We welcome you as the owner of a new TOMCAR® off-road vehicle. We trust that the years to come will prove you made a wise choice, and your experience with your TOMCAR® will be truly special, full of many hours of service and enjoyment.

Your new TOMCAR® reflects fine engineering honed over many years. This includes component selection, field testing, customer recommendations and vehicle manufacturing codes, which all lead to this fine utility and recreational vehicle.

Your safety is our prime concern, both while operating and servicing your TOMCAR®. We have achieved excellent safety records throughout our history. In order to maintain this good record, we need your cooperation in following the instructions and recommendations outlined in this Owner’s Manual.

This manual is a part of your TOMCAR® and should remain with the vehicle.
TOMCAR® Electric Vehicle Variants

Two-Seater Pickup (TM37E)

Four Seater (TM47E)

Two-Seater Pickup (TM58E)
Identification Number

It is important that your vehicle identification number is kept in a safe place. Please record in the space provided below. Store a spare key in a safe place. Should all keys be lost or stolen, please contact your TOMCAR® supplier for assistance.

For security purposes, the Identification number also appears inside the cabin. (Not visible without disassembly.)

Frame VIN/PIN (under hood on middle frame bar): Ignition Key Number (stamped on key):

(A)

Your Supplier Details:

________________________________________

________________________________________

________________________________________

Vehicle Delivery Date:

________________________________________

Signature of Supplier (at delivery): Signature of Customer (at delivery):
Model Legends

Throughout this Owner’s Manual when indication of a specific model is required, the model descriptor uses the “X” letter as a wild card (relating to several models available).

The following list elaborates the various models and how they are reflected within this manual:

TMXXEL – Six models are derived from this descriptor:

1. TM27EL
2. TM37EL
3. TM47EL
4. TM58EL

(E – Electric Motor)
(L – High/Low Differential Lock Gearbox)
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Safe Operation Instructions

⚠️ WARNING

Reading and understanding the contents of this Owner’s Manual will protect you from injury and the vehicle from damage. Your knowledge of safe operation of this vehicle will help you train others who may operate it. This is a powerful vehicle and, as such, all driving rules, licenses and permits apply to all TOMCAR® models. Your TOMCAR® handles differently from other vehicles such as motorcycles, ATVs and cars. Therefore, the driver must undergo training prior to use. If you ignore the warnings contained in this Owner’s Manual and on the vehicle, and fail to take appropriate precautions, collisions or rollovers can happen quickly, even during routine driving maneuvers such as driving over obstacles, turning, or hill driving, and may result in severe injury or death.

TOMCAR® is intended to be used off-road, where special driving skills and know-how are essential for safe operation.

Age Restrictions

Operation of this vehicle is limited to persons who are licensed and have been trained, including reading and understanding this Owner’s Manual. No one under the age of 16 should be allowed to operate a TOMCAR®. The minimum age recommendation for passengers is 16 years old. Young or inexperienced drivers may not be able to control the vehicle. Local regulations may also restrict the age of the driver.

Vehicle Awareness

This Owner’s Manual contains valuable information about all aspects of your vehicle which will enable you, as the driver of the vehicle, to be responsible for your personal safety, the safety of others and the protection of the environment. It is important that you read, familiarize yourself with and understand this manual.

The use of a TOMCAR® is subject to certain hazards that can only be protected against by the exercise of intelligence, care and common sense. It is therefore essential to have a driver who is competent and careful, physically and mentally fit, and thoroughly trained in the safe driving and controlling of a TOMCAR® off-road.
It is important that you are familiar with and follow all laws and regulations concerning the operation of an off-road vehicle, such as the TOMCAR®, which are in force in the area in which you use it. Follow the recommended maintenance program outlined in your Owner’s Manual in order to ensure that all critical components on your vehicle are thoroughly inspected at the specified intervals.

⚠️ **DANGER**

When you see the safety alert DANGER, it is an indication that there is an immediate hazard that will result in severe personal injury or death.

⚠️ **WARNING**

When you see the safety alert WARNING, it is an indication that there is an immediate hazard that may result in serious personal injury or death.

⚠️ **CAUTION**

When you see the safety alert CAUTION, it is an indication that there is an immediate hazard that may result in minor personal injury or damage to the vehicle.

**CAUTION**

When you see CAUTION, without the safety symbol it is an indication that there is a situation that may potentially cause property damage.
DANGER

Tomcar™ electric vehicles drive system uses an alternating voltage of 100 volts. The system can get hot during and after switching off the ignition. Respect warning messages given on the labels in the vehicle. All interventions or modifications to the high-power system (components, cables, connectors, traction battery) are strictly prohibited due to the risks they present to your safety.

This Symbol denotes the electrical elements of your vehicle may present health risks.

The risk of serious burns or electric shocks can lead to death.

Please follow all instructions and procedures outlined in further detail within your Owner’s Manual. Failure to do so may result in serious injury or death.

WARNING

1. Please read this manual and all labels carefully and follow the operating procedures described.
2. Never allow anyone without a valid driver’s license and appropriate TOMCAR® training to operate this vehicle.
3. Electric vehicles have special features. It is important to read the following manual carefully.
4. When operating this vehicle, eye protection and helmets are recommended at all times.
5. Should you wish a guest to operate this vehicle, please ensure that they read this Owner’s Manual and all product labels.
6. In order to reduce the risk of rollover, be careful when encountering slopes and other obstacles, during turns and when braking.
7. Ensure that drugs or alcohol are never consumed before or while operating this vehicle.
8. Always travel at speeds proper for the terrain, visibility, operating conditions and your experience. Never operate at excessive speeds.

9. Never attempt jumps or stunts.

10. Always follow the inspection and maintenance procedures at schedules described in this manual. Inspect your vehicle each time you use it to make sure it is in safe operating condition.

11. Always use correct driving procedures when operating this vehicle. Keep both hands on the steering wheel and both feet on the floorboards of the vehicle during operation.

12. When operating on unfamiliar terrain, be alert to changes in that terrain, travel slowly and use extra caution for maximum safety.

13. Use additional caution when driving on excessively loose, slippery or rough terrain.

14. Always practice turning at slow speeds before attempting to turn at faster speeds. Follow procedures for turning as described in this manual. Never turn at excessive speeds.

15. Should this vehicle be involved in an accident, always have it thoroughly checked before continued use.

16. Practice operating the TOMCAR on smaller hills before attempting larger hills. Never operate TOMCAR® on hills that are too steep for the vehicle or your abilities.

17. Always check the terrain carefully before attempting to climb a hill and always follow the proper procedures for climbing hills as set out in this manual. Never climb hills with excessively loose or slippery surfaces, never go over the top of hills at high speed.

18. Check the terrain carefully before descending a hill and always follow the proper procedures outlined in this manual before traveling downhill or braking on hills. Never travel downhill at excessive speeds, avoid going downhill at an angle which would cause the vehicle to lean sharply to one side, and travel straight down the hill where possible.
19. Always follow the proper procedures outlined in this manual when operating over obstacles and never attempt to drive over large obstacles such as rocks or fallen trees. Always check for obstacles before driving or operating the vehicle in an unfamiliar or new area.

20. On slippery surfaces such as ice or mud, travel slowly and be cautious in order to reduce the chances of skidding or sliding out of control. At all times, be careful and aware of the dangers of skidding or sliding.

21. Never operate your vehicle in water deeper than that specified in this manual or in fast-flowing water. Wet brakes may reduce stopping ability, so test your brakes after leaving water and, if necessary, apply them lightly several times to allow the friction to dry them out.

22. When reversing, in order to ensure that it is safe to proceed, always make sure that there are no obstacles or people behind you, move slowly when it is safe to do so, and avoid turning at sharp angles when in reverse.

23. Always use the correct type and size of tires specified in this manual and maintain the correct tire pressure as specified in the maintenance and specification sections of this manual.

24. Never modify this vehicle through improper installation or use of accessories.

25. When hauling cargo, ensure that the cargo is properly distributed and securely attached.

26. Never exceed the stated load capacity for the vehicle.

27. When either hauling cargo or pulling a trailer, reduce speed and follow the instructions in this manual.

28. The 4-point safety harness reduce the risk of severe injury in case of a sudden stop or collision. The appropriate restraint should always be worn for the activity at hand.

29. Arms and legs should always be kept inside the cab frame while the vehicle is in motion.

30. The parking brake should always be engaged before leaving the vehicle.

31. The foot pedal brake should always be engaged before releasing the parking brake.

32. To prevent any unauthorized use or accidental start-up, always remove the ignition key when the vehicle is not in use.
WARNING

We recommend that the operator always check all safety components before using TOMCAR® in order to ensure that it is in excellent operating condition at all times.

Equipment Modifications

Do not make any modifications to your TOMCAR® vehicle.

Operating your TOMCAR® with modifications other than those specifically designed for TOMCAR® may result in failure of critical machine components, especially those which increase speed or power. TOMCAR® may become aerodynamically unstable at speeds higher than those for which it is designed, and loss of control may occur at higher speeds. Such modifications may also create a safety hazard, which could lead to bodily injury.

The warranty on your TOMCAR® is terminated if any modifications have been made to the vehicle or any equipment has been added to the vehicle that increases its speed or power.
## WARNING

<table>
<thead>
<tr>
<th>Potential Hazard</th>
<th>What can happen</th>
<th>How to avoid hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staling, rolling backward while climbing a hill</td>
<td>Vehicle overturn</td>
<td>Maintain a steady speed when climbing a hill.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>IF YOU LOSE ALL FORWARD SPEED:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apply the brakes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lock the parking brake when fully stopped.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>IF YOU BEGIN ROLLING BACKWARD:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Never apply engine power.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apply the brake gradually.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When fully stopped, lock parking brake.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In the event of an accident, have a qualified service supplier check the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>complete vehicle for possible damage.</td>
</tr>
<tr>
<td>Operating this vehicle on public streets, roads or</td>
<td>Collision with another</td>
<td>Avoid operating this vehicle on public streets, roads or highways</td>
</tr>
<tr>
<td>highways</td>
<td>vehicle</td>
<td></td>
</tr>
<tr>
<td>Potential Hazard</td>
<td>What can happen</td>
<td>How to avoid hazard</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Operating this vehicle without proper instruction</td>
<td>Loss of control, accident</td>
<td>The risk of an accident is greatly increased if the operator does not know how to operate the vehicle properly in different situations and on different types of terrain. All operators must read and understand the Owner’s Manual and all warning and instruction labels before operating the vehicle.</td>
</tr>
<tr>
<td>Operating this vehicle after consuming alcohol or drugs</td>
<td>Could seriously affect your judgment</td>
<td>Driving a TOMCAR® requires your full attention. DO NOT drink alcohol or use drugs or medications before or while driving. They will reduce your alertness and slow your reaction time. In most states and provinces, it is prohibited by law to drive while intoxicated or under the influence of drugs.</td>
</tr>
<tr>
<td>Operating this vehicle at excessive speeds</td>
<td>Loss of control, accident</td>
<td>Always travel at a speed proper for the terrain, visibility and operating conditions, and your experience.</td>
</tr>
<tr>
<td>Attempting jumps and other stunts</td>
<td>Loss of control, accident and/or vehicle overturn</td>
<td>Never attempt jumps and other stunts. Avoid exhibition driving.</td>
</tr>
<tr>
<td>Operating on frozen bodies of water</td>
<td>Severe injury or death can result if the vehicle and/or the operator fall through the ice</td>
<td>Never operate the TOMCAR® on a frozen body of water.</td>
</tr>
<tr>
<td>Potential Hazard</td>
<td>What can happen</td>
<td>How to avoid hazard</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Failure to inspect the vehicle before operating</td>
<td>Accident, equipment damage</td>
<td>Always inspect your TOMCAR® before each use to make sure it is in safe operating condition. Always follow the inspection and maintenance procedures and schedules described in this Owner’s Manual.</td>
</tr>
<tr>
<td>Failure to properly maintain the vehicle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to use extra caution when operating this vehicle on unfamiliar terrain</td>
<td>Loss of control, vehicle overturn</td>
<td>Travel slowly and use extra caution when operating on unfamiliar terrain. Always be alert to changing terrain conditions when operating the vehicle. You may come upon hidden rocks, bumps or holes suddenly, without enough time to react.</td>
</tr>
<tr>
<td>Failure to follow the minimum age recommendations for this vehicle</td>
<td>Serious injury or death (to the child or others)</td>
<td>Only persons with a valid driver’s license should operate a TOMCAR®. Even though a child may be within the age group for which some vehicles are recommended, he or she may not have the skills, abilities or judgment needed to operate the vehicle safely and may be involved in a serious accident.</td>
</tr>
<tr>
<td>Operating this vehicle with improper tires, or with improper or uneven tire pressure</td>
<td>Loss of control, accident and/or overturn</td>
<td>Always use the size and type of tires specified in the Owner’s Manual for this vehicle. Always maintain proper tire pressure as described in the Owner’s Manual. See specifications at rear of manual.</td>
</tr>
</tbody>
</table>
NOTE:

Use only TOMCAR ® approved accessories and familiarize yourself with their function and effect on the vehicle. The addition of certain accessories, including (but not limited to) extra wheels, extra fuel tank, etc. may change the handling characteristics of the vehicle.

WARNING

Leaving the key in the ignition can lead to unauthorized use of the vehicle resulting in serious injury or death. Always remove the ignition key when the vehicle is not in use.

After any overturn or accident, have qualified service personnel inspect the entire vehicle for possible damage, including (but not limited to) brakes, throttle and steering systems.
Warning decals have been placed on the TOMCAR® for your protection. Read and follow the instructions of the decals on the TOMCAR® carefully. If any of the decals depicted in this manual differ from the decals on your TOMCAR®, always read and follow the instructions of the decals on the TOMCAR®.

If any decal becomes illegible or comes off, contact your TOMCAR® supplier to obtain a replacement. Replacement safety decals are provided by TOMCAR® at no charge. The part number is printed on the decal.

*This general purpose off-road utility vehicle does not meet federal motor vehicle safety standards for on-road vehicles.*
Location 1 – Rear Cross Tube

WARNING

VEHICLE ROLLOVER could cause severe injury or death. ALWAYS WEAR YOUR SEAT BELT AND HELMET for maximum protection.
Location 2 – Front Firewall
Electric Components Safety

1. Electric Motor
2. Motor Controller
3. Traction Battery
4. Safety Disconnect
5. Charger Socket
6. 12 volt battery

TM37E
1 Electric Motor
2 Motor Controller
3 Traction Battery
4 Safety Disconnect
5 Charger Socket
6 12 volt battery
Electric Components safety

1. Electric Motor
2. Motor Controller
3. Traction Battery
4. Safety Disconnect
5. Charger Socket
6. 12 volt battery
7. 24 volt battery (optional)
Batteries
Your Electric Vehicle has two types of batteries:
  • High voltage, 100v traction battery.
  • Auxiliary 12v battery, identical to the one used in conventional vehicles.

Traction Battery
This battery stores the energy necessary to operate the motor. As with any battery, it discharges after use and must be regularly recharged.

The traction battery is equipped with a manual safety disconnect switch to cut the battery power in case of an emergency or prior to system maintenance.

12-volt Battery
The second battery on your vehicle is a 12v battery. This battery supplies the energy to operate vehicle equipment (lights, audio etc.) and to start up the system. It is charged while the vehicle is powered on from the traction battery.

High power cables
The high-power circuit is denoted by orange cables, orange with grey stripe wires and parts marked by the \( \Delta \) symbol.
Important recommendations
Please read these instructions carefully. Failure to follow these instructions may lead to risk of fire, serious injury or electric shock which may present a risk to life.

All interventions or modifications to the high-power system (components, cables, connectors, traction battery) are strictly prohibited

In the event of an accident or impact
In the event of an accident or impact next to or direct to the traction battery or high-power components, have the vehicle checked by an authorized dealer.

Never touch the high-power components or cables which are exposed and visible inside or outside the vehicle.

In the event of fire
In the event of fire, evacuate everyone from the vehicle immediately and contact the emergency services, informing them that this is an electric vehicle.

Disconnect the safety switch on the battery box.

Only use extinguishing agents that are permitted for use with electric fires. Do not use water.

Washing the vehicle
Never wash the engine compartment next to the motor housing or controller, driver controls and battery compartment with high-pressure jet.

Never wash the vehicle while it is charging.
Component Locations

Some TOMCAR® vehicles are equipped with special features such as a spare tire, winch, etc. Not all models come with all features. Please refer to the specifications section at the end of this manual.

1 Handle bar
2 Head protection bar
3 Side\Hip protection bar
4 Seat belts
5 Cargo box
6 Cargo box latch
7 Side mirror
8 Signal/Parking lights
9 Head lights
10 Hood rubber strap
11 Rear view mirror
12 Registration plate bracket
13 LED Tail lights
14 Tow ball receiver
Towing Ball

This vehicle is equipped with a receiver for a trailer hitch. Trailer-towing equipment is not supplied (see your supplier for availability). To avoid injury and property damage, always heed the warnings and towing capacities outlined in this manual.
Load Compensators

The Load Compensators are located between the rear trailing arm and the vehicle frame, one on each side.

When carrying a heavy load that effects the ground clearance, or if you are unsure of the load mass, inflate both load compensators to 150 psi (10 bar) using an air compressor. If, when fully loaded, the rear of the vehicle sits too high, release equal amounts of air from both compensators until the vehicle is level. To release air from the compensators, depress the center pin of the Schrader valve with a pointed object.

An indication of proper use of the compensators is to ensure that the vehicle height, once loaded, is the same as the vehicle height when empty.
Seat Belts

The TOMCAR® is equipped with a 4-point safety harness.

To install the 4-point harness, secure the clips for the left and right lower straps of the harness to the seat belt brackets. Place the left and right shoulder harness over the seat. Cross the shoulder straps behind the seat and secure the clips to the shoulder harness brackets.

⚠️ WARNING

For your safety, when using the 4-point harness, please perform the following steps:

1. Loosen shoulder straps. (1)
2. Place arms through the shoulder straps. (1)
3. Insert the latch plate into the buckle until it clicks. (3)
4. Tighten straps (2) followed by shoulder straps (1)
5. Make sure the harness is tightened securely.

Falling from a moving vehicle could result in serious injury or death. Always fasten your harness securely before operating or riding in the TOMCAR®.

Small passengers require special restraints, which are not available with this vehicle. No passenger should be allowed to ride in the TOMCAR® if the harness does not fit properly or if the passenger is under five years of age.

To unfasten, press the square red button in the buckle’s center.
Seat Adjustment

Your TOMCAR® is equipped with adjustable driver and front passenger seats only.

To adjust the seat, locate the lever (1) underneath the seat. Pull up on the lever and slide the seat to the desired position. Once the desired position is reached, try to slide the seat forward and backward to make sure the lever is locked in place.
Console

1  Steering Wheel
2  Instrument panel – All in one display
3  Instrument panel – EV display
4  12v Accessory plug
5  Glove box
**Instrument Panel – All in One Display**

1. Speedometer
2. Odometer
3. LH turn signal marker
4. RH turn signal marker
5. High beam marker
6. Hazard warning lights marker
7. 12v Battery – Low voltage warning
Instrument Panel – EV Display

The EV display unit is used for SOC display, error messages and warnings from the main computer on your electric TOMCAR®.

Driver must pay attention to the display in all times for range control and system awareness.

5 LED SOC Display
Displays the traction battery state of charge using five LEDs. Each LED represents approximately 20% of charge.

Error LED
The Error LED will Blink or illuminate constantly whenever a system fault that requires driver’s attention is present. Not all faults require an immediate stop however all faults require your attention.

LCD
The LCD displays the following information:
1. Accurate traction battery state of charge in percentage from 0% to 100%.
2. Selected driving mode, at standstill.
3. The present error number if an error is present.
Steering Wheel Adjustment

Steering wheel adjustment lever (1) is used to position the steering wheel’s height. Turn the lever counterclockwise to release the column and adjust the height. Lock the steering wheel’s position by rotating the lever clockwise till the lever is pointing upwards as seen in the picture.

Make sure the steering wheel is locked by tilting the steering wheel up and down.

Ignition Switch

The ignition switch is a two or three-position switch. The key can be removed from the switch when it is in the “OFF” position.

- **ACCESSORIES** – Motor is off. All electrical circuits are on.
- **OFF** – All vehicle systems are OFF.
- **ON** – All vehicle systems are ON. Vehicle can be driven.

⚠️ WARNING

Electric vehicles are silent when powered on. Never leave the vehicle ON while exiting the vehicle. Leaving the keys in the ignition can lead to unauthorized use of the vehicle, resulting in serious injury or death. Always remove the ignition key when the vehicle is not in use.
Driver Controls

1. Direction selection switch
2. Driving mode selection switch
3. Maximum regeneration switch
4. Windshield wiper lever
5. Lights/Signal/Horn lever
6. Throttle pedal
7. Brake pedal
8. Gear shifter
9. Rear Differential Lock lever
10. Parking brake lever

Steering wheel and driver seat are hidden for clarity.
Direction & Driving modes selection

Direction Selection Switch

This switch is used to determine the vehicle driving direction.

- **Switch up** – selected driving direction is FORWARD.
- **Switch centered** – electric motor is in NEUTRAL.
- **Switch Down** – selected driving direction is REVERSE.

The switch must be in Neutral position while powering up the vehicle or a startup error will be initiated. To exit Neutral position, the lever must be pulled out (toward driver).

⚠️ **WARNING**

Once a direction has been selected, pushing the throttle pedal will result in vehicle movement. Never leave the driving selection switch in forward or reverse position while exiting the vehicle.

Driving Mode Selection Switch

Your electric TOMCAR® has 3 driving modes to select from. Each mode influences driving range and performance. Refer to page 44 for further details.

- **Switch up** – MAX PERFORMANCE. Fast acceleration and maximum top speed. Minimum range.
- **Switch centered** – NORMAL PERFORMANCE. Moderate acceleration and maximum top speed.
- **Switch down** – MAX RANGE. Low acceleration and moderate top speed. Maximum range.

Maximum Regeneration Switch

This switch is used to increase neutral braking at low speed, below 9 mph. Neutral braking occurs while your foot is off the accelerator pedal and vehicle is coasting. It is used to recover energy. Care must be taken not to use the switch on low tractive ground to prevent vehicle slippage while applying the brakes.
Windshield wiper operation

a. Move the lever down 2 positions to start wipers operation in low.
b. Move the lever down 3 positions to set the wipers to high.
c. With fingers behind the lever, pull up on the lever to operate the washer motor.

Lights / Horn / Signal control

Multifunctional handle controls the following:

a. Shift handle up, right signal blinks. (2)
b. Shift handle down, left signal blinks. (2)
c. Turn handle forward once to switch on side lights. (6)
d. Turn handle forward twice to switch on headlights. (5)
e. Pull handle backward, switches to high beam. (4)
f. Push handle toward steering wheel activates horn. (1)

NOTE:
The ignition switch key must be in the “ON” position to operate the headlights.
The multifunctional handle will not return automatically to its original position on low-turning angle of the vehicle.
Pedals

Your electric TOMCAR® pedals are used as in any automatic transmission vehicle. However, proper pedal use can help improve driving range.
Avoid applying the brake and throttle pedal together while the vehicle is moving to prevent energy loss. Anticipating traffic changes and lifting your foot off the accelerator pedal will result in energy recovery by using the motor braking torque.

Brake Pedal
Press the brake pedal to slow or stop the vehicle.

Throttle Pedal
Press the pedal down to increase requested motor torque. Spring pressure returns the pedal to the rest position when released. Always check that the throttle pedal returns normally before starting the vehicle.

⚠️ WARNING
Always check free pedal movement. Never place items on the floor beneath the driver. Never install unauthorized floor mats. Throttle and brake pedal movement may be interfered and severe injury or death may occur.
**Gear Shifter**

High is the primary driving gear for your TOMCAR®.

Low is intended for use where maximum torque is required.

To change gears, stop the vehicle and move the lever to the desired position. If the gear shifter is stuck, choose a driving direction and press the throttle pedal lightly while moving the lever out of gear. Stop the motor and engage desired gear.

Maintaining proper shift linkage adjustment is important for the shifter function. See your supplier if you experience any shifting problems.

⚠️ **CAUTION**

Do not attempt to shift gears while the vehicle is moving or damage to the transmission could result.

Make sure the lever is in the proper position and the gear is fully engaged.

⚠️ **WARNING**

When parking the vehicle, always switch OFF the ignition and remove the key. Engage the parking brake and shift the transmission to Neutral to avoid vehicle movement by accidently pressing the throttle.
Differential Lock Lever

The rear axle is equipped with a lockable differential that allows the driver to choose between a locked differential or unlocked differential. It is beneficial to lock the differential in low-traction situations. To lock the differential, while driving slowly, push the differential lever until it goes all the way forward into the locked position. Disengagement is simply the reversal of the engagement procedure.

Slight changes in direction of travel while operating the lever may assist in the engagement and disengagement of the differential lock.

Damage to the differential can occur if the differential lock is engaged while the vehicle is traveling at high speeds or while the rear wheels are spinning without traction.

⚠️ CAUTION

Using the differential lock feature requires special care. Using the vehicle incorrectly can cause rollover. The vehicle’s steering firms up while the differential lock is engaged.

⚠️ WARNING

While the differential lock is engaged, do not operate the vehicle at speeds greater than 10 mph.
The parking brake lever is located between the driver and passenger seats.

When the parking brake handle is in the upper position, as presented in the above illustration (1), the brakes are locked. To unlock the brakes, shift the handle to a horizontal position (2).

Parking Brake Engagement (1) Engage the parking brake when parking the vehicle to prevent the vehicle from rolling. To apply the parking brake, pull up the lever with your hand.

Parking Brake Release (2) To release the parking brake, slightly pull the lever up to disengage the lock position, press the thumb button and push the lever down all the way. Make sure the parking brake lever is functioning properly before each operation.
Vehicle Range

The range of your electric TOMCAR®, in real usage, may vary depending on several factors over which you have partial control, which may make a considerable difference to the vehicle range. These factors are:

- Speed and driving style.
- Type of road.
- Tires.
- Vehicle loading.

**Speed and driving style**

High speeds will reduce your vehicle’s range.

A “sporty” driving style reduces your vehicle range. opt for a “lighter” driving style.

Drive at a constant speed. Adapt your driving to avoid excessive energy consumption.

Anticipate traffic changes by lifting your foot off the accelerator pedal to recover energy.

**Road type**

Do not try to maintain the same speed up a hill. Accelerate no more than you would on a level ground.

**Tires**

An under inflated tire increases energy consumption. Comply with the specified tire pressure for your TOMCAR® while driving on hard surfaces (paved roads, gravel roads etc.).

Use tires made by the same manufacturer with the same dimensions, structure and pressure on each axle.

**Vehicle loading**

Avoid pointlessly overloading your vehicle.
Driving
When driving, if you lift your foot off the accelerator pedal the motor generates electrical current during the neutral braking process while it is decelerating. This energy is used to brake the vehicle and recharge the traction battery.

An electric motor generates a greater engine brake than in petrol or diesel engine vehicle.

When the brake pedal is applied, it generates greater motor braking and therefore greater recharge current.

The neutral braking can be increased by turning ON the ‘maximum regen’ switch. This function is automatically cancelled above 20kmh. It is good practice to only use the switch when going down steep hills at low speeds. Be aware that the neutral braking torque is greater when using the LOW gear in the transmission.

Using the neutral braking, by anticipating traffic and road conditions ahead, will increase your mileage, however it is forbidden to use the neutral braking or the ‘maximum regen’ function instead of the brake pedal. Always be ready to use the brake pedal.

Important Note
After a maximum charge of the battery and during the first few miles of using the vehicle, the engine brake will be temporarily reduced. Please adapt your driving style appropriately.

Traction Battery Protection
To prevent depletion of the traction battery which will result in immediate battery damage, the control system will reduce the driving performance when low SOC is reached. First the vehicle will reduce its performance to the ‘Normal performance’ mode and then to the ‘Maximum range’ mode. Once the SOC reaches 0% the vehicle will shut down.
Guidelines

1. This vehicle is designed for off-road driving.
2. Adjust seat – make sure it is locked. Sit all the way in and make sure your back is straight. Make sure your wrist touches the steering wheel.
3. Adjust steering wheel position – tighten lever.
4. Fasten safety harness in the following order:
   a. Lock buckle.
   b. Tighten bottom horizontal straps.
   c. Tighten shoulder straps.
5. Change gears only when the vehicle is stationary.
7. While driving, avoid applying the throttle and brake pedal simultaneously.
8. Read and understand safety instructions.
9. Driver must have a valid driver’s license.
10. Reverse operation can be dangerous even at low speeds. Avoid sharp turns.
11. In case of primary brake system failure, the parking brake can be used to stop the vehicle.
Pre-Ride Inspections

⚠️ WARNING
If a proper inspection is not done before each use, severe injury or death could result. Always inspect the vehicle before each use to ensure it is in proper operating condition.

Safety instructions
1. Make sure the ignition key is in the OFF position
2. Make sure the vehicle is on a flat surface.
3. Make sure the gear lever is in neutral.
4. Make sure the parking brake is engaged (locked).
5. Make sure the battery disconnect switch is in the OFF position.
6. Make sure you read and follow the instructions carefully.
<table>
<thead>
<tr>
<th>Item</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brake System</td>
<td>Check the level of the brake fluid in the reservoir canister. Check the completeness of the reservoir canister and that the cap is tightened. Verify that the clear tubes coming from the canister to the pump are not damaged in any way. Pay attention! If brake fluid is missing in the canister, that means leakage. Adding brake fluid will not solve the problem! When pressing the brake pedal, make sure that the pedal feels stiff high up on its travel. Check that all the hoses coming from the brake pump to the wheels are undamaged and in order (no leaks). Check vacuum lines from the pump for wear and tear. After vehicle startup check vacuum pump operation.</td>
</tr>
<tr>
<td>2. Steering System</td>
<td>Check for free play by turning the steering wheel left and right.</td>
</tr>
<tr>
<td>3. 12v Electrical System</td>
<td>Check the light system – front/rear parking lights, headlights high/low, indicators left/right, brake lights and registration plate light.</td>
</tr>
<tr>
<td>4. Throttle Travel</td>
<td>Check that the throttle has full movement and springs back when released.</td>
</tr>
<tr>
<td>5. Wheels</td>
<td>Check for free play by grabbing the top of the tire firmly and pulling it back and forth.</td>
</tr>
<tr>
<td>6. Front Suspension</td>
<td>Check shock absorbers by pressing the vehicle hard downward. The vehicle should spring back slowly and symmetrically. Check that all fasteners are in place and tight. Check for free play and adjust ball joint when necessary.</td>
</tr>
<tr>
<td>7. Wheel Nuts</td>
<td>Check that the four-wheel and center wheel nuts are tightened securely.</td>
</tr>
<tr>
<td>8. Tires</td>
<td>Check the condition and inflation of the front and rear tires.</td>
</tr>
<tr>
<td>Item</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>9. Moving Parts Under Hood</td>
<td>Make sure that there are no loose objects under the hood that might damage or interfere with the pedals or battery. Check that the battery is connected and tightened firmly in its place. Make sure that there are no metal parts that could short the battery.</td>
</tr>
<tr>
<td>10. Washer Fluid</td>
<td>Top up the washer fluid if necessary.</td>
</tr>
<tr>
<td>11. Hood</td>
<td>Make sure that the hood is secured onto the car with the rubber straps.</td>
</tr>
<tr>
<td>12. 4-Point Harness</td>
<td>Check that the harness is secured correctly and is in good condition.</td>
</tr>
<tr>
<td>13. Parking Brake</td>
<td>Engage the parking brake and check that the vehicle does not roll.</td>
</tr>
<tr>
<td>14. Oil Leaks</td>
<td>Check for large oil leaks from the transmission box and final drive. Slight oil moisture is not problematic. Vehicle operation can result in oil drips from the breathers.</td>
</tr>
<tr>
<td>15. Rear Suspension</td>
<td>Check shock absorbers by pressing the vehicle hard downward. The vehicle should spring back slowly and symmetrically. Check that all fasteners are in place and tight.</td>
</tr>
<tr>
<td>16. Load Compensators</td>
<td>If carrying a heavy payload that effects the ground clearance, fill the load compensators with compressed air at 150 psi.</td>
</tr>
<tr>
<td>17. Rear Transmission Drive</td>
<td>Check driving belt for wear and tear. Check the belt’s tension.</td>
</tr>
<tr>
<td>18. Electric drive components</td>
<td>Check visible orange cables for wear and tear. Check traction battery box for any visible damage.</td>
</tr>
<tr>
<td>19. Cooling System</td>
<td>After vehicle start up make sure the motor controller cooling fan is ON visually.</td>
</tr>
</tbody>
</table>
**WARNING**

Please read these instructions carefully. Failure to follow these instructions may lead to risk of fire, serious injury or death.

Never use a non TOMCAR® approved charger.

Do not alter or damage the charge connector. If damage to the charger or charge connector is noticeable contact your dealer.
Installation for using a charger

Have a qualified professional check that each outlet you intend to use with the charger complies with the standards and regulations in your country, especially proper overvoltage protection fuse. you are recommended to check regularly the domestic power supply as well as the charger wall socket.

Charging Precautions

1. Do not perform any operations on the vehicle during charging (washing, maintenance etc.).
2. In the event of the presence of water, signs of corrosion or foreign bodies in the charging cord or socket, do not charge the vehicle.
3. Do not attempt to touch the cord contacts.
4. Avoid charging your vehicle in extreme temperatures (hot or cold).
   At temperatures below -5°C or above 55°C the battery cannot be charged.

Charging

1. Switch the ignition off.
2. Make sure the manual battery disconnect switch is in the ON position.
3. Connect the charger to the wall socket.
4. Remove charge connector cover and connect the charger to the vehicle.
5. Charge time varies depending on SOC, charger type and ambient temperature.
6. You do not need to wait until your traction battery SOC is low to recharge your vehicle.
7. When the charger is complete, disconnect the charger from the wall socket, unplug the charger from the vehicle and close the vehicle’s charge socket cover.
Starting the Vehicle / Gear Shifting / Braking

Starting the Vehicle

1. Make sure the driving selection switch is in the Neutral position.
2. Make sure the transmission is at Neutral position.
3. Make sure the Parking brake is engaged.
4. Make sure the manual battery disconnect switch is in the ON position.
5. Do not press the throttle pedal.
6. Turn the ignition to the ON position.
7. Wait for the EV display unit to reset (LED and LCD display working). If 5 seconds have passed and the display is not working refer to section ‘diagnostics & trouble shooting’.

Gear Shifting

This vehicle is equipped with a 2-speed transmission. Select the proper gear ratio as described in page 41. The transmission was designed for increased durability with a mechanical gear engagement mechanism. This mechanism will lock the gears and block the shifting in the event torque is present in the system (such as holding the vehicle from rolling on a hill with the motor). If this occurs and a shifting is required, try releasing the pressure by pressing the throttle slightly and changing vehicle position.

Braking

1. Release the throttle pedal completely.
2. Press on the brake pedal evenly and firmly.
Direction Selection

Driving direction must be selected after the vehicle is powered on. Pull the switch lever and lift up for Forward direction or down for reverse direction. Direction cannot be reversed during driving. In case the direction is reversed while driving, the motor will increase regenerative braking till the vehicle comes to a complete stop. Only then the system will allow for a change of direction.

Vehicle Shutdown

1. Release the throttle pedal completely.
2. Brake to a complete stop.
3. Change direction selection switch to the Neutral (center) position.
4. Shift vehicle’s transmission to Neutral.
5. Engage the parking brake.
6. Turn the ignition switch to the “OFF” position.
**WARNING**
Practice starting and stopping (using the brakes) until you are familiar with the controls.

**WARNING**
A rolling vehicle can cause property damage and serious injury. Always apply the parking brake when the vehicle is parked.

Failure to allow for increased braking distance when hauling cargo, towing a trailer or in inclement weather may result in accident and injury.

Always slow down and allow additional braking distance when towing, hauling cargo or in inclement weather.
Always drive appropriately for the conditions at hand. Allow enough braking distance to come to a complete stop safely.

**Driving Safely**

1. Sit in the driver’s seat and fasten the seat belt (as described earlier).
2. **press the brake pedal** and shift the transmission into gear.
3. Check your surroundings and determine your path of travel.
4. Disengage the parking brake.
5. Keeping both hands on the steering wheel, with thumbs on the outside, take your foot off the brake pedal and slowly press the throttle with your right foot and begin driving. Vehicle speed is controlled by the amount the pedal is pressed.
6. Practice maneuvering and using the throttle and brakes on level surfaces.
7. Never operate at speeds too fast for your skills or the conditions at hand.

**NOTE:**
The high/low transmission enables the driver to better control the vehicle on different terrains and applications.
When driving with heavy loads, use the low gear.
NOTE:
TOMCAR® was designed for safe off-road operation. When driving on public roads (where legal) or in the vicinity of other vehicles or people, please exercise caution and drive responsibly as not to pose risk to yourself or others. Avoid such things as speeding, making sharp turns, driving over obstacles or on narrow shoulders.

Driving on Slippery Surfaces

When driving on slippery surfaces such as wet trails, loose gravel or ice, be alert for the possibility of skidding and sliding. Under these conditions, follow these precautions:

1. Slow down.
2. Read the trail and avoid quick, sharp turns, which can cause skids. Keep alert at all times.
3. In the event of skidding, correct a skid by turning the steering wheel in the direction of the skid.

⚠️ WARNING

- Failure to exercise care when operating on slippery surfaces can result in the loss of tire traction and cause loss of control, accident, and serious injury or death.
- Never apply the brakes during a skid.
- Do not operate on excessively slippery surfaces.
- Always reduce speed and use additional caution when operating on slippery surfaces
Driving Procedures

Driving Uphill

1. Whenever traveling uphill, follow these precautions:
2. Always travel uphill in a straight line.
3. Avoid steep hills (15° maximum).
4. Keep feet and hands within the cabin at all times.
5. Proceed at a constant speed.

⚠️ **WARNING**
- Climbing hills improperly can cause loss of control or vehicle overturn. Always check the terrain carefully before climbing a hill.
- When operating on hilly terrain, braking and handling are greatly affected. Improper procedure could cause loss of control or overturn, and result in serious injury or death.
- Avoid climbing steep hills (15° maximum).
- Use extreme caution when operating on hills, and follow proper operating procedures outlined in this Owner’s Manual.
- Use caution when climbing hills with excessively slippery or loose surfaces.
- Never go over the crest of a hill at a high speed; an obstacle could be on the other side of the hill.

Driving on Side Slopes

⚠️ **WARNING**
- Crossing hillsides or turning on hills can result in loss of control or vehicle rollover, resulting in severe injury or death.
- When driving on side slopes, exercise extreme caution.
- Avoid operating on steep hills (15° maximum).
Driving Procedures

Driving Downhill

Whenever driving down a hill, please follow these precautions:

1. Test the brake pedal and parking brake before descent.
2. Keep in a straight line and proceed directly downhill.
3. Maintain a safe speed in accordance with the conditions.
4. Consider using Low gear in accordance with the conditions.
5. Turn on the ‘maximum regeneration’ switch before descent to aid in a control descent.
   a. If engine brake is too high and you feel the need to use the throttle, turn off the ‘maximum regeneration’ switch.
   b. Avoid turning the ‘maximum regeneration’ switch after starting the descent. It could result an unexpected braking torque.
6. Apply the brakes slightly and softly to aid in slowing if required.

⚠️ WARNING

- Traveling downhill improperly could cause loss of control or vehicle overturn. Always check the terrain carefully before descending a hill.
- Never descend a hill at high speed. Excessive speed may result in the loss of vehicle control and can lead to serious injury or death. Always operate slowly when traveling downhill.
- Avoid descending a hill at an angle, which could cause the vehicle to lean sharply to one side. Travel straight downhill when possible.
- Avoid applying the brakes for very long (“Dragging”).
Driving Through Water

⚠️ WARNING

- Driving the vehicle through water could result in the loss of vehicle control and may lead to serious injury or death.
- Never cross deep or fast-flowing water with your TOMCAR®.
- After leaving water and then traveling on a level surface, always dry the brakes by applying light pressure to the brake pedal repeatedly until braking action is normal.
- Never cross water at depth greater than recommended below or at high speeds. Severe damage to the electric powertrain and or injury can occur.

Your TOMCAR® can operate through water up to a maximum recommended depth equal to your TOMCAR®’s floor level.

1. Always determine water depths and current before entering.
2. Deeper water levels than recommended can result is critical electric powertrain damage and may result in electric shock.
3. Choose a crossing where both banks have inclines that are as gradual as possible.
4. Proceed slowly, avoiding rocks and any other obstacles that might be in your way.

NOTE:
After running your vehicle in water, it is critical that you perform the services outlined in the Periodic Maintenance Chart. Give special attention to the battery pack, high power connections, transmission oil, final drive oil and all grease fittings.

NEVER DRIVE IN SEA WATER
Driving Procedures

Driving Over Obstacles

You must always be alert when driving your TOMCAR®. Look ahead to read the terrain and watch out for hazards such as rocks, holes and low-hanging branches.

⚠️ WARNING

Severe injury or death can result if your vehicle suddenly comes in contact with a hidden obstacle. Not all obstacles are immediately visible. Reduce speed and travel with caution in unfamiliar terrain.

Driving in Reverse

When driving in reverse, please follow the guidelines outlined below:

1. Apply the brakes.
2. Put ‘direction selection’ switch in the reverse position (down).
3. Always look around you before reversing.
4. Slowly release brake pedal, and gently apply the throttle pedal for movement.
5. Reverse slowly.
6. Apply the brakes lightly for stopping.
7. Avoid turning at sharp angles.
8. Be gentle and minded when applying throttle pressure.

⚠️ WARNING

Failure to use caution when operating in reverse can result in serious injury or death. Before switching into reverse, always check for obstacles or people behind the vehicle and follow the reverse operation procedures outlined in this manual. **Always reverse slowly. Never leave the direction selection switch in the reverse position.**
Parking the TOMCAR®

Always apply the parking brake while parking.

1. Stop the vehicle on a level surface (if parking on an incline, see below).
2. Set ‘direction selection’ switch to Neutral (center position).
3. Turn off the vehicle and apply the parking brake.
4. Shift the transmission lever to Neutral position.

Parking on an Incline

If possible, avoid parking on an incline. If it is unavoidable, follow the procedure below:

1. Make sure parking brake is applied.
2. Block the rear wheels on the downhill side.

⚠️ WARNING ⚠️

• A rolling vehicle can cause property damage and serious injury. Always apply the parking brake after turning off the vehicle. Always block the downhill side of the wheels if leaving the vehicle on a hill, or park the vehicle in a side-hill position instead.
• Operating the vehicle while the hand brake is engaged is not energy efficient and could cause loss of control and result in serious injury or death. Always disengage the parking brake before operating the vehicle.

NOTE:
The TOMCAR® transmission has no parking position as in a standard automatic transmission. Engaging the gear box will not hold the vehicle. Be certain the parking brake is in good working condition. However, do not rely solely on the parking brake. Place a rock or other obstacle under the wheels in case the hand brake is released accidentally.
Hauling Cargo

⚠️ WARNING

Hauling cargo improperly can alter vehicle handling and may cause loss of control or brake instability, which can result in serious injury or death. Always follow these precautions when hauling cargo:

- Always load the cargo box with the load as far forward as possible.
- Always operate the vehicle with extreme care when hauling or towing loads.
- Slow down.

The TOMCAR® has been designed to carry or tow specific capacities. Always read and understand the load distribution warnings listed on the warning labels. Driving with passengers in the cargo box can result in severe injury or death.

Hauling excessive weight will reduce your driving range. Always be aware of your traction battery state of charge and plan your drive accordingly.

⚠️ WARNING

- Never allow passengers to ride in the cargo box.
- Passengers must always ride in the cabin with their safety belts/harness fastened securely.
Towing Loads

⚠️ WARNING
Towing improperly can alter vehicle handling and may cause loss of control or brake instability, which can result in serious injury or death. Always follow the precautions outlined below when towing:

- Do not exceed the recommended maximum towing loads for your vehicle (see Specifications section).
- Make sure the vertical load on the trailer hitch never exceeds 100 kg or 220 lbs.
- Operate the vehicle slower than usual and take into consideration the terrain and the slope.
- Do not tow more than the recommended weight for the vehicle.

Attach a trailer to the trailer hitch bracket only. Do not attach a trailer to any other location or you may lose control of the vehicle. Never tow a trailer on a grade steeper than 15°.

Driving Range
Towing loads will reduce your driving range. Avoid high speeds and fast accelerations. It is recommended to use low gear for towing uphill. Always be aware of your traction battery state of charge and plan your drive accordingly.
Safety Instructions for Routine Maintenance

- Make sure the vehicle is on a firm and level surface.
- Engage the hand brake and place wheel chocks in front and behind the wheels.
- Lifting mechanism can be placed under the side rails, rear bumper and in the front towing hitch receiver.
- Always use jack stands after lifting the vehicle.
- Never work on the vehicle while charging the traction battery.
- Always ensure power is OFF.
- Place an electric fire fire extinguisher nearby.

⚠️ WARNING

To reduce the possibility of severe injury or death always follow the guidelines of this manual.
Never perform any changes or additions to the electric system.
Never expose wires.
Periodic Maintenance Chart

Careful periodic maintenance will help keep your vehicle in the safest, most reliable condition.

Inspection, adjustment and lubrication instructions for important components are explained in the Periodic Maintenance Chart.

Inspect, clean, lubricate, adjust and replace parts as necessary. When inspection reveals the need for replacement parts, please use genuine TOMCAR® parts available from your TOMCAR® supplier.

NOTE:
- Service and adjustments are critical. If you are not familiar with safe service and adjustment procedures, have a qualified person perform these operations.
- Maintenance intervals in the following chart are based upon average riding conditions.
- Vehicles subjected to severe use must be inspected and serviced more frequently.

Severe Use Definition
- Frequent immersion in mud, water or sand.
- Operating at high motor speeds.
- Prolonged low speed, heavy load operation.
## Pre-Ride Maintenance/Inspection

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-Ride</th>
<th>Page Number</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
<tr>
<td>2. Suspension</td>
<td>I</td>
<td>68, 70, 83</td>
<td></td>
</tr>
<tr>
<td>3. Tires</td>
<td>I</td>
<td>81</td>
<td>Max tire air pressure – 7 psi Front / 15 psi Rear</td>
</tr>
<tr>
<td>4. Brake Pedal Travel</td>
<td>I</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>5. Brake Fluid Level</td>
<td>I</td>
<td>75-76</td>
<td></td>
</tr>
<tr>
<td>6. Wheel Nuts</td>
<td>I, A</td>
<td>--</td>
<td>Torque to 165 Nm</td>
</tr>
<tr>
<td>7. Frame Hardware</td>
<td>I</td>
<td>84</td>
<td>Frame nuts, bolts and fasteners</td>
</tr>
<tr>
<td>8. Headlights/Tail Lights</td>
<td>I, C</td>
<td>--</td>
<td>Check proper operation</td>
</tr>
<tr>
<td>9. Parking Brake Operation</td>
<td>I</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>10. Drive Belt</td>
<td>I</td>
<td>79</td>
<td>Tension and wear</td>
</tr>
</tbody>
</table>

I = Inspect, C = Clean, A = Adjust
## Periodic Maintenance Chart

### 2000 km Maintenance Chart

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Check tires and wheels</td>
</tr>
<tr>
<td>2.</td>
<td>Check and adjust tire pressure</td>
</tr>
<tr>
<td>3.</td>
<td>Check for free play in wheel bearings</td>
</tr>
<tr>
<td>4.</td>
<td>Remove Wheels</td>
</tr>
<tr>
<td></td>
<td>Check A-arm bushings</td>
</tr>
<tr>
<td></td>
<td>Adjust and grease ball joints (replace rubber boots as needed)</td>
</tr>
<tr>
<td></td>
<td>Check steering rod ends</td>
</tr>
<tr>
<td></td>
<td>Check shock mounts</td>
</tr>
<tr>
<td>5.</td>
<td>Inspect shock absorbers for any kind of damage</td>
</tr>
<tr>
<td>6.</td>
<td>Inspect brake disc and pads</td>
</tr>
<tr>
<td>7.</td>
<td>Check for free play in rear end</td>
</tr>
<tr>
<td></td>
<td>Final drives</td>
</tr>
<tr>
<td></td>
<td>Shock mounts</td>
</tr>
<tr>
<td>8.</td>
<td>Change transmission oil</td>
</tr>
<tr>
<td>9.</td>
<td>Change final drives oil</td>
</tr>
<tr>
<td>10.</td>
<td>Inspect timing belt for cracks and proper tension</td>
</tr>
<tr>
<td>11.</td>
<td>Adjust parking brake</td>
</tr>
<tr>
<td>12.</td>
<td>Check for leaks</td>
</tr>
<tr>
<td>13.</td>
<td>Check low voltage electrical system (Lights, Horn, Wipers)</td>
</tr>
<tr>
<td>14.</td>
<td>Clean auxiliary battery terminals if required</td>
</tr>
<tr>
<td>15.</td>
<td>Check motor controller cooling system</td>
</tr>
<tr>
<td>16.</td>
<td>Check brake vacuum pump</td>
</tr>
</tbody>
</table>
### 2000 km Maintenance Chart

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Check brake fluid level</td>
</tr>
<tr>
<td>18. Check wiper blades</td>
</tr>
<tr>
<td>19. Check windshield washer fluid</td>
</tr>
<tr>
<td>20. Inspect throttle cable and linkage</td>
</tr>
<tr>
<td>21. Grease steering box, Shock mounts, A-arm mounts &amp; rear driving shafts</td>
</tr>
<tr>
<td>22. Check steering system for free play</td>
</tr>
<tr>
<td>23. Test drive the vehicle</td>
</tr>
</tbody>
</table>

### Lubrication and Fluid Recommendations

<table>
<thead>
<tr>
<th>Item</th>
<th>Lubricant</th>
<th>Capacity</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission case oil</td>
<td>BG 80-90w Extra duty</td>
<td>2.4 L</td>
<td>Maintain as recommended</td>
</tr>
<tr>
<td>Final drive oil</td>
<td>90w Gear oil</td>
<td>0.75 L per side</td>
<td>Maintain as recommended</td>
</tr>
<tr>
<td>Brake fluid</td>
<td>DOT 4</td>
<td>By tank markings</td>
<td>Maintain level according to tank markings</td>
</tr>
<tr>
<td>Front ball joints</td>
<td>multipurpose grease</td>
<td>As needed</td>
<td>Locate fittings and grease</td>
</tr>
<tr>
<td>Steering Box</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear driving shaft</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Front Suspension Lubrication

Grease fitting locations:
1. Shock Absorber
2. Upper Ball Joint
3. Lower Ball Joint

Image of right hand side. Lubrication of left side is the same.
Steering Box Grease Fitting
Rear Area Lubrication

Grease fitting locations:
1. LHS drive axle exterior joint
2. LHS drive axle inner joint
3. RHS drive axle exterior joint
4. RHS drive axle inner joint
5. LHS shock absorber pivots (RHS is similar)

(Motor removed for clarity)
Transmission

Always check and change the transmission oil at the intervals outlined in the periodic maintenance chart.

Checking lubrication level
Position the vehicle on a level surface. Clean the area around the check plug and remove the plug. The correct lubrication level is just below the bottom of the threaded hole.

1. Transmission fill plug
2. Oil level check plug
3. Drain Plug
Transmission Oil Change

1. Position the vehicle on a level surface.
2. Remove the fill plug.
3. Remove the drain plug and drain the oil into a drain pan.
4. Wipe the magnetic end of the drain plug and remove accumulated metallic filings.
5. After the oil drain is complete, install a new sealing washer and reinstall drain plug. Tighten to 25 Nm.
6. Add 2.4 liters of oil (per the lubrication fluid table).
7. Reinstall the fill plug and tighten to 20 Nm.
Final Drive Oil Change

1. Position the vehicle on a level surface.
2. Remove the wheel.
3. Remove the fill plug.
4. Remove the drain plug and drain the oil into a drain pan.
5. Wipe the magnetic end of the drain plug and remove accumulated metallic filings.
6. After the oil drain is complete, install a new sealing washer and reinstall drain plug. Tighten to 35 Nm.
7. Add 0.75 liters of oil (per the lubrication fluid table).
8. Reinstall the fill plug and tighten to 30 Nm.
Throttle System

⚠️ WARNING

- Failure to check or maintain proper operation of the throttle system can result in an accident and lead to serious injury or death if the throttle pedal sticks during operation.
- Never start or operate this vehicle if it has a sticking or improperly operating throttle pedal.
- Immediately contact your qualified TOMCAR® service representative if throttle problems arise.
- Always check the pedal for free movement and return before starting the vehicle and occasionally during operation.

Throttle Free-Play

If the throttle pedal has excessive play due to cable stretch or misadjustment, it will cause a delay in throttle response. In addition, the throttle may not open fully. If the throttle pedal has no free play, the throttle may be hard to control.

Check the throttle pedal free-play at the intervals outlined in the Periodic Maintenance Chart.

Inspection

1. Sit in the car, put it in neutral. Apply the brake with the left foot.
2. Turn ON the vehicle.
3. Apply the throttle slowly and measure the distance the gas pedal moves before the motor begins to pick up speed. Free-play should be 1/16 in. 3. to 1/8 in. (1.5 mm - 3 mm)
Brakes

The front and rear brakes are hydraulic Disc-Type brakes and are activated by the brake pedal. Failure to check or maintain proper operation of the brake system can result in an accident and lead to serious injury or death if the brake pedal sticks during operation.

- Never start or operate this vehicle if it has a sticking or improperly operating brake pedal.
- Immediately contact your qualified TOMCAR® service representative if brake problems arise.
- Always check proper functionality of the brake system before and occasionally during driving.

Brake Inspection

1. Check the brake system for fluid leaks.
2. Check the brake pedal for excessive travel or a spongy feel.
Brake Fluid

Routine inspections are recommended to keep the brake system in good operating condition.

Change the brake fluid at the intervals outlined in the Periodic Maintenance Chart. The brake fluid should also be changed if it becomes contaminated, or if the type and brand of the fluid in the reservoir are unknown.

1. Position the vehicle on a level surface.
2. View the brake fluid level at the reservoir under the hood (1). The level should be about 1/2 in. (12.5 mm) from the top of the reservoir.
3. If the fluid level is lower, check for leakage in the system and add brake fluid.
4. Apply the brake forcefully for a few seconds and check for fluid leakage around the fittings.

⚠️ WARNING

- After opening a bottle of brake fluid, always discard any unused portion. Never store or use a partial bottle of brake fluid. Brake fluid absorbs moisture from the air.
- Never mix different types of brake fluid. Fluids used should be DOT4.
- Moisture may cause brake fade or failure, and the possibility of accident or severe injury.
**Parking Brake Inspection**

1. Pull the parking brake lever up with your hand and release the button to lock its position.
2. Once the lever is locked, check the vehicle for movement. The vehicle should not roll while parked. If the vehicle moves, adjustment is necessary.

**Parking Brake Adjustment**

1. Position the vehicle on a level surface.
2. Use wheel chocks to prevent the vehicle from rolling.
3. Loosen or tighten the nuts on both sides of the cabin side cable.
Steering Wheel

⚠️ WARNING

- Failure to check or maintain proper operation of the steering system can result in an accident and lead to serious injury or death if free-play exists when using the steering wheel.
- Never start driving the TOMCAR® if it has free play in the steering wheel.
- Immediately contact your qualified TOMCAR® service representative if steering system problems arise.
- Always check proper functionality of the steering system before driving.
- While driving, ensure that your thumbs remain outside of the steering wheel.

Inspection

1. Position the vehicle on level ground.
2. Check slack in the steering wheel by moving it left and right.
3. There should be no free play.
4. If there is free play or strange noises, or the steering feels rough or “catchy,” have the steering system inspected by an authorized TOMCAR® supplier.
Rear Drive Belt Inspection

- Check drive belt for visible wear.
- Check drive belt tension by applying 3 kg force on the top slack (1). The belt should move 2-3mm.

Belt Replacement

- If noticeable wear is present, the belt must be replaced.
- Place the gear box in neutral.
- Turn OFF the vehicle.
- The belt can be replaced in the field by loosening the top tensioner (4) securing nuts and rotating the center section counter clockwise to move the motor closer to the gear box.
- Install the new belt and tension to the proper level.
- Turn ON the vehicle. Ensure the gear is in the neutral position, select drive direction and apply slight pressure to the throttle pedal.
- A second person must look at the belt to see it is aligned.

Belt Alignment

- Release four motor housing screws (2) on both side of the housing.
- Turn the motor slowly and correct the alignment with the adjustment bolts (3).
  One side must be release and the other tightened accordingly.
- Once proper alignment is achieved, tighten the motor housing bolts (2) and recheck alignment.
- Recheck belt tension.
4 Point Harness

Inspect all the harnesses for proper operation before each use of the vehicle.

1. Push the latch plate into the buckle until it clicks. The latch plate must slide smoothly into the buckle. A click indicates that it is securely latched.
2. Push the red button in the middle of the buckle to make sure it releases freely.
3. Check the belt webbing for wear, cuts or damage. If any irregularities are found, have the seat belt system checked and/or replaced by a TOMCAR® supplier.
4. Check that the harness is attached firmly to the hooks on the frame (four locations).

The TOMCAR® 4-point harness is adjustable and should be adjusted for all occupants before driving. Make sure the 4-point harness is adjusted before riding.

⚠️ WARNING

Failure to follow the age recommendations for this vehicle could result in serious injury or death. No one under the age of 16 may operate this vehicle or ride as a passenger in this vehicle.
Tires

Operating your vehicle with worn tires will increase the possibility of skidding, loss of control and an accident, which could result in serious injury or death.

Improper tire inflation or the use of a non-standard size or type of tires may adversely affect vehicle handling, which could result in vehicle damage or personal injury.

Low tire pressure also consumes more energy from the system which in turn reduces your mileage.

Always maintain proper tire pressure.

**Tire Tread Depth**

Always replace tires when the tread depth is worn to 5/16 in. (8 mm) or less on both front and rear wheels.

* This value applies to the original Tires. Consult tire manufacturer when using other tires.
Tire pressure (original Tires)

The recommended tire pressures are:

- Front – 7 psi
- Rear – 15 psi

⚠️ WARNING

Improperly installed wheels can adversely affect tire wear and vehicle handling, which can result in serious injury or death. Always use TOMCAR® recommended tires and ensure that all wheel nuts are tightened to specification.
Shock and Air Compensators Pressure Adjustment

Do not use an air compressor that has a maximum air pressure capacity above 200 psi.

To fill the shock air chamber or air compensators, raise the wheel off the ground. Remove the valve cap from the shock air valve. Attach the air chuck to the shock air valve and hold in place for five seconds. Reinstall the valve cap.

Important: Due to the size of the air chamber in the shock, the volume of air is small. Do not try to check the air pressure with a pressure gauge. Attempting to check the shock air pressure will release a significant amount of air, resulting in poor shock performance and possible shock damage.
Hardware

Periodically the vehicle should be inspected for loose fasteners. Use care when tightening fasteners. Excessive torque can damage a thread or break a fastener.

- Self-securing nuts and spring washers must be replaced after opening.

The following table indicates the tightening torque for specific fasteners in the vehicle.

Oiled threads are to be tightened by 20% less torque. This torque is indicated in brackets.

<table>
<thead>
<tr>
<th>Description</th>
<th>Thread</th>
<th>Tightening torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock absorbers</td>
<td>M12 x 1.5</td>
<td>85</td>
</tr>
<tr>
<td>Air compensators</td>
<td>M12 x 1.5</td>
<td>85</td>
</tr>
<tr>
<td>Steering ball joint</td>
<td>M14 x 1.5</td>
<td>100</td>
</tr>
<tr>
<td>Upright ball joint (king pin)</td>
<td>M16 x 1.5</td>
<td>200</td>
</tr>
<tr>
<td>Trailing arm pivot nut</td>
<td>M24 x 2</td>
<td>400</td>
</tr>
<tr>
<td>Trailing arm fill plug</td>
<td>M16 x 1.5</td>
<td>30 (24)</td>
</tr>
<tr>
<td>Trailing arm drain plug</td>
<td>M16 x 1.5</td>
<td>35 (28)</td>
</tr>
<tr>
<td>Transmission box fill plug</td>
<td>BSP ½”</td>
<td>20 (16)</td>
</tr>
<tr>
<td>Transmission box drain plug</td>
<td>M16 x 1.5</td>
<td>25 (20)</td>
</tr>
<tr>
<td>Transmission box oil level plug</td>
<td>M8 x 1.25</td>
<td>10 (8)</td>
</tr>
</tbody>
</table>
Auxiliary Battery

It is necessary to keep the battery terminals and connections free of corrosion. For cleaning, remove the corrosion with a stiff wire brush. Wash with hot water. Coat the terminals with dielectric grease or petroleum jelly.

⚠️ DANGER

Batteries can explode. Keep sparks and flames away from vehicle. Ventilate when charging battery or operating vehicle in an enclosed space. Always wear eye protection and gloves when handling the battery.

KEEP OUT OF REACH OF CHILDREN.

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing.

Battery Removal

1. Remove the hood.
2. Disconnect the black (negative) battery cable.
3. Remove the bracket on the battery.
4. Disconnect the red (positive) battery cable next.
5. Lift the battery out of the vehicle, being careful not to tip it sideways and spill any electrolyte.
6. If electrolyte spills, immediately wash it off with water to prevent damage to the vehicle.
Battery Installation

1. Set the battery in its place.
2. It must be free from obstructions and securely installed. If not, battery gases could accumulate and cause an explosion. Avoid skin contact with electrolyte, as severe burns could result.
3. Replace the tightened bar.
4. First, connect and tighten the red (positive) cable.
5. Second, connect and tighten the black (negative) cable.
6. Verify that cables are properly routed.

NOTE:
When installing a new battery, make sure it is fully charged prior to its initial use. Using a new battery that has not been fully charged can damage the battery and result in a shorter life. It can also hinder vehicle performance.

Battery Storage

When the vehicle is placed in storage for three months or more, the battery should be removed, stored out of the sun in a cool, dry place, and tested monthly. Before reusing, take the battery to a technical support center for testing and recharging.

Traction battery charging while placed in storage is not affected by the lack of the auxiliary battery.
# Low Voltage Fuse Panel

<table>
<thead>
<tr>
<th>Relay</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>VAC PUMP</td>
</tr>
<tr>
<td>12</td>
<td>VCU COOLING SYSTEM</td>
</tr>
<tr>
<td>13</td>
<td>DISP - BACK LIGHT</td>
</tr>
<tr>
<td>14</td>
<td>LIGHTS - MAIN</td>
</tr>
<tr>
<td>15</td>
<td>BRAKE LIGHT</td>
</tr>
<tr>
<td>16</td>
<td>MAIN - SWITCH</td>
</tr>
<tr>
<td>17</td>
<td>BRAKE LIGHT</td>
</tr>
<tr>
<td>18</td>
<td>ACC</td>
</tr>
<tr>
<td>19</td>
<td>ACC</td>
</tr>
<tr>
<td>20</td>
<td>FLASHER</td>
</tr>
</tbody>
</table>

** TMxEU Only **

| 50A MAIN FUSE |

- 5A HORN
- 7.5A LIGHTS - PRK + NUM
- 7.5A DISP - BACK LIGHT
- 10A REV LIGHT
- 10A AIR COMP. P. SWITCH
- 10A WIPERS
- 10A BATT. BOX 12V SWITCH INPUT
- 7.5A DISP - SW
- 5A PMR SOCKET + INTERIOR LIGHT
- 10A VCU SWITCH INPUTS

** MAINTENANCE **
### Fuses

<table>
<thead>
<tr>
<th>Fuse#</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Brake vacuum pump</td>
</tr>
<tr>
<td>12</td>
<td>Motor controller cooling system</td>
</tr>
<tr>
<td>14</td>
<td>Main lights fuse</td>
</tr>
<tr>
<td>15</td>
<td>Brake light</td>
</tr>
<tr>
<td>16</td>
<td>Main switch fuse</td>
</tr>
<tr>
<td>21</td>
<td>Horn</td>
</tr>
<tr>
<td>22</td>
<td>Parking and license plate lights</td>
</tr>
<tr>
<td>23</td>
<td>All in one display back light</td>
</tr>
<tr>
<td>24</td>
<td>Low beam</td>
</tr>
<tr>
<td>25</td>
<td>High beam</td>
</tr>
<tr>
<td>26</td>
<td>ACC</td>
</tr>
<tr>
<td>31</td>
<td>Turn signals</td>
</tr>
<tr>
<td>34</td>
<td>Switch input to traction battery fuse panel</td>
</tr>
<tr>
<td>35</td>
<td>All-in-one display KSI</td>
</tr>
<tr>
<td>36</td>
<td>All-in-one display memory</td>
</tr>
<tr>
<td>41</td>
<td>Reverse light</td>
</tr>
<tr>
<td>42</td>
<td>Air compressor pressure switch input</td>
</tr>
<tr>
<td>43</td>
<td>Wipers</td>
</tr>
<tr>
<td>46</td>
<td>Cabin power socket + interior light</td>
</tr>
<tr>
<td>51</td>
<td>Switch input to Remote control fuse panel</td>
</tr>
<tr>
<td>56</td>
<td>Switch input to electric drive switches</td>
</tr>
</tbody>
</table>

### Relays

<table>
<thead>
<tr>
<th>Relay#</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake vacuum pump</td>
</tr>
<tr>
<td>2</td>
<td>Motor controller cooling system</td>
</tr>
<tr>
<td>4</td>
<td>Main lights relay</td>
</tr>
<tr>
<td>6</td>
<td>Brake light relay</td>
</tr>
<tr>
<td>7</td>
<td>ACC</td>
</tr>
<tr>
<td>8</td>
<td>Flasher</td>
</tr>
</tbody>
</table>
High Voltage System

⚠️ DANGER

- High voltage components must only be replaced by authorized TOMCAR personal.
- Do not add, remove or temper with high voltage cables, wires and components.
- If it is required to turn the vehicle ON for maintenance, rear wheels must be lifted and supported.
- Always use isolated tools and clothing.
- Remove all jewelry.
- If you recognize any wear in the high voltage system components, stop using the vehicle and contact your Tomcar dealer.
- Always have an electric fire extinguisher nearby.
Traction System Fuse Panel

⚠️ DANGER
Opening the fuse panel of the traction battery involves high voltage maintenance and should be performed only by authorized personal.

Fuse Panel Cover Removal
- Turn OFF the key switch.
- Disconnect the charger from the vehicle if connected.
- Turn OFF the Safety Switch (1) located on the traction battery box.
- Open the fuse panel cover (2) securing bolts

TM58E Battery Box
## High Voltage System

### Traction System Fuse Panel

<table>
<thead>
<tr>
<th>Rear Motor Controller KSI</th>
<th>BMS Drive Mode KSI</th>
<th>Battery Box Cooling Fan</th>
<th>Motor Controller KSI</th>
<th>*Ground Loop</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>10A 11</td>
<td>1A 21</td>
</tr>
<tr>
<td>5A 12</td>
<td>5A 13</td>
<td>4</td>
<td>5A 14 22</td>
<td>5A 23</td>
</tr>
<tr>
<td>Batt. Box Fan</td>
<td></td>
<td></td>
<td>BMS Charge KSI 15</td>
<td></td>
</tr>
<tr>
<td>5A 16</td>
<td></td>
<td>24</td>
<td>DC-DC Input 10A 25</td>
<td>5A 26</td>
</tr>
<tr>
<td>*Pre-Charge !! 72V !!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Keeping you TOMCAR® Clean

⚠️ DANGER
Care must be taken while cleaning your vehicle. The battery pack and motor housing are not sealed for side splashing.

- Never wash a vehicle while it is powered ON or connected to the charger.
- Do not use direct water flow for cleaning the battery box area.
- Do not use direct water flow for cleaning the motor housing or motor controller.
- Avoid direct water flow directly on the dashboard.
- If a high-pressure type car wash system is used, extreme care must be taken to avoid water damage to the wheel bearings, transmission seals, body panels, brakes, headlights and warning labels.

The safest way to clean your vehicle is by using a hose and a pail of mild soap and water. Use a professional-type washing mitten, cleaning the upper body first and the lower parts last. Rinse with water frequently and dry with a chamois to prevent water spots.

By doing so, your TOMCAR® will not only improve in appearance, but it can also extend the life of various components.

Protect your vehicle by using a protective cover (available from TOMCAR®)

NOTE:
If warning labels are damaged, contact your TOMCAR® supplier for a replacement.
Storing Your Electric TOMCAR®

If your vehicle is to be placed in extended storage the following steps should be taken to preserve its condition and traction battery health:

1. Perform all necessary repairs and thoroughly clean the vehicle.
2. Remove and store the auxiliary battery according to page 85.
3. Raise the vehicle so all tires are suspended off the ground.
4. Spray oil on unpainted metal surfaces to prevent rusting. Avoid getting oil on rubber parts or in the brakes.
5. Lubricate cables.
6. Cover the vehicle with a canvas. Do not use plastic material, since they do not allow ventilation.
7. Traction battery storing:
   a. All batteries will self-discharge over time. The rate of discharge varies depending on the ambient temperature and battery age and condition.
   b. Traction battery is to be stored above 0°C and below 40°C Celsius.
   c. For long durations (more than a month), it is best to store the traction battery at around 50% SOC.
   d. It is important to check battery SOC every 4 weeks and recharge if SOC drops below 10%.
   e. A special storing charger can be purchased and left connected to the traction battery, provided the charger is plugged into an active electrical source.

   If the source power to the charger is disconnected or interrupted the battery management system will keep checking the batteries, this will draw power from the battery pack and eventually drain the batteries if power is not restored in a timely manner.

   This procedure requires the auxiliary battery to be connected in the vehicle.
Remove your Electric TOMCAR® from Storage

1. Connect the auxiliary battery as described on pg. 86.
2. Recharge the traction battery as described on pgs. 50-51
3. Perform a pre-ride inspection as described on pg. 65.
4. Lubricate at the intervals outlined in the periodic maintenance chart on pgs. 66-67.
5. Turn on the vehicle and check the traction battery SOC.
Traction Battery Charging Faults

The standard vehicle charger is equipped with 2 LED light indicating the charger status. If the LED is blinking red and green and the battery SOC has not reached 95%, there is a connection problem between the charger and traction battery.

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Set\Clear Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Loose charger plug connection</td>
<td>Make sure charge plug is properly connected</td>
</tr>
<tr>
<td>2 Damaged charge cable or connector</td>
<td>Visually inspect the cable, plug and socket for wear and tear. Contact manufacturer for replacement if necessary</td>
</tr>
<tr>
<td>3 BMS charge power failure</td>
<td>Check fuse 14 in traction battery fuse panel. Replace if necessary</td>
</tr>
<tr>
<td>4 Main BMS power failure</td>
<td>Check fuse 21 in traction battery fuse panel. Replace if necessary</td>
</tr>
<tr>
<td>5 DC-DC converter power up failure</td>
<td>Check fuse 15 and relay 5 in traction battery fuse panel. Replace if necessary</td>
</tr>
<tr>
<td>6 Charger or charge contactor failure</td>
<td>Contact manufacturer for further assistance</td>
</tr>
</tbody>
</table>
## Mechanical Driving Faults

This section outlines a few typical mechanical driving faults that can be encountered.

<table>
<thead>
<tr>
<th>System</th>
<th>Phenomena</th>
<th>Set\Clear Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brakes</td>
<td>Noisy brakes and erratic vehicle movement</td>
<td>Check parking brake release.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check brake pedal movement.</td>
</tr>
<tr>
<td>Steering</td>
<td>Hard steering</td>
<td>Grease steering box</td>
</tr>
<tr>
<td></td>
<td>Free play in steering wheel</td>
<td>Tighten steering linkage joints</td>
</tr>
<tr>
<td>Shifter</td>
<td>Shifter lever is stuck in gear</td>
<td>Try releasing the lever while driving at low speed with low traction</td>
</tr>
<tr>
<td></td>
<td>Shifter lever pops out of gear</td>
<td>Ensure proper engagement by driving at low speed while engaging the shifter</td>
</tr>
<tr>
<td>Differential</td>
<td>Diff lock does not engage</td>
<td>Engagement should be performed while driving with minimum load</td>
</tr>
<tr>
<td>Lock</td>
<td>Diff lock does not release</td>
<td>Try changing drive direction and release while driving with minimum load.</td>
</tr>
</tbody>
</table>

*If equipped with a pneumatic locker, make sure air compressor is working properly*
## Electrical Drive System Faults

If an error occurs in the motor controller or BMS it is represented to the driver on the Spyglass display by a number with the prefix ‘E’.


The following table displays some of the trouble codes that can be checked and solved without contacting your authorized TOMCAR dealer.

### Motor Controller Faults

<table>
<thead>
<tr>
<th>CODE</th>
<th>Fault name &amp; Effect of Fault</th>
<th>Possible cause</th>
<th>Set/Clear Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Pre-charge Failed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Motor</em>;</td>
<td>Open circuit in external pre-charge resistor or associated wiring.</td>
<td>Check safety switch (located by the charge socket) is ON. Check fuse 16 in traction battery fuse panel. Cycle KSI</td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Main Contactor</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Throttle</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Full Brake</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Controller Severe Under temp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Motor</em>;</td>
<td>Controller is operating in an extreme environment</td>
<td>Bring temperature above -40°C. Cycle KSI</td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Main Contactor</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Throttle</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Full Brake</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Controller Severe Over temp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Motor</em>;</td>
<td>1. Controller is operating in an extreme environment. 2. Excessive load on vehicle</td>
<td>Bring controller temperature below 95°C. Cycle KSI</td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Main Contactor</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Shutdown Throttle</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Full Brake</em>;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CODE</td>
<td>Fault name &amp; Effect of Fault</td>
<td>Possible cause</td>
<td>Set/Clear Conditions</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
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<td>----------------------</td>
</tr>
<tr>
<td>17</td>
<td>Severe B+ Under Voltage <em>Reduced drive torque</em></td>
<td>1. Traction battery depleted below authorized SOC. 2. Main contactor did not close.</td>
<td>Check SOC on spyglass display. Cycle KSI</td>
</tr>
<tr>
<td>17</td>
<td>Severe KSI under Voltage <em>Motor current may switch off and reset may occur.</em></td>
<td>1. Low power circuit power source is below 8.4 volts. 2. Blown Fuse</td>
<td>Check auxiliary battery voltage and bring above 10 volts. Check fuse 11 in traction battery fuse panel.</td>
</tr>
<tr>
<td>18+57</td>
<td>Severe B+ Over Voltage <em>Shutdown Motor; Shutdown Main Contactor; Shutdown Throttle; Full Brake</em></td>
<td>1. Battery charger fault. Battery was charged to excessive voltage. 2. Battery disconnected while regen braking.</td>
<td>Cycle KSI</td>
</tr>
<tr>
<td>18</td>
<td>Severe KSI Over Voltage <em>Shutdown Motor; Shutdown Main Contactor; Shutdown Throttle; Full Brake</em></td>
<td>1. Auxiliary battery voltage too high. 2. Auxiliary battery polarity is reversed.</td>
<td>Check auxiliary voltage battery voltage and polarity.</td>
</tr>
<tr>
<td>22</td>
<td>Controller Over Temp Cutback <em>Reduced drive and brake torque</em></td>
<td>1. Controller is operating in an extreme environment. 2. Excessive load on vehicle</td>
<td>Bring controller temperature below 85°C.</td>
</tr>
<tr>
<td>23</td>
<td>B+ Under Voltage Cutback <em>Reduced drive torque</em></td>
<td>Batteries need recharging</td>
<td>Recharge the traction battery</td>
</tr>
<tr>
<td>CODE</td>
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</tr>
<tr>
<td>24</td>
<td>B+ over Voltage Cutback&lt;br&gt;&lt;em&gt;Reduced brake torque&lt;/em&gt;</td>
<td>Battery disconnected while regen braking</td>
<td>Cycle KSI</td>
</tr>
<tr>
<td>28</td>
<td>Motor Temp Hot Cutback&lt;br&gt;&lt;em&gt;Reduced drive torque&lt;/em&gt;</td>
<td>Motor temperature too high</td>
<td>Reduce load on vehicle</td>
</tr>
<tr>
<td>47</td>
<td>Sequencing Fault&lt;br&gt;&lt;em&gt;Shut down throttle&lt;/em&gt;</td>
<td>Safety fault. KSI input was received after direction selection switch or throttle pedal command.</td>
<td>Set ‘Direction selection’ switch to Neutral and release the throttle. Cycle KSI if error remains.</td>
</tr>
<tr>
<td>73</td>
<td>Stall Detected&lt;br&gt;&lt;em&gt;Shutdown Motor;&lt;/em&gt;&lt;br&gt;&lt;em&gt;Shutdown Main Contactor;&lt;/em&gt;&lt;br&gt;&lt;em&gt;Shutdown Throttle;&lt;/em&gt;&lt;br&gt;&lt;em&gt;Full Brake;&lt;/em&gt;</td>
<td>Stalled motor</td>
<td>Cycle KSI</td>
</tr>
</tbody>
</table>
## Troubleshooting

### Traction Battery Faults

<table>
<thead>
<tr>
<th>CODE</th>
<th>Fault name &amp; Effect of Fault</th>
<th>Possible cause</th>
<th>Set/Clear Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>BMS timeout Error <strong>Shutdown Motor</strong>;</td>
<td>Blown Fuse</td>
<td>Check fuses 12&amp;21 in traction battery fuse box</td>
</tr>
<tr>
<td>52</td>
<td>BMS Over Current <strong>Shutdown Motor</strong>;</td>
<td>Excessive load on vehicle</td>
<td>Cycle KSI and reduce load</td>
</tr>
<tr>
<td>53</td>
<td>Traction Battery Over Temp <strong>Shutdown Motor</strong>;</td>
<td>Vehicle is operating in an extreme environment.</td>
<td>Bring battery temperature below 55°C.</td>
</tr>
<tr>
<td>54</td>
<td>Traction Battery Critical Discharge <strong>Shutdown motor</strong>;</td>
<td>Battery SOC is below allowed value.</td>
<td>Recharge the battery</td>
</tr>
<tr>
<td>56</td>
<td>BMS in Charge Mode</td>
<td>Charger is connected while KSI is switched ON</td>
<td>Disconnect Charger and Cycle KSI</td>
</tr>
<tr>
<td>57</td>
<td>Traction Battery Over Voltage <strong>Shutdown Motor</strong>;</td>
<td>1. Battery charger fault. 2. Battery disconnected while regen braking.</td>
<td>Cycle KSI</td>
</tr>
<tr>
<td>59</td>
<td>Traction Battery Internal BMS Over Temp <strong>Shutdown Motor</strong>;</td>
<td>Charge cycle was interrupted during modules balancing at final stage.</td>
<td>Wait for a few minutes and cycle KSI</td>
</tr>
<tr>
<td>61</td>
<td>Traction Battery Low drive current limit <strong>Reduced drive torque</strong>;</td>
<td>1. High or low temperatures. 2. Low SOC</td>
<td>If no other faults appear, check SOC. If SOC is low, recharge the battery.</td>
</tr>
<tr>
<td>65</td>
<td>Traction Battery Low SOC <strong>Shutdown Motor</strong>;</td>
<td>Battery SOC is below allowed value.</td>
<td>Recharge the battery</td>
</tr>
</tbody>
</table>