By KWANG YANG Motor Co., Ltd.
First Edition, Apr 2005

4121-LCA5/LDE9-S00

PREFACE

This Service Manual describes the technical features and servicing procedures for the KYMCO ***MXU 300/25***0.

Section 1 contains the precautions for all operations stated in this manual. Read them carefully before starting any operation.

Section 2 is the removal/installation procedures for the frame covers which are subject to higher removal/installation frequency during maintenance and servicing operations.

Section 3 describes the inspection/ adjustment procedures, safety rules and service information for each part, starting from periodic maintenance.

Sections 4 through 19 give instructions for disassembly, assembly and inspection of engine, chassis frame and electrical equipment.

Most sections start with an assembly or system illustration and troubleshooting for the section. The subsequent pages give detailed procedures for the section.

The information and contents included in this manual may be different from the vehicle in case specifications are changed.

KWANG YANG MOTOR CO., LTD.
OVERSEAS SALES DEPARTMENT
OVERSEAS SERVICE SECTION

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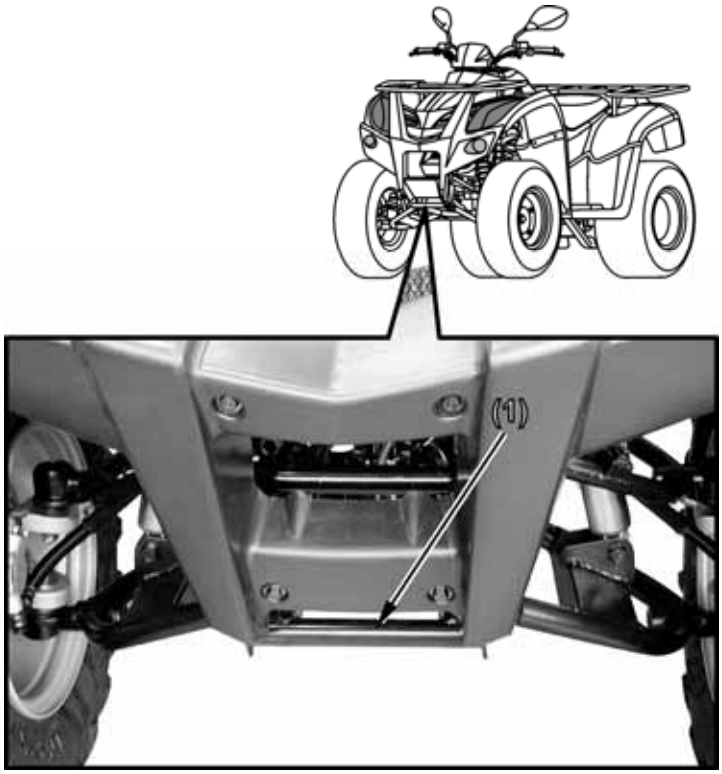
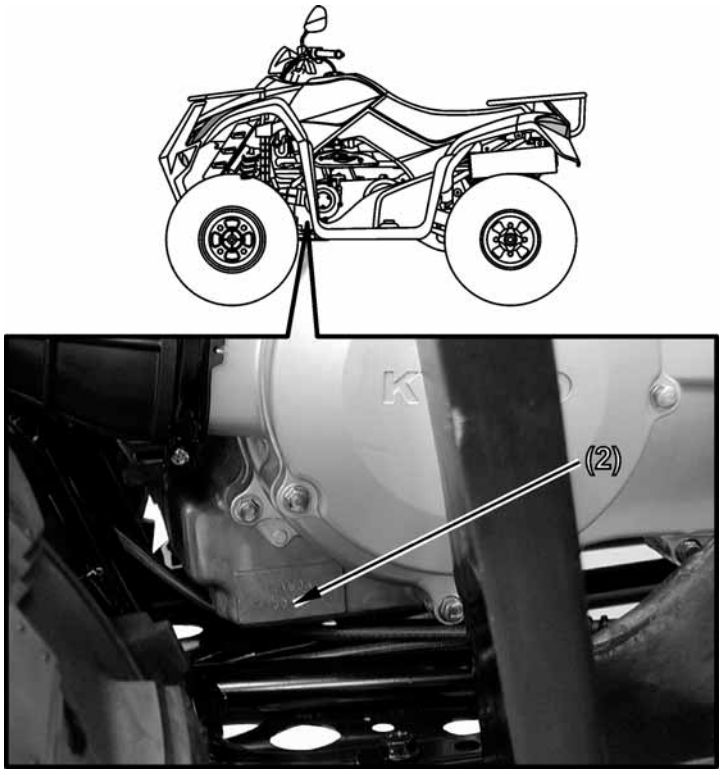
GENERAL INFORMATION

SERIAL NUMBER



(1) Location of Frame Serial Number



(2) Location of Engine Serial Number

SPECIFICATIONS (MXU 250)

Model No.			LB50
Name & Type			MXU 250
Overall length			1810 mm (72.4 in)
Overall width			1050 mm (42 in)
Overall height			1110 mm (44.4 in)
Wheel base			1170 mm (46.8 in)
Engine type			O.H.C.
Displacement			249 cm^3 (15.2 cu-in)
Fuel Used			92# nonleaded gasoline
Dry weight		Front wheel	112 kg (246 lbs)
		Rear wheel	102 kg (224 lbs)
		Total	214 kg (471 lbs)
Curb weight		Front wheel	116 kg (255 lbs)
		Rear wheel	110 kg (242 lbs)
		Total	226 kg (497 lbs)
Tires		Front wheel	22*7-10
		Rear wheel	22*10-10
Ground clearance			125 mm (5 in)
Min. turning radius			2900 mm (116 in)
Engine	Starting system		Electric/Recoil starter
	Type		Gasoline, 4-stroke
	Cylinder arrangement		Single cylinder
	Combustion chamber type		Semi-sphere
	Valve arrangement		O.H.C., chain drive
	Bore x stroke		72.7 x 60 mm (2.9 x 2.4 in)
	Compression ratio		10.3:1
	Compression pressure		15 kgf/cm² (1500kPa, 213 psi)
	Intake valve (at 1 mm lift)	Open	8.1° BTDC
		Close	41° ABDC
	Exhaust valve (at 1 mm lift)	Open	37° BBDC
		Close	7.9° ATDC
	Valve clearance (cold)	Intake	0.1 mm (0.004 in)
		Exhaust	0.1 mm (0.004 in)
	Idle speed (rpm)		1500rpm
	Lubrication System	Lubrication type	Forced pressure & Wet sump
		Oil pump type	Trochoid
		Oil filter type	Full-flow filtration
		Oil capacity	1.6 L (1.4 lmp qt, 1.7 Us qt)
		Oil exchanging capacity	1.4 L (1.23 lmp qt, 1.48 Us qt)
	Cooling Type		Liquid cooled

Fuel System	Air cleaner type & No		Wet type element
	Fuel capacity		12.5 L (2.63 lmp gal, 3.25 US gal
	Carburetor	Type	PTG
		Main jet NO.	98
		Venturi dia.	ϕ22 mm (ϕ0.88 in)
		Throttle type	PISTON
Electrical Equipment	Ignition System	Type	Full transistor digital ignition
		Ignition timing	5°BTDC/1000rpm
		Spark plug	DPR7EA-9
		Spark plug gap	0.6～0.7mm (0.002～0.003 in)
	Battery	Capacity	12V12AH
Drive Train	Clutch type		Dry, centrifugal automatic
	Clutch operation system		Automatic (V-belt)
	Primary reduction system		Helical gear/spur gear
	Secondary reduction system		Chain drive
	Primary reduction ratio		26.5
	Secondary reduction ratio		10.02
	Reverse ratio		50.9
Moving Device	FR/RR tire rolling circumference		1759/1759 mm (71.8/71.8 in)
	Tire pressure	Front	0.28 kg/cm² (28 Kpa, 3.2 psi)
		Rear	
	Turning angle	Left	40°
		Right	40°
Brake system type		Front	Disk brake
		Rear	Disk brake
Suspension type		Front	Double wishbone
		Rear	Link suspension
Frame type			Double cradle

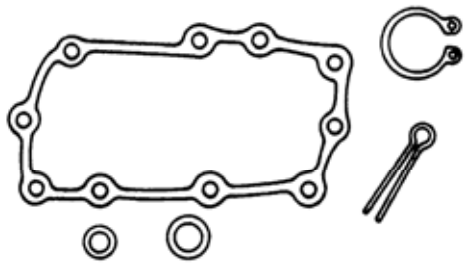
SPECIFICATIONS (MXU 300)

Model No.			LA60
Name & Type			MXU 300
Overall length			1810 mm (72.4 in)
Overall width			1030 mm (41.2 in)
Overall height			1100 mm (44 in)
Wheel base			1170 mm (46.8 in)
Engine type			O.H.C.
Displacement			270 cm^3 (16.2 cu-in)
Fuel used			92# nonleaded gasoline
Dry weight	Front wheel		110 kg (242 lbs)
	Rear wheel		110 kg (242 lbs)
	Total		220 kg (484 lbs)
Curb weight	Front wheel		115 kg (253 lbs)
	Rear wheel		110 kg (242 lbs)
	Total		225 kg (495 lbs)
Tires	Front wheel		22*7-10
	Rear wheel		22*10-10
Ground clearance			250 mm (10 in)
Min. turning radius			2900 mm (116 in)
Engine	Starting system		Electric/Recoil starter
	Type		Gasoline, 4-stroke
	Cylinder arrangement		Single cylinder
	Combustion chamber type		Semi-sphere
	Valve arrangement		O.H.C., chain drive
	Bore x stroke		72.7 x 65.2 mm (2.9 x 2.608 in)
	Compression ratio		10.3:1
	Compression pressure		16 kgf/cm² (1600kPa, 227 psi)
	Intake valve (at 1mm lift)	Opens	5° BTDC
		Closes	41° ABDC
	Exhaust valve (at 1mm lift)	Opens	37° BBDC
		Closes	5° ATDC
	Valve clearance (cold)	Intake	0.1 mm (0.004 in)
		Exhaust	0.1 mm (0.004 in)
	Idle speed (rpm)		1600 rpm
	Lubrication System: Lubrication type		Forced pressure & Wet sump
	Lubrication System: Oil pump type		Trochoid
	Lubrication System: Oil filter type		Full-flow filtration
	Lubrication System: Oil capacity		1.6 L (1.4 lmp qt, 1.7 Us qt)
	Lubrication System: Oil exchanging capacity		1.4 L (1.23 lmp qt, 1.48 Us qt)
	Cooling Type		Liquid cooled

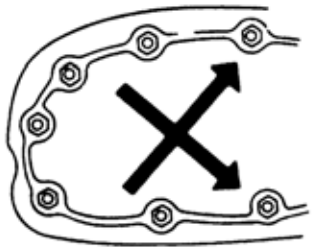
Fuel System	Air cleaner type & No		Wet type element
	Fuel capacity		12.5 L (2.63 lmp gal, 3.25 US gal
	Carburetor: Type		PTG
	Carburetor: Main jet NO.		98
	Carburetor: Venturi dia.		ϕ22 mm (ϕ0.88 in)
	Carburetor: Throttle type		PISTON
Electrical Equipment	Ignition System: Type		Full transistor digital ignition
	Ignition System: Ignition timing		5°BTDC/1500 rpm
	Ignition System: Spark plug		DPR7EA-9
	Ignition System: Spark plug gap		0.6～0.7mm (0.002～0.003 in)
	Battery	Capacity	12V12AH
Drive Train	Clutch type		Dry, centrifugal automatic
	Clutch operation system		Automatic (V-belt)
	Primary reduction system		Helical gear/spur gear/bevel gear
	Secondary reduction system		Driven mechanism
	High reduction ratio		2.01
	Low reduction ratio		3.84
	Reverse ratio		3.23
Moving Device	FR/RR tire rolling circumference		1756/1756 mm (70.24/70.24 in)
	Tire pressure	Front	0.28 kg/cm² (28 Kpa, 3.2 psi)
		Rear	
	Turning angle	Left	40°
		Right	40°
Brake system type		Front	Disk brake
		Rear	Disk brake
Suspension type		Front	Double wishbone
		Rear	Link suspension
Frame type			Double cradle

SERVICE PRECAUTIONS

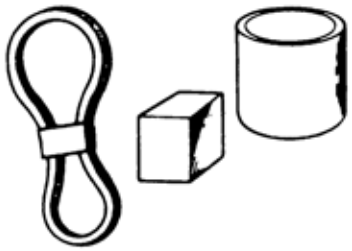
■ Make sure to install new gaskets, O-rings, circlips, cotter pins, etc. when reassembling.



■ When tightening bolts or nuts, begin with larger-diameter to smaller ones at several times, and tighten to the specified torque diagonally.

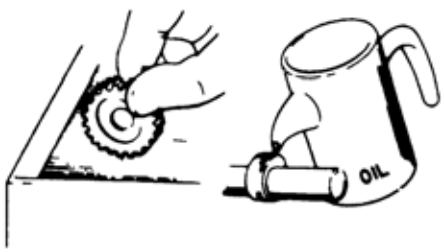


■ Use genuine parts and lubricants.

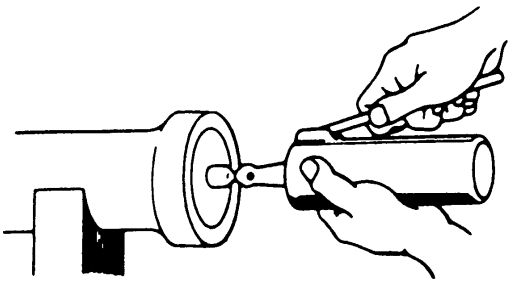


■ When servicing the motorcycle, be sure to use special tools for removal and installation.

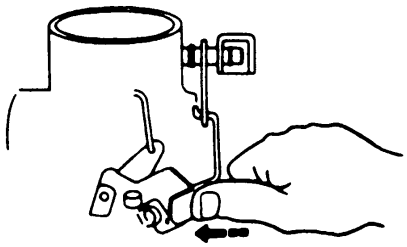
■ After disassembly, clean removed parts. Lubricate sliding surfaces with engine oil before reassembly.



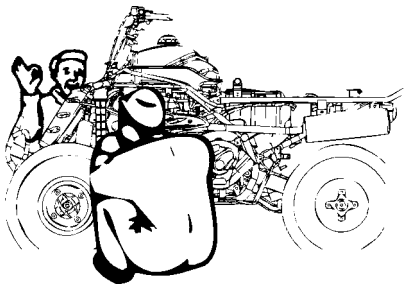
■ Apply or add designated greases and lubricants to the specified lubrication points.



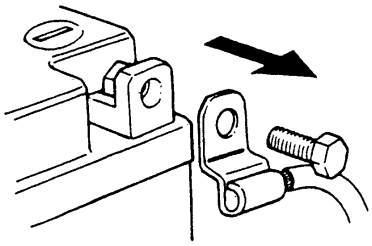
■ After reassembly, check all parts for proper tightening and operation.



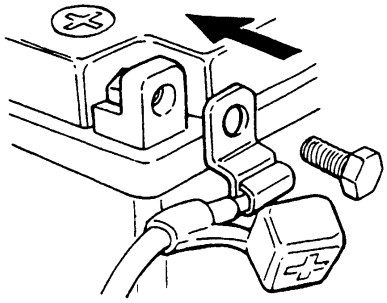
■ When two persons work together, pay attention to the mutual working safety.



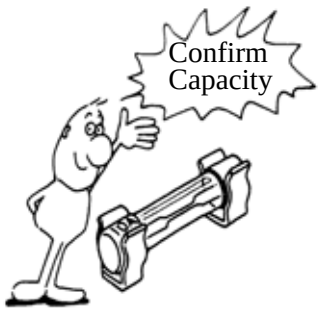
■ Disconnect the battery negative (-) terminal before operation.
■ When using a spanner or other tools, make sure not to damage the motorcycle surface.



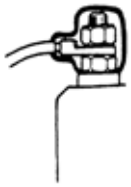
■ After operation, check all connecting points, fasteners, and lines for proper connection and installation.
■ When connecting the battery, the positive (+) terminal must be connected first.
■ After connection, apply grease to the battery terminals.
■ Terminal caps shall be installed securely.



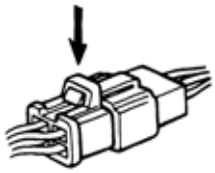
■ If the fuse is burned out, find the cause and repair it. Replace it with a new one according to the specified capacity.



■ After operation, terminal caps shall be installed securely.

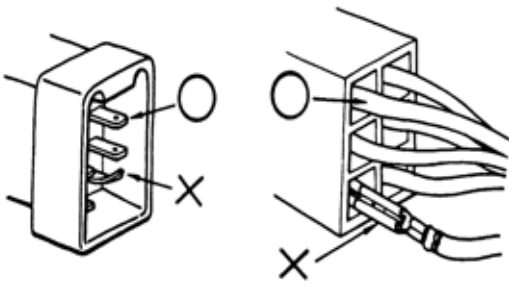


■ When taking out the connector, the lock on the connector shall be released before operation.

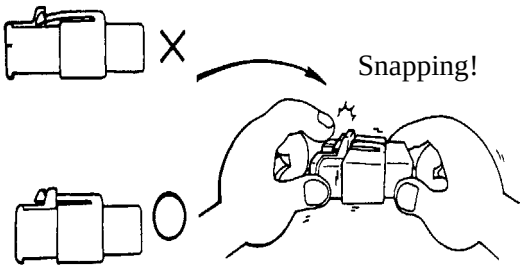


■ Hold the connector body when connecting or disconnecting it.
■ Do not pull the connector wire.

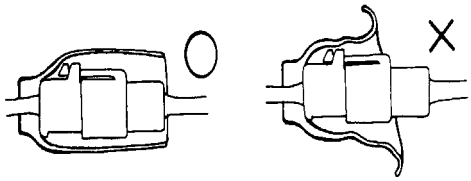
■ Check if any connector terminal is bending, protruding or loose.



- The connector shall be inserted completely.
- If the double connector has a lock, lock it at the correct position.
- Check if there is any loose wire.

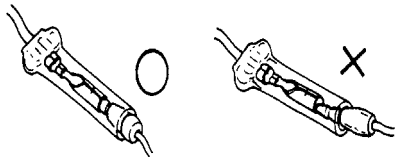


- Before connecting a terminal, check for damaged terminal cover or loose negative terminal.

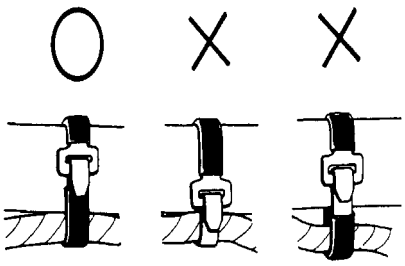


- Check the double connector cover for proper coverage and installation.

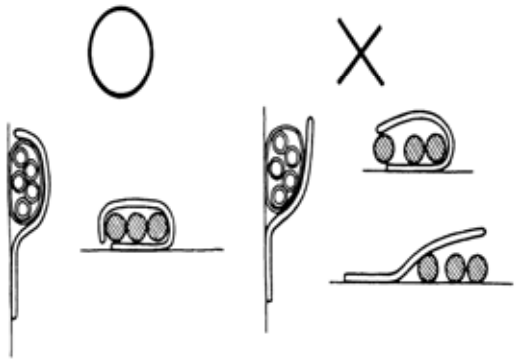
- Insert the terminal completely.
- Check the terminal cover for proper coverage.
- Do not make the terminal cover opening face up.



- Secure wire harnesses to the frame with their respective wire bands at the designated locations.
  Tighten the bands so that only the insulated surfaces contact the wire harnesses.

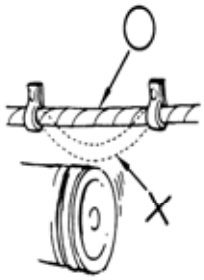


■ After clamping, check each wire to make sure it is secure.

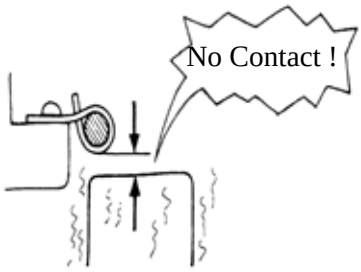


■ Do not squeeze wires against the weld or its clamp.

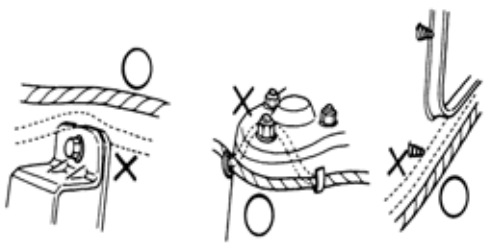
■ After clamping, check each harness to make sure that it is not interfering with any moving or sliding parts.



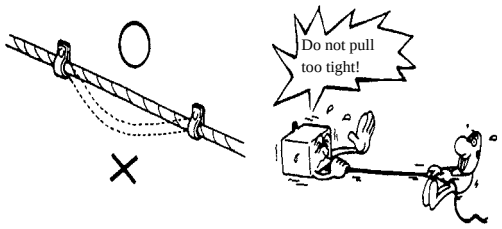
■ When fixing the wire harnesses, do not make it contact the parts which will generate high heat.



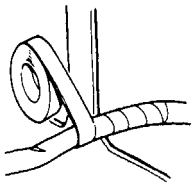
■ Route wire harnesses to avoid sharp edges or corners. Avoid the projected ends of bolts and screws.
■ Route wire harnesses passing through the side of bolts and screws. Avoid the projected ends of bolts and screws.



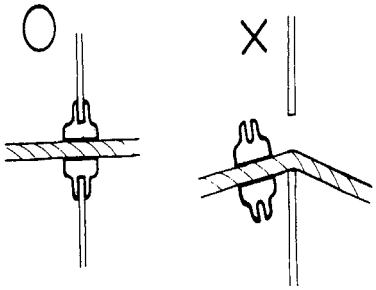
■ Route harnesses so they are neither pulled tight nor have excessive slack.



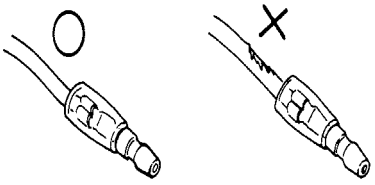
■ Protect wires and harnesses with electrical tape or tube if they contact a sharp edge or corner.



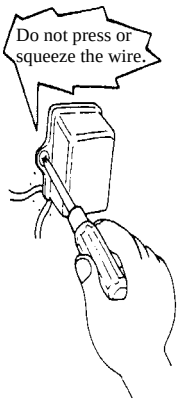
■ When rubber protecting cover is used to protect the wire harnesses, it shall be installed securely.



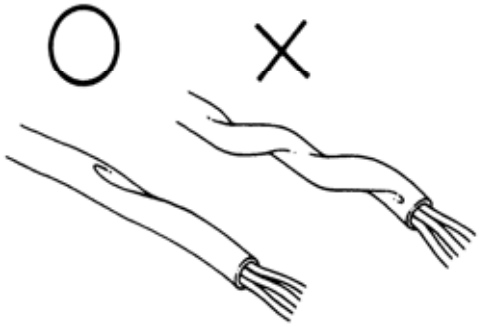
■ Do not break the sheath of wire.
■ If a wire or harness is with a broken sheath, repair by wrapping it with protective tape or replace it.



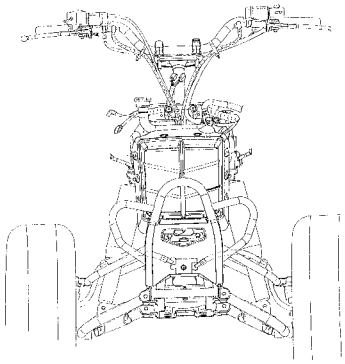
■ When installing other parts, do not press or squeeze the wires.



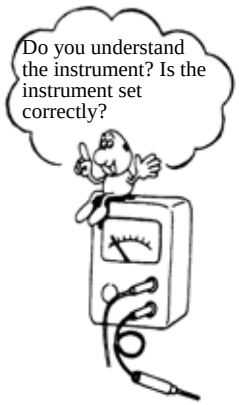
■ After routing, check that the wire harnesses are not twisted or kinked.



■ Wire harnesses routed along with handlebar should not be pulled tight, have excessive slack or interfere with adjacent or surrounding parts in all steering positions.



■ When a testing device is used, make sure to understand the operating methods thoroughly and operate according to the operating instructions.



■ Be careful not to drop any parts.

■ When rust is found on a terminal, remove the rust with sand paper or equivalent before connecting.

■ Symbols:

The following symbols represent the servicing methods and cautions included in this service manual.


Engine Oil

: Apply engine oil to the specified points. (Use designated engine oil for lubrication.)


Grease

: Apply grease for lubrication.


Gear Oil

: Transmission Gear Oil (90#)

: Caution

: Warning

TORQUE VALUES

STANDARD TORQUE VALUES

Item	Torque kgf-m (N-m, lbf-ft)	Item	Torque kgf-m (N-m, lbf-ft)
5mm bolt and nut	0.5 (5, 3.6)	4mm screw	0.3 (3, 2.2)
6mm bolt and nut	1 (10, 7.2)	5mm screw	0.4 (4, 2.9)
8mm bolt and nut	2.2 (22, 16)	6mm screw, SH bolt	0.9 (9, 6.5)
10mm bolt and nut	3.5 (35, 25)	6mm flange bolt and nut	1.2 (12, 9)
12mm bolt and nut	5.5 (55, 40)	8mm flange bolt and nut	2.7 (27, 20)
14mm bolt and nut	7 (70, 50)	10mm flange bolt and nut	4 (40, 29)

Torque specifications listed below are for important fasteners.

ENGINE

Item	Q'ty	Thread dia. (mm)	Torque kgf-m (N-m, lbf-ft)	Remarks
Stud bolt	4	8	0.9 (9, 6.5)	
Oil filter screen cap	1	30	1.5 (15, 11)	
Seat ball stopper bolt	1	14	4.8 (48, 35)	
L cover bolt	10	6	1.2 (12, 8.6)	
Cam shaft holder nut	4	8	2.5 (25, 18)	Apply oil
Tappet ADJ nut	2	5	0.9 (9, 6.5)	Apply oil
Pivot tensioner bolt	1	8	1 (10, 7.2)	
Lifter tensioner bolt	2	6	1.2 (12, 8.6)	
Lifter tensioner cap	1	6	0.4 (4, 2.9)	
Mission case bolt	9	8	2.7 (27, 20)	
Mission fill and drain bolt	2	12	2 (20, 15)	
Driver face nut	1	14	9.5 (95, 68)	Apply oil
Clutch outer nut	1	12	5.5 (55, 40)	
Drive plate nut	1	28	5.5 (55, 40)	
ACG flywheel nut	1	14	6 (60, 43)	
Spark plug	1	12	1.8 (18, 13)	
Water pump impeller	1	7	1.2 (12, 8.6)	Left thread
Oil drain plug	1	12	2.5 (25, 18)	
Oil pump screw	1	3	0.2 (2, 1.5)	
Head CYL stud bolt (IN pipe)	2	6	0.9 (9, 6.5)	
Head CYL stud bolt (EX pipe)	2	8	0.9 (9, 6.5)	
A.C.G Startor	3	5	0.9 (9, 6.5)	
Drive bevel gear nut (MXU 300)	1	18	10 (100, 72)	
Driven bevel gear nut (MXU 300)	1	16	10 (100, 72)	

FRAME

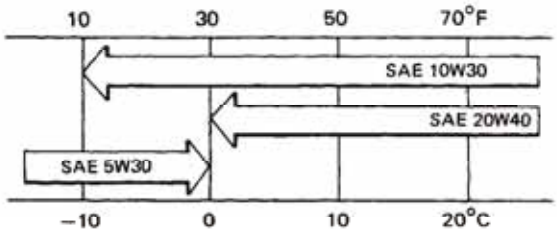
Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, lbf-ft)	Remarks
Steering stem nut	1	14	7 (70, 50)	
Front swing arm nut	8	10	4.5 (45, 32)	
Knuckle ball joint nut	4	12	3 (30, 22)	Castle nut
Tie-rod ball joint nut	4	10	2 (20, 15)	Castle nut
Front wheel nut	8	12	4.5 (45, 32)	
Rear wheel nut	8	12	4.5 (45, 32)	
Front wheel hub nut	2	14	7 (70, 50)	Castle nut
Rear wheel hub nut	2	16	10 (100, 72)	Castle nut
Front shock absorber upper mount bolt	2	10	4 (40, 29)	
Front shock absorber lower mount bolt	2	10	4 (40, 29)	
Rear shock absorber upper mount bolt	1	10	4 (40, 29)	
Rear shock absorber lower mount bolt	1	10	4 (40, 29)	
Right pivot bolt (MXU 300)	1	30	11.8 (118, 85)	
Left pivot bolt (MXU 300)	1	30	1.1 (11, 8)	
Left pivot lock nut (MXU 300)	1	30	11.8 (118, 85)	
Final gear case mounting bolt	8	10	5.5 (55, 40)	
Axle hub holding bolt (MXU 250)	1	10	4 (40, 29)	
Caliper holder bolt (MXU 250)	1	6	1 (10, 7.2)	
Rear wheel shaft nut (MXU 250)	2	40	12 (120, 86)	
Rear swingarm pivot bolt (MXU 250)	1	14	7 (70, 50)	
Rear engine upper mounting bolt	1	10	4 (40, 29)	
Rear engine lower mounting bolt	1	10	4 (40, 29)	
Front engine mounting bolt	1	10	4 (40, 29)	
Exhaust muffler lock bolt (frame)	2	8	3.5 (35, 25)	
Exhaust muffler lock nut (engine)	2	8	3.5 (35, 25)	
Brake caliper mounting bolt	8	8	3.2 (32, 24)	
Brake hose oil bolt	10	10	3.5 (35, 25)	
Master cylinder holder bolt	4	6	1.2 (12, 8.6)	

SPECIAL TOOLS

Tool Name	Tool No.	Remarks
Flywheel puller	E003	Flywheel removal
Valve adjuster	E012	Valve clearance adjustment
Valve spring compressor	E040	Cylinder head disassembly
Oil seal and bearing install	E014	
Universal holder	E017	Drive face/Clutch outer removal/installation
Flywheel holder	E021	Flywheel removal
Clutch spring compressor	E034	Driven pulley disassembly
Bearing puller	E037	
Nut wrench (MXU 300)	F013	Left pivot lock nut removal/installation
Pinion puller set (MXU 300)	F014	Pinion/Bearing removal
Lock nut wrench (MXU 300)	F015	Pinion bearing nut removal
Nut wrench (MXU 250)	F010	Rear axle nut removal/installation
Ball join remover	F012	Knuckle removal

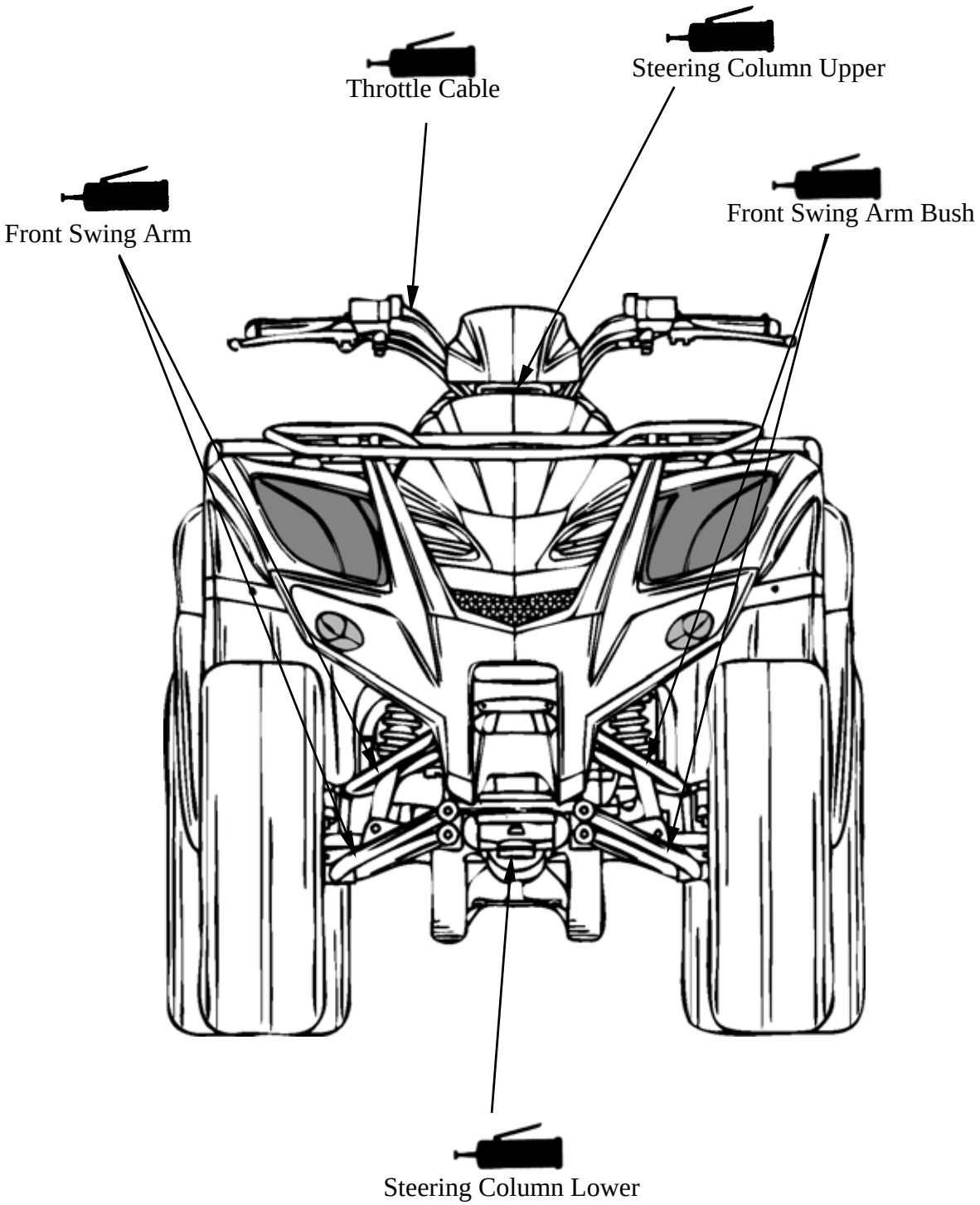
LUBRICATION POINTS

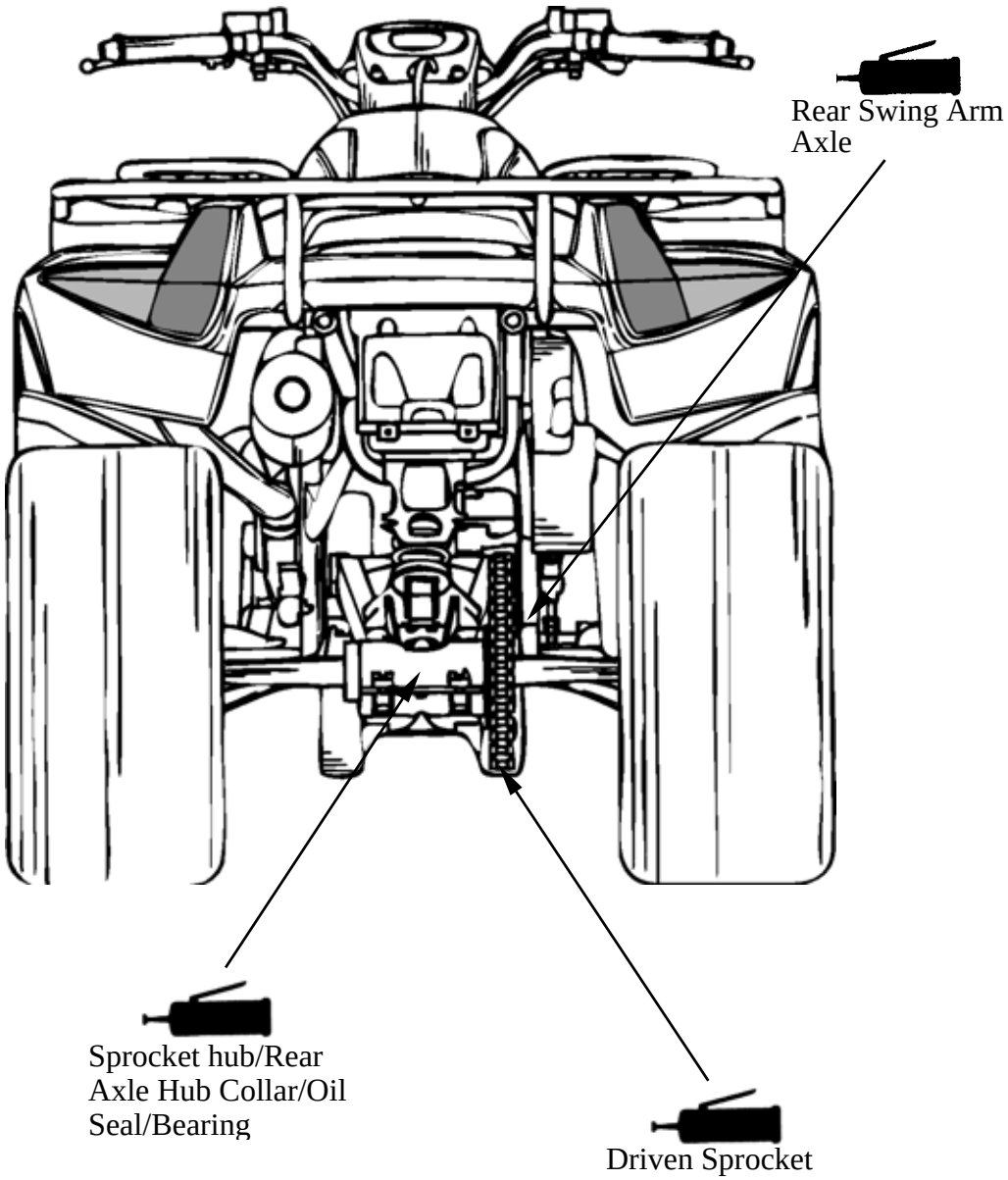
ENGINE

Lubrication Points	Lubricant
Valve guide/valve stem movable part Cam lobes Valve rocker arm friction surface Cam chain Cylinder lock bolt and nut Piston surroundings and piston ring grooves Piston pin surroundings Cylinder inside wall Connecting rod/piston pin hole Connecting rod big end Crankshaft right side oil seal Crankshaft one-way clutch movable part Oil pump drive chain Balance gear A.C. generator Starter one-way clutch Bearing movable part O-ring face Oil seal lip	•Genuine KYMCO Engine Oil (SAE10W-30) •API SG Engine Oil 
Transmission gear and rear driving mechanism	Gear oil: SAE90#

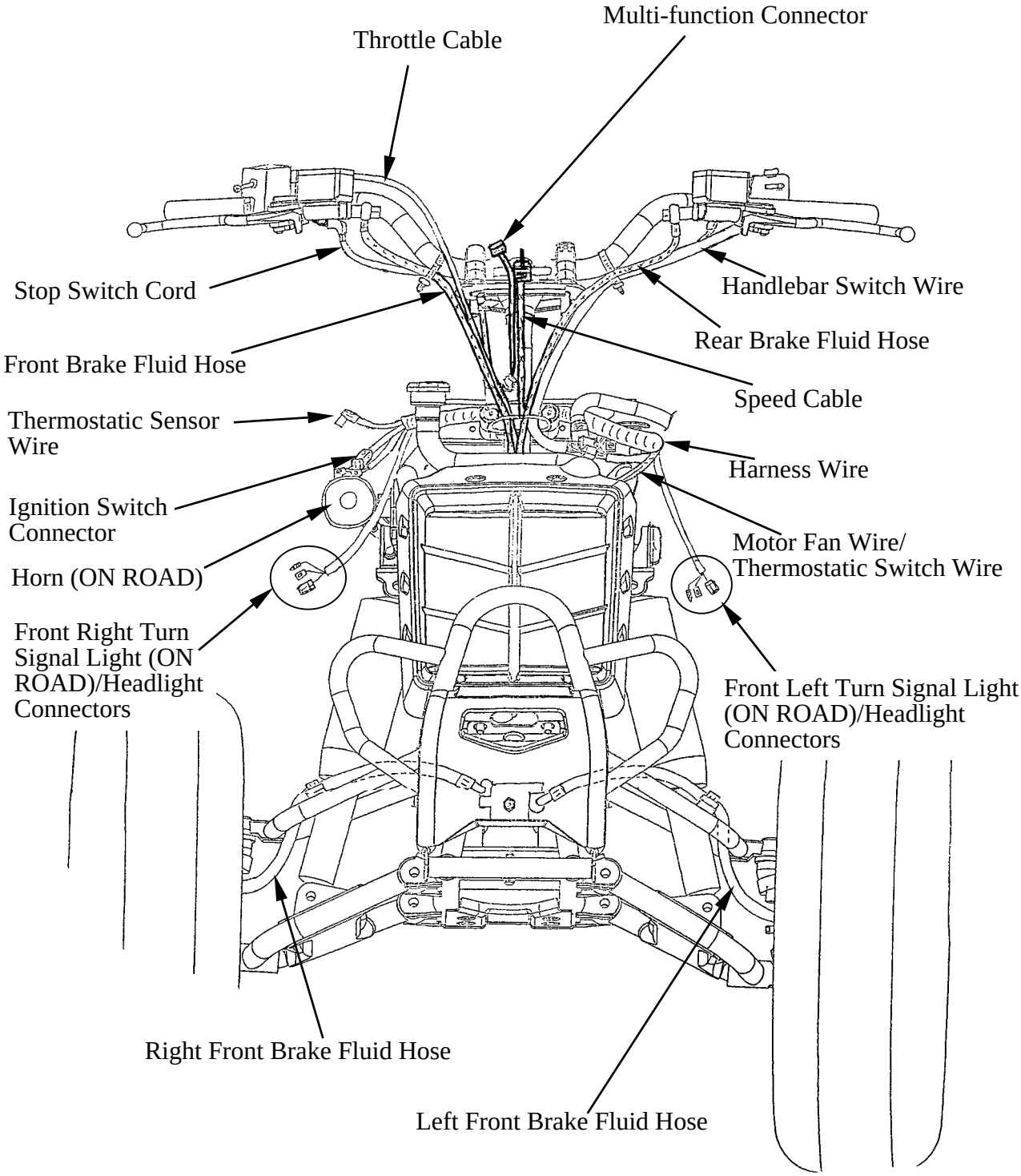
FRAME

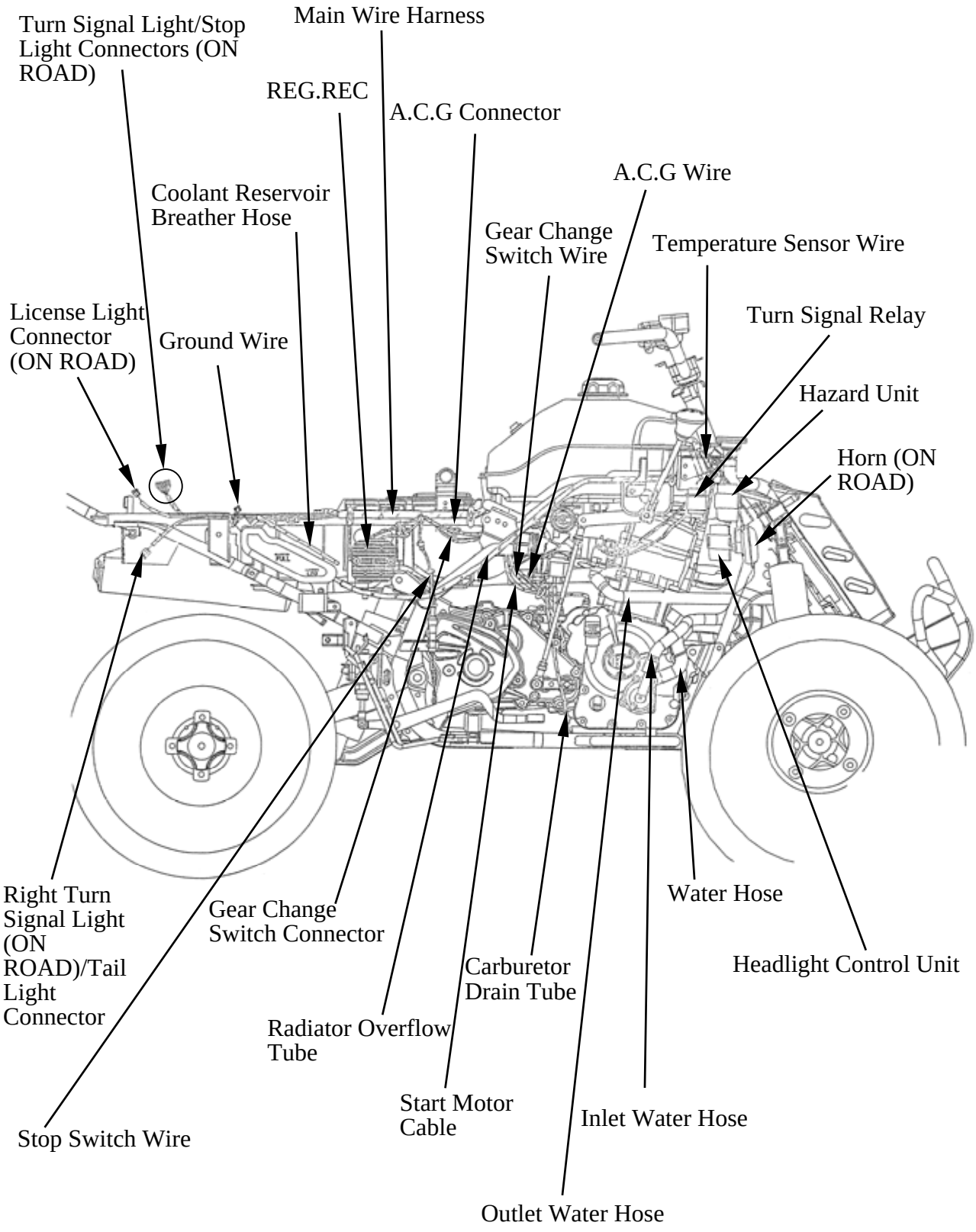
The following is the lubrication points for the frame.
Use general purpose grease for parts not listed.
Apply clean engine oil or grease to cables and movable parts not specified. This will avoid abnormal noise and rise the durability of the ATV.

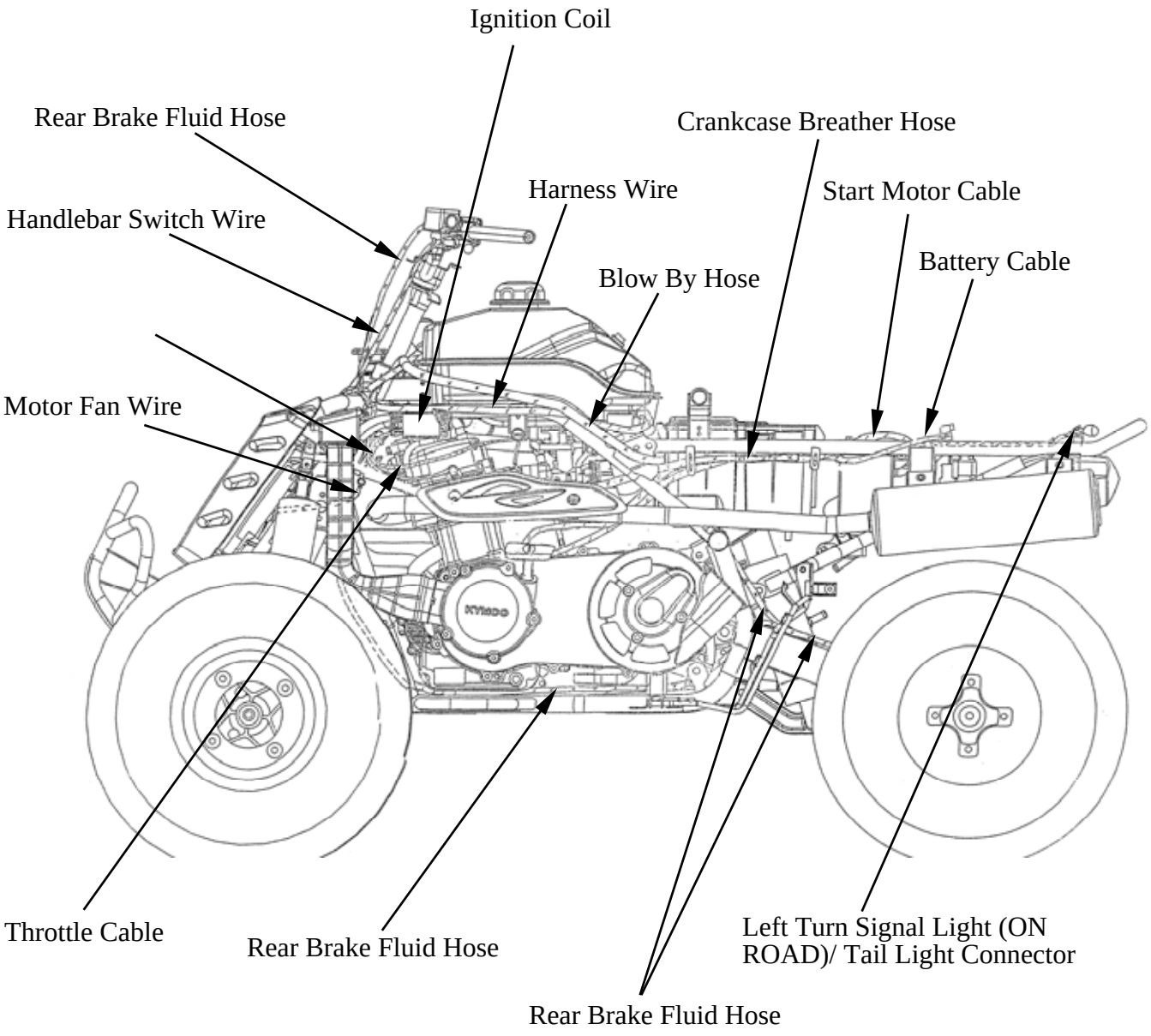


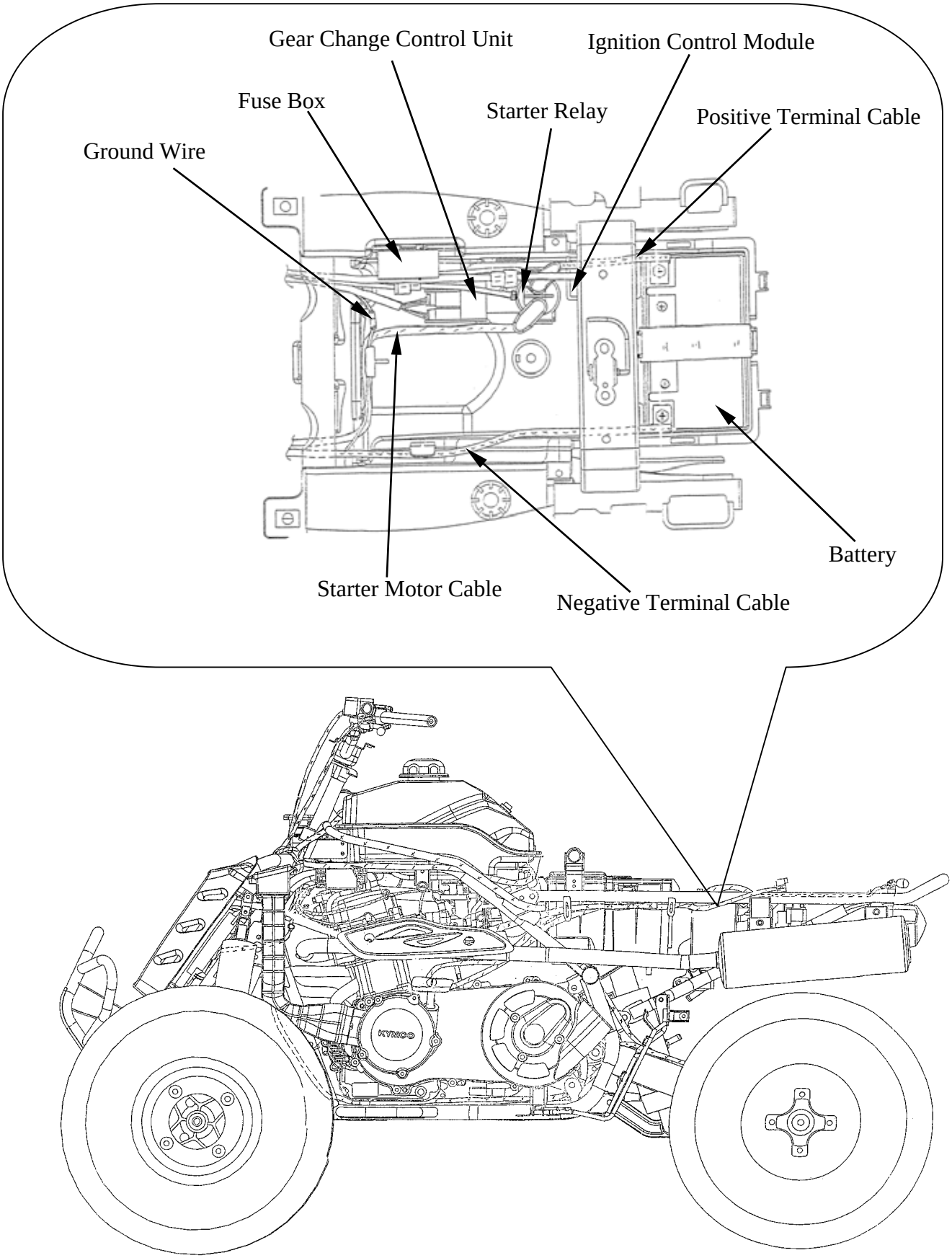

Rear Swing Arm Axle
Sprocket hub/Rear Axle Hub Collar/Oil Seal/Bearing
Driven Sprocket

CABLE & HARNESS ROUTING

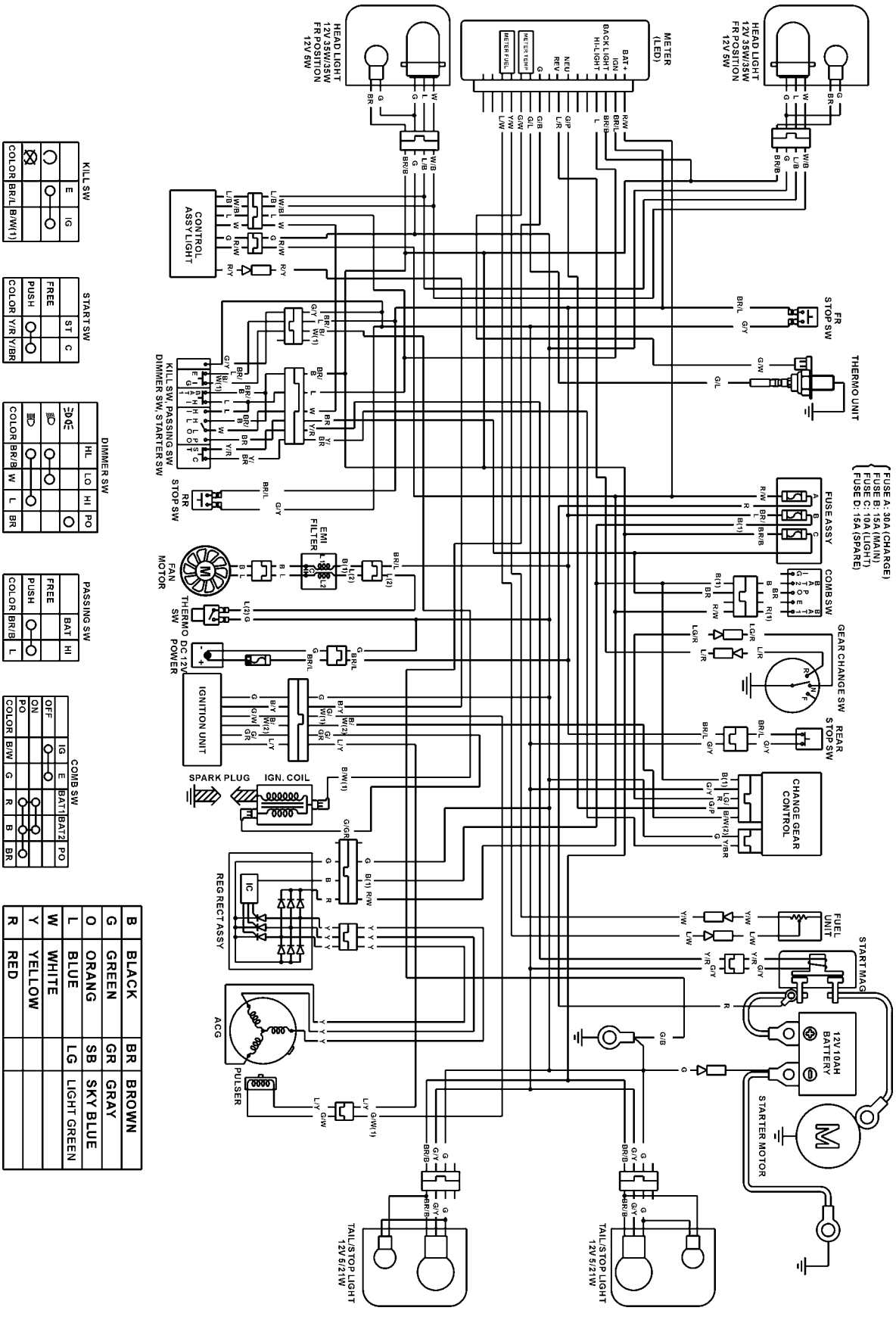



Turn Signal Light/Stop Light Connectors (ON ROAD)
Main Wire Harness
REG.REC
A.C.G Connector
A.C.G Wire
Coolant Reservoir Breather Hose
Gear Change Switch Wire
Temperature Sensor Wire
License Light Connector (ON ROAD)
Ground Wire
Turn Signal Relay
Hazard Unit
Horn (ON ROAD)
Right Turn Signal Light (ON ROAD)/Tail Light Connector
Gear Change Switch Connector
Water Hose
Headlight Control Unit
Carburetor Drain Tube
Radiator Overflow Tube
Start Motor Cable
Inlet Water Hose
Stop Switch Wire
Outlet Water Hose

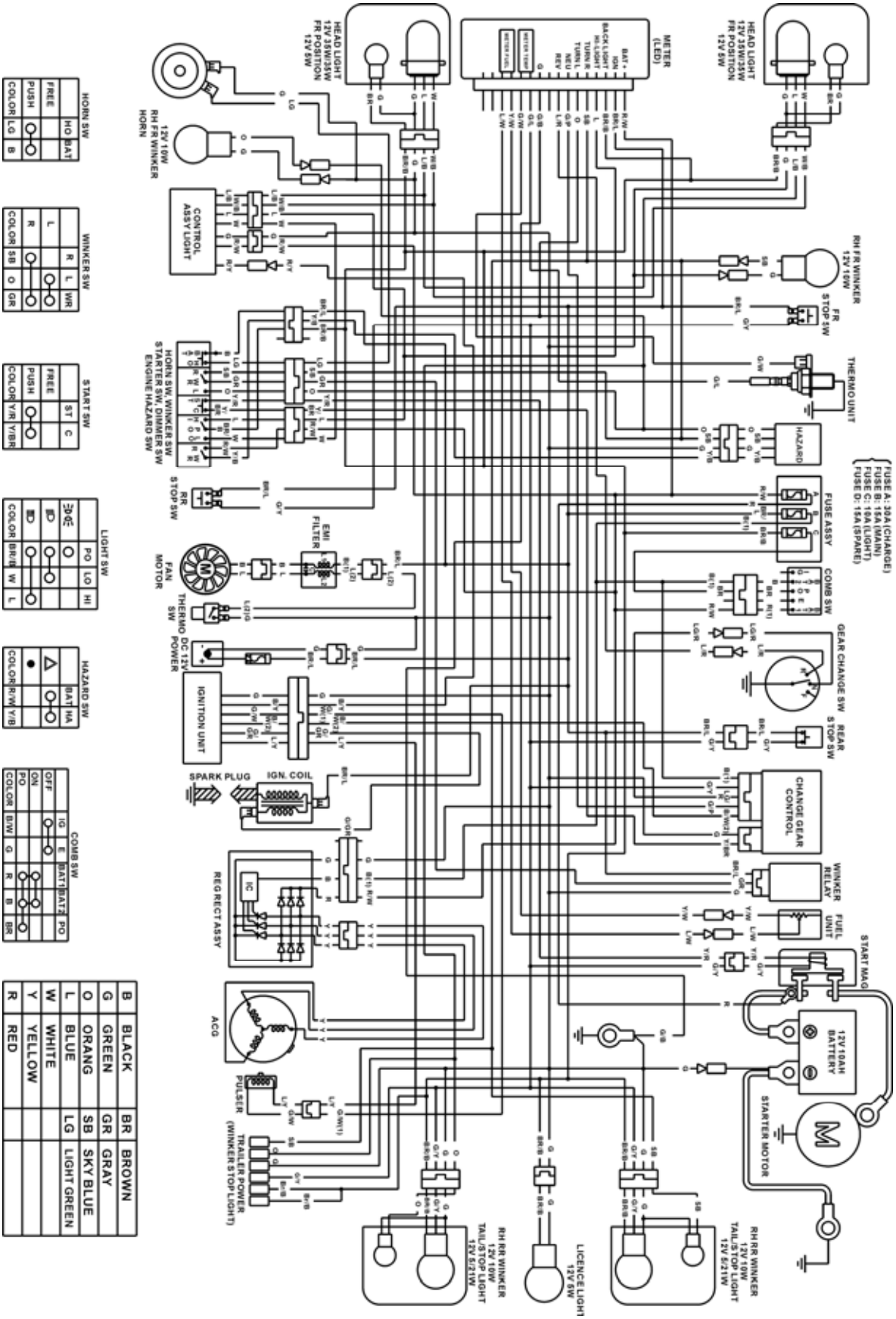

Ignition Coil
Rear Brake Fluid Hose
Crankcase Breather Hose
Harness Wire
Start Motor Cable
Handlebar Switch Wire
Battery Cable
Blow By Hose
Motor Fan Wire
Throttle Cable
Rear Brake Fluid Hose
Left Turn Signal Light (ON ROAD)/ Tail Light Connector
Rear Brake Fluid Hose


Gear Change Control Unit
Ignition Control Module
Fuse Box
Starter Relay
Positive Terminal Cable
Ground Wire
Battery
Starter Motor Cable
Negative Terminal Cable

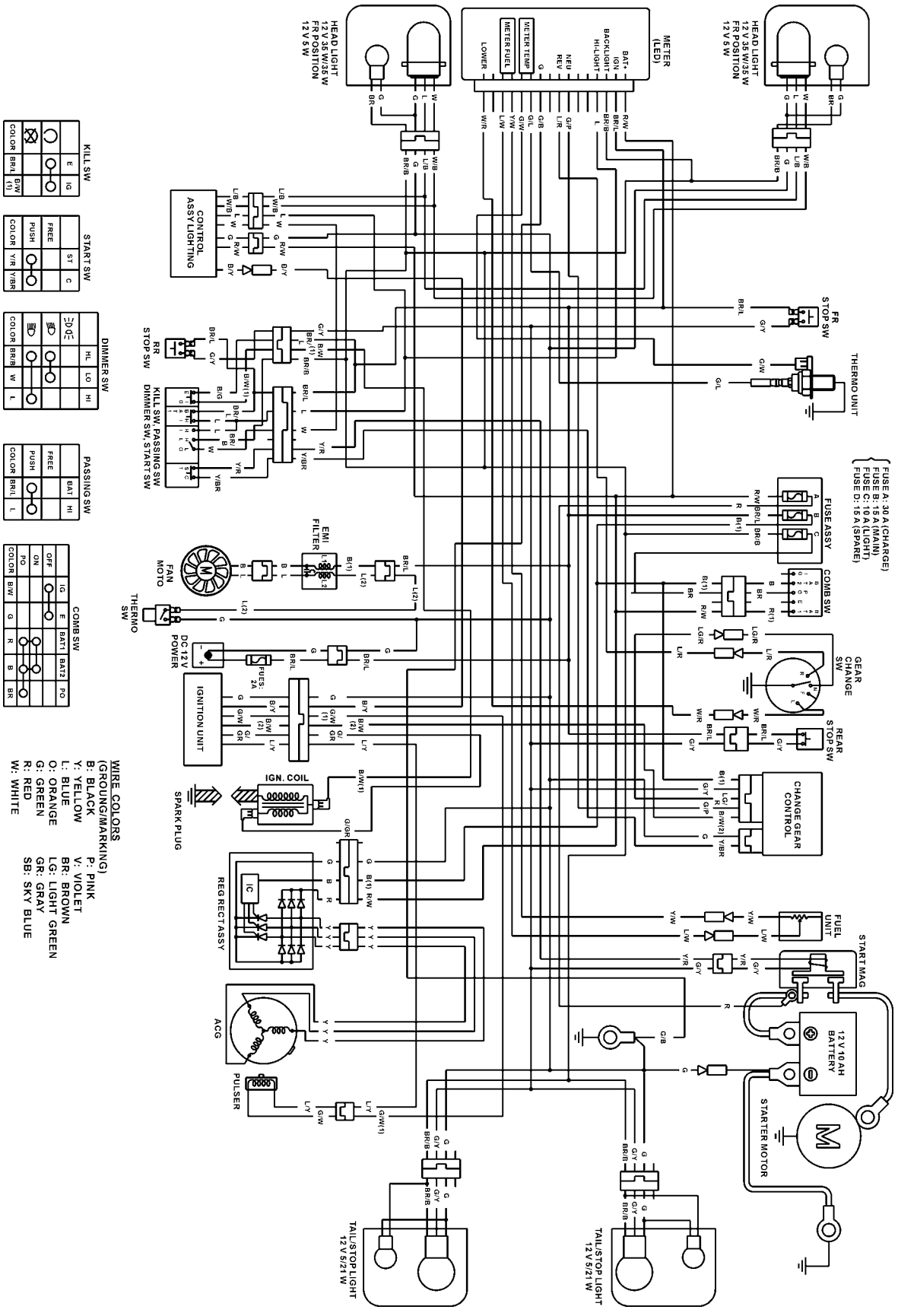
WIRING DIAGRAM (MXU 250 OFF ROAD)



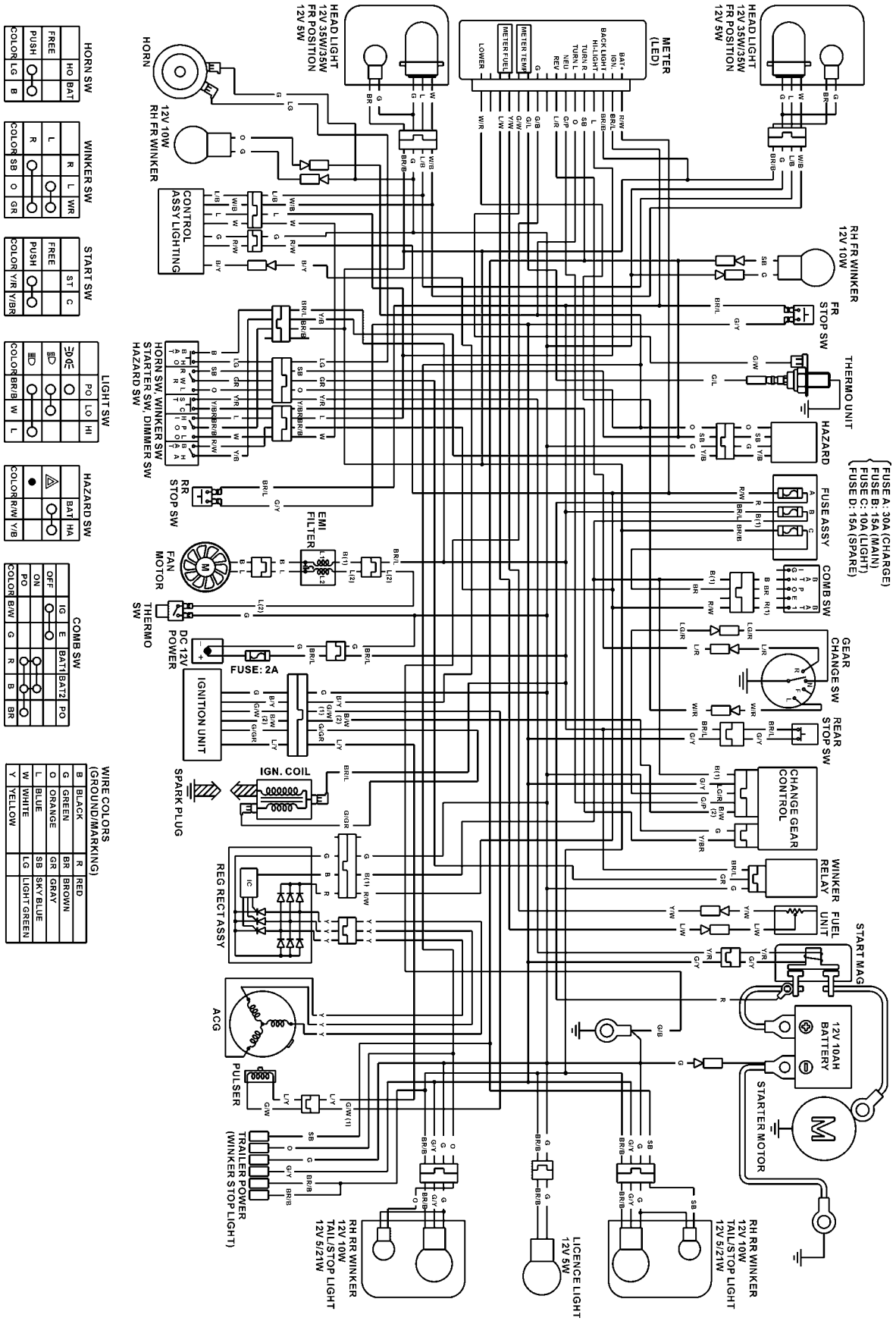
WIRING DIAGRAM (MXU 250 ON ROAD)



WIRING DIAGRAM (MXU 300 OFF ROAD)

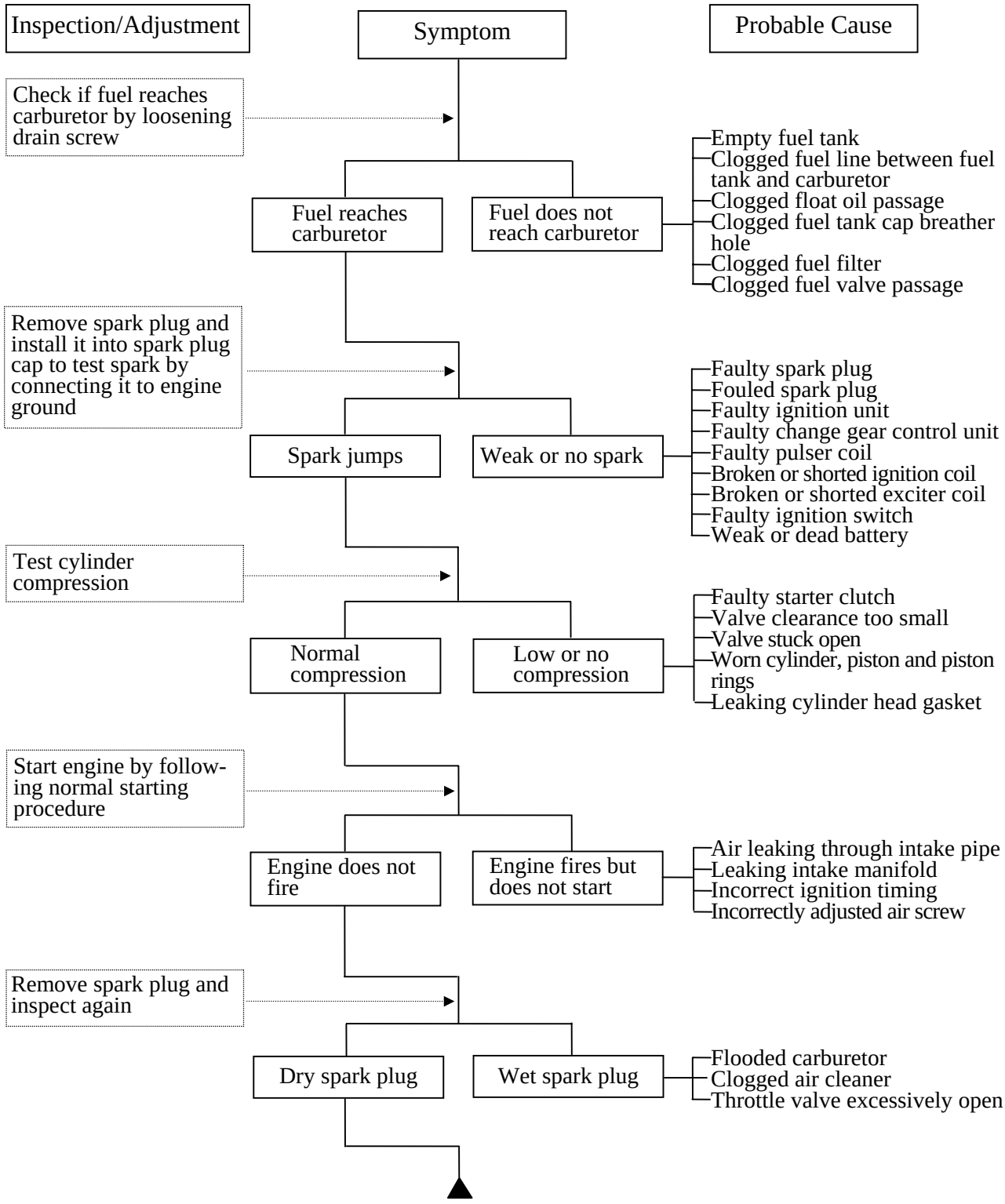


WIRING DIAGRAM (MXU 300 ON ROAD)

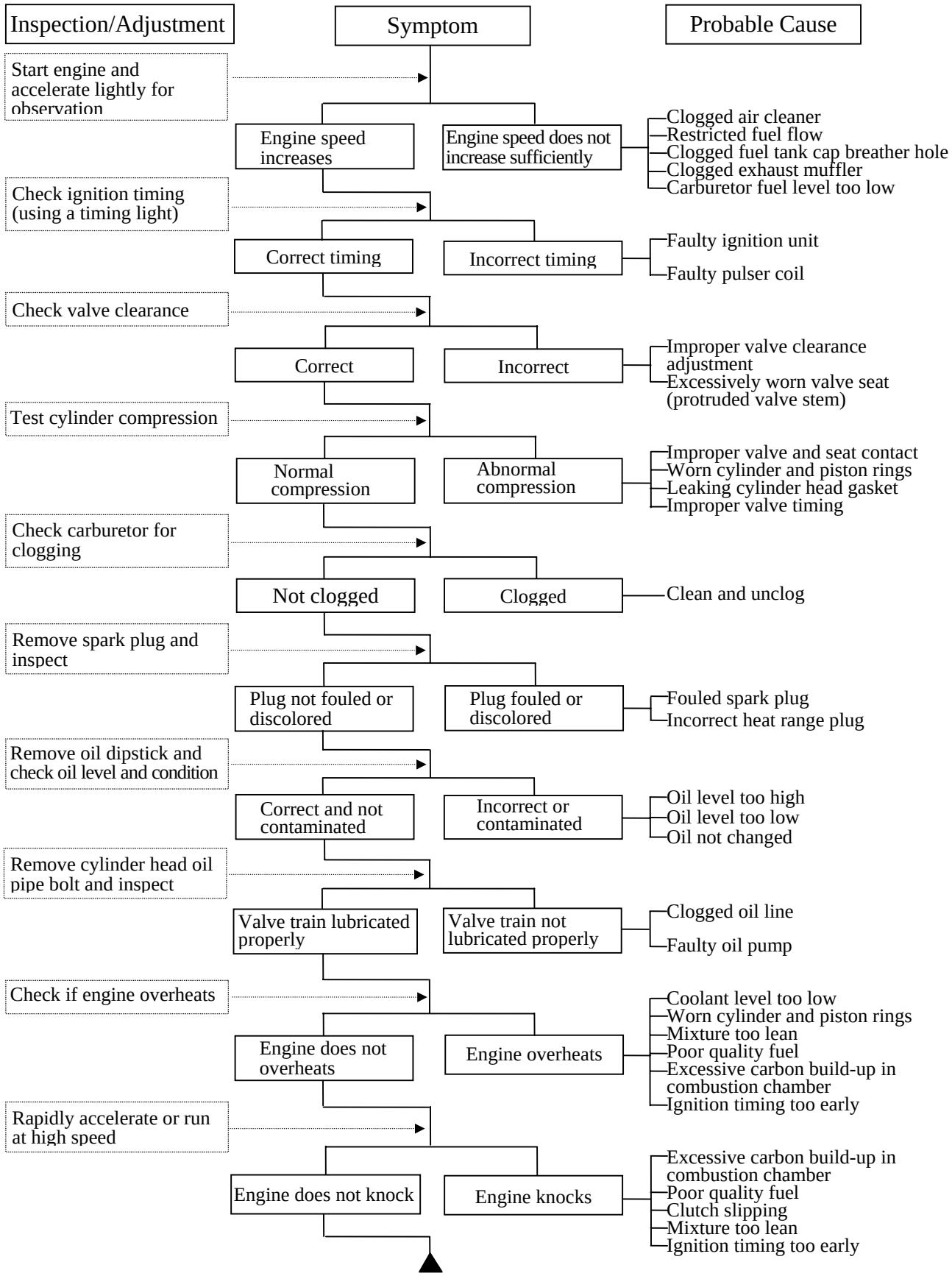


TROUBLESHOOTING

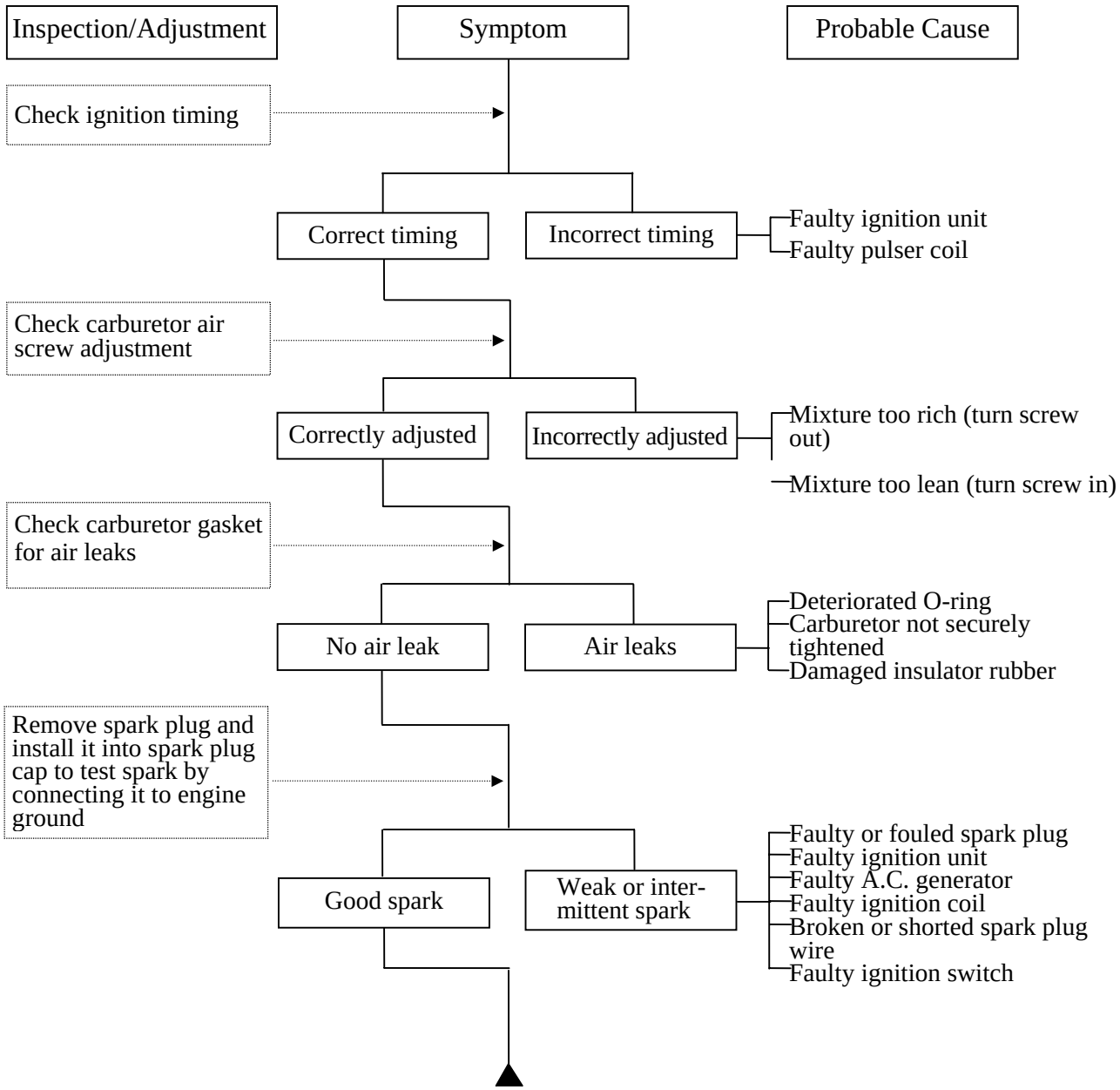
ENGINE WILL NOT START OR IS HARD TO START



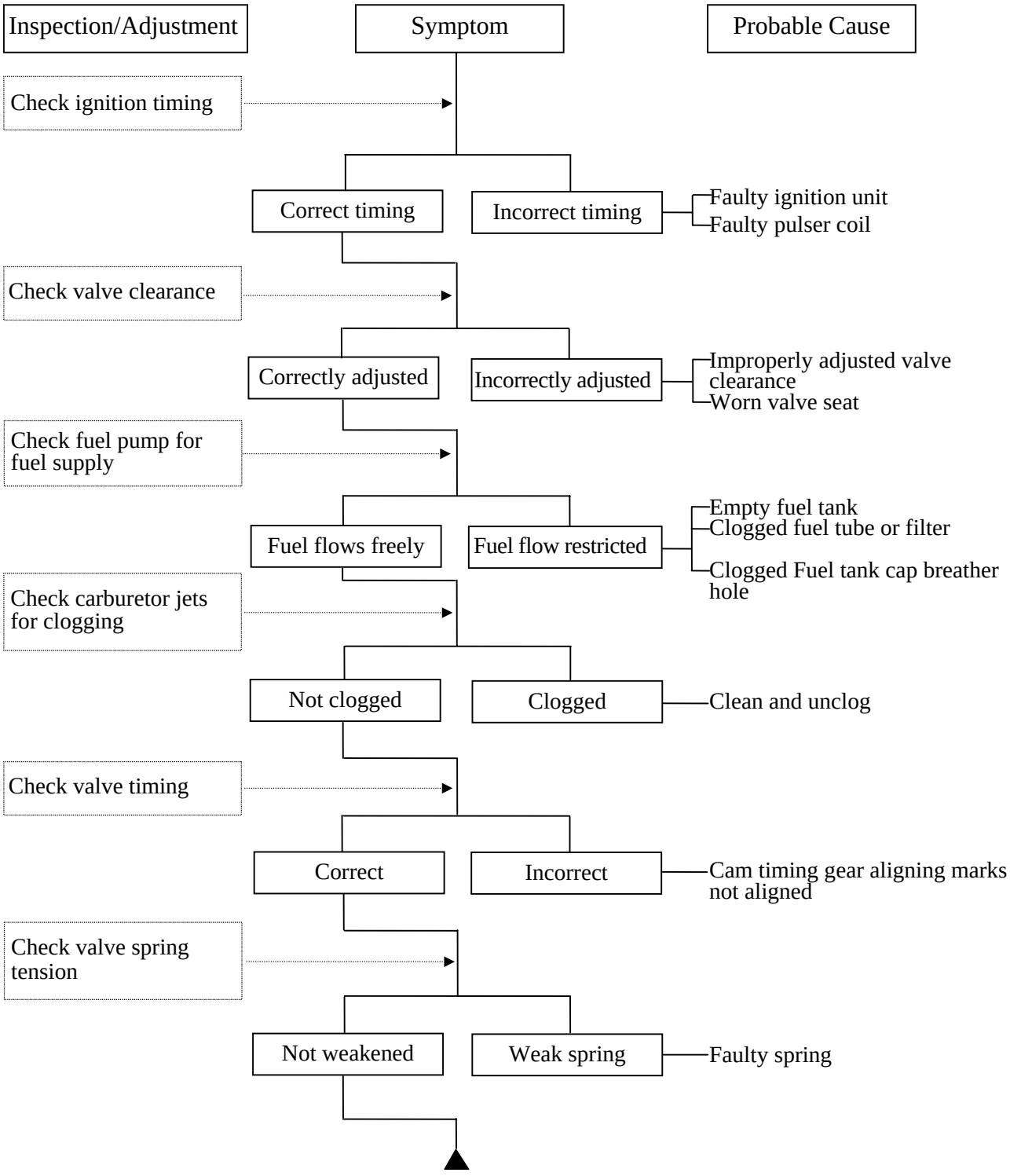
ENGINE LACKS POWER



POOR PERFORMANCE (ESPECIALLY AT IDLE AND LOW SPEEDS)

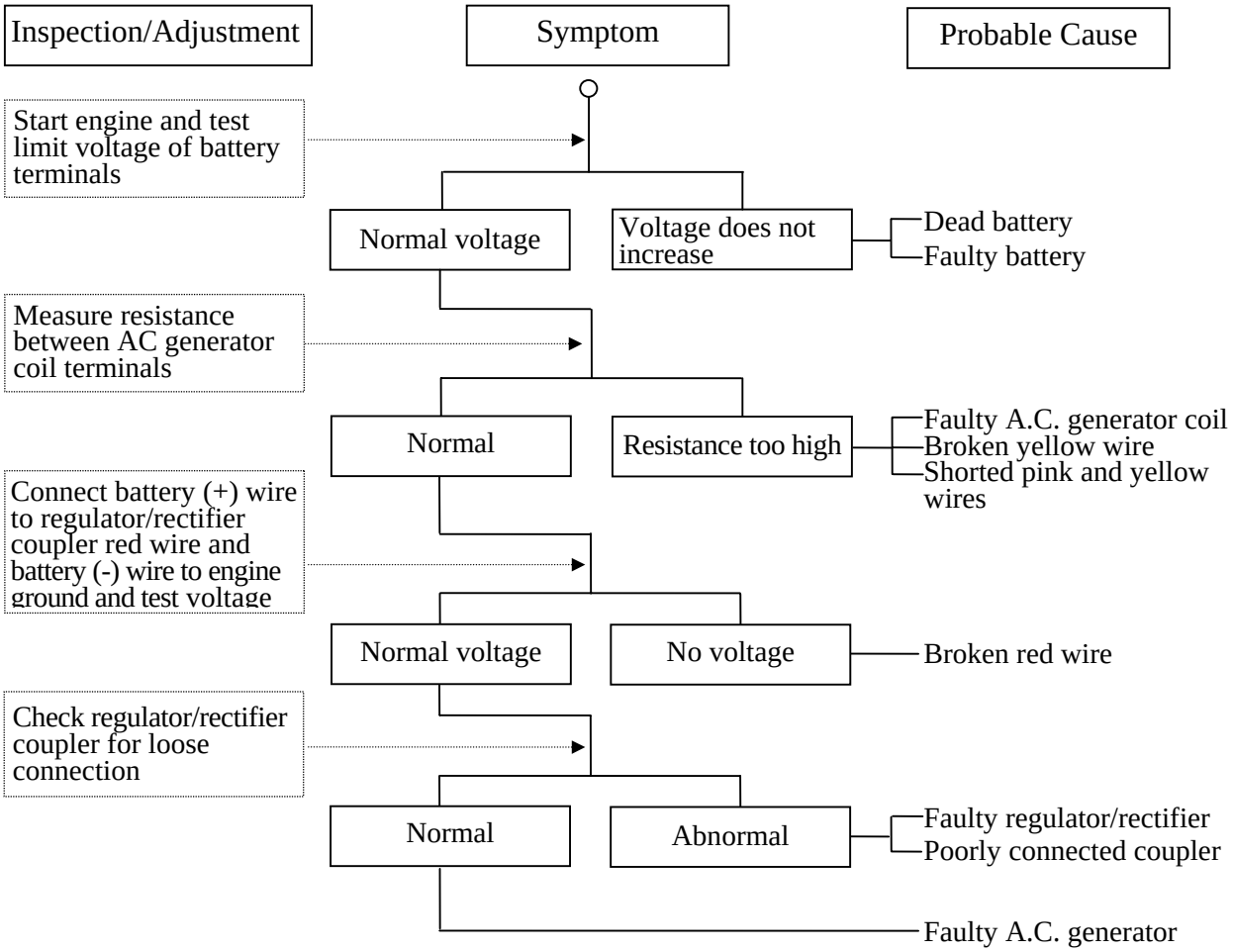


POOR PERFORMANCE (AT HIGH SPEED)

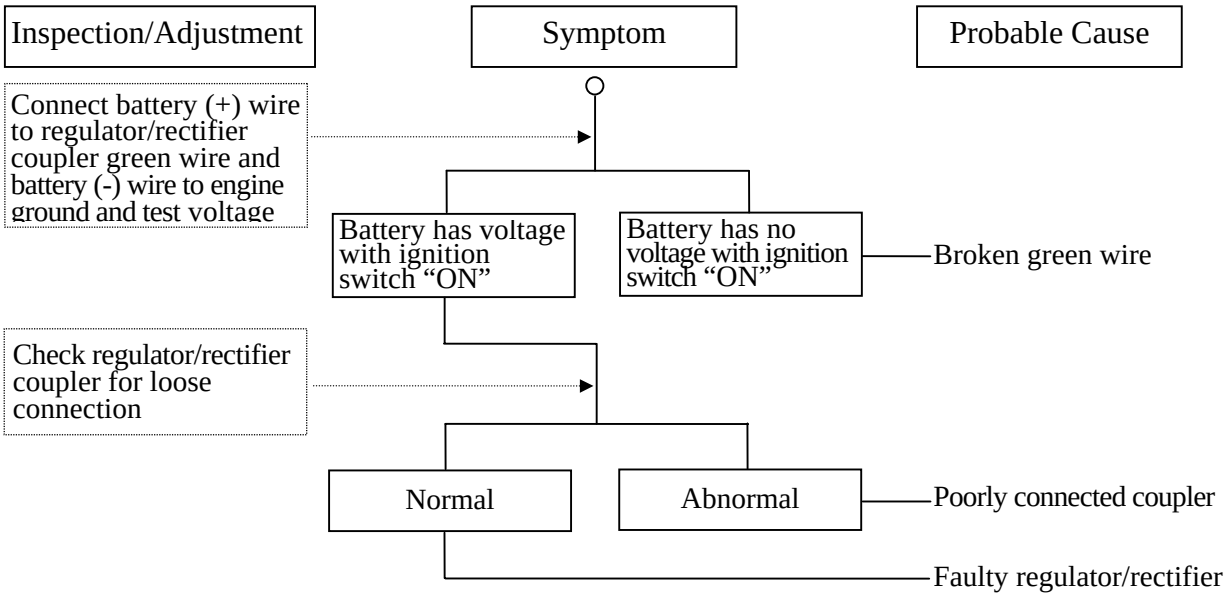


POOR CHARGING (BATTERY OVER DISCHARGING OR OVERCHARGING)

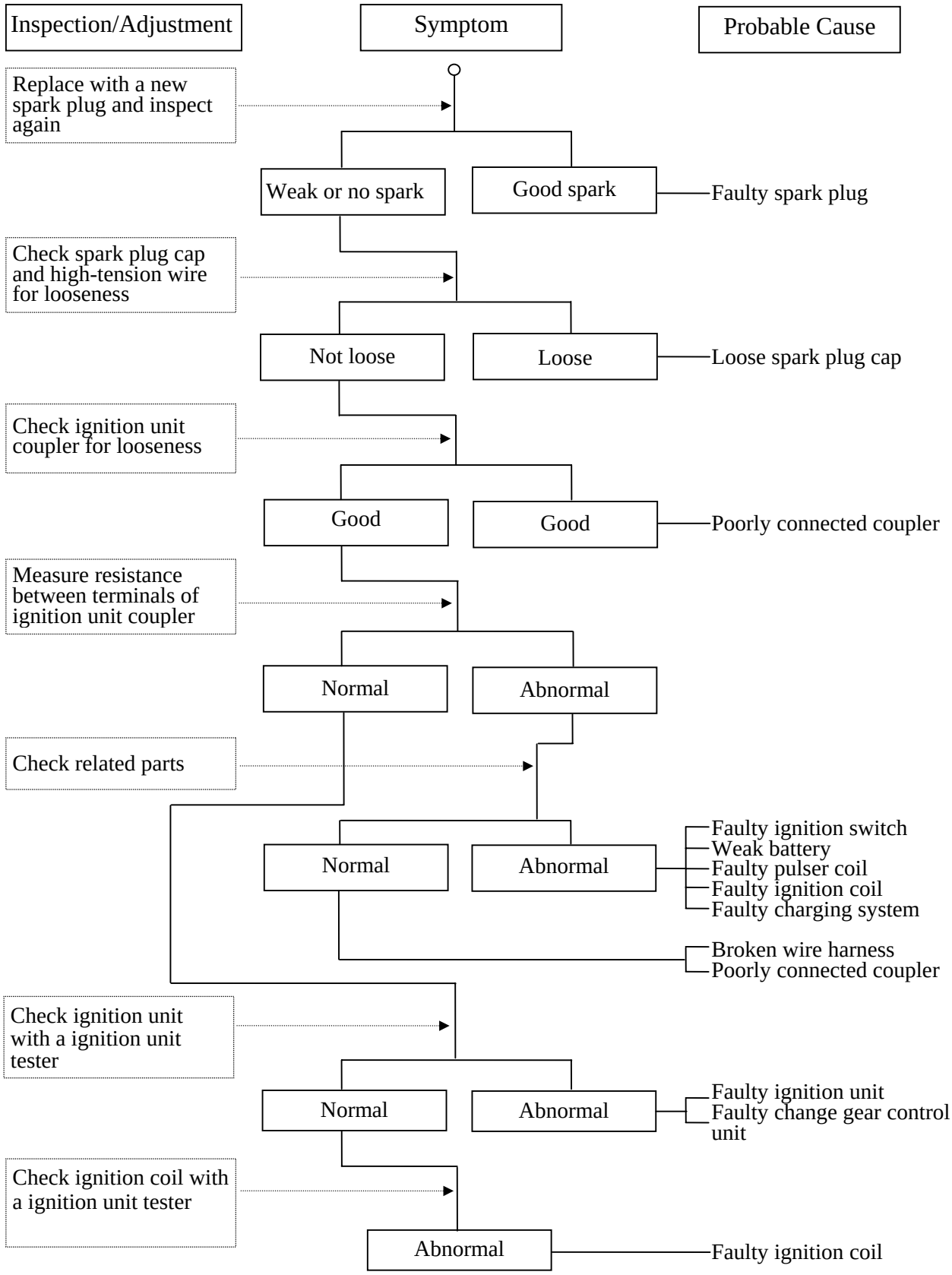
Undercharging



Overcharging



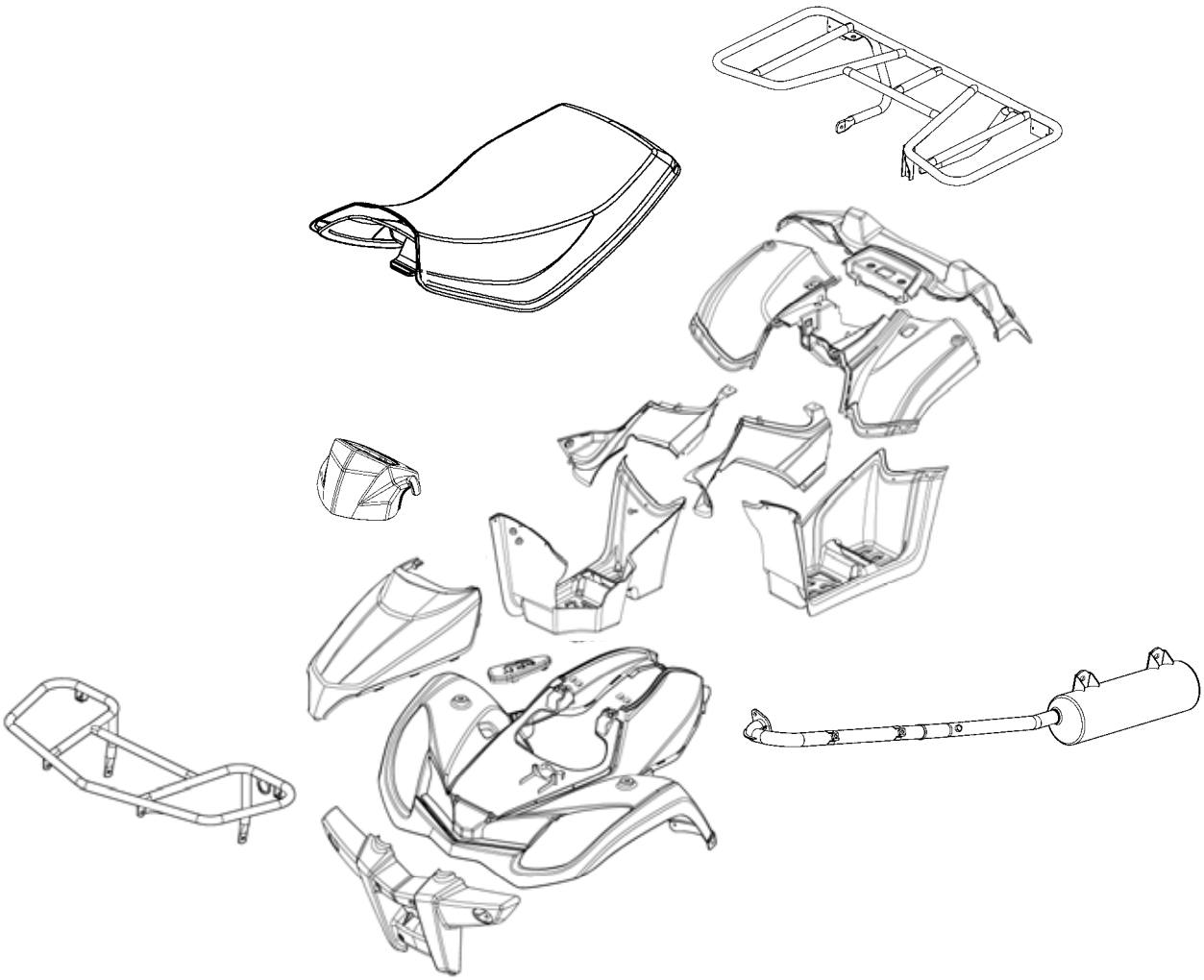
NO SPARK AT SPARK PLUG



2

FRAME COVERS/EXHAUST MUFFLER

2. FRAME COVERS/EXHAUST MUFFLER



SERVICE INFORMATION

GENERAL INSTRUCTIONS

- When removing frame covers, use special care not to pull them by force because the cover joint claws may be damaged.
- Make sure to route cables and harnesses according to the Cable & Harness Routing.

TORQUE VALUES

Exhaust muffler lock bolt	3.5 kgf-m (35 Nm, 25 lbf-ft)
Exhaust muffler lock nut	3.5 kgf-m (35 Nm, 25 lbf-ft)

TROUBLESHOOTING

Noisy exhaust muffler

- Damaged exhaust muffler
- Exhaust muffler joint air leaks

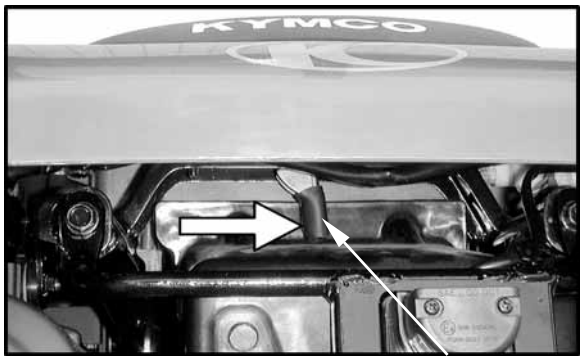
Lack of power

- Caved exhaust muffler
- Exhaust muffler air leaks
- Clogged exhaust muffler

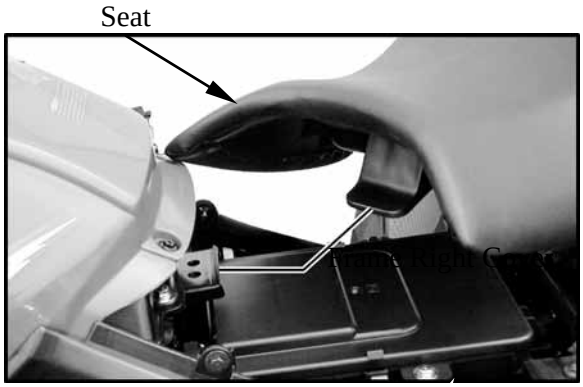
FRAME COVERS

SEAT

REMOVAL
Pull the lever right and pull up the seat at the rear.
Remove the seat.



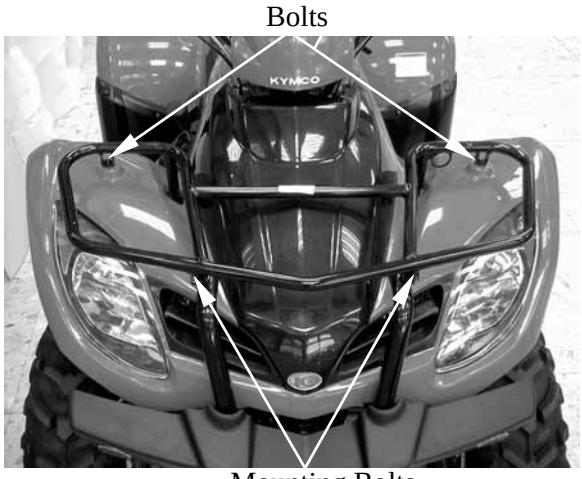
INSTALLATION
To install the seat, align the tabs on the seat with the grommets on the frame and press the seat down until it locks.



FRONT CARGO RACK

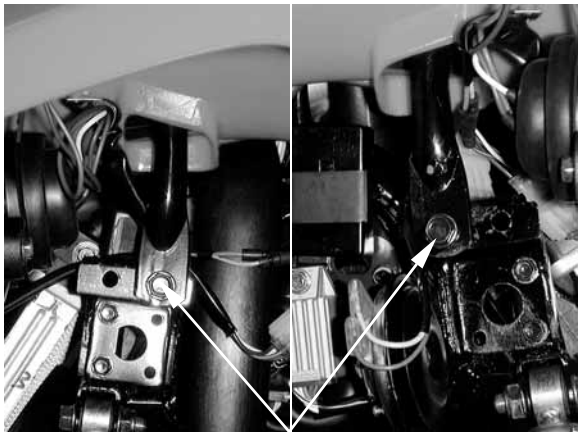
REMOVAL/INSTALLATION
Remove the two mounting bolts and two bolts under front fender

.



Remove the two mounting bolts from the front cargo rack right/left side under the front fender, remove the front cargo rack.

Installation is in the reverse order of removal.



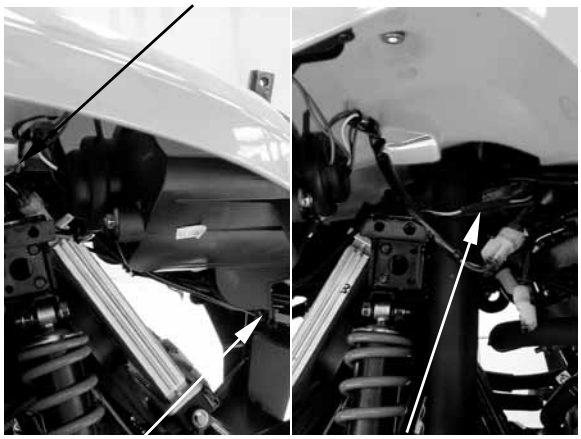
Mounting Bolts

FRONT CARRIER
REMOVAL/INSTALLATION

Remove front cargo rack (see page 2-3).

Disconnect the right and left signal light connectors. (ON ROAD)
Remove the bolt from the right headlight case.

Right Signal Light Connectors

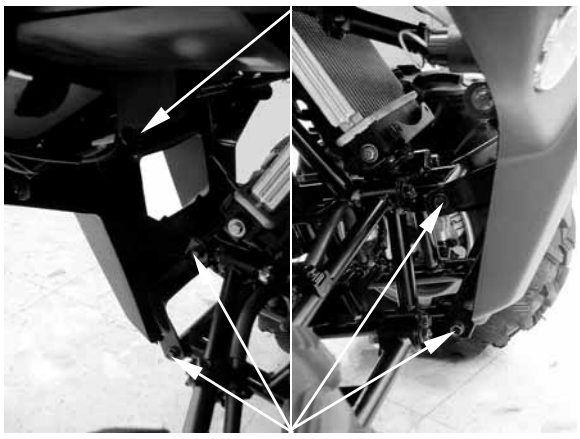


Bolt Left Signal Light Connectors

Remove the bolt from the left headlight case.
Remove the four mounting bolts from the front carrier right/left side, then remove the front carrier.

Installation is in the reverse order of removal.

Bolt



Mounting Bolts

REAR CARGO RACK

REMOVAL/INSTALLATION

Remove the two mounting bolts from the rear cargo rack.

Remove the two bolts under the rear fender.

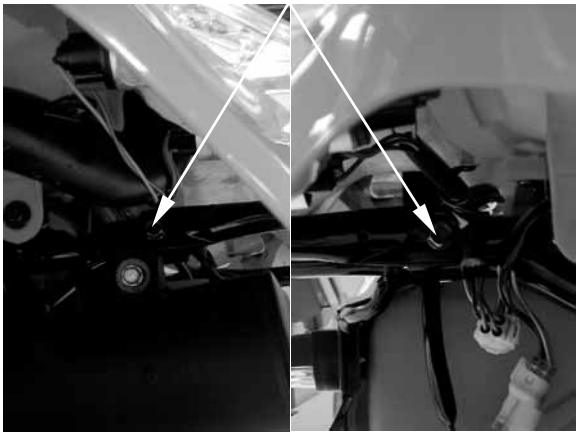
Bolts

Mounting Bolts

Remove the two mounting bolts from the rear cargo rack right/left side under the rear fender.

Installation is in the reverse order of removal.

Mounting Bolts



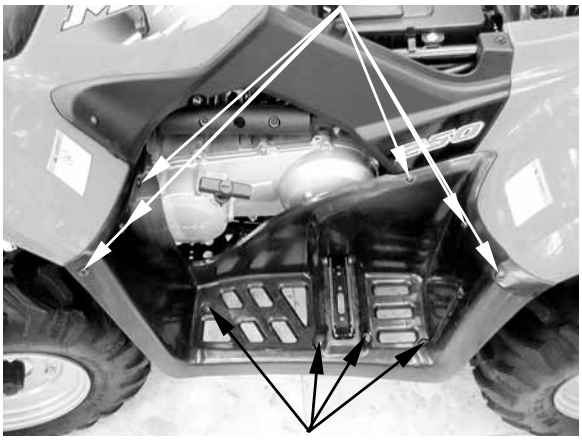
Bolt Left Signal Light Connectors

RIGHT/LEFT FOOTBOARD

REMOVAL/INSTALLATION

Remove 6 screws/nuts, 4 mounting bolts and the left footboard.

Screws/Nuts

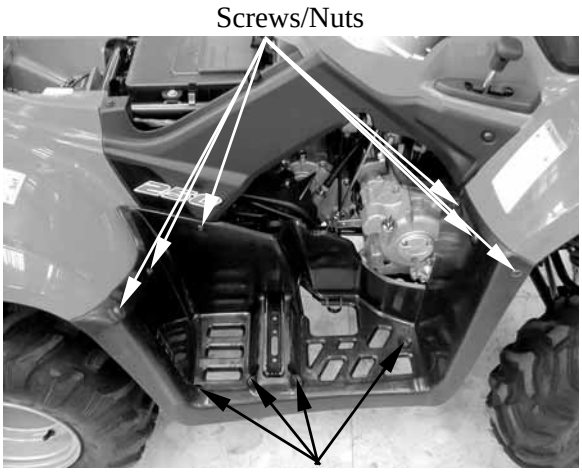


Mounting Bolts

Remove 6 screws/nuts, 4 mounting bolts and the right footboard.

✳ During removal, do not pull the joint claws forcedly to avoid damage.

Installation is in the reverse order of removal.



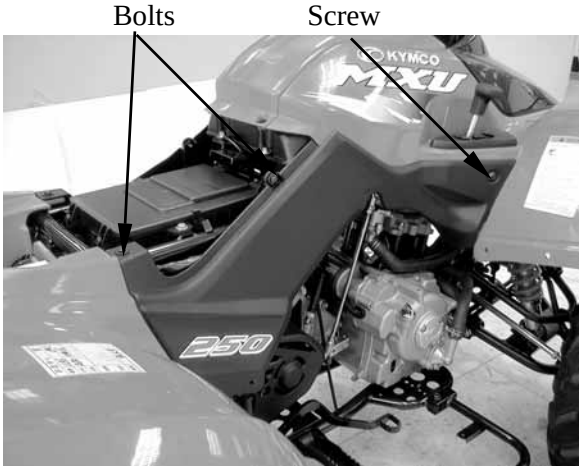
RIGHT/LEFT SIDE COVER

REMOVAL/INSTALLATION

Open the seat (see page 2-3).

Remove the right/left footboard (see page 2-5).

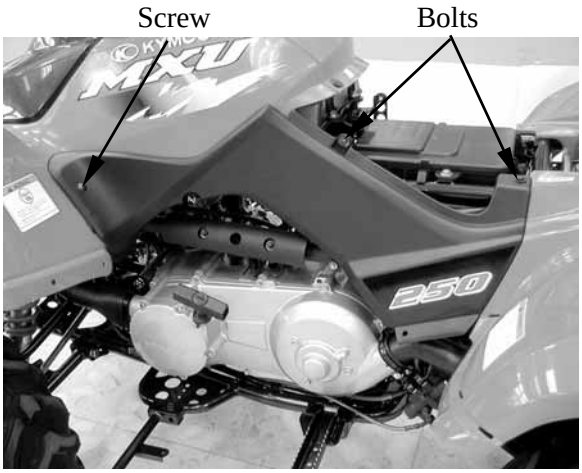
Remove the screw, two mounting bolts and right side cover.



Remove the screw, two mounting bolts and left side cover.

✳ During removal, do not pull the joint claws forcedly to avoid damage.

Installation is in the reverse order of removal.



FRONT CENTER COVER

REMOVAL/INSTALLATION

Remove the front cargo rack (see page 2-3).

Remove the two screws and front center cover.

* During removal, do not pull the joint claws forcedly to avoid damage.

Installation is in the reverse order of removal.

Screws

HANDLEBAR COVER

REMOVAL/INSTALLATION

Remove the front center cover (see page 2-7).

Disconnect the fuel tank breather tube from the handlebar cover.

Remove the two screws and raise the handlebar cover.

Disconnect the speedometer cable from the instrument.

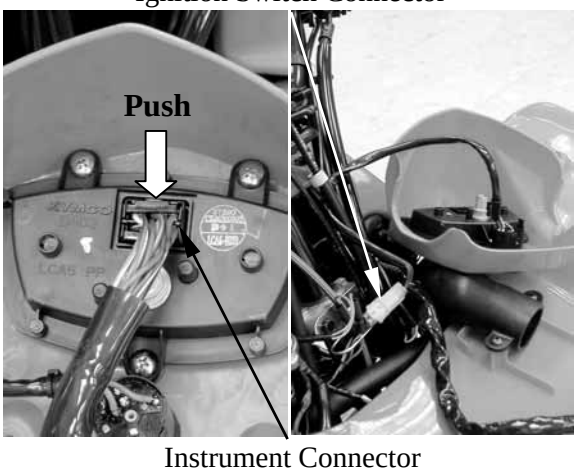
Fuel Tank Breather tube Speedometer Cable


Screws

Disconnect the instrument and ignition switch connectors, then remove the handlebar cover and instrument.

Installation is in the reserve order of removal.

Ignition Switch Connector



Instrument Connector

FUEL TANK COVER

REMOVAL/INSTALLATION

Remove the front center cover (see page 2-7).

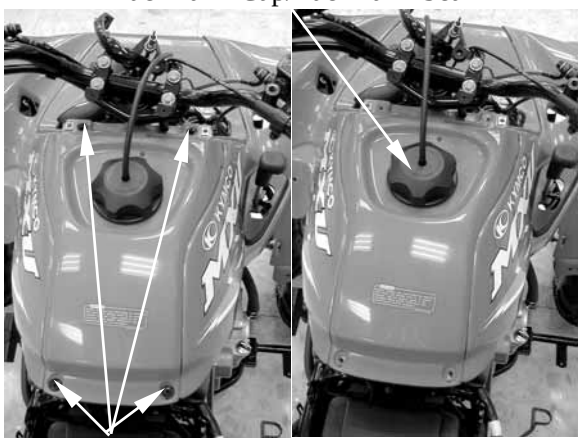
Remove the four screws from the fuel tank cover.

Remove the fuel tank cap by turning it counterclockwise and fuel tank seal, then remove the fuel tank cover.

✳ Put on the fuel tank cap after removing the cover to prevent duct, mud, etc. from entering the fuel tank

Installation is in the reverse order of removal.

Fuel Tank Cap/Fuel Tank Seal



Screws

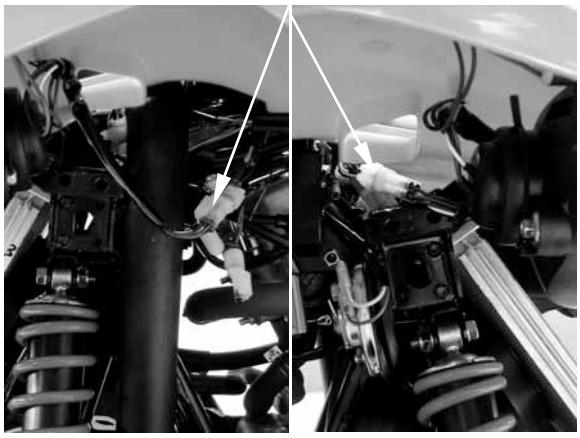
FRONT FENDER

REMOVAL/INSTALLATION

Remove front carrier (see page 2-4), front center cover (see page 2-7), fuel tank cover (see page 2-8) and right/left side cover (see page 2-6).

Disconnect the right and left headlight connectors.

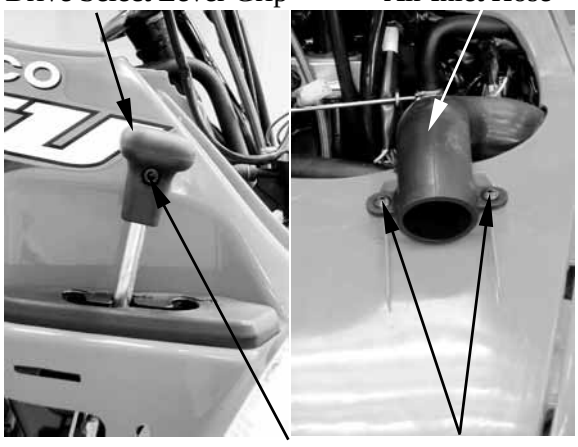
Headlight Connectors



Remove the bolt and drive select lever grip.

Remove the two screws and disconnect the air inlet hose.

Drive Select Lever Grip Air Inlet Hose

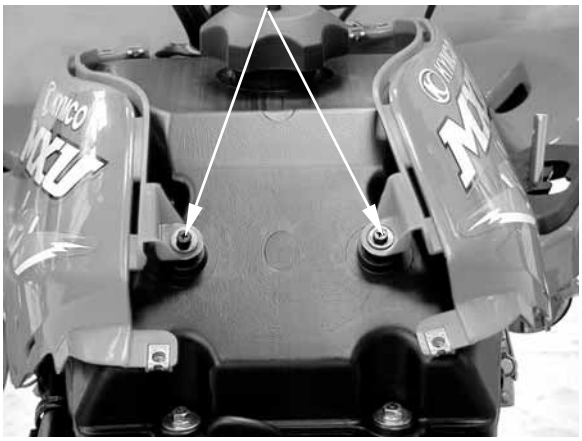


Bolt Screws

Remove the two screws and front fender.

Installation is in the reverse order of removal.

Screws



REAR FENDER

REMOVAL/INSTALLATION

Remove rear cargo rack (see page 2-5), battery (see chapter 16) and right/left side cover.

Disconnect the right and left taillight connectors.

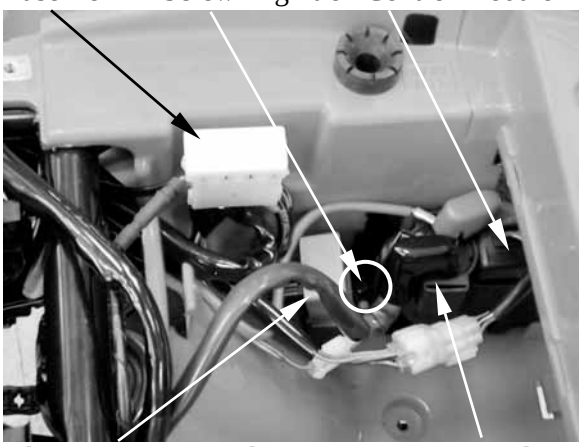
Taillight Connectors

Remove the fuse box.

Remove the holder screw, then remove the change gear control unit and starter relay.

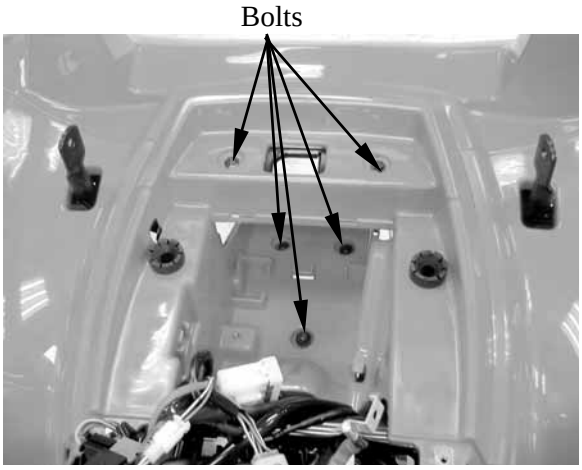
Remove the ignition control module.

Fuse Box Screw Ignition Control Module

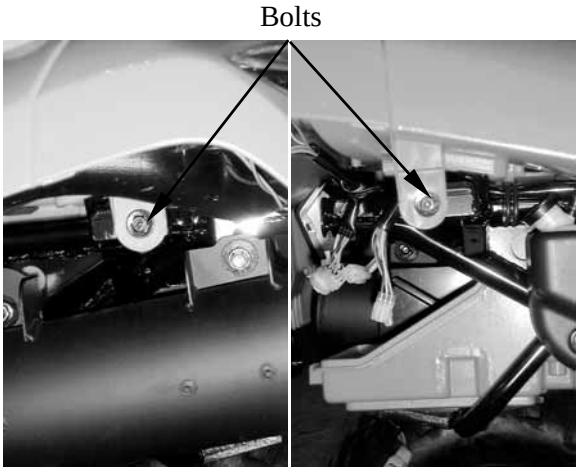


Change Gear Control Unit Starter Relay

Remove the five bolts from the rear fender.



Remove the two bolts under the rear fender right/left side.



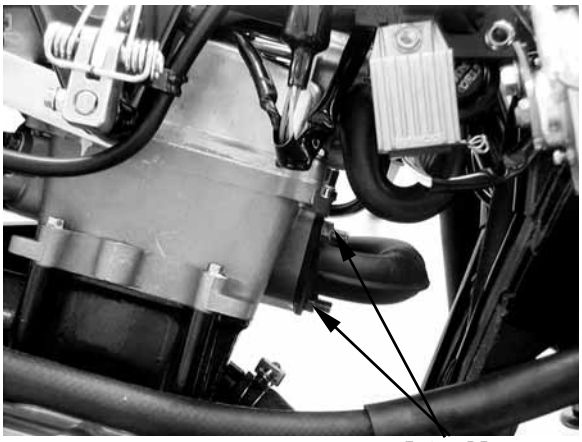
Loosen the air outlet hose band screw and disconnect the air outlet hose from the V-belt compartment cover, then remove the rear fender.

Installation is in the reverse order of removal.

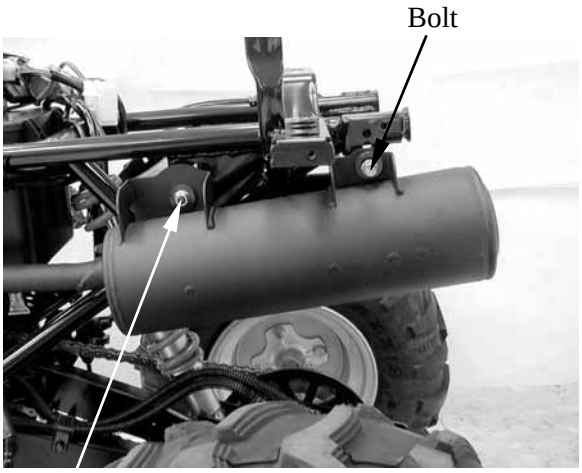
EXHAUST MUFFLER

REMOVAL/INSTALLATION

Remove the exhaust pipe joint nuts.



Remove the muffler mounting bolt, nut and exhaust muffler.



Inspect the gasket.

If the exhaust gas leaks, the gasket should be replaced.

Installation is in the reverse order of removal.

Torque:

Exhaust muffler lock bolt:
3.5 kgf-m (35 Nm, 25 lbf-ft)

Exhaust muffler lock nut:
3.5 kgf-m (35 Nm, 25 lbf-ft)

✳ Be sure to install a new exhaust gasket.

3

INSPECTION/ADJUSTMENT

SERVICE INFORMATION

GENERAL

⚠ WARNING

- Before running the engine, make sure that the working area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas which may cause death to people.
- Gasoline is extremely flammable and is explosive under some conditions. The working area must be well-ventilated and do not smoke or allow flames or sparks near the working area or fuel storage area.

SPECIFICATIONS

Throttle grip free play : 1～4 mm (0.04～0.16 in)

Spark plug gap : 0.6～0.7 mm (0.002～0.003 in)

Spark plug: Standard: DPR7EA-9

Valve clearance : IN: 0.1 mm (0.004 in)
EX: 0.1 mm (0.004 in)

Idle speed
MXU 250 : 1500±100 rpm
MXU 300 : 1600±100 rpm

Engine oil capacity
At disassembly : 1.6 liter (1.4 lmp qt, 1.7 Us qt)
At change : 1.4 liter (1.23 lmp qt, 1.48 Us qt)

Gear oil capacity (MXU 250)
At disassembly : 400 cc (0.35 lmp qt, 0.42 Us qt)
At change : 300 cc (0.26 lmp qt, 0.32 Us qt)

Gear oil capacity (MXU 300)
At disassembly : 600 cc (0.52 lmp qt, 0.64 Us qt)
At change : 500 cc (0.43 lmp qt, 0.53 Us qt)

Rear final gear case oil (MXU 300)
At disassembly : 150 cc (5.33 lmp oz, 5 Us oz)
At change : 100 cc (3.56 lmp qt, 3.33 Us qt)

Cylinder compression: 16 kg/cm² (1600 kPa, 227 psi)

Ignition timing : BTDC 5°±1°/2000 rpm

Tire pressure

	1 Rider
Front	0.28 kgf/cm² (28 Kpa, 3.2 psi)
Rear	0.28 kgf/cm² (28 Kpa, 3.2 psi)

Tire size:
Front : 22*7-10
Rear : 22*10-10

TORQUE VALUES
Front wheel nut 4.5 kgf-m (45 Nm, 32 lbf-ft)
Rear wheel nut 4.5 kgf-m (45Nm, 32 lbf-ft)

MAINTENANCE SCHEDULE

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service ad well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

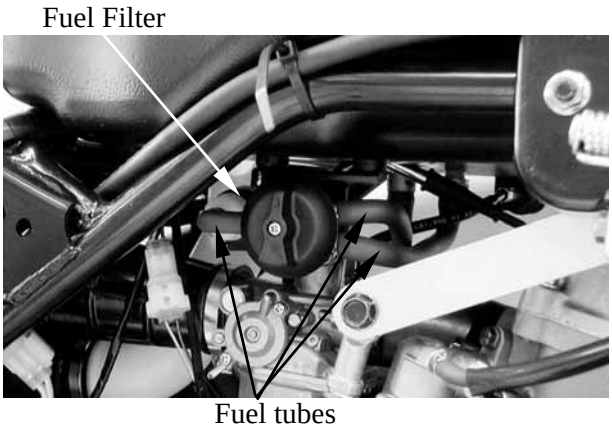
ITEM	ROUTINE / WHICHEVER COMES FIRST		INITIAL	EVERY	
		mi	100	600	1200
		Km	150	1000	2000
		MONTH	1	6	12
Engine oil	•Replace (Warm engine before draining).		○	○	○
Oil strainer	•Clean. •Replace if necessary.		○	○	○
Transmission oil	•Check oil level/oil leakage •Replace every 12 months.		○		○
Rear final gear case oil	•Check oil level/oil leakage •Replace every 12 months.		○		○
V-belt	•Check operation. •Replace if damage or excessive wear.		○		○
Air filter element (for engine and *V-belt compartment)	•Clean. •Replace if necessary.	Every 20~40 hours (150~300km, 100~200mi) (More often in wet or dusty areas.)			
Carburetor	•Check idle speed/starter operation. •Adjust if necessary.		○	○	○
Cylinder head cover breather system	•Check breather hose for cracks or damage. •Replace if necessary.			○	○
Spark plug	•Check condition. •Adjust gap and clean. •Replace if necessary.		○	○	○
Fuel line	•Check fuel hose for cracks or damage. •Replace if necessary.			○	○
Valves	•Check valve clearance. •Adjust if necessary.		○	○	○
Brake	•Check operation and brake fluid. •Replace brake pad if necessary.		○	○	○
Spark arresster (OFF ROAD)	•Clean			○	○
Coolant	•Check coolant leakage. •Replace if necessary. •Replace coolant every 24 months.		○	○	○
Battery	•Check specific gravity. •Check breather hose for proper operation. •Correct if necessary.		○	○	○
Exhaust system	•Check leakage. •Retighten if necessary. •Replace gasket if necessary.			○	○
Drive chain	•Check and adjust slack/alignment/clean/lube.		○	○	○
Wheels	•Check balance/damage/runout. •Replace if necessary.		○	○	○
Wheel bearings	•Check bearing assembly for looseness/damage. •Replace if damaged.		○	○	○
Steering system	•Check operation. •Replace if damaged. •Check toe-in. •Adjust if necessary.		○	○	○
Knuckle shafts/ Steering shaft	•Lubricate every 6 months.			○	○
Fittings and Fasteners	•Check all chassis fittings and fasteners. •Correct if necessary.		○	○	○

•In the interest of safety, we recommend these items should be serviced only by an authorized KYMCO motorcycle dealer.

FUEL LINE

Check the fuel tubes and replace any parts, which show signs of deterioration, damage or leakage.

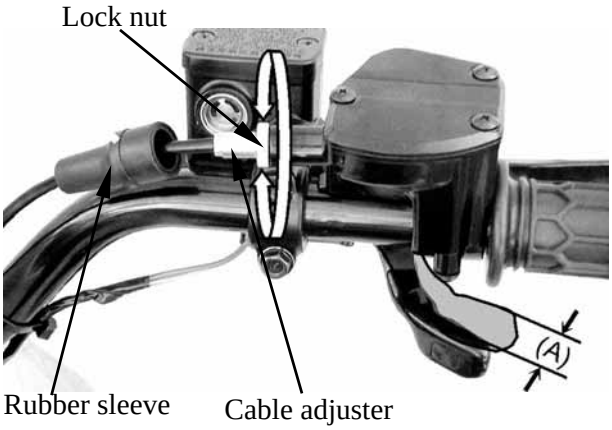
* Do not smoke or allow flames or sparks in your working area.



THROTTLE OPERATION

Check the throttle to swing for smooth movement.
Measure the throttle to swing free play.
Free Play (A): 1～4 mm (0.04～0.16 in)

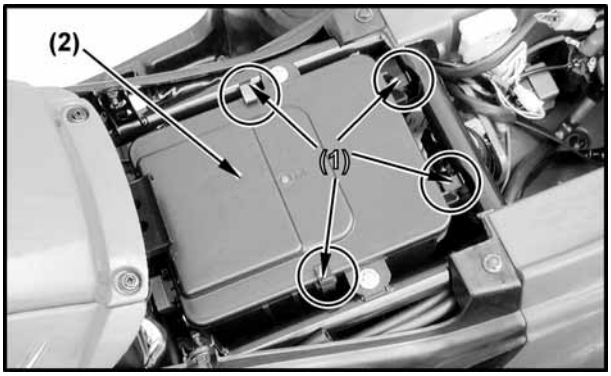
To adjust throttle free play:
Slide the rubber sleeve back to expose the throttle cable adjuster.
Loosen the lock nut, then turn the adjuster to obtain the correct free play. (1~4 mm or 0.04~0.16 in)
Tighten the lock nut and reinstall the sleeve.



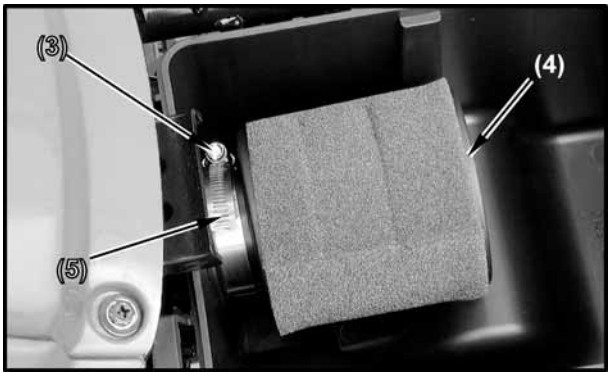
AIR CLEANER

AIR CLEANER REPLACEMENT

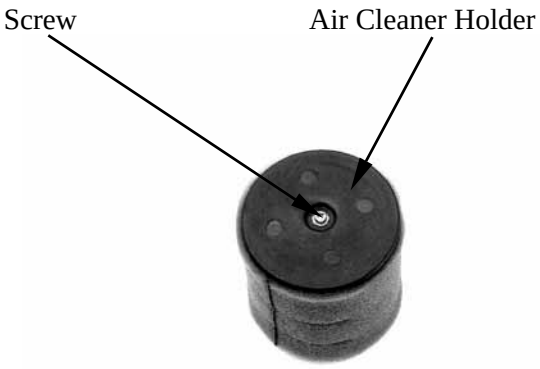
Remove the seat. (See page 2-3)
Unlatch the four retainer clips (1) and remove the air cleaner housing cover (2).



Unscrew (3) the clamp (5) and remove the air cleaner assembly (4) from the air cleaner housing.

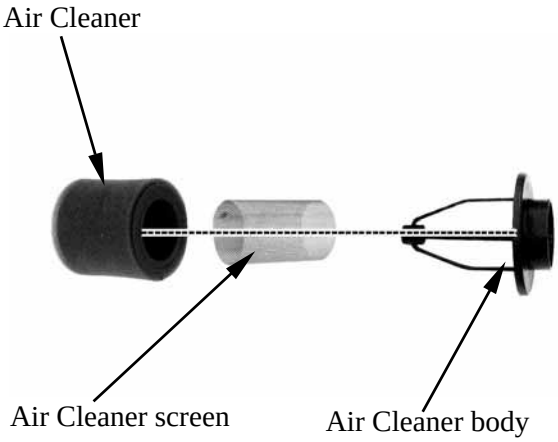


Remove the screw and remove the air cleaner assembly from the air cleaner holder.



Remove the air cleaner and air cleaner screen from the air cleaner body.
Remove the air cleaner net from the air cleaner.

Reassemble by reversing the disassembly sequence.



CLEAN AIR FILTER ELEMENT

Wash the element gently, but throughly in solvent.

* Use parts cleaning solvent only. Never use gasoline or low flash point solvents which may lead to a fire or explosion.

Squeeze the excess solvent out of the element and let dry.

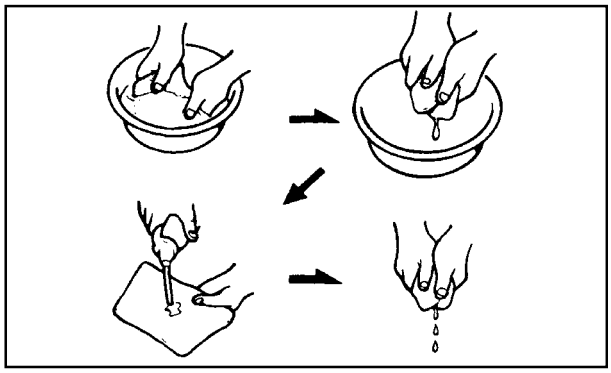
* Do not twist or wring out the foam element. This could damage the foam material.

Apply the engine oil.

Squeeze out the excess oil.

* The element should be wet but not dripping.

More frequent replacement is required when riding in unusually dusty or rainy areas.

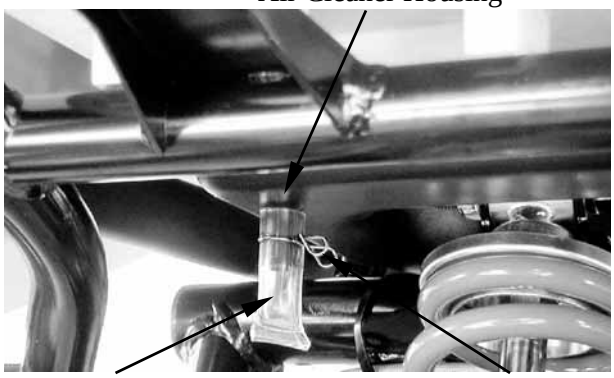


AIR CLEANER HOUSING DRAIN

Remove the drain tube (under air cleaner case) by removing the clip.

Drain the deposits.

Reinstall the drain tube, securing it with the clip.



AIR FILTER FOR DRIVE BELT

To clean the air filter:

Remove front center cover. (See page 2-7)

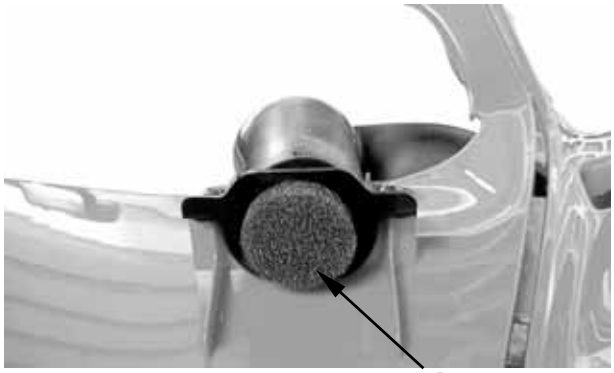
Remove air filter.

Tap the element lightly to remove most of the dust and dirt.

Blow out the remaining dirt with compressed air.

Installation is in the reverse order of removal.

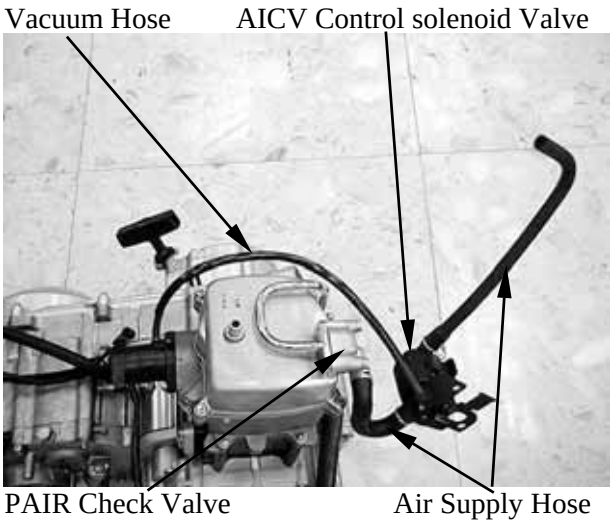
If necessary replace the air filter.



SECONDARY AIR SUPPLY SYSTEM

This model is equipped with a built-in secondary air supply system. The pulse secondary air supply system is located on the cylinder head cover.

The secondary air supply system introduces filtered air into exhaust gases in the exhaust port. The secondary air is drawn into the exhaust port whenever there is negative pressure pulse in the exhaust system. This charged secondary air promotes burning of the unburned exhaust gases and changes a considerable amount of hydrocarbons and carbon monoxide into relatively harmless carbon dioxide and water.



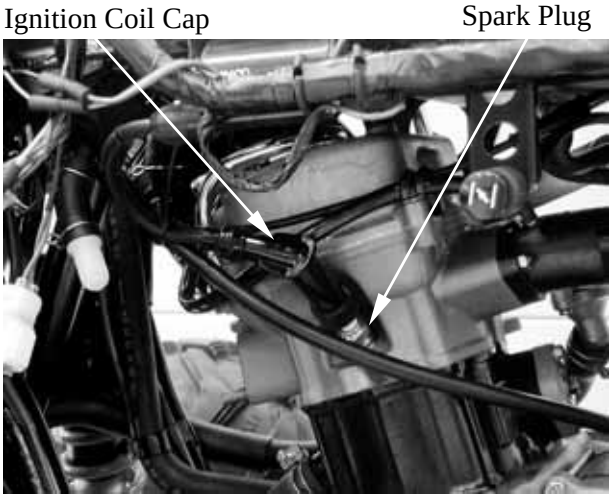
Check the AICV (air injection control valve) hoses between the AICV control solenoid valve and cylinder head cover for deterioration, damage or loose connections. Make sure the hoses are not cracked.

If the hoses show any signs of heat damage, inspect the AICV check valve in the AICV reed valve cover damage.

SPARK PLUG

Remove ignition coil cap and spark plug. Check the spark plug for wear and fouling deposits.
Clean any fouling deposits with a spark plug cleaner or a wire brush.

Specified Spark Plug: DPR7EA-9

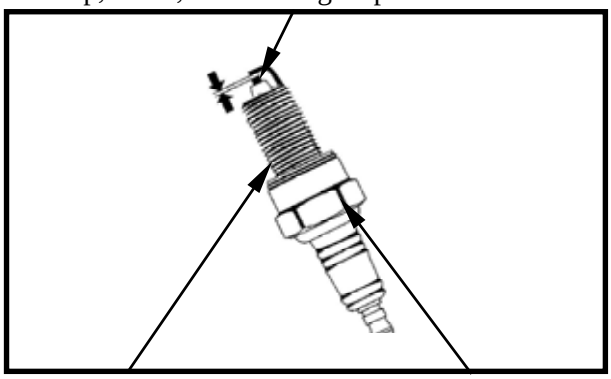


Measure the spark plug gap.

Spark Plug Gap: 0.6～0.7 mm (0.002～0.003 in)

* When installing, first screw in the spark plug by hand and then tighten it with a spark plug wrench.

Gap, Wear, and Fouling Deposits

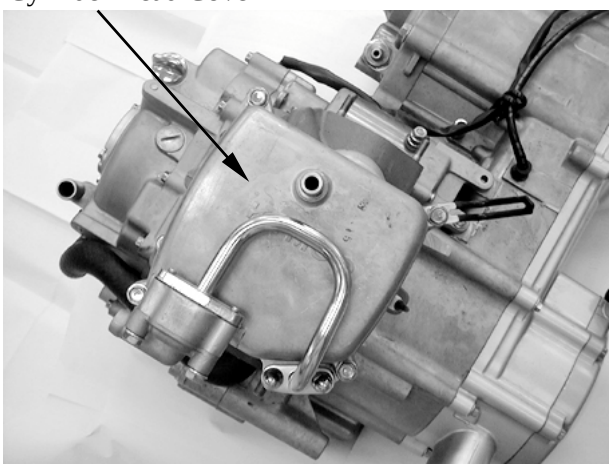


VALVE CLEARANCE

* Inspect and adjust valve clearance while the engine is cold (below 35℃).

Remove the cylinder head cover. (See chapter 7)

Cylinder Head Cover



Turn the flywheel clockwise so that the “T” mark on the flywheel aligns with the index mark on the right crankcase cover to bring the round hole on the camshaft gear facing up to the top dead center on the compression stroke.

Index Mark “T” Mark

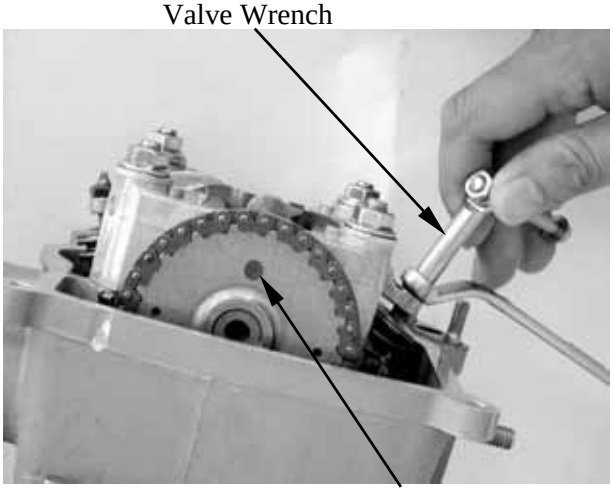
Inspect and adjust the valve clearance.

Valve Clearance: IN: 0.1 mm (0.004 in)
EX: 0.1 mm (0.004 in)

Loosen the lock nut and adjust by turning the adjusting nut

Special tool: Tappet adjuster E012

* • Check the valve clearance again after the lock nut is tightened.



CARBURETOR IDLE SPEED

* • The engine must be warm for accurate idle speed inspection and adjustment.

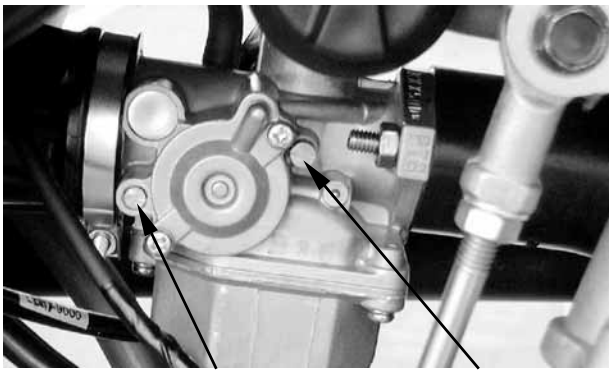
Warm up the engine before this operation. Start the engine and connect a tachometer. Turn the throttle stop screw to obtain the specified idle speed.

Idle Speed:

MXU 250: 1500±100 rpm

MXU 300: 1600±100 rpm

When the engine misses or run erratic, adjust the air screw.

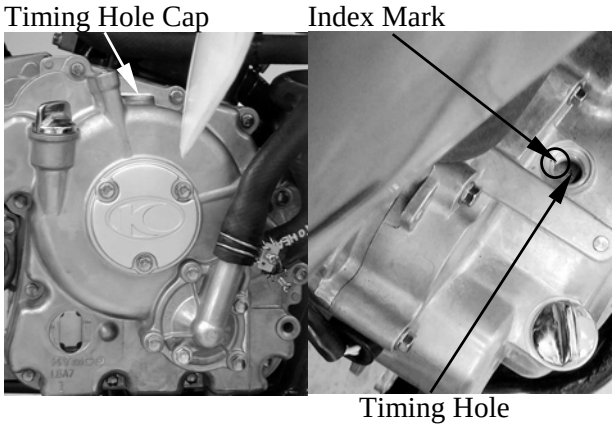


IGNITION TIMING

* The ignition unit is not adjustable. If the ignition timing is incorrect, check the ignition system.

Remove the timing hole cap.

Check the ignition timing with a timing light.
When the engine is running at idle speed, the ignition timing is correct if the “F” mark on the flywheel aligns with the index mark on the right crankcase cover.



CYLINDER COMPRESSION

Warm up the engine before compression test.
Remove the spark plug.
Insert a compression gauge.
Open the throttle valve fully and push the starter button to test the compression.

Cylinder compression:
MXU 250: 15 kg/cm² (1500 kPa, 213 psi)
MXU 300: 16 kg/cm² (1600 kPa, 227 psi)

If the compression is low, check for the following:
- Leaky valves
- Valve clearance too small
- Leaking cylinder head gasket
- Worn piston rings
- Worn piston/cylinder

If the compression is high, it indicates that carbon deposits have accumulated on the combustion chamber and the piston head.

Compression Gauge

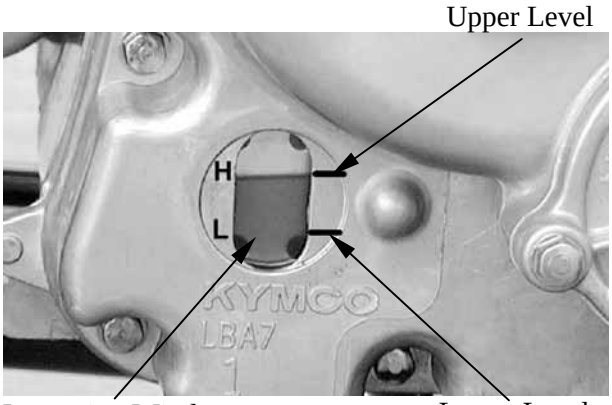
ENGINE OIL

OIL LEVEL

Place the machine on a level place.
Warm up the engine for several minutes and stop it.

* Run the engine for 2～3 minutes and check the oil level after the engine is stopped for 2～3 minutes.

Check the oil level through the inspection window.
The oil level should be between the maximum (H) and minimum (L) marks. If the level is low, add oil to raise it to the proper level.



ENGINE OIL REPLACEMENT

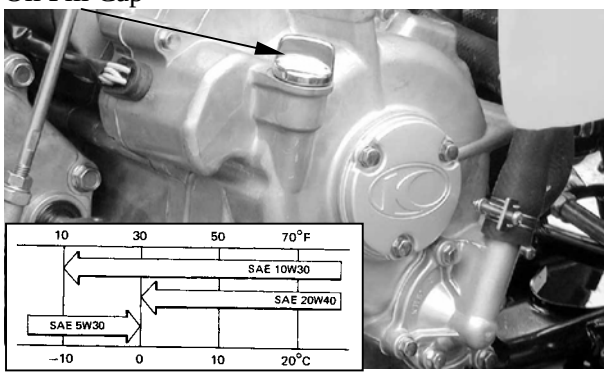
Place the machine on a level place.

Warm up the engine for several minutes and stop it.

Place a container under the engine.

Remove the oil fill cap and drain plug to drain the oil.

Oil Fill Cap

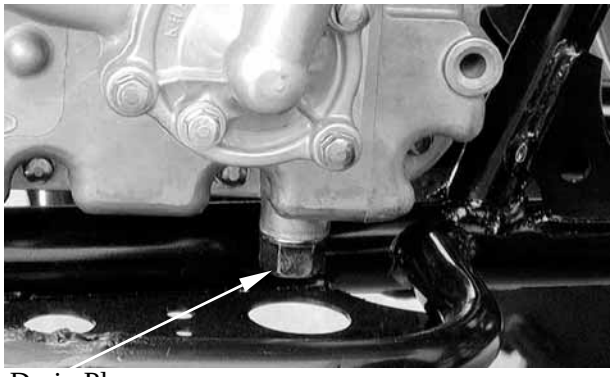


Reinstall the drain plug and tighten the drain plug to specification.

Torque: 2.5 kgf-m (25 Nm, 18 lbf-ft)

Fill the engine with oil and install the oil fill cap.

* The engine oil will drain more easily while the engine is warm.



Drain Plug

Oil Capacity:

At disassembly:

1.6 liter (1.4 lmp qt, 1.7 Us qt)

At change:

1.4 liter (1.23 lmp qt, 1.48 Us qt)

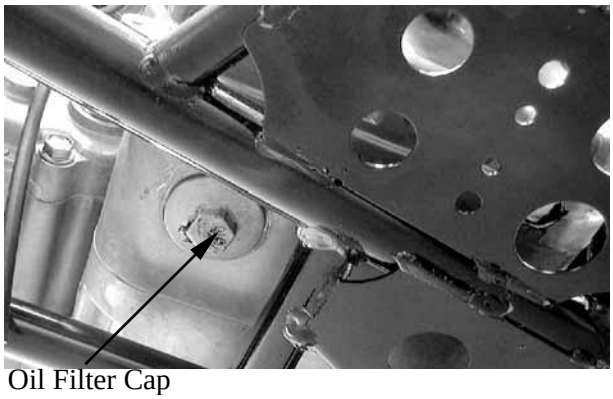
ENGINE OIL REPLACEMENT AND OIL FILTER CLEANING

Place the machine on a level place.

Warm up the engine for several minutes and stop it.

Place a container under the engine.

Remove the oil fill cap and oil filter cap to drain the oil.



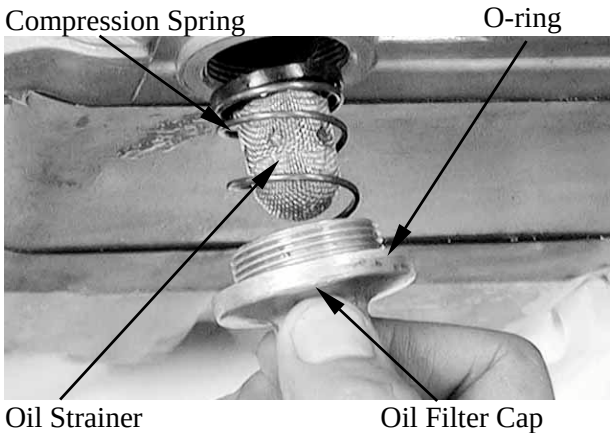
Oil Filter Cap

Clean the oil strainer with solvent.
Inspect the O-ring and replace if damaged.
Reinstall the O-ring, oil strainer, compression spring and oil filter cap.
Tighten the oil filter cap to specification.

Torque: 1.5 kgf-m (15 Nm, 11 lbf-ft)

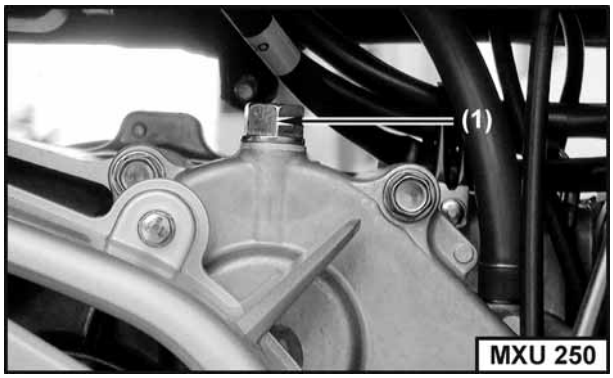
Fill the engine with oil and install the oil fill cap.

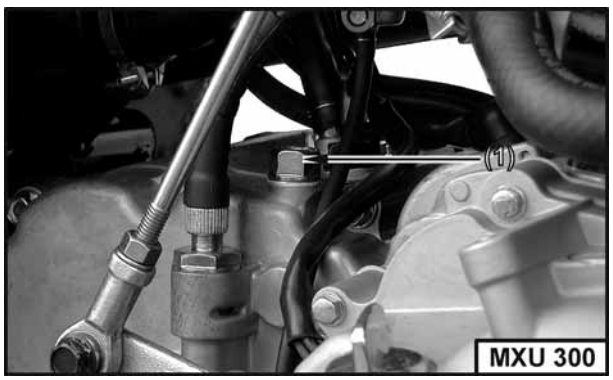
Oil Capacity:
At disassembly:
1.6 liter (1.4 lmp qt, 1.7 Us qt)
At change:
1.4 liter (1.23 lmp qt, 1.48 Us qt)



TRANSMISSION OIL REPLACEMENT

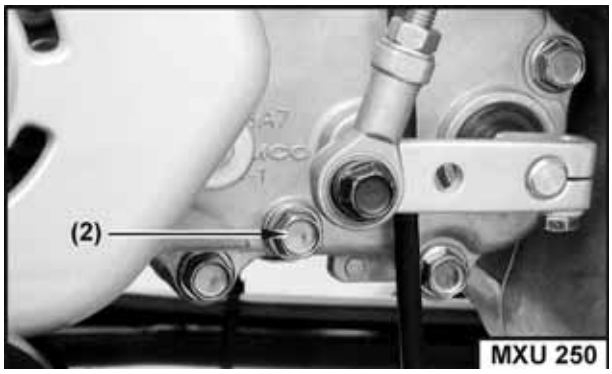
Place the machine on a level place.
Place a container under the engine.
Remove the oil filler bolt (1).





Remove the drain plug (2) to drain the oil.
Reinstall the drain plug and tighten to specified torque.

Torque: 2 kgf-m (20 Nm, 15 lbf-ft)



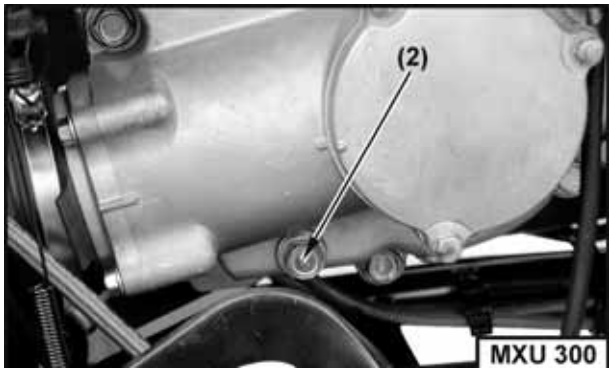
Fill the engine with recommended oil **(SAE #90)**.

Oil Capacity (MXU 250):

At disassembly : 400 cc (0.35 lmp qt, 0.42 Us qt)
At change : 300 cc (0.26 lmp qt, 0.32 Us qt)

Oil Capacity (MXU 300):

At disassembly : 600 cc (0.52 lmp qt, 0.64 Us qt)
At change : 500 cc (0.43 lmp qt, 0.53 Us qt)



Install the oil filler bolt and tighten to specified torque.

Torque: 2 kgf-m (20 Nm, 15 lbf-ft)

Start the engine and warm up for a few minutes. While warming up, check for oil leakage. If oil leakage is found, stop the engine immediately and check for the cause.

✳ Make sure that the sealing washer is in good condition.

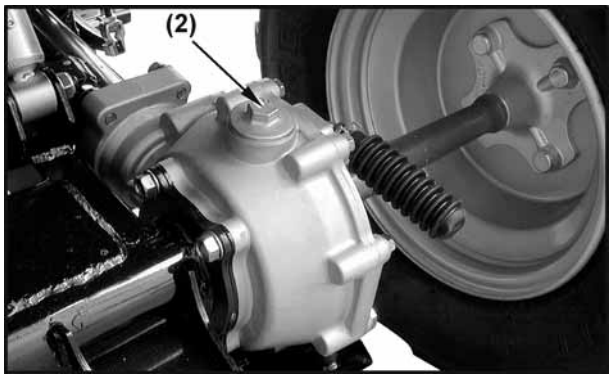
REAR FINAL GEAR CASE OIL REPLACEMENT (MXU 300)

Change the oil with the final gear case warm, and the ATV on level ground to assure complete and rapid draining.

Rear final gear oil replacement

To drain the oil, first place an oil drain pan under the oil drain plug (1).

Remove the oil filler cap (2).



Remove the drain plug.

After the oil has completely drained, reinstall and tighten the drain plug to specified torque.

Torque: 2 kgf-m (20 Nm, 15 lbf-ft)

Fill the gear case with the recommended oil **(SAE #90)**.

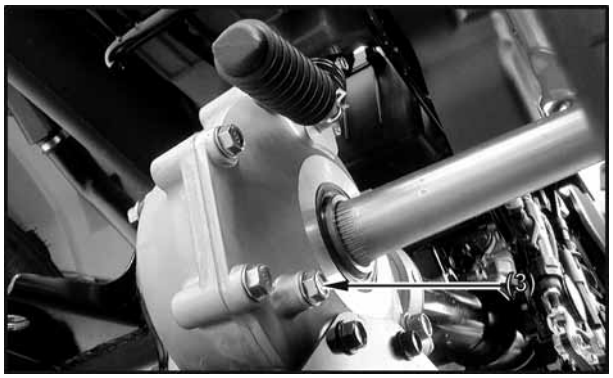
Oil Capacity (MXU 300):

At disassembly : 0.15 L (5.33 lmp oz, 5 US oz)

At change : 0.1 L (3.56 lmp oz, 3.33 US oz)

Remove the oil level check bolt (3).

Make sure the oil level reaches the oil level check hole.



Install and tighten the oil level check bolt to the specified torque.

Torque: 2 kgf-m (20 Nm, 15 lbf-ft)

Install and tighten the oil filler cap to the specified torque.

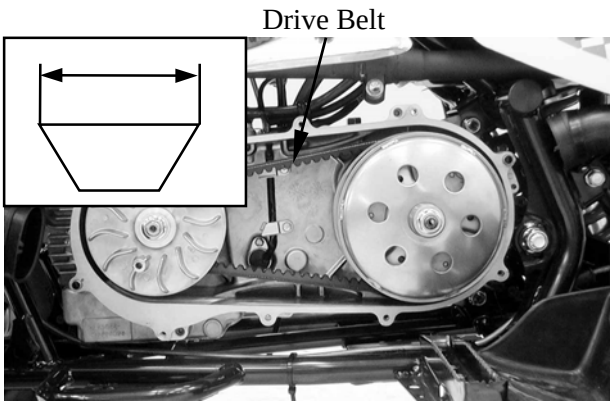
Torque: 1.5 kgf-m (15 Nm, 11 lbf-ft)

DRIVE BELT

Remove the left crankcase cover.
Inspect the drive belt for cracks, scaling, chipping or excessive wear.
Measure the V-belt width

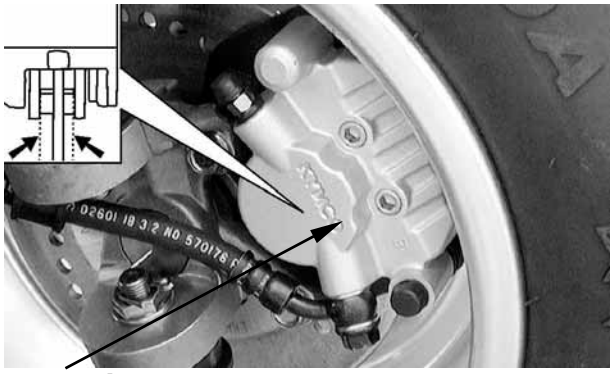
Service limit: 22 mm (0.88in)

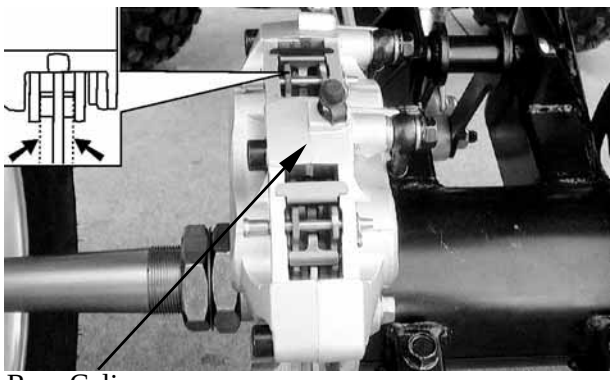
Replace the drive belt if out of specification.



BRAKE PADS INSPECTION

A wear indicator is provided on each brake. The indicators allows checking of brake pads wear. Check the position of the indicator. If the indicator reaches the wear limit line, to replace the pads.

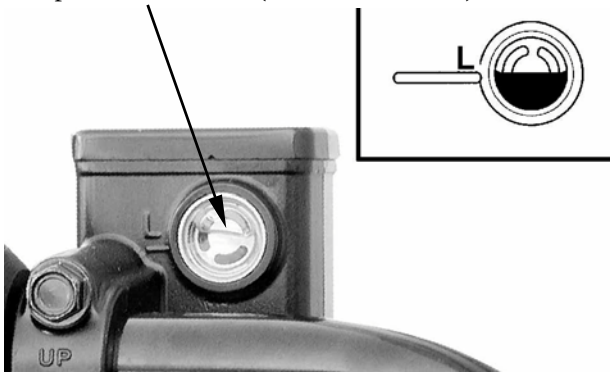

Front Caliper


Rear Caliper

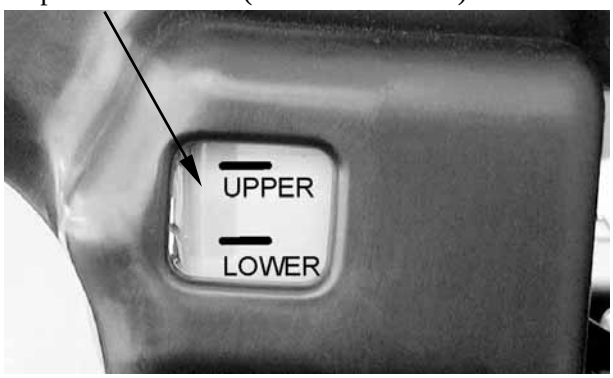
BRAKE FLUID INSPECTION

Check if the fluid level is below the lower level mark through the inspection window.

Inspection Window (R/L Brake Lever)



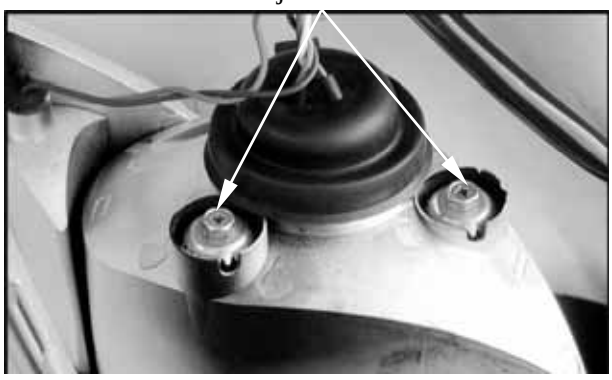
Inspection Window (Rear Brake Pedal)



HEADLIGHT AIM

Turn the ignition switch ON and start the engine.
Turn on the headlight switch.
Adjust the headlight aim by turning the headlight aim adjusting screws.

Adjust Screws



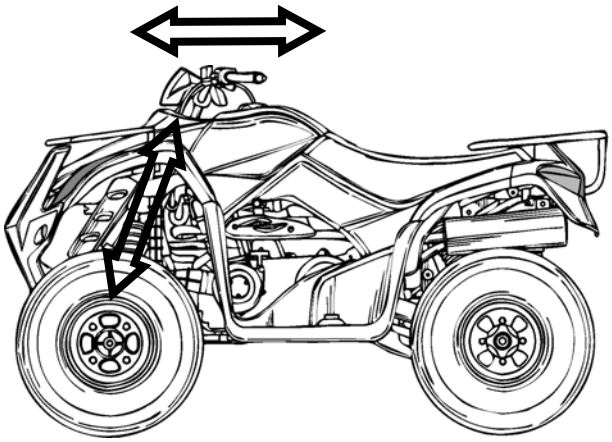
STEERING SYSTEM
INSPECTION

Place the machine on a level place.

Check the steering column bushings and bearings:

Move the handlebar up and down, and/or back and forth.

Replace the steering column bushings and or bearings if excessive play



Check the tie-rod ends

Turn the handlebar to the left and/or right until it stops completely, then slightly move the handlebar from left to right.

Replace the tie-rod ends if tie-rod end has any vertical play.

Tie-rod Ends

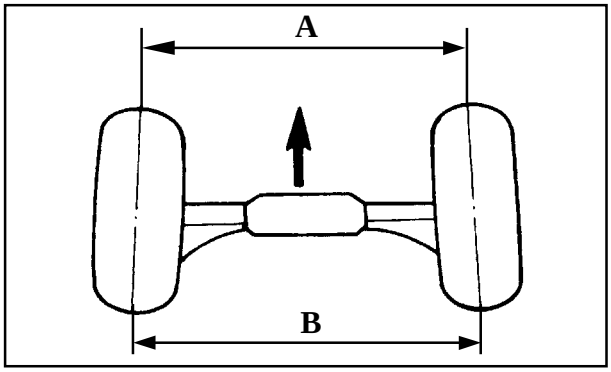
Raise the front end of the machine so that there is no weight on the front wheels.

Check ball joints and/or wheel bearings.

Move the wheels lately back and froth.

Replace the front arms and/or wheel bearings if excessive free play.

TOE-IN ADJUSTMENT



Place the machine on a level place.

Measure the toe-in

Adjust if out of specification.

Toe-in measurement steps:

Mark both front tire tread centers.

Raise the front end of the machine so that there is no weight on the front tires.

Fix the handlebar straight ahead.

Measure the width A between the marks.

Rotate the front tires 180 degrees until the marks come exactly opposite.

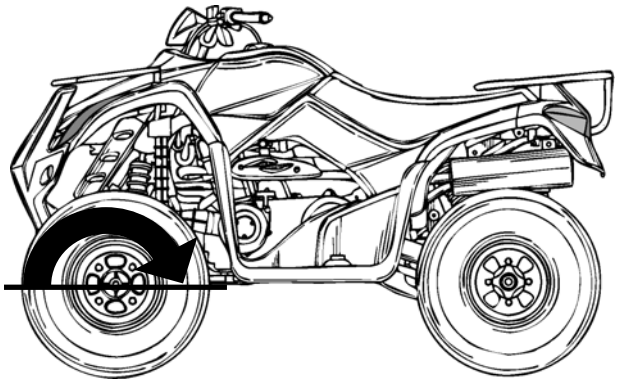
Measure the width B between the marks.

Calculate the toe-in using the formula given below.

Toe-in = B－A

Toe-in: 0～15 mm (0～0.6 in)

If the toe-in is incorrect, adjust the toe-in



Adjust the toe-in step:

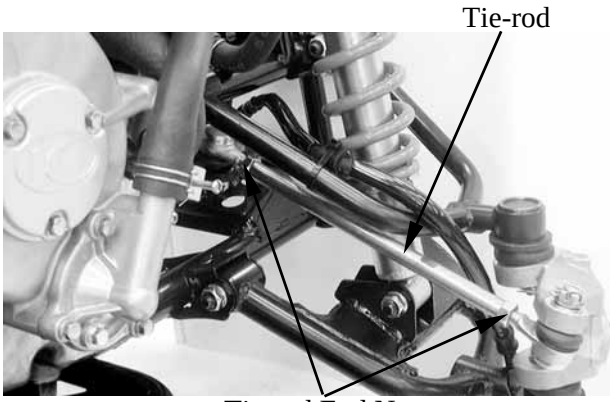
Mark both tie-rods ends.

This reference point will be needed during adjustment.

Loosen the lock nuts (tie-rod end) of both tie-rods

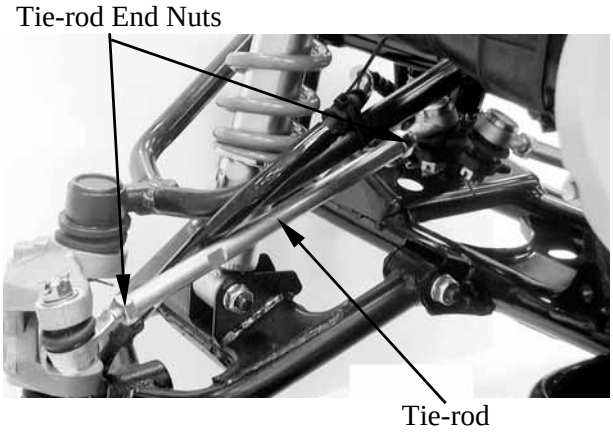
The same number of turns should be given to both tie-rods right and left until the specified toe-in is obtained, so that the lengths of the rods will be kept the same.

Tighten the rod end locknuts of both tie-rods



Torque: 2 kgf-m (20 Nm, 15 lbf-ft)

* • Be sure that both tie-rod are turned the same amount. If not, the machine will drift tight or left even though the handlebar is positioned straight which may lead to mishandling and accident.
• After setting the toe-in to specification, run the machine slowly for some distance with hands placed lightly on the handlebar and check that the handlebar responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.



WHEELS/TIRES

Check the tires for cuts, imbedded nails or other damages.
Check the tire pressure.

* Tire pressure should be checked when tires are cold.

TIRE PRESSURE

	1 Rider
Front	0.28 kgf/cm² (28 Kpa, 3.2 psi)
Rear	0.28 kgf/cm² (28 Kpa, 3.2 psi)

TIRE SIZE
Front : 22*7-10
Rear : 22*10-10

Check the front axle nut for looseness.

Check the rear axle nut for looseness.
If the axle nuts are loose, tighten them to the specified torque.

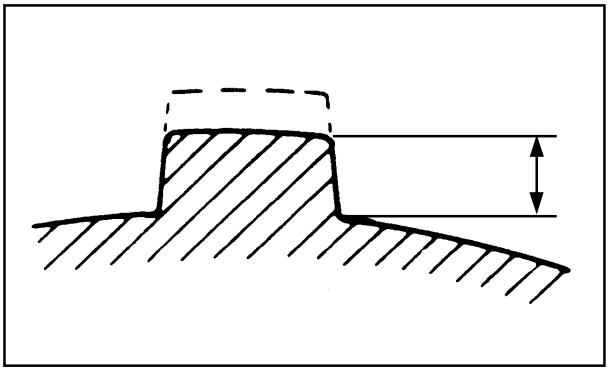
Torque:

Front : 7 kgf-m (70 Nm, 50 lbf-ft)

Rear : 10 kgf-m (100 Nm, 72 lbf-ft)

Inspect the tire surfaces.
Replace if wear or damage.

Tire wear limit: 3 mm (0.12 in)



* It is dangerous to ride with a worn out tire. When a tire wear is out of specification, replace the tire immediately.

WHEEL INSPECTION

Inspect the wheel.

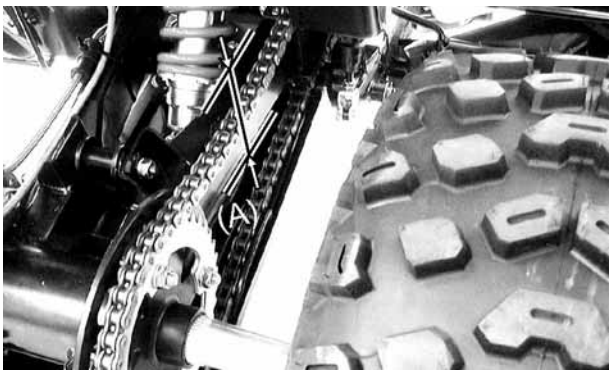
Replace if damage or bends

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

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

DRIVE CHAIN SLACK ADJUSTMENT (MXU 250)

Before checking and/or adjusting, rotate the rear wheels several revolutions and check slack at several points to find the tightest point. Check and/or adjust the chain slack with the rear wheels in this "tightest" position.



* Too little of chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

Place the machine on a level place.

* Wheels should be on the ground without the rider on it.

Check drive chain slack.

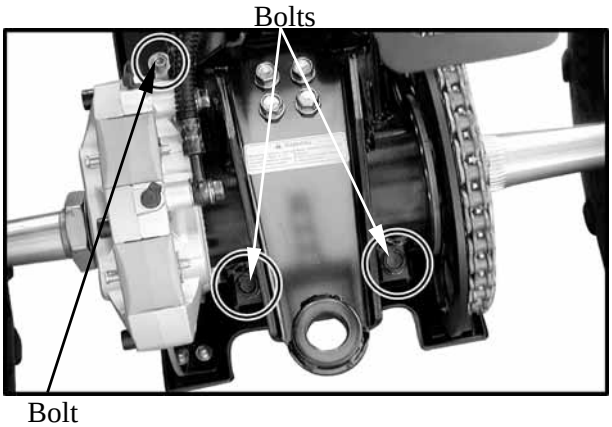
Adjust if out of specification.

Drive chain slack (A):

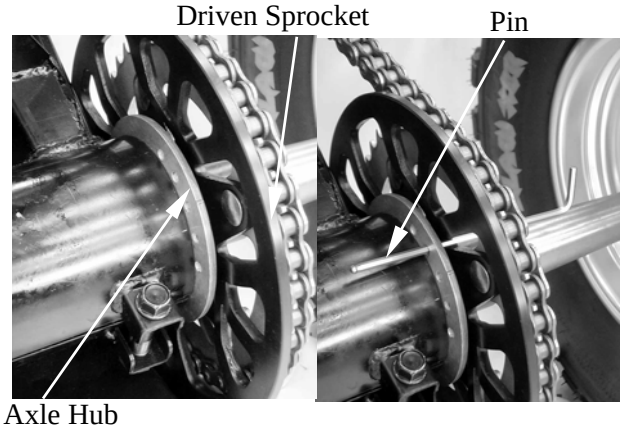
30 ~ 40 mm (1.2 ~ 1.6 in)

Adjust drive chain slack:

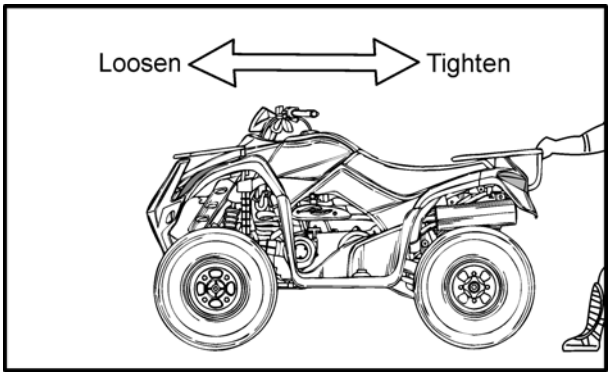
Loosen the caliper holder bolt and two axle hub holding bolt.



Provide a proper pin and pass the pin through the axle hub and driven sprocket.

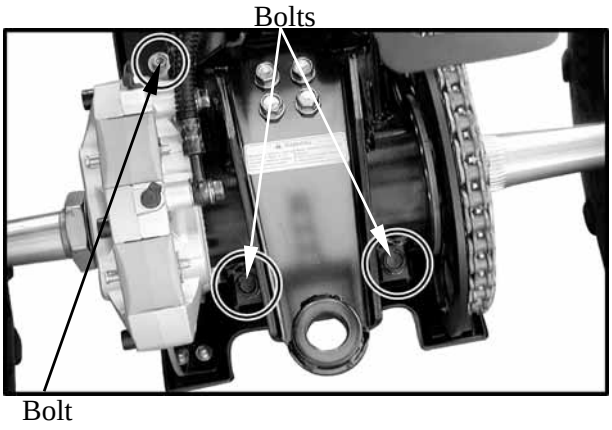


To tighten the chain, push the ATV forward.
To loosen the chain, pull the ATV backward.

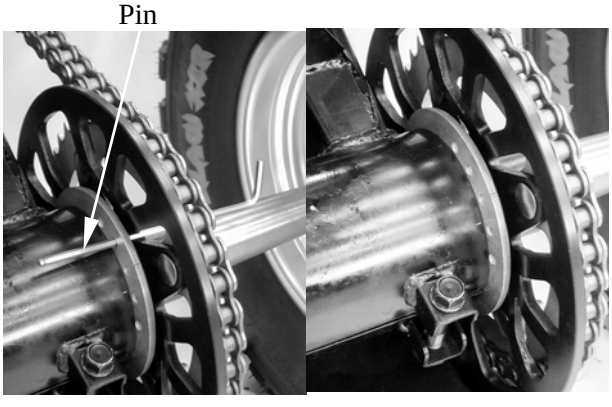


Retighten the two axle hub holder bolt and caliper holder bolt to the specification.

Torque:
Axle hub holding bolt:
4 kgf-m (40 Nm, 29 lbf-ft)
Caliper holder bolt:
1 kgf-m (10 Nm, 7.2 lbf-ft)



Pull out the pin.



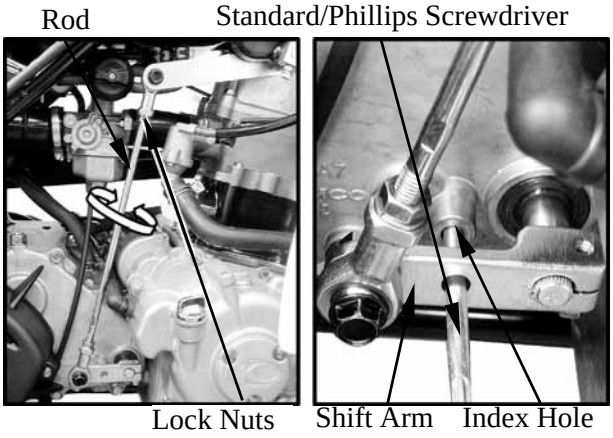
DRIVE SELECT LEVER ADJUSTMENT

Turn the ignition switch is ON and make sure the engine stop switch in the OFF position.

Loosen the lock nuts of rod.

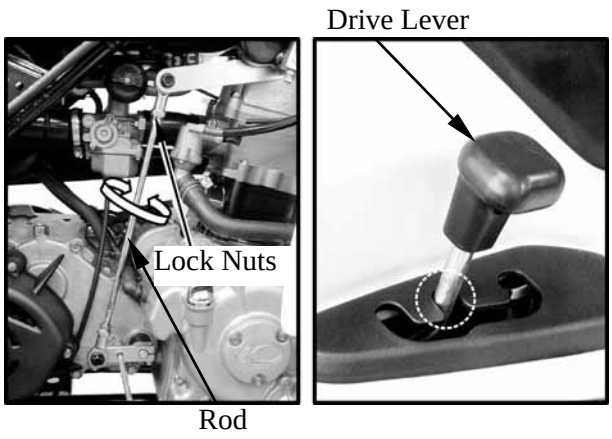
Shift the gear to neutral by moving the shift lever and/or turn the rod. (The neutral indicator lamp comes on.)

Provide standard/phillips screwdriver and pass the standard/phillips screwdriver through the shift arm into the index hole at the transmission case cover.



Turn the rod clockwise or counterclockwise until the drive select lever into the "N" position of the shift guide and tighten the lock nuts, then pull out the standard/phillips screwdriver.

After adjustment, start the engine and test to ride the ATV to be sure the drive select lever is operating properly.



CABLE INSPECTION AND LUBRICATION

* Damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace such cable as soon as possible.

Inspect the cable sheath.
Replace if damage.
Check the cable operation.
Lubricate or replace if unsmooth operation.

* Hold cable end high and apply several drops of lubricant to cable.

LEVER LUBRICATION

Lubricate the pivoting parts of each lever.

REAR SUSPENSION LUBRICATION (MXU 250)

Inject grease into the nipples using a grease gun until slight over flow is observed from the thrust covers.

* Wipe off the excess grease.

Nipple

COOLING SYSTEM

COOLANT LEVEL INSPECTION

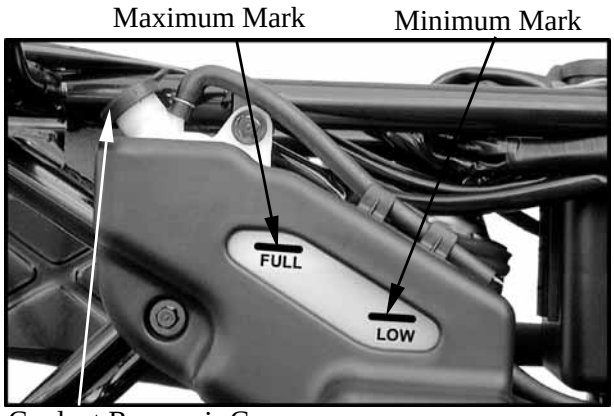
Place the machine on the level ground.

Check the coolant level in the coolant reservoir when the engine is cold as the coolant level will vary with engine temperature. The coolant level should be between the maximum and minimum marks.

If the level is low, remove the coolant reservoir cap, and then add coolant or distilled water to raise it to the specified level.

Recommended Coolant: SIGMA Coolant
(Standard Concentration 30%)

* The coolant level does not change no matter the engine is warm or cold. Fill to the maximum mark.



Coolant Reservoir Cap

COOLANT REPLACEMENT

* Perform this operation when the engine is cold.

Remove the front fender. (⇨2-8)

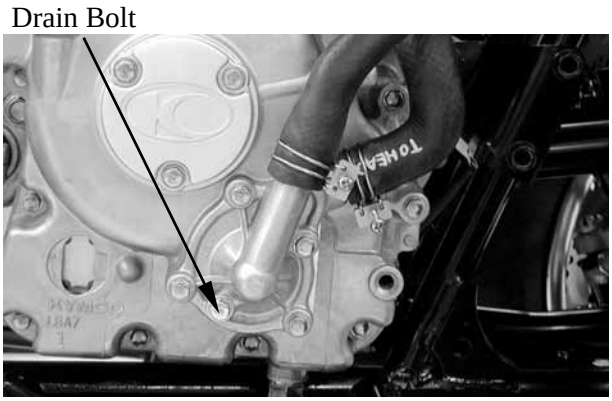
Remove the radiator cap.

Remove the drain bolt to drain the coolant.

Drain the coolant in the reserve tank.

Reinstall the drain bolt.

* The coolant freezing point should be 5 °C lower than the temperature of the riding area.



Coolant capacity:
1400 cc (1232 lmp qt, 1484 Us qt)

Radiator capacity:
1100 cc (968 lmp qt, 1166 Us qt)

Reserve tank capacity:
300 cc (264 lmp qt, 318 Us qt)

Start the engine and check if there are no bubbles in the coolant and the coolant level is stable. Reinstall the radiator cap.

If there are bubbles in the coolant, bleed air from the system.

Fill the reserve tank with the recommended coolant up to the maximum mark.

SPARK ARRESTER CLEANING (OFF ROAD)

Be sure the exhaust pipe and muffler are cool before cleaning the spark arrester.

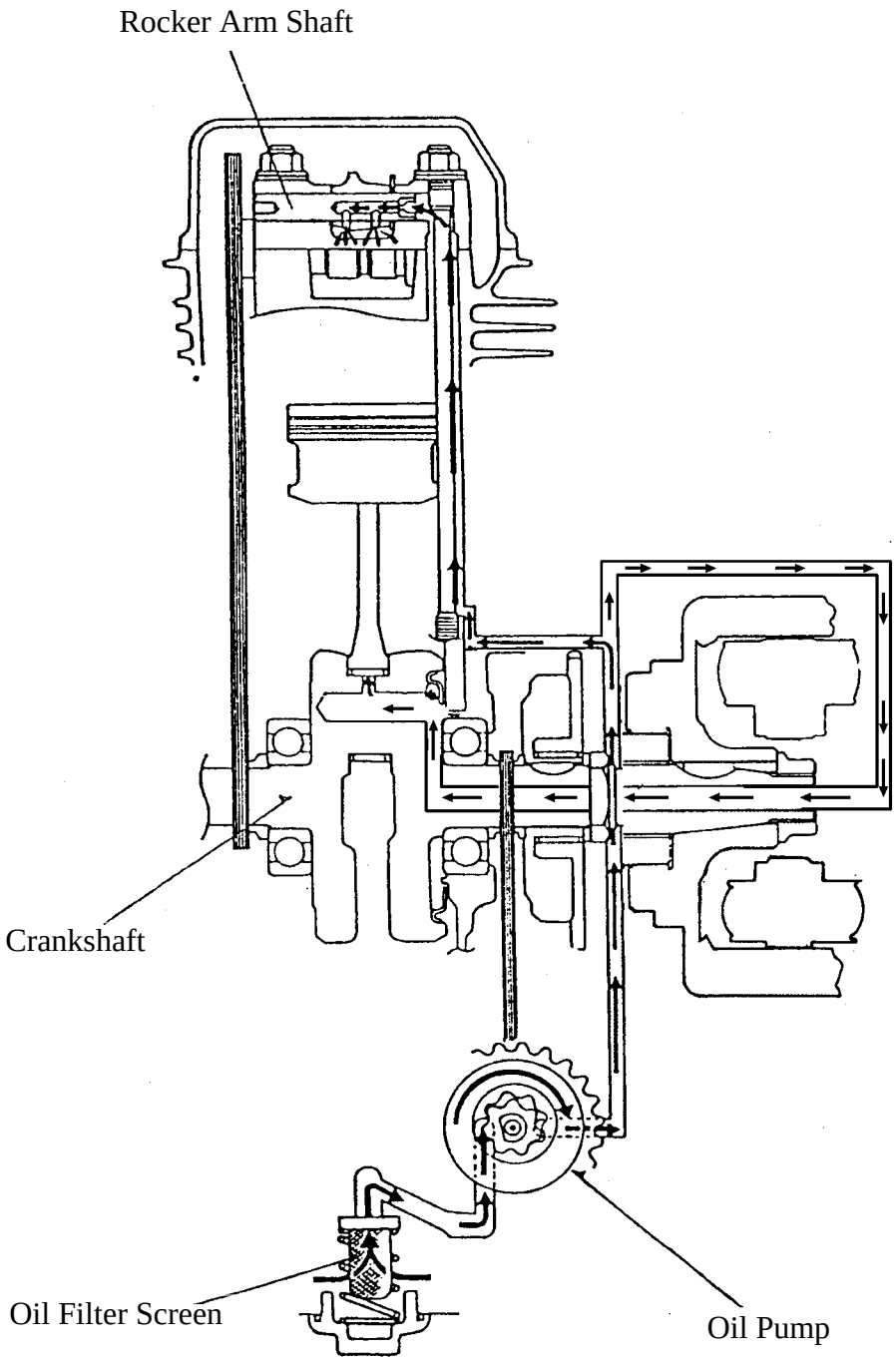
1. Remove the bolt (1).

2. Remove the tailpipe (2) by pulling it out of the muffler.
3. Tap the tailpipe lightly, then use a wire brush to remove any carbon deposits from the spark arrester portion of the tailpipe.
4. Insert the tailpipe into the muffler and align the screw holes.
5. Install the bolt and tighten it.

4

LUBRICATION SYSTEM

LUBRICATION SYSTEM



SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The maintenance of lubrication system can be performed with the engine installed in the frame.
- Use care when removing and installing the oil pump not to allow dust and foreign matters to enter the engine and oil line.
- Do not attempt to disassemble the oil pump. The oil pump must be replaced as a set when it reaches its service limit.
- After the oil pump is installed, check each part for oil leaks.

SPECIFICATIONS

Unit: mm (in)

Item		Standard	Service Limit
Oil pump	Inner rotor-to-outer rotor clearance	0.15 (0.006)	0.2 (0.008)
	Outer rotor-to-pump body clearance	0.15～0.2 (0.006～0.008)	0.25 (0.01)
	Rotor end-to-pump body clearance	0.04～0.09 (0.0016～0.0036)	0.12 (0.0048)

TROUBLESHOOTING

Oil level too low

- Natural oil consumption
- Oil leaks
- Worn or poorly installed piston rings
- Worn valve guide or seal

Poor lubrication pressure

- Oil level too low
- Clogged oil filter or oil passages
- Not use the specified oil

ENGINE OIL/OIL FILTER

OIL LEVEL AND OIL CHANGE

Refer to the “ENGINE OIL” section in the chapter 3 to check the oil level and replacement and oil filter cleaning.

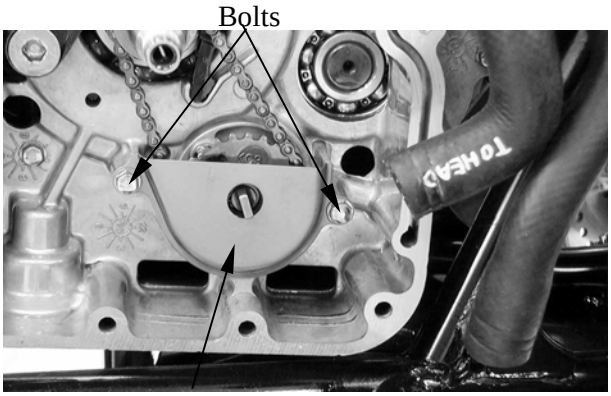
OIL PUMP

REMOVAL

Remove the right crankcase cover and the A.C. generator flywheel. (Refer to the “A.C. GENERATOR/FLYWHEEL” section in the chapter 16)

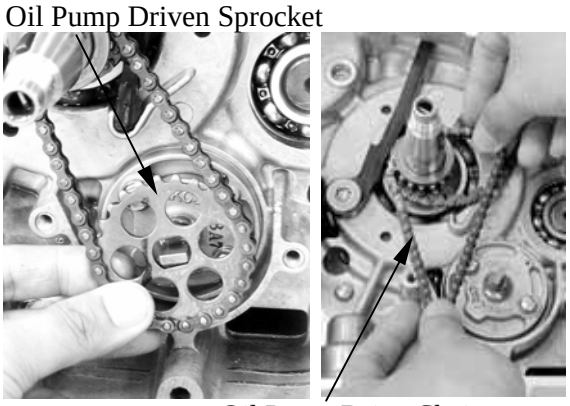
Remove the starter clutch gear. (Refer to the “STARTER CLUTCH” section in the chapter 18)

Remove the two bolts and oil separator cover.

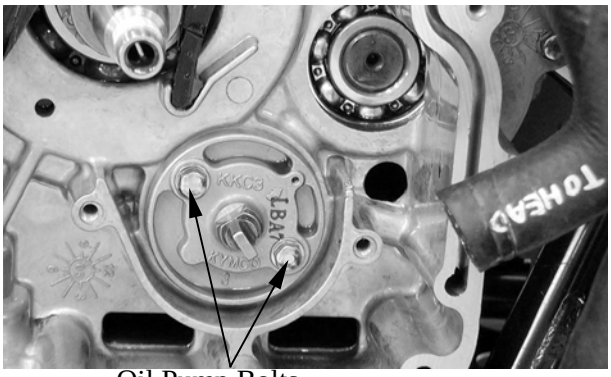


Pry off and remove the circlip from oil driven sprocket.

Remove the oil pump drive chain and oil driven sprocket.

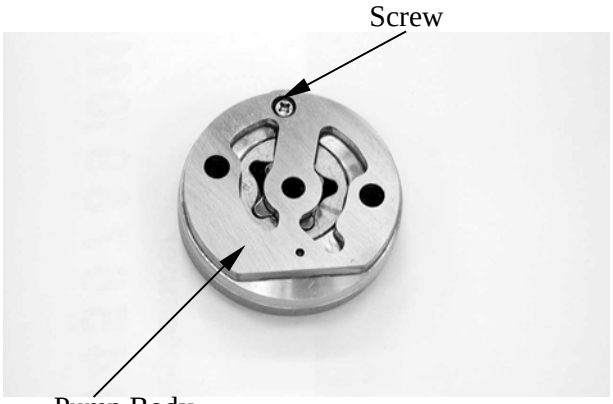


Remove the two oil pump bolts for remove the oil pump.



OIL PUMP DISASSEMBLY

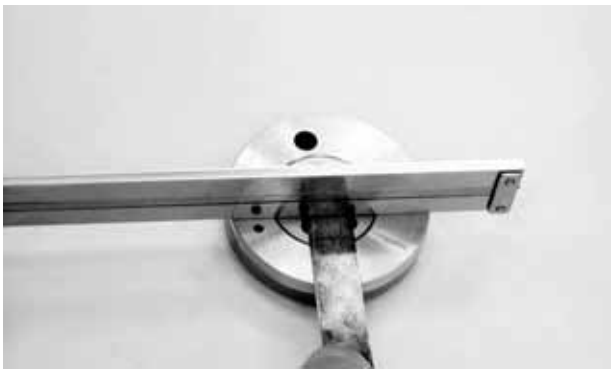
Remove the screw and disassemble the oil pump.



INSPECTION

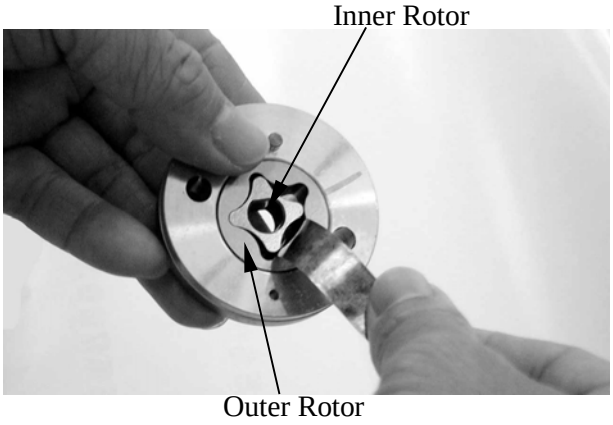
Measure the rotor end-to-pump body clearance.

Service Limit: 0.12 mm (0.0048 in)



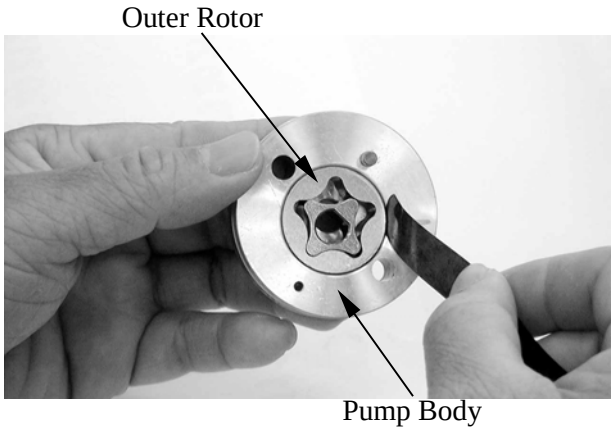
Measure the inner rotor-to-outer rotor clearance.

Service Limit: 0.2 mm (0.008 in)



Measure the pump body-to-outer rotor clearance.

Service Limit: 0.25 mm (0.01 in)



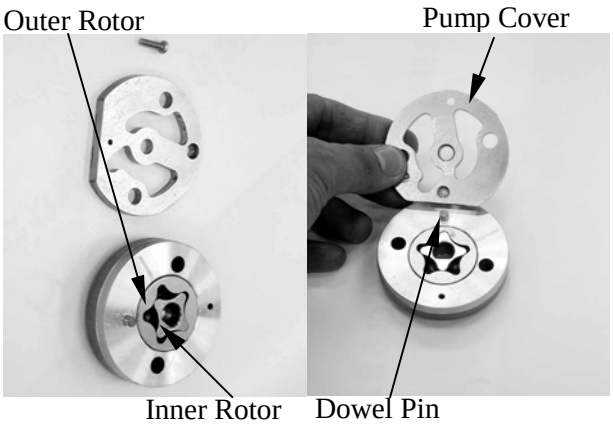
ASSEMBLY

Install the outer rotor, inner rotor and pump shaft into the pump body.

* Insert the pump shaft by aligning the flat on the shaft with the flat in the inner rotor.

Install the dowel pin.
Install the pump cover by aligning the hole in the cover with the dowel pin.
Tighten the screw to the specified torque.

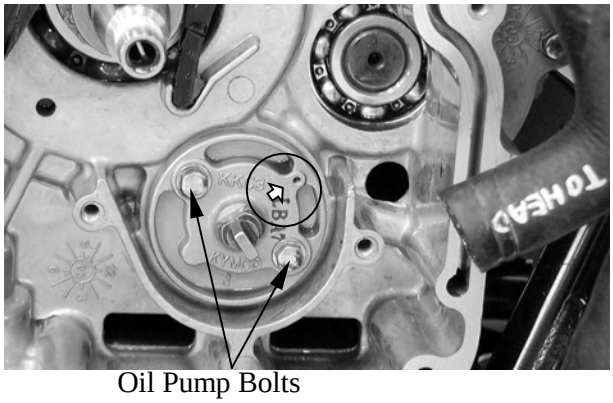
Torque : 0.2 kgf-m (2 Nm, 1.5 lbf-ft)



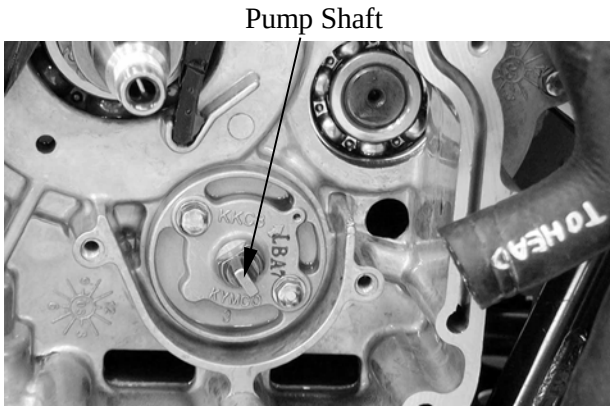
INSTALLATION

Reverse the “OIL PUMP REMOVAL” procedures.

* Install the oil pump with the arrow on the pump body facing up and fill the oil pump with engine oil before installation.



Make sure that the pump shaft rotates freely without binding.

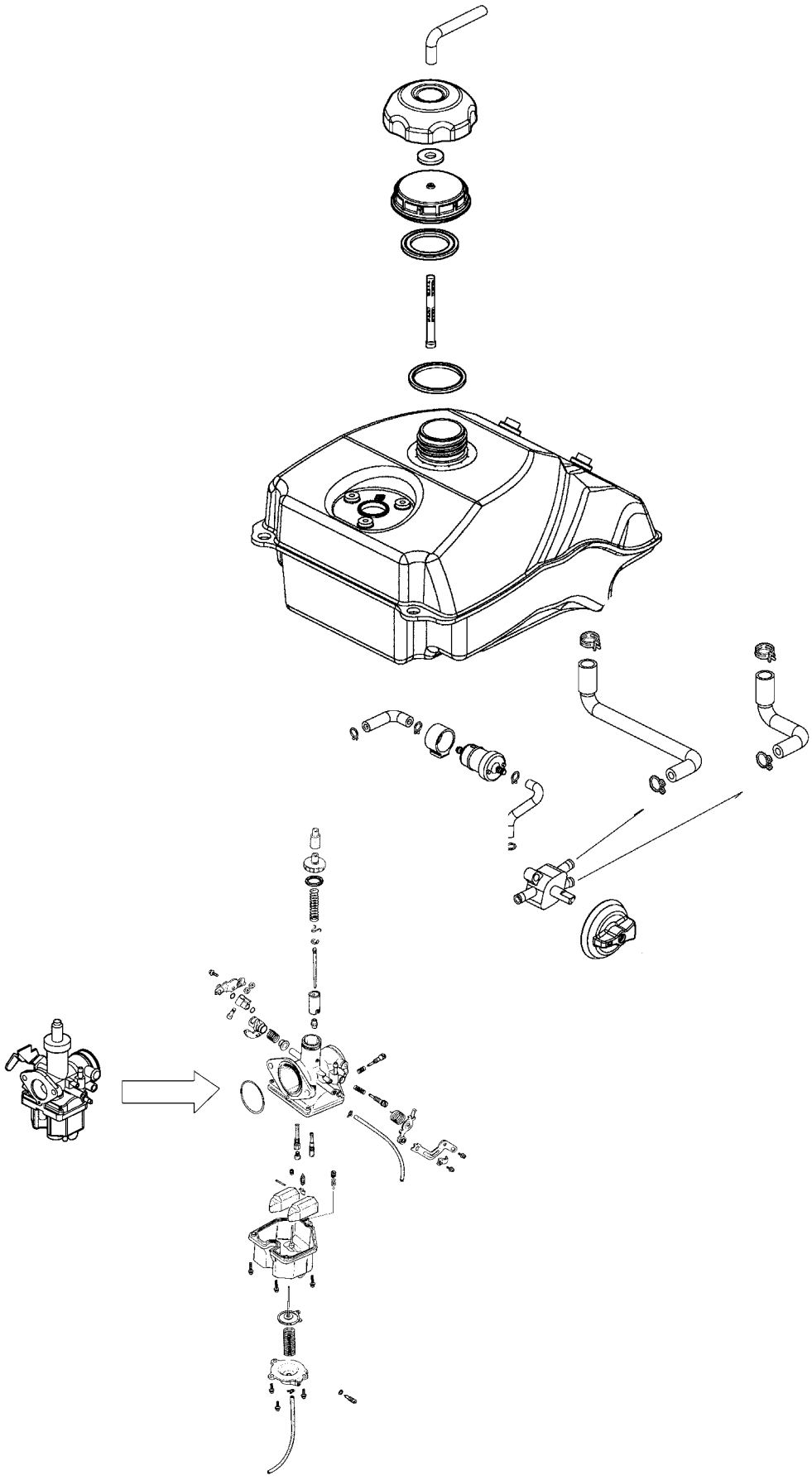


Install oil pump driven sprocket and drive chain, circlip and oil separator cover.

5

FUEL SYSTEM

5. FUEL SYSTEM



SERVICE INFORMATION

GENERAL INSTRUCTIONS

Gasoline is very dangerous. When working with gasoline, keep sparks and flames away from the working area.
Gasoline is extremely flammable and is explosive under certain conditions. Be sure to work in a well-ventilated area.

- Do not bend or twist control cables. Damaged control cables will not operate smoothly.
- When disassembling fuel system parts, note the locations of O-rings. Replace them with new ones during reassembly.
- Before float chamber disassembly, loosen the drain screw to drain the residual gasoline into a clean container.
- After the carburetor is removed, plug the intake manifold side with a clean shop towel to prevent foreign matters from entering.
- When cleaning the carburetor air and fuel jets, the O-rings and diaphragm must be removed first to avoid damage. Then, clean with compressed air.
- When the motorcycle is not used for over one month, drain the residual gasoline from the float chamber to avoid erratic idling and clogged slow jet due to deteriorated fuel.

SPECIFICATIONS

Item		Standard
Type		PTG
Venturi dia.		ϕ22
Float level		14.8mm
Main jet No.		98
Adjust method		Piston
Idle speed	MXU 250	1500±100rpm
	MXU 300	1600±100rpm
Throttle grip free play		1～4mm
Air screw opening		1 1/8±1/2

TROUBLESHOOTING

Engine cranks but won't start
- No fuel in tank
- No fuel to carburetor
- Cylinder flooded with fuel
- No spark at plug
- Clogged air cleaner
- Intake air leak
- Improper throttle operation

Engine idles roughly, stalls or runs poorly
- Excessively used choke
- Ignition malfunction
- Faulty carburetor
- Poor quality fuel
- Lean or rich mixture
- Incorrect idle speed

Misfiring during acceleration
- Faulty ignition system
- Faulty carburetor

Backfiring at deceleration
- Float level too low
- Incorrectly adjusted carburetor
- Faulty exhaust muffler

Engine lacks power
- Clogged air cleaner
- Faulty carburetor
- Faulty ignition system

Lean mixture
- Clogged carburetor fuel jets
- Float level too low
- Intake air leak
- Clogged fuel tank cap breather hole
- Kinked or restricted fuel line

Rich mixture
- Float level too high
- Clogged air jets
- Clogged air cleaner

FUEL TANK

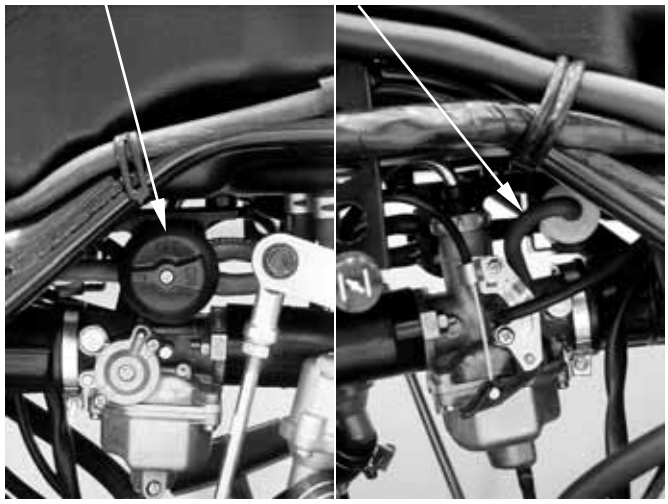
REMOVAL

Warning

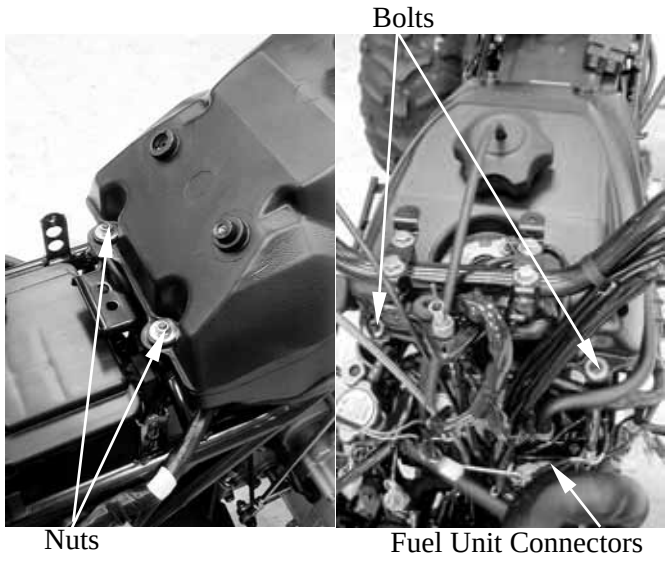
- Keep sparks and flames away from the work area.
- Wipe off any spilled gasoline.

Remove the seat (See page 2-3), right and left side frame cover (See page 2-6) and fuel tank cover (See page 2-8).

Switch the fuel valve “OFF”.
Disconnect the fuel tube from carburetor.



Disconnect the fuel unit connectors.
Remove the two bolts and two nuts from the fuel tank, then remove the fuel tank.



INSTALLATION

Reverse the “FUEL TANK REMOVAL” procedures.

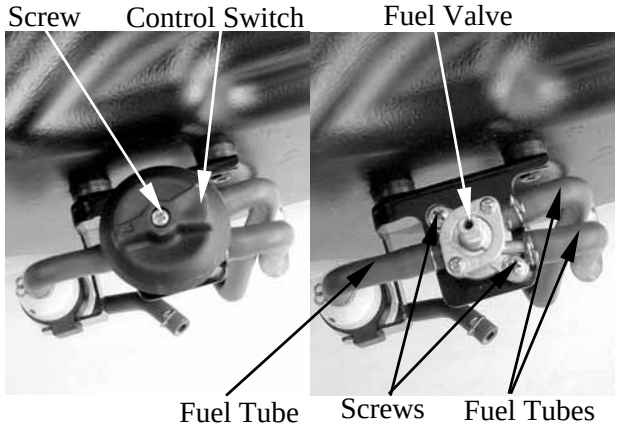
FUEL VALVE

REMOVAL

*

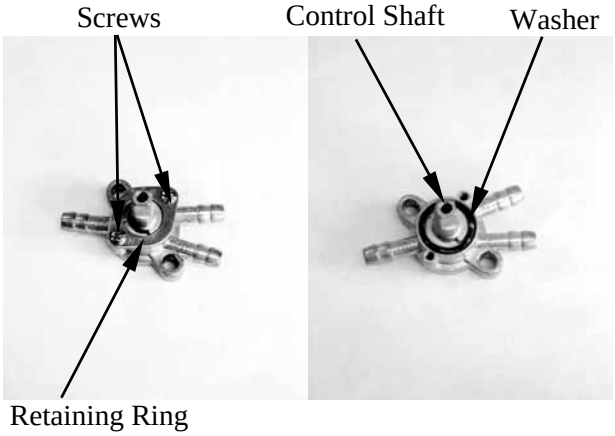
- Keep sparks and flames away from the work area.
- Drain gasoline into a clean container.

Remove the screw and then remove control switch.
Disconnect all fuel tubes and remove the two screws, then remove fuel valve.

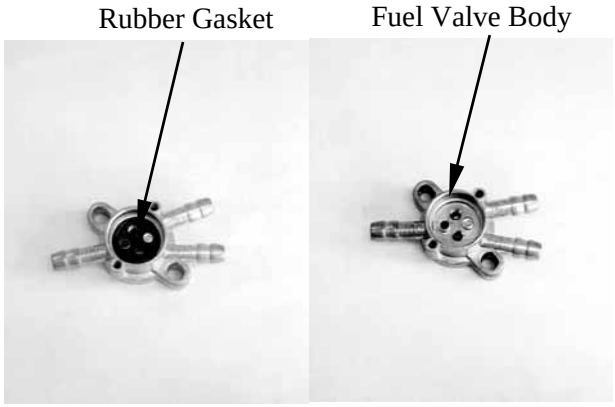


DISASSEMBLY

Remove the two screws on the retaining ring and then remove retaining ring.
Remove the washer and control shaft.



Remove the rubber gasket from the fuel valve body.

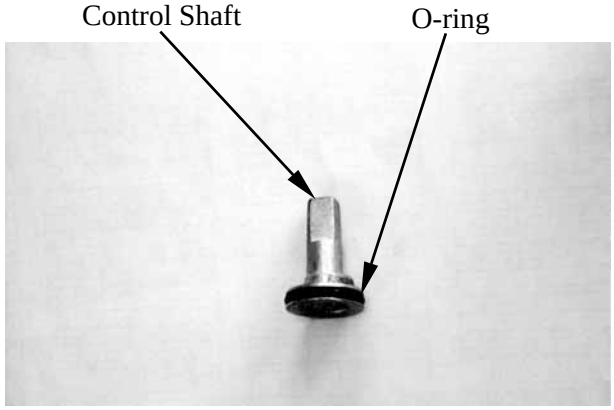


INSPECTION

Inspect the fuel valve body for dirt and clog. Clean if necessary.

Replace the rubber gasket with new ones if they are damaged or deteriorated.

Replace the O-rings with new ones if they are damaged or deteriorated.

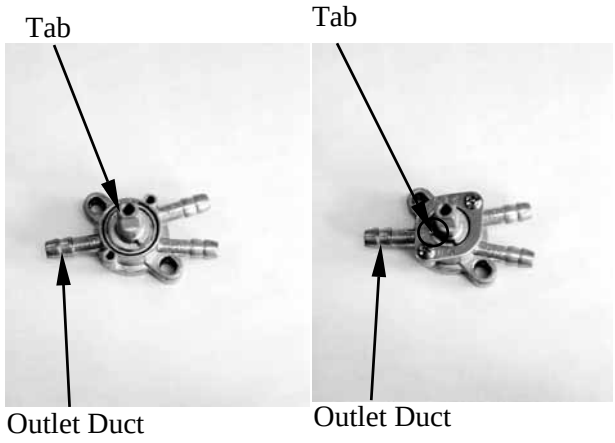


ASSEMBLY

Reverse the “DISASSEMBLY” procedures.

Install rubber gasket, control shaft, washer and retaining ring.

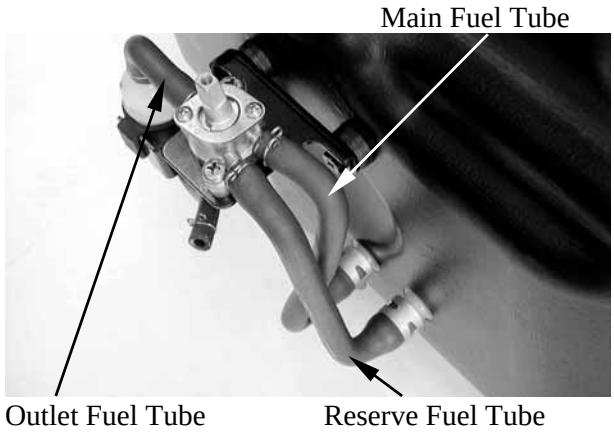
* • Aligning the tab on the control shaft with the outlet duct in the fuel valve body.
  • Aligning the tab on the retaining ring with the outlet duct in the fuel valve body.



INSTALLATION

Reverse the “FUEL VALVE REMOVEAL” procedures.

Connect all fuel tube.

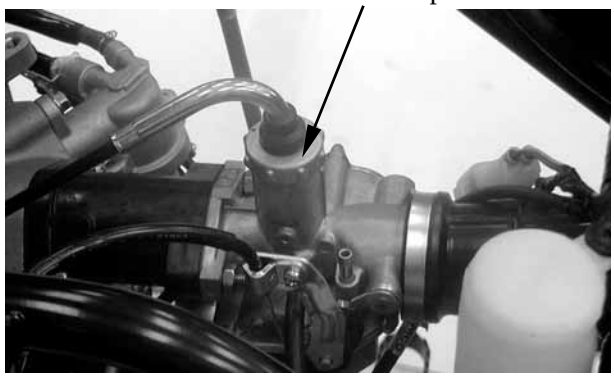


THROTTLE VALVE

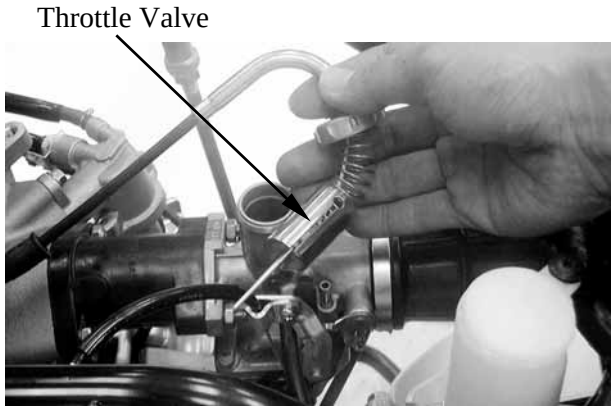
DISASSEMBLY

Remove the fuel tank. (Refer to "FUEL TANK" section in the chapter 5)

Remove the carburetor cap.

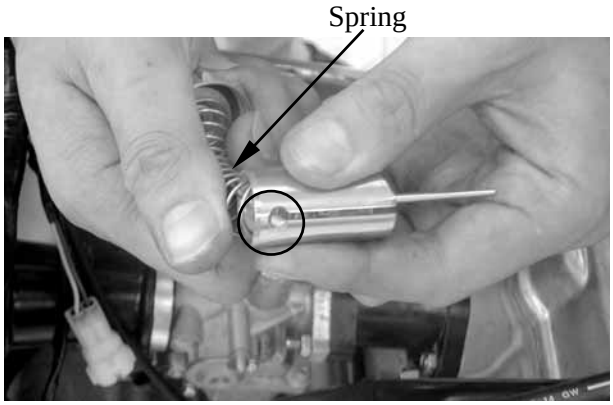


Pull out the throttle valve.

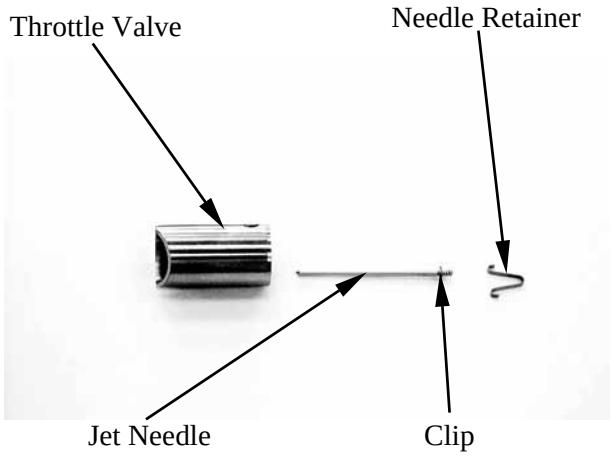


Compress the spring to disconnect the throttle cable by hand.

Remove the spring from the throttle valve



Pry off the needle retainer and remove the jet needle.
Check the throttle valve and jet needle for wear or damage.

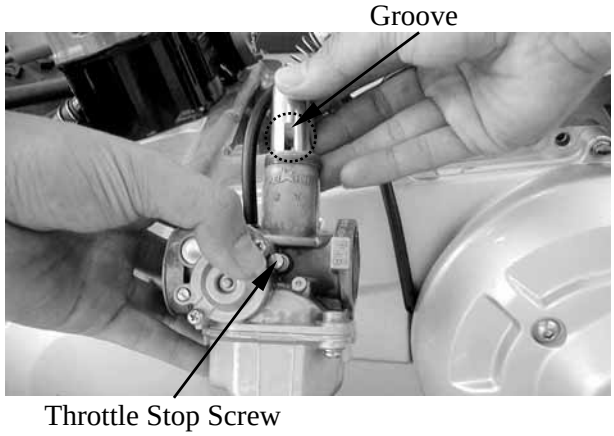


ASSEMBLY

Reverse the "DISASSEMBLY" procedures.

Install the throttle valve into the carburetor body.

* Align the groove in the throttle valve with the throttle stop screw on the carburetor body.

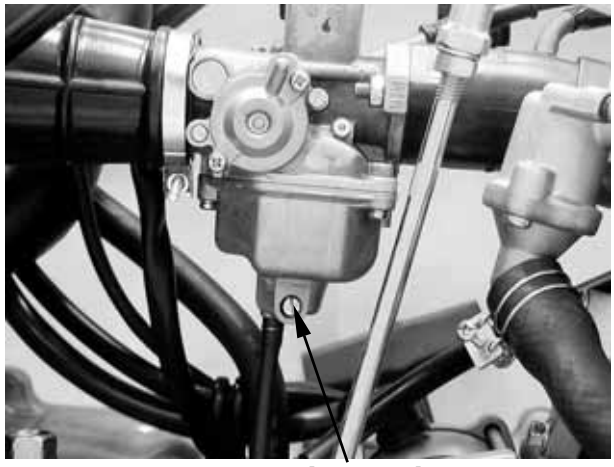


CARBURETOR

REMOVAL

Remove the fuel tank and carburetor cap. (Refer to “FUEL TANK” and “THROTTLE VALVE DISASSEMBLY” section in the chapter 5)
Loosen the drain screw to drain the gasoline from the float chamber.

* • Keep sparks and flames away from the work area.
  • Drain gasoline into a clean container.

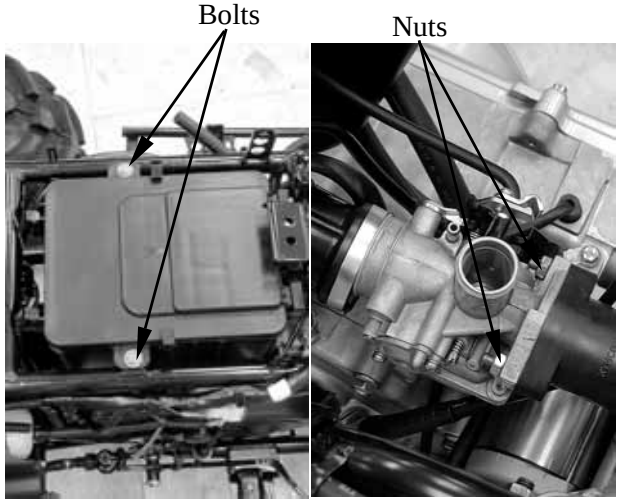

Fuel Drain Plug

Loosen the screw on the lock plate for disconnect the choke cable

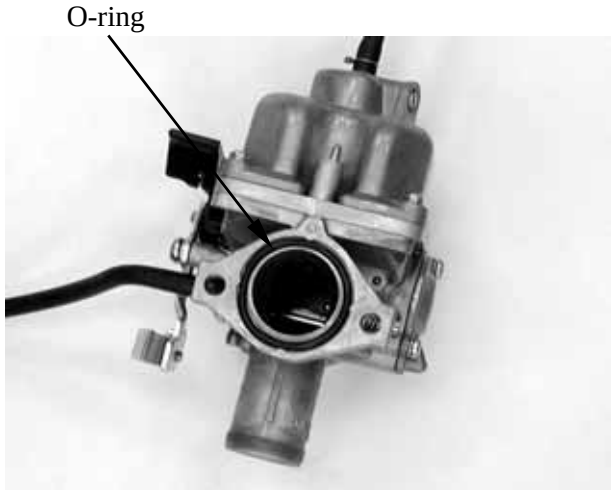
Loosen the air cleaner connecting tube band screw.

.

Remove the two bolts at the air cleaner case.
Disconnect the air cleaner connecting tube from the carburetor.
Remove the two carburetor mounting nuts and carburetor body.
Remove the carburetor.

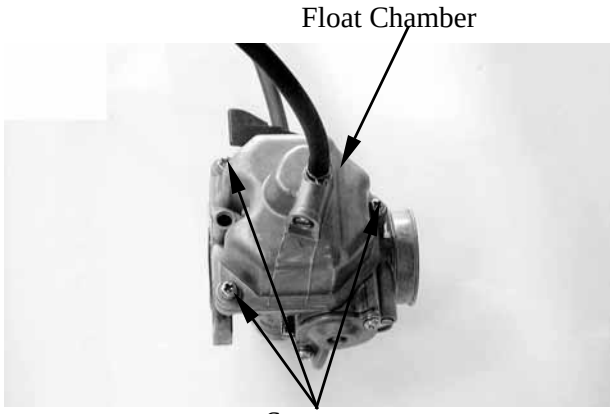


Check the O-ring for damage.
Replace with new ones if necessary.



DISASSEMBLY

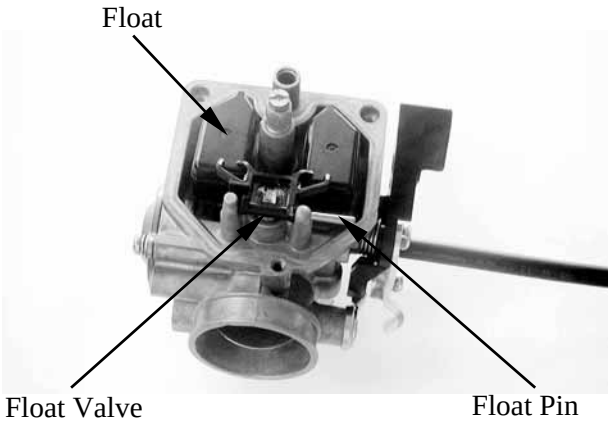
Remove the float chamber attaching three screws and remove the float chamber.



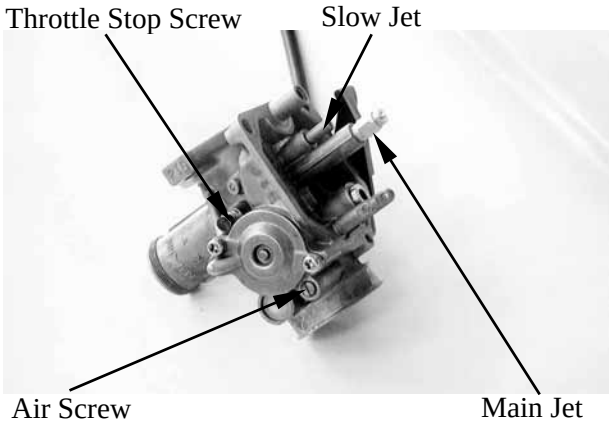
Remove the baffle plate.

Pull out the float pin, then remove float and float valve.

Inspect the float for deformation or damage.

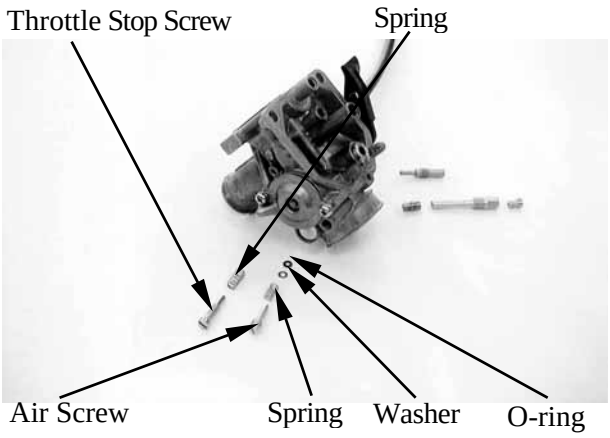


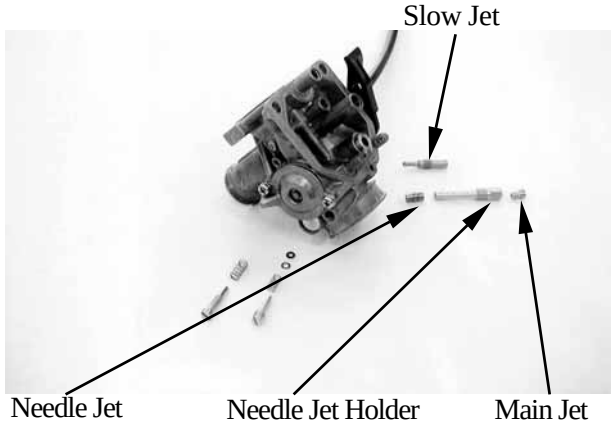
Remove the main jet, needle jet holder, and needle jet.
Remove the slow jet.
Remove the air screw and throttle stop screw.



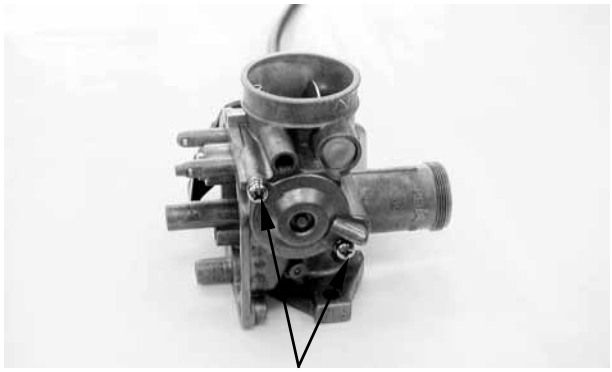
CAUTIONS!

*
- Be careful not to damage the jets and jet holder when removing them.
- Before removal, turn the throttle stop screw and air screw in and count the number of turns until they seat lightly and then make a note of this.
- Do not force the screw against its seat to avoid seat damage.
- Be sure to install the O-ring in the reverse order of removal.

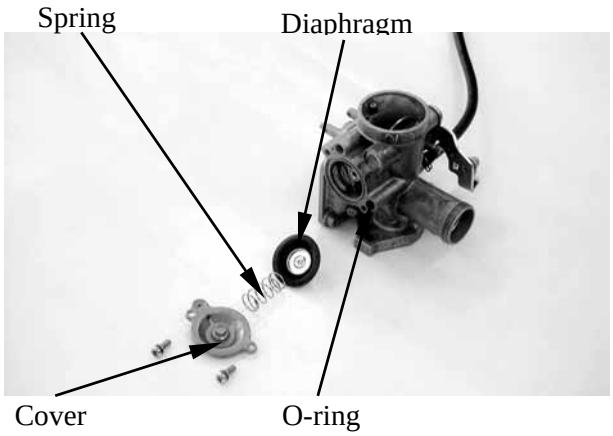




Remove the two screws and the air cut-off valve cover.

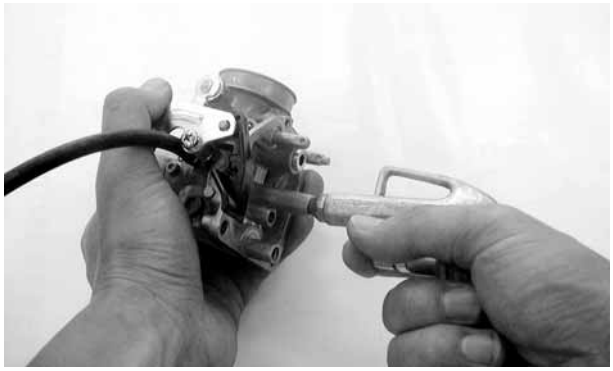


Remove the spring, diaphragm and O-rings. Inspect the diaphragm and spring for wear or damage.



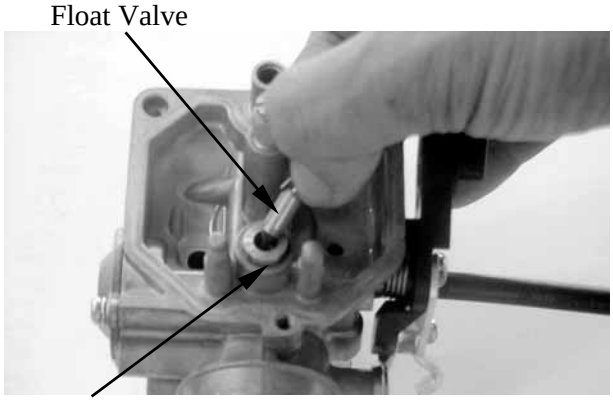
CARBURETOR CLEANING

Blow compressed air through all passages of the carburetor body.



FLOAT/FLOAT VALVE INSPECTION

Inspect the float valve seat for wear or damage.
Inspect the float for damage or fuel level inside the float chamber.

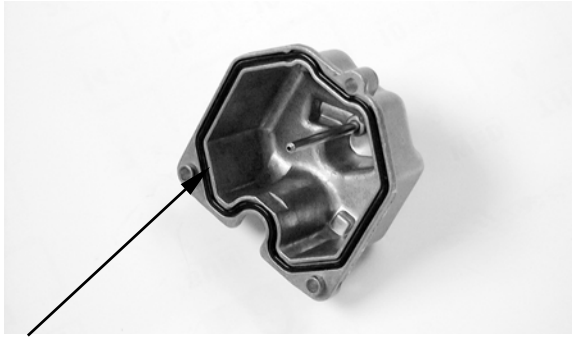


FUEL RESERVOIR O-RING CHECK

Remove the O-ring.

INSPECTION

Inspect the check the O-ring for damage.
Replace with new ones if necessary



ASSEMBLY

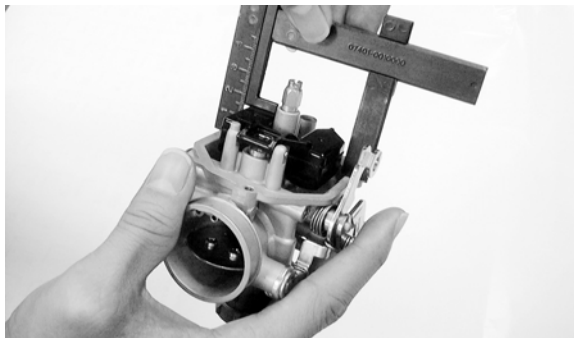
Install the slow jet.
Install the needle jet, needle jet holder and main jet.
Install the throttle stop screw and air screw
Install the spring, diaphragm and O-rings.

* • When installing the air screw, return it to the original position as noted during removal
  • After the carburetor is installed, be sure to perform the Exhaust Emission

Install the float valve, float and float pin.

FLOAT LEVEL INSPECTION

Turn the carburetor upside down so that the float will go down to make the float valve contact the float valve seat.
Then slowly tilt the carburetor and measure the float level with the float level gauge while the float pin just contacts with float valve.

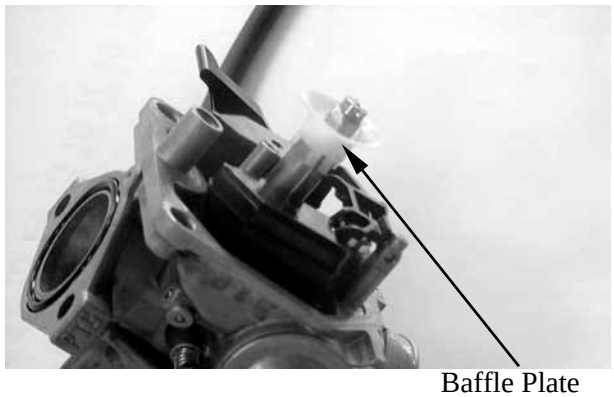


Float Level: 14.8mm

When adjusting, carefully bend the float pin.

Check the float for proper operation.

Install the jet holder, aligning the baffle plate groove with the carburetor tab and then install the float chamber.



INSTALLATION
Reverse the " CARBURETOR REMOVAL" procedures.

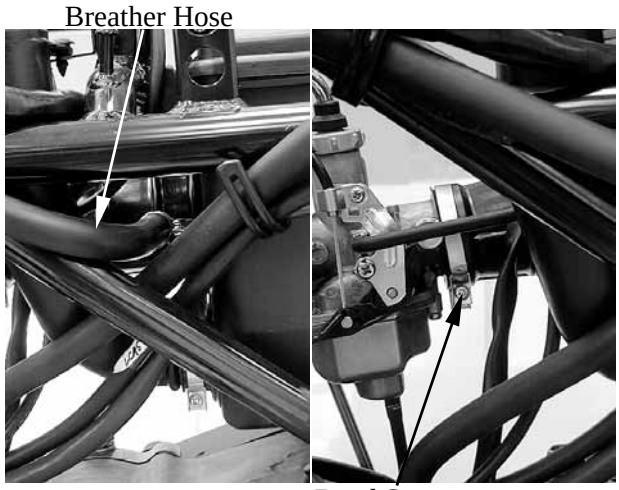
AIR CLEANER

Refer to the "AIR CLEANER" section in the chapter 3 for air cleaner replacement and cleaning.

AIR CLEANER HOUSING
REMOVAL/INSTALLATION

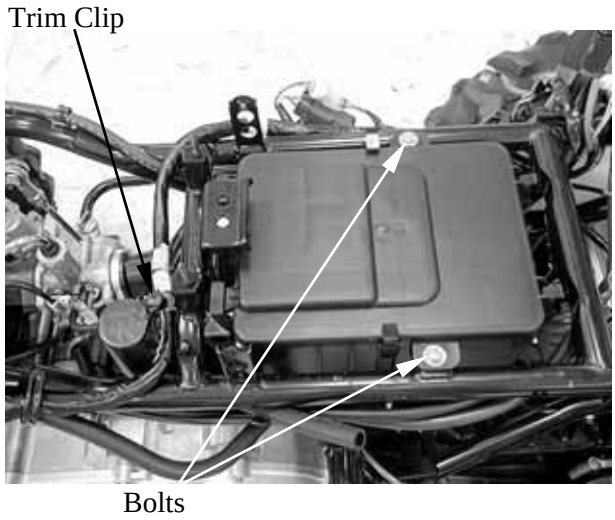
Remove the seat (see page 2-3).
Remove the side covers (see page 2-6).

Remove the clip and disconnect the crankcase breather hose from the crankcase.
Loosen the carburetor-to-air cleaner connecting tube band screw.



Remove the intake air duct trim clip.
Remove the mounting bolts and then remove the air cleaner housing from the carburetor and the intake duct.

Installation is in the reverse order of removal.

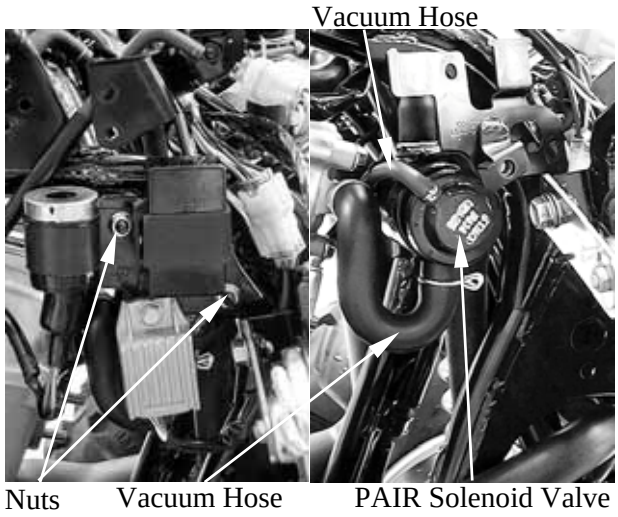


PAIR SOLENOID VALVE

REMOVAL/INSTALLATION

Remove the two nuts and electrical holder.

Disconnect air supply hose and vacuum hose from the air solenoid valve, then remove the air solenoid valve.



Installation is in the reverse order of removal.

ENGINE REMOVAL

6

SERVICE INFORMATION

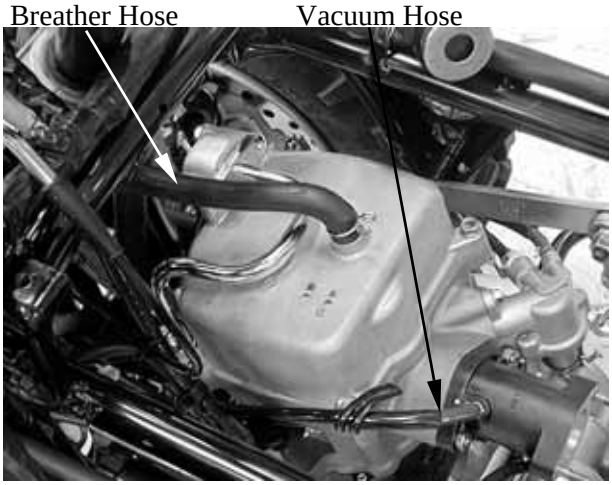
GENERAL INSTRUCTIONS

- A floor jack or other adjustable support is required to support and maneuver the engine. Be careful not to damage the machine body, cables and wires during engine removal.
- Use shop towels to protect the machine body during engine removal.
- Parts requiring engine removal for servicing:
  — Crankcase
  — Crankshaft

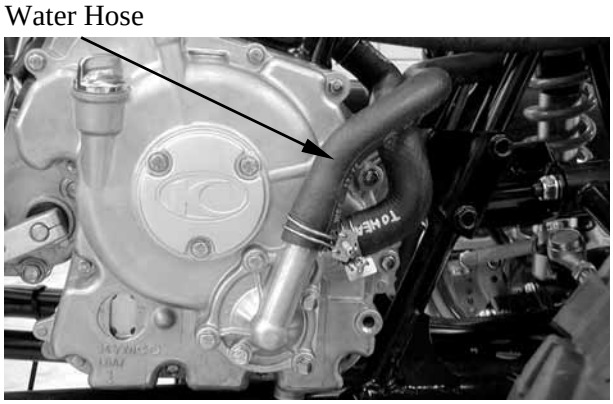
ENGINE REMOVAL (MXU 250)

Drain engine oil and transmission oil. (Refer to chapter 3).
Remove frame covers and exhaust pipe. (Refer chapter 2).
Remove the air cleaner housing and carburetor. (Refer to chapter 5).
Remove the air solenoid valve (refer to chapter 5).
Remove the spark coil (refer to chapter 17).

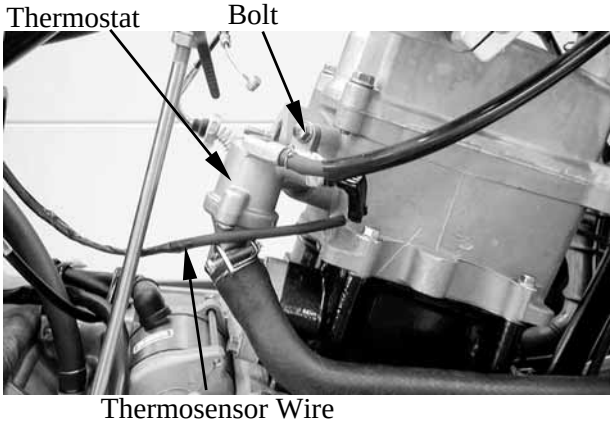
Disconnect the crankcase breather from the cylinder head cover.
Disconnect the vacuum hose from the inlet pipe.



Disconnect the water hose from water pump cover.



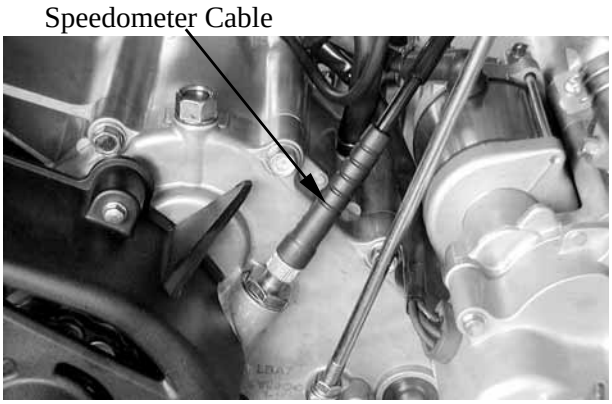
Remove the bolt at the thermostat and disconnect the thermosensor wire, then disconnect the thermostat from the cylinder head.



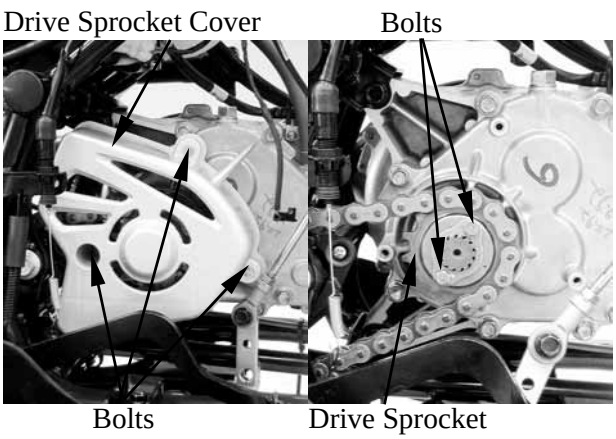
6. ENGINE REMOVAL/INSTALLATION

Remove the drive select shift to drive select arm connecting bolt and nut.
Remove the two mounting nuts and drive select shift.

Disconnect the speedometer cable.

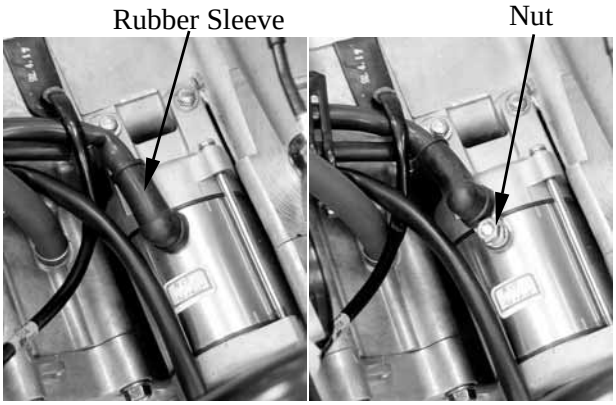


Remove the three bolts at the drive sprocket cover and then remove the drive sprocket cover.
Remove the two bolts on the drive sprocket.
Remove the drive sprocket and washer.

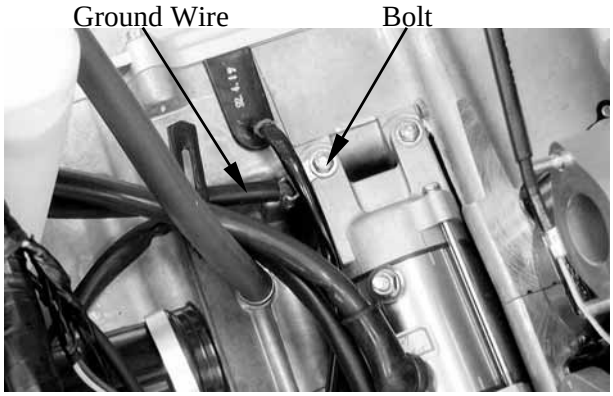


Slide the rubber sleeve back to expose the starter motor wire nut.

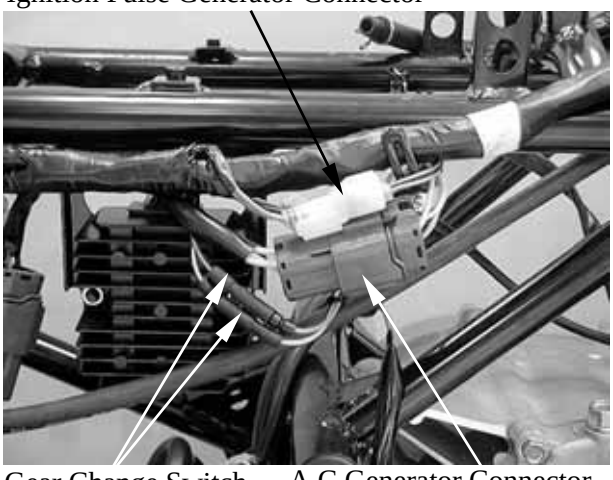
Remove the starter motor wire nut for disconnect the starter motor wire.



Remove the bolt at the starter motor for disconnect the ground wire lead.

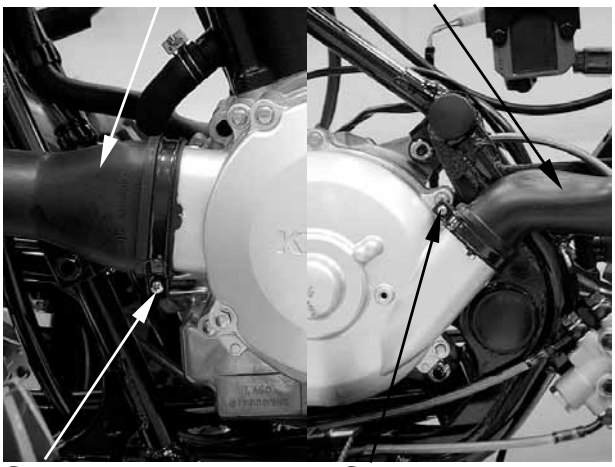


Remove the A.C.Generator, ignition pulse generator and gear change switch connectors.

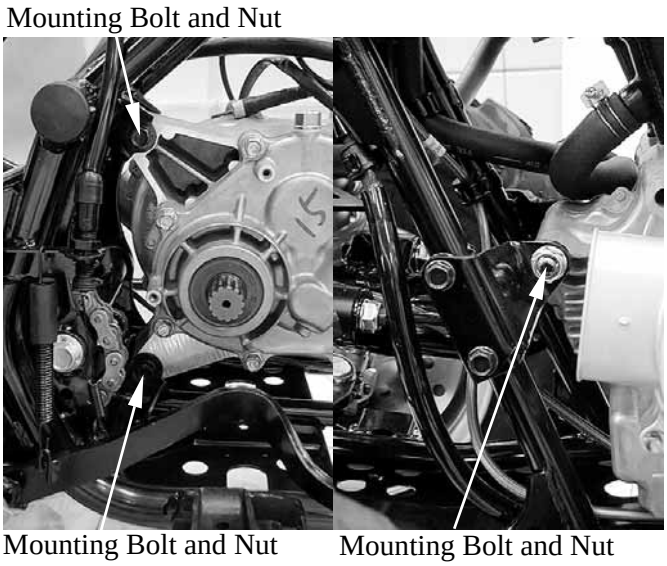


6. ENGINE REMOVAL/INSTALLATION

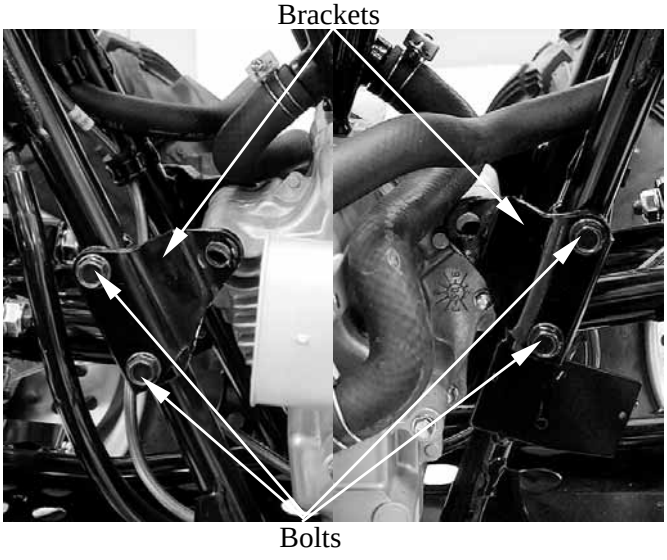
Loosen the inlet hose band screw and then disconnect the inlet hose from the left crankcase cover.
Loosen the outlet hose band screw and then disconnect the outlet hose from the left crankcase cover.



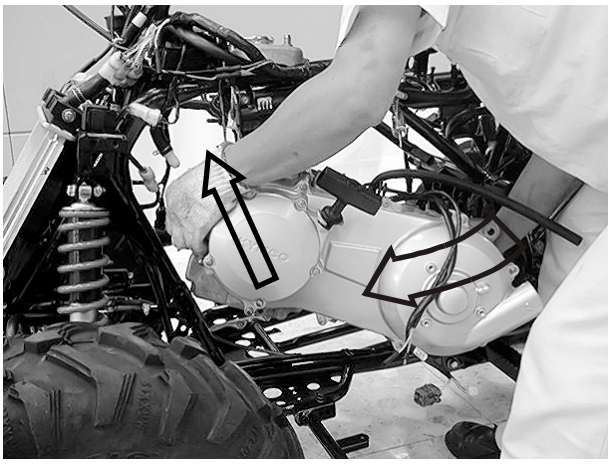
Remove the rear lower mounting bolt and nut.
Remove the rear upper mounting bolt and nut.
Remove the front mounting bolts and nuts.

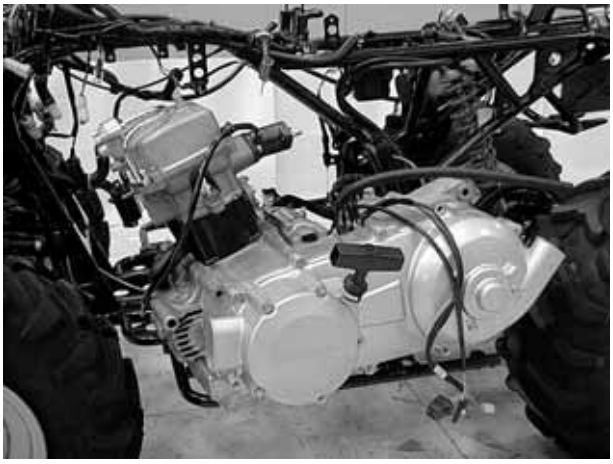


Remove the four bolts for remove the left and right engine brackets.

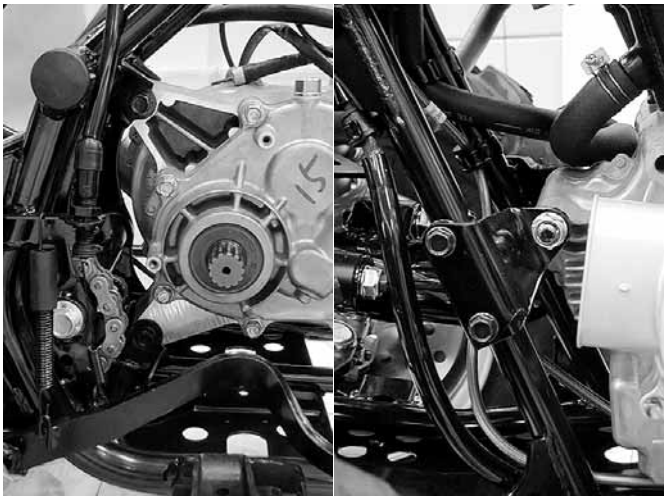


Remove the engine assembly to the left side of the machine.





ENGINE INSTALLATION (MXU 250)



Installation is in the reverse order of removal.

The rear upper and lower engine mounting bolts and nuts loosely install, then tighten the engine mounting nuts to the specified torque.

Torque: 40 N-m (4 kgf-m, 29 lbf-ft)

The brackets, bolts, front engine mounting bolt and loosely install, then tighten the bolts on the brackets to the specified torque.

Torque: 22 N-m (2.2 kgf-m, 16 lbf-ft)

Tighten the front engine mounting bolt and nut to the specified torque.

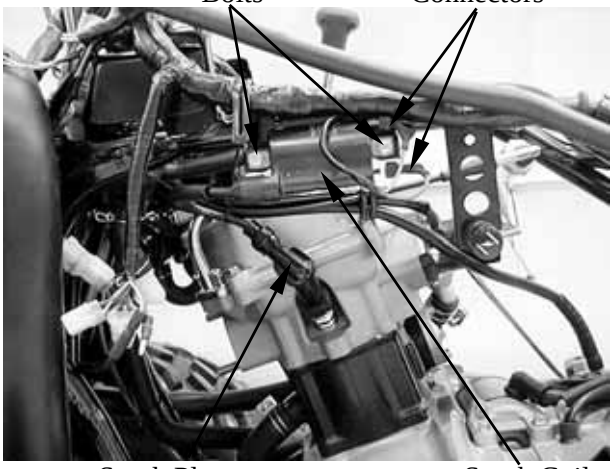
Torque: 40 N-m (4 kgf-m, 29 lbf-ft)

ENGINE REMOVAL (MXU 300)

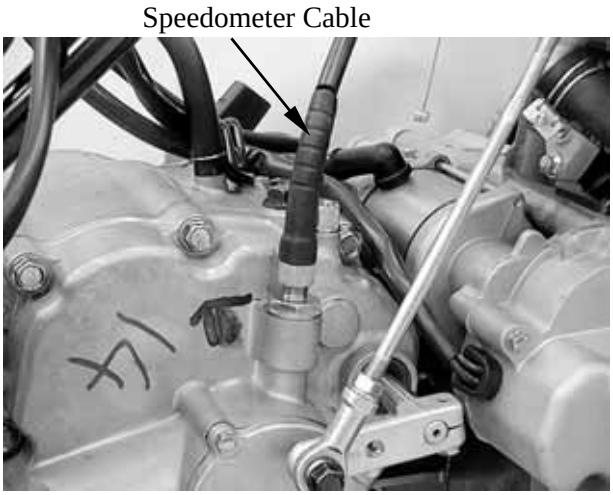
Drain engine oil and transmission oil. (Refer to chapter 3).
Remove frame covers and exhaust pipe. (Refer chapter 2).
Remove the air cleaner housing and carburetor. (Refer to chapter 5).

Disconnect the spark plug from the cylinder head.

Disconnect the spark coil connectors from the spark coil, then remove the two bolts and spark coil.

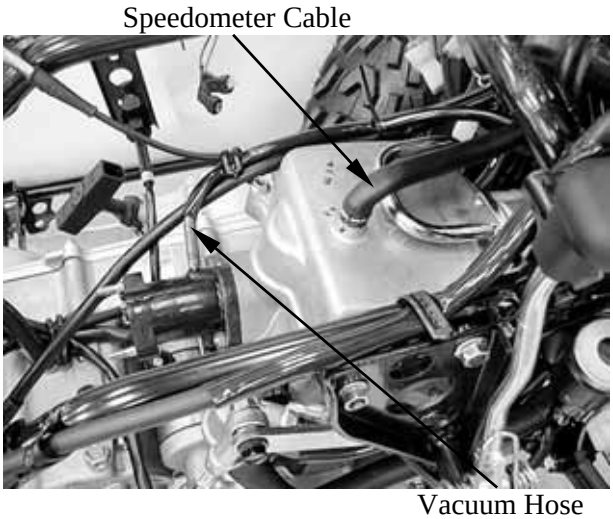


Disconnect the speedometer cable.



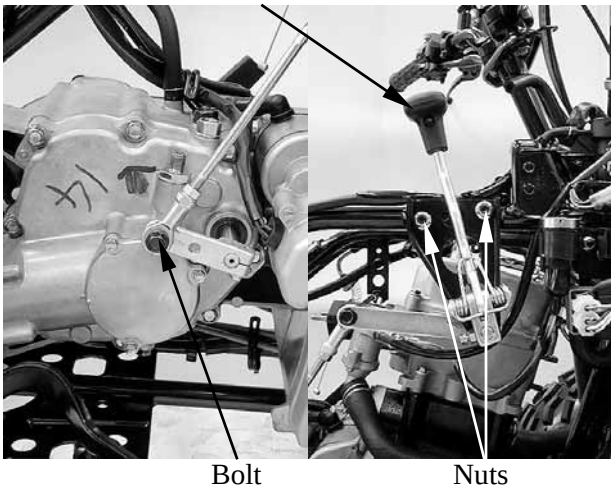
Disconnect the crankcase breather from the cylinder head cover.

Disconnect the vacuum hose from the inlet pipe.

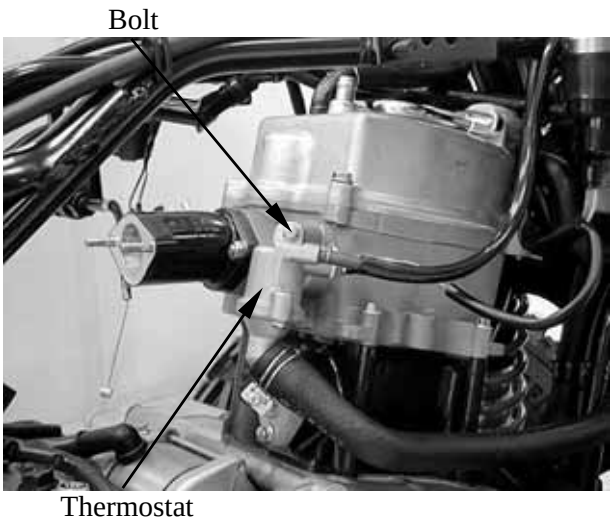


Remove the drive select shift to drive select arm connecting bolt and nut.

Remove the two mounting nuts and drive select shift.

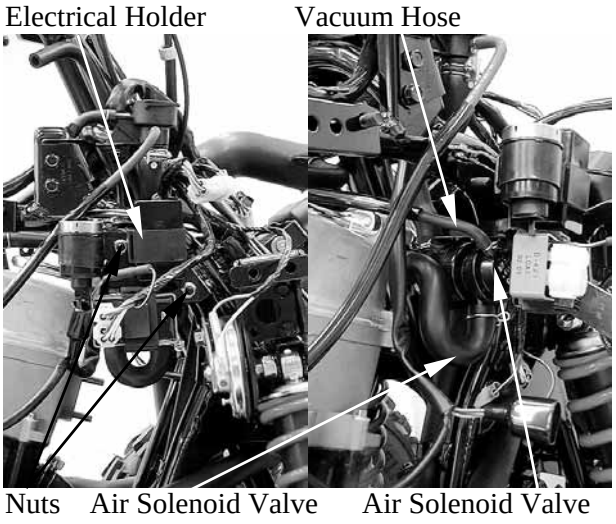


Remove the bolt and thermostat.

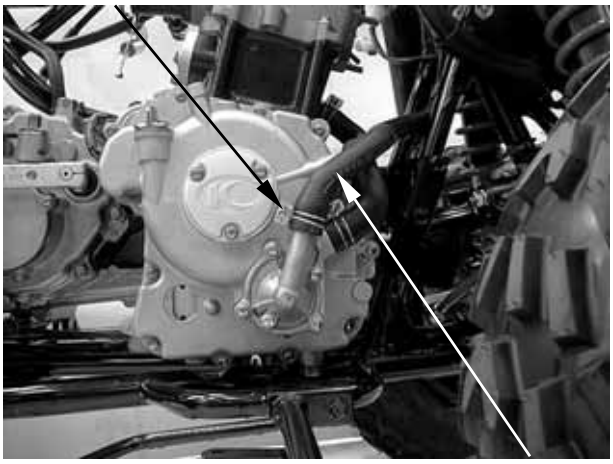


Remove the two nuts and electrical holder.

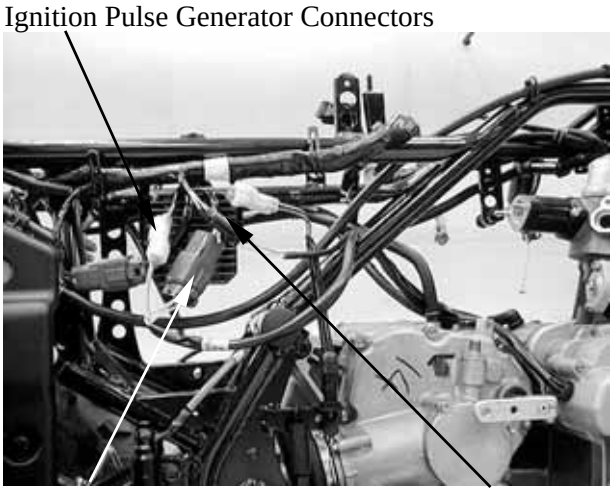
Disconnect air supply hose and vacuum hose from the air solenoid valve, then remove the air solenoid valve.



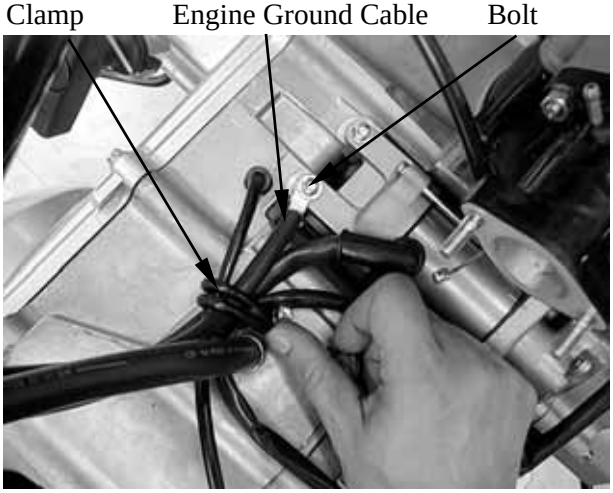
Loosen the hose band and disconnect the water hose from the water pump.



Remove the A.C. Generator, ignition pulse generator and gear change switch connectors.

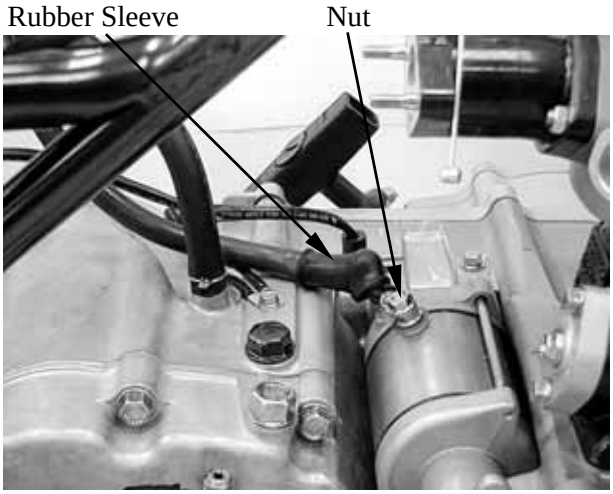


Straight the clamp and remove the bolt, then disconnect the engine ground cable.



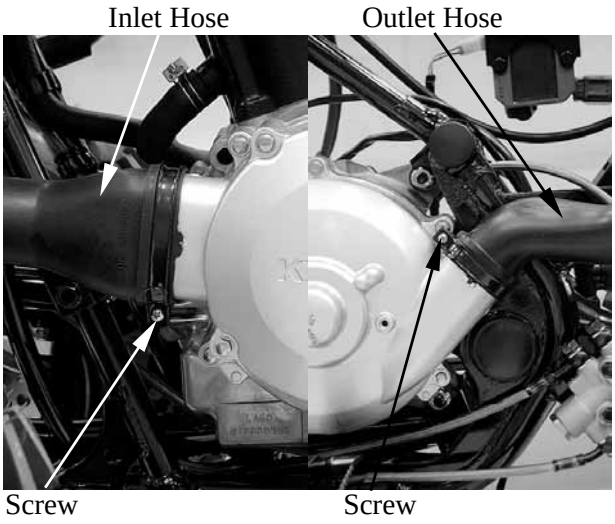
Slide the rubber sleeve back to expose the starter motor wire nut.

Remove the starter motor wire nut for disconnect the starter motor wire.

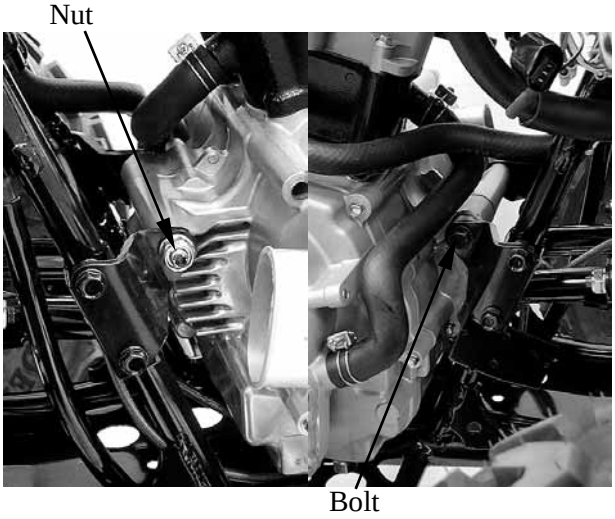


Loosen the inlet hose band screw and then disconnect the inlet hose from the left crankcase cover.

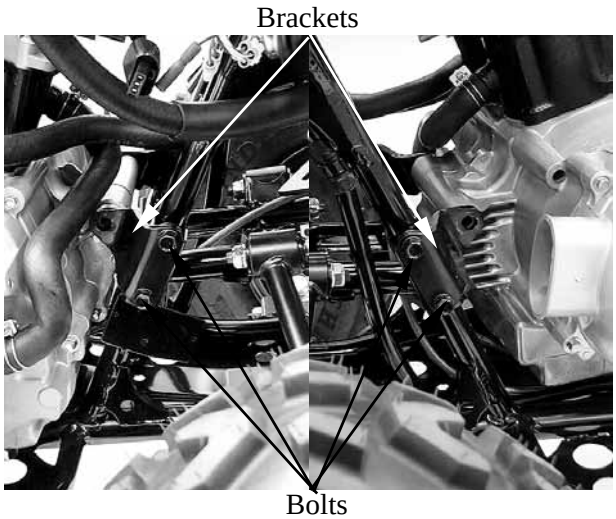
Loosen the outlet hose band screw and then disconnect the outlet hose from the left crankcase cover.



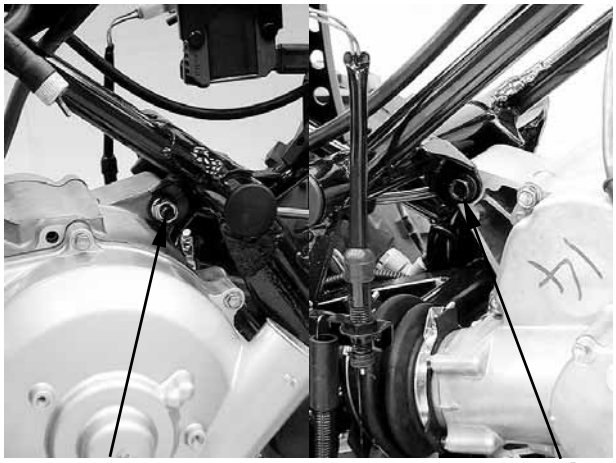
Remove the front mounting bolt and nut.



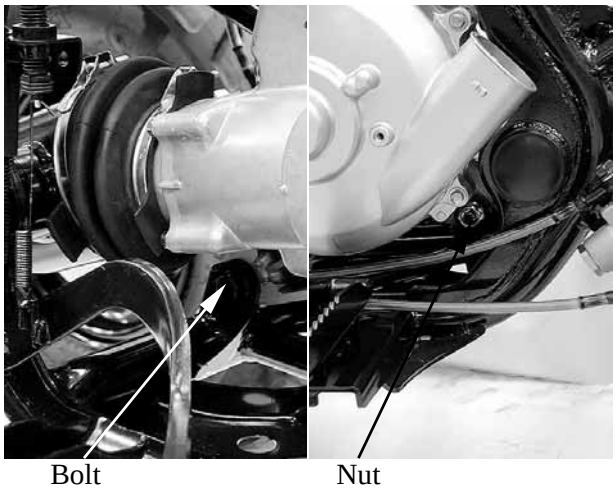
Remove the four bolts for remove the left and right engine brackets.



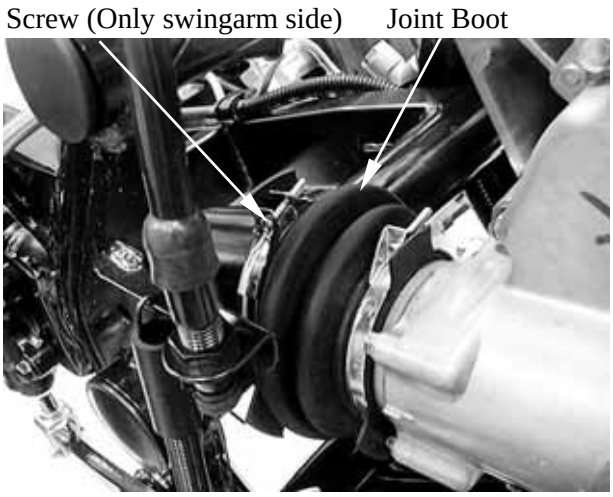
Remove the rear upper mounting bolt and nut.



Remove the rear lower mounting bolt and nut.

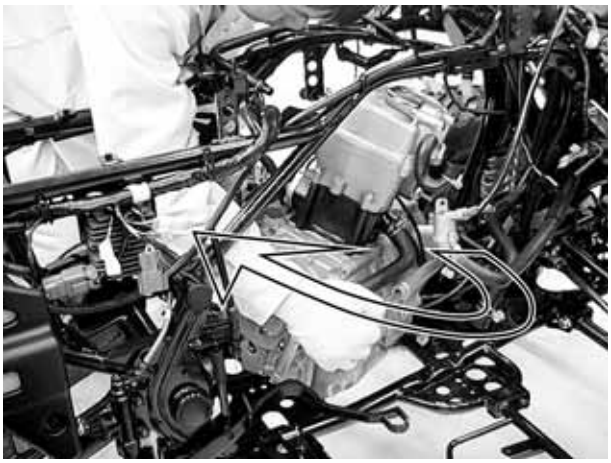


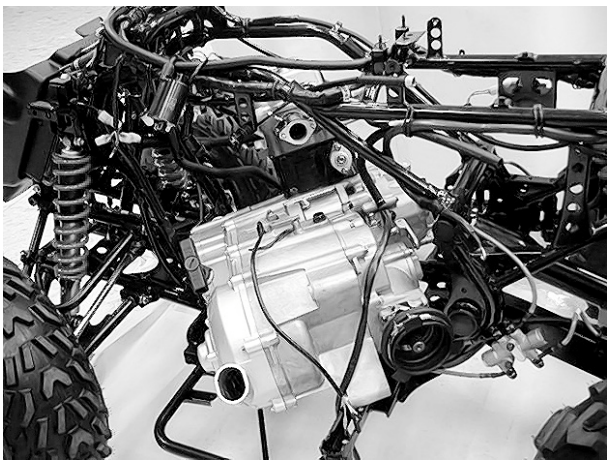
Loosen the joint boot band screw on the swingarm side. Remove the joint boot from the swingarm.



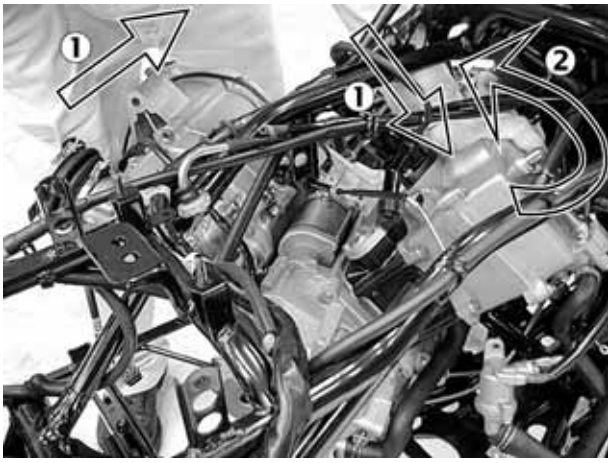
Rise the engine front side and move the engine forward, then remove the engine from the frame by disengaging the countershaft from the universal joint in the swing arm.

Turn the engine rear side to frame left side.

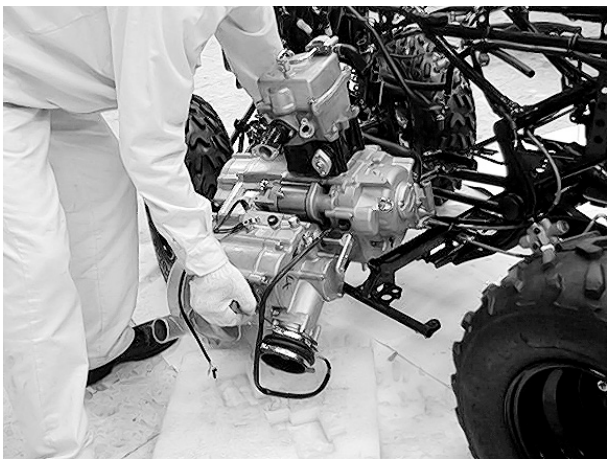




Lower the cylinder head to turn the cylinder head to frame left side.

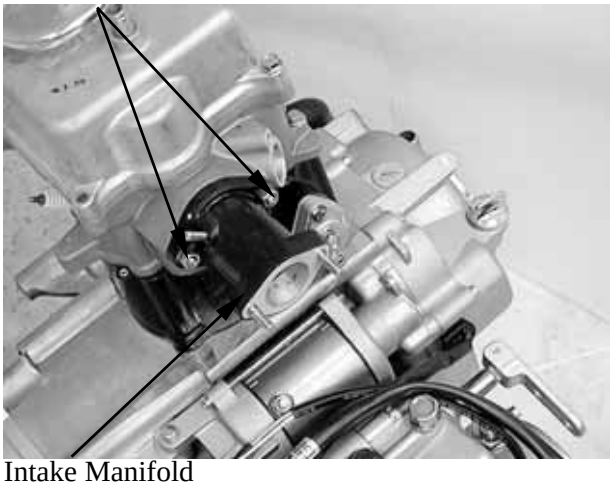


Move the engine to a rubber mat.



✳ Remove the two bolts and intake manifold may more easy to move engine.

Bolts



Intake Manifold

✳ Be careful not to damage choke knob cable and holder plate when the engine is moved.

Holder Plate

Choke Knob Cable

ENGINE INSTALLATION (MXU 300)

Installation is in the reverse order of removal.

Check the joint boot for tears or other damage.

Check the secondary driven bevel gear shaft splines and universal joint splines for wear or damage.

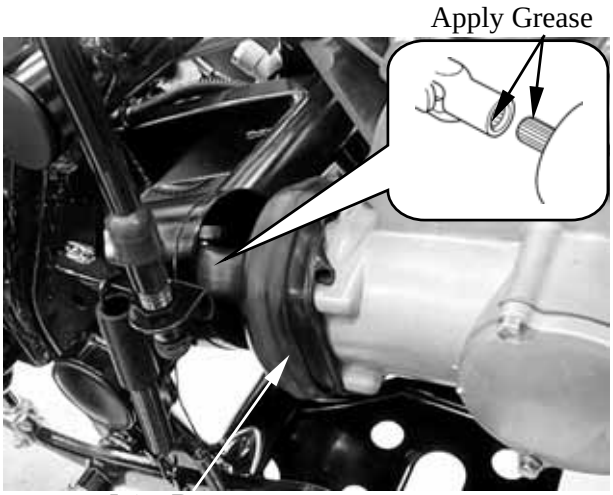
Be sure to install the joint onto the secondary driven bevel gear shaft case.

✳ Apply molybdenum disulfide grease to the universal joint splines and the secondary driven bevel gear shaft splines.

Slide the joint boot front to expose the secondary driven bevel gear shaft.

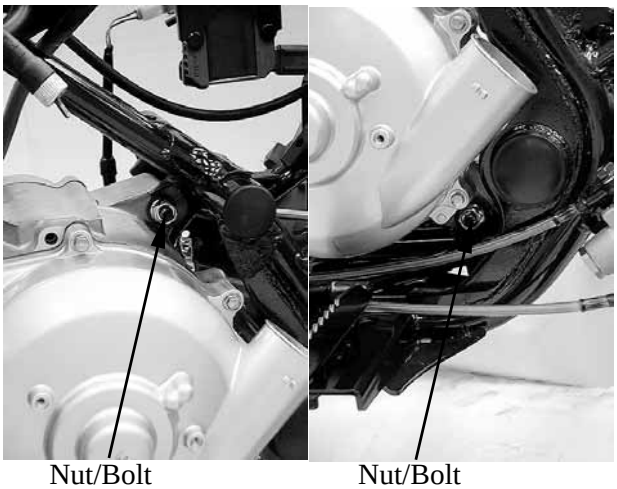
Install the engine the frame.

Move the engine rearward and engage the secondary driven bevel gear shaft into the universal joint.



The rear upper and lower engine mounting bolts and nuts loosely install, then tighten the engine mounting nuts to the specified torque.

Torque: 40 N-m (4 kgf-m, 29 lbf-ft)

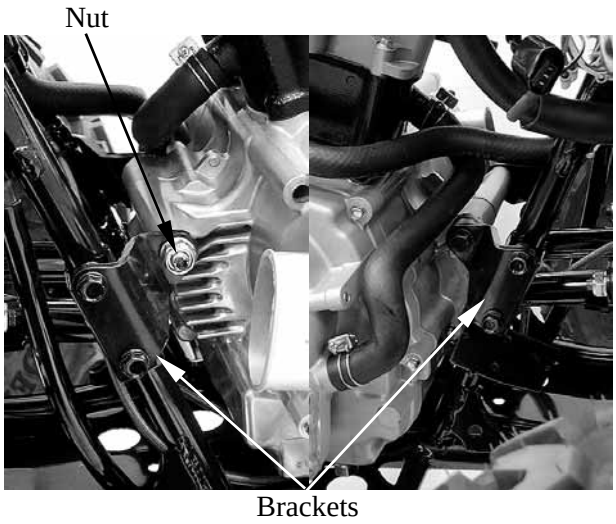


The brackets, bolts, front engine mounting bolt and loosely install, then tighten the bolts on the brackets to the specified torque.

Torque: 22 N-m (2.2 kgf-m, 16 lbf-ft)

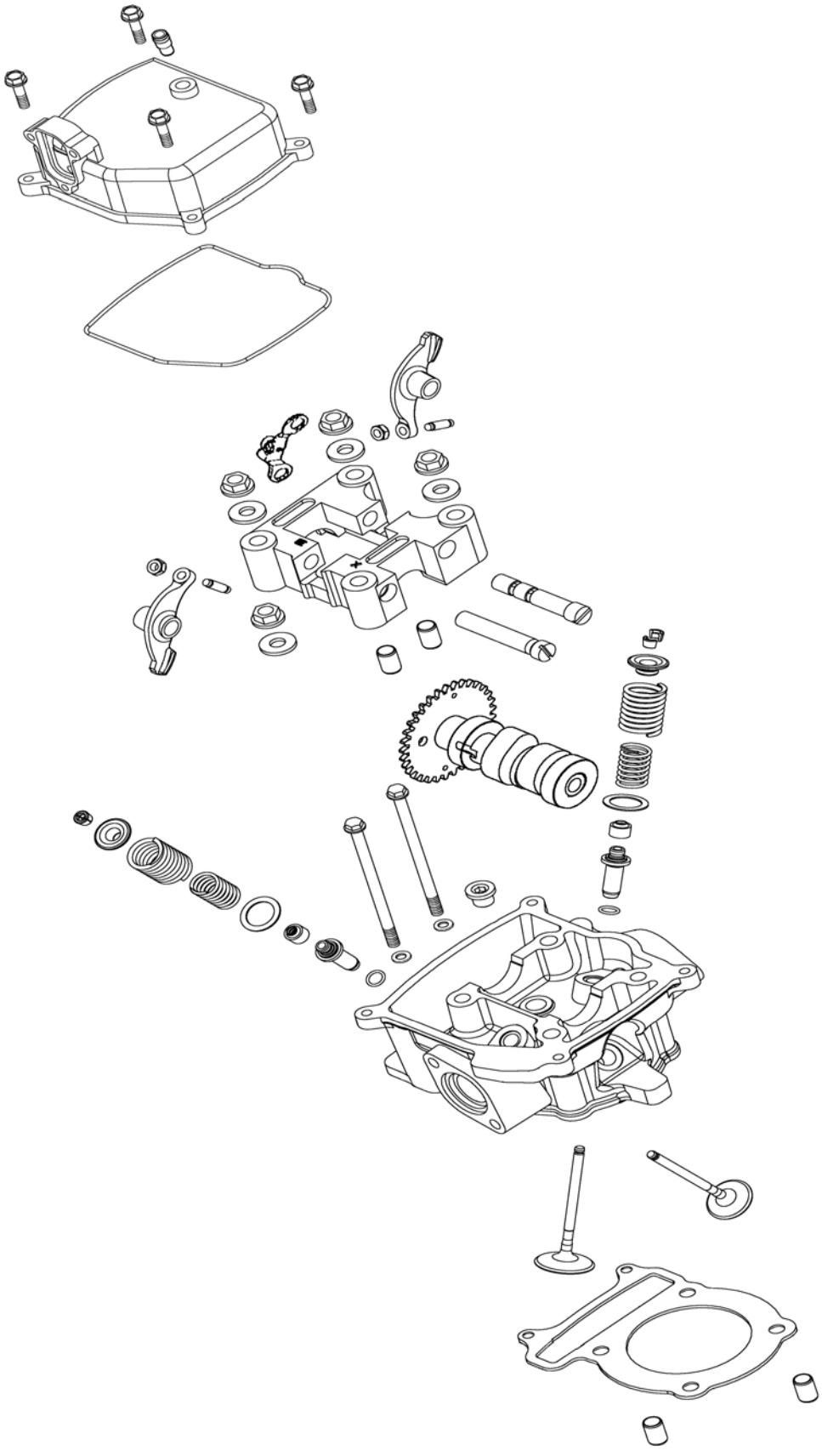
Tighten the front engine mounting bolt and nut to the specified torque.

Torque: 40 N-m (4 kgf-m, 29 lbf-ft)



CYLINDER HEAD/VALVES

7. CYLINDER HEAD/VALVES



SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The cylinder head can be serviced with the engine installed in the frame.
- When assembling, apply molybdenum disulfide grease or engine oil to the valve guide movable parts, valve arm and camshaft sliding surfaces for initial lubrication.
- The camshaft is lubricated by engine oil through the cylinder head engine oil passages. Clean and unclog the oil passages before assembling the cylinder head.
- After disassembly, clean the removed parts and dry them with compressed air before inspection.
- After removal, mark and arrange the removed parts in order. When assembling, install them in the reverse order of removal.

SPECIFICATIONS

Unit mm (in)

Item			Standard	Service Limit
Valve clearance (cold)		IN	0.1 (0.004)	—
		EX	0.1 (0.004)	—
Cylinder head compression	MXU 250		15±2 kgf/cm² (1500 kPa, 213 psi)	—
	MXU 300		16±2 kgf/cm² (1600 kPa, 227 psi)	—
Cylinder head warpage			—	0.05 (0.0002)
Camshaft cam height		IN	34.287 (1.3715)	34.15 (1.366)
		EX	34.1721 (1.3669)	34.05 (1.362)
Valve rocker arm to shaft clearance			0.034～0.09 (0.0014～0.0036)	0.1 (0.004)
Valve stem-to-guide Clearance		IN	0.01～0.037 (0.004～0.0015)	0.06 (0.0024)
		EX	0.025～0.052 (0.001～0.0021)	0.08 0.0032)
Valve spring free length		IN	30.9 (1.236)	29.4 (1.176)
		EX	41 (1.64)	39 (1.56)
Valve spring compressed force		IN	10.20～11.84kg(at 18.05mm)	—
		EX	19.14～22.02kg(at 21.5mm)	—
Valve spring tilt		IN	0.8 (0.032)	—
		EX	1.07 (0.0428)	—

TORQUE VALUES

Cylinder head cover bolt	1 kgf-m (10 Nm, 7.2 lbf-ft)	
Cam shaft hold nut	2.5 kgf-m (25 Nm, 18 lbf-ft)	Apply engine oil to threads
Tappet adjusting nut	0.9 kgf-m (9 Nm, 6.5 lbf-ft)	

SPECIAL TOOLS

Valve spring compressor	E040
Tappet adjuster	E012

TROUBLESHOOTING

- The poor cylinder head operation can be diagnosed by a compression test or by tracing engine top-end noises.

Poor performance at idle speed
- Compression too low

Compression too low
- Incorrect valve clearance adjustment
- Burned or bend valves
- Incorrect valve timing
- Broken valve spring
- Poor valve and seat contact
- Leaking cylinder head gasket
- Warped or cracked cylinder head
- Poorly installed spark plug

Compression too high
- Excessive carbon build-up in combustion chamber

White smoke from exhaust muffler
- Worn valve stem or valve guide
- Damaged valve stem seal

Abnormal noise
- Incorrect valve clearance adjustment
- Sticking valve or broken valve spring
- Damaged or worn camshaft
- Worn cam chain guide
- Worn camshaft and rocker arm

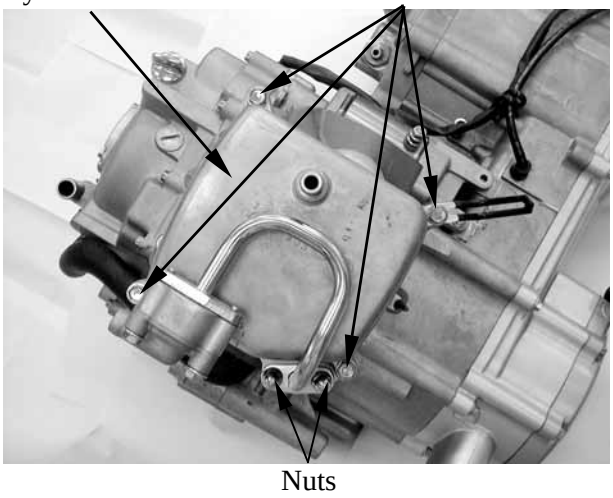
CYLINDER HEAD COVER

REMOVAL

Remove fuel tank. (Refer to the chapter 5)

Disconnect the crankcase breather hose and pair control valve hose from the cylinder head cover. (Refer to the chapter 6)

Remove the four bolts at the cylinder head cover, then remove the cylinder head cover.

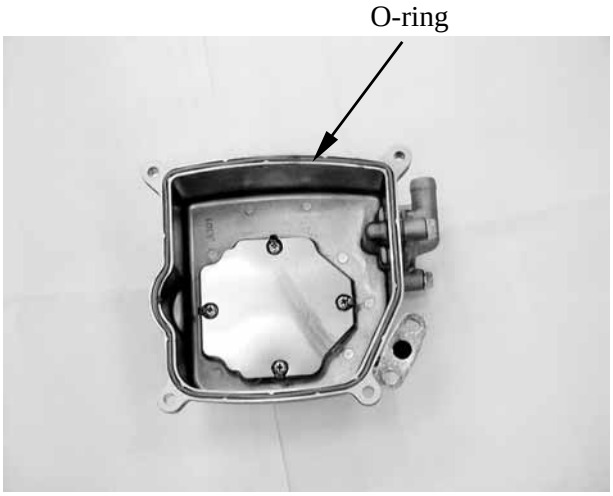


INSTALLATION

Install a new cylinder head cover O-ring and install the cylinder head cover.
Install and tighten the cylinder head cover bolts.

Torque: 1 kgf-m (10 Nm, 7.2 lbf-ft)

* Be sure to install the O-ring into the groove properly.

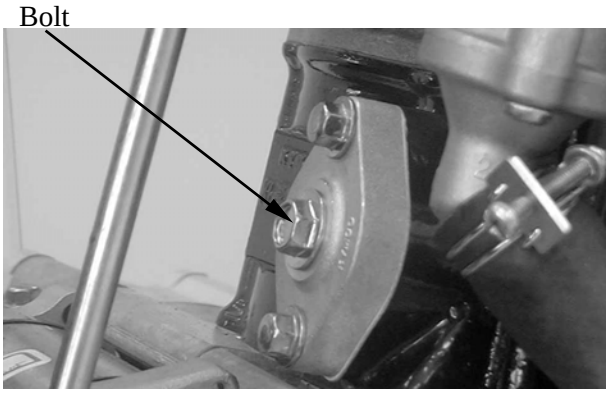


CAMSHAFT/CAMSHAFT HOLDER

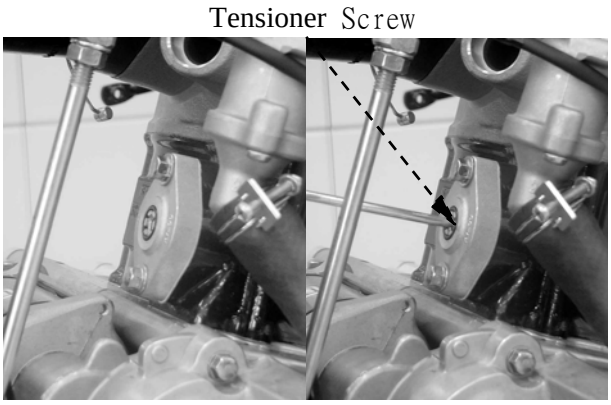
REMOVAL

Remove the cylinder head cover. (Refer to the cylinder head cover removal)

Remove the cam chain tensioner cap bolt and the O-ring.



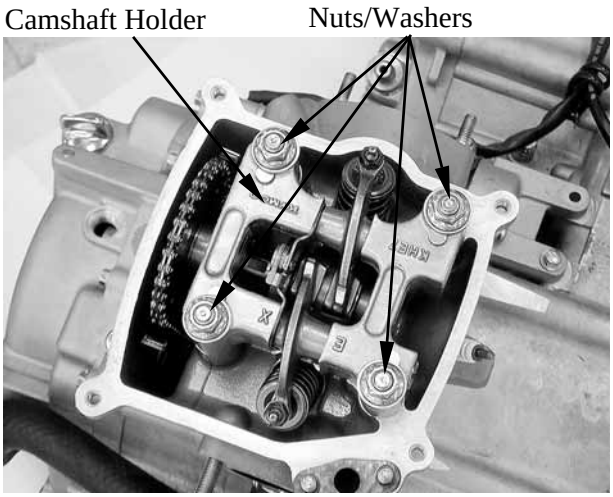
Turn the cam chain tensioner screw clockwise to tighten it.



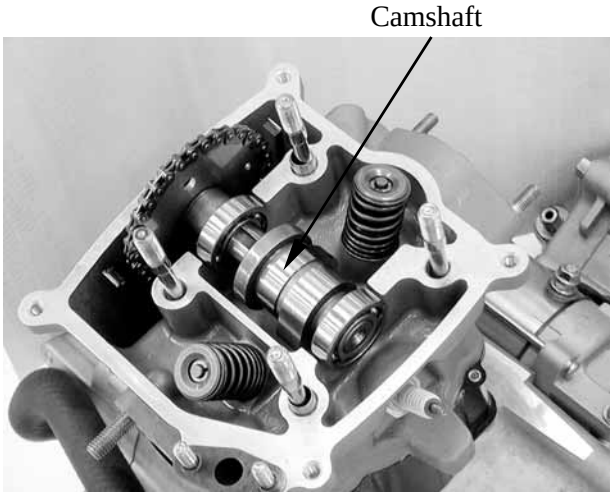
Remove the four camshaft holder nuts and washers.

* Diagonally loosen the cylinder head nuts in 2 or 3 times.

Remove the camshaft holder and dowel pins.



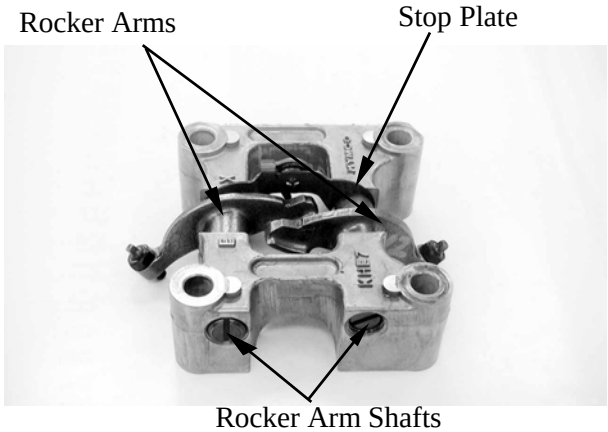
Remove the camshaft gear from the cam chain and remove the camshaft.



7. CYLINDER HEAD/VALVES

CAMSHAFT HOLDER DISASSEMBLY

Take out the valve rocker arm shafts. Remove the valve rocker arms, arm shafts and stop plate.

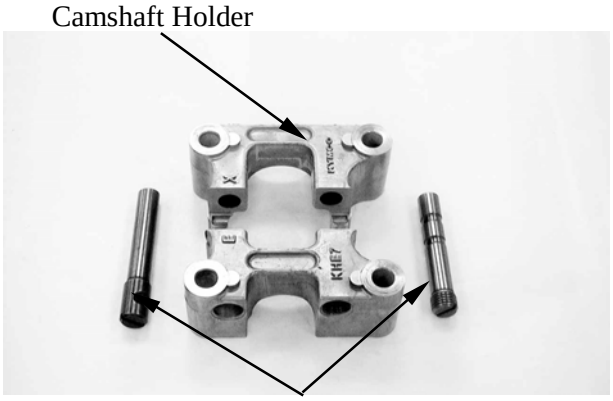


CAMSHAFT HOLDER INSPECTION

Inspect the camshaft holder for wear or damage.

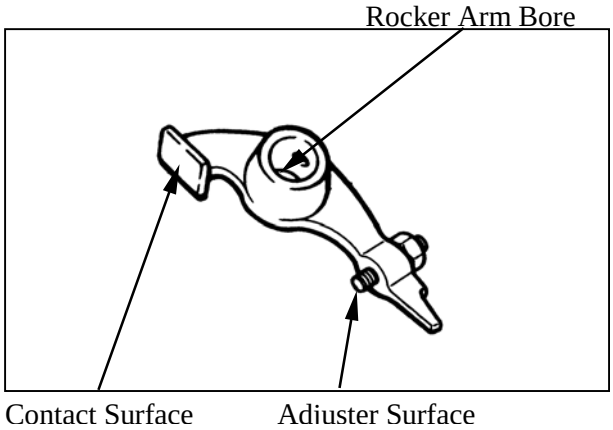
Inspect the rocker arm shaft for blue discoloration or grooves.

If any defects are found, replace the rocker arm shaft with a new one, then inspect lubrication system.



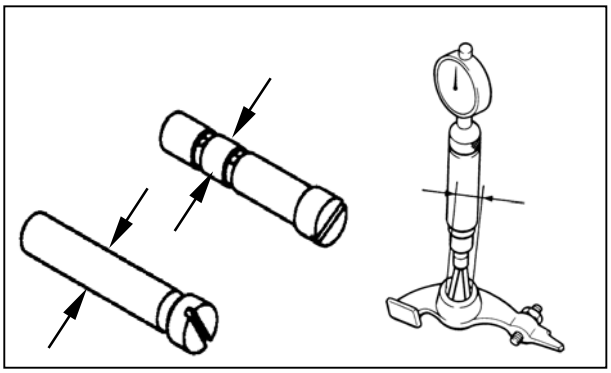
Inspect the rocker arm bore, cam lobe contact surface and adjuster surface for wear/pitting/scratches/blue discoloration.

If any defects are found, replace the rocker arm shaft with a new one, then inspect lubrication system.

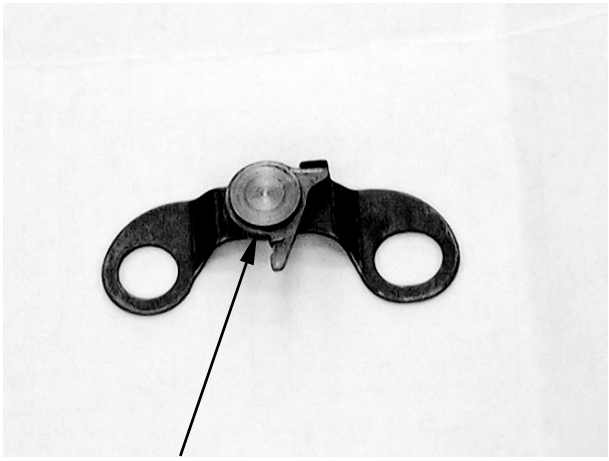


Measure each rocker arm shaft O.D.
Measure the I.D. of each valve rocker arm.
Measure arm to shaft clearance.
Replace as a set if out of specification.

Service limits: 0.1 mm (0.004 in)



Check the stop plate spring for damage.
Replace the stop plate assembly with a new one if the spring is damage.

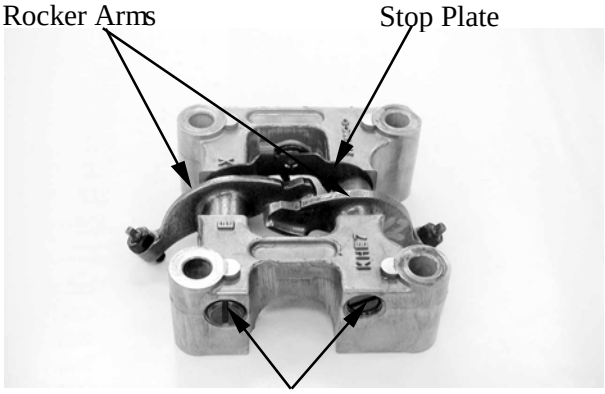


Spring

CAMSHAFT HOLDER ASSEMBLY
Reverse the "CAMSHAFT HOLDER DISASSEMBLY" procedures.

* Align the cross cutout on the exhaust valve rocker arm shaft with the bolt of the camshaft holder.

Rocker Arms Stop Plate

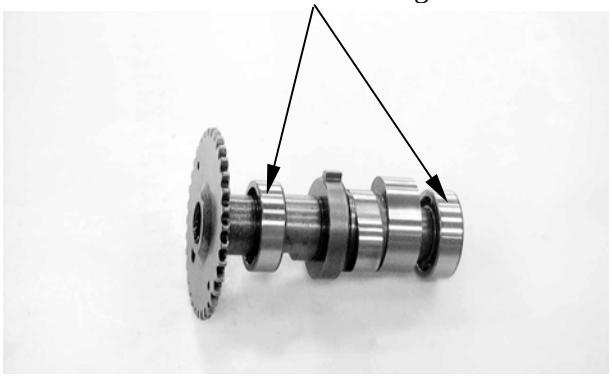


Rocker Arm Shafts

CAMSHAFT INSPECTION

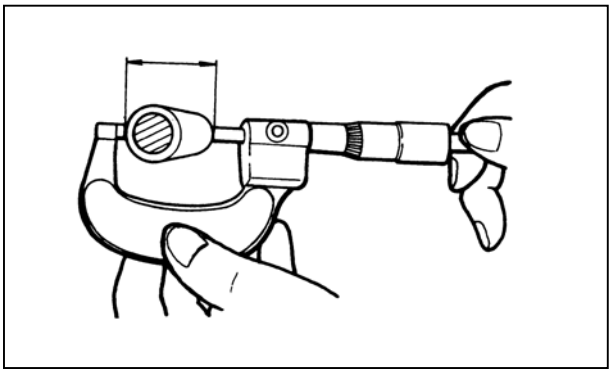
Check each camshaft bearing for play or damage. Replace the camshaft assembly with a new one if the bearings are noisy or have excessive play.

Camshaft Bearings



Inspect camshaft lobes for pitting/scratches/blue discoloration.

Measure the cam lobe height.



Service Limits (replace if below):

IN : 34.15 mm (1.366 in)
EX: 34.05mm (1.362 in)

If any defects are found, replace the camshaft with a new one, then inspect lubrication system.

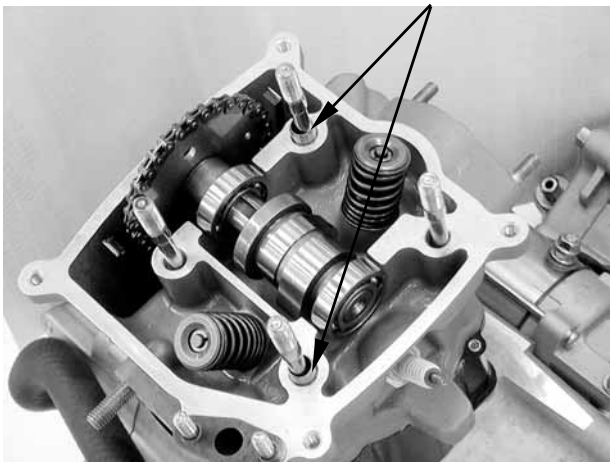
INSTALLATION

Reverse the "CAMSHAFT REMOVAL" procedures.

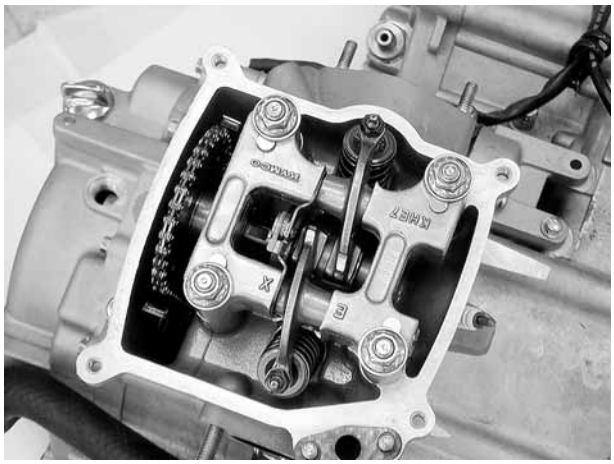
Note the following points:

1. Turn the flywheel so that the "T" mark on the flywheel aligns with the index mark on the crankcase.
   Keep the round hole on the camshaft gear facing up and align the punch marks on the camshaft gear with the cylinder head surface (Position the intake and exhaust cam lobes down.) and install the camshaft onto the cylinder head. (Refer to the "VALVE CLEARANCE" section in the chapter 3)

Dowel Pins



Install the camshaft dowel pins and holder. Install the washers and nuts and tighten the nuts.



* • Apply engine oil to the threads of the cylinder head nuts.
  • Diagonally tighten the cylinder head nuts in 2～3 times.

Torque:
Cam shaft hold nut (Apply engine oil to threads): 2.5 kgf-m (25 Nm, 18 lbf-ft)

2. Turn the cam chain tensioner screw counter-clockwise to release it.
   Apply engine oil to a new O-ring and install it.
   Tighten the cam chain tensioner cap bolt.

* Be sure to install the O-ring into the groove properly.

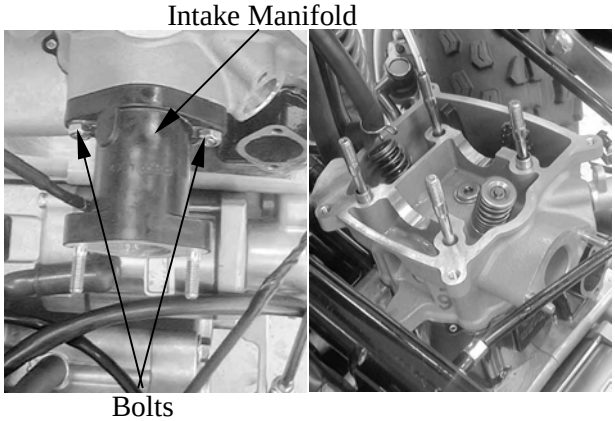
3. Adjust the valve clearance. (Refer to the "VALVE CLEARANCE" section in the chapter 3)

CYLINDER HEAD

REMOVE

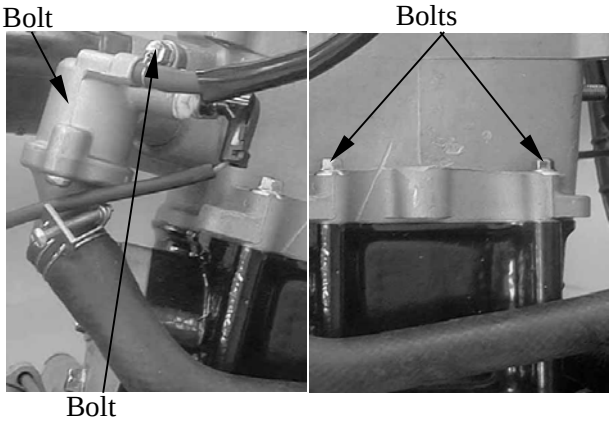
Remove the camshaft (page 7-4).
Remove the carburetor. (Refer to the "carburetor remove" section in the chapter 5)
Remove the exhaust muffler (page 2-11).

Remove the two bolts and then remove the carburetor intake manifold.



Remove the bolt and disconnect the thermostat.

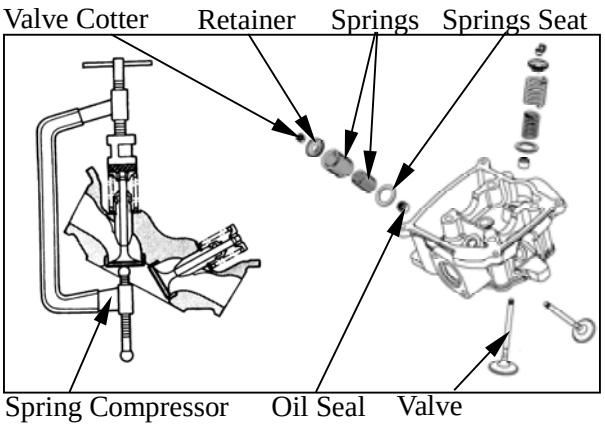
Remove the two cylinder head bolts.
Remove the cylinder head.



CYLINDER HEAD DISASSEMBLY

Remove the valve spring cotters, retainers, springs, spring seats, oil seals and valves using a valve spring compressor.

* • Be sure to compress the valve springs with a valve spring compressor.
  • Mark all disassembled parts to ensure correct reassembly.

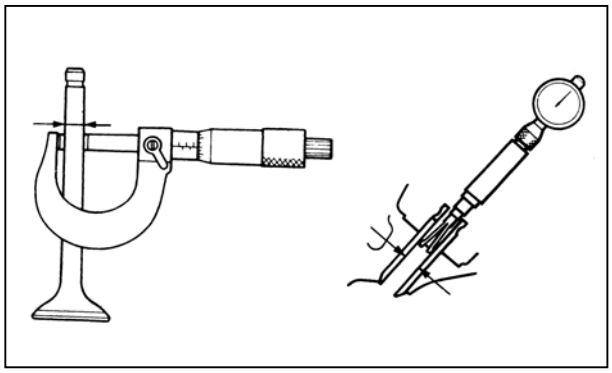


Special tool:
Valve Spring Compressor E040

7. CYLINDER HEAD/VALVES

VALVE /VALVE GUIDE INSPECTION
Inspect each valve for bending, burning, scratches or abnormal stem wear.
If any defects are found, replace the valve with a new one.

Check valve movement in the guide.
Measure each valve stem O.D.
Measure each valve guide I.D.
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

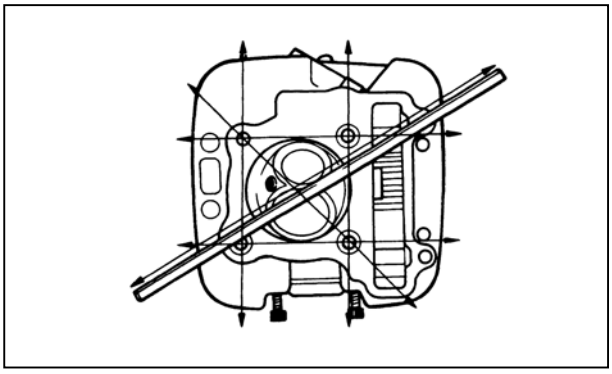


Service limits (replace if over):
IN : 0.06 mm (0.0024 in)
EX: 0.08 mm (0.0032 in)

* If the stem-to-guide clearance exceeds the service limits, replace the cylinder head is necessary.

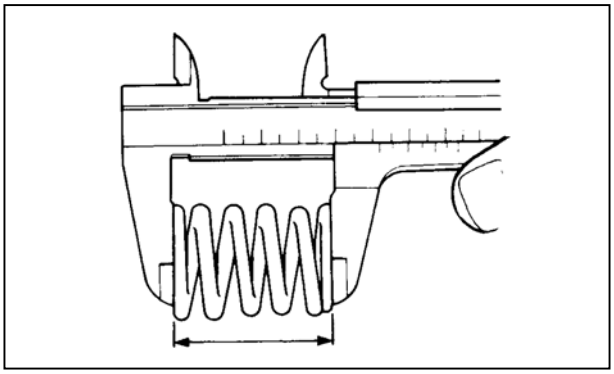
CYLINDER HEAD INPECTION
Check the spark plug hole and valve areas for cracks.

Check the cylinder head for warpage with a straight edge and feeler gauge.



Service Limit: 0.05mm repair or replace if over.

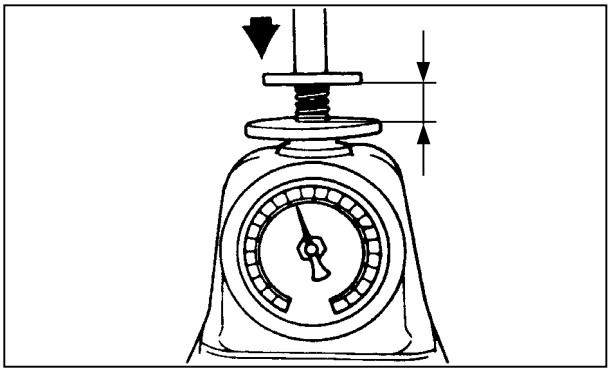
VALVE SPRING INSPECTION
Measure the free length of the inner and outer valve springs.



Service Limit (replace if below):
Inner: 29.4 mm (1.176 in)
Outer: 39 mm (1.56 in)

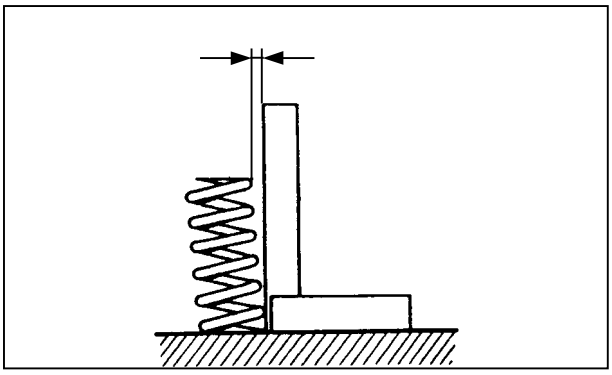
Measure compressed force (valve spring) and installed length.
Replace if out of specification.

Standard:
IN : 10.20～11.84kg(at 18.05mm)
EX : 19.14～22.02kg(at 21.5mm)



Measure the spring tilt.
Replace if out of specification.

Standard: IN : 0.8mm (0.032)
EX : 1.07mm (0.0428)



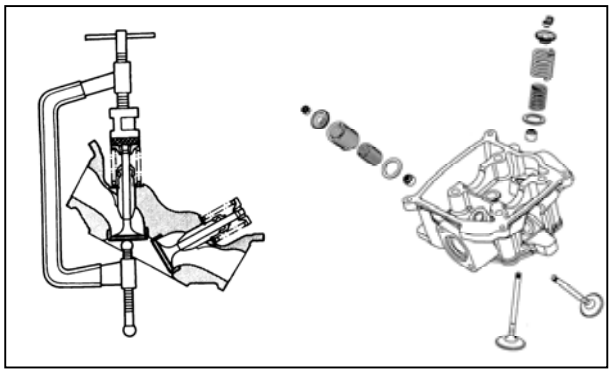
ASSEMBLY

Install the valve spring seats and oil seal.

* Be sure to install new oil seal.

Lubricate each valve with engine oil and insert the valves into the valve guides.

Install the valve springs and retainers.



Compress the valve springs using the valve spring compressor, then install the valve cotters.

* • When assembling, a valve spring compressor must be used.
  • Install the cotters with the pointed ends facing down from the upper side of the cylinder head.

Special tool:
Valve Spring Compressor E040

Tap the valve stems gently with a plastic hammer for 2～3 times to firmly seat the cotters.

* Be careful not to damage the valves.

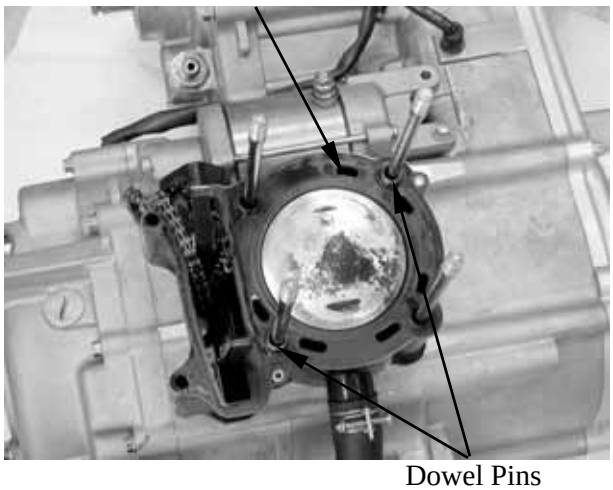
INSTALLATION

Install the dowel pins and a new cylinder head gasket.

Reverse the “CYLINDER HEAD REMOVAL” procedures.

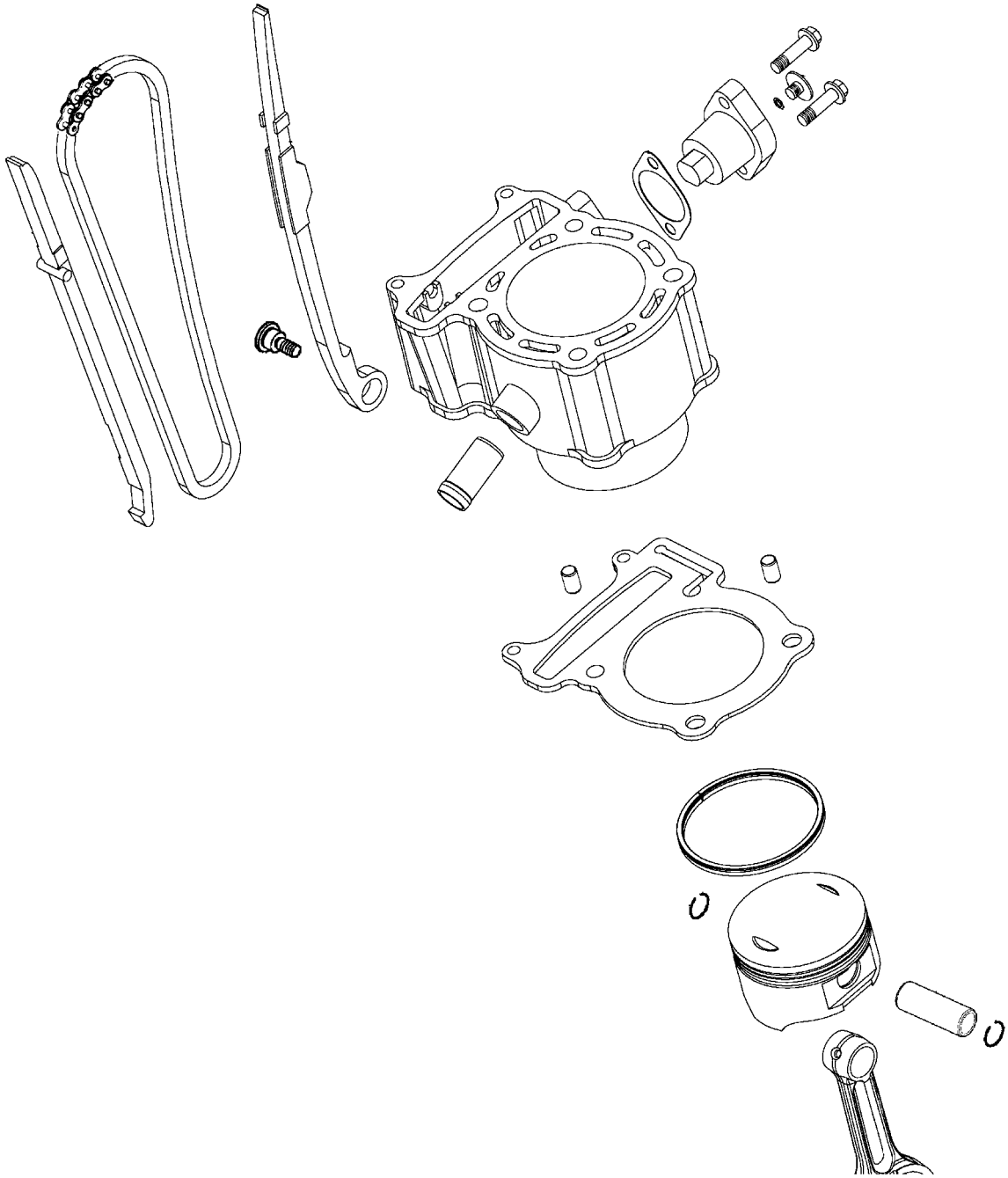
After camshaft holder is installed and tighten the nuts, then tighten cylinder head bolts.

Torque:
Cylinder head bolt:
1 kgf-m (10 Nm, 7.2 lbf-ft)



CYLINDER /PISTON

8. CYLINDER/PISTON



SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The cylinder and piston can be serviced with the engine installed in the frame.
- After disassembly, clean the removed parts and dry them with compressed air before inspection.

TROUBLESHOOTING

- When hard starting or poor performance at low speed occurs, check the crankcase breather for white smoke. If white smoke is found, it means that the piston rings are worn, stuck or broken.

Compression too low or uneven compression

- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston

Compression too high

- Excessive carbon build-up in combustion chamber or on piston head

Excessive smoke from exhaust muffler

- Worn or damaged piston rings
- Worn or damaged cylinder and piston

Abnormal noisy piston

- Worn cylinder, piston and piston rings
- Worn piston pin hole and piston pin

SPECIFICATIONS Unit: mm (in)

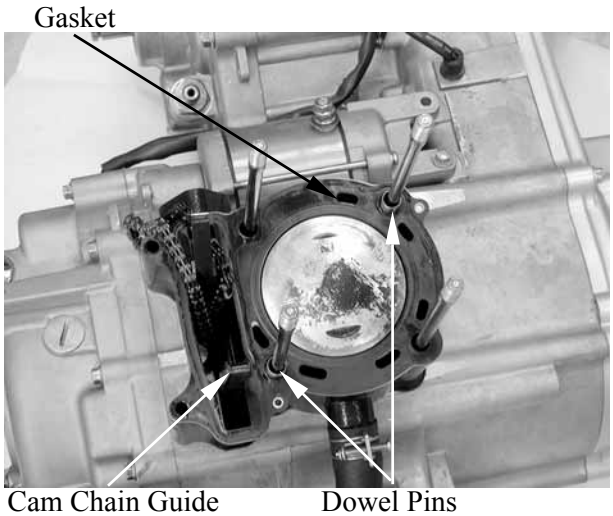
Item			Standard	Service Limit
Cylinder	I.D.		72.705～72.715 (2.9082～2.9086)	72.8 (2.912)
	Warpage		—	0.05 (0.002)
	Cylindricity		—	0.05 (0.002)
	True roundness		—	0.05 (0.002)
Piston, Piston ring	Ring-to-groove clearance	Top	0.015～0.055 (0.0006～0.0022)	0.09 (0.0036)
		Second	0.015～0.055 (0.0006～0.0022)	0.09 (0.0036)
	Ring end gap	Top	0.15～0.3 (0.006～0.012)	0.5 (0.02)
		Second	0.3～0.45 (0.012～0.018)	0.65 (0.026)
		Oil ring	0.2～0.7 (0.008～0.028)	0.9 (0.036)
	Piston O.D.		72.67～72.69 (2.9068～2.9076)	72.6 (2.904)
	Piston O.D. measuring position		10mm from bottom of skirt	—
	Piston-to-cylinder clearance		0.01～0.04 (0.0004～0.0016)	0.1 (0.004)
	Piston pin hole I.D.		17.002～17.008 (0.68008～0.68032)	17.04 (0.6816)
Piston pin O.D			16.994～17 (0.67976～0.68)	16.96 (0.6784)
Piston-to-piston pin clearance			0.002～0.014 (0.00008～0.00056	0.02 (0.0008)
Connecting rod small end I.D. bore			17.016～17.034 (0.68064～0.68136)	17.06 (0.6824)

CYLINDER/PISTON

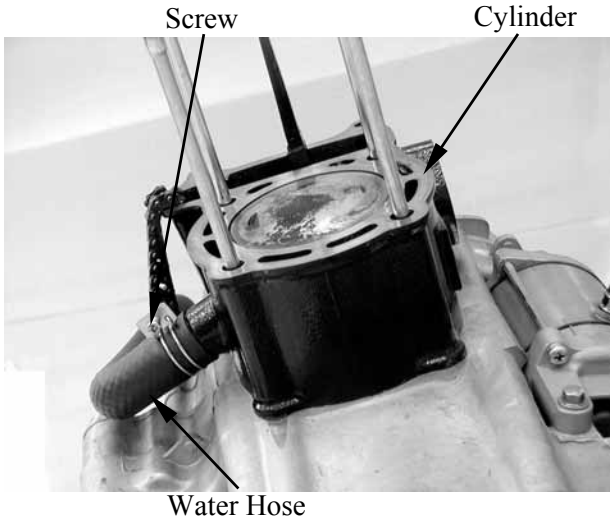
REMOVAL

Remove the cylinder head. (Refer to the chapter 7)

Remove the two dowel pins, cylinder head gasket and cam chain guide.

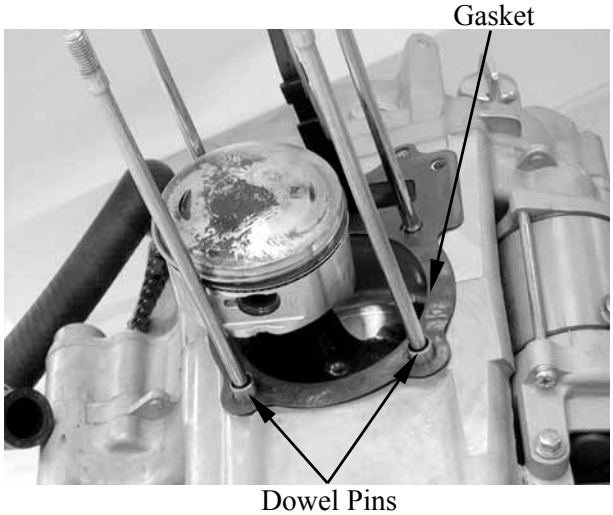


Unscrew the clamp and disconnect the water hose.
Remove the cylinder.



Remove the cylinder gasket and dowel pins. Clean any gasket material from the cylinder surface.

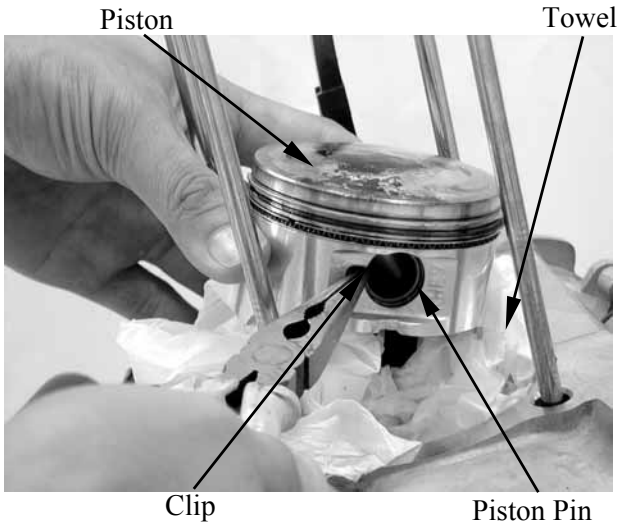
* Be careful not to drop foreign matters into the crankcase.



Remove the piston pin clip.

* Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.

Press the piston pin out of the piston and remove the piston.



INSPECTION

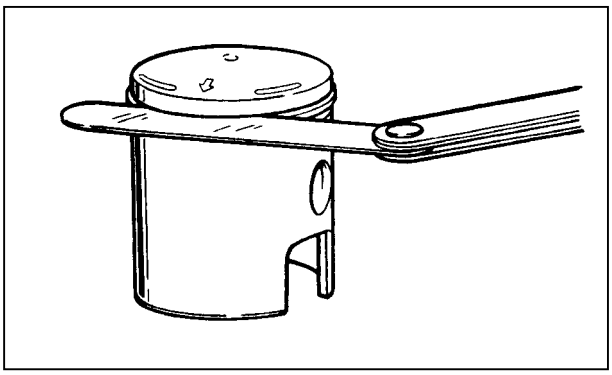
Inspect the piston, piston pin and piston rings.
Remove the piston rings.

* Take care not to damage or break the piston rings during removal.

Clean carbon deposits from the piston ring grooves.

Inspect the piston wall for wear/scratches/damage.
If any defects are found, replace the piston with a new one.

Install the piston rings onto the piston and measure the piston ring-to-groove clearance.



Service Limits (replace if over):

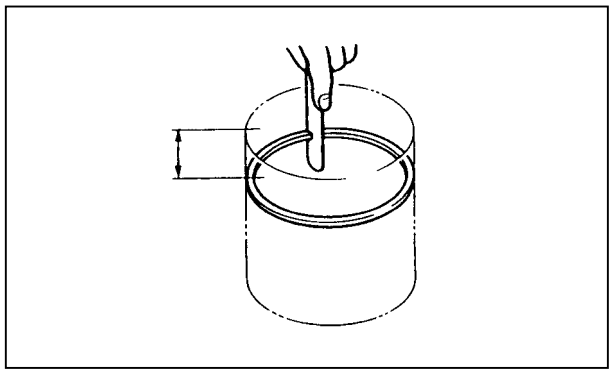
Top: 0.09 mm (0.0036 in)

2nd: 0.09 mm (0.0036 in)

Remove the piston rings and insert each piston ring into the cylinder bottom.

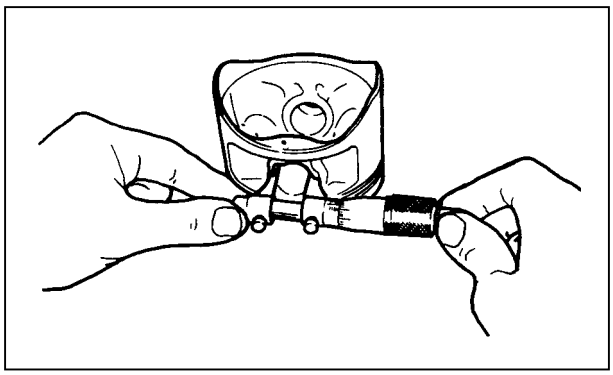
* Use the piston head to push each piston ring into the cylinder.

Measure the piston ring end gap.



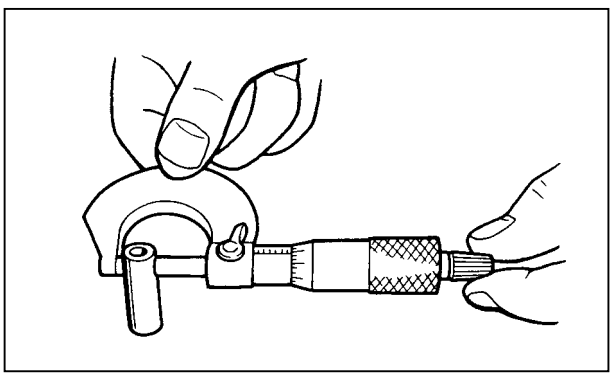
Service Limit (replace if over):
Top: 0.5 mm (0.02 in)
2nd: 0.65 mm (0.026 in)
Oil ring: 0.9 mm (0.036 in)

Measure the piston pin hole I.D.



Service Limit (replace if over):
17.04 mm (0.6816 in)

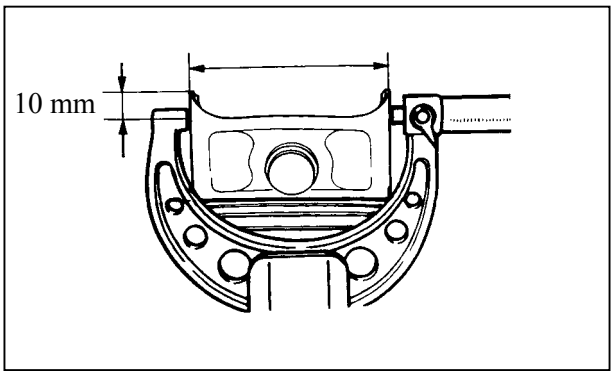
Measure the piston pin O.D.



Service Limit (replace if below):
16.96 mm (0.6784 in)

Measure the piston O.D.

* Take measurement at 10mm from the bottom and 90° to the piston pin hole.



Service Limit (replace if below):
72.6 mm (2.904 in)

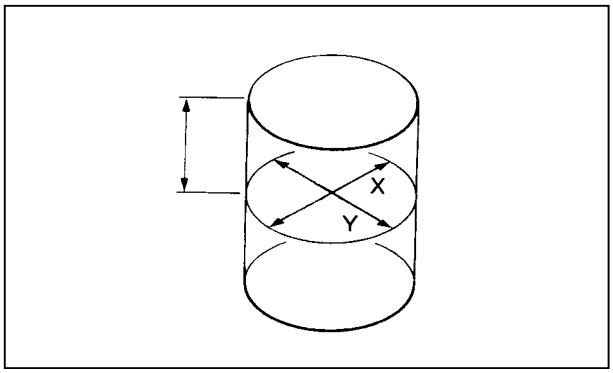
Measure the piston-to-piston pin clearance.

Service Limit (replace if over):
0.02 mm (0.0008 in)

CYLINDER INSPECTION

Inspect the cylinder bore for wear or damage. Measure the cylinder I.D. at three levels of top, middle and bottom at 90° to the piston pin (in both X and Y directions).

Cylinder I.D.:



Service Limit (replace if over):
72.8 mm (2.912 in)

Measure the cylinder-to-piston clearance.

Service Limit (repair or replace if over):
0.1 mm (0.004 in)

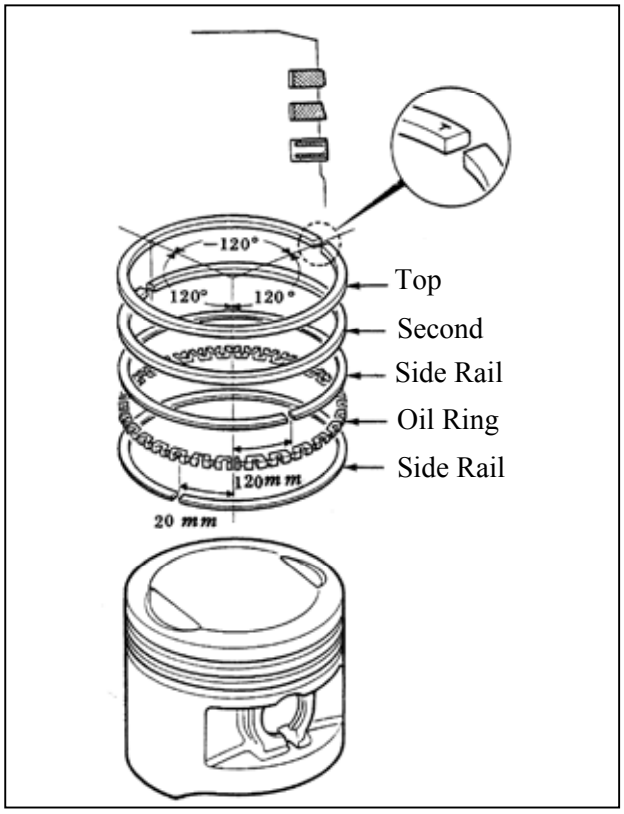
The true roundness is the difference between the values measured in X and Y directions. The cylindricity (difference between the values measured at the three levels) is subject to the maximum value calculated.

Service Limits (repair or replace if over):
True Roundness: 0.05 mm (0.002 in)
Cylindricity: 0.05 mm (0.002 in)

PISTON RING INSTALLATION

Install the piston rings onto the piston.
Apply engine oil to each piston ring.

*
- Be careful not to damage or break the piston and piston rings.
- All rings should be installed with the markings facing up.
- After installing the rings, they should rotate freely without sticking.

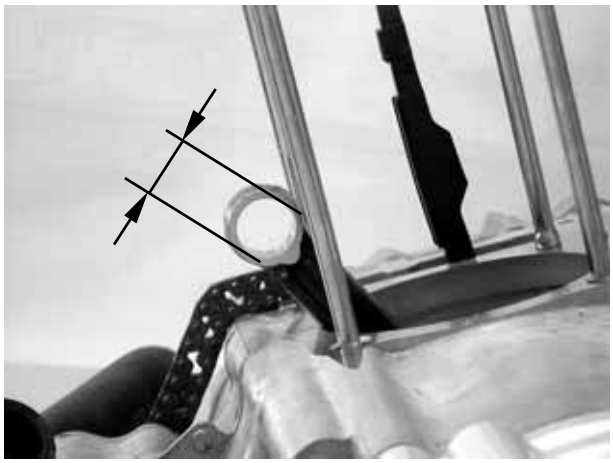


Measure the connecting rod small end I.D.

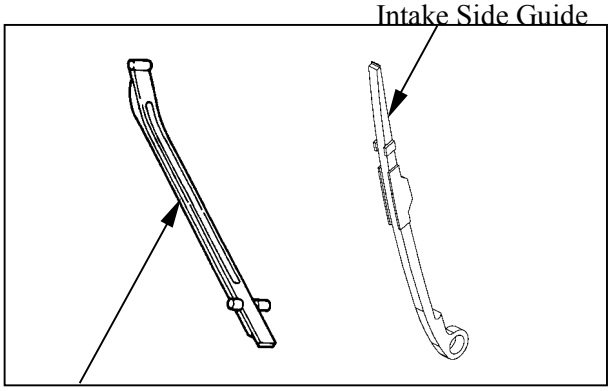
Service Limit (replace if over):
17.06 mm (0.6824 in)

Measure the connecting rod to piston pin clearance.

Service Limit (replace if over):
0.06 mm (0.0024 in)



Inspect the exhaust side and intake side chain guides.
Wear/Damage → Replace.



Exhaust Side Guide

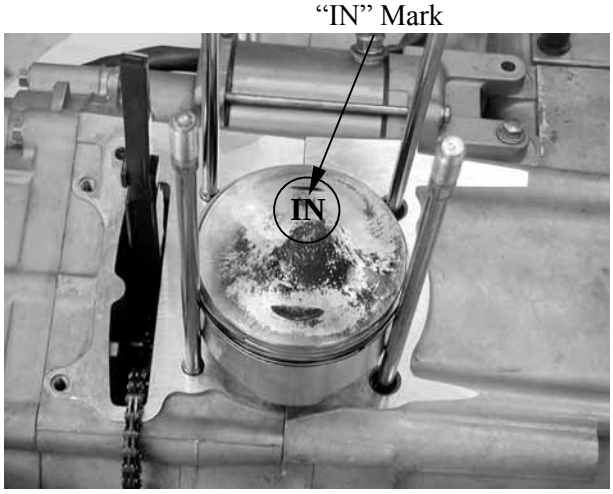
PISTON INSTALLATION

Remove any gasket material from the crankcase surface.

* Be careful not to drop foreign matters into the crankcase.

Install the piston, piston pin and a new piston pin clip.

* • Position the piston "IN" mark on the intake valve side.
  • Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.



CYLINDER INSTALLATION

Install the dowel pins and a new cylinder gasket on the crankcase.

Coat the cylinder bore, piston and piston rings with clean engine oil.
Carefully lower the cylinder over the piston by compressing the piston rings.

* • Apply proper clean engine oil around cylinder wall.
  • Be careful not to damage or break the piston rings.
  • Stagger the ring end gaps at 120° to the piston pin.