Ural (Урал) - Dnepr (Днепр) Russian Motorcycle Carburetors Part 11B: Mikuni Overhaul

(See Also Part 11: VM 28mm Mikuni and Part 11A: Mikuni VM Carburetor Manual)

Ernie Franke for Nemo DeNovo

(May 2009, 28mm VM Mikuni on a 1988 MT-16, http://www.advrider.com/forums/showthread.php?t=447932&page=4)

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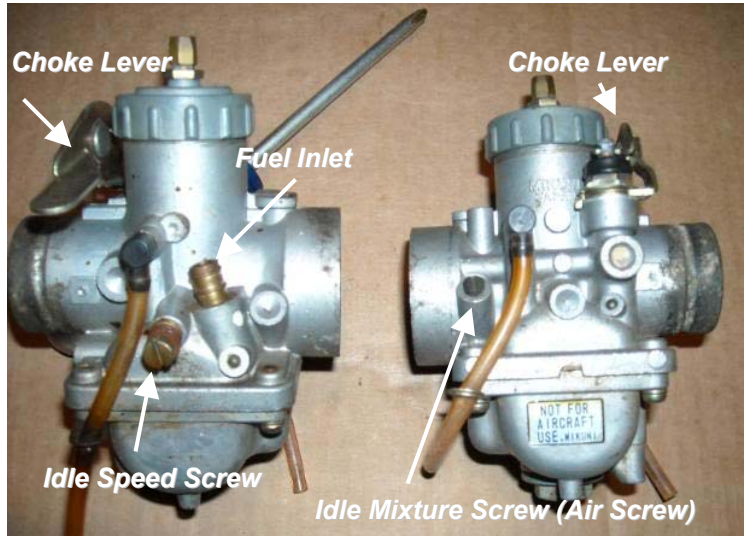
Carb Identification and Idle Mixture Screws

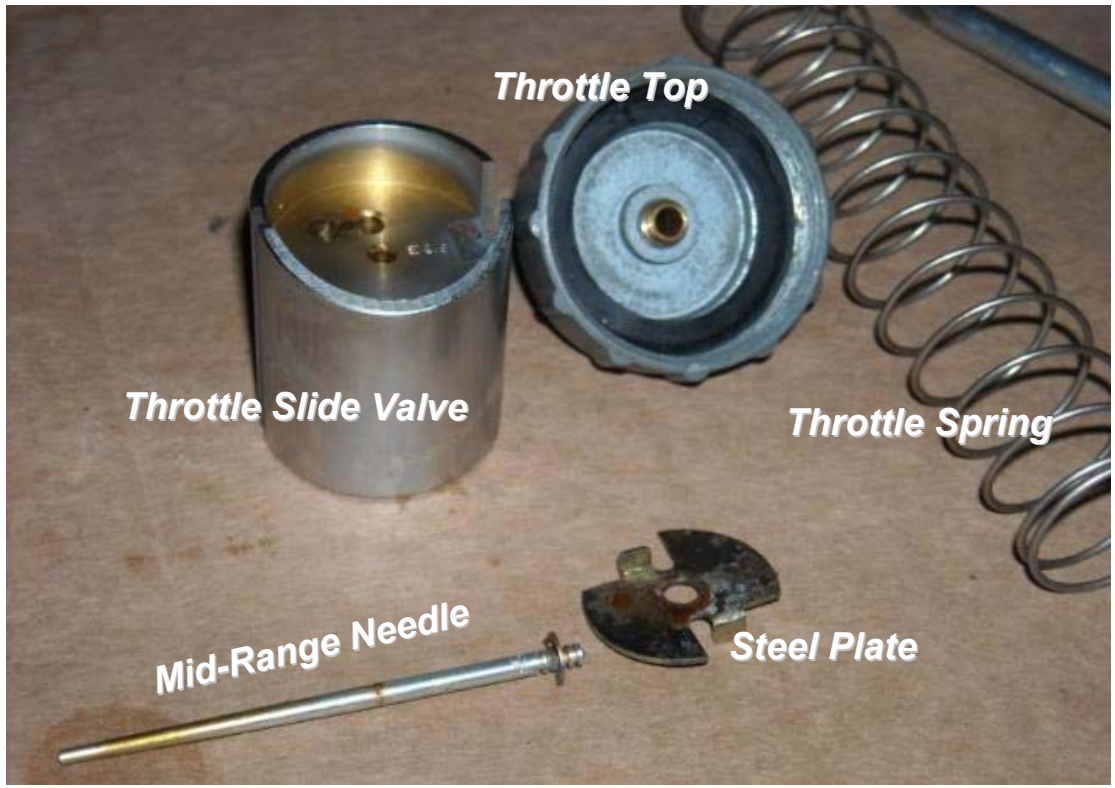
- Carburetor on Left Shows Choke Lever, Idle Speed Screw and Fuel Line
- Carb on Right Shows Idle Mixture Screw and Choke Valve
- Hoses on Both Sides Are Float Bowl Vents and Should Never Be Plugged
  - –Also Overflow Hose Barb on Float Bowl
  - –Should Never Be Plugged and Must Run under the Bike, Away from Exhaust
- Carbs Have 28mm Bores
  - –Probably Adequate for This Engine (650cc), but 30 or 32mm Would Be Closer to Size of Intake Ports



- Note on Idle Mixture Screws:
  - –Mikuni, Keihin and Other Brands Use Different Methods of Adjusting Idle Mixture
  - –If You Don't Know How to Tell the Difference, You Could Adjust Your Carbs Too Lean and Cause Damage, or Too Rich and Cause Plugs to Foul
  - –Rule-of-Thumb Is the Location of Adjustment Screw Relative to the Throttle Slide
    - If Screw Is on the Side of the Carb Body and It's on the Air Filter Side of the Throttle Slide, then It's an Air Screw
      - –Turn It Clockwise, Idle Mixture Becomes Richer, and Vice-Versa
    - If Screw Is on the Side of the Carb Body or On the Bottom at Edge of Float Bowl Flange, and It's on the Engine Side of the Throttle Slide, then It's a Fuel Screw
      - –Turning It Clockwise Causes Idle Mix to Become Leaner, and Vice-Versa
    - Some Carbs Have Plugs over the Screws to Prevent Tampering (and proper cleaning), and Some Carbs Have No Adjustment other than Replacement of Fuel Jets
  - –Standard Mikuni Carbs Are "Tuner Friendly" Air Screws
  - –First Thing, Spray Off Outside of Carb and Get It Clean

Cleaning and Adjusting Mid-Range Needle

- Remove the Top, with the Throttle Spring, Slide and Mid-Range Needle
- Usually Whole Assembly Can Remain on the End of the Throttle Cable
  - –Keep Track of Which Carb Is Right or Left in Case Cable Adjustment Is Slightly Different
- Small Steel Plate Goes under Throttle Spring and Holds the Needle in the Center of Slide
- Mid-Range Needle
  - –Controls Mid-Range Fuel Mixture
  - –Has 5 Grooves with a Tiny C-Clip (Circlip) that Fits in a Groove
  - –If Carb Is Properly Jetted, C-Clip Should Be in Center Groove
  - –Possible to Tweak Upper Mid-Range Mixture Slightly by Moving C-Clip
  - –Moving Clip to Lower Groove Raises the Needle and Richens Mixture, and Vice-Versa
- Clean Entire Assembly by Spraying with Carb Cleaner and Wipe Down Slide and Needle
  - –If Needle Is Excessively Dirty, It Can Cause Lean Running at Part-Throttle
  - –Not Necessary to Remove Idle Speed Screw to Clean the Carbs, Leave It Alone



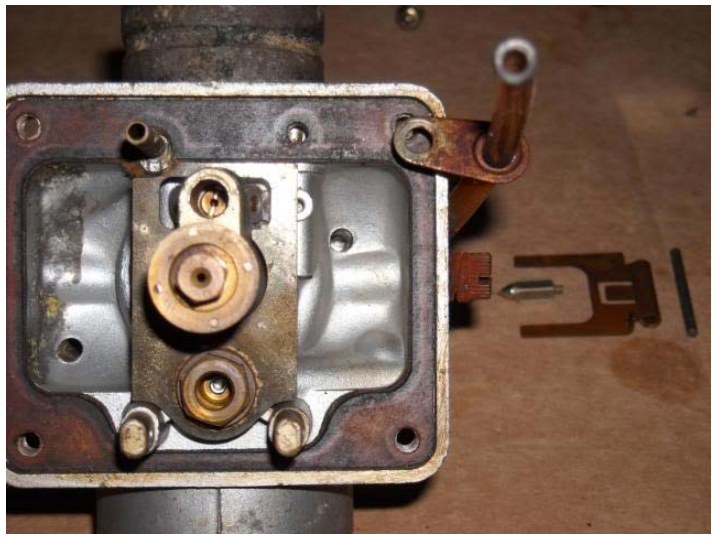
Possible Mikuni Float Repair

- *Next,Turn Carb Upside Down and Remove Float Bowl*
- *Most Mikuni Floats Are Solid Black Foam, but Some Really Old Ones Are Hollow Brass*
- *If Float Is Brass, Shake It and Listen for Fuel Inside*
  - *–Floats Can Get Pinholes and Fill Up with Fuel, Causing Overflowing / Flooding*
  - *–Can Sometimes Be Fixed:*
    - *If There Is Fuel in the Float, Set the Float on the Burner of a Coffee Maker or Electric Stove Set on Low*
    - *When It Gets Hot, the Fuel Will Boil and Shoot Out thru the Hole*
    - *Mark Where the Hole Is*
    - *Then When It's Boiled Dry, Let It Cool Completely*
    - *Lightly Sand Where the Hole Is, to Clean It, and Apply a Tiny Dab of Soldering Paste (Flux)*
    - *Then Solder the Hole Shut Quickly with a Very Hot Soldering Iron, So the Float Doesn't Heat Too Much, or It Will Collapse When It Cools*

Cleaning Float Bowl and Passageways

- *Clean the Float Bowl and Floats, Including the Hole in the Foam Floats Where They Slide Up and Down the Rods in the Bowl*
- *Clean the Rods Too*
- *There Is a Passage Leading Down the Inside of the Float Bowl, Connected to a Small Hole at the Bottom*
  - *This Feeds the Choke and Must Be Cleaned as Shown Next*
- *Whenever You Shoot Carb Cleaner into a Passage in a Carb, It Should Go All the Way Thru and Come Out the Other End*
  - *This Way You Know the Passage Is Clear*
  - *Keep In Mind That Some Holes in the Carb are Dead-Ends, So Make Sure It's Actually a Passage That Goes Somewhere*

Removing Float Lever Pin and Main Jet



- Next, Remove the Float Lever and Needle Valve
  - Visible on the Table to the Right of the Carb
- Make a Scratch on Bottom of Float Lever
  - To Return It In the Right Way on Re-Assembly
- Float Lever Held in by a Pin
  - Pin Will Sometimes Slide Out Easily
  - If It Doesn't Easily Slide, Be Very Careful
  - Some Pins Have Heads Like a Nail, Fit Tight and Must Be Tapped Out
- Use Small Punch or Nail to Tap the Pin Out, <u>Be Careful</u>!!
  - Bosses on Carb Body, Where the Pin Goes Thru Are Not Very Strong and May Break
  - Support the One on the Side You Are Tapping Toward by Resting It on Something Solid Like a Vise, While Leaving Room for the Pin to Come Out Past the Support

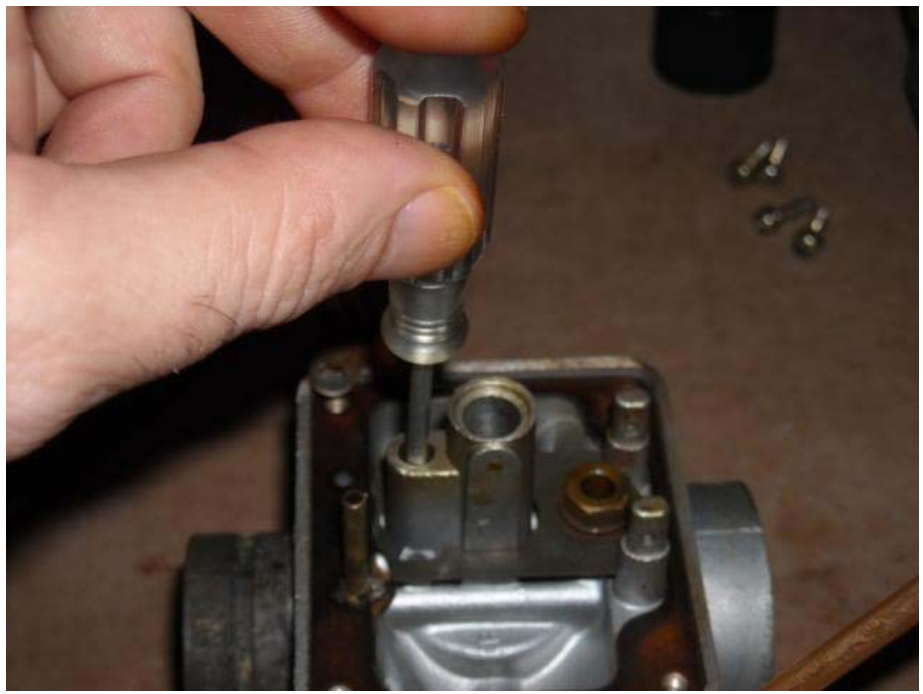
- Next, Use ¼" or 6mm Wrench to Remove Main Jet
- Some Main Jets Have Screw Slots, Instead of Hex-Head
- Round Thing Under the Main Jet Is a Baffle and Comes Off with the Jet
  - There Are Different Styles of Main Jets
  - Some Carbs Only Have a Small Washer
  - Don't Freak-Out If It Looks a Little Different
- Shoot Carb Cleaner Thru the Jet and Visually Check That It's Clear

Cleaning the Needle Jet

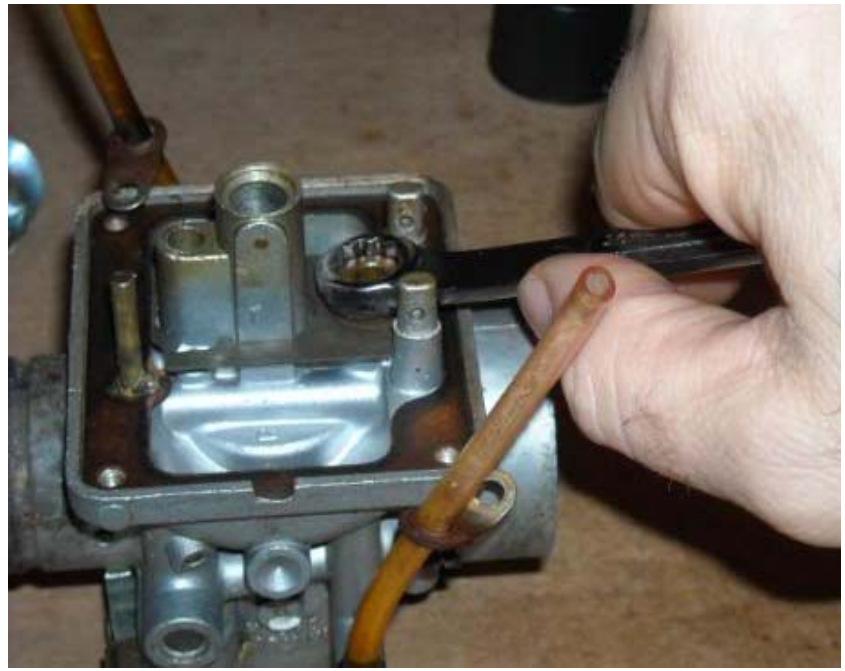
- *Under the Main Jet is the “Needle Jet"*
  - *–Also Known as Mid-Range Jet or Emulsion Tube*
  - *–Works in Conjunction with the Long Needle in the Slide to Control Part-Throttle Mixture*
  - *–Can Be Tapped Out from the Bottom thru the Top of the Carb*
    - *Use Wooden Dowel or Something Relatively Soft because Jet Is Brass and Easily Damaged*
  - *–Shoot Carb Cleaner thru This Jet and Visually Inspect That It's Clear*
- *Jet Has a Hole in the Side That Allows Air to Mix with Fuel Passing thru the Jet*
  - *–Shoot Carb Cleaner in This Hole and Make Sure You See a Good Spray Out the Top*

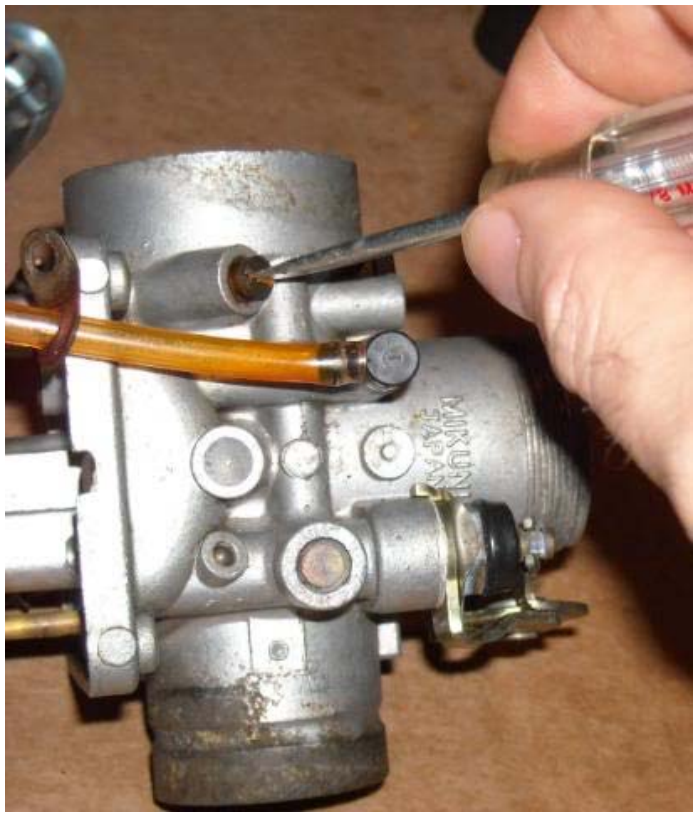
Pilot Jet Removal and Cleaning

- *Next, Remove the "Pilot Jet," Also Known as the Idle, or Low-Speed Jet*
- *Works in Conjunction with the Idle Mixture Screw, Also Known as the "Air Screw" to Control Idle and Off-Idle Mixture*
- *Most Common Culprit for Hard-Starting, Cold-Bloodedness, Sluggishness on Take-Off and Rough or Hard-to-Adjust Idle Speed*
- *This Jet Is So Tiny It's Easily Clogged*
  - *Use a Small Flat Screwdriver with a Really Good Tip to Remove It, Because It's Brass and If You Damage It You're in Big Trouble*
  - *It's Almost Impossible to Remove It Once You Strip the Head*
  - *Once You Have It Out, Shoot Cleaner thru It Several Times and Visually Check It against a Light to Make Sure It's Clear*
  - *Slightest Obstruction of This Jet Will Cause Problems*
    - *<u>NEVER</u> Use a Steel Wire or Any Hard Metal Object to Clean It*
  - *If You Must Poke It Out with Something, Use a Copper Wire or Some Fishing Line*



Next, Remove the Needle Valve Seat, Usually 10mm. There Is a Baffle Under It with 2 Seal Washers. Keep These All in Order.





Next Remove the Idle Air Mixture Screw. Before Removal, Gently Turn This Screw Clockwise 1/4 Turn at a Time and Count the Turns Until It Bottoms-Out. When You Re-Assemble the Carb, Put It Back with the Same Number of Turns Out from Bottom.

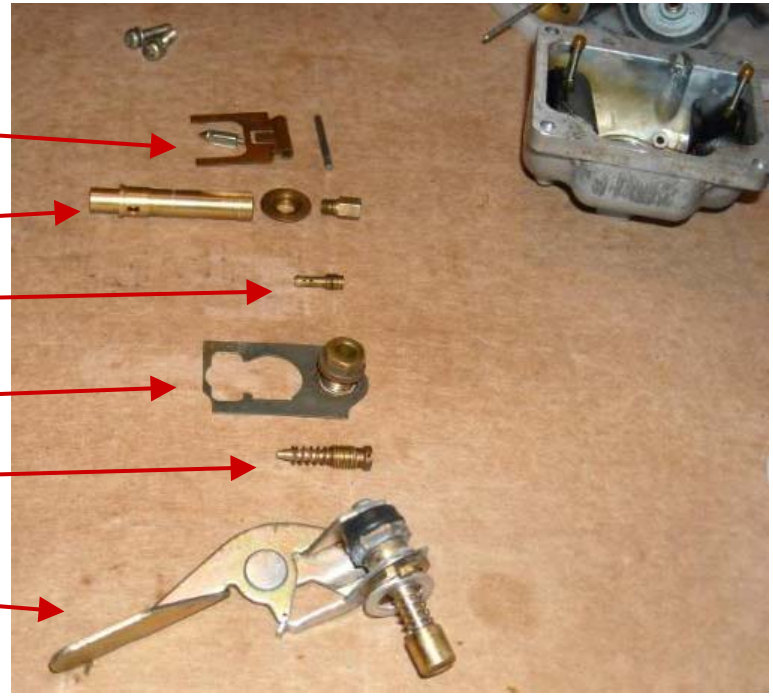
Note on the Air Screw/Pilot Jet: If You Have an Engine That Didn't Originally Have Mikunis or If It's Older than 10 years, Your Pilot Jet May Not Be Correct. Due to Improper Jetting by Custom Installers or Reformulation of the Gasoline by Oil Companies, You Could Have the Wrong Size Pilot Jet. When Adjusted So the Idle Is As Good as Possible, Take Note of How Many Turns Out the Air Screw Is. If the Screw is Less than 3/4 Turn Out, You Need the Next Richer Jet. If the Screw Is More than 1-1/2 Turns Out, You Need the Next Leaner Jet.

Choke (Cold-Start) Removal

- *Lastly, Remove the Choke Valve Using a 12mm Wrench*
- *The Word “Choke" Is Inaccurate to Describe the Mikuni Starting Circuit*
- *Mikuni Carbs Use an “Enrichment Circuit," Rather than a “Choke“*
  - *A Choke Restricts Air at the Carb Entrance, Causing Engine Vacuum to Pull Fuel thru All the Jets in the Carb*
  - *On Mikuni Carbs, the Enrichment Valve Opens an Air Passage that Bypasses the Throttle Slide and Also Opens a Fuel Passage Straight from the Float Bowl*
  - *Engine Vacuum Pulls Air and Raw Fuel Thru This Circuit, So Cracking the Throttle Actually Leans Out the Mixture because Vacuum Drops*
  - *“Choke" on a Mikuni Works Best with the Throttle Closed*

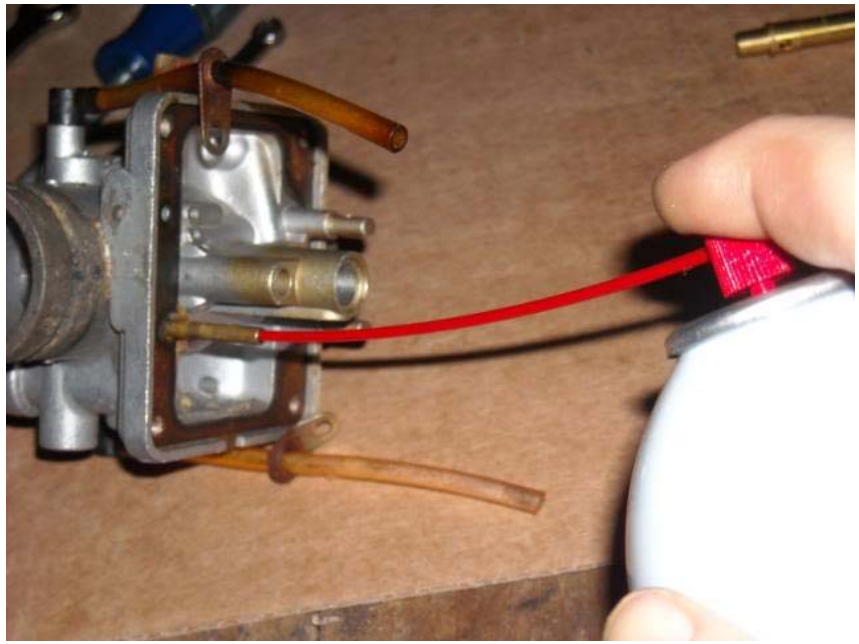
Disassembly

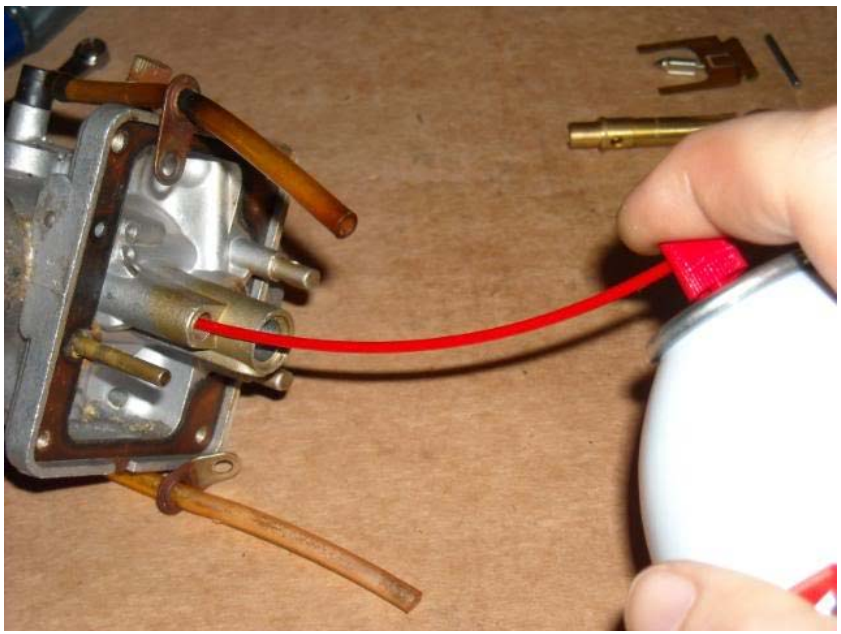
- *All All Parts Removed during Cleaning Shown Here:*
  - *–At Top Is Needle Valve with Float Lever and Pin*
  - *–Next is Needle Jet, Baffle and Main Jet*
  - *–Next the Pilot Jet*
  - *–Next the Baffle and Needle Valve Seat*
  - *–Next the Idle Air Screw with Spring*
  - *–And Last, the “Choke" Assembly*

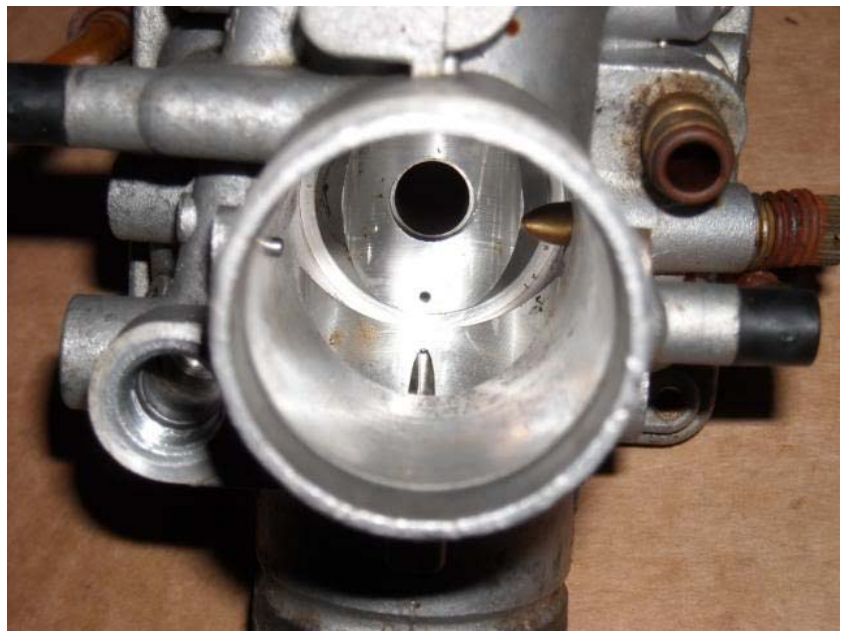


- *A Note on Mikuni Needle Valves:*
  - *–The Needle Valve, Along with the Floats, Controls the Fuel Level in the Float Bowl*
  - *–Mikuni Needle Valves Are Available in Different Sizes*
    - *The Difference Is the Size of the Hole in the Valve Seat*
  - *–Carbs Used on Most Bikes Are Set-Up for Gravity-Fed Fuel Systems, and Therefore Have a Large Hole in the Valve Seat to Allow Enough Flow with Only Gravity to Move the Fuel*
  - *–Carbs Set-Up for Use with a Fuel Pump Have a Smaller Hole in the Seat to Prevent the Fuel Pressure from Pushing the Needle Valve Open and Flooding the Carb*
    - *If a Fuel Pump Valve Is Used in a Gravity-Fed System the Engine May Starve for Fuel*
    - *This Is Common When Adapting Snowmobile Carbs to Motorcycles*
  - *–When Replacing a Needle Valve, Be Sure to Check the Number on the Valve Seat*
  - *–Also, Look Closely at the Rest of the Valve to Make Sure Everything Is Identical*
  - *–Mikuni Has Many Different Valves, and Just Because It Will Screw in the Hole Doesn't Mean It's the Right One*

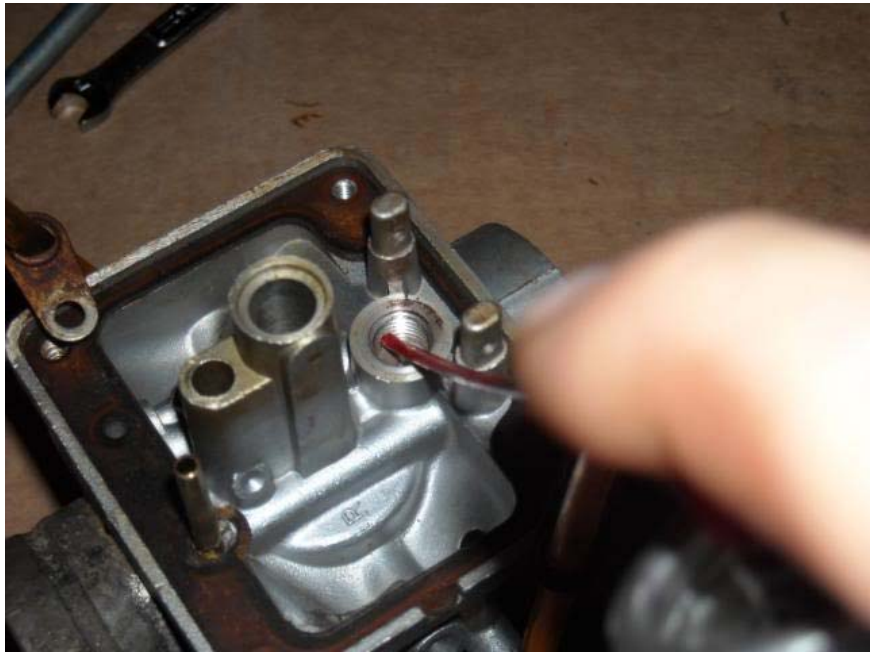
Next It's Time to Clean-Out the Passages in the Carb Body as Shown:
a. “Choke" Fuel Feed



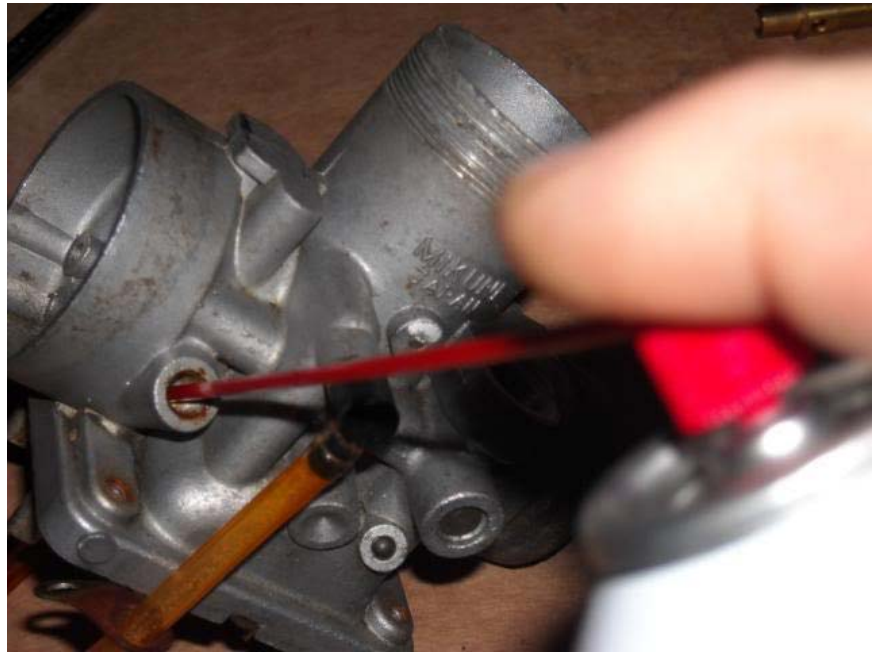




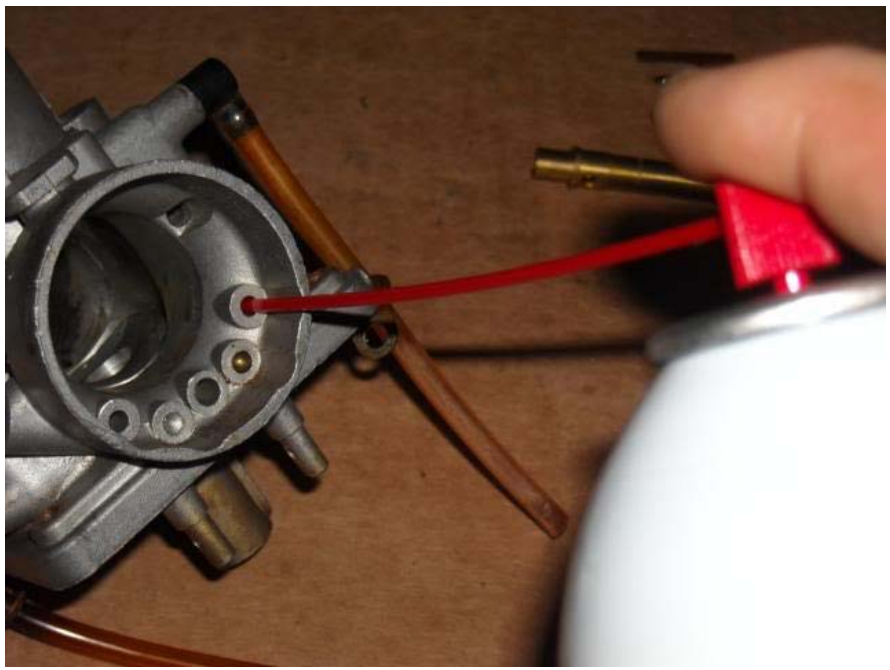
b. Pilot Jet Orifice
When Sprayed, Fuel Will Come Out the Small Hole Shown in the Picture to the Right.



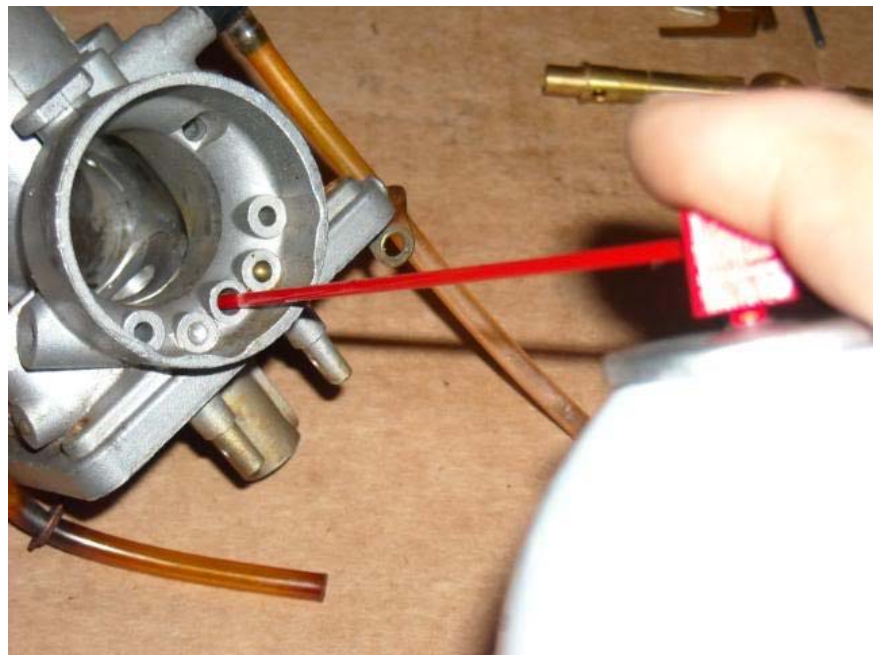
c. Main Fuel Feed



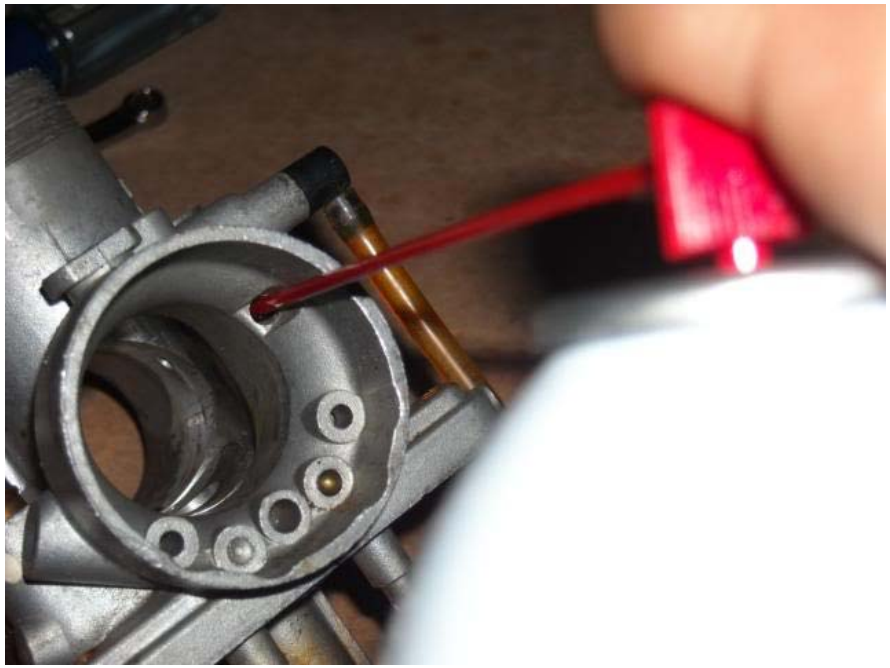
d. Idle Air Screw Seat



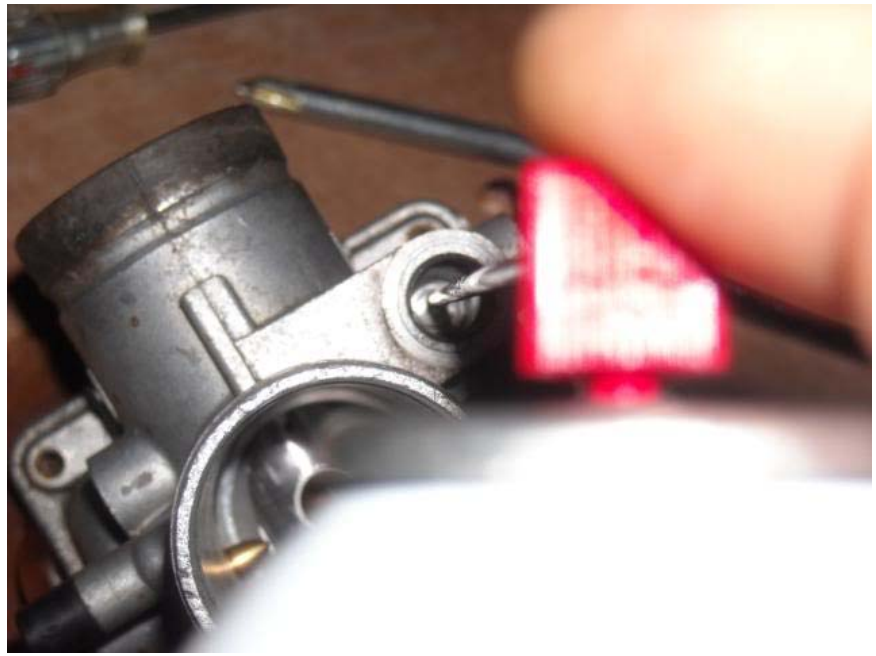
e. Idle Air Passage



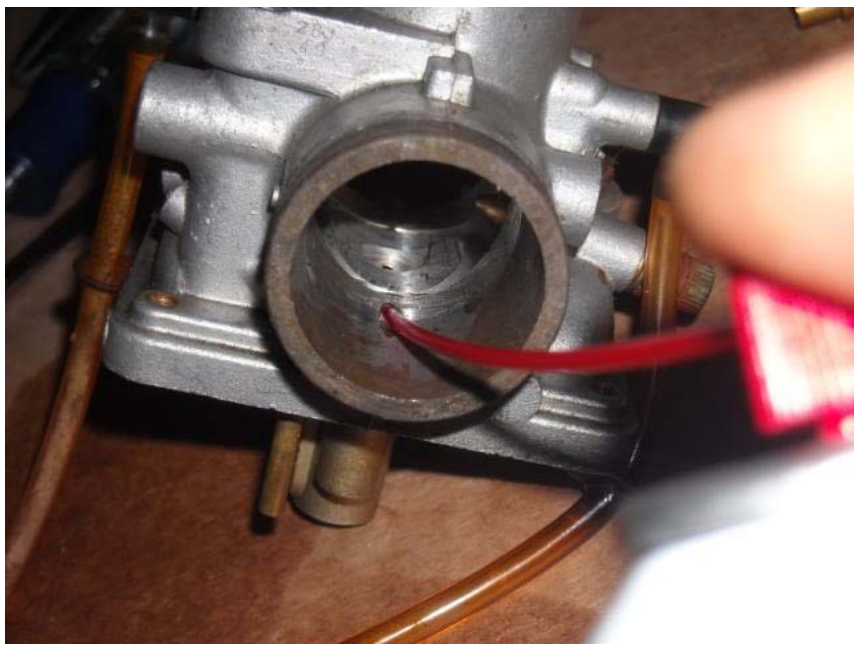
f. Needle Jet Air Passage



g.“Choke" Air Passage



h. “Choke" Fuel Feed



i. Idle Mixture Orifice (This is VERY important) For Each of the Above Passages, the Cleaner Should Shoot-Out of One or More Places at the Far-End of the Passages. Look to Be Sure You Get a Good Flow All the Way Thru.

Re-Assembly of Mikuni Carburetor

- *Re-Assembly Is Reverse of Disassembly*
  - *You DO Remember How It Came Apart.....DON'T YOU???*
- *On Assembly, Note the Position of the Float Lever*
  - *It Should Be Parallel to the Float Bowl Flange to Have the Proper Float Level*
- *And That's Pretty Much It, Just Don't Lose Any Pieces and You'll Be Good*