SERVICE MANUAL

ATV-500S

2002/24

JAN 31, 2010 Ver. 1.1

High Power Engine

HER CHEE INDUSTRIAL CO., LTD.

Foreword

This service manual contains information on servicing ATV-500S

This manual is written for use as a guideline only. It is recommended that any mechanic, with or without sufficient experience, thoroughly read through the manual and only attempt to service those areas that are fully understood in accordance with the guidelines provided by this manual. For fully qualified mechanics, this manual supplies service data necessary for repairs and maintenance. It is highly recommended that a qualified mechanic, regardless of technical level, should study the service manual in full before attempting service on ATV-500S

All the data and diagrams provided in this service manual are valid at the time of publication. Information may be updated without notice due to improvements or upgrades.

CONTENTS

General Information & Lubrication

General Information ---------- F-
Information for Preparation ---------- F-
Check & Adjust ---------- F-

Chapter 1 Engine

Engine Removal & Installation ---------- I-
Cylinder Head & Valve ---------- I-
Cylinder & Piston ---------- I-
Crankcase & Crankshaft ---------- I-
Transmission & Gear ---------- I-
Lubrication ---------- ---------- I-

Chapter 2 Fuel System & Carburetion

Carburetor ---------- II-
Fuel Tank ---------- II-
Air Cleaner ---------- II-
Exhaust System ---------- II-

Chapter 3 Frame & Cover

Frame & Cover ---------- III-

Chapter 4 Wheels, Tyres & Brakes

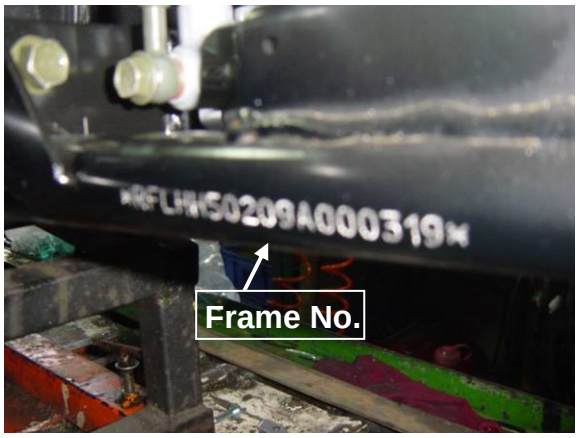
Handlebar & Steering ---------- IV-
Front & Rear Wheel ---------- IV-
Suspension System ---------- IV-
Hydraulic Brake System ---------- IV-

Chapter 5 Electrical Equipment

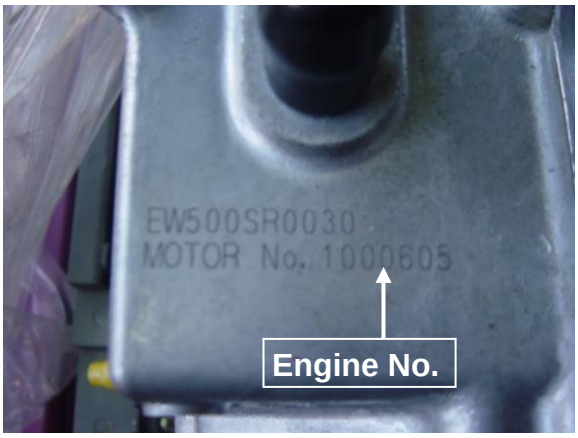
Electrical Device ---------- V-
Wire Diagram ---------- V-

General Information

MODEL IDENTIFICATION

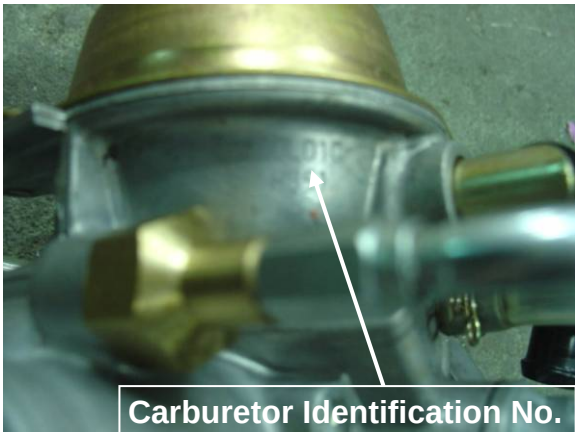


The frame serial number is stamped on the lower front right side of frame.



The engine serial number is stamped on the upper rear right crankcase.

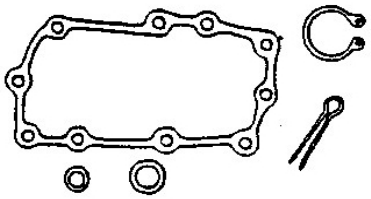
The VIN (Vehicle Identification Number) is attached to the lower front right side of frame behind the frame number.



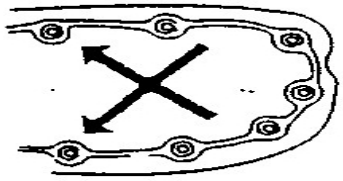
The carburetor identification number is stamped on the right side of the carburetor.

Information for Preparation
ATTENTION ON OPERATION

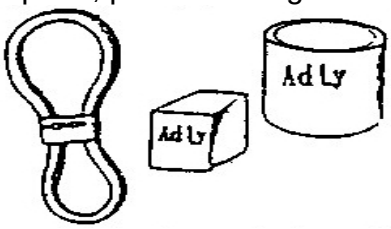
- All washers, oil rings, clamp rings, opening pins shall be duly replaced by a new item when dismounted.



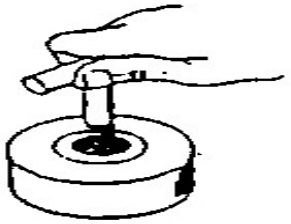
- Locking of all screws, nuts, cross screws shall be performed in the order of first the large screws and then the small ones and from inside to outside in opposite angles by tightening the torque locks.



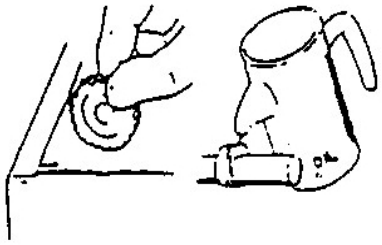
- All items must use original parts, pure oil and greases.



- All service shall use special tools and general tools to repair.

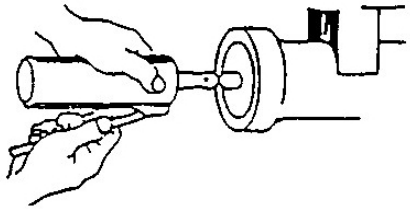


- All dismounted items requiring for checks shall be duly cleaned and for assembly, all items shall be duly lubricated.

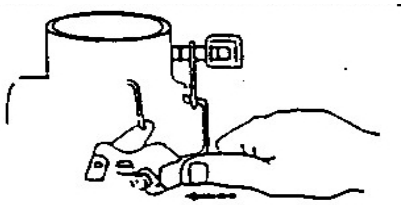


Information for Preparation
ATTENTION ON OPERATION

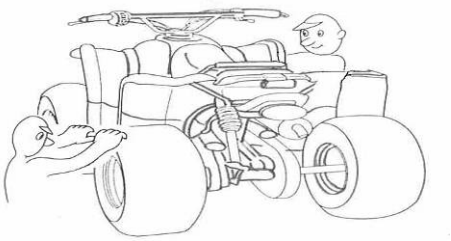
- Certified lubricants in cans shall be used on all the elements to be lubricated.



- After assembly, performance of all elements shall be duly checked and the locking shall be duly verified.



- In case of an operation is performed by over 2 people, the assignment shall be conducted in coordination and safety shall be the first priority.



- Definition of signs:
  The sign given in the Service Manual shall refer to the operation methods and observation.

OIL: Lubrication by designated lubricant.

GREASE: Lubrication by grease

Special Tool: Parts on which special tools shall be used

General Tool: General tools shall be used

New: Replace by new items after dismounting

Attention

Information for Preparation

SPECIFICATION

TYPE	**ATV-500S**
LENGTH	1900 mm
WIDTH	1270 mm
HEIGHT	1140 mm
SEAT HEIGHT	830 mm
WHEEL BASE	1310 mm
NET WEIGHT	236 kg
ENGINE TYPE	4-STROKE, Single Cylinder
COOLING	LIQUID COOLED
DISPLACEMENT	499 c.c.
BORE×STROKE	Ø 99.2 × 64.6 mm
TRANSMISSION	Manuel , 5 speed First gear 0.052 Second gear 0.079 Third gear 0.099 Forth gear 0.117 Fifth gear 0.139 Reverse gear 0.061
CLUTCH TYPE	Wet, Multi-disc
ENGINE OIL (CHANGE)	10W/40 (Standard), 2.5 Lit
ENGINE IDLE SPEED	1400±100 rpm
VALVE CLEARANCE (IN)	0.15 ± 0.05 mm
VALVE CLEARANCE (EX)	0.27 ± 0.05 mm
STARTING	Electric starter
SPARK PLUG	NGK DCPR8E
SPARK PLUS GAP	0.6~0.7 mm
IGNITION	C.D.I
SUSPENSION	Front：Dual A-arm Rear：Swing arm Both with adjustable damping and oil/gas reservoir.
BRAKE	Front : Double Disc , Rear: Disc
BATTERY	9 A/h, Maintenances Free
FINAL DRIVE	Chain
FRONT TIRE	21×7-10 (Optional 22×8-10)
REAR TIRE	20×11-9 (Optional 20×10-9)
FRONT BUMPER (LOAD)	N/A
REAR BUMPER (LOAD)	N/A

Information for Preparation

LOCKING TORQUE

The standard locking torque shall apply in case of no specification.

STANDARD TORQUE：

Type	Torque (kg-m)	Type	Torque (kg-m)
5mm Bolt, Nut	0.5	5 mm Screw	0.4
6mm Bolt, Nut	1.0	6 mm Screw	0.9
8mm Bolt, Nut	2.2	6 mm Flange Bolt, Nut	1.2
10mm Bolt, Nut	3.5	7 mm Flange Bolt, Nut	2.1
12mm Bolt, Nut	5.5	8 mm Flange Bolt, Nut	2.7
18mm Bolt, Nut	15.0	10 mm Flange Bolt, Nut	4.0
18mm Lock Nut	11.0		

CHASSIS：

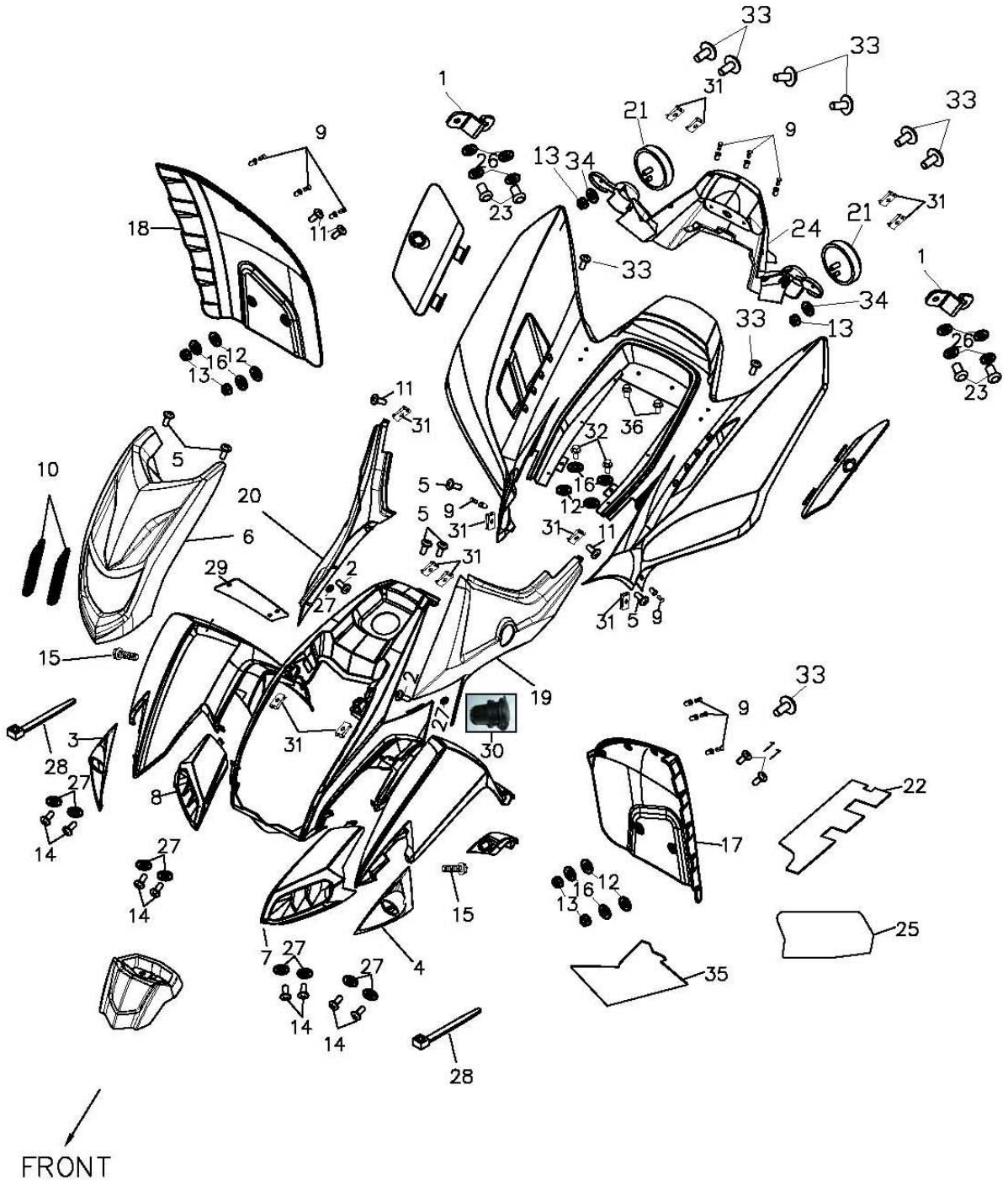
Locking Place	Qty	Dia. (mm)	Torque (kg-m)	Remark
Handle bar bottom flange nut	2	10	4.5	Nylon insert type
Steering shaft bottom nut	1	14	5.5	
Ball joint fixed nut	4	10	4.5	Nylon insert type
Engine mounting flange nut	2	8	2.5	
Engine mounting bracket bolt	5	10	4.0	
Foot rest flange bolt	6	8	4.0	
Rear swing arm fixed nut	1	15	12	Spring lock nut
Rear brake panel flange bolt	4	12	7	
Front suspension fixed nut	4	10	4.0	Nylon insert type
Rear suspension lower nut	1	10	5.5	
Rear suspension upper nut	1	12	10	
Wheel nut	16	10	6	
Wheel Hub nut	2	18	15	

ENGINE：

Refer to Chapter 01 Engine for specified torque.

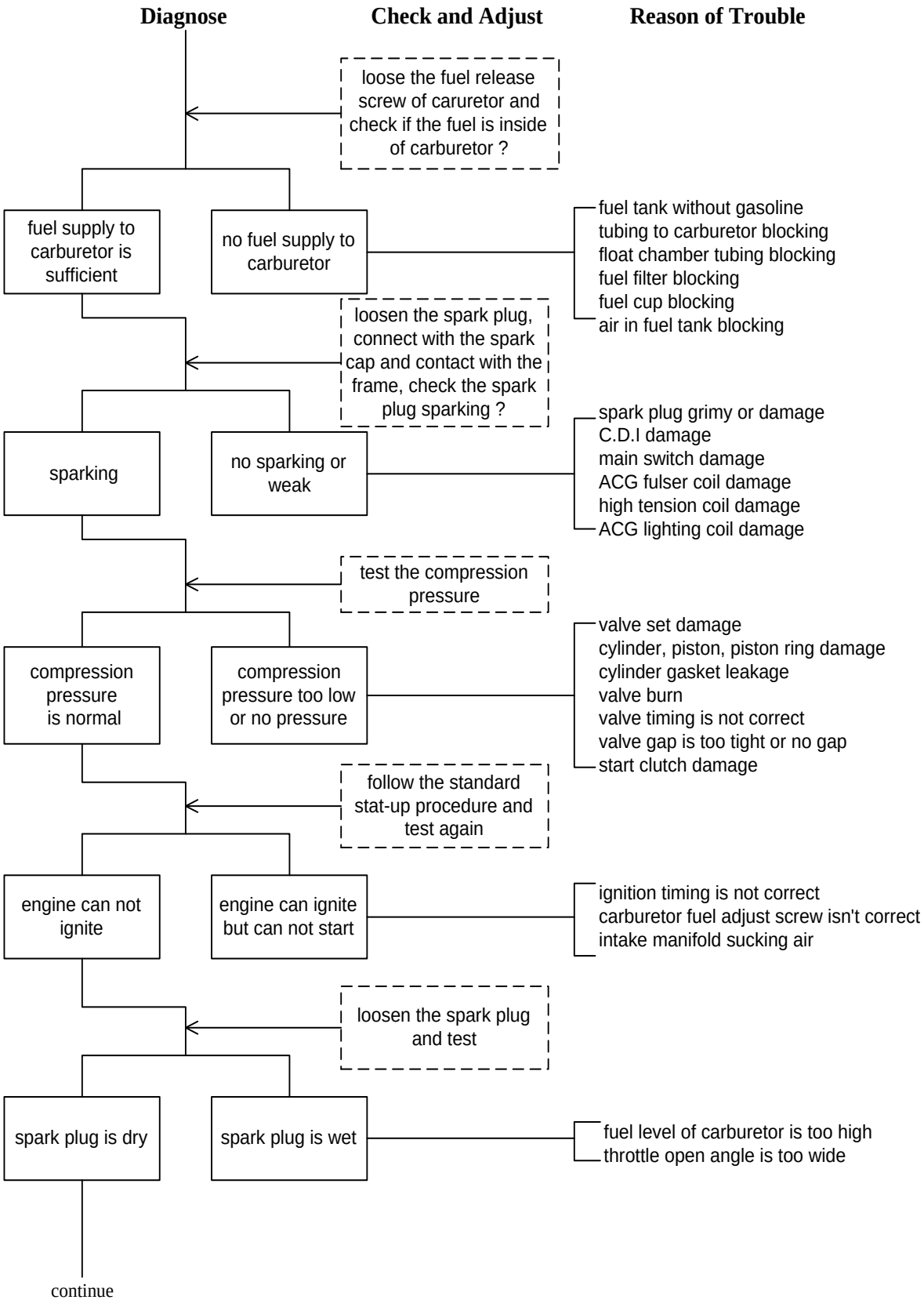
Information for Preparation

The following drawing that shows the disassembling situation of the cover parts for ATV-500S



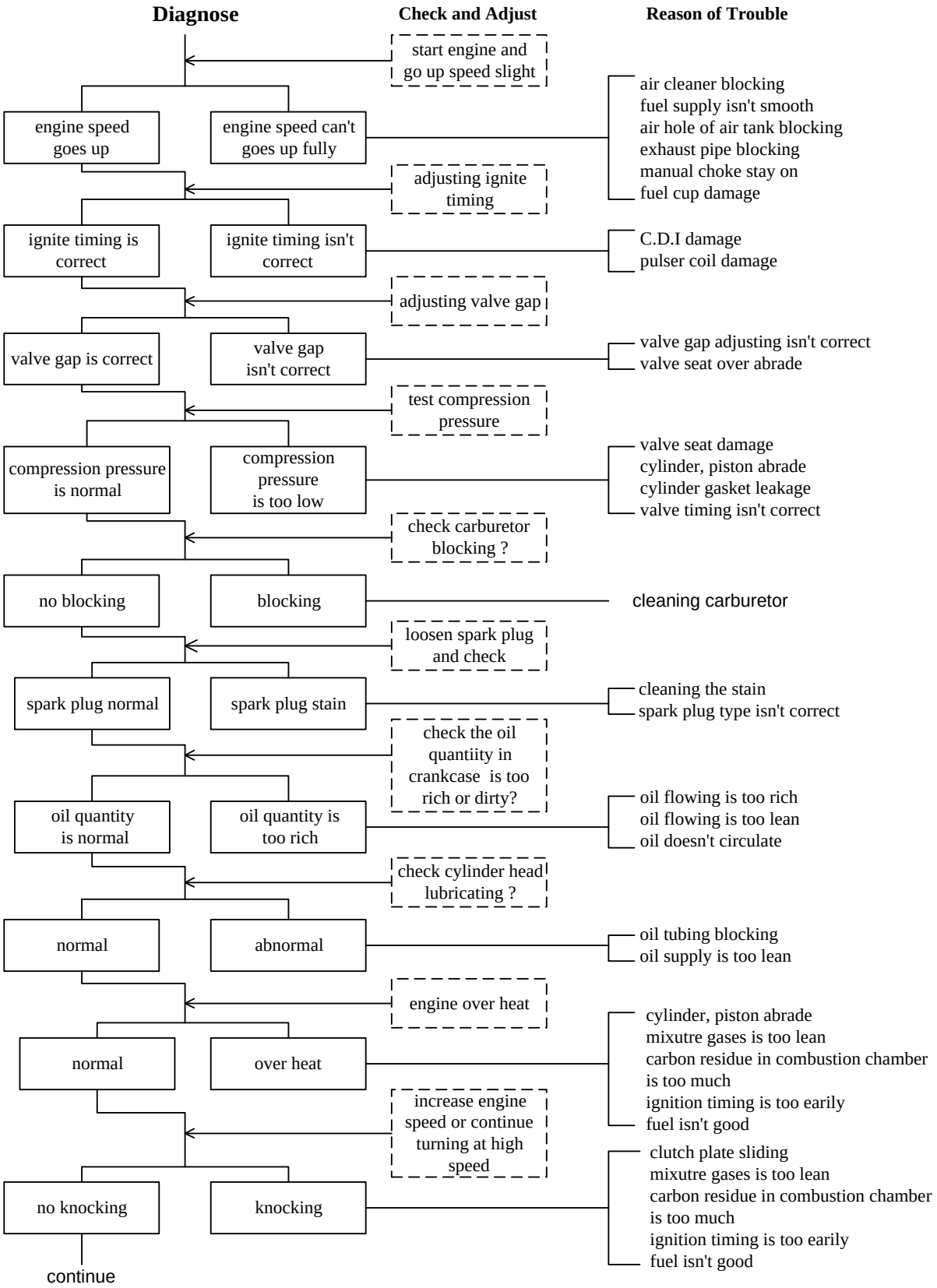
INFORMATION FOR PERPARATION

DIFFICULT START OR CANN'T START



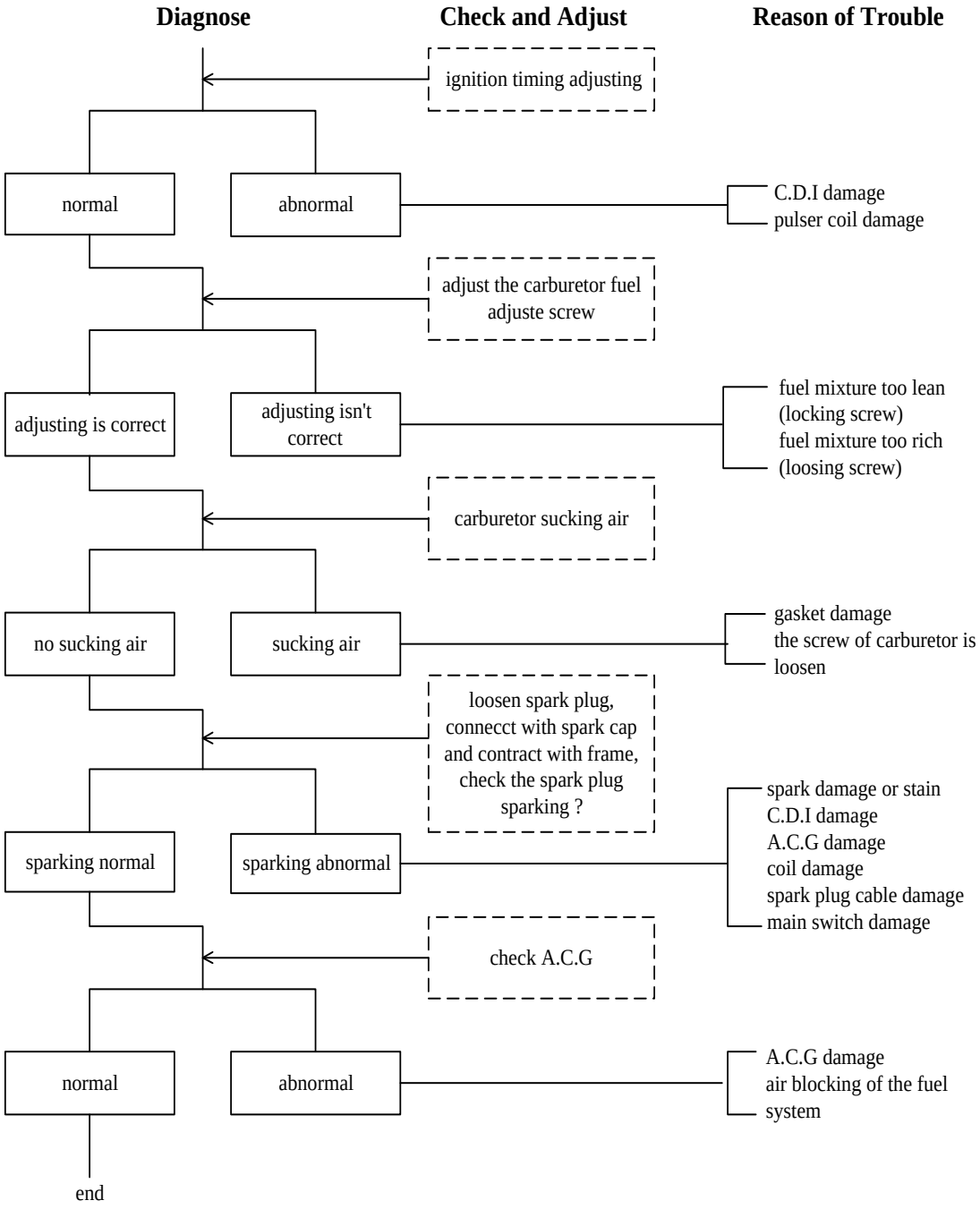
INFORMATION FOR PREPARATION

REVOLUTION NOT SMOOTH , LOST POWER

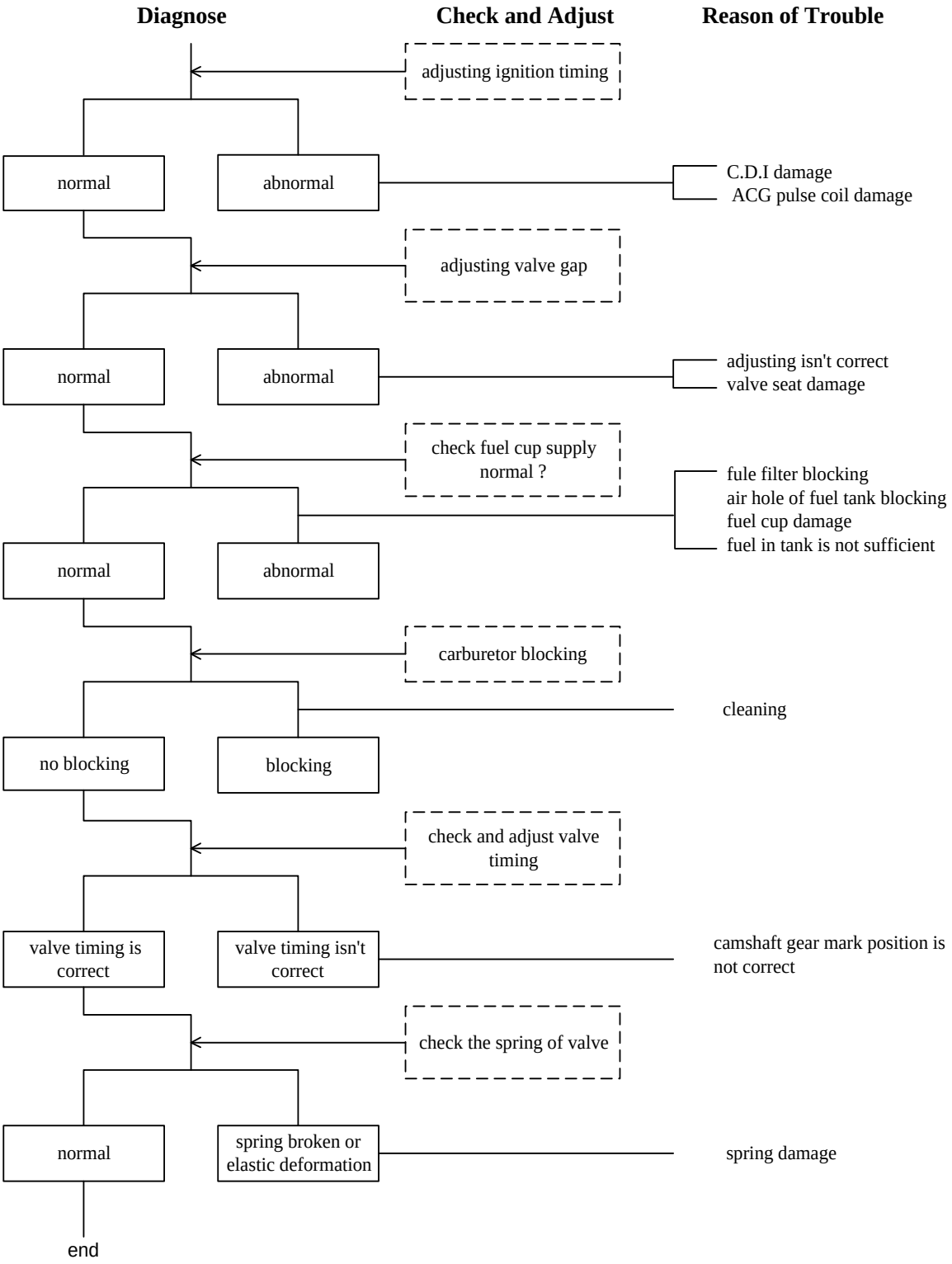


INFORMATION FOR PREPARATION

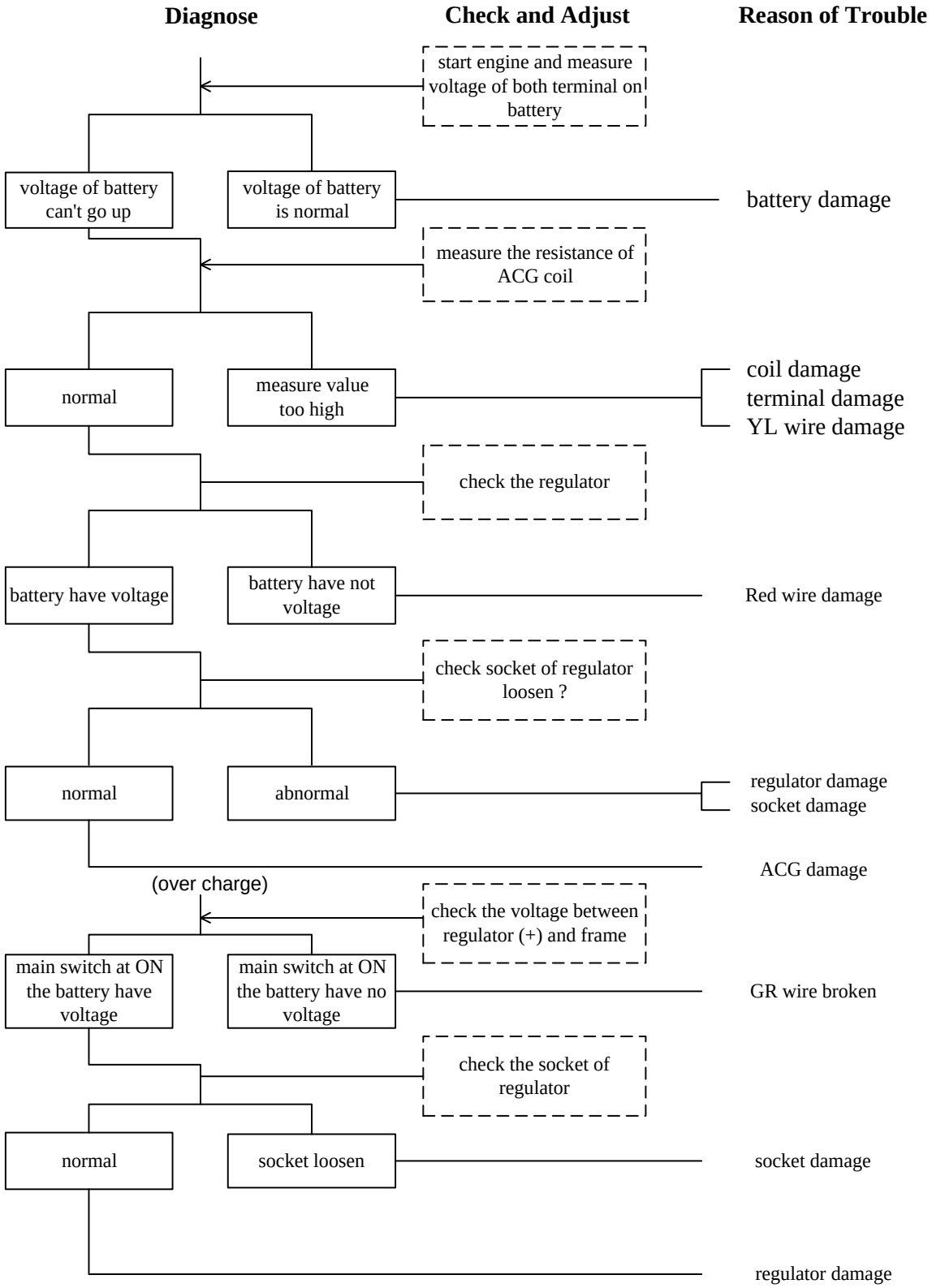
REVOLUTION NOT STABLE (LOW R.P.M.)



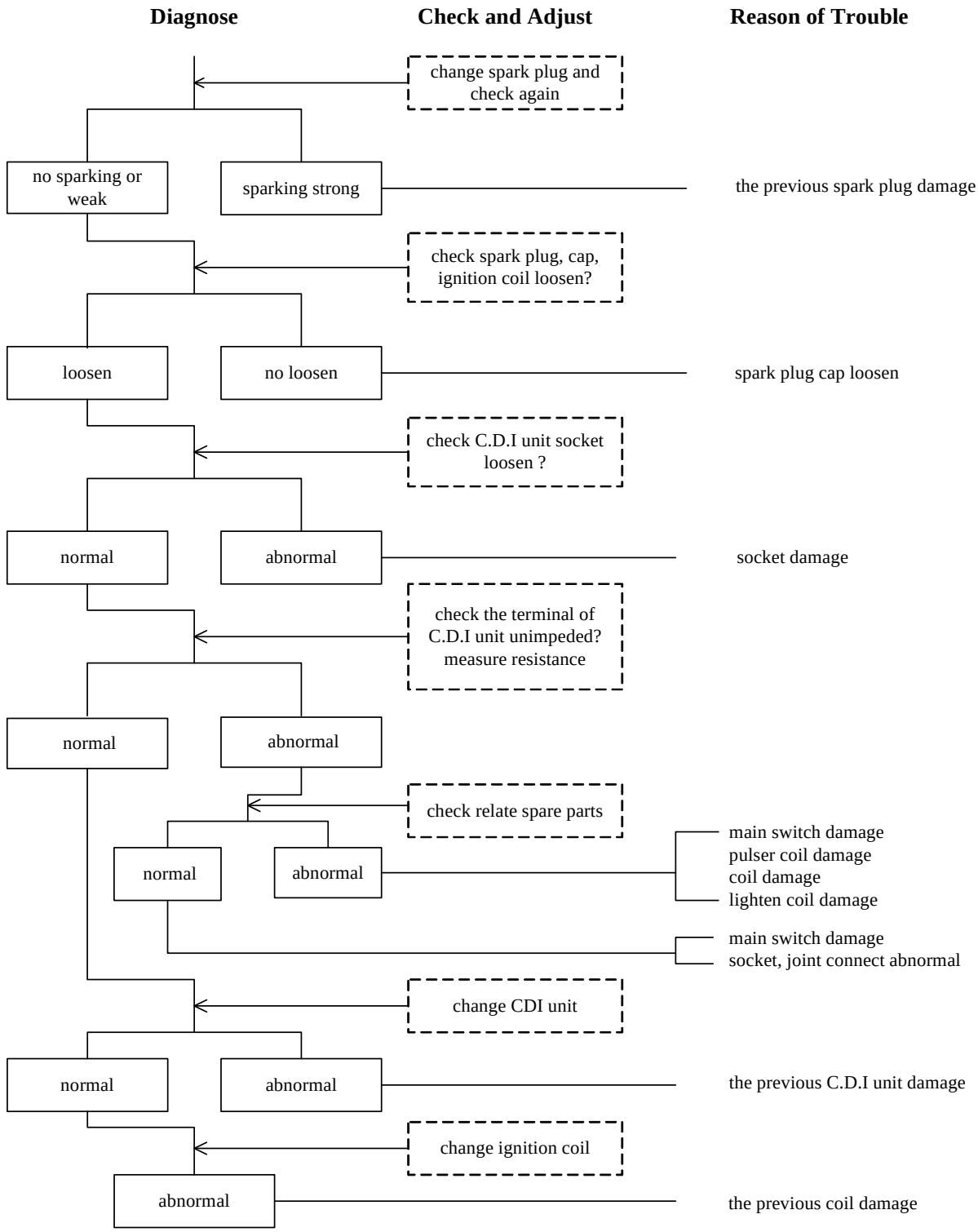
INFORMATION FOR PREPARATION
REVOLUTION NOT SMOOTH(HIGH SPEED)



INFORMATION FOR PREPARATION
CHARGE ABNORMAL



INFORMATION FOR PREPARATION
SPARK PLUG NO SPARKING



CHECK AND ADJUST

INFORMATION

WARNNING
Do not start the engine at a close zone, because the exhaust gases from the engine including some noxious emission such as CO, HC, NOx... etc. that can result serious damage for health.
Strictly prohibit using any flammable thing in the working zone, because that can rise fire easily.

ENGINE：

ITEM	SPECIFICATION	REMARK
Spark Plug Gap	0.6~0.7 mm	
Spark Plug Type	DR8EA	with resistance
Valve Clearance	0.15±0.05mm	intake valve
	0.27±0.05mm	exhaust valve
Idle Speed	1400±100 rpm	
Engine oil type	SAE 10W/40	Synthetic
Engine Oil Capability	2.5 L	At oil change
	2.9 L	After engine overhaul
Compression Pressure	13 kg/cm^2	1400 rpm
Ignite Timing	17° BTDC	1400±100 rpm

CHASSIS：

ITEM	SPECIFICATION	REMARK
Parking brake lever free play	10~20 mm	
Left lever free play	5~10 mm	
Throttle free play	2~6 mm	
Front Tire Pressure	10 psi	Check the mark on tire
Rear Tire Pressure	10 psi	Check the mark on tire
Torque of Front Rim Nut	14 kg-m	
Torque of Rear Rim Nut	14 kg-m	

Detailed tire pressure specification please check the marking on tires.

CHECK AND ADJUST

MAINTENANCE SCHEDULE

Please follow the maintenance schedule to do the routine maintenance.

Service Interval

Item \ Frequency	Regular Service Mileage (KM)						
	200	1000	2000	3000	4000	5000	6000
Engine Oil	**R**	**R**	**R**	**R**	**R**	**R**	**R**
Oil Filter	**R**		**R**		**R**		**R**
Spark Plug							**I**
Air Filter	**CLEAN AND CHECK EACH 1000KM OR AFTER OFF-ROAD USE**						
Carburetor	**I**		**I**		**I**		**C,I**
Driver Chain	**CHECK AND LUBRICATION EVERY RIDE**						
Suspension	**I**	**I**	**I**	**I**	**I**	**I**	**I**
Brake System	**CHECK EVERY RIDE**						
Tires Pressure	**CHECK EVERY RIDE**						
Tire Wear		**I**	**I**	**I**	**I**	**I**	**I**
Steering	**I**	**I**	**I**	**I**	**I**	**I**	**I**
Chassis Nuts，Bolts	**I**			**I**			**I**
Battery	**I**		**I**		**I**		**I**
Coolant		**I**	**I**	**I**	**I**	**I**	**R**
Parking Brake	**A**	**A**	**A**	**A**	**A**	**A**	**A**
Nerfbars	**CHECK EVERY RIDE**						

C: Clean; **A**: Adjust; **R**: Replace; **C**: Clean; **I**: Inspect, Adjust, Verify, Lubricate.

Note：

(1) If the ATV is new then the motor oil have to replace at the first initial service.

(2) For safety reason, we suggest the maintenance should be done at local service center.

(3) If the driving condition is very abominable such as rainy, dust zone or heavy load...that we suggest operating maintenance more frequency.

CHECK AND ADJUST

THROTTLE LEVER

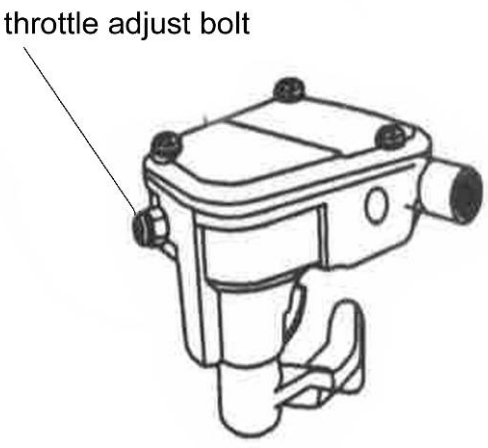
The main adjusting nut for throttle play is located under the handle bar

Loose the fixed nut and adjust the play nut to proper position.

The throttle lever control bolt is located the throttle base.

Loose the fixed nut and adjust the screw to get proper position.

The throttle lever free play：2~6 mm

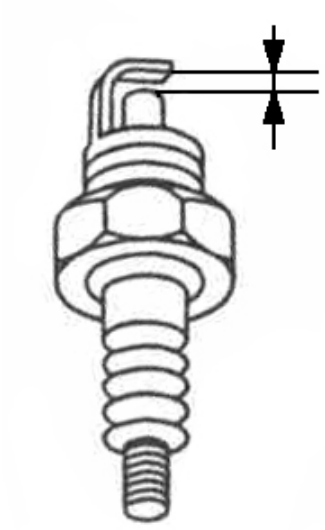


SPARK PLUG

Pull to remove the spark plug cap.

Use tools come with the vehicle to remove the spark plug.

If the spark plug grimy or with carbon residue then using the copper brush to clean it.



Spark plug specification

Type: NGK DCPR8E

Resistance: 5KΩ

Check the gap of spark plug

Gap：0.6~0.7 mm

CHECK AND ADJUST

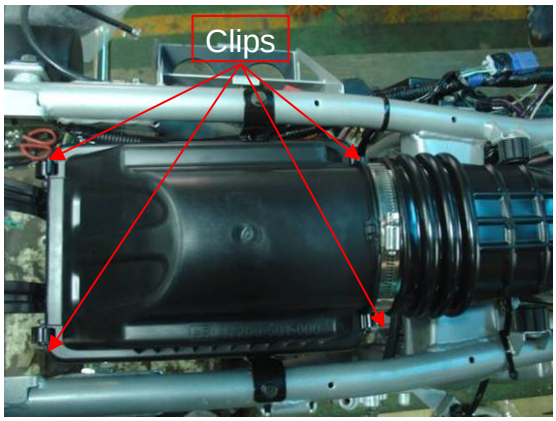
AIR CLEANER

Remove the seat.

Pull to open 4 clips on air cleaner cover and remove the cover.

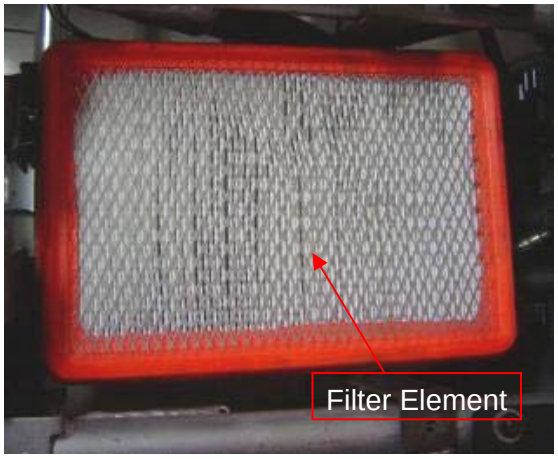
Take-out the air filter element

Check the filter whether is dirty or damaged. If it‘s dirty or damaged then clean it or change a new one.



Attention：

Clean the element and frame in a high flash point solvent，squeeze the solvent out ofthe foam and let the guide and element dry completely.



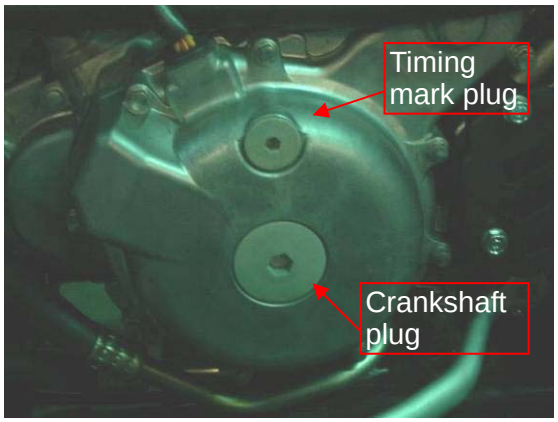
Check period：

If the ATV often driving at the rainy or abominable surroundings, please check the filter more frequently.

VALVE CLEARANCE CHECK

Attention：

This engine using special shim to setting valves clearance. It's unnecessary to check or adjust the valves clearance. However, if necessary, this procession needs to execute by skilled machinist.



Remove the timing hole plug and the crankshaft hole plug with hex socket driver.

Rotate the flywheel and keep the "I” mark aim at the centerline of the inspection hole.

Measure valve clearance with a feeler gauge of the specified thickness.

CHECK AND ADJUST

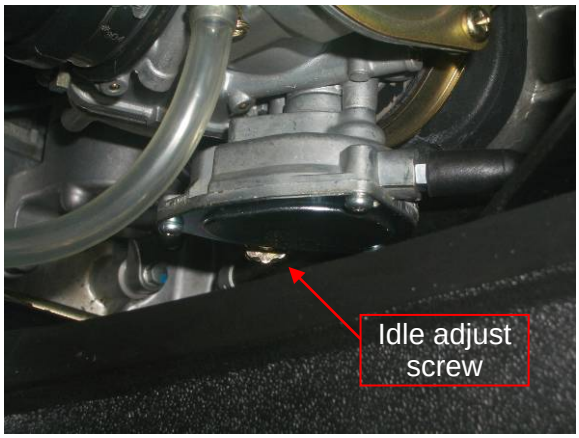
ADJUSTING IDLE SPEED

Engine idle speed adjustment has to do it when the engine is warm.

Remove seat, connect with the rpm meter then starting the engine.

Before adjusting the idle speed, make sure the spark plug gap is correct.

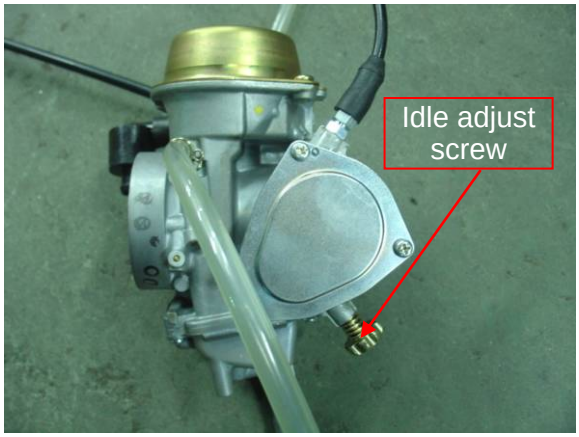
Also, turn the handlebars from left to right and note whether the idle speed changes. If it does, the throttle cable may be incorrectly routed. Be sure to correct this problem before proceeding.



Warning：
Use screw driver to adjust the idle speed to avoid injury.

Adjust the idle speed adjust screw reach to the normal idle speed.

The idle speed: 1400±100 rpm.



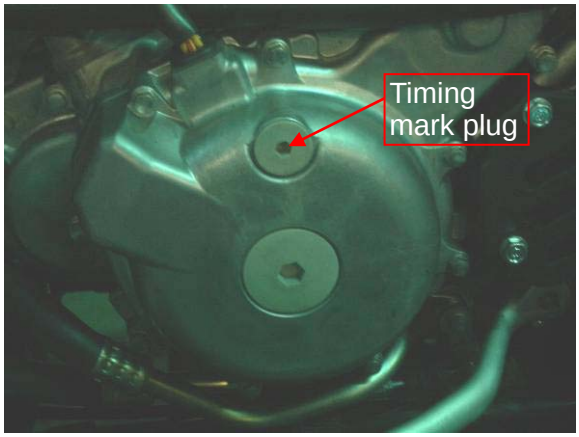
IGNITION TIMING

The ignition system of this ATV is controlled by C.D.I unit, thus don‘t need to adjust anything. If the ignition timing isn’t correct then checking the ignition system whether normally.

Remove the timing mark plug. Using the timing light to check the ignition timing.

When the engine speed running at idle, the “I” mark of flywheel should aim at the inspection hole.

Keep the engine speed about 4000 rpm, if 2 mark-lines on flywheel aim at center of inspection hole then the ignition timing is correct.



CHECK AND ADJUST

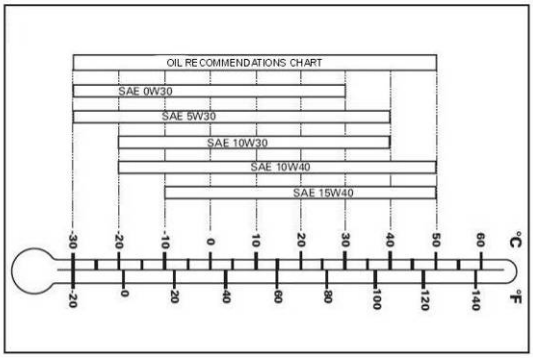
ENGINE OIL

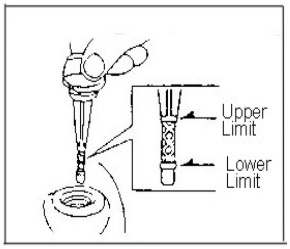
Oil Change

Remove oil drain plug and dipstick to draining engine oil.

Tighten oil drain plug and add **1.5L** engine oil to oil tank.

Start the engine about 30 second then stop. Add another **1.0L** oil to oil tank and tighten the oil dipstick.

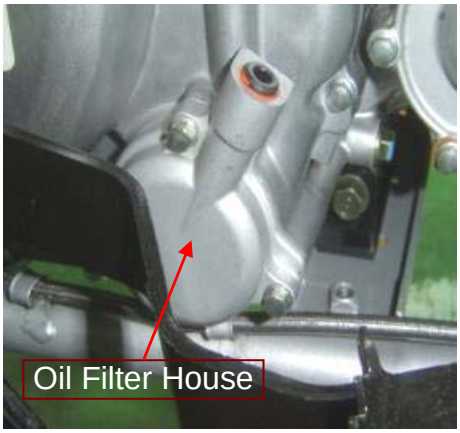




Replace Oil Filter

Oil filter house is located on right side of engine case.

Remove oil filter house for replacing filter.



CAUTIONS **：**

◎ Be sure to have sufficient oil, check oil dipstick every ridding and the tighten dipstick properly.

◎ Total oil capacity：**2.5** Liter

◎ Prescribed 4-stroke engine oil only, **JASO MA is strongly recommended**.

◎ Select the proper viscosity of oil.

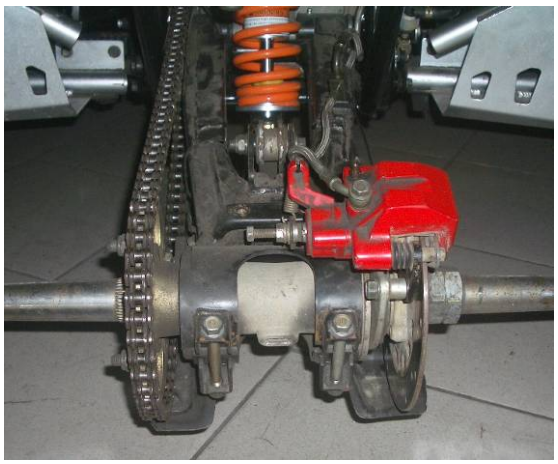
◎ It would damage or burn down the engine parts if oil is insufficient.

CHECK AND ADJUST

DRIVE CHAIN

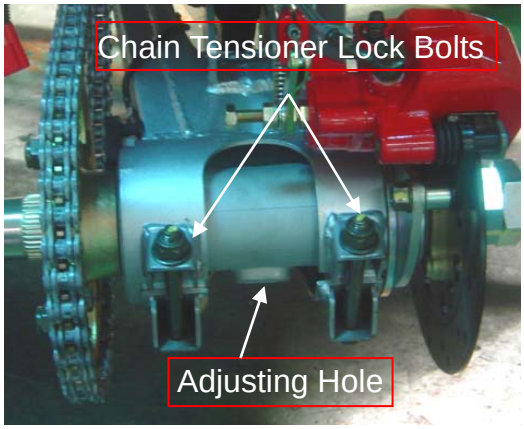
Check and Lubricate

Before operating the vehicle, always inspect the drive chain.
Check the free play of drive chain and adjust if necessary.
Never operate this vehicle with the drive chain too loose or too tight as severe damage to the drive components can occur.
Check for damage or missing O-ring or rollers.
Do not brush chain.
Lubricate only with an approved O-ring chain lubricant.

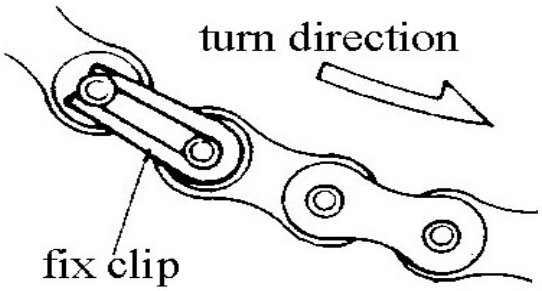


Adjustment

Loosen chain tensioner lock bolts for adjustment.
Insert a tool to adjustment hole and move up-down to change free play.
The deflection should be between 10 and 20 mm (3/8 and 3/4 in).
Tighten lock bolts after properly adjustment.



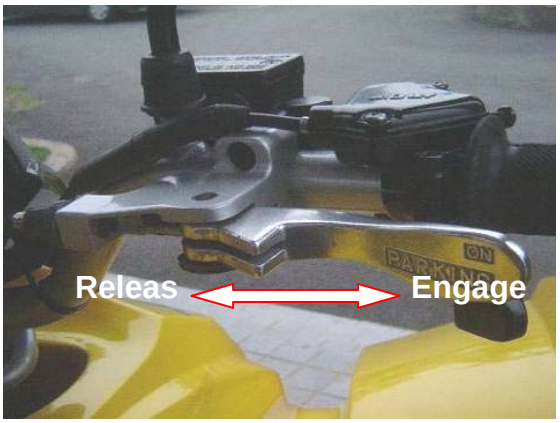
Inspect the front sprocket teeth for excessive wear; mark sure there's no play in the sprocket.
When install the chain clip, beware the clip direction.



BRAKE SYSTEM

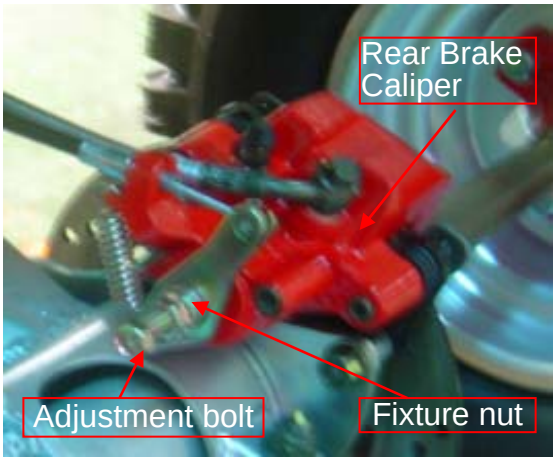
PARKING BRAKE

Parking brake was co-instructed with rear brake caliper but control by parking brake lever and wire separately.
Check parking before ride.
Adjust parking brake if your ATV slipping or can be easily moving even the brake lever was engaged.



ADJUSTMENT

Place the parking lever to **L** side.
Loosen the fixture nut and turn-in the adjustment bolt until you can feel it is slightly touched.
Turn-out the adjustment bolt half circle then hold it and tight the fixture nut.
Recheck the parking brake effectiveness.



CHECK AND ADJUST

STEERING

Turn the steering handlebar from right side to left side to check the steering operation.

Be sure the wiring and cable does not affect the steering handle.

CHECK AND ADJUST

FIXING OF NUTS AND BOLTS

Check the fixing nuts, bolts on all parts to see if the nuts, bolts loosen then tie-up with certain locking torque.

TIRE, RIM

Check the tires whether have any nail, broken…etc.

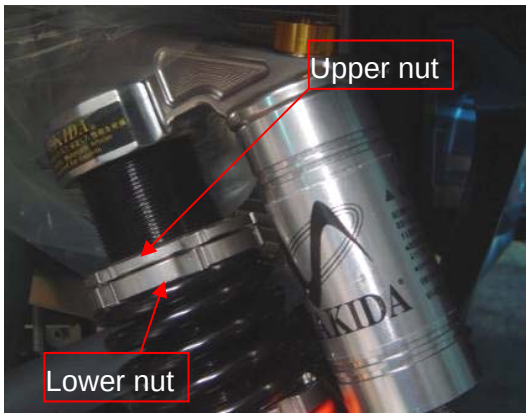
Check tire pressure with a gauge that will read accurately at the low pressure used in ATV tires.

The tire pressure can be very depends on different operation condition. Please check the mark on tire for operation pressure tolerance.

SUSPENSION

Front

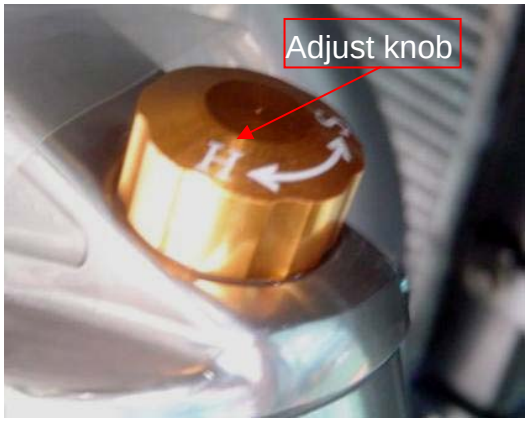
Hold the brake lever and push the handlebar. Check the fork movement and other parts if is loose or oil leaking.



Rear

Check the damping of rear suspension
Check the suspension bush function normally.

Inspect all suspension fasteners before riding.



SHOCKS ADJUSTMENT

Rebound

Loosen the upper nut on damping house by using the specify tool.
Adjust lower nut to increase or decrease spring preload.
Tighten the upper nut on damping house by using the specify tool.

Damping (Optional)

Turn the adjust knob on the top of separated oil/gas reservoir.
Turn the knob toward **S** to soften the damper.
Turn the knob toward **H** to harden the damper.

Chapter I Engine

PREPARATIONS AND PRECAUTIONS for Disassembly & Reassembly

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

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

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

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

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

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

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

- Reverse the order when retightening.

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

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

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

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

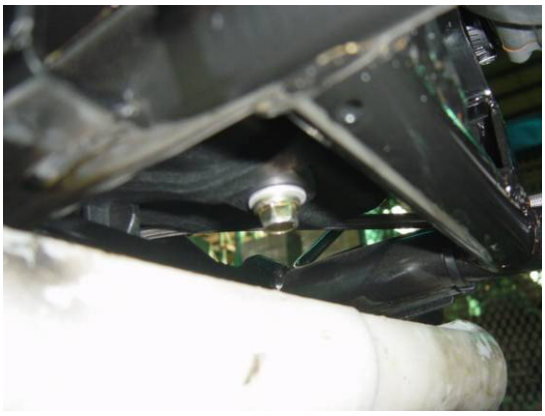
- Install oil seal with main lip faced towards oil chamber and with the brand marking or designation stamping faced outside. Be sure to install oil seal with grease applied to lip, and not to damage the lip with sharp edge or burrs.

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

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

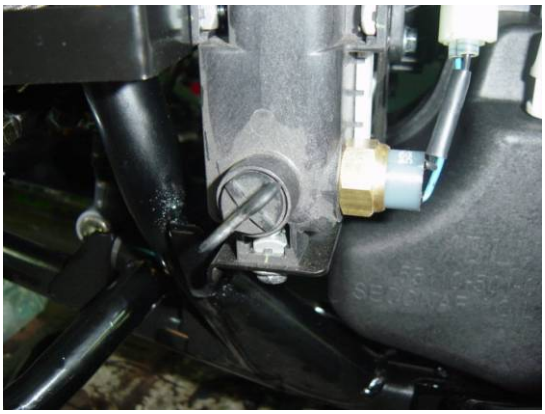
Chapter I Engine

ENGINE REMOVE AND INSTALLATION



ENGINE REMOVAL

- Drain the engine oil and coolant.
- Remove the seat and the left/right footpad assembly.
- Remove the body front fender assembly.
- Disconnect the negative battery cable.
- Disconnect the crankcase breather tube from cylinder head cover and on cylinder.



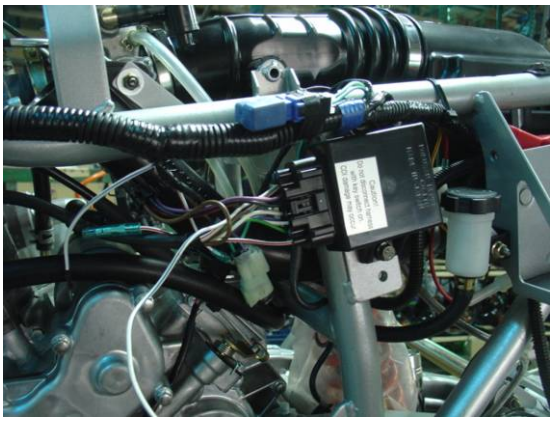
- Remove the air filter and carburetor.

Chapter I Engine

ENGINE REMOVAL

- Remove the exhaust system.
  Disconnect 2nd air intake tube
  Loosen exhaust pipe to head nuts
  Disconnect exhaust pipe front and rear joint clip.

- Label and disconnect the following wires:
  Spark plug wire
  Alternator (there-pin connector)
  Reverse and neutral switches
  Starter cable
- Disconnect the reverse cable.
- Disconnect the clutch cable from the lifter arm and detach the cable from the bracket.



- Remove the drive sprocket cover, remove the drive sprocket and pull the drive chain back so that it doesn't interfere with engine removal.

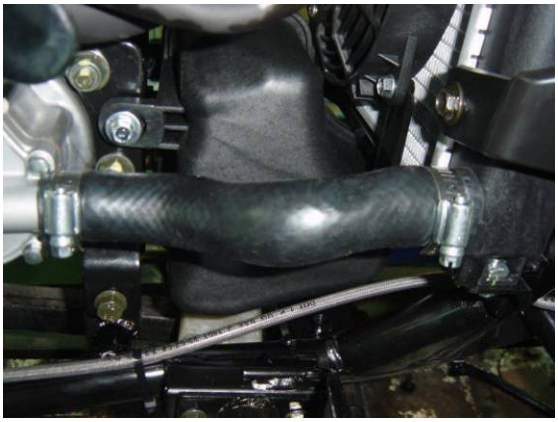
Chapter I Engine

ENGINE REMOVAL

- Disconnect oil pipes and remove oil tank

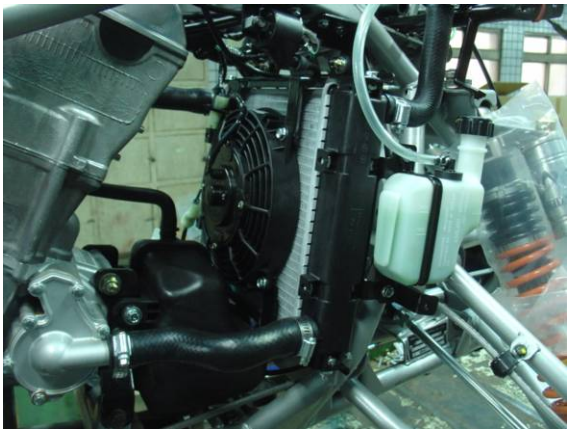
NOTE: Drain the oil from oil tank and engine before this operation.

- Disconnect radiator tubes and electric core.



NOTE: Drain the radiator coolant before this operation.

- Remove radiator from frame



- Remove the engine mounting bolts, nuts and brackets at the lower front and lower rear.

Chapter I Engine

ENGINE REMOVAL

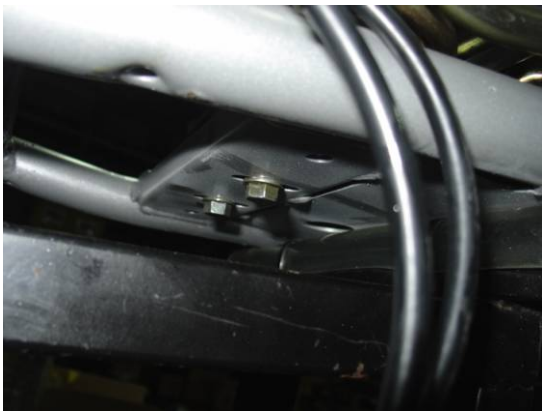
Locking Torque when assembly:

5 x M10 bolts and nuts	
T.T	45 ± 5 N-m

- Loose 2 bolts under the engine.

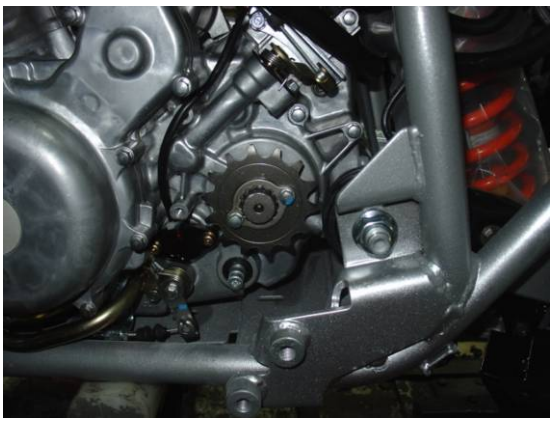
Locking Torque when assembly:

2 x M8 bolts	
T.T	25 ± 2 N-m



- Remove the break pedal from the right side.
- Loose the rear swing arm fixing nut then pull out the swing arm bolt.

M15 bolts and nuts	
T.T	120 ~ 130 N-m



- Have an assistant help you lift the engine and remove it from the left side.
- Slowly lower the engine to a suitable working area.

ENGINE INSTALLATION

Engine installation which are based on the reverse sequence as removal.

Note: Follow the assembly torque as specified during removal procedure.

Chapter I ENGINE

ENGINE REMOVE AND INSTALLATION

INSTALLATION

- Mounting the engine and tie-up fixed nuts with standard locking torque.
- Place a floor jack under the engine. Again, be sure to protect the engine from the jack head with a block of wood. Lift the engine to align the mounting bolt holes, then install the brackets, bolts and nuts.
- The remainder of installation is the reverse of the removal steps, with the following additions:
  a) Use new gaskets at all exhaust pipe connections.
  b) Adjust the clutch cable and the throttle cable.
  c) Fill the engine with oil. Run the engine and check for leaks.
- Finish mounting the engine; be sure to check the throttle cable tolerance.

Use reversed procedure to setup the parts that has been removed.

NOTE：

※ All cables and wiring has to be set into correct position

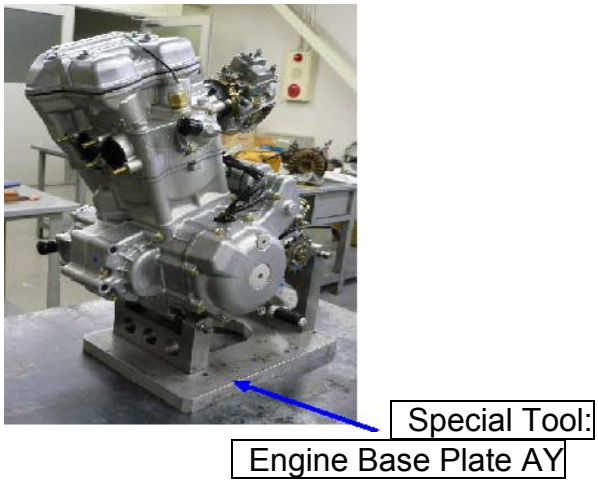
Chapter I ENGINE

1 Engine Disassembly

1-1 Set the engine assembly onto special tool: **Engine Base Plate AY.**

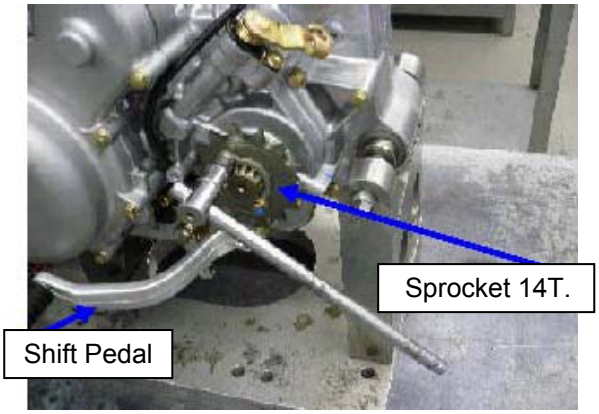
Take out Cover CP (Drive Chain) and Plate (Drive Chain).

Take out parts on the vehicle side.M6×25L bolts, 2 pcs.



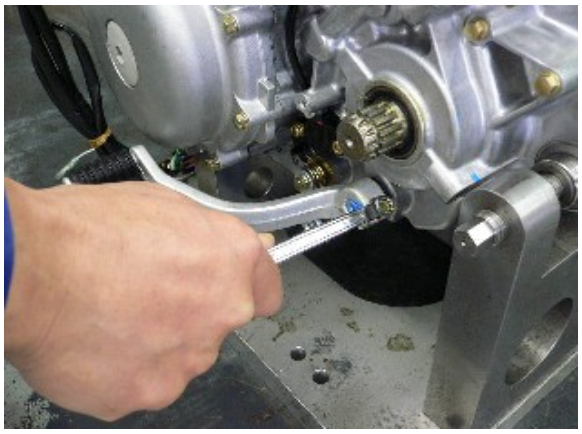
1-2 Operate shift pedal to engage the transmission gears.

Remove bolts and take out fixing plate, and then remove M6×12L bolts, 2 pieces. (T-wrench: 8mm),

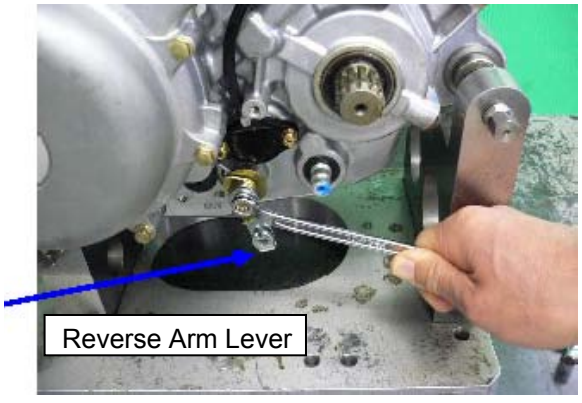


1-3 Remove shift pedal.

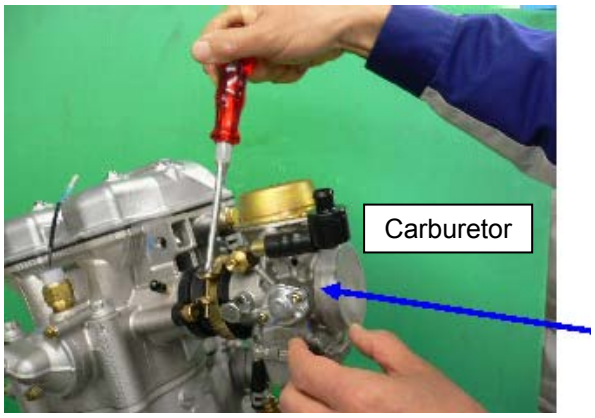
M6×25L bolt 1 piece.
(Box-end wrench: 8mm)



1-4 Remove Reverse Arm Lever (Reverse Lo)
M6×12L bolt 1 piece,
(T-wrench:8 mm)



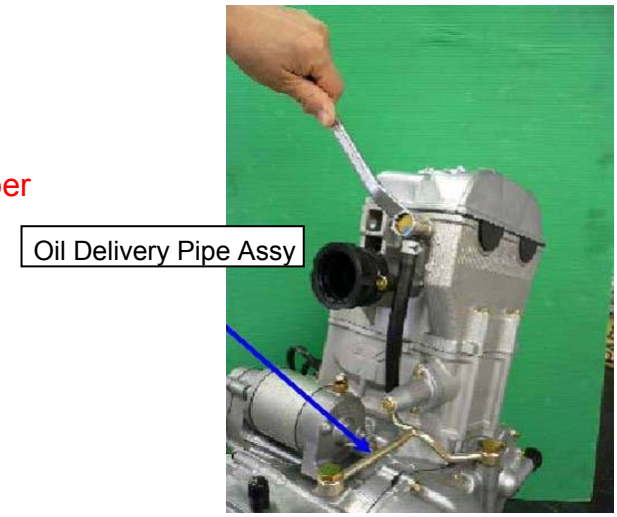
1-5 Remove carburetor.
M4×30L screw 1 piece. (Philips driver: medium size).



1-6 Take out Oil Delivery Pipe Assy.

Remove upper side banjo bolt (oil fitting) first. M12 banjo bolts3 pieces, (Box-end wrench:17 mm)

Note: Pay attention not to lost total 6 cupper washers



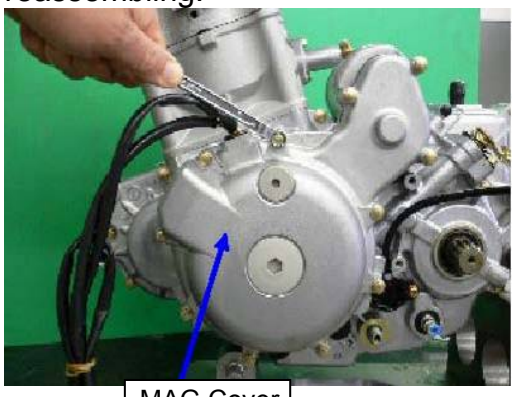
1-7 Remove MAG Cover CP.

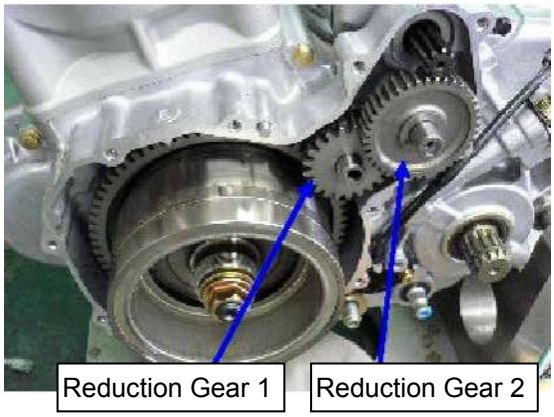
Note: Adopt tray or clothes (waste) to prevent oil pollution.

M6×35L 11 pieces.
(T-wrench:8 mm)

Remove Reduction Gear x 1, Shaft x1, Reduction Gear x 2, Shaft x 2.

Make sure their original positions for reassembling.





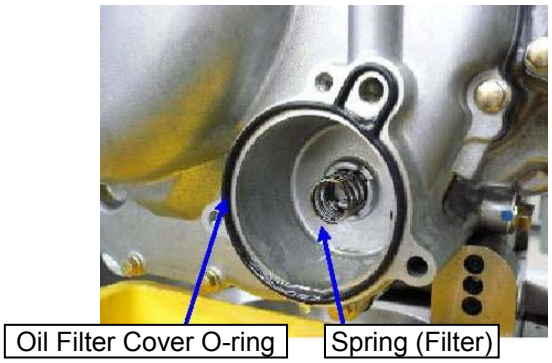
1-8 Remove Oil Filter Cover and take out Oil Filter CP.

M6×25L 2 pieces. (T-wrench : 8 mm),
M6×65L 1 piece. (T-wrench: 8 mm)
Remove Oil Filter CP, O-ring and Spring (Filter)

Note: Adopt tray or clothes (waste) to prevent oil pollution.

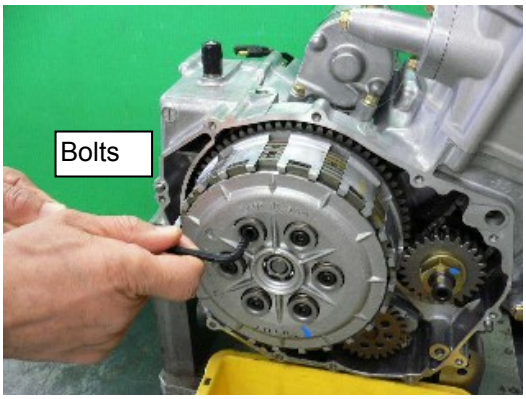
1-9 Remove Clutch Cover CP.
Remove clutch cover M6×25L 11 bolts. (T-wrench: 8 mm)

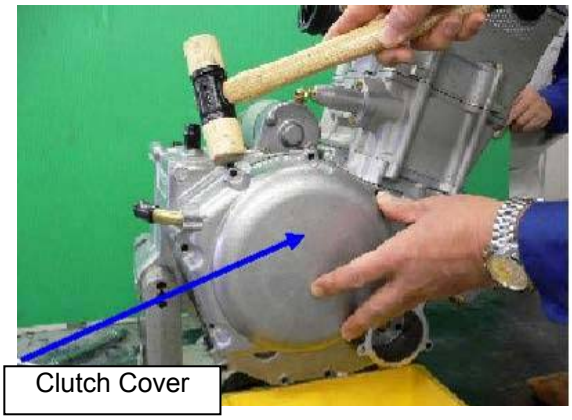
Note: Adopt tray or clothes (waste) to prevent oil pollution.

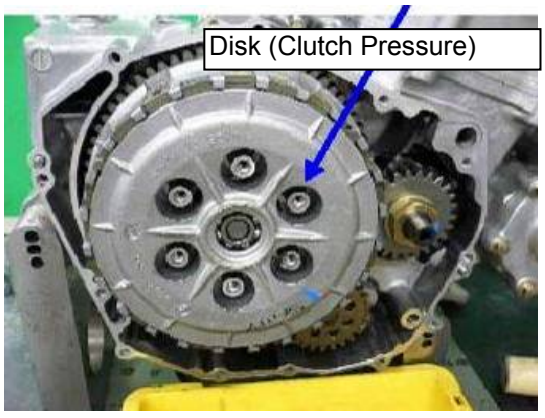


1-10 Remove Clutch.
Remove bolts and take out Spring and Washer.

M6×35L 6 pieces. (Allen wrench: 5 mm)
Take out Disk (Clutch Pressure).Take out Pusher.
Remove Push Rod by depressing Release Lever.
Take out Release lever

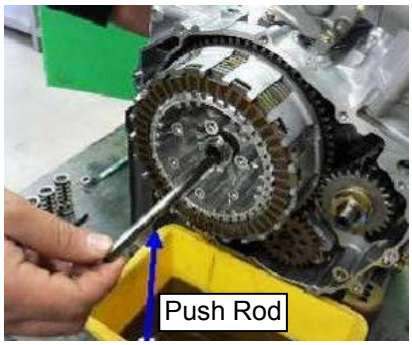







Pusher


Release Lever


Push Rod

Remove Lock Nut
Note: Lock Nut was caulked, so unlock the caulk by using drill.

Stopper for rotation, when removing M18 Lock Nut (Box wrench: 27 mm)
(Use air-assist tool)


Caulk of Lock Nut


Special Tool : Stopper

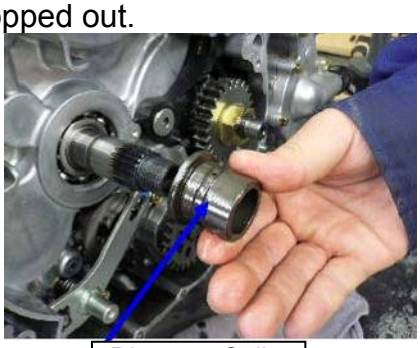

Wrench (Counter shaft)

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

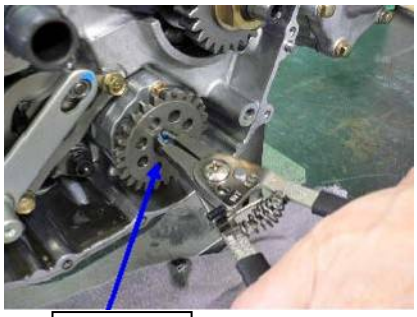
Thrust Washer

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


After Outer, Clutch removed


Distance Collar

1-11 Remove Oil Pump.
Take out Snap Ring and Oil Pump Gear.
Remove bolts and take out Oil Pump Case.
M6×30L 3 pieces. (T-wrench: 8 mm)
Take out Oil Pump; Feed Pump, Scavenging Pump, and Oil Pump Shaft etc.


Snap Ring


Oil Pump Gear


Oil Pump

1-12 Take out Shift Shaft. CP along with washer.
Note: Fit the washer onto the Shaft; not to lose it.

1-13 Remove Guide Plate and Drum Shifter.
Remove bolts, and take out Guide Plate and Drum Shifter.
M6×20L 2 pieces. (T-wrench: 10 mm)
Note: Pay attention Drum Shifter is not disassembled.
Make sure the orientation for reassembling. Not to disassembled.

Guide Plate


Drum Shift


Not to disassemble

Move the Shifter Arm apart from Shifter Cam.

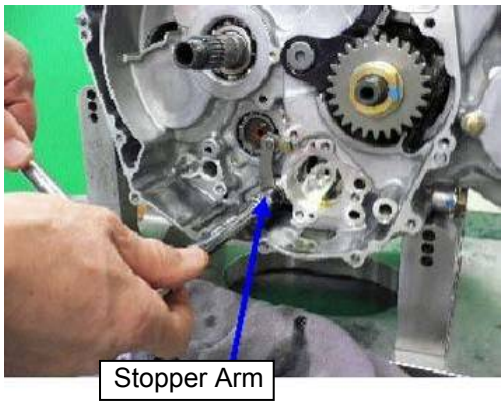
1-14 Take out Shifter Pin and then pull out Shifter Cam.
(Deep-type socket wrench: 12 mm）

Shifter Pin

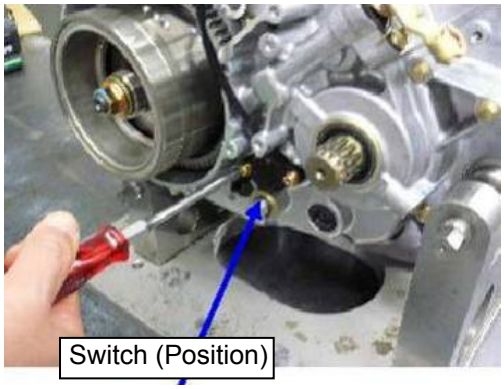
Shifter Cam

Move the shift arm apart from shifter

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



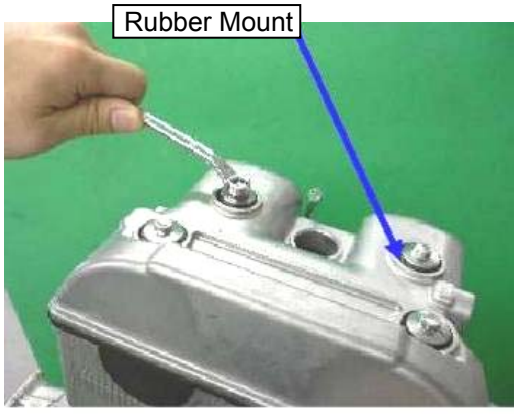
1-16 Remove Switch (Position).
Take out Point (Neutral) along with Spring (Point).
M5×20L screw and washer 2 pieces.
(Philips driver: Medium size)



1-17 Remove Primary Gear
Remove M18 nut by air-assist to take out washer and Primary Gear.

1-18 Remove Head Cove
Remove bolts and take out Rubber Mount, O-ring and Head Cover
M6×14L 4 pieces. (T-wrench: 8 mm）

Note: Pay attention large saline cutting for alignment with crankshaft, when reassembling.



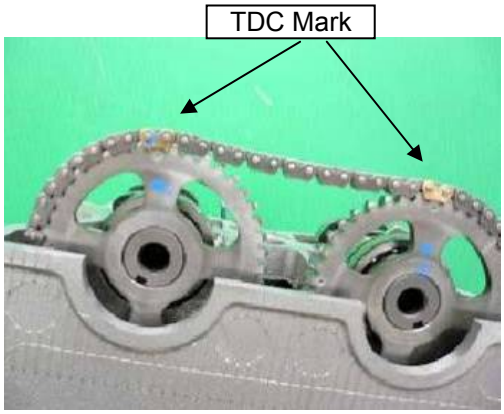
1-19 Remove Spark Plug（Box wrench: 16 mm）

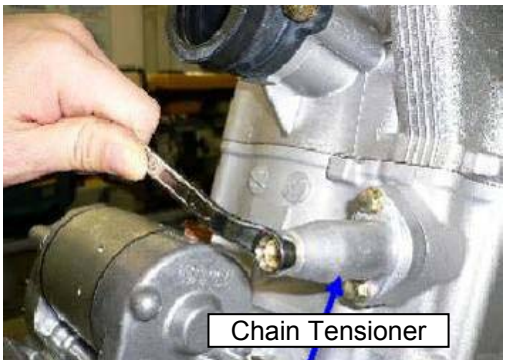
1-20 Remove Chain Tensioner

Note: Align the engine TDC

Remove bolt.M6×8L1 piece.
(T-wrench: 10 mm)
Remove bolts and take out Chain Tensioner. M6×25L 2 pieces.
(T-wrench: 8 mm)

Note: Un-tighten upper and lower bolts evenly

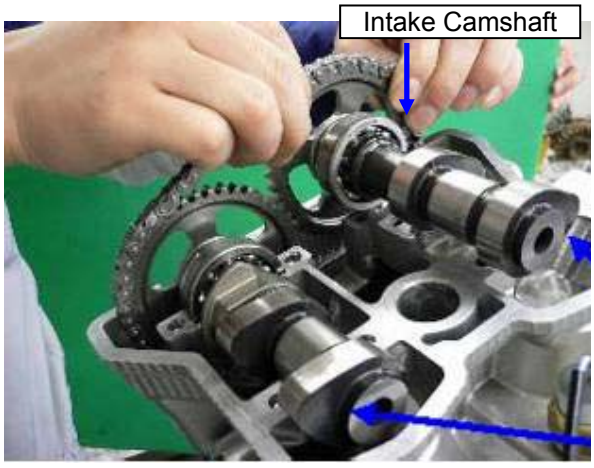




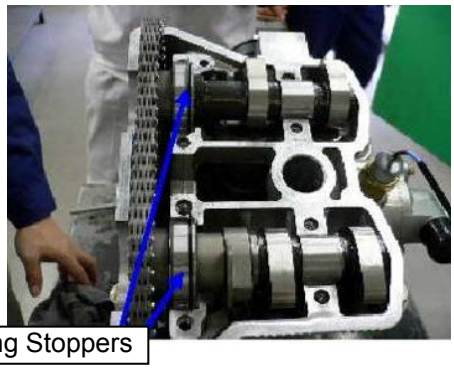
1-21 Remove Cam Support and Camshafts.

Remove bolts and take out Cam Support.
M6×40L 8 pcs.
Take out Intake Camshaft and Exhaust Camshaft along with Bearing supports.

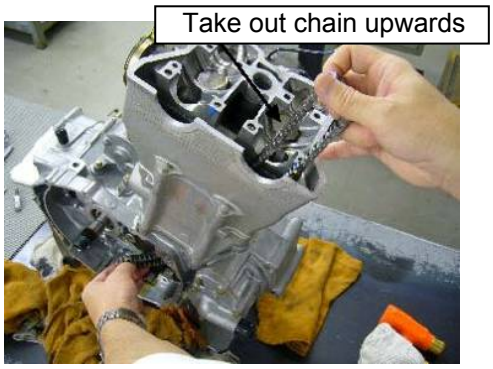
Note: Pay attention not to lose Bearing Supports.



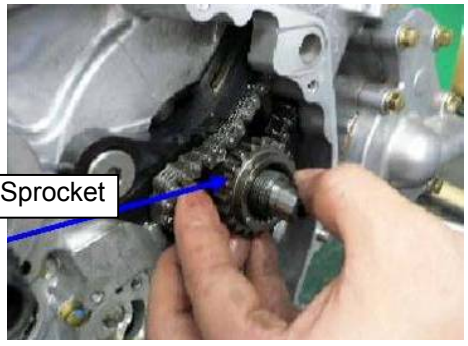
Take out chain upwards.
Take out Crank Sprocket by holding the chain at the upper portion (cylinder head side).
Note: Take out Chain Sprocket first.



1-22 Take out Timing Chain.

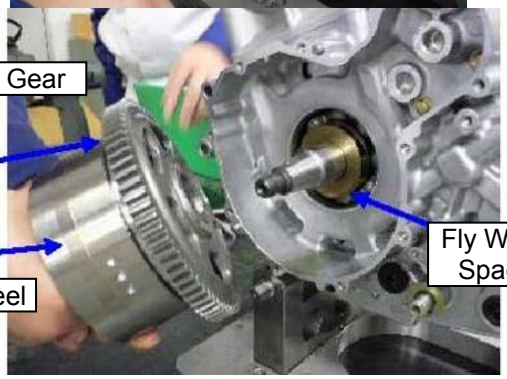


1-23 Remove M14 flange nut on MAG side by using air-assist tool. (Box wrench: 19 mm）



1-24 Take out Magneto Assy by means of Special Tool; Fly wheel Puller.
By using air-assist tool, turn Special Tool; Fly wheel Puller.

Take out along with Starter Gear, Needle Bearing and Spacer.
Special Tool: Fly wheel Puller
Pay attention not to drop Needle Bearing out.



1-25 Remove Thermostat cover and Thermostat.

Remove bolts and take out Thermostat Cover and Thermostat.

M6×20L 2 pieces.

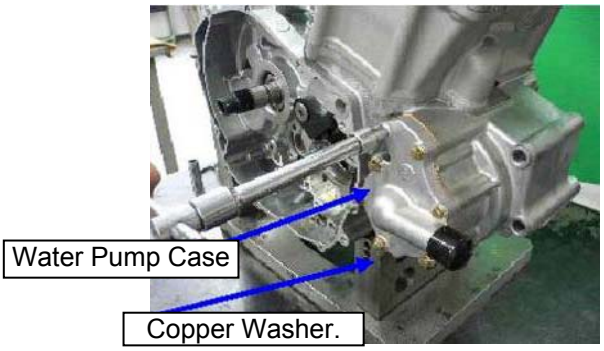
Note: Pay attention the orientation of Thermostat for reassembling; Opening is upwards.

1-26 Remove Water Pump Case and Water pump.

Remove bolts (7 pieces.) and take out Pump Case.（BOX wrench：8mm）

Note; Adopt tray to prevent coolant pollution

Make sure the original position of a cupper washer.

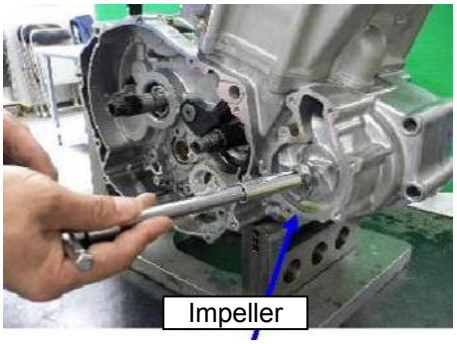


1-27 Take out impellent water pump case

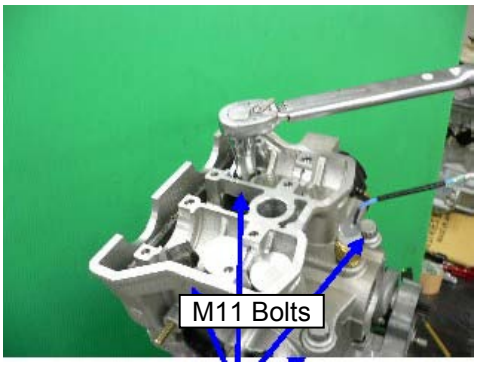
(Deep-type Box wrench:12 mm)

Take out copper washer

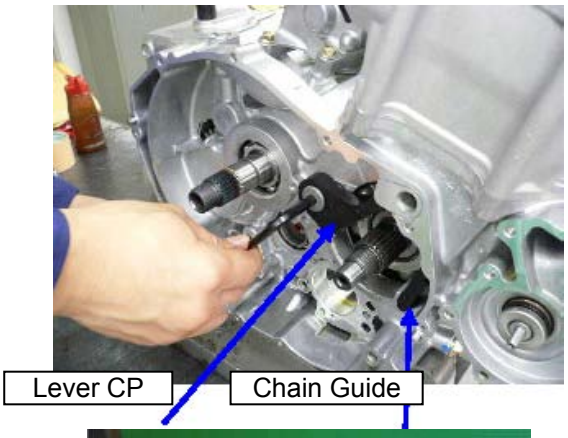
Note : Never depress impeller when reassembling, replace with new Sealing Washer.



1-28 Remove Cylinder Head Assy,
Remove four M11 bolts (M11×198L, Deep-type Box wrench：14 mm) evenly and diagonally.
Take out Cylinder Head Assy along with Head Gasket.



1-29 Remove Lever CP.
Remove Chain Guide.
Remove pivot bolt and take out Lever CP.
M8×22.5L Pivot bolt（Allen wrench：6 mm）



1-30 Take out Cylinder and Gasket.
Note: Use Special Tool; Piston Support Plate.
Hold Piston not to damage it.

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

1-32 Remove Starting Motor
Remove bolts and take out Starting Motor.
M6×25L, 2 pcs. (T-wrench：8 mm)

Chapter I　ENGINE

1-33 Disassemble Crankcase Ass
Take out the crankcase from Special Tool; Engine Base Plate AY and set it with the clutch side
facing up on the plastic container.

One bolt on Clutch sideM6×40L　1 pc. (T-wrench：8 mm)
Total 15 bolts on MAG side (T-wrench：8 mm)

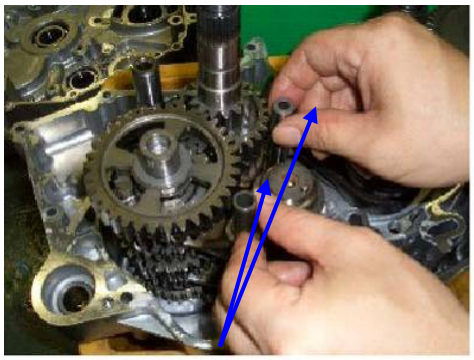
On MAG side M6×40L, 7 pc's. M6×75L 7 pcs.M6×50L, 1 pc.

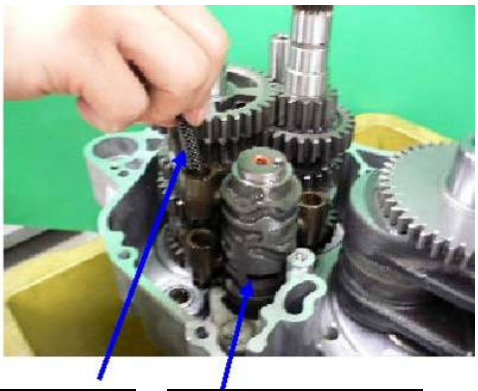
Place the crankcase with the Clutch side facing up on the plastic container.
Attach Special tool; Case Separator Kit onto the clutch cover mating surface of the crankcase. Tighten two (2) bolts evenly, keeping the opening between crankcase mating surfaces in the parallel condition. (Box-end wrench：12 mm)

Note; Place Special Tool ; Guide (Oil Seal) onto the crankshaft without fail.
Special Tool; Case Separator Kit

Take out Fork Shafts (2 pcs.)
Pull out Spring located under the Fork Shaft on the counter shaft side.

1-34 Transmission





Shift Fork Right and Left Reverse Shaft Spring Shift Drum

Take out Shift Fork (Main), Shift Fork (Right) and Shift Fork (Left).
Note : Make sure their original positions for reassembling.
Take out Shift Drum CP with the Reverse Lock released.
With the case put in the upright position, take out Main Shaft and Counter Shaft.

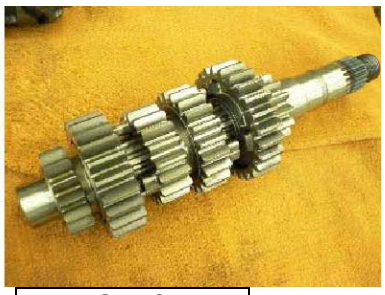
Shift Drum CP removed (倒挡锁) Reverse Arm (Reverse Lock
With the case put in the original position again, take out Reverse Shaft CP (Reverse Idle Gear, Collar, Washer etc.)
Note : Pay attention not to lose the Counter Shaft washer.

Remove Oil Strainer UN.

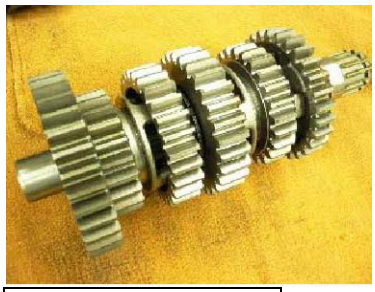
Reverse Arm

Reverse Lock

Oil Strainer UN



Main Shaft Assy



Counter Shaft Assy

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

1-36 By means of hand-press machine, depress the MAG side end of the Crankshaft and take out Crankshaft from crankcase 1..

2. Inspection

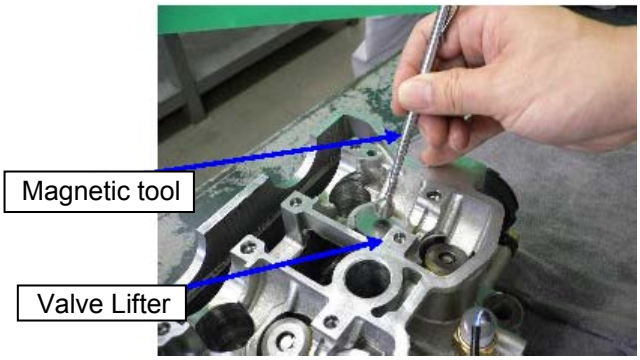
2-1) CYLINDER HEAD

Disassembling

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

Remove Valve lifter and adjusting pad. Valve Lifter is easily taken out by magnetic tool.

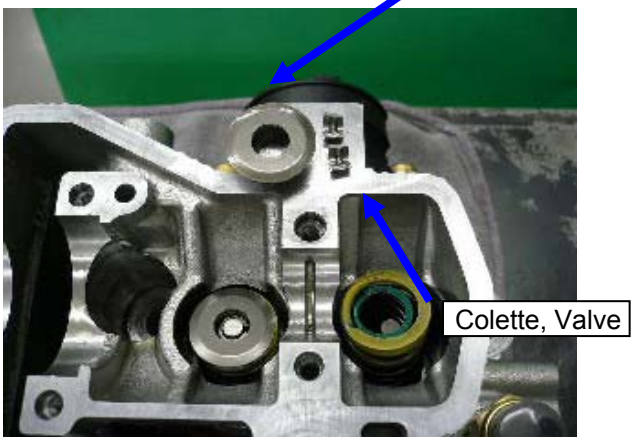
Note: Put ID onto the parts at taking out from either IN or EX side.

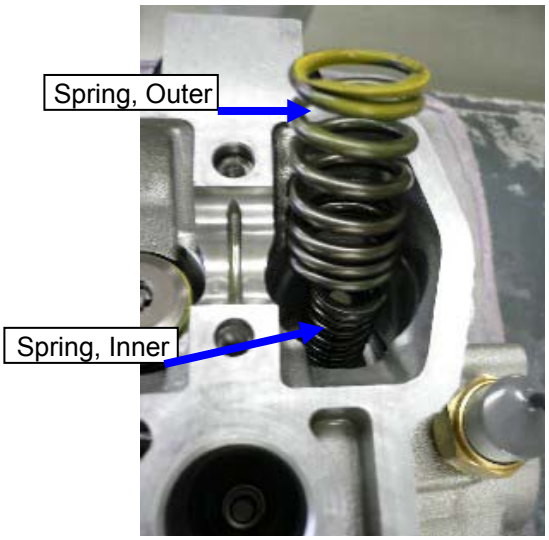


While depressing Valve Spring with exclusive tool (Valve spring compressor), take out Colette.

Exclusive tool (Valve spring compressor)

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



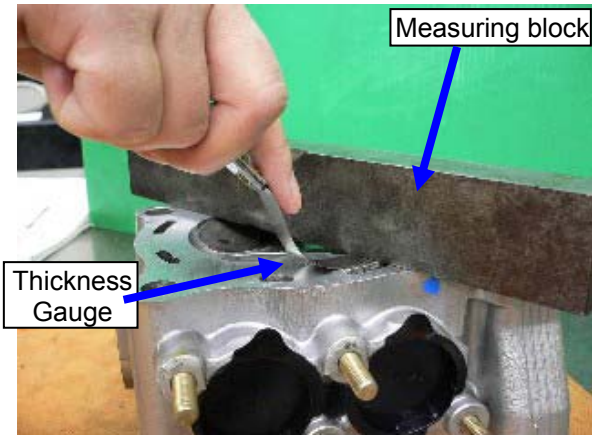


Cylinder Head warpage.

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

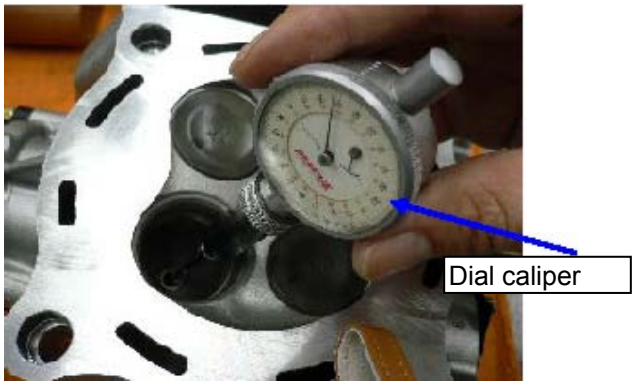
* Place the measuring block diagonally on the surface,
and check with thickness gauge.

* If the result is out of specifications, replace with new Cylinder Head.



Cylinder Head warpage	
Service Limit	0.05 mm

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

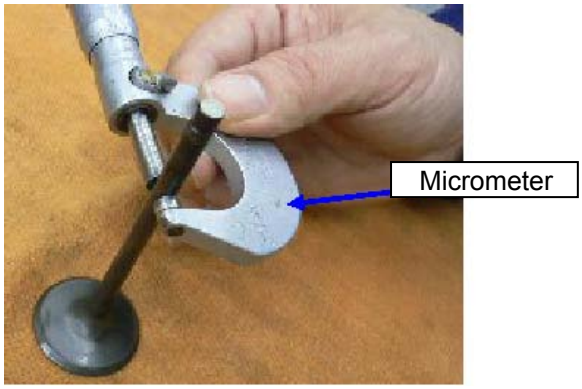


Valve Guide ID		
STD	IN	6.000～6.012mm
	EX	6.000～6.012mm

2-2) INTAKE and EXHAUST VALVE
a. Valve Stem runout
  * Remove carbon deposits.
  Dial gauge
  * Measure the runout by means of dial gauge.
  * If the result is out of specifications, replace with new Valve. V-block

Valve Stem runout	
Service Limit	0.01 mm

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

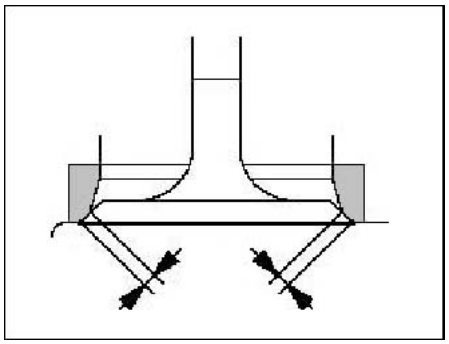


Valve Stem OD		
STD	IN	5.950～5.965mm
	EX	5.945～5.960mm

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

Clearance		
Service Limit	IN	0.15mm
	EX	0.15mm

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



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

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

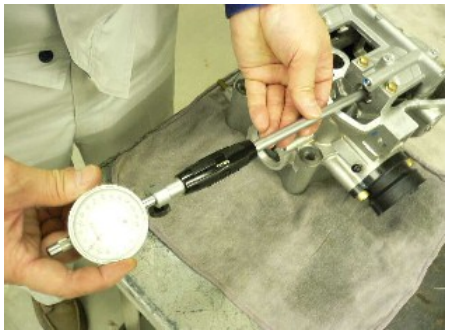
Valve Spring free length		
Service Limit	inner	38.0mm
	Outer	39.9mm

2-3) CAMSHAFT
a. Cam profile height
* Check for damage and ware on cam profile.
* Measure the height of cam profile.

Visual checking for cam profile and Measure the height Micrometer

Cam profile height		
Service Limit	IN	42.05mm
	EX	42.05mm

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



ID of cam journal portion	
STD	25.000~25.021mm

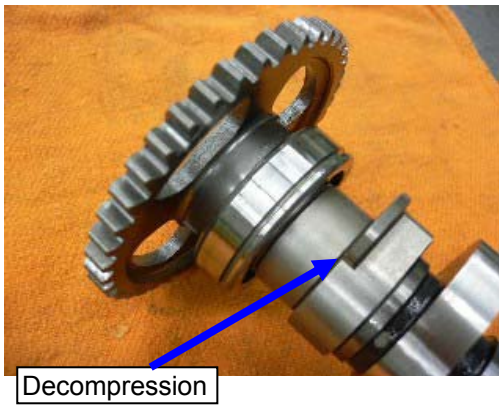
OD of Camshaft journal portion	
STD	24.946~24.963mm

* Oil clearance is ID minus OD.

Oil clearance at cam journal portion	
Service Limit	0.10mm

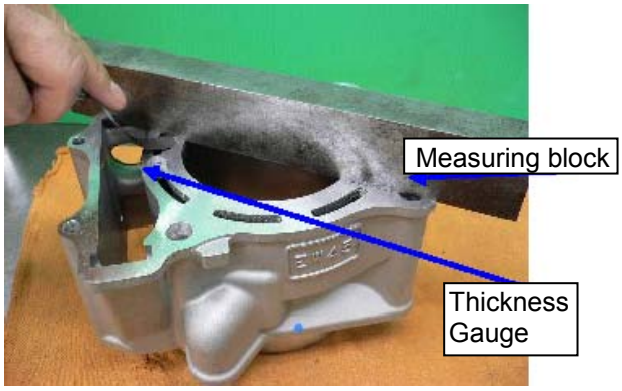
* Measure the OD of Camshaft journal portion with micrometer

c. Visual Checking
* Check for ware and damage on Cam Sprocket gear teeth.
Cam Sprocket gear
* Check for ware and damage on decompression related parts.
* Check if decompression would be operated smoothly.



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

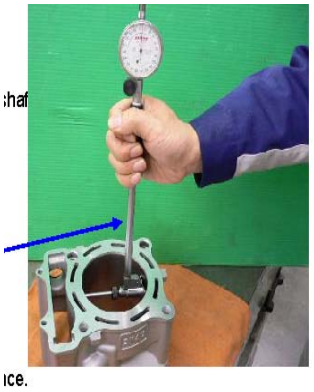
2-4) CYLINDER
a. Cylinder warpage
* Clean and remove carbon deposits from the surface.
Never damage the surface when cleaning.

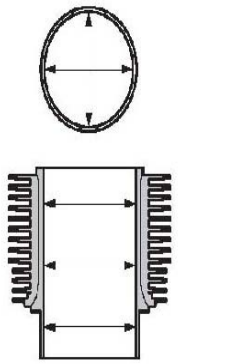


* Place the measuring block diagonally on the surface, and check with thickness gauge.
Measuring Block

Cylinder warpage	
Service Limit	0.05mm

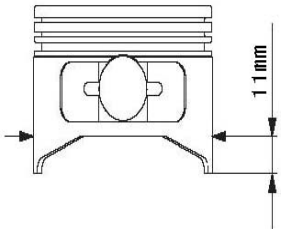
b. Cylinder bore
* Check for damage or ware on bore surface.
* Measure the cylinder bore at total 6 positions; top, middle and bottom positions and axial (Camshaft) and right angle directions.





Cylinder bore	
STD	99.200~99.220mm

2-5) PISTON and PISTON PIN
a. Piston OD
* Check for ware and damage on the sliding surface.
* Measure OD of Piston at 11 mm distance from the bottom end in the right angle against Piston Pin with micrometer.



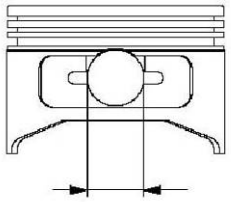
* Clearance is Cylinder ID minus Piston OD.

b. Clearance between Piston and Cylinder

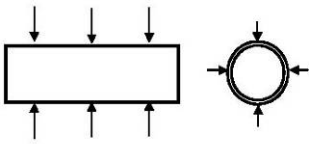
Piston OD	
STD	99.155~99.170mm

Clearance	
Service Limit	0.100mm

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



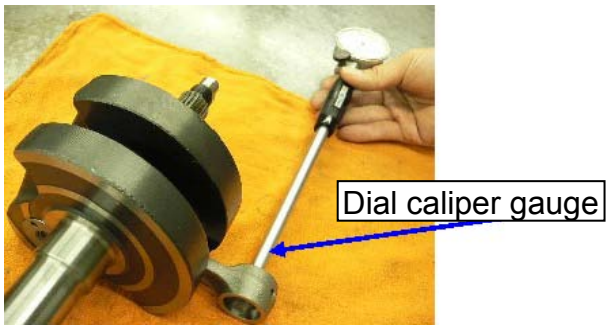
ID of Piston hole for Pin	
STD	23.001~23.007mm



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

Piston Pin OD	
STD	22.994~23.000mm

2-6) CONNECTING ROD
a. Small end ID
* Check for ware and damage on the sliding surface.
* Measure ID in the X- and Y-direction with dial caliper gauge.

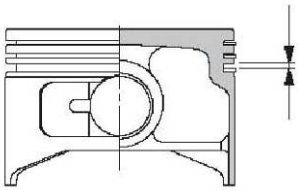


Small end ID	
STD	23.007~23.020mm

b. Clearance between Small end ID and Piston Pin OD
* Clearance is small end ID minus Piston Pin OD.

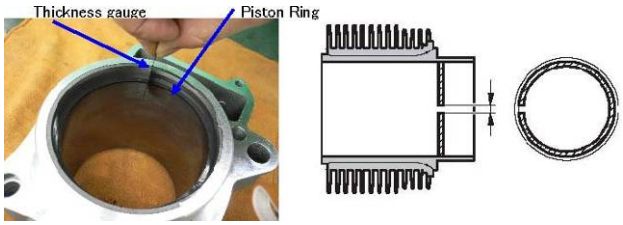
Clearance	
Service Limit	0.05mm

2-7) PISTON RING
a. Clearance between Piston Ring and groove
* Remove carbon deposits from Rings and grooves.
* Measure the clearance between Piston Ring and groove, by holding the Ring upwards in the groove, with thickness gauge.



Clearance		
Service Limit	Top	0.15mm
	Second	0.15mm

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



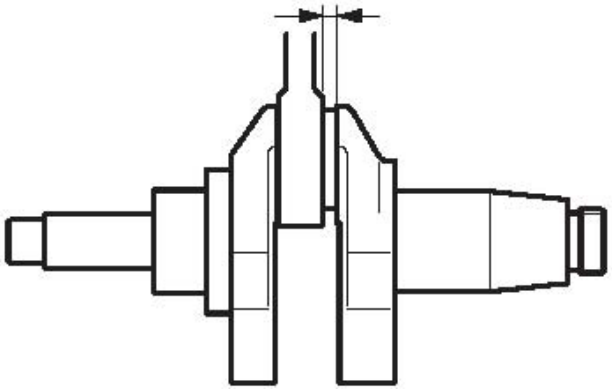
Piston Ring gap (opening)		
Service Limit	Top	0.7mm
	Second	0.8mm
	Oil	1.0mm (Side rail)

2-8) CRANKSHAFT
a. Runout
* Set on the V-block and measure runout with dial gauge.

Crankshaft runout	
Service Limit	0.06 mm

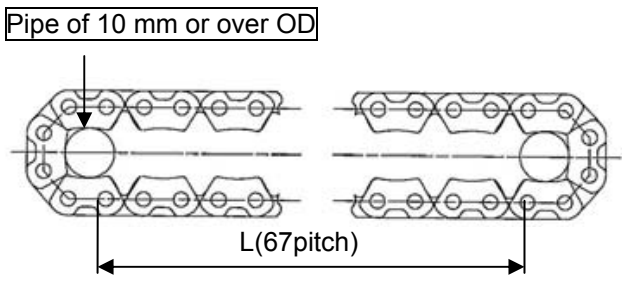
b. Side-clearance at large end of Connecting Rod
* Measure the side-clearance at large end of Connecting Rod with thickness gauge.

Side clearance	
Service Limit	0.65 mm



2-9) TIMING CHAIN
a. Chain pitch
* Check for ware, damage and roller fallout.
* Place Chain on the flat table and pull with the 127N (13 kg) force and th 1 2 3 measure the length of 67 pitches.

Timing Chain (67 pitch)	
Service Limit	431.8 mm



2-10) STARTING GEAR/ONE-WAY CLUTCH

● Disassembly

* Remove One-way Clutch from Flywheel Assy.

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

2-11) CLUTCH

a. Visual checking - Pressure Disk

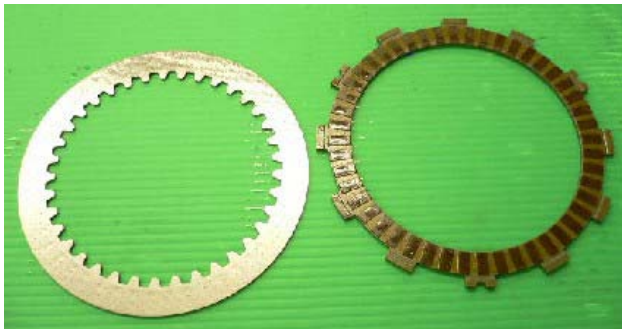
* Check for ware and damage.
* Check for movement of bearing.
* If any fault would be found, replace with new one.


Clutch Disk


Pressure Plate

b. Visual checking - Plate and Disk

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

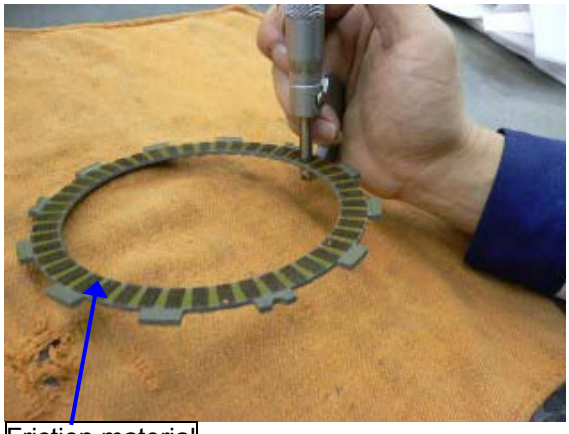


c. Width of friction material

* Measure the width of friction material with caliper gauge.

Width of friction material	
Service Limit	2.8mm

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


Friction material

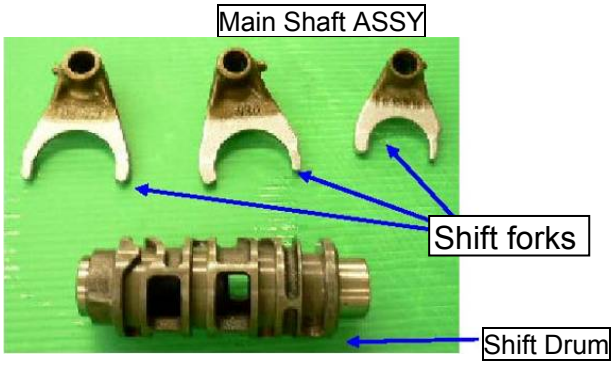
d. Visual checking - Release Shaft and Push Rod


Release Shaft


Push Rod

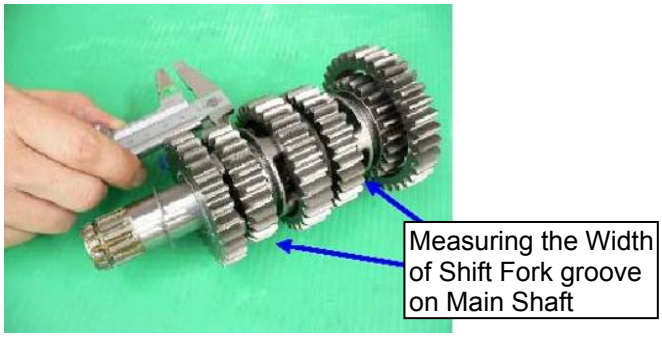
2-12) TRANSMISSION

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



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

Width of Shift Fork groove	
STD	5.10~5.17mm



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

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

Clearance	
STD	0.1~0.24mm

e. Visual checking – Main Shaft and Counter Shaft Assy
* After disassembling, check for ware and damage on dug clutch portion, gears and spline portions.
* If any ware and damage, replace with new one.

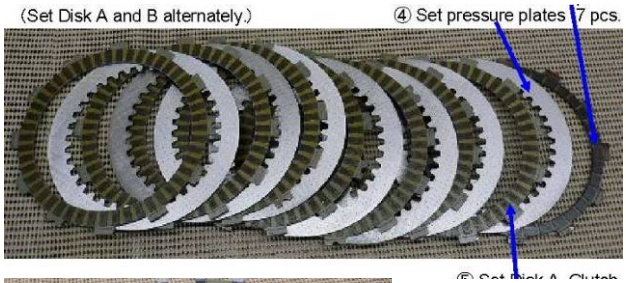
Counter Shaft ASSY

2-13) CLUTCH

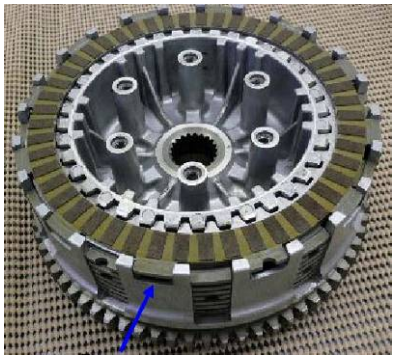
- Sub-assembling

a. Set Disk B at the bottom position. Set Washer first.（Set Disk A and B alternately.）

b. Set Center CP



c. Set pressure plates 7 pcs.) Set Disk B at the bottom position. Set Disk A, Clutch (7 pcs.)



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

2-14) MECHANICAL SEAL Replacement

a. Remove Mechanical Seal.

b. Take out Mechanical Seal.

c. Install Mechanical Seal

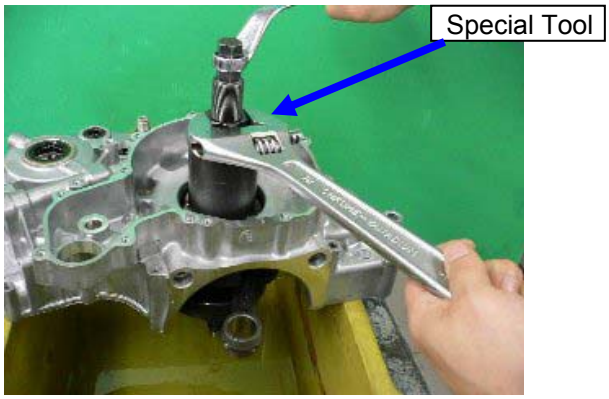
Remove Mechanical Seal.

② Take out Mechanical Seal.

3. Reassembly
Reassembly should be performed in the reverse order of Disassembly. 1/8 plug

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

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



3-2) Install 1/8 plug in position. Crank Assy Tool Kit

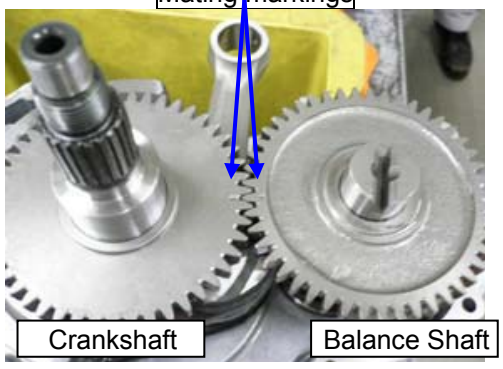
T.T.	12±3N·m

（Allen wrench） T.T. ; Tightening Torque

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

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

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

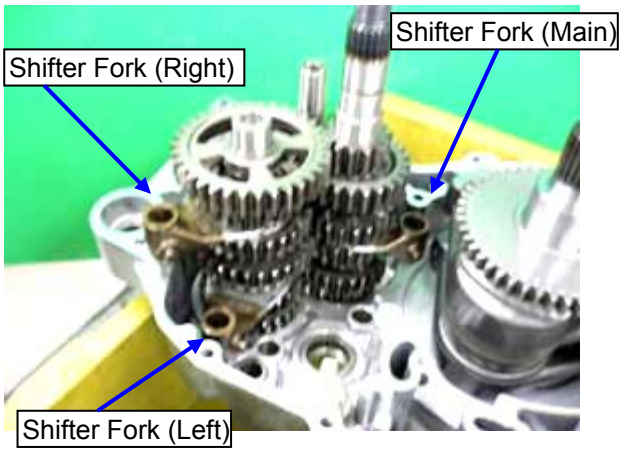


3-5) Install Reverse Shaft CP.

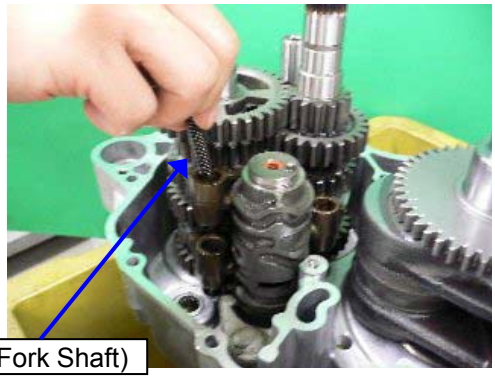
3-6) Install Main Shaft Assy and Counter Shaft Assy with gears engaged into crankcase 1.

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

3-7) Install Shifter Fork (Main), facing the ID marking "M" upwards, into the Groove of Main Shaft.
Install Shifter Fork (Right), facing the ID marking "R" upwards into the upper groove of Counter Shaft.
Shifter Fork (Right)Install Shifter facing the ID marking "L" upwards, into the lower groove of Counter Shaft.



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



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

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

Insert Fork Shaft into Shift Fork (Main).

Fork Shaft

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

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

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

T.T.	13±1N·m

Bearing Retainer Plate; 1 pc.

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

T.T.	8±1N·m

Bearing Retainer Plate B ; 2pcs.

3-11) Install Drain Plug.
Fastener ; M16 bolt

T.T.	21.5±1.5N·m

Note; Make sure the gasket is in position.

3-12) Install Oil Strainer UN.

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

Sealing agent	Three Bond #1215

Convex on the end surface of Water Pump Shaft

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

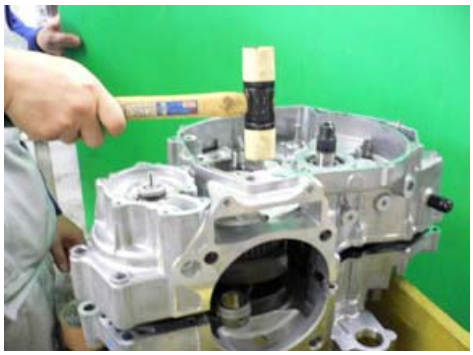
Make sure the washer is in position

Groove on the end surface of Bearing Shaft

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

Note; The groove of Balancer Shaft is moved with connecting rod rotated. Hold the connecting rod not to rotate.

Make sure the convex position is engaged with the groove of Bearing Shaft.



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

T.T.	10±1N·m

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

3-16) Install Position Switch
Insert Spring (Point) into the hole on the end surface of Shift Drum. Then insert Point (Neutral)
After that install Position Switch

T.T.	4±1N·m

Fastener ; M5 X 20L, 2 pcs.

Spring first and Point (neutral)

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

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

Spring first and Point (neutral)

Position Switch

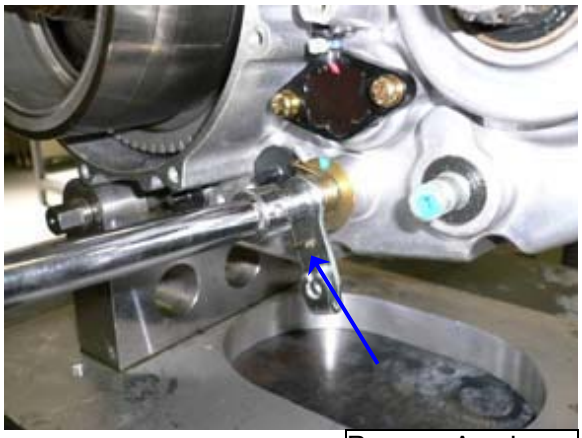
3-18) Apply TB #1344 to M6 thread portion of Reverse Arm Lever, and install along with Reverse Arm Spring.

T.T.	10±1N·m

Fastener ; M8 X 12L 1 pc

（T-wrench : 8 mm）

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



Reverse Arm Lever

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

T.T.	23±3N·m

（Deep-type socket wrench）

3-20) Align the locator pin of Shift Drum at the groove of Shift Cam, and assemble and fix with Shifter Pin

Shifter Pin

Note; Apply a proper amount of Three Bond #1316 onto the thread portion of Shifter Pin.

T.T.	23±3N·m

Shifter Pin　　Shifter Cam

（Deep-type socket wrench : 12mm）

3-21) Install Stopper Arm CP and Spring (stopper).

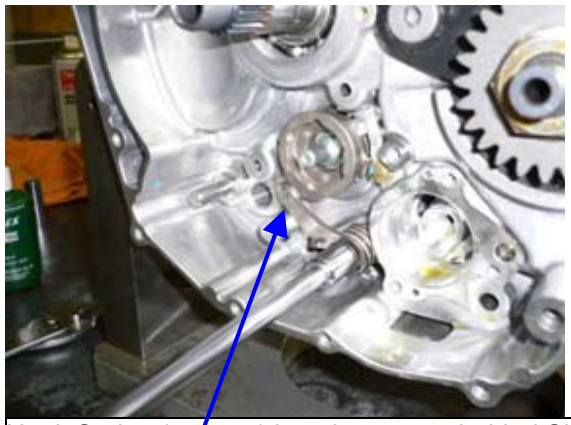
Fastener ; M6 stepped bolt 1 pc.

T.T.	10±1N·m

Apply Three Bond #1344 to the thread portion.

（T-wrench : 10 mm）

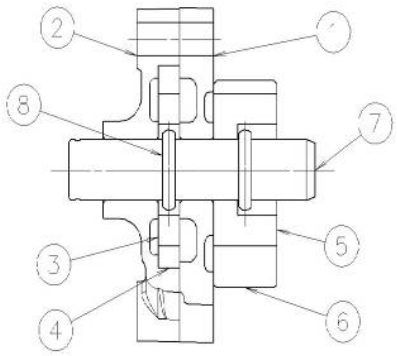
Note; Make sure Spring (stopper) is in the correct position



Hook Spring (stopper) into the groove behind Shift C Stopper Arm CP

3-22) Assembly Oil Pump Assy as shown in the illustration in advance.

部品名称	個数
OIL PUMP CASE 1	1
OIL PUMP CASE 2	1
INNER ROTOR （FEED）	1
OUTER ROTOR （FEED）	1
INNER ROTOR （SCAV.）	1
OUTER ROTOR （SCAV.）	1
OIL PUMP SHAFT	1
DOWEL PIN	2



a. Insert shorter pin (φ3 X 15L) into the hole of Oil Pump Shaft, then assemble with Inner Rotor (Scavenge). Shorter pin

b. Set Pump Case 1 into Oil Pump Shaft. Insert another shorter pin (φ3 X 15L) into the hole of Oil Pum

c. Assemble Outer Rotor (Feed) and Inner Rotor (Feed) with Pump Case 2, and apply oil into rotor chamber.

d. Set Oil Pump Shaft into Pump Case 2, fix Case 1 Shorter pin and 2 with two longer pins (φ3 X 19.8L).
Fit Outer Rotor (Scavenge)

● Apply oil into oil pump rotor chamber and install Oil Pump Assy.

T.T.	10±1N·m

Fastener ; M6 X 30L 3 pcs.
（T-wrench ： 8 mm）

Note; Make sure oil pump shaft is smoothly rotated.

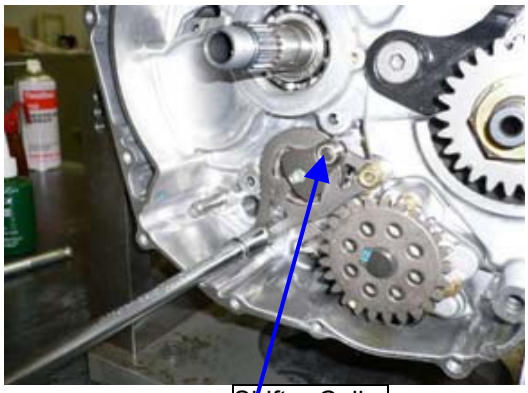
3-23) Assemble Drum Shifter and related parts as shown in the photo.
Make sure Ratchet pole is moved back by spring force and smoothly operated by tapping it.
Note; Make sure Ratchet pole A and B are in the correct position without fail.

Component parts of Drum Shifter Drum Shifter assembled

● Install Drum Shifter along with Guide Plate onto Shift Cam.

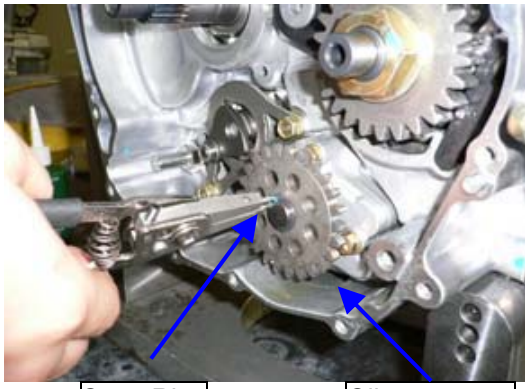
T.T.	10±1N·m

Fastener ; M6 X 20L 2 pcs.
（T-wrench ：10mm）
Set Shifter Caller onto pin portion of Drum Shifter.



Shifter Caller

3-24) Fit Oil Pump Gear and adopt snap ring into the groove on Oil Pump Shaft end.
（Snap ring pliers）

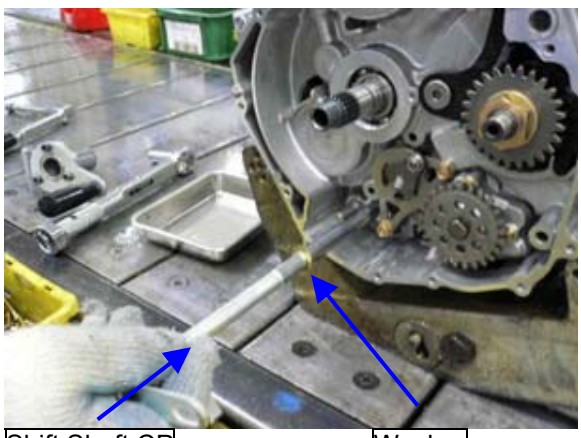


Snap Ring Oil pump gear

3-25) Insert Shift Shaft CP with Special Tool; Oil Seal Guide adopted. Apply oil to Special Tool; Oil Seal Guide. Engage Stopper Pin and Shifter Collar into the groove of Shifter Lever

Special Tool; Oil Seal Guide

Note ; Be sure to install washer onto Shift Shaft CP



Shift Shaft CP Washer

●Take out Special Tool; Oil Seal Guide, temporally fit Shift Pedal CP and make sure gear shifting without fail.

Note ; Hold Shift Shaft CP not to moved out at temporally fitting Shift Pedal.

● Also make sure reverse locking operation.

Make sure reverse locking operation

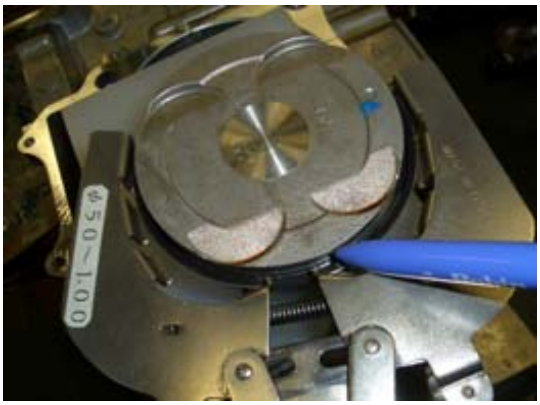
3-26) Fit two Pipe Knocks and set Cylinder Gasket.

3-27) Assemble and install Piston
Set Piston Rings into Piston grooves;
- Expander Ring (upper and lower) into Oil Ring groove.
- Second Ring, facing the marking upwards
- Top Ring, facing the marking upwards.
- Make sure rings are smoothly moved and adjust the openings (gaps) at 120-degrees intervals.

Fit new clip into the groove on one side and make sure
of the clip fitting properly in the groove.

Note ; Make sure the clip is in the groove!

Cylinder Gasket Pipe Knocks



Place Special Tool; Piston Support Plate.

Insert Piston, with the marking on the top surface faced to magneto side, into cylinder. Apply oil to small end hole of Connection Rod, Piston Pin and hole. Then fit Piston Pin into Piston.

Fit new clip into the groove on another side and make sure the clip fitting properly in the groove.

Note ; Make sure the clip is in the groove.
Special Tool ; Piston Support Plate

Marking be faced to MAG side

3-28) Apply oil around Piston and Rings, and cylinder bore.
Install Cylinder by holding Rings by Special Tool; Ring Band.
Make sure of the smooth operation by turning Crankshaft, with Cylinder pressed down by hand

Special Tool; Ring Band

3-29) Apply oil to O-ring and install Starter Motor in position.

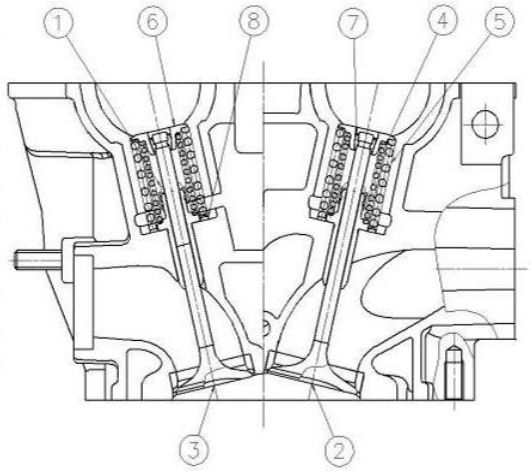
T.T.	10±1N·m

Fastener ; M6 X 25L 2 pcs.

3-30) Install Chain Guide 1 onto Cylinder.

3-31) Assemble Cylinder Head as shown in the illustration;

	部品名称	個数
①	SEAL-VALVE	4
②	INTAKE VALVE	2
③	EXHAUST VALVE	2
④	VALVE SPRING（INNER）	4
⑤	VALVE SPRING（OUTER）	4
⑥	SPRING RETAINER	4
⑦	COLLET（VALVE）	8
⑧	SEAT（VALVE SPRING）	4



a. Press-fit Seal (Valve) by means of exclusive tool

Note ; Make sure the appearance of Seal (Valve);

IN side ; Black

EX side ; Green

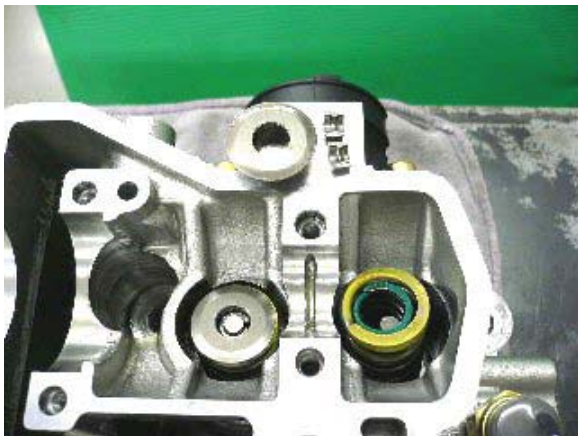
b. Apply oil onto the shaft ends of IN and EX Valve, Valve Guide and Seal (Valve) and fit the valves into Cylinder Head.

Note ; Be sure to install IN and EX Vale in the correct position.

c. Fit Seat (Valve Spring) not to over-ride the step

d. Set Valve Spring (Inner), facing the green paint marking upwards

e. Set Valve Spring (Outer), facing the yellow paint marking upwards



f. Fit Spring Retainer and Collet onto valve shaft end, while depressing Valve Springs with Special Tool; Valve ASSY Tool

Note ; Make sure Valve Retainer is fit with Collet properly.
Never depress Valve Spring excessively.

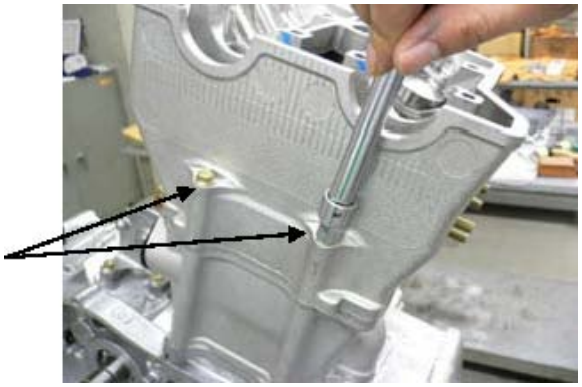
g. Fit Adjusting Pad and Valve Lifter onto each valve.
Note ; Adjusting Pad and Valve Lifter are fit in the original position.

3-32) Fit two pipe knocks and Head Gasket.

3-33) Install Cylinder Head. Apply oil to M11 thread portion and washer, then tighten them in the following procedure.

Fastener ; M11 X 198L 4 pcs. (Socket wrench ; 14 mm)

Tightening procedure	
Tighten bolts in an even, crisscross pattern.	
a	Tighten to 30 N-m.
b	Tighten to 70 N-m.
c	Loose by 180-degrees
d	Loose by 180-degrees
e	Tighten to 35 N-m
f	Turn by 80 to 90-degrees clockwise.
g	Turn by additional 80 to 90-degrees clockwise

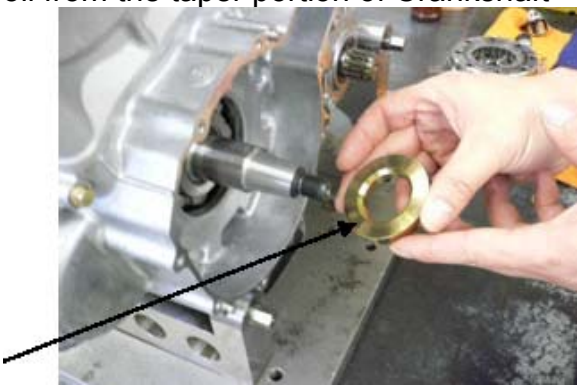


Tighten M6 bolts.

T.T.	10±1N·m

Fastener ; M6 X 140L 2 pcs. (Socket wrench ; 8 mm)

3-34) Fit Spacer with the chamfer side inwards onto Crankshaft on the magneto side. Apply Three Bond #1306 and remove oil from the taper portion of Crankshaft



Remove oil from taper portion

3-35) Fit Needle Bearing and apply grease. Not to apply grease onto the taper portion.

Install One-way Clutch onto Flywheel,
Fastener ; M6 X 16L, 8 pcs.

T.T.	14±1N·m

Apply Three Bond #1316.
（Allen wrench ： 4 mm）
Attach Stator Gear.
Make sure Stator Gear smoothly rotates counterclockwise.

3-36) Apply TB #1306 and remove oil from taper hole of Flywheel, apply oil to threads and retaining surface of M14 nut Tighten the nut to the specified tightening torque, with Special Tool; Wrench (Counter Shaft) adopted to Crankshaft for preventing rotation.

T.T.	160±10N·m

Fastener ; M14 nut, 1 pc
（Socket wrench ： 19 mm）

Special Tool ; Wrench (Counter Shaft)

3-37) Install Chain Lever with pivot bolt.

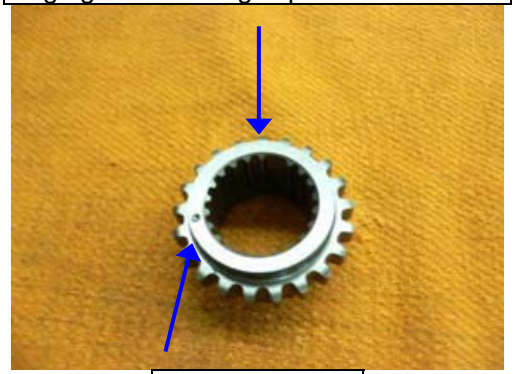
T.T.	15±1.5N·m

Fastener ; M8 X 22.5L, Pivot bolt 1 pc.
(Allen wrench ; 6 mm)

Chain Lever

3-38) Put Timing Chain from the Cylinder Head side. Fit Crank Sprocket with the chamfer portion inside and with each spline aligned into Crankshaft.

Large groove for large spline of Crankshaft

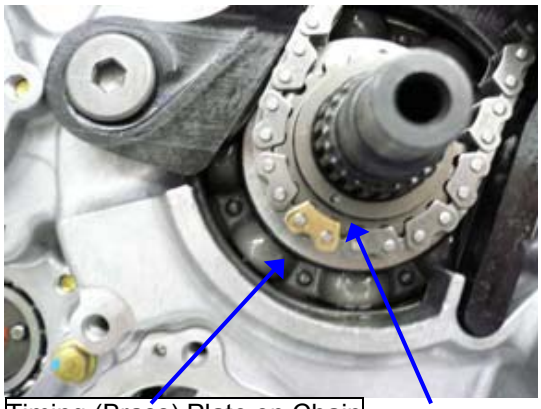


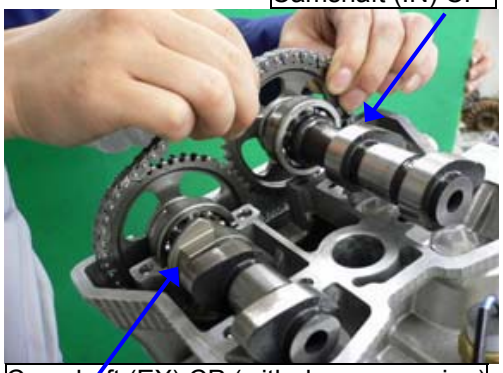
Marking for Chain

● Align the Crank Sprocket marking with Timing (Brass) Plate on Chain.

3-39) Apply oil to Camshafts and install them in position so that the Timing Marks are aligned with the Timing (Brass) Plates on Chain

Note : Be sure to install Camshaft (IN) CP and Camshaft (EX) CP in the correct position.





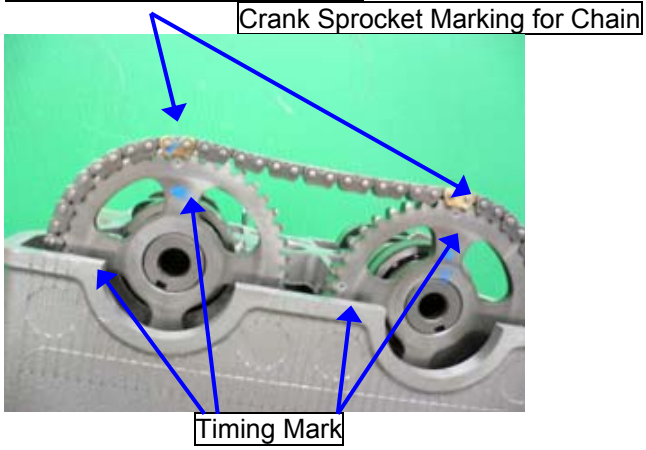
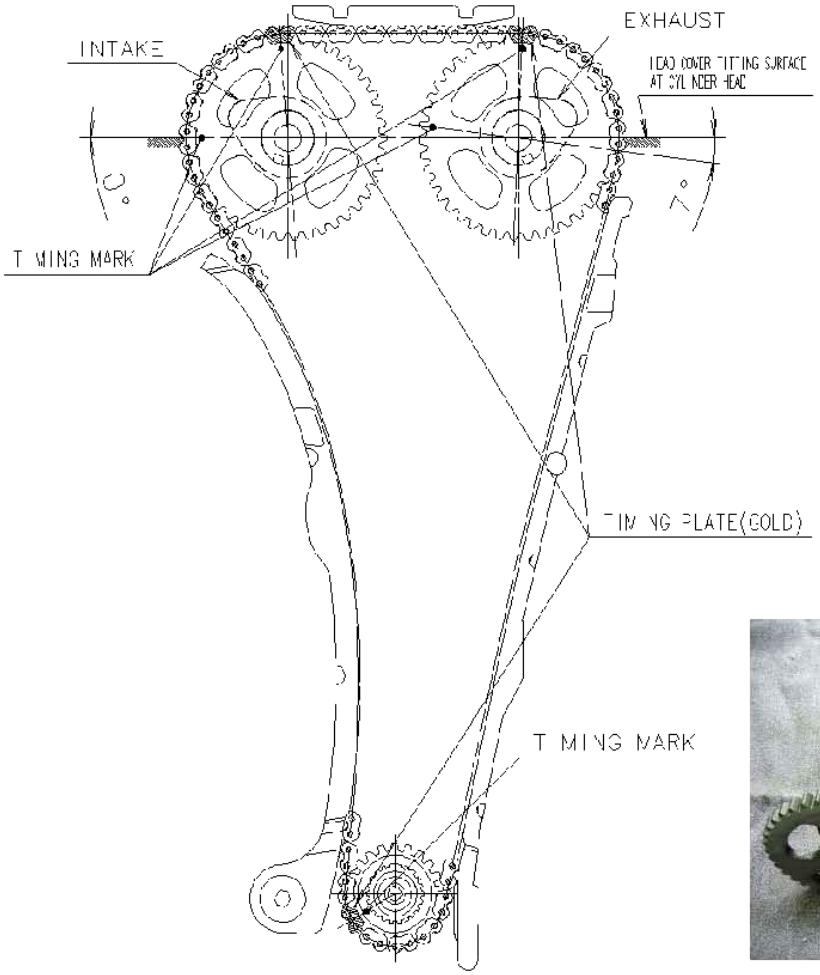


FIG Relation between Timing Mark and Timing (Brass) Plate at TDC



3-40) Fit Bearing Stopper onto Ball Bearing

Clearance between Ball Bearing and bearing Stopper ; Approx. 0.2 mm

3-41) Apply oil to Cam Support and install in position. Tighten M6 bolts in an even, crisscross pattern

Fastener ; M6 X 40L 8 pcs.

T.T.	10±1N·m

3-42) Depress Chain Tensioner plunger into the bottom position by Special Tool; Chain Tensioner Tool and install Tensioner ASSY along with Gasket (Tensioner)

Fastener ; M6 X 25L 2 pcs

T.T.	10±1N·m

(T-wrench ; 8 mm)

Special Tool; Chain Tensioner Tool

3-43) Take out Special Tool and install bolt with Gasket (Aluminum)

T.T.	4.5~6N·m

Fastener ; M6 X 8L, 1 pc.

(T-wrench ; 10 mm)

Make sure of smooth operation by turning Crankshaft.

3-44) Adjust valve clearance with thickness gauge adopted at TDC position on the following procedures

Valve Clearance (Cold condition)	
IN	0.15±0.05mm
EX	0.27±0.05mm

Adjusting Valve Clearance:
a. Temporally fit original Adjusting Pad, and check the valve clearance.
b. In accordance with the matrix table (Attachment), make sure the relationship between checking results and listed figures (3 digits).
c. Select applicable Adjusting Pad and fit it in place with original one.
d. Check again valve clearance and make sure it is within the specifications.
e. If out of the specifications, repeat the procedures.

Finally make sure the valve clearance is within the specifications.

Example:

Intake – Valve clearance before adjusting: 0.23mm (.009")
Exsisting adjusting pad mark: 177
From "Intake Adjusting Pad Selection Matrix", a suitable adjusting pad would be **185**

Exhaust – Valve clearance before adjusting: 0.35mm (.0137")
Exsisting adjusting pad mark: 177
From "Exhaust Adjusting Pad Selection Matrix", a suitable adjusting pad would be **185**

<Intake —Adjusting Pad Selection Matrix>

Valve Clearance before adjusting (mm)	Existing Adjusting Pad Marking (numeral mark w/ 3 digits on Adjusting Pad)																												
	145	150	155	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	225	230
	Suitable Adjusting Pad Marking (numeral mark w/ 3 digits on Adjusting Pad)																												
0.000-0.01			145	150	150	155	155	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	212	220
0.015-0.05		145	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	212	220	225
0.10-0.20 (Standard)	Existing Adjusting pad = Suitable Adjusting pad																												
0.21-0.25	155	160	162	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	230		
0.26-0.30	160	162	167	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	230				
0.31-0.35	162	167	172	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230				
0.36-0.40	167	172	177	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230						
0.41-0.45	172	177	182	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230								
0.46-0.50	177	182	187	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230										
0.51-0.55	182	187	192	197	200	202	205	207	210	212	215	220	220	225	225	230	230												
0.56-0.60	187	192	197	202	205	207	210	212	215	220	220	225	225	230	230														
0.61-0.65	192	197	202	207	210	212	215	220	220	225	225	230	230																
0.66-0.70	197	202	207	212	215	220	220	225	225	230	230																		
0.71-0.75	202	207	212	220	220	225	225	230	230																				
0.76-0.80	207	212	220	225	225	230	230																						
0.81-0.85	212	220	225	230	230																								
0.86-0.90	220	225	230																										
0.91-0.95	225	230																											
0.96-1.00	230																												

<Exhaust ---Adjusting Pad Selection Matrix>

Valve Clearance before adjusting (mm)	Existing Adjusting pad (numeral mark w/ 3 digits on Adjusting Pad)																												
	145	150	155	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	225	230
	Existing Adjusting pad = Suitable Adjusting pad																												
0.02-0.06						145	145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	197	202	207
0.07-0.11				145	145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	202	207	212
0.12-0.16			145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	207	212	220
0.17-0.21	145	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	212	220	225	
0.22-0.32	std																												
0.33-0.37	155	160	162	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	230		
0.38-0.42	160	162	167	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230			
0.43-0.47	162	167	172	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230				
0.48-0.52	167	172	177	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230						
0.53-0.57	172	177	182	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230								
0.58-0.62	177	182	187	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230										
0.63-0.67	182	187	192	197	200	202	205	207	210	212	215	220	220	225	225	230	230												
0.68-0.72	187	192	197	202	205	207	210	212	215	220	220	225	225	230	230														
0.73-0.77	192	197	202	207	210	212	215	220	220	225	225	230	230																
0.78-0.82	197	202	207	212	215	220	220	225	225	230	230																		
0.83-0.87	202	207	212	220	220	225	225	230	230																				
0.88-0.92	207	212	220	225	225	230	230																						
0.93-0.97	212	220	225	230	230																								
0.98-1.02	220	225	230																										
1.03-1.07	225	230																											
1.08-1.12	230																												

3-45) Fit One-way Valve

T.T.	18±3N·m

Note ; Make sure One-way Valve ASSY is pushed as far as it will go.

3-46) Fix Impeller along with Seal Washer by means of Special Tool; Wrench (Counter Shaft) adopted to Counter Shaft

T.T.	10±1N·m

(T-wrench ; 12 mm)

3-47) Fit Water Pump Case along with Gasket (Water Pump).
Be sure to fit the cupper gasket at one place.
Fastener ; M6 X 25L, 7 pcs.

T.T.	10±1N·m

(T-wrench ; 8 mm)

3-48) Install Primary Gear with the marking inside aligned to spline.
Fastener ; M18 nut, 1 pc.

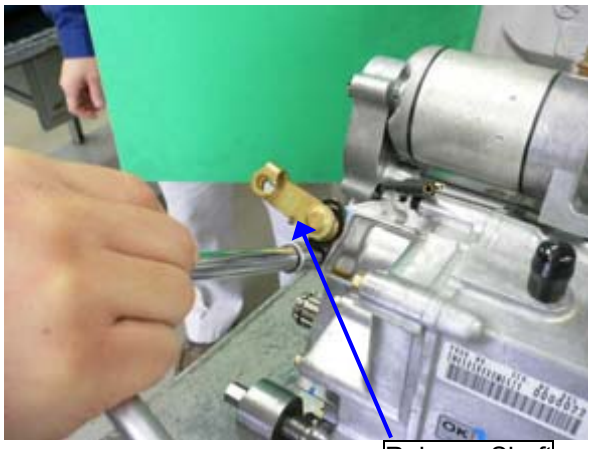
T.T.	120±10N·m

(Socket wrench ; 27 mm)

3-49) Fit Release Shaft along with Spring (Release) and Plate (Release) in position.
Fastener ; M6 X 20L, 1 pc.

T.T.	10±1N·m

Note; Make sure Spring (Release) is in the correct position.

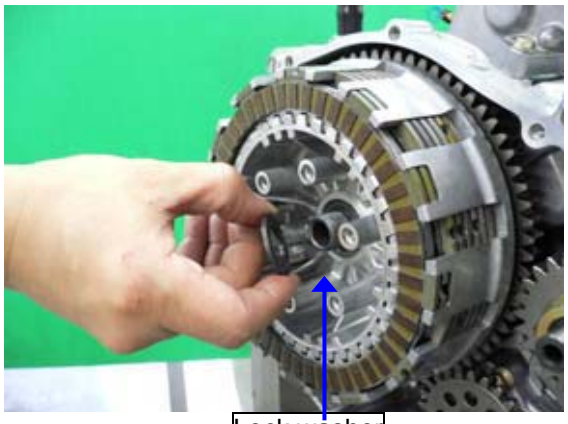


3-50) Prepare the component parts of Clutch ASSY.

3-51) Fit Distance Collar into Main Shaft, apply oil into hole and turn Collar by one-turn.

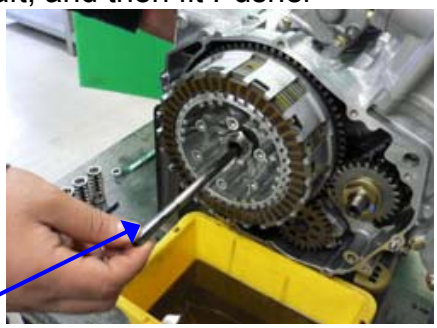
3-52) Fit Cultch Outer CP, lock washer with the hollow surface inwards and lock nut.
Fastener ; M 18 Special nut 1 pc.

T.T.	100±10N·m



3-53) Caulk the lock nut with Special Tool; Caulking Tool.

3-54) Apply oil onto Push Rod and insert into Main Shaft, and then fit Pusher



3-55) Fit Disk (Clutch) and Plate (Clutch)

Note ; Make sure the friction material applied area of the most inside Clutch Plate is the largest.
Attach the most outside Clutch Plate into the shallow depth groove of Clutch Outer CP.

Fit Spring (Clutch) and tighten bolts evenly.
Fastener ; M6 X 35L 6 pcs.

T.T.	10±1N·m

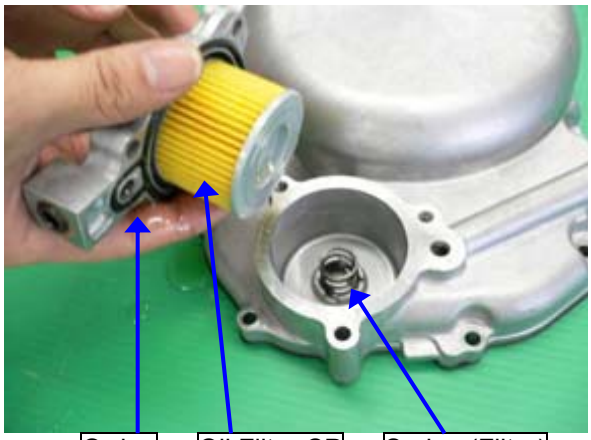
(Allen wrench ; 5 mm)

● Make sure again the tightening torque of Primary Gear fixing nut.

T.T.	120±10N·m

3-56) Attach Spring (Filter) onto Clutch Cover.
Fit Filter Cover along with Oil Filter CP and O-ring.
Fastener ; M6 X 25L, 2 pcs.

T.T.	10±1N·m



3-57) Fit Gasket (Clutch Cover) onto Crankcase after spot applying Three Bond #1215 onto the Crankcase surface

Note ; Use the long bolt fixing Filter Cover and Clutch cover commonly.
Fastener ; M6 X 25L, 11 pcs.
M6 x 65L, 1 pc.

T.T.	10±1N·m

3-58) Tighten Filter Cover plug to the specified tightening torque

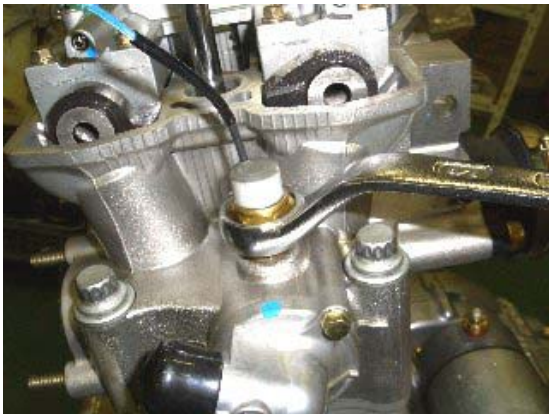
T.T.	20±3N·m

3-59) Install Thermostat with the hole upwards and Thermostat Cover
Fastener ; M6 X 20L 2 pcs.

T.T.	8±1N·m

3-60) Install Thermo Switch with Three Bond #1344 applied to threads

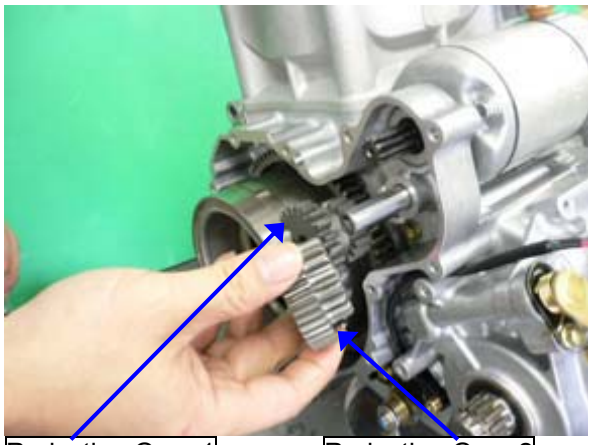
T.T.	35±3N·m



3-61) Install Spark Plug

T.T.	17.5±2.5N·m

3-62) Apply grease around Shaft 1 and 2, and fit Reduction Gear 1 and 2 correspondingly.
Apply grease to gears
Note; Make sure Shaft 1 and 2 are in the correct position.



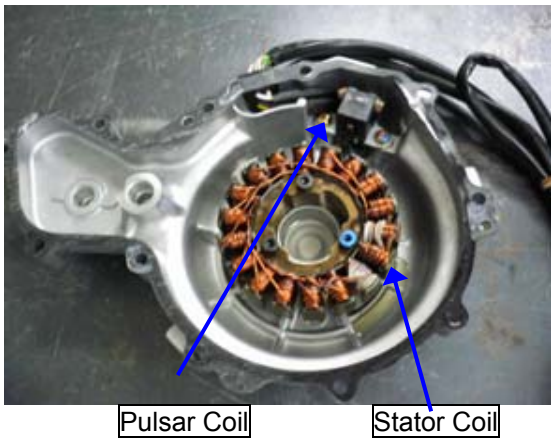
3-63) Install Magneto Cover
a. Fit Stator Coil into MAG Cover
Fastener ; M5 X 30L 3 pcs.

T.T.	6±0.5N·m

Apply Three Bond #1316. Pulsar Coil

b. Route the coil wiring along the groove and fix Pulsar Coil over the wiring.
Stator Coil Fastener ; M5 X 12L Screw 2 pcs

T.T.	3±0.5N·m



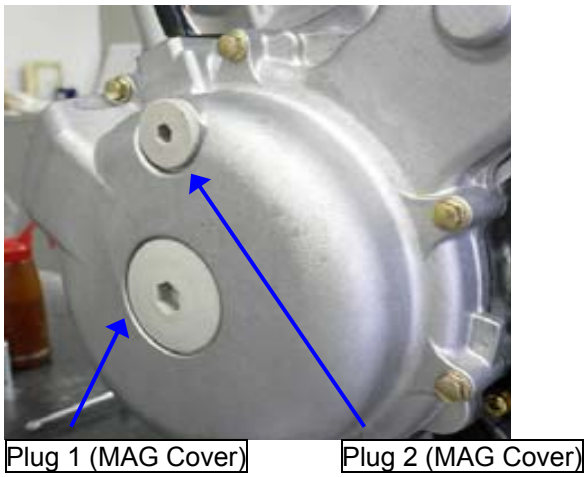
3-64) Fit Gasket (MAG Cover) onto Crankcase after spot applying Three Bond #1215 onto the Crankcase surface.
Fit MAG Cover and tighten bolts
Fastener ; M6 X 35L, 11 pcs.

T.T.	10±1N·m

● Fit Plug 1 and 2 (MAG Cover).

T.T. Plug 1	11±1N·m
T.T. Plug 2	4±1N·m

Note ; Make sure O-ring is attached Plug
Route the harness under the Pulsar Coil and set the Grommet into the groove



3-65) Fit Oil Delivery Pipe

T.T.	18±3N·m

Note ; Fit Gasket onto both side of Banjo bolt.
Arrange the rubber pipe in upright position.

Gasket arranged on both side of Banjo bolt

3-66) Make sure O-ring (Head Cover) and Chain Guide 2 furnished and fit Head Cover. Fit rubber mount and bolts.

T.T.	10±1N·m

Chain Guide 2

3-67) Install Adapter with convex portion upwards.

Fastener ; M8 X 20L, 2 pcs.

T.T.	18±2N·m

Convex portion.

3-68) Install carburetor onto Adapter. Place Adapter band screw with the screw head upwards on MAG side.
Fastener ; M4 X 30L screw 1 pc.

T.T.	10±1N·m

3-69) Fit Shift Pedal.

Fastener ; M6 X 25L, 1 pc.

T.T.	10±1N·m

3-70) Apply grease onto front and rear surfaces of Sprocket 14T, and install it in position.
Apply grease Counter Shaft Sprocket and install Fixing Plate over the sprocket

Fastener ; M6 X 12L, 2 pcs.

T.T.	10±1N·m

---

1. Measure valve clearance at TDC (Compression stroke) using thickness gauge with original adjusting pad installed.
2. Reference the measurement ant the 3 digits marked on the existing adjusting pad on the matrix below.
3. Select a suitable adjusting pad from the matrix below and replace existing pad.
4. Measure and confirm that valve clearance is within the standard values.
5. If valve clearance is not within standard, re-verify step#1 and repeat procedures again.

Example:
Intake- Valve clearance before adjusting: 0.23mm (.009") Existing adjusting pad mark 177 From "Intake Adjusting Pad Selection Matrix", a suitable adjusting pad would be 185.

Exhaust- Valve clearance before adjusting: 0.35mm (.0137") Existing adjusting pad mark 177 From "Intake Adjusting Pad Selection Matrix", a suitable adjusting pad would be 185

Chapter I Engine

<Intake - Adjusting pad selection matrix>

Valve Clearance before adjusting (mm)	Existing Adjusting pad marking (numeral mark w/3 digits on Adjusting pad)																													
	145	150	155	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	225	230
	Suitable Adjusting pad marking (numeral mark w/3 digits on Adjusting pad																												
0.00-0.04			145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	207	212	220
0.05-0.09		145	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	212	220	225
0.10-0.20 (standard)	Existing Adjusting pad = Suitable Adjusting pad																												
0.21-0.25	155	160	162	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	230		
0.26-0.30	160	162	167	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230			
0.31-0.35	162	167	172	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230				
0.36-0.40	167	172	177	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230						
0.41-0.45	172	177	182	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230								
0.46-0.50	177	182	187	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230										
0.51-0.55	182	187	192	197	200	202	205	207	210	212	215	220	220	225	225	230	230												
0.56-0.60	187	192	197	202	205	207	210	212	215	220	220	225	225	230	230														
0.61-0.65	192	197	202	207	210	212	215	220	220	225	225	230	230																
0.66-0.70	197	202	207	212	215	220	220	225	225	230	230																		
0.71-0.75	202	207	212	220	220	225	225	230	230																				
0.76-0.80	207	212	220	225	225	230	230																						
0.81-0.85	212	220	225	230	230																								
0.86-0.90	220	225	230																										
0.91-0.95	225	230																											
0.96-100	230																												

Chapter I Engine

<Exhaust - Adjusting pad selection matrix>

		Existing Adjusting pad marking (numeral mark w/3 digits on Adjusting pad)																													
		145	150	155	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	225	230
		Existing Adjusting pad = Suitable Adjusting pad																												
Valve Clearance before adjusting (mm)	0.02-0.06						145	145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	197	202	207
	0.07-0.11				145	145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	202	207	212
	0.12-0.16			145	150	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	207	212	220
	0.17-0.21		145	150	155	155	160	160	162	165	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	212	220	225
	0.22-0.32	Std																												
	0.33-0.37	155	160	162	167	170	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	230		
	0.38-0.42	160	162	167	172	175	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	22	225	230			
	0.43-0.47	162	167	172	177	180	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230				
	0.48-0.52	167	172	177	182	185	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230						
	0.53-0.57	172	177	182	187	190	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230								
	0.58-0.62	177	182	187	192	195	197	200	202	205	207	210	212	215	220	220	225	225	230	230										
	0.63-0.67	182	187	192	197	200	202	205	207	210	212	215	220	220	225	225	230	230												
	0.68-0.72	187	192	197	202	205	207	210	212	215	220	220	225	225	230	230														
	0.73-0.77	192	197	202	207	210	212	215	220	220	225	225	230	230																
	0.78-0.82	197	202	207	212	215	220	220	225	225	230	230																		
	0.83-0.87	202	207	212	220	220	225	225	230	230																				
	0.88-0.92	207	212	220	225	225	230	230																						
	0.93-0.97	212	220	225	230	230																								
	0.98-1.02	220	225	230																										
	1.03-1.07	225	230																											
	1.08-1.12	230																												

Chapter I Engine

Chapter II Fuel System & Carburetion

Contents

Carburetor
Fuel Tank
Air Cleaner
Exhaust System

Service Information

GENERAL

The fuel system comprises a petrol tank from which petrol is fed by gravity to the float chamber of the Keihin carburetor. A vacuum control tap with build-in gauze filter is located beneath the rear end of the fuel tank. An electrical fuel level sensor which provision single to speed meter and shows fuel level on it.

WARNING

◦ *Gasoline is extremely flammable and is explosive under certain condition. Work in a well ventilated area. Do not smoke or allow flames or sparks in the work area.*

◦ When disassembling the fuel system parts, note the location of the O-ring and gasket. Replace them with new ones if necessary on reassembly.

◦ Before disassembling the carburetor, drain the fuel in the float chamber by turning the drain screw.

CAUTION

◦ Do not bend or twist control cable. Damaged control cable may stick or bind.

SPECIFICATIONS

ITEM	SPECIFICATION
Type	MIKUNI BSR 42
Identification Number	H851
Venturi diameter	42 mm
Float level	35±1 mm
Needle Jet	6CGY7-60
Main Jet	150
Idle Jet	45
Idle speed	1400 +/- 100 rpm
Throttle lever free play	2 ~ 3 mm

Chapter II Fuel System & Carburetion

Troubleshooting

Engine cranks but won't start
- No fuel in tank
- No fuel to carburetor
- Engine flooded with fuel
- No spark at plug (faulty ignition system)
- Clogged air cleaner
- Intake air leak
- Improper choke operation
- Improper throttle operation
- Faulty fuel valve

Hard starting or stalling after starting
- Improper choke operation
- Ignition malfunction
- Faulty carburetor
- Contaminated fuel
- Intake air leak
- Incorrect idle speed
- Faulty fuel valve

Rough idle
- Faulty ignition system
- Incorrect idle speed
- Faulty carburetor
- Contaminated fuel

Misfiring during acceleration
- Faulty ignition system

Backfiring
- Faulty ignition system
- Faulty carburetor

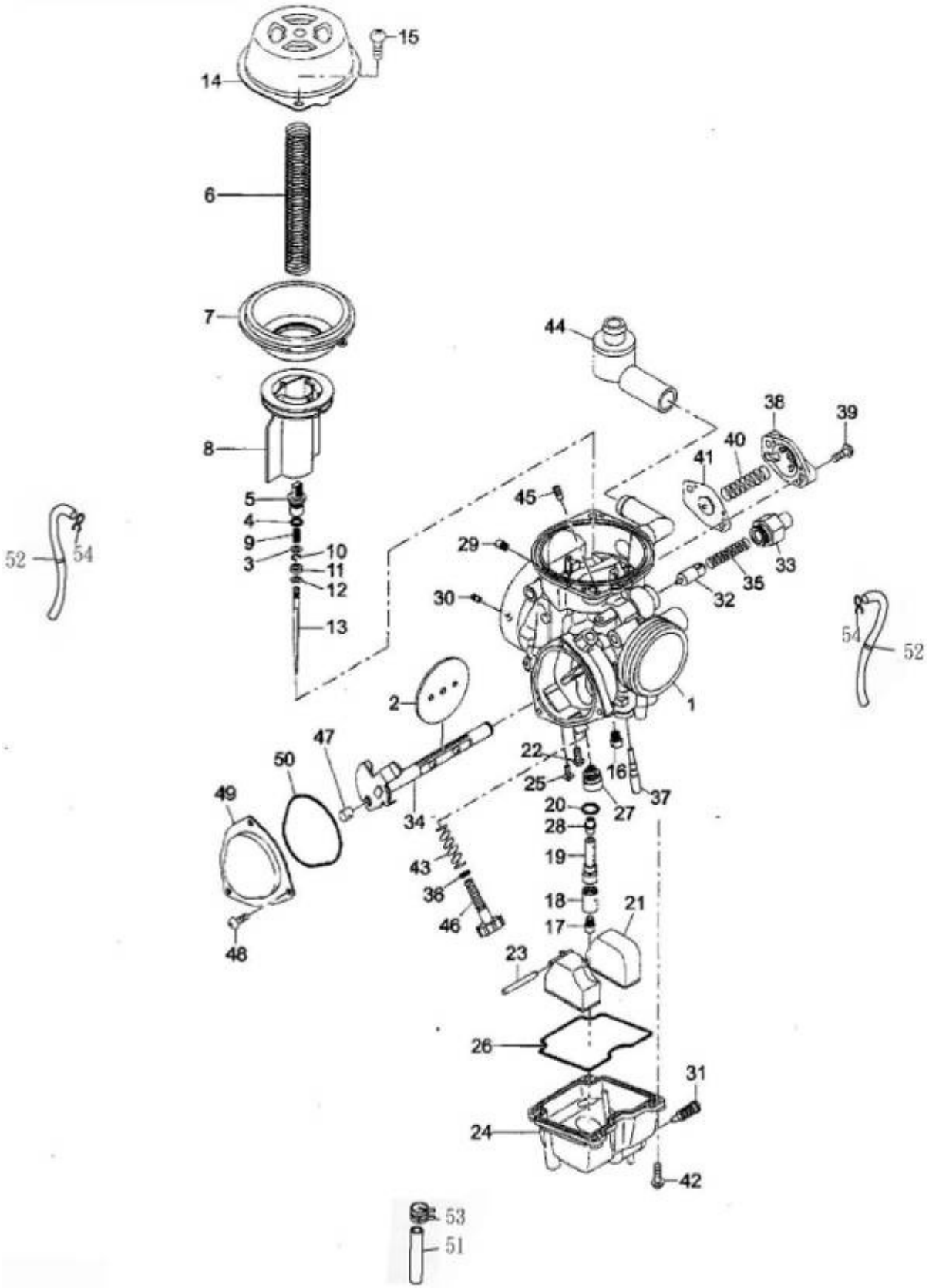
Poor performance and fuel economy
- Clogged fuel system
- Faulty ignition system
- Faulty fuel valve
- Faulty components in the evaporative emission control system (US version only)

Lean mixture
- Clogged fuel jet
- Stuck vacuum piston
- Faulty float valve
- Low float level
- Blocked fuel cap vent
- clogged fuel line
- Restricted fuel line
- Clogged air vent tube
- Intake air leak
- Faulty fuel valve

Rich mixture
- Clogged air jets
- Faulty float valve
- Float level too high
- Improper choke operation
- Dirty air cleaner

Chapter II Fuel System & Carburetion

Carburetor

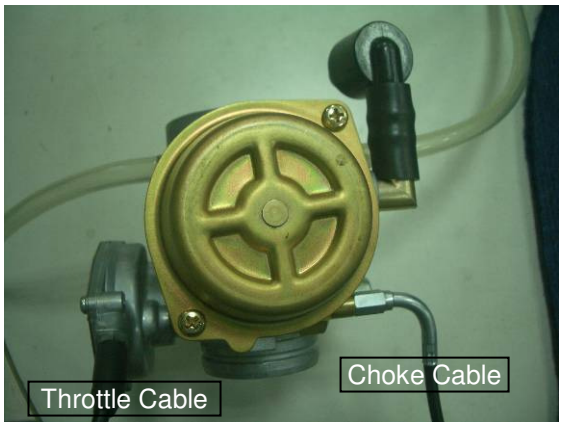


Chapter II Fuel System & Carburetion

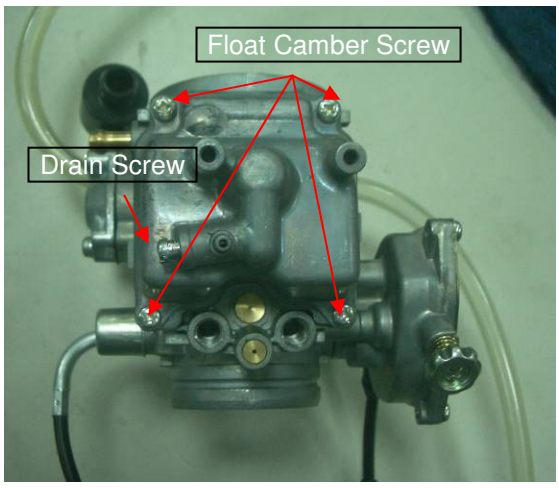
CARBURETOR

Remove the Carburetor

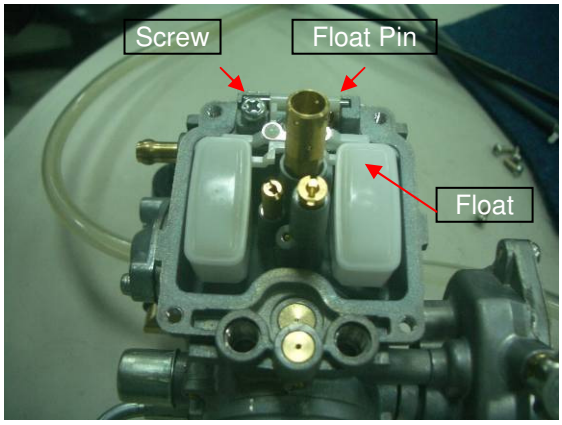
- Loose the fuel releasing screw of the carburetor and release the fuel in float chamber.
- Remove the fuel tube and vacuum (-) pressure tube.
- Taking off the intake clamp.
- Taking off the guide pipe clip.
- Remove the choke cable from carburetor.
- Remove the throttle cable.



Disassembly of carburetor



- Loosen the drain screw to draining the reserve fuel in float camber.
- Remove the float chamber screws, the float chamber and its O-ring



- Remove the screw and float pin, then remove the float.
- Remove the needle valve

Chapter II　Fuel System & Carburetion

FUEL SYSTEM

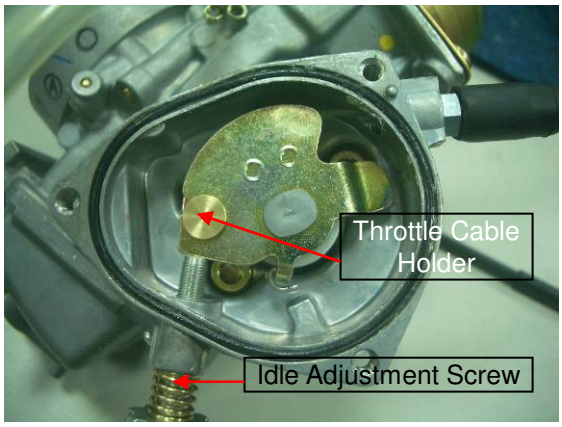
- Using a backup wrench on the main jet holder, unscrew the main jet, then the needle jet holder and nut.

Warning：
Be ware not to damage the main jet.

- Remove the needle jet
- Unscrew and remove the slow jet

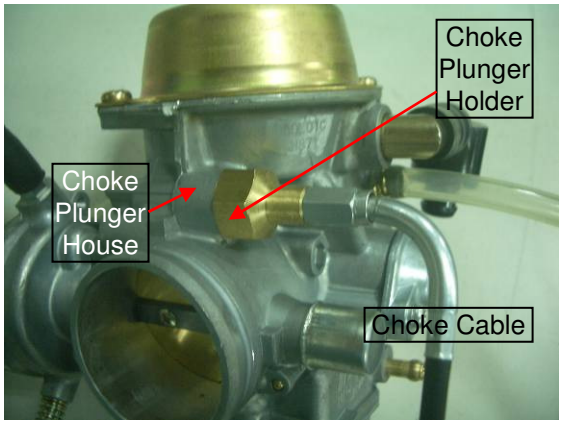
Remove throttle cable

- Remove the throttle cable cover screws, then open the cover
- Remove the throttle cable holder to pull out the throttle cable



Remove choke cable

- Remove the choke plunger holder
- Remove plunger, spring and choke cable



Chapter II Fuel System & Carburetion

Assembly

Clean main jet, needle jet holder, needle jet and idle jet in cleaning solvent and blow them open with compressed air.

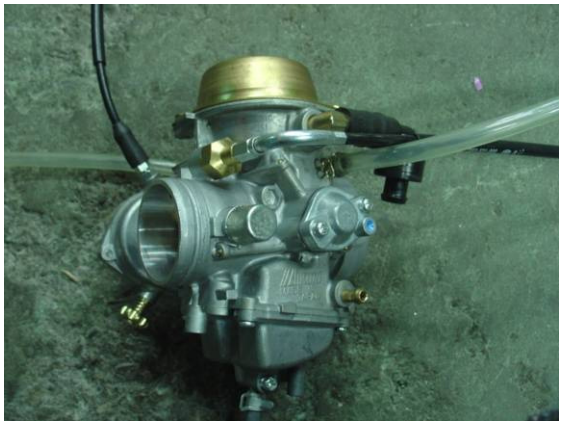
Install main jet and idle jet.

Install the needle jet and needle jet holder.

Install the float valve, float and float pin.
Reinstall the float chamber.

Carburetor Installation

Tighten the drain screw.
Connect the drain tube to the carburetor.



Install the choke cable with choke plunger.

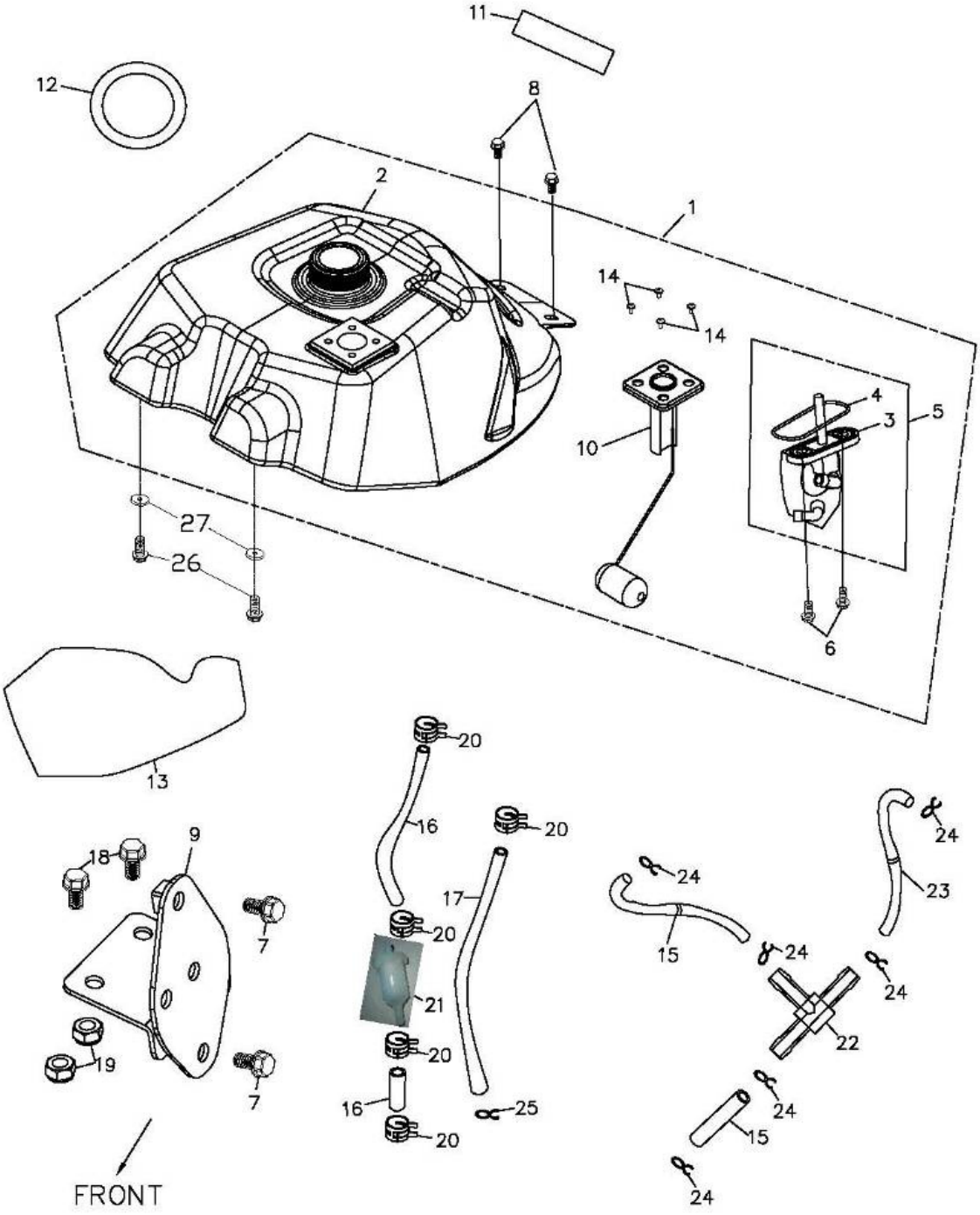
Install the carburetor aligning the tab on the carburetor with the groove in the intake manifold and tighten the band screw.

Install the air chamber and tighten the connecting tube bands.
Adjust the following:

- throttle lever free play
- idle speed

Chapter II Fuel System & Carburetion

FUEL TANK



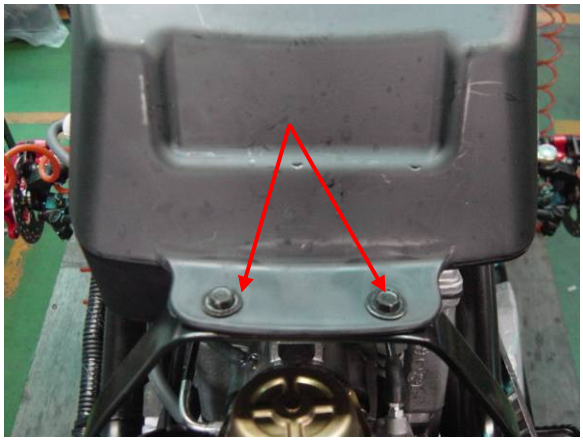
Chapter II Fuel System & Carburetion

FUEL TANK

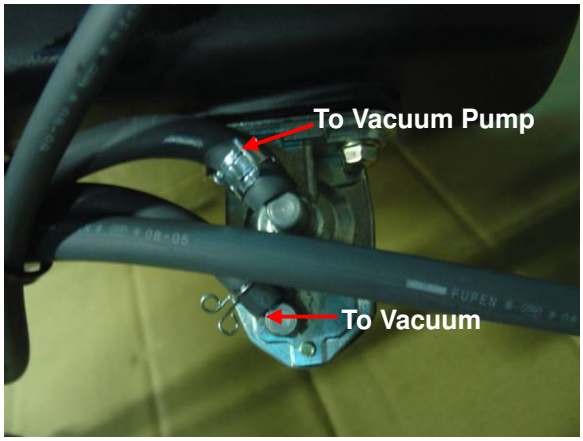
Removal

WARNING

◦ *Do not smoke or allow flames or spark in the work area.*

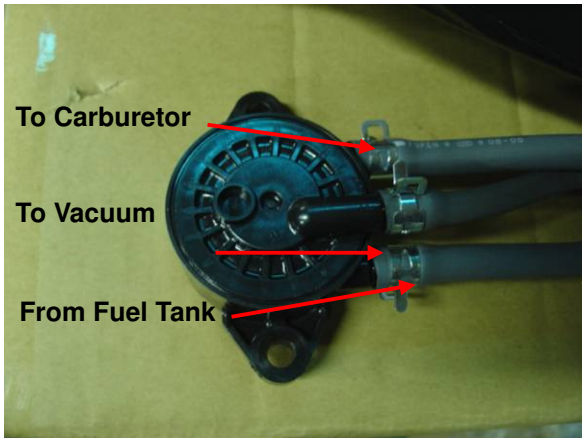


Remove the seat.
Remove the front fender.
Remove fuel tank to frame mounting bolts.
Disconnect the fuel tube and vacuum tube on fuel valve.
Disconnect the petrol gauge connector.
Remove the fuel tank from frame body.



Fuel Valve Inspection

Disconnect vacuum tube from fuel valve and fuel tube to vacuum pump.
Connect a commercially brake bleeder to vacuum tube then pump the brake bleeder.
Check the fuel flow thru fuel tube, if it's block or intermittently, replace the fuel valve.



Installation

Install the fuel tank in the reverse order of removal.

NOTE

◦ Install vacuum pump hose as it's specified direction.

Chapter II Fuel System & Carburetion

PETROL GAUGE SENSOR

Removal

Remove fuel tank.

Loosen four petrol gauge mounting bolts.

Remove petrol gauge from the fuel tank.

NOTE

◦ Do not damage or bend the float and float arm.

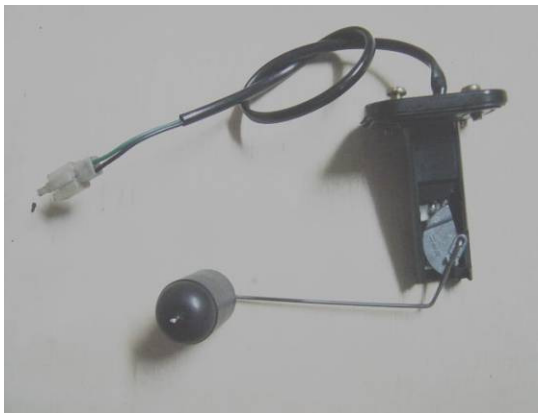
Inspection

Check the petrol gauge seal for damage or deterioration and replace if necessary.

Use a ohmmeter connect to gauge terminal to

check the ohm reading from upper to lower float level of petrol gauge.

Ohm reading: 10 Ω ~ 90 Ω



Replace petrol gauge if the ohm reading is discontinuousness or the reading is ∞.

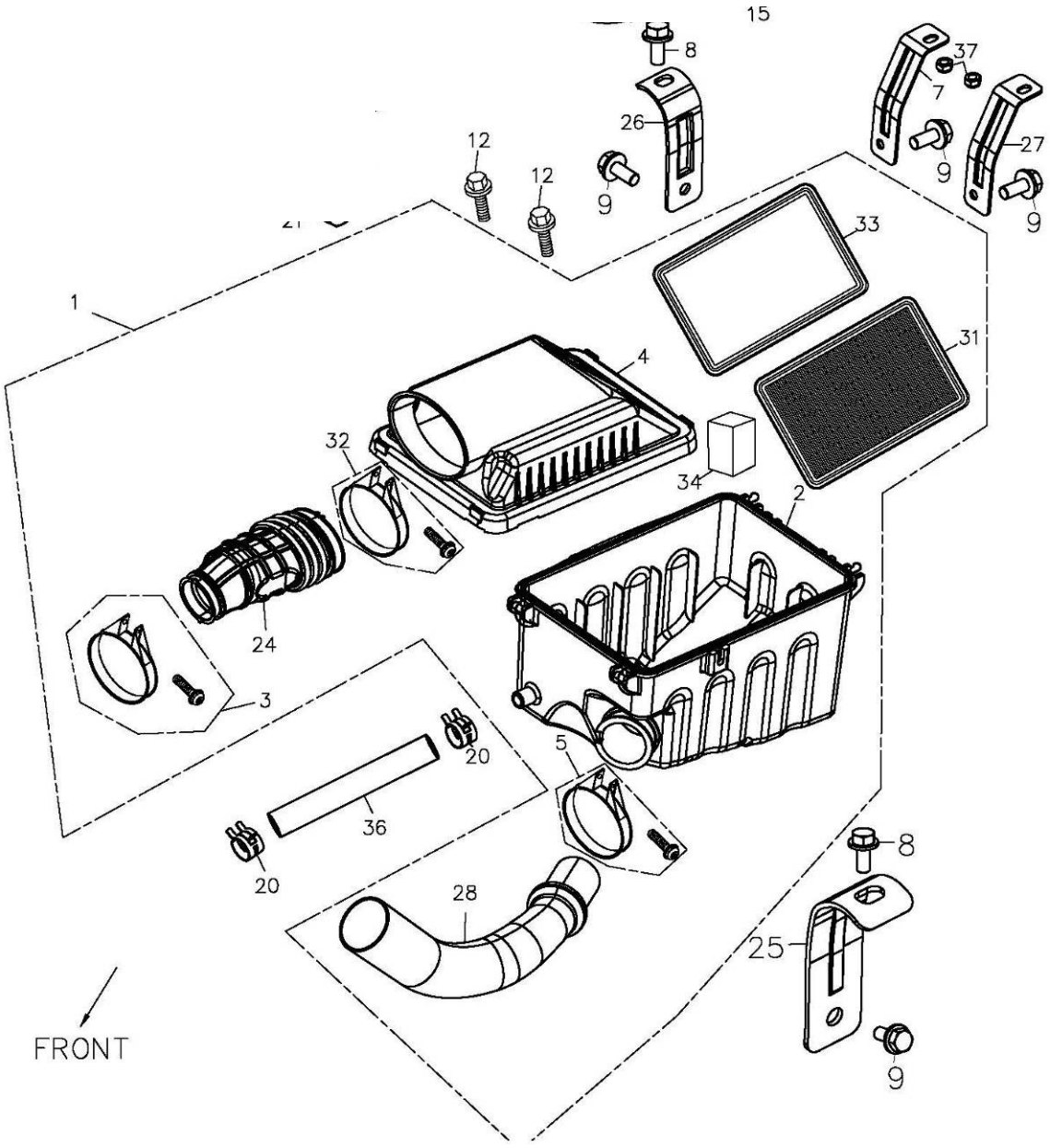
Installation

Install the petrol gauge onto the fuel tank.

Install the mounting bolts.

Chapter II Fuel System & Carburetion

AIR CLEANER ASSEMBLY



Chapter II Fuel System & Carburetion

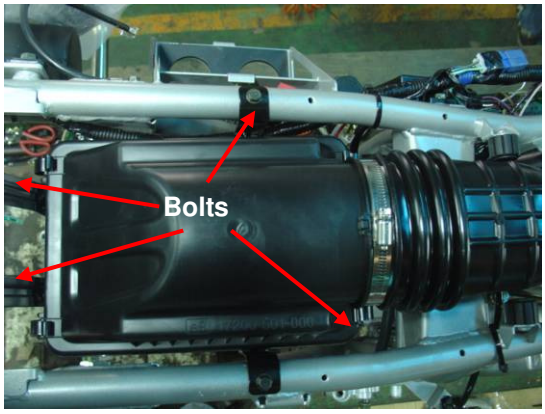
AIR CLEANER ASSEMBLY

Removal

Remove the seat.

Loosen the air cleaner case to air camber connecting tube band.

Remove the four air cleaner case mounting bolts and remove the air cleaner case.



Inspection and clean out

Disconnect the air filter assembly mounting clamp.

Remove the air filter element cover.

Drain the accumulated water or dust.

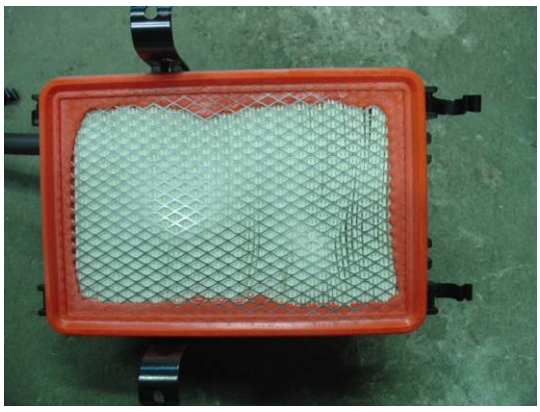
Clean the air cleaner case and filter element with compress air.

Inspect the filter element A and B, replace it if necessary.

Install the filter assembly to air cleaner case.

NOTE

◦ Tighten the mounting clamp screw securely.



Installation

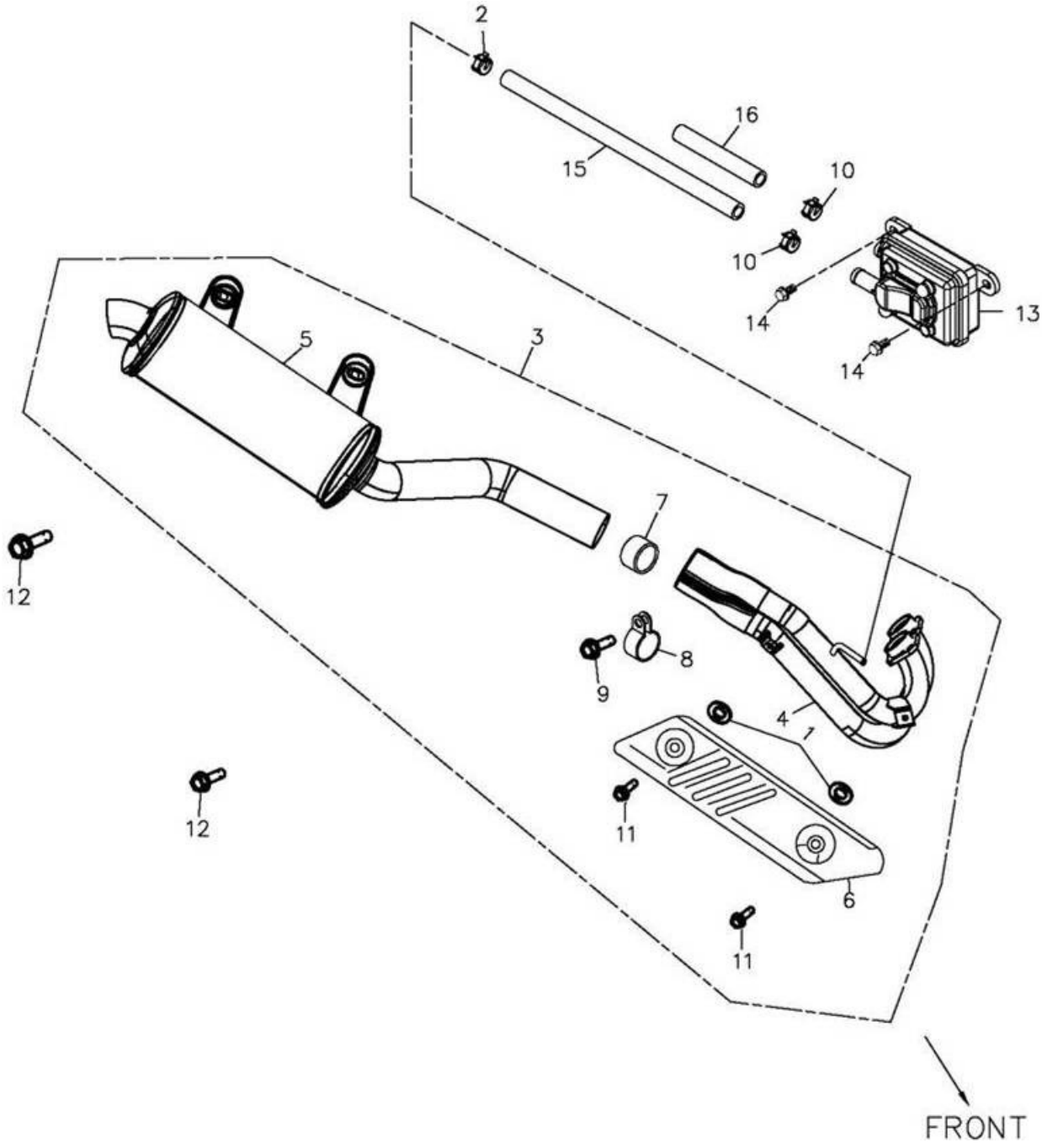
Install the air cleaner case in the reverse order of removal.

NOTE

◦ Tighten the connecting tube band screw securely.

Chapter II Fuel System & Carburetion

EXHAUST SYSTEM

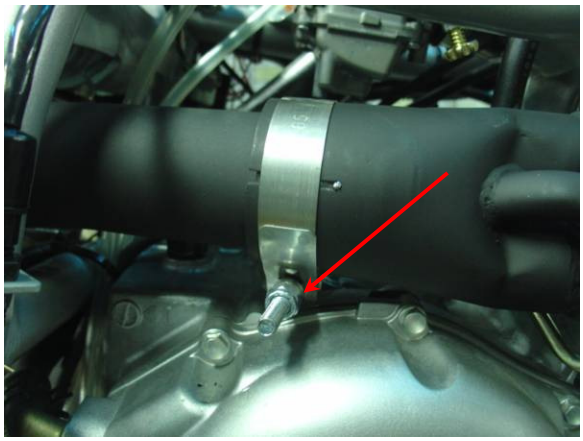


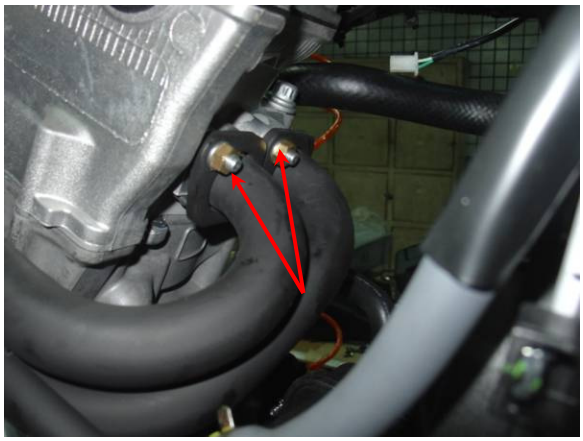
Chapter II Fuel System & Carburetion

EXHAUST SYSTEM

Removal

Disconnecting reed valve intake hose
Loosen exhaust pipe front section to cylinder head mounting nuts.
Loosen muffler silencer hanger mounting bolts.
Pull back the muffler assembly for removal.
Bend the exhaust pipe front section to release pipe springs.





Inspection

Check the exhaust pipe gasket, replace it if necessary.

Installation

Install the muffler assembly in the reverse order of removal.

NOTE

◦ Tighten the exhaust pipe to cylinder head mounting nuts properly.

Start the engine to check any leak thru gasket.

Chapter IV Frame & Cover

GENERAL INFORMATION

This Chapter covers the procedures necessary to remove and install the body panels and other body parts. Since many service and repair operations on this vehicle require remove of the panels and/or other parts, the procedure are grouped here and referred to from other Chapter.

In the case of damage to the panels or other parts, it is usually necessary to remove the broken component and replace it with a new (or used) one. The material that the plastic body parts are composed of doesn't lend itself to conventional repair techniques. There are, however, some shops that specialize in "plastic welding", so it would be advantageous to check around first before throwing the damaged parts away.

NOTE

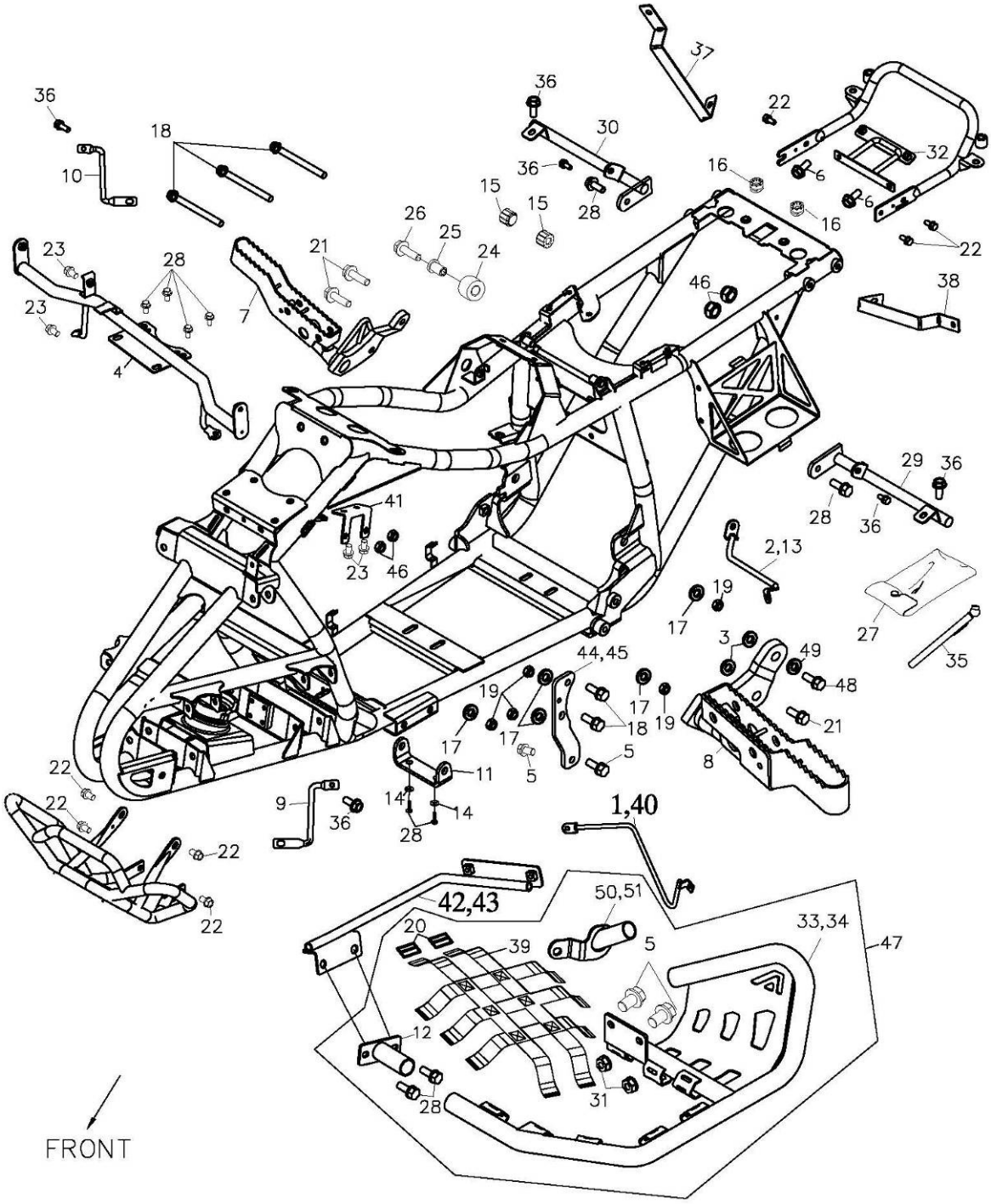
- When attempting to remove any body panel, first study the panel closely, noting any fasteners and associated fittings, to be sure of returning everything to its correct place on installation.
- In some cases, the aid of an assistant will be required when removing panels, to help avoid damaging the surface.
- Once the visible fasteners have been removed, try to lift off the panel as described but **DO NOT FORCE** the panel – if it will not release, check that all fasteners have been removed and try again. Where a panel engages another by means of tabs and slots, be careful not to break the tabs or to damage the bodywork.
- Remember that a few moments of patience at this stage will save you a lot of money in replacing broken panels.

FRAME

- All models use a double-cradle frame made of steel tubing.
- The frame shouldn't require attention unless accident damage has occurred. In most cases, frame replacement is the only satisfactory remedy for such damage. A few frame specialists have the jigs and other equipment necessary for straightening the frame to the required standard of accuracy, but even then there is no simple way of assessing to what extent the frame may have been over-stressed.
- After the machine has accumulated a lot of miles, the frame should be examined closely for signs of cranking or splitting at the welded joints. Corrosion can also cause weakness at these joint

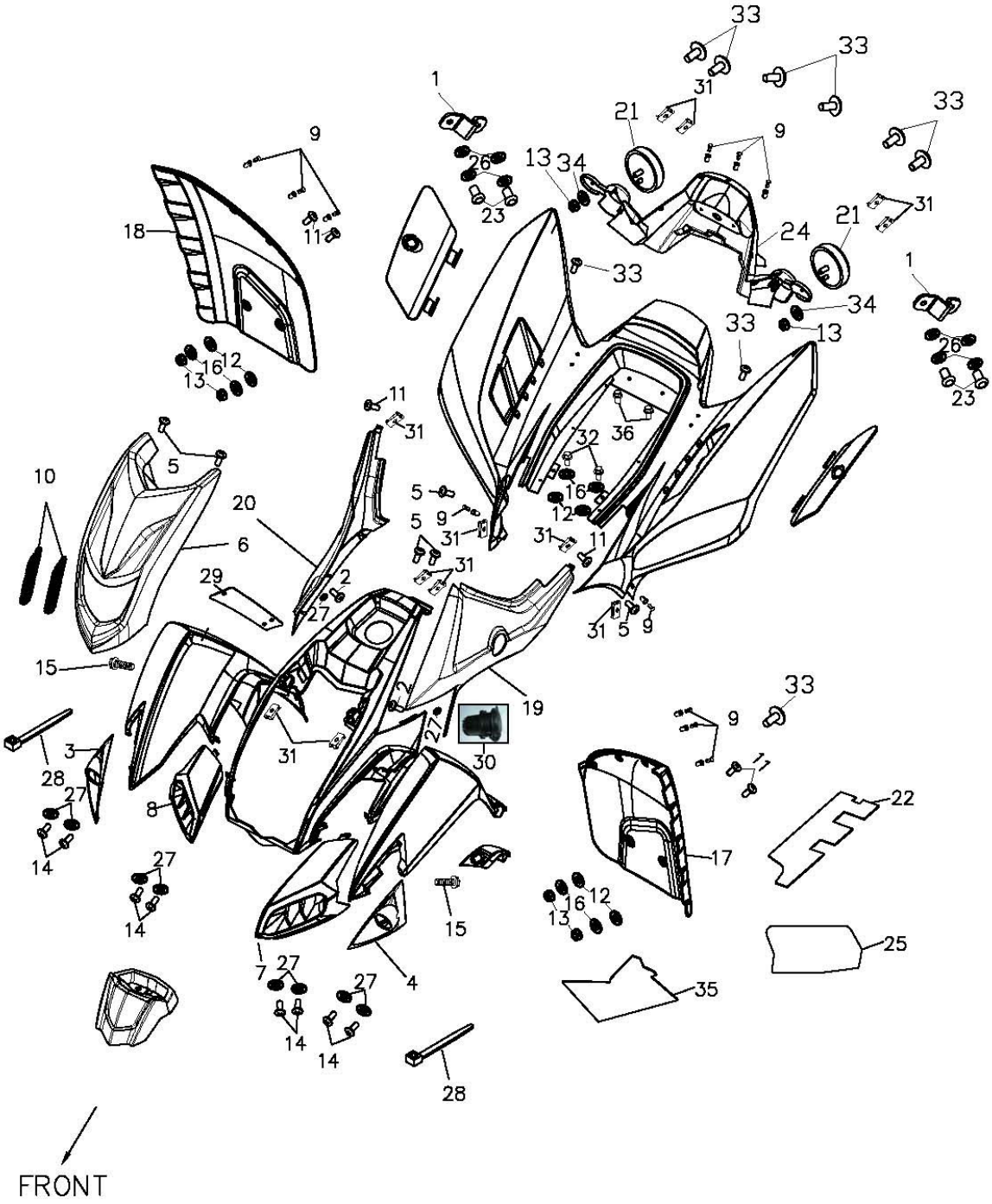
Chapter IV Frame & Cover

FRAME ATV-500S



Chapter IV Frame & Cover

COVER ATV-500S

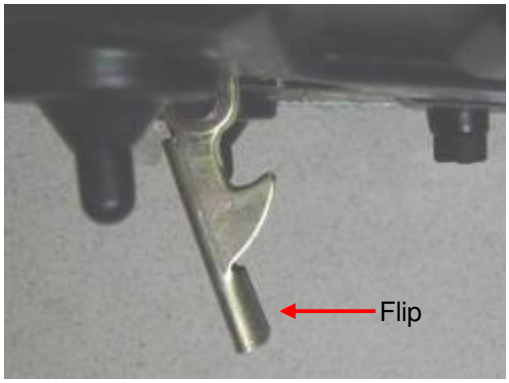


Chapter IV Frame & Cover

REAR FENDERS

REMOVAL

Remove the seat by flip back the latch level and lift the back end of seat.
Remove left and right floor panels.
Disconnect tail light and L/R indicator light connector.



Remove upper fender to frame mounting bolts and front to rear fender joint bolts.
Remove two lower mount bolts.

Remove tail light fender.
Open the rear luggage box and remove the mounting bolt.
Raise up the fender and pull to back to remove the rear fender.

INSTALLATION

Install the rear fender in the reverse order of removal.

NOTE

◦ Be sure to insert floor panel tabs to front and read fenders corresponding slots.

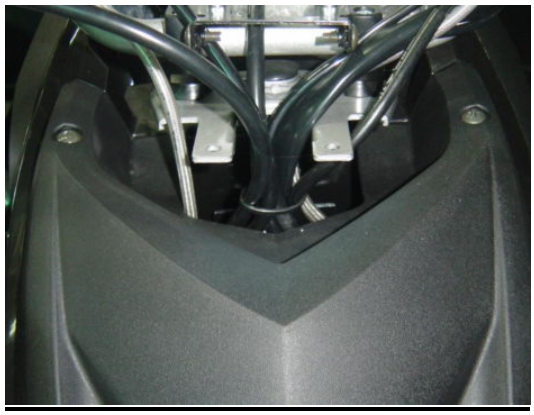
Chapter IV Frame & Cover

FRONT FENDER

REMOVAL

NOTE

◦ The aid of an assistant will be required when removing front panel.



Remove L/R floor panel.

Remove front fascia and disconnect Disconnect indicator light and main switch wire.

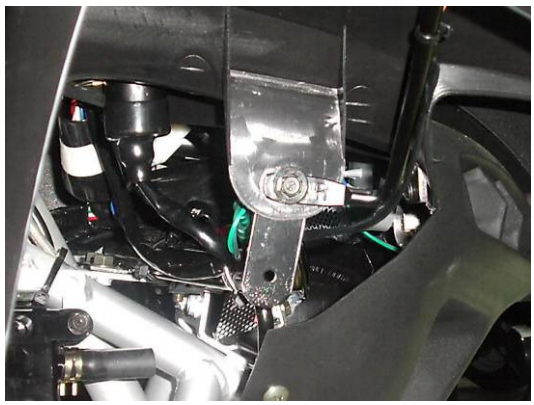
Remove L/R side cover and front to rear joint bolts.

Remove speedometer cover and handle bar supporter then make handle bar freely for moving.

Remove fender to frame mounting bolts

Remove fuel cap

With an assistant to help to raise the front fender and let it passed the handle bar and remove it from frame.



INSTALLATION

Install the rear fender in the reverse order of removal.

NOTE

◦ Be sure to insert floor panel tabs to front and read fenders corresponding slots.

Chapter V Wheels, Tires & Brakes

Contents

Handlebar & Steering
Front & Rear Wheel
Suspension System
Hydraulic Brake

Service Information

Specification

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Axle round out		---	0.2 (0.008)
Rim round out	Radial	---	2.0 (0.08)
	Axial	---	2.0 (0.08)

Torque Values

Steering shaft bottom nut		50~60 N.m (36~43 ft.lb)
Handle bar holder clamp nut		30-40 N.m (22-29 ft.lb)
Handle bar holder clamp bolt		24-30 N.m (17-22 ft.lb)
Tie rod end		40 N.m (29 ft.lb)
Ball joint	Upper	55 N.m (40 ft.lb)
	Lower	55 N.m (40 ft.lb)
Front wheel hub nut		120 N.m (87 ft.lb)
Rear wheel hub nut		150 N.m (108 ft.lb)
Wheel nut		60 N.m (43 ft.lb)
Brake disk bolt		30 N.m (22 ft.lb)
Shock absorber		
Front		45 N.m (33 ft.lb)
Rear Upper		100 N.m (72 ft.lb)
Rear Lower		55 N.m (33 ft.lb)

Troubleshooting

Hard steering

- Steering shaft nut too tight
- Steering shaft bearing damage
- Steering shaft holder too tight
- Insufficient tire pressure

Soft suspension

- Damper oil leaks
- Weak shock absorber spring

Steers to one side or do not tract straight

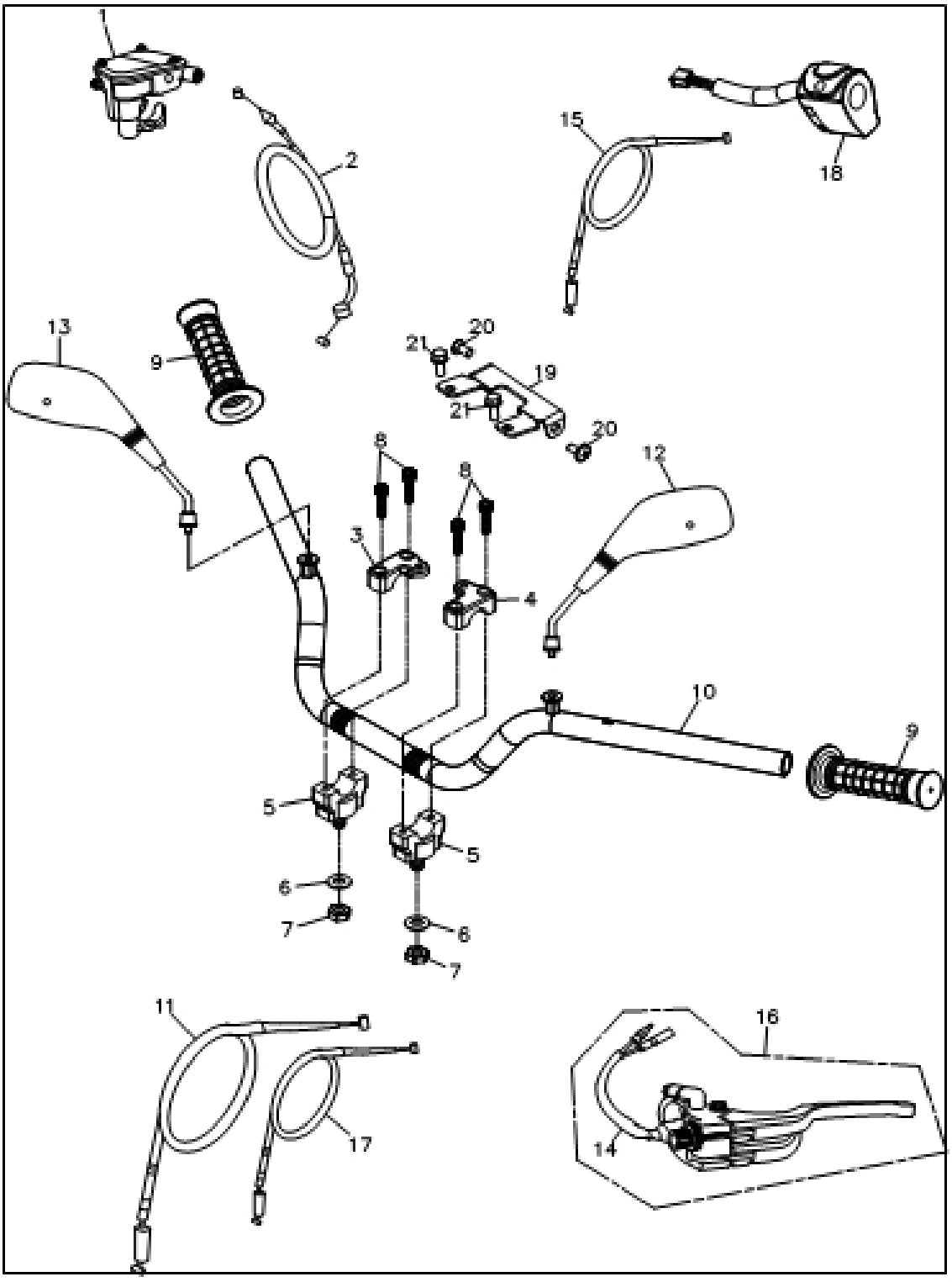
- Insufficient toe in setting
- Bend A-arm
- Insufficient tire pressure

Front wheel wobbling

- Bent rim
- Faulty or unevenly worn tire
- Excessive wheel bearing play

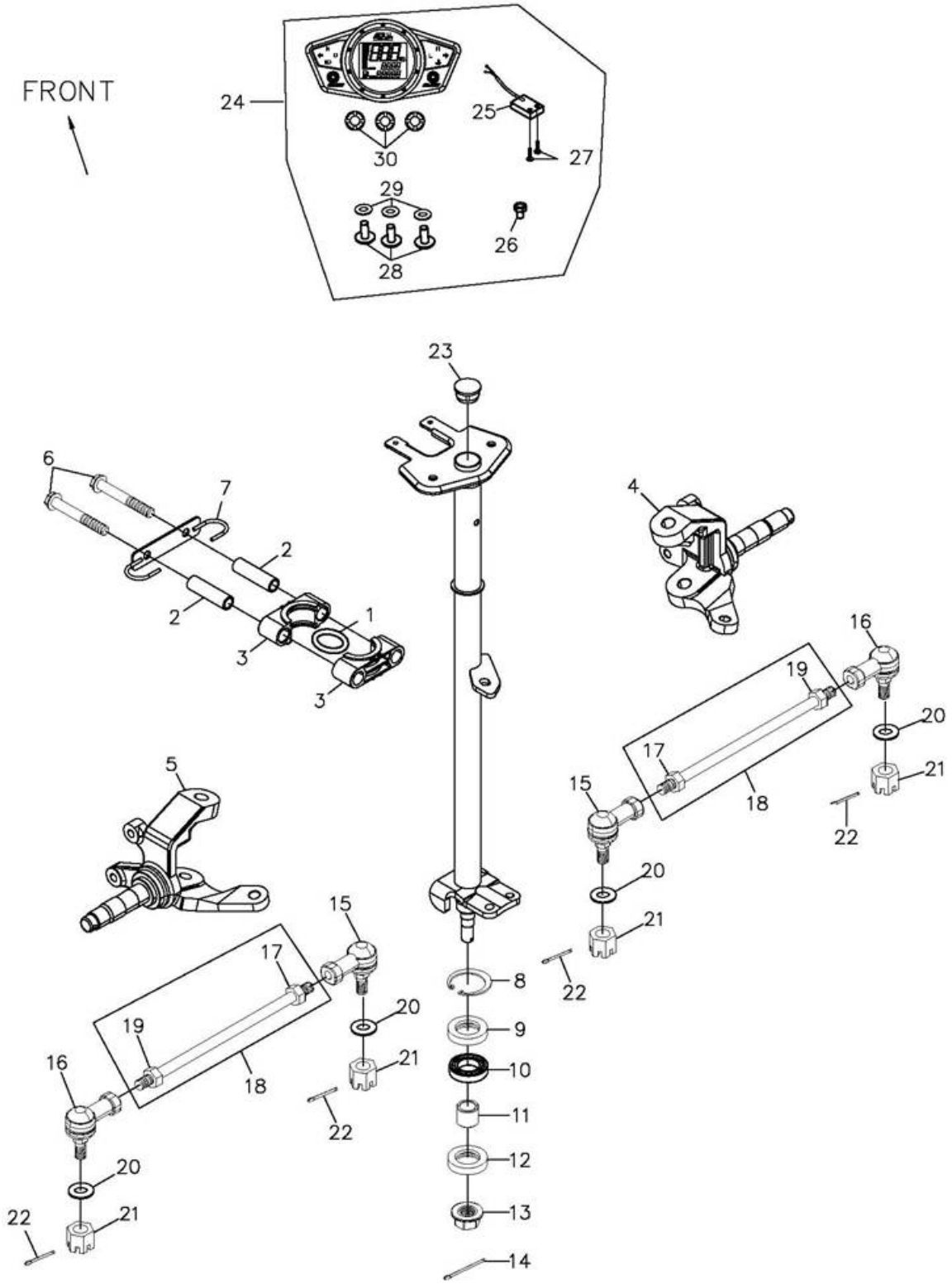
Chapter V Wheels, Tires & Brakes

HANDLEBAR



Chapter V Wheels, Tires & Brakes

STEERING



Chapter V Wheels, Tires & Brakes

REMOVAL

Remove the speedometer assembly mounting screws.

Loosen L/R hand brake master cylinder holder mounting bolts and remove brake cylinder from handlebar.

Loosen L handle switch mounting bolts and remove switch from handlebar.

Disconnect brake switch wire, overdrive switch wire, throttle and choke cable.

Loosen four handle clamp hex socket bolts and remove handlebar.

NOTE

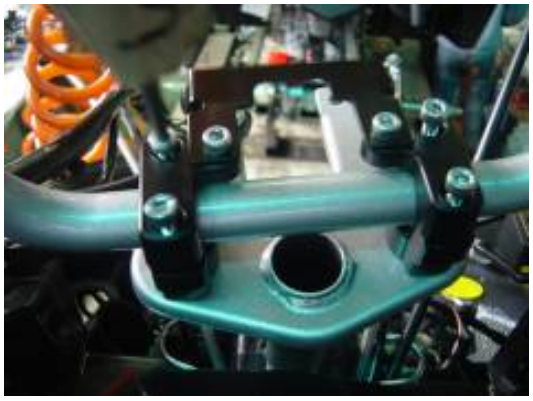
◦ Do not remove the brake hose bolt from the brake cylinder.

INSTALLATION

Install handlebar onto lower holders and aligning the punch mark on the handlebar with the upper surfaces surface of the lower holders.

Install the handlebar upper holders and tighten four hex socket bolts.

Torque: 24-30 N.m (17-22 ft.lb)



Install the L/R hand master cylinder holder with the UP mark facing up and aligning the end of the holder with the punch mark on the handlebar.

Tighten the upper bolt first, then tighten the lower bolt.

Torque: 24-30 N.m (17-22 ft.lb)

Install the L handle switch housing aligning the locating pin on the housing with the hole in the handlebar.

Connect the throttle and choke cable.

Connect the brake switch and overdrive wire.Insert speedometer assembly to the handlebar and tighten the mounting screw.

Chapter V Wheels, Tires & Brakes

STEERING SHAFT REMOVE

Remove the front fender.

NOTE

◦ Raise the front frame and secure with stable stand for easily working.

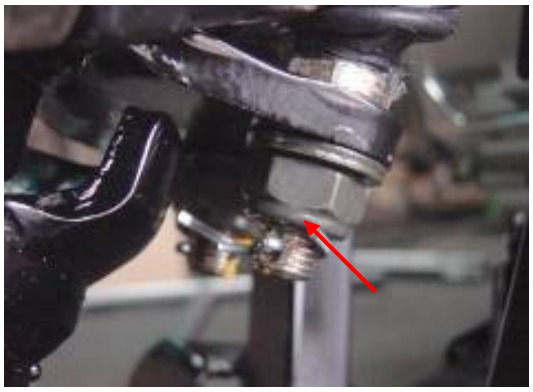
Remove the handlebar.

Remove tie rod end nuts on steering shaft side.

Remove the steering shaft nut.

Remove the steering shaft holder bolts

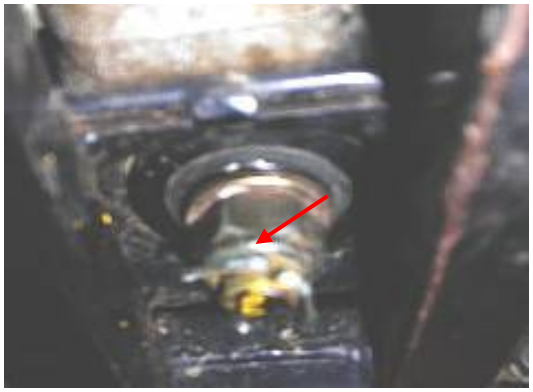
Remove the steering shaft holder basket and pull out the steering from frame.



INSPECTION

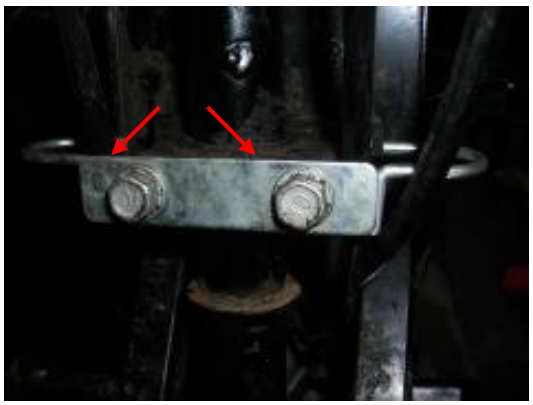
Inspect tie rod end mounting plate for wear or damage and replace if necessary.

Inspect steering shaft bush and holder bush for wear and damage. Replace if necessary.



NOTE

◦ Apply grease to steering shaft bush and holder bush when replace and reassembling.

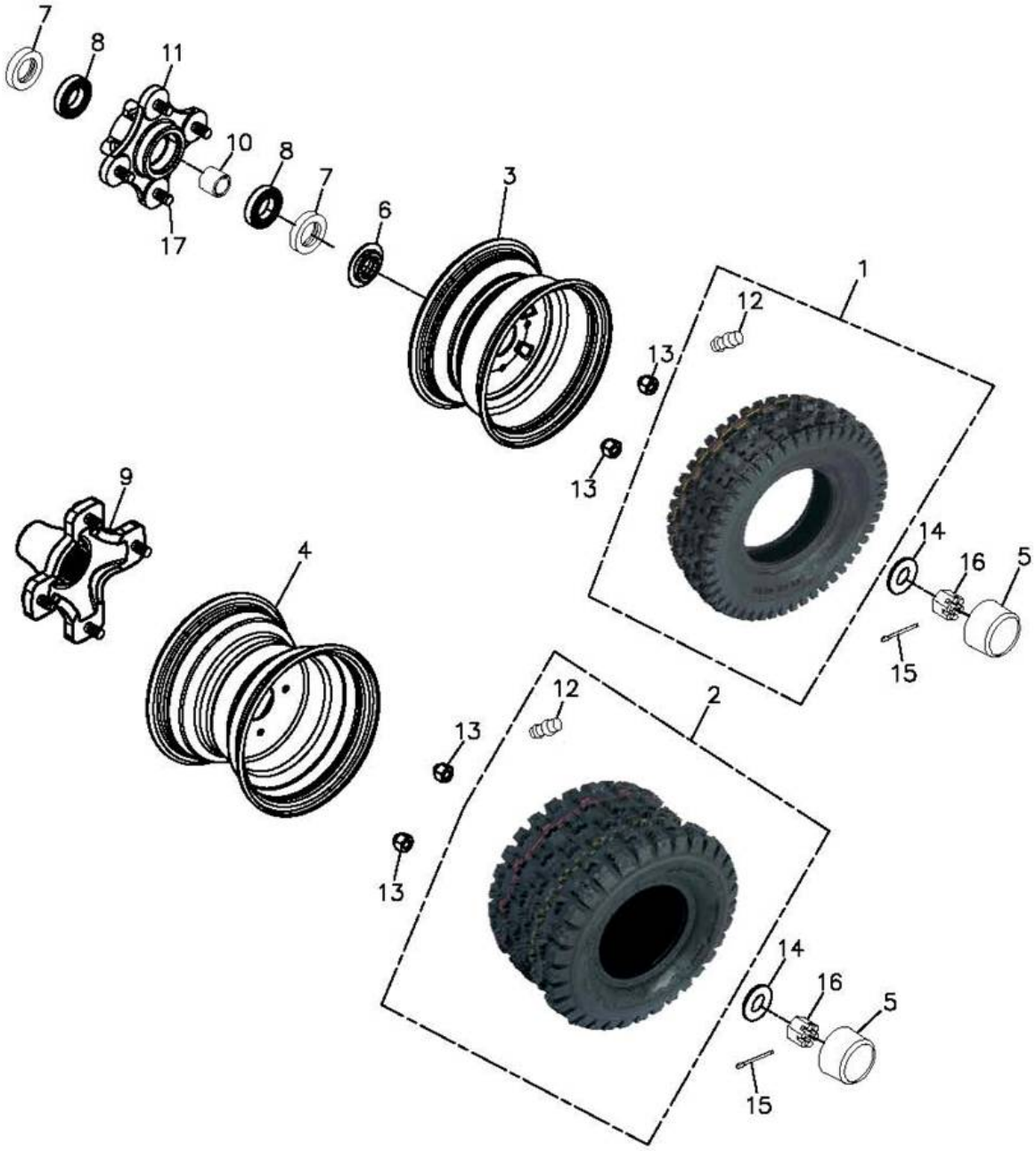


INSTALLATION

Install the steering shaft in the reverse order of removal.

Chapter V Wheels, Tires & Brakes

FRONT & REAR WHEEL



Chapter V Wheels, Tires & Brakes

Front & Rear Wheel

WHEEL REMOVAL

NOTE

◦ Use a hydraulic jacket for easily serving.

Use parking brake to locked rear wheel.
Slightly loosen wheel nuts.
Raise the frame to let wheel leave ground.
Loosen and remove wheel nuts then remove wheel.

INSPECTION

Check the tires for cuts or embedded object
Check the front and rear wheels rim for trueness.

Service Limits:

Radial: 2.0 mm (0.08in)
Axial: 2.0 mm (0.08in)

Replace if the reading exceeds the service limit.
Measure the tread depth at the center of tires.
Replace the tires if the tread depth reaches the following limits:

Minimum tread depth:

Front: 1.5 mm (0.06in)
Rear: 2.5 mm (0.08in)

INSTALLATION

Align wheel to hub studs and install wheel nuts.
Down the vehicle to ground and tighten wheel nuts to specified torque.

Torque: 60 N.m (43 ft.lb)

Chapter V Wheels, Tires & Brakes

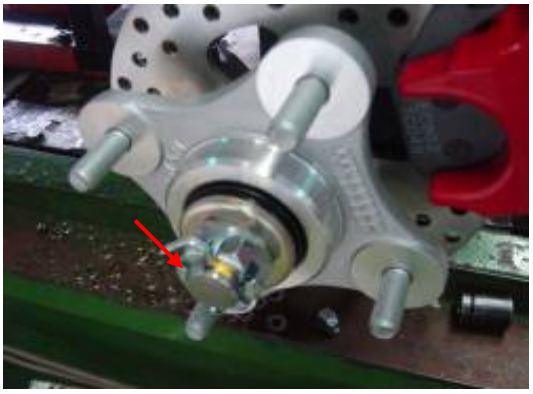
HUB REMOVAL

Remove the wheel.

Remove the hub to axle mounting nut cotter pin.

Loosen the hub to axle mounting nut and remove nut and plane washer.

Remove the hub from axle.



INSPECTION

Front hub

Check oil seal for broken or damage, replace it if necessary.

Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly.

Check the outer race fits tightly in the hub.

Remove and discard the bearing if the races do not turn smoothly, quietly or if they are fit loosely in the hub.

NOTE

◦ Replace the hub bearing in pairs.

INSTALLATION

Install front and rear hub in the reverse order of removal.

Torque:

Front: 120 N.m (87 ft.lb)

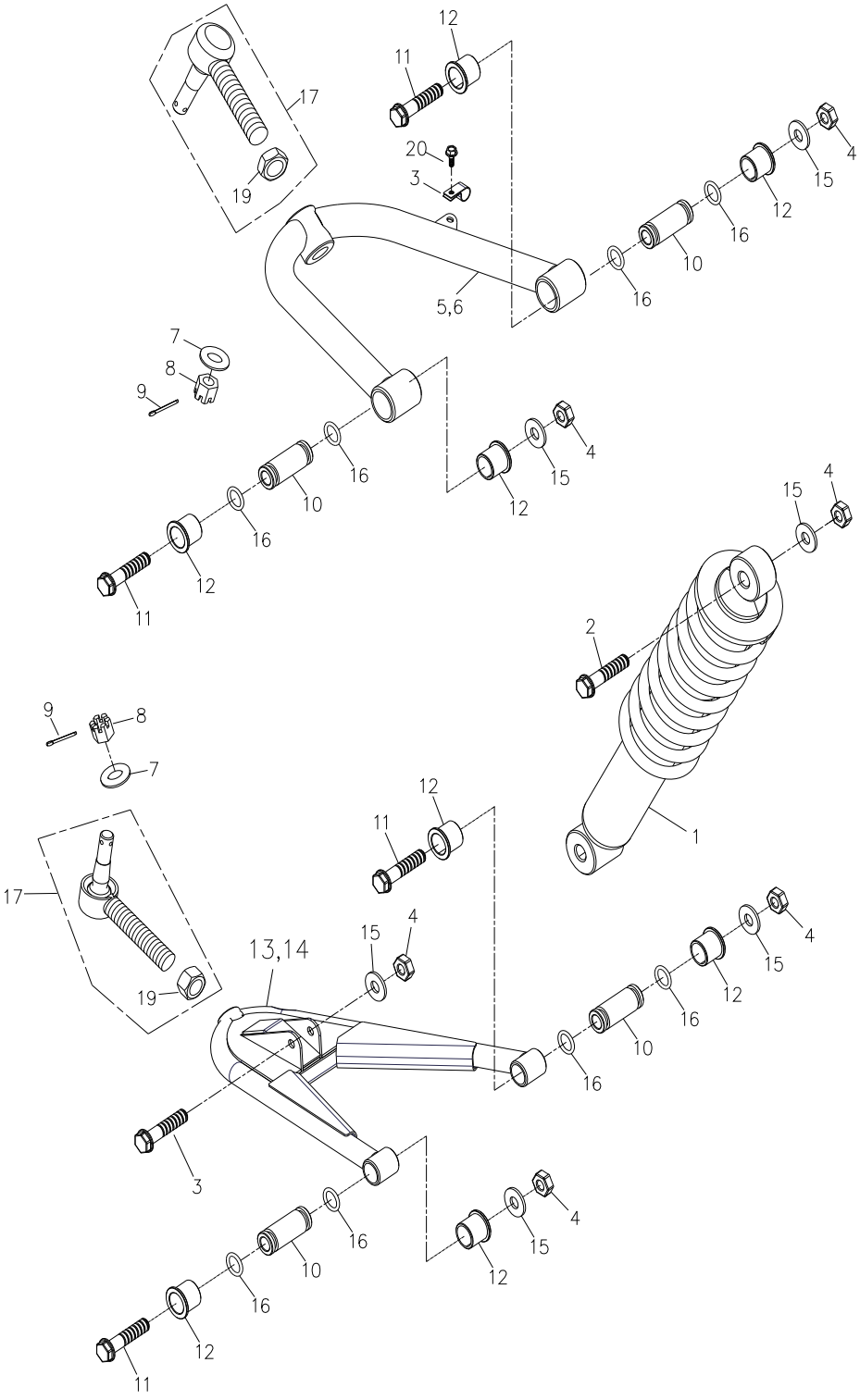
Rear: 150 N.m (108 ft.lb)

NOTE

◦ Use a new axle mounting nut cotter pin.

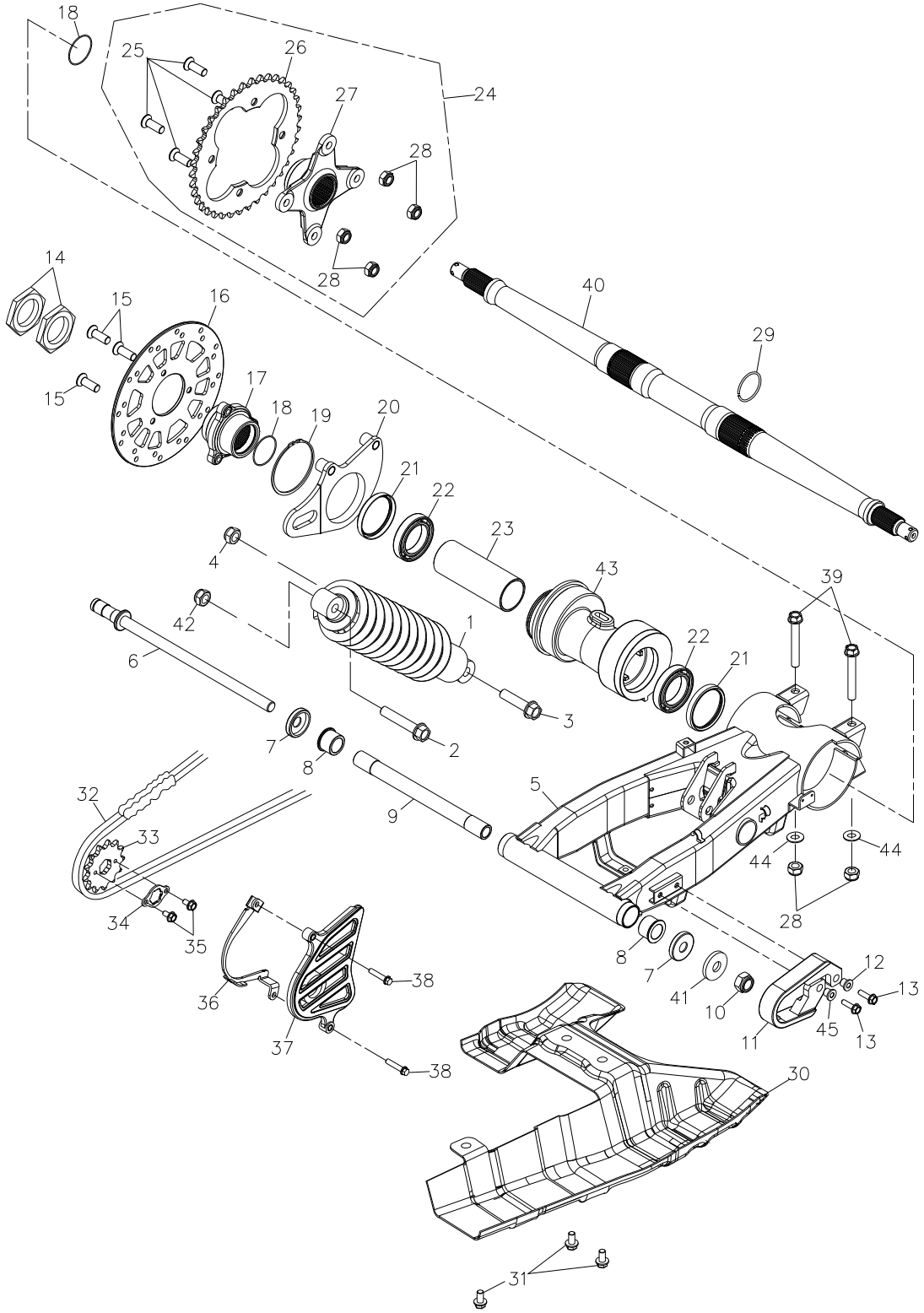
Chapter V Wheels, Tires & Brakes

FRONT SUSPENSION



Chapter V Wheels, Tires & Brakes

REAR SUSPENSION



Chapter V Wheels, Tires & Brakes

Front Suspension

A-arm REMOVAL

CAUTION

◦ Support the vehicle frame steady when servicing or inspecting.

Remove front tire.

Remove tie rod end on knuckle.

Remove upper and lower ball joint on knuckle and apart the knuckle with brake clipper from ball joint.

Remove lower shock absorber mounting bolt.

Remove upper and lower a-arm mounting bolts and remove a-arm from vehicle frame.

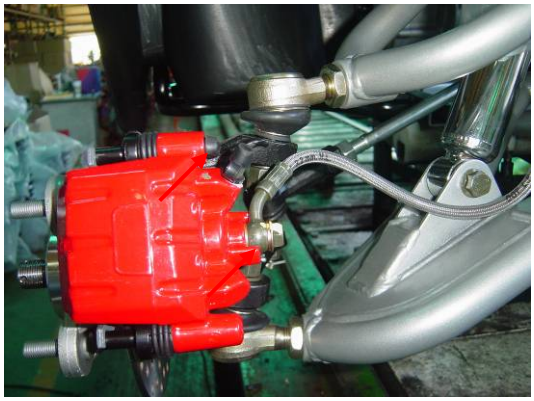
INSPECTION

Inspect ball joint rubber and joint for wear or damage.

Replace ball joint upper and lower at same time.

Inspect a-arm bushing, replace it if necessary.

Inspect a-arm for any crushed or bended.

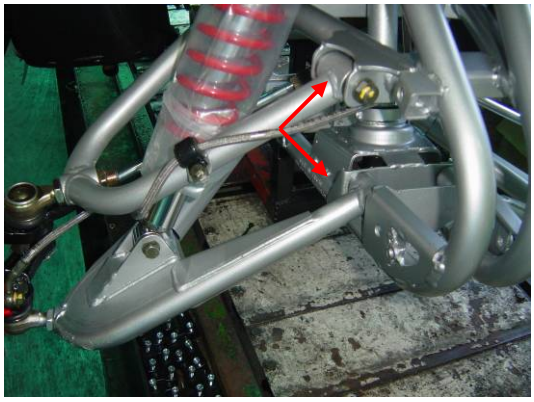


INSTALLATION

Install upper and lower a-arm in the reverse order of removal.

Torque:

Ball joint	**55 N.m (40 ft.lb)**
Mounting bolts	**30 N.m (22 ft.lb)**
Tie rod end nuts	**40 N.m (29 ft.lb)**



NOTE

◦ Apply greases on both of axle holder oil seal before installation.

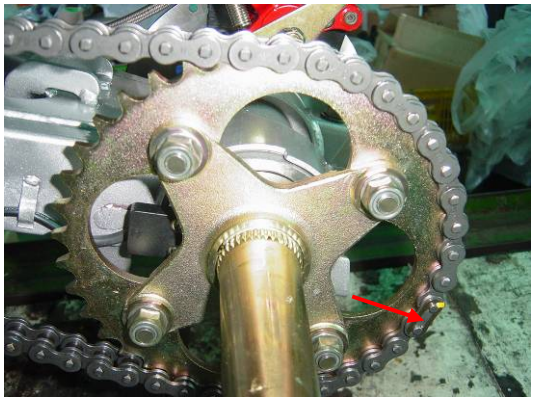
Chapter V Wheels, Tires & Brakes

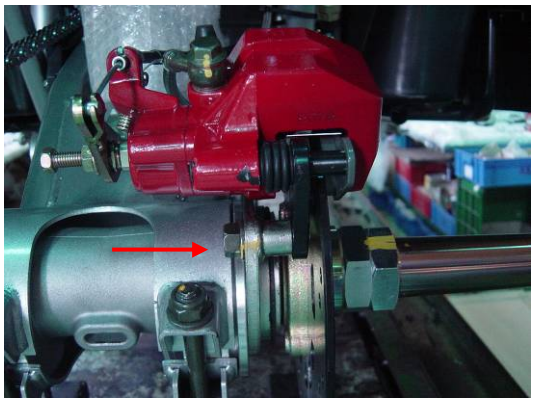
Rear Suspension

SWING ARM REMOVAL

CAUTION

◦ Support the vehicle frame steady when servicing or inspecting.





Remove L and R foot pad and rear tires.
Disconnect drive chain and remove the chain
Remove rear shock absorber mounting bolts both upper and lower then remove shock from axle.
Remove rear caliper and pull back caliper set with brake line and parking brake cable aside the swing arm assemble.
Remove rocker arm to chassis mounting bolt.
Remove foot brake pedal.
Loosen the swing arm bolt and remove it.
Pull back the swing arm assembly with axle and remove it from chassis.

INSPECTION

Check swing arm bushing and oil seal for broken or damage, replace it if necessary.
Check rocker arm bushing and roller bearing. The bearing must turn smoothly and quietly.
Check shoe slider for unusually wear, replace it if necessary.

INSTALLATION

Install rear wheel axle in the reverse order of removal.

Chapter V Wheels, Tires & Brakes

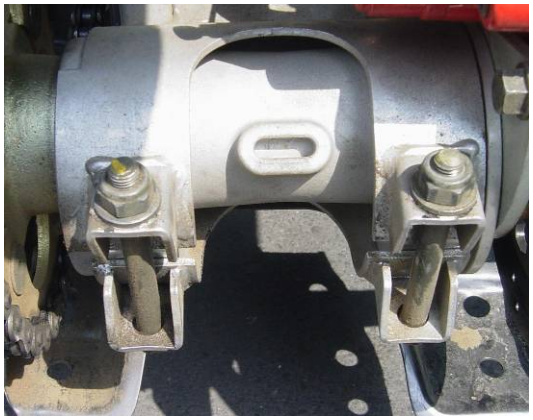
REAR WHEEL AXLE RMOVAL

Loosen brake disk flange tighten nuts and remove the nuts.

Remove brake disk flange assembly.

Push wheel axle to left side and remove axle with rear sprocket assembly from axle holder.

Remove rear sprocket assembly from axle.



SPROCKET INSPECTION

Check sprocket teeth, replace if show as illustration.

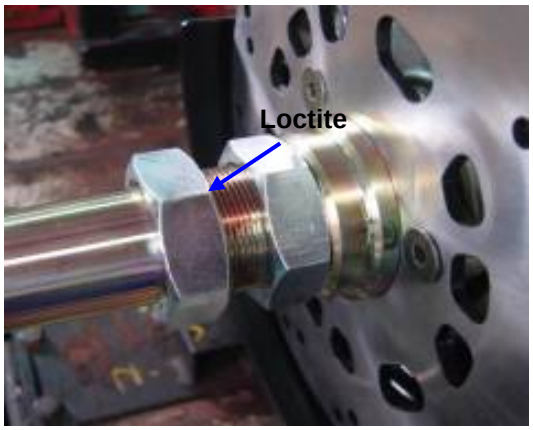
REAR AXLE HOLDER INSPECTION

Check oil seal for broken or damage, replace it if necessary.

Turn the inner race of each bearing with your finger. The bearing should turn smoothly and quietly.

Check the outer race fits tightly in the holder.

Remove and discard the bearing if the races do not turn smoothly, quietly or if they are fit loosely in the holder.



NOTE

◦ Replace holder bearing in pairs.

INSTALLATION

Install rear wheel axle in the reverse order of
removal.

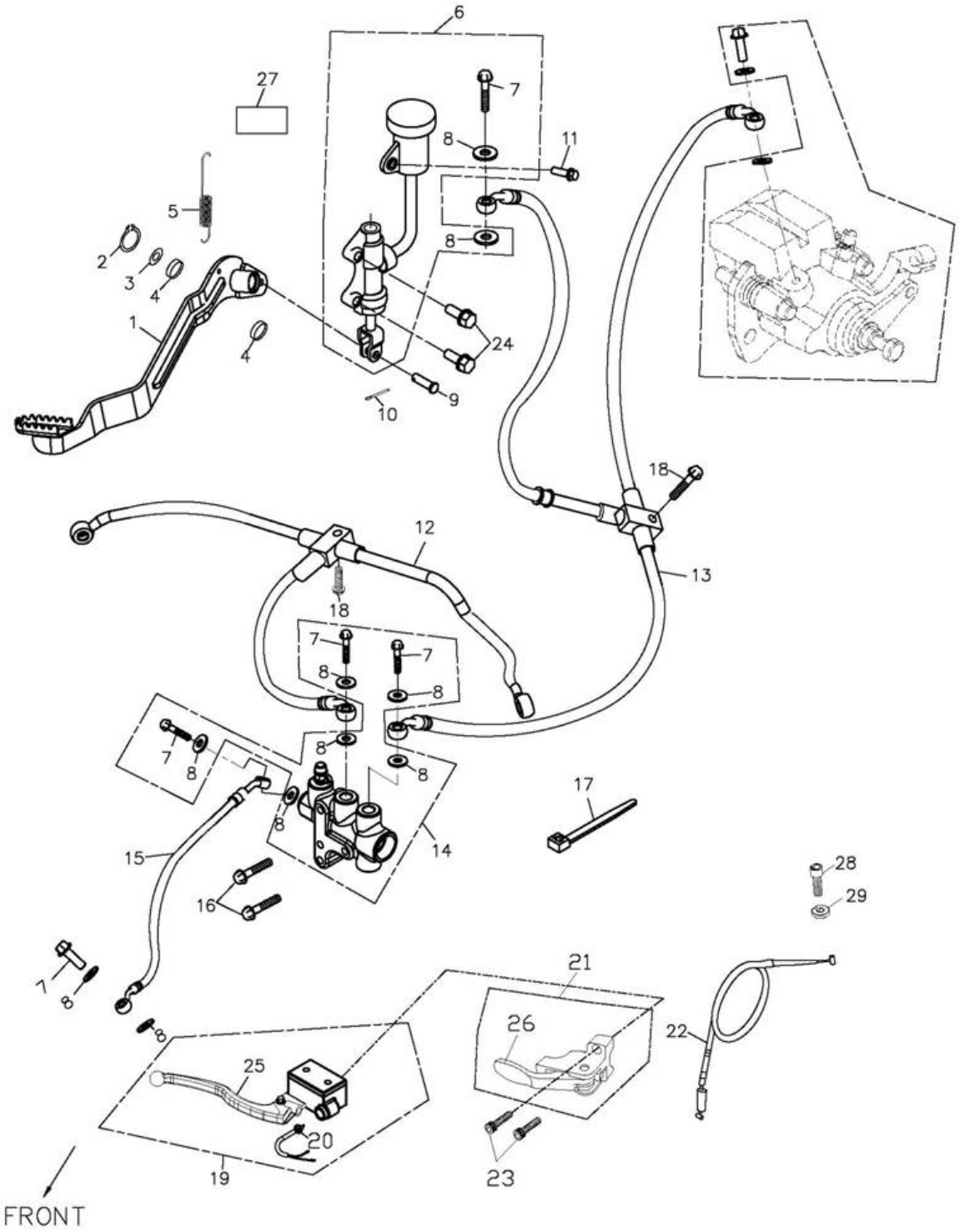
NOTE

◦ Apply greases on bushing before installation.

◦ Apply **Loctite** on brake disk flange tighten nuts when installation.

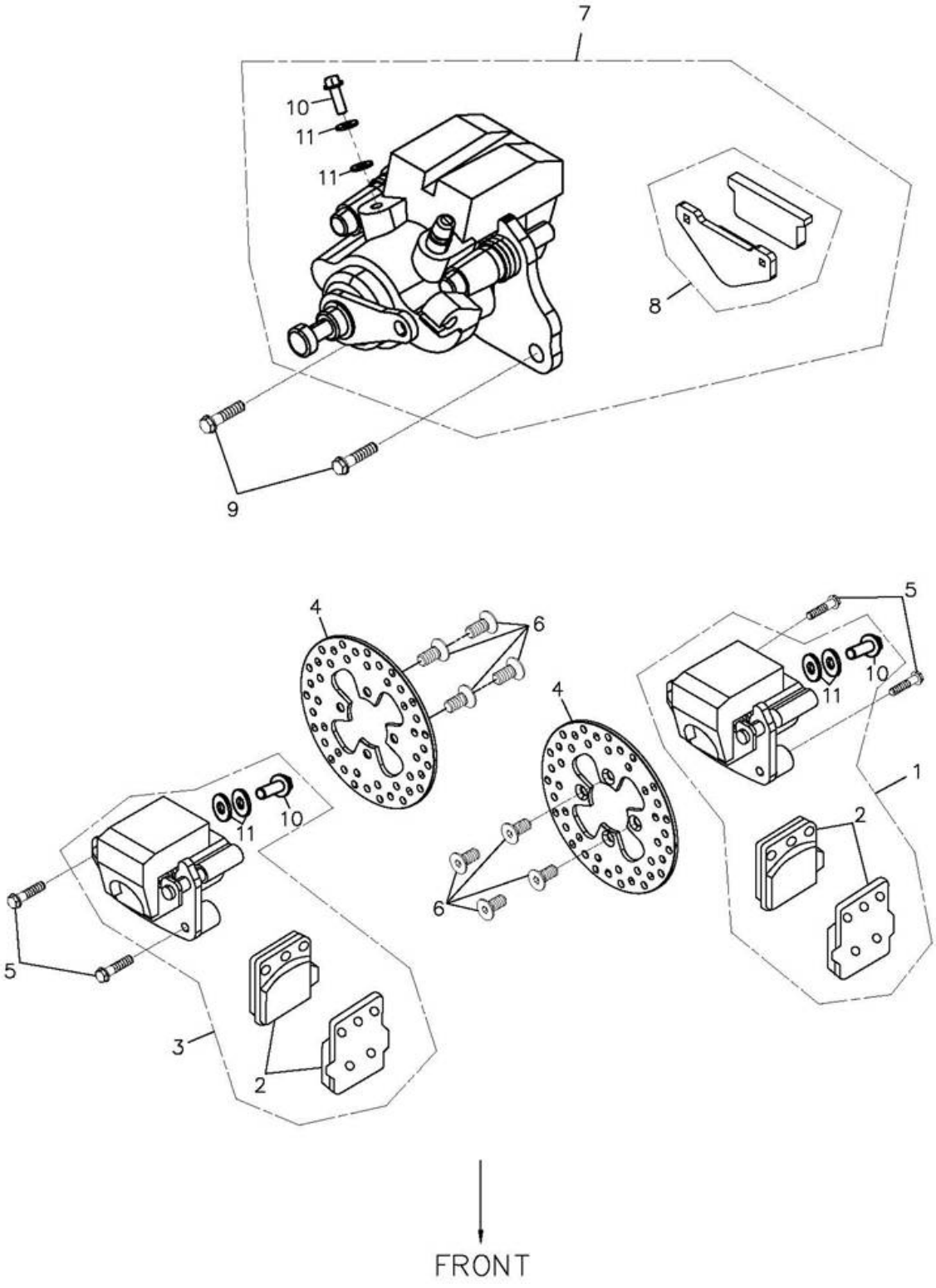
Chapter V Wheels, Tires & Brakes

HYDRAULIC BRAKE SYSTEM



Chapter V Wheels, Tires & Brakes

BRAKE CALIPER



Chapter V Wheels, Tires & Brakes

Service Information

GENERAL

◦ The brake calipers can be removed without disconnecting the hydraulic system.

◦ Bleed the hydraulic system if it has been disassembled or if the brake feels spongy.

◦ Do not allow foreign material to enter the system when filling the reservoir.

◦ Brake fluid will damage painted, plastic and rubber parts. Whenever handling brake fluid, protect the painted, plastic and rubber parts by covering them with a rag. If fluid does get on the parts, wipe if off with a clean cloth.

◦ Always check brake operation before riding the motorcycle.

SPECIFICATION

ITEM		STANDARD mm (in)	SERVICE LIMIT mm (in)
Disc thickness	Front	4.0 (0.16)	3.0 (0.14)
	Rear	4.0 (0.16)	3.5 (0.14)
Disc run out		---	0.3 (0.012)
Brake pad thickness			1.0 (0.04)

TORQUE VALUES

Bleed valve	4-7 N.m (3-5 ft.lb)
Caliper mounting bolt	30 N.m (22 ft.lb)
Brake fluid line bolt	14-18 N.m (10-13 ft.lb)
Master cylinder holder bolt	10-14 N.m (7-10 ft.lb)

Troubleshooting

Brake lever soft or spongy

◦ Air bubbles in hydraulic system

◦ Low fluid level

◦ Hydraulic system leaking

Brake lever too hard

◦ Sticking piston(s)

◦ Clogged hydraulic system

◦ Pads glazed or excessively worn

Brake drag

◦ Hydraulic system sticking

◦ Sticking piston(s)

Brakes grab or pull to one side

◦ Pads contaminated

◦ Disc or wheel misaligned

Brake chatter or squeal

◦ Pads contaminated

◦ Excessive disc runout

◦ Caliper installed incorrectly

◦ Disc or wheel misaligned

Chapter V Wheels, Tires & Brakes

Brake Fluid Replacement/Bleeding

Brake Fluid d Draining

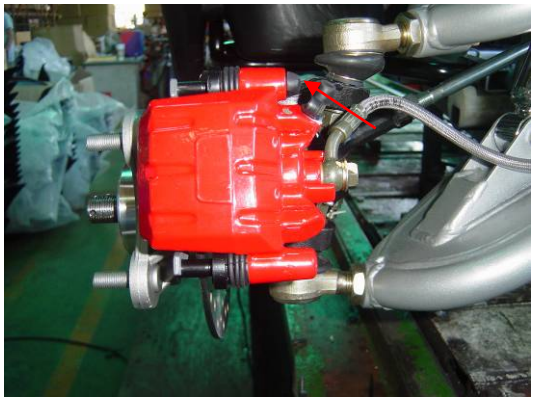
WARNING

◦ *A contaminated brake disc or pads reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.*

CAUTION

◦ Do not allow foreign material to enter the system when filling the reservoir.

◦ Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

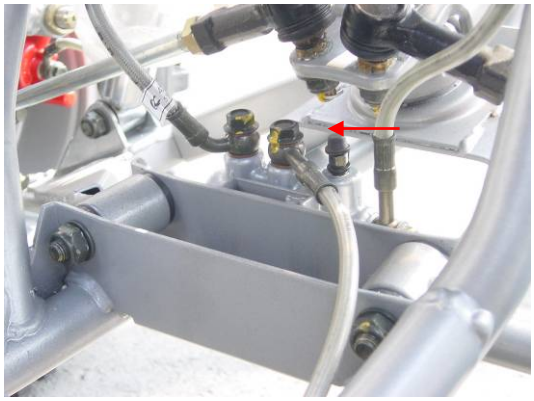


With the fluid reservoir parallel to the ground, remove the reservoir cap and diaphragm plate.

Connect a hose to the bleed valve.

Loosen the caliper bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

Close the bleed valve.



BRAKE FLUID FILLING/BLEEDING

Fill the reservoir with DOT-3 or DOT-4 brake fluid from a sealed container.

CAUTION

◦ Do not mix different types of fluid. They are not compatible.

Connect a commercially available brake bleeder to the bleed valve.Pump the brake bleeder and loosen the bleed valve.

Bleeding front wheel first by bleeding front brake shunt then left and right brake caliper. After completed bleeding front wheels calipers, then bleeding the rear brake shunt and caliper.

Add fluid when the fluid level in the master cylinder reservoir is low.

NOTE

◦ Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.
◦ When using a brake bleeding tool, follow the manufacture's operating instruction.
◦ If air is entering the bleeder from around the bleed valve threads.

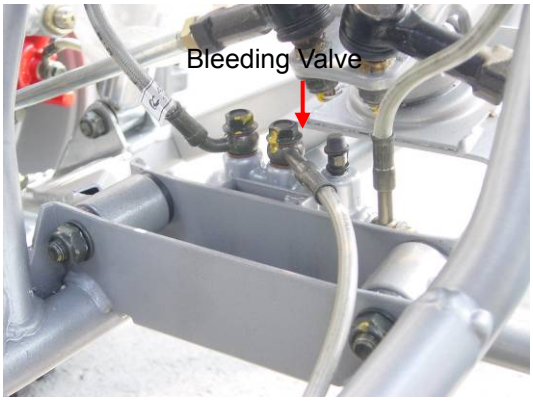
Repeat the above procedures until air bubbles do not appear in the plastic hose. Close the bleed valve and operate the brake lever. If it feels spongy, bleed the system by performing BLEEDING procedure.

BRAKE FLUID FILLING/BLEEDING

If a brake bleeder is not available, perform the following procedure:

Pump up the system pressure with the lever until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever resistance is felt.

1. Squeeze the brake lever and hold it down, then open the bleed valve half turn and then close the valve.



NOTE

◦ Do not release the brake lever until the bleed valve has been closed.

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat steps 1 and 2 until bubbles cease to appear in the fluid.

Tighten the bleed valve.

Torque: 4-7 N.m (3-5 ft.lb)

Fill the fluid reservoir to the upper level mark.

Reinstall the diaphragm, diaphragm plate and reservoir cap.

Chapter V Wheels, Tires & Brakes

BRAKE PAD REPLACEMENT

WARNING

◦ *Never blow out brake dust with compressed air and don't inhale it.*

NOTE

◦ Always replace the brake pads in pair to assure even disc pressure.

FRONT BRAKE PADS

Remove the front wheel.

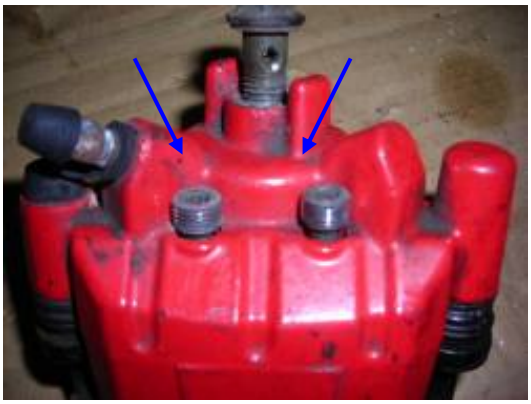
Remove the caliper mounting bolts and remove caliper from knuckle.

NOTE

◦ It's unnecessary to remove the brake line for brake pads replacement.

Loosen two brake pad fixation bolts and pull out the bolts.

Push brake pads against caliper piston to let it back into the caliper bore then remove inner brake pad from caliper house.



Press caliper mounting plate toward bore side then push outer brake pad out of the caliper.

NOTE

◦ For easily remove the outer pad, pull the pad apart with align pin one side first then the other

INSTALLATION

Installation is the reverse of removal. Using a C-clamp, depress the piston back into the caliper bore to provide enough room for the new pads to clear the disc.

Insert brake pads fixation bolts and tighten the bolts.

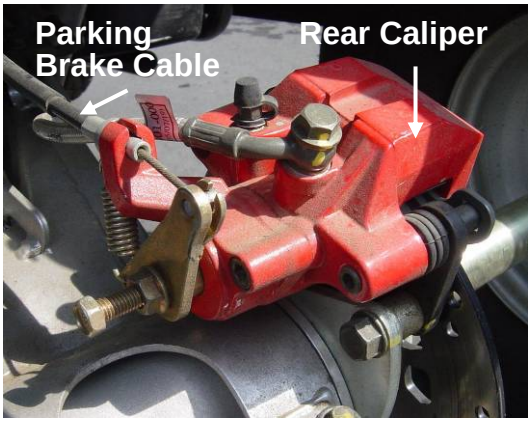
Tighten the caliper mounting bolts.

Torque: 30 N.m (25 ft.lb)

Rear 3.5 mm

REAR BRAKE PADS

Remove the caliper mounting bolts and remove caliper from rear swing arm.



Push caliper piston back into the caliper bore to provide enough room for remove pads.

Remove the inner pad first then outer pad.

NOTE

◦ For easily remove the outer pad, pull the pad apart with align pin one side first then the other

Installation is the reverse of removal. Using a C-clamp, depress the piston back into the caliper bore to provide enough room for the new pads to clear the disc.

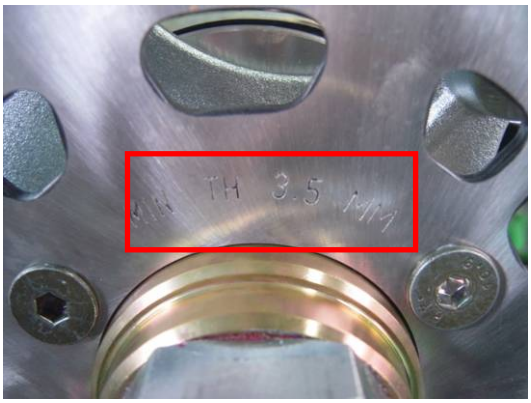
Tighten the caliper mounting bolts.

Torque: 30 N.m (25 ft.lb)

BRAKE DISC INSPECTION, REMOVAL AND INSTALLATION

INSPECTION

Visually inspect the surface of the disc for score mark and other damage.



Light scratches are normal after use and won't affect brake operation, but deep grooves and heavy score marks will reduce braking efficiency and accelerate pad wear.

If the disc is badly grooved it must be machined or replaced.

Check the thickness of the disc with a micrometer. If the disc is thinner than service limit, replace it.

The minimum thickness is also stamped on the disc surface.

Service limit: Front 3.5 mm

Chapter V Wheels, Tires & Brakes

REMOVAL AND INSTALLATION

Front disc removal/installation

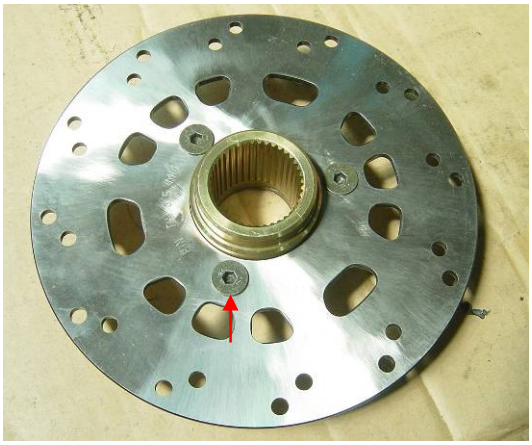
Remove the wheel hub.

Remove the disc retaining bolts on hub.

Installation is the reverse of removal.

Tighten the disc retaining bolts.

Torque: 43 N.m (31 ft.lb)



Rear disc removal/installation

Remove the left rear wheel hub.

Remove the rear caliper.

Remove the disc retaining bolts and remove the disc.

Installation is the reverse of removal.

Tighten the disc retaining bolts.

Torque: 43 N.m (31 ft.lb)

Parking Brake

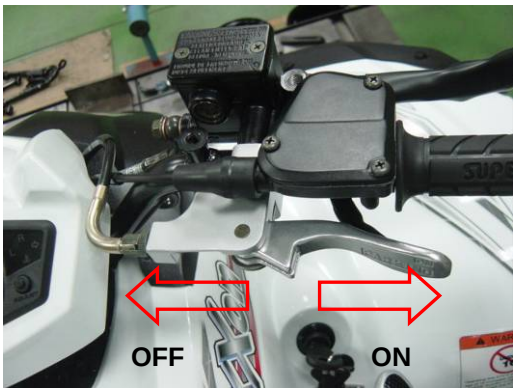
ADJUSTMENT

Park the vehicle on a level ground.

Pull the parking lever to left side.

Loosen the parking brake adjust bolt fixing nut and then turn in the adjust bolt until you can feel it touch the piston wall.

Turn out the adjust bolt half turn and hold the adjust bolt then tight the fixing nut.



NOTE

◦ Pull the parking lever to right side and push the vehicle to check it's movable or not. If it could easily moving, the adjustment is not in position.

Re-adjust and check to confirm.

Chapter VI Electrical Equipment

Electrical Equipment Service Information

GENERAL INFORMATION

◦ The machines covered by this manual are equipped with a 12 volt electrical system. The components include a three-phase permanent magnet alternator and a regulator/rectifier unit.
The regulator/ rectifier unit maintains the charging system output within the specified range to prevent overcharging and converts the AC (alternating current) output of the alternator to DC (direct current) to power the lights and other components and to charge the battery.

◦ Electrical problems often stem from simple causes, such as loose or corroded connections or a blown fuse. Prior to any electrical troubleshooting, always visually check the condition of the fuse, wires and connections in the problem circuit.

◦ If testing instruments are going to be utilized, use the diagrams to plan where you will make the necessary connections in order to accurately pinpoint the trouble spot.

◦ One method of finding short circuits is to remove the fuse and connect a test light or voltmeter in its place to the fuse terminal. There should be no load in the circuit. Move the wiring harness from side-to side while watching the test light. If the bulb light, there is a short to ground somewhere in that area, probably where insulation has rubbed off a wire. The same test can be performed on other components in the circuit, including the switch.

◦ A ground check should be done to see if a component is grounded properly. Disconnect the battery and connect one lead of a self-powered test light (such as a continuity tester) to a known good ground. Connect the other lead to the wire or ground connection being tested. If the bulb lights, the ground is good. If the bulb does not light, the ground is not good.

◦ A continuity check is performed to see if a circuit, section of circuit or individual component is capable of passing electricity through it. Disconnect the battery and connect one lead of a self-powered test light (such as a continuity tester) to one end of the circuit being tested and the other lead to the other end of the circuit. If the bulb lights, there is continuity, which means the circuit is passing electricity through it properly. Switched can be checked in the same way.

◦ Remember that all electrical circuits are designed to conduct electricity from the battery, through the wires, switches, relays, etc. to the electrical component (light bulb, motor, etc.). From there it is directed to the frame (ground) where it is passed back to the battery. Electrical problems are basically an interruption in the flow of electricity from the battery or back to it.

Chapter VI Electrical Equipment

Electrical Device

Attention of Operation

WARNING：

∗ Battery electrolyte contains sulfuric acid, which can cause severe burns. Avoid contact of skin, eyes, or clothing
∗ When sulfuric acid water spill into clothing will stick to skin. Take off the clothing and flush with water.

- Battery can be charged and discharged. Without charging, the battery will have lower lifetime.
- If the battery have short circuit inside, both terminal will not have voltage existed. Besides, the regulator rectifier lost the function and shorter lifetime.
- If the battery stay too long without use, it will lost power and have less capacity. The battery need to charge each 2~3 months.
- After fill up the electrolyte, the new battery will generate voltage. It's necessary to recharge if the voltage is low. It's necessary, leave the battery for more than 20 minutes before sealing the cap. It will increase the lifetime of new battery if recharged before installed.
- Do not unplug the electrical components from wire hardness when the current is working. This will cause too high of voltage and damage other compounds such as rectifier, light bulbs…etc. Turn off the main switch to OFF before any movement or unplug.
- The Maintenance Free battery does not need to refill electrolyte or water.
- All charge system needs to be installed before check.
- Do not use quick charge unless it's in urgent.
- The battery needs to be taking out from vehicle when doing charge work.
- When checking the voltage, must use the electrical meter.

Diagnosis of troubles

No Electrical Power

- Over discharged of the battery
- Wire hardness did not connected to the battery
- Fuse broken
- Main switch defect

Low Voltage

- Battery charges insufficient
- Bad connection
- Regulator rectifier defect

No Continues Current

- Bad contact of battery with main wire hardness
- Bad connection of charge system
- Bad contact of the lighting system cause short circuit

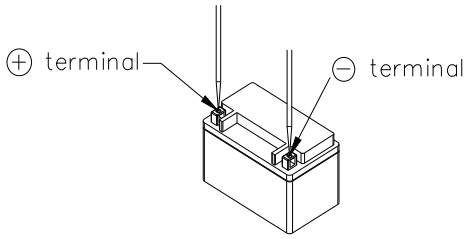
Charge System no function

- Bad connection of the wire hardness connectors
- Main wire hardness broken or short-circuit
- Regulator rectifier defect
- AC Generator defect
- Fuse broken

Chapter VI Electrical Equipment

Electrical Device

Check Voltage of Battery
Remove rubber strap on battery, disassembly connection wires of battery, check voltage between battery terminals.



Charging sufficiently: over 12.8 V
Charging insufficiently: Below 11.5V

※ ***WARNING:***
- Must check battery voltage with digital voltmeter.
- Remove the negative (-) cable first.

Check Charging Status
NOTICE:
Check battery voltage when battery charged completely, over 12.8 V.
Engine starting will consume a lot power of battery.
Assembly voltmeter to the terminal of main fuse. Start engine, raising RPM and check charging voltage & current.

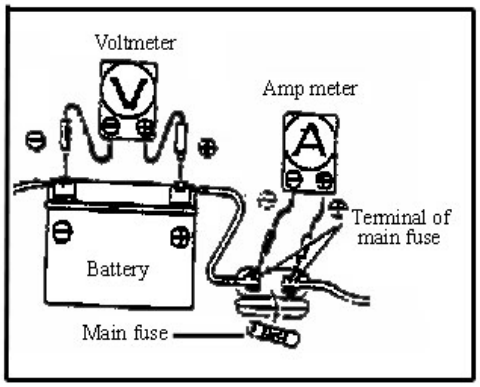
Turn off the light and cooling fan to check.

Charging current:
1~7 Amp/5000rpm

Voltage of charging control:
14 ± 0.5 V/5000rpm

Operation procedure:
Check head light with wires connecting.
Start engine, turn “ON“ light switch, open high beam.
Check voltage between green (+) & black (-) guide wires.

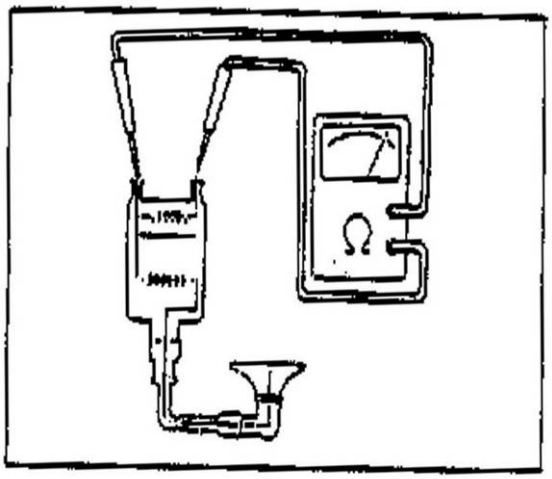
Control Voltage:

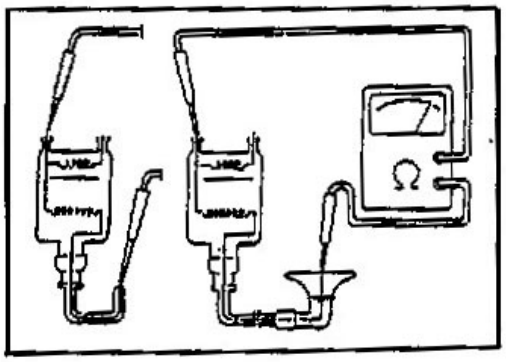


11~15V.AC/5000rpm

Chapter VI Electrical Equipment

Check ignition status with performance tester due to this test has its own standard.





Electrical Device

Ignition Coil Conduction Test

WARNING:

Check coil primary resistance of ignition terminal.
Standard valve (20℃): 1.0 ~ 2.0 Ω
Check coil secondary resistance between spark plug cap & (-) terminal.
Standard valve : 10.0 ~ 12.5 kΩ (spark plug cap installed)
Remove spark plug cap from high tension coil.

Remove main switch

- Disconnect main switch wire.
- Pull the main switch Bracket inside front cover.
- Push the stopper on main switch underneath front cover then push out the main switch.

Check main switch

Remove connector of main switch wire, check conductivity between each terminal.

Color	R	BK
OFF		
ON	O	O

Engine stop switch

Color	BK	BK/W
START	O	O
OFF		

Start switch

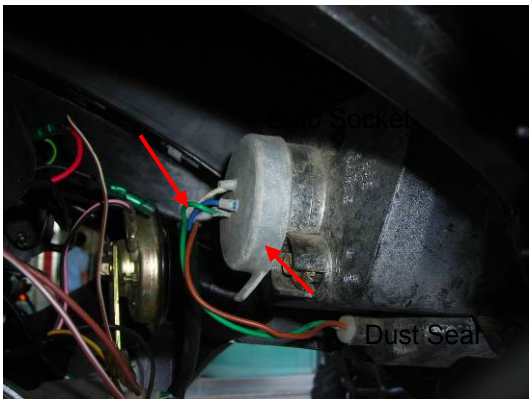
Color	YL/R	BK
ON	O	O
OFF		

Chapter VI Electrical Equipment

Headlight

BULB REPLACEMENT

Remove headlight panel.
Disconnect the headlight coupler.
Remove headlight bulb rubber dust seal.
Remove the bulb socket.
Remove the clip and replace the headlight bulb.



CAUTION

- Do not put finger prints on the headlight bulb, they may create hot sports on the bulb.
- If you touch the bulb with your hands, clean it with c cloth moistened with alcohol to prevent its early failure.
- Do not try to replace the bulb with light ON

Position the headlight bulb rubber dust seal.

NOTE

- Install the dust seal securely.

Speedometer

REMOVAL/INSTALLATION

Loosen two mounting bolts of speedometer cover.
Disconnect speedometer connectors and pull out the speedometer cover with speedometer.
Loosen three speedometer mounting screws and remove the speedometer.

Install the speedometer in the reverse order of removal.

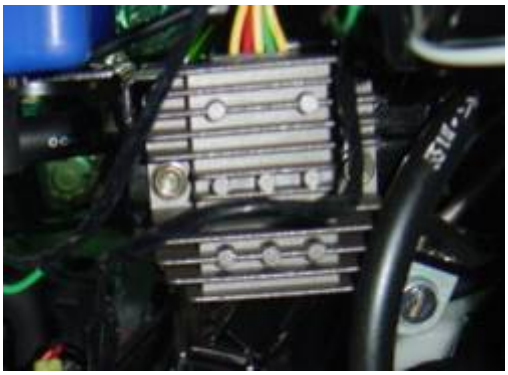
Chapter VI Electrical Equipment

Regulator/Rectifier

GENERAL

Regulator/rectifier was located on left front side of front fender.

The regulator/rectifier unit maintains the charging system output within the specified range to prevent overcharging and converts the AC (alternating current) output of the alternator to DC (direct current) to power the lights and other components and to charge the battery.



INSPECTION

During the regulator normally function, the alloy body of regulator will became heated.

Started the engine, use your hand to touch the alloy body to check it's functional.

When engine is running, turnoff the light and other electrical accessory and use a voltmeter to check the volts of battery.

Battery volts: 13.6 – 14.3 V

Replaced the regulator if it's not heated or charging volts not in range when engine is running.

REMOVAL/INSTALLATION

Disconnect alternator wire couplers and connector on right side then loosen two mounting bolts and remove regulator.

Install the regulator in the reverse order of removal.

Chapter VI Electrical Equipment

Wire Diagram