SERVICE MANUAL

Model EW50

FUJI HEAVY INDUSTRIES LTD.

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PREPARATIONS AND PRECAUTIONS for Disassembly & Reassembly

■ Use genuine parts. With regards to the oil, adhesive and sealing agent, also use genuine or recommended one.

■ With regards to gasket, O-ring, piston clip with new one, replace with new one when reassembling.

■ When disassemble engine, memorize the location of each part so that you can reassemble the engine correctly. To prevent parts from being mislaid, keep each group provisionally assembled after removing the parts from the engine. This will make reassembly easier.
If necessary, attach identification tags with the required assembly information to the parts.

■ Handle the disassembled parts with the utmost care. Before measuring and reassembly, clean them with cleaning agent. Remove cleaning agent by means of pressurized air.

Apply oil onto rotating and sliding surface without fail when reassembling.
Also apply recommended grease onto the specified portion.

■ Use the special tool in the correct way when disassembling and reassembling the engine.

■ Tighten bolts and nuts in the order; temporally tighten and then tighten from larger diameter one to smaller diameter one, from inner one to outer one in an even, crisscross pattern.
Finally tighten to the specified tightening torque.

Reverse the order when retightening.

■ Replace special bolt (with sealing agent) with new one.

■ Never reuse the press-fitted ball bearing if any excessive force was applied when removing.

■ Make sure ball bearing is smoothly operated by turning inner or outer race with your finger. Replace with new one, if the excessive free play is available in axial or longitudinal direction.

■ Install bearing with the marking or stamping faced outside. Never apply the force onto balls when press-fitting ball bearing.

■ Install oil seal with main lip faced towards oil chamber and with the brand marking or designation stamping faced outside. Be sure to install oil seal with grease applied to lip, and not to damage the lip with sharp edge or burrs.

■ Remove gasket and sealing agent thoroughly from the mating surface of cases before reassembling.

■ Make sure smooth rotation and operation of each parts during reassembling.

Removal and Installation

- Engine removal from vehicle
- Installation onto vehicle

} OEM (vehicle manufacturer) to complete

1. Disassembly

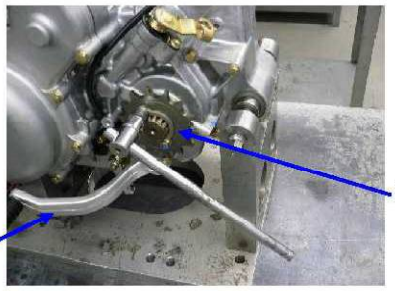
1-1) Set the engine assembly onto Special Tool; Engine Base Plate AY.
固定架子上

Special Tool;
Engine Base Plate AY

Take out Cover CP (Drive Chain) and Plate (Drive Chain).
Take out parts on the vehicle side.
M6×25L BOLT 2 pcs.

1-2) Operate Shift Pedal to engage the transmission gears.
Remove bolts and take out Fixing Plate, and then remove Sprocket 14T.
固定板

M6×12L BOLT 2 pcs.
(T-wrench : 8 mm)



Sprocket 14T

Shift Pedal

1-3) Remove Shift Pedal.
脚蹬
M6×25L BOLT 1 pc. 变速器
(Box-end wrench : 8 mm)

1-4) Remove Reverse Arm Lever (Reverse L(倒挡锁)

M6×12L 1 pc.
(T-wrench : 8 mm)

Reverse Arm Lever

1-5) Remove carburetor. (卸下化油器)

M4×30L Screw 1 pc.
(Philips driver : Medium size)

Carburetor

1-6) Take out Oil Delivery Pipe Assy.
Remove upper side banjo bolt (oil fitting) first 送油管

M12 Banjo bolt 3 pcs. 班卓琴式螺栓
(Box-end wrench : 17 mm)

Note; Pay attention not to lose total 6 cupper washers.
垫片6长不要丢掉

1-7) Remove MAG Cover CP. 飞轮外壳
Note; Adopt tray or clothes (waste) to prevent oil pollution.
M6×35L 11 pcs. (T-wrench : 8 mm)

Remove Reduction Gear 1、Shaft 1 变速齿輪
Reduction Gear 2 , Shaft 2. Make sure their original positions for reassembling.

機油過濾器
1-8) Remove Oil Filter Cover and take out Oil Filter CP.
Note; Adopt tray or clothes (waste) to prevent oil pollution.

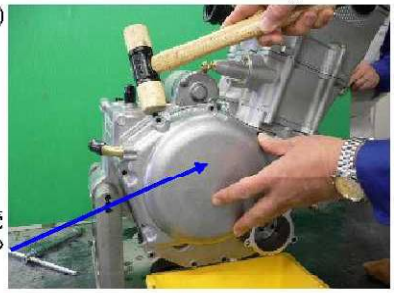
M6×25L 2 pcs. (T-wrench : 8 mm)
M6×65L 1 pc. (T-wrench : 8 mm)

Remove Oil Filter CP, O-ring and Spring (Filter).
機油過濾器，密封圈，弹簧

1-9) Remove Clutch Cover CP. 离合器外壳

Note; Adopt tray or clothes (waste) to prevent oil pollution.
有点機油要注意

M6×25L 11 pcs. (T-wrench : 8 mm)



1-10) ①Remove Clutch. 离合器
Remove bolts and take out Spring and Washer.

M6×35L 6 pcs. (Allen wrench : 5 mm)

Take out Disk (Clutch Pressure). 圆板
Take out Pusher. 推杆 挺杆
Remove Push Rod by depressing Release Lever.

②Take out Release leve 放松杆

③Remove Lock Nut (螺栓锁)

Note; Lock Nut was caulked, and so unlock the caulk by using drill.

（Use air-assist tool）

(使用冲击拌手)

M18 Lock Nut （Box wrench：27 mm）

Caulk of Lock Nut

Stopper for rotation, when removing Lock Nut
Special Tool; Wrench (Counter shaft)

④Take out Lock Washer. Note; Make sure the Lock Washer orientation for reassembling.

⑤Take out Clutch without Distance Collar and Thrust Washer dropped out.,

管道 垫片

Thrust Washer

After Outer, Clutch removed.

Distance Collar

1-11) Remove Oil Pump. 机油泵

Take out Snap Ring and Oil Pump Gear.

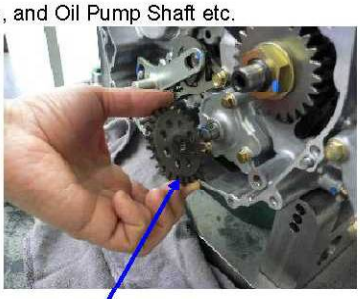
Remove bolts and take out Oil Pump Case.

M6×30L 3 pcs. （T-wrench：8 mm）

机油泵主体（含有給油泵, 回油泵, 机油泵轴）

Take out Oil Pump; Feed Pump, Scavenging Pump, and Oil Pump Shaft etc.

Snap Ring （开口锁）



Oil Pump Gear （机油泵齿轮）

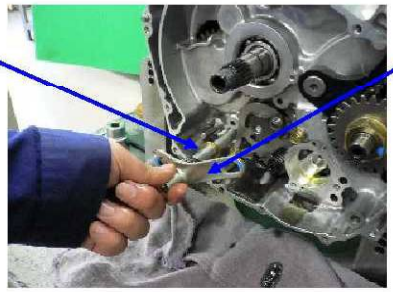
Oil Pump （机油泵主体）

1-12) Take out Shift Shaft. CP along with washer.. (变速轴)

Note; Fit the washer onto the Shaft; not to lose it.

(防备丢掉垫片, 要放在变速轴上)

Washer
垫片



Shift Shaft CP
变速轴

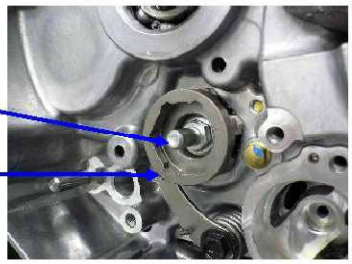
1-13) Remove Guide Plate and Drum Shifter.
Remove bolts, and take out Guide Plate and Drum Shifter.
M6×20L 2 pcs. (T-wrench : 10 mm)

导板, 鼓形转换器,

Note; Pay attention Drum Shifter is not disassembled.
Make sure the orientation for reassembling.

1-14) Take out Shifter Pin and then pull out Shifter Cam.
(Deep-type socket wrench : 12 mm)

拔叉销, 拔叉凸轮



Move the Shifter Arm apart from Shifter C

1-15) Remove Stopper Arm. 锁挡杆
Remove bolts, and take out Stopper Arm and Spring (Stopper).
M6 Stepped bolt 1 pc. (T-wrench : 10 mm)

1-16) Remove Switch (Position). 定位开关
Take out Point (Neutral) along with Spring (Point).
点测头 弹簧

M5×20L SCREW AND WASHER 2 pcs.
(Philips driver: Medium size)

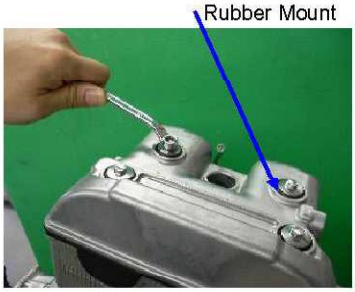
1-17) Remove Primary Gear. 初次齿轮
Remove M18 nut by air-assist t (Box wrench : 27 mm)
Take out washer and Primary Gear.
(使用冲击拌手)

Note ; Pay attention large spline cutting for alignment with crankshaft, when reassembling.

(初次齿轮内侧有定位)

1-18) Remove Head Cove (缸盖外壳)
Remove bolts and 橡胶垫
take out Rubber Mount, O-ring and Head Cov橡胶座

M6×14L 4 pcs. (T-wrench : 8 mm)



1-19) Remove Spark Plug (Box wrench : 16 mm)
(火花塞)

1-20) Remove Chain Tensione (链条张紧器)
Align the engine TDC.

Remove bolt.
M6×8L 1 pc. (T-wrench : 10 mm)
Remove bolts and take out Chain Tensioner.
M6×25L 2 pcs. (T-wrench : 8 mm)

Align the engine TDC.
(压缩上止点)

(压力注意)
Untighten upper and lower bolts evenly.

1-21) Remove Cam Support and Camshafts.
Remove bolts and take out Cam Support.
M6×40L 8 pcs.

Take out Intake Camshaft and Exhaust Camshaft along with Bearing supports.
Note; Pay attention not to lose Bearing Supports.

Cam Suppo 凸轮支架

Bearing Stoppers 滚珠锁挡

Intake Camshaft 进气凸轮
Exhaust Camshaft 排气凸轮

定位链条 缸盖

Take out Crank Sprocket by holding the chain at the upper portion (cylinder head side).
Note; Take out Chain Sprocket first.

Crank Sprocket

Take out chain upwards 从上取出

1-22) Take out Timing Chain.
Take out chain upwards.
定位链条 从上取出

1-23) Remove M14 flange nut on MAG side by using air-assist tool.
(Box wrench : 19 mm)

Special Tool;
MAG Remover

1-24) Take out Magneto Assy by means of Special Tool;
MAG Remover.

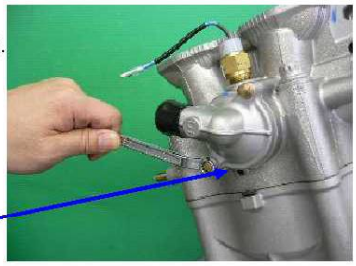
By using air-assist tool, turn Special Tool; MAG Remover.
使用冲击拌手

启动齿轮 滚针轴承 垫片
Take out along with Starter Gear, Needle Bearing and Spacer.
Pay attention not to drop Needle Bearing out.
防止滚珠轴承落掉

Starter Gear
Fly Wheel
Spacer

1-25) Remove Thermostat cover and Thermos (恒温器)
Remove bolts and take out Thermostat Cover and Thermostat.
M6×20L 2 pcs.

Note; Pay attention the orientation of Thermostat for reassembling; Opening is upwards.

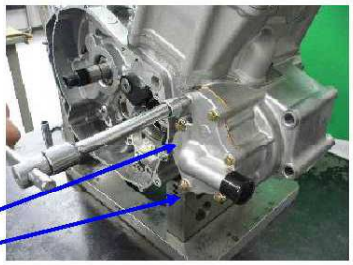


Thermostat Cover

Thermostat

1-26) Remove Water Pump Case and Water Pump.
Remove bolts (7 pcs.) and take out Water Pump Case.
(BOX wrench : 8 mm)

Note; Adopt tray to prevent coolant pollution
Make sure the original position of a cupper washer.

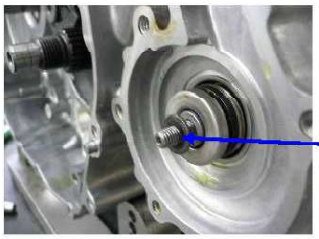


Water Pump Case
Cupper washer

Impeller

1-27) Take out Impell (卸下叶轮)
(Deep-type Box wrench : 12 mm)
Take out Sealing Washer.

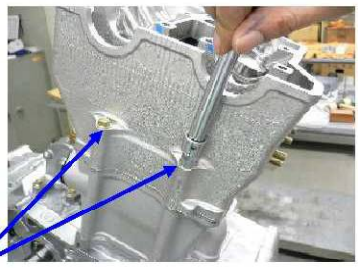
Note ; Never depress impeller.
When reassembling, replace with new Sealing Washer.

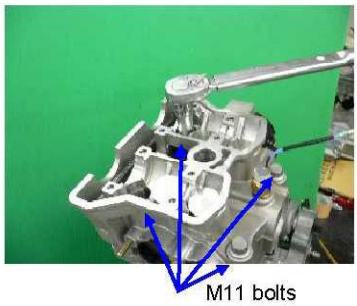


Sealing Washer （密封垫）

1-28) Remove Cylinder Head Ass(卸缸盖)
Remove two (2) M6 bolts.
Remove four (4) M11 bolts evenly and diagonally.
Take out Cylinder Head Assy along with Head Gasket.

M6×140L 2 pcs. (T-wrench : 8 mm)
M11×198L 4 pcs. (Deep-type Box wrench : 14 mm)

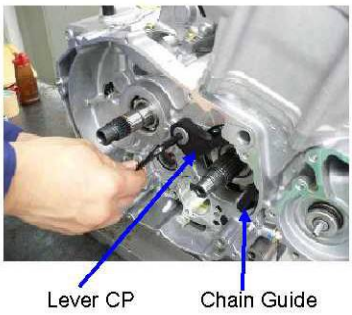




(导轨) (链条导杆)

1-29) Remove Lever CP. Remove Chain Guide.
Remove pivot bolt and take out Lever CP.

M8×22.5L Pivot bolt
(Allen wrench : 6 mm)



1-30) Take out Cylinder and Gasket. (缸筒, 垫片)
Note; Use Special Tool; Piston Support Plate.
Hold Piston not to damage it.

1-31) Take out Piston (活塞)
Remove Clip on one side and pull out Piston Pin,
and then take out Piston.

1-32) Remove Starting Mo(卸下启动马达)
Remove bolts and take out Starting Motor.
M6×25L 2 pcs. (T-wrench : 8 mm)

1-33) Disassemble Crankcase Ass(分离曲轴箱)

Take out the crankcase from Special Tool;
Engine Base Plate AY and set it with the clutch side facing up on the plastic container.
飞轮侧向上，放在树胶箱上

One bolt on Clutch side
M6×40L 1 pc. (T-wrench : 8 mm)

Total 15 bolts on MAG side (T-wrench : 8 mm)
M6×40L 7 pcs.
M6×75L 7 pcs.
M6×50L 1 pc.

Place the crankcase with the Clutch side facing up on the plastic container.

(机箱分离器) (离合器盖)
Attach Special tool; Case Separator Kit onto the clutch cover mating surface of the crankcase.
Tighten two (2) bolts evenly, keeping the opening between crankcase mating surfaces in the parallel condition.
(Box-end wrench : 12 mm)
Note; Place Special Tool ; Guide (Oil Seal) onto the crankshaft without fail.
(轴环一定要使用)

1-34) Transmission
（变速器）
① Take out Fork Shafts (2 pcs.).
（拔叉轴）
② Pull out Spring located under the Fork Shaft on the counter shaft side. （还击轴）

huan ji cha zi
还 击 叉子

(弹黄) Spring　Shift Drum （换挡圆柱）

(倒挡轴) Reverse Shaft

③ Take out Shift Fork (Main), Shift Fork (Right) and Shift Fork (Left). （换挡拔叉） 右Right 左Left

Note; Make sure their original positions for reassembling.

④ Take out Shift Drum CP with the Reverse Lock released.
(倒挡锁)　（换挡圆柱）

⑤ With the case put in the upright position, take out Main Shaft and Counter Shaft. （主动轴） （传动轴）

Shift Drum CP removed

(倒挡锁) Reverse Arm (Reverse Lock

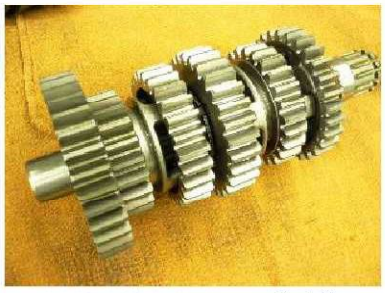
⑥ With the case put in the original position again, take out Reverse Shaft CP (Reverse Idle Gear, Collar, Washer etc.)

Note; Pay attention not to lose the Counter Shaft washer.
（不可丢失传动轴垫片）

⑦ Remove Oil Strainer UN.
(机油过滤网)

Oil Strainer UN

Main Shaft Assy （主动轴）



Counter Shaft Assy （传动轴）

(平衡器齿轮)

1-35) Align the mating markings, and take out Balancer Shaft by lightly tapping with plastic hammer.

Balancer Gear
Mating marking

Crankshaft
Mating marking
（定时记号）

(压力机或冲床)　(平衡器齿轮)

1-36) By means of hand-press machine, depress the MAG side end of the Crankshaft and take out Crankshaft from crankcase 1..
（压飞轮侧曲轴头顶）

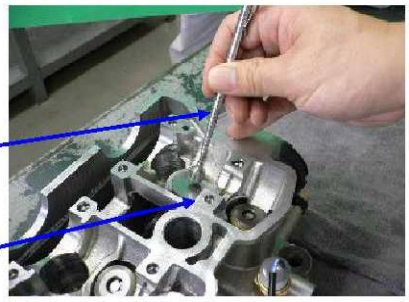
2. Inspection

2-1) CYLINDER HEAD

① **Disassembling**

(Note) Identify the original position of disassembled parts,
with marking as necessary. Place them in order on the clean table.

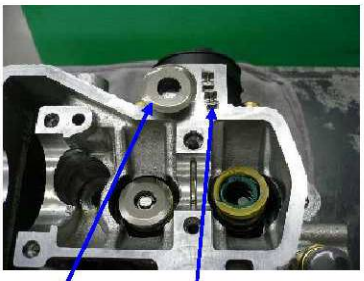
* Remove Valve lifter and adjusting pad.
Valve Lifter is easily taken out by magnetic tool.
(Note) Put ID onto the parts at taking out from either IN or EX side.



* While depressing Valve Spring with exclusive tool (Valve spring compressor),
take out Colette.

Exclusive tool (Valve spring compressor)

* Take out Spring Retainer, Spring (inner and outer), Seat (spring).
* Take out IN and EX Valve.
* Take out Valve (Seal).

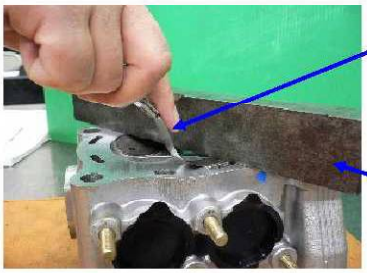


② **Cylinder Head warpage**

* Clean and remove carbon deposits from the surface.
Never damage the surface when cleaning.

* Place the measuring block diagonally on the surface,
and check with thickness gauge.
* If the result is out of specifications, replace with new Cylinder Head.

Cylinder Head warpage	
Service Limit	0.05mm



③ **Inner diameter (ID) of Valve Guide**

* Clean up the Valve Guide hole.
* Measure ID of Valve Guide at total 6 points; upper, middle and
bottom positions and X- and Y-directions, by means of dial caliper

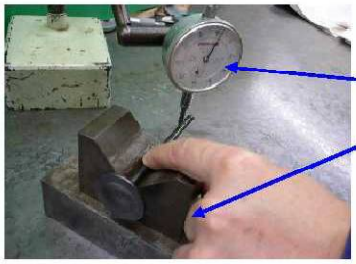
Valve Guide ID		
STD	IN	6.000~6.012mm
	EX	6.000~6.012mm

2-2) INTAKE and EXHAUST VALVE

① **Valve Stem runout**

* Remove carbon deposits.
* Measure the runout by means of dial gauge.
* If the result is out of specifications, replace with new Valve.

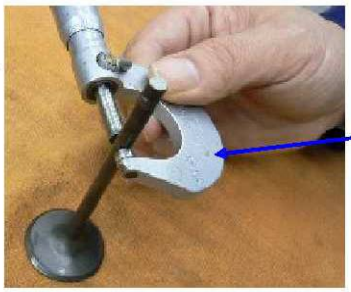
Valve Stem runout	
Service Limit	0.01mm



② **Outer diameter (OD) of Valve Stem**

* Measure OD of Valve Stem sliding portion at total 6 points; upper, middle and lower positions and X- and Y-directions, by means of micrometer.

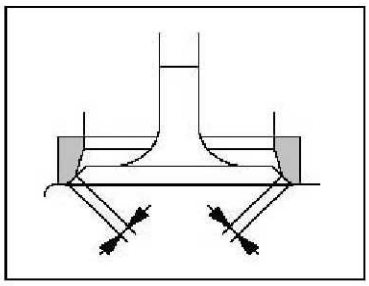
Valve Stem OD		
STD	IN	5.950~5.965mm
	EX	5.945~.960mm



③ **Clearance between Valve stem and Guide**

Clearance is the difference between ID of Valve Guide and OD of Valve Stem
ID of Valve Guide minus OD of Valve Stem.

Clearance		
Service Limit	IN	0.15mm
	EX	0.15mm



④ **Width of Valve face**

* Measure the marginal width of valve face portion.
* If the result is out of specifications, replace with new valve.

Marginal width of valve face portion		
Service Limit	IN	0.8mm
	EX	0.8mm

⑤ **Valve Spring free length**

* Measure the free length of inner and outer Valve Spring.
* If the result is out of specifications, replace with Spring as a set

Valve Spring free length		
Service Limit	inner	38.0mm
	Outer	39.9mm

2-3) CAMSHAFT

① **Cam profile height**

* Check for damage and ware on cam profile.
* Measure the height of cam profile.

Cam profile height		
Service Limit	IN	42.05mm
	EX	42.05mm

Visual checking for cam profile portion

② **Oil clearance at cam journal portion**

* Measure the ID of cam journal portion with Cam Support fixed to the specified tightening torque; 9 – 11 N-m.

ID of cam journal portion	
STD	25.000~25.021mm

Measure the ID

* Measure the OD of Camshaft journal portion with micrometer

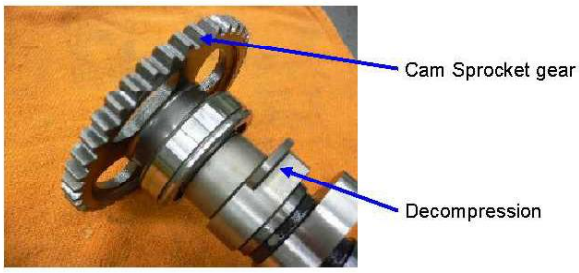
OD of Camshaft journal portion	
STD	24.946~24.963mm

Measure the OD

* Oil clearance is ID minus OD.

Oil clearance at cam journal portion	
Service Limit	0.10mm

③ Visual Checking
* Check for ware and damage on Cam Sprocket gear teeth.



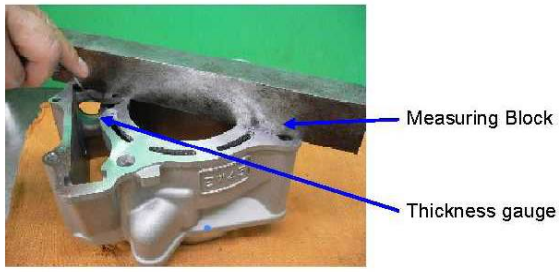
* Check for ware and damage on decompression related parts.
* Check if decompression would be operated smoothly.

* If any parts would be damaged or worn, replace with new Camshaft Assy.

2-4) CYLINDER

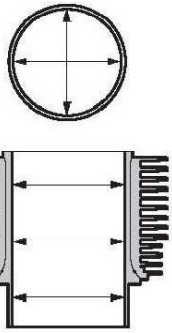
① Cylinder warpage
* Clean and remove carbon deposits from the surface.
Never damage the surface when cleaning.
* Place the measuring block diagonally on the surface, and check with thickness gauge.

Cylinder warpage	
Service Limit	0.05mm



② Cylinder bore
* Check for damage or ware on bore surface.
* Measure the cylinder bore at total 6 positions;
top, middle and bottom positions and axial (Camshaf
and right angle directions.

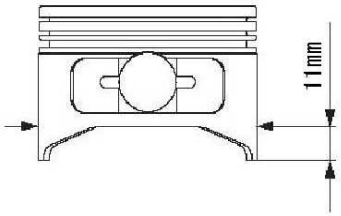
Cylinder bore	
STD	99.200~99.220mm



2-5) PISTON and PISTON PIN

① Piston OD
* Check for ware and damage on the sliding surface.
* Measure OD of Piston at 11 mm distance from the bottom end in the right angle against Piston Pin with micrometer.

Piston OD	
STD	99.155~99.170mm

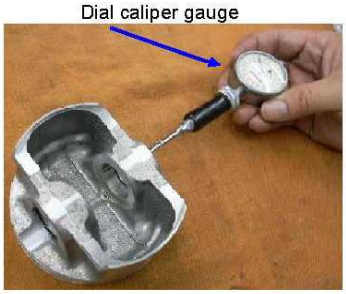


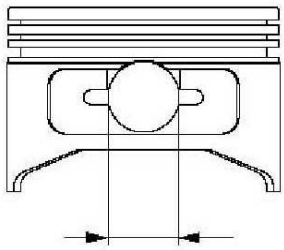
② Clearance between Piston and Cylinder
* Clearance is Cylinder ID minus Piston OD.

Clearance	
Service Limit	0.100mm

③ ID of Piston hole for Pin
* Clean Piston hole for Pin.
* Measure ID in the up and down direction and .
the right angle direction with dial caliper gauge

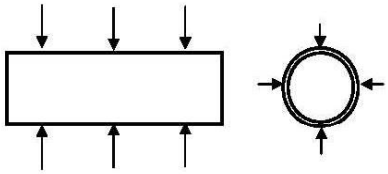
ID of Piston hole for Pin	
STD	23.001~23.007mm





④ Piston Pin OD
* Check for ware and damage on the sliding surface.
* Measure OD at total 3 positions; both ends anc
middle position in the X- and Y-direction.

Piston Pin OD	
STD	22.994~23.000mm

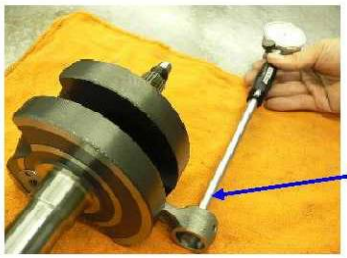


2-6) CONNECTING ROD

① **Small end ID**

* Check for ware and damage on the sliding surface.
* Measure ID in the X- and Y-direction with dial caliper gauge.

Small end ID	
STD	23.007~23.020mm



② **Clearance between Small end ID and Piston Pin OD**

* Clearance is small end ID minus Piston Pin OD.

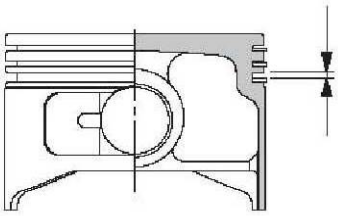
Clearance	
Service Limit	0.05mm

2-7) PISTON RING

① **Clearance between Piston Ring and groove**

* Remove carbon deposits from Rings and grooves.
* Measure the clearance between Piston Ring and groove, by holding the Ring upwards in the groove, with thickness gauge.

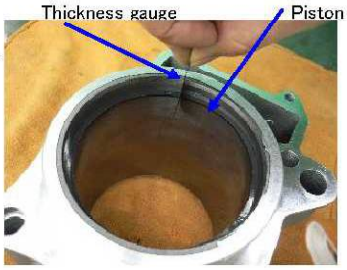
Clearance		
Service Limit	Top	0.15mm
	Second	0.15mm

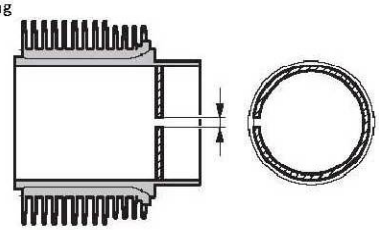


② **Piston Ring gap (opening)**

* Insert Piston Ring into the lower portion of Cylinder horizontally by using Piston.
* Measure the Piston Ring gap (opening) with thickness gauge.

Piston Ring gap (opening)		
Service Limit	Top	0.7mm
	Second	0.8mm
	Oil	1.0mm (Side rail)





2-8) CRANKSHAFT

① **Runout**

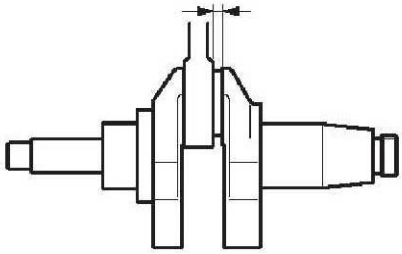
* Set on the V-block and measure runout with dial gauge.

Crankshaft runout	
Service Limit	0.06mm

② **Side-clearance at large end of Connecting Rod**

* Measure the side-clearance at large end of Connecting Rod with thickness gauge.

Side-clearance	
Service Limit	0.65mm

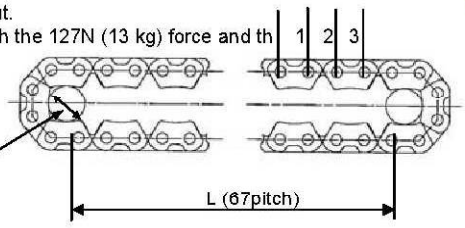


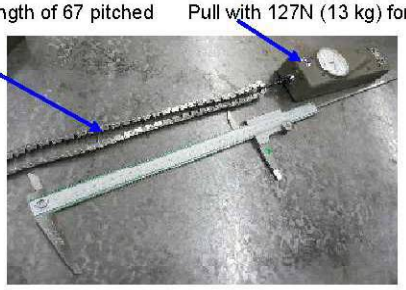
2-9) TIMING CHAIN

● **Chain pitch**

* Check for ware, damage and roller fallout.
* Place Chain on the flat table and pull with the 127N (13 kg) force and th measure the length of 67 pitches.

Timing Chain (67 pitch)	
Service Limit	431.8mm





2-10) STARTING GEAR/ONE-WAY CLUTCH

● **Disassembly**

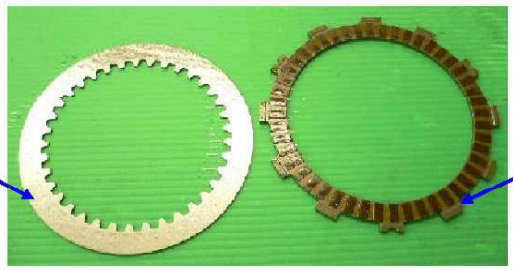
* Remove One-way Clutch from Flywheel Assy.

Fastener ; M6 X 16L bolt (socket head) 8 pcs.
(Allen wrench ; 4 mm)

2-11) CLUTCH

① **Visual checking - Pressure Disk**
* Check for ware and damage.
* Check for movement of bearing.
* If any fault would be found, replace with new one.

② **Visual checking - Plate and Disk**
* Check for ware and deformation on Plate.
* Check for ware and damage on Disk.
* If any damage or excessive ware would be found, replace with new one as a set.



③ **Width of friction material**
* Measure the width of friction material with caliper gauge.

Width of friction material	
Service Limit	2.8mm

(Note) Clutch Disk A and B are available. Clutch Disk B should be facing front side.

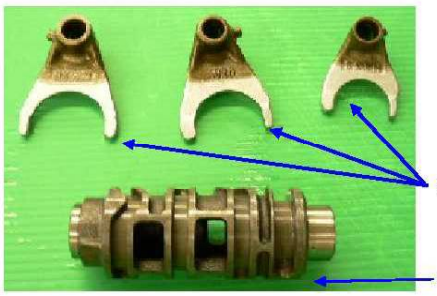
④ Visual checking - Release Shaft and Push Rod

Release Shaft

Push Rod

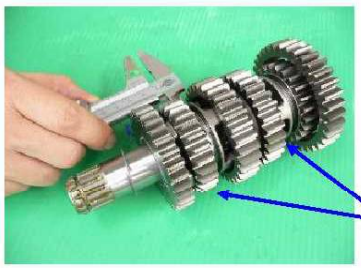
2-12) TRANSMISSION

① **Visual checking - Shift Fork and DRUM**
* Check for ware and damage.
* If any ware on the Fork craw portion, replace with new one.



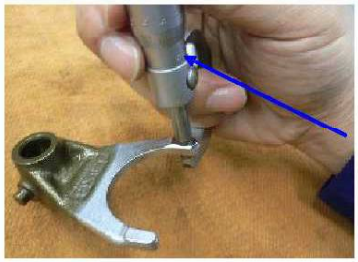
② **Width of Shift Fork groove on Main Shaft**
* Check for ware and scratch in the Fork groove.
* Measure the width of Shift Fork groove with caliper gauge

Width of Shift Fork groove	
STD	5.10~5.17mm



③ **Width of Shift Fork craw**
* Measure the width of Shift Fork craw with micrometer.

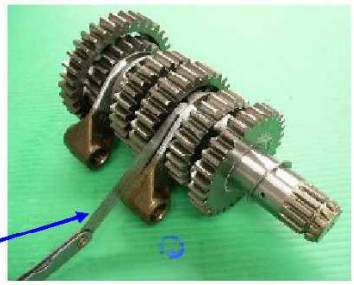
Width of Shift Fork craw	
STD	4.93~5.00mm



④ **Clearance between Shift Fork and groove**

* Measure the clearance between Shift Fork and transmission gear groove at craw portion, with thickness gauge.

Clearance	
STD	0.1~0.24mm



⑤ **Visual checking – Main Shaft and Counter Shaft Assy**

* After disassembling, check for ware and damage on dug clutch portion, gears and spline portions.

* If any ware and damage, replace with new one.


Main Shaft ASSY


Counter Shaft ASSY

2-13) CLUTCH

● **Sub-assembling**

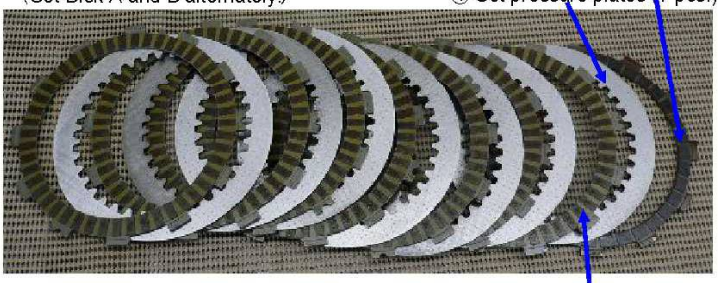
① Set Washer first.

② Set Center CP

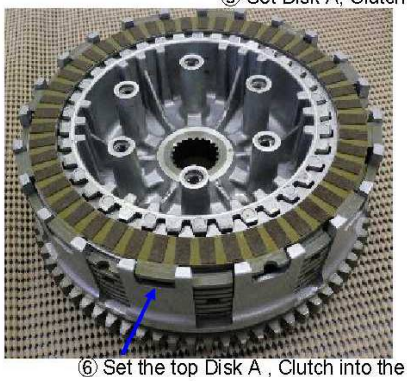
(Set Disk A and B alternately.)

③ Set Disk B at the bottom position.

④ Set pressure plates (7 pcs.)



⑤ Set Disk A, Clutch (7 pcs.)



⑥ Set the top Disk A , Clutch into the groove.

2-14) MECHANICAL SEAL

● **Replacement**

① Remove Mechanical Seal.

② Take out Mechanical Seal.

③ Install Mechanical Seal.

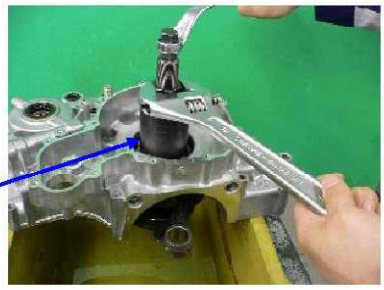
3. Reassembly

Reassembly should be performed in the reverse order of Disassembly.

3-1) Press-fit crankshaft into crankcase 1 by means of .
Special Tool; Crank Assy Tool Kit

Note; Hold Connecting Rod not to strike the crankcase mating surface while press fitting.

Special Tool;
Crank Assy Tool Kit



3-2) Install 1/8 plug in position.

T.T.	12±3N･m

(Allen wrench) T.T. ; Tightening Torque

1/8 plug (塞子)

3-3) Attach Reverse Arm CP onto crankcase 1.
Retain the Reverse Arm CP with washer and snap ring from the outside of crankcase 1.

Note; Be sure not to damage oil seal.
Make sure the snap ring is in the groove without fail.

3-4) On plastic container, place crankcase 1 with the mating surface upwards.
Install Balancer Shaft with the markings between Drive Gear of Crankshaft and Driven Gear of Balancer Shaft aligned.

Mating markings

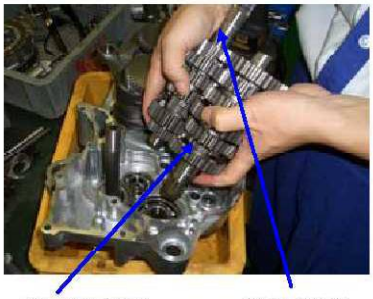
Crankshaft

Balance Shaft
(平衡齿轮)

3-5) Install Reverse Shaft CP.

3-6) Install Main Shaft Assy and Counter Shaft Assy with gears engaged into crankcase 1.

Note; Pay attention not to miss washer fitting to Counter Shaft.
Be sure not to damage the lip portion of oil seal by the Counter Shaft end spline.



Counter Shaft

Main Shaft

3-7) Install Shifter Fork (Main), facing the ID marking "M" upwards, into the Groove of Main Shaft.

Install Shifter Fork (Right), facing the ID marking "R" upwards, into the upper groove of Counter Shaft.

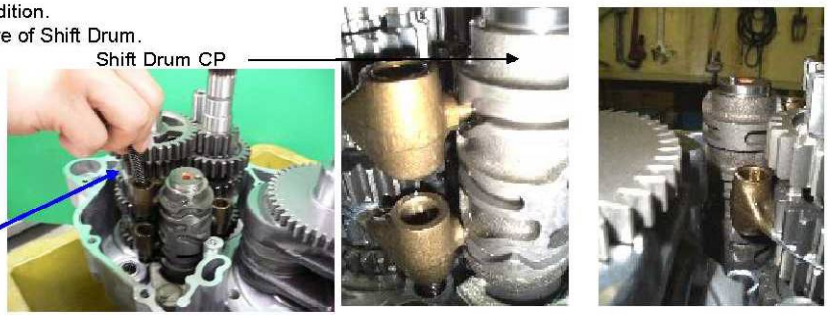
Install Shifter Fork (Left), facing the ID marking "L" upwards, into the lower groove of Counter Shaft.

Shifter Fork (Main)

Shifter Fork (Right)

Shifter Fork (Left)

3-8) Install Shift Drum CP in the pin side upright condition.
Set each pin of Shift Forks into applicable groove of Shift Drum.



3-9) Insert Spring (Fork Shaft) into the hole (inner diameter; 11 mm) each of Shift Fork (Right) and (Left).

Insert Fork Shaft into Shift Fork (Right) and (Left).

Insert Fork Shaft into Shift Fork (Main).

Apply oil into the grooves of Fork Shaft and Shift Drum.
Turn Main Shaft and make sure that Counter Shaft, Shift Drum and Shift Fork can be smoothly operated.

3-10) (When replacing Bearing with new one) Install Stopper Plate.

Stopper Plate ; 1 pc. (Main shaft Bearing)
Faster ; M6 bolt (inner hexagon)

T.T.	13±1N・m

Stopper Plate B ; 2 pcs. (Shift Drum Bearing)
Fastener ; M6 bolt (inner hexagon)
Apply sealing agent Three Bond #1316 onto the thread portion.

T.T.	8±1N・m

3-11) Install Drain Plug.

Fastener ; M16 bolt

T.T.	21.5±1.5N・m

Note; Make sure the gasket is in position.

3-12) Install Oil Strainer UN.

3-13) Place on the plastic containers so that the mating surface is up
Apply sealing agent evenly onto the mating surface to crankcase 1.

Sealing agent	Three Bond #1215

● Adjust the convex position on the end surface of Water Pump Shaft to meet with the groove on the end surface of Balancer Shaft (on Crankcase 1 side).

Groove on the end surface of Bearing Shaft

Make sure the washer is in position

Convex on the end surface of Water Pump Shaft

3-14) Cover Crankcase 2 over Crankcase 1, assemble cases by lightly and carefully tapping with hammer to fit mating surfaces properly, without decline.

Note; The groove of Balancer Shaft is moved with connecting rod rotated. Hold the connecting rod not to rotate.
Make sure the convex position is engaged with the groove of Bearing Shaft.

3-15) Tighten bolts to the specified tightening torque.
Crankcase 2
Faster ; M6 X 75L 1pc.

Crankcase 1
Fastener ; M6×40L 7 pcs.
M6×75L 7 pcs.
M6×50L 1 pc.

T.T.	10±1N·m

Note; Make sure the crankshaft is smoothly rotated after tightening bolts.

Crankcase 2

Crankcase 1

3-16) Install Position Switch.

Insert Spring (Point) into the hole on the end surf of Shift Drum. Then insert Point (Neutral) After that install Position Switch.

Fastener ; M5 X 20L 2 pcs.

T.T.	4±1N·m

Spring (point) first and Point (neutral)

Position Switch

3-17) Set the case assembly onto Special Tool; Engine Base Plate AY.

Special Tool ; Engine Base Plate AY

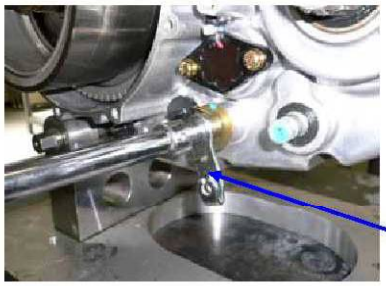
3-18) Apply TB #1344 to M6 thread portion of Reverse Arm Lever, and install along with Reverse Arm Spring.

Fastener ; M8 X 12L 1 pc.

T.T.	10±1N·m

(T-wrench : 8 ㎜)

Note; Make sure Reverse Arm Spring is in the correct potion.



Reverse Arm Lever

3-19) Apply TB #1316 to thread portion of Stopper Pin, and tighten to the specified tightening torque.

T.T.	23±3N·m

(Deep-type socket wrench)