Chapter 2 Fuel System & Carburetion

Contents

Service Information

GENERAL

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

WARNING

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

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

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

US version only:

◦ Refer to the sticker on vehicle for the hose connections of the evaporative emission control system.

CAUTION

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

SPECIFICATIONS

ITEM	STANDARD
Identification Number	24-506
Venturi diameter	24 mm
Float level	17.0-18.0 mm
Needle Jet	5GNY72
Main Jet	117.5
Idle Jet	22.5
Idle speed	1600 +/- 100 rpm
Throttle lever free play	2-6mm (1/8-1/4 in)

Chapter 2 Fuel System & Carburetion

Troubleshooting

Engine cranks but won't start

◦ No fuel in tank
◦ No fuel to carburetor
◦ Engine flooded with fuel
◦ No spark at plug (faulty ignition system)
◦ Clogged air cleaner
◦ Intake air leak
◦ Improper choke operation
◦ Improper throttle operation
◦ Faulty fuel valve

Hard starting or stalling after starting

◦ Improper choke operation
◦ Ignition malfunction
◦ Faulty carburetor
◦ Contaminated fuel
◦ Intake air leak
◦ Incorrect idle speed
◦ Faulty fuel valve

Rough idle

◦ Faulty ignition system
◦ Incorrect idle speed
◦ Faulty carburetor
◦ Contaminated fuel

Misfiring during acceleration

◦ Faulty ignition system

Backfiring

◦ Faulty ignition system
◦ Faulty carburetor

Poor performance and fuel economy

◦ Clogged fuel system
◦ Faulty ignition system
◦ Faulty fuel valve
◦ Faulty components in the evaporative emission control system (US version only)

Lean mixture

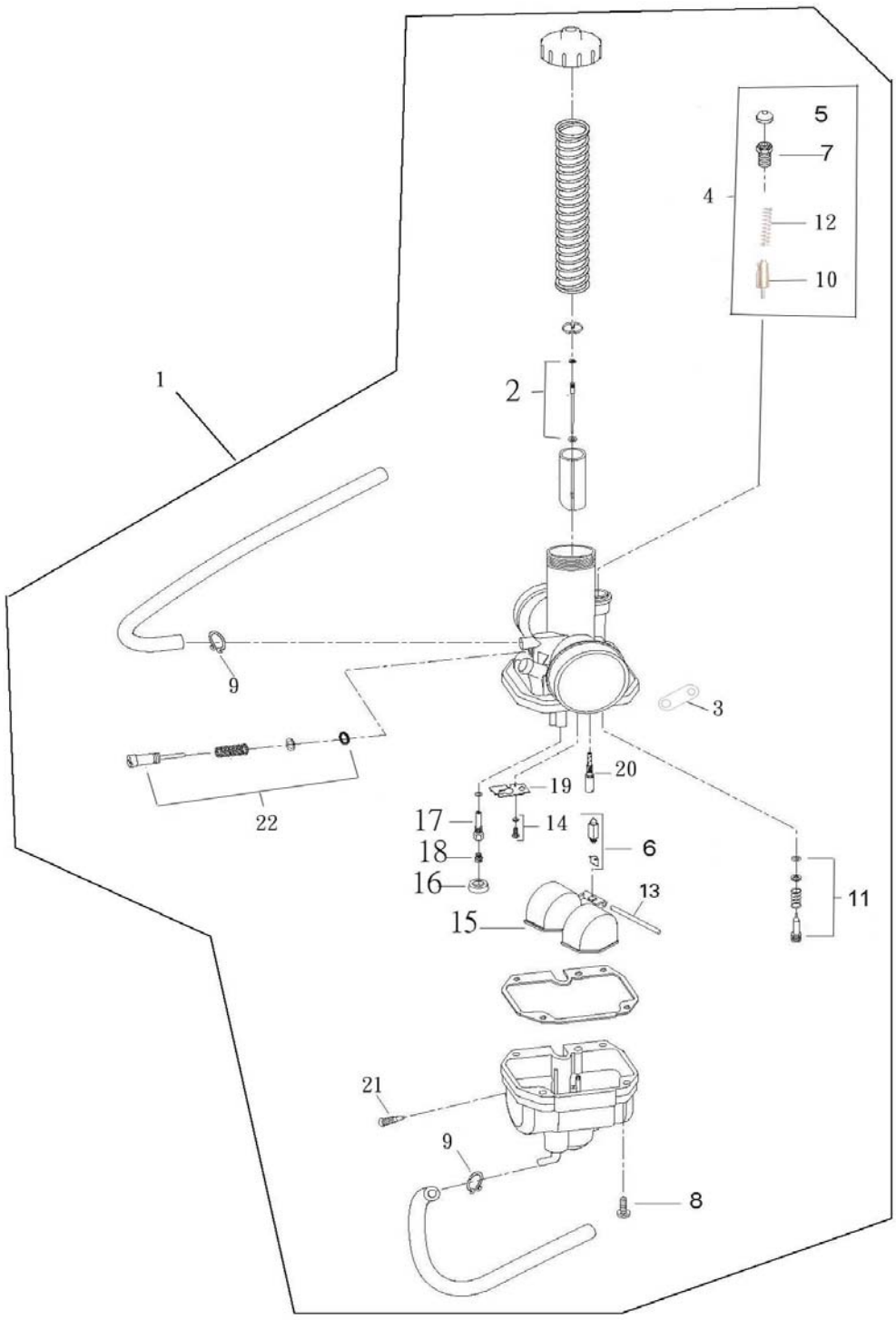
◦ Clogged fuel jet
◦ Stuck vacuum piston
◦ Faulty float valve
◦ Low float level
◦ Blocked fuel cap vent
◦ clogged fuel line
◦ Restricted fuel line
◦ Clogged air vent tube
◦ Intake air leak
◦ Faulty fuel valve

Rich mixture

◦ Clogged air jets
◦ Faulty float valve
◦ Float level too high
◦ Improper choke operation
◦ Dirty air cleaner

Chapter 2 Fuel System & Carburetion

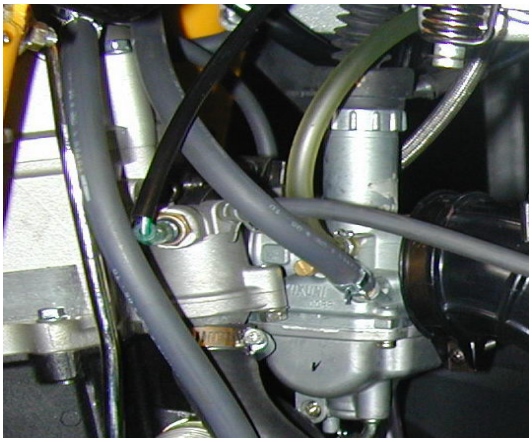
CARBURETOR



Chapter 2 Fuel System & Carburetion

Carburetor

CARBURETOR REMOVAL



Loosen the air chamber and intake manifold tube bands.

Remove the throttle cable with throttle piston.

Remove the choke cable with choke piston.

Leave the throttle cable and choke cable on Vehicle.

NOTE

◦ Do not damage jet needle on the throttle piston

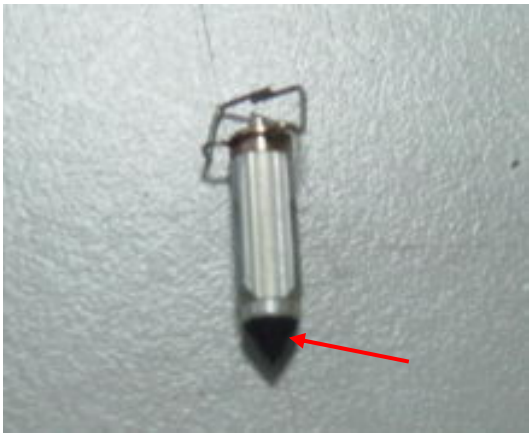
Disconnect the heater component on carburetor.

Disconnect the fuel tube from the carburetor.

Remove the carburetor.

Float/Float valve/Jets

DISASSEMBLY



Remove the four chamber screws and the float chamber.

Remove the float pin, float and float valve.

FLOAT VALVE INSPECTION

Inspect the float valve for grooves and nicks.

Inspect the operation of the float valve.

Remove the main jet, needle jet holder and needle jet.

Remove the idle jet.

Blow open all passages with compressed air before assembling.

Chapter 2 Fuel System & Carburetion

ASSEMBLY

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

Install the needle jet and needle jet holder.

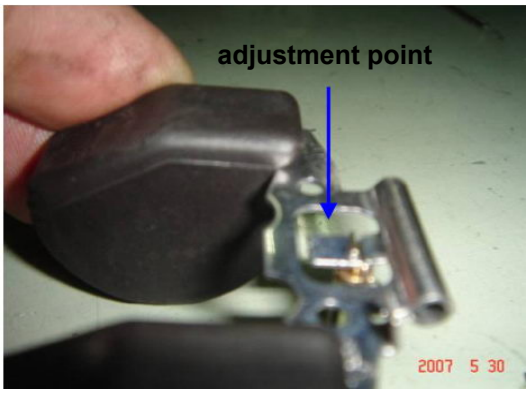
Install main jet and idle jet.

Install the float valve, float and float pin.

FLOAT LEVEL ADJUSTMENT

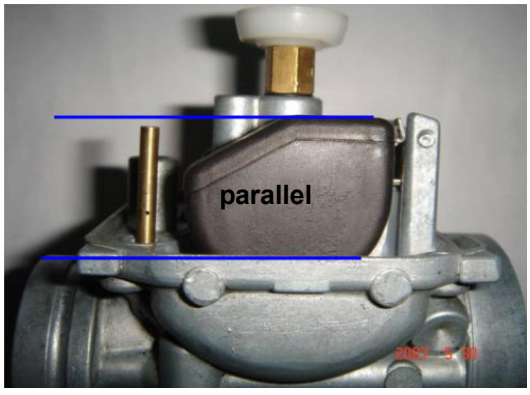
Adjust the float level by pressing the float valve hanger plate and then install the float valve to carburetor.

Turn the carburetor upside down and check the float. The upper edge of float should parallel with camber edge.



FLOAT LEVEL: 17.0 ~18.0 mm

Reinstall the float chamber.

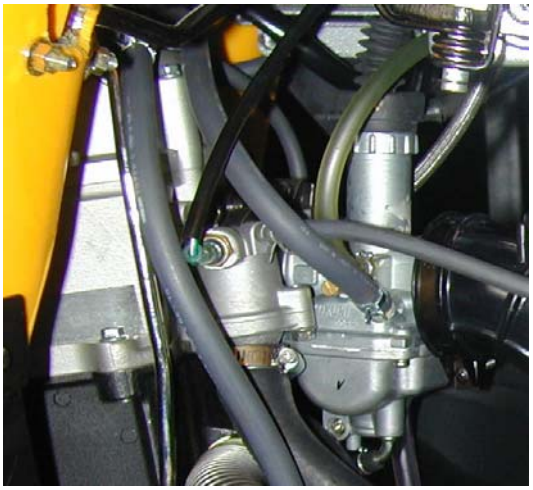


Chapter 2 Fuel System & Carburetion

CARBURETOR ONSTALLATION

Tighten the drain screw.

Connect the drain tube to the carburetor.



Install the heater component on carburetor.

Install the throttle cable with throttle piston.

Install the choke cable with choke piston.

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

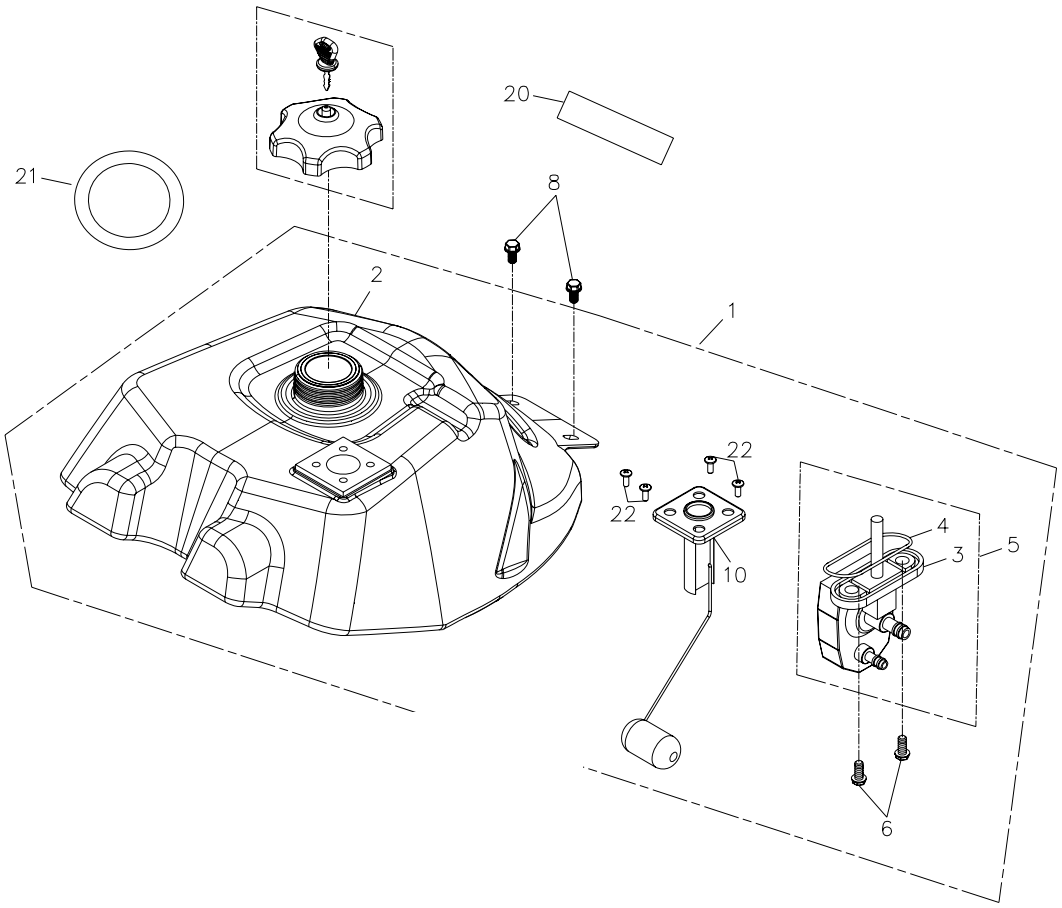
Install the air chamber and tighten the connecting tube bands.

Adjust the following:

- throttle lever free play
- idle speed

Chapter 2 Fuel System & Carburetion

FUEL TANK



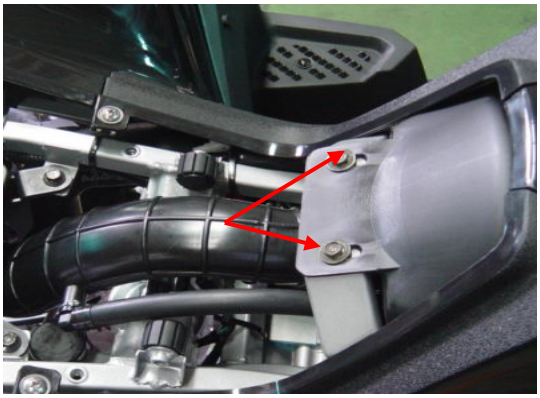
Chapter 2 Fuel System & Carburetion

Fuel Tank

REMOVAL

WARNING

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



Remove the seat.

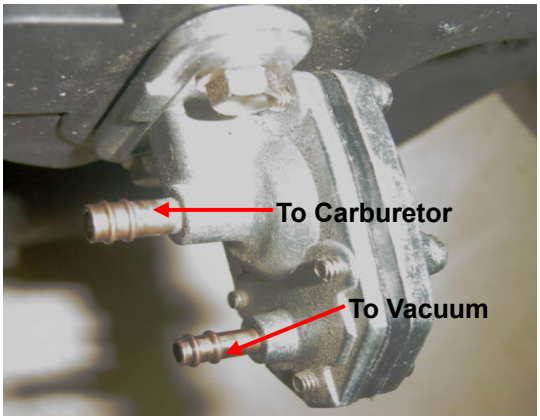
Remove the front fender.

Remove fuel tank to frame mounting bolts.

Disconnect the fuel tube and vacuum tube on fuel valve.

Disconnect the petrol gauge connector.

Remove the fuel tank from frame body.



FUEL VALVE INSPECTION

Disconnect vacuum tube from fuel valve and fuel tube from carburetor.

Connect a commercially brake bleeder to vacuum tube then pump the brake bleeder.

Check the fuel flow thru fuel tube, if it's block or intermittently, replace the fuel valve.

INSTALLATION

Install the fuel tank in the reverse order of removal.

Petrol Gauge Sensor

REMOVAL

Remove fuel tank.

Loosen four petrol gauge mounting bolts.

Remove petrol gauge from the fuel tank.

NOTE

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

INSPECTION

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

Use a ohmmeter connect to gauge terminal to check the ohm reading from upper to lower float level of petrol gauge.

Ohm reading: 10 Ω ~ 90 Ω

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

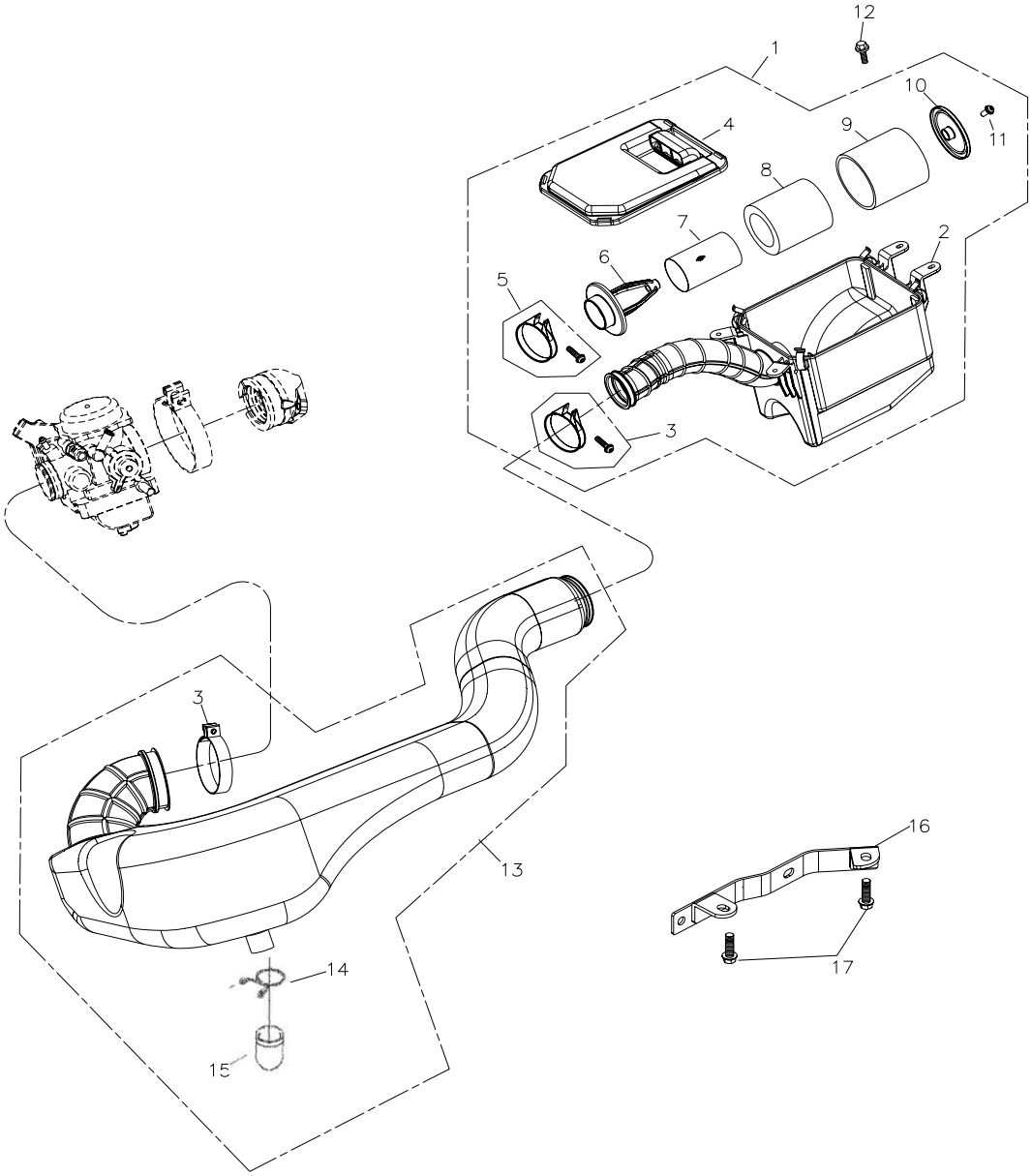
INSTALLATION

Install the petrol gauge onto the fuel tank.

Install the mounting bolts.

Chapter 2 Fuel System & Carburetion

AIR CLEANER ASSEMBLY



Chapter 2 Fuel System & Carburetion

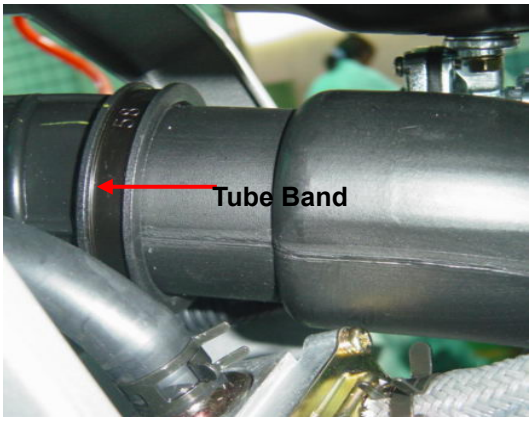
Air Cleaner Assembly

REMOVAL

Remove the seat.

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

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



INSPECTION AND CLEAN OUT

Disconnect the air filter assembly mounting clamp.

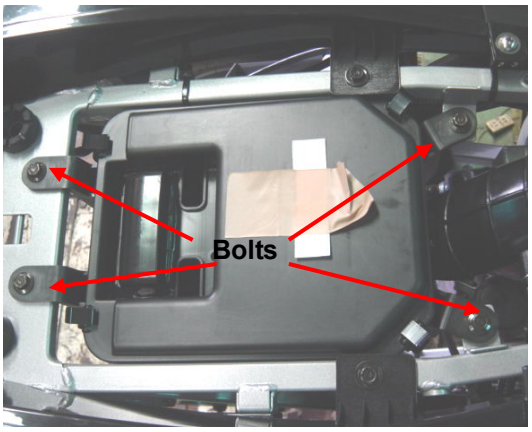
Remove the air filter element cover.

Drain the accumulated water or dust.

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

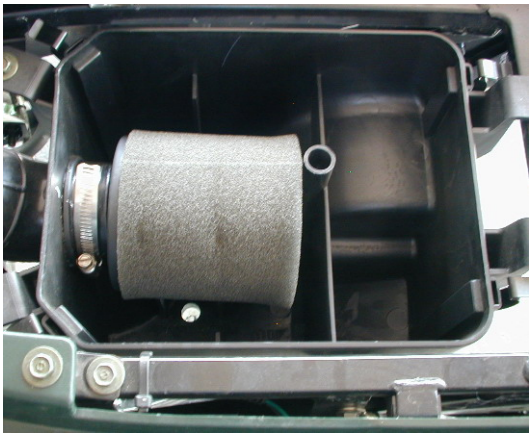
Inspect the filter element A and B, replace it if necessary.

Install the filter assembly to air cleaner case.



NOTE

◦ Tighten the mounting clamp screw securely.



INSTALLATION

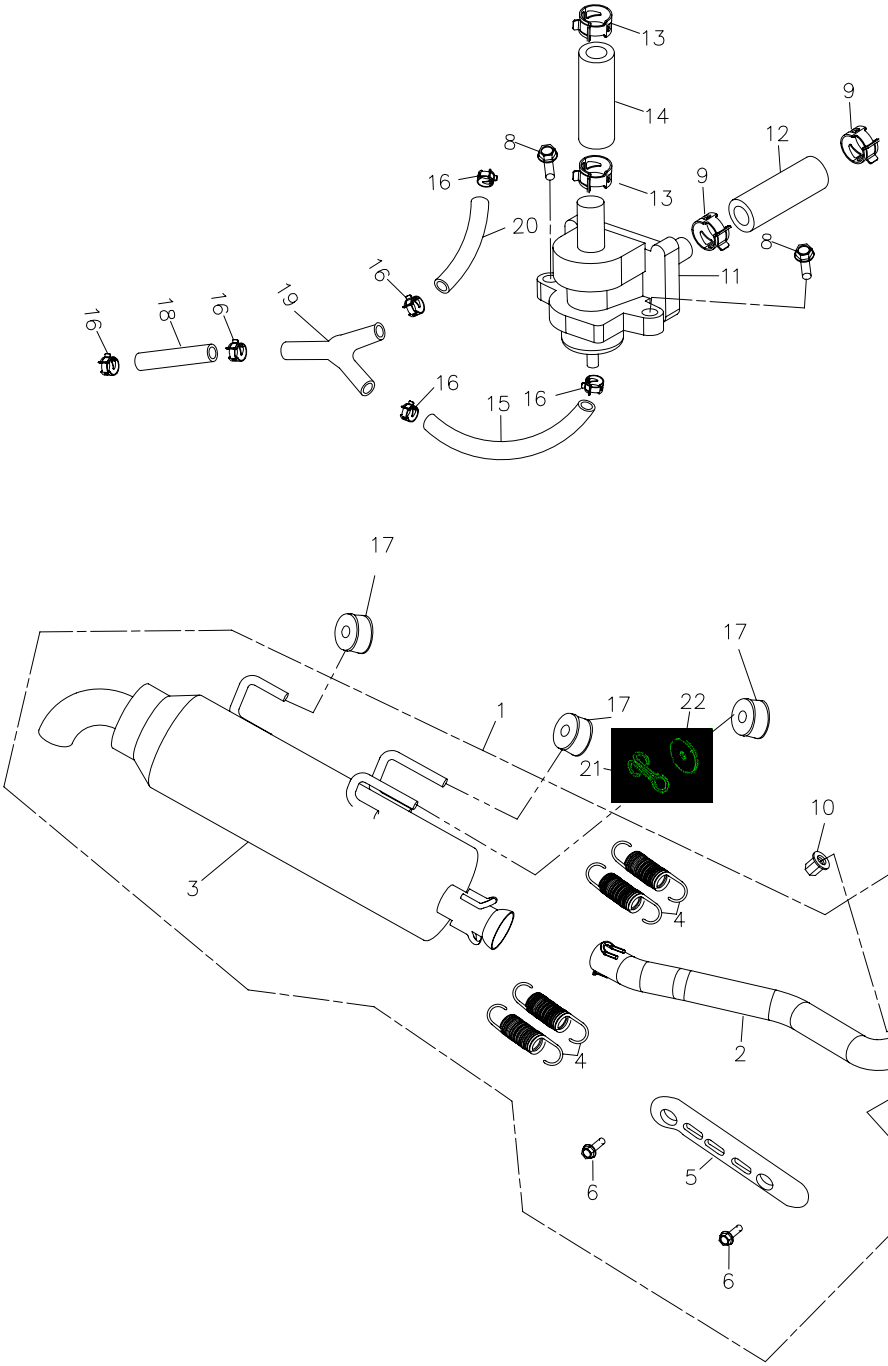
Install the air cleaner case in the reverse order of removal.

NOTE

◦ Tighten the connecting tube band screw securely.

Chapter 2 Fuel System & Carburetion

EXHAUST SYSTEM



Chapter 2 Fuel System & Carburetion

Exhaust System

REMOVAL

Disconnect the shaft selecting rod nut.

Loosen exhaust pipe front section to cylinder head mounting nuts.

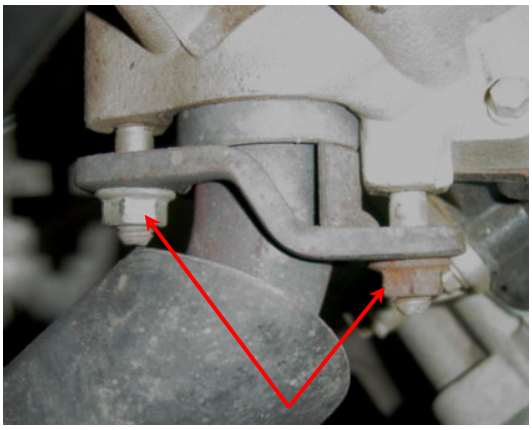
Loosen muffler silencer hanger mounting bolts.

Pull back the muffler assembly for removal.

Bend the exhaust pipe front section to release pipe springs.

INSPECTION

Check the exhaust pipe gasket, replace it if necessary.



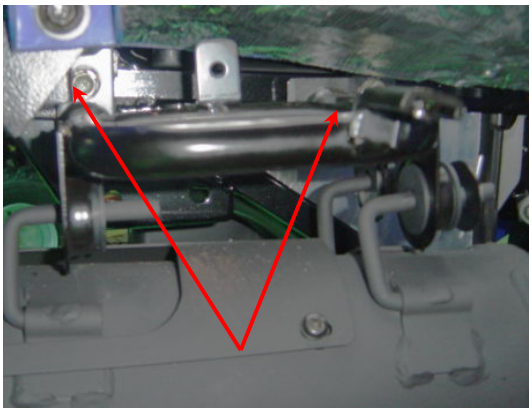
INSTALLATION

Install the muffler assembly in the reverse order of removal.

NOTE

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

Start the engine to check any leak thru gasket.



Chapter 3 Ignition and Starting System

Ignition System Service Information

GENERAL

◦ Ignition timing cannot be adjusted since the ignition control module is factory present.

◦ A continuity check can usually be made without removing the parts from the vehicle. Simply disconnect the wires and use a continuity tester or ohmmeter at the terminals.

◦ Inspect should be made sequence referring for troubleshooting of the system.

SPECIFICATION

ITEM			STANDARD
Ignition coil	Primary		0.1 – 0.3 Ω
	Secondary	With plug cap	3.7 – 4.6 kΩ
		Without plug cap	7.4 – 11 kΩ
Ignition pulse generator at 20 ℃ (68 ℉)			50 – 170 Ω

TROUBLESHOOTING

No spark at plug

◦ Poorly connected, broken or shorted wire.
- Between ignition pulse generator and ignition control module (CDI)
- Between CDI and ignition coil
- Between CDI and ignition switch
- Between ignition coil and spark plug

◦ Faulty:
- Ignition switch
- Ignition control module (CDI)
- Ignition pulse generator
- Spark plug

Engine starts but runs poorly

◦ Ignition primary circuit
- Faulty ignition coil
- Loose or bare wire
- Poor connection at ignition switch

◦ Ignition secondary circuit
- Faulty ignition coil
- Faulty spark plug
- Faulty spark plug wire
- Poorly insulated plug cap

◦ Improper ignition timing
- Faulty ignition pulse generator
- Stator not installed properly
- Faulty ignition control module (CDI)

Chapter 3 Ignition and Starting System

Ignition Coil

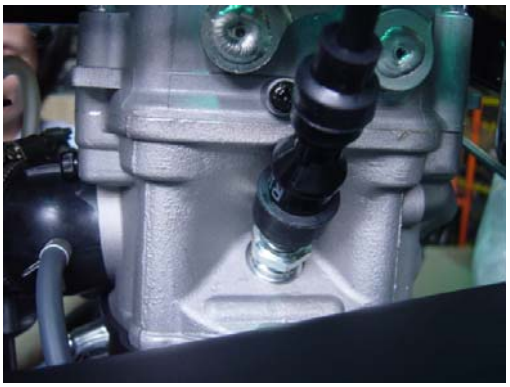
INSPECTION

Disconnect the ignition coil primary wires and measure the resistance between the terminals.

Resistance: 0.1 – 0.3 Ω

Remove the spark plug cap from the spark plug and measure the resistance between the ignition coil primary terminal and spark plug cap.

Resistance: 7.4 - 11 kΩ



If the resistance is out of the specification, remove the spark plug cap from spark plug wire and measure the resistance of the secondary coil.

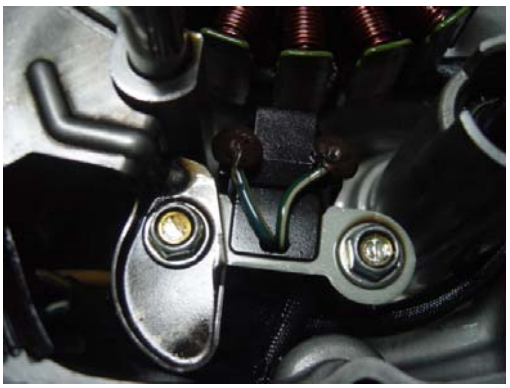
Resistance: 3.7 – 4.5 kΩ

REMOVAL/INSTALLATION

Disconnect the ignition coil primary wires connectors and remove the spark plug cap from the spark plug.

Remove the ignition coil mounting bolt and remove the ignition coli.

Install the ignition coil in the reverse order of removal.



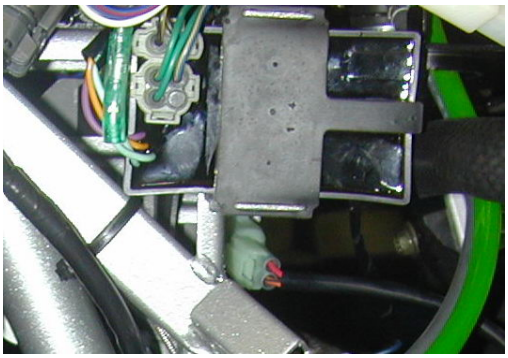
Ignition Pulse Generator

Disconnect the ignition pulse generator wire connectors and measure the resistance between the terminals.

Resistance: 50 - 170 Ω

Chapter 3 Ignition and Starting System

Capacitive Discharge Ignition - C.D.I.

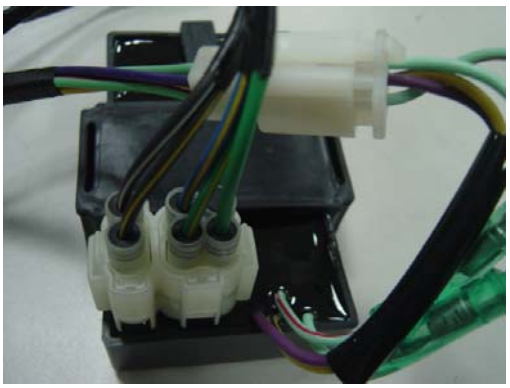


GENERAL

The CDI unit was located on front right of frame, about the right front shock absorber.

There are three electrical connectors for the CDI: the two-pin connector and a four-pin connector on CDI body and a four-pin gear position coupler.

INSPECTION



Disconnect the CDI coupler and connectors and check each circuit according to the table below:

CIRCUIT	COLOR	CORRECT
Ignition Puler	Bu/Y-G	50-170 Ω
Ignition coil	Bl/Y-G	0.1-0.3 Ω
	Bl/Y-Plug cap	w/cap 7.4-11kΩ w/o cap 3.7-4.5kΩ
Ignition switch	Bl/W-G	No continuity when switch ON

If the harness and all other components are all okay, the CDI is probably defective. But before replace a new one. It's a good idea to substitute a known good CDI.

Chapter 3 Ignition and Starting System

Starting System Service Information

SPECIFICATION

ITEM	STANDARD	SERVICE LIMIT
Starter motor brush length	12.0-12.5 mm (0.47-0.49in)	6.5 mm (0.26 in)
Starter motor brush spring tension	680-920 g (1.49-2.03 lb)	680 g (1.49 lb)

TROUBLESHOOTING

Starter won't turn

◦ Burned out fuse

◦ Weak battery

◦ Poorly connected, broken or shorted wire

◦ Faulty:

- Ignition switch
- starter switch
- Rear brake light switch
- Starter motor

Lack of power

◦ Weak battery

◦ Loose or bare wire

◦ Faulty starter gear

Starter turns, but engine does not start

◦ Faulty starter clutch

◦ Faulty starter pinion

Chapter 3 Ignition and Starting System

Starter Relay

GENERAL

The relay coil is normal if you hear a click when starter button is depressed with the ignition switch ON and brake lever pressed.

REMOVAL/INSPECTION

Remove the seat.

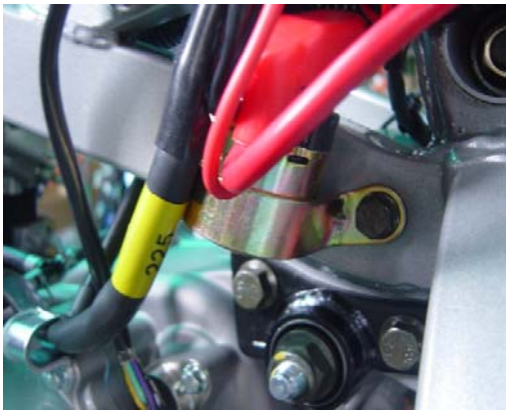
Disconnect the negative battery cable from the battery.

Disconnect the positive cable and starter motor cable from the starter relay.

Disconnect starter relay terminal and remove the starter relay.

Connect an ohmmeter between the positive and starter motor terminal.

Connect the yellow/red wire terminal to the positive battery terminal and green wire to the negative battery terminal by using a jumper wire.



Check for continuity between the starter relay terminal.

Replace the starter relay with a new one if there is no continuity.

INSTALLATION

Install the ignition coil in the reverse order of removal.

Chapter 3 Ignition and Starting System

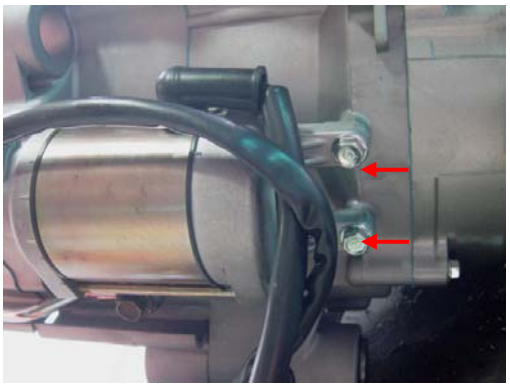
Starter Motor

REMOVAL

Remove the negative battery cable from the battery.

Disconnect the starter cable from the starter motor.

Remove the two mounting bolts then remove the starter motor.



INSTALLATION

NOTE

◦ Before installing the starter motor, check the operation by connecting the starter motor wire to the starter relay.

Install the starter motor in the reserve order of removal.

Tighten the starter motor cable attaching nut.

Torque: 10-14 N.m (7-10 ft.lb)

Install and tighten the starter motor mounting bolts.

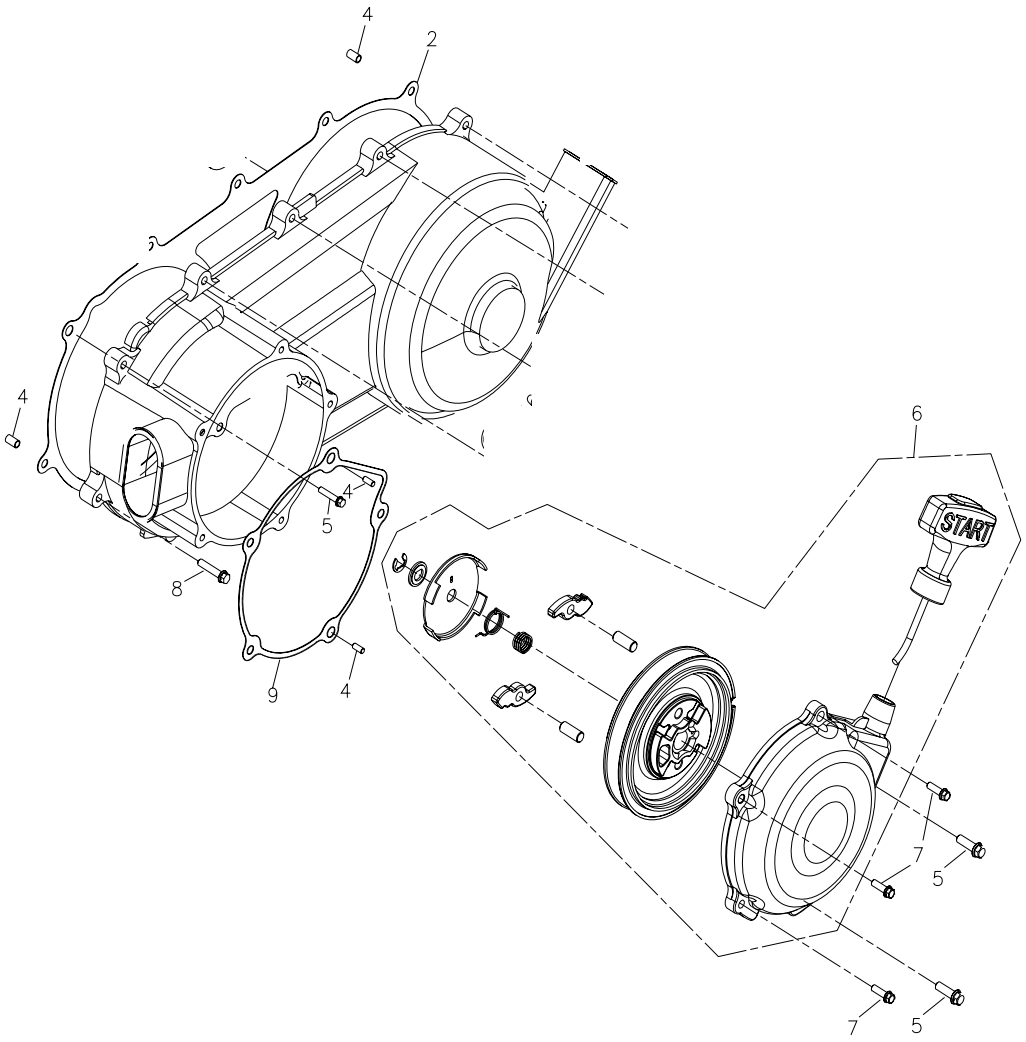
Torque: 10-14 N.m (7-10 ft.lb)

NOTE

◦ Place the starter motor cable cover securely.

Chapter 3 Ignition and Starting System

Recoil Backup Starting System



Chapter 3 Ignition and Starting System

Recoil Backup Starting System

CHECK

NOTE

◦ Pull the recoil haft rapidly to have enough kinetic energy for engine starting.

Park the vehicle on a level ground.

Put the gear shaft to “Neutral”.

Turn the ignition switch “ON”.

Pressed the brake lever then pull the recoil haft.

Repeat about-mentioned process till the engine starting.

After engine start, release the recoil haft, the wire should return into the recoil body and the haft stay to it’s original position.

NOTE

◦ If the recoil haft can’t back to original position, slightly pull out the recoil wire till it can retract.

If the recoil haft still can’t return to it’s original position, replace the recoil set.

REMOVAL/INSTALLATION

Remove foot pad.

Loosen five mounting bolts on recoil cover.

Remove recoil set.

Check starting dish edge for wear or damage.

Install the starter motor in the reserve order of removal.

Chapter 4 Frame & Cover

GENERAL INFORMATION

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

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

NOTE

◦ When attempting to remove any body panel, first study the panel closely, noting any fasteners and associated fittings, to be sure of returning everything to its correct place on installation.

◦ In some cases, the aid of an assistant will be required when removing panels, to help avoid damaging the surface.

◦ Once the visible fasteners have been removed, try to lift off the panel as described but **DO NOT FORCE** the panel – if it will not release, check that all fasteners have been removed and try again. Where a panel engages another by means of tabs and slots, be careful not to break the tabs or to damage the bodywork.

◦ Remember that a few moments of patience at this stage will save you a lot of money in replacing broken panels.

FRAME

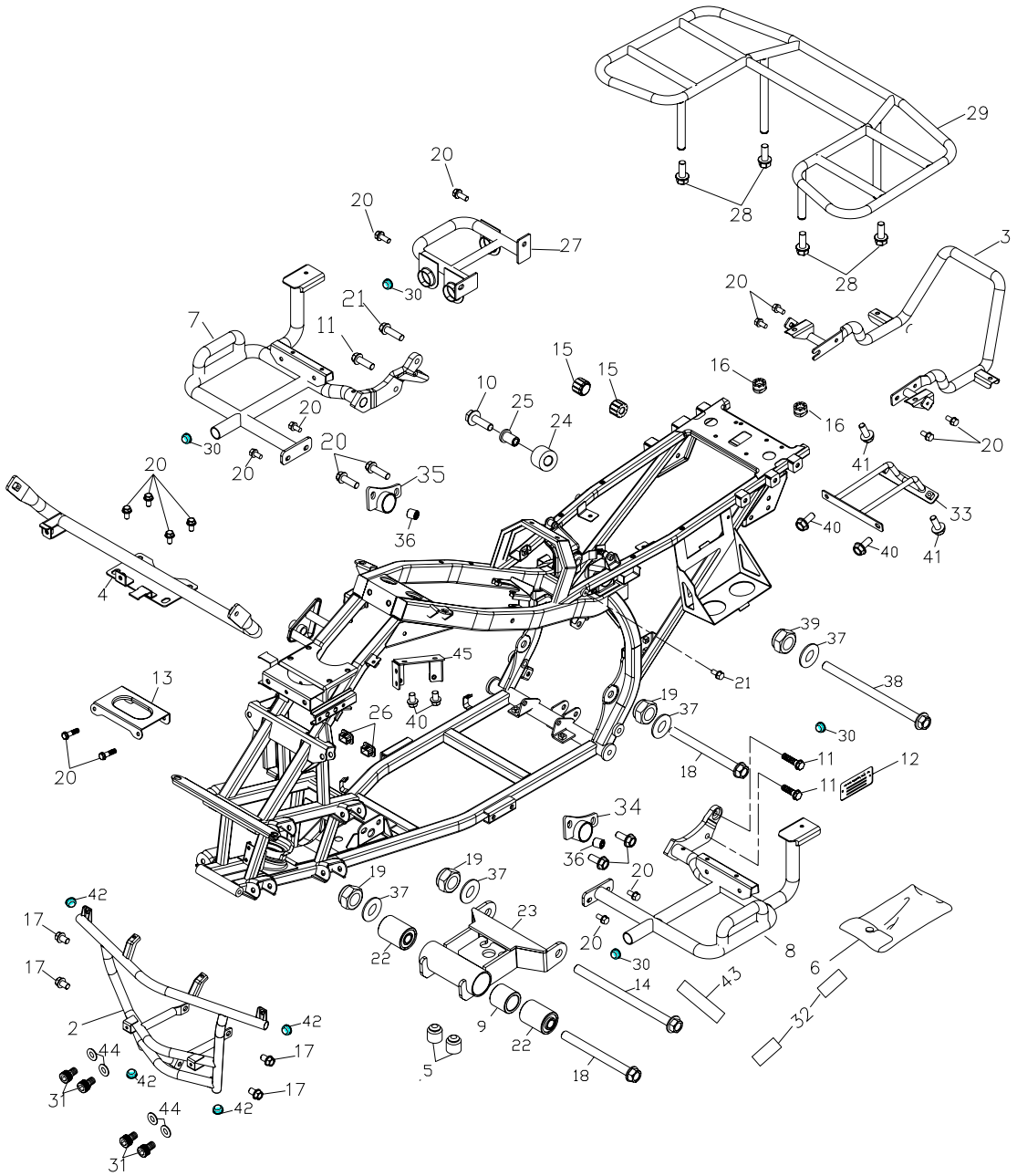
◦ All models use a double-cradle frame made of steel tubing.

◦ The frame shouldn't require attention unless accident damage has occurred. In most cases, frame replacement is the only satisfactory remedy for such damage. A few frame specialists have the jigs and other equipment necessary for straightening the frame to the required standard of accuracy, but even then there is no simple way of assessing to what extent the frame may have been over-stressed.

◦ After the machine has accumulated a lot of miles, the frame should be examined closely for signs of cranking or splitting at the welded joints. Corrosion can also cause weakness at these joint

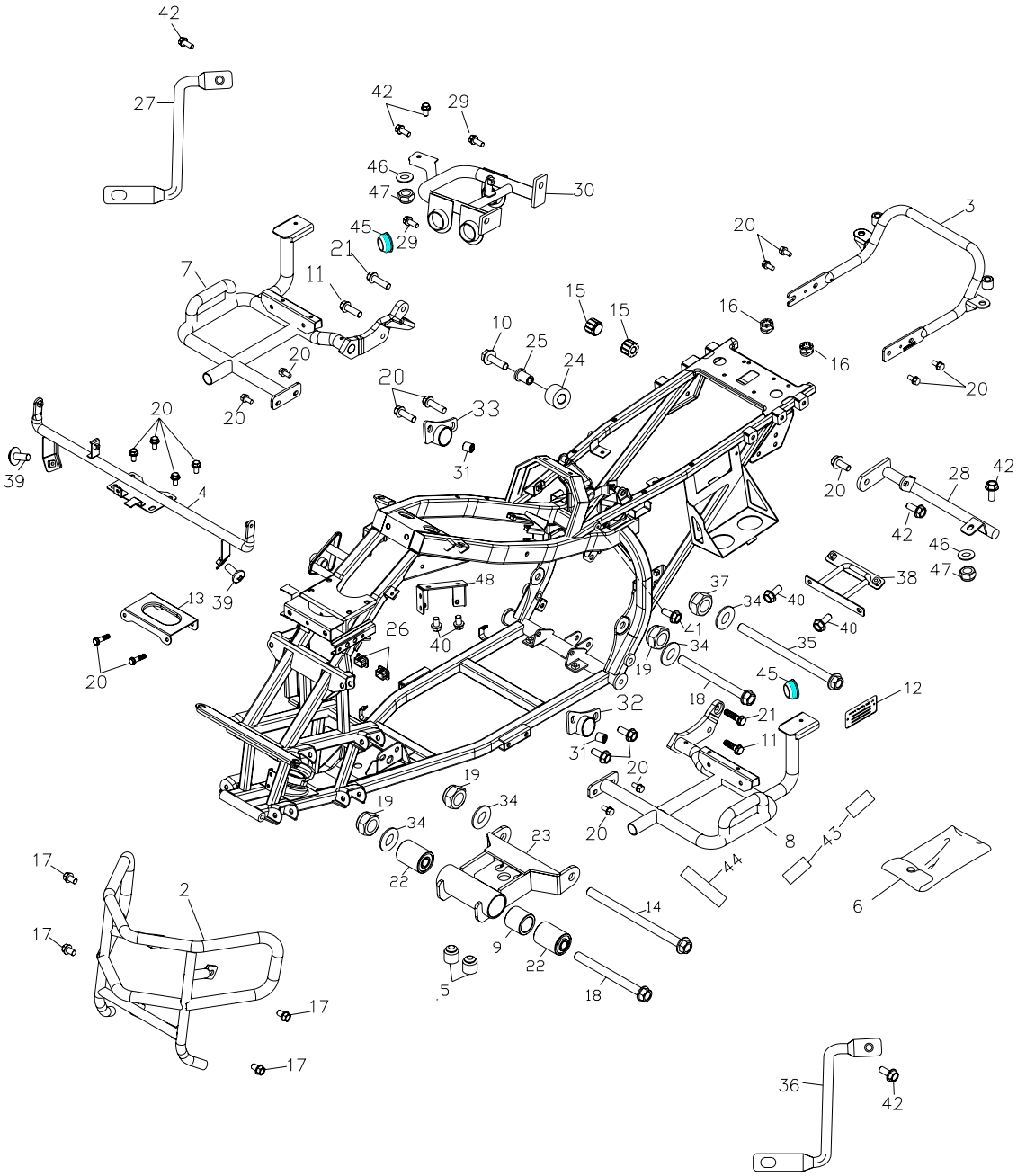
Chapter 4 Frame & Cover

FRAME BODY-280AU



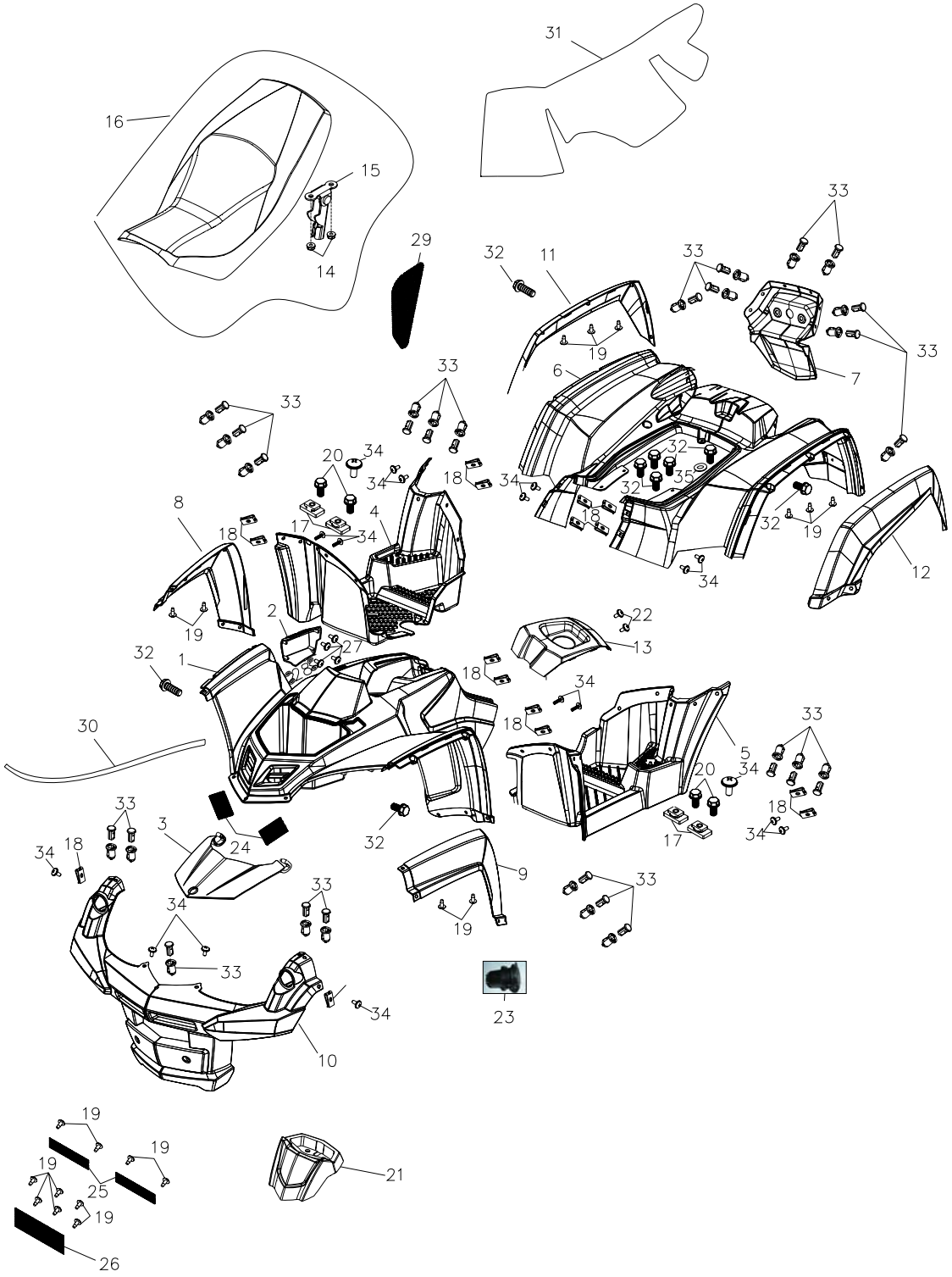
Chapter 4 Frame & Cover

FRAME BODY-280AS



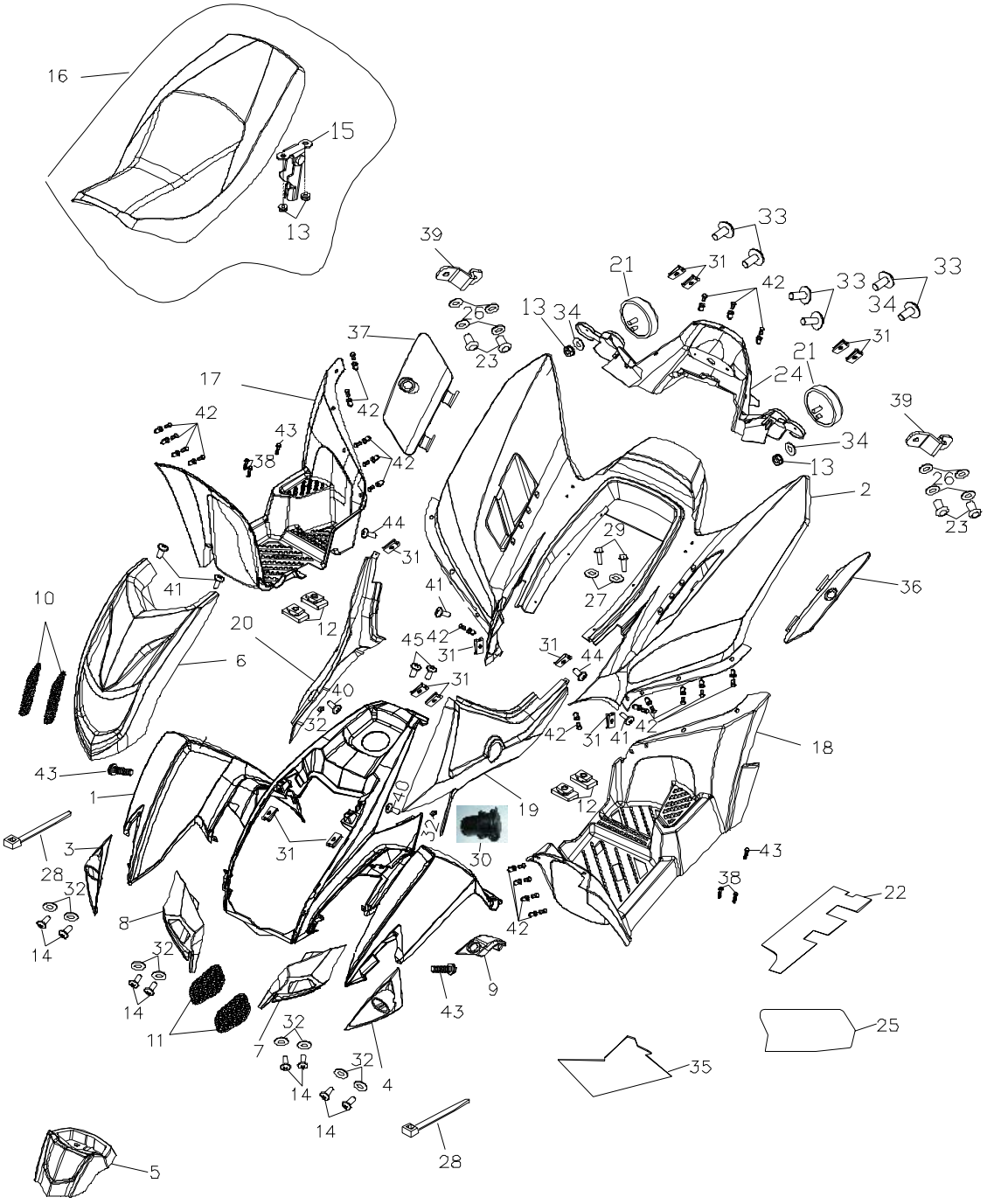
Chapter 4 Frame & Cover

BODY COVER & SEAT-280AU



Chapter 4 Frame & Cover

BODY COVER& SEAT-280AS

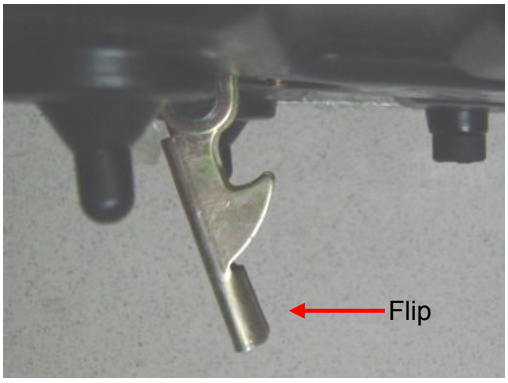


Chapter 4 Frame & Cover

REAR FENDERS

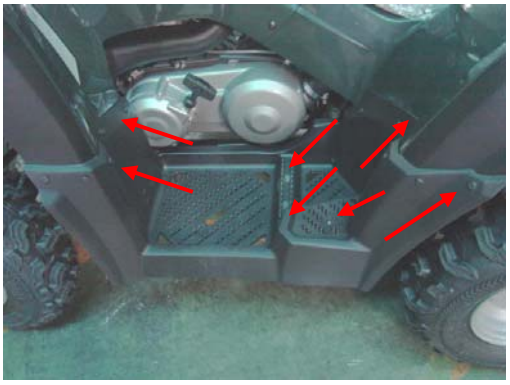
REMOVAL

Remove the seat by flip back the latch level and lift the back end of seat.



Remove left and right floor panels.

Remove rear carrier.



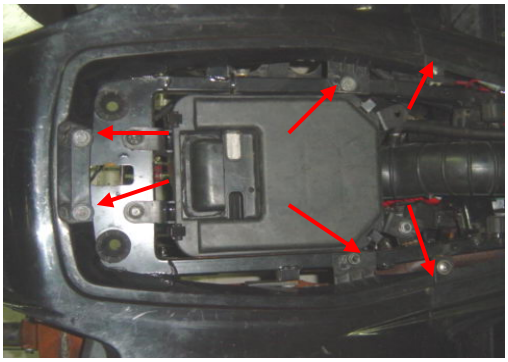
Disconnect tail light and L/R indicator light connector.

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

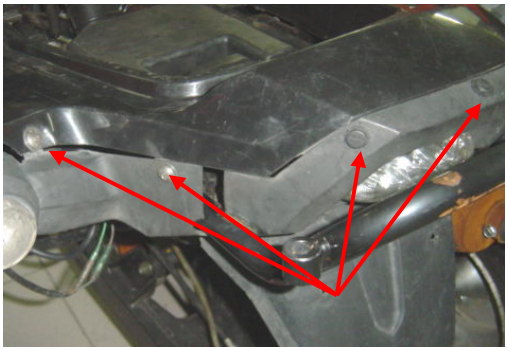
Remove two lower mount bolts.

Remove tail light fender. (280AS)

Open the rear luggage box and remove the mounting bolt. (280AS)



Raise up the fender and pull to back to remove the rear fender.



INSTALLATION

Install the rear fender in the reverse order of removal.

NOTE

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

Chapter 4 Frame & Cover

FRONT FENDER

REMOVAL

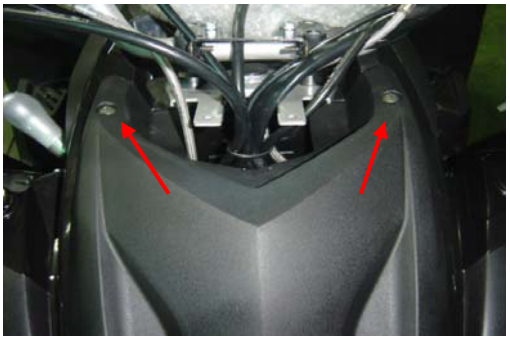
280AS

NOTE

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

Remove L/R floor panel.

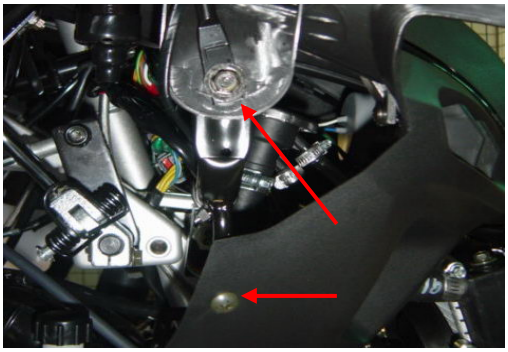
Remove front fascia and disconnect headlight wire.



Disconnect indicator light and main switch wire.

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

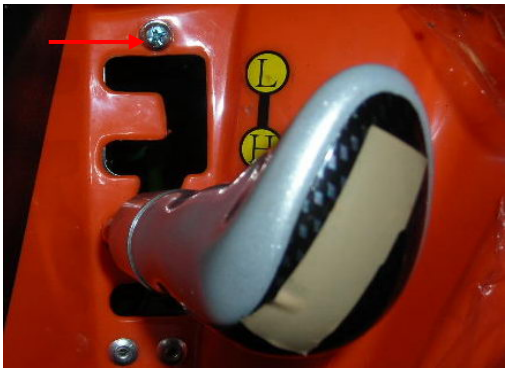
Remove speedometer cover and handle bar supporter then make handle bar freely for moving.



Remove fender to frame mounting bolts

Remove shaft nob and shaft rod plate fixing bolts.

Remove fuel cap



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

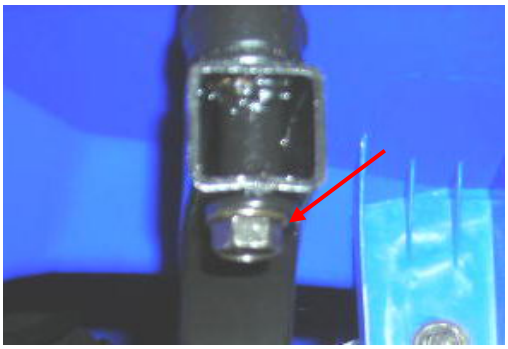
280AU

Remove L/R floor panel.

Remove front carrier (optional accessory).

Disconnect headlight, indicator light and main switch connector.

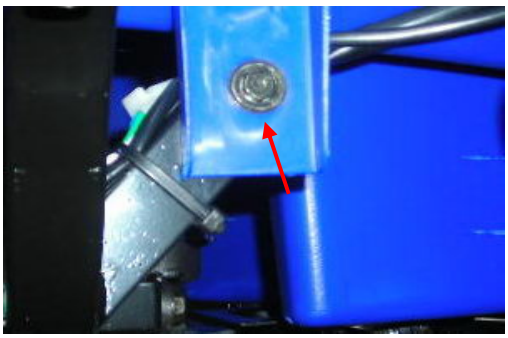
Remove shaft nob and shaft rod plate fixing bolts.



Remove two fender to frame mounting bolts

Remove four bumper cover to bumper and headlight to bumper mounting bolts.

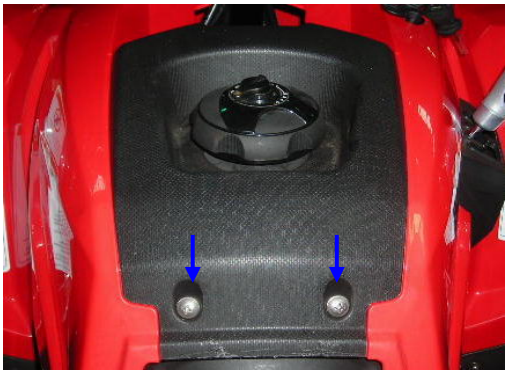
Remove fuel cap then remove fuel tank dash board.



NOTE

◦ Lock the fuel cap to fuel tank as soon as removed fuel tank dash board.

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



INSTALLATION

Install the rear fender in the reverse order of removal.

NOTE

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

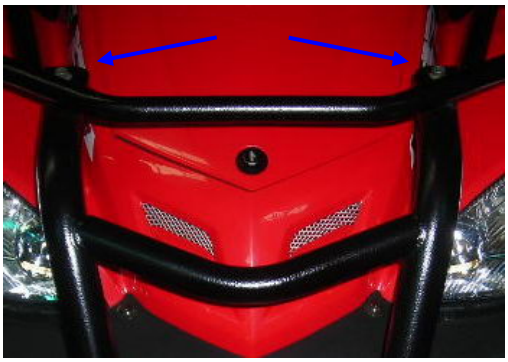
FRONT/REAR CARRIER (280AU ONLY)

FRONT CARRIER REMOVAL

Loosen two carrier to bumper mounting bolts.

Loosen two carrier to cover fixed pole bolts.

Remove the front carrier.

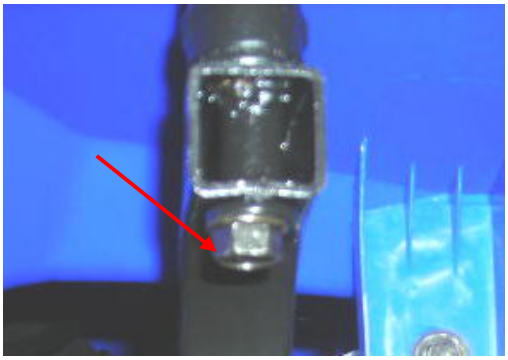


INSTALLATION

Install the front carrier in the reverse order of removal.

NOTE

◦ Attached all four bolts first, and after aligned the carrier, then tighten the bolts.



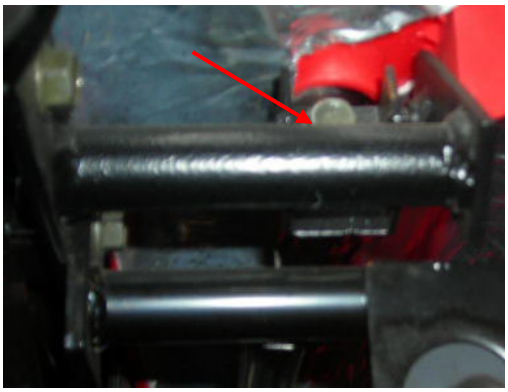
INSTALLATION

Install the front carrier in the reverse order of removal.

REAR CARRIER REMOVAL

Remove two carrier to plate bracket bolts and two carrier to rear bumper bolts.

Remove the rear carrier.



INSTALLATION

Install the front carrier in the reverse order of removal.

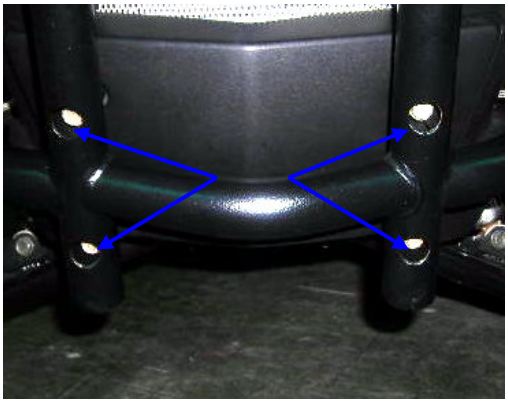
Chapter 4 Frame & Cover

FRONT BUMPER REMOVAL

Remove the front carrier.

Remove four bumper mounting bolts.

Remove the front bumper.



NOTE

◦ Attached all four bolts first, and after aligned the bumper, then tighten the bolts.

INSTALLATION

Install the front bumper in the reverse order of removal.

REAR BUMPER REMOVAL

Remove the rear carrier.

Remove four bumper mounting bolts.

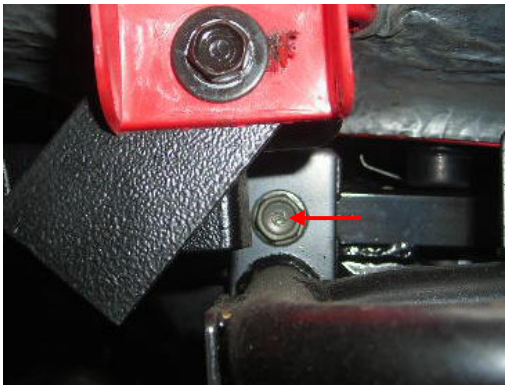
NOTE

◦ The right side front bolt also tighten the muffler bracket. For easily removing the rear bumper, loosen another bracket mounting bolt, too,

Remove the rear bumper.

INSTALLATION

Install the rear bumper in the reverse order of removal.



Chapter 5 Wheels, Tires & Brakes

Contents

Service Information

Specification

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

Torque Values

Steering shaft nut	80-120 N.m (58-87 ft.lb)
Steering shaft holder bolt	50-60 N.m (36-43 ft.lb)
Handle bar holder clamp nut	30-40 N.m (22-29 ft.lb)
Handle bar holder clamp bolt	24-30 N.m (17-22 ft.lb)
Tie rod end	45 N.m (33 ft.lb)
Ball joint Upper	55 N.m (40 ft.lb)
Lower	55 N.m (40 ft.lb)
Front wheel hub nut	59-79 N.m (43-58 ft.lb)
Rear wheel hub nut	140-160 N.m (101-116 ft.lb)
Wheel nut	64 N.m (17-22 ft.lb)
Brake disk bolt	30 N.m (22 ft.lb)
Shock absorber	
Front	45 N.m (33 ft.lb)
Rear Upper	108 N.m (80 ft.lb)
Lower	59 N.m (43 ft.lb)

Troubleshooting

Hard steering

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

Soft suspension

◦ Damper oil leaks
◦ Weak shock absorber spring

Steers to one side or do not tract straight

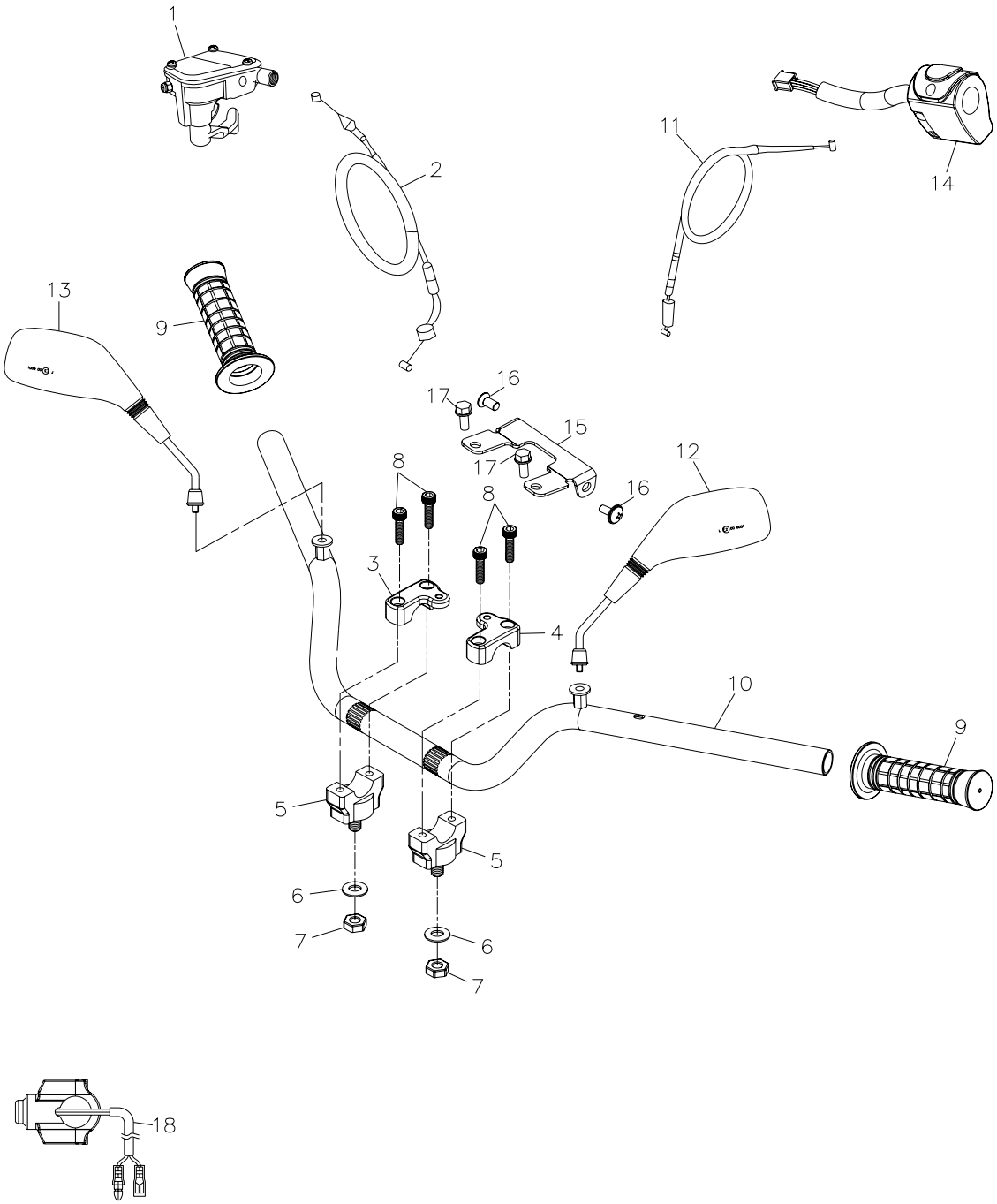
◦ Insufficient toe in setting
◦ Bend A-arm
◦ Insufficient tire pressure

Front wheel wobbling

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

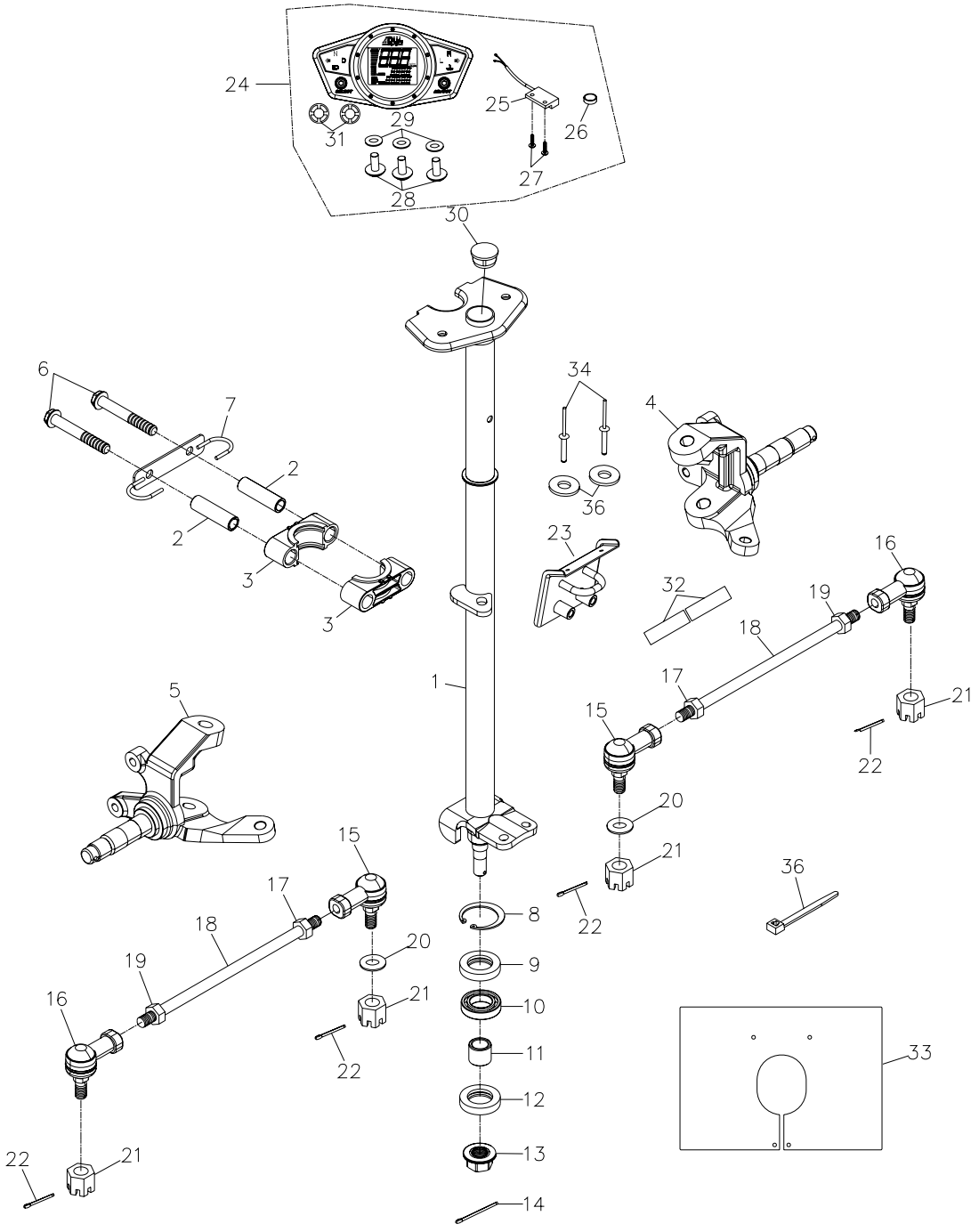
Chapter 5 Wheels, Tires & Brakes

HANDLE BAR



Chapter 5 Wheels, Tires & Brakes

STEERING



Chapter 5 Wheels, Tires & Brakes

Handlebar

REMOVAL

Remove the speedometer assembly mounting screws.

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

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

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

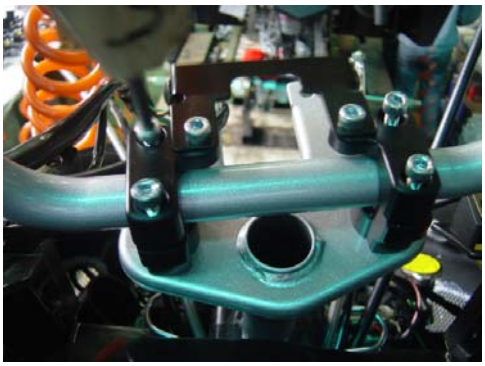
Loosen four handle clamp hex socket bolts and remove handlebar.

NOTE

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

INSTALLATION

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

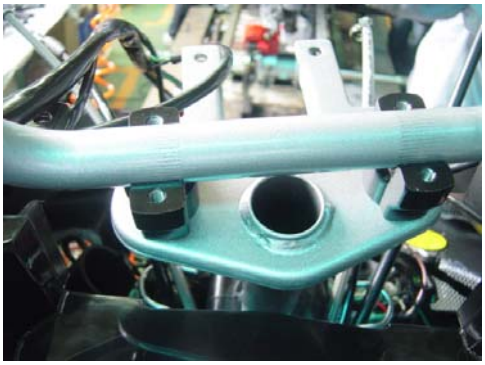


Install the handlebar upper holders and tighten four hex socket bolts.

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

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

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



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

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

Connect the throttle and choke cable.

Connect the brake switch and overdrive wire.

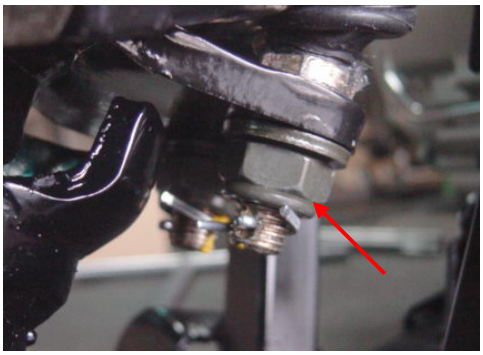
Insert speedometer assembly to the handlebar and tighten the mounting screw.

Chapter 5 Wheels, Tires & Brakes

Steering

STEERING SHAFT REMOVE

Remove the front fender.



NOTE

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

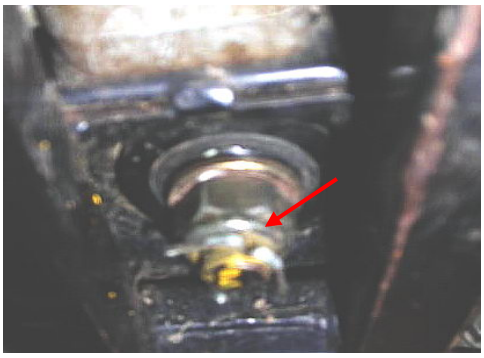
Remove the handlebar.

Remove tie rod end nuts on steering shaft side.

Remove the steering shaft nut.

Remove the steering shaft holder bolts

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



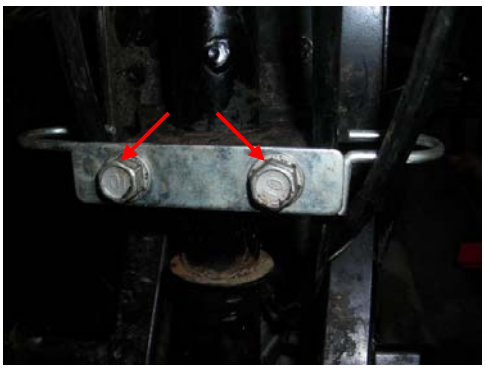
INSPECTION

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

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

NOTE

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

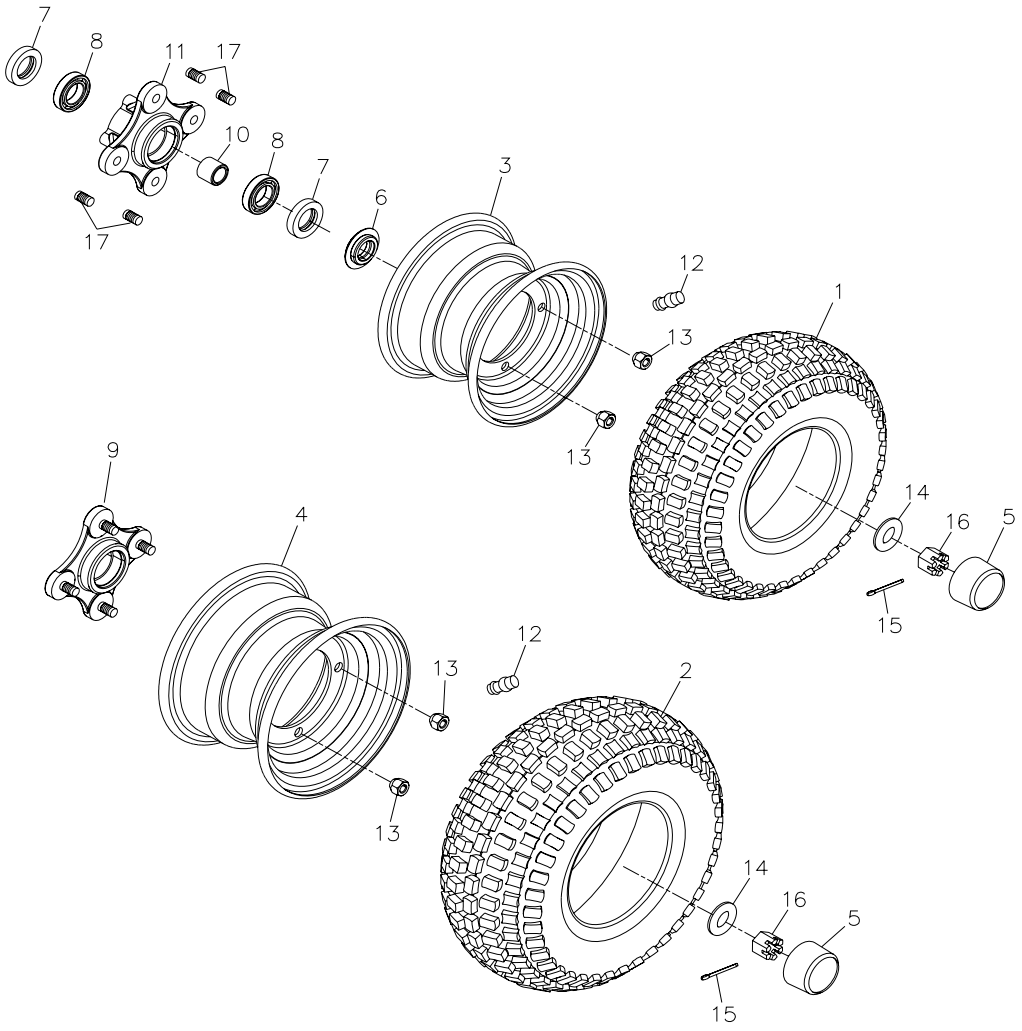


INSTALLATION

Install the steering shaft in the reverse order of removal.

Chapter 5 Wheels, Tires & Brakes

FRONT & REAR WHEEL



Chapter 5 Wheels, Tires & Brakes

Front & Rear Wheel

WHEEL REMOVAL

NOTE

◦ Use a hydraulic jacket for easily serving.

Use parking brake to locked rear wheel.

Slightly loosen wheel nuts.

Raise the frame to let wheel leave ground.

Loosen and remove wheel nuts then remove wheel.

INSPECTION

Check the tires for cuts or embedded object

Check the front and rear wheels rim for trueness.

Service Limits:

Radial: 2.0 mm (0.08in)

Axial: 2.0 mm (0.08in)

Replace if the reading exceeds the service limit.

Measure the tread depth at the center of tires.

Replace the tires if the tread depth reaches the following limits:

Minimum tread depth:

Front: 1.5 mm (0.06in)

Rear: 2.5 mm (0.08in)

INSTALLATION

Align wheel to hub studs and install wheel nuts.

Down the vehicle to ground and tighten wheel nuts to specified torque.

Torque: 64 N.m (47 ft.lb)

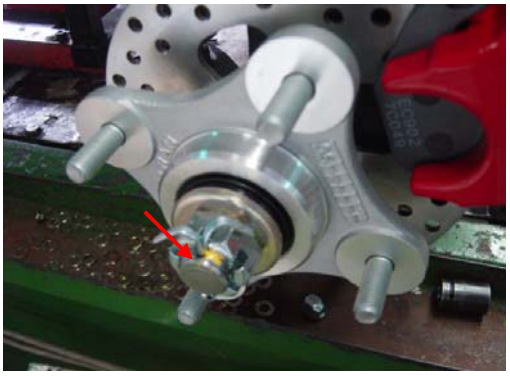
HUB REMOVAL

Remove the wheel.

Remove the hub to axle mounting nut cotter pin.

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

Remove the hub from axle.



INSPECTION

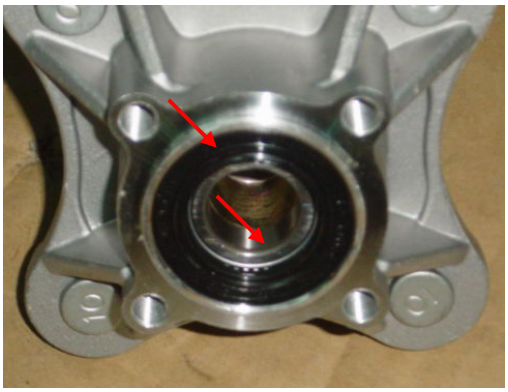
Front hub

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

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

Check the outer race fits tightly in the hub.

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



NOTE

◦ Replace the hub bearing in pairs.

INSTALLATION

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

Torque:

Front: 59-79 N.m (43-58 ft.lb)

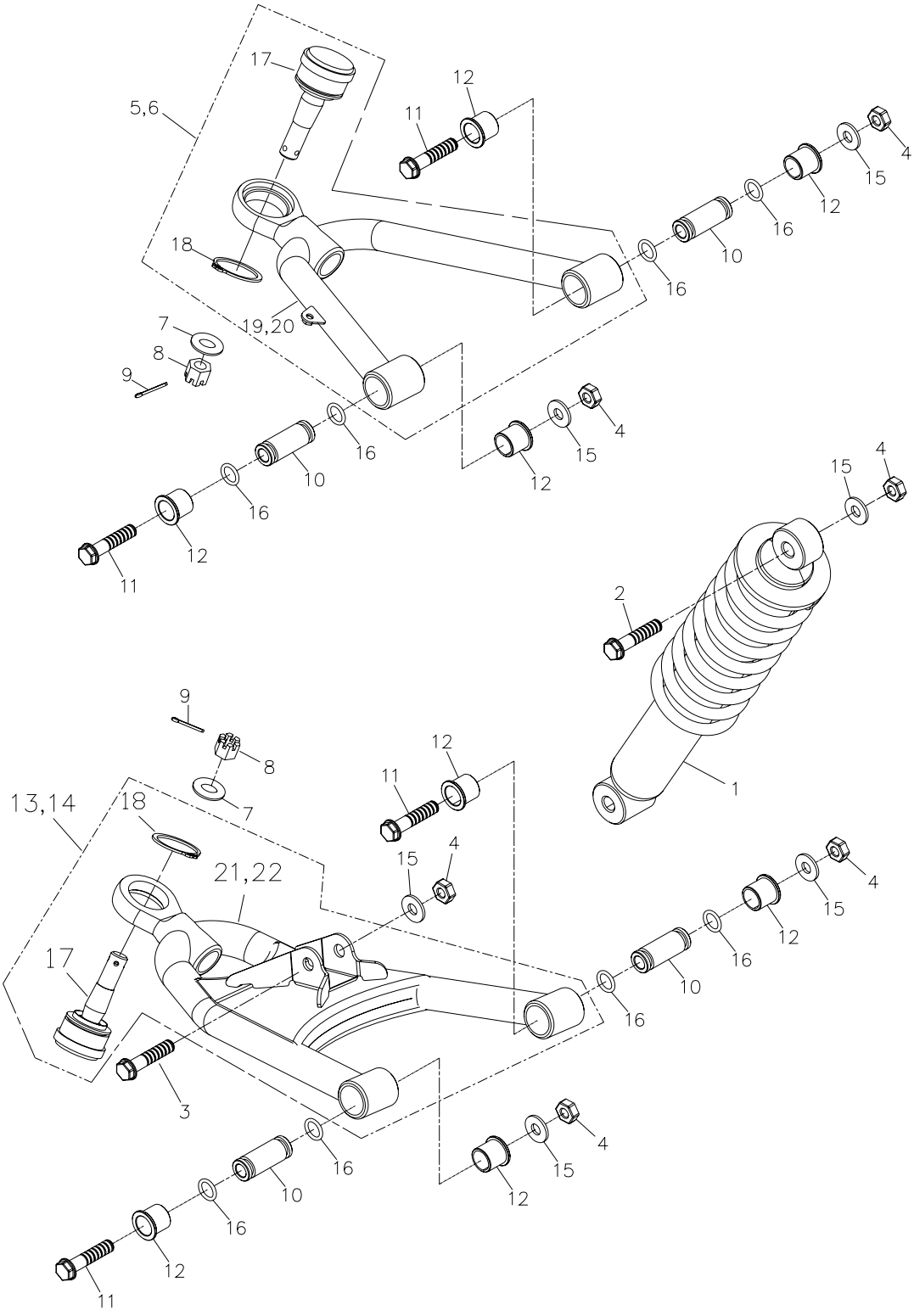
Rear: 140-160 N.m (101-116 ft.lb)

NOTE

◦ Use a new axle mounting nut cotter pin.

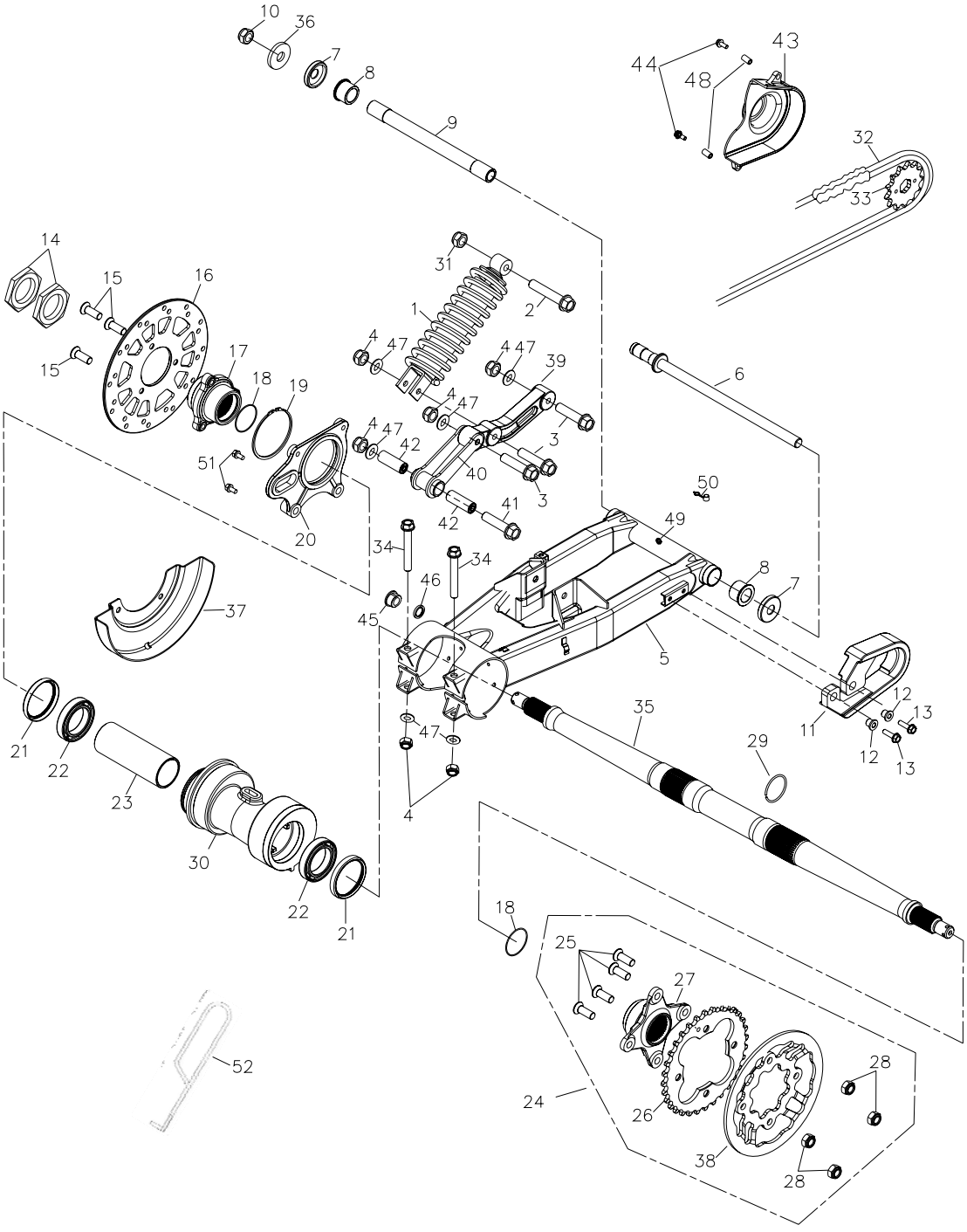
Chapter 5 Wheels, Tires & Brakes

FRONT SUSPENSION



Chapter 5 Wheels, Tires & Brakes

REAR SUSPENSION & SWING ARM SUB ASS'Y



Chapter 5 Wheels, Tires & Brakes

Front Suspension

A-arm REMOVAL

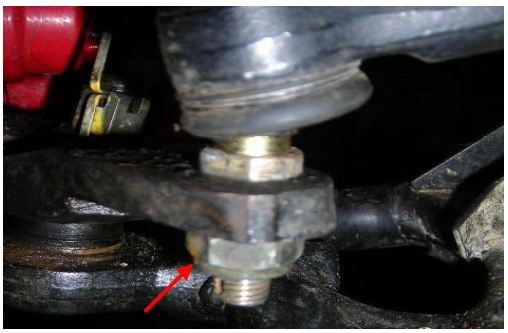
CAUTION

◦ Support the vehicle frame steady when servicing or inspecting.

Remove front tire.

Remove tie rod end on knuckle.

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



Remove lower shock absorber mounting bolt.

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

INSPECTION

Inspect ball joint rubber and joint for wear or damage.

Replace ball joint upper and lower at same time.

Inspect a-arm bushing, replace it if necessary.

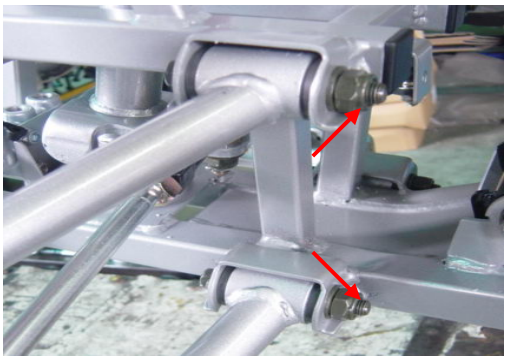
Inspect a-arm for any crushed or bended.

INSTALLATION

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

Torque:

Ball joint	**55 N.m (40 ft.lb)**
Mounting bolts	**30 N.m (22 ft.lb)**
Tie rod end nuts	**45 N.m (33 ft.lb)**



NOTE

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

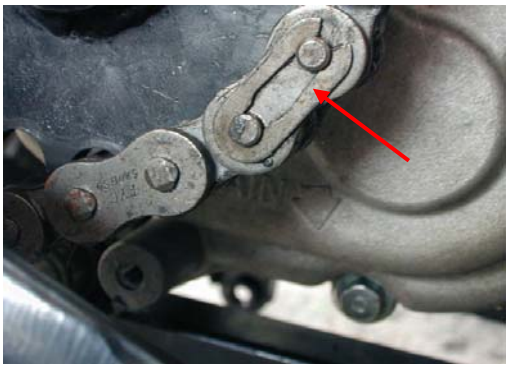
Chapter 5 Wheels, Tires & Brakes

Rear Suspension

SWING ARM REMOVAL

CAUTION

◦ Support the vehicle frame steady when servicing or inspecting.



Remove L and R foot pad and rear tires.

Disconnect drive chain and remove the chain

Remove rear shock absorber mounting bolts both upper and lower then remove shock from axle.

Remove rear caliper and pull back caliper set with brake line and parking brake cable aside the swing arm assemble.

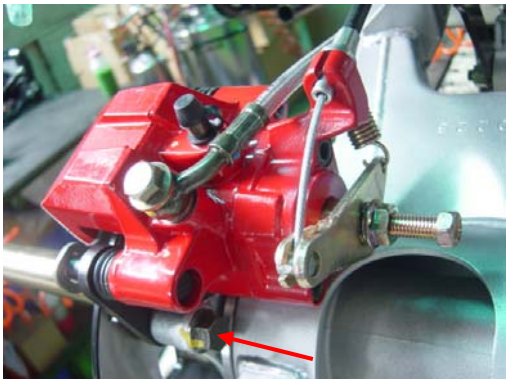
Remove rocker arm to chassis mounting bolt.

Remove foot brake pedal.

Loosen the swing arm bolt and remove it.

Pull back the swing arm assembly with axle and remove it from chassis.

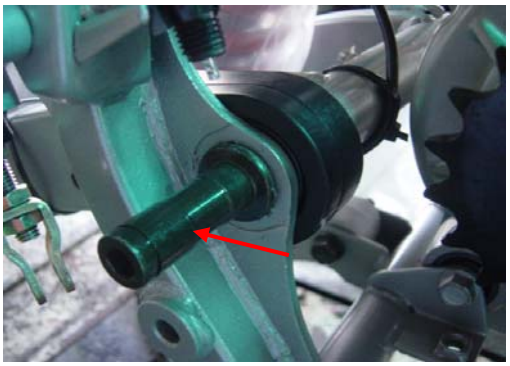
INSPECTION



Check swing arm bushing and oil seal for broken or damage, replace it if necessary.

Check rocker arm bushing and roller bearing. The bearing must turn smoothly and quietly.

Check shoe slider for unusually wear, replace it if necessary.



INSTALLATION

Install rear wheel axle in the reverse order of removal.

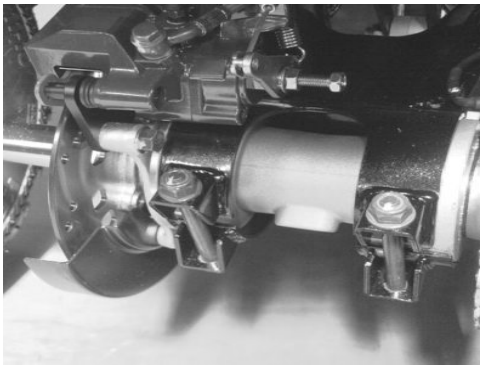
REAR WHEEL AXLE RMOVAL

Loosen brake disk flange tighten nuts and remove the nuts.

Remove brake disk flange assembly.

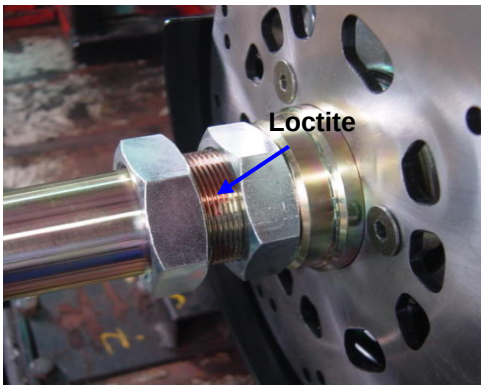
Push wheel axle to right side and remove axle with rear sprocket assembly from axle holder.

Remove rear sprocket assembly from axle.



SPROCKET INSPECTION

Check sprocket teeth, replace if show as illustration.



REAR AXLE HOLDER INSPECTION

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

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

Check the outer race fits tightly in the holder.

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

NOTE

◦ Replace holder bearing in pairs.

INSTALLATION

Install rear wheel axle in the reverse order of removal.

NOTE

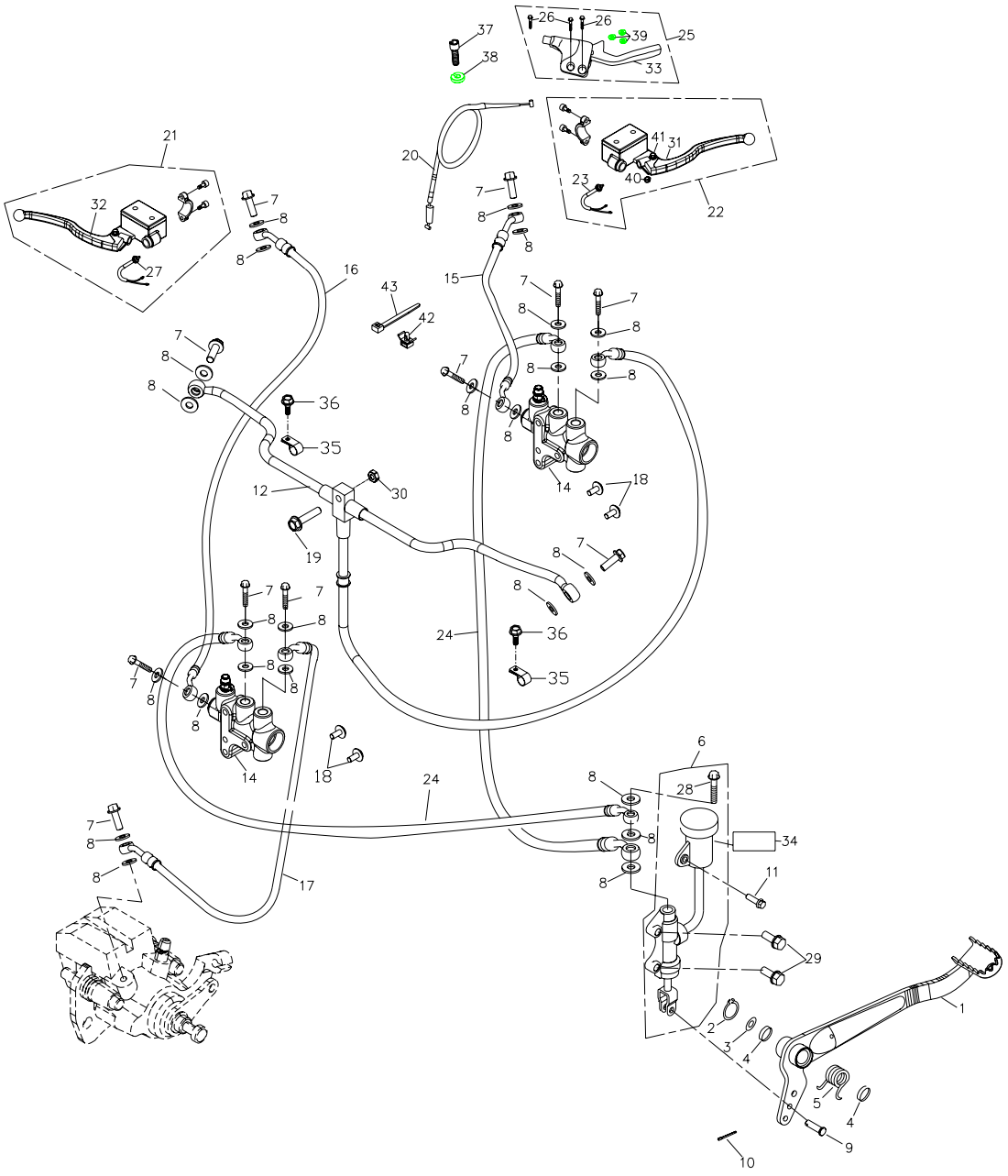
◦ Apply greases on bushing before installation.

NOTE

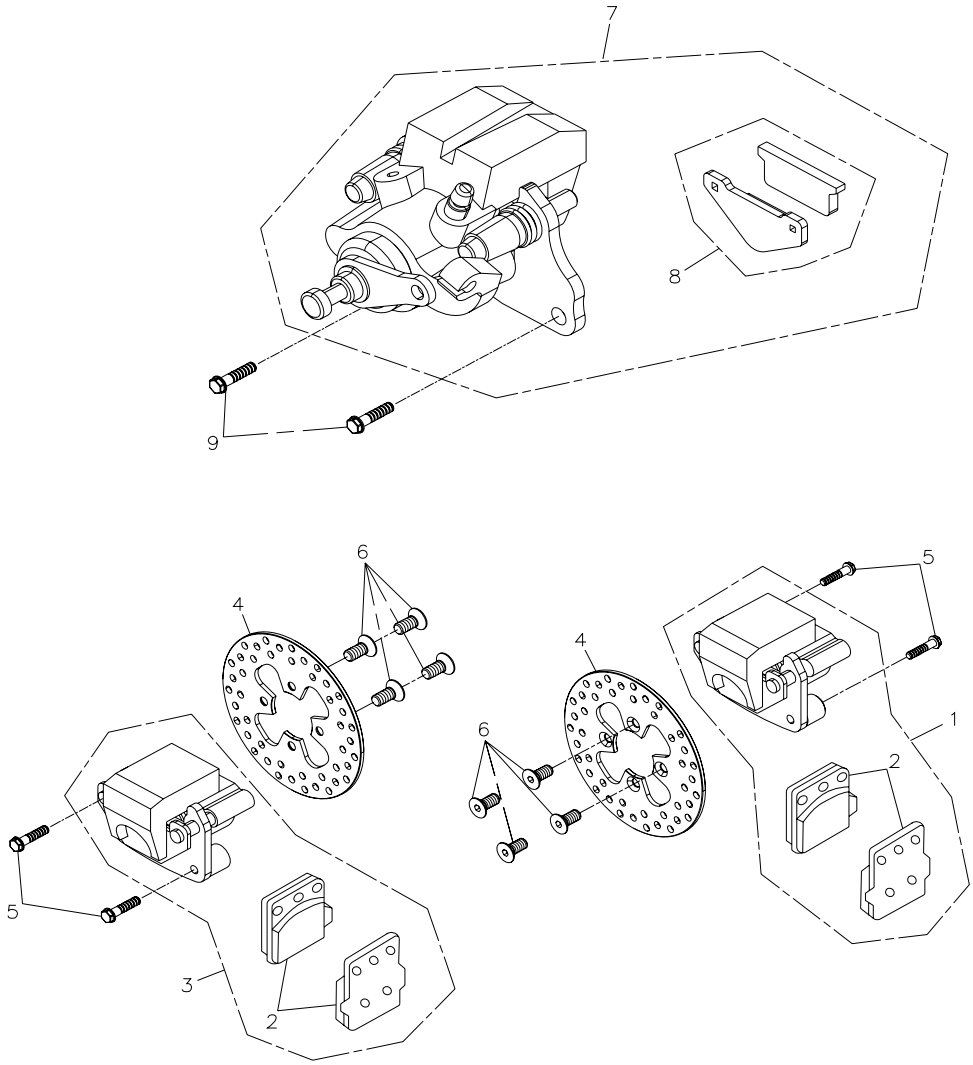
◦ Apply **Loctite** on brake disk flange tighten nuts when installation.

Chapter 5 Wheels, Tires & Brakes

HYDRAULIC BRAKE SYSTEM



BRAKE CALIPER



Chapter 5 Wheels, Tires & Brakes

Service Information

GENERAL

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

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

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

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

◦ Always check brake operation before riding the motorcycle.

SPECIFICATION

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

TORQUE VALUES

Bleed valve	4-7 N.m (3-5 ft.lb)
Caliper mounting bolt	30 N.m (22 ft.lb)
Brake fluid line bolt	34 N.m (25 ft.lb)
Master cylinder holder bolt	10-14 N.m (7-10 ft.lb)

Troubleshooting

Brake lever soft or spongy

◦ Air bubbles in hydraulic system

◦ Low fluid level

◦ Hydraulic system leaking

Brake lever too hard

◦ Sticking piston(s)

◦ Clogged hydraulic system

◦ Pads glazed or excessively worn

Brake drag

◦ Hydraulic system sticking

◦ Sticking piston(s)

Brakes grab or pull to one side

◦ Pads contaminated

◦ Disc or wheel misaligned

Brake chatter or squeal

◦ Pads contaminated

◦ Excessive disc runout

◦ Caliper installed incorrectly

◦ Disc or wheel misaligned

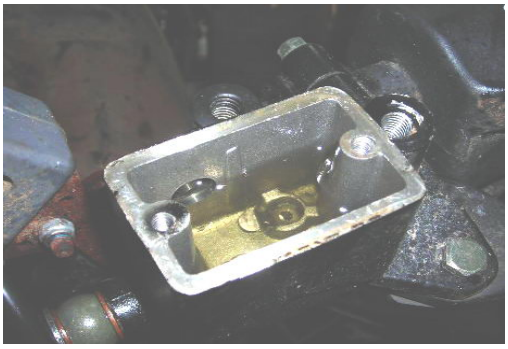
Chapter 5 Wheels, Tires & Brakes

Brake Fluid Replacement/Bleeding

BRAKE FLUID DRAINING

WARNING

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



CAUTION

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

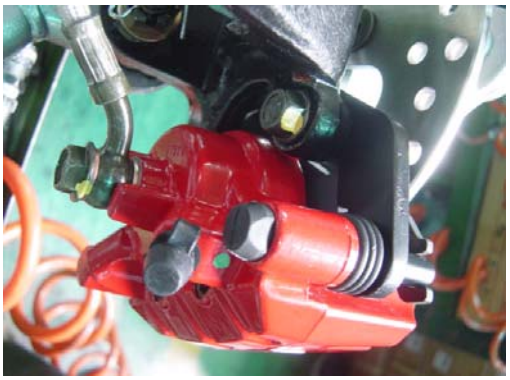
◦ Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

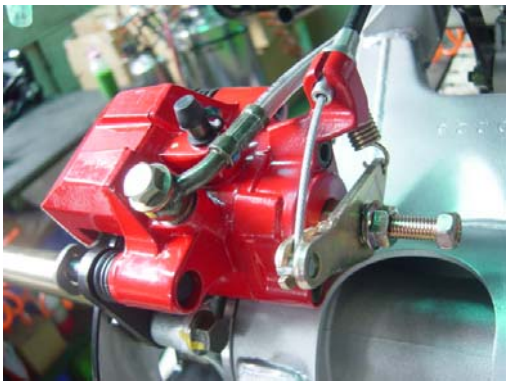
With the fluid reservoir parallel to the ground, remove the reservoir cap and diaphragm plate.

Connect a hose to the bleed valve.

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

Close the bleed valve.





BRAKE FLUID FILLING/BLEEDING

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

CAUTION

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

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve.

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

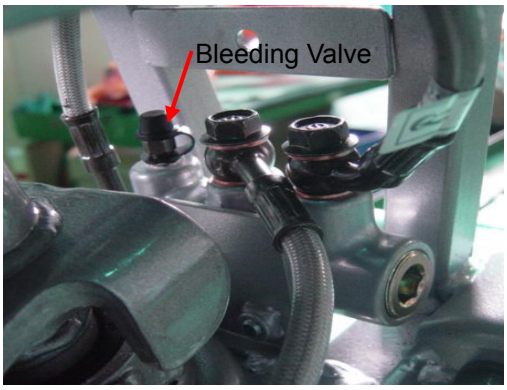
Add fluid when the fluid level in the master cylinder reservoir is low.

NOTE

◦ Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.

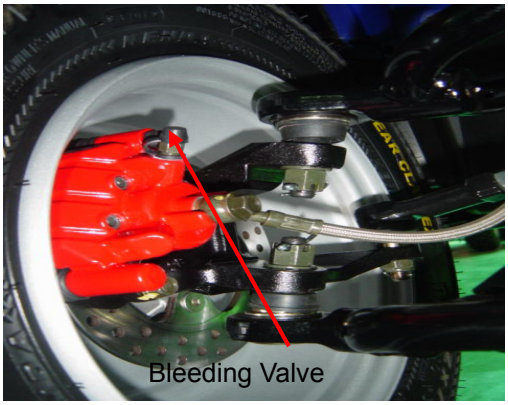
◦ When using a brake bleeding tool, follow the manufacture's operating instruction.

◦ If air is entering the bleeder from around the bleed valve threads, seal the threads with Teflon tape.



Repeat the above procedures until air bubbles do not appear in the plastic hose.

Close the bleed valve and operate the brake lever. If it feels spongy, bleed the system by performing BLEEDING procedure.



BRAKE FLUID FILLING/BLEEDING

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

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

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

NOTE

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

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

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

Tighten the bleed valve.

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

Fill the fluid reservoir to the upper level mark.

Reinstall the diaphragm, diaphragm plate and reservoir cap.

BRAKE PAD REPLACEMENT

WARNING

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

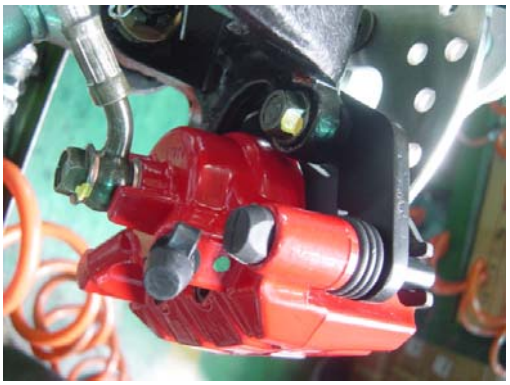
NOTE

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

FRONT BRAKE PADS

Remove the front wheel.

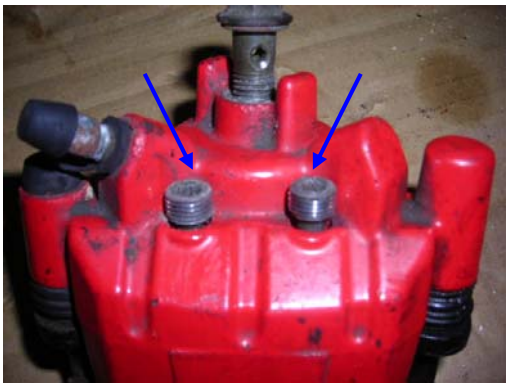
Remove the caliper mounting bolts and remove caliper from knuckle.



NOTE

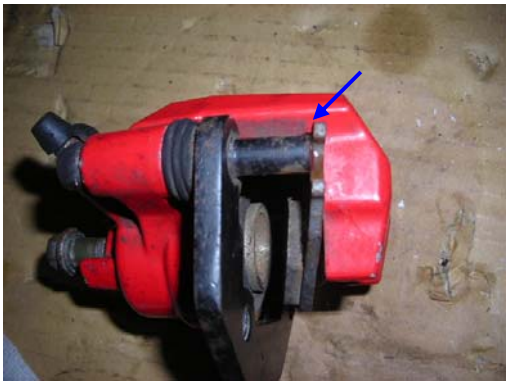
◦ It's unnecessary to remove the brake line for brake pads replacement.

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



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

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



NOTE

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

INSTALLATION

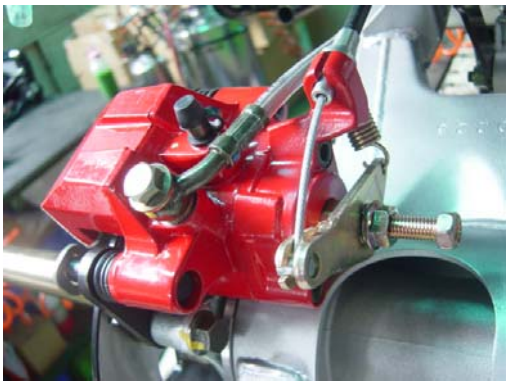
Installation is the reverse of removal. Using a C-clamp, depress the piston back into the caliper bore to provide enough room for the new pads to clear the disc.

Insert brake pads fixation bolts and tighten the bolts.

Tighten the caliper mounting bolts.

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

REAR BRAKE PADS



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

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

Remove the inner pad first then outer pad.

NOTE

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

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

Tighten the caliper mounting bolts.

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

BRAKE DISC INSPECTION, REMOVAL AND INSTALLATION

INSPECTION

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

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

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

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

The minimum thickness is also stamped into disc.

Service limit: Front 3.5 mm

Rear 3.5 mm

REMOVAL AND INSTALLATION

Front disc removal/installation

Remove the wheel hub.

Remove the disc retaining bolts on hub.

Installation is the reverse of removal.

Tighten the disc retaining bolts.

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

Rear disc removal/installation

Remove the left rear wheel hub.

Remove the rear caliper.

Remove the disc retaining bolts and remove the disc.

Installation is the reverse of removal.

Tighten the disc retaining bolts.

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

Chapter 5 Wheels, Tires & Brakes

Parking Brake

ADJUSTMENT

Park the vehicle on a level ground.

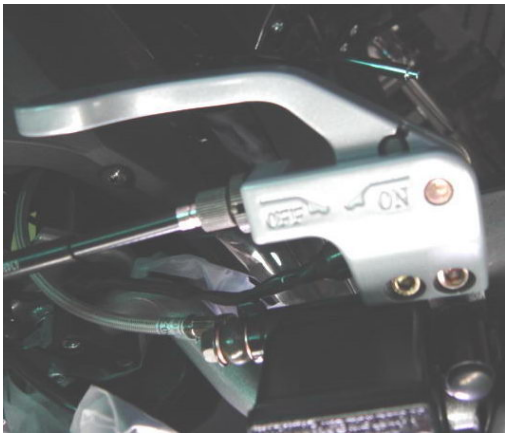
Pull the parking lever to left side.

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

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

NOTE

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



Chapter 5 Wheels, Tires & Brakes

Chapter 6 Alternator/Electrical Equipment

Contents

Alternator/Starter Clutch

Service Information

GENERAL

◦ The alternator and starter clutch can be serviced with the engine installed in the frame.

SPECIFICATION

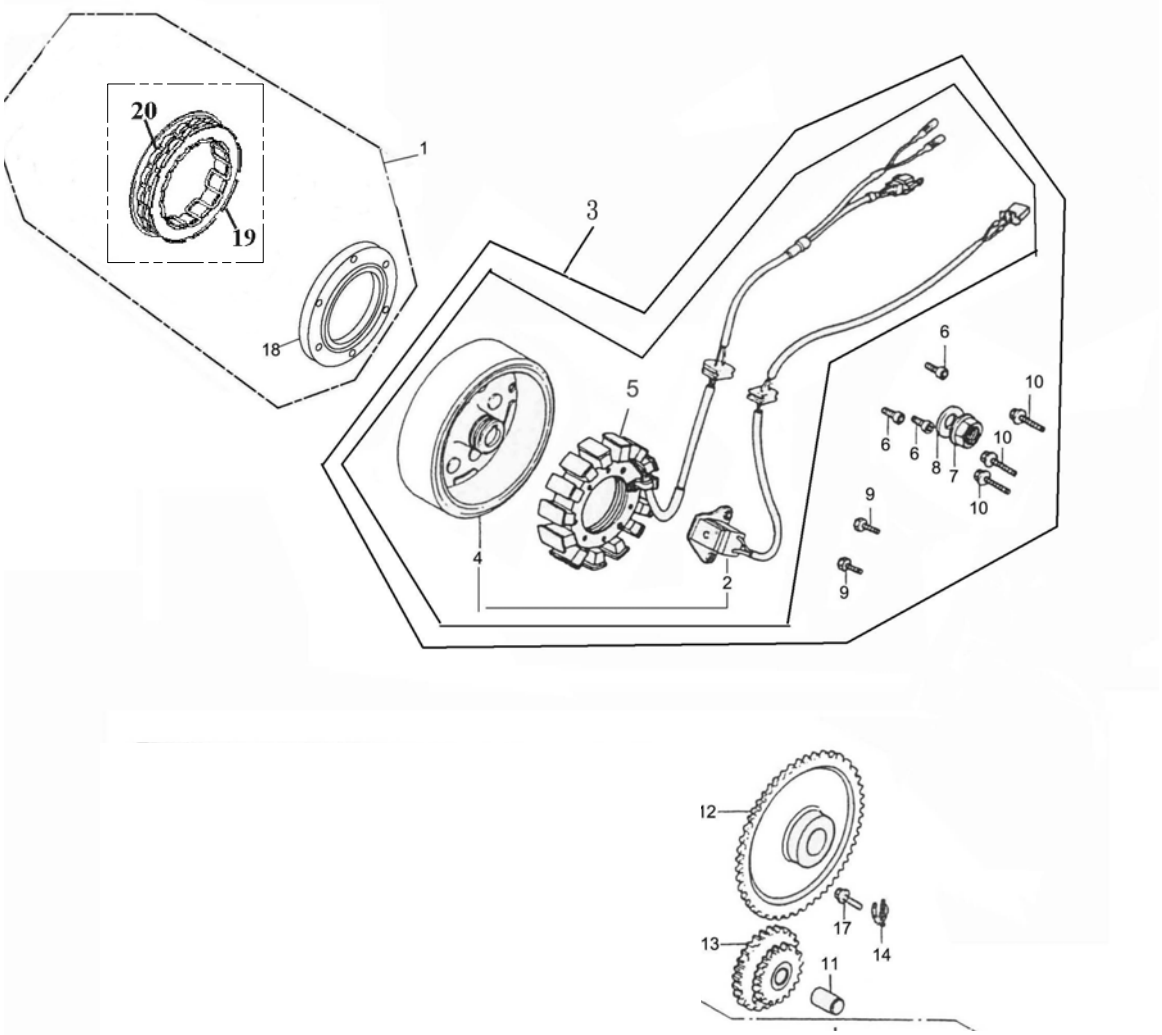
ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Starter driven gear I.D.	22.026-22.045 (0.8672-0.8679)	22.10 (0.870)
Starter Driven gear O.D.	42.195-42.208 (1.6612-1.6617)	42.15 (1.659)
One way clutch outer I.D.	58.897-58-927 (2.3187-2.3200)	58.98 (2.322)

TROQUE VALUES

Flywheel nut		105-115 N.m (76-83 ft.lb)
Oil pipe bolt	8 mm	8-12 N.m (6-9 ft.lb)
	12 mm	18-22 N.m (13-16 ft.lb)
One way clutch bolt		28-32 N.m (21-24 ft.lb)

Chapter 6 Alternator/Electrical Equipment

ALTERNATOR & STARTER GEAR



Chapter 6 Alternator/Electrical Equipment

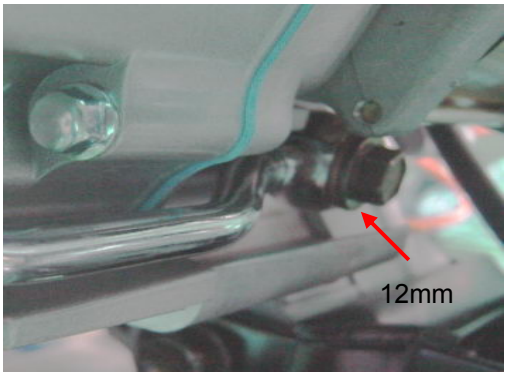
Right Crankcase Cover

REMOVAL

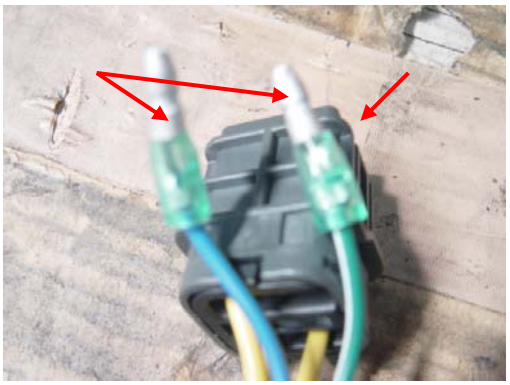
Remove right foot pad.

Drain the coolant by disconnecting the water hoses of the water pump.

Remove the two pipe bolts, two 8 mm oil pipe bolts, 12 mm oil pipe bolt and washer, then remove the pipe.



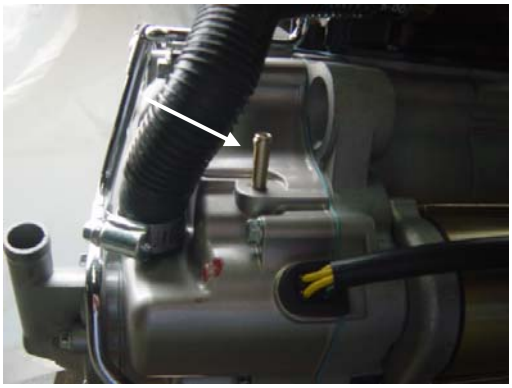
Disconnect the pulse generator and alternator wire connectors.



Disconnect the crankcase breather tube from the right crankcase cover.

Remove the right crankcase cover attaching bolts and right crankcase cover.

Remove the dowel pins and gasket.



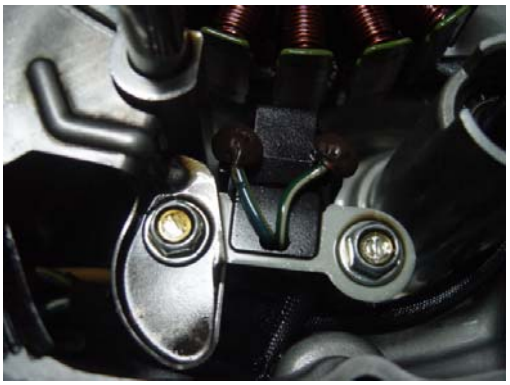
Chapter 6 Alternator/Electrical Equipment

STATOR REMOVAL

Remove the wire grommet from the groove in the cover.

Remove the breather plate and ignition pulse generator.

Remove the three stator attaching bolts and stator.



FLYWHEEL REMOVAL

Remove the oil orifice from the end of the crankshaft.

Hold the flywheel with a flywheel holder and remove the flywheel nut and washer.

NOTE

◦ Be careful not to drop the drive pin into the crankcase.

Remove the flywheel with a flywheel puller.

Remove the woodruff key from the crankshaft.

Chapter 6 Alternator/Electrical Equipment

Starter Gear

STARTER IDLE/DRIVEN GEAR REMOVAL

Remove the starter idle gear.

Remove the set plate.

Remove the starter driven gear and idle gear shaft.

STARTER GEAR INSPECTION

Inspect the starter driven gear for wear or damage.

Measure the starter driven gear I.D. and O.D.

Service Limit: I.D. 22.10 mm (0.870in)

O.D. 42.15 mm (1.659in)

Inspect the starter idle gear and shaft for wear or damage.

Install the starter driven gear onto the one way clutch and check for proper operation by turning the starter driven gear.

The starter driven gear should only turn in one direction.

Chapter 6 Alternator/Electrical Equipment

Starter Clutch

DISASSEMBLY

Remove the hex socket bolts using an impact driver and 6 mm socket bit.

Measure the one way clutch outer I.D.

Service Limit: 58.98 mm (2.322in)

ASSEMBLY

Install the one way clutch into the one way clutch outer.

Install the one way clutch assembly to the flywheel and tighten with 6 mm socket bolts.

Torque: 28-32 N.m (21-24 ft.lb)

NOTE

◦ Apply a locking agent to the socket bolt threads.

INSTALLATION

Install the starter driven gear onto the crankshaft.

Install the set plate and set plate bolt.

Check that the starter driven gear rotates freely.

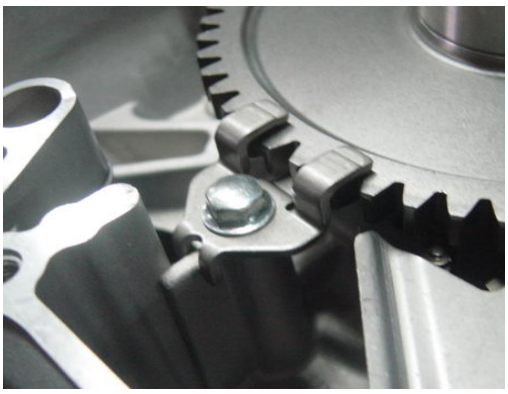
Install the starter idle gear shaft.

Install the starter idle gear on the shaft.

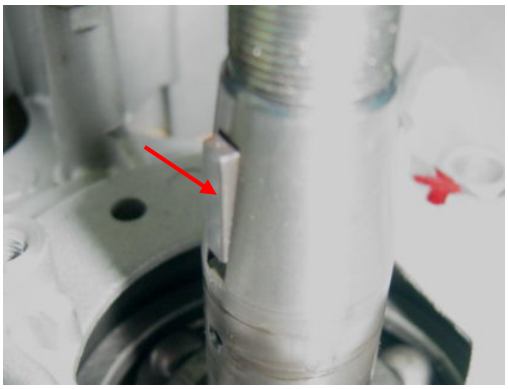
Chapter 6 Alternator/Electrical Equipment

FLYWHEEL INSTALLATION

Install starter gear to crankshaft, apply some grease onto crankshaft for easily insert.
Install starter gear holding plate by slight raise the starter gear and insert the holding plate.
Fasten the holding plate tighten blot.
Wipe off oil and grease from the tapered section of the crankshaft and flywheel.



Install the oil orifice drive pin in the crankshaft.
Install the woodruff key into the crankshaft slot.



Install the flywheel onto the crankshaft, aligning the key on the crankshaft with the groove in the flywheel.
Apply oil to the washer and install onto the crankshaft.

Apply molybdenum disulfide grease to the flywheel nut and crankshaft threads then install and tighten the flywheel nut while holding the flywheel.

Torque: 105-115 N.m (76-83 ft.lb)

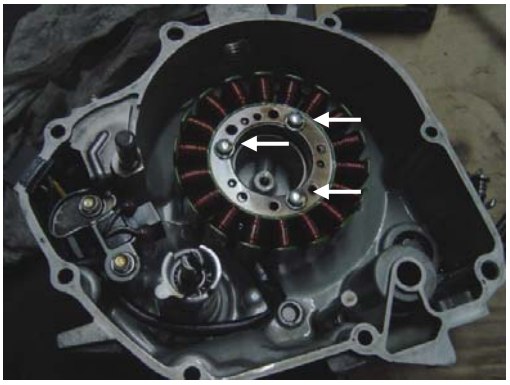
Install the spring and oil orifice onto the crankshaft aligning the slot in the orifice with the drive pin in the crankshaft.

STATOR INSTALLATION

Install the stator on the right crankcase cover with the three bolts.

Install the ignition pulse generator and breather plate with two bolts.

Install the wire grommet in its groove in the cover securely.



NOTE

◦ Be sure to route the stator wire under the pulse generator.

◦ Make sure that the breather plate is in position securely.

RIGHT CRANKCASE COVER

INSTALLATION

Install the dowel pins and a new gasket.

Install the right crankcase cover over the crankcase, aligning the water pump shaft groove with the oil pump shaft.

Install the right crankcase cover attaching bolts and tighten them.

Connect the crankcase breather tube to the right crankcase cover

Connect the ignition pulse generator and alternator wire couplers and connector.

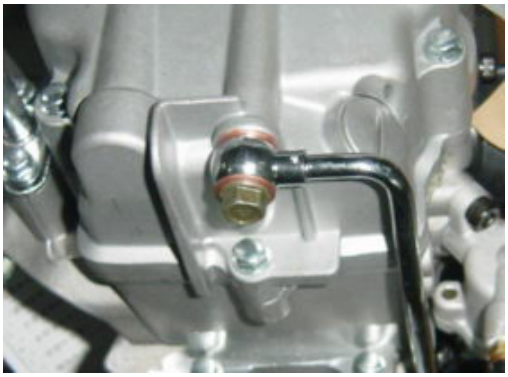
Connect the water hoses to the water pump.

Make sure that the oil pipe is not clogged.

Install the oil pipe with oil bolts and sealing washers.

CAUTION

◦ The 8 mm oil pipe bolt for the cylinder head cover side is black because its oil hole differs from the oil pipe bolt for the right crankcase cover side.
◦ Install the oil pipe bolts in the correct position.
◦ If the 8 mm oil pipe bolts are interchanged, engine damage may result.



NOTE

◦ Make sure that the sealing washer tab at the right crankcase cover faces the right crankcase side.

Install the oil pipe stay bolts on the right crankcase cover and water pump.
Tighten the 8 mm and 12 mm oil pipe bolts.

Torque: 8 mm: 8-12 N.m (6-9 ft.lb)
12 mm: 18-22 N.m (13-16 ft.lb)

Tighten the oil pipe stay bolts.

Chapter 6 Alternator/Electrical Equipment

Electrical Equipment
Service Information

GENERAL INFORMATION

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

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

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

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

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

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

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

Chapter 6 Alternator/Electrical Equipment

Headlight

BULB REPLACEMENT

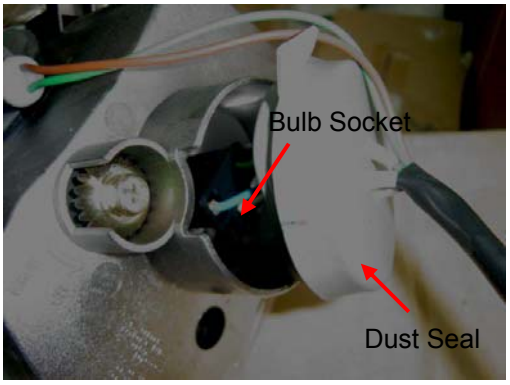
Remove headlight panel. (280AS only)

Disconnect the headlight coupler.

Remove headlight bulb rubber dust seal.

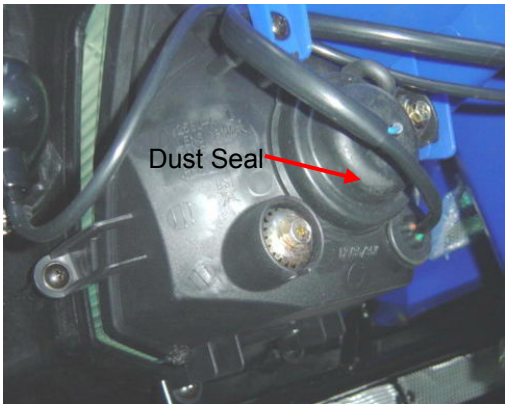
Remove the bulb socket.

Remove the clip and replace the headlight bulb.



CAUTION

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



Position the headlight bulb rubber dust seal.

NOTE

- Install the dust seal securely.

Speedometer

REMOVAL/INSTALLATION

Loosen two mounting bolts of speedometer cover.

Disconnect speedometer connectors and pull out the speedometer cover with speedometer.

Loosen three speedometer mounting screws and remove the speedometer.

Install the speedometer in the reverse order of removal.

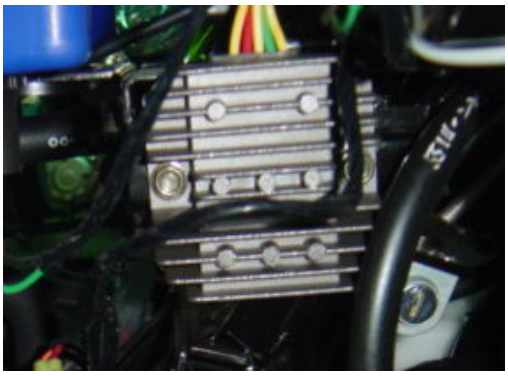
Chapter 6 Alternator/Electrical Equipment

Regulator/Rectifier

GENERAL

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

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



INSPECTION

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

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

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

Battery volts: 13.6 – 14.3 V

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

REMOVAL/INSTALLATION

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

Install the regulator in the reverse order of removal.