

# *CROSSFIRE* E10 / E10 CREW

## SERVICE MANUAL



# *CROSSFIRE* E10 / E10 CREW SERVICE MANUAL



**WARNING:**

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

BEFORE OPERATING THIS VEHICLE, THE OWNER AND EACH OPERATOR MUST HAVE READ AND HAVE AN UNDERSTANDING OF ALL THE INSTRUCTIONS FOR PROPER ASSEMBLY AND SAFE OPERATION, AS WELL AS THE INSTRUCTIONS CONCERNING THE ENGINE AND ALL OTHER PORTIONS OF THE VEHICLE.

---

## NOTICE

This manual was produced by the Crossfire Motorcycles primarily for use by Crossfire Motorcycles dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual, so it is assumed that anyone who uses this book to perform maintenance and repairs on Crossfire Motorcycles vehicle has a basic understanding of the mechanical ideas and the procedures of vehicle repair. Repairs attempted by anyone without this knowledge are likely to render the vehicle unsafe and unfit for use.

Crossfire Motorcycles is continually striving to improve all its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Crossfire Motorcycles dealers and will appear in future editions of this manual where applicable.

### NOTE:

Designs and specifications are subject to change without notice.

## IMPORTANT INFORMATION

Particularly important information is distinguished in this manual by the following notations.



The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

### WARNING

Failure to follow WARNING instructions could result in severe injury or death to the vehicle operator, passenger, a bystander, or a person checking or repairing the vehicle.

### CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the vehicle.

### NOTE:

A NOTE provides key information to make procedures easier or clearer.

# CONTENTS

CHAPTER1 .....	<i>General Information</i>
CHAPTER2 .....	<i>Maintenance</i>
CHAPTER3.....	<i>Chassis</i>
CHAPTER4.....	<i>Final Drive</i>
CHAPTER5.....	<i>Brakes</i>
CHAPTER6.....	<i>Electrical</i>



Never run an engine in an enclosed area. Carbon monoxide exhaust gas is poisonous and can cause severe injury or death. Always start engines outdoors.

Gasoline is extremely flammable and explosive under certain conditions. Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing. Always keep alert and wear protection.

Exhaust system components are very hot during and after use of UTV. Never service when the engine is warm or hot. Escaping steam from cooling system or hot oil from the machine can cause severe burns. The engine must be cool before service.

Crate of the UTV and parts in the UTV maybe have sharp edge, always pay attention and wear protection.

# CHAPTER 1 GENERAL INFORMATION

** WARNING**

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each UTV model for spare parts information and service.

## 1.1 IMPORTANT INFORMATION

## 1.2 V.I.N AND MOTOR SERIAL NUMBER

## 1.3 VEHICLE DIMENSIONS

**1.1 IMPORTANT INFORMATION**

**PREPARATION FOR REMOVAL PROCEDURES**

1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment.
3. When disassembling the machine, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “ mated ”through normal wear. Mated part must always be reused or replaced as an assembly.
4. During machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

**REPLACEMENT PARTS**

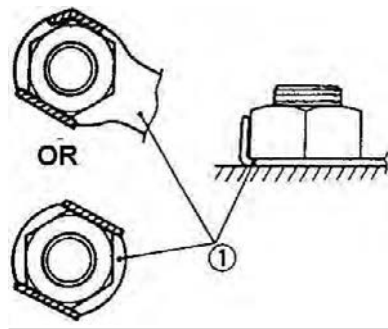
Use only genuine parts for all replacements. Use recommended oil and grease for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

**GASKETS,OIL SEALS AND O-RINGS**

1. Replace all gaskets seals and O-rings when overhauling the engine. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.

**LOCK WASHERS/PLATES AND COTTER PINS**

Replace all lock washers/plates and cotter pins after removal. Bend lock tabs along the bolt or nut flats after the bolt or nut has been tightened to specification.



**BEARINGS AND OIL SEALS**

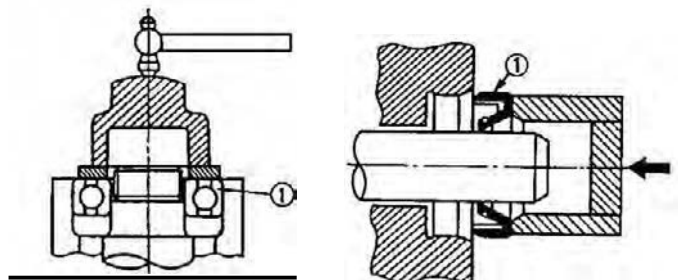
Install bearings and oil seals so that the manufacturer’s marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil bearings liberally when installing, if appropriate.

① oil seal

**CAUTION:**

Do not use compressed air to spin the bearings dry. This will damage the bearing surfaces.

① Bearing

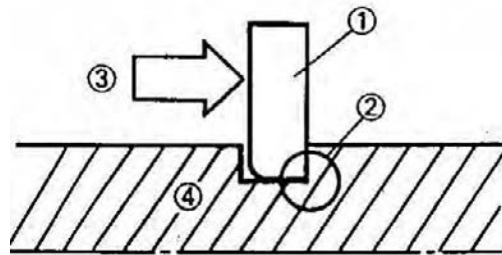


**CIRCLIPS**

1. Check all circlips carefully before reassembly. Always replace piston pin clips after one use.

Replace distorted circlips. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ it receives. See sectional view.

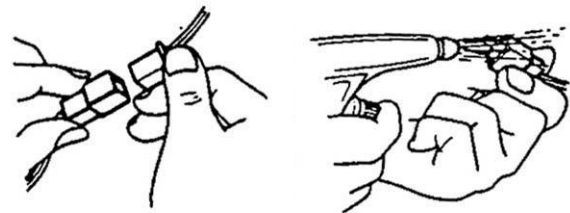
④ Shaft



**CHECKING OF CONNECTIONS**

Dealing with stains, rust, moisture, etc. on the connector.

1. Disconnect:
  - Connector
2. Dry each terminal with an air blower.
3. Connect and disconnect the connector two or three.
4. Pull the lead to check that it will not come off.
5. If the terminal comes off, bend up the pin ① and reinsert the terminal into the connector.
6. Connect:
  - Connector



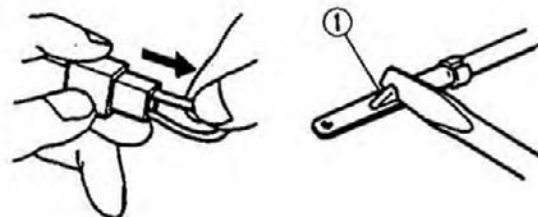
**NOTE:**

The two connectors "click" together.

7. Check for continuity with a tester.

**NOTE:**

- If there is no continuity, clean the terminals.
- Be sure to perform the steps 1 to 7 listed above when checking the wire harness.
- Use the tester on the connector as shown.



**⚠ WARNING**

Never run an engine in an enclosed area. Carbon monoxide exhaust gas is poisonous and can cause severe injury or death. Always start engines outdoors.  
 Gasoline is extremely flammable and explosive under certain conditions. Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing. Always keep alert and wear protection.  
 Exhaust system components are very hot during and after use of UTV. Never service when the engine is warm or hot. Escaping steam from cooling system or hot oil from the machine can cause severe burns. The engine must be cool before service.  
 Crate of the UTV and parts in the UTV maybe have sharp edge, always pay attention and wear protection.



CONVERSION TABLE

How to use the CONVERSION TABLE

Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

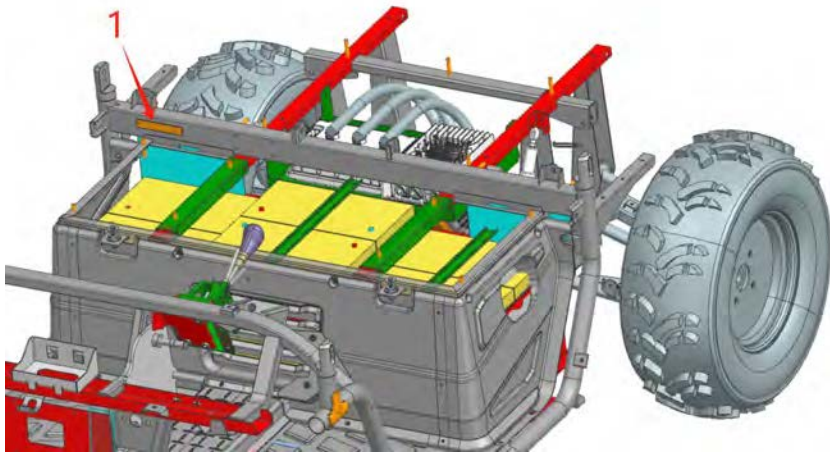
METRIC		MULTIPLIER		IMP
**mm	x	0.3937	=	**in
**cm	x	0.03937	=	**in

CONVERSION TABLE

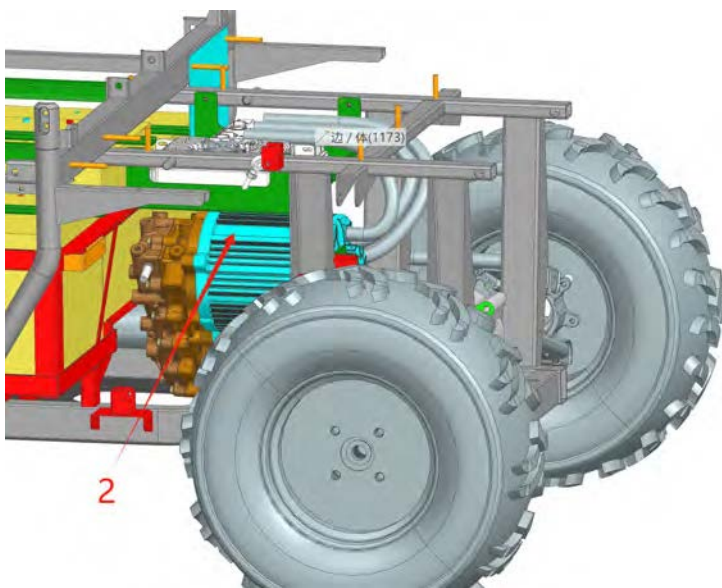
METRIC TO IMP			
	Known	Multiplier	Result
Torque	m • kg	7.233	ft • lb
	m • kg	86.794	ln • lb
	cm • kg	0.0723	ft • lb
	cm • kg	0.8679	ln • lb
Weight	kg	2.205	lb
	g	0.03527	oz
Distance	km/h	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3927	in
Volume/ Capacity	mm	0.03927	in
	cc(cm <sup>3</sup> )	0.03527	oz(IMP liq.)
	cc(cm <sup>3</sup> )	0.06102	cu • in
	lit(liter)	0.8799	qt (IMP liq.)
Miscellaneous	lit(liter)	0.2199	gal(IMP liq.)
	kg/mm	55.997	lb/in
	kg/cm <sup>2</sup>	14.2234	psi(lb/in <sup>2</sup> )
	Centigrade	9/5(°C)+32	Fahrenheit(° F)

**1.2 V.I.N AND ENGINE SERIAL NUMBER**

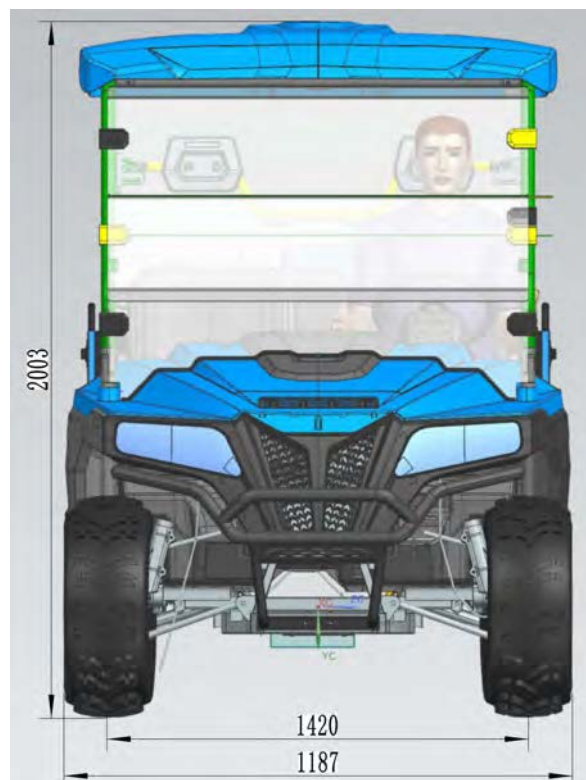
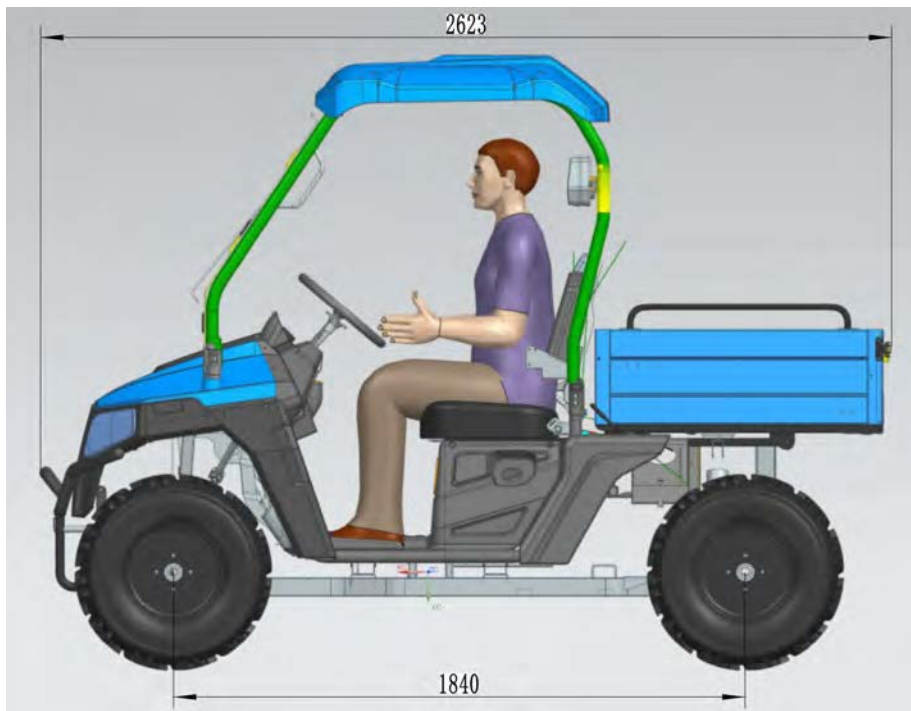
The vehicle identification number ① is stamped into the left side of the rear frame tube.



The engine serial number ② is stamped into left side of engine crankcase.



1.3 VEHICLE DIMENSIONS





# CHAPTER 2 MAINTENANCE

## WARNING

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each UTV model for spare parts information and service.

### 2.1 PERIODIC MAINTENANCE

### 2.2 TOE ALIGNMENT

### 2.3 BRAKING SYSTEM INSPECTION

### 2.4 SUSPENSION SPRING RPELOAD ADJUSTMENT

### 2.5 WHEELS

### 2.6 TIRE PRESSURE

### 2.7 FRAME, NUTS, BOLTS, FASTENERS

**2.1 PERIODIC MAINTENANCE**


CAUTION

Due to the nature of the adjustments marked with a **D** on the following chart, it is recommended that service be performed by an authorized dealer.

- More often under severe use, such as dirty or wet conditions to purge water or dirt contamination from grease fittings and other critical components.

**PERIODIC MAINTENANCE SCHEDULE:**

Careful periodic maintenance will help keep your vehicle in the safest, most reliable condition. Inspection, adjustment and lubrication intervals of important components are explained in the following chart on the following pages.

Maintenance intervals are based upon average riding conditions and an average vehicle speed of approximately 16km/h (10 miles per hour). Vehicles subjected to severe use, such as operation in wet or dusty areas, should be inspected and serviced more frequently.

Inspect, clean, lubricate, adjust or replace parts as necessary.

**NOTE:**

Inspection may reveal the need for replacement parts. Always use genuine parts available from your dealer.

Service and adjustments are critical. If you are not familiar with safe service and adjustment procedures, ask for a qualified dealer perform these operations.

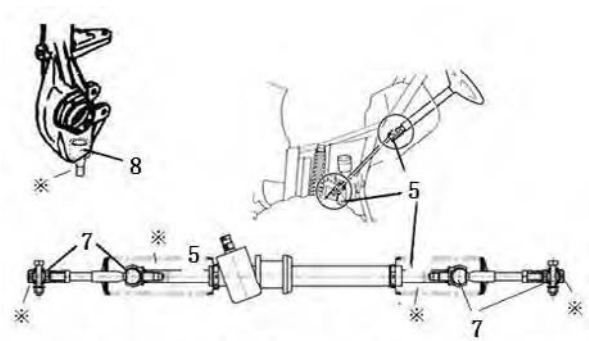
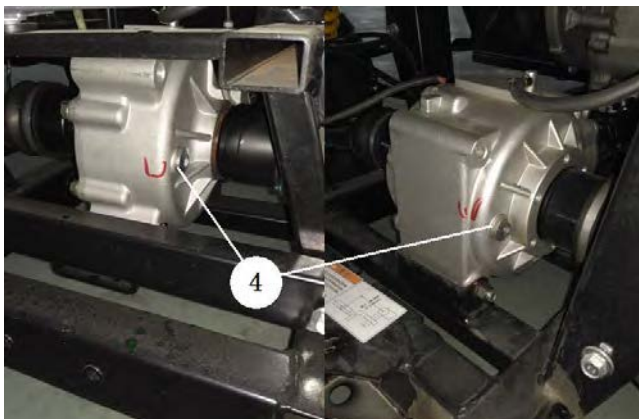
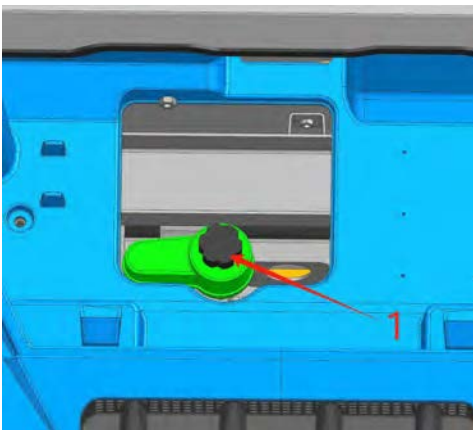
	Item	Hours	When	Remarks
●	Brake System	Pre-ride	Pre-ride	Pre-ride inspection item
	Accelerator pedal	Pre-ride	Pre-ride	Inspect return to initial position, replace if necessary; pre-ride inspection item
●	Tires	Pre-ride	Pre-ride	Inspect daily, pre-ride inspection item
●	Front and Rear Wheels/ Hubs	Pre-ride	Pre-ride	Pre-ride inspection item
●	Steering	Pre-ride	Pre-ride	Inspect daily, lubricate
<b>D</b>	Wheels Bearings	10 hrs	Monthly	Check for looseness/ damage. Replace if damaged
	Frame Nuts, Bolts Fasteners	Pre-ride	Pre-ride	Pre-ride inspection item
	Battery	20 hrs	Monthly	Check/clean Terminals; Inspect damage and deformation
	Motor controller	20 hrs	Monthly	Check/clean Terminals; Inspect damage and deformation
	Headlamp Inspection	Daily	Daily	Check operation daily; apply dielectric

				grease to connector when replaced
	Tail / Indicator Lamp Inspection	Daily	Daily	Check operation daily; apply dielectric grease to socket when replaced
●	Transmission Oil Level	20 hrs	Monthly	Inspect monthly; change annually
D	Brake Pad Wear	10 hrs	Monthly	Inspect periodically
●	Front/Rear axle Gear case Oil	100 hrs	Monthly	Check yearly or every 100 hours
●	General Lubrication	50 hrs	3 months	Lubricate all fittings, pivots, cables, etc.
D	Drive Belt	50 hrs	6 months	Inspect, replace if necessary
D	Steering System	50 hrs	6 months	Check operation and for looseness, worn, damage, binding feeling / Adjust, repair, Replace if necessary. Check toe alignment /Adjust if necessary.
D	Toe Alignment Adjustment	As required	As required	Periodic inspection, adjust when parts are replaced
D	Shaft	50 hrs	6 months	Check for looseness/ damage
●	Axle	50 hrs	6 months	Inspect bearings, Lube
●	Front Prop Shaft & Shaft Yoke	50 hrs	6 months	Check for looseness/ damage
●	Rear Prop Shaft, Shaft Yoke & Boots	50 hrs	6 months	Check for/ boots/ looseness/ damage
●	Front Suspension	50 hrs	6 months	Inspect - lubricate, tighten fasteners
●	Rear Suspension	50 hrs	6 months	Inspect, tighten fasteners
	Motor Mounts	25 hrs	3 months	Inspect
D	Brake Fluid	200 hrs	24 months	Change every two years
	Headlight Aim	As required	As required	Adjust if necessary

**LUBRICANT AND FLUID**

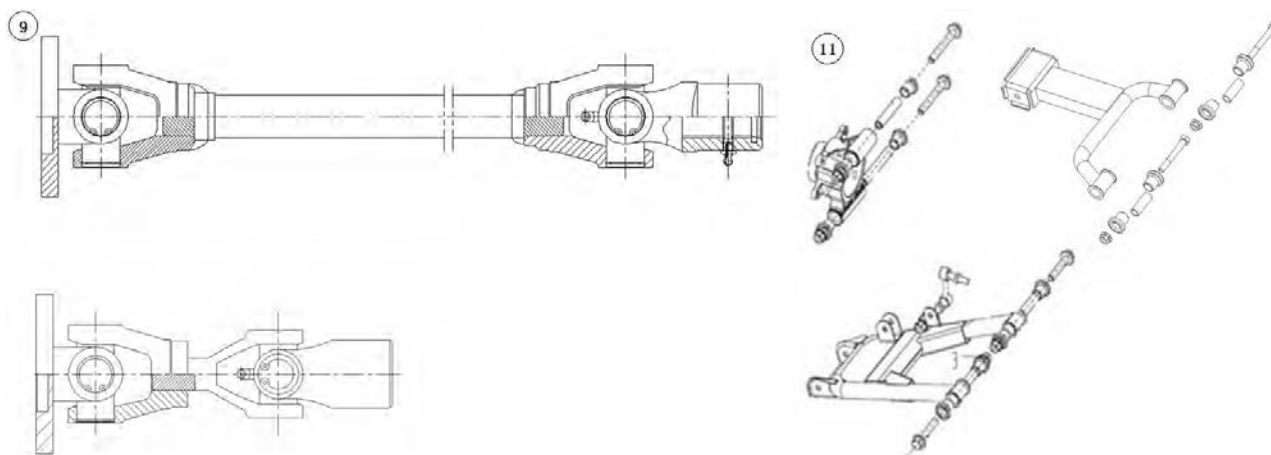
	<b>Item</b>	<b>Lube Rec</b>	<b>Method</b>	<b>Frequency</b>
	1. Brake Fluid	DOT 3 Only	Maintain level between fill lines	As require; change every two years or 200 hours
	2. Rear Gear case oil	SAE 80W/90GL5	700ml	Change annually or 100 hours
●	3. Brake pedal	Grease	Grease, inspect	Monthly or 20 hours
	4. Front / Rear Axle Gear Case Oil	SAE 80W/90GL5	Fill the bottom of the fill plug threads	Change annually or 100 hours
●	5. Steering System	Grease	Lubricate the pivoting and sliding parts	Every 3 months or 50 hours
●	6. Shift Linkages	Grease	Locate fittings and Grease	Semi-annually

●	7. Tie Rods	Grease	Grease	Semi-annually
●	8. Ball Joints	Grease	Inspect, Locate fittings and Grease, or replace it if necessary	Semi-annually
●	9. Prop Shaft & Shaft Yoke, Spline Joint	Grease	Locate fitting and Grease	Semi-annually
●	10. Throttle Cable plug		Ensure reliable connection (Must be powered off for inspection!!)	Monthly or 20 hours
●	11. Front / Rear A-arm Pivot Shaft	Grease	Locate fitting on pivot shaft and grease with grease gun	Every 3 months or 50 hours



※---Check the protective boots for holes or tears. If any damage is found, have them replaced by an authorized dealer.





## LUBRICATION RECOMMENDATIONS

### NOTE:

1. More often under severe use, such as wet or dusty conditions.
2. Grease: Light weight lithium-soap grease.
3. Grease M: Molybdenum disulfide ( $\text{MoS}_2$ ) grease (water resistant).
4. When suspension action becomes stiff or after washing.
1. 5. Hours are based on 10 mph (16 Km/h) average.

**2.2 TOE ALIGNMENT**

**METHOD: STRAIGHTEDGE OR STRING**

Be sure the steering wheel in a straight ahead position.

**NOTE:** String should just touch side surface of rear tire on each side of the UTV.

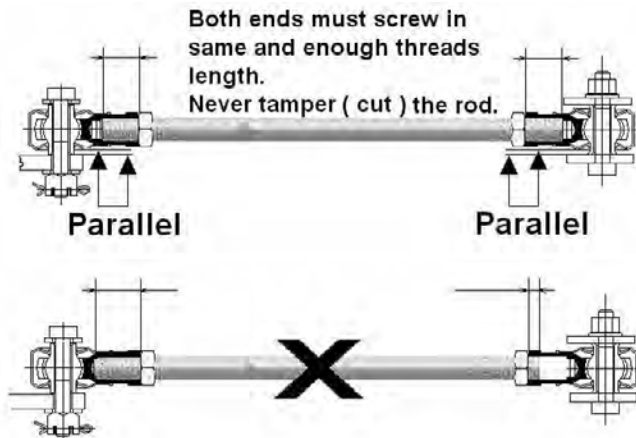
The recommended toe alignment is 1/8"to 1/4"(3 to 6mm) toe out.

1. Set the steering wheel in a straight ahead position and hold them in this position.
2. Measure A and B, A minus B should be 1/8" to 1/4" (3 to 6mm).



**⚠ WARNING**

Always pay attention to tie rods assembly, Both ends must screw in same and enough threads length.



**2.3 BRAKING SYSTEM INSPECTION**

The following checks are recommended to keep the braking system in good operating condition. Service life of braking system components depends on operating conditions. Inspect brakes in accordance with the maintenance schedule and before each ride

- Keep fluid level in the master cylinder reservoir to the indicated level on reservoir.

- Use DOT 3 brake fluid.

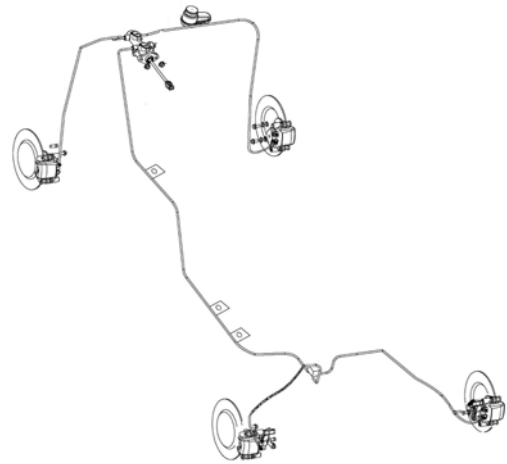
**NOTE:** Use new brake fluid or brake fluid from a sealed container to avoid contamination to system.

- Check brake system for fluid leaks.

- Check brake for excessive travel or spongy feel.

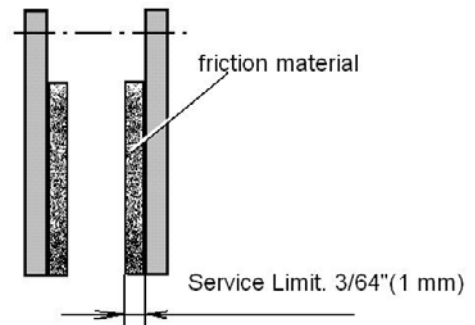
- Check friction pads for wear, damage and looseness.

- Check surface condition of the disc.



**BRAKE PAD INSPECTION**

Pads should be changed when friction material is worn to 3/64" (1mm).



**HOSE/FITTING INSPECTION**

Check braking system hoses and fittings for cracks, deterioration, abrasion, and leaks. Tighten any loose fittings and replace any worn or damaged parts.

**ADJUSTING THE BRAKE PEDAL**

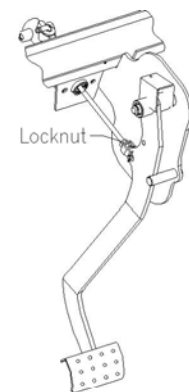
Check the brake pedal free play. Free play should be 8 – 12mm. Out of specification →Adjust.

1. Loosen the locknut
2. Turn brake rod in or out until the correct free play is obtained.

Turning in: Free play is increased.

Turning out: Free play is decreased.

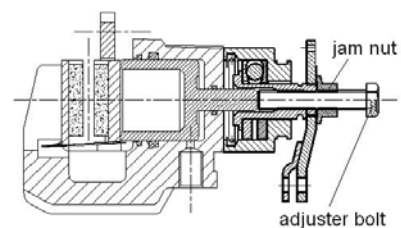
3. Tighten the locknut



**ADJUSTING THE PARKING BRAKE**

Although the parking brake has been adjusted at the factory, the brake should be checked for proper operation. The mechanical brake must be maintained to be full functional.

1. With the engine off, apply the parking brake



lever and attempt to move the UTV.

2. If the rear wheels are locked, it is adjusted properly.

3. If the wheels are not locked, it must be adjusted.

**To adjust (set up) the mechanical parking brake, use the following procedure**

**Note:** The adjusting on the caliper is for the wear out of the pads.

1. With the engine off, loosen the adjuster on the lever.

2. Loosen the jam nut of the adjuster on the caliper.

3. Turn the adjuster (bolt) CW (clockwise) by hand till the pad touch the brake disc, turn the adjuster bolt CCW (counterclockwise) by 1/4 to one turn for 10 to 20mm free play at the end of the parking lever.

4. Tighten the jam nuts securely against the adjusters.

5. Make sure the rear wheels turns freely without dragging.

6. Turn the adjuster (the one on the lever) and apply the lever. While adjusting, it is important you apply the lever back and forth for operation, free play and the locking of the parking position.

7. Make sure the rear wheels turns freely without dragging and parking brake works properly.

8. Field test for parking. It must be capable of holding the laden UTV stationary on an 18% up and down gradient.

A temporary adjusting can also be done to the brake cable on the parking lever side by turn the adjuster (nut) directly. But the adjust range is limited. Always do the **procedure 1 to 8** when necessary.

## **2.4 SUSPENSION SPRING RPELOAD ADJUSTMENT**

Operator weight and vehicle loading affect suspension spring preload requirements. Adjust as necessary.

### **FRONT SUSPENSION**

Compress and release front suspension. Damping should be smooth throughout the range of travel.

Check all front suspension components for wear or damage.

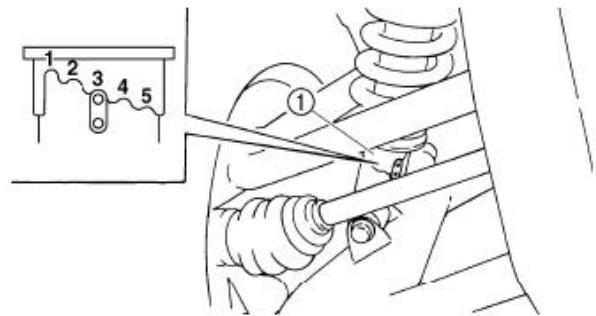
Inspect from strut cartridges for leakage. Shock spring preload can not be adjusted, replace if necessary.

### **REAR SUSPENSION**

Compress and release rear suspension. Damping should be smooth throughout the range of travel. Check all rear suspension components for wear or damage.

Inspect shock for leakage

Shock spring preload can be adjusted using the shock spanner wrench.



### **⚠ WARNING**

Always adjust both shock absorber spring preload to the same setting. Uneven adjustment can cause poor handling and loss of stability.

Turn the adjuster ① to increase or decrease the spring preload.

Standard position: 3

Minimum (Soft) position: 1

Maximum (Hard) position: 5

## **2.5 WHEELS**

Inspect all wheels for runout of damage.

Check wheel nuts and ensure they are tight.

Do not over tighten the wheel nuts.

### **WHEEL REMOVAL**

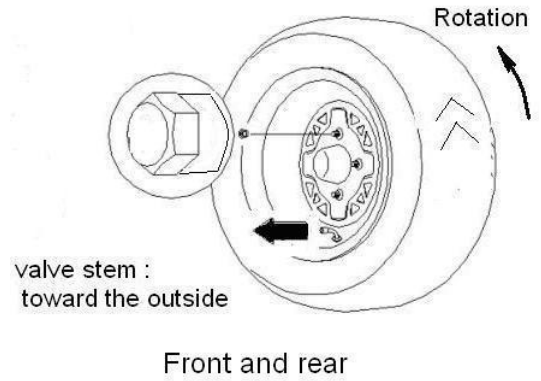
1. Stop the engine, place the transmission in gear and lock the parking brake.
2. Loosen the wheel nuts slightly.
3. Elevate the side of the vehicle by placing a suitable stand under the footrest frame.
4. Remove the wheel nuts and remove the wheel.

### **WHEEL INSTALLATION**

1. With the transmission in gear and the parking

brake locked, place the wheel in the correct position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward rotation.

2. Install the wheel nuts and tighten them by hand.
3. Lower the vehicle to the ground.
4. Securely tighten the wheel nuts to the proper torque listed in the table. On wheel nuts, Make sure tapered end of nut goes into taper on wheel.



**Wheel Nut Torque Specifications**

Bolt Size		Specification	
Front	M12X1.25	59Ft.Lbs	66Nm
Rear	M12X1.25	59Ft.Lbs	66Nm

**CAUTION:**

If wheels are improperly installed it could affect Vehicle handling and tire wear.

**2.6 TIRE PRESSURE**

**TIRE INSPECTION**

**CAUTION:**

- Maintain proper tire pressure. Refer to the warning tire pressure decal applied to the vehicle.
- Improper tire inflation may affect UTV maneuverability.
- When replacing a tire always use original equipment size and type and replace in pairs.
- The use of non- standard size or type tires may affect UTV handling and cause machine damage.

Tire Pressure	
front	rear
48kPa/7SI	48kPa/7PSI

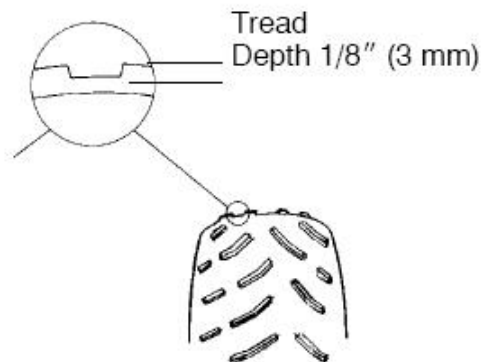
**TIRE TREAD DEPTH**

Always replace tires when tread depth is worn to 1/8" (3mm ) or less.

**⚠ WARNING**

Operating an UTV with worn tires will increase the possibility of the vehicle skidding easily with possible loss of control.

Worn tires can cause an accident. Always replace tires when the tread depth measures 1/8" (3mm ) or less.



**2.7 FRAME , NUTS, BOLTS, FASTENERS**

Periodically inspect the tightness of all fasteners in accordance with the maintenance schedule. Check that all cotter pins are in place. Refer to specific fastener torques listed in each chapter.





# CHAPTER 3 CHASSIS

**WARNING**

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each CUV model for spare parts information and service.

## 3.1 FRONT A-ARM REPLACEMENT

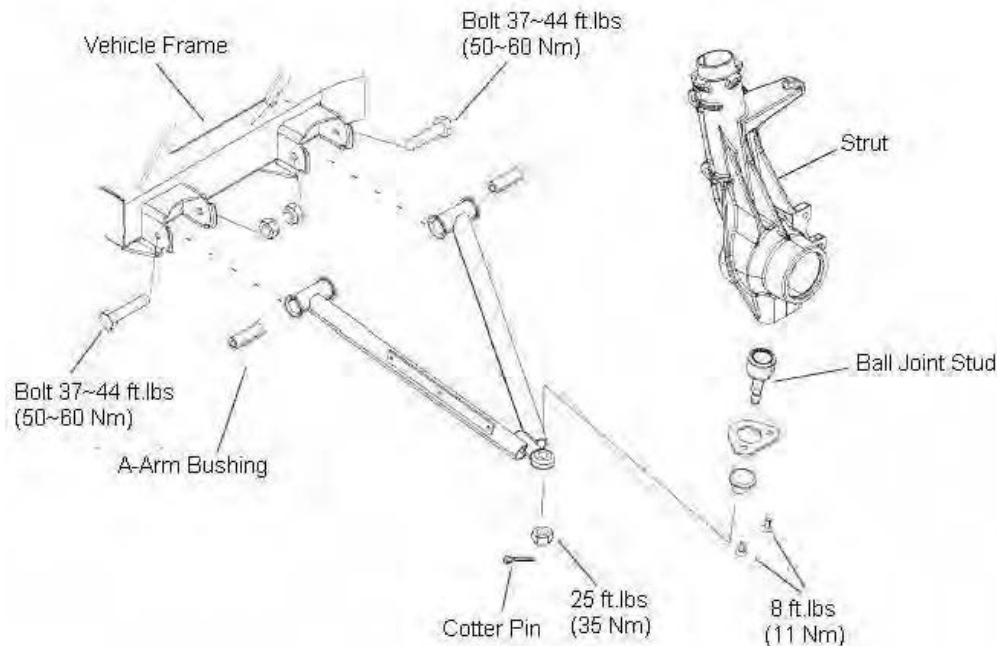
## 3.2 REAR A-ARM REPLACEMENT

## 3.3 REAR STABILIZER BAR REMOVAL/INSTALLATION

## 3.4 FRONT STRUT REPLACEMENT

## 3.5 FRONT STRUT BALL JOINT REPLACEMENT

## 3.6 STEERING ASSEMBLY REMOVAL/INSTALLATION

**3.1 FRONT A-ARM REPLACEMENT**

1. Elevate and safely support vehicle with weight removed from front wheel(s).
2. Remove cotter pin from ball joint stud at wheel end of A- arm and loosen nut until it is flush with end of stud.
3. Using a soft face hammer, tap nut to loosen A- arm from bolt. Remove nut and A-arm from hub strut assembly.
4. Loosen and remove two bolts on A-arm, and remove A-arm.
5. Examine A-arm bushing. Replace if worn or tore. Discard hardware.
6. Install new A-arm assembly onto vehicle frame. Install new bolts and new nuts.

**NOTE:**

Tighten the nuts only finger-tighten at this time. They will be tightened to the final torque after the front wheels are installed and the vehicle is on the ground.

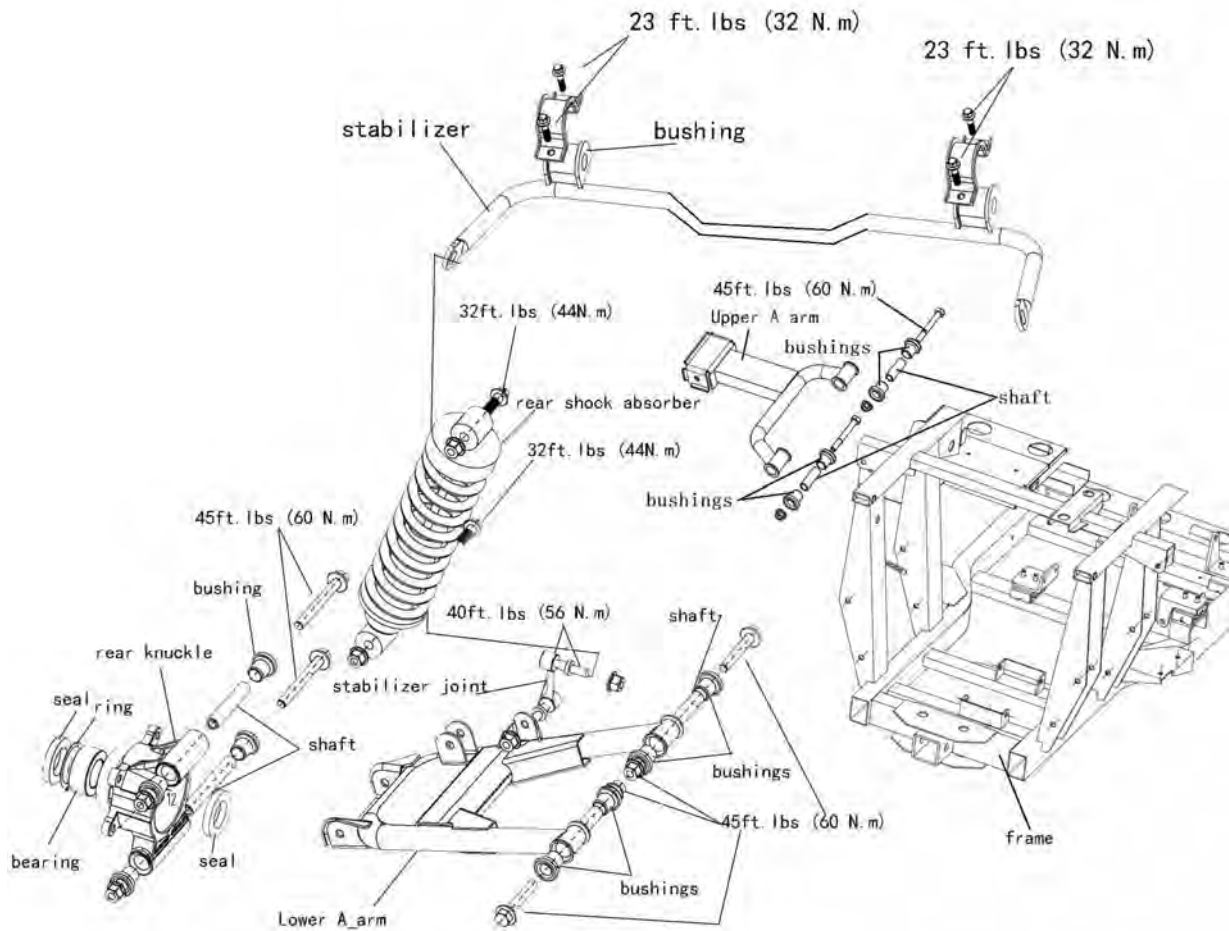
**⚠ WARNING**

DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

7. Attach A-arm to strut assembly. Tighten ball joint nut to 25 ft. lbs. (35 Nm). If cotter pin holes are not aligned, tighten nut slightly to align. Install a new cotter pin with open ends toward rear of machine. Bend both ends in opposite directions around nut.
8. Install hubs, calipers and wheels, lower the vehicle to the ground. Apply Loctite™ 242 to screw threads of the A arm bolts and torque bolts to 37-44 ft. lbs. (50-60 Nm ).

**⚠ WARNING**

Upon A-arm installation completion, test vehicle at low speeds before putting into regular service.

**3.2 REAR A-ARM REPLACEMENT**

1. Elevate and safely support vehicle with weight removed from the rear wheel(s).

2. Remove the wheel nuts and wheel.

**NOTE:** To ease the removal of the spindle bolt, remove the hub cap and loosen the spindle bolts before removing the wheel.

3. Remove the hub cap, cotter pin, spindle bolt, and washer.

4. Remove the brake caliper. Suspend the brake caliper from the frame with a wire.

**NOTE:** Do not let the brake caliper hang from the brake line or damage may occur.



5. Loosen two bolts that secure the rear knuckle to the A-arm. Remove the rear knuckle assembly by sliding it off of the axle.

6. Remove the bolt that secures the shock absorber to the lower A-arm.

7. Remove the bolts that secure the upper A-arm to frame.

8. Remove the bottom stabilizer bar nut.

9. Remove the bolts that secure the lower A-arm to frame.



10. Examine all the A-arm bushings and A-arm shafts. Replace if worn. Discard hardware.

11. Insert new A-arm bushings and new A-arm shafts into new A-arm.

12. Install new A-arm assembly onto vehicle frame. Apply Loctite™ 242 to screw threads of the A arm bolts and torque bolts to 44 ft. lbs. (60 Nm).

### **⚠ WARNING**

DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

13. Attach A-arm to rear knuckle. Tighten upper and lower bolts to 44 ft. lbs. (60 Nm ).

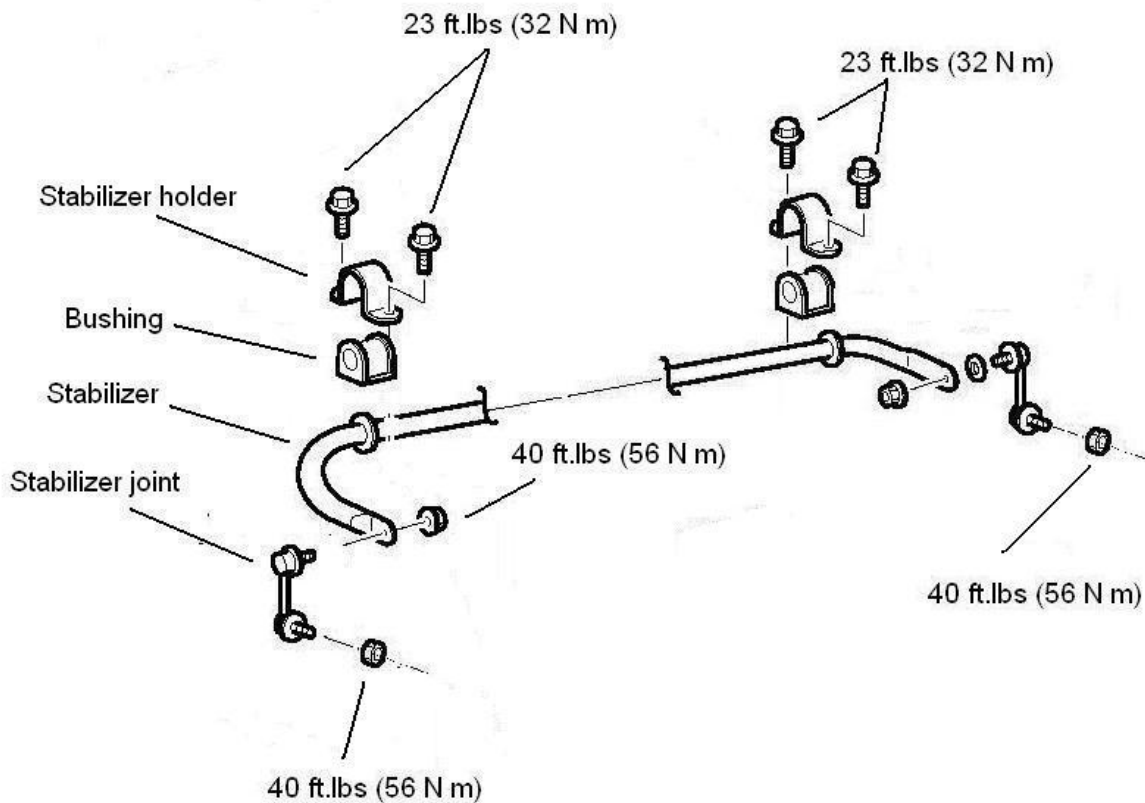
14. Install the shock absorber and tighten shock bolt to 32 ft.lbs. (44 Nm).

15. Install the stabilizer and tighten nut to 40 ft.lbs. (56 Nm).

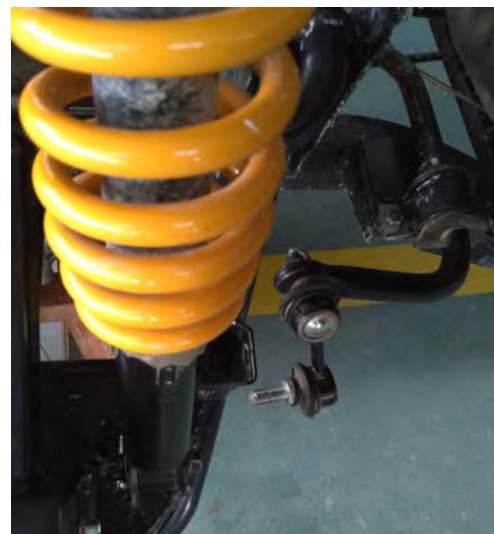
16. Re-install wheel and caliper.

### **⚠ WARNING**

Upon A-arm installation completion, test vehicle at low speeds before putting into regular service.

**3.3 REAR STABILIZER BAR REMOVAL/INSTALLATION**

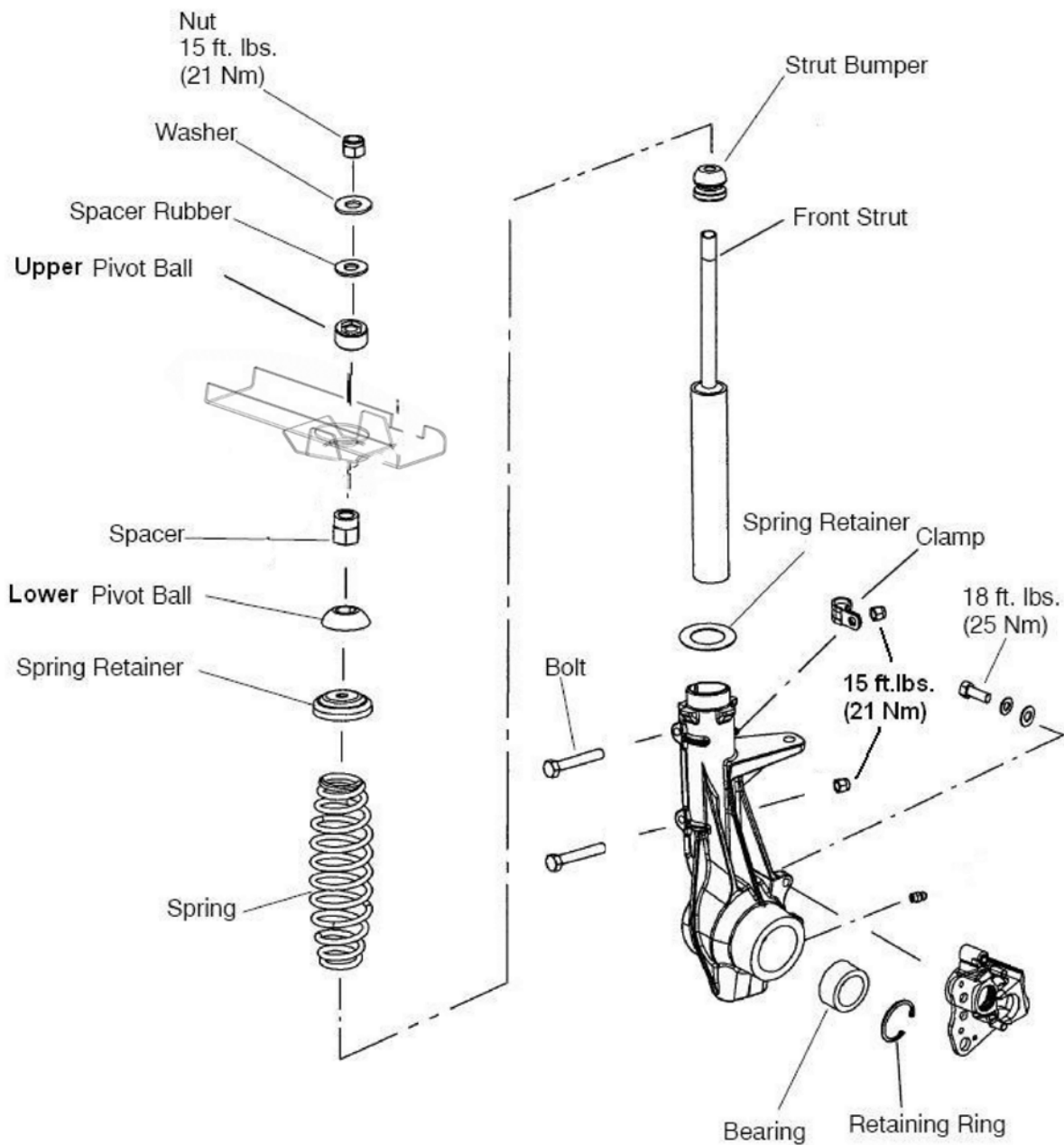
1. Elevate and safely support vehicle with weight removed from the rear wheel(s).
2. Remove the rear wheel to gain access to the stabilizer bar, each side.
3. Remove the stabilizer bar nut from the lower A-arm, each side.
4. Remove the two bolts that secure the stabilizer bar to the main frame, each side.



5. Remove the stabilizer from the frame.
6. Inspect the stabilizer bar. Inspect the bushings and replace if needed.
7. Inspect the stabilizer joint and replace if needed.
8. Reverse the procedure for installation. Torque the stabilizer bolts to 23 ft.lbs (32 Nm).



**3.4 FRONT STRUT REPLACEMENT**





1. Hold strut rod with wrench and remove top nut.
2. Compress spring.
3. Remove all strut pivot assembly.
4. Remove coil spring and collapse strut body.
5. Remove two pinch bolts from strut body.
6. Remove strut body.
7. Install front shock cartridge until bottomed in strut casting.
8. Install pinch bolts with clamp(s). Torque pinch bolts to 18ft.lbs.(25Nm).
9. Reassemble spring and top pivot assembly. Be sure all parts are installed properly and seated fully.
10. Torque strut rod nut to specification. Do not over torque nut.

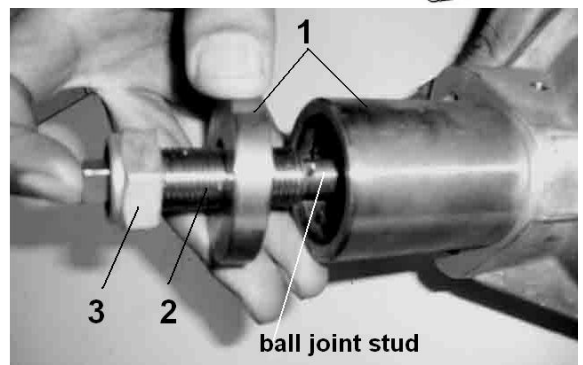
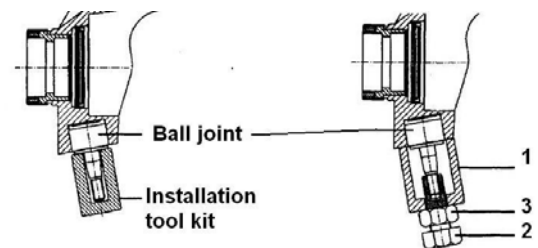
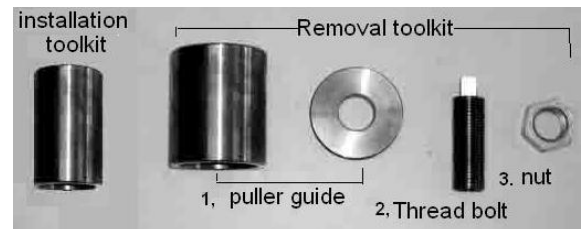
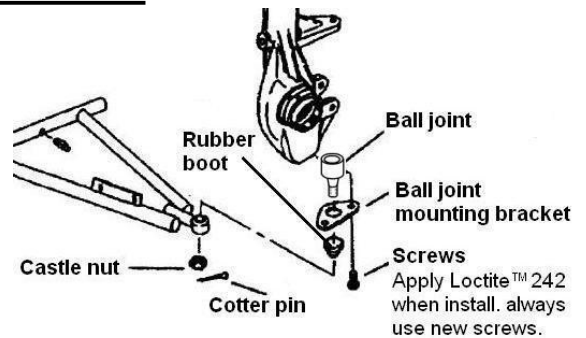
**Strut Rod Nut Torque :15 ft. lbs. (21 Nm)**

**3.5 FRONT STRUT BALL JOINT REPLACEMENT**

1. Loosen front wheel nuts.
2. Elevate and safely support CUV under footrest / frame area. .

**CAUTION:** Serious injury may result if CUV tips or falls. Be sure CUV is secure before beginning this service procedure.

3. Remove wheel nuts and wheels.
4. Remove cotter pin from ball joint
5. Remove castle nut and separate A-arm from ball joint stud.
6. Remove screws and ball joint mounting bracket.
7. Using ball joint cup removal/installation toolkit, remove ball joint cup from strut housing. Refer to photos at right.
  - Install puller guide (1) .
  - Thread bolt (2) with nut (3) onto ball joint stud as shown .
  - Hold bolt (2) and turn nut (3) clockwise until ball joint is removed from strut housing.
8. To install new ball joint cup.
  - Insert new ball joint into driver (installation toolkit).
  - Drive new ball joint cup into strut housing until fully seated.
9. Apply Loctite 242 (blue) to threads of mounting bracket new screws.



Torque screws to 8 ft.lbs. (11 Nm).

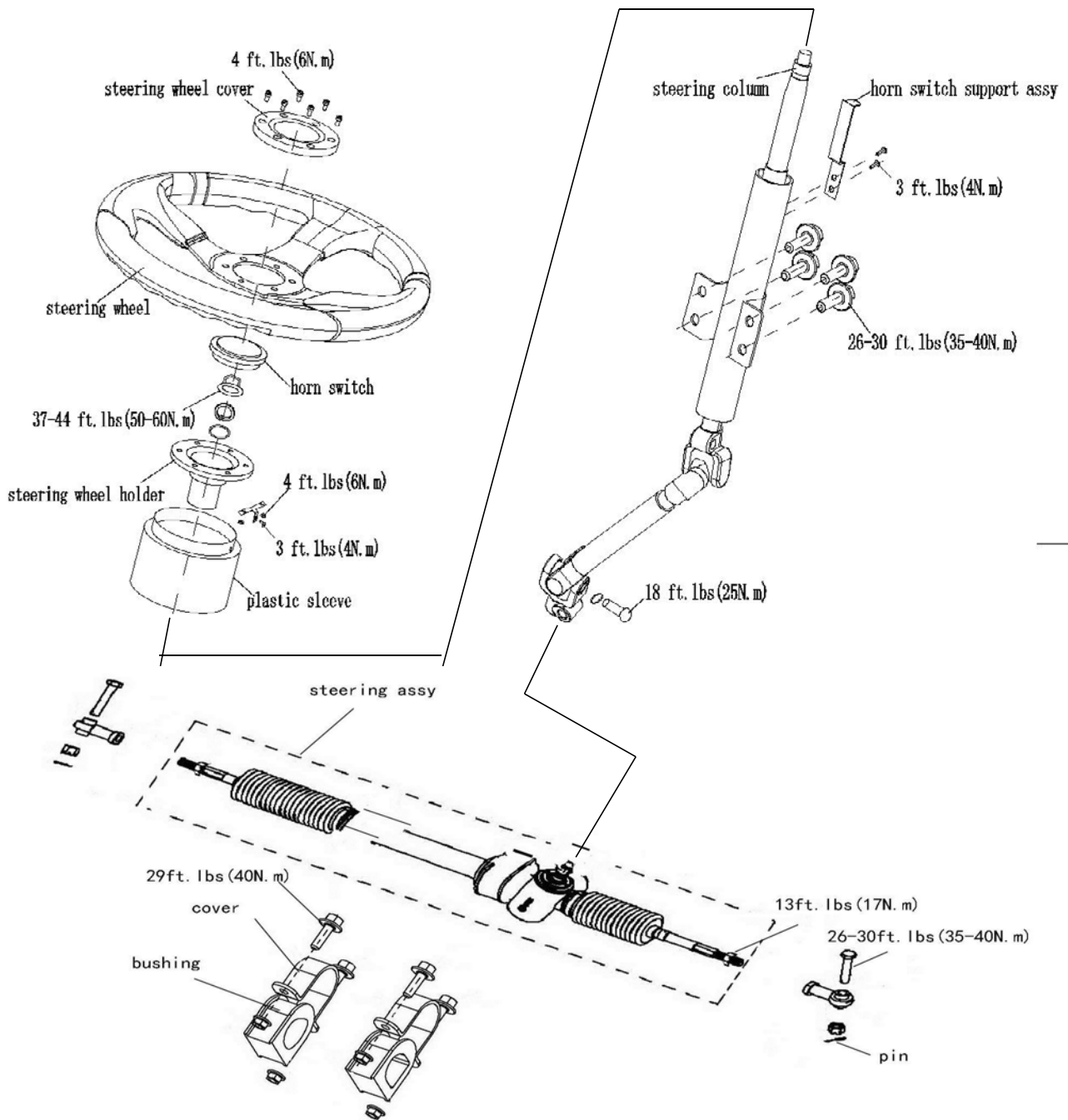
10. Install A-arm on ball joint cup and torque castle nut to 25 ft. lbs. (35 Nm).

11. Reinstall cotter pin with open ends toward rear of machine.





**3.6 STEERING ASSEMBLY**



1. Remove the bolt and nuts that fixed the plastic sleeve.
2. With the steering wheel cover bolts removed, remove the steering wheel cover and steering wheel and horn switch.
3. With the steering wheel holder nut / spring washer / flat washer removed, remove the steering wheel holder and plastic sleeve.
4. With the steering column bolts removed, remove the upper of the steering column.
5. Remove the cotter pins and the tie rod end bolts (both sides).
6. With the cover bolts removed, remove the steering assy and the lower of the steering column.
7. Reverse the procedure for installation.



# CHAPTER 4 FINAL DRIVE

## **WARNING**

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each CUV model for spare parts information and service.

### 4.1 WHEEL, HUB, AND SPINDLE TORQUE TABLE

### 4.2 FRONT HUB EXPLODED VIEW

### 4.3 FRONT HUB REMOVAL/INSPECTION

### 4.4 FRONT HUB INSTALLATION

### 4.5 FRONT HUB BEARING REPLACEMENT

### 4.6 REAR HUB EXPLODED VIEW

### 4.7 REAR HUB AND KNUCKLE REMOVAL/INSPECTION

### 4.8 REAR HUB AND KNUCKLE INSTALLATION

### 4.9 REAR DRIVE SHAFT REMOVAL

### 4.10 REAR DRIVE SHAFT INSTALLATION

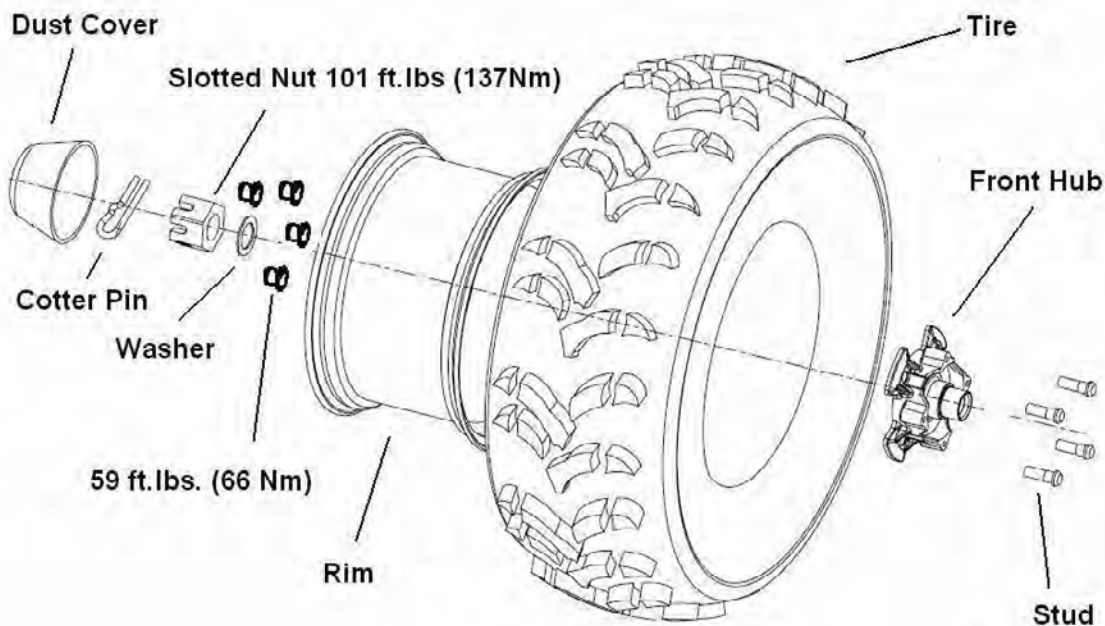
**4.1 WHEEL, HUB, AND SPINDLE TORQUE TABLE**

Item	Specification
Front Wheel Nuts	59 Ft.Lbs 66 N.m
Rear Wheel Nuts	59 Ft.Lbs 66 N.m
Front Hub Nut on Spindle/ outer CV joint	101 Ft.Lbs 137 N.m
Rear Hub Retaining Nut	101 Ft.Lbs 137 N.m

Refer to exploded views and text for torque values of other fasteners.

**CAUTION:** Locking nuts, and bolts with pre-applied locking agent should be replaced if removed. The self- locking properties of the nut or bolt are reduced or destroyed during removal.

**4.2 FRONT HUB EXPLODED VIEW**



**4.3 FRONT HUB REMOVAL/INSPECTION**

1. Elevate front end and safely support machine under footrest / frame area.

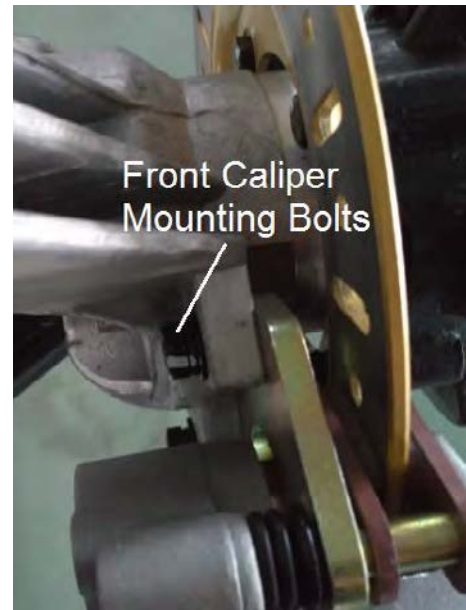
**CAUTION:** Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Wear eye protection when removing bearings and seals.

2. Check bearings for side play by grasping the tire/Wheel firmly and checking for movement.

3. Grasp the top and bottom of the tire. The tire should rotate smoothly without binding or rough spots.
4. Remove wheel nuts and wheel.
5. Remove the two brake caliper mounting bolts.

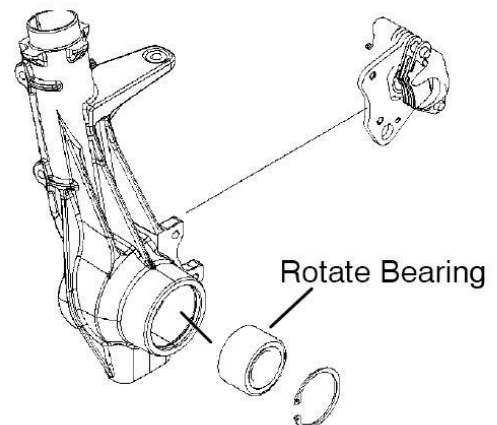
**CAUTION:** Do not hang the caliper by the brake line. Use wire to hang the caliper to prevent possible damage to the brake line.

6. Remove hub cap, cotter pin, front spindle nut, and washer, separate hub from front driveshaft.
7. Rotate break disc by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion, or roughness is evident.



**4.4 FRONT HUB INSTALLATION**

1. Inspect the rotate bearing surface for wear or damage.
2. Install the hub into the bearing.
3. Apply grease to the spline of front driveshaft. Install driveshaft through the backside of the HUB.
4. Install washer and spindle nut and tighten to 101 ft.lbs (137 N.m).
5. Install a new cotter pin. Tighten nut slightly if necessary to align cotter pin holes. bend both ends of cotter pin around end of spindle in different directions. Install hub cap.



6. Rotate hub. It should rotate smoothly without binding or rough spots or side play.

7. Install brake caliper using new bolts. (Apply Loctite™ 242 to threads) Tighten bolts to 18 ft.lbs (25 N.m)

**CAUTION:** New bolts have a pre-applied locking agent which is destroyed bolts upon removal. Always use new brake caliper mounting bolts upon assembly.

8. Install wheel and wheel nuts and tighten evenly in a cross pattern to specified torque.



**4.5 FRONT HUB BEARING REPLACEMENT**

1. Remove outer snap ring.

2. From the back side, tap on the outer bearing race with a drift punch in the reliefs as shown.

3. Drive bearing out evenly by tapping on outer race only. Once bearing is at bottom of casting, support casting on outer edges so bearing can be removed.



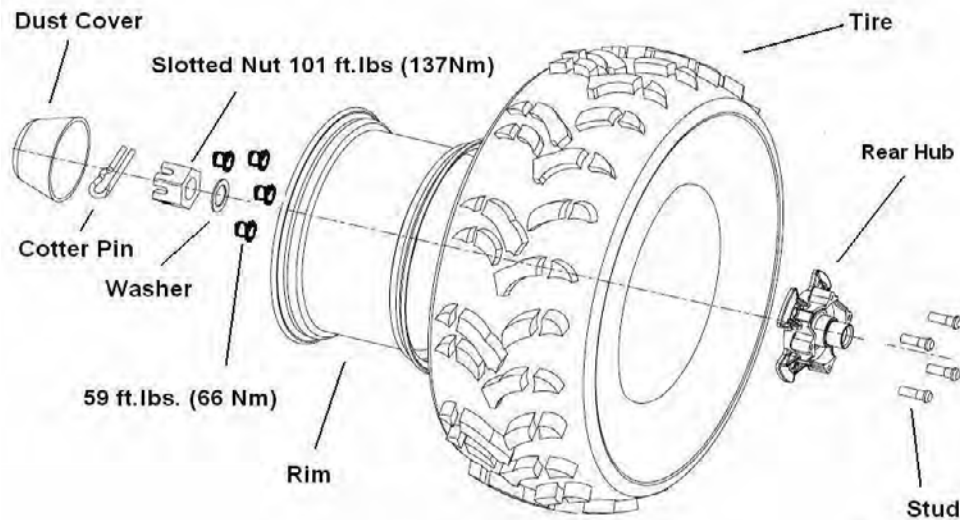
4. Inspect bearing.

**NOTE:** Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. While rotating bearings by hand, inspect for rough spots, discoloration, or corrosion. The bearings should turn smoothly and quietly, with no detectable up and down movement and minimal movement sideways between inner and outer race.



5. Inspect bearing housing for scratches, wear or damage. Replace housing if damaged.

## 4.6 REAR HUB EXPLODED VIEW



## 4.7 REAR HUB AND KNUCKLE REMOVAL/INSPECTION

1. Elevate rear end and safely support machine under main frame area.

**CAUTION:** Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Wear eye protection when removing bearings and seals.

2. Check bearings for side play by grasping the tire/wheel firmly and checking for movement. Grasp the top and bottom of the tire. The tire should rotate smoothly without binding or rough spots.



3. Remove wheel nuts and wheel.

4. Remove the two brake caliper attaching bolts.

**CAUTION:** Do not hang the caliper by the brake line. Use wire to hang the caliper to prevent possible damage to the brake line.

5. Remove hub cap, cotter pin, rear spindle nut, and washer.



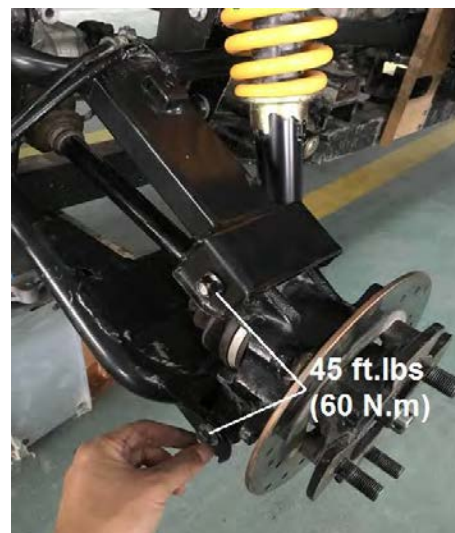


6. Remove the upper and lower control arm bolts.
7. Slide the rear hub and knuckle from the rear drive shaft.
8. Inspect the rear hub and knuckle assembly by hand for smoothness and side to side movement, replace as needed.



**4.8 REAR HUB AND KNUCKLE INSTALLATION**

1. Install the rear hub and knuckle assembly onto the drive shaft.
2. Align the bottom of knuckle and lower control arm. Secure with the lower control arm bolt.
3. With the driveshaft placed in the knuckle, align the knuckle with the top control arm. Secure with the upper control arm bolt.
4. Tighten upper and lower bolts to 45 ft.lbs (60 N.m).
5. Install the washer and the spindle retainer nut, tighten bolts to 101 ft.lbs (137 N.m), install a new cotter key and hub cap.
6. Install brake caliper using new bolts. (Apply Loctite™ 242 to threads) Tighten bolts to 18 ft.lbs (25 N.m).
7. Install the wheel and wheel nuts. Torque wheel nuts to 59 ft.lbs. (66 N.m).



**4.9 REAR DRIVE SHAFT REMOVAL**

1. Repeat of the steps in the “REAR HUB AND KNUCKLE REMOVAL” section.
2. Pull the rear drive shaft straight out of the frame. Use short sharp jerks to free the circlip from the gearcase. (The circlip holds the shaft in the gearcase)



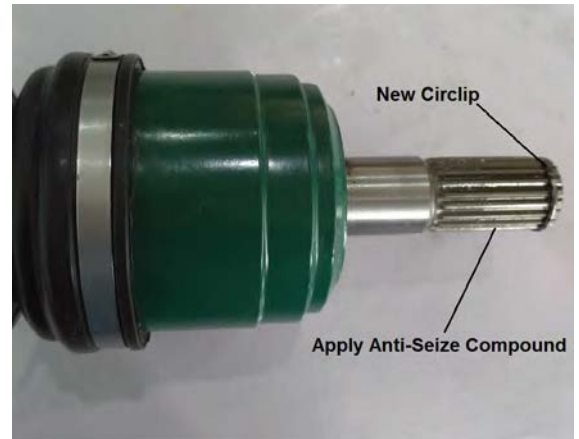


3. Inspect the shaft splines and cv boots for any damage.



## **4.10 REAR DRIVE SHAFT INSTALLATION**

1. Install a new circlip onto the rear drive shaft. Apply Anti-Seize Compound onto the rear driveshaft splines (both ends).
2. Reinstall the rear driveshaft into the rear gearcase. Be sure the circlip is securely fit into the rear gearcase. Use a rubber mallet to tap on the outboard end of the driveshaft if necessary.



3. Slide the rear drive shaft into the knuckle.
4. Lift knuckle into place and install bolt to upper and lower control arm. Torque bolt to 45 ft.lbs (60 N.m).
5. Install the washer and the spindle retainer nut, tighten bolts to 101 ft.lbs (137 N.m), install a new cotter key and hub cap.
6. Install brake caliper using new bolts. (Apply Loctite™ 242 to threads) Tighten bolts to 18 ft.lbs (25 N.m).
7. Install the wheel and wheel nuts. Torque wheel nuts to 59 ft.lbs. (66 N.m).





# CHAPTER 5 BRAKES

## WARNING

The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

**NOTE:** Also See Chapter 2 for Maintenance Information.

## 5.1 SPECIFICATIONS

## 5.2 TORQUE

## 5.3 BRAKE SYSTEM SERVICE NOTES

## 5.4 BURNISHING PROCEDURE

## 5.5 BRAKE BLEEDING-FLUID CHANGE

## 5.6 PARKING BRAKE AND BRAKE LINE INSPECTION

## 5.7 PARKING BRAKE ADJUSTMENT

## 5.8 REAR PADS REMOVAL/INSTALL

## 5.9 FRONT PADS INSPECTION / REMOVAL / REPLACEMENT

## 5.10 FRONT DISC INSPECTION / REMOVAL / REPLACEMENT

## 5.11 FRONT CALIPER REMOVAL/ INSPECTION / INSTALLATION

## 5.12 REAR CALIPER REMOVAL/ INSPECTION/ INSTALLATION

## 5.13 REAR BRAKE DISC INSPECTION / REMOVAL / REPLACEMENT

**5.1 SPECIFICATIONS**

Front Brake Caliper		
Item	Standard	Service Limit
Brake Pad Friction material Thickness	0.157"/ 4mm	0.04"/ 1mm
Brake Disc Thickness	0.150- 0.164"/3.810- 4.166mm	0.140"/ 3.556mm
Brake Disc Thickness Variance Between Measurements	-	0.002 " / .051m m
Brake Disc Runout	-	0.005 " / .127mm
Rear Brake Caliper		
Item	Standard	Service Limit
Brake Pad Friction material Thickness	hydraulic	0.04"/ 1mm
	Hydraulic with mechanics park	
	mechanics park	
Brake Disc Thickness	0.177-0.187"/4.496-4.750m m	0.167"/4.242mm
Brake Disc Thickness Variance Between Measurements	-	0.002 " / 0.051mm
Brake Disc Run out	-	0.005 " / 0.127mm

**5.2 TORQUE**

Item	Torque (ft. lbs. except where noted*)	Torque (N.m )
Front Caliper Mounting Bolts	18.0	25
Rear Caliper Mounting Bolts	18.0	25
Front Brake Disc	18.0	25
Rear Brake Disc	18.0	25

**5.3 BRAKE SYSTEM SERVICE NOTES**

- It is strongly recommended always change the caliper and (or) the master cylinder as an assembly. The parts inside maybe not interchangeable due to different brake manufactures and (or) different brake type.
- Do not over – fill the master cylinder fluid reservoir.
- Make sure the brake lever and pedal returns freely and completely.
- Check and adjust master cylinder reservoir fluid level after pad service.
- Make sure atmospheric vent on reservoir is unobstructed.

- Adjust foot brake after pad service.
- Test for brake drag after any brake system service and investigate cause if brake drag is evident.
- Make sure caliper moves freely on guide pins (where applicable) .
- Inspect caliper piston seals for foreign material that could prevent caliper pistons from returning freely.
- Perform a brake burnishing procedure after install new pads to maximize service life.
- DO NOT lubricate or clean the brake components with aerosol or petroleum products. Use only approved brake cleaning products.

## **5.4 BURNISHING PROCEDURE**

Brake pads (both hydraulic and mechanical) must be burnished to achieve full braking effectiveness. Braking distance will be extended until brake pads are properly burnished. To properly burnish the brake pads, use the following procedure.

1. Choose an area large enough to safely accelerate the CUV to 50 km/h (30 mph ) and to brake to stop.
2. Using hi gear, accelerate to 50 km/h (30 mph); then compress brake lever (pedal) to decelerate to 0-8km/h (5 mph).
3. Repeat procedure on each brake system 20 times until brake pads are burnished.
4. Adjust the mechanical parking brake (if necessary).
5. Verify that the brake light illuminates when th e hand lever is compressed or the brake pedal is depressed.

### **WARNING**

Failure to properly burnish the brake pads could lead to premature brake pad wear or brake loss. Brake loss can result in severe injury.

## **5.5 BRAKE BLEEDING-FLUID CHANGE**

**NOTE:** When bleeding the brakes or replacing the fluid always start with the caliper farthest from the master cylinder.

### **CAUTION:**

Always wear safety glasses.

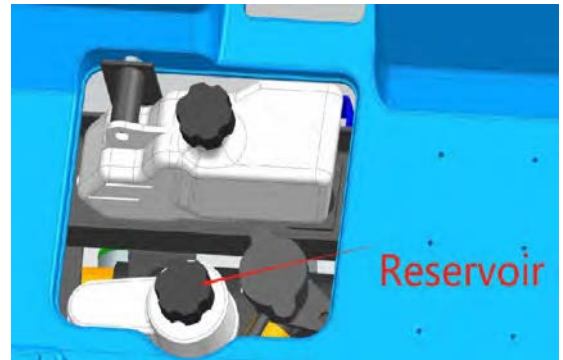
### **CAUTION:**

Brake fluid is highly corrosive. Do not spill brake fluid on any surface of the CUV. This procedure should be used to change fluid or bleed brakes during regular maintenance.

1. Clean reservoir cover thoroughly.
2. Remove cover from reservoir.
3. If changing fluid, remove old fluid from reservoir with a brake fluid pump or similar tool.
4. Add brake fluid between the MIN line and MAX line of reservoir.

#### DOT 3 Brake Fluid

5. Begin bleeding procedure with the caliper that is farthest from the master cylinder. Install a box end wrench on the caliper bleeder screw. Attach a clean clear hose to the fitting and place the other end in a clean container. Be sure the hose fits tightly on the fitting.
6. Slowly pump foot pedal until pressure builds and holds.



7. Hold brake pedal on to maintain pedal pressure, and open bleeder screw. Close bleeder screw and release foot pedal.

**NOTE:** Do not release foot pedal before bleeder screw is tight or air may be drawn into master cylinder.

8. Repeat procedure until clean fluid appears in bleeder hose and all air has been purged. Add fluid as necessary to maintain level in reservoir.

#### CAUTION:

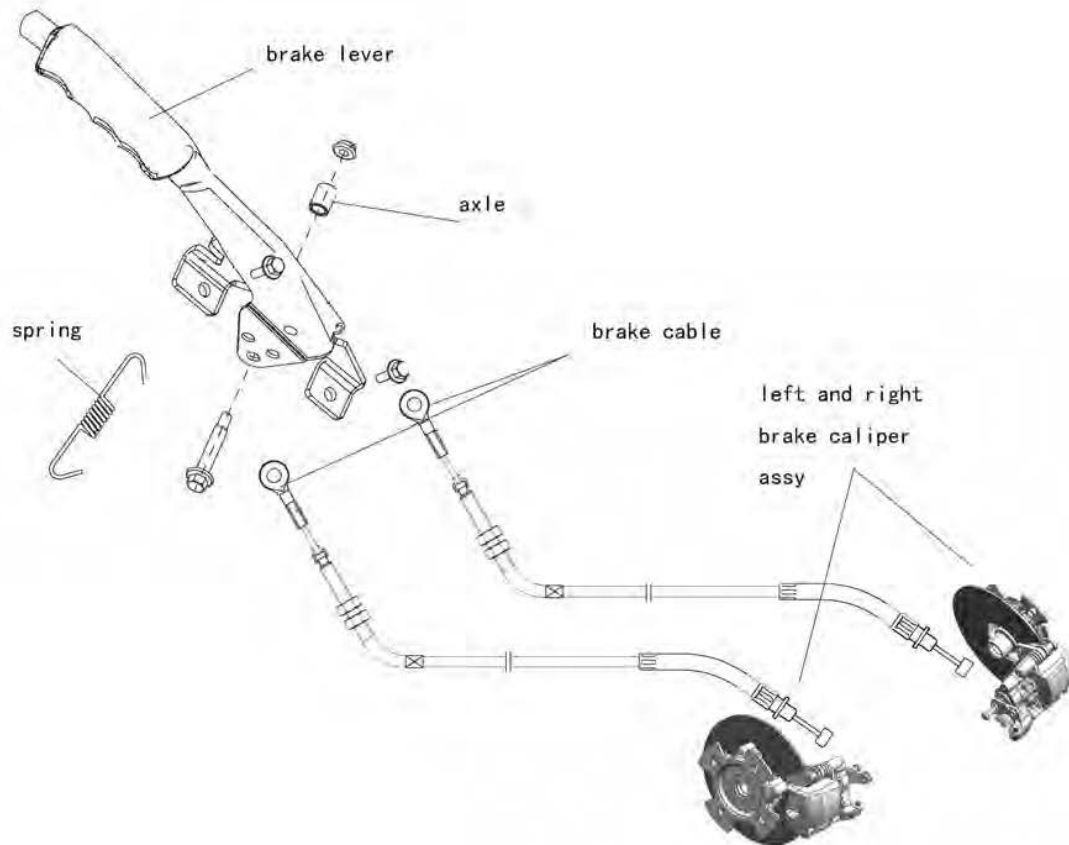
Maintain at least 1/2 " (13mm) of brake fluid in the reservoir to prevent air from entering the master cylinder.

9. Tighten bleeder screw securely and remove bleeder hose.
10. Repeat procedure steps 5- 9 for the remaining calipers.
11. Add brake fluid to MAX level inside reservoir.

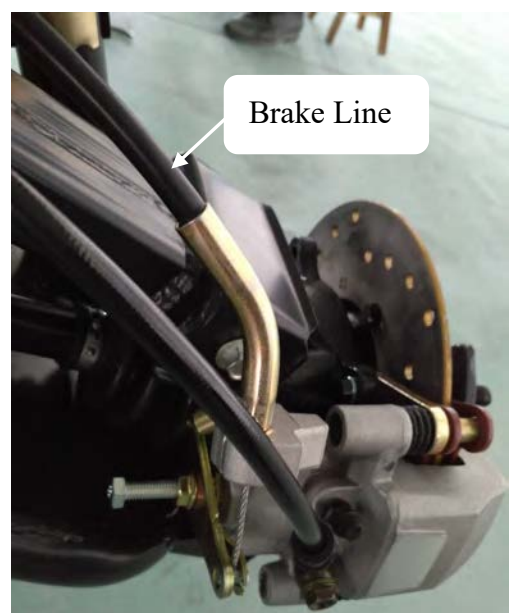
#### Master Cylinder Fluid Level

**Between the MIN line and the MAX line of reservoir.**

12. Install master cylinder reservoir cover.
13. Field test machine at low speed before putting into service. Check for proper braking action and pedal reserve. With pedal firmly applied, pedal reserve should be no less than 1/2 " (13mm).
14. Check brake system for fluid leaks and inspect all hoses and lines for wear or abrasion. Replace hose if wear or abrasion is found.

**5.6 PARKING BRAKE AND BRAKE LINE INSPECTION**

1. Inspect the spring on the parking brake lever assembly.
2. Inspect the parking brake cable at the parking brake lever assembly on the brake caliper.
3. Inspect the brake lines and brake line connections for possible leaks or loose lines.



## 5.7 PARKING BRAKE ADJUSTMENT

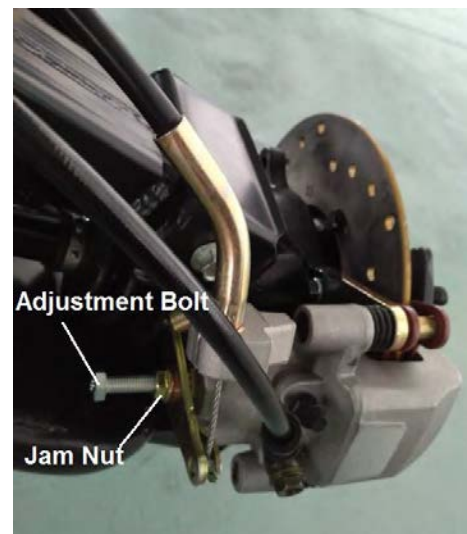
### Parking Brake Inspection

1. Push the parking brake up with your hand.
2. After 7 to 9 clicks of lever travel, the vehicle should not roll while parked.
3. If the vehicle moves, adjustment is necessary.
4. Adjust the parking brake where the cable attaches to the lever assembly on the rear brake caliper.



### Parking Brake Adjustment

1. Place the vehicle in neutral on a flat level surface.
2. Carefully lift the rear of the vehicle off the ground and stabilize on jack stands.
3. Loosen the jam nut on the rear caliper adjustment bolt.
4. Tighten the adjustment bolt until the rear tire will not rotate.
5. Back off the adjustment bolt 1/4 turn.
6. Tighten the jam nut while holding the adjustment nut in place.



## 5.8 REAR PADS REMOVAL / INSTALL

**NOTE:** The brake pads should be replaced as a set.

1. Elevate and support rear of CUV safely.

### **CAUTION:**

Be care when supporting vehicle so that it does not tip or fall. Severe injury may occur if machine tips or falls.

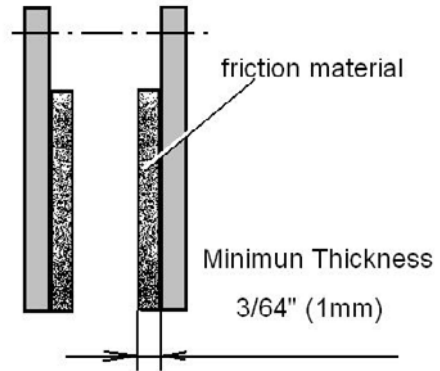
2. Remove the rear wheels.
3. Remove the two caliper bolts and caliper from mounting bracket.





4. Measure the thickness of the caliper parking brake pads. Replace pads if worn beyond the service limit.

Service Limit 3/64"(1 mm)



**The Procedure of Pads Replacement**

1. Push caliper piston into caliper bore slowly using a C-clamp or locking pliers with pads installed.

**NOTE:** Brake fluid will be forced through compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.



2. Push mounting bracket inward and slip outer brake pad past edge. Remove inner pad.

3. Lubricate mounting bracket pins with a light film of All Season Grease, and install rubber dust boots.

4. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other.

**NOTE:** Do not get oil, grease or fluid on the park brake pads. Damage to the pads may cause the pads to function improperly.



**Rear Brake Caliper Installation**

1. Install the park brake assembly into place. Tighten the two bolts for proper installation.
2. Torque the two bolts to 18 ft.lbs. (25 N.m).
3. Test the park brake for proper function.

**5.9 FRONT PADS REMOVAL / INSPECTION / INSTALLATION**

**NOTE:** The brake pads should be replaced as a set.

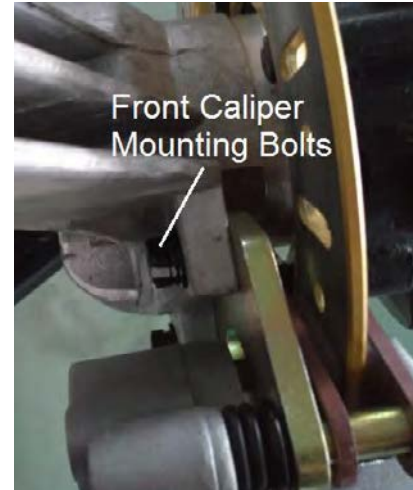
**REMOVAL**

1. Elevate and support front of CUV safely.

**CAUTION:**

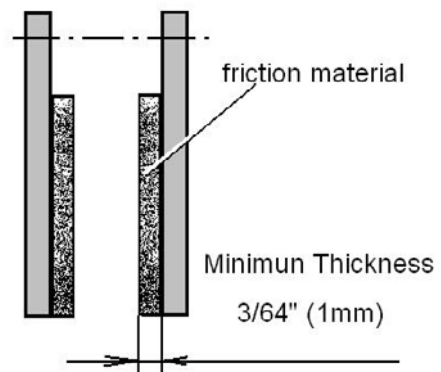
Be care when supporting vehicle so that it does not tip or fall. Severe injury may occur if machine tips or falls.

2. Remove the front wheels.
3. Remove the two caliper bolts and caliper from mounting bracket.

**INSPECTION**

Measure the thickness of the pads friction material. Replace pads if worn beyond the service limit.

**Service Limit 3/64"(1 mm)**

**The procedure of pads replacement**

1. Repeat of the **Replacement Steps** in the "REAR PADS REMOVAL / INSTALL" section.

**Front Caliper Installation**

1. Install caliper on hub strut, and torque mounting bolts.  
**Front Caliper Mounting Bolts Torque 18 ft. lbs. (25 N.m )**

**NOTE:** The Following Procedure Should Be Done After Front / Rear Brake Pads Replacement.

1. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2 "(13 mm) of brake fluid in the reservoir to prevent air from entering the brake system.
2. Turn the adjustment bolt clockwise until stationary pad contacts disc, then back off 1/4 turn (counter clockwise), then lock the jam nut.
3. Be sure fluid level in reservoir is up to MAX line inside reservoir and install reservoir cap.
4. Install wheels and torque wheel nuts.
5. It is recommended that a burnishing procedure be performed after installation of new brake pads to extend service life and reduce noise. Start machine and slowly increase speed to 30 mph. Gradually apply brakes to stop machine. Repeat procedure 10 times.

**5.10 FRONT DISC INSPECTION / REMOVAL / REPLACEMENT****INSPECTION**

1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.

**Brake Disc Thickness****New 0.150-0.164" (3.810 - 4.166 mm)****Service Limit 0.140" / 3.556 mm****Brake Disc Thickness Variance****Service Limit 0.002 " (0.051 mm)****difference between measurements**

3. Mount dial indicator as shown to measure disc runout on the dial indicator. Replace the disc if runout exceeds specifications.

**Brake Disc Runout****Service Limit 0.005" (0.127 mm)****REMOVAL/ REPLACEMENT**

1. Remove caliper and hub. Apply heat to the hub in the area of the brake disc mounting bolts to soften the bolt.
2. Remove bolts and disc.
3. Clean mating surface of disc and hub.
4. Install new disc on hub and tighten to specified.

**Front Brake Disc Mounting Bolt Torque**  
**18 ft. lbs (25 N.m )**

**CAUTION:**

Always use new brake disc mounting bolts.

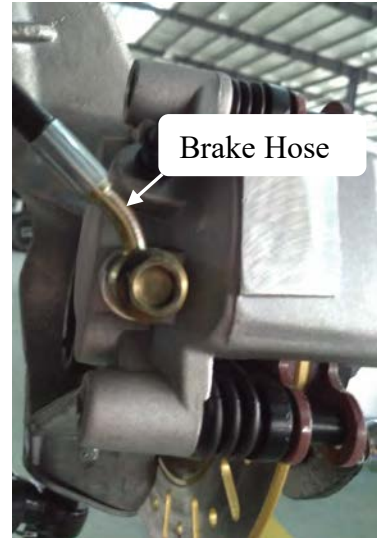
**5.11 FRONT CALIPER REMOVAL/ INSPECTION / INSTALLATION****CAUTION:**

The caliper is a non-serviceable Component, it must be replaced as an assembly.

**NOTE:** If any special service needed, contact the CUV manufacture via the agent for the parts and special instruction.

**REMOVAL**

1. Remove wheel, remove caliper from the strut.
2. Loosen and remove brake hose to caliper. Place a container under caliper to catch fluid draining.

**INSPECTION**

Inspect caliper body for nicks, scratches or worn. Replace caliper as an assembly if any problem exists.

**INSTALLATION**

1. Install caliper on hub strut, Apply Loctite™ 242 to screw threads and Install new bolts.  
**Front Caliper Mounting Bolt Torque: 18 ft. lbs (25 N.m )**
2. Install brake hose and tighten to specified torque.  
**Bolt Torque: 15 ft. lbs (21 N.m)**

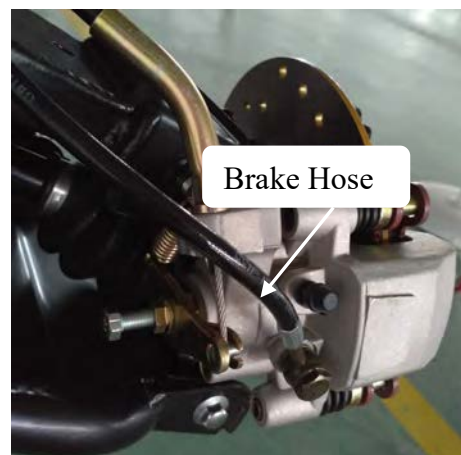
**NOTE:** If new brake pads are installed, it is recommended that a burnishing procedure be performed after installation of new brake pads to extend service life and reduce noise. Start machine and slowly increase speed to 30 mph. Gradually apply brakes to stop machine. Repeat procedure 10 times.

**5.12 REAR CALIPER REMOVAL/ INSPECTION/ INSTALLATION****CAUTION:**

The caliper is a non-serviceable Component; it must be replaced as an assembly.

**NOTE:** If any special service needed, contact the CUV manufacture via the agent for the parts and special instruction.

1. Safely support the rear of the machine.
2. Remove the brake hose and park brake line.  
Place a container to catch brake fluid draining



from brake hose.

3. After the fluid has drained into the container, remove the caliper mounting bolts and remove caliper.
4. Remove brake pads as described above.
5. Inspect surface of caliper for nicks, scratches or damage and replace if necessary.
6. Install brake pads in caliper body with friction material facing each other, with the spacer between the pads. Install retaining pin through outer pad, pad spacer and inner pad.
7. Install caliper and torque mounting bolts to 18 ft.lbs (25 N.m).
8. Install park brake line, brake hose and tighten to specified torque.

**Bolt Torque: 15 ft. lbs(21 N.m)**

9. Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.
10. Install the rear wheel and wheel nuts. Carefully lower the vehicle.

**NOTE:** If new brake pads are installed, it is recommended that a burnishing procedure be performed after installation of new brake pads to extend service life and reduce noise.

### **5.13 REAR BRAKE DISC INSPECTION / REMOVAL / REPLACEMENT**

#### **INSPECTION**

1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.

**Brake Disc Thickness**

**New 0.150-0.164" (3.810 - 4.166 mm)**

**Service Limit 0.140" / 3.556 mm**

**Brake Disc Thickness Variance**

**Service Limit 0.002 " (0.051 mm)**

**difference between measurements**

3. Mount dial indicator to measure disc runout on the dial indicator. Replace the disc if runout exceeds specifications.

**Brake Disc Runout Service Limit 0.005" (0.127 mm)**

#### **REMOVAL/ REPLACEMENT**

1. Removal wheel/ hub and caliper.
2. Remove bolts and disc from the flange.
3. Clean mating surface of disc and hub.
4. Install new disc on flange.

**Rear Brake Disc Mounting Bolt Torque : 18 ft. lbs (25 N.m )**

#### **CAUTION:**

Always use new brake disc mounting bolts.



# **CHAPTER 6 ELECTRICAL**

6.1 HEADLIGHT ADJUSTMENT

6.2 BATTERY

6.3 LIGHTING SYSTEM

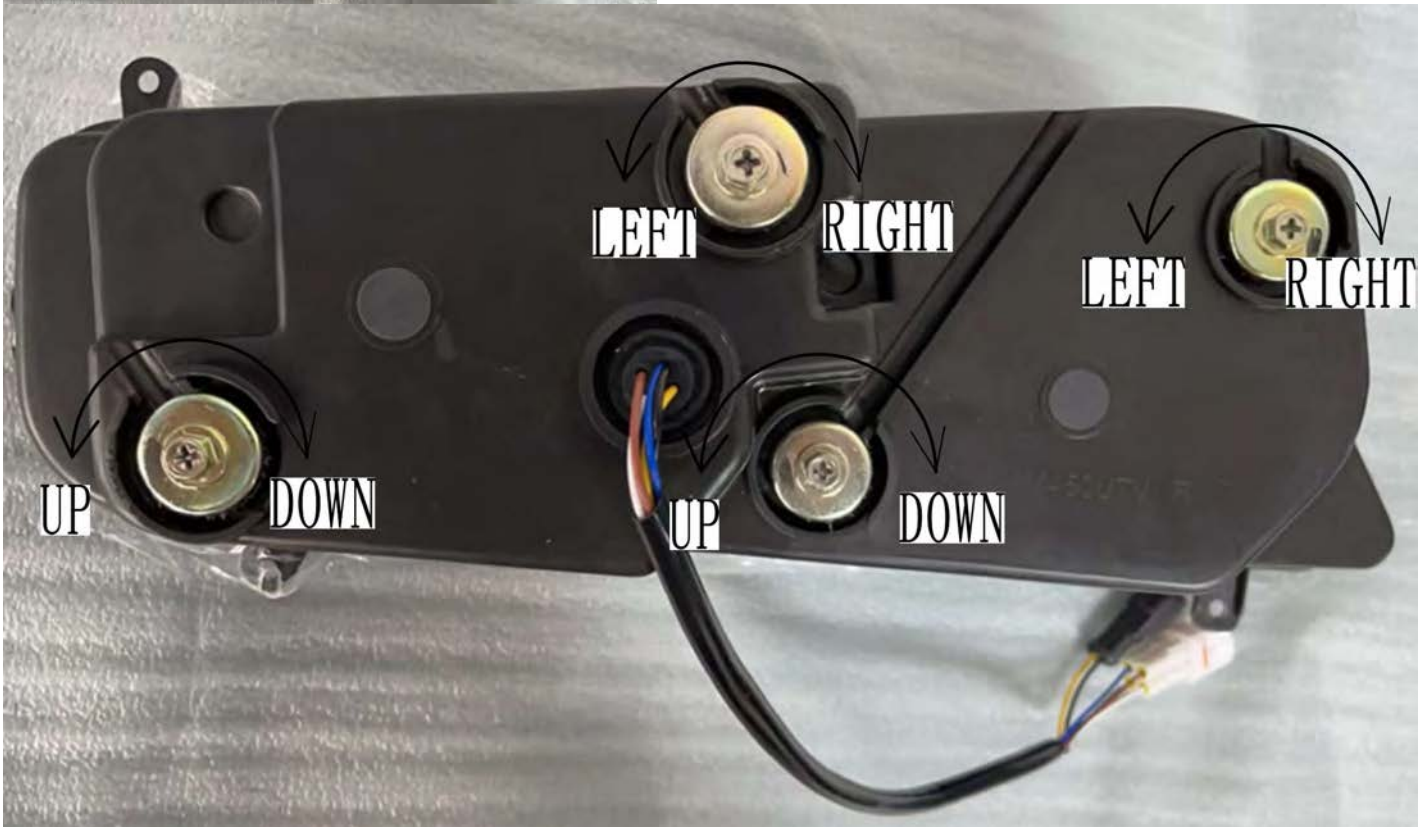
6.4 CHARGING SYSTEM

6.5 METER

6.6 TROUBLESHOOTING

6.7 WIRING DIAGRAM



**6.1 HEADLIGHT ADJUSTMENT****HEADLIGHT ADJUSTMENT**

1. The headlight beam can be adjusted vertically.
2. Place the vehicle on a level surface with the headlight approximately 33in(10m) from a wall.
3. Measure the distance from the floor to the center of the headlight and make a mark on the wall at the same height.
4. Start the engine and turn the headlight switch to high beam.
5. Observe headlight aim. The most intense part of the headlight beam should be aimed to 129mm below the mark placed on the wall in step 2.  
NOTE : Riding weight must be included on the seat.
6. Adjust the light direction as shown

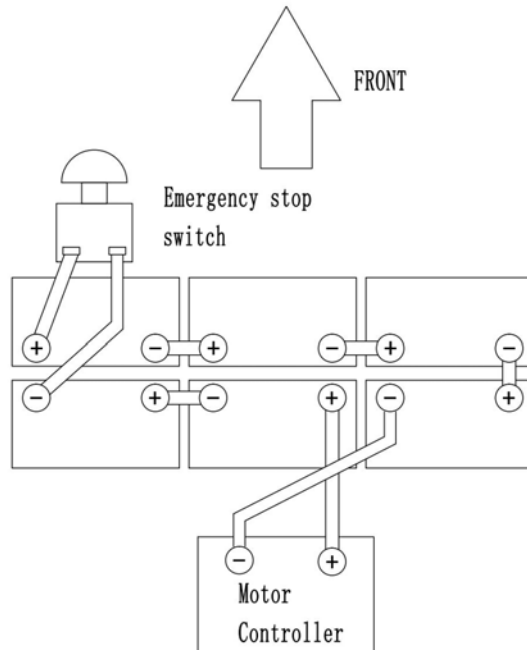


## 6.2 BATTERY

### 6.2.1 Lead acid battery

**Battery capacity:** DC 72V 140Ah (6×12V)

#### Battery connection



**NOTE:** Tighten the cable terminal. Poor contact of battery terminal may result in burnout of terminal.

**⚠ WARNING** : Keep the sharp drop switch disconnected (pressed) during wiring.

**⚠ WARNING** : Connect the two ends of a single cable before connecting the next one. Do not let the two ends of different cables come into contact, as it can cause serious burns and fires.

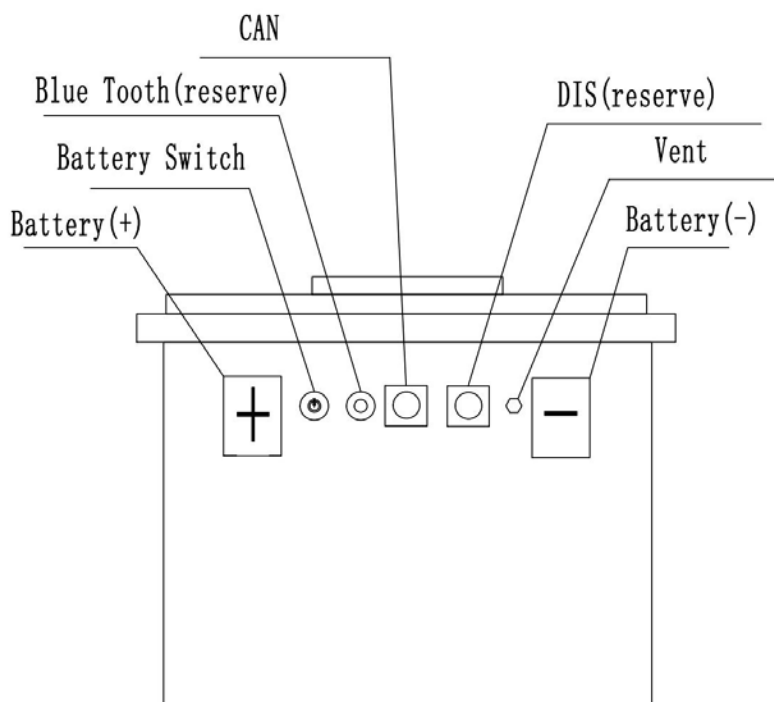
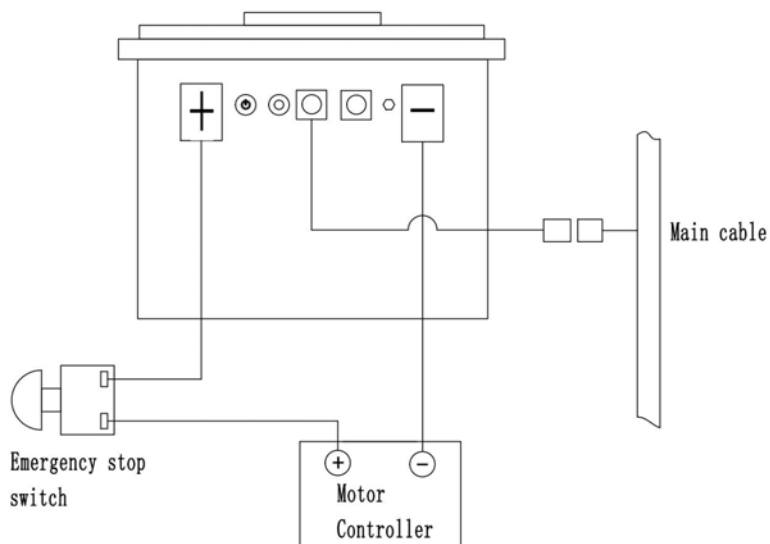
#### Battery Maintenance:

**After running out of battery, it should be charged in a timely manner and kept charged once a month when the vehicle is idle!**

1. Check if the battery wiring is loose, poor cable contact can cause a fire.
2. After fully charging, check the voltage of each battery, and the voltage difference should be within 0.3V. If a certain battery voltage is found to be too low or too high, it needs to be replaced.
3. Check whether the battery has obvious expansion or drying, and whether there is any impact damage.
4. After replacing one of the batteries, it is necessary to charge the six batteries separately with a 12V charger to ensure that the voltage of each battery is consistent when fully charged. If the battery voltage of the battery pack is difficult to balance, the entire battery pack needs to be replaced
5. Lead acid batteries reduce their capacity by about 2% for every 1 °C decrease below 0 °C, which is a normal phenomenon.

6.2.2 Lithium battery

**Battery Type: LiFePO4 Battery**  
**Battery capacity: 76.8V 150Ah**



**NOTE:** Tighten the cable terminal. Poor contact of battery terminal may result in burnout of terminal.

**NOTE:** Please turn off the battery switch before connecting the battery.

**Battery Maintenance:**

**After running out of battery, it should be charged in a timely manner and kept charged once three month when the vehicle is idle!**

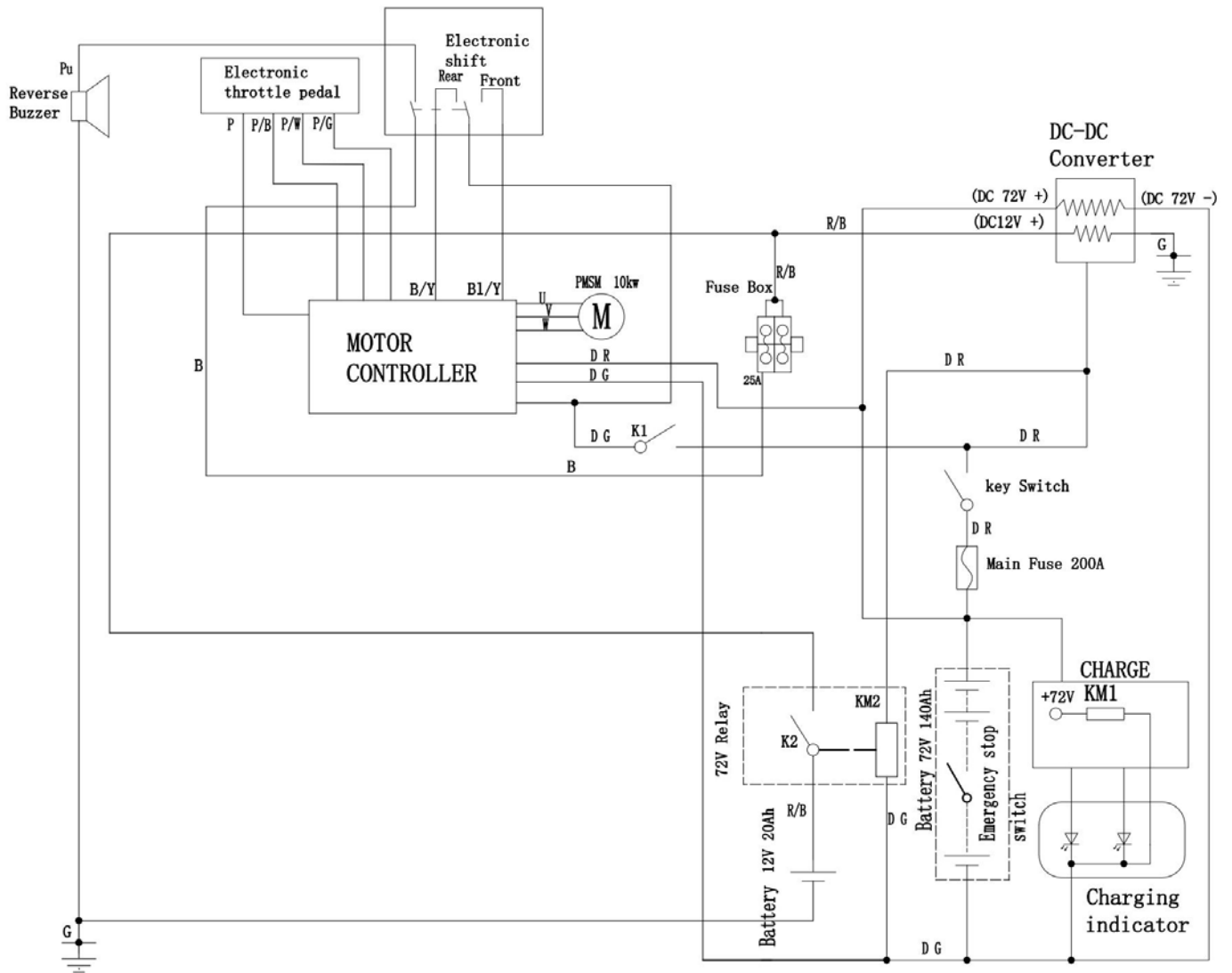
1. Check if the battery wiring is loose, poor cable contact can cause a fire.
2. If your battery reports an error or is damaged and cannot be used, do not open the battery box for repair without authorization. Please provide fault codes and other information to the battery manufacturer for repair.

**Please refer to Fault code chart for specific fault codes**

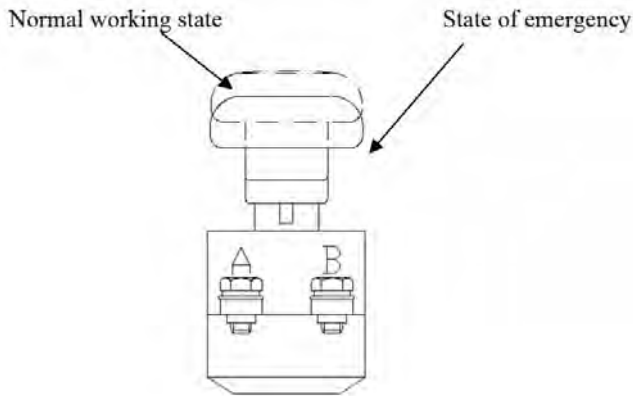
**Specification:**

No.	Item	Specification	
01	Pack configuration	24S1P	
02	Cell Model	3.2V/150Ah	
03	Charge Voltage	85.2V	
04	Discharge cut-off Voltage	60V	
05	Nominal Voltage	76.8V(3.2V/Cell)	
06	Minimum Capacity	150Ah @ 0.5C discharge	
07	Nominal Capacity	150Ah @ 0.5C discharge	
08	Nominal Energy	11520Wh @ 0.5C discharge	
09	Nominal Charge Current	75A	
10	Maximum charging current	150A	
11	Standard discharge current	150A	
12	Maximum discharge current	200A	
13	Maximum instantaneous discharge current	400A (35S)	
14	Standard Charge	1C constant current to 76.8V, CV to taper current ≤ 0.05C	
15	Gradodi impermeabilizzazione	IP67	
16	Operating Temperature	Charge	0°C ~55°C: standard charging method
		Discharge	-20°C ~60°C
17	Storage Temperature	-20 ~ 25°C, Less than 12 months	
		-20 ~ 45°C, Less than 3 months;	

6.3 Vehicle travel system

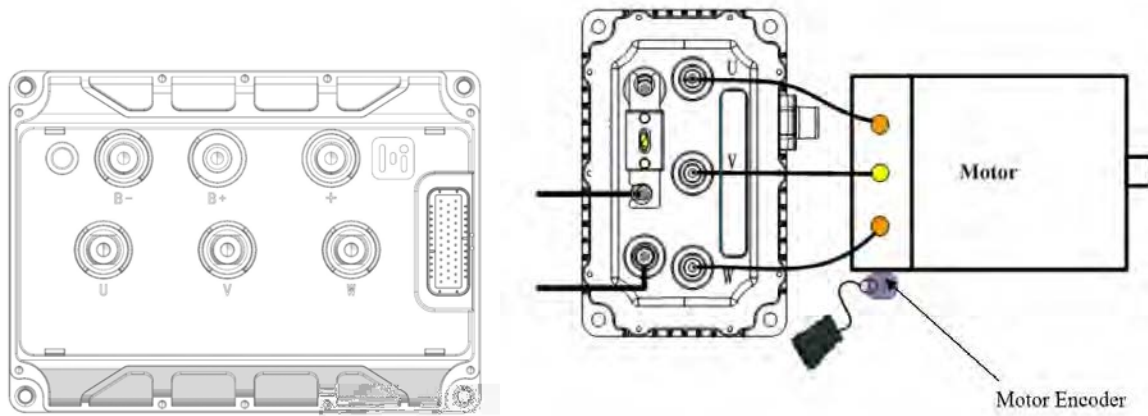


Emergency stop switch:

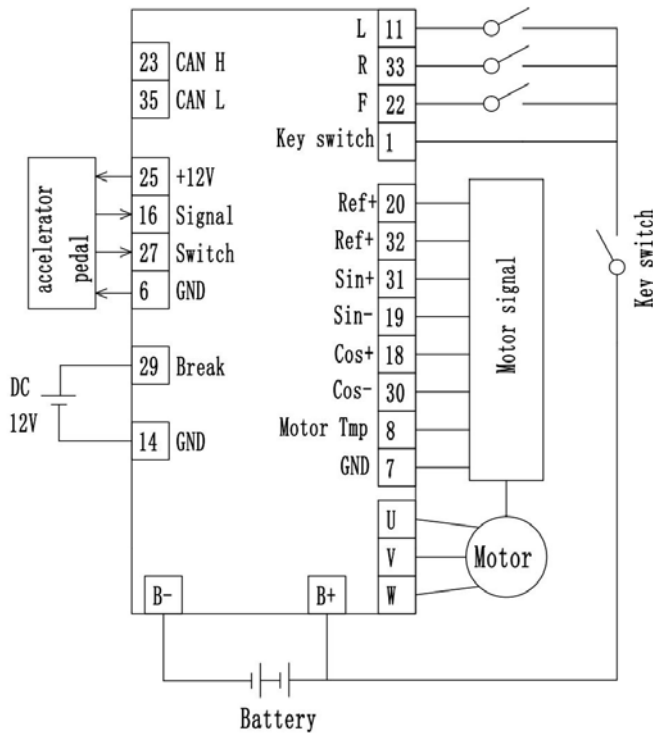
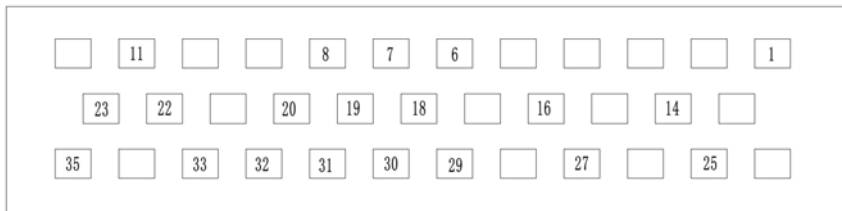


**NOTE:** When a vehicle is in danger, the user should press the emergency stop switch at the first time. The vehicle will not be able to drive or charge after pressing the emergency stop switch. When the emergency stop switch is in normal working state, the terminals A and B are connected.

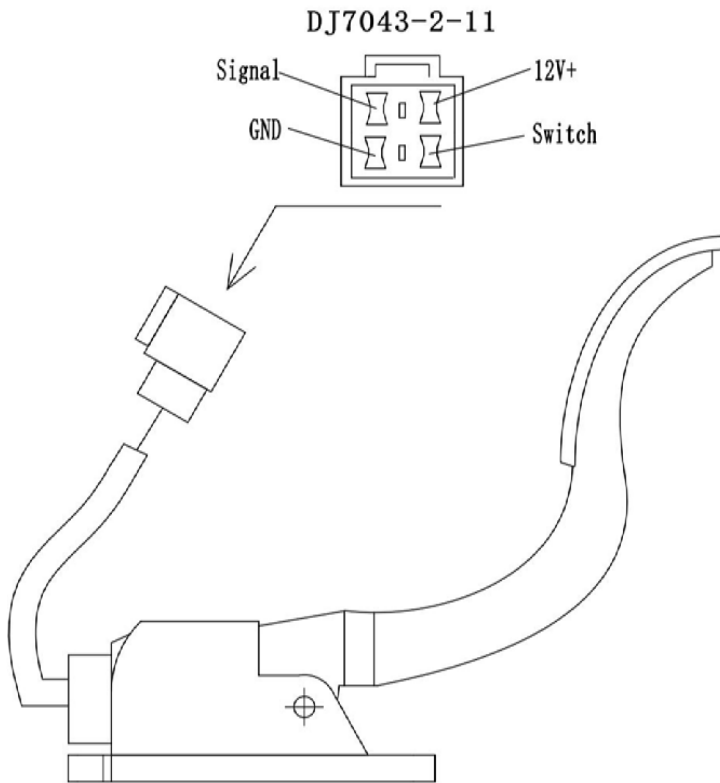
**Motor controller:**



**Interface definition**



**Accelerator pedal:**



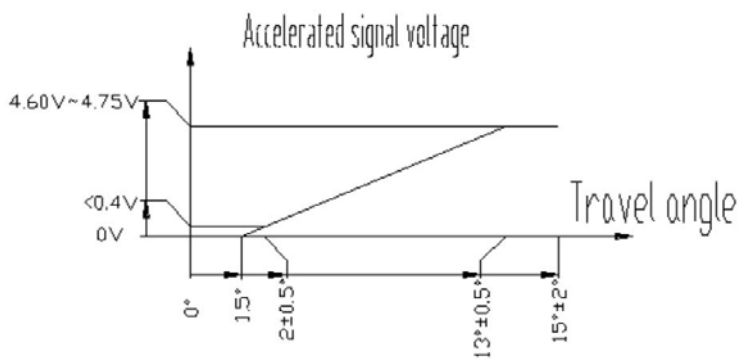
**Working principle:**

The motor controller outputs 12V power to the accelerator pedal;

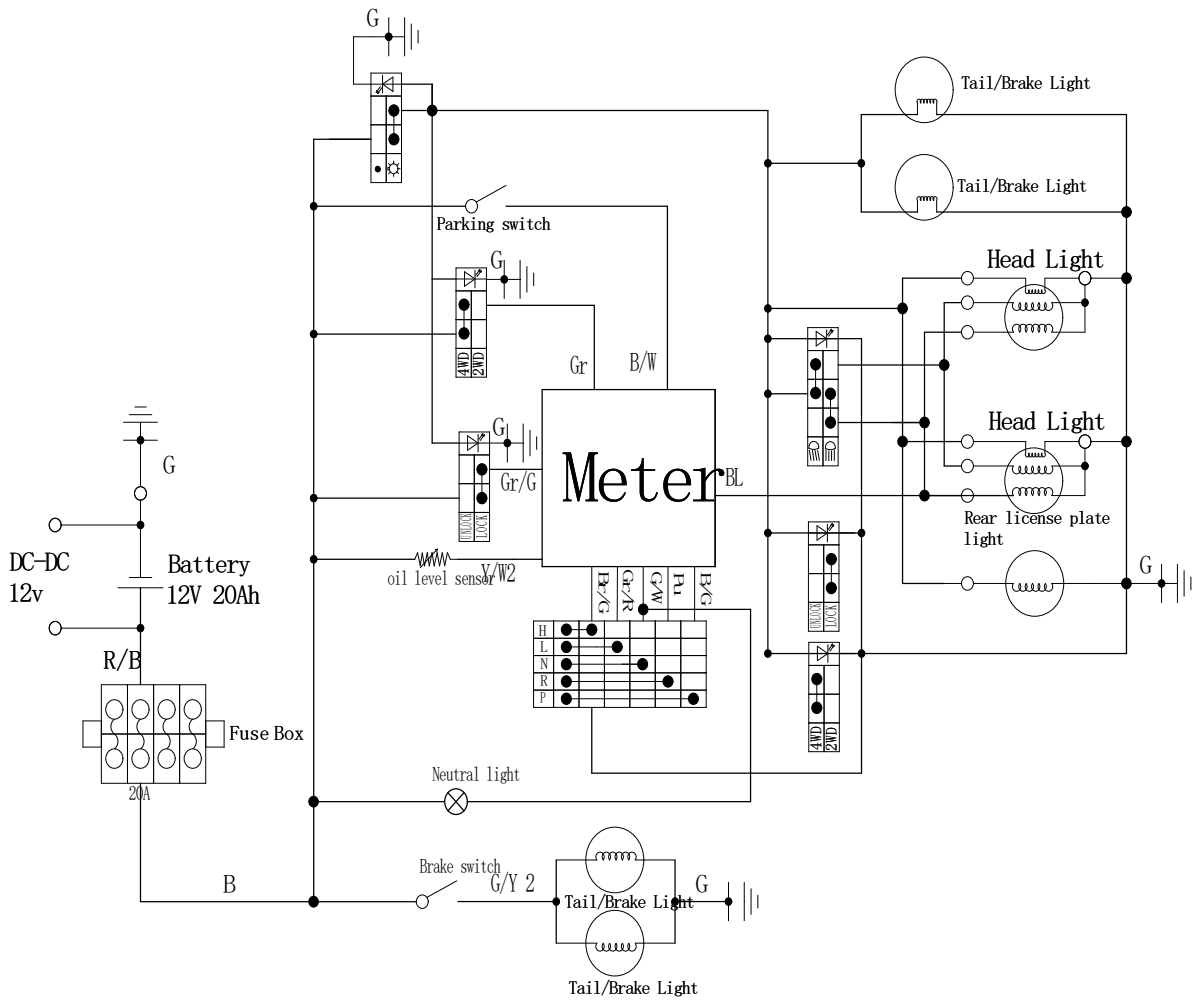
The rotation of the accelerator pedal generates different voltage signals to the controller;

The voltage signal is between 0 and 5V, as shown in the following figure;

The switch signal of the accelerator pedal is a safety insurance item. When the pedal is rotated to a certain angle and the switch is turned on, the motor controller is allowed to output current.



6.3 LIGHTING SYSTEM



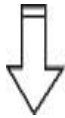
**TROUBLESHOOTING**

**Procedure**

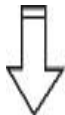
Check:

- 1. Fuse
- 2. Battery
- 3. Main switch
- 4. Lights switch
- 5. Distance light switch
- 6. Wiring connection (entire lighting system)

1. fuse  
refer to "CHECKING SWITCHES"  
section

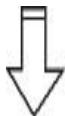


2. Battery and DC-DC  
Check the input and output of DC-DC



3. Main switch

CHECK SWITCHES



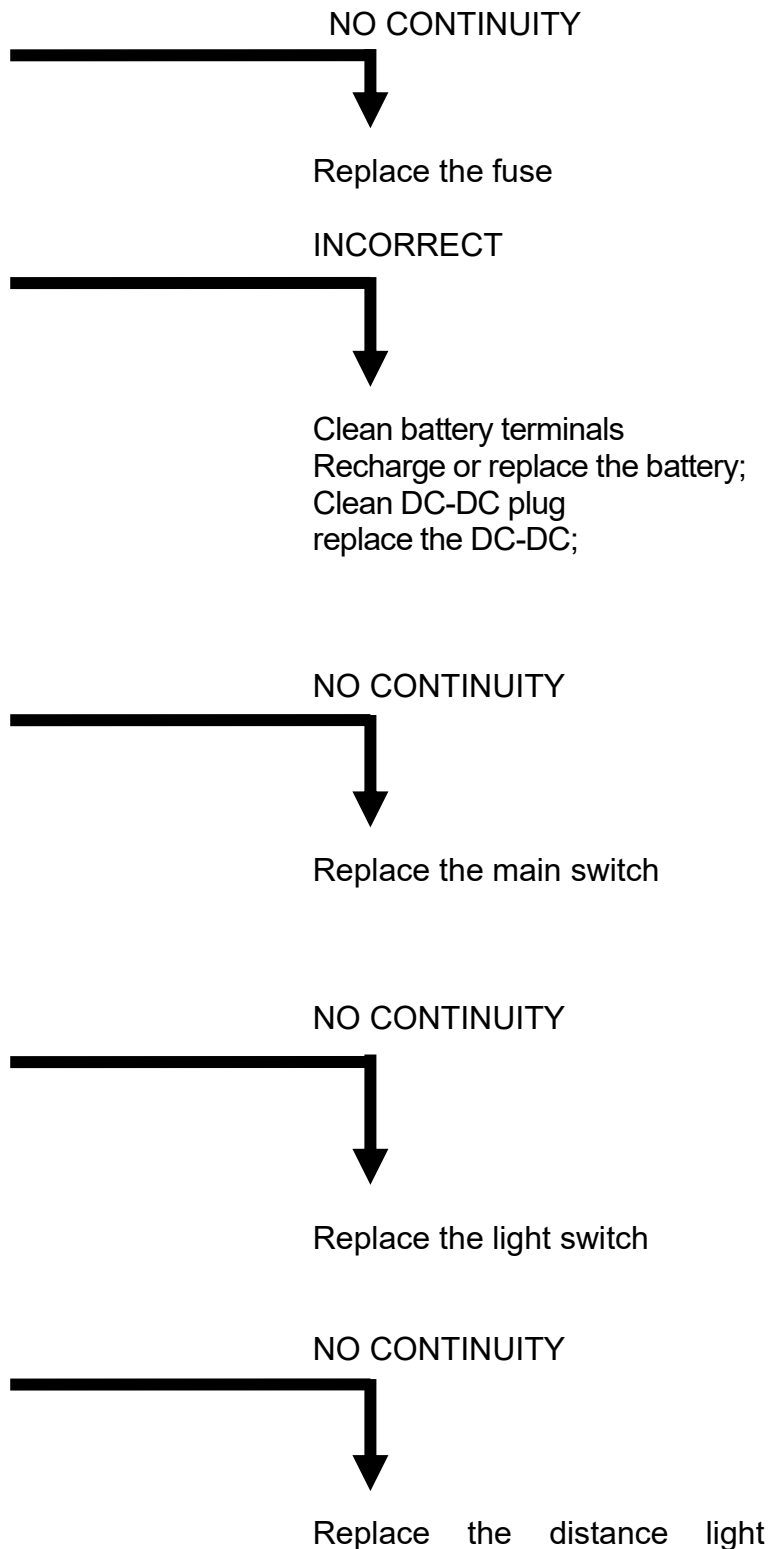
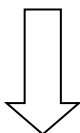
4. Light switch

CHECK SWITCHES



5. Distance light switch

CHECK SWITCHES

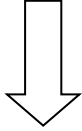




switch

6. Wiring connection

Check the connection of the entire lighting system



POOR CONNECTIONS



correct

7. check the condition of each of the lighting system's circuits

Refer to "LIGHTING SYSTEM CHECK"

**LIGHT SYSTEM CHECK**

**1. If the headlight and the high beam indicator light fail to come on**

1. Bulb and bulb socket

**CHECK SWITCHES**



NO CONTINUITY



Replace the bulb and/ or bulb socket

2. Voltage

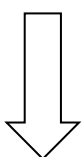
Connect the pocket tester (DC20V) to the headlight and high beam indicator light couplers.

**A** When the dimmer switch is on low beam.

**B** When dimmer switch is on high beam

Headlight::  
Tester (+) lead → White ① or Blue ② lead  
Tester negative (-) lead → Green ③ lead

Turn the main switch to on.  
Turn the light switch to on position.  
Turn the dimmer switch to low beam or high beam.  
Check for voltage (12V) on the lead at bulb socket connectors



This circuit is not faulty

OUT OF SPECIFICATION



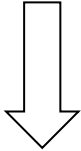
The wiring circuit from the main switch to bulb socket connector is faulty.  
Repair

1. the taillight fails to come on

1. Bulb and bulb socket

CHECK SWITCHES

CONTINUITY



2. Voltage

Connect the pocket tester (DC20V) to the LED Blub socket connector.

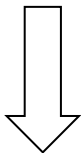
Tester (+) lead →  
Brown terminal ①

Tester (-) lead →  
Green terminal ②

Turn the main switch to on.

Turn the lights switch to on pilot position.

Check the voltage (12V) on the bulb socket connector



This circuit is not faulty

NO CONTINUITY



Replace the bulb and /or bulb socket

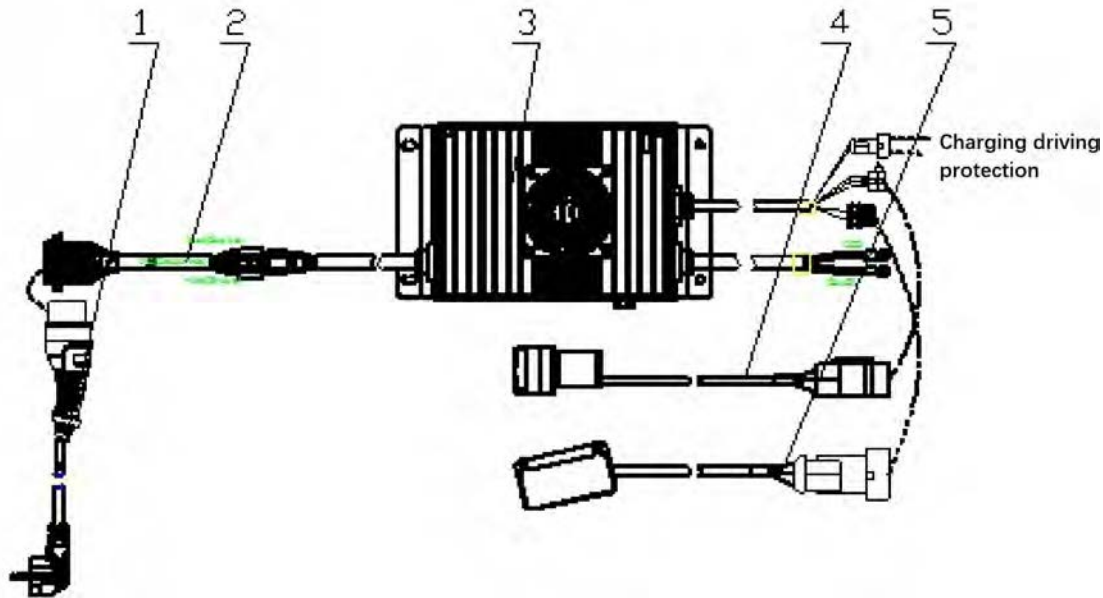
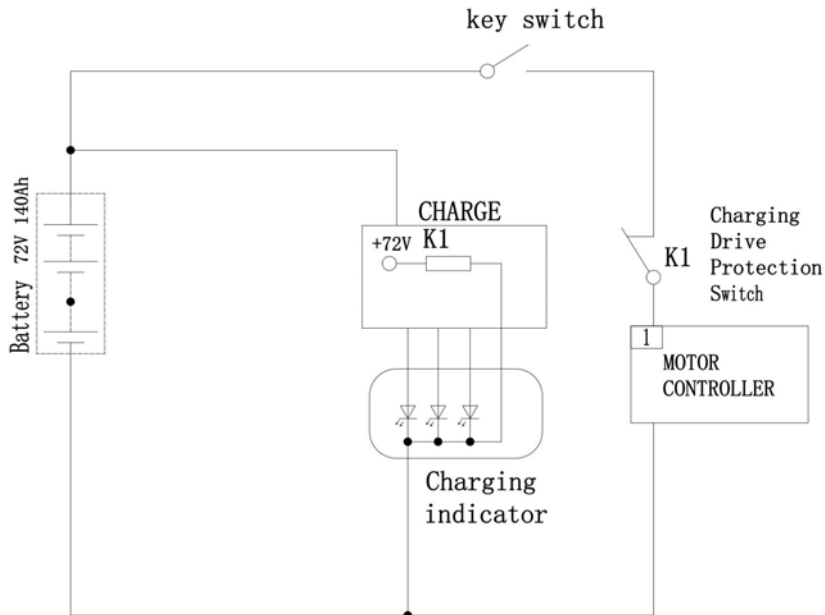
OUT OF SPECIFICATION



The wiring circuit from main switch to bulb connector of faulty.

Repair

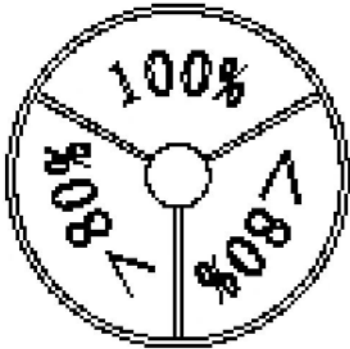
**6.4 CHARGING SYSTEM**



Connecting positive and negative poles of battery pack (Red Wire Connecting Positive Pole)

- 1、 Charging interface
- 2、 Charger socket
- 3、 Charger body
- 4、 Charging display lamp
- 5、 Battery temperature sensor

Indicator lamp



Charging capacity < 80% flashing interval of red light 1s;

Charging capacity > 80% yellow light flashing interval 1s;

Charge = 100% green light always on

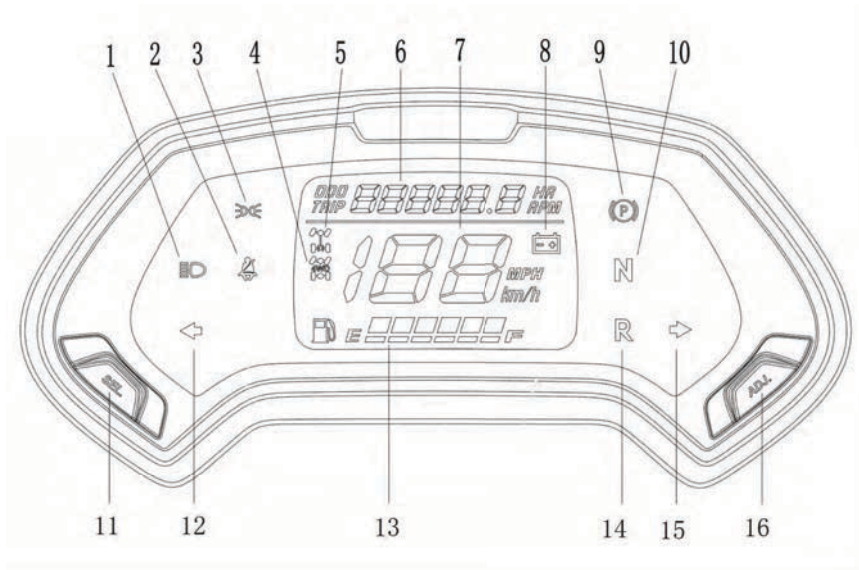
**Charging driving protection:**

When the charger is charging, the internal switch of the charger will disconnect the line from the key switch to the motor controller, ensuring that it cannot be driven while charging.

**Charging fault indication**

NO.	Indicator “-” means a pause of 1 second	Fault indication	Measure
1	RED GREEN RED GREEN RED GREEN	carrying idler	Check the connection between the battery and charger; Or the battery voltage is too low
2	RED GREEN RED - - -	overload	Error occurs again after restarting, charger needs to be replaced
3	RED GREEN RED GREEN - -	Temperature too high or too low	Check ambient temperature
4	GREEN RED - - - -	Charger overheating	Check ambient temperature
5	RED GREEN - - - -	Output undervoltage	Error occurs again after restarting, charger needs to be replaced
6	RED GREEN RED GREEN RED -	Input exception	Check input voltage

**6.5 METER**



1. Headlight switch indicator	11. Function buttons1
2. Seat belt warning	12. Left Turn Indicator
3. Headlight switch indicator	13. Electricity Gauge
4. 2WD-4WD indicator	14. Reverse indicator
5. Rear differential lock indicator	15. Right Turn Indicator
6. Odometer	16. Function buttons2
7. Speed	
8. Low battery warning	
9. Parking indicator	
10. Neutral indicator	

Key function:

Function	Button 1	Button 2	Display
Interface switching	Short press		Total mileage Subtotal mileage Engine tachometer Backlight level Engine tachometer
Backlight adjustment		Short press	Backlight level +1
Mileage clearing		Long press	Subtotal mileage clearing
Unit Swithcing	Short press		Speed unit flashing
		Short press	Metric/English unit switching
Return	Short press		Save and Exit

**Caution:** Electric fuel injection failure alarm indicator should be lit, when open the key switch but did not start the engine, to prompt the alarm function is normal. After the engine starting, the lamp shall be put out, otherwise the efi system is faulty. with the cap.

**Fault Code Table**

NO.	Fault	measure
P0001	Battery severely overheated	After 3 seconds, the battery stops discharging
P0002	Battery voltage too high	After 3 seconds, the battery stops discharging
P0003	Battery voltage too low	After 3 seconds, the battery stops discharging
P0004	Severe overcurrent during battery discharge	After 3 seconds, the battery stops discharging
P0005	Single cell voltage too high	After 3 seconds, the battery stops discharging
P0006	Single cell voltage too low	After 3 seconds, the battery stops discharging
P0021	Battery temperature high	Motor controller power reduced by 50%
P0022	Battery temperature low	Motor controller power reduced by 50%
P0023	Single cell voltage high	Motor controller power reduced by 50%
P0024	Single cell voltage low	Motor controller power reduced by 50%
P0025	Excessive discharge current	Motor controller power reduced by 50%

P0026	BMS communication failure	Motor controller power reduced by 50%
P0027	SOC too low	Motor controller power reduced by 50%
P0028	The voltage difference of the battery cell is large	Motor controller power reduced by 50%
P0029	Large temperature difference between battery cells	Motor controller power reduced by 50%
P0064	Charger hardware failure	Stop charging, Check the charger
P0065	Charger temperature abnormality	Stop charging, Check the charger
P0066	Charger power limiting fault	Stop charging, Check the charger
P0067	Charger input voltage fault	Stop charging, Check the charger
P0068	Charger output overcurrent	Stop charging, Check the charger
P0069	Charger startup fault	Stop charging, Check the charger
P0070	Charger communication failure	Stop charging, Check the charger
P0071	Charger and battery connection failure	Stop charging, Check the charger
P0101	Accelerator pedal not returning, high voltage	Check accelerator pedal return
P0102	Motor controller pre charging fault	Replacing the motor controller
P0103	Motor controller overcurrent	Cannot drive after restarting, replace controller
P0104	Motor controller overheated	Check the ambient temperature and fan
P0105	Main circuit power outage	Check the circuit and emergency stop switch
P0106	Current sampling fault	replace controller
P0107	encoder failed	Check the encoder plugin
P0108	BMS malfunction	Check the battery
P0109	Battery undervoltage	Charge for battery
P0110	Battery overvoltage	Check the battery
P0111	Motor overheating	Check ambient temperature, pause driving, cool down
P0113	Accelerator pedal malfunction	Check the wiring of the accelerator pedal

## **6.6 TROUBLESHOOTING**

The instrument has a fault code. Please search for the fault based on the fault code.  
This chapter explains some common faults that cannot display fault codes.

Fault 1: There is one direction (forward or backward) that cannot work  
Measure: Check the shifter plug; Replacing the gear shifter

Fault 2: The lighting instrument panel is normal, but the vehicle cannot be driven  
Measure:

Connect the controller via Bluetooth on your phone

Unconnectable: Check if it is in charging state;

Check the connection of the motor controller plug-in;

Check if the charging driving protection switch is closed;

Replace the motor controller;

Can be connected: Shift the gear, step on the accelerator, and observe if there is a signal input

Fault 3: Lights and instruments do not light up

Measure: Check the fuse

Check battery voltage

Check the DC-DC plugin

Replace DC-DC

Fault4: Short range

Measure: Pay attention to releasing the handbrake while driving

Check if the charging time is too short. If so, the battery is faulty

Check if the voltage of each battery is balanced

Fault5: Driving cannot reach the maximum speed

Measure: Pay attention to whether it is in low-speed mode

Connect the controller with a mobile phone and observe if the throttle pedal travel voltage can reach full range.

Jack up the vehicle and rotate the tire in neutral to check if it is stuck

Replacing the motor



6.7 WIRING DIAGR

Note	Colour
R	Red
D R	Dark Red
Br	Brown
L G	Light Green
W	White
P	Pink
P/B	Pink/Black
P/G	Pink/Green
P/W	Pink/White
G	Green
D G	Dark Green
G/Y	Green/Yellow
Y/W	Yellow/White
Y/B	Yellow/Black
Or	Orange
Bl/W	Blue/White
R/Bl	Red/Blue
B/Y	Black/Yellow
Bl	Blue
L Bl	Light Blue
Br/R	Brown/Red
Bl/Y	Blue/Yellow
Pu	Purple
G/W	Green/White
B/W	BLACK/White
Gr	Gray
Gr/W	Gray/White
Br/R	Brown/Red

