SERVICE DATA

POWER BLOWER

PB-251
PB-255ES
ES-255ES

(Serial number : 37000001 and after)

STAGE Ⅱ MODEL

INTRODUCTION

We are constantly working on technical improvement of our products. For this reason, technical data, equipment and design are subject to change without notice. All specifications and directions in this SERVICE DATA are based on the latest products information available at the time of publication.

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Reference No. **21-25F-00**
ISSUED: 200801

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KIORITZ CORPORATION

1 SERVICE INFORMATION

1-1 Specifications

Model		PB-251	PB-255ES	ES-255ES
Dimensions	Length* mm(in)	340 (13.4)		
	Width* mm(in)	265 (10.4)	260 (10.2)	
	Height mm(in)	350 (13.8)		
Dry weight	with blower pipe** kg(lb)	4.5 (9.9)	4.8 (10.5)	---
	with vacuum pipe and bag*** kg(lb)	---	---	5.9 (12.9)
Engine	Type	KIORITZ, air-cooled, two-stroke, single cylinder		
	Rotation	Anticlockwise as viewed from the output end		
	Displacement $cm^3(in^3)$	25.4 (1.55)		
	Bore mm(in)	34.0 (1.34)		
	Stroke mm(in)	28.0 (1.10)		
	Compression ratio	7.0		
Carburettor	Type	Rotary type : Diaphragm, horizontal-draught, with primer purge bulb		
	Model	ZAMA RB-K85		
Ignition	Type	CDI (Capacitor discharge ignition) system Variable Slope Timing (VST) : Slope advance ignition system combined with electronic speed governor		
	Spark plug	BPMR8Y		
Exhaust	Muffler type	Spark arrestor muffler with catalyst		
Starter	Type	Automatic rewind	ES (effortless start)	
	Rope diameter x length mm(in)	3.0 x 815 (1/8 x 32.1)		
Fuel	Type	†Premixed two-stroke fuel		
	Mixture ratio	50 : 1 (2%)		
	Petrol	Minimum 89 octane		
	Two-stroke engine oil	ISO-L-EGD (ISO/CD13738), JASO FC/FD		
	Tank capacity L (U.S.fl.oz.)	0.5 (16.9)		
Blower	Fan type	Centrifugal, single stage		
	Blower pipe type	Fan head		
	Max. air volume (with pipes) m^3/min (ft^3/min)	8.5 (300)	9.2 (325)	
	Max. air velocity (with pipes) m/s (mph)	71 (159)	67 (150)	
	Blower nozzle size, (inner) mm (in)	113 x 24 (4.5 x 0.94) oval shape		

*Without blower pipes **With all blower pipes

***With vacuum pipe and bag

†Refer to Operator's manual.

1-2 Technical data

Model			PB-251	PB-255ES	ES-255ES
Engine					
Idling speed		r/min	2800 - 3400*	2700 - 3300*	2500 - 3100**
Wide open throttle speed		r/min	7200 - 7500*		6000 - 6500**
Compression pressure		MPa (kgf/cm^2) (psi)	0.87 (8.9) (126)		
Ignition system					
Spark plug gap		mm (in)	0.6 - 0.7 (0.024 - 0.028)		
Minimum secondary voltage at 1500 r/min		kV	15		
Primary coil resistance		Ω	160 - 400		
Secondary coil resistance		kΩ	2.5 - 3.2		
Pole shoe air gaps		mm(in)	0.3 - 0.4 (0.012 - 0.016)		
Ignition timing	at 1000 r/min	°BTDC	7		
	at 3000 r/min	°BTDC	18		
	at 7000 r/min	°BTDC	31		
Carburettor					
Idle mixture needle initial setting		turns back	4 1/8		
H mixture needle initial setting		turns back	7/8		
Idle adjust screw initial setting		turns back	1 5/8		
Test Pressure, minimum		MPa (kgf/cm^2) (psi)	0.05 (0.5) (7.0)		
Metering lever height		mm (in)	0.1 - 0.25 (0.004 - 0.010) lower than diaphragm seat		

BTDC: Before top dead centre.

*With fan head blower pipe.

** With vacuum pipe and bag.

1-3 Torque limits

Descriptions		Size	kgf•cm	N•m	in•lbf
Starter system	Starter pawl	M8*	130 - 150	13 - 15	115 - 130
	Starter case	M5	40 - 55	4.0 - 5.5	35 - 50
Ignition system	Ignition coil	M4	35 - 45	3.5 - 4.5	30 - 40
	Spark plug	M14	130 - 170	13 - 17	114 - 150
Fuel	Carburettor insulator	M5	50 - 70	5 - 7	45 - 60
system	Carburettor	M5	30 - 45	3 - 4.5	25 - 40
Engine	Crankcase	M5	70 - 110	7 - 11	60 - 95
	Cylinder	M5**	70 - 110	7 - 11	60 - 95
	Cylinder cover	M5	60 - 80	6 - 8	50 - 70
	Cylinder cover with lead	M5	40 - 60	4 - 6	35 - 50
	Engine mount	M4*	30 - 45	3 - 4.5	25 - 40
	Muffler	M5	70 - 80	7 - 8	60 - 70
	Muffler cover	M5*	30 - 45	3 - 4.5	25 - 40
Others	Outer fancase	M5†	20 - 40	2 - 4	17 - 35
	Fan	M8	140 - 160	14 - 16	120 - 140
	Fan hub	M8*	160 - 200	16 - 20	140 - 175
Regular bolt, nut and screw		M3	6 - 10	0.6 - 1	5 - 9
		M4	15 - 25	1.5 - 2.5	13 - 22
		M5	25 - 45	2.5 - 4.5	22 - 40
		M6	45 - 75	4.5 - 7.5	40 - 65
		M8	110 - 150	11 - 15	95 - 130

* Apply thread locking sealant (See below)

** The torque differences among four bolts should not exceed 20 kgf•cm (N•m, 17in•lbf) on one cylinder or crankcase.

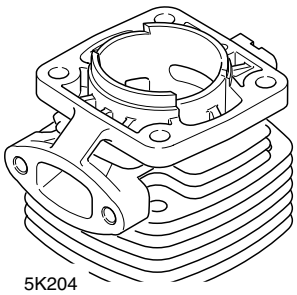
† Tapping screw

1-4 Special repairing materials

Material	Location	Remarks
Thread locking sealant	Engine mount	Loctite # 242, ThreeBond 1324 or equivalent
	Fun hub	
	Starter pawl	Loctite # 222, ThreeBond 1342 or equivalent
	Muffler cover	
Grease	Rewind spring	Lithium based grease or ECHO LUBE™
	Starter centre shaft	

1-5 Service limits

A



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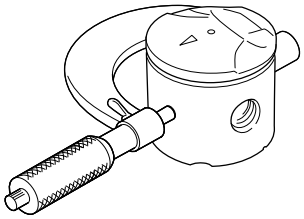

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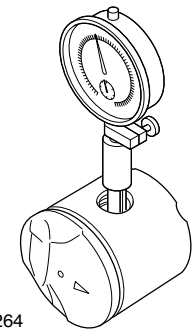

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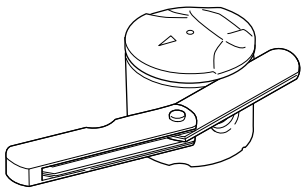

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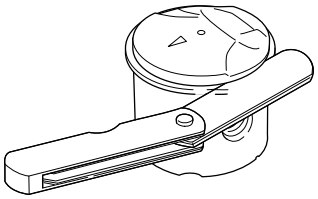

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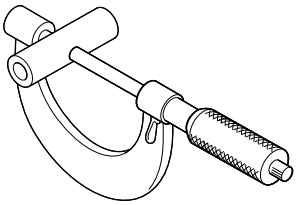

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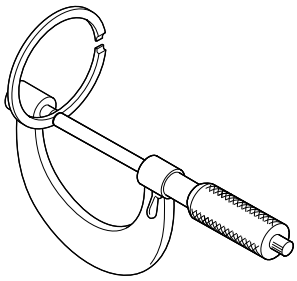

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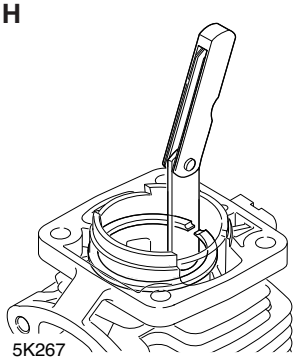

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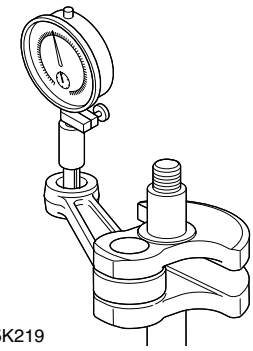

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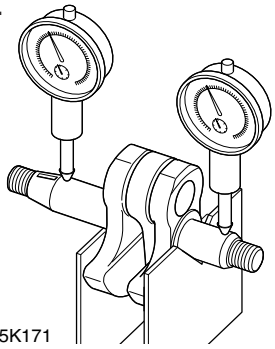

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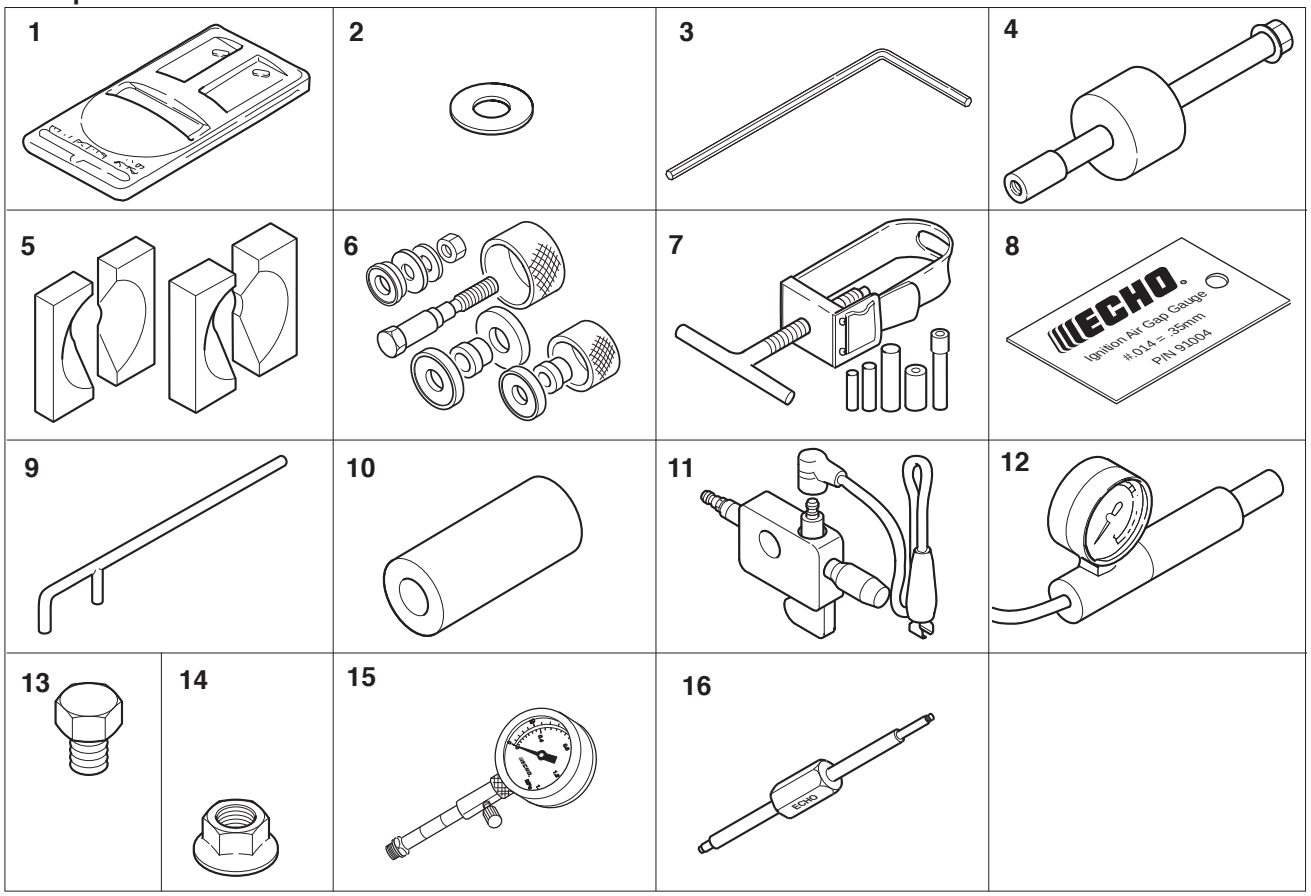
Description			mm (in)
A	Cylinder bore		When plating is worn and aluminium can be seen
B	Piston outer diameter	Min.	33.91 (1.335)
C	Piston pin bore	Max.	8.035 (0.3163)
D	Piston ring groove	Max.	1.3 (0.051)
E	Piston ring side clearance	Max.	0.1 (0.004)
F	Piston pin outer diameter	Min.	7.980 (0.3142)
G	Piston ring width	Min.	1.15 (0.045)
H	Piston ring end gap	Max.	0.5 (0.02)
K	Con-rod small end bore	Max.	12.000 (0.4724)
L	Crankshaft runout	Max.	0.03 (0.001)

1-6 Special tools



Key	Part Number	Description	Used for:
1	897801-33330	Tachometer PET-1000	Measuring engine speed
2	363018-00310	Washer	Installing crankcase oil seal of starter side
3	895610-79920	L-hex wrench (4 mm)	Removing and installing hex. socket bolts (M5)
4	897603-23030	PTO shaft puller	Removing driven (PTO) shaft
5	897701-06030	Bearing wedge	Removing ball bearings on crankshaft
6	897701-14732	Bearing tool	Removing and installing crankcase ball bearings
7	897702-30131	Piston pin tool	Removing and installing piston pin (Use 8 mm dia. adapter.)
8	91004	Module air gap gauge	Adjusting pole shoe air gaps
9	897712-04630	2-pin wrench	Removing and installing pawl carrier
10	897726-16431	Oil seal tool	Installing crankcase oil seals
11	990511-30023	Spark tester	Checking ignition system
12	897803-30133	Pressure tester	Checking carburettor and crankcase leakages
13	900100-08008	Bolt	Removing magneto rotor (flywheel)
14	433019-12330	Flange nut	Removing magneto rotor (flywheel)
15	91037	Compression gauge	Measuring cylinder compression
16	91020	Limiter plug tool	Removing and installing plug

2 CARBURETTOR ADJUSTMENT PROCEDURE

2-1 General adjusting rules

A. Before starting the unit for adjustment, check the following items.

1. The correct spark plug must be clean and properly gapped.

2. The air filter element must be clean and properly installed.

3. The muffler exhaust port must be clear of carbon.

4. The fuel lines, tank vent and fuel filter are in good condition and clear of debris.

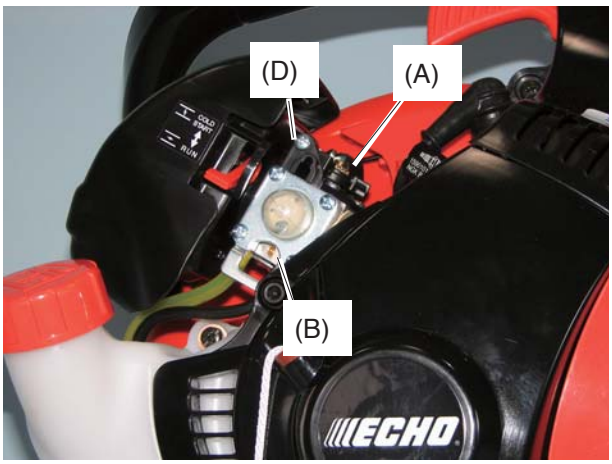
5. The fuel is fresh (> 89 octane : RON) and properly mixed at 50 : 1 with “ISO L-EGD” or “JASO FC/FD” 2 stroke oil.

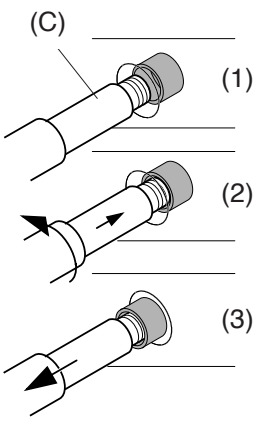
6. All blower pipes (fan head type) are installed for proper engine loading. ES-255ES should be blower setting.

B. Start and run engine for 3 minutes alternating rpm between WOT for 50 seconds and idle for 10 seconds. Adjust idle speed screw to 3,000 +/- 100 r/min. If engine does not run correctly after this adjustment, proceed to the next step 2-2.

IMPORTANT : After adjusting carburettor according to the steps 2-2 and 2-3, the limiter plug(s) must be installed in Idle and hi speed mixture needle to comply with Emission Directive.

2-2 Presetting idle adjust screw, Idle mixture needle and hi speed (H) mixture needle





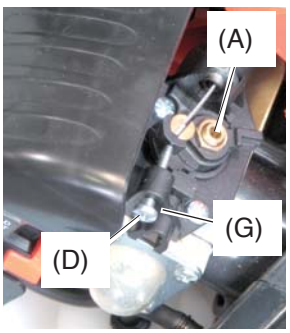


Fig1

Tools Required : Small screwdriver with 2.5 mm blade, P/N 897801-33330 electronic tachometer, P/N 91020 limiter plug removal tool. Parts Required : (2) P/N P005-001270 limiter plugs.

1. Remove plugs from Idle mixture needle hole (A) and H mixture needle hole (B) using limiter plug tool (C) as follows.

(1)Put limiter plug tool (C) on limiter plug in mixture needle hole.

(2)Screw limiter plug tool anticlockwise 2 turns into limiter plug pushing the tool against the plug to engage tool threads.

(3)Pull out limiter plug tool with the limiter plug from mixture needle hole.

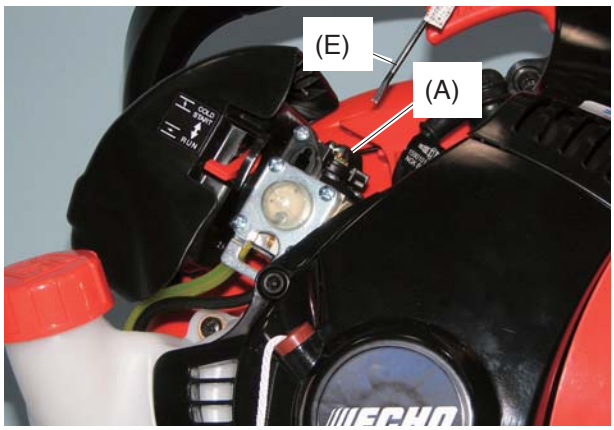
(4)Repeat plug removal procedure for the other mixture needle.

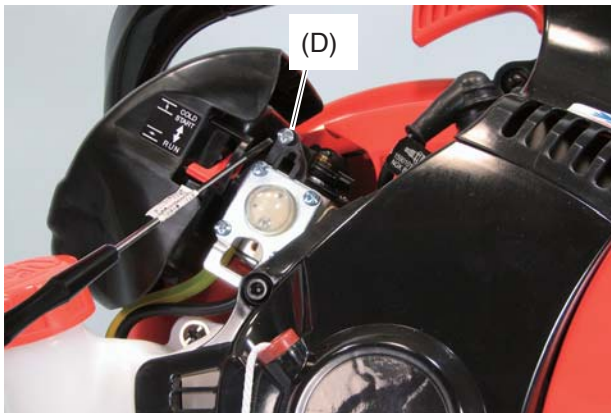
NOTE : If the plug is damaged and left in the hole, use a needle or pin-shaped tool to remove deformed plug pieces.

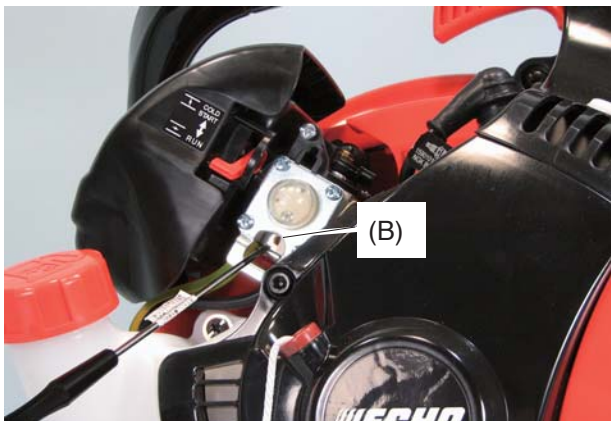
2. Turn hi speed mixture needle (B) clockwise until lightly seated. And then turn hi speed mixture needle anticlockwise 7/8 turns. Turn idle mixture needle (A) clockwise until lightly seated. And then turn L mixture needle anticlockwise 4 1/8 turns.

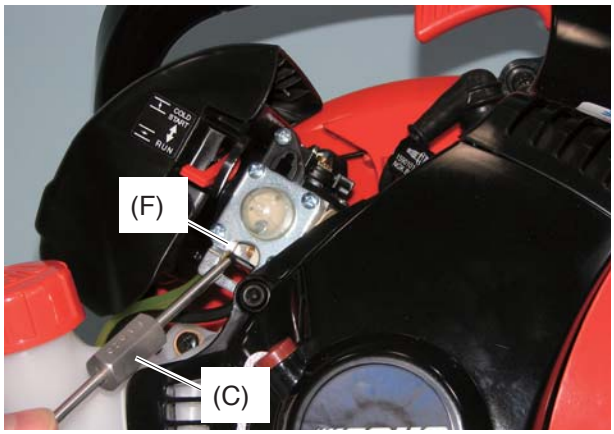
3. Turn idle adjust screw (D) clockwise until its head touches boss (G) as shown Fig 1. Then turn idle adjust screw (D) anticlockwise 1 5/8 turns.

2-3 Adjusting carburettor









1. Start engine and warm it up alternating engine speed between WOT and idle every 10 seconds for 1 minute.

2. Adjust idle mixture needle (A) with 2.5 mm blade screwdriver (E) to reach maximum engine speed just before drop off.

3. Set idle speed to 3,500 r/min on PB-251, to 3,400 r/min on PB-255ES and ES-255ES by turning idle adjust screw (D). Engine speed should be stable at 3,500 +/- 30 r/min on PB-251, at 3,400 +/- 30 r/min on PB-255ES and ES-255ES after idle adjust screw adjustment.

4. Turn idle mixture needle (A) anticlockwise to reduce idle speed 400 to 600 r/min in the range of 2,900 to 3,100 r/min on PB-251, 2,800 to 3,000 r/min on PB-255ES and ES-255ES.

NOTE : Engine speed must be allowed to stabilize a minimum of 20 seconds after each adjustment of L mixture needle to assure accurate tachometer readings.

5. Adjust hi speed mixture needle (B) to obtain maximum WOT engine speed just before lean drop off using 2.5 mm blade screwdriver.

6. Turn hi speed mixture needle (B) anticlockwise to reduce WOT engine speed 10-20 r/min. Minimum WOT engine speed after adjusting should be over 7,200 r/min.

7. PB-251 with fan head blower pipe: Start engine, and verify engine idle speed ranges from 2,800 to 3,400 r/min, and WOT engine speed ranges from 7,200 to 7,500 r/min.

PB-255ES with fan head blower pipe: Start engine, and verify engine idle speed ranges from 2,700 to 3,300 r/min, and WOT engine speed ranges from 7,200 to 7,500 r/min.

ES-255ES with vacuum attachment: Remove fan head blower pipe, and install vacuum pipe and bag. Start engine, and verify engine idle speed ranges from 2,500 to 3,100 r/min, and WOT engine speed ranges from 6,000 to 6,500 r/min.

When final adjustment is completed, the engine should idle, accelerate smoothly, and attain WOT per above specification.

8. After adjusting carburettor, insert and secure new plug(s) (F) P005-001270 deep in the needle holes per the Emission regulation using limiter plug tool.

NOTE : The initial carburettor settings for idle adjust screw, idle and hi mixture needles are intended to start and run the engine before final carburetor adjustments are made to conform the unit to meet Emission Directive. Actual turns required for engine operation may vary.