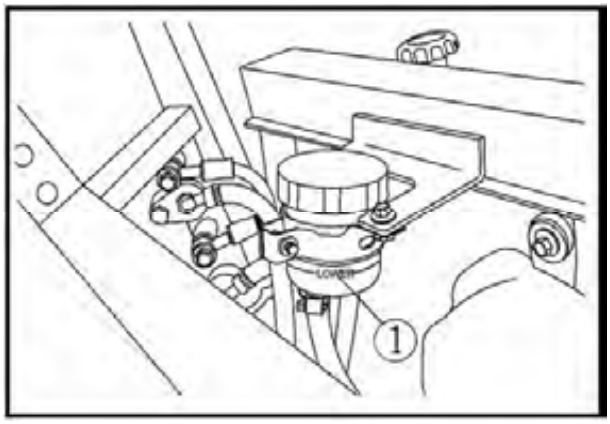


CHECKING THE BRAKE FLUID LEVEL

1. Place the vehicle on a level surface.

NOTE:

When checking the brake fluid level, make sure that the top of the brake fluid reservoir top is horizontal.

2. Lift the hood up.
3. Check:
   brake fluid level Fluid level is under "LOWER" level line ① ⟶ Fill up.

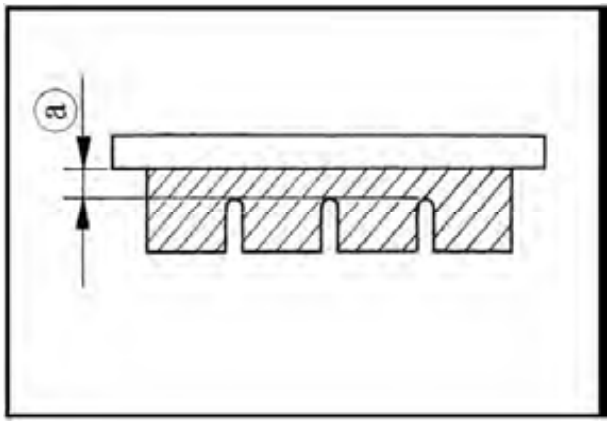
NOTE:

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

WARNING:

- ***Use only the designed quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.***
- ***Refill with the same type of brake fluid: mixing fluids may result in a harmful chemical reaction and lead to poor performance.***
- ***Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in a vapor lock.***

4. Close the hood.



CHECKING THE FRONT BRAKE PADS

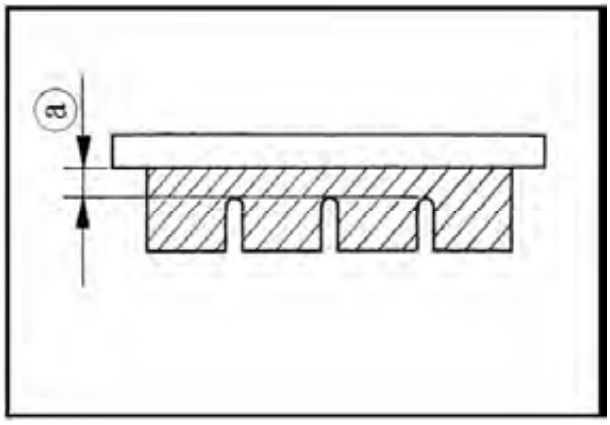
1. Remove:
   - front wheels
2. Check:
   - brake pads

   Wear indicator groove ⓐ almost disappeared
   Replace the brake pads as a set.

Brake pad wear limit ⓐ
1.5 mm (0.06 in)

3. Operate the brake pedal.

4. Install:
   • front wheels

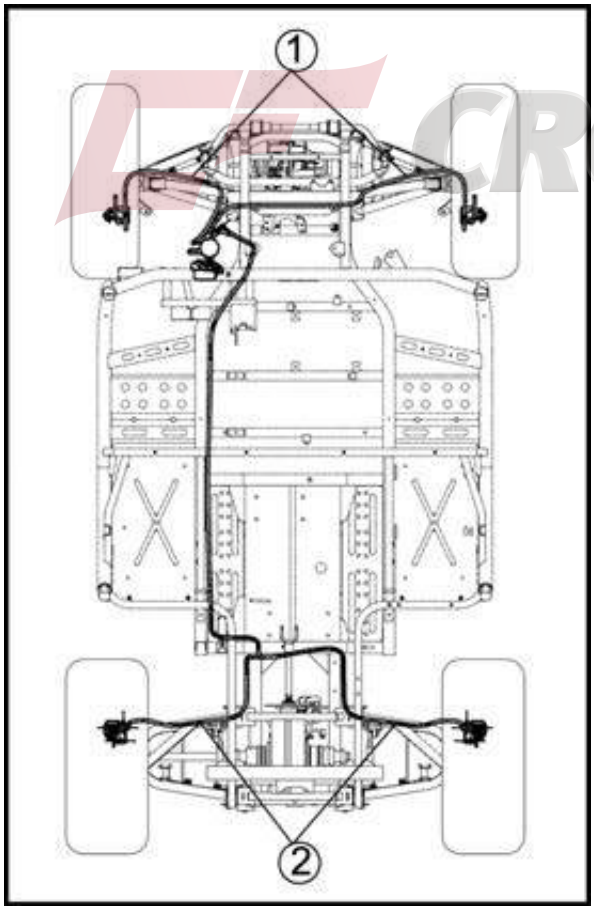


CHECKING THE REAR BRAKE PADS

1. Check:
   • brake pads
   Wear indicator groove ⓐ almost disappeared
   Replace the brake pads as a set.
   Refer to "FRONT AND REAR BRAKES" in chapter 5.

Brake pad wear limit ⓐ
1.5 mm (0.06 in)

3. Operate the brake pedal.



CHECKING THE BRAKE HOSES AND BRAKE PIPES

1. Remove:
   • driver seat
   • console
   Refer to "SEATS" in chapter 5
2. Lift the hood up.
3. Lift the cargo bed.
4. Check:
   • front brake hoses ①
   • rear brake hoses ②
   Cracks/wear/damage → Replace.
   Fluid leakage → Replace all damaged parts.

NOTE:

Hold the vehicle in an upright position and apply the brake pedal.

5. Install:
   • console
   • driver seat

BLEEDING THE HYDRAULIC BRAKE SYSTEM

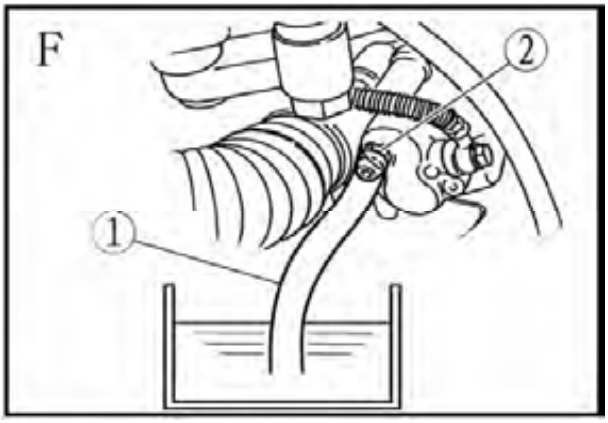
WARNING:

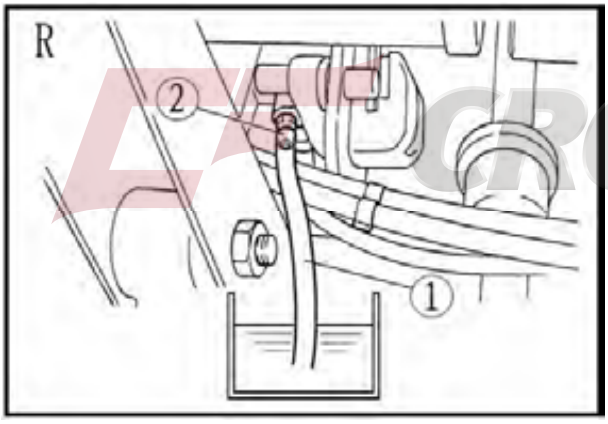
Bleed the brake system if:

• The system has been disassembled.

- ***A brake hose or brake pipe have been loosened or removed.***
- ***The brake fluid has been very low.***

The brake operation has been faulty. A loss of braking performance may occur if the brake system is not properly bled.





1. Bleed:
   - brake system

a. Add the proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic hose ① tightly to the caliper bleed screw ②.
   Ⓕ Front
   Ⓡ Rear
d. Place the other end of the hose into a container.
e. Slowly apply the brake pedal several times.
f. Push down on the pedal and hold it.
g. Loosen the bleed screw and allow the pedal to travel towards its limit.
h. Tighten the bleed screw when the pedal limit has been reached, then release the pedal.
i. Repeat steps (e) to (h) until all the air bubbles have disappeared from the fluid.
j. Tighten the bleed screw.

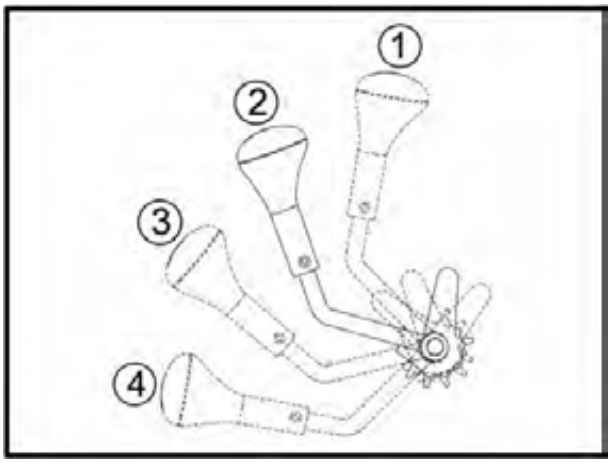
NOTE:

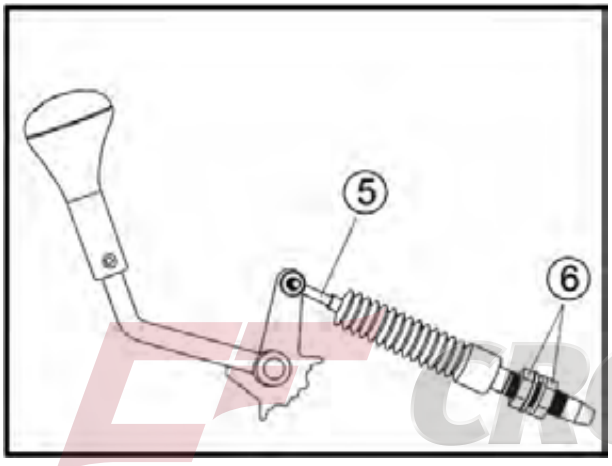
If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

k. Add brake fluid to the proper level.

WARNING:

Check the operation of the brake after bleeding the brake system.





ADJUSTING THE SELECT LEVER SHIFT ROD

① Low
② High
③ Neutral
④ Reverse
⑤ Select lever shift rod
⑥ Both locknuts

WARNING:

Before shifting, you must stop the vehicle and take your foot off the accelerator pedal. Otherwise, the transmission may be damaged

1. Adjust:
   • Select lever shift rod

a. Make sure the select lever is in NEUTRAL.
b. Loosen both locknuts ⑥.

WARNING:

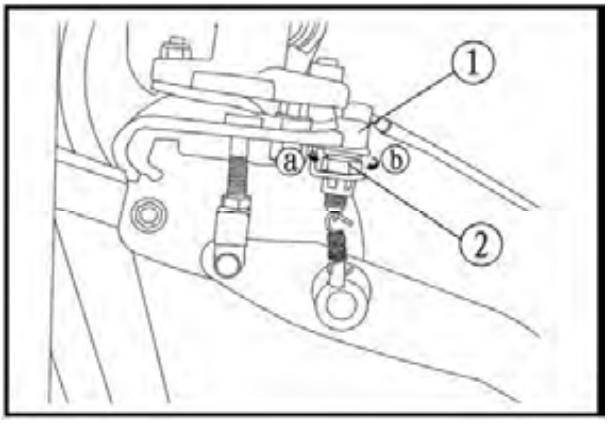
The select lever shift rod locknut (select lever side) has left-handed threads. To loosen the locknut, turn it clocwise.

b. Tighten the locknuts ⑥.

ADJUSTING THE BRAKE LIGHT SWITCH

NOTE:

- **The brake light switch is operated by movement of the brake pedal.**
- **The brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.**

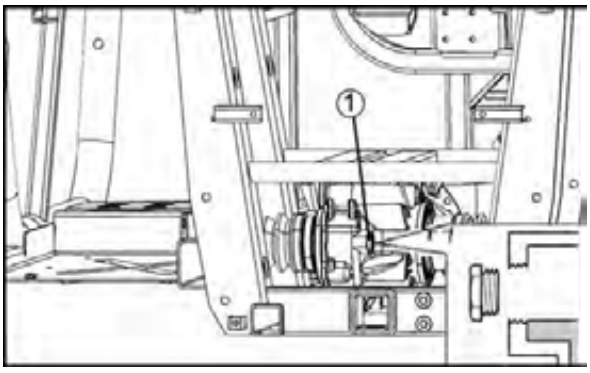


1 Check
   • brake light operation timing
   Incorrect → Adjust.
2. Adjust:
   • brake light operation timing

a. Hold the main body of the brake light switch ① so that it does not rotate and turn the adjusting nut ② in direction ⓐ or ⓑ until the brake light comes on at the proper time.

Direction ⓐ	Brake light comes on sooner.
Direction ⓑ	Brake light comes on later.

CHECKING THE FINAL GEAR OIL LEVEL



1. Place the vehicle on a level surface.
2. Remove:
   • oil filler plug ①
3. Check:
   • oil level
   Oil level should be up to the brim of the hole.
   Oil level low → Add oil to the proper level.

Recommended oil
SAE 80 API "GL-4" Hypoid gear oil

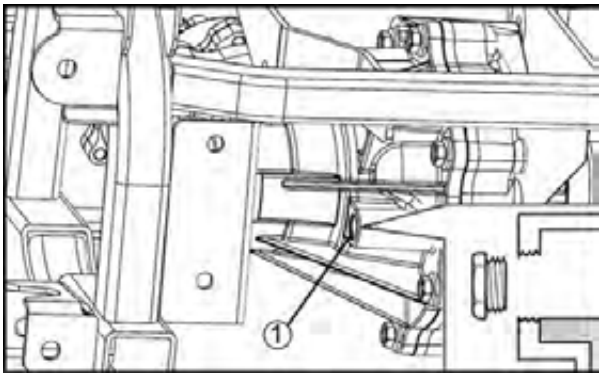
WARNING :

Take care not allow foreign material to enter the final gear case.

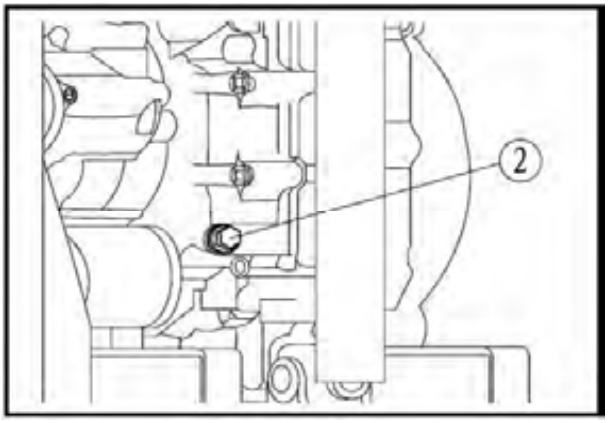
4. Install:
   • oil filler plug

Tightening torque
23 Nm (2.3 m·kgf, 16.3 ft·lbs)

CHANGING THE FINAL GEAR OIL



1. Place the vehicle on a level surface.
2. Place a container under the final gear case to collect the used oil.
3. Remove:
   • oil filler plug ①



• Final gear oil drain bolt ②
• Fill:
final gear case

Periodic oil change
0.25 L (0.22 Imp qt)
Total amount
0.28 L (0.25 Imp qt)

WARNING:

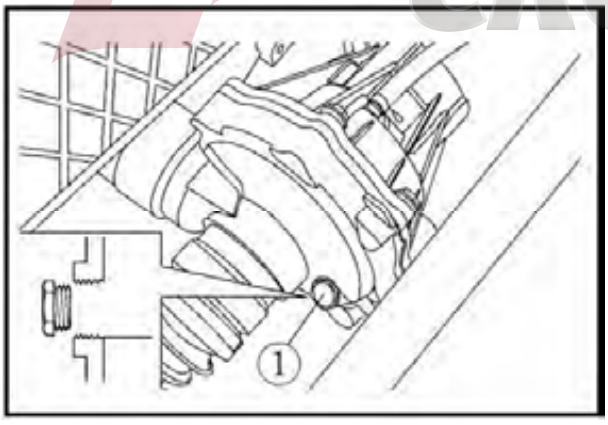
Take care not to allow foreign material to enter the final gear case.

• Install:
oil filler plug and Final gear oil drain bolt

20 Nm (2.0 m·kgf, 14 ft·lbs)

CHECKING THE DIFFERENTIAL GEAR OIL

1. Place the vehicle on a level surface.
2. Remove:
Remove the differential gear oil filler bolt and check the oil level. It should be up to the brim of the filler hole. If the level is low, add sufficient oil of the recommended type to raise it to the specified level
• Differential gear oil drain bolt ①



3. Check:
• oil level
Oil level should be up to the brim of hole.
Oil level low → Add oil to proper level.

WARNING:

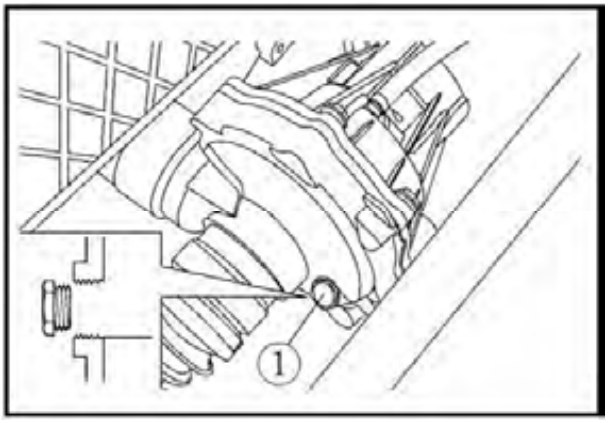
Take care not allow foreign material to enter the differential gear case.

4. Install:
• oil filler plug

23 Nm (2.3 m · kg, 17 ft · lb)

CHANGING THE DIFFERENTIAL GEAR OIL

1. Place the vehicle on a level surface.
2. Place a receptacle under the differential gear case.



3. Remove:
   • Differential gear oil drain bolt ①
4. Drain:
   • differential gear oil
5. Install:
   • drain plug

10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:

Check the gasket (drain plug). If it is damaged, replace it with new one.

6. Fill:
   • differential gear case

Periodic oil change
0.25 L (0.22 Imp qt, 0.26 US qt)
Total amount
0.28L (0.25 Imp qt, 0.3 US qt)

NOTE:

If gear oil is filled to the brim of the oil filler hole, oil may start leaking from the differential gear case breather hose. Therefore, check the quantity of the oil, not its level.

WARNING:

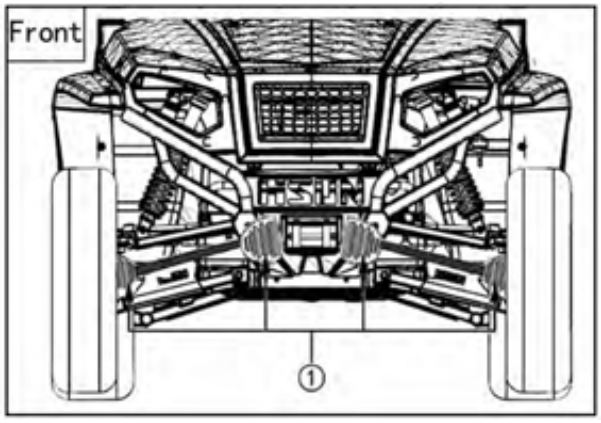
Take care not to allow foreign material to enter the differential gear case.

7. Install:
   • oil filler plug

23 Nm (2.3 m · kg, 17 ft · lb)

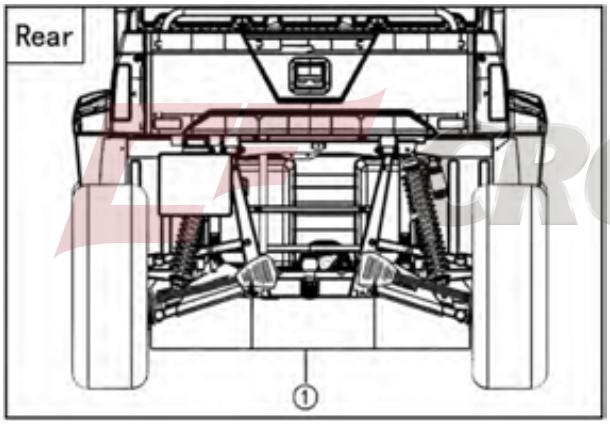
CHECKING THE CONSTANT VELOCITY JOINT DUST BOOTS

1. Check:
• dust boots ①
Damage → Replace.
Refer to "FRONT CONSTANT VELOCITY JOINTS," in chapter 5.



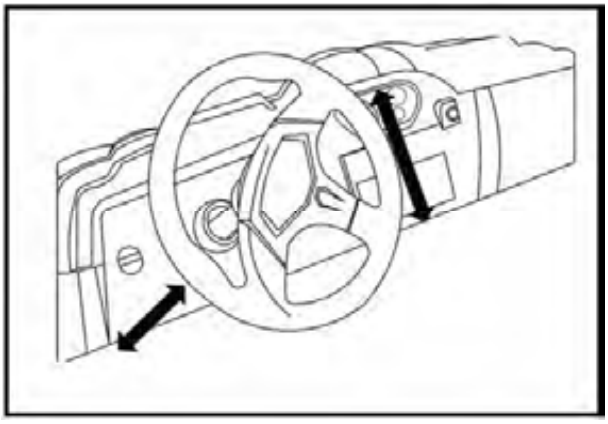
Ⓕ Front

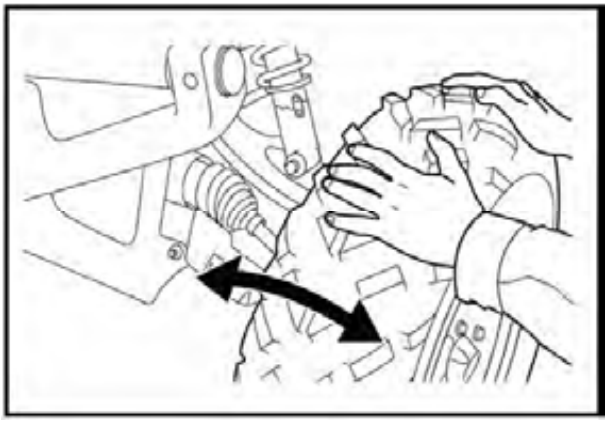
Ⓡ Rear



CHECKING THE STEERING SYSTEM

1. Check:
Place the vehicle on a level surface.
• steering assembly bearings Try to the steering wheel up and down, and back and forth.
Excessive play → Replace the steering shaft assembly.
• tie-rod ends
Turn the steering wheel to the left and right until it stops completely, and then move the steering wheel slightly in the opposite direction. Tie-rod end (s) have vertical play → Replace the tie-rod end(s).
• Raise the front end of the vehicle so that there





is no weight on the front wheels.

• Check:

Ball joints and/or wheel bearings Move the wheels laterally back and forth. Excessive free play → Replace the front arms (upper and lower) and/or wheel bearings.

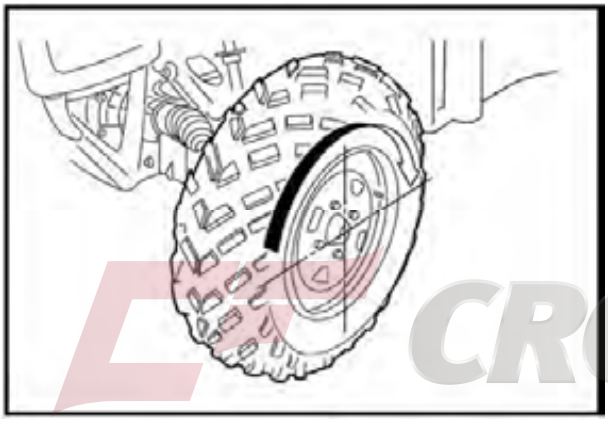
ADJUSTING THE TOE-IN

1. Place the vehicle on a level surface.
2. Measure:

• toe-in

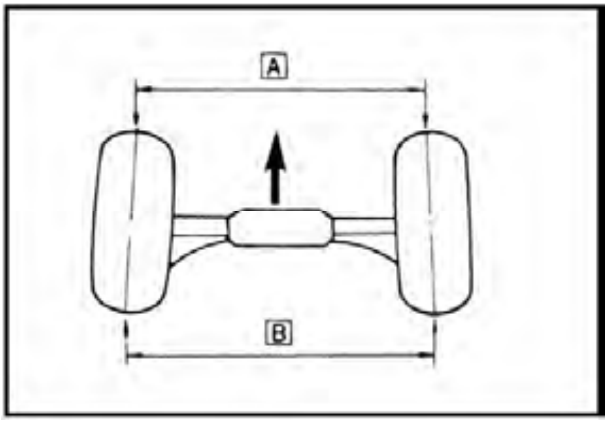
Out of specification → Adjust.

Toe-in
0 ~ 10 mm (0.00 ~ 0.39 in)
(with tires touching the ground)



NOTE:

Before measuring the toe-in, make sure that the tire pressure is correct.



a. Mark both front tire tread centers.
b. Face the steering wheel straight ahead.
c. Measure distance Ⓐ between the marks.
d. Rotate the front tires 180° until the marks are exactly opposite one another.
e. Measure distance Ⓑ between the marks.
f. Calculate the toe-in using the formula given below.

Toe-in=Ⓑ-Ⓐ

g. If the toe-in is incorrect, adjust it.。

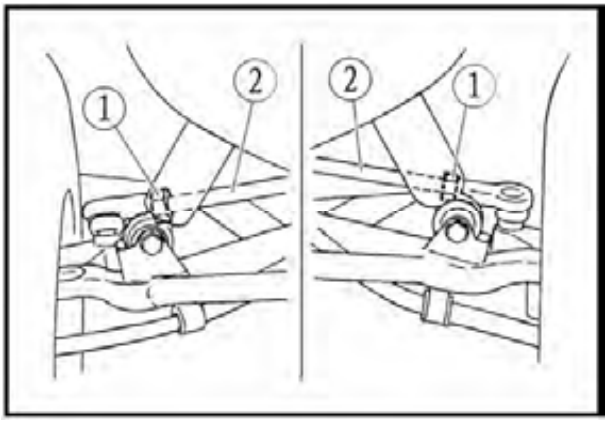
3. Adjust:

• toe-in

WARNING:

Make sure that left / right tension rods have turned the same turns . Otherwise the UTV will still go UTV left and right even though . Operate the UTV to go forward straightly with steering bar , easily causing to getting

out of contor and accident . After adjusting the toe-in correctly drive the UTV to move forward a span of distance by fastering the steering bar so as to make , sure if the Steering bar is pormal , if not , adjust the tension rod left or right within the specification .



a. Mark both tie-rods ends. This reference point will be needed during adjustment.
b. Loosen the locknut (tie-rod end) ① on each tie-rod.
c. The same number of turns should be given to both the right and left tie-rods ② until the specified toe-in is obtained. This is to keep the length of the rods the same.
d. Tighten the rod end locknut on each tie-rod.

Locknut (rod end)
40 Nm (4.0 m · kg, 29 ft · lb)

ADJUSTING THE FRONT AND REAR SHOCK ABSORBERS

WARNING :

These shock absorber assemblies contain highly pressurized nitrogen gas, read and understand the following information before handling the shock absorber assemblies.

• Do not tamper with or attempt to open the cylinder assemblies.

• Do not subject the shock absorber assemblies to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.

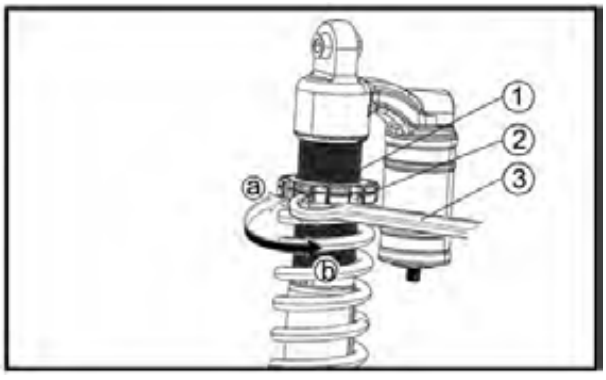
• Do not deform or damage the cylinders in any way. Cylinder damage will result in poor damping performance.

• Do not dispose of a damaged or worn out shock absorber assembly yourself. Take the shock absorber assembly to a HSUN dealer for any service.

The spring preload, rebound damping and compression damping forces of the front and rear shock absorber assemblies can be adjusted to suit the operating conditions.

NOTE:

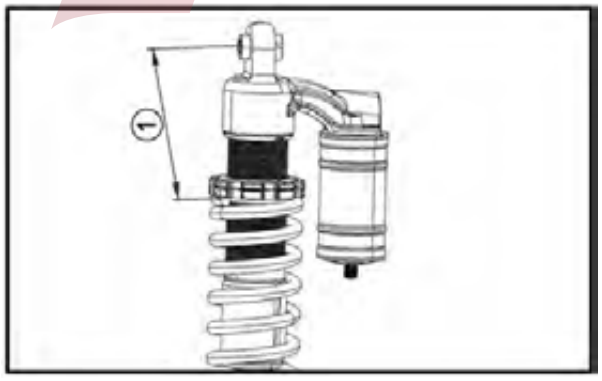
Never turn an adjusting mechanism beyond the minimum and maximum settings.



Spring preload

1. Loosen the locknut.
2. Turn the spring preload adjusting nut in direction ⓐ to increase the spring preload and thereby harden the suspension, and in direction ⓑ to decrease the spring preload and thereby soften the suspension.
   - Locknut ①
   - Spring preload adjusting nut ②
   - Special wrench ③

• A special wrench can be obtained at a HSUN dealer to make this adjustment.



• The spring preload setting is determined by measuring distance A, shown in the illustration. The shorter distance A is, the lower the spring preload; the longer distance A is, the higher the spring preload. With each complete turn of the adjusting nut.

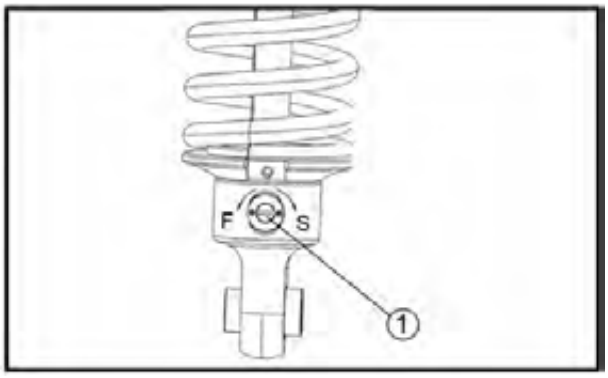
- Distance A ①

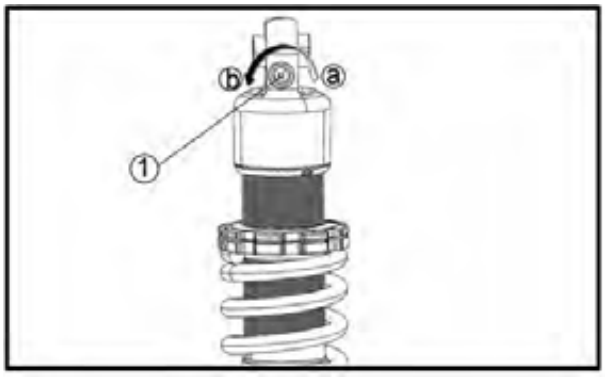
Spring travel setting(Front)
Minimum(soft): 375mm(14.76in)
Maximum(hard): 490mm(19.29in)
Spring travel setting(Rear)
Minimum(soft): 402mm(15.83in)
Maximum(hard): 490mm(19.29 in)

3. Tighten the locknut.

NOTE:

Always tighten the locknut against the adjusting nut, and then tighten it to the specified torque.





Rebound damping force

Turn the rebound damping force adjusting screw ① in direction **S** to increase the rebound damping force and thereby harden the damping, and in direction **F** to decrease the rebound damping force and thereby soften the damping.

Compression damping force

Turn the compression damping force adjusting screw ① (use 2.5 allen wrench) in direction ⓐ to increase the compression damping force and thereby harden the damping, and in direction ⓑ to decrease the compression damping force and thereby soften the damping.

WARNING:

·Suspension components become hot during operation. Never touch the compression damping force adjusting screw, the rebound damping force adjusting screw or the oil reservoir with your bare hand or skin until suspension components have cooled.

·Always adjust the shock absorber assemblies on the left and right side to the same setting. Uneven adjustment can cause poor handling and loss of stability, which could lead to an accident.

CHECKING THE TIRES

WARNING:

• TIRE CHARACTERISTICS

a. Tire characteristics influence the handling of vehicle's. If other tire combinations are used, they can adversely affect your vehicle's handling characteristics and are therefore not recommended.

	Size	*Type*
Front	*6PR*	*25 × 8-12*
Rear	*6PR*	*25× 10-12*

- ***TIRE PRESSURE***

  Recommended tire pressure

  Front 70Kpa

  Rear 70KPa

  when seating the tire beads. Higher pressure may cause the tire to burst. Inflate the tires slowly and carefully. Fast inflation could cause the tire to burst.

- ***MAXIMUM LOADING LIMIT***

a. Vehicle loading limit (total weight of cargo, operator, passenger and accessories, and tongue weight): 869kg

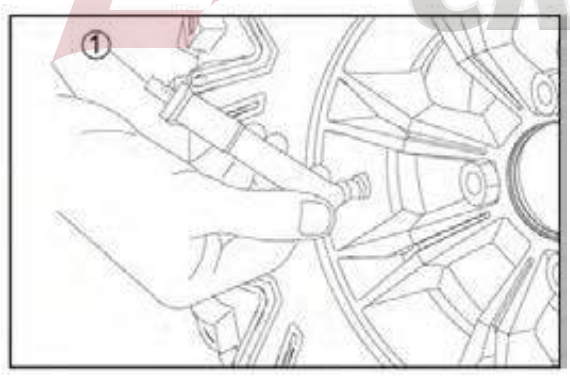
b. Cargo bed: 159kg

c. Trailer hitch:

Pulling load (total weight of trailer and cargo): 259 kg

Be extra careful of the vehicle balance and stability when towing a trailer.

1. Measure:
   - Tire pressure (cold tire pressure) Out of specification → Adjust.



NOTE:

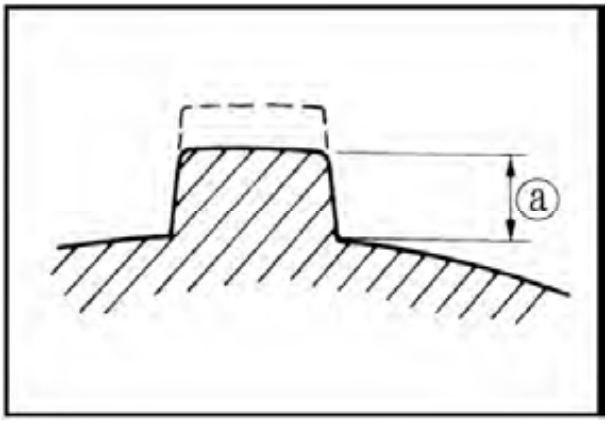
- **The tire pressure gauge ① is included as standard equipment.**
- **If dust or the like is stuck to this gauge, it will not provide the correct readings. Therefore, take two measurements of the tire's pressure and use the second reading.**

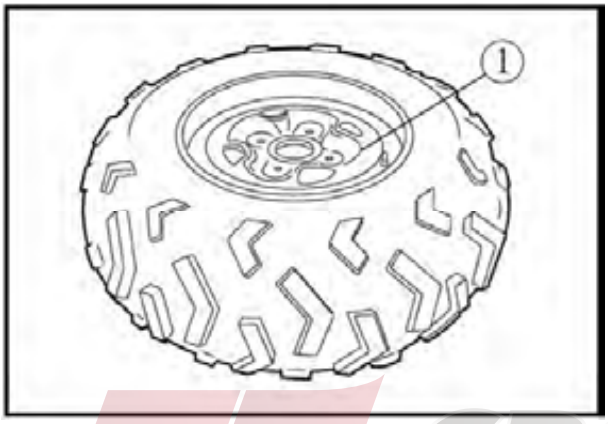
WARNING:

Uneven or improper tire pressure may adversely affect the handling of this vehicle and may cause loss of control.

- ***Maintain proper tire pressures.***
- ***Set tire pressures when the tires are cold.***
- ***Tire pressures must be equal in both*** **front** ***tires and equal in both rear tires.***

2. Check:
   - tire surfaces





Wear/damage ⓐ → Replace.

Tire wear limit ⓐ
Front and rear: 3.0 mm (0.12 in)

WARNING:

It is dangerous to ride with a worn-out tire.

When tire wear is out of specification, replace the tire immediately.

CHECKING THE WHEELS

1. Check:
• Wheels ①
Damage/bends → Replace.

NOTE:

Always balance the wheel when a tire or wheel has been changed or replaced.

WARNING:

- ***Never attempt even small repairs to the wheel.***
- ***Ride conservatively after installing a tire to allow it to seat itself properly on the rim.***

CHECKING AND LUBRICATING THE CABLES

WARNING:

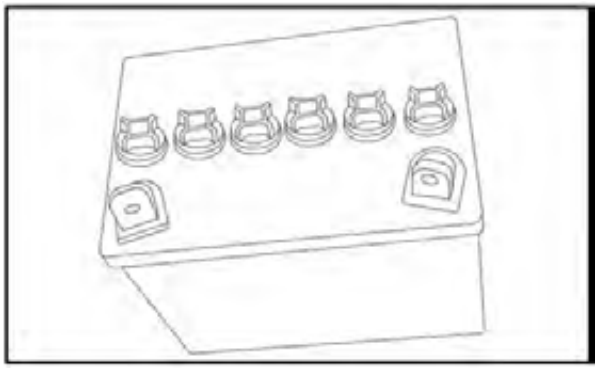
A damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace a damaged cable as soon as possible.

1. Check:
• cable sheath Damage → Replace.
• cable operation Unsmooth operation → Lubricate or replace.

NOTE:

Hold the cable end up and apply several drops of lubricant to the cable.

2. Apply:
• lithium-soap-based grease (onto end of the cable) lithium-soap-based.



ELECTRICAL

CHECKING AND CHARGING THE BATTERY

WARNING:

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- ***Wear protective eye gear when handling or working near batteries.***
- ***Charge batteries in a well-ventilate2d area.***
- ***Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).***
- ***DO NOT SMOKE when charging or handling batteries.***
- ***KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.***
- ***Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.***

FIRST AID IN CASE OF BODILY CONTACT:

EXTERNAL

- ***Skin — Wash with water.***
- ***Eyes — Flush with water for 15 minutes and get immediate medical attention.***

INTERNAL

Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

WARNING:

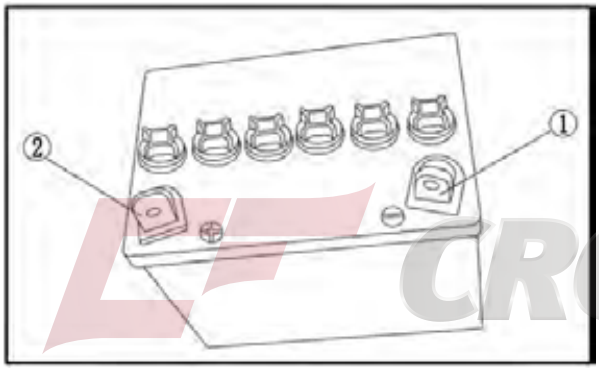
- ***This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.***
- ***Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged***

as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably.

• Therefore, take special care when charging the battery.

NOTE:

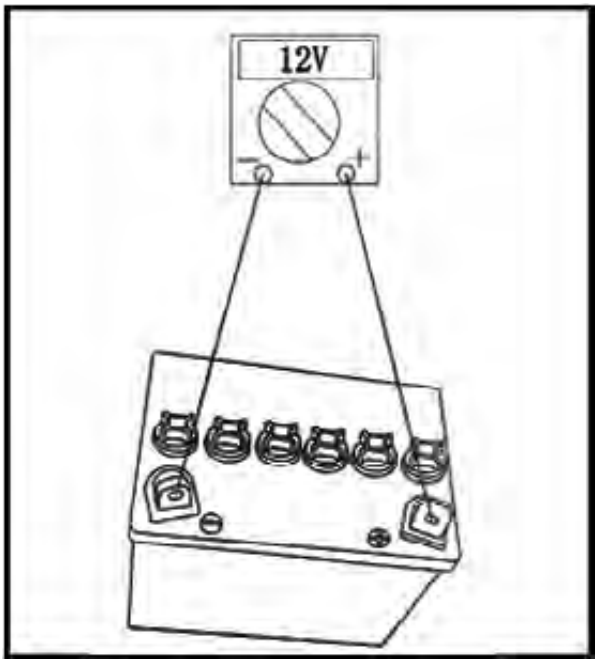
Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.



1. Remove:
• Lift the hood up.
• battery case cover
• Disconnect:
battery leads

NOTE:

First, disconnect the negative battery lead ①, and then the positive battery lead ②.



• Remove:
battery
• Check:
battery charge

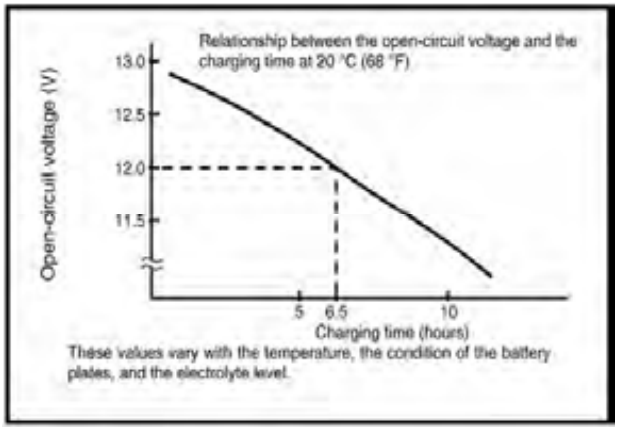
a. Connect a pocket tester to the battery terminals.

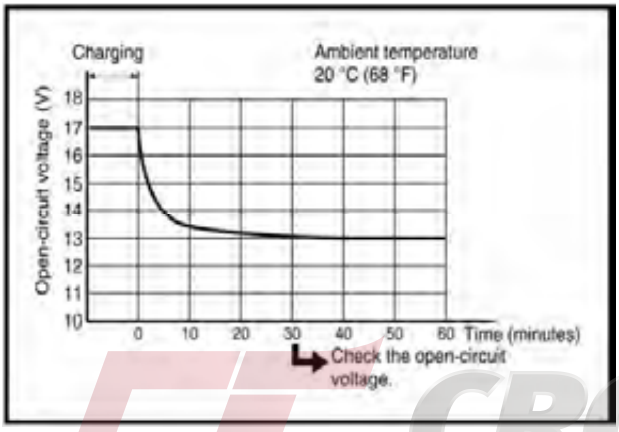
Positive tester probe → positive battery terminal
Negative tester probe → negative battery terminal

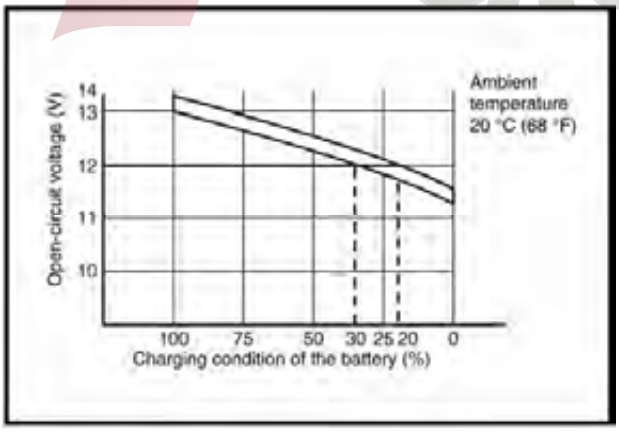
NOTE:

- **The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive terminal is disconnected).**
- **No charging is necessary when the open-circuit voltage equals or exceeds 12.8V.**

b. Check the charge of the battery, as shown in the charts and the following example.







Example

c. Open-circuit voltage = 12.0 V

d. Charging time = 6.5 hours

e. Charge of the battery = 20 ~ 30%

2. Charge:

• battery(refer to the appropriate charging method illustration) .

WARNING:

Do not quick charge a battery.

NOTE:

- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.**
- **If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.**
- **When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)**
- **To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.**
- **Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.**
- **Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.**
- **If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!**
- **As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.**

Charging method using a variable-current

(voltage) charger

NOTE:

- **Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.**
- **Set the charging voltage to 16 ~17 V. (If the charging voltage is lower, charging will be insufficient, if it is higher, the battery will be)**

Measure the open-circuit voltage prior to charging.

↓

Connect a charger and ammeter to the battery and start charging.

↓

Is the amperage higher than the standard charging amperage written on the battery?

YES → **Adjust the voltage to obtain the standard charging amperage**

NO → **Adjust the charging voltage to 20 ~ 25 V**

↓

Monitor the amperage for 3 ~ 5 minutes. Is the standard charging amperage exceeded?

YES → **Adjust the voltage to obtain the standard charging amperage**

NO → **If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.**

↓

Set the timer to the charging time determined by the open circuit voltage.

↓

If the required charging time exceeds 5 hours, it is advisable to check the charging amperage after 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging amperage.

↓

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.
12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.

Charging method using a constant voltage charger

NOTE:

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

Measure the open-circuit voltage Prior to charging.

↓

Connect a charger and ammeter to the battery and start charging.

↓

Is the amperage higher than the standard charging amperage written on the battery?

YES → **Charge the battery until the charging voltage reaches 15 V.**

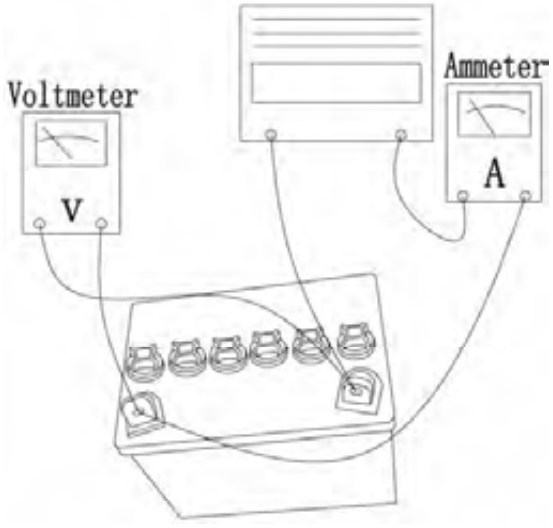
NOTE:

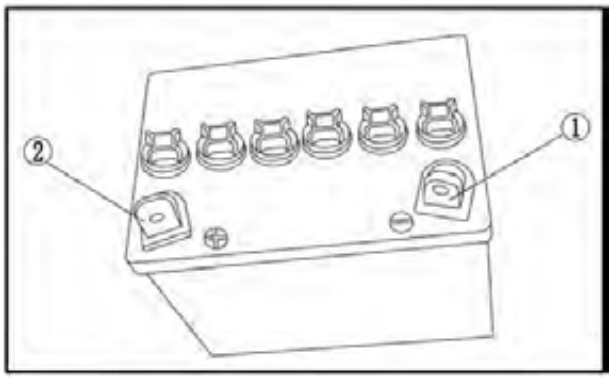
Set the charging time to a maximum of 20 hours.

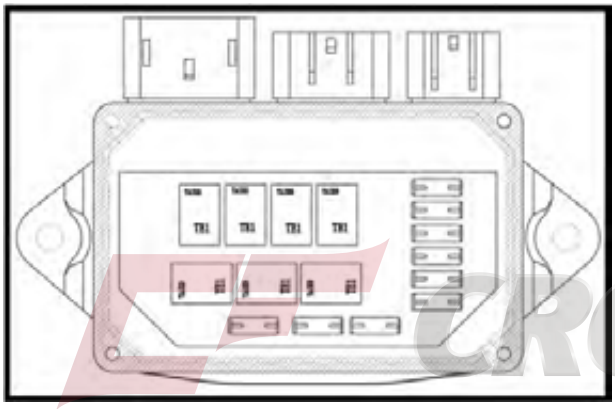
↓

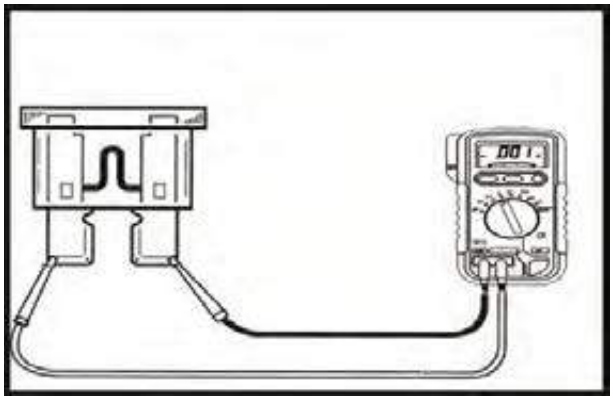
Leave the battery unused for more than 30 Minutes before measuring its open-circuit voltage.
12.8 V → Charging is complete.
12.0 ~12.7 V → Recharging is required.
Under 12.0 V → Replace the battery

NO → **This type of battery charger cannot charge an MF battery. A variable voltage charger is recommended.**









NOTE:

Constant amperage chargers are not suitable for charging MF batteries.

3. Install:
- battery
- Connect:
  battery leads

NOTE:

First, connect the positive battery lead ①, and then the negative battery lead ②.

- Check:
  Battery terminals Dirt → Clean with a wire brush.
  Loose connection → Connect properly.
- Lubricate:
  battery terminals
- Install:
  battery case cover
- Close the hood.

CHECKING THE FUSES

NOTE:

Always turn off the main switch when checking or replacing a fuse. Otherwise, a short circuit may occur.

1. Remove:
- lift the hood up.
- battery case cover

2. Check:
- fuses

a. Connect the pocket tester to the fuse and check it for continuity.

NOTE:

Set the tester to the "Ω × 1" position.

b. If the tester indicates"∞", replace the fuse.

3. Replace:
- blown fuse

a. Turn off the ignition.
b. Install a new fuse of the proper amperage.
c. Turn on switches to verify operation of the

related electrical devices.

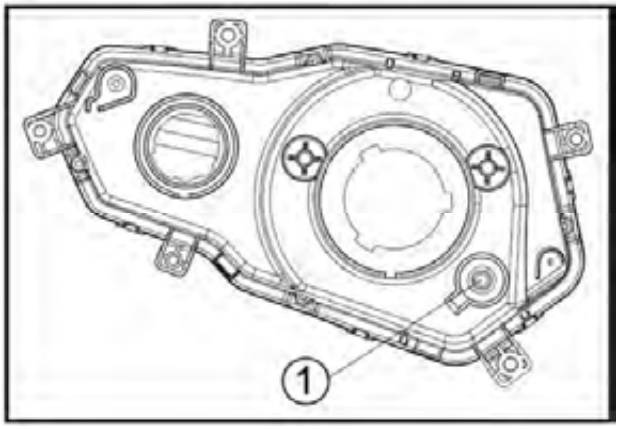
d. If the fuse immediately blows again, check the electrical circuit.

Description	Current rating	Quantity
Instrument, ECU often electric fuse	5A	1
2WD/4WD	10A	1
Signaling system fuse	10A	1
ECU, instrument fuse switch power supply	15A	1
DC power supply socket fuse	15A	1
Headlamps power fuse	15A	1
Reserve	5A	1
Reserve	10A	1
Reserve	15A	1

WARNING:

ever use a fuse with a rating other than that specified. Never use other materials in place of a fuse. An improper fuse may cause extensive damage to the electrical system, a malfunction of the lighting and ignition systems and could possibly cause a fire.

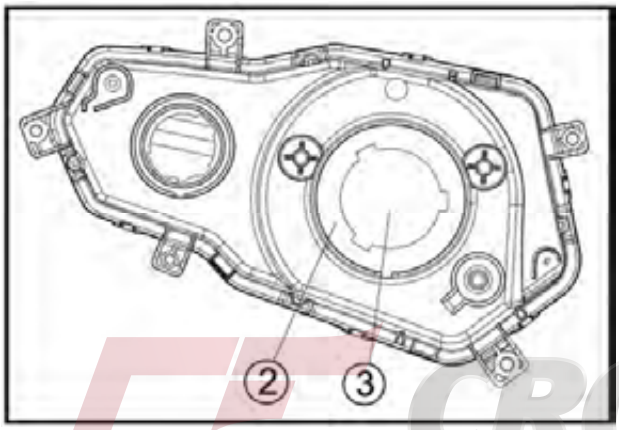
4. Install:
   • battery case cover
5. Close the hood.



ADJUSTING THE HEADLIGHT BEAM

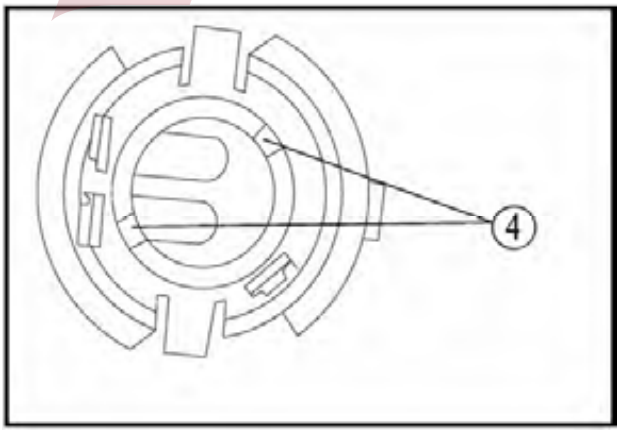
1. Adjust:
   • headlight beam (vertically)
   • turn the adjuster ① in or out.

Turning in	**Headlight beam raised.**
Turning out	**Headlight beam lowered.**



CHANGING THE HEADLIGHT BULB Ⅰ

Remove:
• Lift the hood up.
• headlight bulb holder cover ②
• headlight bulb holder (with bulb) ③
• bulb



NOTE:

Remove the defective bulb by unhooking the headlight bulb holder tabs ④.

WARNING:

Keep flammable products and your hands away from the bulb while it is on, since it* will *be hot. Do not touch the bulb until it cools down.

2. Install:
   • bulb new
   Secure the new bulb with the headlight bulb holder.

NOTE:

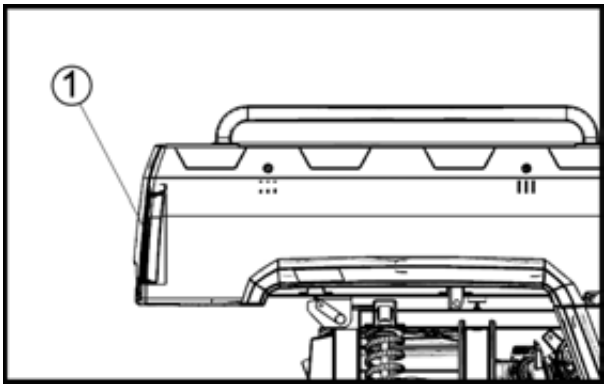
Avoid touching the glass part of the bulb.
Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a

cloth moistened with alcohol or lacquer thinner.

- headlight bulb holder (with bulb)
- headlight bulb holder cover
- Close the hood.

CHANGING THE TAIL/BRAKE LIGHT BULB

1. Remove:
   - Rear panel
   - tail/brake light bulb holder ①
   - bulb



NOTE:

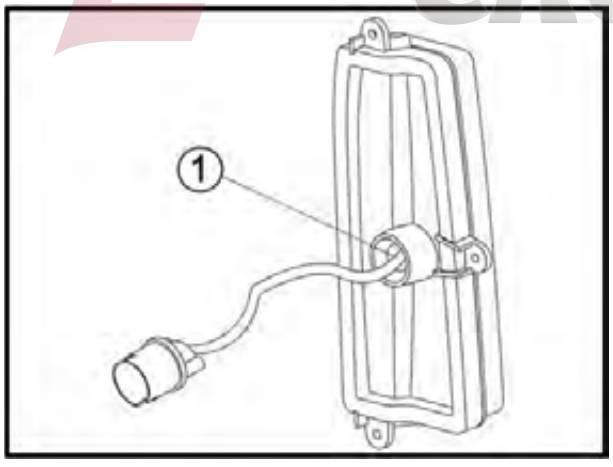
Turn the bulb holder counterclockwise and remove the defective bulb.

WARNING:

Keep flammable products and your hands away from the bulb while it is on, since it will be hot. Do not touch the bulb until it cools down.

2. Install:
   - bulb new

     Secure the new bulb with the tail/brake light bulb holder.



NOTE:

Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

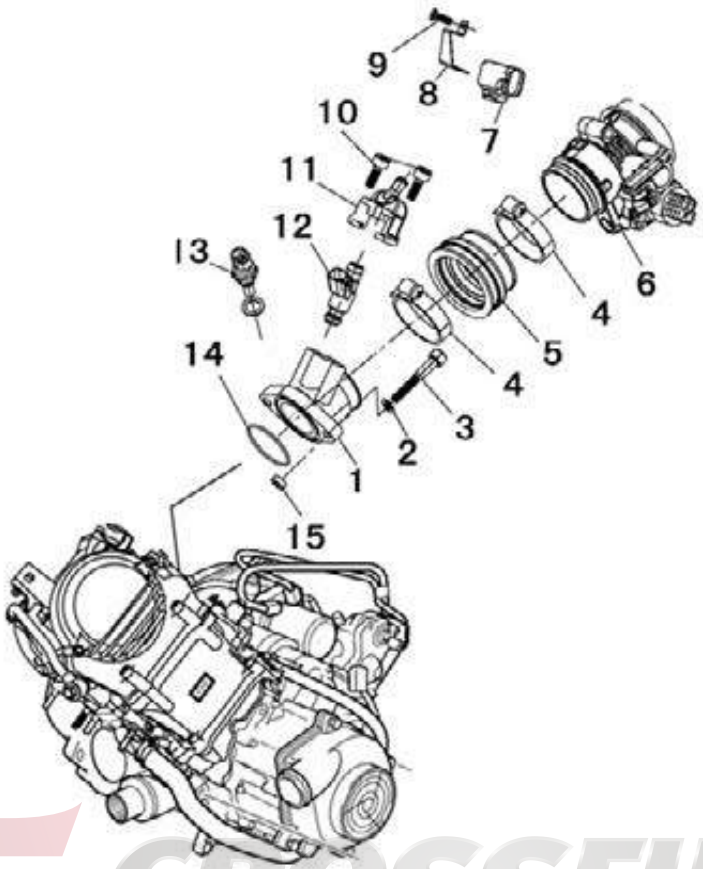
- tail/brake light bulb holder (with bulb)①

ENGINE

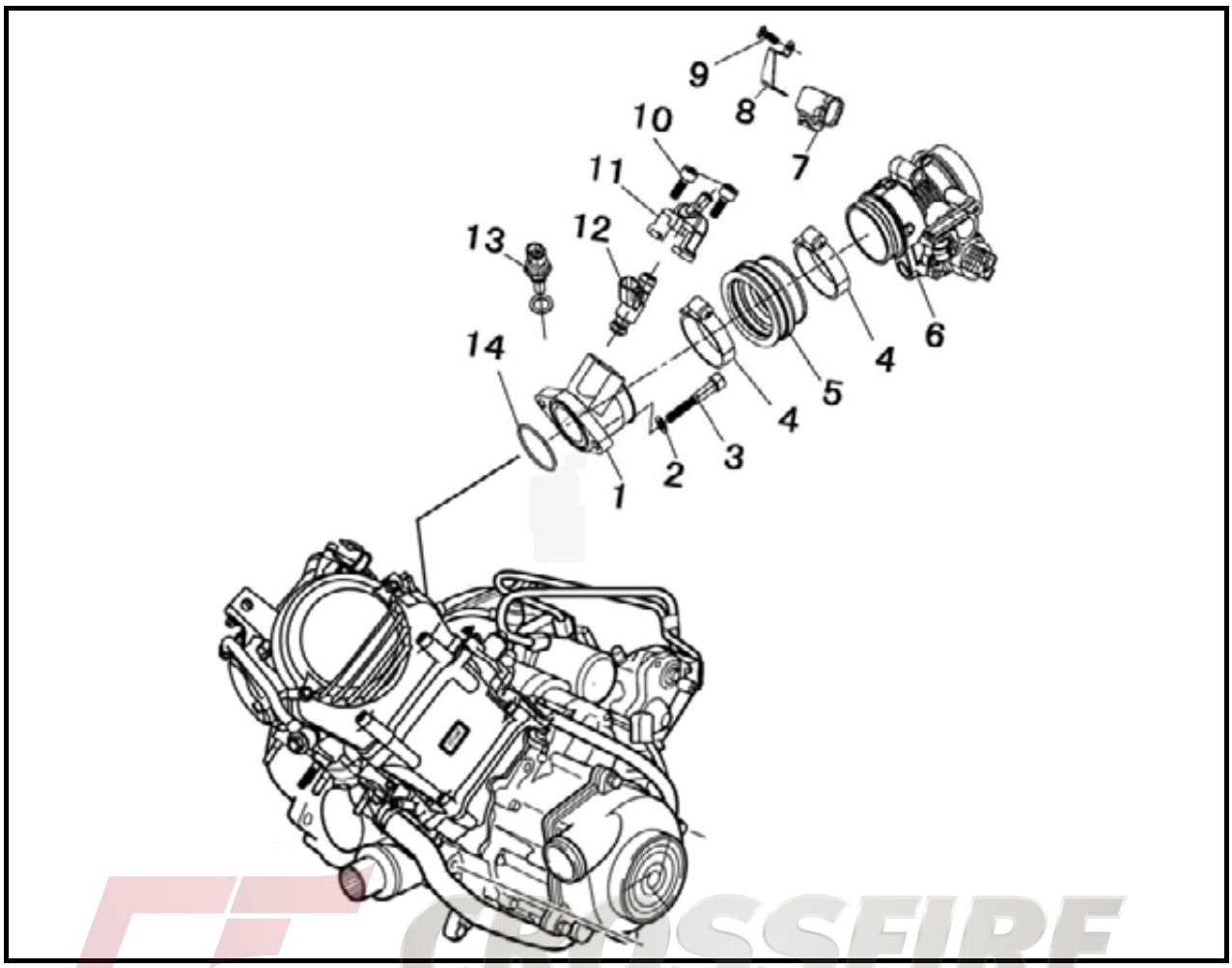
ENGINE NOTE

1. Make sure the components, oil, adhesive, sealant are from the company or recommended.
2. Original removal oil seal，gasket, O-ring, piston ring can not be re-assemblied again, make sure all these parts are new.
3. Pay attention to keep dismantled parts orderly, make sure their original positions for reassembling.
4. Prevent dismantled parts damaged, clean before measure and assembly, remove the oil with compressed air. Paint the rotating and sliding parts with specified oil, paint or inject designated location with recommended grease.
5. Bolts and nuts tightening order: pre-fixed bolts, and then tighten them from the large diameter to small diameter, from inside to outside by diagonal points 2 or 3 times to the specified torque. Opposite order is for removing bolts and nuts.
6. Make sure sealing bolt (with the sealant) must be replaced
7. Make sure to use new bearing when remove assembly set up by pressure.
8. Determined axial and radial clearance of inner and outer bearing ring by touch, new bear should be replaced if the clearance is too large or non-rotating flexible.
9. Bearing assembly directions: bearing logo should be visible assemblies; confirm bearing outer ring rotate and move reliably and flexibly when assemble bearing by pressure.
10. Oil seal assembly: pay attention to seal side is in the side of oil, logo side outwards, seal side be painted with grease, and make sure seal side without scratch and oil seal be vertical.
11. Before assembly, sealing material attached to all engine covers and crank case combination surface should be cleaned.
12. Before assembly engine, be familiar with engine lubrication circuit, clean and blow oil circuit.

ENGINE REMOVAL



No.	Part Name	Qty	Remarks
	Removing Throttle and intake manifold.		Remove the parts in the order listed.
1	Intake-tube Assy	1	
2	Washer Φ8× Φ16×1.5	2	
3	Hexagon socket head cap screws M8×50	2	
4	Hoop Φ50～Φ70	2	
5	Joint inlet pipe	1	
6	Throttle assy（D46-5）	1	
7	Intake air temperature / pressure sensor 28086011	1	
8	Tmap press plate	1	
9	Cross recess head screw M4×8	1	
			For installation, reverse the removal procedure.



No.	Part Name	Qty	Remarks
	Removing Throttle and intake manifold.		Remove the parts in the order listed.
10	Cylinder Screw M6×20 inner	2	
11	Permanent Seat Ⅱ Fuel Injector	1	
12	Fuel injector 28160355	1	
13	Water temperature sensor	1	
14	O-ring 44×2	1	
15	Bushing ϕ8.5× ϕ11×34	1	
			For installation, reverse the removal procedure.

1、NOTE

• Removing the drain plug

NOTE:

Before remove drain plug, please prepare vessel for containing oil and cotton yarn.

2、INSTALL

• Install intake manifold

• Install intake manifold bolt

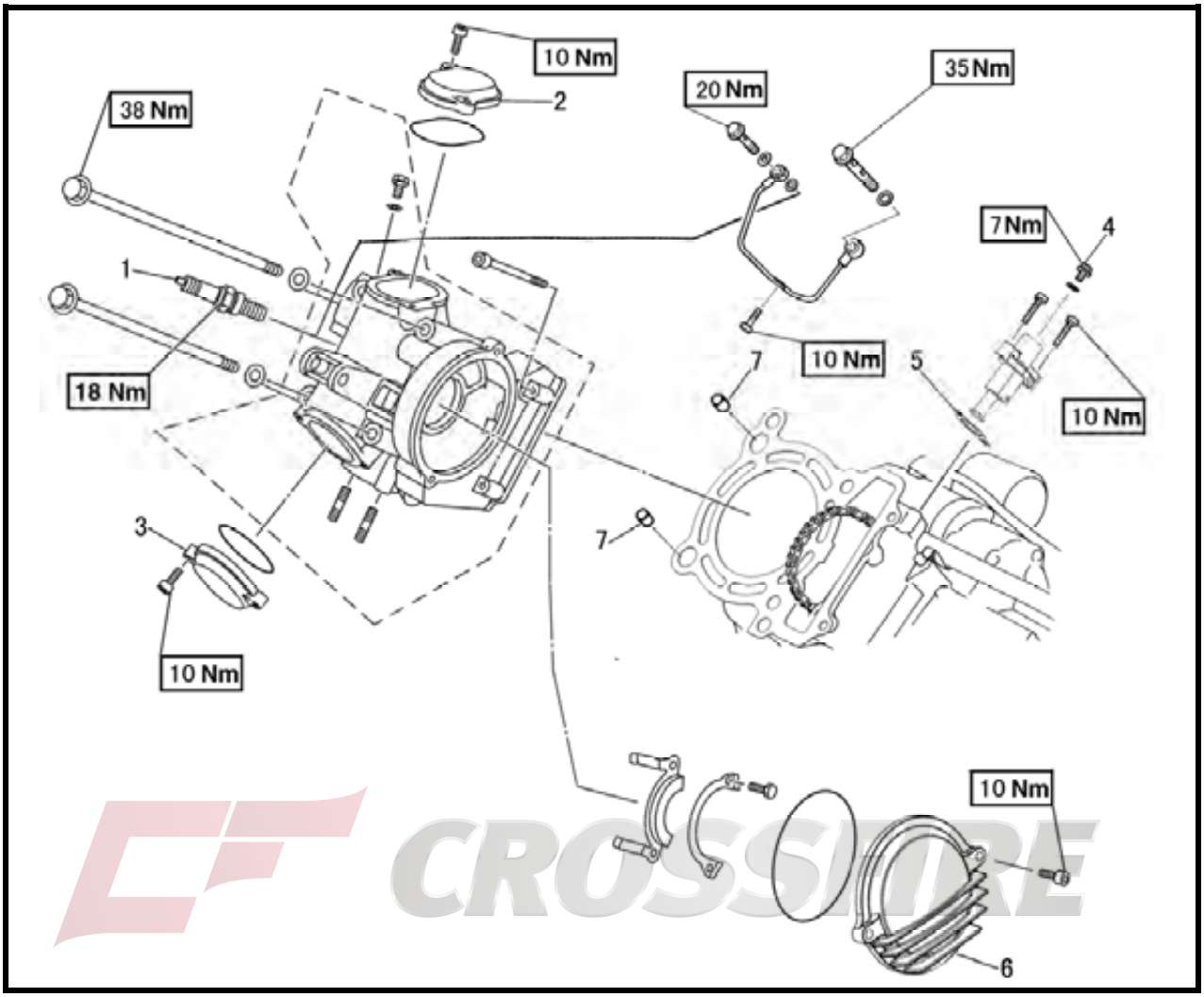
• Install carburetor joint

• Install carburetor

NOTE:

When installed, don't make an object from the intake fell into the cabinet.

CYLINDER HEAD AND CYLINDER HEAD COVER



No.	Part Name	Qty	Remarks
	Removing the cylinder head cover and cylinder head		Remove the parts in the order listed.
1	Spark plug	1	
2	Tappet cover (intake)	1	
3	Tappet cover (exhaust)	1	
4	Timing chain tensioner cap bolt	1	
5	Timing chain tensioner / gasket	1/1	
6	Left cover of cylinder head	1	
7	Dowel pin	2	
			For installation, reverse the removal procedure.

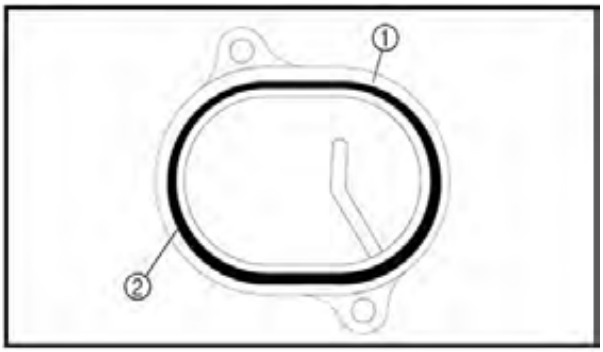
1、CHECK

1). Checking the valve clearance

• Valve clearance

Refer to “ADJUSTING THE VALVE CLEARANCE” in chapter 3.

2). Checking the tappet covers



• tappet cover ①

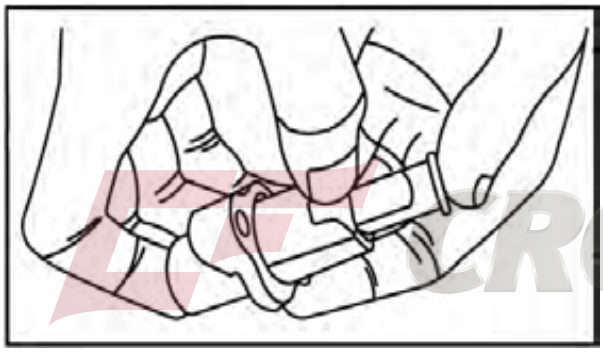
Cracks/damage → Replace.

• O-rings ②

NOTE:

When installing, new replacement washer and apply wheel bearing grease LS.

3). Removing the timing chain tensioner rod.



NOTE:

Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

4). Checking the cylinder head

(1). Eliminate:

• carbon deposits (from the combustion chamber)

Use a rounded scraper.

NOTE:

Do not use a sharp instrument to avoid damaging or scratching:

• spark plug threads

• valve seats

(2). Check:

• cylinder head

Scratches/damage → Replace the cylinder head cover and cylinder head as a set.

• cylinder head water jacket

Mineral deposits/rust → Eliminate.

2、INSTALL

1). Installing the cylinder head

- cylinder head
- washers
- bolts

NOTE:

• Tighten the bolts in the proper sequence.

- timing chain guide (exhaust side)
- timing chain tensioner

a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

b. While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver ① until it stops.

c. With the screwdriver still inserted into the timing chain tensioner, install the timing chain tensioner and gasket onto the cylinder block. Then, tighten the timing chain tensioner bolts to the specified torque.

WARNING:

Always use a new gasket.

NOTE:

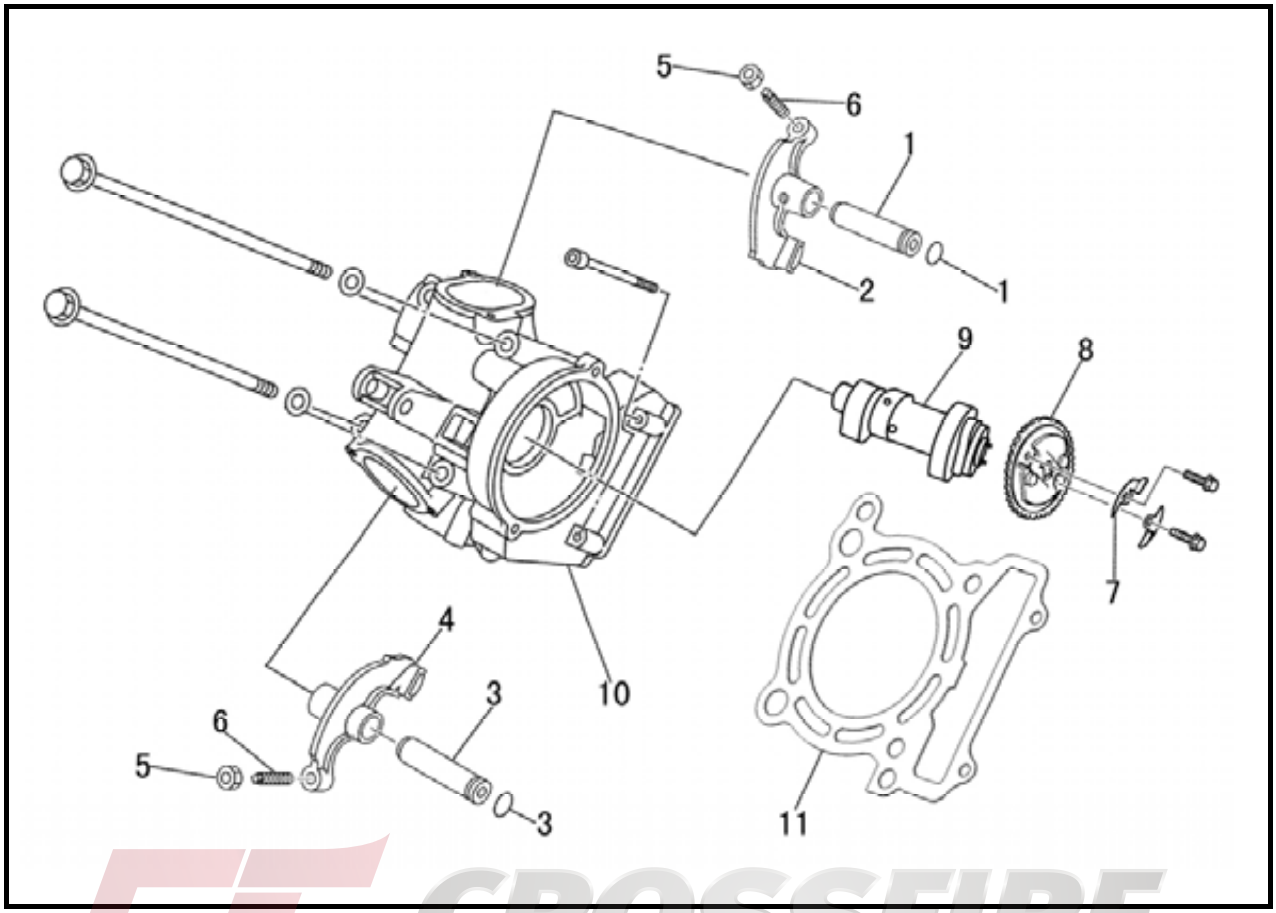
The "UP" mark on the timing chain tensioner should face up.

Timing chain tensioner bolt (10 Nm)

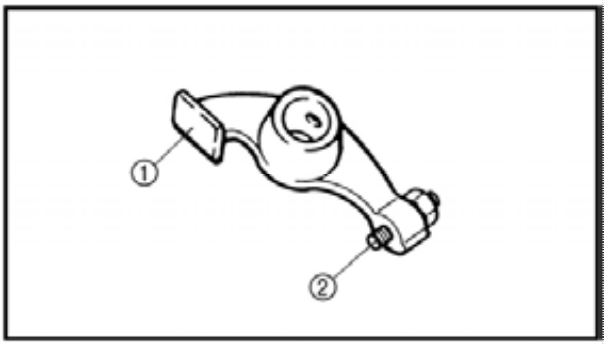
d. Remove the screwdriver, make sure that the timing chain tensioner rod releases, and tighten the cap bolt to the specified torque.

Timing chain tensioner cap bolt (7 Nm)

ROCKER ARMS AND CAMSHAFT



No.	Part Name	Qty	Remarks
	Removing the rocker arms and camshaft		Remove the parts in the order listed.
	Cylinder head cover		
1	Rocker arm shaft 1/O-ring	1/1	
2	Rocker arm 1	1	
3	Rocker arm shaft 2/O-ring	1/1	
4	Rocker arm 2	1	
5	Locknut	2	
6	Valve adjuster	2	
7	Decompress or cam guide plate	2	
8	Camshaft sprocket	1	
9	Camshaft	1	
10	Cylinder head	1	
11	Cylinder head gasket	1	
			For installation, reverse the removal procedure.



1、CHECK

1). Checking the rocker arms

- rocker arm lobes ①
- valve adjusters ②

Blue discoloration / pitting / scratches → Replace.

- rocker arms
- rocker arm shafts

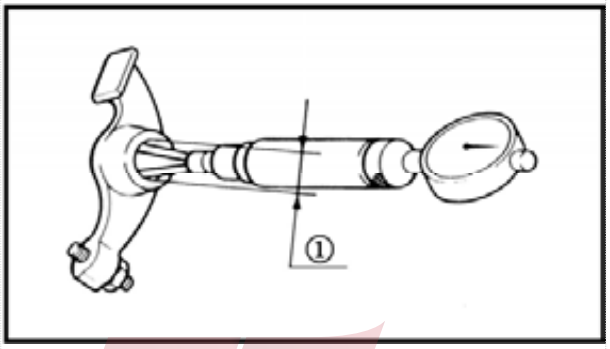
Damage/wear → Replace.

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

b. If there is a rocker arm to be replaced, check the camshaft prominent position of unfairness.

c. Measure the inside diameter of the rocker arm holes ①.

Out of specification → Replace.



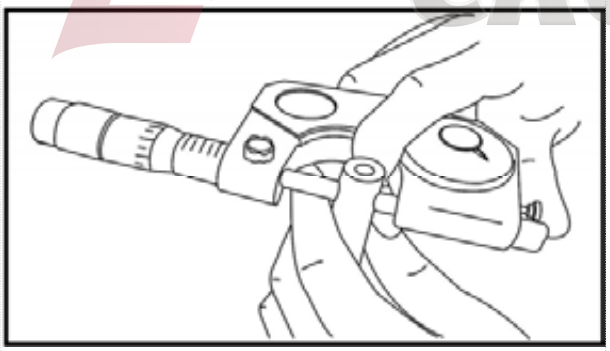
Rocker arm inside diameter repairing limit value
Φ12.038mm

d. Check the surface of the rocker arm shafts.

Worn/pitting/scratches → Replace.

e. Measure the external diameter of rocker arm shaft with micrometer.

Out of specification → Replace.

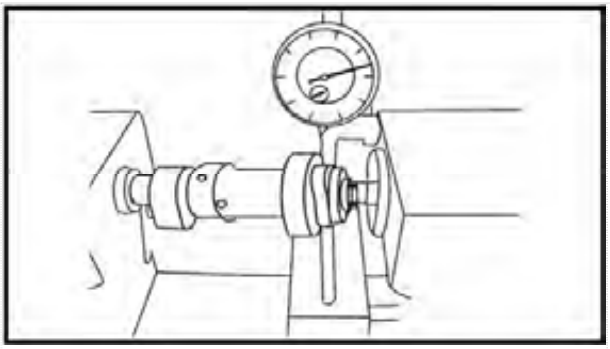


Rocker arm shaft outside diameter repairing limit value
Φ11.96mm

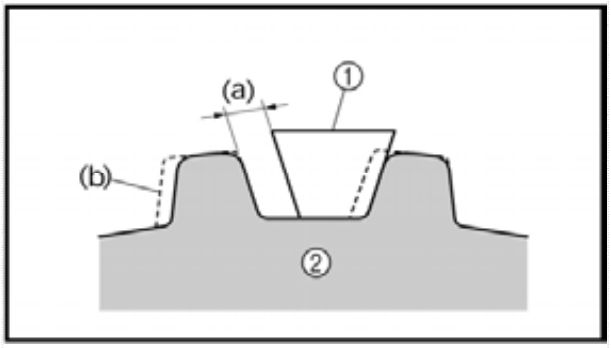
f. Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

Out of specification → Replace the defective part(s).

Rocker arm to shaft clearance repairing limit value
0.05mm

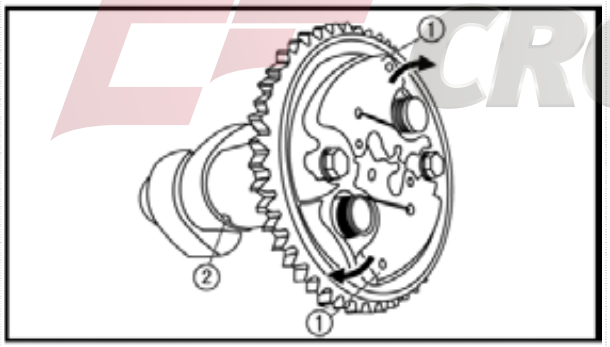


2). Checking the camshaft
- cam lobes
  Pitting/scratches/blue discoloration → Replace
- camshaft journal
  Wear/damage → Replace
- Measure the external diameter of camshaft journal with micrometer.
  Out of specification → Replace.
- small holes on camshaft sprocket
- rotor "I" mark
  Out of alignment



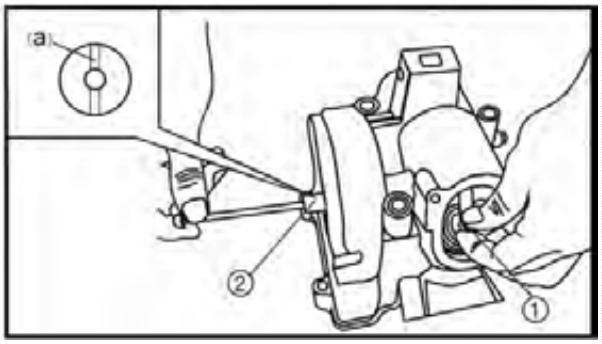
3). Checking the camshaft sprocket
- camshaft sprocket
  Wear/damage → Replace the camshaft sprocket and timing chain as a set.

(a) 1/4 of a tooth
(b) Correct
①Timing chain
②Sprocket



4). Checking the decompression system
- decompression system
  Check while the camshaft sprocket is installed on the camshaft.

a. Check that the decompressor cam ① moves smoothly.
b. Check that the decompressor lever pin ② projects from the camshaft.

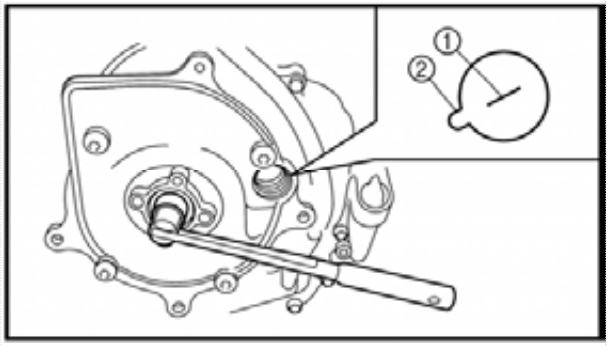


2、INSTALL

1). Installing the rocker arms
- rocker arms ①
- rocker arm shafts ②

NOTE:

- **The thread hole (a) of the rocker arm shaft must face to the outside.**
- **After installation, make sure that the thread hole (a) of the rocker arm shaft is positioned correctly, as shown in the illustration.**



2). Installing the camshaft
- camshaft
- camshaft sprocket

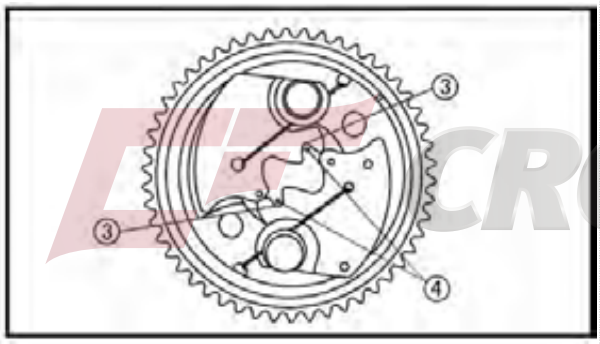
a. Turn the crankshaft counterclockwise with a T-sleeve.

b. Align the “I” mark ① on the rotor with the stationary pointer ② on the A.C. magneto cover. When the “I” mark is aligned with the stationary pointer, the piston is at the Top Dead Center (TDC).

CAUTION:

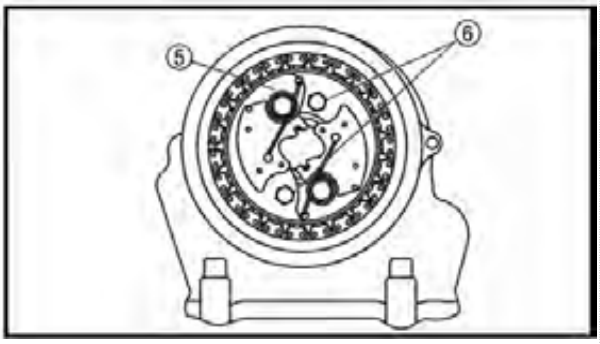
Do not turn the crankshaft during the camshaft installation.

c. Align the notches ③ on the decompressor cams with the projections ④ on the decompressor spring lever, then install the camshaft sprocket on the camshaft.



NOTE:

Check that each part is positioned as shown in the illustration.



d. Install the decompressor cam guide plates ⑤ and camshaft sprocket bolts⑥

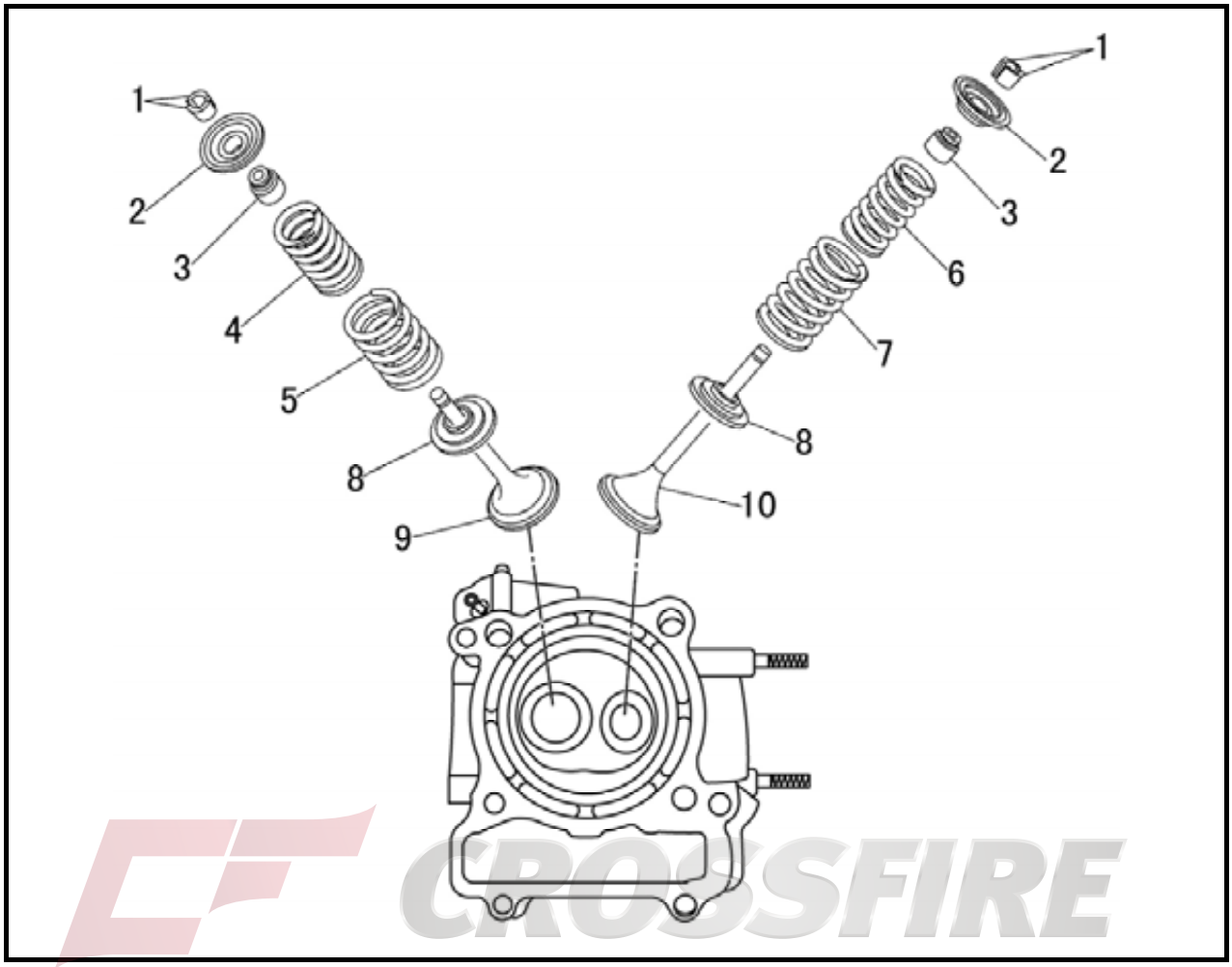
Camshaft sprocket bolt(20 Nm)

NOTE:

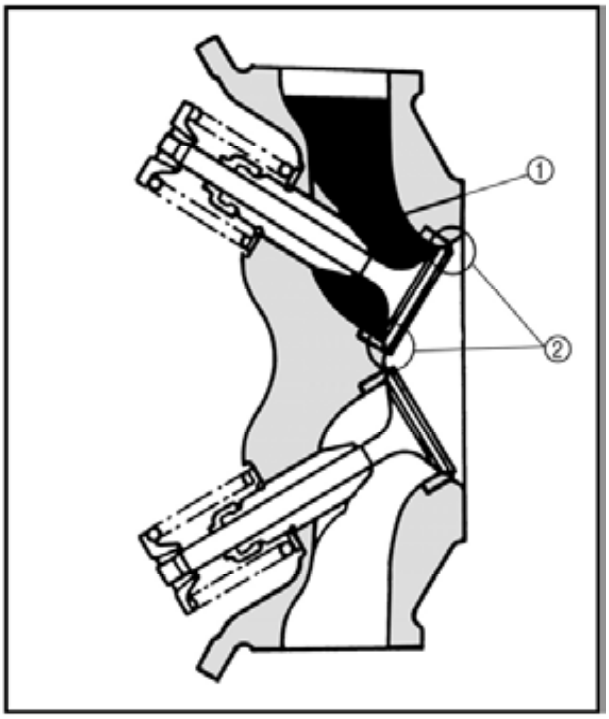
Insert a screwdriver into the timing chain tensioner hole and push the timing chain guide (intake side) inward.

f. Remove the retaining wire.

VALVES AND VALVE SPRINGS



No.	Part Name	Qty	Remarks
	moving the valves and valve springs		Remove the parts in the order listed.
	Cylinder head cover		
1	Valve cotter	2	
2	Valve spring retainer	2	
3	Valve stem seal	2	
4	Intake valve with inner spring	1	
5	Intake valve with outer spring	1	
6	Exhaust valve with inner spring	1	
7	Exhaust valve with outer spring	1	
8	Valve spring seat	2	
9	Intake valve	1	
10	Exhaust valve	1	
			For installation, reverse the removal procedure.



1、CHECK

• valve sealing

Leakage at the valve seat → Check the valve face, valve seat and valve seat width.

a. Pour a clean solvent ① into the intake and exhaust ports.

b. Check that the valve seals properly. There should be no leakage at the valve seat ②.

• valve face

Pitting/wear → Grind the face.

• valve stem end

Mushroom shape or diameter larger than the body of the stem → Replace.

• valve seats

Pitting/wear → Reface the valve seat。

2、MEASURE:

1).Measure:

• The valves surface width

Repairing limit value
2.0mm

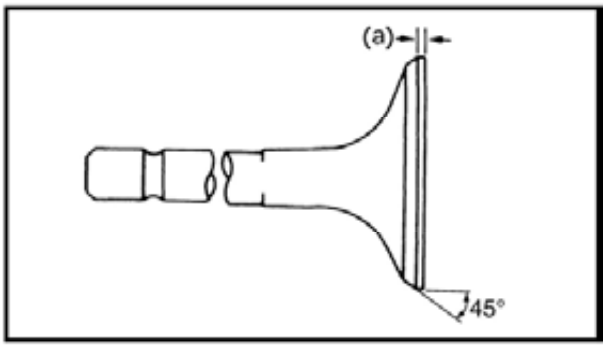
• stem-to-guide clearance

Stem-to-guide clearance = valve guide inside diameter – valve stem diameter

NOTE:

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

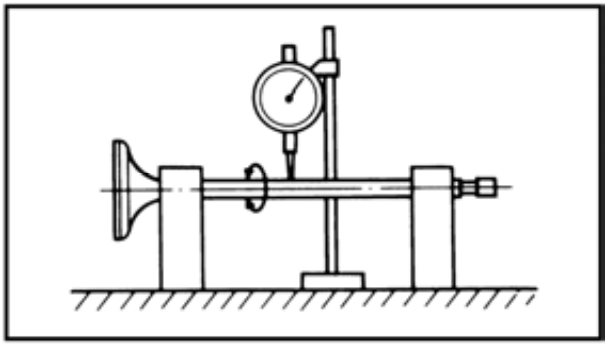
Stem-to-guide clearance repairing limit value	
Intake: 0.12mm	**Exhaust: 0.14mm**



• margin thickness (a)

Out of specification → Replace.

Margin thickness
Intake:0.85 ~ 1.15 mm
Exhaust:0.85 ~ 1.15 mm



• valve stem runout
Out of specification → Replace.

Runout limit 0.01 mm

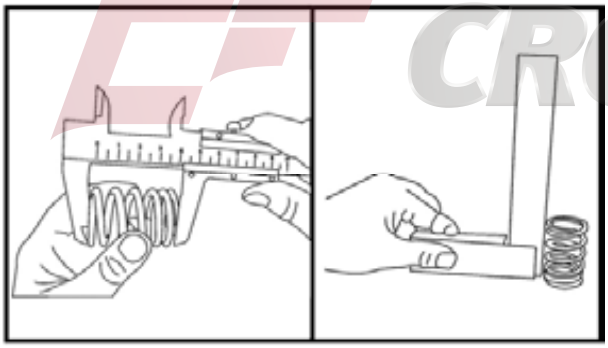
NOTE:

- **When installing a new valve always replace the guide.**
- **If the valve is removed or replaced always replace the oil seal.**

• The valve seat surface width
Out of specification → Reface the valve seat.

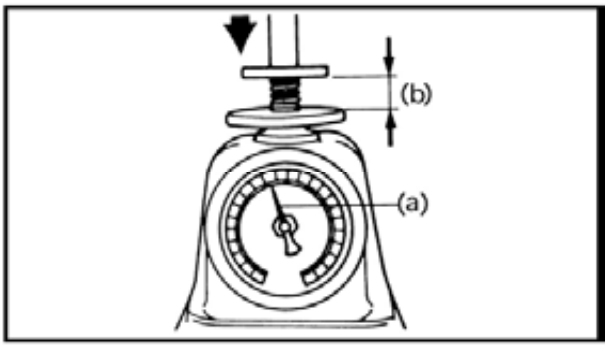
Repairing limit value 2.0mm

a. Install the valve into the cylinder head.
b. Press the valve through the valve guide and onto the valve seat to make a clear pattern.
c. Measure the valve seat width. Where the valve seat and valve face made contact, blueing will have been removed.



• Valve spring free length
• Valve spring squareness
Out of specification → Replace.

Valve spring free length Outside spring: Intake:42.5mm Exhaust:42.5mm Within spring: Intake:39.0mm Exhaust:39.0mm Valve spring squareness Intake:0.10mm Exhaust:0.10mm



• compressed spring force(a)
Out of specification → Replace.
(b) Installed length

Compressed spring force Outside spring: Intake: 735.0~ 765.0N at 26 mm Exhaust: 240.0~260.0 N at 36 mm Within spring: Intake: 100.0 ~ 115.7 N at 27.5 mm Exhaust: 120.6 ~ 138.3 N at 31.0 mm

2). Remove:
- valve guide

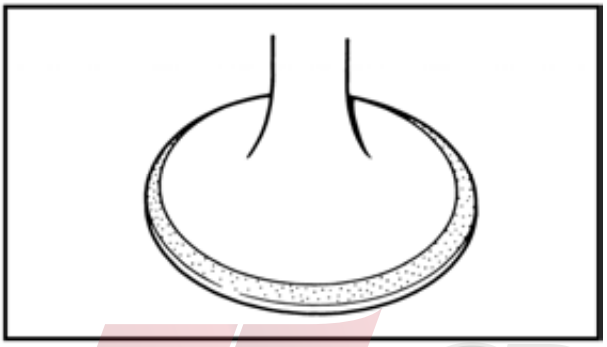
NOTE:

To ease guide removal, installation and to maintain correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.

3). Lap:
- valve face
- valve seat

NOTE:

After reface the valve seat or replacing the valve and valve guide, the valve seat and valve face should be lapped.



a. If the pipe will be replaced, grind the valve seat again.

CAUTION:

Do not let the compound enter the gap between the valve stem and the guide.

b. Install the valve into the cylinder head.

NOTE:

For best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

d. Apply a fine lapping compound to the valve face and repeat the above steps.

NOTE:

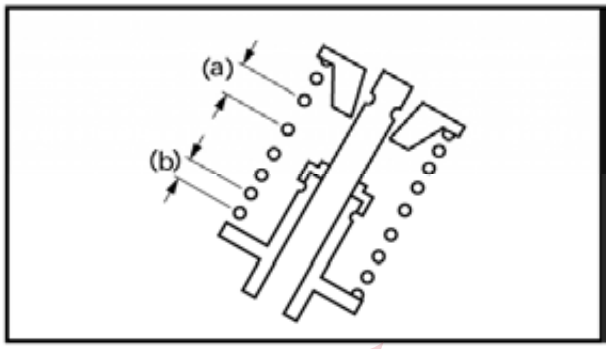
After every lapping operation be sure to clean off all of the compound from the valve face and valve seat.

e. Install the valve into the cylinder head.
g. Press the valve through the valve guide and onto the valve seat to make a clear pattern.
h. Measure the valve seat width again. If the valve seat width is out of specification, reface and relapse the valve seat.

3、INSTALL:

1). Apply:
- molybdenum disulfide oil
  (onto the valve stem and valve stem seal)

2). Install:
- valve spring seats
- valve stem seals
- valves
- valve springs
- valve spring retainers



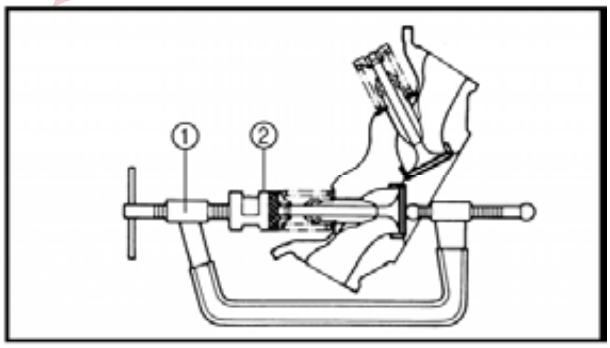
NOTE:

Install the valve springs with the larger pitch (a) facing upwards.

(b) Smaller pitch
- valve cotters

NOTE:

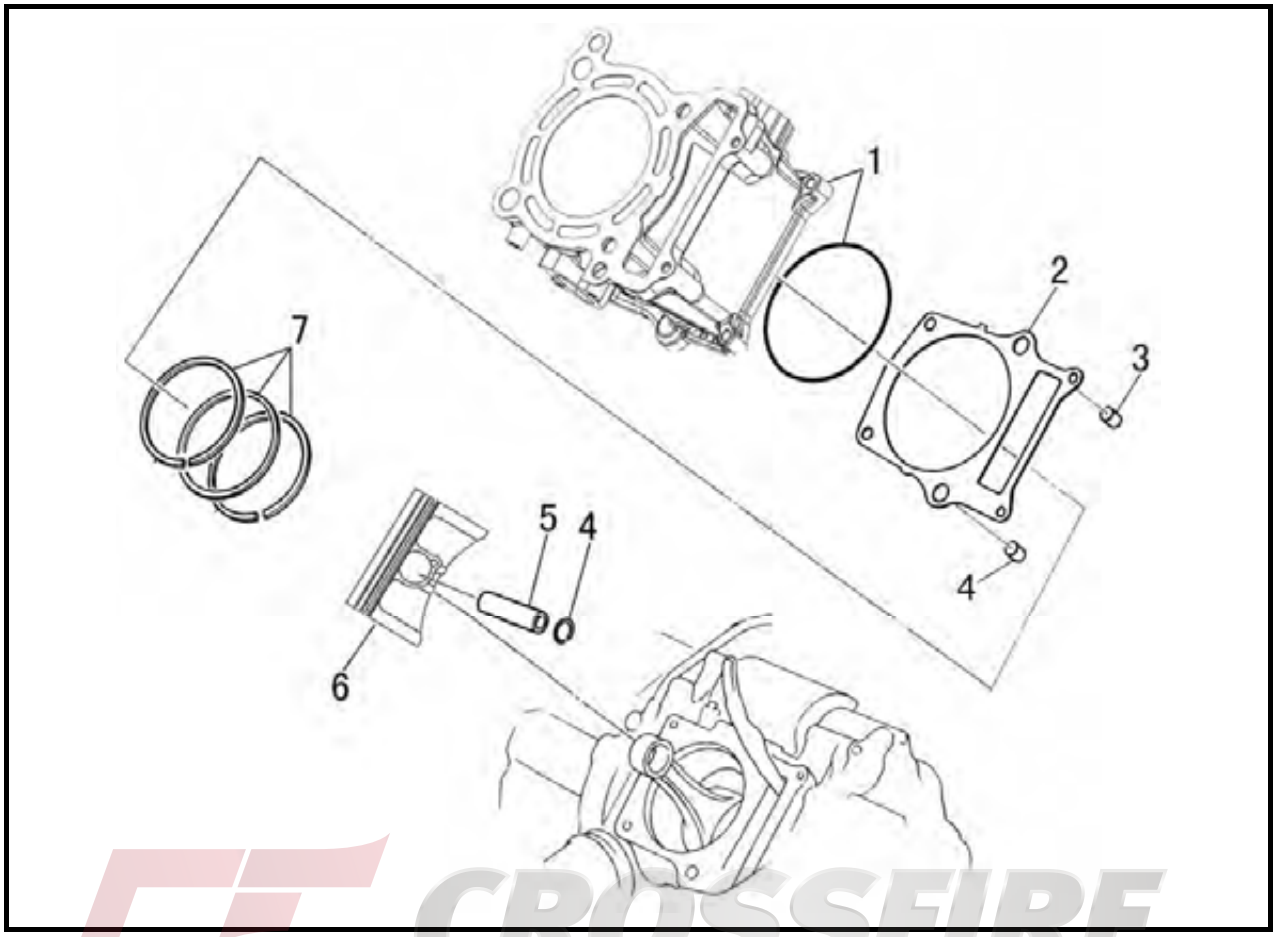
Install the valve cotters while compressing the valve spring with the valve spring compressor ① and valve spring compressor attachment ②.



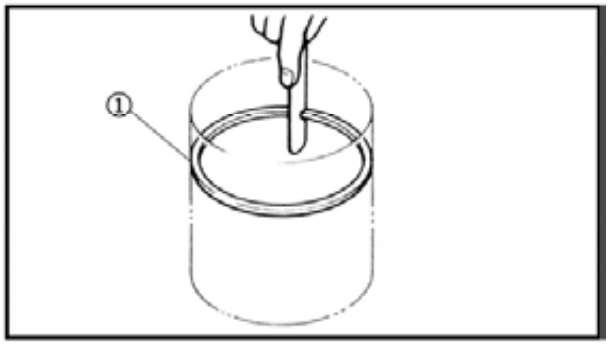
CAUTION:

Hitting the valve tip with excessive force could damage the valve.

CYLINDER AND PISTON



No.	Part Name	Qty	Remarks
	Removing the cylinder and piston		Remove the parts in the order listed.
	Water pump outlet hose		
	Cylinder head		
1	Coolant inlet joint	1	
2	Cylinder/O-ring	1/1	
3	Cylinder gasket	1	
4	Dowel pin	2	
5	Piston pin clip	2	
6	Piston pin	1	
7	Piston	1	
8	Piston ring set	1	
			For installation, reverse the removal procedure.



1、CHECK

1).Checking the cylinder and piston

- cylinder and piston walls Vertical scratches → Rebore or replace the cylinder and the piston.

2).Checking the piston rings

- piston ring

(Insert in cylinder piston ring will be ① ,and measure the end gap.)

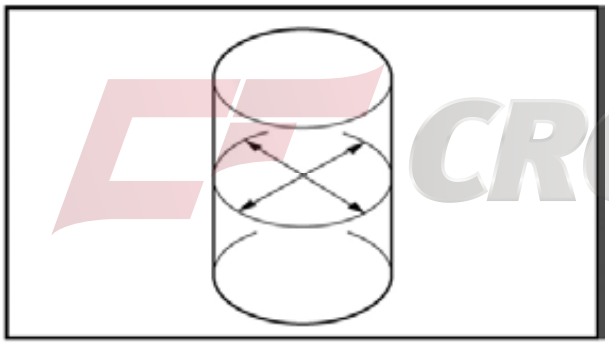
NOTE:

Check whether the piston and the piston groove is cracked and abraded.

3).Checking the piston pin

- piston pin

Blue discoloration/grooves → Replace, then check the lubrication system.



2、MEASURE

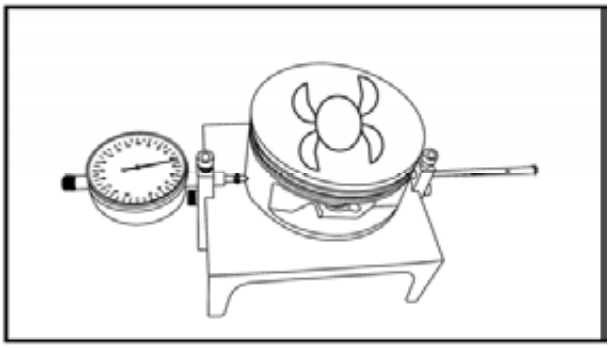
- At the top, the middle and the bottom of the piston stroke.

NOTE:

Measure the bore diameter at directions of right-angle intersection.

Repairing limit value
Out of roundness:0.005mm
Taper:0.005mm

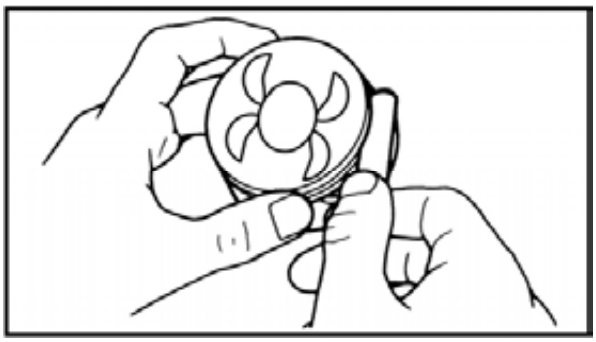
- The external diameter 10mm above the bottom of the piston skirt.



NOTE:

Repair limit on the clearance between the piston and cylinder.

Repairing limit value
0.1mm



• ring end gap

Out of specification → Replace.

Repairing limit value
Top ring/2nd ring:0.5mm

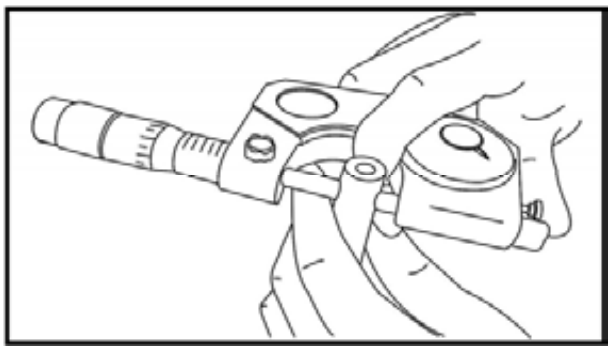
• ring side clearance

Use a thickness gauge.

Out of specification → Replace the piston and rings as a set.

NOTE:

Clean carbon from the piston ring grooves and rings before measuring the side clearance.

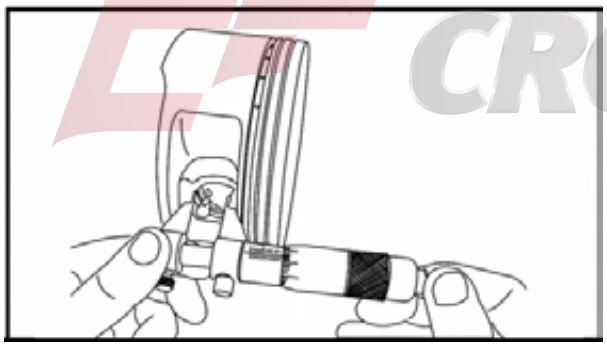


	Side clearance	
	Standard	Limit
Top ring	0.04~0.08mm	0.13mm
2nd ring	0.03~0.07mm	0.13mm

• piston pin-to-piston clearance.

a. Measure the piston pin outside diameter.

Repairing limit value
0.02mm



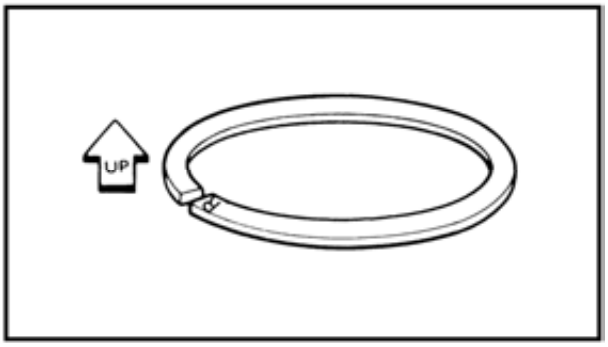
b. Measure the piston pin bore inside diameter.

Repairing limit value
0.02mm

c. Calculate the piston pin-to-piston clearance with the following formula.

Piston pin-to-piston clearance = Piston pin bore inside diameter – Piston pin outside diameter

d. If out of specification, replace the piston.



3、INSTALL:

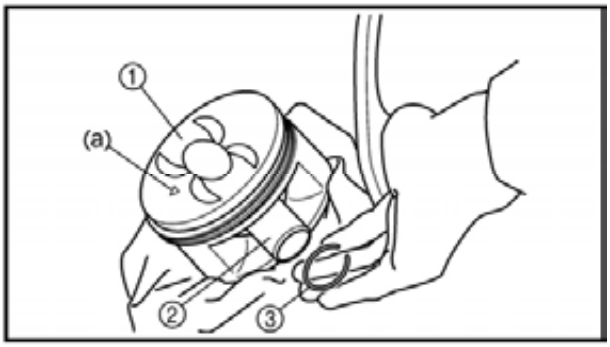
1). Installing the piston

- piston rings

(onto the piston)

NOTE:

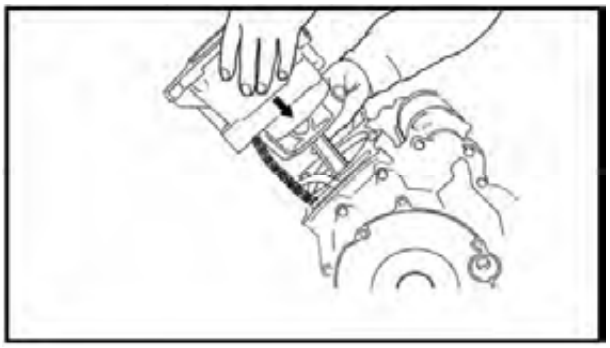
- **Be sure to install the piston rings so that the manufacturer's marks or numbers are located on the upper side of the rings.**
- **Lubricate the piston and piston rings liberally with engine oil.**



- piston ①
- piston pin ②
- piston pin clips ③ (new replacement)

NOTE:

- **Apply engine oil onto the piston pin, piston rings and piston.**
- **Be sure that the arrow mark a on the piston points to the exhaust side of the engine.**
- **Before installing the piston pin clip, cover the crankcase with a clean rag to prevent the piston pin clip from falling into the crankcase.**



2). Installing the cylinder

- cylinder
- O-ring
- bolts (M10,42Nm)
- bolts (M6,10Nm)

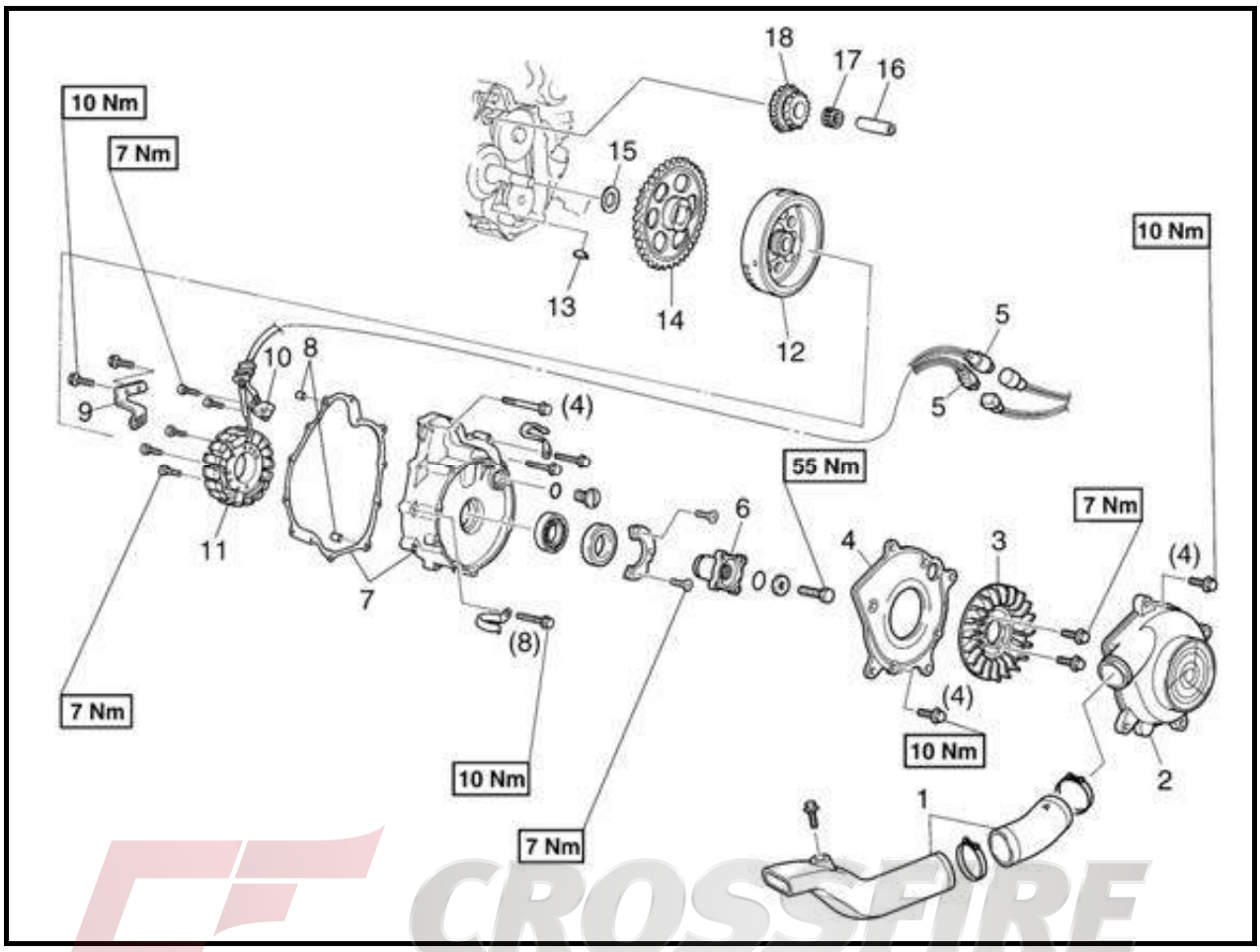
NOTE:

Install the cylinder with one hand while compressing the piston rings with the other hand.

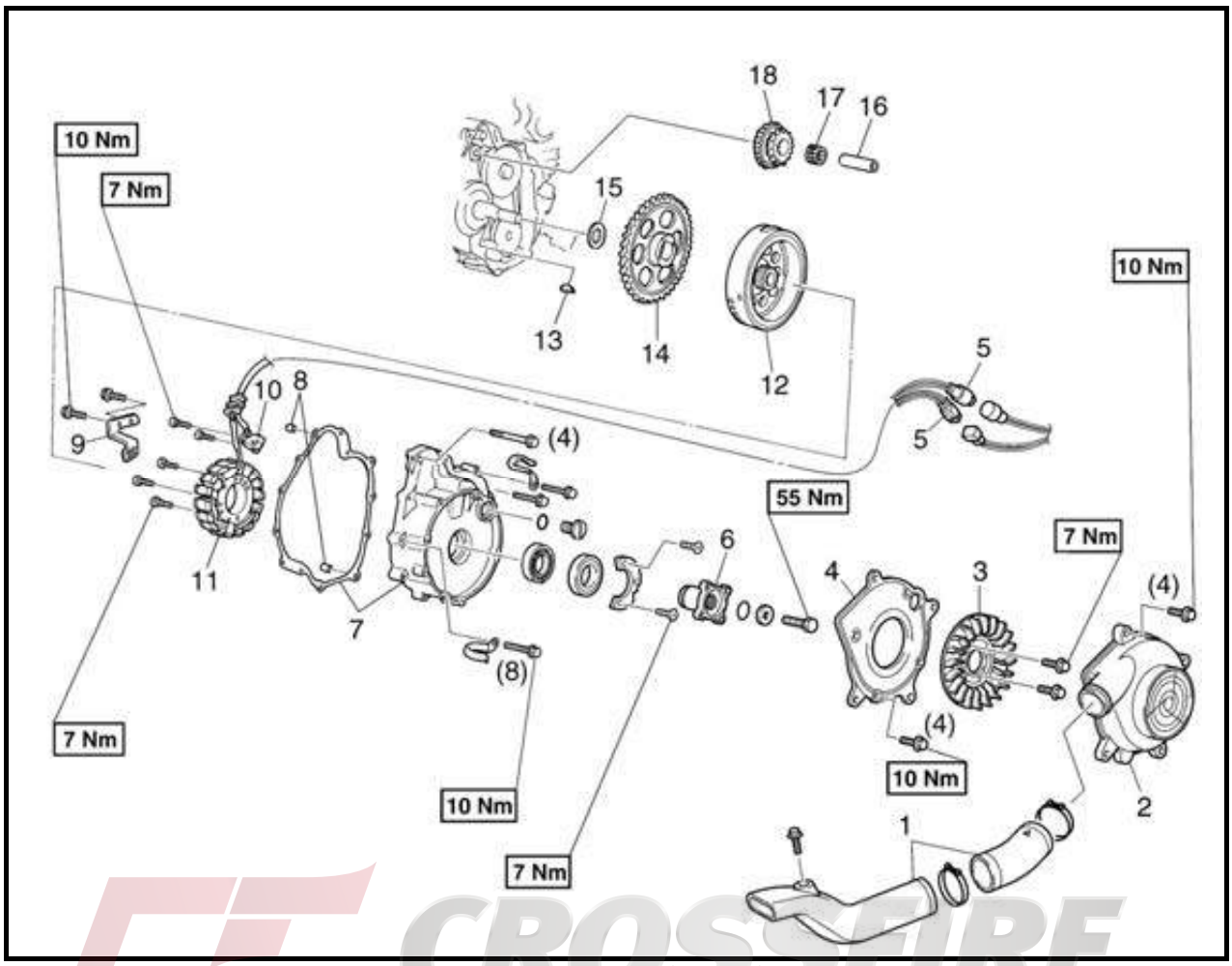
CAUTION:

- **Be careful not to damage the timing chain guide during installation.**
- **Pass the timing chain through the timing chain cavity.**

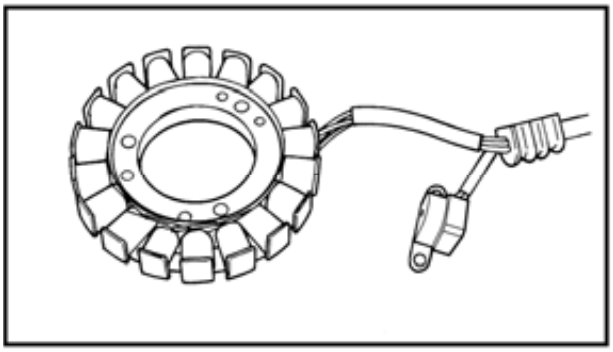
ENGINE COOLING FAN AND A.C. MAGNETO



No.	Part Name	Qty	Remarks
	Removing the engine cooling fan and A.C. magneto		Remove the parts in the order listed.
	Drive belt cover		
	Engine oil		
	Coolant		
	Water pump assembly		
1	Engine cooling fan air duct assembly	1	
2	Air shroud 1	1	
3	Engine cooling fan	1	
4	Air shroud 2	1	
5	A.C. magneto coupler	2	
6	Engine cooling fan pulley base	1	
7	A.C. magneto cover/gasket	1/1	
8	Dowel pin	2	
9	Stator lead holder	1	



No.	Part Name	Qty	Remarks
10	Pickup coil	1	
11	Stator assembly	1	
12	A.C. magneto rotor	1	
13	Woodruff key	1	
14	Starter wheel gear	1	
15	Washer	1	
16	Starter idle gear shaft	1	
17	Bearing	1	
18	Starter idle gear	1	
			For installation, reverse the removal procedure.

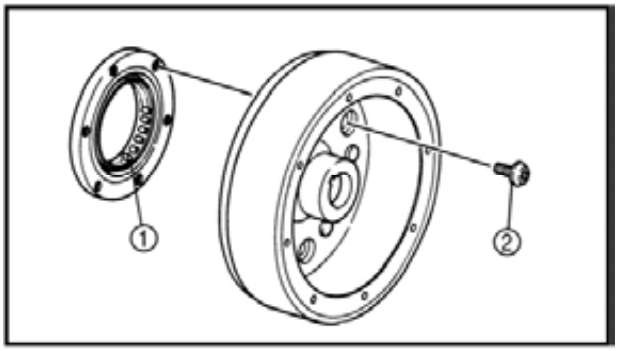


1、CHECK

1). Checking the A.C. magneto

- stator coil
- pickup coil

Damage → Replace.



2). Checking the starter clutch

- starter clutch ①

Cracks/damage → Replace.

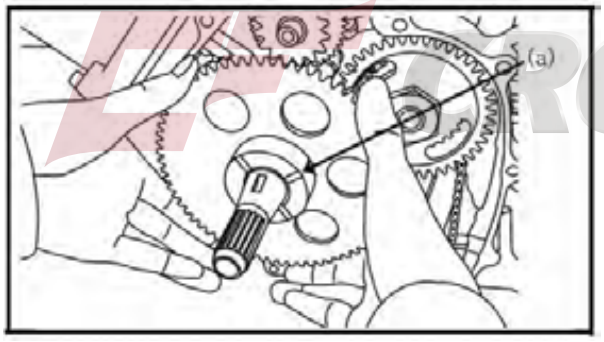
- starter clutch bolts ②

Loose → Replace with new ones, and clinch the end of the bolts.

NOTE:

• The arrow mark on the starter clutch must face inward, away from the A.C. magneto rotor.

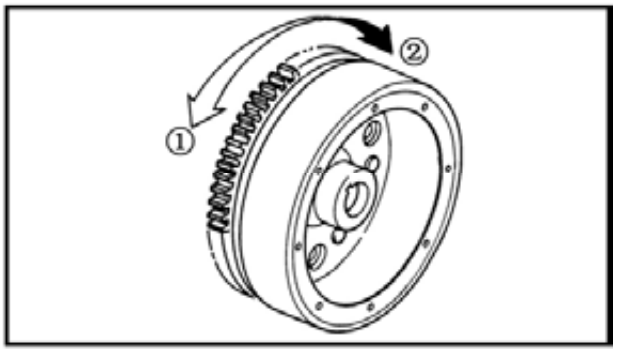
• When installing, apply the locking agent.



a. Install the starter wheel gear onto the starter clutch, and hold the starter clutch.

NOTE:

Install the starter wheel gear with the groove (a) facing the A.C. magneto rotor.

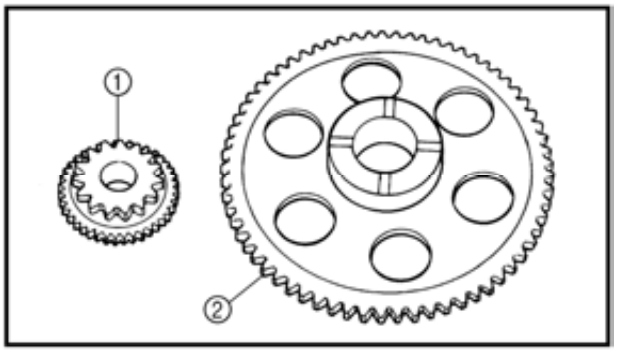


b. Turn the starter wheel gear counterclockwise ① to check that the starter clutch and wheel gear engage.

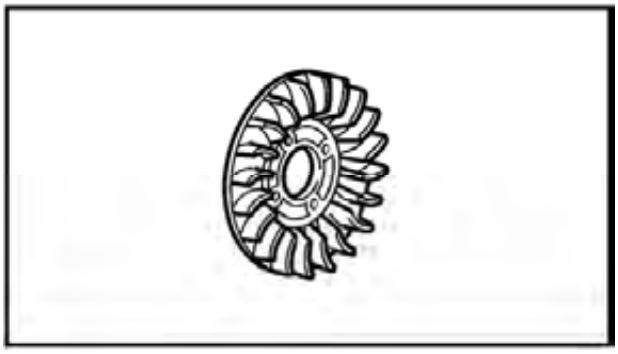
If the starter clutch and wheel gear do not engage, replace the starter clutch.

c. Turn the starter wheel gear clockwise ② to check the starter wheel gear for smooth operation.

If operation is not smooth, replace the starter clutch.



• starter idle gear teeth ①
• starter wheel gear teeth ②
Burrs/clips/roughness/wear → Replace.
• starter wheel gear
(contacting surface)
Damage/pitting/wear → Replace.



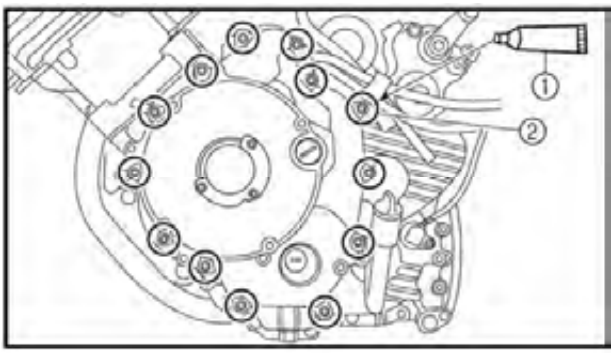
3). Checking the engine cooling fan
• engine cooling fan
• air shroud 1
• air shroud 2
Cracks/damage → Replace.

2、INSTALL
• woodruff key
• A.C. magneto rotor

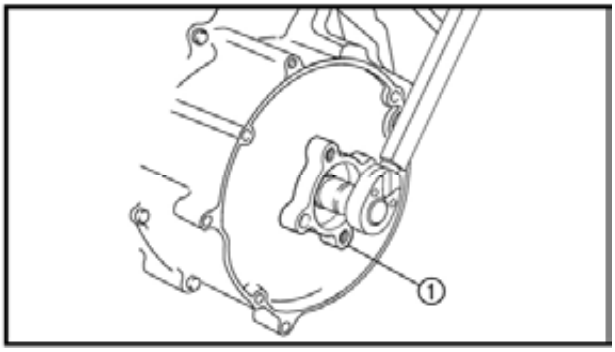
NOTE:
• Before installing the rotor, clean the outside of the crankshaft and the inside of the rotor.
• After installing the rotor, check that the rotor rotates smoothly. If not, reinstall the key and rotor.

• dowel pins
• gasket (New replacement)
• A.C. magneto cover(10Nm)

NOTE:
• When installing the A.C. magneto cover, use a long rod to hold the A.C. magneto rotor in position from the outside. This will make assembly easier. Be careful not to damage the oil seal.
• Apply sealant (Quick Gasket) ① to the thread of the bolt ② shown in the illustration.
• Tighten the bolts in stages, using a crisscross pattern.



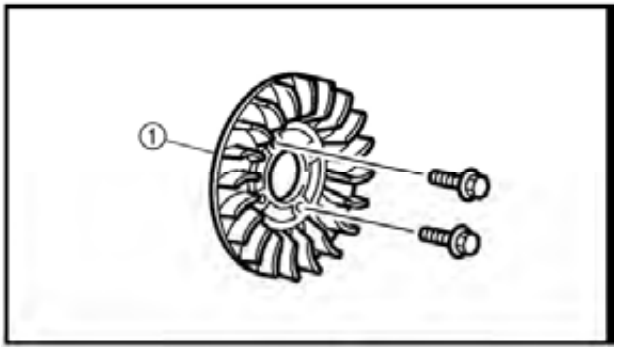
• engine cooling fan pulley ①(55Nm)



NOTE:

Before installing the engine cooling fan pulley, do not forget to install the O-ring.

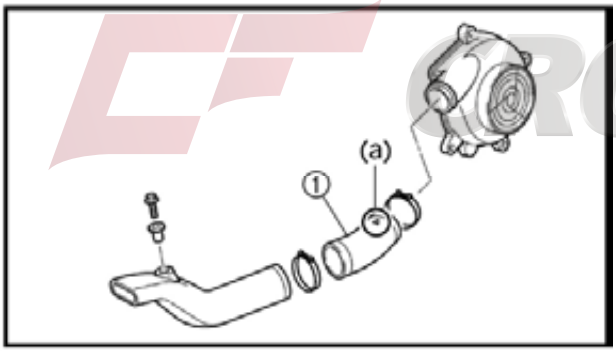
• engine cooling fan ① (7Nm)



NOTE:

Install the bolts in the holes in the collar of the engine cooling fan.

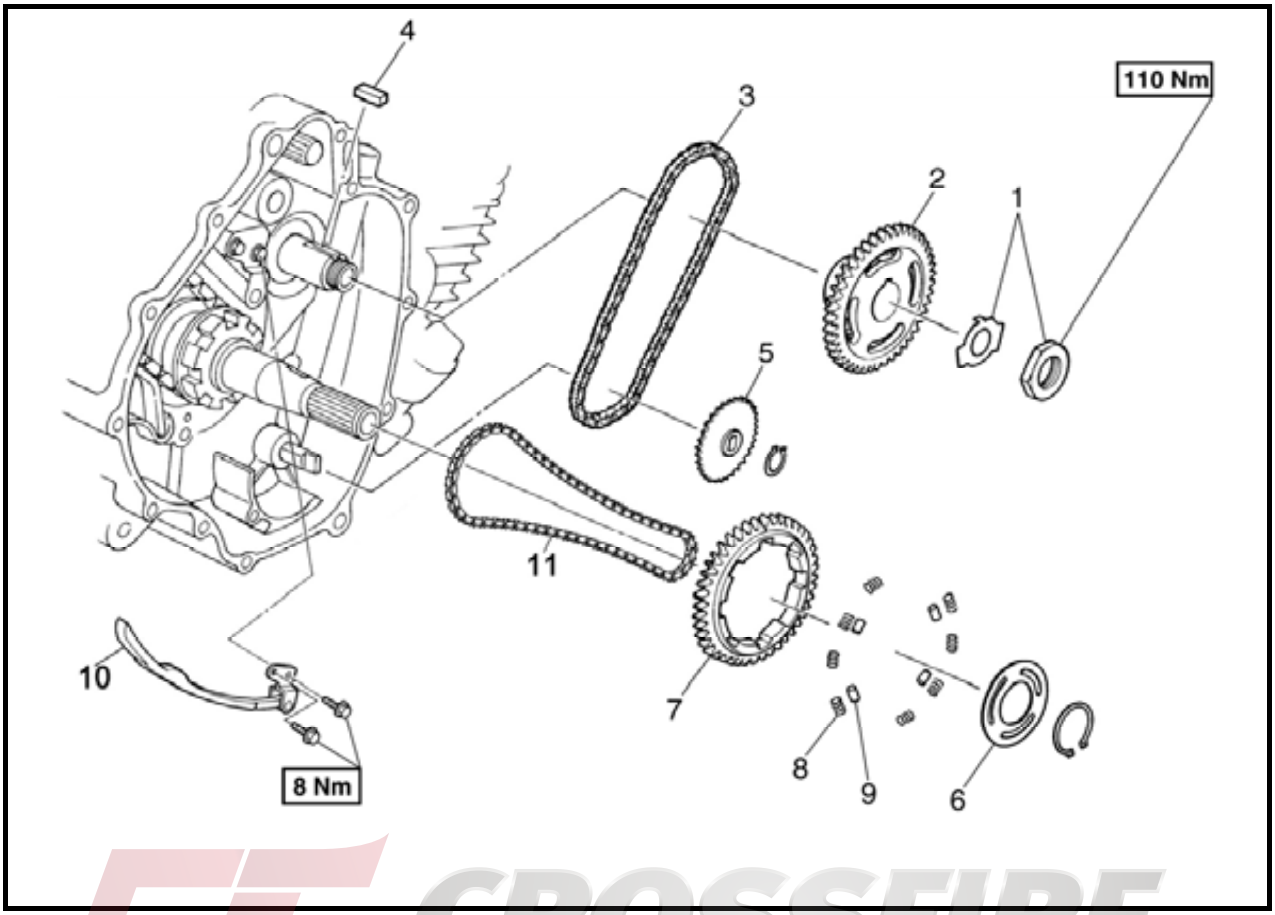
• air shroud ① (10Nm)
• engine cooling fan air duct assembly ①



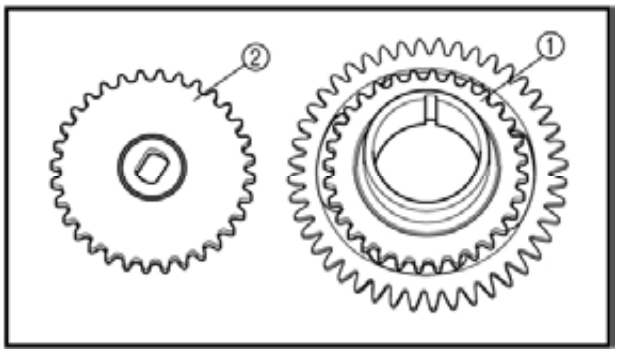
NOTE:

Install the engine cooling fan air duct assembly with the arrow mark (a) towards the air shroud ①.

BALANCER GEARS AND OIL PUMP GEARS



No.	Part Name	Qty	Remarks
	Removing the balancer gears and oil pump gears		Remove the parts in the order listed.
1	Nut/lock washer	1/1	
2	Balancer driven/oil pump drive gear	1	
3	Chain	1	
4	Straight key	1	
5	Oil pump driven gear	1	
6	Plate	1	
7	Balancer drive gear	1	
8	Spring	8	
9	Pin	4	
10	Timing chain guide (intake side)	1	
11	Timing chain	1	
			For installation, reverse the removal procedure.

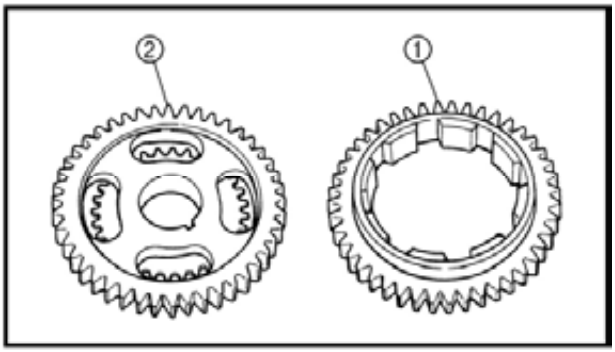


1、CHECK

1) Checking the oil pump drive gear and oil pump driven gear

- oil pump drive gear ①
- oil pump driven gear ②

Cracks/wear/damage → Replace



2).Checking the balancer drive gear and balancer driven gear

- balancer drive gear ①
- balancer driven gear ②

Damage/wear → Replace the balancer drive gear and balancer driven gear as a set.

Excessive noise during operation → Replace the balancer drive gear and balancer driven gear as a set.

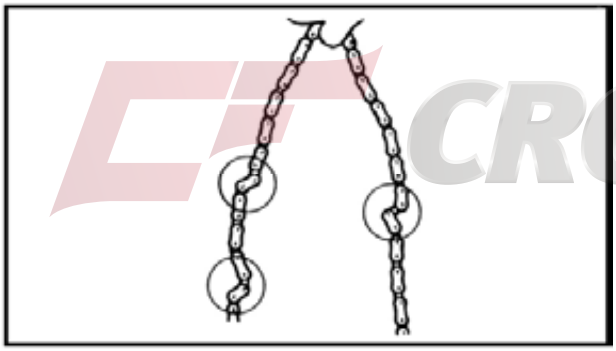
3). Checking the timing chain and guides

- timing chain

Cracks/stiff → Replace the timing chain and camshaft sprocket as a set.

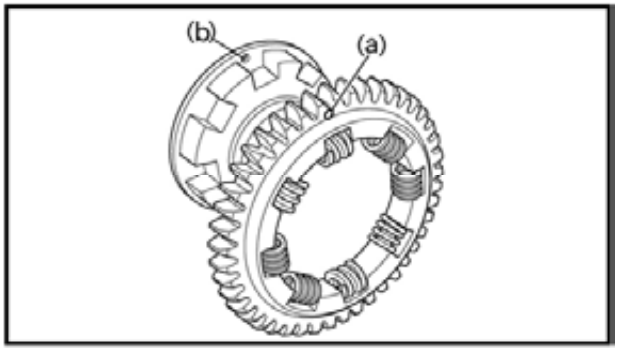
- timing chain guides

Wear/damage → Replace.



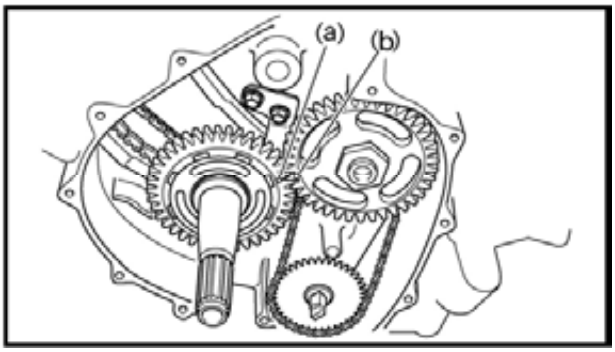
2、INSTALL

- pins
- springs
- balancer drive gear (onto the buffer boss)
- plate
- circlip



NOTE:

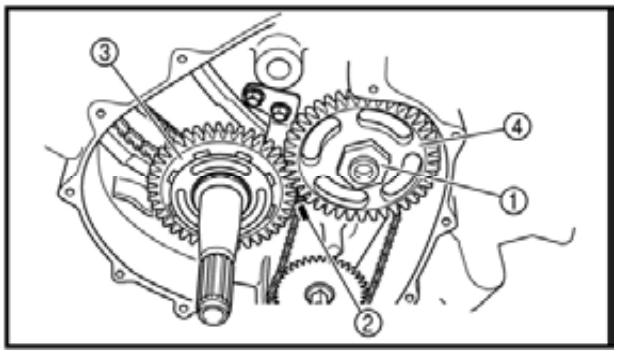
Align the punch mark (a) on the balancer drive gear with the hole (b) to the buffer boss.



• balancer driven gear

NOTE:

Align the punch mark (a) on the balancer drive gear with the punch mark (b) on the balancer driven gear.



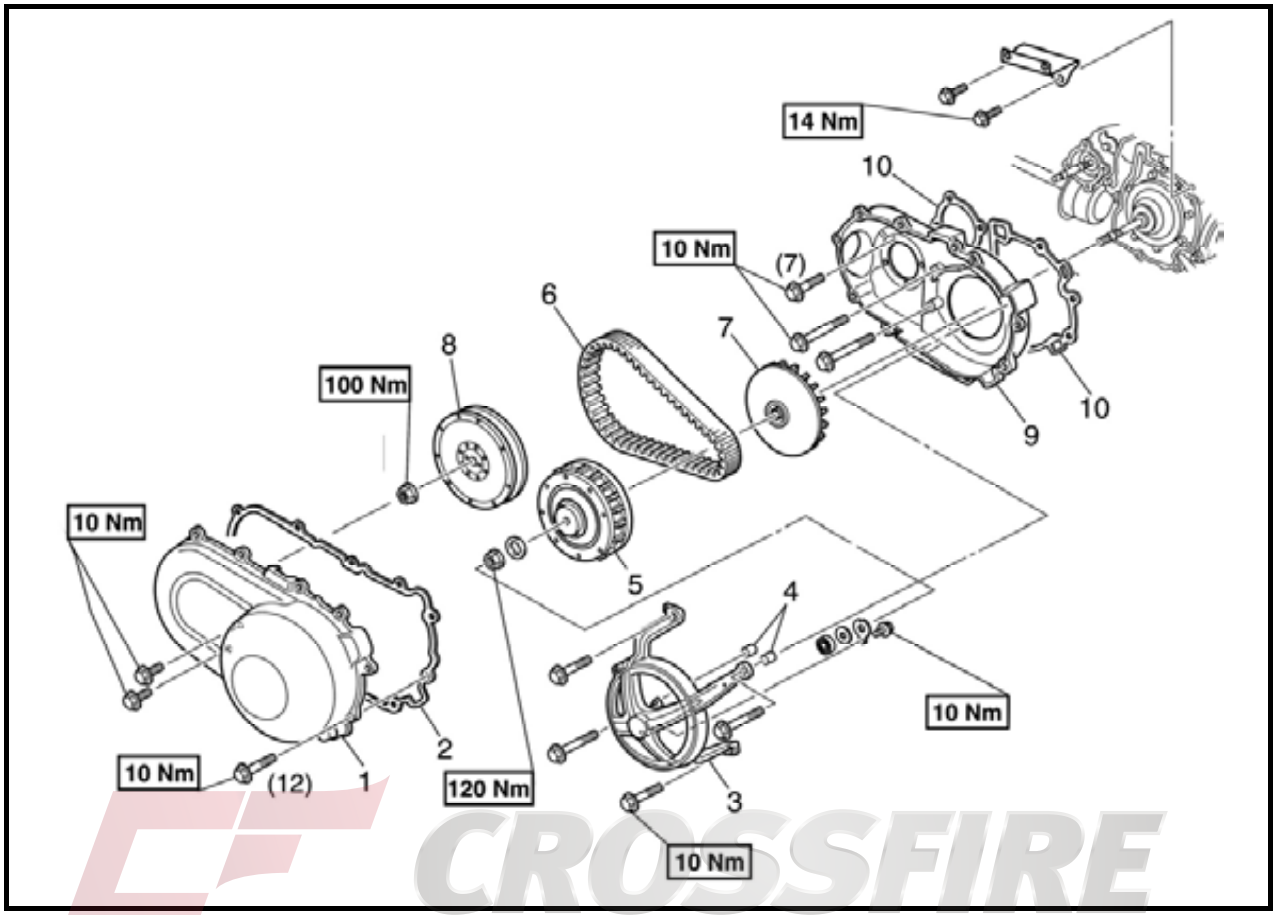
• lock washer(new replacement)
• balancer driven gear nut ①(110Nm)

NOTE:

- **Place an aluminum plate ② between the teeth of the balancer drive gear ③ and balancer driven gear ④.**
- **Apply the molybdenum disulfide grease to the thread of axle and nut.**

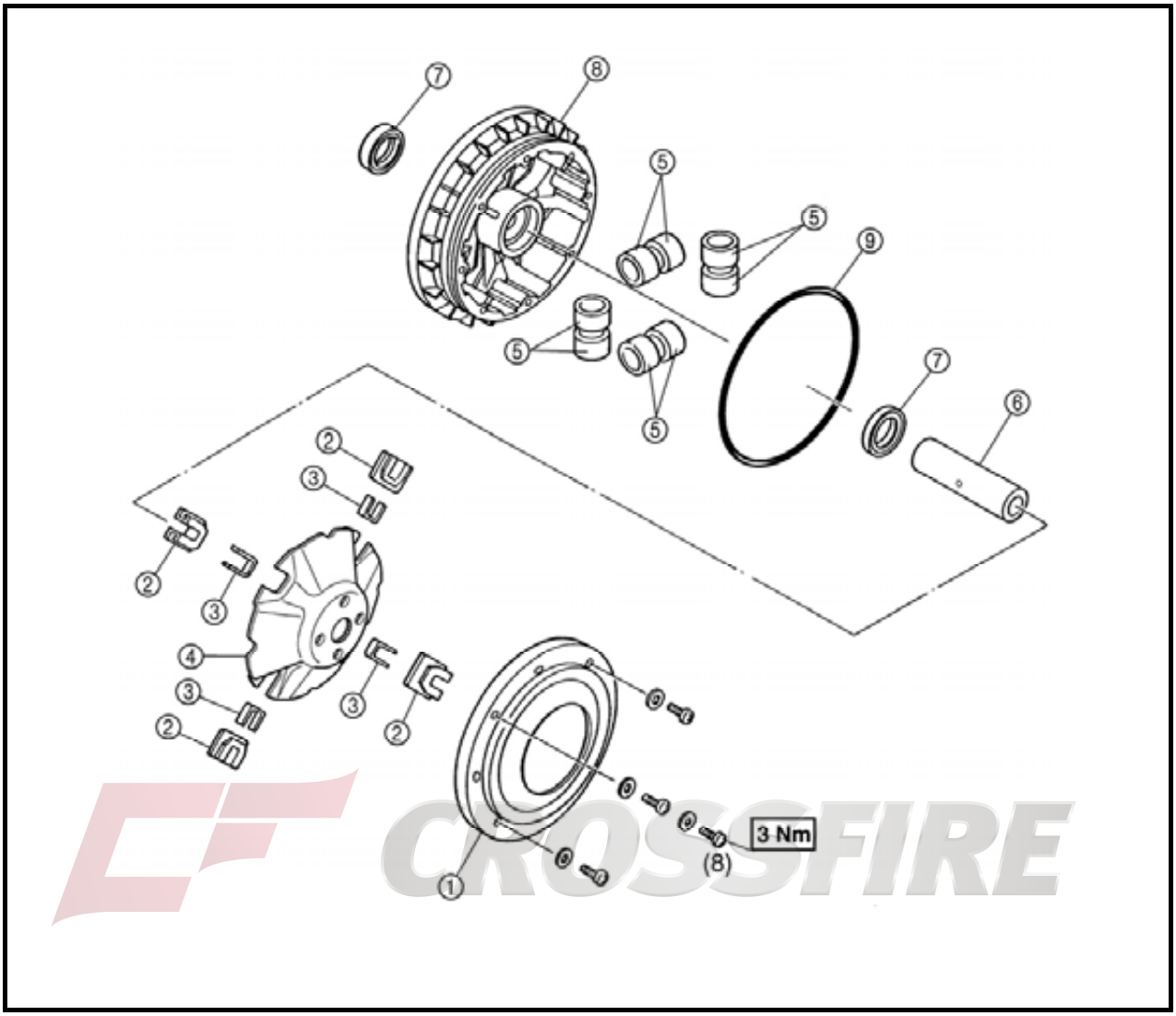
PRIMARY AND SECONDARY SHEAVES

Primary and secondary sheaves



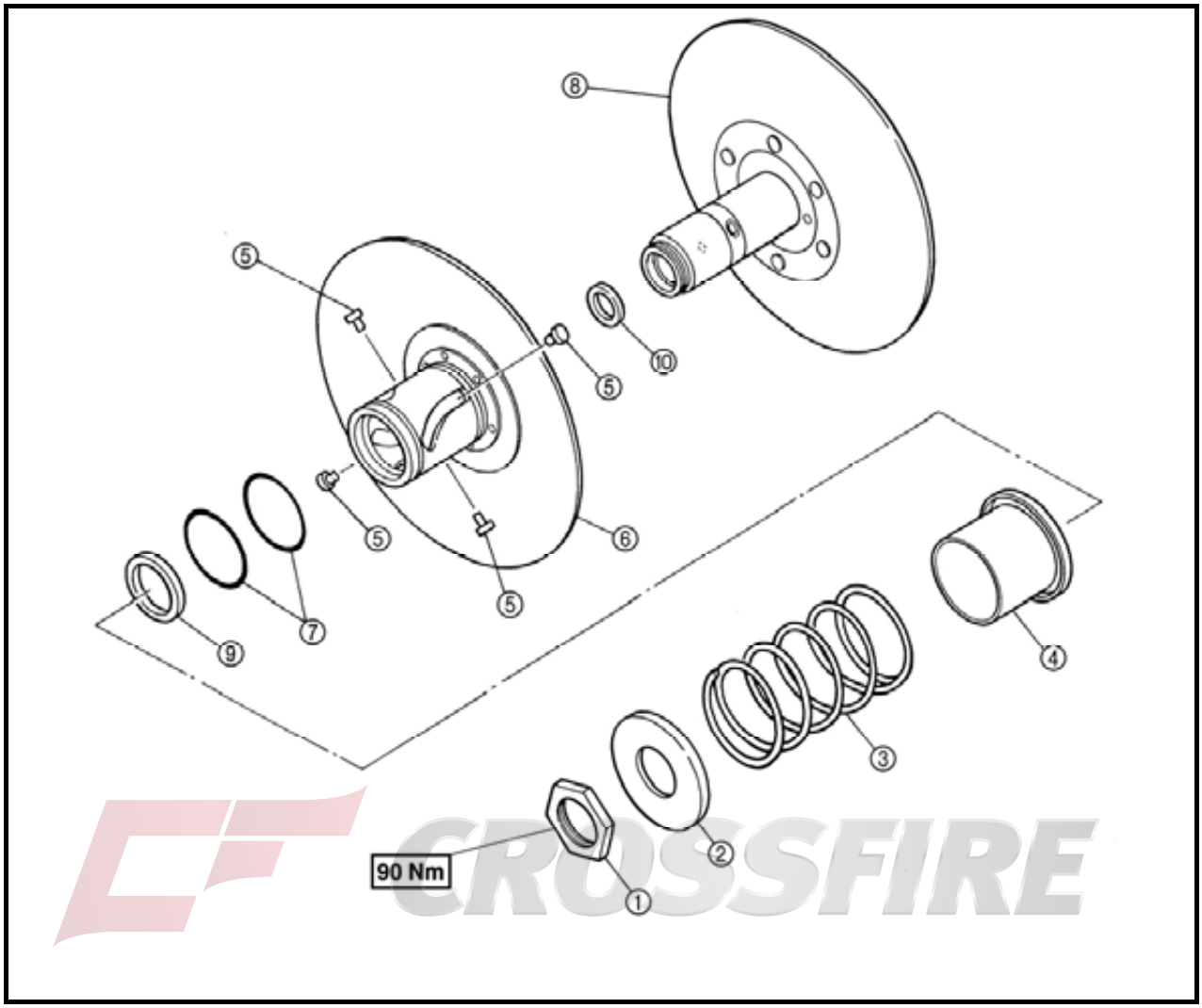
No.	Part Name	Qty	Remarks
	Removing the primary and secondary sheaves		Remove the parts in the order listed.
	Engine assembly		
1	Drive belt cover	1	
2	Rubber gasket	1	
3	Bearing housing	1	
4	Dowel pin	2	
5	Primary sheave assembly	1	
6	V-belt	1	
7	Primary fixed sheave	1	
8	Secondary sheave assembly	1	
9	Drive belt case	1	
10	Rubber gasket	2	
			For installation, reverse the removal procedure.

Primary sheave

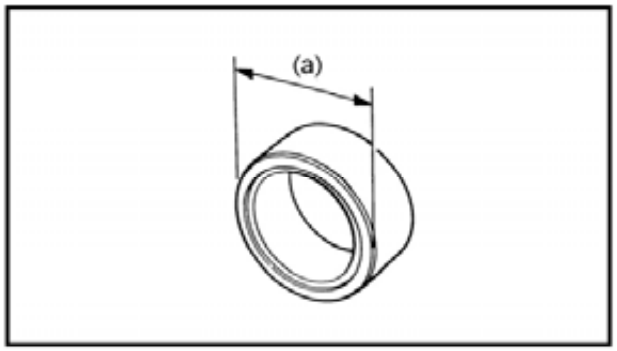


No.	Part Name	Qty	Remarks
	Disassembling the primary sheave		Remove the parts in the order listed.
①	Primary pulley sheave cap	1	
②	Primary pulley slider	4	
③	Spacer	4	
④	Primary pulley cam	1	
⑤	Primary pulley weight	8	
⑥	Collar	1	
⑦	Oil seal	2	
⑧	Primary sliding sheave	1	
⑨	O-ring	1	
			For assembly, reverse the disassembly procedure.

Secondary sheave



No.	Part Name	Qty	Remarks
	Disassembling the secondary Sheave		Remove the parts in the order listed.
①	Nut	1	
②	Spring seat	1	
③	Compression spring	1	
④	Spring seat	1	
⑤	Guide pin	4	
⑥	Secondary sliding sheave	1	
⑦	O-ring	2	
⑧	Secondary fixed sheave	1	
⑨	Oil seal	1	
⑩	Oil seal	1	
			For assembly, reverse the disassembly procedure.



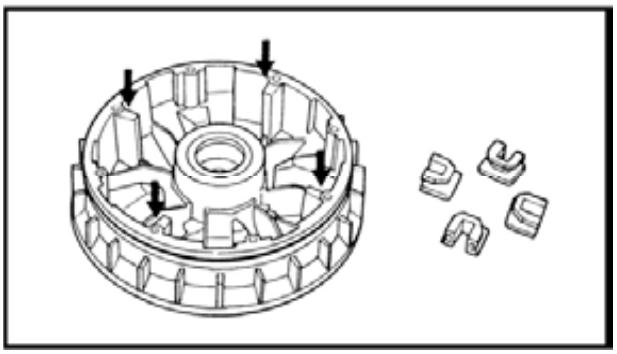
1、Check

1). Checking the primary sheave

- weight outside diameter (a)

  Out of specification → Replace the weight.

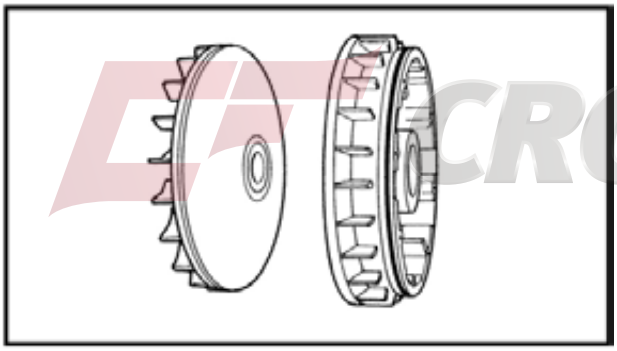
Weight outside diameter limit: 29.5 mm



- primary pulley slider
- primary sliding sheave splines

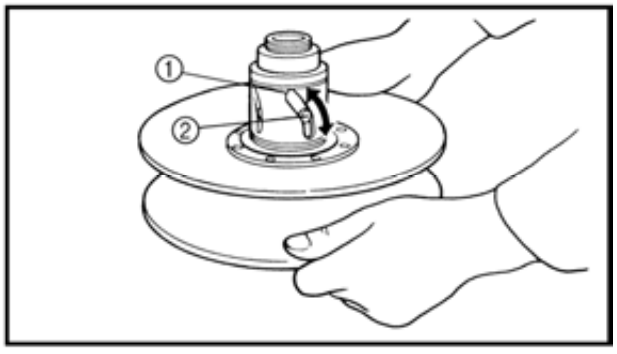
  Wear/cracks/damage → Replace.
- spacer
- primary pulley cam

  Cracks/damage → Replace.



- primary sliding sheave
- primary fixed sheave

  Cracks/damage → Replace.



2). Checking the secondary sheave

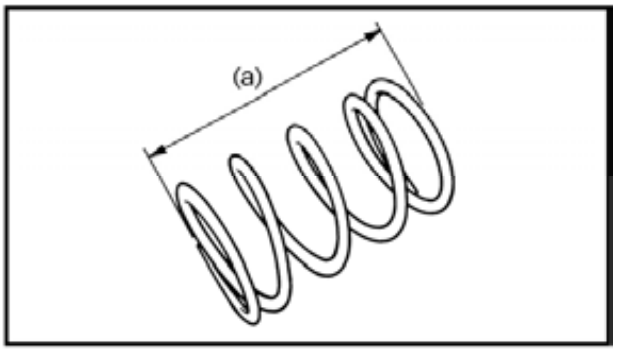
- secondary fixed sheave smooth operation
- secondary sliding sheave smooth operation

  Scratches/damage → Replace as a set.
- torque cam grooves ①

  Wear/damage → Replace
- guide pins ②

  Wear/damage → Replace.
- secondary sheave spring

  Damage → Replace.



2、Measure

• secondary sheave spring free length (a)

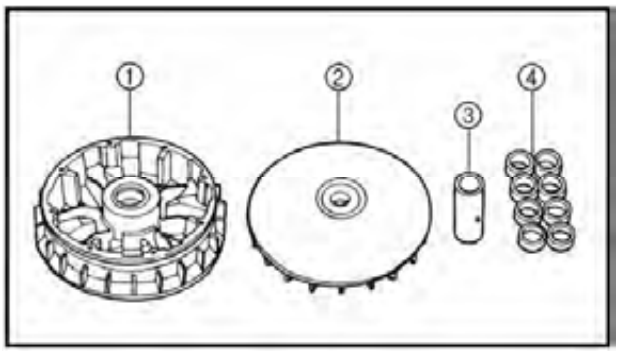
Out of specification → Replace the secondary sheave spring.

3、INSTALL

1). Assembling the primary sheave

(1)Clean:

• primary sliding sheave face ①
• primary fixed sheave face ②
• collar ③
• weights ④
• primary sliding sheave cam face

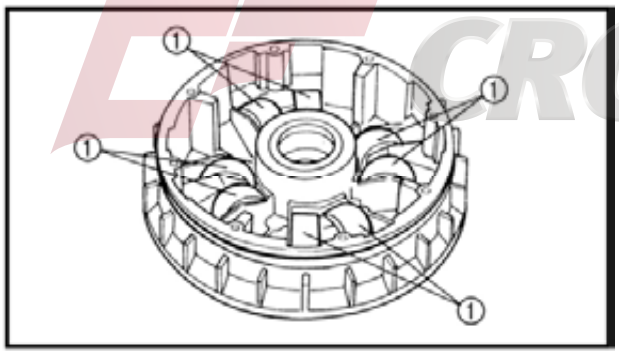


NOTE:

Remove any excess grease.

(2)Install:

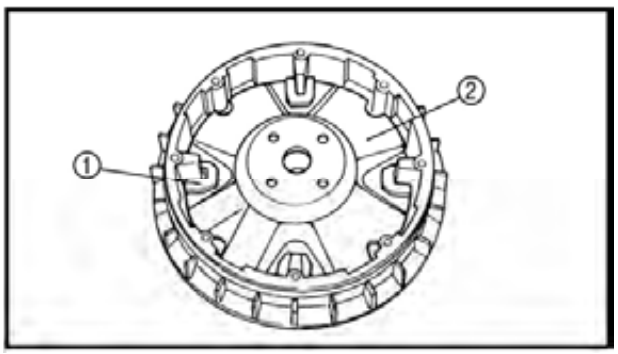
• weights ①

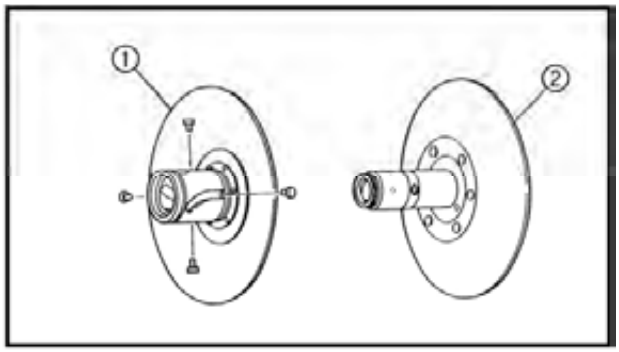


NOTE:

- **Apply grease (90g) to the whole outer surface of the weights and install.**
- **Apply grease to the inner surface of the collar.**
- **Apply grease to the inner surface of the primary sliding sheave.**

• spacer
• sliders ①
• primary pulley cam ②
• primary sliding sheave cap (3 Nm)





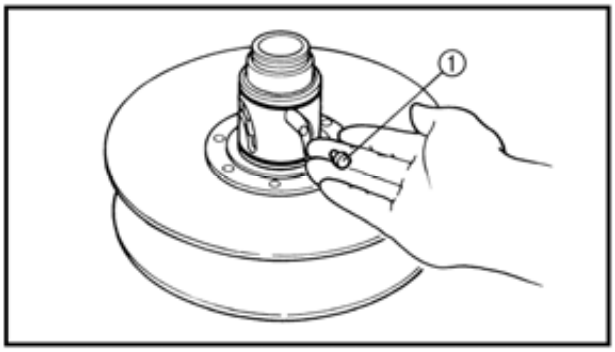
2). Assembling the secondary sheave

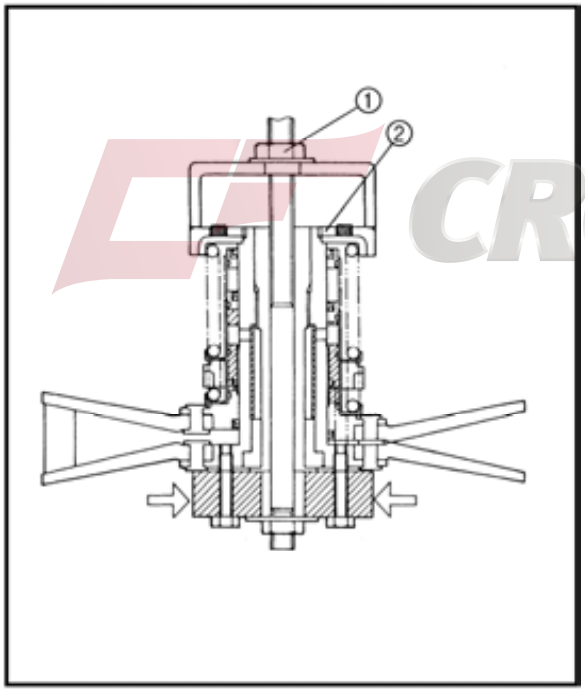
(1)Apply:

- assembly lube
  (to the secondary sliding sheave ① inner surface and oil seals)。
- assembly lube
  (to the bearings, oil seals and inner surface of the secondary fixed sheave ②)

(2)Install:

- guide pins ①
- spring seat
- compression spring
- spring seat
- nut





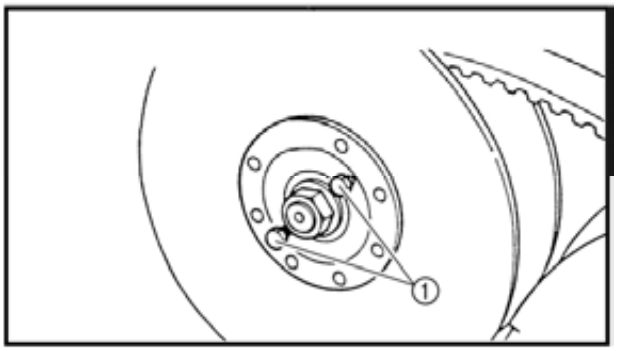
a. Attach the sheave fixed block, locknut wrench and sheave spring compressor to the secondary sheave assembly.

b. Place the sheave fixed block in a vise and secure it.

c. Tighten the sheave spring compressor nut ① and compress the spring.

d. Install the nut ② and tighten it to the specified torque using the locknut wrench.(Nut:90Nm)

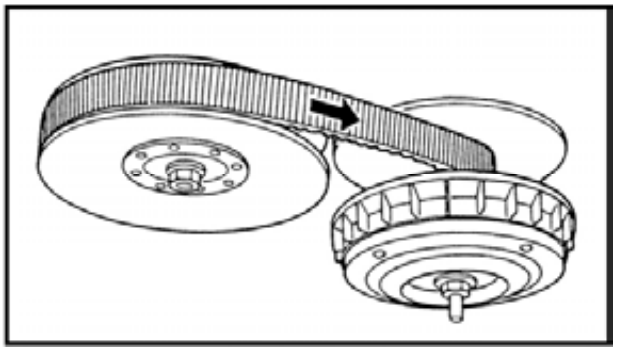
e. Remove the sheave spring compressor, locknut wrench, and sheave fixed block.



3). Installing the primary and secondary sheaves

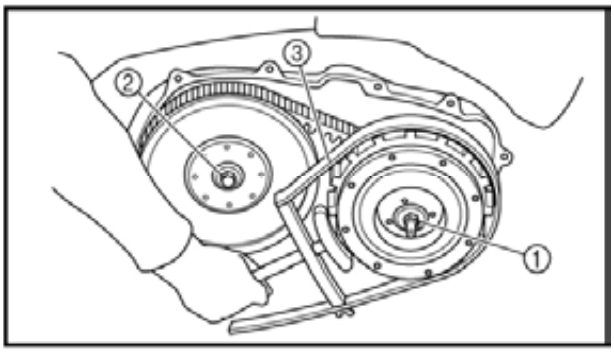
(1) Install:

- secondary sheave assembly
- V-belt
- primary sheave assembly



NOTE:

- **Tightening the bolts ① will push the secondary sliding sheave away, causing the gap between the secondary fixed and sliding sheaves to widen.**
- **Install the V-belt so that its arrow faces the direction show in the illustration.**



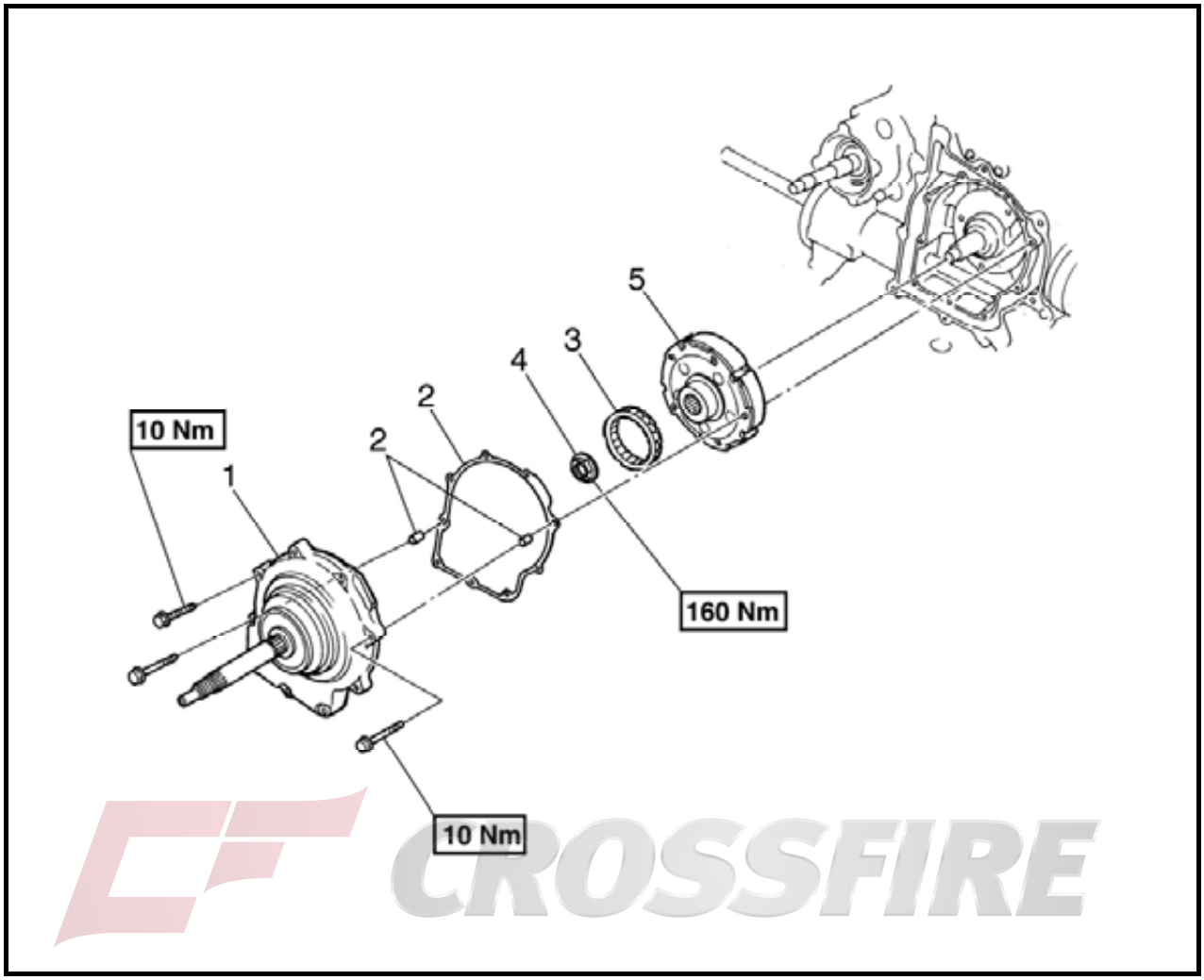
(2)Tighten:

- primary sheave nut ① (120Nm)
- secondary sheave nut ② (100Nm)

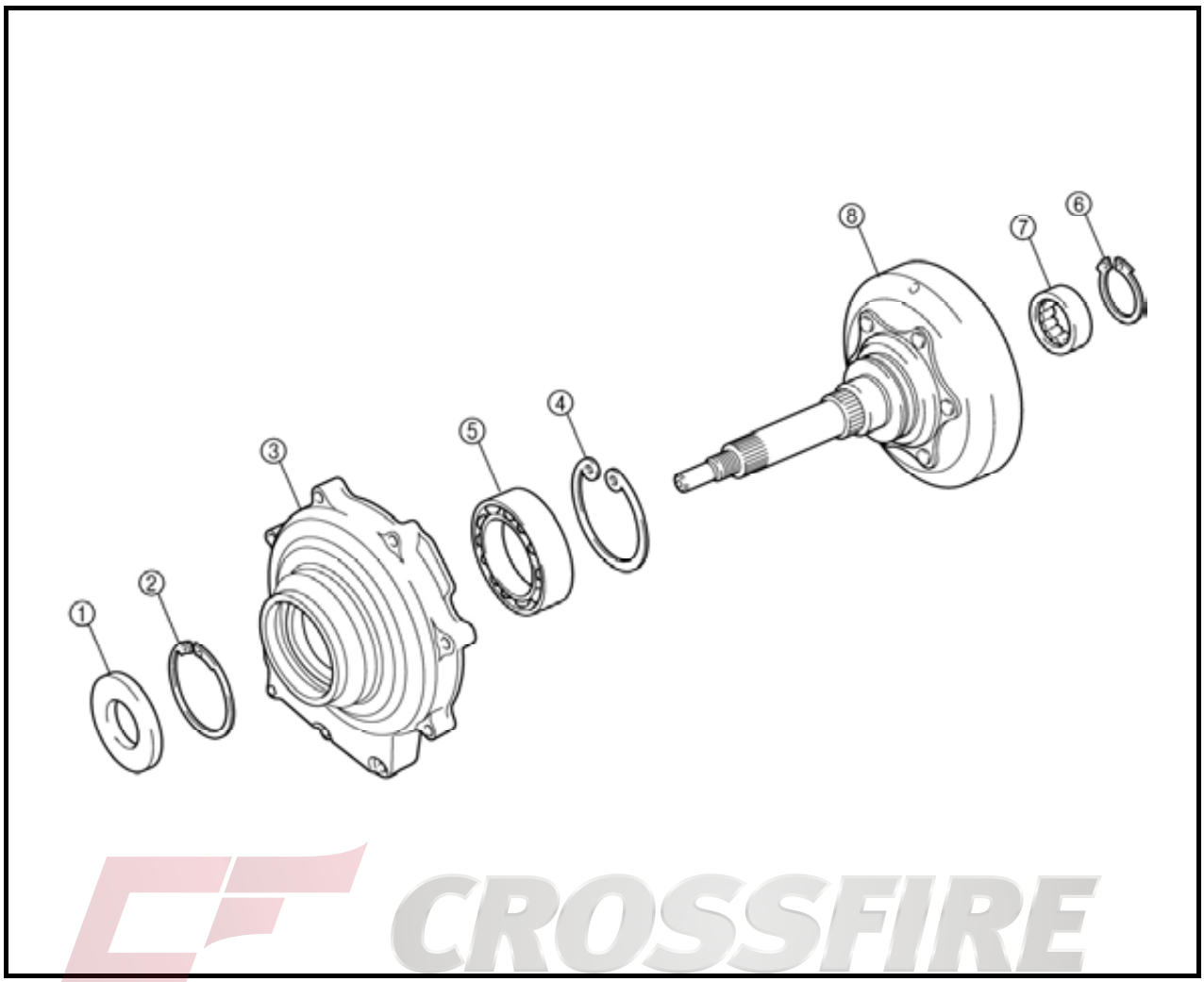
NOTE:

- **Use the sheave holder ③ to hold the primary sheave.**
- **First, tighten the primary sheave nut ①, then tighten the secondary sheave nut ②.**

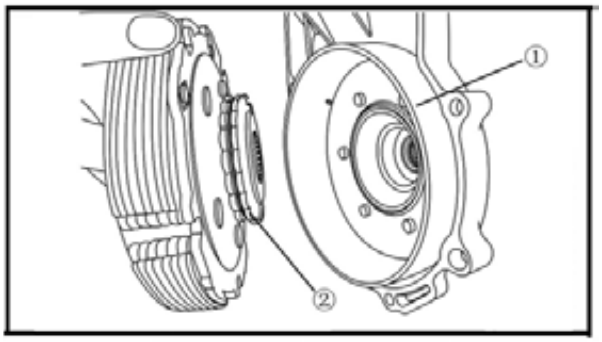
CLUTCH



No.	Part Name	Qty	Remarks
	Removing the clutch		Remove the parts in the order listed.
	Primary and secondary sheaves		
1	Clutch housing assembly	1	
2	Gasket/dowel pin	1/2	
3	One-way clutch bearing	1	
4	Nut	1	
5	Clutch carrier assembly	1	
			For installation, reverse the removal procedure.



No.	Part Name	Qty	Remarks
	Disassembling the clutch housing		Remove the parts in the order listed.
①	Oil seal	1	
②	Circlip	1	
③	Bearing housing	1	
④	Circlip	1	
⑤	Bearing	1	
⑥	Circlip	1	
⑦	Bearing	1	
⑧	Clutch housing	1	
			For assembly, reverse the disassembly procedure.



1、CHECK

1). Checking the clutch

• clutch housing ①

Heat damage/wear/damage → Replace.

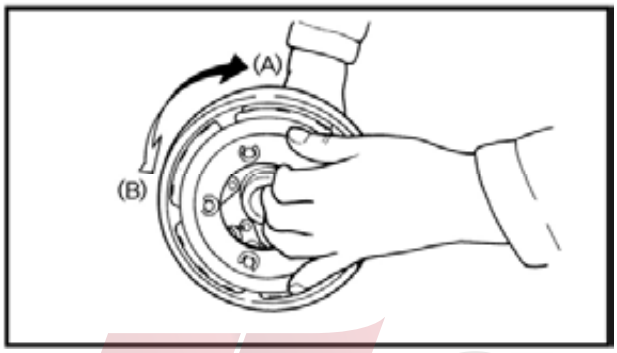
• one-way clutch bearing ②

Chafing/wear/damage → Replace.

NOTE:

• Replace the one-way clutch assembly and clutch housing as a set.

• The one-way clutch bearing must be installed with the flange side facing in.



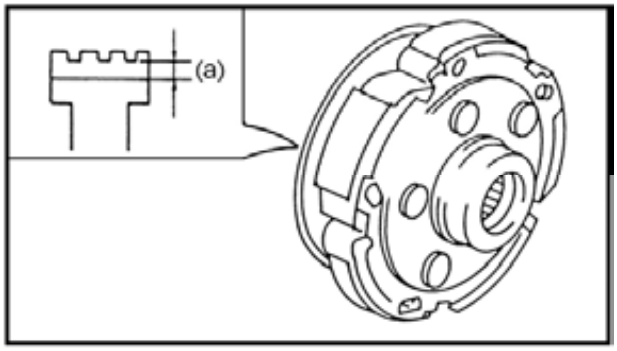
a. Install the one-way clutch bearing and clutch carrier assembly to the clutch housing and hold the clutch carrier assembly.

b. When turning the clutch housing clockwise (A), the clutch housing should turn freely. If not, the one-way clutch assembly is faulty. Replace it.

c. When turning the clutch housing counter-clockwise (B), the clutch housing and crank-shaft should be engaged.If not, the one-way clutch assembly is faulty. Replace it.

• clutch shoe

Heat damage → Replace.

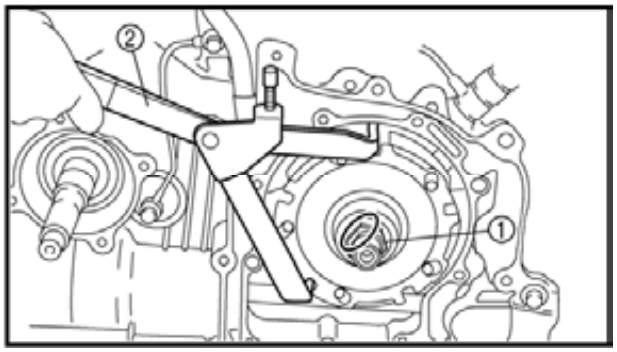


2、MEASURE

• clutch shoe thickness

Out of specification → Replace.

Clutch shoe wear limit (a)
1.0 mm



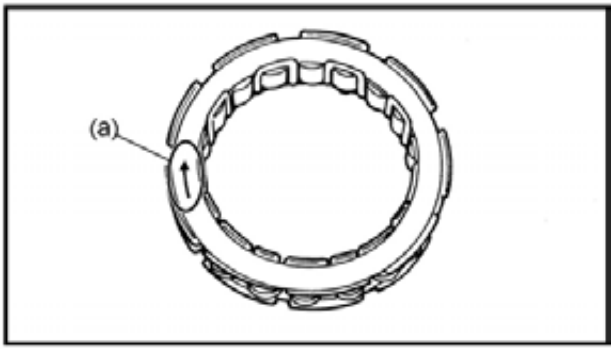
3、INSTALL

- clutch carrier assembly
- nut ①(160Nm)

NOTE:

Use a universal clutch holder ② to hold the clutch carrier assembly.

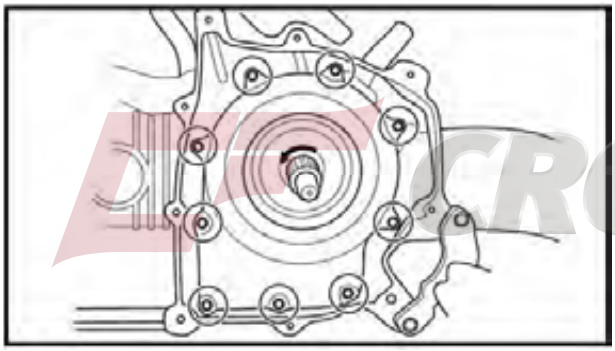
- Lock the threads with a drift punch.



- one-way clutch bearing

NOTE:

The one-way clutch bearing should be installed in the clutch carrier assembly with the arrow mark (a) facing toward the clutch housing.



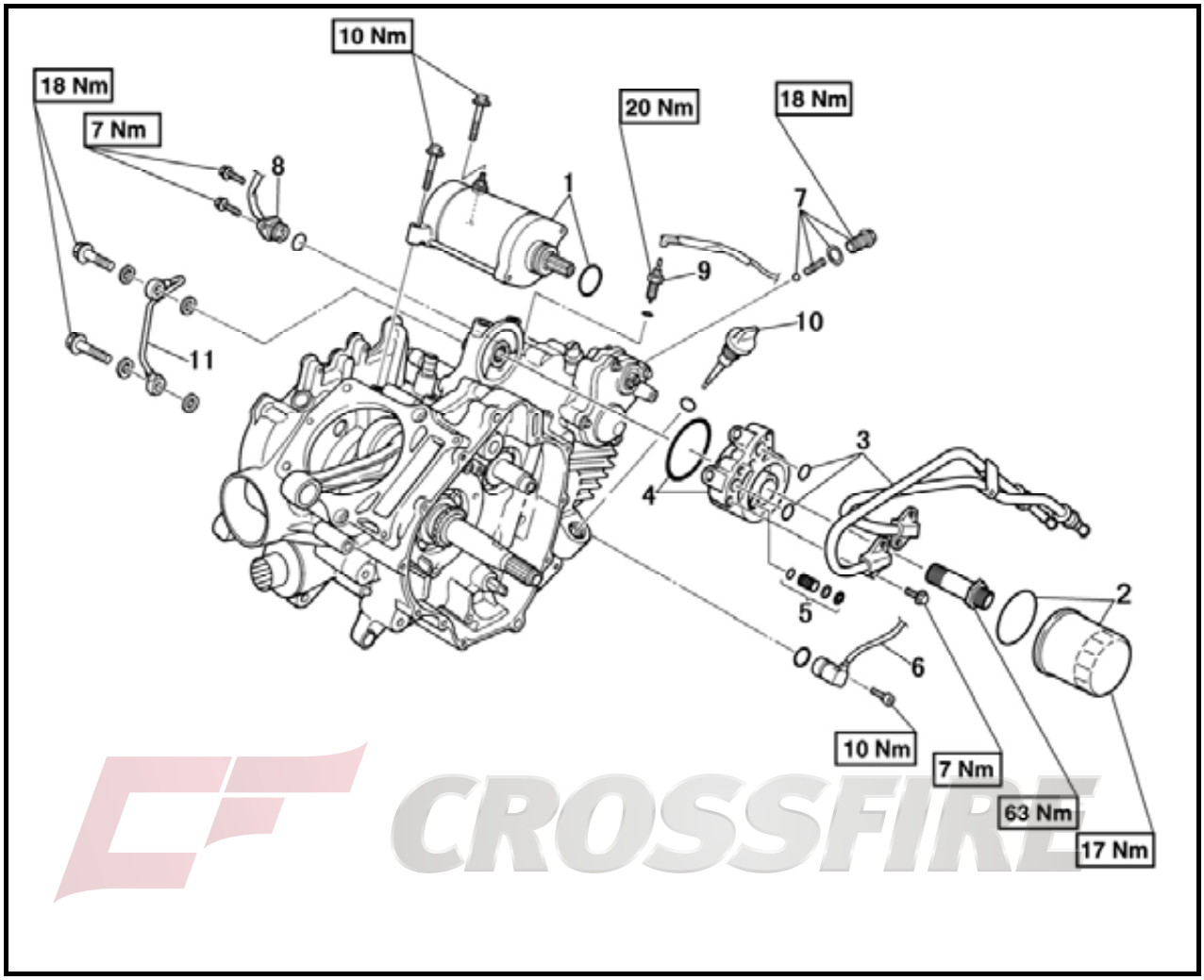
- dowel pins
- gasket
- clutch housing assembly (10 Nm)

NOTE:

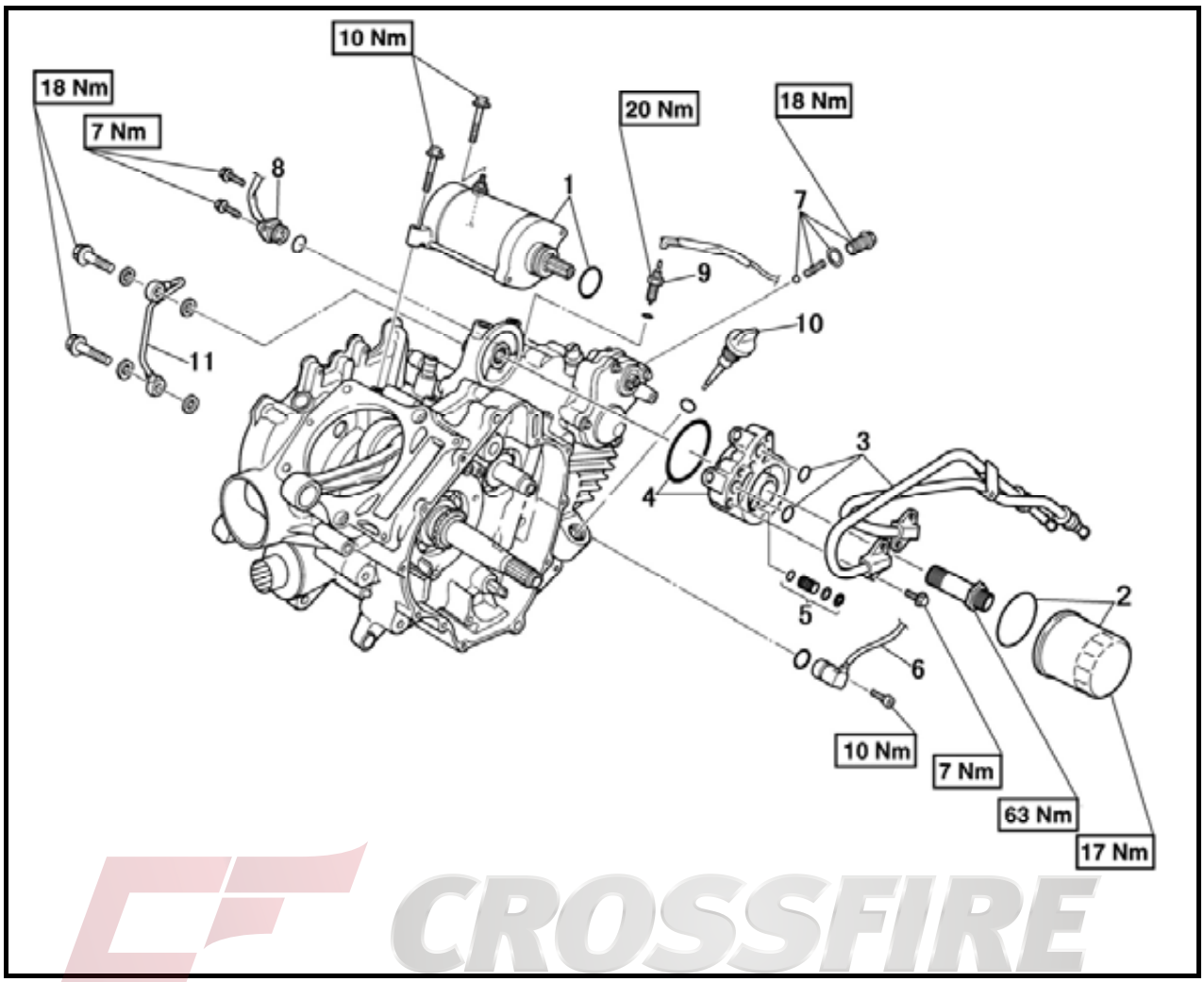
- Tighten the bolts in stages, using a crisscross pattern.
- After tightening the bolts, check that the clutch housing assembly to counterclockwise rotates smoothly.

CRANKCASE

Starter motor and oil filter

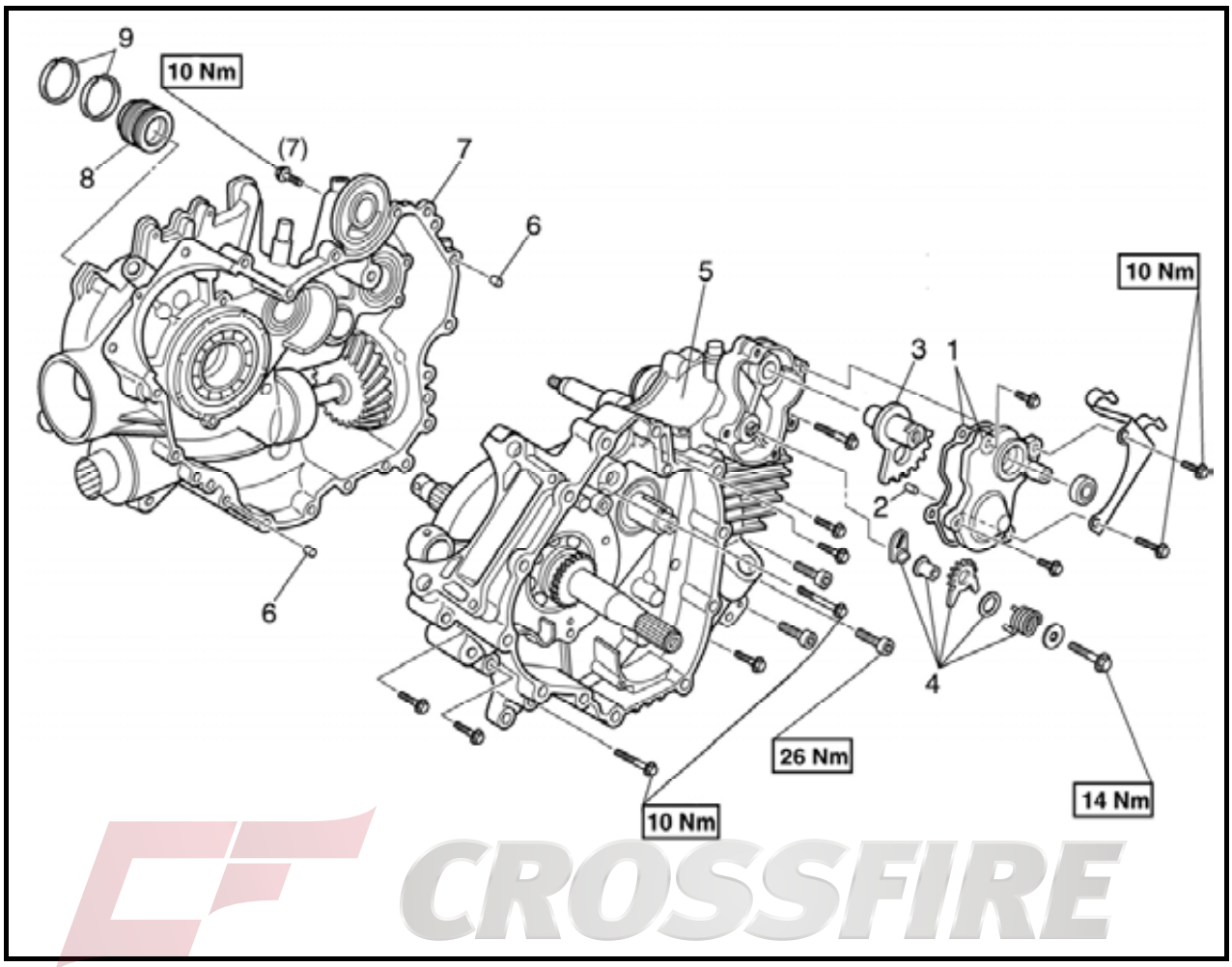


No.	Part Name	Qty	Remarks
	Remove the starter motor, timing chain and oil filter		Remove the parts in the order listed.
	A.C. magneto rotor		
	Primary and secondary sheaves		
	Clutch carrier assembly		
1	Starter motor/O-ring	1/1	
2	Oil filter cartridge/O-ring	1	
3	Oil pipe assembly/O-ring	1/2	
4	Oil pipe adapter/O-ring	1/1	
5	Relief valve assembly	1	
6	Speed sensor	1	
7	Shift drum stopper	1	
8	Gear position switch	1	



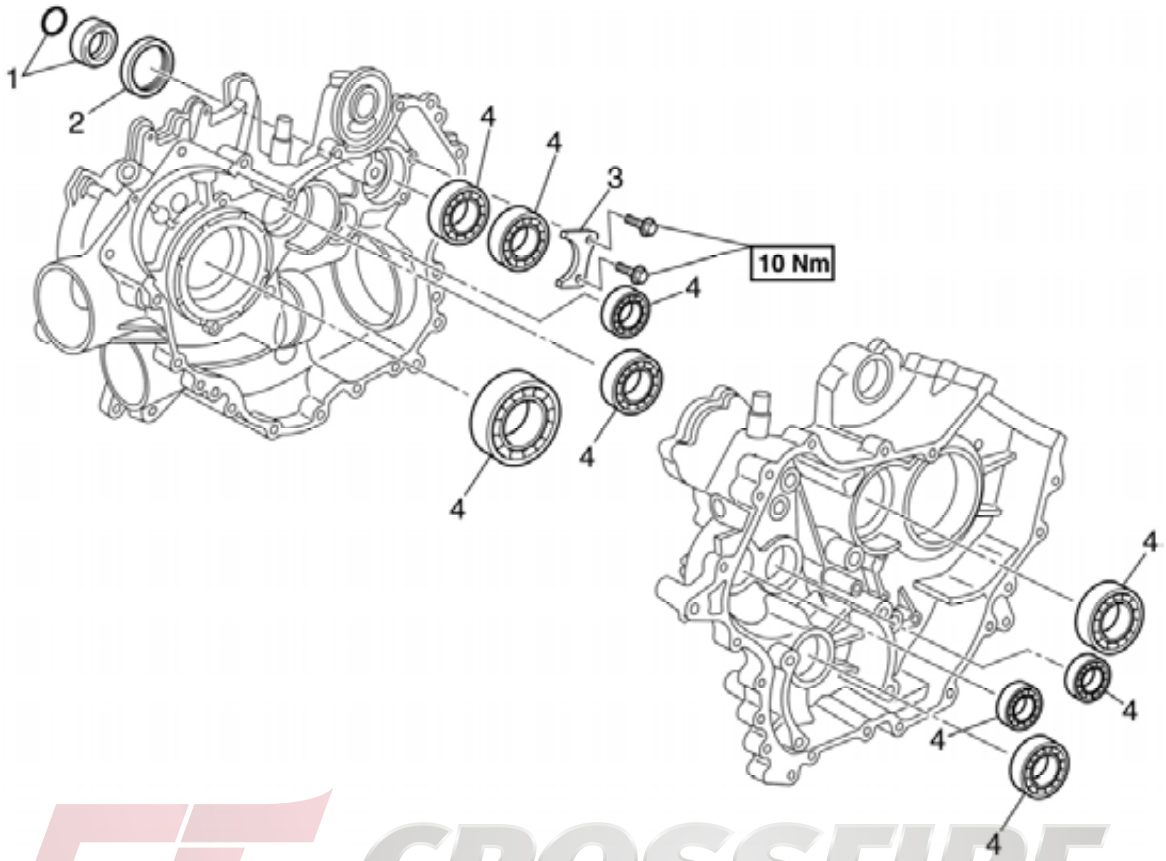
No.	Part Name	Qty	Remarks
9	Reverse switch	1	
10	Oil filler cap	1	
11	Oil delivery pipe 1	1	
			For installation, reverse the removal procedure.

Crankcase

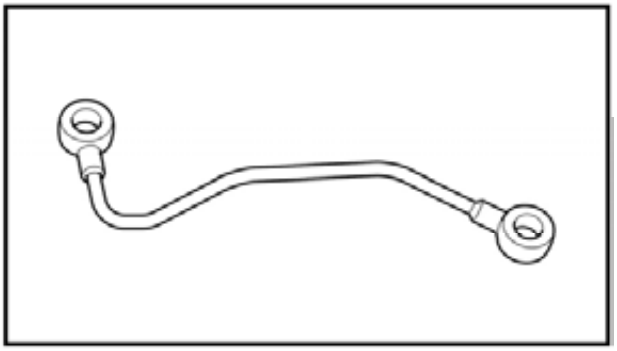


No.	Part Name	Qty	Remarks
	Separating the crankcase		Remove the parts in the order listed.
1	Shift lever cover/gasket	1/1	
2	Dowel pin	1	
3	Shift lever 1	1	
4	Shift lever 2 assembly	1	
5	Right crankcase	1	
6	Dowel pin	1	
7	Left crankcase	1	
8	Spacer	1	
9	Crankshaft seal	1	
			For installation, reverse the removal procedure.

Crankcase bearings



No.	Part Name	Qty	Remarks
	Removing the crankcase bearings		Remove the parts in the order listed.
	Crankshaft and oil pump		
	Transmission		
	Middle drive/driven shaft		
1	O-ring/collar	1/1	
2	Oil seal	1	
3	Bearing retainer	1	
4	Bearing	9	
			For installation, reverse the removal procedure.



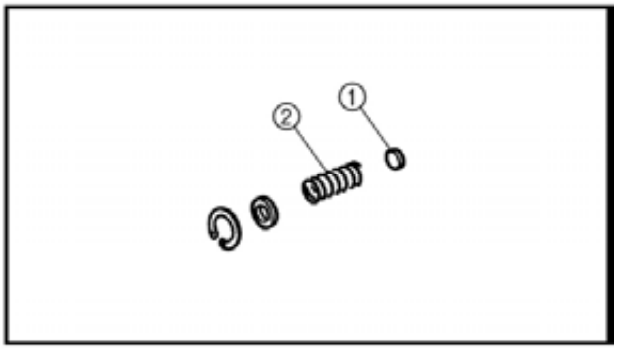
1、CHECK

1). Checking the oil delivery pipe

• oil delivery pipe

Cracks/damage → Replace.

Clogged → Blow out with compressed air.



2). Checking the relief valve

• relief valve ①

• spring ②

Damage/wear → Replace the defective part(s).

3). Checking the crankcase

(1) Thoroughly wash the case halves in a mild solvent.

(2) Clean all the gasket mating surfaces and crankcase mating surfaces thoroughly

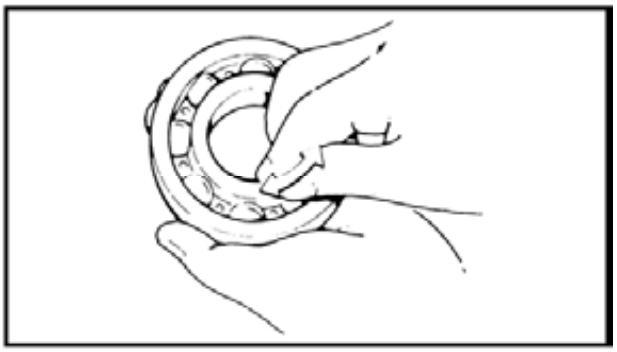
(3) heck:

• crankcase

Cracks/damage → Replace.

• oil delivery passages

Clogged → Blow out with compressed air.



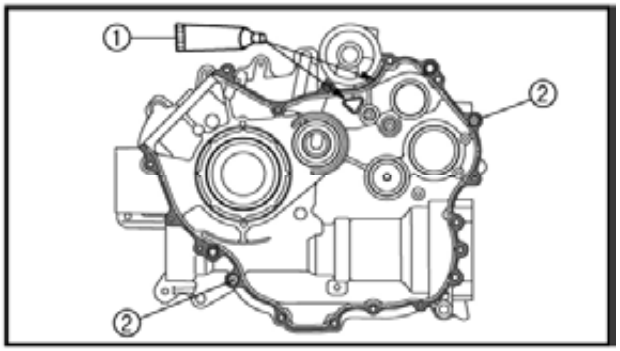
4). Checking the bearings

(1) Check:

• bearings

Clean and lubricate, then rotate the inner race with a finger.

Roughness → Replace



2、INSTALL

1). Assembling the crankcase

(1) Apply:

• sealant (Quick Gasket) ①
(to the mating surfaces of both case halves)

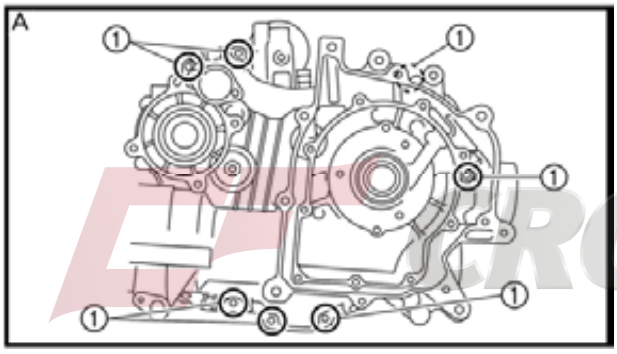
(2) Install:

• dowel pins ②

(3) Fit the left crankcase onto the right case. Tap lightly on the case with a soft hammer

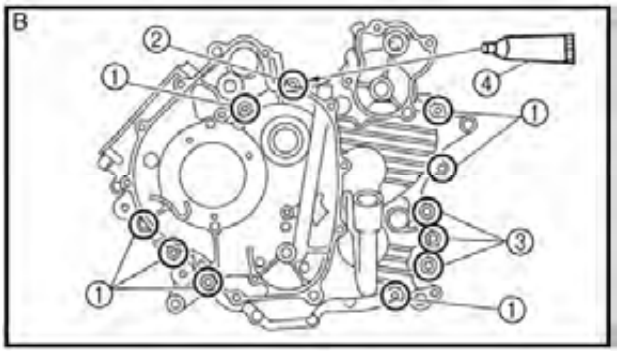
CAUTION:

Before installing and torque the crankcase holding bolts, be sure to check whether the transmission is functioning properly by manually rotating the shift drum in both directions.



(4)Tighten:

• crankcase bolts ①, ② (10Nm)
(follow the proper tightening sequence)
• crankcase bolts ③ (26Nm)
(follow the proper tightening sequence)
A Left crankcase



B Right crankcase

NOTE:

- **Tighten the bolts in stages, using a crises cross pattern.**
- **Apply sealant (Quick Gasket) ④ to the thread of the bolt ② shown in the illustration**

(5) Apply:

• 4-stroke engine oil
(to the crank pin, bearing and oil delivery hole)