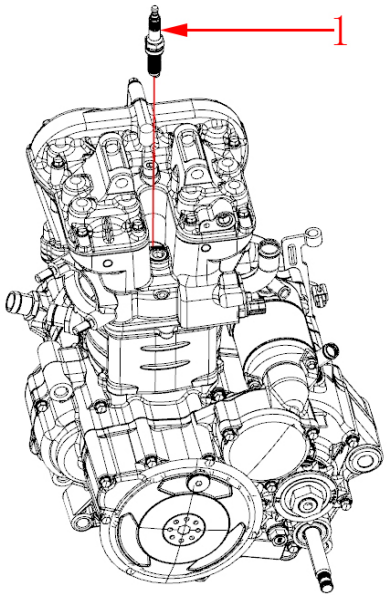
CONTENTS

Sparking plug

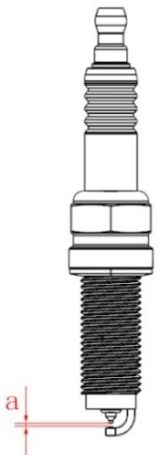


Di

1.Use a needle-nose plier to pull out the high pressure cap.
2.Remove the spark plug (1) with a special sleeve for the spark plug.
Note: Turn the spark plug counterclockwise to remove it.

Check the spark plug

1.Check the spark plug threads and the center electrode if it is damaged or deformed,the spark plug should be replaced.
2.Use a feeler gauge to measure the spark plug gap a.If it is out of range, the spark plug must be replaced.
The standard value of the gap is 0.′



Install the spark plug

1.Put the spark plug into the cylinder head and sleeve special sleeve for spark plug ,turn 3 times clockwise to tighten, then turn 1/4 turn or use a fixed torque wrench to tighten to 20 ± 2N.m.
2. Use a needle-nose plier to insert the high-pressure cap into the spark plug and press down tightly.

Measuring compression pressure

1.Starting the engine,warm up for a few mintues and then turn off the flame.

2.Disassemble the spark plug.
Note:Before disassemble the spark plug,make sure there is no dust around the spark plug hole.

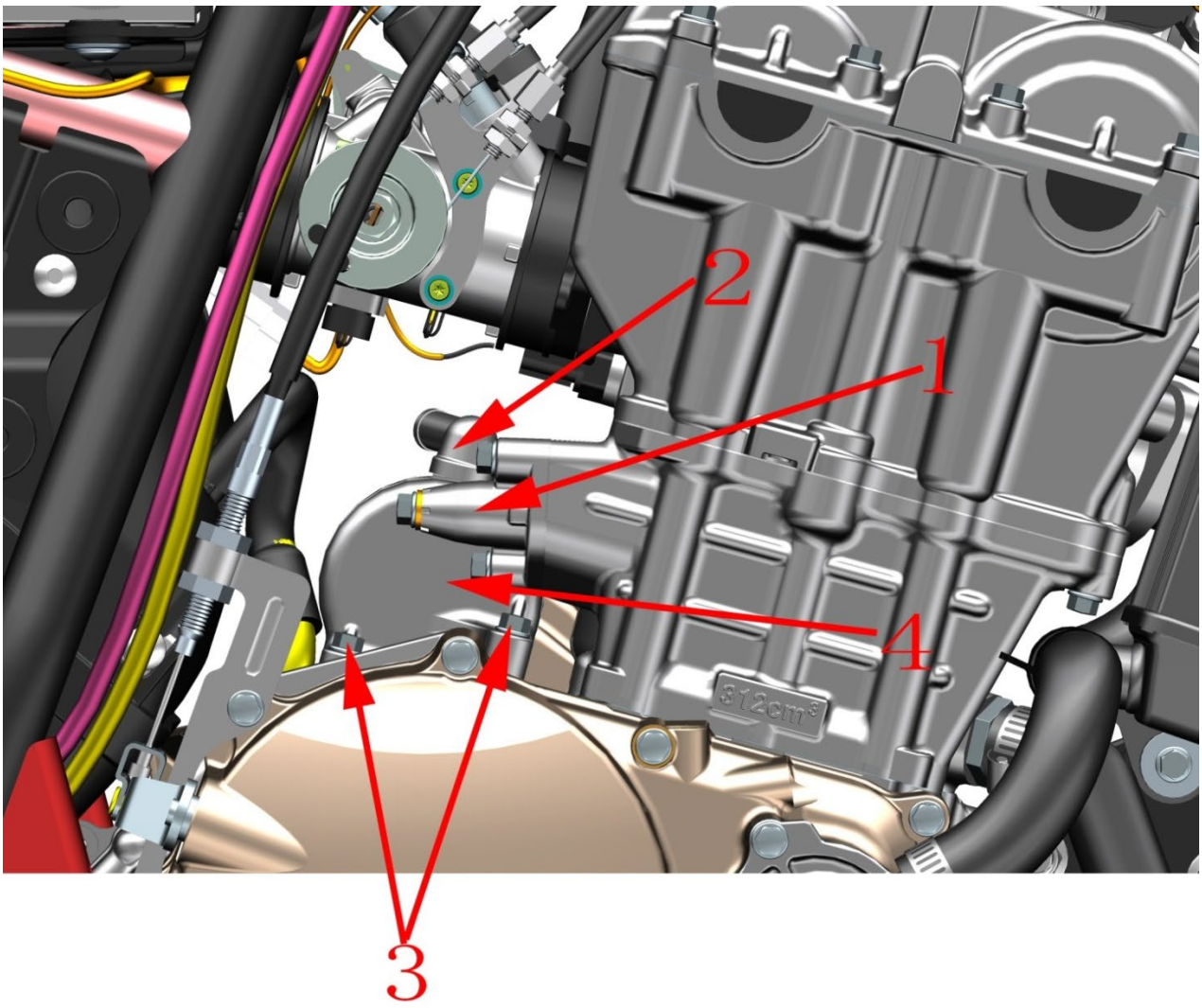
3.Install the pressure gauge.

4.Measure the compression pressure.
Min-Max:1300～1900KPa/1500r/min；
500～900KPa/540r/min.
a.Turn the throttle to the maximum position and use the starting motor to drive the engine to rotate until the reading on the pressure gauge stabilizes.
Caution: Remove the fuel injector before starting the engine.
b. If the compression pressure is above the maximum, check the cylinder head, valve surface and piston top whether there are carbon deposits. If there are, please clean the carbon deposits.
c.If the compression pressure is below the minimum, put a spoon of the oil into the spark plug hole and measure again.

Refer to the following conclusions:
Higher than before adding the oil : Piston ring is worn or damaged→replaced
Equal to before adding oil : Piston,Valve, Cylinder head, Gasket may be defective→replaced

5.Use spark plug special tools(16mm) install the spark plug.

Starting motor



NO.	Part name	Quantity	Remarks
1	Tensioner	1	8#T rod or socket wrench
2	Positive wire nut	1	10#wrench or socket wrench/5±1.5N.m
3	M6×30 hexagon flange bolt (environmental color zinc)	2	8#T rod or socket wrench/12±1.5N.m
4	Starter motor	1	

Disassemble the starter motor

1.Disassemble tensioner:Disassemble the M6×10 Pin bolt,Copper gasket, and disassemble two M6×30 Hexagon flange bolt.

Tip: Please refer to the "cylinder head" for details.

2.Lift the rubber cap of the starter motor positive pole, remove the positive wire nut and remove the gasket and positive wire.

3.Disassemble the two M6×30 Hexagon flange bolts(3) on the fixed starter motor.

4.Remove the starter motor.

Tip: When it is difficult to remove, use a rubber hammer to knock gently the starter motor out.

Install the starter motor:

1.Check if the shaft rotation of the starter motor is flexible.

(If it is not flexible, replace the starter motor.)

2.Install the starter motor:

Align the head of the starter motor with the left cover hole and shake it gently until the two bolt holes of the starter motor are aligned with the threaded holes on the case.

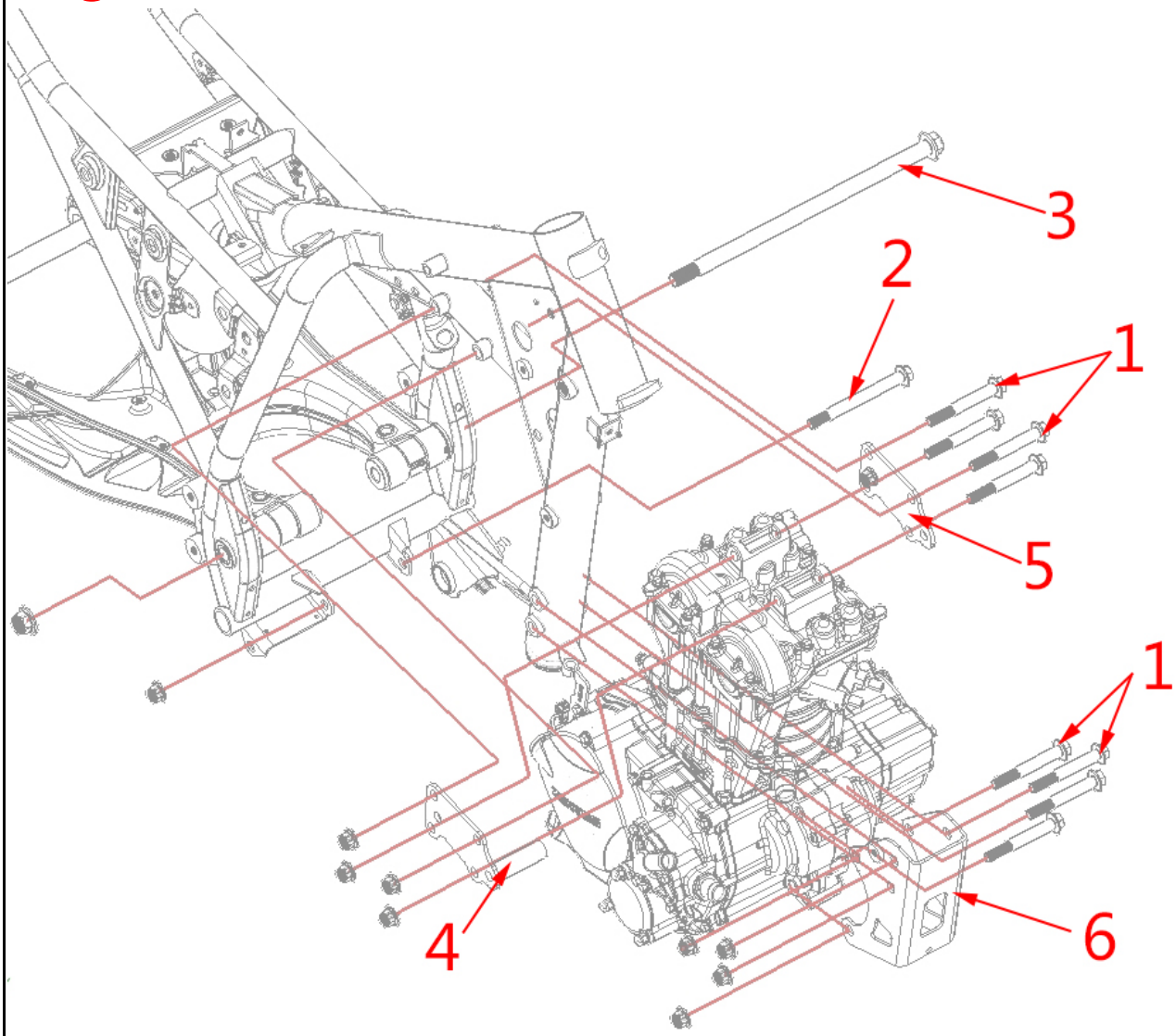
3.Install the starter motor negative wire as shown in figure.

4.Install the starter motor positive wire,gasket and nuts.

5.Install the tensioner

Tip:For detailed steps, please refer to "Cylinder Head → Install Tensioner"

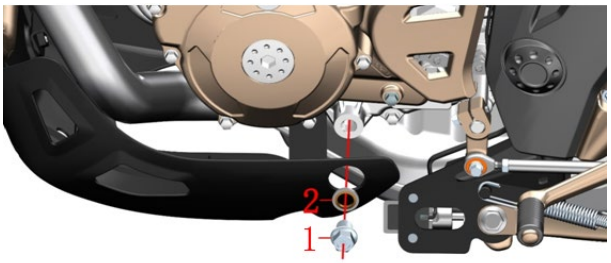
Engine



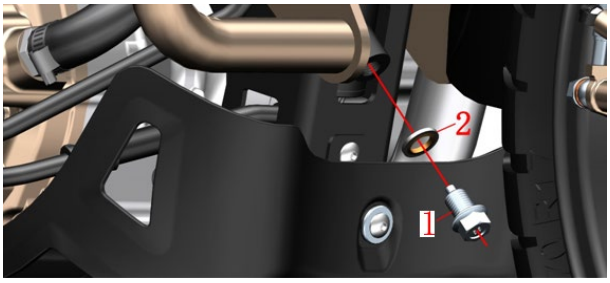
NO.	Part name	Quantity	Remarks
1	Non-standard bolt M10×1.5×80（Dacro）	8	14#socket wrench/65±5N.m
2	Non-standard bolt M10×1.5×112（Dacro）	1	
3	Rear forkφ14×310（Dacro）	1	19#socket wrench/110±5N.m
4	Right upper hanging piece	1	
5	Left upper hanging piece	1	
6	Bracket	1	

Disassemble the engine:

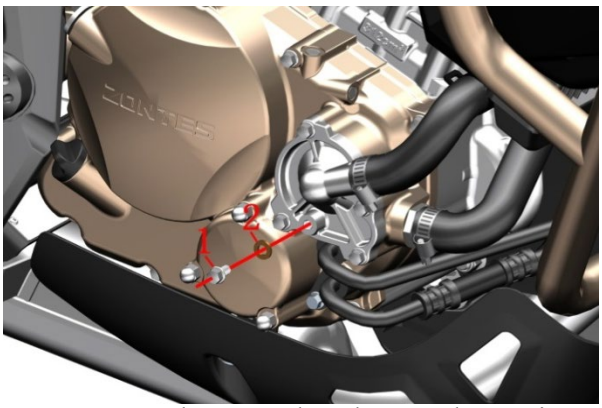
1.Remove the oil drain bolt on the left crankcase of the engine and release all the oil in the engine.



2.Remove the oil drain bolt on the frame, and release all the oil in the frame.



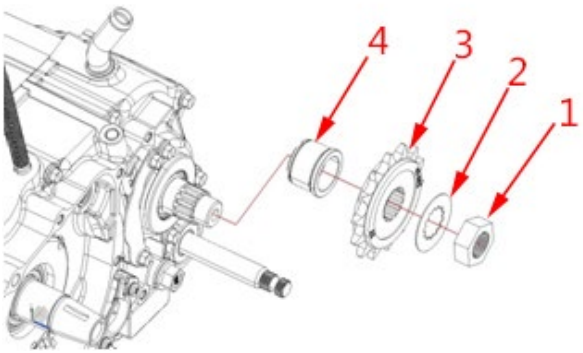
3.Remove the water drain bolt on the water pump cover to allow the coolant to flow out automatically. When the water flow becomes small, open the right tank cover and release all the coolant inside the engine.



4.Loosen: Use the wrench to loosen the engine mounting bolts (upper hanging pieace, bracket, rear fork shaft), and then remove the upper hanging piece fixing bolt 1, bracket fixing bolt 1, frame bolt 2, rear fork shaft bolt 3 and then remove the engine.

5.Use a flat-blade screwdriver to knock the locking piece 2 flat, loosen and remove the locking nut 1, the locking piece 2, the output sprocket 3, and the sleeve 4. (Lock nut torque: 95±5N.m)

Tool : 27# socket wrench



Install the engine:

1.When install the engine,the bolts are installed in the same order as they were removed, tightened in turn, and the torque wrench is used to verify all bolt torques.

2.Install the oil drain bolts on the left crankcase and frame, water drain bolt on the water pump cover.

Note：oil drain bolt：25±4N.m；

Water drain bolt：12±1.5N.m.

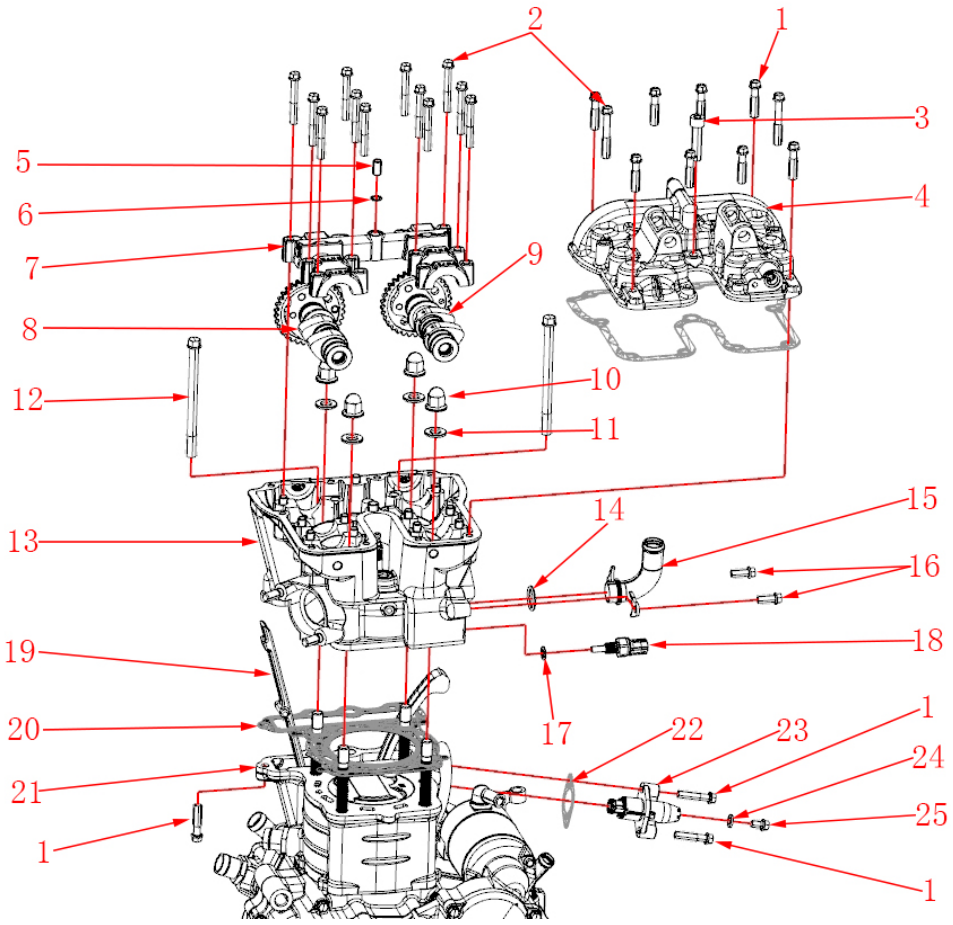
3.Add 1600mL from the right crankcase cover of the engine (1700mL if the oil filter is replaced) and API SM or higher oil with the viscosity of SAE10W-40 or SAE10W-50.

4.Add coolant to the right tank until it is full.

5.Starting the engine for 8 to 10 seconds and then turn it off.

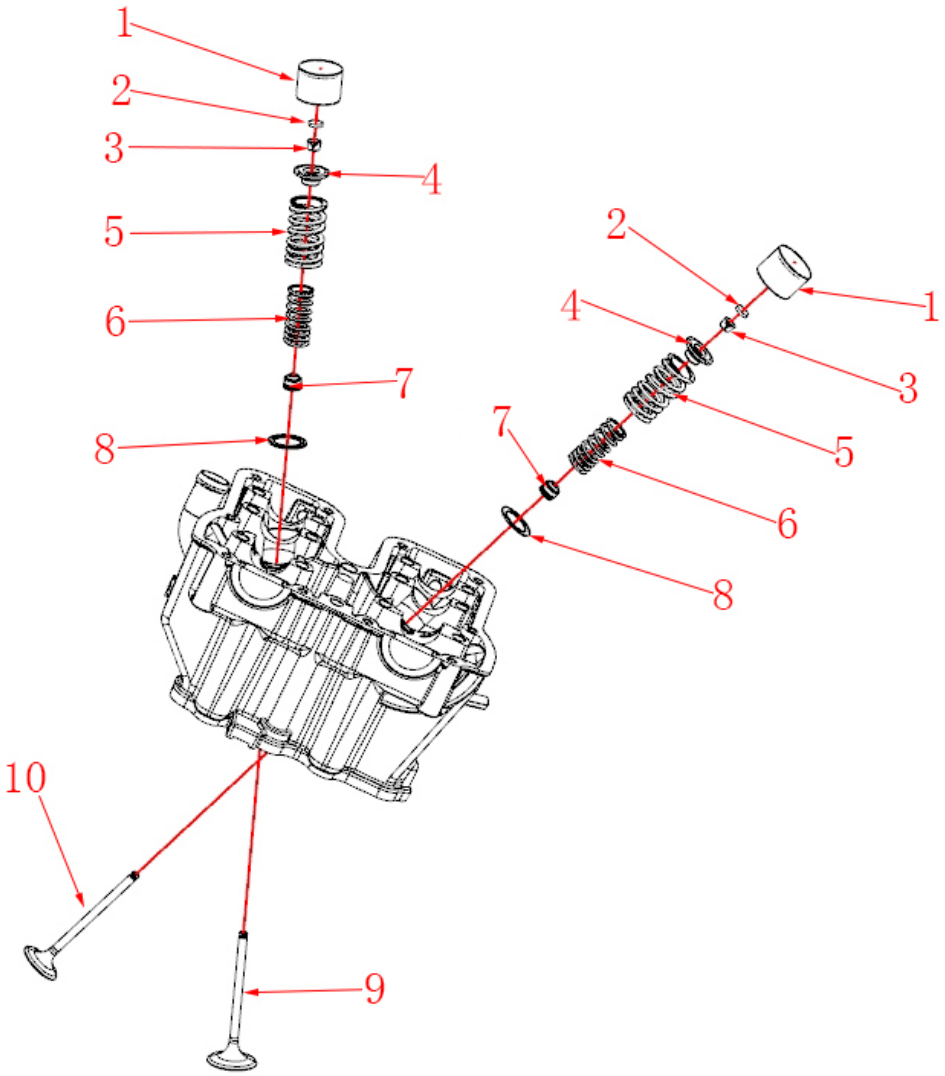
6.Add coolant to the right tank again until it is full. Add coolant to the sub tank until the coolant level remains between the F and L lines.

Cylinder head



NO.	Part name	Quantity	Remarks
1	M6×30 Hexagon flange bolt（environmental color zinc）	11	8# T rod/12±1.5N.m
2	M6×45Hexagon flange bolt（environmental color zinc）	14	6#hex socket/21±2N.m
3	GB70.1Inner hexagon M8×35（environmental color zinc）	1	21±2N.m
4	Cylinder head cover subassembly	1	
5	φ8×14 Hollow locating pin	14	Includes 12 camshaft cover
6	7.5×1.5 Fluorine rubber O-ring	1	
7	Camshaft seat cover	5	
8	Camshaft seat cover	1	
9	Intake camshaft subassembly	1	
10	M10×1.25 Cap flange nut (12 grade / black oxide)	4	14#socket wrench and the torque wrench /60±
11	10.3×20×2 Gasket	4	
12	M8×110 Hexagon flange 9.8 bolt(environmental color zinc)	2	10#T rod/20±2N.m
13	Cylinder head sub-assembly	1	
14	18×2.65 EPDM O-ring	1	
15	Outlet pipe subassembly	1	
16	M6×16 Hexagon flange bolt	2	8# T rod /12±1.5N.m
17	9×2 EPDM O-ring	1	
18	Water temperature sensor	1	17# T rod /13±1.5N.m
19	Guide strip	1	
20	Cylinder head gasket	1	
21	Cylinder block	1	
22	Tensioner gasket	1	
23	Tensioner	1	
24	6.3×12×1.6 Copper gasket	1	
25	M6×10 Top pin bolt（environmental color zinc）	1	8# T rod /12±1.5N.m

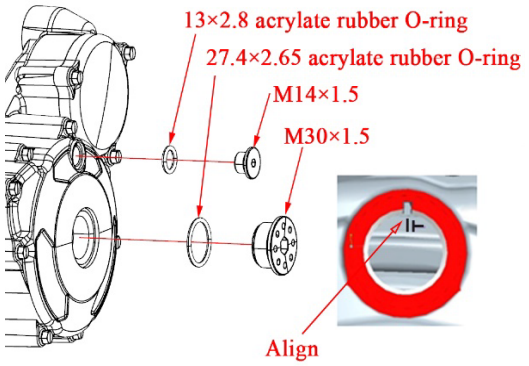
Cylinder head valve assembly



NO.	Part name	Quantity	Remarks
1	Sliding tappet	4	When disassembling the valve, the removed four sets of valves should be marked separately so that they can be returned to their original positions.
2	Valve clearance adjustment pad	4	
3	Valve lock clip	4	
4	Valve spring upper ring	4	
5	Valve outer spring	4	
6	Valve inner spring	4	
7	Valve stem oil seal	4	
8	Valve spring seat	4	
9	Intake valve	2	
10	outtake valve	2	

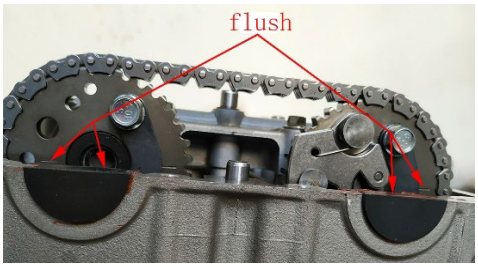
Disassemble Camshaft

1.Remove the cylinder head cover,M30×1.5 aluminum screw plug, M14×1.5 screw plug, 27.4×2.65 acrylate rubber O-ring,13×2.8 acrylate rubber O-ring.(5#、10# hex socket).



Note:The cylinder head cover bolts must be uniform diagonal unscrewed.

2.Turn the crankshaft counterclockwise to align the line before the "T" mark on the magneto motor with the midline of the M14×1.5 screw plug hole. At this time, the engraved line on the intake camshaft and the exhaust camshaft timing sprocket should be Cylinder head assembly surface flush.



3.Remove the tensioner.

4.Loosen the camshaft seat cover bolt evenly diagonally and remove the camshaft seat cover and camshaft.

Note: a. The seat cover positioning pin should be placed back to the corresponding position of the cylinder head and cannot be misplaced.

b. First remove the intake camshaft and then remove the exhaust camshaft.

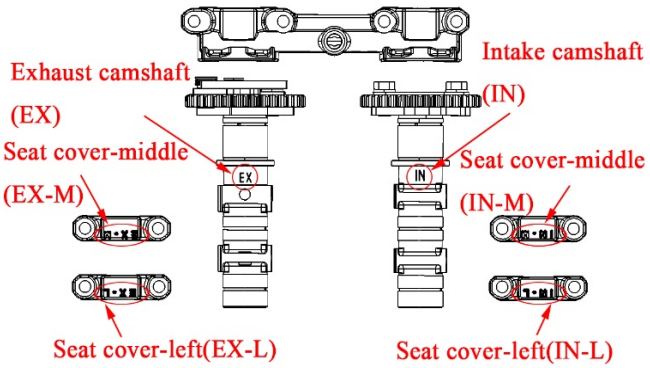
Check the crankcase

1.Check the intake camshaft, the journal of the exhaust camshaft and the base circle of the camshaft whether is Intact respectively. If there is wear or corrosion, replace the defective camshaft.

Install the crankcase

1.Tighten the timing chain and turn the crankshaft counterclockwise to the compression top point. At this time, observe the threaded hole and the front line of the magnet on the rotor with the "T" mark and the M14×1.5 screw hole on the left crankcase cover. Align the center line of the marking groove, install the camshaft as shown in Figure 2, install the camshaft seat cover at the corresponding position, and evenly tighten the cover bolts diagonally.

2.Marks on the camshaft and seat cover:"IN"means intake,"EX"means out take,"L"means left,"M"means middle.



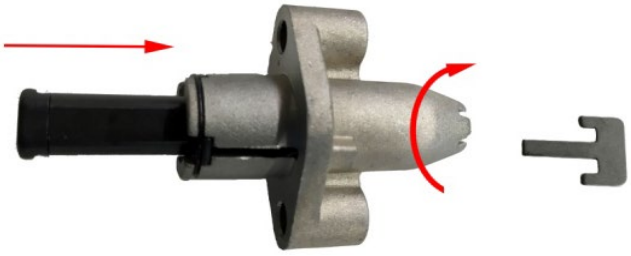
Note:a. Apply a proper amount of oil to the base of the sliding tappet, camshaft neck, cam journal and camshaft.

b. Install the exhaust camshaft first, then install the intake camshaft.

c. The camshaft seat cover bolts must be evenly tightened diagonally, otherwise the cylinder head, camshaft seat cover and camshaft will be damaged.

Install the tensioner:

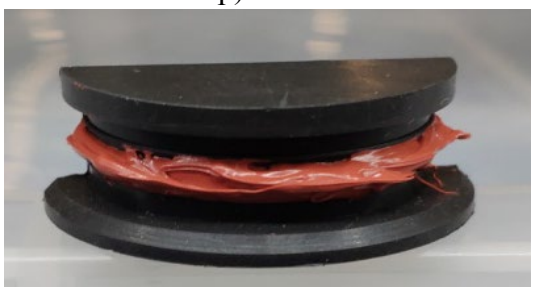
1.Loosen and remove the M6×10 pin bolt (25), press the tensioner ejector lever by hand, insert the tensioner from the back threaded hole with a flat-blade screwdriver, and tighten the tensioner screw clockwise until the ejector Self-locking. Insert the tensioner gasket, install the tensioner and gasket into the cylinder tensioner installation position, screw in and tighten the two M6×30 hex flange bolts (1), and twist it counterclockwise with a slotted screwdriver. The tensioner screw to the ejector pin automatically pops up against the tension bar, screw in the bolt (25) (with copper pad) and tighten to 12N.m.



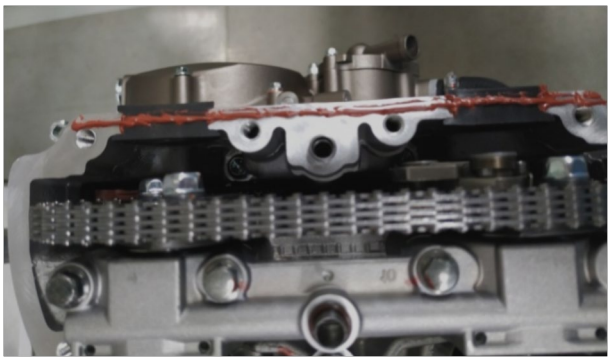
2.Rotate the crankshaft two times until the scribe line before the “T” mark on the magneto rotor is aligned with the center line of the M14×1.5 screw plug mark groove on the left crankcase cover. At this time, the scribe line and cylinder on the camshaft timing sprocket the head assembly surface is flush.

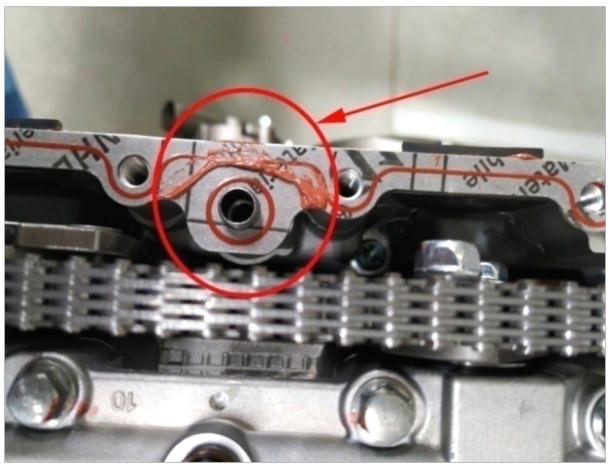
Assemble the cylinder head cover

1Assemble the cylinder head seal cap(As picture shown, evenly apply heat-resistant plane seal silica gel around the seal cap).



2.Assemble the new gasket of cylinder head cover (As picture shown, before assembling the new gasket ,it should be evenly applied heat-resistant plane seal silica gel around the new gasket).



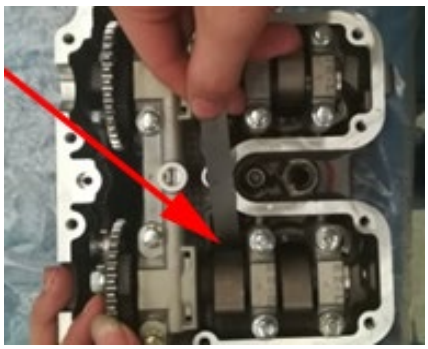


3.Assemble the cylinder head cover, the cylinder head bolts must be diagonally uniform and tightened to the specified torque.

Valve clearance:

1.Measuring the valve cleanrance:Remove the cylinder head cover,Insert the feeler gauge between the camshaft base circle and the sliding tappet to measure the valve clearance.

Note:Make sure that the measured value is the gap between the camshaft base circle and the sliding tappet



2.Adjust valve clearance

a.Remove the camshaft,remove the adjustable gasket between sliding tappet and valve clearance.

b.Replace the valve clearance adjustable gasket according to the difference between the measured value of the valve clearance and its standard range.

Valve clearance standard range:

Intake valve clearance：0.13mm～0.20mm；

Outtake valve clearance：0.20mm～0.30mm.

Note:The sliding tappet and the valve clearance adjusting pad are in one-to-one correspondence with the respective valves, and cannot be misplaced.

Disassemble the camshaft

1.Remove the camshaft, loosen the bolts (M6×30), bolts (12), and nuts (10) on the cylinder block in sequence, and remove the cylinder head, guide bar, and cylinder head gasket.

Note: The nut (10) must be loosened evenly diagonally, and each nut is loosened by 1/3 each time, and all nuts are removed after they have been completely loosened.

Install the cylinder head

1.Install the new cylinder head gasket.

2.Install the guide strip.

3.Install the cylinder head, tighten the nut (10) diagonally in 3 times with a fixed torque wrench, tighten the bolt (12), and finally tighten the bolt (M6×30) on the cylinder block. Nut (10) 3 times torque:

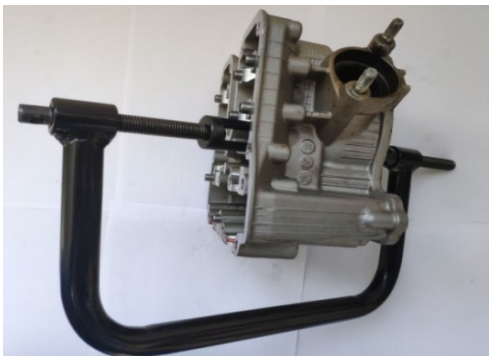
First time: 25N.m; second time: 45N.m;

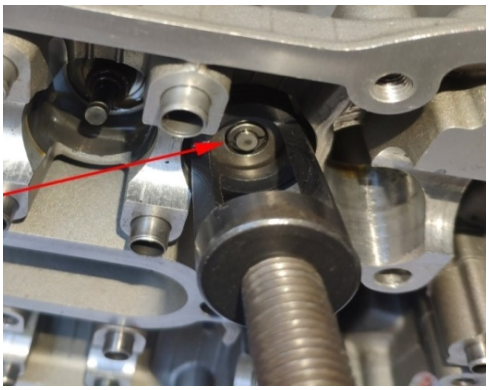
Third time: 60N.m.

Torque wrench(the range more than 60N.m)

Disassemble the valve:

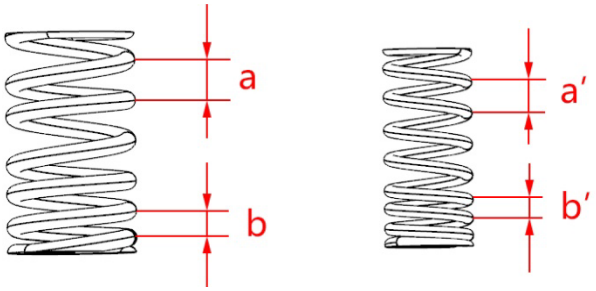
1.Remove the sliding tappet and valve clearance adjustable gasket,use valve disassembler to squeeze valve spring,disassemble the valve lock clip,remove the valve spring upper ring, valve outer spring, valve inner spring, oil seal, valve spring seat and valve in turn. Tips:Mark each component of the valve to ensure they can be installed in their original position.



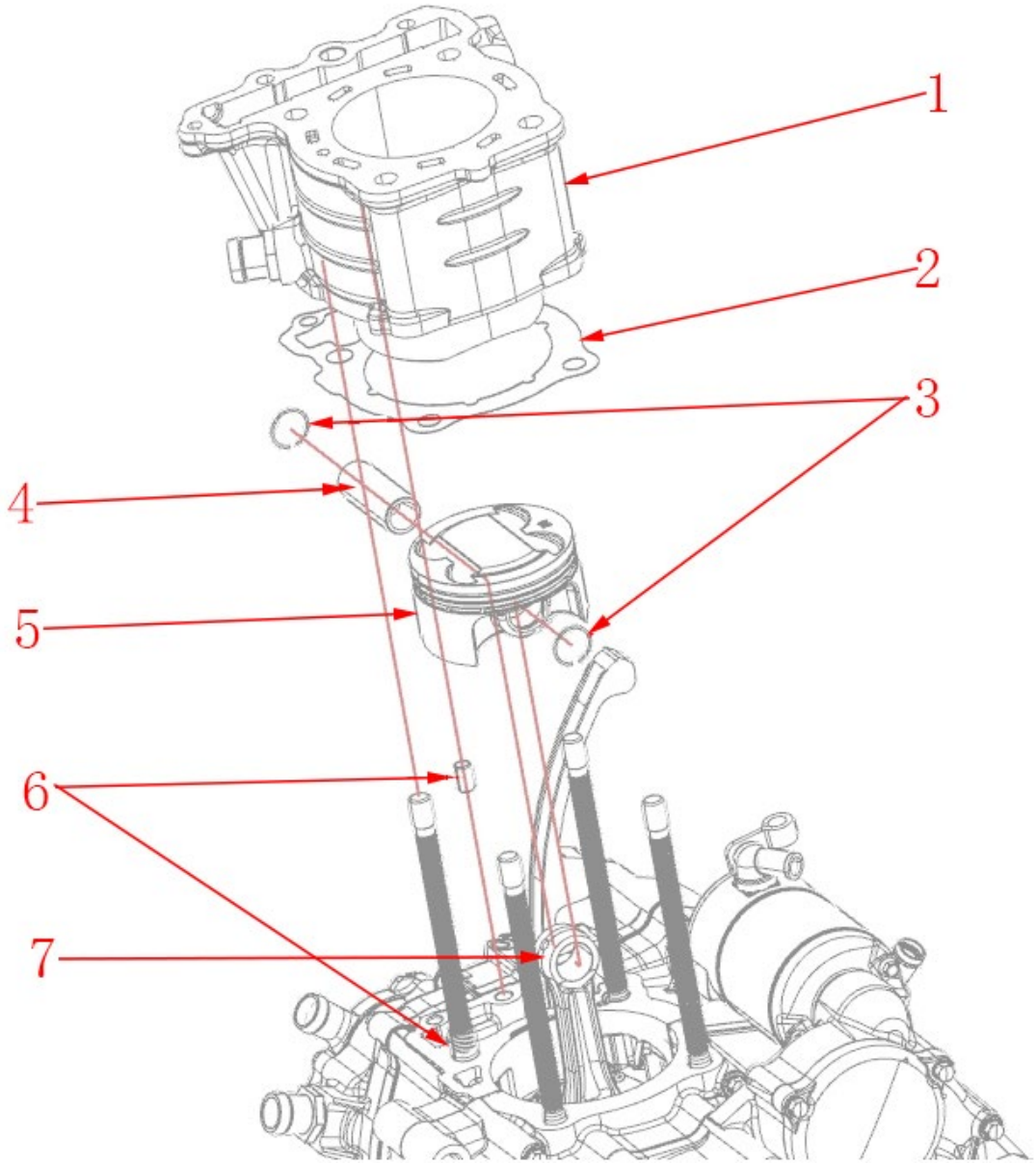


Install the valve

1.Install the valve ,valve spring seat,oil seal,valve inner spring, valve outer spring,valve spring upper ring,compressing the valve spring with a valve disassembler,install the upper valve lock clip,install the valve clearance adjustable gasket and sliding tappet. Note:The ends of the "b" and "b' " with denser valve spring spacing are mounted downward.



Cylinder piston



NO.	Part name	Quantity	Remarks
1	Cylinder sub-assembly	1	
2	Box cylinder gasket	1	
3	Piston pin retaining ring	2	The retaining ring must be fully assembled into the slot
4	Piston pin	1	
5	Pitson	1	
6	φ8×14 Hollow positioning pin	1	
	Locating pin 12×20	1	This positioning pin is not removed
7	Connecting rod	1	

Disassemble cylinder and piston

1.Pull the cylinder softly,and hold the piston and connecting rod with your hand.

2.Rotate the opening of the piston pin retaining ring to the vicinity of the notch of the retaining ring groove, remove it with a needle-nose plier, push the piston pin out of the small hole of the connecting rod, and remove the piston.

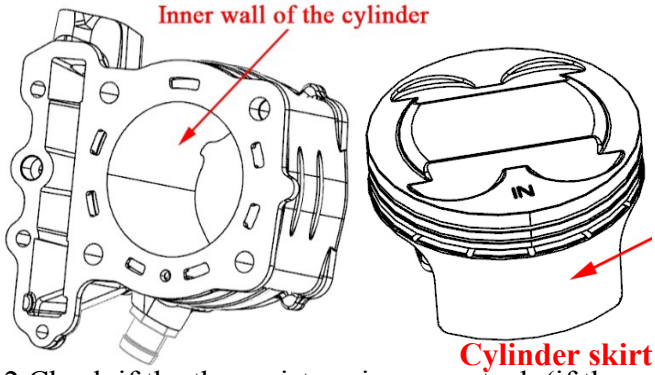
Note:Prevent the piston pin retaining ring from falling into the inside of the cabinet.

3.Remove box cylinder gasket.

Check the cylinder and piston

1.Check the inner wall of the cylinder and the skirt of

the piston: If the inner wall of the cylinder and the skirt of the piston are obviously scratched or damaged (the surface is obviously rough by hand), the defective part must be replaced.



2.Check if the three piston rings are stuck (if they are, replace the pistons and piston rings).

Disassemble piston ring:

1.Remove the first air ring ,the second air ring and oil ring combination.

Tip:When disassemble the piton ring, open the end notch by hand and lift the other side of the ring to the top of the piston.

Install piston ring

1.Clean the piston ring groove and dust on the postion ring, apply a proper amount of oil to the piston ring groove.

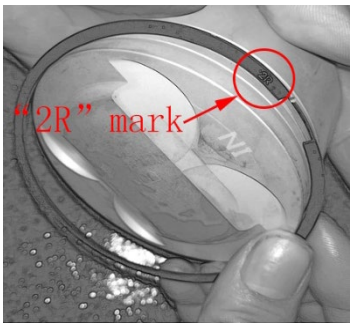
2.Insert the oil ring combination into the piston oil ring groove, first install the copper ring, and then install two scraper rings.

Note: a. The copper backing ring joints cannot overlap.

b. The copper lining ring is between the two squeegee rings, and the opening of the two squeegee rings should be offset from each other by 120-180°.

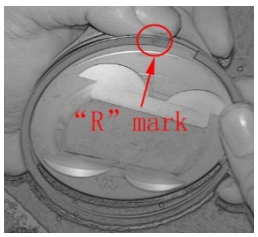
3.Install the second air ring into the piston ring groove.

Note: The “2R” mark is mounted towards the top of the piston.



4.Install the first air ring into the piston ring groove.

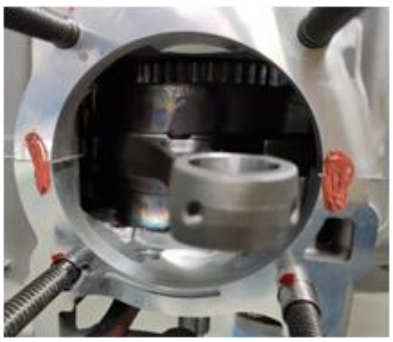
Note: The “R” mark faces the top of the piston.

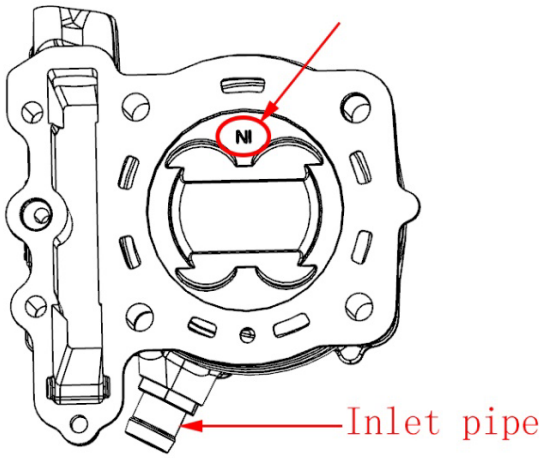


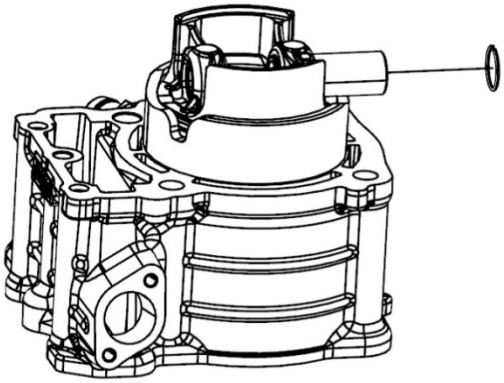
Install the cylinder and piston

1. Assemble the new box cylinder gasket.Ensure that the assembly plane of the cylinder body is smooth before installing the new gasket of the box body and apply a heat-resistant plane seal silica gel around the new gasket,after installing the new gasket, apply appropriate amount of heat-resistant plane sealing silica gel on the new gasket).

2.Insert the piston head into the cylinder skirt with the "IN" mark side facing the rear side of the cylinder (reverse of the inlet pipe). The piston ring should be properly installed in the cylinder and must not come out of the ring groove.The piston pin holes are all exposed to the cylinder skirt.







Note:

a. Pistons and cylinders are grouped into A.B.C.D four groups,the pistons and cylinders assembled together must be in the same group,e.g:Piston in A group just only be assembled into cylinder in A group.If there need to replace the piston,the selected piston group should be consistent with the original cylinder group.

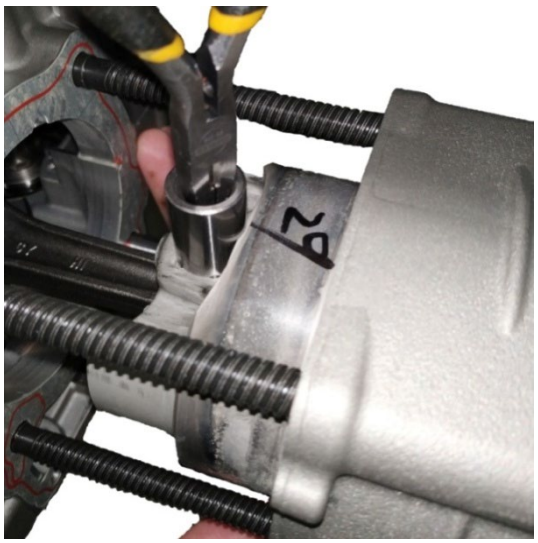
b.The position of each piston ring opening cannot overlap, and the two are offset by 120°.

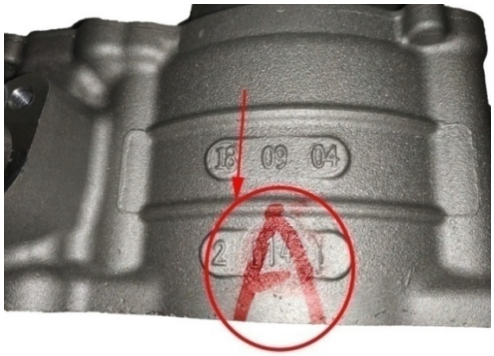
c.Apply a proper amount of oil to the inner wall of the cylinder.

3.Install the piston pin

Push the cylinder piston pre-assembly to the side of the box, align the pin hole of the piston with the small end hole of the connecting rod, and insert the piston pin into the pin hole of the piston and the small end hole of the connecting rod.

Note: Apply a proper amount of oil to the piston pin.





4.Install the piston pin retaining ring into the corresponding retaining ring groove and turn the opening to a position offset from the slot notch by 120° to 180°.

Note:

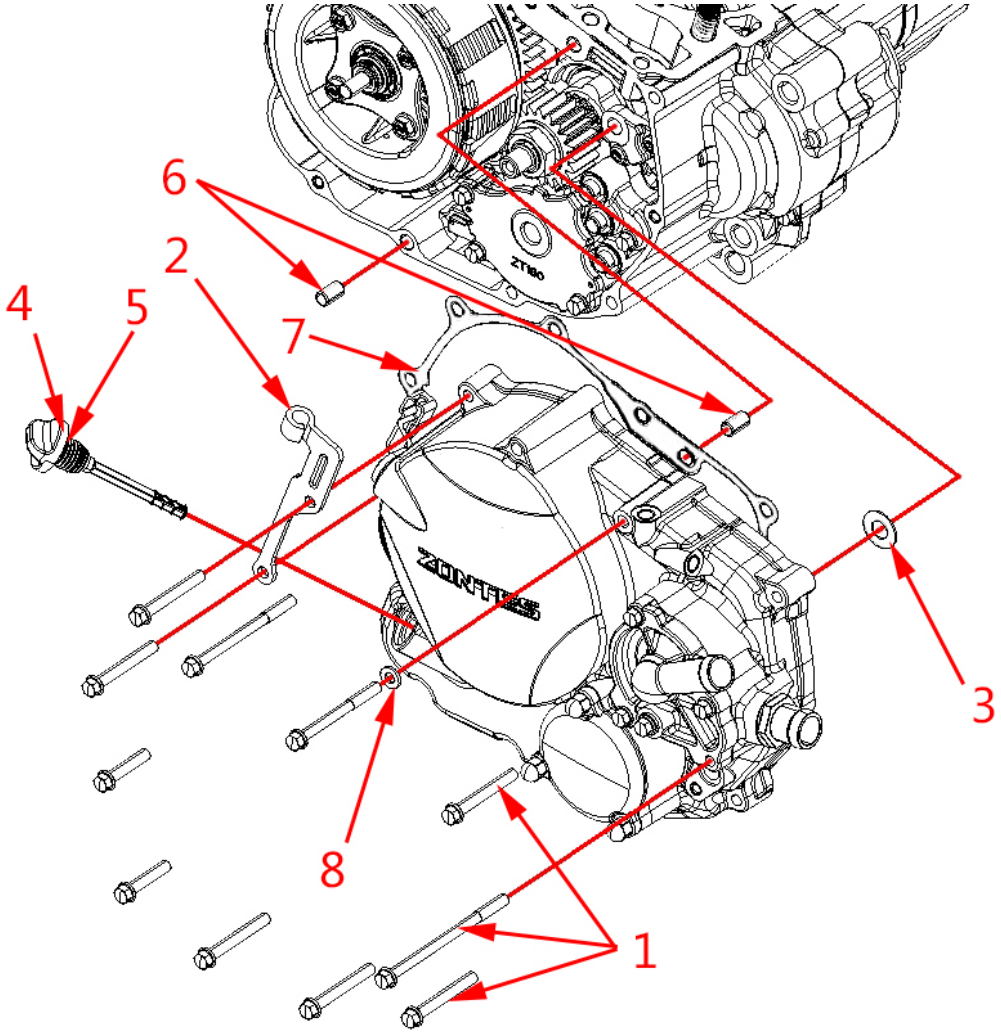
a. Check the piston pin retaining ring. If there is deformation or no elastic force, it must be replaced.

b. Prevent the piston pin retaining ring from falling into the inside of the box.

c. The retaining ring must be fully assembled into the slot.

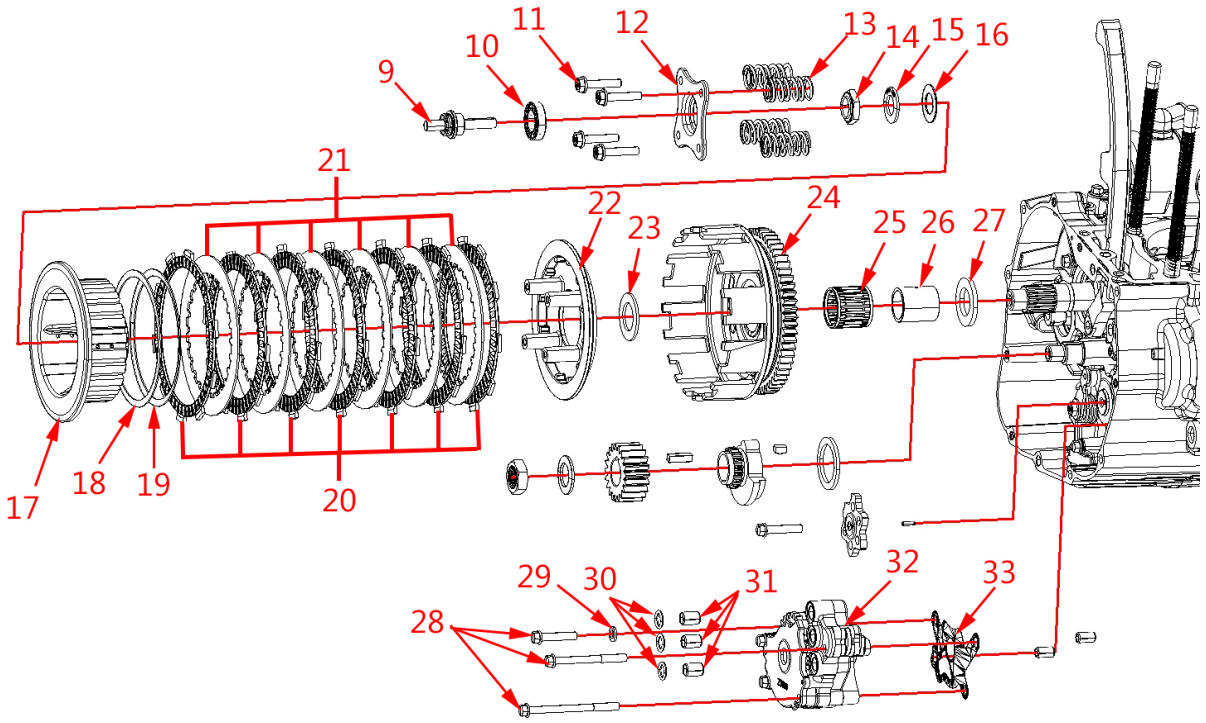
d. After the two side retaining rings are installed, the piston pin should have an axial clearance.

Right crankcase cover

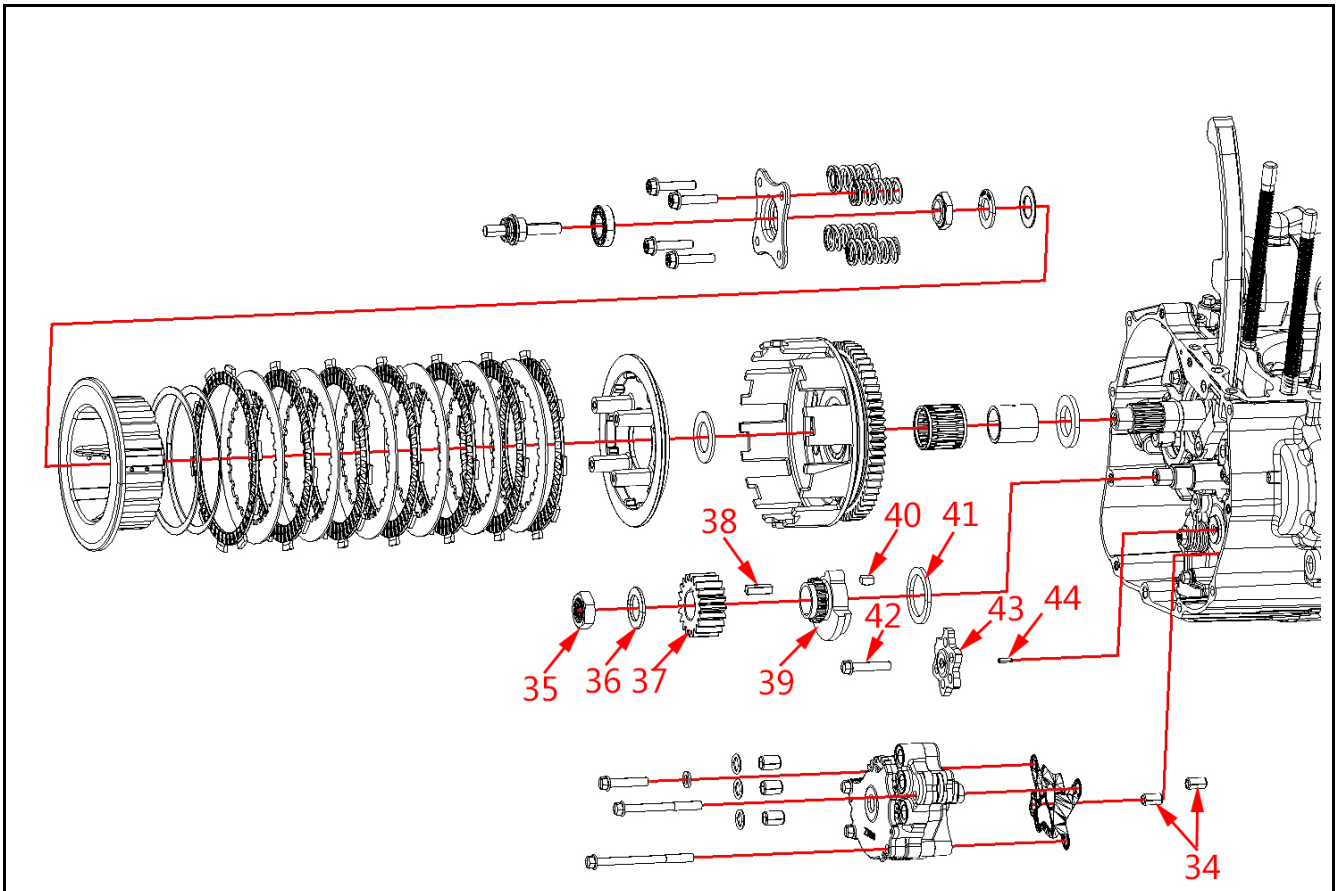


NO.	Part name	quantity	Remarks
1	M6×30 Hexagon flange bolt (environmental color zinc)	2	8# T rod or socket wrench Preload 5±1N.m， Correction force 12±1.5N.m
	M6×45 Hexagon flange bolt (environmental color zinc)	6	
	M6×60 Hexagon flange bolt (environmental color zinc)	1	
	M6×75 Hexagon flange bolt (environmental color zinc)	1	
	M6×90 Hexagon flange bolt (environmental color zinc)	1	
2	Clutch cable bracket	1	
3	10.2×21×1 Thrust washer	1	
4	Dipstick	1	
5	15×3.1 Acrylate rubber O-ring	1	
6	φ8×14 Hollow locating pin	2	
7	Right crankcase cover gasket	1	
8	6.3×12×1.6 Copper gasket	1	

Clutch, oil pump

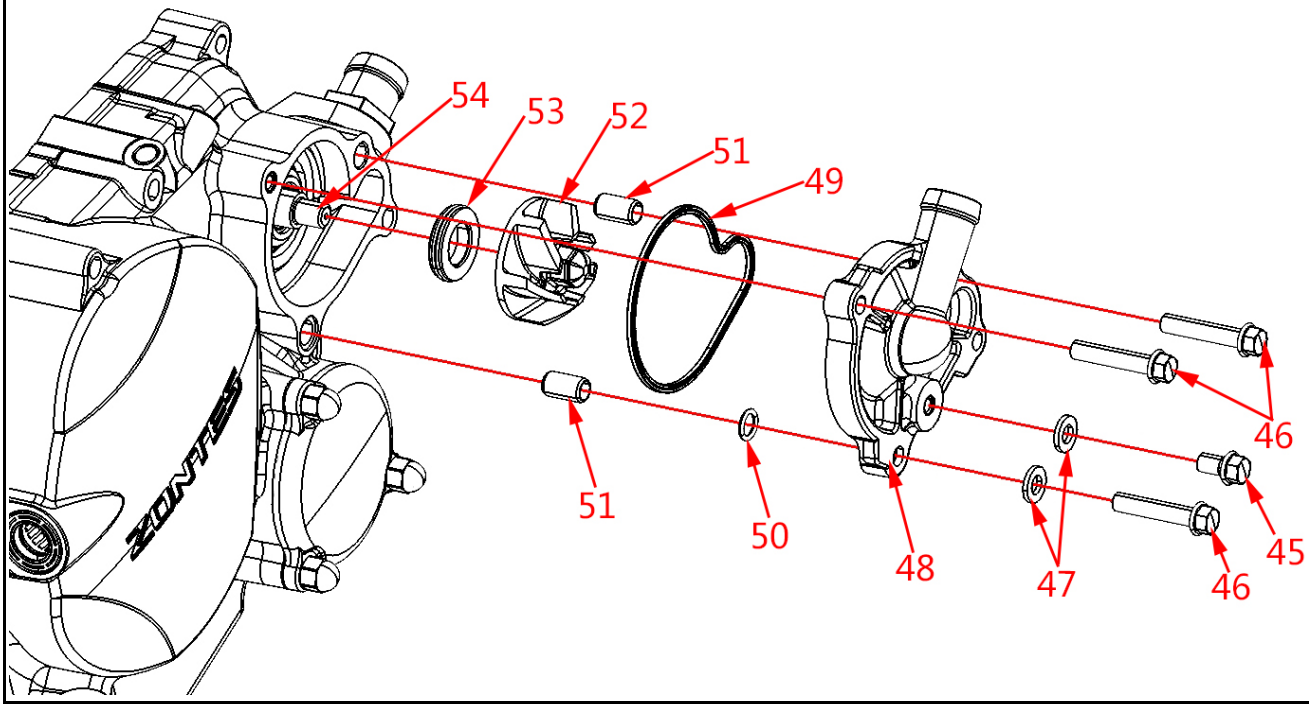


No.	Part name	Quantity	Remarks
9	Clutch release ejector bushing assembly	1	
10	GB276－61903 Deep groove ball bearing	1	
11	M6×30 Flange face full screw bolt (9.8 grade / environmental protection color zinc)	4	10# T rod or socket wrench /12±1.5N.m
12	Clutch lift plate	1	
13	Clutch spring	4	
14	M16×1 Hexagonal thin nut (oxidized black)	1	24# socket wrench/108±15N.m
15	16.2×28×2.4×2 Lock washer	1	
16	16.2×30×1 Thurst washer	1	
17	Clutch disc	1	
18	96.3×107×1 Thurst washer	1	Flat pad
19	96.5×107×2.2×1 Lock washer	1	Dish washer
20	Friction plate subassembly	1	7 pieces, the larger inner hole and is assembled on the outermost side.
21	125×1.5 Clutch follower	6	
22	Clutch pressure plate	1	
23	22.2×37×2 Thurst washer	1	
24	Clutch active disc subassembly	1	
25	K27×32×29.3 Needle bearing	1	
26	Clutch bushing (homemade)	1	
27	Clutch bushing thrust pad	1	
28	M6×30 Hexagon flange bolt (color zinc)	1	8# T rod or socket wrench /12±1.5N.m
	M6×60 Hexagon flange bolt (color zinc)	1	
	M6×75 Hexagon flange bolt (color zinc)	1	
29	6.3×12×1.6 Copper gasket	1	
30	9.8×2.5 Acrylate rubber O-ring	3	
31	φ10×14 Hollow locating pin	3	
32	Oil pump subassembly	1	
33	Oil pump cushion	1	



NO.	Part name	Quantity	Remarks
34	φ8×14 Hollow locating pin	2	
35	M18×1.0 Hexagonal thin nut (10 grade / black oxide)	1	24# socket wrench/1108±15N.m
36	18.2×30×2.5×2 Lock washer	1	
37	Primary drive gear	1	
38	5×5.5×19.2 Ordinary flat key	1	
39	Counterweight timing sprocket	1	Matches the number of slices in the timing chain
40	5×5.5×26×9 Semicircle key	1	
41	Crankshaft right bearing limit retaining ring	1	
42	M6×30 Hexagon flange bolt (environmental color zinc)	1	8# T rod or socket wrench/12±1.5N.m
43	Shift star cam	1	
44	GB119.2φ3×10 Cylindrical pin	1	

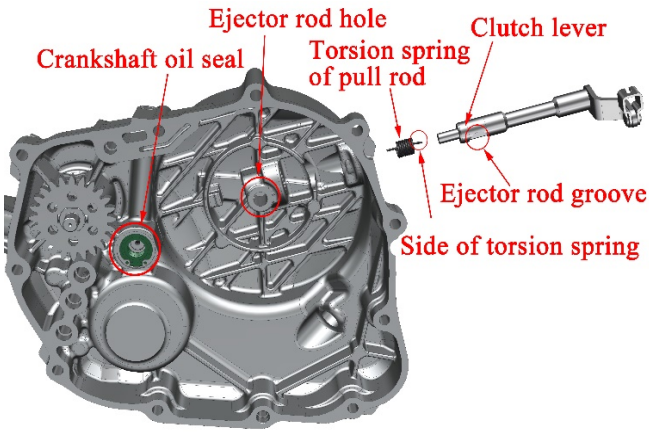
Water pump



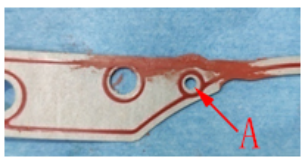
NO.	Part name	Quantity	Remarks
45	M6×16 hexagon flange bolt (color zinc)	1	8# T rod or socket wrench /Preload 5 ±1N.m,Correction force 12±1.5N.m
46	M6×30 hexagon flange bolt (color zinc)	3	
47	6.3×12×1.6 Copper gasket	2	
48	Water pump cover（Titanium）	1	
49	Water pump seal ring	1	
50	7.5×1.5 Fluorine rubber O-ring	1	
51	φ8×14 Hollow locating pin	2	
52	Water pump	1	12# T rod or socket wrench /20±1.5N.m
53	Water seal ring	1	
54	Pump shaft	1	

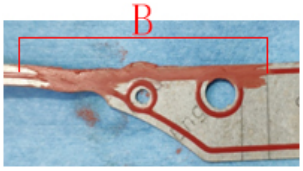
Disassemble right cover

1.Loosen the right crankcase cover bolt 1 diagonally, remove the bolt 1, the cable bracket 2,right crankcase cover,Thrust washer 3,paper washer and locating pin. Note:Before removing the right crankcase cover, the engine is tilted down to prevent the wateproof pump shaft thrust washer 3 from falling off. **Install the right cover** 1.Check the crankshaft oil seal:Demaged/Inner ring hardened--replace the defective oil seal(There are two oil seals, the removed oil seals can not be used.) 2.Install the clutch lever: first insert torsion side of torsion spring into the rod hole, and then install the lever on the right cover.

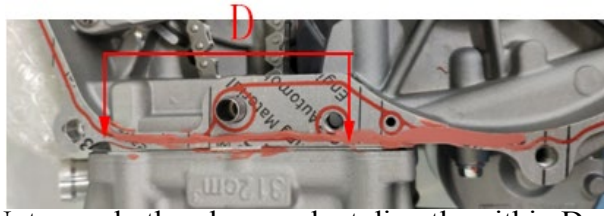


3.Install two locating pins,gasket,water pump shaft thrust washer ring 3, cover the right crankcase cover until seamless.Put in the rod bracket and right crankcase cover bolts,evenly pre-tighten bolts diagonally and verify the torque of the bolts.





Note: a.No plane sealant shall be allowed within 3mm around hole A. b. Section B sealant needs to be evenly used thin and smoothly.



Note: apply the plane sealant directly within D section area.

Disassemble the clutch

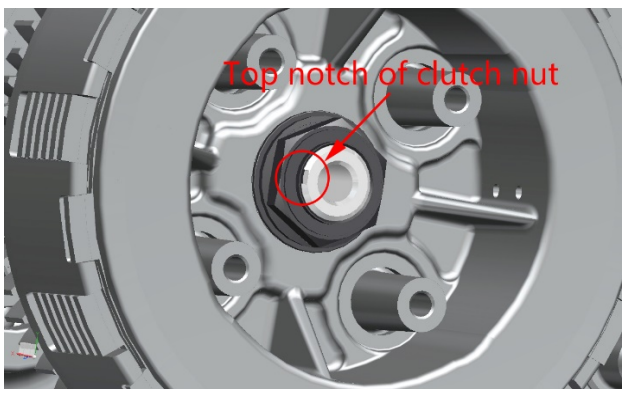
1.The jack sleeve assembly 9 is removed,the lock bolt 11 is loosely released diagonally and remove the clutch lift plate 12,clutch spring 13.

2.Fixed the clutch,loosen the clutch nut 14, remove the thrust washer ring 15,thrust washer 16, clutch driven disc subassembly,thrust washer 23 clutch active disk,needle roller bearing,clutch bushing,bushing thrust pad.

Install the clutch

1.Check the wear of the various components of clutch severely replace the defective parts.Check the clutch friction plate, if the blackening of friction plate is serio-us,replace it with a new one.Check if the 125×1.5 clutch driven follower is flat, if it is not smooth, it must be replaced.

2.Put the clutch bushing thrust washer 27,clutch bushing 26,needle bearing 25,clutch driven subassembly 24.thrust washer 23,clutch press plate 22,friction plate assembly(inludes friction plate and driven follower),96.3×107×1 thrust washer 19, 96.5×107×2.2×1 lock thrust washer 18, clutch driven plate 17, thurst washer 16, lock washer 15(Word side facing outward),clutch nut 14.Fixed clutch, lock the clutch nut and check the torque with a torque wrench.Use a rubber mallet and a flat-blade screwdriver to strike the top of the clutch nut until it is recessed at the top and fit into the locking groove on the spindle.



Note:When the friction plate is installed, the friction plate and the driven piece are separated by two, wherein the large hole friction plate is close to the driven plate side.
3.Insert 4 clutch springs into the platen studs, install the lifting plate and deep groove ball bearings, screw in 4 bolts 11, evenly lock the bolts diagonally and check the torque with a fixed torque wrench. Put the clutch release ejector bushing assembly, ensure that the split ram bearing can rotate flexibly.

Oil pump

1.Disassemble oil pump: loose the bolt, and remove three bolts 28,oil pump two locating pins and oil pump seat cushion.
2.Check oil pump:Dial the engine driven gear to check if it can rotate freely(If not, make sure replace the oil pump).
3.Check the oil seat cushion:Deformation/cracking →replacement.
4.Check O-ring:Cracking/hardening→ replacement. 5.Install the oil pump:Put two φ8 locating pins,oil pump seat cushion,oil pump,three φ10 locating pins, three O-rings,three bolts, lock the bolt and check the torque with a torque wrench. (M6×30 bolts need to be equipped with copper pads).

Primary drive gear, timing drive sprocket

1.Disassembly:Use the 17# sleeve to extend from the aluminum screw plug hole on the left crankcase cover, and fit it on the magnet motor rotor clutch M12×1.25×50 bolt to fix the crankshaft. The primary drive gear nut 35 is loosened counterclockwise with a 24# sleeve, and the lock washer 36, the primary drive gear 37, the flat key 38, the timing drive sprocket 39, the semi-circular key 40, and the limit retaining ring 41 are sequentially removed.
2.Installation:Before installation, inspect each component and abrasion – replace the defective parts. Insert the limit retaining ring, semi-circular key, timing drive sprocket, flat key, primary drive gear, lock washer, nut, lock nut and torque test with torque wrench.

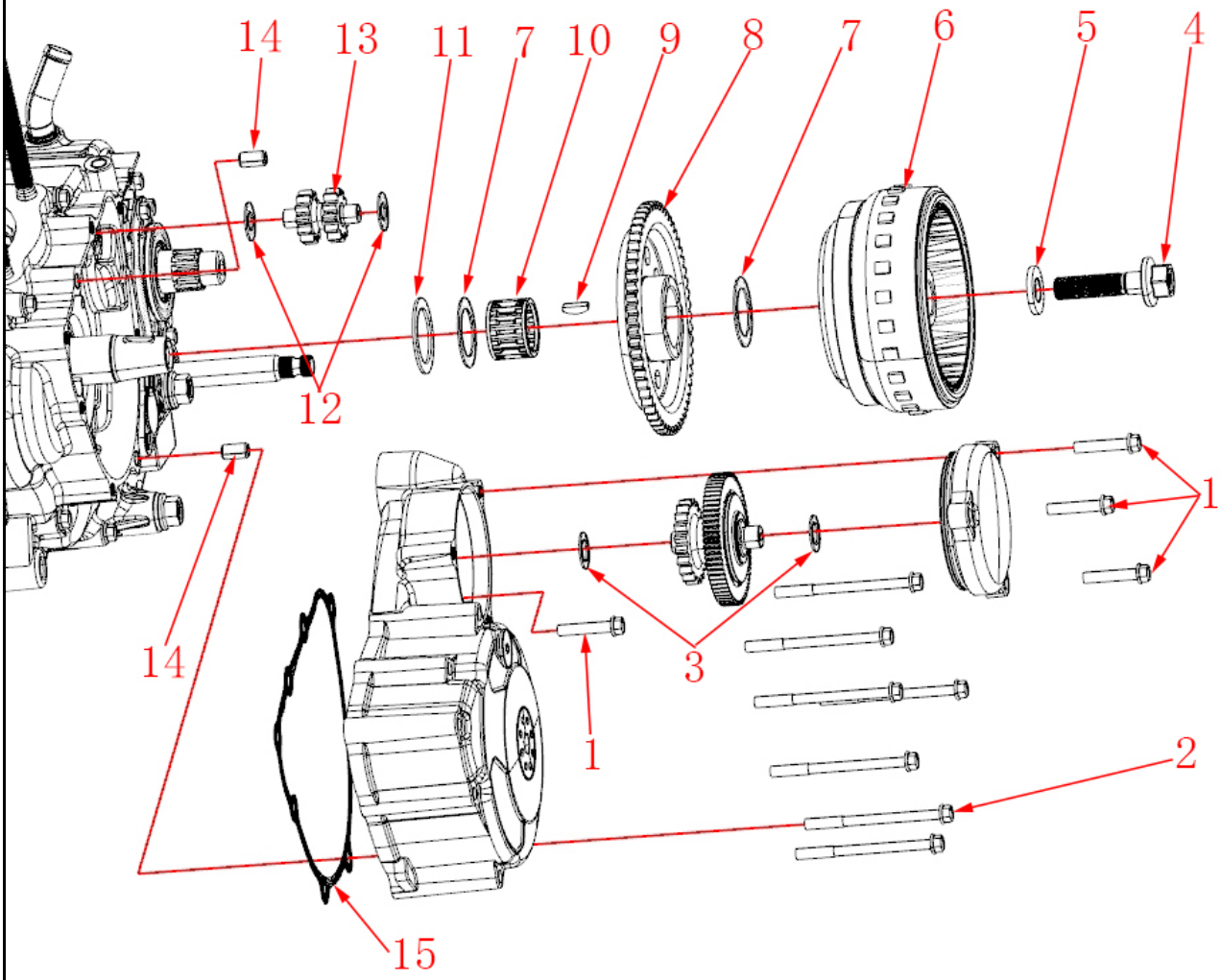
Shift star cam:

1.Diassembly:Use 8# sleeve to loosen the M6×30 bolt, and remove the shift star cam,Φ3×10 cylindrical pin.
2.Installation:Before installation,inspect each component and abrasion- replace the defective parts.Put the Φ3×10 cylindrical pin, shift star cam,bolt, tighten the bolt and check the torque with a torque wrench.Check if each gear position conversion is flexible.
Note:Place the cylindrical pin carefully and prevent the cylindrical pin from falling into the case.

Water pump

1.Disassembly:Use a 8# sleeve to loosen bolt, remove the water pump cover,water pump seal ring,two locating pins,O-ring, use a 14# wrench to catch the pump shaft from the other side ,use a 12# sleeve feed water pump,loosen and remove it.
2.Check:
O-ring:Cracking/Hardening→replacement.
Water pump seal ring:Deformation/Cracking→ replacement
3.Installation:First install the water seal ring into the water pump, apply a proper amount of silicone oil on the moving ring surface, screw the pump assembly into the pump shaft, lock the pump and check the torque (torque 20±1.5N.m). Put two positioning pins, O-rings, install the water pump seal on the water pump cover, and close the cover. Apply a proper amount of flat seal silicone to the 3 M6×30 bolts 2 threads, install 4 bolts and 2 copper washers to the corresponding positions, lock the bolts and check the bolt torque.
Note:The water seal ring faces outward and the sealing gasket does not protrude. Appropriate amount of flat seal silicone should be applied to the three M6×30 bolts.

Left crankcase cover, magneto rotor clutch



NO.	Part name	quantity	Remarks
1	M6×30 Hexagon flange bolt (color zinc)	4	8# T rod or socket wrench /12±1.5N.m
2	M6×75 Hexagon flange bolt (color zinc)	7	
3	12.2×20×1 Thurst washer	2	
4	M12×1.25×50 Hexagon flange bolt	1	17# T rod or socket wrench /103±15N.m
5	12.3×26×3 Gasket	1	
6	Magneto motor rotor clutch sub-assembly	1	Puller(bolt):M20×1.5
7	26.2×38×1Thurst washer	2	
8	Electric start large tooth	1	
9	Semicircle key	1	
10	Needle bearing	1	
11	30×42×1.4Thurst washer	1	
12	10.2×21×1Thurst washer	2	
13	Electric start bridge gear	1	
14	φ8×14Hollow locating pin	2	
15	Left crankcase cover gasket	1	

Remove the reduction gear

1.Loosen three bolts 1 on the reduction gear cover, remove the reduction gear cover and reduction gear. Tips:Prevent the upper and lower two cushion ring 3 of reduction gear from falling off.

Install the reduction gear

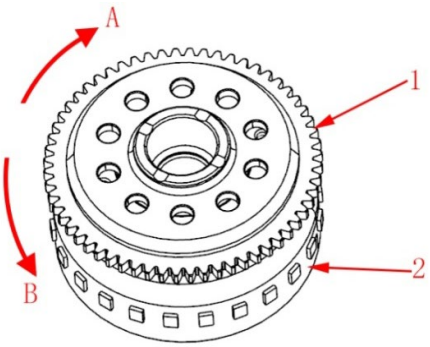
1.Check the reduction gear tooth, if there is damaged or worn, it needs to be replaced.
2.Install the reduction gear and reduction gear shaft. 3.Install the reduction gear cover and reduction gear cover bolt.
Note:There is a thrust washer 3 on the top and bottom of the reduction gear that cannot be leaked.

Disassemble the magneto-motor rotor clutch sub-assembly

1.Remove the reduction gear.
2.Remove the left crankcase cover.
3.Remove the M12×1.25×50 hexagon flange bolt(4),use the Rama to pull the magneto-motor rotor clutch sub-assembly.Remove the magneto-motor rotor 6, Thrust washer 7, Electric starter 8, Semicircle key 9,Needle bearing 10, 26.2×38×1 thrust washer7,and 30×42×1.4 thrust washer 11.
4.Remove the electric start bridge gear.
Note: There is a washer 12 on the top and bottom of the electric start bridge.

Check the magneto rotor clutch one-way device

1.Install the starting large tooth"1" on the magneto-motor rotor clutch"2" and fixed the magneto-motor rotor clutch.
2.When the clockwise A rotates to start the large tooth, the magneto rotor clutch and the starting large tooth should not slide relative to each other. Otherwise, the starting large teeth and the magneto rotor clutch parts must be replaced.
3.When turning counterclockwise B to starting large tooth, it can rotate freely, otherwise the magneto rotor clutch is faulty and must be replaced.

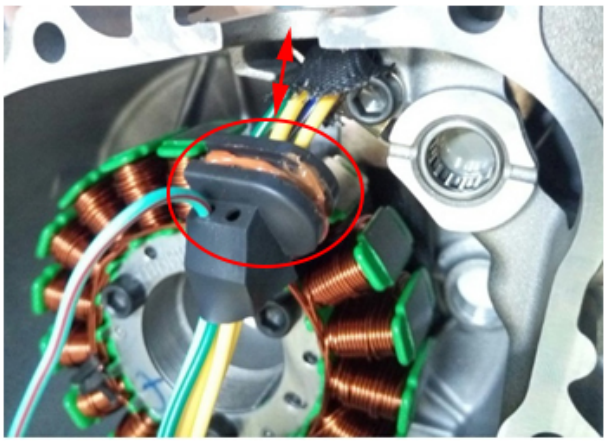


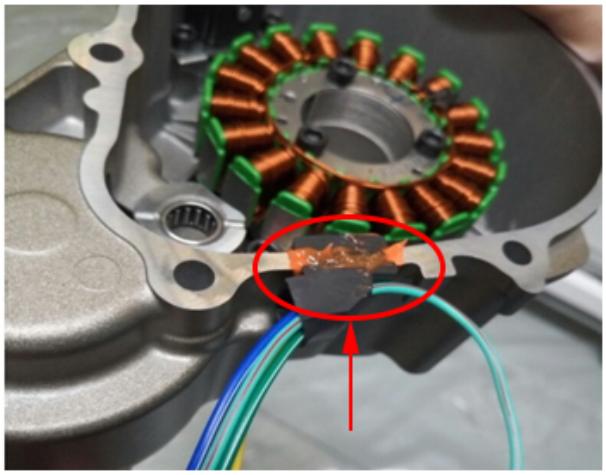
Install the magneto-motor rotor clutch sub-assembly

1. As shown in figure, install the 30×42×1.4 thrust washer,26.2×38×1 thrust washer,needle bearing,Semicircle key,Electric starting large tooth,26.2×38×1 thrust washer,magneto-motor rotor clutch,12.3×26×3 gasket and M12×1.25×50 hexagon flange bolt.
2.Install the electric start bridge gear
Note:There is a washer 12 on the top and bottom of the electric start bridge gear.

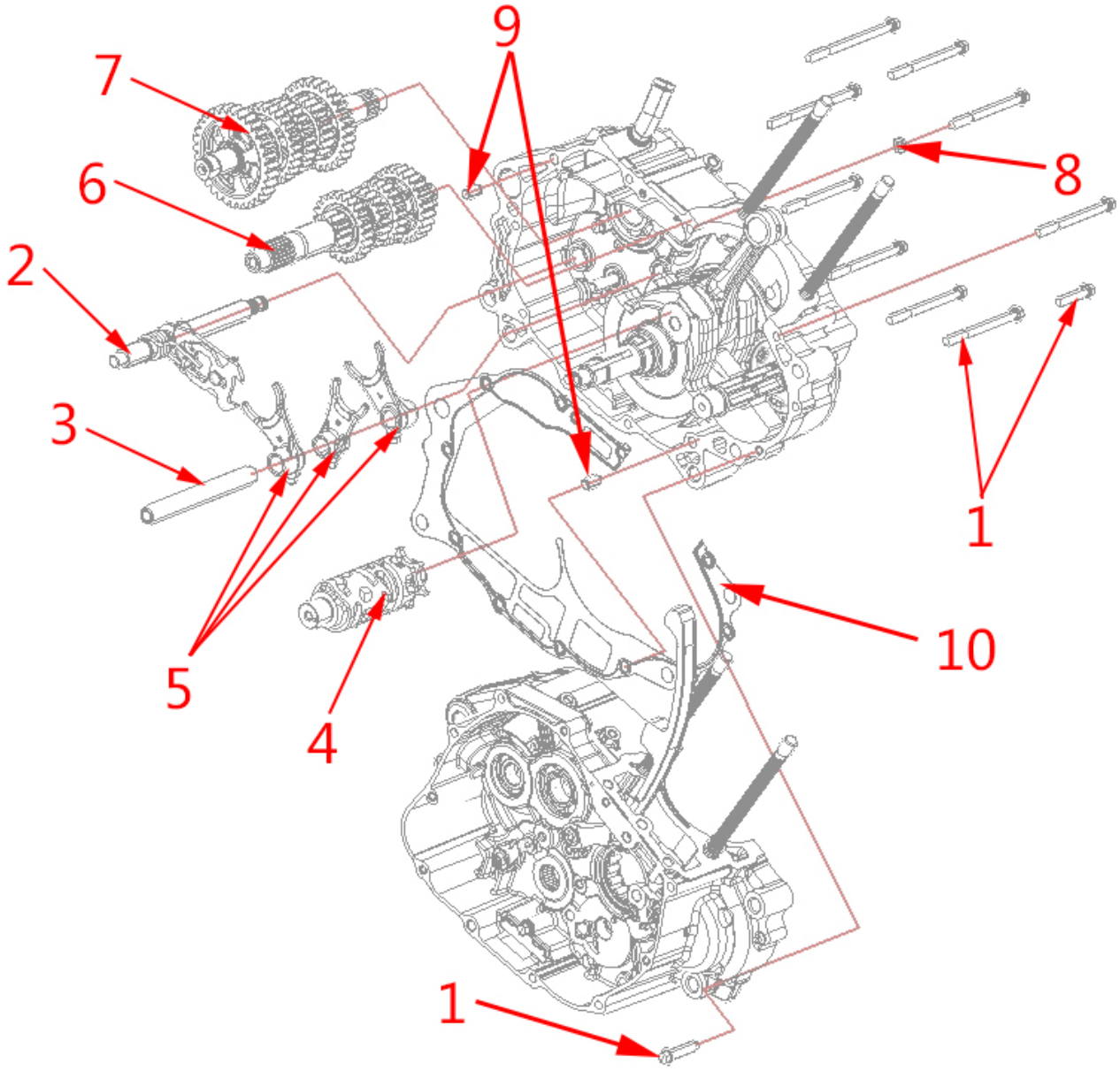
Install the left crankcase cover

1.Install two φ8×14 hollow locating pins,new left crankcase cover gaskets 15.
2.Evenly tighten the left crankcase cover bolt diagon-ally and correct the torque with a fixed torque wrench. Note:
a.Apply a flat seal silicone to the rubber of the export-ed harness before attaching the left crankcase cover. b.the M6×30 hexagon flange bolts can not be leaked on the reduction gear.



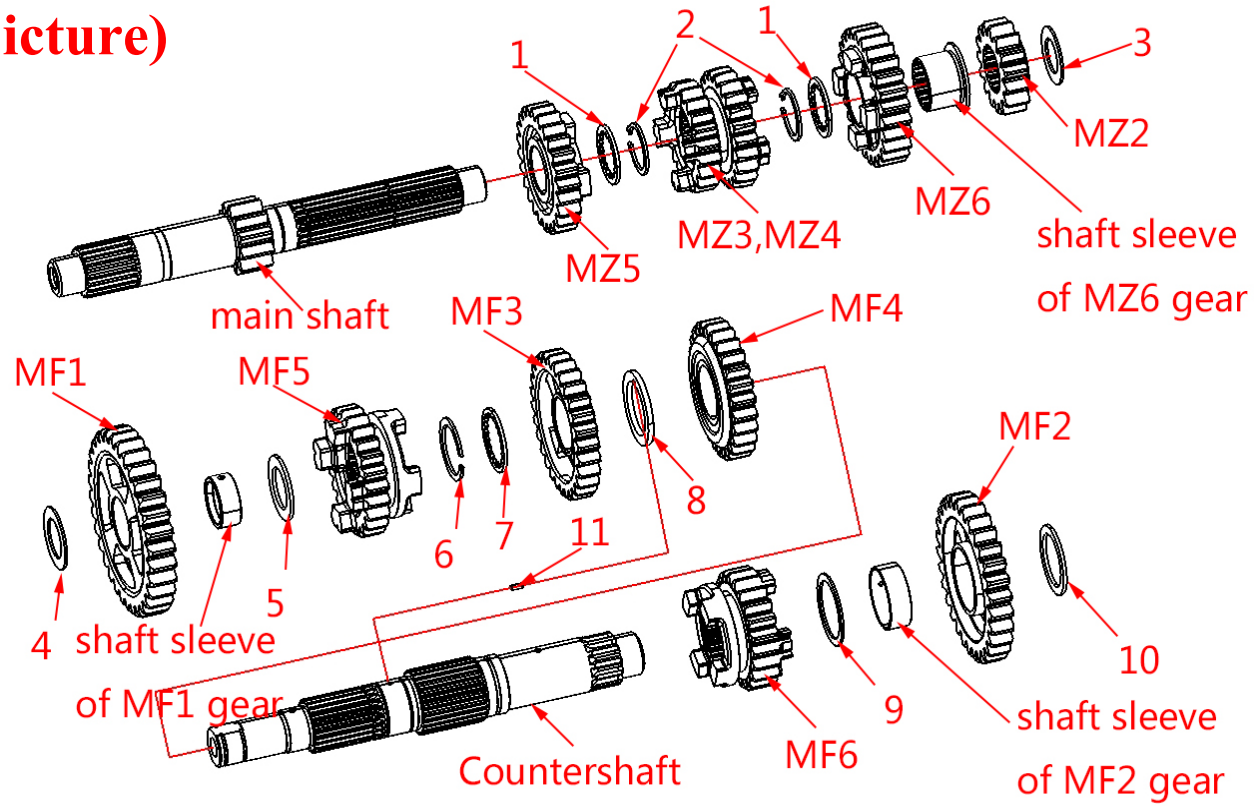


Transmission



NO.	Part name	quantity	Remarks
1	M6×30 Hexagon flange bolt (color zinc)	2	8# T rod or socket wrench /Preload 5 ±1N.m, Correction force 12±1.5N.m
	M6×75 Hexagon flange bolt (color zinc)	7	
	M6×90 Hexagon flange bolt (color zinc)	2	
2	Shift shaft subassembly	1	
3	Shift fork shaft	1	
4	Shift gear shifting drum subassembly	1	
5	Shift fork	3	
6	Transmission spindle sub-assembly	1	
7	Transmission auxiliary shaft sub-assembly	1	
8	6.3×12×1.6 Copper gasket	1	
9	φ8×14 Hollow locating pin	2	
10	Crankcase gasket	1	

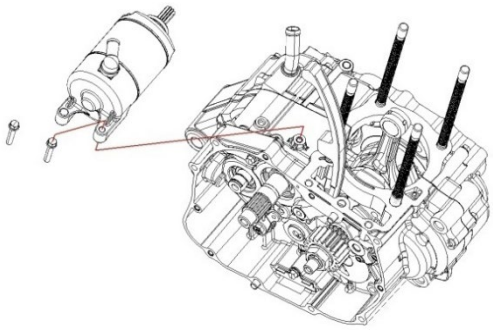
Main and auxiliary Transmission shaft assembly (picture)



NO.	Part name	quantity	Remarks
1	19Z×1M×37.5×1.5×25.5 Involute spline washe	2	
2	GB894.1 Shaft circlip φ20×1.2	2	External circlip pliers(on shafts)
3	15.2×25×1.0 Thurst washer	1	
4	17.2×27×1 Thurst washer	1	
5	18.2×28×1.5 Thurst washer	1	
6	23×1.2 Shaft circlip	1	Internal circlip pliers(in bores)
7	22Z×1M×37.5×1.5×27.5 Involute spline washe	1	
8	Secondary shaft three fourth gear	1	
9	25.2×31×1.0 Thurst washer	1	
10	23×30×1.5 Thurst washer	1	
11	GB119.2φ2×5 Cylindrical pin	1	

Disassembly of the transmission device

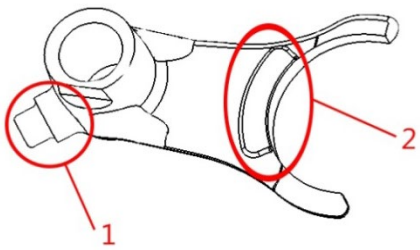
1.Loosen the fixed starting motor bolt and remove it.



2.Loosen all the bolts of the case(First loose the M6×30 bolts on the right crankcase,then diagonally loosen the bolts on the left crankcase).The left crankcase is placed horizontally (the box faces up), the right crank-case, the washer and the positioning pin are pulled out, and the shifting shaft, the fork shaft, the variable speed drum, the shifting fork, the transmission spindle, and the transmission auxiliary shaft are sequentially remov-ed.

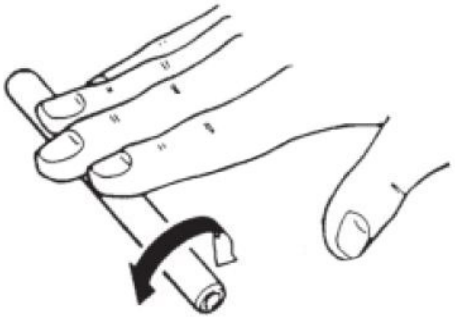
Check

1.check the fork:fork cam follower 1 and fork jaw 2 (bending/damage/cracking - replace it)



2.Check the fork shift:Rolling fork shaft on a flat surface (bending - replace it)

Warning:DO NOT try to straighten the curved fork shaft.



3.Check the variable speed drum:

Abrasion/Scratch→replace it.

4.Check transmission spindle and transmission auxiliary shaft:

Gear(Abrasion/Gear injury→replace the defective gear)Retaining ring, washer(bending deformation/looseness→replace the defective retain ring and washer)

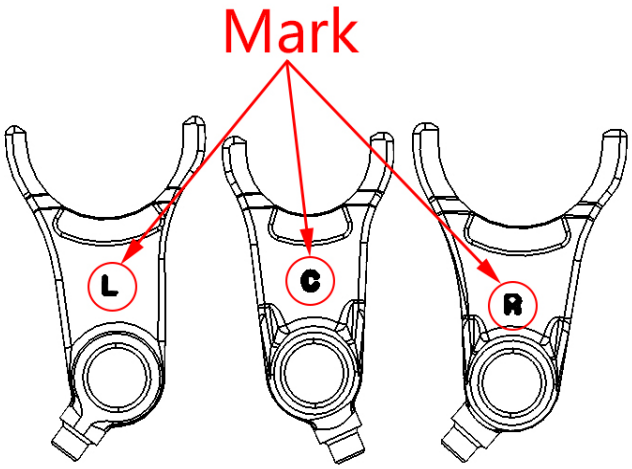
5.Check bearing:

Struck/Abrasion→replace the defective bearing.

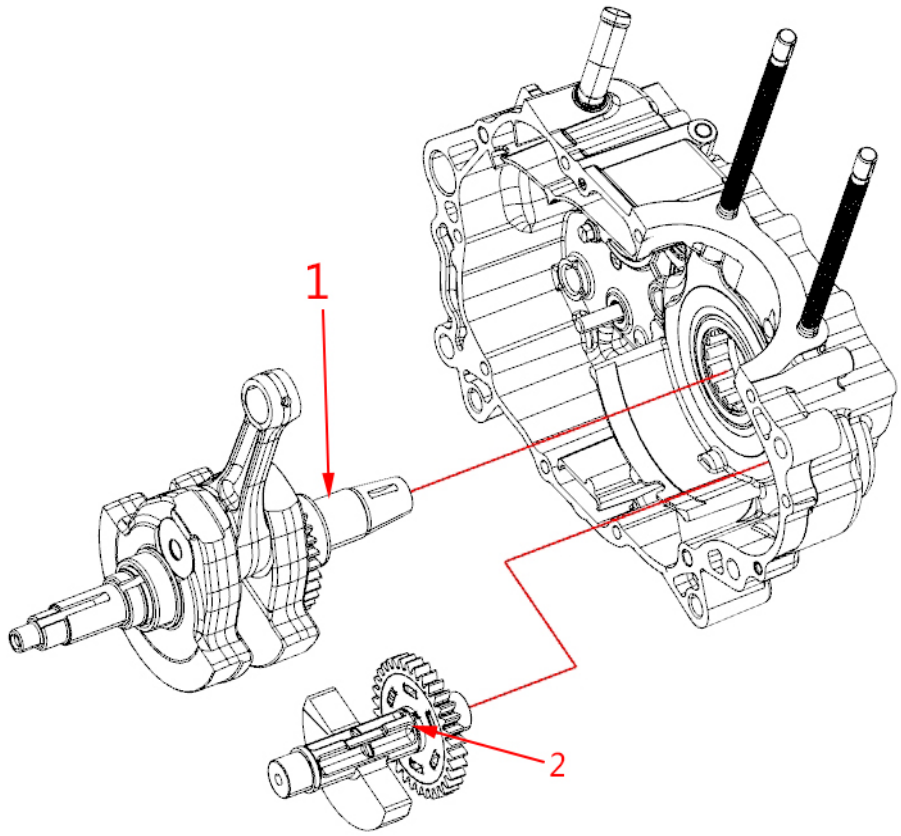
Install the transmission device

Pre-install the transmission spindle subassembly and transmission auxiliary shaft subassembly and install them into the left crankcase.Install the "L"fork,variable speed drum,"C" fork,"R" fork,fork shaft and shift shaft in turn.Apply a proper amount of oil to the surface of the part and check if the drive shaft and countershaft are flexible.(if not,reinstall them),Install the crankcase pad and two φ8×14 hollow locating pin ,cover the right crankcase until seamless.Install the bolt,pretight-en the bolts and verify all bolt torques (remember not to miss the M6×30 bolts on the right crankcase).Install the shift star cam to check if the shift is smooth (if not, reinstall the transmission device).

Tips:Fork marked "L" is auxiliary left fork,"C" is spin-dle middle fork ,"R" is auxiliary right fork.



Crankshaft, balance shaft



NO.	Part name	Quantity	Remarks
1	Crankshaft connecting rod assembly	1	
2	Balance axis assembly	1	

Disassemble crank shaft and balance shaft

1.The angle between the crankshaft and the balance shaft is shifted. One hand holds the crankshaft at the end of the right crank. One hand uses a rubber hammer to tap the end of the left crank to remove the crankshaft and the balance shaft.

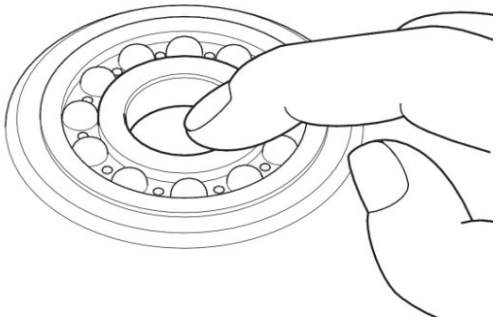
Note: the connecting rod shaft cannot hit the cabinet

Check bearing

The following steps apply to all bearing inspections:

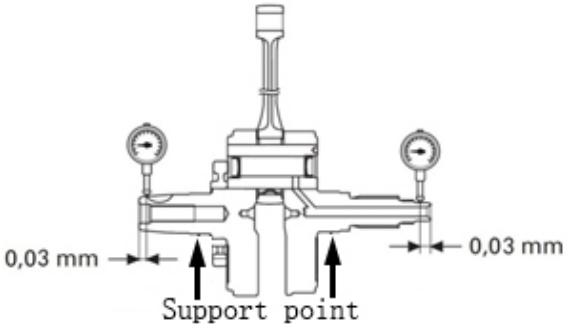
1. Move the inner ring of the bearing by hand, there is a phenomenon of stuck and worn, and replace the defective bearing

(Note: the crankshaft bearing on the box cannot be interchanged, and the bushing on the crankshaft one correspondence).



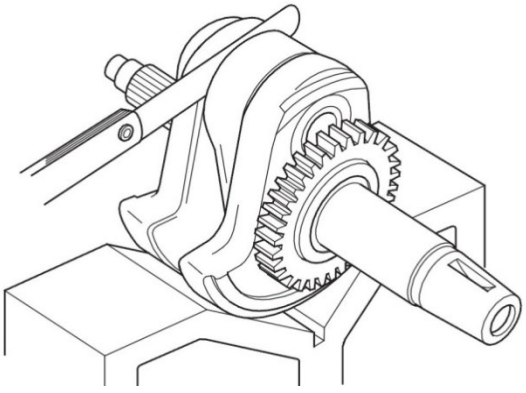
Check the crank shaft and balance shaft

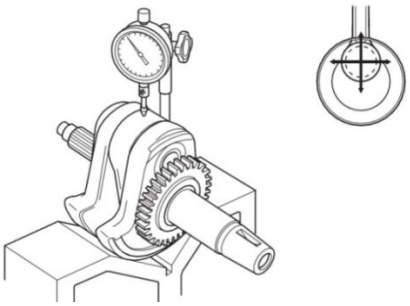
1.Crankshaft axial runout: ≤0.03mm.



2.Connecting rod big head axial clearance: 0.15-0.35mm, with feeler gauge measuring.

3.Radial clearance between crank pin and bearing bush: 0.03-0.056mm..





4.If there are some scratch,abrasion on the balance shaft,replace it.

Install the crank shaft and balance shaft

The left crankcase is placed horizontally(the box faces up).Spraying the right amount of oil on then crankshaft bearing and the balance shaft bearing.When install,the balance shaft gear and the gear on the crankshaft need to be in a positive angle phase. The mark on the balan-ce shaft gear (as shown in the figure "B") is aligned with the mark on the crank gear (as shown in the figure "A").After installation, when the crankshaft is rotated to top dead center, the mark on the crank (as shown in the illustration "C") should be aligned with the mark on the balance shaft weight (as shown in the figure "D"). Turn the crankshaft to check if the crankshaft rotation is flexible and interfere with the balance shaft. If so, re-mark the bracket and install the crankshaft and balance shaft.