ETON America

50-70-90cc SERVICE MANUAL

Covering Models:

Viper 50	(RXL-50)
Viper 50M	(RXL-50M)
Viper 70	(RXL-70)
Viper 90	(RXL-90)
Viper 90R	(RXL-90R)

Table of Contents

1. INFORMATION

1.1 SAFETY

- **Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow sparks or flames in your work area.**

- **Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.**

- **The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. If you contact it, flush thoroughly with water and call a doctor if electrolyte gets in your eyes**.

1.2 NOTES

All information, illustrations, directions and specifications included in this publication are base on the latest product information available at the time of approval for printing.

1.3 SPECIFICATIONS

			Viper 50M (RXL-50M)	Viper 50 (RXL-50)
Engine				
Type			Two cycle air cooled	Two cycle air cooled
Displacement			49.3cc	49.3cc
Bore / Stroke			ϕ40.0 * 39.2mm	ϕ40.0 * 39.2mm
Compression Ratio / Pressure			6.8 : 1 / 90-120psi	6.8 : 1
Torque / BHP			5.2N m @ 7000rpm / 5.0BHP	5.2hp @ 7000rpm
Starting			Electrical with Kick start backup	Electrical with Kick start backup
Transmission				
Type			Automatic (C.V.T. V-Belt)	Automatic (C.V.T. V-Belt)
Chassis				
Overall Length			1430mm / 56.3"	1470mm / 57.9"
Overall Width			820mm / 32.3"	850mm / 33.5"
Overall High			800mm / 31.5"	830mm / 32.7"
Wheel Base			930mm / 36.1"	930mm / 36.1
Seat Higth			650mm / 25.5"	650mm / 25.5"
Ground Clearance			121mm / 4.75"	127mm / 5"
Dry Weight			108kg / 238lbs	108kg / 238lbs
Suspension				
Front			Dual A-arm Adjustable Shocks	Dual A-arm Adjustable Shocks
Rear			Swing Arm / Shock	Swing Arm Adjustable Shock
Brakes				
Front			N/A	Dual Mechanical drum
Rear			Hydraulic Disc	Hydraulic Disc
Tires				
Front			145/70-6	16/8-7
Rear			145/70-6	16/8-7
Tire Pressure	Front	Min	3.2psi / 0.23kg/cm2	3.2psi / 0.23kg/cm2
		Max	4.0psi / 0.28kg/cm2	4.0psi / 0.28kg/cm2
	Rear	Min	3.2psi / 0.23kg/cm2	3.2psi / 0.23kg/cm2
		Max	4.0psi / 0.28kg/cm2	4.0psi / 0.28kg/cm2
Wheels				

Bolt Pattern		Direct attach	4 x 110mm
		Viper 50M (RXL-50M)	**Viper 50 (RXL-50)**
Carburetor			
Make/Size		SW 18mm (Manual Coke)	SW 18mm (Manual Coke)
Main Jet		80mm	85mm
Pilot Jet		20mm	20mm
Air Mixture Adjustment		Back out ¾ - 1¼ turns	Back out ¾ - 1¼ turns
Idle Speed		Idle 1700 - 1900rpm	Idle 1700 - 1900rpm
Sprockets			
Front		19 teeth	420x19t
Rear		28 teeth	420x28t
Chain		#420	#420
Battery Size			
Jell Acid (Maintenance Free)		12V-4AH/5AH - GTX5L	12V-4AH/5AH - GTX5L
Fluids			
Fuel	Type	Unleaded Gasoline 89 octane	Unleaded Gasoline 89 octane
	Volume	4.5liters / 1.2gal	4.5liters / 1.2gal
Engine Oil	Type	High grade synthetic 2 cycle oil	High grade synthetic 2 cycle oil
	Volume	1.0liters / 1gt	1.0liters / 1gt
Transmission	Type	SAE 80/90 weight	SAE 80/90 weight
	Volume	100cc / 3.4oz	100cc / 3.4oz
Spark Plug			
NGK		BPR7HS	BPR7HS
Nipendenso		W22FRP-U	W22FRP-U
Champion		QL82YC	QL82YC
	Electrode Gap	0.6-0.7mm / 0.023"	0.6-0.7mm / 0.023"
Safety Features			
Remote Control Stop/Start		Standard equipment	Optional kit
Safety Tether Switch		Standard equipment	Optional kit
Enclosed Foot Rest Area		Standard equipment	Standard equipment
Enclosed Engine compartment		N/A	N/A
Carrying Capacity			
Rack Capacity	Front	N/A	N/A
	Rear	N/A	N/A
Towing Capacity	Trailer Wgh	N/A	N/A
	Tongue Wgh	N/A	N/A
Maximum Rider Weight		36.3kg / 80lbs	68.2kg / 190lb
Minimum Rider Age		6 years	6 years

Specifications are subject to change without notice.

			Viper 70 (RXL-70)	Viper 90 & 90R (RXL-90/RXL-90R)
Engine				
Type			Two cycle air cooled	Two cycle air cooled
Displacement			68.0cc	82.5cc
Bore / Stroke			ϕ47.0 * 39.2mm	ϕ50.0 * 42.0mm
Compression Ratio / Pressure			8.3 : 1 / 90-120psi	5.8 : 1 / 90-120psi
Torque / BHP			6.3N ms @ 6000rpm / 6.0BHP	7N m @ 7500rpm / 7.0BHP
Starting			Electrical with Kick start backup	Electrical with Kick start backup
Transmission				
Type			Automatic (C.V.T. V-Belt)	Automatic (C.V.T. V-Belt)
Chassis				
Overall Length			1470mm / 57.9"	1500mm / 59.0"
Overall Width			850mm / 33.5"	850mm / 33.5"
Overall High			830mm / 32.7"	900mm / 35.4
Wheel Base			930mm / 36.1	930mm / 36.1
Seat Higth			650mm / 25.5"	670mm / 26.3"
Ground Clearance			127mm / 5"	127mm / 5"
Dry Weight			108kg / 238lbs	113kg / 249lbs
Suspension				
Front			Dual A-arm Adjustable Shocks	Dual A-arm Adjustable Shocks
Rear			Swing Arm Adjustable Shock	Swing Arm Adjustable Shock
Brakes				
Front			Dual Mechanical drum	Dual Mechanical drum
Rear			Hydraulic Disc	Hydraulic Disc
Tires				
Front			16/8-7	18/7-8
Rear			16/8-7	18/9-8
Tire Pressure	Front	Min	3.2psi / 0.23kg/cm2	3.2psi / 0.23kg/cm2
		Max	4.0psi / 0.28kg/cm2	4.0psi / 0.28kg/cm2
	Rear	Min	3.2psi / 0.23kg/cm2	3.2psi / 0.23kg/cm2
		Max	4.0psi / 0.28kg/cm2	4.0psi / 0.28kg/cm2
Wheels				
Bolt Pattern			4 x 110mm	4 x 110mm

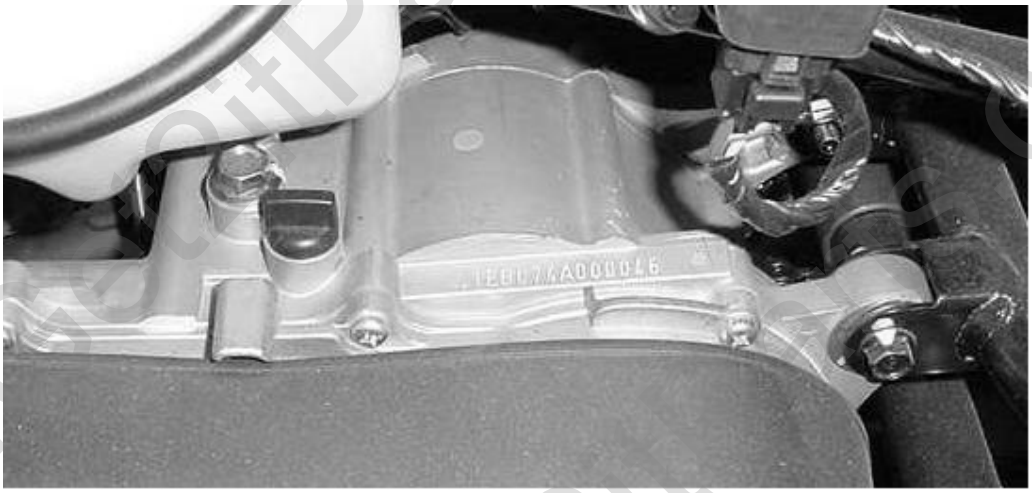
Specifications are subject to change without notice.

		Viper 70 (RXL-70)	Viper 90 & 90R (RXL-90/RXL-90R)
Carburetor			
Make/Size		SW 18mm (Manual Coke)	SW 18mm (Manual Coke)
Main Jet		85mm	85mm
Pilot Jet		20mm	20mm
Air Mixture Adjustment		Back out ¾ - 1¼ turns	Back out ¾ - 1¼ turns
Idle Speed		Idle 1700 - 1900rpm	Idle 1700 - 1900rpm
Sprockets			
Front		15 teeth	15 teeth
Rear		28 teeth	28 teeth
Chain		#520	#520
Battery Size			
Jell Acid (Maintenance Free)		12V-4AH/5AH - GTX5L	12V-4AH/5AH - GTX5L
Fluids			
Fuel	Type	Unleaded Gasoline 89 octane	Unleaded Gasoline 89 octane
	Volume	4.5liters / 1.2gal	4.5liters / 1.2gal
Engine Oil	Type	High grade synthetic 2 cycle oil	High grade synthetic 2 cycle oil
	Volume	1.0liters / 1gt	1.0liters / 1gt
Transmission	Type	SAE 80/90 weight	SAE 80/90 weight
	Volume	100cc / 3.4oz	**V90** 100cc / 3.4oz **V90R** 300cc / 10.2oz
Spark Plug			
NGK		BPR7HS	BPR7HS
Nipendenso		W22FRP-U	W22FRP-U
Champion		QL82YC	QL82YC
	Electrode Gap	0.6-0.7mm / 0.023"	0.6-0.7mm / 0.023"
Safety Features			
Remote Control Stop/Start		Optional kit	**V90** Optional kit **V90R** Option kit (Stop only)
Safety Tether Switch		Standard equipment	N/A
Enclosed Foot Rest Area		Standard equipment	Standard equipment
Enclosed Engine compartment		N/A	N/A
Carrying Capacity			
Rack Capacity	Front	N/A	N/A
	Rear	N/A	N/A
Towing Capacity	Trailer Wgh	N/A	N/A
	Tongue Wgh	N/A	N/A
Maximum Rider Weight		68.2kg / 190lb	68.2kg / 190lb
Minimum Rider Age		6 years	12 years

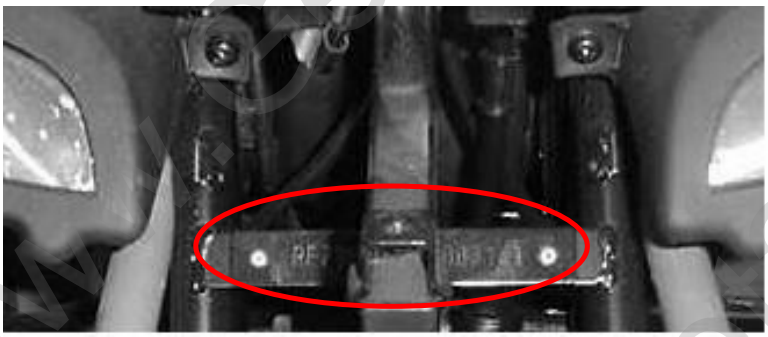
1.4 VIN NUMBER

For this ATV VIN, the number of frame and engine are the same position, just like the picture below.

The frame VIN number is stamped on the front of the frame.
The engine VIN number is stamped on the left side of the crankcase.



Engine Number



Frame VIN Number

1.5 TORQUE VALUES

For this series ATVs, the torque values of frame and engine are the same.

ENGINE

Cylinder head nut 28	**30 N/m (20.7 - 22.1 lb/ft)**
Spark plug 12	**19 N/m (8.9 - 14.0 lb/ft)**
Cylinder head bolt 20	**30 N/m (14.8 - 22.1 lb/ft)**
Alternator bolt 8	**12 N/m (5.9 - 8.9 lb/ft)**

FRAME

Handlebar upper holder bolt	**24-30 N/m (17.7-22.1 lb/ft)**
Steering shaft nut	**50-60 N/m (36.9-44.3 lb/ft)**
Steering shaft bushing holder nut	**24-30 N/m (17.7-22.1 lb/ft)**
Wheel rim bolt	**18-25 N/m (13.3-18.4 lb/ft)**
Tie rod lock nut	**35-43 N/m (25.8-31.7 lb/ft)**
King pin nut	**30-40 N/m (22.1-29.5 lb/ft)**
Handlebar lower holder nut	**40-48 N/m (29.5-35.4 lb/ft)**
Front wheel bolt	**24-30 N/m (17.7-22.1 lb/ft)**
Front axle nut	**55-65 N/m (40.6-47.9 lb/ft)**
Front brake arm nut	**4-7 N/m (3.0- 5.2 lb/ft)**
Rear brake arm nut	**7-12 N/m (5.2- 8.9 lb/ft)**
Rear axle nut	**60-80 N/m (44.3-59.0 lb/ft)**
Rear wheel bolt	**24-30 N/m (17.7-22.1 lb/ft)**
Exhaust muffler mounting bolt	**30-35 N/m (22.1-25.8 lb/ft)**
Engine hanger bolt	**24-30 N/m (17.7-22.1 lb/ft)**

2. MAINTENANCE

2.1 MAINTENANCE SCHEDULE

The maintenance internals in the follow table are based upon average riding conditions. Riding in unusually dusty areas requires more frequent servicing. (This table applies to all ATV series covered by this service manual)

	INITIAL SERVICE (First week)	REGULAR SERVICE (Every 30 operating days)	EVERY YEAR
FUEL LINE			I
THROTTLE OPERATION	I	I	
AIR CLEANER		C	
SPARK PLUG		I	
CARBURETOR IDLE SPEED	I	I	
DRIVE CHAIN	I, L	I, L	
BRAKE SHOE WEAR			I
BRAKE SYSTEM	I	I	
NUT, BOLT, FASTENER	I	I	
WHEEL	I	I	
STEERING SYSTEM			I
SUSPENSION SYSTEM			I
C.V.T. AIR FILTER		C	
GEAR OIL			R

Note –
I: Inspect and Clean, Adjust, Lubricate, or Replace (if necessary)
C: Clean
L: Lubricate
R: Replace

2.2 MAINTENANCE RECORD

Maintenance Performed	Date	Performed By

2.3 FUEL LINES

Inspect the fuel lines for deterioration, damage, or leakage, and replace if necessary.

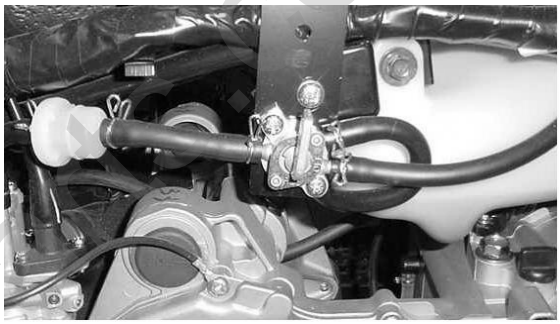
Check the fuel filter for accumulated dirt and debris. Replace as needed. Filter replacement is also recommended at the beginning of each riding season.

Filter assembly: Part # 650328
Filter element: Part # 800002
Main fuel line: Part # 650329
Reserve fuel line: Part # 650330

(For RXL50 / 90)

2.4 THROTTLE OPERATION

- **Inspect for smooth throttle lever full opening and automatic full closing in all steering positions. Insure that there is no wear, damage, or kinking in the throttle cable, replace it if necessary.**
- **Check the throttle lever slack. It should be between 5-10 mm (or 0.197-0.394 in) at the tip of the throttle lever.**
- **To lubricate cable, disconnect the throttle cable at the upper end. Lubricate the cable with commercially available lubricant to prevent premature wear and binding of the cable in the case.**
- **To replace a damaged or worn cable, order:**
  - **RXL-50M Part # 811123**
  - **RXL-50 Part # 610013**
  - **RXL-70 Part # 610013**
  - **RXL-90 Part # 610013**
  - **RXL-90R Part # 610013**

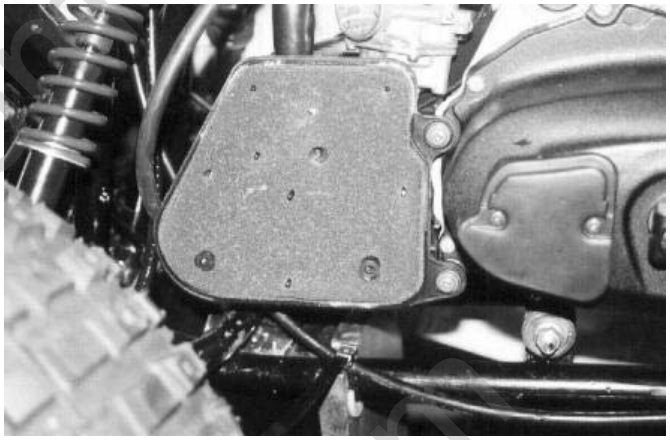


(For RXL70 / RXL90R / RXL50M)

2.5 THROTTLE CABLE ADJUSTMENT

Slide the rubber cap on the adjuster off the throttle connection. Loosen the lock nut and adjust the slack of the throttle lever by turning the adjuster on the throttle housing. Check the slack of the throttle lever. Ensure it is set to 5-10 mm (or 0.197-0.394 in).

2.6 AIR CLEANER

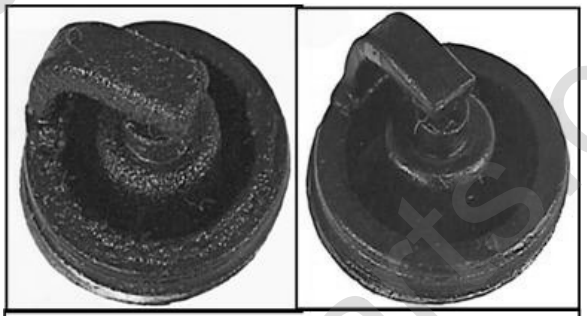


- Unscrew the air cleaner cover screws.
- Pull out the air filter element from the air cleaner case. Wash the element in non-flammable solvent and squeeze out the solvent thoroughly.
- Let it dry.
- Soak the filter element in gear oil, and then squeeze out the excess oil.
- Install the element into air cleaner carefully.

2.7 SPARK PLUG

Two (2)-cycle engines burn a mixture of fuel and oil. When the mixture contains too much oil, the spark plug can become fouled, causing a weak spark condition that will drastically degrade the engine performance. When the plug is fouled heavily a no spark condition can occur that will prevent the engine from running at all.

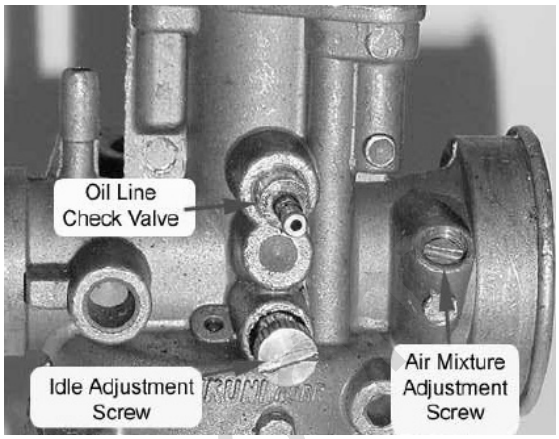
To change the spark plug, do the following:
1. Stop the engine and wait for it to cool, 30-60 min. (Never work on a hot engine. A hot engine and exhaust can present a fire and burning hazard.)
2. Locate the spark plug at the front of the engine.
3. Remove the Spark plug lead wire by gently pulling on the plug wires boot. (Do not pull on the wire itself as this could cause damage to the wire).
4. Remove the old spark plug using the supplied plug wrench and screwdriver by turning the plug counter clockwise.
5. Set the electrode gap on the new plug to 0.6m-0.7mm / 0.023".
6. Insert the new plug by hand and tighten finger tight by turning the plug in a clockwise direction. Use caution not to cross thread the plug in the head.
7. Use the plug wrench to tighten the plug another ¼ to ½ turn.
Caution: over tightening the plug can cause the thread in the engine head to be striped, under tightening the plug can cause compression lose and possible cylinder head failure.
8. Reinstall the plug wire by pressing the wire boot over the plug until it is completely seated on the spark plug.


Oil Fouled Plugs

ETON recommends that you replace your spark plug at the beginning of each riding season.

Spark Plug MFG	MFG Number	Plug Gap	ETON Part
NGK	BPR7HS	0.6-0.7mm / 0.023"	# 650013
Nipendenso	W22FRP-U	0.6-0.7mm / 0.023"	
Champion	QL82YC	0.6-0.7mm / 0.023"	

2.8 IDLE SPEED



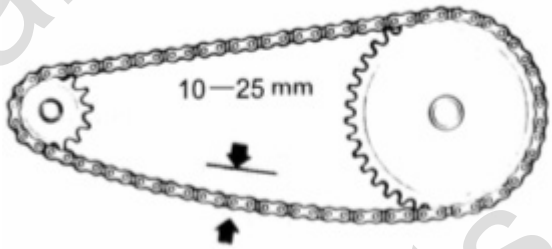
Air/Fuel Ratio adjusting procedure:

Step 1: Air adjusting screw.
Turn adjusting screw all the way in then back off
¾ to 1¼ turn on 50cc and 70cc engine
1 to 1½ turns on 90cc engine.

Step 2: Adjust idle RPM. (Warm Engine)
Turn the adjustment screw in or out to adjust the engine idle speed to between 1700—1900 RPM.

2.9 DRIVE CHAIN

Inspect the chain slack. The standard is 10-25mm or 0.394-0.984 in.

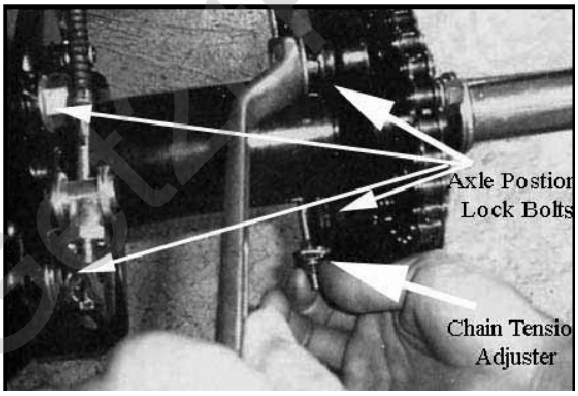


The drive chain will stretch with use and will require periodic adjustments. To check the chain tension, remove the chain guard and measure the slack. The amount of slack in the chain should not exceed 10-25mm (or 0.394-0.984 in).

Inspect the drive and axle sprockets for damaged or broken teeth. Replace as needed. Inspect the chain links for damaged, worn or loose rivets. Repair or replace as needed.

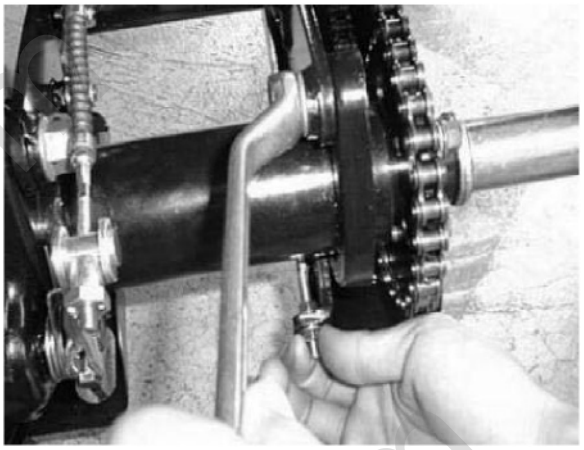
Chain Slack Adjustment:

Loosen the axle position lock bolts slightly and turn the chain adjuster nut to take up the excess slack in the chain. Once the chain has been adjusted to the proper tension retighten the axle position locking bolt.



The chain should be kept well lubricated to prevent excess wear and premature failure. We recommend that you lubricate the chain every 20 hours of operation, or more frequently if needed, with a high quality chain lubricant.

When the drive chain becomes very dirty, it should be removed, cleaned, and lubricated. Use commercial chain lubricant to lubricate the drive chain.
Clean the drive chain with kerosene and wipe it dry. Inspect the drive chain for worn or damaged links and rivets. Replace the chain if it is worn excessively or damaged.



Inspect the sprocket teeth. If there is excessive wear or damage, replace it.

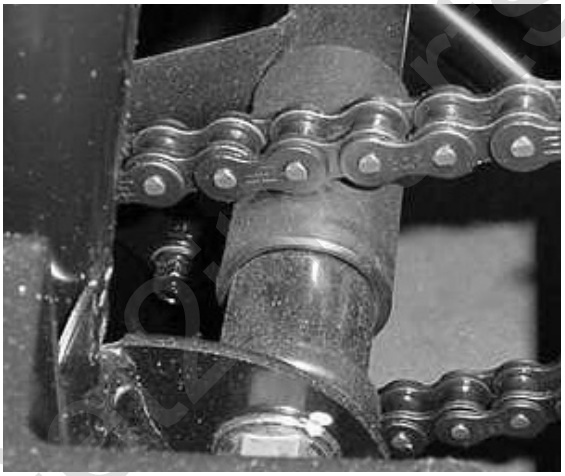
Engine Sprocket Part #;

RXL-50M	**650224 (420x19t)**
RXL-50	**650224 (420x19t)**
RXL-70	**650507 (520x15t)**
RXL-90	**650507 (520x15t)**
RXL-90R	**650507 (520x15t)**

Drive Axle Sprocket Part #;

RXL-50M	**610128 (420x28t)**
RXL-50	**610128 (420x28t)**
RXL-70	**610037 (520x28t)**
RXL-90	**610037 (520x28t)**
RXL-90R	**610037 (520x38t)**

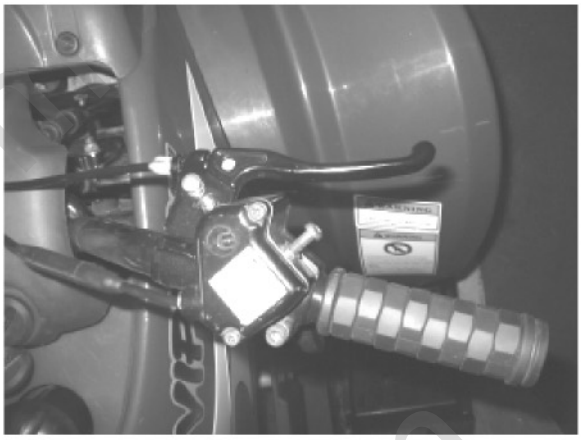
Inspect the chain-tensioned roller. Replace it, if necessary.



2.10 BRAKE SYSTEM

Inspect the front brake lever (the right hand lever) and cable for excessive wear or other damage. Replace or repair if necessary. Measure the slack of the brake lever at the end of the brake lever. The standard of slack is 15-25 mm (or 0.591-0.984 in).
(For RXL50 / 70 / 90 / 90R; the RXL50M RH level is the parking brake.)

For RXL50M, parking brake in rear axle, the brake switch is located on the (RH) brake lever.



- **Inspect the rear brake lever (the left hand lever) and cable for excessive wear or other damage.**
- **Replace or repair if necessary.**
- **Measure the slack of the rear brake lever at the end of the lever. The standard is 15-25 mm (or 0.591-0.984 in). (For all models)**

2.11 WHEELS AND TIRES

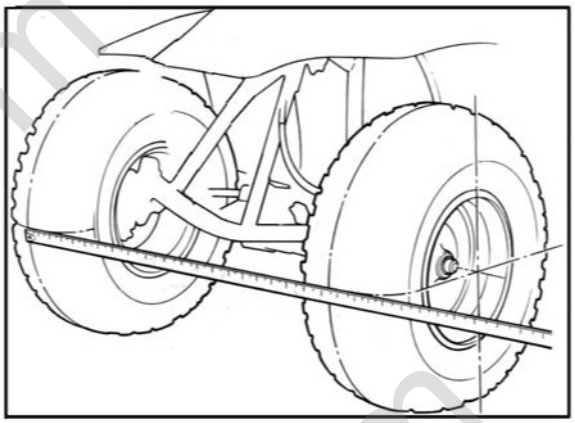
- **Inspect the tire surfaces for cuts, nails, or other sharp objects.**
- **Check the tire surfaces at cold tire condition. The standard tire pressure is 3.2±0.4 psi. (or 0.23 kgf/cm^2)**

2.12 STEERING SYSTEM

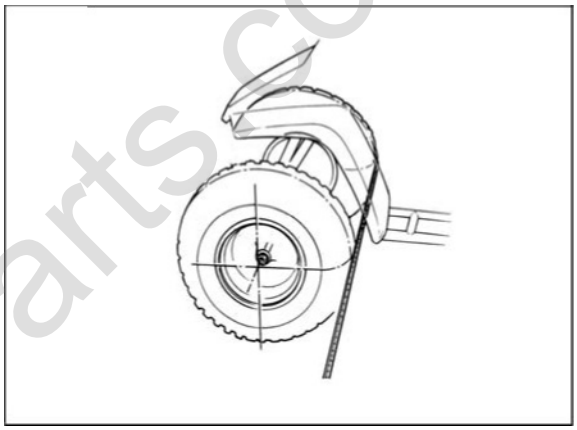
Check the slack of the steering shaft with the front wheels facing straight ahead. When there is excessive play, inspect the tie-rod, kingpin bushing and ball joint.

2.13 TOE-IN

- **Park the vehicle on level ground and leave the front wheels facing straight ahead.**
- **Mark the centers of the tires to indicate the axle center height.**
- **Measure the distance between the marks.**



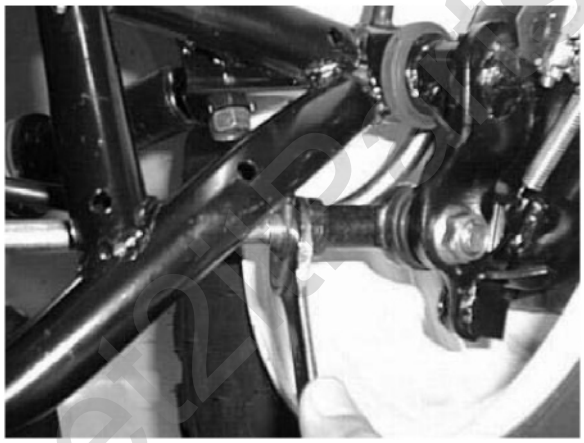
- **Carefully move the vehicle back, and rotate the wheels 180 °, so the marks on the tires are aligned with the axle center height on the other side.**
- **Measure the distance between the marks. Calculate the difference in the front and rear measurements.**
- **Toe-in: 5±10mm (or 0.197±0.394 in)**



If the toe-in is out of standard, adjust it by changing the length of the tie-rods equally. Loosen the locking nuts and turn the tie-rod while holding the ball joint.

Tighten the lock nuts.

Torque: 35-43 N/m (or 2.40-2.95 lb/ft)



2.14 GEAR OIL

Gear oil needs to be changed every year.

1. Place an oil catch pan under the unit directly below the transmission box.

2. Remove the transmission box drain plug located on the bottom of the transmission box on the underside of the unit.

3. Remove the transmission box fill hole plug locate on top of the transmission box near the oil tank bracket on the left hand side of the unit.

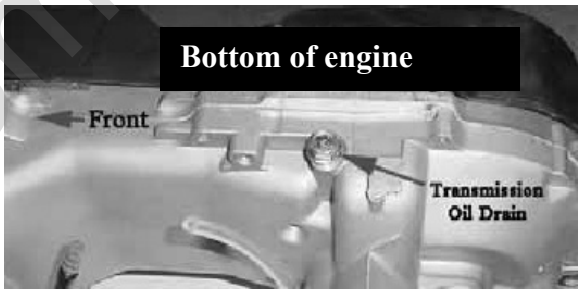
4. Allow the oil to drain completely (15-30 min).

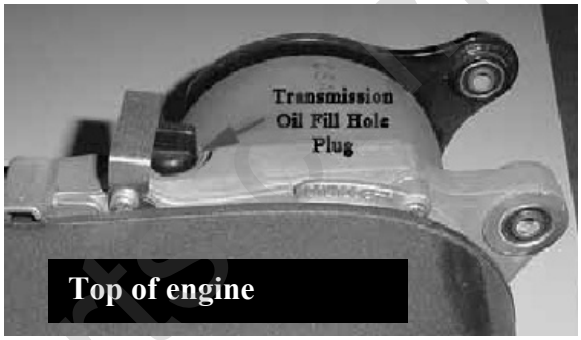
5. Reinstall the drain plug and tighten. Torque to 7-10lbf-ft

6. Fill the transmission box with of SAE 80-90 gear oil
- **50cc Engine = 100cc / 3.4oz**
- **70cc Engine = 100cc / 3.4oz**
- **90cc Engine = 100cc / 3.4oz**
- **90cc Engine with Reverse 300cc / 10.2oz**

7. Reinstall the fill hole plug finger tight.

8. Dispose of used oil at a proper recycling station as required by law.



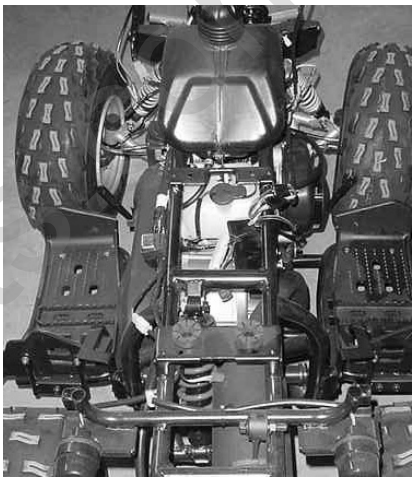


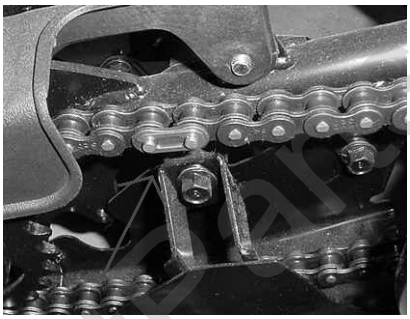
3. ENGINE REMOVAL AND INSTALLATION

3.1 SERVICE INFORMATION

NOTE: The engine should only be removed when repair conditions warrant its removal. Engine removal is a complex task that should be performed only by a qualified technician or mechanic.

3.2 ENGINE REMOVAL





1. **Remove the seat, side panels and fenders. (See Section 11)**
2. **Disconnect the spark plug cap from spark plug.**
3. **Remove the exhaust muffler assembly.**
4. **Disconnect the throttle cable from the carburetor by removing the two screws on top of the carburetor.**
5. **Disconnect the oil pump cable from the oil pump control plate, located under the right side of engine.**
6. **Disconnect the wire connections:**
    a. **Carburetor auto-choke (If installed)**
    b. **Carburetor manual choke cable (If installed)**
    c. **Starter motor**
    d. **A/C generator**
    e. **C.D.I. Leads (Label before disconnecting)**
    f. **Disconnect the shifting motor (Viper 90R)**
    g. **Label & disconnect the shift sensor leads (Viper 90R)**
    h. **Disconnect the engine ground wire on the (LH) side of the engine**
7. **Disconnect the fuel line from the carburetor.**
8. **Remove the drive chain cover.**
9. **Remove the drive chain retaining clip and master link.**
10. **Remove the drive chain.**
11. **Remove the three engine hanger nuts and bolts.**
12. ***Carefully* remove the engine from the right side of frame.**

3.3 ENGINE INSTALLATION

Engine installation is basically removal in reverse.

1. **Replace the engine in the frame from the right side.**
2. **Reinstall the engine hanger bolts and torque to 24-30 N/m (1.64-2.06 lb/ft).**
3. **Reinstall the drive chain, and connect with the master link and retaining clip.**
4. **Reinstall the chain guard.**
5. **Reconnect the wire connections:**
    a. **Carburetor auto-choke (If installed)**
    b. **Carburetor manual choke cable (If installed)**
    c. **Starter motor**
    d. **A/C generator**
    e. **Reconnect C.D.I. Leads by following the labeling from 3.2 (part 6-e)**
    f. **Reconnect the engine ground wire on the (LH) side of the engine (Viper 90R)**
    g. **Reconnect the shift motor**
    h. **Reconnect the shift sensor lead by following the labeling from 3.2 (part 6-3)**

    Note: Use care when rerouting the cables and wires so as not to pinch or bend them.
6. **Reconnect the oil pump cable.**
7. **Reconnect the throttle cable.**
8. **Reinstall the exhaust muffler assembly.**

    Note: Replacement of the exhaust gasket with a new gasket is recommended.
9. **Reconnect the fuel line.**
10. **Replace the spark plug cap.**
11. **Test-start the engine.**
12. **Test the shifting function. (Viper 90R only)**
13. **Reinstall fenders, side panels, and seat.**

4. ENGINE FUEL SYSTEM

4.1 TROUBLESHOOTING

Engine does not start.	• **No fuel in tank** • **No fuel to cylinder** • **Too much fuel going into cylinder** • **No spark at plug** • **Air cleaner clogged**
Engine idles rough, stalls or runs poorly.	• **Improper adjustment of the idle speed screw** • **Ignition malfunction** • **Bad fuel/air mixture ratio** • **Air filter dirty** • **Intake leaks** • **Fuel tank cap breather clogged** • **Fuel jet of carburetor clogged** • **Fuel filter clogged** • **Fuel flows restricted** • **Float level in carburetor set too low** • **Lean mixture/rich mixture** • **Faulty float needle valve** • **Float level set too high** • **Carburetor air duct is clogged** • **Air filter dirty**

4.2 FUEL TANK

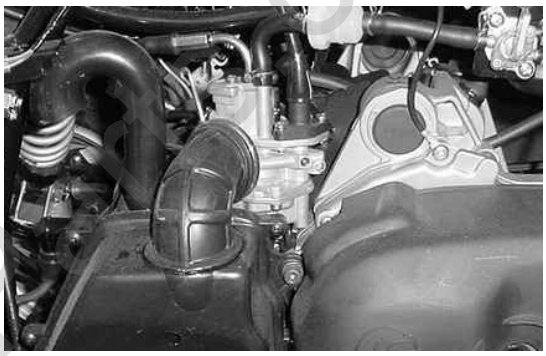
REMOVAL

- **Remove the seat and rear fender.**
- **Disconnect the fuel line from the carburetor.**
- **Remove the fuel tank cap and front fender.**
- **Unscrew the fuel tank mounting bolts.**

Warning: Gasoline is highly flammable

Note: Keep gasoline away from flames or sparks.
Wipe up spilled gasoline at once.

4.3 CARBURETOR



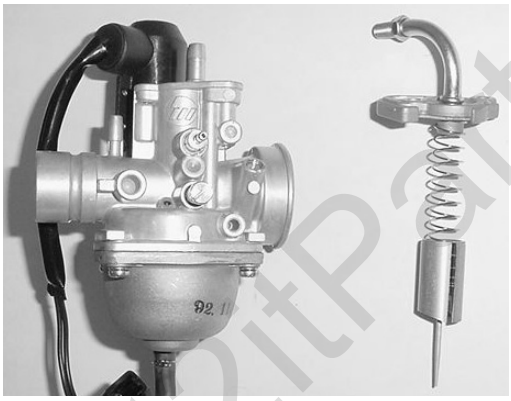
REMOVAL

Note: Turn fuel petcock to "off" position

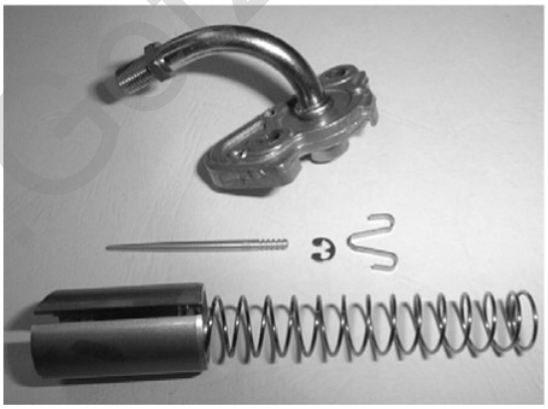
- **Remove the air filter assembly.**
- **Disconnect the fuel line and choke cable or lead wire. Unscrew the intake pipe mounting bolts at the carburetor**
- **Remove the carburetor**

DISASSEMBLY

- **Remove the carburetor cap.**
- **Remove the throttle cable from the throttle valve while depressing the throttle valve spring.**

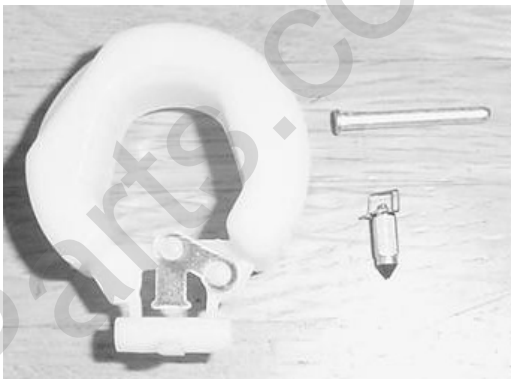


- **Remove the needle clip retainer, the jet needle and needle clip.**
- **Inspect the throttle valve and jet needle surface for wear, scratches or dirt.**

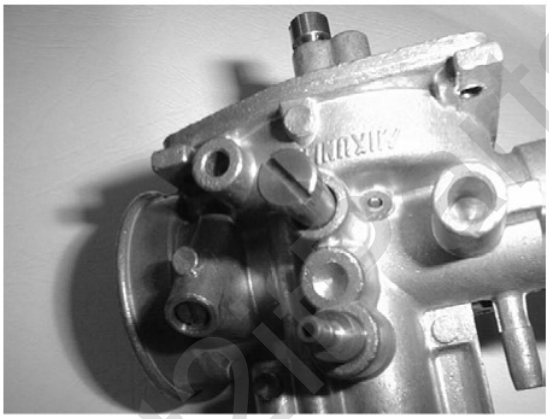


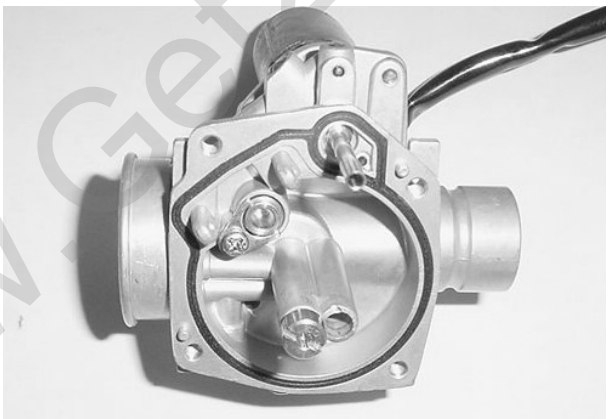
- **Unscrew the float chamber screws and remove the float chamber.**

- **Remove the float arm pin, float, and float needle valve.**
- **Inspect the seat of the float needle valve for wear or damage.**
- **Inspect the float for signs of leakage (fluid inside of float)**
- **Replace all worn or damaged parts**



Disassemble the idle jet, main jet, idle speed adjustment, and idle mixture adjustment screws.
Inspect all the jets and screws for wear or damage. Replace as needed. Clean the passages and jets with compressed air.





ASSEMBLY

Clean all parts in solvent and blow it dry with compressed air. Assembly is basically disassembly in reverse. E-TON recommends that the bowl gasket be replaced during assembly.

THROTTLE VALVE ASSEMBLY

- **Install the needle clip on the jet needle.**
- **Install the jet needle in the throttle valve.**
- **Assemble the throttle cable, spring, and throttle valve. Align the throttle valve groove with the idle speed adjust screw, and install the carburetor cap on the carburetor.**

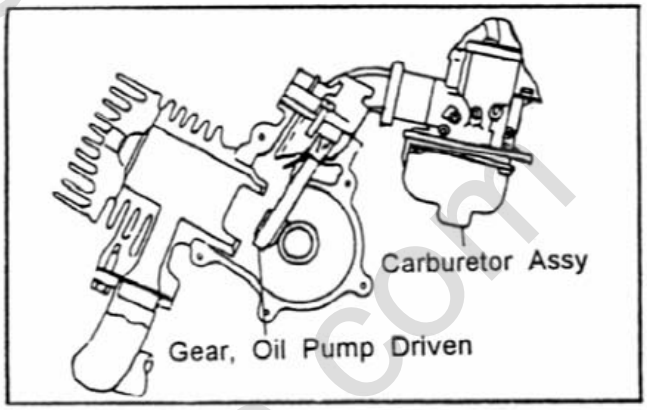
Carburetor rebuild kits:

50cc – Part # 811124
70cc – Part # 811117
90cc – Part # 811004

5 - ENGINE LUBRICATION & COOLING

5.1 ENGINE LUBRICATION SYSTEM

The engine drives the oil pump crankshaft. Pump gears rotate the plunger shaft in oil pump. This shaft sends the lubricating oil into the crankcase to mix with the air-fuel flow evenly. The oil drops create a foam, covering the cylinder wall, piston surface, and piston rings.



5.2 CAUTION

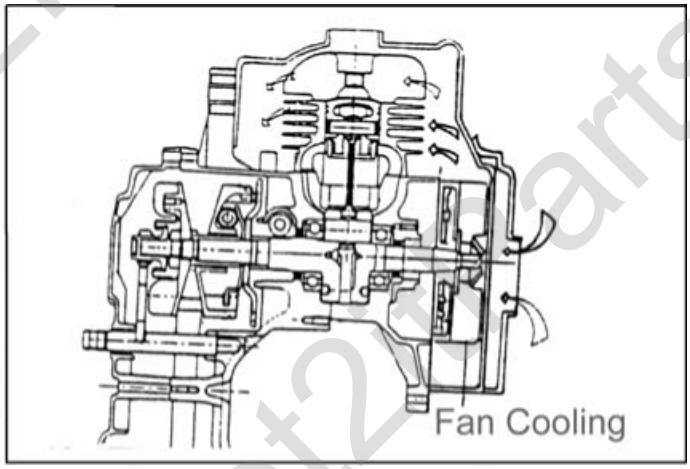
2 Cycle oil supply to the engine is critical in maintaining lubrication of internal moving parts.
If the oil supply is impaired or shut off, the engine will sustain serious scarring and lead to engine seizure. When the engine is substantially scarred or has seized, you will need to change the piston, piston rings, and cylinder (Top End Rebuild).

5.3 OIL PUMP

The quantity of oil that is delivered from the oil pump increases with engine speed and carburetor throttle advancement. The oil pump is located under the right side of the engine, and is connected with a control cable from the throttle lever.

5.4 COOLING SYSTEM

The engine is air cooled. Air is circulated around the cylinder and head by means of a fan located on the right side of engine. The air is forced to flow through cylinder fin and cylinder head, preventing overheating of the engine. *This engine should never be operated without the engine shroud or cool fan installed.*



5.5 TROUBLESHOOTING

Insufficient oil supply to the engine.

- **The oil level in oil tank is too low.**
- **Oil line was not properly installed.**
- **Oil lines are leaking.**
- **Oil lines are broken or disconnected.**
- **Oil lines are clogged.**
- **Oil pump is not working.**
- **Oil cable needs adjusted**

Oil level in oil tank is always too low.

- **External oil leaks from lines or tank.**
- **Worn cylinder or head gasket.**
- **Worn piston rings.**

6. ENGINE
COMBUSTION SYSTEM

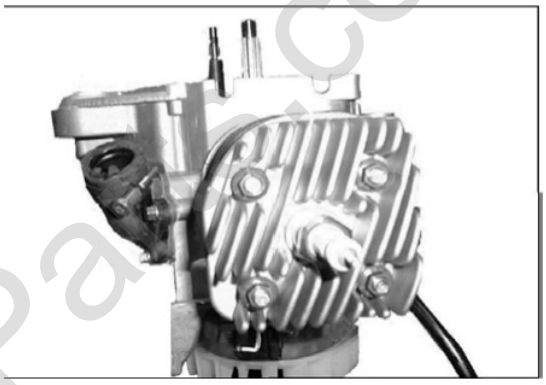
6.1 TROUBLESHOOTING

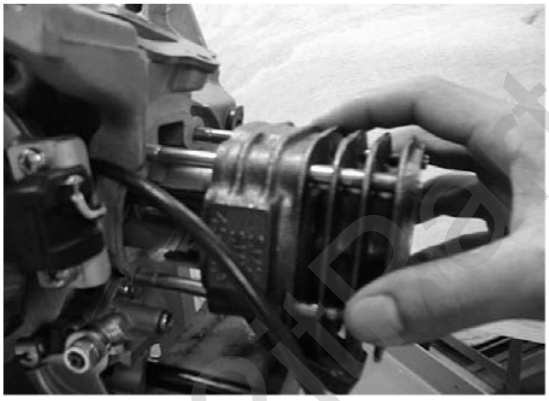
Low compression	• **Cylinder head gasket leaking or damaged** • **Warped or cracked cylinder head** • **Cylinder or piston rings worn or damaged**
High compression	• **Excessive carbon build-up on piston head or in combustion chamber**
Excessive noise	• **Excessive wear of piston or cylinder** • **Excessive carbon build-up in cylinder** • **Excessive wear of piston rings**
Excess smoke	• **Improper installation of piston rings** • **Piston or cylinder wall scored or scratched** • **Oil pump cable adjusted to high fuel/oil ratio**
Overheating	• **Excessive carbon build-up on the piston or in the combustion chamber** • **Engine cooling system fan damaged** • **Engine cooling air intake blocked** • **Cylinder fins dirty or clogged** • **Insufficient oil supply** • **Ignition timing out of sync**

6.2 CYLINDER AND PISTON REMOVAL

1. **Remove the seat, rear fender, and exhaust.**
2. **Remove the spark plug cap.**
3. **Disconnect the wiring.**
4. **Pull out the engine. (**see engine removal – section 3**)**
5. **Remove the air cleaner and carburetor.**
6. **Remove the intake pipe mounting bolts.**
7. **Remove the cylinder bolt nuts.**
8. **Remove the cylinder head.**
9. **Remove the cylinder *carefully***
10. **Remove one piston pin clip.**
11. **Remove the piston pin and piston.**
12. **Spread each piston ring and remove it by lifting up at a point just opposite the gap.**

Caution: Don't let the clip or other foreign objects drop into engine crankcase.





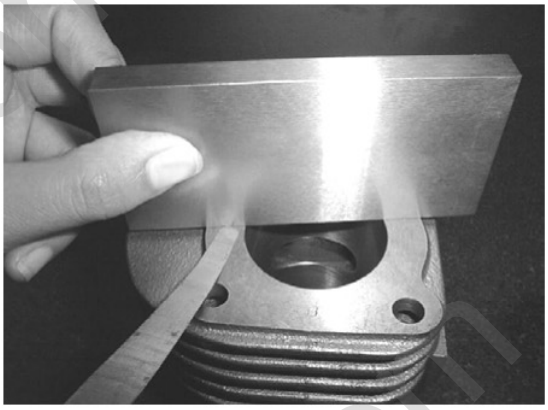
6.3 CYLINDER AND PISTON INSPECTION

Inspect the cylinder bore for wear or damage. Measure the cylinder inner diameter at three levels in the X- and Y-axis.

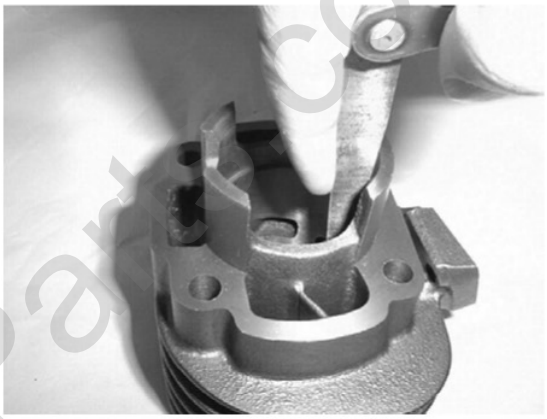
- **Taper limit: 0.10 mm (or 0.00394 in)**
- **Out of round: 0.10 mm (or 0.00394 in)**

Check the cylinder head matting surface for warping with a straight-edge and feeler gauge.

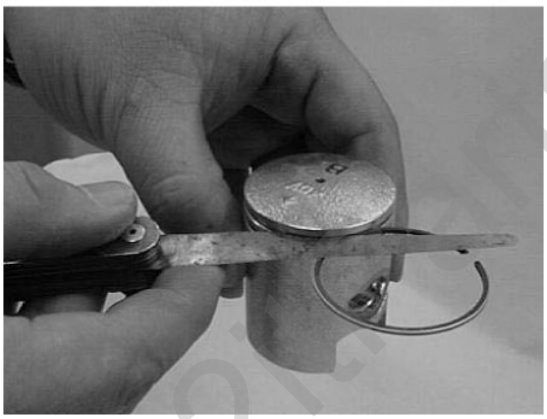
Service limit: 0.10 mm (or 0.00394 in)



Insert each piston ring into the cylinder and measure the end gap.
Service limit: 0.5 mm (or 0.0197 in)



Measure the clearance between the ring and groove.
Service limit: 0.09 mm (or 0.00354 in)



Measure the piston outer diameter at 10mm up from the bottom of the skirt. *Service limit*:

RXL				
50 ~ 39.9 mm (1.57")	70 ~ 46.9 mm (1.85")	90 ~ 49.9 mm (1.96")	90R ~ 49.9 mm (1.96")	50M ~ 39.9 mm (1.57")

Measure the piston pin bore and the piston pin outer diameter. Pin outer diameter service limit:

RXL				
50 ~ 9.96 mm (0.392")	90R ~ 9.96 mm (0.392")	50M ~ 1.96 mm (0.077")	90 ~ 1.96 mm (0.077")	70 ~ 9.96 mm (0.392")

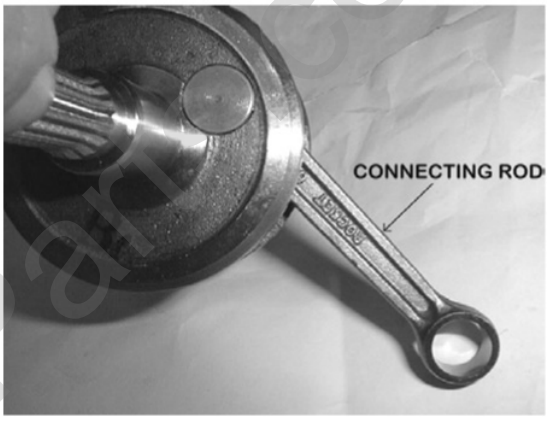
Pin bore service limit:

RXL				
50 ~ 10.04 mm (0.395")	90R ~ 10.04 mm (0.395")	50M ~ 12.04 mm (0.474")	90 ~ 12.04 mm (0.474")	70 ~ 10.04 mm (0.395")

Measure the connecting rod small end inner diameter with a small bore diameter gauge.

Service limit:

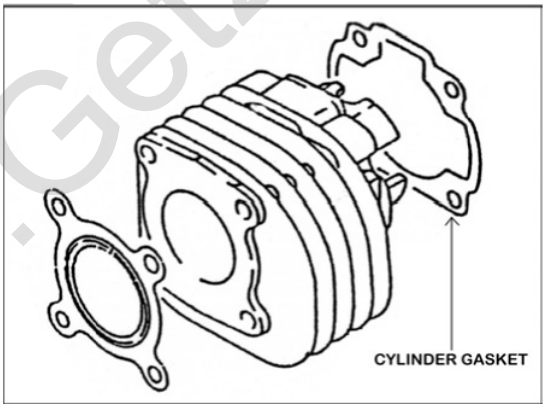
RXL				
50 ~ 14.06 mm (0.554")	90R ~ 14.06 mm (0.554")	50M ~ 15.06 mm (0.593")	90 ~ 15.06 mm (0.593")	70 ~ 14.06 mm (0.554")



6.4 REBUILDING THE TOP END

Install the piston rings with the Δ marks facing up. Do not damage the piston rings by spreading the ends too far.

Clean the cylinder gasket surface, being careful not to drop any gasket material into the crankcase.
(Continued)



- **Apply oil to inside of the connecting rod connection bearing hole. Install the connecting rod bearing in the connecting rod. Install the piston, piston pin and clips.**
- **Install the piston with the arrow mark facing the exhaust port.**
- **Do not align the piston pin clip end gap with the piston cutout.**
- **Install a new cylinder gasket.**
- **Apply a thin coat of engine oil to the piston rings and cylinder wall.**
- **Install the cylinder, compressing the piston rings. Install a new cylinder head gasket. Install the cylinder head.**
- **Tighten the cylinder-mounting bolt. The torque is 10-14N/m**

Engine Top End Kits:

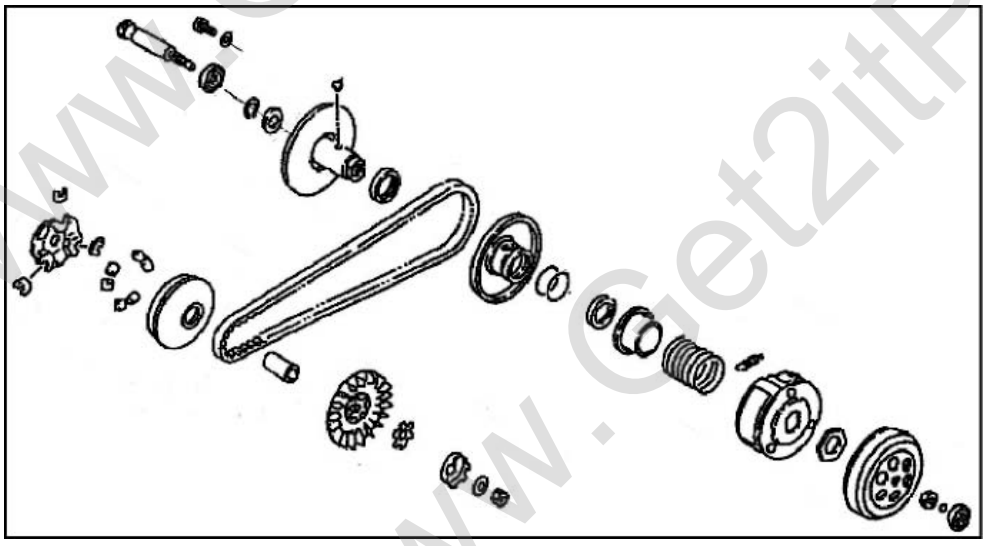
50cc – Part # 810789
70cc – Part # 811091
90cc – Part # 810790

7. TRANSMISSION SYSTEM

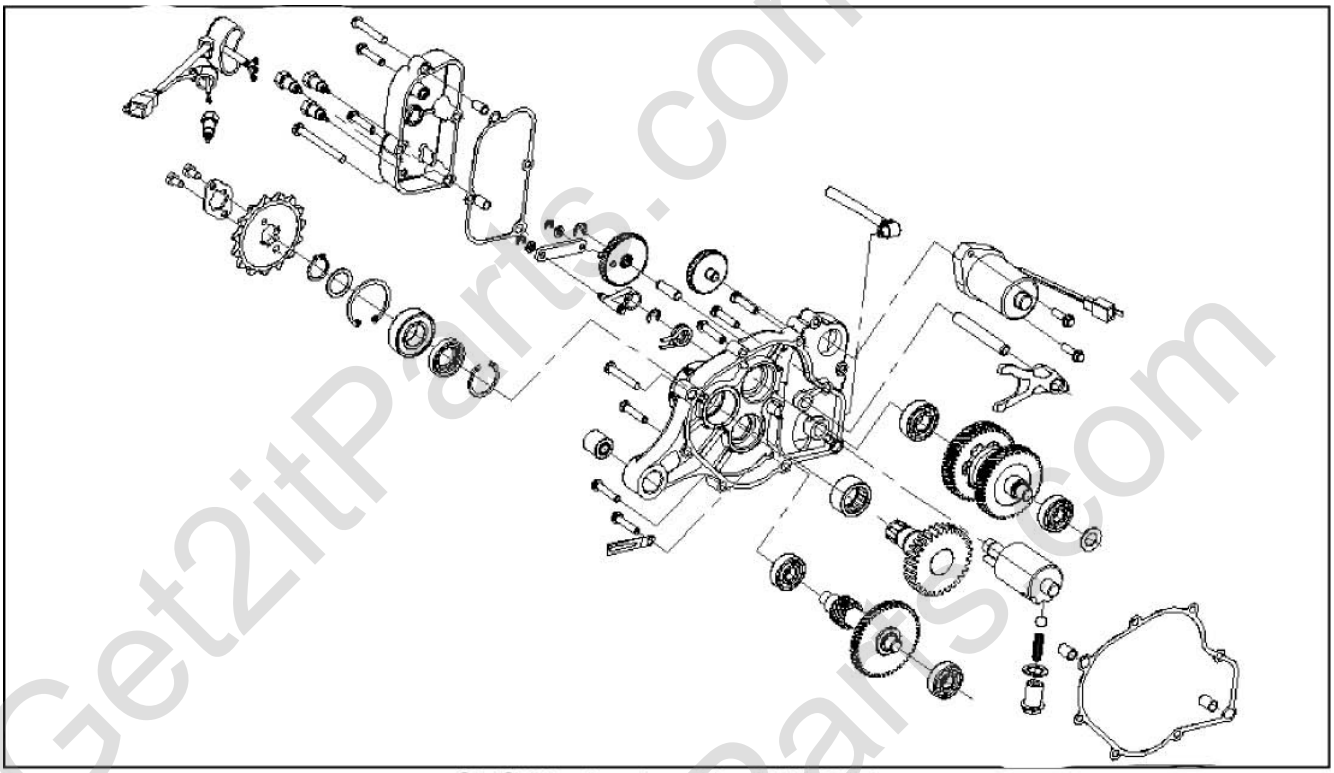
7.1 TROUBLESHOOTING

Abnormal shifting or will not reset	• Abnormal speed limited function • Faulty C.D.I.
Will not move after engine is started	• Faulty shift motor • Faulty shift spring or gear • Faulty sensor (F, N1)
Does not run at high speed	• Belt worn • Front pulley worn or broken • Clutch lining worn • Faulty shift spring • Rollers worn • Rear pulley spring distorted
Engine stop after successful shift	• Faulty sensor (F, N1) • Faulty C.D.I.

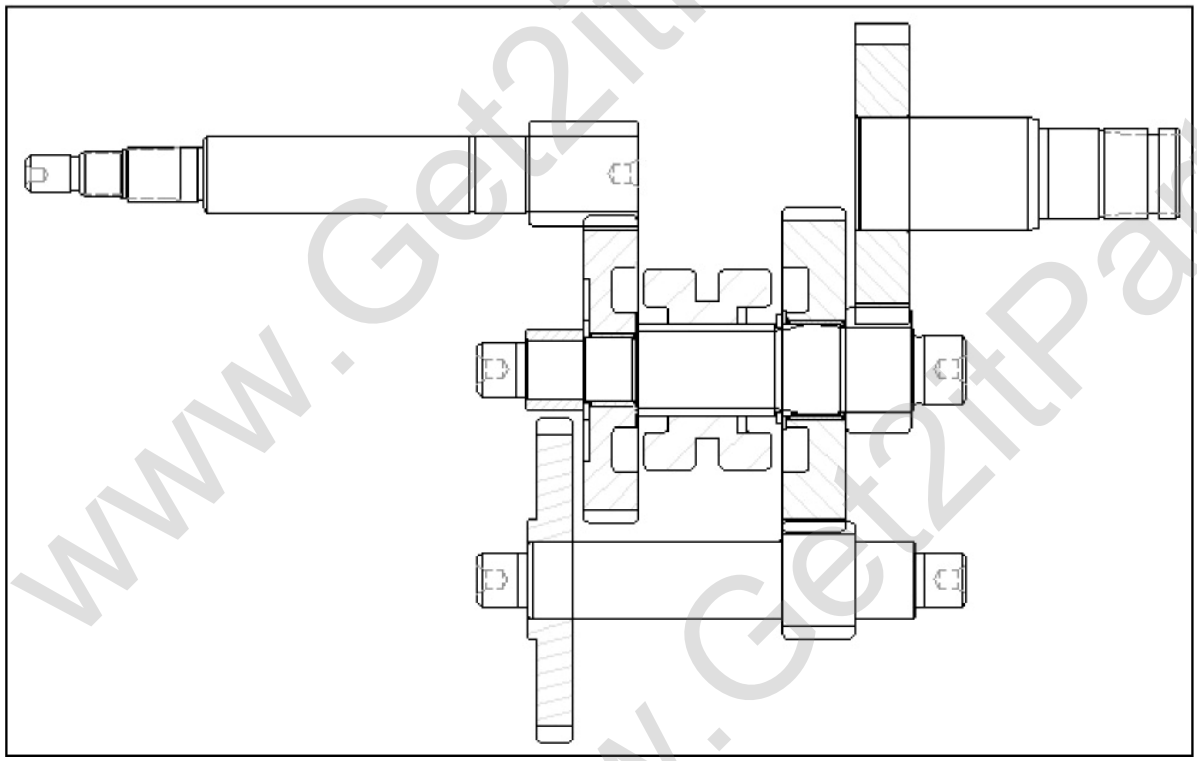
7.2 PARTS DRAWING OF TRANSMISSION SYSTEM



C.V.T



Shift Mechanism For RXL 90R



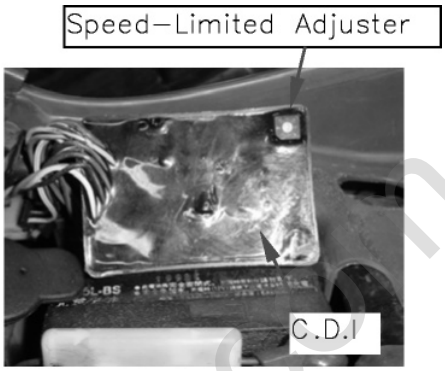
Gear Box For RXL 90R

7.3 SHIFT MECHANISM (For RXL 90R) C.D.I.

The C.D.I. is located below the seat. It includes the shift control system. Replace it if the control system is functioning improperly. There is also a speed-limit adjuster in the corner. Adjust speed-limited as follows:

Speed-Limited Adjuster

Position	Speed-Limited (RPM)
0	4900±150
1	5500±150
2	6100±150
3	6700±150
4~7	9500±150



Sensor

Inspect wire for break or damage and check the contact. Measure sensor dimension (fig-1) after removing the sensor.

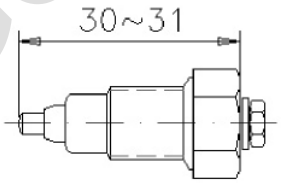
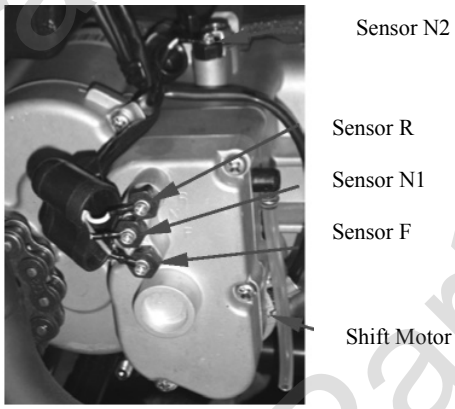


fig-1

If the length of the sensor is below 30mm (1.18 in), it must be replaced.

SERVICE LIMITS: 30 mm (1.18 in)



Shift Spring and Gear

Remove the transmission side cover and other parts as required. Check the shift gear for wear or damage. Measure the opening width of the shift spring (fig-2).

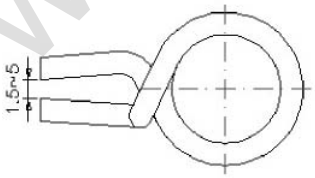
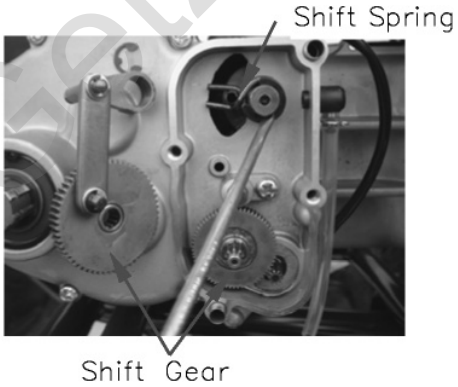


fig-2

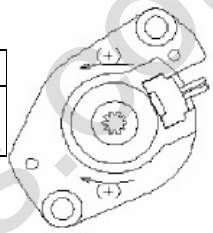
If the opening width is greater than 5mm (or 0.197 in), it must be replaced. SERVICE LIMITS: 5 mm (0.197 in)

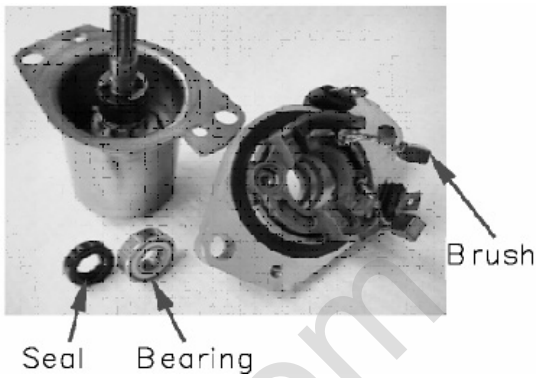


Shift Motor

Check the shift motor for normal operation by using the following data:

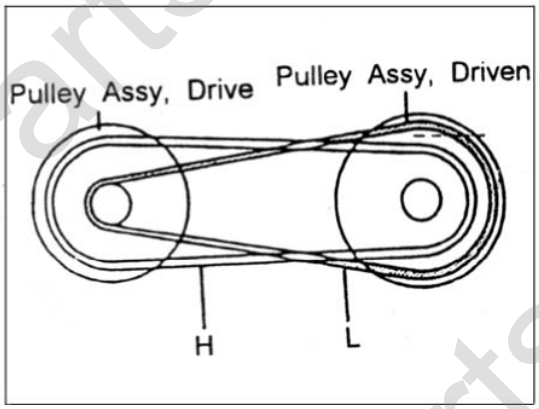
Voltage	Current	Torque (Min)	RPM (Min)
Loading	12V	0.5Kg/cm (2.8 lb/in)	1200





- **Disassemble the transmission side cover, parts of the shift mechanism, and transmission cover.**
- **Remove the seal and bearing after removing the shift motor from the transmission cover.**
- **Check the seal and bearing for wear**
- **Replace it if necessary.**

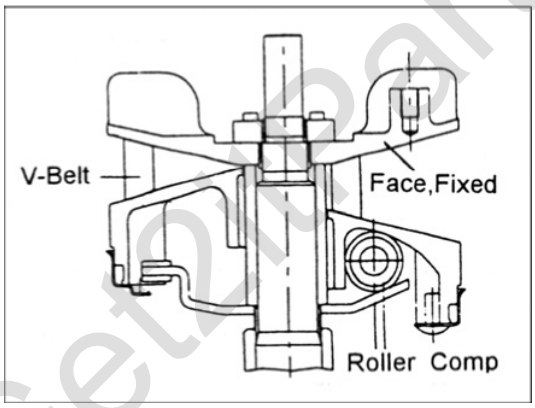
7.4 AUTOMATIC CONTINUOUS VARIABLE TRANSMISSION (C.V.T.)



This transmission is a combination of an automatic centrifugal clutch and V-belt continuous variable transmission, which changes the transmission ratio automatically.

When engine speed increases, the drive pulley will push the belt by centrifugal force from six rollers. This causes the pitch circle of the belt in the drive pulley to increase. The belt at the driven pulley is forced to move to the center of the shaft, causing the radius of the pitch circle to decrease.
The transmission ratio is therefore altered by the alteration of the pitch circle's radius.

(NOTE: In the drawing, "H" means high speed; "L" means low speed.)

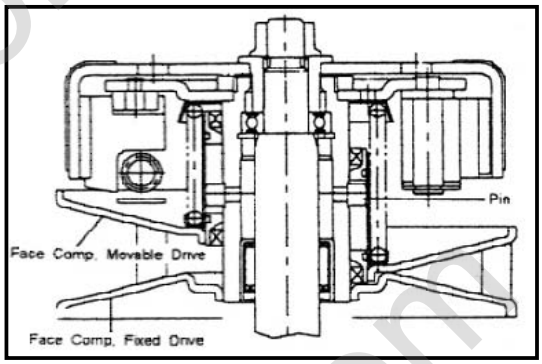


Driven Pulley

Because the revolving radius of the V-Belt at the Drive End is increased, the Face Comp Movable Drive is forced out by the V-Belt at the Driven End to shorten the revolving radius. There is a Torque Cam on the Movable Drive Face.
The Torque Cam is loaded from outside. When the outside load is higher than the engine's output, the pulley of the fixed shaft and belt slip to make the Movable Drive Face move along the inner side of the Cam and compensate to increase to high torque (toward low speed) and makes the engine run smoothly.

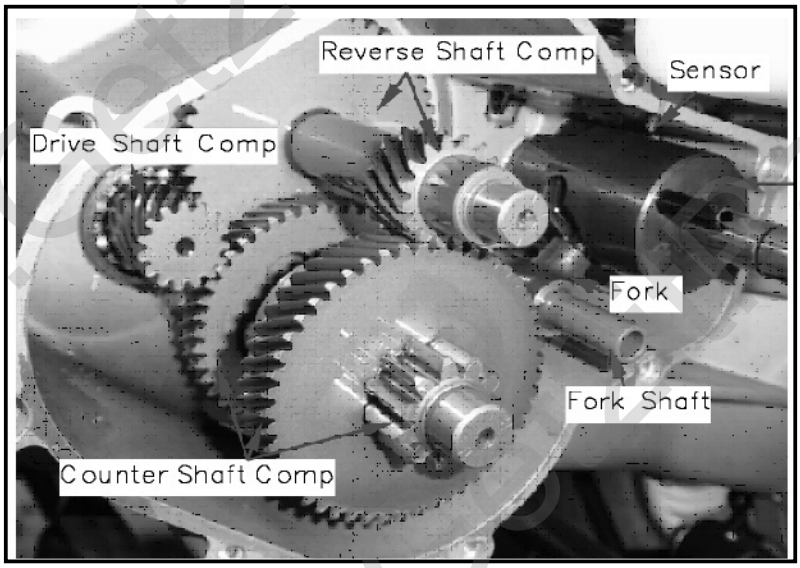
7.5 CONTINUOUS VARIABLE TRANSMISSION V-Belt

Made of rubber fiber, it is resistant to heat, pressure, and abrasion. The inner side of the belt is toothed to provide flexibility for radial diameter changes.



Drive Pulley

When the engine speed increases, the rollers push the movable drive face by centrifugal force. This applies pressure to the belt which increases its turning radius. The aluminum fan is installed on the exterior of fixed drive face. This creates an air flow through the C.V.T. case to remove excess heat cause by the friction of the drive belt.



7.6 Viper 90R GEAR BOX

Gear Shifting Drum

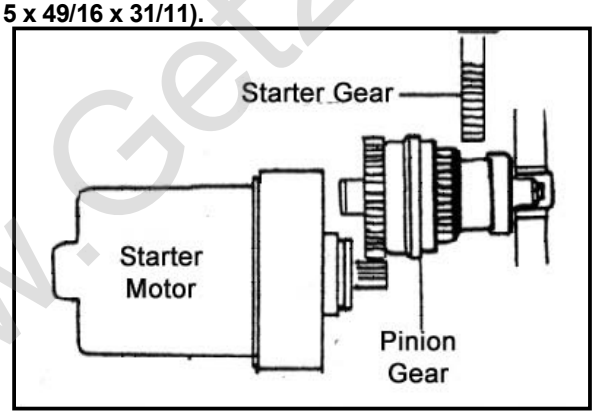
Remove the transmission side cover, parts of shift mechanism, and transmission cover. Inspect the gears for wear, scoring, chipping, or breaking. Replace it if necessary.

The gear ratio of the forward gear composition is about (47/15 x 31/11).

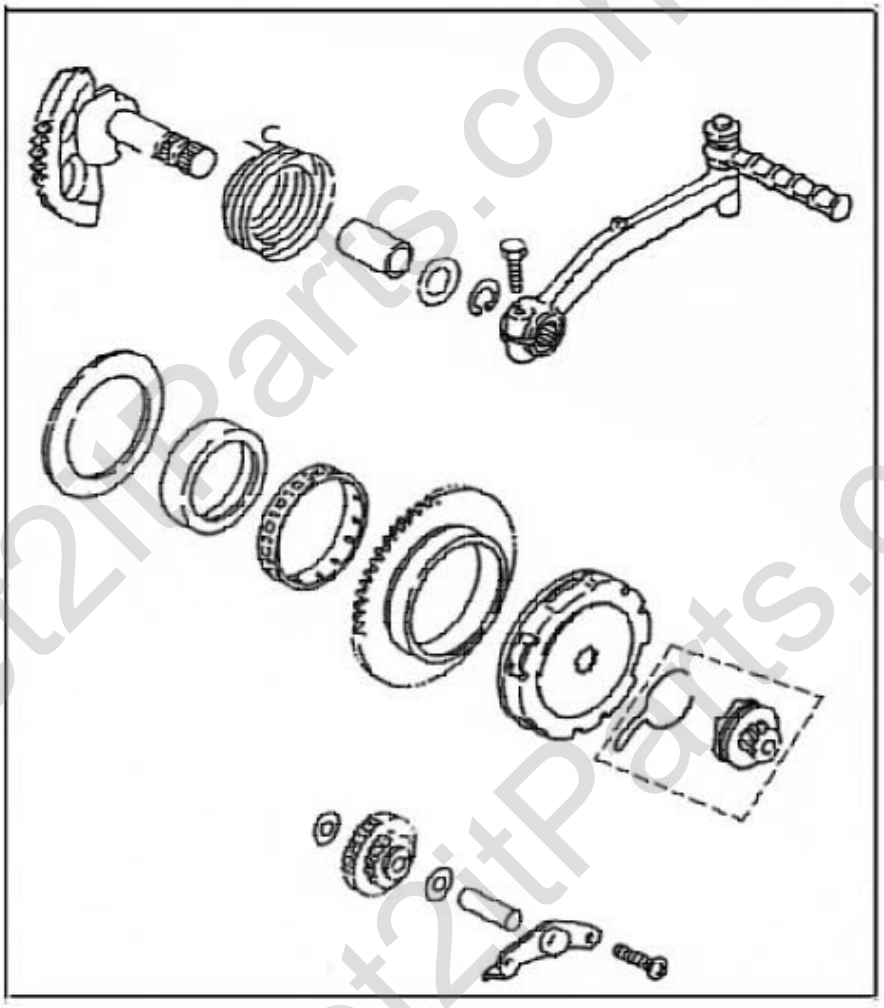
The gear ratio of the reverse gear composition is about (49/15 x 49/16 x 31/11).

7.7 ELECTRIC STARTER MECHANISM

The Starter Motor is installed on the upper side of engine. The starter motor can only be activated when the left hand brake is applied, the transmission is in neutral position, and the ignition switch is in the on position.



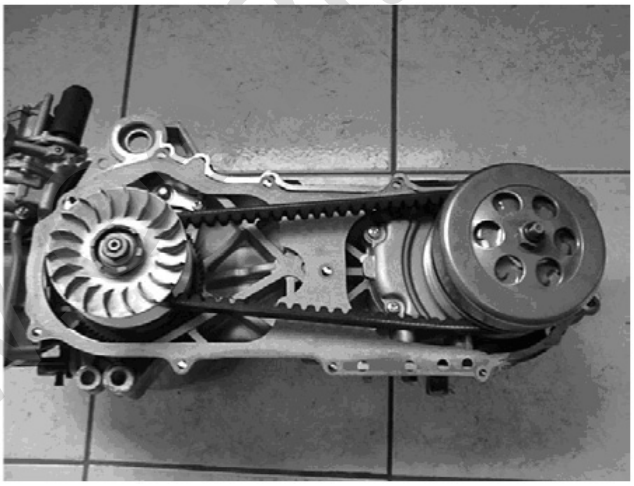
7.8 KICK STARTER



This kick-starter arm is on the left side of engine. When the kick-starter arm is kicked, the gear of the start shaft will drive the kick-starter to revolve the crankshaft to start the engine. After the engine is started, the kick-started will stop transferring the power to the kick-starter-driven gear. When the kick-starter lever is released, the kick-starter gear will go back to its original position.

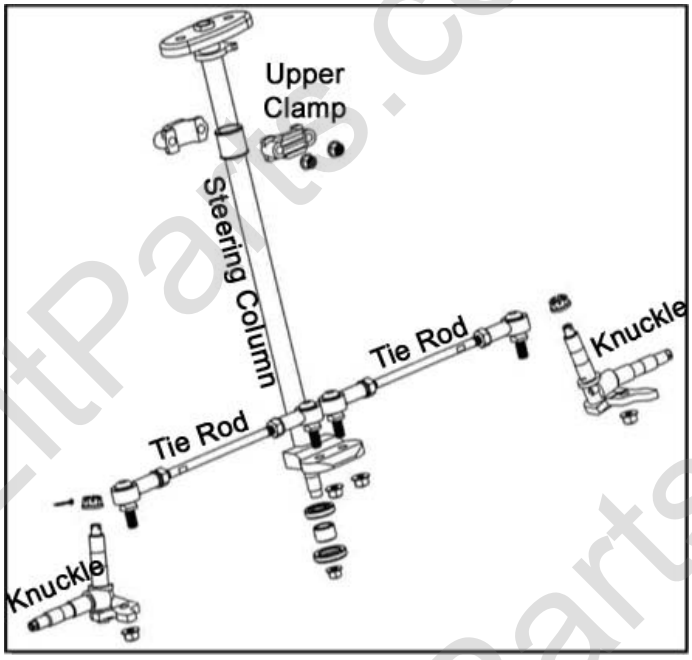
7.9 DISASSEMBLY AND INSPECTION OF C.V.T. SYSTEM

Remove the engine clutch cover by unscrewing the attached bolts. Check the belt for wear. If necessary, replace the belt. Disassemble the front drive pulley and check the six rollers for wear. If necessary, replace the rollers.



8. STEERING SYSTEM

8.1 STEERING SYSTEM DRAWING



8.2 TROUBLESHOOTING

Hard steering

- **Faulty tire(s)**
- **Upper steering shaft clamp too tight**
- **Low tire pressure**
- **Damaged steering shaft bearings**
- **Damaged steering shaft bushing**

8.3 HANDLEBAR REMOVAL

Remove the throttle lever housing on the right handle bar.
Then, remove brake lever bracket.

Viper 90R

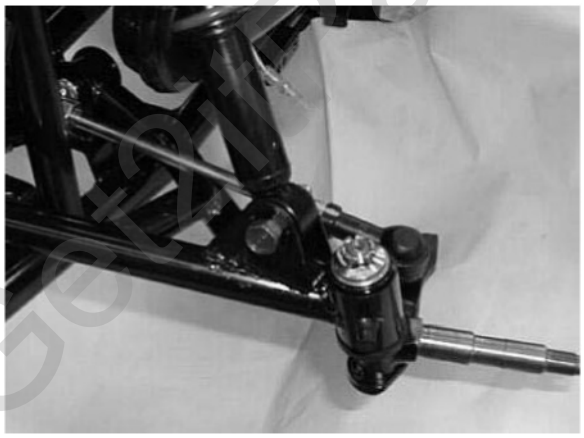
Viper 50 / 70 / 90

Viper 50M

INSTALLATION

- **Place the handlebar on the lower holders.**
- **Make sure to align the handlebar punch mark with the tops of the handlebar lower clamps.**
- **Install the handlebar upper clamps with the L or R marks facing forward.**
- **Tighten the front bolts first, and then the rear bolts.**
- **Install the handlebar upper clamp cover.**
- **Install the switch housing, aligning the boss with the hole. Tighten the upper screw first; then, tighten the lower one.**
- **Install the rear brake lever bracket, aligning the boss with the hole. Tighten the screw securely.**
- **Align the split line of the throttle housing and holder with the punch mark. Tighten the screw securely.**

8.4 STEERING SYSTEM REMOVAL OF KINGPIN AND TIE-ROD

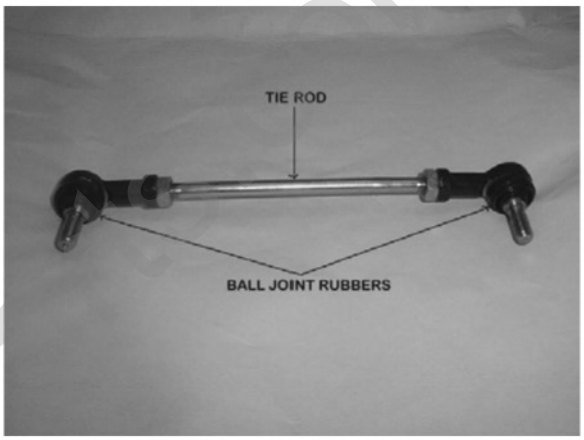


- **Remove the front wheels and brake plates.**
- **Remove the carter key and the two self-locking nuts from the tie rod ball joint ends.**
- **Remove the tie rod.**

- **Remove the rubber cap on the kingpin and remove the cotter pin.**
- **Unscrew the castle nut and remove the kingpin.**

TIE-ROD INSPECTION

- **Inspect the tie-rod for damage or bending.**
- **Inspect the ball joint rubbers for damage, wear or deterioration.**
- **Turn the ball joints with fingers. The ball joints should turn smoothly and quietly.**
- **Replace as needed.**



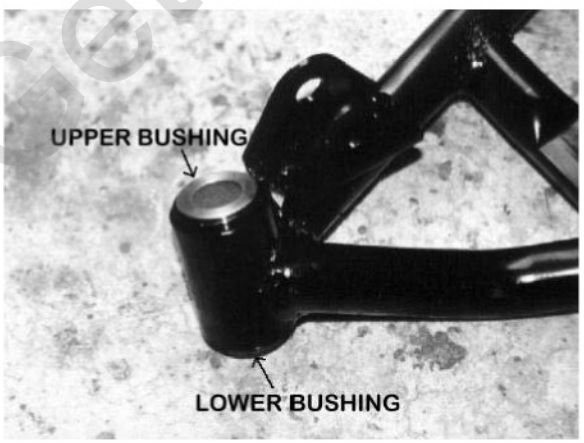
KINGPIN INSPECTION

- **Inspect the kingpin for damage or cracks.**
- **Measure the kingpin outer diameter.**

Upper minimum limit: Ø15.40 mm (or 0.606 in)
Lower minimum limit: Ø16.90 mm (or 0.665 in)

KINGPIN BUSHING INSPECTION

There are two bushing in the sleeve of front swing arm, the upper and lower bushing. Check the kingpin bushings for wear or damage. Measure the inner diameter of the bushings.
Upper minimum limit: Ø15.69 mm (or 0.618 in)
Lower minimum limit: Ø17.19 mm (or 0.677 in)

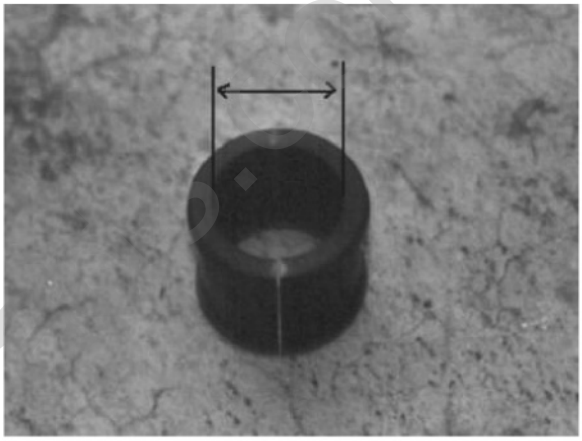


STEERING SHAFT REMOVAL

- **Remove the handle bar and handle bar cover (see paragraph 8-1).**
- **Remove the front fender (see section 11-1).**
- **Remove attaching nut from the bottom of the steering shaft.**
- **Pull steering shaft carefully.**

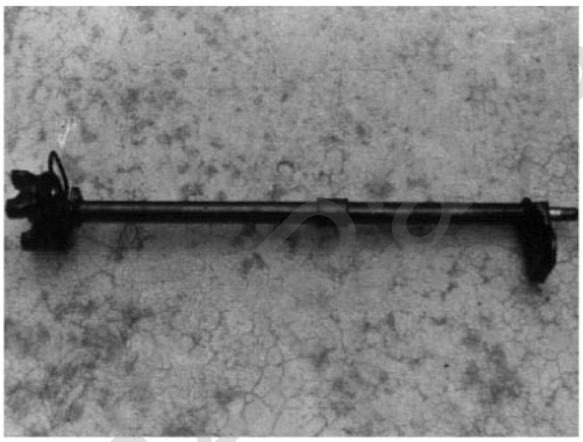
BUSHING INSPECTION

- **Remove the steering shaft.**
- **Remove the bushing from the shaft.**
- **Inspect the bushing for damage or wear, replace if necessary.**
- **Measure the bushing inner diameter. Maximum limit: Ø22.8 mm (or 0.898 in)**



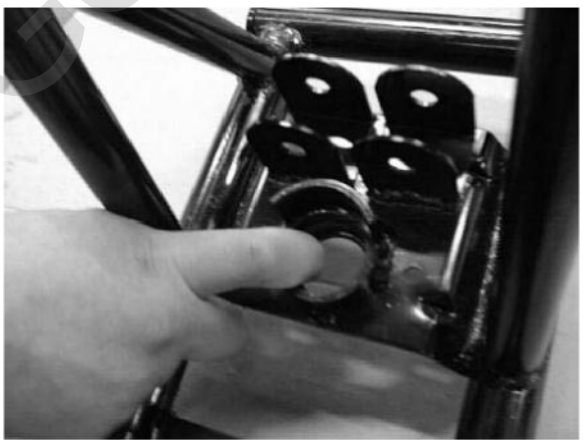
STEERING SHAFT INSPECTION

- **Inspect the steering shaft for damage or cracks. Measure the steering shaft outer diameter at the bushing seat.**
- **Minimum limit: Ø22.0 mm (or 0.866 in)**



STEERING SHAFT BEARING INSPECTION

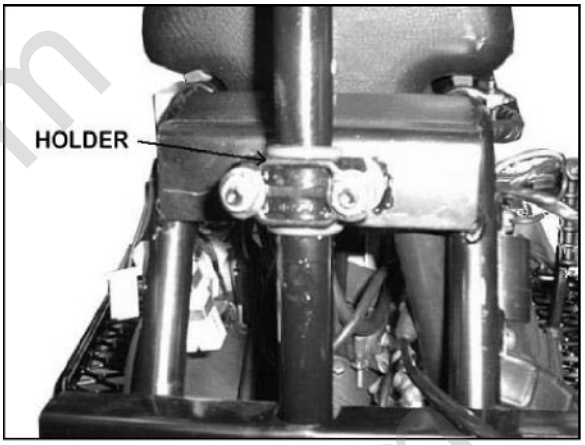
- **Turn the shaft bearing with your finger.**
- **The bearing is on the front part of frame. It should turn smoothly and quietly.**
- **Inspect the bearing races for wear or damage and for proper fit.**
- **Replace the bearing if necessary.**



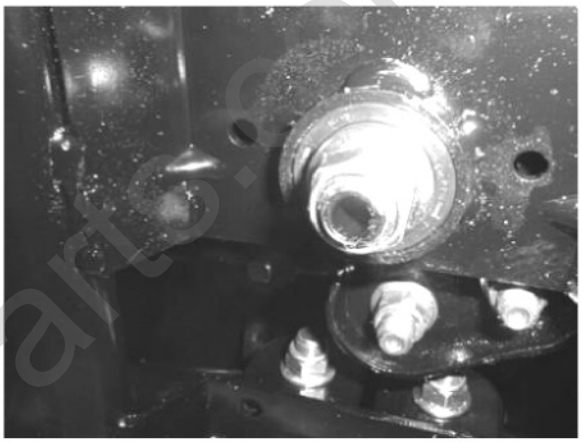
INSTALLATION OF STEERING SHAFT

- **Apply grease to the steering shaft bushing.**
- **Insert the steering shaft through the bushing.**
- **Ensure the shaft is properly seated in the bearing at the bottom of the shaft.**

Torque: 24-30 N/m (1.64-2.06 lb/ft)



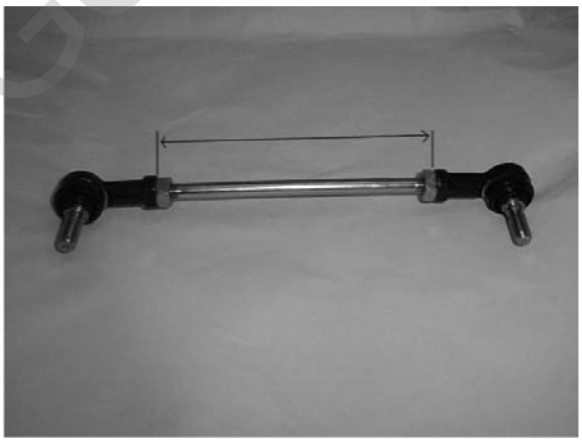
Install the steering shaft nut at the bottom of the steering shaft and tighten it.
Torque: 50-60 N/m (3.43-4.11 lb/ft)



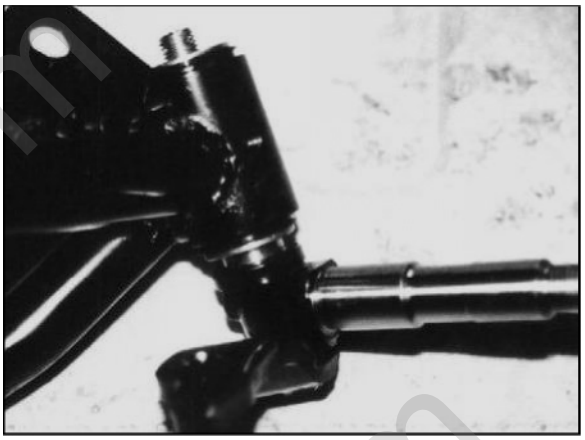
INSTALLATION OF TIE-ROD

- **Install the ball joint with the "L" mark on the steering shaft side.**
- **Install the tie-rod with the mark on the wheel side.**

Set the distance between the ball joints to 164 mm (or 6.46 in) for RXL 50/70/90, RXL90R, and RXL50M. This is a temporary setting.



INSTALLATION OF KINGPIN

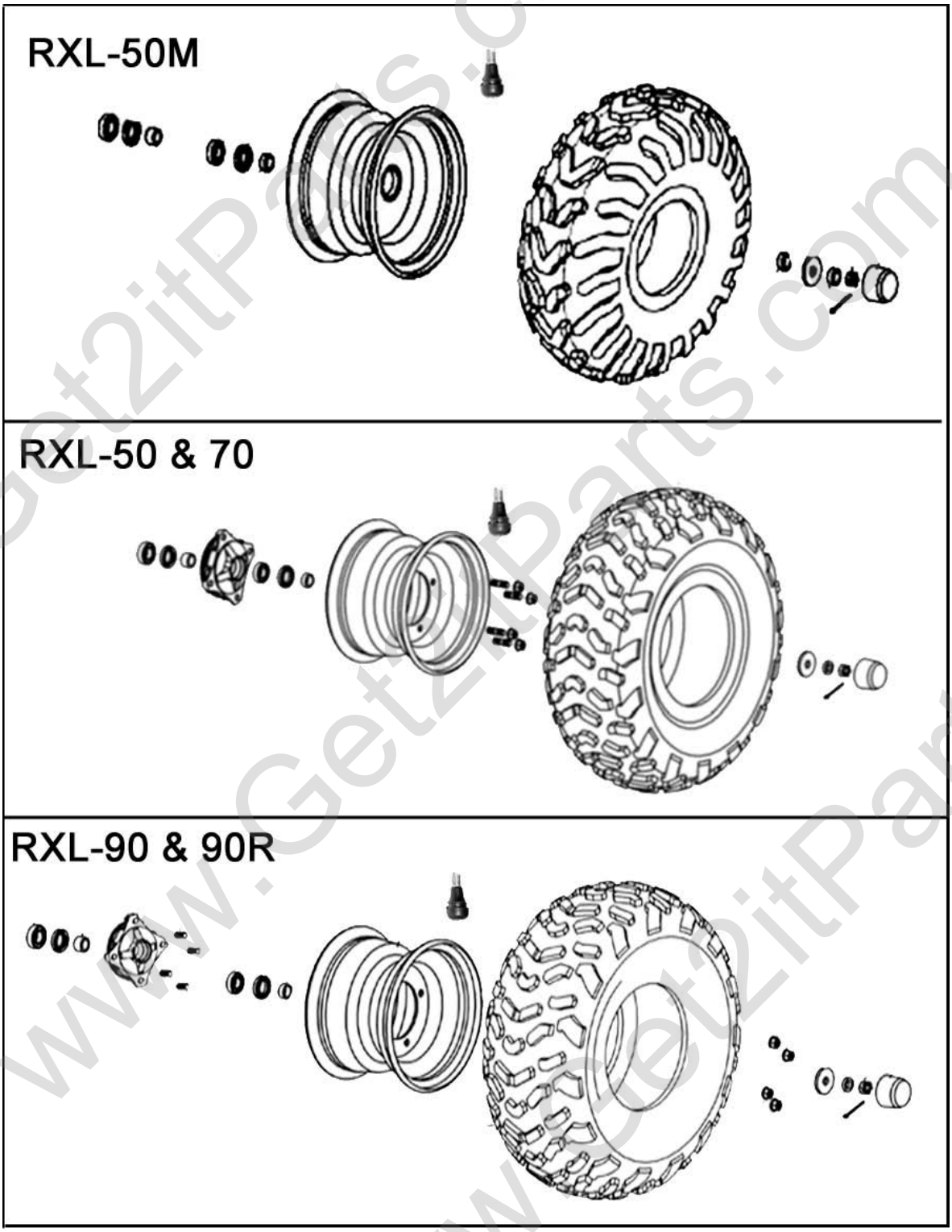


- **Apply grease on the kingpin lower dust seal lips and install.**
- **Grease the bushing and install the kingpin.**
- **Tighten the kingpin nut.**
- **The torque setting is 30-40 N/m (or 2.06-2.74 lb/ft).**
- **Fix the waterproof rubber cap.**

- **Temporarily set the distance to 147mm (or 5.79 in) between the ball joints.**
- **Install the tie-rod and tighten the nuts.**
- **The torque setting is 35-43 N/m (or 2.40-2.95 lb/ft).**
- **Install the front brake.**
- **Install the front wheel.**
- **Adjust the toe in. (see section 2)**

9 FRONT WHEELS AND TIRES

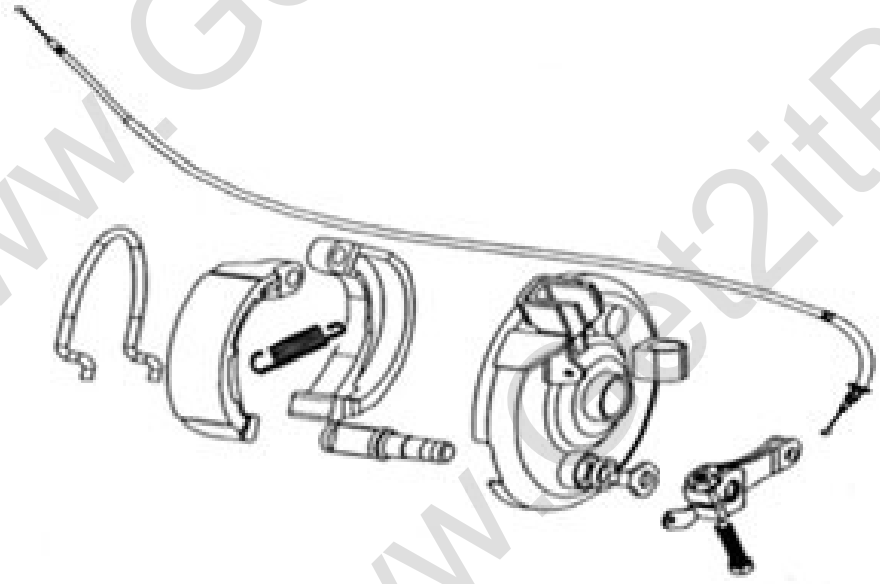
9.1 THE PARTS DRAWING OF FRONT WHEELS SYSTEM



9.2 TROUBLESHOOTING

FRONT WHEEL WOBBLING	• Damaged Tire • Bent Wheel Rim • Worn Front Brake Drum • Loose Axle Nut • Improper Brake Adjustment • Worn or Damaged Wheel Bushings and/or Spacers • Bent or Damaged Spindle Axle • Worn or Damaged A-Arm Bushings
BRAKE DRAG	• Improper Brake Adjustment • Worn or Damaged Brake shoes • Worn or Damaged Brake Drum • Foreign Material, (Sand or Mud), in Brake Drum • Rusted Brake • Drum Worn or Damaged Brake Return Spring

POOR BRAKE PERFORMANCE	• Worn Brake Shoes
	• Worn or Damaged Brake Drum
	• Brake Lining Contamination
	  ◦ Oil
	  ◦ Grease
	  ◦ Dirt
	  ◦ Mud
	  ◦ Water
	• Improper Brake Adjustment
	• Brake Cable Damaged, Bent, Kinked, or Under Lubricated
	• Worn or Damaged Brake Return Spring

9.3 FRONT WHEEL

REMOVAL

Raise the front wheels off the ground by placing a block under the frame.
Remove:

- **Rubber Dust Cover**
- **Cotter pin**
- **Castle Nut**
- **Axle Washer**
- **Wheel**

INSTALLATION

Install components in this order:

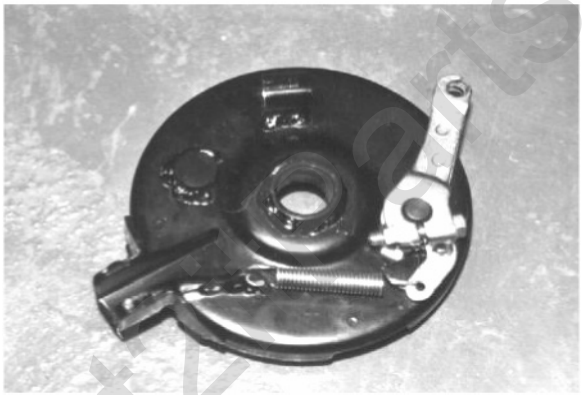
- **Oil Seal**
- **Bearing**
- **Inter Spacer**
- **Bearing**
- **Oil Seal**
- **Outer Spacer**
- **Wheel Rim**
- **Outer Spacer**
- **Axle Washer**
- **Castle nut (Torque: 50-60N/m or 37-44 lb/ft)**
- **Cotter Pin (New Cotter Pin recommended)**
- **Rubber Dust Cover**

9.4 FRONT BRAKES

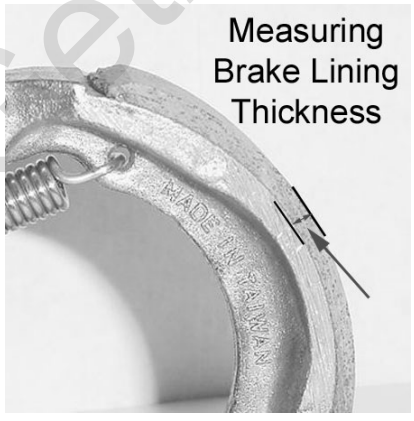
FRONT BRAKE INSPECTION (*Note: does not apply to RXL-50M)*

Remove the front wheel (Section 9.3)
Remove the brake drum.

Measure the brake lining thickness at its thinness point
The minimum limit: 1.5 mm (or 0.06 in)



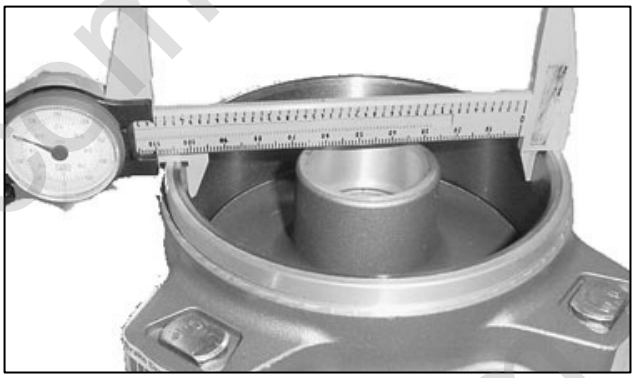
Replace Brake shoes if measurement is below service standard.



- **Measure the brake drum inner diameter**

  Using a set of calipers and measure across the diameter

  The maximum limit: 86 mm (or 3.39 in)
- **Clean the drum of all dirt, oil, grease or other contaminates.**
- **Inspect the surface for deep scratches or scaring.**
- **Remove any scratches or scaring by resurfacing the drum on a Drum turning machine. *Caution: When resurfacing a drum do not exceed the service limit.***



Turn the inner race with your fingers. The bearings should turn smoothly and quietly. If the race does not turn smoothly or quietly, remove and discard the bearings.

BRAKE PANEL REMOVAL

Disconnect the brake cable from the brake arm. Remove the brake panel from the knuckle.

Remove brake arm and cam. Remove return spring. Remove indicator plate and felt seal.

INSTALL BRAKE PANEL

Apply grease to the brake cam and anchor pin and install the cam in the brake panel. Soak the felt seal in the engine oil and install the seal on the brake cam.

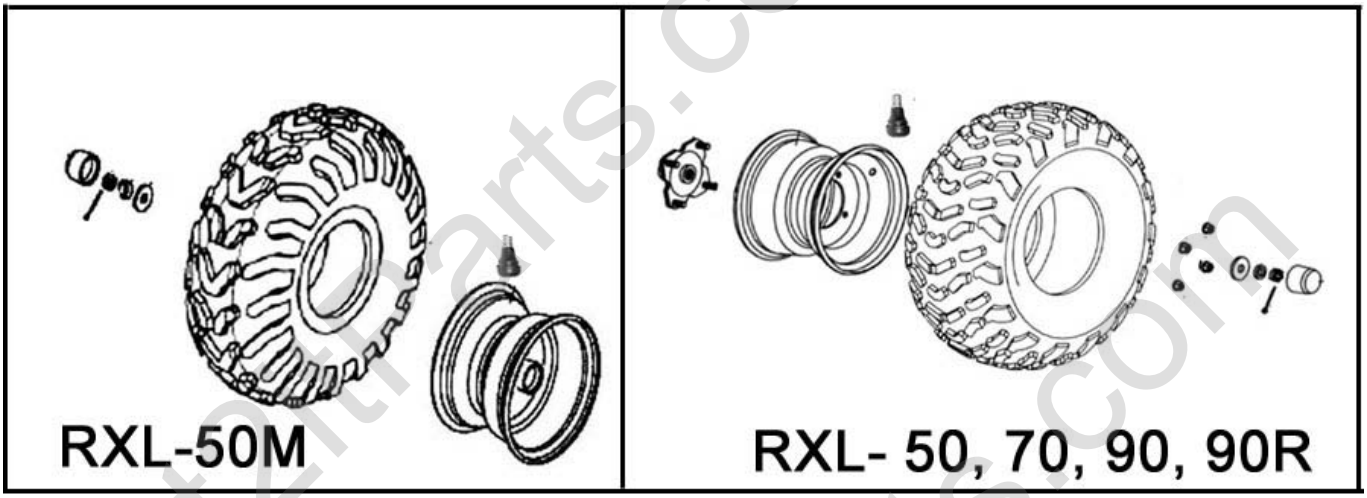
Install the brake arm on the cam by aligning the punch mark and the groove on the cam.
Tighten the brake arm bolt and nut.
Torque: 4-7 N/m (or 0.274-0.480 lb/ft)
Install the return spring.

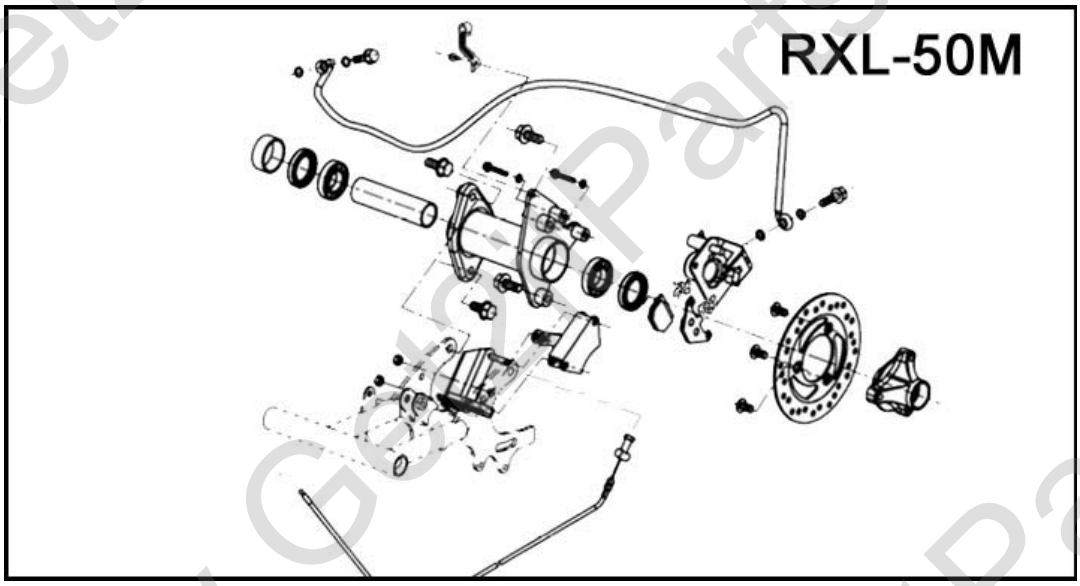
Install the brake panel on the knuckle.
Connect the brake cable to the brake arm.

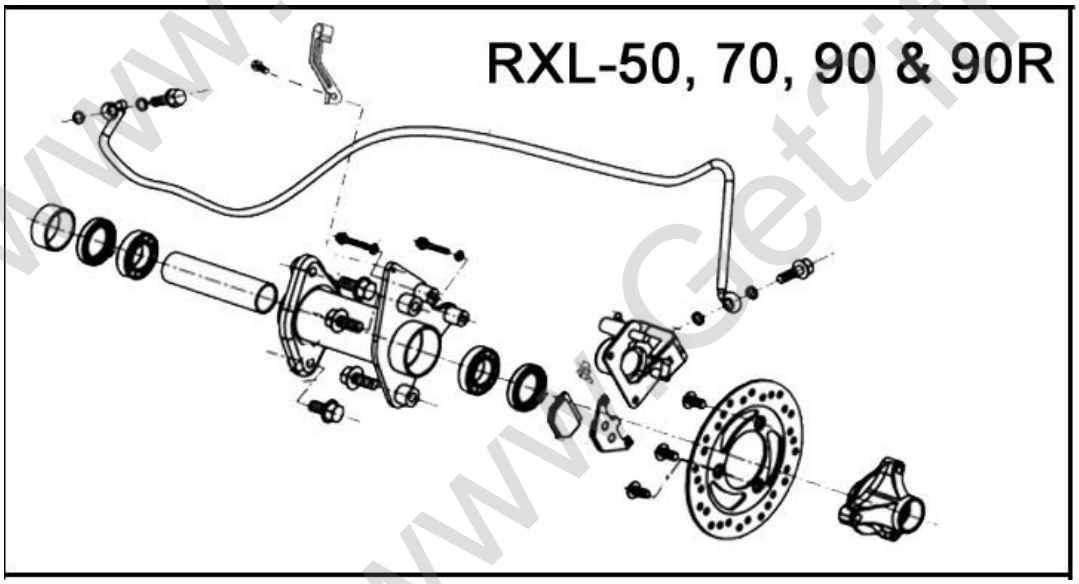
Install the brake arm cover.
Tighten the screws securely.
Position the brake shoes in their original locations and install the brake shoe spring. Install the brake drum and front wheel. Install the castle nut and cotter pin.

10. REAR WHEEL AND BRAKE SYSTEM

10.1 THE PARTS DRAWINGS OF REAR WHEEL and BRAKE SYSTEMS







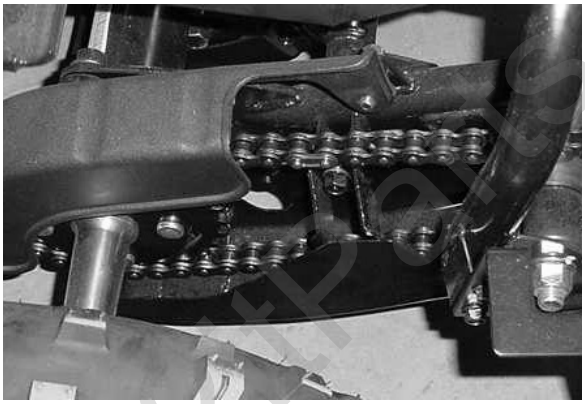
10.2 TROUBLESHOOTING

Bad brake performance	• **Brake shoes are worn** • **Bad brake adjustment** • **Brake linings are oily, greasy, or dirty** • **Brake drums are worn** • **Brake arm setting is improperly engaged** • **Axle is not tightened well**
Vibration or wobble	• **Bent rim** • **Axle bearings are worn** • **Faulty tires** • **Rear axle bearing holder is faulty**
Brake drag	• **Incorrect brake adjustment** • **Sticking brake cam** • **Sticking brake cable**

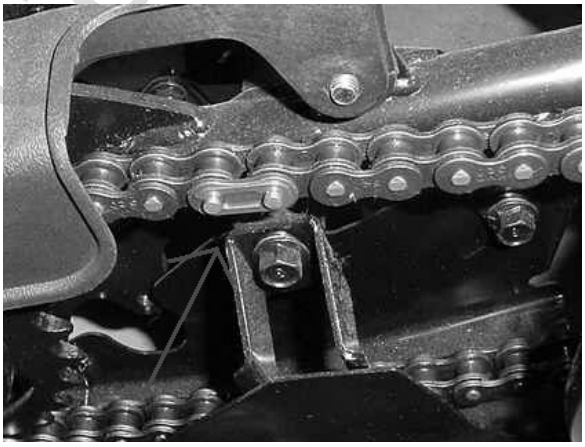
10.3 DRIVE MECHANISM

Removal and inspection:

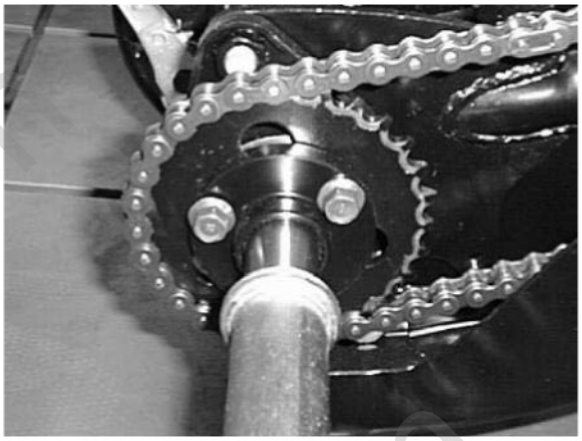
- **Remove the rear wheel**
- **Raise the rear wheels off the ground.**
- **Remove the cotter pin, axle nut and washer. Remove the wheel and wheel hub. Remove the drive chain under the cover.**



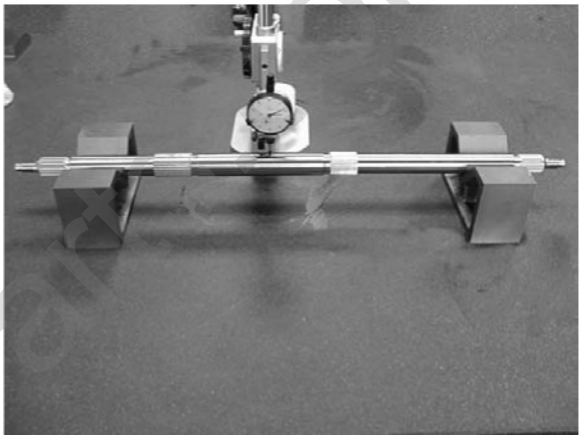
Disassemble the chain, retaining clip, and master link.



Disassemble the driven sprocket, axle, and sprocket collar.
Check the driven sprocket for damage or wear.



Place the rear axle on V-blocks and check the run out.
The run out limit is 0.5 mm (or 0.0197 in).

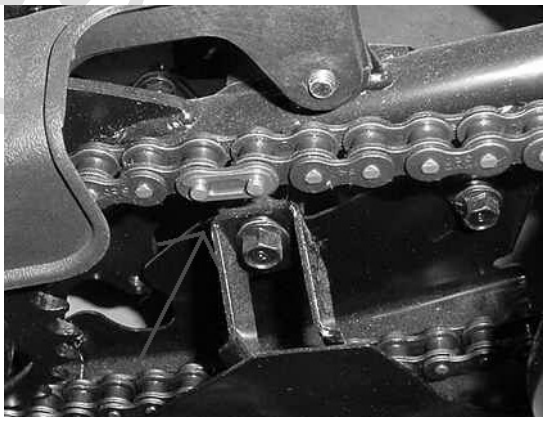


Check the bearing by turning with your fingers.
The bearings should turn smoothly and quietly.
Replace if necessary.

INSTALLATION

Add grease to the dust seal lips and install dust seals.
Assemble the rear axle and the driven sprocket.

- **Assemble the drive chain on the driven sprocket. Assemble the master link and retaining clip. Note the retaining clip's direction. Install the drive chain cover.**
- **Assemble the chain cover.**

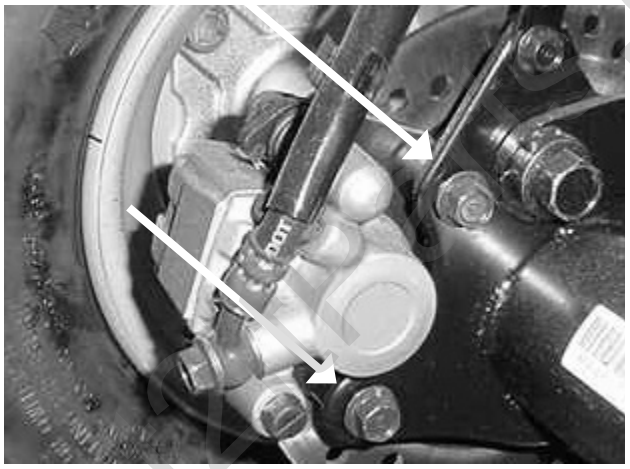


- **Assemble the wheel.**
- **Tighten the rear axle nut with 60-80 N/m (or 4.11-5.48 lb/ft). Install a new cotter pin.**
- **Adjust the rear brake slack.**
  Adjust chain slack.

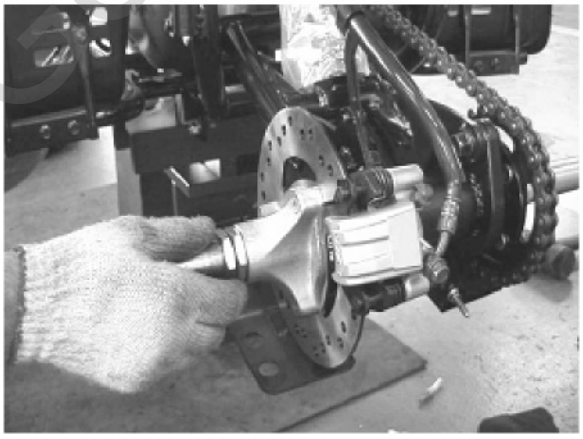
10.4 HYDRAULIC DISC BRAKE SYSTEM

- **To the replace brake disc, first remove the rear left tire.**

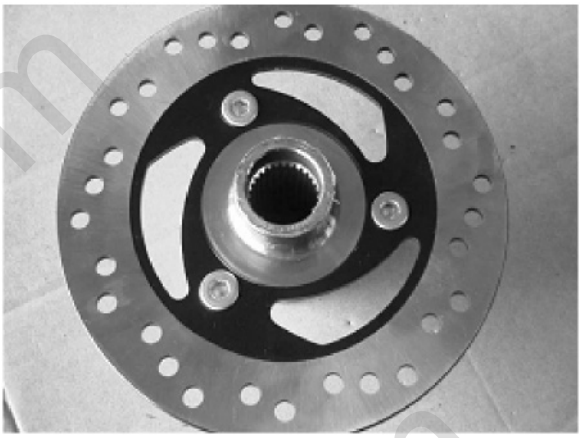
- **Unscrew the two bolts shown on the photo and remove the caliper.**



- **Unscrew the rear wheel axle nut and remove the mounting seat of the disc.**



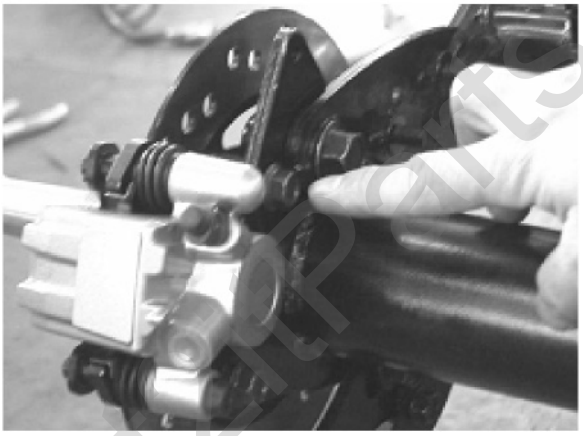
Unscrew the bolts and remove the brake disc. Check the thickness of disc and replace with a new one if the thickness less than 3mm (or 0.118 in).



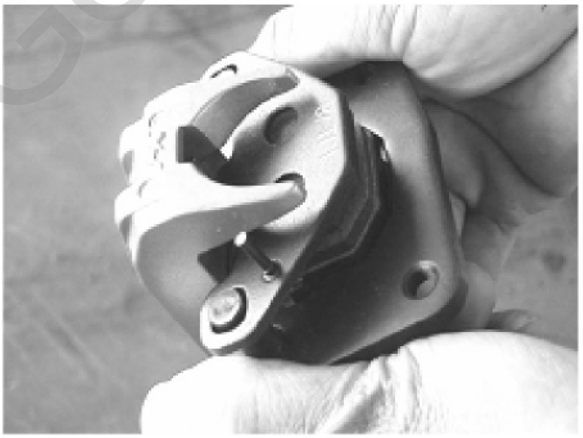
TO REPLACE THE BRAKE PADS:

First, remove the rear left tire.

- **Unscrew the two bolts shown on the photo and remove the caliper.**



- **Press the plate to the end.**



- **Remove the brake pad as shown.**

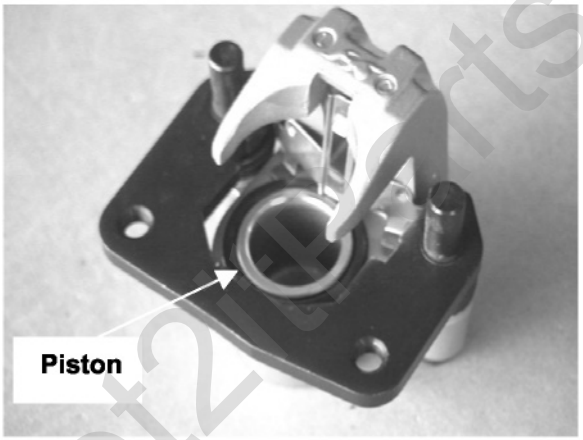
- **Check the thickness of the brake pad and replace with a new one if the thickness less than 1mm (or 0.0394 in).**

  Take great care as to not contaminate the brake pads or rotor with oil, grease, or brake fluid during the installation.

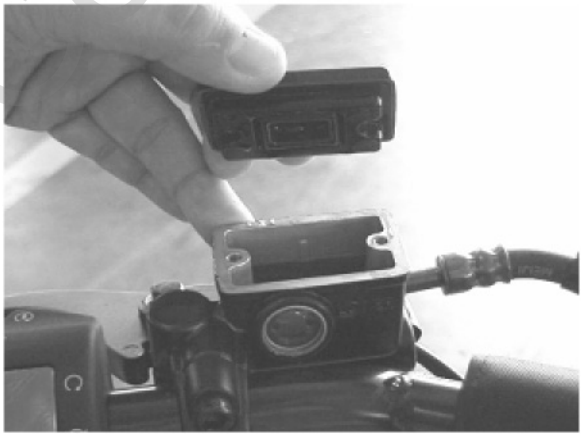
  To begin reinstallation of the brakes, replace the brake rotor on the mounting seat. Reinstall the mounting seat over the axle and secure with the two large axle nuts. Torque to 60-80 N/m (or 4.11-5.48 lb/ft).

- **Press the caliper piston in fully and place the piston pad over the retaining pins and piston. Replace the static pad in the retaining clip and ensure that it is fully engaged and in the proper location.**

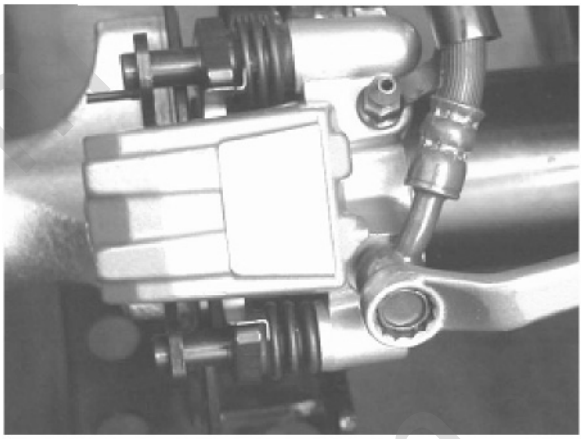
  Slide the caliper back into position over the rotor and replace the two caliper retaining bolts and tighten the torque to 30-40 N/m (or 2.06-2.74 lb/ft).



TO REPLACE THE BRAKE HYDRAULIC OIL:
First, unscrew the bolts and open the cover.

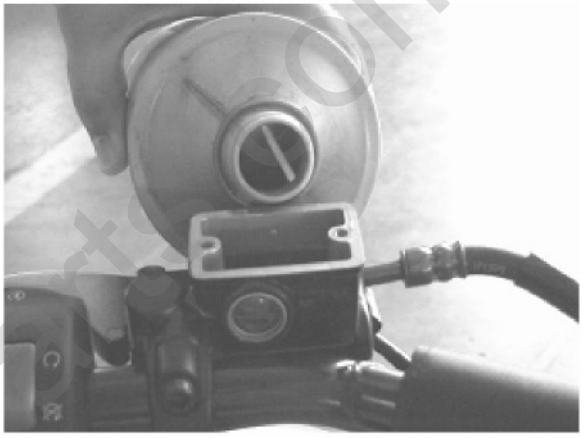


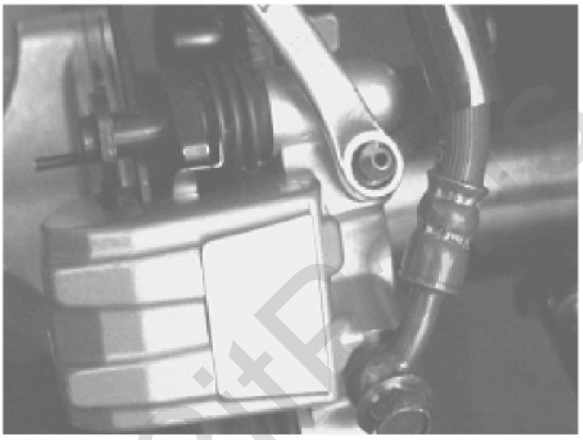
- **Unscrew the bolt and drain the used oil.**
- **Fasten the bolt after the used oil has been drained out completely.**



- **Loosen the bleeder valve on the caliper and depress the brake lever to expel any air in the line. Tighten the bleeder valve before releasing the brake lever. Repeat the process until all air has been purged from the brake line. Tighten the bleeder valve and fill the reservoir with (Dot 3 or Dot 4) brake fluid to a half full level.**

  Reinstall the reservoir cap and cap bolts. Test the brake system and check for any leaks in the brake line connections.

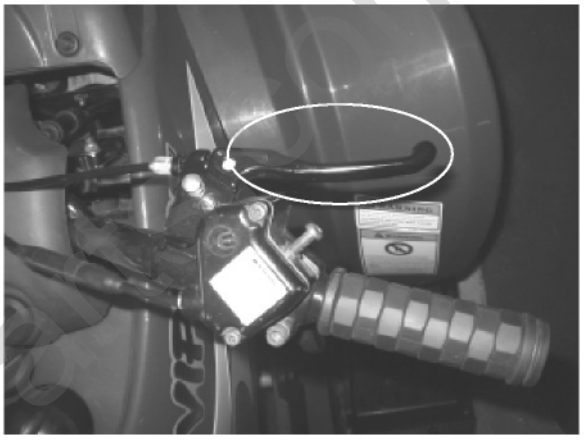




PARKING BRAKE ASSEMBLY (RXL 50M):

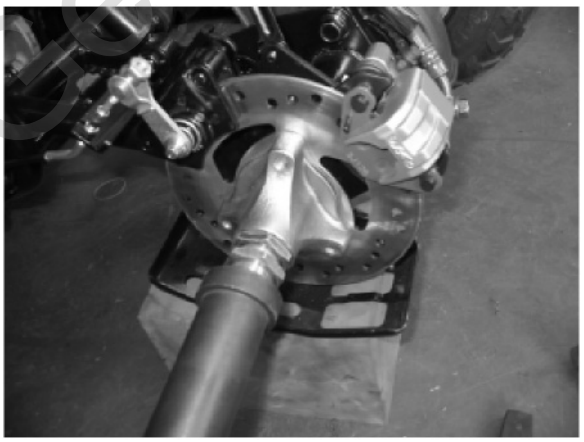
The Viper 50M parking brake is a mechanical caliper on the rear brake rotor. This caliper is controlled via the right hand brake lever.

The Viper 70, 90, and 90R parking breaks utilize the front drum brakes as the parking brake and are controlled by the right hand brake lever.

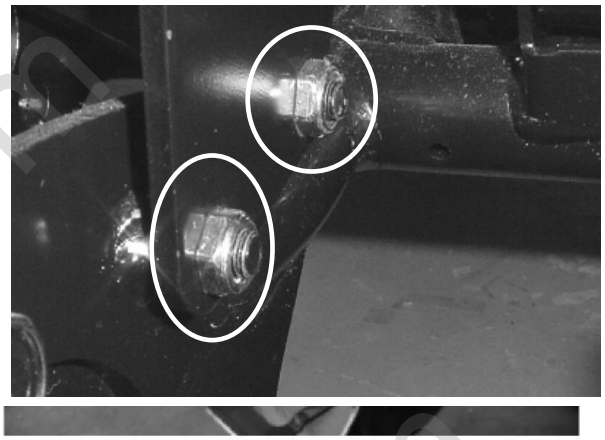


REMOVAL OF THE PARKING BRAKE PAD:

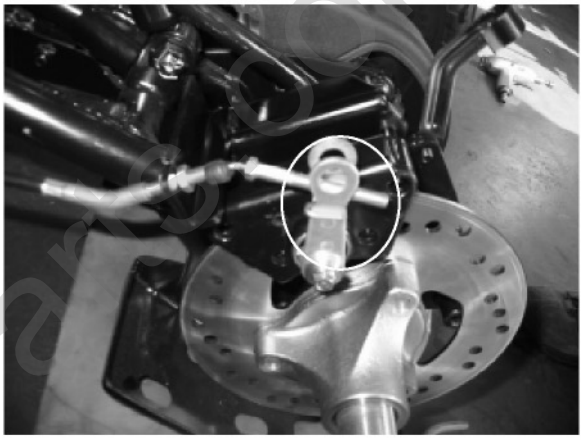
First, remove the tire.



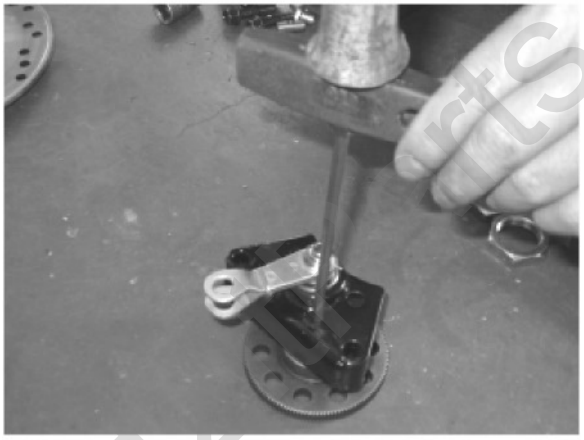
There are two brake caliper fixing bolts on the back of the plate. Use a wrench to remove those two bolts; you can now take the whole caliper out.



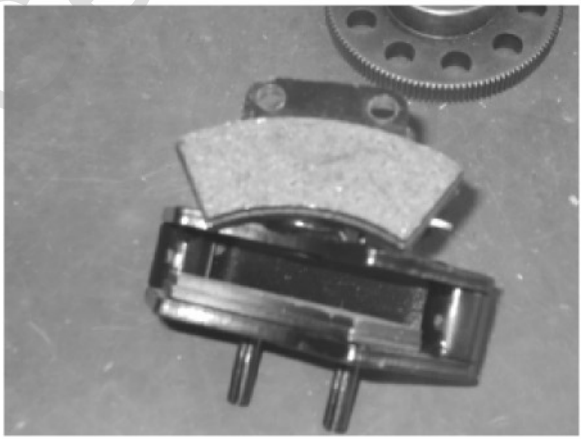
After removing the rear brake caliper, release the brake cable nut. Then, you can take apart the parking brake caliper.



When replacing the brake pads, you must use a hammer and punch to push the pins out. This will release the pad for replacement.

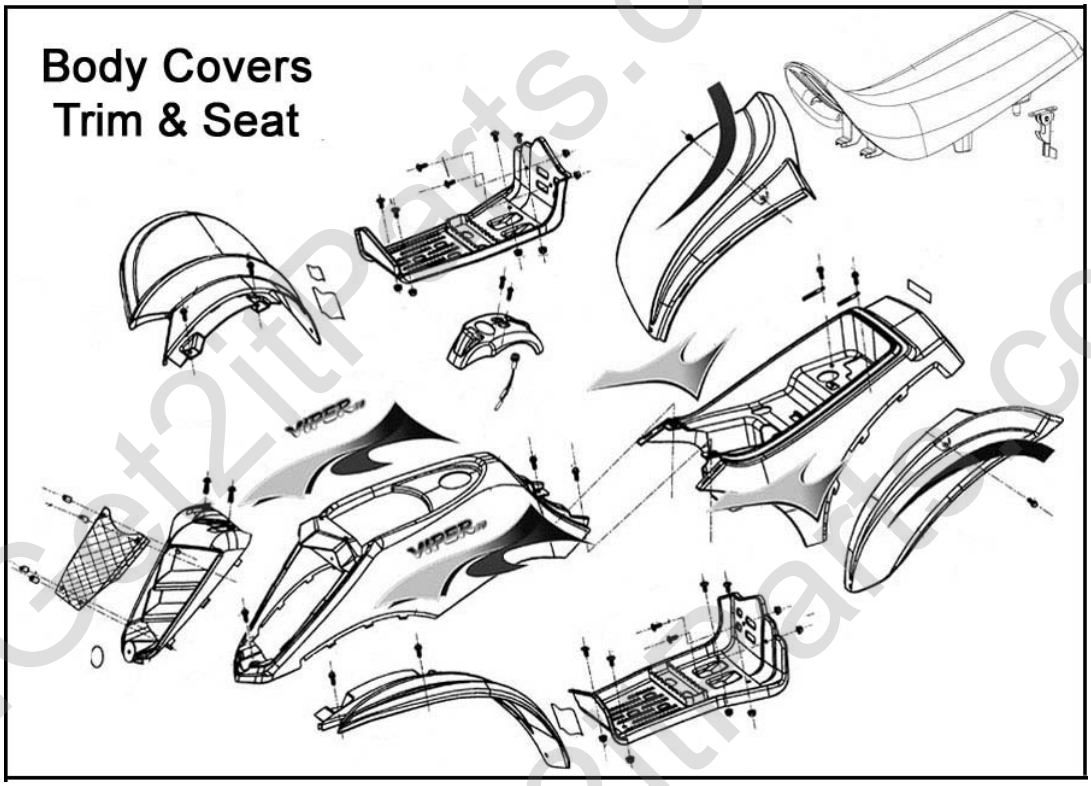


Reassemble the brake caliper using the reverse order of removal.



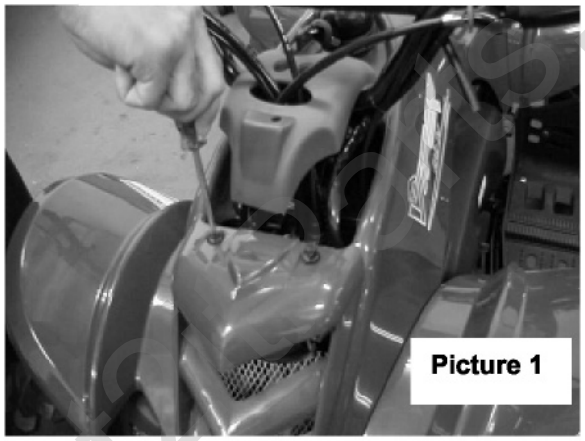
11. FENDERS AND EXHAUST PIPE

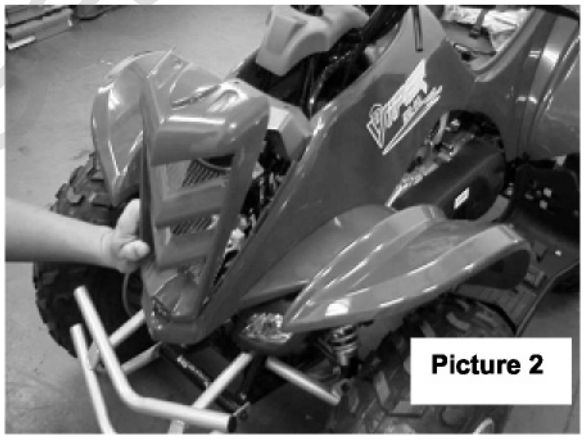
11.1 FENDERS DRAWING



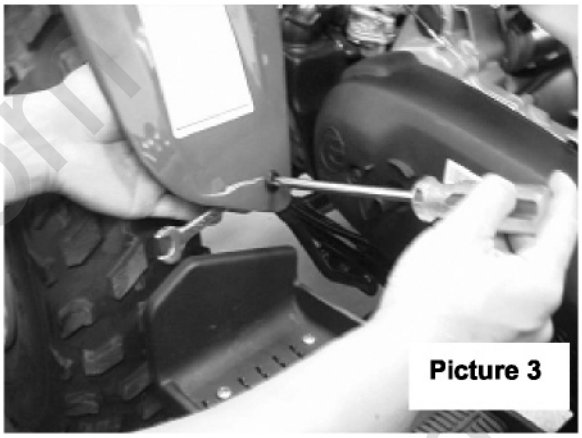
11.2 HOW TO REMOVE THE FENDERS

The rear fender panels must be removed prior to removing the rear body cover.
Remove the seat assembly by releasing the latch located at the rear of the unit under the seat.

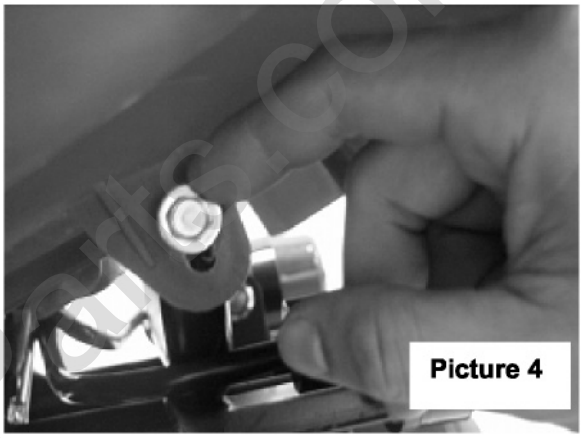

Picture 1


Picture 2

Remove the fender panel retaining bolts as shown in pictures 3 & 4 from both the LH & RH panels. Gently lift the fender panels up to disengage the locking tabs located on the body cover. Use caution when removing the fender panels to make sure you do not break the locking tab located on the bottom edge of the body cover.



Picture 3

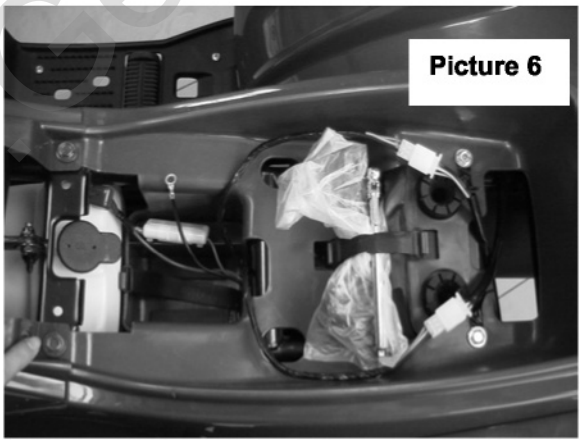


Picture 4

Gently tilt the panel up toward the unit until the locking tabs disengage from the body panel (see picture 5).

Picture 5

To remove the body cover, remove the four body cover retaining bolts located in the seat well (picture 6). Gently slide the rear cover tabs from under the front cover by pulling the rear cover toward the rear of the unit.



Picture 6

To remove the front body cover
(The front body cover must be removed prior to removal of the front fender panels):

1. Remove the front grill assembly by removing the two retaining clips located at the top of the grill panel. Gently tilt the grill cover forward to disengage the locking tabs located on the sides and at the bottom of the grill cover, taking care not to break the locking tabs or slots.

2. Loosen the handle bar cover by removing the two retaining bolts located in the middle of the cover, just under the handlebar.

3. Remove the body cover retaining bolt located at the front of the unit behind the grill panel.

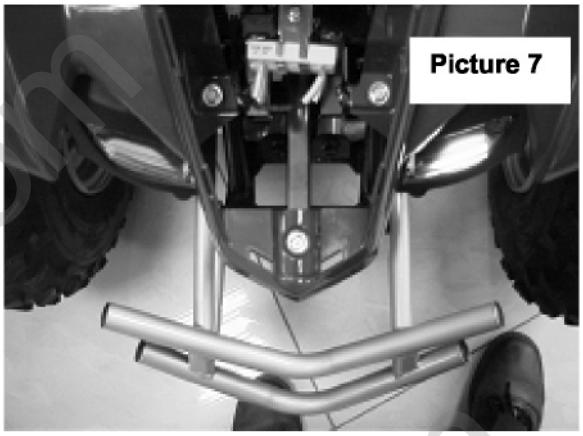
4. Remove the two retaining bolts located under the seat toward the gas tank.

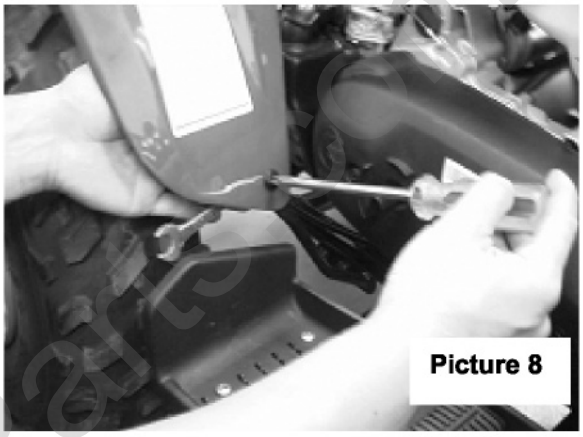
5. Remove the body cover by lifting upwards to disengage the locking tabs from the fender panels, then slide the body cover forward to clear the handlebars.

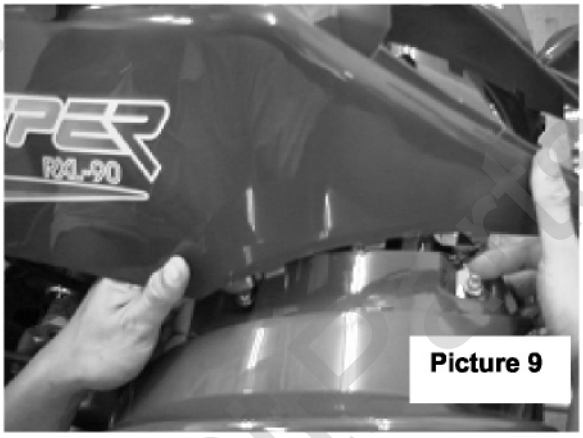
To remove the front fender panels (LH and RH):

1. Remove the three retaining bolts located on the inner edge of the fender panel (one is at the front of the footrest, one is at the mid point of the fender panel, and one is in the front behind the grill panel).

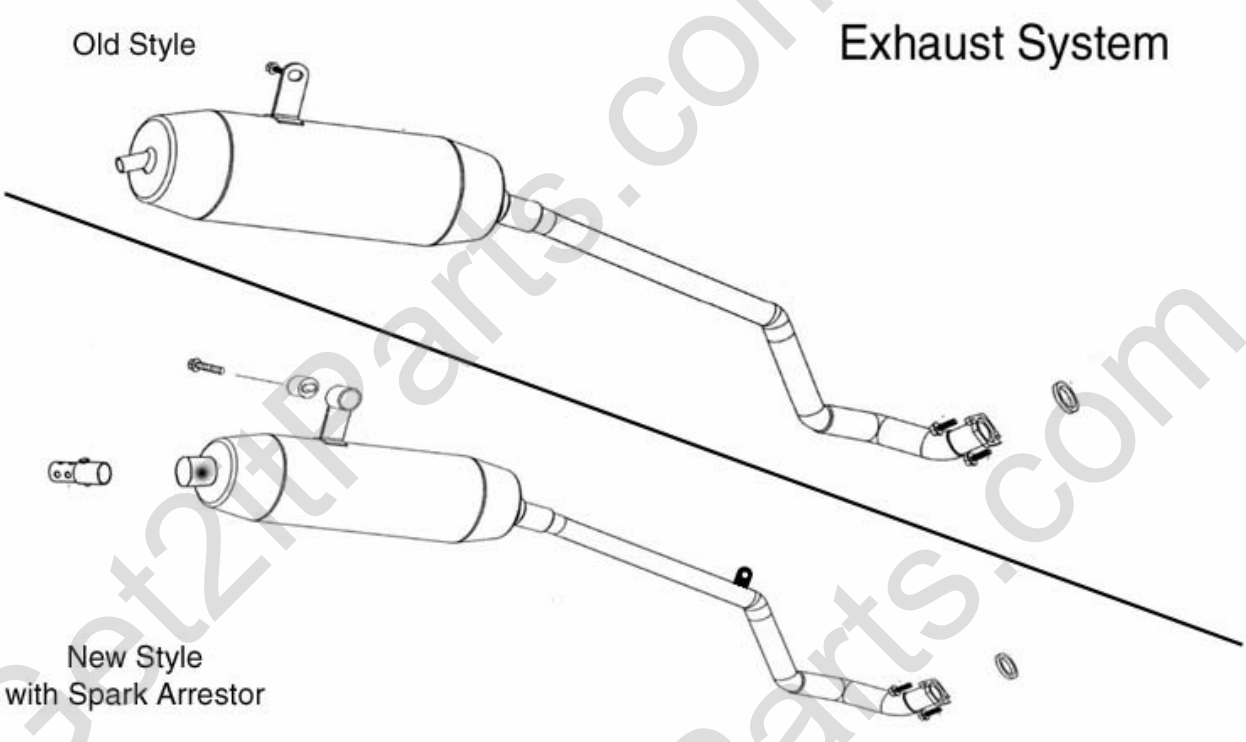
2. Lift the fender panel up and away from the unit.


Picture 7


Picture 8


Picture 9

11.3 EXHAUST PIPE DRAWING

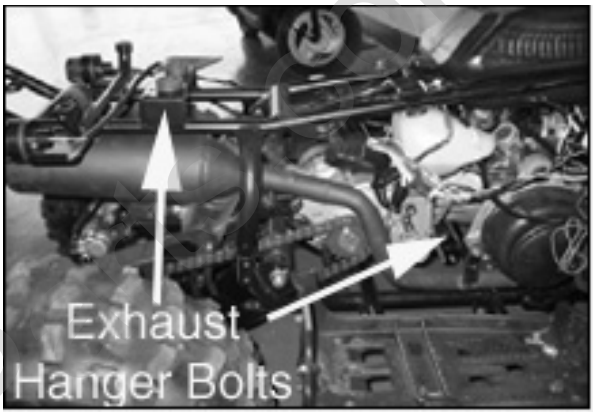


Old style exhaust muffler – Part #;
(No longer Available)

New style exhaust muffler – Part #;
RXL-50M Part # 811121
RXL-50 Part # 811121
RXL-70 Part # 811121
RXL-90 Part # 811121
RXL-90R Part # 811010

11.4 EXHAUST PIPE REMOVAL

- ***Caution:** Do not attempt to perform maintenance on a hot exhaust system. Hot exhaust pipe and muffler pose a serious risk of burn and/or fire hazard.*
- **Remove the two mounting bolts that attach the exhaust pipe to the exhaust port on the under side of the engine cylinder.**
- **Remove the two (2) exhaust pipe hanger mounting bolt from the frame and remove the exhaust pipe/muffler assembly by tilting the front down and sliding the assembly to the rear of the unit.**



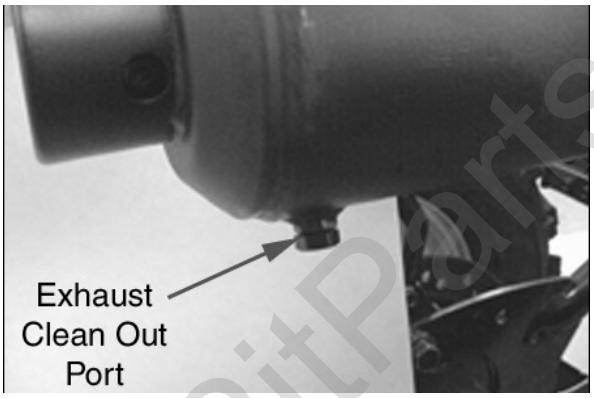
- **Clean the exhaust gasket material from the cylinder head exhaust port completely using a wire brush and scraper. *DO NOT scratch the gasket seat.***
- **When reinstalling the exhaust system, always use a new muffler gasket to ensure there are no exhaust leaks between the cylinder and muffler.**

Muffler gasket – Part # 650243

11.5 SERVICING THE SPARK ARRESTOR

(New style muffler only)

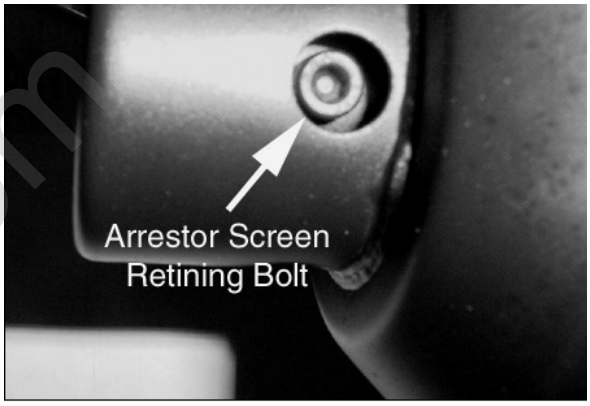
After every 100 hours of operation, the muffler should be cleaned. Remove the clean out bolt, using a 12mm wrench.



After every 60 hours of operation, the Spark Arrestor has to be cleaned. Remove the retaining bolt using a 10mm socket.

Use pliers on the removal bar to turn the sleeve of the Spark Arrestor counterclockwise while applying an outward pressure until the screen is removed.

Clean the screen with an exhaust cleaning solution and replace, securing it by tightening the retaining nut.



After every 200 hours of operation, the Spark Arrestor has to be replaced by removing the retaining bolt using a 10mm socket wrench.

Use pliers on the removal bar to turn the sleeve of the Spark Arrestor counterclockwise while applying an outward pressure until the screen is removed.

Replace with a new Spark Arrestor Screen and secure it by tightening the retaining bolt.

Spark Arrestor Screen – Part # 811008

NOTE: Failure to maintain a clean exhaust system will cause loss of power and can eventually lead to engine damage and/or failure.

12. ELECTRICAL SYSTEM

12.1 TROUBLESHOOTING

Engine starts but dies

- Fuel petcock not in ON position
- Dirty or clogged fuel filter
- Improper ignition timing
- Faulty spark plug

No spark at plug

- Engine stop switch in OFF position
- Remote control switch in OFF position
- Ignition switch in OFF position
- Safety tether switch disengaged
- Faulty spark plug
- Faulty ignition switch
- Faulty ignition coil
- Faulty CDI module
- Improper gaping on pickup coil
- Faulty A/C generator
- Poor connection:
  Between CDI and ignition coil
  Between alternator and CDI unit
  Between CDI and engine stop switch
  Between ignition coil and spark plug
  Between generator and CDI unit

Engine starts but runs poorly

- Exhaust system clogged
- Fuel petcock not fully opened
- Fuel filter clogged or dirty
- Air filter clogged or dirty
- Carburetor vacuum leak
- Carburetor main jet, pilot jet, or needle valve dirty
- Ignition primary circuit:
  - Poor connection of primary contact
  - Improper gap adjustment of pickup coil
  - Faulty ignition coil
  - Faulty A/C generator
  - Faulty CDI module
- Ignition secondary circuit:
  - Poor connection of ignition coil to spark plug
  - Faulty or damaged spark plug
- Improper ignition timing:
  - Faulty A/C generator
  - Faulty CDI module

Intermittent engine power

- Loose battery connection
- Loose charger connection
- Poor ground wire connection

Charging system failure	• Loose connection of battery terminal • Corrosion of battery terminal leads • Loose or poor connection of frame ground wire • Loose connection of A/C generator wires • Abnormal high current draw on battery • Faulty A/C generator • Faulty rectifier • Faulty battery
Starter motor does not turn	• Ignition switch in OFF position • Brake lever is not engaged • Engine stop switch in OFF position • Discharged battery or low battery charge • Faulty starter relay • Starter switch wires disconnected • Faulty starter switch • Starter motor wires disconnected • Faulty starter motor
Starter motor turns, but engine does not start	• Fuel tank empty • Fuel petcock in OFF position • Fuel filter dirty or clogged • Dirty air filter • Spark plug wire disconnected • No spark at plug (see "No Spark" above) • Dirty main jet, pilot jet, or needle valve in carburetor • Loose or poor main ground wire connection • Improper gap adjustment of pickup coil • Faulty A/C generator • Faulty ignition coil • Faulty CDI module
Remote stop switch inoperable	• Remote control battery low or discharged • Remote receiver antenna wire broken or not arrayed • Remote receiver leads disconnected • Remote receiver out of range (30 feet) • Remote receiver obstructed • Loose or poor main ground wire connection • Remote receiver and transmitter not on same frequency • Faulty remote receiver • Faulty remote transmitter

12.2 IGNITION COIL

(For Viper models RXL-50M, 70, 90, and 90R)

Testing the ignition coil:

- **Remove the coil wire cap from the spark plug**
- **Unplug the ignition coil primary leads**
- **Test the primary coil as shown in the picture. Primary coil resistance should range between 0.1-0.3 Ω.**

- **Test the secondary coil as shown in this picture. Secondary coil resistance should range between 7.4-12.0 kΩ.**
- **If the test results fall outside the stated ranges, replace the ignition coil assembly (part # 610189).**

12.3 IGNITION TIMING

The preprogrammed ignition advance is 15°± 3°/4000rpm.

Ignition timing is controlled by the CDI (Capacitive Discharge Ignition) module and is set at the factory via a RCP (ROM Chip Program). The timing cannot be manually adjusted.

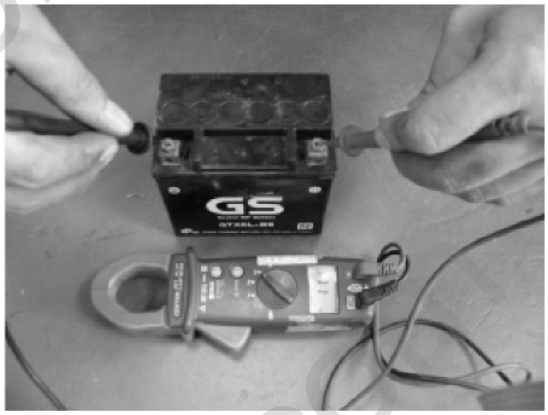
12.4 BATTERY INSPECTION AND MAINTENANCE

CAUTION*: The battery emits flammable and explosive fumes during normal operation. Keep away from sparks, open flame, and other possible sources of ignition. Always provide adequate ventilation during charging and maintenance of the battery. The battery contains sulfuric acid (an electrolyte). Contact with skin or eyes may cause severe burns or blindness. Always wear protective clothing and eye protection when servicing the battery. The electrolyte is toxic. If swallowed, drink large quantities of water or milk and seek medical attention immediately, or contact a poison control center.*

The battery is located under the seat in the battery compartment.

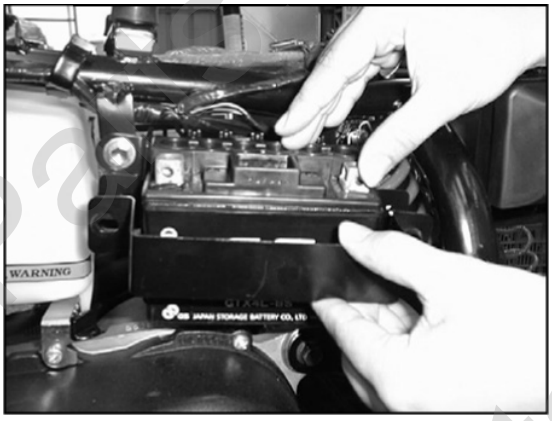
Battery removal:

- **Remove the battery retainer strap**
- **Disconnect the negative (BLACK) battery lead first**
- **Disconnect the positive (RED) battery lead next**
- ***Use caution when disconnecting lead so as not to cause a spark***
- **Remove the battery from the battery compartment**



Testing the battery:

- **Measure the battery voltage using a multi-meter set to Voltage**
- **A fully charged battery should read 13.0-13.5V. An under charged or faulty battery will be below 12.0V.**
- **If the battery is showing under charge condition, charge the battery using a trickle charger at 7 amps for 10 hours. When charging the battery, it should be removed from the unit. Connect the charger lead to the battery before turning on the charging unit. Turn the charging unit off before disconnecting the charging leads from the battery. Retest the battery voltage. If the battery voltage shows an under charge condition after charging, replace the battery (Part # 750173).**

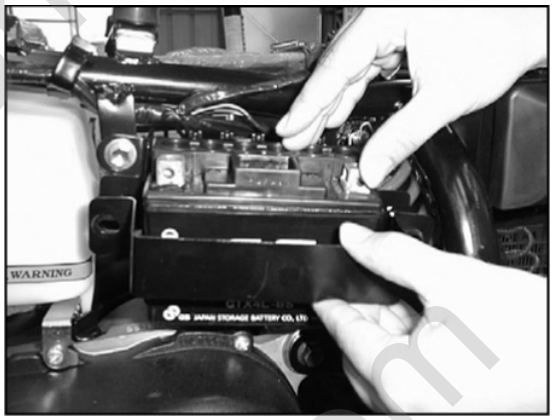


New battery preparation:

- **The new battery is shipped dry with the electrolyte in a separate container. Remove the battery cell caps and install the electrolyte in the battery cells. *CAUTION: Electrolyte contains sulfuric acid that can cause severe burns if contact is made with the skin or eyes.***
- **Allow the battery to completely absorb the electrolyte (approximately one (1) hour). The battery should have a full charge. The battery is a gel acid battery and will not show any liquid electrolyte when fully absorbed.**

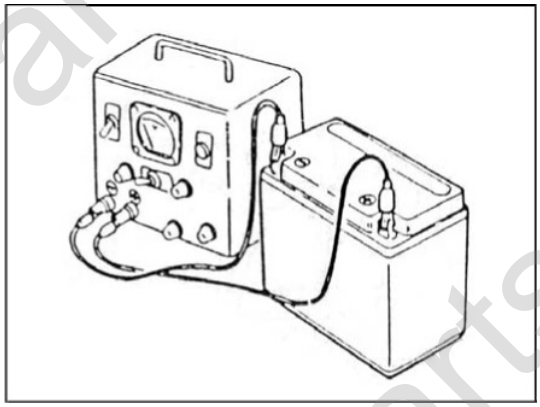
DO NOT **place the new battery on a charger as this can damage the cell plates and make the battery unusable.**

Battery installation:



- **Place the battery in the battery compartment.**
- **Clean the battery terminals and lead connectors of all dirt and corrosion.**
- **Attach the positive (RED) lead to the [+] positive terminal of the battery first.**
- **Attack the negative (BLACK) lead to the [-] negative terminal of the battery next.**
- **Check the lead routing to ensure they are clear of obstruction and do not fall between the battery and unit body where they could be abraded or otherwise damaged.**
- **Attach the battery retainer strap to secure the battery in place.**

Battery charging:



- **If the battery become discharged or shows low voltage you can recharge the battery using a 12 volt battery trickle charger.**
- **Connect the positive lead of the charger to the positive terminal of the battery.**
- **Connect the negative lead of the charger to the negative terminal of the battery.**
- **Turn on the charger and allow the battery to charge from 4 to 6 hours.**
- **Test the battery voltage after charging it should give a reading of between 12-and 13 volts.**
- **If after charging the battery is still indication a low voltage or the battery will not hold the charge for more than a day or two the battery should be replaced.**

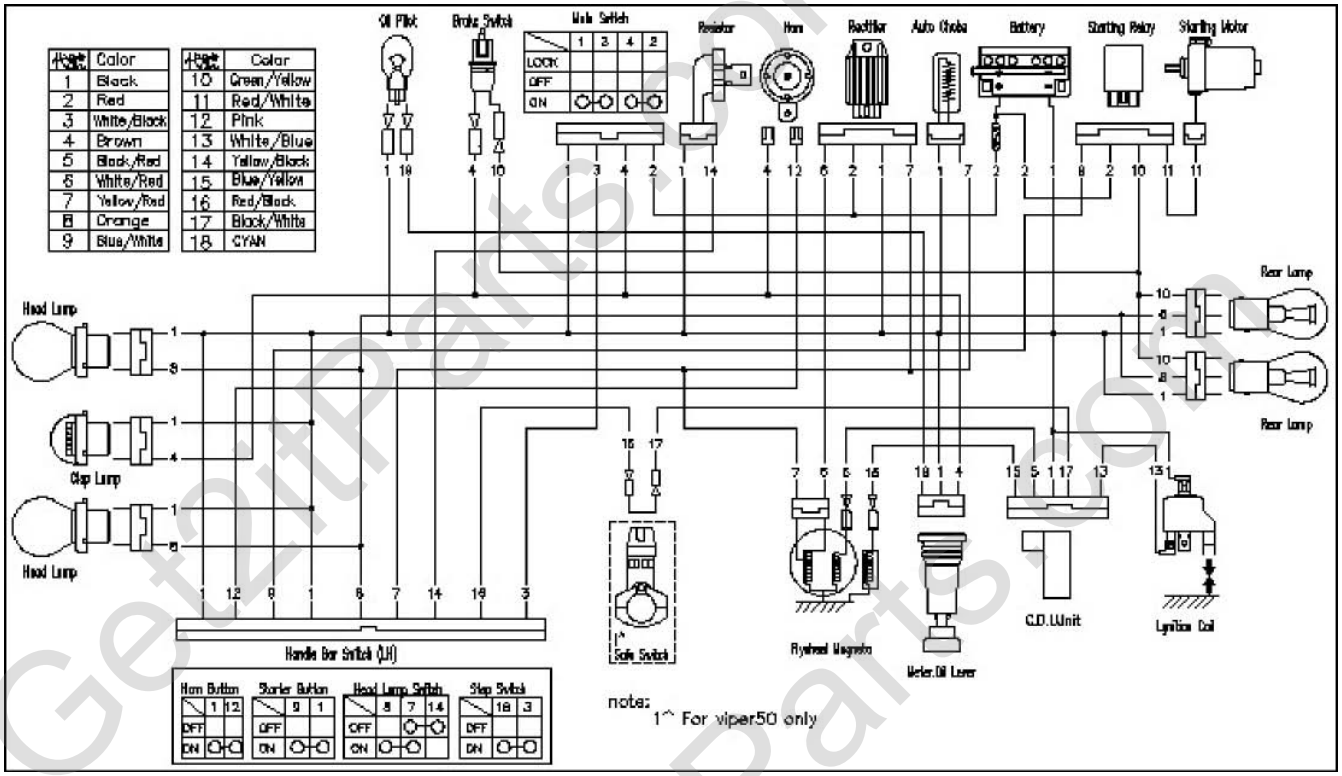
ETON recommends replacing the battery every two years for optimal performance.

Battery Storage:

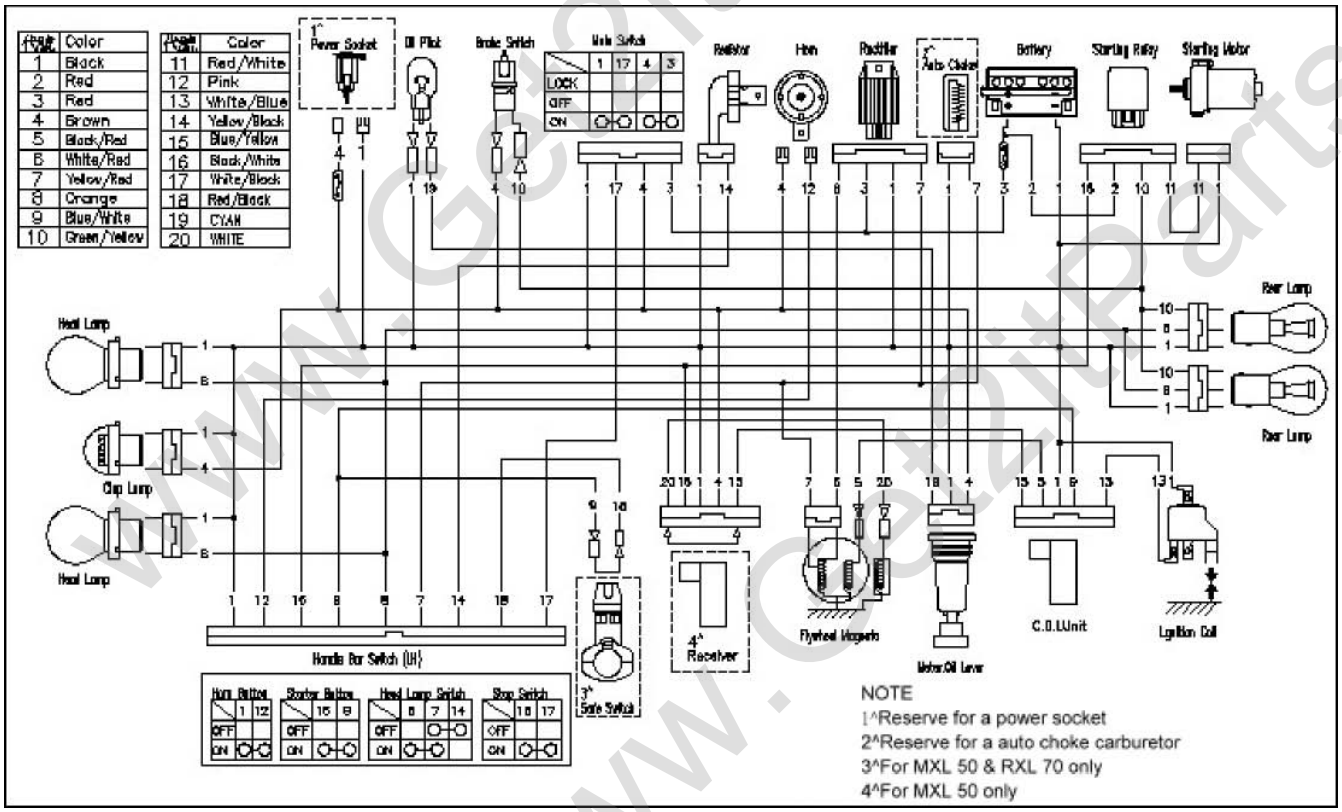
If you are not going to use your vehicle for an extend period you should remove the battery and store it in a location that will insure that battery will not freeze.

DO NOT Store the battery on a concert surface as it can draw the charge from the battery and damage the battery plates.

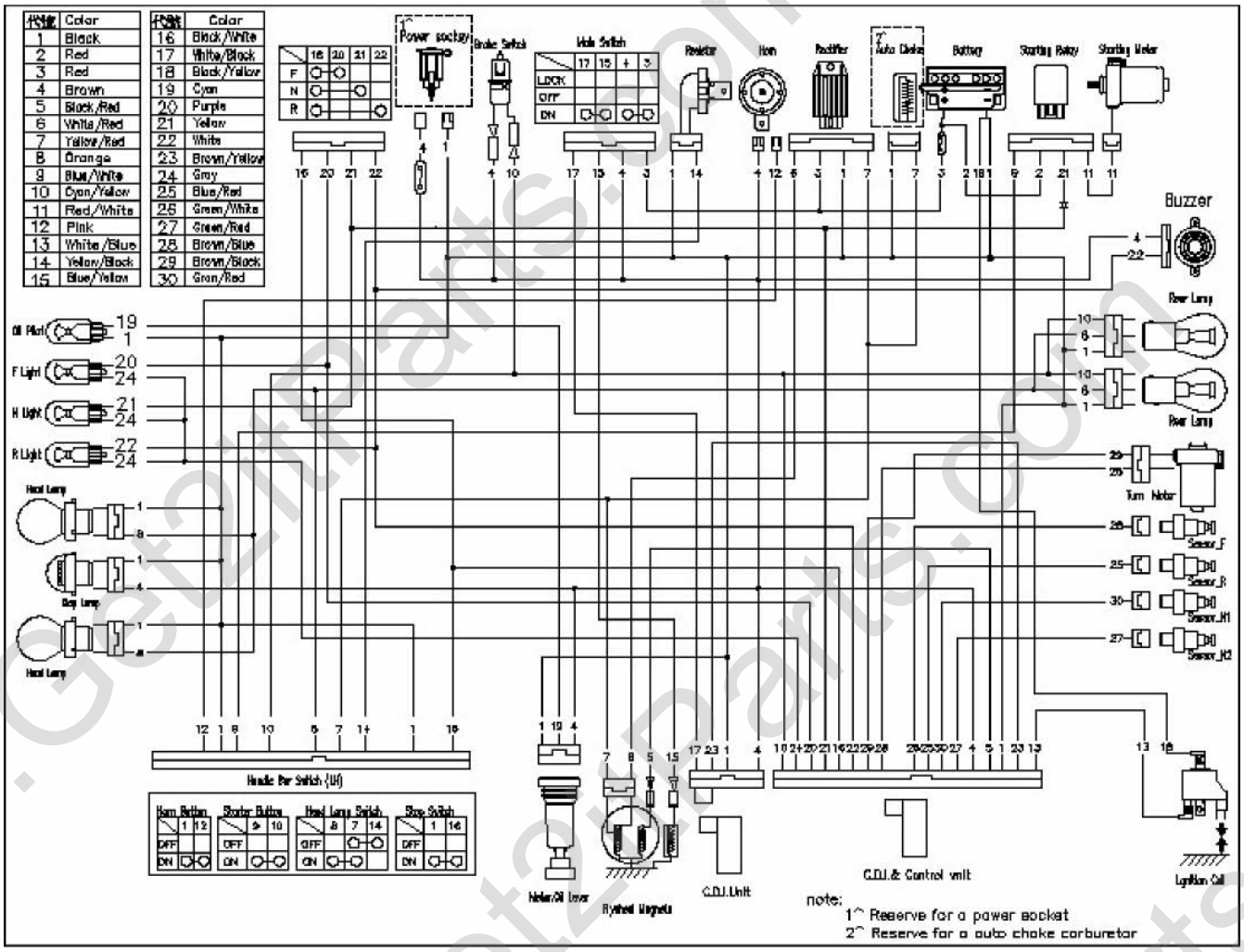
12.5 WIRING DIAGRAMS



The wiring diagram above is for RXL 50



The wiring diagram above is for RXL 70 / 90 and RXL 50M



The wiring diagram above is for RXL 90R

13. TROUBLESHOOTING

13.1 ENGINE DOES NOT START

No fuel flow to carburetor	• No fuel In fuel tank • Clogged float valve • Clogged fuel tank cap breather hole • Clogged at fuel tube
Weak or no spark	• Faulty spark plug • Fouled spark plug • Faulty CDI unit • Faulty alternator • Faulty engine stop switch • Poorly connected, broken, or shorted wires • Broken or shorted ignition coil • Broken or shorted spark plug wire • Faulty pulse generator • Faulty ignition switch
Low compression	• Worn cylinder and piston rings • Damaged cylinder head gasket
Engine starts but dies	• Auto choke off or damaged • Auto choke power wire disconnected • Improperly adjusted air screw • Improperly ignition timing • Fuel / air mixture ratio is too lean
Engine does not fire	• Carburetor flooded • Improperly adjusted air screw • Fuel / air mixture ratio too rich • Auto choke stuck or damaged • Air cleaner dirty

13.2 POOR PERFORMANCE AT LOW AND IDLE SPEEDS

Bad ignition timing	• **Faulty CDI unit or pulse generator**
Restricted fuel flow	• **Improperly adjusted air screw**
Leaking intake pipe	• **Deteriorated insulator o-ring** • **Loose carburetor**
Weak or intermittent spark	• **Loose or disconnected ignition system wires** • **Faulty, wet, or fouled spark plug** • **Faulty alternator** • **Faulty CDI unit** • **Faulty ignition switch** • **Faulty ignition coil** • **Faulty pulse generator** • **Broken or shorted spark plug wire** • **Faulty engine stop switch**

13.3 POOR PERFORMANCE AT HIGH SPEED

Bad ignition timing	• **Faulty CDI unit** • **Faulty pulse generator**
Restricted fuel flow	• **Lack of fuel in tank** • **Clogged fuel line** • **Clogged fuel valve** • **Clogged fuel tank breather hole**
Clogged carburetor jets	• **Clean with high pressure air gun**
Dirty air filter	• **Clean the filter**

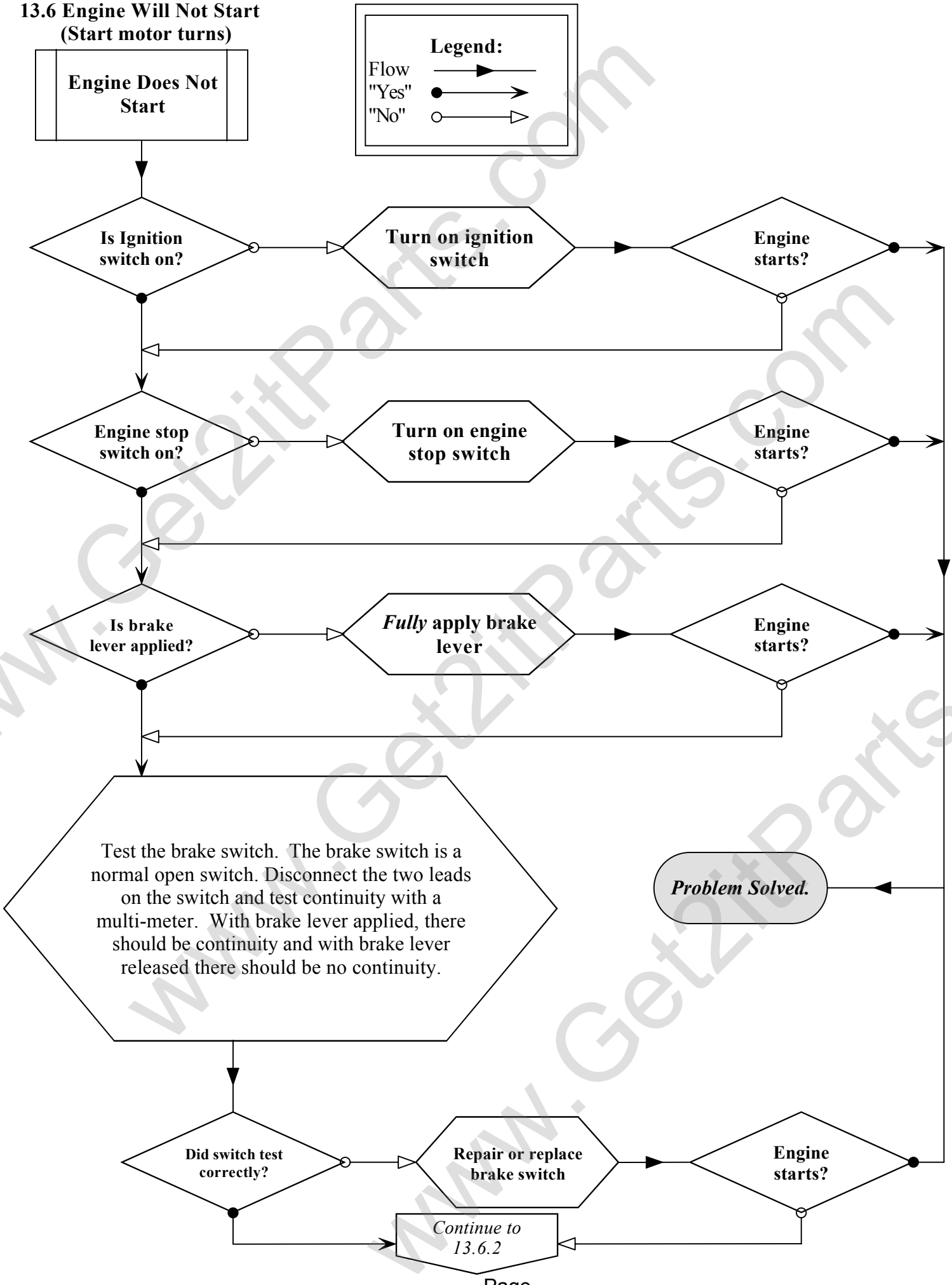
13.4 LOSS OF POWER

Wheels do not spin freely	• Brake dragging • Drive chain too tight • Damaged wheel bearing • Wheel bearing needs lubrication
Low tire pressure	• Punctured tire • Faulty tire valve
Engine speed does not increase when accelerated lightly	• Fuel / air mixture ratio too rich or lean • Clogged in air cleaner • Clogged in muffler • Restricted fuel flow • Clogged fuel tank cap breather hole
Bad ignition timing	• Faulty pulse generator • Faulty CDI unit
Cylinder compression too low	• Leaking head gasket • Worn cylinder and piston rings
Clogged carburetor	• Clean
Fouled or discolored spark plug	• Clean the spark plug • Spark plug is incorrect heat range
Engine overheating	• Excessive carbon deposited in Combustion chamber • Wrong type of fuel • Fuel / air mixture ratio is lean • Use of poor quality fuel
Engine knocking at high speed	• Worn piston and cylinder • Fuel / air mixture ratio is lean • Wrong type of fuel • Ignition timing too advanced • Excessive carbon deposited in Combustion chamber

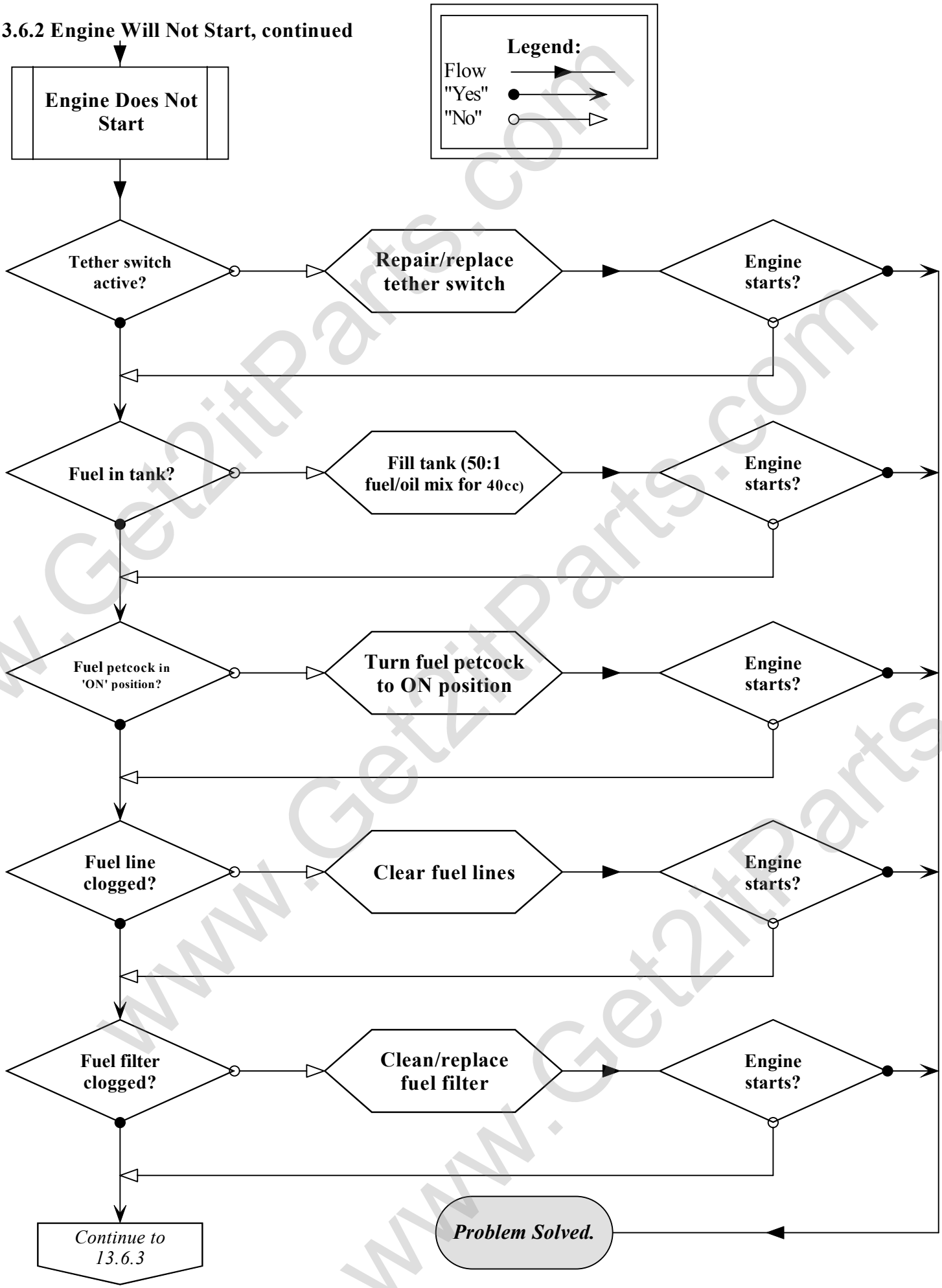
13.5 POOR HANDLING

Steering is heavy	• **Damaged steering bearing** • **Damaged steering shaft bushing**
One wheel is wobbling	• **Bent rim** • **Improperly installed wheel hub** • **Excessive wheel bearing play** • **Bent swing arm** • **Bent frame** • **Swing arm pivot bushing excessively worn**
Vehicle pulls to one side	• **Bent tie-rod** • **Incorrect tie-rod adjustment** • **Rear tie air pressure incorrect** • **Improper wheel alignment** • **Bent frame**

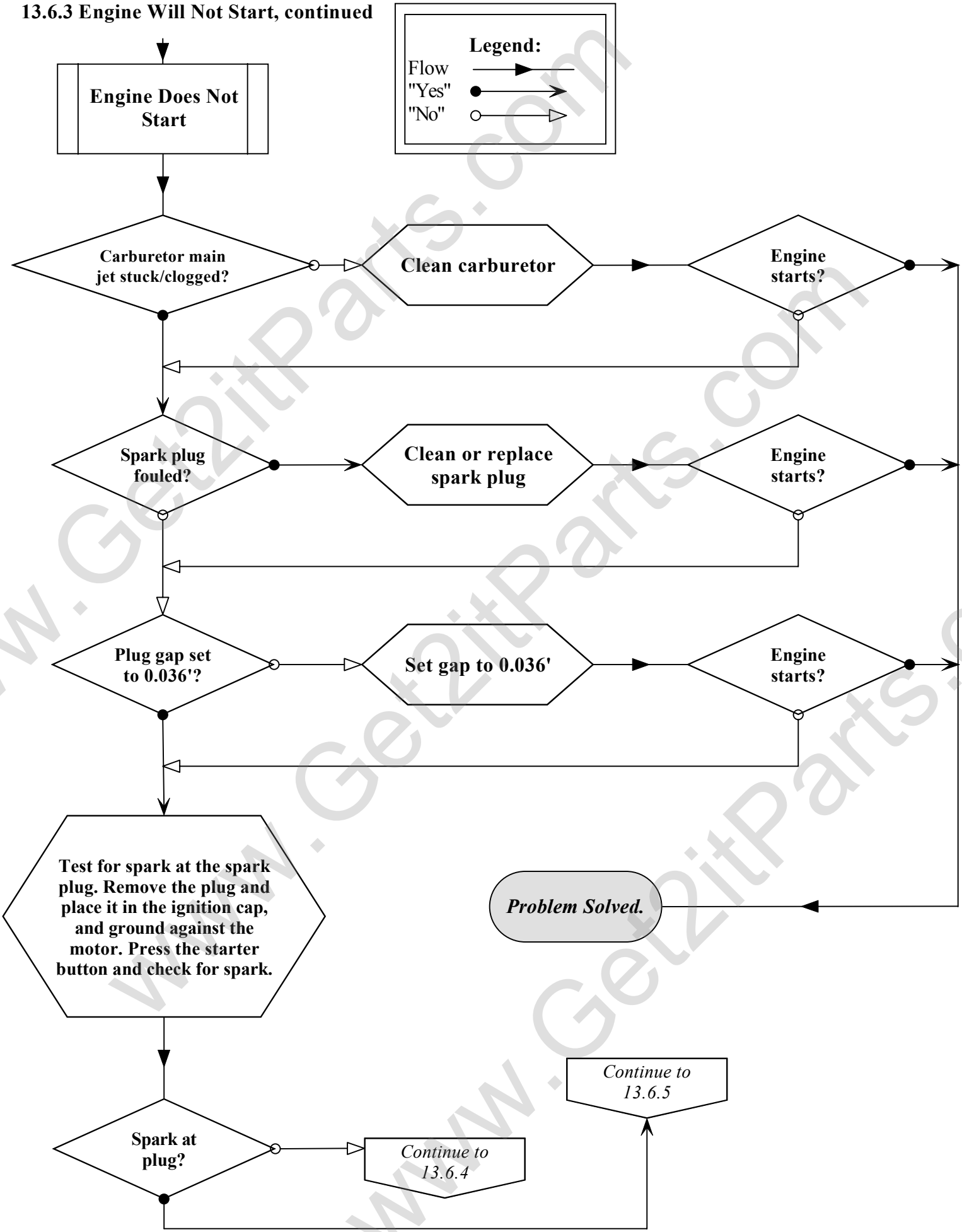
13.6 Engine Will Not Start (Start motor turns)



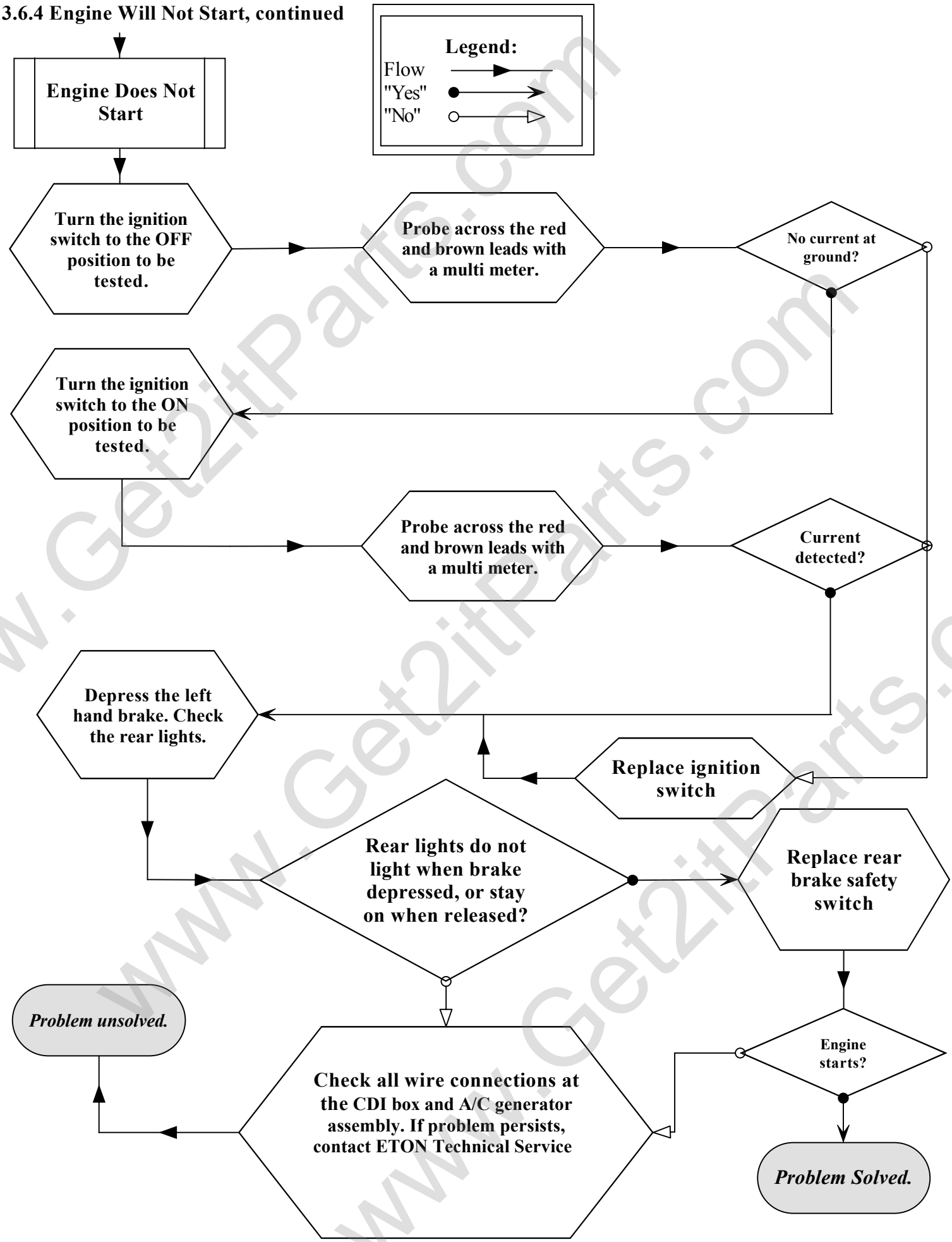
13.6.2 Engine Will Not Start, continued



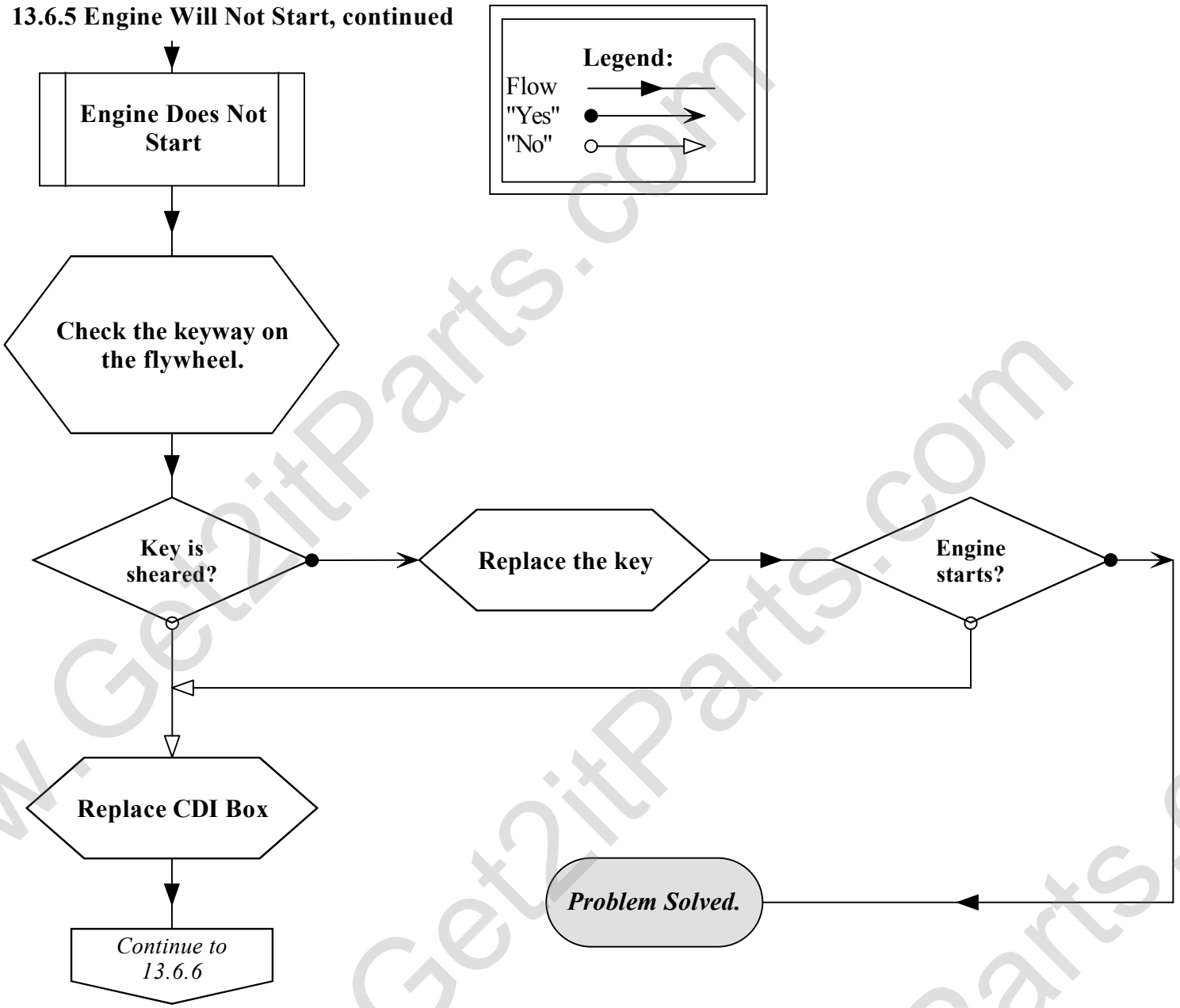
13.6.3 Engine Will Not Start, continued



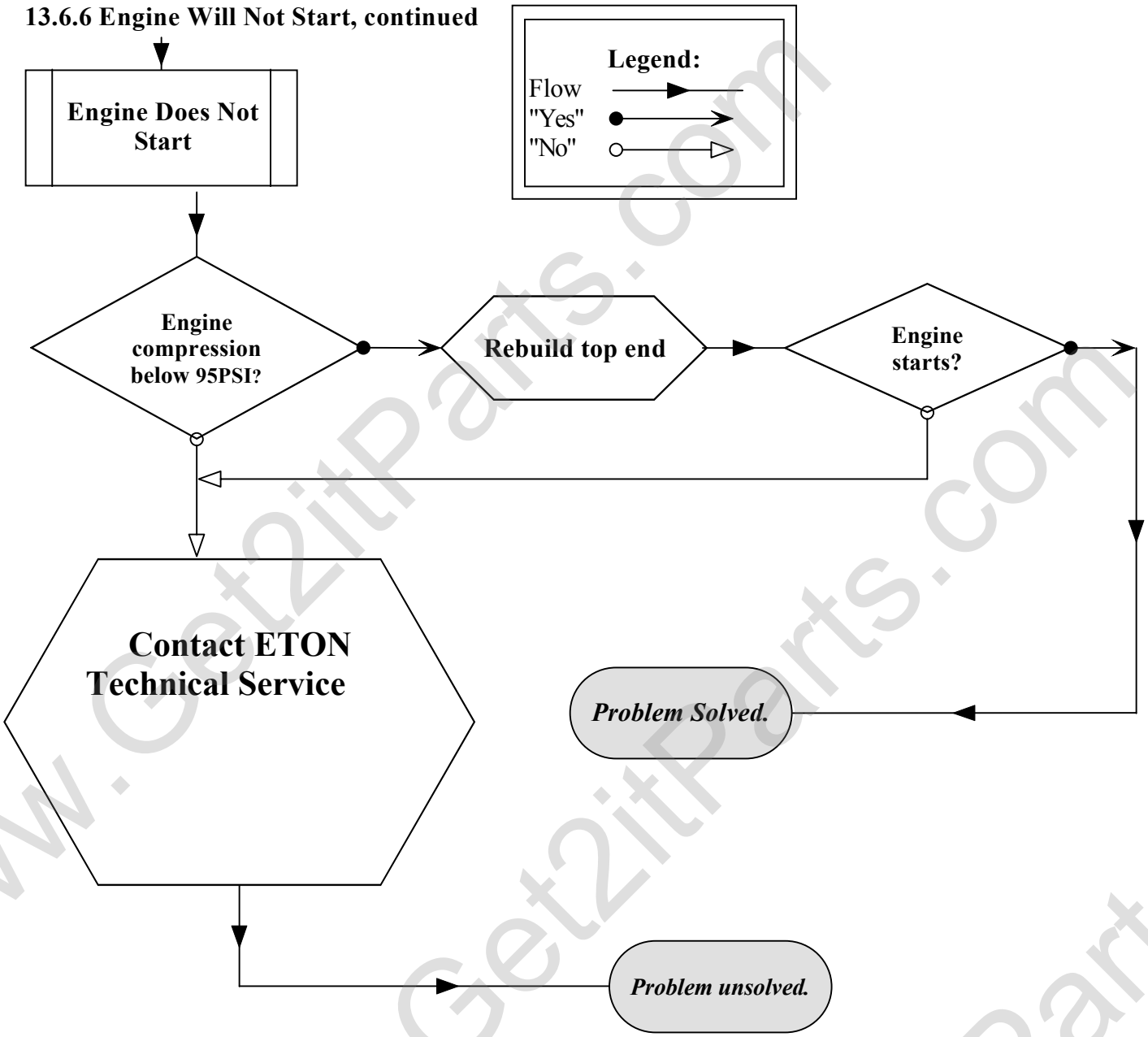
13.6.4 Engine Will Not Start, continued



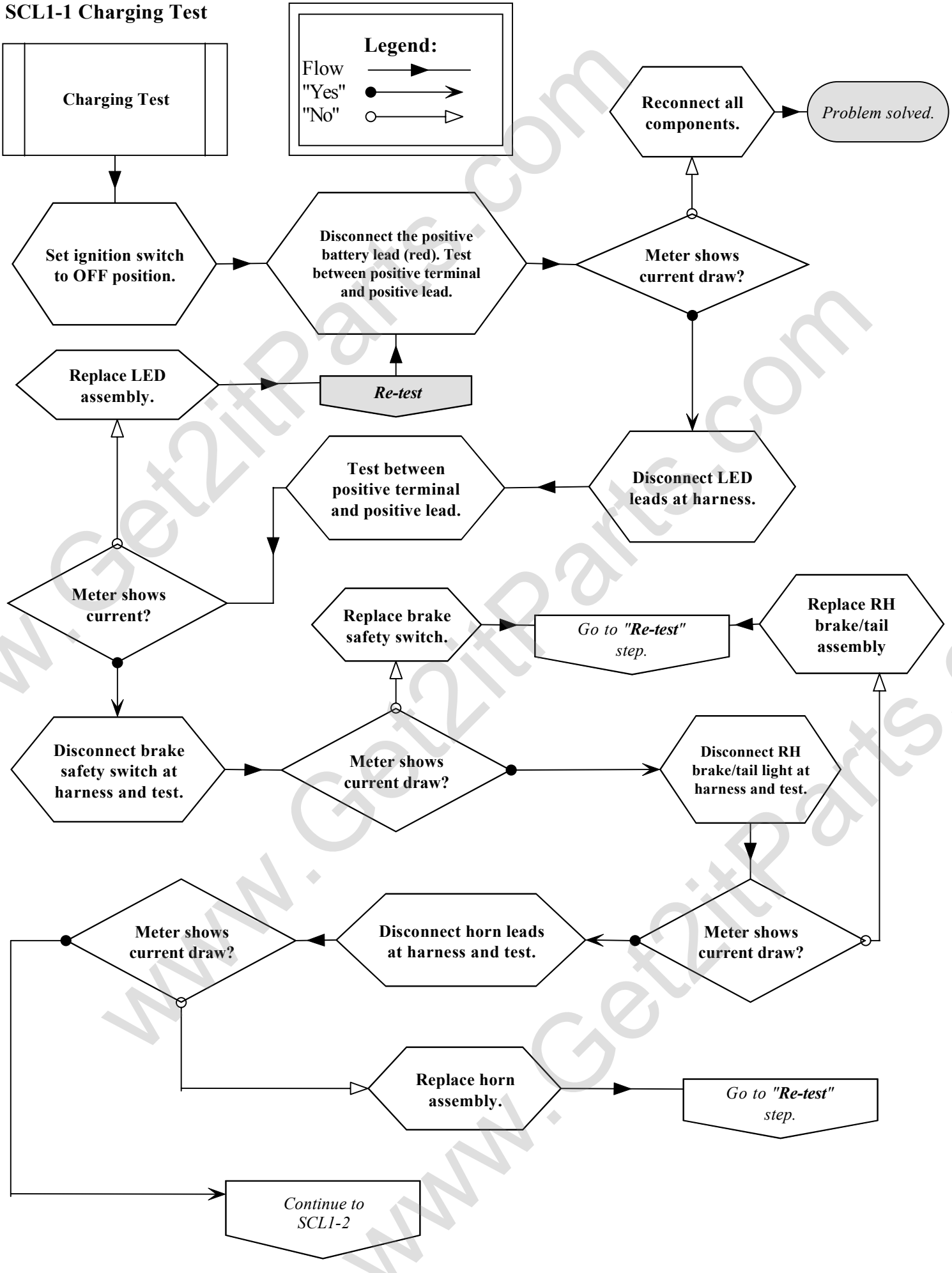
13.6.5 Engine Will Not Start, continued



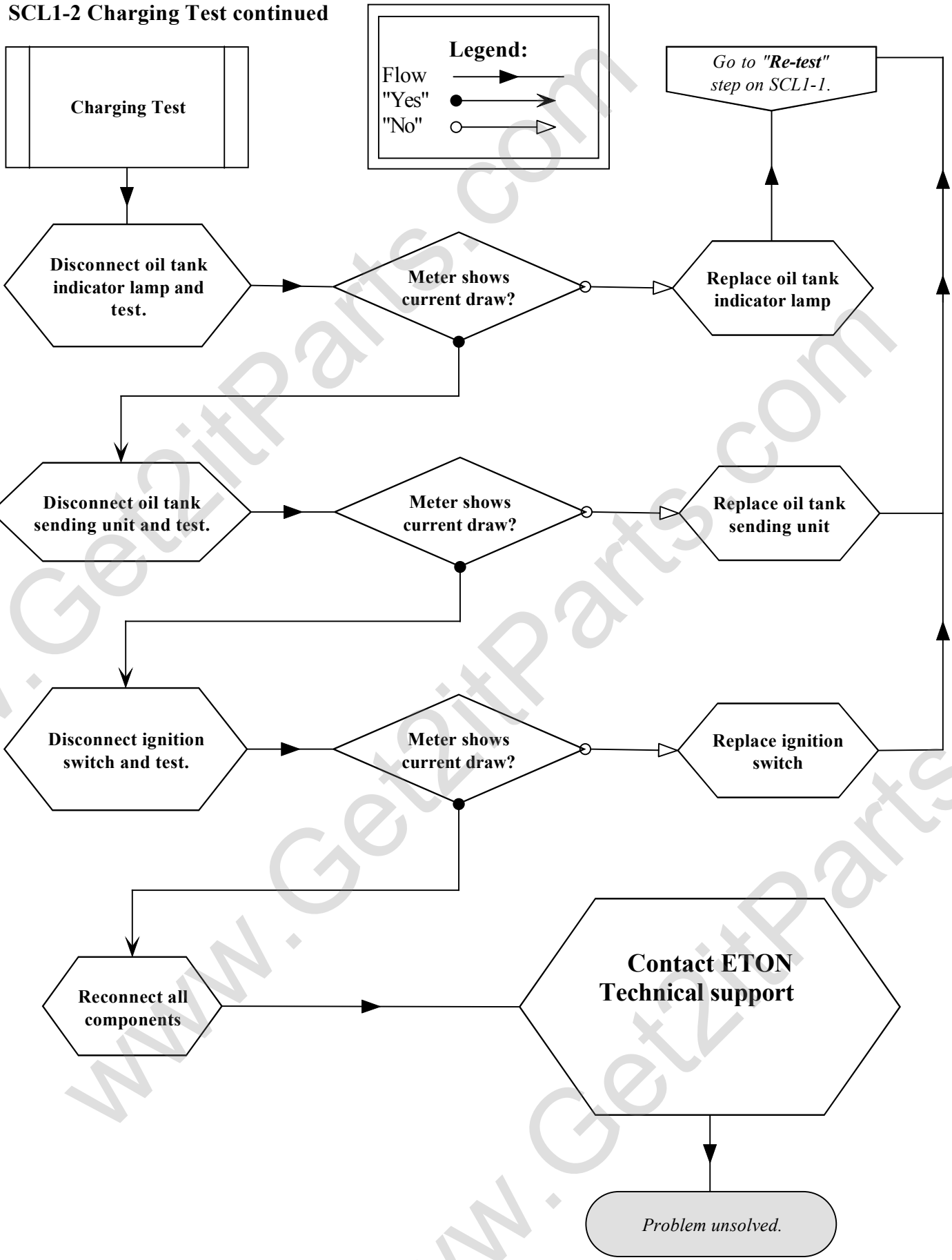
13.6.6 Engine Will Not Start, continued



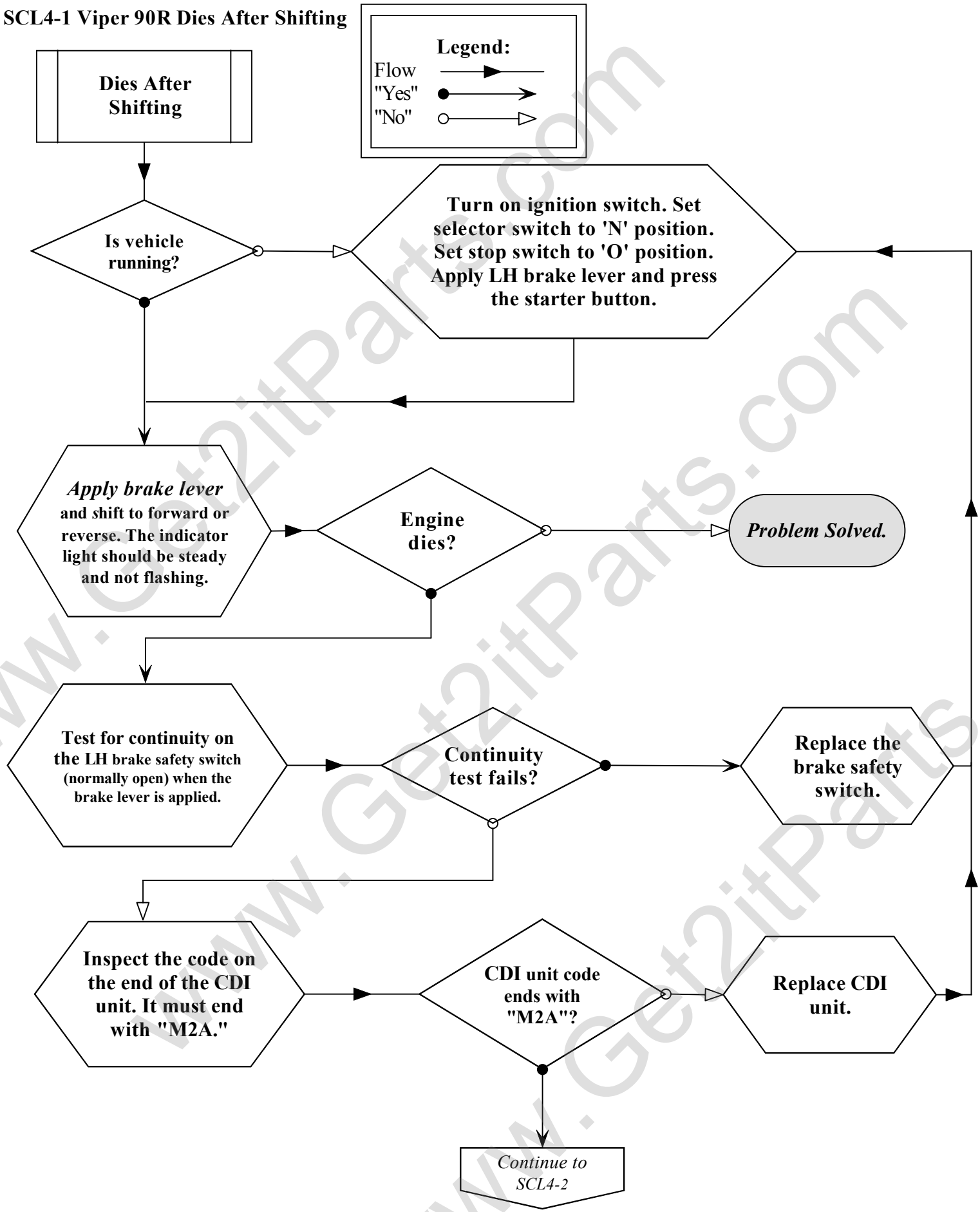
SCL1-1 Charging Test



SCL1-2 Charging Test continued



SCL4-1 Viper 90R Dies After Shifting

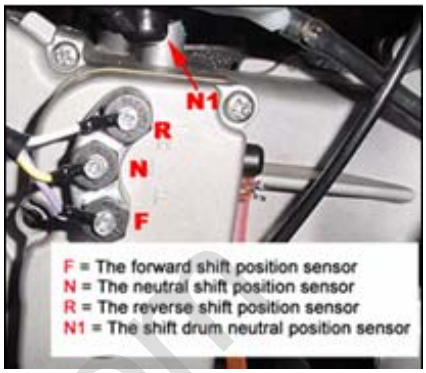


Legend:
Flow
"Yes"
"No"

Dies After Shifting

Verify the wiring harness sensors using the table and image.

	Type A	Type B
Reverse:	Blue/Red	White
Neutral:	Gray/Red	Yellow/White
Forward:	Green/White	Purple
N1:	Yellow/Blue	Green/Red



Wiring harness sensors correspond to either 'A' or 'B' and are undamaged?

Repair if possible or replace harness.

Go back to SCL4-2 start

Fig. 1

(Note: always apply the LH brake when using the selector switch) **Turn ignition switch to 'O', and place shift selector in 'F'. Probe the F sensor to ground and check for continuity.**

Continuity exists?

Verify the sensor size limit (fig 1) and replace if necessary.

Place shift selector in 'N' position. Probe the 'N' and 'N1' sensors to ground and check for continuity.

Continuity exists?

Verify the sensor size limit (fig 1) and replace if necessary.

Continue to SCL4-3

SCL4-3 Viper 90R Dies After Shifting, continued

Legend:
Flow
"Yes"
"No"

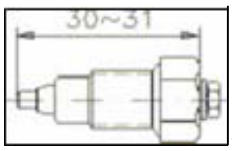


Fig. 1

Dies After Shifting

Place shift selector in 'R' position. Probe the 'R' and sensor to ground and check for continuity.

Continuity exists?

Verify the sensor size limit (fig 1) and replace if necessary.

Go back to SCL4-2 start

Check ALL connections, starting at the CDI, and all grounds.

Check the remote receiver loop (while/black to brown/yellow connection). Bypass the remote switch (if installed) by connecting the two leads to each other and removing the switch from the loop.

Check for continuity on the selector switch.

Continuity exists?

Replace the selector switch.

Go back to SCL4-1 start

Turn ignition switch to OFF position. Test across ignition switch red and brown leads. There should be no continuity.

Continuity exists?

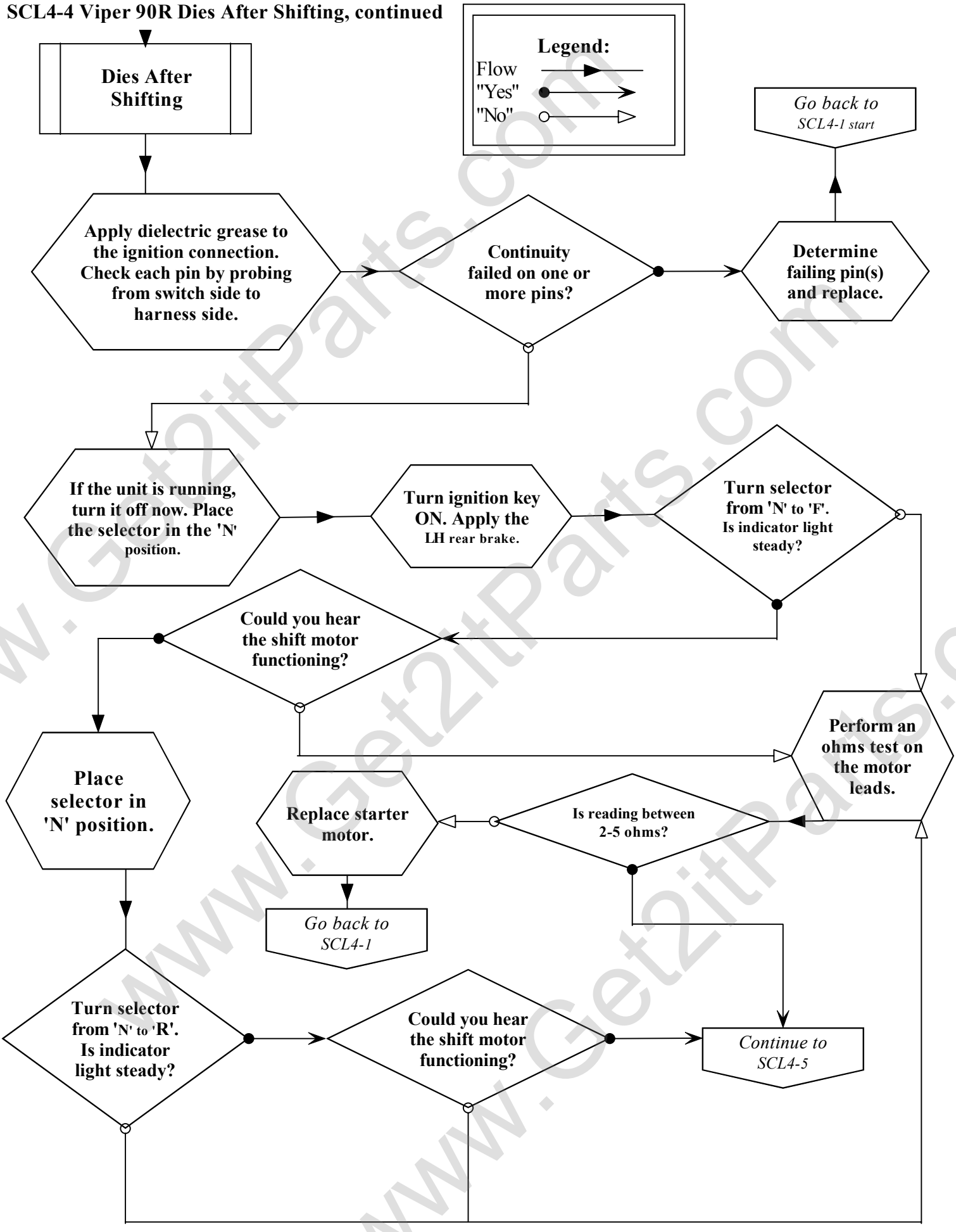
Replace the ignition switch.

Turn ignition switch to ON position. Test across ignition switch red and brown leads.

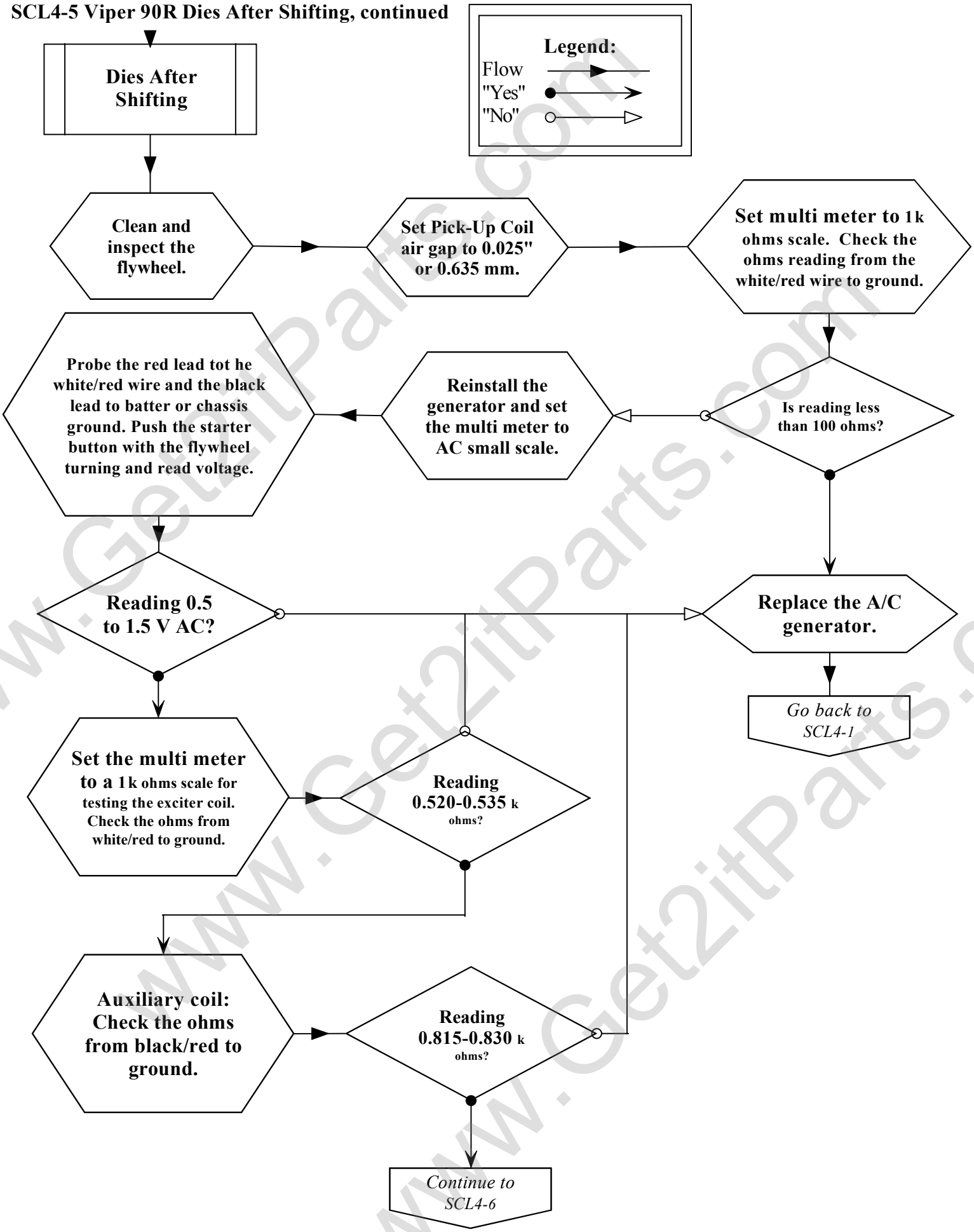
Continuity exists?

Continue to SCL4-4

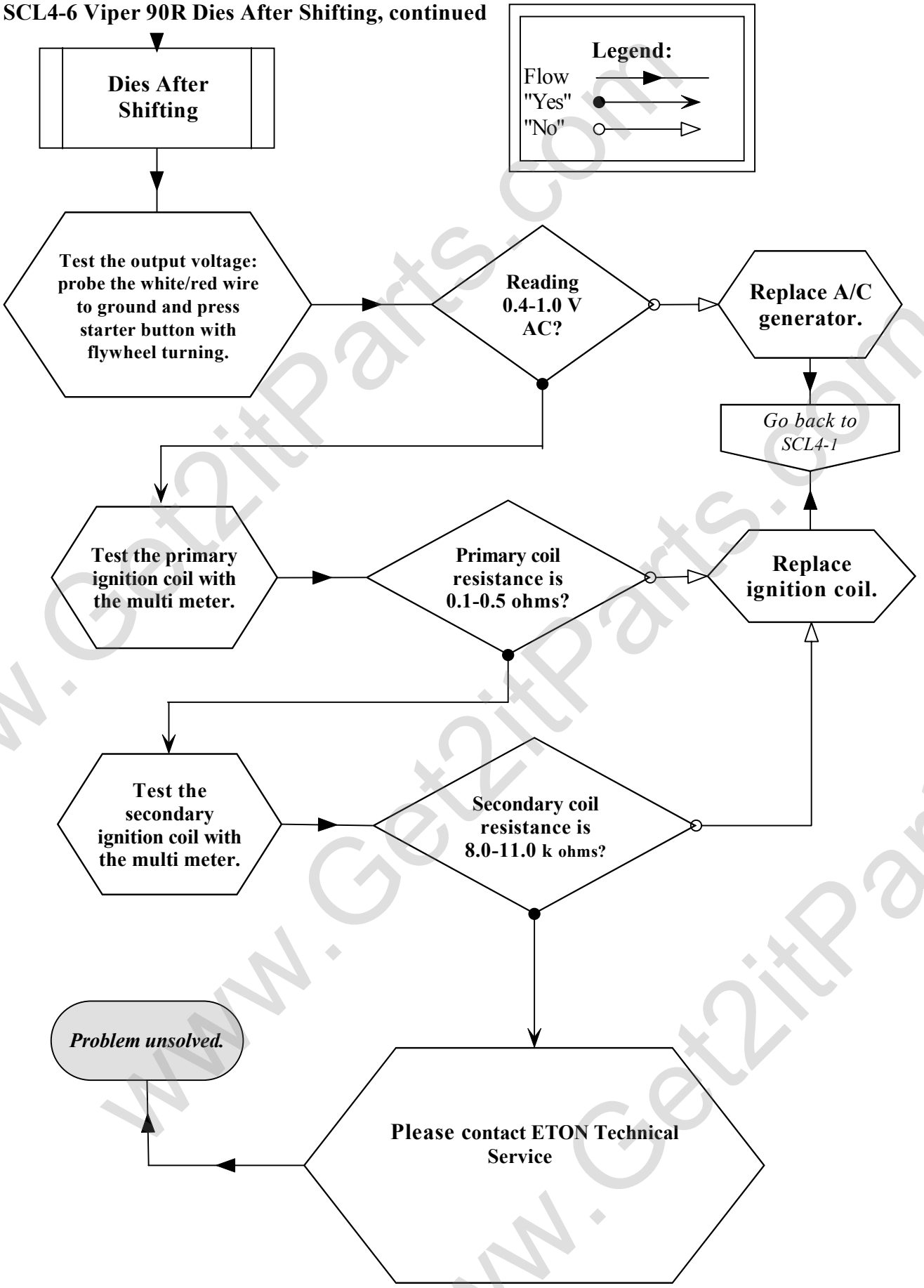
SCL4-4 Viper 90R Dies After Shifting, continued



SCL4-5 Viper 90R Dies After Shifting, continued



SCL4-6 Viper 90R Dies After Shifting, continued



NOTES:

NOTES:

ETON America, LLC

Service Bulletin

Bulletin: **SB-0003**
Date: 05/01/2000

Air/Fuel Ratio adjusting procedure
50cc 70cc & 90cc 2 Cycle Engines

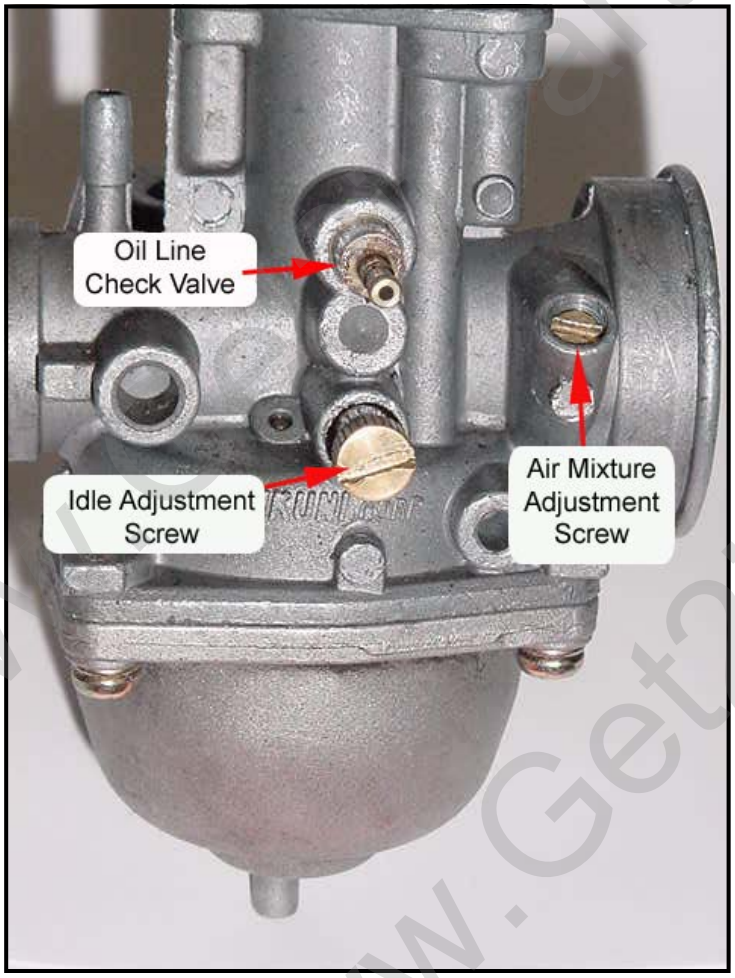
Air/Fuel Ratio adjusting procedure

Step 1: Air adjusting screw,

Turn adjusting screw all the way in then back off
¾ to 1¼ turn on 50 & 70cc engine
1 to 1½ turns on 90cc engine.

Step 2: Adjust idle RPM. (Warm Engine)

Turn the adjustment screw in or out to adjust the engine idle speed to Between 1700—1900 RPM.



ETON America, LLC

Service Bulletin

Bulletin No:	**0008**
Date:	**08/25/2000**

Technical Tips

1. PAPER FUEL FILTERS -CAUSE: RESTRICTIVE FUEL FLOW

THEY CLOG EASIER
THEY WILL SHOW FUEL IN FILTER, BUT THERE WILL BE NO FUEL IN CARBURATER BOWL.
REPAIR: REPLACE WITH AN E-Z FLO WITH FILTER OR A STONE TYPE FILTER.

2. EXHAUST RESTRICTERS-CAUSE: LACK OF POWER

LOSS OF POWER
FOULED PLUGS
REPAIR: CLEAN RESTRICTER ONCE A MONTH OR REMOVE RESTRICTER AND USE THROTTLE STOP SCREW.

3. AIR FILTERS ----------CAUSE: LACK / LOSS OF POWER

LEAN CONDITIONS
POOR THROTTLE RESPONSE
REPAIR: CLEAN AFTER EVERY 3-5 RIDES, MORE FREQUENTLY IN DUSTY CONDITIONS.
USE A GOOD QUALITY FOAM FILTER SPRAY.(BEL-RAY FOAM FILTER SPRAY)

4. BATTERIES----THE BATTERIES FOR ALL ETON VEHICLES ARE MAINTANCE-FREE .

PROPER SERVICE PROCEDURES ARE AS FOLLOWS:

1. FILL BATTERY WITH BATTERY PACK SUPPLIED.
2. REMOVE FUNNEL AND LET BATTERY STAND WITH CAP OFF FOR AT LEAST 1 HR.
3. ALL FLUID IN BATTERY SHOULD ABSORBED BY BATTERY PLATES BEFORE CAP IS INSTALLED.
4. BATTERY IS READY TO BE CAPPED WHEN ALL ELECTROLYTE IS ABSORBED. (YOU SHOULD BE ABLE TO TURN BATTERY UPSIDE DOWN AND NO FLUID COME OUT)
5. MEASURE BATTERY VOLTAGE ACROSS TERMINALS AND IT SHOULD BE ABOVE 12.8 VOLTS IF PLATES HAVE ABSORBED ALL ELECTROLYTE.
6. NEVER ADD WATER OR HYDRO-SULFURIC ACID TO BATTERY HYDRO-SULFURIC ACID WILL CAUSE A SERIOUS CHEMICAL REACTION AND COULD CAUSE HARM TO YOU AND WILL DAMAGE BATTERY. ADDING WATER WILL ALSO DAMAGE BATTERY.
7. IF CHARGING IS REQUIRED SLOW CHARGE @ 5 AMPS FOR 5 HRSAND FAST CHARGE @ 5 AMPS FOR 30 MIN.

ETON America, LLC

Service Bulletin

Bulletin No:	0019
Date:	08/15/03

Fuel Line Routing for Improved Flow

Affecting all Viper 50 & Viper 90 model years 2002-2004.

If your unit is showing any of the following symptoms this bulletin should correct the problem:

1. Being starved for fuel
2. You experience poor throttle response
3. You experience hesitation

Check your fuel line routing. If the fuel lines are routed as in fig #1 you may have a fuel flow restriction.

To improved fuel flow we suggest that you reroute the fuel line as shown in fig #2.

Fig #1

Fig #2

Reroute the fuel line from the bottom of the tank to petcock along side the tank instead of over the tank.

ETON America, LLC

Service Bulletin

Bulletin No:	**0020**
Date:	**8/19/03**

Wire Routing For Brake/Tail Lights

The rear tail light wires may have been routed where they are caught between seat supports and frame. This could cause a short in the harness or tail lights shown in figure 1. They should be routed behind the battery and pulled up through the plastic to connect to the rear tail lights as shown in Figure 2.

Figure 1

Figure 2

ETON America, LLC

Service Bulletin

Bulletin No:	**0021**
Date:	**09/10/03**

ATV Break-In Procedure

Your ATV requires a break-In period just as with all other internal combustion engines. This period allows the engine parts to seat and wear properly without undue strain which can cause premature failure.

1. For the first two weeks of operation do not run your ATV at full throttle for extended periods of time.
2. Viper 50M/50/70/90/90R
   Your first tank of fuel should be a pre-mixture of fuel and oil at a 50:1 ratio. This will insure that the oil pump system has been primed and bled of air that may have occurred in shipping.
3. Viper Jr.
   All fuel should be a pre-mixture of fuel and oil at a 50:1 ratio.
4. Do not operate the unit at more than 85% of maximum speed.
5. Do not over rev the engine.
6. Use light braking pressure to allow the brake pads to seat to the rotor and drums.

ETON America, LLC

Service Bulletin

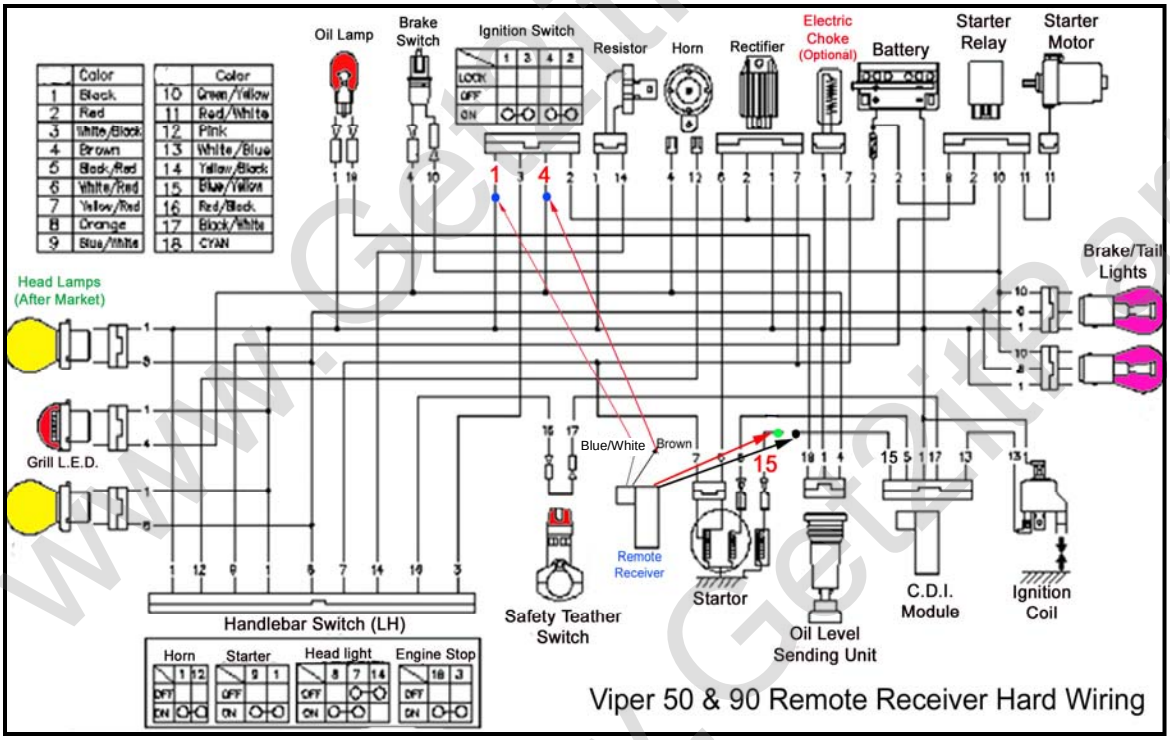
Bulletin No:	**0025**
Date:	**04/01/2004**

TXL, AXL, NXL, & RXL 50-90 models
Hard wire Remote stop Switch

To install a remote stop receiver on either the RXL 50, 90, or previous TXL, AXL, NXL models follow this procedure.

A. Cut the 3 prong connector from the remote receiver control box.
B. Hard wire the brown wire from the box to a 12volt power wire from the bike's ignition switch.
C. Hard wire the Blue/White wire from the remote box to a ground wire on the bikes harness.
D. Mount the remote receiver to the frame using a zip tie.
E. Disconnect the White/Red (female) and the Blue/Yellow (male) wires from the bike's pickup coil. Wire the remote receiver box White/ Black (female) wire to the Blue/Yellow (male) wire on bike's pickup coil. Then connect the Blue/Yellow (male) wire of the remote receiver box to the White/Red (female) wire from the bike's pickup coil.
F. Test the remote stop switch by starting the vehicle and pressing the transmitter's stop button.

Also check to see if the indicator light comes on when you press the buttons on the remote, if not the battery will need to be replaced. Once you have replaced the battery the remote will need to be reset to the box. Ground the black (female) wire from the remote box to bike's engine ground and hold both buttons down on the remote for 15 seconds; it is reset. Then unhook the ground wire and test the system.



Viper 50 & 90, TXL, AXL & NXL
Model Years 99-04

ETON America, LLC

Service Bulletin

Bulletin No: **0026**
Date: **04/01/2004**

2005 Adjustable C.D.I Speed Control

ETON America has installed an adjustable speed control on the 2005 Viper models from the RXL-50M through the RXL-90R. This devise allow the vehicle speed to be increased in steps as the rider becomes more experienced.

The table below illustrates the factory setting, which is a combination of the setting on the CDI pod and the throttle stop bolt,. It can also be used to set the desired speed limit for each model as the rider develops their skill level.

Use a combination the CDI control POD and throttle stop bolt to set the desired for the customer.

ETON Product Speed Control Settings

Adjustable Position	Factory Setting	Engine RPM	Mini 50	Viper70	Viper90	Viper90R	Yukon	Beamer
Factory Set Speed	**Set by CDI & Throttle Stop**		**16.0 km/h** **10.0 mph**	**16.0 km/h** **10.0 mph**	**24.0 km/h** **15.0 mph**	**24.0 km/h** **15.0 mph**	**55.6 km/h** **35.6 mph**	**25.0 km/h** **15.5 mph**
0	**V70**	4900 rpm	**15.5 km/h** **9.6 mph**	**21.3 km/h** **13.2 mph**	**23.6 km/h** **14.7 mph**	**23.0 km/h** **14.3 mph**	n/a	n/a
1	**V50**	5500 rpm	**22.7 km/h** **14.1 mph**	**30.0 km/h** **18.6 mph**	**33.1 km/h** **20.6 mph**	**31.3 km/h** **19.5 mph**	n/a	n/a
2		6100 rpm	**29.3 km/h** **18.2 mph**	**34.1 km/h** **21.2 mph**	**40.2 km/h** **25.0 mph**	**39.6 km/h** **24.6 mph**	n/a	n/a
3		6700 rpm	**32.1 km/h** **20.0 mph**	**37.7 km/h** **23.4 mph**	**43.8 km/h** **27.2 mph**	**43.8 km/h** **27.2 mph**	n/a	n/a
4	**V90** **V90R**	No Limit	**32.5 km/h** **20.1 mph**	**42.7 km/h** **26.5 mph**	**47.8 km/h** **29.7 mph**	**44.8 km/h** **27.8 mph**	n/a	n/a
Reverse		n/a	n/a	n/a	n/a	**10.0 km/h** **6.2 mph**	**15.7 km/h** **9.8 mph**	n/a
Wire Cut	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**52.5 km/h** **32.6 mph**

ETON America, LLC

Service Bulletin

Bulletin No: **0027**
Date: **04/01/2004**

Viper 40E, 50M, 70/90/90R 2005 Models Only Optional Remote Stop Switch Installation

To install a optional remote stop receiver on either the Viper 70, Viper 90, or the Viper 90R, follow this procedure.

The 2005 model year units have been pre-wired to accept the Remote Stop switch.

1. Remove the front grill body panel from the vehicle by removing the two retaining fasteners.
2. Gently pull the three connector leads on the wire harness from under the right from fender.
3. Connect the receiver as shown in the two left hand pictures.
4. Install the remote receiver holder over the frame mounting bracket at the front of the unit.
5. Insure the antenna lead is to the front of the unit and routed to prevent breaking.
6. Test the receiver by starting the unit and pressing the stop button on the transmitter.
7. Replace the grill body cover and two fasteners.
8. This is a relay box and DOES NOT TAKE THE PLACE OF THE ORIGINAL CDI BOX.

The remote receiver will have to be reset to restart the vehicle. To reset the receiver press the run button on the remote transmitter or turn the ignition key switch to the OFF position for at least 15 second before turning it back to the ON position.

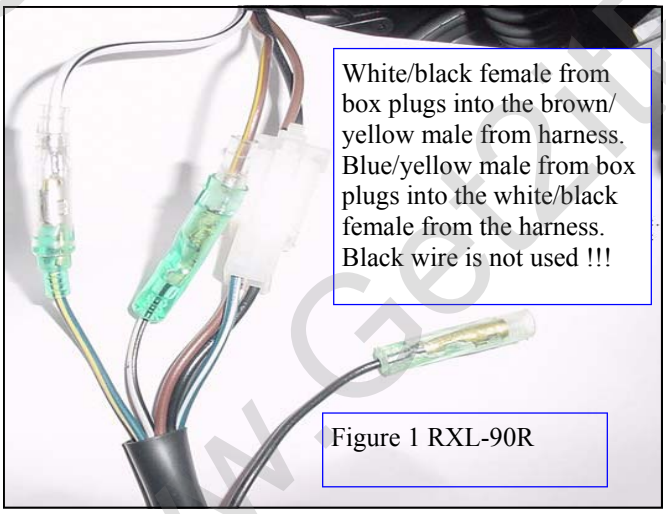
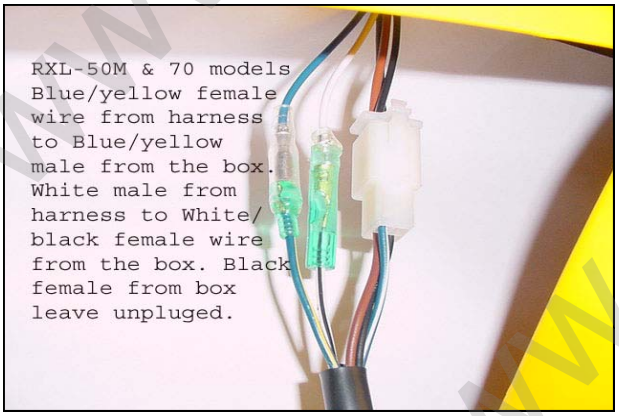


Figure 1 RXL-90R



Viper 70,90 & 90R
Model Years 2005.

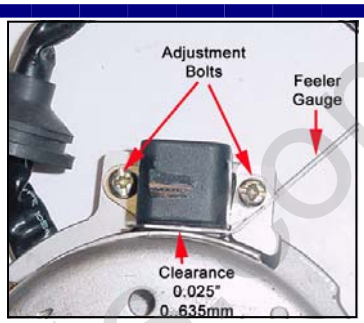
ETON America, LLC

Service Bulletin

Bulletin No: **0028** Date: **05/24/04**	Viper 50, 50M, 70, 90 & 90R A/C Generator Test

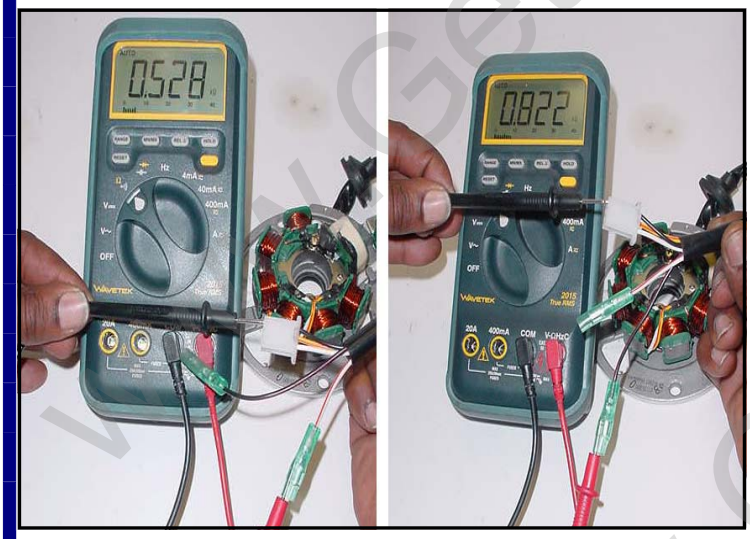
Symptoms for faulty generator

1. Weak or intermittent spark
2. No spark
3. Battery continually discharging
4. Slow throttle response



1. Clean the flywheel
2. Set the Pickup Coil air gap to 0.025" / 0.635mm.

To test the generator, set the multi-meter to a 1k ohms scale. Check the ohms from the white/red wire to the generator case or ground as shown in picture. Ohms reading should between 105-115 ohms; replace if 100 ohms or less. To check the output voltage, the generator must be installed and multi-meter set to AC small scale. Probe the red lead to the white/red wire and the black lead to battery or chassis ground. Push the starter button with the flywheel turning the voltage should read 0.5 to 1.5 volts AC. If reading is low, replaced the A/C generator.



To test the exciter coil, set the multi-meter to a 1k ohms scale. Check the ohms from the white/red wire to the generator case or ground as shown in Figure 2. The reading should be 0.520— 0 .535 k ohms.

To test the auxiliary coil, check from the black/red wire to generator case or ground as shown in Figure 3. Reading should be 0.815—0.830 k ohms. If the readings are outside this range replace the A/C generator.

Flywheel Puller Tool Part Number 650660

Replacement A/C Generator part Number
650234

ETON America, LLC

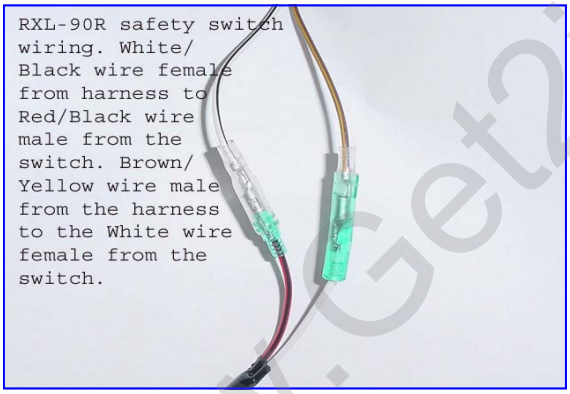
Service Bulletin

Bulletin No: **0031**
Date: **07/20/04**

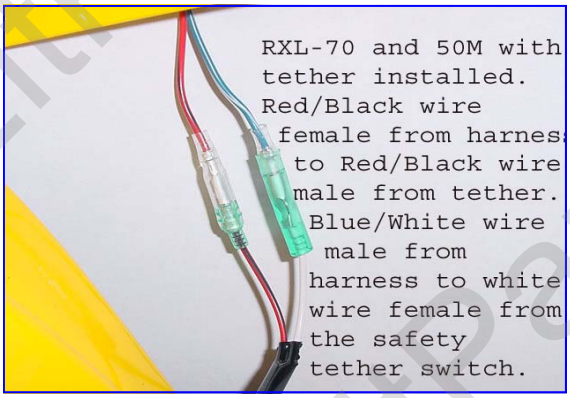
Safety Tether Switch Installation

Install the tether switch on the LH side of the handlebars and shown in the picture. Tighten to the handlebars with the 4 bolts supplied with the switch. Start the bike and lock the parking brake. Pull the rubber cap from the switch and the bike should stop. If it doesn't check the connections for your bike as shown in the pictures.

RXL-40E safety tether switch wiring. Red/Black wire female end from the harness to the Red/black wire male end from the switch. White wire male end from harness t the white wire female from switch.



RXL-90R safety switch wiring. White/ Black wire female from harness to Red/Black wire male from the switch. Brown/ Yellow wire male from the harness to the White wire female from the switch.



RXL-70 and 50M with tether installed. Red/Black wire female from harnes to Red/Black wire male from tether. Blue/White wire male from harness to white wire female from the safety tether switch.

Switch color codes	40E	50M	70	90R
Red/Black male	Red/Black Female	Red/ Black Female	Red/ Black Female	White/ Black Female
White wire female	White wire Male	Blue/ White Male	Blue/ White Male	Brown/Yel Male

ETON America, LLC

Service Bulletin

Bulletin No: **0032**
Date: **07/23/2004**

2005 Viper Models No Power

Viper models with no power or bad throttle response. Remove the 4mm spark arrestor retainer bolt as shown in figure 2. Then remove the spark arrestor with a pair of needle nose pliers (figure 3). Then clean the screen or replace the element part # 811008.

Symptoms of a dirty spark arrestor.

1. Loss of power or no power
2. Bad throttle response
3. No start situation

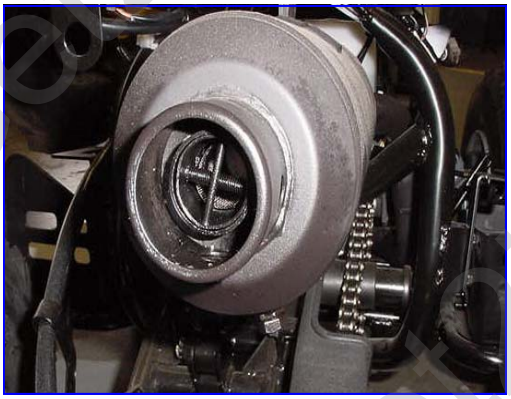


Figure 1

Figure 2

Figure 3

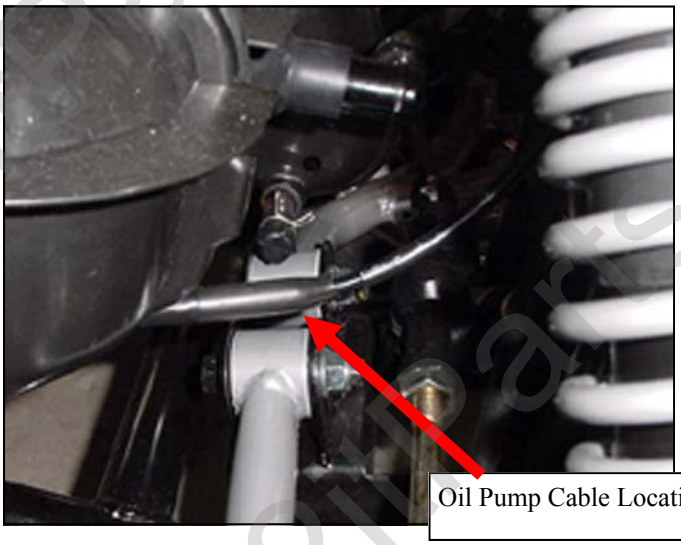
Figure 4

ETON America, LLC

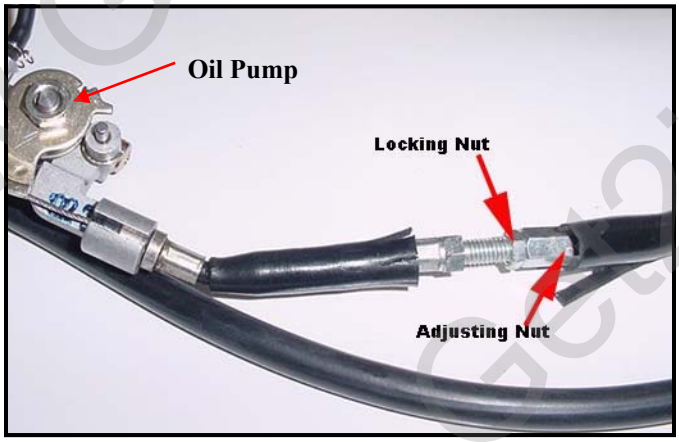
Service Bulletin

Bulletin No: **0033** Date: **04/01/2004**	Oil Pump Flow Adjustment all Oil Injected two cycle Engines

To adjust the oil pump flow on a two cycle oil injected engine you must adjust the oil pump cable length. . The Oil pump cable is located on the right hand side of the engine just above the (RH) A-arm



To reduce the oil flow you must lengthen the cable by loosening the lock nut and turning the adjusting nut counter clockwise then retighten the locking nut. To increase the oil flow you would shorten the cable by turning the adjusting nut clockwise.

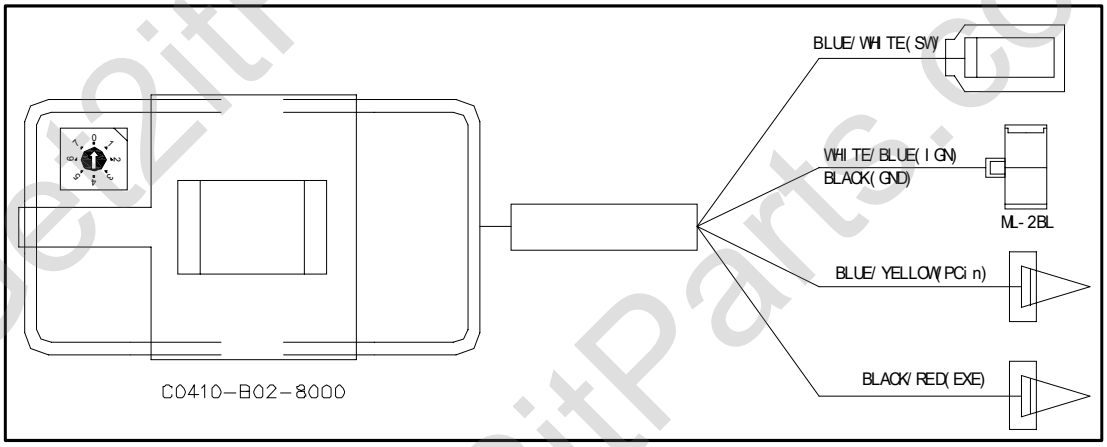


ETON America, LLC

Service Bulletin

Bulletin No.: **SB-0041**
Date: 05/01/2006

C.D.I. Module Specifications
Viper 50, 50M, 70, & 90 (2 Cycle)



RXL-50/50M/70/90 (2 Stroke) -- C0410-B02-8000

Electric resistance(Ω) specification

-	SW	IGN	GND	Pcin	EXE
SW		∞	∞	∞	∞
IGN	18-22K		2-3K	∞	6-8K
GND	9-11K	∞		∞	2-3K
Pcin	48-52K	∞	18-22K		28-32K
EXE	∞	∞	∞	∞	

Specifications highlighted in yellow are the suggested critical testing points. Test points should be tested first.

We suggest using analogy type multi-meter to test the electric resistance. We have found using digital type meter produces to many inaccurate readings.

ETON America, LLC

Service Bulletin

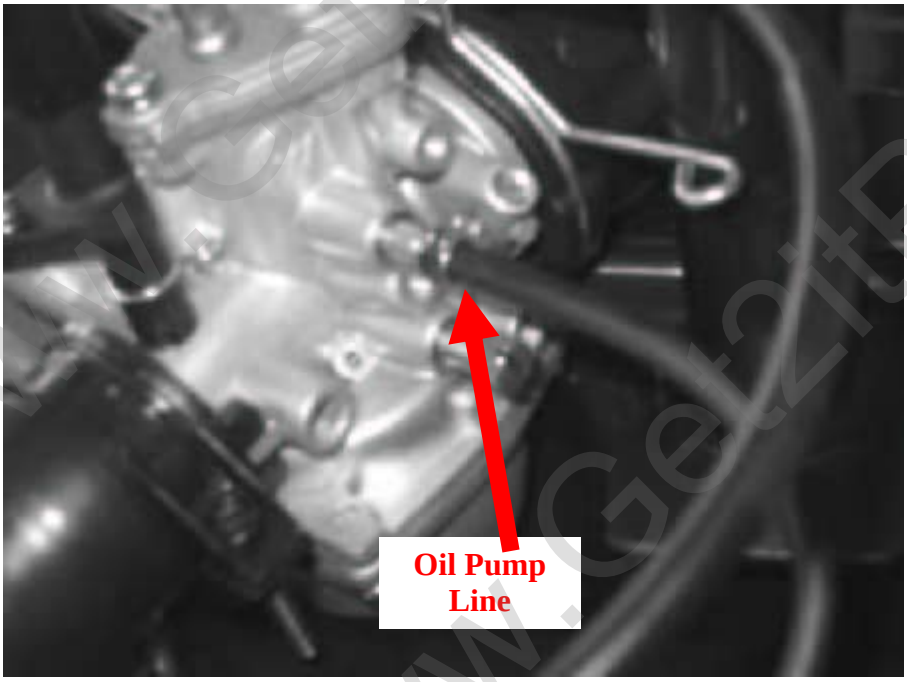
Bulletin No:	0052
Date:	06/12/2007

E-TON 50 & 90cc 2 cycle engine Oil pump testing

The following steps are used to determine if the 2 cycle oil injector pump is functioning properly on E-TON 50cc and 90cc 2 cycle engines.

1. Fill the fuel tank with a pre mix fuel / 2 cycle oil mixture at a 50 : 1 ratio.
2. Disconnect the oil pump line at the carburetor.
3. Start the engine and count the drops per minute at the various RPM listed in the table below.

RPMs	50cc	90cc
1700 (idle)	3-4	5-6
4000	5-9	12-14
7000	8-12	20-22



Note: 32 Drop = aporx -1cc