2014 ATV

LINHAI

SERVICE MANUAL EUROPE 14.0

PN. F010102A14

- *ATV 500-D*

493cc

Cette revue concerne les modèles suivants :
HY510S - HY500 60ème - HY500T - HY510IS - HY500IS - HY540ST - HY540STL

WARNING
The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

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LH500ATV-D 维修手册欧标英文 版本 14.0　　零件代号 F010102A14

Foreword

This manual is designed primarily for use by the ATV factory certified service technicians in a properly equipped shop. Persons using this manual should have a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. The technician should read the text and be familiar with service procedures before starting the work. Certain procedures require the use of special tools. Use only the proper tools, as specified. Cleanliness of parts and tools as well as the work area is of primary importance.

This manual is divided into sections. Each section covers a specific ATV component or system and, in addition to the standard service procedures. Keep this manual available for reference in the shop area. When using this manual as a guide, the technician should use discretion as to how much disassembly is needed to correct any given condition.

All references to left and right side of the vehicle are from the operator's perspective when seated in a normal riding position.

At the time of publication all information contained in this manual was technically correct. Some photographs used in this manual are used for clarity purposes only and are not designed to depict actual conditions. We constantly refine and improve its products, all materials and specifications are subject to change without notice.

This ATV’s publications and decals display the words **Warning, Caution, Note,** and At This Point to emphasize important information:

WARNING

Indicates a potential hazard which will result in severe injury or death to the operator, bystander or person inspecting or servicing the ATV..

CAUTION

Indicates a potential hazard which may result in personal injury or death or damage to the machine.

NOTE

The word “**NOTE**” in this manual will alert you to key information or instructions.

CONTENTS

WARNING

Never run an engine in an enclosed area. Carbon monoxide exhaust gas is poisonous and can cause severe injury or death. Always start engines outdoors.

Gasoline is extremely flammable and explosive under certain conditions. Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing. Always keep alert and wear protection..

Exhaust system components are very hot during and after use of ATV. Never service when the engine is warm or hot. Escaping steam from cooling system or hot oil from the machine can cause severe burns. The engine must be cool before service.

Crate of the ATV and parts in the ATV maybe have sharp edge, always pay attention and wear protection.

CHAPTER 1 GENERAL INFORMATION

WARNING
The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

1.1 IMPORTANT INFORMATION

1.2 V.I.N AND ENGINE SERIAL NUMBER

1.3 VEHICLE DIMENSIONS

1.1 IMPORTANT INFORMATION

PREPARATION FOR REMOVAL PROCEDURES

1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment.
3. When disassembling the machine, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been ”mated ”through normal wear. Mated part must always be reused or replaced as an assembly.
4. During machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

REPLACEMENT PARTS

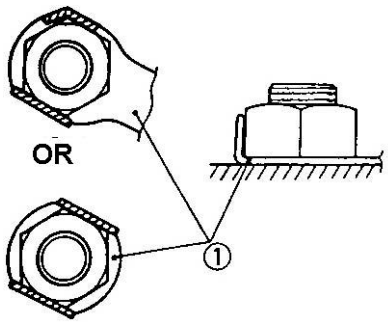
Use only genuine parts for all replacements. Use recommended oil and grease for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

GASKETS,OIL SEALS AND O-RINGS

1. Replace all gaskets seals and O-rings when overhauling the engine. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.

LOCK WASHERS/PLATES AND COTTER PINS

Replace all lock washers/plates and cotter pins after removal. Bend lock tabs along the bolt or nut flats after the bolt or nut has been tightened to specification.



BEARINGS AND OIL SEALS

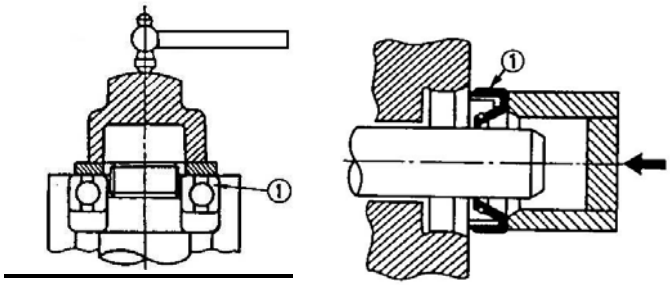
Install bearings and oil seals so that the manufacturer’s marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil bearings liberally when installing, if appropriate.

□ oil seal

CAUTION:

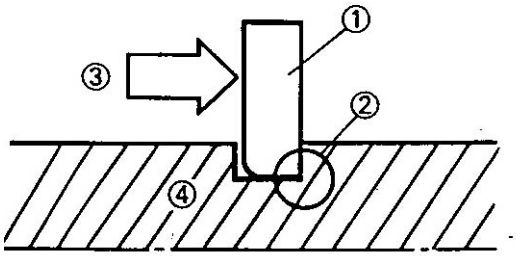
Do not use compressed air to spin the bearings dry. This will damage the bearing surfaces.

□ Bearing



CIRCLIPS

1. Check all circlips carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip①, make sure that the sharp-edged corner ② is positioned opposite the thrust ③ it receives. See sectional view.

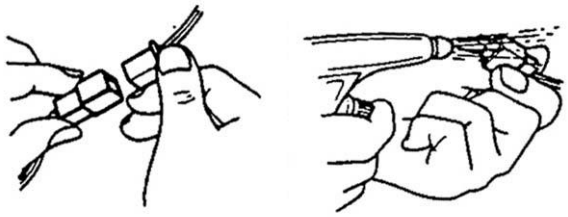


④Shaft

CHECKING OF CONNECTIONS

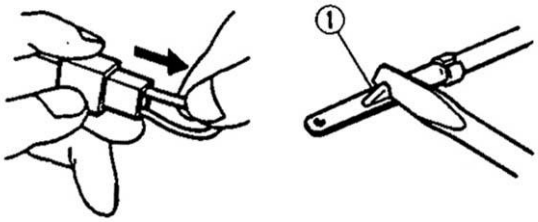
Dealing with stains, rust, moisture, etc. on the connector.

1. Disconnect:
   - ●Connector
2. Dry each terminal with an air blower.
3. Connect and disconnect the connector two or three.
4. Pull the lead to check that it will not come off.
5. If the terminal comes off, bend up the pin ① and reinset the terminal into the connector.
6. Connect:
   - Connector



NOTE:

The two connectors ” click ” together.



7. Check for continuity with a tester.

NOTE:

- If there is no continuity, clean the terminals.
- Be sure to perform the steps 1 to 7 listed above when checking the wire harness.
- Use the tester on the connector as shown.

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CONVERSION TABLE

How to use the CONVERSION TABLE

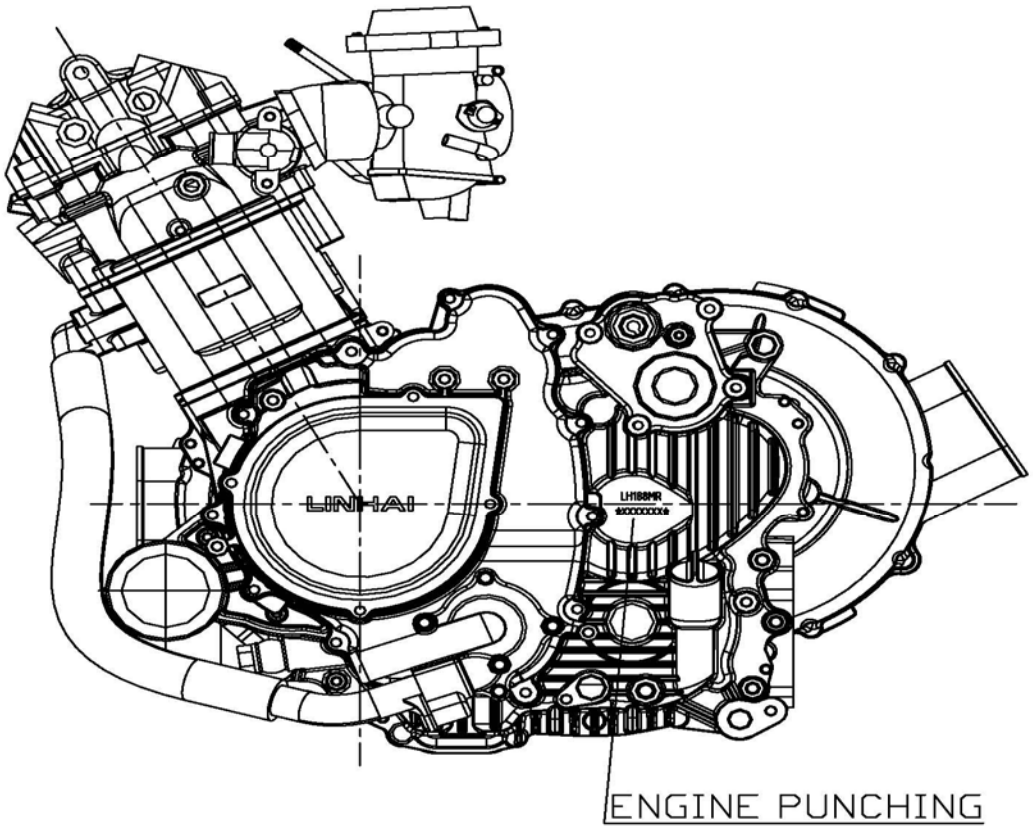
Use this table to convert METRIC unit data to IMPERIAL unit data.
Ex.

METRIC		MULIPLIER		IMP
**mm	x	0. 3937	=	**in
**cm	x	0.03937	=	**in

CONVERSION TABLE

METRIC TO IMP			
	Known	Multiplier	Result
Torque	m·kg m·kg cm·kg cm·kg	7.233 86.794 0.0723 0.8679	ft·lb In·lb ft·lb In·lb
Weight	kg g	2.205 0.03527	lb oz
Distance	km/h km m m cm mm	0.6214 0.6214 3.281 1.094 0.3927 0.03927	mph mi ft yd in in
Volume/ Capacity	cc(cm^3) cc(cm^3) lit(liter) lit(liter)	0.03527 0.06102 0.8799 0.2199	oz(IMP liq.) cu·in qt (IMP liq.) gal(IMP liq.)
Miscellaneous	kg/mm kg/cm^2 Centigrade	55.997 14.2234 9/5(℃)+32	lb/in psi(lb/in^2) Fahrenheit(°F)

1.2 V.I.N AND ENGINE SERIAL NUMBER



ENGINE	PUNCHING
LH188MR	☆XXXXXX☆

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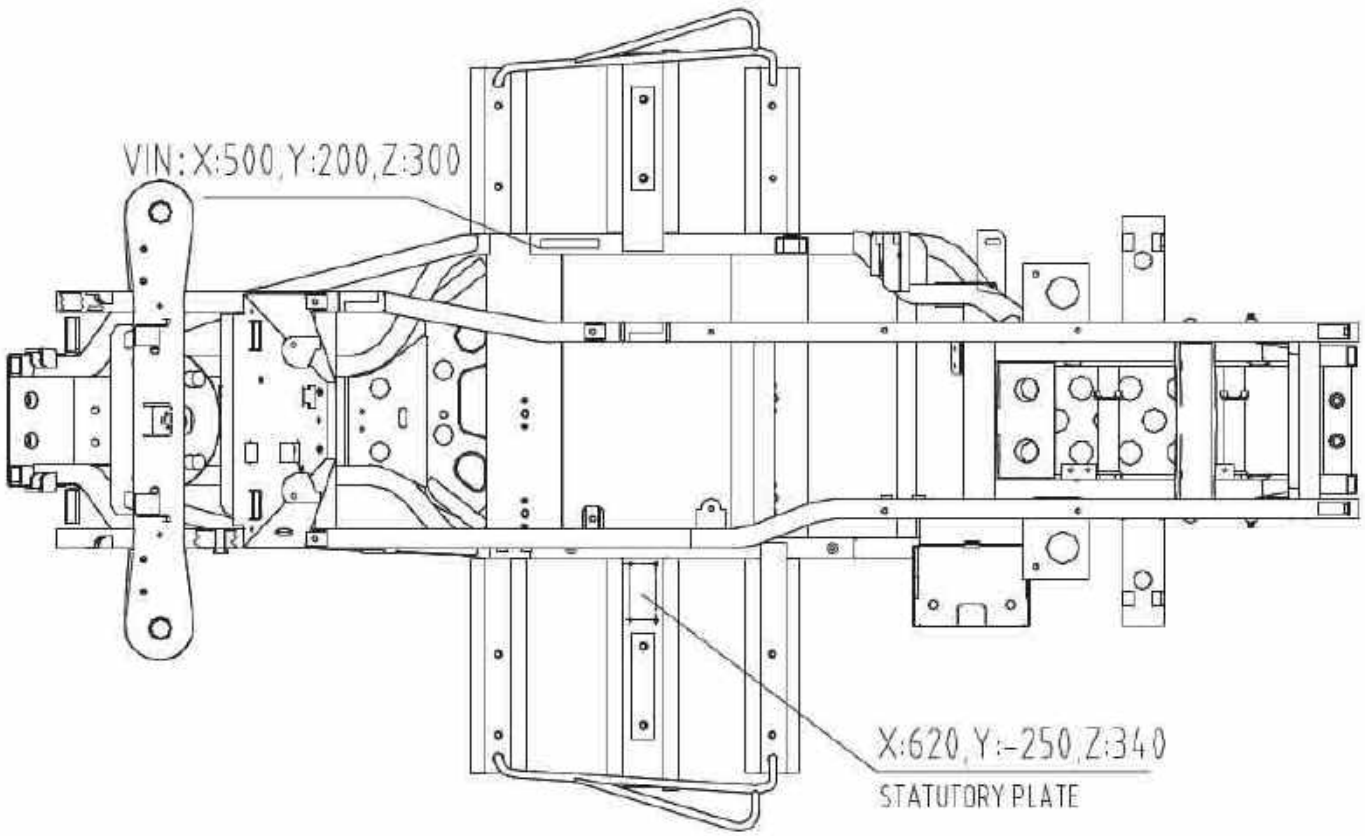
VIN:X:500,Y:200,Z:300
X:620,Y:-250,Z:340
STATUTORY PLATE

1.3 VEHICLE DIMENSIONS

Note.
The on-road equipments (rear view mirror, turn lights, etc.) are not Standard Equipment for USA.

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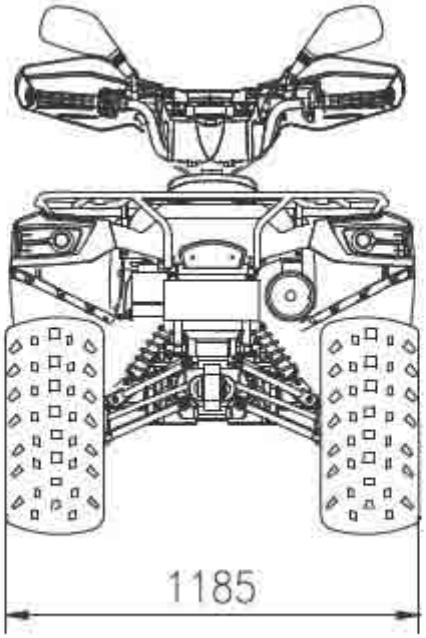
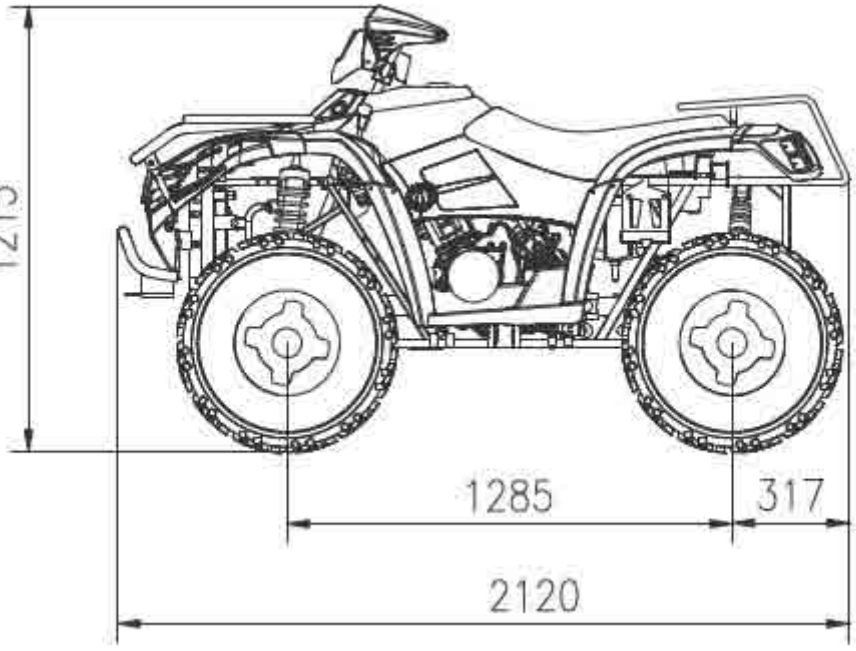




NOTES

CHAPTER 2 MAINTENANCE

WARNING
The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

2.1 PERIODIC MAINTENANCE

GENARAL
CAUTION
Mark on the following chart

DL : Due to the nature of the adjustments marked with a DL on the following chart, it is recommended that service be performed by an authorized dealer.

▲ : Service/Inspect more frequently when operating in adverse conditions.

PERIODIC MAINTENANCE SCHEDULE

Careful periodic maintenance will help keep your vehicle in the safest, most reliable condition. Inspection, adjustment and lubrication intervals of important components are explained in the following chart on the following pages.

Maintenance intervals are based upon average riding conditions and an average vehicle speed of approximately 16km/h (10 miles per hour). Vehicles subjected to severe use, such as operation in wet or dusty areas, should be inspected and serviced more frequently.

Inspect, clean, lubricate, adjust or replace parts as necessary.

NOTE: Inspection may reveal the need for replacement parts. Always use genuine parts available from your dealer.

Service and adjustments are critical. If you are not familiar with safe service and adjustment procedures, have a qualified dealer perform these operations.

A = Adjust I = Inspect
C = Clean L = Lubricate
D = Drain R = Replace
T =Tighten to Correct Torque

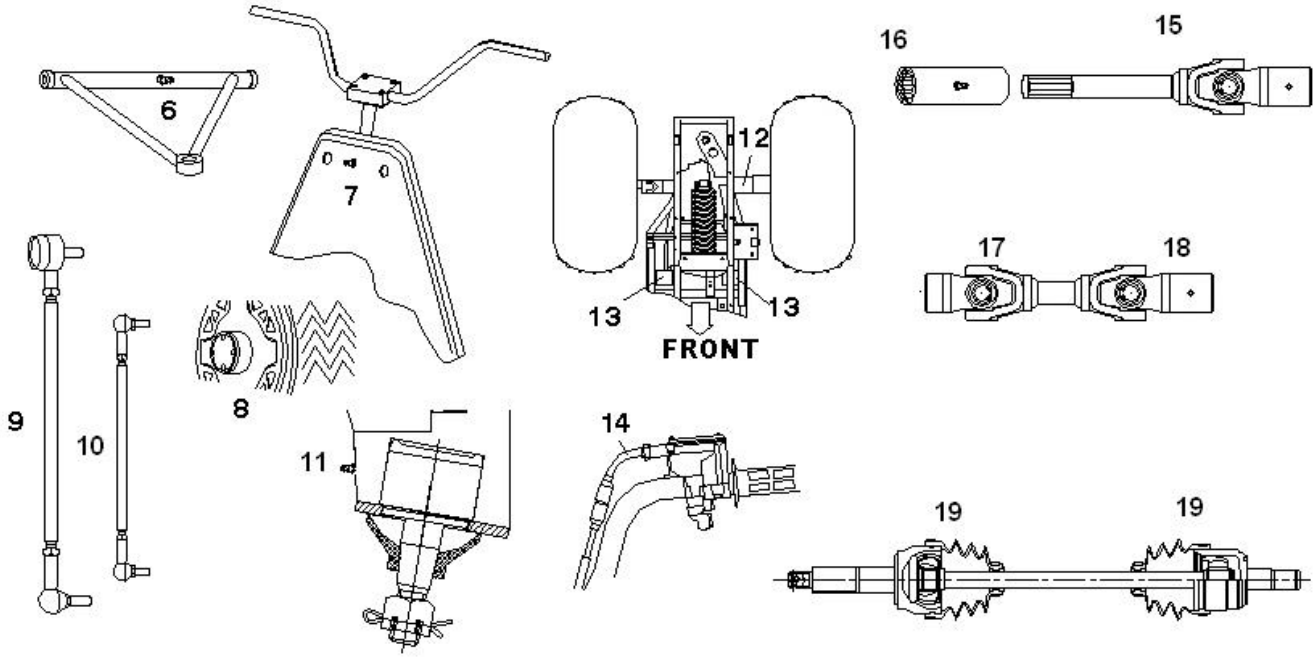
	Item	Hours	When	Remarks
	Service (Main) Brake System	/	Pre-ride	I
	Auxiliary (Secondary) Brake	/	Pre-ride	I
	Parking Brake	/	Pre-ride	I
	Tires	/	Pre-ride	I
	Wheels	/	Pre-ride	I
	Frame nuts, bolts fasteners	/	Pre-ride	I
▲	Air Filter-Pre-Cleaner	/	Daily	I C
	Coolant/Level	/	Daily	I
	Coolant	150	Annually	R

	Coolant strength	25 hrs	3 months	I Inspect strength seasonally
▲	Air Box Sediment Tube	/	Daily	D
	Headlamp Inspection	/	Daily	C apply dielectric grease to connector when replaced
	Tail lamp inspection	/	Daily	C apply dielectric grease to socket when replaced
▲	Air Filter-Main Element	2	Weekly	I C Replace if necessary
▲	Transmission Oil Level	10	Monthly	I change annually
	Battery Terminals	10	Monthly	I C
	Battery fluid level	10	Monthly	I
DL	Brake pad wear	2	Weekly	I
▲	Gear case Oil	10	Monthly	C
		150	annually	R
	Engine Cylinder Head and Cylinder Base Fasteners	25	3 months	I (re-torque required at first service only)
▲	General Lubrication all fittings, pivots, cables, etc.	25	3 months	L
	Engine Oil-Level	/	Daily	I
	Engine Oil Change	30 hrs	3 months	R Break-in Service at 1 month. Change oil more often in cold weather use.
▲	Oil Filter	50 hrs	6 months	I C
▲	Engine breather hose	100 hrs	6 months	I
	Carburetor Float Bowl	50 hrs	6 months	Drain bowl periodically and prior to storage
	Throttle Cable	/	Pre-ride	I
DL	Throttle Cable	50 hrs	6 months	A L (Grease M) R if necessary
	Shift linkage	50 hrs	6 months	I A R if necessary
DL	Transmission belt	50 hrs	6 months	I R if necessary
▲	Steering	50 hrs	6 months	I L T if necessary
▲	Rear Axle (and Bearings)	50 hrs	6 months	I L

▲	Front Suspension	50 hrs	6 months	I L T if necessary
▲	Rear Suspension	50 hrs	6 months	I T if necessary
	Spark Plug	100 hrs	12 months	I R if necessary
DL	Ignition Timing	100 hrs	12 months	I Adjust as needed
DL	Fuel System	100 hrs	12 months	Check for leaks at tank, cap, lines, fuel valve, filter, and carburetor. Replace lines every 2 years.
DL	Fuel Filter	100 hrs	12 months	R
	Radiator	100 hrs	12 months	I R
	Cooling System hoses	50 hrs	6 months	I R if necessary
	Spark arrestor	10 hrs	monthly	C R if necessary
DL	Clutches (drive and Driven)	25 hrs	3 months	I R R if necessary
	Engine mounts	25 hrs	3 months	I T
DL	Valve clearance	100 hrs	12 months	I A
DL	Shift selector box (H/L/R/N)	200 hrs	24 months	Change grease every two years
DL	Brake fluid Level	/	Pre-ride	I
	Brake fluid	200 hrs	24 months	Change every two years
	Idle Speed	/	As Required	A
DL	Toe adjustment	/	As Required	Periodic inspection, adjust when parts are replaced
	Headlight Aim	/	As Required	Adjust if necessary
▲ DL	Front drive chain (and sprockets) in transmission (only SDX300);	300 hrs (full time in 4X4), or 1000 hrs (in 2X4 alternate 4X4)		I, Replace if necessary
▲ DL	Ball joint (A arm- strut)	10 hrs	monthly	I, (for damage, wear, and play) R. Replace if necessary

LUBRICANT AND FLUID

	Item	Lube Rec	Method	Frequency
	1. Engine Oil	SAE 15W/40 SE	Add to proper level on dipstick	Check level daily
	2. Brake Fluid	DOT 3 Only	Maintain level Between fill lines. See "7.CONTROL"	As require; change every two years or 200 hours
	3. Transmission Oil	SEA 80W/90GL5	Add to proper level on dipstick	Change annually or at 100 hours
	4.Rear Gear case oil	SEA 80W/90GL5	Add to proper level	Change annually or at 100 hours
	5. Front Gear case oil (SDX30-0)	SEA 80W/90GL5	Add to proper level	Change annually or at 100 hours
▲	6. Front A-arm pivot Shaft	Grease	Locate fitting on pivot shaft and grease with grease gun	Every 3 months or 50 hours (Except Maintenance-Free A-arm pivot)
▲	7.Steering Post Bushings	Grease	Locate fitting on pivot shaft and grease with grease gun	Every 3 months or 50 hours
▲	8.Front Wheel bearings	Grease (high temperature resist)	Inspect and replace bearings if necessary	Semi-annually
	9.Tie rods	Grease	Locate fittings and grease	Semi-annually
	10.Shift Linkages	Grease	Locate fittings and grease	Semi-annually
▲	11.Ball joints	Inspect	Inspect and replace it if necessary	Semi-annually
▲	12.Rear Axle Bearing	Grease	Locate fittings and grease	Every 3 months or 50 hours
▲	13.Swing Arm Bearing	Grease	Locate fittings and grease	Monthly or 20 hours
▲	14.Throttle Cable	Grease M	Grease, inspect and replace it if necessary	Monthly or 20 hours
	15. Rear prop shaft U-joint	Grease	Locate fittings and grease	Every 3 months or 50 hours
	16. Rear prop shaft yoke	Grease	Locate fittings and grease	Every 3 months or 50 hours
	17. Front prop shaft U-joint (SDX300)	Grease	Locate fittings and grease	Every 3 months or 50 hours
	18. Front prop shaft yoke (SDX300)	Grease	Locate fittings and grease	Every 3 months or 50 hours
	19. Inner and outer CV-Joints (SDX300)	Grease M	Grease, inspect and replace it if necessary	Every 3 months or 50 hours
▲				
	21. A-arm pivot shaft	Grease	Locate fittings and grease	Every 3 months or 50 hours



LUBRICATION RECOMMENDATIONS
NOTE:

1. ⚠ More often under severe use, such as wet or dusty conditions.
2. ⚠ Grease: Light weight lithium-soap grease.
3. ⚠ Grease M：Molybdenum disulfide (MoS_2) grease (water resistant).
4. ⚠ When suspension action becomes stiff or after washing.
5. ⚠ Hours are based on 10 mph(16Km/h) average.

2.2 FUEL SYSTEM

WARNING

Gasoline is extremely flammable and explosive under certain conditions.

Always stop the engine and refuel outdoors or in a well ventilated area.

Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.

Do not overfill the tank. Do not fill the tank neck.

⚠ If you get gasoline in your eyes or if you swallow gasoline, see your doctor immediately.

If you spill gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.

⚠ Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.

⚠ Never drain the float bowl when the engine is hot. Severe burns may result.

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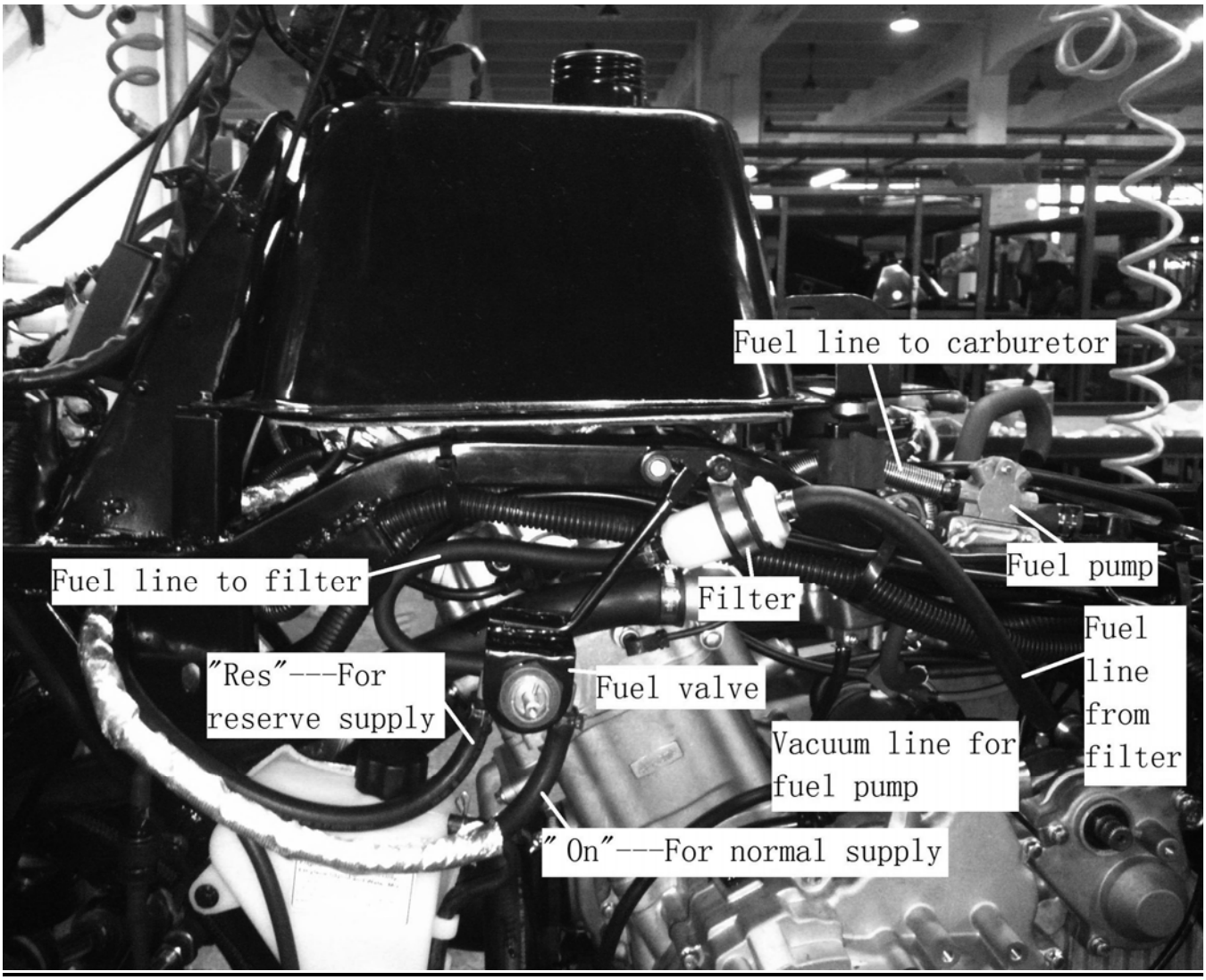


FUEL LINES

Check fuel lines for signs of wear, deterioration, damage or leakage. Replace if necessary.

Be sure fuel lines are routed properly and secured with cable ties.

CAUTION: Make sure lines are not kinked or pinched.

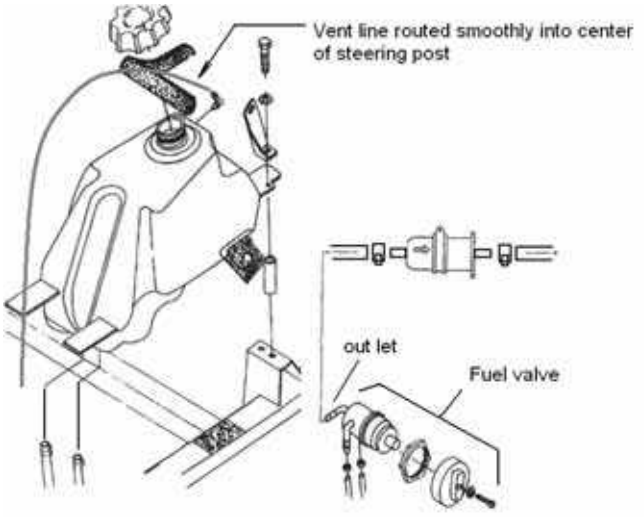
Replace all fuel lines every two years.

FUEL FILTER

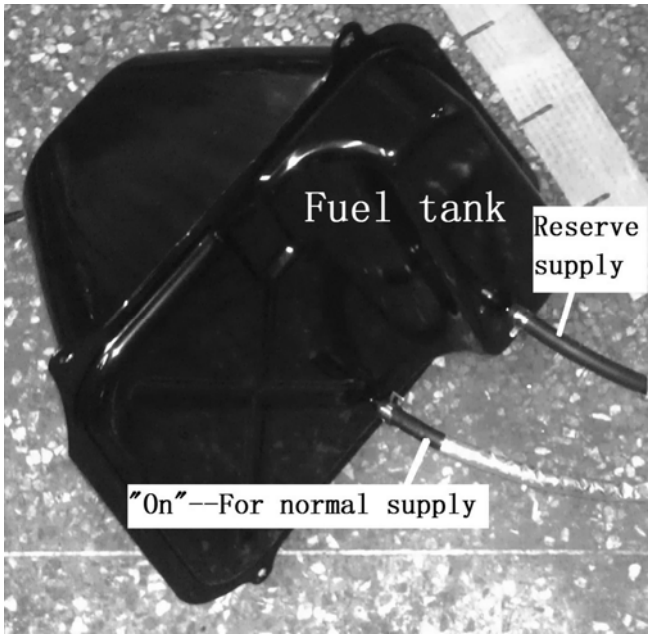
The fuel filter should be replaced in accordance with the Periodic Maintenance Chart or whenever sediment is visible in the filter.

1. Shut off fuel supply at fuel valve.
2. Remove line clamps at both ends of the filter.
3. Remove fuel lines from filter.
4. Install new filter and clamps onto fuel lines with arrow pointed in direction of fuel flow.
5. Install clamps on fuel line.

6. Turn fuel valve ON.
7. Start engine and inspect for leaks.
8. Reinstall fuel tank.



ATV 500



ATV 500

FUEL VALVE AND STRAINER SCREEN FOR B-TYPE ATV500

NOTE

After installing the fuel valve and connecting the fuel line, refill the fuel tank and turn the fuel valve ON and check that there is no fuel leaking.

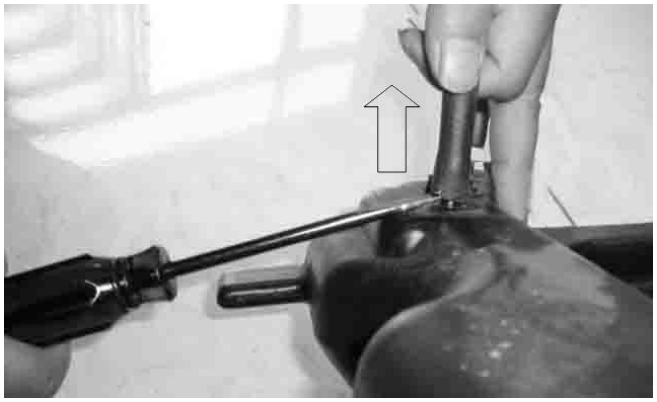
WARNING

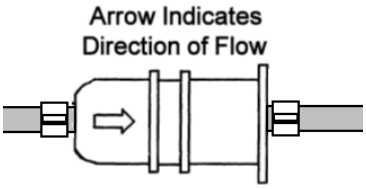
Always pay attention to the fittings of the plastic gas tank during fuel lines service. Don't pull the line from the tank directly for removal. Inspect fittings and tank body for looseness, nicks, and scratches. Replace gas tank if necessary.

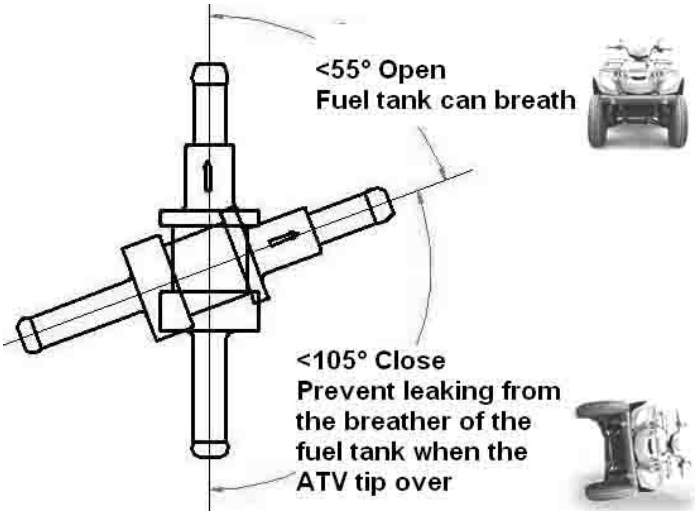
VENT LINES AND ROLL OVER VALVE*

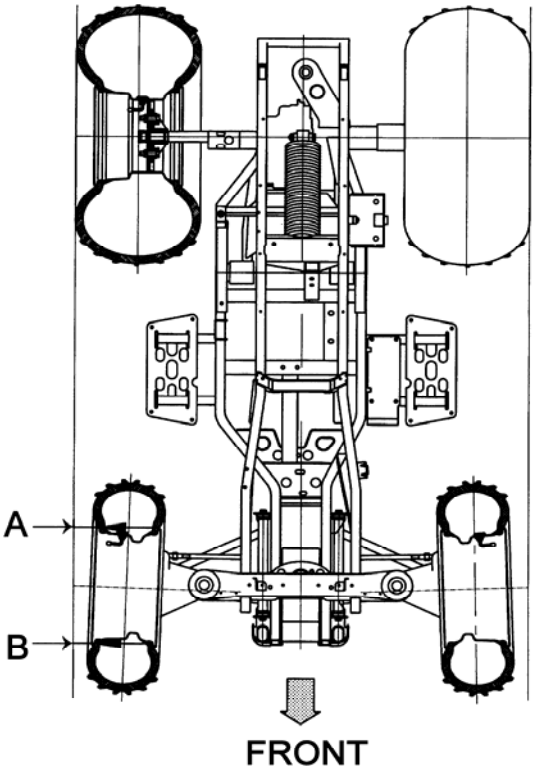
1. Check fuel tank, oil tank, carburetor, battery, and transmission vent lines for signs of wear, deterioration, damage or leakage. Replace every two years.
2. Be sure vent lines and drain lines are routed properly toward the ground and secured with cable ties. **CAUTION**: Make sure lines are not kinked or pinched

***NOTE. On some models, there is a Roll-Over Valve on the end of the gas tank vent line. Make sure the ↑ mark on the R-O Valve is upwards.**





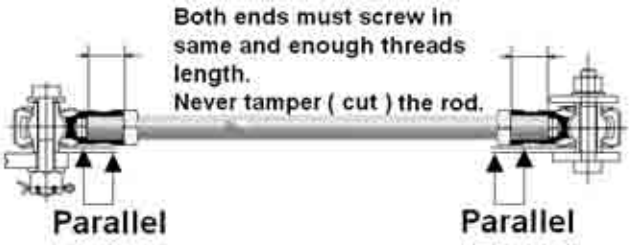




2.3 TOE ALIGNMENT

METHOD: STRAIGHTEDGE OR STRING
Be sure to keep handlebars centered

NOTE: String should just touch side surface of rear tire on each side of the ATV.
Measure from string to rim at front and rear of rim.
Rear rim measurement (A) should be 1/16" to 1/8" (1.5 to 3 mm) more than front rim measurement (B).
NOTE: The steering post arm (frog) can be used as an indicator of whether the handlebars are straight. The frog should always point straight back from the steering post when handlebars are straight.



WARNING: Always pay attention to tie rods assembly, Both ends must screw in same and enough threads length.

2.4 BRAKING SYSTEM INSPECTION

The following checks are recommended to keep the braking system in good operating condition. Service life of braking system components depends on operating conditions. Inspect brakes in accordance with the maintenance schedule and before each ride.

- Keep fluid level in the master cylinder reservoir to the indicated level on reservoir.
- Use DOT 3 brake fluid.

NOTE: Use new brake fluid or brake fluid from a sealed container to avoid contamination to system.

- Check brake system for fluid leaks.
- Check brake for excessive travel or spongy feel.
- Check friction pads for wear, damage and looseness.
- Check surface condition of the disc.

BRAKE PAD INSPECTION

- Pads should be changed when friction material is worn to 3/64" (1mm).

HOSE/FITTING INSPECTION

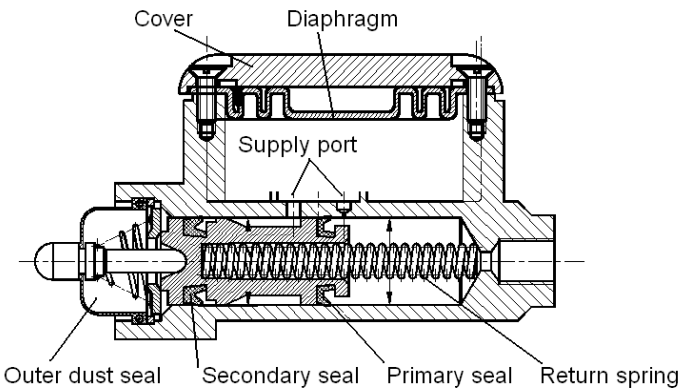
Check braking system hoses and fittings for cracks, deterioration, abrasion, and leaks. Tighten any loose fittings and replace any worn or damaged parts.

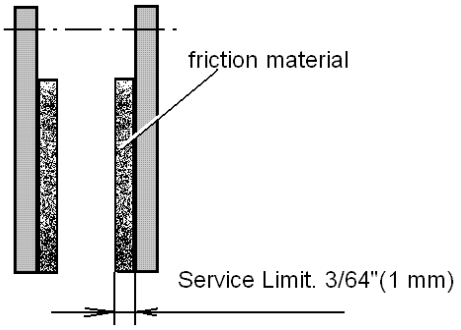
FOOT BRAKE ADJUSTMENT

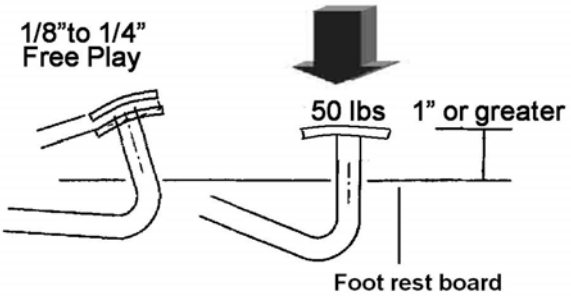
NOTE

On European ATV 260 / 300 and B-type , foot brake is the SERVICE brake (MAIN brake)

Use the following procedure to inspect the hydraulic foot brake system and adjust or bleed if necessary.



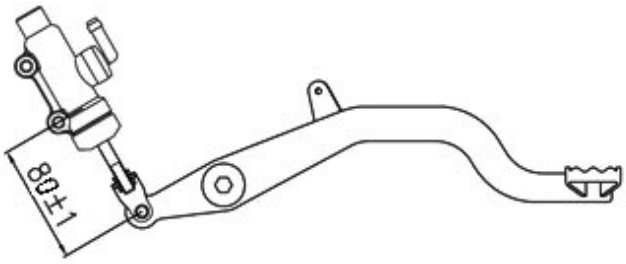




Foot control brake is only for ATV 260 / 300

Adjusting brake pedal for B-Type

If the push rod joint is reinstalled, adjust the push rod length so that the distance between the centers of the master cylinder lower mounting bolt hole and joint pin hole is 80±1mm.After adjustment, tighten the joint nut.



1. First check foot brake effectiveness by applying a 25 kg (50 lb). (Approx) downward force on the pedal.

   The top of the pedal should be at least 1 inch, (25 .4m m) above the surface of the footrest.

If less than one inch, two things must be examined:

Free Play:

Free play of the brake pedal should be 1/8-1/4 inch (3-6mm).

If free play is excessive, inspect pedal, linkage, and master cylinder for wear or damage and replace any worn parts.

Bleeding:

If free play is correct and brake pedal travel is still excessive, air may be trapped some where in the system. Bleed the hydraulic brake system in a conventional manner, following the procedure outlined in the Brake chapter.

FOOT BRAKE TESTING

The foot brake should be checked for proper adjustment.

Support the rear wheels off the ground. While turning the rear wheels by hand, apply the auxiliary footbrake. This brake should not stop the wheels from turning until the lever is half way between its rest position and bottoming on the footrest.

MECHANICS PARKING BRAKE FOR EUROPE ATV 500

Checking

Although the parking brake has been adjusted at the factory, the brake should be checked for proper operation. The mechanical brake must be maintained to be full functional.

CONTROLS

Check controls for proper operation, positioning and adjustment.

Brake control and switch must be positioned to allow brake level to travel throughout entire range without contacting switch body.

Note: burnishing procedure is also applicable for parking brake. See CHAPTER 7 BRAKES.

1. With the engine off, apply the parking brake lever and attempt to move the ATV.
2. If the rear wheels are locked, it is adjusted properly.
3. If the wheels are not locked, it must be adjusted.

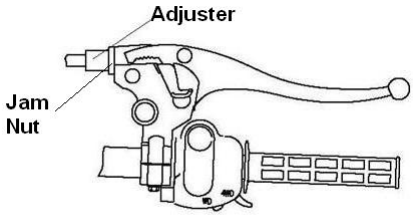
To adjust (set up) the mechanical parking brake, use the following procedure.

1. With the engine off, loosen the adjustor on the lever.
2. Loosen the jam nut of the adjuster on the caliper.
3. Turn the adjuster (bolt) CW (clockwise) by hand till the pad touch the brake disc, turn the adjuster bolt CCW (counterclockwise) by 1/4 to one turn for 10 to 20mm free play at the end of the parking lever.
4. Tighten the jam nuts securely against the adjusters.
5. Make sure the rear wheels turns freely without dragging.
6. Turn the adjustor (the one on the lever) and apply the lever. While adjusting, it is important you apply the lever back and forth for operation, free play and the locking of the parking position.
7. Make sure the rear wheels turns freely without dragging and parking brake works properly.

CAUTION Don't over tighten the adjustor. Free play of the lever: 20mm.

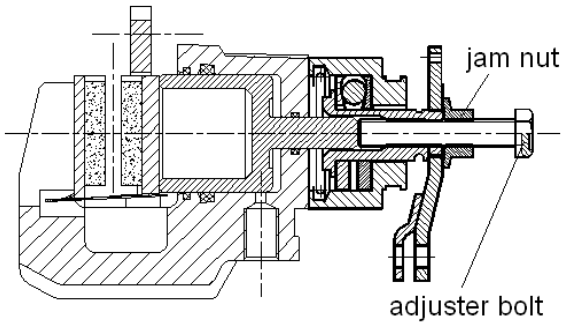
8. Field test for parking. It must be capable of holding the laden ATV stationary on an 18% up and down gradient.

↑adjust on the lever



↑ adjust on the lever ATV500

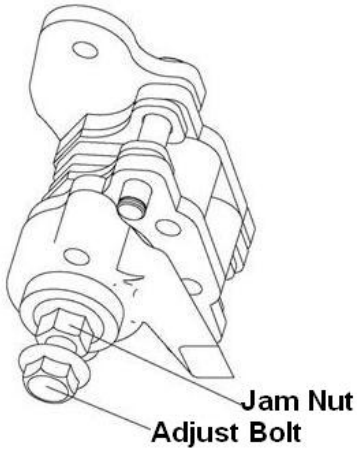
Adjusting can also be done to the brake cable on the parking lever side by turn the adjuster (nut) directly.



↑ adjust on the caliper ATV 500

Note: The adjusting on the caliper is for the wear out of the pads.

A temporary adjusting can also be done to the brake cable on the parking lever side by turn the adjuster (nut) directly. But the adjust range is limited. Always do the **procedure 1 to 8** when necessary.



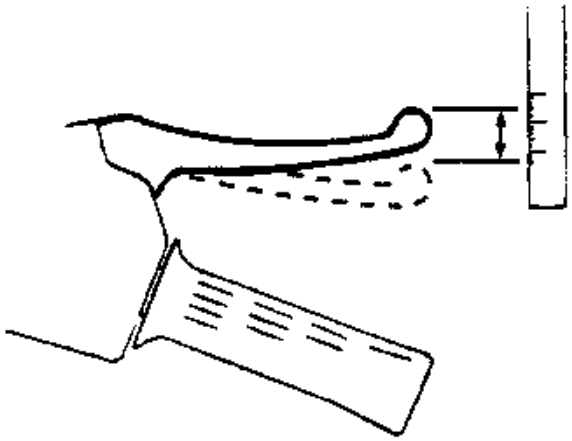
↑ adjust on the caliper B-type ATV

2. If the both front wheels are locked, it is adjusted properly.
3. If the wheels or one wheel are/is not locked, it must be adjusted.

Adjusting
To adjust (set up) the mechanical drum brake, use the following procedure.
1. Loosen the jam nuts of the adjuster on the right hand of right and left brake cable.
2. Turn the both adjusters keep the rock arm on the lever balance until 1/8” (2to3mm) free play is achieved at the brake lever.

rake shoes as a set either is worn to the limit.

NOTE: While adjusting free play, it is important you apply the lever back and forth.
3. Tighten the jam nuts securely against the adjusters.
If the right hand adjustment is inadequate to attain the proper brake free-play gap, make adjustment at the middle of the cables adjuster jam nuts.
NOTE: Apply the front brake a number of times to ensure the wheels lock and the brake light illuminate properly.
4. Make sure the right and left brake are balance after the adjustment of the front brakes by test at low speed. Contact your dealer for proper diagnosis and repairs.
5. If adjusting the cables does not attain proper brake performance and free-play, the brake shoes must be replaced.
Note: After the adjusting, the adjustment distance of the cables and the angle of the drum levers between the right and left brake must be same.



2.5 SUSPENSION SPRING RPELOAD ADJUSTMENT

Operator weight and vehicle loading affect suspension spring preload requirements. Adjust as necessary.

FRONT SUSPENSION

Compress and release front suspension. Damping should be smooth throughout the range of travel.

Check all front suspension components for wear or damage.

Inspect from strut cartridges for leakage. Shock spring preload can not be adjusted, replace if necessary.

REAR SUSPENSION

Compress and release rear suspension. Damping should be smooth throughout the range of travel. Check all rear suspension components for wear or damage.

Inspect shock for leakage

Shock spring preload can be adjusted using the shock spanner wrench.

2.6 WHEELS

Inspect all wheels for runout of damage.
Check wheel nuts and ensure they are tight.
Do not over tighten the wheel nuts.

WHEEL, HUB TORQUE TABLE

Item	ATV500	
Front Wheel Nuts	69 Ft.Lbs	96 N.m
Rear Wheel Nuts	69 Ft.Lbs	96 N.m
Front Spindle Nut	Refer to FRONT HUB INSTALLATION	
Rear Hub Retaining Nut	80 Ft.Lbs	110.6 N.m

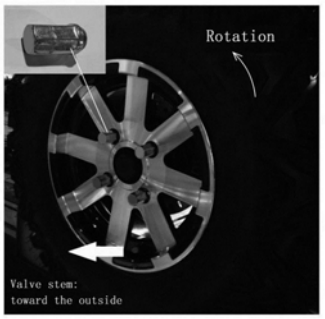
WHEEL REMOVAL

1. Stop the engine, place the transmission in gear
   And lock the parking brake.
2. Loosen the wheel nuts slightly.
3. Elevate the side of the vehicle by placing a suitable stand under the footrest frame.
4. Remove the wheel nuts and remove the wheel.

WHEEL INSTALLATION

1. With the transmission in gear and the parking Brake locked, place the wheel in the correct Position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward rotation.
2. Attach the wheel nuts and finger tighten them.
   Install as shown at right for front or rear wheels.
3. Lower the vehicle to the ground.
4. Securely tighten the wheel nuts to the proper Torque listed in the table above. On rear wheel nuts, Make sure tapered end of nut goes into taper on wheel.

ATV500



Front
Flange nuts:install with tapered side against wheel

Rear
Flange nuts:install with tapered side against wheel

CAUTION:
If wheels are improperly installed it could affect Vehicle handling and tire wear.

2.7 TIRE PRESSURE

TIRE INSPECTION

CAUTION :

- Maintain proper tire pressure. Refer to the warning tire pressure decal applied to the vehicle.
- Improper tire inflation may affect ATV maneuverability.
- When replacing a tire always use original equipment size and type and replace in pairs, especially in SDX300 model.
- The use of non- standard size or type tires may affect ATV handling and cause machine damage, especially in SDX300 model.

TIRE TREAD DEPTH

Always replace tires when tread depth is worn to 1/8" (3mm) or less.

Tire Pressure Inspection

	Front	Rear
500	14PSI (96±0.5KPa)	14PSI (96 ±0.5KPa)

WARNING Operating an ATV with worn tires will increase the possibility of the vehicle skidding easily with possible loss of control.

Worn tires can cause an accident.
Always replace tires when the tread depth measures 1/8" (3mm) or less.

2.8 FRAME , NUTS, BOLTS, FASTENERS

Periodically inspect the tightness of all fasteners in accordance with the maintenance schedule. Check that all cotter pins are in place. Refer to specific fastener torques listed in each chapter.

ATV 500			
Item	Torque (Ft-Lb)	Torque (Nm)	Remarks
EARLY DESIGN* Handlebar Clamp Nut M6	12	16	Only ATV 260 early model
Handlebar Clamp Nut M8	18	25	
Nut M10X1.25 Attaching Tie Rod to Steering column	26-30	35-41	
Nut M10X1.25 Attaching Tie Rod to Front Absorber Strut body	26-30	35-41	
Tie Rod Jam Nut M12	13	17	
MANTENANCE-FREE PIVOT DESIGN Bolt M12 Attaching A-Arm and Frame	37-44	50-60	LT*
Nut M10X1.25 Attaching A-Arm to Ball Joint Stud	22-25	30-35	
Screw M6 Attaching Ball Joint Mounting Bracket to Front Absorber Strut body (MacPherson)	8	11	LT*
Swing Arm Pivot Left	14	19	Refer to SWING ARM ASSEMBLY INSTALLATION , 4.2 SWING ARM , CHAPTER 4A CHASSIS
Swing Arm Pivot Right	120	165	
Threaded Pivot Nut (for swing arm)	120	165	
Nut M14X1.5 Attaching Front Absorber to Frame (MacPherson)	15-18	21-25	LT*
Nut M8 Binding Front Absorber and Front Absorber Strut body (MacPherson)	15	21	LT*
Bolt M8 Attaching Front Caliper to Front Absorber Strut body	18	25	LT*
Bolt M8 Attaching Upper Steering Clamp to Frame	12	16	
Nut M8 Attaching Lower Steering Bearing Retainer to Frame	12	16	
Nut M10X1.25 Attaching Front Wheel to Front Wheel Hub	20	27	
Front (Drive) Axle Nut	Refer to FRONT HUB INSTALLATION		
Screw M8 Attaching Front Brake Disc to Front Wheel Hub	18	25	LT*
Nut M10X1.25 Attaching Rear Brake Disc to Rear Brake	22-25	30-35	LT*
Rear Axle Nut M20X2 (for swing arm)	80	110.6	
Rear Hub Retaining Nut M20X1 (for IRS)	101	137	
Nut M10X1.25 Attaching Rear Caliper to Axle Tube	18	25	LT*
Bolt M12x30 Attaching Axle Tube and Swing arm to Rear Gear-box	60	80	
Bolt M12x35 Attaching Axle Tube to Swing arm	60-66	80-90	

LT*—Apply Loctite™ 242

NOTES

CHAPTER 3 ENGINE

500 cc

3.1. Removal and Installation of Engine, Drive Train and Gearshift Unit

3.1.1 Overhaul info

Operation cautions

- **Securely support the ATV with bracket when removing or installing engine.**

  Take care not to damage frame, engine body, bolts and cables.

- **Wrap the frame to avoid any possible damage when removing or installing the engine.**

- **Following operation doesn't require removal of engine from the vehicle:**

—Oil pump

—Carburetor, air filter

—Cylinder head cover, cylinder head, cylinder body, camshaft

—CVT system, CVT cover

—Gearbox

—Right side cover, AC magneto, water pump

—Piston, piston ring, piston pin

- **Following operation require removal of engine from vehicle:**

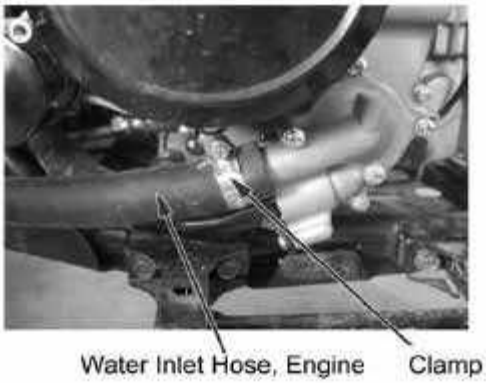
—Crankshaft

- **Tightening torque:**

Engine front upper mounting bolt:	35 ~ 45N·m
Engine front rear mounting bolt:	40 ~ 50N·m
Bolt, engine front rear mounting bracket	35 ~ 45N·m

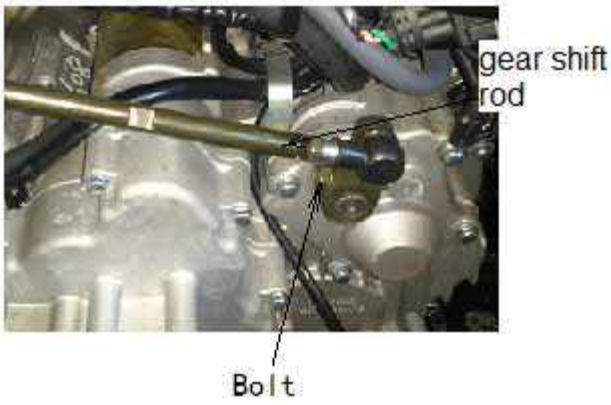
•Engine Removal

Remove:
--Plastic(→Chapter 2)
--Air Filter(→Engine service chapter)
--Carburetor (→Engine service chapter)
--Clamp
--Water Inlet Hose



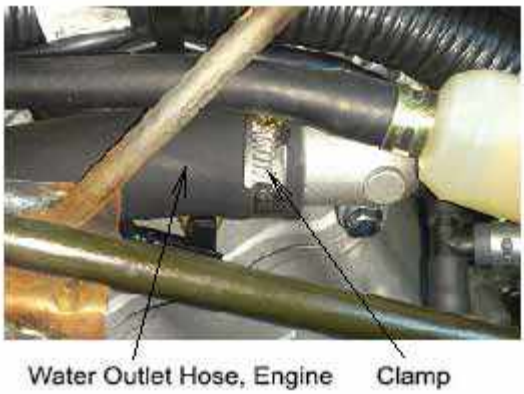
Remove screw

Remove gear shift rod

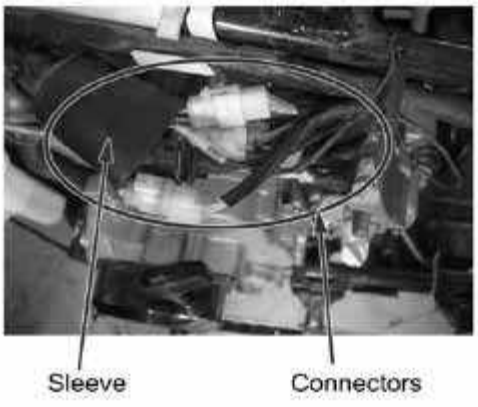


Remove clamp

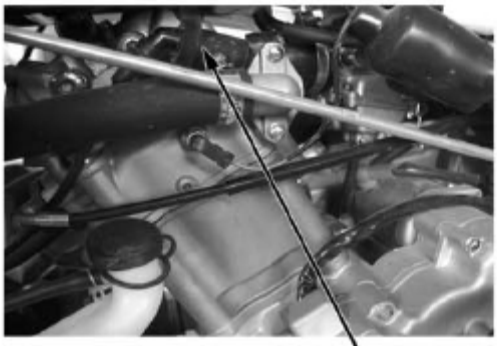
Remove water outlet hose



Remove Sleeve.
Remove connectors of magneto, enriching device lead, pickup, water temperature transducer, gear sensor as illustrated on the right.



Remove spark plug cap from cylinder.



Remove protection sleeve of starter relay.

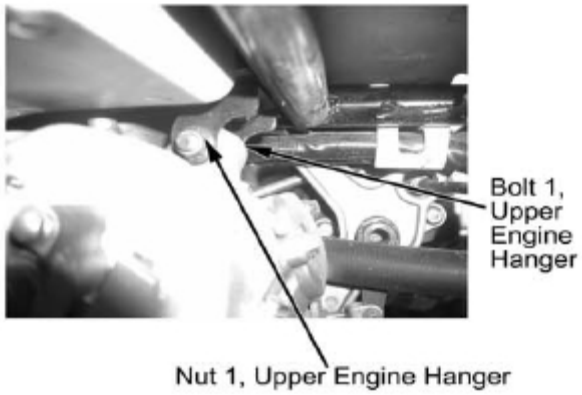
Remove Nut.

Disconnect positive wire of starter relay.

Remove nut.

Remove negative wire of starter relay.

Remove Bolt 1 and Nut 1 of upper engine hanger.



Remove Bolt 1 and Nut 1 of lower engine hanger.

Bolt 1(Nut 1), Lower Engine Hanger

Remove Bolt 2 and Nut 2 of lower engine hanger.

Bolt 2(Nut 2), Lower Engine Hanger

3.1.2 Engine Installation

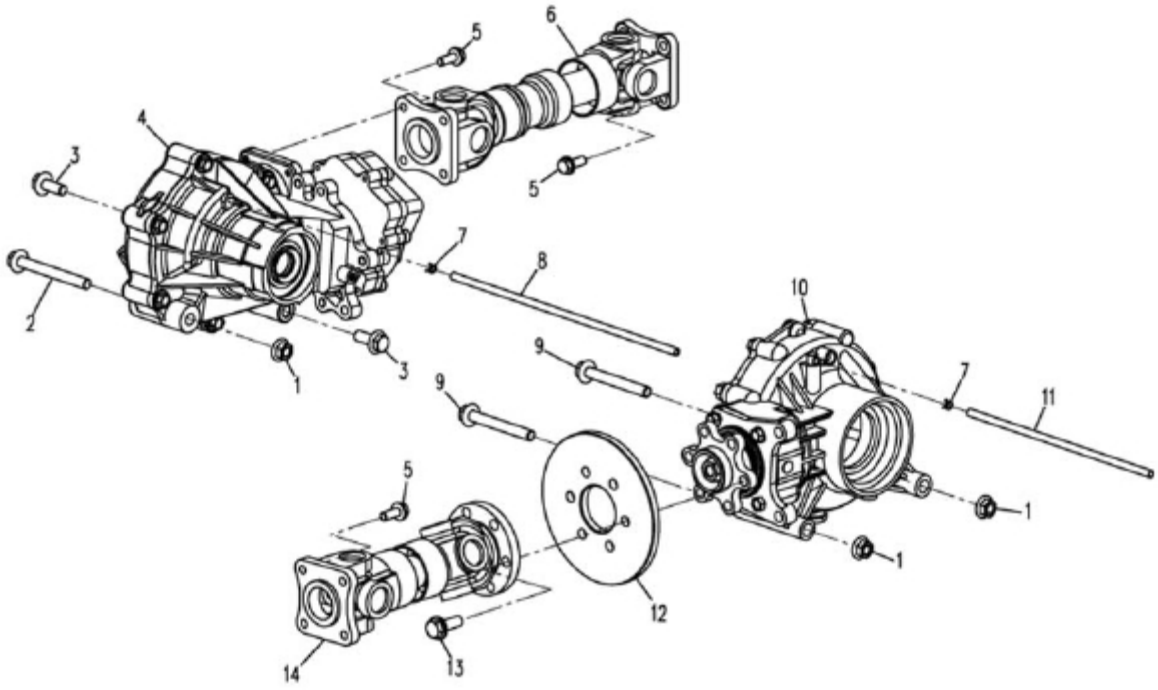
Put engine onto the frame，install the two lower mounting bolts and nuts.
Then install the upper and lower engine hangers.

Tightening torque: Engine upper hanger bolt:35～45N.m
Engine lower hanger bolt:50～60N.m

Install:
--Water outlet and inlet hoses to engine with proper clamps.
--Positive and negative starting wires to engine.
--Connect all the connectors.
--Spark plug cap.
--Gearshift rod to engine.
--Air filter, carburetor and removed parts.

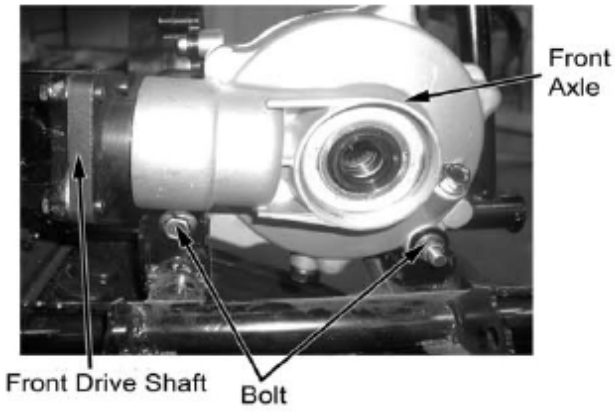
3.1.3 Removal and Installation of Front and Rear Axle

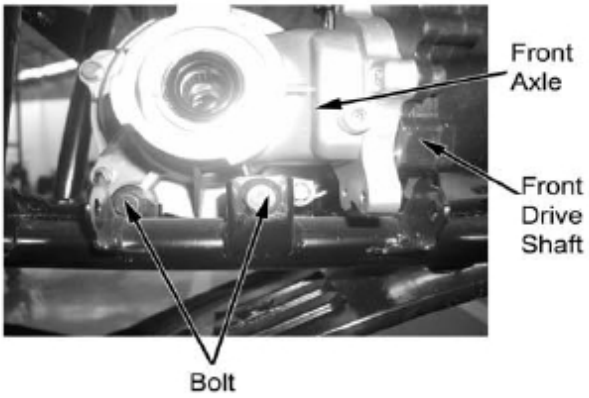
Support the vehicle with jack, make sure the vehicle will not fall.
Remove:
--Plastic parts for frame(→Chapter 2)
--Front and rear wheels and arms(→Chapter 6)
--Air filter(→engine service chapter)
--Carburetor(→engine service chapter)
--Engine
--Rear brake caliper(→7-4)



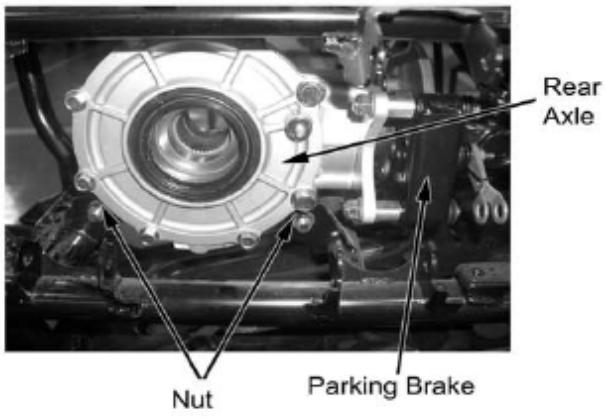
1. Nut 2. Bolt 1 3. Bolt 2 4. Front Axle 5. Bolt 3 6. Front Drive Shaft
7. Clamp 8. Breather Hose, Front Axle 9. Bolt 4 10. Rear Axle
11. Breather Hose, Rear Axle
12. Rear Brake Disk 13. Bolt 5 14. Rear Drive Shaft

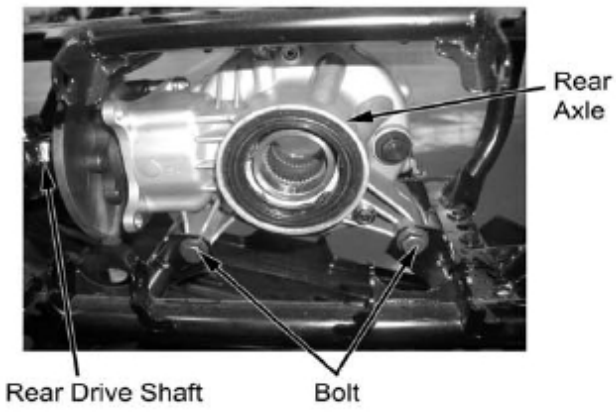
Remove nut and bolt of front axle from frame.



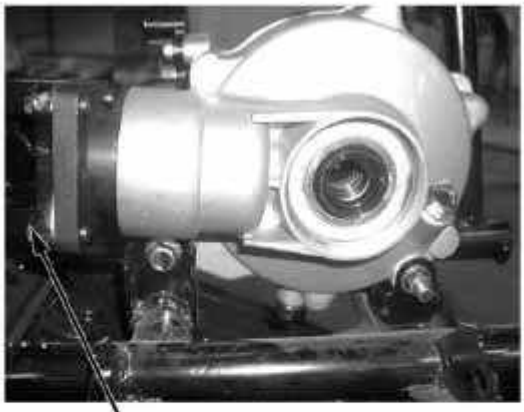


Remove nut and bolt of rear axle from frame.





Remove the 18 bolts for drive shafts
and front and rear axles.
(Refer to P. 5-5, Bolt 3 of Part No.5)

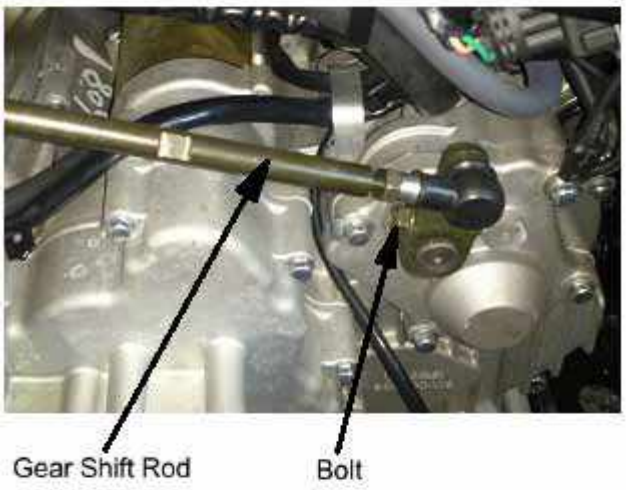


Remove:
--Front and rear axles, drive shafts, rear brake disc

Installation:
Reverse the removal procedure for installation.

Tightening torque:
Bolt, front axle：40-50N.m
Bolt, rear axle：40-50N.m
Bolt, front and rear drive shafts：40-50N.m

Gearshift Unit
Remove:
--Left and right side panel
--Fuel tank top cover
--Front fender
--Bolt
--Gearshift rod



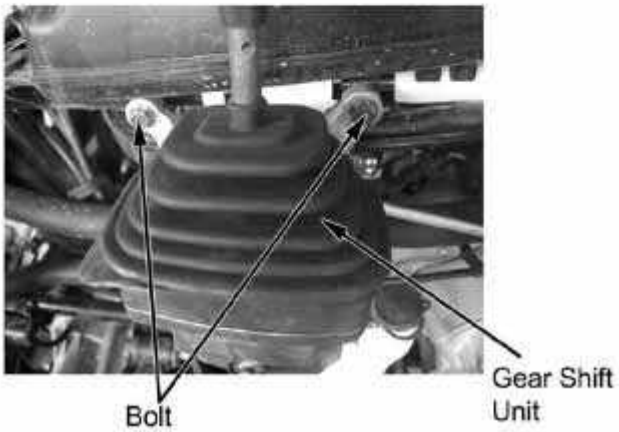
Remove the 2 bolts

Remove gearshift unit

Installation:
Reverse the removal procedure for installation.

Make sure that gearshift is flexible.

In case of any inflexibility, adjust the gearshift rod to ensure the gear engagement.



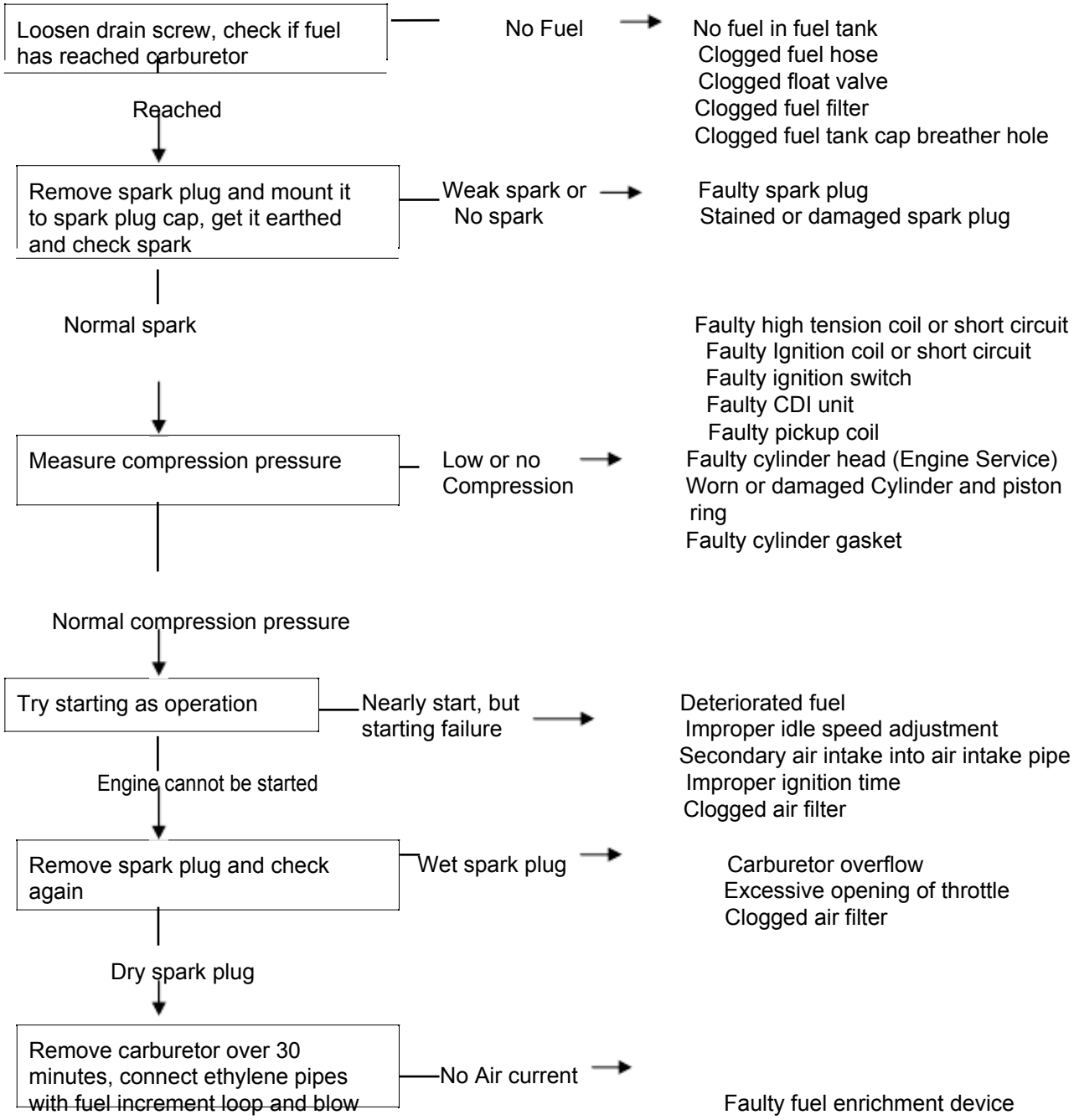
3.2. Troubleshooting

Operating Notice

This chapter is a general explanation of major troubleshooting of the whole engine.
Refer to the relevant chapters for troubleshooting not listed in this chapter.

Starting Failure/Hard Starting

In case of starting failure or hard starting, refer to chapter of starting system (Engine maintenance notebook) for troubleshooting and check the starting system whether have problems or not.



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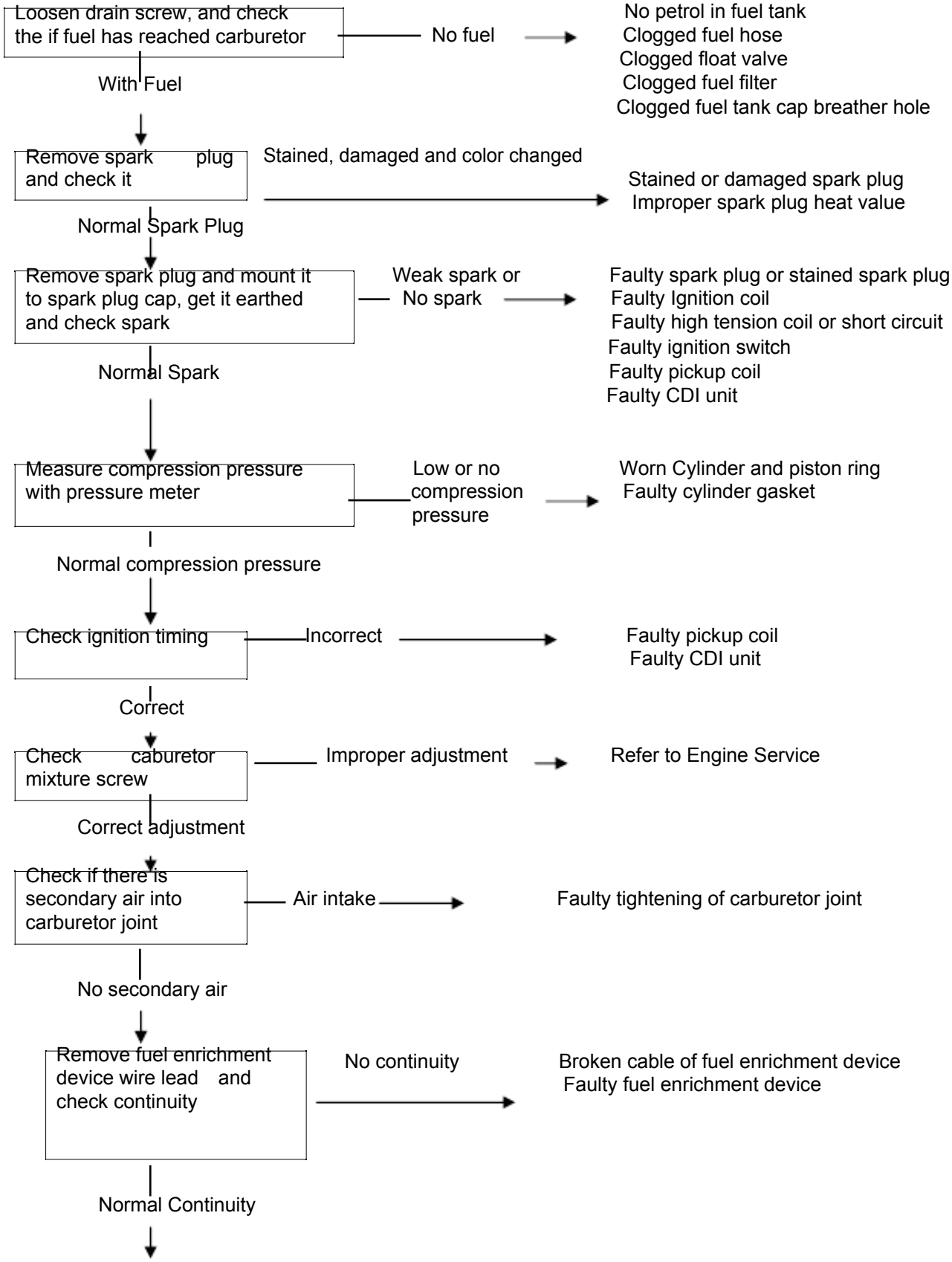
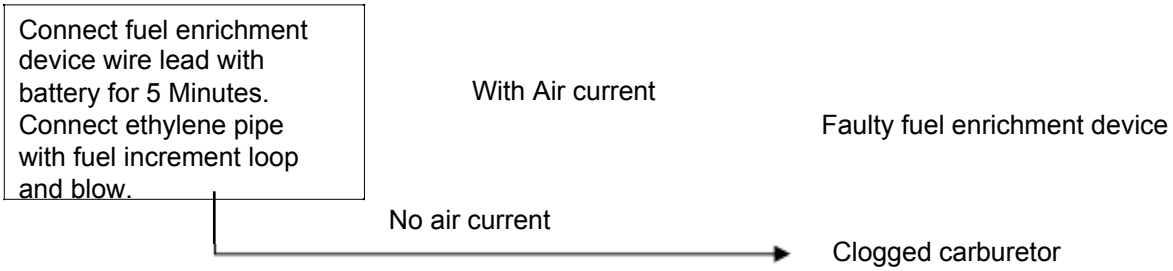
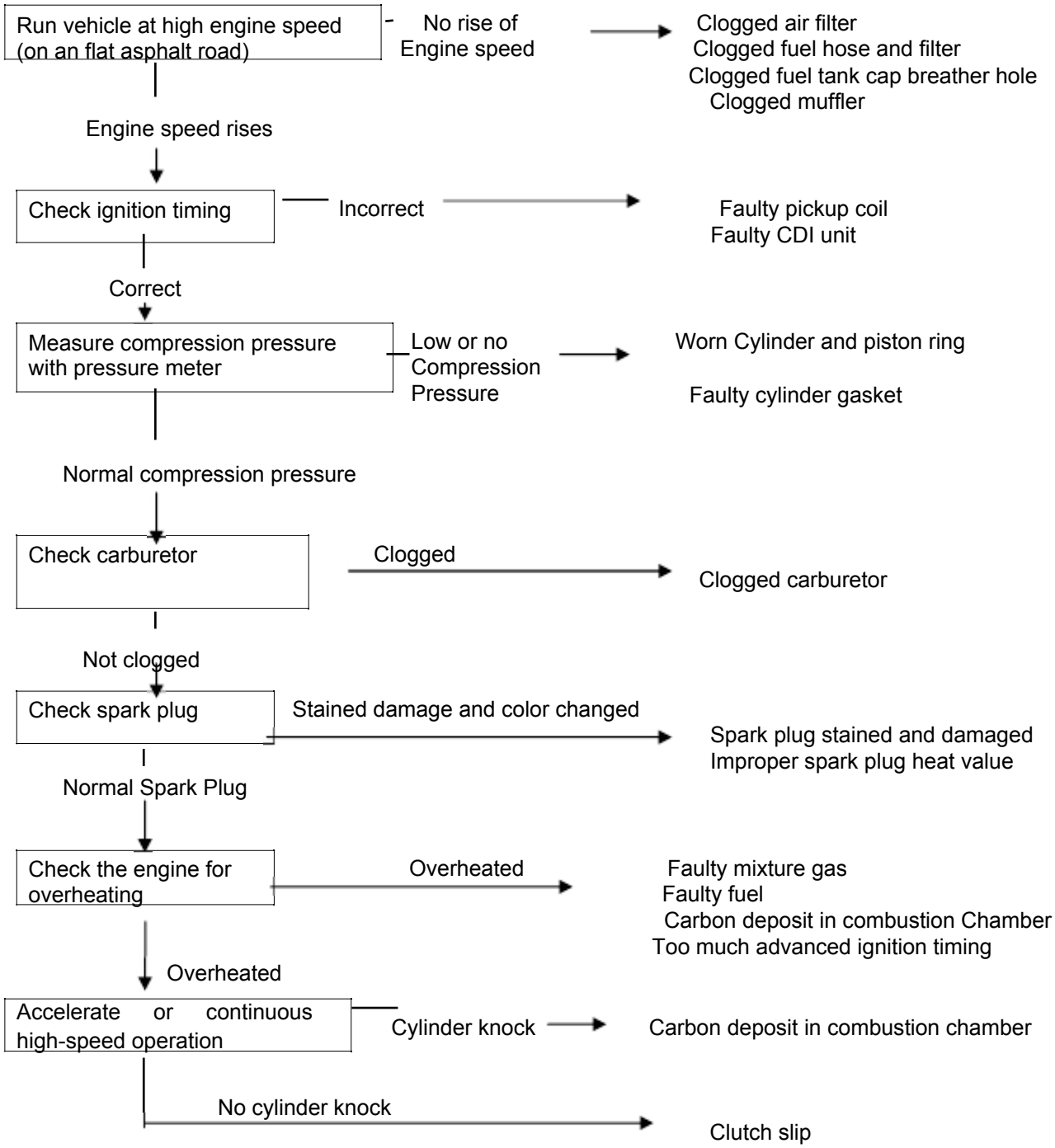
Unstable Engine Running or Engine Stops

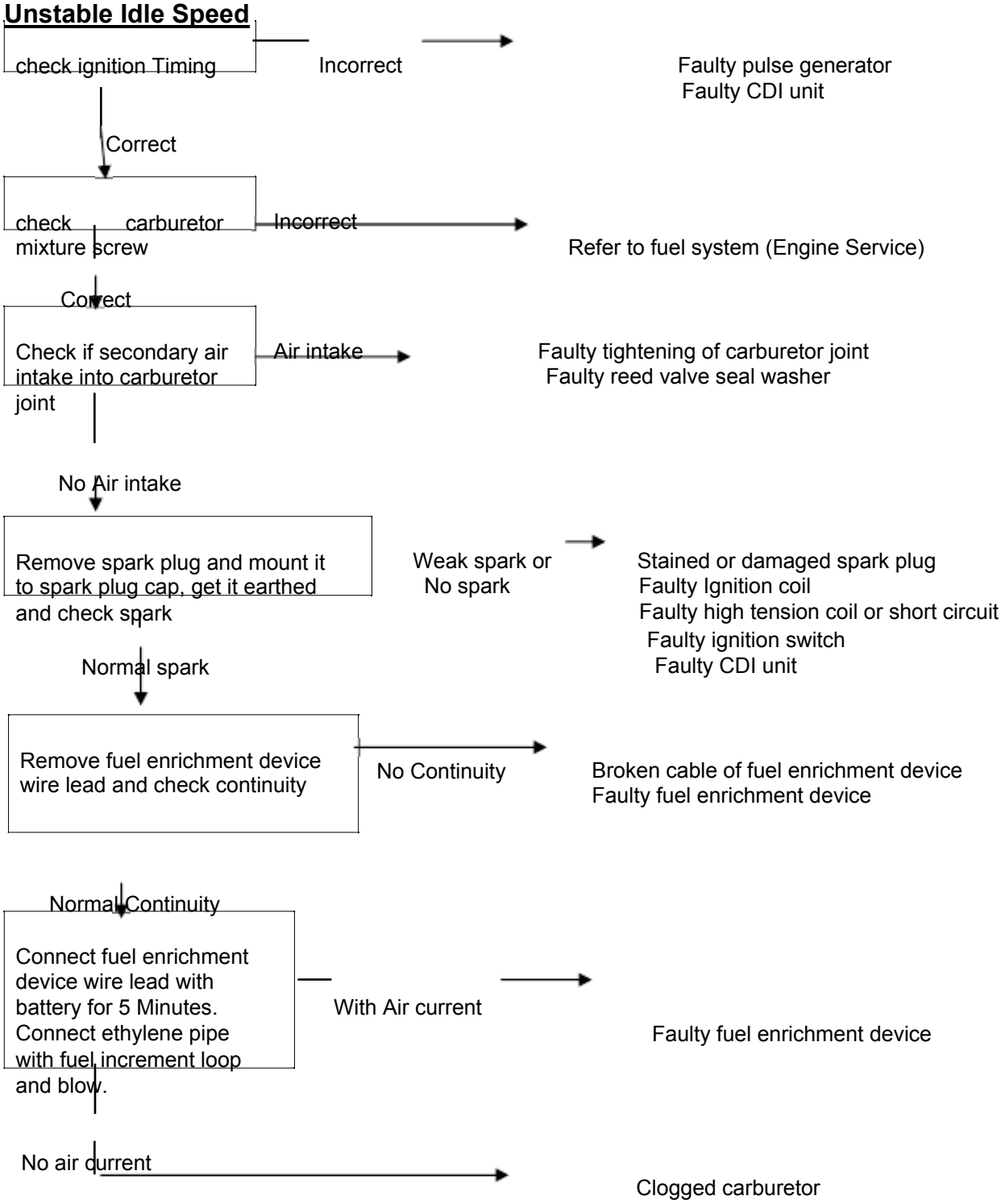




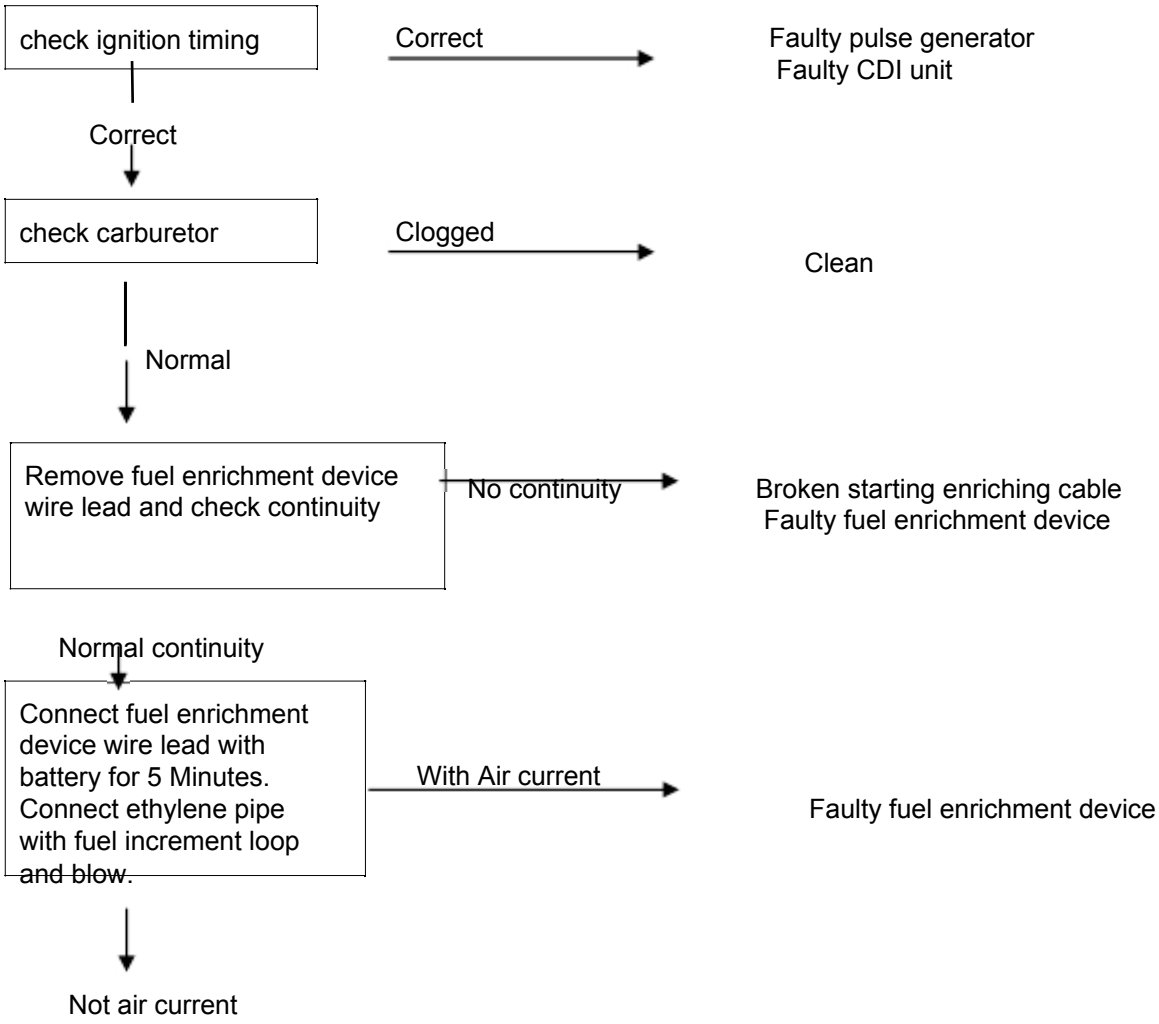
Poor Engine Performance in Hi-speed Range or Slow Speed Rising



Unstable Idle Speed



Poor Engine Performance in Middle or High Range



3.3．Engine Overhaul Information

Item	Conversion
Press	1kgf/cm^2 =98.0665KPa 1KPa=1000Pa 1mmHg=133.322Pa=0.133322KPa
Torque **Conversion Table**	1kgf.m=9.80665N.m
Volume	1ml=1cm^3=1cc 1l=1000 cm^3

Warning/Caution/Note

Please read this manual and follow is instructions carefully. To emphasize special information, the symbol and the words WARNING,CAUTION and NOTE have special meanings. Pay attention to the messages highlighted by these signal words.

Warning:

Indicates a potential hazard that could result in injury or death.

Caution:

indicates a potential hazard that could be result in vehicle damage.

Note:

provides key information to make procedures easier or instruction clearer.

Please note, however, that the warnings and cautions contained in this manual can’t possibly cover all the potential dangerous information to the servicing, or lack of the vehicle. Except WARNINGS and CAUTIONS stated in this manual, mechanic should have a basic understanding of the mechanical ideas and the procedure of machine repair. If mechanic can’t master all the troubleshooting operation, please consult with qualified mechanic for advice.

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GENERAL PRECAUTIONS

Warning ! Proper service and repair procedures are important for the safety of operator and the safety and reliability of the vehicle.

When two or more persons work together, keep reminding each other for safety purpose.
When start the engine indoors, make sure that the exhaust gas is forced outdoors.
If use hazardous or flammable material, please strictly operate according to manufacturer's operation manual. Operate in a well- ventilated place.
Never use gasoline as a cleaning solvent.
Do not touch the engine oil, radiator or muffler with bare hands to avoid scalding before it is cooled.
Check all the lines, and fittings related to the system for leakages, after repairing fuel, cooling, lubricating or exhaust system .
Do not dispose used oil, coolant or defective parts optionally for environmental purpose.

CAUTION:

Use genuine CFMOTO parts or their equivalent.
Place and store the disassembled parts separately in order for correct assemble.
Use special tools according to service manual.
Make sure that all parts used in reassembly are clean, lubricated them when specified.
Use the special lubricants, sealants and greases.
Pre-tighten the bolts, nuts and screws, then tighten according to the specified torque, from big to small and from inner side to outer side.
Fix torque screw with torque wrench, clean grease or oil from the screw thread before fixing.
Check the parts after disassembling, clean the parts before measuring.
Check parts for tightness and proper operation, after assembling.
Replace the disassembled washers, o-rings, seals, locknuts, lockwashers, cotter pins, circlips with new ones.

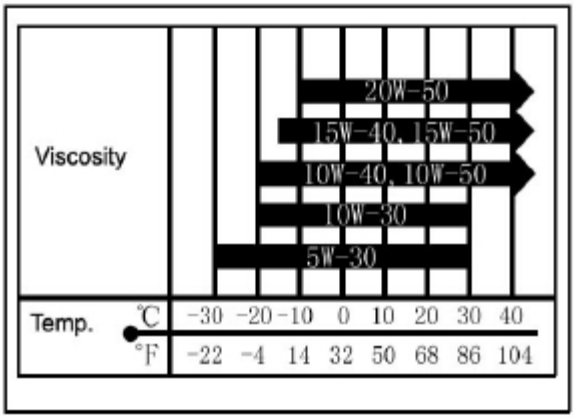
FUEL, OIL, COOLANT

Fuel

Use unleaded gasoline with octane number over 90.

OIL

Use a premium quality 4-stroke motor oil to ensure longer service life of your vehicle. Use only oils that meet API service classifications SF or SG and that have a viscosity rating of SAE10W/40. If oil with a rating of SAE 10W/40 is not available, select an alternative according to the chart.



ENGINE COOLANT

Since antifreeze also has corrosion and rust-inhibiting properties, always use coolant containing antifreeze, even if the atmospheric temperature does not go below the freezing point.

It is suggested that the freezing point of antifreeze should be 5℃ lower than the lowest ambient temperature where the vehicle is used.

Recommended Coolant: -35℃ antifreeze, corrosion-resistant, high boiling point coolant

Warning! Coolant is poisonous. Never drink it. Store it properly.

Caution: DO NOT mix coolant with that of other engines.

BREAK-IN PROCEDURES

During manufacturing only the best possible material are used and all machined parts are finished to a very high standard. It is still necessary to allow the moving parts to “BREAK-IN” before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. Refer to the following break-in engine speed recommendations.

For better performance and durability, a new engine requires a run-in time of 20 hours as under:

0~10 Hours:

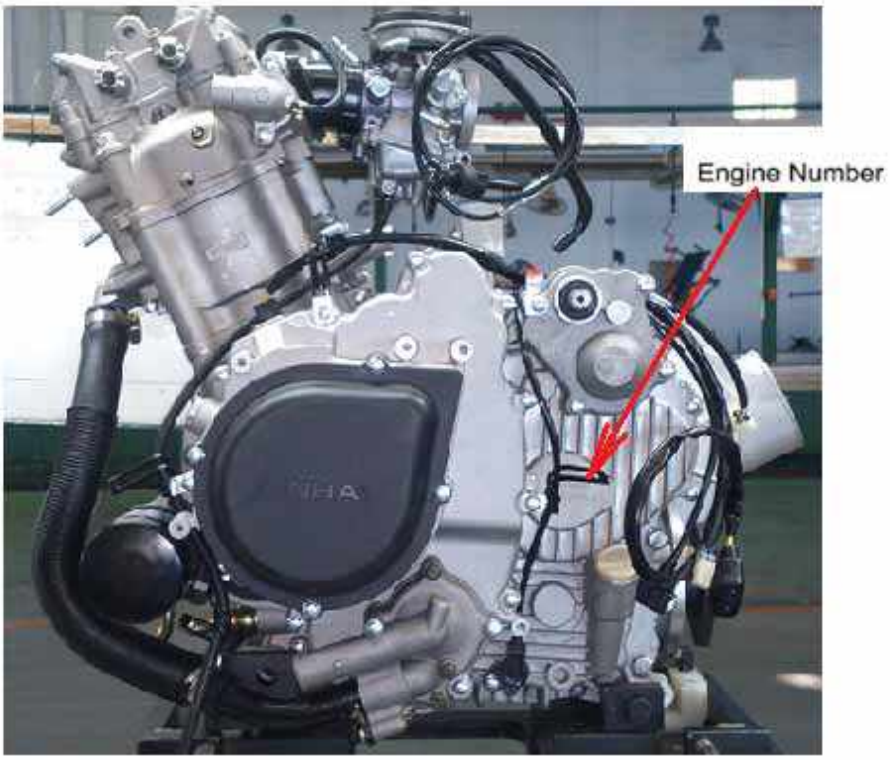
Avoid continuous operation above half throttle. Allow a cooling off period of five to ten minutes after every hour of operation. Vary the speed of vehicle from time to time. Do not operate it at one set throttle position.

10~20 Hours

Avoid prolonged operation above 3/4 throttles. Rev the vehicle freely but do not use full throttle at any time.

Note: Keep the daily maintenance during the run-in time and eliminate the troubles, if any. After 20h run-in time, do the maintenance according to the owner’s manual for normal operation of the ATV.

Engine Exterior and Engine No



View From Engine Right Side

View From Engine Left Side

Engine Specification

REF. NO	ITEM			Type/SPECIFICATION
1	Type			Single Cylinder, 4-Storke, Liquid-cooled, 4 Valve, SOHC
2	Bore and stroke			87.5mm×82.0mm
3	Displacement			493ml
4	Compression ratio			10.2: 1
5	Lowest continuous idle speed with load			1400r/min±100r/min
6	Starting type			Electrical starting/ Recoil Starting
7	Electrical System	Ignition / Ignition Timing		CDI Magneto ignition/BTDC10°1500r/min
		Spark Plug/ Spark Plug Gap		DPR7EA-9 (NGK)/0.8mm-0.9mm
		Magneto		Permanent Magnet AC Type
8	Combustion System	Combustion Chamber		Triangle Combustion Chamber
		Carburetion Type/Model		Vacuum Diaphragm Type/MIKUNI BSR36-129
		Air Filter		Sponge Element Filter
		Gasoline		RQ-90
9	Valve System	Valve Type		SOHC/Chain Drive
10	Lubrication System	Lubrication Type		Pressure & Splash
		Oil Pump		Rotor Type
		Filter Type		Full Flow Filter Screen
		Oil Type		SAE15W-40/SF
11	Cooling System	Cooling Type		Closed Coolant Circulation
		Coolant Type		—35℃ Rust-resistant antifreeze
12	Drive System	Clutch type		Wet, Auto-centrifugal
		Operation Mode		Automatic(CVT)+Parking and Gear Shifting
		Gears		2 Forward Gears + 1 Reverse Gear
		Shift Type/Sequence		Hand Operation/L-H-N-R
		(CVT) Gear Ratio		2.88-0.70
		Transfer Gear Ratio	Final Ratio	1.333(24/18, bevel gear)
			Secondary Ratio	1.952(41/21)
			Gears	Low Gear:2.25(36/16) High Gear :1.35(27/20) Reverse Gear:1.471(25/17)
			Total	Low Gear:5.857, High Gear:3.514,Reverse Gear:3.828
13	Overall Dimension			610×568×519mm
14	Net Weight			70kg
15	Output type			Front and rear shaft output
16	Rotational Direction of Engine Output			Clockwise (from behind engine at forward gear)

Overhaul Data

Item	Standard		Service Limit	Remark
Valve Head Diameter	IN	30.6	----------	
	EX	27.0		
Valve Clearance	IN	0.05-0.10	----------	
	EX	0.010-0.037		
Clearance Between Valve Guide and Valve Stem	IN	0.010-0.037	----------	
	EX	0.030-0.057		
Inner Diameter of Valve Guide	IN & EX	5.000-5.012	----------	
Outer Diameter of Valve Stem	IN	4.975-4.990	----------	
	EX	4.955-4.970	----------	
Valve Stem Play	IN & EX	----------	0.05	
Length of Valve Stem End	IN & EX	2.9-3.1	2.3	
Valve Head Thickness	IN & EX	----------	0.5	
Play of Valve Head Seal	IN & EX	----------	0.03	
Width of Valve Seat Seal	IN & EX	0.9-1.1	----------	
Valve Spring Free Length	IN & EX	40	38.8	
Valve Spring Tension	IN & EX	182-210N,(when compressed to 31.5mm)	----------	
Cam Height	IN	33.430-33.490	33.130	
	EX	33.500-33.560	33.200	
Clearance Between Camshaft Outer Diameter & Hole	Φ22	0.032-0.066	0.150	
	Φ17.5	0.028-0.059	0.150	
Camshaft Outer Diameter	Φ22	21.959-21.980	----------	
	Φ17.5	17.466-17.484	----------	
Inner Diameter of Camshaft Hole	Φ22	22.012-22.025	----------	
	Φ17.5	17.512-17.525	----------	
Camshaft Play			0.10	
Inner Diameter of Rocker Arm	IN & EX	12.000-12.018	----------	
Outer Diameter of Rocker Arm	IN & EX	11.973-11.984	----------	
Cylinder Head Distortion	0.03		0.05	
Cylinder Head Cover Distortion	0.03		0.05	

Cylinder + Piston + Piston Ring + Connecting Rod

Item	Standard			Service Limit	Remark
Cylinder Pressure	1000KPa			----------	
Cylinder-Piston Clearance	0.030-0.051			0.15	
Piston Skirt Diameter	87.460-87.480 (10mm form skirt end)			87.380	
Inner Diameter of Cylinder	87.500-87.522			----------	
Cylinder Joint Face Distortion	0.015			0.05	
Piston Ring Free Gap	Top Ring	R	About 11.7	8.9	
	2ND Ring	R	About 12	9.5	
Piston Ring Gap In Bore	Top Ring		0.15-0.30	0.60	
	2ND Ring		0.15-0.30	0.60	
Piston Ring Groove Clearance	Top Ring		0.04-0.08	0.180	
	2ND Ring		0.03-0.07	0.150	
Piston Ring Thickness	Top Ring		0.97-0.99	----------	
	2ND Ring		1.17-1.19	----------	
Piston Ring Groove Width	Top Ring		1.03-1.05	----------	
	2ND Ring		1.22-1.24	----------	
	Oil Ring		2.51-2.53		
Inner Diameter of Piston Pin Hole	23.002-23.008			23.030	
Outer Diameter of Piston Pin	22.995-23.000			22.980	
Inner Diameter of Connecting Rod Small End	23.006-23.014			23.040	
Clearance of Connecting Rod Big End	0.10-0.55			1.0	
Thickness of Connecting Rod Big End	24.95-25.00				
Crankshaft Play	0.03			0.08	

Lubrication

Item	Standard		Service Limit	Remark
Clearance between Inner and Outer Rotors	0.03mm-0.10mm		0.15mm	
Clearance between Outer Rotor and Oil Pump Body	0.03mm-0.10mm		0.12mm	
Oil Pressure	130Kpa-170Kpa (3000r/min)		---------	
Oil Type	SAE10W-40, API SF or SG		---------	
Oil Capacity	When changing	1900ml	----------	
	When Replacing Filter	2000ml	----------	
	Engine Repair	2200ml	---------	

Clutch + Transfer

Item	Standard	Service Limit	Remark
Clutch Plate Inner diameter	140.00-140.15	140.50	
Clutch Engagement Speed	1800-2400r/min	---------	
Clutch Lock Speed	3300-3900r/min	---------	
Drive Belt Width	35.2	33.5	
Free length of Secondary Sheave Spring	168	160	
Shift Fork to Groove Clearance	0.10-0.40	0.50	
Thickness of Left Shift Fork	5.8-5.9	----------	
Thickness of Right Shift Fork	5.8-5.9	----------	
Shift Fork Groove Width	6.0-6.2	----------	
Drive Output Gear Groove Width	6.0-6.2	----------	

Cooling System

Item	Standard		Service Limit	Remark
Thermostat Valve Opening Temperature	68-74℃		----------	
Thermostat Valve Lift	4.5-6.5mm (at 80℃)		----------	
Radiator Cap Opening Pressure	110-140Kpa		----------	
Corresponding Relation Between Water-temperature Transducer' resistance and water-temperature	Water Temperature (℃)	Resistance (Ω)	----------	
	50	154+16		
	80	52+4		
	100	27+3		
	120	16+2		
Functioning Temperature of Thermoswitch	OFF--ON	88 ℃	----------	
	ON--OFF	82℃	----------	
Coolant Type	-35℃ antifreeze, corrosion-resistant, high boiling point coolant		----------	

Carburetor

Item	Standard	Remark
Carburetor Type	MIKUNI BSR36-129	
I.D. Mark	07G0	
Carburetor Barrel Size	36mm	
Engine Idle Speed	1400r/min+100r/min	
Main Jet (MJ)	N10221-137.5#	
Main Air Jet (MAJ)	MD13/24-35#	
Jet Needle (JN)	J8-5DH77	
Needle Jet (NJ)	785-401011-P-OM	
Pilot Jet (PJ)	N224103-22.5#	
Pilot Jet Screw (PS)	604-16013-1A	

Electrical System

Item		Standard	Remark
Spark Plug	Type	NGK;DPR7EA-9	
	Gap	0.8-0.9	
Spark Character		>8mm	
Ignition coil Resistance	Primary	0.1Ω-0.5Ω	
	Secondary	12Ω-22Ω	
Magneto Coil Resistance	Pick-up	150Ω-300Ω	
Magneto Voltage (Without load)		>100V(AC),5000r/min	
Max. Magneto Output Power		300W, 5000r/min	
Regulated Voltage		13.5V-15.0V, 5000r/min	
Primary Peak Voltage of Ignition Coil		>150W	
Starter Relay Coil Resistance		>120W	
Starter Relay Coil Resistance		3Ω-5Ω	
Auxiliary Starter Relay Coil Resistance		90-100Ω	

Tightening Torques

Item	Quantities	Thread Size (mm)	Tightening Torque (N.m)	Remark
Reverse Gear Sensor	1	M10*1.25	20	
Spark Plug	1	M12*1.25	18	
Water-temperature Sensor	1	Rc1/8	8	Apply Thread Locker
Adjusting Nut, Valve Clearance	4	M5	10	
Nut, Primary Sheave	1	M20*1.5	115	
Nut, Secondary Sheave	1	M20*1.5	115	
Ring Nut, Secondary Sheave	1	M30*1	100	
Nut, Front Drive Shaft	1	M14*1.5	97	
Nut, Drive Bevel Gear	1	M22*1	145	
Nut, Driven Bevel Gear	1	M16*1.5	150	
Fixing Nut, Clutch	1	M18*1.5	70	Counter Clockwise
Limit Nut, Drive Bevel Gear Bearing	1	M60	110	Apply Thread Locker
Nut, Universal Joint Yoke	1	M55	80	Counter Clockwise, Apply Thread Locker
Bolt, Rocker Arm Shaft	2	M14*1.25	40	
Oil Drain Bolt	1	M12*1.5	30	
Bolt, Overriding Clutch	6	M8	26	Apply Thread Locker
Bolt, Magneto Stator	3	M6	10	Apply Thread Locker
Screw, CVT Plate	3	M6	10	Apply Thread Locker
Bolt, Oil Pipe	2	M14*1.5	40	
Bolt, Oil Pump	3	M6	10	
Bolt, Pressure Release Valve	2	M6	10	
Bolt, Drive Bevel Gear Cover	4	M8	32	
Bolt, Driven Bevel Gear Cover	4	M8	25	
Bolt, Gear Limit	1	M14×1.5	18	
Bolt, Splined Spacer	1	M10×1.25	60	

Tightening Torques

Item	Quantities	Thread Size (mm)	Tightening Torque (N.m)	Remark
Bolt, Crankcase	14	M6	10	
	3	M8	25	
Bolt, Driven Sector Gear	1	M6	12	
Bolt, Oil Filter	1	M20×1.5	36	
Bolt, Oil Starter Motor	2	M6	10	
Bolt, Cylinder Head	4	M10	42	
Bolt, Cylinder Head	2	M6	10	
	1	M8	25	
Bolt, Cylinder (Upper & Lower)	4	M6	10	
Bolt, Cylinder Head Cover	12	M6	10	
Bolt, Chain Tensioner	2	M6	10	
Bolt, Chain Tensioner	1	M8	20	
Bolt, Fan Motor	3	M6	10	
Bolt, Thermostat Housing	2	M6	10	
Bolt, Water Pump Cover	3	M6	10	
Bolt, Water Pump	2	M6	10	
Fixing Bolt, Timing Chain	2	M6	15	Apply Thread Locker
Other Bolts		M5	4.5-6	
		M6	8-12	
		M8	18-25	

Maintenance Tools

Measurement Tools			
No.	Description	Specification	Purpose
1	Vernier Caliper	0-150mm	For measuring the length and thickness
2	Micrometer	0-25mm	For measuring outer diameters of rocker arm, valve stem and camshaft
3	Micrometer	25-50mm	For measuring the max. lift of camshaft
4	Micrometer	75-100mm	For measuring piston skirt
5	Cylinder Gauge		For measuring cylinder bore diameter
6	Small Bore Gauge	10-34mm	Fore measuring inner gauge of rocker arm, piston pin bore, connecting rod small end bore
7	Dial Indicator	1/100	For measuring the play
8	Straightedge Gauge		Plane measuring
9	Feeler Gauge		Plane and valve clearance measuring
10	Fuel Level Gauge		For measuring the carburetor fuel level
11	Thickness Gauge		For measuring the clearance
12	Spring Balance		For measuring the spring tension
13	Tachometer		For measuring engine speed
14	Oil Pressure Gauge		For measuring oil pressure
15	Compression Gauge & Adapter		For measuring cylinder compression
16	Radiator Cap Tester		For measuring radiator cap opening pressure
17	Ohmmeter		For measuring resistance and voltage
18	Ammeter		For measuring current/switches
19	Thermometer		For measuring liquid temperature
20	Timing Light		For checking the ignition timing
21	Torque Wrench		For measuring the tightening torque
General-purpose and Auxiliary Tools			
22	Alcohol Burner		Heating up
23	Magnetic Stand		For micrometer
24	Slab		Auxiliary tool for measuring
25	V-block		For measuring the play
26	Tweezer		For installation of valve cotter
27	Circlip Pliers		For removal and installation of circlips
28	Long Nose Pliers		For removal and installation of retainers
29	Impact Driver		For removal of cross-headed bolts
30	(-) Driver		
31	(+) Driver		

Special Tools

No.	Description	Specifications	Purpose
1	Spark Plug Wrench		Removal and installation of spark plug
2	Clutch Holder		For removing/installing clutch carrier nuts
3	Oil Filter Wrench		Removal and installation of oil filter cartridge
4	Piston Pin Puller		For removal of piston pin
5	Flywheel Puller		For removal of magneto rotor
6	Crankcase Separating Tool		For separation of left and right crankcase
7	Crankshaft Remover		For removal of crankshaft from left crankcase
8	Crankshaft Installation Set		For installing crankshaft to left crankshaft
9	Valve Spring Compressor		For removal and installation of valve spring
10	Valve Seat Cutter		For valve-seating
11	Ring Nut Wrench		Removal/installation of CVT secondary sheave
12	Sheave Holder		Removal/installation of CVT secondary sheave
13	Sheave Spring Compressor		Removal/installation of CVT secondary sheave
14	Couple Gear/Middle Shaft Tool		Removal/installation of the coupling gear nut
15	Bearing Driver	Set	For installation of bearing and oil seal
16	Bearing Removing Tool	Set	For removal of bearing
17	Oil Seal Removing Tool		For removal of oil seal
18	Universal Joint Holder		For removal/installation of the universal joint yoke nut

Materials for Operation and Fixing

Materials for engine operation engine oil, grease and coolant. Fixing materials include sealant, thread locker, etc.

Description	Type	Application Area	Remark
Lubricating Oil/Engine Oil	SAE10W-30 or SAE15W-40 or SAE20W-50 API service classifications SF or SG	Cylinder bore Crankcase Refer to Engine Lubrication System (→14-14)	capacity 1900ml (for changing oil) 2000ml (for replacing filet) 2200ml (for engine repairing)
Molybdenum lubrication oil		piston pin、valve stem、valve oil seal、camshaft	
Lubricating Grease	#3 MoS_2 Lithium Base Grease	Oil seal lip, O-ring and sealing faces of other rubber seal materials, bearings with seals, CVT bearing and collar	
Coolant	-35℃ antifreeze, corrosion-resistant, high boiling point coolant	Cooling system、Water-seal	Capacity according to radiator and water hose system
Joint Face Sealant		Joint face of crankcase, crankcase and cylinder, cylinder head and cover	
Thread Locker		Thread Parts	See 3.3.10, 3.3.11

3.4. Checks & Adjustment

Periodic Maintenance Table

The table below lists the recommended intervals for all the required periodic maintenance work necessary to keep the vehicle at its best performance and economy. Maintenance intervals are expressed in terms of kilometer, miles and hours, whichever occurs first.

Note: More frequent maintenance may be required on vehicles that are used in severe conditions.

Interval / Item					Remark
	Km	Initial 200	Every 1000	Every 2000	
	Miles	Initial 100	Every 600	Every 1200	
	Hours	Initial 20	Every 40	Every 80	
Valve Clearance		I	--	I	IN: 0.05~0.10 EX:0.15~0.20
Idle Speed		I	I	I	1400±100r/Min
Spark Plug		--	--	I	No carbon deposit
		Replace every 6000Km			Gap: 0.8~0.9mm
Air Filter		--	C	C	Replace every 2000Km
Fuel Hose, Carburetor		--	--	I	Replace every 4 years
Clutch		--	--	I	
Drive Belt		--	I	R	
Engine Oil		R	--	R	
Oil Filter		R	--	R	
Coolant Level		I	I	I	
Water Hose & Pipes		I	I	I	
Coolant		Replace every 2 years			

I=Inpection and adjust, or replace if necessary

R=Replace

C=Clean

Procedures of Maintenance & Adjustment

This section describes the maintenance procedures for each item mentioned in the Periodic Maintenance Chart.

VALVE CLEARANCE

Inspect initially at 20-hour break-in and every 40 hours or every 1000km thereafter. Inspect the clearance after removing cylinder head.

Excessive valve clearance results in valve noise and insufficient valve clearance results in valve damage and reduced power.

Check the valve clearance at the period indicated above and adjust the valve clearance to specification, if necessary.

Remove cover ①

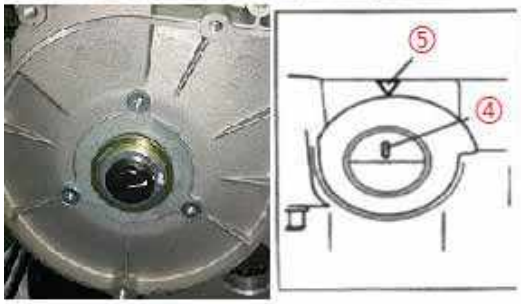
Remove inspection cap ②on left crankcase.

Remove 2 valve adjusting cover ③

Turn the crankshaft until the line④ of T.D.C. on rotor is aligned with mark⑤ of inspection hole on left crankcase.

Insert feeler gauge to check the clearance between the valve stem end and the adjust bolt on the rocker arm.

Valve Clearance (When cold)
IN: 0.05-0.10mm EX: 0.15-0.20mm



Note:

The valve clearance must be adjusted when the engine is cold.

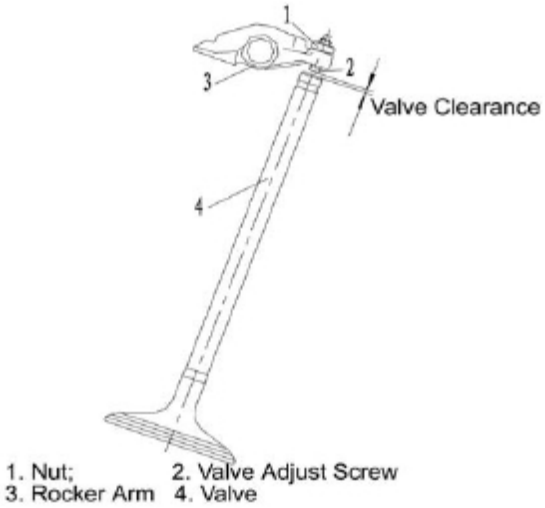
Adjust the valve clearance when the piston is at the Top Dead Center (T.D.C.) on the compression stroke.

If the clearance is incorrect, bring it into the specified range using the special tool.

Loosen valve adjust bolt and nut, insert a feeler gauge between the valve stem end and valve adjusting bolt, tighten valve adjust bolt, make sure it slightly contacts the feeler gauge, tighten bolt and nut.

Take out the feeler gauge, measure the clearance.
If the clearance is incorrect, repeat the above steps until the proper clearance is obtained.
Locknut: 10 N.m

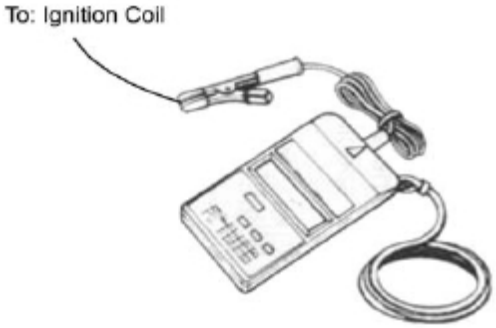
Caution:
Securely tighten the locknut after completing adjustment



1. Nut; 2. Valve Adjust Screw
3. Rocker Arm 4. Valve

Install:
2 valve adjusting cover;
Inspection cap;
Recoil starter;
Cover plate;
Apply a small quantity of THREAD LOCKER to recoil starter fixing bolts.

Tools:
Valve adjuster
Feeler gauge
Material:
Thread Locker



ENGINE IDLE SPEED

Inspect initially at 20 hours run-in and every 40 hours or 1000km thereafter.

Start the engine and warm it up for several minutes, measure engine speed with a tachometer. Set the engine idle speed between 1300~1500 r/min by turning the throttle stop screw of carburetor.

Engine idle speed: 1400r/min±100r/min

Note:
Make this adjustment when the engine is hot
Tool: Tachometer

SPARK PLUG

Inspect initially at 20 hours run-in and every 80 hours or 2000km thereafter. Replace every 6000km.
Remove the spark plug with a special tool
Specification: DER7EA-9(NGK)

If the electrode is extremely worn or burnt, or spark plug has a broken insulator, damaged thread, etc, replace the spark plug with a new one.

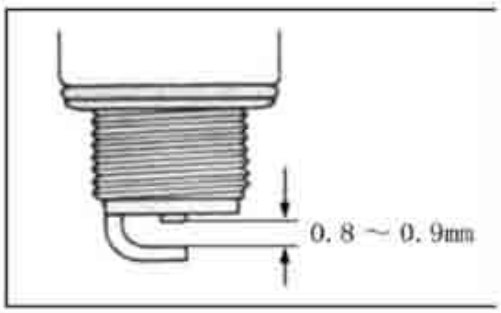
In case of carbon deposit, clean with a proper tool.

SPARK PLUG GAP

Measure the spark plug gap with a feeler gauge.

Out of specification: → Adjust

Spark plug gap: 0.8-0.9mm



Caution:
Check the thread size and reach when replacing the spark plug. If the reach is too short, carbon will be deposited on the screw portion of the spark plug hole and engine damage may result.

Installation:

Caution:
To avoid damaging the cylinder head threads; first, tighten the spark plug with fingers, and then tighten it to the specified torque using the spark plug wrench.

Tightening Torque: 18 N.m

Tool: Spark Plug Wrench, Feeler Gauge

Air Filter

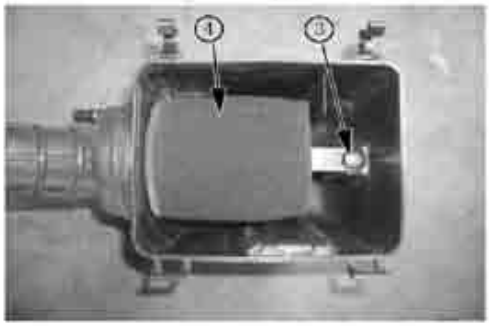
Inspect every 40 hours or 1000 km, clean it if necessary.

If the air cleaner is clogged with dust, intake resistance will be increased, with a resultant decrease in power output and an increase in fuel consumption. Check and clean the air filter as following:

Remove fixing clamp① and top cover②

Note:
Be careful not to drop the o-ring into the air filter box that is attached to the air filter top cover.

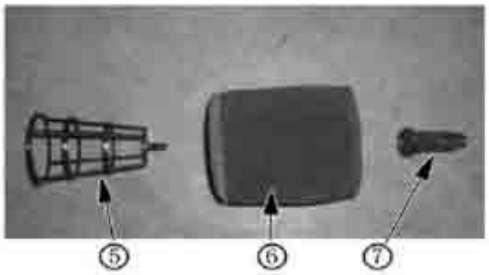
Loosen screw③, remove filter element④, separate support⑤, filter element⑥ and filter element seat⑦.



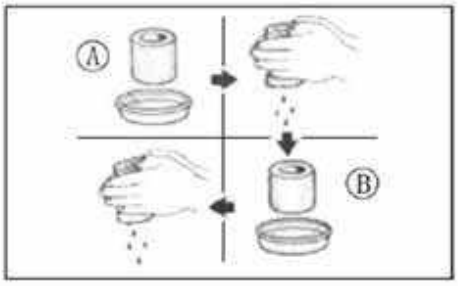
Fill a wash pan of a proper size with a non-flammable cleaning solvent A. Immerse the filter element in cleaning solvent and wash it.

Press the filter element between the palms of both hands to remove the excess solvent. Do not twist or wring the element or it will tear.

Immerse the element in engine oil B, and then squeeze out the excess oil leaving the element slightly wet.



A--Non-flammable cleaning solvent
B—Engine oil SAE#30 or SAE10W/40.



Warning:
Never use with gasoline or low flash point solvents to clean the filter element

Inspect the filter element for tears. torn element must be replaced.

Note:
If driving under dusty conditions, clean the air filter element more frequently. The surest way to accelerate engine wear is to operate the engine without the element or with torn element. Make sure that the air filter element is in good condition at all times.

Remove the drain plug⑧ of air box to drain out any water.

Fuel Hose

Inspect every 80 hours or 2000 km, replace every 4 years.

Inspect the fuel hose for damage and fuel leakage. If any damages are found, replace the fuel hose with a new one.

Drive Belt

Removal:
Remove CVT cover

Hold the primary sheave with special tool and loosen primary sheave nut.

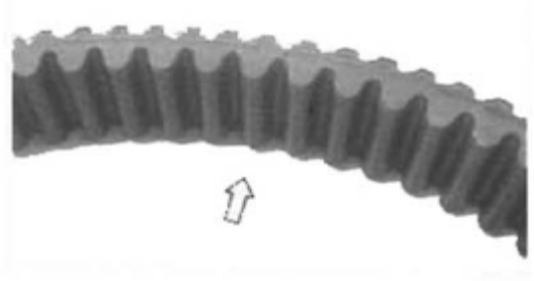
Special Tool: Rotor Holder

Remove primary sliding sheave 1;
Hold the secondary sheave with special tool and loosen secondary sheave nut. Remove secondary sheave together with drive belt.

Special Tool: Rotor Holder

Remove drive belt from secondary sheave

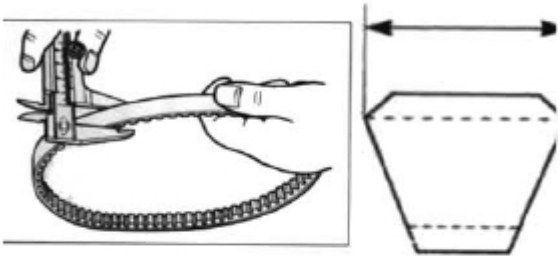
Inspection:



Inspect drive belt for wear and damage. If any cracks or damages are found, replace drive belt with a new one.

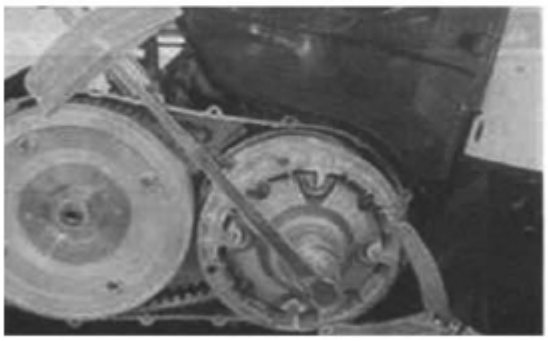
Inspect drive belt for width, if width is out of service limit, replace drive belt with a new one.
Service Limit: 33.5mm
Tool: Vernier Caliper

Installation
Reverse the removal procedure for installation. Pay attention to the following:
Insert drive belt, as low as possible, between secondary sliding sheave and primary fixed sheave.
Hold secondary sheave with a special tool and tighten the nut to the specified torque.
Nut, Secondary Sheave: 115 N.m



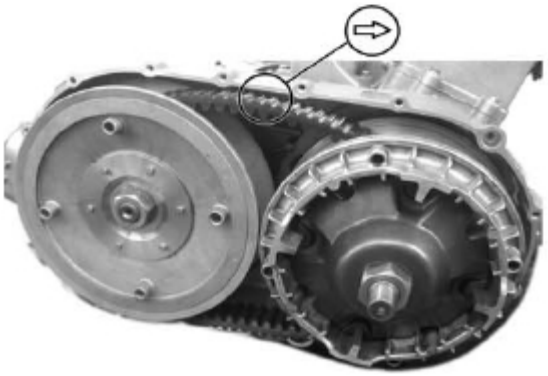
Install primary sheave and nut. Hold the primary sheave with a special tool and tighten the nut to the specified torque.
Nut, Primary Sheave:115N.m

Turn primary sheave, until the drive belt is properly seated and both the primary and secondary sheaves rotate together smoothly and without slipping.



Caution:
Fit the drive belt with the arrow on the drive belt points toward normal turning direction.
The drive belt contact surface of the driven face should be thoroughly cleaned.

Install CVT cover



Inspection of Lubrication System

Replace engine oil and oil filter initially at 20 hours or 200km and every 80 hours or 2000km thereafter.

Check Engine Oil Level

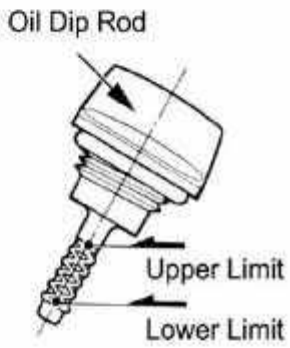
Keep the engine in a plan position.

Remove oil dip rod 1

Clean oil dip rod, insert oil dip rod but do not tighten it.

Take out oil dip rod and check if oil is between upper and lower limit.

If the engine oil is insufficient, fill more oil until the sufficient oil is obtained.



Engine Oil: SAE15W/40 classification SF or SG

Note:

Keep the engine in a plan position

Do not tighten oil dip rod when measuring oil level

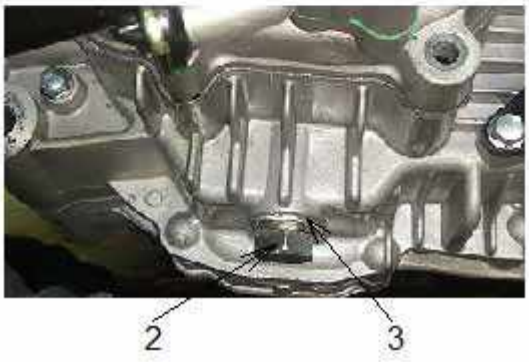
Replacing Engine Oil

Remove oil dip rod 2, drain bolt 2 and washer 3.

Drain out the engine oil while the engine is still warm.

Clean oil dip rod, drain bolt and washer with solvent.

Install washer and drain bolt.



Drain Bolt: 30 N.m

Fill engine oil. (about 1900ml)

Install oil dip rod, start the engine and allow it to run for several minutes at idling speed.
Turn off the engine and wait for about 3 minutes, and then check the oil level on the dipstick.

Caution:
The engine oil should be changed when the engine is warm. If the oil filter should be replaced, replace engine oil at the same time.

Replacing Oil Filter

Remove relative parts (see Replacing Engine Oil)
Remove oil filter① with the special tool
Install washer and drain bolt
Install new oil filter with the special tool
Fill engine oil (about 2000ml) and check (see Replacing Engine Oil)

Tool: Oil Filter Wrench

Engine Oil Capacity
When replacing oil: 1.9L
When replacing oil filer: 2.0 L
Engine overhaul:2.2 L

Inspection of Cooling System

Check initially at 40 hours or 1000km, replace coolant every 2 years.

Check radiator, reservoir tank and water hoses.

Leakage or Damage: → Replace

Check coolant level by observing the upper and the lower limit on the reservoir tank.

If the level is below lower limit, fill coolant until the level reaches the upper limit.

Replacing Coolant

Remove radiator cap① and reservoir tank cap②.

Place a pan below water pump, and drain coolant by removing drain plug③ and water hose④.

Drain coolant from reservoir tank.

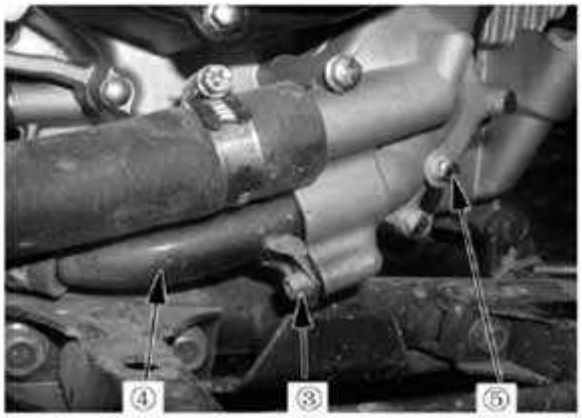
Warning !

Do not open radiator cap when engine is hot, you may be injured by escaping hot liquid or vapor.

Engine coolant is harmful. If coolant splashes in your eyes or clothes, thoroughly wash it away with water and consult a doctor. If coolant is swallowed, induce vomiting and get immediate medical attention.

Keep coolant away from reach of children

Clean radiator with fresh water, if necessary.



Connect water hose④ and tighten drain bolt③ securely.

Fill the specified coolant into the radiator.

Loosen bleed bolt⑤ on water pump, when coolant flow from bleed bolt, tighten the bolt. Install radiator cap ①securely after filling coolant.

Start the engine and keep it running for several minutes. After warm up and cooling down the engine, open radiator cap and check coolant. Fill the specified coolant until the level is between the upper and lower lines on the reservoir tank.

Caution:

Repeat the above procedures several times and make sure the radiator is filled with coolant and air is discharged.

Fill coolant into the reservoir tank till between upper and lower limit.
Install reservoir tank cap.

Warning: Never mix with other brand

Inspection of Radiator Hose

Perform inspection every 40 hours or

Check radiator hose and clamp.
Leakage or Damage: →Replace

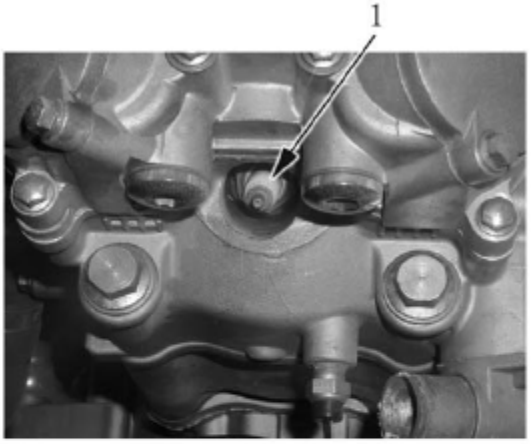
Inspection of cylinder pressure

Check cylinder pressure is necessary.

Cylinder Pressure: 1000kpa

A lower cylinder pressure may be caused by:

Excessive wear of cylinder;
Wear of piston or piston ring;
Piston ring jam in groove;
Poor closure of valve seat;
Damaged cylinder gasket or other defects

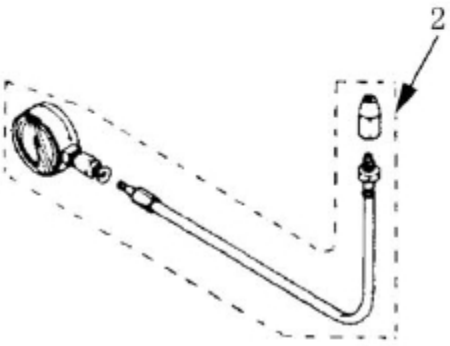


Note: When cylinder pressure too low, check the above items.

Testing Cylinder Pressure

Note: Before testing of cylinder pressure, make sure that cylinder head bolts are tightened to the specified torque and valve clearance has been properly adjusted.

Warm up the engine before testing;
Make sure battery is fully charged;
Remove spark plug 1;
Install cylinder pressure gauge 2 in spark plug hole and tighten nut;
Keep throttle full open;
Press start button crank the engine a few seconds. Record the maximum reading of cylinder pressure.



Tools: Cylinder Pressure Gauge
Adaptor

Inspection of Oil Pressure

Oil Pressure: 130 ~ 170kpa at 3000r/min

Lower or higher oil pressure may be caused by:

I **Oil pressure is too low**

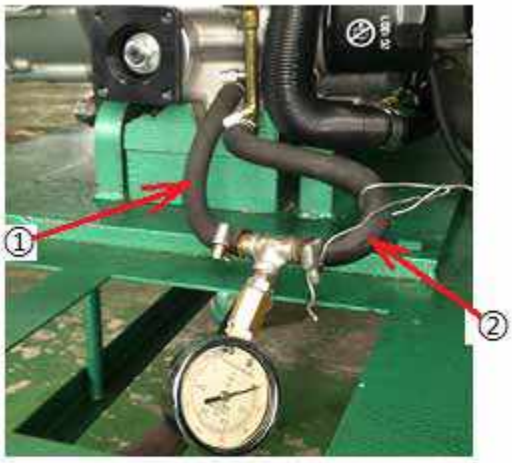
Clogged oil filter;
Leakage from oil passage;
Damaged O-ring;
Oil pump failure;
Combination of above items;

II **Oil pressure is too high**

Oil viscosity is too high;
Clogged oil passage;
Combination of above items;

Testing Oil Pressure

Install hose① and hose②;
Connect tachometer③with ignition coil
Install oil pressure gauge④ and joint seat to main oil gallery.
Warm up engine as per following:
Summer: 10 minutes at 2000r/min
Winter: 20 minutes at 2000r/min



To: Ignition Coil

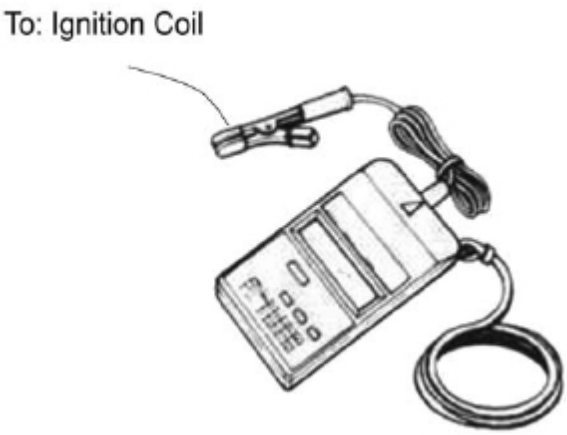
After warming up, increase engine speed to 3000r/min, and record readings of oil pressure gauge.

Tools : Oil pressure gauge
Tachometer

Inspection of Clutch Engagement and Lock-up

Engine is equipped with a centrifugal type automatic clutch.

Before checking the initial engagement and clutch lock-up two inspection checks must be performed to thoroughly check the operation of the drive train.



I Initial Engagement Inspection

Connect tachometer to ignition coil

Start engine

Shift gear lever to “High” position

Slowly increase throttle and note down the engine speed (r/min) when the vehicle starts to move forward.

Engagement speed:1800r/min ~ 2400r/min

If the engagement speed is out of the above range, check the following:

Clutch shoes

Clutch shoe wheel

Primary and secondary sheave

Refer to Chapter 12 for inspection of clutch

II Clutch Lock-up Inspection

Connect the tachometer to ignition coil;

Start the engine;

Shift gear lever to “High” position;

Apply front and rear brakes as firmly as possible;

Fully open the throttle for a brief period and note the maximum engine speed obtained during the test cycle.

Lock-up Speed: 3300r/min ~ 3900r/min

Warning: Do not apply full power for more than 5 seconds or damage to clutch or engine may occur.

If the lock-up speed is out of the above range, check the following:

Clutch shoes

Clutch wheel

Primary and secondary sheave

Refer to Chapter 12 for inspection of clutch

Tool: Tachometer

3.5. Engine Removal, Inspection & Installation

Δ Engine Removal/Installation Orders and the Relative Page Numbers

Item	Description	Disassembly	Inspection / Maintenance	Assembly	Remarks
Engine Periphery	Water Hose/Pipe	15-2	15-11	15-69	
	Left Side Cover	15-2	—	15-68	
Engine Front Side	Spark Plug	15-2	15-4	15-68	
	Cylinder Head Cover	15-3	15-14	15-66	
	Tensioner	15-3	15-24	15-67	
	Camshaft	15-3	15-21	15-65	
	Cylinder Head/Tensioner Plate	15-4	15-15/15-23	15-64	
	Cylinder/Timing Chain Guide	15-4	15-24/15-23	15-64	
	Piston	15-5	15-25	15-62	
Engine Left Side	Starting Motor	15-5	15-3	15-62	
	Oil Filter	15-6	15-9	15-62	
	Sector Gear	15-6	—	15-62	
	Water Pump	15-7	15-7	15-61	
	Sheave Drum	15-7	15-48	15-60	
	Left Crankcase Cover/ Magneto Stator	15-7	15-48	15-60	
	Magneto Rotor	15-7	15-47	15-60	
	Starting Driven Gear	15-8	15-47	15-59	
	Starting Dual Gear/Idle Gear	15-8	15-48	15-59	
	Oil Pump Sprocket and Chain	15-8	—	15-59	
Engine Right Side	CVT Cover	15-9	15-51	15-58	
	Drive Belt	15-9	15-36	15-57	
	Primary Sheave/Secondary Sheave	15-9	15-30	15-57	
	CVT Housing/Clutch Outer Face	15-10	15-51	15-57	
	Clutch	15-10	15-28	15-56	
	Timing Chain	15-10	15-23	15-56	
Engine Center	Gear Position Bolt	15-11	—	15-56	
	Right Crankcase	15-11	15-52	15-56	
	Front Output Shaft Components	15-11	15-43	15-55	
	Driven Bevel Gear Components	15-11	15-43	15-55	
	Shift Cam	15-12	15-40	15-55	
	Guide Bar, Fork	15-12	15-39	15-55	
	Drive Bevel Gear Components	15-12	15-42	15-55	
	Main Transmission Shaft	15-12	15-38	15-54	
	Transmission Counter Shaft	15-12	15-38	15-54	
	Balancer Shaft	15-12	15-46	15-54	
	Crankshaft	15-13	15-27	15-54	
	Oil Pump, Pressure-limiting Valve	15-13	15-41	15-53	
	Left Crankcase		15-52		

Notes: Arrowhead direction is for engine removal orders. Reverse the direction for assembly and installation

15-1

Engine Removal

ΔPreparation before engine removal

Prepare a proper tray used for load of components

Prepare necessary removal and assembly tools

Drain up engine oil (→11-8)

Drain up coolant (→ 11-10)

△ **Engine Periphery**

Water Hose/Pipe

Remove water hose clamp① and②;

Remove water hose③

Remove screw④ and water hose⑤

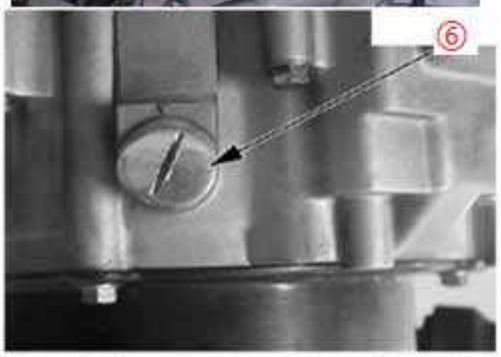
Left Side Cover

Remove 4 bolts(M6X12) of left side cover

Remove left side cover

Inspection Plug

Remove inspection plug⑥ with screwdriver



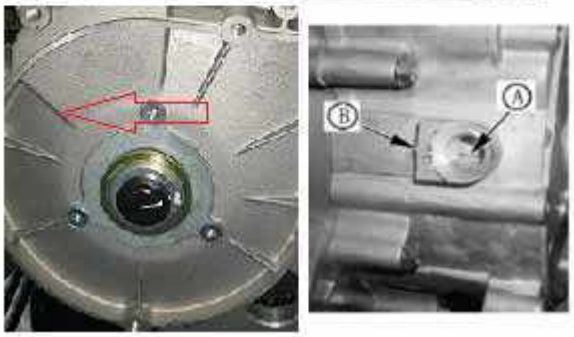
ΔEngine Front Side

Spark Plug

Remove spark plug⑦ with special wrench

Tool: Spark Plug Wrench

Turn crankshaft, align T.D.C. line A on magneto rotor with mark B of left crankcase



Cylinder Head Cover

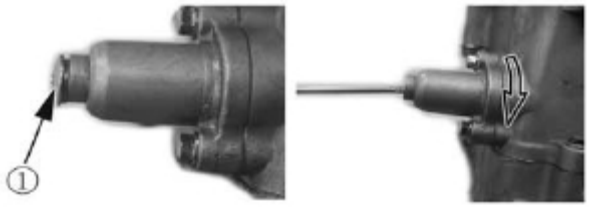
Remove valve adjusting cover

Remove12 bolts of cylinder head cover

Remove cylinder head cover

Timing Chain Tensioner

Remove screw plug①, insert a flat screwdriver into slot of timing chain tensioner adjuster , turn it clockwise to lock tensioner spring;



Remove tensioner fix bolt

Remove tensioner and gasket

Camshaft

Loosen timing sprocket bolt;

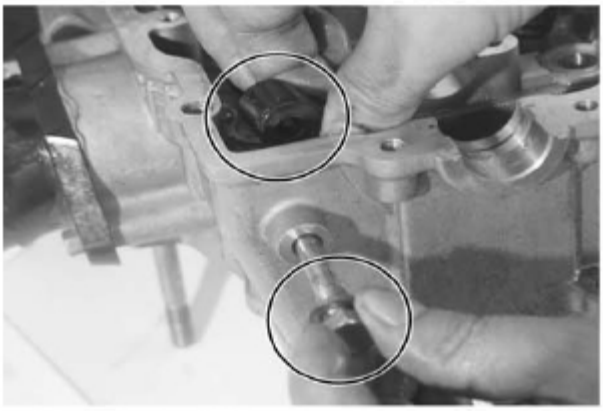
Remove timing sprocket bolt and lock;

Remove C-ring①

Remove timing sprocket from camshaft, remove camshaft

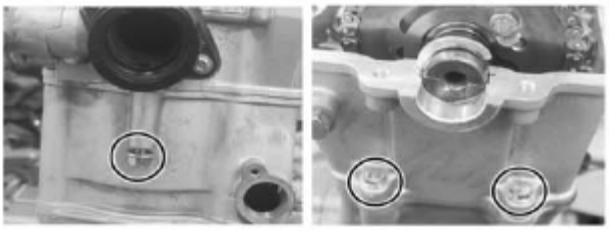
Note: Take care not to drop spacer, bolt, bolt lock and C-ring into crankcase.

Remove tensioner plate



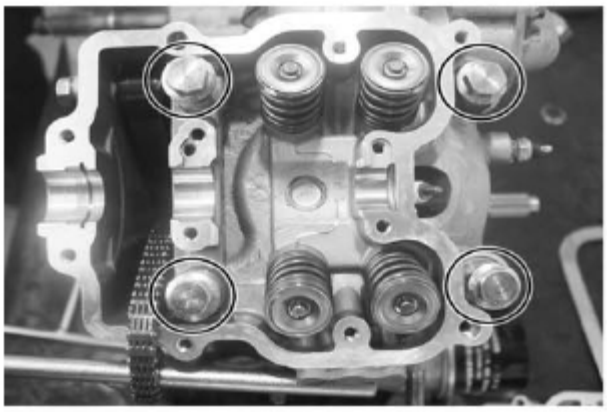
Cylinder Head

Remove cylinder head bolt



Remove cylinder head bolts diagonally;

Remove cylinder head



Note: Take care not to drop dowel pin into crankcase

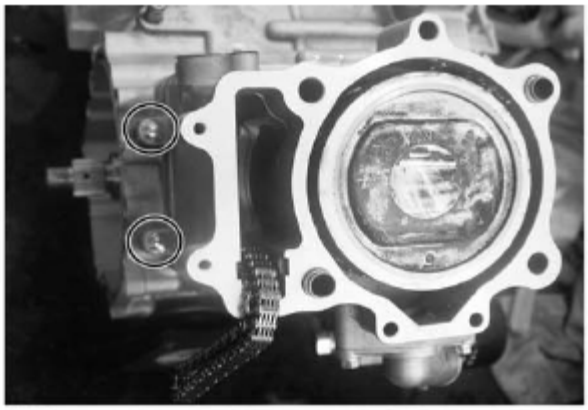
Cylinder

Remove dowel pin and cylinder head gasket

Remove timing chain guide①

Remove cylinder bolt
Remove cylinder

Note：Take care not to drop dowel pin into crankcase



Remove dowel pin and cylinder gasket

Note：When performing above removal process, be sure to hook up timing chain to prevent it from falling into crankcase

Piston

Remove piston pin circlip① with long nosed pliers

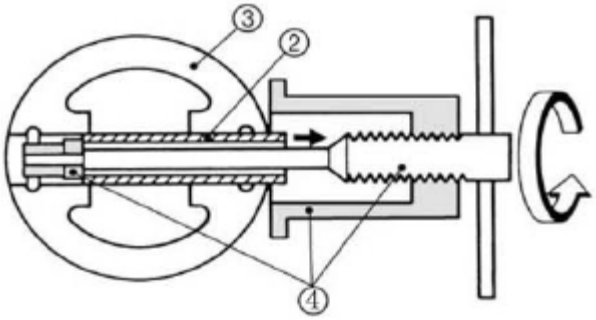
Note: Put a clean rag under piston so as not to drop piston pin circlip into crankcase

Remove piston pin②and piston③

Notes:

When installing piston, make sure its identification conforms to that of cylinder;
When removing piston pin, clean off burrs of piston pin hole and groove. If it's difficult to remove the piston, DO NOT hammer, use a special remover④

Tool: Piston Pin Remover

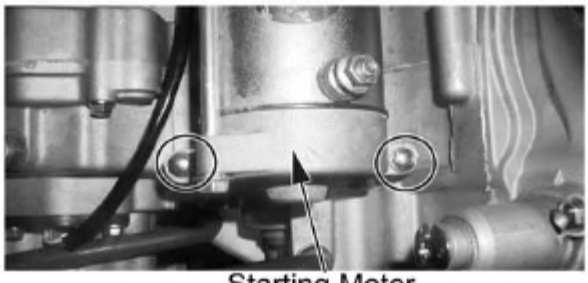


ΔEngine Left Side

Starting Motor

Remove 2 bolts of starting motor

Remove starting motor

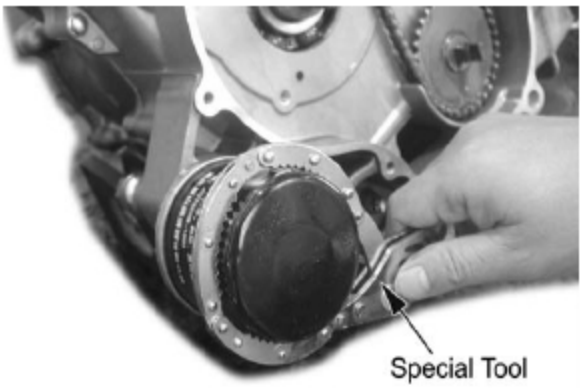


Starting Motor

Oil Filter

Remove oil filter with special tools

Tool: Oil filter Remover



Sector Gear

Remove bolt of sector gear housing cover

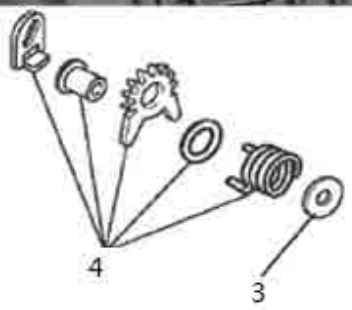
Remove wire clip and sector gear housing cover

Remove dowel pin and gasket

Remove drive sector gear 1

Remove bolt 2 of driven sector gear

Remove washer3 and driven sector 4



Water Pump

Screw out bolt of water pump

Remove water pump

SPLINED SPACER

Remove bolt and washer;

Remove splined spacer

Left Crankcase Cover

Remove bolts; Remove left crankcase cover Remove dowel pin and gasket

Magneto Rotor

Install the bolt M10×1.25×40 into crankshaft.

Use the rotor assy puller.

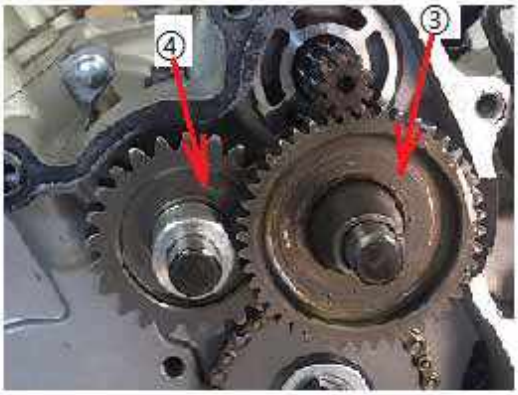
Tool: Rotor Remover

Starting Motor Gear

Remove driven gear ① and needle bearing

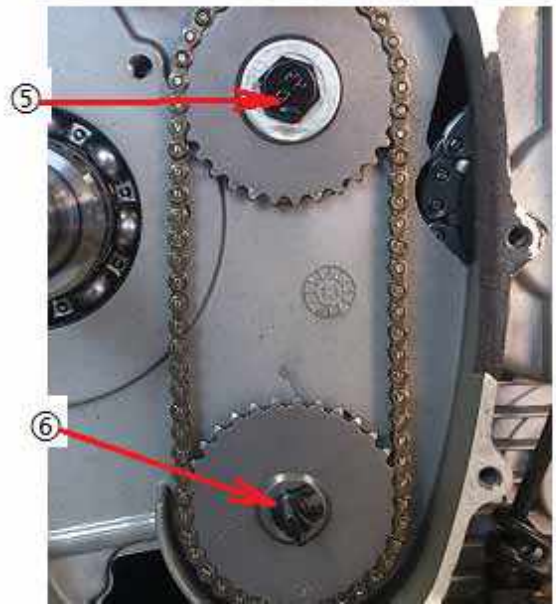
Remove spacer ②

·Remove dual gear and shaft ③
·Remove idle gear and shaft ④



Oil Pump Sprocket and Chain

Remove drive sprocket nut ⑤
Remove C-ring ⑥
Remove oil pump drive and driven sprockets and chain

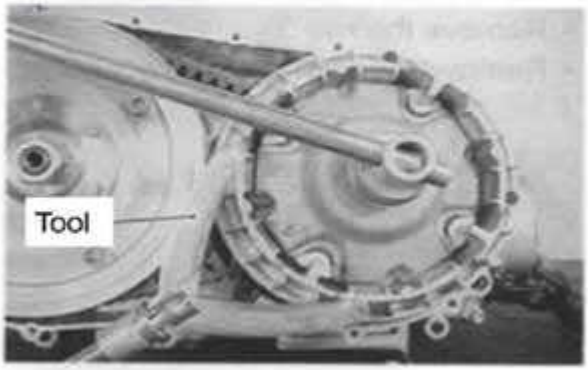


Δ Engine Right Side

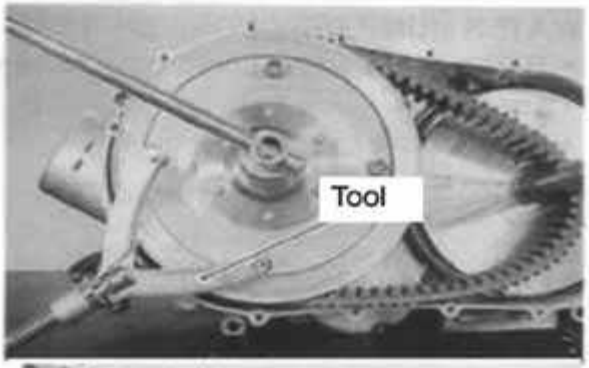
CVT Cover

Remove bolt of CVT cover
Remove CVT cover
Remove gasket and dowel pin

CVT(Continuously Variable Transmission)

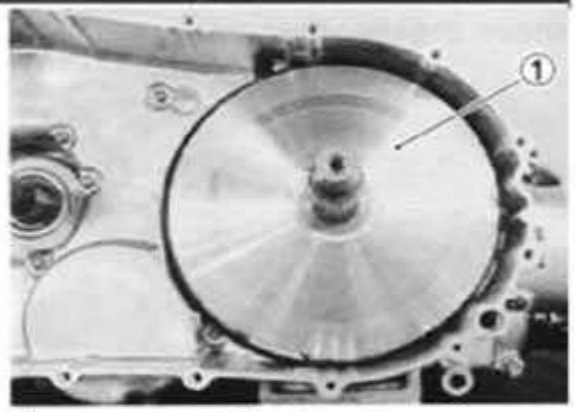


Remove primary sheave nut with special tool
Remove primary sliding sheave



Remove secondary sheave nut with special tools
Remove secondary sheave
Remove drive belt

Tool: Sheave Holder



Remove primary fixed sheave ①

Remove bolt for air guide plate.

Remove air guide plate

CVT Case

Remove bolt 1 of CVT case

Remove bolt 2 of CVT case

Remove outer clutch face and CVT case

Remove dowel pin, front and rear gasket

Clutch

Remove one-way clutch

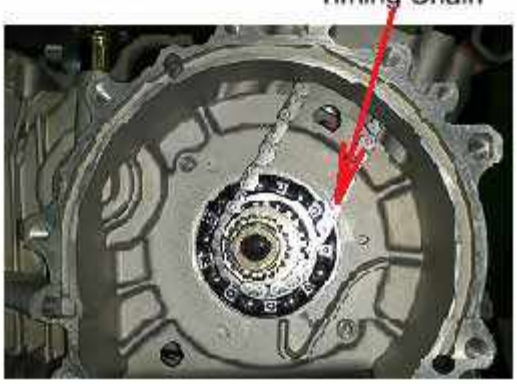
Remove clutch shoe fixing nut with special tool

Remove clutch shoe.

Note: The clutch shoe nut has left-hand threads.

Timing Chain

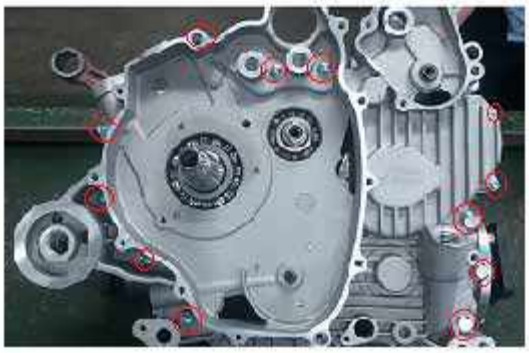
Remove timing chain



Engine Center

Gear position bolt

Remove gear position bolt 1
Remove spring and steel ball



Right Crankcase
Remove left crankcase bolts
Remove right crankcase bolts
Separate right crankcase with special tool

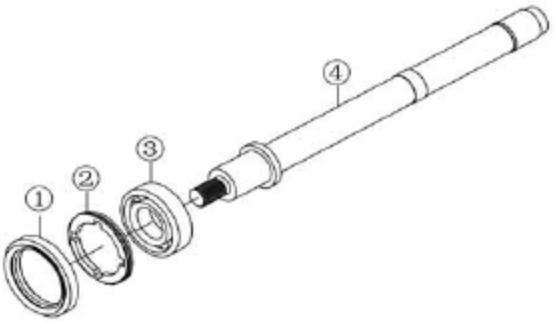
Caution

The Crankcase separator plate should be parallel with the end face of crankcase
Crankshaft should remain in the left crankcase half.

Driven Bevel Gear, Front Output Shaft

Remove bevel gear cover bolt
Remove driven bevel gear ③
Remove front output shaft nut ④

Remove Oil seal①, Bearing limit nut②
Remove Bearing③, Front Output Shaft ④



Shift Cam, Fork/Shaft

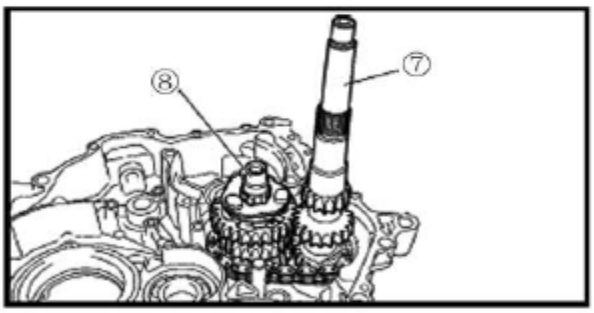
Remove Shift Cam⑤, Fork /Shaft⑥

Drive Bevel Gear

Remove left crankcase from driven bevel gear

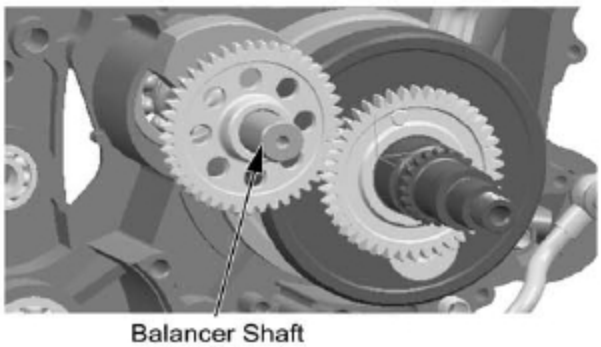
Drive Shaft, Drive Shaft

Remove drive shaft⑦ and driven shaft⑧

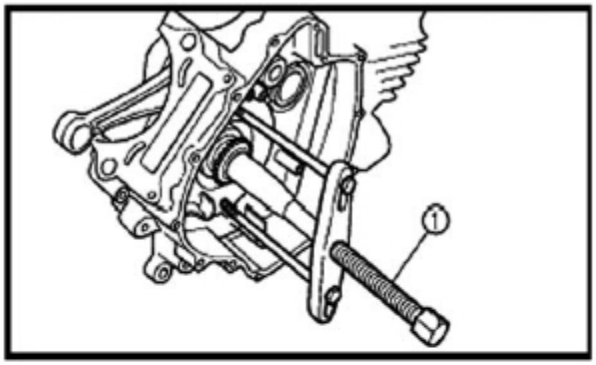


Balancer Shaft

Remove balancer shaft



Crankshaft



Separate crankshaft from left crankcase with special tool

Tool: Crankshaft Separator

Oil bump, Relief Valve

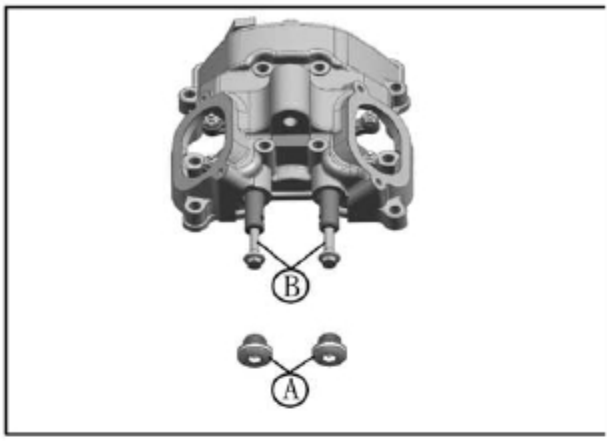
Remove oil bump and relief valve

Engine Components Inspection

Cylinder Head Cover

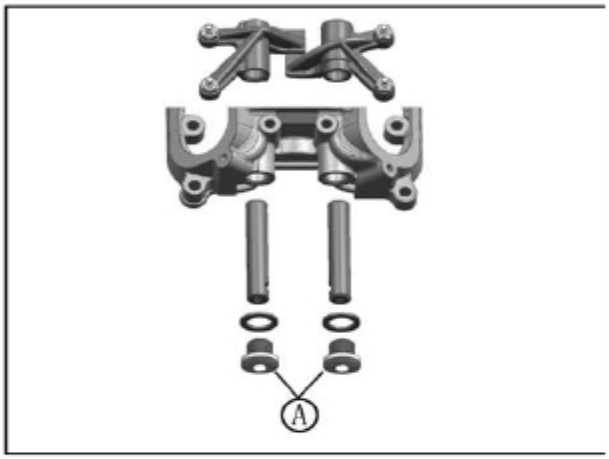
Disassembly

Caution: Each removed part should be identified to its location, and the pars should be laid out in groups designated as “Exhaust”, “Intake”, so that each will be restored to the original location during assembly.



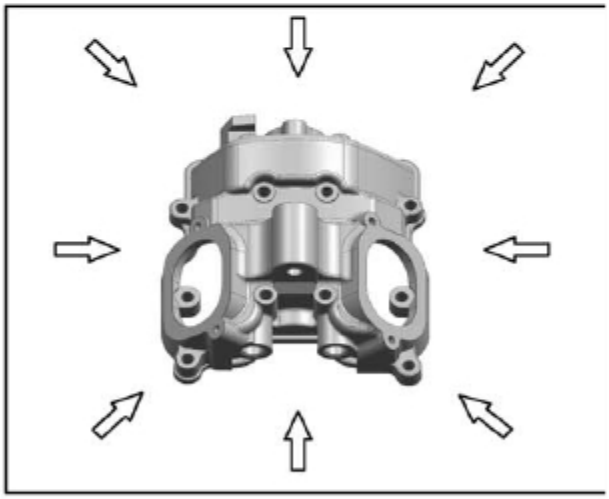
Remove rocker arm shaft bolts A

Remove rocker arm shaft by using M6 bolts B



Cylinder Head Cover Distortion

Clean off sealant from the fitting surface of cylinder head cover, place cylinder head cover on a surface plate and measure distortion with a thickness gauge.



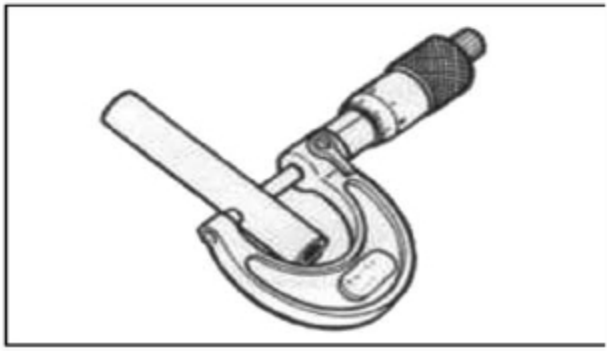
Cylinder head Cover Distortion
Limit: 0.05mm
Tool: Thickness Gauge
Distortion out of range: → Replace

Note: Cylinder head cover and cylinder head should be replaced together.

Rocker Arm Shaft

Measure out diameter of rocker arm shaft with a micrometer.

Rocker Arm Shaft O.D.: (IN, EX)
Limit: 11.973~11.984mm

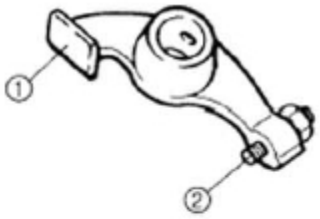


Tool: Micrometer (0~25mm)

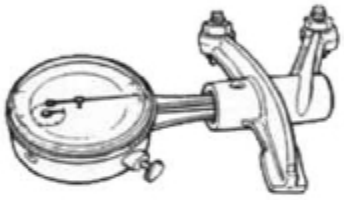
Rocker Arm

When checking the rocker arm, check the inner diameter of the valve rocker arm and wear of the camshaft contact surface.

Rocker Arm I.D. : .000~12.018mm



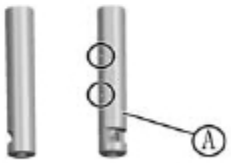
Tool: Dial Calipers



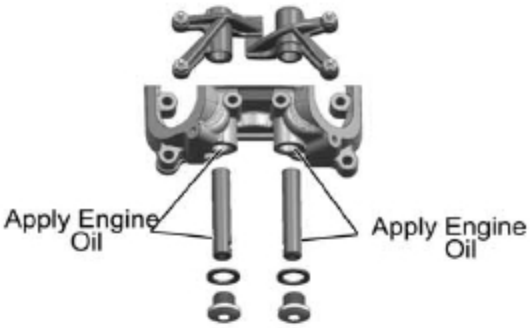
Assembly

Note: Intake rocker arm shaft A has oil holes.

Apply engine oil to rocker arms and shafts;
Install rocker arms and tighten rocker arm shaft to the specified torque:



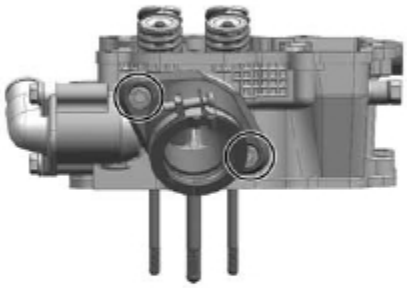
Rocker Arm Shaft Bolt: 28N.m



Cylinder Had

Disassembly

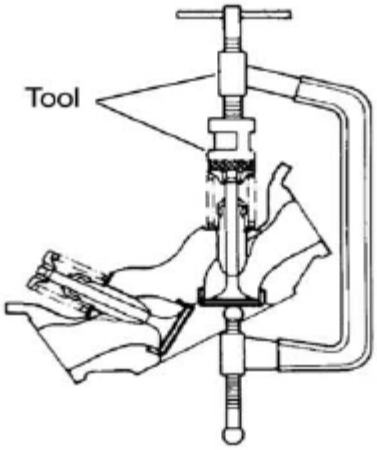
Remove intake pipe



Remove water temperature sensor ①and thermostat cover ②

Remove thermostat

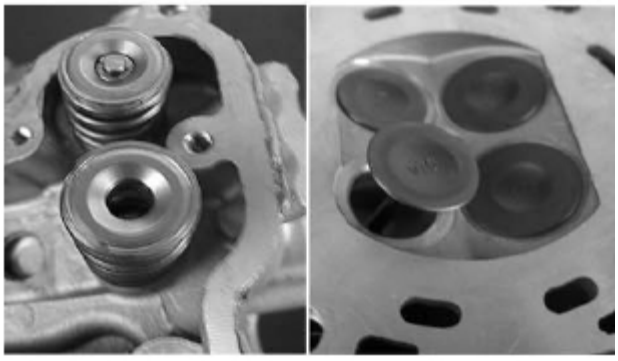
Compress the valve spring and remove valve cotter with tweezers.



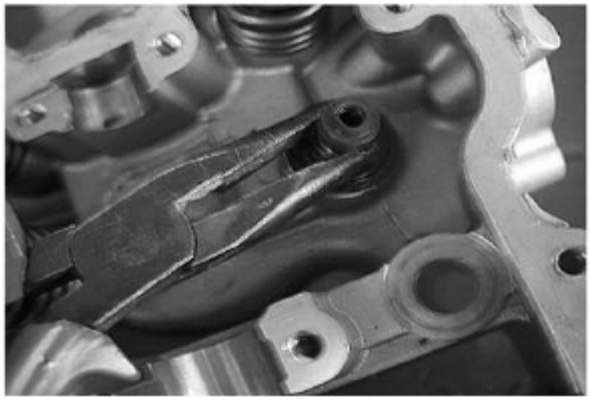
Tools: Valve Spring Compressor
Tweezers

Remove valve spring upper seat and valve spring

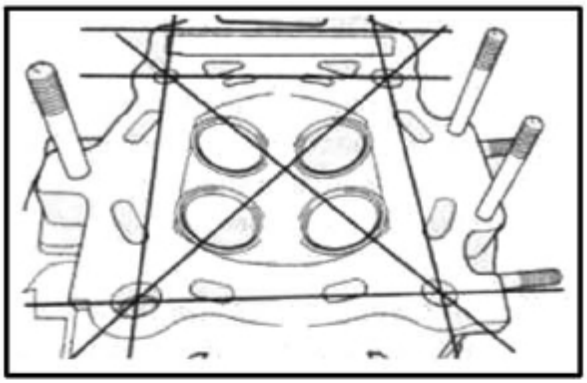
Remove valve from the other side.



Remove valve stem seal ring and valve lower seat.

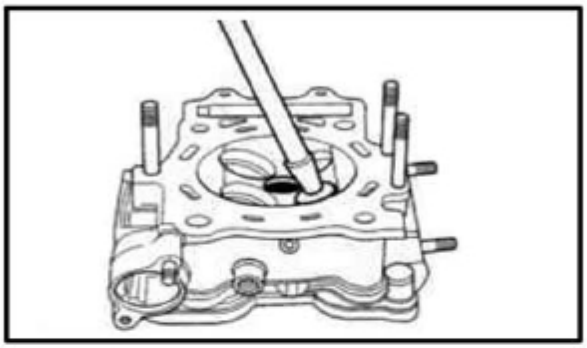


Cylinder Head Distortion



Clean off carbon deposit from combustion chamber; Check the gasket surface of the cylinder head for distortion with a straightedge and thickness gauge. Take clearance readings from several places. If any clearance reading is out of the service limit, replace with a new cylinder head.

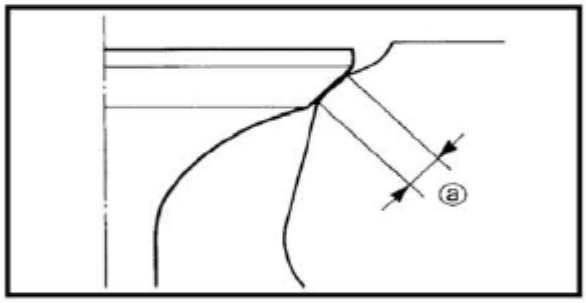
Cylinder Head Distortion Service Limit: 0.05mm
Tool: Thickness Gauge



Valve Seat Width

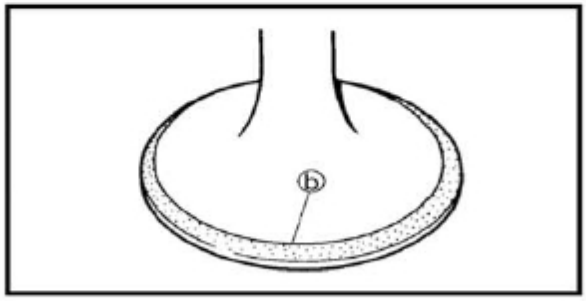
Coat the valve seat with color uniformly. Fit the valve and tap the coated seat with the valve face in a rotating manner. To get a clear impression of the seating contact, use a valve lapper to hold the valve head.

The ring-like dye impression on the valve face should be continuous, without any break. The width of the dye ring, which is the visualized seat width, should be within the following range:

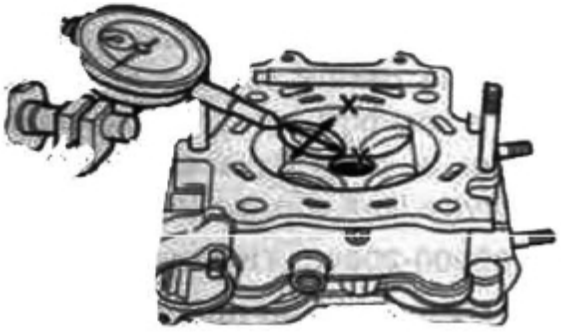


Valve Seat Width: 0.9-1.1mm
Tool: Valve Lapper

Valve Stem and Valve Guide



Lift the valve about 10mm from valve seat. Check the valve stem deflection in the directions of X and Y perpendicular to each other, with a dial gauge. If the deflection measured is out of the limit, replace either the valve or the valve guide. (If the valve stem is worn to the limit and the clearance is found to be in excess of the limit, replace the valve. If the valve stem is within the limit, replace the valve guide. Double check the clearance after replacing the valve stem or the guide).



Valve Stem Deflection (IN & EX): 0.35mm
Tool: Micrometer
Magnetic Stand

Valve Stem O.D

Measure valve stem O.D with a micrometer

Service Limit

IN: 4.975-4.990mm

EX: 4.955-4.970mm

Tool: Micrometer (0-25mm)

Valve Stem Run-out

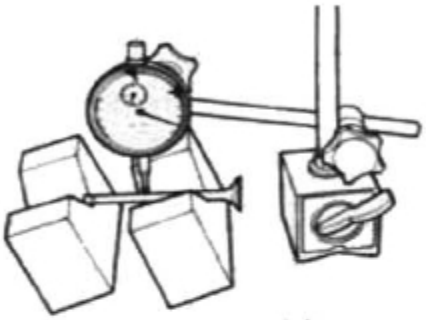
Support valve stem with V block as illustrated on the right. Check the run-out with a dial gauge.

Service Limit: 0.05mm

Tool: Magnetism Stand

Dial Gauge (1/100)

V block



Valve Head Radial Run-out

Measure the valve head radial run-out as illustrated on the right.

Valve head Radial Run-out out of range: →Replace

Service Limit: 0.03mm

Tool: Dial Gauge (1/100)

Magnetic Stand

V Block

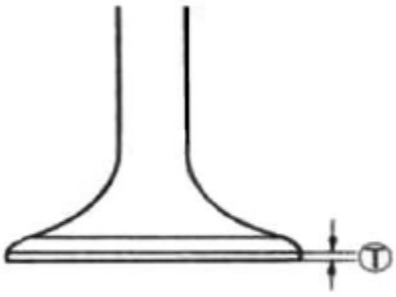
Valve Face Wear

Check each valve face for wear or damage. Replace valve with a new one if it is found to have abnormal wear. Measure valve head thickness T.

Valve head thickness T out of range: → Replace

Service Limit: 0.5mm

Tool: Vernier Caliper



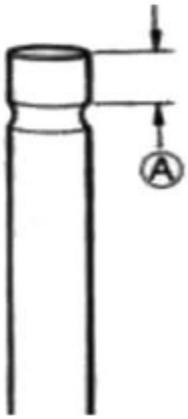
Valve Stem End

Check valve stem end for pitting or wear. In case of any pitting or wear, resurface the valve stem end. If the length T is less than service limit, replace valve with a new one.

Valve Stem End Length

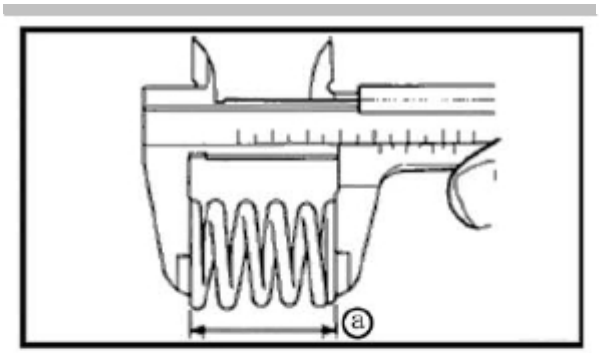
Service Limit: 2.1mm

Tool: Vernier Caliper



Valve Spring

Valve Spring keeps valve and valve seat tight. Weakened spring results in reduced engine power output and chattering noise from valve mechanism.

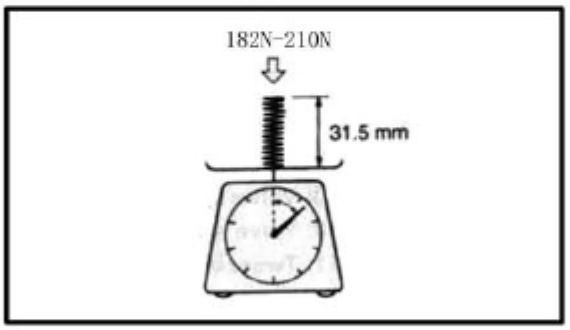


Measure the spring free length.

Spring free length out of range: →Replace

Service Limit: 38.8mm

Tool: **Vernier Caliper.**



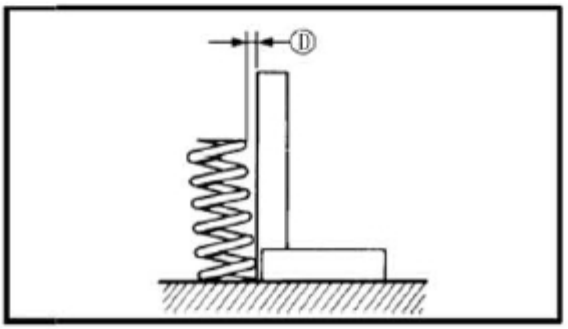
Measure the force to compress the spring to the specified length.

Valve spring tension out of range: → Replace

Service Limit: (IN/EX)

182N-210N/31.5mm

Tool: Spring Scale.



Measure valve spring incline.

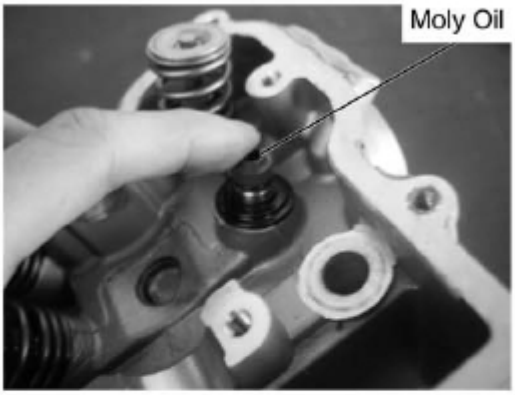
Spring incline out of range:→ Replace

Valve Spring Incline Limit: 2.5º/1.7mm

Assembly of Cylinder Head

Install each valve spring seat;

Apply moly oil to valve stem seal and fit into position.

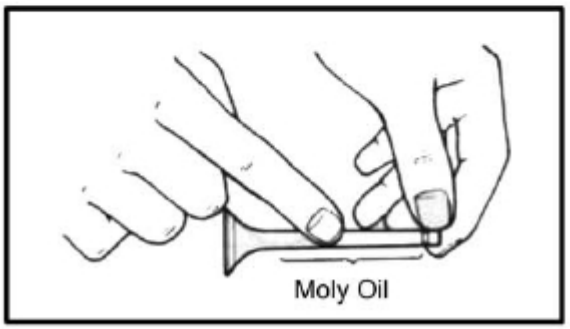


Material: Moly oil

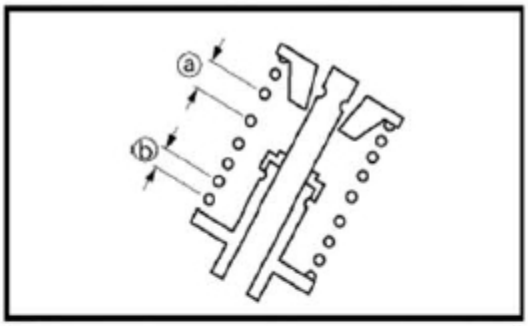
Note: Do not reuse the valve stem seal.

Insert the valves, with stems coated with moly oil all around.

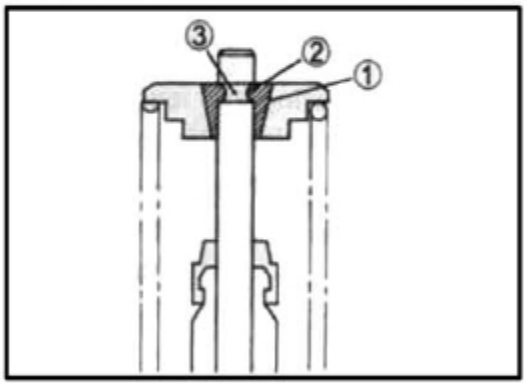
Note: When inserting the valve, be careful not to damage the lip of the stem seal.



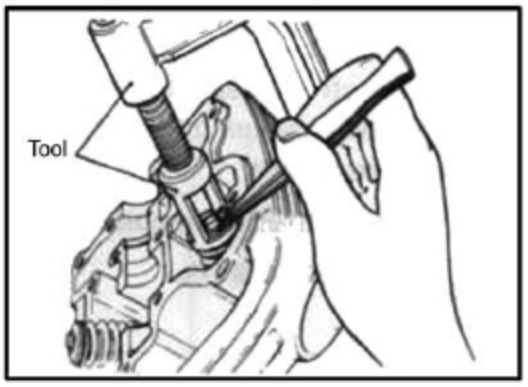
Install valve spring with small-pitch end “b” facing cylinder head. Big-pitch end “a” is marked.



Put on the valve spring retainer. Use the valve spring compressor to press down the spring. Fit the two cotter halves to the stem end and release compressor to allow the cotter ① to wedge in between seat and stem. Make sure that the rounded lip② of the cotter fits into the groove③ in the stem end.

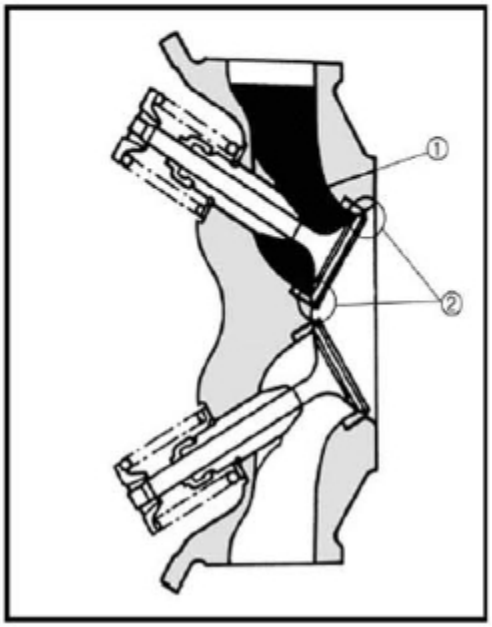


Tool: Valve Spring Compressor
Tweezers



NOTE: Knock the valve end with rubber hammer. Make sure valve cotter is fit into groove.

Check the sealing effectiveness of cylinder head. Dip clean solution into valve IN/EX ① and check for any leakage of valve seat ② after a few minutes.

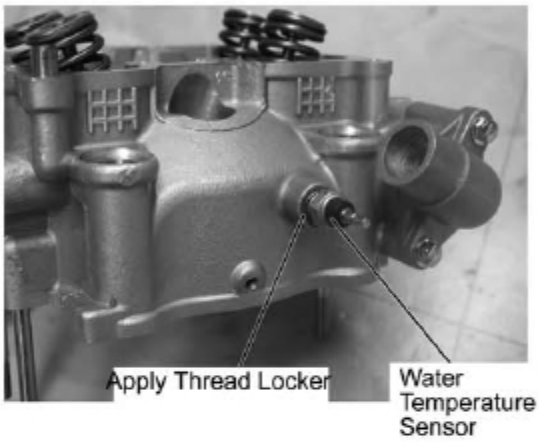


Install thermostat

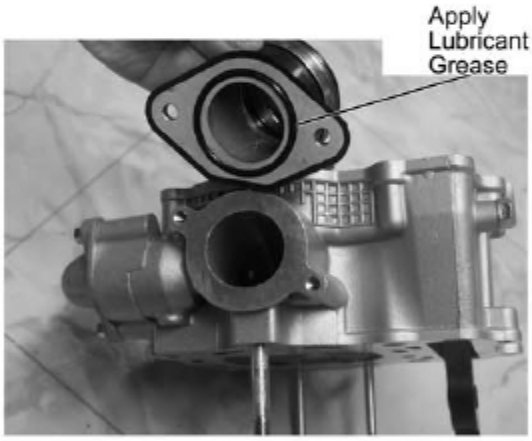
Install thermostat cover

Install water temperature sensor, apply thread locker to the thread part, tighten it to the specified torque.

Water temperature sensor
Tightening torque: 10 N·m



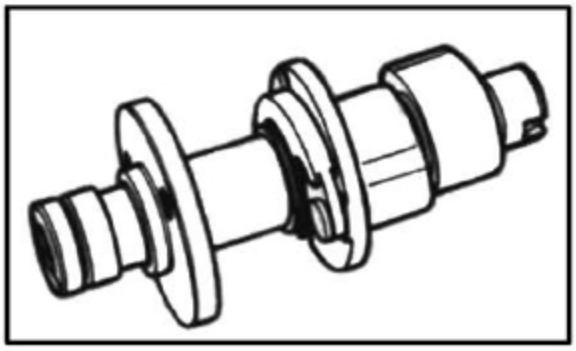
Install intake pipe, apply lubricant to 0-ring.



Camshaft

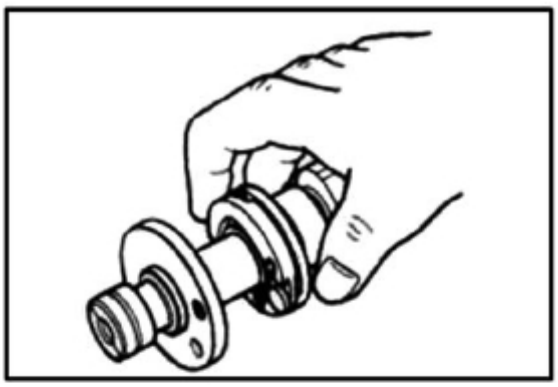
Check camshaft for wear and run-out of cams and journals if the engines produces abnormal noise or vibration or lacks power output. Any of these symptoms could be caused by wear of camshaft.

Note: Do not try to disassemble the camshaft/automatic decompression assembly. It is not serviceable.



Automatic Decompression

Move the automatic decompression weight with hand and check if it is operating smoothly. If it is not working smoothly, replace with a new camshaft/automatic decompression assembly.



Cam Wear

Worn cams can often cause mistimed valve operation resulting in reduced power output. The limit of cam wear is specified for both IN and EX cams in terms of cam height “a”. Measure with a micrometer the cam height.

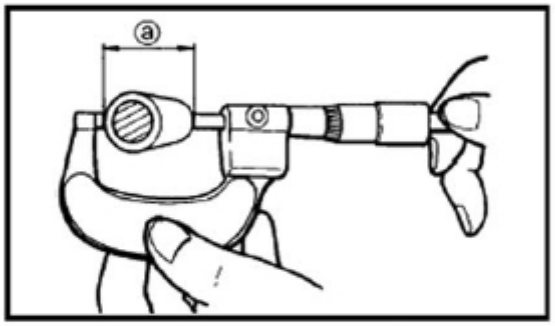
Cam height out of range: →Replace

Cam height service limit:

IN: 33.130mm

EX: 33.200mm

Tool: **micrometer (25-50mm)**



Camshaft Journal Wear

Check whether each journal is worn to the limit by measuring camshaft journal oil clearance with the camshaft installed.

Camshaft journal oil clearance

Service limit: 0.15mm

Check according to the following steps:

Clean off materials from cylinder head and cover;

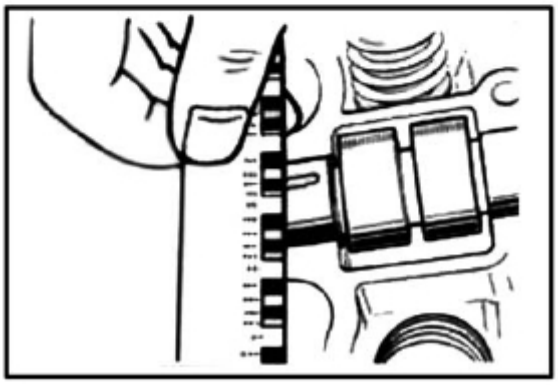
Install camshaft with plastic gauge;

Install cylinder head cover and tighten bolts evenly and diagonally to the specified torque:

Tightening torque: 10 N·m

Remove cylinder head cover, read the width of the compressed plastic gauge with envelop scale. The reading should be taken from the widest part.

Tool: Plastid Gauge



Note: Do not turn the camshaft with plastic gauge in place.

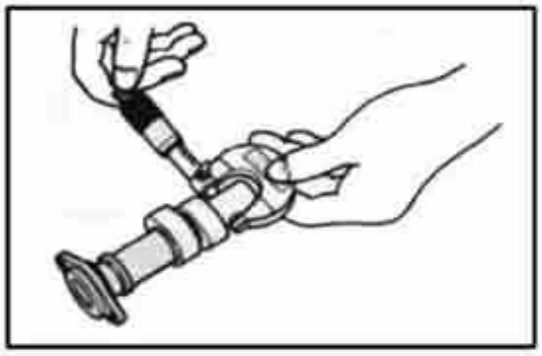
If the camshaft journal oil clearance exceeds the limit, measure the outer diameter of camshaft;

Replace either cylinder head set or the camshaft if the clearance is not correct.

Camshaft Journal O.D.

Measure camshaft journal O.D. with a micrometer. If the O.D. is out of range, replace camshaft with a new one.

Camshaft journal O.D. service limit:

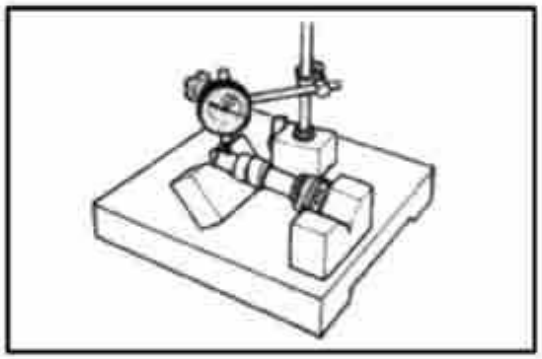


Sprocket end: 22.959 mm—21.980mm
Other end: 17.466mm—17.484mm

Tool: micrometer (0-25mm)

Camshaft Run-out

Measure the run-out with a micrometer. Replace camshaft is the run-out is out of range.



Service limit: 0.10mm

Timing Sprocket and Chain

Check timing sprocket and chain for wear or damage.

Replace with new parts if abnormal wear or damage is found.

Tensioner and Chain Guide

Check contact surface of tensioner and chain guide for wear and damage.

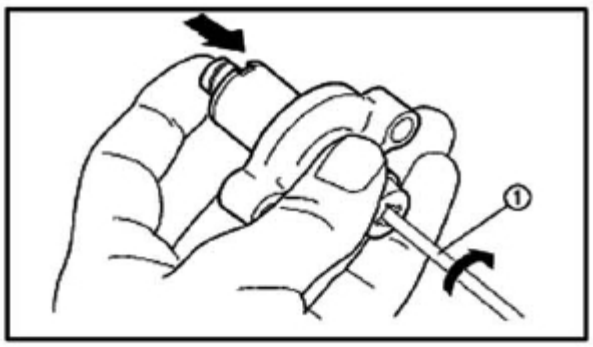
Replace with news parts if abnormal wear or damage is found.

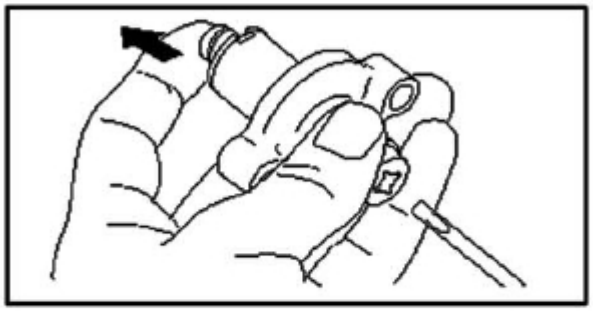
Chain Tensioner
Inspection

Check tensioner for any damage or poor function.

Damage, poor function: →Replace

Insert screw driver into the slotted end of adjusting screw, turn it clockwise to loosen the tension and release the screwdriver.
Check the push rod movement. If the push rod is stuck or there is a failure with spring mechanism, replace the chain tensioner with a new one.

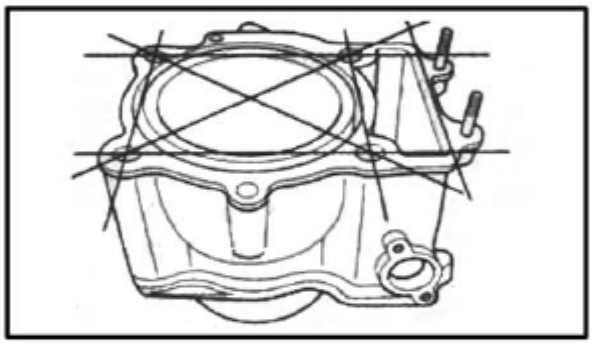


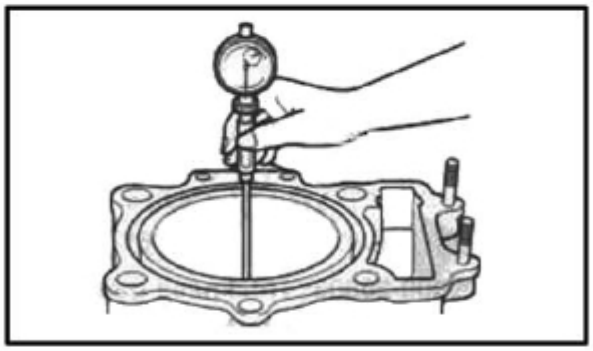


Cylinder
Cylinder Distortion

Check the gasket face of cylinder for distortion with a straightedge and thickness gauge and take clearance readings at 7 points as illustrated. If the largest reading at any of the 7 points of the straightedge is out of the range, replace the cylinder.

Cylinder Distortion Service Limit: 0.05mm
Tool: Straightedge
Thickness Gauge

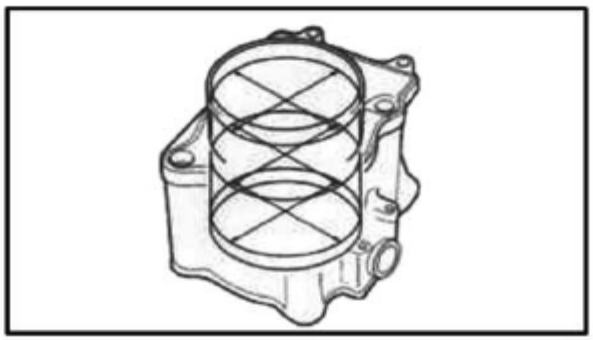




Cylinder Bore

Check cylinder wall for scratches, nicks or other damage. Replace with a new one if any.
Measure cylinder bore diameter at three points of upper, middle and lower.

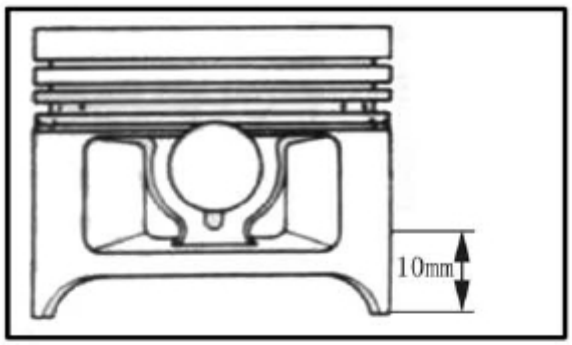
Standard Cylinder Bore: 87.500-87.522mm
Tool: Cylinder Gauge Set



Piston

Piston Diameter

Use a micrometer to measure the diameter at the point 10mm above the piston end, as illustrated on the right. If the measurement is less that the limit, replace the piston



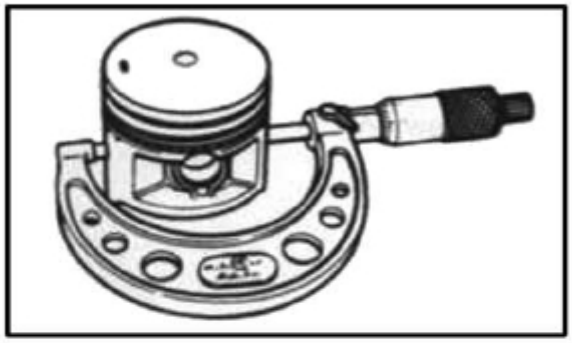
Standard: 87.460-87.480mm

Limit: 87.380mm

Tool: Micrometer (75-100mm)

Calculate the piston to cylinder clearance according to the above measurement.

If the clearance is more than 0.15mm, replace the cylinder or piston, or both.



Piston Ring to Groove Clearance

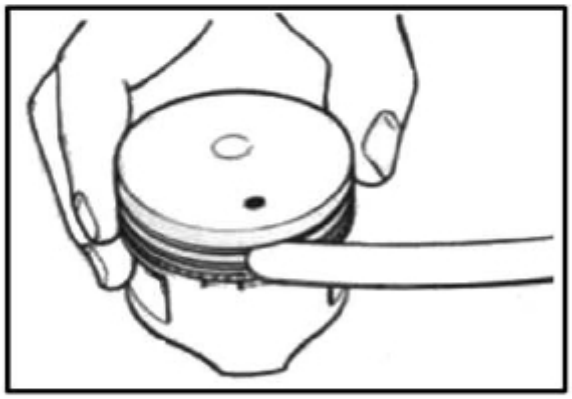
Use a thickness gauge to measure the side clearance of top ring and 2nd ring.

If the clearance exceeds the limit, replace both piston and piston rings.

Service Limit:

Top ring: 0.18mm

2nd ring: 0.15mm



Standard width of piston ring groove

Top ring: 1.03-1.05mm

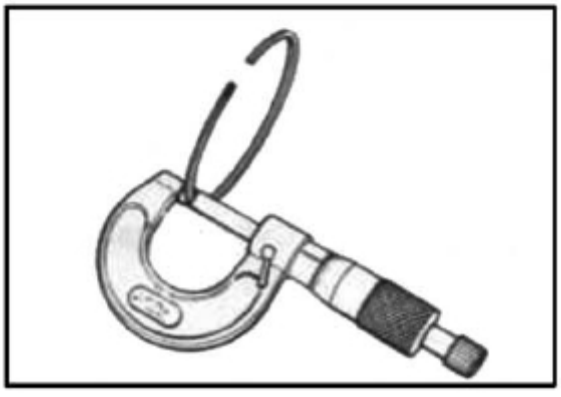
2nd ring: 1.22-1.24mm

Oil ring: 2.51-2.53mm

Standard thickness of piston ring

Top ring: 0.970-0.990mm

2nd ring: 1.170-1.190mm



Tools: Thickness gauge

Micrometer (0-25mm)

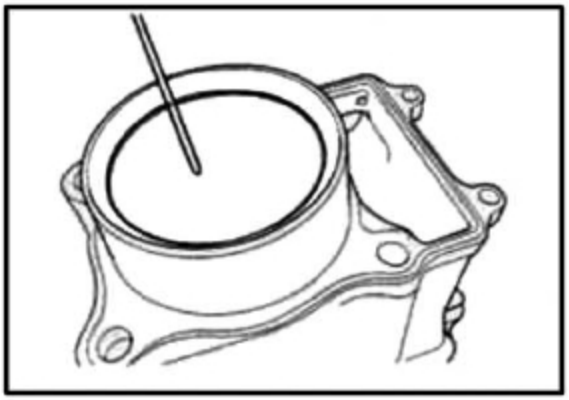
Piston Ring Free End Gap and End Gap

Before installing piston rings, use vernier caliper to measure the free end gap of each ring, and then fit ring into the cylinder.

Use thickness gauge to measure each ring end gap, if any ring has an excess end gap, replace the piston ring.

Piston ring free end gap limit:
Top ring: 8.9mm
2nd ring: 9.5mm

Piston ring end gap limit:
Top Ring: 0.60mm
2nd ring: 0.60mm



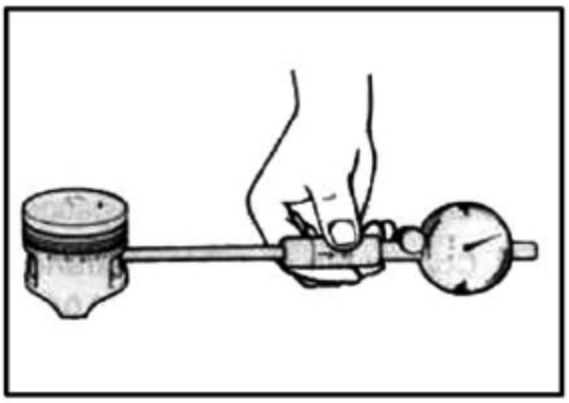
Tool: Vernier caliper
Thickness gauge

Piston Pin and Pin Bore

Use a bore gauge to measure the inner diameter of piston pin bore.

Use micrometer to measure outer diameter of piston pin.

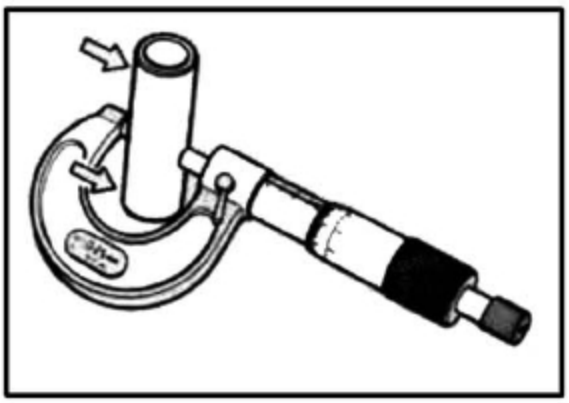
If out of limit, replace both piston and piston pin.



Piston pin bore limit: 23.030mm

Use micrometer to measure piston pin outer diameter at three points

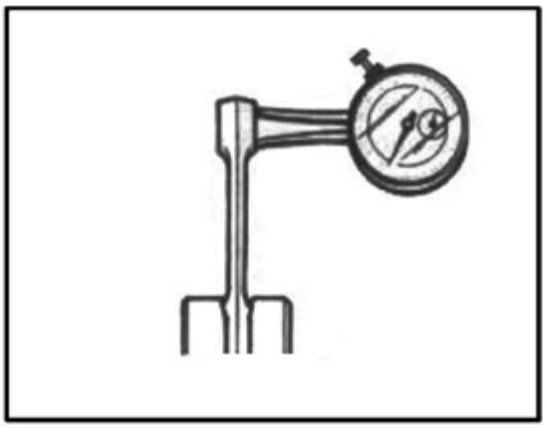
Piston pin outer diameter limit: 22.980mm
Tools: Bore gauge (18-35mm)
Micrometer (0-25mm)



Connecting Rod/Crankshaft

Connecting rod small end I.D.

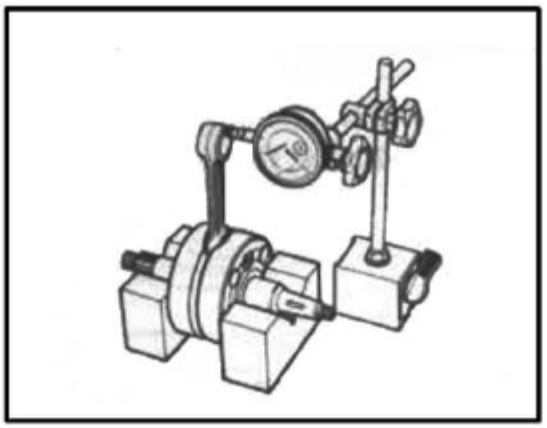
Use a dial gauge to measure the I.D. of connecting rod small end. If the measurement exceeds the limit, replace the connecting rod.



Connecting rod small end I.D. : 23.040mm
Tool: Dial Gauge (18-35mm)

Connecting Rod Deflection

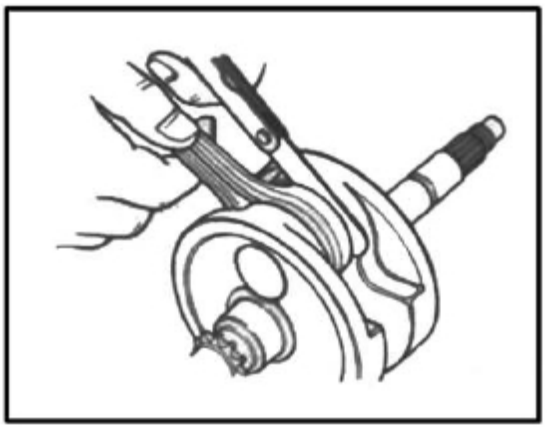
Check the movement of the small end of the rod and inspect the wear of the small end. This method is also applicable to check and inspection of big end.



Connecting Rod Deflection: 3.0mm
Tools: Dial Gauge
Magnetic stand
V-block

Connecting Rod Big End Side Clearance

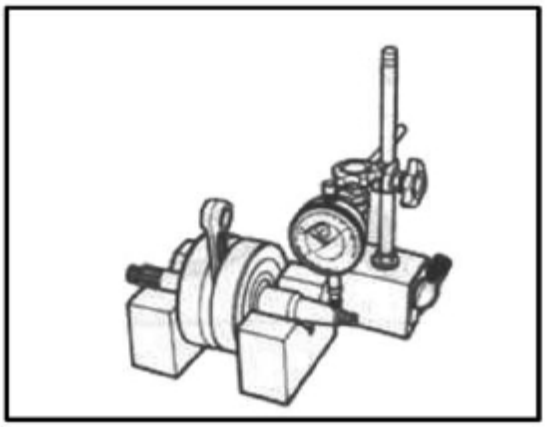
Push the big end to one side, and use thickness gauge to measure the other side clearance.
If out of limit, replace with a new crankshaft.



Connecting Rod big end side clearance: 1.0mm
Tool: Thickness Gauge

Crankshaft Run-out

Support crankshaft with “V” blocks as illustrated. Put the dial gauge, slowly turn the crankshaft and measure run-out with a dial gauge.
If the run-out exceeds the limit, correct or replace the crankshaft.

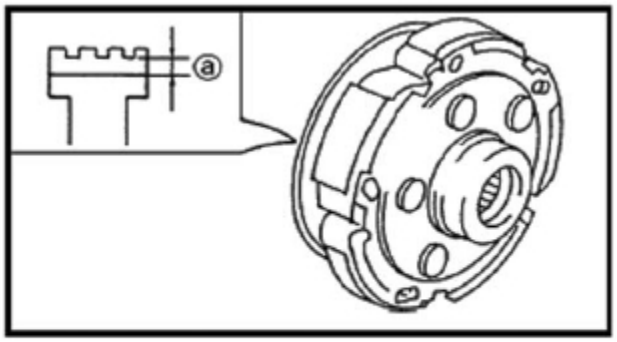


Run out limit: 0.08mm
Tools: dial gauge
Magnetic stand
V-block

Clutch

Clutch Shoes

Check clutch for chipping, scrape, uneven wear or heat discoloration. At the same time check depth of the grooves of clutch shoes. If any of the clutch shoes has no groove, replace the clutch.



Note: clutch should be replaced as a set.

Clutch Wheel

Check the inner clutch wheel ① for scratches, scuffs or blue discoloration or uneven wear. If any damage is found, replace the clutch wheel with a new one.

Check oil seal lip for wear or damage.

Wear or Damage: →Replace

Use special tool to remove oil seal

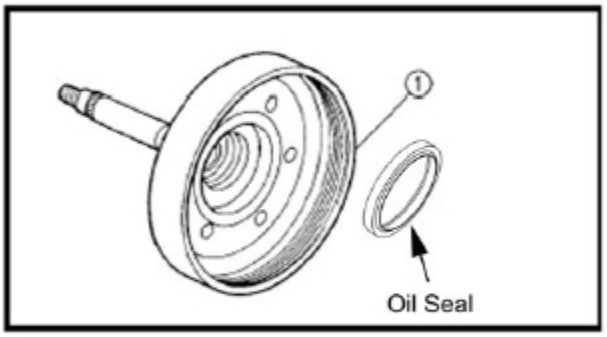
Tool: Oil seal remover

Use special tool to assemble oil seal

Tool: Oil seal installer set

Check the turning of bearing.

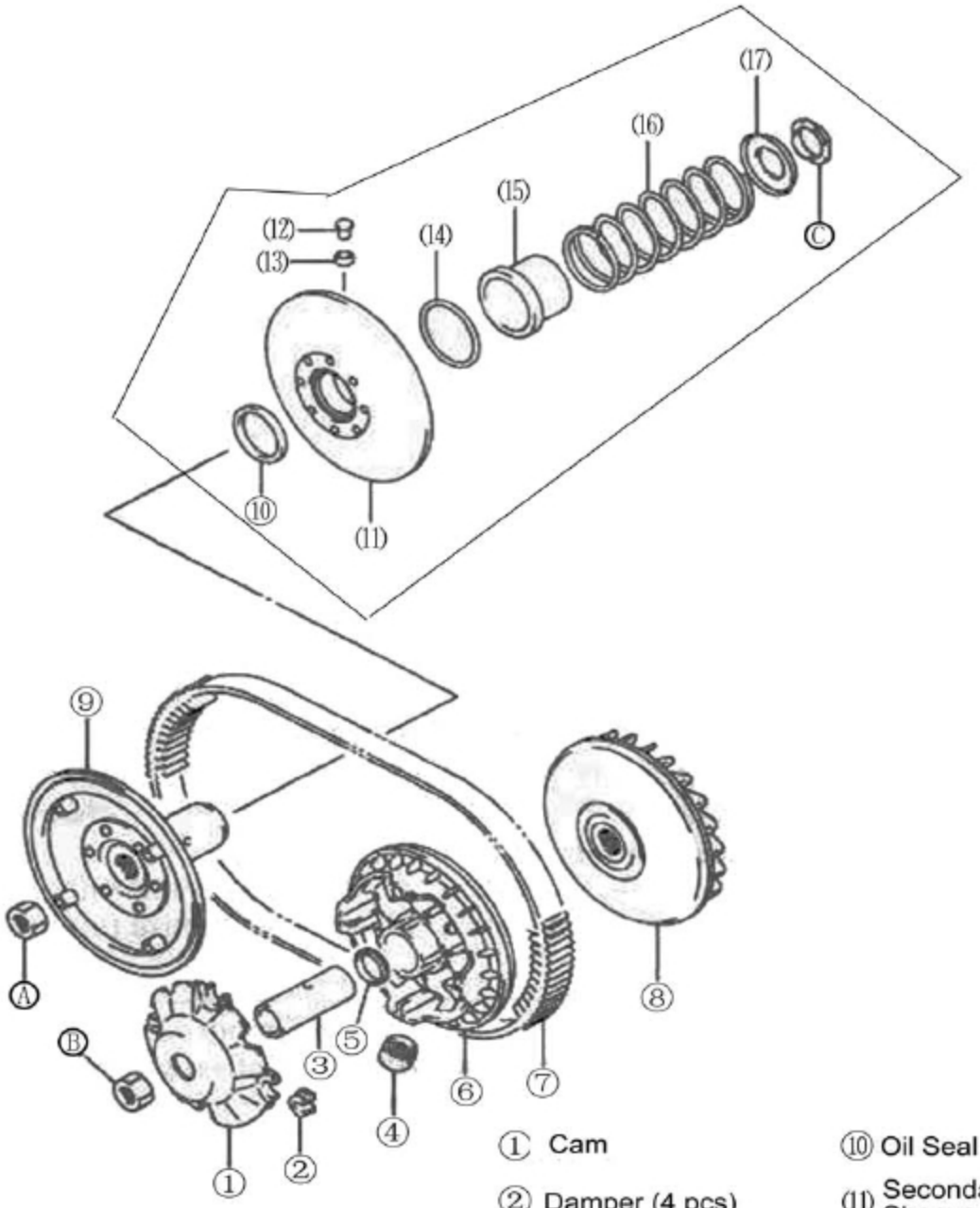
Abnormal damage: →Replace



Assembly

Apply lubricant grease to oil seal when assembling.

Primary and Secondary Sheave



Ⓐ Nut, Primary Sheave
Ⓑ Nut, Secondary Sheave
Ⓒ Ring Nut, Secondary Sheave

	N • m
A	115
B	115
C	100

① Cam
② Damper (4 pcs)
③ Spacer
④ Roller (8 pcs)
⑤ Oil Seal (2 pcs)
⑥ Primary Sliding Sheave
⑦ Drive Belt
⑧ Primary Fixed Sheave
⑨ Secondary Fixed Sheave
⑩ Oil Seal (2 pcs)
⑪ Secondary Sliding Sheave
⑫ Guide Pin (4 pcs)
⑬ Spacer (4 pcs)
⑭ O-ring (2 pcs)
⑮ Spring Seat
⑯ Spring
⑰ Spring Plate

Primary Sliding Sheave

Disassembly

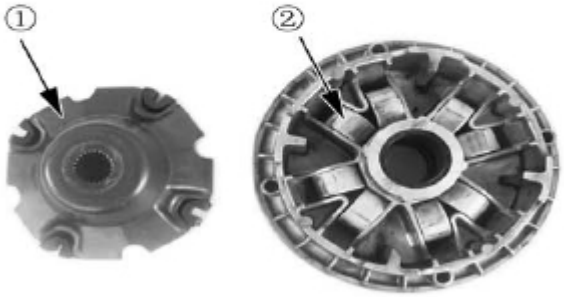
Remove spacer

Remove Cam ①and Roller②

Roller

Check each roller and sliding face for wear and damage.

Wear and damage: →Replace



Note: rollers should be replaced as a set.

Oil Seal

Check oil seal lip for wear and damage.

Wear and damage: →Replace

Remove the oil seal

Primary Sliding Sheave and Fixed Sheave

Check the drive face for any abnormal conditions such as damage or stepped wearing.

Damage or wearing: → Replace

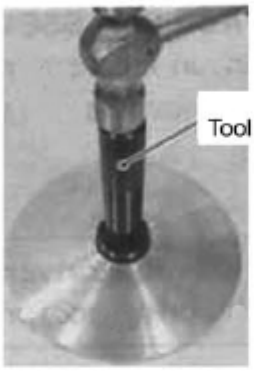
Install oil seal with special tool.

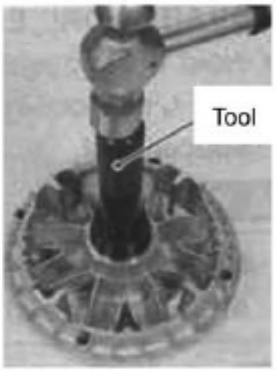
Tool: Bearing install set

Assembly

Reverse the removal procedure of primary sliding and fixed sheave for installation.

Pay attention to the following:



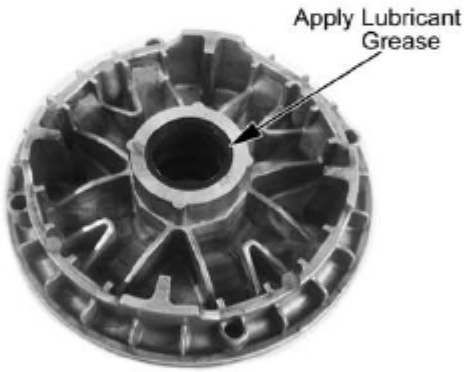


Apply grease to inner bore and oil seal lip.

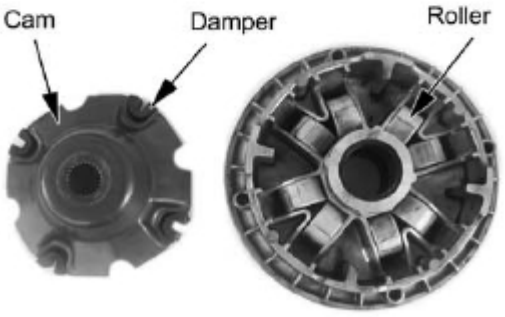
Note:

Wipe off any excessive grease thoroughly.
Take care not to attach any lubricant grease to contact surface of drive belt.

Material: Lubricant grease



Position 8 rollers ①on the primary sliding sheave
Install 4 dampers ② to cam ③
Install cam to primary sliding sheave.



Notes:

When inserting the spacer, press down the cam so that the rollers will not come out of position.

Install spacer

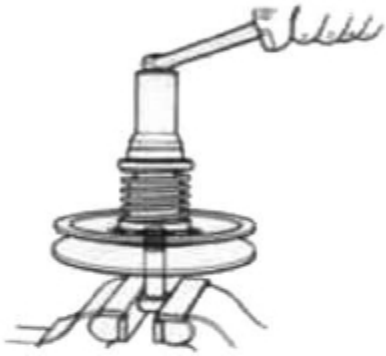
Secondary Sheave

Disassembly

Use special tool and holder to hold the secondary sheave. Remove secondary sheave nut with special tool.

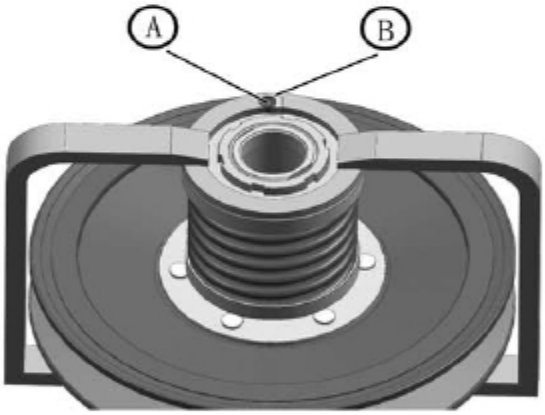
Caution:
Do not remove the ring nut before attaching the clutch spring compressor.

Tool: Nut Wrench
Sheave Holder



Attach special tool to the secondary sliding sheave and compress it by turning in the tool handle.

Note:
Make sure that spring end A is inserted into slot B of the tool handle.

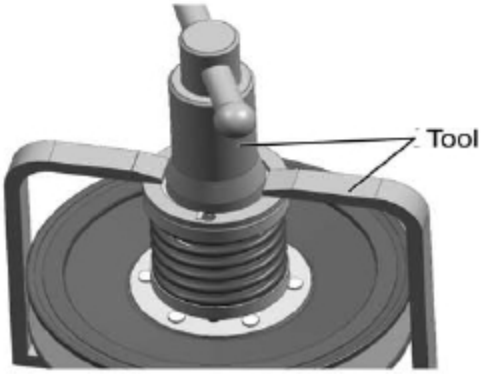


Remove ring nut.

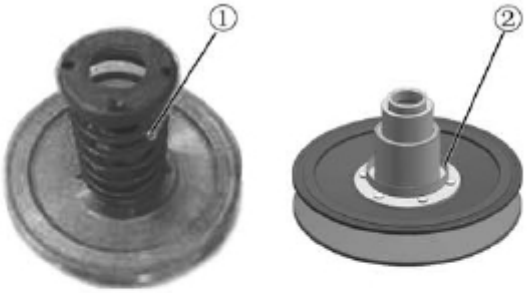
Tool: Secondary sliding sheave spring compressor

Note:
Since a high spring force applies to the secondary sliding sheave, take special care that the secondary sliding sheave will not come off abruptly.

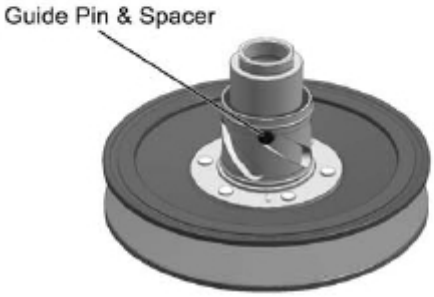
Slowly loosen tool handle and remove the special tool.



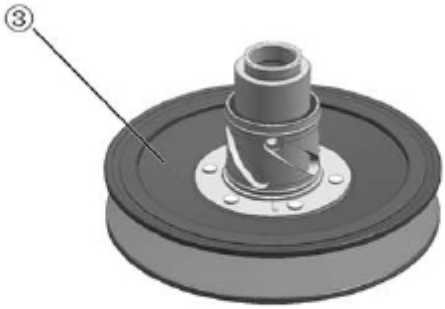
Remove spring ①
Remove spring seat ②.



Remove guide pin and spacer.

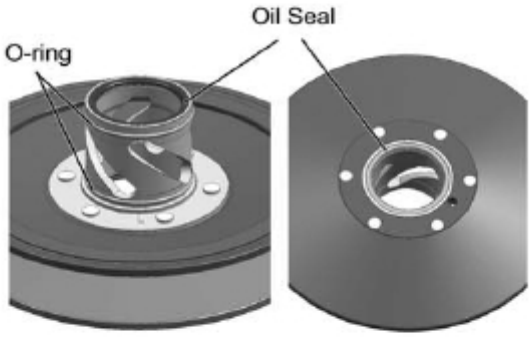


Remove secondary sliding sheave ③



O-ring and Oil Seal

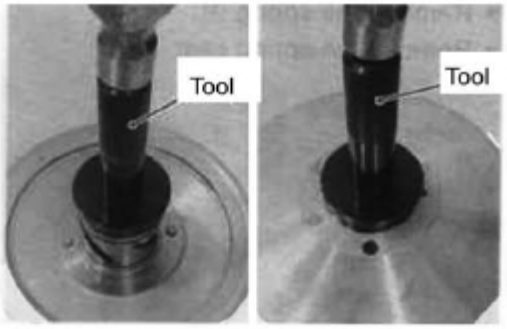
Check the O-ring and oil seal for wear and damage.
Wear and Damage: → Replace



Remove Oil Seal

Install oil seal with special tool.

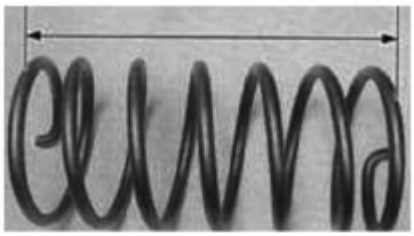
Tool: Bearing install set



Secondary Sheave Spring

Use vernier caliper to check the spring free length. If the length is shorter than the service limit, replace with a new one.

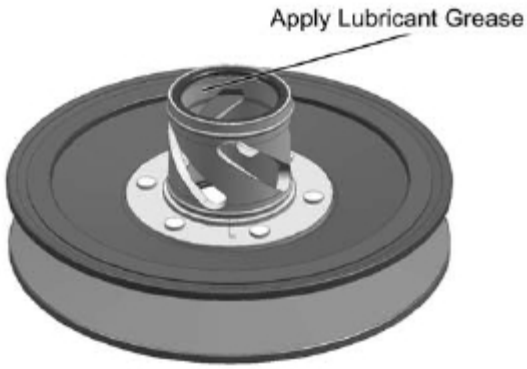
Service Limit: 145.4mm



Secondary Sliding and Fixed Sheave

Check drive face for any abnormal condition such as stepped wear or damage.

Wear or damage: → Replace

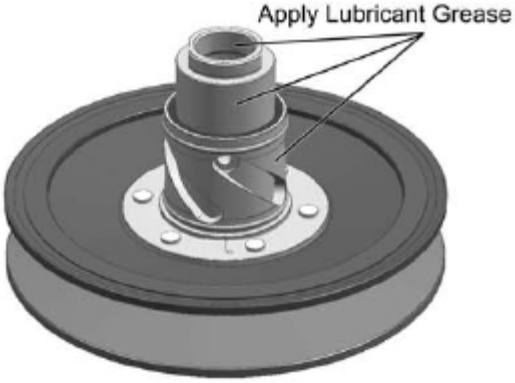


Assembly

Install a new O-ring

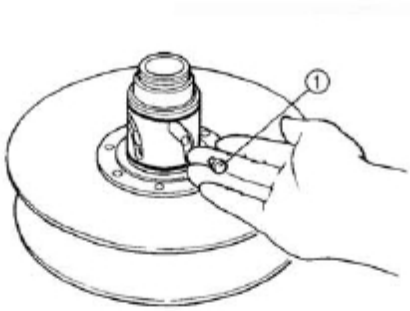
Apply lubricant grease to O-ring, oil seal lip and guide pin groove.

Material: lubricant grease

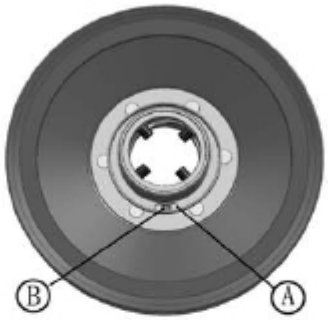


Install guide pin and spacer ①

Note: To avoid damage to the oil seal lip during assembly, slide the lip with a 0.1mm steel sheet as guide.



Install spring seat. Align hole A with hole B.

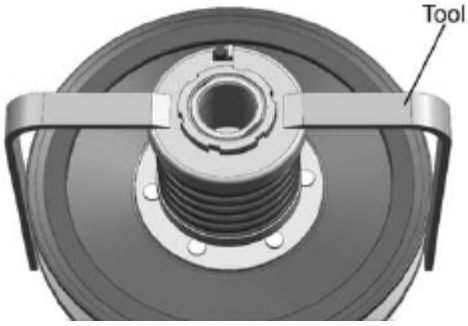


Install spring and spring plate. Insert spring end into the hole.

Compress spring with special tool.
Align the secondary sheave end with spring plate hole.

Tool: Secondary sheave spring compressor

Tighten ring nut temporarily.
Remove the special tool from secondary sheave.

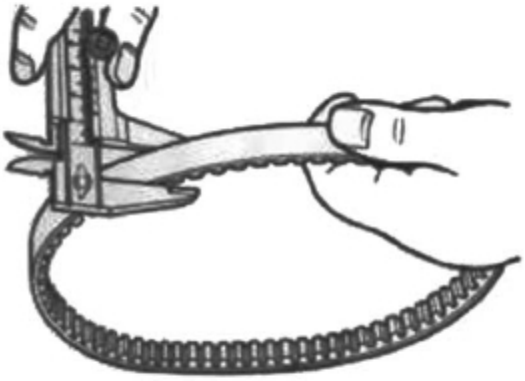


Tighten the ring nut with special tool to the specified torque.

Ring Nut Tightening Torque: 100N·m
Tool: Ring nut wrench
Sheave Holder

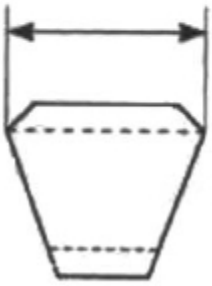
Drive belt

Check belt for any greasy substance.
Check contact surface of belt for any cracks and damage.
Check belt width with vernier caliper.



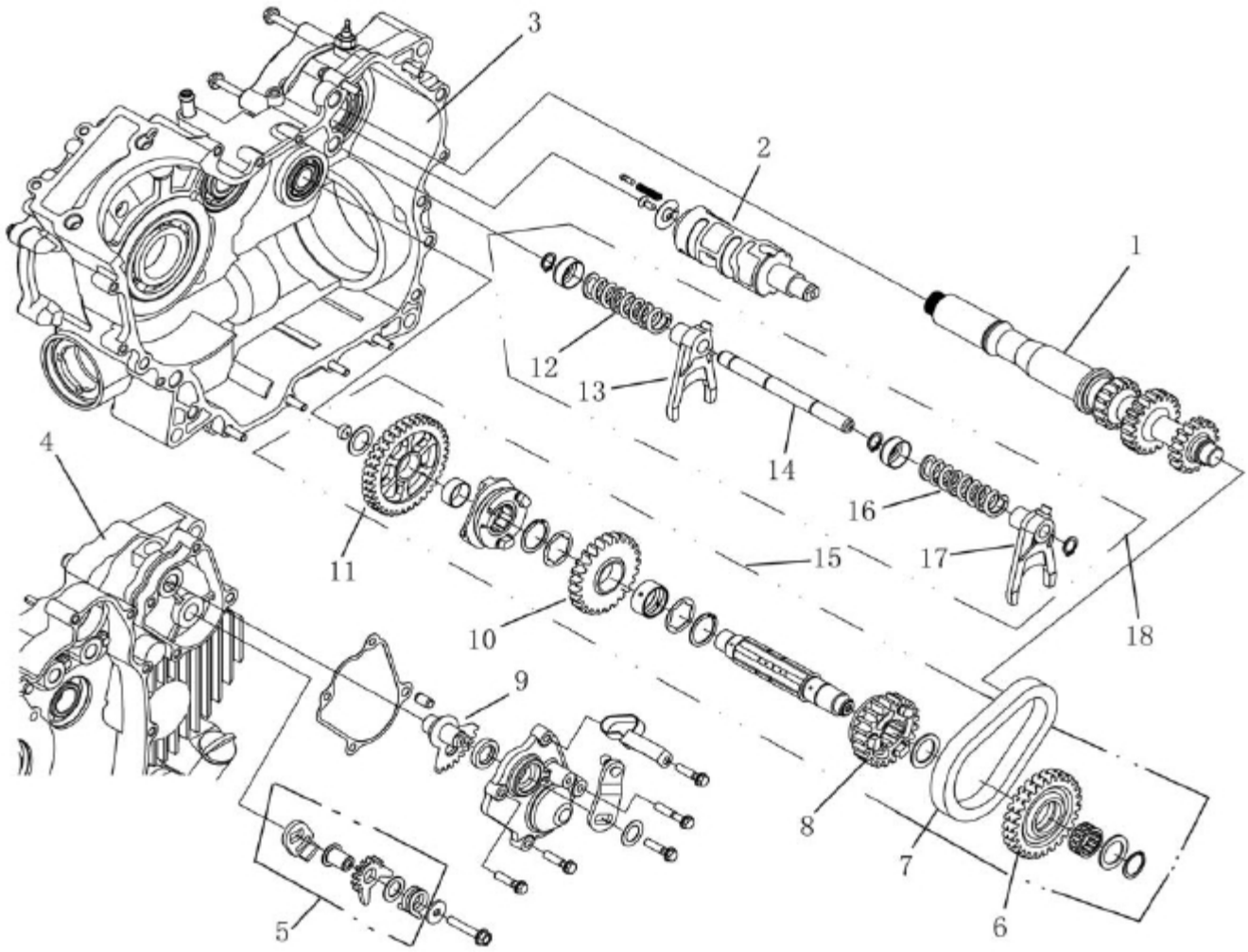
Damage, width out of range: →Replace

Belt width service limit: 33.5mm
Tool: vernier caliper



Caution:
If belt surface is stained with grease or oil, degrease the belt thoroughly.

Transmission

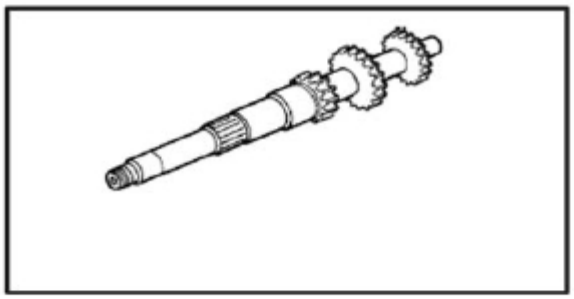


No.	Description	Qty		No.	Description	Qty.
1	MAIN SHAFT. GEARSHIFT	1		10	DRIVEN GEAR, HIGH RANGE	1
2	SHIFT CAM	1		11	DRIVEN GEAR, LOW RANGE	1
3	RIGHT CRANKCASE	1		12	SPRING, SHIFT FORK	1
4	LEFT CRANKCASE	1		13	RIGHT SHIFT FORK	1
5	DRIVEN SECTOR GEAR	1		14	GUIDE BAR	1
6	SPROCKET, REVERSE GEAR	1		15	DRIVEN SHAFT	1
7	CHAIN, REVERSE GEAR	1		16	SPRING, SHIFT FORK	1
8	DRIVEN OUTPUT GEAR	1		17	LEFT SHIFT FORK	1
9	DRIVE SECTOR GEAR	1		18	SHIFT FORK ASSEMBLY	1

Inspection

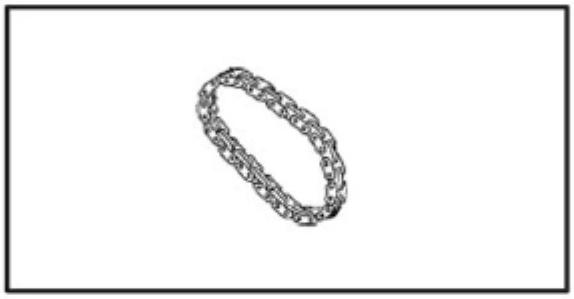
Check main shaft gear and sprocket surface for any damage or over wear.

Damage or over wear: → Replace

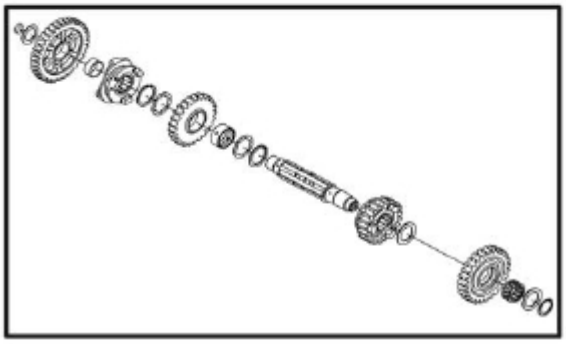


Check reverse gear chain for any damage or over wear.

Damage or over wear: → Replace



Disassemble driven shaft as illustrated.



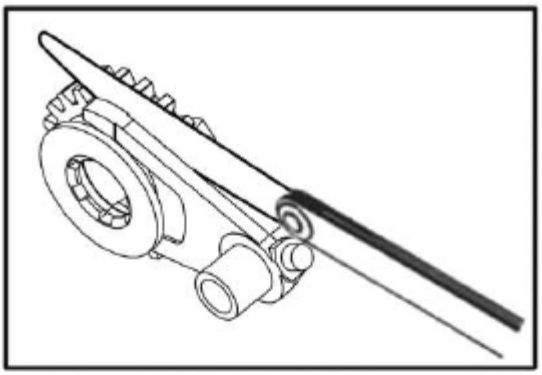
Check each gear surface for any damage or over wear.

Check bearing and collar for any wear or damage..

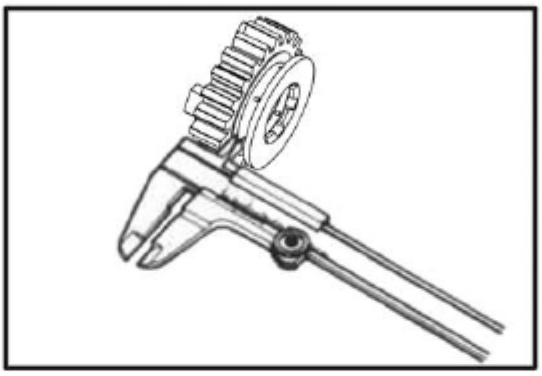
Damage or over wear: → Replace

Check the shift fork clearance with a thickness gauge in the groove of its gear.

Clearance exceeds the limit: → Replace

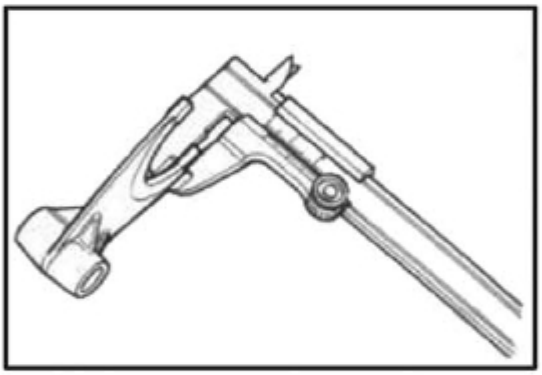


Shift fork to Groove clearance
Standard clearance :0.10-0.30mm
Service Limit :0. 50mm



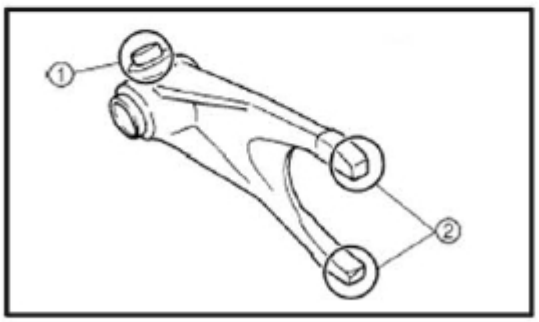
Measure shift fork groove width with vernier caliper

Standard shift fork groove width: 6.05-6.15mm



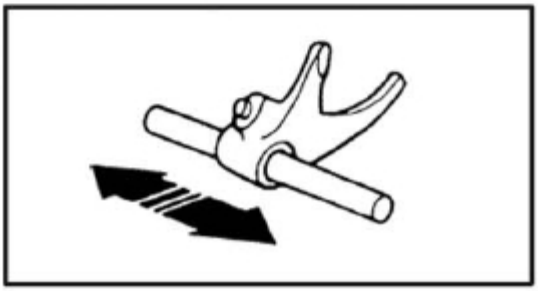
Measure shift fork thickness with vernier calipers;

Standard fork thickness: 5.08-5.90mm



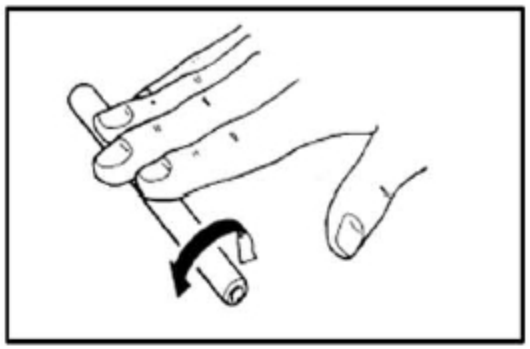
Check shift fork ① and ② for damage or bend

Damage, bend: → Replace



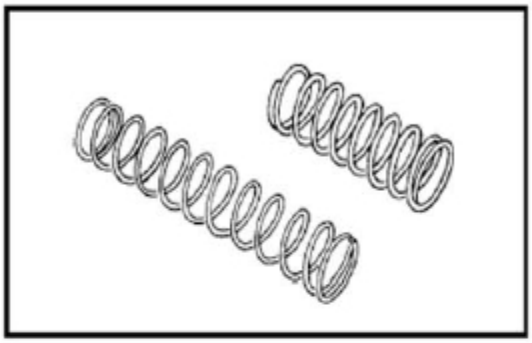
Install shift fork to guide bar and move left and right. In case of any unsmooth moving, replace with a new one.

Put the guide bar on a flat plate and roll it. In case of any bend, replace with a new one.

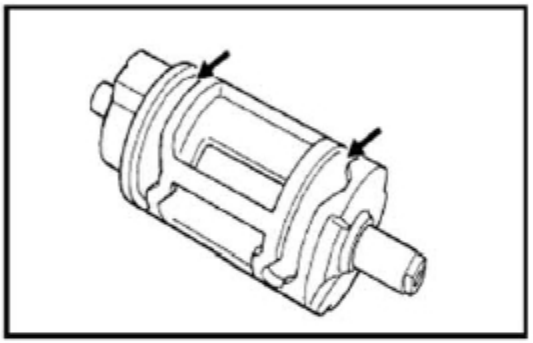


NOTE:DON NOT attempt to correct a bent guide bar.

Check shift fork spring for breakage, damage
Broken or damaged: → Replace



Check shift cam groove for scratches, damage.
Scratch or damage: → Replace

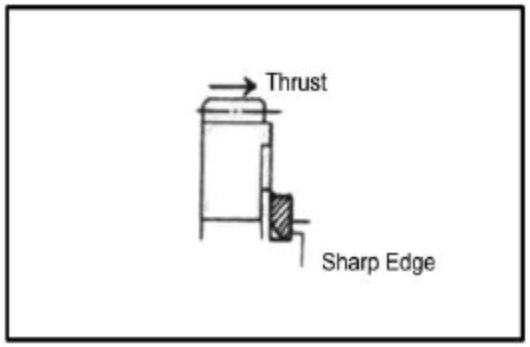


Assembly

Reverse the removal procedure for assembly. Pay attention to the following:

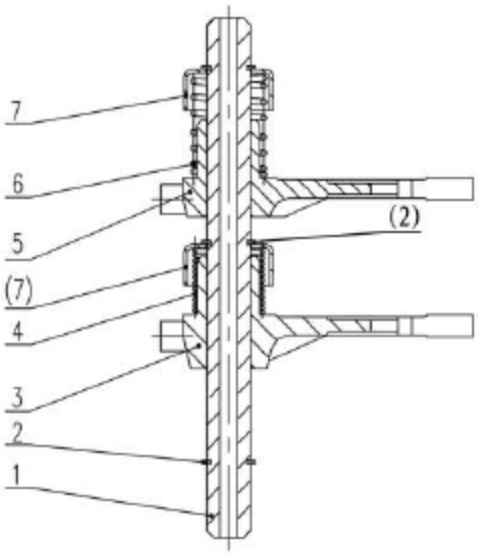
Use new retainers. Pay attention to the direction of the retainers. Fit to the side where the thrust is as illustrated.

Coat the gears and shafts with engine oil before assembly.



Note:
Do not reuse the retainers
Do not expand of the gap end of new retainers too wide when assembling.
Make sure that all the retainers are properly fitted.

When assembling the guide bar, take care not to assemble the two shift forks and springs in the opposite direction.

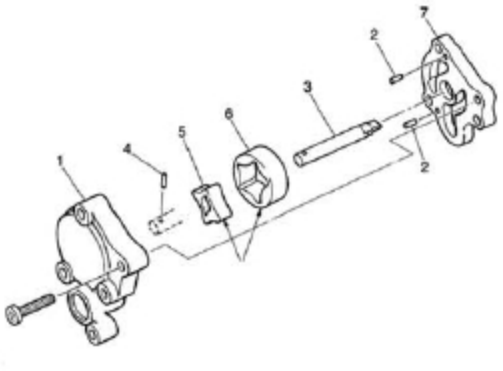


1. Guide bar
2. Retainer
3. Left shift fork
4. Shift fork Spring (small)
5. Right shift fork
6. shift fork spring (big)
7. Spring seat

OIL PUMP

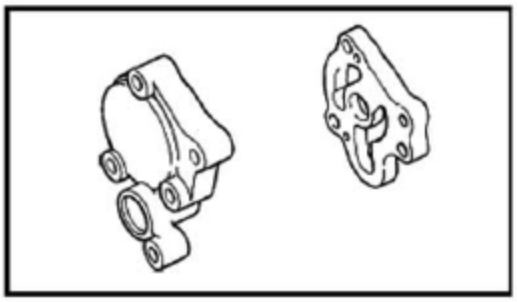
Disassembly oil pump as illustrated:

1. Oil pump housing
2. Dowel pin
3. Oil pump shaft
4. Straight pin
5. Inner rotor, oil pump
6. Outer rotor, oil pump
7. Oil pump cover



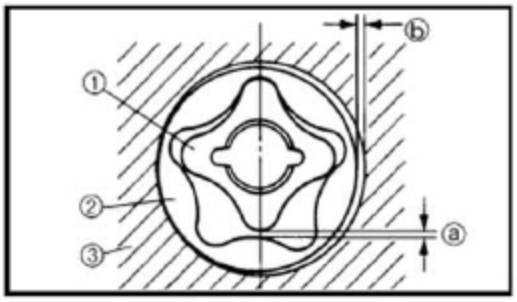
Check oil pump housing and cover for cracks and damage.

Crack or damage: → Replace



Measure top clearance “a” between inner and outer rotors and side clearance “b” between outer rotor and oil pump housing. If the clearance exceeds the limit, replace with new one.

Top Clearance:0. 03-0.10mm
Service Limit: 0. 15mm



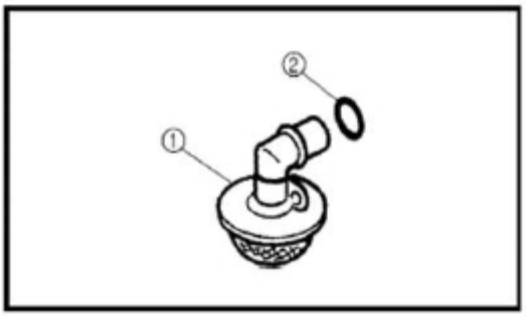
Side clearance: 0. 03-0.10mm
Service Limit: 0.12mm

Oil strainer

Check oil strainer ① and O-ring ② for damage

Damaged oil strainer: → Replace

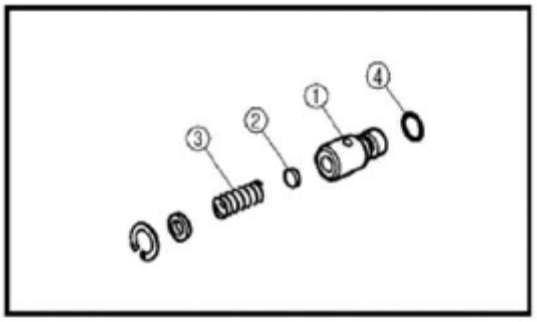
Clean the surface of oil strainer with engine oil



Relief Valve

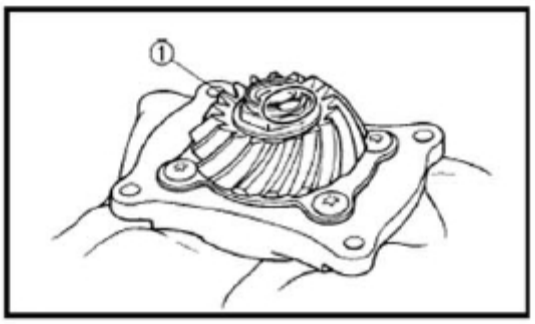
Check the valve body ① 、valve ② and spring ③O ring④ for damage or wear.

Damage or wear: → Replace



Drive Bevel Gear

Use a clean rag to protect the drive bevel gear shaft, clamp it to the pliers.



1. Drive bevel gear cover
2. Output driven gear
3. Drive bevel gear nut
4. Drive bevel gear
5. Adjust washer
6. Drive bevel gear shaft
7. Bearing press
8. Bearing

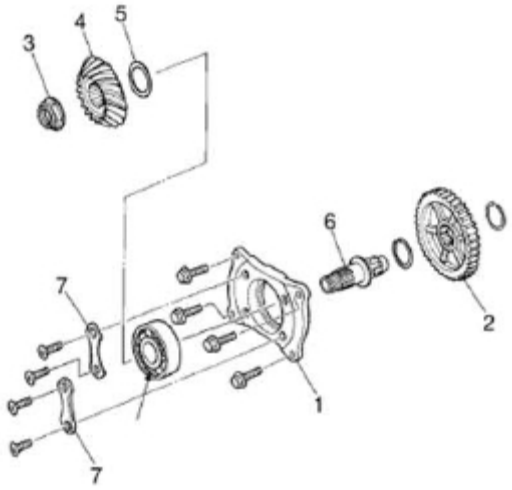
Loosen drive bevel gear nut 3, remove the drive bevel gear 4 and adjust washer 5

Check the drive bevel gear 4 and output driven gear 2 for rust, scratch, wear or damage. Replace if any.

Check if the bearing 8 turns smoothly, replace with a new bearing if necessary.

Adjust Washer 5 if any of right crankcase, drive bevel gear 4, or drive bevel gear cover 1 is replaced. Refer to bevel gear adjustment for details.

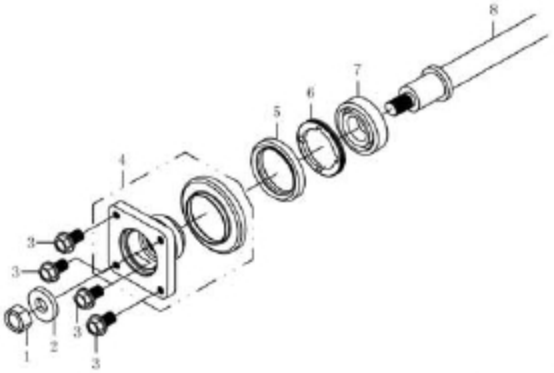
Apply engine oil to bearing 8 when assembling and tighten nut 3 to the specified torque.



Drive bevel gear nut
Tightening torque: 145N.m

Front Output Shaft

Check bearing 7 for smooth turning and abnormal wear. Check oil seal 5 for damage.
Wear or damage: → Replace



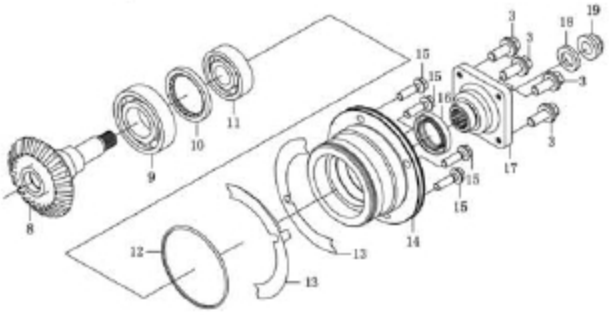
Apply lubrication oil to bearing 7 and oil seal 5 lip before assembly.

Apply thread locker to bearing limit nut 6 (left thread) and tighten to the specified torque.
Bearing limit nut Tightening torque: 80N.m

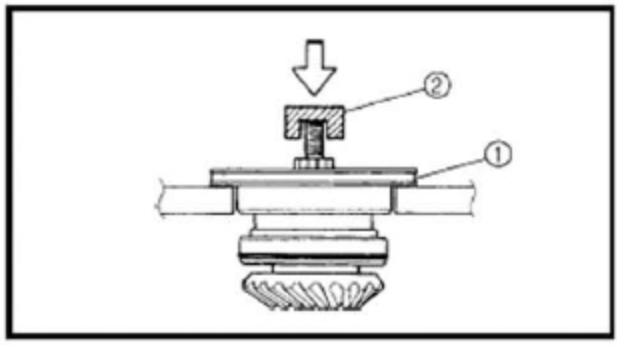
Tighten Nut 1 to the specified torque
Front output shaft nut tightening torque: 97N.m

Driven Bevel Gear

Remove nut 19, washer 18, coupler 17 and oil seal 16.

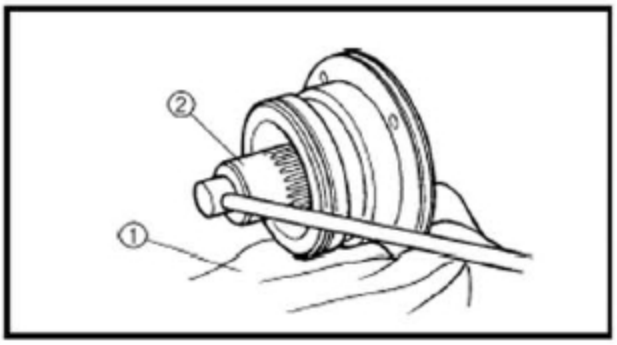


Protect end thread of driven bevel gear with proper device ②. Fix bevel gear cover 14 and press out driven bevel gear.
Place a clean rag ① under bevel gear cover.
Remove bearing limit nut 10 with special tool ② and remove bearing.



Check driven bevel gear 8 surface for scratches, wear. Scratch or wear: → Replace

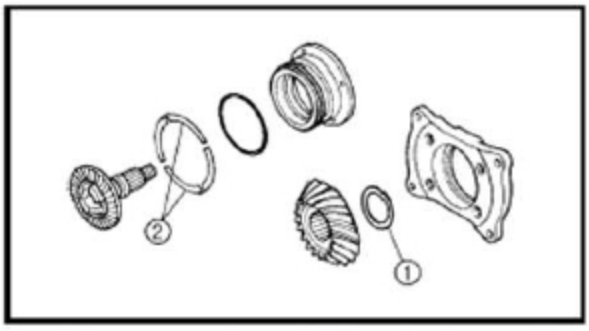
Check free turning of bearing 9 and 11. Replace with a new one if any abnormal is found.



Use new oil seal 16 and O-ring 12 when assembling.

Adjust washer 13 if any of right crankcase, driven bevel gear 8 or driven bevel gear cover 14 is replaced. Refer to bevel gear adjustment for details.

Apply lubrication oil to bearing 9 and 11 and oil seal 16, O-ring. Apply thread locker to nut 10 and tighten to the specified torque.
Tightening torque :110N.m
Tool: driven bevel gear nut wrench
Driven bevel gear nut tightening torque:150N.m

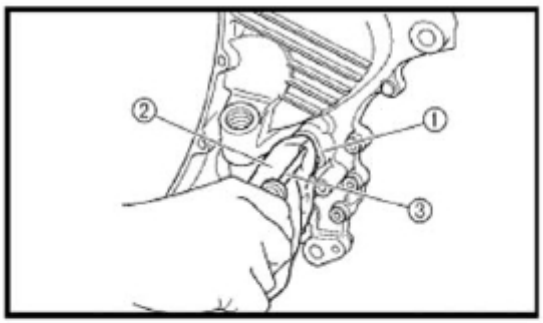


Bevel Gear Washer Adjustment

Adjust washer ① and ② when replacing crankcase and/or bevel gear and/or bevel gear cover,

Bevel Gear

Note: Proper bevel gear engagement depends on that the gear backlash and tooth contact are within the proper range.

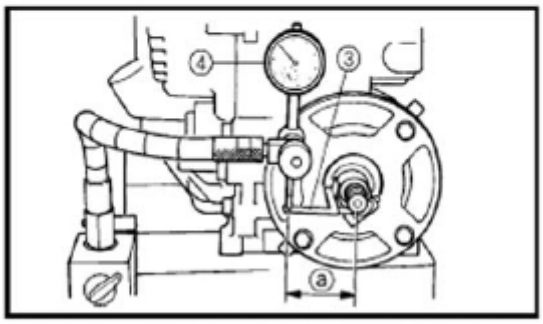


Bevel Gear Backlash

Install drive and driven gears to the crankcase. Wrap a (--) screwdriver ③with a rag ② and insert it into the speed sensor hole ① of left crankcase to fix the drive bevel gear.

Install special tool ③ and micrometer ④.

Tool: Bevel gear side clearance dial gauge
Micrometer
a=46mm



Turn the driven bevel gear in each direction and measure the backlash.

NOTE: Measure four points in the mutual vertical direction

If the backlash is not within the specification, adjust the thickness of the driven bevel gear adjust washer. Re-check the backlash until the backlash is correct.

Bevel Gear Backlash: 0.1-0.2mm

Adjustment

Measured Backlash	Washer Thickness Adjustment
< 0.1mm	Decrease washer thickness
0.1~0.2m	**Correct**
> 0.2mm	Increase washer thickness

Tooth Contact

After adjusting the backlash, check the tooth contact according to the following procedures:

Remove drive and driven bevel gear shafts from crankcase;

Clean and degrease every tooh of drive and driven bevel gear;

Coat the driven bevel gear with machinist's layout dye or paste;

Install drive and driven bevel gear;

Rotate the driven bevel gear several turns in both directions;

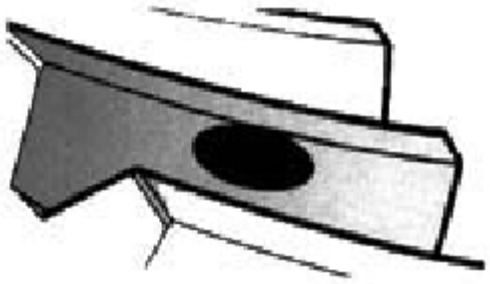
Remove drive and driven bevel gear shafts and check the coated teeth of the drive bevel gear;

Refer to the illustration on the right for tooth contact pattern ①, ② and ③

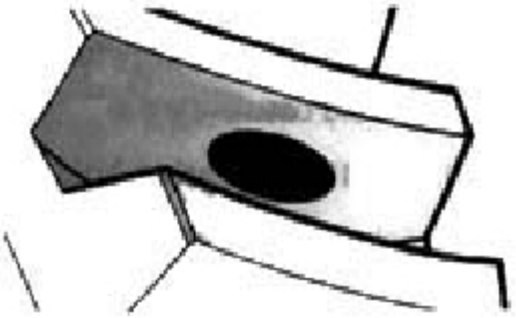
① Incorrect (contact at tooth top)
② Correct
③ Incorrect (contact at tooth bottom)

If tooth contact is correct (Contact ②), continue the next procedure.
If tooth contact is not correct (② and ③), adjust the thickness of the washer of drive bevel gear. Repeat above steps to check tooth contact until it is correct.

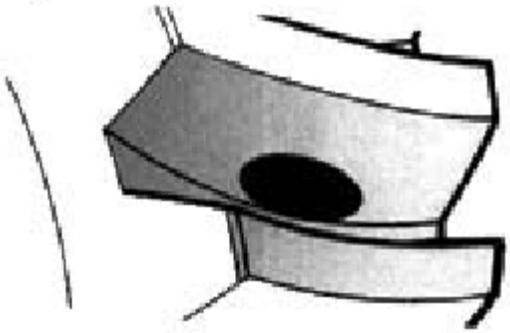
①



②



③



Adjustment

Tooth Contact	Washer Adjustment
Contact at tooth top ①	Increase Thickness
Contact at tooth bottom ③	Decrease Thickness

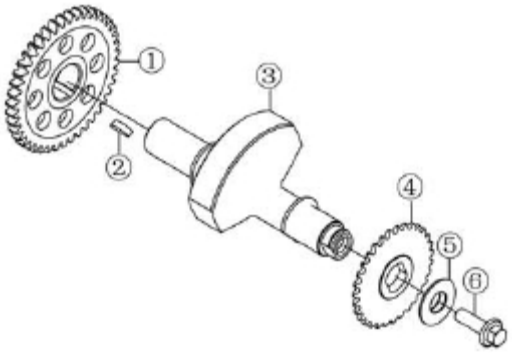
Note:

After adjusting the tooth contact, the backlash must be checked again;
If the backlash is adjusted but tooth contact is still out of specification, replace the drive and driven bevel gears;
Both tooth contact and backlash should be within the required specification.

Balancer Shaft

Remove the parts as illustrated on the right. Check each part for abnormal wear or damage.

Wear or damage: → Replace



① Balancer shaft gear
② Woodruff key
③ Balancer shaft
④ Balancer shaft sprocket
⑤ Washer
⑥ Bolt

Magneto Rotor

Remove starter clutch nut;

Check starter clutch roller and holder for abnormal wear or damage.
Wear or damage: → Replace
Install the starter clutch in the correct direction.

Note:
When install the starter clutch to the magneto rotor, make sure side “A” is in the right direction.

Face arrow mark “B” to the engine side;
Apply engine oil to starter clutch.

Apply thread locker to bolt and tighten to the specified torque:

Tightening torque of starter clutch bolt: 30N.m
Material: Thread Locker

Install the starter driven gear

Make that the starter driven gear turns in the opposite direction of the arrow mark “B”. The gear cannot turn in the direction of the arrow.

Check starter driven gear bearing. In case of anything unusual, replace the bearing.

Remove starter driven gear bearing with special tool

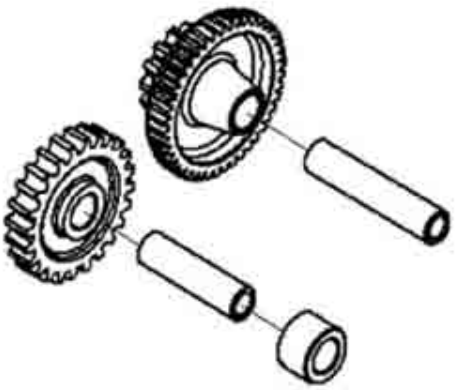
Install starter driven gear bearing with special tool.

Tool: Bearing Installer/Remover

Electric Starter Gear

Check the gear surface for scrap or damage.

Scrape or Damage: → Replace



LEFT CRANKCASE COVER

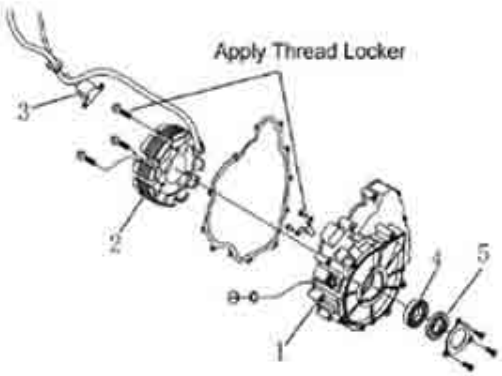
Check magneto stator coil 2, pickup coil 3 for damage,
burn or short circuit, if any , replace with new one;

Check bearing 4 for smooth turning. If it is stuck, replace with a new one;

Check oil seal 5 for damage. Replace it if it's damaged;

Apply thread locker to the bolt when assembling.
Tightening torque for magneto coil bolt: 10N.m

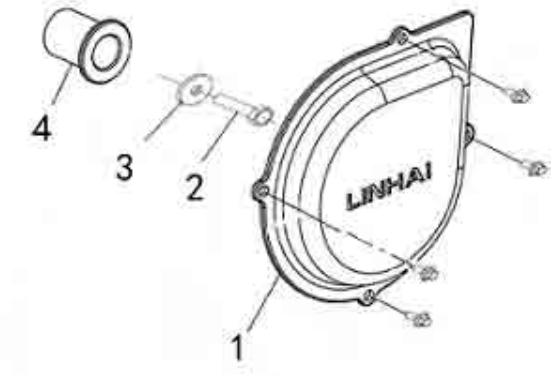
Apply lubrication oil to bearing 4 and lubricant grease to lip of oil seal 5 when assembling.



LEFT SIDE COVER

Disassembly

1— Left side cover
2— Bolt
3— Washer
4—Splined spacer



CVT Cover

Remove screw 5, oil seal limitator 4. Remove oil seal 3 with special tool;

Check bearing 2 for free turning. In case of any abnormal, remove with special tool and replace with a new bearing;

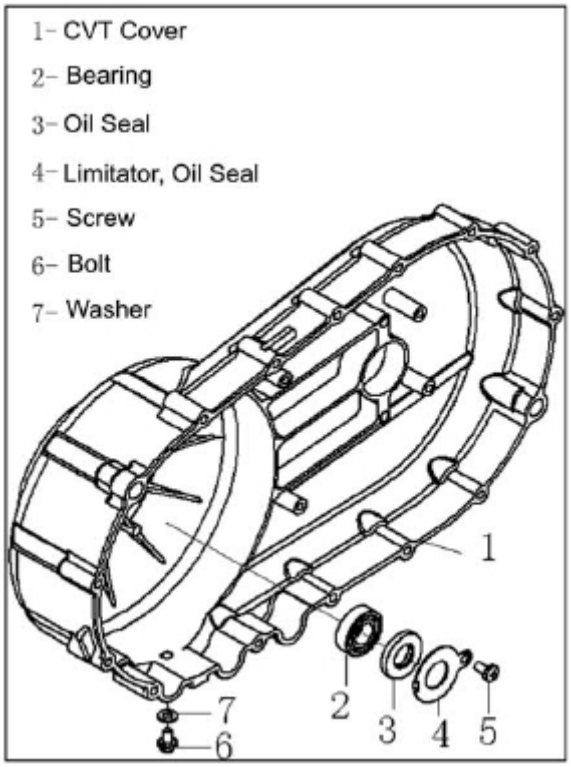
Apply lubrication oil to outer ring of bearing and install bearing with special tool. Check bearing for smooth turning.

Apply grease to bearing inner side;

Apply grease to oil seal lip and install oil seal with special tool.

Note: Use a new oil seal.

Install oil seal limitator and tighten screw after applying thread locker.



Tool: Bearing Remover
Oil Seal Remover
Bearing Installer

CVT Case

Check bearing 5 for smooth turning. In case of any abnormal, remove screw 3 and bearing retainer 4 and replace with a new bearing.

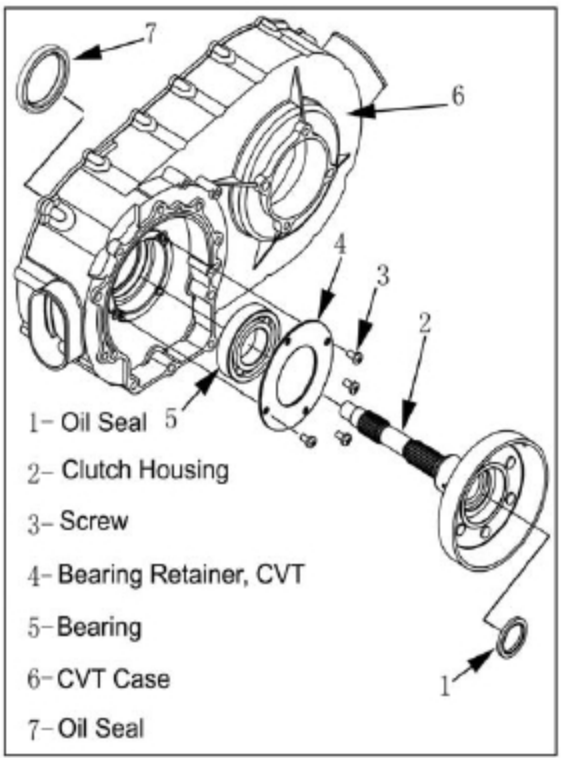
Check oil seal 7. In case of any damage, replace it;

Apply grease to oil seal lip and install with special tool.

Apply lubrication oil to bearing 5 and install with special tool; Check bearing for smooth turning. The seal side of bearing 5 should face bearing retainer 4.

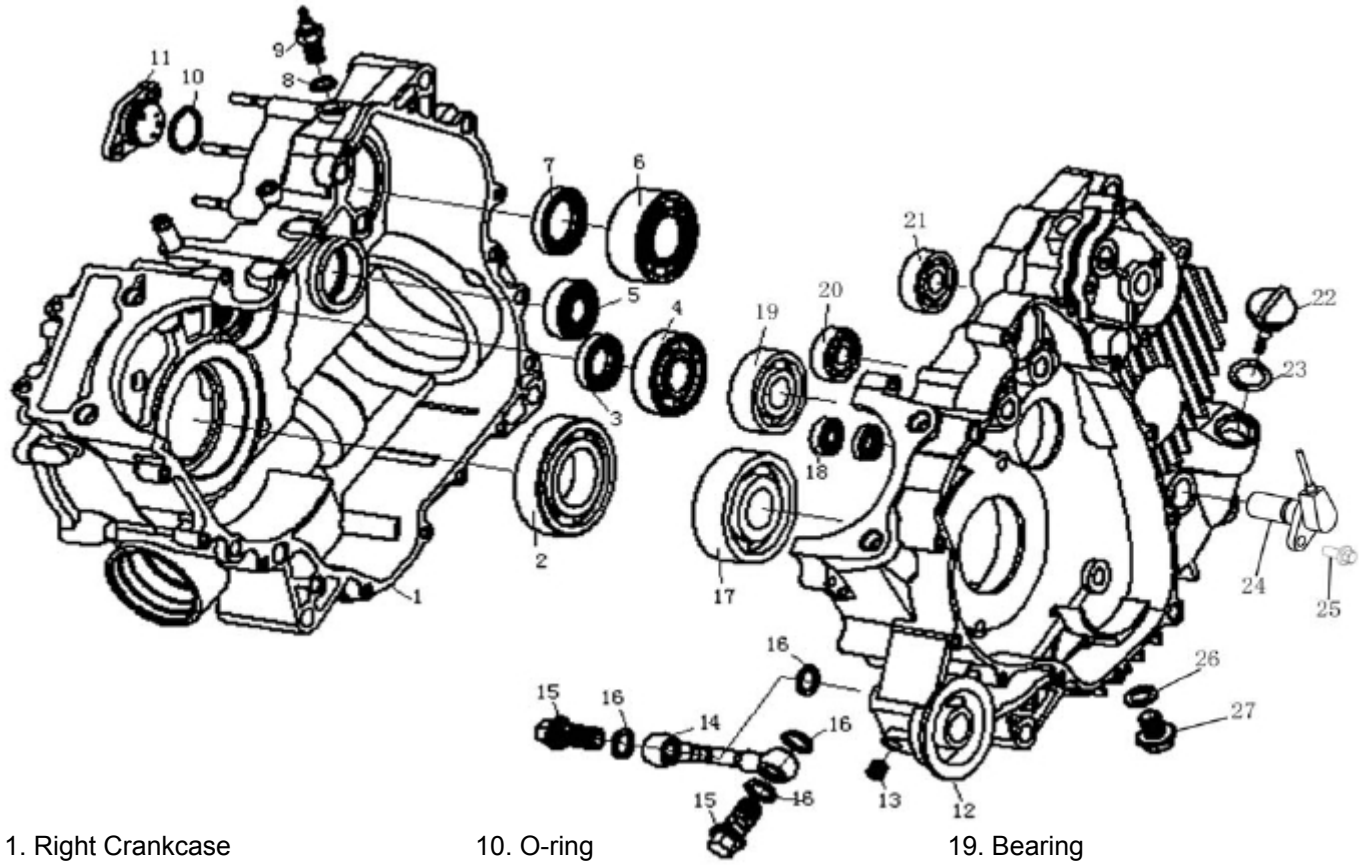
Install bearing retainer 4 and screw 3.

Install oil seal 1 into clutch housing 2 with special tool.



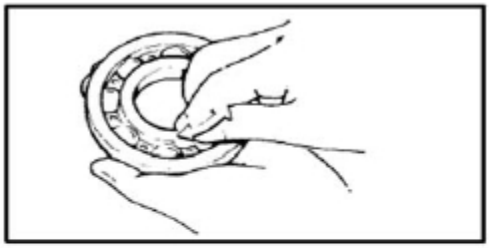
Tool: Oil Seal Installer
Bearing Installer

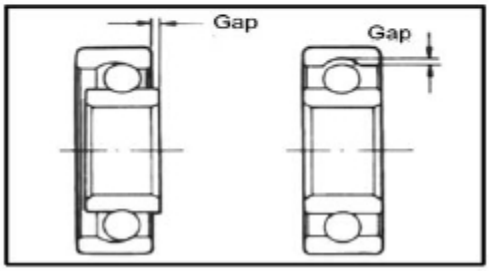
Crankcase



1. Right Crankcase
2. Bearing
3. Seal
4. Bearing
5. Bearing
6. Bearing
7. Oil Seal
8. Washer, Reverse Gear Sensor
9. Reverse Gear Sensor
10. O-ring
11. Gear Sensor
12. Left Crankcase
13. Oil Plug
14. Oil Pipe
15. Link Bolt
16. Washer
17. Bearing
18. Bearing
19. Bearing
20. Bearing
21. Bearing
22. Oil Dip Rod
23. O-ring
24. Speed sensor
25. Bolt
26. Washer
27. Oil Drainage Bolt

Clean and grease the bearings, turn the inner race of bearing and check the play, noise and smooth turning. In case of any abnormal, remove bearing with special tool and replace;
Check all the oil seals for over wear or damage. In case of any over wear or damage, remove with special tool and replace with a new oil seal;
Remove gear sensor 11 and check for continuity with reverse gear sensor 9 with a multimeter.
Remove link bolt and oil pipe 14 and check oil pipe for crack or clog. Replace with a new one if any;
Remove oil drainage bolt 27 and clean it.





Note: Check bearing for smooth turning after installation.

Install new O-ring and apply grease;
Install gear sensor;
Install reverse gear sensor 9 and tighten to the specified torque.

Reverse gear sensor tightening torque: 20N.m

Install speed sensor 24

Install oil pipe and tighten the link bolt to the specified torque;
Link bolt tightening torque: 40N.m

Install washer 26 and oil drainage bolt 27 and tighten to the specified torque;
Drain bolt tightening torque: 30N.m

Tool: Bearing Remover
Bearing Installer
Multimeter

III Engine Assembly

Reverse the engine removal procedure for installation.

Caution:
Clean all the parts before assembly;
Make sure that the parts are in good condition without any damage;
Apply engine oil to the moving parts before assembly;
Apply grease to oil seal lip and O-ring

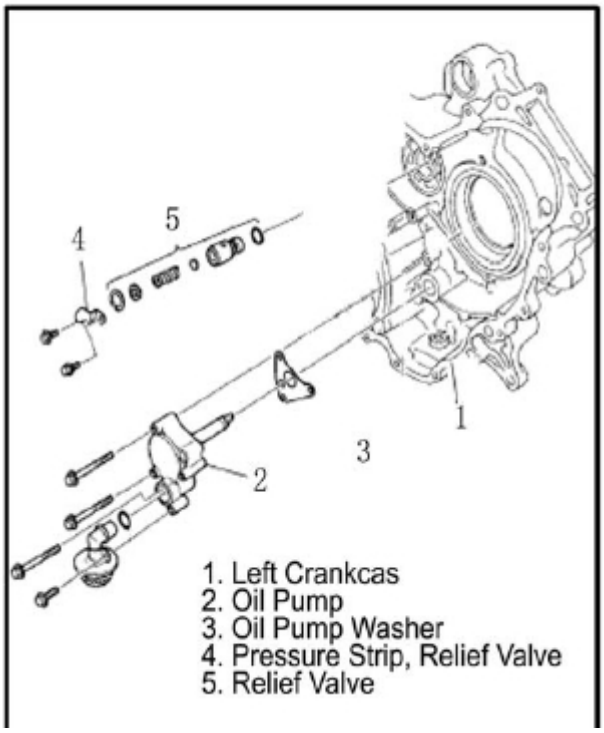
Caution:
Make sure that drive belt, primary and secondary sheaves are not stained with grease.

Engine Center

Oil Pump and Relief Valve

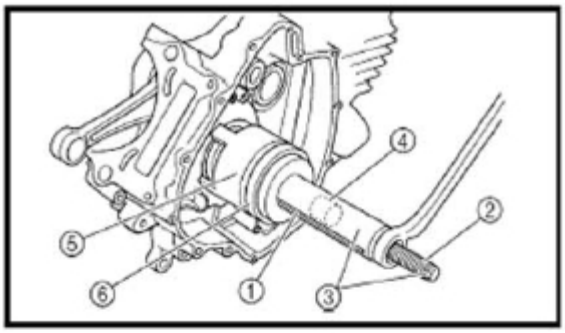
Install oil pump and relief valve to left crankcase, as illustrated on the right. Tighten to the specified torque:

Oil pump bolt: 10N.m
Relief valve bolt: 10N.m



Connecting Rod

Install connecting rod to left crankcase with special tool;



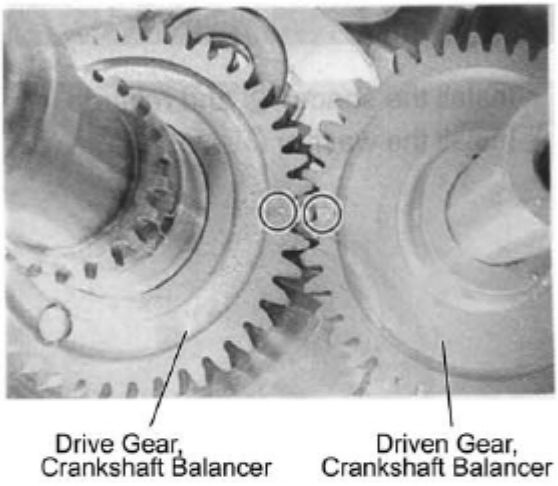
Note:
Do not hammer the conrod into crankcase with plastic mallet;
Use special tool to avoid affect of conrod precision

Tool: Conrod Installer

Balancer Shaft

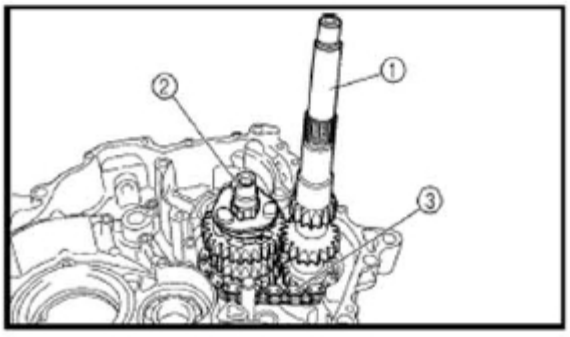
Install balancer shaft

Caution: Balancer shaft driven gear should be aligned to the mark as illustrated.



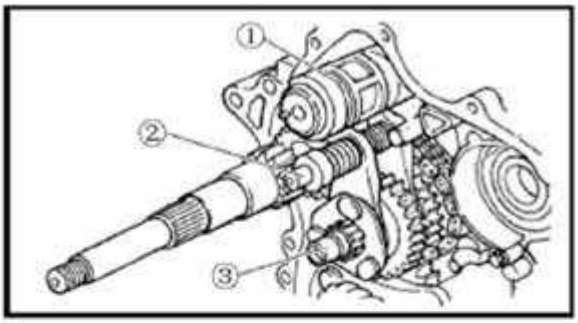
Main Shaft, Counter Shaft

Install main shaft and counter shaft.



Shift Cam, Shift For

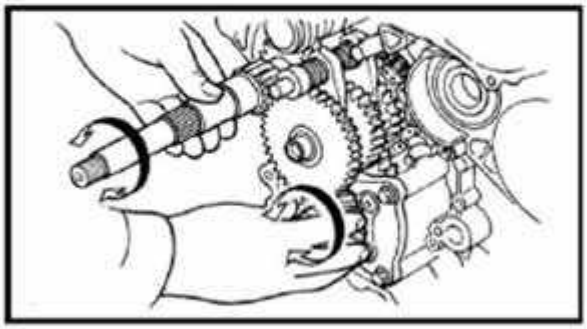
Install shift can① and shift fork②



Check each part for smooth turning

Install low range driven gear to counter shaft③

Spray adequate engine oil to each part.



Drive Bevel Gear

Install drive bevel gear and tighten to the specified torque.

Drive bevel gear tightening torque: 32N. m
Material: Thread Locker

Right Crankcase

Driven Bevel Gear

Install driven bevel gear and tighten to the specified torque.

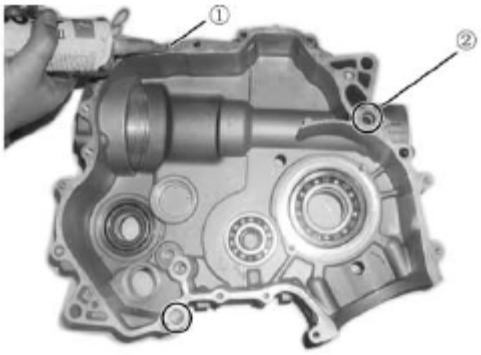
Driven bevel gear tightening torque: 25N. m

Check bevel gear backlash (Refer to 12-44)

Front Output Shaft

Install front output shaft to right crankcase

Apply sealant ①to the mating face of right crankcase.



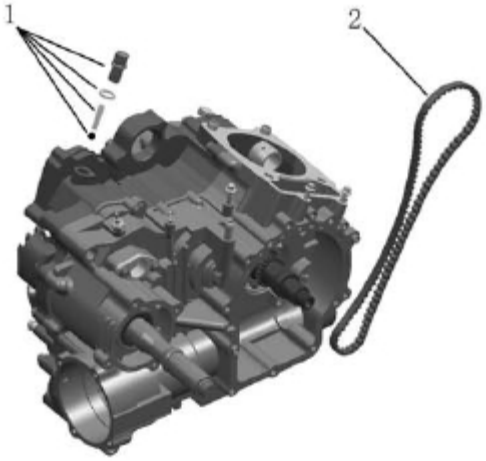
Note: Apply sealant evenly in an uninterrupted thin line.

Install 5 dowel pins②

Assemble crankcase and tap slightly with a rubber hammer so that the crankcase is properly fitted.

Install bolt and tighten to the specified torque.

Crankcase bolt tightening torque: M6: 10N.m
M8: 25N.m



Note: Crankcase bolts should be tightened diagonally in several steps.

Place the steel ball and install gear positioning bolt and tighten the bolt to the specified torque.

Gear positioning bolt tightening torque: 40N.m

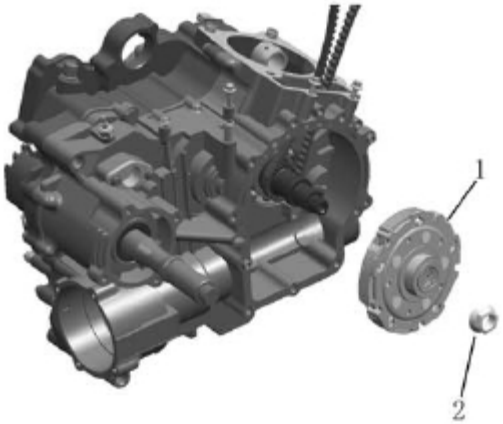
Engine Right

Timing Chain

Put on timing chain 2

Clutch

Install clutch 1 and nut 2. Tighten the nut to the specified torque (left thread).



Clutch nut tightening torque: 80N.m

Install new o-ring⑥ in spacer⑧

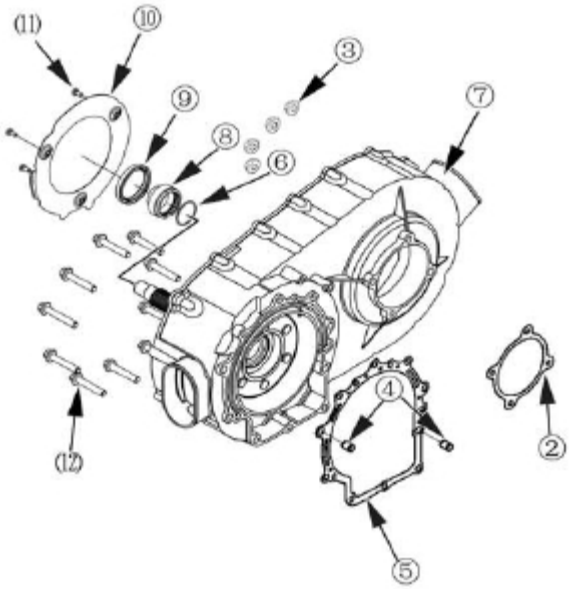
Install spacer onto the clutch housing shaft, then install into CVT case

Note: align oil nick on spacer with oil hole on the shaft

CVT Case

Install dowel pin ④, gasket ② and gasket⑤ to the right crankcase. Install CVT case assembly to right crankcase.

Install bolt ⑿ and nut③

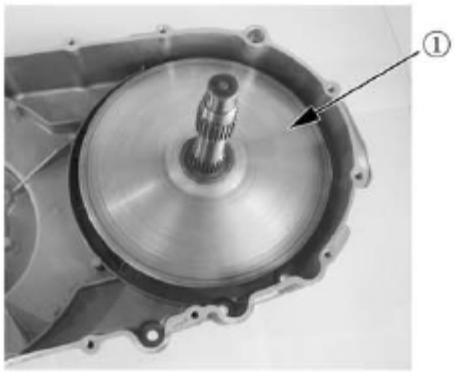


Note:
Tighten bolt/nut diagonally
Use a new gasket

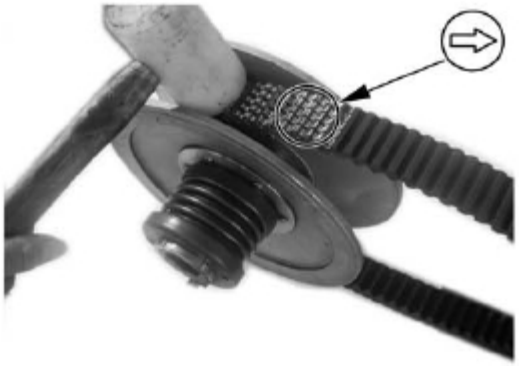
Install air guide plate⑩ and screw⑾

Primary Sheave, Secondary Sheave, Drive Belt

Install primary fixed sheave ①as illustrated on the right;



Install drive belt between secondary sliding/fixed sheave and tap with a plastic hammer to keep the belt as low as possible.



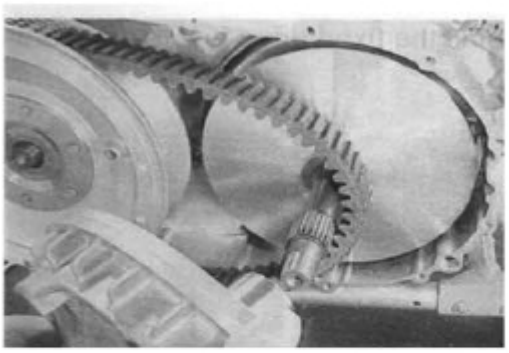
Note:

Install the drive belt with the arrow on the belt turn in the clockwise direction

Drive belt contact surface should be free from any stains.

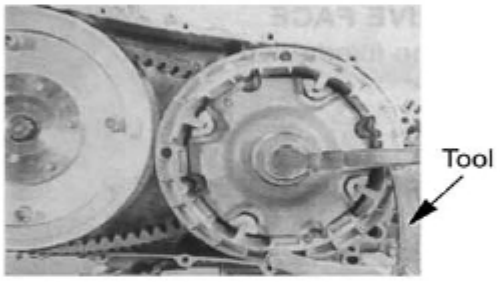
Install secondary sheave;

Install primary sliding sheave



Tighten primary sheave nut with special tool to the specified torque;

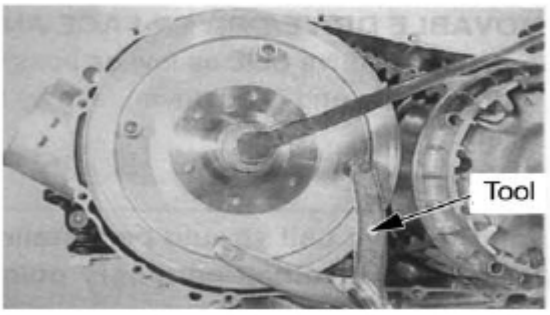
Primary sheave nut tightening torque: 115 N·m
Tool: Rotor Holder



Tighten secondary sheave nut with special tool to the specified torque;

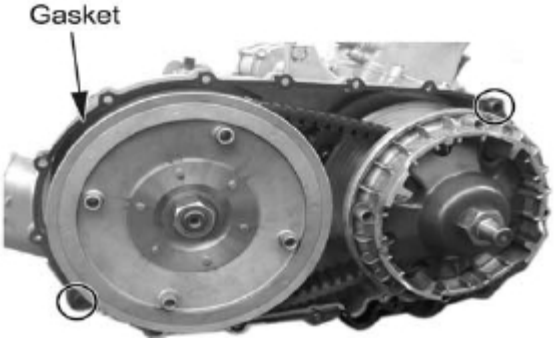
Secondary sheave tightening torque: 115 N·m
Tool: Rotor Holder

Note:
Turn the primary fixed sheave until the belt is seated in and both primary and secondary sheaves move together smoothly without slip.



CVT Case Cover

Install the new gasket and dowel pins.



Install CVT case cover bolts and tighten diagonally in several steps.

Engine Left

Oil Pump Sprocket and Chain

Install oil pump drive sprocket;

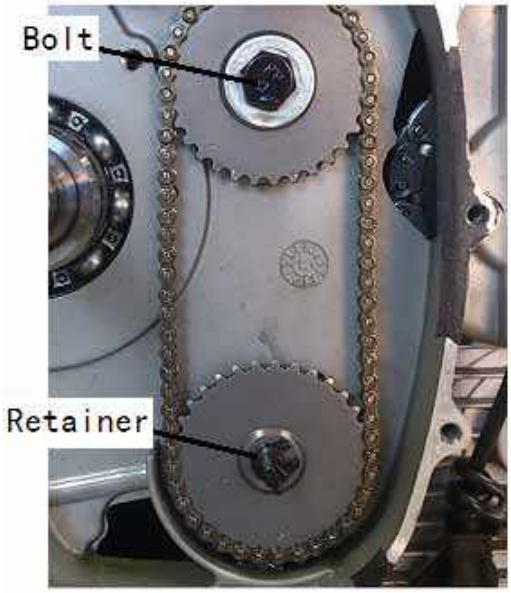
Install oil pump driven sprocket;

Install oil pump drive chain;

Install oil pump sprocket bolt;

Install sprocket retainer with a long nose pliers

Tool: Long Nose Pliers



Dual Gear, Idle Gear

Install dual gear shaft① and dual gear ②

Install dual gear shaft③, dual gear ④and bush⑤

Starting Driven Gear

Install starting driven gear bush⑥

Install starting driven gear;

Magneto Rotor

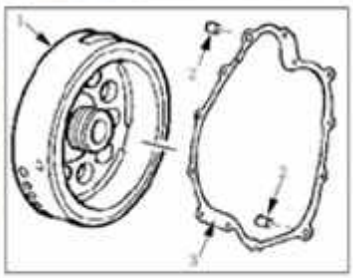
Install woodruff key into crankshaft groove;

Install magneto rotor 1;

Note: Degrease the tapered part of rotor and crankshaft. Use nonflammable solvent to clean off the oily or greasy matter and fully dry the surfaces.

Install Splined Spacer N°1;
Install Bolt N°2,
Bolt tightening torque: 60N.m;

Remove Bolt;
Remove Splined Spacer



Left Crankcase Cover

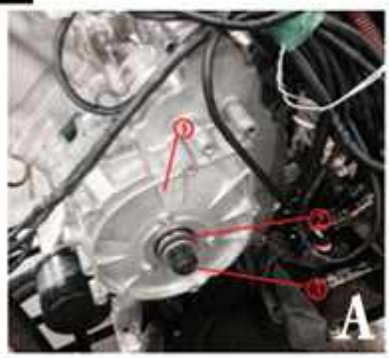
Install dowel pin2 and gasket 3

Note: Use a new gasket

Apply Lubricant grease to oil sea lip;

Install left crankcase cover N°1A

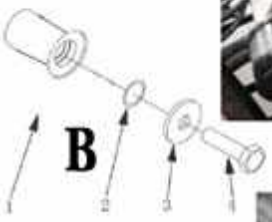
Install bolts;



Splined Spacer

Install splined spacer 1B / 2A

Install O-ring 2B



Note: Use a new O-ring and apply lubricant grease to the O-ring

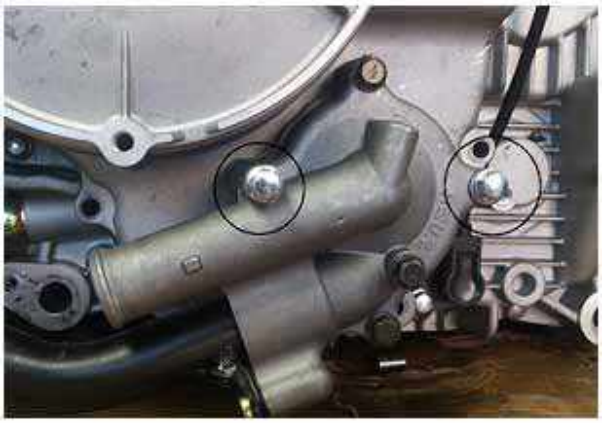
Install washer 3B and bolt 4B / 3A, tighten to the specified torque:

Bolt tightening torque: 100N.m

Water Pump

Install water pump;

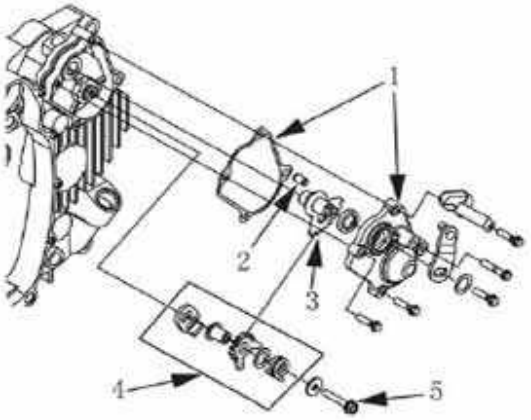
Install water pump fixing bolts;



Note: Before tightening the bolts, be sure to insert oil pump shaft into groove of water pump shaft.

Sector Gear

Install the parts as illustrated on the right.



1- sector gear cover and gasket
2-dowel pin
3-drive sector gear
4-driven sector gear
5-driven sector gear bolt

Note: When the shift cam is in the neutral position, the mark of drive sector gear should be between the two marks of the driven sector gear.

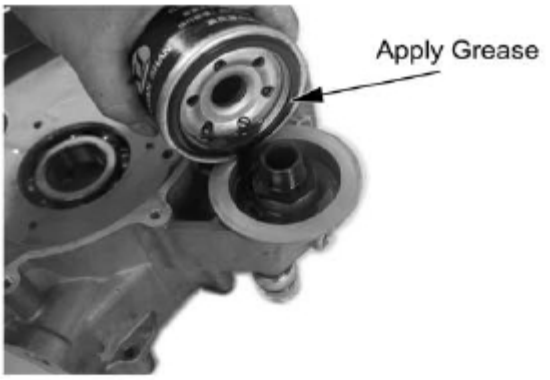
Driven sector gear tightening torque: 14N.m

Oil Filter

Install oil filter bolt and tighten to the specified torque;

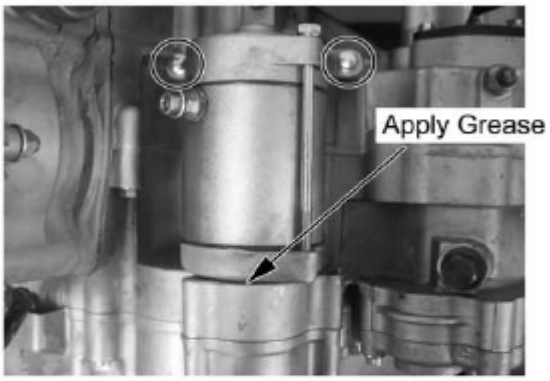
Oil filter bolt tightening torque: 36 N·m

Apply engine oil to O-ring;



Install oil filter, turn it by hand until the filter gasket contacts the mating surface. Tighten the bolts to the specified torque.

Tool: Oil Filter Wrench



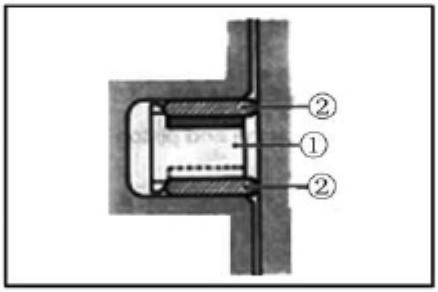
Starting Motor

Apply engine oil to new O-ring;

Install starting motor;

Install bolt and tighten to the specified torque

Tightening torque: 10N·m

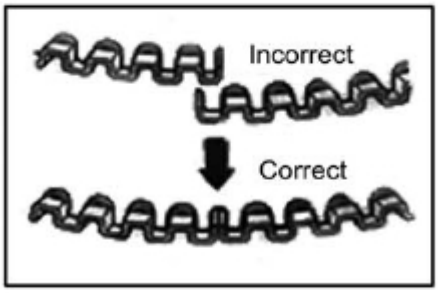


Engine Top Side

Piston

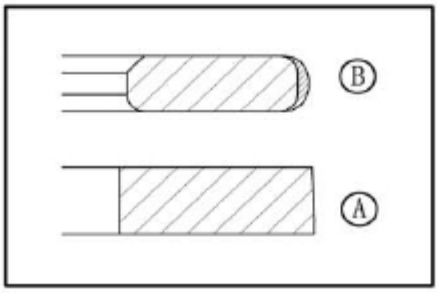
Install the piston rings in the order of oil ring, ②ring and ①ring.;

The first member to go into the oil ring groove is spacer①, after placing the spacer, fit the two side rails②.



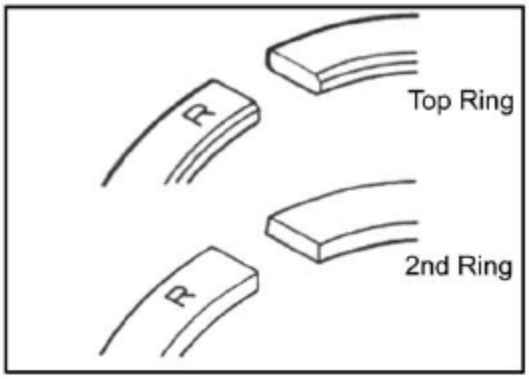
Warning: when installing the spacer①, do not overlap its two ends in the groove.

Install the second ring A and first ring B

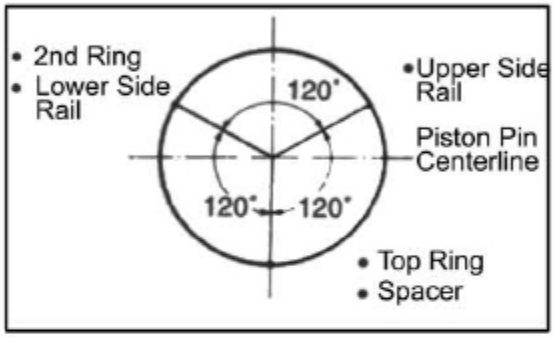


Note: 1st ring and 2nd ring differ in shape

1st and 2nd rings have letter “R” marked on the side. Be sure to bring the marked side to the top when fitting them to the piston.



Position the gaps of the three rings as illustrated on the right. Before installing the piston into the cylinder, check that the gaps are so located.



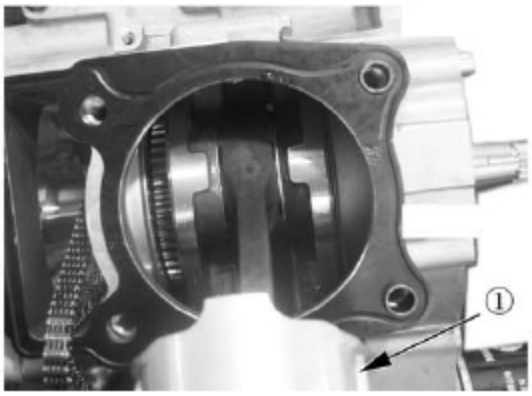
Apply a light coat of moly oil to the piston pin;

Install piston pin into holes of piston and conrod small end.

Note: When installing the piston, the “IN” mark on piston top is located to the intake side.

Place a clean rag beneath piston and install piston pin circlip ①

Note: while rotating crankshaft, pull the cam chain upward, or the chain will be caught between sprocket and crankcase.



Install the dowel pins and the new cylinder gasket;

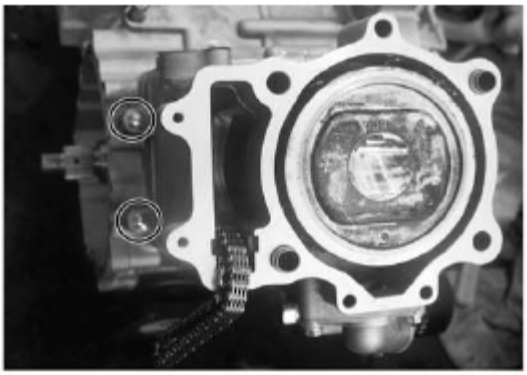
Note: Use a new cylinder gasket to prevent oil leakage

Cylinder

Apply engine oil to piston skirt and cylinder wall;

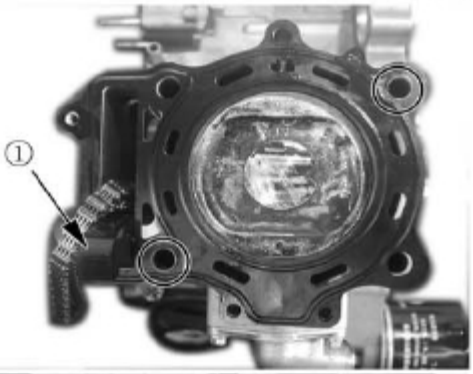
Hold each piston ring with proper position, insert piston into the cylinder;

Tighten the cylinder base bolts temporarily;



Note: When installing the cylinder and cylinder head, pull the cam chain upward, or the chain will be caught between sprocket and crankcase.

Install chain guide①;

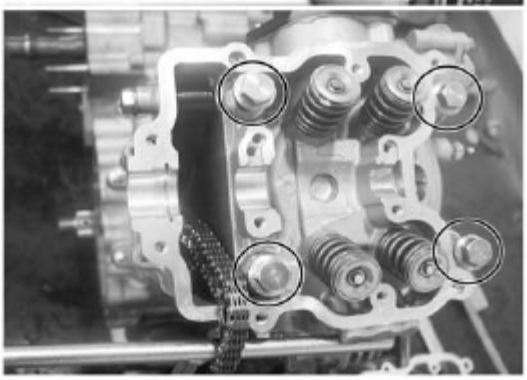


Fit the dowel pin and new cylinder cover gasket;

Note: Use a new cylinder cover gasket to prevent oil leakage

Cylinder Head

Install the cylinder cover, tighten the cylinder head bolts diagonally to the specified torque.



Cylinder head bolt tightening torque: Initial: 25 N·m
Final: 40 N·m

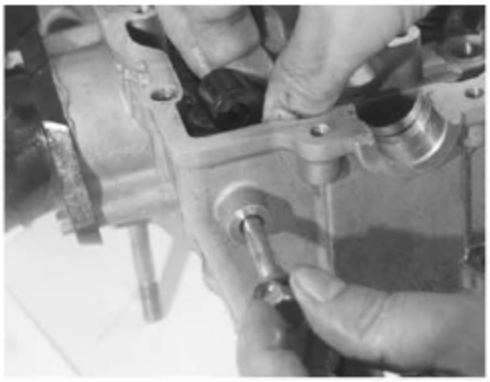
Tighten the cylinder head nuts to the specified torque;

Cylinder head nuts tightening torque:
M6: 10 N·m
M8: Initial 10 N·m
Final 25 N·m

Tighten the cylinder top nuts and cylinder base to the specified torque;

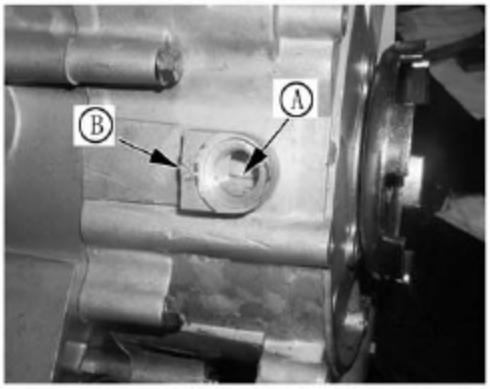
Tightening torque: 10 N·m

Install chain tensioner;



Camshaft

Align mark “A” on magneto rotor with mark “B” on crankcase;

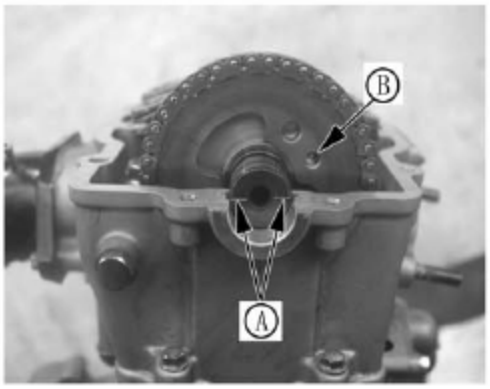


Note: while rotating crankshaft, pull the cam chain upward, or the chain will be caught between sprocket and crankcase.

Align the mark “A” on the camshaft so that they are parallel with the mating surface of the cylinder head.

Note: Do not rotate the magneto rotor while doing this. when the sprocket is not positioned correctly, turn the sprocket;

Engage the chain on the sprocket with the locating pin “B” as illustrated on the right;



Recheck if the position of mark “A” and “C” is correct. If not, reassemble until it is correct.

Install crankshaft C-ring ①

Install lock washer so that it covers the locating pin;

Apply thread locker to the bolts before installing, and tighten them to the specified torque;

Sprocket bolt tightening torque: 15 N·m

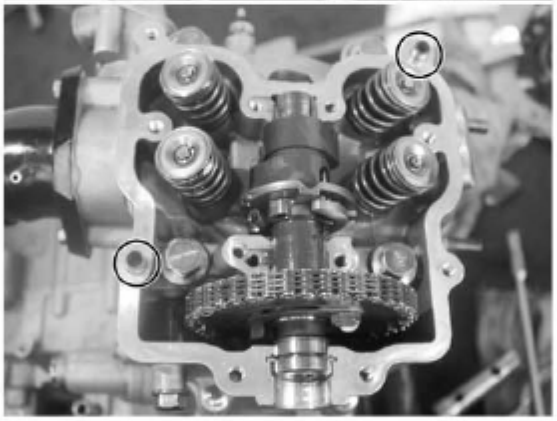
Bend up the lock washer to lock the bolts.

Cylinder Head Cover

Clean the mating surface of cylinder head and cylinder head cover;

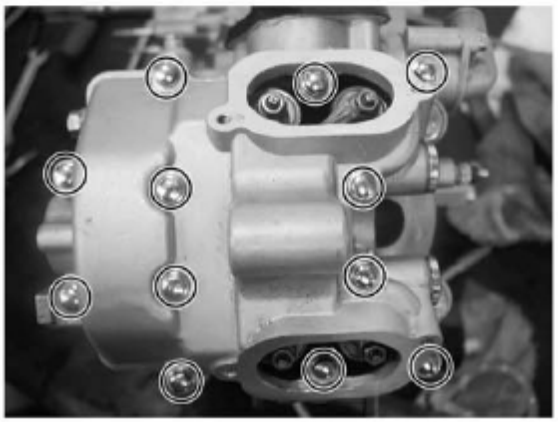
Install dowel pin to the cylinder head

Apply sealant to the mating surface of the cylinder head cover;



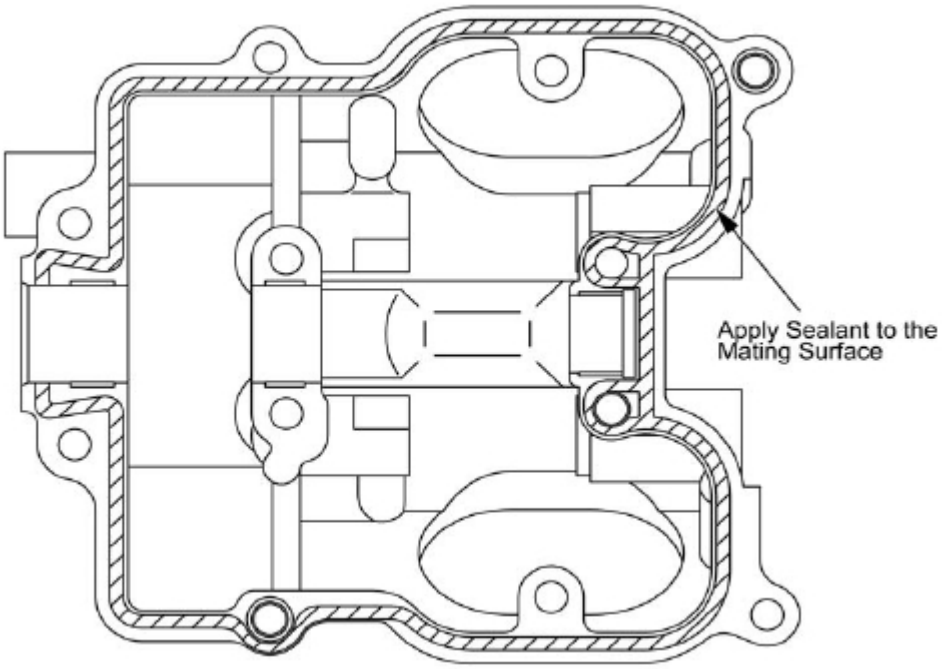
Install cylinder head cover bolts, tighten diagonally to the specified torque.

Cylinder head cover bolt tightening torque: 10 N·m



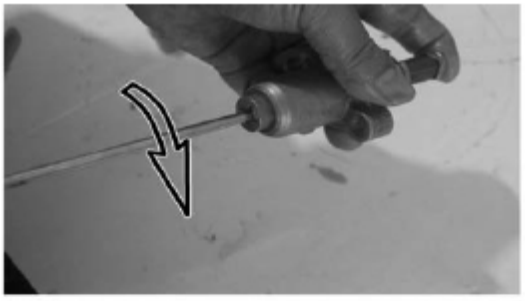
Note: When tightening the cylinder head cover bolts, the piston must be at top dead center on the compression stroke.

Gasket Sealant Applying Place



Chain Tensioner

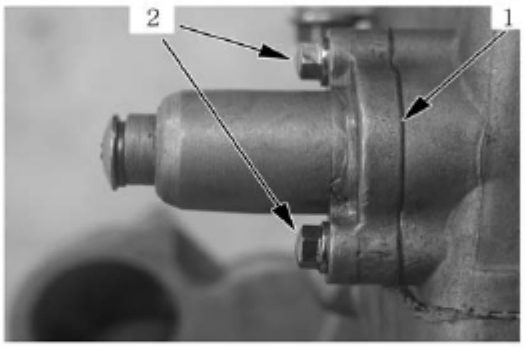
Insert (--) screwdriver into slotted end of chain tension adjuster, turn it clockwise to lock the tensioner spring;



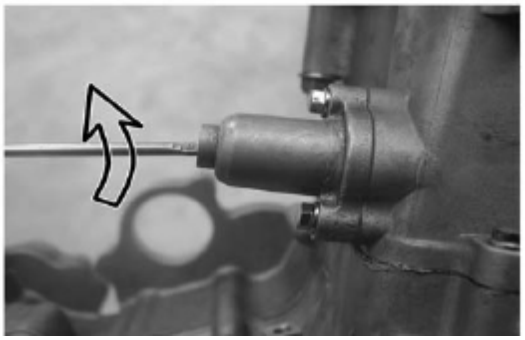
Install the chain tensioner and the new washer 1;

Install the bolt 2, tighten it to the specified torque;

Chain tensioner bolt tightening torque: 10 N·m

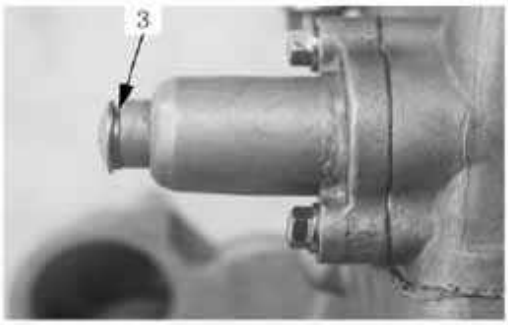


After chain tensioner is installed, turn the (--) screwdriver counter clockwise. The tensioner rod will be advanced under spring force and push tensioner against chain.



Install the new gasket 3;

Install chain tensioner screw, tighten it to the specifiedTorque



Chain tensioner screw tightening torque: 8 N·m

Valve Adjuster Cover

Refer to 11-3 for valve clearance;

Use new rubber gasket and apply grease;

Install Valve Inspection Cap

Install valve inspection cap bolt;

Spark Plug

Install spark plug with special tool and tighten to the specified torque;

Note: To avoid damage to the cylinder head thread, screw in the spark plug with hand first, then tighten it to the specified torque with spark plug wrench.

Spark plug tightening torque: 18N.m
Tool: Spark Plug Wrench

Engine Periphery

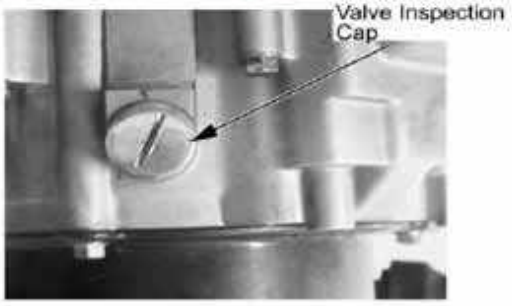
Left Side Cover

Install left side cover

Install the bolts

Valve Inspection Cap

Install valve inspection cap



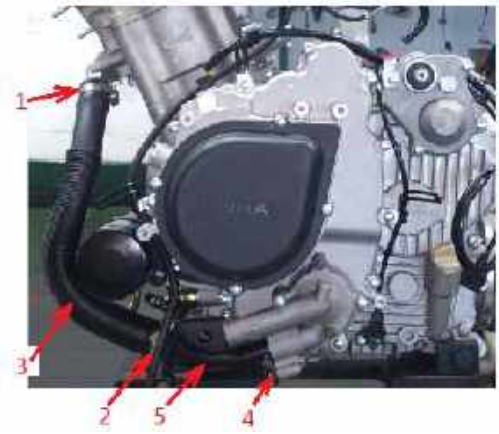
Water Pipe and Hose

Install water hose 5

Install bolt 4

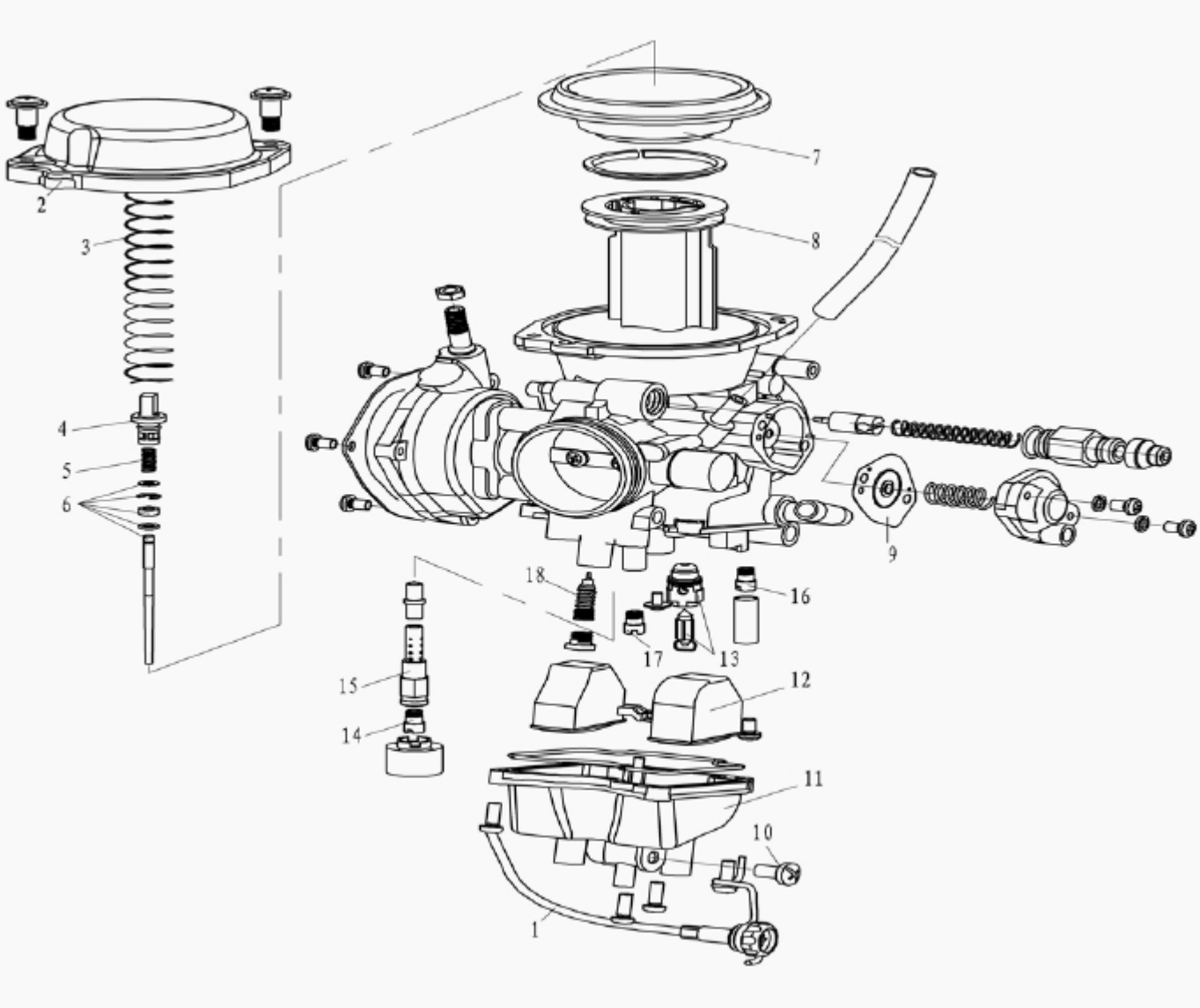
Install water hose 3

Install clamp 1 and 2



3.6. Carburetor

1. Carburetor Removal



Disassemble the carburetor in the following serial number:

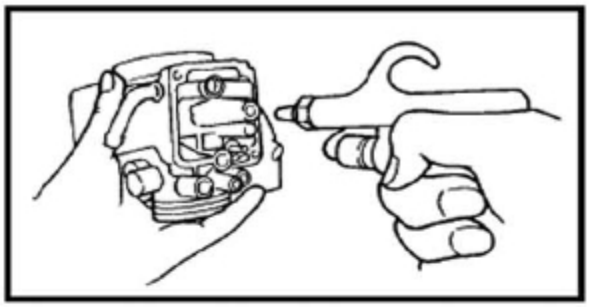
Serial No.	Description	Qty.	Serial No.	Description	Qty.
1	Idle Adjust Shaft	1	10	Drain Screw	1
2	Vacuum Chamber Cover	1	11	Float Chamber	1
3	Spring	1	12	Float	1
4	Jet Needle Holder	1	13	Needle Valve Set	1
5	Spring	1	14	Main Jet (MJ)	1
6	Jet Needle Set	1	15	Needle Jet (NJ)	1
7	Vacuum Diaphragm	1	16	Pilot Jet (PJ)	1
8	Piston Valve	1	17	Starter Jet (GS)	1
9	Enriching Diaphragm	1	18	Pilot Air Jet (PAJ)	1

2. Inspection

Check carburetor body for cracks or damage.

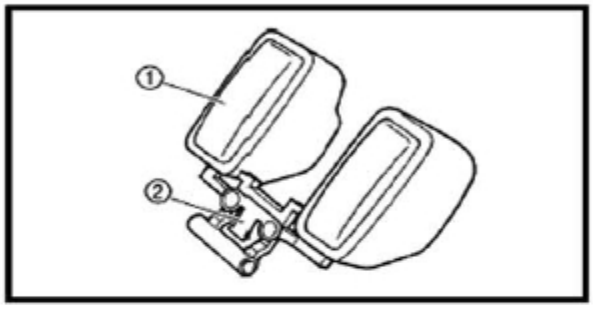
Cracks or damage:→ Replace

Check carburetor float chamber, fuel passage for dirt or clog. Clean these parts.



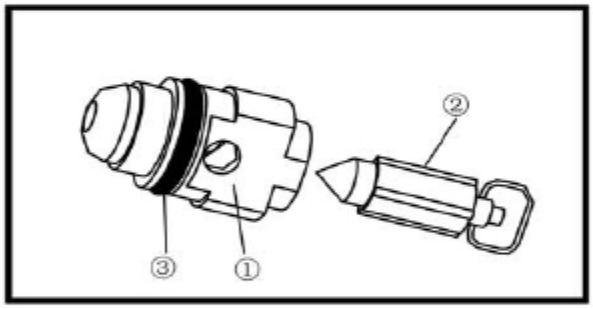
Check float①, float tang ② for damage.

Damage: → Replace



Check valve seat①, needle valve②, O-ring③ for damage, abnormal wear or dirt.

Damage or wear or dirty: → Replace



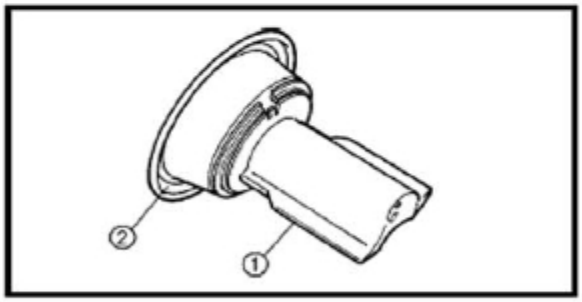
Note: Valve set①, needle valve② should be replaced as a set.

Check piston valve① for scratches, abnormal wear or damage.

Scratches, wear or damage: → Replace

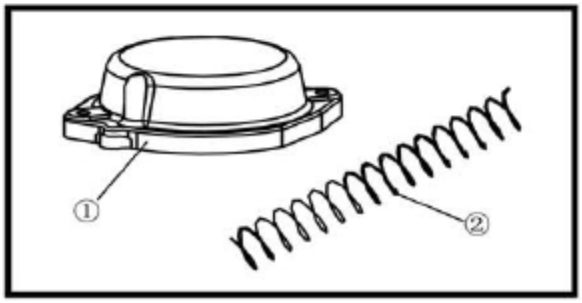
Check diaphragm② for tears.

Tears: → Replace



Check vacuum chamber cover①, spring② for damage or cracks.

Damage or cracks: → Replace

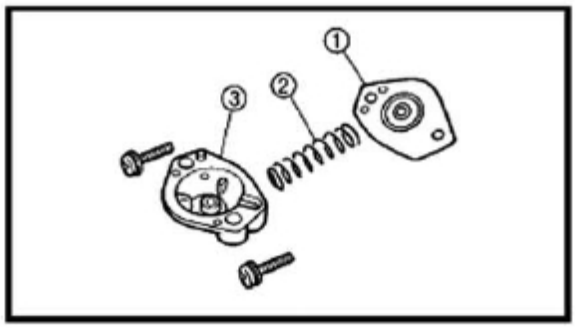


Check the diaphragm ① for tears;

Tears: → Replace

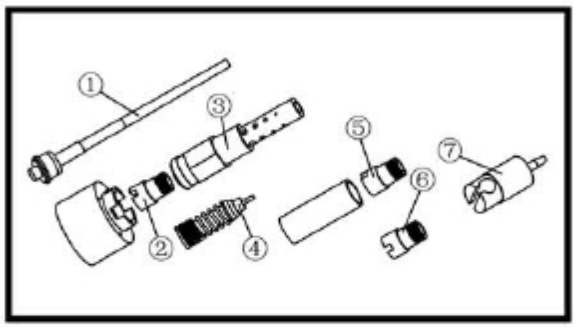
Check the spring ②,cover ③ for damage and tears;

Damage or tears: → Replace

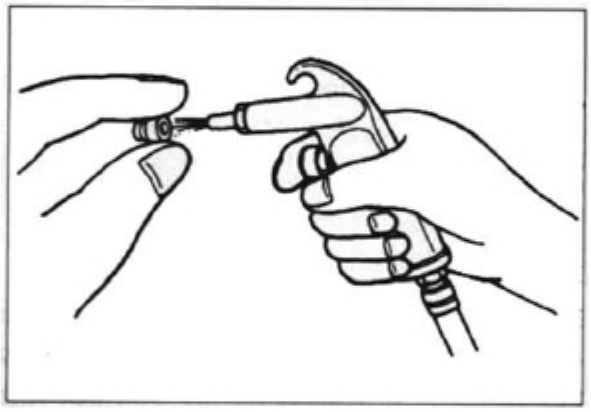


Check the jet needle①, mail jet②, needle jet③, pilot air jet④, pilot jet⑤, starter jet⑥ and starter plunger⑦ for wear and bends;

Wear or bends: → Replace

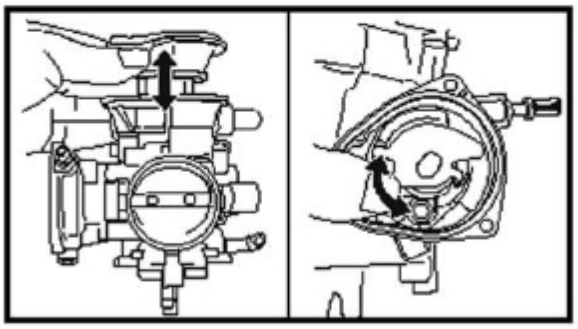


Check above jets for clog. Blow out the jets with compressed air.



Insert piston valve into carburetor body and check the free movement;

Check free movement of throttle valve. Replace with a new one if it's stuck;

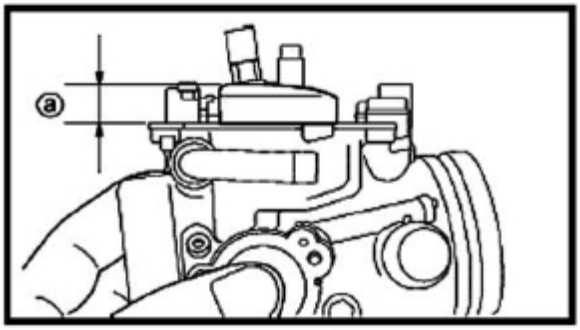


3. Measurement and Adjustment

Keep the carburetor in a upside down position. Measure distance "a" from the mating surface of float chamber (without gasket) to the top of float.

Note: The float arm should rest on the needle valve. Do not compress the needle valve.

Float Height: 10±1mm

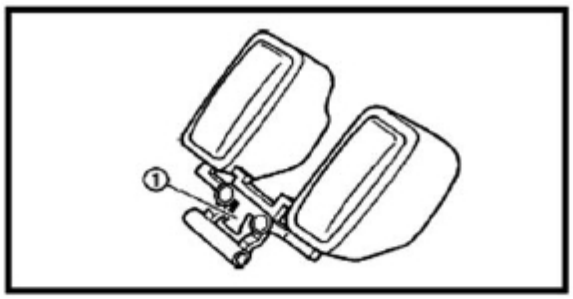


If float height is not within the specification, check the valve seat and needle valve;

If either of valve seat or needle valve is worn, replace both;

If both are fine, adjust float height by bending the float tang ①on the float;

Measure float height again till it's within the specification

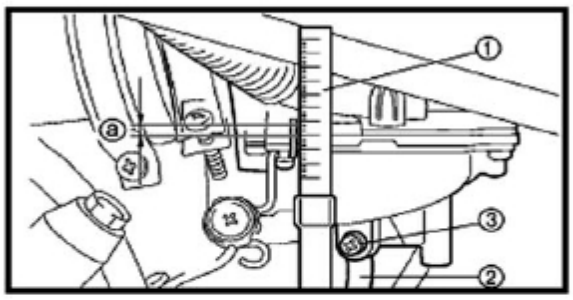


Fuel Level

Place carburetor on a level surface. Connect fuel level gauge① with drain pipe②;

Tool: Fuel Level Gauge
Loosen drain screw ③

Keep fuel level gauge vertical next to the float chamber line and read the fuel level "a"



Fuel Level: 3.5±0.5mm

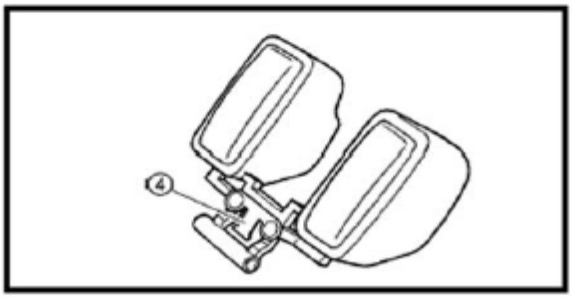
If the fuel level is not within the specification, adjust the fuel level;

Remove carburetor

Check valve seat and needle valve

If either of valve seat or needle valve is worn, replace both;

If both are fine, adjust float height by bending the float tang ①on the float;



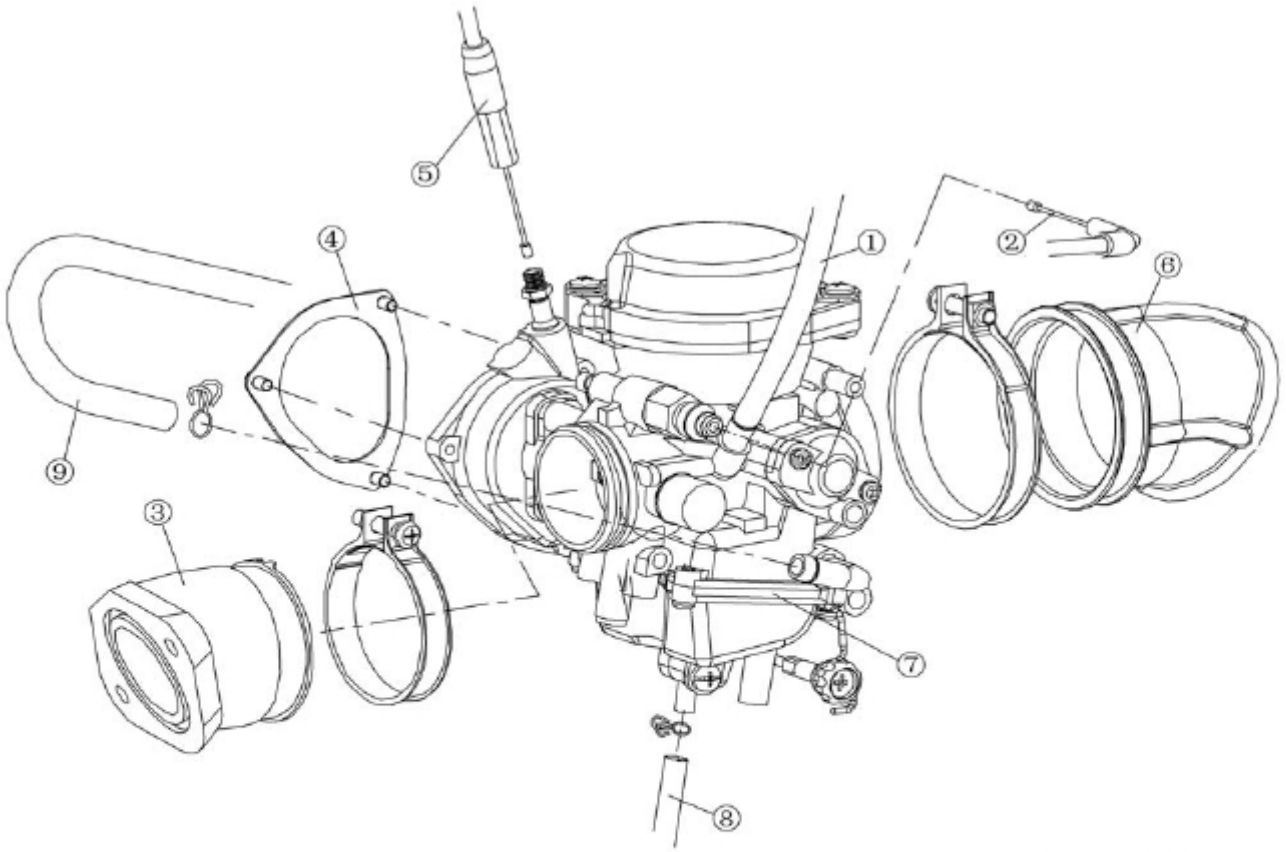
Install carburetor

Check again the fuel level

Carburetor Assembly

Reverse the disassembly procedure for assembly

Carburetor Installation
①-vacuum breather hose ②-starter cable ③-carburetor joint (engine intake manifold))
④-throttle valve cover ⑤-throttle cable ⑥-Carburetor joint (air filter) ⑦-carburetor
⑧-drain hose ⑨-fuel inlet hose



Note: Align the installation mark of carburetor and carburetor joint

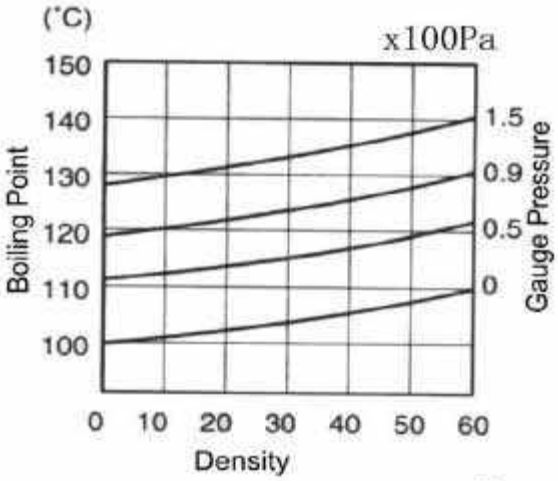
6. Carburetor Parameters

Type		MIKUNI BSR36-129
Aperture No.		07G0
Throat size	(mm)	36mm
Pilot	(r/min)	1400 r/min±100 r/min
Float height	(mm)	10±1
Fuel level	(mm)	3.5±0.5
Main jet	(MJ)	N102221-137.5#
Main air jet	(MAJ)	MD13/24-35#
Jet needle	(JN)	J8-5DH77
Needle jet	(NJ)	785-401011-P-OM
Pilot jet	(PJ)	N224103-22.5#
Pilot screw	(PS)	604-16013-1A
Pilot air jet1	(PAJ1)	MD13/24-65#
Pilot air jet2	(PAJ2)	N211100-165#

3.7. Cooling and Lubrication System

Engine Coolant

The coolant used in cooling system is a 100% ethylene glycol antifreeze.



Warning !

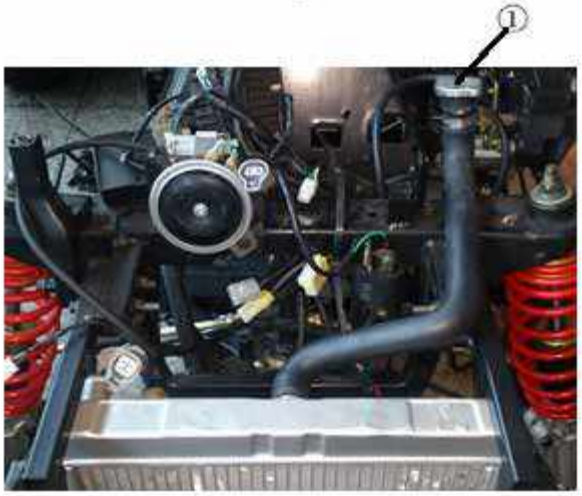
DO NOT open radiator cap when the engine is still hot. Or you may be injured by scalding fluid or steam;

Coolant is harmful. DO NOT swallow or stain your skin or eyes with coolant. In case of accidental swallow or stains, flush with plenty of water and consult the doctor immediately.

Keep coolant away from reach of children.

Inspection of Cooling Circuit

Remove radiator cap① and connect tester ② to filler.

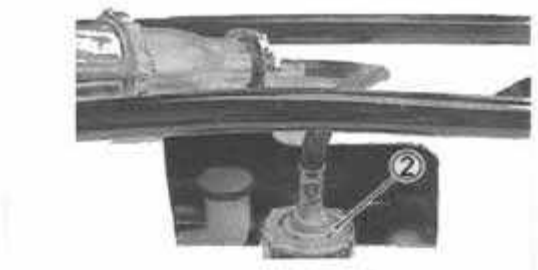


Warning!

Do not open the radiator cap when the engine is still hot.

Give a pressure of 120 kPa and check if the cooling system can hold this pressure for 10 seconds.

If the pressure drops during this 10 seconds, it indicates that the there is leakage with the cooling system. In this case, check the complete system and replace the leaking parts or components.



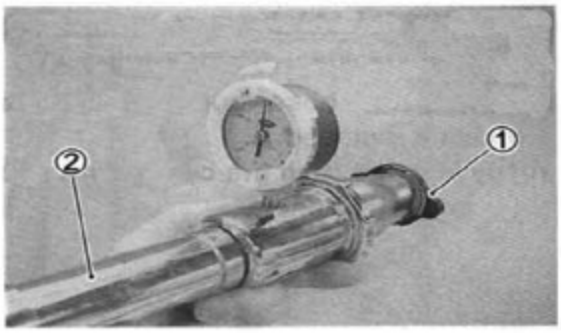
Warning!

When removing the radiator cap tester, put a rag on the filler to prevent splash of coolant.

Warning!

Do not allow a pressure to exceed the radiator cap release pressure.

Inspection and Cleaning of Radiator and Water Hoses

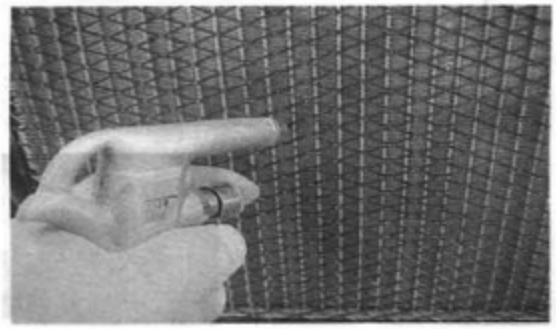


Radiator Cap

Remove radiator cap①
Install radiator cap to cap tester②

Slowly increase pressure to 110-140 kPa and check if the cap can hold the pressure for at least 10 seconds.

If the cap cannot meet the pressure requirement, replace it.

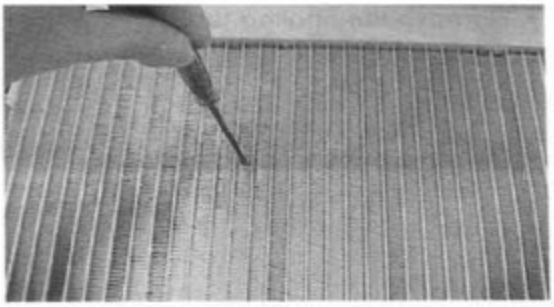


Radiator Cap Valve Opening Pressure:
Standard: 110-140 kPa
Tool: Radiator Cap Tester

Radiator Inspection and Cleaning

Remove dirt or trash from radiator with compressed air;

Correct the radiator fins with a small screwdriver;

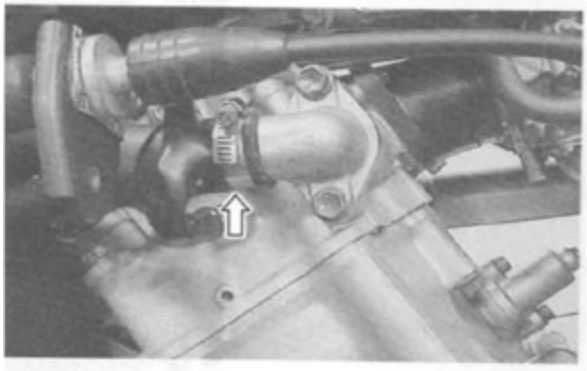


Radiator Hose Inspection

Check radiator hoses for leakage or damage.

Leakage or Damage: → Replace

Check tightening of clamps. Replace the clamps if necessary;



After inspection and cleaning of radiator and hoses, check coolant level. Fill coolant if necessary.

Inspection of Fan Motor

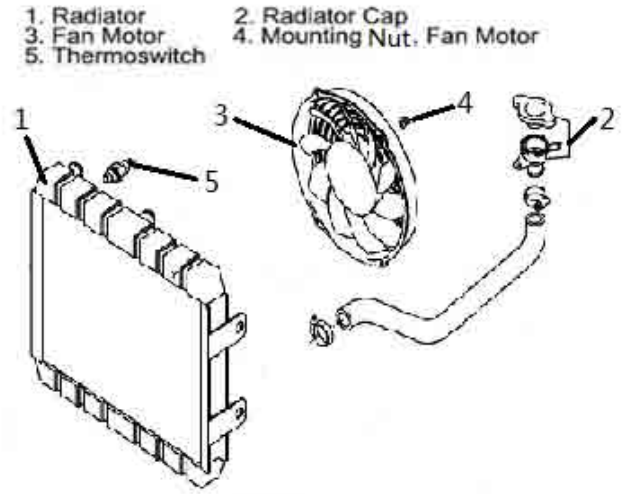
Remove fan motor from radiator

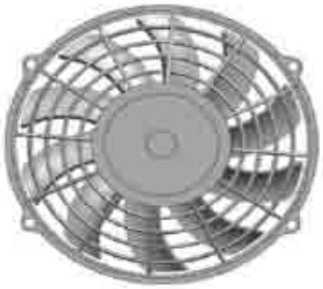
Turn the vanes and check if they can turn smoothly;

Check fan motor: Make sure that the battery applies 12 volts to the motor and the motor will run at full speed while the ammeter shall indicate the ampere not more than 5A.
If the motor does not run or the ampere exceeds the limit, replace the motor.

Installation: Apply a little thread locker to the bolts and tighten to the specified torque.

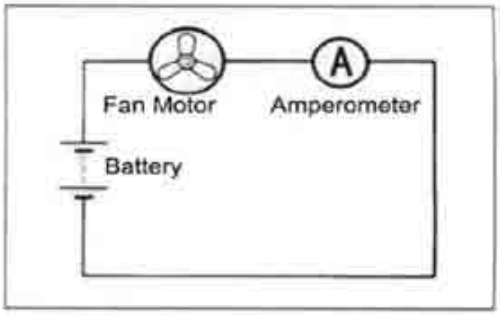
Fan Motor Bolt Tightening Torque: 10N.m



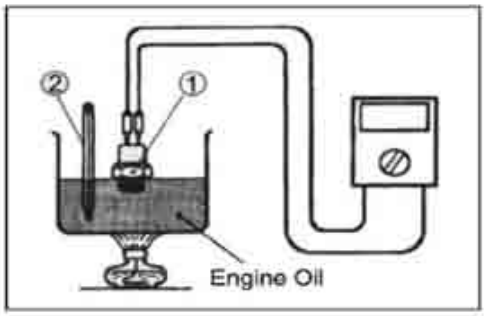


Inspection of Thermoswitch

Remove thermoswitch
Check the thermoswitch for closing or opening by testing it at the bench as illustrated. Connect the thermoswitch① to the circuit tester, place it in a vessel with engine oil. Place the vessel above a stove.
Heat the oil to raise the temperature slowly and take the reading from thermometer ② when the thermoswitch closes and opens.



Tool: ammeter
Thermoswitch Operating Temperature
Standard: (OFF-ON): Approx. 88℃
(ON-OFF): Approx. 82℃



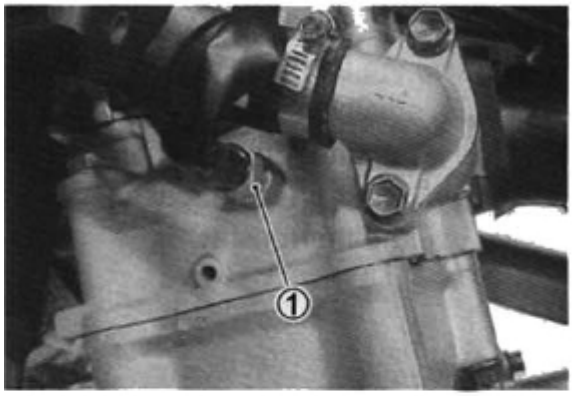
Note:
Avoid sharp impact on thermoswitch.
Avoid contact of thermoswitch with thermometer or vessel

Installation: Use a new O-ring③ and tighten the thermoswitch to the specified torque:

Thermoswitch Tightening Torque: 17N.m

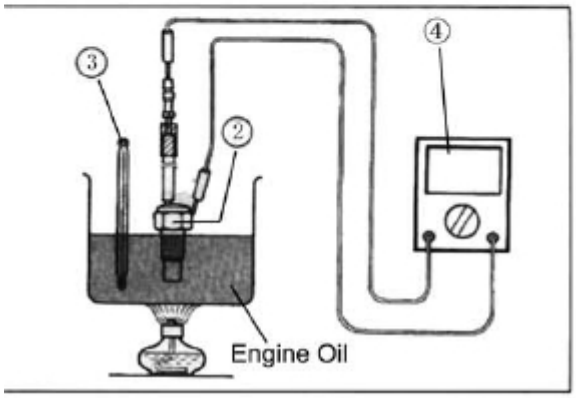
Check coolant level after installation of thermoswitch. Fill coolant if necessary.

Inspection of Water Temperature Sensor



Place a rag under water temperature sensor① and remove it from cylinder head.

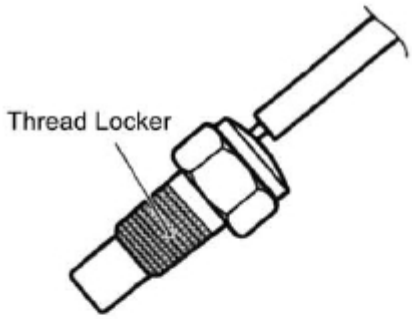
Check the resistance of water temperature sensor as illustrated on the right. Connect the temperature sensor② to the circuit tester, place it in a vessel with engine oil. Place the vessel above a stove. Heat the oil to raise the temperature slowly and take the reading from thermometer ③ and ohmmeter ④ .



Water Temperature and Resistance

Temperature(℃)	50	80	100	120
Resistance(Ω)	154±16	52±4	27±3	16±2

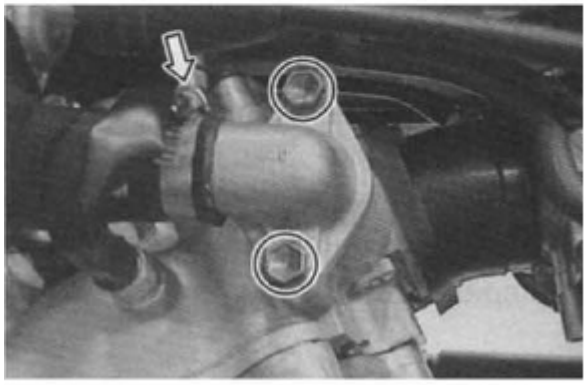
Installation: Apply a little thread locker and install it to the cylinder head by tightening to the specified torque.



Water Temperature Sensor
Tightening Torque: 10N.m

Note:
Avoid sharp impact on temperature sensor
Avoid contact of temperature sensor with thermometer or vessel

After installation, check the coolant level. Fill coolant if necessary.



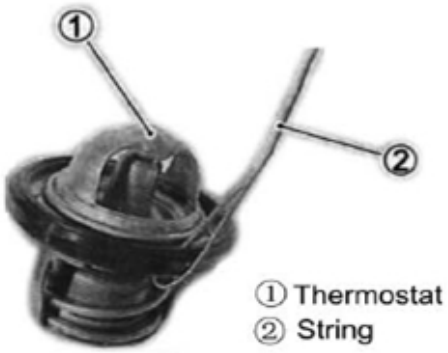
Inspection of Thermostat

Remove thermostat case

Remove thermostat

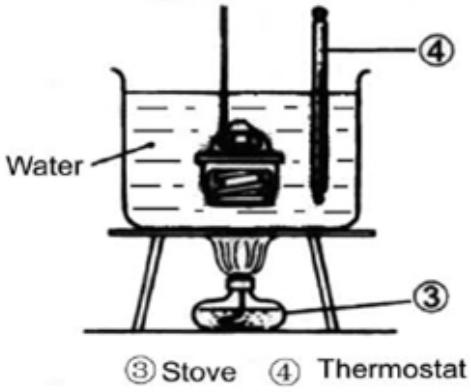
Check thermostat pellet for cracks
Test the thermostat in the following steps:

Pass a string between thermostat flange as illustrated on the right;
Immerse the thermostat in a beaker with water. Make sure that the thermostat is in the suspended position without contact to the vessel. Heat the water by placing the beaker above a stove and observe the temperature rise on a thermometer;
Take the temperature reading from thermometer when the thermostat valve opens.

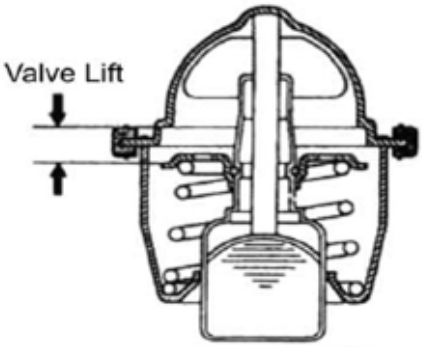


Thermostat Valve Opening Temperature: 68-74℃

Keep heating the water to raise the water temperature.



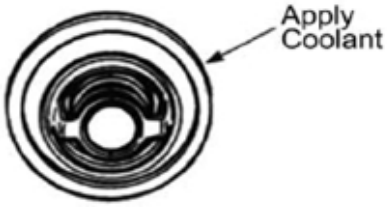
Just when the water temperature reaches the specified value, the thermostat valve should have been lifted by 3.5-4.5mm



Installation:

Reverse the removal procedure for installation.

Apply coolant to the rubber seal of thermostat.



Install thermostat case. Tighten to the specified torque:

Tightening Torque: 10N.m

Water Pump

Removal and Disassembly

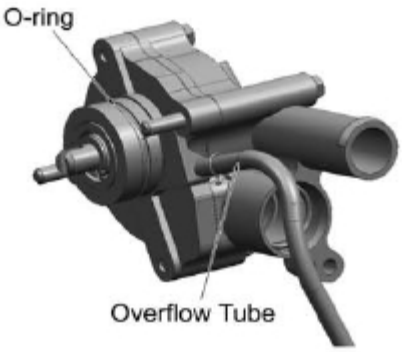
Drain coolant (→11-10)

Note: Before draining coolant, check water pump for oil or coolant leakage. In case of oil leakage, check the water pump oil seal, O-ring. In case of coolant leakage, check the water seal.

Remove clamps and water hoses

Release bolts and remove water pump

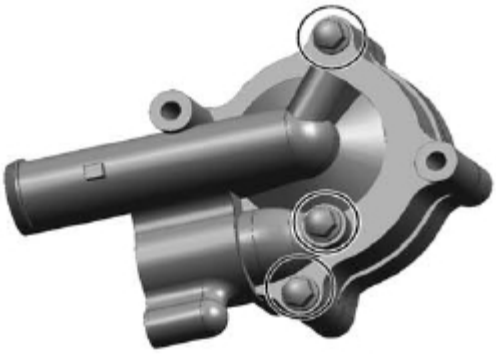
Remove O-ring



Note: Do not reuse the O-ring.

Remove the overflow tube

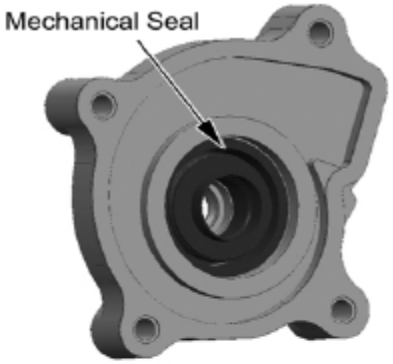
Release water pump cover screws, water pump cover and gasket



Remove E-ring and impeller

Remove seal ring ①and rubber seal②

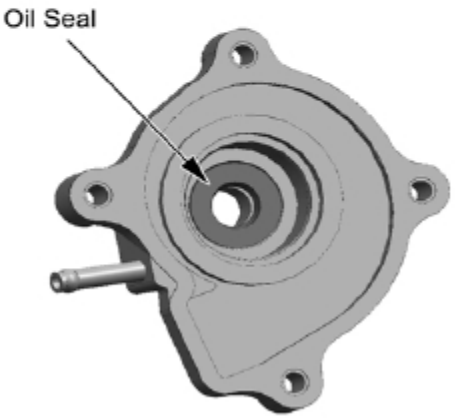
Remove mechanical seal with special tool



Note: The mechanical seal does not need to be removed if there is no abnormal condition.
Note: Do not reuse a removed mechanical seal

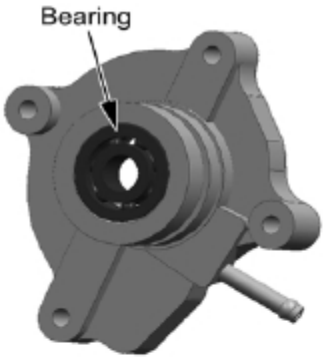
Put a rag on the water pump body

Remove oil seal.



Note: The oil seal does not need to be removed if there is no abnormal condition
Note: Do not reuse a removed oil seal

Remove bearing with special tool.

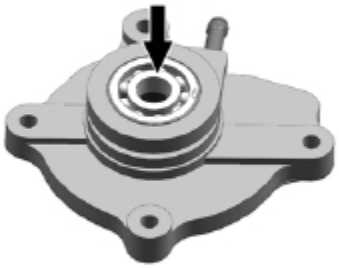


Note: The bearing does not need to be removed if there is no abnormal noise.
Note: Do not reuse a removed bearing.

Inspection of Water Pump

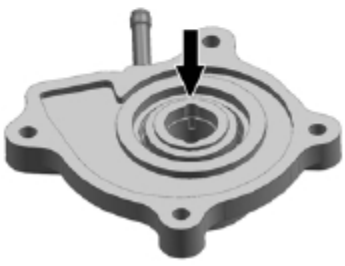
Bearing

Check the play of bearing by hand while it is still in the water pump body;
Turn inner race of bearing to check for abnormal noise and smooth rotation;
Replace the bearing if there is abnormal condition;



Mechanical Seal

Check mechanical seal for damage, pay special attention to the seal face;
In case of leakage or damage, replace the mechanical seal. If necessary, also replace the seal ring.



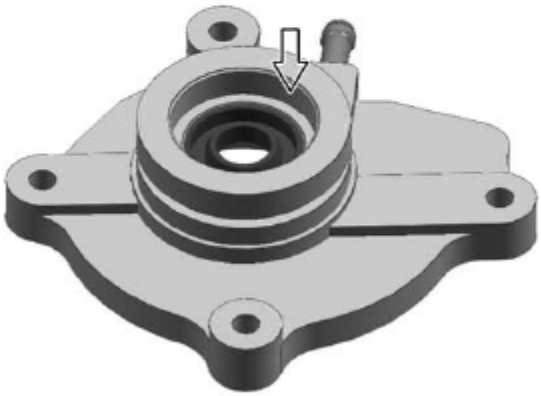
Oil Seal

Check oil seal for damage. Pay special attention to the oil seal lip;

In case of damage or leakage, replace the oil seal;

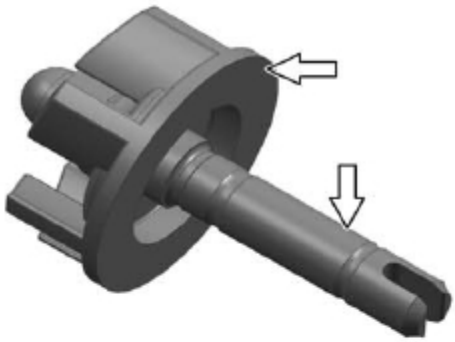
Water Pump Body

Check the mating mace of water pump body with bearing and mechanical seal.
Damage: →Replace



Impeller

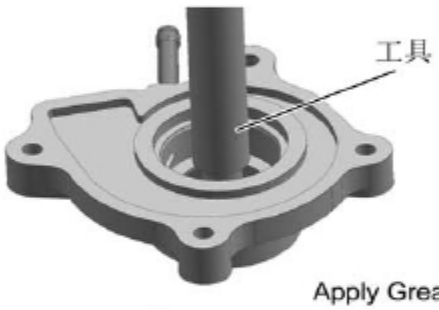
Check the impeller and shaft for damage.
Damage: →Replace



Assembly and Installation of Water Pump

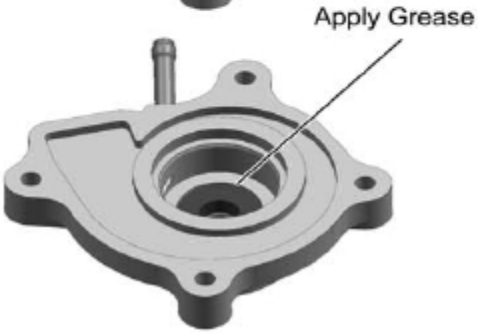
Install oil seal with special tool;

Tool: Oil Seal Installer



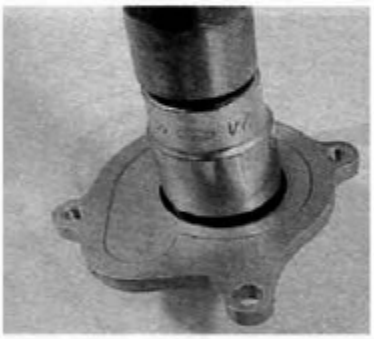
Note: The stamped mark on the oil seal faces outside

Apply a little grease to the oil seal lip.



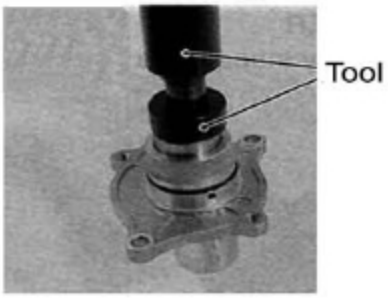
Install mechanical seal with a suitable socket wrench

Note: Apply sealant to side "A" of mechanical seal



Install bearing with special tool

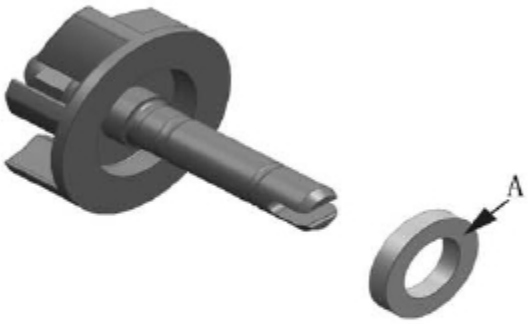
Tool: Bearing Installer



Note: The stamped mark on the bearing faces outside.

Install seal ring to impeller

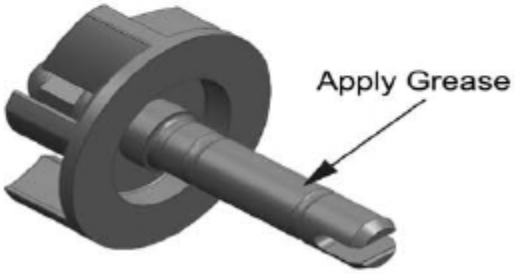
Clean off the oil and grease from mechanical seal and install it into the impeller.



Note: "A" side of mechanical seal faces impeller

Apply grease to impeller shaft

Install impeller shaft to water pump body.

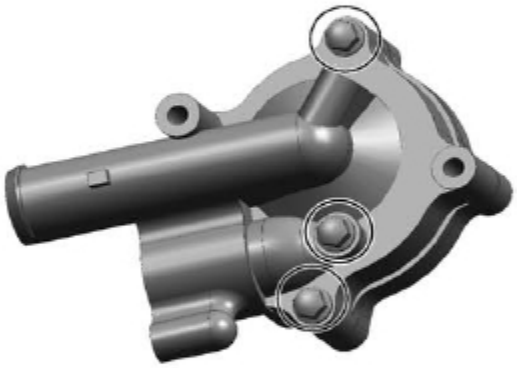


Install E-ring to water pump shaft;

Install new gasket to water pump body;

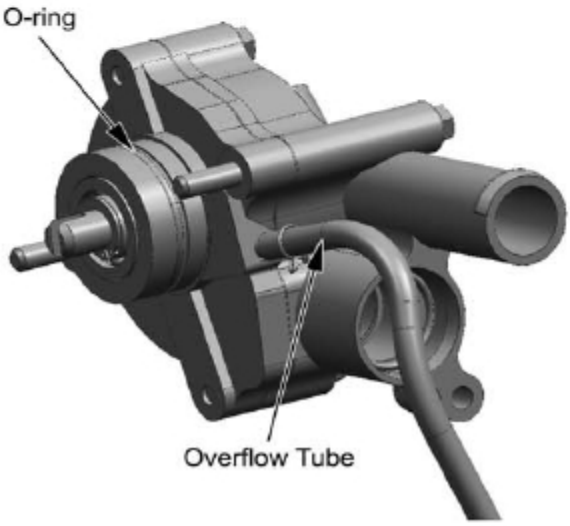
Install water pump cover and tighten the bolts and bleed bolt.

Water Pump Cover Bolts Tightening Torque: 6N.m



Check impeller for smooth turning.

Install the new O-ring



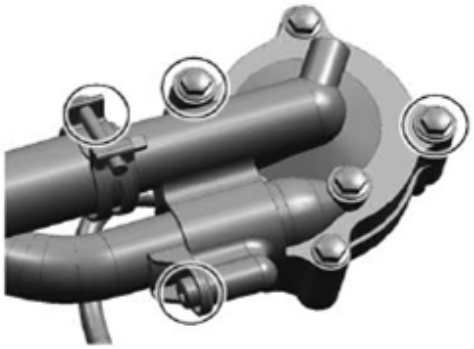
Note:

Use the new O-ring to prevent oil leakage;

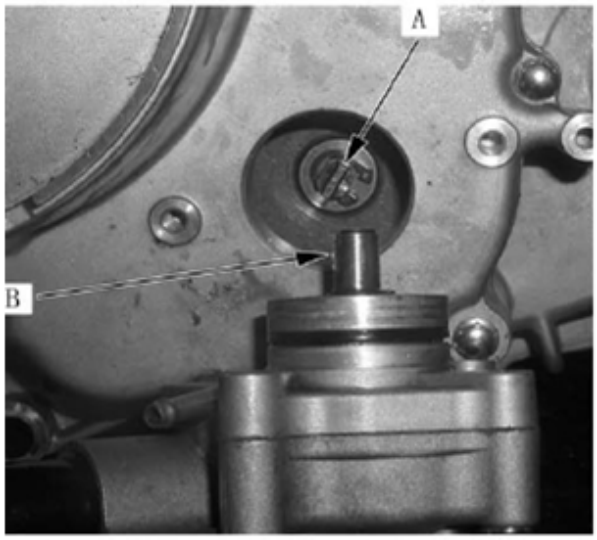
Apply grease to O-ring

Install water pump and tighten the bolts to the specified torque;

Water pump bolts tightening torque: 10N.m



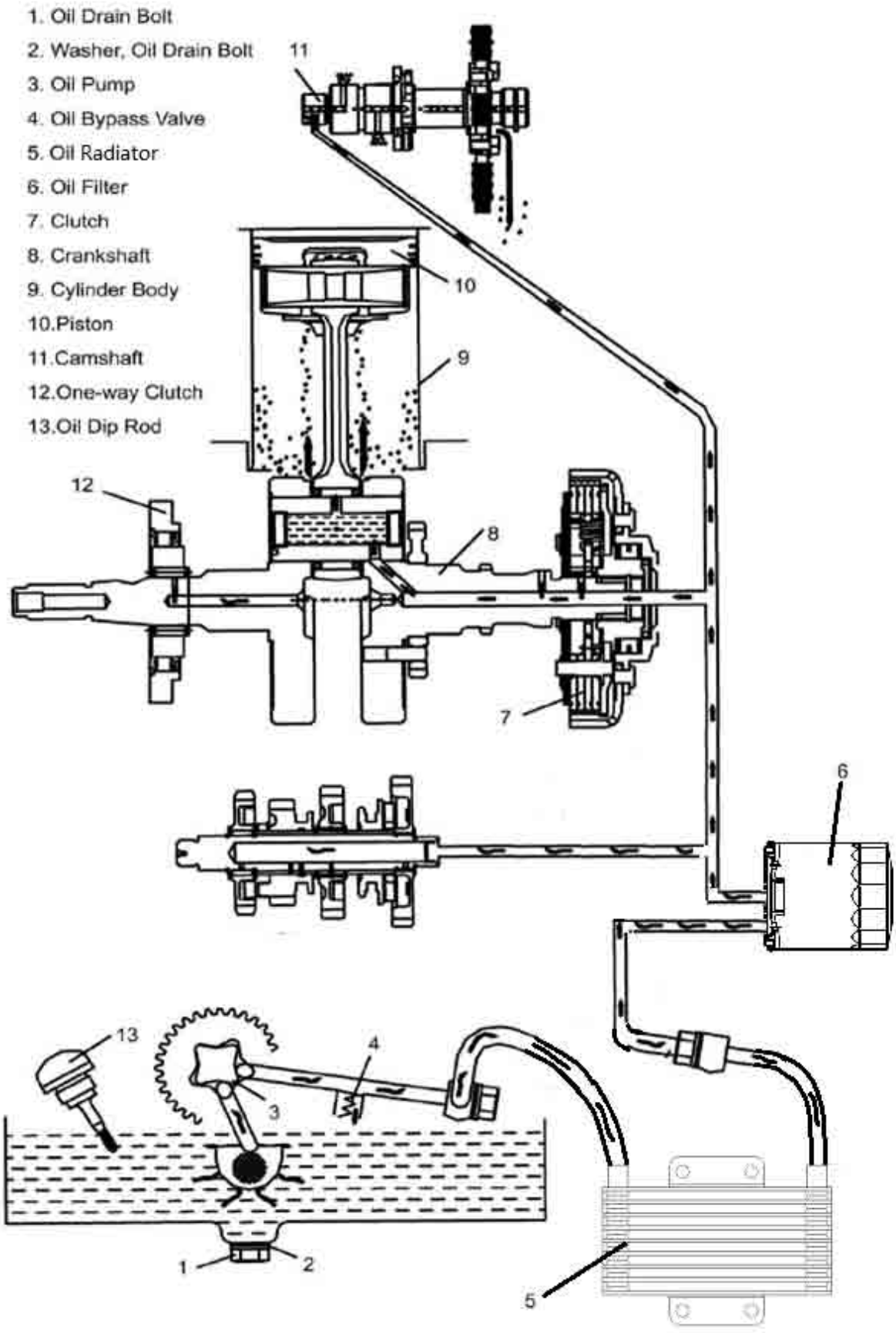
Note: Set the water pump shaft slot end “B” to oil pump shaft flat side “A”.



Connect water hoses

Add coolant

Illustration of Engine Lubrication System



1. Engine

Complaint	Symptom and Possible Causes	Remedy
Engine will not start of is hard to start	**Compression is Too Low**	
	1. Worn cylinder	Replace
	2. Worn piston ring	Replace
	3. Leakage with cylinder gasket	Replace
	Wear valve guide or improper valve seating	Repair or Replace
	4. Loose spark plug	Tighten
	5. Slow cranking of starting motor	Check electrical part
	6. Faulty valve timing	Adjust
	7. Improper valve clearance	Adjust
	No Sparking from Spark Plug	
	1. Fouled spark plug	Clean or Replace
	2. Wet spark plug	Clean and dry or replace
	3. Defective ignition coil	Replace
	4. Open or short circuit with pickup coil	Replace
	5. Faulty generator	Replace
	6. Faulty CDI	Replace
	No Fuel Reach Into Carburetor	
	1. Clogged fuel tank vent tube	Clean or Replace
	2. Clogged or faulty fuel valve	Clean or Replace
	3. Faulty carburetor needle valve	Replace
	4. Clogged fuel hose	Replace
	5. Clogged fuel filter	Clean or Replace
	Transfer is not in Neutral position	Set to Neutral position
Engine stalls easily or has unstable idle speed	1. Improper valve clearance	Adjust
	2. Improper valve seating	Replace or Correct
	3. Faulty valve guide	Replace
	4. Worn rocker arm or rocker arm shaft	Replace
	5. Fouled spark plug	Replace
	6. Improper spark plug gap	Replace or Adjust
	7. Faulty ignition coil	Replace
	8. Faulty CDI	Replace
	9. Faulty generator	Replace
	10. Improper fuel level in float chamber	Adjust Fuel level
	11. Clogged carburetor jet	Clean
	12. Faulty fuel valve	Replace
	13. Improper adjustment or idle screw	Adjust

3.8. Troubleshooting

Complaint	Symptom and Possible Causes	Remedy
Poor engine running in high-speed range.	1. Week valve spring	Replace
	2. Worn camshaft	Replace
	3. Fouled spark plug	Clean or replace
	4. Insufficient spark plug gap	Adjust or replace
	5. Improper valve timing	Replace
	6. Faulty ignition coil	Adjust float chamber fuel level
	7. Low fuel level in float chamber	Clean or replace
	8. Dirty air filter	Clean
	9. Clogged fuel hose, resulting in poor fuel supply	Clean
	10. Clogged fuel valve	Clean
Exhaust smoke is dirty or thick	1. Excessive engine oil	Check oil level and drain
	2. Worn piston ring	Replace
	3. Worn valve guide	Replace
	4. Scored or scuffed cylinder wall	Replace
	5. Worn valve stem	Replace
	6. Worn valve stem oil seal	Replace
Engine lacks power	1. Improper valve clearance	Adjust
	2. Weak valve spring	Adjust
	3. Improper valve timing	Adjust
	4. Worn cylinder	Replace
	5. Worn piston ring	Replace
	6. Improper valve seating	Replace or Correct
	7. Fouled spark plug	Clean or replace
	8. Improper spark plug gap	Clean or replace
	9. Clogged carburetor jet	Clean or replace
	10. Improper fuel level in fuel chamber	Adjust fuel level
	11. Dirty air filter	Clean or replace
	12. Worn rocker arm or rocker arm shaft	Replace
	13. Air leakage from air intake pipe	Tighten or replace
	14. Excessive engine oil	Check oil level and drain
Engine overheats	1. Carbon deposit on piston top	Clean
	2. Insufficient or excessive engine oil	Check level, add or drain
	3. Faulty oil pump	Replace
	4. Clogged oil passage	Clean
	5. Fuel level in float chamber is too low	Adjust fuel level
	6. Air leakage from air intake pipe	Tighten or replace
	7. Incorrect engine oil	Change engine oil
	8. Faulty cooling system (→16-5)	

Complaint	Symptom and Possible Causes	Remedy
Engine is noisy	**Valve Chatter**	
	1. Excessive valve clearance	Replace
	2. Worn or broken valve spring	Replace
	3. Worn rocker arm or camshaft	Replace
	Noise from Piston	
	1. Worn piston	Replace
	2. Worn cylinder	Replace
	3. Carbon deposit in combustion chamber	Clean
	4. Worn piston pin or pin hole	Replace
	5. Worn piston ring or piston ring groove	Replace
	Noise from Timing chain	
	1. Stretched chain	Replace chain & sprocket
	2. Worn sprocket wheel	Replace chain & sprocket
	3. Faulty chain tensioner	Repair or replace
	Noise from Clutch	
	1. Worn or damaged crankshaft spline	Replace crankshaft
	2. Worn inner race spline	Replace inner race
	Noise from Crankshaft	
	1. Rattling bearing	Replace
	2. Worn or burnt crank pin bearing	Replace
	3. Excessive thrust clearance	Replace
	Noise from CVT	
	1. Worn or slipping drive belt	Replace
	2. Worn rollers in primary sheave	Replace
	Noise from Transmission	
	1. Worn or damaged gear	Replace
	2. Worn or damaged input or output shafts	Replace
	3. Worn bearing	Replace
	4. Worn bushing	Replace
Slipping Clutch	1. Worn or damaged clutch shoes	Replace
	2. Weakened clutch shoe spring	Replace
	3. Worn clutch housing	Replace
	4. Worn or slipping drive belt	REplace

Complaint	Symptom and Possible Causes	Remedy
Difficulty or locked gearshift	1. Broken drive or driven bevel gear teeth 2. Distorted shift fork 3. Worn shift cam 4. Improper gearshift rod	Replace Replace Replace Adjust

2. Carburetor

Complaint	Symptom and Possible Causes	Remedy
Starting Difficulty	1. Clogged starter jet 2. Clogged starter jet passage 3. Air leakage from joint between starter body and carburetor 4. Faulty starting plunger	Clean Clean Clean, adjust or replace gasket Adjust
Idling or low-speed trouble	1. Clogged slow jet 2. Clogged slow jet passage 3. Clogged air intake 4. Clogged bypass port 5. Starter plunger not fully closed 6. Improper set of idle screw 7. Improper float height	Clean Clean Clean Clean Adjust Adjust Adjust
Medium or high speed trouble	1. Clogged main jet 2. Clogged main air jet 3. Clogged needle jet 4. Faulty throttle valve 5. Clogged fuel filter 6. Improper float height 7. Starter plunger not fully closed	Clean Clean Clean Adjust Clean Adjust Adjust
Overflow and fuel level fluctuation	1. Worn or damaged needle valve 2. Damaged needle valve spring 3. Improper working float 4. Foreign matter in needle valve	Replace Replace Adjust or Replace Clean

3. Cooling System/Radiator

Complaint	Symptom and Possible Causes	Remedy
Engine overheats	1. Clogged water passage or radiator	Clean
	2. Air in the cooling system; insufficient coolant	Discharge air and add coolant
	3. Faulty water pump	Check and replace
	4. Incorrect coolant	Replace
	5. Faulty thermostat	Replace
	6. Faulty fan motor or thermoswitch	Check and/or replace
Engine coolant overcools	1. Faulty thermoswitch	Replace
	2. Extremely cold weather	Put on radiator cover
	3. Faulty thermostat	Replace

4. Ignition System

Complaint	Symptom and Possible Causes	Remedy
No Sparking or Weak Sparking	1. Faulty CDI	Check and replace
	2. Faulty spark plug	Check and replace
	3. Faulty Generator	Check and replace
	4. Insufficient battery voltage	Check and replace
	5. Faulty ignition coil	Check and replace
	6. Faulty pickup coil	Check and replace

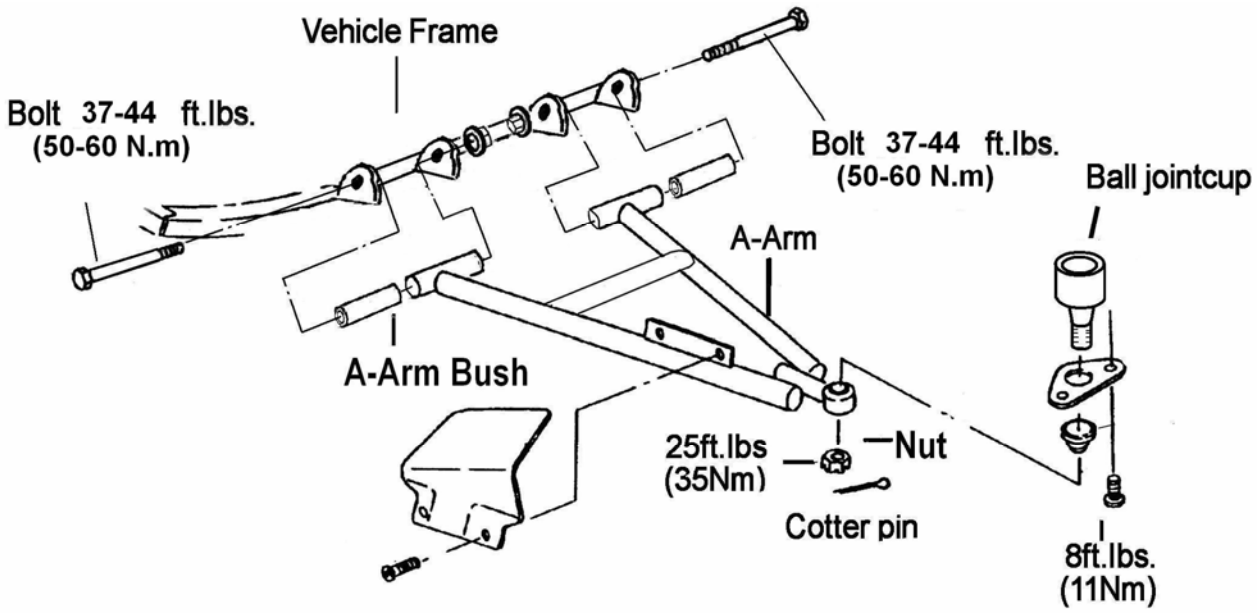
NOTES

CHAPTER 4 CHASSIS
ATV 500

WARNING
The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

4.1 A-RM REPLACEMENT (MacPherson)

MANTENANCE-FREE PIVOT DESIGN



1. Elevate and safely support vehicle
2. Remove cotter pin from ball joint cup at wheel end of A- arm and loosen nut until it is flush with end of cup.
3. Using a soft face hammer, tap nut to loosen A- arm from bolt. Remove nut and A-arm from hub strut assembly.
4. Loosen and remove two bolts on A-arm, and remove A-arm.
5. Examine bushing. Replace if worn or tore. Discard hardware.
6. Install new A-arm assembly onto vehicle frame. Install new bolts and new nuts. **NOTE.** Tighten the nuts only finger-tighten at this time. They will be tightened to the final torque after the front wheels are installed and the vehicle is on the ground.

WARNING

DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

7. Attach A-arm to strut assembly. Tighten ball joint nut to 25 ft. lbs. (35 Nm). If cotter pin holes are not aligned, tighten nut slightly to align. Install a new cotter pin with open ends toward rear of machine. Bend both ends in opposite directions around nut.
8. Install hubs, calipers and wheels, lower the vehicle to the ground. Apply Loctite™ 242 to screw threads of the A arm bolts and torque bolts to 37-44 ft. lbs. (50-60 Nm).

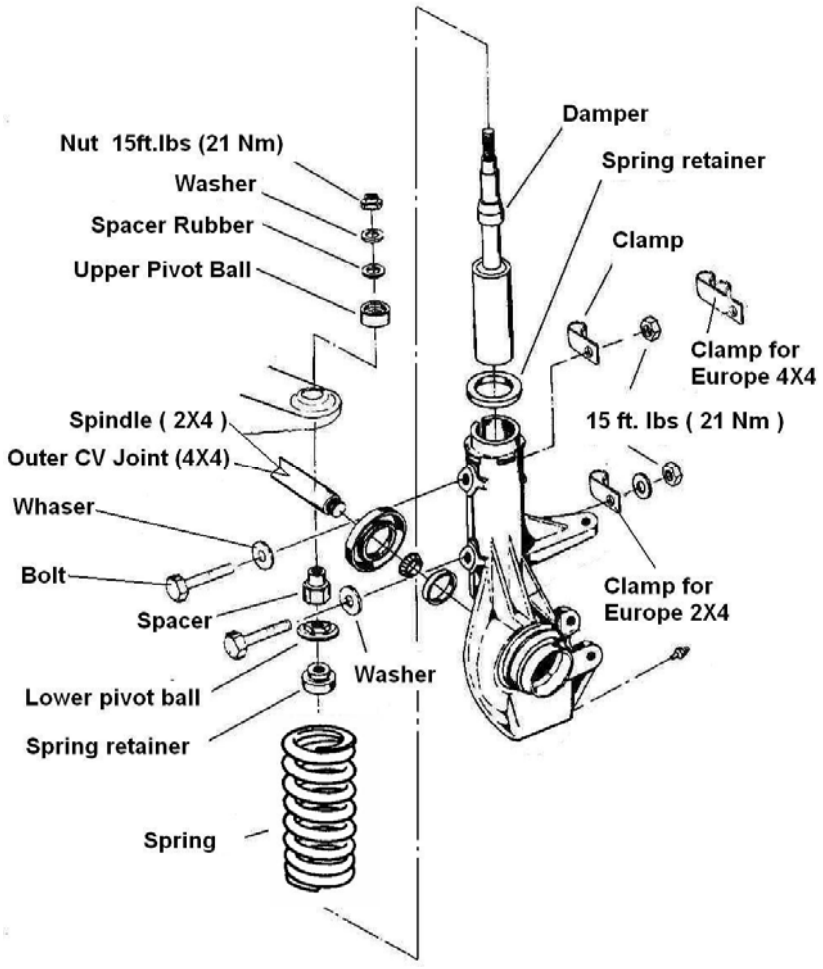
WARNING

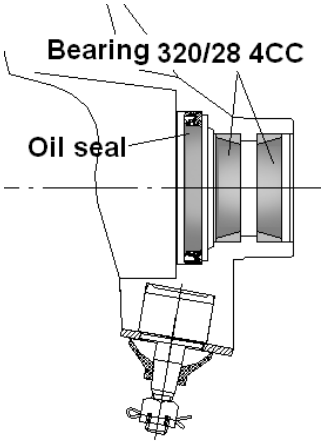
Upon A-arm installation completion, test vehicle at low speeds before putting into regular service.

4.3 FRONT STRUT REPLACEMENT ATV500

1. Hold strut rod with wrench and remove top nut
2. Compress spring.
3. Remove upper strut pivot assembly.
4. Remove coil spring and collapse strut body.
5. Remove two pinch bolts from strut body.
6. Remove strut body.
7. Install front shock cartridge until bottomed in strut casting.
8. Install pinch bolts with clamp(s).
   Torque pinch bolts to 15ft.lbs.(21Nm).
9. Reassemble spring and top pivot assembly. Be sure all parts are installed properly and seated fully.
10. Torque strut rod nut to specification. Do not over torque nut.

Strut Rod Nut Torque
15 ft. lbs. (21 Nm)





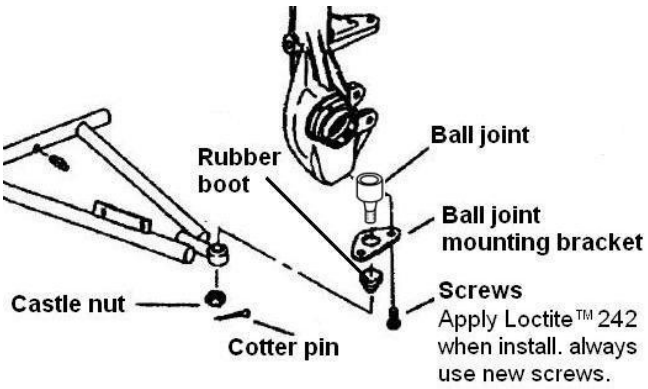
4.4 FRONT STRUT BALL JOINT REPLACEMENT ATV500

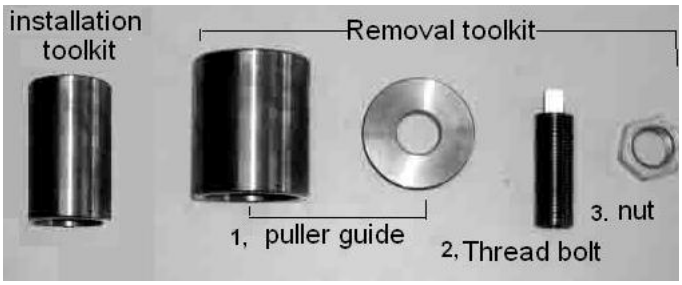
1. Loosen front wheel nuts.
2. Elevate and safely support ATV under footrest/frame area. .

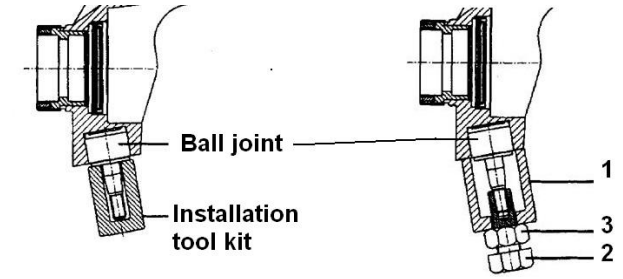
CAUTION: Serious injury may result if ATV tips or falls. Be sure ATV is secure before beginning this service procedure.

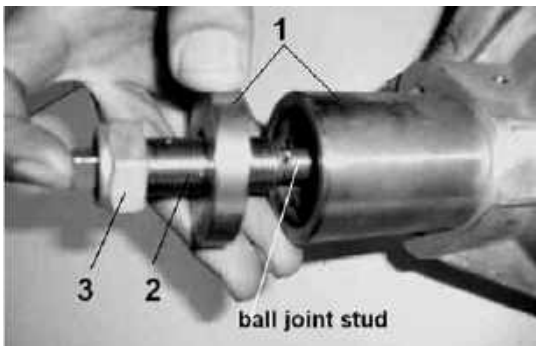
3. Remove wheel nuts and wheels.
4. Remove cotter pin from ball joint
5. Remove castle nut and separate A-arm from ball joint stud.
6. Remove screws and ball joint mounting bracket.
7. Using ball joint cup removal/installation toolkit, remove ball joint cup from strut housing. Refer to photos at right.
   - ●Install puller guide (1) .
   - ●Thread bolt (2) with nut (3) onto bal joint stud as shown .
   - ●Hold bolt (2) and turn nut (3) clockwise until ball joint is removed from strut housing.
8. To install new ball joint cup.
   - ●Insert new ball joint into driver (installation toolkit).
   - ●Drive new bal joint cup into strut housing until fully seated.
9. Apply Loctite 242 (blue) to threads of mounting bracket new screws.

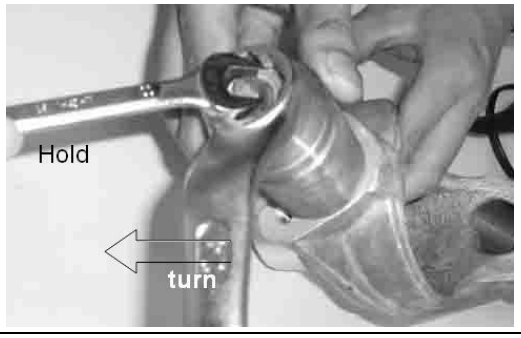
   Torque screw s to 8 ft.lbs. (11 Nm).
10. Install A- arm on bal joint cup and torque castle nut to 25 ft. lbs. (35 Nm).
11. Reinstall cotter pin with open ends toward rear of machine.



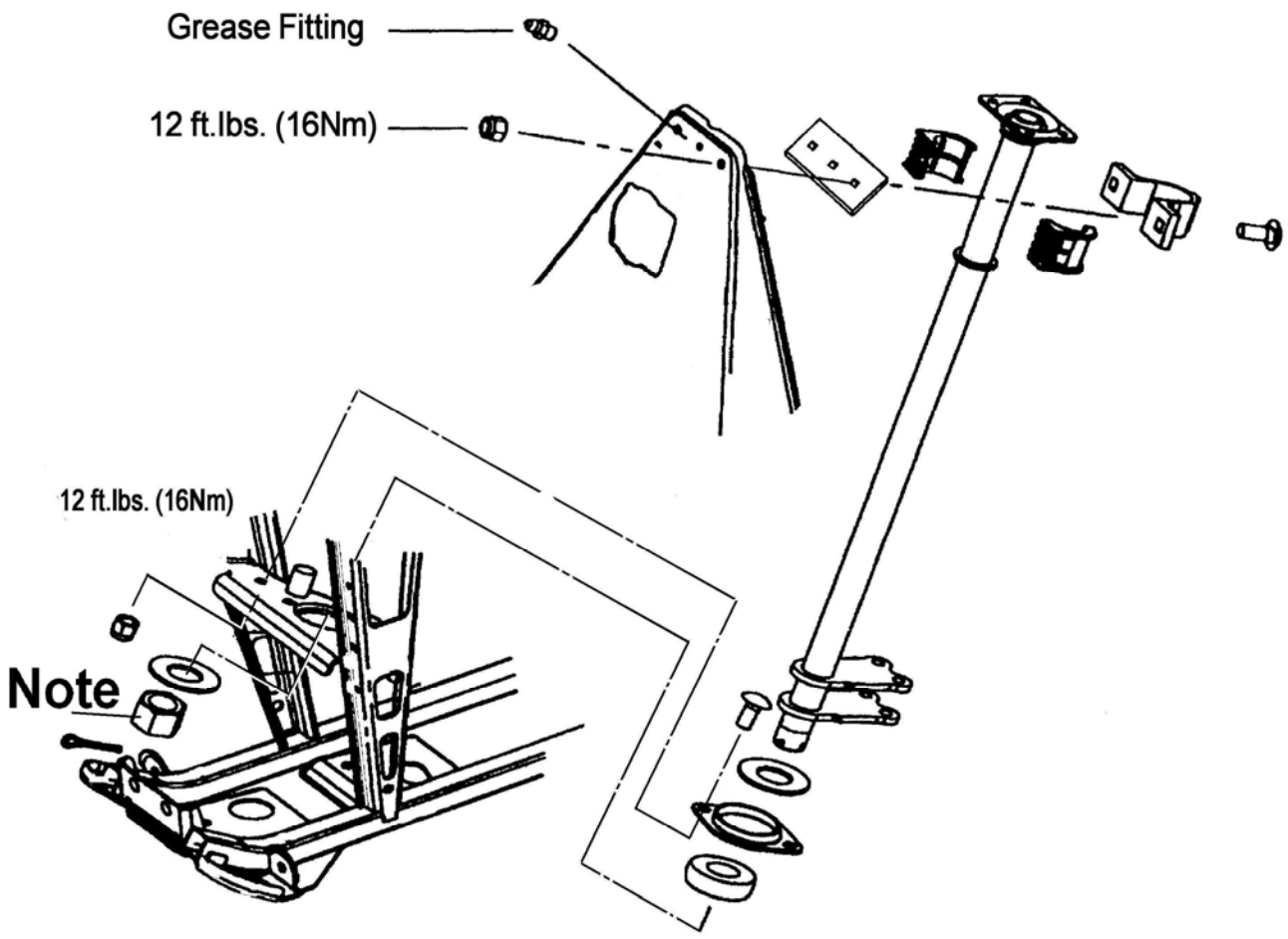








4.5 STEERING POST ASSEMBLY



Note:

1, Hand tighten the crown nut of the steering post.

2, Align cotter pin hole.

3, Install cotter pin. Bend both ends of cotter pin around nut in opposite directions.

4, Check steering, must move freely and easily from full left to full right without binding.

NOTES

CHAPTER 5 FINAL DRIVE

ATV500

WARNING
The parts of different types/ variants/ versions maybe un-interchangeable, even some parts have almost same appearance. Always refer to Parts Manual of each ATV model for spare parts information and service.

(PLEASE SEE CHARPTER 4B IN THIS MANUAL FOR THE WHEEL, HUB, AND DRIVE CHAIN OF MINE/ YOUTH ATV)

5.1 WHEEL, HUB, AND SPINDLE TORQUE TABLE

Item	Specification
Front Wheel Nuts	69 Ft.Lbs 96 N.m
Rear Wheel Nuts	69 Ft.Lbs 96 N.m
Front Hub Nut on Spindle/ outer CV joint	Refer to FRONT HUB INSTALLATION
Rear Hub Retaining Nut	101Ft.Lbs 137N.m

CAUTION: Locking nuts, and bolts with pre-applied locking agent should be replaced if removed. The self- locking properties of the nut or bolt are reduced or destroyed during removal.

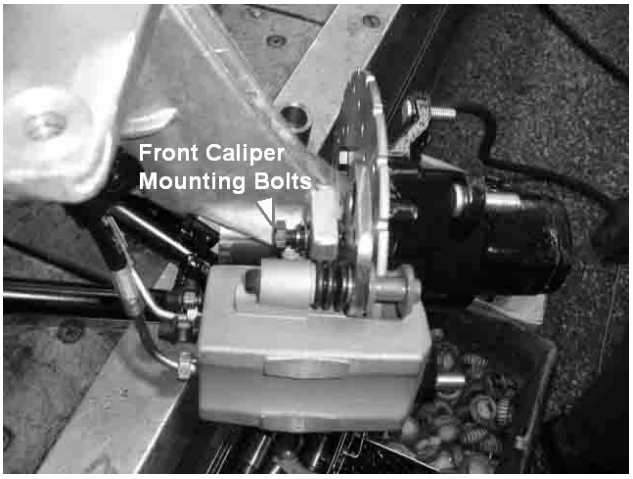
5.2 FRONT HUB DISASSEMBLY/INSPECTION

1. Elevate front end and safely support machine under footrest/frame area.

CAUTION

Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Wear eye protection when removing bearings and seals.

2. Check bearings for side play by grasping tire/wheel firmly and checking for movement. It should rotate smoothly without binding or rough spots.
3. Remove wheel nuts and wheel.
4. Remove brake caliper
5. Remove hub cap, cotter pin, front spindle nut, and washer.
6. Rotate each bearing by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion. Replace bearing if moisture, dirt, corrosion, or roughness is evident.



7. Place a shop towel on hub to protect surface. Carefully pry seal out of hub. Do not damage the surface of the seal. Clean the hub.
8. Drive bearing out through opposite side of hub and discard.
9. Drive other bearing out and discard.
10. Clean hub and spacer thoroughly.

5.2 FRONT HUB REMOVAL/INSPECTION 4x4(ATV500)

1. Elevate front end and safely support machine Under footrest/frame area.

CAUTION:

Serious injury may result if machine tips or falls, Be sure machine is secure before beginning this service procedure. Wear eye protection when removing bearings and seals.

2. Check bearings for side play by grasping the tire/Wheel firmly and checking for movement. Grasp The top and bottom of the tire. The tire should rotate smoothly without binding or rough spots.
3. Remove wheel nuts and wheel.
4. Remove the two brake caliper attaching bolts.

CAUTION:

Do not hang the caliper by the brake Line. Use wire to hang the caliper to prevent. Possible damage to the brake line.

5. Remove hub cap, cotter pin, front spindle nut, and Washer.

6. Rotate each bearing by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion, or roughness is evident.

5.3 b. FRONT HUB INSTALLATION 4X4 (ATV500)

1. Inspect the hub strut bearing surface for wear or damage.
2. Apply grease to drive axle spindle.
3. Install spindle through the backside of the hub strut. Install the hub onto the spindle.
4. Install spindle nut and tighten to specification.
5. Install a new cotter pin. Tighten nut slightly if necessary to align cotter pin holes.
6. Rotate wheel and check for smooth operation. Bend both ends of cotter pin around end of Spindle in different directions.
7. Install hub cap.
8. Rotate hub. It should rotate smoothly without binding or rough spots or side play.
9. Install brake caliper using new bolts. Tighten bolts to specified torque.

   CAUTION: New bolts have a pre-applied

   locking. agent which is destroyed upon removal. Always use new brake caliper mounting bolts upon assembly.

10. Install wheel and wheel nuts and tighten evenly in a cross pattern to specified torque.

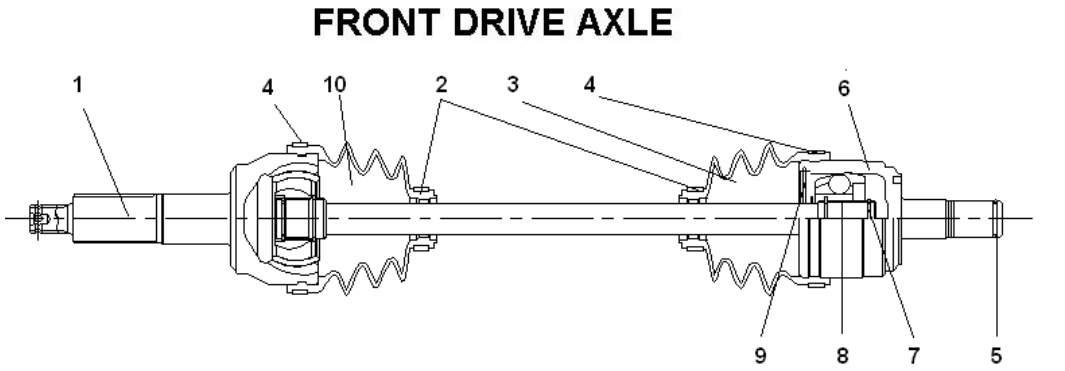
5.4 b. FRONT HUB BEARING REPLACEMENT 4X4 (ATV500)

1. Remove outer snap ring.
2. Form the back side, tap on the outer bearing race with a drift punch in the relief as shown.
3. Drive bearing out evenly by tapping on outer race only. Once bearing is at bottom of casting, support casting on outer edges so bearing can be removed.
4. Inspect bearing.

NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. inspect for rough spots, discoloration, The bearings should turn smoothly and quietly, no detectable up and down movement and minimal movement sideways between inner and outer race.

5. Inspect bearing housing for scratches, wear or damage. Replace housing if damaged.

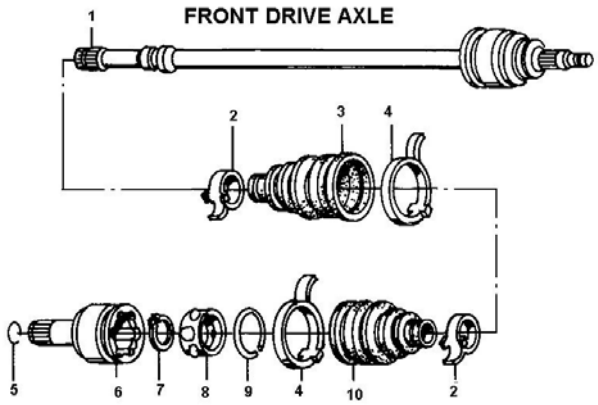
5.5 FRONT DRIVE AXLE (INNER AND OUTER CV JOINT) REMAVAL/ INSPECTION (4X4)



NOTE

The outer CV joint cannot be disassembled or repaired, if damage or faulty the drive axle assembly must be replace.

1. Drive axle/ outer CV joint assembly.
2. Boot band “A”.
3. Outer board boot.
4. Boot band “B”.
5. Stopper ring
6. Outer CV joint *
7. Circlip
8. Bearing *
9. stopper ring
10. Inboard boot.



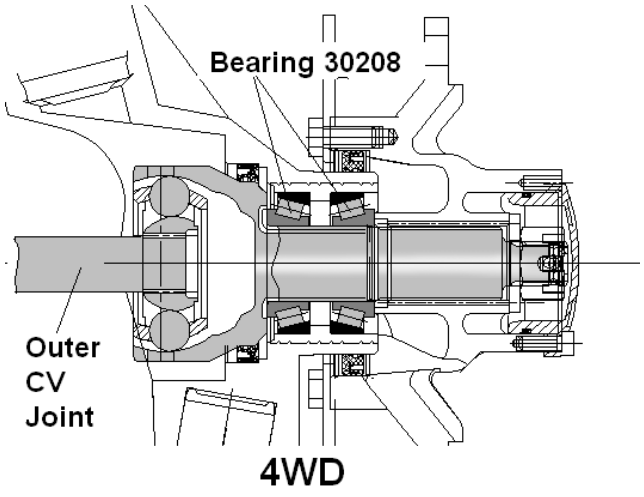
NOTE: Always order and replace 6 and 8 together.

REMOVAL

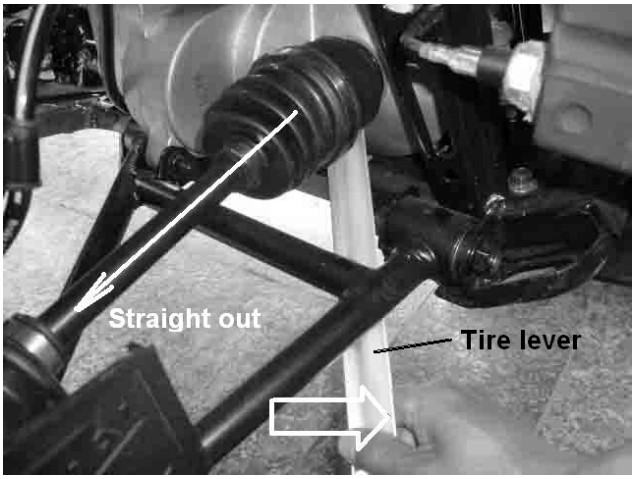
1. Place the vehicle on level ground and set the parking brake, Block the rear wheels so the vehicle will not roll in either direction.
2. Remove the front wheels, steering tie rods, disconnect the A arm on the ball joint end as described in this Chapter and Chapter 4.

CAUTION

To avoid damage to the front differential oil seal, hold the front drive shaft horizontal and straight out from the front differential during removal.



3. Hold the drive shaft straight out.
4. Place a tire lever between the inner CV joint and the differential housing, with a small piece of wood against the housing to help get "leverage" and protect the casting. "pop" the in inner CV joint out from the front differential.



INSPECTION

NOTE The boots are subjected to a lot of abuse if the vehicle is ridden in rough terrain. If the boots are damage and left un-repaired, the driveshaft joints will fair prematurely by allowing the joint to be exposed to dirt, mud and moisture. This also allow the loss of critical lubrication.

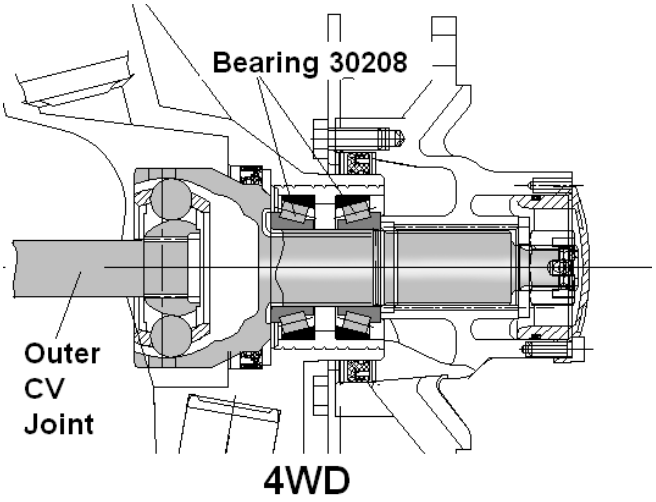
1. Check the rubber boots for wear, cuts or damage and replace if necessary as described under the Disassembly / Assembly procedure in this chapter.
2. Move each end of the drive shaft in a circular motion (and also a reciprocate for inner one) and check the drive shaft joints for excessive wear or play.
3. This inner CV joint (inboard pivot joint) can be serviced if there is wear or play. The outer CV joint (outboard pivot joint) cannot be serviced if worn or damage and if necessary, the drive shaft assembly must be replaced.

5.6 FRONT DRIVE AXLE INSTALLATION (4X4)

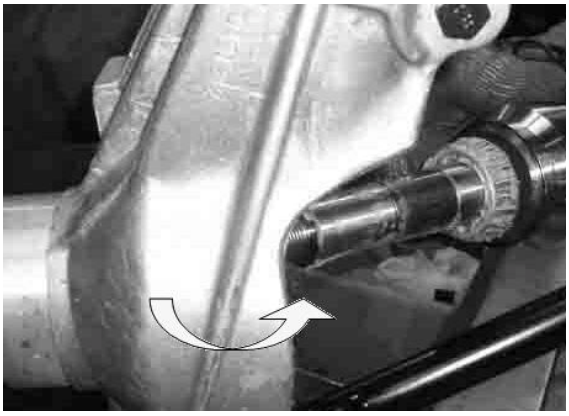
CAUTION

To avoid damage to the front differential oil seal and the strut oil seal, hold the front drive shaft horizontal and straight into the strut during installation.

1. Hold the drive shaft straight in from the front differential.
2. Push the drive shaft straight into the front differential and push it in all the way until it bottoms out. If necessary, carefully tap on the outer end of the drive shaft with a rubber mallet or soft-faced mallet.



3. After the drive shaft is installed, pull the inner CV joint a little to make sure the drive shaft stopper ring has locked into the front differential side gear groove.
4. Carefully install the outer CV joint (spindle) into the strut ,install the front hub and wheel.
5. Install the ball joint on the A arm, the steering tie rods, the hubs and the wheels as described in this Chapter and Chapter 4.



5.7 FRONT DRIVE AXLE DISASSEMBLY/ INSPECTION (4X4)

INNER CV JOINT DISASSEMBLY

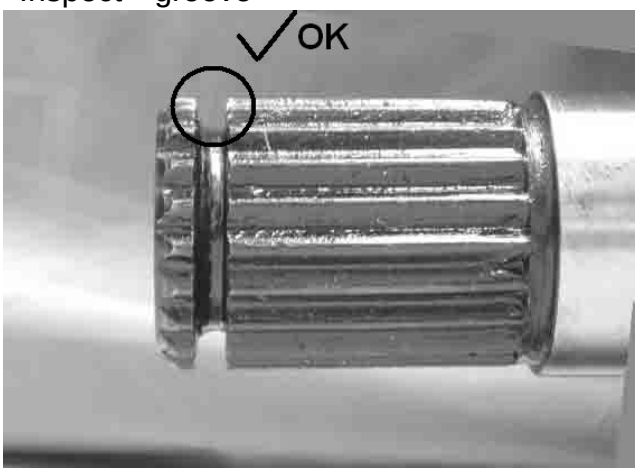
NOTE

The outer CV joint cannot be disassembled or repaired, if damage or faulty the drive axle assembly must be replace.

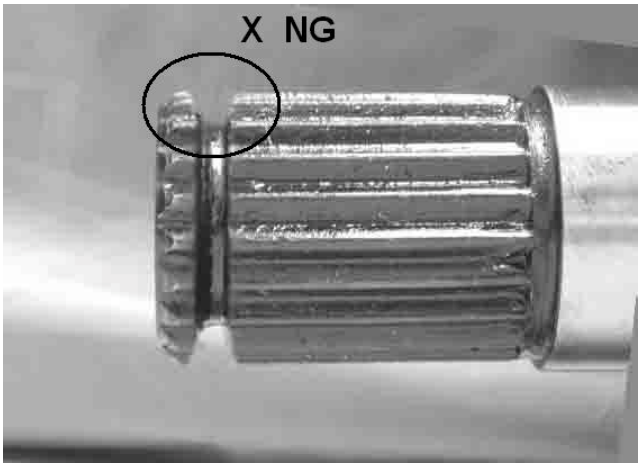
1. Open the clamps on both boot band“A” and“B”on the inner CV joint, then remove boot band“B”.Discard the boot band, it cannot be reused.
2. Carefully slide the boot (A) onto the drive axle and off the inboard joint.
3. Wipe out all of the molybdenum disulfide grease within the inboard joint cavity.
4. Remove the stopper ring from the inboard joint.
5. Remove the inner CV joint.
6. Remove the circlip and slide off the bearing assembly. Be careful not to drop any of the steel balls from the bearing cage.
7. slide the inner CV off the drive axle and discard the boot band“A”, it cannot be reused.

Remove the stopper ring

Inspect groove



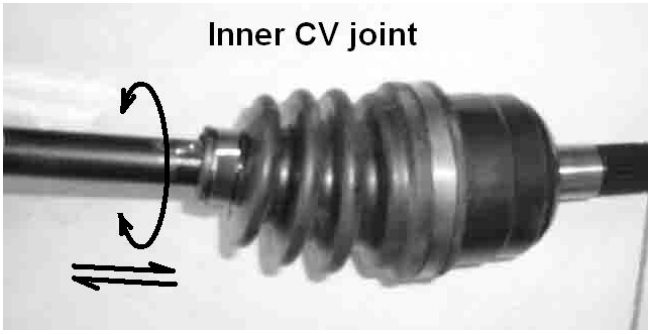
8. If the outboard boot requires replacement, perform the following:
   a. Open the clamps on both boot bands “A”and“B” on the outer CV joint, then remove boot band“B”.Discard the boot band, it cannot be reused.
   b. Slide the outboard boot off the drive axle and discard the boot band“A”, it cannot be reused.
9. Inspect the drive axle as described in this chapter.



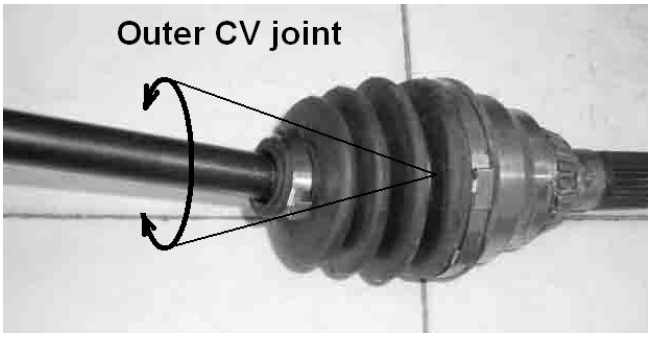
INNER CV JOINT INSPECTION

1. Clean the bearing assembly in solvent and thoroughly dry.
2. Inspect the steel balls, bearing case and the bearing race for wear or damage.
3. Check for wear or damage to the inner splines of the bearing race.
4. If necessary, disassembly the bearing assembly for further inspection. Carefully remove the steel balls from the bearing cage then remove the bearing race from the bearing cage.
5. If any of the components of the bearing assembly are damaged, replace the entire assembly as no replacement parts are available.
6. Clean the inner CV joint in solvent and thoroughly dry.
7. Inspect the interior of the inboard joint where the steel balls ride. Check for wear or damage and replace the joint if necessary.
8. Inspect the snap ring groove on the inboard joint for wear or damage.
9. Inspect the splines on the inner CV joint for wear or damage.
10. Check the stopper ring in the end of the inboard joint. Make sure it seats in the groove correctly, if damage the ring must be replaced.

Check the movement of the joint



11. Inspect the exterior of the inner CV joint for cracks or damage, replace if necessary. Check the movement of the joint for excessive play or noise by moving the drive axle in a circular and reciprocate direction.
12. Inspect the drive axle for bending, wear or damage.
13. Inspect the inner end splines, the outer end splines and the front hub cotter pin hole for wear or damage. If any of these areas are worn or damaged, replace the drive axle.



NOTE. Inner CV joint must be replaced with the bearing as an assembly.

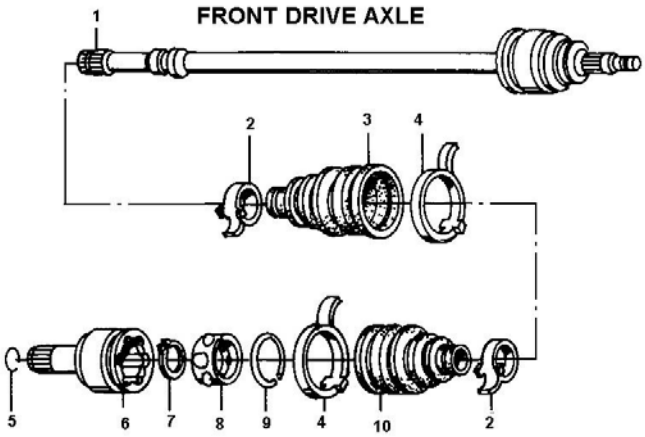
5.8 FRONT DRIVE AXLE ASSEMBLY (4X4)

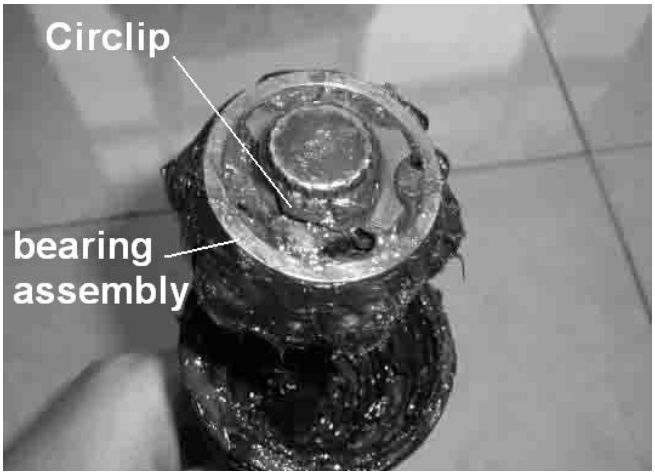
1. The rubber boots are not identical and must be installed on the correct joint. The boots are marked as follows:
   a. Inner CV joint boot : “inner”,
   b. Outer CV joint boot: “outer”.
2. IF the outboard boot was removed, install a new boot onto the drive axle at this time.

NOTE

Position the new boot bands with their tabs facing toward the rear of the vehicle.

3. Install 2 new small boot bands onto the drive axle.
4. Install the inboard boot and move the small boot band onto the boot. Bend down the tab on the boot band and secure the tab with the locking clips and tap them with a plastic hammer. Make sure they are locked in place.
5. If the bearing assembly was disassembled, assemble the bearing as follows:
   a. Position the bearing race and install the race into the bearing case. Align the steel ball receptacles in both parts.
   b. Install the steel balls into their receptacles in the bearing case.





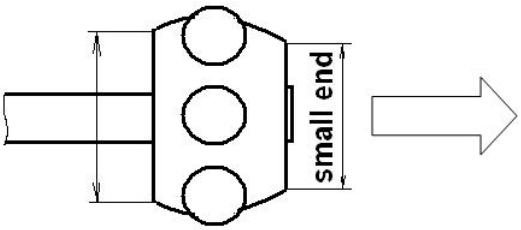
c. Pack the bearing assembly with molybdenum disulfide grease. This will help hold the steel balls in place.

6. Position the bearing assembly with the small end of the bearing going on first and install the bearing onto the drive axle.
7. Push the bearing assembly on until it stops, then install the circlip, Make sure the circlip seats correctly in the drive axle groove.
8. Apply a liberal amount of molybdenum disulfide grease to the bearing assembly. Work the grease in between the balls, the race and the case. Make sure all voids are filled with grease.
9. Apply a liberal amount of molybdenum disulfide grease to the inner surfaces of the inboard joint.
10. Install the inboard joint over the bearing assembly and install the stopper ring. Make sure it is seated correctly in the inboard joint groove.
11. After the stopper ring is in place, fill the inboard joint cavity behind the bearing assembly with additional molybdenum disulfide grease.
12. Pack each boot with the following amounts of molybdenum disulfide grease:
    a. Inboard boot:35-55grams(1.2-1.9oz.).
    b. Outboard boot:30-50grams(1.1-1.8oz.).
13. Move the inboard boot onto the inner CV joint.
14. Move the inboard joint on the drive axle.

NOTE

Position the new boot bands with their tabs facing toward the rear of the vehicle .

15. Move the small boot band onto the boot. Bend down the tab on the boot band and secure the tab with the locking clips and tap them with a plastic hammer. Make sure they are locked in place.



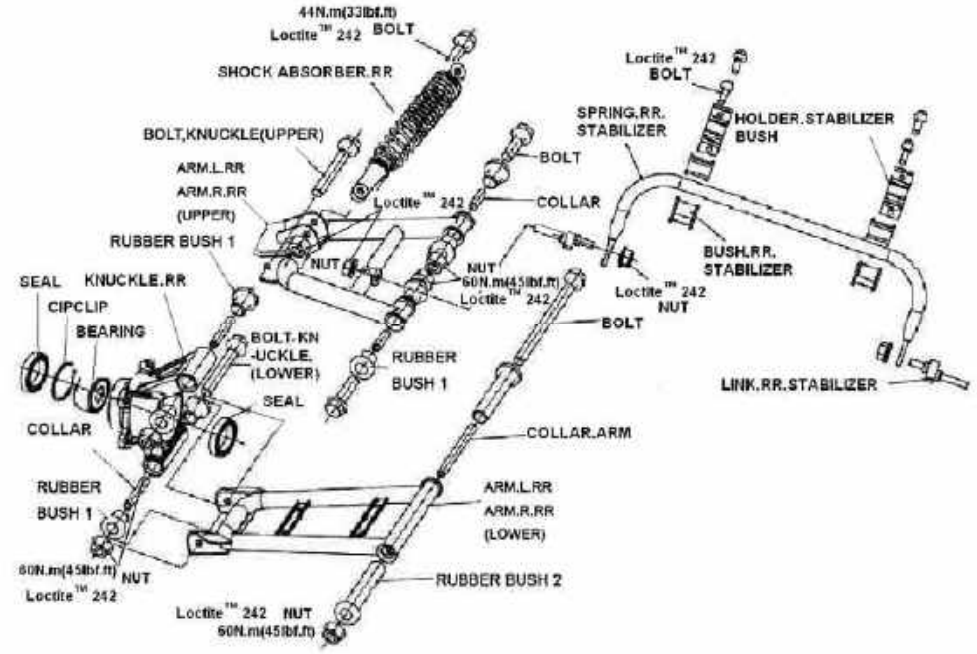
16. Install the large boot bands onto each boot.

CAUTION

It is critical to avoid undue stress on the rubber boots after the drive axle is installed and the vehicle is run. Don't twist the boot, and always set the both ends in designed position.

17. Secure all large boot bands. Bend down the tab on the boot band and secure the tab with the locking clip and tap them with a plastic hammer. Make sure they are locked in place.
18. If removed, install the stopper ring and make sure it is seated correctly in the drive axle groove.
19. Apply molybdenum disulfide grease to the end splines.

5.9 REAR HUB INSPECTION



1. Remove rear wheel.
2. Remove the cotter pin on the rear wheel driving shaft nut, than remove the nut.
3. Remove the rear disc brake caliper.

4. Remove the link, RR. Stabilizer.
5. Remove the mounting bolt of rear shock absorber and upper and lower A-arm. Takedown the A-arm components.
6. Remove the mounting bolt of the rear hub, after that inspect bushes, A-arms and collar. Replace if worn. Discard hardware.

7. Using hub extractor to take down the rear hub.
8. Remove oil seal.

9. Remove the snap spring of the rear hub.
10. Using bearing extractor to take down the hub bearing.
    Notice: when reassembling hub bearing that were removed and rear hub, which are need replaced. (The method is in accordance with removing steering knuckle.)

NOTES

CHAPTER 6 BRAKES

NOTE
Also See Chapter 2 for Maintenance Information.

6.1 SPECIFICATIONS

Front Brake Caliper		
Item	**Standard**	**Service Limit**
Brake Pad Friction material Thickness	0.157"/ 4mm	0.04"/ 1mm
B rake Disc Thickness	0.150- 0.164"/3.810- 4.166m m	0.140"/3 .556m m
Brake Disc Thickness Variance Between Measurements	-	0.002 "/ .051m m
Brake Disc Runout	-	0.005 "/ .12 7m m

Rear Brake Caliper			
Item		**Standard**	**Service Limit**
Brake Pad Friction material Thickness	hydraulic	0.157"/ 4mm	0.04"/ 1mm
	Hydraulic with mechanics park	0.236"/ 6mm	
	mechanics park	0.197"/ 5mm	
Brake Disc Thickness		0.177-0.187"/4.496-4.750m m	0.167"/4.242mm
Brake Disc Thickness Variance Between Measurements		-	0.002 "/ 0.051m m
Brake Disc Run out		-	0.005 "/ 0.12 7m m

6.2 TORQUE

Item	Torque (ft. lbs. except where noted*)	Torque (Nm)
Front Caliper Mounting Bolts	18.0	25
Rear Caliper Mounting Bolts	18 .0	25
Master Cylinder Mounting Bolts	*55 in. lbs	6.0
Master Cylinder Reservoir Cover Bolts	*5 in. lbs	.6
Hand Brake Hose Banjo Bolt	15 .0	21
Front Brake Disc	18 .0	2 5
Front Wheel Mounting Nuts	20 .0	27

6.3 BRAKE SYSTEM SERVICE NOTES

- It is strongly recommended always change the caliper and (or) the master cylinder as an assembly. The parts inside maybe not interchangeable due to different brake manufactures and (or) different brake type.
- Do not over – fill the master cylinder fluid reservoir.
- Make sure the brake lever and pedal returns freely and completely.

- Check and adjust master cylinder reservoir fluid level after pad service.
- Make sure atmospheric vent on reservoir is unobstructed.
- Adjust foot brake after pad service.
- Test for brake drag after any brake system service and investigate cause if brake drag is evident.
- Make sure caliper moves freely on guide pins (where applicable) .
- Inspect caliper piston seals for foreign material that could prevent caliper pistons from returning freely.
- Perform a brake burnishing procedure after install new pads to maximize service life.

6.4 BURNISHING PROCEDURE

Brake pads (both hydraulic and mechanical) must be burnished to achieve full braking effectiveness. Braking distance will be extended until brake pads are properly burnished. To properly burnish the brake pads, use the following procedure.

1. Choose an area large enough to safely accelerate the ATV to 50 km/h (30 mph) and to brake to a stop.
2. Using hi gear, accelerate to 50 km/h (30 mph); then compress brake lever (pedal) to decelerate to 0-8km/h (5 mph).
3. Repeat procedure on each brake system 20 times until brake pads are burnished.
(4. Adjust the mechanical parking brake (if necessary).)
5. Verify that the brake light illuminates when the hand lever is compressed or the brake pedal is depressed.

WARNING

Failure to properly burnish the brake pads could lead to premature brake pad wear or brake loss. Brake loss can result in severe injury.

6.5 FLUID REPLACEMENT/BLEEDING PROCEDURE

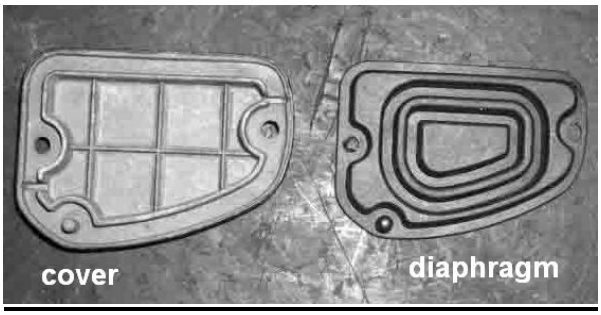
NOTE : When bleeding the brakes or replacing the fluid always start with the caliper farthest from the master cylinder.

CAUTION

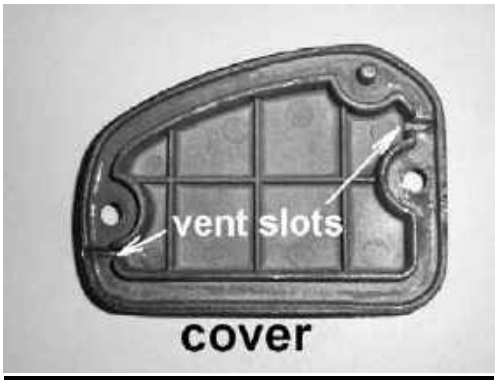
Always wear safety glasses.

CAUTION

Brake fluid is highly corrosive. Do not spill brake fluid on any surface of the ATV.



BRAKE BLEEDING-FLUID CHANGE



This procedure should be used to change fluid or bleed brakes during regular maintenance.

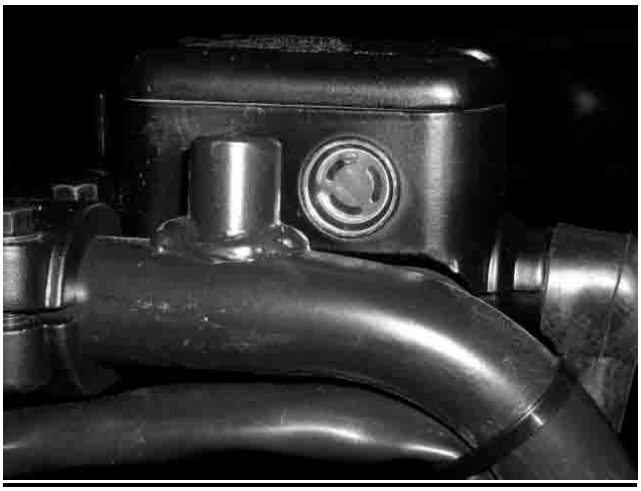
1. Clean reservoir cover thoroughly.
2. Remove screws, cover and diaphragm from reservoir.
3. Inspect vent slots in cover and remove any debris or blockage.
4. If changing fluid, remove old fluid from reservoir with a brake fluid pump or similar tool.

NOTE: Do not remove brake lever when reservoir fluid level is low.

5. Add brake fluid up to the indicated MAX level on the reservoir.
6. Begin bleeding procedure with the caliper that is farthest from the m aster cylinder. Install a box end wrench on the caliper bleeder screw. Attach a clean, clear hose to the fitting and place the other end in a clean container. Be sure the hose fits tightly on the fitting.

NOTE: Fluid may be forced from supply port when brake lever is pumped. Place diaphragm in reservoir to prevent spills. Do not install cover.

DOT 3 Brake Fluid



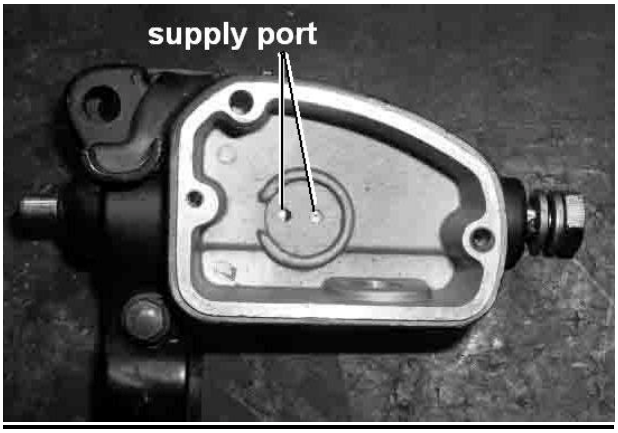
Reservoir Cover Torque
5 in. lbs. (.6 Nm)

7. Slowly pump brake lever (D) until pressure builds and holds.
8. While maintaining lever pressure, open bleeder screw. Close bleeder screw and release brake lever.

NOTE: Do not release lever before bleeder screw is tight or air m ay be draw n into caliper.

NOTE: In some versions of brake, there are 2 hydraulic circulates in one caliper for foot brake and hand brake. Make sure you bleed the right circulate.

9. Repeat procedure until clean fluid appears in bleeder hose and al air has been purged. Add fluid as necessary to maintain level in reservoir.



CAUTION:
Maintain at least 1/2 " (13mm of brake fluid in the reservoir to prevent air from entering the master cylinder.

10. Tighten bleeder screw securely and remove bleeder hose.
11. Repeat procedure steps 5- 9 for the remaining caliper (s).
12. Add brake fluid to MAX level on reservoir.

Master Cylinder Fluid Level:

MAX level or
Sight glass must look dark, if sight glass is clear, fluid level is too low.

13. Install diaphragm, cover and screws. Tighten screws to specification.
14. Field test machine at low speed before putting into service. Check for proper braking action and lever reserve. With lever firmly applied, lever reserve should be no less than 1/2 " (13mm) from handlebar.
15. Check brake system for fluid leaks and inspect al hoses and lines for wear or abrasion. Replace hose if w ear or abrasion is found.

6.6 HAND BRAKE MASTER CYLINDER REMOVAL/ INSPECTION /INSTALLATION

CAUTION: The master cylinder is a non-serviceable Component; it must be replaced as an assembly.

NOTE: If any special service needed, contact the ATV manufacture via the agent for the parts and special instruction.

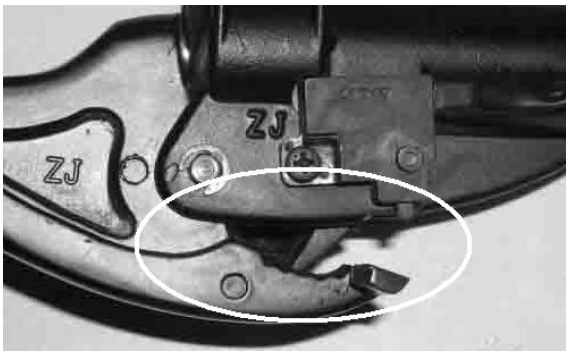
REMOVAL

1. Clean master cylinder and reservoir assembly. Make sure you have a clean work area to disassemble brake components.
2. Place a shop towel under brake hose connection at m aster cylinder. Loosen bolt, remove bolt and sealing washers.

CAUTION

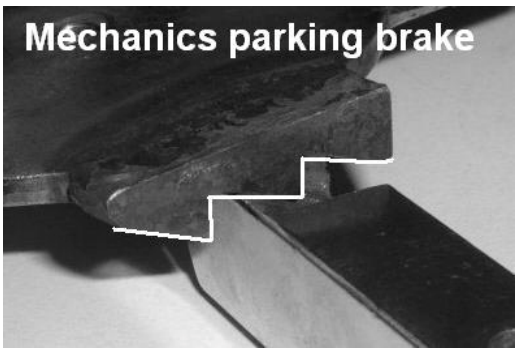
Brake fluid will damage finished surfaces. Do not allow brake fluid to come in contact with finished surfaces.

3. Remove master cylinder from handlebars.



INSPECTION

Inspect parking brake for wear. If teeth or locking cam are worn, replace lever and test the parking performance, if any locking problem exists, Replace the master cylinder as an assembly. **NOTE:** Mechanics parking brake is equipped for new Europe model.



INSTALLATION

1. Install master cylinder on handlebars. Torque mounting bolts to 55 in. lbs. (6 N m).

NOTE: To speed up the brake bleeding procedure the m aster cylinder can be purged of air before brake hose is attached. Fill with DOT3 brake fluid and pump lever slowly two to three times with finger over the outlet end to purge master cylinder of air.

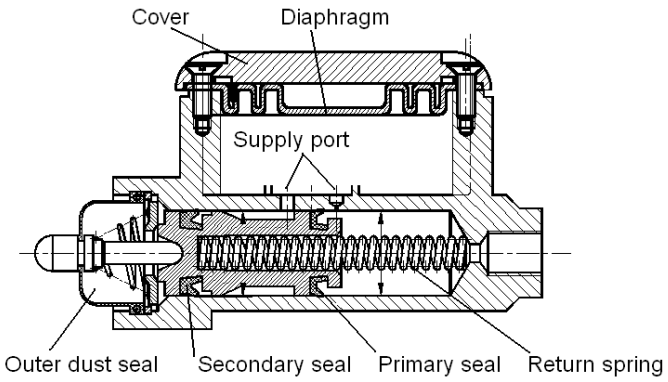
2. Place new sealing washers on each side of hand brake hose and torque bolt to specification.

Master Cylinder Mounting Bolt Torque 55 in. lbs . (6 N m)

Brake Line Banjo Bolt Torque 15 ft. lbs. (21 Nm)

3. Fill reservoir with **DOT 3** fluid.

4. Follow bleeding procedure, Check all connections for leaks and repair if necessary.



6.7 FRONT PAD REMOVAL / INSPECTION / INSTALLATION

NOTE: The brake pads should be replaced as a set.

REMOVAL

1. Elevate and support front of ATV safely.

CAUT ION: Use care w hen supporting vehicle so that it does not tip or fall. Severe injury m ay occur if machine tips or falls.

2. Remove the front wheel.

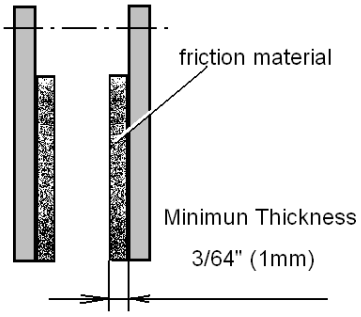
3. Remove caliper from mounting bracket.

4. Push caliper piston into caliper bore slowly using a C-clamp or locking pliers with pads installed.

NOTE: Brake fluid will be forced through compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

5. Push mounting bracket inward and slip outer brake pad past edge. Remove inner pad.

6. Measure the thickness of the pad material. Replace pads if worn beyond the service limit.



INSPECTION

Measure the thickness of the pad friction material. Replace pads if worn beyond the service limit.

Service Limit 0.3/64"(1 mm)

INSTALLATION

1. Lubricate mounting bracket pins with a light film of All Season Grease, and install rubber dust boots.
2. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other. Be sure pads and disc are free of dirt or grease.
Front Caliper Mounting Bolts Torque 18 ft. lbs. (25 Nm)
3. Install caliper on hub strut, and torque mounting bolts.
4. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2 ". (13 mm) of brake fluid in the reservoir to prevent air from entering the brake system.
5. Install the adjuster screw and turn clockwise until stationary pad contacts disc, then back off 1/2 turn (counter clockwise).
6. Install reservoir cap.

Hand and (or) Foot Brake Master Cylinder(s) Fluid Level:
Between MIN and MAX lines

7. Install wheels and torque wheel nuts, test and burnish.
See **BURNISHING PROCEDURE**

6.8 FRONT DISC INSPECTION / REMOVAL / REPLACEMENT

INSPECTION

1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.

Brake Disc Thickness
New0.150-0.164"(3.810-4.166mm)
Service Lim it 0.140"/3 .556 mm
Brake Disc Thickness Variance
Service Limit 0.002 " (0.051mm)
difference between measurements
Brake Disc Runout
Service Limit 0.005" (0.127 mm)

REMOVAL/ REPLACEMENT

1. Removal caliper and hub. Apply heat to the hub in the area of the brake disc mounting bolts to soften the bolt locking agent.
2. Remove bolts and disc.
3. Clean mating surface of disc and hub.
4. Install new disc on hub.
5. and tighten to specified.

CAUTION: Always use new brake disc mounting bolts.

Front Brake Disc Mounting Bolt Torque :
18 ft. lbs. (25 Nm)

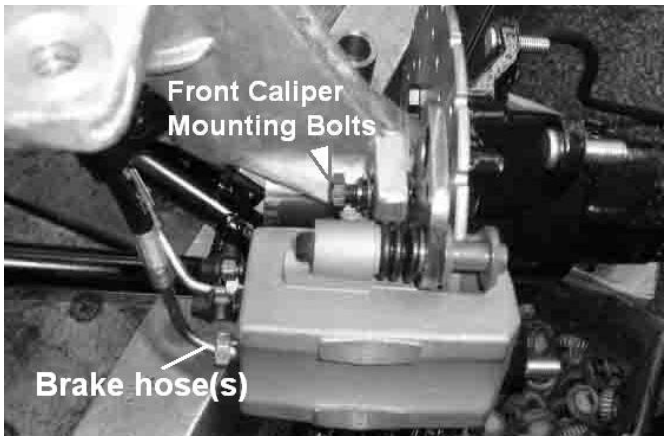
6.9 FRONT CALIPER REMOVAL/ INSPECTION / INSTALLATION

CAUTION: The caliper is a non-serviceable Component; it must be replaced as an assembly.

NOTE: If any special service needed, contact the ATV manufacture via the agent for the parts and special instruction.

REMOVAL

1. Remove wheel, remove caliper from the strut.
2. Loosen and remove brake hose(s) to caliper. Place a container under caliper to catch fluid draining.



INSPECTION

Inspect caliper body for nicks, scratches or worn. Replace caliper as an assembly if any problem exists.

INSTALLATION

1. Install caliper on hub strut, Apply Loctite™ 242 to screw threads and Install new bolts.

Front Caliper Mounting Bolt Torque
18 ft. lbs. (25 Nm)

2. Install brake hose and tighten securely.

NOTE: In some versions of brake, there are 2 hydraulic circulates (for foot brake and hand brake) in one caliper. Make sure you install the right hose.

3. Bleeding and Install wheels, If new brake pads are installed, burnishing procedure should be performed. See **BURNISHING**

PROCEDURE, And field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.

6.10 REAR BRAKE PAD REMOVAL/ INSPECTION / INSTALLATION

NOTE: The brake pads should be replaced as a set.

REMOVAL and INSPECTION

1. Remove caliper mounting bolts and lift caliper off of disc.

NOTE. When removing caliper, be careful not to damage brake hose . Support caliper so as not to kink or bend brake hose.

2. Push caliper pistons into caliper bore slowly with pads installed.

NOTE: Brake fluid will be forced through compensating port into m aster cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

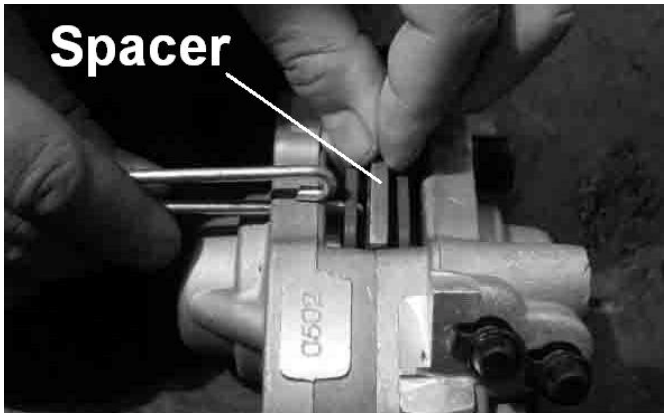
3. Remove brake pad retaining pin, and pad spacer.

NOTE: Do not over spread this spring pin a-part farther than necessary to remove it.

4. Clean.

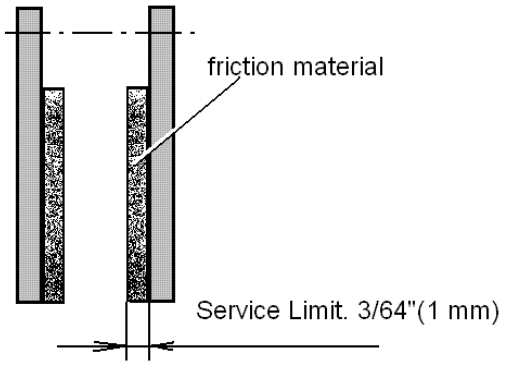
5. Measure the thickness of the pad friction material. Replace pads if worn beyond the service limit.

Rear Brake Pad Service Limit 0.3/64"(1 mm)



INSTALLATION

1. Install new pads in caliper body. Be sure to put spacer between pads.
2. Install caliper and torque mounting bolts.
Brake Caliper Torque: 18 ft. lbs. (25 Nm)
3. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2 " (13 mm) of brake fluid in the reservoir to prevent air from entering the master cylinder.
Hand and (or) Foot Brake Master Cylinder(s) Fluid Level:
Between MIN and MAX lines
4. Install wheels, burnishing procedure should be performed. See **BURNISHING PROCEDURE,** And field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.



6.11 REAR CALIPER REMOVAL/ INSPECTION/ INSTALLATION

CAUTION: The caliper is a non-serviceable Component; it must be replaced as an assembly.
NOTE: If any special service needed, contact the ATV manufacture via the agent for the parts and special instruction.

1 . Clean caliper area.

2 . Using a flare nut wrench, remove hose(s).

Place a container to catch brake fluid draining from brake hose.
3. Remove caliper.
4. Remove brake pad as described above.
5. Inspect surface of caliper for nicks, scratches or damage and replace if necessary.
6. Install brake pads in caliper body with friction material facing each other, with the spacer between the pads. Install retaining pin through outer pad, pad spacer and inner pad.
7. Install caliper and torque mounting bolts.
Caliper Mounting Bolt/ Caliper body Bolt Torque:
18 ft. lbs. (25 Nm)

8. Install brake hose and tighten to specified torque.

Banjo Bolt Torque: 15 ft. lbs. (21 Nm)

NOTE: In some versions of brake, there are 2 hydraulic circulates (for foot brake and hand brake) in one caliper. Make sure you install the right hose.

9. Bleed.

10. Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.

6.12 REAR BRAKE DISC INSPECTION / REMOVAL / REPLACEMENT

INSPECTION

1. Visually inspect the brake disc for nicks, scratches, or damage.

2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.

Brake Disc Thickness

New0.177-0.187"(4.496-4.750mm)

Service Lim it 0.167"(4.242 mm)

Brake Disc Thickness Variance

Service Limit 0.002 " (0.051mm)

difference between measurements

Brake Disc Runout

Service Lim it 0.005" (0.127 mm)

REMOVAL/ REPLACEMENT

1. Removal wheel/ hub and caliper.
2. Remove bolts and disc from the flange.
3. Clean mating surface of disc and hub.
4. Install new disc on flange.
5. Tighten to specified.

CAUTION: Always use new brake disc mounting bolts.

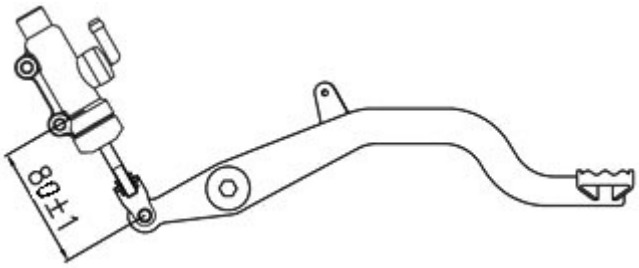
Rear Brake Disc Mounting Bolt Torque :

18 ft. lbs. (25 Nm)

6.13 FOOT BRAKE PEDAL FOR B-TYPE

ADJUSTING

If the push rod joint is reinstalled, adjust the push rod length so that the distance between the centers of the master cylinder lower mounting bolt hole and joint pin hole is 80±1mm.After adjustment, tighten the joint nut.



NOTES

CHAPTER 7 ELECTRICAL

7.1 PARTS INSPECTION AND SERVICE

HEADLIGHT LAMP REPLACEMENT

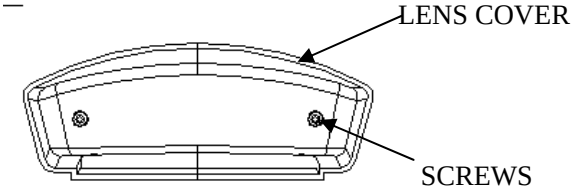
1. . 'Use bulb 12V 35W/35W.
2. Pull the cable plug off the conducting strip in the socket, remove the clip① before dismounting the bulb.
3. Fit a new bulb into the socket, sitting properly in the three slots, install the clip as shown in the fig. and connect the cable plug to the conducting strip.
4. Change the bulb.

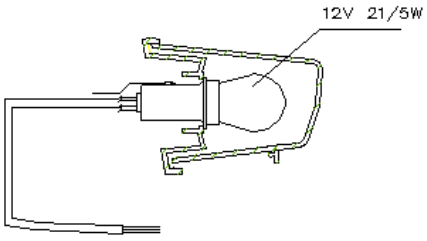
HEADLIGHT ADJUSTMENT

1. The headlight beam can be adjusted vertically (all models) and horizontally (except the light on handlebar).
2. Place the vehicle on a level surface with the headlight approximately 25'(7.6m) from a wall.
3. Measure the distance from the floor to the center of the headlight and make a mark on the wall at the same height.
4. Start the engine and turn the headlight switch to high beam.
5. Observe headlight aim. The most intense part of the headlight beam should be aimed 2' (51mm) below the mark placed on the wall in step 2. NOTE : Riding weight must be included on the seat.
6. Loosen but not remove pivot bolt/ screw and adjust beam to desired position.
7. Tighten nut and bolt / screw.

TAILLIGHT / BRAKELIGHT LAMP REPLACEMENT

1. From the rear of the taillight remove two screws holding lens cover in place and remove lens cover.
2. Remove lamp and replace it with recommended lamp.
3. Reinstall the lens cover removed in step 1.
4. Test the taillight / brake light.





7.2 BATTERY

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing Antidote:
External: Flush with water.

Internal: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries.
KEER OUT OF REACH OF CHILDREN

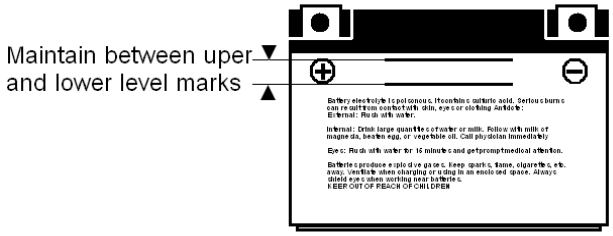
WARNING: The gases given off by a battery are explosive. Any spark or open flame near a battery can cause an explosion which will spray battery acid on anyone close to it. If battery acid gets on anyone, wash the affected area with large quantities of cool water and seek immediate medical attention.

To ensure maximum service life and performance from a new battery, perform the following steps.
NOTE: Do not service the battery unless it will be put into regular service within 30 days. After initial service, add only distilled water to the battery. Never add electrolyte after a battery has been in service.
NOTE: New Battery must be fully charged before use.
1. Remove vent plug from vent fitting.
2. Fill battery with electrolyte to upper level marks on case.
3. Set battery aside and allow it to cool and stabilize for 30 minutes.
4. Add electrolyte to bring level back to upper level mark on case.

NOTE: This is the last time that electrolyte should be added. If the level becomes low after this point, add only distilled water.
5. Charge battery at 1 /10 of its amp /hour rating. Examples: 1 /10 of 14 amp battery = 1.4 amp; 1/10 of 7 amp battery = 0.7 amp (recommended charging rates).
6. Check specific gravity of each cell with a hydrometer to assure each has a reading of 1.270 or higher.

BATTERY INSPECTION / REMOVAL

The battery is located under the left rear fender. Inspect the battery fluid level. When the battery fluid nears the lower level, the battery should be removed and distilled water should be added to the upper level line. To remove the battery:
1. Disconnect holder strap and remove cover.
2. Disconnect battery negative (-) (black) cable first,
followed by the positive (+) (red) cable.



CAUTION

Whenever removing or reinstalling the battery, disconnect the negative (black) cable first and reinstall the negative cable last!
3. Disconnect the vent hose.
4. Remove the battery.

5. Remove the filler caps and add *distilled water only* as needed to bring each cell to the proper level.

Do not overfill the battery.

To refill use only distilled water. Tap water contains minerals which are harmful to a battery. Do not allow cleaning solution or tap water to enter the battery. It will shorten the life of the battery.

6. Reinstall the battery caps.

BATTERY INSTALLATION

1. Clean battery cables and terminals with a stiff wire brush. Corrosion can be removed using a solution of one cup water and one tablespoon baking soda. Rinse with clean water and dry thoroughly.
2. Reinstall battery, attaching positive (+) (red) cable first and then the negative (-) (black) cable.
3. Install clear battery vent tube from vehicle to battery vent.

WARNING: Vent tube must be free from obstructions and kinks and securely installed. If not, battery gases could accumulate and cause an explosion. Vent should be routed away from frame and body to prevent contact with electrolyte. Avoid frame, corrosion will occur.

4. Route cables so they are tucked away in front and behind battery.
5. Reinstall battery cover and holder strap.

Do not start the engine with the battery disconnected. Vehicle lamps will burn out if battery is disconnected during vehicle operation. Also, the reverse speed limiter can be damaged.

BATTERY TESTING

Whenever a service complaint is related to either the starting or charging systems, the battery should be checked first.

Following are three tests which can easily be made on a battery to determine its condition: OCV Test, Specific Gravity Test and Load Test.

MF (Maintenance Free) battery does not require the Specific Gravity Test and Refill

Open Circuit Voltage Test

Battery voltage should be checked with a digital multitester. Readings of 12.6 or less require further battery testing and charging.

NOTE: Lead acid batteries should be kept at or near a full charge as possible.

Load test

CAUTION: Remove spark plug high tension leads and connect securely to engine ground before proceeding.

NOTE: This test can only be performed on machines with electric starters. This test cannot be performed with an engine or starting system that is not working properly.

A battery may indicate a full charge condition in the OCV test and the specific gravity test, but still may not have the storage capacity necessary to properly function in the electrical system. For this reason, a battery capacity or load test should be conducted whenever poor battery performance is encountered. To perform this test, hook a multitester to the battery in the same manner as was done in the OCV test. The reading should be 12.6 volts or greater. Engage the electric starter and view the registered battery voltage while cranking the engine. Continue the test for 15 seconds. During this cranking period, the observed voltage should not drop below 9.5 volts. If the beginning voltage is 12.6 or higher and the cranking voltage drops below 9.5 volts during the test, replace the battery.

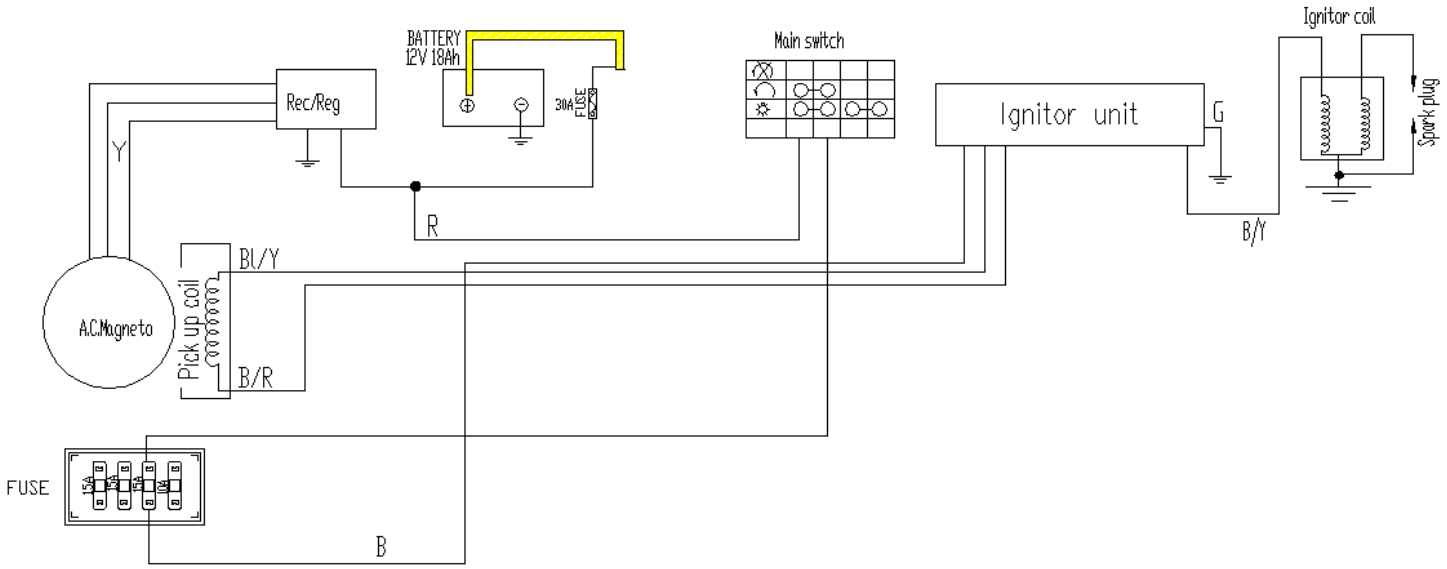
7.3 IGNITION SYSTEM

IGNITION SYSTEM TROUBLESHOOTING

No Spark, Weak or Intermittent Spark

- Spark plug gap incorrect
- Fouled spark plug
- Faulty spark plug cap or poor connection to high tension lead
- Related wiring loose, disconnected, shorted, or corroded
- Engine stop switch or ignition switch faulty
- Terminal board or connections wet, corroded
- Poor ignition coil ground (e.g. coil mount loose or corroded)
- Faulty stator (measure resistance of all ignition related windings)
- Incorrect wiring (inspect color coding in connectors etc.)
- Faulty ignition coil winding (measure resistance of primary and secondary)
- Worn magneto (RH) end crankshaft bearings
- Sheared flywheel key
- Flywheel loose or damaged
- Trigger coil air gap too wide (where applicable) should be 0.030-0 .050" (0. 75-1.25 mm)
- Excessive crankshaft run out on magneto (RH) end should not exceed 0.005" (0.13mm)
- Faulty CDI module

CIRCUIT DIAGRAM



IF THE IGNITION SYSTEM FAILS TO OPERATE

Procedure

Check:

1. Fuse (Main)
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil
7. Pickup coil resistance
8. Main switch
9. Engine stop switch
10. Wiring connection (entire ignition system)

1.Fuse → NO CONTINUITY → Replace the fuse.

Check switches

⇩ CONTINUITY

2. Battery → INCORRECT

- Check the battery condition.

Refer to "BATTERY INSPECTION"

- Clean battery terminals.
- Recharge or replace the battery.

⇩ CORRECT

Standard spark plug: DPR7EA 9 / NGK

3.Spark plug → OUT OF SPECIFICATION

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.

→ Repair or replace the spark plug

Spark plug gap: 0.6 ~ 0.7mm

⇩

*

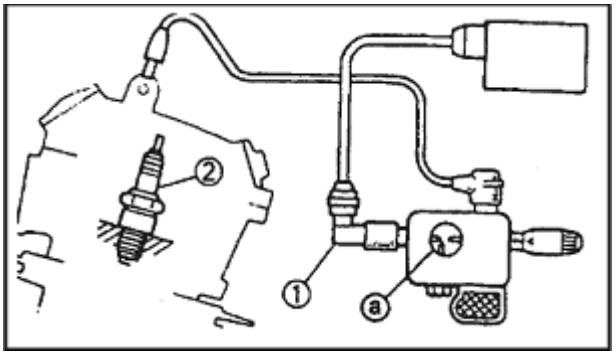
*

⇩

4.Ignition spark gap

● Disconnect the spark plug cap from the spark plug

●Connect the ignition tester 1 as shown.
2 Spark plug
●Turn the main switch to "ON".
●Check the ignition spark gap .
●Check the spark by pushing the starter switch, and increase the spark gap until a misfire occurs.



MEETS SPECIFICATION

The ignition system is not faulty.

Minimum spark gap: 6mm (0.24 in)

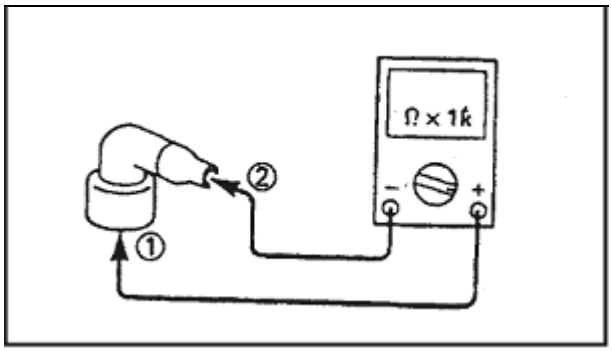
OUT OF SPECIFICATION OR NO SPARK

5.Spark plug cap resistance

●Remover the spark plug cap.

●Connect the pocket tester (ΩX1 k) to the spark plug cap.
NOTE:
● When removing the spark plug cap. do not pull the spark plug cap from high tension cord.
●Remove→Turning counterclockwise
●Connect→Turning clockwise.
●Check the high tension cord when connecting the spark plug cap.
● When connecting the spark plug cap, cut the high tension cord about 5mm.

Tester (+) lead →
Spark plug side①
Tester (—) lead→
High tension cord side ②



OUT OF SPECIFICATION

Replace the spark plug cap

Spark plug cap resistance:
10KΩ(20 ℃)

⇩ CORRECT

*

*

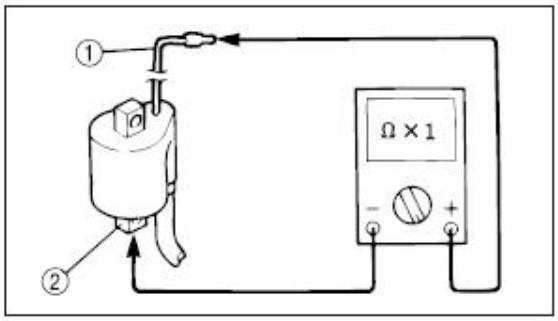
⇩

6. Ignition coil resistance

Disconnect the ignition coil connector from the wire harness.

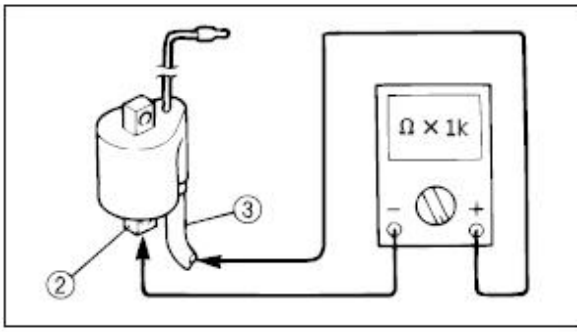
- Connect the pocket tester (1) to the ignition coil.
- Check if the primary coil has the specified resistance.

Tester (+) lead
B/Y Terminal
Tester (-) lead Green Terminal



Primary coil resistance:
3.6-4.8Ω (20 ℃)

Tester (+) lead
Spark plug lead
Tester (—) lead
Green Terminal



- Connect the pocket tester (Ω×1k) to the ignition coil.
- Check the secondary has the specified resistance

Secondary coil resistance:

3.5kΩ±10% (20℃)

OUT OF SPECIFICATION

⇩

BOTH MEET SPECIFICATION

⇩

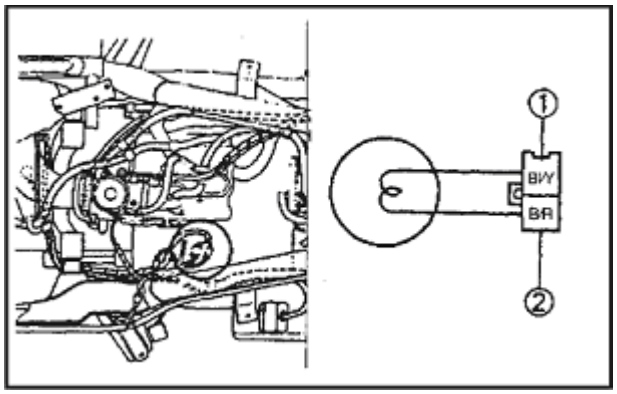
Replace the ignition coil.

*

⇩

7. Pickup coil resistance

● Disconnect the pickup coil coupler from the wire harness.
●Connect the pocket tester (Ω 100) to the pickup coil coupler.



Tester (+) lead →
BI/Y Terminal ①
Tester (-) lead→
B/R Terminal ②

● Check the pickup coil has the specified resistance.

Primary coil resistance:
115 -145Ω (20℃)

OUT OF SPECIFICATION → Replace the pickup coil.

MEETS SPECIFICATION

⇩

8.Main switch
CHECK SWITCHES

NO CONTINUITY → Replace the main switch

CONTINIUTY

⇩

9.Engine stop switch (for USA model)

NO CONTINUITY → Replace the handlebar switch.

CONTINIUTY

⇩

10.Wiring connection
●Check the connection of the entire ignition system
Refer to “CIRCUIT DIAGRAM”.

POOR CONNECTIONS

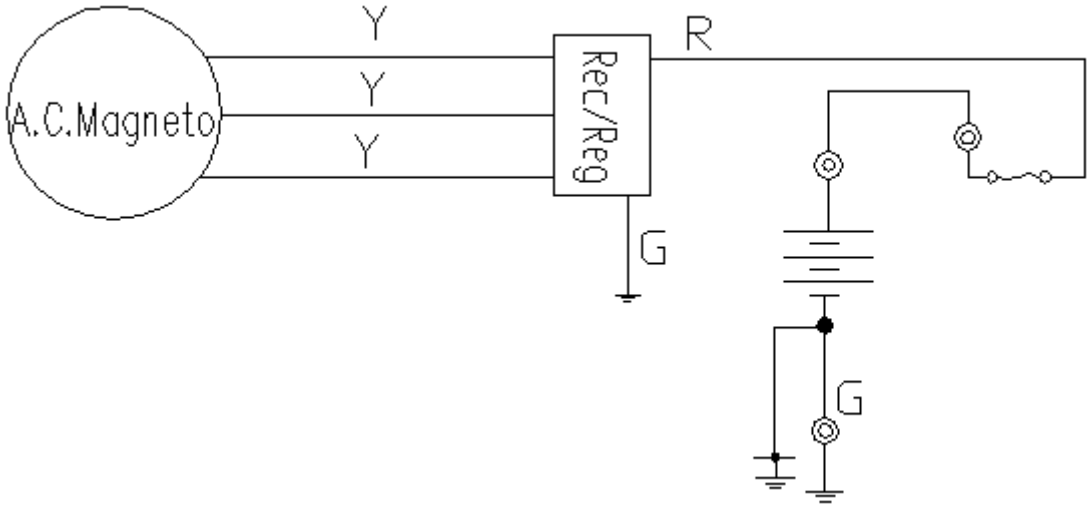
CORRECT

Correct

Replace the igniter unit.

7.4 CHARGING SYSTEM

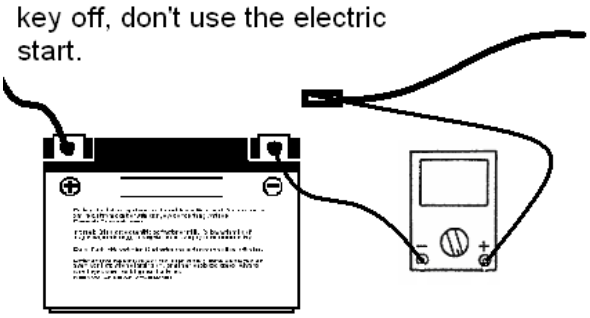
CHARGING SYSTEM CIRCUIT DIAGRAM



CURRENT DRAW - KEY OFF

CAUTION: Do not connect or disconnect the battery cable or ammeter with the engine running. Damage will occur to light bulbs and speed limiter.
Connect an ammeter in series with the negative battery cable. Check for current draw with the key off, if the draw is excessive, loads should be disconnected from the system one by one until the draw is eliminated. Check component wiring as well as the component for partial shorts to ground to eliminate the draw.

Current draw key off:
Maximum of 0.01DCA(10mA)



CHARGING SYSTEM

Procedure

Check:

1. Fuse (Main)
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring system (entire charging system)

1. fuse

NO CONTINUITY

Replace the fuse

2. Battery

Check the battery condition.
Refer to "BATTERY INSPECTION"

INCORRECT

Clean battery terminals
Recharge or replace the battery

3.Charging voltage

Connect the engine tachometer to the spark plug lead.

●Connect the pocket tester (DC20V) to the battery

Test (+) lead→
Battery (+) terminal ①
Tester (-) lead→
Battery (-) terminal ②

Measure the battery terminal voltage.

start the engine and accelerate to about 5,000rpm

●check the terminal voltage

Measured voltage-terminal
Voltage:
0.2-2.5V up

NOTE: Use a fully changed battery.

MEETS SPECITICATION

The charging circuit is not faulty
Replace the battery

OUT OF SPECICATION

4. Starter coil resistance
Remove the A.C. magneto coupler from wire harness
Connect the pocket tester (ΩX1) to the stator coil
Tester (+) lead –yellow terminal
Tester (-) lead –yellow terminal
Measure the stator coil resistance
Stator coil resistance 0.5-0.8Ω (20□)

OUT OF SPECITICATION

Replace the stator coil

MEETS SPECIFICATION

5.Wiring connection
check the entire charging system for connections
Refer to “CIRCUIT DIAGRAM”

POOR CONNECTION

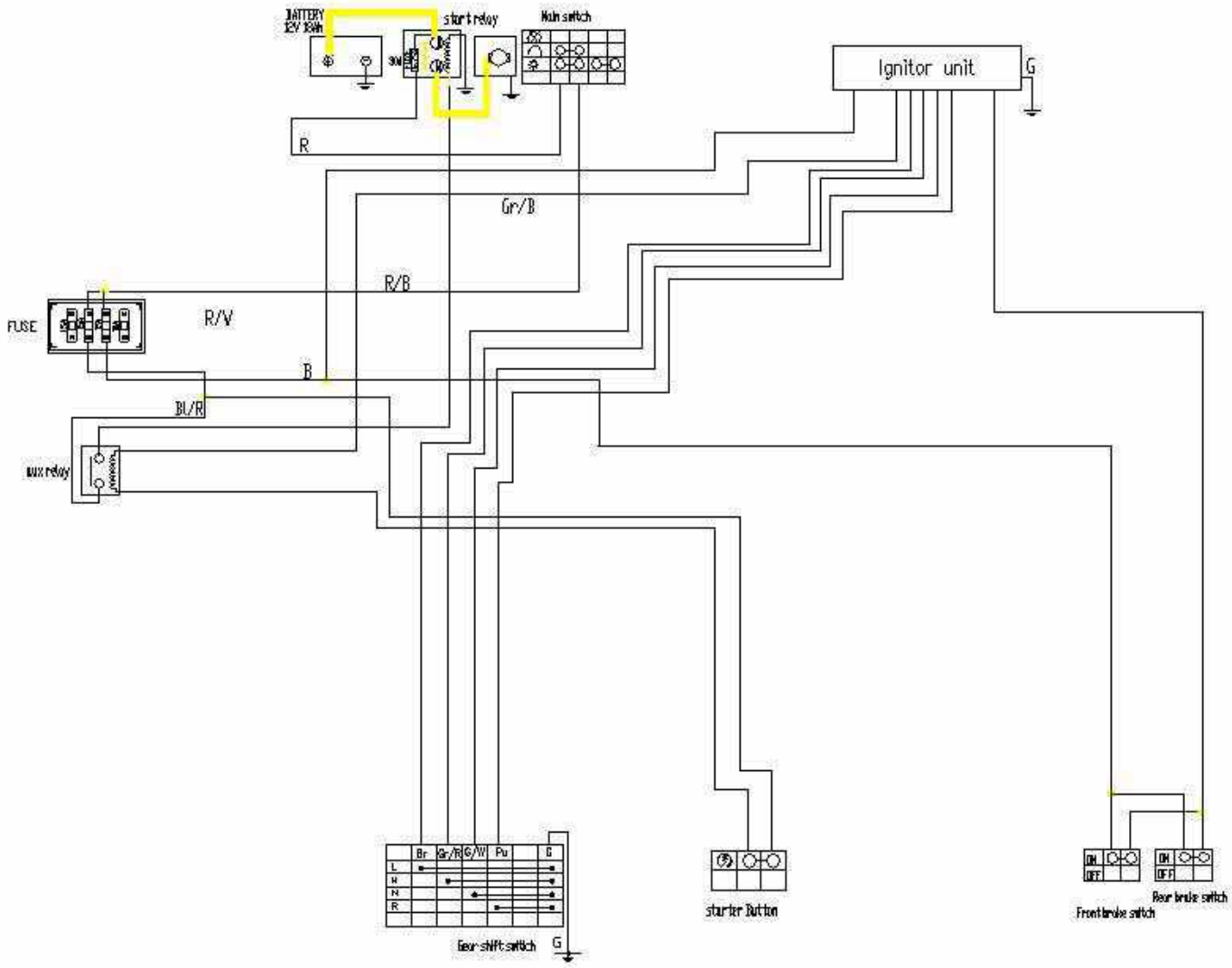
correct

CORRECT

Replace the rectifier/regulator

7.5 ELECTRICS STARTING SYSTEM

DIAGRAM



TROUBLESHOOTING

THE STARTER MOTOR OPERATES WHEN GEAR SHIFT SWITCH IS IN NEUTRAL OR THE FRONT/REAR SWITCH IS ON

IF THE STARTER MOTOR FAILS TO OPERATE

Procedure

Check:

1. Fuse (Main)
2. Battery
3. starter motor
4. starter relay
5. aux relay
6. main switch
7. gear shift switch
8. front/rear brake switch
9. starter switch
10. wiring connection (entire starting system)

1. fuse

refer to "CHECKING SWITCHES" section

NO CONTINUITY → Replace the fuse

2. Battery

Check the battery condition.

Refer to "BATTERY INSPECTION" section in CHAPTER 3

INCORRECT → Clean battery terminals
Recharge or replace the battery

3. Starter motor

Connect the battery positive terminal and starter motor cable using a jumper lead.

Check the starter motor operation

DOES NOT MOVE → Repair or replace the starter motor

4.Starter relay

●Disconnect the relay unit coupler from the wire harness.

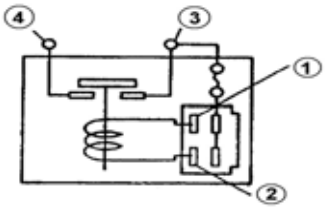
●Connect the pocket tester (Ωx1) and battery (12V) to the relay unit coupler terminals.

Battery (+) lead→
Green/Yellow terminal ①
Battery (-) lead→
Yellow/Red terminal ②

●Check the starter relay for continuity.

Test (+) lead → ③ terminal
Test (-) lead → ④ terminal

WARNING
A wire used as a jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may burn.
This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity



CONTINUITY ⇩

Replace the starter replay

5. .Aux relay

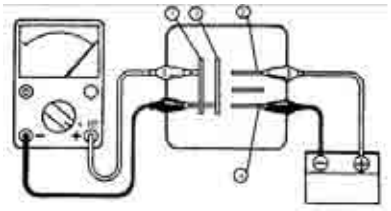
●Disconnect the aux relay coupler from the wire harness.

●Connect the pocket tester (Ωx1) and battery (12V) to the aux relay coupler terminals.

Battery (+) lead→ terminal ②
Battery (-) lead→ terminal ④

●Check the aux relay for continuity.

Test (+) lead → ① terminal
Test (-) lead → ③ terminal



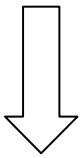
⇩

Replace the aux relay

6. Main switch
CHECK SWITCHES

NO CONTINUITY

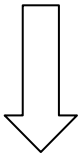
Replace the main switch



7.Gear shift switch
CHECK SWITCHES

NO CONTINUITY

Replace the handlebar switch

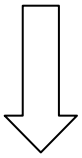


8 Front /rear brake switch

CHECKING SWITCHES

NO CONTINUITY

Replace the brake switch

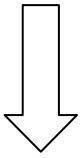


9. Starter switch

CHECKING SWITCHES

NO CONTINUITY

Replace the handlebar switch



10. Wiring connection

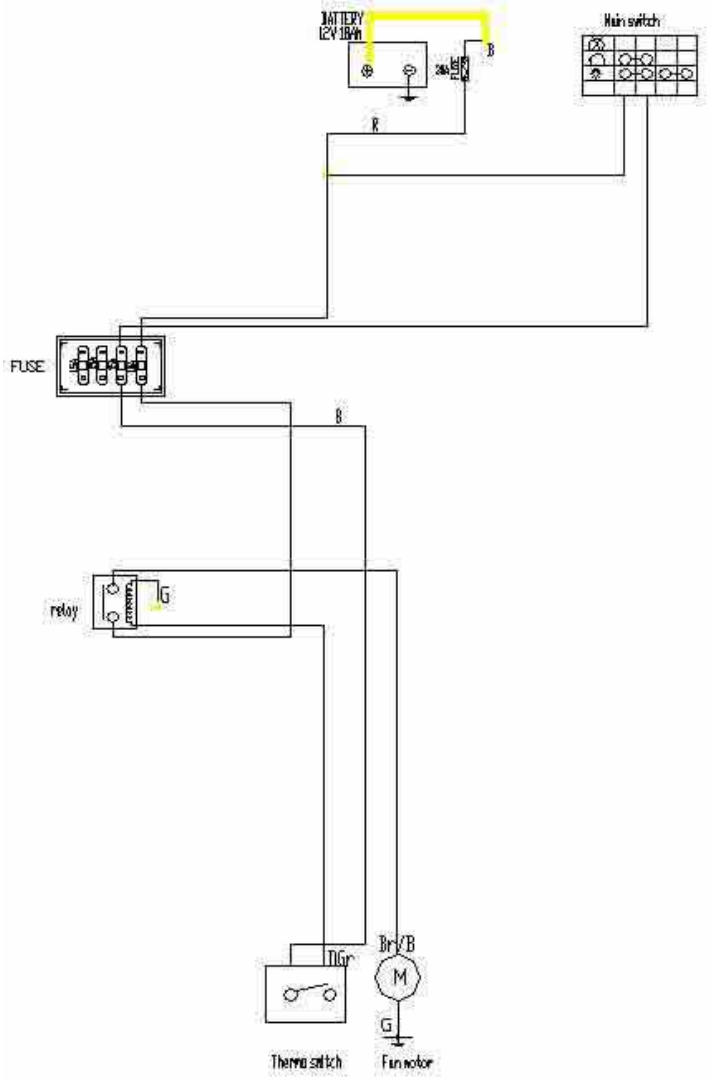
Check the connections of the entire starting system.

Refer to “CIRCUIT DIAGRAM

POOR CONNECTION

Correct

7.6 COOLING SYSTEM



IF THE FAN MOTOR FAILS TO TURN

Procedure
Check:
1. Fuse (Main, Fan)
2. Battery
3. Main switch
4. Fan motor (inspection)
5. Thermo switch
6. relay
7. Wiring connection (entire cooling system)

1. fuse

CHECK SWITCHES → NO CONTINUITY → Replace the fuse

2. Battery

Check the battery condition.
Refer to "BATTERY INSPECTION" section → INCORRECT → Clean battery terminals
Recharge or replace the battery

3 Main switch

CHECK SWITCHES → NO CONTINUITY → Replace the main switch

4.1 Fan motor(inspection 1)

Connect the battery to the fan motor.
Battery (+) lead→Green/Blue terminal ①
Battery (-) lead→Green ground ②
Check the fan motor operation → DOES NOT MOVE → Replace fan motor

4.2 Fan motor (inspection 2)

Turn the main switch to off.
- Remove the thermo switch lead from thermo switch.
- Connect jumper lead to thermo switch leads.
- Turn the main switch to on

→ DOES NOT MOVE → The wiring circuit from battery to fan motor is faulty. Repair

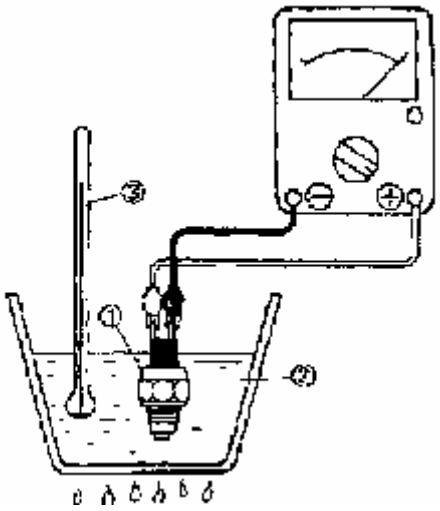
5. Thermo switch

Remove the thermo switch from the radiator.

- Connect the pocket tester (ΩX1) to the thermo switch①.
- Immerse the thermo switch in the water ②
- Check the thermo switch for continuity.

NOTE:

Measure temperatures while heating the coolant with the temperature gauge



WARNING

- Handle the thermo switch with special care.

Never subject it to strong shocks or allow it to be dropped. Should it be dropped, it must be replaced.

- Do not touch the thermo switch to the bottom of the heated vessel.

88±3 Thermo switch "ON"
80 Thermo switch "OFF"

OUT OF SPECIFICATION

Replace the thermo switch

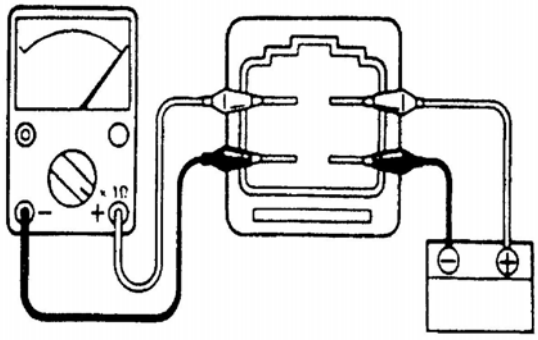
6.Relay

- Disconnect the starting circuit cut-off relay coupler from the wireharness.
- Connect the pocket tester (Ωx1) and battery (12V) to the starting circuit cut-off relay coupler terminals.

Battery (+) lead→ terminal ②
Battery (-) lead→ terminal ④

- Check the starting circuit cut-off relay for continuity.

Test (+) lead → ① terminal
Test (-) lead → ③ terminal



7. Wring connection

●Check the connection of the entire cooling system.

Refer to “CIRCUIT DIAGRAM”

UPPER CONNECTION

Correct

IF THE HEAT ALARM UNIT WORKING

When the main switch is turned on, the temperature of the engine begins to go up. As it comes to 88±3□ the thermostat is connected and the fan starts to work, cooling the coolant, if the thermostat or the fan, fails to work; the coolant temperature will keep rising. The heat alarm unit operates the moment the temperature reaches 115±5□and the signal flashing. Stop the engine now to have the circuit fixed.

Procedure

Check:

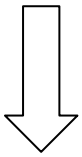
1 .Fuse(Main, Fan)
2. Battery
3.Main switch
4. Thermo unit
5. Voltage
6. Wiring connection (entire cooling system)

1. fuse

CHECKING SWITCHES

NO CONTINUITY

Replace the fuse



2. Battery

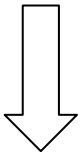
Check the battery condition.

Refer to "BATTERY INSPECTION"

INCORRECT

Clean battery terminals

Recharge or replace the battery

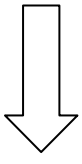


3.Main switch

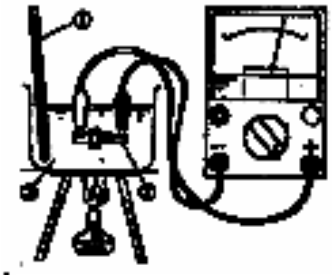
CHECKING SWITCHES

NO CONTINUITY

Replace the main switch



4.Thermo unit
●Drain the coolant and remove the thermo unit from the cylinder head.
●Immerse the thermo unit ②in the coolant③ .
①Thermometer.



Handle the thermo unit with special care.
Never subject it to strong shocks or allow it to be dropped.
Should it be dropped, it must be replaced.
Do not touch the thermo unit to the bottom of the heated vessel.

Coolant temperature	Resistance
80□	47.5~56.8Ω
100□	26.2~29.3Ω

OUT OF SPECIFICATION

Replace the thermo unit

MEETS SPECIFICATION

8.□ Voltage
●Connect the pocket tester (DC20V) to the
Temperature gauge couple.
Tester (+) lead→Green/Blue terminal
Tester (-) lead→Green ground
●Turn the main switch to on.
●Check for voltage (12V) on the temperature gauge lead.

OUT OF SPECIFICATION

The wiring circuit from main switch to temperature gauge is faulty. Repair.

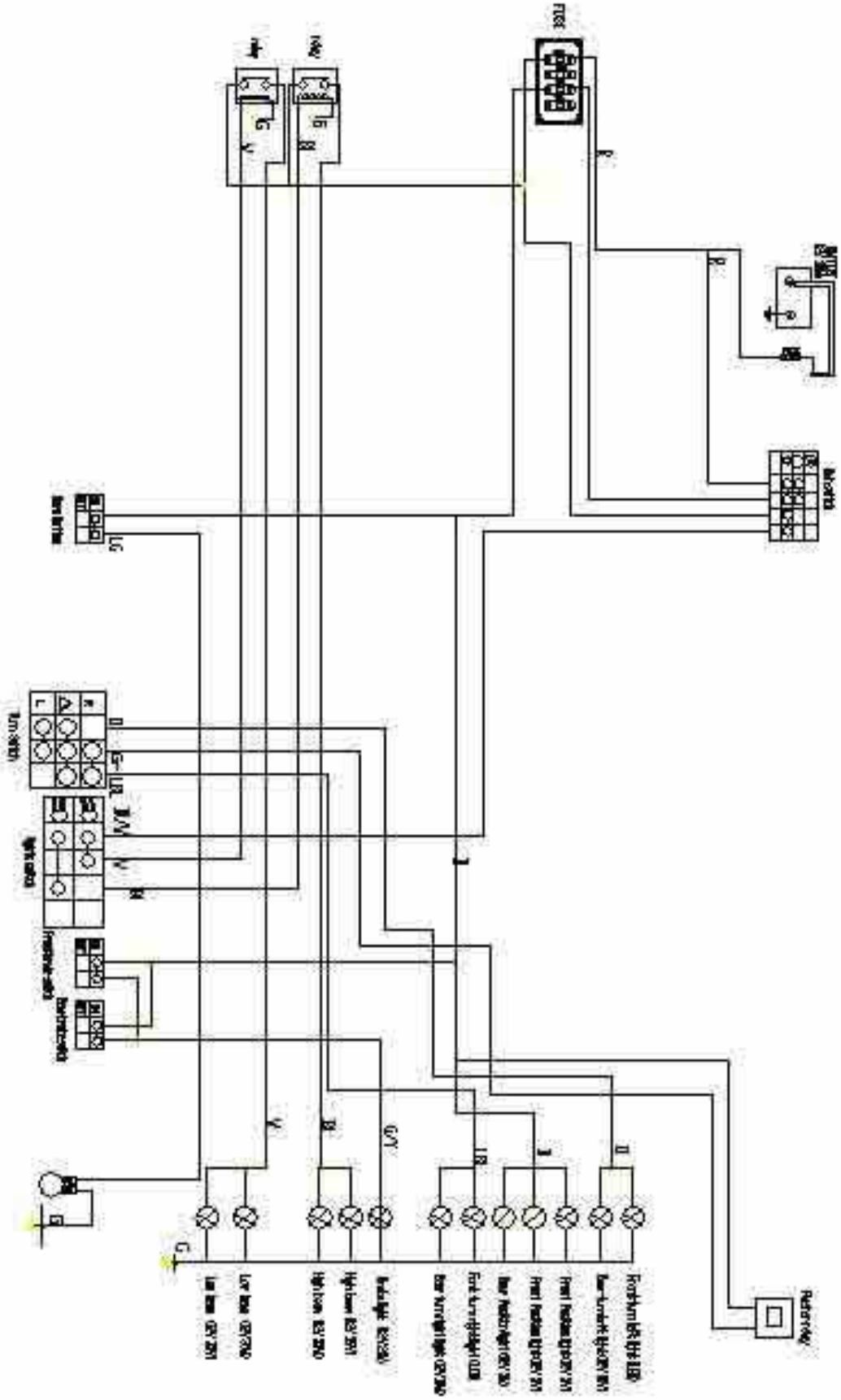
8.□ Wiring connection check the connections of the entire cooling system.
Refer to “CIRCUIT DIAGRAM”

POOR CONNECTION

CORRECT

Replace the temperature gauge

7.7 LIGHTING SYSTEM



TROUBLESHOOTING

Procedure

Check:

1. Fuse (Main)
2. Battery
3. Main switch
4. Lights switch
5. Dimmer switch
6. Wiring connection (entire lighting system)

1.fuse
refer to "CHECKING SWITCHES" section

NO CONTINUITY

Replace the fuse

2. Battery
Check the battery condition.
Refer to "BATTERY INSPECTION" section in CHAPTER 3

INCORRECT

Clean battery terminals
Recharge or replace the battery

3. Main switch

CHECK SWITCHES

NO CONTINUITY

Replace the main switch

4. Light switch

CHECK SWITCHES

NO CONTINUITY

Replace the right handlebar switch

5. Dimmer sw

CHECK SWITCHES

NO CONTINUITY

Replace the left handlebar switch

7. Wiring connection

Check the connection of the entire lighting system

POOR CONNECTIONS

correct

8. check the condition of each of the lighting system's circuits

Refer to "LIGHTING SYSTEM CHECK"

LIGHT SYSTEM CHECK

1. If the headlight and the high beam indicator light fail to come on

1.Blub and bulb socket

CHECK SWITCHES

NO CONTINUITY

Replace the bulb and/ or bulb socket

2. Voltage

Connect the pocket tester (DC20V) to the headlight and high beam indicator light couplers.

A When the dimmer switch is on low beam.

B When dimmer switch is on high beam

Headlight::

Tester (+) lead →White ①or Blue ②lead

Tester negative (-) lead →Green ③lead

Turn the main switch to on.

Turn the light switch to on position.

Turn the dimmer switch to low beam or high beam.

Check for voltage (12V) on the lead at bulb socket connectors

OUT OF SPECIFICATION

This circuit is not faulty

The wiring circuit from the main switch to

bulb socket connector is faulty.

Repair

2. the taillight fails to come on

1. Bulb and bulb socket

CHECK SWITCHES

NO CONTINUITY

Replace the bulb and /or bulb socket

CONTINUITY

2. Voltage

Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead→
Black terminal ①
Tester (-) lead→
Green terminal ②

Turn the main switch to on.

Turn the lights switch to on pilot position.

Check the voltage (12V) on the bulb socket connector

OUT OF SPECIFICATION

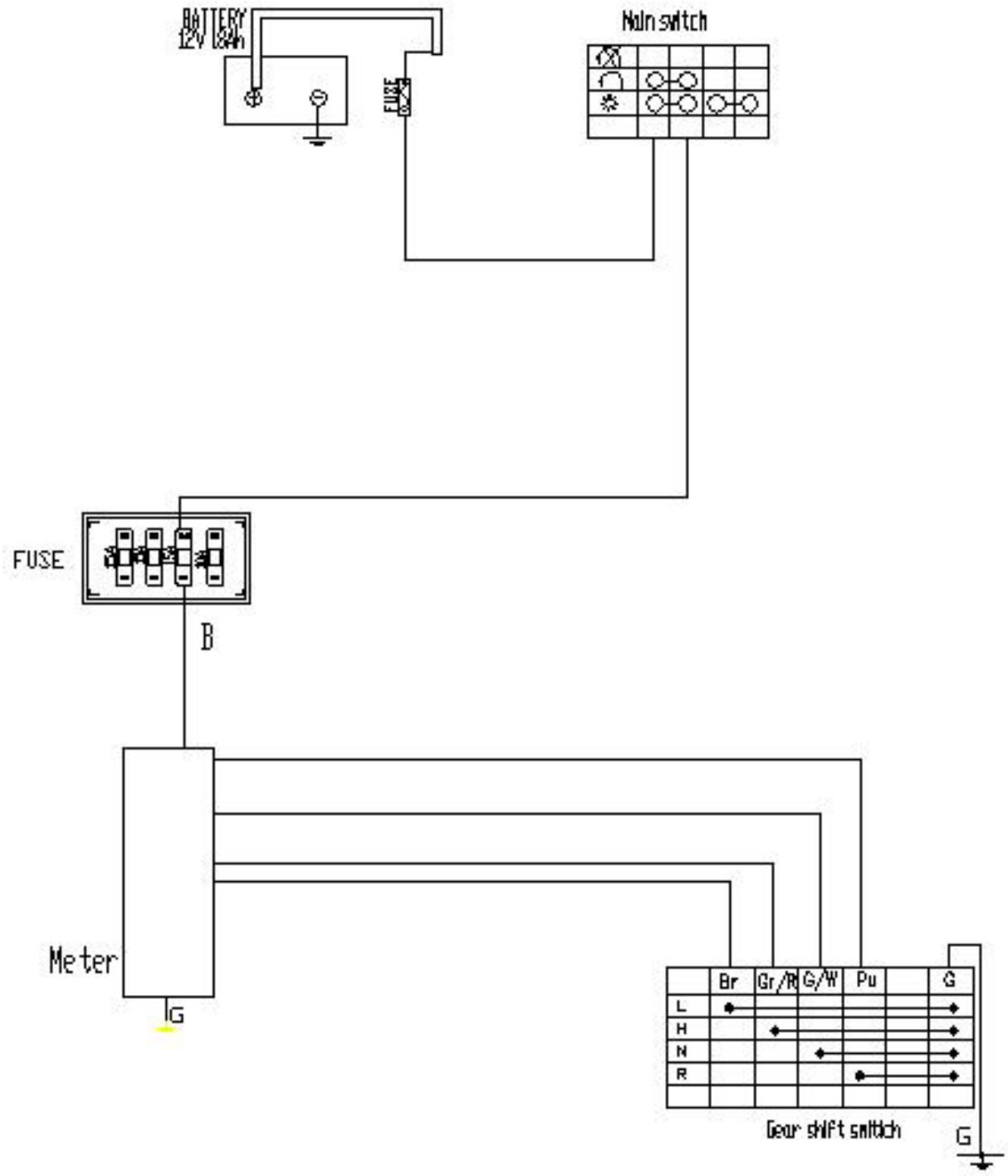
The wiring circuit from main switch to bulb connector of faulty.

Repair

This circuit is not faulty

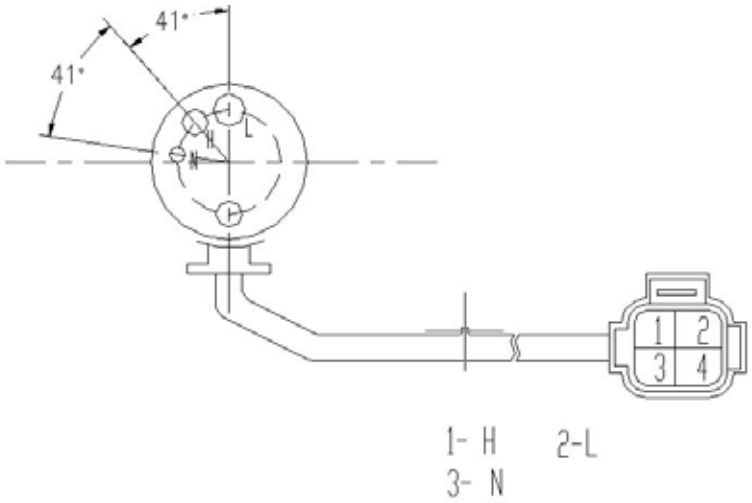
7.8 GEAR SHIFT SWITCH TEST

DIAGRAM



Switch table

	Gr/R	Br	G/W	Pu	G
High Range	○				○
Low Range		○			○
Neutral			○		○
Reverse				○	○



7.9 SPEEDMETER SYSTEM

OPERATION OF SPPED SENSOR

Speed Sensor is on the engine

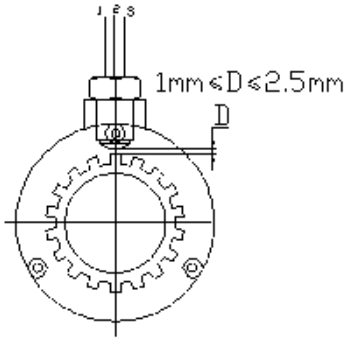
Operation Instructions of Electric Dial Meter and Speed Sensor/ Operation Instructions of LCD Meter and Speed Sensor

A. Hall Sensor is a new type sensor used to measure speed, angle, revolution and length, etc by means of voltage pulse signals converted from sensing gear ratio of black metal gear or gear rack.

B. Main Technical Parameter for sensor：

Item	Code	Vol value	Unit
Operating voltage	Vcc	5-20	V
Operating current	Icc	≤15	mA
Operating distance	D	1mm ≤ D ≤ 2.5mm	mm

C. The following is the graphic illustration for sensor installation, Wire 1 (red) is positive and wire 2 (black) negative, Wire 3 (yellow) works as the one to output signals.



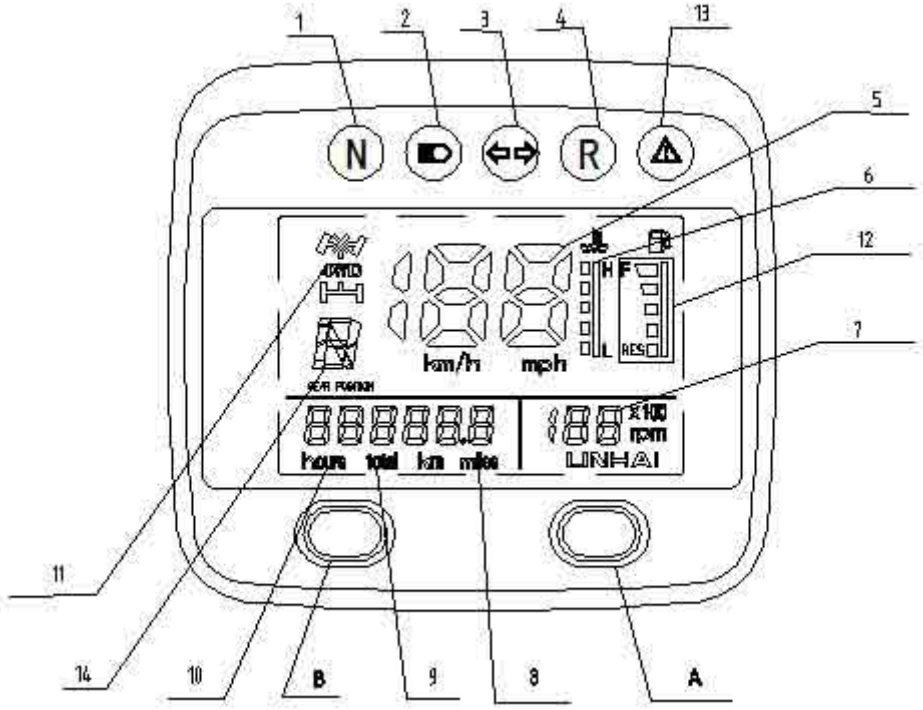
The following is the graphic illustration for sensor installation。

METER

Dial Meter

Item	Vol value	Unit
Operating voltage	10V~18V	V
Operating current	≤ 500mA	A
Operating Environmental temperature	-10□~65□	□
Battery warning voltage	≤11.5V	V

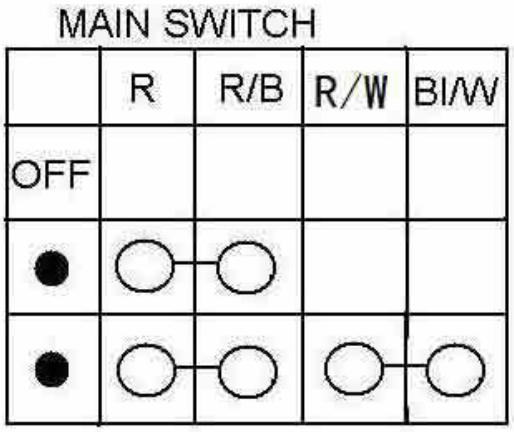
LCD Meter



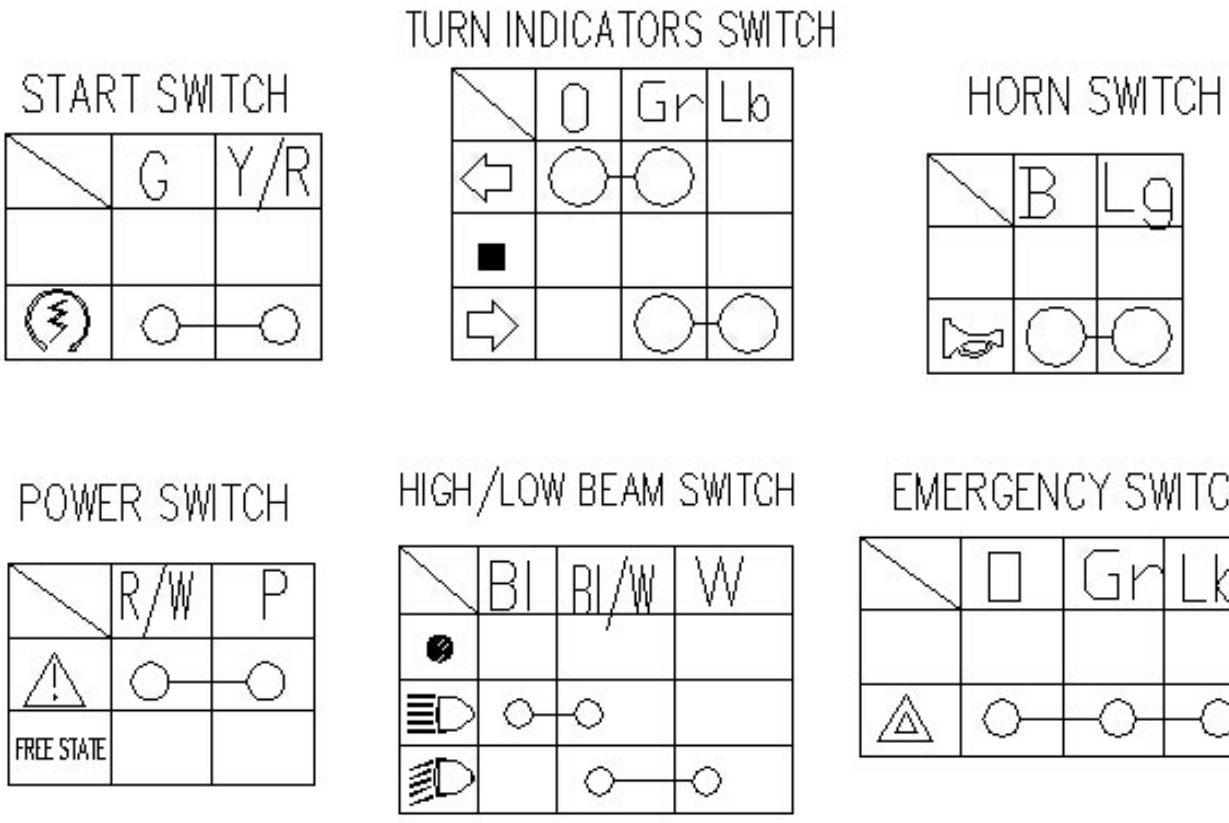
1. Neutral indicator light
2. High beam indicator light
3. Turn indicator light
4. Reverse indicator light
5. Speedometer
6. Coolant temperature meter
7. Engine rpm meter

8、9. The odometer
10.Engine working hour counter
11. 2WD/4WD indicator
A: km/ mile selector
B: hour / distance selector
12. Fuel gauge Indicator
13. Power Indicator
14.Gear position indicator

7.10 MAIN SWITCH AND HANDLE SWITCH



HANDLE SWITCH SCHEMATIC FOR EUROPE MODEL



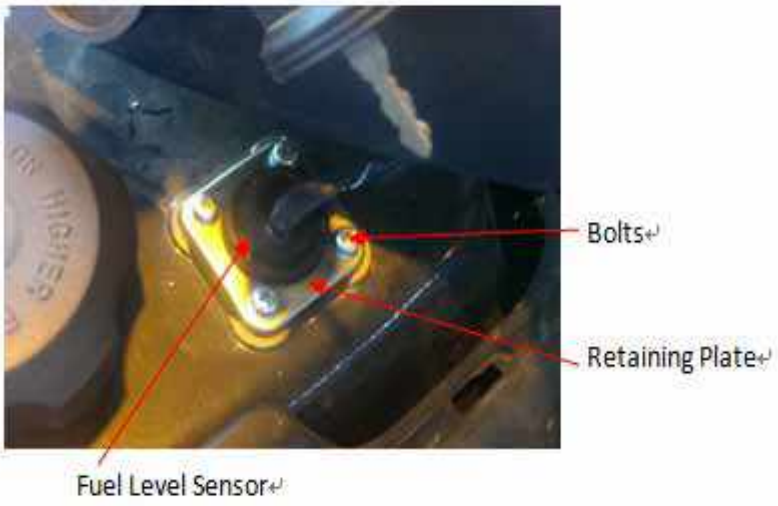
7.11 FUEL GAUGE/ FUEL LEVEL SENSOR

Removal

Turn the ignition switch to“OFF”.

Remove the fuel tank cover.

Remove the four bolts, retaining plate and fuel level sensor from the fuel tank.



Installation

Install a new seal rubber onto the fuel level sensor.

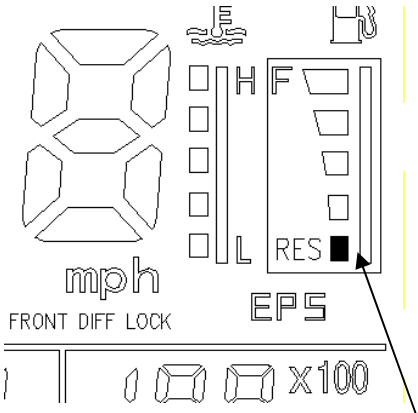
Install the retaining plate onto the sensor

Install and tighten the bolts securely.

Install the removed parts in the reverse order of removal.

Fuel Gauge / Fuel level Sensor Inspection

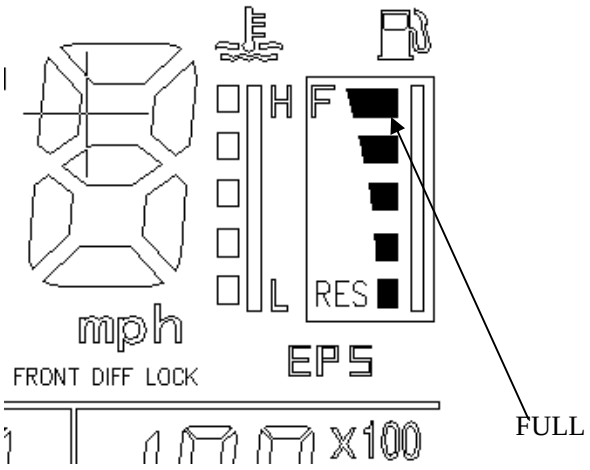
Move the float to the bottom (RESERVE) position, turn the ignition switch to “ ON ” and check the fuel gauge.



Segment“RES”should blink.

SEGMENT “RES”

With the fuel level sensor float at the top (FULL) position, turn the ignition switch to “ON” and check the fuel gauge. All segments up to segment “F”should come on.

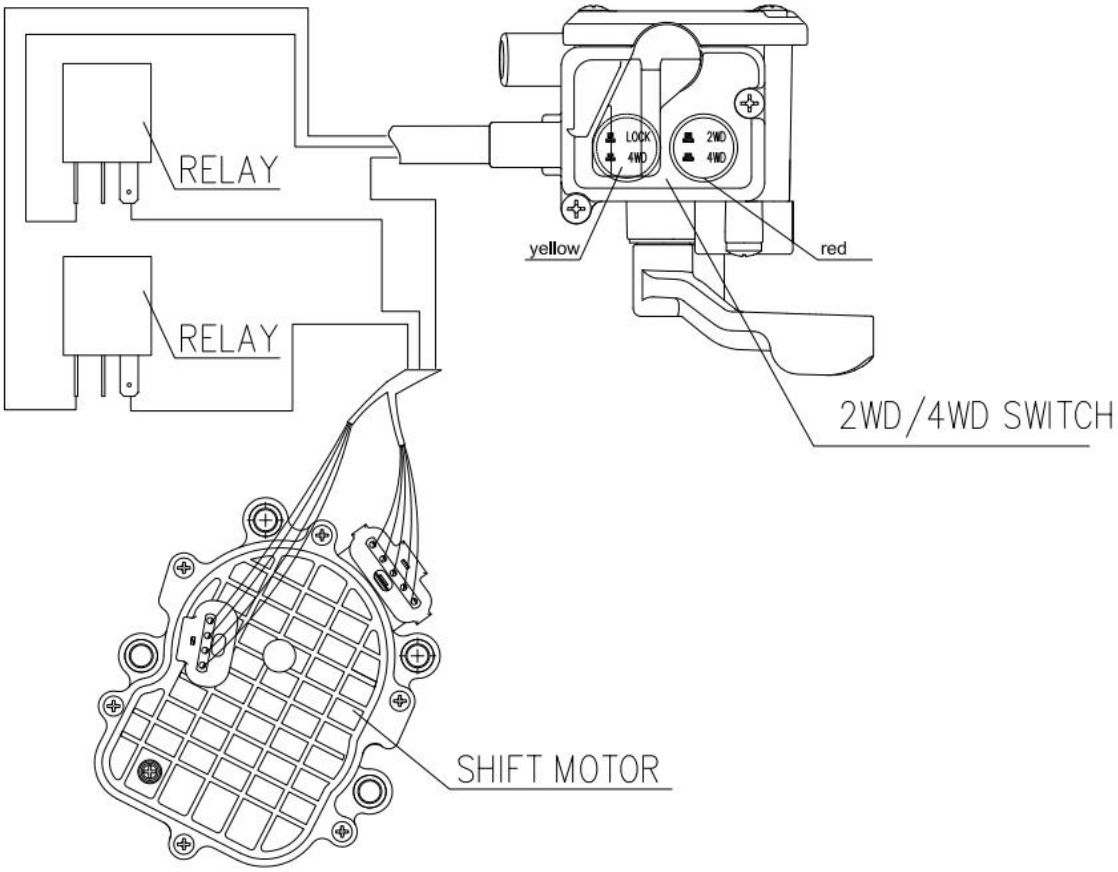


If the fuel gauge does not function properly, check the fuel level sensor
If the fuel level sensor is OK, replace the LCD Meter.

Fuel level Sensor Inspection
Disconnect the fuel level sensor 2p Green connector and connect the ohmmeter to the sensor side connector terminals.
Measure the fuel level sensor resistance with the float at the top (FULL)
And bottom (RESERVE) positions.

FLOAT POSITION	RESISTANCE(20℃/ 68°)
TOP(FULL)	4-10Ω
BOTTOM(RESERVE)	100-110Ω

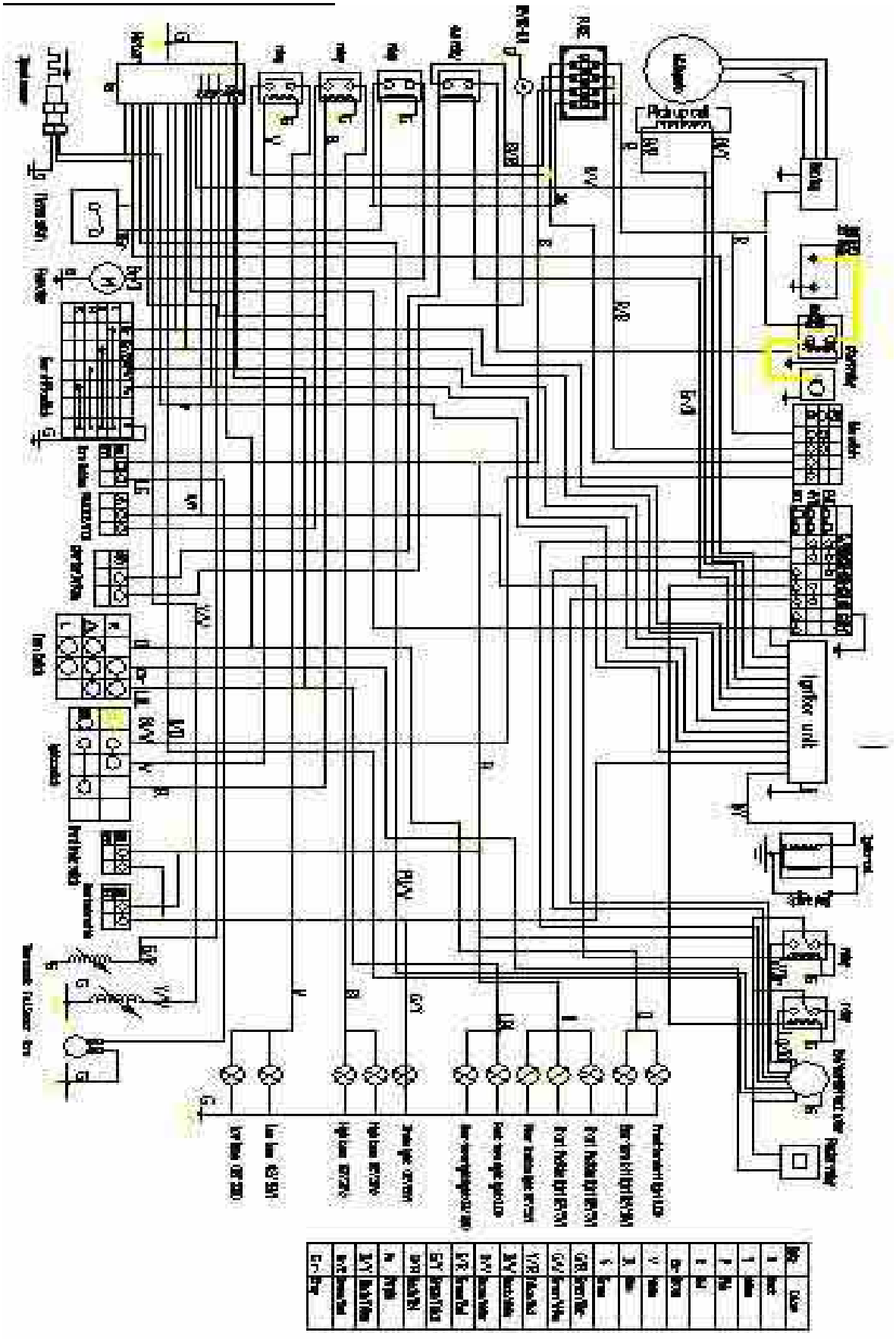
7.12 THE OPERATION PRINCIPLE OF THE ELECTRIC 4WD SHIFT



(Fig 1)

1, The rider shifts 2WD to 4WD by the Switch on handlebar.
2. When shift 2WD/ 4WD or Diff Lock, the mechanics in the front gear box maybe still engaged/ disengaged, the mechanics would finally disengaged/ engaged when rides on a hard surface or rides in reverse.
3. Always shift as the vehicle stop.

7.13 WIRING DIAGRAM



NOTES