PANTHER 550

SERVICE MANUAL

NOTICE

This manual was produced by the NABULA Group primarily for use by NABULA 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 NABULA 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 dealers and will appear in future editions of this manual where applicable.

NOTE:
Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

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

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

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

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

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

CONTENTS

⚠ 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

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

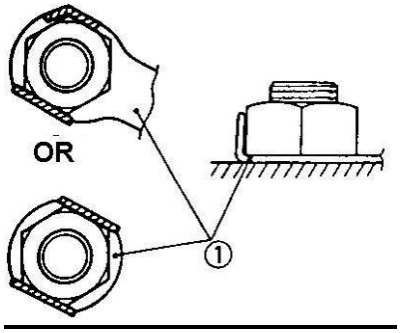
Use only genuine parts for all replacements. Use recommended oil and grease for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

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

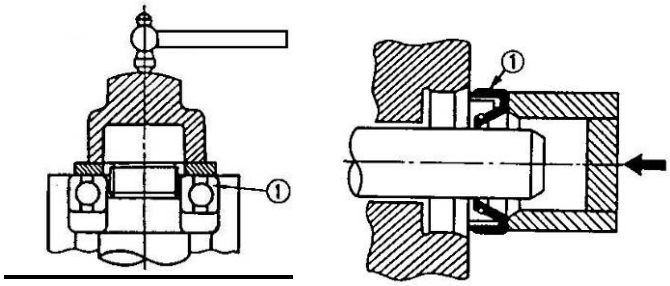
Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil bearings liberally when installing, if appropriate.

① oil seal

CAUTION:

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

① Bearing

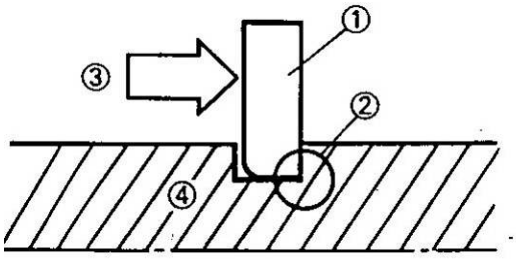


CIRCLIPS

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

Replace distorted circlips. When installing a circlip①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ it receives. See sectional view.

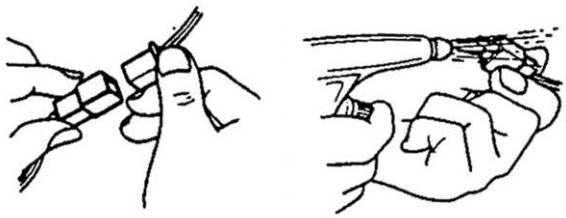
④Shaft



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



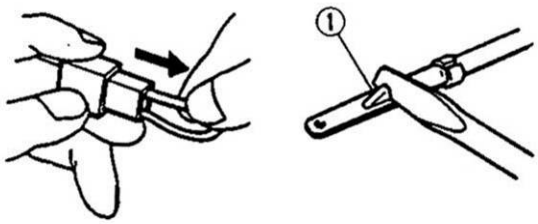
NOTE:

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.



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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.

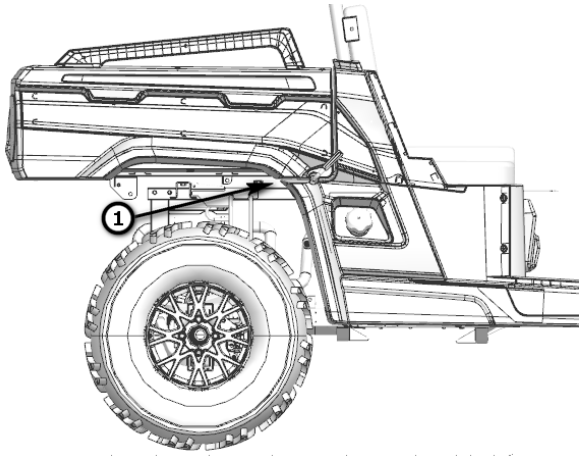
METRIC	MULTIPLIER	IMP
**mm	x 0.3937 =	**in
**cm	x 0.03937 =	**in

CONVERSION TABLE

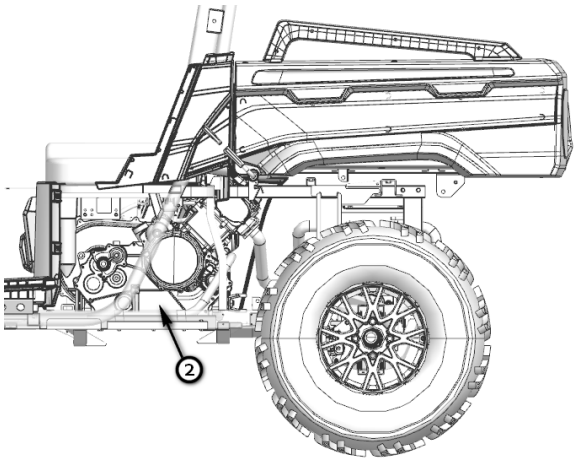
METRIC TO IMP			
	Known	Multiplier	Result
Torque	m • kg	7.233	ft • lb
	m • kg	86.794	In • lb
	cm • kg	0.0723	ft • lb
	cm • kg	0.8679	In • lb
Weight	kg	2.205	lb
	g	0.03527	oz
Distance	km/h	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume/ Capacity	cc(cm^3)	0.03527	oz(IMP 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(℃)+32	Fahrenheit(° F)

1.2 V.I.N AND ENGINE SERIAL NUMBER

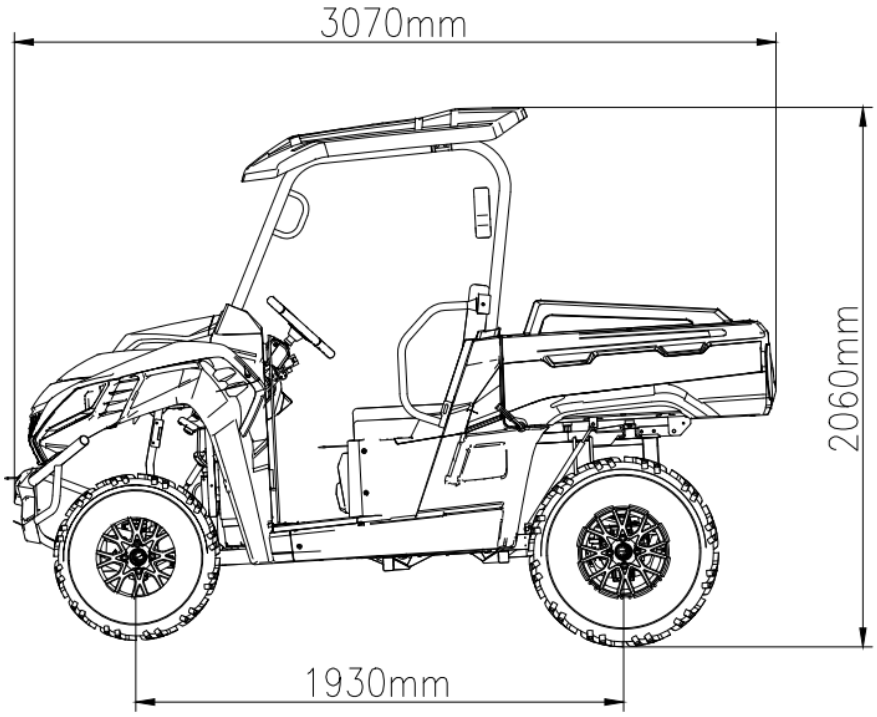
The vehicle identification number ① is stamped into the right side of the square tube under the cargo bed.

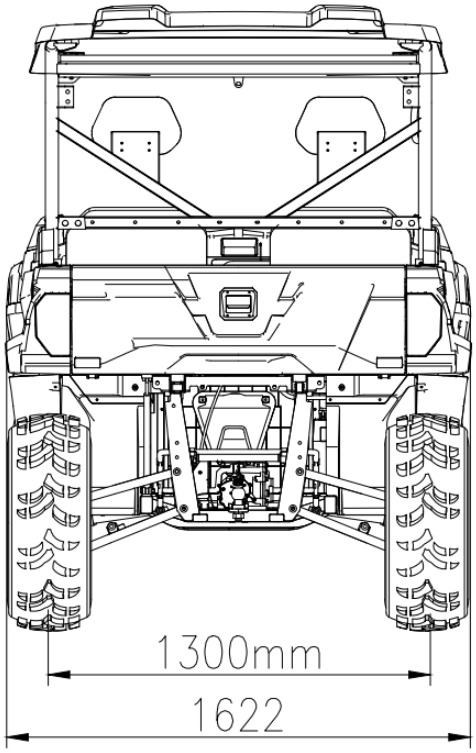


The engine serial number ② is stamped into left side of engine crankcase.



1.3 VEHICLE DIMENSIONS





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

NOTES

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

CAUTION

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

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

PERIODIC MAINTENANCE SCHEDULE:

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

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

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

NOTE:

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

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

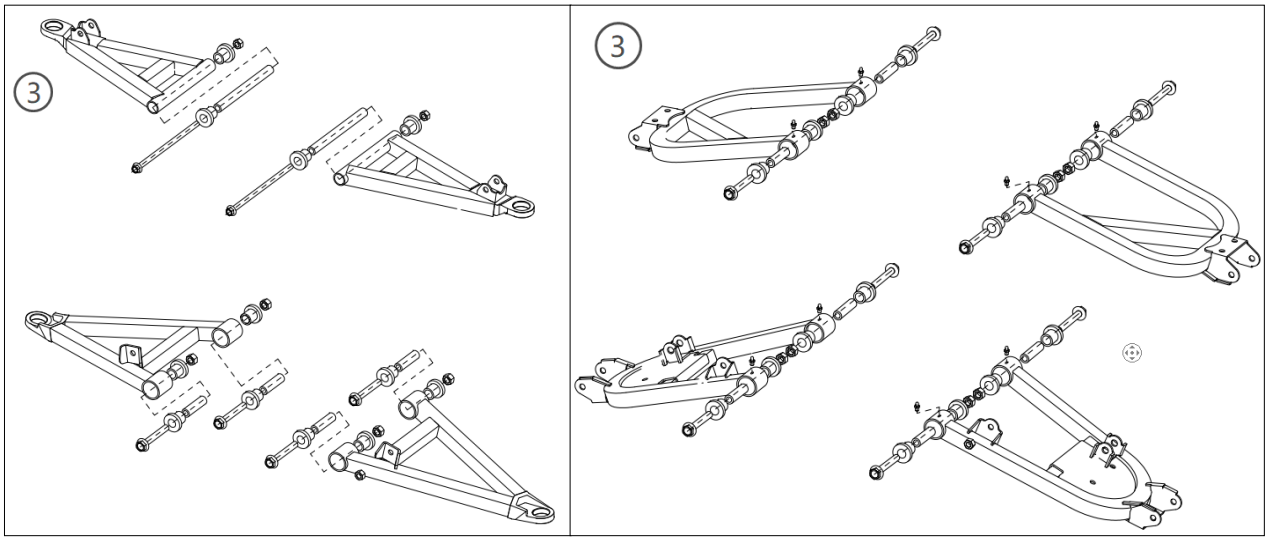
	Item	Hours	When	Remarks
●	Brake System	Pre-ride	Pre-ride	Pre-ride inspection item
	Accelerator pedal	Pre-ride	Pre-ride	Inspect –adjust, lubricate, replace if necessary; pre-ride inspection item
	Fuel System	Pre-ride	Pre-ride	Check for leaks at tank cap, lines, fuel valve, filter, and carburetor
●	Tires	Pre-ride	Pre-ride	Inspect daily, pre-ride inspection item
●	Front and Rear Wheels/ Hubs	Pre-ride	Pre-ride	Pre-ride inspection item
●	Steering	Pre-ride	Pre-ride	Inspect daily, lubricate
D	Wheels Bearings	10 hrs	Monthly	Check for looseness/ damage. Replace if damaged
	Frame Nuts, Bolts Fasteners	Pre-ride	Pre-ride	Pre-ride inspection item
●	Air Filter-Pre-Cleaner	Daily	Daily	Inspect-Clean
	Coolant/Level Inspection	Daily	Daily	Replace engine coolant every one year

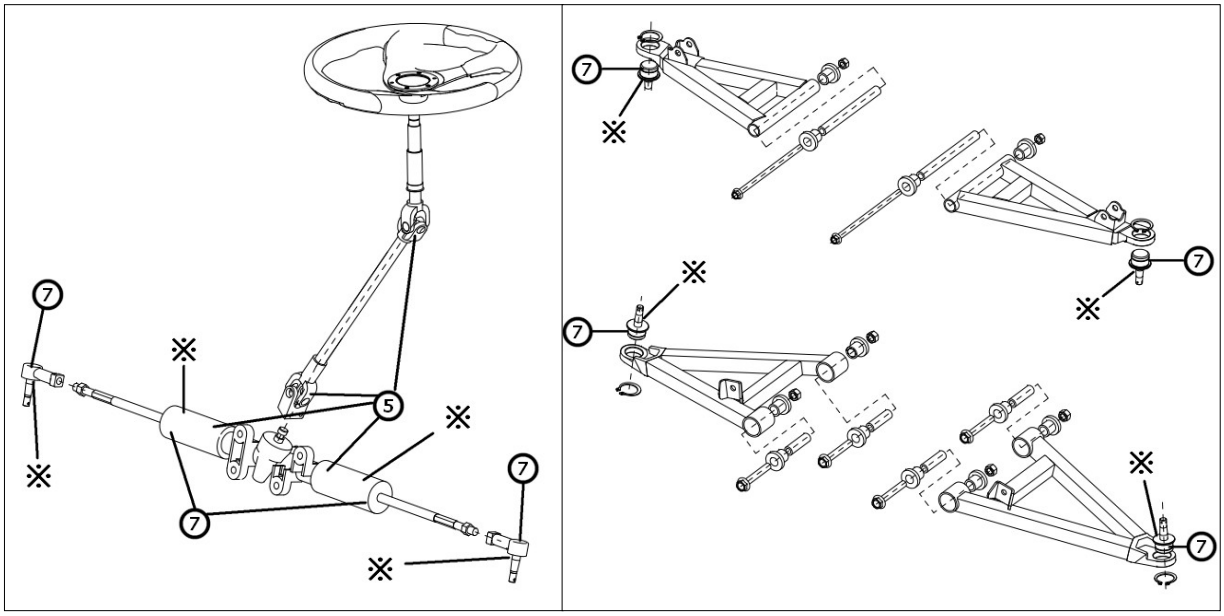
●	Air Box Sediment Tube	Daily	Daily	Drain deposits whenever visible
	Headlamp Inspection	Daily	Daily	Check operation daily; apply dielectric grease to connector when replaced
	Tail / Indicator Lamp Inspection	Daily	Daily	Check operation daily; apply dielectric grease to socket when replaced
●	Air Filter-Main Element	Weekly	Weekly	Inspect –Replace if necessary
	Battery	20 hrs	Monthly	Check/clean Terminals; check fluid level
D	Brake Pad Wear	10 hrs	Monthly	Inspect periodically
●	Front/Rear axle Gear case Oil	100 hrs	Monthly	Check yearly or every 100 hours
	Engine Cylinder Head and Cylinder Base Fasteners	25 hrs	3 months	Inspect (re-torque required at first service only)
●	General Lubrication	50 hrs	3 months	Lubricate all fittings, pivots, cables, etc.
●	Engine Oil-Level/ Change	30 hrs	3 months	Check Level Daily; Break in Service at 1 month. Change oil more often in cold weather use
●	Dipstick	50 hrs	6 months	Inspect - clean
	Engine Breather Hose	100 hrs	6 months	Inspect
D	Throttle Cable / Accelerator Pedal	20 hrs	monthly	Inspect – adjust, lubricate, replace if necessary; pre-ride inspection item
	Shift Linkage	50 hrs	6 months	Inspect, adjust
D	Drive Belt	50 hrs	6 months	Inspect, replace if necessary
D	Steering System	50 hrs	6 months	Check operation and for looseness, worn, damage, binding feeling / Adjust, repair, Replace if necessary. Check toe alignment /Adjust if necessary.
D	Toe Alignment Adjustment	As required	As required	Periodic inspection, adjust when parts are replaced
D	Shaft	50 hrs	6 months	Check for looseness/ damage
●	Axle	50 hrs	6 months	Inspect bearings, Lube
●	Front Prop Shaft & Shaft Yoke	50 hrs	6 months	Check for looseness/ damage
●	Rear Prop Shaft, Shaft Yoke & Boots	50 hrs	6 months	Check for/ boots/ looseness/ damage
●	Front Suspension	50 hrs	6 months	Inspect - lubricate, tighten fasteners
●	Rear Suspension	50 hrs	6 months	Inspect, tighten fasteners
	Spark Plug	100 hrs	12 months	Inspect - replace if necessary
D	Ignition Timing	100 hrs	12 months	Inspect and adjust as needed
D	Fuel System	50 hrs	6 months	Check for leaks at tank cap, lines, fuel filter. Replace lines every one year

D	Fuel Filter	100 hrs	12 months	Replace annually
	Radiator	100 hrs	12 months	Inspect/clean external surface
	Spark Arrestor	50 hrs	3 months	Clean out-replace if necessary
D	Clutches (drive and driven)	25 hrs	3 months	Inspect, clean
	Engine Mounts	25 hrs	3 months	Inspect
D	Valve Clearance	100 hrs	12 months	Inspect/adjust
D	Brake Fluid	200 hrs	24 months	Change every two years
	Idle Speed	As required	As required	Adjust
	Headlight Aim	As required	As required	Adjust if necessary

LUBRICANT AND FLUID

	Item	Lube Rec	Method	Frequency
●	1. Engine Oil	SAE 15W/40SG	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. Front / Rear A-arm Pivot Shaft	Grease	Locate fitting on pivot shaft and grease with grease gun	Every 3 months or 50 hours
	4. Front / Rear Axle Gear Case Oil	SAE 80W/90GL5	Fill the bottom of the fill plug threads	Change annually or 100 hours
●	5. Steering System	Grease	Lubricate the pivoting and sliding parts	Every 3 months or 50 hours
●	6. Shift Linkages	Grease	Locate fittings and Grease	Semi-annually
●	7. Ball Joints	Grease	Inspect, Locate fittings and Grease, or replace it if necessary	Semi-annually
●	8. Prop Shaft & Shaft Yoke, Spline Joint	Grease	Locate fitting and Grease	Semi-annually
●	9. Cooling Liquid	HEC-Ⅱ-35	Maintain level between fill lines	Check level daily
●	10. Throttle Cable	Grease M	Grease, inspect and replace it if necessary	Monthly or 20 hours
●	11. 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 (MoS_2) grease (water resistant).

4.When suspension action becomes stiff or after washing.

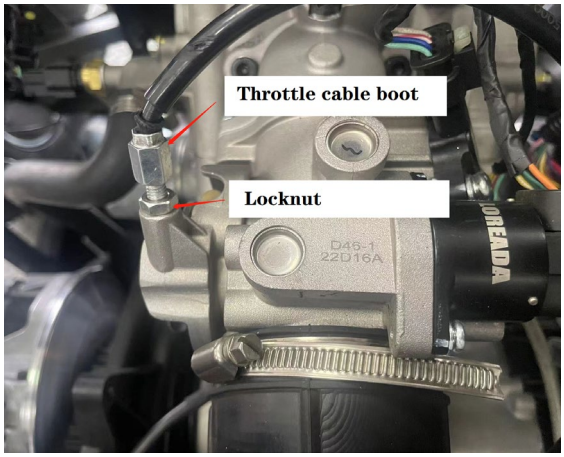
5.Hours are based on 10 mph(16Km/h) average.

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, free play is achieved pedal. NOTE: While adjusting free play, it is important you flip the throttle lever back and forth.
3. Tighten locknut.

2.3 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.

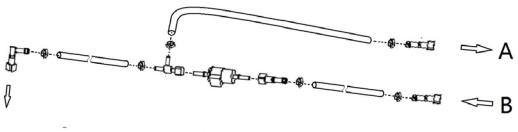
⚠ Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a

short time.

⚠ Never drain the float bowl when the engine is hot. Severe burns may result.

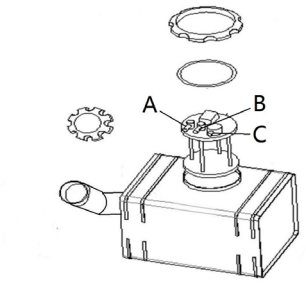
FUEL LINES

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:

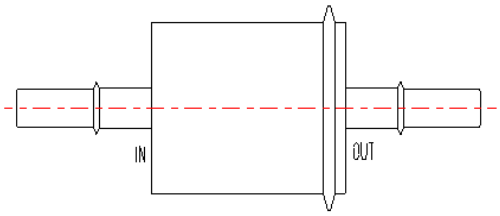
Make sure lines are not kinked or pinched.
Replace all fuel lines every two years.



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 connectors at both ends of fuel filter.
2. Install new fuel filter onto fuel lines (the direction of fuel flow should be IN → OUT).
3. Start engine and inspect for leaks.

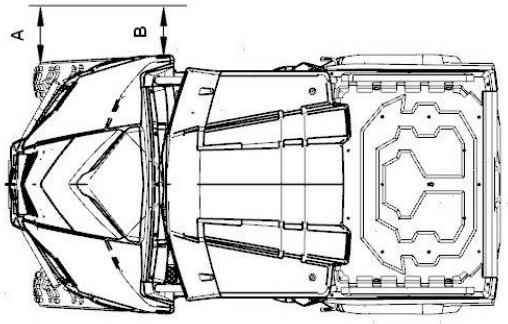


2.4 TOE ALIGNMENT

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 0 to 13/64”(0 to 5mm) toe in.

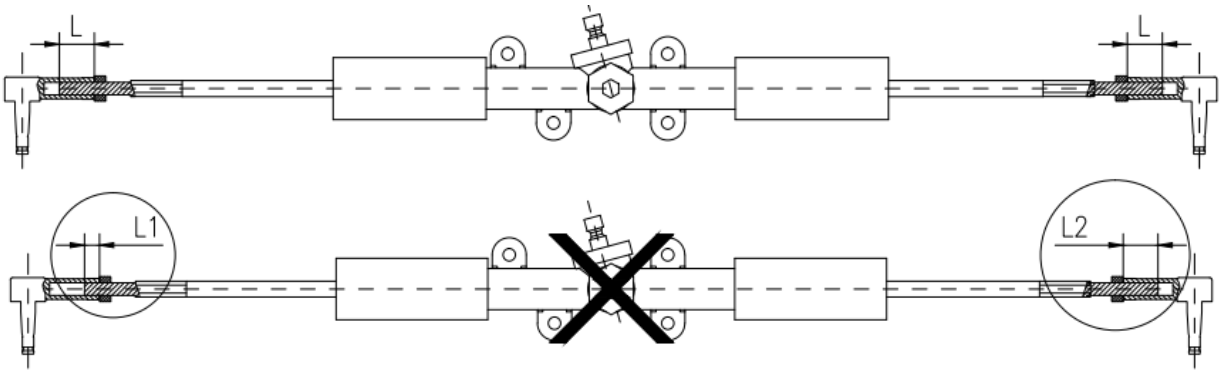
1. Set the steering wheel in a straight ahead position and hold them in this position.
2. Measure A and B, A minus B should be 0 to 6/64” (0 to 2.5mm).



⚠ WARNING

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

Both ends must screw in same and enough threads length.
Never tamper (cut) the rod.



2.5 SUSPENSION SPRING RPELOAD ADJUSTMENT

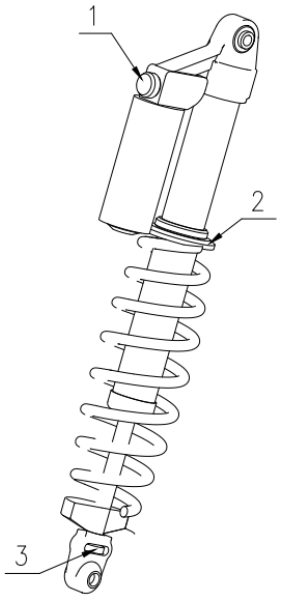
Operator weight and vehicle loading affect suspension spring preload requirements. Adjust as necessary.

FRONT AND REAR SUSPENSION

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

Check all suspension components for wear or damage.

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 2 to increase or decrease the spring preload.
Turn the adjuster 1 to “F” direction can reduce the down pressure damping.
Turn the adjuster 1 to “S” direction can increase the down pressure damping.
Turn the adjuster 3 to “F” direction can reduce the release damping.
Turn the adjuster 3 to “S” direction can increase the release damping.

2.6 WHEELS

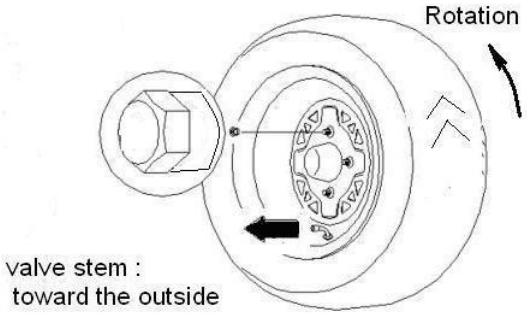
Inspect all wheels for runout of damage.
Check wheel nuts and ensure they are tight.
Do not over tighten the wheel nuts.

WHEEL REMOVAL

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

WHEEL INSTALLATION

1. With the transmission in gear and the parking brake locked, place the wheel in the correct position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward rotation.
2. Install the wheel nuts and tighten them by hand.
3. Lower the vehicle to the ground.
4. Securely tighten the wheel nuts to the proper



Front and rear

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	49 Ft.Lbs	66 Nm
Rear M12X1.25	49 Ft.Lbs	66 Nm

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

2.7 TIRE PRESSURE

TIRE INSPECTION
CAUTION:

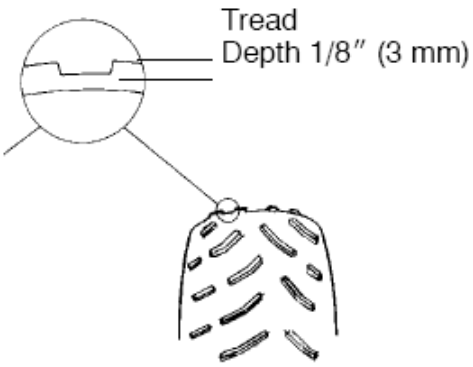
- Maintain proper tire pressure. Refer to the warning tire pressure decal applied to the vehicle.
- Improper tire inflation may affect UTV maneuverability.
- When replacing a tire always use original equipment size and type and replace in pairs.
- The use of non- standard size or type tires may affect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

Tire Pressure	
front	rear
138 kPa (20 PSI)	138 kPa (20 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.



2.8 FRAME , NUTS, BOLTS, FASTENERS

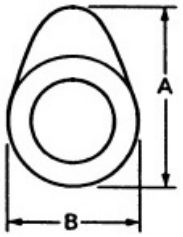
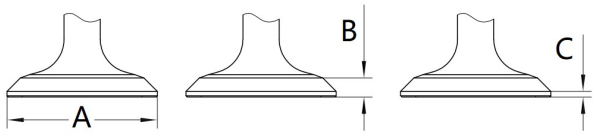
Periodically inspect the tightness of all fasteners in accordance with the maintenance schedule. Check that all cotter pins are in place. Refer to specific fastener torques listed in each chapter.

NOTES

CHAPTER 3 ENGINE

3.1 MAINTENANCE SPECIFICATIONS

3.1.1 SPECIFICATIONS

Item			Standard	Limit
Cylinder head:				
Warp limit				0.07 mm
Cylinder:				
Bore size			92.000 - 92.015 mm	92.025 mm
Out of round limit				0.01 mm
Camshaft:				
Cam dimensions				
Intake	"A"		32.76 - 32.80 mm	32.63 mm
	"B"		27.95 - 28.05 mm	27.92 mm
Exhaust	"A"		32.76 - 32.80 mm	32.63 mm
	"B"		27.95 - 28.05 mm	27.92 mm
Camshaft runout limit			…..	0.03 mm
Cam chain:				
Cam chain type/No. of links			CL04CF-9-122LW	…
Rocker arm /rocker arm shaft:				
Rocker arm inside diameter			22.000 - 22.021 mm	22.033 mm
Rocker shaft outside diameter			21.973 - 21.984 mm	21.94 mm
Rocker arm to rocker arm shaft Clearance			0.009- 0.012 mm	…
Valve, Valve seat, Valve guide:				
Valve clearance (cold)	IN		0.05 mm	…
	EX		0.08 mm	…
Valve dimensions				
"A" head diameter	IN		30.9 - 31.1 mm	…
	EX		26.9 - 27.1 mm	…
"B" face thickness	IN		2.6 - 3.0 mm	…
	EX		3.2 -3.6 mm	…
"C" margin thickness	IN		0.85 - 1.15 mm	…
	EX		0.85 - 1.15 mm	…
Stem outside diameter	IN		5.95 - 5.965 mm	5.91 mm
	EX		5.95 - 5.965 mm	5.91 mm

Item		Standard	Limit
Guide inside diameter	IN	6 - 6.015 mm	6.05 mm
	EX	6 - 6.015 mm	6.05 mm
Stem-to-guide clearance	IN	0.035 - 0.065 mm	0.08 mm
	EX	0.035 - 0.065 mm	0.1 mm
Stem runout limit		…	0.01 mm
Valve seat width	IN	1 - 1.25 mm	1.6 mm
	EX	1 - 1.25 mm	1.6 mm
Valve spring:			
Free length	IN / EX	42mm	40.1 mm
Set length (valve closed)	IN / EX	36.3 mm	…
Com pressed pressure	IN / EX	15 - 30.3 kg	…
Tilt limit	IN / EX	…	2.5° /1.7mm
Piston:			
Piston to Cylinder clearance		0.02 - 0.055 mm	0.15 mm
Piston size "D"		91.96 - 91.98 mm	…
Measuring point "H"		12 mm	…
Piston pin bore inside diameter		23.002 - 23.008 mm	23.038 mm
Piston pin outside diameter		22.994 - 23 mm	22.975 mm
Piston rings:			
Top ring:			
Type		Barrel	…
End gap (installed)		0.15 - 0.30 mm	0.45 mm
Side clearance (installed)		0.02 - 0.06 mm	0.1 mm
2nd ring:			
Type		Taper	…
End gap (installed)		0.20 - 0.35 mm	0.6 mm
Side clearance (installed)		0.01 - 0.05 mm	0.1 mm
Oil ring:			
End gap (installed)		0.20 - 0.80 mm	…
Crankshaft:			
Crank width "A"		70.9 - 71.0 mm	…
Runout limit "C "		0.03 mm	…
Big end side clearance "D"		0.35 - 0.85 mm	…
Continuous Variable Transmission：			
Clutch operating speed		1900 - 2000 RPM	…
V-belt:			
V-belt width		32 mm	30.4 mm

Item	Standard	Limit
Throttle Body:		
Type	No Adjustment	
Oil pump:		
Type	Trochoid	
Tip clearance	0.1 - 0.34 mm	0 .4 mm
Side clearance	0.013 - 0.036 mm	0.15 mm
Housing and rotor clearance	0 .04 - 0.09 mm	0.15 mm
Radiator:		
Type	Cooling fin with electric fan	
Width/height/thickness	526/324/46 mm	
Radiator cap opening pressure	110 -140 KPa	
Radiator capacity (excluding water pipe)	1.5 L	
Reservoir tank capacity	0.35 L	

3.1.2 TIGHTENING TORQUES

Part to be tightened	Part name	Thread size	Q'ty	Tightening Torque		Remarks
				N.m	m.kg	
Front bearing cover	Bolt	M6	4	10	1	
Rear bearing cover	Bolt	M8	4	25	2.5	
Connection disk	Nut	M16	1	100	10	
Bearing plate	Bolt	M6	4	10	1	
Drive bevel gear	Nut	M16	1	110	10	
Drive bevel gear assy.	Bolt	M8	4	45	4.5	
Oil pump assy.	Bolt	M6	3	10	1	
Right box	Bolt	M8	6	25	2.5	
	Bolt	M6	14	10	1	
Shift driven gear	Bolt	M6	14	10	1	
Shift cover	Bolt	M6	2	10	1	
Crankshaft sprocket	--	--	1	70	7	
Cylinder	Bolt	M10	4	60	6	
Pull rod	--	--	1	12	1.2	
Cylinder head	Bolt	M10×1.5	4	60	6	
Timing sprocket	Bolt	M6	3	10	1	
Stator seat	Bolt	M6	5	10	1	
Magneto motor stator	Bolt	M6	3	10	1	
Magneto motor rotor	Nut	M16	1	110	11	

Part to be tightened	Part name	Thread size	Q'ty	Tightening Torque		Remarks
				N.m	m.kg	
Trigger	Bolt	M5	2	6	0.6	
Right cover	Bolt	M6	9	10	1	
Timing check plug	Bolt	M14	1	10	1	
Cylinder head cover	Bolt	M6	8	10	1	
Cylinder head side cover	Bolt	M6	5	10	1	
Timing chain adjuster assy.	Bolt	M6	2	10	1	
Spark plug	--	--	1	30	3	
Water pump	Bolt	M6	4	10	1	
Thermostat housing	Bolt	M6	2	10	1	
Water temperature sensor	--	--	1	10	1	
Starting motor	Bolt	M6	2	10	1	
Active clutch assy.	Bolt	M12X1.25	1	110	11	
Driven clutch assy.	Bolt	M10X1.25	1	75	7.5	
CVT cover	Bolt	M6	11	8	0.8	
Connecting bend	Bolt	M8	2	25	2.5	
Throttle body assy.	Bolt	M6	2	10	1	
Injector	Bolt	M6	1	10	1	
Drain oil cock	Bolt	M10X1.25	1	32	3.2	

3.2 PARTS INSPECTION AND SERVICE

3.2.1 VALVE CLEARANCE ADJUSTMENT

NOTE:

Valve clearance adjustment should be made with the engine cool, at room temperature.

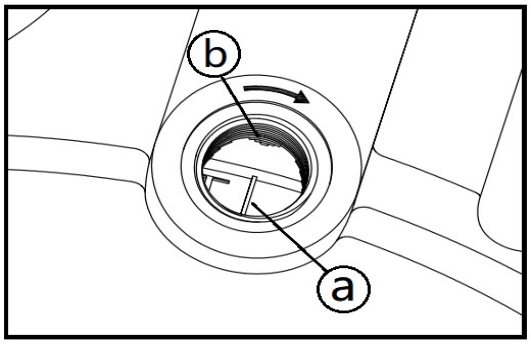
When the valve clearance is to be measured or adjusted, the piston must be at Top Dead Center (T.D.C.) on the compression.

1. Remove:
- Cylinder head cover
- CVT cover

2. Remove:
- Spark plug

3. Remove:
- Timing check plug

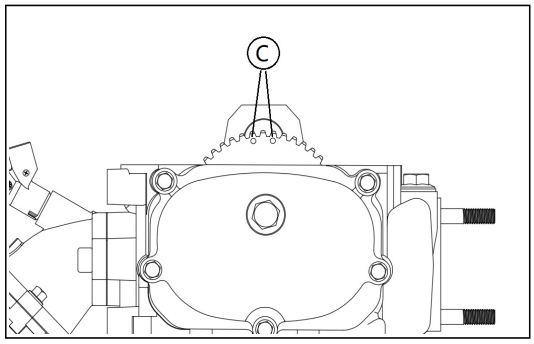
4. Adjust
- Turn the active clutch to align the mark ⓐ on the rotor of the magneto machine with the mark ⓑ on the right cover. At this time, the mark ⓒ on the camshaft sprocket is parallel to the cylinder head plane. The piston is at the Top Dead Center (T.D.C.) on the compression.



5. Measure:
- Valve clearance

Out of specification → Adjust.

- Measure the valve clearance by using a feeler gauge.



Valve clearance (cold):

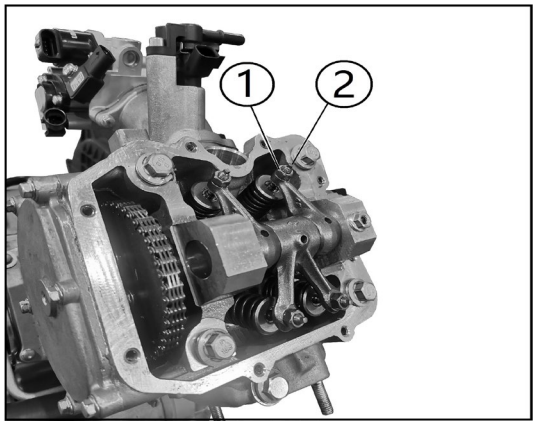
Intake valve	**0.05 - 0.08 mm**
Exhaust valve	**0.08 - 0.10 mm**

6. Adjust
- Valve clearance

Adjustment steps:
- Loosen the locknut ①
- Turn the adjuster ② in or out until specified clearance is obtained.

Turning in → Valve clearance is decreased.
Turning out → Valve clearance is increased.

- Hold the adjuster to prevent it from moving and tighten the locknut.



14 Nm(1.4m·kg)

● Measure the valve clearance.
If the clearance is incorrect, repeat above steps until specified clearance is obtained.

7. Install:
Refer to the reverse steps of disassembly for assembly. If the gasket between the cylinder head cover and the cylinder head is damaged, please replace it.

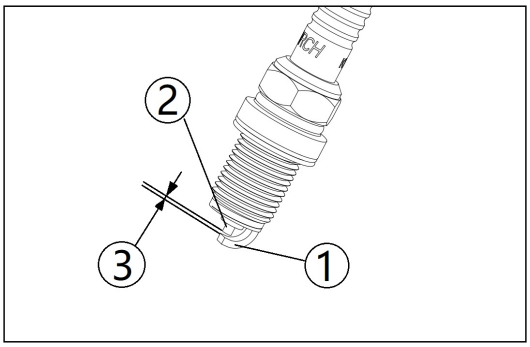
3.2.2 SPARK PLUG INSPECTION

1. Remove:
● Spark plug cap
● Spark plug

CAUTION:
Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinder.

2. Check:
● Spark plug type
Incorrect ⟶ Replace.

	Standard spark plug: TORCH K6RTC



3. Inspect:
● Electrode ①
Wear/ damage ⟶ Replace.
● Insulator ②
Abnormal color ⟶ Replace.
Normal color is a medium - to- light tan color.

4. Clean:
● Spark plug
(with spark plug cleaner or wire brush)

5. Measure:
● Spark plug gap ③ (with a wire gauge)
Out of specification ⟶ Adjust gap.

	Standard plug gap: 0.6 - 0.7 mm

6. Install:
● Spark plug

	18Nm(1.8m·kg)

NOTE:
Before installing a spark plug, clean the gasket surface and plug surface.

3.2.3 COMPRESSION PRESSURE

NOTE:

Insufficient compression pressure will result in performance loss.

1. Check:
- Valve clearance
  Out of specification ⟶ Adjust.

Refer to "3.2.1 VALVE CLEARANCE ADJUSTMENT" section.

2. Start the engine and let it warm up for several minutes.

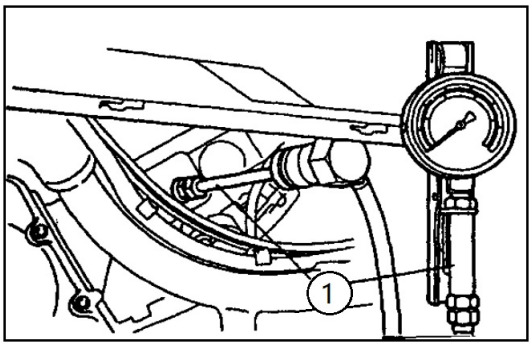
3. Turn off the engine.

4. Remove:
- Spark plug

NOTE:

Before removing the spark plug, use compressed air to blow away any dirt accumulated in the spark plug well to prevent it from falling into the cylinder.

5. Attach:
- Compression gauge①



6. Measure:
- Compression pressure

If it exceeds the maximum pressure allowed, Inspect the cylinder head, valve surfaces and piston crown for carbon deposits.

If it is below the minimum pressure, Squirt a few drops of oil into the affected cylinder and measure again.

Follow the table below.

Compression pressure (With oil applied into cylinder)	
Reading	**Diagnosis**
Higher	Inspect the cylinder head, valve surfaces and piston crown for serious carbon deposits→ Clean
Lower	Possible defective rings, valves, cylinder head gasket or piston → Repair

Compression pressure (at sea level):

Standard: 1,140 kPa (11.6kgf/cm^2,11.4bar)

Minimum: 912kPa (9.3kgf/cm^2,9.1bar)

Measurement steps:

● Crank the engine with the throttle wide open until reading on the compression gauge stabilizes.

WARNING:

Before cranking the engine, ground all spark plug leads to prevent sparking.

7. Install:

Refer to the reverse steps of disassembly for assembly.

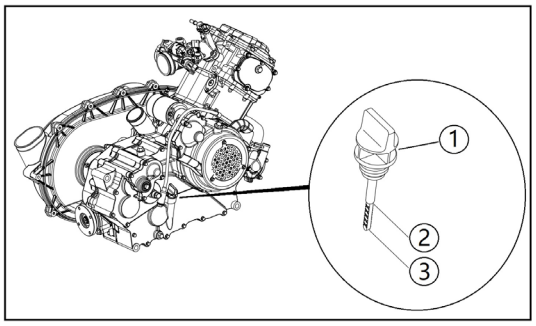
3.2.4 ENGINE OIL LEVEL INSPECTION

1. Start the engine and let it warm up for a few minutes.

2. Turn off the engine.

NOTE:

Wait a few minutes until the oil settles before inspecting the oil level.

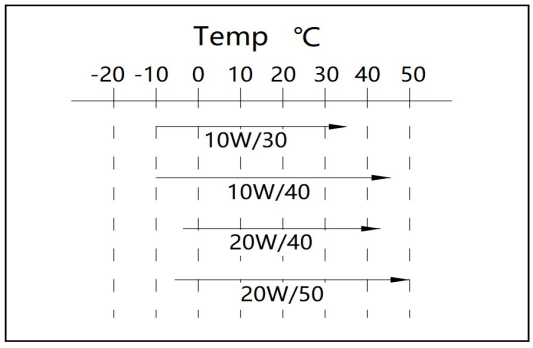


3. Inspect: (Do not thread dipstick① in)

● Engine oil level

Oil level should be between maximum② and minimum③ marks.

Oil level is below the minimum mark. Add oil up to the proper lever.



Recommended engine oil

Refer to the chart for selection of the oils suited to the atmospheric temperature.

API STANDARD: API

API SE or higher grade

CAUTION:

● Do not put in any chemical additives or use oils with a grade of CD or higher.

●Be sure not to use oils labeled "ENERGY CONSERVING I" or higher.

●Be sure no foreign material enters the crankcase.

3.2.5 ENGINE OIL REPLACEMENT

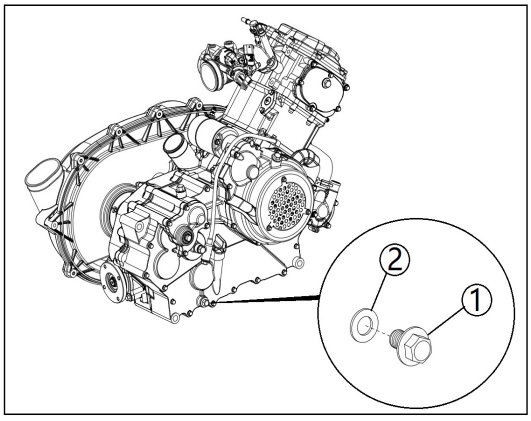
1. Start the engine and let it warm up for several minutes.

2. Turn off the engine and place an oil pan under the engine.

3. Remove:
- Drain oil cock①

	32Nm(3.2m·kg)

- Copper washer②
- Drain the crankcase of its oil.



4. Install:
Refer to the reverse steps of disassembly for assembly. Please check the aluminum washer and replace it if it is damaged.

5. Fill:
- Crankcase

	Oil quantity:
	2.3 L

6. Check:
- Engine oil level

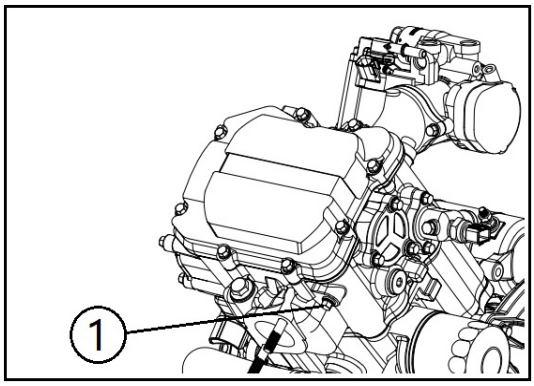
Refer to "**3.2.4 ENGINE OIL LEVEL INSPECTION**" section.

3.2.6 ENGINE OIL PRESSURE INSPECTION

Inspection steps:

- Slightly loosen the oil check bolt①
- Start the engine and keep it idling until the oil begins to seep from the oil check bolt. If no oil comes out after one minute, turn the engine off so it will not seize.
- Check oil passages and oil pump for damage or leakage.
- Start the engine after solving the problem (s), and recheck the oil pressure.
- Tighten the oil check bolt to specification.

	10Nm(1.0m·kg)



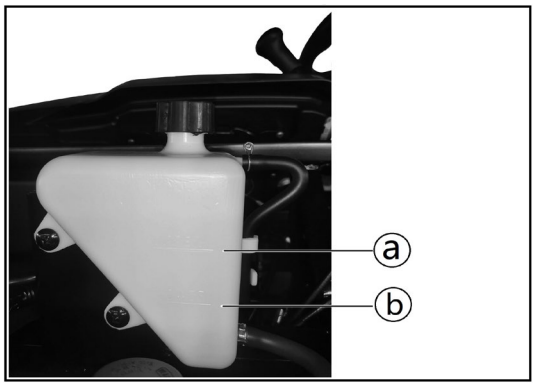
CAUTION:
- Start the engine and check the oil pressure with the oil check bolt loosened.
- Do not apply at high speeds more than specified when checking the pressure.

NOTE:
Wipe any spilled oil off the engine.

3.2.7 COOLANT LEVEL INSPECTION

Inspect:
- Coolant level

1. Start the engine and let it warm up for several minutes.
2. Turn off the engine and inspect the coolant level again.



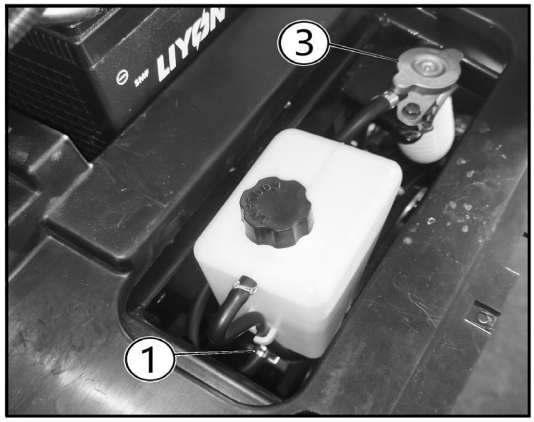
NOTE:
Wait a few minutes until the coolant settles before inspecting the coolant level.

Coolant level should be between the maximum ⓐ and minimum ⓑ marks.

Coolant level is below the "LOWER " level line Add coolant up to the proper level.

CAUTION:
Hard water or salt water is harmful to engine parts. Use only soft water or distilled water if coolant is not available. If you use tap water, make sure it is soft water.

3.2.8 COOLANT REPLACEMENT



1. Remove:
- Front cover of UTV plastic body work.
- Seat.

2. Remove:
- Hose ① (reservoir tank)

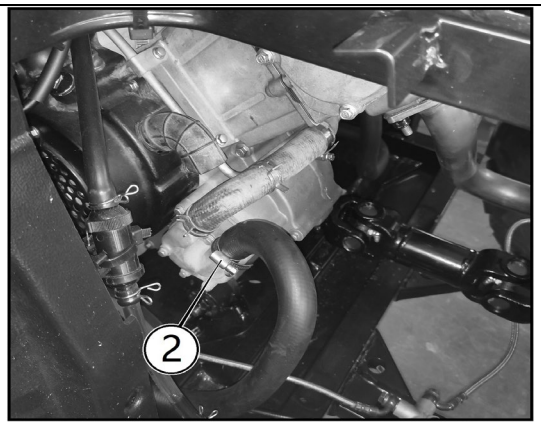
Drain the reservoir tank of its coolant.

3. Loosen:
- Engine coolant inlet pipe ②

4. Remove:
- Radiator cap ③

WARNING:
Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:

Place a thick rag or a towel over the radiator cap. Slowly rotate the cap counterclockwise toward the detent. This allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



NOTE:

● Remove the radiator cap after loosening engine coolant inlet pipe.

5. Clean:

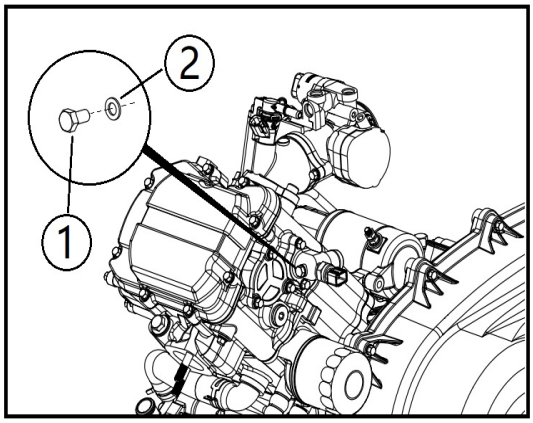
● Radiator

6. Connect:

● Hose (reservoir tank)
● Engine coolant inlet pipe②
● Tighten Hose Clamp

7. Remove:

● Bolt M6×12① (in the Cylinder Head coolant outlet pipe)
● Copper washer②



8. Fill:

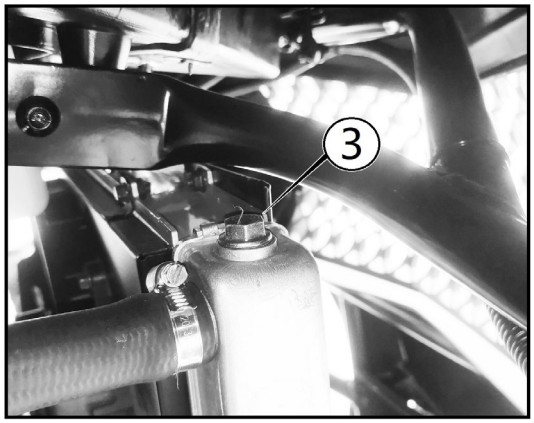
● Radiator (to specified level)

Fill the coolant slowly, until the coolant comes out from the tapped hole.

9. Install:

● Bolt M6×12①
● Copper washer②

10Nm(1.0m·kg)



10.Remove:

● Drain Bolt③ (in the upper right corner of the Radiator)

11.Fill:

● Radiator (to specified level)

Fill the coolant slowly, until the coolant comes out from the tapped hole.

12.Install:

● Drain Bolt③

13.Fill:

● Reservoir tank (to maximum level ⓐ)

	Recommended coolant: High quality ethylene glycol anti-freeze containing corrosion inhibitors for aluminum engine.

Total amount:
2L (including water pipe)
Reservoir tank capacity:
0.35L

HANDLING NOTES FOR COOLANT:

Coolant is potentially harmful to environment and should be handled with special care.

WARNING:

Splashes in your eyes:

●Thoroughly wash your eyes with water and consult a doctor.

If coolant splashes on your clothes:

● Quickly wash it away with water and then with soap and water.

WARNING:

Coolant is poisonous. Never drink it. Store it properly.

If coolant is swallowed: Vomit immediately and see a physician.

CAUTION:

●Hard water or salt water is harmful to engine parts.

● Do not use water containing impurities or oil.

● Take care that no coolant splashes onto painted surfaces. If it does, wash them immediately with water.

●Do not mix different types of ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines.

14.Install:

● Radiator cap

15. Start the engine and let it warm up for several minutes.

16. Stop the engine and inspect the level.

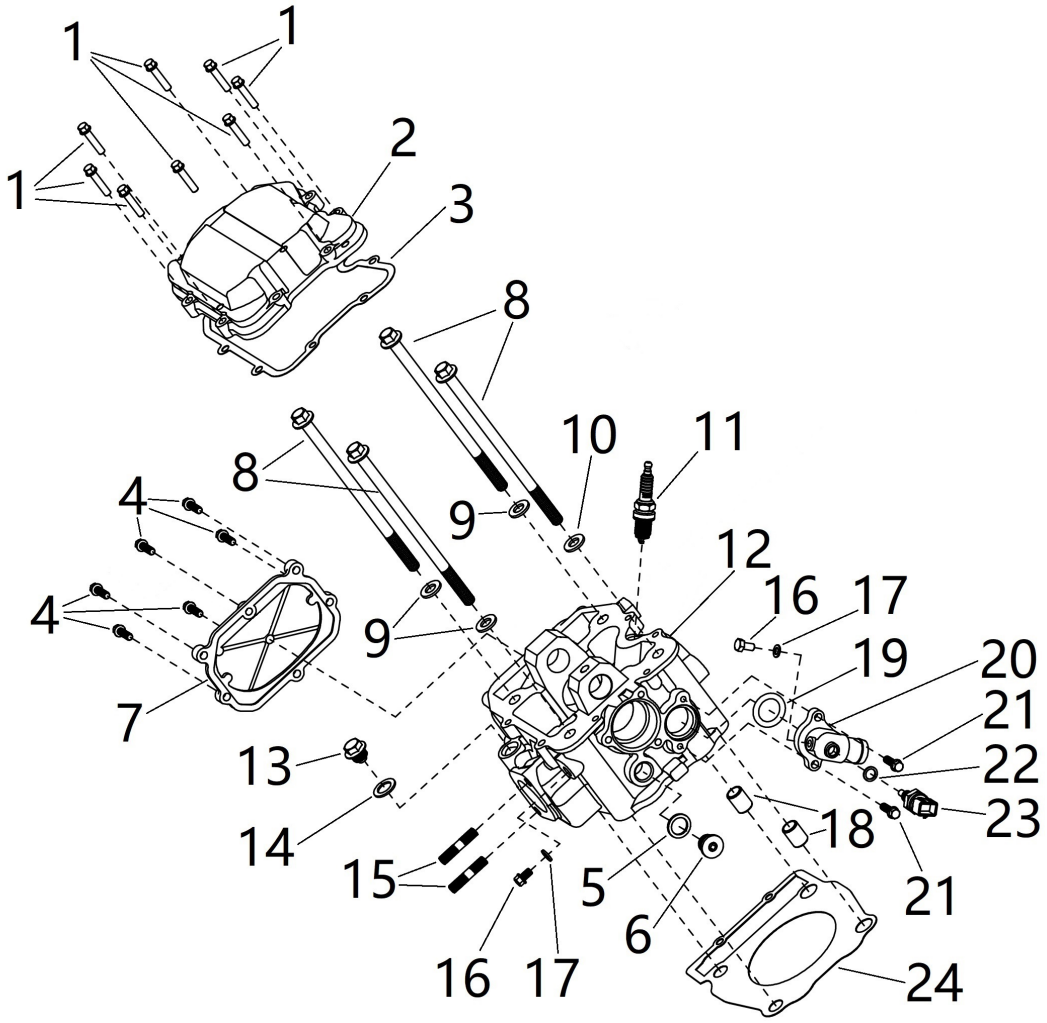
NOTE:

Wait a few minutes until the coolant settles before inspecting the coolant level.

17. Install:

● Remain parts.

3.3 CYLINDER HEAD AND CYLINDER COMPONENTS



Order	Job name / Part name	Q'ty	Remarks
1	BOLT M6×28	10	
2	CYLINDER HEAD COVER	1	
3	GASKET，CYLINDER HEAD COVER	1	
4	BOLT M6×20	5	
5	SCREWED PLUG M16×1.5	1	
6	ALUMINUM WASHER 16	1	
7	CYLINDER HEAD SIDE COVER	1	
8	BOLT M10×190×1.5	4	
9	WASHER 10	3	
10	COPPER WASHER 10	1	
11	PIUG SPARK K6RTC	1	
12	CYLINDER HEAD ASSY.	1	
13	SCREWED PLUG M14×1.5	1	
14	ALUMINUM WASHER 14	1	
15	BOLT STUD M8×42	2	
16	BOLT M6×12	2	
17	COPPER WASHER 6.5	2	
18	PIN DOWEL 15×20	2	

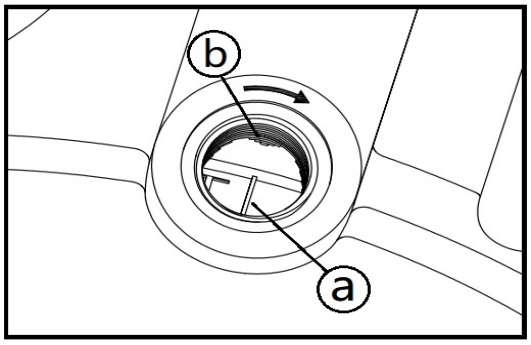
Order	Job name / Part name	Q'ty	Remarks
19	O-RING 21.5×5	1	
20	THERMOSTAT HOUSING	1	
21	BOLT M6×20	2	
22	ALUMINUM WASHER 10	1	
23	COOLANT SENSOR	1	
24	GASKET, CYLINDER HEAD	1	

CYLINDER HEAD REMOVAL

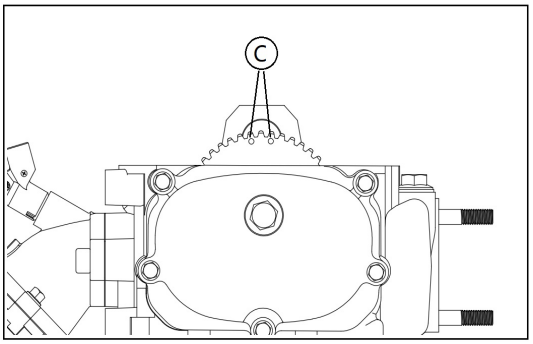
1. Remove:
- Cylinder head cover
- CVT cover

2. Remove:
- Spark plug

3. Remove:
- Timing check plug



4. Adjust:
- Turn the active clutch to align the mark ⓐ on the rotor of the magneto machine with the mark ⓑ on the right cover. At this time, the mark ⓒ on the camshaft sprocket is parallel to the cylinder head plane. The piston is at the Top Dead Center (T.D.C.) on the compression.



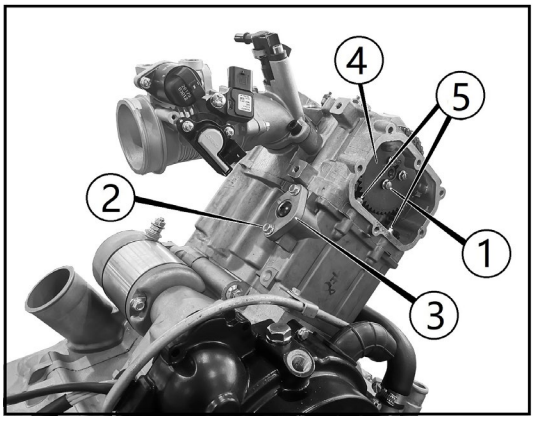
NOTE: If any special mark found, contact the UTV manufacture via the agent for the parts and special instruction.

5. Remove:
- Bolt M6×20
- Cylinder head side cover

6. Remove:
- Bolt M×22①, number: 3
- Bolt Single Coil Spring Lock Washer 6, number: 3

7. Remove:
- Bolt M6×20②, number: 2
- Cam Chain Tension Adjuster③

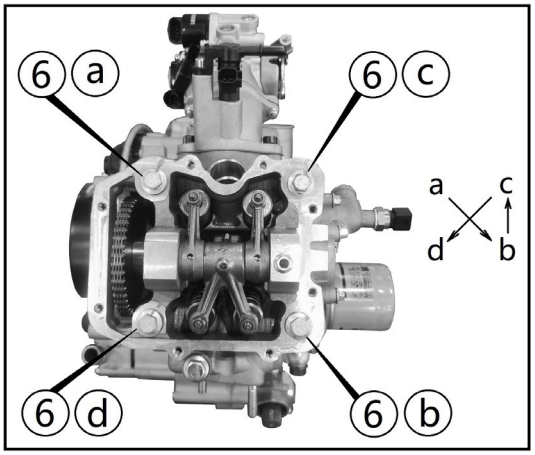
8. Remove:
- Camshaft Sprocket④



NOTE:
- Fasten a safety wire to the timing chain to prevent it from falling into the crankcase.

9. Remove:
- Bolt M6×28⑤
- Bolt M10×190×1.5⑥

NOTE:
- Loosen the nuts in their proper loosening sequence.
- Loosen the bolts from a to d; Start by loosening each nut 1/2 turn until all are loose.

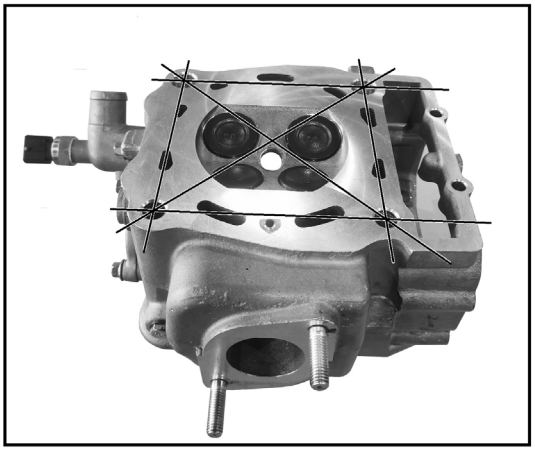


10. Remove:
- Cylinder head

CYLINDER HEAD INSPECTION:

1. Eliminate:
- Carbon deposits (from combustion chambers); Use a rounded scraper.

NOTE:
Do not use a sharp instrument to avoid damaging or scratching:
- Spark plug threads
- Valve seats



2. Inspect:
- Cylinder head
  Scratches/damage → Replace.

3. Measure:
- Cylinder head warpage
  Out of specification → Resurface.

	Cylinder head warpage: Less than 0.03 mm

Warpage measurement and resurfacement.

Steps:

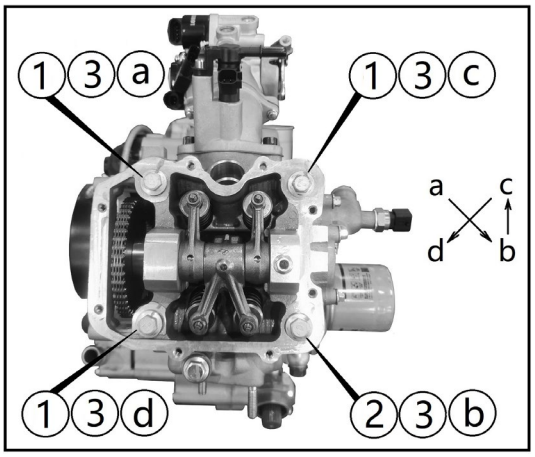
- Place a straight edge and a feeler gauge across the cylinder head;
- Measure the warpage.

If the warpage is out of specification, resurface the cylinder head.

- Place a 400 ~ 600 grit wet abrasive paper on the surface plate, and resurface the head.

NOTE:
Rotate the cylinder head several times for an even resurfacement.

CYINDER HEAD INSTALLATION



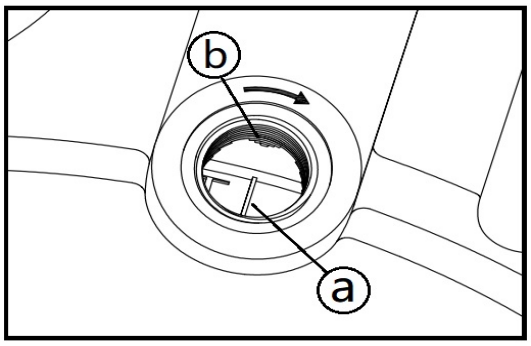
1. Install:
- Gasket (Cylinder Head) (NEW)
- Pin Dowel 15×20
- Cylinder Head

2. Install:
- Washer 10①
- Copper Washer 10②
- Bolt M10×190×1.5③

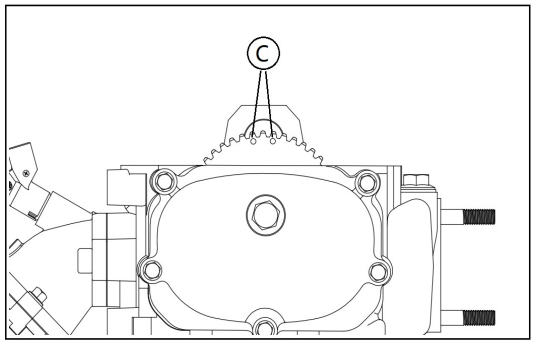
3. Tighten:
- Bolt M10×190×1.5

	60Nm(6m·Kg)

NOTE:
- Apply Threadlocker (LOCTITE 7243) onto the nut threads.
- Tighten the nuts in a crisscross pattern. Tighten the bolts from a to d; Start by tightening each bolt to 30Nm, then tighten each bolt to 60Nm.



3. Install:
- Camshaft Sprocket
- Timing Chain
- Bolt M×22, number: 3
- Bolt Single Coil Spring Lock Washer 6, number: 3



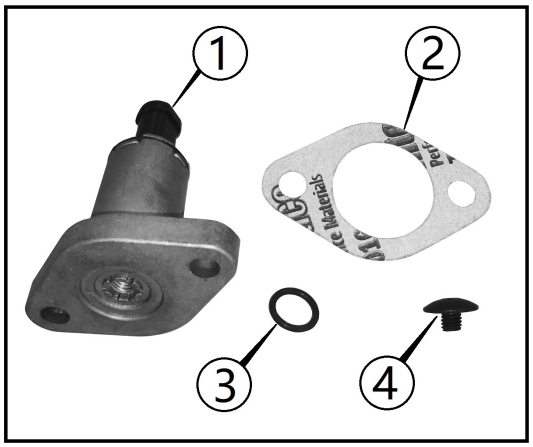
Installing steps:
- Turn the active clutch counterclockwise to align the mark ⓐ on the rotor of the magneto machine with the mark ⓑ on the right cover. At this time, the mark ⓒ on the camshaft sprocket is parallel to the cylinder head plane. The piston is at the Top Dead Center (T.D.C.) on the compression.

NOTE:
- When installing the cam sprocket, keep the timing chain as tense as possible on the exhaust side.
- Align the pin on the cam shaft with the slot in the cam sprocket.

CAUTION:
Do not turn the crankshaft during installation of the cam shaft. Dam age or improper valve timing will result.
- While holding the camshaft, temporarily tighten the bolts.
- Remove the safety wire from the timing chain.

4. Install:
●Timing chain tensioner

Installing steps:



● Rotate the hole in the timing chain tensioner with slotted screwdriver to make① indent, and hold slotted screwdriver;
● Install the tensioner with a new gasket② onto the Cylinder;
● Fasten the tensioner to the Cylinder with bolts M6×20;

10Nm(1.0m·kg)

● Put O-ring③ into the groove of the tensioner head;
● Tighten the bolt④ to the Timing chain tensioner.

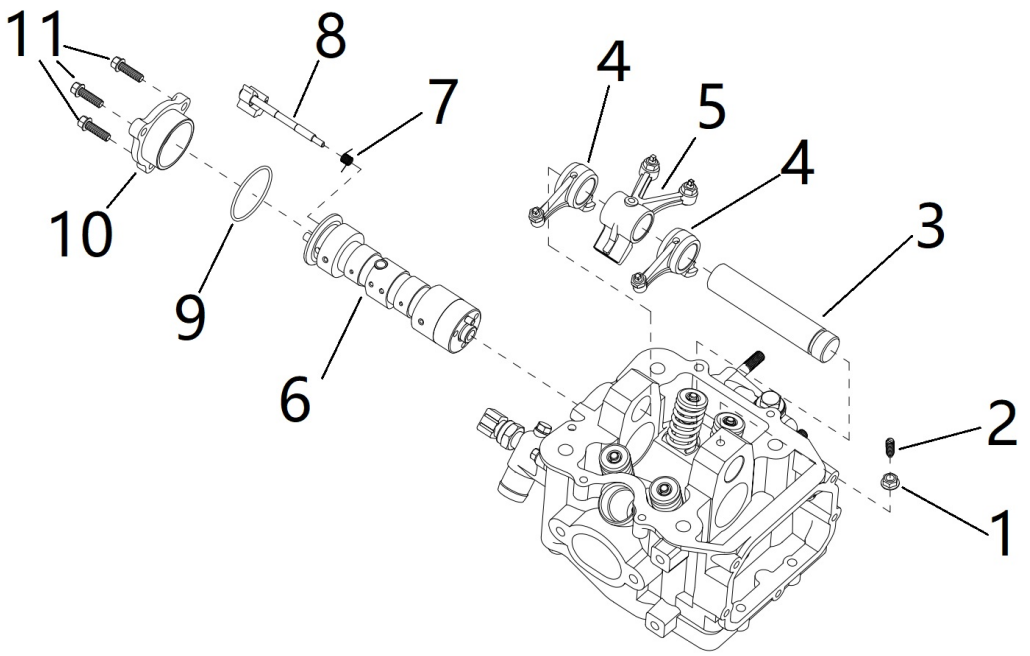
6. Tighten:
● Bolt M×22, number: 3

10Nm(1.0m·kg)

7. Check:
● Valve timing
Out of alignment → Adjust.

8. Check:
● Valve clearance
Out of specification → Adjust.
Refer to the "**VALVE CLEARANC ADJUSTMENT**" section.

3.4 CAMSHAFT AND ROCKER ARMS



Order	Job name / Part name	Q'ty	Remarks
1	NUT M6	1	
2	SLOTTED SET SCREW WITH CONE POINT M6×17	1	
3	ROCKER SHAFT	1	
4	INTAKE SIDE ROCKER ARM VALVE	2	
5	EXHAUST SIDE ROCKER ARM VALVE	1	
6	CAMSHAFT	1	
7	DECOMPRESSION RETURN SPRING	1	
8	VACUUM CENTRIFUGE AXIS	1	
9	O-RING 43×2	1	
10	CAMSHAFT COVER	1	
11	BOLT M6×20	3	

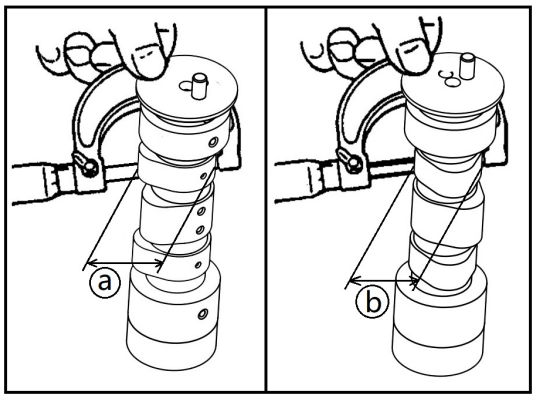
ROCKER ARM AND ROCKER ARM SHAFT REMOVAL

1. Remove:
- Nut M6
- Slotted Set Screws with Cone Point M6×17
- Intake Side Rocker Arm Valve
- Exhaust Side Rocker Arm Valve

2. Remove:
- Bolt M6×20
- Camshaft Cover

3. Remove:
- Vacuum Centrifuge Axis
- Decompression Return Spring

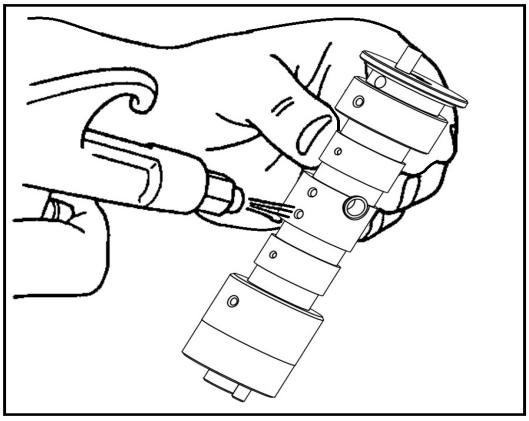
CAMSHAFT INSPECTION



1. Inspect:
● Cam lobes
Pitting/Scratches/Blue discoloration →Replace.

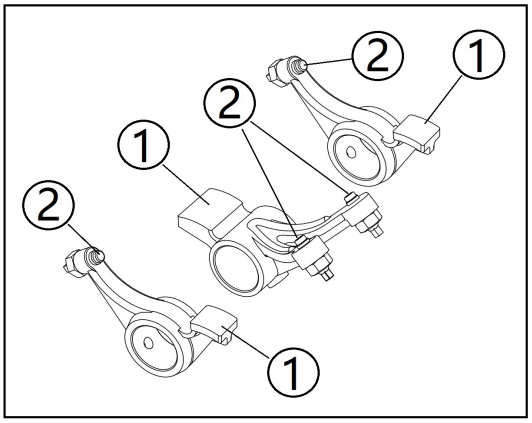
2. Measure:
● Cam lobes length ⓐ and ⓑ
Out of specification → Replace.

Cam lobes length:
Intake:
ⓐ 32.76 - 32.80 mm
<Limit: 32.63 mm>
ⓑ 27.95 - 28.05 mm
<Limit: 27.92 mm>
Exhaust:
ⓐ 32.76 - 32.80 mm
<Limit: 32.63 mm>
ⓑ 27.95 - 28.05 mm
<Limit: 27.92 mm>



3. Inspect:
● Cam shaft oil passage
Stuffed → Blow out oil passage with compressed air.

ROCKER ARMS AND ROCKER ARM SHAFTS INSPECTION



1. Inspect:
● Cam lobe contact surface①
● Adjuster surface②
Wear/Pitting/Scratches/Blue discoloration→Replace.

Inspection steps:

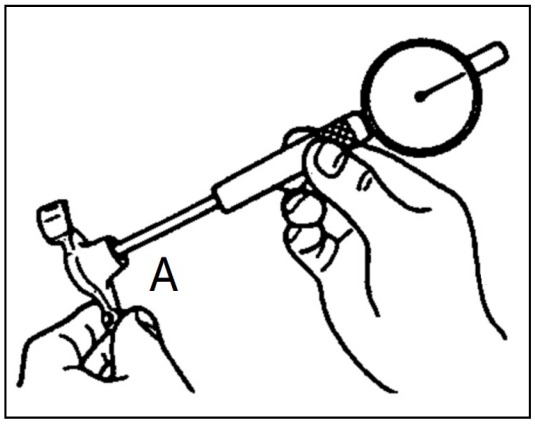
● Inspect the two contact areas on the rocker arms for signs of unusual wear.

● Rocker arm shaft hole.

● Cam-lobe contact surface.
Excessive wear → Replace.

● Inspect the surface condition of the rocker arm shafts.
Pitting/scratches/blue discoloration → Replace or check lubrication.

● Measure the inside diameter A of the rocker arm holes.
Out of specification → Replace.

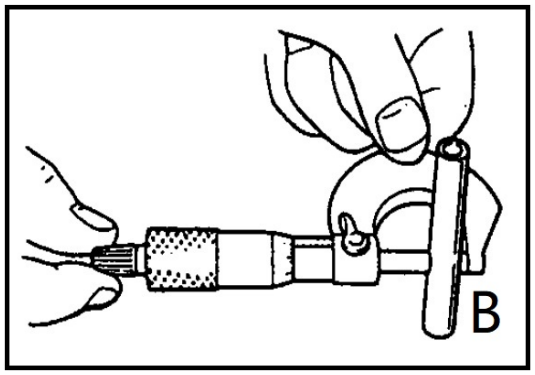


Inside diameter (rocker arm):
22.000- 22.021 mm
< Limit: 22.033 mm >

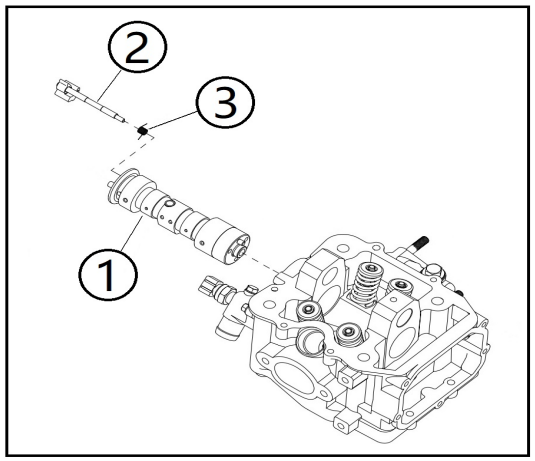
● Measure the outside diameter B of the rocker arm shafts.

Out of specification → Replace.

	Outside diameter (rocker arm shaft): **21.973- 21.984 mm** **< Limit: 21.94 mm >**



CAMSHAFT AND ROCKER ARM INSTALLATION



1. Lubricate:
● Camshaft ①

	Camshaft: **Molybdenum disulfide oil**

2. Install:
● Camshaft ①
● Vacuum Centrifuge Axis ③
● Decompression Return Spring ②

3. Install:
● O-ring 43×2
● Camshaft Cover

4. Install:
● Rocker Shaft
● Intake Side Rocker Arm Valve
● Exhaust Side Rocker Arm Valve

NOTE:
Molybdenum disulfide oil onto the rocker arm and rocker arm shaft.

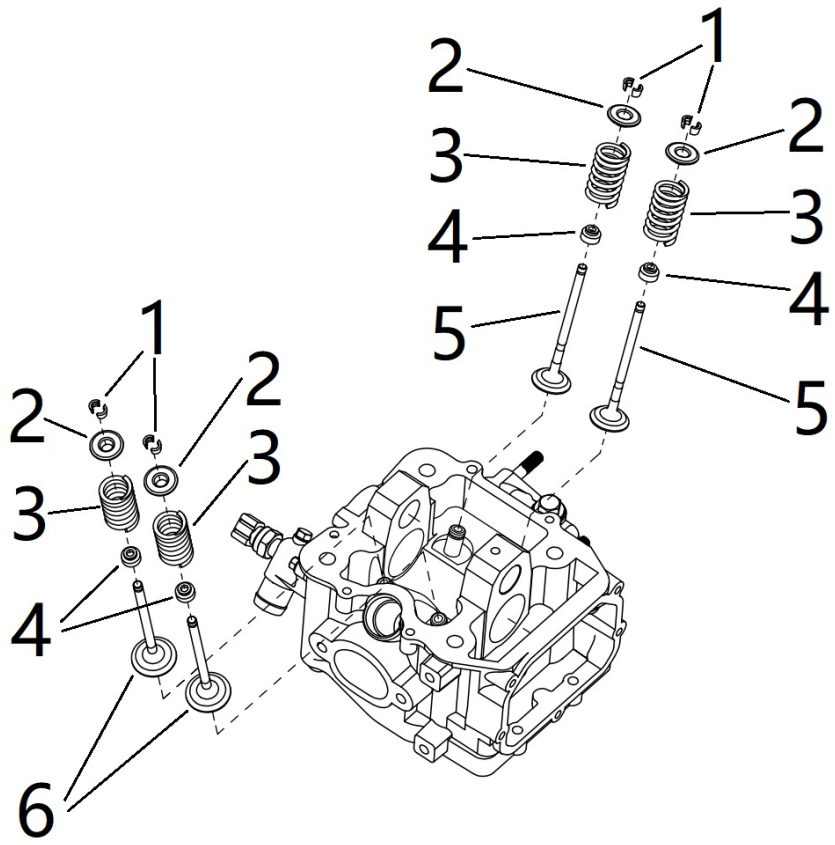
	Molybdenum disulfide oil

5. Install:
● Slotted Set Screw with Cone Point M6×17

NOTE:
Screw the Screw M6×17 into the threaded hole of the Cylinder head, and insert the Screw head into the Rocker shaft groove.

● Nut M6

3.5 VALVES AND VALVE SPRINGS



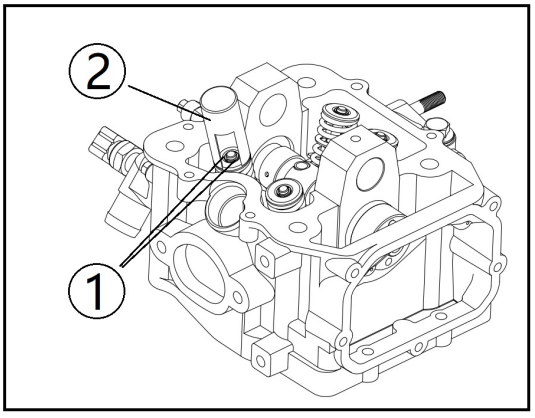
Order	Job name / Part name	Q'ty	Remarks
1	COTTER VALVE	8	
2	RETAINER SPRING VALVE	4	
3	SPRING VALVE	4	
4	VALVE SEAL ASSY.	4	
5	EXHAUST VALVE	2	
6	INTAKE VALVE	2	

VALVES AND VALVE SPRINGS REMOVAL

1. Remove:
● Valve cotters ①

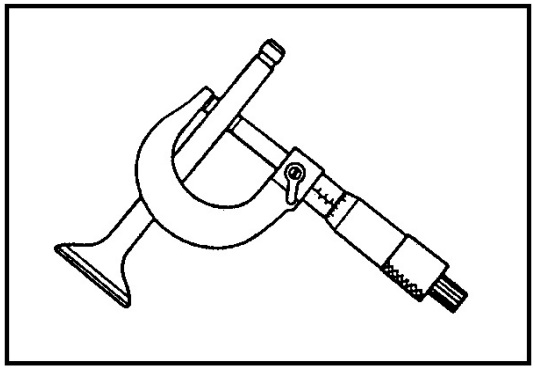
NOTE:
Attach a valve spring compressor and attachment ② between the valve spring retainer and cylinder head to remove the valve cotters.

CAUTION:
Do not compress so much as to avoid damage to the valve spring.



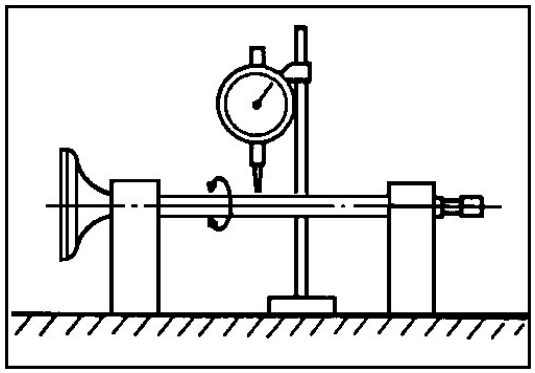
VALVE AND VALVE SPRINGS INSPECTION

1. Measure:
● Valve stem diameter
Out of specification → Replace.



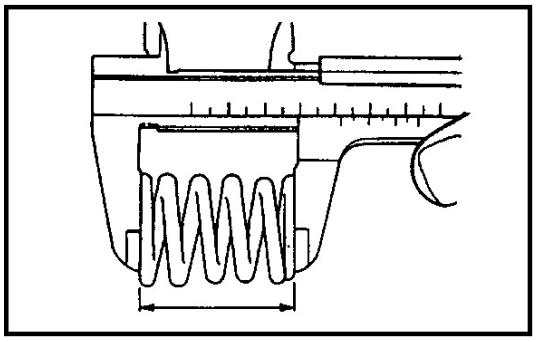
	Valve stem diameter: **Intake: 5.95 - 5.965 mm** **<Limit: 5.91mm>** **Intake: 5.95 - 5.965 mm** **<Limit: 5.91mm>**

2. Measure:
● Runout (valve stem)
Out of specification → Replace.



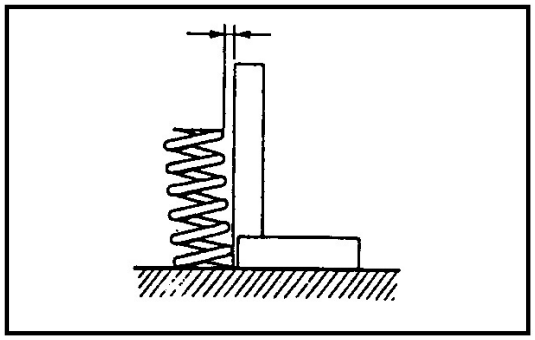
	Runout limit: 0.01 mm

3. Measure:
● Free length (valve spring)
Out of specification → Replace.



	Valve spring free length: **42 mm** **<Limit: 40.1 mm>**

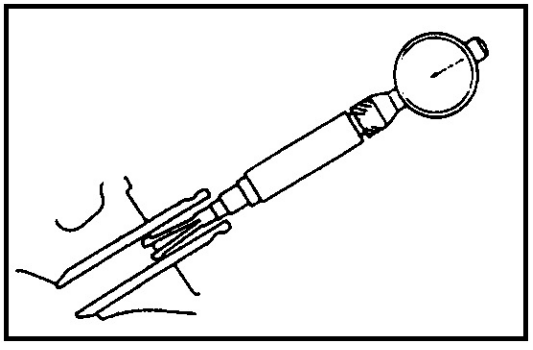
4. Measure:
● Spring tilt
Out of specification → Replace.



	Spring tilt limit: **1.7mm (2.5º)**

5. Inspect:
● Spring contact face
Wear/Pitting/Scratches → Replace.

6. Measure:
● Valve guide inside diameter
Out of specification → Replace.

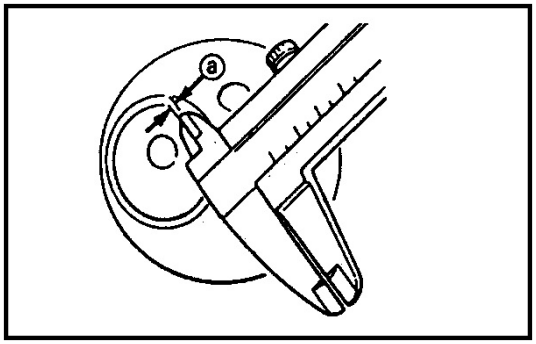


	Valve guide inside diameter: **Intake: 6.000-6.015 mm** **<Limit: 6.05mm>** **Exhaust: 6.000-6.015 mm** **<Limit: 6.05 mm>**

7. Measure:
● Stem-to guide clearance
Out of specification → Replace the valve guide.

	Stem-to-guide clearance limit: **Intake: 0.08 mm** **Exhaust: 0.10 mm**

VALVE SEATS INSPECTION



1. Eliminate:
● Carbon deposits
(from the valve face and valve seat)

2. Inspect:
● Valve seats
Pitting/wear → Reface the valve seat.

3. Measure:
● Valve seat width ⓐ
Out of specification → Reface the valve seat.

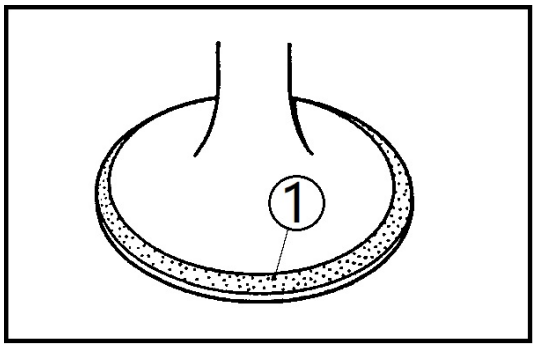
	Valve seat width: **Intake: 1.0-1.25 mm** **<Limit: 1.5 mm>** **Exhaust: 1.0-1.25 mm** **<Limit: 1.5 mm>**

Measurement step:

● Apply Mechanic's bluing dye (DYKEM) ① to the valve face.

● Install the valve into the cylinder head.

● Press the valve through the valve guide and onto the valve seat to make a clear pattern.



● Measure the valve seat width. Where the valve seat and valve face made contact, bluing will have been removed.

● If the valve seat is too wide, too narrow, or the seat is not centered, the valve seat must be replaced.

4. Lap:
● Valve face
● Valve seat

NOTE:
After replacing the valve seat, valve and valve guide, the valve seat and valve face should be lapped.

Lapping steps:
● Apply a coarse lapping com pound to the valve face.

CAUTION:

● Do not let compound enter the gap between the valve stem and the guide.

● Apply molybdenum disulfide oil to the valve stem.

● Install the valve into the cylinder head.

● Turn the valve until the valve face and valve seat are evenly polished, then clean off all com- pound.

NOTE:

For best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hand.

Apply a fine lapping compound to the valve face and repeat the above steps.

NOTE:

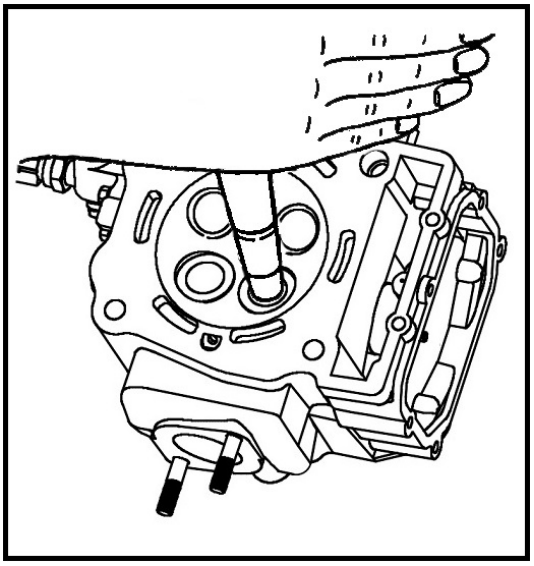
Make sure to clean off all compound from the valve face and valve seat after every lapping operation.

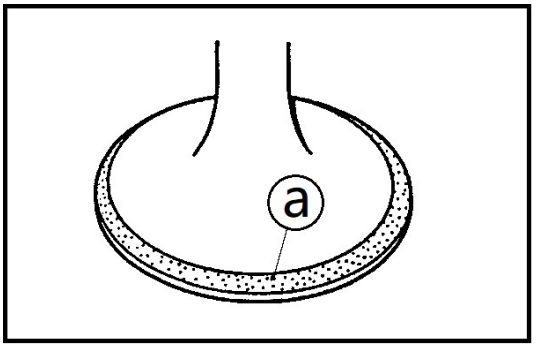
● Apply Mechanic's bluing dye (DYKEM)ⓐ to the valve face.

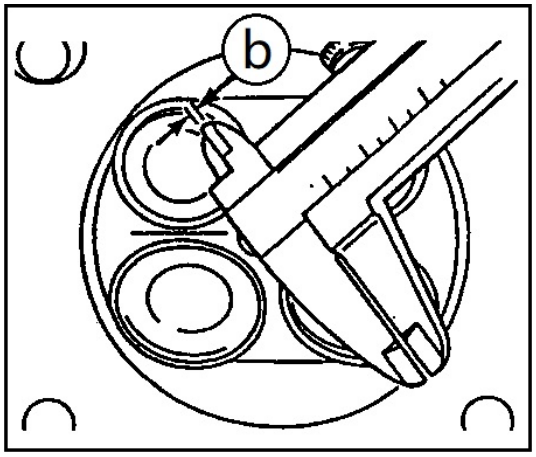
● Install the valve into the cylinder head.

● Press the valve through the valve guide and onto the valve seat to make a clear pattern.

● Measure the valve seat with ⓑ again.







VALVES AND VALVE SPRINGS INSTALLATION

1. Deburr:

● Valve stem end

Use an oilstone to smooth the stem end.

2. Apply:

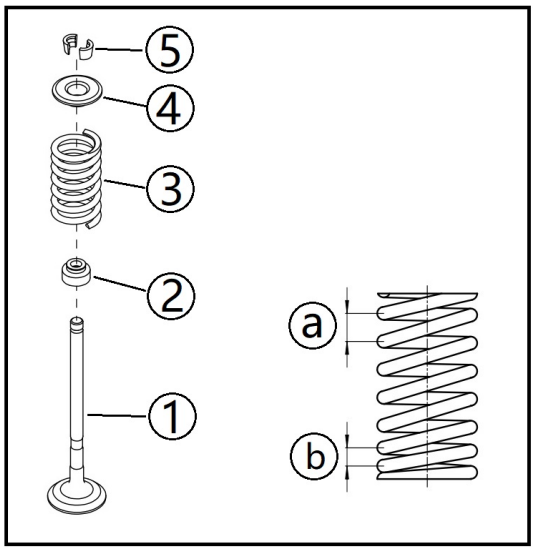
● Molybdenum disulfide oil

(onto the valve stem□ and oil seal)

	Molybdenum disulfide oil

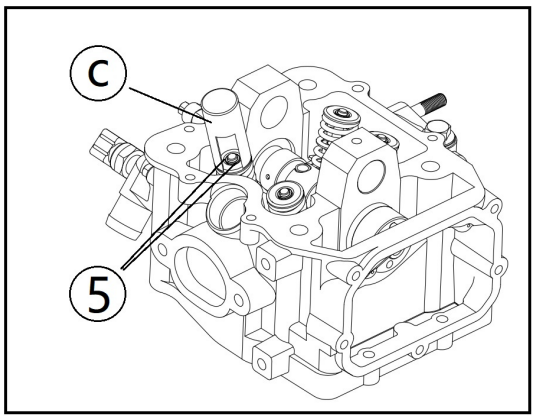
3. Install: □
- Valve seal assy. **(NEW)** ②
- Valve (into the cylinder head) ①
- Valve spring ③
- Retainer spring valve ④

NOTE:
Install the valve spring with the larger pitch ⓐ facing upwards.
ⓑ Smaller pitch.



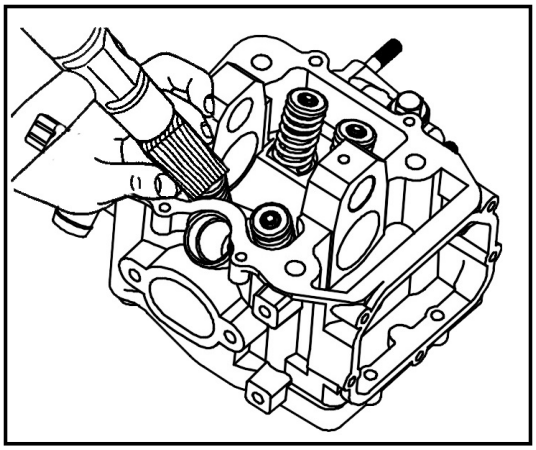
4. Install:
- Valve cotters ⑤

NOTE:
Install the valve cotters while compressing the valve spring with a valve spring compressor and attachment ⓒ.

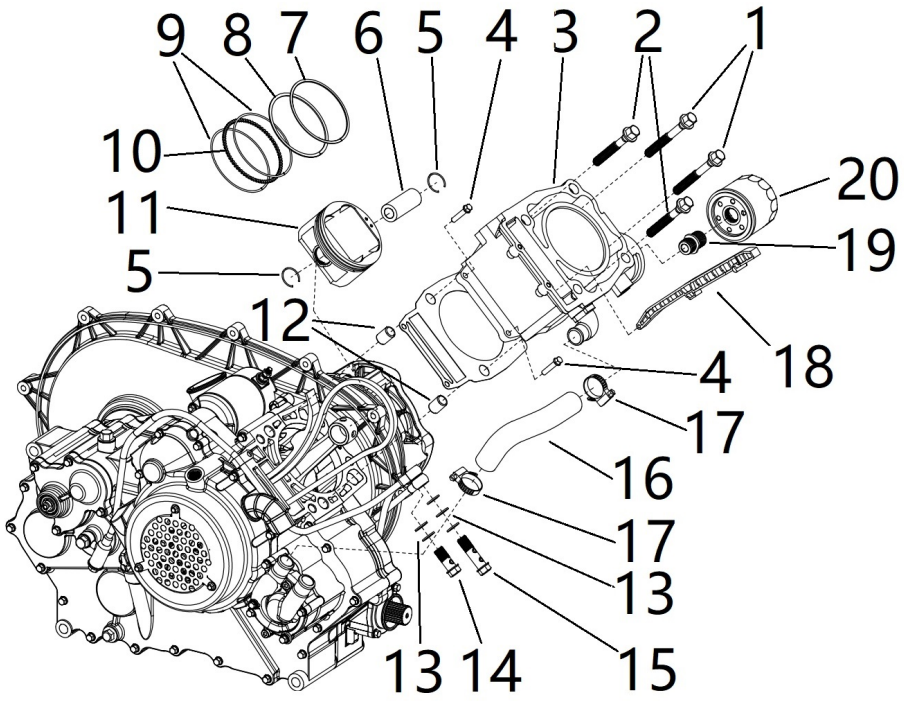


5. Secure the valve cotters onto the valve stem by tapping lightly with a piece of wood.

CAUTION:
Do not hit so much as to damage the valve.



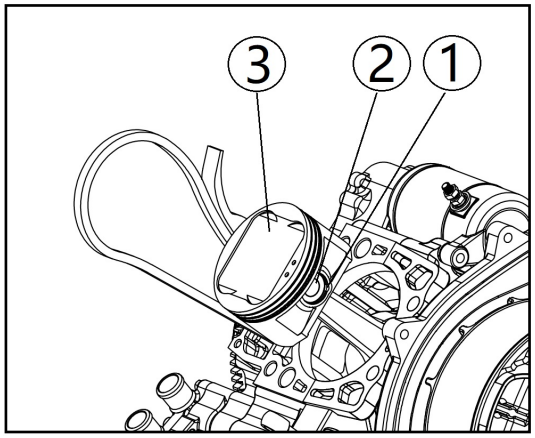
3.6 CYLINDER AND PISTON



Order	Job name / Part name	Q'ty	Remarks
1	BOLT M10×70	2	
2	BOLT M10×78	2	
3	CYLINDER	1	
4	BOLT M6×28	2	
5	CLIP	2	
6	PISTON PIN	1	
7	PISTON TOP RING	1	
8	PISTON 2ND RING	1	
9	SCRAPPER RING	2	
10	OIL CONTROL RING	1	
11	PISTON	1	
12	DOWEL PIN 15×20	2	
13	COPPER WASHER 12	5	
14	HOLLOW BOLT M12×30	1	
15	HOLLOW BOLT M12×43	1	
16	WATER PUMP HOSE	1	
17	HOSE CLAMP	2	
18	CAM CHAIN GUIDE	1	
19	OIL FILTER CONNECTING BOLT	1	
20	OIL FILTER	1	

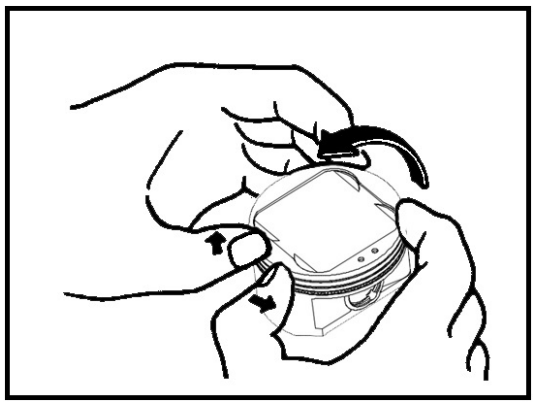
PISTON AND PISTON RINGS REMOVAL

1. Remove:
- Piston pin circ lip ① □
- Piston pin ② □
- Piston ③ □



NOTE:
Before removing the piston pin circ lip, cover the crankcase opening with a clean towel or rag to prevent the circ lip from falling into the crankcase cavity.

2. Remove:
- Top ring
- 2nd ring
- Oil ring



NOTE:
When removing the piston ring, open the end gap of the ring by fingers, and push up the other side of the ring.

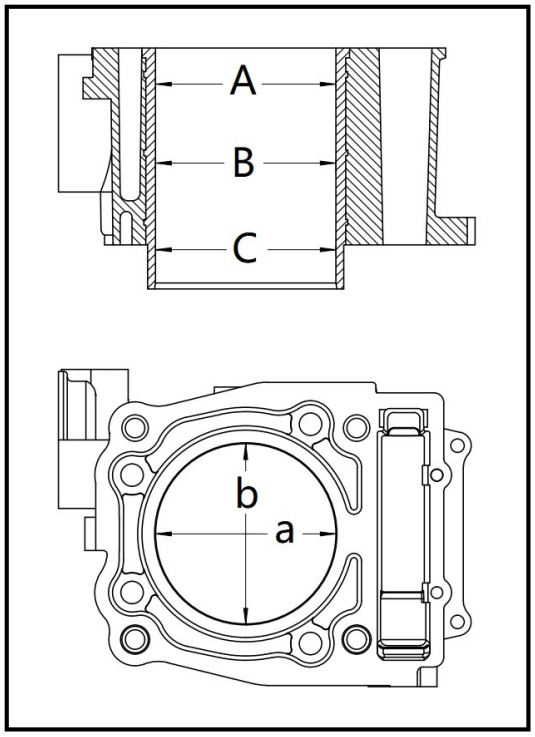
CYLINDER INSPECTION

1. Measure:
- Cylinder bore

Out of specification → Rebore or replace.

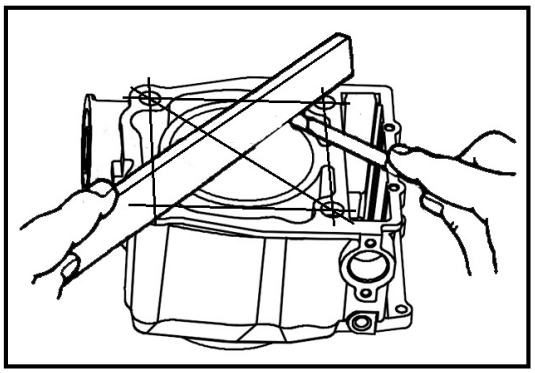
NOTE:
- Measure the cylinder bore with a cylinder bore gauge.
- Measure the cylinder bore in parallel to and a right angle to the crankshaft. Then, find the average of the measurements.

Cylinder bore:
92.000 - 92.015 mm
<Limit: 92.025 mm>
< Difference limit between A, B and C:0.03mm >



2. Measure:
● Warpage
Out of specification → Replace.

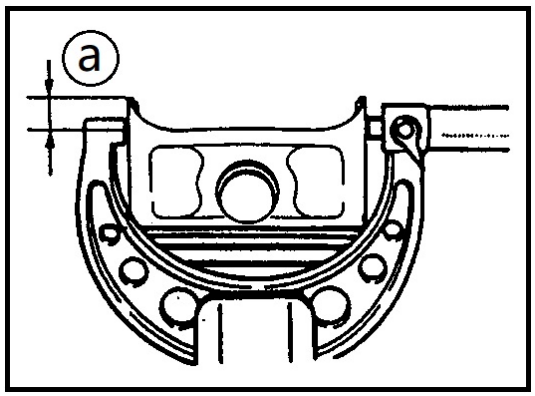
	Cylinder warpage limit: 0.05 mm



PISTON AND PISTON PIN INSPECTION

1. Measure:
● Piston skirt diameter
Out of specification → Replace.
ⓐ 12mm from the piston bottom edge.

	Valve skirt diameter: 91.96 -91.98 mm



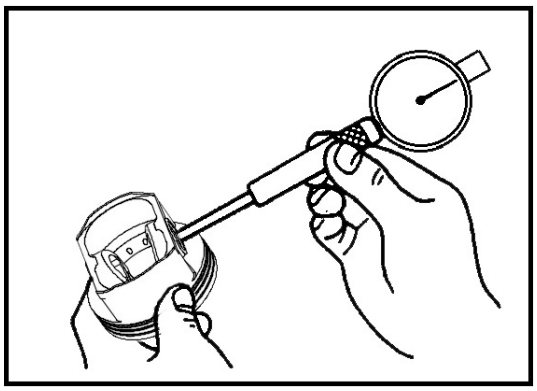
2. Calculate:
● Piston-to-cylinder clearance

Piston-to-cylinder clearance Cylinder bore-Piston skirt diameter

Refer to **"Cylinder Inspection"** section for cylinder bore measurement.

Out of specification → Replace the piston and piston rings as a set.

	Piston-to-cylinder clearance: 0.02 - 0.04 mm

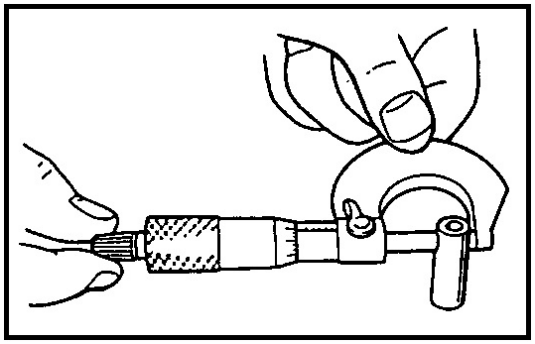


3. Measure:
● Piston pin bore diameter
Out of specification → Replace.

	Piston pin bore diameter: 23.002 – 23.008 mm <Limit: 23.038 mm>

4. Measure:
● Piston pin outside diameter
Out of specification → Replace.

	Piston pin outside diameter: 22.994 – 23.000 mm <Limit: 22.975 mm>



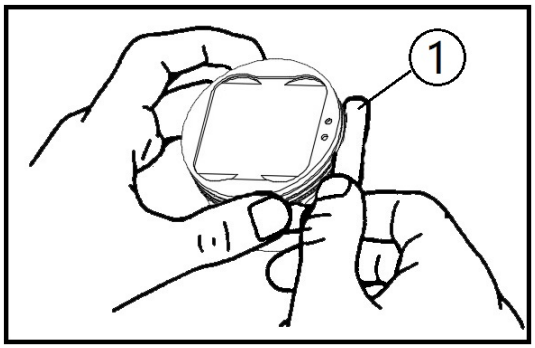
5. Inspect:
● Piston pin
Blue discoloration/groove → Clean or replace.

PISTON RINGS INSPECTION

1. Measure:

● Side clearance ①

Out of specification → Replace the piston and the piston rings as a set.



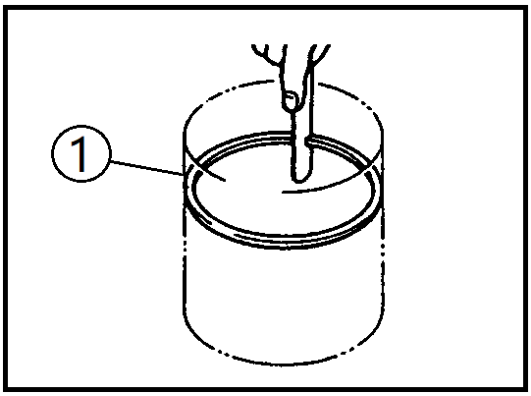
NOTE:

Eliminate the carbon deposits from the piston ring grooves and rings before measuring the side clearance.

Side clearance (piston ring):
Top ring: 0.02 - 0.06 mm
<Limit: 0.1 mm>
2nd ring: 0.01 – 0.05 mm
<Limit: 0.1 mm>

2.Position:

● Piston ring into the cylinder



NOTE:

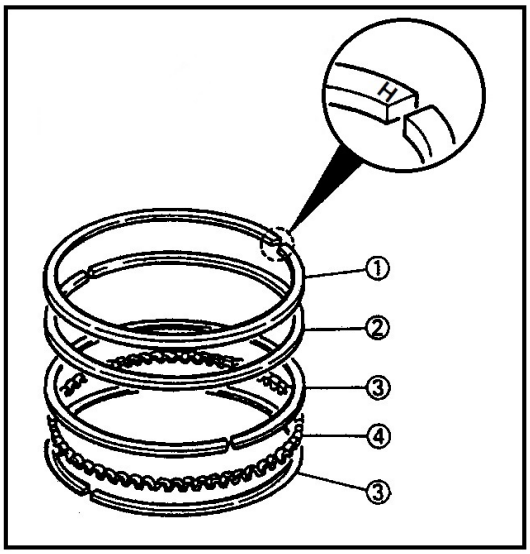
Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.

① 5.0mm

3. Measure:

● End gap

□Out of specification → Replace.



NOTE:

You cannot measure the end gap on the oil control ring. If the oil ring rails show excessive gap, replace all three rings.

End gap:
Top ring: 0.15 - 0.30 mm
<Limit: 0.45 mm>
2nd ring: 0.20 – 0.35 mm
<Limit: 0.60 mm>
Oil ring: 0.20 – 0.80 mm

PISTON RINGS, PISTON AND CYLINDER INSTALLATION

1. Install:

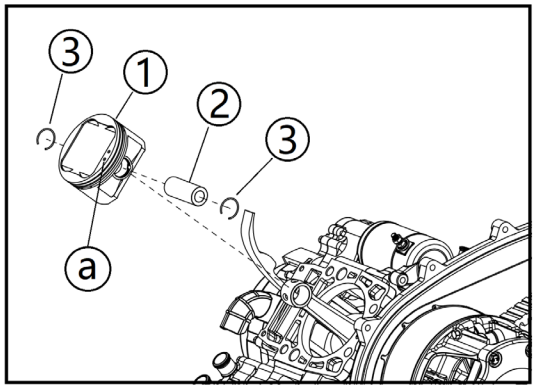
● Top ring ① □

● 2nd ring ② □

● Scrapper ring ③ □

● Oil control ring ④ □

NOTE:
● Make sure to install the piston rings so that the manufacturer's m arks or numbers are located on the upper side of the rings.
● Lubricate the pistons and piston rings liberally with engine oil.

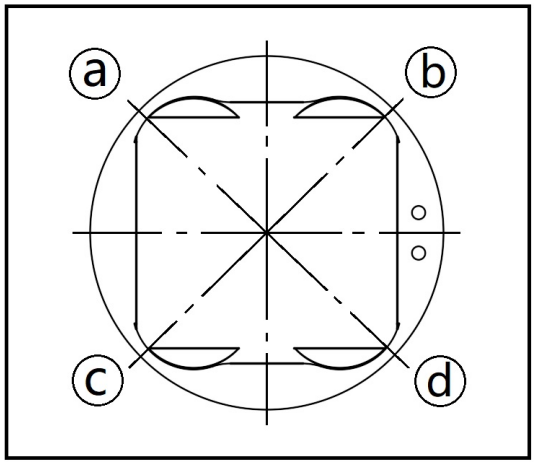


2. Install:
● Piston ①
● Piston pin ②
●Piston pin clip ③ **NEW**

NOTE:
● Apply engine oil to the piston pins.
● The "o o" mark ⓐ on the piston must face the CVT side of the engine.

3. Position:
● Piston rings

NOTE:
Offset the piston ring end gaps as shown.
ⓐ Top ring end
ⓑ Oil ring end (lower)
ⓒ Oil ring end (upper)
ⓓ 2nd ring end



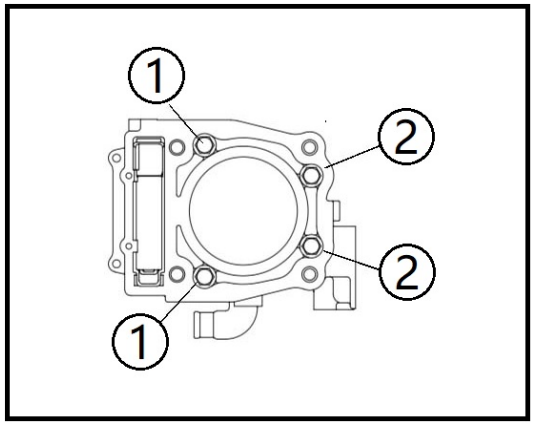
4. Lubricate:
● Piston outer surface
● Piston ring
● Cylinder inner surface

	Engine oil

5. Install:
● Dowel pin 15×20
● Cylinder gasket

6. Install:
● Cylinder

NOTE:
Install the cylinder with one hand while compressing the piston rings with the other hand.
Pass the cam chain and cam chain guide through the cam chain cavity.

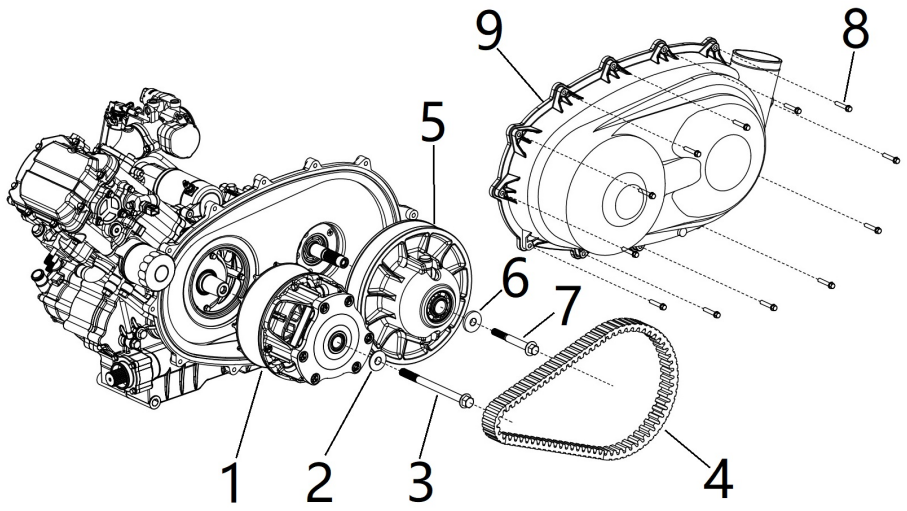


7. Tighten:
● Bolt M10×70 ①
● Bolt M10×78 ②

	60Nm(6m·Kg)

NOTE:
Tighten the bolts in a cross sequence.

3.7 V-BELT AND CLUTCH



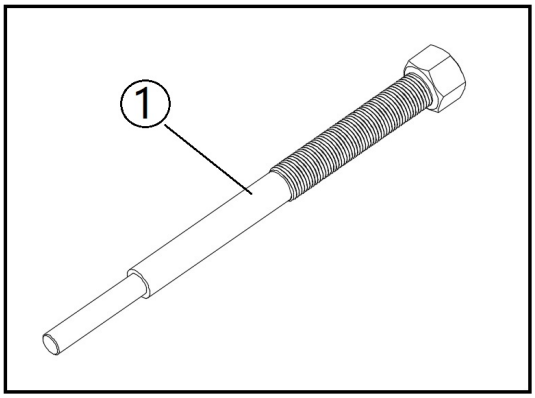
Order	Job name / Part name	Q'ty	Remarks
1	ACTIVE CLUTCH ASSY.	1	
2	ACTIVE CLUTCH INSTALLATION SLEEVE A	1	
3	BOLT M12×170×1.25	1	
4	V-BELT	1	
5	DRIVEN CLUTCH ASSY.	1	
6	DRIVEN CLUTCH INSTALLATION SLEEVE D	1	
7	DRIVEN CLUTCH BOLT	1	
8	BOLT M6×32	12	
9	CVT UPPER COVER COMPONETS	1	

ACTIVE CLUTCH ASSY. REMOVAL

1. Remove:
- Bolt M12×170×1.25
- Active clutch installation sleeve A

2. Tighten:
- Active clutch removal bolt ①

NOTE:
- First, Tighten the active clutch removal bolt manually
- Then, use an electric wrench to tighten the bolt until the clutch falls



DRIVEN CLUTCH ASSY. AND V-BELT REMOVAL

1. Remove:
- Driven clutch bolt
- Driven clutch installation sleeve D

2. Remove:
- Driven clutch assy.
- V-belt

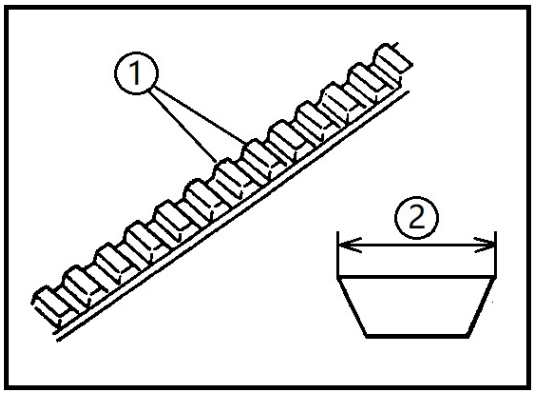
V-BELT INSPECTION

1. Inspect:
- V-belt ① □

Cracks / Wear / Scaling / Chipping → Replace.

2. Measure:
- V-belt width ② □

Out of specification → Replace



	V-belt width: **32 mm** **<Limit: 30.4 mm>**

ACTIVE CLUTCH ASSY. INSTALLATION

1. Install:
- Active clutch assy.

2. Install:
- Active clutch installation sleeve A
- Bolt M12×170×1.25

110Nm(11m·Kg)

DRIVEN CLUTCH ASSY. AND V-BELT INSTALLATION

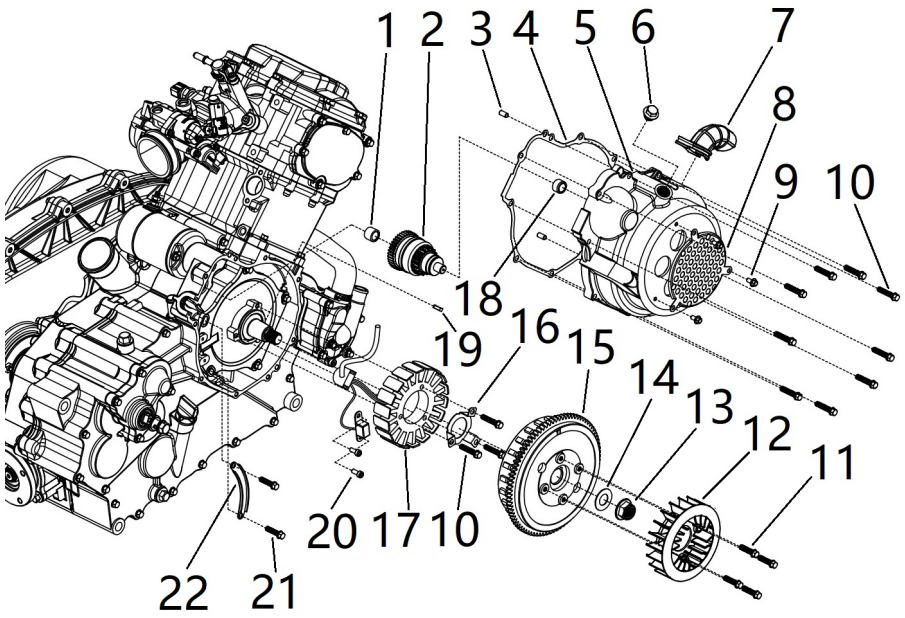
1. Install:
- Driven clutch assy.

2. Install:
- V-belt

3. Install:
- Driven clutch installation sleeve D
- Driven clutch bolt

75Nm(7.5m·Kg)

3.8 A.C. MAGNETO, STARTER CLUTCH AND MAGNETO COVER



Order	Job name / Part name	Q'ty	Remarks
1	STARTING CLUTCH BUSHING A	1	
2	STARTING CLUTCH ASSY.	1	
3	LOCATING PIN 6×12	2	
4	RIGHT CRANKCASE GASKET	1	
5	RIGHT CRANKCASE COVER	1	
6	SCREWED PLUG M14×1.5	1	
7	OUTLET PIPE，RIGHT CRANKCASE COVER	1	
8	AIR INLET GRID	1	
9	BOLT M5×10	3	
10	BOLT M6×30	12	
11	BOLT M6×22	4	
12	COOLING FAN	1	
13	NUT M16×1.5	1	
14	WASHER 16×31×1	1	
15	ROTOR ASSY.	1	
16	OIL SEAL STOP PLATE	1	
17	STATOR ASSY.	1	
18	STARTING CLUTCH BUSHING B	1	
19	FLAT KEY 4×15	1	
20	BOLT M5×12	2	
21	BOLT M6×25	2	
22	LEAD HOLDER	1	

A.C. MAGNETO ROTOR REMOVAL

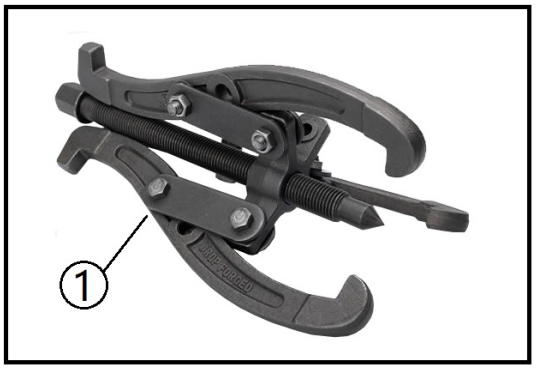
1. Remove:
- Bolt M6×30
- Right crankcase cover

2. Remove:
- Bolt M6×22
- Cooling fan

3. Remove:
- Nut M16×1.5
- Washer 16×31×1

4. Remove:
- Rotor assy.

NOTE:
- Remove the rotor assy. with a three-jaw puller ①
- Screw the nut M16×1.5 on the crankshaft to prevent the rotor from falling



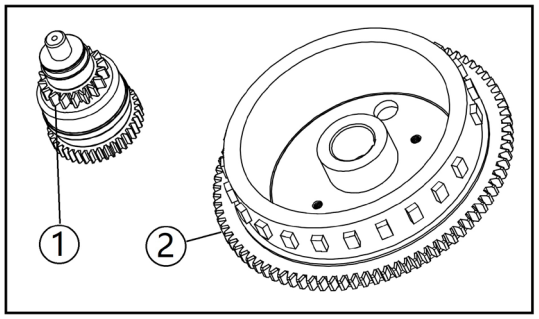
STARTING CLUTCH ASSY. INSPECTION

1. Inspect:
- Starting clutch drive gear teeth ①
- Rotor drive gear teeth ②

Burrs /chips /roughness /wear → Replace.

2. Check:
- Starting clutch operation

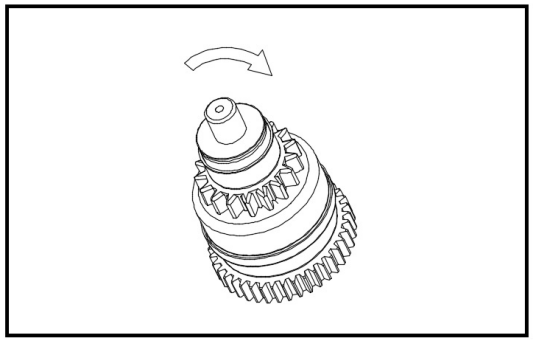
Push the gear ① to the arrow direction.
Unsmooth operation → Replace.



Checking steps:
- When turning the starting clutch gear clockwise, the starting clutch and the rotor drive gear should be engaged.

If not, the starting clutch is faulty. Replace it.
- When turning the rotor assy. clockwise, it should turn freely.

If not, the starting clutch is faulty. Replace it.



A.C. MAGNETO ROTOR INSTALLATION

1. Install:
- Starting clutch
- Flat key 4×15

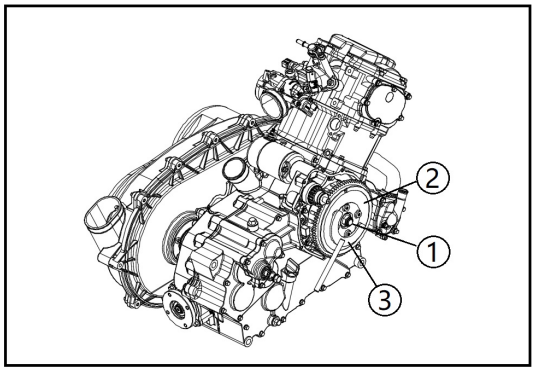
2. Install:
- Rotor assy.□

NOTE:
- Clean the tapered portion of the crankshaft and the rotor assy.
- When installing the magneto rotor, make sure the flat key is properly seated in the key way of the crankshaft.

3. Install:

- Washer 16×31×1
- Nut M16×1.5

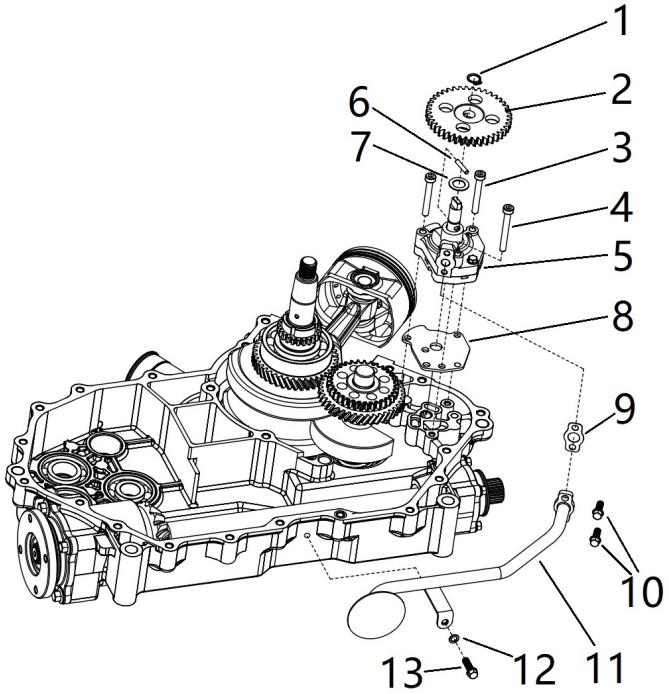
100Nm(10m·Kg)



NOTE:

- Apply Threadlocker (LOCTITE 263) onto the nut threads.
- Tighten the nut (rotor)① while holding the magneto rotor② with a holder③.

3.9 OIL PUMP



Order	Job name / Part name	Q'ty	Remarks
1	CIRCLIP FOR SHAFT 12	1	
2	OIL PUMP DRIVEN GEAR	1	
3	HEXAGON SOCKET HEAD CAP SCREW M6×45	2	
4	HEXAGON SOCKET HEAD CAP SCREW M6×50	1	
5	OIL PUMP ASSY.	1	
6	NEEDLE ROLLER 4×20	1	
7	WASHER 12	1	
8	OIL PUMP PLATE	1	
9	OIL PUMP GASKET	1	
10	BOLT M6×16	2	
11	OIL PUMP INLET PIPE	1	
12	COPPER WASHER 6.5	1	
13	BOLT M6×20	1	

OIL PUMP INSPECTION

1. Inspect:
- Driven gear (oil pump) □
- Pump housing
- Pump housing cover

Wear /cracks/ damage → Replace.

2. Measure:
- Tip clearance

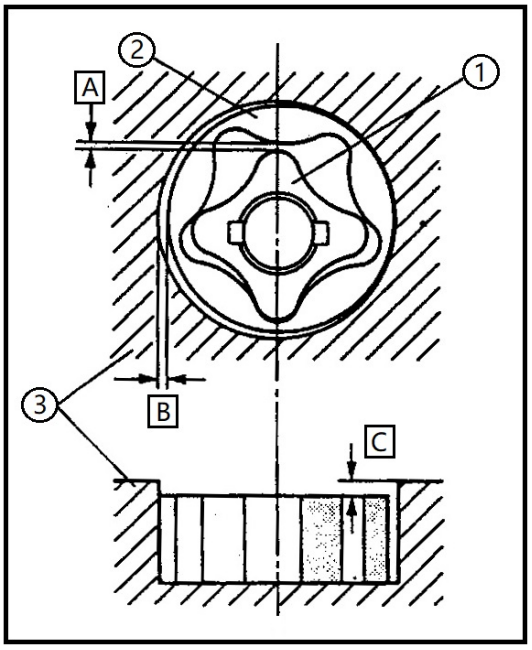
(Between the inner rotor① and the outer rotor□)

● Side clearance
(Between the outer rotor② and the pump housing③)

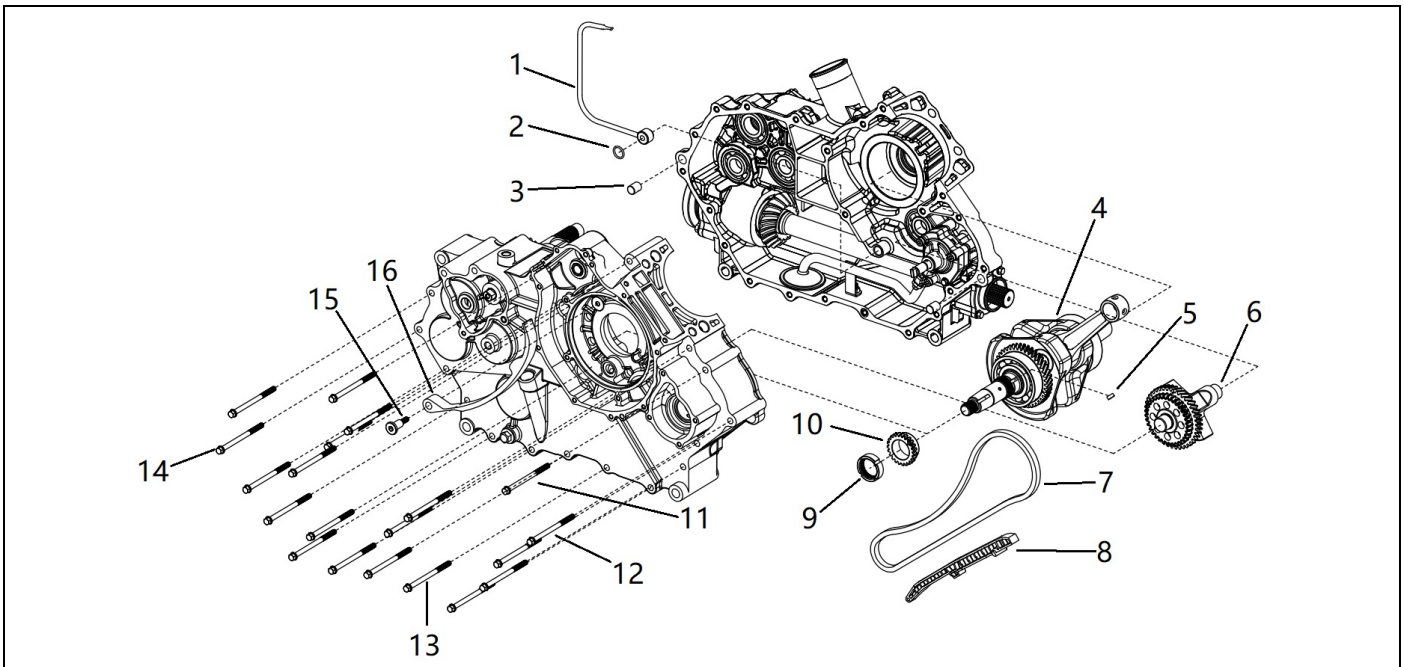
● Housing and rotor clearance
(Between the pump housing③ and the rotors①②)

Out of specification → Replace the oil pump assembly.

	Tip clearance A **0.10 - 0.34 mm <Limit: 0.40mm>** **Side clearance** B **0.013 - 0.036mm <Limit:0.15mm>** **Housing and rotor clearance** C **0.04 - 0.09 mm <Limit: 0.15mm>**



3.10 CRANKCASE AND CRANKSHAFT



Order	Job name / Part name	Q'ty	Remarks
1	CRANKSHAFT LUBRICATION PIPE	1	
2	O-RING 10×2	1	
3	LOCATING PIN 12×18	2	
4	CRANKSHAFT ASSY.	1	
5	WOODRUFF KEY	1	
6	BALABCE SHAFT ASSY.	1	
7	CAM CHAIN	1	
8	CAM CHAIN GUIDE	1	
9	ROUND NUT M28×1.5	1	
10	CRANKSHAFT SPROCKET	1	
11	BOLT M8×90	6	
12	BOLT M6×85	4	
13	BOLT M6×95	6	
14	BOLT M6×105	4	
15	CAM CHAIN TENSIONER BOLT	1	
16	CAM CHAIN TENSIONER	1	

CRANKSHAFT REMOVAL

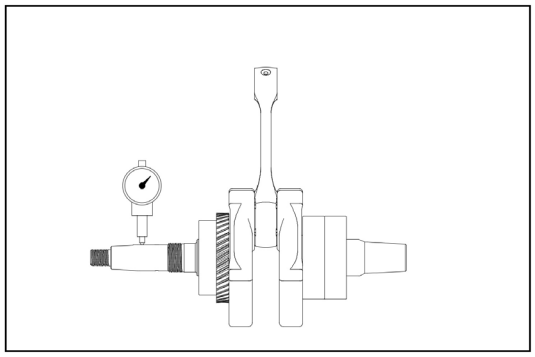
1. Remove:
- Crankshaft assembly
- Cam chain

NOTE:

- Before removing the crankshaft assembly, remove the timing chain from the crankshaft sprocket.
- If the timing chain hooks to the crankshaft sprocket, the crankshaft cannot be removed.

CRANKSHAFT INSPECTION

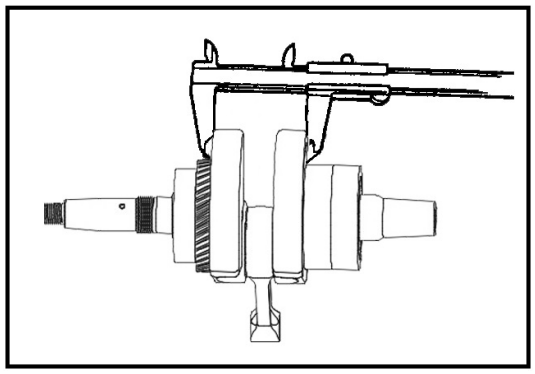
1. Measure:
● Crankshaft runout
Out of specification → Replace crankshaft and / or bearing.



NOTE:
Measure the crankshaft runout with the crankshaft assembly running slowly.

	Runout limit: 0.03 mm

2. Measure:
● Big end side clearance
Out of specification → Replace
big end bearing, crank pin and/or connecting rod.

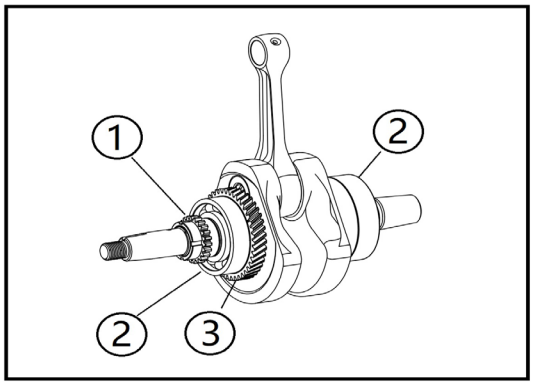


	Big end side clearance: 0.35 - 0.85 mm

3. Measure:
● Crank width
Out of specification → Replace crankshaft.

	Crank width: 70.9 – 71.0 mm

4. Inspect:
● Crankshaft sprocket ① □
Wear/ Damage → Replace crankshaft sprocket.
● Bearing ② □
Wear/ Crack /Damage → Replace crankshaft.
● Crank balancer drive gear ③ □
Wear/ Damage → Replace crankshaft.



5. Inspect:
● Crankshaft journal
Clogged → Blow out the journal with compressed air.

CRANKCASE INSTALLATION

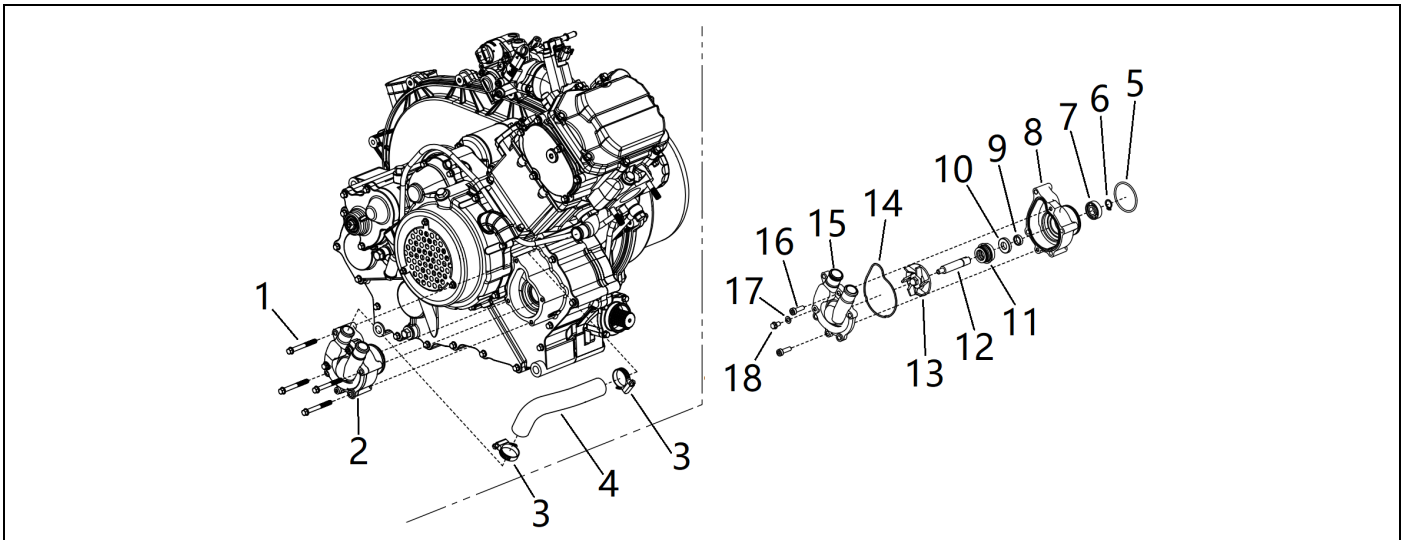
1. Clean all the gasket mating surface and crankcase mating surface thoroughly.

2. Apply:
● Sealant
(Onto the crankcase mating surfaces)

NOTE:
DO NOT ALLOW any sealant to come into contact with the oil gallery.

3. Install:
● Locating pin 12×18
● Cam chain

3.11 WATER PUMP

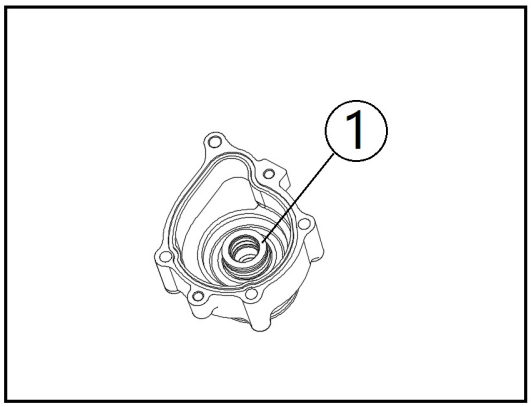


Order	Job name / Part name	Q'ty	Remarks
1	BOLT M6×55	4	
2	WATER PUMP	1	
3	HOSE CLAMP 20/32	2	
4	WATER PUMP HOSE	1	
5	O-RING 44×2.5	1	
6	CIRCLIP 12	1	
7	BEARING 6001	1	
8	WATER PUMP BODY	1	
9	AXLE SLEEVE	1	
10	OIL SEAL 12×24×5	1	
11	MECHANICAL SEAL	1	
12	IMPELLER SHAFT	1	
13	WATER PUMP IMPELLER	1	
14	O-RING	1	
15	WATER PUMP COVER	1	
16	BOLT M6×20	2	
17	COPPER WASHER 6.2	1	
18	BOLT M6×12	1	

NOTE:

- It is not necessary to disassemble the water pump, unless there is an abnormality such as excessive change in coolant temperature and/ or level, discoloration of coolant, or milky transmission oil.
- If necessary, replace water pump as an assembly.

INSPECTION



1. Inspect:
● Impeller shaft
Wear/damage → Replace.
Fur deposits → Clean.

2. Inspect:
● Mechanical seal ① □
Damage/worn/wear → Replace.

WATER PUMP INSTALLATION

1. Install:
● Axle sleeve

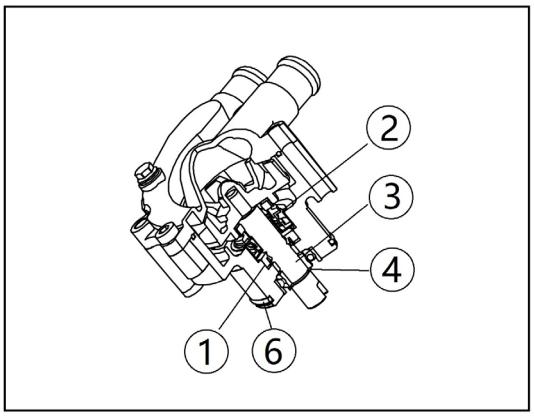
2. Install:
● Oil seal 12×24×5 ① **NEW**

NOTE:
Do not smear any oils or grease on the ring side of the oil seal.

Apply coolant to the outside of the oil seal before installing.

3. Install:
● Mechanical seal ② NEW

Installation steps:
● Apply the bond to the outside of the mechanical seal.
● Install the mechanical seal by using the seal installer.



4. Inspect:
● Mechanical seal, slip ring side. □
Inspect the slip ring side of the mechanical seal and the water pump body for level installation.
Incorrect level → Reinstall.

5. Install:
● Bearing 6001
● Impeller shaft ③ □

Installation steps:
● Apply a small amount of grease to the impeller shaft tip.
● Install the impeller shaft while turning it. Use care so that the oil seal is not damaged or the spring does not slip off its position.

NOTE:
After installing the impeller shaft, check it for smooth rotation.

6. Install:
● Circlip 12④ **NEW**

7. Install:
● Water pump impeller

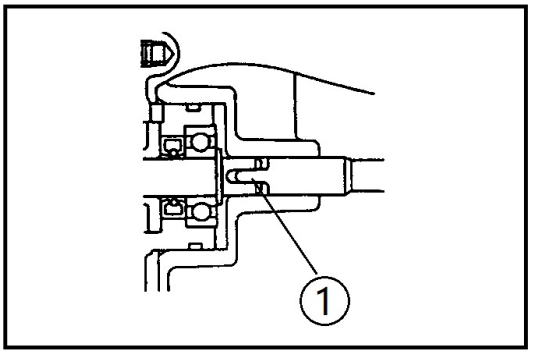
8. Install:
● O-ring⑤ **NEW**

9. Install:
● Water pump cover
● Bolt M6×20
● Copper washer 6.2
● Bolt M6×12

10Nm(1.0m·kg)

10. Install:
● O-ring 44×2.5⑥ **NEW**

11. Install:
● Water pump
Align the slot on the impeller shaft with the projection① on the shaft when installing.

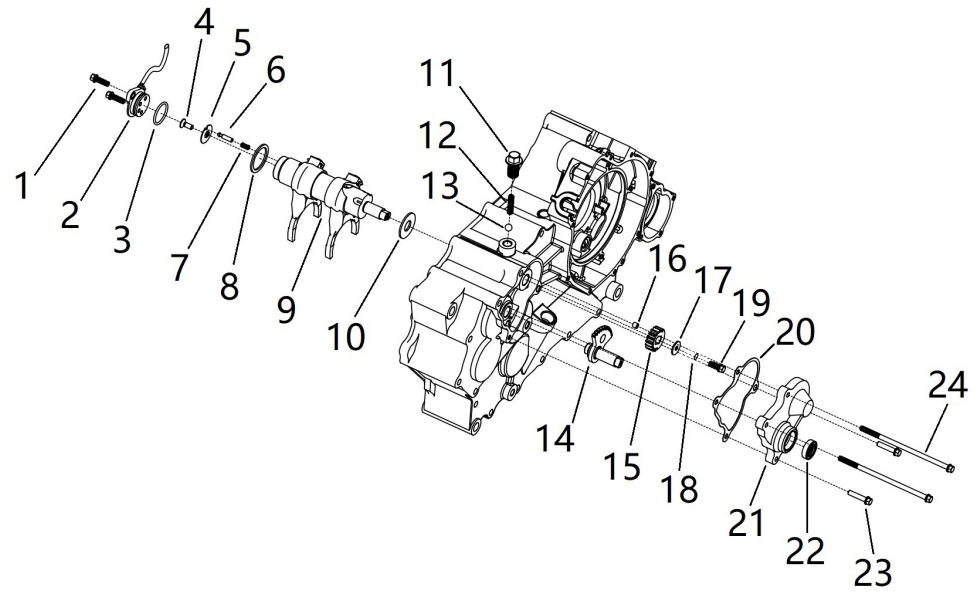


3.12 Transmission assembly

Failure analysis and repair of the transmission assembly refer to the table：

Fault type		Possible causes of failure	Measures	Maintenance Reference
leakage	Shift shaft leakage	Oil seal damage	Replace	Remove the gearshift mechanism
	V-belt with slip	Crankshaft oil seal or spindle oil seal is damaged	Replace	Remove the CVT upper cover and CVT
	Front output shaft leakage	The front output shaft oil seal is damaged	Replace	Remove the connection disk
		The front output shaft O-rings is damaged	Replace	Remove the connection disk
	Rear output shaft leakage	The rear output shaft oil seal is damaged	Replace	Removal
		The rear output shaft is damaged	Replace	Remove the rear output shaft assembly
Gear unclear		The shifter fork is damaged	Replace	Remove the gear control
		The shifting cam is damaged	Replace	
		Damage of shift drum	Replace	Refer to "Gearbox"
Difficulty in shifting or unable to shift gears		The shifter fork is damaged	Replace	
		Shift drum wear / damage	Replace	
		The shift shaft is damaged	Replace	
		Defective shift cable	Replace	Refer to the vehicle section to replace the shift cable

3.12.1 SHIFTING MECHANISM



Order	Job name / Part name	Q'ty	Remarks
1	BOLT M6×20	2	
2	GEAR POSITION SENSOR	1	
3	O-RING 27×2.5	1	
4	SCREW M6×12	1	
5	LIMIT WASHER	1	
6	GEAR CONTACTOR	1	
7	GEAR CONTACTOR SPRING	1	
8	WASHER 32×40×2	1	
9	SHIFT DRUM ASSY.	1	
10	WASHER 15×33×2	1	
11	SHIFT DRUM BOLT	1	
12	SHIFT DRUM SPRING	1	
13	SHIFT DRUM STEEL BALL SR4.5	1	
14	SHIFT GEAR ASSY.	1	
15	SHIFT DRIVEN GEAR	1	
16	LOCATING PIN 8×10	1	
17	WASHER 6	1	
18	SINGLE COIL SPRING LOCK WASHER 6	1	
19	BOLT M6×16	1	
20	SHIFT COVER GASKET	1	
21	SHIFT COVER	1	
22	OIL SEAL 15×26×7	1	
23	BOLT M6×28	2	
24	BOLT M6×135	2	

1. Inspect

● Gear position sensor
Wear / damage → Replace.

● Gear contactor
Wear / stuck → Replace.

● Shift drum assy.
Wear / stuck → Replace.

● Shift gear assy.
Wear / stuck → Replace.

● Shift driven gear
Wear / stuck → Replace.

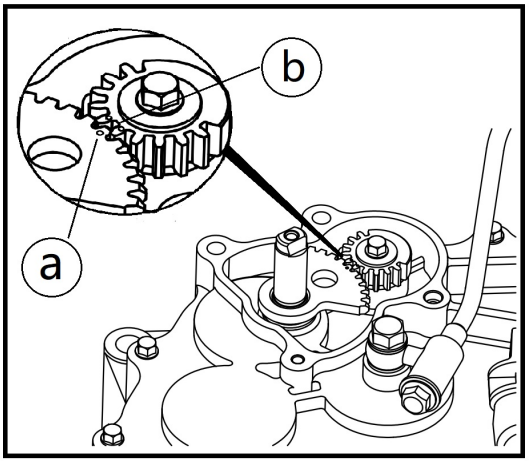
2. Installation

● Shift gear assy.
● Shift driven gear

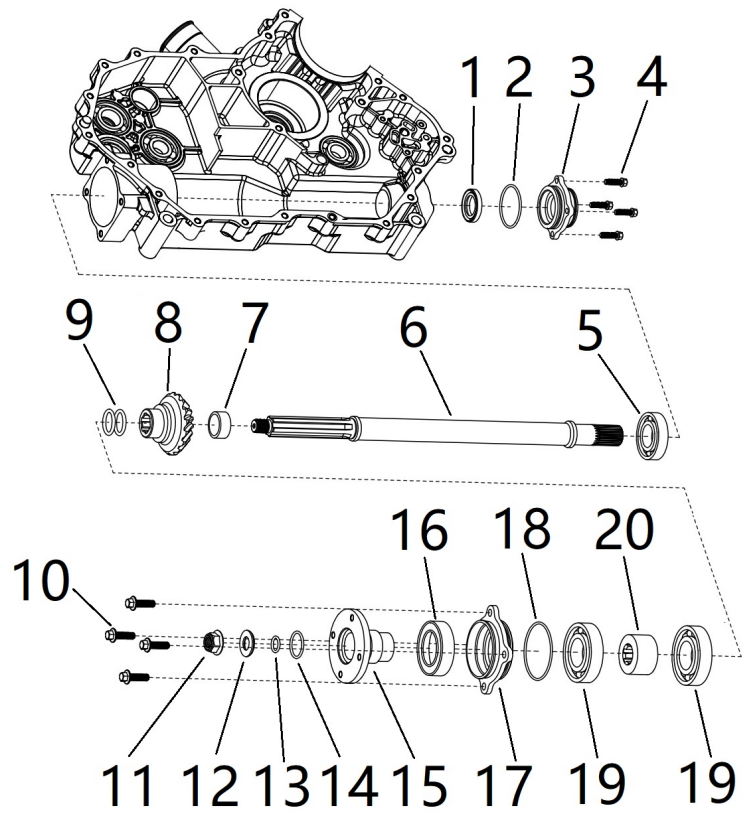
NOTE:
The gears of the shift gear assy. and the shift driven gear are in a one-to-one correspondence.

When the shift gear assy. is mounted, it is ensured that the shift gear assy. has a marked ⓐ one tooth meshed with the two gear teeth marked ⓑ by the shift driven gear. Otherwise, it will cause the shift is not accurate, must be re-adjusted.

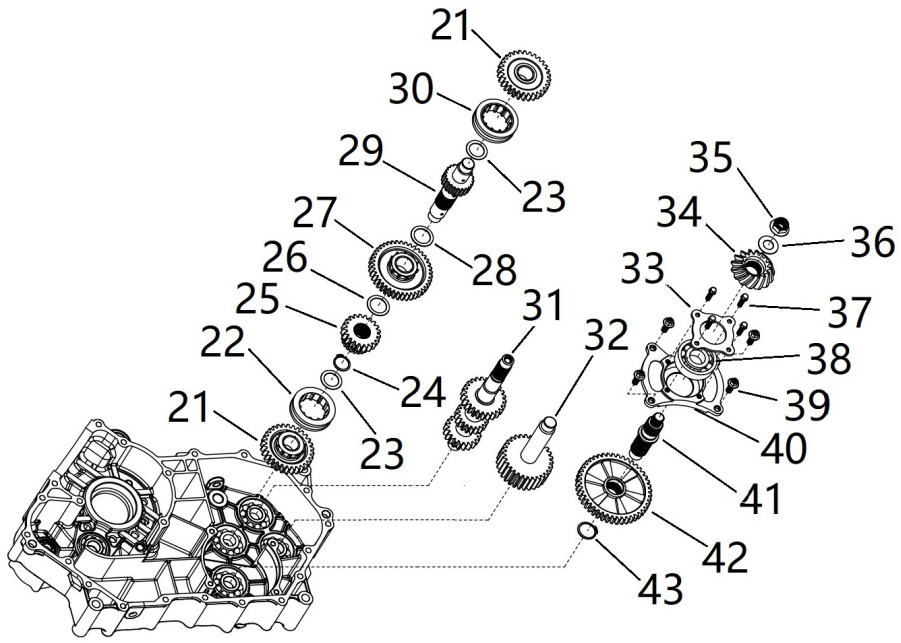
When the teeth, you can turn the shift drum to ensure that the mark is aligned.



3.12.2 GEAR BOX



Order	Job name / Part name	Q'ty	Remarks
1	OIL SEAL 25×40×7	1	
2	O-RING 47×2.5	1	
3	FRONT BEARING COVER	1	
4	BOLT M6×22	4	
5	BEARING 6205	1	
6	OUTPUT SHAFT	1	
7	BECEL GEAR LIMIT SLEEVE	1	
8	DRIVEN BEVEL GEAR	1	
9	WASHER 25×32×0.2	2	
10	BOLT M8×28	4	
11	NUT M16×1.5	1	
12	CONICAL WASHER	1	
13	O-RING 15×2.65	1	
14	O-RING 27×2.65	1	
15	CONNECTION DISK	1	
16	OIL SEAL 40×62×8	1	
17	REAR BEARING COVER	1	
18	O-RING 67×2.5	1	
19	BEARING 6207	2	
20	SPLINE SLEEVE	1	



Order	Job name / Part name	Q'ty	Remarks
21	REVERSE DRIVEN GEAR	2	
22	NEUTRAL-REVERSE GEAR SHIFT DISC	1	
23	WASHER 23.5×33×1	2	
24	CIRCLIPS FOR SHAFT 22	1	
25	IDLER GEAR	1	
26	WASHER 26×35×1.5	1	
27	LOW DRIVEN GEAR	1	
28	WASHER 26×35×1	1	
29	COUNTER SHAFT	1	
30	HIGH-LOW GEAR SHIFT DISC	1	
31	DRIVE SHAFT	1	
32	REVERSE IDLER GEAR	1	
33	BEARING PLATE	1	
34	DRIVE BEVEL GEAR	1	
35	NUT M16×1.5	1	
36	WASHER 16×31×1	1	
37	BOLT M6×22	4	
38	BEARING 6305	1	
39	BOLT M8×22	4	
40	DRIVE BEVEL GEAR BEARING SEAT	1	
41	DRIVE BEVEL GEAR SHAFT	1	
42	DRIVE GEAR OF THE BEVEL GEAR	1	
43	CIRCLIPS FOR SHAFT 25	1	

1. Examination

● Oil seal
Damage/wear/failure of inner spring → Replacement.

● Gear shift disc
Spline damage / wear → Replacement.
Burns / discoloration → Replacement.

● Counter shaft
Wear / damage / substandard → replacement.

● Reverse driven gear
Worn / damaged / broken → replaced.

● Low driven gear
Worn / damaged / broken → replaced.

● Drive shaft
Worn / damaged / broken → replaced.

● Reverse idler gear
Worn / damaged / broken → replaced.

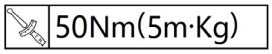
● Drive bevel gear shaft
Worn / damaged / broken → replaced.

● Drive gear of the bevel gear
Worn / damaged / broken → replaced.

NOTE:

● If you replace the output shaft, gear or gear shift disc, please while complete sets of replacement.

● Install the drive bevel gear bearing seat on the gearbox. Apply a little Loctite7243 on the thread of the bolt M8×22. The bolt M8×22 is a special high-strength bolt. Tighten the bolts to the specified torque.



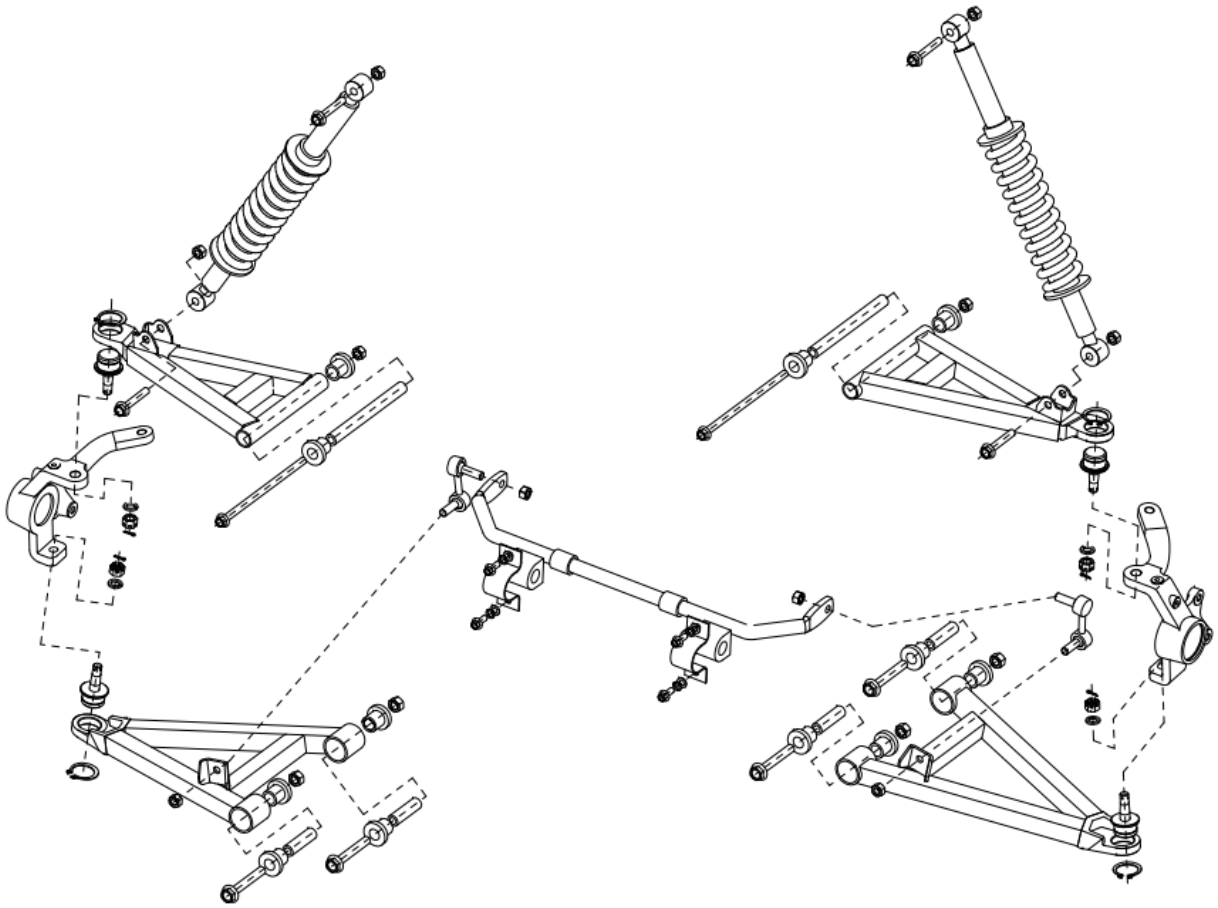
NOTES

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 SUSPENSION REPLACEMENT



1. Elevate and safely support vehicle with weight removed from front wheel(s).
2. Remove the wheel nuts and wheel.
3. loose and remove the bolts on front shock absorber, and remove the front shock absorber.
4. Loose the connection nut between front stabilizer joint and lower A-arm.
5. Remove cotter pins from ball joint stud at wheel end of A- arm and loosen nuts until they are flush with end of stud.
6. Using a soft face hammer, tap nut to loosen A- arm from bolt. Remove nut and A-arm from hub strut assembly.
7. Loosen and remove two bolts on lower A-arm, and remove lower A-arm.
8. Loosen and remove the bolt on upper A-arm, and remove upper A-arm.
9. Examine A-arm bushing. Replace if worn or tore. Discard hardware.
10. Install new A-arm assembly onto vehicle frame. Install new bolts and new nuts.
11. Tighten the connection nut between front stabilizer joint and lower A-arm.
12. Attach upper A-arm to front shock absorber.
13. Tighten ball joint nuts to 41 ft. lbs. (55 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.

14. Tight all bolts and nuts, check the torque by torque wrench.
15. Install wheels(tightening torque 66Nm), lower the vehicle to the ground.

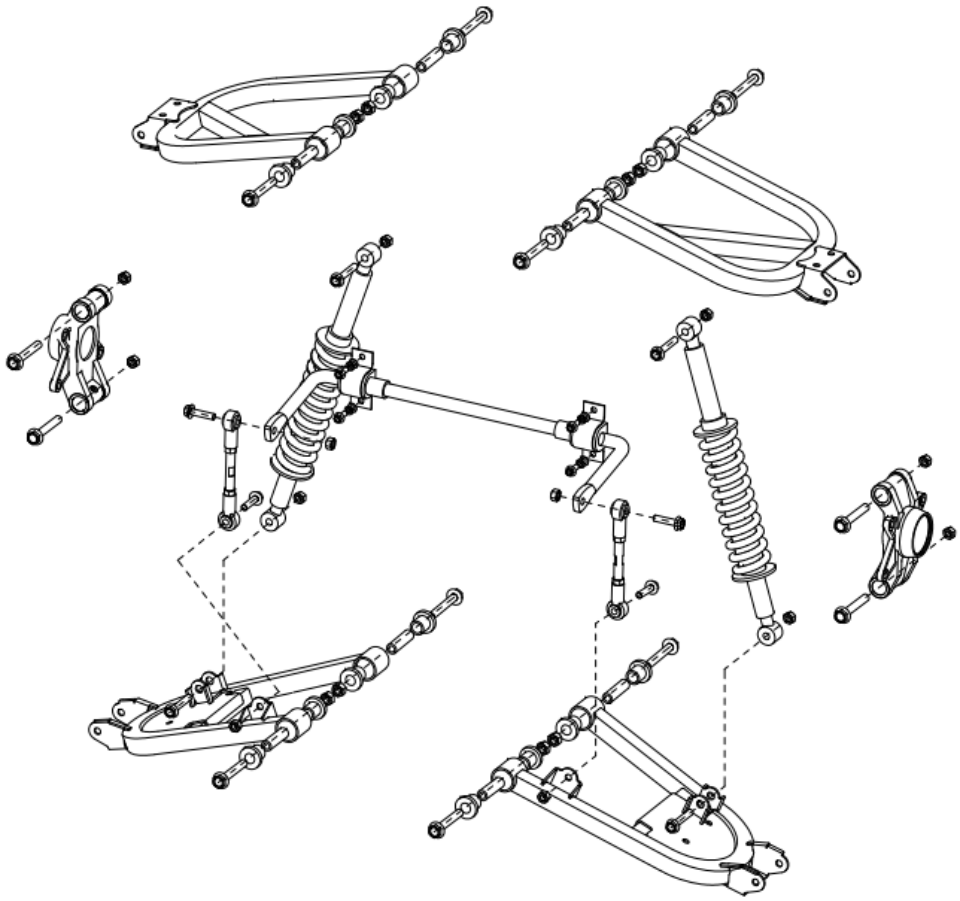
⚠ WARNING

Enough lubricating grease should be supply for the A-arm steel shaft and rubber bushing.
DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

⚠ WARNING

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

4.2 REAR SUSPENSION REPLACEMENT



1. Elevate and safely support vehicle with weight removed from the rear wheel(s).
2. Remove the wheel nuts and wheel.
3. loose and remove the bolts on rear shock absorber, and remove the rear shock absorber.
4. Loose the connection nut between rear stabilizer joint and lower A-arm.
5. loose and remove the bolts on knuckle.
6. Loosen and remove two bolts on upper A-arm, and remove upper A-arm.
7. Loosen and remove two bolts on lower A-arm, and remove lower A-arm.
8. Examine A-arm bushing. Replace if worn or tore. Discard hardware.
9. Install new A-arm assembly onto vehicle frame. Install new bolts and new nuts.
10. Tighten the connection nut between rear stabilizer joint and lower A-arm.
11. Attach lower A-arm to rear shock absorber.
12. Tight all bolts and nuts, check the torque by torque wrench.
13. Install wheels(tightening torque 66Nm), lower the vehicle to the ground.

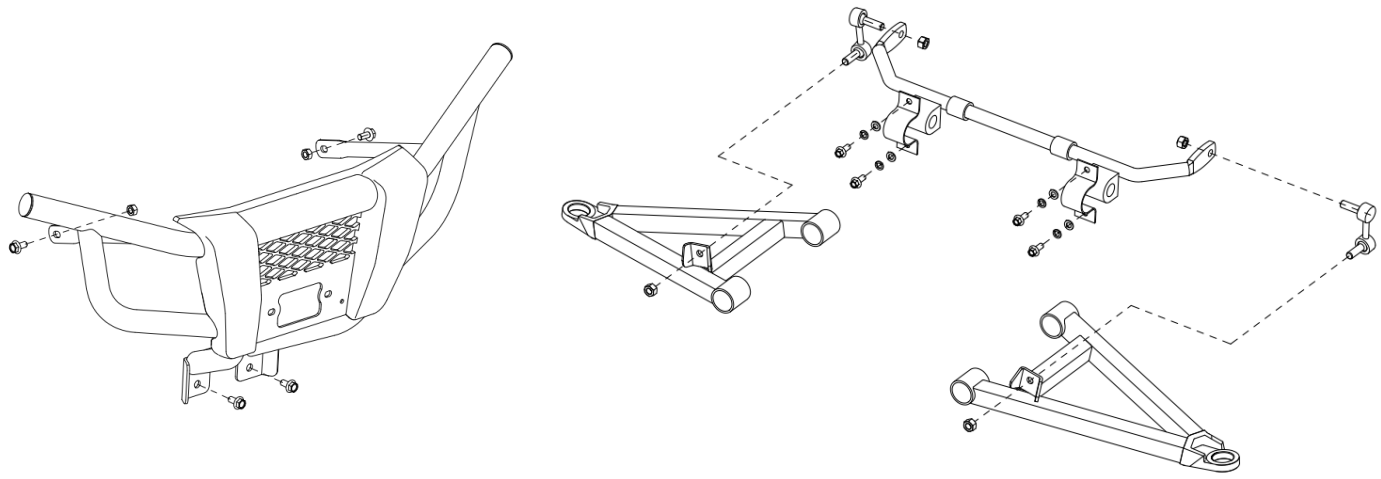
⚠ WARNING

Enough lubricating grease should be supply for the A-arm steel shaft and rubber bushing.
DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

⚠ WARNING

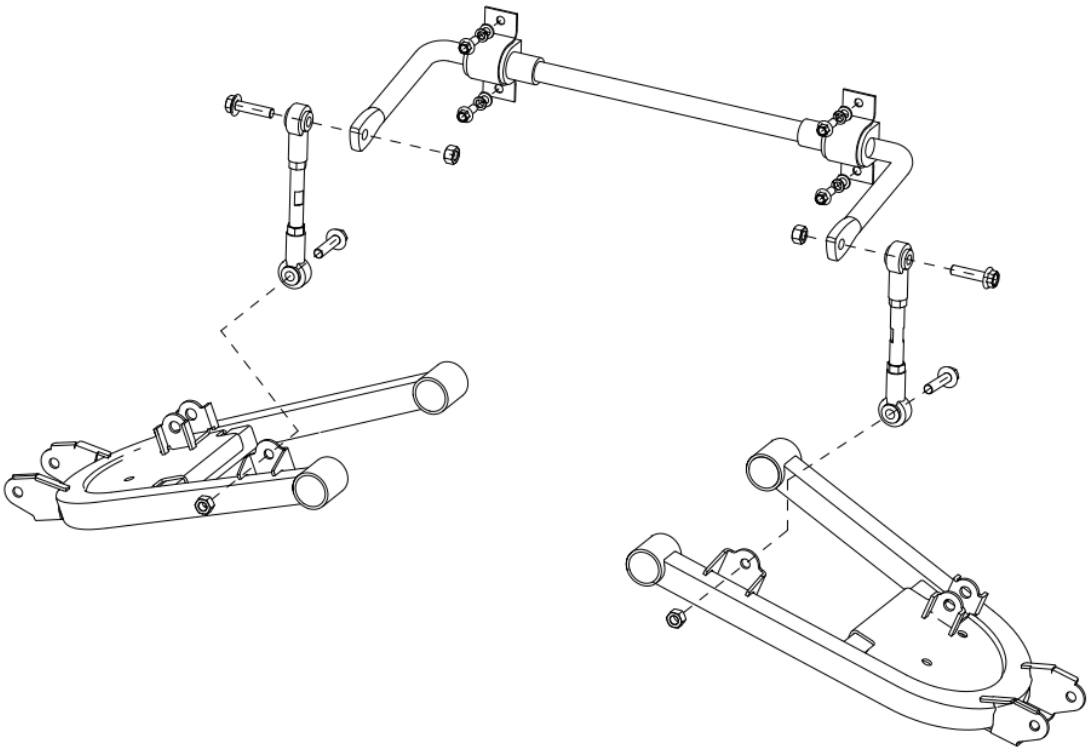
Upon A-arm installation completion, test vehicle at low speeds before putting into regular service.

4.3 FRONT STABILIZER BAR REMOVAL/INSTALLATION



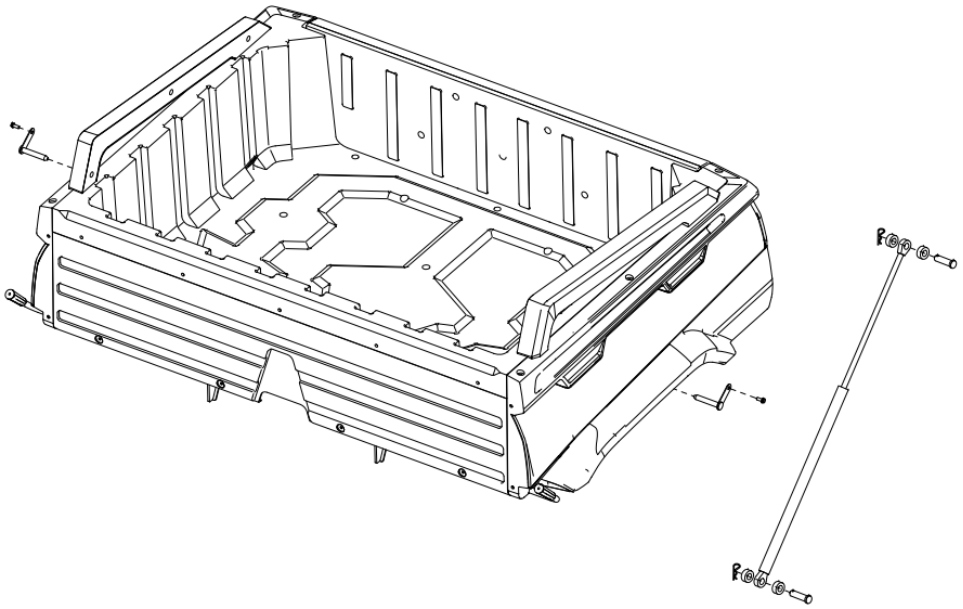
1. Park the vehicle on the level ground
2. Loosen and remove bolts on front bumper, and remove front bumper.
3. Loose the connection nut between front stabilizer joint and lower A-arm.
4. Loose and remove 4 bolts that secure the stabilizer bar to the main frame, and remove the front stabilizer bar.
5. Inspect the stabilizer bar. Inspect the bushings and replace if needed.
6. Inspect the stabilizer joint and replace if needed.
7. Reverse the procedure for installation.
8. Tight all bolts and nuts, check the torque by torque wrench.

4.4 REAR STABILIZER BAR REMOVAL/INSTALLATION



1. Elevate and safely support vehicle with weight removed from the rear wheel(s).
2. Remove the wheel nuts and wheel.
3. Loose the connection nut between rear stabilizer joint and lower A-arm.
4. Loose and remove 4 bolts that secure the stabilizer bar to the main frame, and remove the rear stabilizer bar.
5. Inspect the stabilizer bar. Inspect the bushings and replace if needed.
6. Inspect the stabilizer joint and replace if needed.
7. Reverse the procedure for installation.
8. Tight all bolts and nuts, check the torque by torque wrench.
9. Install wheels(tightening torque 66Nm), lower the vehicle to the ground.

4.5 BOX REMOVAL/INSTALLATION



Box Removal

1. Disconnect the taillight coupler.
2. Lift the box into the dump position.
3. Remove the box shock pin and rubber pad and B type 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 bolts on hinge pin (both sides), Remove the hinge pin (both sides).

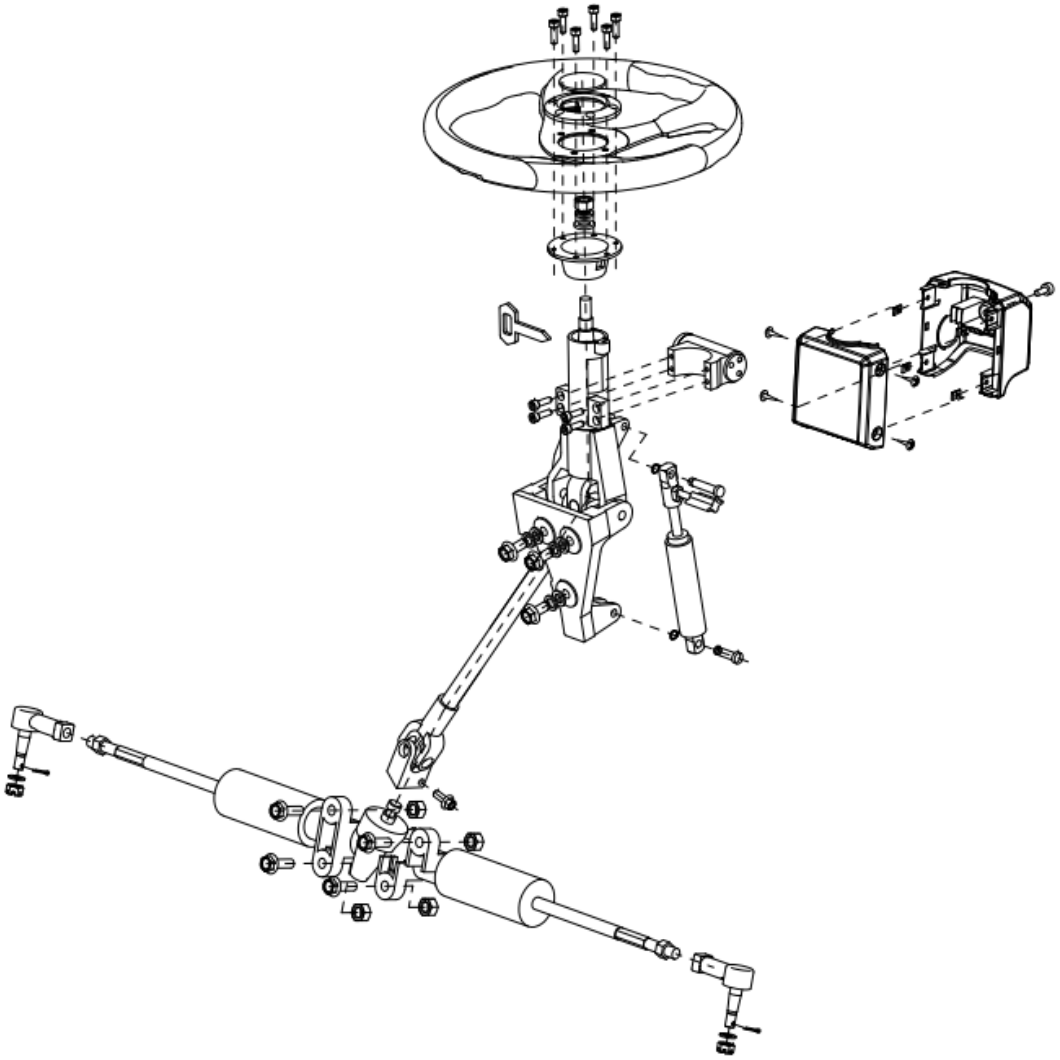
CAUTION: Safely support the box during the rest of the removal process. The box is not as stable with the hinge pin removed.

6. With the hinge pins removed, remove the box from the frame. Two people may be needed to remove the bed from the frame.
7. **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 bolt (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 and rubber pad and B type pin (both sides).
6. Lower the box and secure the latch.
7. Connect the taillight coupler.

4.6 STEERING ASSEMBLY REMOVAL/INSTALLATION



1. Remove the plastic cover of Ignition switch.
2. Loose and remove 4 bolts on ignition switch, remove the Ignition Switch.
3. Loose and remove 6 bolts on steering wheel, remove steering wheel and horn switch.
4. Loose and remove upper bolt / spring washer / flat washer on steering column, remove the steering wheel holder by special tool.
5. Remove the upper-Circlip and pin of damper. remove the damper by counterclockwise rotation.
6. Remove the cotter pin and Slotted nut from ball joint stud(both sides).
7. Loose and remove the bolt between steering column and steering gear assy.
8. Loose and remove 4 bolts and nuts on steering gear assy, remove the steering gear assy.
9. Loose and remove 3 bolts / spring washers / flat washers on steering column holder, remove steering column holder assy.
10. Reverse the procedure for installation.

4.7 GENERAL TIGHTENING TORQUE

Size of bolt	M8	M10	M12
Torque of tightening	25 Nm (18 ft•lbs)	35 Nm (26 ft•lbs)	55 Nm (41 ft•lbs)

NOTES

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.

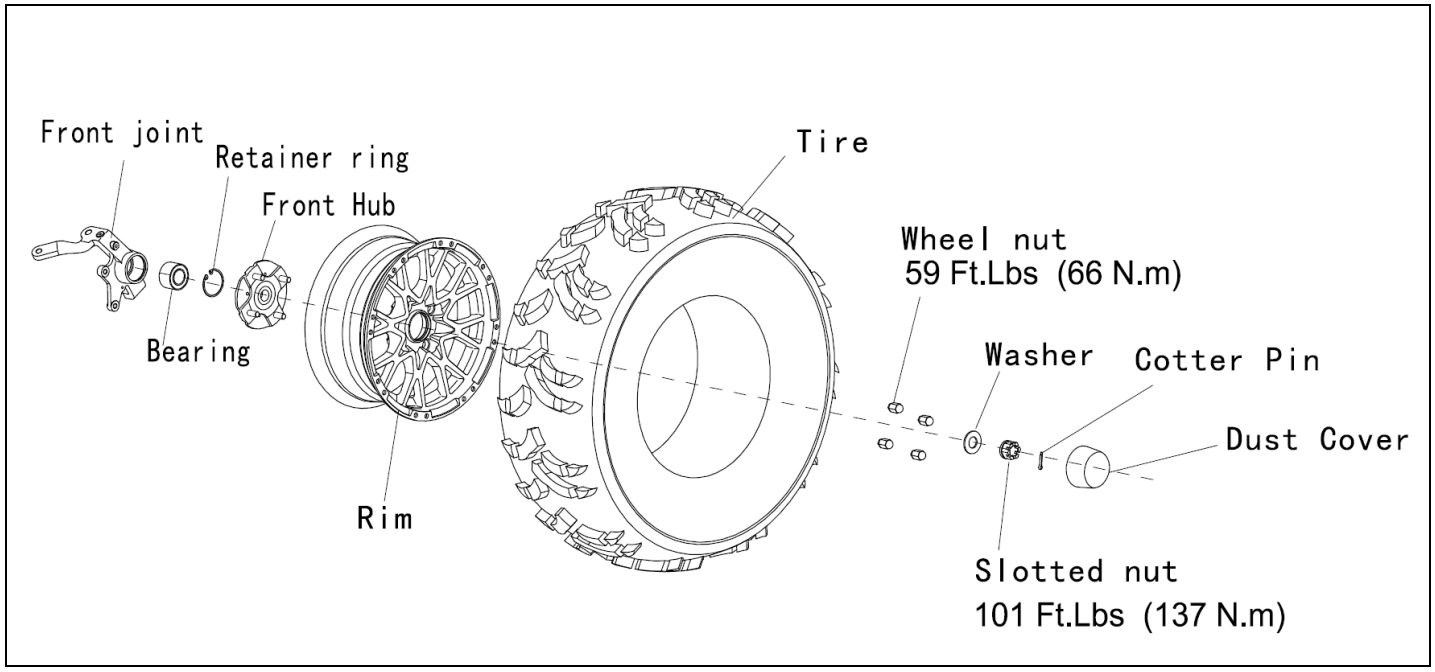
5.1 WHEEL, HUB, AND SPINDLE TORQUE TABLE

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

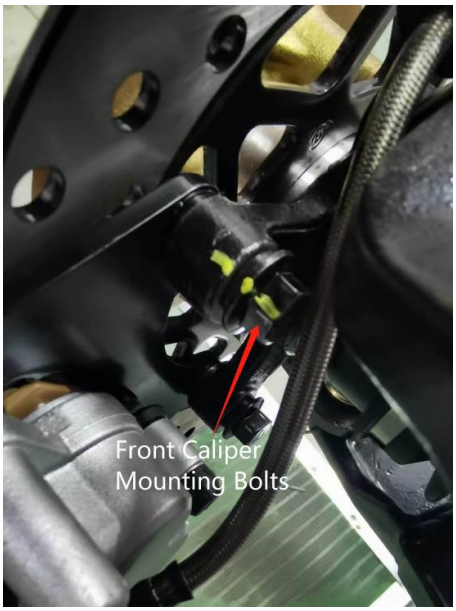
Refer to exploded views and text for torque values of other fasteners.

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

5.2 FRONT HUB EXPLODED VIEW



5.3 FRONT HUB REMOVAL/INSPECTION



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

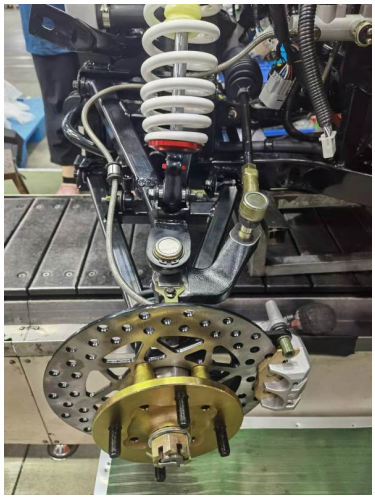
CAUTION: Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Wear eye protection when removing bearings and seals.

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.

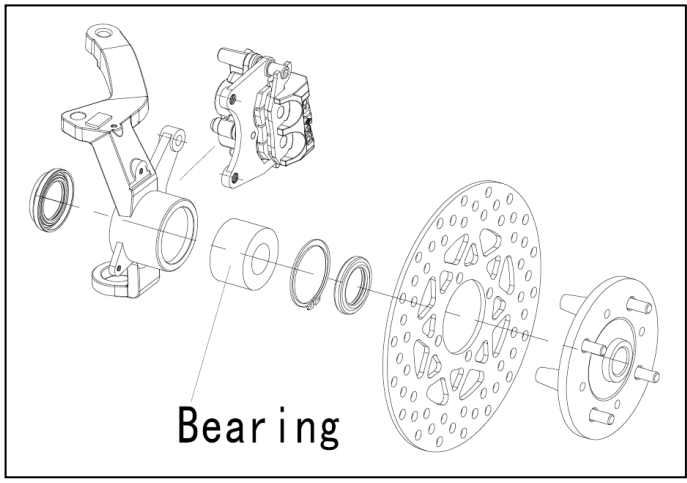
CAUTION: Do not hang the caliper by the brake line. Use wire to hang the caliper to prevent possible damage to the brake line.



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

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

5.4 FRONT HUB INSTALLATION



1. Inspect the rotate bearing surface for wear or damage.

2. Install the hub into the bearing.

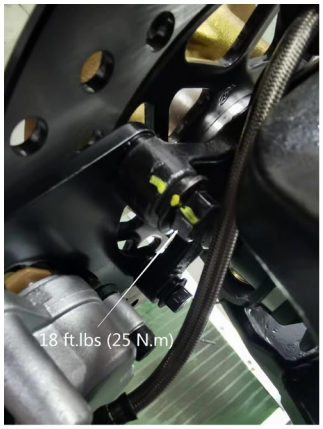
3. Apply grease to the spline of front driveshaft. Install driveshaft through the backside of the HUB.

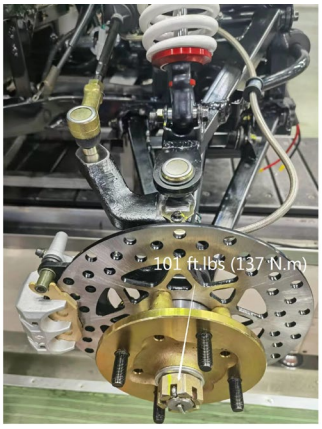
4. Install washer and spindle nut and tighten to 101 ft.lbs (137 N.m).

5. Install a new cotter pin. Tighten nut slightly if necessary to align cotter pin holes. bend both ends of cotter pin around end of spindle in different directions. Install hub cap.

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

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



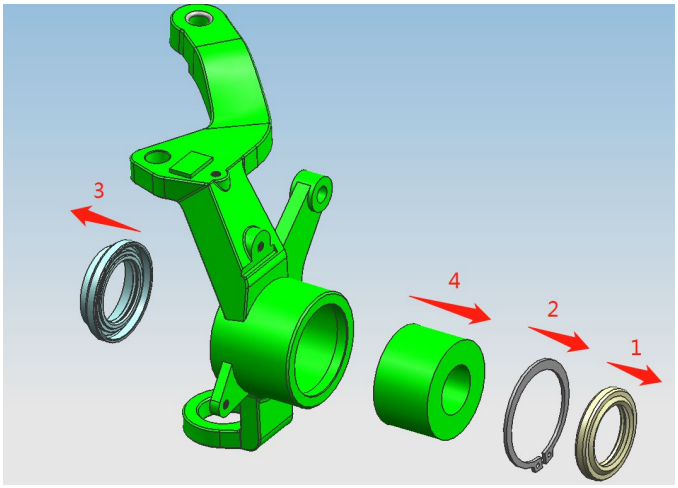


CAUTION: New bolts have a pre-applied locking agent which is destroyed bolts upon removal. Always use new brake caliper mounting bolts upon assembly.

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

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.

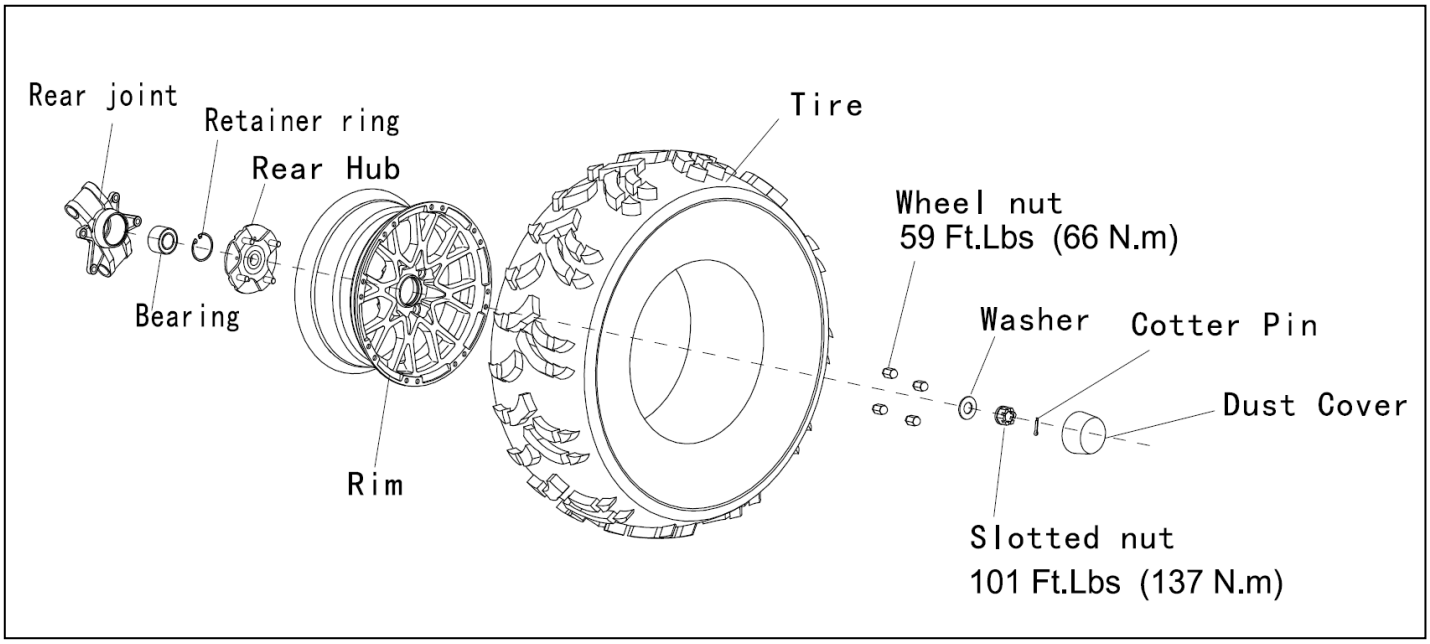
3. Drive bearing out evenly by tapping on outer race only. Once bearing is at bottom of casting, support casting on outer edges so bearing can be removed.

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.

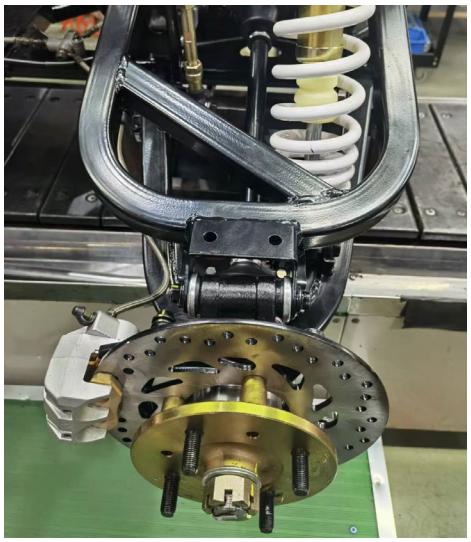
5.6 REAR HUB EXPLODED VIEW



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.

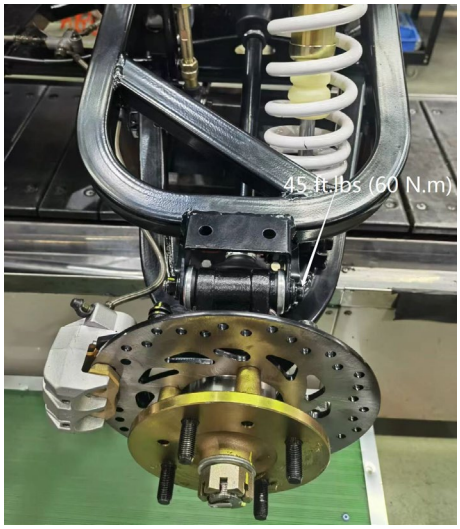
5. Remove hub cap, cotter pin, rear spindle nut, and washer.

6. Remove the upper and lower control arm bolts.

7. Slide the rear hub and knuckle from the rear drive shaft.

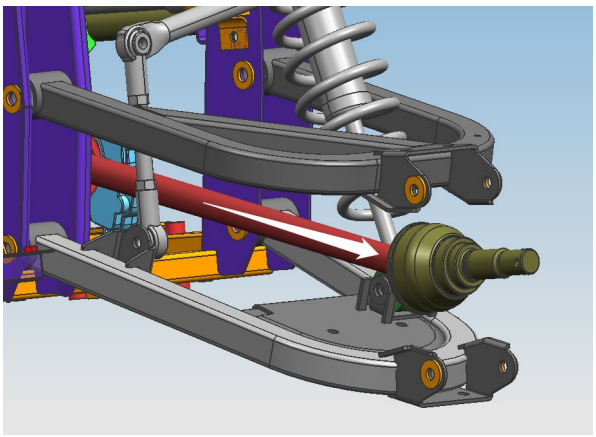
8. Inspect the rear hub and knuckle assembly by hand for smoothness and side to side movement, replace as needed.

5.8 REAR HUB AND KNUCKLE INSTALLATION



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

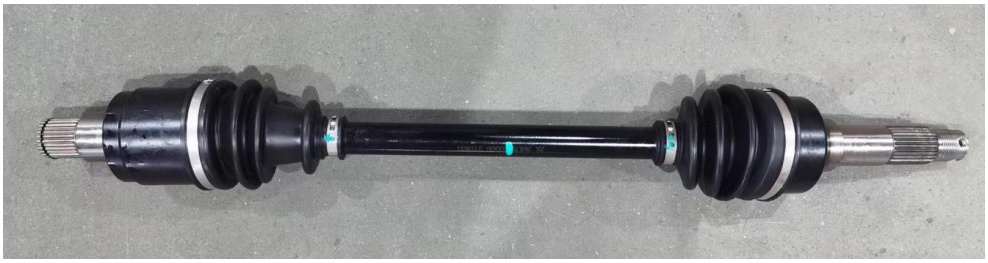
5.9 REAR DRIVE SHAFT REMOVAL



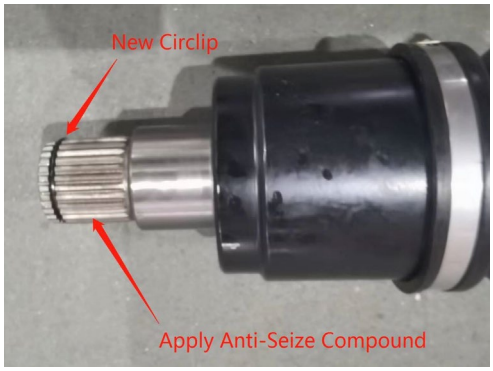
1. Repeat of the steps in the “REAR HUB AND KNUCKLE REMOVAL” section.

2. Pull the rear drive shaft straight out of the frame. Use short sharp jerks to free the circlip from the gearcase. (The circlip holds the shaft in the gearcase)

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

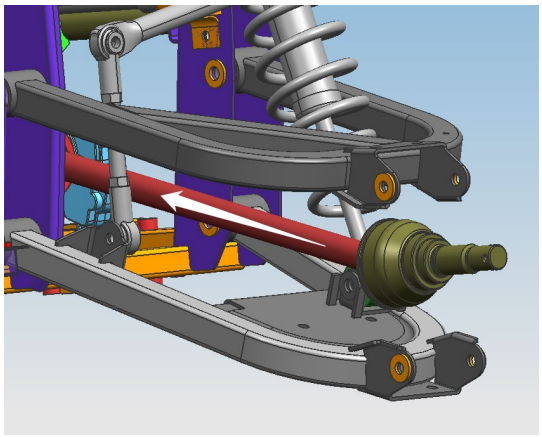


5.10 REAR DRIVE SHAFT INSTALLATION



1. Install a new circlip onto the rear drive shaft. Apply Anti-Seize Compound onto the rear driveshaft splines (both ends).

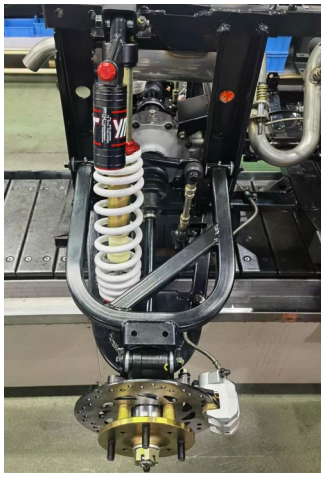
2. Reinstall the rear driveshaft into the rear gearcase. Be sure the circlip is securely fit into the rear gearcase. Use a rubber mallet to tap on the outboard end of the driveshaft if necessary.



3. Slide the rear drive shaft into the knuckle.

4. Lift knuckle into place and install bolt to upper and lower control arm. Torque bolt to 45 ft.lbs (60 N.m).

5. Install the washer and the spindle retainer nut, tighten bolts to 101 ft.lbs (137 N.m), install a new cotter key and hub cap.



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

7. Install the wheel and wheel nuts. Torque wheel nuts to 59 ft.lbs. (66 N.m).

NOTES

CHAPTER 6 BRAKES

6.1 SPECIFICATIONS

Front Brake Caliper		
Item	**Standard**	**Service Limit**
Brake Pad Friction material Thickness	0.236"/ 6mm	0.04"/ 1mm
Brake Disc Thickness	0.189-0.203"/4.81-5.166 mm	0.179"/ 4.556mm
Brake Disc Thickness Variance Between Measurements	-	0.002 "/ .051m m
Brake Disc Runout	-	0.005 "/ .127mm
Rear Brake Caliper		
Item	**Standard**	**Service Limit**
Brake Pad Friction material Thickness	0.236"/ 6mm	0.04"/ 1mm
Brake Disc Thickness	0.189-0.203"/4.81-5.166 mm	0.167"/4.242mm
Brake Disc Thickness Variance Between Measurements	-	0.002 "/ 0.051mm
Brake Disc Run out	-	0.005 "/ 0.127mm
Mechanics Park Caliper		
Friction material Thickness	0.197"/ 5mm	0.04"/ 1mm

6.2 TORQUE

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

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

⚠ WARNING

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

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:

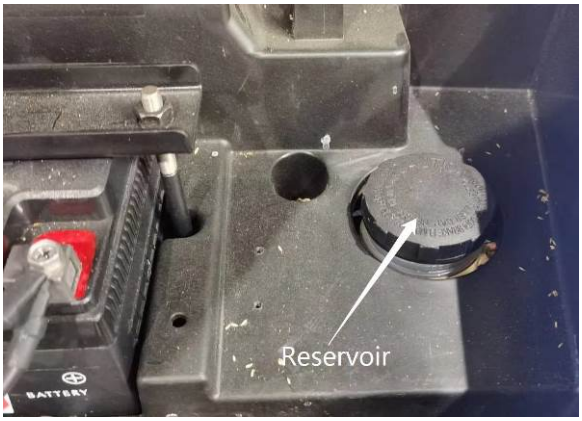
Always wear safety glasses.

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 between the MIN line and MAX line of reservoir.

DOT 3 Brake Fluid



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

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

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

CAUTION:

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

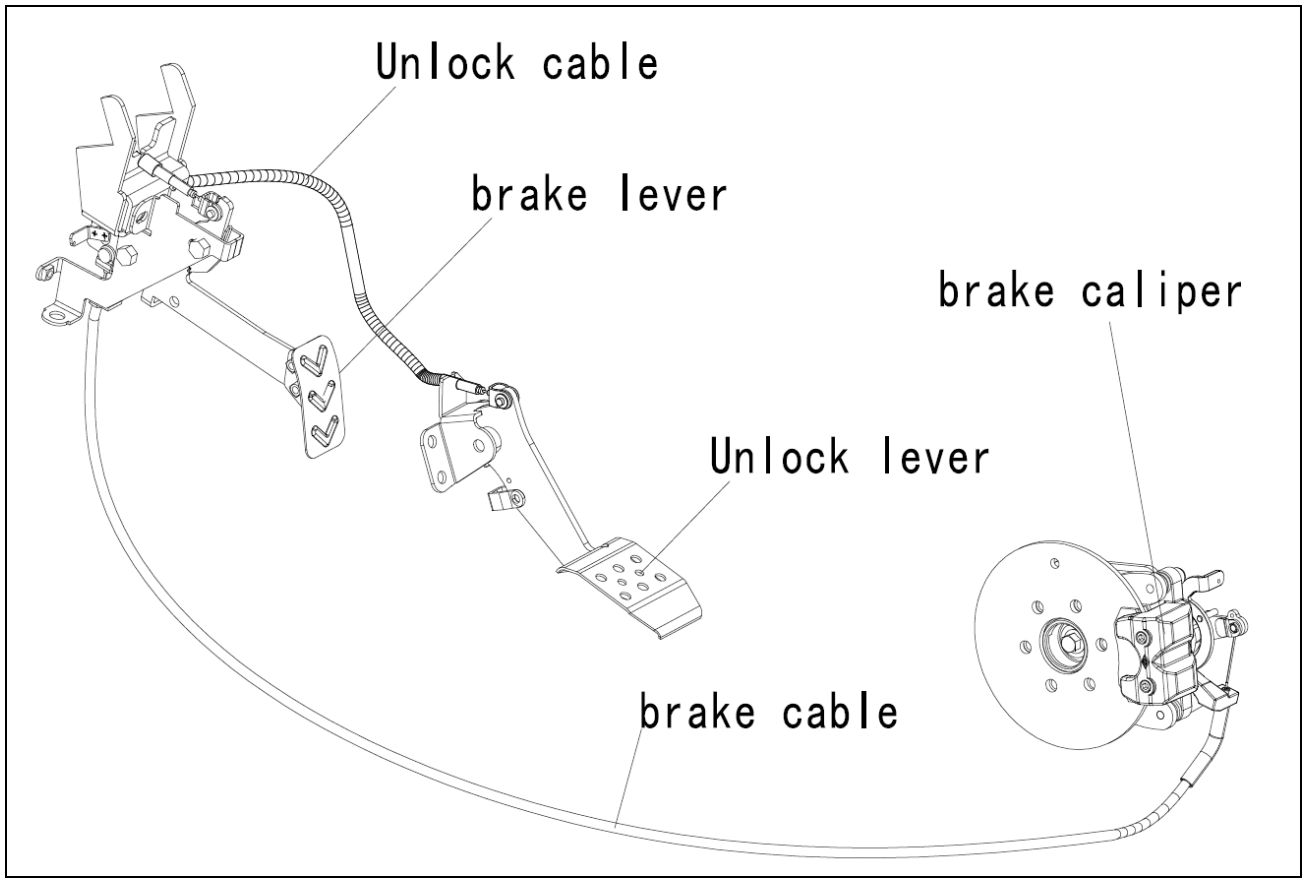
9. Tighten bleeder screw securely and remove bleeder hose.
10. Repeat procedure steps 5- 9 for the remaining calipers.
11. Add brake fluid to MAX level inside reservoir.

    Master Cylinder Fluid Level

    Between the MIN line and the MAX line of reservoir.

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

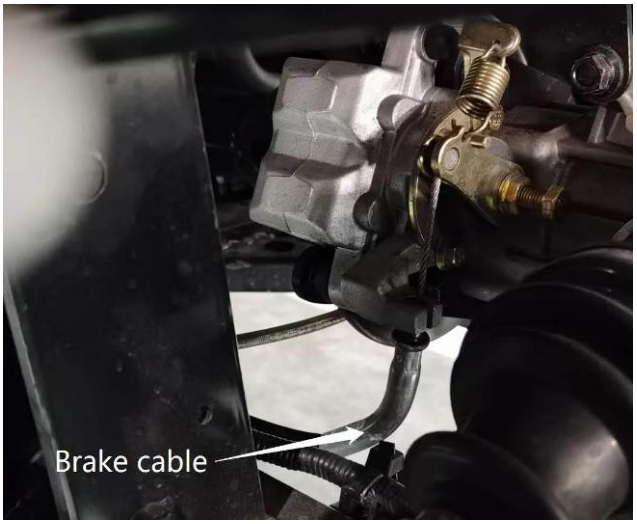
6.6 PARKING BRAKE AND BRAKE LINE INSPECTION



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.

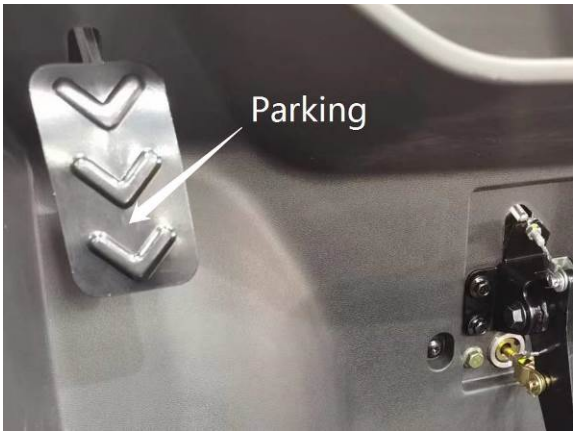
3. Inspect the brake cable and brake cable connections for possible leaks or loose cable.



6.7 PARKING BRAKE ADJUSTMENT

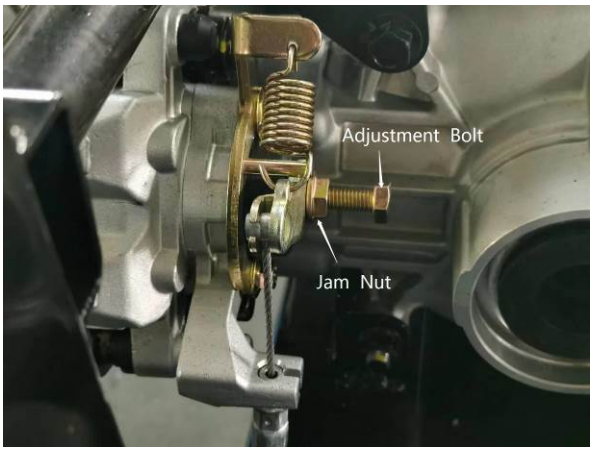
Parking Brake Inspection

1. Put your foot on the parking pedal.
2. After 3 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 on the rear caliper adjustment bolt.
4. Tighten the adjustment bolt until the rear tire will not rotate.
5. Back off the adjustment bolt 1/4 turn.
6. Tighten the jam nut while holding the adjustment nut in place.



6.8 REAR PADS REMOVAL / INSTALL

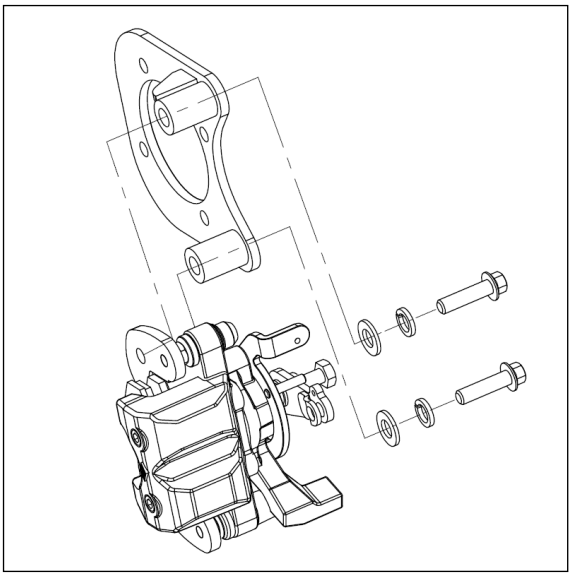
NOTE: The brake pads should be replaced as a set.

1. Elevate and support rear of CUV safely.

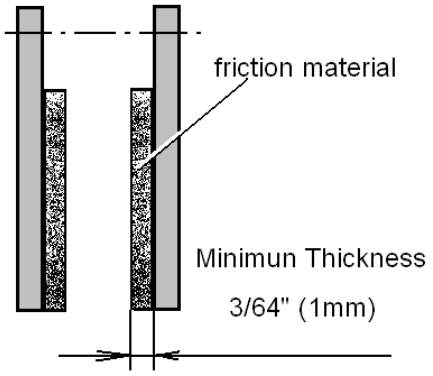
CAUTION:

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

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



3. Measure the thickness of the caliper parking brake pads. Replace pads if worn beyond the service limit.
   Service Limit 3/64"(1 mm)



The Procedure of Pads Replacement

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

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

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

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

4. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other.
   NOTE: Do not get oil, grease or fluid on the park brake pads. Damage to the pads may cause the pads to function improperly.

Rear Brake Caliper Installation

1. Install the park brake assembly into place. Tighten the two bolts for proper installation.

2. Torque the two bolts to 18 ft.lbs. (25 N.m).

3. Test the park brake for proper function.

6.9 FRONT PADS REMOVAL / INSPECTION / INSTALLATION

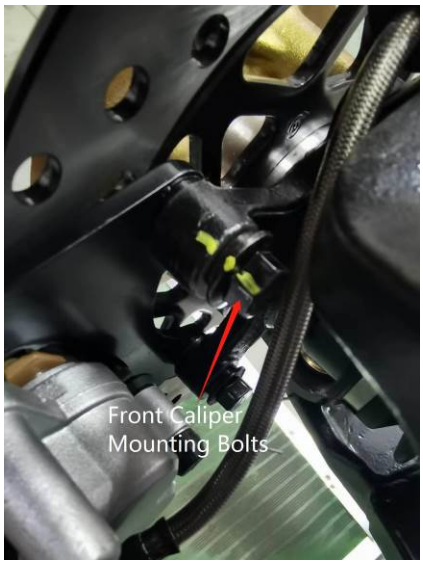
NOTE: The brake pads should be replaced as a set.

REMOVAL

1. Elevate and support front of CUV safely.

CAUTION:

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

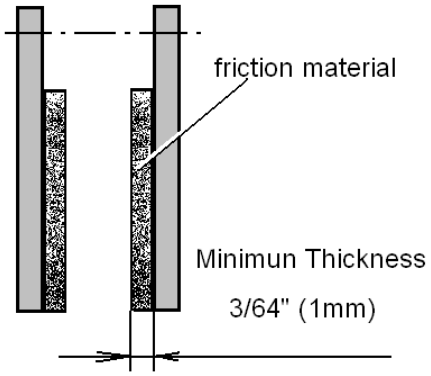


2. Remove the front wheels.

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

INSPECTION

Measure the thickness of the pads friction material.
Replace pads if worn beyond the service limit.
Service Limit 3/64"(1 mm)



The procedure of pads replacement

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

Front Caliper Installation

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

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

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

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 0.189-0.203" (4.810 - 5.166 mm)
   Service Limit 0.179" / 4.556 mm
   Brake Disc Thickness Variance
   Service Limit 0.002 " (0.051 mm)
   difference between measurements

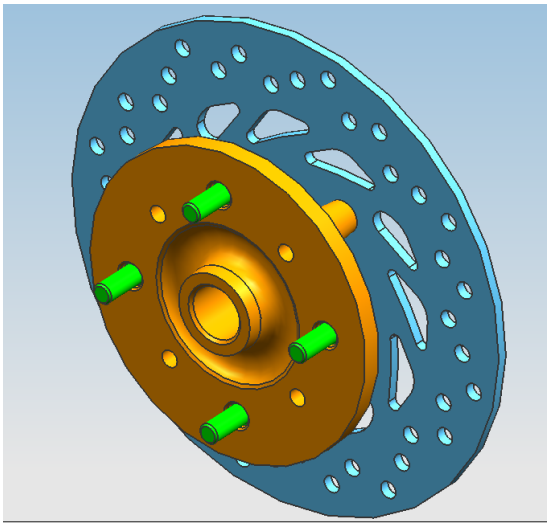
3. Mount dial indicator as shown to measure disc runout on the dial indicator. Replace the disc if runout exceeds specifications.
   Brake Disc Runout
   Service Limit 0.005" (0.127 mm)

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.

2. Remove bolts and disc.

3. Clean mating surface of disc and hub.



4. Install new disc on hub and tighten to specified.

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

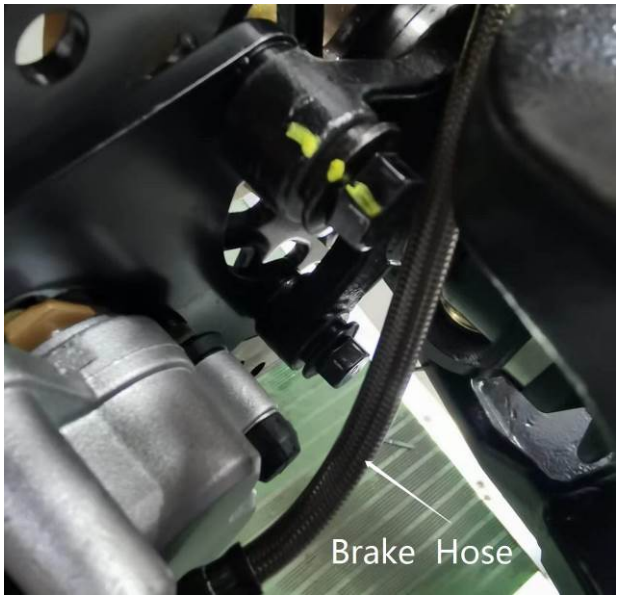
CAUTION:

Always use new brake disc mounting bolts.

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

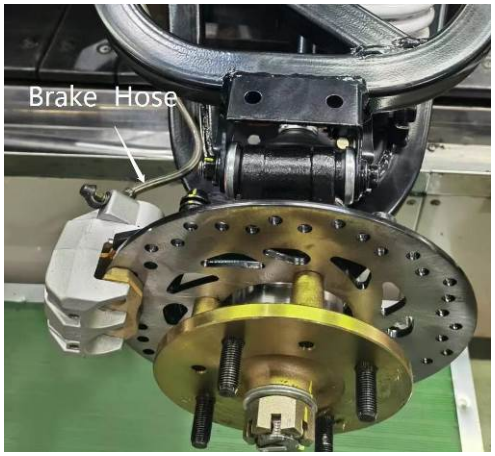
1. Install caliper on hub strut, Apply Loctite™ 242 to screw threads and Install new bolts.
   Front Caliper Mounting Bolt Torque: 18 ft. lbs (25 N.m)
2. Install brake hose and tighten to specified torque.
   Bolt Torque: 15 ft. lbs (21 N.m)

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

6.12 REAR CALIPER REMOVAL/ INSPECTION/ INSTALLATION

CAUTION:

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



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

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

from brake hose.
3. After the fluid has drained into the container, remove the caliper mounting bolts and remove caliper.
4. Remove brake pads as described above.
5. Inspect surface of caliper for nicks, scratches or damage and replace if necessary.
6. Install brake pads in caliper body with friction material facing each other, with the spacer between the pads. Install retaining pin through outer pad, pad spacer and inner pad.
7. Install caliper and torque mounting bolts to 18 ft.lbs (25 N.m).
8. Install park brake line, brake hose and tighten to specified torque.
   Bolt Torque: 15 ft. lbs(21 N.m)
9. Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.
10. Install the rear wheel and wheel nuts. Carefully lower the vehicle.

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

6.13 REAR BRAKE DISC INSPECTION / REMOVAL / REPLACEMENT

INSPECTION

1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.
   Brake Disc Thickness
   New 0.189-0.203" (4.810 - 5.166 mm)
   Service Limit 0.179" / 4.556 mm
   Brake Disc Thickness Variance
   Service Limit 0.002 " (0.051 mm)
   difference between measurements

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

Brake Disc Runout Service Limit 0.005" (0.127 mm)

REMOVAL/ REPLACEMENT

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

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

CAUTION:

Always use new brake disc mounting bolts.

NOTES

CHAPTER 7 ELECTRICAL

7.1 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.
KEER OUT OF REACH OF CHILDREN

INSTERUCTIONS FOR EALED TYPE DRY CHARGED STOR AGE 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.

INSTRUCTIONGS FOR MAINTENANCE FREE BATTERY:

(1) Observe whether the battery has abnormal bulge and contraction;

(2) Observe whether the battery terminal has liquid leakage and corrosion;

(3) Considering the inventory and shipping time, it is recommended to keep the engine running for half an hour after receiving the new car for the first time to charge the battery; If the battery power is too low (below 12.0V) to start normally, the 12V charger should be used directly for charging.

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 multimeter

NOTE: Lead acid batteries should be kept at or near a full digital multitester. Readings of 12.6 or less require further battery testing and charging. charge as possible.

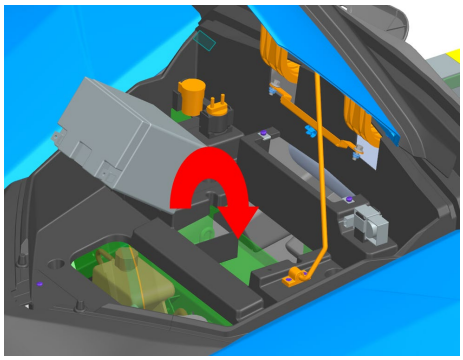
Load test

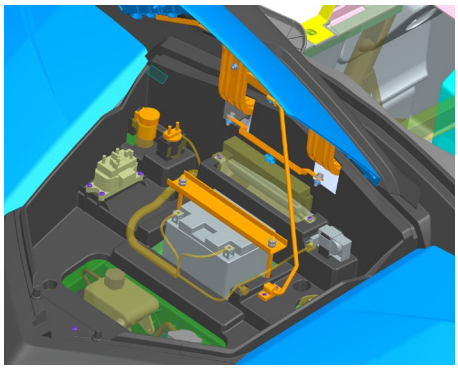
CAUTION: Remove spark plug high tension leads and connect securely to engine ground before proceeding.

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 multitester 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.

BATTERY REPLACEMENT





1. Set the battery in its holder.
2. First connect and tighten the red (positive) cable.
3. Second connect and tighten the black (negative) cable.
4. Reinstall the battery clamp.

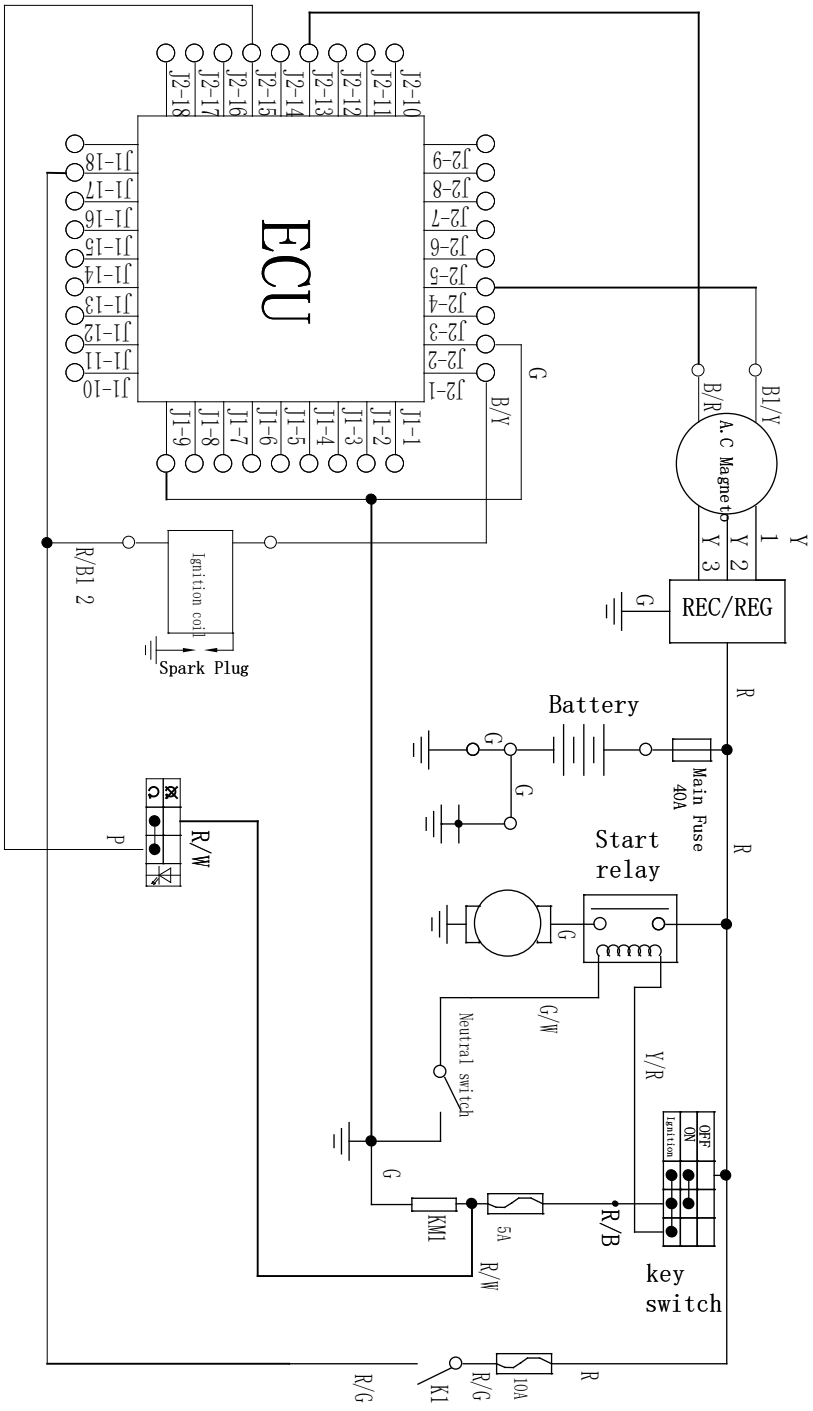
7.2 IGNITION SYSTEM

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 magnetoend crankshaft bearings
- Sheared flywheel key
- Flywheel loose or damaged
- Excessive crankshaft run out on magneto end should not exceed 0.005" (0.13mm)
- Faulty ECU module
- Faulty Electric relay

CIRCUIT DIAGRAM



IF THE IGNITION SYSTEM FAILS TO OPERATE

Procedure

Check:

1. Fuse (Main)
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil
7. Main switch
8. Emergency stop switch
9. Wiring connection (entire ignition system)

1.Fuse → INCONTINUITY → Replace the fuse.

Check switches

⇩ CONTINUITY

2. Battery → INCORRECT

- Check the battery condition.

Refer to "BATTERY TESTING"

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

⇩ CORRECT

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: 0.8 ± 0.1mm

⇩

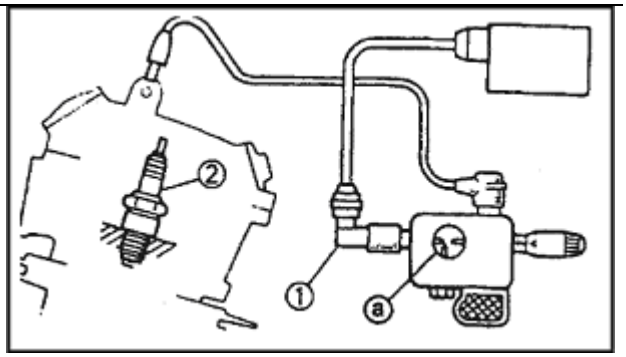
*

*

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 starter switch, and increase the spark gap until a misfire occurs.



Minimum spark gap: 6mm (0.24 in)

OUT OF SPECIFICATION OR NO SPARK

MEETS SPECIFICATION

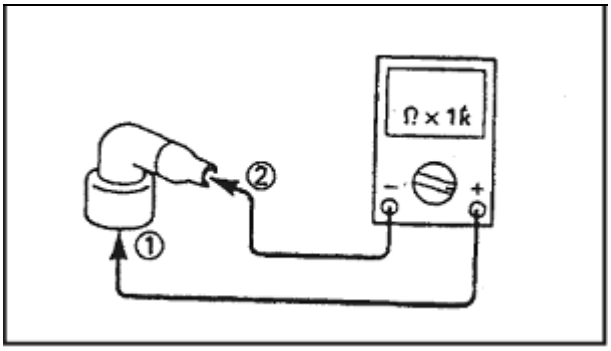
The ignition system is not faulty.

5.Spark plug cap resistance

●Remover the spark plug cap.

●Connect the pocket tester (ΩX1 k) 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.

Tester (+) lead →
Spark plug side①
Tester (—) lead→
High tension cord side ②



OUT OF SPECIFICATION

Replace the spark plug cap

Spark plug cap resistance: 5KΩ(20 ℃)

CORRECT

*

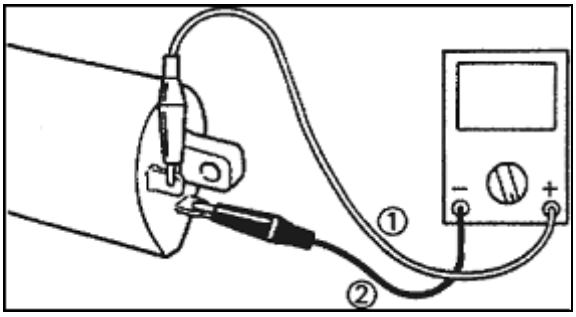
*

6. Ignition coil resistance

Disconnect the ignition coil connector from the wire harness.

- Connect the pocket tester (1) to the ignition coil.
- Check if the primary coil has the specified resistance.

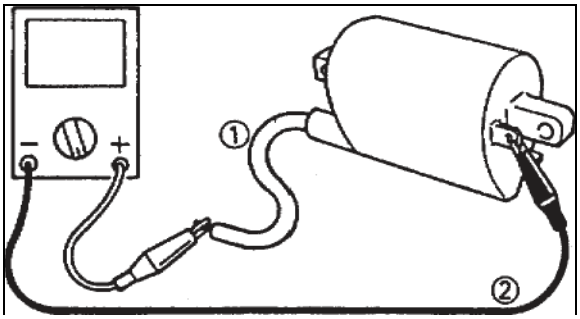
Tester (+) lead
Pink Terminal
Tester ( ) lead B/Y
Terminal



Primary coil resistance:
0.8Ω (20 ℃)

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

Tester (+) lead
Spark plug lead
Tester (—) lead
Pink Terminal



Secondary coil resistance:
6.8KΩ(20℃)

OUT OF SPECIFICATION

BOTH MEET SPECIFICATION

Replace the ignition coil.

NO CONTINUITY

*

7.Main switch

CHECK SWITCHES

Replace the main switch

CONTINIUTY

8.Emergency stop switch

CHECK SWITCHES → NO CONTINUITY → Replace the emergency stop switch

CONTINIUTY

9.Wiring connection

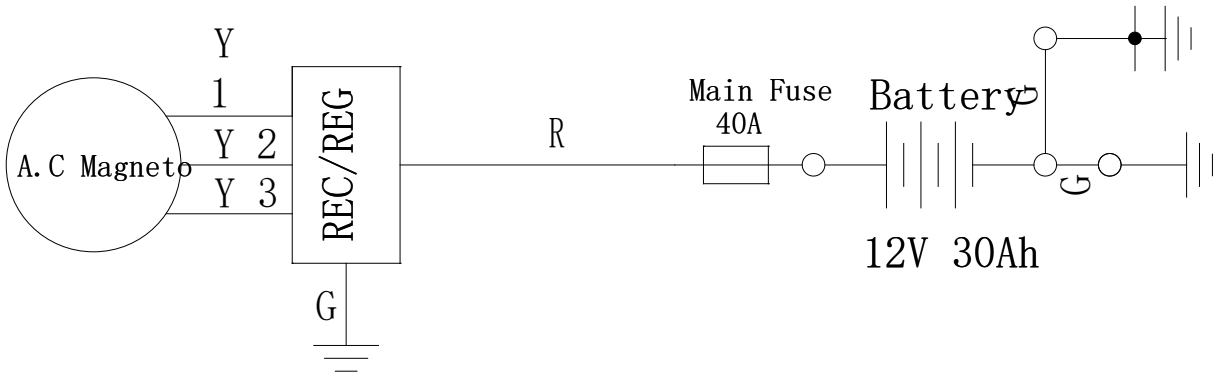
●Check the connection of the entire ignition system
Refer to —CIRCUIT DIAGRAMǁ → POOR CONNECTIONS → Correct

CORRECT

Replace the igniter unit.

7.3 CHARGING SYSTEM

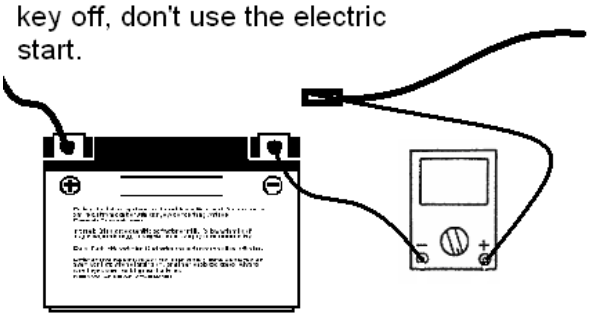
CHARGING SYSTEM CIRCUIT DIAGRAM



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 and speed limiter.
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)



CHARGING SYSTEM

Procedure

Check:

1. Fuse (Main)
2. Battery
3. Charging voltage
4. Startor coil resistance
5. Wiring system (entire charging system)

1. fuse

NO CONTINUITY

Replace the fuse

2. Battery

Check the battery condition.
Refer to "BATTERY INSPECTION"

INCORRECT

Clean battery terminals
Recharge or replace the battery

3.Charging voltage
Connect the engine tachometer to the spark plug lead.
●Connect the pocket tester (DC20V) to the battery
Test (+) lead→
Battery (+) terminal ①
Test (-) lead→
Battery (-) terminal ②
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 changed battery.

OUT OF SPECITICATION

The charging circuit is not faulty
Replace the battery

MEETS SPECICATION

4. Startor coil resistance
Remove the A.C. magneto coupler from wire harness
Connect the pocket tester (ΩX1) to the stator coil
Tester (+) lead –yellow terminal
Tester (-) lead –yellow terminal
Measure the stator coil resistance
Stator coil resistance 0.5-0.8Ω（20℃）

OUT OF SPECITICATION

Replace the stator coil

MEETS SPECIFICATION

5.Wiring connection
check the entire charging system for connections
Refer to “CIRCUIT DIAGRAM”

POOR CONNECTION

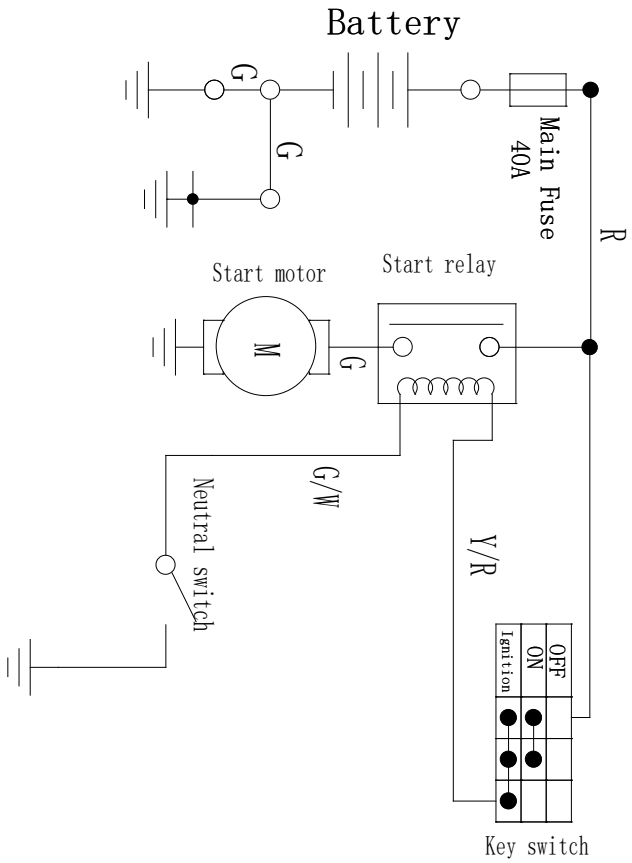
correct

CORRECT

Replace the rectifier/regulator

7.4 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. Key switch
6. neutral switch
7. wiring connection (entire starting system)

1. fuse
refer to “CHECKING SWITCHES” section

NO CONTINUITY

Replace the fuse

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

INCORRECT

Clean battery terminals
Recharge or replace the battery

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

DOES NOT MOVE

Repair or replace the starter motor

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

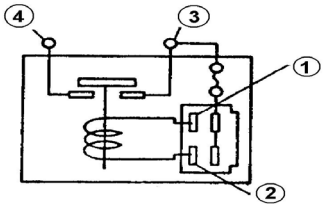
4.Starter relay

●Disconnect the relay unit coupler from the wire harness.
●Connect the pocket tester (Ωx1) and battery (12V) to the relay unit coupler terminals.

Battery (+) lead→
Green/White terminal ①
Battery (-) lead→
Yellow/Red terminal ②

●Check the starter relay for continuity.

Test (+) lead → ③ terminal
Test (-) lead → ④ terminal



CONTINUITY

Replace the starter replay

5.Key switch
CHECK SWITCHES

NO CONTINUITY

Replace the main switch

6. Neutral switch

CHECKING SWITCHES

NO CONTINUITY

Replace the brake switch

7 Wiring connection

Check the connections of the entire starting system.

Refer to “CIRCUIT DIAGRAM

POOR CONNECTION

Correct

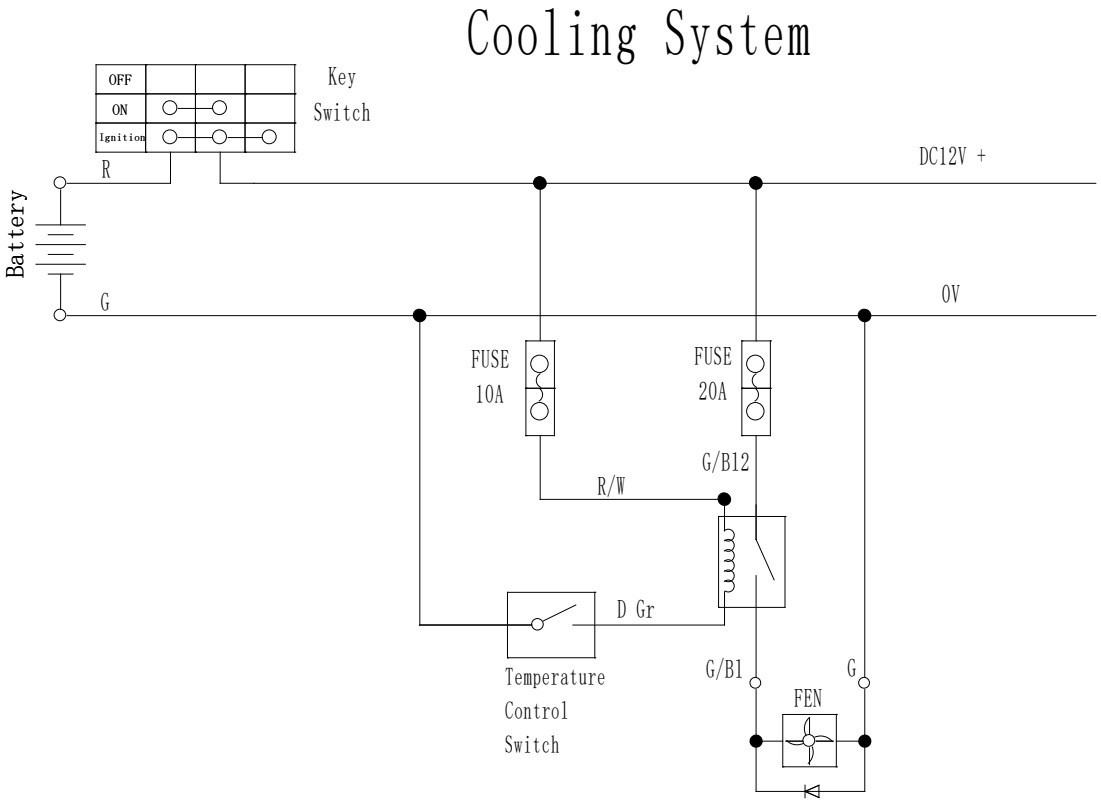
7.5 COOLING SYSTEM

IF THE FAN MOTOR FAILS TO TURN

Procedure

Check:

1. Fuse (Main, Fan)
2. Battery
3. Key switch
4. Fan motor (inspection)
5. Temperature control switch
6. Relay
7. Wiring connection (entire cooling system)



1. fuse

CHECK SWITCHES → NO CONTINUITY → Replace the fuse

2. Battery

Check the battery condition.
Refer to "BATTERY INSPECTION" section → INCORRECT → Clean battery terminals

Recharge or replace the battery

3 Key switch
CHECK SWITCHES → NO CONTINUITY → Replace the main switch

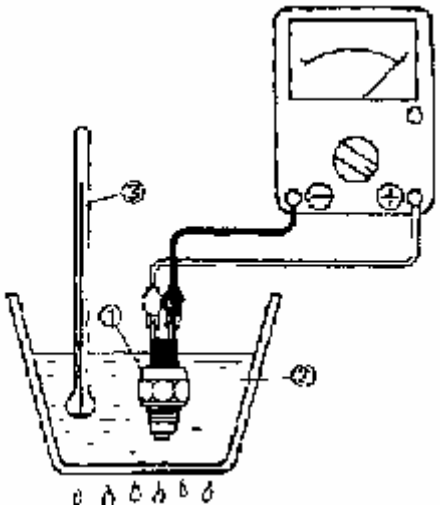
4. Fan motor(inspection 1)
Connect the battery to the fan motor.
Battery (+) lead→Green/Blue terminal ①
Battery (-) lead→Green ground ②
Check the fan motor operation → DOES NOT MOVE → Replace fan motor

5. Fan motor (inspection 2)
Turn the main switch to off.
- Remove the thermo switch lead from thermo switch.
- Connect jumper lead to thermo switch leads.
- Turn the main switch to on

→ DOES NOT MOVE → The wiring circuit from battery to fan motor is faulty. Repair

6. Temperature control switch
Remove the thermo switch from the radiator.
- Connect the pocket tester (ΩX1) to the thermo switch①.
- Immerse the thermo switch in the water ②
- Check the thermo switch for continuity.

NOTE:
Measure temperatures while heating the coolant with the temperature gauge



7.Starter relay

●Disconnect the relay unit coupler from the wire harness.

●Connect the pocket tester (Ωx1) and battery (12V) to the relay unit coupler terminals.

Battery (+) lead→
Dark Gray terminal ①
Battery (-) lead→
Green terminal ②

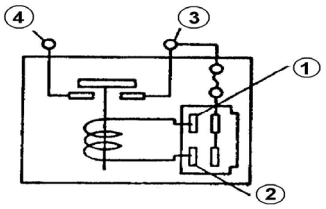
●Check the relay for continuity.

Test (+) lead → ③ terminal
Test (-) lead → ④ terminal

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 relay

8.Wring connection

●Check the connection of the entire cooling system.

Refer to “CIRCUIT DIAGRAM”

UPPER CONNECTION

Correct

IF THE HEAT ALARM UNIT WORKING

When the main switch is turned on, the temperature of the engine begins to go up. As it comes to 75±3℃ the thermostat is connected and the fan starts to work, cooling the coolant, if the thermostat or the fan, fails to work; the coolant temperature will keep rising. The heat alarm unit operates the moment the temperature reaches 115℃ with the signal flashing. Stop the engine now to have the circuit fixed.

Procedure
Check:

1 .Fuse(Main, Fan)
2. Battery
3.Main switch
4. Thermo unit
5. Voltage
6. Relay
7. Wiring connection (entire cooling system)

1. fuse

CHECKING SWITCHES → NO CONTINUITY → Replace the fuse

2. Battery

Check the battery condition.
Refer to "BATTERY INSPECTION"

INCORRECT → Clean battery terminals
Recharge or replace the battery

3.Main switch

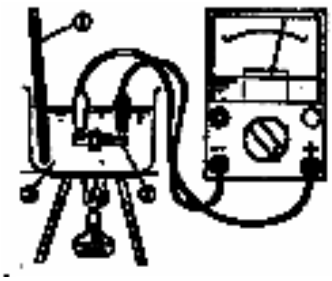
CHECKING SWITCHES → NO CONTINUITY → Replace the main switch

4.Thermo unit

●Drain the coolant and remove the thermo unit from the cylinder head.

●Immerse the thermo unit ②in the coolant③ .

①Thermometer.



Coolant temperature	Resistance
80℃	47.5~56.8Ω
100℃	26.2~29.3Ω

Handle the thermo unit with special care.
Never subject it to strong shocks or allow it to be dropped.
Should it be dropped, it must be replaced.
Do not touch the thermo unit to the bottom of the heated vessel.

OUT OF SPECIFICATION →

Replace the thermo unit

MEETS SPECIFICATION ⇩

5.Voltage

●Connect the pocket tester (DC20V) to the
Temperature gauge couple.
Tester (+) lead→Green/Blue terminal
Tester (-) lead→Green ground

●Turn the main switch to on.

●Check for voltage (12V) on the temperature gauge lead.

OUT OF SPECIFICATION →

The wiring circuit from main switch to temperature gauge is faulty. Repair.

⇩

6.Relay
Measure the relay.

NOT CONDUCTION →

Replace the relay

⇩

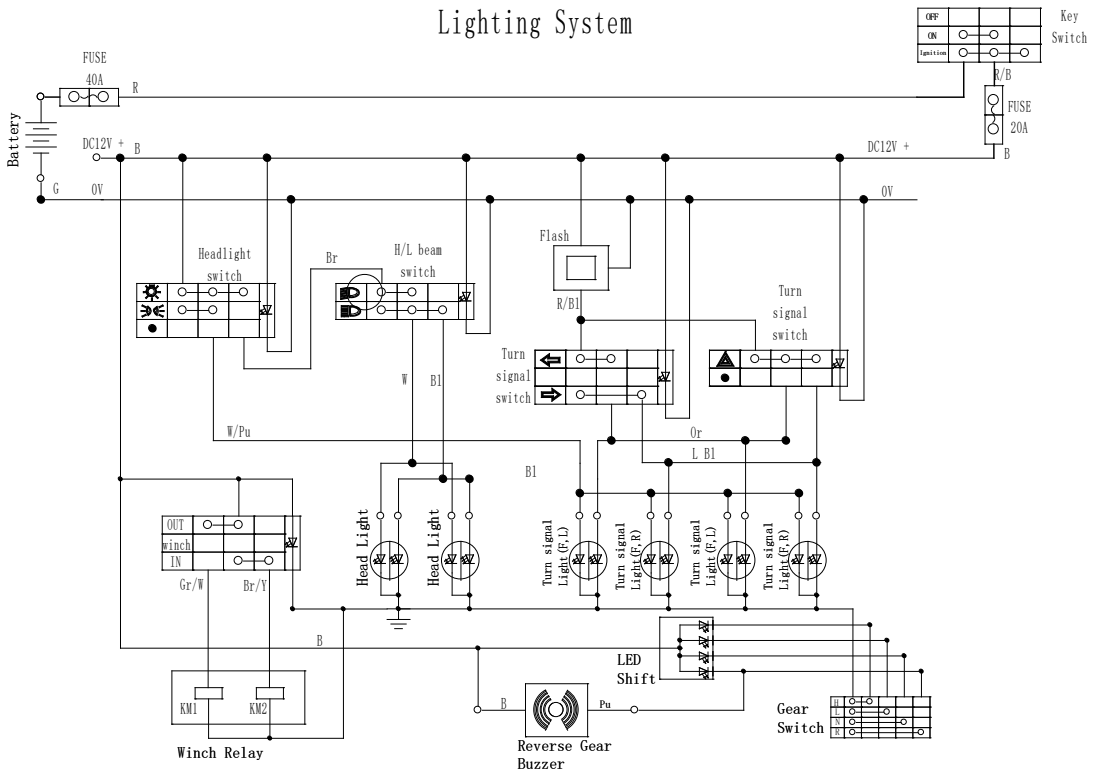
7.Wiring connection check the connections of the entire cooling system.
Refer to “CIRCUIT DIAGRAM”

POOR CONNECTION

CORRECT

Replace the temperature gauge

7.6 LIGHTING SYSTEM



TROUBLESHOOTING

Procedure

Check:

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

1.fuse

refer to "CHECKING SWITCHES" section

NO CONTINUITY

Replace the fuse

2. Battery

Check the battery condition.

Refer to "BATTERY INSPECTION" section in CHAPTER 3

INCORRECT

Clean battery terminals
Recharge or replace the battery

3. Main switch

CHECK SWITCHES

NO CONTINUITY

Replace the main switch

4. Light switch

CHECK SWITCHES

NO CONTINUITY

Replace the light switch

5.Wiring connection

Check the connection of the entire lighting system

POOR CONNECTIONS

correct

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

Refer to "LIGHTING SYSTEM CHECK"

LIGHT SYSTEM CHECK

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

1.

CHECK SWITCHES

NO CONTINUITY

Replace the switch

2. Voltage

Connect the pocket tester (DC12V) to the headlight plug.

A When the dimmer switch is on low beam.

B When dimmer switch is on high beam

Headlight::

Tester (+) lead →White ①or Blue ②lead

Tester negative (-) lead →Green ③lead

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

OUT OF SPECIFICATION

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

This circuit is not faulty

2. the taillight fails to come on

1. Bulb and bulb socket

NO CONTINUITY

Replace the bulb and /or bulb socket

CHECK SWITCHES

CONTINUITY

2. Voltage
Connect the pocket tester (DC12V) to the
socket connector.
Tester (+) lead→
Brown terminal ①
Tester (-) lead→
Green terminal ②
Turn the main switch to on.
Turn the lights switch to on pilot position.
Check the voltage (12V) on the bulb socket connector

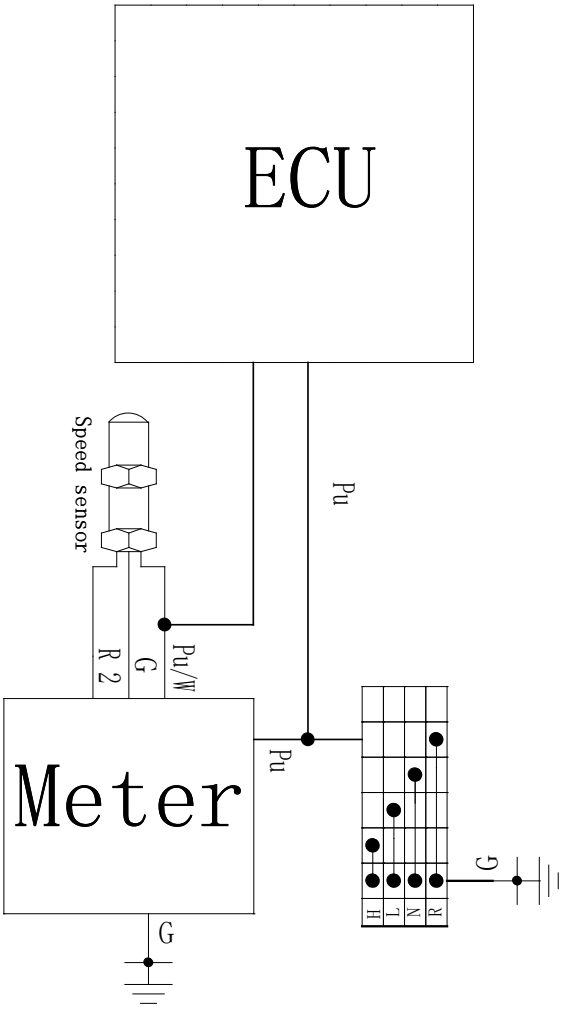
OUT OF SPECIFICATION

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

Repair

This circuit is not faulty

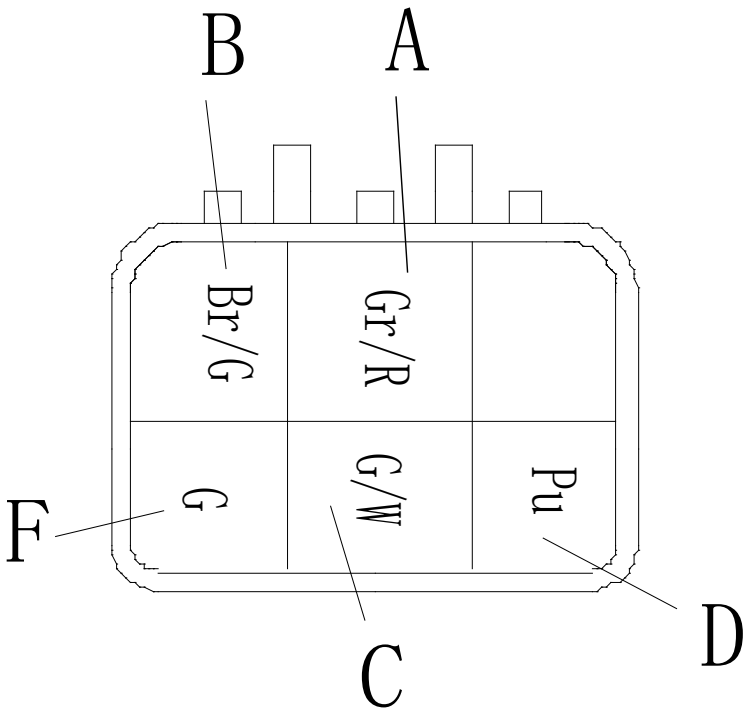
7.7 REVERSE LIMIT SYSTEM



Speed is controlled by the ECU factory Settings In the 15 km/h, which can be reset in accordance with the user's practice.

7.8 GEAR POSITION INDICATOR SWITCH TEST

Switch table



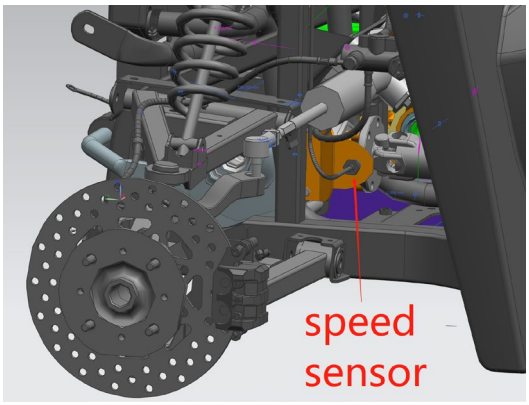
	F	A	B	C	D
High Range	●	●			
Low Range	●		●		
Neutral	●			●	
Reverse	●				●

7.9 SPEEDMETER SYSTEM

OPERATION OF SPPED SENSOR

Speed Sensor is on the front axle

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



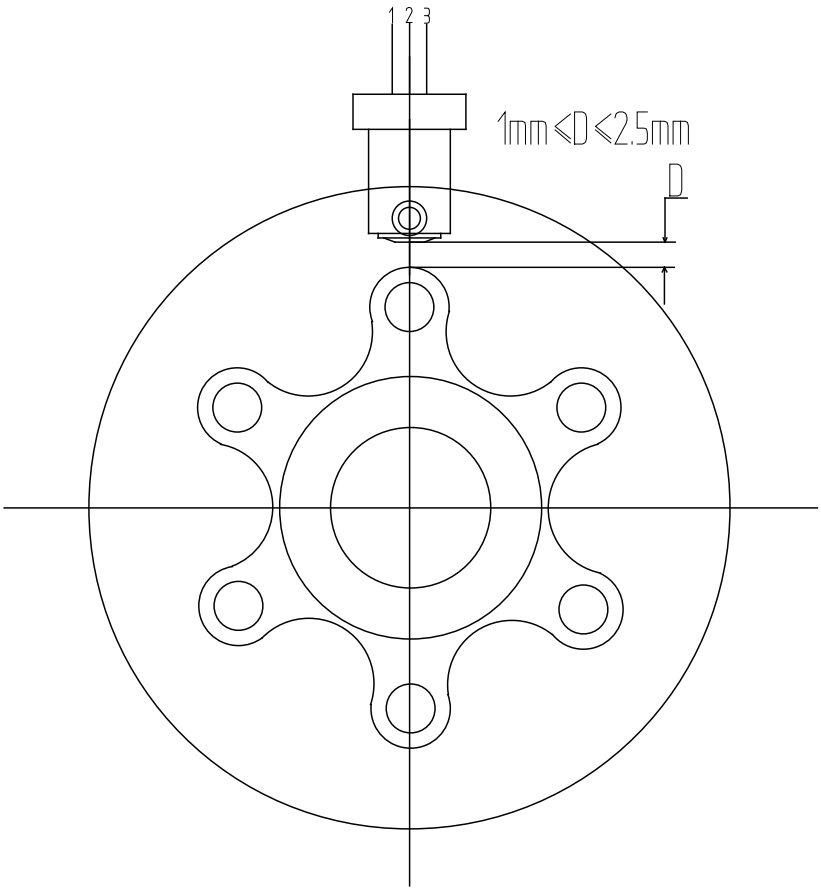
and

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 (red) is positive and wire 2 (black) negative, Wire 3 (purple/white) works as the one to output signals.



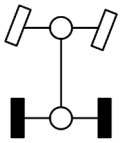
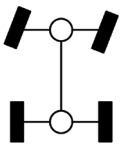
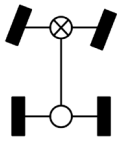
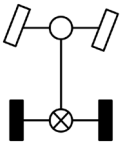
Note: Always screw in the sensor by hand when installation or adjustment.

1, Align one tooth of the splines to the centre of the hole of the sensor by turning the rear axle.
2. Screw the senor 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.

7.10 TFT METER

1. Left Turn Indicator	13. Neutral indicator
2. EFI fault indicator	14. Reverse indicator
3. Function button “SET”	15. Engine RPM
4. Parking indicator	16. Gear indication
5. Low fuel level warning indicator	17. Speed
6. Function button “SEL”	18. Fuel Gauge
7. Water temperature alarm indicator	19. Water temperature
8. Low battery warning	20. Odometer
9. Right Turn Indicator	21. Clock
10. Daytime running lights indicator	22. Battery voltage
11. High beam headlight indicator	23. Driving mode
12. Seat belt warning	

Driving mode

2WD	
4WD	
4WD-FRONT DIFFERENTIAL LOCK	
REAR DIFFERENTIAL LOCK	

Key function:
Short Press Button SET: Adjust backlight brightness;
Short Press Button SEL: Trip A, Trip B switch;
Long Press Button SEL: Trip A or Trip B reset;
Long Press Button SET&SEL : Clock setting mode

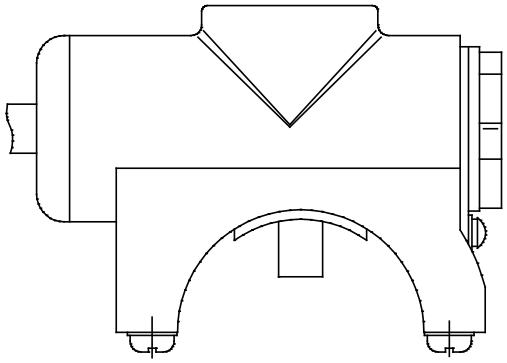
Clock setting mode:
short press SEL：adjust the flashing position
short press SET：switch flashing position
After setting the minute position, short press the Button SET to save and exit.

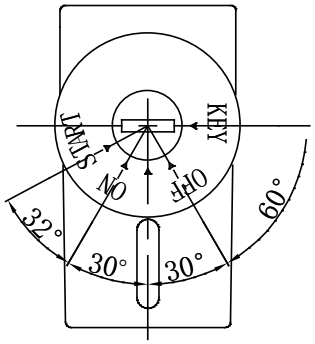
DTC number	DTC Descriptor
P0107	Map Open/GND
P0108	Map Short V
P0112	IAT Short GND
P0117	Toil Short GND
P0118	Toil Short V|Open
P0122	TPS Open|GND
P0123	TPS Short V
P0131	O2 Short GND
P0132	O2 Short V
P0038	O2 heater V
P0037	O2 heater Open|GND
P0201	Injector1 malfunction
P0202	Injector2 malfunction
P0231	Pump/Relay Open/GND
P0232	Pump/Relay Short to Battery
P0336	Crank sensor noisy signal

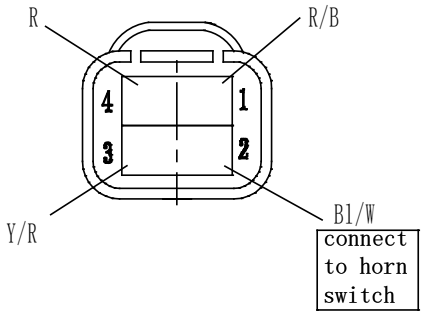
P0337	Crank sensor no signal
P0351	EST1 malfunction
P0500	VSS no valid signal
P0505	Idle speed control
P0562	System voltage low
P0563	System voltage high
P0601	EEPROM Checksum Error
P0650	MIL malfunction

ECU will store the fault code and eliminate it after 40 normal starts; If the fault code needs to be cleared in advance, it can be cleared by the EFI diagnostic apparatus or turned on and off the key switch quickly for 5 times.

7.11 KEY SWITCH





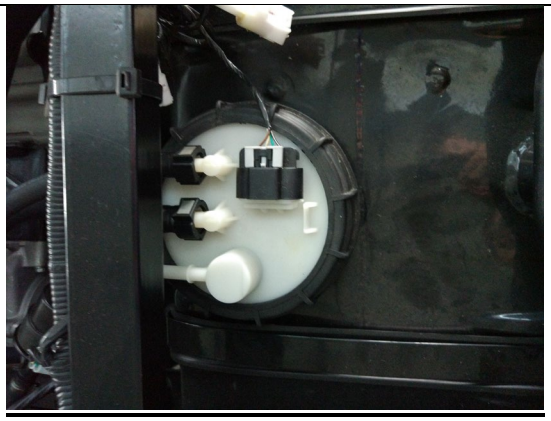


	R	R/B		Y/R
KEY				
OFF				
ON	○	○		
START	○	○		○

7.12 FUEL GAUGE/ FUEL LEVEL SENSOR

Removal

Turn the ignition switch to “OFF”.
Remove two connecting pipe of oil pump.
Remove the terminal of oil pump.
Remove the oil pump cover.
Retain plate and fuel level sensor from the fuel tank.

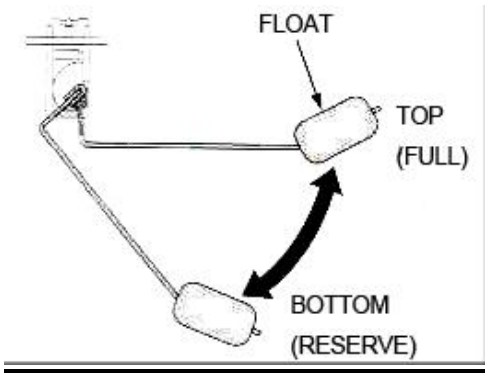


Installation

Install rubber oil seal to the oil pump.
Install oil pump to the fuel tank, location to align .
Install the oil pump cover.
Install two connecting pipe of oil pump.
Install the terminal of oil pump.

Fuel Gauge / Fuel level Sensor Inspection

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



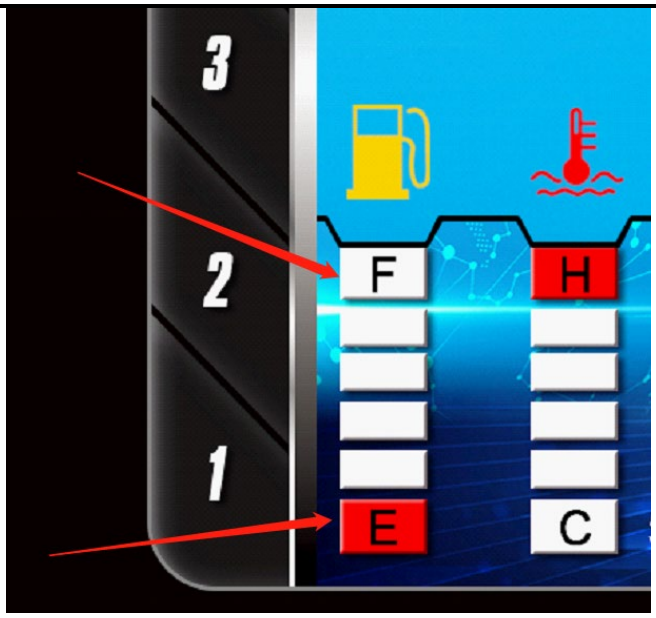
When shows that there are only two segments,segments should blink.

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 TFT Meter.

Fuel level Sensor Inspection
The fuel sensor is integrated on the fuel pump；
Disconnect the fuel pump 4P plug and connect the ohmmeter to the middle 2 terminals.
Measure the fuel level sensor resistance with the float at the top (FULL)
And bottom (RESERVE) positions.

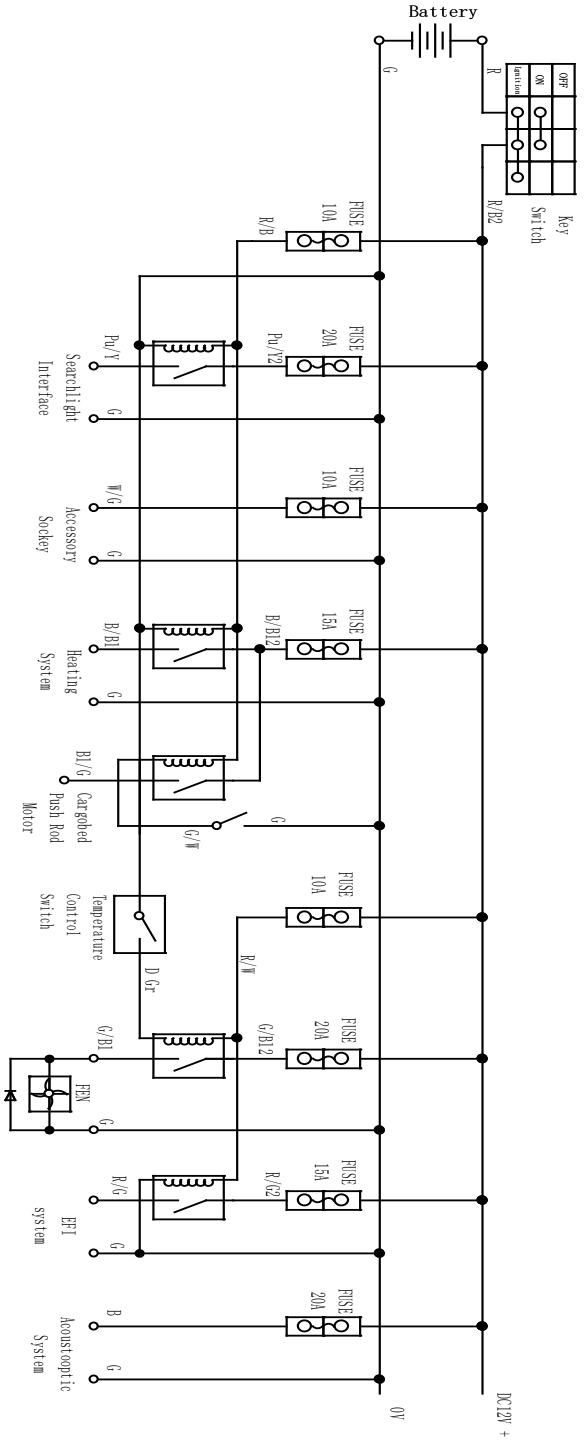


FLOAT POSITION	RESISTANCE(20℃/ 68° F)
TOP(FULL)	0-12Ω(±2Ω)
BOTTOM(RESERVE)	91-118Ω(±2Ω)

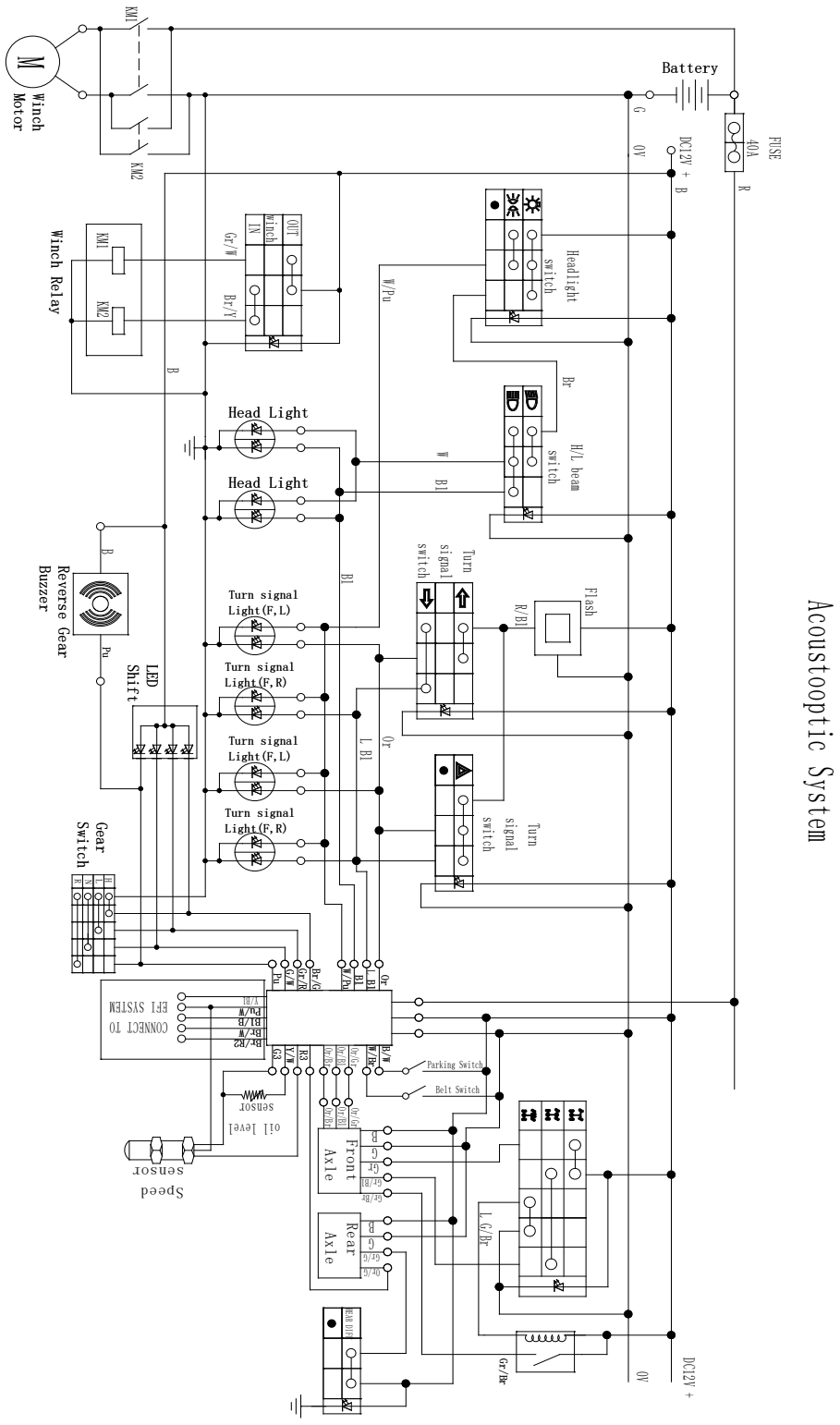
7.13 WIRING DIAGR

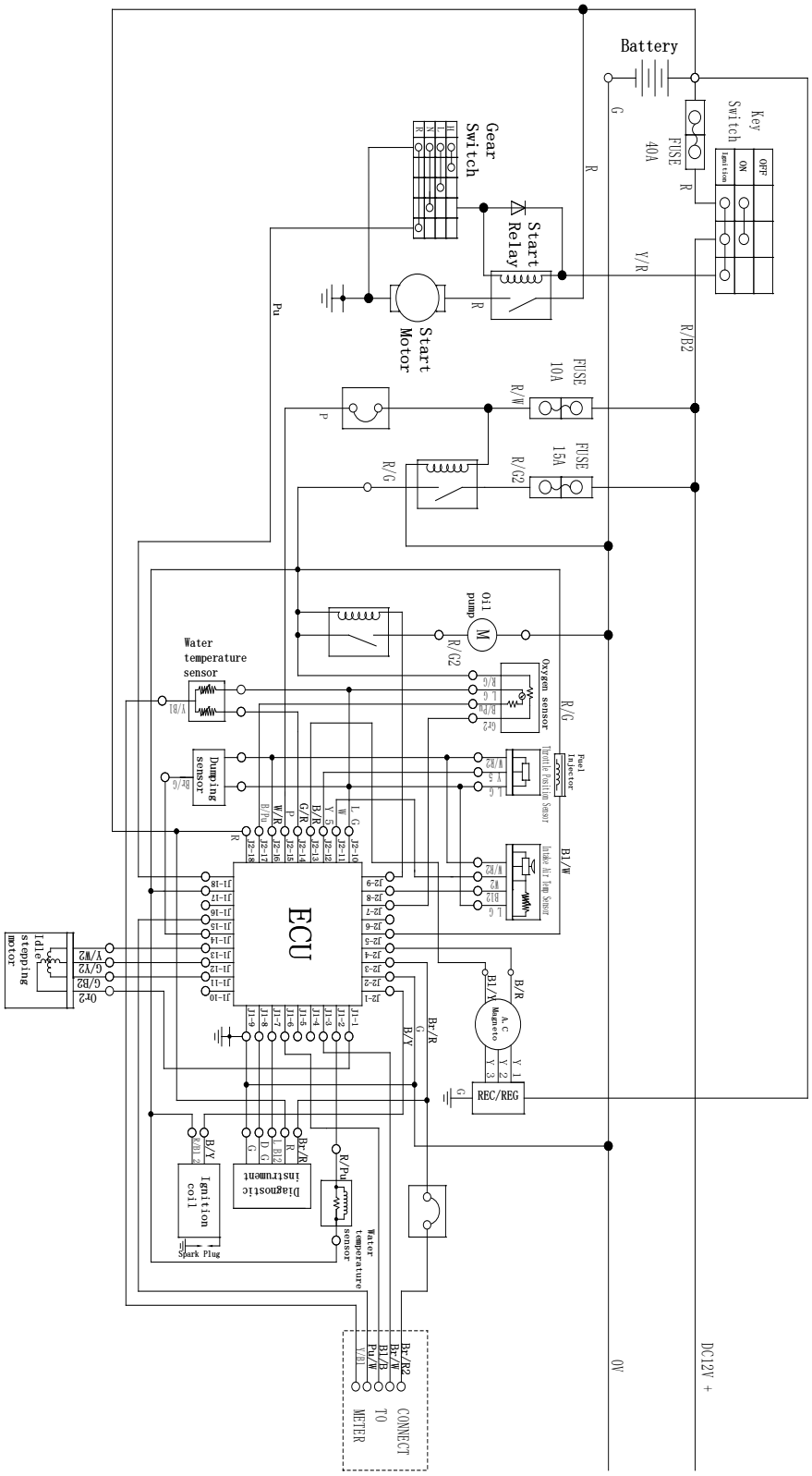
Note	Colour
R	Red
R/Bl	Red/Blue
R/B	Red/Black
R/W	Red/White
R/Pu	Red/Purple
BL	Blue
Bl/Y	Blue/Yellow
Bl/B	Blue/Black
Bl/W	Blue/White
Bl/G	Blue/Green
Y/R	Yellow/Red
Y/Bl	Yellow/Blue
B	Black
B/R	Black/Red
W	White
W/R	White/Red
W/Bl	White/Blue
W/Y	White/Yellow
W/G	White/Green
W/Gr	White/Gray
W/Pu	White/Purple
W/Or	White/Orange
G/R	Green/Red
G/Bl	Green/Blue
G/W	Green/White

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



Power Distribution System


Acoustooptic System
Winch Motor
KM1
KM2
Battery
FUSE
40A
DC12V +
0V
Winch Relay
Headlight switch
H/L beam switch
Head Light
Head Light
Turn signal Light(F,L)
Turn signal Light(F,R)
Turn signal Light(F,L)
Turn signal Light(F,R)
Turn signal switch
Flash
Reverse Gear Buzzer
LED Shift
Gear Switch
CONNECT TO EFI SYSTEM
Parking Switch
Belt Switch
oil level sensor
Speed sensor
Front Axle
Rear Axle
L.G/Br
Gr/Br



EFI System & Engine Start

NOTES