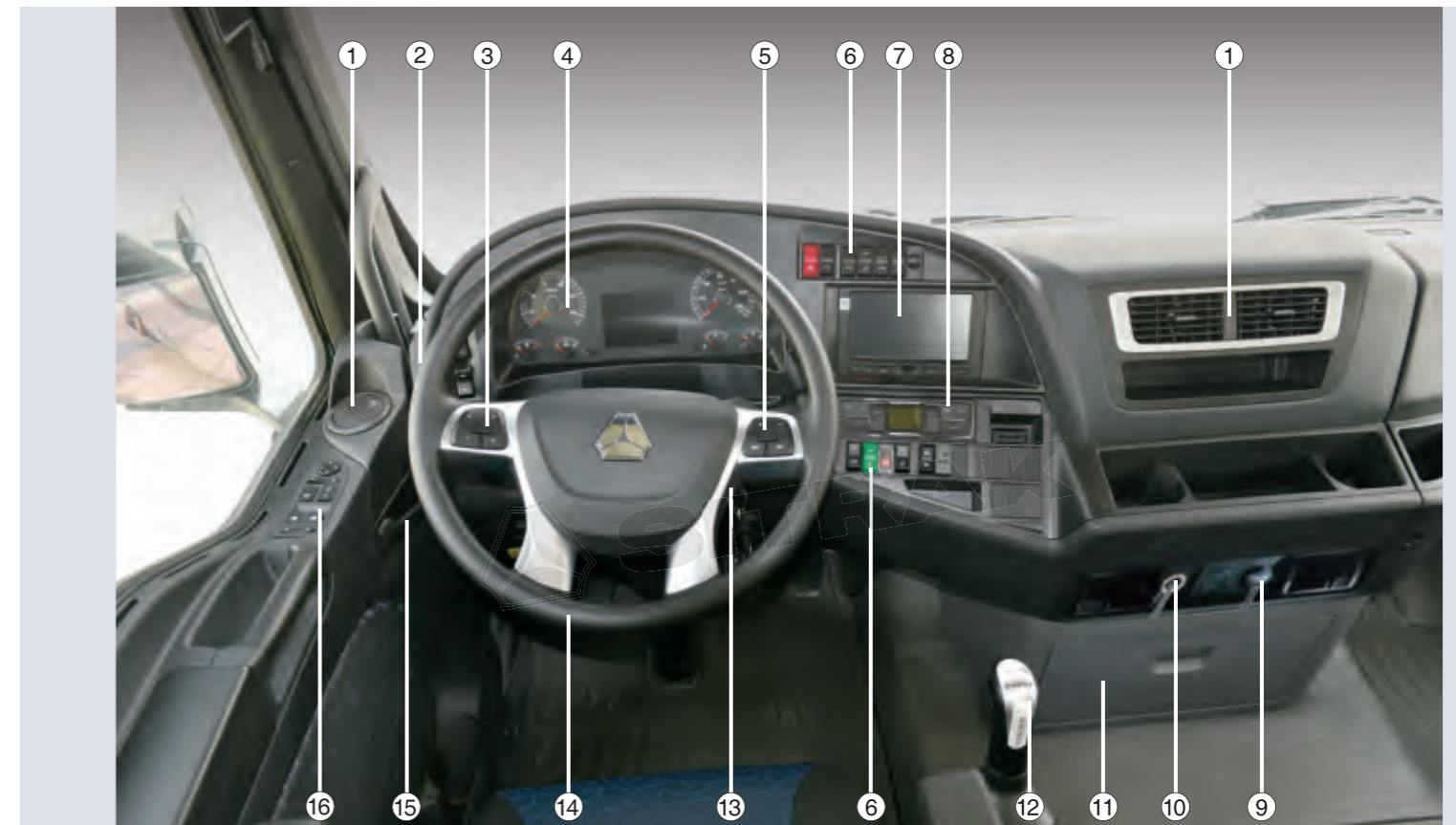
3

3、检查介绍

3.1 冷却系统	58
3.2 发动机机油	58
3.3 空气干燥器	59
3.4 离合器	60
3.5 油浴式空气滤清器	61
3.6 其他注意事项	62

1. 基础介绍

1.1 驾驶室概览



1	通风口
2	左组合开关
3	方向盘左侧按键
4	仪表盘
5	方向盘右侧按键
6	翘板开关
7	MP5 播放器 / 智能通
8	空调控制面板

9	24V 插座
10	点烟器
11	储物盒
12	变速器操纵手柄
13	右组合开关
14	方向盘
15	车门把手
16	车门控制面板

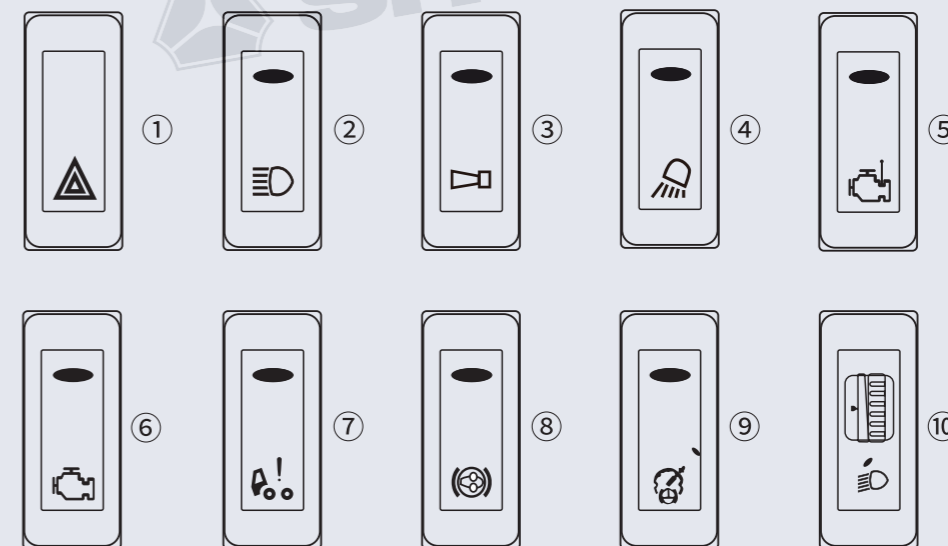
1.2 仪表板



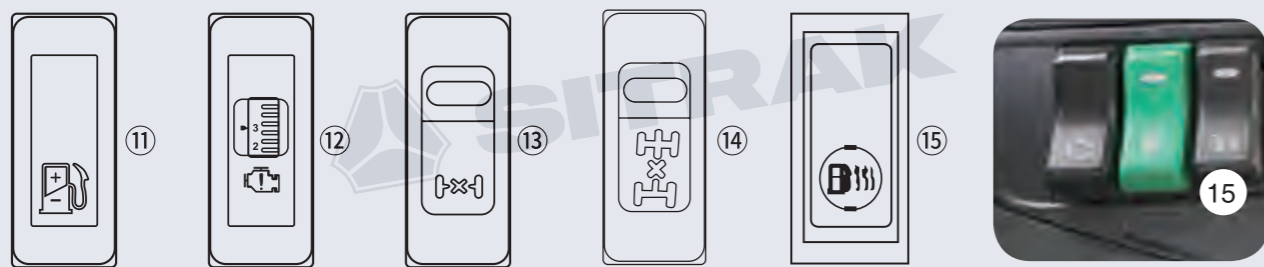
1	发动机转速表
2	检测灯和指示灯
3	车速表
4	电压表
5	燃油表

6	按键 1
7	驾驶员显示屏
8	按键 2
9	气压表
10	水温表

1.3 翘板开关和按钮



- ① **危急报警开关:** 按下开关, 所有转向灯都会闪烁, 仪表上的转向指示灯同时闪烁。
- ② **辅助远光灯开关:** 当远光灯打开时, 按下该开关, 打开辅助远光灯。
- ③ **喇叭转换开关:** 开关不工作时, 按方向盘上的喇叭按键, 电喇叭鸣响; 按下开关后, 按方向盘上的喇叭按键, 气喇叭鸣响。
- ④ **工作灯开关:** 按下开关, 打开驾驶室后面的工作灯。
- ⑤ **发动机取力开关:** 按下开关时, 可以通过调节 PTO 旋钮调节发动机转速。此时油门踏板将不起作用。
- ⑥ **发动机诊断开关:** 按下开关, 可读取仪表上的发动机故障指示灯闪码, 然后查找故障闪码表, 可知道目前发动机系统存在的故障。
- ⑦ **驾驶室翻转开关:** 按下开关, 将举升油泵置于上升或下降状态, 按下驾驶室外部的举升按钮, 实现驾驶室电动举升或下降。
- ⑧ **排气制动开关:** 按下开关, 当排气制动条件满足时, 车辆实现排气制动功能。
- ⑨ **智能制动请求开关:** 默认智能制动处于激活状态, 开关上工作指示灯点亮。此时司机踩下制动踏板, 若排气制动条件满足, 则排气制会与行车制动同时工作。按下智能制动开关, 关闭智能制动功能, 开关上工作指示灯熄灭。
- ⑩ **大灯光束调节旋钮:** 将位置灯和近光灯点亮, 然后通过调节此旋钮对近光灯的光束进行上下调节。



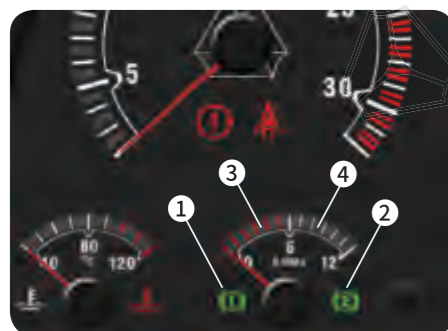
- ⑪ **节油开关**: 按下开关, 可以根据车辆配置自动确定最高行驶车速, 发动机运行更为柔和, 使车辆最大限度地行驶在经济条件下。
- ⑫ **发动机转速模式旋钮**: 按下开关, 可在一定范围内对发动机转速进行调整。操作使用说明详见 2.11 发动机转速模式旋钮。
- ⑬ **轮间差速开关**: 按下开关, 轮间差速锁结合。操作使用说明详见 2.5 差速锁操作。
- ⑭ **轴间差速开关**: 按下开关, 轴间差速锁结合。操作使用说明详见 2.5 差速锁操作。
- ⑮ **燃油加热开关**: 按下此开关激活燃油粗滤器加热功能。

1.4 检测灯和报警灯

编号	描述	符号	颜色	编号	描述	符号	颜色
1	主车左转向指示		绿	10	制动系统故障		红
2	挂车左转向		绿	11	空气悬架		红、黄
3	挂车右转向		绿	12	缓速器报警		红、黄
4	主车右转向指示		绿	13	近光灯		绿
5	机油压力报警		红、黄	14	低冷却液液位		红
6	故障警示符		红、黄	15	昼间行驶灯		绿
7	发动机故障报警灯		红、黄	16	驾驶室锁止		红
8	紧急停车	STOP	红	17	取力器 1		红、黄
9	驻车制动	(P)	红	18	取力器 2		红、黄

编号	描述	符号	颜色	编号	描述	符号	颜色
19	低尿素液位		黄	38	低(高)电压报警		红
20	ASR 工作指示		黄	39	空滤器堵塞		白
21	提升桥		绿	40	排气制动		白
22	前雾灯		绿	41	进气预热		白
23	巡航		绿	42	燃油进水		白
24	远光灯		蓝	43	缓速器工作		白
25	主车 ABS 报警		黄	44	自适应巡航		白
26	挂车 ABS 报警		黄	45	保养提示		黄
27	后雾灯		黄	46	ESC 有效		黄
28	位置灯		绿	47	坡起		黄
29	排放超标报警		黄	48	胎压报警		黄
30	发动机超速		红	49	ESC 关闭		黄
31	安全带故障		红	50	自适应前照灯		黄
32	车辆超速		黄	51	自适应巡航系统故障		红
33	低挡		绿	52	碰撞紧急预警状态激活		红
34	冷却液温度高		红	53	燃油滤清器堵塞		红
35	气压指示 1		绿	54	DPF 积碳指示灯		黄
36	气压指示 2		绿	55	DPF 主动再生指示灯		黄
37	燃油低		黄	56	前轴制动器磨损报警		黄
	低 CNG		黄	57	后桥制动器磨损报警		黄
	低 LNG		黄				

1.5 气压显示



◆在通常情况下，气压表显示气压较低回路的压力值。通过仪表板下方的气压切换按键可以显示另一气压较高回路的气压值，10 秒钟之后会自动切换显示为气压较低回路的压力值。

气压表上①表示后桥，制动回路 I 压力情况；

气压表上②表示前桥，制动回路 II 压力情况；

气压表指针位于红色区域③：气压太低，气压报警指示灯会点亮；

气压表的指针位于白色区域④：气压正常。



注意!

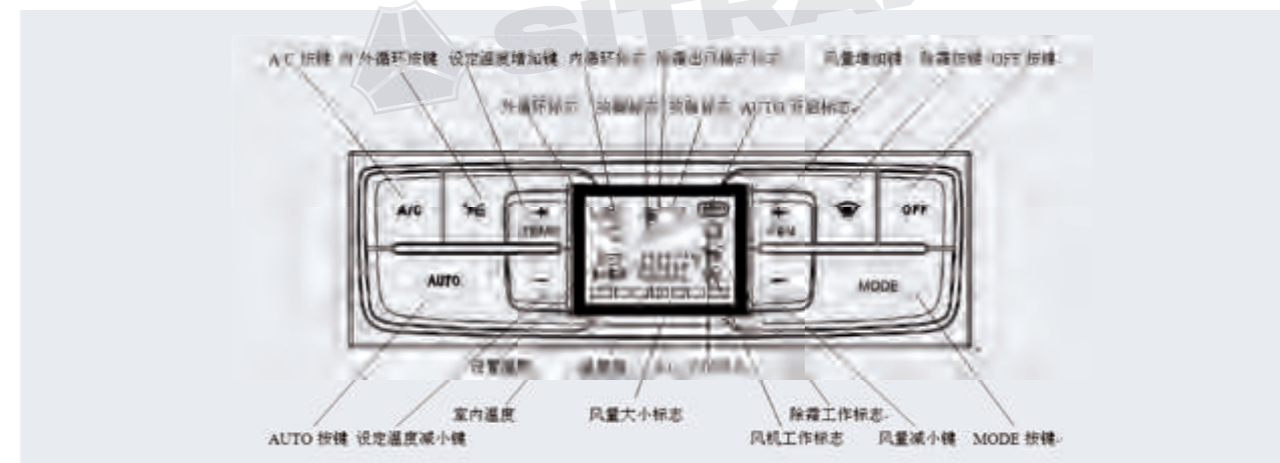
- 如果气压过低 (低于 0.55MPa) 报警灯点亮。应等到报警灯熄灭且显示警示信息消失之后，车辆方可起步。
- 起步后，在路况良好的干燥路面上尽快测试一下制动功能（行车制动和驻车制动）！
- 确保踏板操纵区域内无异物。

2. 操作介绍

2.1 发动机起动

1. 第一次起动时，发动机未发动，需重新将钥匙起动开关置于 2 挡，重新起动。每次起动时间不大于 15 秒，两次起动时间间隔不少于 30 秒。
2. 不得使冷发动机以高速运转！如果发动机起动后机油压力表无显示，应立即熄火检修。
3. 发动机起动时应怠速运转 3 ~ 5 分钟，不能猛轰油门，待机油压力和油温正常后方可施加负荷（特别是冷天启动），否则易使增压器轴承、密封环因缺油而早期磨损。
4. 发动机熄火时，应怠速运转 3 ~ 5 分钟，待增压器转速降低后方可熄火。特别注意熄火前不要猛轰油门。因为猛轰油门会因发动机转速骤然提高而使增压器达到较高的转速，此时突然熄火，机油泵立即停止供油，增压器转子却因惯性还在继续高速运转，转子轴、轴承和密封环因缺油将很快烧损。
5. 长期停机的发动机重新起动前，一定要先将增压器预润滑。可通过拆卸增压器进油管，从进油口倒入适量干净润滑油来实现，否则初次起动会因缺油而早期磨损。
6. 严禁在未关闭钥匙起动开关或其它带有唤醒功能的输入电源时，切断电瓶和中央控制单元之间的电路连接！否则不仅可能在硬件上损坏整车各系统的电控单元、线束和电子电器元器件，更有可能导致系统数据丢失，造成车辆无法使用的严重后果！
7. 当所出现的故障性质很严重时，严重故障报警指示灯“STOP”灯亮，在发动机工作时蜂鸣器将会持续报警。此时应立即停车检查，在排除故障后才允许继续前行！否则可能会发生生命财产损失！

2.2 空调系统



空调控制系统自检及错误修补功能

◆自检条件：

温度设定为 28°C 后 3 秒内，同时按 3 次 MODE 按键及 AUTO 按键，3 秒后控制面板进入自检程序。

◆故障码显示方式：

车内、外温度传感器故障时，屏幕闪烁故障代码，提示驾驶员传感器故障。系统只允许在 HI 和 LO 两种状态工作。

蒸发器温度传感器故障时，如果 AC 正在工作，则每隔 1.5 分钟闪烁故障代码 30 秒提示驾驶员，此时驾驶员应关闭空调，并到中国重汽服务站进行维修，以免蒸发器结冰。

◆强制自检自动退出方式：

显示结束后自动退出。

车辆重新起动或按 OFF 开关。

退出后的工作界面：设定温度为 25°C，在 AUTO 模式下运行。

◆故障代码定义：

00	正常	05	模式电机 2 错误 (断路)
01	车内温度传感器错误 (短、断路)	06	混合电机错误 (断路)
02	车外温度传感器错误 (短、断路)	07	蒸发器温度传感器错误 (短、断路)
03	CAN 通讯错误	08	水阀电机错误 (断路)
04		09	模式电机 1 错误 (断路)

2.3 牵引准备 (拖车)

牵引前，断开传动轴。



注意!

- 无液压助力时，尝试对静止车辆进行转向会导致转向系统损坏!
- 只有在车辆移动时，可以在无液压助力情况下转向。
- 如果发动机停止，由于液压助力失效，需要在方向盘上施加更大的力，应缓慢牵引车辆。
- 如果制动系统气压不足而且弹簧制动启动，可以引入外部压缩空气（至少 0.55MPa）或机械手段解除，应注意此后车辆无制动!

弹簧储能制动气室—紧急解除

◆ 当驻车制动回路气压低于 0.55MPa 时，作用于制动气室膜片压力小于储能弹簧力，弹簧储能制动起作用。同时“STOP”、制动系统故障灯①和驻车制动灯②同时点亮。

◆ 紧急情况时或在维修站可以通过对弹簧储能制动气室进行气动或机械手段解除。



注意!

- 解除弹簧储能制动气室之前，确保汽车不能自行移动!
- 在紧急情况或服务站维修时，方可对弹簧储能制动气室紧急解除。
- 紧急解除弹簧储能气室之后，因为行车制动回路 I 和回路 II 气压不足以保证有效的制动，车辆行驶过程中容易造成事故。
- 在驻车制动信号灯熄灭之前切勿开动汽车。

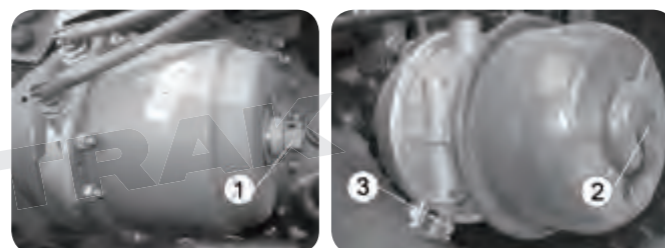
弹簧储能制动气室—机械紧急解除

◆ 膜片弹簧制动气室

当连接弹簧储能制动气室管路因泄漏而造成自行制动时，只要将制动气室后端的螺栓①拧出到解除位置，即可解除制动。

◆ 双膜片弹簧制动气室

打开双膜片弹簧制动气室后端盖②，用螺栓③从后端盖插入后手动拧出，即可解除制动。



2.4 变速箱

2.4.1 ZF16 手动挡

◆ ZF-Ecosplit 16 挡变速器由四挡主箱、高低挡部分和半挡组部分组成。



四挡主箱

- 同步器式，倒挡结合套式。
- 手动换挡（旋转轴控制式）。
- 双 H 挡位。
- 伺服换挡。

高低挡，在变速器后端

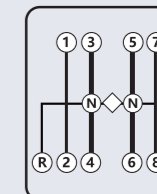
- 同步器换挡。
- 双 H 挡位；换挡手柄在 3/4 和 5/6 挡位置间移动时，自动切换（气动）。

半挡组，在变速器的前端

- 同步器换挡。
- 通过操作换挡手柄上的预选阀气动换挡，然后操作离合器。

◆ 挡位说明 (双 H 挡位)

◇ 自动切换 R 倒挡 N 空挡
1~4 低挡区 5~8 高挡区



2.4.2 ZF-TraXon 变速箱

◆ 换挡手柄加旋钮开关



- ⊕ 加两挡
- ⊕ 加一挡
- S 搜索功能
- ⊖ 降一挡
- ⊖ 降两挡
- MA 手动 / 自动模式切换



- RM 倒挡半联动
- R 倒挡
- N 空挡
- D 前进挡
- DM 前进挡半联动

显示

A/M	自动模式 / 手动模式
N	空挡
D/R	空挡
DM/RM	前进挡
△	升挡


起动发动机

- ◆ 实施驻车制动。
- ◆ 旋转开关①位于“N”（变速器空挡位置）。
- ◆ 钥匙开关置于 ACC 挡。
 - 变速器系统自检。
 - 当驾驶员信息系统中显示“N”时，自检完成。变速器位于空挡位置。
- ◆ 起动发动机。


起步，前行

- ◆ 起动发动机。
- ◆ 将旋转开关从“N”旋至“D”挡。
 - 驾驶员信息系统显示已挂入的起步挡。（系统自行选择起步挡，离合器保持分离状态）
- ◆ 踩下加速踏板，同时松开驻车制动。
 - 车辆起步（离合器自动接合）。行驶期间，挡位在驾驶员信息系统中以数字形式显示。



- 发动机停止时，无法换挡，可换至空挡。
- 在未踩下加速踏板时车轮也可能开始滚动，因此仅可在挂挡后解除行车 / 驻车制动。

坡路起步
调整起步挡

- ◆ 驾驶员可调整系统建议的起步挡，进行调整：
- ◆ 将换挡手柄拨向“-/-”或“+/+”。
- 驾驶员信息系统显示已挂入的起步挡。



- 在坡路起步时，车轮可能向后滚动，应先挂挡并且仅在踩下加速踏板后，方可解除驻车制动。

蠕动模式（离合器半联动）

- ◆ 在缓慢行驶时可使用蠕动模式。
- ◆ 蠕动模式里汽车的加速踏板更加敏感，与常规状态相比，离合器的控制发生了变化。

当旋转开关处在 D 或 R 位置时通过加速踏板蠕行

- ◆ 系统可根据行驶踏板的位置和缓慢的行驶速度识别出蠕行需要。
- ◆ 前两个前进挡以及前两个倒挡可用于蠕动模式（取决于车型，可能仅第 1 个挡位和一个倒挡）。
- ◆ 在其他挡位上，蠕行状态无效。

下坡滑行
前提条件：发动机运行

- ◆ 在已挂入挡位的情况下，解除驻车制动并且车辆开始滑行，则离合器将自动接合，只要挂入挡位与车辆的滑行方向相符，就无需操作油门踏板。
- ◆ 如果已挂入挡位和车辆的滑行方向不相符，则可选择使离合器分离，或反复使其轻微接合和分离。驾驶员将收到驾驶员信息系统的警告。
- ◆ 如果在解除制动后 - 变速器处于空挡位置 - 车辆向前滑行，并且驾驶员将挡位从“N”切换至“D”，则系统将会选择一个适合行驶速度的挡位。

运动模式切换：自动模式 / 手动模式

- ◆ 即便在行驶过程中也可随时切换。
- 例如：阻止某一运行模式（如自动模式）的故障反应处于激活状态。

操作模式从手动切换至自动

- ◆ 将换挡手柄向左按。

操作模式从自动切换至手动

- ◆ 将换挡手柄向左按或按向“+ / +”或“- / -”。
- 根据车型的不同，可在一段设定的时间之后返回到自动运行模式。


注意!

- 如果车辆在未挂挡的情况下 - 旋转开关位于“N” - 滑行，则发动机制动器不起作用!
- 不得使车辆在与所挂挡位相反的行驶方向滑行。

换挡

在自动运行模式下换挡

- ◆ 所有升挡、降挡均自动进行。
- ◆ 这项功能取决于： - 行驶阻力 - 负载 - 加速踏板位置 - 速度 - 发动机转速。

在手动运行模式下换挡

- ◆ 将换挡手柄拨向“- / -”或“+ / +”。 - / + 切换一个挡； - / + 切换两个挡。
- ◆ 进行手动换挡时，换挡系统退出自动运行模式。将换挡手柄向左按则可重新激活自动运行模式。
- ◆ 驾驶员可随时使用旋转开关从任何挡位换至空挡。该换挡要求具有优先权。
- ◆ 在换挡过程中无需改变加速踏板的位置。
- ◆ 如果换挡将导致超出发动机最大允许转速，则不执行换挡指令，或切换至（另）一个合适的挡位。
- ◆ 仅可挂入某一挡位（选择“D”）则可使传动系重新接通。


注意!

- 在行驶过程中也可切换至“空挡”。若切换至“空挡”，则传动系中断。发动机制动器不再起作用。
- 如果车辆在未挂挡的情况下 - 旋转开关位于“N” - 滑行，则发动机制动器不起作用!

倒车

立即将车辆停止。

挂入倒挡

- ◆ 车辆必须处于静止状态。
- ◆ 将旋转开关转到“R”或“RM”。
- R 或 RM 显示在驾驶员信息系统上（离合器保持分离状态）。
- ◆ 踩下加速踏板，同时解除制动（离合器自动接合）。
- 车辆倒车。


注意!

- 车辆滑行时无法切换至倒挡!

转换行驶方向

倒行“R/RM”至前行“D/DM”以及相反过程。

- ◆ 将旋转开关从“R/RM”转至“D/DM”。


注意!

- 仅在车辆静止状态下，通过将旋转开关位置从 R/RM 换至 D/DM 或相反操作完成行驶方向的改变，否则变速器根据车辆速度换至空挡。

2.4.3 中国重汽第二代手自一体变速箱



自动功能 (A 功能)

- ◆ 自动功能为控制系统默认的操作功能。
- ◆ 自动功能下，驾驶员只需要通过换挡手柄选择起步挡位。起步挡位包括前进挡、倒挡或空挡。行车过程中变速器控制系统会根据当前车况自动选择最合适的挡位。驾驶员也可以在自动功能下通过手柄干预换挡操作。

手动功能 (M 功能)

- ◆ 手动功能下任何换挡请求都应由驾驶员发出，驾驶员决定换挡时机，但离合器由系统控制自动完成相关动作。

A/M 功能选择

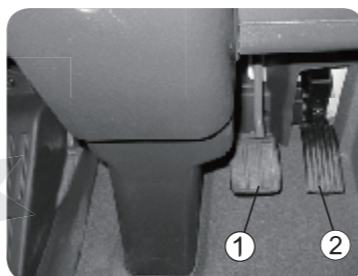
- ◆ 驾驶员可以通过手柄上的按键①实现手动与自动功能的切换。
- ◆ 仪表盘上的显示屏会实时显示变速器当前的工作模式。
- ◆ 系统默认的操作模式为自动功能。驾驶员可在起步、行车过程中随时进行 A/M 功能的切换。

车辆起步

- ◆ 选择合适起步挡位（控制系统只允许在挂 1~8 挡起步，推荐在 1~4 挡起步）。
- ◆ 轻踩油门踏板，车辆起动。
- ◆ 松开驻车制动器。
 - 当需要挂中怠速模式起步时，请保持当前挡位为空挡，然后，再挂入起步挡，踩油门，松开驻车制动器，然后行车。在此模式下，只能运行在 1~4 挡。当不需要 C 模式时，请再按下 C 键，即可退出。
 - 当需要挂高怠速模式起步时，请保持当前挡位为空挡，然后持续按下 C 键 5 秒以上，再挂入起步挡，踩油门到底，然后行车。车辆正常起步后高怠速模式自动，无需再按下 C 键。

蠕行模式

- ◆ AMT 系统提供了蠕行模式，可使车辆在某些特定工况下缓慢行驶。
- ◆ 驾驶员通过双击柄上的 M/A 按键，切换至 M 模式，踩制动踏板挂起步挡，挂挡成功后松开制动踏板，车辆缓慢移动；蠕行过程中可以手动升挡（最高升到 5 挡）；蠕行过程中可以踩油门踏板加速，松开油门踏板继续蠕行模式；也可以踩制动踏板减速或停车，松开制动踏板继续蠕行模式。
- ◆ 蠕行模式支持 1-5 挡及 R1 挡，驾驶员可根据工况自行选择挡位，踩油门踏板及切换挡位不会退出蠕行模式，仅手动切换到 A 模式可以退出蠕行模式。



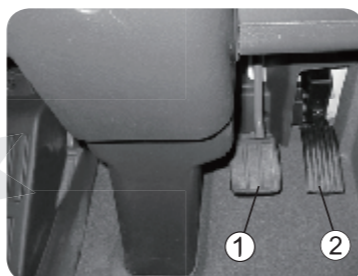
行车过程自动模式下的操作

升挡和降挡

- ◆ 行车过程中，油门踏板②影响发动机转速、扭矩和整车的速度。AMT 会自动根据当前发动机转速等信息计算并挂入合适的挡位。踩制动踏板后车辆会降速，控制系统会自动选择适合车辆运行的最佳挡位。

加速

- ◆ 要使车辆获取最大限度的加速能力，可以将油门踏板②踩到底。驾驶员可按如下步骤操作：
 - 切换到 P 模式。
 - 将油门踏板②踩到底。
 - 控制系统将保持当前挡位或选择一个较低的挡位运行。
 - 此后车辆获得足够动力，车速会迅速提高。



减速

- ◆ 要使车辆减速，踩下制动踏板①或者松开油门踏板②，车辆就会降速。

自动模式下的手动换挡

- ◆ 行车辆在自动模式时，驾驶员可以通过手柄操作对自动模式进行干预。在自动模式下向前推手柄①将升挡，向后推手柄①将降挡。
- ◆ 只有车辆的运行环境满足换挡需求，自动模式下手柄动作才能实现换挡。自动模式下手柄动作能影响自动模式运行，但是并不会解除自动模式，不会将变速器运行模式切换到手动模式。



行车过程手动模式下的操作

- ◆ 要手动模式下任何换挡动作都应由驾驶员发出，但离合器由系统控制自动完成相关动作。
- ◆ 只有车辆的运行环境满足换挡要求才能实现换挡。如果当前发动机转速达不到目标挡位所需转速，控制系统会根据当前转速切换到一个合适的挡位而不一定是目标挡位；若当前运行环境控制系统不允许换挡，会发出警告声音表明驾驶员的换挡请求被拒绝。

升挡操作

- ◆ 根据当前的交通环境，换挡时如果没有特殊情况请不要改变当前油门踏板位置。
- ◆ 驾驶员向前推手柄时，不按下功能键①（手柄左侧圆按键 F）时发出至少升一个挡位的换挡请求，按下功能键时发出升一个挡位的换挡请求。显示屏上目标挡位停止闪烁时表明换挡成功。
- ◆ 只有车辆的运行环境满足换挡要求才能实现换挡，若当前运行环境不允许换挡，车辆会发出警告声音提示无法升挡。



减挡操作

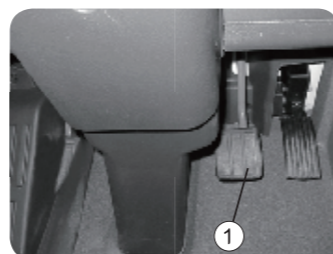
- ◆ 行根据当前的交通环境，换挡时如果没有特殊情况请不要改变当前油门踏板位置。
- ◆ 驾驶员向后推动手柄时，不按下功能键①（手柄左侧圆按键 F）时发出至少降一个挡位的换挡请求，按下功能键时会发出降一个挡位的降挡请求。驾驶员显示屏上目标挡位停止闪烁时表明换挡成功。
- ◆ 只有车辆的运行环境满足换挡要求才能实现换挡。

从空挡挂合适挡位

- ◆ 要当车辆行驶中，变速箱处于空挡位置，通过换挡手柄可以换到合适的挡位。
- ◆ 换到更高的最佳的挡位：向前推动手柄，当驾驶员显示屏显示目标挡位并且停止闪烁时，换挡过程完成。
- ◆ 换到更低的最佳的挡位：向后推动手柄，当驾驶员显示屏显示目标挡位并且停止闪烁时，换挡过程完成。

减速停车

- ◆ 停车时请踩下制动踏板①。制动完毕松开制动踏板时控制系统会自动降挡。车辆停稳后拉下手制动。
- ◆ 停车后车辆仍然在挡位上，停留 90 秒如果没有其他动作会自动回空挡，踩制动停车后拉下手制动。



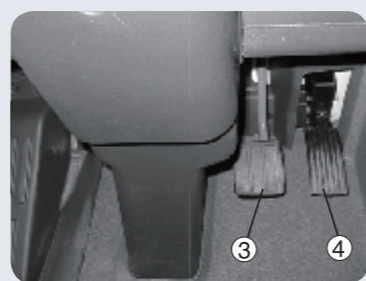
挂空挡

- ◆ 若需要长时间停车，请把变速器切换到空挡位置以保护离合器。按下空挡按键②（手柄右侧圆按键 N），显示屏显示空挡符号 N 时表示回到空挡。



挂倒挡

- ◆ 车辆只能在车辆停止状态下从空挡切换到倒挡。需要倒车时请按以下步骤操作：
 - 先将变速器切换到空挡。
 - 按下功能键①（手柄左侧圆按钮）并且往后推动手柄②。显示屏上目标挡位停止闪烁时表明换挡成功。向后推一次手柄②为倒 1 挡，若需要其他挡位倒车，换挡操作方式与手动换挡方式相同。
 - 松开制动踏板③和手刹，并轻踩油门踏板④开始倒车。



爬挡模式 (C)

- ◆ 系统提供爬挡模式来满足 AMT 系统在一些特殊工况下低速行驶的需要。
- ◆ 按动手柄上的按键 C 启动爬挡模式，再次按动手柄上的按键 C 会取消爬挡模式。
- ◆ 爬挡模式 (C) 设置起步挡位（在停车时从空挡挂起步挡）为 1 挡，起步挡位可以通过手柄操作在 1 ~ 4 挡之间切换。
- ◆ 车辆行驶过程中，不论是在手动模式还是自动模式下，只能在 1 ~ 4 挡位之间切换，即爬挡模式下最高挡位被限定为 4 挡。若行驶中挡位高于 4 挡，则控制系统不允许进入爬挡模式。

2.5 差速锁操作

在驶入坏路或不结实路面前，为防止后轮单个轮胎打滑，可以在短时间地使用差速锁。接合差速锁时，车辆应静止或缓慢直行。

1. 只有在车辆直线行驶时，才能使用轮间差速锁！

2. 轮间差速锁啮合— 4x2, 6x2 车辆

- ◆ 松开油门踏板，减速至车辆停止或相当于人步行的速度，
- ◆ 按下轮差开关①，
- ◆ 后桥轮间差速锁啮合，
- ◆ 轮间差速锁指示灯点亮，
- ◆ 小心踩油门踏板然后缓慢加速。



差速锁的脱开

- ◆ 放开油门，踩下离合器，
- ◆ 将轮差开关①复位
 - 当轮间差速锁脱开后，仪表盘轮间差速指示灯熄灭。

3. 轮间差速锁— 6x4, 6x6 和 8x4 等车辆

- ◆ 差速锁啮合的操作原则：先接合轴间差速锁，再接合轮间差速锁。

- 接合轴间差速锁（具体操作见轴间差速锁的结合）
- 松开油门踏板，减速至车辆停止或相当于人步行的速度
- 按下轮差开关①

- ◆ 后桥轮间差速锁啮合。
- ◆ 轮间差速锁指示灯点亮。
- ◆ 小心踩油门踏板然后慢慢加速。

差速锁的脱开

- ◆ 放开油门，踩下离合器，
- ◆ 将轮差开关①复位，
- ◆ 当轮间差速锁脱开后，仪表盘轮间差速指示灯熄灭。

4. 轴间差速锁

- ◆轴间差速锁：用来锁住第一和第二驱动桥间的轴间差速器。

轴间差速锁的啮合

- ◆松开油门踏板，减速至车辆停止或相当于人步行的速度，
- ◆按下轴间差速开关②，
- ◆当轴间差速器接合后，仪表板轴间差速锁指示灯点亮。

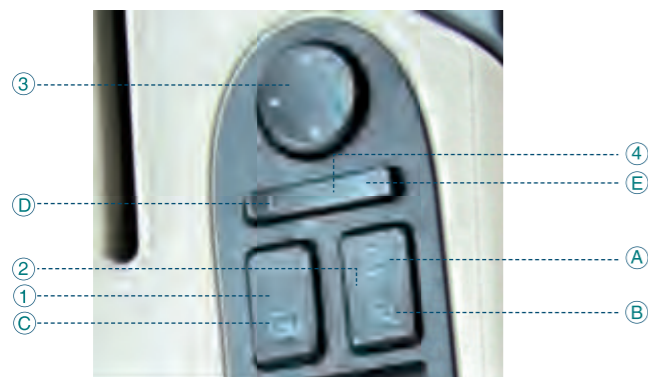
差速锁的脱开

- ◆放开油门，踩下离合器将轴间差速开关②复位，
- ◆当轴间差速锁脱开后，仪表板轴间差速指示灯熄灭。



2.6 左右后视镜的调整

◆后视镜的调整



- ◆检查后视镜的设置，并根据需要进行调整。
- ◆必要时清洁后视镜。
- ◆通过翘板开关②选择需要调整镜子的类型（后视镜和广角镜）。
- ◆通过翘板开关④选择左右侧的镜子。
- ◆后视镜控制按钮③可以进行前、后、左、右不同方位调整。



注意！

- 钥匙开关位于 ON 挡时，方可调整后视镜。
- 确保驾驶员座椅处于舒适的驾乘位置。
- 为了防止开关频繁的动作导致电机过热，控制系统对电机进行过热保护！后视镜电机在 5 秒内连续启动、停止操作 10 次后，在 3 分钟内，该后视镜不再响应任何操作命令。
- 在行车过程中不得调整后视镜。

2.7 取力器的操作

- ◆离合器控制取力器，在车辆静止或行驶时使用。

◆结合 / 脱开

- 取力器只能离合器分离状态下才允许结合或脱开，
- 脱开离合器必须在发动机怠速转速时完成，
- 在变速器副轴静止时才能结合取力器，否则取力器会有打齿现象。

◆ 停车

- 变速器挂入低挡区（1-4 挡）。
- 启用驻车制动器。

为了增加安全性，挂入一个相应的挡位：

- 车辆停在上坡：挂入前进挡！
- 车辆停在下坡：挂入倒挡！
- 负载车辆，为了确保安全，应附加车轮固定装置。



注意！

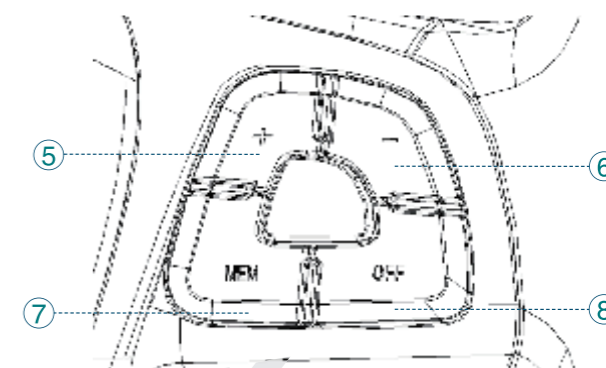
- 副轴停止转动所需时间可能随操作模式有所不同，可以通过短暂启用同步器来缩短时间，最好选用 1 挡。
- 结合或脱开取力器，结合取力器时不允许有打齿声，必要时请延长挂结合取力器前的等待时间，或者检查离合器是否能彻底分离。
- 缓慢结合离合器至正常运行转速。
- 取力器工作状态下不允许换挡。

2.8 巡航的操作

巡航工作的条件：

- ◆车速大于 30km/h；
- ◆发动机未处于外部扭矩控制模式；
- ◆非空挡
- ◆未踩离合器；
- ◆未踩刹车。

◆行驶中，当车辆速度超过 30km/h 时，驾驶员可以通过按压 Set +/- 键设定巡航车速，从而使车辆进入巡航模式。驾驶员即可松开油门踏板，车辆会按照设定好的巡航车速行驶。在巡航行使过程中，驾驶员可以通过 Set +/- 改变巡航目标车速值。当任一条件不满足或驾驶员按 OFF 键时，巡航模式自动退出。当条件再次满足，驾驶员可以通过按下 MEM 键重新进入巡航，巡航目标车速为上次巡航目标车速。



2.9 排气制动操作

◆ 排气制动可使车辆持续减速或稳定车速。下长坡路况、会车或通过较差路段等可用排气制动提前减速。

◆ 驾驶员按下翘板开关①，当下述条件均满足时，车辆将实现发动机排气制动：

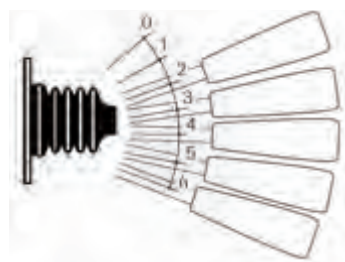
- 未踩下离合器
- 油门踏板松开
- 非空挡
- 发动机转速在 800rpm 以上



注意!

- 在潮湿、脏污或结冰的道路上慎用发动机排气制动，车辆有发生驱动打滑和滑移的危险!
- 下长坡时，应在变速器挡位上使用排气制动，空挡起不到制动作用。
- 排气制动是一种辅助制动装置，不是汽车停车装置，它不能替代汽车的行车制动系统，要使汽车完全停车仍应使用行车制动，即脚刹车。

2.10 缓速器操作



操作说明：

右组合开关为缓速器操作手柄

- 0 挡：关闭缓速器
- 1 挡：下坡恒速功能，随车速自动调节制动力矩
- 2-6 挡：手动设置缓速器制动挡位

1 挡（下坡恒速功能）

- ◆ 车辆在下坡时可以使用该功能保持恒速行驶（车速可以根据需要设置）。
- ◆ 缓速器电控单元自动设定恒速行驶所需要的制动力矩。
- ◆ 当踩下油门踏板时，下坡恒速功能自动中断；再次松开油门踏板时，当前的车速设置为恒速功能再次启动后的行驶速度。

启用 1 挡（下坡恒速功能）

- ◆ 将缓速器手柄置于 1 挡位置

取消 1 挡（下坡恒速功能）

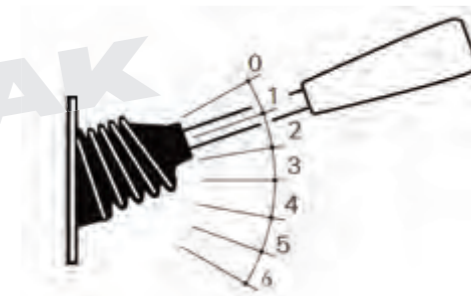
- 在 1 挡工作状态下踩下油门踏板（当油门踏板松开后，下坡恒速功能再次启动并设定在当前车速）。

或者：

- 将缓速器手柄拨至 0 挡或 2-6 挡（制动挡位模式）。

- ◆ 如果车辆在下坡行驶中需要的制动力大于缓速器最大制动力，请同时使用发动机排气制动和行车制动。

- ◆ 如果当前车速小于设定速度，缓速器将不工作，一旦车速达到设定值，缓速器开始工作。



2-6 挡

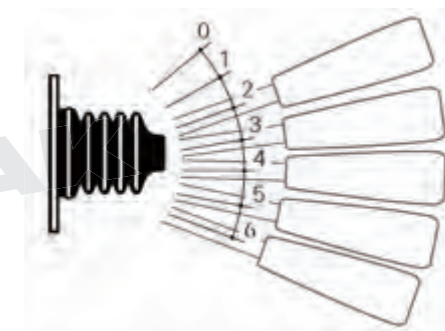
- ◆ 2-6 挡设定不同的固定制动力矩，从 2 挡到 6 挡制动力依次递增。

启用 2-6 挡

- ◆ 将缓速器手柄拨至需要的挡位 2-6 挡。

取消 2-6 挡

- ◆ 拨动缓速器手柄至 0 挡或 1 挡（下坡恒速功能）。
- ◆ 如果车辆需要的制动力大于缓速器的最大制动力，请同时使用发动机排气制动和行车制动。



2.11 发动机转速模式旋钮

- ◆ 许多工程用车要求发动机工作在某个特定的转速下。
- ◆ 在车辆静止时，驾驶员可以通过发动机转速模式旋钮⑨在一定范围内对发动机转速进行调整。

- ◆ 发动机转速模式旋钮⑨共分为 4 挡：

- 0 挡为怠速调整挡
- 1 挡为发动机转速限值设置挡
- 2 挡为发动机转速调整挡
- 3 挡为室外手油门转速调整挡



◆ 发动机转速调整，需满足以下条件：

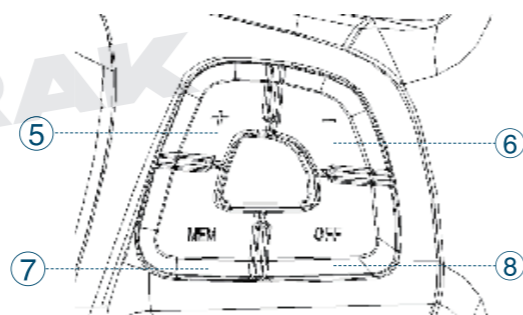
- 发动机处于运转状态；
- 拉上手刹；
- 空挡；
- 发动机未处在外部其他电控单元控制下；
- 车辆处于静止状态；
- 未踩油门踏板。

若以上条件均成立，驾驶员可以通过转速模式旋钮和 Set+/- 键进入发动机转速调整模式。

◆ 发动机怠速调整

怠速状态下，当空调开启时，发动机转速会自动提升 100rpm。当转速模式旋钮⑨处于 0 挡时，可以通过 Set+/- 键增加或减少发动机转速。0 挡下，发动机最大调整转速为 800rpm。

通过按压 MEM 按键可以记忆当前请求的发动机转速值和恢复上次保存的转速请求值。

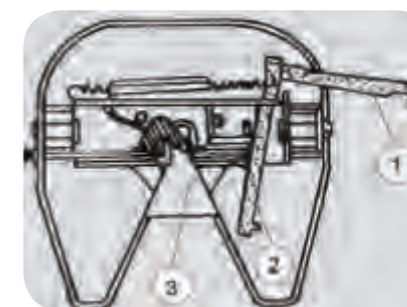


◆ 首先连接控制管路接头（黄色），然后连接供气管路接头（红色）。

◆ 检查功能是否正常。

半挂车的脱开

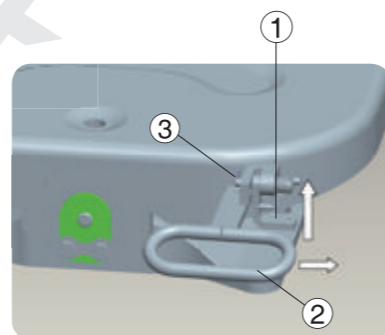
1. 检查路况，防止半挂车滑行。
2. 支起半挂车支腿（注意路面负载能力），直至其承受鞍座上卸下的载荷，或使用空气悬架升高半挂车，支起半挂车支腿，然后降低半挂车，直至半挂车完全由支腿承载。
3. 半挂车或全挂车在脱开牵引车之前，应严格按顺序，先脱开制动供气管路接头（红色），然后再脱开制动控制管路（黄色），否则挂车制动会解除。
4. 将鞍座手柄①拉出，直至其定位槽卡住鞍座壳体，此时楔块②即与锁钩③脱开，向前开动牵引车，锁钩③转动，松开牵引销，完成脱开动作。



2.12 鞍座

鞍座打开操作

◆ 如图示：向上旋转拉栓定位挡①到水平位置，同时向前旋转手柄②，将其四边形的卡槽卡在鞍座板矩形槽前侧边。



挂上挂车后检查

- ◆ 确保拉栓定位挡①已经回位到图示状态，并且警示孔③在鞍座板外侧附近，此时鞍座锁合牢靠。
- ◆ 如果拉栓定位挡①未下落至锁定位置，或警示孔③离鞍座板外侧较远，应检查鞍座是否锁止。

连接半挂车

- ◆ 固定半挂车防止滑行。
- ◆ 将鞍座手柄①向上提起，使手柄进入上部长孔中再向外拉出，直至手柄杆上的定位槽卡住鞍座壳体，此时鞍座便处于准备耦合的张口状态。
- ◆ 倒车对接，当牵引销进入鞍座接口后，锁钩及楔座块便自动将牵引销锁住，完成对接，此时手柄也自动退回位，表示对接正确。
- ◆ 连接半挂车与牵引车之间的制动管路及电气接头。
 - 连接压缩空气管路，注意行驶过程中管路、电线不能被拉紧、摩擦和缠绕。



2.13 驾驶室电动举升

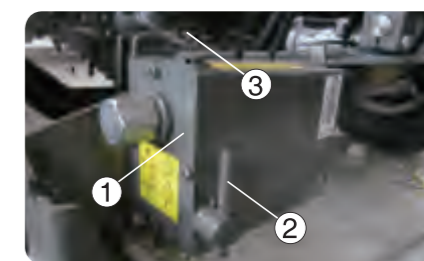
- ① 液压手动油泵
- ② 换向阀
- ③ 油塞
- ④ 驾驶室举升翘板开关

翻转前的准备

- ◆ 将车辆停在平坦的地面上，不影响其它车辆的通行。
- ◆ 使用驻车制动。
- ◆ 将变速杆置于空挡。
- ◆ 关闭发动机。
- ◆ 固定好驾驶室内的松动物体。
- ◆ 确保储物箱已清空。
- ◆ 打开驾驶室前面罩。

驾驶室翻转操作

- ◆ 按下翘板开关④（仅用于电动举升），并关好车门。
- ◆ 将液压手动油泵的换向阀②扳至驾驶室翻转位置，用撬棒撬动油泵①（或按下开关⑤ / 仅用于电动举升）进行翻转操作。



驾驶室回位

- ◆ 将液压手动油泵的换向阀扳至驾驶室回落位置，摇动手摇泵（或按下开关⑤ / 仅用于电动举升）使驾驶室翻回。
- ◆ 驾驶室落下时，与上进气道连接的橡胶波纹管应与下进气道紧密贴合到位，防止进入灰尘。
- ◆ 关闭驾驶室内翘板开关④（仅用于电动举升）。
- ◆ 关闭驾驶室前面罩。
- ◆ 最后，检查仪表板上的锁止信号灯，若驾驶室未锁住，锁止信号灯即点亮。



3. 检查介绍

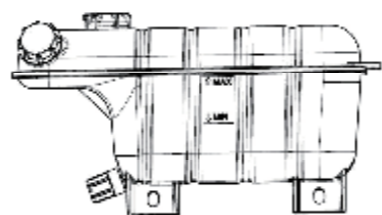
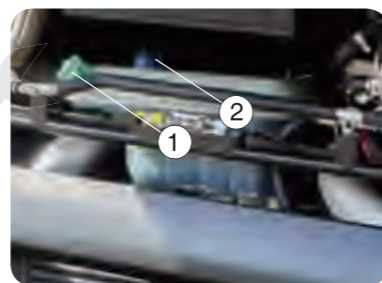
3.1 冷却系统：每天检查

- ◆ 车辆停放在水平路面上，开启前面罩。
- ◆ 观察膨胀水箱的液面，冷却液液面高度应位于膨胀水箱侧面高低位标识之间。

加注冷却液（必要时）

①加液盖 ②限压阀盖

- ◆ 逆时针方向缓慢拧开加液盖，释放冷却系统压力，取下加液盖。
- ◆ 将暖风温度调节按钮开关转到最大暖风位置。
- ◆ 将冷却液（冷却液型号请见发动机保养部分）加注至 MAX 处。
- ◆ 盖上加液盖，将其拧紧。
- ◆ 起动发动机怠速运行 4 分钟。
- ◆ 检查冷却液位，必要时再补充冷却液。



3.2 发动机机油：每天检查

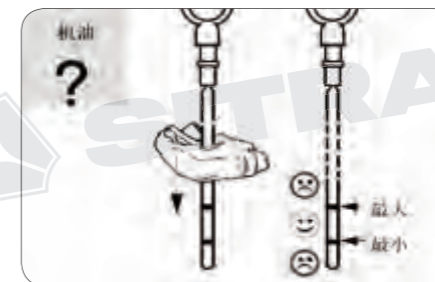
起动发动机前，每天检查。

发动机机油

- ◆ 汽车停放在水平路面上，关闭发动机 20 分钟后方可检查机油液位。

- ◆ 打开前面罩，拔出机油尺①，用干净的无绒布擦拭机油尺，将机油尺插回机油尺管内，再次拔出机油尺。

- ◆ 机油液面应在油尺的最大和最小标记之间，不得低于最小刻度。多次检查确定机油液位偏低时应加注机油。

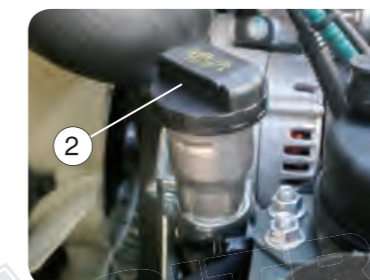


注意！

- 切勿加注机油超过最大刻度。加注过多的机油会损坏柴油机！

加注发动机机油

1. 关闭钥匙开关
2. 翻转驾驶室
3. 拧开加油口盖②
4. 加注机油
5. 拧紧加油口盖②



3.3 空气干燥器：每月检查

- ◆ 每月检查一次空气干燥器是否工作正常及有效（或根据当地气候条件、车辆使用和行车状况进行更频繁的检查）。打开贮气筒的放水阀即可检。



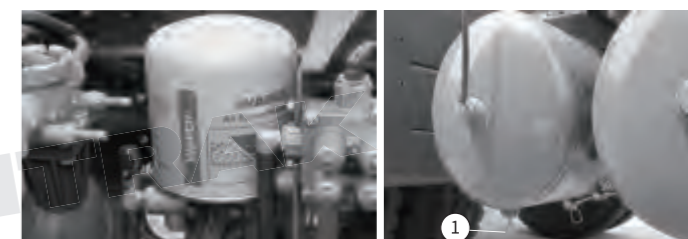
注意！

- 操作放水阀时，注意保护好眼睛和手。
- 注意检查排除制动系贮气筒中的水分。

- ◆ 汽车停止，侧向拉动贮气筒下部的手动放水阀拉环①即可排除凝聚在贮气筒中的水份。

- ◆ 建议每天检查距离空气干燥器最远的贮气筒，如果放水阀处有油水混合物排出，说明空气干燥器失效，应立即更换空气干燥器上部的干燥罐。

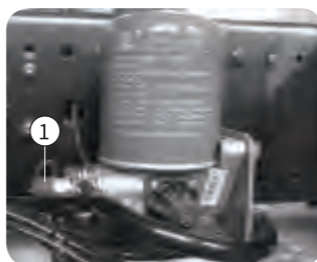
- ◆ 空气干燥器上部的干燥罐至少每 2 年更换一次（推荐入冬之前更换）。



轮胎充气

◆可以通过安装在空气干燥器（或贮气筒）上的充气接头对轮胎充气，步骤如下：

1. 取下充气接头的防尘帽①。
2. 轮胎充气软管一端连接轮胎的气门嘴。
3. 将轮胎充气软管另一端拧在空气干燥器上的充气接头上。
4. 加速运转发动机。
5. 检查轮胎压力，按需调整。



辅助用气模块

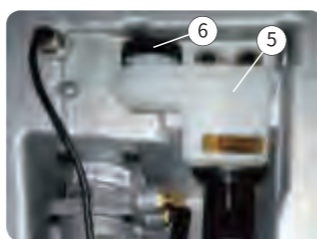
◆辅助用气模块安装于车架处（一般位于纵梁内侧），拧开图示②处或任一堵塞，配上快插接头即可取气。

3.4 离合器：每月检查

检查制动液液面高度

◆车辆应停放在水平路面上，打开驾驶室前面罩，检查离合器储油罐⑤中的制动液液面高度，液面应在 MAX 和 MIN 标记之间。

◆如有必要，拧下储油罐盖⑥，添加 DOT3/DOT4 制动液。



- 若油罐中的油面下降到 MIN 标记以下时，离合器操纵装置将不能正常工作。

检查离合器系统管路

◆检查离合器系统管路是否有漏气漏液情况。

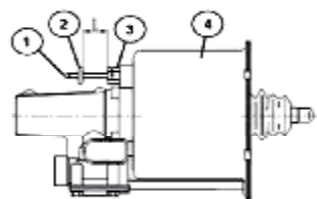
检查磨损指示器

◆检查磨损指示器②，判断离合器从动盘是否需要更换。

◆离合器磨损指示器位于离合器助力缸④阀体上方，通过观察指示片②位置可了解离合器从动盘是否磨损到极限，以便及时更换从动盘。离合器磨损指示器用于匹配拉式离合器的车型。

◆随着离合器从动盘磨损，测量杆座③与指示片②间隙 L 会逐渐变大。HW12706T、HW12710C 变速器，当 L=20mm 时，需更换从动盘；其它变速器，当 L=23mm 时，需更换从动盘。

◆初次安装离合器助力缸④或更换离合器从动盘后，需将指示片②沿测量杆①推到与测量杆座③接触，即初始化。车辆正常使用中不要移动指示片②。



3.5 油浴式空气滤清器



注意！

- 车辆投入运营前应加注机油，机油型号应与发动机机油相同！
- 加注机油时，油深不得超过 30mm 或加油量 5L，不得过量！
- 当晃动底壳，机油不易流动时，需清洗滤芯、更换机油。

拆卸、检查、清洗步骤



3.6 其他注意事项

- ◆ 当车辆下坡时，不要空挡滑行，在采取制动时尽可能同时排气制动减速，在车辆重载时也可以打开排气门制动辅助车辆减速。
- ◆ 当长时间停车时，关闭发动机同时为避免事故，应关闭主电源开关并采用驻车制动。
- ◆ 禁止未经授权的修改和安装各种设备，特别是电子、刹车、转向和其他相关安全的系统，否则它可能影响车辆的寿命和安全性能，导致事故、火灾、损坏车辆，我们将不负责后果。严格禁止拆卸或更换发动机 ECU，否则车辆可能损坏。
- ◆ 翻转驾驶室前应打开前面罩。
- ◆ 当在车辆内或车辆附近进行焊接工作时，需切断主电源开关并拔下电器元件（BCU、仪表、发动机 ECU、ABS 控制单元）插接件。
- ◆ 禁止用水冲洗发动机，因为会导致发动机电器系统短路并损坏 ECU。
- ◆ 冷却系用的是防冻和防锈的冷却液，不允许不同牌号的冷却液混用。如更换不同牌号冷却液，需彻底清洗发动机冷却系统部件。
- ◆ 应及时放掉凝聚在储气筒中的水分，防止结冰。并注意检查空气干燥器的工作情况。正常情况下，干燥器中的干燥剂使用寿命为两年。若发现储气筒中有水污排出时，说明干燥剂已经失效，应立即更换干燥剂。
- ◆ 每三个月检查蓄电池电解液的液面和比重。液面应高于极板 10 – 15mm，比重在 1.24g/cm³ 以上。若较长时间不使用车辆，且气温又较低时，最好将蓄电池取下并放入较温暖的室内。车辆每行驶 5000km，应检查蓄电池电极桩与导线连接夹子是否松动以及蓄电池工况是否正常。
- ◆ 保持好的驾驶习惯，避免长时间或突然制动车辆，否则会影响车辆的使用寿命和燃油经济性。