






STANDARD BIG BORE KIT 124cc for 12V monkey		NO.1 /5
DISCHARGE : (BORE) x (STROKE)	CODE	
124cc : φ 54 × 54mm	215-1133241	
APPLICATION	MONKEY / GORILLA Fno, Z50J-2000001 ~ / AB27-1000001 ~ 1899999 (12V CRANK SHAFT) MONKEY BAJA / XR50R / CRF50F AE03	
REMARK	Crank case boaring process is required.	

- Thank you for purchasing Kitaco product. Read and understand the instruction before installing.
- Special tools are required to install.
- After installation, please use this sheet as setting manual.
- ※ Instruction sheet is not included to repair parts. Please keep this instruction safe.

ATTENTION (MUST READ)

- This product is for racing use. It is out of warranty. Unable to ride on public road with installed vehicle. We are not responsible for violation of law or damages and accidents caused by assembling mistake and improper setting.
- By installing this product, changing plug, gear, etc and setting is required. Please use Kitaco carburetor and exhaust. Using other company's product may cause of break. If riding with stock setting, it enables to power up, cause of burning and break. Please set up to match the engine. Please change stronger clutch.
- Please follow this instruction sheet. Do not modify the way which is not listed or it will cause burning, damage and trouble.
- Please ask authorized mechanic for assembling and setting. Ask a specialist at specialty shop if you do not understand the role of the surrounding parts.
- Change engine oil after break in (around 100km).
- Refer to the manufacturer service manual when installation.
- Bolts and nuts may get loosen by engine vibration. Make sure not to loosen any bolts and nuts before driving.
- Oil the parts with engine oil when assembling.
- Do not use engine brake, etc burden the mission. When starting engine with kick, check the gear is engaged before kick.
- Please ride under 5,000rpm when break in.
- Refer to the manufacturer service manual and Kitaco [BOOK OF SECRETS - BIG BORE KIT SET UP MANUAL] together.

	This instruction sheet is for the person who has basic knowledge for maintenance. Do not operate if you do not have any skill and knowledge.		Toxic, high-volatile gasoline is used during operation. Be sure to ventilate the room. Please start engine under well-ventilated place.		FLAMMABLES Inflammable high gasoline is used during operation. Using products causing fire or smoke is strictly prohibited.
	Do not touch cylinder, crank case, exhaust, etc during or right after engine operation. It is high temperature.		Do not spark the plug outside the cylinder for spark check. It might cause of fire and explosion.		

ATTENTION WHEN INSTALLING

Machining stock crank case is required to insert cylinder sleeve to inside. Refer to the below to machine crankcase. Too much sticking out gasket from crankcase contact surface might cause of oil leaking even a touch. Crankcase strength is over tolerance. Be careful of machining and installing. Depending on the output characteristic, please check there is no crack to crankcase stud bolt and surrounding parts every 1 race (2hours). Recommend to buffed finish to machining and specified point (R) because of reinforcing crank case and prevent from crack. For bring out full performance, please check and change regularly following maintenance schedule.

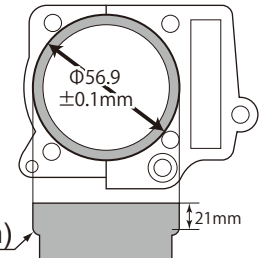
MAINTENANCE SCHEDULE		
	EVERY 1 RACE (2hours)	REMARK
CRANK CASE	CHECK / CLEAN	Change as necessary
CYLINDER	CHECK / CLEAN / FIX	Change more than φ54.060
CYLINDER HEAD	CHECK / CLEAN / ADJUST / FIX	Refer to service guide
PISTON	CHECK / CLEAN	Change every 500km*
PISTON RING	CHECK / CLEAN	Change every 500km*
PISTON PIN	CHECK / CLEAN / FIX	Change every 500km*
PISTON PIN CLIP	CHANGE	
CRANK SHAFT	CHECK / CLEAN / ADJUST	Refer to service guide

"MACHINING POINT"

Recommend to chamfering and buffed finish to through hole surrounding stud bolt of left and right side of crank case to reinforcing and life extension to crank case.

CRANK CASE BOARING

- Boaring machining φ56.9±0.1 / depth 21mm range.
- Install cylinder temporarily, then start boaring carefully while matching.
- Do not shave more than necessary.
- If machining by hand, quite precise technic is required.
- Please ask to specialist if you do not have knowledge, skill and machine.



CYLINDER SURFACE POLISH (When installing version up kit)

- Check the cylinder, if there is strain, etc, please polish head surface (contact surface).

OTHER ATTENTION

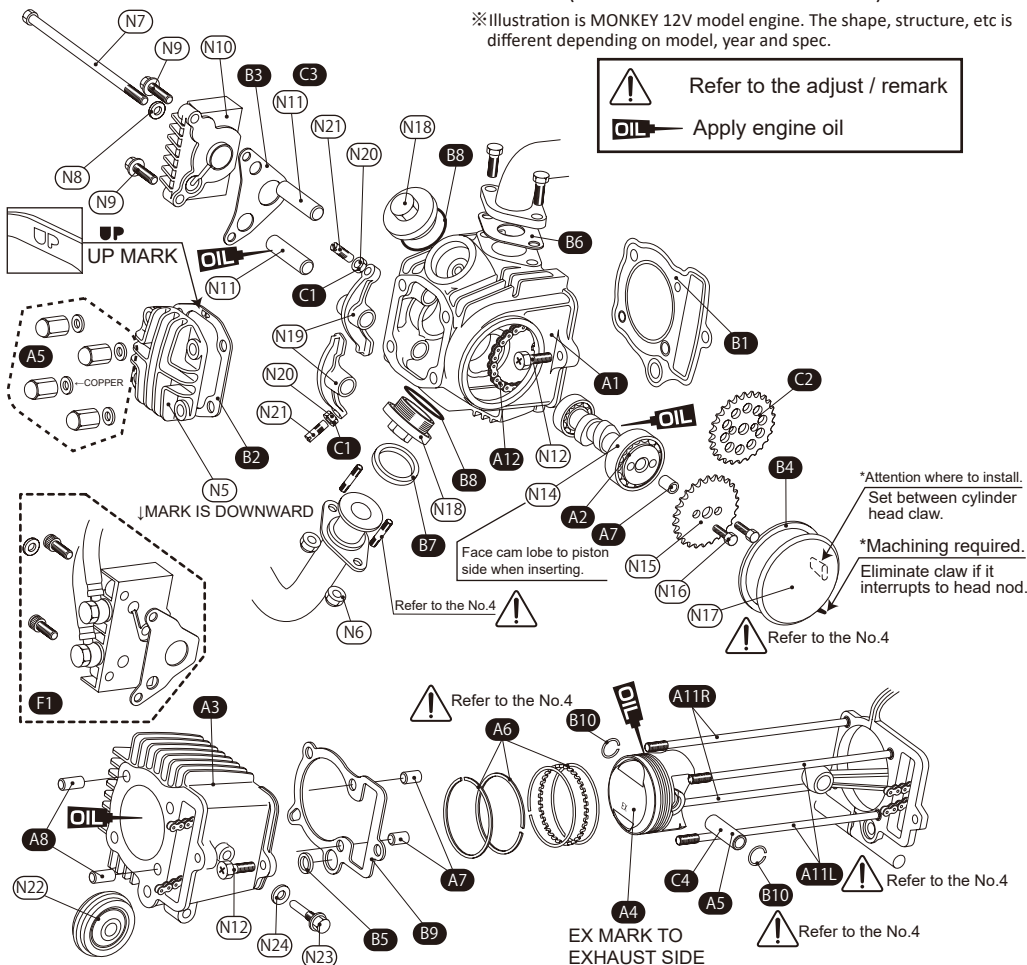
- Please use unleaded premium gasoline. This is high pressure, regular gasoline may cause of knocking and breaking vehicle.

OPTION PARTS (SOLD SEPARATELY)		
▼By installing big bore kit, reinforcing clutch, high geared, installing oil cooler, etc are required.		
OIL SURROUNDINGS	NEW SUPER OIL COOLER KIT (3ROW CONDENSER)	CODE : 360-1133200
	NEW SUPER OIL COOLER KIT (5ROW CONDENSER)	360-1083200
	NEW SUPER OIL COOLER KIT (5ROW CONDENSER) For Kitaco ULTRA clutch kit	360-1083300
	ULTRA OIL PUMP KIT	331-1083400
CLUTCH (Specified for each model.)	MONKEY / GORILLA	ULTRA CLUTCH KIT TYPE X FOR 5SPEED CROSS MISSION 317-1123720~30
TRANSMISSION	MONKEY / GORILLA	5SPEED CROSS MISSION ASSY type II/IV (KICK STARTER GEAR) 305-1123360/305-1123460
		5SPEED CROSS MISSION ASSY type II (WPC/KICK STARTER GEAR) 306-1123100
▼Changing intake parts are required.		
CARBURETOR (Specified for each model.)	MONKEY / GORILLA	MIKUNI VMφ26 (Left side / SHORT / LONG TYPE) 110-1123003/110-1013013
		KEIHIN PWK φ28 110-1083428
CDI (Specified for each model.)	MONKEY / GORILLA	POWER REV2 766-1123300
		REV CON 764-1123100
▼General and special tools are required.		
KITACO SPECIAL TOOLS	FLYWHEEL PULLER	674-0500120
	CENTER LOCK NUT WRENCH	674-1432900
	UNIVERSAL HOLDER	674-0500000
	TAPPET ADJUST WRENCH	674-0900200
COMMERCIAL	THICKNESS GAUGE	-

※If there is a hard degradation like a blem, fatigue and wear etc on the reuse parts, please change to new ones.

■CYLINDER PARTS Refer to the illustration to install. (Please use when maintenance.)

※Illustration is MONKEY 12V model engine. The shape, structure, etc is different depending on model, year and spec.



STOCK PARTS (TORQUE / REMARK) TORQUE : 1kgf·m : 9.80665N·m						
FIGURE	NAME	QTY	TORQUE	FIGURE	NAME	TORQUE
N5	CYLINDER HEAD COVER	× 1		N15	CAM SPROCKET	× 1
N6	M6 FLANGE NUT	× 2	12N · m	N16	M5 BOLT	× 2 8N · m
N7	M6 x 110 BOLT	× 1	10N · m	N17	L CYLINDER HEAD SIDE COVER	× 1
N8	6mm SEALING WASHER	× 1		N18	TAPPET CAP	× 2 12N · m
N9	M6 x 20 BOLT	× 2	10N · m	N19	LOCKER ARM	× 2
N10	R CYLINDER HEAD SIDE COVER	× 1		N20	TAPPET ADJUST NUT	× 2 10N · m
N11	LOCKER ARM SHAFT	× 2		N21	TAPPET ADJUST SCREW	× 2
N12	M6 BOLT	× 2	10N · m	N22	CAM CHAIN GUIDE ROLLER	× 1
N13	CAM CHAIN	× 1		N23	ROLLER PIN	× 1 10N · m
N14	CAMSHAFT	× 1		N24	8mm SEALING WASHER	× 1

▼PACKING LIST 1/2 (Continue to No.3)

FIGURE	CODE	NAME		TORQUE / REMARK 1kgf · m : 9.80665N · m
A1	313-1133110	STD CYLINDER HEAD ASSY (Valve assembled)	× 1	
A2	300-1083100	SPL HIGH CAMSHAFT (For application C)	× 1	
A3	311-1083710	Φ54.0 CHROME CYLINDER (124cc)	× 1	
A4	351-1133102	Φ54.0 PISTON (124cc) 3R (0.8-0.8-1.5)	× 1	
A5	353-0001340	PISTON PIN 13 x 40	× 1	
A6	352-0006540	Φ54.0 PISTON RING 3R (0.8-0.8-1.5)	× 1SET	
-	989-0000010	DOWEL PIN FULL SET	× 1SET	
A7	70-989-08120	DOWEL PIN 8 x 12L	× 5	2SETx (× 2) +1
A8	70-989-08140	DOWEL PIN 8 x 14L	(× 2)	
A9	70-989-10140	DOWEL PIN 10 x 14L	(× 2)	
A10	313-0600000	CAP NUT & WASHER SET	× 1SET	12N · m
-	303-1123520	STUD BOLT SET	× 1SET	12N · m
A11R	303-1123512	STUD BOLT 6 x 195.5mm	(× 1)	
A11L	303-1123513	STUD BOLT 6 x 203mm	(× 1)	
A12	299-0125084	SD CAM CHAIN 25SD-84L	× 1	
B ↓	960-1123124	RUBBER SEAL SET-A (STD124cc)	× 1SET	
B1	961-1083124	HEAD GASKET (Φ54-STEINLESS STEEL)	(× 1)	
B2	966-1015022	CYLINDER HEAD COVER GASKET	(× 1)	
B3	966-1015110	R HEAD SIDE COVER GASKET (12V)	(× 1)	
B4	966-1015021	L HEAD SIDE COVER GASKET	(× 1)	
B5	966-1015010	RUBBER SEAL 16mm	(× 1)	
B6	950-1015010	MANIFOLD RUBBER SEAL	(× 1)	
B7	70-963-11001	EX GASKET (H-1)	(× 1)	
B8	967-1015000	O RING 30.8mm	(× 2)	
B9	962-1083600	BASE RUBBER SEAL	(× 1)	
B10	354-0000130	PISTON PIN CLIP 13mm	(× 2)	

▼OPTION PARTS (CYLINDER HEAD PARTS)

FIGURE	CODE	NAME	QTY
C1	303-1013711	TAPPET ADJUST TITANUM NUT (1pc)	OP
C2	303-1133900	LIGHT CAM SPROCKET 28T (12V MONKEY)	OP
C3	303-1083990	DLC LOCKER ARM SHAFT	OP
C4	353-3001340	DLC PISTON PIN 13 x 40	OP

▲ () is 1set QTY.
▲OP is option parts. Please purchase separately depending on setting.

※Cylinder head valve surrounding parts are assembled. Please use valve spring compressor to install / remove.

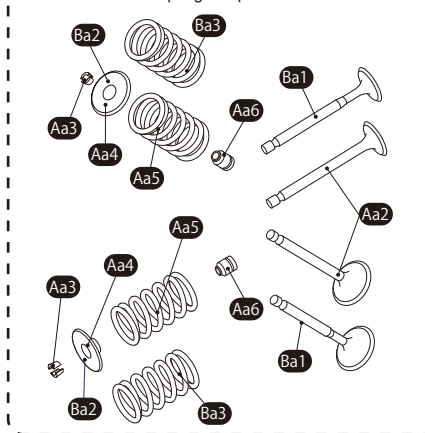


FIGURE	CODE	NAME	QTY
-	313-1133010	STD CYLINDER HEAD COMP	× 1
Aa2 ↓	302-1013011	STD VALVE SET	× 1
	302-1013100	IN VALVE · STD	(× 1)
	302-1013200	EX VALVE · STD	(× 1)
Aa3	303-1013502	VALVE COTTER	× 4
Aa4	303-1013510	VALVE SPRING RETAINER	× 2
Aa5	303-1123220	OUTER VALVE SPRING ULTRA-SE	(× 2)
Aa6	303-1122507	VALVE STEM SEAL	× 2

▲ () is 1SET QTY.

▼Crank case developed illustration and packing list are on No.3.

STANDARD BIG BORE KIT 124cc for 12V monkey

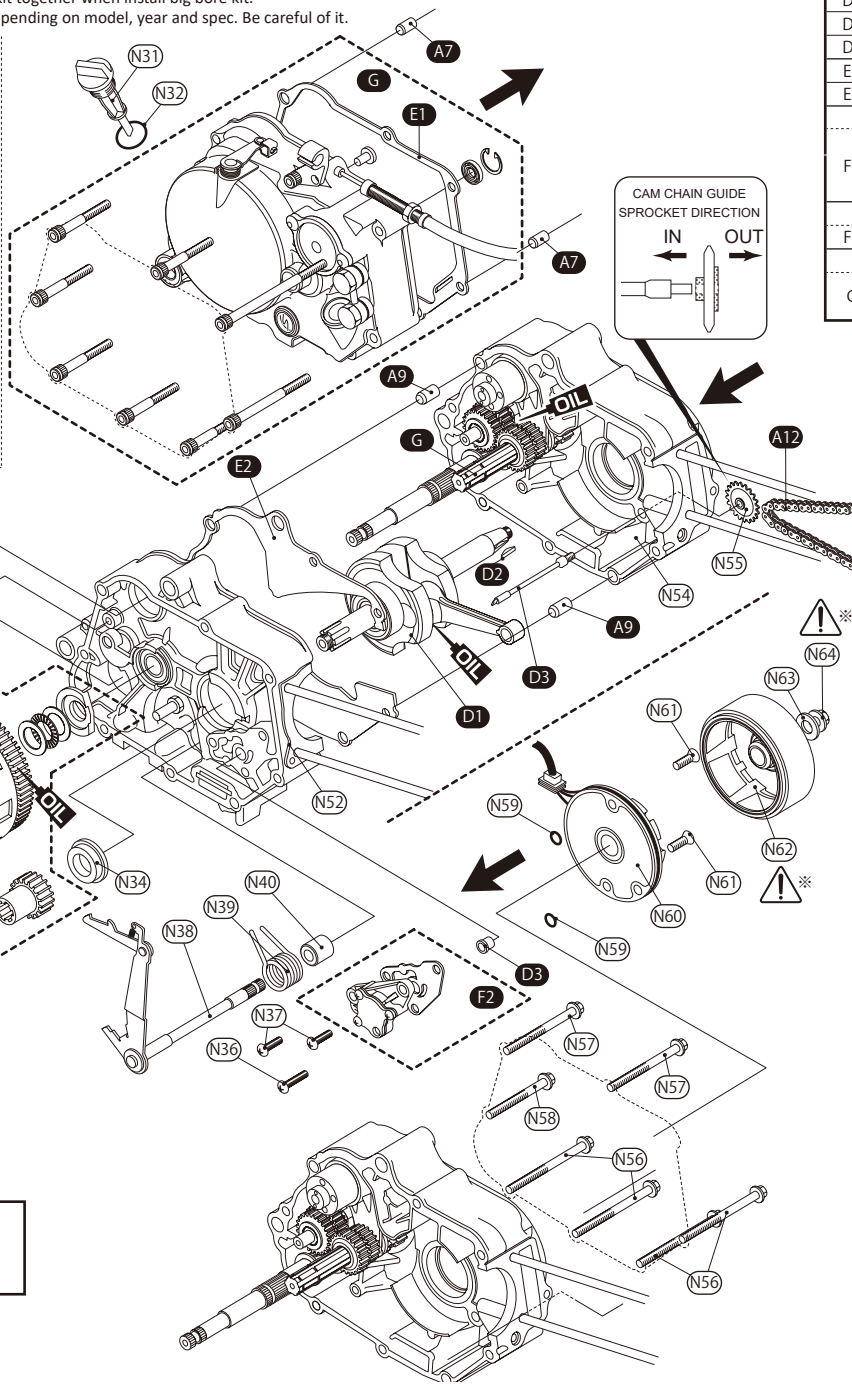
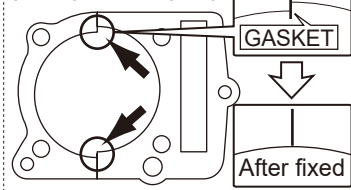
NO.3 /5

■CRANK CASE PARTS Refer to the illustration when installing. (Please use when maintenance)
 ※Illustration is MONKEY 12V model engine. The shape, structure, etc is different depending on model, year and spec.
 ※Please install ultra clutch kit and ultra oil pump kit together when install big bore kit.
 Each parts shape, composition, etc is different depending on model, year and spec. Be careful of it.

CRANK CASE GASKET

When installing cylinder, if the gasket stick out from crank case contact surface, the cylinder sleeve might touch the gasket because of deformation by thermal expansion, and it might cause of burning piston and oil leaking. Crank case hardness is more than tolerance, processing and assembling require extreme caution.

CRANK CASE FLAT SURFACE



⚠ / ※ Refer to the adjust / remark
 (※Refer to the remark on right side.)
 OIL → Apply engine oil

▼PACKING LIST 2/2 (Continue to No.2)

FIGURE	CODE	NAME		
D1	309-1123400	54mm STROKE UP CRANK SHAFT COMP (H CROSS SECTION 12V CRANK)	×	1
D2	309-1123090	SPL WOODRUFF KEY	×	1
D3	331-1083003	OIL PUMP SPINDLE SET (12V)	×	1
E1	966-1015004	R CRANK CASE COVER GASKET	×	1
E2	966-1015023	CRANK CASE GASKET	×	1
OPTION PARTS (OIL COOLER, etc)				
F1	360-1133200	NEW SUPER OIL COOLER KIT 3 ROW (MONKEY/GORILLA)	OP	
	360-1083200	NEW SUPER OIL COOLER KIT 5 ROW (MONKEY/GORILLA)	OP	
	360-1083300	NEW SUPER OIL COOLER KIT 5 ROW (MONKEY/GORILLA) ULTRA CLUTCH KIT	OP	
OPTION PARTS (OIL PUMP)				
F2	331-1083400	ULTRA OIL PUMP KIT (APPLICATION C)	OP	
OPTION PARTS (ULTRA CLUTCH KIT)				
G		ULTRA DRIVE KIT TYPE X (For each type.)	OP	
		ULTRA CLUTCH KIT TYPE X (For each type.)	OP	

▲ OP is option parts. Please purchase separately in necessary.

STOCK PARTS (TORQUE / REMARK)

FIGURE	NAME	QTY	TORQUE 1kgf · m : 9.80665N · m	REMARK
N31	OIL FILLER CAP	×	1	
N32	O RING	×	1	
N-	DOWEL PIN 8 x 12	×	2	
N34	17mm COLLAR	×	1	
N35	OIL THROUGH BEARING	×	1	
N36	M6 x 22 SCREW	×	1	10N · m
N37	M6 x 16 SCREW	×	2	10N · m
N38	GEAR SHIFT ARM COMP	×	1	
N39	GEAR SHIFT ARM RETURN SPRING	×	1	
N40	12.2mm COLLAR	×	1	
N41	DRUM STOPPER ARM PIVOT BOLT	×	1	12N · m
N42	DRUM STOPPER ARM	×	1	
N43	DRUM STOPPER ARM SPRING	×	1	
N44	M6 BOLT	×	1	12N · m
N45	DRUM STOPPER PLATE	×	1	
N46	SHIFT DRUM SIDE PLATE	×	1	
N47	ROLLER 3 x 8.5	×	2	
N48	SHIFT DRUM PIN	×	3	
N49	16mm CIRCLIP	×	1	
N50	KICK SPRING RETAINER	×	1	
N51	KICK STARTER SPRING	×	1	
N52	R CRANK CASE	×	1	
N-	DOWEL PIN 10 x 14	×	2	
N54	L CRANK CASE	×	1	
N55	CAM CHAIN GUIDE SPROCKET 25T	×	1	
N56	M6 x 65 BOLT	×	4	12N · m
N57	M6 x 60 BOLT	×	2	12N · m
N58	M6 x 50 BOLT	×	1	12N · m
N59	O RING	×	2	
N60	STARTER COIL ASSY	×	1	
N61	M6 x 16 FLAT HEAD SCREW	×	2	10N · m
N62	FLYWHEEL	×	1	Remove / install with specified tool (Refer to the No.4)
N63	10mm WASHER	×	1	
N64	M10 NUT	×	1	42N · m Remove / install with specified tool (Refer to the No.4)

INSTALLING PISTON RING

Install piston ring as illustration.

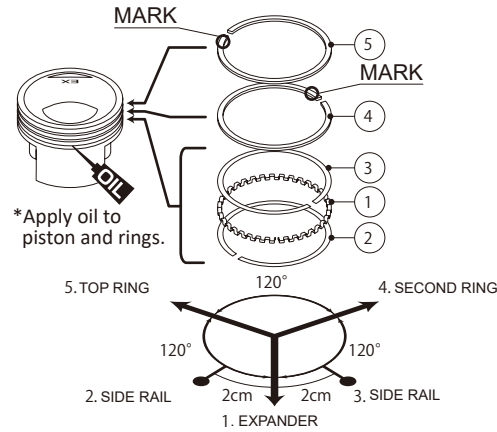
“POINT”

- Divide ring as following illustration.
- Top and second ring marked face to upward (head direction).
- There is no specified direction for expander and side rail.

PARTS DATA (Install in numerical order)

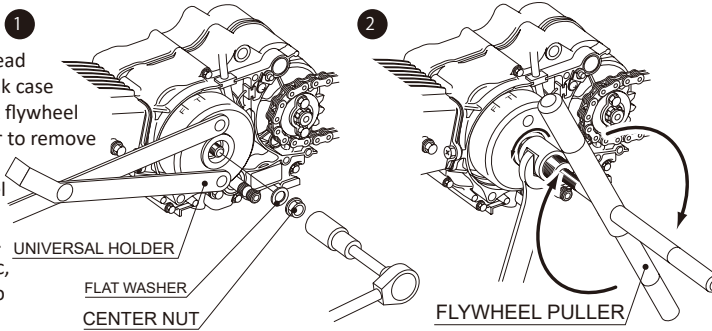
FIGURE	NAME	QTY
1	EXPANDER	× 1
2/3	SIDE RAIL (BOTH SAME)	× 2
4	SECOND RING (BLACK)	× 1
5	TOP RING (WHITE)	× 1

*Install piston with EX mark to exhaust side.



INSTALLING / REMOVING FLYWHEEL

- 1) Firstly, set to compression top dead center (flywheel T mark and crank case matching mark are matched.) Fix flywheel by specified tool universal holder to remove flywheel center nut.
- 2) Install flywheel puller to flywheel with rotating left (counterclockwise) to install firmly deeply. Fix flywheel puller by spanner, etc, then rotate handle to right side to pull out flywheel.

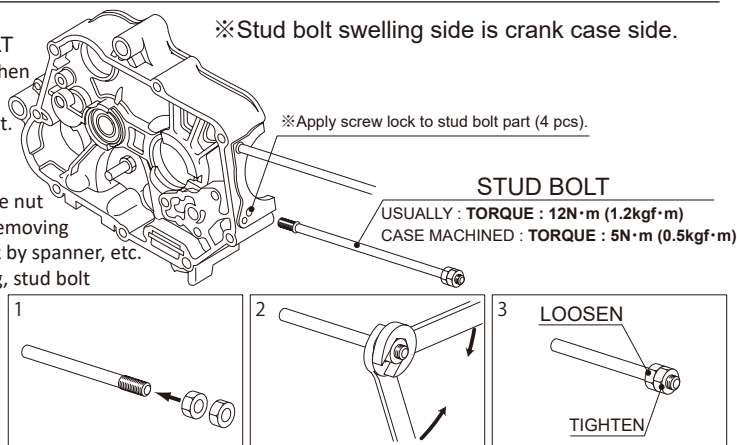


REMOVING / INSTALLING STUD BOLT

(Orifice enlargement machining when installing oil pump.)

- 1) Install 2pcs M6 nuts to stud bolt.
- 2) Hang spanner to each nut, tighten both to fix.
- 3) When installing stud bolt, rotate nut in the front by wrench. When removing stud bolt, rotate nut in the back by spanner, etc.

※ In case of processed case boring, stud bolt surrounding is thin, therefore use screw lock and tighten a half of specified torque. (Install muffler stud bolt as same.)



ADJUSTMENT AND INSTALLING EACH PARTS / CHECK POINT

HOW TO ADJUST VALVE TIMING AND CHECK VALVE CLEARANCE

- 1) Rotate crank shaft to counterclockwise to match fly wheel “T” mark and crank case matching mark.
- 2) Apply clean oil to camshaft and camshaft bearing. Face cam lobe to piston side, install camshaft to inside cylinder head while pushing locker arm.
- 3) Install dowel pin to cam sprocket, match cam sprocket O mark and cylinder head nod. Then install cam chain to sprocket. (Align crank shaft center, cam shaft center and O mark in a straight line.)

- *Refer to the compression top dead center illustration.
- 4) Install cam sprocket to camshaft, tighten cam sprocket bolt. (TORQUE : 0.8kgf·m)

VALVE CLEARANCE SETTING

- 5) Rotate crank shaft to counterclockwise to match fly wheel “T” mark and L crank case matching mark. Move locker arm to check piston position is at compression top dead center.
- 6) Insert thickness gauge between adjust screw and valve stem to adjust intake and exhaust valve clearance.

○ VALVE CLEARANCE

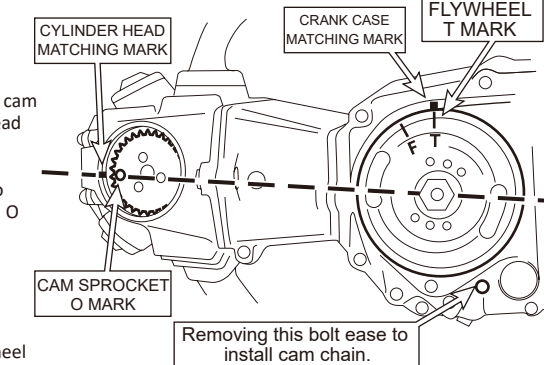
IN : 0.05~0.07mm

EX : 0.07~0.09mm

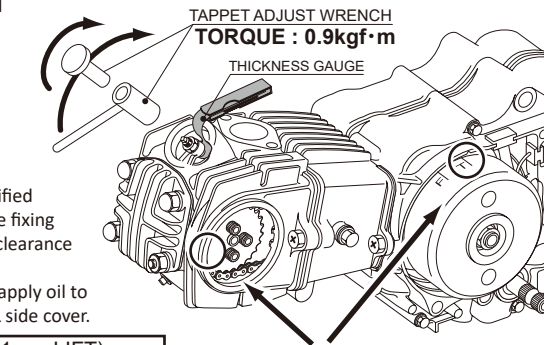
ADJUSTMENT

- 7) Loosen lock nut and rotate adjust screw to adjust specified valve clearance. After adjustment, tighten lock nut while fixing adjust screw. After tightening lock nut, check the valve clearance again. (TORQUE : 0.9kgf·m)
- 8) Check the tappet cap O ring, please change it in need, apply oil to tappet cap O ring, install tappet cap and cylinder head L side cover.

COMPRESSION TOP DEAD CENTER



VALVE CLEARANCE ADJUSTMENT



SERVICE GUIDE VALVE TIMING DEGREE (AT1mm LIFT)

*Compared to sock head, valve train layout and timing is different.

	CAMSHAFT	OPEN	CLOSE	LC
SPL	INTAKE	BTDC 12°	ABDC 38°	103°
	EXHAUST	BBDC 50°	ATDC 9°	110.5°
STOCK	INTAKE	BTDC 3°	ABDC 15°	96°
	EXHAUST	BBDC 8°	ATDC 0°	94°

START ENGINE AFTER INSTALLATION

A time lag of circulation engine oil around engine inside may cause of burning. In case of the engine with oil check bolt, remove check bolt and spark plug, then kick to the (cranking) oil comes out from check bolt. After check it, put check bolt and spark plug back and start engine.

BREAK IN (HEAT TREATMENT)

Please do break in with low (short) gear (in case of 5speed model, please use 4speed) and total 2 hours without applying force to engine.

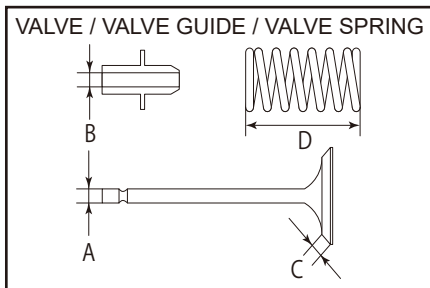
ADDITIONAL TIGHTENING

After break in, cylinder, cylinder head stud bolts might get distortion and elongation because of cooling and heating. Additional tightening to even the power. The bolts of cylinder head for most of the models are 4pcs + hexagon bolts 1 or 2 pcs. After the engine becomes room temperature, loosen a nut of 4pcs stud bolt, then apply oil to nut, washer and stud bolt screw part and tighten with specified torque.

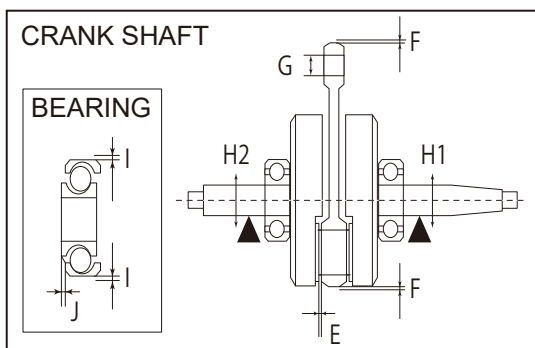
Secondly, loosen diagonally stud bolt nut, then as same as previous, apply oil to nut, washer and stud bolt screw part and tighten with specified torque. (continue)

(ATTENTION! Do not loosen all 4pcs nut at once. Please operate one by one.)

Finally, apply oil to bolts and tighten with specified torque as same to finish.



	SERVICE GUIDE CYLINDER HEAD	BASIC VALUE (mm)	USAGE (mm)
A	IN VALVE STEM DIAMETER	$\varnothing 5.445 \sim \varnothing 5.465$	$\sim \varnothing 5.400$
	EX VALVE STEM DIAMETER	$\varnothing 5.430 \sim \varnothing 5.445$	$\sim \varnothing 5.400$
B	IN VALVE GUIDE I.D.	$\varnothing 5.475 \sim \varnothing 5.485$	$\varnothing 5.500 \sim$
	EX VALVE GUIDE I.D.	$\varnothing 5.475 \sim \varnothing 5.485$	$\varnothing 5.500 \sim$
C	IN VALVE SEAT CONTACT WIDTH	$0.8 \pm 0.1\text{mm}$	$1.3\text{mm} \sim$
	EX VALVE SEAT CONTACT WIDTH	$0.8 \pm 0.1\text{mm}$	$1.5\text{mm} \sim$
D	OUTER VALVE SPRING	-	-



	SERVICE GUIDE (CRANK SHAFT)	BASIC VALUE (mm)	USAGE (mm)
E	CONROD BIG END SIDE GAP	$0.1 \sim 0.35$	$0.5 \sim$
F	CONROD BIG END VERTICAL GAP	$0 \sim 0.01$	$0.05 \sim$
G	CONROD SMALL END I.D.	$13.013 \sim 13.043$	$13.05 \sim$
H	LEFT SIDE CRANK SHAFT SHAKE	$0 \sim 0.05$	$0.08 \sim$
I	INSIDE BEARING, OUTER RING VERTICAL GAP	$0.05 \sim 0.09$	$0.10 \sim$
J	INSIDE BEARING, OUTER RING SIDE GAP	$0.005 \sim 0.040$	$0.050 \sim$

200919 M-T