

XY200U

SERVICE MANUAL

NOTICE

This manual was produced by the NUBULA Group primarily for use by NUBULA 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 NUBULA 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.

NUBULA Group is continually striving to improve all its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized NUBULA 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!



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:
clearer.

A NOTE provides key information to make procedures easier or

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 **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.

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 ENGINE 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

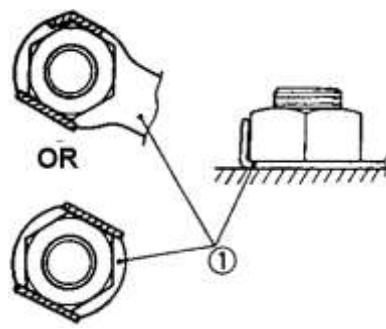
Use only genuine parts for all replacements. Use recommended oil and grease for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

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

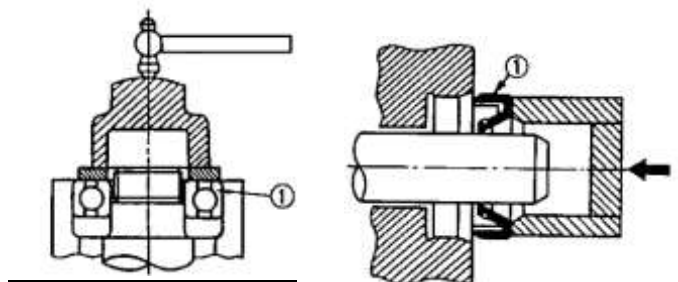
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil bearings liberally when installing, if appropriate.

① oil seal

CAUTION:

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

① Bearing

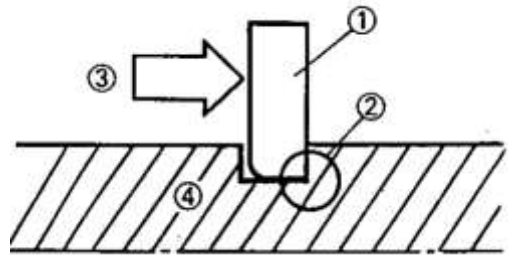


CIRCLIPS

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



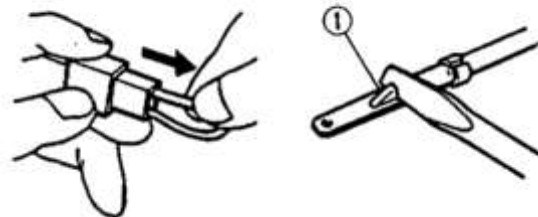
NOTE:

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

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 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.

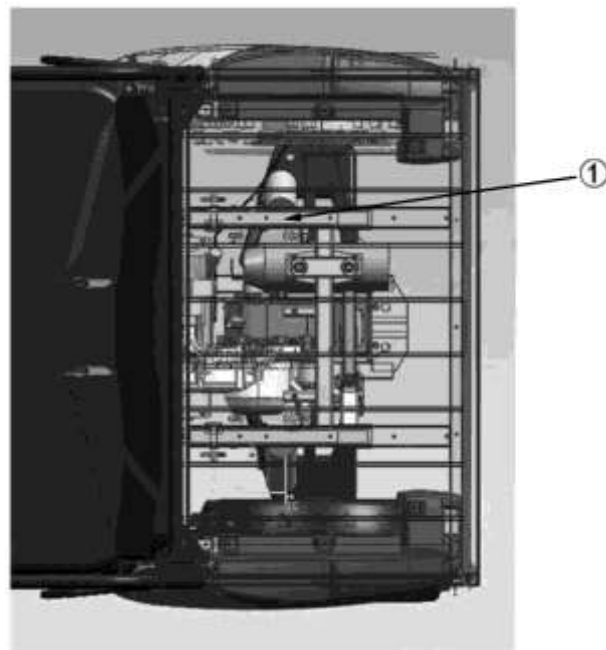
METRIC		MULIPLIER		IMP
**mm	x	0.3937	=	**in
**cm	x	0.03937	=	**in

CONVERSION TABLE

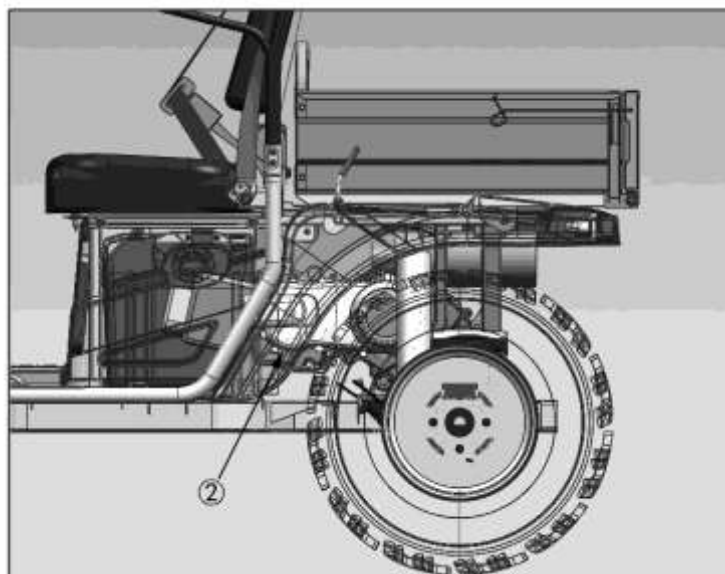
METRIC TO IMP			
	Known	Multiplier	Result
Torque	m • kg	7.233	ft • lb
	m • kg	86.794	In • lb
	cm • kg	0.0723	ft • lb
	cm • kg	0.8679	In • lb
Weight	kg	2.205	lb
	g	0.03527	oz
Distance	km/h	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3927	in
	mm	0.03927	in
Volume/ Capacity	cc(cm ³)	0.03527	oz(IMP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

1.2 V.I.N AND ENGINE SERIAL NUMBER

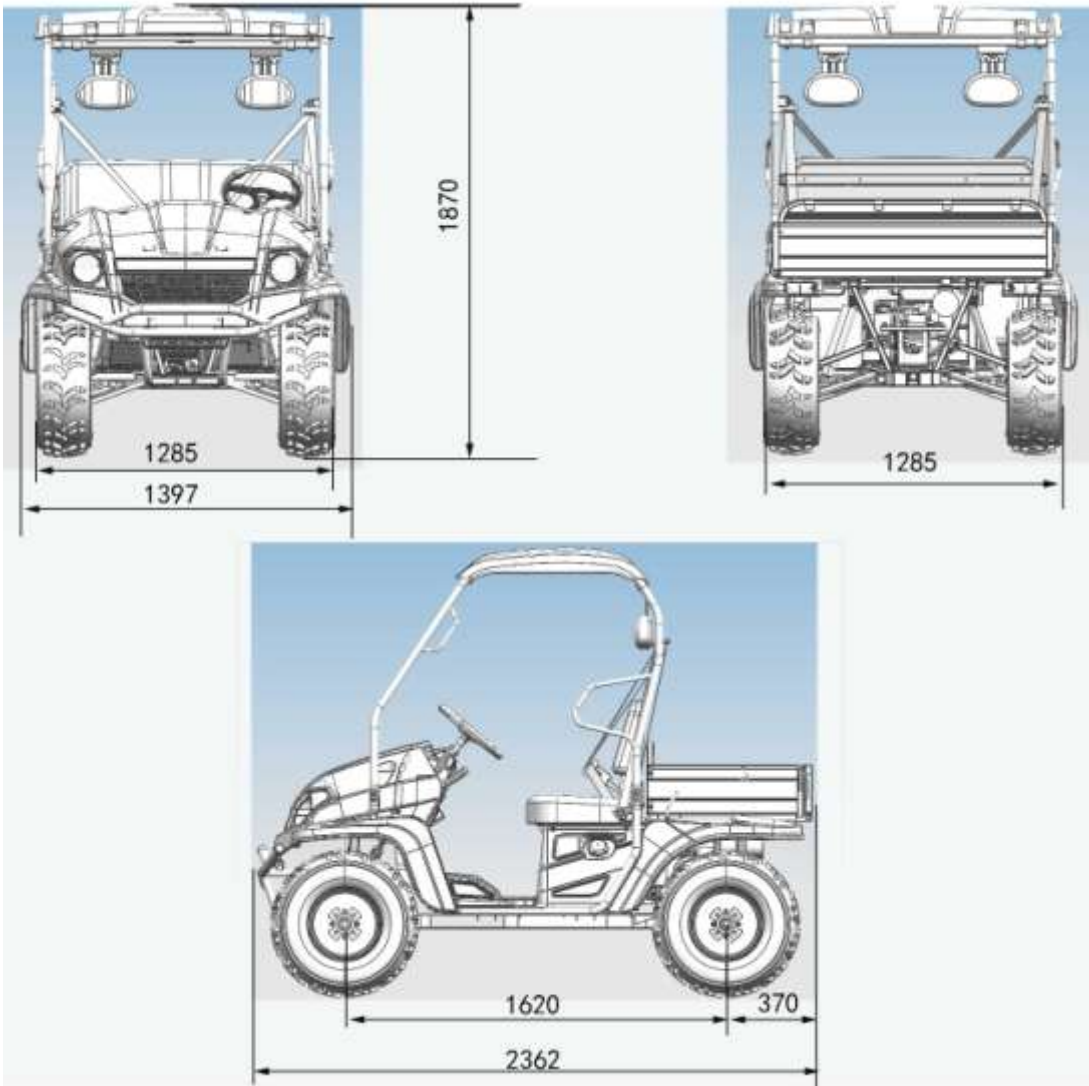
The vehicle identification number ① is stamped into the left side of the rear frame tube.



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



1.3 VEHICLE DIMENSIONS



Note.

The on-road equipments (rear view mirror, turn lights, etc.) are not Standard Equipment for USA.

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 THROTTLE PEDAL INSPECTION

2.3 CHOKE ADJUSTMETN

2.4 FUEL SYSTEM

2.5 TOE ALIGNMENT

2.6 BRAKING SYSTEM INSPECTION

2.7 SUSPENSION SPRING RPELOAD ADJUSTMENT

2.8 WHEELS

2.9 TIRE PRESSURE

3.0 FRAME, NUTS, BOLTS, FASTENERS

2.1 PERIODIC MAINTENANCE

GENERAL

CAUTION

Mark on the following chart

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

▲: Service/Inspect more frequently when operating in adverse conditions.

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, have a qualified dealer perform these operations.

- A = Adjust I = Inspect
- C = Clean L = Lubricate
- D = Drain R = Replace
- T =Tighten to Correct Torque

	Item	Hours	When	Remarks
	Service (Main) Brake System	/	Pre-ride	I
	Parking Brake	/	Pre-ride	I
	Tires	/	Pre-ride	I
	Wheels	/	Pre-ride	I
	Frame nuts, bolts fasteners	/	Pre-ride	I
▲	Air Filter-Pre-Cleaner	/	Daily	I C
▲	Air Box Sediment Tube	/	Daily	D
	Headlamp Inspection	/	Daily	C apply dielectric grease to connector when replaced

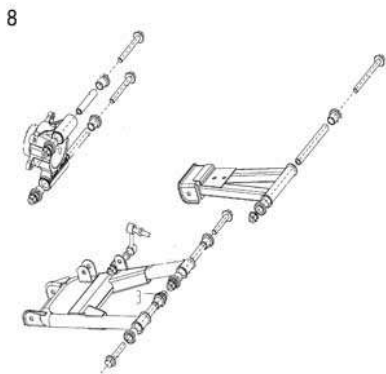
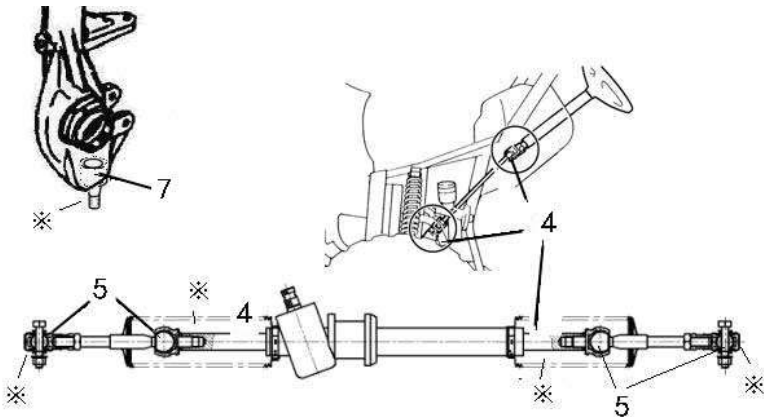
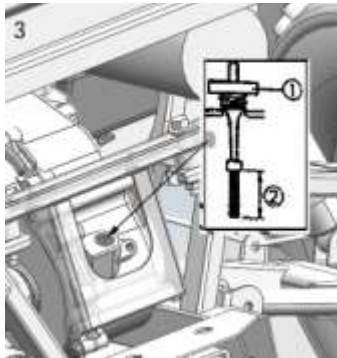
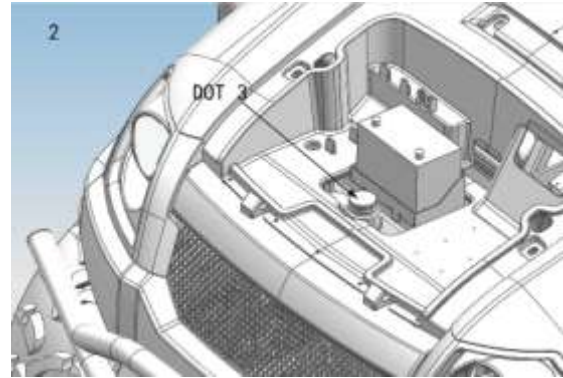
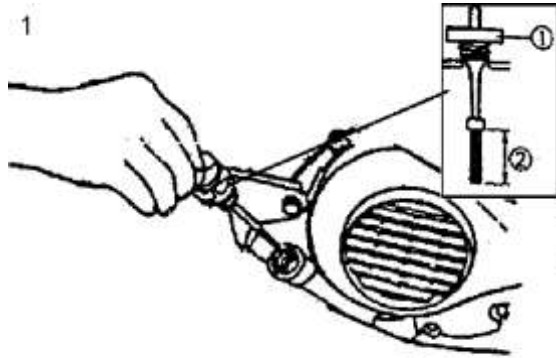
	Tail lamp inspection	/	Daily	C apply dielectric grease to socket when replaced
▲	Air Filter-Main Element	2	Weekly	I C Replace if necessary
▲	Transmission Oil Level	10	Monthly	I change annually
	Battery Terminals	10	Monthly	I C
	Battery fluid level	10	Monthly	I
DL	Brake pad wear	10	Monthly	I
▲	Gear case Oil	10	Monthly	C
		150	annually	R
	Engine Cylinder Head and Cylinder Base Fasteners	25	3 months	I (re-torque required at first service only)
▲	General Lubrication all fittings, pivots, cables, etc.	25	3 months	L
	Engine Oil-Level	/	Daily	I
	Engine Oil Change	30 hrs	500km(312.5mile) or 3 months	R Break-in Service at 1 month. Change oil more often in cold weather use.
▲	Engine breather hose	100 hrs	6 months	I
	Carburetor Float Bowl	50 hrs	6 months	Drain bowl periodically and prior to storage
	Throttle Cable	/	Pre-ride	I
DL	Throttle Cable/Throttle pedal	50 hrs	6 months	A L (Grease M) R if necessary
	Shift linkage	50 hrs	6 months	I A R if necessary
DL	Transmission belt	50 hrs	6 months	I R if necessary

▲	Steering	50 hrs	6 months	I L T if necessary
▲	Front Suspension	50 hrs	6 months	I L T if necessary
▲	Rear Suspension	50 hrs	6 months	I T if necessary
	Spark Plug	100 hrs	12 months	I R if necessary
DL	Ignition Timing	100 hrs	12 months	I Adjust as needed
DL	Fuel System	100 hrs	12 months	Check for leaks at tank, cap, lines, fuel valve, filter, and carburetor. Replace lines every 2 years.
DL	Fuel Filter	100 hrs	12 months	R
	Radiator	100 hrs	12 months	I R
	Cooling System hoses	50 hrs	6 months	I R if necessary
	Spark arrestor	10 hrs	monthly	C R if necessary
DL	Clutches (drive and Driven)	25 hrs	3 months	I R R if necessary
	Engine mounts	25 hrs	3 months	I T
DL	Valve clearance	100 hrs	12 months	I A
DL	Shift selector box (H/L/R/N)	200 hrs	24 months	Change grease every two years
	Exhaust system	100hrs	12 months	I
DL	Brake fluid Level	/	Pre-ride	I
	Brake fluid	200 hrs	24 months	Change every two years
	Idle Speed	/	As Required	A
DL	Toe adjustment	/	As Required	Periodic inspection, adjust when parts

				are replaced
	Headlight Aim	/	As Required	Adjust if necessary
▲ DL	Ball joint (A arm- strut)	10 hrs	monthly	I, (for damage, wear, and play) R. Replace if necessary

LUBRICANT AND FLUID

	Item	Lube Rec	Method	Frequency
	1.Engine Oil	SAE 15W/40 SE	Add to proper level on dipstick	Check level daily
	2. Brake Fluid	DOT 3 Only	Maintain level Between fill lines.	As require; change every two years or 200 hours
	3. Transmission Oil	SEA 80W/90GL5	Add to proper level on dipstick	Change annually or at 100 hours
	4.Steering system	Grease	Lubricate the pivoting and sliding parts	Every 3 months or 50 hours
	5.Tie rods	Grease	Grease	Semi-annually
	6.Shift Linkages	Grease	Locate fittings and Grease	Semi-annually
	7.Ball joints	Grease	Inspect, Locate fittings and Grease, or replace it if necessary	Semi-annually
	8.Front/Rear A-arm pivot Shaft	Grease	Locate fitting on pivot shaft and grease with grease gun	Every 3 months or 50 hours
	9.Throttle Cable	Grease M	Grease, inspect and replace it if necessary	Monthly or 20 hours
	13.Accelerator pedal and brake pedal	Grease	Grease, inspect	Monthly or 20 hours



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

LUBRICATION RECOMMENDATIONS

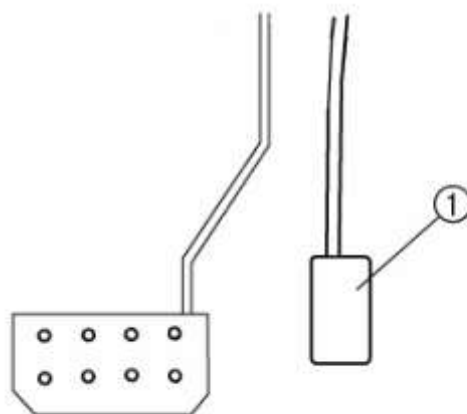
NOTE:

1. More often under severe use, such as wet or dusty conditions.
2. Grease: Light weight lithium-soap grease.
3. Grease M: Molybdenum disulfide (MoS₂) grease (water resistant).
4. When suspension action becomes stiff or after washing.
5. Hours are based on 10 mph(16km/h) average.

2.2 THROTTLE PEDAL INSPECTION

THROTTLE FREEPLAY

If the throttle pedal has excessive play due to cable stretch or cable misadjustment, it will cause a delay in throttle speed. Also, the throttle may not open fully. If the throttle pedal has no play, the throttle may be hard to control, and the idle speed may be erratic. Check the throttle pedal play periodically in accordance with the Periodic Maintenance Chart and adjust the play if necessary.

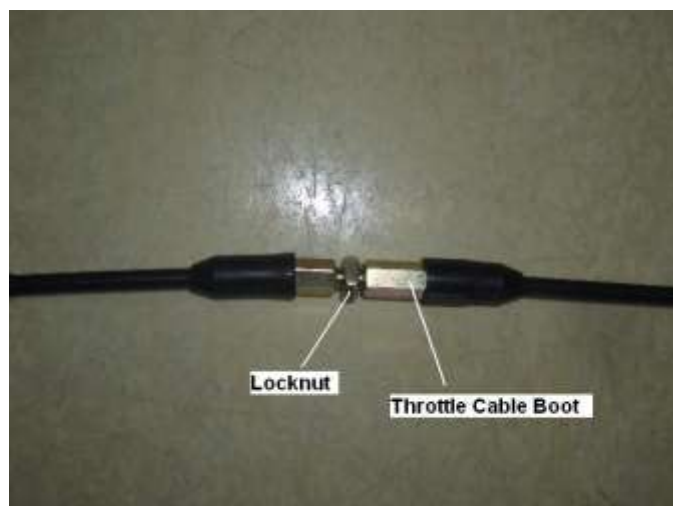


THROTTLE FREEPLAY INSPECTION

1. Apply the parking brake.
2. Put the gear shift lever in the N(Neutral) position.
3. Start the engine, and warm it up thoroughly.
4. Measure the distance the throttle pedal moves before the engine begins to pick up speed. Free play should be 1.5 – 3 mm.

Adjustment

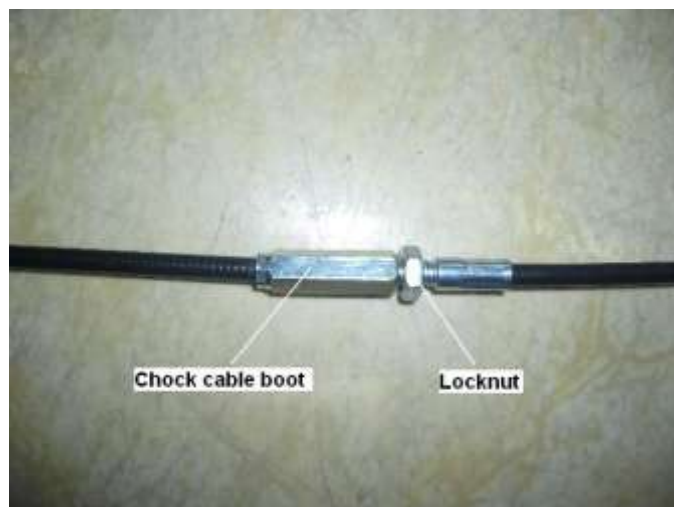
1. Slide the boot off inline cable adjuster sleeve. Loosen adjuster locknut.
2. Turn adjuster until 1.5 to 3 mm, freeplay is achieved pedal. NOTE: While adjusting freeplay, it is important you flip the throttle lever back and forth.
3. Tighten locknut.



2.3 CHOKE ADJUSTMETN

If the choke knob does not stay out when pulled, adjust the choke tension by tightening (clockwise) the chock cable boot until the choke slider freely but stays out when pulled.

If smooth choke operation is not obtainable, inspect choke cable for kinks or sharp bends in routing



2.4 FUEL SYSTEM

⚠ WARNING

Gasoline is extremely flammable and explosive under certain conditions.

- ⚠ Always stop the engine and refuel outdoors or in a well ventilated area.
- ⚠ Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.
- ⚠ Do not overfill the tank. Do not fill the tank neck.
- ⚠ If you get gasoline in your eyes or if you swallow gasoline, see your doctor immediately.
- ⚠ If you spill gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.
- ⚠ Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.
- ⚠ Never drain the float bowl when the engine is hot. Severe burns may result.

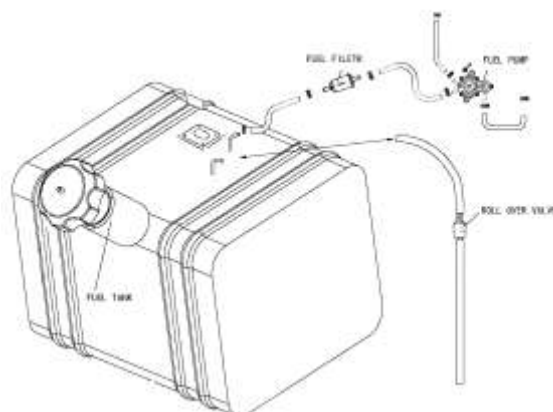
FUEL LINES

1. Check fuel lines for signs of wear, deterioration, damage or leakage. Replace if necessary.
2. Be sure fuel lines are routed properly and secured with cable ties.

CAUTION:

Make sure lines are not kinked or pinched.

Replace all fuel lines every two years.

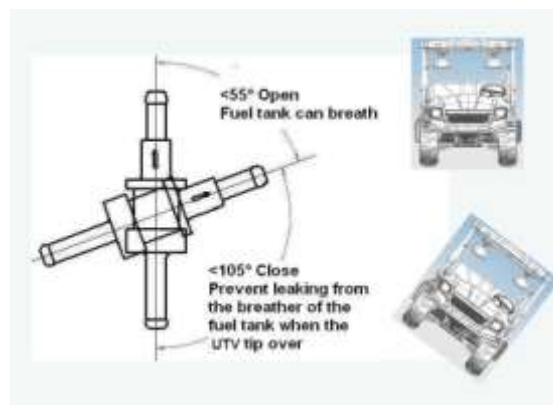


VENT LINES AND ROLL OVER VALVE

1. Check fuel tank, oil tank, carburetor, battery and transmission vent lines for signs of wear, deterioration, damage or leakage. Replace every two years.
2. Be sure vent lines are routed properly and secured with cable ties.

CAUTION: Make sure lines are not kinked or pinched.

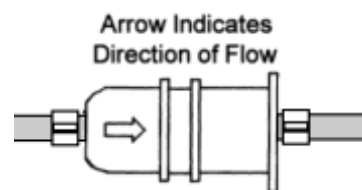
NOTE: Make sure the ↑ mark on the roll over valve is upwards.



FUEL FILTER

The fuel filter should be replaced in accordance with the Periodic Maintenance Chart or whenever sediment is visible in the filter.

1. Remove line clamps at both ends of the filter.
2. Remove fuel lines from filter.
3. Install new filter and calmps onto fuel lines with arrow pointed in direction of fuel flow.
4. Install clamps on fuel line.
5. Start engine and inspect for leaks.



2.5 TOE ALIGNMENT

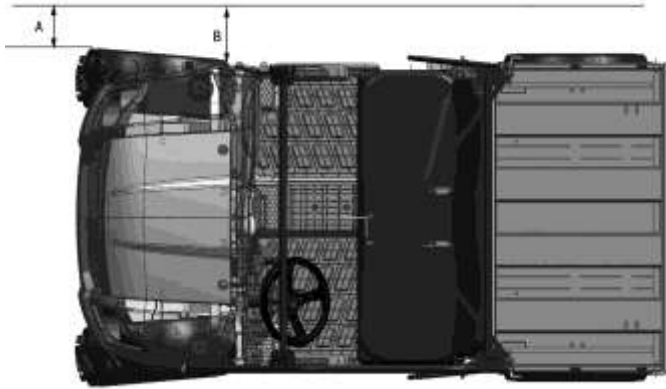
METHOD: STRAIGHTEDGE OR STRING

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.

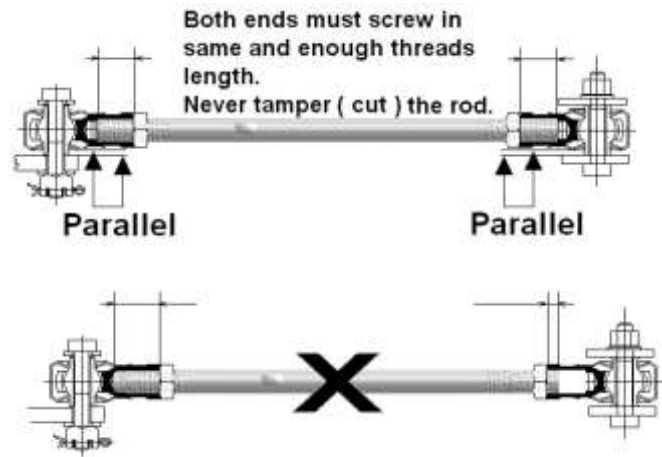
The recommended toe alignment is 1/8" to 1/4" (3 to 6mm) toe out.

1. Set the steering wheel in a straight ahead position and hold them in this position.
2. Measure A and B, B minus A should be 1/16" to 1/8" (1.5 to 3mm).



⚠ WARNING

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



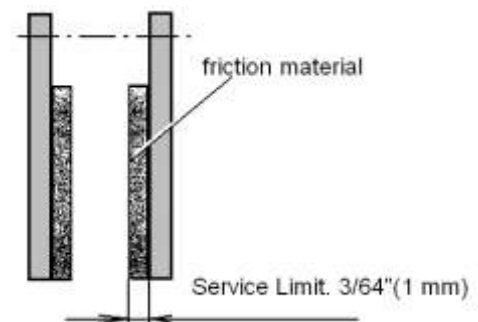
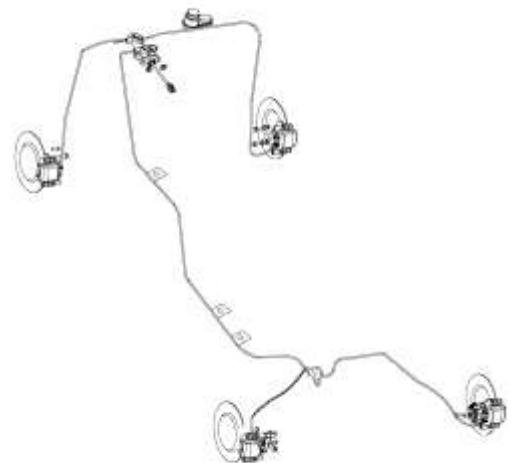
2.6 BRAKING SYSTEM INSPECTION

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

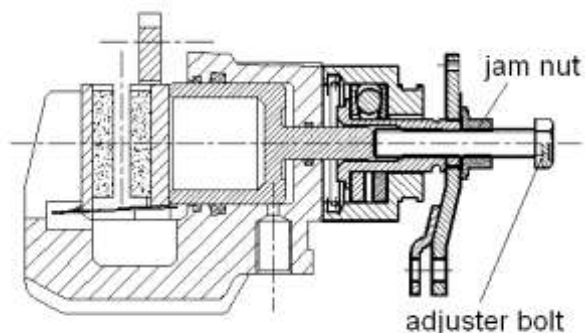
Although the parking brake has been adjusted at the factory, the brake should be checked for proper operation. The mechanical brake must be maintained to be full functional.

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.

2.7 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

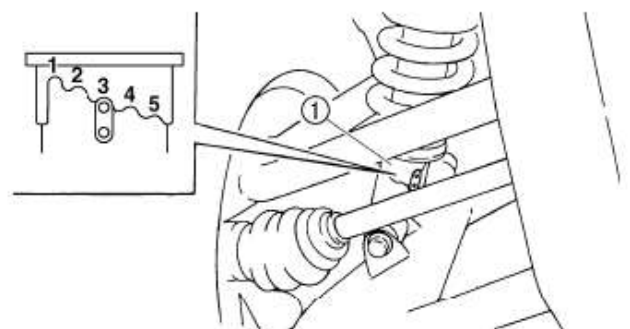
Always adjust both shock absorber spring preload to the same setting. Uneven adjustment can cause poor handling and loss of stability.

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

Standard position: 3

Minimum (Soft) position: 1

Maximum (Hard) position: 5



2.8 WHEELS

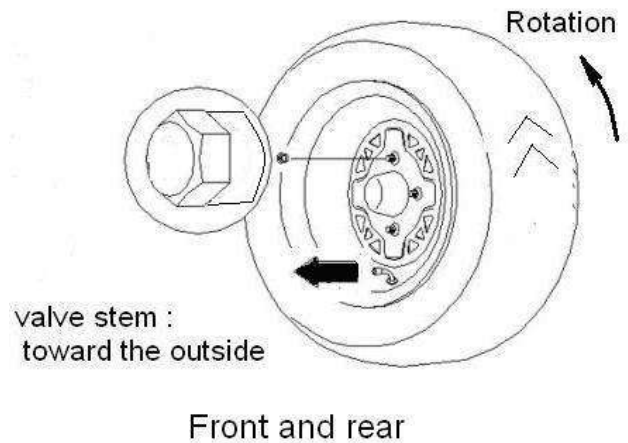
Inspect all wheels for runout of damage.
 Check wheel nuts and ensure they are tight.
 Do not over tighten the wheel nuts.

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. Attach the wheel nuts and finger tighten them. Install as shown at left for front or rear wheels.
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	66N • m
Rear	M12X1.25	59Ft.Lbs	66N • m

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

2.9 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
70kPa/10PSI	100kPa/14 PSI

TIRE TREAD DEPTH

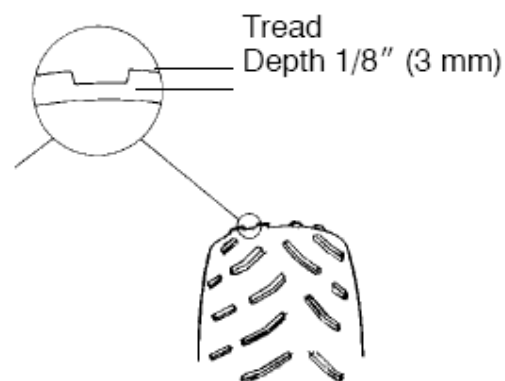
Always replace tires when tread depth is worn to 1/8" (3mm) or less.

⚠ 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.



3.0 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 ENGINE

3.1 PREPARATION FOR REMOVAL PROCEDURES

3.2 REPLACEMENT PARTS

3.2.1 Gaskets, oil seals and o-rings

3.2.2 Bearings and oil seals

3.3 PERIODIC INSPECTION AND ADJUSTMENT

3.3.1 Air filter

3.3.2 Spark plug

3.3.3 Valve clearance adjustment

3.3.4 Transmission oil inspection

3.3.5 Crankcase oil inspection

3.4 ENGINE REMOVAL AND INSTALLATION

3.4.1 Cylinder head

3.4.2 Cylinder body, piston and piston ring

3.4.3 V-belt, AND CVT

3.4.4 Transmission

3.4.5 Crankcase and crankshaft

3.4.6 Magneto

3.4.7 Electric starter

3.4.8 Oil pump

3.5 CARBURATION

3.6 TIGHTENING TORQUES OF ENGINE MAIN FASTENERS

3.7 IGNITION SYSTEM

3.7.1 INSTALLATION INFORMATION

3.7.2 TROUBLESHOOTING

3.7.3 CDI INSPECTION

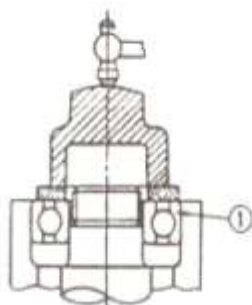
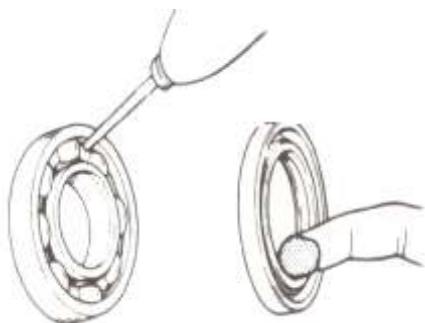
3.7.4 IGNITION COIL

3.7.5 MAGNETO

3.1 PREPARATION FOR REMOVAL

PROCEDURES

1. Remove all dust and dirt before removal and disassembly.
2. Use proper tools and cleaning equipment.
3. During machine disassembly, clean all parts and place them in the order of disassembly, which will speed up assembly and allow for the correct installation of all parts.
4. Keep all parts away from any source of fire.



3.2 REPLACEMENT PARTS

3.2.1 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 and apply grease to the oil seal lips.

3.2.2 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 and oil bearings liberally when installing.



3.3 PERIODIC INSPECTION AND ADJUSTMENT

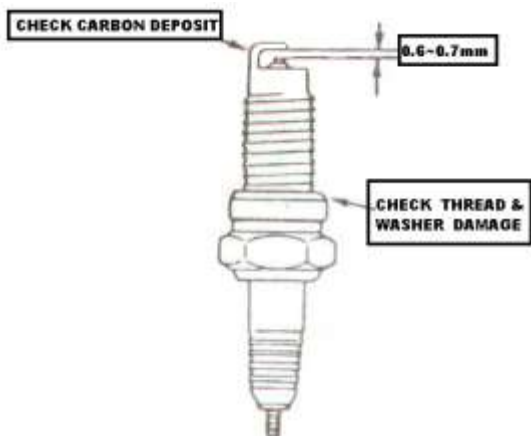
3.3.1 Air filter

1. Remove air filter case cover and 7 fixing screws.
2. Remove 2 filter element fixing screws to check the element for dirt or damage. If so, replace.

NOTE:

As the air filter element is paper-made and contains engine oil, it is not proper to clean it with air.

3. Install the air filter in the reverse order of removal.



3.3.2 Spark plug

1. Remove spark plug.
2. Check for burnout, dirt or carbon deposit. Clean them away with a sparkplug cleaner or a cast-steel wire brush.
3. Spark plug gap specification: 0.6-0.7mm
4. Check for screw thread damage
5. Such spark plug as NGK (C7HSA, C6HSA) and CHAMPION Z9Y are recommended in replacement.



3.3.3 Valve clearance adjustment

1. Remove cylinder head cover.



2. Rotate cooling fan to set the mark on camshaft sprocket in Top Dead Center position, that is, to align the timing line on the rotor with the mark on the crankcase.

NOTE:

Since the crankshaft is equipped with a decompression, the fan cannot be rotated counterclockwise, or it is impossible to adjust the valve.

3. Measure the valve clearance by using a feeler gauge.

Valve clearance specification:

Intake valve 0.08—0.10mm;

Exhaust valve 0.10—0.12mm

4. To adjust valve clearance, loosen the locknut, turn the adjuster in or out with valve adjusting tool until specified clearance is obtained. Measure the valve clearance once more after the locknut is tightened.



3.3.4 Transmission oil inspection

1. Remove the oil level plug.
2. Wipe the oil on the plug and insert it into the filler hole without screwing. The oil level should reach the fourth mark.
3. When replacing the oil, remove transmission case drain plug located on the front cover and drain the oil..
4. Check the O-ring for damage and replace it if necessary.
5. Install the drain plug.
6. Add 80W/90 oil in the recommended amount. Install oil dipstick.
7. The oil capacity of a new engine: 600ml. The top filling for replacement: 550ml.

3.3.5 Crankcase oil inspection

8. Stand the engine on a level surface.
9. Have the engine run at idle speed for several minutes. Inspect the oil level after the engine is turned off 2-3 minutes.
10. Remove the oil level plug.
11. Wipe the oil on the plug and insert it into the filler hole without screwing. The oil level should reach the fourth mark.
12. When replacing the oil, perform the first two steps and remove the oil strainer to drain the oil.
13. Check the O-ring for damage and replace it if necessary.
14. Install the oil strainer, spring and strainer lid.
15. The oil capacity of a new engine: 900ml The replacement volume: 750ml.
16. After replacement, start the engine and keep it idling for 2-3 minutes and inspect the oil level according to the above instructions.



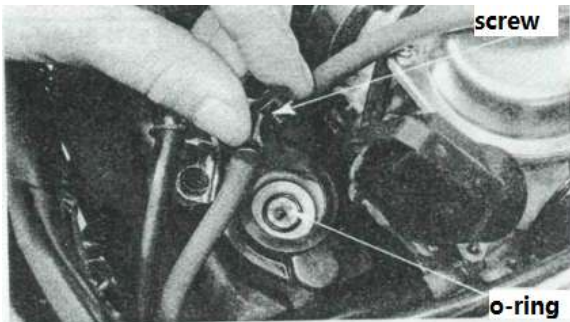


3.4 ENGINE REMOVAL AND INSTALLATION

3.4.1 Cylinder head

A. Camshaft removal

1. Remove cylinder head cover
2. Remove camshaft chain pensioner screw and then O-ring.
3. Lock camshaft chain pensioner by turning it clockwise.
4. Rotate fan to have the mark on the camshaft chain in an upward position, which is TDC of engine compression stroke.
5. Remove cylinder head bolts, fixing nuts and gasket of camshaft holder.



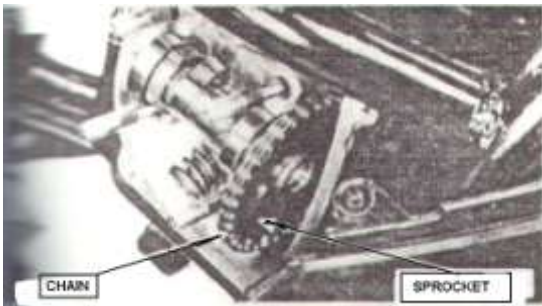
NOTE:

Tighten the nuts in a crisscross pattern, each 1/2 or 1/3 turn at a time.

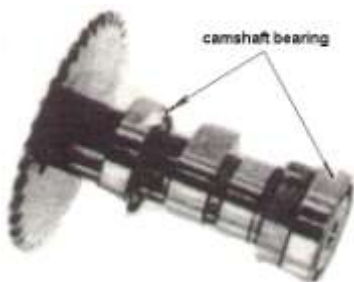
6. Loosen 2 nuts (B) 、 Loosen 4 nuts (A),
Remove camshaft holder and pins



7. Remove camshaft.



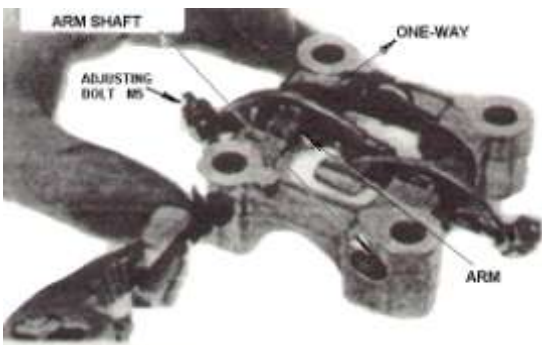
8. Check for intake and exhaust cam damage.
Replace when
intake valve : below 25.75mm exhaust
valve : below 25.41mm.



9. Check camshaft bearing for looseness and wear and tear and sprocket for abnormal wear. If so, replace as a whole.

B. Camshaft holder removal and installation

1. Remove rocker arm shafts by using a bolt of 5mm. Remove one-way exhaust valve and rocker arm.





2. Check camshaft holder, rocker arms and rocker arm shafts for abnormal wear and tear.

3. Measure the inside diameter of rocker arm shaft hole in camshaft holder.

Limit: 10.10mm.

4. Measure the inside diameter of rocker arm hole.

Limit: 10.10mm.

5. Measure the diameter of rocker arm shaft.

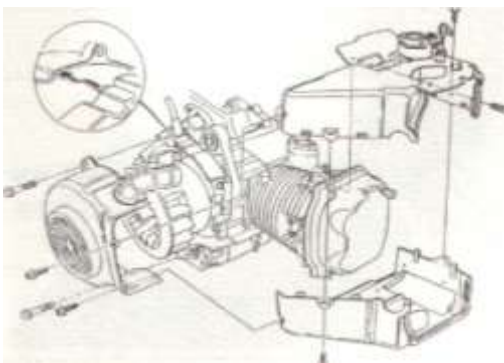
Limit: 9.91mm.

C. Cylinder head removal

1. Remove the pipe composition of carburetor intake valve.

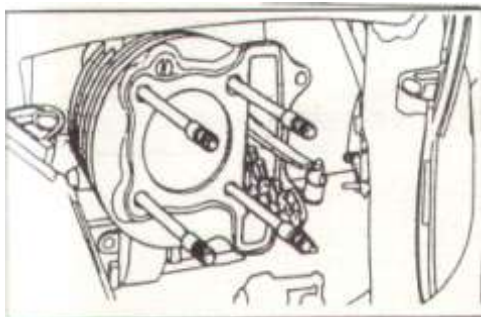


2. Remove fan cover composition.
3. Remove upper and lower shrouds.



4. Remove cylinder head.





5. Remove dowel pin, cylinder head gasket and take out chain guide.
6. Remove the gasket on cylinder surface.

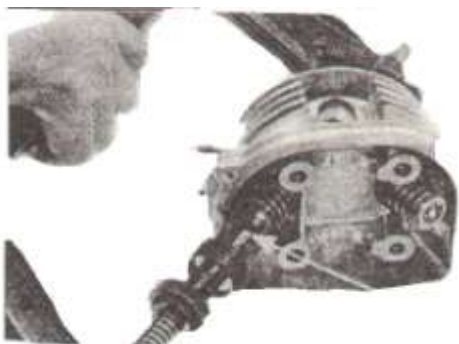
NOTE:

Make sure the contact cylinder surfaces are not scratched.

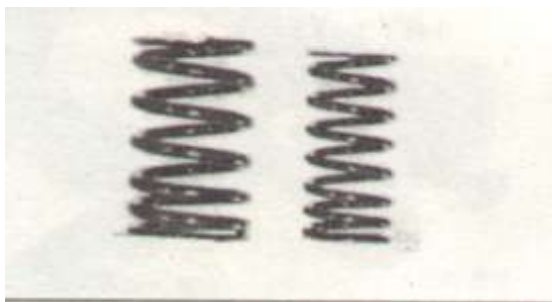
Make no other objects fall into the crankcase.

NOTE:

The cylinder head gasket must not be reused.



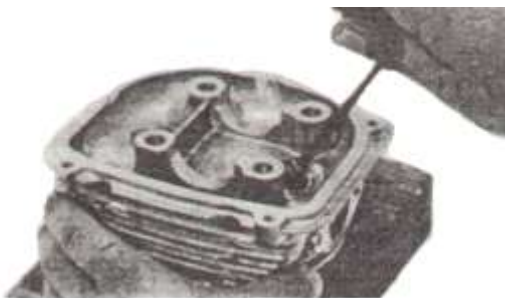
7. Take out valve seat, lock plate, spring, oil seal and valve by using a compressor.
8. Clean off carbon deposits in the combustion chamber.
9. Check spark plug, valve guide and their surrounding areas for cracks.
10. Check contact face evenness.
Limit: 0.05mm.



11. Measure valve spring free length.
Limit: inner spring : 31.2mm
outer spring : 34.1mm.



12. Check valve stem bend and check for burnout. Clean carbon deposits off its surface.
13. Measure valve stem diameter.
Limit: 4.9mm.



14. Clean off carbon deposits in valve guide.



15. Eliminate carbon deposits from valve seat.

NOTE:

Be sure not to scratch the valve seat contact face.

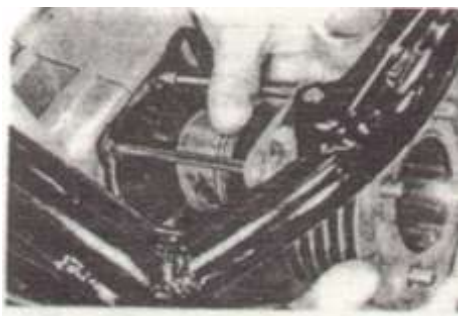


16. Measure valve guide inside diameter.

Limit: Intake: 5.08mm

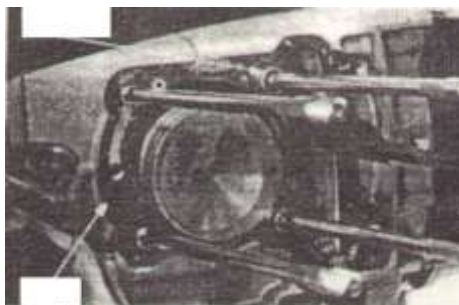
exhaust : 5.10mm

Install cylinder head in the reverse order of removal.

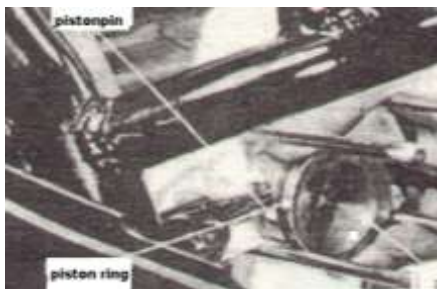


3.4.2 Cylinder body, piston and piston ring

1. Remove cylinder body.



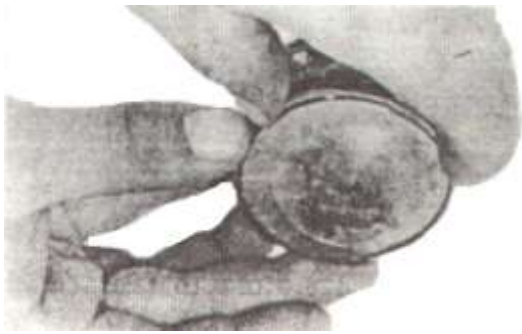
2. Remove cylinder gasket dowel pin.
Eliminate carbon deposits from gasket.



3. Remove piston pin circlip, piston pin and piston.

NOTE:

Make sure the circlip does not fall into the crankcase.



4. Remove piston ring. Eliminate the carbon deposits from the piston ring grooves and rings.

NOTE:

Be sure to keep the piston ring undamaged.

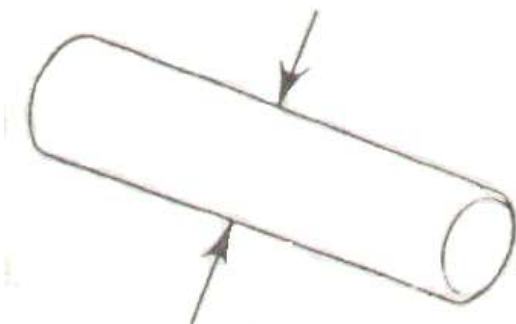


5. Position piston ring. Measure the gap between piston ring and ring groove.

Limit: first ring: 0.09mm
2nd ring : 0.09mm.



6. Measure piston pin bore diameter,
Limit: 15.04mm.



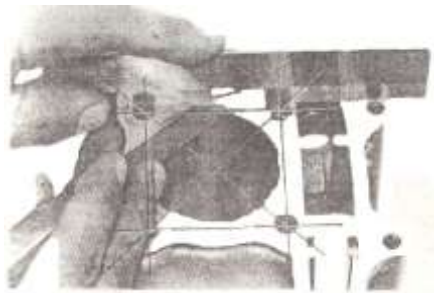
7. Measure piston pin outside diameter
Limit : 14.96mm.



8. Measure piston outside diameter from an angle of 90° to piston pin bore, in a position some 9mm from piston bottom.



9. Check cylinder inside surface for scratches and wear. Measure cylinder inside diameter from an angle of 90° to piston pin and in upper, middle and lower three positions.



10. Check cylinder body evenness.

limit : 0.05mm.

Install cylinder in the reverse order of removal.

NOTE:

Make sure to install the piston rings so that the slots are staggered by 120° and the sides with letters on are located upwards.



3.4.3 V-belt AND CVT

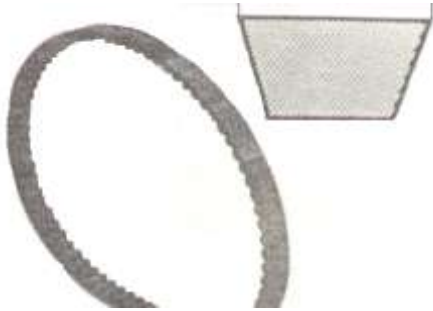
1. Remove left crankcase cover.



2. Remove drive face.



3. Take out V-belt.



4. Check belt for cracks, wear, scaling or chipping.

5. Measure V-belt width.
limit : 19.0mm,



6. Remove sliding sheave.



7. Remove movable cams.



8. Remove clutch weights.



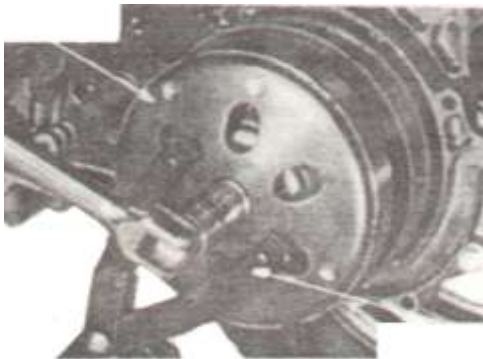
- 9. Check weights wear.
- 10. Measure weight outside diameter.
Limit : 17.44mm



- 11. Measure sliding sheave inside diameter
Limit : 24.06mm.



- 12. Check collar wear. Measure collar outside diameter.
Limit : 23.94mm,replace.



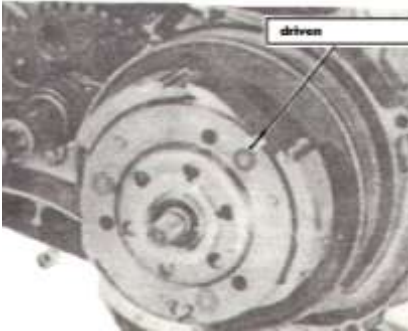
- 13. Remove clutch.



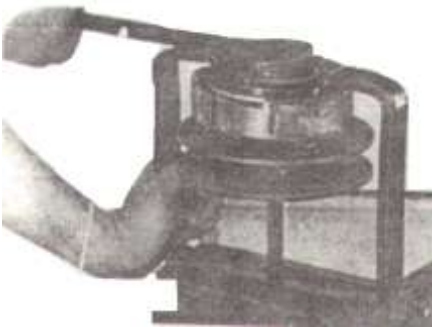
- 14. Check clutch disk wear.
Limit : 125.5mm



15. Check spacer wear. Measure its thickness.
Limit : 1.5mm



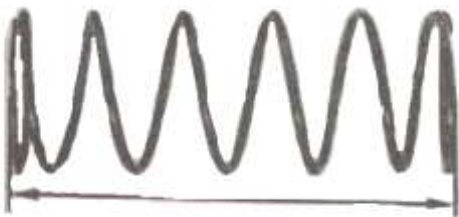
16. Remove clutch assembly.



17. Remove clutch locknut.



18. Take out secondary fixed sheave and sliding sheave.



19. Measure compression spring free length.
Limit: 163mm



20. Check secondary sliding sheave wear.
Measure its shaft inside diameter.

Limit : 34.06mm

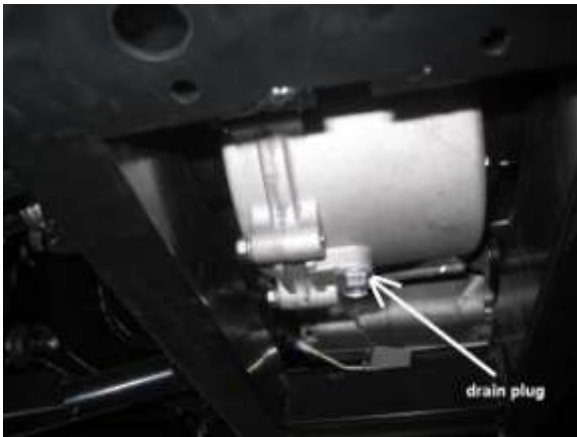
21. Check secondary fixed sheave wear.
Measure its shaft diameter.

Limit : 33.94mm

Install them in the reverse order of removal.

NOTE:

Never smear grease to the V-belt, secondary sheave and clutch.



3.4.4 Transmission

3.4.4.1 Transmission Disassembly

1. Remove transmission case drain plug located on the front cover and drain the oil.



2. Remove transmission case fixing bolts.



3. Knock the input shaft carefully with a soft face hammer to separate the transmission case from the left crankcase.





4. Prior to reinstalling the transmission make sure the mating surfaces are clean and dry, and shafts are fully seated in transmission case. Apply silicon glue to mating surfaces.



5. Reinstall left crankcase and torque bolts in a cross pattern in 3 step to 14.5 ft.lbs. (20N • m).

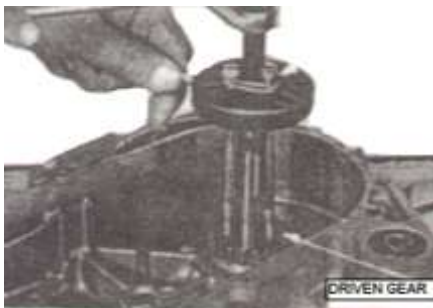
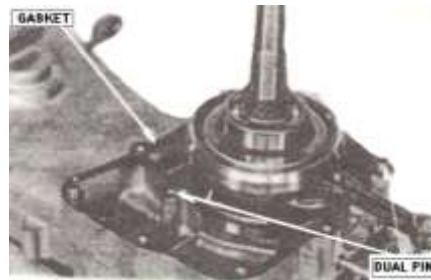
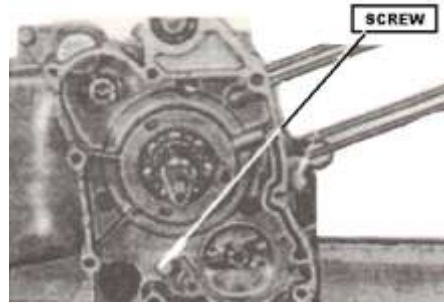
6. Install new input shaft seal.

7. Install drain plug with a new sealing washer. Torque drain plug to 14.5 ft.lb. (20N • m).



8. Add 80W/90 oil in the recommended amount. Install oil dipstick.

9. Between speed sensor and gear top the distance is 1.0 ~ 1.5 mm, adjust the sensor by the screw into the access to the gear, and then go toward outside revolves fixed nut.

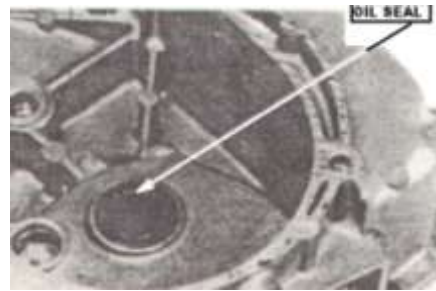


3.4.5 Crankcase and crankshaft

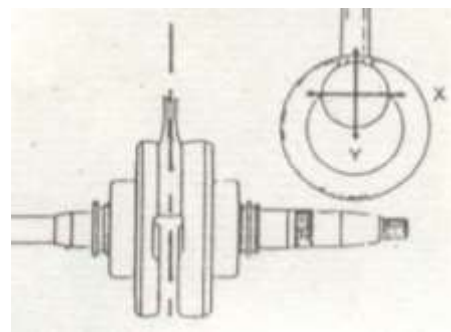
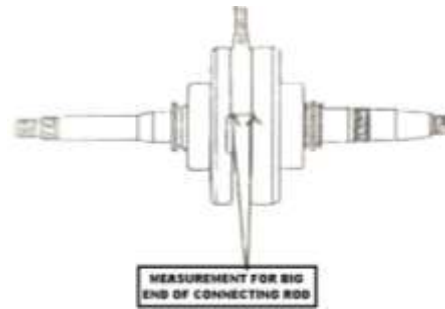
1. Remove chain guide fixing bolt to take out chain.

2. Remove driven gear from crankshaft and inspect gear for wear.

3. Remove crankcase fixing bolts and separate the left crankcase from the right one.



4. Remove gasket fitting pin.



5. Take out crankshaft and timing chain.



6. Clean gasket on crankcase contact face .

NOTE:

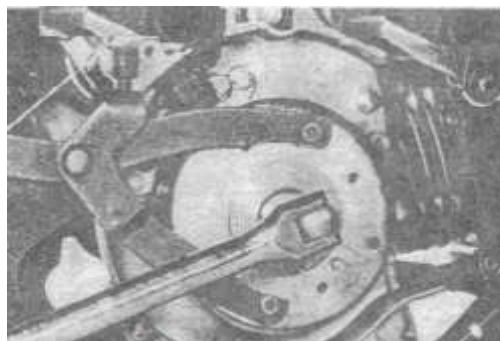
Make sure the contact faces are not scratched to avoid oil leakage.

7. Remove oil seal from crankcase. Inspect oil seal for wear.



8. Measure connecting rod big end side clearance.

Limit : 0.55mm.

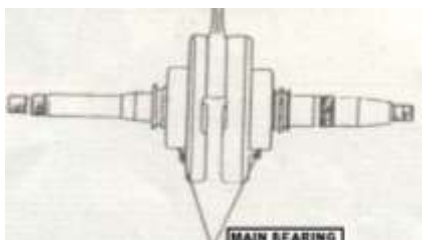


9. Measure big end crankpin diametral clearance.

limit : 0.55mm

10. Measure small end orifice inside diameter.

limit : 15.06mm



4. Inspect crankshaft bearings for abnormal noise and looseness. If so, replace. Install them in the reverse order of removal.

NOTE:

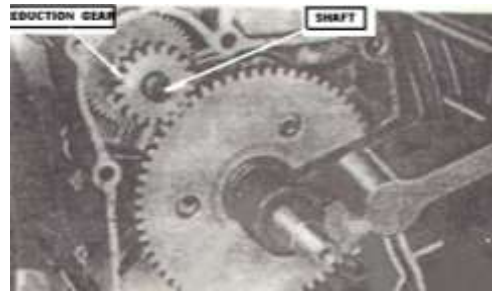
Be sure to drain crankcase oil before crankcase removal.



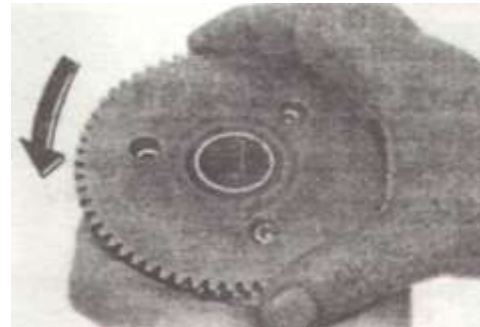
3.4.6 Magneto

1. Remove magneto cover fixing bolts and screws to dismount magneto cover. Inspect cover for damage and cracks.

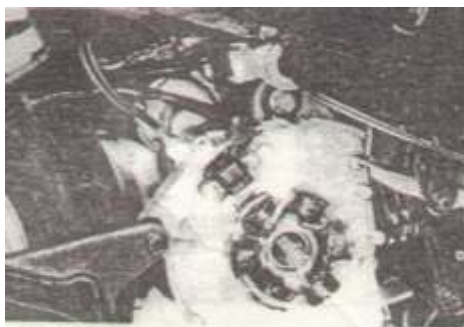
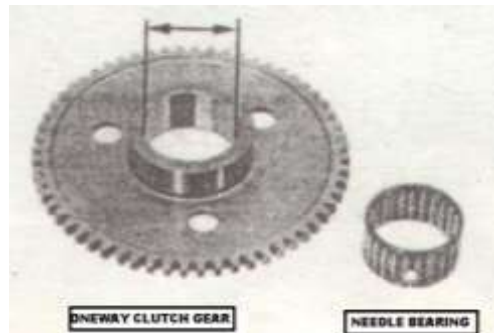
2. Remove 4 fixing bolts to take out fan. Inspect fan for blade aging and cracks. If so, replace.



3. Remove magneto flywheel locknut.



4. Take out magneto rotor using the flywheel puller. Inspect magneto flywheel tapered orifice and key way for wear, scratches and cracks. If so, replace.



5. Remove stator fixing screw to take out stator.
Install it in the reverse order of removal.

NOTE:

As there is magnetism inside the magneto rotor, make sure no metal object is taken in and the inside of the rotor is cleaned out before installation.

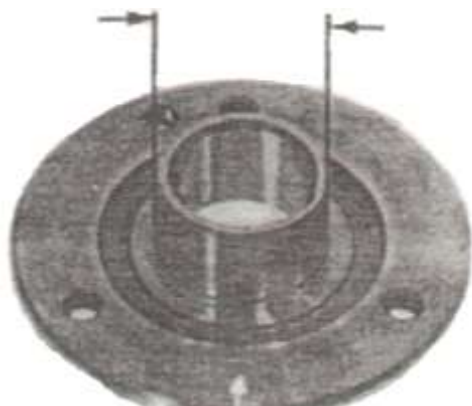
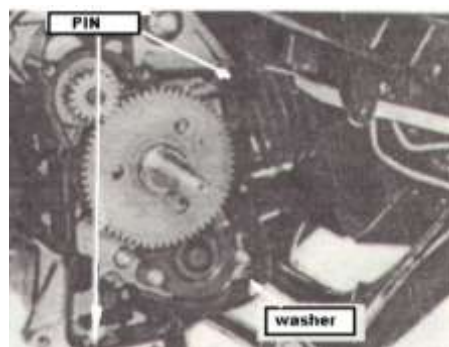
3.4.7 Electric starter

1. Remove starter clutch.
2. Remove idler gear and idle gear shaft.

3. When turning the starter wheel gear counterclockwise, it should turn freely. When turning the starter wheel gear clockwise, it should be engaged.

4. Inspect clutch wheel gear for abnormal wear. If so, replace it with a new one.
5. Measure gear wheel orifice inside diameter. If it goes beyond the limit of 32.06mm, replace.
6. Inspect needle roller bearing for wear. Check if needle roller turns freely in its holder. If it works improperly, replace it with a new one.

7. Take spring, spring sleeve and roller out of clutch outer race. Inspect roller for wear, spring for distortion and out race for wear. If there appears anything abnormal, replace.

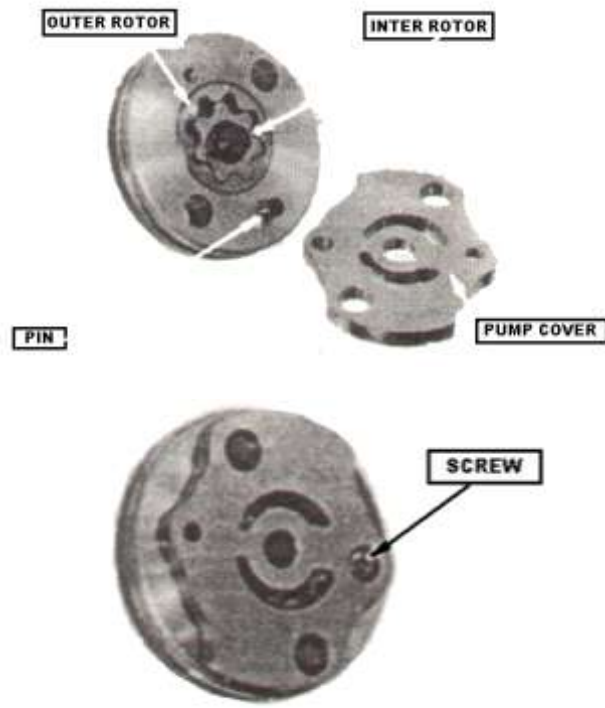


8. Measure clutch disk hub outside diameter.

Limit : 27.94mm

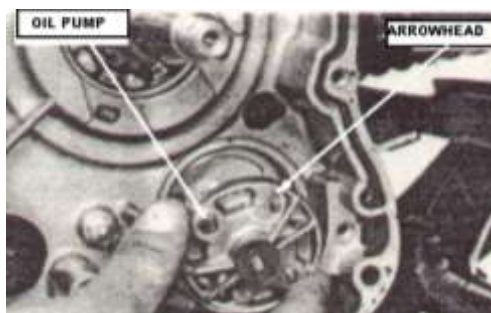
9. Inspect idler gear and idle gear shaft for abnormal wear. If so, replace.

- 10. Measure idle gear shaft orifice inside diameter.
Limit : 10.05mm
 - 11. Measure idle gear shaft outside diameter.
Limit : 9.94mm
- Install them in the reverse order of removal.



3.4.8 Oil pump

- 1. Remove bolts to dismount right crankcase cover.
- 2. Remove gasket and dowel pin. Remove clutch.
- 3. Remove oil pump cover.
- 4. Remove nut to take out oil pump sprocket and chain. Inspect them for abnormal wear. If so, replace

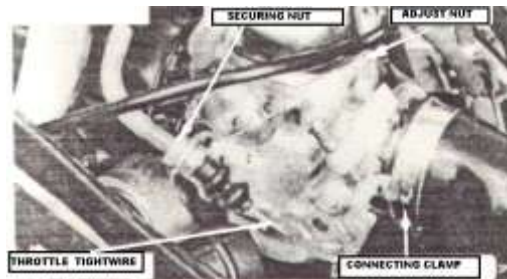


- 5. Measure tip clearance between rotors and pump housing.
Limit : 0.2mm

6. Inspect oil pump inner and outer rotors for abnormal wear. If so, replace the oil pump assembly.



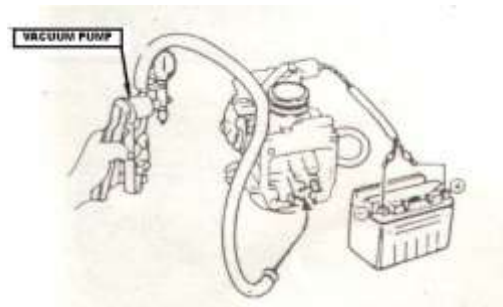
7. Fasten oil pump with screws after assembling.



Install oil pump in the reverse order of removal.

NOTE:

Be sure to point the arrow on the oil pump to the direction of crankshaft in installation and infuse some oil into the pump beforehand.



3.5 CARBURETION

1. Remove auto choke lead coupler.



2. Remove fuel hose and air pressure tube.

3. Remove throttle cable locknut to take out throttle cable. Loosen inlet-valve seat screw and air filter fixing screw to remove carburetor.

NOTE:

Make sure the fuel in the fuel bowl is drained before the carburetor removal lest the cylinder head be sprinkled with the fuel, which is likely to bring about a fire.

4. Inspect auto choke unit.
Connect yellow auto choke unit lead to the positive pole (+) of a battery and green lead to the negative pole (-). Some 5 minutes later, connect a pipe to idle port and blow it with the mouth. Being blocked up means a good condition of the unit. Disconnect the leads from the battery. Around 30 minutes later, blow the pipe with the mouth or a vacuum pump. If it is unblocked, the unit is in good condition.

5. Remove fixing screw to take out auto choke unit.

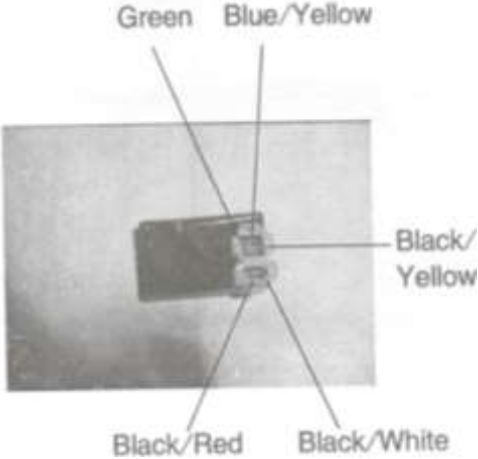
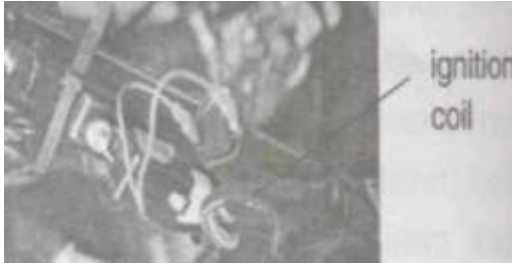
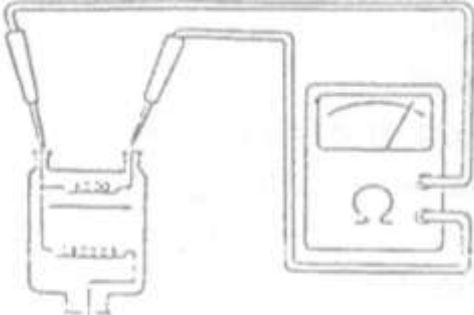
6. Inspect auto choke unit, piston and needle for abnormal wear. If so, replace as a set.

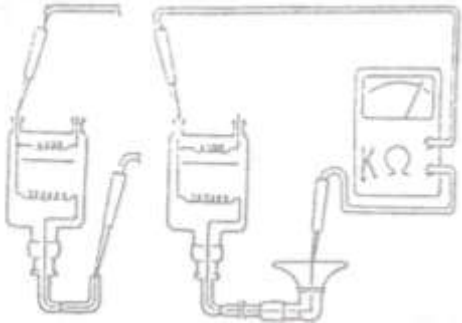
7. Fit auto choke unit on carburetor.


3.6 TIGHTENING TORQUES OF ENGINE MAIN FASTENERS

Description	Thread size	Tightening torque (N•m)
Cylinder head bolt	M6	9
Oil filter screen cover bolt	M30	15
Exhaust pipe nut	M6	9
Camshaft seat nut	M8	20
Valve adjuster lock nut	M5	9
Cam chain tensioner bolt	M6	10
Transmission case drain bolt	M8	19
Clutch drive plate nut	M12	55
Clutch driven disk nut	M12	55
Spark plug	M10	12
Driven clutch wood ruff key nut	M22	95
Case (right & left) and case cover (right & left)	M6	9
Transmission output gear bolt	M8	30

3.7 IGNITION SYSTEM			
3.7.1 INSTALLATION INFORMATION			
OPERATING POINTS			
<ul style="list-style-type: none"> • Check ignition system in accordance with the troubleshooting procedure in section 3.11.2 • As the ignition system has an electric automatic spark control in CDI unit, there is no need for spark advance angle adjustment. • Poor contact may be the cause of many ignition system faulty cases. Check all terminal connections to be sure they are clean and tight whenever troubleshooting an electrical problem. • Make sure spark plug heat range is correct. Using incorrect spark plug will result in improper engine operation or spark plug damage. • Peak voltage is used as reference point in tests. Record coil resistance tests. 			
REFERENCE STANDARD			
item		Standard value	
Specific spark plug		A7TC	
spark plug gap		0.6-0.7mm	
spark plug angle	Maximum advance in "F" position	13°±1°(1700r/min)	
Ignition coil resistance(20°C)	Primary coil		0.1-1.0Ω
	S	Wit	7-9kΩ
	e	h	
c	ca	3-4kΩ	
o	p		
n	Wit		
d	ho	80-160Ω	
ar	ut		
y	ca		
Pickup coil resistance(20°C)		80-160Ω	
Pickup coil peak voltage		Over 2.1V	
3.7.2 TROUBLESHOOTING			
High Tension Voltage Too Low			
<ul style="list-style-type: none"> • Crankshaft revolution too low or battery voltage too low • Ignition system wiring loose • Faulty Ignition coil • Faulty CDI unit • Faulty pickup coil 			
High Tension Voltage Intermittent			
<ul style="list-style-type: none"> • Faulty main switch • Poor CDI terminal connection 			

<ul style="list-style-type: none"> • Poor CDI ground • Faulty pickup coil • Poor high tension lead terminal connection • Faulty CDI unit 	
High Tension Voltage Normal but No Spark	
<ul style="list-style-type: none"> • Faulty spark plug • Faulty spark plug cap 	
No High Tension Voltage	
<ul style="list-style-type: none"> • Faulty main switch • Faulty Ignition coil • Faulty CDI unit 	
No or Intermittent High Tension Voltage	
<ul style="list-style-type: none"> • Faulty Ignition coil 	
3.7.3 CDI INSPECTION	
<p>Disconnect the CDI module from the wire harness</p>	
<p>Test resistance of the terminals with a multi-meter.</p>	
<ul style="list-style-type: none"> • Since there is semiconductor in return circuit, testing result may be significantly different if different multi-meter are used. • If the pointer on the dial flickers and finally stops at ∞ in testing, it should be regarded as normal. Because the capacitor in the CDI module is charged while being tested and it cannot discharge at this time. 	
3.7.4 IGNITION COIL	
Removal Steps	
Remove the middle box.	
Remove the spark plug cap.	
Disconnect the wires, remove ignition coil	
Jam nuts and remove the ignition coil.	
Inspection	
Check the ignition coil circuit.	
<p>The spark advance angle does not need to be adjusted.</p> <p>If spark advance is abnormal, check the CDI, pickup coil or magneto.</p> <p>Replace the ignition coil if necessary.</p>	

<p>Test the primary coil resistance, the standard value of which should be 0.1-1.0Ω.</p>	
<p>Test the secondary coil resistance from spark plug cap negative terminals, the standard value of which should be 7-9kΩ(with cap) and 3-4kΩ(without cap). Coil test using after market spark tester.</p>	
	<p>Perform the following inspection in accordance with the operating instructions in the Manual.</p> <p>1. Set the ignition coil tester switch in 12V and connect the tester to the ignition coil.</p> <p>2. Turn the switch to the ON position to check spark frequency from the inspection door.</p> <ul style="list-style-type: none"> ● In good condition: Sparking continuously ● In faulty condition: Sparking abnormally

<p>3.7.5 MAGNETO</p>	
<p>Pickup Coil Inspection</p>	
<p>This test is to be conducted with the stator mounted in the engine.</p>	
<p>Remove the cover.</p>	
<p>Disconnect the magneto.</p>	
<p>Test the pickup coil resistance between the blue/yellow and the green lead terminals, whose standard value is 80-160Ω.</p>	
<p>Dismounting the magneto.</p>	
<p>Charging Coil Inspection(for MINI ATV100/150)</p>	
<p>Test the charging coil resistance between the black/red and the green lead terminals, whose standard value is 450-550Ω.</p>	
<p>Spark Advance Angle Inspection</p>	

<p>Since CDI is used, there is no need to adjust the timing advance.</p> <p>If the spark advance is abnormal, inspect CDI, pickup coil or magneto. Replace if necessary.</p>	
<p>Remove timing lid.</p>	
<p>After the engine is warmed up, check the spark advance angle by the spark timing lamp. It is proper for "F" to align within $\pm 2^\circ$ with the engine revolving at a speed of 1700rpm.</p>	
<p>The spark advance angle should be $13^\circ \pm 1^\circ$ (1700r/min)</p>	

CHAPTER 4 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.

4.1 FRONT A-ARM REPLACEMENT

4.2 REAR A-ARM REPLACEMENT

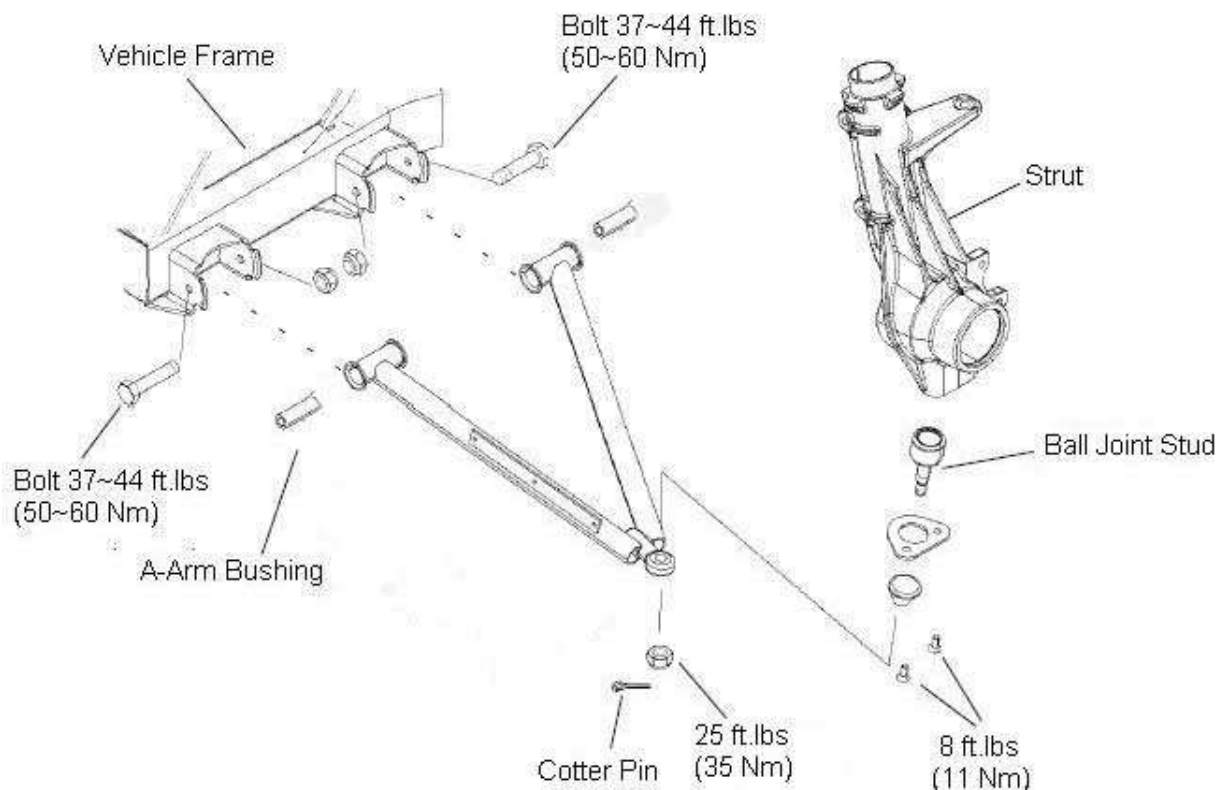
4.3 REAR STABILIZER BAR REMOVAL/INSTALLATION

4.4 FRONT STRUT REPLACEMENT

4.5 FRONT STRUT BALL JOINT REPLACEMENT

4.6 BOX REMOVAL/INSTALLATION

4.7 STEERING ASSEMBLY REMOVAL/INSTALLATION

4.1 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

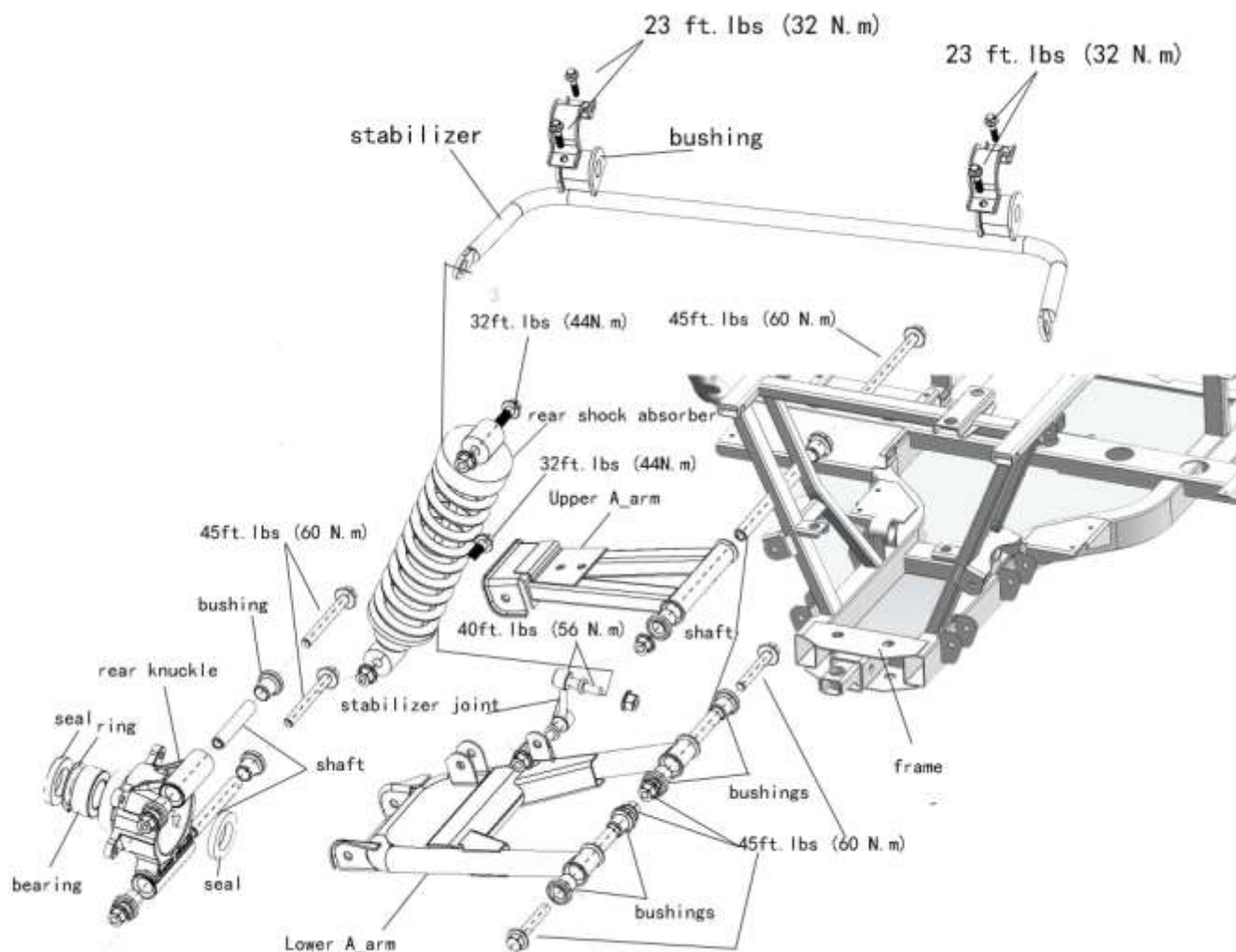
DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

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.

4.2 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.

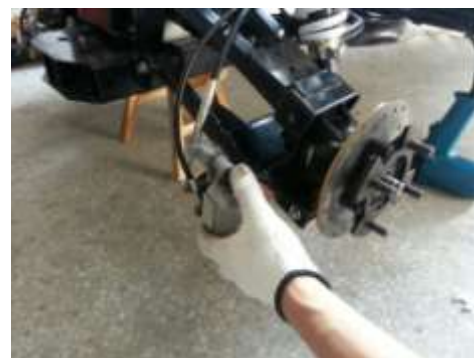
3. Remove the hub cap, cotter pin, spindle bolt, and washer.

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 and coil to the lower A-arm.



7. Loosen the bolt that secure the A-arm to frame by alternating each about 1/3 of the way until A-arm can be removed. Perform this procedure on the upper A-arm.
8. Examine the A-arm bushing and A-arm shaft. Replace if worn. Discard hardware.

9. Remove the bottom stabilizer bar nut.

10. Loosen two bolts that secure the A –arm bushing to frame by alternating each about 1/3 of the way until the A-arm can be removed. The lower A-arm should now be free to remove.
11. Insert new A-arm bushings and new A-arm shaft 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

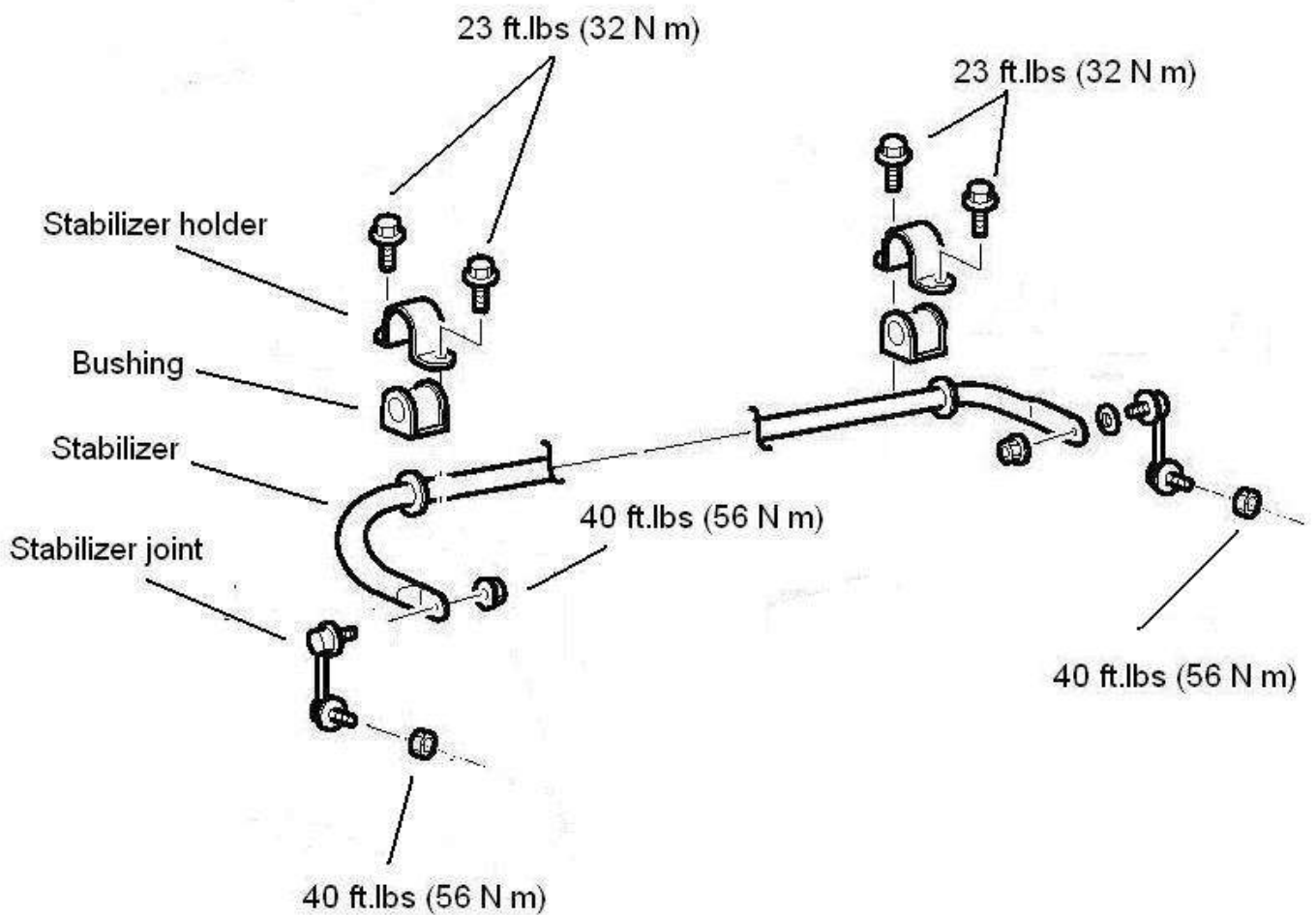
DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

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

4.3 REAR STABILIZER BAR REMOVAL/INSTALLATION



3. Remove the stabilizer bar nut from the lower A-arm, each side.



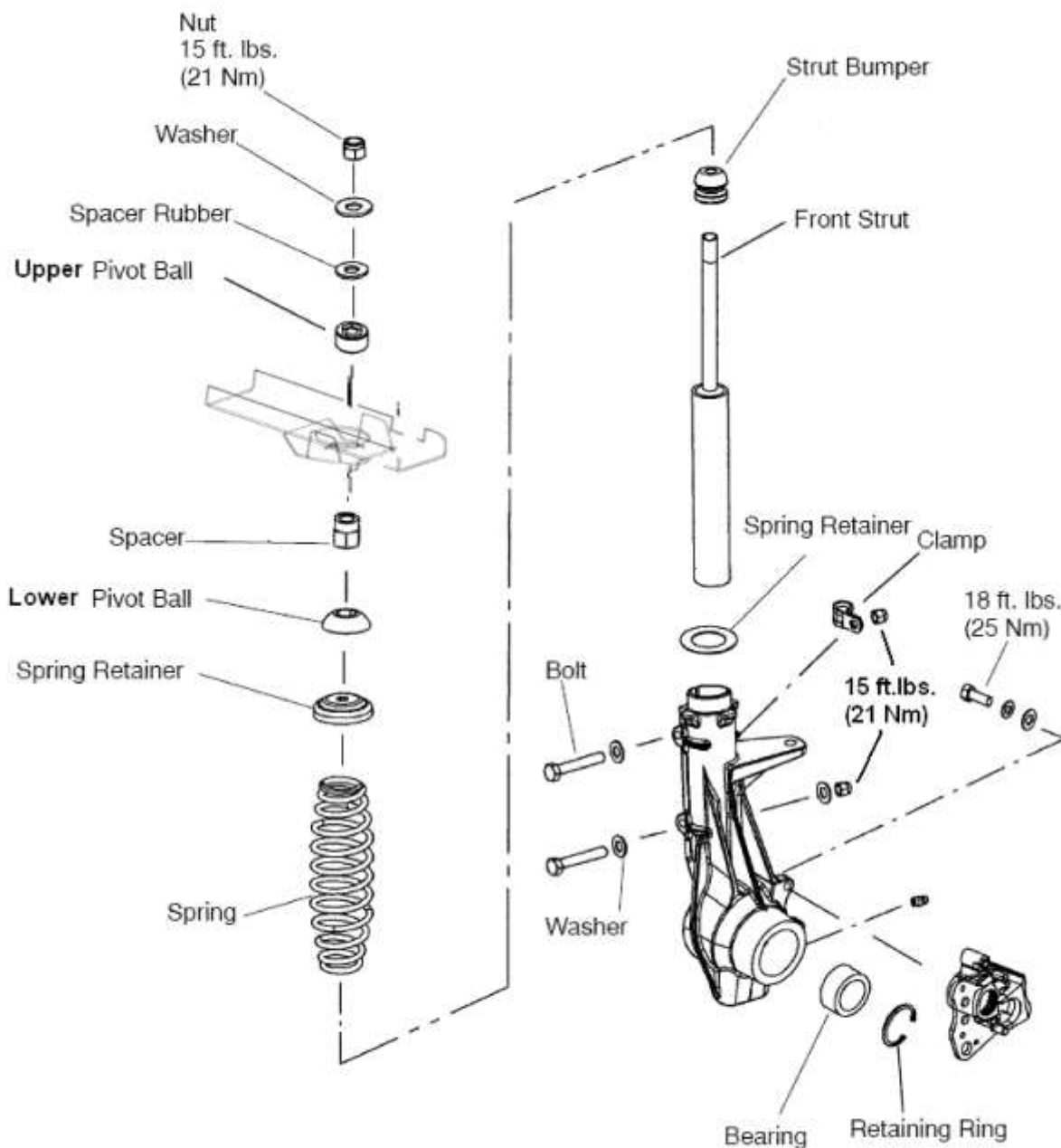
4. Remove the two bolts that secure the stabilizer bar to the main frame, each side.

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.



- Reverse the procedure for installation. Torque the stabilizer bolts to 23 ft.lbs (32 Nm).

4.4 FRONT STRUT REPLACEMENT



- Hold strut rod with wrench and remove top nut.
- Compress spring.
- Remove upper strut pivot assembly.
- Remove coil spring and collapse strut body.
- Remove two pinch bolts from strut body.
- Remove strut body.

7. Install front shock cartridge until bottomed in strut casting.
8. Install pinch bolts with clamp(s). Torque pinch bolts to 15ft.lbs.(21Nm).
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)

4.5 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.

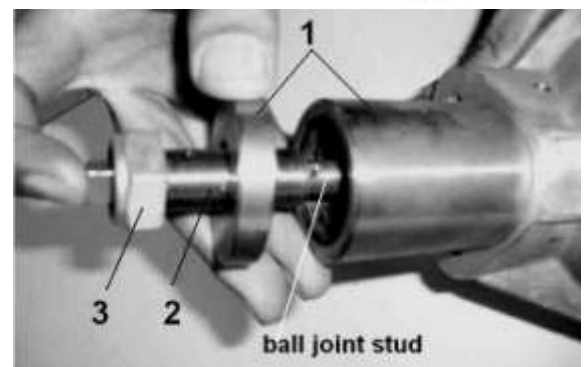
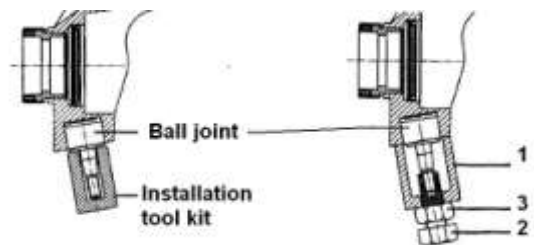
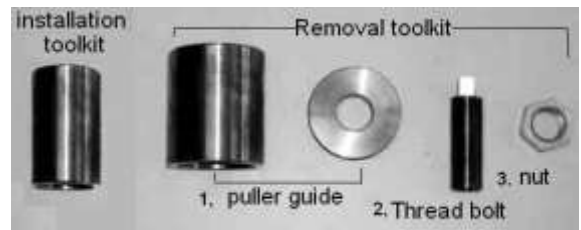
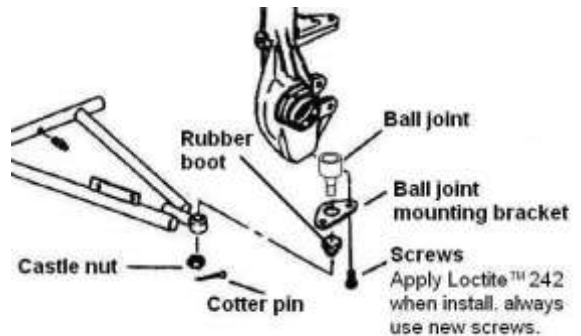
3. Remove wheel nuts and wheels.
4. Remove cotter pin from ball joint
5. Remove castle nut and separate A- arm from ball joint stud.
6. Remove screws and ball joint mounting bracket.
7. Using ball joint cup removal/installation toolkit, remove ball joint cup from strut housing. Refer to photos at right.

- Install puller guide (1) .
- Thread bolt (2) with nut (3) onto bal 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 screw s to 8 ft.lbs. (11 Nm).

10. Install A- arm on bal joint cup and torque castle nut to 25 ft. lbs. (35 Nm).
11. Reinstall cotter pin with open ends toward rear of machine.



4.6 BOX REMOVAL/INSTALLATION

Box Removal

1. Disconnect the license light coupler.
2. Lift the box into the dump position.
3. Remove the box shock pin from the frame (both sides).
4. Remove the shocks from the shock brackets. Let the shocks fully extend.

CAUTION: Safely support the box during the rest of the removal process. The box is not as stable with the shocks removed.

5. Remove the cotter pin from the hinge pin.
6. Remove the hinge pin (both sides).

CAUTION: Safely support the box during the rest of the removal process. The box is not as stable with the hinge pin removed.

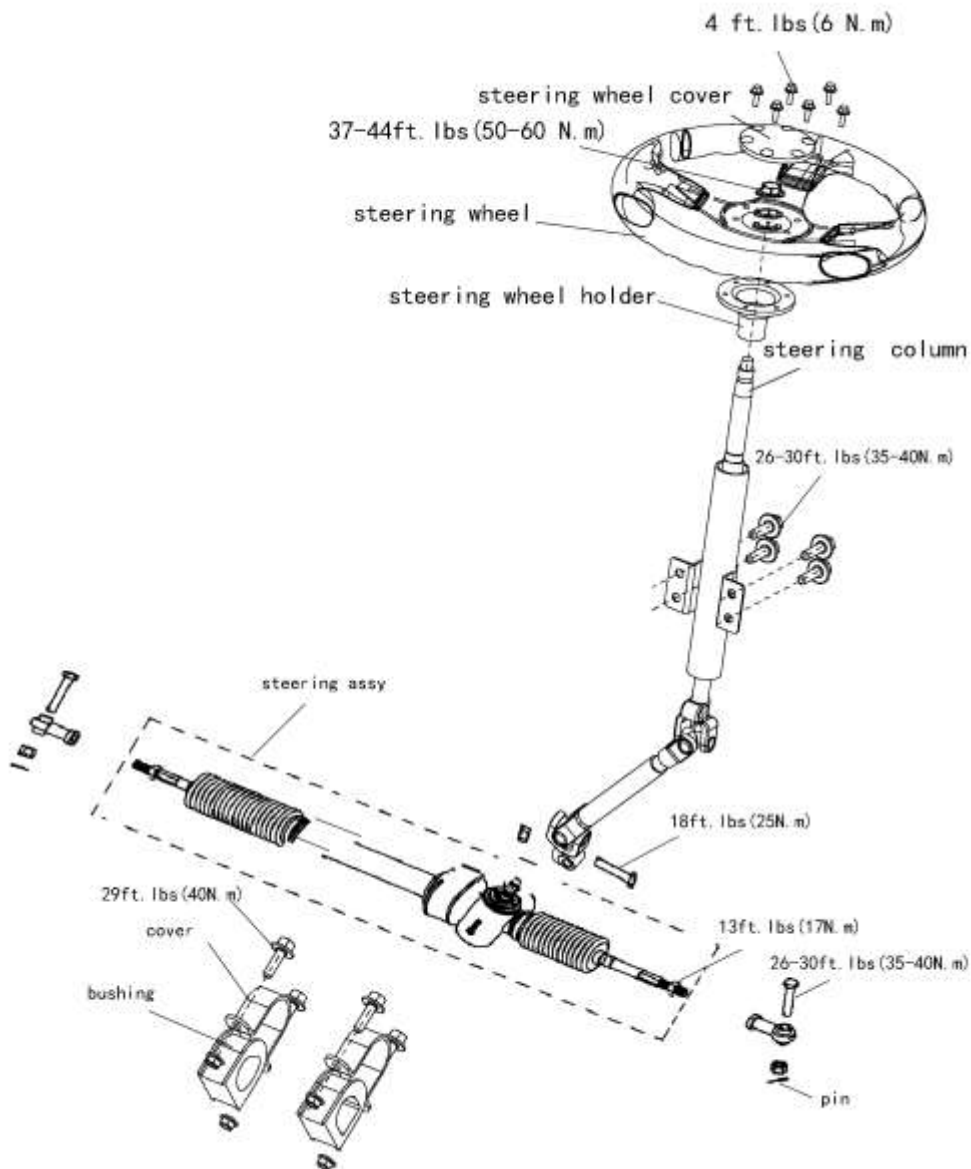
7. With the hinge pins removed, remove the box from the frame. Two people maybe needed to remove the bed from the frame.

CAUTION: Use caution when removing the box. It is recommended to have two people to carefully remove the box from the frame.



Box Installation

1. Place the box onto the frame. Align the hinges of the box with the frame.
2. Install the box hinges (both sides).
3. Secure the box hinges with the cotter pins (both sides).
4. With the hinges installed, decompress the box shocks and place them into the shock brackets on the frame (both sides).
5. Secure the box shocks with the shock pin (both sides).
6. Lower the box and secure the latch.
7. Connect the taillight coupler.

4.7 STEERING ASSEMBLY REMOVAL/INSTALLATION

1. With the steering wheel cover bolts removed, remove the steering wheel cover and the steering wheel.
2. With the steering wheel holder nut removed, remove the steering wheel holder.
3. Remove the steering column bolts.
4. 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 5 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.

- 5.1 WHEEL, HUB, AND SPINDLE TORQUE TABLE
- 5.2 FRONT HUB EXPLODED VIEW
- 5.3 FRONT HUB REMOVAL/INSPECTION
- 5.4 FRONT HUB INSTALLATION
- 5.5 FRONT HUB BEARING REPLACEMENT
- 5.6 REAR HUB EXPLODED VIEW
- 5.7 REAR HUB AND KNUCKLE REMOVAL/INSPECTION
- 5.8 REAR HUB AND KNUCKLE INSTALLATION
- 5.9 REAR DRIVE SHAFT REMOVAL
- 5.10 REAR DRIVE SHAFT INSTALLATION

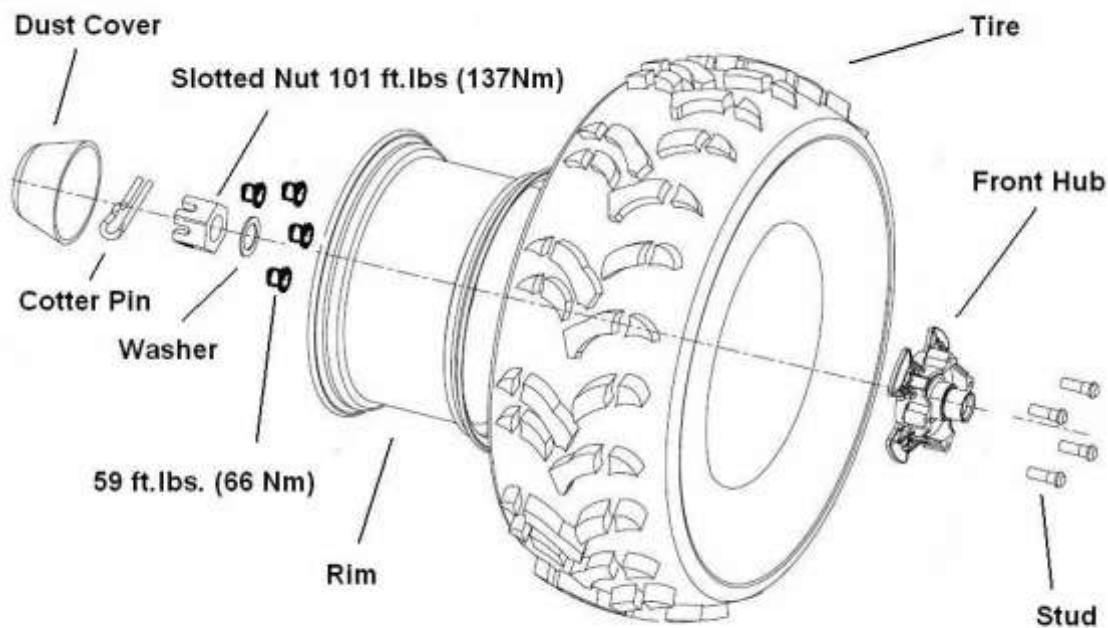
5.1 WHEEL, HUB, AND SPINDLE TORQUE TABLE

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

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.

5.2 FRONT HUB EXPLODED VIEW



5.3 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.

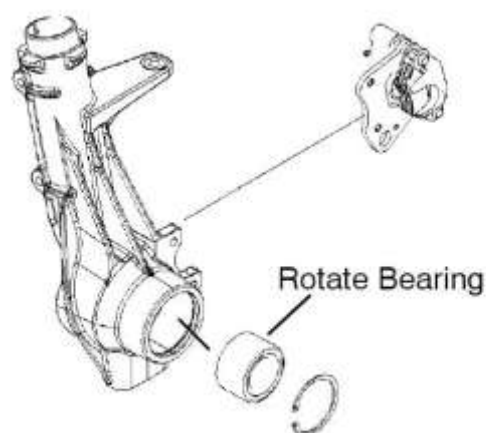
CAUTION: Do not hang the caliper by the brake line. Use wire to hang the caliper to prevent possible damage to the brake line.



6. Remove hub cap, cotter pin, front spindle nut, and washer.



7. Rotate each bearing by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion, or roughness is evident.



5.4 FRONT HUB INSTALLATION

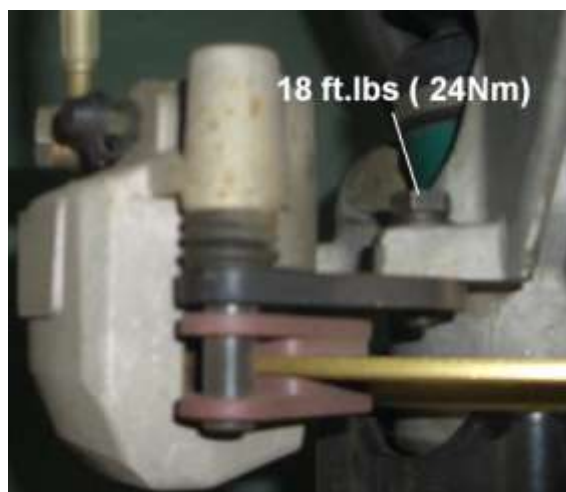
1. Inspect the hubstrut bearing surface for wear or damage.
2. Apply grease to drive axle spindle.
3. Install spindle through the backside of the hubstrut. Install the hub onto the spindle.
4. Install spindle nut and tighten to 101 ft.lbs (137 Nm).
5. Install a new cotter pin. Tighten nut slightly if necessary to align cotter pin holes.
6. Rotate wheel and check for smooth operation. Bend both ends of cotter pin around end of spindle in different directions. Install hub cap.



7. Rotate hub. It should rotate smoothly without binding or rough spots or side play.
8. Install brake caliper using new bolts. (Apply Loctite™ 242 to threads) Tighten bolts to 18 ft.lbs (24 Nm)

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

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



5.5 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.

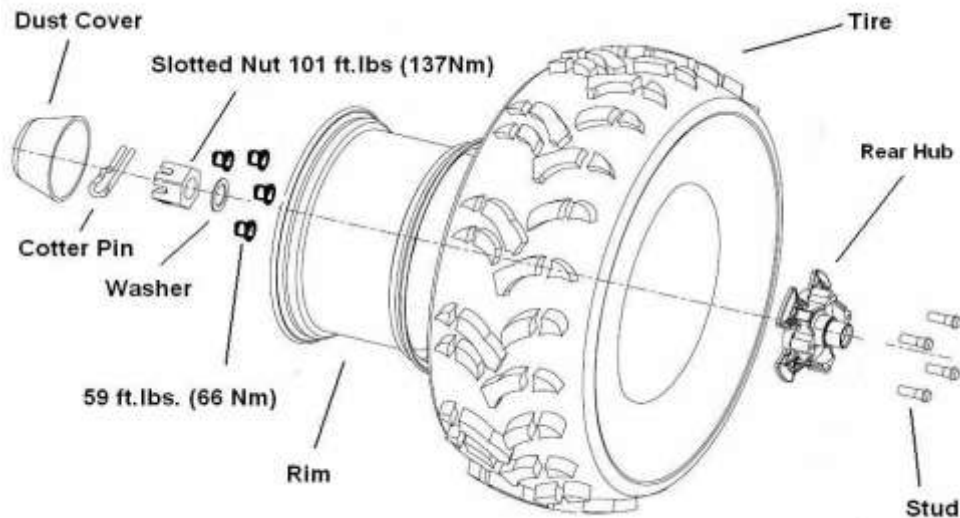


4. Inspect bearing.

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.

5.6 REAR HUB EXPLODED VIEW



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



5.8 REAR HUB AND KNUCKLE INSTALLATION

1. Start 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. Torque the top and bottom A-arm bolts as shown in the photo.
5. Install the washer and the spindle retainer nut.
6. Install the wheel and wheel nuts. Torque wheel nuts to 59 ft.lbs. (66 Nm).
7. Lower the vehicle. Torque the spindle retaining nut to 101 ft.lbs. (137 Nm). Install a new cotter key and the hub cap.
8. Install brake caliper using new bolts. (Apply Loctite™ 242 to threads) Tighten bolts to 18 ft.lbs (24 Nm)



5.9 REAR DRIVE SHAFT REMOVAL

1. Repeat of the steps in the “REAR HUB AND KNUCKLE REMOVAL” section.
2. Slide the rear drive axle out of the knuckle by pulling the hub and knuckle assembly outward and down.

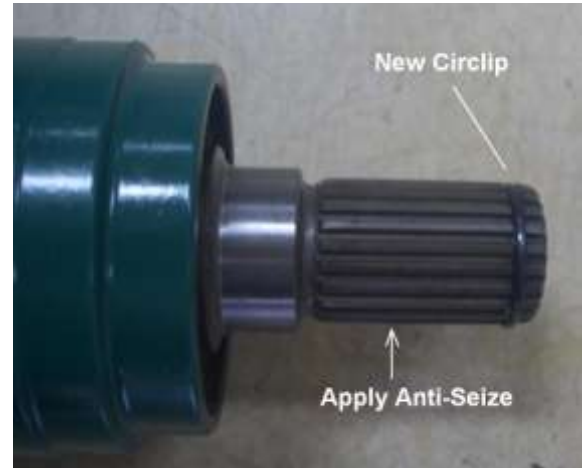


3. Pull the rear drive axle straight out of the frame. Use short sharp jerks to free the circlip from the gearcase. The circlip holds the axle in the gearcase.
4. Inspect the axle splines and cv boots for any damage.



5.10 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 axle into the knuckle.
4. Lift knuckle into place and install bolt to upper and lower control arm. Torque bolt to 44 ft.lbs (60 Nm).
5. Install the washer and the spindle retainer nut.
6. Install the wheel and wheel nuts. Torque wheel nuts to 59 ft.lbs. (66 Nm).

7. Lower the vehicle. Torque the spindle retaining nut to 101 ft.lbs. (137 Nm). Install a new cotter key and the hub cap.
8. Install brake caliper using new bolts. (Apply Loctite™ 242 to threads) Tighten bolts to 18 ft.lbs (24 Nm)

CHAPTER 6 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.

6.1 SPECIFICATIONS

6.2 TORQUE

6.3 BRAKE SYSTEM SERVICE NOTES

6.4 BURNISHING PROCEDURE

6.5 BRAKE BLEEDING-FLUID CHANGE

6.6 PARKING BRAKE AND BRAKE LINE INSPECTION

6.7 PARKING BRAKE ADJUSTMENT

6.8 PARKING BRAKE REAR CALIPER REMOVAL/INSTALL

6.9 FRONT PAD INSPECTION / REMOVAL / REPLACEMENT

6.10 FRONT DISC INSPECTION / REMOVAL / REPLACEMENT

6.11 FRONT CALIPER REMOVAL/ INSPECTION / INSTALLATION

6.12 REAR BRAKE PAD REMOVAL/ INSPECTION / INSTALLATION

6.13 REAR CALIPER REMOVAL/ INSPECTION/ INSTALLATION

6.14 REAR BRAKE DISC INSPECTION / REMOVAL / REPLACEMENT

6.1 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 "/ 0.051m m
Brake Disc Run out	-	0.005 "/0 .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

6.2 TORQUE

Item	Torque (ft. lbs. except where noted*)	Torque (Nm)
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

6.3 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.

6.4 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 40 km/h (24 mph) and to brake to a stop.
2. Using hi gear, accelerate to 40 km/h (24 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 the 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.

6.5 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.

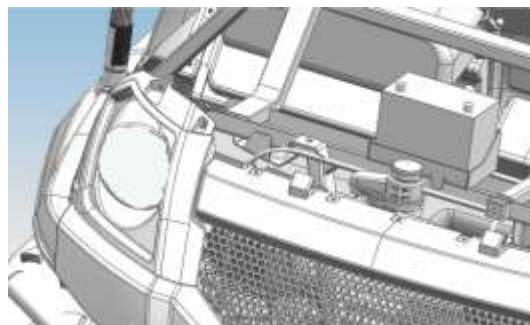
CAUTION:

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 up to the indicated MAX level on the 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.

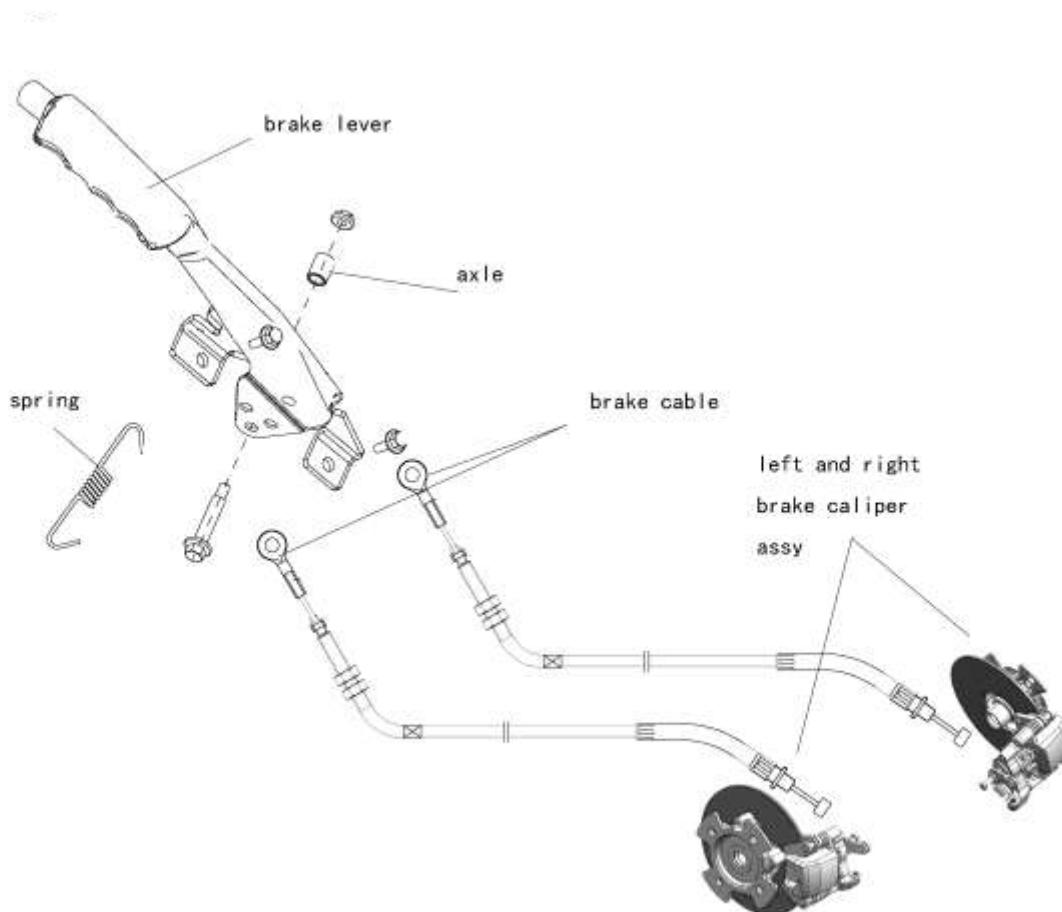
10. Repeat procedure steps 5- 9 for the remaining calipers.

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 " (1.3cm).
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.

6.6 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.



6.7 PARKING BRAKE ADJUSTMENT

Parking Brake Inspection

1. Push the parking brake up with your hand.
2. After 2 to 4 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 (A) on the rear caliper adjustment bolt (B).
4. Tighten the adjustment bolt (B) until the rear tire



will not rotate.

5. Back the adjustment bolt (B) out 1/4 turn.
6. Tighten the jam nut (A) while holding the adjustment nut (B) in place.

6.8 PARKING BRAKE REAR CALIPER REMOVAL / INSTALL

Park Brake Caliper Disassembly / Pad Inspection

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

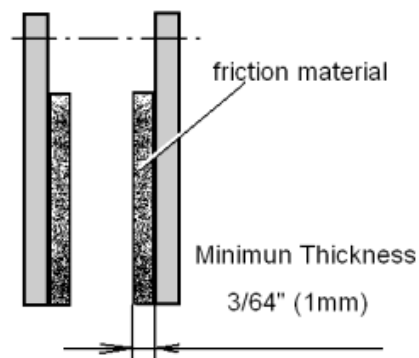
1. Loosen the two brake caliper bolts in equal increments. Remove the bolts from the bracket and lift park brake assembly out.



2. Measure the thickness of the caliper parking brake pads. Replace pads if worn beyond the service limit.
Service Limit 0.3/64" (1 mm)

Park Brake Caliper Installation

1. Install the park brake assembly into place. Tighten the two bolts in increments for proper installation.
2. Torque the two bolts to 18 ft.lbs. (24 Nm).
3. Test the park brake for proper function.



6.9 FRONT PAD REMOVAL / INSPECTION / INSTALLATION

NOTE: The brake pads should be replaced as a set
REMOVAL

1. Elevate and support front of CUV safely.

CAUTION:

Use 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 wheel.

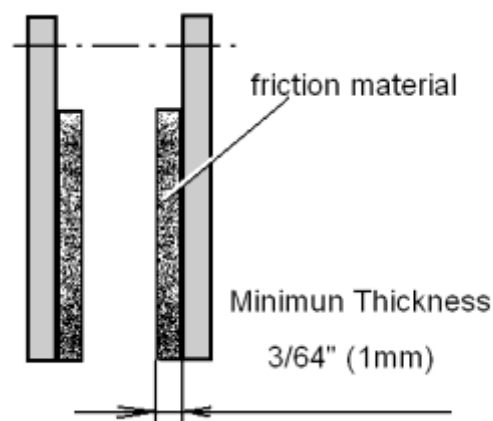


3. Remove the two caliper bolts and caliper from mounting bracket.

4. 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.

5. Push mounting bracket inward and slip out brake pad past edge. Remove inner pad.



INSPECTION

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

Service Limit 0.3/64"(1 mm)

INSTALLATION

1. Lubricate mounting bracket pins with a light film of All Season Grease, and install rubber dust boots.
2. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other. Be sure pads and disc are free of dirt or grease.
3. Install caliper on hub strut, and torque mounting bolts.

Front Caliper Mounting Bolts

Torque 18 ft. lbs. (25 Nm)

4. 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.
5. Install the adjuster screw and turn clockwise until stationary pad contacts disc, then back off 1/2 turn (counter clockwise).
6. Be sure fluid level in reservoir is up to MAX line inside reservoir and install reservoir cap.

Master Cylinder Fluid

Up to MAX line inside reservoir

7. Install wheels and torque wheel nuts.
8. 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.

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



CAUTION:

Always use new brake disc mounting bolts.

**Front Brake Disc Mounting Bolt Torque :
18 ft. lbs. (25 Nm)**

6.11 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 Nm)

2. Install brake hose and tighten to specified torque.

Banjo Bolt Torque: 15 ft. lbs. (21 Nm)

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.

6.12 REAR BRAKE PAD REMOVAL/ INSPECTION / INSTALLATION

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

REMOVAL

1. Elevate and support rear of CUV safely.

CAUTION:

Use 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 wheel.
3. Remove the two caliper bolts and lift caliper off of disc.

NOTE: When removing caliper, be careful not to

damage brake line. Support caliper so as not to kink or bend brake line.

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

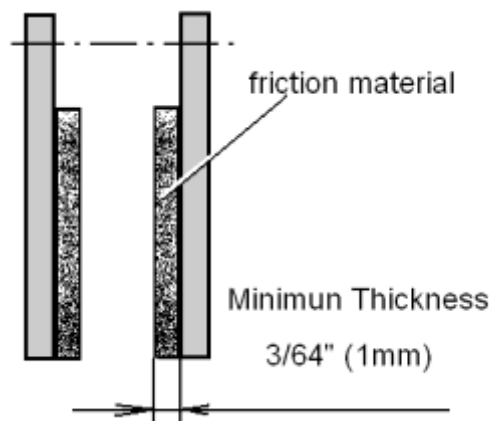
NOTE: Brake fluid will be forced through compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

5. Remove the brake pads.
6. Clean the caliper with brake cleaner or alcohol.

INSPECTION

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

Service Limit 0.3/64"(1 mm)



INSTALLATION

1. Install new pads in caliper body.
2. Install caliper and torque mounting bolts.
Brake Caliper Torque: 18 ft. lbs. (25 Nm)
3. Turn adjuster screw back in finger tight using a hex wrench.
4. 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.
5. Install wheels, burnishing procedure should be performed.

6.13 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.

CAUTION:

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

1. Safely support the rear of the machine.
2. Use a wrench to remove the brake line. Place a container to catch brake fluid draining from brake lines.
3. After the fluid has drained into the container, remove the caliper mounting bolts and remove caliper.
4. Remove brake pad 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 Nm).
8. Install brake hose and tighten to specified torque.

Banjo Bolt Torque: 15 ft. lbs. (21 Nm)

9. Bleed.
10. 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.
11. 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.



6.14 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 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. 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.

Tighten to specified.

Rear Brake Disc Mounting Bolt Torque :**18 ft. lbs. (25 Nm)****CAUTION:**

Always use new brake disc mounting bolts.

CHAPTER 7 ELECTRICAL

- 7.1 PARTS INSPECTION AND SERVICE
- 7.2 BATTERY
- 7.3 IGNITION SYSTEM
- 7.4 CHARGING SYSTEM
- 7.5 ELECTRICS STARTING SYSTEM
- 7.6 LIGHTING SYSTEM
- 7.7 REVERSE LIMIT SYSTEM
- 7.8 GEAR POSITION INDICATOR SWITCH TEST
- 7.9 SPEEDOMETER SYSTEM
- 7.10 MAIN SWITCH
- 7.11 FUEL GAUGE/ FUEL LEVEL SENSOR
- 7.12 WIRING DIAGRAM

7.1 PARTS INSPECTION AND SERVICE

A HEADLIGHT ADJUSTMENT

1. Use bulb 12V 35W/35W.
2. Remove the black sheath, turning the socket counterclockwise and take it out. Turning the bulb counterclockwise and Remove it from the socket.
3. Change the bulb.



HEADLIGHT ADJUSTMENT

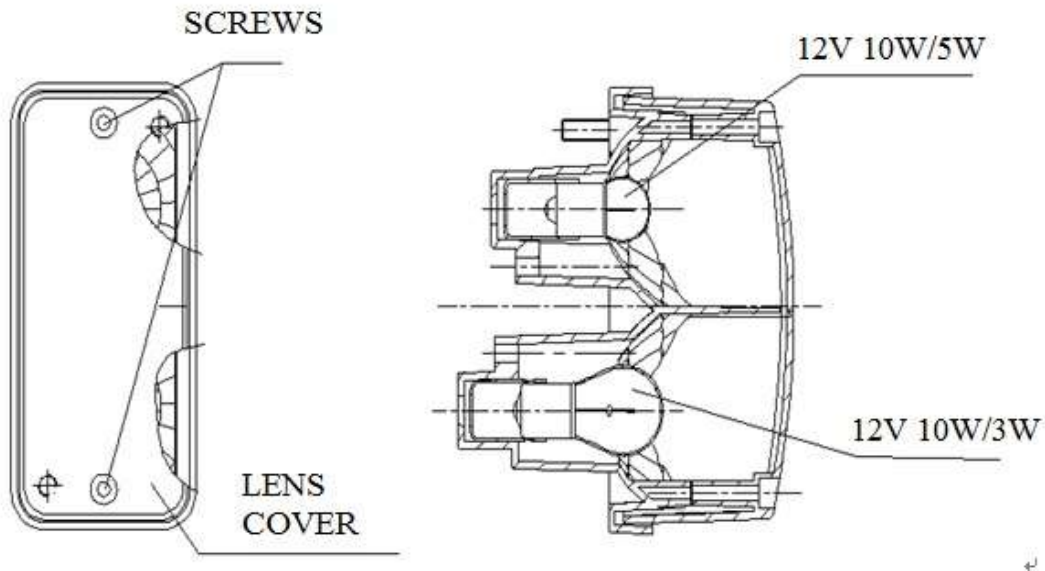
1. The headlight beam can be adjusted vertically.
2. Place the vehicle on a level surface with the headlight approximately 33in(10m) from a wall.
3. Measure the distance from the floor to the center of the headlight and make a mark on the wall at the same height.
4. Start the engine and turn the headlight switch to high beam.
5. Observe headlight aim. The most intense part of the headlight beam should be aimed 86mm to 129mm below the mark placed on the wall in step 2. **NOTE :** Riding weight must be included on the seat.
6. Loosen but not remove pivot bolt/ screw and adjust beam to desired position.
7. Tighten nut and bolt / screw.



To turn the two adjusting screws backward is to lower the beam. To turn the two adjusting screws forward is to heighten the beam.

TAILLIGHT / BRAKELIGHT LAMP REPLACEMENT

1. From the rear of the taillight remove two screws holding lens cover in place and remove lens cover.
2. Remove lamp and replace it with recommended lamp.
3. Reinstall the lens cover removed in step 1.
4. Test the taillight / brake light.



7.2 BATTERY

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

External: Flush with water.

Internal: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries.

KEEP OUT OF REACH OF CHILDREN

WARNING: The gases given off by a battery are explosive. Any spark or open flame near a battery can cause an explosion which will spray battery acid on anyone close to it. If battery acid gets on anyone, wash the affected area with large quantities of cool water and seek immediate medical attention.

INSTRUCTIONS FOR SEALED TYPE DRY CHARGED STORAGE BATTERY

This battery is dry and charged, which means that it starts operating when being filled with the electrolyte and sealed with the sealing plugs.

To fill the electrolyte proceed as follows:

(1) Place the battery on a level place, and tear down the sealed tape on even place.

(2) Softly inlay the filling funnel on the ports the storage battery.

(3) Take out the electrolyte container. Put it down straightly. Then pour through the funnel to the ports.

CAUTION: Unless the electrolyte container is pushed in straightly, the battery may fall down, from which spillages may cause loss of eyesight and/or burns.

(4) Be sure that bubbles are generating in all 6 cells of the electrolyte container and the level of electrolyte should be down.

CAUTION: If there is any cell which does not produce bubbles, tap it softly with finger and filling will start.

Removing the electrolyte container from the battery is not necessary.

BATTERY TESTING

Whenever a service complaint is related to either the starting or charging systems, the battery should be checked first.

Following are three tests which can easily be made on a battery to determine its condition: OCV Test, Specific Gravity Test and Load Test.

MF (Maintenance Free) battery does not require the Specific Gravity Test and Refill**Open Circuit Voltage Test**

Battery voltage should be checked with a digital multimeter. Readings of 12.6 or less require further battery testing and charging.

NOTE: Lead acid batteries should be kept at or near a full charge as possible.

Load test

CAUTION: Remove spark plug high tension leads and connect securely to engine ground before proceeding.

NOTE: This test can only be performed on machines with electric starters. This test cannot be performed with an engine or starting system that is not working properly.

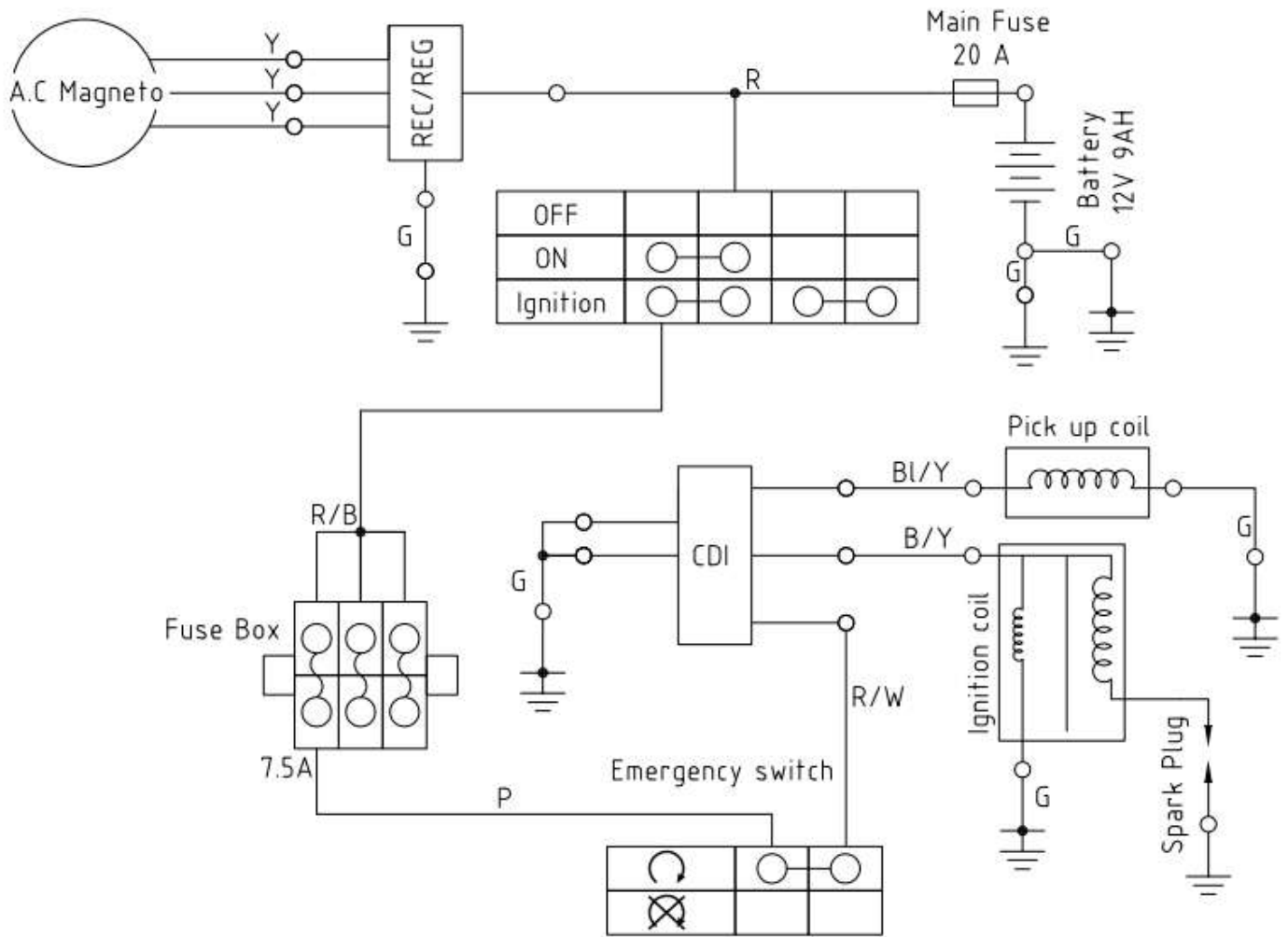
A battery may indicate a full charge condition in the OCV test and the specific gravity test, but still may not have the storage capacity necessary to properly function in the electrical system. For this reason, a battery capacity or load test should be conducted whenever poor battery performance is encountered. To perform this test, hook a multimeter to the battery in the same manner as was done in the OCV test. The reading should be 12.6 volts or greater. Engage the electric starter and view the registered battery voltage while cranking the engine. Continue the test for 15 seconds. During this cranking period, the observed voltage should not drop below 9.5 volts. If the beginning voltage is 12.6 or higher and the cranking voltage drops below 9.5 volts during the test, replace the battery.

7.3 IGNITION SYSTEM

IGNITION SYSTEM TROUBLESHOOTING

No Spark, Weak or Intermittent Spark

- Spark plug gap incorrect
- Fouled spark plug
- Faulty spark plug cap or poor connection to high tension lead
- Related wiring loose, disconnected, shorted, or corroded
- Emergency switch faulty
- Terminal board or connections wet, corroded
- Poor ignition coil ground (e.g. coil mount loose or corroded)
- Faulty stator (measure resistance of all ignition related windings)
- Incorrect wiring (inspect color coding in connectors etc.)
- Faulty ignition coil winding (measure resistance of primary and secondary)
- Worn magneto (RH) end crankshaft bearings
- Sheared flywheel key
- Flywheel loose or damaged
- Trigger coil air gap too wide (where applicable) should be 0.030-0 .050" (0. 75-1.25 mm)
- Excessive crankshaft run out on magneto (RH) end should not exceed 0.005" (0.13mm)
- Faulty CDI module



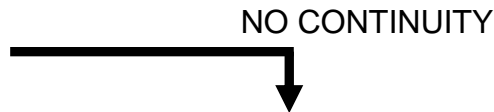
IF THE IGNITION SYSTEM FAILS TO OPERATE

Procedure

Check:

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Fuse (Main) 2. Battery 3. Spark plug 4. Ignition spark gap 5. Spark plug cap resistance 6. Ignition coil | <ol style="list-style-type: none"> 7. Pickup coil resistance 8. Main switch 9. Engine stop switch 10. Wiring connection (entire ignition system) |
|--|--|

1. Fuse



NO CONTINUITY

Check switches

Replace the fuse.



2. Battery



INCORRECT

- Check the battery condition. Refer to "BATTERY TESTING"

- Clean battery terminals.
- Recharge or replace the battery.



3. Spark plug



OUT OF SPECIFICATION

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.

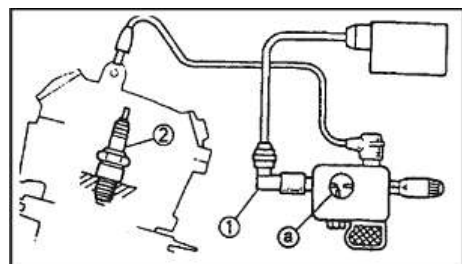
Repair or replace the spark plug

Spark plug gap: $0.7 \pm 0.1\text{mm}$



4. Ignition spark gap

- Disconnect the spark plug cap from the spark plug
- Connect the ignition tester ① as shown.
- (② Spark plug)

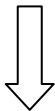


- Turn the main switch to "ON".
- Check the ignition spark gap .
- Check the spark by pushing the ignition switch, and increase the spark gap until a misfire occurs.



**Minimum spark gap:
6mm (0.24 in)**

OUT OF
SPECIFICATION
OR
NO SPARK



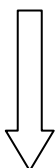
5. Spark plug cap resistance

- Remove the spark plug cap.
 - Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap.
- NOTE:
- When removing the spark plug cap, do not pull the spark plug cap from high tension cord.
 - Remove → Turning counterclockwise
 - Connect → Turning clockwise.
 - Check the high tension cord when connecting the spark plug cap.
 - When connecting the spark plug cap, cut the high tension cord about 5mm.



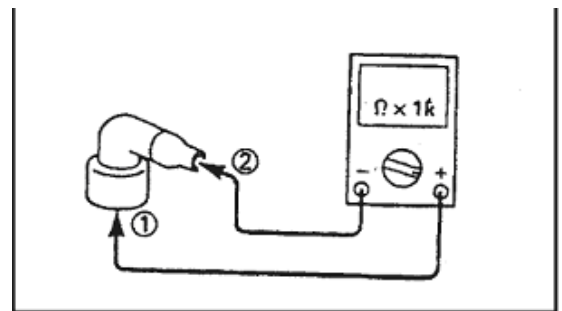
**Spark plug cap
resistance:
 $5K\Omega \pm (20^\circ C)$**

CORRECT



MEETS SPECIFICATION
The ignition system is not faulty.

Tester (+) lead →
Spark plug side ①
Tester (-) lead →
High tension cord side ②



OUT OF SPECIFICATION

Replace the spark plug cap

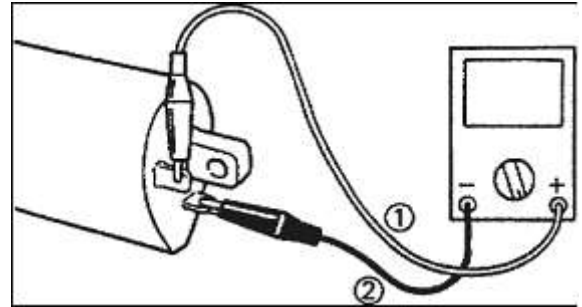


6. Ignition coil resistance

Disconnect the ignition coil connector from the wire harness.

- Connect the pocket tester to the ignition coil.
- Check if the primary coil has the specified resistance or inductance.

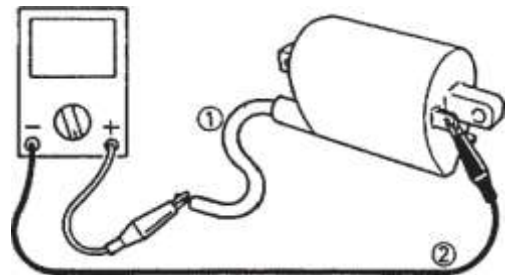
Tester (+) lead
Light Green Terminal
Tester (-) lead Black Terminal



Primary coil resistance:
 $0.28\Omega \pm 10\% (20\text{ }^\circ\text{C})$

- Connect the pocket tester to the ignition coil.
- Check if the secondary has the specified resistance.

Tester (+) lead
Spark plug lead
Tester (-) lead
Light Green Terminal



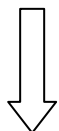
Secondary coil resistance:
 $2.8\text{ K}\Omega \pm 10\% (20\text{ }^\circ\text{C})$

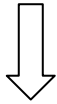
BOTH MEET
SPECIFICATION

OUT OF SPECIFICATION



Replace the ignition coil.





7. Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester (Ω 100) to the pickup coil coupler.

Tester (+) lead →
 Bl/Y Terminal
 Tester (-) lead →
 engine ground

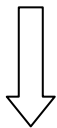


- Check the pickup coil has the specified resistance.

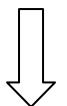


Primary coil resistance:
 $150\Omega \pm 20\%$ (20°C)

MEETS
 SPECIFICATION



8. Main switch
 CHECK SWITCHES



CONTINIUTY

9. Emergency switch

OUT OF SPECIFICATION



Replace the pickup coil.

NO CONTINUITY



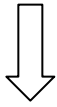
Replace the main switch

NO CONTINUITY



CHECK SWITCHES

CONTINIUTY



Replace the Emergency switch.

10.Wiring connection

- Check the connection of the entire ignition system
Refer to "CIRCUIT DIAGRAM".

POOR CONNECTIONS



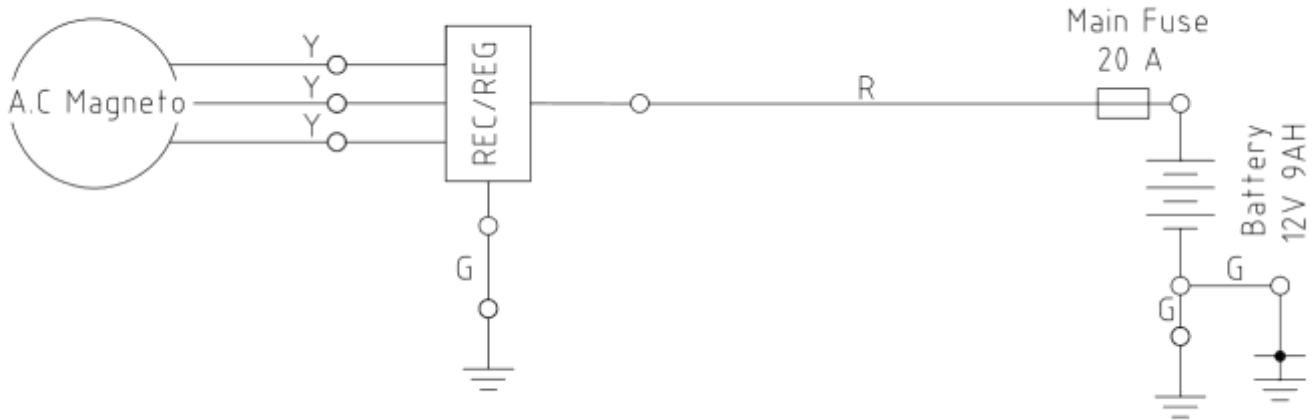
Correct

CORRECT

Replace the igniter unit.

7.4 CHARGING SYSTEM

CHARGING SYSTEM CIRCUIT DIAGRAM



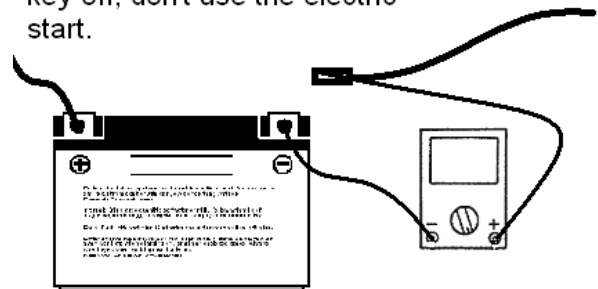
CURRENT DRAW - KEY OFF

CAUTION: Do not connect or disconnect the battery cable or ammeter with the engine running. Damage will occur to light bulbs .

Connect an ammeter in series with the negative battery cable. Check for current draw with the key off, if the draw is excessive, loads should be disconnected from the system one by one until the draw is eliminated. Check component wiring as well as the component for partial shorts to ground to eliminate the draw.

**Current draw key off:
Maximum of 0.01DCA(10mA)**

key off, don't use the electric start.



CHARGING SYSTEM

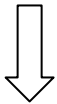
Procedure

Check:

- 1. Fuse (Main)
- 2. Battery
- 3. Charging voltage

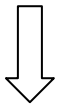
- 4. Stator coil resistance
- 5. Wiring system (entire charging system)

1. fuse



2. Battery

Check the battery condition.
Refer to "BATTERY TESTING"



3. Charging voltage

Connect the engine tachometer to the spark plug lead.

● Connect the pocket tester (DC20V) to the battery

Test (+) lead →

Battery (+) terminal

Tester (-) lead →

Battery (-) terminal

Measure the battery terminal voltage.

start the engine and accelerate to about 5,000rpm

● check the terminal voltage

Measured voltage-terminal

Voltage:

0.2-2.5V up

NOTE: Use a fully charged battery.

NO CONTINUITY



Replace the fuse

INCORRECT



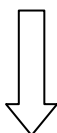
Clean battery terminals
Recharge or replace the battery

OUT OF SPECIFICATION



The charging circuit is not faulty
Replace the battery

MEETS SPECIFICATION



4. Starter coil resistance

Remove the A.C. magneto coupler from wire harness

Connect the pocket tester ($\Omega X1$) to the starter coil

Tester (+) lead – starter motor terminal

Tester (-) lead –engine ground

Measure the stator coil resistance

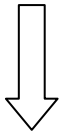
Stator coil resistance 0.5-0.8 Ω (20 $^{\circ}$ C)

OUT OF SPECIFICATION



Replace the stator coil

MEETS SPECIFICATION



5. Wiring connection

check the entire charging system for connections

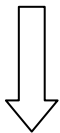
Refer to "CIRCUIT DIAGRAM"

POOR CONNECTION



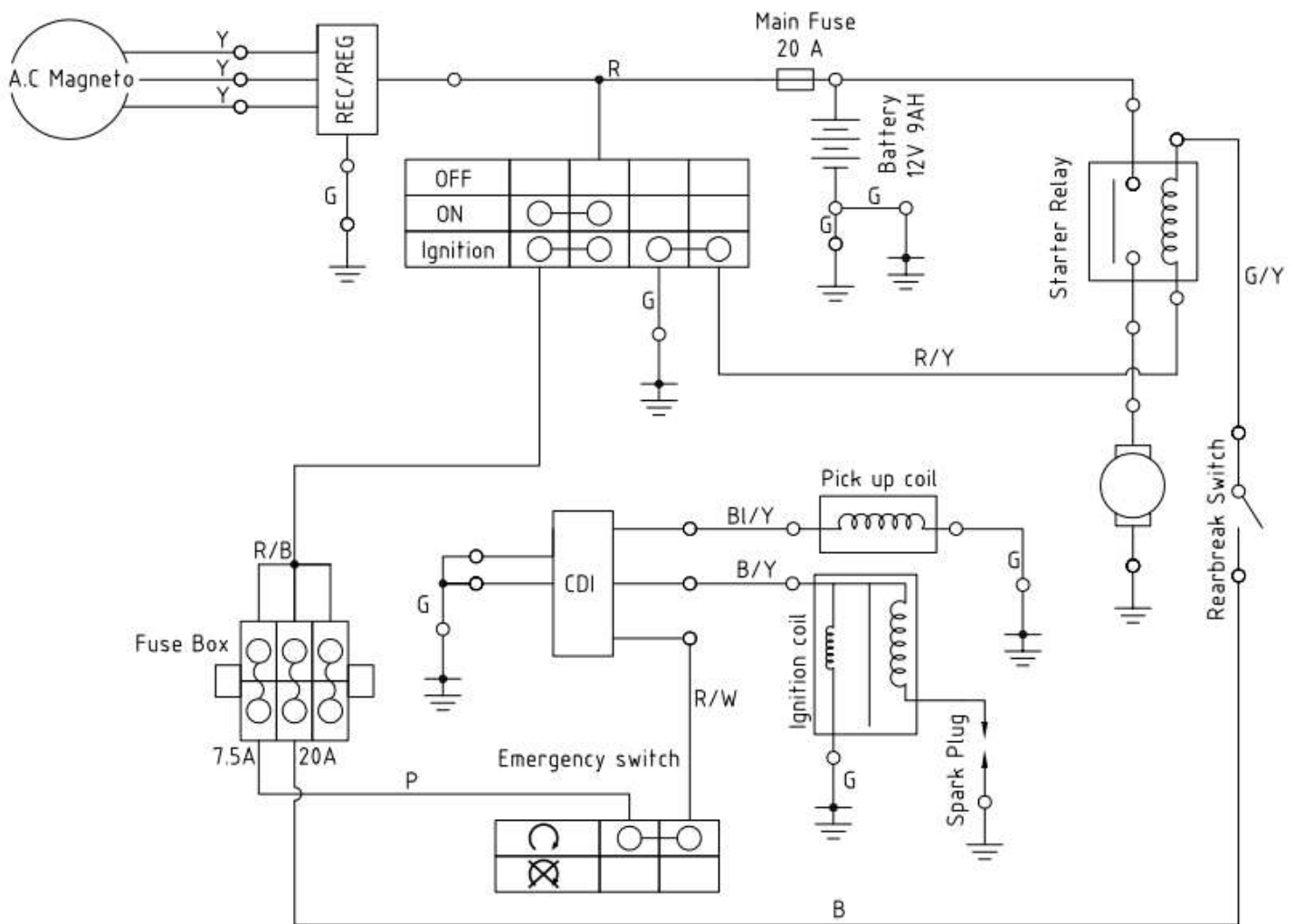
correct

CORRECT



Replace the rectifier/regulator

**7.5 ELECTRICS STARTING SYSTEM
DIAGRAM**



TROUBLESHOOTING

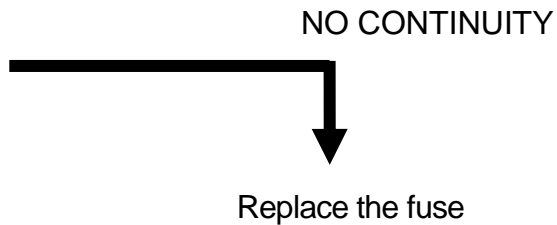
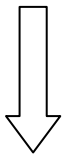
IF THE STARTER MOTOR FAILS TO OPERATE

Procedure

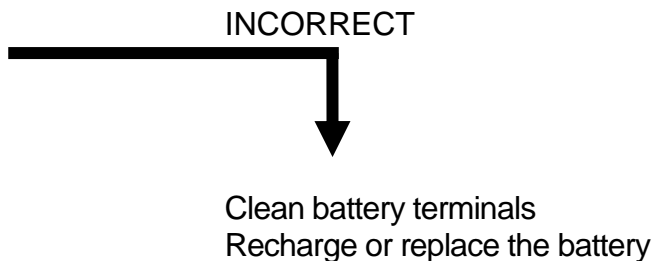
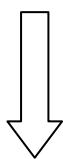
Check:

- 1. Fuse (Main)
- 2. Battery
- 3. starter motor
- 4. starter relay
- 5. main switch
- 6. Engine stop switch
- 7. front/rear brake switch
- 8. wiring connection (entire starting system)

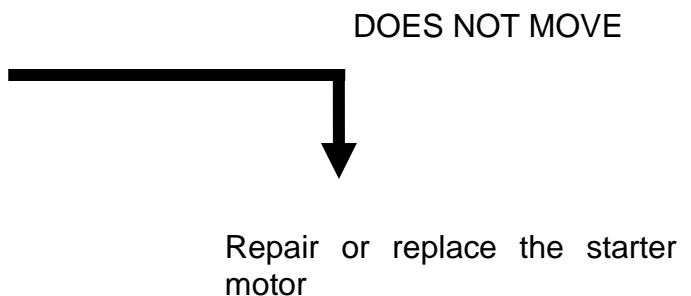
1. fuse



2. Battery
Check the battery condition.
Refer to "BATTERY TESTING" section in
CHAPTER 2



3. Starter motor
Connect the battery positive terminal
and starter motor cable using a jumper
lead.
Check the starter motor operation



4. Starter relay

●Disconnect the relay unit coupler from the wire harness.

●Connect the pocket tester ($\Omega \times 1$) and battery (12V) to the relay unit coupler terminals.

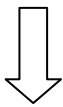
Battery (+) lead →
Green/Yellow terminal ①

Battery (-) lead →
Yellow/Red terminal ②

●Check the starter relay for continuity.

Test (+) lead → ③ terminal

Test (-) lead → ④ terminal

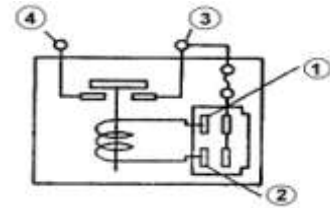


CONTINUITY

WARNING

A wire used as a jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may burn.

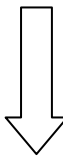
This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity



Replace the starter replay

5. Main switch

CHECK SWITCHES

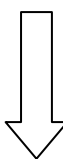


NO CONTINUITY



Replace the main switch

6. Engine stop switch



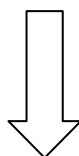
NO CONTINUITY



Replace the handlebar switch

7. Front /rear brake switch

CHECKING SWITCHES



NO CONTINUITY

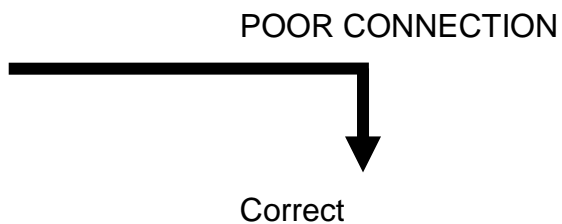


Replace the brake switch

8. Wiring connection

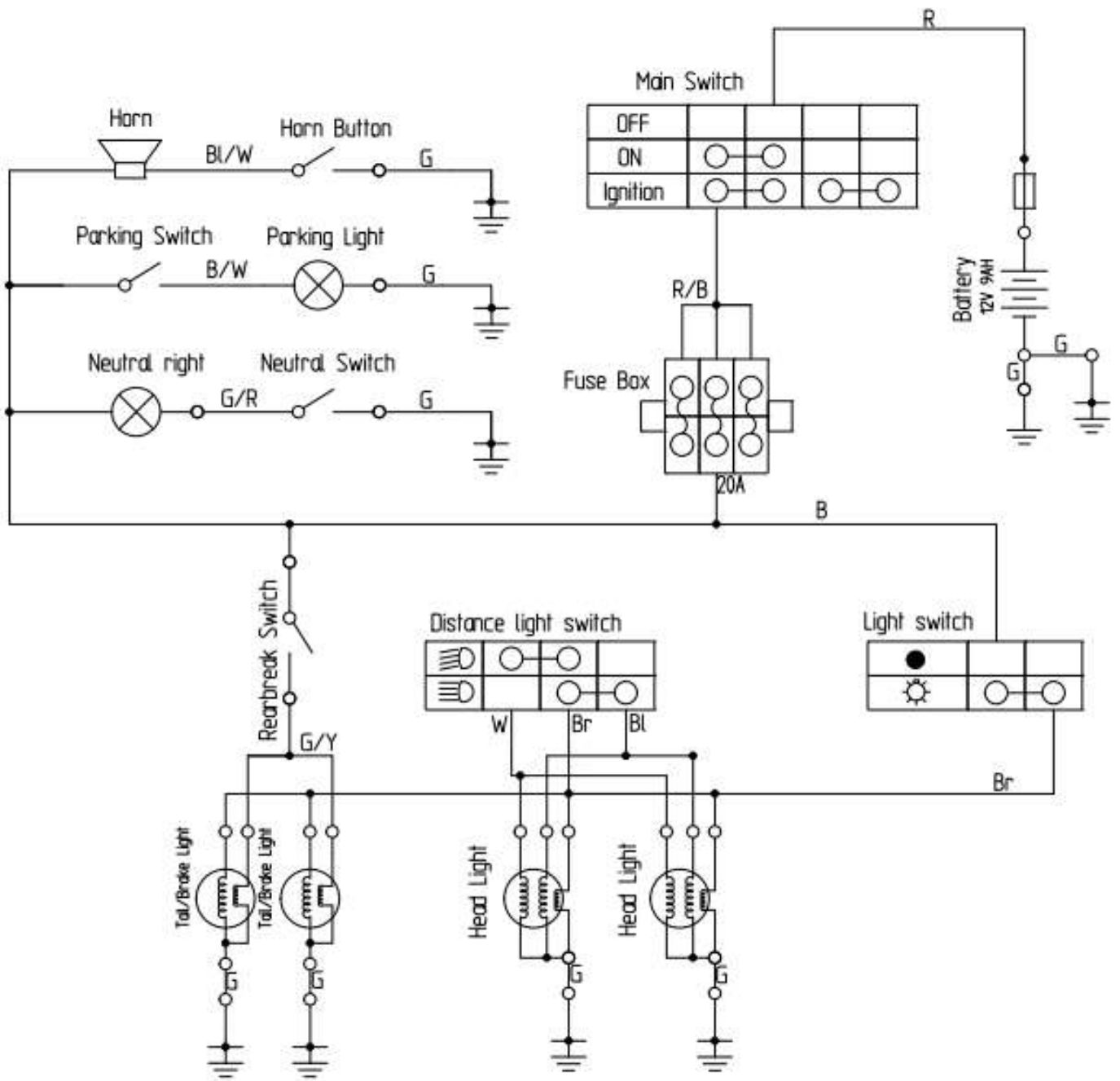
Check the connections of the entire starting system.

Refer to "CIRCUIT DIAGRAM

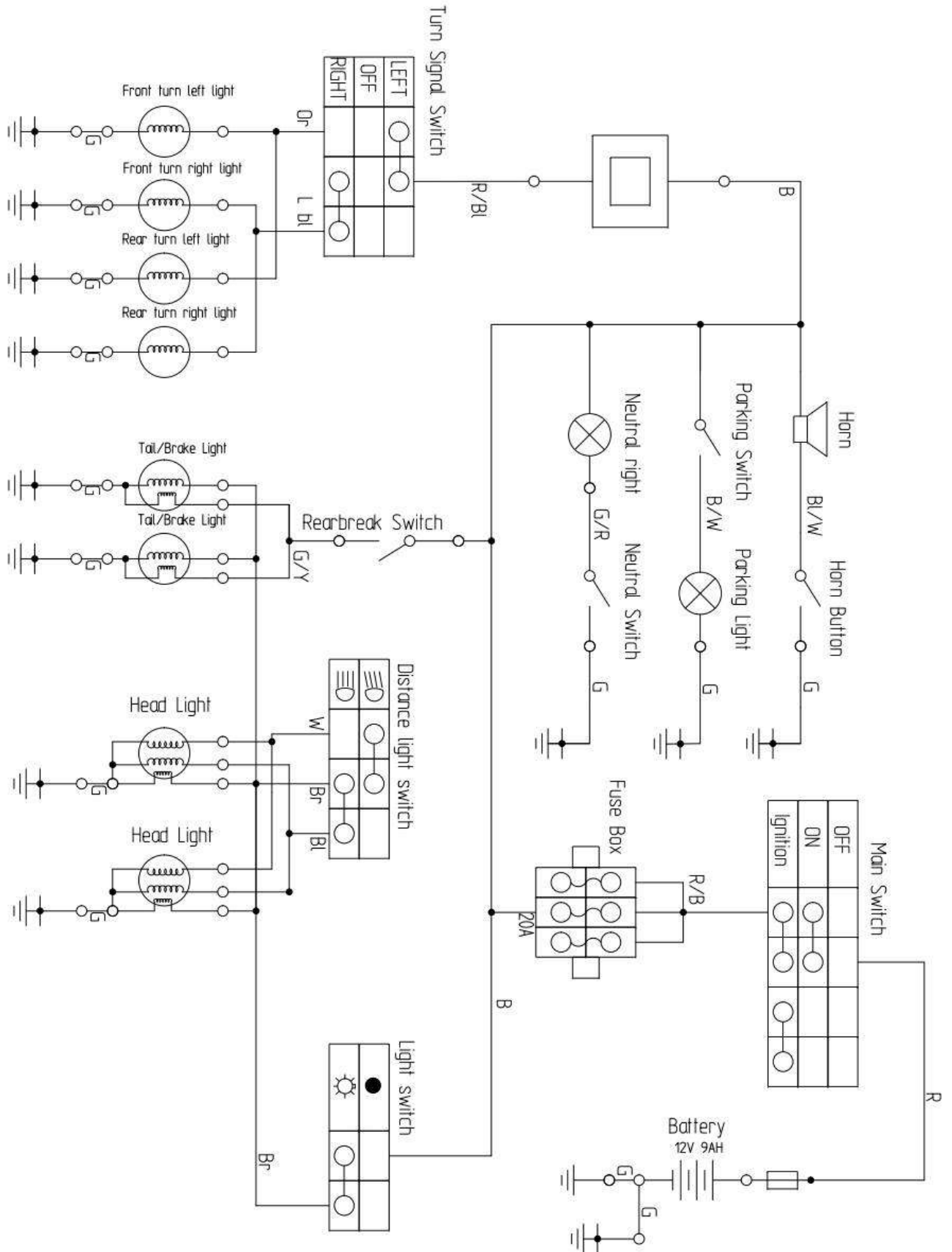


CHAPTER 7 ELECTRICAL
7.6 LIGHTING SYSTEM

FOR USA MODEL



FOR EUROPE MODEL



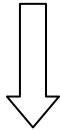
TROUBLESHOOTING

Procedure

Check:

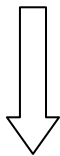
- 1. Fuse (Main)
- 2. Battery
- 3. Main switch
- 4. Lights switch
- 5. Distance light switch
- 6. Wiring connection (entire lighting system)

1.fuse



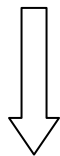
2. Battery

Check the battery condition.
Refer to "BATTERY INSPECTION" section
in CHAPTER 3



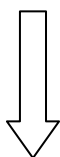
3. Main switch

CHECK SWITCHES



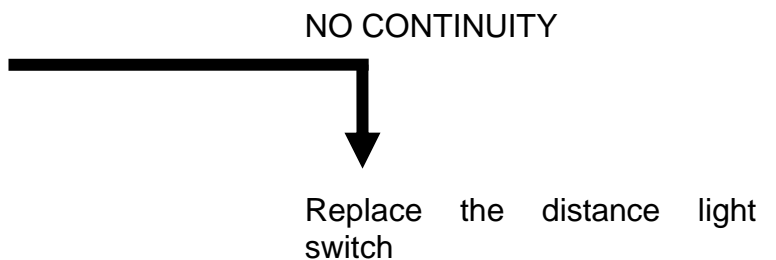
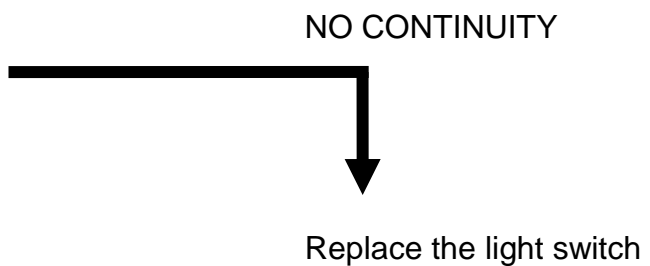
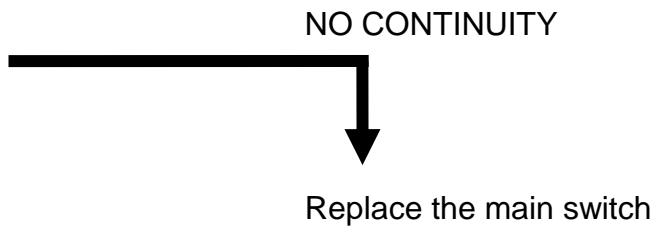
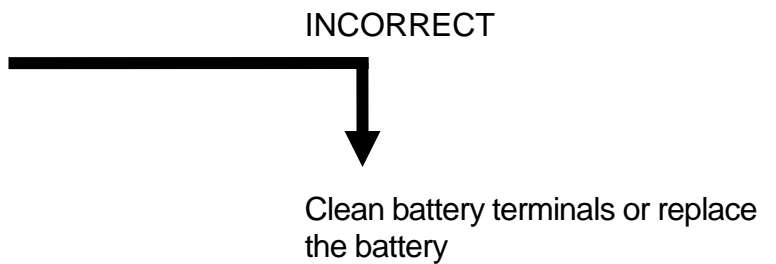
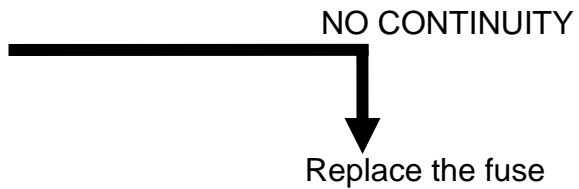
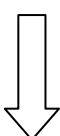
4. Light switch

CHECK SWITCHES



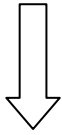
5. Distance light switch

CHECK SWITCHES



6.Wiring connection

Check the connection of the entire lighting system



7.check the condition of each lighting system.

Refer to "LIGHTING SYSTEM CHECK"

LIGHT SYSTEM CHECK

1. If the headlight fail to come on

1.Blub and bulb socket
CHECK SWITCHES



2. Voltage

Connect the pocket tester (DC20V) to the headlight.

A When the distance switch is on low beam.

B When the distance switch is on high beam.

Headlight:

Tester (+) lead →White or Blue lead

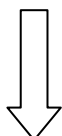
Tester negative (-) lead →Green lead

Turn on the main switch.

Turn on the light switch.

Turn the distance switch to low beam or high beam.

Check for voltage (12V) on the lead at bulb socket connectors.



This circuit is not faulty

POOR CONNECTIONS



correct

NO CONTINUITY



Replace the bulb and/ or bulb socket

OUT OF SPECIFICATION



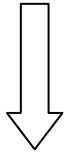
The wiring circuit from the main switch to bulb socket connector is faulty.

Repair

2. the taillight fails to come on

- 1. Bulb and bulb socket

CHECK SWITCHES



CONTINUITY

- 2. Voltage

Connect the pocket tester (DC20V) to the bulb socket connector.

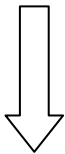
Tester (+) lead → Brown terminal

Tester (-) lead → Green terminal

Turn on the main switch.

Turn the lights switch to 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

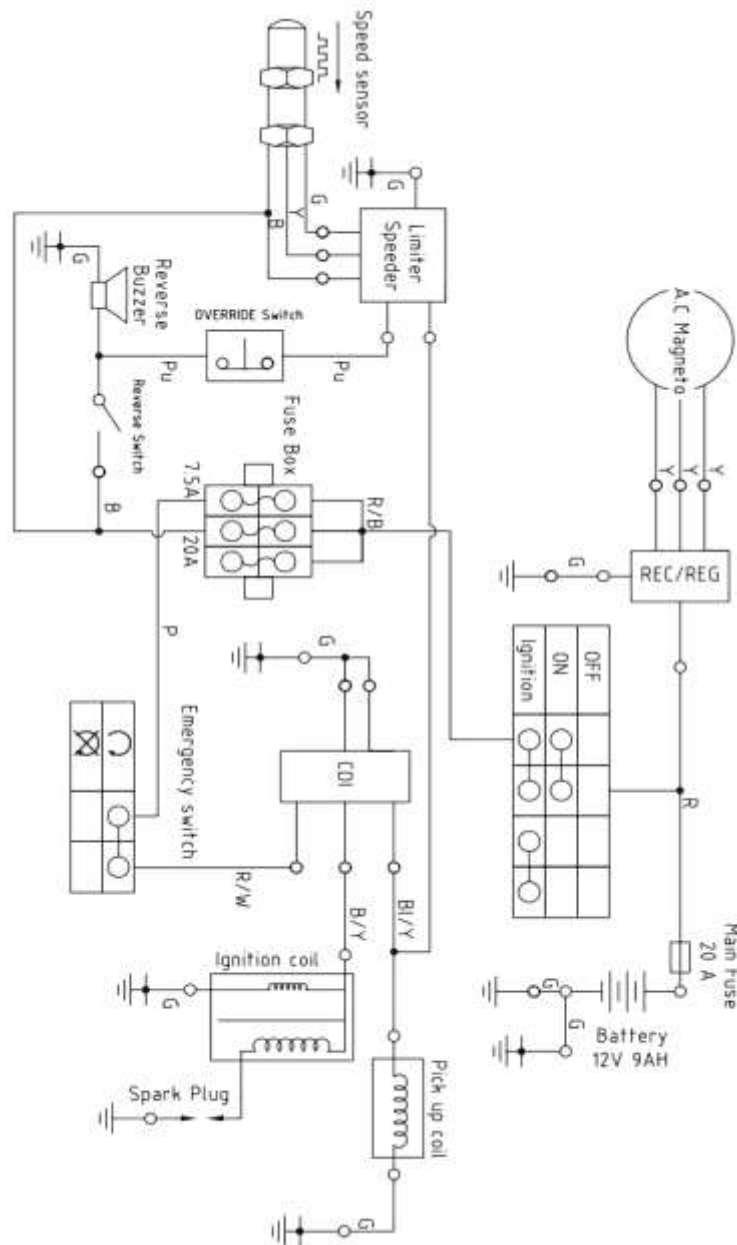
OUT OF SPECIFICATION



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

Repair

7.7 REVERSE LIMIT SYSTEM



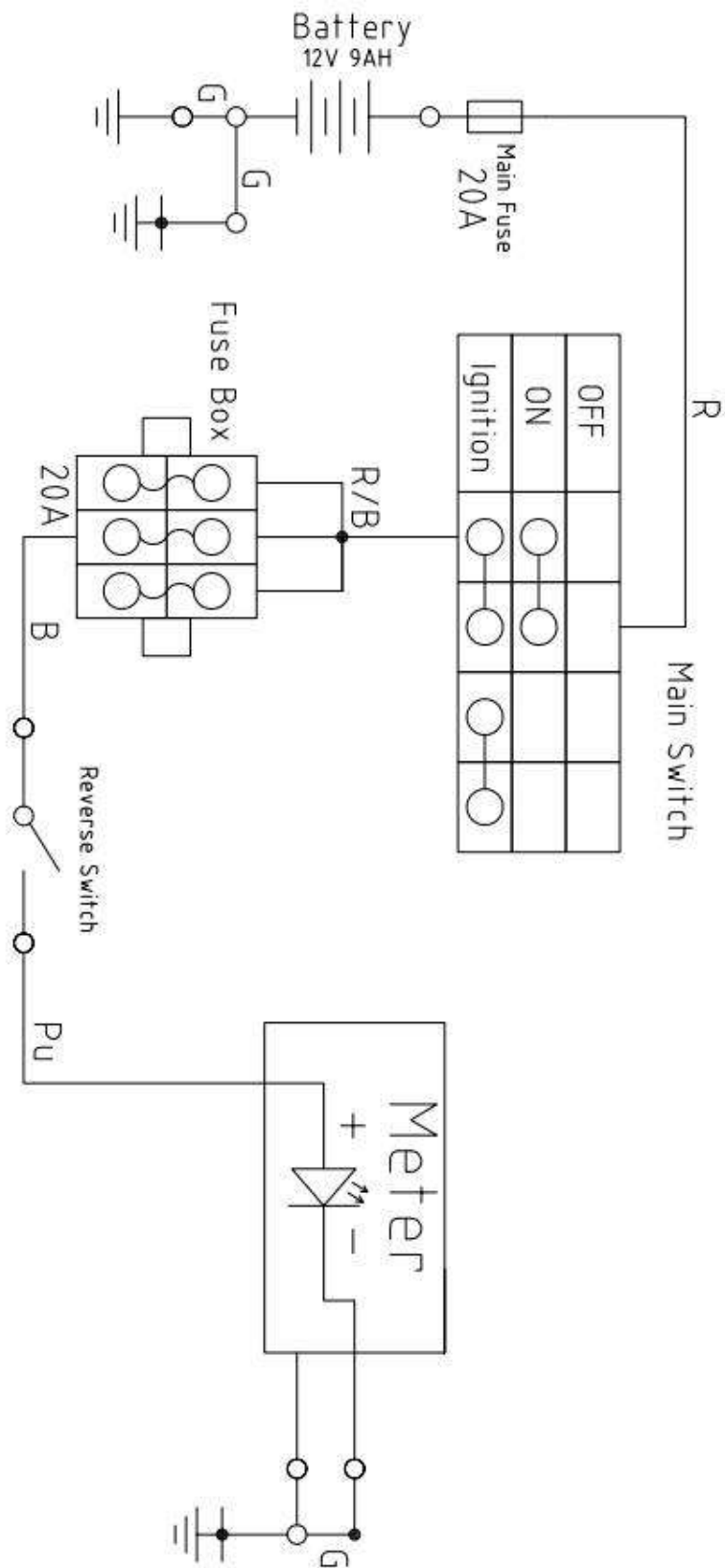
The limit set for the speed limiter by the manufacturer is 20 km/h, which can be reset in accordance with the user's practice. Turning the adjusting bolt clockwise is to increase the speed, while counterclockwise decrease it.

NOTE. This limit can be released by the override switch.



7.8 GEAR POSITION INDICATOR SWITCH TEST





7.9 SPEEDMETER SYSTEM

OPERATION OF SPPED SENSOR

Speed Sensor is on the rear axle

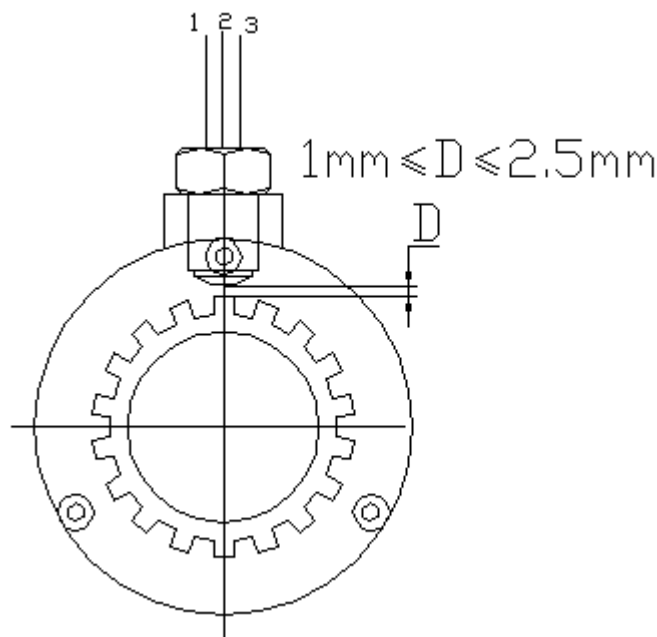
Operation Instructions of Electric Dial Meter and Speed Sensor/ Operation Instructions of LCD Meter and Speed Sensor

A. Hall Sensor is a new type sensor used to measure speed, angle, revolution and length, etc by means of voltage pulse signals converted from sensing gear ratio of black metal gear or gear rack.

B. Main Technical Parameter for sensor:

Item	Code	Vol value	Unit
Operating voltage	Vcc	5-20	V
Operating current	Icc	≤15	mA
Low voltage output	Vol	≤ 0.4	V
Hight voltage output	Voh	≥ (Vcc-1)	V
Operating distance	D	1mm ≤ D ≤ 2.5mm	mm

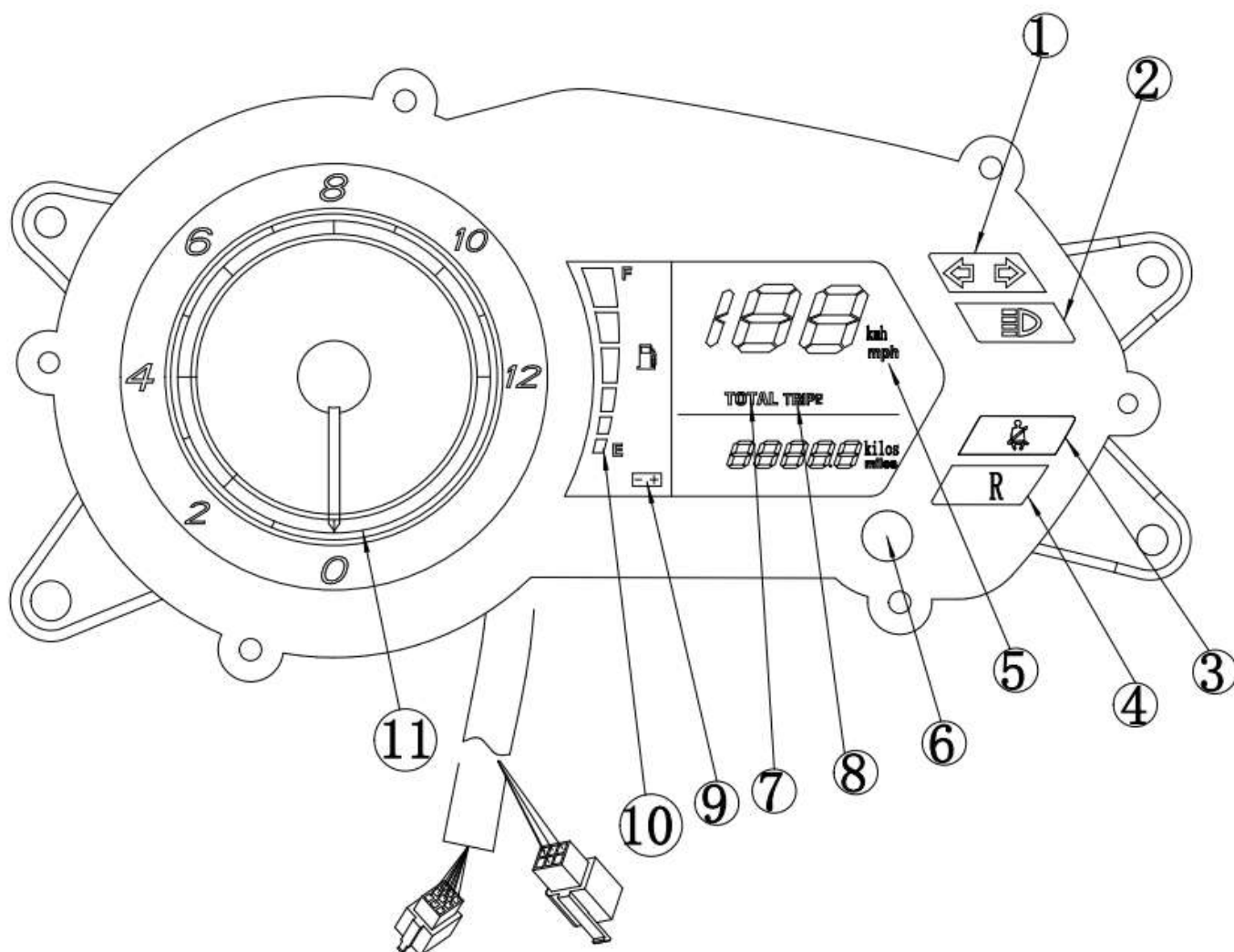
C. The following is the graphic illustration for sensor installation, Wire 1 (black) is positive and wire 2 (green) negative, Wire 3 (yellow) works as the one to output signals.



Note: Always screw in the sensor by hand when installation or adjustment.

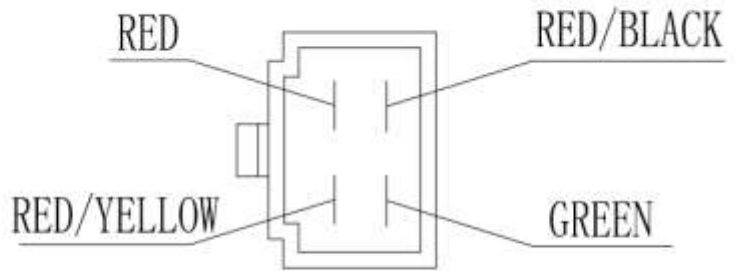
- 1, Align one tooth of the splines to the centre of the hole of the sensor by turning the rear axle.
2. Screw the sensor in (CW) by hand slightly until resistance is felt.
3. Turn the sensor CCW by 1 to 2 turn(s).
4. Tighten the jam nut.

Operation Instructions of the Meter assembly



- | | |
|------------------------------|--------------------------|
| 1. Turn indicator light | 7、8. The odometer |
| 2. High beam indicator light | 9. low voltage indicator |
| 3. Seatbelt light | 10. Fuel gauge Indicator |
| 4. Reverse indicator light | 11. Electric Dial Meter |
| 5. Speedometer | |
| 6. Multifunction button | |

	R	R/B	G	R/Y
OFF				
ON	○—○			
START	○—○		○—○	



DJ70413-6. 3-11



7.11 FUEL GAUGE/ FUEL LEVEL SENSOR**Removal**

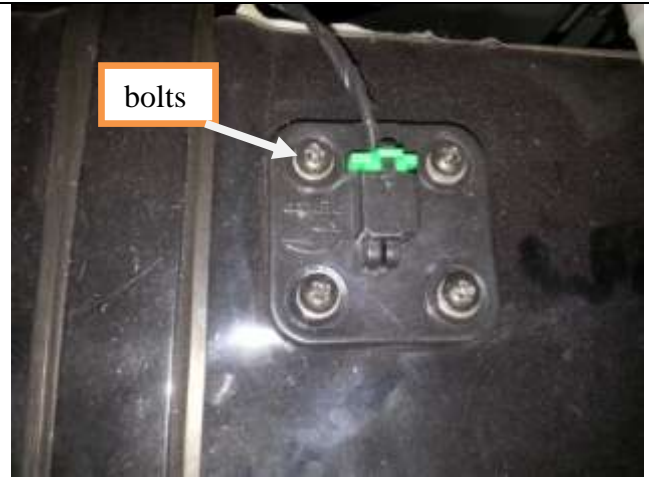
Turn the main switch to “OFF” .
Disconnect the fuel level sensor from wire harness.
Remove the four bolts, washer, spring washers and fuel level sensor from the fuel tank.

Installation

Install the sensor into the fuel tank .(refer to the right photo)
Install and tighten the bolts securely.
Install the removed parts in the reverse order of removal.

Fuel Gauge / Fuel level Sensor Inspection

Move the float to the bottom (RESERVE) position, turn the main switch to “ON” and check the fuel gauge.



When shows that there are only two segments, segments should blink.

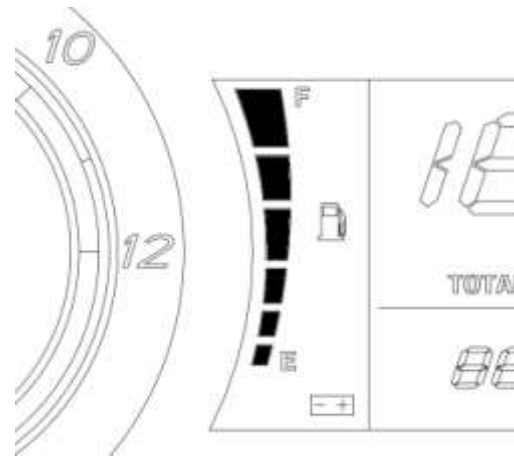
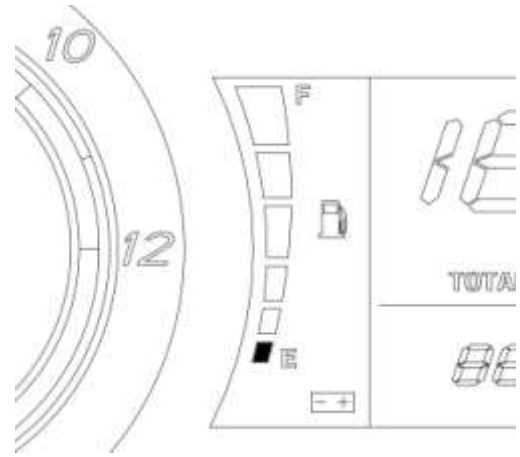
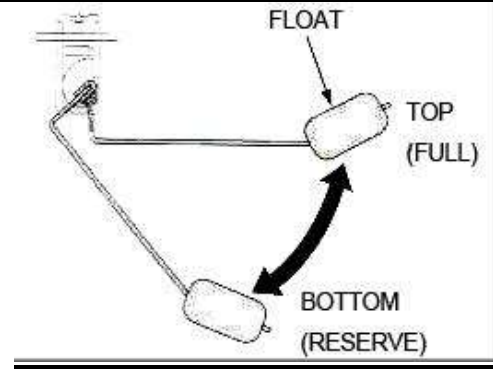
With the fuel level sensor float at the top (FULL) position, turn the main switch to “ON” and check the fuel gauge. All segments up to segment “F” should come on.

If all of the six segments blink, check the wiring connection of fuel level system. Refer to " Circuit of the fuel level"

If the fuel gauge does not function properly, check the fuel level sensor
If the fuel level sensor is OK, replace the LCD Meter.

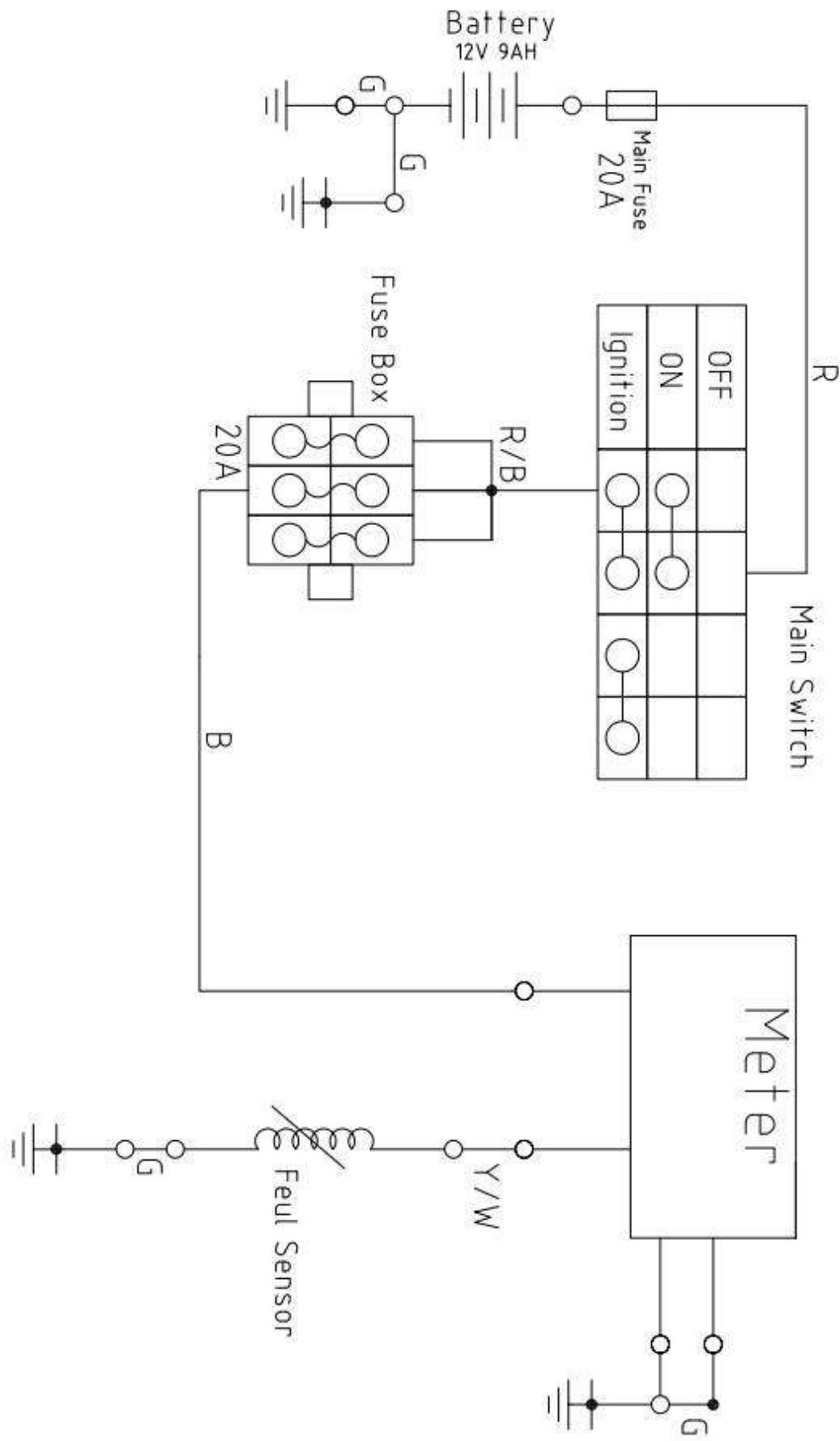
Fuel level Sensor Inspection

Disconnect the fuel level sensor 2p Black connector and connect the ohmmeter to the sensor side connector terminals.
Measure the fuel level sensor resistance with the float at the top (FULL)
And bottom (RESERVE) positions.



FLOAT POSITION	RESISTANCE(20°C/ 68°)
TOP(FULL)	0-12Ω
BOTTOM(RESERVE)	94-110Ω

Circuit of the fuel level



7.12 WIRING DIAGR

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

