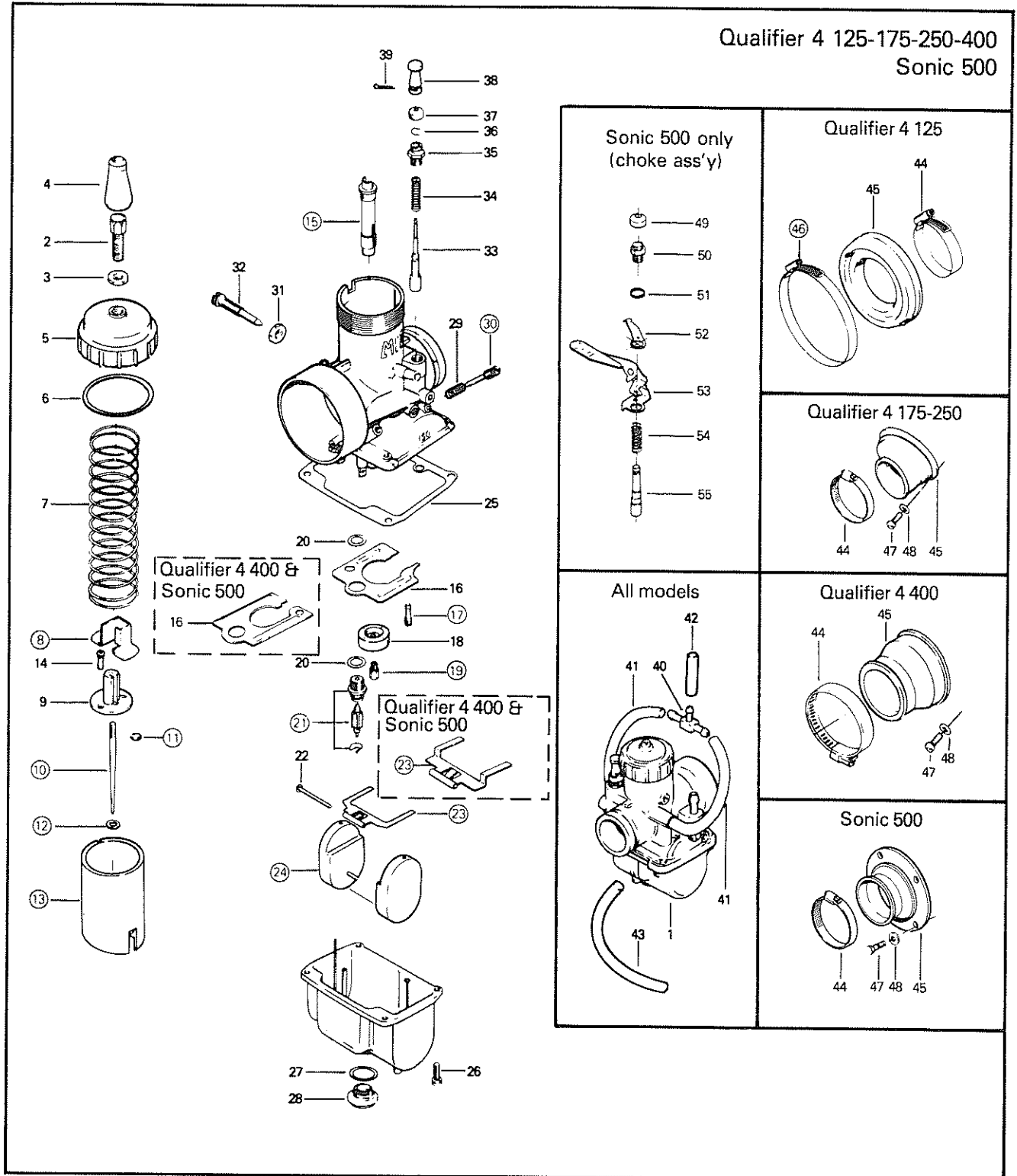


CARBURETOR



SECTION 02 ENGINE

SUB-SECTION 04 (CARBURETOR)

1. Mikuni carburetor
2. Adjustment screw
3. Nut
4. Cap
5. Mixing chamber top
6. O'ring
7. Throttle valve spring
8. Cover
9. Connector
10. Jet needle
11. Circlip
12. Packing
13. Throttle valve
14. Screw with lockwasher (2)
15. Needle jet
16. Baffle plate
17. Pilot jet
18. Main jet baffle ring
19. Main jet
20. Washer (2)
21. Needle valve
22. Float arm pin
23. Float arm
24. Float
25. Gasket
26. Screw with lockwasher (4)
27. O'ring
28. Drain screw
29. Idle adjusting screw spring
30. Idle adjusting screw
31. Nut
32. Throttle stop screw
33. Choke piston
34. Spring
35. Plunger cap
36. Spring clip
37. Rubber cap
38. Knob
39. Cotter pin
40. Tee
41. (All models) Vent tube 127 mm (5")
42. Qualifier 4 125-175-250
Vent tube 63.5 mm (2.5")
Qualifier 4 400
Vent tube 76 mm (3")
Sonic 500
Vent tube 229 mm (9")
43. Qualifier 4 125-175-250
Vent tube 127 mm (5")
Qualifier 4 400
Vent tube 254 mm (10")
Sonic 500
Vent tube 305 mm (12")
44. Hose clamp (carburetor)
45. Adaptor
46. Hose clamp (air box)
47. Hexagonal head cap screw M5 x 0.80 x 12
48. Flat washer 5.3 mm x 10 x 1
49. Rubber cap
50. Plunger cap
51. O'ring
52. Spring
53. Choke lever
54. Spring
55. Choke piston

REMOVAL

WARNING: Gasoline is flammable and explosive under certain conditions. Always perform procedures in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity.

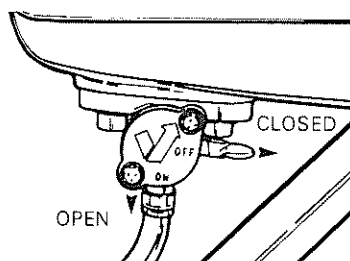
Disconnect or perform the followings then remove the carburetor from engine.

— Fuel line (at carburetor).

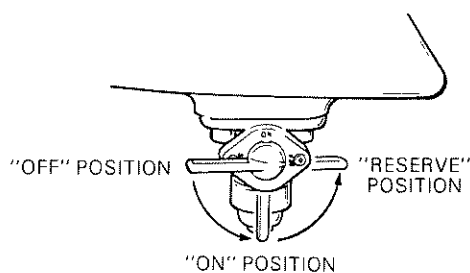


NOTE: Make sure the fuel valve is on (off) position.

Qualifier 4 125 model



Qualifier 4 175-250-400 & Sonic 500 models

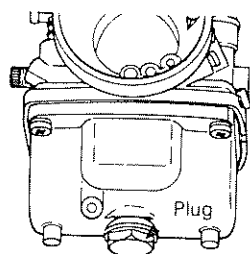


- Vent tube(s).
- Completely loosen both carburetor retaining hose clamps. (Slide front clamp forward and rotate carburetor towards clutch side). (Sonic 500 rotate magnet to side.)
- Remove the carburetor throttle slide chamber cover & pull out throttle slide ass'y.

CAUTION: Exercise care when handling throttle slide. Damage incurred may cause throttle slide to stick open in operation.

- Pry carburetor body towards air box, out of the engine/carburetor adaptor.
- Twist carburetor body away from engine intake manifold and remove carburetor (complete with boot Qualifier 4 125).

NOTE: The Mikuni carburetors can be dried out by removing the drain plug under the float bowl.



CLEANING AND INSPECTION

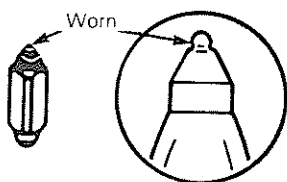
The entire carburetor should be cleaned with a general solvent and dried with compressed air before disassembly.

Carburetor body and jets should be cleaned in a carburetor cleaner following manufacturer's instructions.

CAUTION: Heavy duty carburetor cleaner may be harmful to the float material and to the rubber parts, O'ring, etc. Therefore, it is recommended to remove those parts prior to cleaning.

WARNING: Solvent with a low flash point such as gasoline, naphtha, benzol, etc., should not be used as they are flammable and explosive.

② Check inlet needle tip condition. If worn, the inlet needle should be replaced.



CAUTION: A worn inlet needle will cause carburetor overflowing.

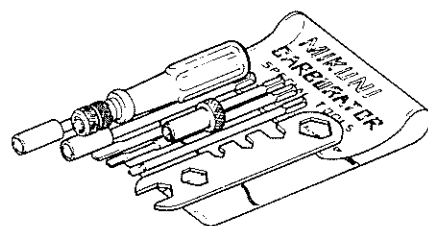
Check if floats are leaking or damaged and replace if necessary.

Check the throttle slide for wear, replace if worn or damaged.

WARNING: ⑬ An excessively worn or damaged throttle slide may cause the slide to stick in the open position.

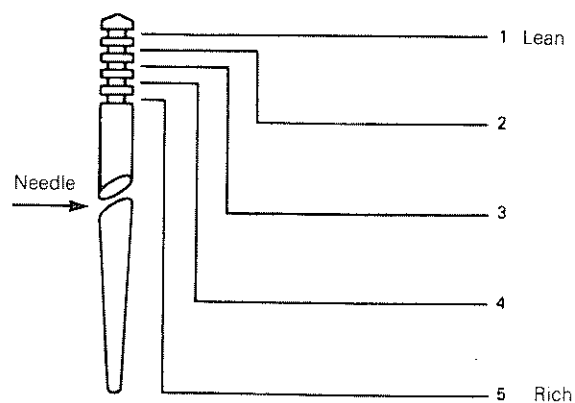
DISASSEMBLY & ASSEMBLY

NOTE: To ease the Mikuni carburetor disassembly and assembly procedures it is recommended to use a special tool kit available under P/N 404 112 000.



⑩ ⑪ The position of the needle in the throttle slide is adjustable by means of an "E" clip inserted into one of 5 grooves located on the upper part of the needle. Position 1 is the leanest, 5 the richest.

NOTE: For correct needle clip installation/position, refer to Section 08 Technical Data sub-section 02 "Carburation".

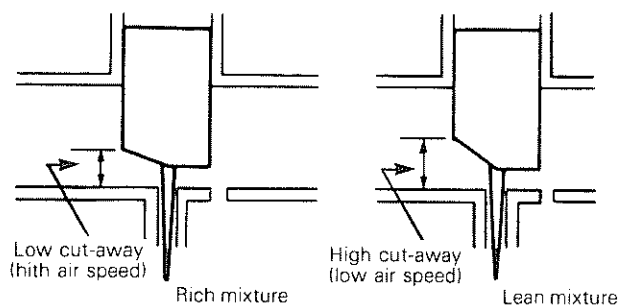


Example:
Needle identification **6DH4-3**
Position of the "E" clip from top.

SECTION 02 ENGINE

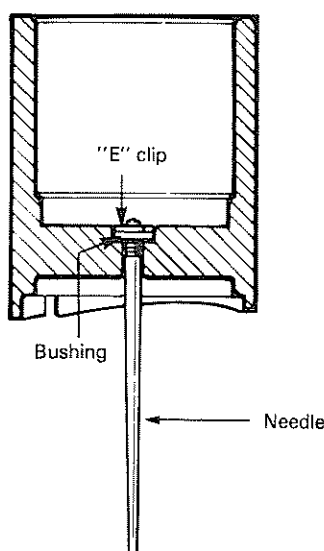
SUB-SECTION 04 (CARBURETOR)

⑬ The size of the throttle slide cut-away affects the fuel mixture between 1/8 to 1/2 throttle opening. A certain amount of richness is needed for that particular range because this is where the transition from the low speed to the high speed circuit takes place.

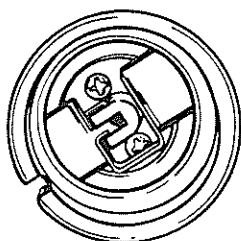


⑫ Make sure the bushing is installed on throttle slides.

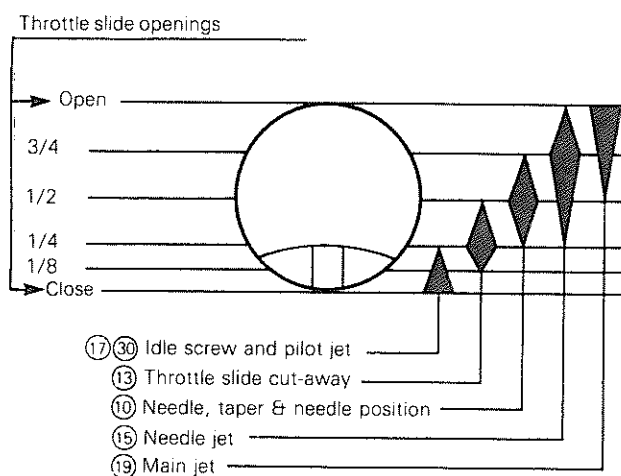
⚠ **CAUTION:** Serious engine damage can occur if this notice is disregarded.



⑧ At assembly, the cover should be installed as illustrated.



The illustration below shows which part of the carburetor begins to function at different throttle slide opening.



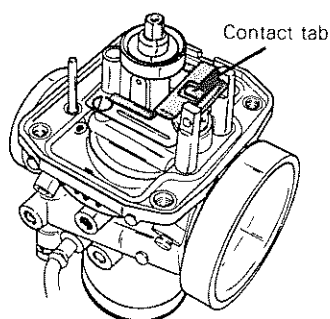
○ **NOTE:** For fine tuning, refer to Section 08 Technical Data, sub-section 02 "Carburation".

Float arm adjustment

- ⑫ With carburetor chamber upside-down, measure height between float chamber flange rib (gasket removed) and top edge of float arm.
- To adjust bend contact tab of float arm until the specified height is reached.

Mikuni VM 34: 36.5 mm $\pm$ 1 mm (1.437 $\pm$ 0.039")

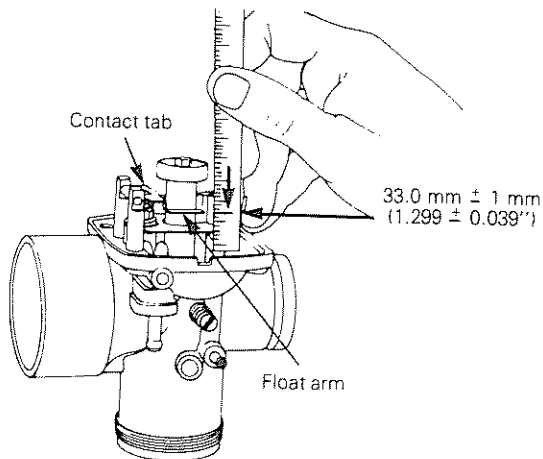
Mikuni VM 38: 33.0 mm $\pm$ 1 mm (1.299 $\pm$ 0.039")



SECTION 02 ENGINE

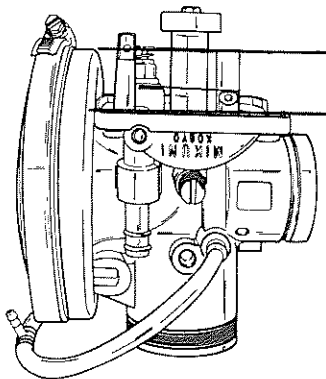
SUB-SECTION 04 (CARBURETOR)

Ex: Mikuni VM 38 (Qualifier 4 400 & Sonic 500)

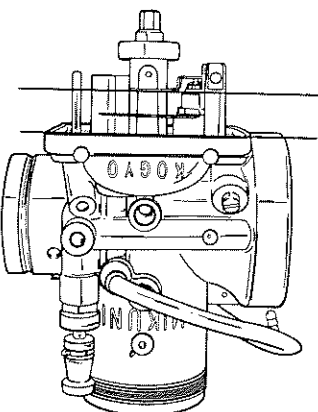


NOTE: If no measuring device is available, position the top of float arm parallel with carburetor body.

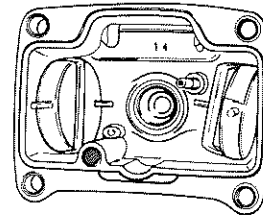
Mikuni VM 34



Mikuni VM 38



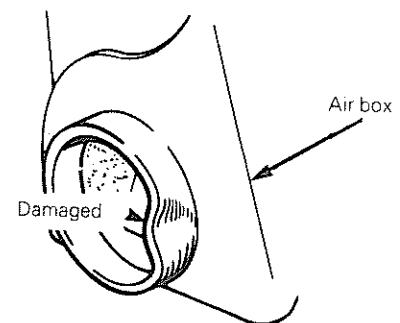
24 Always install the floats inside the float bowl as illustrated.



INSTALLATION AND ADJUSTMENT

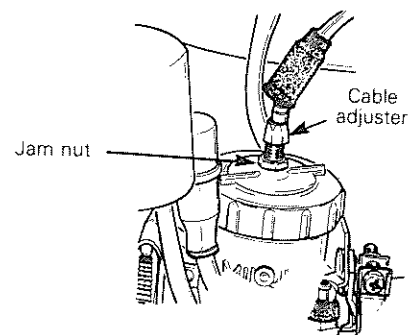
To install the carburetor, inverse the removal procedure.

CAUTION: 46 (Qualifier 4 125) — Make sure not to overtighten the air box boot hose clamp. Air box flange may distort sufficiently to allow entry of foreign particles.



Throttle cable adjustment

Using the cable adjuster located on the throttle slide chamber cover, set cable slack to 1.6 mm (1/16'').



WARNING: Before starting engine, carburetor slide must be free to snap back to idle position. Make sure the rubber grip does not rub on the throttle body or the handlebar end.

FUEL

Recommended gasoline (all models)

The correct gasoline is premium gasoline leaded or unleaded.

▼ **CAUTION:** Never experiment with different fuel and/or fuel ratios (2 stroke models). Never use naphtha, methanol or similar products.

FUEL MIXING (2 STROKE MODELS)

Recommended oil

Use Castrol injector oil (P/N 413 801 500) available from your dealer. This type of oil meets the lubrication requirements of the Bombardier-Rotax engine.

If Castrol injector oil is unavailable substitute with a high-quality 2 cycle oil, ex: Castrol Super 2 stroke. The oil gas mix must meet the vehicle requirements. See oil manufacturer recommendations on container.

▼ **CAUTION:** Never use outboard oils, straight mineral oils.

Fuel mixture ratio

The importance of using the correct fuel mixture cannot be overstressed. An incorrect fuel ratio results in serious engine damage. Recommended fuel ratios are:

125-175-250 models: 32 to 1

400 model: 20 to 1

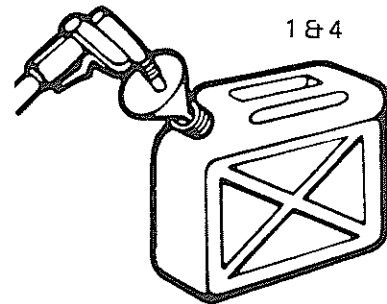
Refer to "Fuel mixing charts".

Fuel mixing procedure

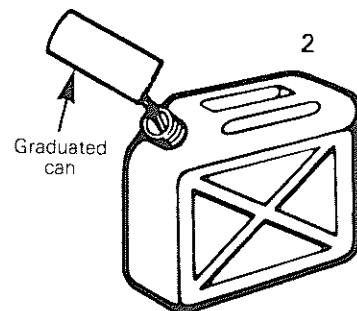
Never mix directly in your motorcycle tank. The best way to mix the gasoline and the oil is to use two clean containers, either plastic or metal. Fill the first one with the oil and gas. Draw from the first one to the second one until empty; then use the second one to fill your motorcycle.

◆ **WARNING:** Gasoline is flammable and explosive under certain conditions. Always perform procedures in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity. If gasoline fumes are noticed while driving, the cause should be determined and corrected without delay. Never add fuel while engine is running.

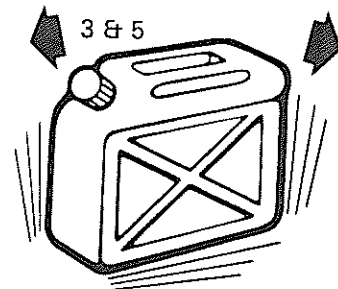
1. Pour approximately the fourth of the desired gasoline quantity into a clean container.



2. Add oil amount corresponding to the desired quantity of gasoline.



3. Replace container cap and shake the container thoroughly.



4. Add the remainder of the gasoline.
5. Once again thoroughly agitate the container. Then using a funnel with a fine mesh screen to prevent the entry of foreign particles, transfer mixture from container into the tank.

○ **NOTE:** When using pre-mixed fuel, always shake the container thoroughly as the oil has a tendency to settle.

◆ **WARNING:** Never "top up" gas tank before placing the vehicle in a warm area. At certain temperatures, gasoline will expand and overflow.

○ **NOTE:** Avoid mixing oil and gas directly in your motorcycle tank. However if this has to be done, be sure to respect the proper fuel/oil ratio and to close the fuel control valve during this procedure.

SECTION 02 ENGINE

SUB-SECTION 04 (CARBURETOR)

Mixture adjustment

With the motorcycle held in a vertical position, gently turn air screw in until it stops, then back it out:

Qualifier 4 125-175-400: 1 1/2 turn

Qualifier 4 250: 1 1/2

Sonic 500: 1 1/4

Idle speed

Start the engine and allow it to warm.

Adjust idle speed in or out for desired idle speed (approximately):

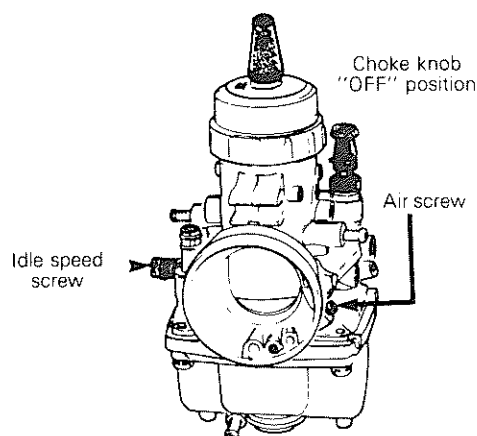
Qualifier 4 125-175-250: 2000 R.P.M.

Qualifier 4 400: 1500 R.P.M.

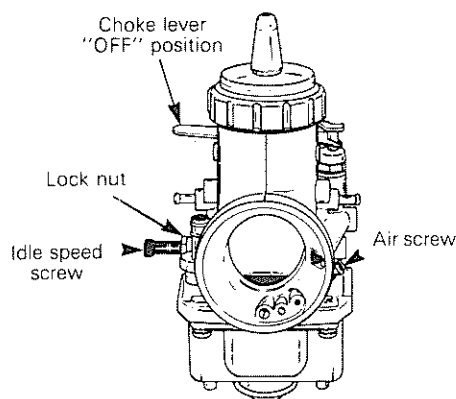
Sonic 500: 1200 R.P.M.

○ **NOTE:** The air screw can be turned in or out (within 1/4 turn of basic setting) to achieve smoothest idle possible. Re-adjust idle speed if necessary.

Qualifier 4 models



Sonic 500 model



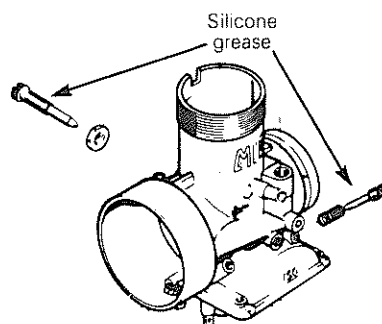
▼ **CAUTION:** Do not attempt to set the idle speed by using the air screw. Severe engine damage can occur. If idle speed is unattainable contact your authorized dealer.

WATERPROOFING

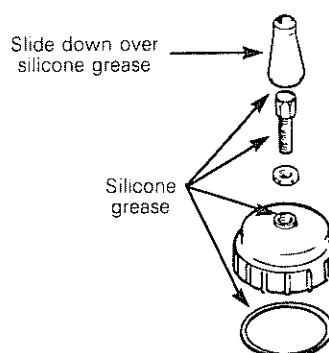
Under wet and muddy conditions it is recommended to properly seal the carburetor.

Proceed as follows:

To improve the sealing ability, apply a light coat of silicone grease (DC-4 or equivalent), on the adjustment screw threads.



Apply silicone grease (DC-4) or equivalent to the carburetor cover and throttle cable rubber boot (at carburetor top).



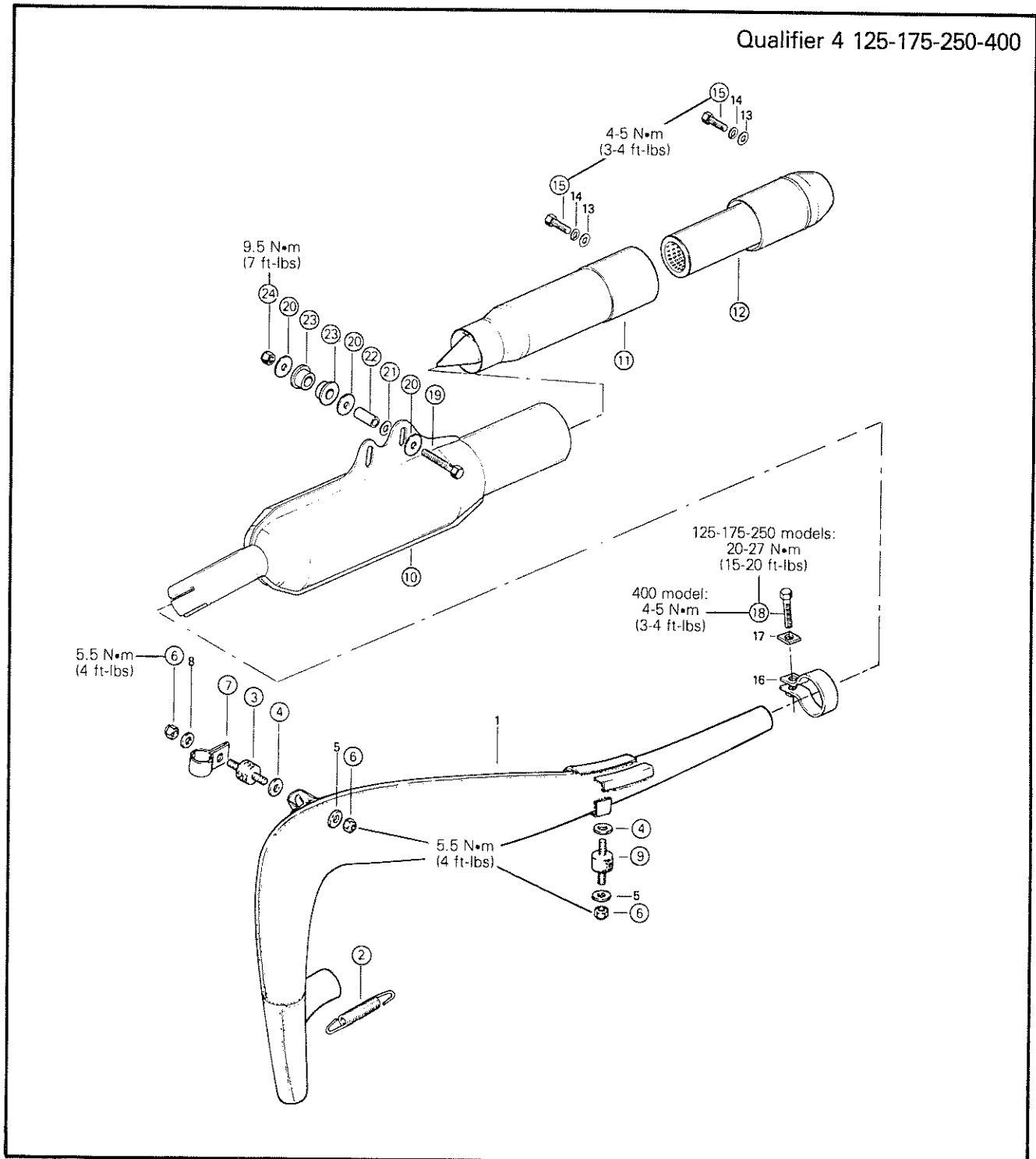
Ensure carburetor/engine and carburetor/air box connections are leakproof.

▼ **CAUTION:** The carburetor-air filter servicing/sealing is of the utmost importance under wet and muddy conditions.

EXHAUST SYSTEM

EXHAUST SYSTEM (2 STROKE)

Qualifier 4 125-175-250-400



SECTION 02 ENGINE

SUB-SECTION 05 (EXHAUST SYSTEM)

1. Exhaust pipe
2. Exhaust spring (2)
3. Rubber mount
4. Asbestos washer (2)
5. Flat washer 6.2 x 20 x 2 (2)
6. Hexagonal elastic stop nut 6 x 1.00 (3)
7. Clamp
8. Flat washer 6.4 x 14 x 1.5
9. Rubber mount
10. Muffler
11. Spark arrestor
12. Resonator

13. Flat washer 6.4 x 14 x 1.5 (2)
14. Lockwasher 6 (2)
15. Hexagonal head capscrew M6 x 1.00 x 10 (2)
16. Clamp
17. Reinforcement plate
18. Hexagonal head capscrew M8 x 1.25 x 20
19. Hexagonal head capscrew M8 x 1.25 x 40 (2)
20. Flat washer 8.4 x 25 x 1.6 (6)
21. Asbestos washer (2)
22. Bushing (2)
23. Rubber sleeve (4)
24. Hexagonal elastic stop nut 8 x 1.25 (2)

WARNING: To prevent burns, it is necessary to allow sufficient time to the exhaust system to cool prior to working on or near the exhaust system. If any adjustment has to be performed with the engine running do not touch the components related to the exhaust system.

REMOVAL

Remove or disconnect the followings (if applicable) then withdraw the muffler and/or exhaust pipe from motorcycle.

- Left number plate (Qualifier 4 125)
- Exhaust springs
- Exhaust socket (Qualifier 4 400 if necessary)
- Muffler screws

DISASSEMBLY AND ASSEMBLY

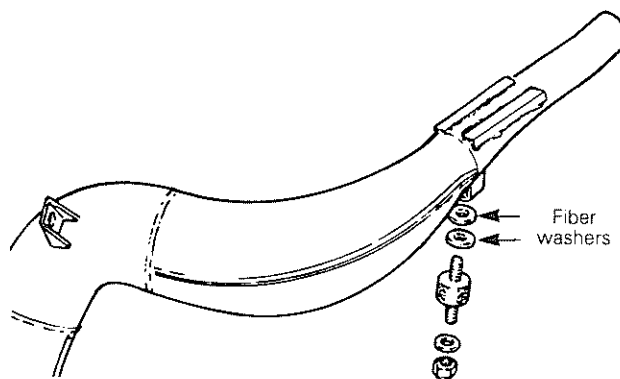
- ② For removal and installation use "vise-grip" pliers.

WARNING: Exercise care when removing or installing the springs.

- ③ At assembly, torque to 3 N•m (2 ft-lbs).

CAUTION: ④ ② Make sure to install the asbestos washer at assembly as heat can damage the rubber mount.

NOTE: To obtain a better fit, it may be necessary to install two fiber washers to the middle exhaust mount.



- ⑥ At assembly, torque to 5.5 N•m (4 ft-lbs).

- ⑦ At assembly, closely wrap the clamp around the frame tube, using a pair of "vise grip" pliers.

WARNING: ⑨ ⑪ Removal, modification or failure to maintain spark arrestor in effective working order may constitute a violation of existing federal, state or provincial regulations.

- ⑩ ⑪ ⑫ At assembly, the muffler must be hand slipped over the exhaust pipe.

CAUTION: Do not use a hammer or heavy mallet to drive the muffler onto the exhaust pipe. Damage may occur, causing improper pressure in the exhaust system and possible engine damage.

- ⑮ At assembly, torque to: 4-5 N•m (3-4 ft-lbs).

- ⑯ At assembly torque to:

20-27 N•m (15-20 ft-lbs)

Qualifier 4 125-175-250

4-5 N•m (3-4 ft-lbs)

Qualifier 4 400