

The BCI Cruiser 12

OWNER'S BOOK



Bus and Coach International Pty Ltd

Preface

Dear Customer:

We would firstly like to thank you for selecting to purchase one of our Bus and Coach International vehicles and congratulate you on your wise choice. We believe that you will be impressed by the excellent performance of our products.

The BCI FBC6124CRS1 Cruiser 12, is well-known for good value, safety and comfortable performance, its advantages are stable smooth handling, powerful engine and quiet operation. All models of buses and coaches are produced to meet the needs of public transport, touring and commercial use.

In this Owner's Book, we will be introducing you to all the features and tips on how to best operate and maintain your new BCI vehicle. Please ensure you read the instructions carefully before putting the vehicle into operation. It is a requirement for the driver of this vehicle to strictly observe all laws and regulations concerning the operation of vehicles.

We believe our product will provide you with a more comfortable and safe service which will add value to your business.

Please ensure you operate and maintain the vehicle with care and attention. BCI will not be responsible for any loss caused by improper use of the product. Should you have any doubts about the operating or maintenance of the vehicle, please do not hesitate to make contact with your Service Agent or Dealer in your area to discuss it.

BCI is always striving for excellence and continues to improve its products and services as a means of offering the best value for our customers in a very competitive market place. Bus and Coach International Pty Ltd. Reserves the right to make changes in design and specifications and / or to make additions to, or improvements to this product without obligation to install them on products previously manufactured.

Bus and Coach International Pty Ltd

May 2021

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Note: The content of this Owner's Book is to provide as much relevant information to the Driver as possible. It will also contain information on factory optional equipment, which may or may not be included in your vehicle

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Section 1 - Important Items

1A - Name Plate Introduction

1A.1 - Vehicle Name & Tyre Plates:

The vehicle name plate and the tyre plate are mounted on the left of the second step of the passenger door (figure 1), the name plate includes: Bus model, the VIN, the date of manufacture and the manufacturer; the tyre plate includes: tyre type, rim type, standard tyre pressure and the maximum load.

Figure 1



1A.2 - Chassis VIN Number:

The Chassis Vehicle Identification Number (VIN) is located on the off-side surface of the chassis-structure, in front of the offside front wheel. This is viewable by lifting the wheel arch panel (figure 2)

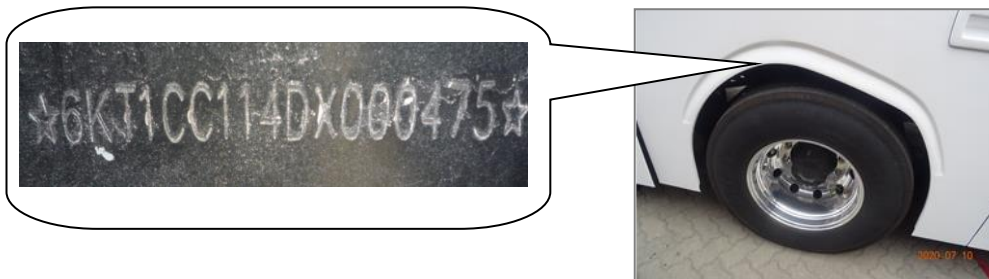


Figure 2

1A.3 - Engine Name Plate:

The label for the engine is located on the top of the engine and the stamped engine number is located on the block above the sump, on the nearside of the bus, towards the back of the engine.

1B - Product Warranty: (Please refer to the Warranty Guide Booklet for further details)

Please ensure all users STRICTLY follow the Operating Instructions of the vehicle so that it is used and maintained correctly. The BCI body warranty is limited to 100,000km or two years, whichever comes first. Other Supplier Warranties such as engine, transmission and air conditioning etc. will be covered directly by the Supplier's Warranty and can be taken to a Supplier's outlet for rectification.

Please ensure any warranty repairs required are communicated with your selling Dealer. Should a warranty repair not be able to be carried out at an official BCI Dealership, please ensure an official order number is obtained for the repairs from your selling Dealership, prior to them being carried out at another service center.

1C - Technical Documents

Please use this Vehicle Owner's Book together with the supplied manuals, as follows; Engine Operation Manual or Service Manual; Allison Shift Selector Operators Manual; A/C Operation Manual; Audio Operation Manual (For further vehicle technical reference documents please go to the BCI Dealer website: bcibus.com.hk)

Section 2 - Main Technical Specifications

2A - Main Technical Specifications of the Vehicle (All figures quoted are approximate):

2A.1 - Body Dimensions (mm):

Overall L x W x H	12360 * 2495 * 3815
Wheelbase	6550
Track (front / rear)	2054 / 1860
Front overhang	2368
Rear overhang	3440
Approach angle / departure angle (full load) (°)	9.0 / 8.0

2A.2 - Vehicle Mass (kg):

Body Mass (approx) (Vehicle with 57 seats)	11,820
Gross Vehicle Mass (GVM)	18,000
Maximum axle laden mass (front / rear)	7,500 / 13,000

2A.3 - Performance Parameters:

Maximum Speed (km/h)	≥100
Maximum angle of grade ability (%)	≥25
Minimum diameter of turning (m)	≤24

2B - Main Technical Specifications of the Chassis:

2B.2 - Engines:

Model	Cummins ISL 8.9 E6 400
Manufacturer	Cummins
Mode and Type	6 inline, water cooling, direct injection, turbocharged, inter cooled electrically controlled diesel engine
Displacement (l)	8.9
Normal rated power / Rotation rate (R/min)	294Kw @ 2100rpm
Maximum torque / Rotation rate (Nm/(min))	1700Nm @ 13 -1400rpm
Compression ratio	16.6:1
Cylinder diameter x Stroke (mm)	114 / 145

Section 2 - Main Technical Specifications (continued)**2B.3 - Transmission:**

- **Model:** ZF 6AP1700B (with retarder for ISL engine) – Diff ratio 4.778
Type: Automatic
Mode of operation: Electronic control
Speed ratio: First gear: 3.487; Second gear: 1.846; Third gear: 1.409; Fourth gear: 1.00; Fifth gear: 0.75; Sixth gear: 0.62; Reverse gear: 5.0
Option: Allison

2B.4 - Drive Shaft Model: Exposed, two universal joints; Universal joint: Rigid cross-shaft needle bearing

2B.5 - Front Axle Model : ZF RL-75E IFS 7500Kg with Knorr disc brakes

Type: Independent front suspension system, air pneumatic control braking system; Knorr disc brakes.

The orientation of the front wheels:

- Front wheel camber: Nearside -15' to -30', Offside +45' to 1°
- Caster angle: Nearside +2° to max +3°, Offside + 2°
- Toe-in (mm) : 0.5 – 1mm

2B.6 - Rear Axle Model: Hande 13000Kg with Knorr disc brakes

Type: Integrated forged-welded axle housing, full-floating axle shaft.

Final gear ratio: 4.778

Brake type: Air pneumatic control braking system; Knorr disc brakes.

2B.7 - Steering System Type : Model Bosch 8098 power steering + Zenke steering wheel with radio / cruise control

Redirector type: Recirculation ball-type, power steering system

Steering wheel diameter: 500mm, adjustable height and rake

2B.8 - Suspension Type:

Front suspension: ZF (IFS) suspension with 2 air bellows, two telescopic shock absorbers and transversal stabilizer.

Rear suspension: Jinben rear suspension with 4 air bellows, four telescopic shock absorbers and transversal stabilizer.

2B.9 - Wheels and Tyres:

Wheel type: 8.25 × 22.5 alloy rims

Tyre specification (front / rear): 295 / 80R22.5 Double Coin RR680

Tyre inflation pressure (front / rear): 850 / 850Kpa (maximum)

2B.10 - Braking:

Service braking type: WABCO EBS3 dual circuit pneumatic braking system; Automatic slack adjusters.

Option: WABCO ABS

Park brake type: Spring actuated on drive axle

Other: Transmission hydraulic retarder.

Section 2 - Main Technical Specifications (continued)

2B.11 - Electric equipment:

Circuit system: Single wire system, Negative earth

Circuit voltage: 24V

Alternator: 28V 150A (x 2)

Storage battery: 12V-195Ah (x 2)

Instrument Panel: Combination instrument panel, rated voltage 24V, including: Odometer, Intelligent signal processor, Voltage meter.

2B.12 - Fuel Tank: Capacity 400L approximately

2C - Body Structure

2C.1 - Structure type: Monocoque Body Frame

2C.2 - Structure of the Vehicle Body:

The structure of the vehicle body is fully welded and made with imported 4003 stainless steel tube. The structure is designed and fully tested to meet ADR 59 roll-over requirements. The main components of the framework have been treated after welding to ensure their antirust properties.

2C.3 - Vehicle doors & panels:

Easy access aluminum frames and panels, with fiberglass side panels

2C.4 - Vehicle windows:

The front windscreen is laminated glass; the side windows are 4mm thick toughened glass with a dark grey tint. All glass is fully bonded to the body.

2C.5 - Interior finish:

The interior of the bus has a light airy feel with a leather textured vinyl finish on the ceiling and headers. The sides are also a modern light pastel grey with an easy clean vinyl surface. The floor is covered with a heavy duty grey carpet and black coin rubber in the entry and aisle areas

2C.6 - Seats:

Driver seat: ISRI, with right hand control & 3-point safety belts.

Passenger seats (57): All seats are ADR approved for public transportation and are available in fixed back, reclining or metro configurations with two types of seat belts.

2C.7 - Interior trim:

The following items can be found inside the vehicle:

Digital clock, driver's side sun visor, electric front windshield sun visor, interior rear view mirror, emergency hatches.

Electrical devices: Driver's microphone, FM/AM /CD, USB charger port, Front-Middle TV.

Section 2 - Main Technical Specifications (continued)

2C.8 - Air Conditioning System:

Standard: MCC Husky 40; otherwise please refer to the relevant A/C operator's manual. Option: Thermoking

Cooling: Roof mounted independent cooling system 33kw

Heating: Floor heaters (optional)

Defrost: Water heating defrost.

Section 3 - Operating Guide

3A – ISRI 6860-875 Driver's seat (figure 3):
(Extract from ISRI Seat Brochure)

- 1) Belt adjustment
- 2) Armrest adjustment
- 3) Backrest adjustment
- 4) Shoulder adjustment
- 5) Seat climate control
- 6) Integrated pneumatic system (IPS)
- 7) Height adjustment (+ memory)
- 8) Vertical shock absorber (adjustable)
- 9) Quick release



Figure 3

Attention: For safety reasons, NEVER attempt to adjust the Driver's Seat whilst the vehicle is in motion.

3B - Steering column adjustment (figure 4):

3B.1 -Steering Rake adjustment (located at left side of steering wheel), turn knob anti-clockwise, adjust steering wheel rake to the desired position, then turn knob clockwise to lock.

3B.2 -Steering Height adjustment (located at right side of steering wheel), turn knob anti-clockwise, adjust steering wheel height to the desired position, then turn knob clockwise to lock.



Figure 4

Attention: NEVER attempt to adjust the steering column whilst the vehicle is in motion.

3C - Driver controls (figure 5):

- 1) Steering wheel
- 2) Headlight & direction indicator stalk
- 3) Windscreen wiper & retarder stalk
- 4) A/C control panel
- 5) Nearside switches, indicators
- 6) Harine audio
- 7) Transmission control
- 8) Combination instrument panel (CAN)
- 9) Offside Switch, Indicators
- 10) Console Switches

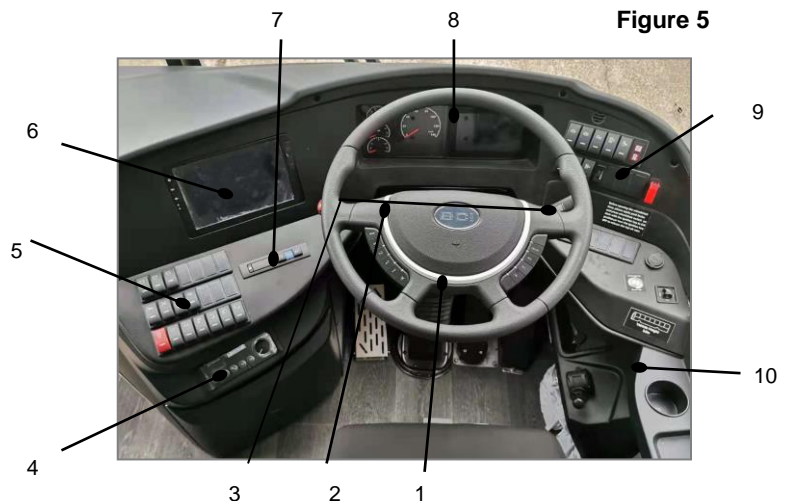


Figure 5

Section 3 - Operating Guide (continued)

3C.1 - Steering wheel horn buttons (figure 6):

- The horn button is located towards the center of the steering wheel.
- To sound the horn press down highlighted area in fig 6.



Figure 6

3C1.1 – Steering wheel controls – LH side (figure 7)

- 1) Press button to choose option
- 2) Press button to activate driver speaker
- 3) Press to adjust the volume up
- 4) Press to adjust volume down
- 5) Press to activate passenger speakers
- 6) Press to mute sound



Figure 7

3C1.2 - Steering wheel controls – RH side (figure 7a)

- 1) Press for cruise control
- 2) Press to reset to normal driving
- 3) Press button to 'set' cruise control
- 4) Press 'to cancel cruise control



Figure 7a

3C1.1 - Ignition switch (figure 8):

The photo on the right shows the Ignition key position.

- "LOCK" : This is the place to insert and draw out key. Power off
- "ACC" : Instrument power on
- "ON" : Vehicle running
- "START" : Engine startup, release the key after the engine has started.



Figure 8

Attention: DO NOT turn the ignition key to the LOCK position until the engine has stopped. If the first start attempt failed, wait two minutes before re-start again. If the start has failed three times; please check the fuel-supply system.

Section 3 - Operating Guide (continued)

3C.2 - Headlight & direction indicator control stalk (figure 9):

This is located on the left side of the steering column.

Figure 9



OFF Both high beam headlight and side lights are turned off.



This is the side lights. Rotate the handle clockwise to the sign position, all the side lights, instrument lamp and outline marker lamps turn on.



This is the headlights. Rotate the stalk continuously clockwise to the sign position, all the headlights, the small lights, the instrument lamps and outline marker lamps turn on. To change over to the high beam and low beam lamps: push the stalk down, then the high beam lamp will turn on; pull the stalk back to normal (middle) position and the low beam lamp will turn on. Pull the stalk upwards and the high beam will be in 'pass' mode, in this position the stalk is spring loaded and will return to normal position when released.



This is the turn signal indicator sign. Move the lever upwards to engage left turn signal; move the lever downwards to engage right turn signal.



(Red button) Hazard indicator switch: Push the red button on the end of the indicator stalk, switch to turn the hazards on and off.

3C.3 - Windscreen wiper & retarder handle (figure 9a):

1) The windscreen wiper and the retarder operating stalk is located on the right side of the steering wheel.

2) Rotate the stalk to operate the wiper:

- OFF: Stop wiping
- INT: Intermittent wiping
- LO: Wiping at a low speed
- HI: Wiping at a high speed



Figure 9a

3) To spray water on the screen, press the end of the stalk inwards, the wipers will automatically start in the low speed and will automatically turn off a few seconds after the button is released.

4) The retarder has three positions:

0= Off、 1= 33%、 2= 66%、 3= 100%.

This control will only work if the switch on the dash is in the 'ON' position

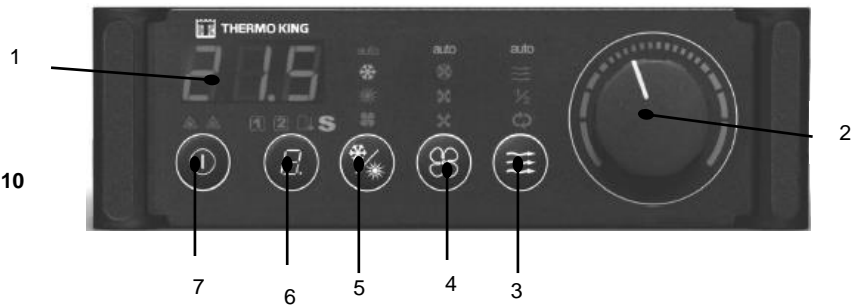
Section 3 - Operating Guide (continued)

3C.4 - A/C control panel introduction (figure10):

Thermoking ClimaAIRE II

- 1) Digital display
- 2) Thermostat control
- 3) Air mode
- 4) Speed
- 5) Mode setting
- 6) Display temperatures
- 7) Power on / off

Figure 10



Note: Please refer to the appropriate A/C operator's manual for more detailed information

3C.5 - Nearside instrument descriptions (figure 11):

- 1) N/S electric blind
- 2) O/S electric blind
- 3) Front TV
- 4) Middle TV
- 5) School light indicator
- 6) School light switch
- 7) Fridge
- 8) Windscreen demister
- 9) Luggage bin lights
- 10) Driver's fan
- 11) Air horn / Electric horn transfer switch
- 12) Passenger door switch
- 13) Interior LED saloon lights (white)
- 14) Interior LED saloon lights (blue)
- 15) Reading lights
- 16) Driver's reading light
- 17) Aisle light switch
- 18) Fog light switch

Figure 11



Nearside instrument functions:

3C5.2 Electric blind switches

& Press down the upper end, the blind moves up; press down the lower end, the blind moves down



Note: the bottom of all switches have an indicator light, this alights when switch is activated.

Section 3 - Operating Guide (continued)

Nearside instrument functions (continued):

- 3C5.3** **TV switch (front) / TV switch (middle):**
 & Press down the lower end to open the cover of the TV, press down the upper end to close.
3C5.4 **Note:** The TV will automatically close when the passenger door is opened.



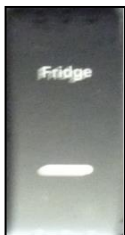
- 3C5.5** **School bus lights indicator:**
 Indicator light will come on to show school lights activated



- 3C5.6** **School bus lights switch:**
 Press down to activate school lights, press again to stop.



- 3C5.7** **Fridge switch:**
 Press to activate power for fridge, press again to switch off



- 3C5.8** **Windscreen demister switch:**
 The middle position is for the low flow rate; press down upper end to turn off the power; and press down lower end for high flow rate.
 Up = off; Middle = low speed; Down = high speed



- 3C5.9** **Luggage bin light switch:**
 Press down lower end to connect the power and switch lamps on, press down upper end to turn off the power.



Section 3 - Operating Guide (continued)

Nearside instrument functions (continued):

3C5.10



Driver's fan switch:

Press down the lower end to switch the driver fan on low, press again for high. Press down the upper end to switch the fan off.

3C5.11



Air / Electric horn switch:

Press down the lower end to use the air horn; press down upper end to use the electric horn.

Note: Indicator light on bottom will alight when switch is activated (applies to all switches)

3C5.12



Passenger door switch:

Press down the lower end to open the door; press down the upper end to close the door.

3C5.13



Interior LED saloon light switch (white-2stage) :

Press down the lower end to turn the lamps on; press down the upper end to switch the lamps off

3C5.14



Interior LED saloon light switch (blue-2stage) :

Press down the lower end to turn the lamps on; press down the upper end to switch the lamps off

3C5.15



Reading lights:

Press down the lower end to turn the light on; press down the upper end to switch the light off.

Section 3 - Operating Guide (continued)

Nearside instrument functions (continued):

3C5.16



Driver's reading light switch:

Press down the lower end to connect the power, press down the upper end to turn off the power.

3C5.17



Aisle light switch:

Press down the lower end to switch on the lights (underneath passenger seats), to assist personnel cleaning the vehicle; press down the upper end to switch the lights off

3C5.18



Front fog light switch:

Press down to connect the power. Press up to turn off the power,

NOTE: this will only work with the parking lights on.

3C6.1 – Harine audio (figure 13):

Refer to the following document on the BCI Dealers Website: **14ZW - Harine CM1017 10.1 central control player**



Figure 12

3C7.1 - Transmission operating panel (figure 12):

Refer to ZF operator's manual



Figure 13

Section 3 - Operating Guide (continued)

3C.8 - CAN instrument panel operating guide (figure 14):

Refer to the following document on the BCI Dealers Website: 13B - Parker DPS70 Menu System




Figure 14

3C.9 - Offside instrument descriptions (figure 15):

	1	2	3	4	5	6
1) Park brake indicators / Passenger door alarm						
2) Engine diagnostic switch						
3) ZF economy switch						
4) Rearview mirror defrost switch						
5) Power switch - wheelchair loader						
6) Instrument panel dimmer adjustment						
7) Luggage bin fan switch						
8) Fire alarm switch						
9) Kneeling reset switch						
10) Kneeling switch						
11) Vehicle body raise / lower switch						

Figure 15

3C.9 - Offside instrument functions:

3C9.1  **Park brake indicators / Passenger door alarm:**
 Either alarm will activate if not operated in correct sequence

Section 3 - Operating Guide (continued)**Offside instrument functions (continued):****3C9.2****Engine diagnostic switch:**

Press to activate engine diagnostics.

Indicator light on bottom will alight when switch is activated (applies to all switches)

3C9.3**ZF mode switch:**

Press to change between Power & Economy modes

3C9.4**Defrost switch - rearview mirror:**

Press bottom of switch to activate defrost of external rearview mirrors. Press top of switch to deactivate.

3C9.5**Wheelchair loader power switch:**

Press down to activate the power for the wheelchair loader. Press again to deactivate.

Note: Before opening wheelchair door, please apply park brake and then press wheelchair loader power switch with the ignition in ON position, or turn the ignition key OFF to release the top air ram.

3C9.6**Instrument panel dimmer adjustment:**

Rotate backwards, the light becomes brighter; rotate forwards, the light becomes dimmer.

3C9.7**Luggage bin fan switch:**

Press switch to activate luggage bin fans, press again to de-activate.

Section 3 - Operating Guide (continued)

Offside instrument functions (continued):

3C9.8 Fire extinguisher switch (fitted to some vehicles):
 When sensor does not work in engine bay, driver can manually press this button to activate fire extinguisher system.



3C9.9 Kneeling reset switch:
 Press down switch-the vehicle body return to the normal height.



3C9.10 Kneeling switch:
 Press down to activate the vehicle kneeling function, this lowers the vehicle to allow easy access for passengers entering the vehicle.



3C9.11 Vehicle raise / lower switch:
 Press down to lower or raise the vehicle



Misc: Master power switch (fitted to some vehicles):
 Lift cover and press down to isolate all vehicle electrics.



WARNING: DO NOT SWITCH OF POWER USING MASTER POWER SWITCHES, WHILE ENGINE IS RUNNING. YOU MUST SWITCH OFF ENGINE USING IGNITION FIRST. WAIT 15 MINUTES BEFORE SWITCHING OFF POWER.
NOTE: FAILURE TO FOLLOW THE ABOVE WILL RESULT IN DISRUPTION TO ECU'S AND MAY VOID VEHICLE WARRANTY

3B10 – Driver's console instruments (figure 16):

- 1) Lights
- 2) USB port
- 3) Rearview toggle switch
- 4) Vehicle height sign
- 5) Park brake

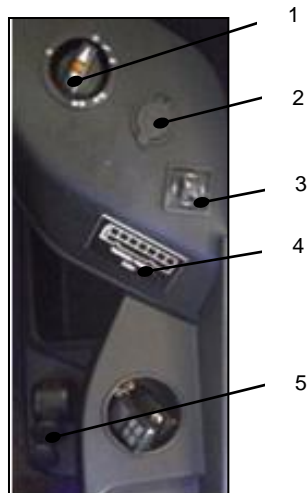
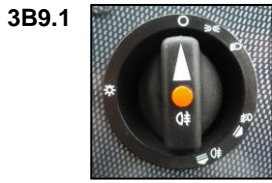


Figure 16

Section 3 - Operating Guide (continued)

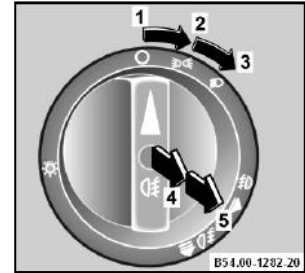
3C.9 Driver's side console instruments:



Vehicle lights:

Turn to desired position for vehicle lights. 'O' = off position

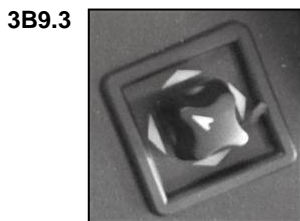
- 1° - position 1 lights off
- 2° - position 2 lamp activation (standing lights).
- 3° - position 3 main headlight activation.
- Push-button
- 4° - position 4 rear fog lights activation.
- 5° - position 5 fog light activation.



3B9.2

USB port:

To be utilised for USB items



3B9.3

Rearview toggle switch:

Press left or right and adjust mirror position to suit.

3B9.4 Vehicle height sign (figure 17) (fitted to some vehicles):

This indicates the vehicles normal operating height.



Figure 17



Misc:

Passenger door – emergency override button (fitted to some vehicles):

Press to release door.

3C.10 - Park Brake control (figure 18):

The Park Brake control is located within easy reach on the driver's side console.

- 1) To release the park brake, lift the round collar and move the lever forward (both are spring loaded).
- 2) To apply the park brake, pull the lever back until it locks into position (if the lever springs forward it is not locked in position and the brakes are not applied). Try again until the lever is locked in the rear position.



Figure 18

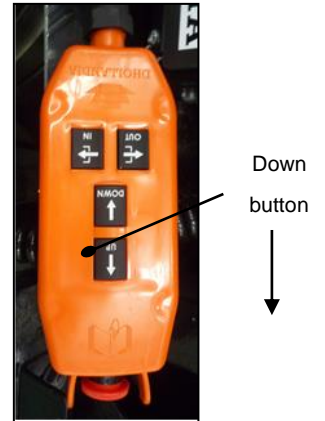
Section 3 - Operating Guide (continued)

3D - Wheelchair loader (figure 19 & 19a): The loader is stowed in a box located on the nearside of the vehicle (Refer to appropriate operating manual for further instructions)

3D.1 - MOVEMENT OUT-DOWN (figure 19):

- Press the black button of the button box continuously. The lift will make the following movements:
- The lift will start leaving the box.
- Then the bridge plate will start opening, turning 90° until it reaches the vertical position.
- Once the bridge plate is open, the handrails will deploy simultaneously until they reach the vertical position.
- The lift will start lowering until it reaches the ground level.
- Once the lift stops, the small bridge plate will fully open until it rests on the ground to allow access.
- At this moment, stop pressing the button of the button box.

Figure 19



3D.2 - MOVEMENT UP (figure 19a):

- Press the white button of the button box continuously. The lift will make the following movements:
- The lift will start rising until it reaches the vehicle floor.
- Once the lift stops, the bridge plate will open until it rests on the vehicle floor.
- At this moment, stop pressing the button of the button box (note: when releasing the button, even if done before the bridge plate touches the floor, the bridge plate will be free and may continue to fall due to inertia).
- During the time the lift is in this position, the bridge plate is un-braked in order to absorb the variation of the relative position between the floor and the lift due to the stepping in and out of the users.

Figure 19a



3E- Main Power control switch \ Power Isolator switch (figure 20):

The main power for the vehicle is controlled by the master or isolator switch, located in the engine bay compartment to the right of the header tank.



Figure 20

WARNING: DO NOT SWITCH OF POWER USING MASTER POWER SWITCHES, WHILE ENGINE IS RUNNING. YOU MUST SWITCH OFF ENGINE USING IGNITION FIRST. WAIT 15 MINUTES BEFORE SWITCHING OFF POWER.
NOTE: FAILURE TO FOLLOW THE ABOVE WILL RESULT IN DISRUPTION TO ECU'S AND MAY VOID VEHICLE WARRANTY

Section 3 - Operating Guide (continued)

3F - Passenger Door Operating Instructions:

3F.1 - Open and closing the passenger doors, while the driver is INSIDE the vehicle

- The driver can operate the passenger door (**All Doors**) via the passenger door control switch located on the dash (Refer to 3C5.12 above).

3F.2 - Passenger door lock operation (figure 21):

3F.2.1 - Locking the door:

- Rotate the splash-proof cover counterclockwise 180 degrees, then insert the door key into the lock; Rotate the key clockwise 90 degrees to the vertical. Counterclockwise rotate the lock handle 90 degrees, the handle will spring back to the vertical when let go;
- Counterclockwise rotate the key 90 degrees to the horizontal and take out the key.

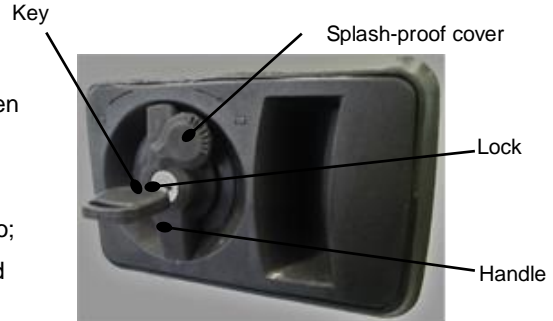


Figure 21

3F.2.2 - Unlocking the passenger door:

- Counterclockwise rotate the splash-proof cover of the door lock 180 degrees, insert the door key to the lock hole.
- Clockwise rotate the key 90 degrees to the vertical. Clockwise rotate the lock handle 90 degrees, the handle will spring back vertically when let go. Counterclockwise rotate the key 90 degrees to the horizontal and take out the key.

3F.3 - Passenger door emergency operation:

3F3.1 - Internally: Use the emergency exit valve (figure 22) – This is LOCATED IN THE VEHICLE STAIRWELL, rotate to release the air pressure in the door and then push the door open.

FOR USE WITH ALL PASSENGER DOORS



Figure 22

3E3.2 – Externally: Emergency exit valve (figures 23a & 23b) – This is located under the label (figure 23a) attached to front near-side of the vehicle –Push the valve (figure 23b) to release the air pressure and then pull the door open

Figure 23a

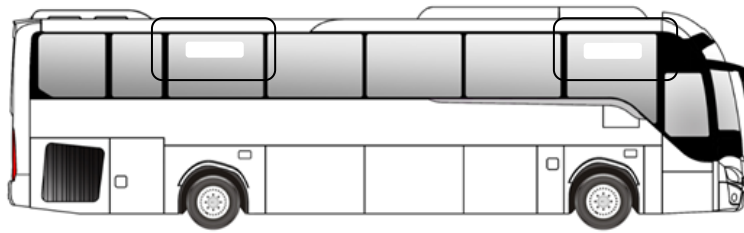


Figure 23b

Section 3 - Operating Guide (continued)

3F - Emergency exits: There are the following available emergency exits (figures 24a to 24f):

3F.1 - Two windows (offside, these are marked with an emergency exit label) see figure 24a.



Figure

The emergency windows can be broken using the hammers (see fig 24b) located inside the vehicle.

NB: All windows can be broken with the hammer.



Figure 24b

3F.2 - Two roof hatches marked with an emergency exit label (see figure 24c). The roof hatches can be used in an emergency as follows: Pull plastic cover (see figure 24d) to access the red release lever, then rotate the lever left or right, to unlock and then push the hatch up to open.



Figure 24c



Figure 24d

Pull plastic cover – to remove

3F.3 - The nearside passenger door (see figure 24e). Refer to passenger door operation instructions on page 22.



Figure 24e

3F.4 - One emergency door (offside window behind the driver- see figure 24f), this is marked with an emergency exit label. This 'door' can be accessed by removing the EMERGENCY panel and using a hammer to break the window

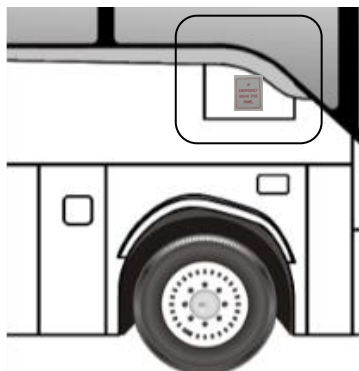


Figure 24f



Section 4 - Startup and Driving

4A - Routine checks before and after driving:

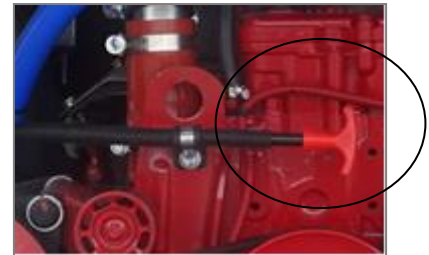
The vehicle should be parked on level ground before carrying out the pre-driving checks.

4A.1 - Check the engine oil level (figure 25) :

- Pull out the oil dip-stick, dry the dip-stick by using of a piece of clean cloth.
-
- Insert it all the way in again, and then remove the dip-stick. The operating oil level should be located between the oil marks.

NB: If you want to check the oil level just after running engine, please wait at least 5 minutes to make sure that all the oil returns to the

Figure 25



4A.2 - Check the coolant level (figure 26) :

The engine should be cold before checking. Check to see the coolant is between the marks on the sight glass on the header tank. Add coolant only when necessary. TAKE CARE:

- If the temperature of the coolant is relatively high, do not open the lid of the expansion tank as the hot coolant will spill and scald.
- The pressure valve on the expansion radiator should be opened when adding any coolant; this is to exclude the air in the coolant pipe.
- **ALWAYS be sure to use the correct coolant for the engine, as specified by the engine manufacturer.**

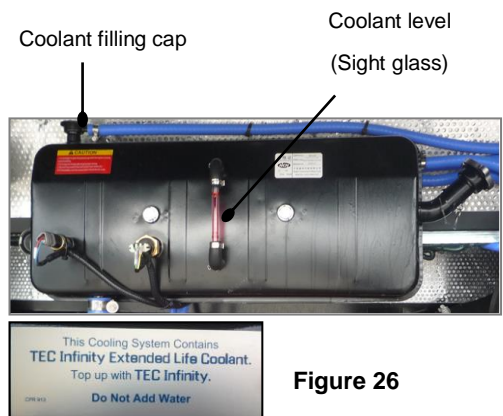


Figure 26

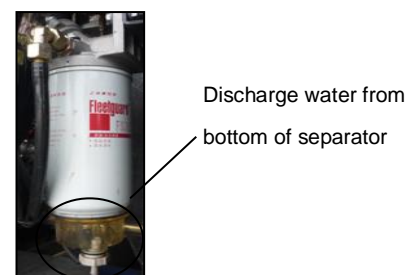
4A.3 - Check the fuel level:

The fuel level can be seen from the fuel gauge on the instrument panel. Add clean diesel as required. If the vehicle operates in a humid area, it is advisable to keep the fuel level as high as possible at all times to reduce the amount of condensation in the tank and in turn reduce the risk of tank corrosion. Ensure you drain water deposits regularly from the water sediment filter in the engine bay. Ensure the filler cap and surrounding area is clean before removing the cap.

Note: ENSURE you fill with the recommended diesel.

4A.4 - Discharge the water from the oil-water separator of the engine (Figure 27)

Figure 276



4A.5 - Check electrical appliances:

- Check whether various instruments operate normally, especially the front headlights, the indicator lamps, the braking lamps, the reversing lamp and the emergency hazard lamp.
- Check for damage to any lights, light bulbs and switches.
- Regularly clean the outside of the various lights and indicators to maintain clarity.

Section 4 - Startup and Driving (continued)

4A.6 - Check the driver's seat safety belt:

Check the seat belt buckle of the driver's seat safety belt operates normally or not and ensure that the safety belt is tightly locked when buttoned up in the following cases:

- the body moves abruptly forward;
- the vehicle brakes abruptly or accelerates suddenly

4A.7 - Check, adjust and clean the rear-view mirror regularly

4A.8 - Check various emergency apparatus: Such as the fire extinguisher, the emergency hammer, the vehicle jack, as well as the tools that are supplied with the vehicle

4A.9 - Check whether the speedometer and dash mileage display function normally or not

4A.10 - Check the oil pressure of the engine. The oil pressure gauge indicator may be very high after cold starting. With the engine running and the oil temperature rising along with normalization of the engine rotation rate, the oil pressure gauge indicator should be in the range of 3-6Kpa. If the indicator is excessively low, the alarm will engage, stop and check the oil level.

4A.11 - Discharge any water in the air tanks (figure 28):

Toggle the drain valve to dispel any grease, dirt and water thoroughly from the air tanks. If there is too much grease, dirt, or water in the air tanks; check the air dryer cartridge as it may require replacement. As such, it is recommended that the air tanks be checked for excess water every two weeks. Pay particular attention to the tank nearest the engine.

Note: The air drier cartridge MUST be replaced at least once each year.

Figure 28



4A.12 - Check whether the foot brake and the hand brake operate normally and if there are any leaks.

4A.13 - Check the steering box free-play. Steering box free-play allowance should be in the range of $\pm 10^\circ$. If the free-play is larger than these values, please drive to the nearest after-sales service center for adjustment.

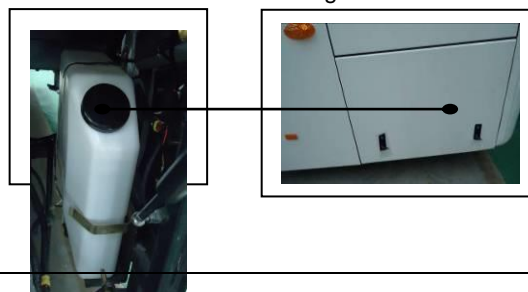
4B - Checks before / after every one-week driving:

4B.1 - Check the wheels & tyres. Before driving the vehicle, please check the air pressure (**760Kpa**) in the tyres, as well as for any damage to the tyres. Also, carefully check whether the wheel-nuts are securely fastened or not.

Note: After a new vehicle has been operated for about 50 km, re-check the wheel-nuts according to the specified torque (600Nm for steel rims and 550Nm for alloy rims). The sequence for fastening the wheel-nuts should conform to the cross-symmetrical one.

4B.2 - Check the windscreen washer fluid (figure 29). Stop the vehicle on a level roadway and open the bin door cover (front outside), where the container is situated. The fluid level can be seen through the container

Figure 29



Section 4 - Startup and Driving (continued)

4B.3 - Inspect: the engine, the gearbox, the drive axle, the steering system and the cooling system as well as the pipelines for any oil and or air leakage. Repair as required

4B.4 - Check the operating condition of the air filter (figure 30):

Get rid of any dust in the dust-removable outlets of both the air filter and the air intake box each week manually. Meanwhile, check ALL the clamps connecting the rubber hoses to the air-intake system are not loose, damaged or missing, to minimize the risk of dust getting into the air intake system which will reduce the service life of the engine. (Refer to pages 31 to 33)

Note: If the air filter warning light on the instrument panel comes on; then it is important to clean or replace the core of the filter.



Figure 30

4C - Checks before / after every two-weeks driving:

4C.1 - Check the oil level in the power steering oil tank, if insufficient, refill as required

- Park the vehicle on a smooth flat roadway, apply brakes, open the door of the rear compartment and inspect the level of the power steering liquid from the viewable window on the oil tank (figure 31)
- To fill with oil: start the engine. slowly add oil through the top of the reservoir, until the oil level reaches midway in the reservoir viewing mirror.
- Some air may be drawn in during the pouring process; it is important to turn the steering wheel to the two full lock positions several times so as to exhaust any air bubbles from the oil storage tank.



Figure 31

4C.2 - Check the tension of the belts (figure 32) :



Figure 32

- Inspect the engine belts, the fan belt and the air conditioning compressor, if any slack noted, re-tension as necessary.
- Check for any intersecting crack or not, minor lateral cracks across the width of the belt could be acceptable, cracks along the length of the belt with a lateral crack could be unacceptable. If any wear, tear or damage, replace the affected parts immediately.
- Over-tight or over-loose belt tensions can be harmful to the engine. The tension of the belts may be checked with a belt tension gauge, but, to ensure the correct tension of any belt, please refer to the relevant subjects in the engine assembly manual.

4C.3 - Check the level of the battery fluid:

Open the top of the battery, distilled water should be added when the level is lower than the height shown on the battery.

Note: The battery master switch should be OFF when adding distilled water into the battery.

Section 4 - Startup and Driving (continued)**4D - Startup of engine:**

- Check the accelerator pedal moves freely.
- Please do not load the engine when cold.
- Shift the gear selector into neutral gear, insert the starting key into the ignition switch, then turn the ignition switch (rotate clockwise) according to KEY—OFF — ACC — ON — **wait approx. 20 seconds for ABS to activate and ECMS to initiate**, then - START, to start the engine. **Note:**
- If the engine has failed to start, operate once more. The duration for operating the starting key should not exceed 10 seconds, but DO NOT re-start again within 2 minutes. (electric motor)
- After starting for the first time each day, DO NOT set out with the vehicle, until the engine has been operated for at least 3~5 minutes at low or middle rate.
- To avoid engine damage DO NOT accelerate while the engine is in a cool or cold condition. When cold starting the engine, the revolutions should be gradually increased. DO NOT drive the vehicle at the maximum speed until the water temperature has reached 85°C. The engine should not operate at its maximum revolutions without any load.
- DO NOT operate the engine at idle speed for more than 20 minutes in neutral. DO NOT idle for more than 5 minutes in drive or reverse.
- The oil pressure display should appear on the instrument panel within 15 seconds after starting the engine, otherwise, stop the engine and check the oil level immediately.
- Increase the engine speed slowly when starting in order to ensure adequate lubrication of the bearings.

4E - Moving / driving the vehicle:

- After starting the engine, the pressure in the braking system should be above 6kg/cm², a buzzer will sound until the air pressure reaches this level. The various instruments and indicators should be normal; the outlet water temperature should be above 60°C.
- DO NOT move out with the vehicle until the brakes have been fully released.
- **When driving the vehicle normally:** The water thermometer should be within the range of 80°C-95°C. The oil pressure indicator gauge should be within the range of 3-6Kpa. The indicator for the air pressure gauge should be within the range of 6-8Kpa. The alarm will engage if the pressures are incorrect.

Please pay attention to the following while driving a vehicle:

- Stop the vehicle and check should some abnormal sound be heard, or some abnormal odour can be smelt.
- Abrupt acceleration or emergency braking should be avoided as much as possible whilst you are driving.
- Any unnecessary revving of the engine should be avoided as much as possible whilst you are driving. The engine is likely to operate at a higher speed after changing gear position, especially when the vehicle is going downhill. In this case, pay special attention to the pneumatic brake or retarder of the engine, as well as the service brake, these should be used so as to control the engine speed.
- DO NOT switch off the engine while the vehicle is going downhill, since this will cause insufficient air pressure in the braking system and malfunction of the power steering.
- AUTO TRANSMISSION VEHICLES: **DO NOT** select neutral when coasting down hills, as this is not only dangerous, but can cause extensive damage to the transmission.

Section 4 - Startup and Driving (continued)

Please note the following points for driving in winter conditions:

- DO maintain the level of and add the specified coolant to the cooling system.
- DO remove the accumulated water in the air tanks after stopping.
- DO check the fluid levels, the specific gravity and the voltage of the electrolyte in the battery.
- Use only recommended coolant for the cooling system, as specified by the engine manufacturer.
- The vehicle should not set out before releasing all the brakes.

4F - Shutting down the engine:

Turn the ignition key to the position ACC to switch-off the engine.

Note:

- After the engine has been operated with heavy loads, the temperature of the cooling water may be above 90°C, the engine **MUST NOT** be shut down immediately. Operate the engine for a while; **DO NOT** shut down the engine until the temperature of water has dropped to a normal value.
- Select the neutral position on the transmission control pad and then turn off the power.
- After shutting down the engine, engage the parking brake,

WARNING: If you leave the vehicle with the engine running, the vehicle could move unexpectedly and people could be injured. If you must leave the engine running, **DO NOT LEAVE** the vehicle until you have completed all of the following:

- Put the transmission in **N** (Neutral).
- Ensure the engine is at low idle (500–800 rpm).
- Apply the parking brakes and emergency brake and ensure they are properly engaged.
- Chock the wheels and take any other appropriate action to prevent the vehicle from moving.

NOTE: If the passenger door is open while the engine is running and without the park brake applied; a buzzer will sound. Apply the park brake and the buzzer will turn off.

Section 4 - Startup and Driving (continued)

4G - Spare wheel:

There is a spare wheel located on a cradle underneath the front end of the vehicle (figure 33a).



Spare wheel located underneath the front end of the vehicle

To lower the spare wheel:

- Ensure your vehicle is secure, cannot move unexpectedly and is on firm, flat ground.
- First remove the bolts securing the spare wheel (figure 33b)
- Remove the rubber cap located in the stairwell; behind this is the socket for the spare wheel cradle (figure 33c).
- Insert spare wheel handle (figure 33d); ensure handle is fully seated; then proceed to unwind spare wheel cradle (four turns of the handle = approx. one linkage movement) until spare wheel is accessible.
- Remove the wheel from the cradle.



Figure 33b
Bolts securing spare wheel cradle



Figure 33c
Rubber cap located in passenger stair well



Figure 33d
Spare wheel handle

Removing the defective wheel:

- Locate jack under the jack-point nearest the wheel to be changed. **Note:** there are four jack-points on the vehicle chassis (two forward of the rear wheels; and two behind the front wheels in-line with the mud-flaps). refer to figure 33e



Figure 33e
Jack point x 4

- Raise the 'jack' until it begins to load; then raise vehicle slightly to take the load of the wheel, but leave the tyre in contact with the ground.
- Using the wheel nut brace, ease the wheel nuts loose (do not remove nuts). Note: ensure brace is fully seated to avoid damage to wheel nuts and possible injury.
- Using the 'jack', raise the vehicle until the tyre is no longer in contact with the ground. Release the wheel nuts and carefully remove the wheel.
- Replace with the spare wheel and finger-tighten wheel nuts onto bolts, secure wheel nuts using the brace but do not over tighten the wheel nuts. Note: ensure brace is fully seated to avoid damage to wheel nuts and possible injury.
- Lower the 'jack' until the wheel is in contact with the ground; then ensure the wheel nuts are tightened to the correct torque (600Nm for Steel rims and 550Nm for Alloy rims). Note: Tyre pressure should be **760Kpa**.
- Remove the 'jack' and return to its location.
- Place defective wheel onto spare wheel cradle and rewind cradle into position. **CAUTION: Ensure cradle is fully secured before driving the vehicle.**
- Remove spare wheel handle and replace rubber cap.

CAUTION: NEVER lie beneath a vehicle when using a 'jack' only – axle stands should also be used to ensure personal safety.

Section 5 - General Maintenance

5A - General knowledge:

The vehicle will remain in good operating condition as long as the correct maintenance and operating procedures are followed. During maintenance, the vehicle should be parked on a level dry surface with the hand-brake in the 'ON' position; this is to ensure the vehicle does not move. **Note:** If the vehicle operates under extreme conditions, (such as bad roads, thick dust condition and frequent stop start operations), the maintenance interval should be reduced accordingly. Carefully clean all surrounding areas before adding fluids or changing parts.

5B - Cleaning the vehicle:

- Be careful not to pollute or damage the environment when washing the vehicle.
- Ensure the correct concentrations of cleaning detergents are used.
- DO NOT wash the vehicle in direct sunlight.
- ENSURE water is not directed onto or into the air intake system as this can cause extensive engine damage.
- DO NOT spray high pressure water onto the radiator fins; or any Electronic Control Unit (ECU).

5C - Maintaining the engine:

For up to date and correct engine maintenance information, please refer to the engine Supplier's Operation Handbook. For cleaning, steam is the best method for an engine and its components. ENSURE that all electrical components such as ECU's, alternators, starters, openings, wiring and terminals are protected from the full force of the cleaner spray nozzle. If steam is not available, use a solvent. **WARNING:** Use protective clothing to avoid risk of serious injury.

5D - Cleaning the radiator:

Keep the outside of the radiator clean to enable a good air flow to pass through it.

Use compressed air or water to clean the outside of the radiator. If there is hard scale on the radiator, steam can be used to blow and clean both sides. DO NOT USE HIGH PRESSURE CLEANERS ON THE RADIATOR FINS WHICH MAY CAUSE DAMAGE.

5E – Coolant:

Note: ONLY the coolant recommended by the engine manufacturer MUST be used in the cooling system.

5F - Rotation of the tyres (figure 34):

To assist with tyre life, it is suggested to periodically rotate the RADIAL tyres according to the diagram below:

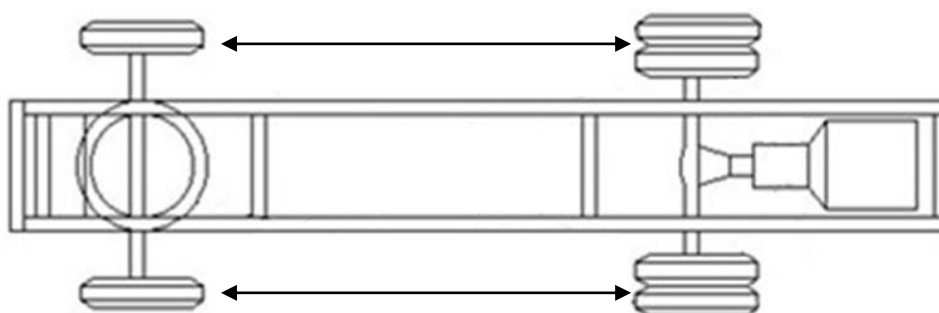


Figure 34

ROTATION OF THE RADIAL TYRES

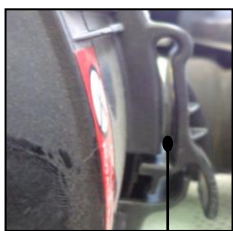
Section 5 - General Maintenance (continued)

5G - Cleaning the air filter (figures 35a to 35d):

The filter elements should be replaced in following cases:

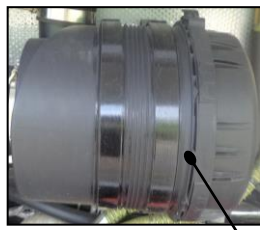
- The filter elements are 'clogged -up'.
- The filter cores have been damaged.
- The indicator lamp on the instrument panel lights-up, this means that the filter elements should be cleaned or replaced. Dirty or damaged filter elements will cause insufficient power and possible damage to the engine.
- In order to ensure the service life and normal operation of the engine, the air filter **MUST BE** regularly and carefully maintained.
- Under normal operating conditions the air filter should be checked and maintained after the vehicle has been driven for each 15,000 km. When the vehicle operates in heavy dust conditions, the checking and replacement period of the filter elements **MUST** be greatly reduced accordingly.
- The engine must be turned off when the filter system is being maintained.
- Release the lock lever, twist and turn to remove the cover; then **take out the large filter element ONLY**.
- **DO NOT start the engine after the filter has been removed.**
- Clean the cover and the inside of the shell using a dry, clean cloth.
- Do prevent water entering the air filter directly.
- Expel the dust in the blunter valve.
- Clean the filter elements by using compressed air at maximum 2.5bar to lightly blow the dust off without tearing the paper element. The elements may be washed, but please check with the manufacturer for the correct procedure.
- ◆ **NOTE: DO NOT damage the paper elements.**

Figure 35a



Lock lever

Figure 35b



Cover

Figure 35c



Figure 35d



Filter elements

Using compressed air to blow the filter elements:

- ◆ *Use compressed air with a pressure not exceeding 2.5 bar from inside to outside until there is no dust remaining.*
Caution: DO NOT blow the outside surface of the filter elements using compressed air. Clean the surface using a piece of cloth.
- The filter elements should be visually checked with the aid of a lamp to make sure that there is no damage before re-installing them.
- Also check for damage or cracks on the sealing ring.

Note: DO NOT start the engine without the air filter and elements fitted.

AFTER ANY MAINTENANCE ON THE FILTER SYSTEM – IT IS ESSENTIAL THAT PERSONNEL ENSURE THE FILTER COVER IS CORRECTLY SECURED.

Section 5 - General Maintenance (continued)

5H - Changing the air filter (figures 36a to 36m):

5H.1 – The filter sensor will turn on the indicator mounted on the driver's dash, which indicates when the element needs changing. **Note: the sensor will automatically reset when the new filter/s are installed**

Figure 36a



Figure 36b



5H.2 - Lift the lever on the filter cover (figure 36c) and twist cover to the left into the open position (figures 36d & 36e).



Figure 36c



Figure 36d



Figure 36e

5H.3 – Remove the filter cover (figure 36f) and twist the end of the filter to disengage seal (figure 36g). Gently remove the filter element from the housing. Inspect the filter for foreign material on the sealing surface and potential marks of dust on the clean air side. Note: If servicing a system that contains a secondary element, apply the same procedure.



Figure 36f

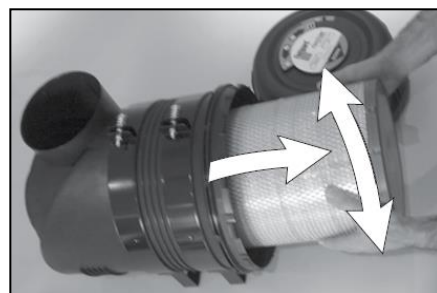


Figure 36g

5H.4 - Thoroughly clean the sealing surface and the inside of the filter housing (figure 36h). Inspect the new filter element for damage, and if acceptable insert into the housing (figure 36j). Note: If servicing a system that contains a secondary element, apply the same procedure.

Figure 36h



Figure 36j



Section 5 - General Maintenance (continued)

5H - Changing the air filter (figures 36a to 36m) (continued):

5H.5 – Place the filter cover back on the housing and make sure the dust ejection valve is oriented downward (figure 36k). Twist the cover to the right into the locked position (figures 36l & 36m). **ESSENTIAL TO ENSURE THE COVER IS SECURELY LOCKED BEFORE DRIVING THE VEHICLE.**



Figure 36k Dust ejection valve



Figure 36l

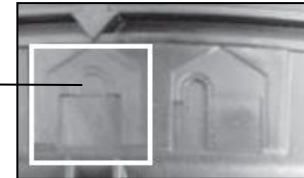


Figure 36m

Changing the air filter has been extracted from the Cummings / Fleetguard Optiair Service instruction

5J - DEF tank remote breather filters:

Extracts from Cummins Maintenance Manual

Remove

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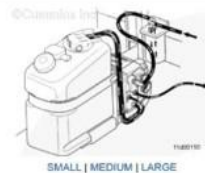
WARNING

Diesel exhaust fluid (DEF) contains urea. Do not get the substance in your eyes. In case of contact, immediately flush eyes with large amounts of water for a minimum of 15 minutes. Do not swallow. In the event the DEF is ingested, contact a physician immediately. Reference the materials safety data sheet (MSDS) for additional information.

Disconnect the electrical connections and pipework from the DEF tank level sensor assembly.

Remove the DEF tank level sensor assembly from the DEF tank. Refer to the OEM service manual.

NOTE: In some cases, the DEF tank is bonded to the vehicle chassis, leaving no access to the DEF tank level sensor assembly. If this is the case, contact the OEM to arrange for the tank to be removed and inspected.



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Inspect for Reuse

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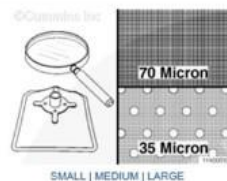
WARNING

Diesel exhaust fluid (DEF) contains urea. Do not get the substance in your eyes. In case of contact, immediately flush eyes with large amounts of water for a minimum of 15 minutes. Do not swallow. In the event the DEF is ingested, contact a physician immediately. Reference the materials safety data sheet (MSDS) for additional information.

Inspect the inlet filter attached to the DEF tank level sensor assembly. Confirm that the filter is a 35 micron filter, per the illustration.

Inspect the DEF tank level sensor assembly inlet filter for dirt or contamination. If signs of dirt or contamination are found, replace the inlet filter.

NOTE: If the inlet filter is **not** a 35 micron filter, then replace the inlet filter with a 35 micron filter.



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Section 6 - Vehicle Maintenance

Notice: The service intervals and items that Bus and Coach International Pty Ltd suggest are only a guide for general maintenance. Please refer to component suppliers service guides such as engine and transmission for correct service intervals and instructions. Vehicles operating under arduous conditions require the service intervals to be reduced accordingly to suit.

Note: The very first maintenance service is to be carried out when the vehicle first reaches 5000km or before 6 months from delivery to the customer. Complete all checks as per the 15000km service schedule in this handbook under section 6 and at this time ensure the engine oil and filters plus differential oil and manual transmission (if installed) oil is replaced. (Do not change the Allison automatic transmissions oil as this unit has synthetic Castrol Transynd oil filled from the factory which only requires replacing at 120 000km).

Note: These service intervals are to be used as a guide only and may change from time to time. Therefore, it is important to confirm details from the Supplier's maintenance instruction booklet prior to commencement. Oil change intervals are based on mineral oil being used. Other checks such as draining condensation from air tanks, greasing and checking of the fluid levels etc.; MUST be done in between these recommended services. For buses operating under arduous conditions, these service intervals must be reduced. Confirm details from the Supplier's maintenance booklet prior to commencement.

6A	CRUISER 12 - ENGINE CHECKS	FIRST 5000KM
No		TICK IF OK
1	Air cleaner restriction - check	
2	Air compressor mounting - check	
3	Charge air cooler + Coolant radiator - check & clean	
4	Fuel pump mounting maintenance - check	
5	Fuel filter housing mounting bolts - check	
6	Engine oil - check level	
7	Check for fluid leaks from engine area	
8	All drive Belts - check	
9	Fan belt tensioner - check	
10	Fan hub, belt driven - check	
11	Check for any warning lights on dash or faults on transmission controller	
12	Radiator hoses - check for leaks, damage and clamp security/tension	
	CRUISER 12 - OTHER CHECKS	FIRST 5000KM
13	Check battery terminals for corrosion and tension	
14	Check transmission oil level (Auto transmission)	
15	Replace differential oil	
16	Check steering system for leaks, damage and correct operation	
17	Check steering system for worn ball joints	
18	Check steering gear and system for loose bolts and nuts	
19	Check steering shaft universal joints for wear and bolt tension	
20	Check power steering fluid level	
21	Check fluid level in cooling system	
22	Check brake linings, brake components and pipes for wear and damage	
23	Check operation of service / park brakes and adjust as necessary	
24	Check all hoses, pipes and electrical wires for wear, damage or leaks	

Section 6 - Vehicle Maintenance (continued)

6A	CRUISER 12 - OTHER CHECKS	FIRST 5000KM
No		TICK IF OK
25	Check driveline for damage or leaks	
26	Check engine & transmission mountings for damage and tension	
27	Air filter check / clean or replace if necessary	
28	Check air cleaner housing, hoses, pipes and clamps for damage and are secure	
29	Check tension of half axle bolts and wheel nuts	
30	Check tyre pressures and tyres for damage	
31	Check for any abnormal tyre wear	
32	Check wheel nuts are secure	
33	Lubricate all grease points accordingly	
34	Check all chassis fastening points for looseness and wear	
35	Check propeller shaft sliding joint for wear and lubricate	
36	Check tension of propeller shaft flange bolts and nuts	
37	Check suspension air bags / arms / bushes - for wear / leaks	
38	Check condition and function of shock absorbers	
39	Check operation of all lights and gauges	
40	Check all warning lights are functioning correctly	
41	Check emergency exit lights and stickers for wear and damage	
42	Check operation of air conditioner	
43	Check operation of wipers and washers	

6B	CRUISER 12 – ENGINE CHECKS	A	B	C	D
	BOXES NOT FILLED IN WITH BLACK ARE TO BE ACTIONED IF THEY	EVERY	EVERY	EVERY	EVERY
	LINE-UP WITH THE RELEVANT SERVICE COLUMN A,B,C,D	15000KM	30000KM	60000KM	120000KM
No	TICK REQUIRED SERVICE DUE IN BOX OPPOSITE				
1	Air cleaner intake piping - check				
2	Air cleaner restriction - check				
3	Air compressor mounting - check				
4	Charge air cooler + piping + Coolant radiator - check & clean				
5	Crankcase breather tube - check				
6	Fuel injection pump mounting maintenance - check				
7	Cooling system - antifreeze/glycol level and PH check				
8	Fuel filters - replace + drain fuel / water separator				
9	Engine oil - change				
10	Coolant filter - replace				
11	Engine oil filters - replace				
12	Drive belts - check				
13	Fan belt tensioner - check				
14	Cooling Fan & hub - check				
15	Air compressor carbon build up in lines - check / clean				

Section 6 - Vehicle Maintenance (continued)

6B	CRUISER 12 – ENGINE CHECKS (contd)	A	B	C	D
	BOXES NOT FILLED IN WITH BLACK ARE TO BE ACTIONED IF THEY LINE-UP WITH THE RELEVANT SERVICE COLUMN A,B,C,D	EVERY 15000KM	EVERY 30000KM	EVERY 60000KM	EVERY 120000KM
No	TICK REQUIRED SERVICE DUE IN BOX OPPOSITE				
16	Radiator hoses - check				
17	Exhaust gas filter clean (only to be done every 240 000km)				
18	Engine steam clean				
19	Engine mounts check				
20	Vibration damper & rubber - check				
21	Set tappets (valve lash only to be done every 240 000km)				
22	Drain condensation from air tanks (must be done daily)				
23	Check battery electrolyte level and correct if necessary				
24	Check battery terminals for corrosion and tension				
25	Check transmission oil level				
26	Check differential oil level				
27	Check steering system for leaks, damage and correct operation				
28	Check steering system for worn ball joints				
29	Check steering gear and system for loose bolts and nuts				
30	Check steering shaft universal joints for wear and bolt tension				
31	Check power steering fluid level				
32	Check fluid level in cooling system				
33	Check brake linings & components for wear and damage				
34	Check operation of service / park brakes and adjust as necessary				
35	Check all hoses, pipes and wires for wear, damage or leaks				
36	Check driveline for damage or leaks				
37	Check engine & transmission mountings for damage and tension				
38	Replace air drier filter (minimum once per year)				
39	Air filter check / clean or replace if necessary				
40	Replace differential oil				
41	Replace Transmission oil				
42	Replace transmission filter				
43	Replace power steering filter and fluid				
44	Replace Coolant and flush system				
45	Check all 'V' belts				
46	Check brake pedal free play				
47	Check tension of half axle bolts and wheel nuts				
48	Check tyre pressures, wear & damage				
49	Lubricate all grease points accordingly				
50	Check all chassis fastening points for looseness and wear				
51	Check lubricant level of reduction final drive and clean breather				
52	Clean lubricate and adjust wheel hub bearings				

Section 6 - Vehicle Maintenance (continued)

6B	CRUISER 12 – ENGINE CHECKS (contd)	A	B	C	D
	BOXES NOT FILLED IN WITH BLACK ARE TO BE ACTIONED IF THEY LINE-UP WITH THE RELEVANT SERVICE COLUMN A,B,C,D	EVERY 15000KM	EVERY 30000KM	EVERY 60000KM	EVERY 120000KM
No	TICK REQUIRED SERVICE DUE IN BOX OPPOSITE				
53	Check propeller shaft sliding joint for wear and lubricate				
54	Check propeller shaft universal joints for wear and lubricate				
55	Check tension of propeller shaft flange bolts and nuts				
56	Check suspension air bags / arms / bushes - for wear / leaks				
57	Check and adjust wheel alignment				
58	Check condition and function of shock absorbers				
59	Check operation of all seat belts and seats are correctly secured				
60	Check fire extinguishers levels and expiry date				
61	Check operation of all lights and gauges				
62	Check all warning lights are functioning correctly				
63	Check emergency exit lights and stickers for wear and damage				
64	Check operation of air conditioner				
65	Replace air conditioner cabin filter				
66	Replace AdBlue filter				
67	Replace AdBlue tank filter (bottom of suction pipe)				
68	Purge AdBlue airline with warm water				
69	Note: Items 46 & 47, otherwise, at least once a year	N/A	N/A	N/A	N/A

6C - Recommendations for lubricants:
6C.1 - Choosing the lubricant according to the Supplier's Engine Manual:

During the engine's use, some engine oil used to lubricate the pistons will be burnt (consumed) due to the high temperatures. This 'burning' causes the engine oil to deteriorate and the 'burnt' oil contaminates the lubricant. It is therefore important that the engine oil is replaced after a certain period. Such deterioration depends on the operating conditions as well as the quality of the oil used. So, the time interval for replacing the oil is dependent upon usage and environment.

6C.2 - Gear lubricant:

- **Allison Transmissions:** Lubricant used from factory on all Allison product is Transynd – it is recommended this be used to top up and be replaced with the same product every 120 000km

NOTE: ALWAYS refer to the transmission Supplier for up to date recommendations on lubricants and service intervals.

6C.3 - Hydraulic oil for power steering:

Applied standard: The Genera Allison C-3; The DEXRON-II hydraulic transmission oil should be chosen when the power steering mechanism operates under a temperature lower than 10°C; If above 10°C then choose C-3 / 10W. The C-3/10W grade oil is all-purpose oil used in a variety of conditions; The C-3 / 30 grade oil is all-purpose oil for above freezing environments.

Section 6 - Vehicle Maintenance (continued)**6C.4 - Engine coolant:**

Refer to engine manufacturer's recommendations for correct product and service intervals.

6C.5 - Lubricant for the chassis:

Lithium based Extreme Pressure 2" grease "LX EP-2" should be applied to the various components.

6C.6 - Parker Hydraulic Fan Drive Oil (figures 37a & 37b): For vehicles fitted with the Parker hydraulic fan drive:

- Check the oil level by viewing the sight glass (figure 37a)
- If necessary, remove cap (figure 37b) and 'top-up' oil level as required with Shell Tellus (semi-synthetic hydraulic oil) S2M 46.
-

Figure 37a**Figure 37b**

Section 7 - Trouble Shooting

NOTE - Engine: Please refer to OEM Engine Manuals

NOTE – Transmission: Please refer to OEM Transmission Manuals

NOTE – For models using an OEM chassis (e.g. Scania / MAN/ Mercedes). Please refer to OEM manuals.

7A – Chassis:

7A.1 – Engine / transmission		
Fault	Possible causes	Trouble shooting
Not selecting a gear – Automatic transmissions	Ensure foot is depressed firmly enough on the brake pedal before selecting a gear	Reselect neutral and then depress foot brake firmly before selecting a gear
	Foot brake switch has failed – Switch is located above the spare wheel below driver's position	Replace brake switch
	Some new generation Allison 'Gen 5' transmissions have a 'forced neutral' programmed as standard, which automatically selects neutral when the park brake is applied whilst the vehicle is in gear.	Release the park brake and select a gear with the foot firmly applied.
Engine not starting	Rear engine door not closed firmly	Ensure rear engine door is fully closed and the door warning light on dash for 'open rear door' is no longer illuminated
	Vehicle in gear	Select neutral on transmission control selector
	Bus isolator switch has not been turned back on	Turn on bus isolator switch
	Red engine safety isolator switch in engine bay is in the 'on' position	Turn safety switch back to 'off' position
	Battery terminals loose	Check battery terminals are secure
	Batteries have no charge	Charge or replace batteries
	Failed starter solenoid	Replace starter circuit solenoid
	Loose earth strap from engine to chassis	Ensure earth strap is secure and has good connection
Green engine light on dash – maintenance level event	Possible adblu / urea tank empty. Water in fuel. Failed real time clock battery for ECM.	Check adblu / urea tank is not empty, and refill if necessary. May need to have adblu system reset, if fluid has run-out. Contact your BCI Dealer for guidance should you require assistance.

7A.1 – Engine / transmission (continued)

Fault	Possible causes	Trouble shooting
Orange dash light 'on' and buzzer sounding	Orange engine light 'on' – Attention is required – Possibly low coolant in the header tank. Check all engine fluid levels. Contact your BCI Dealer for guidance should you require assistance.	Check coolant level in header tank, if it is full and all other engine fluid levels are ok and you want the buzzer to stop sounding – locate the sender unit wires from the sender at the bottom of the header tank and disconnect them at the plug. Note: Be sure to have the sender unit replaced as soon as you complete the trip.
Red engine dash light 'on'	Urgent attention required	Stop the bus urgently, as soon as it is safe to do so and turn off the engine. Call a BCI or Cummins Dealer for assistance
Engine loss of power	Possible binding of brakes	Stop driving and position the vehicle on a slope and release the foot brake to see if the bus rolls freely and brakes are not dragging. If brakes are dragging, stop and call a BCI Dealer for guidance on how to proceed.
	Engine lamp illuminated	Engine has possibly de-rated as a self - protection measure – Call a BCI or Cummins Dealer for assistance
Bus will not accelerate	Entry door not properly closed	Ensure the entry door is fully closed
Bus not building up air pressure	Delivery pipe from air compressor to air tank has failed	Replace delivery pipe
	Major air leak	Check for major air leaks and rectify
Engine not using adblu	Adblu injector blocked	Remove adblu injector and remove clean crystalized adblu blockage with warm water

7A.2 - Rear Axle and Propeller / Tail Shaft

Fault	Possible causes	Trouble shooting
Noise or vibrations from transmission or drivetrain	Failed or dry propeller shaft universal joints	Inspect and lubricate grease nipples of propeller shaft – replace joints if any freeplay is found
	Low oil level in transmission or rear axle	Check oil levels and top-up as necessary
	Loose bolts on propeller shaft coupling flange	Re-tension fasteners of propeller shaft coupling flanges
	Propeller shaft universal joints not in phase	Check propeller shaft has been phased correctly. If not, rectify
	Air conditioning belt 'anti-slap' tensioner failed bearings	Check tensioner for failed bearings and ensure there is at least a 5mm gap between the belts and pulley roller
	Loose or collapsed engine or transmission mountings	Tighten or replace mountings
	Metal to metal contact causing a 'drumming' noise through the cabin	Inspect mountings such as engine, transmission, exhaust, engine fan and air-conditioning compressor for areas of contact
Worn, loose or damaged rear sway bar bushes	Check and replace bushes as required or tighten fasteners	

7A.3 - Steering:

Fault	Possible causes	Trouble shooting
Steering still / noisy and / or not self - centering after turning	Low tyre pressure	Check tyre pressure and adjust as required
	Lack of lubrication in king-pins and steering ball joints	Raise the front axle onto stands ensuring the king-pins have no load on them. Grease the king pins and steering ball joints
	Lack of power steering oil	Check oil level in reservoir is sufficient
	Steering shaft universal joints seized on shaft from steering wheel or shaft to steering box	Inspect universal joints and replace if failed
	Failed steering pump	Replace steering pump
	Stiff or seized tie rods ends	Replace tie rod ends
	Loose fasteners on tie rod ends, drag link or steering box	Check and re-tension if necessary
Steering wheel not centralized or too much free-play	Wheel alignment incorrect	Reset wheel alignment
	Worn tie rod ends or damage to the steering link	Check steering system for damage or wear and repair as necessary
	Loose nuts on tie rod ends or drag link	Check and re-tension as necessary
	Loose steering wheel retaining nut	Re-tension nut

7A.3 – Steering (continued):		
Fault	Possible causes	Trouble shooting
Uneven tyre wear	Incorrect tyre pressures	Check and reset tyre pressures
	Incorrect wheel alignment settings	Re-set wheel alignment
	Failed shock absorbers	Check and replace shock absorbers
Bus wanders on road, driver continually making adjustments to compensate	Incorrect ride height settings	Set vehicle to correct ride height
	Stiff king-pins or tie-rod ends	Check and repair as necessary
	Stiff or seized steering shaft	Inspect both shaft universal joints from steering wheel to steering box
Excess freeplay in steering	Possible steering box adjustment required	Adjust steering box freeplay

7B – Body:		
Fault	Possible causes	Trouble shooting
Entry door not opening or closing	No air pressure in system	Start engine and build up air pressure
		Incorrect setting of RT146 entrapment – AU Eastern States
	Emergency door valve is in the on position	Turn off the emergency door valve under front nearside of bus
	Door remote control has flat battery	Replace battery
	Vehicle isolator switch is on	Turn off vehicle isolator switch
	Bus on a slope and door not closing	Adjust spring at top of door pillar shaft
	Collar on door ram not set correctly	Micro switch ball jammed
		Reed switches not set correctly
RTA 146 Entrapment for UA Eastern States not set correctly or has failed	Adjust and or replace as necessary	

7C - Electrical Equipment:		
Fault	Possible causes	Trouble shooting
The power-charging indicator does not go out and the vehicle is difficult to start	The generator has been damaged.	To replace the generator.
	The circuit of the power-charging indicator has a short circuit.	To check the circuit.
	The belt slips.	To adjust the belt.
Lose of battery power. The battery is not being charged at a low speeds.	The battery has been damaged.	To replace the battery.
	The generator has been damaged.	To replace the generator.
	The belt slides.	To adjust the belt.
There is an abnormal noise when the generator rotates.	The belt is too loose or the wear and tear of the belt is severe. The belt shakes during operating.	To adjust the belt and or replace the bearings.
	The bearings have been damaged or the clearance in the bearings is too large.	
	The clearance in the bearings is too large.	
The vehicle is difficult to start.	The battery has no power or insufficient power. Or the terminals may be loose.	To charge the battery. To clean and fasten the terminals.
	The switch of the starter contacts poorly. Connection short or the solenoid goes bad	To repair or replace the switch.
	The small gear of the starter has been jammed at the tooth ring of the flywheel. The bearings of the engine have burnt out.	To repair or replace them.
The engine rotation speed is very low while starting	The battery power is insufficient. The terminals have become loose or soiled.	To charge the battery. To clean, fasten, repair or replace the terminals.
	The connecting points of the switch on the engine have been burned out and eroded. The armature shaft has bent or the copper sleeve has burnt out.	To replace the switch. Repair or replace the armature parts
	The electric brush has been worn down or elasticity of the electric brush is insufficient.	To replace the brushes.
The starter starting gear and the starter ring gear do not engage.	The contact of the igniting switch is bad or loose.	To clean, and fasten the contact.
	The wiring of the relay and the electromagnetic switch is not secure.	To secure the wiring.
	The starter solenoid winding is broken	To replace it
	The starting gear or the starter ring gear is damaged.	To repair the surface of the teeth or replace it.
	Synchromesh gear operation is poor	To find out the causes and eliminate them
	The armature shaft of the starter has bent.	To replace the armature shaft.
The starting gear of the starter cannot separate	The shaft sleeve of the starting gear is too tight and / or jammed.	To replace, clean and correct the shaft sleeve.
	The clearance between the starting gear and the flywheel tooth-ring is excessively small or the starter gears have been damaged.	To adjust the clearance or replace the starting gear.
	The solenoid winding is soiled.	To clean it

Section 8 - Appendix

8.1 - CAN instrument panel operating guide:

Refer to the following document on the BCI Dealers Website: 13B - Parker DPS70 Menu System



8.2 – ICONS (SYMBOLS MAY VARY):

The instrument panel contains alarm indicators (temperature alarm, water-level alarm and so on), operations (left turn, right turn and so on) and states (ABS working indication, retarder working indication).













For the range of icons and their meaning, please refer to the table below. The ZB277 will display the important signals using these icons, for instance: when one alarm signal is a light, the STOP icon will also light up to remind the driver to stop the vehicle. When the fuel is low, the fuel icon will a light. When the water-level alarm, speed alarm, rotational speed alarm and oil pressure alarm and so on occur, the buzzer will make the sound "Dee..., Dee...".

Seq.	Name	Sign	Comments
1	Offside indicator	➔	
2	Nearside indicator	➔	
3	Safety belt	🚗	
5	ASR	(ASR)	
8	Transmission error	⚙️❗	
13	Coolant temperature gauge	🌡️	
14	Oil pressure alarm	🛢️	
15	Air Pressure 1 alarm	(!)	
16	Air Pressure 2 alarm	(!)	
18	Parking lamp	(P)	
19	Front Fog Lamp	🌫️	
21	High beam	🚗	
22	Low beam	🚗	
23	SCR alarm	🚗	
24	STOP	STOP	

Section 8 – Appendix (continued)

8.1 - CAN instrument panel (continued)

8.2 – Icons (continued):

Seq.	Name	Sign	Comments
26	Clearance light		
27	Water level alarm		
30	Fuel filter alarm		
39	Engine MIL		
40	Engine start light		
41	Engine shut-off light		
42	Engine warning indicator		
43	WC Inadequate water alarm		
61	Rear bin door		
67	Side kneeling	KNEELING	
69	Transmission oil temperature		
71	Nearside brake disc wear		
72	Offside brake disc wear		
108	Cruise	CRUISE	Icon different
	Luggage bin door		Currently no details
	EBS alarm		
	Battery charge		
	EBS fault		
	Safety hammer alarm		
	Front door open		