A detailed close-up photograph of a motorcycle engine's carburetor and choke assembly. The carburetor is a silver, cylindrical component with various adjustment screws and a black choke lever. It is connected to a black air filter. The engine block is visible in the background, showing cooling fins and other mechanical parts. The text is overlaid on the image in a white, bold, sans-serif font.

***Ural (Урал) - Днепр (Днепр)  
Russian Motorcycle Carburetors  
Part 17: Carburetor Chokes***

***Ernie Franke  
eaf Franke@tampabay.rr.com  
09/2012***

# **Russian Sidecar Carburetor Chokes**

- **Carburetor Chokes Are Known By Many Names**
  - *Enrichener / Tickler / Utopitel / Concentrator / Corrector / Depressor or Depresser / Cold-Start Assist*
- **Enrichener on Russian Sidecar Motorcycles Is Often Referred to as the Choke**
  - *But That's a Misnomer*
  - *When the Engine Is Cold, Fuel Vaporizes Less Readily and Tends to Condense on the Walls of the Intake Manifold, Starving the Cylinders of Fuel and Making the Engine Difficult to Start*
    - *Typically a Cold-Start Problem*
    - *More Apparent at Cold Temperatures*
  - *Richer Mixture (more fuel-to-air) Is Required to Start and Run the Engine until It Warms Up*
  - *Richer Mixture Is Also Easier to Ignite*
  - *On Other Motorcycles, Airplanes and Cars, a Choke Is Typically Used to Increase Fuel-to-Air Mixture*
    - *Choke Restricts the Flow of Air (chokes) at the Entrance to the Carburetor, before the Venturi*
  - *Russian Sidecar Motorcycles Use a Combination of Mixture-Enrichment Circuits*
- **When You Apply the Choke, You're Doing One of Three Things:**
  - *Older Style Enrichener (Tickler-Only)*
    - *Depresses the Floats (hence the term depressor)*
    - *Adds Additional Fuel in the Float Chamber*
    - *Increases Fuel-to-Air Mixture (richer)*
  - *Later Style Enrichener (Ticklers and Enricheners)*
    - *Raise Lever or Pull-Out Control Knob*
    - *Retracting a Plunger that Opens a Tube Connected to the Starter Jet*
    - *Allows Additional Fuel to Enter the Venturi*
    - *Supplements the Pilot (Idle) System at Start-Up*
  - *Latest Model Enrichener (1998+ Urals)*
    - *Tickler Removed*
    - *28 mm Mukuni and 32 mm Keihin Carbs*

**Russian carburetors use a fuel enhancement scheme for cold-starting, and not a “choke” which decreases the air in the mixture.**



# **Russian Sidecar Carburetor Enricheners**

- **Older Style Enrichener**
  - **Classic British Motorcycles, with Side-Draft, Slide-Throttle Carburetors, Used a Type of Cold-Start Device Called a “Tickler”**
  - **A Spring-Loaded Rod, That When Depressed, Manually Pushes the Float Down to Allow Excess Fuel to Fill the Float Bowl and Flood the Intake Tract**
  - **If “Tickler” Is Held Down Too Long It Also Floods the Outside of the Carburetor and the Crankcase Below, and Was Therefore a Fire Hazard**
- **With the K-301/K-302, the Choke System Was Independent of the Carburetor**
  - **Usually found upstream of the intakes, just under the air filter on the engine case.**
  - **System of slide tubes, which constrict the air entering the intakes, thus enriching the mixture.**
- **The K-68 Carburetor Was the Last of the “Tickler” Carburetors**
  - **Originally Designed for the Ural**
  - **Not Installed as Factory Equipment on Imported Rigs because of EPA Concerns**
  - **Ticklers Spilled Fuel on the Ground**
  - **Mikuni Carbs Added for Import into the U.S.**
  - **K-68 Pekars Are More Reliable than Either the Mikuni’s or Keihin’s**
- **Non-Tickler Carbs First Used on Urals imported to U.S. to Satisfy EPA**
  - **28 mm VM Mikuni (1994-1999)**
  - **32 mm CVK Keihin (2000-present)**

**Original Russian sidecar motorcycles used “ticklers” for cold-start operation, but were later replaced with “enricheners” to satisfy Environmental Protection Association concerns.**

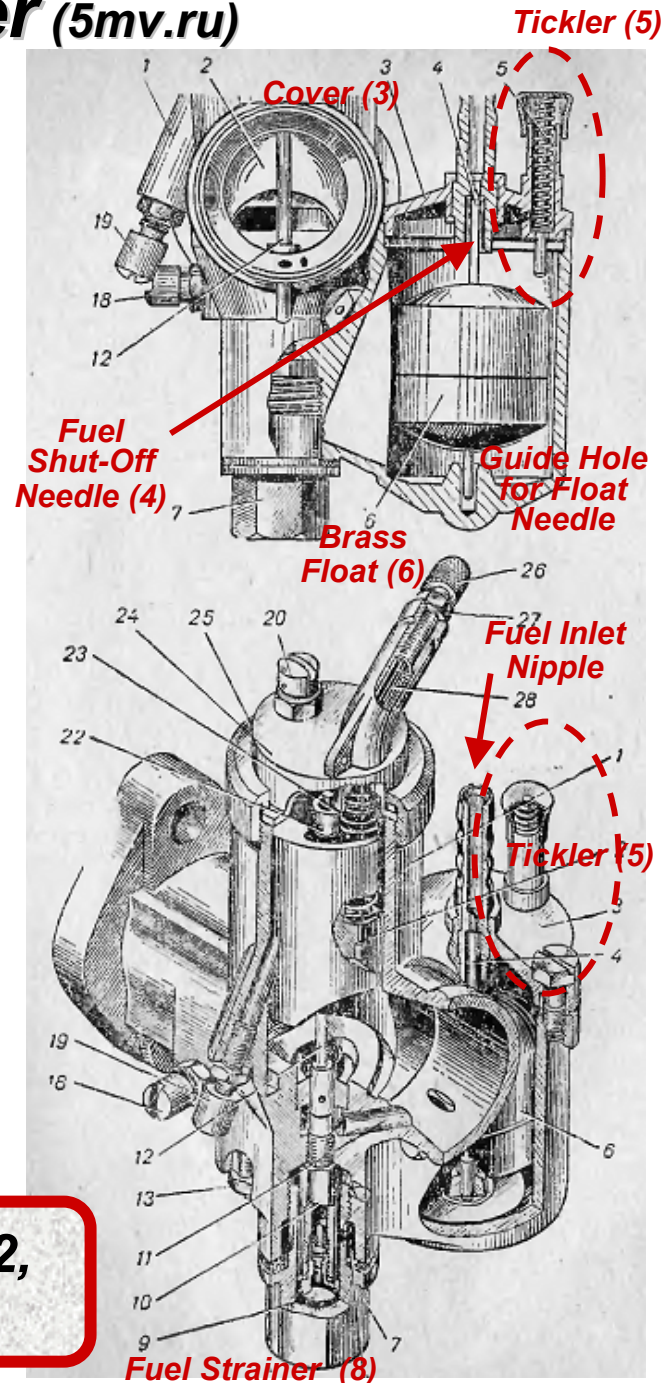
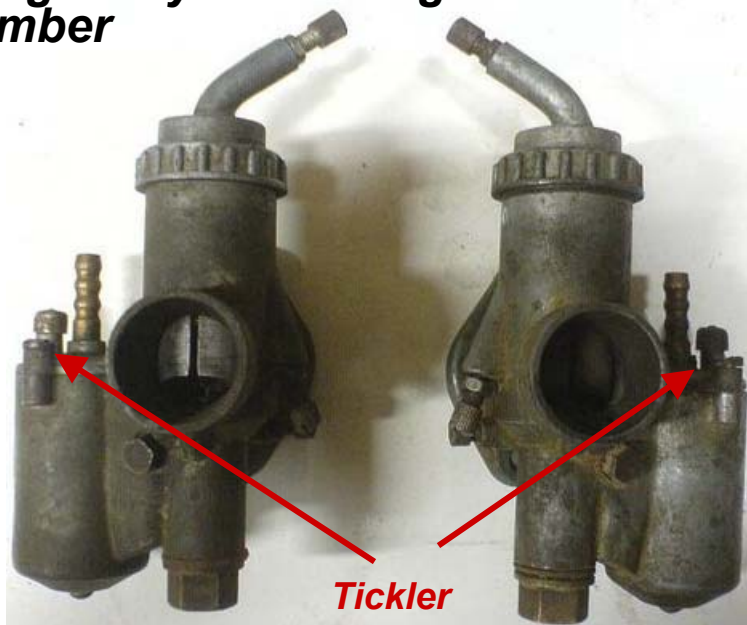
# Carburetors on Russian Sidecar Motorcycles

Carburetor	Cold-Start		Motorcycle	
	Tickler	Enrichener	Ural	Dnepr
<i>K-37</i>	X	-	<i>M-72</i>	<i>M-72, K-750, MB-750</i>
<i>K-38</i>	X	-	<i>M-61, M-62, M-63</i>	<i>K-750</i>
<i>K-301</i>	X	-	<i>M-63, M-66, M-67, M-67.36</i>	<i>K-650/MT-8, K-650/MT-9, MT-10, MT-10.36, MB-650, MB-650M, MT-11, MT-16, K-750M, MB-750, MB-750M</i>
<i>K-302</i>	X	-	<i>IMZ-8.103 (650cc)</i>	<i>MT-12, MT-14</i>
<i>K-62</i>	X	X	-	<i>MT-11, MT-16, MB-650</i>
<i>K-63</i>	X	X	<i>IMZ-8.103 (650cc)</i>	<i>K-750, MB-750M, MT-10, MT-11, MT-12, MT-16</i>
<i>K-65</i>	X	X	-	<i>MT-11, MT-12, MT-16</i>
<i>K-68</i>	X	X	-	<i>MB-650, MT=11, MT-16</i>
<i>Kaptex VDC-RAM</i>	X	X	-	<i>Copy of K-68</i>
<i>Jikov 2928CE</i>	-	X	<i>IMZ-8.103 (650cc) for England</i>	-
<i>Mikuni</i>	-	X	<i>IMZ-8.103 (650cc)</i>	-
<i>Keihin</i>	-	-	-	-

***Russian carburetors evolved from tickers-only, to ticklers plus enricheners, to enricheners-only.***

# K-37 Carburetor Tickler (5mv.ru)

- K-37 and K-37A Used in Dnepr M-72, MB-750 and K-750 750 cc Engines
- Later Replaced by K-38 and K-301
- Concentrating Button, Called a "Tickler", Serves to Enrich the Mixture at Start-Up
- When You Push on the Tickler (utopitel), the Float Drops and the Level of Gasoline in the Float Chamber Rises
- Tickler (5) In Float Chamber Cover
  - Temporarily Pushes Down Float to Enrich Mixture when Starting Engine by Increasing Level of Fuel in the Float Chamber



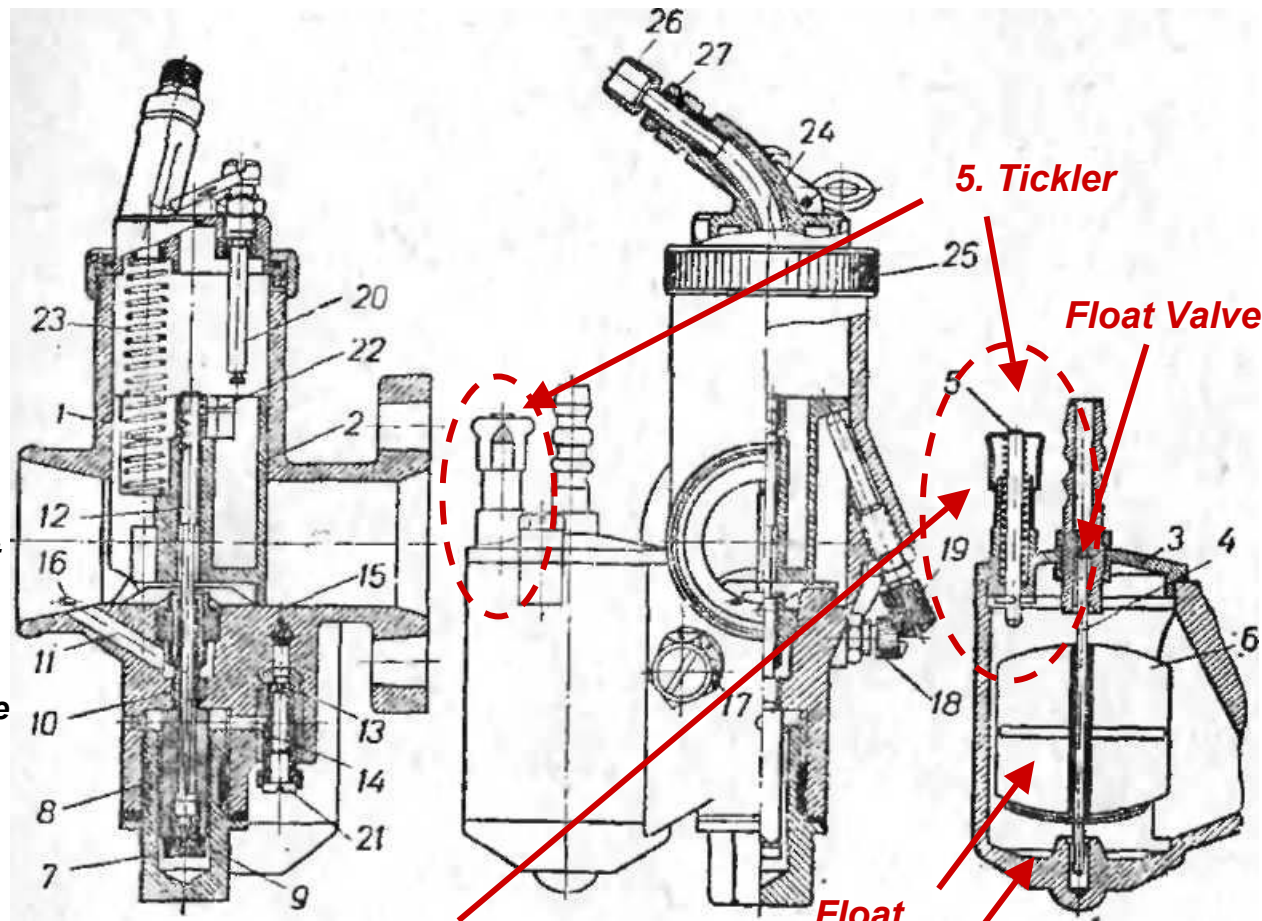
The first Russian sidecar motorcycle, the M-72, used "ticklers" for cold-start operation.



# Carburetor K-37 Parts Breakdown

(5mv.ru/article.php & Manual for Motorcycle with Sidecar M-72, City of Irbit, 1954)

- 1 - Carburetor Body
- 2 - Round-Slide Throttle Valve
- 3 - Cover of Float Chamber
- 4 - Float Needle Valve
- 5 - Tickler
- 6 - Float
- 7 - Connecting Piece
- 8 - Filter Screen
- 9 - Main Jet
- 10 - Atomizer
- 11 - Air Duct of Atomizer
- 12 - Jet Needle
- 13 - Low-Speed (Idle) Jet
- 14 - Fuel Channel of Idle Jet
- 15 - Atomizer (Spray Nozzle) Idle Jet
- 16 - Air Duct of Idle Jet
- 17 - Filter of Auxiliary Air Duct Idle Jet
- 18 - Idle Mixture Adjustment Screw
- 19 - Throttle Slide Stop Screw
- 20 - Throttle Stroke Limiter
- 21 - Lock Screw of Idle Jet
- 22 - Attachment Split-Pin of Jet Needle
- 23 - Spring
- 24 - Housing Cover
- 25 - Union Nut
- 26 - End of Control Cable
- 27 - Lock Nut
- 28 - Control Cable

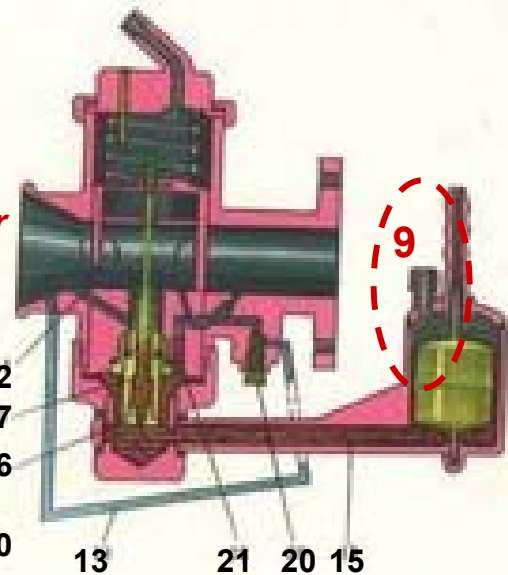
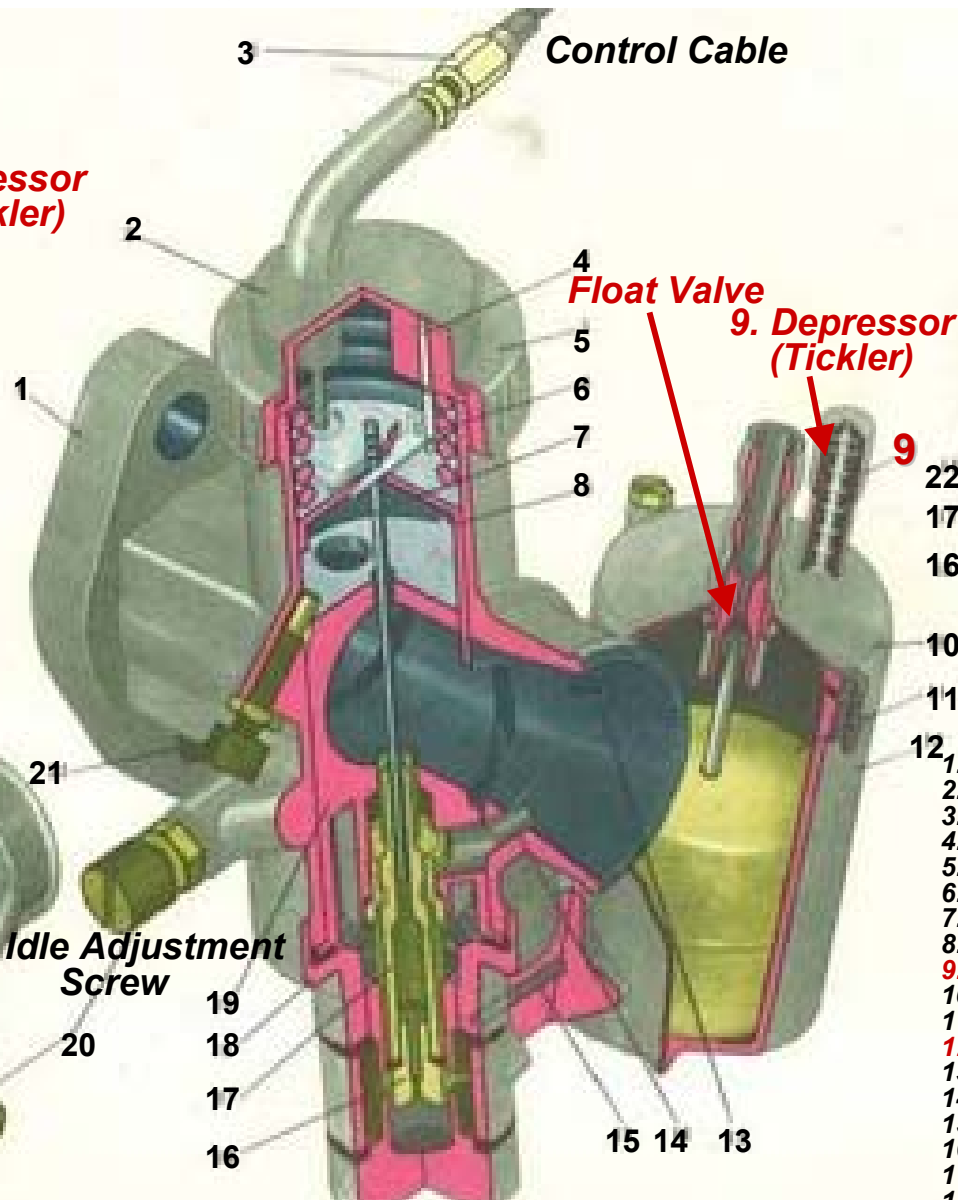
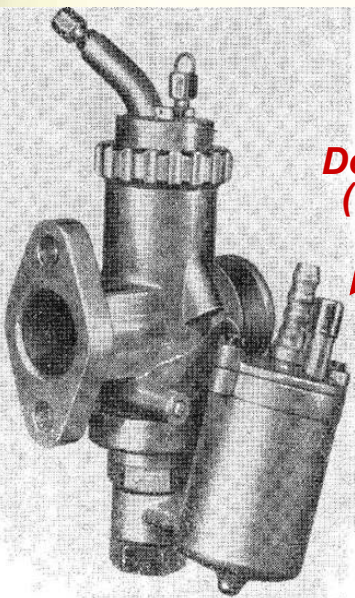


**Pressing on the Spring-Loaded Tickler  
Temporarily Bypasses the Float Valve**

**Float Chamber**

**When you push on the tickler (utopitel), the float drops  
and the level of gasoline in the float chamber rises.**

# K-38 from the M-63 Maintenance Manual (rmoa.multiply.com)



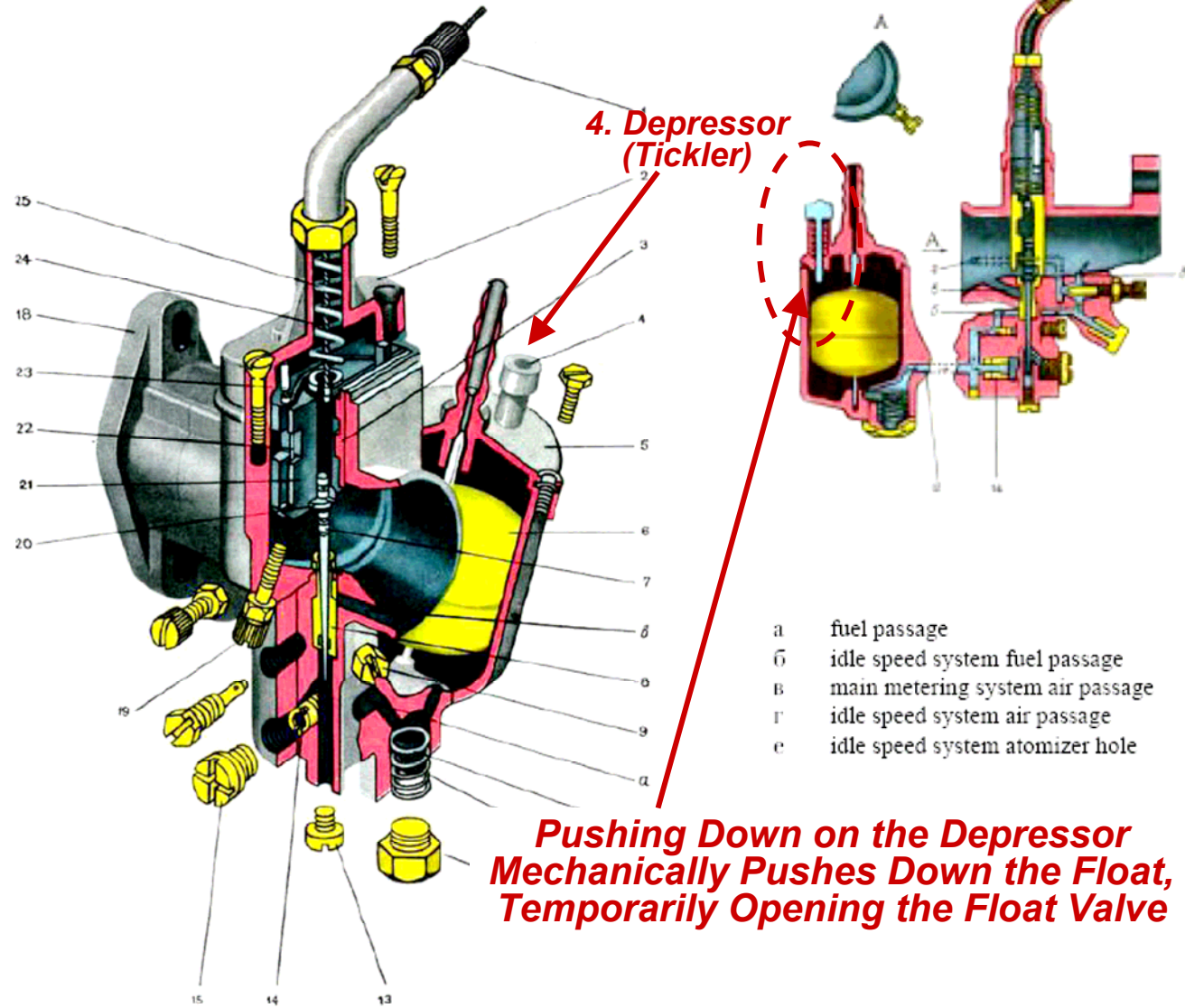
1. Carburetor Body
2. Throttle Valve Cover
3. Control Cable Armor Thrust Nipple
4. Throttle Valve Stop Screw
5. Cover Nut
6. Throttle Float Valve Spring
7. Jet Needle (Tapered Metering Needle)
8. Throttle Valve
9. Depressor (Tickler)
10. Float Chamber Cover
11. Float with Shut-Off Needle
12. Float Chamber
13. Idle Speed Air Suction Passage
14. Air Passage
15. Fuel Passage
16. Main Jet
17. Atomizer
18. Jet Chamber

**Similar to the K-37, when you push on the tickler in the K-38, the float drops and the level of gasoline in the float chamber rises.**



# K-301 / K-302 Carburetors ([www.russiancycles.com](http://www.russiancycles.com))

- 1 carburettor cover
- 2 throttle cheek
- 3 depressor
- 4 float chamber cover
- 5 float with shut-off needle
- 6 throttle valve needle
- 7 atomizer
- 8 air filter
- 9 fuel filter
- 10 filter spring
- 11 filter plug
- 12 atomizer duct plug
- 13 main jet
- 14 main jet plug
- 15 low speed jet
- 16 idle speed screw
- 17 carburettor body
- 18 throttle valve screw
- 19 throttle needle lock
- 20 throttle body
- 21 throttle distance spring
- 22 throttle stop screw
- 23 throttle lift cable
- 24 throttle spring

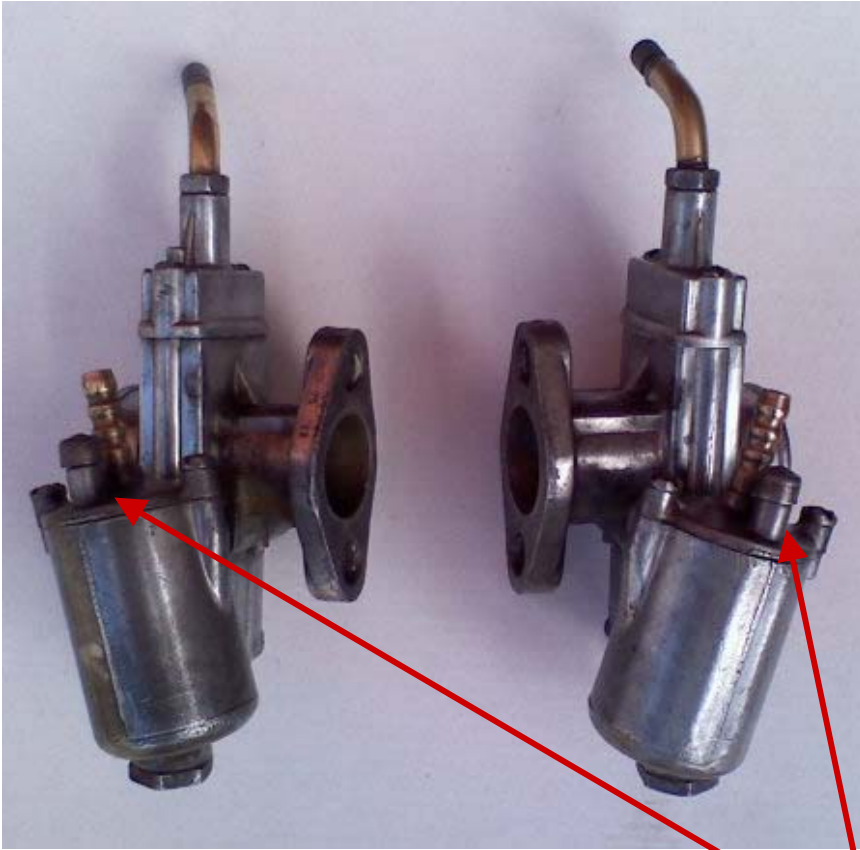


**Pushing Down on the Depressor Mechanically Pushes Down the Float, Temporarily Opening the Float Valve**

**K-301 carbs, introduced with Ural's M-63, M-66, M-67 and Dnepr's K-650, were used on the Dnepr MT-9 as well.**



# ***K-301 / K-302 Carburetors***



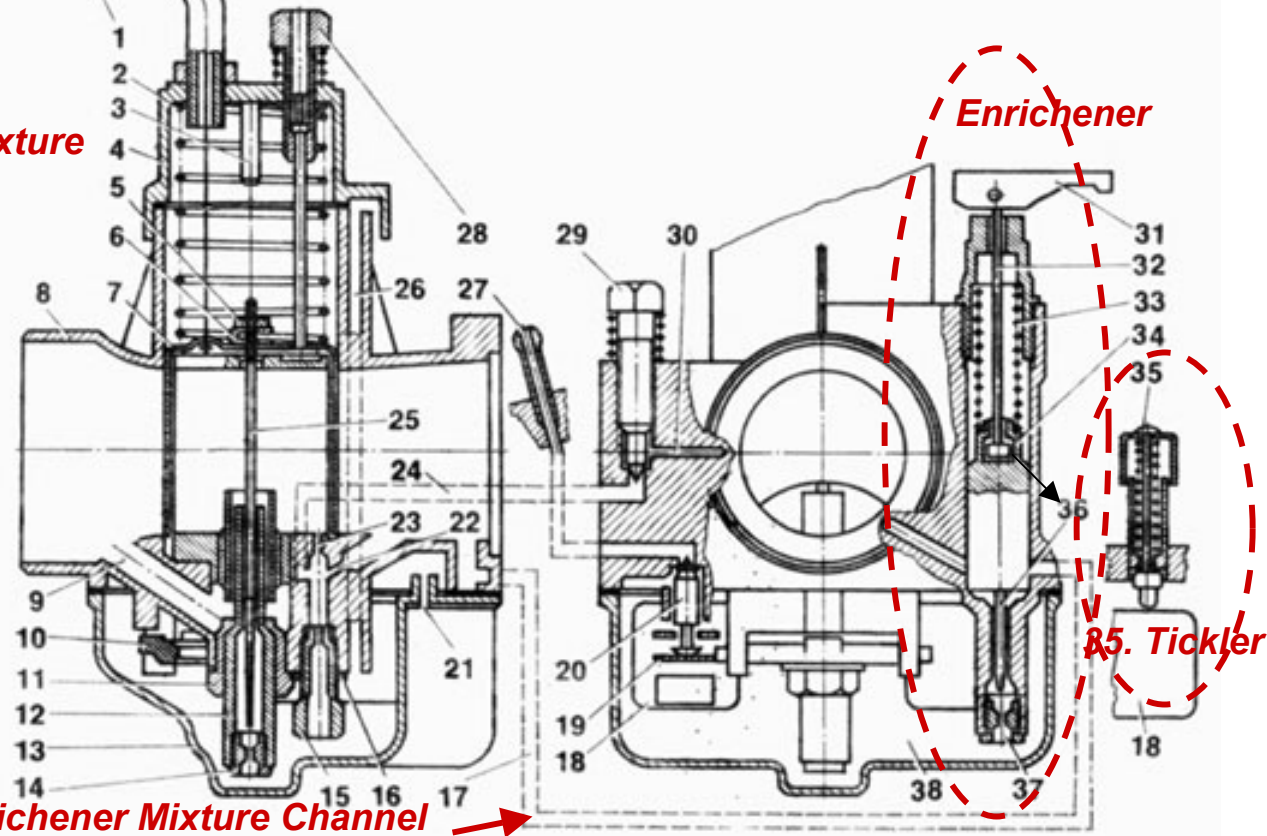
***Tickler***

***The K-301 (on the left) has an angled fuel bowl, compared to the later K-302 (on the right).***

# K-62 / K-63 / K-65 Carburetors

## Carburetor K63T:

- 17. Channel for supplying Fuel Mixture from Enrichener
- 18. Float
- 21. Drain Hole
- 22. Emulsion Hole
- 31. Starter Lever
- 32. Rod
- 33. Spring
- 34. Plunger Launcher
- 35. Tickler
- 36. Needle Plunger
- 37. Fuel Injector Launcher

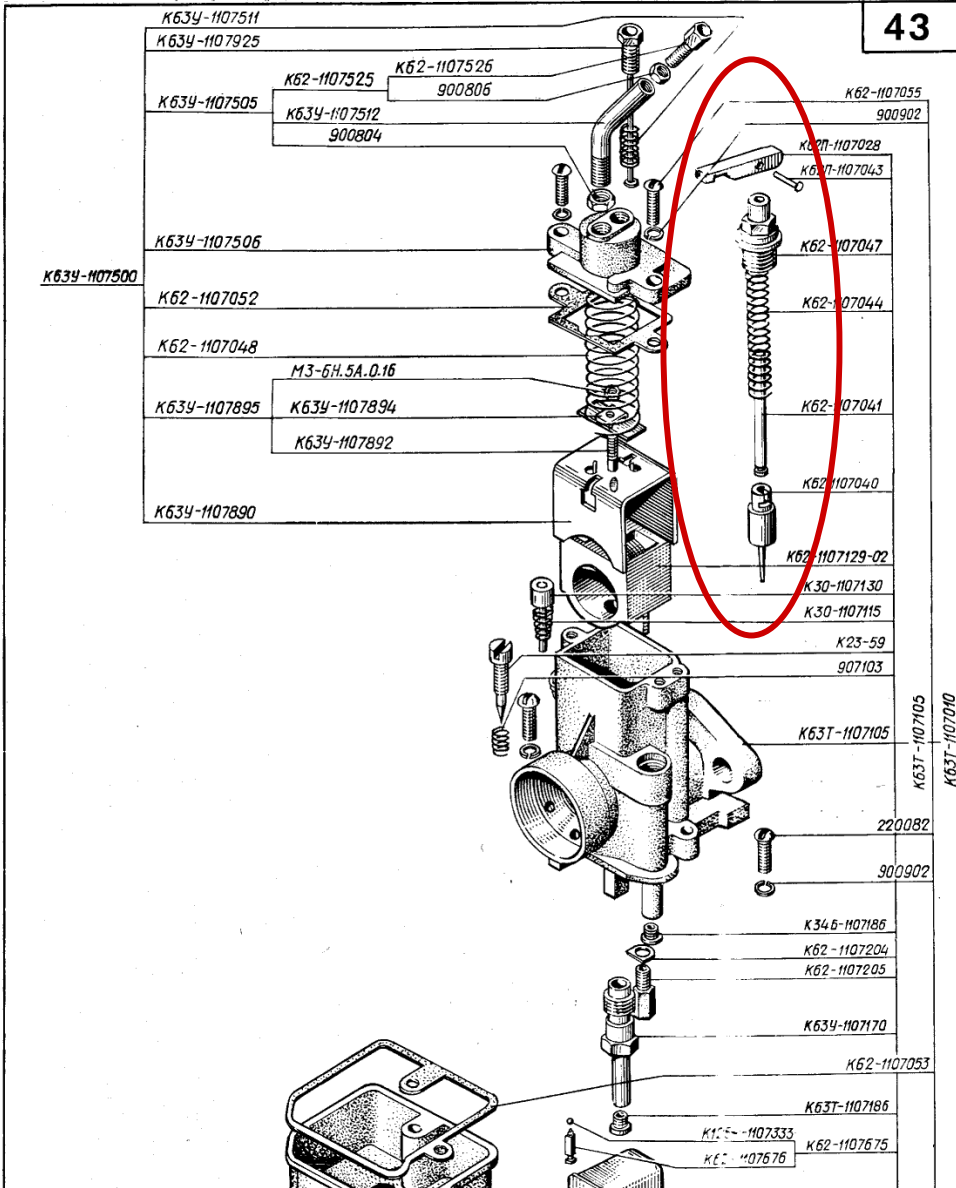


17. Enrichener Mixture Channel

Before starting a cold engine, lever (31) raises piston (34). Under the influence of vacuum, formed for the throttle when turning the kick-starter, fuel flows through the nozzle (37) in the cavity under the plunger. Here it is mixed with air, which goes through a channel to the inlet pipe of the carburetor, then in the form of a rich emulsion is directed through channel (17) in the mixing chamber and then into the engine cylinder. When fully raised, the plunger reaches the maximum enrichment of the mixture, based on the limited capacity of the nozzle (37). When fully retracted, the plunger needle closes the fuel feed and fuel supply is stopped.



# K-63 Carburetor (MT-11 and MT-16 Repair Manual)



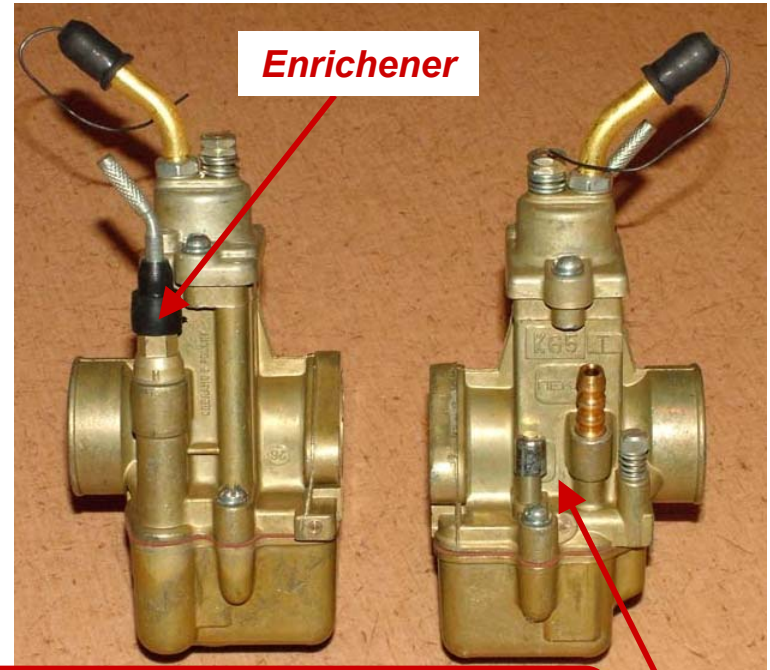
**K62-1107028 Enricher Lever**  
**K62-1107043 Axle Pin**

**K62-1107047 Guide Spring**

**K62-1107044 Corrector Spring**

**K62-1107041 Rod**

**K62-1107040 Corrector-Enrichener**

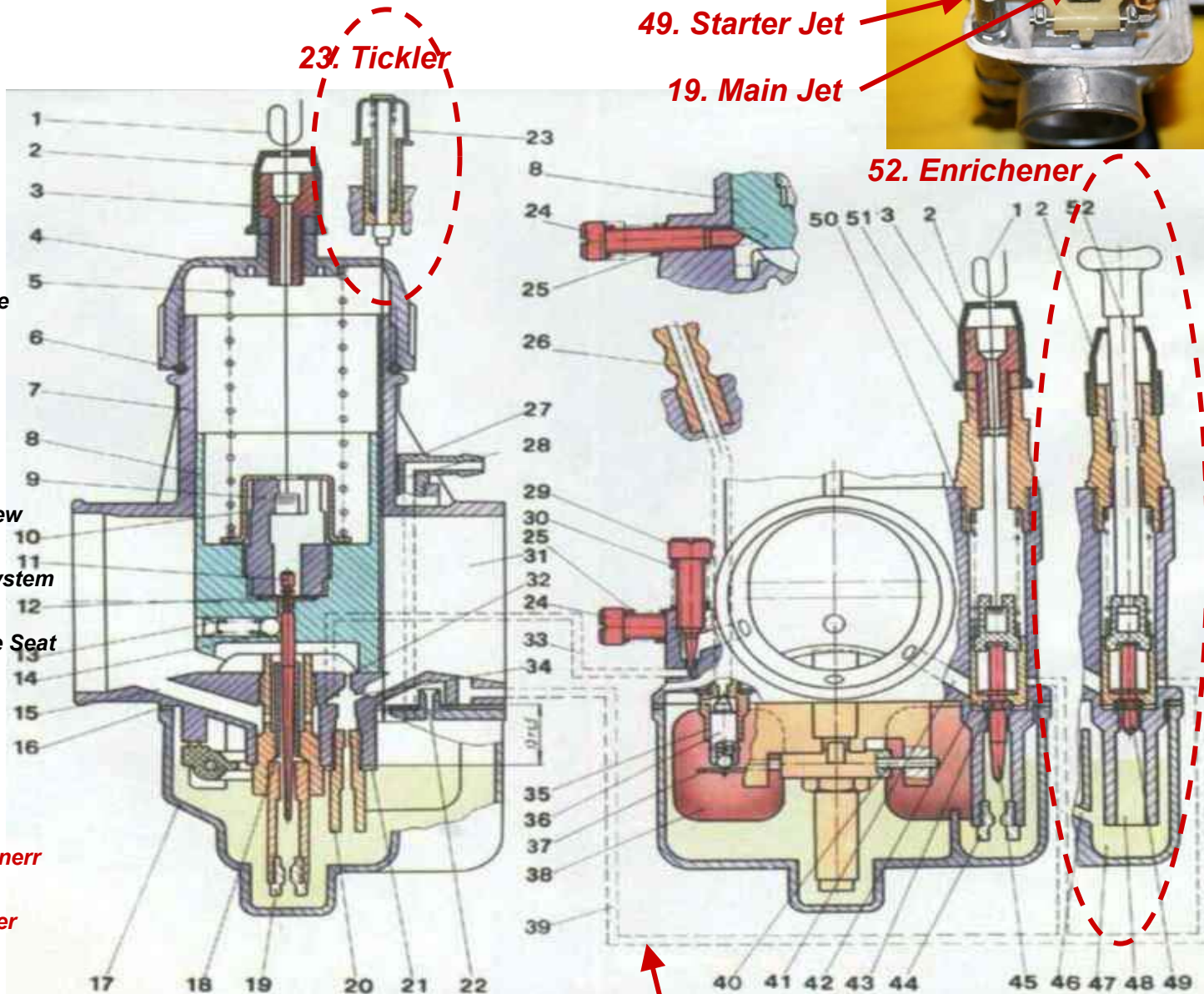


**As evidenced from the part numbers, the K-63 enricher used parts from the K-62.**

**Tickler**

# K-68 Assembly Diagram

1. Throttle Cable
2. Protective Cap
3. Cable Guide
4. Throttle Cover
5. Throttle Spring
6. O-Ring Seal
7. Housing
8. Slide Throttle
9. Cable Catch
10. Cable Stop
11. Throttle Needle
12. Needle Lock
13. Spring Pre-load Needle
14. Slide Ball
15. Air Channel Main System
16. Chamber Cover Gasket
17. Cover of Float Chamber
18. Sprayer
19. Main Fuel Jet
20. Idle Atomizing (Dosing) Tube
21. Lock Washer
22. Drain Hole
23. Float Activator (Tickler)
24. Idle Adjusting Screw
25. Screw Spring
26. Fuel Inlet Fitting
27. Balancing Port
28. Balance Channel of Float Chamber
29. Idle Mixture Adjustment screw
30. Screw Spring
31. Mixing Chamber
32. Transient Opening of Idle System
33. Air channel of Idle System
34. Idling Hole
35. Removable Brass Fuel Valve Seat
36. Fuel Valve Assembly
37. Float Element Adjust
38. Float
39. Channel of Starter
40. Float Axle
41. Air Channel (Duct)
42. Starter Plunger Assembly
43. O-Ring Seal
44. Jet (Nozzle)
45. Needle of Corrector-Enricher
46. Dosing Hole
47. Fuel Well (Pit)
48. Fuel Channel (Duct) of Starter
49. Starter Jet
50. Plunger Spring
51. Spring Guide
52. Enrichener (a.k.a. choke)



23. Tickler

49. Starter Jet

19. Main Jet

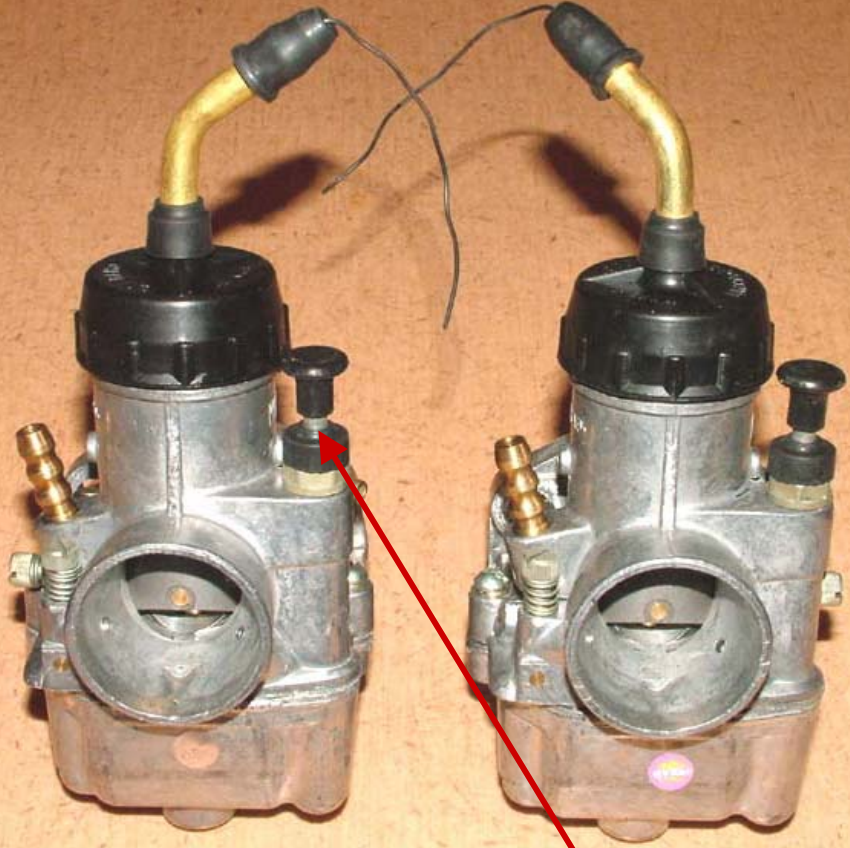
52. Enrichener

22. Drain Hole

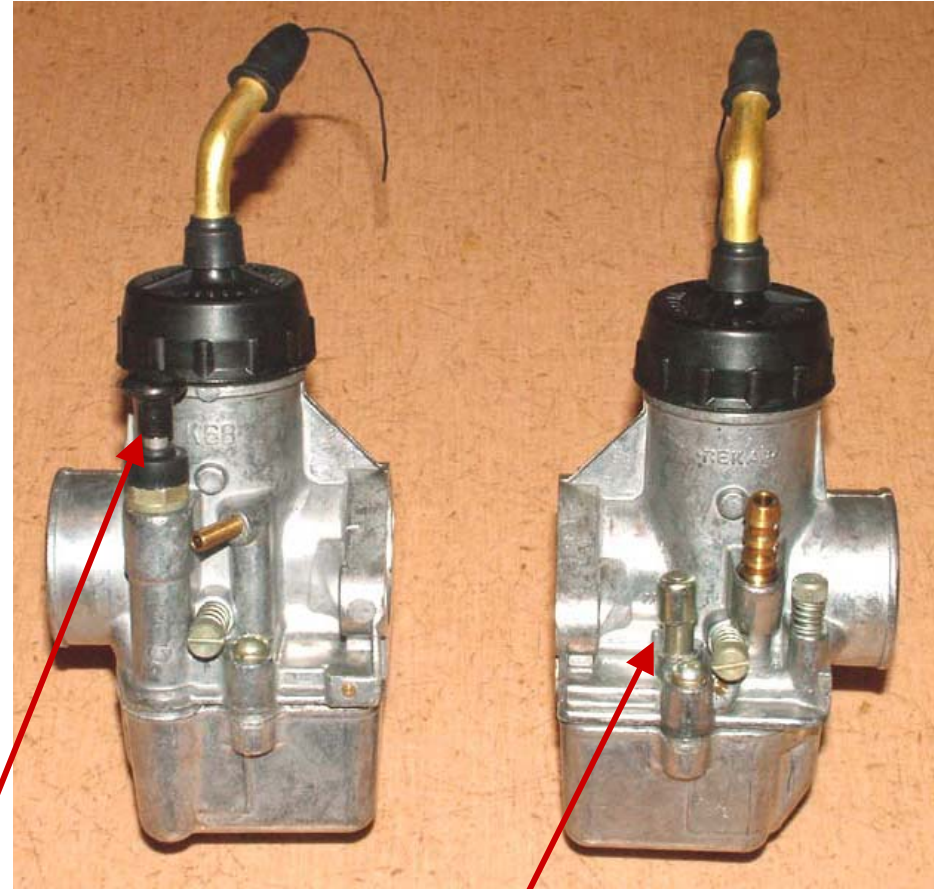
39. Channel from Enrichener to Venturi



# ***K-68 Carburetors***



***Enrichener***

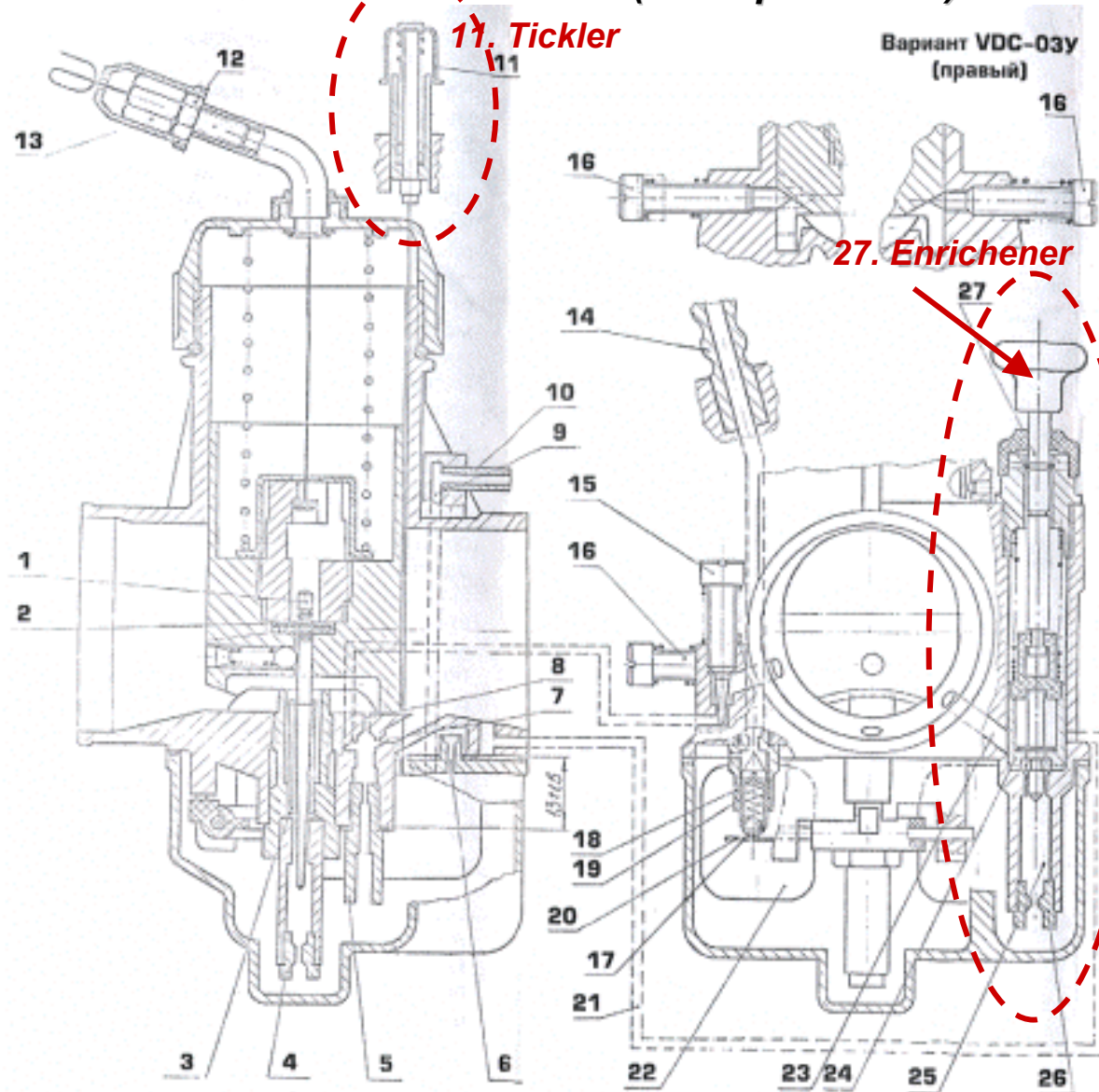


***Tickler***

***The K-68 carburetor has both a tickler and an enrichener.***

# Kaptex VDC-RAM Carburetor (moto-planeta.ru)

- 1 - Needle Valve
- 2 - Needle C-Clip
- 3 - Sprayer
- 4 - Main Fuel Nozzle (Jet)
- 5 - Idle Jet
- 6 - Drain Hole
- 7 - Idling Hole
- 8 - Transient Opening of Idle System
- 9 - Balance Channel of Float Chamber
- 10 - Balancing Port
- 11 - "Tickler" Float
- 12 - Lock-nut
- 13 - Protective Cap
- 14 - Fuel Inlet Fitting
- 15 - Idle Mixture Adjustment Screw
- 16 - Idle Adjusting Screw
- 17 - Ball
- 18 - Fuel Valve Seat
- 19 - Needle Fuel Valve
- 20 - Adjust Float Element
- 21 - Channel of Starter
- 22 - Float
- 23 - Air Channel (Duct)
- 24 - Starter Plunger Assembly
- 25 - Fuel Channel
- 26 - Enrichener Needle
- 27 - Enrichener (a.k.a. choke)

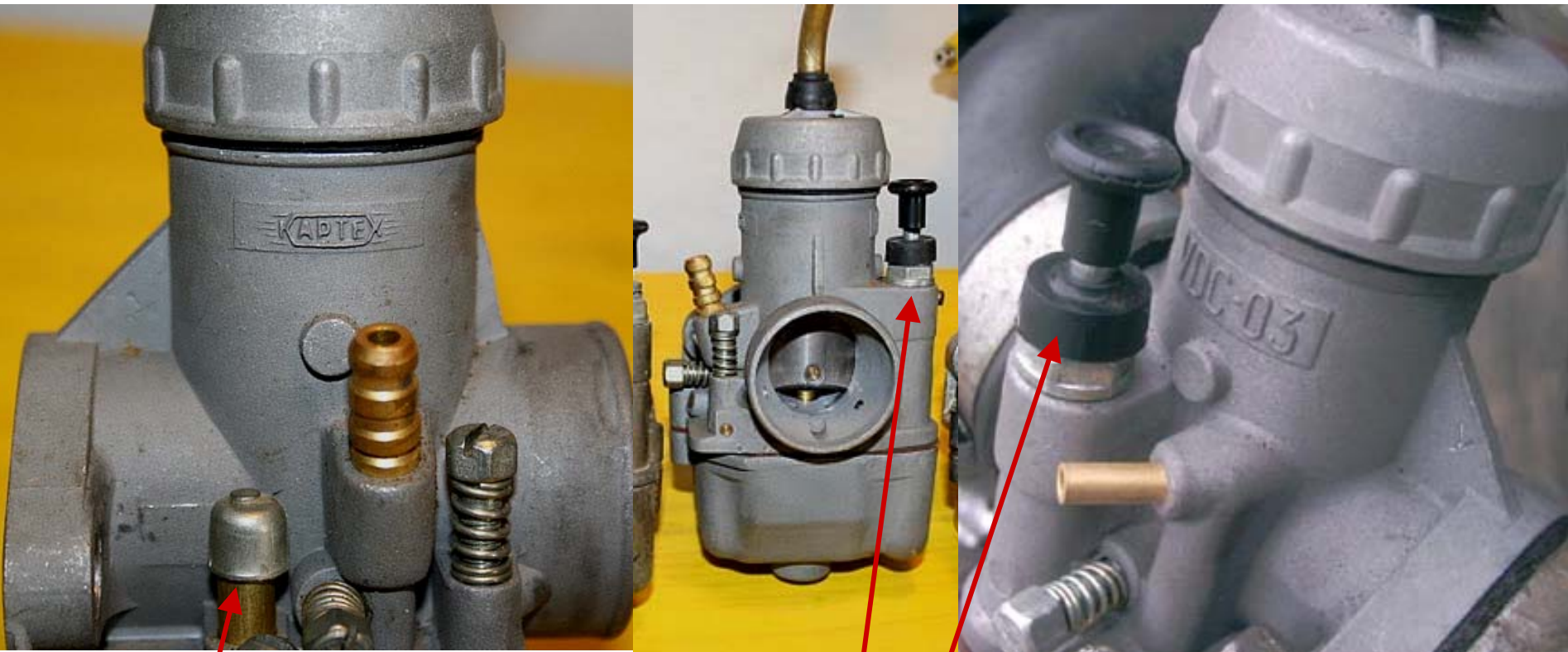


**The Kaptex starter float is used for cold-starts (tickler:11 and enrichener:21, 23, 24, 25, 26 ,27).**



# Kaptex VDC-RAM Carburetor

(Russian Iron Board Forum, Antoni Font)



*Tickler*

*Enrichener*

***The Kaptex VDC-RAM carburetor has both a tickler and an enrichener.***

# ***Enricheners for the Kaptex and K-68 Carbs***

***(Russian Iron Board Forum, Antoni Font)***



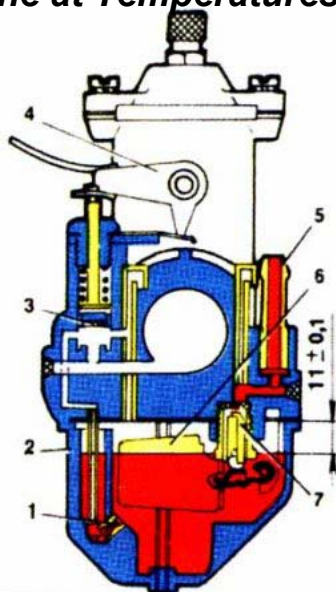
***Enricheners Used to  
Prime the Carbs for  
Cold-Start Conditions***

***Enricheners act in the same manner  
as a choke for initial starting, to give an extra shot of fuel.***

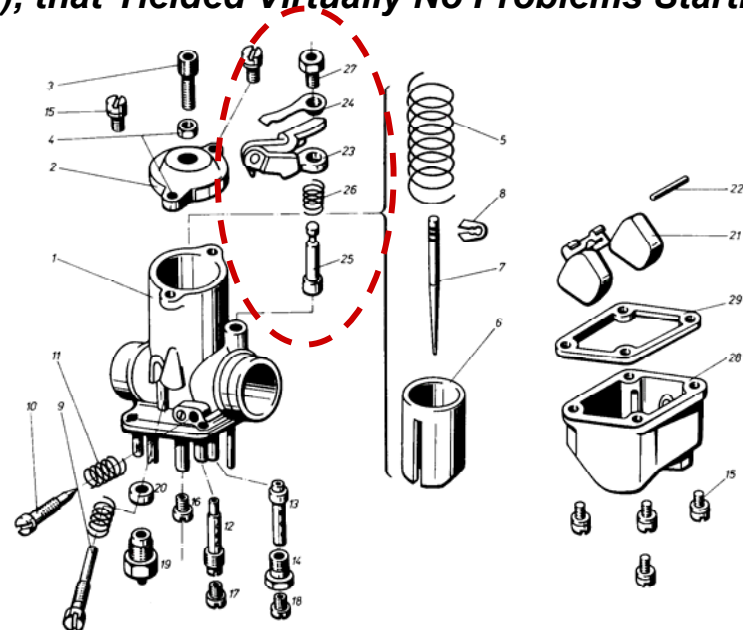


# Jikov 2928CE Carburetor ([www.zid-voshod.narod.ru](http://www.zid-voshod.narod.ru))

- **Starting System Has Undergone Significant Changes**
  - Instead of the Usual Tickler Float, Carburetor Is Equipped with Additional Carburetor (the enricher)
  - Thru the Nozzle Pressed into the Float Chamber, Fuel Is Fed into a Special Pit, and then to the Brass Tube into the Mixing Nozzle
  - Here It Mixes with Air, After which the Resulting Mixture Is Injected Directly into the Mixing Chamber
- **Enricher Designed to Enrich the Mixture during Cold Engine Start**
  - When Enricher Lever (4) Is Lifted, Extra Fuel Flows thru the Starting Jet (1) and Flows thru a Canal into the Mixing Chamber
  - Enricher Works Effectively Only when the Throttle Valve Is Down (Idle)
  - The Lower the Throttle Is, the Greater Is the Vacuum and the More Enriched Is the Mixture
  - Works Only for Small (up to 0.5 mm) Lifting of the Throttle Valve
  - Therefore, When Starting a Cold Engine, the Throttle Should Be Left Resting
- **Enricher (Concentrator) Lever**
  - Only Two Positions: On (lever raised) and Off (lever lowered)
  - After Engine Warms Up, the Lever Must Be Lowered (off)
  - Use of Enrichers on a Warm Engine Is Not Recommended
  - Starter Jet Is Located Near the Bottom of the Float Chamber
  - Starter Jet Is Possible to Clog, in Which Case Remove and Rinse the Float Chamber and Blow Out the Nozzle
- **Carburetor Enrichers Manufactured during 1984-1985 Had Jets Designated 72 (diameter 0.72 mm)**
  - Subsequently Replaced with 85's (0.85 mm diameter), that Yielded Virtually No Problems Starting the Engine at Temperatures Up to -10°C (-23°F)

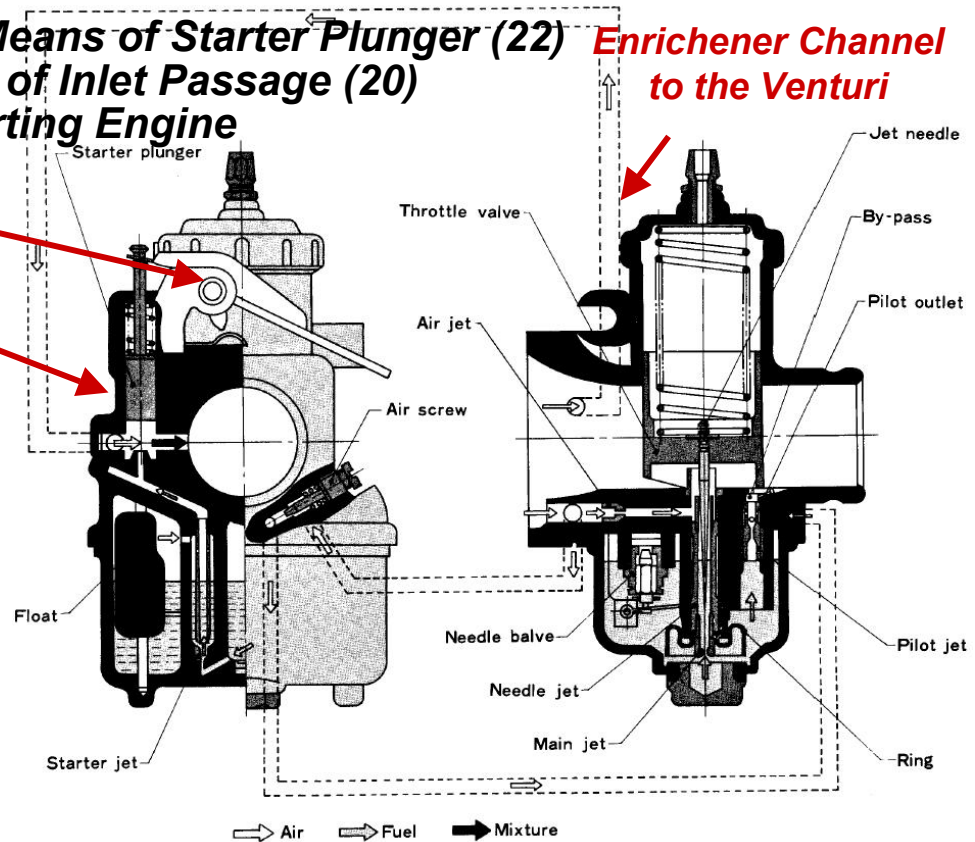
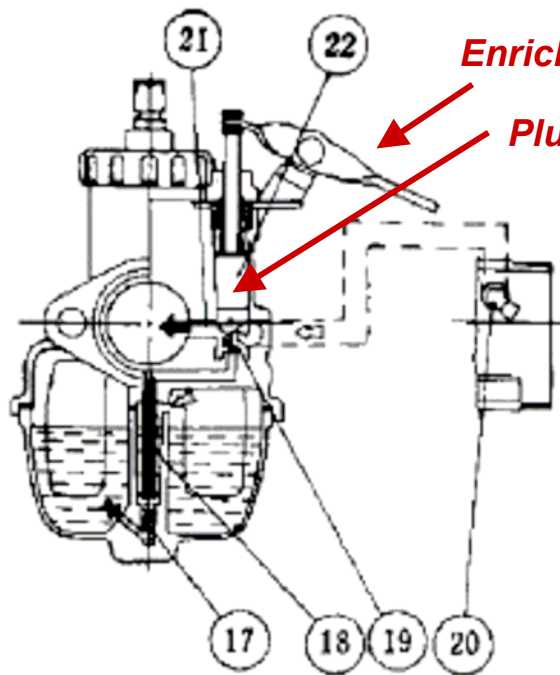


1. Enricher Jet
2. Float Chamber
3. Trigger
4. Enricher Lever
5. Fuel Fitting Inlet
6. Float
7. Needle Valve



# 28mm VM-Type Mikuni Enrichment System (1998 Ural Manual)

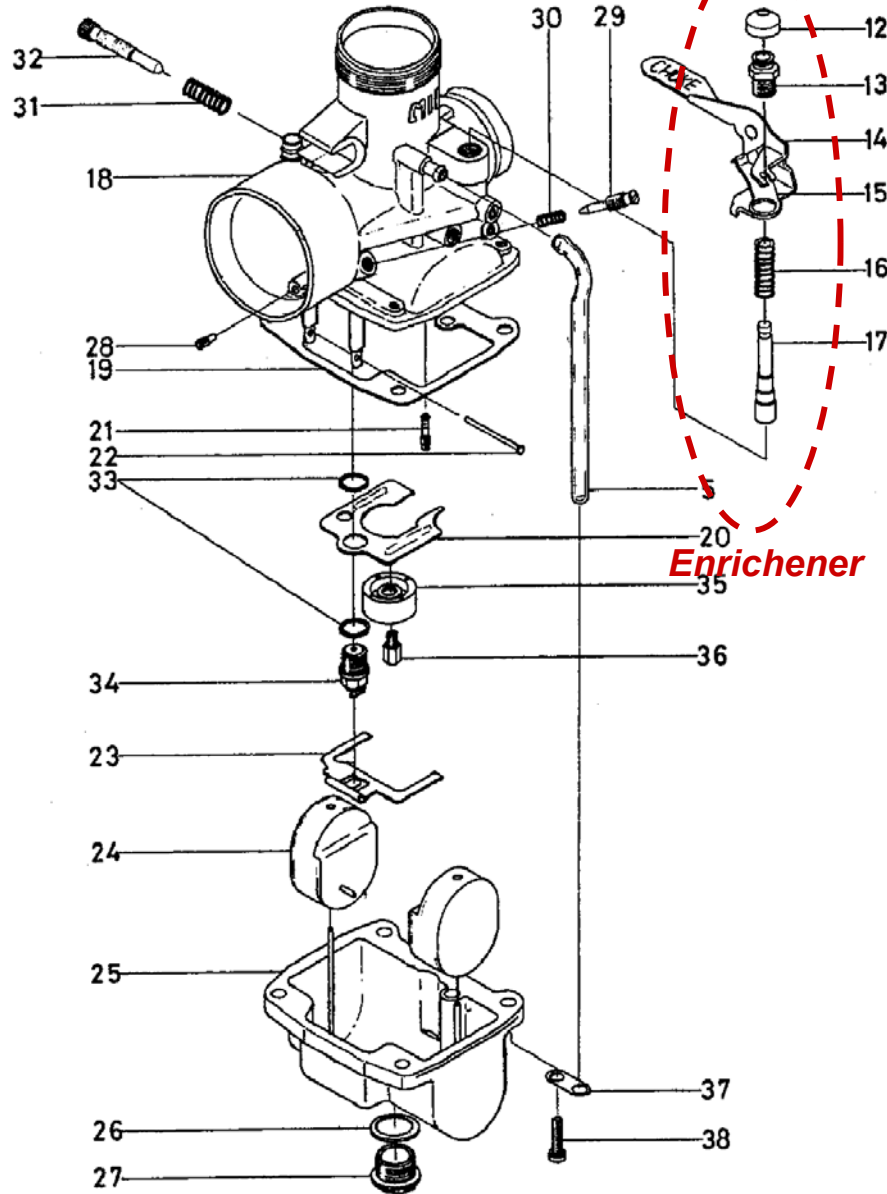
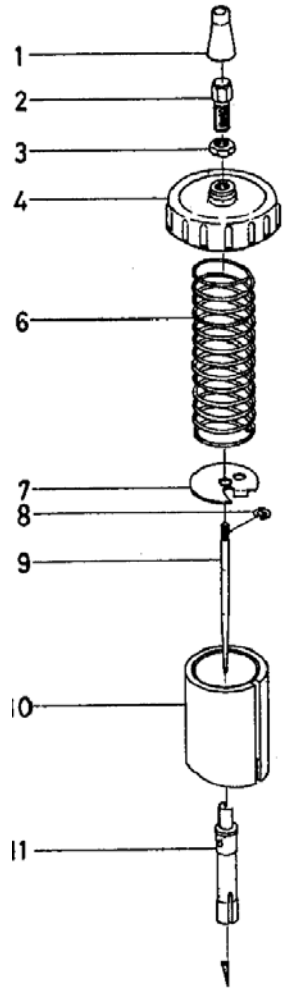
- Added to Urals in 1998 To Satisfy the EPA for Importing to U.S.
- Enrichment System Used on Mikuni Carburetors in Place of Choke
- Fuel and Air for Starting the Engine Are Metered by Entirely Independent Jets
- Fuel Metered by Starter Jet (17) Mixed with Air and Broken into Tiny Particles in Emulsion Tube (18)
- Mixture then Flows into Plunger Area (19), Mixes Again with Air Coming from Air Intake Port for Starting and Delivered to Engine in Optimum Air-Fuel Ratio thru Fuel Discharge Passage (21)
- Enrichment Valve Opened and Closed by Means of Starter Plunger (22)
- Enrichment Constructed to Utilize Vacuum of Inlet Passage (20)
- Important that Throttle Is Closed when Starting Engine



**The Mikuni carburetor uses a lever/plunger to initially supply an increased supply of fuel to the venturi for cold-weather starting.**



# Mikuni VM-28-49 Carburetor



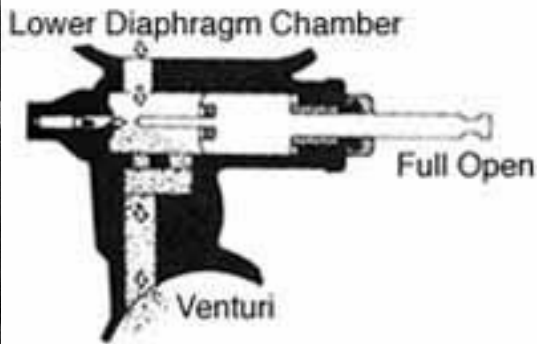
1. Rubber Cap, Throttle Cable
2. Cable Adjuster
3. Locknut, Cable Adjuster
4. Top, Mixing Chamber
5. Tube, Air Vent
6. Spring, Piston Valve
7. Plate, Needle Retainer
8. "E" Ring
9. Jet Needle
10. Piston Valve
11. Needle Jet
12. Rubber Cap, Starting System
13. Cap, Starter Plunger
14. Lever Assy, Starting System
15. Leaf Spring, Lever Positioning
16. Spring, Starter Plunger
17. Plunger, Starting System
18. Body, Mixing Chamber
19. Gasket, Float Chamber
20. Baffle Plate, Float Chamber
21. Pilot Jet
22. Pin, Float Arm Hinge
23. Float Arm
24. Float
25. Float Chamber
26. Washer, Float Chamber Plug
27. Plug, Float Chamber
28. Air Jet
29. Air Screw
30. Spring, Air Adjusting Screw
31. Spring, Idle Adjusting Screw
32. Screw, Idle Adjusting
33. Washer, Needle & Seat Assy
34. Needle & Seat Assy
35. Cup, Fuel Retaining
36. Main Jet
37. Plate, Vent Tube Retaining
38. Screw, Float Chamber

**Enrichener**

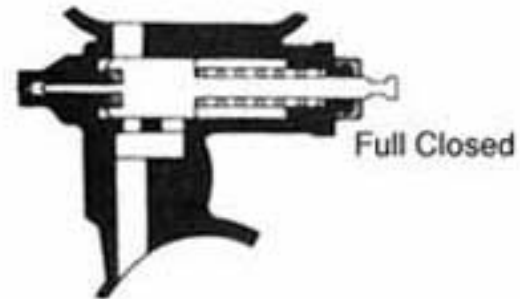
**The Mikuni enrichener system consists of a rubber cap (12), plunger (13), lever assembly (14), leaf spring (15), spring (16) and plunger (17).**

# **Keihin Carburetor Enricheners** ([www.gadgetjq.com](http://www.gadgetjq.com))

- **Added to Ural Motorcycles in 2000**
- **Carburetor Enricheners Provide Extra Fuel to the Fuel-Air Mixture, Allowing a Cold Engine to Start and Run until Warmed-Up Sufficiently to Allow Normal Operation**
- **Pulling the Enrichener Retracts a Plunger that Opens a Tube Connected to the Starter Jet, Allowing Additional Fuel to Enter Venturi just below Vacuum Hose Nipple**
- **It Supplements the Pilot (Idle) System at Start-Up**
- **Use Caution When Using Enricheners, as They Can Easily Cause Engine to Flood or to Foul Spark Plugs**



**Enrichener On**  
(Pulled Out, Starting)

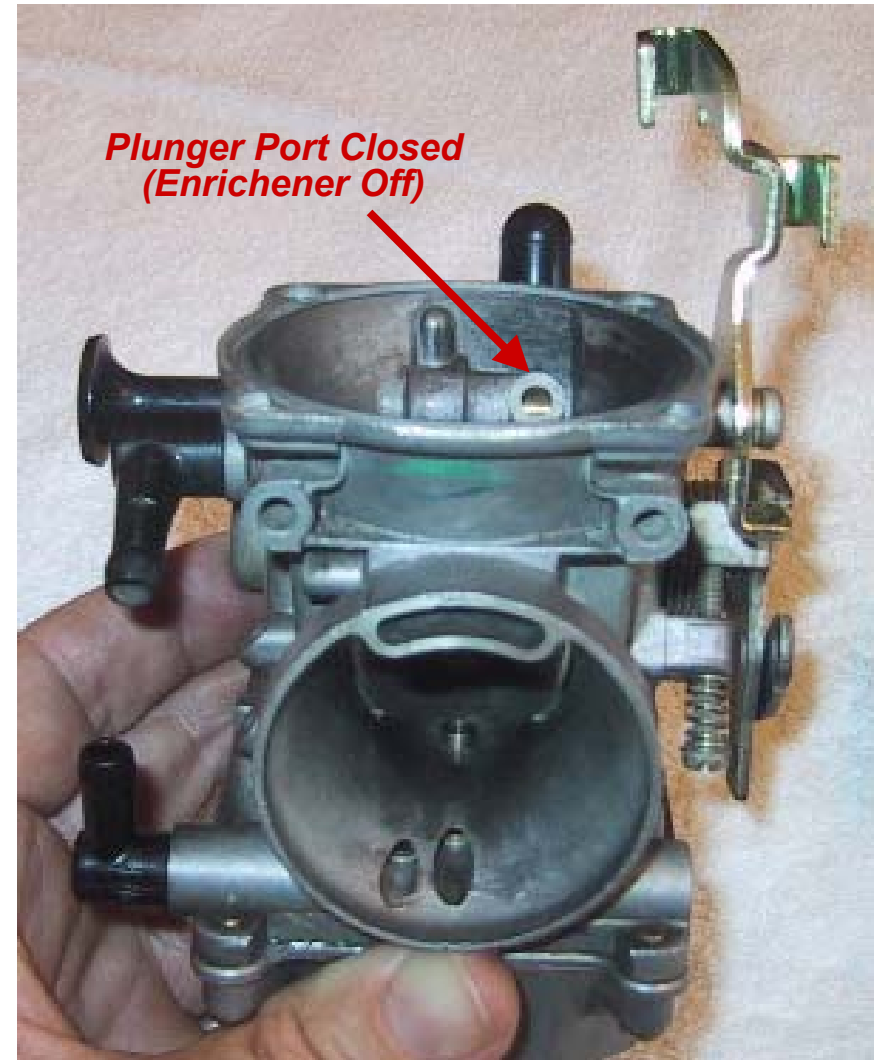
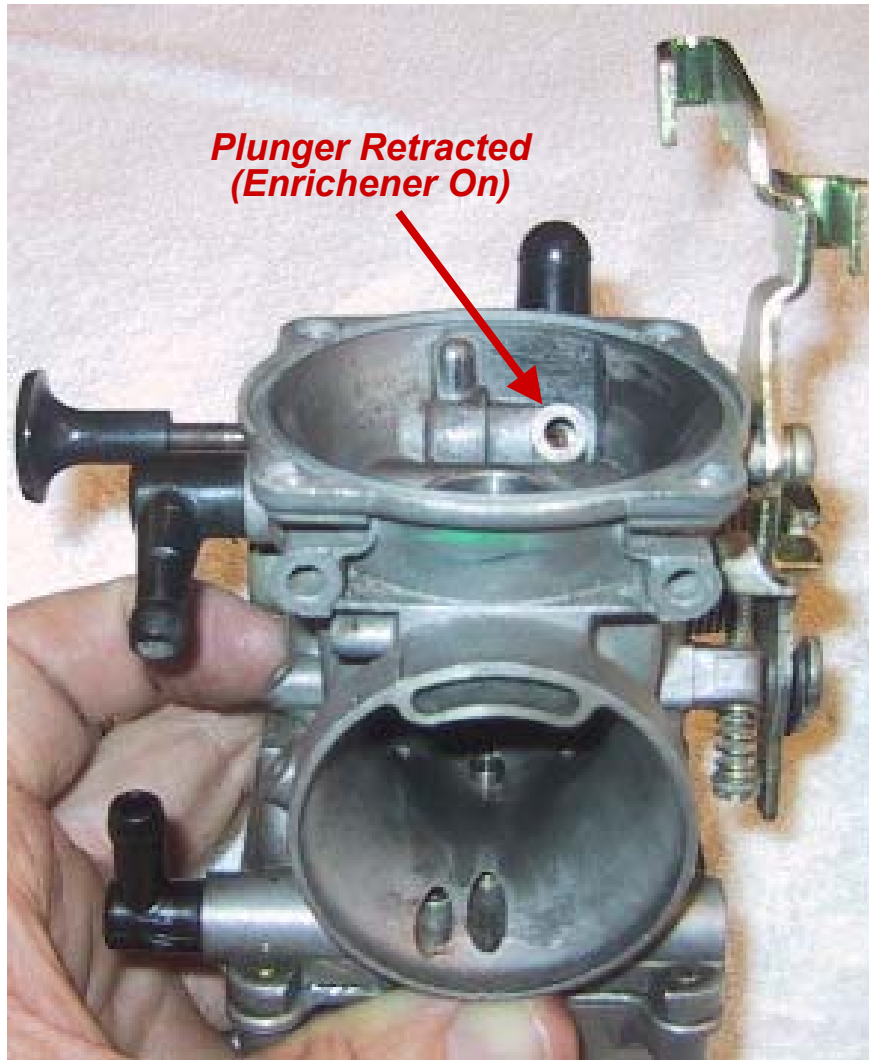


**Enrichener Off**  
(Pushed In, Running)

**Enricheners should only be left on as long as necessary to keep the engine running while cold and should be turned off as soon as possible.**



# **Keihin CVK32 Disassembly from The "Unofficial" URAL 750cc Motorcycle Service Manual (myural.com)**



**Choke Pulled On, Opening the Enrichener Orifice  
(top right, inside carb)**

**Keihin Choke Pushed In (off)**

# Keihin Enricheners

- **Keihin Carbs Do Not Have a Choke, but Use a Mixture Enrichment Circuit, or Enrichener**
- **Enricheners Work by Opening a Secondary Fuel Circuit below the Throttle Valve**
  - **Circuit Works Like Idle Circuit, Supplying Extra Fuel when Throttle Is Closed**
- **First Enricheners Used on Urals Imported to U.S. to Satisfy EPA**
  - **32mm CVK Keihin (2000-present)**
- **When Engine Is Cool or Cold and Ambient Temp between 40°F-60°F (5°C-15°C), Pull-Out (engage) Both Enricheners to Start**
- **As Soon as Engine Starts, Immediately Push-In Enricheners**
- **Run Engine at Moderate Speed for 30-60 seconds**
- **If Engine Starts to Die, Blip the Twist Throttle (rapidly twist part way towards full throttle and then back off) to Keep Engine Running**
- **After 1 to 3 minutes, Depending on Ambient Temp, Engine should Run Smoothly without “blipping” the Throttle**
- **If Engine Is Cold and Ambient Temperature Is below 40°F (5°C)**
  - **Give Engine 5-10 (depending on how cold it is) Priming Kicks with Ignition Off**
    - **Gets Some Oil Circulated to Key Internal Parts**
  - **Engage Enricheners on Both Carburetors**
  - **Engine Should Fire, Depending on Temp (for example, when the ambient temperature is 0°F, it typically takes about 5-10 rotations to start Engine)**
  - **When Engine Starts, Disengage Both Enricheners (after a few seconds)**
- **Back-Off on Enricheners as soon as Engine Sustains Itself without Stalling**
- **Since the Ural is Carbureted Air-Cooled Engine, Plugs Will Foul Quickly (as soon as one minute) If Engine Mixture Too Rich**
- **If One Plug Fouls and Other Doesn't, Engine Will Run Unevenly and May Cause Internal Damage**
- **When Engine Is Hot, Do Not Enrichen Carburetors (Risks Flooding Engine)**

**If the ambient temp is high (60°F (15°C) or above), try starting the engine without pulling the carburetor enricheners.**