



# 500 BEARCLAW ATV

## Maintenance Manual

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# General Information

## 1 Description





## 1.1 Identification code

### 1.1.1. Frame No.

The frame No. is engraved in the right bottom of the supporting frame. See Figure 1-1



1-1

### 1.1.2. Engine NO.

The engine No. is engraved in the right side of the engine. See figure 1-2



## 1.2 Special tools, instruments and meters

### 1.2.1 Oil filter detacher

To fasten and detach the oil filter



### 1.2.2 Height gauge

To gauge the height of various components



### 1.2.3 Vernier

To measure the length of various components



### 1.2.4 尺 Outside micrometer

To accurately measure external

Diameter of a column



### 1.2.5 inside micrometer

To accurately measure internal



Diameter of a hole

1.2.6 Dial indicator

To accurately measure a small distance



1.2.7 Torque Spanner

To measure torque force



1.2.8 Feeler gauge

To measure gap-width



1.2.9 Multimeter

To check electrical circuits and parts



1.2.10 Barometer

To measure pressure of the tire



1.2.11 Magneto drawing device



To detach the magneto



1.2.12 Snap ring clamp to install

And detach snap rings

### 1.3 Periodic maintenance chart

ITEM	ROUTINE	Which ever comes first	EVERY			INITIAL		
			month	1	3	6	6	12
			km	320	1,200	2,400	2,400	4,800
			(mi)	(200)	(750)	(1,500)	(1,500)	(3,000)
			hours	20	75	150	150	300
Valves	<ul style="list-style-type: none"> <li>● Check valve clearance.</li> <li>● Adjust if necessary.</li> </ul>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sparkplug	<ul style="list-style-type: none"> <li>● Check condition.</li> <li>● Adjust gap and clean.</li> <li>● Replace if necessary.</li> </ul>		<input type="radio"/>					
Air filter element	<ul style="list-style-type: none"> <li>● Clean.</li> <li>● Replace if necessary.</li> </ul>	Every 20–40 hours (More often in wet or dusty areas.)						
Carburetor*	<ul style="list-style-type: none"> <li>● Check and adjust idle speed/starter operation.</li> <li>● Adjust if necessary.</li> </ul>			<input type="radio"/>				
Crankcase breather system*	<ul style="list-style-type: none"> <li>● Check breather hose for cracks of damage.</li> <li>● Replace if necessary.</li> </ul>				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exhaust system*	<ul style="list-style-type: none"> <li>● Check for leakage.</li> <li>● Tighten if necessary.</li> <li>● Replace gasket(s) if necessary.</li> </ul>				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spark arrester	<ul style="list-style-type: none"> <li>● Clean.</li> </ul>				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fuel line*	<ul style="list-style-type: none"> <li>● Check fuel hose for cracks or damage.</li> <li>● Replace if necessary.</li> </ul>				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engine oil	<ul style="list-style-type: none"> <li>● Replace. (Warm engine before draining.)</li> </ul>		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Engine oil filter cartridge	<ul style="list-style-type: none"> <li>● Replace.</li> </ul>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>
Engine oil strainer*	<ul style="list-style-type: none"> <li>● Clean.</li> </ul>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>

Final gear oil	<ul style="list-style-type: none"> <li>● Check for oil leakage.</li> </ul>	<input type="radio"/>					<input type="radio"/>
Differential gear oil	<ul style="list-style-type: none"> <li>● Replace even 12 months.</li> </ul>						
Front brake*	<ul style="list-style-type: none"> <li>● Check operation/fluid leakage. (See NOTE page 8).</li> <li>● Correct if necessary.</li> </ul>	<input type="radio"/>					
Rear brake*	<ul style="list-style-type: none"> <li>● Check operation.</li> <li>● Adjust if necessary.</li> </ul>	<input type="radio"/>					
Select lever safety system cable	<ul style="list-style-type: none"> <li>● Check operation.</li> <li>● Adjust if necessary.</li> </ul>			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
V-belt*	<ul style="list-style-type: none"> <li>● Check operation.</li> <li>● Check for cracks or damage.</li> </ul>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wheel	<ul style="list-style-type: none"> <li>● Check balance/damage/</li> <li>● Repair if necessary.</li> </ul>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wheel bearing*	<ul style="list-style-type: none"> <li>● Check bearing assemblies for loosened/ Damage.</li> <li>● Replace if necessary.</li> </ul>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Front and rear suspension*	<ul style="list-style-type: none"> <li>● Check operation.</li> <li>● Correct if necessary.</li> </ul>			<input type="radio"/>			<input type="radio"/>
Steering system*	<ul style="list-style-type: none"> <li>● Check operation./Replace if damaged</li> <li>● Check toe-in. /Adjust if necessary.</li> </ul>	<input type="radio"/>					
Drive shaft universal joint*	<ul style="list-style-type: none"> <li>● Lubricate with lithium–soap–based grease.</li> </ul>			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Axle boots*	<ul style="list-style-type: none"> <li>● Check operation.</li> <li>● Replace if damaged.</li> </ul>	<input type="radio"/>					
Fittings and fasteners*	<ul style="list-style-type: none"> <li>● Check all chassis fittings and fasteners.</li> <li>● Correct if necessary.</li> </ul>	<input type="radio"/>					
Lights and switches*	<ul style="list-style-type: none"> <li>● Check operation.</li> <li>● Adjust headlight beams.</li> </ul>	<input type="radio"/>					

## Engine

### 2. Inspection and adjustment of engine

#### 2.1.1 Inspection cylinder head, intake and exhaust system

Check the pressure of cylinder

Preheat the engine, then misfire and unplug the spark plug.

Fix pressure gauge into the hole.

Note: Giving a leakage check to the pressure gauge.  
Rotate the engine until the pressure gauge stop rising.  
The maximum reading would be greater than 0.7– 0.9Mpa  
after starting for 4–6 times. See figure 2-1.



Figure 2-1

Check the valve clearance

Note: when adjust valve clearance, the engine must be cooled. (The temperature should be less than 35°C)

Remove the seat cushion and fuel tank, unplug the vision hole cover, round the flywheel of magneto anti-clockwise to aim “T”  
At the signal of fore cover on the left.

Note: The piston must be fixed to the top dead enter.

(Figure 2-2)



Remove cylinder valve cover, check the clearance between the valve stem by feeler gauge.

Valve clearance: inlet and exhaust valve: 0.05~0.08mm.

See figure 2-3.



Figure 2-3

Loose the lock nut, rotate the adjusting screw until it appears that the feeler gauge be pulled .Then fasten the adjusting screw by valve adjuster, tighten the lock nut and check the valve clearance .After installing the cylinder valve cover , vision hole cover, the fuel tank and cushion. See figure 2-4.



Figure 2-4

### 2.1.2 Spark Plug checking

1. Unplug the Spark-Plug cap: remove the spark plug by spanner, look over whether the spark-plug insulator and electrode is damaged. If so, see figure 2-5.



Figure 2-5

1. Check the spark clearance by feeler gauge whether it is between 0.6~0.7mm. Or adjust the gap, clean incrustation with spark-plug cleaner and steel wire brush and check if the spark plug sealing washer(Figure 2-6).



Figure 2-6

3. Swirl the spark plug and tighten to 18~20N.m by spanner, then fix the spark plug cap when assembling.

### **2.1.3** Cylinder, piston, piston ring

#### Specification

item		mm		
		standard value: mm	limit value:mm	
cylinder	Inner diameter of cylinder		$\phi 84.503 \sim \phi 84.527$	$\phi 84.6$
	taper		0.0040	0.005
	out of roundness		0.0035	0.005
	degree of warp		0.04	0.10
Piston, piston ring and piston pin	Outside diameter of piston		$\phi 84.47 \sim \phi 84.45$	$\phi 84.35 \sim \phi 84.25$
	Inner diameter of piston pin hole		$\phi 20.002 \sim \phi 20.01$	$\phi 20.05 \sim \phi 20.1$
	gap between piston pin and piston pin hole		0.002~0.019	0.03
	Piston ring end clearance	Top ring/the second ring	0.2~0.4	0.5~0.7
		oil ring	0.03~0.15	0.3~0.5
	gap between piston ring and piston groove	top ring	0.03~0.07	0.10~0.15
		second ring	0.02~0.06	0.09~0.14
	gap between cylinder and piston		0.033~0.062	0.07~0.10
	outside diameter of piston pin		$\phi 19.991 \sim \phi 20$	$\phi 19.95 \sim \phi 19.97$
Crank shaft	Inner diameter		$\phi 20.016 \sim \phi 20.027$	$\phi 20.05$
	Gap between small end of connecting rod and piston pin		$\phi 0.018 \sim \phi 0.036$	0.05

Diagnosing and eliminating of malfunction:

● Emission of black smoke for abrasion of cylinder or piston,

1. Cylinder, piston or piston ring is worn out.
2. The piston ring is not properly assembled.
3. The piston or cylinder wall is scraped.

● **overheated**

- 1 Excessive incrustation of piston.
- 2 Blast and abnormal noise.
- 3 Abrasion of cylinder or piston.

Inspection of cylinder.

1. Check whether the cylinder is damaged.
2. Measure the bore diameter of cylinder at three spots.
3. At the top, the middle and the bottom of the piston stroke .And measure the bore diameter at directions of right-angle intersection

Repairing limit value:

0.05 mm , out of roundness: 0.005 mm

0.05mm taper : 0.005mm

### Inspection of piston and piston ring

1. Measure the gap between piston ring and piston groove.
2. The first ring
3. The second ring

**Note:** It is forbidden to damaging the piston ring when assembling. Check whether the piston and the piston groove is cracked and abraded. See figure 2-9.



Figure 2-9

: 0.5mm。

Insert piston ring into cylinder, and measure the end gap.

Repairing limit value: the first ring/the second ring: 0.5mm

See figure 2-10.



Figure 2-10

Measure the bore diameter of piston pin hole.

Repairing limit value: see figure 2-11.



Figure 2-11

Measure the external diameter 10mm above the bottom of the piston skirt.

Extreme position: the gap between cylinder and piston

Repairing limit value: 0.1mm

See figure 2-12.

1、



Figure 2-12

7. Measure the external diameter of piston pin:

The gap between piston and piston pin:

0.02mm

Repairing limit value: 0.02mm .See figure 2-13.



Figure 2-13

#### 2.1.4 Inspection of crank and connecting rod

Check that whether crank and connecting rod can rotate without stuck and whether the clearance between crank and connecting rod is 0.5~0.6mm. The hop of crank shaft should be 0.05mm. If not so, replace it. See figure 2-14-1, figure 2-14-2.



Figure 2-14-1

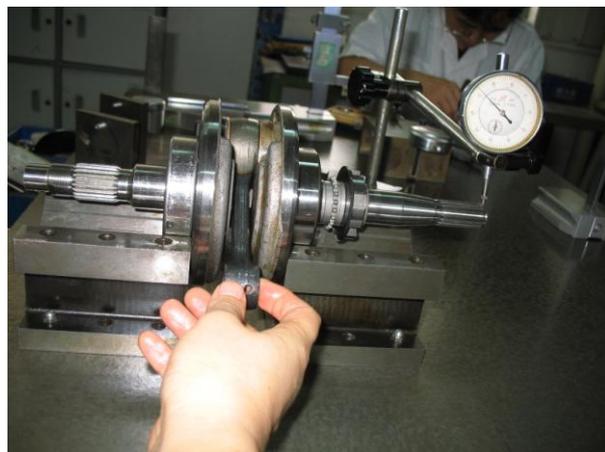


Figure 2-14-2

### 2...1.5 Inspection of clutch

The wear condition of shoe block and friction plate: See figure 2-15



Figure 2-15

### 2.1.6 Inspection of Carburetor

1、Inspect the idle of carburetor

The engine speed should be  $1500 \pm 150$  r/min 10 minutes after starting at normal idle and will not misfire when briskly accelerate. If not so, rotate the carburetor idle adjusting screw clockwise to raise the idle, anti-clockwise to lower. When adjusting is unavailable, check that if there is a jam in carburetor idle nozzle or an air-leakage of intake pipe. See figure 2-16.



Figure 2-16

### 2.1.7 Inspection of air cleaner

1、Disassemble the air cleaner, remove filter element, clean the filter element with non-flammable cleaning solvent, and then make it dry.

**Note: Petrol is forbidden.**

2. Dip the air filter element into 20# oil, then take it out and squeeze the excessive oil, assemble it orderly. Impermeability is necessary. See figure 2-17.



Figure 2-17

### 2. 1. 8 Inspection of oil clarifier

Cleaning of lubricator oil strainer: remove **clarifier** (Figure 2-18-1), clean it to ensure a well work- condition. Then fix it up.



Figure 2-18-1

### 2.1.9 Inspection of lubrication system

1. Lubricant of engine: the vehicle is oiled with lubricant of APISGSAE10W/40. Others are forbidden.

The capacity is 1.9L after disassembly and assembly.

2、

The capacity is 1.8L when fueling up after drain.

Inspection of oil pump:

Flow of oil pump:

L/min	1500	2000	2500	3000	3500	4000	4500
L/min	2.8	4.0	5.0	6.0	7.1	8.2	9.1

Measure clearance of the top of internal external rotor

Limit value: 0.20mm

### 2.1.10 lubrication

#### Lubrication of engine

Check the oil level, start the engine and let it running for a few minutes to make it heated and lubricated completely, then misfire. Unplug the dip stick to do cleaning and dip it into the oil case again. Then unplug the dip stick and look whether oil level is lower than the indicator. See figure 2-20.

**Note:** Ensure that the engine is landed by both four wheels in flat ground.

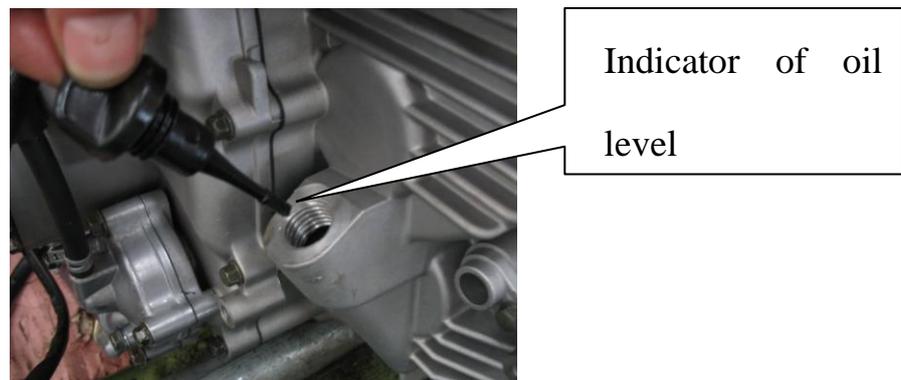


Figure 2-20

### 2.1.11 Inspection of cylinder head

1. Check whether the spark plug and valve seat is cracked and whether the cylinder head is out of shape. Examine the flatness

of cylinder head by flat or knife edge gauge and clearance gauge.

Repairing limit value: 0.05mm. See figure 2-21



Figure 2-21

2. Remove and examine the width of valve.

Repairing limit value: 2.0mm. See figure 2-21-1, 2-21-2, 2-21-3.

If the mating surface is coarse, corrode or cannot contact with valve seat normally. Replace it.



Figure 2-21-1



Figure 2-21-2



Figure 2-21-3

Measure the width of mating surfaces of valve

1.5mm repairing limit value: 1.5mm

**If the valve seat is too wide or narrow or cracked, grind it to ensure impermeability.**

Measure bore diameter of valve guide with internal micrometer and special gauge. At last calculate clearance between valve stem and valve guide.

Repairing limit value: intake: 0.12mm exhaust: 0.14mm

**Note: eliminate carbon in the pipe before measuring.**

**If the pipe will be replaced, grind the valve seat again**

5、Check whether the valve is bent, burn or the valve stem is worn out

Check the motion of valve and measure external diameter.

Repairing limit value: intake: 6.92mm exhaust: 6.9mm. See figure 2-22.

Fix valve into guide, and look over the motion.

## Inspection of valve spring

Measure the free height and squareness

Repairing limit value : ( intake and exhaust) See figure  
2-23-1, 2-23-2

Free height of external spring: 43mm squareness: 0.8mm

Free height of inner ring: 39.5mm squareness 0.8mm



Figure 2-23-1,

Figure 2-23-2

## 6、Examining lifting distance of cam.

Measure the length of fillet with micrometer and check if  
it is worn out

Repairing limit value: inlet lifting distance: 8.25mm

Exhaust lifting distance: 8.18mm. See figure 2-24.



Figure 2-2

### Inspection of rocker arm

Check whether the rocker arm is worn out, or damaged and whether the oil hole is blocked.

**Note: If there is a rocker arm to be replaced, examine the peak of cam**

Measure the bore diameter of rocker arm

$\phi 12 +0.038\text{mm} +0.020\text{mm}$

Repairing limit value:  $\phi 12 +0.038\text{mm} +0.020\text{mm}$  . See figure 2-25



Figure 2-25

### 7. Inspection of rocker arm shaft.

Examine if the rocker arm if worn out or cracked.

Measure the external diameter of rocker arm shaft with micrometer.

Repairing limit value:  $\phi 12 \begin{matrix} -0.051 \\ -0.067 \end{matrix}$

The repairing limit value of clearance between rocker arm shaft and hole: 0.09mm, See figure 2-26



Figure 2-26

### 3.1 disassembly of engine

#### 3.1.1 Cylinder head and block

①Unplug the intake pipe and spark plug. ( Figure 2-27-1, 2-27-2)



Remove cylinder valve cover, cam sprocket cover and

④remove timing sprocket



Figure 2-28-1



Figure 2-28-2

⑤remove lower rocker arm shaft. See figure 2-29-1.



Figure 2-29-1

⑥ Remove vision hole cover of left front cover . See figure 2-30.

## Figure 2-30

Alignment: align the " 1 " indicator of the cam chain wheel and the “ ∇ ” symbol of cylinder.

Alignment of top dead center:

◦

Rotate the crankshaft with “T” sleeve anti-clockwise

Until the indicator of the cam chain wheel to be at the same level with the “ ∇ ” symbol on cylinder cover, that is to say the piston of cylinder is at the top dead center.

Inspection of compression top dead center:

When the “1” indicator on the magneto rotor to be at the same level with the “ ∇ ” symbol on the crankshaft case, that is to say the piston is at the compression top dead center and there are valve clearance in these two rocker arms of cylinder head.

If there is defects, rotate the crankshaft anti-clockwise,

and repeat the above-mentioned steps. See figure 2-31-1



, Figure 2-31-1

⑦ Remove chain tensioner adjuster. See figure 2-32.



Figure 2-32

Remove the cylinder head

Loosen the bolt by intersection manner before remove the bolt.

See figure 2-33.



Figure 2-33

Remove

- dowel pin

- Cushion (cylinder head)

- Chain guide board

. See figure 2-34.



Figure 2-34

Remove

Cylinder

Oil seal

Dowel pin

◦ Shim(cylinder)

See figure 2-35.



Figure 2-35

### 3.1.2 Piston and connecting rod

①remove the piston circlip

**Note:** block the crankcase breather with a piece of cleaning cloth to avoid the circlip falling into the case. See figure 2-36.



Figure 2-36

②remove piston pin and piston

Clean the buckle of piston and piston pin hole to facilitate the removing of piston pin.

**Note:** it is forbidden to knock the piston pin with a hammer. See figure 2-37.



Figure 2-37

### 3.1.3 Remove pull-out hand start assembly

See figure 2-38.



Figure 2-38

### 3.1.5 left crankshaft case cover

See figure 2-40.



Figure 2-40

### 3.1.6 Magneto

Remove the stator coil

Remove the pulse coil

Remove the stator with rotor stripper. See figure 2-41.



Figure 2-41

Remove the woodruff key. See figure 2-42.

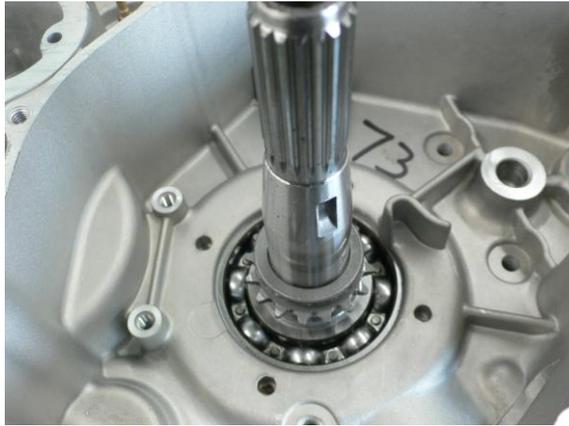


Figure 2-42

### 3.1.7 Oil pump

Remove the bolt of oil pump cover .See figure 2-43.

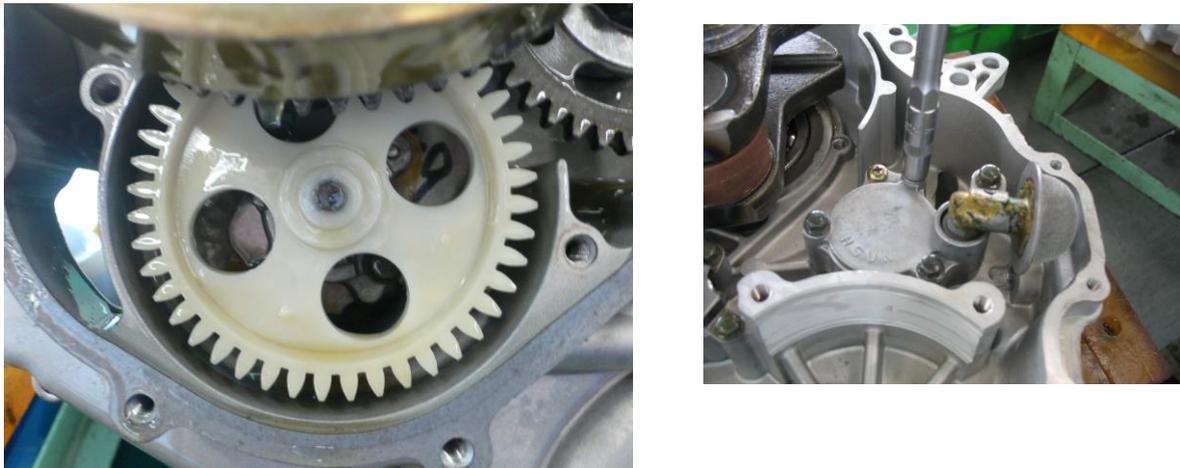


Figure 2-43

Remove right cover .See figure 2-44.



Figure 2-44

Remove the right bracket, clutch pulley disc .See figure 2-45-1, figure 2-45-2, figure 2-45-3.

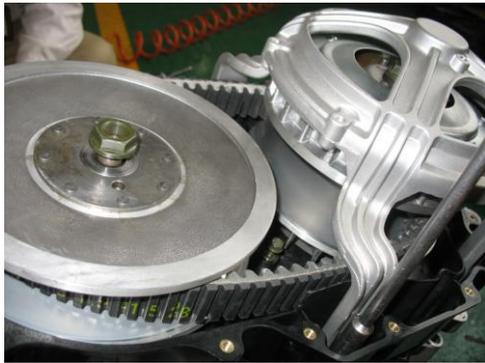


Figure 2-45-1

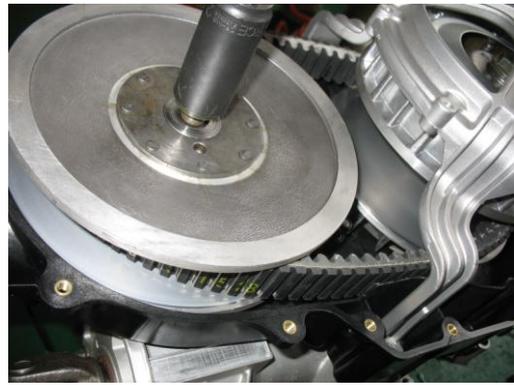


Figure 2-45-2



Figure 2-45-3

### 3.1.8 Clutch

①remove the clutch Remove screws. See figure 2-46

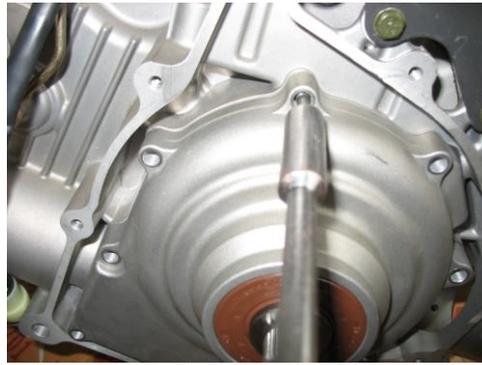


Figure 2-46

Remove the clutch shoe block and clutch cover. See figure 2-47.



Figure 2-47

Check the wear condition of the clutch shoe block and clutch cover. See figure 2-48.

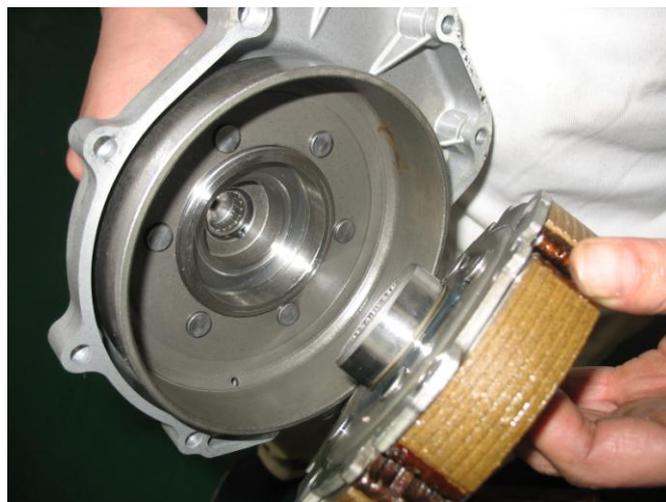
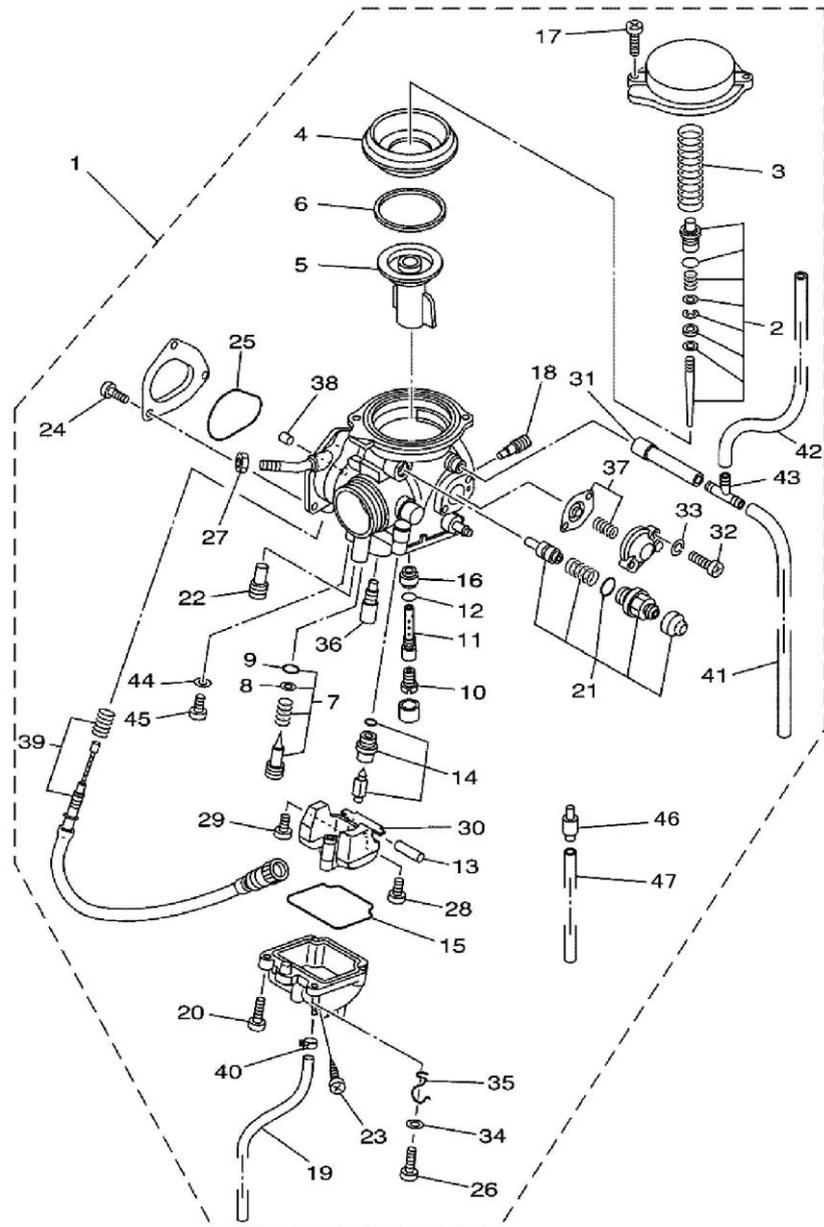


Figure 2-48

### 3.9 carburetor

#### 3.9.1 Structure of carburetor



carburetor			
serial number	code	part name and standard	quantity
1	16100-F12-0000	carburetor assembly	1
2	16101-F12-0000	fuel needle part	1
3	16102-F12-0000	column-filled spring	1
4	16103-F12-0000	big diaphragm	1
5	16104-F12-0000	column filler	1
6	16105-F12-0000	diaphragm circlip	1
7	16106-F12-0000	adjusting screw comp, mixing rate	1
8	16107-F12-0000	adjusting screw washer, mixing rate	1
9	16108-F12-0000	adjusting screw o-ring, mixing rate	1
10	16109-F12-0000	main measure hole	1
11	16110-F12-0000	foam pipe	1
12	16111-F12-0000	o-ring, foam pipe	1
13	16112-F12-0000	float pin	1
14	16113-F12-0000	fuel inlet needle valve	1
15	16114-F12-0000	seal gasket, float room	1
16	16115-F12-0000	main spray nozzle	1
17	16116-F12-0000	screw, upper cover	2
18	16117-F12-0000	air measure hole, idle speed	1
19	16118-F12-0000	rubber tube, fuel drain	1
20	16119-F12-0000	screw M4×10	3
21	16120-F12-0000	dense column filler	1
22	16121-F12-0000	measure hole, starting motor	1
23	16122-F12-0000	fuel drain screw	1
24	16123-F12-0000	screw M4×8	3
25	16124-F12-0000	seal gasket, door-hinge room cover	1
26	16125-F12-0000	screw M4×12	1
27	16126-F12-0000	nut M6×0.75	1
28	16127-F12-0000	screw M4×8	1
29	16128-F12-0000	large head screw	1
30	16129-F12-0000	float	1
31	16130-F12-0000	minus pressure tube A	1
32	16131-F12-0000	screw M4×12	2
33	16132-F12-0000	spring cushion	2
34	16133-F12-0000	spring cushion	1
35	16134-F12-0000	fixed clip	1
36	16135-F12-0000	measure hole, idle speed	1
37	16136-F12-0000	PCV valve diaphragm	1
38	16137-F12-0000	clamp sheath, throttle cable	1

### 3.2.2 Inspection and adjusting **carburetor**

Decomposition

Remove the evacuated chamber cover

1. spring
2. piston valve



Remove permanent seat

Spring

Spring seat

Oil needle



Remove pilot screw

Spring

Washer

O-rings

Note: The pilot screw is set at maximum performance. Before removing pilot screw, note the revolutions of screw in order to fix it back.



Remove pontoon chamber cover

Shim



Remove pontoon pin

Pontoon

Triangular needle

Remove the cover

Nut

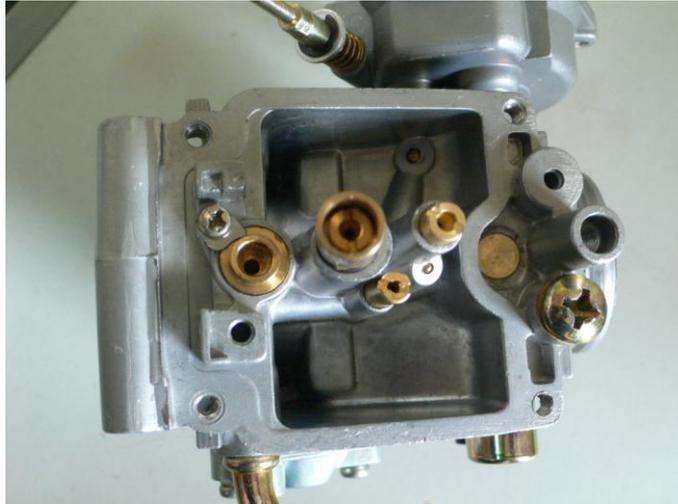
O-rings

Spring

Starting plunger

Pilot jet





Check the carburetor body

Pontoon chamber

Oil passage

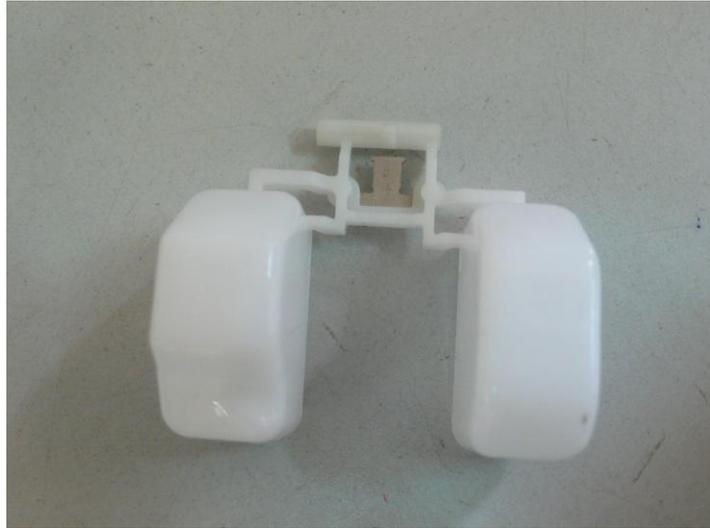
Gas-fouling block → cleaning

Chap/damage → replace the carburetor assy

Cleaning steps:

Check the pontoon

damaged → replace



Check the pontoon triangular needle

Triangular needle seat

O-rings

Filter net

Damaged/worn out/block→replace



Check the piston valve

crack→replace

Diaphragm

rupture→replace

Piston valve oil needle

Bent/worn out→replace

Note: If the piston valve is damaged, inject the petrol into

valve. Replace it when there is oil leakage.



Check the main jet

Main jet

Pilot jet

Pilot screw

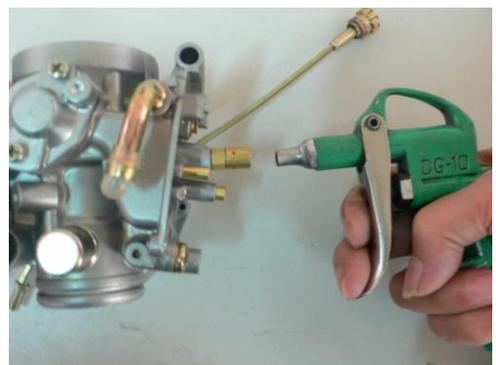
O-ring

Pilot jet

Bent/worn out/damaged → replace

Gas-fouling block →

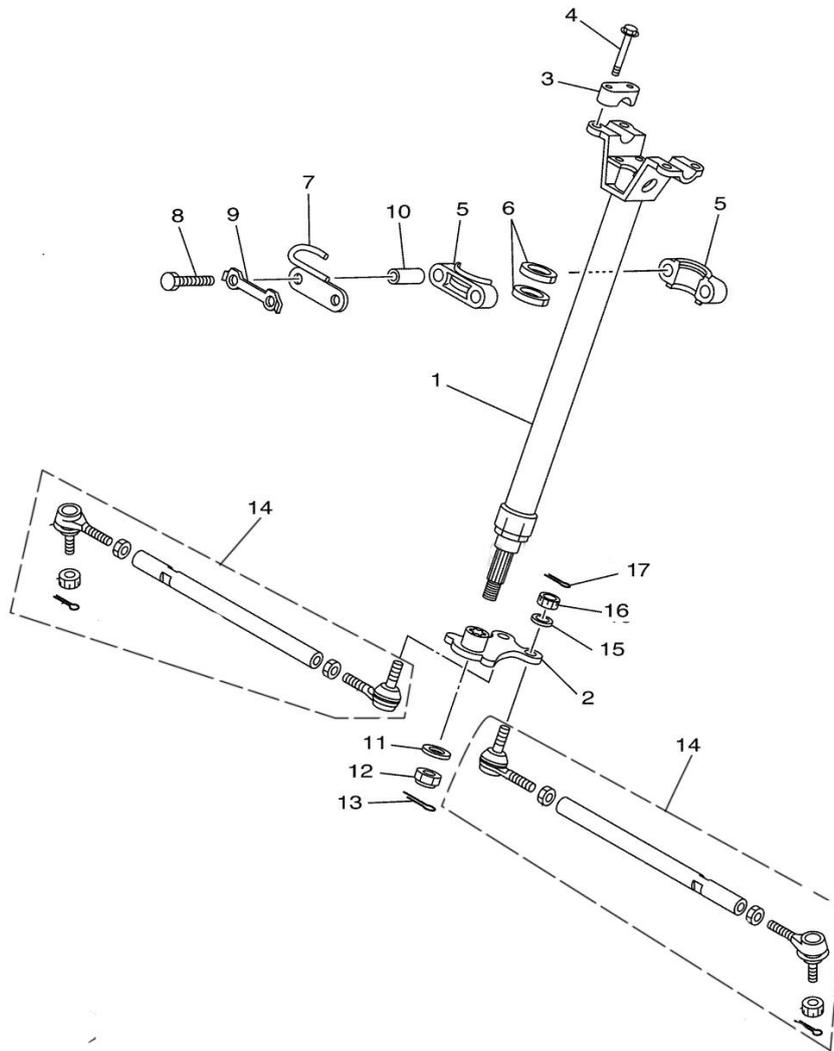
blow with compressed air



# 4. Chassis

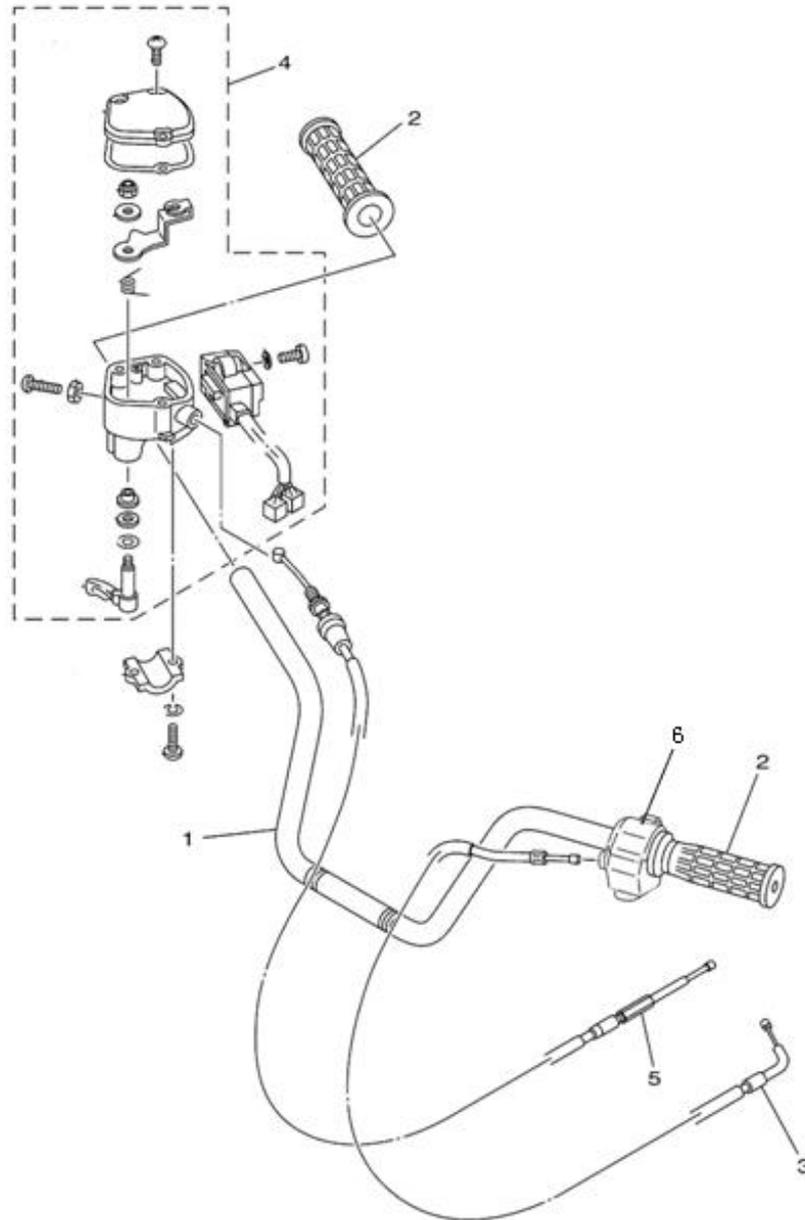
## 4.1 Steering operation system

### Structure of Steering Vertical Column



- 1、steering vertical column components      2、turning rocker arm components      3、Steering Bar Clip      4、hexagon flange bolt M8×35  
5、inner and external bearing of steering vertical column      6、Supporting seal ring of steering vertical column      7、Supporting stent      8、hex bolt M8×60  
9、stop reverse piece      10、Supporting Collar Sheath      11、cushion  $\Phi 14 \times \Phi 32 \times 4$       12、Hexagon open-groove nut M14  
13 cotter pin 3.2×32      14、tension rod assembly      15、cushion  $\Phi 10$       16 Hexagon open-groove nut M10      17

## Components of Steering Bar



- 1、Steering Bar      2、steering Rubber Sheath      3、air duct door pull cable 4、oiler components      5、accelerator pull cable components  
6、left switch components

## 4.1.1 Disassembly, inspection and assembly of Steering Vertical Column

### 4.1.1.1 Disassembly of Steering Vertical Column

1. Remove all of the Plastic cover and Plastic ornaments on Steering Bar (Figure 4-1-1)

- 1) . Front Mud Shield
- 2) . Plastic Ornament
- 3) . Rear Mud Shield

2. Remove Steering Bar Holder (Figure 4-1-2)



Figure 4-1-1

1) . Hexagon Flange Bolt M8×30

2) . Steering bar Holder

3) . Steering bar Clip

3. Unplug all cables and connecting Wires and remove the Steering Bar

(Figure 4-1-3)

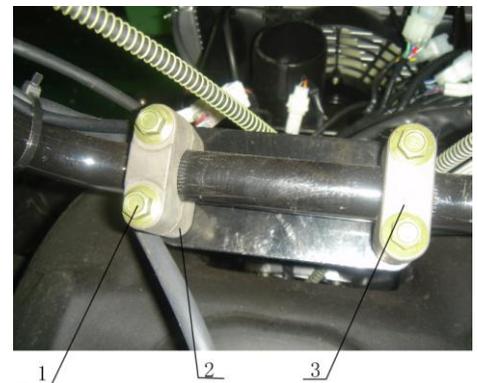


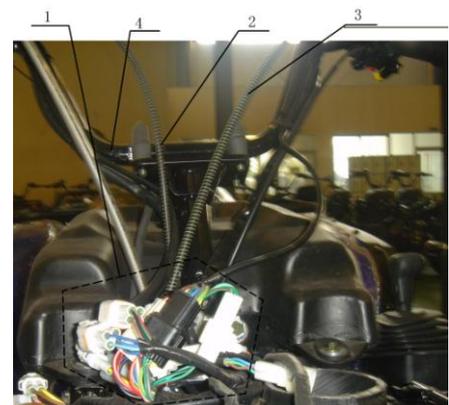
Figure 4-1-2

1) Connecting Wire

2) Rear Brake Cable

3) Front Brake Cable

4) Steering Bar



4. Remove the cotter pin,

Figure 4-1-3)

Open-groove nut and

Cushion at the bottom

Of the Steering Vertical Column. (Figure 4-1-4)

1) .cotter pin 3.2×32

2) .cushion  $\phi 14 \times \phi 32 \times 4$

3) .Hexagon open-groove nut M14

5. Remove the supporting

Brackets of the steering

Vertical column

(Figure 4-1-5)

1) Supporting stent

2) Inner and outer supporting

Bracket

3) safety cushion

6. Remove outer ball pin

Components on tension

Rod form turning joint

(Figure 4-1-6)

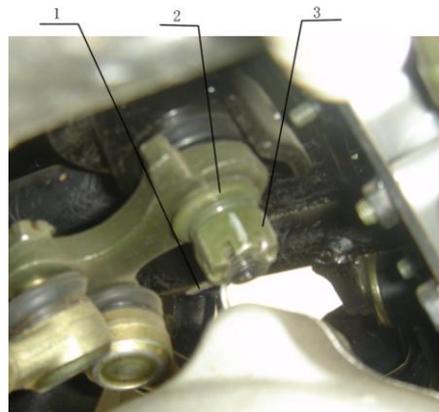


Figure 4-1-4

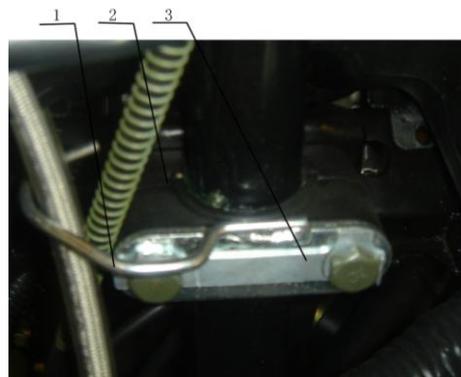


Figure 4-1-5

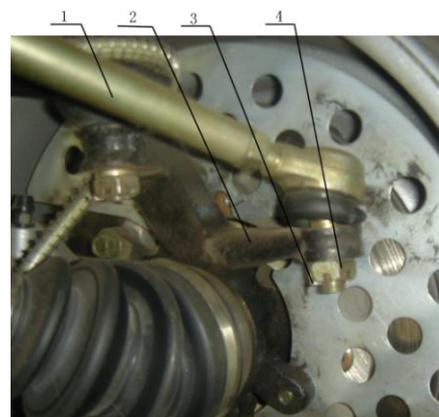


Figure 4-1-6

- 1) Tension rod
- 2) front right Yanggakdo
- 3)cotter pin 3.2\*32
- 4) Hexagon open-groove nut M10

7. Pull out the components of  
The steering vertical column  
From the bottom seat.

(Figure 4-1-7)

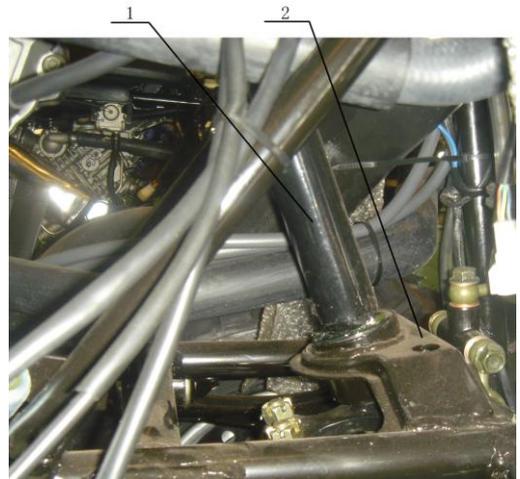


Figure 4-1-7

1、Steering Vertical Column

2、Bottom Seat

#### 4.1.1.2 Inspection of steering vertical column components:

1. Check whether the nut between  
the inner ball pin of tension  
rod and the Turning rocker arm  
is tightened. (Figure 4-1-8)

In case of loosen or worn out,  
tighten it with proper tools or  
replace with identical nuts.

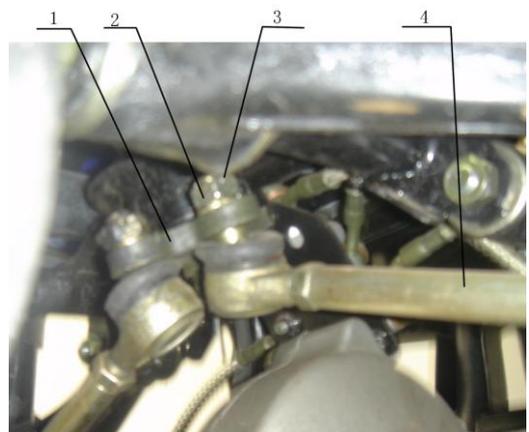


Figure 4-1-8

**Torque: 32–36N.m**

- 1) Steering drop arm assembly
  - 2) Hexagon open-groove nutM10
  - 3) Cotter pin 3.2\*32
  - 4) Tension rod
2. Check whether the inner and outer ball pin of the tension rod is loosen or got stuck. (Figure 4-1-8)

In occasion of above defects, further inspection of the exact causation must be carried out and replace with new ball pin components.

**Caution: Continuous use of defective ball pin might cause severe injury or death.**

3. Check whether the tension rod is bended, cracked or rusted. In occasion of above problems, please have the tension rod replaced.

**Caution: tension rod should not be repaired by welding.**

4. Check whether the hexagon open-groove nut and cotter pin are intact. (No crack or flaw is allowed) (Figure 4-1-8). Those two components are crucial and should be replaced whenever there is a potential problem.
5. Check whether the supporting bracket is firmly fixed

to the steering vertical column. Figure 4-1-5

**Inspection method:**

Assemble the steering vertical column to the main frame with supporting bracket and M8 bolts etc. and rotate the steering bar to ensure the column is not stuck or swinging.

In occasion of above problems, the supporting bracket must be replaced.

**Rotating Torque of the steering vertical column:  
3-5N. m**

4.1.1.3 Assembly of steering vertical column

a、 Firstly, fix the Turning rocker arms comp into the steering vertical column. Then plug the steering vertical column into the bottom seat and fix it with M14 open-groove nut (1pcs),  $\phi 14 \times \phi 36 \times 4$  cushion (1pcs), collar sheath (1pcs) and 3.2\*32 cotter pin (1pcs) ( Figure 4-1-9).

**Fastening Torque of M14 open-groove nut:  
70-80N. m**

**Caution:** before inserting the steering vertical column into the bottom seat, both upper and lower oil

seals must be greased with lithium lubrication.

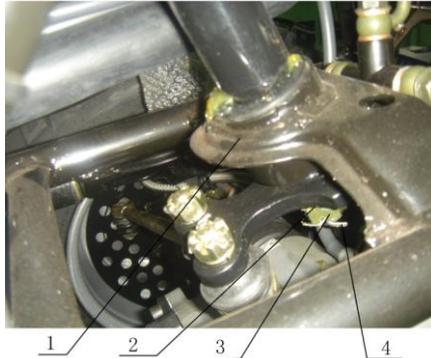


Figure 4-1-9

- 1) 、 Steering bottom seat
- 2) 、 Cushion
- 3) 、 Hexagon open-groove nut M14
- 4) 、 Cotter pin 3.2×32

2. Fix the steering vertical column onto the frame with hexagon flange bolt M8\*60 (2pcs), supporting stent (1pcs), inner and outer supporting bracket (2pcs), stop reverse piece (1pcs) and collar pipes (2pcs). (Figure 4-1-10)

**Fastening Torque of M8\*60 Bolt: 26-30N.m**

**Caution: inner surface of the supporting brackets must be greased with lithium lubrication.**

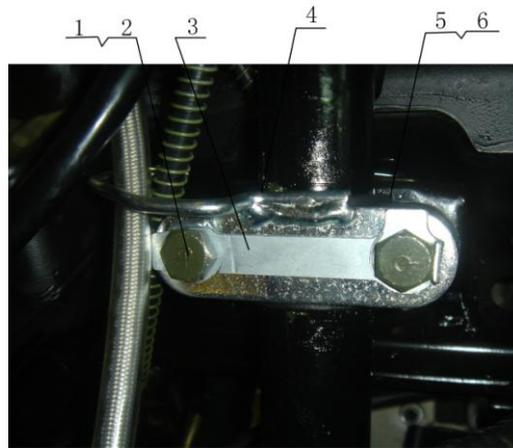


Figure 4-1-10

- 1) 、 hexagon flange bolt M8\*6
- 2) 、 Inner and outer supporting bracket
- 3) 、 stop reverse piece
- 4) 、 Supporting stent
- 5) 、 Supporting Collar Sheath
- 6) 、 Supporting Ferrell

4. Fix the tension rod into the conical bore of the steering vertical column with tension rod components (2sets), cushion  $\phi 12$  (2pcs), M10 hexagon open-groove nuts (2pcs) and cotter pins  $3.2 \times 32$  (2pcs). Figure 4-1-11

**Fastening Torque: 28N.m**

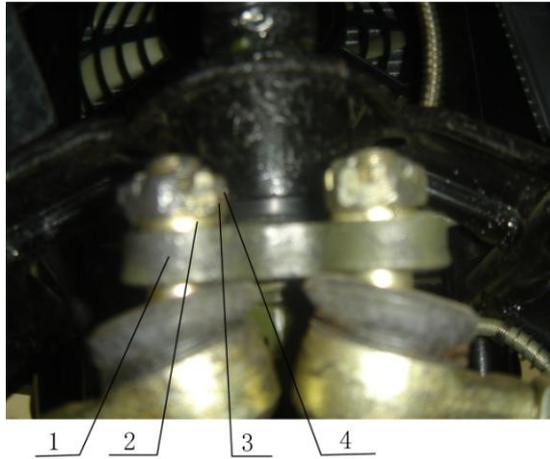


Figure 4-1-11

- 1) Turning rocker arms comp
- 2) Cushion  $\phi 10$
- 3) Hexagon open-groove nut M12
- 4) Cotter pin  $3.2 \times 32$

#### 4.1.2 Disassembly, inspection and assembly of steering bar

##### 4.1.2.1 Disassembly of steering bar

1. Remove all of the Plastic cover and Plastic ornaments on Steering Bar (Figure 4-1-1)
2. Remove steering bar clip (附图4-1-2)
3. Unplug all cables and wires and remove the steering bar (Figure 4-1-3)

##### 4.1.2.2 Inspection of steering bar

1. Check any existing or potential crack on the steering bar. In case of above defects, the steering bar must be replaced (Figure 4-1-12)



Figure 4-1-12

2. Altitude balance on each end of the steering bar must be less than 3mm, otherwise replace the steering bar. Figure 4-1-12
3. Check if there exists any slip thread, crack or other defects on the fastening bolts, in which case the bolts must be replaced.
4. Check whether the steering bar clip is damaged (Figure 4-1-12). (Radial run out and wear condition of the inner surface must be less than 0.8mm) Otherwise, replace the steering bar clip.

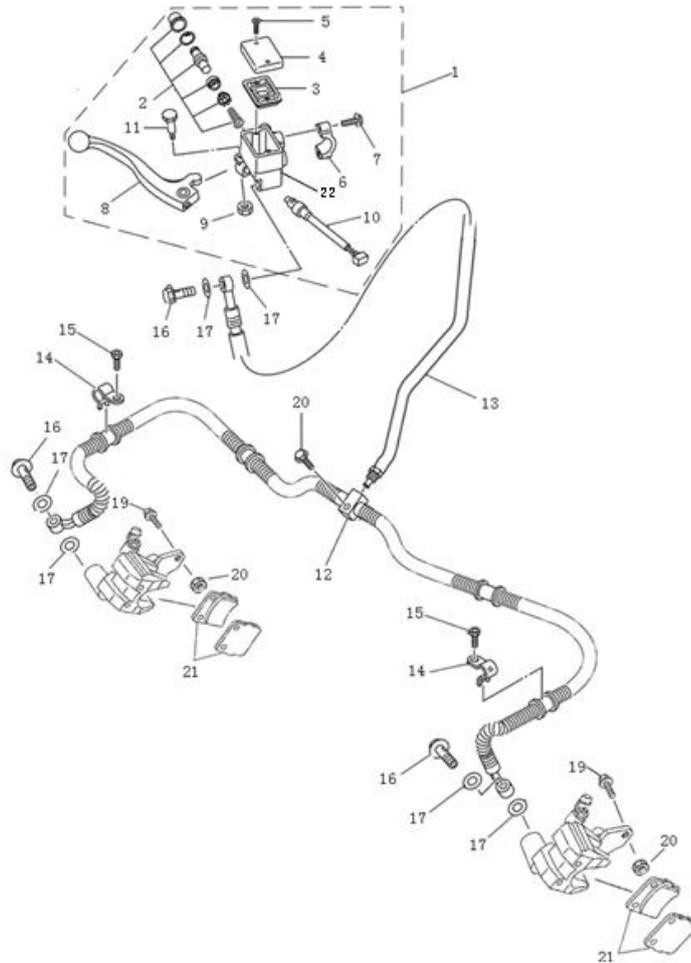
#### 4.1.2.3 **Assembly of the steering bar**

1. Connect the steering bar, clip and holder with the main frame by hexagon flange bolts M8\*30 (4pcs) and adjust the direction of brake cables on both left and right handlebar and clutch cable (Figure 4-1-2)

Fastening Torque of the M8\*30 Bolt is: 26–30N.m

## 4.2 Brake System

### 4.2.1 Front Disk Brake components



- 1、disk brake pump assembly    2、disk brake compressed bearing    3、disk brake oil bowl sealing washer    4、disk brake oil bowl cover  
 5、cross recess half-countersunk head screw M5×12    6、disk brake pump seat    7、cross recess pan head screw M5×60    8、disk brake handle  
 9、hexagonal locknut M8    10、disk brake switch    11、disk brake handle bolt    12、disk brake oil pipe branch seat  
 13、 front disk brake pipe    14、 rear brace of front hydraulic pipe    15、 inner hex bolt M6×10  
 16、 bolt of front hydraulic pipe    17、 front hydraulic disk brake cushion    18、 Hexagon Flange Bolts M6×25  
 19、 Hexagon Flange Bolt M8×14    20、 Hexagon Flange nut M8    21、 rear brake piece    22、 brake-fluid case

### 4.2.1 Preparation for inspection and maintenance of the front disk brake system.

1. Brake system is crucial to the life safety of the operator and therefore must be periodically inspected and maintained.

The vehicle uses brake plate. Please follow the tips of inspection as below:

a) Inspect the brake fluid box level

On the right handlebar. Should

The fluid level falls under

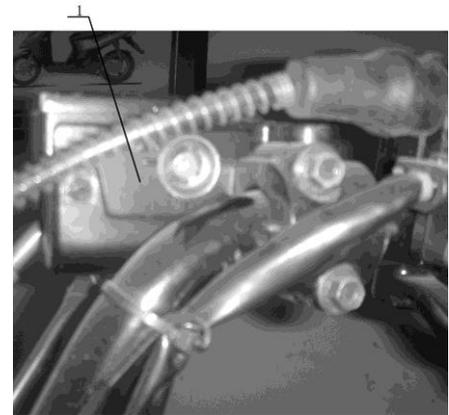
The minimum mark, please refill

The box with the same type

Of fluid as was recommended

By the manufacture Figure 4-2-1

To ensure the fluid level  
Is higher than the minimum mark.



(Figure 4-2-1

1) 、 Brake fluid box

b) Travel distance of the front brake lever should be kept between 10mm-15mm. Otherwise, please adjust the screw to meet required travel distance. Figure 4-2-2

## 1、 Adjusting Screw



Figure 4-2-2

- c) Inspect the elasticity of the brake handlebar.
- d) Brake fluid will be automatically injected into the brake fuel pipe in the process of abrading brake pad reducing the fluid level in the box. Therefore, periodical inspection of the fluid level is necessary.

**Caution: must use DOT4 Brake Fluid**

- e) Periodical inspection of the wear condition of front disk brake plate is also necessary.

Disk brake plate must be replaced depending on its wear condition. Figure 4-2-3

**Caution: 1. if the thickness of the disk brake plate is less than 1.5mm, it must be replace.**

2. In occasion of crack or distortion, the disk brake plate must be replaced.

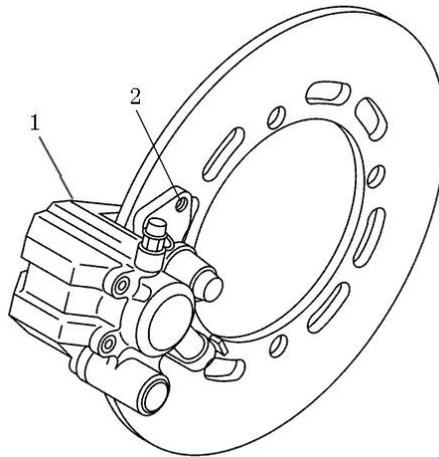


Figure 4-2-3

- 1) Brake plate clip
- 2) Hexagon self-lock nut M8

f) Disk brake plate uses hydraulic pressure of the brake fluid. Therefore, fuel pipe must be periodically inspected and replaced.

**Inspection Method: Fuel pipe must be replaced when worn out, cracked or distorted.**

4.2.1.1 Disassembly, inspection, maintenance and assembly of Front Disk Brake System.

4.2.1.2 Disassembly of front disk brake plate

1、Removing the wheel component see Figure 4-2-4

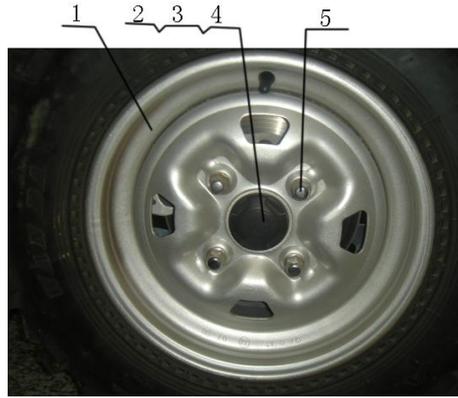


Figure 4-2-4

- 1) Front wheel hub
- 2) Hexagon open-groove nut M30
- 3) Cotter pin 3.2\*32
- 4) Cushion
- 5) Taper nut M10

2. Sequentially remove the cotter pins, open-groove nuts, cushion and front wheel hub from the front wheel shaft.

(Figure 4-2-4)

3. Remove the disk brake Plate from the front wheel Hub. (Figure 4-2-5)

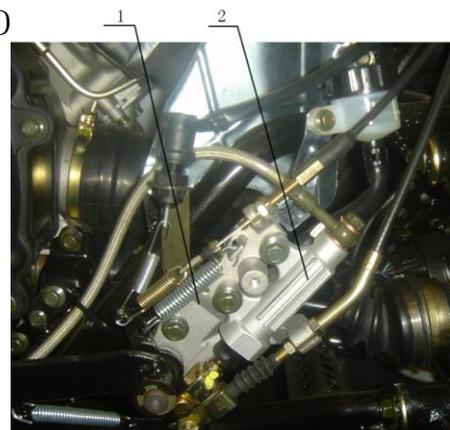


Figure 4-2-5

- 1) Disk brake plate
- 2) Front brake plate clip

#### 4.2.1.3 Disassembly of the Front D

1. Remove the bottom seat  
Of Disk Brake Pump and



Then remove the whole unity.

Figure 4-2-6

Figure 4-2-6

- 1) Bottom seat of Disk Brake Pump
- 2) Disk Brake Pump unity

2、 Remove the Front Fuel Pipe Brackets (Figure4-2-7)



Figure4-2-7

- 1).branch seat of Disk Brake Fuel Pipe
- 2).Hexagon Flange Bolts M8

3. Detach the Plate Clip nut and remove the Plate Clip (Figure4-2-3).

4、 Remove the Front brake plate system (Figure4-2-3)

#### 4.2.1.4 Inspection of the Front Brake System

1. Check the Brake Fluid Box for crack, leakage and other

potential defects.

2. Check Fastening Bolts of all Fuel Pipes for possible looseness or damage.
3. Check all Fuel Pipes for deterioration, distortion, crack, wear and other hidden defects.
4. Check the Brake Plate Clip for distortion, crack, and rust and stuck.
5. Inspect the Brake Shoe for wear condition. Brake shoe must be replaced when worn out. (Figure 4-2-8)

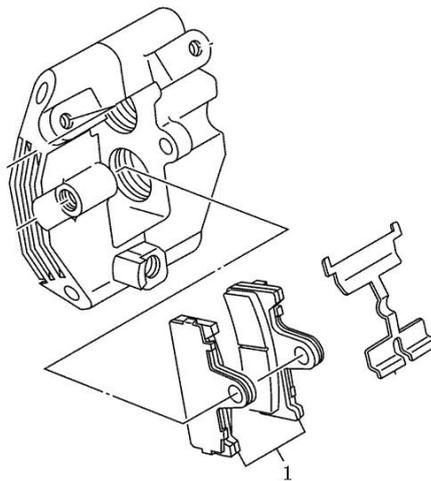


Figure 4-2-8

1) Brake Shoe

6. Inspect the Brake Shoe for maximum wear, distortion and crack, in which case it must be replaced.

Maximum wear of Rear Disk Brake Plate is less than  
1.5mm

#### 4.2.1.5 Assembly of Front Brake System

1. Use Fuel Pipe Brackets (2pcs) and Hexagon Flange Bolts M8\*16 (2pcs) to connect the Fuel Pipe Clip with both left and right Lower Front L/R rocker arms.

**Caution: Fuel Pipe must avoid physical contact with other components in movement.**

2. Fix the Disk Brake Plate onto the Front Wheel Hub with M8 Special Bolts (4pcs) (Figure 4-2-4)

**Caution: grease the bolt with thread glue when**

**fastening. Fastening Torque of the Bolt:  
22N. m—26N. m**

3. Fix the Front Wheel Hub onto the Front Wheel Shaft with open-groove nuts and cotter pins. (Figure 4-2-4)

**Fastening Torque of Open-groove nut:  
50N. m—60N. m**

4. Fix the Plate Clip onto Front Turning Joint with M8 Bolts (4pcs)

**Fastening Torque: 18 N. m—22 N. m**

5. Assemble Front Wheel Components onto Front Wheel Hub with M10 Conical Nuts of GB/T802 (4pcs) (Figure 4-2-15)

Fa

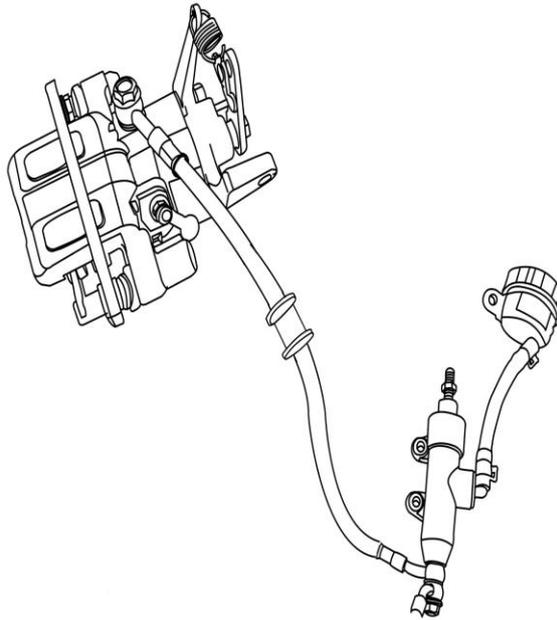
steering Torque of Conical Nut: 55 N. m-40N. m

6、 Fix Front Disk Brake Pump onto the Right Handlebar  
with M5\*60 hexagon bolts (2pcs) (Figure 4-2-16)

Fastening Torque of the bolt is: 10 N. m -14 N. m

Caution: Do not operate the vehicle immediately after assembling the brake system. Please apply the Brake Lever several times to fully engage the Disk Brake Plate and have the Brake Fluid circulating before riding the vehicle

## 4. 2. 2. Rear Brake System



4. 2. 2. 1 Preparation for inspection and maintenance of the Rear Brake System

a) Brake system is crucial to the life safety of the

operator and therefore must be periodically inspected and maintained.

- b) Rear wheels of the vehicle use brake plates mechanized by a rear brake pedal. Please follow the tips of inspection as below.
- c) Inspect the brake fluid box level on the right handlebar. Should the fluid level falls under the minimum mark, please refill the box with the same type of fluid as was recommended by the manufacturer (Figure 4-2-9) to ensure the fluid level is higher than the minimum mark.

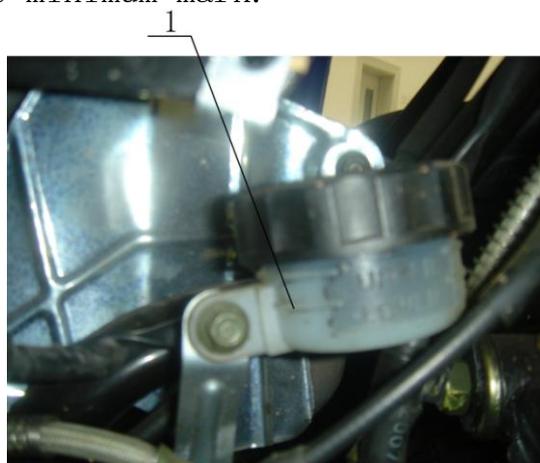


Figure 4-2-9

1、 Minimum Mark

- d) Travel distance of the Rear Brake Pedal should be kept between 20mm-30mm. Otherwise, please adjust the screw to meet required travel distance. ( Figure 4-2-10)
- e) Inspect the elasticity

Of the brake handlebar.

f) Brake fluid will be  
Automatically injected  
Into the fuel pipe in

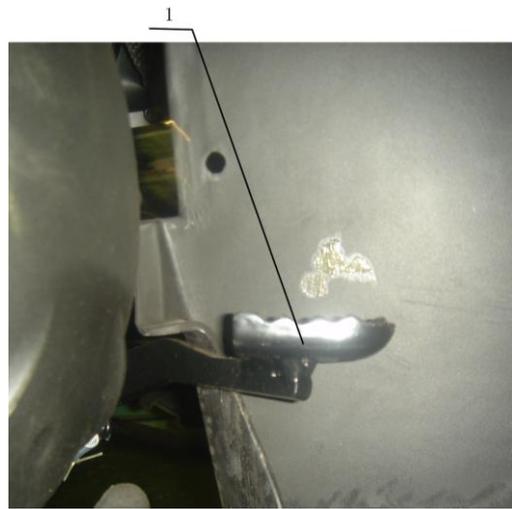


Figure 4-2-10

1、Rear Brake Pedal

The process of

Abrading brake pad

Reducing the fluid level in the box. Therefore,  
periodical inspection of the fluid level is  
necessary.

**Caution: must use DOT4 Brake Fluid**

◦

g) Periodical inspection of the wear condition of  
front disk brake plate is also necessary.

Disk brake plate must be replaced depending on its  
wear condition. (Figure 4-2-11)

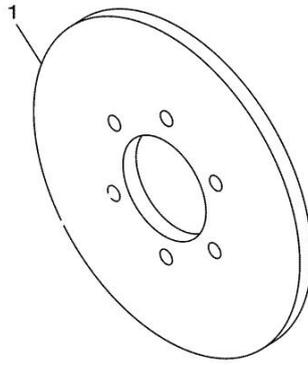


Figure 4-2-11

### 1、 Disk Brake Plate

**Caution: 1. If the thickness of the disk brake plate is less than 2.5mm, it must be replaced.**

**2. In occasion of crack or distortion, the disk brake plate must be replaced.**

h) Disk brake plate uses hydraulic pressure of the brake fluid. Therefore, fuel pipe must be periodically inspected and replaced.

**Inspection Method: Fuel pipe must be replaced when worn out, cracked or distorted.**

#### 4.2.2.2

Disassembly, Inspection and Assembly of Rear Disk Brake System:

#### 4.2.2.3 Disassembly of Rear Disk Brake System

1. Detach Rear Disk Brake Pump from the Frame

(Figure 4-2-6)

2. Remove Rear Disk Brake oil bowl from the Frame

(Figure 4-2-9)

3. Release assembling

Bolt (M8\*14) and

Detach the Rear Disk

Brake Clip. (Figure 4-2-12)

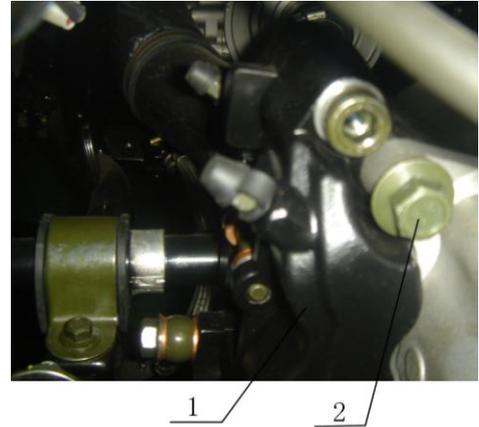


Figure 4-2-12

- 1) Rear Disk Brake Clip
- 2) Hexagon flange bolt M18×14

4. Remove Rear Disk Brake System

4.2.2.4. Disassembly of Rear Disk Brake Plate

1. Remove rear wheel components (Figure 4-2-13)

2. Release the transmission

Case components of Rear Bridge

From the main frame. Remove

Rear central transmission shafts

Components. (Figure 4-2-14)

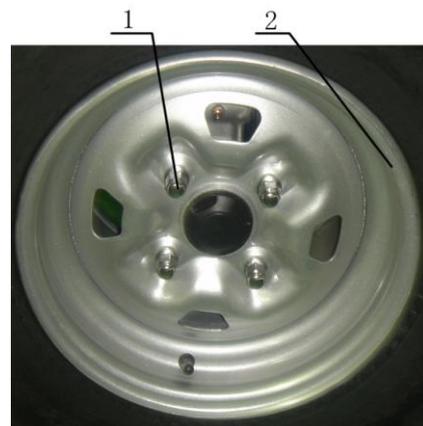


Figure 4-2-13

- 1) Conical Nuts M10
- 2) Wheel Hub

3. Remove the Bottom Seat

Of Rear Disk Brake Plate  
From the Rear Bridge.  
(Figure 4-2-14)

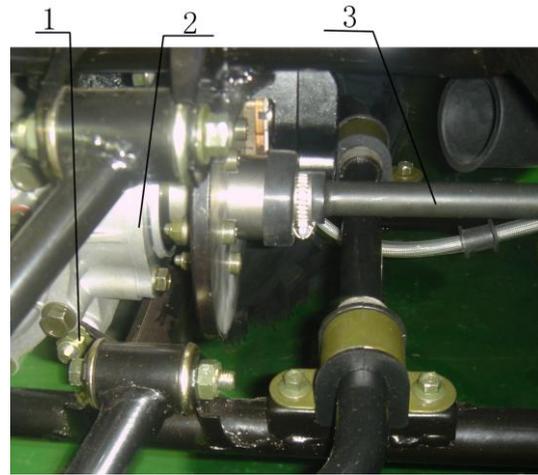


Figure 4-2-14

- 1) Hexagon flange bolt M10×115
- 2) Rear transmission case
- 3) Rear central transmission shafts

3. Remove the Rear  
Disk Brake Plate from  
Bottom Seat see  
Figure 4-2-15

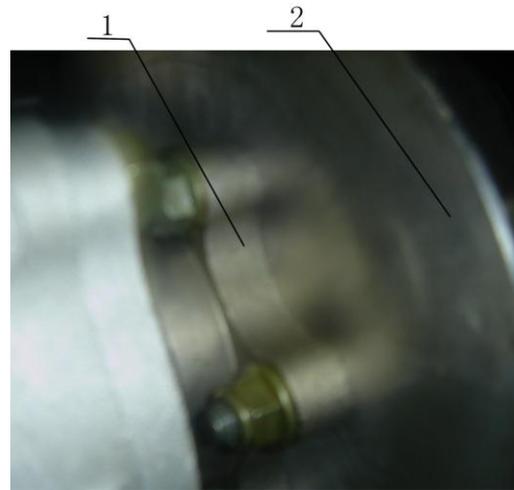


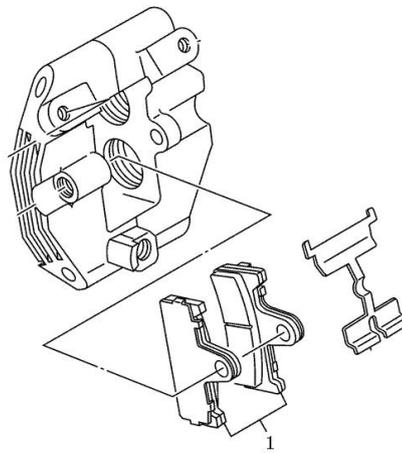
Figure 4-2-15

- 1). Bottom Seat of Rear Disk Brake Plate
- 2) Rear Disk Brake Plate

#### 4.2.2.5 Inspection of Rear Brake System:

- 1、 Check the Brake Fluid Box for crack, leakage and other potential defects.
- 2、 Check Fastening Bolts of all Fuel Pipes for possible looseness or damage.

- 3、 Check all Fuel Pipes for deterioration, distortion, crack, wear and other hidden defects.
- 4、 Check the Brake Plate Clip for distortion, crack, rust and stuck.
- 5、 Inspect the Disk Brake Shoe for wear condition. Brake shoe must be replaced when worn out.



1、 Brake Shoe

- 6、 Inspect the Brake Shoe for maximum wear, distortion and crack, in which case it must be replaced.

**Maximum wear of Rear Disk Brake Plate is less than 2.5mm**

#### 4. 2. 2. 6 Assembly of Rear Brake System

1 Fix Disk Brake Plate onto the Bottom Seat with Special M8 Bolts (6pcs).

**Caution: Grease the bolt with thread glue**

## When fastening

**Fastening Torque of bolt: 22 N.m –28N.m**

2、Mount the Bottom Seat of Rear Disk Brake Plate onto rear transmission case .Then configure the rear central transmission shaft, rear transmission case in turn. See Figure 4-2-15

3、Mount the Disk Brake Clip onto rear transmission case with M10×30 Bolts (2pcs)

**Fastening Torque: 18 N.m --22 N.m**

4、Mount Fluid Box of Rear Disk Brake onto the Frame with M Bolt (1pcs).

**Fastening Torque: 8 N.m—12N.m**

5、Mount Rear Disk Brake Pump onto the Frame with M Bolts (2pcs).

**Fastening Torque: 22 N.m—26N.m**

6 Fix front wheel hub onto the front wheel shaft with cushion,

**open-groove nuts and cotter pins.**

**Fastening Torque: 50N.m—60N.m**

7. Assemble Front Wheel Components onto Front Wheel Hub with M10 Conical Nuts (GB/T802) (4pcs).

**Fastening Torque of Conical Nut: 55 N.m–40N.m**

**Caution:** Do NOT operate the vehicle immediately after assembling the brake system. Please apply the Brake Lever several times to fully engage the Disk Brake Plate and have the Brake Fluid circulating before riding the vehicle.

### 4.3 Wheel and Tire

#### 4.3.1: Preparation for maintenance of wheel:

1. Inspect wear condition

Of the tire.

(Figure 4-2-16)

2. Check if the Wheel Hub is worn-out or Damaged. (Figure 4-2-13)

3. Check if the Wheel Hub Is rusted or cracked.

4. Check if the conical Nuts of the Wheel Hub Are loosened or distorted.

#### 4.3.2 Disassembly, inspection and assembly of wheel components:



Figure 4-2-16

#### 4.3.2.1 Disassembly of wheel components:

Remove M10 Conical Nuts (4pcs) and detach the tire.

(Figure 4-2-13)

#### 4.3.2.2 Inspection of wheel components:

1. Check if the wheel hub has any distortion, rust, crack or other potential defects. If so, please replace the wheel hub.
2. Check if the tire has reached its maximum wear condition in which case it should be replaced.
3. Check the joining condition of the tire and wheel hub. If the joint of tire and wheel hub is loose, replace the tire immediately.
4. Check the vibration of tire/wheel hub. (Figure 4-2-13)

**Vibration of assembled Tire must be controlled within 3mm. Otherwise, please replace with new tire.**

**Remove the tire for vibration test of the wheel hub. Should the vibration exceed 1.2mm, the wheel hub must be replaced.**

5. Inspect the four conical bores on the wheel hub.

In occasion of angular distortion or wear, the wheel hub must be replaced.

#### 4.3.2.3 Assembly of wheel:

Attach wheel hub onto the wheel with M10 Conical ball Nuts (4pcs) and dust-proof cover. (1pcs).

**Fastening Torque: 45~55N.m**

**Caution: assemble the wheel in correct direction (shown as the arrow). Front and Rear Wheels are not interchangeable. (Figure 4-2-17).**

4.3.2 Specifications and Operation guide of Wheel Hub and Tire.

Since wheels and tires Are crucial to the



Figure 4-2-17

Vehicle operation, periodical inspection for tire pressure and profile depth is necessary.

### Specification of Wheel and Tire

	Wheel Hub Dimension	Tire Dimension	(kPa) Tire Pressure
Front Wheel	12×6	25×8-12	35
Rear Wheel	12×8	25×10-12	35

To ensure maximum security and longer life expectancy of the wheel, please periodically inspect the tire pressure and

profile depth. Insufficient tire pressure can result in not only intensified wearing of the tire but also instability during the course of operating the vehicle (such as hard turning). Excessive tire pressure can also reduce the friction force between the tire and ground, causing spinning or lose of control. Therefore, please ensure the tire pressure strictly complies with figures shown in the chart above.

Before operating the vehicle each time, please check if profile depth of the tire is over worn, which might result in spinning, instability, lose of control and other potential security risk of the vehicle.

**Caution: Should the profile depth falls below 3mm, please replace the tire immediately. (Figure 4-2-18)**



Figure 4-2-18)

## 4.4 Transmission System

### 4.4.1 Fore Bridge

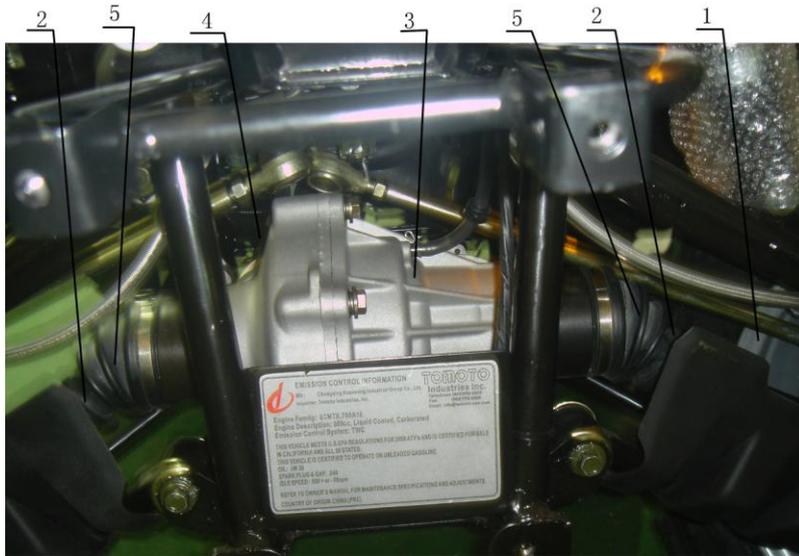
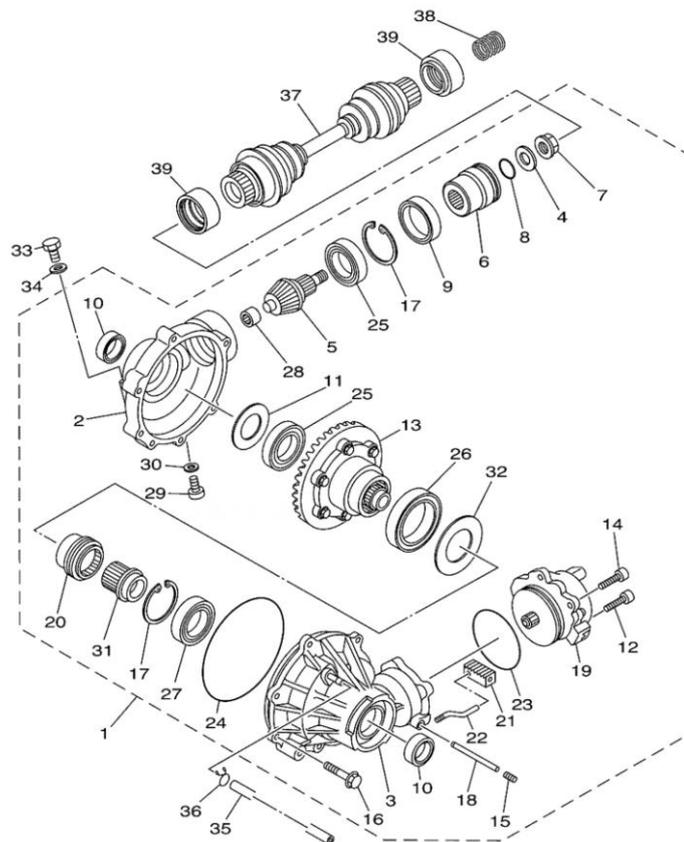


Figure 4-2-19

- 1、 front wheel hub    2、 L/R transmission shaft    3、 fore bridge differential components  
 4、 middle transmission shaft components of fore bridge  
 5、 L/R turning joint

### Front tank components



- 1、 gear-box assembly of front bridge    2、 the right cover    3、 the left case    4、 cushion  $\phi$

10.5 5、drive gear of front bridge  
 6、front driving axis pin sleeve 7、M10X1.25 flange locknut 8、O-ring of front bridge drive gear 9、 $\phi 65 \times \phi 48$  oil seal 10、oil seal of rear constant velocity joint assembly 11、differential - adjusted washer  
 12、M8X20 engine gearbox bolt 13、differential assembly 14、inner hex bolt M8X25 15、inner hex bolt M8X10 16、hexagon flange bolt M10 $\times$ 25  
 17、clip used in  $\phi 66$  18、 $\phi 5 \times 80$  cylindrical pin 19、engine gearbox assembly 20、adaptor 21、cog rack  
 22、fork 23、O-rings of engine gearbox 24、O-rings of front cover 25、deep-groove ball bearing 6007 26、deep-groove ball bearing 6912 27、deep-groove ball bearing 16007 28、needle bearing 15BM2112 29、M10X16 oil-change bolt 30、 $\phi 10 \times 1.5$  cooper gasket 31、power divider coupling 32、differential-adjusted washer II 33、bolt M14X15 34、cooper gasket  $\phi 14 \times 2$  35、vent pipe of drive case 36、clip of oil pipe 37、fore transmission shaft  
 38、weak spring of fore transmission shaft  
 39、dust-proof cover of fore transmission shaft

4.4.1 Disassembly, inspection, assembly of Rear Bridge components (refer to the figure of fore Bridge, fore case components)

4.4.1.1

1. Check if the connection between wheel hub and the Bottom Seat of wheel hub is reliable and if there is any distortion on the Bottom Seat of wheel hub. If there exists any such potential defects, the Bottom Seat of wheel hub must be replaced immediately.
2. Check if the Yanggakdo and its attachments are compatible well and if there is stagnation, slosh and Crunch of the Yanggakdo bearing. In case the bearing or Yanggakdo is flawed, the fore bridge must be removed in the first instance, then replace the bearing and

Yanggakdo.

3. Check if the constant velocity joint is matched up well.  
If not so or there is gear-cracked and abnormal noise, remove the constant velocity joint and align it.
4. Check if there exists any slip thread or flaw on the open-groove nut.
- 5...Disassemble the front tank and check whether the gears  
Is engaged properly.
- 6...In case the choke is jammed, it must be dredged with a needle. If the problem is not solved, replaced it.
7. If there are defects on sensors, it must be checked and maintained by a professional.
8. Gears are fragile commodities in transmission system.

#### 4.4.1.2 Disassembly of fore bridge component:

1. Detach the two front wheel parts.
2. Removed front Disk Brake Clip, cotter pin, cushion and the front wheel hub. (Figure 4-2-20)



Figure 4-2-20

3. Disassemble the fore bridge differential (Figure 4-2-20)

4、 Take out the fore bridge from the frame

5、 Release engine oil in the differential

6、 Unplug the transmission shaft from the differential

(Figure 4-2-19)

#### 4.4.1.3

Inspection and Maintenance of fore bridge:

1. If the dust-proof Rubber Sheath of the transmission shaft is worn out or cracked, please have it replaced immediately.

2、 Check whether the ball is running smoothly. If found loosen or stunk, replace the transmission shaft.

3、 disassemble the transmission shaft, clean, then install,

**Caution:** 1. the dust-proof Rubber Sheath can not be touched by petrol and diesel oil.

2 The dust-proof Rubber Sheath must not be cracked for slight scratch may be damaged the Rubber Sheath.

3. Inject 2/3 Lithium Lubrication into the ball.

4、 Open the differential, and inspect wear condition of gear, shaft and cushion, then replace the defective component.

#### 4.4.1.4

assembly of fore bridge component

1、 Fix transmission shaft onto fore bridge differential.

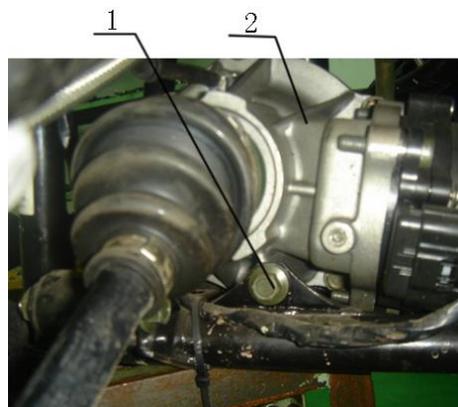
(Figure 4-2-19)

2、 Inject 0.32L of Gear Lubricant of SAE 80 API GL-4 into Fore bridge differential. Then tighten the bolt.

**Torque of the bolt: 23N.m**

3、 Fix the fore bridge differential onto the frame with hexagon flange bolt M10×110 (2pcs), M10 nuts (2pcs), cushion 10 (2pcs) (Figure 4-2-21).

**Fastening Torque of the Bolt is  
40 N.m~45N.m.**



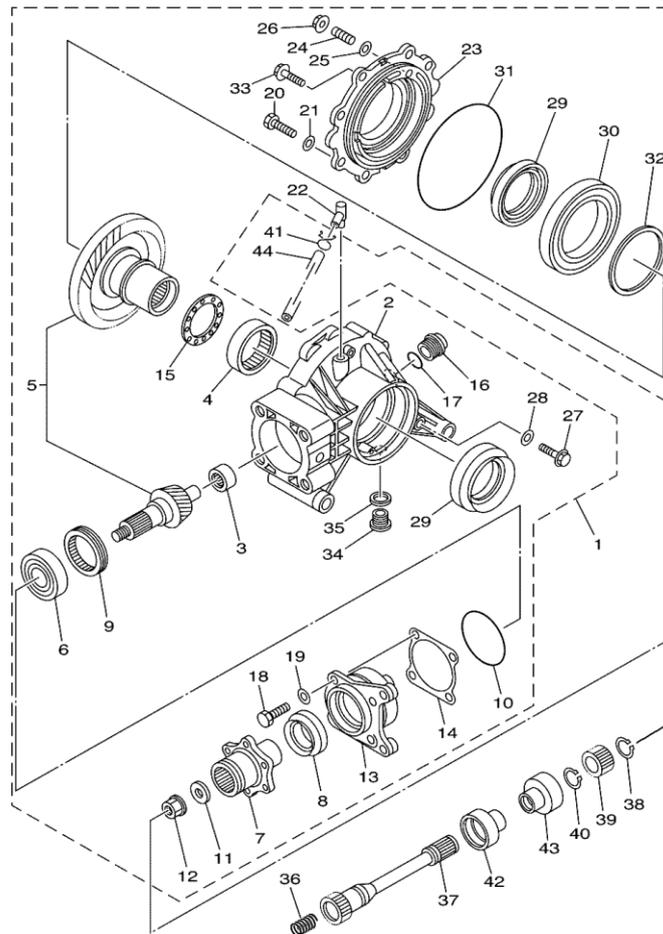
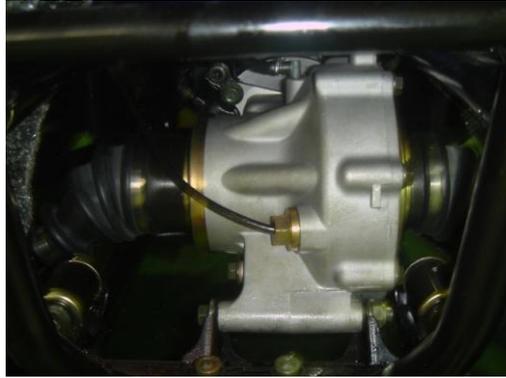
(Figure 4-2-21)

1、 hexagon flange bolt M10×110

2、 fore bridge case

#### 4.4.2 Rear Bridge

##### 4.4.2.1 transmission case of Rear Bridge

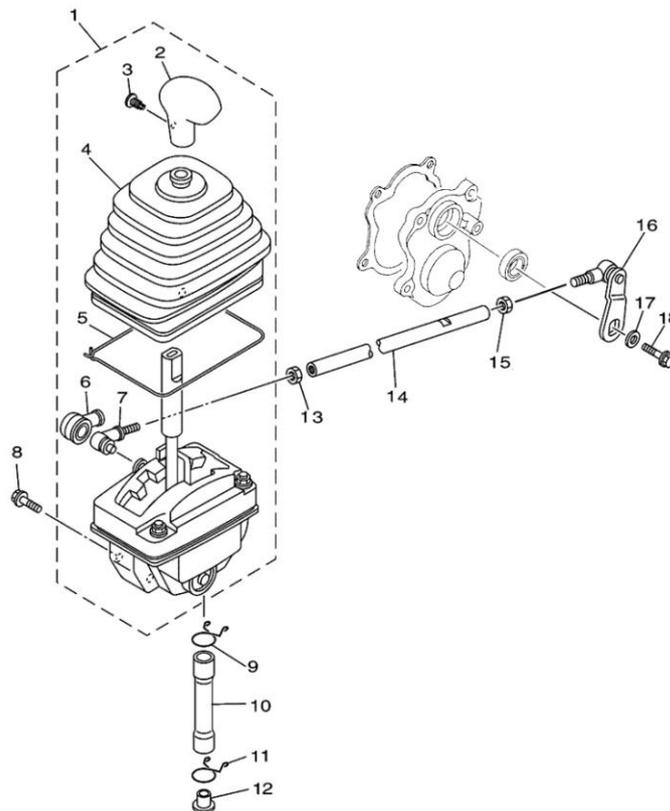


- 1, rear bridge transmission case assembly    2, the left case    3, needle bearing 22BM3010    4, needle bearing 55BM6720A
- 5, cluster gear of rear bridge    6, needle bearing    7, rear disk brake seat    8,  $\phi X \phi$  oil seal    9, clamp sheath
- 10, O-ring of rear drive gear    11, cushion  $\phi 12$     12, nut M12X1.25    13, rear drive gear seat
- 14, rear adjuster cushion I    15, rear adjuster cushion II    16, oiling plug    17, O-rings of grease hole    18, hex bolt M8X35
- 19, cushion  $\phi 8$     20, hex bolt M8X25    21, cushion  $\phi 8$     22, zinc-base alloy oil cap    23, case cover of rear bridge    24, inner hex bolt M8X45
- 25, cooper gasket  $\phi 8$     26, flange nut M8    27, hexagon flange bolt M8X12    28, cooper gasket  $\phi 8$     29,  $\phi 90 X \phi 65$  oil seal
- 30, deep-groove ball bearing 16017    31, O-rings of rear bridge cover    32, rear adjuster washer III    33, hexagon flange bolt M10X25
- 34, rear bridge oil-change plug M14X15    35, Copper gasket  $\phi 14$     36, Weak spring of rear bridge transmission shaft    37, Rear bridge transmission shaft    38, External clip  $\phi 18$
- 39, Sheath of rear bridge transmission shaft    40, External clip  $\phi 18 \phi 18$     41, clip    42, For dust-proof cover of rear bridge transmission shaft
- 43, Rear dust-proof cover of rear bridge transmission shaft    44, Bypass line

The maintenance of Rear Bridge is identical to the fore bridge.

Please refer to the preceding contents.

#### 4.5 gear shift mechanism



- 1、gear shift mechanism assembly 2、gear shift mechanism handle 3、换档机构  
 plastic screw of gear shift mechanism  
 4、dust-proof cover of gear shift mechanism 5、dust-proof cover thimble of gear shift  
 mechanism 6、velocity joint robber sheath of gear shift mechanism  
 7、velocity joint of gear shift mechanism 8、hex nut (anti)M8 9、waste oil pipe  
 thimble of gear shift mechanism  
 10、waste oil pipe of gear shift mechanism 11、waste oil pipe thimble of gear shift  
 mechanism 12、waste oil pipe robber plug of gear shift mechanism  
 13、hex nut (upright) M8 14、connecting rod of gear shift mechanism 15、hex nut  
 (anti)M8  
 16. Gear shift controlling 17. cushion  $\phi 6$  18. Hex nut M6 $\times$ 36

#### 4.5.1 Inspection and Maintenance of gear shift Mechanism (refer to the picture of gear shift Mechanism)

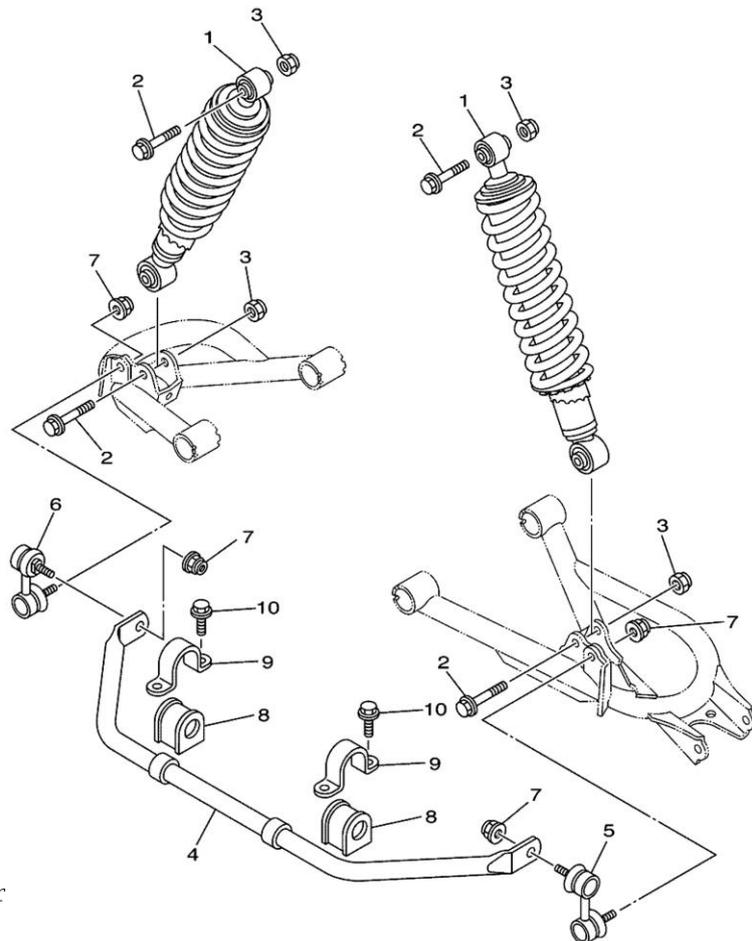
1. Check the mobility of gear shift handle. If it is not working properly, remove the gear shift Mechanism to check if the fork, ball and spring are stuck. in which case replace the defective component and try again. The last way is to turn to the professional repairman.
2. If there is lack in the gear shift mechanism, adjust the nut of the fork to correct position and strengthen gear shift mechanism.
3. Remove the gear shift mechanism and check whether the linking rod is cracked; if so, it should be changed.
4. Check whether the bouncing spring of gear shift mechanism is intense enough.
5. Check whether the gear is engaged correctly and whether there is trip stop or lack. If this situation exists, call for

the maintenance staff to test and repair it.

6. If the gear can not be engaged, we can test it from the following aspects: ① whether the clutch can completely declutch; ② whether the gearshift is greased reliable (whether the oil pipe of gear shift mechanism is blocked) ③ whether gear shift mechanism jams; If these situation happens, maintenance staff would come to test and repair it.

## 4.6 Suspension

### 4.6.1 components of rear Suspension

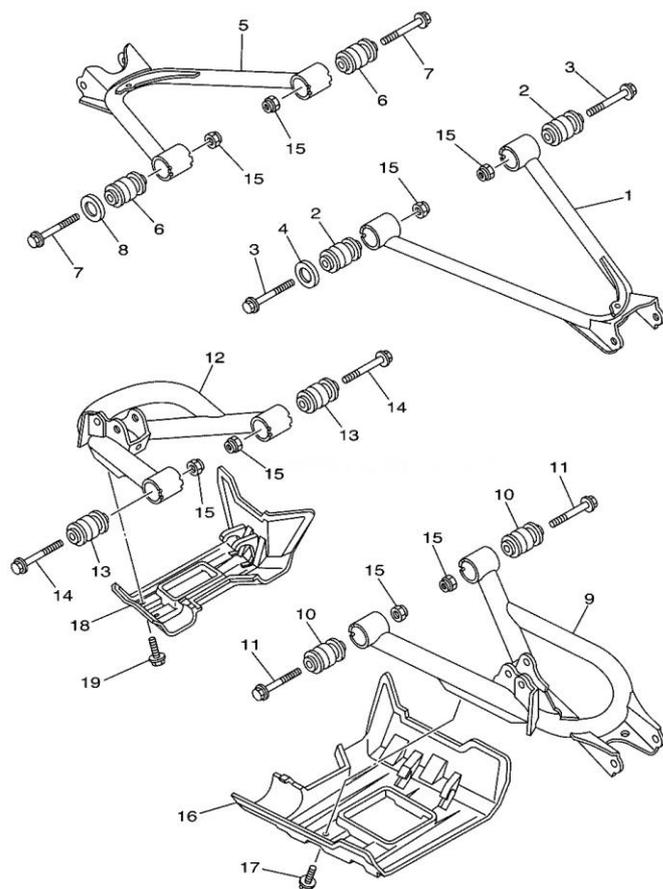


1、 rear damper

nutM10×1.25

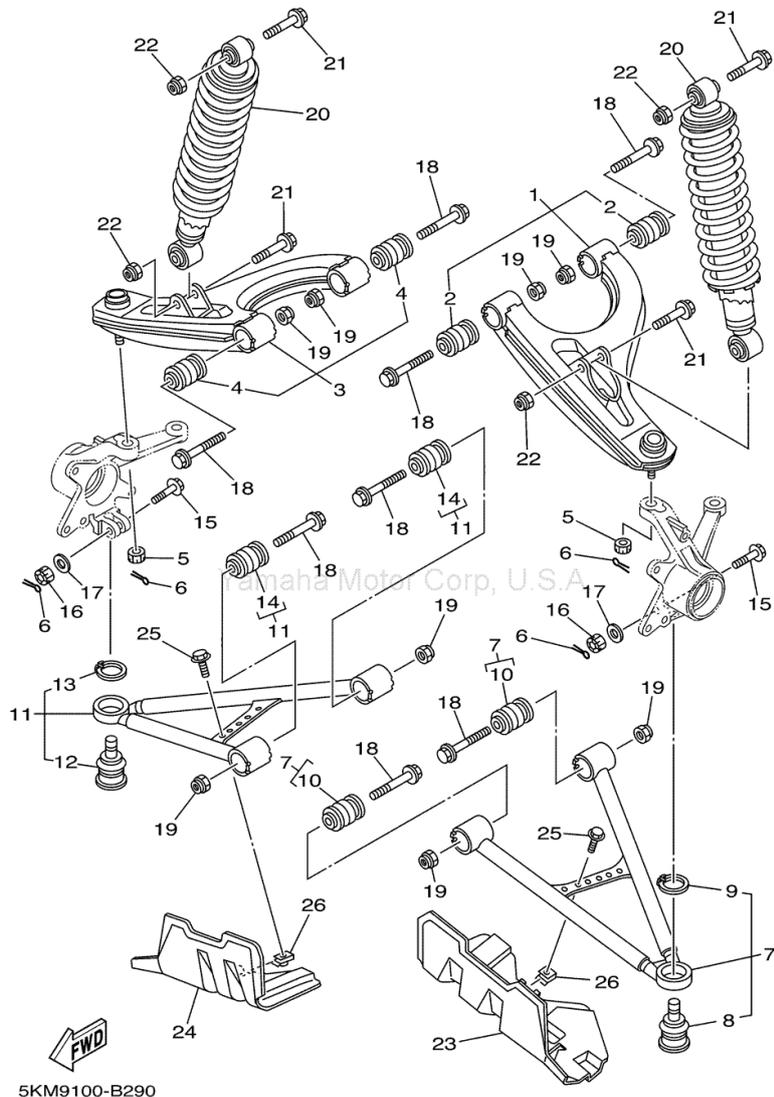
- 4、horizontal rear-fin components  
 5、 the right horizontal rear-fin velocity joint                      6、 the left horizontal rear-fin velocity joint  
 7、 locknutM12×1.25      8. Horizontal rear-fin robber sheath  
 9. Horizontal rear-fin press plate 10. Hexagon flange bolt M8×14

#### 4.6.2 rear rocker arm



- 1、 rear left-upper rocker arm assembly 2、 middle spacer sleeve of fore L/R rocker arm  
 3、 hexagon flange bolt M10×65 4、 dust-proof cover of rear rocker arm  
 5、 rear left-upper rocker arm assembly 6、 middle spacer sleeve of fore L/R rocker arm  
 7、 hexagon flange bolt M10×65 8、 Dust-proof cover of rear rocker arm  
 9、rear left-bottom rocker arm assembly 10、middle spacer sleeve of fore L/R rocker arm  
 11、 hexagon flange bolt M10×65  
 12、rear left-bottom rocker arm assembly 13、middle spacer sleeve of fore L/R rocker arm  
 14、 hexagon flange bolt M10×65  
 15、 hex locknut M10×1.25 16、 cover of rear left-bottom rocker arm 17. Hexagon flange bolt M6×12  
 18. cover of rear right-bottom rocker arm 19. Hexagon flange bolt M6×12

### 4.6.3. Front Suspension



5KM9100-B290

(c) 2005 Yamaha Motor Corporation, U.S.A.

- 1、 fore upper-left rocker arm
- 2、 middle spacer sleeve of fore L/R rocker arm
- 3、 fore upper-right rocker arm assembly
- 4、 middle spacer sleeve of rocker arm
- 5、 open-groove nut M10
- 6、 cotter pin 3.2×32
- 7、 fore bottom-left rocker arm assembly
- 8、 fore bottom velocity joint assembly
- 9、 stopper elastic ring for shaft
- 10、 middle spacer sleeve of fore L/R rocker arm
- 11、 fore bottom-right rocker arm
- 12、 fore bottom velocity joint assembly

13、stopper elastic ring for shaft 14、middle spacer sleeve for security 15、hexagon flange bolt M10×40 16、hex locknut  
17、elastic cushion 18、hexagon flange bolt M10×65 19、hex locknut M10×1.25  
20、fore L/R damper 21、hexagon flange bolt M10×50 22、hex locknut M10×1.25  
23、cover of fore bottom-left rocker arm 24、cover of fore bottom-right rocker arm 25、hexagon flange bolt M6×12 26、holding plate nutM6

#### **4.6.4 Disassembly, Maintenance and Assembly of**

**up-and-down** rocker arm 1、Disassembly and Maintenance  
Collar Sheath, cotter pin and damper may easily occur problem.

A、If the L/R rocker arms swing easily, we can test it from the following aspects: whether the collar sheath is defective by pressure and whether the Rubber Sheath is worn out or cracked

B、Check whether the cotter pins is reliable. If not so, replace it.

C、The main problems and homologous maintenance are as following:  
check whether the spring is split or the oil will spill out in which case the damper muse be replaced and test if the oil bowl is excellent without damage in different circumstances.

#### **2、Disassembly (as the following picture)**

Mount for L/R damper, up-and-down rocker arm assembly onto the frame with Hexagon Flange Bolt M10×65 (8pcs), M10 nuts (8pcs), Hexagon Flange Bolt M10×50 (4pcs) and M10locknuts

(4pcs) to ensure a torque of 40~45Nm.

Caution: A: These components should be greased with butter before assembly.

B: The surface of components can not be cracked.



Check whether these components are greased with butter and then tighten the up-and-down rocker arm assembly and L/R fore Dampers and there components. Fix the L/R tension rods into hole by way of the trough of open-groove nut with cotter pin (4 pcs), and make these tension rods bisection on feet.



#### 4.6.5. Inspection and Maintenance of rear Suspension

1. Inspection and Maintenance are similar to the fore Suspension
2. Check whether the assemble shaft of the rear damper is deformed in which case it must be changed.
3. Check the Collar Sheath and Rubber Sheath
4. Check if the cotter pin on the assembly shaft of the rear damper is reliable.

##### Caution:

Disassemble rear damper and check if the damper and the connecting hole is bent or cracked. In case of above defects, call for professional staff or replace the damper and then tighten the bolt (Note: self-lock nut is necessary and the torque must be at a range of 45~55 N. m)

## 5. Electrical system

### Route color indication

1. Black-----B
2. Red-----R

- 18.Blue White-----L/W
- 19.Blue Black-----L/B

- |                          |                         |
|--------------------------|-------------------------|
| 3. Yellow-----Y          | 20.Red Black-----R/B    |
| 4. Green-----G           | 21.Red White-----R/W    |
| 5. Orange-----O          | 22.Green White-----G/W  |
| 6. White-----W           | 23.Brown White-----Br/W |
| 7. Gray-----Gr           | 24.Brown Blue----- Br/L |
| 8. Blue-----L            | 25.Red Brown-----R/Br   |
| 9. Brown-----Br          | 26.Yellow Red-----Y/R   |
| 10. Dark Green-----Dg    | 27.Green Red-----G/R    |
| 11. Dark Red-----Dr      | 28.Green Black-----G/B  |
| 12. White Green-----W/G  | 29.Black White-----B/W  |
| 13. White Red-----W/R    | 30.White Blue-----W/L   |
| 14. White Black-----W/B  | 31.Yellow White-----Y/W |
| 15. Light Blue-----Lb    | 32.Green Blue-----G/L   |
| 16. Light Green-----Lg   | 33.Purple-----V         |
| 17. Black Yellow-----B/Y |                         |

### Troubleshooting and repair

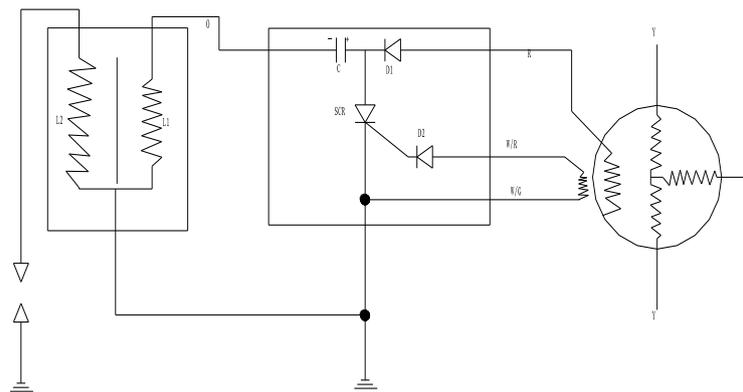
- No electrification: 1. First, check the safety.
2. Second, if the safety is good, then check the battery whether it is power on.
3. Finally, check the switch lock and electric route, whether they are bad.

Other troubleshooting and causations as follows



	phenomena	cause	measure	remark
ignition system	1 ,no spark	1.switch lock ※ carve out a way or short circuit, connection badness ※ line bonding badness 2.CDI set ※ After electrify no noise from the CDI 3.high voltage ※ high voltage lead insulated badness ※high voltage lead carve out a way or short circuit 4. magneto ※ signal loop and charge loop carve out a way or short circuit	★repair  ★repair  ★replace  ★replace  ★replace  ★replace	
	2 . spark weak or spark over intermittence	1. spark plug ※ pollute or wear intermittence 2. high voltage bag ※high voltage lead wire insulated badness	★replace  ★replace	
electrification system	1,discharge self  2, uncharge or shortage-charge	1. cover polluted or drenched by rain  1.carve out a way or short circuit, caused by connected wire badness 2.rectifier damaged 3.baterry  ※lower-electrolyte  ※electrode failure	★ water-proof, keep clean of the cover and replace electrolyte  ★repair ★replace ★entered distilled water  ★replace	
	1 . flash not bright or weak  2 , horn sound	1. the switch of flash lamp or emergency light contacted badness 2. lamp ※ filament of lamp damaged ※ the watt of lamp larger or smaller than regulated number 3.routing	★ repair or replace  ★replace ★replace	95

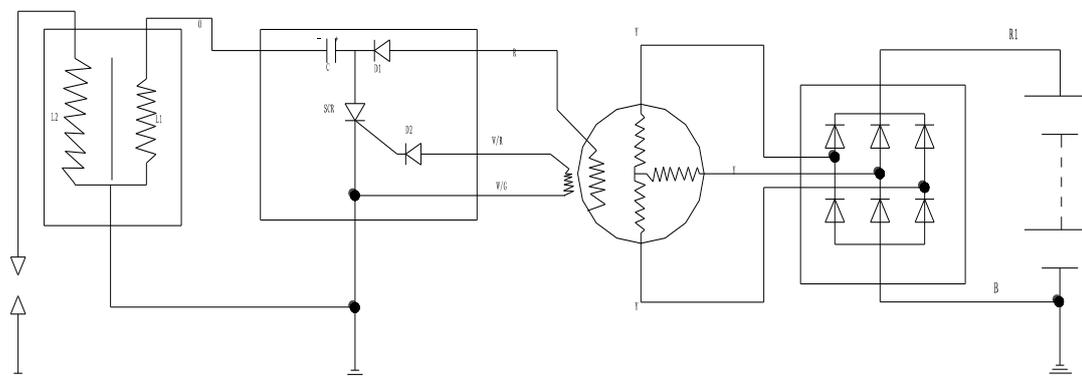
## 5.1 ignition system



The key diagram of ignition elements ignition elements:

Ignition pressure provided by magneto ignition coil through diode commutated, by R (red line) input CDI (capacitance discharge ignition), charge to capacitance C. at the same time, spring coil produce spring signal, provided to SCR as the turn-on spring signal, when reaching the ignition timing, SCR turn-on capacitance began to discharge at the elementary coil L1 caused instant lower pressure, while at the secondary coil caused induce pressure. Its instant pressure up to 10000V, sparkover at the clearance of sparkplug (0.6mm). so the engine ignited

## Charge system



The key diagram of charge elements

## 5.2 magneto and charge system

The elements of charge:

When the engine running, driven magnet rotor circumscribe, so on the stator coil produce alternating current then induce electromotive force come into to being the pressure. Through 3 lines Y (yellow) output into the rectifier, through rectifier into direct current pressure and output. Through R1 to charge the battery.

## 5.3 Battery

Under the following problems, please change the battery

1. With long time charge but the pressure do not increase to a set value.
2. At the bottom of case there is something dirty or

electrode have become white or the case with a sulfate function

3. Electrode former scratched or scratched by press or insulation without work.

### **Pay attention when using**

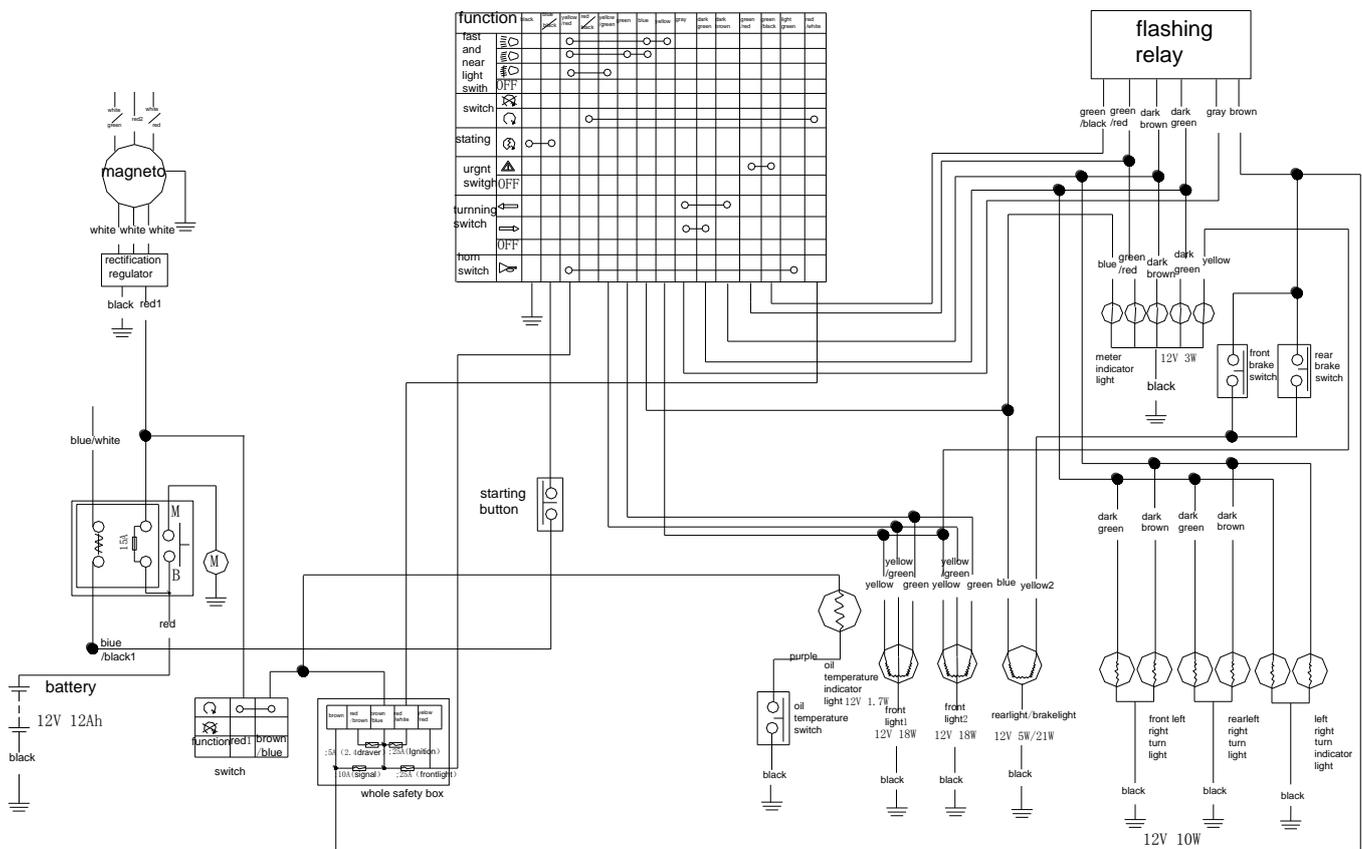
1. Long time out of using but without charge is not correct.
2. Too much charge (so long time charge is not correct, generally if battery empty, the normal charge time hours)
3. Do not charge under a much higher pressure or electric current
4. Keep battery at a low temperature and dry place
5. Charge battery before fix it.

If battery without electrolyte, it may cause the rectifier damaged. And the electrolyte is venomous and dangerous. As it contains vitriol it may cause burn accident. Battery also contains explode gas, so keep it far away spark and flame and cigarette. When charge or using in house, keep the air easy floating. When work near the battery, please take care of your eyes and keep kids away from the battery.

If under such accidents, please deal with it as follows or ask for help from the doctors.

1. Exterior, wash lots of cleaning water
2. Interior, drink milk or water and then milk of magnesia or egg or rap oil and hospitalize as soon as possible.
3. Eyes wash cleaning water at least 15 minutes and hospitalize as soon as possible.

## 5.4: Lighting system



The key diagram of illumination system

## 5.5 Meter and signal system

: Operation and working way:

### 1、 Headlight

Headlight Switch

function	yellow /red	yellow	green
	○ — ○		
	○ — ○ — ○		

### 2、 Emergency light switch

### 3、 Turing light switch

function	green /red	green /black
	○ — ○	
○		

function	gray	nigger brown	dark green
	○ — ○		
	○ — ○ — ○		
OFF			

When using this function, left and right turning lights will shine at the same time.

Meter meet an emergency, the lamp is red (do not shine)

### 4、 Horn Switch

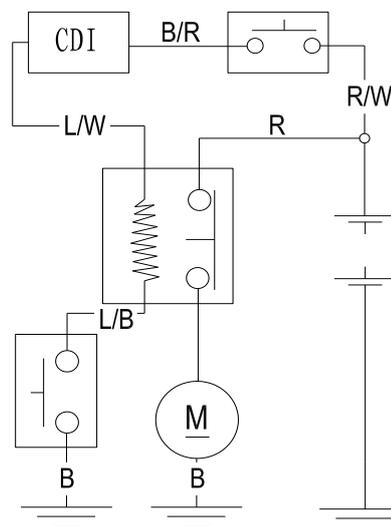
function	yellow /red	light green
	○ — ○	
○		

function	yellw /red	blue /white	biue
	○ — ○ — ○		
	○ — ○ — ○		
OFF			

When press the button, the horn will move. But if without sound or with unclear sound or with little sound please check the problem according to the guide

## 5.6: Electrical starting system

Starting Circuit



Starting system working process

Turn on the start switch on the left handlebar; the battery can supply power for the CDI. Then the CDI supply power for the stator relay, then the power from the battery can be sent to the stator motor through the stator relay and the stator motor works help the engine to work.

## Note:

1. When electrical starting, please keep the battery with enough power and the time of pressing button will be within 55 seconds. If longer time more than 5 seconds, it may cause the damage of stator relay and the stator relay motor and may also cause the damage of the battery that it can not be charged or not charge enough.
2. When starting, if heard some noises from the stator relay, the battery must be without enough power. Please stop starting and change a powerful battery or charge for it.
3. If the stator motor can not work normally, please check according to the 2 rule to see if it is not lubricated enough

## Appendix

### 6.1 Specification

#### 6.1.1 Specification of technique

##### A) Specification of vehicle

Overall length	2235mm (B model)
Overall width	1280mm (B model)
Overall height	1225mm (B model)
Wheel base	1365mm
Wheel gauge	900mm
Mini. Clearance to the ground	260mm

Seat height	900mm(B model)
turning radius	2000mm
Suspension	Front: Hydraulic spring swing arm Rear: Hydraulic spring swing arm
Braking pattern (Normal condition)	Front dual disk, Rear single disk/front and rear linkage, Right foot/left hand operation
(1): (E-mark) Braking pattern Primary Brake (1): (E-mark)	Front dual disk, Rear single disk/front and rear linkage, right foot/right hand operation
Emergency brake:	Front dual disk, Rear single disk/front and rear linkage, right foot/right hand operation
Parking brake:	Engine/ hand operation, Gear shift handle
Wheel Hub	Front: Alloy/ Steel wheels Rear: Alloy/ Steel wheels
Tire dimension	Front 25x8-12 (Vacuum Tire) Rear 25x10-12 (Vacuum Tire)
Tire pressure	前轮 70kpa Front 70kpa 后轮 70kpa Rear 35kpa
Fuel tank Vol.	17L±0.1L
Dry weight	319kg
Max. loading weight	180kg
Total weight(including	509kg

hitch):

weight of the drawbar hook	100kg
Total weight of the drawbar hook	609kg

## B) Specification and model of engine

Engine Model/Brand	HS185MR/ HSUN
Pattern	Single cylinder, water cool, exhaust, four stroke
Bore×Stroke	84.5mm×84mm
Compression Ratio	9.4:1
Volume	471ml
Max. power	17kW (5000r/min– 5500r/min)
(E-mark) Max. power	14.2kW (5500r/min)
(E-mark)	
Rated power	16kW (4500r/min–5000r/min)
Max. Torque	35N·m (5000r/min)
Max. Torque (E-mark)	26.7N·m (5000r/min)
Mini. Idle speed	1400±100r/min
Fuel type	Unleaded #90
Lubrication	Pressure Splash
Starting system	Electric Start and hand recoil start
Ignition	C.D.I electric ignition
Drive train	Axle
Transmission	AUTOMATIC

Belt drive ratio 5.0695~0.7679

L Drive ratio 5.3595 (35/17 × 41/21 × 24/18)

H Drive ratio: 3.2230 (26/21 × 41/21 × 24/18)

R Drive ratio 3.8282 (25/17 × 41/21 × 24/18)

Engine Drive ratio 16.339~2.475

Clutch Wet automatic centrifugation

Lubrication (Crankcase) Comply with GB11121-1995 standard. Depending on regional weather condition, choose either SAE 5W-40 or SAE 10W-30 (Cold region) SAE. 20W-40 (Warm region)

Oil capacity 1.9L

Engine dry weight 68kg

C) Specification and model of spare parts

Carburetor PD33J-A

Pattern Parallel Vacuum

Spark plug DR8EA

Speed meter Electronic

Battery 12V 21Ah

Headlight 12V 35W/35W White light

Front Indicator 12V 3W White light

Rear Indicator 12V 5W Red light

Brake light	12V 21W	Red light
Rear license plate light	12V 5W	White light
Turning light	12V 10W	Amber light
Rear reflector		Red light

D) specification and model of other parts and structure

Disk brake hydraulic oil	DOT4
Turning operation system	Hand operating steering bar
Driving method	Two wheel/ four wheel drive (2W means two wheel drive, 4W means four wheel drive)
Shaft arms	Front and Rear dual shaft arms
Parking brake	Mechanical
Frame	Steel pipe
Magneto	Rotate DC output
Spark plug gap	0.6-0.7 mm
Safety fuse	30A

6.1.2 Performance Requirement

a) Starting Performance

Starting time must be less than 15s

b) Accelerating Performance

Starting accelerate must less than 16s/200m, superpass accelerate must less than 15s/200m.

c) Max. Speed

The Max. Speed is 82km/h (e-mark is 80km/h)

d) Climbing power

The climbing angle must more than  $22^\circ$

e) Lowest fuel oil consumption rate

Lowest fuel oil consumption rate is  $\leq 340\text{g/Kw}\cdot\text{h}$

f) Reliability

The reliable actual service life is 6000KM. The testing method carries on according to GB/T5374-1995.

g) Durability

The durability actual service life is 16000KM; the testing method carries on according to GB/T4570-1995.

h) Exhaustion

The pollutant limiting value should conform to GB 14621-2002, the GB14622-2002 reques

a) idle speed discharges

$\text{CO} \leq 3.8\%$ ,  $\text{HC} \leq 800\text{ ppm}$

b) The operating mode discharges

$\text{CO} \leq 7.0\text{ g/km}$ ,  $\text{HC} \leq 1.5\text{ g/km}$ ,  $\text{NO}_x \leq 0.4\text{ g/km}$

l) braking performance

a) Braking distance  $\leq 27\text{m}$  (Initial speed is 60km/h)

B) the brake to reduce the speed must more than  $5.88\text{m/s}^2$

j) Noise

The acceleration travel noise is not bigger than 79dB (A), installment noise is 93dB (A), rotate speed is  $2750\text{min}^{-2}$

k)

1 Radio harassment characteristic

The multipurpose vehicle produces the radiated interference permissible value and the ignition system noise remover insertion loss value, the radio harassment characteristic should conform to GB14023-2006

l) Parking performance

Multipurpose vehicle when neutral position use parking brake, of in the vehicle arresting gear should guarantee the vehicles in the slope are 18%, coefficient of adhesion between the tire and the road surface is not smaller than on 0.7 slope way, the counter- two directions maintains static fixed is motionless, meantime between many to 5min

m) The side leans the steady constant angle

The multipurpose vehicle under the idling, the static condition, and right flank inclines the biggest side to left side to lean the steady constant angle not to have to be smaller than 25° .

n) Front illuminator performance

p).1 the vehicle should be loaded with conforms to GB 5948-1998 or the GB 4599-94 request front illuminator

q).2 the high beam of each front light luminous

Intensity should achieve 8000cd. When test, its electrical power System should be at the charge condition

## 6.2 Requirements for torque of fastener

fastening parts	(N.m) torque
pillar	35~45

nut on chain stay	45~50
Upper nut on fore damper	35~45
bottom nut on fore damper	35~45
Upper nut on rear damper	45~55
bottom nut on rear damper	45~55
Nut on upper rocker arm of the left	40~50
Nut on bottom rocker arm of the left	40~50
Nut on upper rocker arm of the right	40~50
Nut on bottom rocker arm of the right	40~50
Suspension nut	35~45
Nut connecting chain stay and rocker support	40~50
Nut on fore wheel	45~55
Nut on rear wheel	45~50

### 6.3 Electrical circuits

See the figure followed

