ETON America VIPER SILVER SERIES SERVICE MANUAL

Covers:

Viper 70 Silver

Viper 90 Silver

Viper 90R Silver

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1. INFORMATION

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1.1 GENERAL SAFETY

Gasoline
Gasoline is extremely flammable and explosive under certain conditions. KEEP
OUT OF REACH OF CHILDREN
Carbon Monoxide
• 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.
Battery electrolyte
▲ WARNING
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.
Hot Parts
• Engine and exhaust pipe become very hot and remain hot for one hour after the
engine is run. Wear insulated gloves before handling these parts.

Used Engine/ Gear Oil

M WARNING

• Used engine oil and gear oil may cause skin disease from repeated contact with the skin for long periods of time. Keep out of reach of children.

1.2 NOTES

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

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1.3 SPECIFICATION

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GENERAL SPECIFICATIONS

Item		Standard	
Model code	VIPER 70	VIPER 90	VIPER 90R
Dimensions			
Overall length	1,510 mm (59.4 in)	1,500 mm (59.1 in)	
Overall width	850mm (33.4 in)	850 mm (33.4 in)	
Overall height	890 mm (35.0 in)	900 mm (35.4 in)	
Seat height	670 mm (26.4 in)	680 mm (26.8 in)	
Wheelbase	930 mm (36.6 in)	930 mm (36.6 in)	
Minimum ground clearance	100 mm (3.9 in)	120 mm (4.7 in)	
Minimum turning radius	2.9 m (114in)	2.9 m (114in)	
Basic weight			
With oil and full fuel tank	112 kg (247 lb)	113 kg (249 lb)	
Engine			
Engine type	Forced air cooled 4-	-stroke	
Cylinder arrangement	Single cylinder		
Displacement	69.3 cm ³	88.4 cm ³	
	(3.84 cu.in)	(4.90 cu.in)	
Bore × stroke	47.0 × 40.0 mm	47.0 × 51.0 mm	
Compression ratio	$(1.85 \times 1.6 \text{ in})$	$(1.85 \times 2.0 \text{ in})$	
	9.0 : 1	10.6 : 1	
Standard compression pressure (at sea level)	1,230 kPa	1,250 kPa	
	(12.3 kg/cm ⁻ , 178.4 psi)	(12.5 kg/cm ⁻ , 181.3 psi)	
Starting system	Electric starter & & I	kickstarter	
Lubrication system	Wet sump		
Oil type or grade			
Engine oil			
0 10 30 50 70 90 110 130 F	YAMALUBE 4, SAE	5W-30 or SAE10W-4	0
	or SAE20W-50		
YAMALUBE 4 (20W-50) or SAE 20W-50			
YAMALUBE 4 (10W-40) or SAE 10W-40			
SAE 5W-30			
⁻²⁰ -10 0 10 20 30 40 50 C			
Final transmission ail		hundid and an all	
	SAE OUAPI "GL-4" I	Typola gear oll	
UII CAPACITY			
	0.75 L (0.66 lmp. at	0.80 LIS at)	
Total amount	$0.75 \pm (0.00 \text{ mp qt},$	0.85 US at)	
Final transmission oil	0.00 E (0.70 mp qt,	0.00 00 40	
Total amount	0 12 (0 11 lmp at	0.30 L (0.27 lmn at	
	0.13 US qt)	0.32 US qt)	
Air filter	Wet type element	1	

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Item	Item		Standard			
Model code		VIPER 70	VIPER 90	VIPER 90R		
Fuel Type Fuel tank capacity	Plastic	Unleaded gasoline o 4.5 L (0.99 lmp gal, 3.6 L (0.79 lmp gal,	only 1.17 US gal) 0.94 US gal)			
Fuel reserve amount	Plastic Iron	1.2 L (0.26 Imp gal, 1.0 L (0.22 Imp gal,	0.31 US gal) 0.26 US gal)			
Carburetor Type/quantity Manufacturer	0	SVR 22-1G x 1 TK				
Spark plug Type/manufacturer Spark plug gap	>	NGK/CR7HSA 0.6 ~ 0.7 mm (0.024	~ 0.028 in)	y		
Clutch type		Dry, centrifugal auto	matic			
Tire Type Size	front rear	Tubeless AT16 × 8-7 AT16 × 8-7	Tubeless AT18 × 7-8 AT18 × 9-8	Tubeless AT18 × 7-8 AT18 × 9-8		
Manufacturer Type	front rear front	MAXXIS MAXXIS M913 M012	MAXXIS MAXXIS M939 M040	MAXXIS MAXXIS M939 M040		
Tire pressure (cold tire) Maximum load* Off-road riding *Load in total weight of rider a accessories	front rear and	62.8 kg (150 lb) 23 ~ 28 kPa (0.23 ~ 23 ~ 28 kPa (0.23 ~	0.28 kgf/cm ² , 3.2 ~ - 0.28 kgf/cm ² , 3.2 ~ -	4.0 psi) 4.0 psi)		
Brake				<u>0'0'</u>		
Front brake	type operation	Drum brake Right hand operation	n 🔹			
Rear brake	type operation	Single disc brake				
Suspension Front suspension Rear suspension		Single wishbone / In Swingarm	idependent	7		
Shock absorber Front shock absorber Rear shock absorber		Coil spring/oil damp Coil spring/oil damp	er er			
Electrical Ignition system Generator system Battery type Battery capacity		DC-CDI AC magneto GTX5L-BS 12 V 4.0 Ah				

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ENGINE SPECIFICATIONS

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Item	Standard	Limit	
Cylinder head			
Warp limit *	7.00 ~ 7.40 cm ³ (0.43 ~ 0.45 cu.in)	0.05 mm (0.002 in)	
Cylinder			
Bore size	47.000 ~ 47.010 mm (1.8504 ~ 1.8508 in)	47.10 mm (1.8543 in)	
Maximum out-of-round		(0.002 in) 0.01 mm	
	X	(0.0004 in)	
Camshaft			
Drive method	Chain drive (Left)	 	
Cam dimensions	<u><u> </u></u>		
			С Э
Intake "A"	25.683 ~ 25.843 mm	25.583 mm	
	(1.0111 ~ 1.0174 in)	(1.0072 in)	
"B"	20.986 ~ 21.016 mm	20.886 mm	
Extract "A"	$(0.8262 \sim 0.8274 \text{ in})$	(0.8223 in)	
Exhaust	$25.525 \sim 25.685$ [1][1] (1.0049 \approx 1.0112 in)	25.425 mm $(1.0010 in)$	
"B"	$20.986 \sim 21.016 \text{ mm}$	20 886 mm	
	$(0.8262 \sim 0.8274 \text{ in})$	(0.8223 in)	
Camshaft runout limit		0.03 mm	
	G	(0.0012 in)	
Timing chain type/No. of links	KMC 92 BH 2005 / 82		
Timing chain type/No. of links	KMC 92 BH 2005 / 86 VIPER 90		
		1 I	

Item		Standard		Limit	
Rocker arm/rocker arm sh	naft				
Rocker arm inside diamet	er	10.000 ~ 10.015 mm		10.100 mm	
		(0.3937 ~ 0.3943 in)		(0.3976 in)	
Rocker arm shaft outside	diameter	9.972 ~ 9.987 mm		9.910 mm	
		(0.3926 ~ 0.3932 in)		(0.3902 in)	
Rocker-arm-to-rocker-arm	n-shaft clearance	0.009 ~ 0.034 mm		0.19 mm	
		(0.0005 ~ 0.0017 in)		(0.0075 in)	
Valve, valve seat, valve ge	uide				
Valve clearance (cold)	IN	0.05 ~ 0.10 mm			
		(0.002 ~ 0.004 in)			
	EX	0.05 ~ 0.10 mm			
		(0.002 ~ 0.004 in)			
Valve dimensions					
				1	
	► S B	c		<u> </u>	
				D	
Hoad Diamotor	Eaco Width	Soat Width	Margin 7	 Thicknose	
		Sear Width	iviaryiri i	THICKNESS	
"A" head diameter	IN	20.9 ~ 21.1 mm			
		(0.8228~ 0.8307 in)			
	EX	18.9 ~ 19.1 mm			
		(0.7441~ 0.7520 in)			
"B" face width	IN	1.50 ~ 1.80 mm			
	EV	(0.0591~ 0.0622 ln)			
	EX	$1.50 \sim 1.80 \text{ mm}$			
		(0.0591~ 0.0622 ln)			
"C" seat width	IN	$0.8 \sim 1.1 \text{ mm}$		1.6 mm	
	FV	$(0.0315 \sim 0.0433 \text{ ln})$		(0.0630 In)	
	◆ ^{EX}	$0.8 \sim 1.1 \text{ mm}$	XX	1.6 mm	
"D" movin this is a	IN I	$(0.0315 \sim 0.0433 \text{ In})$			
margin thickness	IIN	$0.5 \sim 0.9 \text{ mm}$			
		$(0.0197 \sim 0.0354 \text{ In})$		(0.0630 IN)	
	EX	$0.0 \sim 1.0 \text{ mm}$			
Cham autoide diamater	IN I	(0.0236 ~ 0.0394 IN)			
Siem outside diameter	IIN	4.975 ~ 4.990 mm		4.900 mm	
		$(0.1959 \sim 0.1965 \text{ III})$		(U. 1930 III)	
	ΕX	4.955 ~ 4.970 mm		4.900 mm	
Quido incido discretar	INI	(0.1951~ 0.1957 IN)		(U. 1930 IN)	
Guide Inside diameter	IIN	$5.000 \sim 5.012 \text{ mm}$		5.030 mm	
		$(0.1909 \sim 0.1973 \text{ In})$		(U. 1980 IN)	
	ΕX	$5.000 \sim 5.012 \text{ mm}$		5.030 mm	
		(0.1969 ~ 0.1973 IN)		(0.1980 IN)	

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Item		Standard	Limit	
Stem-to-guide clearance	IN	0.010 ~ 0.037 mm	0.08 mm	
		(0.0004 ~ 0.0015 in)	(0.0031 in)	
	EX	0.025 ~ 0.052 mm	0.10 mm	
		(0.0010 ~ 0.0020 in)	(0.0039 in)	
Stem runout limit			0.02 mm	
			(0.0008 in)	
	$= \mathcal{N}$			
	777			
Valve seat width	IN	0.9 ~ 1.1 mm	1.6 mm	
		(0.0354 ~ 0.0433 in)	(0.0630 in)	
	EX	0.9 ~ 1.1 mm	1.6 mm	
Value environ		(0.0354 ~ 0.0433 lh)	(0.0630 in)	
valve spring				
Inner spring	INI	20.00 mm (1.18 in)	07.00 mm	
Free length	IIN	30.00 mm (1.18 m)	27.00 mm (1.06 in)	
	FY	30.00 mm (1.18 in)	(1.00 lll) 27 00 mm	
			(1.06 in)	
Compressed pressure	•		(1.00 m)	
(installed)	IN	39 ~ 48 N at 22.45 mm		
		(3.99 ~ 4.87 kg,		
		10.69 ~ 13.05 lb at 0.88 in)		
	EX	39 ~ 48 N at 22.45 mm		
		$(3.99 \sim 4.67 \text{ kg},$ 10.69 \sim 13.05 lb at 0.88 ip)		
Tilt limkt	IN	10.09 ~ 10.05 lb at 0.00 liff	$2.0^{\circ}/1.1$ mm	
			(2.0°/0.04 in)	
	EX		$2.0^{\circ}/1.1 \text{ mm}$	
			(2.0°/0.04 in)	
			, , , , , , , , , , , , , , , , , , ,	
Direction of winding				
(top view)	IN	Counterclockwise		
	EX	Counterclockwise		
Outer spring				
Free length		33.50 mm (1.32 in)	30.50 mm	
			(1.20 in)	
	EX	33.50 mm (1.32in)	30.50 mm	
	Ň	· · · /	(1.20 in)	
		1		

F	Item				
			Standard	Limit	
	Compressed pressure installed)	IN	74 ~ 90 N at 25.45 mm 7.52 ~ 9.18 kg, 20.15 ~ 24.60 lb at 1.00 in)		
		EX	74 ~ 90 N at 25.45 mm 7.52 ~ 9.18 kg, 20.15 ~ 24.60 lb at 1.00 in)		
	Tilt limit *	IN EX		0.2 °/1.2 mm (0.2 °/0.05 in) 0.2 °/1.2 mm (0.2 °/0 05 in)	
			xS.		
	Direction of winding				
	(top view)	IN EX	Counterclockwise Counterclockwise		
-	Piston				
	Piston to cylinder clearance		0.010 ~ 0.040 mm	0.10 mm	
			(0.0004 ~ 0.0016 in)	(0.0039 in)	
	Piston size "D"	XV	46.970 ~ 46.990 mm		0
			(1.6492 ~ 1.6500 III)	3	
	Measuring point "H"		5.0 mm (0.20 in)		
	Piston off-set		0.5 mm (0.02 in)		
	Piston off-set direction		Intake side		
	Piston pin bore inside diameter		13.002 ~ 13.008 mm	13.040 mm (0.5134 in)	
	Piston pin outside diameter		(0.5119 ~ 0.5121 iii) 12.996 ~ 13.000 mm (0.5117 ~ 0.5118 in)	(0.5104 iii) 12.960 mm (0.5102 in)	

Item	Standard	Limit
Piston rings		
Top ring		
Type	Barrel	
Dimensions (B × T)	1.0 × 2.1 mm	
5	(0.0394 × 0.0827 in)	
End gap (installed)	0.10 ~ 0.25 mm	0.45 mm
Cide electrones (installed)	$(0.0039 \sim 0.00981n)$	(0.0177 in)
Side clearance (installed)	(0.0006~0.0022in)	(0.0035in)
2nd ring		(,
Туре	Taper	
Dimensions ($B \times T$)	1.0 × 2.0 mm	
	0.0394 × 0.0787 in)	0.55
End gap (installed)	$0.25 \sim 0.40 \text{ mm}$	0.55mm (0.0217in)
Side clearance	$0.015 \sim 0.055 \text{ mm}$	0.09mm
Oil ring	(0.0006~0.0022in)	(0.0035in)
	\sim	
	\sim	
Dimensions (B ×) T	2.0 × 1.9 mm	
	(0.0787 × 0.0748 in)	
End gap (installed)	$0.20 \sim 0.70 \text{ mm}$	
Crankshaft	(0.0079~0.027611)	
	• * *	>
Crankwidth "A"	42 30, 42 35mm	
Clarkwidth A	(1.6653~1.6673in)	
	44.10~44.15mm VIPER 90	
	(1.7362~1.7382in)	
Runout limit C1		0.04 mm
<u> </u>		(0.0016in)
62	* 7.0	0.04 mm (0.0016in)
Big endside clearanceD"	0.10~0.30mm	0.50 mm
	(0.0039~0.0118in)	(0.0197in)
BigendradialclearanceƓ	0.007~0.015mm	
N	(0.0003~0.0006in)	
Small endfree play "F"	0.80~1.00mm	1.50mm
	(0.0315~0.039410)	(0.059110)

Iter	n	Standard	Limit
Clutch			
Clutch type		Automatic centrifugal	
Clutch shoe thickness		3.5 ~ 4.0 mm	2.0 mm
		(0.1338 ~0.1575 in)	(0.078 in)
Clutchshoe spring free	elength	3.5 ~ 4.0 mm	
Clutch housing inside c	liameter	107.0 ~107.2 mm (4.21 ~4.22 in)	107.5 mm (4.23in)
Compression spring fre	e length	87.9 mm (3.46 in)	
Weight outside diamete	er of the second se	14.9 ~ 15.1 mm (0.587 ~0.594 in)	
Clutch-in revolution		2110±140r/min	
Clutch-stall revolution		2350±150 r/min	
V-belt			
V-belt width		18.0 mm (0.709 in)	17.0 mm (0.669in)
Transmission		X	
Transmission type		V-belt automatic	
Primary reduction syste	em	Helicalgear	
Primary reduction ratio		43/14 (3.071) VIPER 70	
		41/15 (2.733) VIPER 90 VIPER 90R	
 Secondary reduction system 	vstem	Spurgear	
Secondary reduction ra	atio	40/13(3.077) VIPER 70	
····, ····,		45/13(3.462) VIPER 90	
Reverse reduction syst	am		
Reverse reduction ratio		$40/15 \times 47/12 \times 45/13$	
		(44,288)	
Max. main axle runout		(0.08 mm
			(0.0031in)
Max. drive axle runout			0.08 mm
Carburatora			(0.00311n)
I. D. IIIdik		A25 00 VIPER 70	
		A26 00 VIPER 90	
		A26 00 VIPER 90R	
Main jet	(M.J)	#95 VIPER 70	
		#100 VIPER 90 VIPER 90R	
Air jet	(A.J)	1.0	
Jet needle	(J.N)	#4T11 3/5 VIPER 70	
		#4T10 3/5 VIPER 90	
		#4T10 3/5	
Needle ist		2 090 H5 5	
	(IN.J) (D. I)		
Pliot jet	(P.J)	#32	
valve seat size	(V.S)		
Fuel level	(F.L)	$5.0 \sim 6.0$ mm (0.20 ~ 0.24 in)	
		Surface	
Engine idle speed		1,600 ~ 1,800 r/min	

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Item		Standard	Limit
Front suspension			
Shock absorber travel		30 mm (1.18 in)	
Optional spring		No	
Rear suspension	-6	×	
Shock absorber travel		40 mm (1.57 in)	
Optional spring		No	
Front wheel			
Туре		Panel wheel	
Rim size		$7 \times 5 \text{ AT}$ VIPER 70	
• X \		8 × 5.5 AT VIPER 90 VIPER 90R	
Rim material		Steel	
Rim runout limit	radial		2.0 mm
			(0.08 in)
	lateral		2.0 mm
			(0.08 in)
Rear wheel			
Туре		Panel wheel	
Rim size		7 × 5 AT VIPER 70	
	•	8 × 7 AT VIPER 90 VIPER 90R	
Rim material		Steel	
Rim runout limit	radial		2.0 mm
	lateral		(0.08 IN)
	lateral		2.0 mm
Front drum brake			
Type		Leading trailing	
Brake drum inside diameter		95.0 mm (3.74 in)	96.0 mm
			(3.38 in)
Lining thickness		3.0 mm (0.12 in)	1.5 mm
			(0.06 in)
Shoe spring free length		60.0 mm (2.36 in)	
Rear disc brake		XV	
Туре		Single	
Disc outside diameter × thickness	3	190.0 × 3.5 mm (7.48 × 0.14 in)	3.0 mm
			(0.12 in)
Brake disk maximum deflection			0.15 mm
Pad thickness inner		3.7 mm (0.15 in)	1 0 mm
			(0.04 in)
Pad thickness outer		3.7 mm (0.15 in)	1.0 mm
			(0.04 in)
Master cylinder inside diameter		12.7 mm (0.50 in)	
Caliper cylinder inside diameter		30.23 mm (1.19 in)	
втаке пина туре			

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Item			Standard	Limit
Brake lever and brake pedal Brake lever free play (pivot) Throttle lever free play	front rear	4.0 ~ 7.0 mm 0 ~ 1.5 mm (1.0 ~ 3.0 mm	n (0.16 ~ 0.28 in) (0 ~ 0.06 in) n (0.04 ~ 0.12 in)	

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
Voltage	12 V	
Ignition system		
Ignition timing (B.T.D.C.)	13.0 °/1,700 r/min	
Advanced timing (B.T.D.C.)	29°/4,000 r/min	
Advancer type	Electrical (analogue)	
C.D.I.		
Magneto model/manufacturer	C1120-A26-6000/SHIHLIN	
Pickup coil resistance/color	94 ~ 140 Ω at 20 °C (68 °F)/	· · · ·
	White/Blue—Red	
Source coil resistance/color	640 ~ 960 Ω at 20 °C (68 °F)/	
	Black/Green—Red	
C.D.I. unit model/manufacturer	C0410-A26-6000/SHIHLIN	
Ignition coil		
Model/manufacturer	C0510-A26-6000/SHIHLIN	
Minimum spark gap	6 mm (0.24 in)	
Primary winding resistance	0.19 ~ 0.23 Ω at 20 °C (68 °F)	
Secondary winding resistance	2.79 ~ 3.41 kΩ at 20 °C (68 °F)	
Spark plug cap		
Туре	Resin	
Resistance	5 ~ 12 k Ω	
Charging system		
Туре	A.C. magneto	
Model/manufacturer	C1120-A26-6000/SHIHLIN	
Nominal output	14 V 85 W at 5,000 r/min	
Charging coil resistance/color	0.60 ~ 0.90 Ω at 20 °C (68 °F)/	
	White—White	
Rectifier/regulator		
Regulator type	Semi conductor-short circuit	
No-load regulated voltage (DC)	14.0 ~ 15.0 V	
Model/manufacturer	C1600-9KB0-0000/EYE	
Capacity (DC)	1 0A	
Withstand voltage	500 V	

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Item	Standard	Limit	
Electric starter system			
Туре	Constant mesh		
Starter motor			
Model/manufacturer	C1200-A26-6000/SY		
Output	0.35 kW		
Armature coil resistance	0.014 ~ 0.019 Ω at 20 °C (68 °F)		
Brush overall length	7.0 mm (0.24 in)	3.5 mm	
		(0.14 in)	
Brush overall length	1.0 ~ 3.0 N		
	(102~ 306gf, 3.60 ~ 10.80 oz)		
Commutator diameter	22.0 mm (0.87 in)	19.5 mm	
		(0.77in)	
Mica undercut	1.6 mm (0.06 in)		
Starter relay			
Model/manufacturer	C5850-FBF0-0000/SY		
Model/manufacturer	150 A		
Coil winding resistance	2 98 ~ 4 03 Q at 20 °C (68 °F)		
Circuit breakers			
	Fuse		
Amperage for individual circuit			
Main fuse	1 0A × 1		((
Main ruse			
			5

1.4 SERIAL NUMBER

Every E-TON's ATV has a serial number which is stamped on each frame and engine. The position of the serial number is shown in the pictures below. Make sure the serial number is the same as in your owner's manual.

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

<image>

Engine serial number



1.5 TORQUE VALUES

Make sure every torque value is correct when you assemble the engine & frame. Please follow the torque values list to assemble your ATV.

FRAME					
Part to tightopod	Thread	Tig	Pomarka		
	size	N.m	kg-m	ft.lb	Remarks
Handlebar upper holder bolt	M 6	12-15	1.2-1.5	8.9-11.1	
Throttle housing cover screw	M 4	3.5-5.0	0.35-0.5	2.6-3.7	
Steering shaft nut	M14	50-60	5.0-6.0	36.9-44.3	
Steering shaft holder bolt	M 8	20-30	2.0-3.0	14.8-22.1	
Tie rod lock nut	M10	35-43	3.5-4.3	25.8-37.1	
King pin nut	M10	30-40	3.0-4.0	22.1-29.5	
Handlebar lower holder nut	M10	30-40	3.0-4.0	22.1-29.5	
Front wheel bolt	M10	35-45	3.5-4.5	25.8-33.2	
Front axle castle nut	M14	70-90	7.0-9.0	30-45	.C.
Front brake arm nut	M 6	8-12	0.8-1.2	5.2-8.9	
Rear brake calliper bolt	M 8	24-32	2.4-3.2	1.8-2.4	Loctite 271
Rear axle castle nut	M14	70-90	7.0-9.0	30-45	
Rear wheel bolt	M10	35-45	3.5-4.5	25.8-33.2	
Exhaust muffler mounting bolt	M 8	20-30	2.0-3.0	14.8-22.1	
Engine hanger bolt	M10	30-40	3.0-4.0	22.1-29.5	
Rear axle holder bolt	M33	160-180	16-18	11.8-13.3	Loctite 271
Swing arm pivot nut	M14	70-90	7.0-9.0	30-45	
Shock absorber mounting bolt	M10	30-40	3.0-4.0	22.1-29.5	

ENGINE

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Part to tightonod	Thread	Tigl	Pomorko		
Fait to tightened	size	N.m	kg-m	ft.lb	Remarks
Spark plug	M10	10-12	1.0-1.2	7.4-8.9	
Cylinder head bolts	M6	10-14	1.0-1.4	7.4-10.3	
Tappet adjusting nut	M5	7-11	0.7-1.1	5.2-8.1	
Oil drain bolt	M12	20-30	2.0-3.0	14.8-22.1	
Clutch outer nut	M10	39-41	3.9-4.1	28.8-30.2	
Drive face nut	M12	54-56	5.4-5.6	4041.4	Loctite 638 Catalyst 7649
Camshaft holder nuts	M8	14-16	1.4-1.6	10.3-11.8	
Hole cap tap adjusting	M30	7-9	0.7-0.9	5.2-6.6	
Stud bolt	M7	8-12	0.8-1.2	5.9-8.9	
Starting clutch outer	M28	50-60	5.0-6.0	36.9-44.3	
Oil pump driven sprocket nut	M6	10-14	1.0-1.4	7.4-10.3	
	XV				XC
	5				
()					0
GENERALITY					
	M5	3.5-5.0	0.3-0.5	2.2-3.7	
	M6	10.0~14.0	1.0-1.4	7.4-10.4	

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	ino	10.0 14.0	1.0-1.4	7.4-10.4	
General holt nut	M8	20.0~30.0	2.0-3.0	14.8-22.1	
	M10	30.0~4.00	3.0-4.0	22.1-29.5	
	M12	50.0~60.0	5.0-6.0	36.9-44.2	

2. MAINTENANCE

2.1 MAINTENANCE SCHEDULE	2.8 DRIVE CHAIN
2.2 FUEL TUBE	2.9 BRAKE SYSTEM
2.3 THROTTLE OPERATION	2.10 WHEELSAND TIRES
2.4 THROTTLE CABLE ADJUSTMENT	2.11 STEERINGSYSTEM
2.5 AIR CLEANER	2.12 TOE-IN
2.6 SPARK PLUG	2.13 GEAR & ENGINE OIL
2.7 IDLE SPEED	

2.1 MAINTENANCE SCHEDULE

The maintenance times in this table are based upon average riding conditions. Riding in unusually dusty areas requires more frequent servicing. (For any ATV in this service manual.)

Periodic maintenance chart for the emission control system

- For ATVs not equipped with an odometer or an hour meter, follow the month maintenance intervals.
- For ATVs equipped with an odometer or an hour meter, follow the km (mi) or hours maintenance intervals. However, keep in mind that if the ATV isn't used for a long period of time, the month maintenance intervals should be followed.
- Items marked with an asterisk should be performed by a E-TON dealer as they require special tools, data and technical skills.

						INITIAL			EVERY	
NO.			CHECK OR MAINTENANCE	Whichev-	month	1	3	6	6	12
		ITEM	JOB	er comes first	km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
					hours	20	80	160	160	320
1	*	Fuel line	 Check fuel hoses for cracks or replace if necessary. 	ge, and			\checkmark	\checkmark	\checkmark	
2		Spark plug	 Check condition and clean, necessary. 	 Check condition and clean, regap, or replace if necessary. 				\checkmark	\checkmark	\checkmark
3	*	Valves	Check valve clearance and a	adjust if nec	essary.	\checkmark		\checkmark	\checkmark	\checkmark
4	*	Carburetor	 Check choke operation and o Check engine idling speed a sary. 	 Check choke operation and correct if necessary. Check engine idling speed and adjust if necessary. 					\checkmark	\checkmark
5	*	Crankcase breather system	 Check breather hose for crack and replace if necessary. 	ks or other da	amage,			V	\checkmark	\checkmark
6		Exhaust system	 Check for leakage and replace gasket(s) if necessary. Check for looseness and tighten all screw clamps and joints if necessary. 				\checkmark			
7		Spark arrester	Clean.					\checkmark		

General maintenance and lubrication chart

							INITIAL		EV	ERY]
			CHECK OR MAINTENANCE	Whichev-	month	1	3	6	6	12	
N	0.	ITEM	JOB	er comes first	km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)	
					hours	20	80	160	160	320	
1	*	Timing chain	Check chain tension.Adjust if necessary.			\checkmark		\checkmark	\checkmark	\checkmark	
2		Air filter element	• Clean and replace if necess	sary.		Every 2 dusty a	20–40 ho areas)	ours (mo	re often	in wet o	r I
3	*	Clutch	Check operation			\checkmark		V	V		
4	*	Front brake	Check operation and correct Check brake lever free play a sary.	t if necessar and adjust if	y. neces-	V	N		V	V	
			Replace brake shoes.	-			Wheneve	er worn	to the	limit	-
5	*	Rear brake	 Check operation and correct if Check fluid level and ATV for f correct if necessary. 	f necessary. fluid leakage,	and	N	V	\checkmark	V	\checkmark	
			Replace brake pads.				Wheneve	er worn	to the lin	nit	I
6	*	Brake hoses	 Check for cracks or other dam necessary. 	age, and repl	lace if		\checkmark	\checkmark	\checkmark	\checkmark	
			Replace.			×	Ev	ery 4 ye	ars	1	
7	*	Wheels	 Check runout and for damage, essary. 	and replace	if nec-	\checkmark		\checkmark	\checkmark	\checkmark	
8	*	Tires	 Check tread depth and for dan necessary. Check air pressure and bala necessary. 	nage, and rep nce, and cor	place if rrect if	\checkmark		\checkmark	\checkmark	\checkmark	C
9	*	Wheel hub bearings	 Check for looseness or dama necessary. 	age, and repl	ace if	\checkmark		\checkmark	V	V	•
10	*	Chassis fasteners	 Make sure that all nuts, bolt properly tightened. 	s, and screw	vs are	\checkmark	\checkmark	\checkmark	V	V	
11	*	Shock absorber assemblies	 Check operation and correct Check for oil leakage and re 	if necessar	y. essary.			V	V	\checkmark	
12	*	Front knuckle piv- ots	• Lubricate with lithium-soap-b	ased grease				V	V	\checkmark	
13	*	Steering shaft	 Lubricate with lithium-soap-b 	ased grease	•			\checkmark	\checkmark	\checkmark	
14	*	Steering system	 Check operation and repair or Check toe-in and adjust if n 	replace if dan necessary.	naged.	\checkmark	V	V	\checkmark	\checkmark	
15		Engine oil	 Change. Check ATV for oil leakage, ar sary. 	nd correct if r	ieces-	V		V	√	\checkmark	
16		Engine oil strainer	• Clean.			V				\checkmark	1
17		Final transmission oil	 Change. Check ATV for oil leakage, ar sary. 	nd correct if r	neces-	N				\checkmark	
18	*	Moving parts and cables	• Lubricate.				√	\checkmark	\checkmark	√	

Ann .

						INITIA			AL EVERY	
				Whichev-	month	1	3	6	6	12
N	0.	ITEM	JOB	er comes first	km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
				5	hours	20	80	160	160	320
19	*	Moving parts and cables	Lubricate.				\checkmark	\checkmark	\checkmark	\checkmark
20	*	Drive select lever safety system cable	 Check operation and adjust or sary. 	r replace if ne	eces-			\checkmark	\checkmark	\checkmark
21	*	Throttle lever hous- ing and cable	 Check operation and correct i Check throttle cable free play sary. Lubricate throttle lever housin 	neces-	\checkmark	\checkmark	N	V	V	
22	*	Front and rear brake switches	Check operation and correct in	f necessary.		\checkmark	\checkmark	V	\checkmark	\checkmark
23	*	Lights and switches	 Check operation and correct in Adjust headlight beams. 	f necessary.		\checkmark	V	N	\checkmark	\checkmark
24	*	V-belt	 Check operation Check for wear, cracks or other if necessary. 	 Check operation Check for wear, cracks or other damage, and replace if necessary. 			+	\checkmark		\checkmark
25	*	Throttle lever hous- ing and cable	 Check operation and correct if necessary. Check throttle cable free play and have a E-TON dealer adjust if necessary. Lubricate throttle lever housing and cable. 				\checkmark			
26	*	Front and rear brake switches	Check operation and correc	t if necessar	ry.	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service:
 - Regularly check and, if necessary, correct the brake fluid level.
- Every two years, replace the internal components of the brake master cylinder and caliper, and change the brake fluid.
- Replace the brake hoses every four years and if cracked or damaged.

2.2 FUEL TUBE

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



2.3 THROTTLE OPERATION

Inspect for smooth throttle lever full opening and automatic full closing in all steering positions. Inspect if there is no deterioration, damage or kinking in the throttle cable, replace it if necessary. Check the throttle lever, free play is 5-10 mm at the tip of the throttle lever.

Disconnect the throttle cable at the upper end. Lubricate the cable with commercially lubricant to prevent premature wear.



2.4 THROTTLE CABLE ADJUSTMENT

Slide the rubber cap of the adjuster off the throttle Housing, loosen the lock nut and adjust the free play of the throttle lever by turning the adjuster on the throttle housing. Inspect the free play of the throttle lever.



2.5 AIR CLEANER

Lossen the air cleaner cover screws. Pull out the air filter element from the air cleaner case.

Wash the element in non-flammable solvent, 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.



2.6 SPARK PLUG

This spark plug is located at the front of the engine. Disconnect the spark plug cap and unscrew the spark plug. Check the spark plug electrodes for wear. Install a new spark plug if the electrodes and insulator tip appear unusually fouled or burned. Discard the spark plug if there is apparent wear or if the insulator is cracked or chipped. The spark plug gap should be set to 0.6-0.7mm. With the sealing washer attached, thread the spark plug in by hand to prevent cross threading. Tighten the spark plug with 10-12 N.m



2.7 IDLE SPEED

Connect an engine tachometer to the engine. Warm up the engine by letting it run for at least 10 min. Turn the idle-speed adjustable screw on the carburetor to obtain the idle speed. "Turn in" (clockwise) will get higher speed. "Turn out" (counter clockwise) will get lower speed. IDLE SPEED: 1700±100 rpm



2.8 DRIVE CHAIN

Inspect the chain slack. The standard range is 10-25mm.



Adjust the chain slack

Loosen the locked bolts (4 pcs) then adjust the drive chain slack by turn the adjusting nut.

Tighten the four locked bolts.

When the drive chain becomes very dirty, it needs be removed, cleaned and lubricated. Use a commercial chain lubricant to lubricate the drive chain.



Clean the drive chain with kerosene and wipe it dry. Inspect the drive chain for possible wear or damage. Replace the chain if it is worn excessively or damaged. Inspect the sprocket teeth. If there is excessive wear or damage, replace it with new one.



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



2.9 BRAKE SYSTEM

Inspect the front brake lever and cable for excessive play or other damage.

Replace or repair it if necessary.

Measure the free play of the brake lever at the end of the brake lever. The standard of free play is 15-25 mm.



There is a parking brake located at the rear tire. Its controller is located at the handler bar on the right side. Inspect the rear brake lever and cable for excessive play or other damage. Replace or repair if necessary.

Measure the free play of the rear brake lever at the end of the lever. The standard range is 15-25 mm.



2.10 WHEELS AND TIRES

Inspect the tire surfaces for cuts, nails or other puncturing objects.

Check the tire surfaces at cold tire condition.

The standard of tire pressure is 3.6 ± 0.4 psi. (0.25 kgf/cm²)



2.11 STEERING SYSTEM

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



2.12 TOE-IN

Set the vehicle on level ground and set the front wheels facing straight ahead.

Mark the centers of the tires to indicate the axle center height. Measure the distance between the marks.



Move the vehicle back carefully until the wheels have turned 180 °, so the marks on the tires are aligned with the axle center height.

Measure the distance between the marks. Calculate the difference in the front and rear measurements.

Toe-in: 5±10mm

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

Torque: 35-43 N.m



2.13 GEAR & ENGINE OIL

Gear oil needs to be changed every year.

There is a gear oil release bolt at the rear of engine. Loosen this release bolt and let the dirty oil flow out. The refilling oil hole is on the engine case beside gearbox. Please refer to Chapter 4

3. ENGINE REMOVAL AND INSTALLATION

3.1 SERVICE INFORMATION	3.3 ENGINE INSTALLATION
3.2 ENGINE REMOVAL	

3.1 SERVICE INFORMATION

ENGINE SHUWŠÖ BE REMOVED UÞŠŸÁN THE CONDITION OF NECESSARY REPAIR OR ADJUSTMENT TO THE TRANSMISSION AND COMBUSTION SYSTEMÈ

3.2 ENGINE REMOVAL

Remove the seat and rear fender. (Chapter 11) Remove the spark plug cap from the spark plug. Remove the exhaust pipe.

Disconnect the carburetor cable by unscrew 3 * two screws on top of the carburetor.

Take off oil pump cable from the oil pump control plate. Oil pump is under the right side of engine.



Disconnect the wire connectors. There are three connectors for carburetor auto-choke, starter motorÊ and generator respectively.

Remove the drive chain cover. This is under the chain. Remove the drive chain retaining clip and master link, and remove the drive chain.



Remove the tow engine hanger nuts and bolts.

Remove the engine from the right side of frame.



3.3 ENGINE INSTALLATION

Engine installation is essentially the reverse order of removal. The torque of engine hanger bolt is **24-30 Nm** Route the wires and cable in reverse order properly.



4. LUBRICATION

4.1 SERVICE / GENERAL INFORMATION	4.4 ENGINE OIL & FILTER CHANGE
4.2 TROUBLESHOOTING	4.5 OIL PUMP REMOVAL
4.3 ENGINE OIL LEVEL	

4.1 SERVICE / GENERAL INFORMATION

- This section describes inspection and replacement of the engine oil, oil filter screen and assembly of the oil pump.
- Fill the oil pump with clean oil when reassembling the pump.

SPECIFICATION

ENGINE OIL CAPACITY API service classification: SE or SF 0.8 liter ENGINE OIL RECOMMENDATION Viscosity: SAE 15W/40

• When the average temperature in your riding area is within the indicated range, you should use the other engine oil viscosities that's shown in the chart.



ENGINE OIL VISCOSITIES

	ITEM	STANDARD	SERVICE
OIL PUMP	Body-to-rotor clearance		0.12
	Rotor tip clearance	—	0.12
	End clearance	0.05 - 0.10	0.2

TORQUE VALUE

OIL DRAIN BOLT

20-30 N.m

4.2 TROUBLESHOOTING

Oil lever too low-high oil consumption

- Normal oil consumption.
- External oil leaks.
- Worn piston rings.
- Faulty head gasket.

Oil contamination

- Worn piston rings.
- Faulty head gasket.
- Oil or filter not changed often enough.

4.3 ENGINE OIL LEVEL

- Place the engine on ælevel plane.
- Check the oil level with the oil level gaugeÈÖ[Á
 } [cÁ&^, it in when making this check.



• Add the recommended oil up to the upper level if the oil level is below or near lower level line on the gauge.



4.4 ENGINE OIL & FILTER CHANGE

• Remove the oil filter cap and the oil drain bolt. NOTE: Drain the oil while the engine is warm to ensure complete draining.

- Remove the oil filter cap, springÊand oil filter screen.
- •
- Check the O-ring for damage or fatigue. Install a new oil filter screen and springÊthen install the cap. •





• Install the oil drain bolt with sealing washer. **TORQUE: 20-30 N.m**



- Fill the crankcase with recommended oil. ENGINE OIL CAPACITY: 0.8 liter at draining.
- Install the oil filter cap.Install the oil level gauge.
- Start the engine and let it idle speed for 2 or 3 minutes.
- Stop the engine and check that the oil level at the upper line on the gauge. Make sure there are no oil leaks.



4.5 OIL PUMP REMOVAL

• Remove the fan cover assy.



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• Remove the cooling fan composition.



• Remove the A.C.G generator assy.



• Remove the right crankcase cover.



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• Remove the oil pump driven sprocket.



• Remove the oil pump assy.



• Disassemble the oil pump.



INSPECTION

• Measure the oil pump body-to-rotor clearance. **SERVICE LIMIT:** <u>0.12 mm</u>



 Install the oil pump shaft and measure the pump rotor tip clearance.
 SERVICE LIMIT: 0.12 mm



 Remove the oil pump shaft and measure the pump end clearance.
 SERVICE LIMIT: 0.2 mm.



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OIL PUMP ASSEMBLY / INSTALLATION

• Install the oil pump assy.



• Install the oil pump driven sprocket.



• Install the A.C.G generator assy and cooling fan composition.



5. CYLINDER HEAD / VALVES

5.1 SERVICE / GENERAL INFORMATION	5.4 CYLINDER HEAD REMOVAL
5.2 TROUBLESHOOTING	5.5 CYLINDER HEAD ASSEMBLY
5.3 CAMSHAFT COMPOSITION	•

5.1 SERVICE / GENERAL INFORMATION

- This section describes cylinder head, valves, camshaft and the other parts maintenance.
- The engine must be removed from the frame to service cylinder head.
- Camshaft lubrication oil is fed to the cylinder head through an oil @ |^ in the engine case.
- Before installing the cylinder headÊmake sure the @ |^ is not clogged and the gasket, O-ringÊand dowel pins are in place.

5.2 TROUBLESHOOTING

• Engine top-end problems usually affect engine performance. These problems can be diagnosed by a compression test, or by tracing engine noise to the top end with a sounding rod or stethoscope.

Low compression

Valve

- Incorrect valve adjustment.
- Worn or damaged valve seats.
- Burned or bent valve.
- Incorrect valve timing.
- Weak valve spring.

Cylinder head

- Leaking or damaged head gasket.
- Warped or cracked cylinder head.
- Faulty cylinder or piston.

Excessive noise

- Incorrect valve adjustment.
- Sticking valve or broken valve spring.
- Worn or damaged rocker arm or camshaft.
- Worn or damaged cam chain.
- Worn or damaged cam chain tension.
- Worn cam sprocket teeth.

Excessive smoke

- Damaged valve stem seal.
- Faulty cylinder or piston rings.

5.3 CAMSHAFT COMPOSITION REMOVAL

• Remove the cylinder head cover.



- Remove the air cleaner and carburetor.
 Remove the inlet pipe assy.
 Remove the shroud compositions.



• Relax the cam chain adjuster screw.



- Remove the nuts and washers.
- Remove the camshaft holder and dowel pins.
- Relax the camshaft gear from cam chain and remove the camshaft.





INSPECTION

• Inspect the cam lobes surface and height of cam lobes for wear or damage.

SERVICE LIMIT: IN 25.583 mm EX 25.425 mm



 Inspect the camshaft and bearings for wear or damage and replace them if necessary.



• Screw a 5mm bolt into the rocker arm shaft threaded end. Pull on the bolt to remove the shafts and rocker arms.



• Inspect the camshaft holder, rocker arms and rockerarm shafts for wear or damage.



Measure the I.D. of each rocker arm. **SERVICE LIMIT:** <u>10.10mm</u>

Measure the O.D. of each rocker arm shaft. SERVICE LIMIT: <u>9.91mm</u>



5.4 CYLINDER HEAD REMOVAL

• Remove the flange bolts and cylinder head.



• Remove the cylinder head gasket and dowel pins.



• Remove the cam chain guide.



CYLINDER HEAD DISASSEMBLY

• Remove the valve cotters, spring retainers and valve springs with a valve spring compressor.



INSPECTION

- Clean off all carbon deposits from the combustion chamber.
- Check the spark plug hole and valve area for cracks.



• Measure the cylinder head diagonally for warpa * with a straight edge and feeler gauge.

SERVICE LIMIT: 0.05 mm



• Measure the free lenght of the inner and outer valve springs.

SERVICE LIMITS: Inner 27.0 mm Outer 30.5 mm



 Inspect each valve for turning, burning, scratches or abnormal stems wear.



- Check the valve movement in the guide.
- Measure and record each valve stem O.D.
 SERVICE LIMITS: <u>4.90 mm</u>



- Measure and record the valve guide I.D. SERVICE LIMITS: IN / EX 5.03 mm
- Calculate the stem-to-guide clearance.
 SERVICE LIMITS: <u>IN 0.08 mm</u>
 EX 0.10 mm

NOTE: If the stem-to-guide clearance exceeds the service limits, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace guides as necessary and ream to fit. If the valve guide is replaced, the valve seat must be refaced.

5.5 CYLINDER HEAD ASSEMBLY

- Lubricate each valve stem with oil.
- Insert the valves into guides.
- Install the valve springs, retainers and the cotters.

NOTE: To prevent loss of tension, don't compress

the valve springs more than necessary.



INSTALLATION

• Install the new gasket and dowel pins.



• Install the cam chain guide.



• Install the cylinder head



CAMSHAFT COMPOSITION

INSTALLATION

• Install the rocker arms and rocker arm shafts into the camshaft holder.



 Align the "T" mark on the flywheel with the index mark on the alternator cover by turning the flywheel counter-clockwise.



• Position the camshaft gear with cam chain so that its "I" mark aligns with the cylinder head surface and the circle hole forwards front.



- Install the dowel pins and camshaft holder.
- Tighten the washers and nuts.

TORQUE: 14-16 N.m



• Adjust the clearance between the rocker arm and valve stem by applying a feeler gauge.

STANDARD VALVE: 0.07 mm

TORQUE: 7-11 N.m



• Relax the cam chain adjusting bolt with counterclockwise direction and install the o-ring and screw.



• Install the cylinder head cover. screw and install the carburetor cap to the carburetor.



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6. CYLINDER / PISTON

6.1 SERVICE INFORMATION	6.4 PISTON REMOVAL
6.2 TROUBLESHOOTING	6.5 PISTON INSTALLATION
6.3 CYLINDER REMOVAL	6.5 CYLINDER INSTALLATION

6.1 SERVICE INFORMATION

<u>GENERAL</u>

• Camshaft lubrication oil is fed to the cylinder head through an oil @ |^ in the cylinder head and engine case. Before installing the cylinder head make sure the @ |^ As not clogged and the gasket, O-ringÊand dowel pins are in place.

6.2 TROUBLESHOOTING

Low or unstable compression

• Worn cylinder or piston rings.

Overheating

• Excessive carbon build-up on piston or combustion chamber wall.

Knocking or abnormal noise

- Worn piston and cylinder.
- Excessive carbon build-up.

Excessive smoke

- Worn cylinder, piston, or piston rings.
- Improper installation of piston rings.
- Scored or scratched piston or cylinder wall.
- Damaged valve stem seal.

6.3 CYLINDER REMOVAL

• Remove the cylinder head.





• Remove the cylinder.

• Remove the cylinder gasket and dowel pins.

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• Clean off any gasket materials from the cylinder surface. NOTE: Be careful not to damage the gasket

<u>surface.</u>



6.4 PISTON REMOVAL

- Stuff a shop towel into the crankcase.Remove the piston pin clip with needle nose pliers.

NOTE: <u>Do not allow the clip fall into the</u> crankcase.



- Remove the piston pin from the piston.
- Remove the piston.



• Spread each piston ring and remove it by lifting up at a point opposite the gap.



INSPECTION

• Inspect the cylinder walls for scratches or wear.



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• Measure and record the cylinder I.D. at three levels in both an X and Y axis. Take the maximum reading to determine the cylinder wear.

SERVICE LIMIT: 47.1 mm



- Calculate cylinder taper at three levels in an X and Y axis. Take the maximum reading to determine the taper.
 SERVICE LIMIT: 0.05 mm
- Calculate the cylinder out-of-round at three levels in an X and Y axis. Take the maximum reading to determine the out-of-round. SERVICE LIMIT: 0.01 mm



• Inspect the top of the cylinder for warpą * . SERVICE LIMIT: 0.05 mm



PISTON / PISTON RING INSPECTION

 Measure the piston ring-to-groove clearance.
 SERVICE LIMITS: <u>TOP</u> 0.09 mm SECOND 0.09 mm



• Inspect the piston for wear or damage.



• Insert each piston ring into the cylinder and measure the ring end gap.

NOTE: Push the rings into the cylinder with the top of the piston to be sure they are squarely set in the cylinder. SERVICE LIMITS: TOP 0.45 mm SECOND 0.55 mm



Measure the piston pin O.D.
 SERVICE LIMIT: 12.96 mm



Measure the piston pin bore.
 SERVICE LIMIT: 13.04 mm



• Calculate the piston-to-piston pin clearance. SERVICE LIMIT: 0.02 mm



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 Measure the connecting rod small end I.D. SERVICE LIMIT: 13.06 mm



6.5 PISTON INSTALLTION

PISTON RING INSTALLATION

• Clean the piston ring grooves thoroughly and installthe piston ring with the mark facing up.

NOTE: <u>Don't interchange the top</u> and <u>second ring</u>s. <u>Avoid piston and piston ring damage</u> <u>during</u> <u>installatio</u>n.



• Space the piston ring end gaps 120 degrees apart.

After installation, the rings should be free to rotate in the ring grooves.



PISTON INSTALLATION

• Install the piston with it's "IN" mark on the intake valve side.



- Install the piston pin with new pin clips.Do not align the piston pin clip end gap with the piston cutout.

NOTE: <u>Do not allow the clip to fall into the</u> Crank case.



6.6 CYLINDER INSTALLATION

• Clean any gasket material from the crank case surface.

NOTE: Be careful not to damage the gasket surface.



• Install the dowel pins and a new gasket.



 Coat the cylinder bore and piston rings with engine oil and install the cylinder. NOTE: Ö[Å[
 A[
 Copiston rings damage cylinder bore during installation. Do not allow the cam chain
 A[fall into the crankcase.



Install the cylinder head.



7. TRANSMISSION / KICK STARTER

7.1 SERVICE INFORMATION	7.4 KICK STARTER
7.2 TROUBLESHOOTING	7.5 KICK STARTER ASSEMBLY
7.3 C.V.T DISASSEMBLY L CRANK CASE COVER REMOVAL	7.6 C.V.T ASSEMBLY

7.1 SERVICE INFORMATION

• If the drain tube assy fills with water, the tube should be drained.

7.2 TROUBLESHOOTING

Engine starts but can't travel

- Worn driven belt.
- Worn clutch lining.
- Damaged driven face spring.

Low engine power

- Worn driven belt.
- Worn weight roller.
- Dirty drive face.

7.3 C.V.T DISASSEMBLY L CRANK CASE COVER REMOVAL

• Relax the band screw and remove the C.V.T inlet duct.





• Remove the bolts and L crank case cover.

• Remove the gasket and dowel pins.



• Clean off any gasket material from L crank case surface.



C.V.T REMOVAL

- Relax the flange nut and remove kick-starter ratchet.
- Remove the drive face.



- Relax the flange nut. Remove the drive pulley assy and d riven belt.



• Remove the drive face boss and movable driven face assy.



• Remove the ramp plate and weight roller set.



• Relax the special nut and remove the driven plate composition and driven face spring.



INSPECTION

- Inspect the driven belt for wear, tearā * Êor damage.
 Measure the width of c@ Ádriven belt.
- SERVICE LIMIT: 17.0 mm



- Inspect the weight roller for wear or damage and replace them if necessary. •
- Measure the O.D. of weight rollers. SERVICE LIMIT: 14.6 mm •



- Measure the I.D. of c@Ánovable driven face. • SERVICE LIMIT: 21.24mm
- Inspect the drive face collar for wear or damage.



- Inspect the drive face boss for wear or damage. Measure the O.D. of drive face boss.
- SERVICE LIMIT: 20.94mm



- •
- Inspect the clutch outer for wear or damage. Measure the I.D. of clutch outer. SERVICE LIMIT: 107.5 mm •



- Inspect the clutch weight set for wear or damage.
 Measure the thickness of clutch weight lining. SERVICE LIMIT: 2.0mm



Measure the length of driven face spring. **SERVICE LIMIT: 82.6 mm** •



· Inspect the driven face assy and replace them if necessary.



7.4 KICK STARTER

This kick-starter arm is on the left side of engine.

When the kick-starter arm is kicked, the gear of start/shaft will drive the kick starter to revolve the crank shaft to start the engine.

After the engine is started, the kick-startel will stop transfer 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 positãon.



ELECTRIC SELF-STARTER MECHANISM

Starter Motor is installed on the upper side of engine. The starter motor can act only when the left hand brake is applied.





KICK STARTER DISASSEMBLY

- Remove the L crank case cover.
- Remove the kick starter.



• Remove the ex. cir clip and washer from kick starter spindle composition.



- Rotate the kick starter spindle composition to remáve the kick driven gear and spring. •
- Remove the kick starter spindle composition and • return spring.
- Remove the kick spindle bush. •



INSPECTION

Inspect the kick starter spindle composition ٠ for wear or damage.



- Inspect the kick return spring for fatigue or damage. Inspect the kick spindle bush for wear or damage.



Inspect the kick driven gear and spring for wear or • damage.



Inspect the machining surface for wear or damage.



7.5 KICK STARTER ASSEMBLY

- Install the kick spindle bush, return springÊand spindle assy. Install the kick driven gear and spring. •
- .


7.6 C.V.T ASSEMBLY

• Put together the driven face assy, spring, and driven plate composition.



• Compose the movable driven face composition, weight roller set, and drive face.



• Install the movable drive face assy and boss.



• Install the drive face and kick starter ratchet.



• Install the driven belt and driven pulley assy.



• Install the dowel pins and gasket.



• Install the L crank case cover.



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8A. TRANSMISSION GEAR SET

8A1 SERVICE INFORMATIONF	8A.4 GEAR SET INSPECTION
8A2 TROUBLESHOOTING	8A.5 GEAR SET INSTALLATION
8A3 GEAR SET REMOVAL	

8A.1 SERVICE INFORMATION

<u>GENERAL</u>

- For dæ) mission gear set repair, the engine must à^Á^{ [ç^å from c@ Árame.
- Fill the recommend oil after reassembla * the dae mission cover.
- Bring the vehicle to a full stop before shifting to drive or reverse.
- Avoid shift³ * to drive when vehicle is reversing, which will cause d³ mission gear set to damage.

8A.2 TROUBLESHOOTING

Hard to shift

- Shift fork bent
- Shift fork shaft bent
- Speed too fast

Gear noisy

• Worn dæ) • mission gear

Transmission jumps out of gear

- Gear dogs worn
- Shift fork bent or damaged

8A.3 GEAR SET REMOVAL

Remove the drain bolt and drain the oil.



• Š[[•^} the bolts and remove the dæ) •{ ã •ion cover.



Remove the dowel pins and gasket. Pull the shaft gearshifts out and remove the fork shift.

Remove the reverse shaft comp, and counter shaft comp.



Remove the sprocket and fixing plate from the final shaft comp.



Remove the cir clip and final shaft comp.



8A.4 GEAR SET INSPECTION

Turn the inner race of the bearing with your finger.

- The bearing should turn smoothly and quietly.
- Also check that the outer races of the bearings fit tightly in the left crankcase.
- Replace the bearings if they are abnormal.



- Check the sprocket and fixing plate for wear or damage.
- Replace the sprocket and fixing plate if necessary.



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8A.5 GEAR SET INSTALLATION

 Install the dæ) • mission cover and final shaft gear comp together with cir clip.



- Install the counter shaft comp and reverse shaft comp in the left crankcase.
- Install the shaft gearshifts and the fork shift.
- Install a new gasket and the dowel pins.



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8B. SHIFTING / GEAR BOX (ONLY FOR VIPER 90R)

8B.1 SERVICE INFORMATIONF	8B.4 SHIFT MECHANISM
8B.2 TROUBLESHOOTING	8B.5 GEAR BOX
8B.3 THE PARTS DRAWING OF TRANSMISSION SYSTEM	

8B.1 SERVICE INFORMATIONF

GENERAL

- FOR HF5 A GMISSION GEAR SET REPAIR, THE ENGINE MUST 69 F9A CJ98 FROM FRAME.
- FILL THE RECOMMEND OIL AFTER REASSEMBL=B; THE HF5 BGMISSION COVER.
- BRING THE VEHICLE TO A FULL STOP BEFORE SHIFTING TO DRIVE OR REVERS9"
- AVOID SHIFT=B; TO DRIVE WHEN VEHICLE IS REVERSING, K < = 7 < WILL CAUSE HF5 BGMISSION GEAR SET TO DAMAGE.

8B.2 TROUBLESHOOTING

ABNORMALLY ACT IN SHIFTING AND CAN'T RESET	*	FAULTY C.D.I
	★	FAULTY SHIFT MOTOR
	★	FAULTY SENSOR (F, N, R)
	★	FAULTY SHIFT SPRING OR GEAR
CAN NOT MOVE AFTER ENGINE START	★	BELT WORN
	★	FRONT PULLEY WORN OR BROKEN
	★	LINING OF CLUTCH WORN
	★	FAULTY SHIFT SPRING
CAN NOT RUN AT HIGH SPEED	★	BELT WORN
	\star	ROLLERS WORN
	\star	SPRING OF REAR PULLEY IS DISTORTED
ENGINE STOP AFTER SHIFT SUCCESSFULLY	\star	FAULTY C.D.I
THE FUNCTION OF SPEED LIMITED IS ABNORMAL	*	FAULTY C.D.I

8B.3 THE PARTS DRAWING OF TRANSMISSION SYSTEM



CVT





to 4800 r/min.Y hen this wire $\tilde{a} \stackrel{\sim}{Ac}$ c, $c \stackrel{\sim}{@} \stackrel{\sim}{A} op$ engine speed (8000 r/min) is available. (VIPER 90 RÁJ |^)



Sensor

Inspect wire for break a^* or damage and check c@ A contact. $U^{\{ c^{A} \otimes A^{} \in [A_{A}) \in A^{} \in A^{} \}$



If length is below 30mm, it must be replaced. Œ] |^ Šoctite 5699 and ♣ • œ with torque 25 kgf-cm.

SERVICE LIMIT: 30 mm A5L TORQUE:" \$ kgf-cm





Shift fixed Spring, Shift Push, Shaft Fixed and Fork

Remove dæ) • mission cover and other parts. Check shift pushÊfixedÁ @ec; æ) å/fork for wear or damage. Measure shift fixed spring lengthÁ§^^ fig-2D

fig-2



SERVICE LIMITS: ÄÜeplace Ás Ár •• Ás@e) ÁG { { .

Knock Block, Bearing and Cam Shift

Check knock block, bearing, and cam shaft for wear or damage. Replace it if necessary.





Shift Motor

Check shift motor for proper action using the following data:

	Voltage(v)	Current(mA)	torque (kg-cm)	rpm
loaded	12	≤800	6.0	54
No load	12	≤390	-	60









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

The gear ratio of forward gear composition is about $\frac{41}{15} \times \frac{45}{13}$. The gear ratio of reverse gear composition is about $\frac{49}{15} \times \frac{47}{12} \times \frac{45}{13}$.

9. STEERING SYSTEM

9.1 THE PARTS DRAWING OF STEERING SYSTEM	9.3 HANDLEBAR
9.2 TROUBLESHOOTING	9.4 STEERING SYSTEM

9.1 THE PARTS DRAWING OF STEERING SYSTEM



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9.2 TROUBLESHOOTING

HARD STEERING

- ★ FAULTY TIRE
- ★ STEERING SHAFT HOLDER TOO TIGHT
- ★ INSUFFICIENT TIRE PRESSURE
- ★ FAULTY STEERING SHAFT BEARINGS
- ★ DAMAGED STEERING SHAFT BEARING

9.3 HANDLEBAR

REMOVAL

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

Remove engine switch housing on the left handle bar. Remove rear brake level bracket.

Remove the bolts attaching the upper holder cover. Remove the handlebar holder and handlebar.

INSTALLATION

Put the handlebar on the lower holders. Make sure the handlebar punch mark with the tops of the handlebar lower holders. Install the handlebar upper holders with the L or R marks facing forward. Tighten the forward bolts first, and then tighten the rear bolts.

Install the handlebar upper holder's 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.

Aligning the split line of the throttle housing and holder with the punch mark. Tighten the screw securely





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9.4 STEERING SYSTEM

REMOVAL OF KINGPIN AND TIE-ROD

Remove the front wheels and brakes plates.

Remove the four self-lock nuts from the tie-rod ball joints and take off the two tie-rods.

Take off the rubber cap on the kingpin and remove the cotter pins on the kingpin. 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.



KINGPIN INSPECTION

Inspect the kingpin for damage or cracks. Measure the kingpin outer diameter. Upper minimum limit: Ø15.40 mm Lower minimum limit: Ø16.90 mm



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 Lower minimum limit: Ø17.19 mm

STEERING SHAFT REMOVAL

Remove the handle bar and handle bar cover. (see section 8-1) Remove the front fender. (see section 11-1) Unscrew the steering shaft fixed out below 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

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STEERING SHAFT INSPECTION

Inspect the steering shaft for damage or cracks.

Measure the steering shaft outer diameter in the location of the bushing. Minimum limit: Ø22.0 mm

STEERING SHAFT BEARING INSPECTION

Turn the shaft bearing with finger. The bearing is on the front part of frame. The bearing should turn smoothly and quietly.

Also check that the bearing outer race fits in the holder. Replace the bearing if necessary.





INSTALLATION OF STEERING SHAFT

Install the steering shaft with the bushing.

Apply grease to the bushing. Install the bushing holder and tighten

the nuts. Torque: 20-30 N.m Install the steering shaft nut and tighten it. This nut is under this steering shaft. Torque: 50-60 N.m



INSTALLATION OF TIE-ROD

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



Let the distance between the ball joints be 164 mm for RXL 50/70/90 and RXL90R and RXL50M. This is temporary setting.



INSTALLATION OF KINGPIN

Use grease to the kingpin lower dust seal lips and install it. Pump grease to bushing and install the kingpin.

Tighten the kingpin nut, the setting torque is 30-40 N.m. Fix the waterproof rubber cap. Temporarily, set the distance 147mm between the ball joints. Install the tie-rod and tighten the nuts. The setting torque: 35-43 N.m Install the front brake. Install the front brake. Adjust the toe in. (see chapter 2)



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10. FRONT WHEEL SYSTEM

10.1 THE PARTS DRAWING OF FRONT WHEELS SYSTEM	10.3 FRONT WHEEL
10.2 TROUBLESHOOTING	10.4 FRONT BRAKES

10.1 THE PARTS DRAWING OF FRONT WHEELS SYSTEM



10.2 TROUBLESHOOTING

FRONT WHEEL WOBBLING

BRAKE DRAG

POOR BRAKE PERFORMANCE

- ★ FAULTY TIRE
- ★ WORN FRONT BRAKE DRUM BEAR ING
- ★ BENT RIM
- ★ AXLE NUT NOT TIGHTENED PROPERLY
- ★ INCORRECT BRAKE ADJUSTMENT
- ★ STICKING BRAKE CABLE
- ★ BRAKE SHOES WORN
- ★ WORN BRAKE DRUM
- ★ BRAKE LININGS OILY, GREASY OR DIRTY
- ★ IMPROPER BRAKE ADJUSTMENT

10.3 FRONT WHEEL

REMOVAL

Raise the front wheels off the ground by placing a block under the frame. Remove the front wheel nuts, washer and wheels.

INSTALLATION

Install and tighten the four-wheel nuts Torque: 70-90 N.m Remember put a cotter pin in the castle nut.



10.4 FRONT BRAKES



FRONT BRAKE INSPECTION

Remove the front wheel. Remove the brake drum.

Measure the brake lining thickness. The minimum limit: 1.5 mm If they are thinner than the minimum limit, replace the brake linings.



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Measure the brake drum inner diameter. The maximum limit: 86 mm



Turn the inner race of each bearing with 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 PANAL

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. **Torque: 8-12 N.m** 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.

11. REAR WHEEL AND BRAKE SYSTEM

11.1 THEPARTSDRAWINGOFREAR	11.3 DRIVEMECHANISM
WHEELSYSTEM	
11.2 TROUBLESHOOTING	11.4 HYFRAULICDISCBRAKE
	SYSTEM

11.1 THE PARTS DRAWING OF REAR WHEEL SYSTEM



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11.2 TROUBLESHOOTING

BAD BRAKE PERFORMANCE

VIBRATION OR WOBBLE

BRAKE DRAG

11.3 DRIVE MECHANISM

REMOVAL & INSPECTION

Remove the rear wheel Lift the rear wheels up the ground. Loosen the cotter pin, axle nut and washer. Loosen the wheel and wheel hub. Remove the drive chain under cover.

- ★ BAD BRAKE ADJUSTMENT
- ★ BRAKE LININGS ARE OILY, GREASY OR DIRTY
- ★ BRAKE DRUMS ARE WORN
- ★ BRAKE ARM SETTING IS IMPROPERLY ENGAGE
- ★ AXLE IS NOT TIGHTENED WELL
- ★ BENT RIM
- ★ AXLE BEARINGS ARE WORN
- ★ FAULTY TIRES
- ★ REAR AXLE BEARING HOLDER IS FAULTY
- ★ INCORRECT BRAKE ADJUSTMENT
- ★ STICKING BRAKE CAM
- ★ STICKING BRAKE CABLE



Disassemblies the chain retaining clip and master link.





Check the driven sprocket for damage or wear.



Let the rear axle lie in V-blocks and check the run out. The run out limit is 0.5 mm Check the turning of bearing with fingers. The bearings should turn smoothly and quietly.

Replace if necessary.



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INSTALLATION

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Add grease to the dust seal lips and install dust seals. Assembly the rear axle and the driven sprocket. Assembly the drive chain on the driven sprocket. Assembly the master link and retaining clip. Note the retaining clip direction. Install the drive chain cover. Assembly the chain under cover.



Assembly the wheel. Tighten the rear axle nut with 70-90 N.m. Install a new cotter pin. Adjust rear brake level free play. Adjust chain slack.



11.4 HYFRAULIC DISC BRAKE SYSTEM



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To replace brake disc To replace brake disc Remove the rear left tire



Unscrew the two bolts shown on the photo and remove caliper



Unscrew the rear wheel axle nut and then remove the mounting seat of the disc



Unscrew bolts and remove the brake disc Check the thickness of disc and replace a new one if the thickness less than 3mm



TO REPLACE THE BRAKE SHOE

Remove the rear left tire



Loosen the two bolts as shown in the photo and remove caliper Press the plate to the end



Remove the brake shoe as shown in fig



Check the thickness of brake shoe and replace a new one if the thickness less than 1mm.



Press the piston to the end prior to installation of brake shoe



TO REPLACE THE BRAKE HYDRAULIC OIL

Loosen the bolts and open the cover.



Loosen the bolt and drain out the used brake oil. Tighten the bolt after the used oil being drained out completely.



Add the brake oil (Dot 3 or Dot 4)

Keep oil level at least half of the cup to avoid air gets into brake system, such like caliper and tube



Loosen the bolt to vent air from brake system. Fasten the bolt if there isn't any air in the brake system.



Pull left brake lever slightly to extract air from brake system



Fill the brake oil to the level as shown in the cup when no air comes out Assemble the cover



12. FENDERS AND EXHAUST PIPE

12.1 FENDERS DRAWING	12.4 EXHAUST PIPE REMOVE
12.2 HOW TO REMOVE THE FENDERS	12.5 EXHAUST PIPE INSTALLATION
12.3 EXHAUST PIPE DRAWING	

12.1 FENDERS DRAWING




12.2 HOW TO REMOVE THE FENDERS

Loosen two plastic bolts, you can remove the front body covers as shown in picture 1 & 2.





You need to remove the seat before removing the front and rear fender. Loosen the bolts as shown in pictures 3 & 4 then you can remove the rear R/L fender.





As picture 5 you can remove the rear R/L fender.



As picture 6 unscrew these four bolts then you can remove the rear body fender.



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Before remove the front body cover you have to remove the handle bar cover fristly. Secondly, you need to disassembly the front and rear brake cable and throttle cable, then disassembly the handle bar. Loosen the bolt then you can remove the front body fender (Picture 7).



Loosen these three bolts then you can remove the front R/L fender. (Picture 8 & 9)





12.3 EXHAUST PIPE DRAWING



12.4 EXHAUST PIPE REMOVE

Do not service the exhaust pipe while they are hot. Loosen the exhaust pipe nuts that fixed with engine. Remove the exhaust pipe mounting bolts that beside the muffler body. Remove the exhaust pipe carefully.



12.5 EXHAUST PIPE INSTALLATION

Installation is the reverse order of removal. Torque: Exhaust muffler bolts 20-30 N.m After installation; make sure that there are no exhaust leaks.





13. ELECTRICAL SYSTEM

13.1 TROUBLESHOOTING	13.4 BATTERY INSPECTION
13.2 IGNITION COIL	13.5 CHARGING
13.3 BATTERY CAUTION	13.6 WIRING DIAGRAMS

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13.1 TROUBLESHOOTING

ENGINE STARTS BUT STOPS			
	★ FAULTY SPARK PLUG		
NO SPARK AT PLUG	—★ ENGINE STOP SWITCH AT " OFF "		
	★ FAULTY IGNITION COIL		
	★ FAULTY GENERATOR		
	★ FAULTY CDI UNIT		
	★ POOLY CONNECTED:		
	Between CDI and ignition coil		
	Between alternator and CDI unit		
	Between CDI and engine stop switch		
	Between generator and CDI unit		
ENGINE STARTS BUT RUNS POORLY	→ IGNITION PRIMARY CIRCUIT		
* . X `	Faulty generator		
	Faulty CDI unit		
	Loosen contacted terminals		
	Faulty ignition coil		
	★ IGNITION SECONDARY CIRCUIT		
	Faulty plug		
	Loosen contacted spark plug wire		
	Faulty CDI unit		
CHARGING SYSTEM FAILURE	-+ LOOSE, BROKEN OR SHORTED WIRE		
	★ FAULTY ALTERNATOR		
	★ FAULTY IGNITION SWITCH		
	-+ LOOSE BATTERY CONNECTION		
	LOOSE CHARGING SYSTEM CONNECTION		
STARTER MOTOR WILL NOT TURN	─★ DEAD BATTERY		
	★ FAULTY IGNITION SWITCH		
	★ LOOSE OR DISCONNECTED WIRE		
STARTER MOTOR AND ENGINE TURN,	- ★ FAULTY IGNITION SYSTEM		
BUT ENGINE DOES NOT START	★ ENGINE PROBLEMS		
	★ FAULTY ENGINE STOP SWITCH		
REMOTE CONTROLLER INCAPABLE ACTION	➡ FAULTY REMOTE CONTROLLER		
TO MAKE ENGINE UNABLE RUNNING	★ SCANTY CONTROLLER BATTERY		
	ELECTRIC		

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13.2 IGNITION COIL

Remove the spark plug cap from the spark plug. Disconnect the ignition coil primary wire.



Measure the primary coil resistance. **STANDARD: 0.1 - 0.3Ω (20°C)**

Measure the secondary coil resistance with the spark plug cap in place. **STANDARD :** $7.4 - 12 \text{ k}\Omega (20^{\circ}\text{C})$



IGNITION TIMING

The ignition advance is $15^{\circ} \pm 3^{\circ}/4000$ rpm The Capacitive Discharge Ignition (CDI) system is factory pre-set and does not require adjustment.

ALTERNATOR EXCITER COIL

Remove the seat / rear fender and front fender. (see chapter 10) Disconnect the exciter coil wire. Measure the resistance between the yellow / red wire and ground.

STANDER : 460-700Ω (AT 20°C, 6°F)

13.3 BATTERY CAUTION

A CAUTION

The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate

ventilation when charging or using the battery in an open area. The battery contains sulfuric acid

(electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield. Electrolyte is poisonous. If swallowed drink large quantities of water or milk and call a physician.

13.4 BATTERY INSPECTION

Battery is under the seat, you can see this battery from the left side.

Measure the battery voltage using a voltmeter. VOLTAGE: Fully charged: 13.1 V Undercharged: Below 12.0 V

BATTERY REMOVAL

Remove the battery holder bolt nuts. Disconnect the negative cable and then the position cable and remove the battery. BATTERY INSTALLATION Install the battery in the reverse order of removal. After installing the battery, coat the terminals with clean grease.

13.5 CHARGING

Connect the charge positive cable to the battery position terminal.

Connect the charge negative cable to the battery negative terminal.

Using 0.9A-charging current about 5 hours. (Normal charging) Or using 4A-charging current about 1 hour. (Quick charging) Keep flames and sparks away from a battery being charged. Quick charging should be limited to an emergency; Normal charging is preferred.







13.6 WIRING DIAGRAMS (ONLY FOR VIPER 90R)



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WIRING DIAGRAMS (FOR VIPER 70 & 90)



14.TROUBLESHOOTING

14.1 ENGINE DOES NOT START	14.4 LOSS POWER
14.2 POOR PERFORMANCE AT LOW AND IDLE SPEEDS	14.5 POOR HANDLING
14.3 POOR PERFORMANCE AT HIGH	
SPEED	

14.1 ENGINE DOES NOT START





14.2 POOR PERFORMANCE AT LOW AND IDLE SPEEDS

14.4 LOSS POWER



	14.5	POOR	HANDL	ING
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STEERING IS HEAVY

ONE WHEEL IS WOBBLING

VEHICLE PULLS TO ONE SIDE

POSSIBLE REASON

Damaged steering bearing

★ Damaged steering shaft bushing

- Bent rim
- ★ Improperly installed wheel hub
- Excessive wheel bearing play
- Bent swingarm
- Bent frame
- Swing arm pivot bushing excessively
- r Worn
- Bent tie-rod
- Incorrect tie-rod adjustment

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- ★ Rear tie air pressure incorrect
- Improper wheel alignment
- Bent frame