SERVICE DATA

HEDGE TRIMMER

ECHO: HCA-265ES

(Serial number : 36000001 and after)

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 product information available at the time of publication.

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Reference No. **15-25D-00**
ISSUED: 201210

1 SERVICE INFORMATION

1-1 Specifications

Dimensions	Length	mm (in)	2365 (93.1)
	Width	mm (in)	250 (9.8)
	Height	mm (in)	250 (9.8)
Dry weight*		kg (lb)	7.2 (15.8)
Engine	Type		YAMABIKO, 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		7.3
Carburettor	Type		Rotary type : Diaphragm, horizontal-draught, with primary
	Model		ZAMA RB-K89
Ignition	Type		CDI (Capacitor discharge ignition) system Digital magneto
	Spark plug		BPMR8Y
Exhaust	Muffler type		Spark arrester muffler
Starter	Type		ES (effortless-start)
	Rope diameter x length	mm (in)	2.8 x 850 (0.11 x 33.5)
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)
Clutch	Type		Centrifugal, 2-shoe pivot
Drive shaft	Type		Aluminum extrusion
	Inner shaft: Diameter - Length	mm(in)	6.15 - 1522 (0.24 - 60.0)
	Housing OD-ID	mm(in)	24.9 - 22.0 (0.98 - 0.87)
	(Main pipe) Length	mm(in)	1504 (59.2)
Gear case	Reduction ratio		3.97
	Gear tooth		Bevel gear
	Lubrication		Lithium based grease or ECHO XTended Protection ™ Lubricant
Cutter	Type		Double reciprocating, Double edge blade
	Effective length	mm(in)	446 (17.6)
	Pitch	mm(in)	35 (1.38)
	Height	mm(in)	21 (0.83)
	Thickness	mm(in)	2.5 (0.1)
	Lubrication		Apply oil every 4 hours of use

OD: Outer diameter. ID: Inner diameter. * Refer to Operator's manual.

1-2 Technical data

Engine			
Idling speed		r/min	2,900 +/- 300
Wide open throttle speed		r/min	10,300 - 11,300
Clutch engagement speed		r/min	3,900
Engagement Minimum†		r/min	3,500
Compression pressure		MPa (kgf/cm^2) (psi)	0.92 (9.4) (133)
Ignition system			
Spark plug gap		mm (in)	0.6 - 0.7 (0.024 - 0.028)
Minimum secondary voltage at 1,500 r/min		kV	15
Primary coil resistance		Ω	320 - 420
Secondary coil resistance		kΩ	2.7 - 3.3
Pole shoe air gaps		mm (in)	0.30 - 0.40 (0.012 - 0.016)
Ignition timing	at 2,000 r/min	°BTDC	7
	at 3,000 r/min	°BTDC	5
	at 8,000 r/min	°BTDC	28
	at 11,000 r/min	°BTDC	22
	at 12,000 r/min	°BTDC	Revolution limiter
PET-9000	Parameter 1		105
	Parameter 2		03
Carburettor			
Venturi Size		mm(in)	10.5 (0.413)
Throttle Bore		mm(in)	10.5 (0.413)
Idle adjust screw initial setting		turns out	7 7/8
Idle mixture needle initial setting		turns out	2 1/4
Hi speed mixture needle initial setting		turns out	1 1/2
Test Pressure, minimum		MPa (kgf/cm^2) (psi)	0.05 (0.5) (7.0)
Metering lever height		mm (in)	0.05-0.20 (0.002-0.008) lower than diaphragm seat

BTDC: Before top dead centre.

† If clutch engagement speed is lower than minimum clutch engagement speed, replace clutch assembly with new one.

1-3 Torque limits

Descriptions			Size	kgf•cm	N•m	in•lbf
Starter system	Starter pawl assembly		M 8	160 - 200	16 - 20	140 - 175
	Starter case		M 4*	25 - 35	2.5 - 3.5	22 - 33
Ignition system	Flywheel		M 8	160 - 200	16 - 20	140 - 175
	Ignition coil		M 4*	35 - 50	3.5 - 5	30 - 45
	Fan cover		M 5*	35 - 50	3.5 - 5	30 - 45
	Spark plug		M 14	130 - 170	13 - 17	112 - 150
Fuel system	Carburettor		M 5	30 - 45	3.0 - 4.5	25 - 40
	Intake insulator		M 5	60 - 80	6 - 8	55 - 70
	Fuel tank with stand		M 5*	40 - 60	4 - 6	32 - 55
Clutch	Clutch shoe		M 6	70 - 110	7 - 11	60 - 95
Cylinder cover		Flanged bolt	M 5*	30 - 45	3.0 - 4.5	25 - 40
		Button bolt	M 5*	20 - 30	2 - 3	17 - 25
Engine	Crankcase		M 5	70 - 110	7 - 11	60 - 95
	Cylinder		M 5	70 - 110	7 - 11	60 - 95
	Muffler		M 5	60 - 80	6 - 8	55 - 70
	Exhaust guide		M 4	14 - 28	1.4 - 2.8	12 - 24
	Muffler cover		M 5*	30 - 45	3.0 - 4.5	25 - 40
	Top guard		M 5*	20 - 40	2 - 4	20 - 32
Other	Cutter fastener		LM 10	280 - 320	28 - 32	245 - 280
Regular bolt, nut and screw			M 3	6 -10	0.6 - 1	5 - 9
			M 4	15 -25	1.5 - 2.5	13 - 22
			M 5	25 -45	2.5 - 4.5	22 - 40
			M 6	45 -75	4.5 - 7.5	40 - 65
			M 8	110 -150	11 - 15	95 - 130

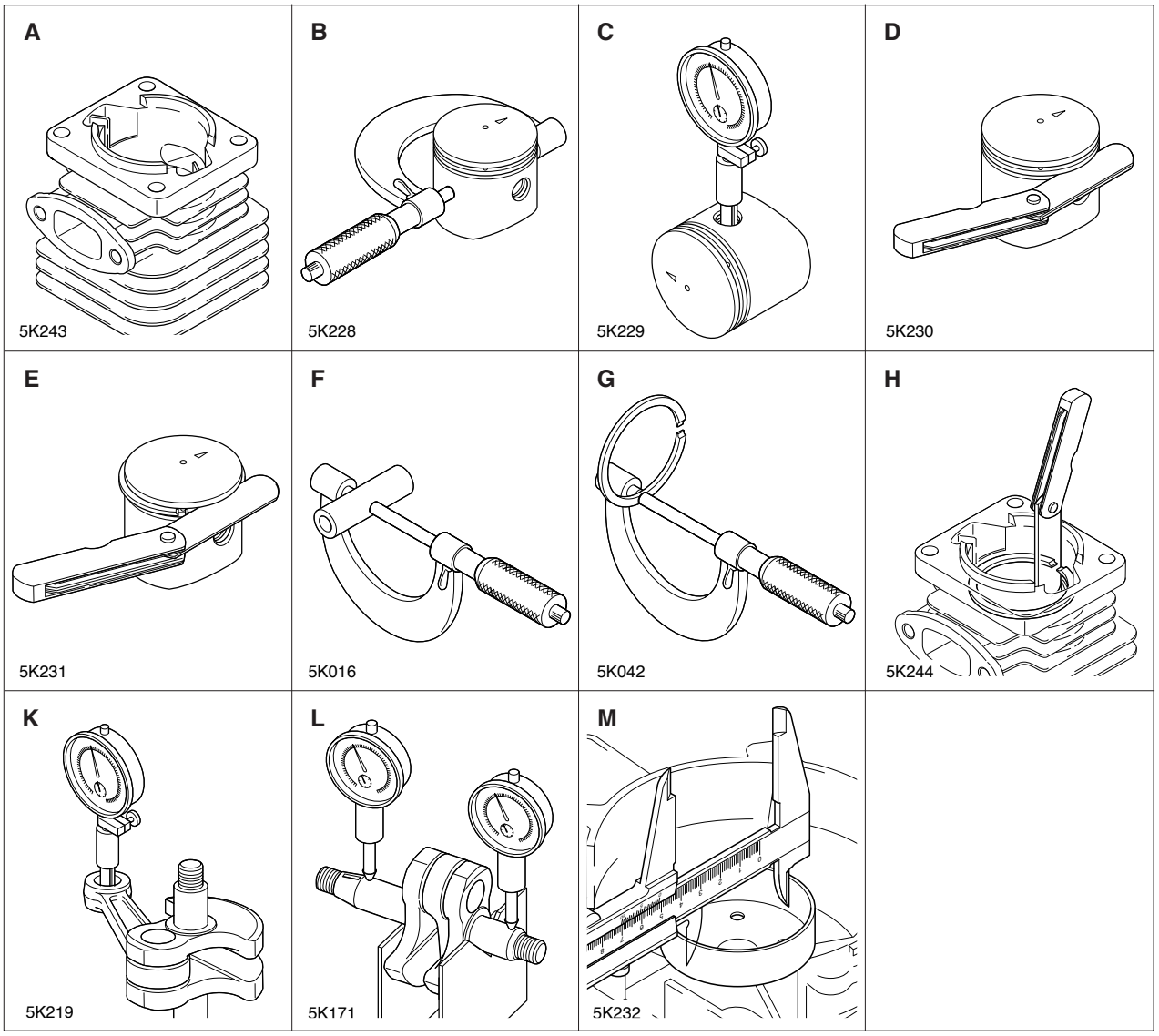
LM: Left-hand thread. * Apply thread locking sealant. (See below)

** The torque differences among four bolts should not exceed 20 kgf•cm (2N•m, 17in•lbf) on one cylinder or crankcase

1-4 Special repairing materials

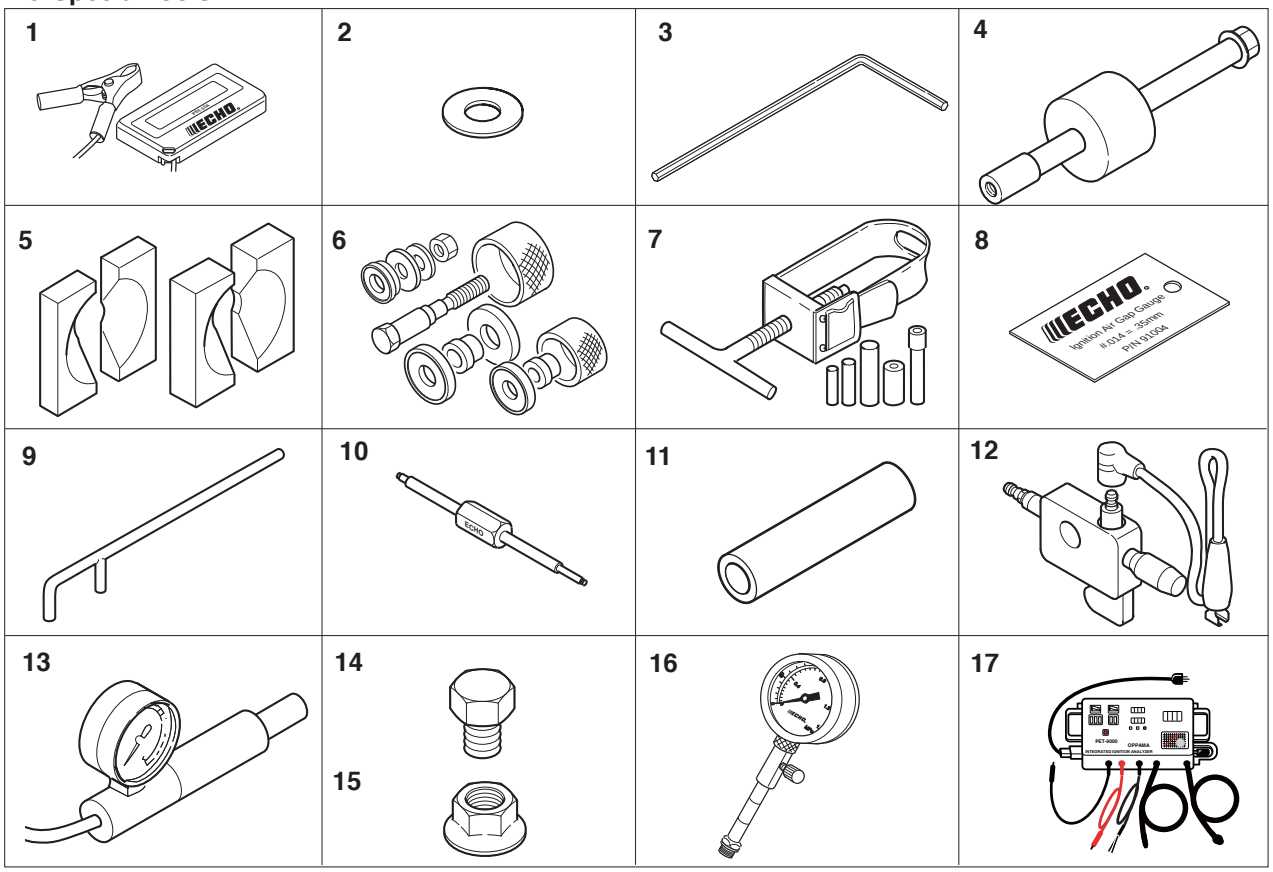
Material	Location	Remarks
Grease	Drive shaft	Lithium based grease or ECHO XTended Protection ™ Lubricant
	Gear case	
	Rewind spring	
	Starter center post	
	Oil seal inner lips	
Thread locking sealant	Starter case	Loctite #675 or equivalent
	Fuel tank with stand	
	Ignition coil	Loctite #242, ThreeBond #1324 or equivalent
	Fan cover	Loctite #222, Three Bond #1342 or equivalent
	Top guard	
	Stand	
	Muffler cover	
	Cylinder cover	

1-5 Service limits



Description			mm (in)
A	Cylinder bore		When plating is worn and aluminium can be seen
B	Piston outer diameter	Min.	33.92 (1.335)
C	Piston pin bore	Max.	9.035 (0.3557)
D	Piston ring groove	Max.	1.65 (0.065)
E	Piston ring side clearance	Max.	0.1 (0.004)
F	Piston pin outer diameter	Min.	8.98 (0.3535)
G	Piston ring width	Min.	1.45 (0.057)
H	Piston ring end gap	Max.	0.5 (0.02)
K	Con-rod small end bore	Max.	12.025 (0.4734)
L	Crankshaft runout	Max.	0.03 (0.001)
M	Clutch drum bore	Max.	59.5 (2.34)

1-6 Special tools



Key	Part Number	Description	Used for:
1	G310-000050	Tachometer PET-304	Measuring engine speed
2	363018-00310	Washer	Installing crankcase oil seal
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	91020	Limiter plug tool	Removing and installing plug
11	897726-09130	Oil seal tool	Installing crankcase oil seals
12	990511-30023	Spark tester	Checking ignition system
13	897803-30133	Pressure tester	Checking carburettor and crankcase leakages
14	900100-08008	Bolt	Removing magneto rotor (flywheel), crankshaft from crankcase
15	433019-12330	Flange nut	Removing magneto rotor (flywheel)
16	91037	Compression gauge	Measuring cylinder compression
17	900300	Ignition Analyzer : PET-9000	Measuring Ignition timing, Primary/Secondary voltage, engine speed

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.

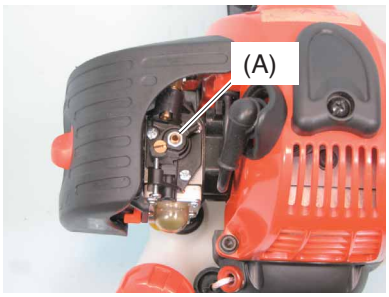
6. Remove gear case assembly with cutting blade, and install nylon line cutter. Extend nylon line cutter and cut nylon line cutter lengths to 180 mm (7.0 inches) for proper engine loading to adjust carburettor.

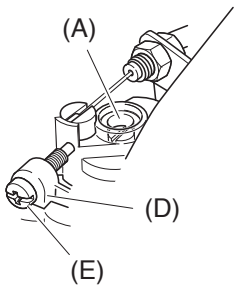
B. Adjustment with limiter plugs on carburettor.

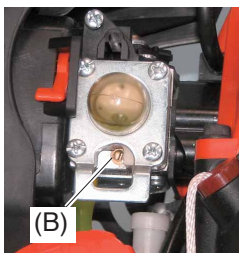
Start and run engine for 2 minutes alternating rpm between WOT and idle every 5 seconds. Adjust idle speed to 2,900 +/- 200 r/min by turing Idle adjust screw. If engine does not run correctly after this adjustment, proceed to the next step 2-2.

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(s) hole(s) to comply with Emission Directive.

2-2 Presetting Idle mixture needle and Hi speed mixture needle







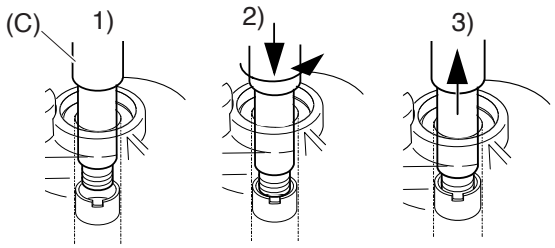
Tools Required : Small screwdriver with 2.5 mm blade, P/N G310-000050 electronic tachometer, P/N 91020 limiter cap tool with 2.5 mm left-hand thread.
Parts Required : (2) limiter plug P/N P005-001270

1. Remove the plugs from Idle mixture needle hole (A) and Hi speed 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) Push and turn limiter plug tool anticlockwise 2 turns into limiter plug slowly.

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



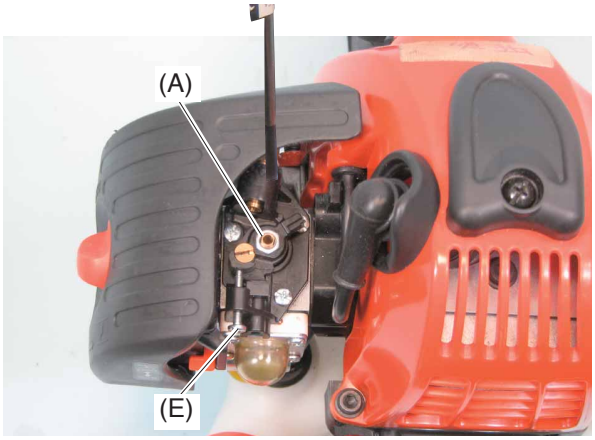
NOTE : If plug is damaged and stays in the hole, use hand auger or pin-shaped tool to scrape, and lift the cap pieces out of the hole.

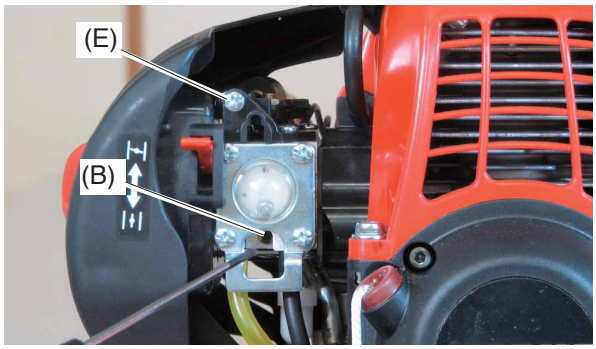
2. Turn Idle mixture needle (A) clockwise completely until lightly seated. Then turn it anticlockwise 2 1/4 turns. Turn Hi speed mixture needle (B) clockwise until lightly seated. Then turn it anticlockwise 1 1/2 turns.

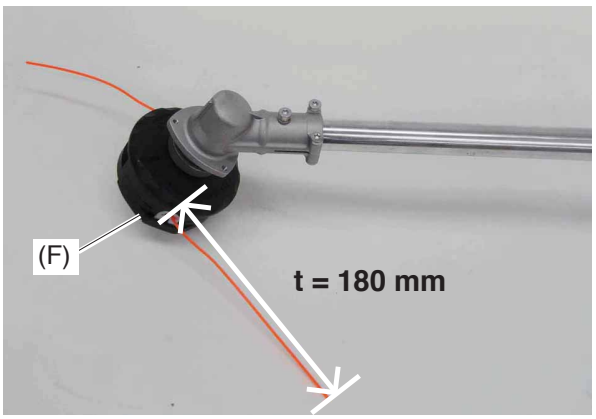
3. Turn Idle adjust screw (E) clockwise until its head touches boss (D). Then turn Idle adjust screw (E) anticlockwise 7 7/8 turns.

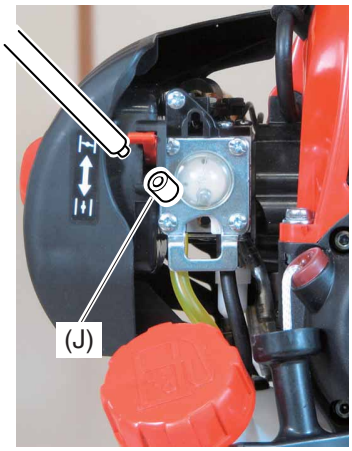
NOTE : The initial carburettor settings for Idle adjust screw, Idle and Hi speed mixture needles are intended to start and run the engine before final carburettor adjustments are made to conform the unit to meet Emission Directive. Actual turns required for engine operation may vary.

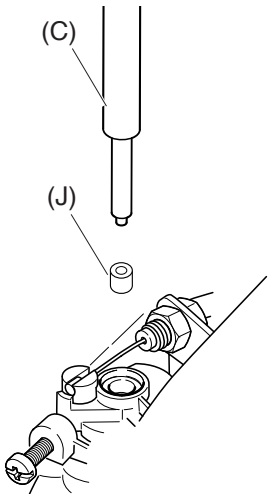
2-3 Adjusting carburettor











1. Start and warm engine for 1 minute alternating engine between WOT and idle every 5 seconds.

2. Adjust Idle mixture needle (A) to reach maximum idle speed with 2.5 mm blade screwdriver.

3. Set idle speed to 3,700 r/min by turning idle adjust screw (E). Engine speed should be stable at 3,700 +/- 50 r/min.

4. Turn Idle mixture needle anticlockwise to reduce engine idle speed 800 r/min to set idle speed at 2,900 r/min. The idle speed range is 2,800 - 3,000 r/min.

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

5. Adjust Hi speed mixture needle (B) to reach maximum WOT engine speed. Then turn Hi speed mixture needle anticlockwise to reduce WOT engine speed 20 r/min. (max. approx. 8,500 r/min).

NOTE : Nylon line length should be 180 mm.

6. Stop engine. Remove nylon line cutter (F) and reinstall gear case assembly (G). Restart engine again and verify engine idle speed ranges from 2,600 to 3,200 r/min, and WOT engine speed ranges from 10,300 to 11,300 r/min.

Make sure the blade does not rotate when engine is idle,and engine should accelerate smoothly.

7. After adjusting carburettor, insert and secure new plug(s) (J) P005-001270 deep in the needle holes per the Emission Directive using limiter plug tool (C).

NOTE : Engine WOT, and idle speed in field operation may vary from final adjustment specifications due to changing ambient conditions, fuel, and engine loads. Engine speed variances should be within the safe ranges for WOT and Idling speed as listed in Section 1-2 Technical data, otherwise the carburettor should be readjusted.