Ural (Урал) - Dnepr (Днепр) Russian Motorcycle Carburetors

Part 5: K-302 Carburetor

(See Also Part 5A- Adjustment and Overhaul of K-302 Carburetors)

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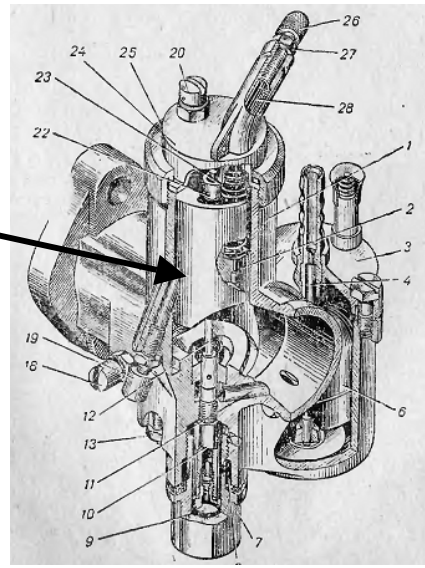
K-302 Carburetor

- Replacement for K-301Г(G) Russian Carburetor
  - Same Flange Size and Orientation (Vertical)
- Better than K-301, but Not Good Enough
- Replaced by K-Series (K-62, -63, -65, and -68) of Carburetors
- K-301 Fitted to Dnepr K-650, MT-9, & MT-10 and Ural M-63, M-66 & M-67 (All 650 cc OHV Models)
- Later Dnepr MT-11 & MT-12 and Later K-750 & MB-750s Used K-302
  - Main Difference Would Be the Jets for Larger Engine
- K-301 vs. K-302 Carburetors
  - K-301 and K-302 Carburetors Are Similar
  - Typically Treated Together in Repair Manuals
  - K-301 Has an Angled Fuel Bowl, Compared to Vertical K-302

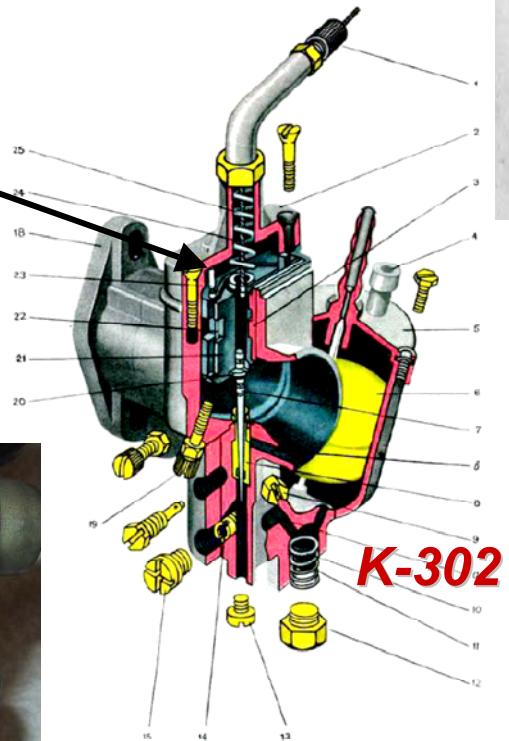
The K-302 captured all the changes during the development of the K-301 series, but was quickly over-taken by the K-63/K-65 carburetors.

Round-Slide vs. Flat-Slide vs. Butterfly Throttle Valves

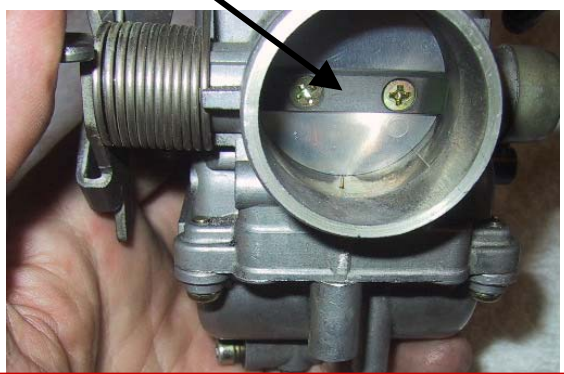
- **Round-Slide Throttle Valve**
  - K-37, PZ-28, K-38
  - Kaptex VDC-RAM
  - K-68
  - Mikuni VM-28
  - Jikov 2928



- **Flat-Slide Throttle Valve**
  - K-301 / K-302
  - K-62 / K-63 / K-65



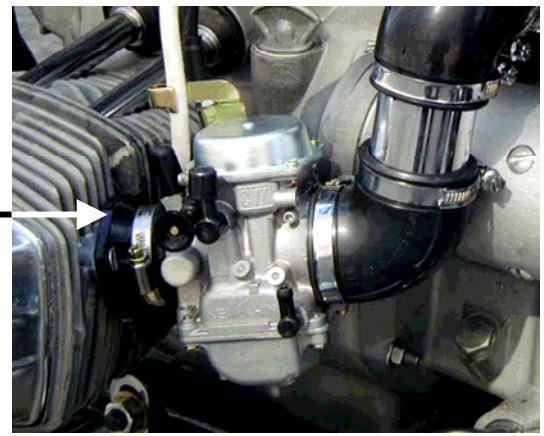
- **Butterfly Throttle Valve**
  - Keihin CVK32



One term describing carburetors is round-slide, flat-slide or butterfly throttle valves.

Flange-Mount vs. Spigot-Mount

- *Flange-Mount*
  - *Bolts Directly on Cylinder Head or Adapter*
  - *K-37, PZ-28, K-38,*
  - *K-301 / K-302*
  - *K-62 / K-63 / K-65 / K-68*
  - *Kaptex VDC-RAM*



- *Spigot-Mount*
  - *Rubber Compliant Mount to Cylinder Head*
  - *Mikuni VM-28*
  - *Jikov 2928CE*
  - *Keihin CVK32*

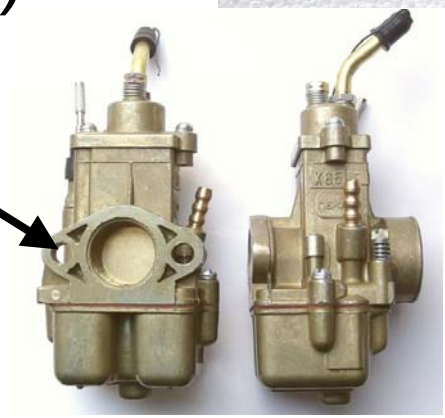
Another term describing carburetors is flange-mount or spigot-mount.

Flange-Mount: Vertical vs. Horizontal

- *Vertical Mounting Holes (MT-9's, MT-10's)*
  - *K-37, PZ-28, K-38, K-301, K-302*

K-302

- *Horizontal Mounting Holes (MT-11's, MT-16's)*
  - *K-62, K-63, K-65, Kaptex VDC-RAM, K-68*



- *Transition from Vertical-to-Horizontal*
  - *Used to Transition from Older K-37/38 and K-301/302 Carbs to Modern K-62 / K-65 / K-68 Carbs*
  - *Adapter Plates Readily Available*

An adapter plate is needed to upgrade K-302's to the modern horizontal pattern for the K-63 / K-65 / K-68 type carbs.

Russian Carburetor Time-Line (03/2011)

K-37 (M-72)

K-37 (M-72, M-72K, M-72M, M-72H, K-750)

K-38 (M-61, M-62, M-63)

К-301Б (М-63, М-66, К-650/МТ-9)

К-301В (МТ-10)

К-301Г (М-63, М-67, М-67.36)

К-301Д (МТ-10, МТ-10.36, МВ-650М, К-650/МТ-8/МТ-9)

K-37

K-37A

K-38

K-301

1940 1945 1950 1955 1960 1965 1970 1975

K-302 (МТ-11, МТ-12, IMZ-8.103)

K-62 (МТ-16, МТ-12, МВ-650)

K-63/K-65 (МТ-11, МТ-16)

28 mm Mikuni (8.103)

K-68 (МВ-650)

CVK32 Keihin (8.103, 8.107)

Urals

K-302

K-62

K-63/K-65

K-68

Last of the Dneprs

1975 1980 1985 1990 1995 2000 2005 2010

We have seen the gradual migration of the K-37 to the K-37A and then the K-38. The K-301 went through several iterations before the K-302 came along, followed by the K-60 Series carburetors.

Simple Identification of the K-302 (www.russianiron.com (Scott Pell))

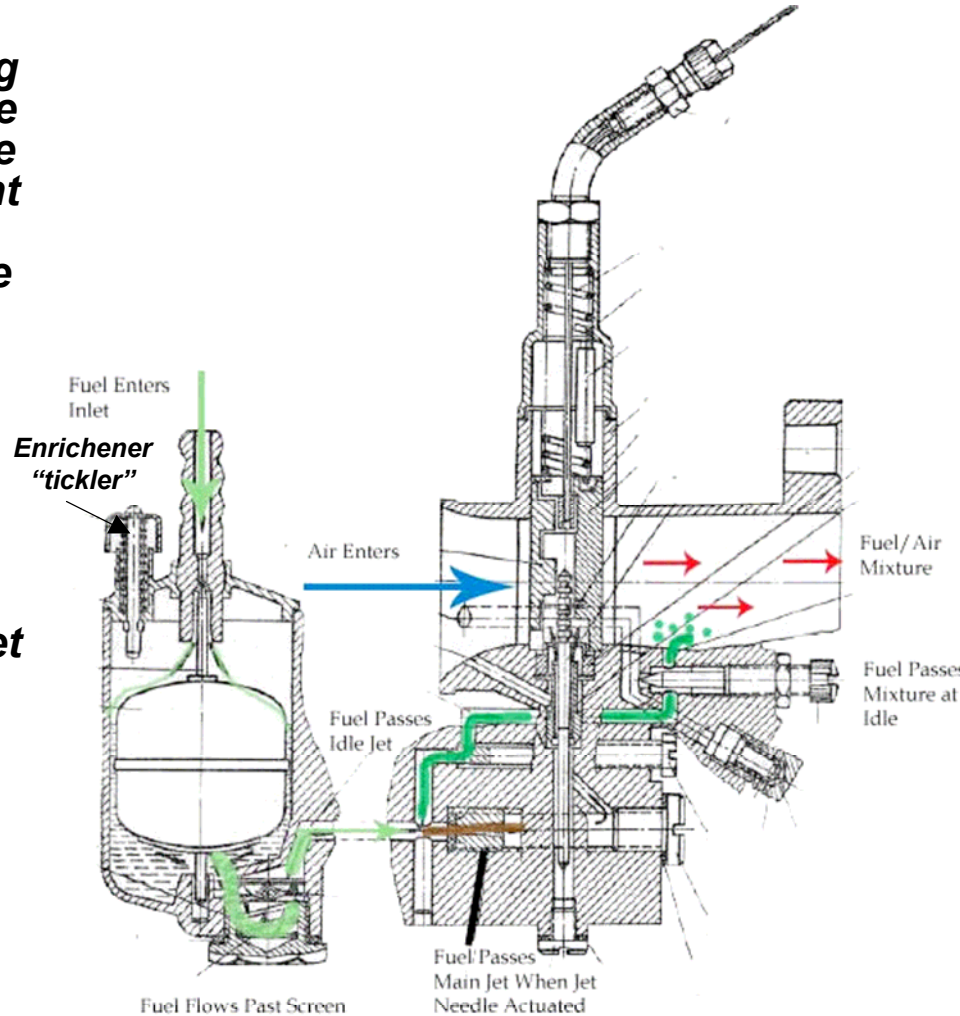
The K-301 (on the left) has an angled fuel bowl, compared to the later K-302 (on the right). The K-301 has a shorter intake plenum (tube that screws to the head) for use on the differently angled intake ports on the 650cc heads.

Simple Identification of the K-302

The K-302 appeared around 1976 as a direct replacement for the K-301. Much of the information from the K-301 applies to the K-302.

K-301 / K-302 Basics (www.russiancycles.com)

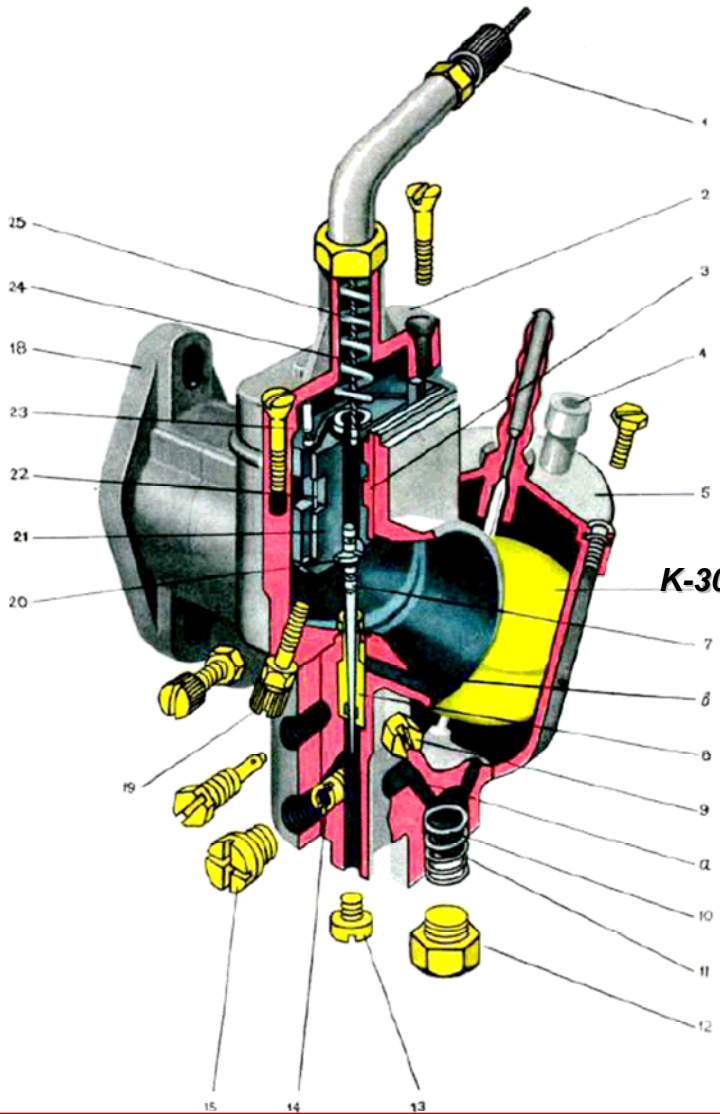
- Air Enters Carb Throat via Air Filter
- Fuel from Tank, Metered into Bowl by Float Mechanism, Is Siphoned thru Jets (depending upon the amount of air entering), into Throttle Body by Passing Air and Low Pressure where It Is Atomized into Mixture of 14.7:1 by Weight
- Air Volume Changed by Height of Flat-Slide Throttle, Directly Controlled by Throttle Cable
- Since Each Carb Has It's Own Cable, It's Important that Each Slide (throttle valve) Operates Similarly
- Air/Fuel Mixture Passes into Body of Carb, Past Intake Seals, into Combustion Chamber
- Role Played Depends Upon Operating Range
  - Idle: Idle Jet and Idle Mixture Screw
  - 1/8 to 1/4 throttle: Radius of Jet Needle
  - 1/4 to Open Throttle: Tapered Section of Jet Needle and Main Jet
- If Engine Runs Well at Idle, but Pinging or Knocking Under Load, If It's Not a Timing Issue, It Might Be an Overly-Lean Mixture
  - Adjust Jet Needle as Necessary
- When Everything Is Cold, Fuel Doesn't Vaporize Well, and Enrichening (tickler) Is Used

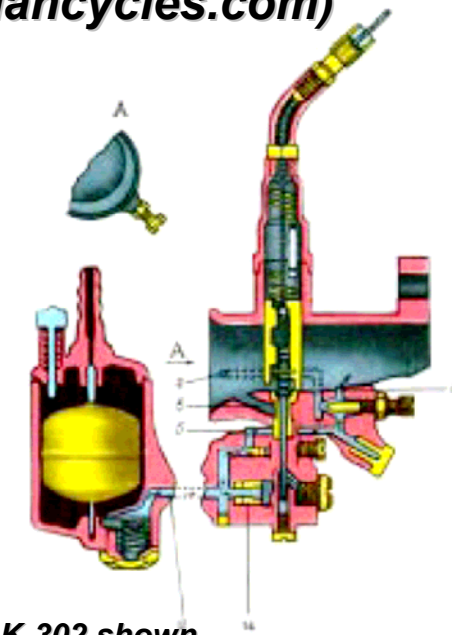


K-301/302 carburetors had a "tickler," to increase (enrichen) the fuel/air mixture to for starting.

K-301 / K-302 Carburetors (www.russiancycles.com)

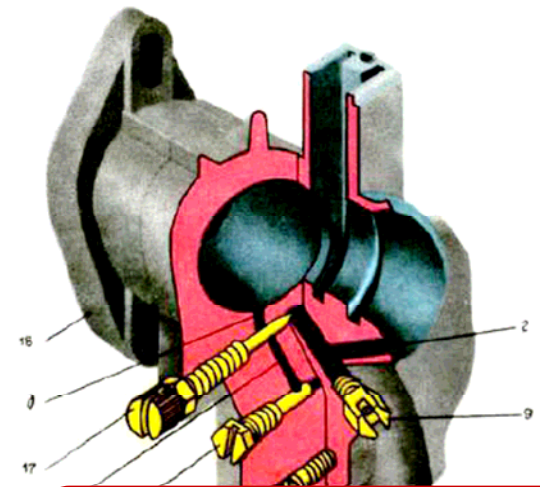
1 control cable armour thrust needle
2 carburettor cover
3 throttle cheek
4 depressor
5 float chamber cover
6 float with shut-off needle
7 throttle valve needle
8 atomizer
9 air filter
10 fuel filter
11 filter spring
12 filter plug
13 atomizer duct plug
14 main jet
15 main jet plug
16 low speed jet
17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





Note: K-302 shown.
K-302 has vertical float chamber.

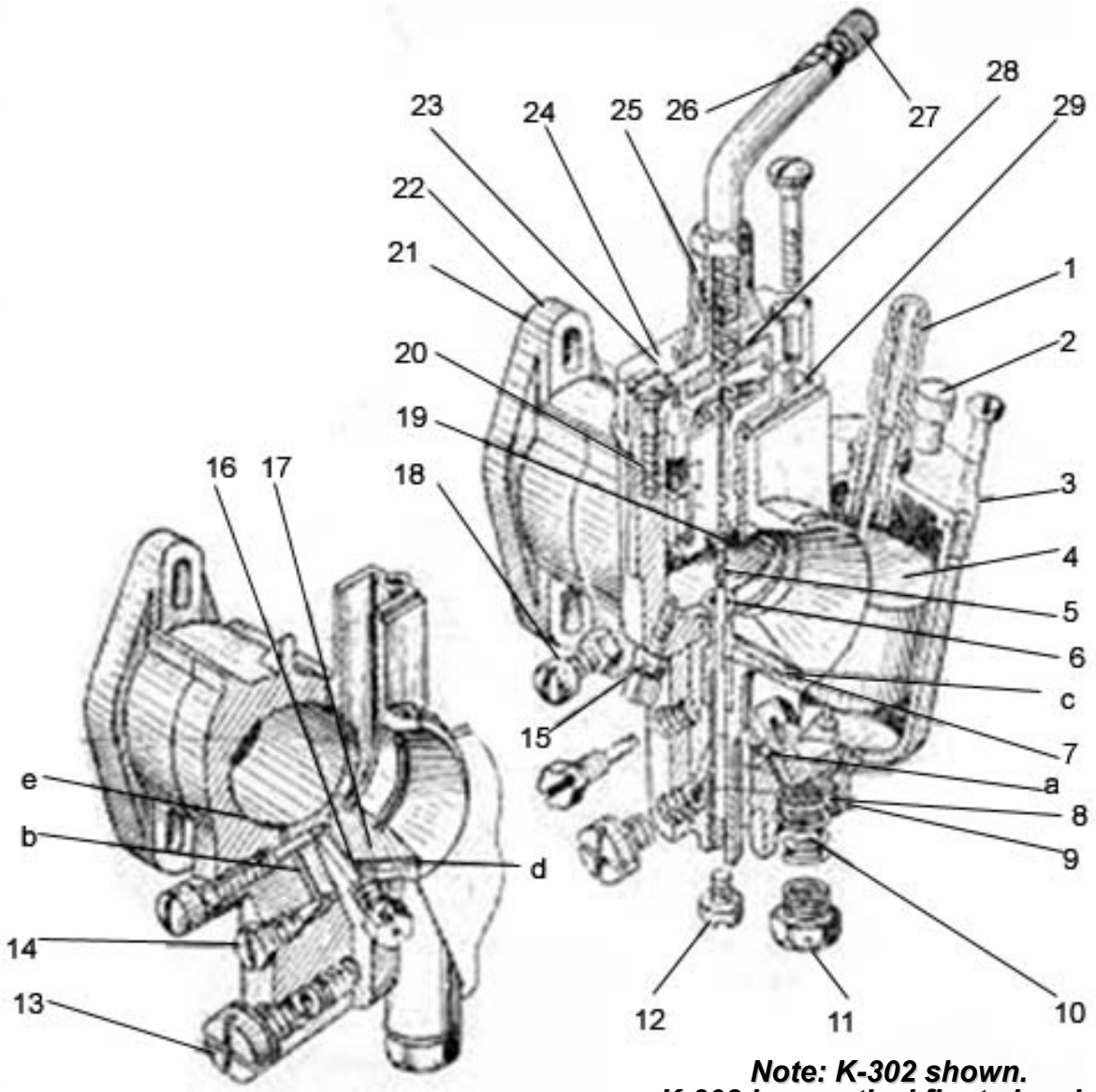
а fuel passage
б idle speed system fuel passage
в main metering system air passage
г idle speed system air passage
е idle speed system atomizer hole



K-302 carbs were introduced with Dnepr's K-750M, MB-750, MT-11 and MT-12.

K-301 / K-302 Carburetors (www.russiancycles.com)

1 – Fuel Inlet
2 – Float Depressor "tickler"
3 – Float Chamber Cover
4 –Float with Shut-Off Needle
5 – Throttle Valve Jet Needle
6 – Needle Jet
7 – Inlet Atomizer Chamber
8 – Main Jet
9 – Fuel Filter Screen
10 –Filter Spring
11 – Filter Plug
12 – Needle Jet Passage Plug
13 – Main Jet Plug
14 – Idling Jet
15 – Throttle Valve Screw
16 – Air Filter Body
17 – Chamber Filter Screw
18 – Idle Adjustment Screw
19 – Throttle Needle Lock
20 – Throttle Body
21 – Throttle Expansion Spring
22 – Carburetor Body
23 – Throttle Rise Stop
24 – Carburetor Cover
25 – throttle Control Cable
26 – Locknut
27 – Control Cable Thrust Nipple
28 – Throttle Spring
29 – Slide Body
a – Fuel Passage
b – Idle Adjustment Fuel Passage
c – Main Jet Air Passage
d – idle Adjustment Air Passage
e – idle Adjustment Atomizer

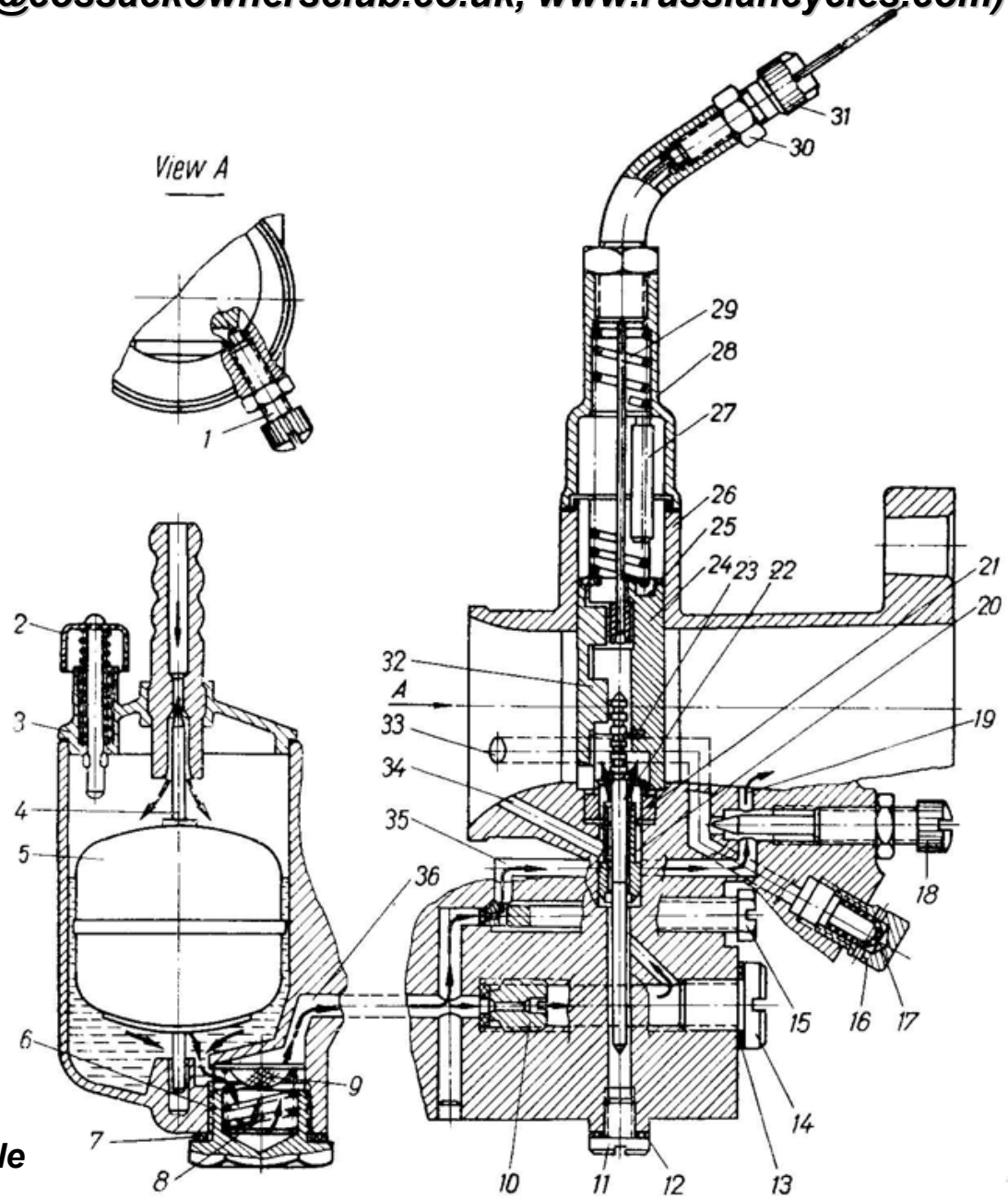


Note: K-302 shown.
K-302 has vertical float chamber.

K-301 / K-302 Carburetors

(http://oppozit.ru/article1057.html, info@cossackownersclub.co.uk, www.russiancycles.com)

- 1 - Throttle Stop Screw
- 2 - Float Depressor (Tickler)
- 3 - Float Chamber Cover
- 4 - Float Shut-Off Needle
- 5 - Float
- 6 - Fuel Screen (Filter) Spring
- 7 - Fuel Screen Plug and Gasket
- 8 - Filter Spring
- 9 - Fuel Filter Screen (Filter)
- 10 - Main Needle Jet
- 11 - Atomizer Passage (Needle Jet) Plug
- 12 - Main Jet Gasket
- 13 - Gasket
- 14 - Main Jet Plug
- 15 - Idling Jet
- 16 - Locknut
- 17 - Air Cleaner Strainer
- 18 - Idle Adjustment Screw
- 19 - Idling Jet Atomizer
- 20 - Jet Needle (Atomizer)
- 21 - Needle Jet
- 22 - Adjusting Needle
- 23 - Throttle Needle Retainer
- 24 - Throttle Body
- 25 - Throttle Slide Spring
- 26 - Carburetor Body
- 27 - Throttle Rise Stop (Travel Limit)
- 28 - Carburetor Cover
- 29 - Spring
- 30 - Stop Lock Nut
- 31 - Nylon Spacer
- 32 - Throttle Side Piece
- 33 - Idling Jet Air Channel
- 34 - Atomizer Air Channel
- 35 - Channel Supply of fuel to atomizing hole
- 36 - Main Fuel Supply Body



Setting K-301/K-302/K-37 Carbs

(http://gspell68.multiply.com/journal/item/1)

1.Warm up the engine (make sure both sides get hot because many times bikes are only running off of one cylinder). If installed, disconnect the supercharger hose and plug up the carb holes so that absolutely ZERO air passes from one side to the other. Then, kill or ground out one cylinder; we'll set the carb on the other cylinder

2.Loosen Carb Neck Screws so that there is slack between the end of the cable casing and the carb neck

3. Loosen the jam-nuts on the HORIZONTAL (mixture) and DIAGONAL (slide lift) adjustments

4. Screw the HORIZONTAL screw all the way in

5. Set the DIAGONAL screw for minimum steady operation

6. Adjust the HORIZONTAL screw for maximum engine speed

7. Set the DIAGONAL screw for minimum steady operation again by backing it out

8. Tighten Jam-Nuts

9. Repeat for Other Side

10. Note differences in engine speeds when operating on single cylinders. Plug up both cylinders. Adjust the DIAGONAL screws equally for final low-speed idle operation.

11. Tighten jam-nuts.

12. Put it on the center stand (or jack up the drive wheels on an MT-16)

13. Fire it up

14. Put in 4th gear (might wanna chock it)

15. Rev Up to 30-40 km/hr

16. Clamp/hold the throttle in place, AND DO NOT CHANGE UNTIL THE PROCEDURE IS OVER

17. Disconnect (or ground) One Cylinder Wire

18. Note exactly what the speedometer settles down to after 10 seconds

19. Quickly Re-Connect that side

20. Disconnect the other (don't move the throttle even though it'll rev up some)

21. Adjust the carb cable ferrule on the running side to match the exact speed you noted while the first side was running

22. Now let off the throttle and reconnect your supercharger

Carburetor Adapter from Vertical (K-301/K-302) to a Horizontal Type of Installation (K-63/K-65/K-68)

A simple conversion kit is needed to adapt from vertical (K-301/302) to a horizontal type of installation (K-63/-65/-68).

Heat Shield for K-301 / K-302 / K-37 (www.ural-zentrale.de)

- Protects Carburetor from Cylinder Heat
- Use on Dnepr and Ural with Carburetors K-301/ -302
- Made from Raw Sheet Material
- Suitable for Both Sides
- Bend Around the Carburetor
  - Gap between Cylinder Head and Carburetor Should Exceed 5 mm
- Use Gasket S115 in Front and Behind Shield
  - Carburetor Gasket 3 mm Original Design
  - Contains Asbestos!
  - Better Insulating against Engine Heat
  - If Necessary Use Longer Stud Bolts
  - 1.5 EUR (2011)

- Use S1501 Exhaust Paint for Surface Treatment
  - Varnish for Exhaust Tubes, Made by MAKRA, Black, Use Up to 650°C, 400 ml
  - 7 EUR (2011)
- Product No.: S245-SB
- Price: 7.5 EUR (2011)

The heat shield helps to keep the carburetor from heating up and changing the fuel/air mixture.