

Reverse Gear Manual

(Monoblock Type)

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Advanced Innovative Machinery



MAMBA Ltd.

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1 Introduction

Thank you for choosing our Mamba Reverse Gear Kit. This is an exquisite product designed and developed by our in house engineers after much experimentation and testing. Our goal is to provide you with the highest quality product and to ensure a safe and easy to ride Harley Davidson. We are proud to produce this original and patented design for you, and we hope you will appreciate our attention to detail.

What makes us unique is that we are the developer, producer, and distributor for our products. This allows us to research and improve upon previous products much better than other companies because we hear the voice of our customers.

This is how we achieve our mission of simplification and ride comfort improvement. You will be satisfied without a doubt with the performance, reliability, and quality of this product once it is installed into your ride.

Please enjoy a more comfortable Harley Davidson life!

Ichiro Mamba

2 Required Tools

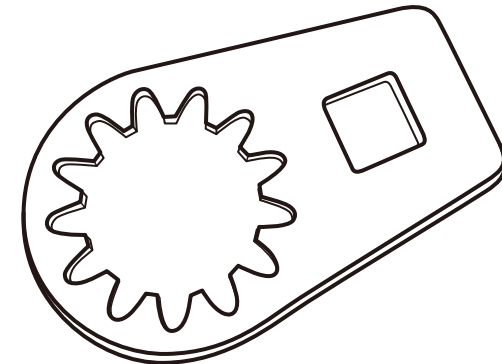
Safety Information and Required Tools

- Read the instructions before moving on. Special tools are required.
- Please confirm that you have all required tools prior to installation.

Required Tools

1. Mamba Special tool, 13 Tooth Socket Wrench [Included]
2. 5mm diameter, Carbide Drill Bit [Included]
3. Loctite #620 (green) [Included]
4. Loctite #272 High Strength red threadlocker [PURCHASE SEPARATELY]

Warning: DO NOT use any adhesives other than those specified. Using other adhesives may result in damage of the product. Use ONLY the thread lockers listed above.

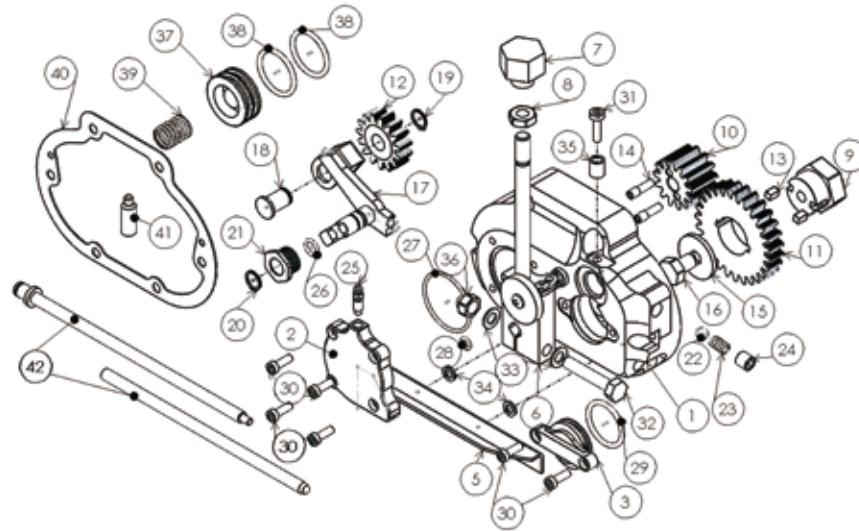


Please make sure to use the provided Mamba Special tool!

3 Kit Inspection

Billet6S CP

- 1 Reverse Gear Housing
- 2 Bleeder Plate
- 3 Inspection Cap
- 4 Sleeve
- 5 Heat Shield
- 6 Shift Lever
- 7 Shift Knob
- 8 M10 Nut
- 9 Counter Boss
- 10 Main Gear 13T
- 11 Counter Gear 27T
- 12 Idler Gear 15T
- 13 Breakoff Key
- 14 Lock Pins
- 15 Washer 32mm OD
- 16 Bolt 10x15
- 17 Shifter
- 18 Idler Pin
- 19 Snap Ring
- 20 Steel Snap Ring
- 21 Shifter Bushing
- 22 Ball 8mm
- 23 Spring
- 24 Hollow Set
- 25 Bleeder Valve
- 26 O-Ring 12mm OD
- 27 O-Ring 45mm OD
- 28 O-Ring 9.5mm OD
- 29 O-Ring 36mm OD
- 30 Screw 5x15
- 31 Screw 6x20
- 32 Bolt 8 x 45
- 33 Washer M8
- 34 Washer M6
- 35 Collar 10x12
- 36 Nut M8
- 37 Piston
- 38 Piston O-Ring
- 39 Piston Spring
- 40 Gasket
- 41 Loctite 620#
- 42 Pushrod 396mm



Please confirm you have all of the parts before beginning the install.
Your kit should have all of the components listed below.

WARNING: Before you begin the installation, you should check to see if the mechanism is set up appropriately and operates smoothly.

- 1 Reverse Gear Body
- 2 Gasket
- 3 Shift Lever - 1 set
- 4 Reverse Counter Gear 22T - 1 Set
- 5 Reverse Main gear 13T - 1 Set
- 6 Caution Label
- 7 Loctite #620
- 8 Spare Breaker Keys

4 Install

STEP 1

1 Remove the nut and washer from the mainshaft and countershaft.

2 Degrease the main shaft, and also the R main gear (13T) of your kit.

3 Apply plenty of Loctite #620 into the screw hole of the R Main gear, and tighten to the main shaft by hand.

4 Using the special tool, tighten and torque the gear to 110 Nm. After that, the Loctite needs 24 hours to completely cure, so do not ride your bike until the Loctite is cured.

5 After tightening the R main gear, bore out the holes to set your lock pins. The main gear of your kit has guide holes, so you can drill them using a carbide drill bit of 5mm diameter. Bore the holes to 23 mm below the face of the gear.

6 After Drilling, screw in the lock pins. Do not apply Loctite on the pins.

7 Degrease the screw threads of the counter boss and the counter shaft. Apply plenty of Loctite #620 to the thread of the shaft, and tighten it by hand. Then torque to 110 Nm using a 32mm socket wrench.

8 Put grease on the contacting area of the counter boss and the counter gear, and put the gear in the boss. Insert the key into the gaps.

WARNING: Do not apply Loctite on the safety breaker keys.

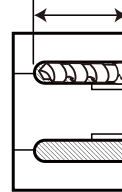
9 Torque the 10 mm x 10 mm bolt to 25 Nm. Before tightening, apply the Loctite (red high strength) on the thread.

REVERSE GEAR Main gear Drilling Process



Bore holes on the Main gear
Use 5 mm carbide rotary bit
Bore the hole 24 mm deep!

23mm

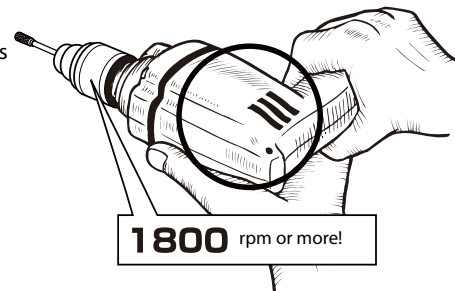


※ If the drill bit reaches the surface of the bearing, the bit would be instantaneously damaged.
※ You must use a drilling tool.
※ Do not use a die grinder.

Set at a right angle (90 degree) to the gear
If the burr is set at a wrong angle, the gear may be damaged.

REVERSE GEAR CAUTION! CUSTOM MC MAMBA NEVER USE A DIE GRINDER TO DRILL THE MAIN GEAR!

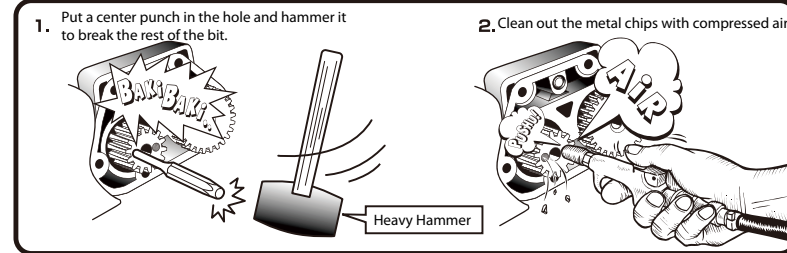
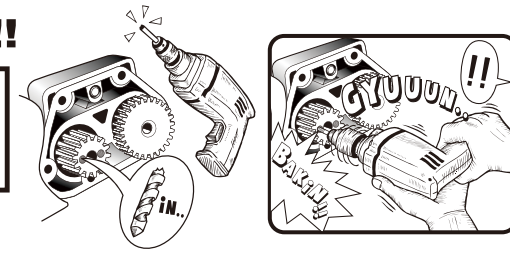
You MUST use a high-speed drill!



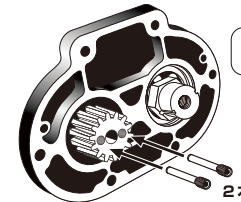
1800 rpm or more!

ACCIDENT!!

Pointers for handling a damaged or broken drill bit!



REVERSE GEAR Torque to tighten the R Main Shaft Gear



Apply Loctite
(Green #620 for cylindrical bonding)

110Nm

- 1). Apply Loctite (Green #620 for cylindrical bonding)
- 2). Torque the gear to 110 Nm.

Note
※ Do not apply Loctite on the lock pins directly!

- 2). After installing the counter gear, insert the keys.

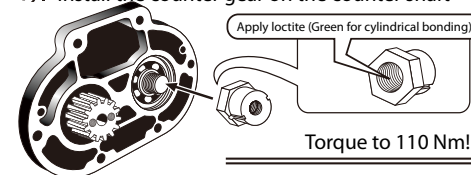
Warning!

Use the keys from MAMBA only!

- These keys have a specific breaking load! 5 x 5 x 8 mm, brass product. Your kit has four keys, includes two spares.

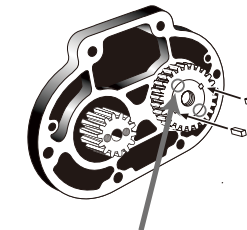
REVERSE GEAR How to install the counter gear

- 1). Install the counter gear on the counter shaft



Apply loctite (Green for cylindrical bonding)

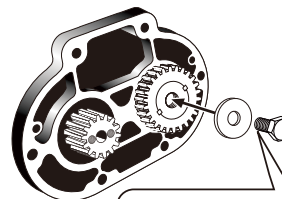
Torque to 110 Nm!



Put grease on these two spots!

Caution! : The keys should be placed below the face of counter gear.

- 3). Install the washer and screw



Apply Loctite (Red - high strength).
Torque to 25 Nm.

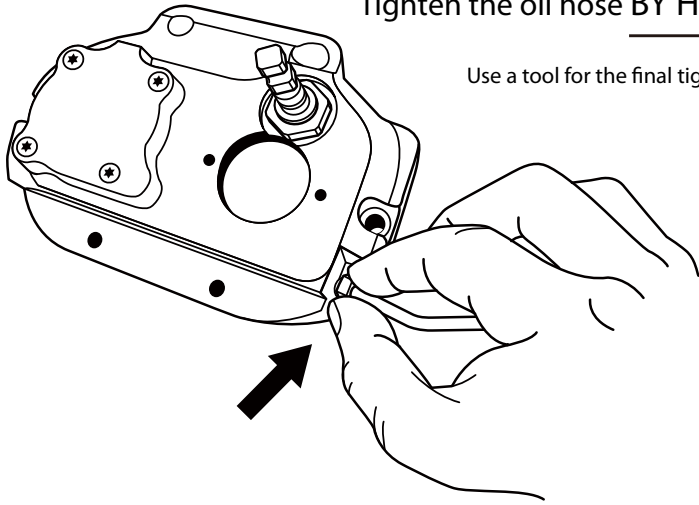
Warning!

※ Do not shift from neutral to reverse! This puts heavy load on the system and the brake keys will snap!

- Before using the reverse gear, you must shift to a low gear to stop any spinning of the transmission!
- Before starting to move forward, you must turn off the reverse gear system

Tighten the oil hose BY HAND FIRST!

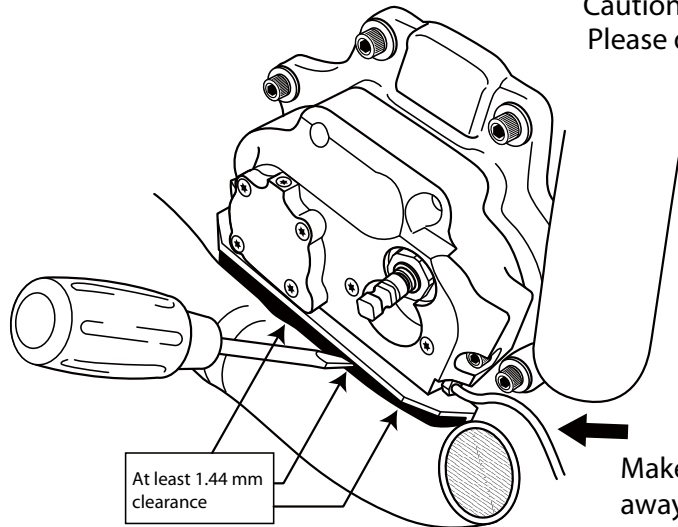
Use a tool for the final tightening.



WARNING: If improperly threaded the fitting will become cross-threaded! Do not put in if it cannot be hand tightened!
Please make sure the fitting is in line with the threaded hole. It is tilted about 11 degrees. The fitting will not fit perpendicular.
Please use a tap if the fitting is difficult to put in. (M10 x 1mm)

WARNING: Do not use any volatile cleaners like brake/parts/carb cleaner!

Caution!
Please do not crush the oil hose.

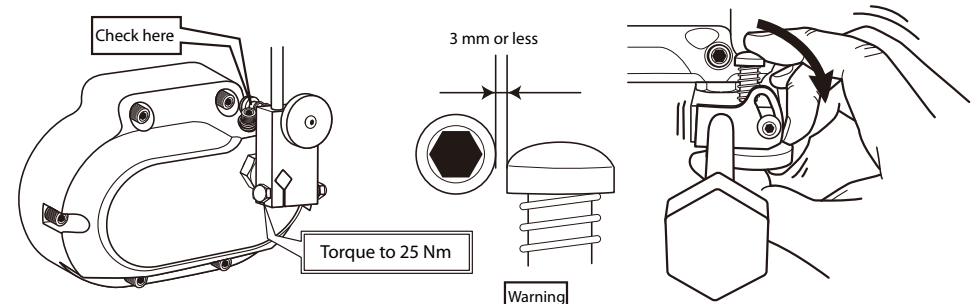


Make sure to route the oil line away from the exhaust pipe

STEP 2

Shift lever installation

After installing the shift lever, please make sure there is less than 3mm of clearance as illustrated below.



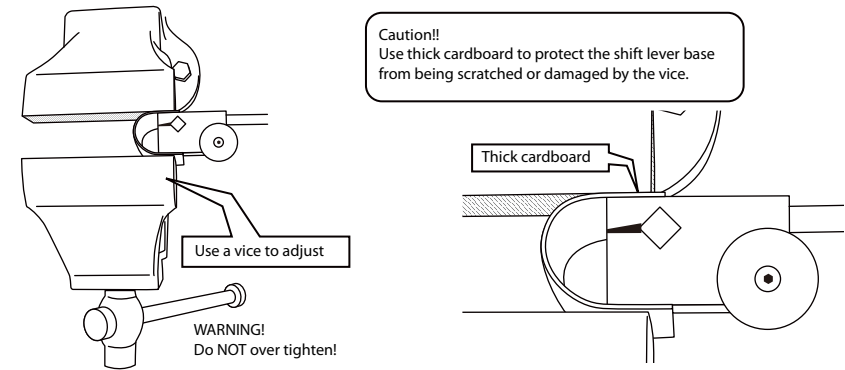
There is some play in the shaft. Make sure there is less than 3mm of clearance even with the play.

Warning
Having more than 3 mm of clearance may engage the R gear, which is dangerous.

REVERSE GEAR CMC MAMBA
WARNING: Be careful when installing the shift lever!

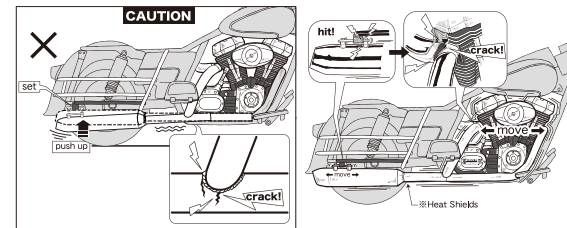
Even after torquing the bolt for the shift lever, there may be some play in the attachment from the cover to the shift lever!

In this case please use a vice to tighten the diamond shape opening so that there is no play in the attachment point!



WARNING!

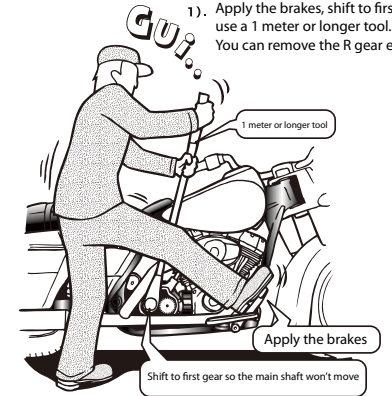
Put the whole exhaust system temporarily on your bike, and check if the exhaust gases can flow properly before fastening it completely. If any load is applied to the pipe, it will cause breakage.



REVERSE GEAR ALL MODEL

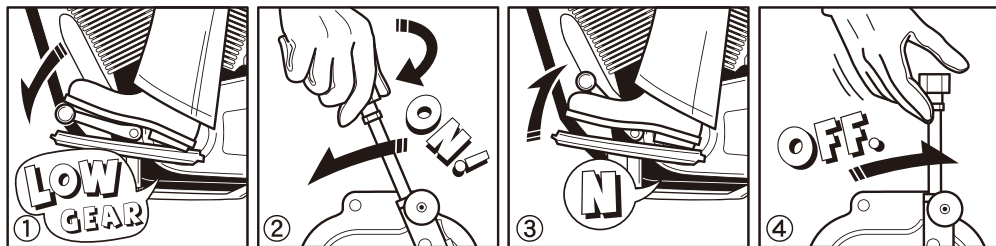
Detaching the R gear

- 1). Apply the brakes, shift to first gear, and use a 1 meter or longer tool. You can remove the R gear easily.



6 Operating Instructions

Billet6S CP



- 1 Hold the clutch to shift into first gear
- 2 Rotate the knob of the shift handle and engage the R gear
- 3 When you shift the bike to neutral from first, the reverse gear system turns on.
- 4 Operate the clutch and brake system to start backing up.
- 4 Put the shift lever into the off position to stop the reverse system. This will return the bike to neutral.

Note: Keep the throttle almost closed when you coast backwards. The ideal operating condition is at around 1,300rpm or close to your idling condition.

Note: Don't shift into a forward moving gear while the R gear is engaged. If you shift by accident, the R gear will be disengaged automatically. However, in rare cases it may not disengage fully. Please make sure the R shift handle comes back firmly to the off position to avoid damage to your gearbox.

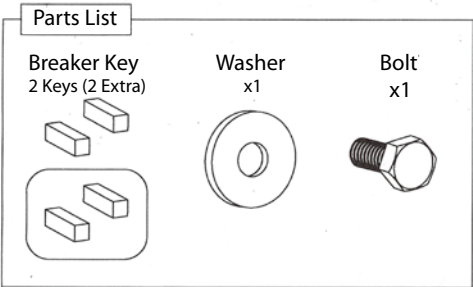
Do not operate the R gear while your bike is moving forward or you are riding. Your gearbox can be damaged and may cause a serious accident.

Always shift to first gear and make sure the transmission shafts have stopped spinning before operating the reverse gear.

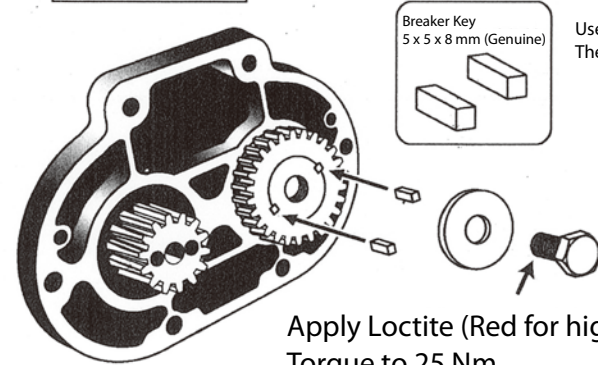
WARNING: If you don't shift into first gear and operate R gear, the safety breaker keys will be broken. When the keys are broken, you should drive turning off the R gear. Ensure you then replace the keys immediately.

- * The safety breaker keys are wear items. You may find that they need to be replaced before your next routine check depending on your usage.
- ** You must do a routine maintenance at the automotive inspection regulated by law (or every two years).

Breaker Kit



Changing Keys



Use keys from MAMBA only!
These keys have a specific breaking load!

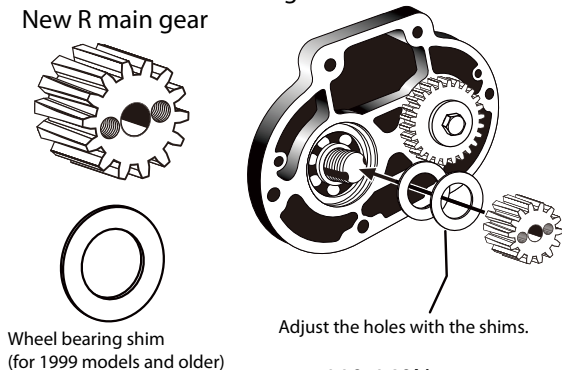
Apply Loctite (Red for high strength).
Torque to 25 Nm

Warning! Do NOT reuse washer and bolt!

REVERSE GEAR CUSTOM MC MAMBA

Lockpin hole adjustment when replacing the main gear

When Replacing the main gear, adjust and line up the holes drilled on the main shaft and of the new R main gear.



Wheel bearing shim (for 1999 models and older)

Adjust the holes with the shims.

When using wheel bearing shims for 1999 models and older, adjust the lock pin holes and torque to 110-140 NM

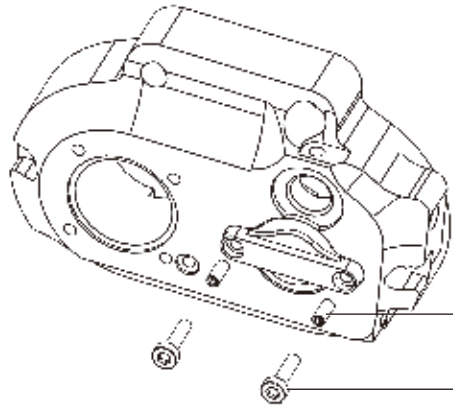
Torque to 110-140Nm and adjust.

TIP SECTION

Reverse Gear System Billet 6SCP

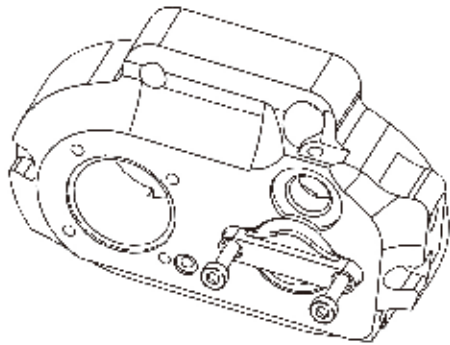
Removing the Inspection Cover

Inspection Cover Puller
Hollow Set Screw x2
Cap Screw x 2



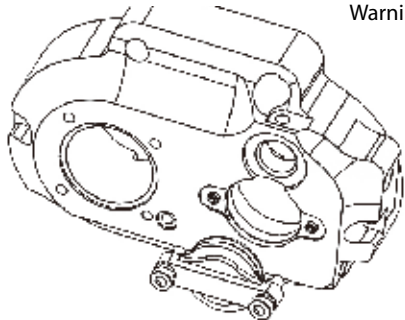
Removing the bolts on the inspection cover will not remove the

Hollow Set Screw
M5 x 12
Cap Screw
M6 x 20



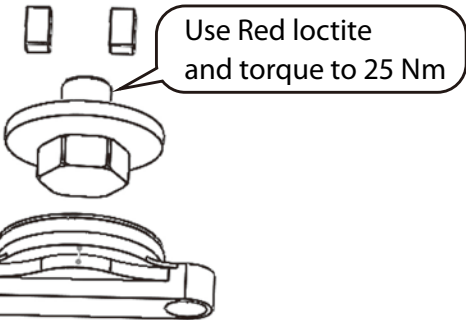
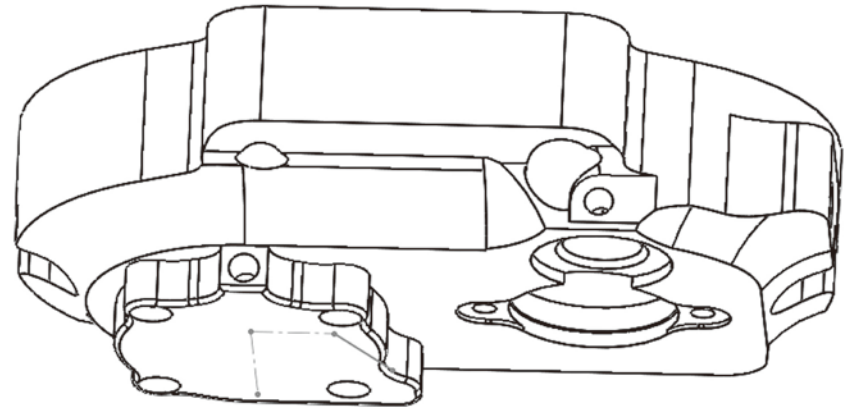
- ① Screw in the Hollow Set Screw into the body first
- ② Insert and tighten the cap screws evenly together to ease out the inspection cover.

Warning: Do not tighten one side at a time. Tighten both sides together.



Exchanging Breaker Keys

Breaker Key Set
Key x 4 Bolt x 2
Washer x 2 O-Ring x 2



Put Grease on O-Ring

Warning

- ※ Do not put it into reverse from neutral. Doing so will put load on the gear and break the keys.

Always shift up to first gear to stop the main shaft before engaging the reverse gear.

Disengage the reverse gear before moving forward! Otherwise the breaker keys will break.

Warning!

- Only use MAMBA break off keys !
- Keys are engineered with a specific breaking load. Always use Mamba keys! 5 x 5 x 8 mm.
- ※ There's four breaker keys in the kit. Two are spares.

Push the breaker key in so that it doesn't sit flush on the surface.