YAMAHA

XS650C

Supplementary Service Manual

584-28197-10

NOTICE

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our product are already known and understood by the reader.

Without such basic knowledge, repairs or service to this model may render the machine unsafe, and for this reason we must advise that all repairs and/or service be performed by an Authorized Yamaha Dealer who is in possession of the requisite basic product knowledge.

The Research, Engineering, and Overseas Service Departments of Yamaha are continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable and changes in specifications or procedures will be forwarded to all Authorized Yamaha Dealers and will, where applicable, appear in future editions of this manual.

YAMAHA
XS650C
SUPPLEMENTARY SERVICE MANUAL
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FOREWORD

This Supplementary Service Manual for XS650C has been published to supplement the Service Manual for the XS650B and includes changes in specifications and addition to the data.
For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with the Service Manual for the XS650B. Page numbers shown in brackets are identical with page numbers of the Service Manual for the XS650B.

SERVICE DEPT.
OVERSEAS ENGINEERING DIVISION
YAMAHA MOTOR CO., LTD.

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SPECIFICATIONS

General specifications should be read as follows:

Items \ Model	XS650C
Dimensions:	
Overall width	835 mm (32.9 in)
Overall height	1,140 mm (44.9 in)
Engine:	
Valve timing	Intake BTDC 36° (open) ABDC 68° (close) Exhaust BBDC 68° (open) ATDC 36° (close)
Valve clearance (cold)	IN: 0.05 mm (0.002 in) EX: 0.15 mm (0.006 in)
Lubrication:	
Sump capacity	2,500 cc (2.6 US qt)
Carburetor:	
Type	BS38X2
Manufacturer	MIKUNI
Main jet	#122.5
Needle jet	Z-8
Pilot jet	#25
Starter jet	GS_1 #80 GS_2 0.5
Jet needle and clip position	4M1-3
Float level	25.0 ±2.5 mm
Pilot screw	1-1/2 ±1/2 turns out
Air jet, Main	1.0ϕ
Air jet, Pilot	1.4ϕ
Throttle valve	#120
Air cleaner:	
Type	Dry foam rubber
Chassis:	
Front wheel, rim size	1.85B × 19
tire size	3.50-19-4PR
inflation pressure	1.6 kg/cm² (23 lb/in²)
Rear wheel, rim size	2.15B × 18
tire size	4.00-18-4PR
inflation pressure	2.0 kg/cm² (28 lb/in²)
Ignition system:	
Ignition timing	15 ±2° BTDC (fully retarded)
Breaker point gap	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)
Spark plug, Manufacturer	NGK
Heat range	BP-7ES
Lights:	
Headlight	12V, 50/40W
Taillight	12V, 8W
Stoplight	12V, 27W
Neutral light	12V, 3W
Flasher indicator lights	12V, 3W × 2
Flasher lights	12V, 27W × 4
High beam indicator light	12V, 3W
Speedometer lights	12V, 3W × 2
Tachometer light	12V, 3W × 2
Rear brake lining warning light	12V, 3W
Stoplight warning light	12V, 3W

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Maintenance Specifications

Rocker arms specifications should be read as follows:

Dimensions	Standard size	Wear limit
D_2: Shaft O.D.	$15\ ^{-0.009}_{-0.015}$ mm (0.590 $^{-0.00035}_{-0.00059}$ in)	———
Clearance	0.009 mm (0.00035 in) (Min.)	0.033 mm (0.0013 in) (Max.)

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Maintenance Specifications

Valve springs specifications should be read as follows:

	Inner		Outer	
	Intake	Exhaust	Intake	Exhaust
Free length	42.0 mm (1.654 in)		42.55 mm (1.675 in)	
Spring rate	K_1 = 1.43 kg/mm (80.07 lb/in) K_2 = 1.81 kg/mm (101.35 lb/in)		K_1 = 3.20 kg/mm (179.19 lb/in) K_2 = 4.18 kg/mm (234.07 lb/in)	
Installed length (valve closed)	35.0 mm (1.379 in)		37.0 mm (1.458 in)	
Installed pressure (valve closed)	10 ±0.7 kg (22.05 ±2.05 lb)		17.7 ±1.25 kg (39.02 ±2.761 lb)	
Compressed length (valve open)	25.5 mm (1.005 in)		27.5 mm (1.084 in)	
Compressed pressure (valve open)	27.2 ±1.9 kg (59.96 ±4.19 lb)		57.5 ±4 kg (126.76 ±8.82 lb)	
Wire diameter	2.9 mm (0.114 in)		4.2 mm (0.165 in)	
Number of windings	6.0 turns		4.25 turns	
Winding O.D.	19.4 mm (0.764 in)		32.6 mm (1.284 in)	

Valves-Intake specifications should be read as follows:

	Dimensions	
	Standard	Wear limit
"A" head diameter	41 mm (1.614 in)	—
"B" face width	2.1 mm (0.083 in)	—
Clearance (cold engine)	0.05 mm (0.002 in)	—

Valves-Exhaust specifications should be read as follows:

	Dimensions	
	Standard	Wear limit
Clearance (cold engine)	0.15 mm (0.006 in)	—

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TORQUE SPECIFICATIONS

Torque specifications should be read as follows:

Valve clearance adjusting nut	8 mm	1.5 ~ 2.5 m-kg	(11 ~ 18 ft-lb)
Cylinder head tightening nut	10 mm	3.0 ~ 3.5 m-kg	(22 ~ 25 ft-lb)
bolt	8 mm	2.1 ~ 2.5 m-kg	(15 ~ 18 ft-lb)
bolt	6 mm	1.0 ~ 1.5 m-kg	(7.5 ~ 11 ft-lb)
stud bolt	10 mm	1.5 ~ 2.0 m-kg	(11 ~ 14.5 ft-lb)
Strainer cover tightening screw	6 mm	0.8 ~ 1.0 m-kg	(6.0 ~ 7.2 ft-lb)
Delivery pipe holding banjo bolt	10 mm	2.0 ~ 2.2 m-kg	(14.5 ~ 16 ft-lb)
	14 mm	2.5 ~ 3.0 m-kg	(18 ~ 22 ft-lb)
Drain plug	30 mm	3.5 ~ 4.0 m-kg	(25 ~ 29 ft-lb)
Pump cover tightening screw	6 mm	0.7 ~ 0.9 m-kg	(5.0 ~ 6.5 ft-lb)
Kick crank holding bolt	8 mm	1.5 ~ 2.5 m-kg	(11 ~ 18 ft-lb)
A.C. generator (rotor) securing nut	12 mm	7.0 ~ 7.5 m-kg	(50 ~ 54 ft-lb)
A.C. generator (startor) securing screw	6 mm	0.7 ~ 0.9 m-kg	(5.0 ~ 6.5 ft-lb)
Clutch boss securing nut	18 mm	7.5 ~ 8.0 m-kg	(54 ~ 58 ft-lb)
Drive sprocket securing nut	22 mm	10.0 ~ 12.0 m-kg	(72 ~ 87 ft-lb)
Crankcase tightening stud bolt	8 mm	1st 1.0, 2nd 1.5, final 2.0 m-kg (1st 7.2, 2nd 11, final 14.5 ft-lb)	
Crankcase tightening stud nut	8 mm	1st 1.0, 2nd 1.5, final 2.0 m-kg (1st 7.2, 2nd 11, final 14.5 ft-lb)	
Primary drive gear securing nut	14 mm	7.0 ~ 10.0 m-kg	(50 ~ 72 ft-lb)
Spark plug	14 mm	2.5 ~ 3.0 m-kg	(18 ~ 22 ft-lb)
Breaker shaft securing nut	6 mm	0.8 ~ 1.0 m-kg	(5.8 ~ 7.2 ft-lb)
Front wheel shaft securing nut	14 mm	7.0 ~ 10 m-kg	(50 ~ 72 ft-lb)
Front fork crown pinch bolt	8 mm	0.8 ~ 1.3 m-kg	(5.8 ~ 9.4 ft-lb)
Steering shaft securing bolt	14 mm	4.2 ~ 6.5 m-kg	(30 ~ 47 ft-lb)
Engine mounting nut	10 mm	3.5 ~ 5.6 m-kg	(25 ~ 40 ft-lb)
Pivot shaft securing nut	14 mm	5.0 ~ 8.0 m-kg	(36 ~ 58 ft-lb)
Rear wheel shaft securing nut	18 mm	12.0 ~ 18.0 m-kg	(87 ~ 130 ft-lb)
Rear cushion holding nut	10 mm	2.3 ~ 3.7 m-kg	(17 ~ 27 ft-lb)

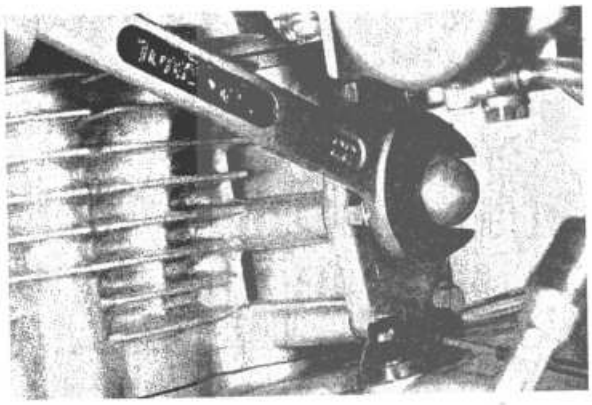
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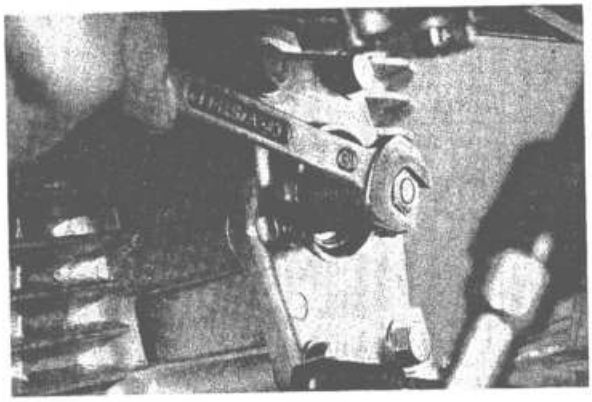
Chain Tensioner

Chain tensioner should be changed as follows:

Adjustment

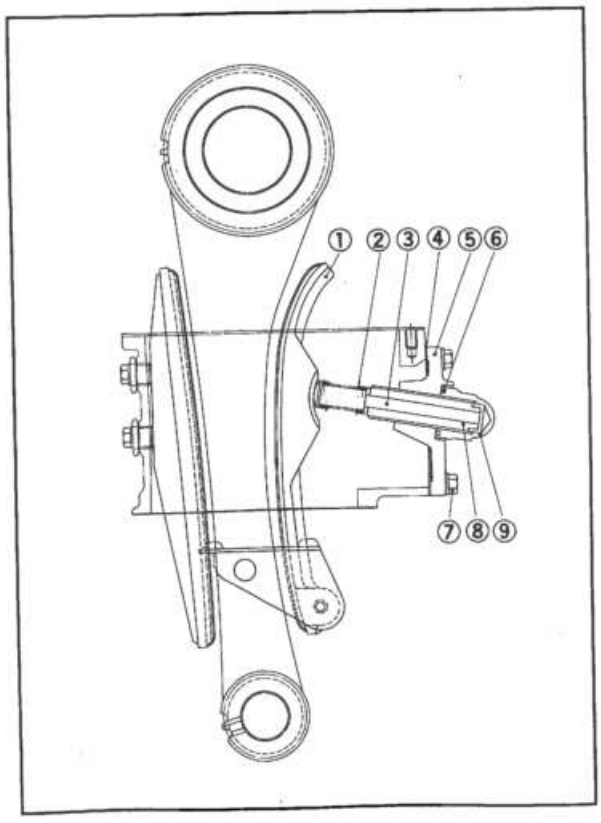
1) Remove the cap nut.
2) Turn the adjuster bolt in until the push rod is flush with the end of the adjuster bolt.
3) Lock the adjuster bolt with the cap nut.
4) Check the chain tensioner every 3,000 kms (2,000 miles).





Disassembly

1) Remove the bolts from the chain tensioner holder.
2) Pull the unit out of the cylinder.
3) The stopper guide attached to the crankcase can be removed after the cylinder is pulled out.
4) During installation, install a new gasket coated on both sides with Yamaha Bond #4.



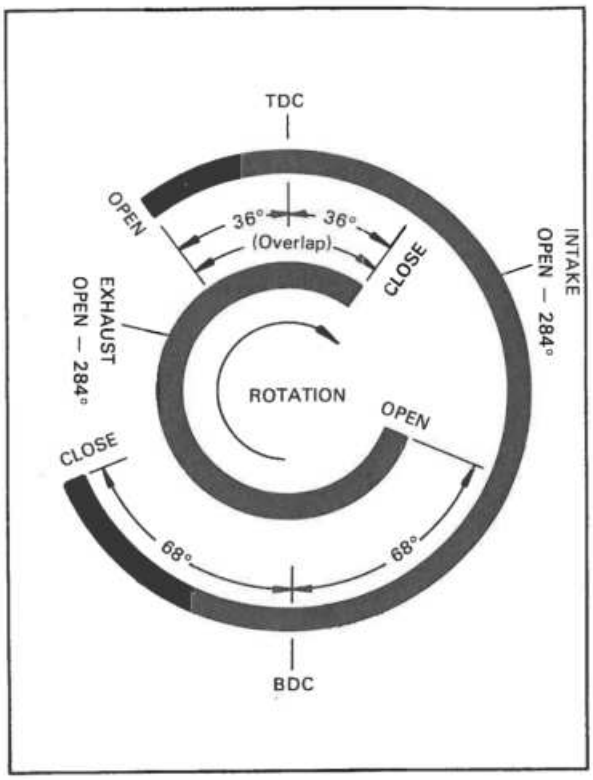
1. Stopper guide
2. Spring
3. Push rod
4. Gasket
5. Tensioner holder
6. O-ring
7. Bolt
8. Adjuster bolt
9. Cap nut

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4. Cam shaft

Item c) should be read as follows:

c) The intake valve opens 36° before top dead center and closes 68° after bottom dead center, which means the intake valve is held open 284°.
The exhaust valve opens 68° before bottom dead center and closes 36° after top dead center. It remains open for a duration of 284°.
At one point during cam rotation, both the intake and exhaust valve closes.



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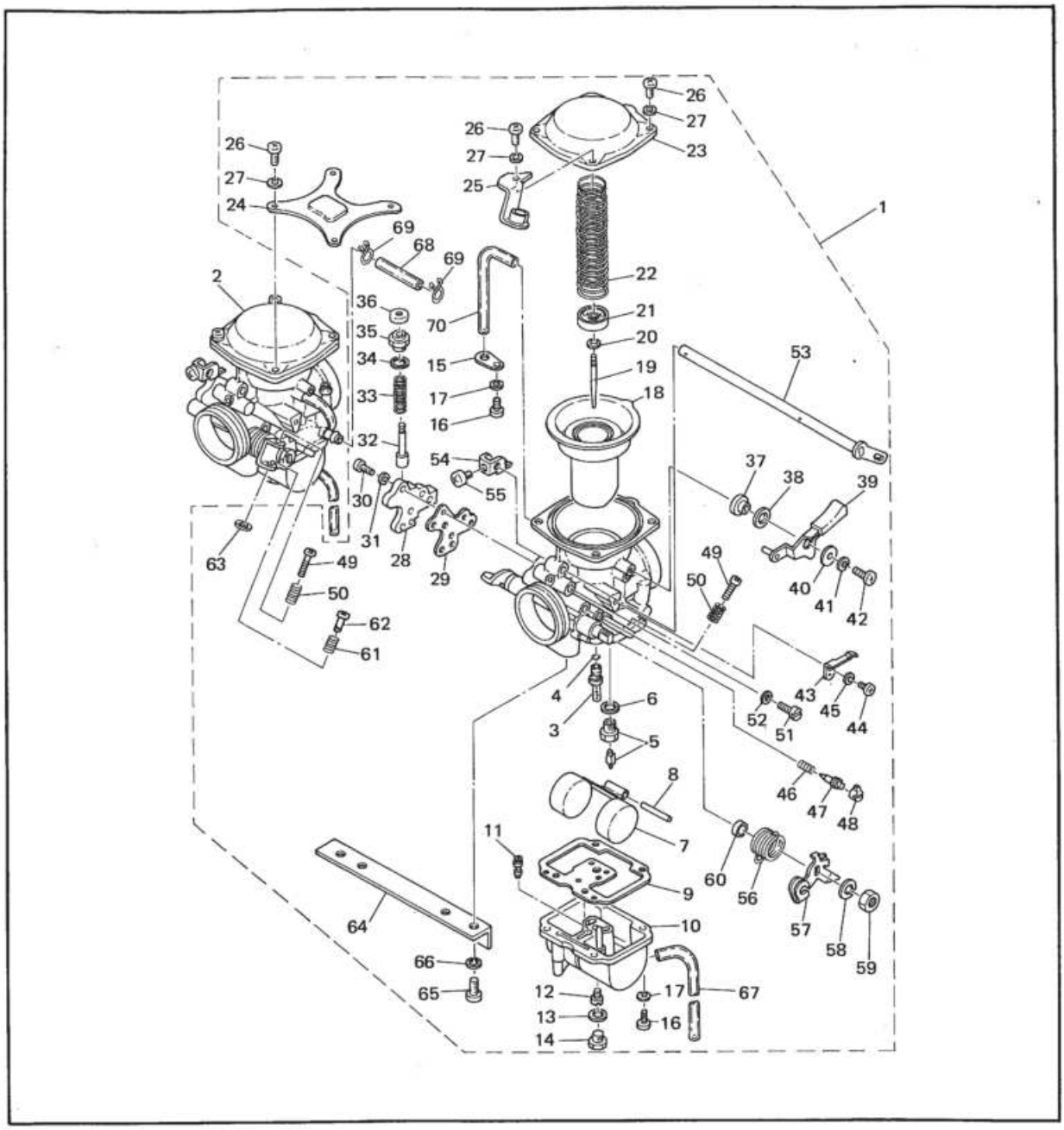
4-2. CARBURETOR

Specifications and illustration of carburetor should be changed as follows:

Carburetor specifications

Main Jet	#122.5
Jet Needle	4M1-3
Needle Jet	Z-8
Pilot Jet	#25
Butterfly (throttle) valve	#120
Starter Jet	GS_1 #80 GS_2. 0.5
Float Level	25.0 ±2.5 mm
Pilot Screw (turns out)	1-1/2 ±1/2
Fuel Valve Seat	2.0
Idling Engine Speed	1,200 ±50 rpm

Illustration



1. Carburetor assembly (left)
2. Carburetor assembly (right)
3. Main nozzle
4. O-ring
5. Valve seat assembly
6. Washer
7. Float
8. Float pin
9. Float chamber gasket
10. Float chamber body
11. Pilot jet
12. Main jet
13. Washer
14. Plug screw
15. Plate
16. Panhead screw
17. Spring washer
18. Diaphragm assembly
19. Needle
20. Clip
21. Needle fitting plate
22. Diaphragm spring
23. Diaphragm cover
24. Plate
25. Throttle bracket assembly
26. Panhead screw
27. Spring washer
28. Starter body
29. Starter body gasket
30. Panhead screw
31. Spring washer
32. Starter plunger
33. Plunger spring
34. Washer
35. Plunger cap
36. Plunger cap cover
37. Ring
38. Starter lever washer
39. Starter lever 1
40. Washer
41. Spring washer
42. Panhead screw
43. Starter lever spring
44. Panhead screw
45. Spring washer
46. Air adjusting spring
47. Pilot screw
48. Pilot screw cap
49. Throttle stop screw
50. Throttle stop spring
51. Screw plug
52. Washer
53. Starter lever shaft
54. Starter lever 2
55. Starter lever screw
56. Throttle spring (left)
57. Throttle lever (left)
58. Spring washer
59. Nut
60. Seal
61. Adjusting spring
62. Push rod
63. Push rod clip
64. Plate
65. Panhead screw
66. Spring washer
67. Pipe
68. Pipe
69. Clip
70. Pipe

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G. Adjustment

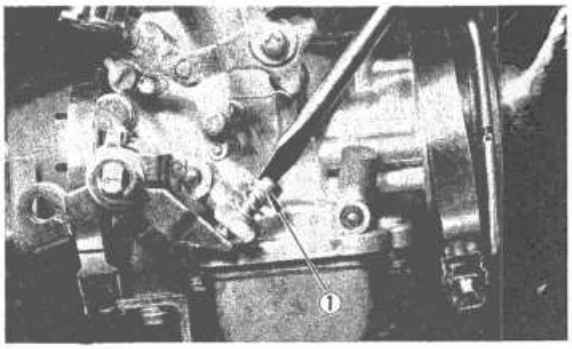
Idle mixture should be changed as follows:

Idle mixture screw setting ..... 1-1/2 ±1/2 turns out

Idle speed should be read as follows:

1) Start the engine and warm it up for a few minutes (normally, 1 or 2 minutes) at approximately 1,000 to 2,000 rpm. Occasionally raising to 4,000 to 5,000 rpm for a few seconds. When the engine responds quickly, the warm up is complete.
2) Remove the throttle cable, or fully loosen the cable.
3) Adjust the throttle stop screw by turning it in or out until the specified engine rpm is attained.

Standard idling rpm:
1,200 ±50 rpm

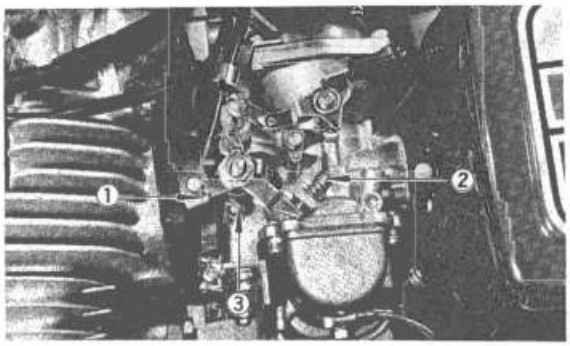


1. Throttle stop screw

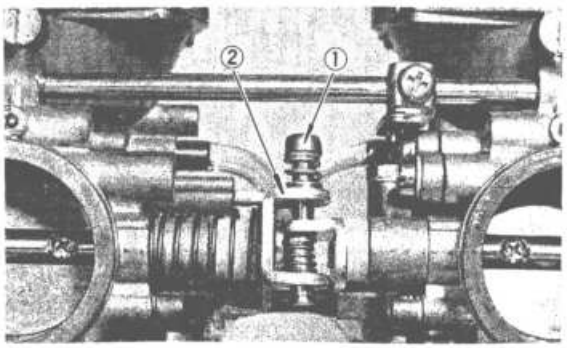
Addition: Carburetor synchronization

Both carburetors must be adjusted to open and close simultaneously.

Fully close the throttle grip so that both butterfly valve actuator mechanisms rest against their throttle stop screws, slowly twist the throttle grip and note weather both butterfly valves start to open at the same time. Twist the throttle "full open" and check to see if both butterfly valve actuators reach the full throttle stops simultaneously.



1. Butterfly valve actuator mechanisms
2. Throttle stop screw
3. Full throttle stop



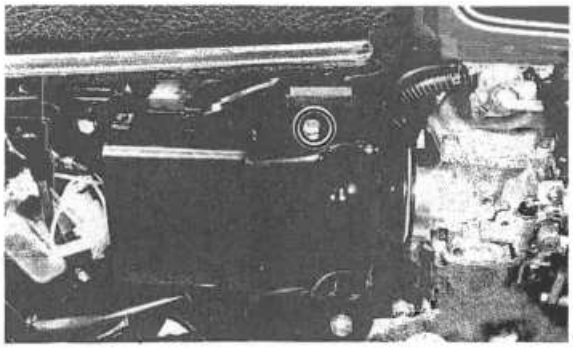
1. Throttle stop screw
2. Butterfly valve actuator mechanisms

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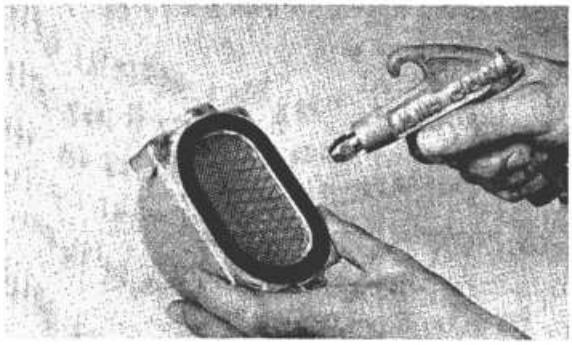
H. Air filter

Air filter should be changed as follows:

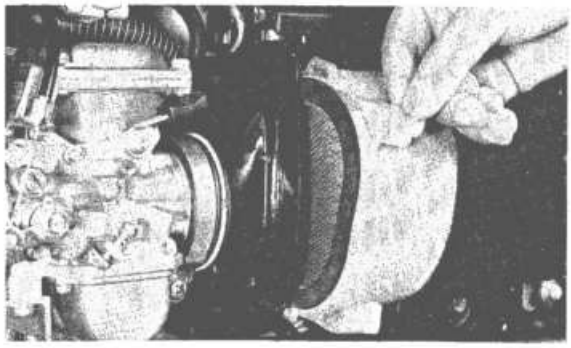
1) Remove the right and left side covers and remove the bolts holding the right and left air cleaner cases.



2) Remove the air filter element and tap it lightly to shake the dust out. Next blow with compressed air through the inner surface of the element.



3) When installing the air filter element in its case, be sure its sealing surface matches perfectly the sealing surface of the case so there is no air leakage.



4) The air filter element should be cleaned once a month or every 1,500 km (1,000 mile). It should be cleaned every ten hours or more often if the machine is operated in extremely dusty areas.

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Ignition breaker points

Item 2. should be changed as follows:
Point gap ..... 0.3 ~ 0.45 mm (0.012 ~ 0.018 in)

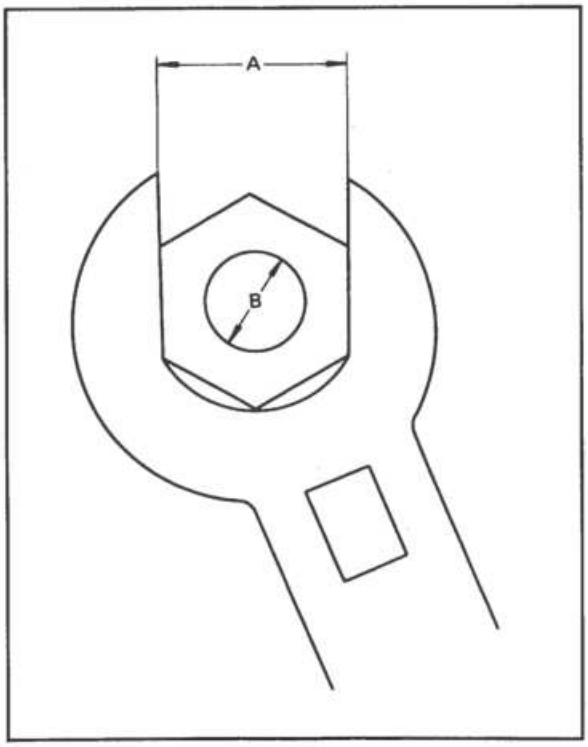
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Spark plug

Item B. should be changed as follows:

Spark Plug Type	BP-7ES
Spark Plug Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

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TORQUE SPECIFICATIONS

Torque specifications should be read as follows:
The list below covers those stud bolt size with standard I.S.O. pitch threads. Torque specifications for components with thread pitches other than standard are given within the applicable chapter.
Torque specifications call for dry, clean threads. Components such as the cylinder or cylinder head should be at room temperature prior to torquing. A cylinder head or any other item with several fasteners should be torqued down in a crisscross pattern in successive stages until torque specification is reached. The method is similar to installing an automobile wheel and will avoid warping the component.



A (Nut)	B (Bolt)	Torque specifications		
		m-kg	ft-lb	in-lb
10	6	1.0	7.2	85
12	8	2.0	15	175
14	10	3.5 ~ 4.0	25 ~ 29	300 ~ 350
17	12	4.0 ~ 4.5	29 ~ 33	350 ~ 400
19	14	4.5 ~ 5.0	33 ~ 36	400 ~ 440
22	16	5.5 ~ 6.5	40 ~ 47	480 ~ 570
24	18	5.8 ~ 7.0	42 ~ 50	500 ~ 600
27	20	7.0 ~ 8.3	50 ~ 60	600 ~ 720
Spark plug		2.5 ~ 3.0	18 ~ 22	220 ~ 260

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