HIGER Bus Company Limited/GO Automobile Manufacturing Sdn Bhd

Service and Maintenance
Diesel Bus and Electric Bus

Proper operation and periodic maintenance is an important guarantee for vehicle performance and driving safety. Failure to perform Running-in Maintenance and other periodic maintenance shall be regarded as a waiver of warranty rights.

Important To User

- To operate and maintain your vehicle properly, please read the User's Manual and Higer Electric Bus Maintenance Manual carefully, then perform PDI, Routine Maintenance, Running-in Maintenance, Elementary Maintenance ,Complete Maintenance, Additional Maintenance I and Additional Maintenance II in conformity with the requirements strictly. Please be sure not to operate against the tips for safety in this book.

- Proper operation and periodic maintenance is an important guarantee for vehicle performance and driving safety. Failure to perform Running-in Maintenance and other periodic maintenance shall be regarded as a waiver of warranty rights.

- When the new bus runs for the first 3,000km or leaves the factory of Higer (date on the nameplate) for 6 months (whichever comes first), please drive the bus to Higer authorized service station for Running-in Maintenance.

- The user should replenish coolant, power steering fluid, reducer oil, rear axle oil, air compressor oil, detergent and grease according to local weather, temperature, road conditions and requirements, specifications and volume of the manual. Oil and fluids should be replaced at intervals as regulated in this manual. Oils or fluids of different models or brands must not to be mixed.

- It is forbidden to install equipment or modify the vehicle without authorization. Any consequence resulted from unauthorized addition or modification will be responsible by the user.

- The vehicle is not allowed to run with malfunctions. When vehicle failures are found, the user should drive the vehicle to the service station immediately for troubleshooting.

- If any contactor, relay, fuse or connector is abnormal, please find the cause and eliminate the potential risk immediately. It is forbidden to use wire or fuse that doesn't meet the standard as substitute.

- When towing a vehicle, a hard connection should be used for traction. Please refer to the User's Manual for details.

- It is forbidden to rinse electric equipment, especially ECU, connector, electric units, relays, etc.

- Before welding, disconnect the negative terminal of the battery and high voltage service switches, and then unplug all connectors to the ECUs to prevent damages to electric units.

- Keep the vehicle from water with a depth of up to 20 centimeters, or may lead to serious consequences.

- Imitation parts will affect the safety and reliability of Higer bus. Please contact with Higer authorized service station or spare parts distributor to purchase the genuine parts. When repairing or maintaining Higer bus, it is required to use Higer genuine parts.

Warranty Coverage

Warranty Coverage at a Glance

This overview chart illustrates warranty coverage and term by months and kilometers. Please refer to the appropriate sections in the maintenance manual book for a detailed information regarding each of these warranties.

ELECTRIC BUS	WARRANTY TERM (whichever comes first)						
	Months in Service	Kilometers in Service					
		10,000	20,000	30,000	40,000	100,000	500,000
Basic	24	→	→	→	→	100,000	
Original Equipment Battery & Electric Motor	60	→	→	→	→	→	500,000
•Service Part and Accessories •*Under cash purchased	6	→	10,000				

Note : * Tyre are warranted by the tyre manufacturers.
* Any parts replaced during the warranty period shall be subject to the duration of the New Vehicle Limited Warranty.

Safety Operations To User

Charging Station

- Staff without authorization is not allowed to carry out operations on the charging device. Only the well-trained working staff of the charging station is allowed to carry out operations on the charging device.
- It is not allowed to turn on the charging device if the connector and LCD do not function well before charging.
- The charger should match with the vehicle, and then well connect the charging gun plug with vehicle socket.
- Ensure the charger casing is grounded and sudden power-off or wire disconnection should be prohibited.
- The charger working staff must keep a real-time monitoring on the charging device status such as the voltage, current and temperature.
- Charging in thunderstorm is prohibited. Stop charging immediately once there is thunderstorm in case of charger damage.
- The charging must be stopped once there is any abnormal noise in charger, abnormal voltage and LCD display. The related symptoms should be recorded and reported to the technician of charger. Only professional personnel are allowed to disassemble the charger.
- For the sake of personnel safety, the repair on the charger must be carried out after turning off for 15 minutes and there should be static-proof action.
- Turn off the charging device to avoid damages if it stays vacant for a long time.

High Voltage Electrical System

- The working staff who operate the high-voltage system must wear quality insulate shoes and gloves, and use the tools with insulated handles. Before the operation, the power must be shut off and warning signs 'In Operation! Don't' move 'and 'Danger! Do not get close' should be hung.
- The operation on the high-voltage system must be carried out by at least two persons, one for the operation and the other for supervision. If there are more than two persons, a head should be elected for the whole operation who points out the risks and precautions.
- Before the operation on the high-voltage system, low-voltage and high-voltage system must be powered off. And then measure the voltage five minutes later after the shut-offs and carry out the operation only after the actual voltage is below 36V.
- Once any danger or unexpected situation occurs during the operation on the high-voltage system, the power must be shut off and report to the superior immediately, and keep guardianship over the working area in case of others' operation by their unawareness.
- Make sure all the high-voltage parts are well stored, the operators are well protected and working environment is safe! Keep your fingers and any metal away from these parts!
- Other unspecified precautions, please refer to electrician safe operation instructions.

Microvast Power Battery

- Before a long-term storage of battery, ensure that the SOC of battery is more than 60% as far as possible, and charge the battery every 3 months to keep SOC ≥60%.
- Store the battery in a dry, ventilated and cool place where the environment temperature is -20°C~55°C and without direct sunlight, violent vibration, high temperature, high humidity or corrosive gas.
- The battery connected with a load or recessive load is prohibited during storage period, which means any types of discharge behavior are forbidden

Maintenance & Repair

Charging Station
Summary

HCD, HCF charger series of maintenance is relatively simple, with a small amount of the characteristics of operation and maintenance when the need to maintain a clean and tidy environment, pay attention to the ventilation and heat dissipation, the air should be no danger of explosion of medium, without sufficient corrosion and damage to the insulation of the gas device shall be installed in the absence of severe vibration or jolt.

Device after the transportation first before operation, or for a long time after the shutdown of the operation again, it generally takes to check the device, in addition to the correct drawings check wiring, still need to check each component is due to transportation and other reasons caused by the loosening of the phenomenon; wire, bronze and other connections are tight, good contact. After the examination, in the electricity test.

Should be according to the degree of the plot of the ambient air regularly on the device for dust removal, and the plot, when cleaning should cut off all power supply, compressed air machine (pressure is not too high), vacuum cleaner or small brush apparatus on the device of external appearance and internal devices, wire connections and other easy to accumulate dirt, careful cleaning. The internal device of the device including the cleaning of the printed circuit, do not use any cleaning agent, it is not suitable to use a damp cloth, etc..

When the equipment is running and fault detection system does not stop on the control channel were detected, but fault inspection system can guaranteed to detect all faults, such as the contactor is normal, so regularly check equipment is necessary.

Maintenance working conditions

When carrying out maintenance work, should pay attention to charger conditions, different inspection, maintenance of the project shall be carried out under different working conditions,

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Working conditions (1): all power supply, cut off all external electrical connection
Working conditions (2): only for AC380V and DC
Working conditions (3): open loop test conditions
Working conditions (4): equipment in operation

Maintenance content

every 3 months to maintain a, can work under conditions (4)
(1) no abnormal signal emitted by the device panel
(2) comparison of measured values. Charger sampling calculation of load current value of the analog control room and other meter reading instructions.
(3) Number should be within the allowable error range

The annual maintenance time
(1) check whether the printed circuit board is clean. Under working conditions (1), clean circuit boards with compressed air (pressure can't be too high).
(2) device function check. Under the working condition (4), whether the panel signal is normal or not, the analog signal acquisition is normal.
(3) open loop test. When necessary, the open loop test is carried out for the whole device. In the experiment, the control circuit is simulated in addition to checking the output harmonic current is normal. The input and output signals are simulated, and the simulation needs to be controlled.

Maintenance Schedule & Parts

Maintenance Intervals	Time (Months)		1			3				6				9				12 (60)				15				18				21				24 (48)				27				30				33				36 (72)
	Mileage (×1000km)	3	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
High voltage equipments insulation (Battery & High voltage cabinet & Inverter & AC etc,. Insulation)						I				I				I				I				I				I				I				I				I				I				I				I
BMS and Battery units						I				I				I				I				I				I				I				I				I				I				I				I
Battery A/C refrigerant		I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A
Consistancy of Power Battery unit																		I																I																	I
Drive Motor insulation						I				I				I				I				I				I				I				I				I				I				I				I
Motor bearing lubrication																														A+																						
Asynchronous motor bearing																		R()																																		
Drive Motor coolant										R								R								R								R								R								R
Drive Motor oil seal																		I/R																I/R																	I/R
Drive Motor insulation																		I																I																	I
Air compressor air filter			R							R								R								R								R								R								R
AC lubrication oil			R							R								R								R								R								R								R
AC lubrication oil filter																		R																R																	R
AC oil return valve filter																		R																R																	R
AC oil-air separator filter																		R																R																	R
AC seal ring & washer kit																		R																R																	R
Power steering oil		F/R								I/A								I/A								R+								I/A								I/A								R
Power steering oil filter		F/R								I/A								I/A								R+								I/A								I/A								R
ATS coolant			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Electric A/C insulation										I								I								I								I								I								I
Air return window & Filter screen			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Heater coolant		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Centralized lubrication system oil		I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A	I/A
Front wheel brake disc/drum			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Rear wheel brake disc/drum			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Front axle & Rear axle friction block						I/R				I/R				I/R				I/R				I/R				I/R				I/R				I/R				I/R				I/R				I/R				I/R
Brake discs & Brake caliper						I				I				I				I				I				I				I				I				I				I				I				I
Differential oil		F/R	I	I	I	I	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	I	I	I	I	R
Reducer lubrication oil		F/R																											R++																						
Seal ring of input/output shaft																																																			R+++
brake clearance			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
brake pedal free trip			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Air Dryer										R								R								R								R								R								R
Toe-in			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Steering wheel free play			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
tie rod ball lubrication			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Front/Rear air suspension			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Tires and Tires Pressure			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Interior Safety Equipments			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Lights & Battery			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Tighten Chassis & Bolts & Connectors			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Wiper & Spray function			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Oil/Fuild leakage			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Body Condition			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I

Note:
I = Inpection; R = Replace; C = Clean; A = Add; F/R = First 3000km / Replace; I/R = Inspect / Replace; A+ = Add lubrication grease every 140,000km / 2 years;
R() = Replace every 60 months; R+ = Replace every 120,000km / 2 years; R++ = Replace every 140,000km / 2 years; R+++ = Replace every 270,000km / 3 years

Maintenance & Repair **Estimated** Price

Item 项目	Description 说明	Year 1st 第1年	Year 2nd 第2年	Year 3rd 第3年	Year 4th 第4年	Year 5th 第5年	Year 6th 第6年	Year 7th 第7年	Year 8th 第8年
	Mileage Per Year	80,000 km 12 Months	160,000 km 24 Months	240,000 km 36 Months	320,000 km 48 Months	400,000 km 60 Months	480,000 km 72 Months	560,000 km 84 Months	640,000 km 96 Months
1	Spare Parts 备件	RM 24,050	RM 24,940	RM 49,400	RM 52,202	RM 58,300	RM 71,160	RM 50,600	RM 53,348
2	Labor 劳力								
3	Consumables 耗材								
4	Axles 车轴								
5	Alternator 发电机								
6	Drive motor 驱动电机								
7	Motor controller 电机控制器								
8	Power Battery 动力电池								

Price are based on :- * 8 Year Maintenance & Repair = RM 384,000. * Mileage 80,000 km Per Year / 6,666 km Per Month / 222 km Per Day

Maintenance & Repair **Estimated** Price

MINI DIESEL BUS SERVICE & MAINTENANCE COST (SUMMARY)

COMPONENT	SERVICE LIFE		YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	TOTAL
	YEAR	KM	1	2	3	4	5	6	7	8	
		,000	0-60	60-120	120-180	180-240	240-300	300-360	360-420	420-480	
		HRS	5,000	10,000	15,000	20,000	25,000	30,000	35,000	40,000	
PERIODICAL SERVICE			10,800.00	10,800.00	10,800.00	10,800.00	10,800.00	10,800.00	10,800.00	10,800.00	86,400.00
ENGINE			2,000.00	18,000.00	2,000.00	37,500.00	2,000.00	18,000.00	2,000.00	37,500.00	119,000.00
TRANSMISSION			3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	24,000.00
REAR AXLE				5,600.00		5,600.00		5,600.00		31,600.00	48,400.00
PROPELLER SHAFT				2,000.00		2,000.00		2,000.00		2,000.00	8,000.00
STEERING				4,000.00		9,000.00		4,000.00		9,000.00	26,000.00
ELECTRICAL			800.00	2,800.00	1,800.00	8,300.00	1,800.00	2,800.00	1,800.00	10,300.00	30,400.00
SUSPENSION				10,000.00	4,000.00	17,500.00		14,000.00		17,500.00	63,000.00
BRAKE			6,900.00	6,900.00	7,900.00	19,400.00	6,900.00	7,900.00	6,900.00	23,400.00	86,200.00
AIR CONDITIONING			5,100.00	9,400.00	5,100.00	14,400.00	5,100.00	9,400.00	5,100.00	14,400.00	68,000.00
BODYWORK			5,000.00	5,000.00	5,000.00	13,000.00	5,000.00	5,000.00	5,000.00	5,000.00	48,000.00
			33,600.00	**77,500.00**	**39,600.00**	**140,500.00**	**34,600.00**	**82,500.00**	**34,600.00**	**164,500.00**	**607,400.00**

Guidance For Customer

When you need to talk to HIGER

Your satisfaction is our goal. We are here to serve you. All Authorized GO EV Service Outlet have the knowledge and tools to keep your HIGER vehicle in tip-top condition. For further queries or recommendations on how to improve the service of your HIGER vehicle or the servicing undertaken on your HIGER by all our authorized GO EV Service Outlet, we recommend that you take the following steps.

STEP 1: Contact the GO EV Authorized Service Dealer

Discuss the matter with an Authorized GO EV Service Outlets/Dealers. This is the quickest and best way to address the issue. If your concern has not been resolved by the Service or Parts Manager, then please contact our Sales Operation Department.

STEP 2: Call the GO EV Solution Sdn Bhd Office – Sales & Marketing Department

If you require any assistance, feel free to contact us at **03 5569 7332**or **fax us at 03 5569 6332**. You could also e-mail us at enquiry@goauto.com.my . Alternatively, you could write to:

ATTN : General Manager
Sales Operation Department
GO EV SOLUTION SDN BHD
No.4 Jalan Pengarah U1/29,
Hicom Glenmarie Industrial Park
40000 Shah Alam, Selangor Darul Ehsan

By following these procedures, we can respond to you as quickly and efficiently as possible.