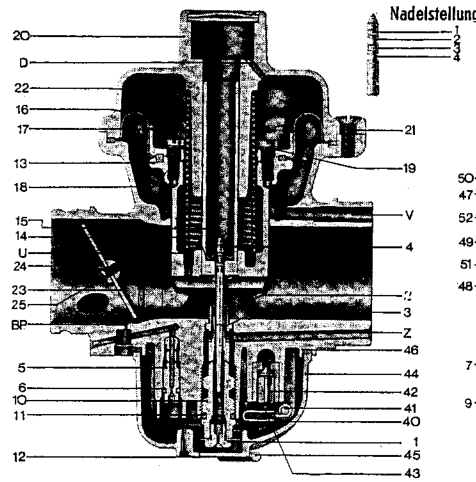
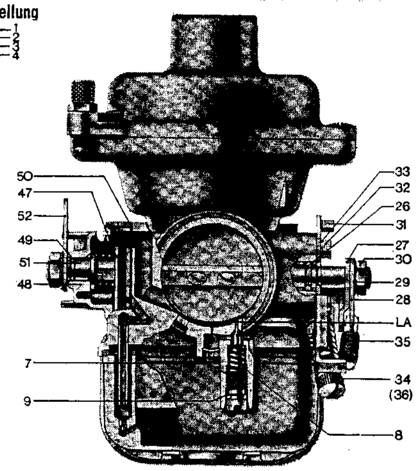
BING Constant Depression Carburettor Type 94 ®

BING Constant Depression Carburettor type 94 comprises a cross-draught, butterfly-valve carburettor with variable **choke tube,** double-float arranged centrally below the carburettor venturi and a rotary-valve type starting carburettor. It features a throttle slide which is suspended from a roller diaphragm and projects into the venturi. It changes the smallest cross-section ("choke tube") of the venturi as a function of the vacuum at this point.
The **throttle valve** diameter is **42 or 44 mm.**





MOUNTING

The carburettor is secured to the motor using a **52 mm push-on connection** which takes a flexible connecting piece with clamps. On the intake side the carburettor is provided with a **socket** having a diameter **of 55 mm** and a length of 12 mm for connecting an air filter or intake silencer.

FUEL INTAKE CONTROL

The **float (40)** of the carburettor consists of two plastic float elements joined by a metal hinge. The float is arranged centrally below the carburettor choke tube so that the carburettor can be tilted very far in all directions without impairing operation. The object of the float is to maintain the fuel level in the **float chamber (44)** constant. When the fuel has reached a specified level in the float chamber, then the **float (40)** mounted on **pin (41)** is lifted until the **float needle (42)** is pressed against the seat of the float needle valve, thus preventing any further supply of fuel. When the engine draws in fuel from the carburettor, the level in the float chamber (44) drops and so does the float. The float needle then opens the valve again and allows fuel to flow in from the tank.

The float needle valve regulates the fuel supply in conjunction with the float but it does not act as a stop valve when the engine is at a standstill. Minute foreign bodies may be deposited between the valve seat and the needle tip, thus preventing complete closure of the valve. When stopping the engine, therefore, the fuel cock on the tank should always be closed. In addition the fuel should be filtered before it reaches the carburettor. The filter should be selected so that foreign bodies greater than 0.1 mm are filtered out and the fuel supply is not impeded to too great an extent.

The float needle (42) contains a spring-loaded plunger which contacts the float hinge.

This absorbs vibrations of the float (40). In addition the float needle (42) is connected to the float hinge by the **retaining spring (43)** to prevent it from moving between float and valve seat and thus reducing the fuel supply. Spring and retaining guide make a considerable contribution towards keeping the fuel level in the float chamber constant.

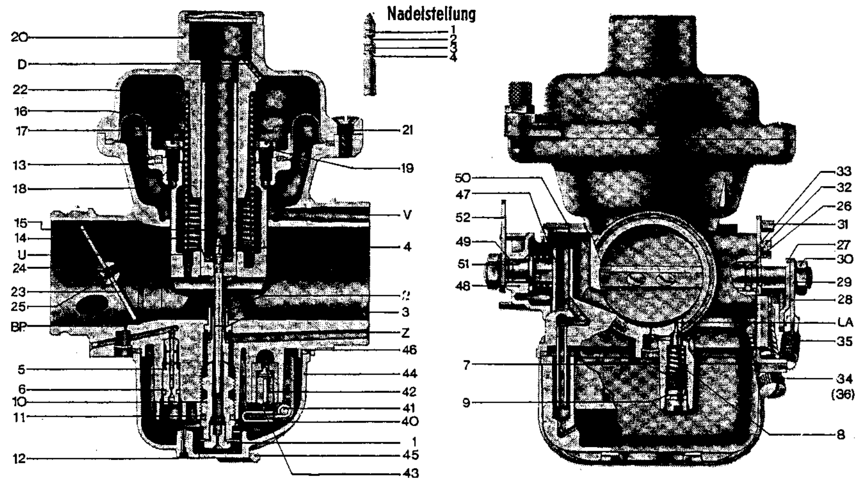
When fitting a new float, the fuel level must be adjusted. When doing this care must be taken to ensure that the fuel needle spring is not compressed by the float weight. It is therefore advisable to put the carburettor in a horizontal position until the float just contacts the float needle. In this position the pointer on the float hinge is set in such a way that the float top edges are parallel to the top edge of the float chamber.

The float chamber (44) is secured to the carburettor housing by a **spring yoke (45).** A **seal (46)** is provided between float chamber and carburettor housing. The space above the fuel level is connected to atmosphere by two ducts. When these ducts are blocked, an air cushion forms above the fuel level. The fuel will not lift the float sufficiently to close the needle valve and the carburettor overflows. The float chamber (44) incorporates an overflow pipe to allow fuel to drain off if the specified level in the float chamber is exceeded substantially due to a faulty needle valve.

MAIN REGULATING SYSTEM WITH PRESSURE REGULATOR

The amount of mixture drawn in by the engine and thus its performance is determined by the cross-sectional area in the choke tube which is opened up by the **throttle valve (23).** The throttle valve is secured to the **valve shaft (24)** by two **screws (25).** The end projecting from the carburettor housing carries the **throttle levers (27) and (28)** which are secured by the **nut (30)** and **washer (29)** to which the Bowden cable is attached which is used to operate the throttle shaft. The **sealing ring (26)** provides the seal between valve shaft and housing. The **retaining arm (31)** attached to the carburettor housing by means of **screws (32)** and **washers (33)** engages the notch in the valve shaft and thus prevents it from moving in axial direction. The **return spring (35)** whose action opposes the Bowden cable is attached between a bent-over tab at the lower end of the retaining arm and the **throttle lever (28).**

If the throttle valve (23) is opened while the engine is running, the increased air flow in the choke tube results in a vacuum building up at the outlet of the **needle jet (3)** which draws fuel from the float chamber through the jet system. At low speeds and in particular in the case of four-stroke engines, this vacuum is not sufficient for an adequate fuel supply; it must therefore be increased artificially by using a pressure regulator. For this purpose BING constant depression carburettor type 94 is provided with a plunger (13) operating in con-



junction with a **diaphragm (16)**; which reduces the cross-sectional area of the needle jet outlet by virtue of its own weight or, in some applications with the additional pressure from a **spring (22)**, and thus increases air velocity and vacuum at this point.

The **plunger (13)** is located centrally in the **cover (20)** which is secured to the carburettor housing by **screws (21)**. The diaphragm (16) is connected to the plunger (13) by a **retaining ring (17)** and **four screws (18)** and **washers (19)** each. The vacuum in the choke tube acts on the top of the diaphragm and the plunger via a **bore (U)** in the plunger (13) and attempts to lift the plunger against its own weight and spring (22). The considerably lower vacuum between air filter and carburettor is applied to the underside of the diaphragm via **duct (V)** as a reference pressure. If the throttle valve (23) is opened when the plunger (13) is closed, then a vacuum will build up in the small cross-section at the bottom of the plunger (13) which is sufficient to provide a supply of fuel. The weight of the plunger (13) and the force of the spring (22) are matched in such a way that this vacuum will be maintained with increasing speed until the plunger has fully opened the carburettor cross-section. From this point onwards the carburettor acts as a throttle valve carburettor with fixed choke tube. The vacuum increases with increasing speed.

The space in the cover (20) above the plunger guide is vented through **bore (D)**. Its diameter is designed in such a way that it acts as a restrictor for air flowing in and out and therefore acts as a vibration damper for the plunger.

On its way from the float chamber to the choke tube the fuel passes through the **main jet (1)**, the **jet carrier (10)** and the **needle jet (3)**; as it leaves the needle jet it is pre-mixed with air which is brought in from the air filter via an **air duct (Z)** and the **atomizer (2)** in an annular flow around the needle jet. This air flow assists the atomizing process to form minute fuel droplets and thus favourably affects the fuel distribution in the intake manifold and combustion in the engine.

The conical section of the **jet needle (4)** which is secured to the **plunger (13)** with the **retaining spring (14)** and the serrated washer (15) engages into the needle jet (3). Depending on the dimension of the flat cone at the end of the jet needle, the annular gap between jet needle and needle jet is enlarged or decreased and thus the fuel supply is throttled to a lesser or greater extent. The jet needle (4) can be located in the plunger (13) in four different positions which, similarly to the jet needle cone, affect the amount of fuel drawn in. For example "needle position 3" means that the jet needle has been suspended from the retaining spring (14) with the third notch from the top. To achieve the height adjustment the jet needle is turned through 90° and pushed up or down, the retaining spring engaging the next notch in the jet needle. If the needle is suspended higher up, this will result in a richer mixture and vice versa.

In short the main regulating system is set using main jets and needle jets of various diameters and also jet needles, plungers and pistons of various types.

Between main jet (1) and nozzle stock (10) a **washer(12)** is provided which, together with the float chamber, forms an annular gap. In particularly severe operating conditions this ensures that the fuel is not spun away from the main jet.

A **rubber ring (11)** seals the nozzle stock (10) off from the carburettor housing to avoid any fuel being drawn in via the thread and thus bypassing the main jet.

IDLING SYSTEM

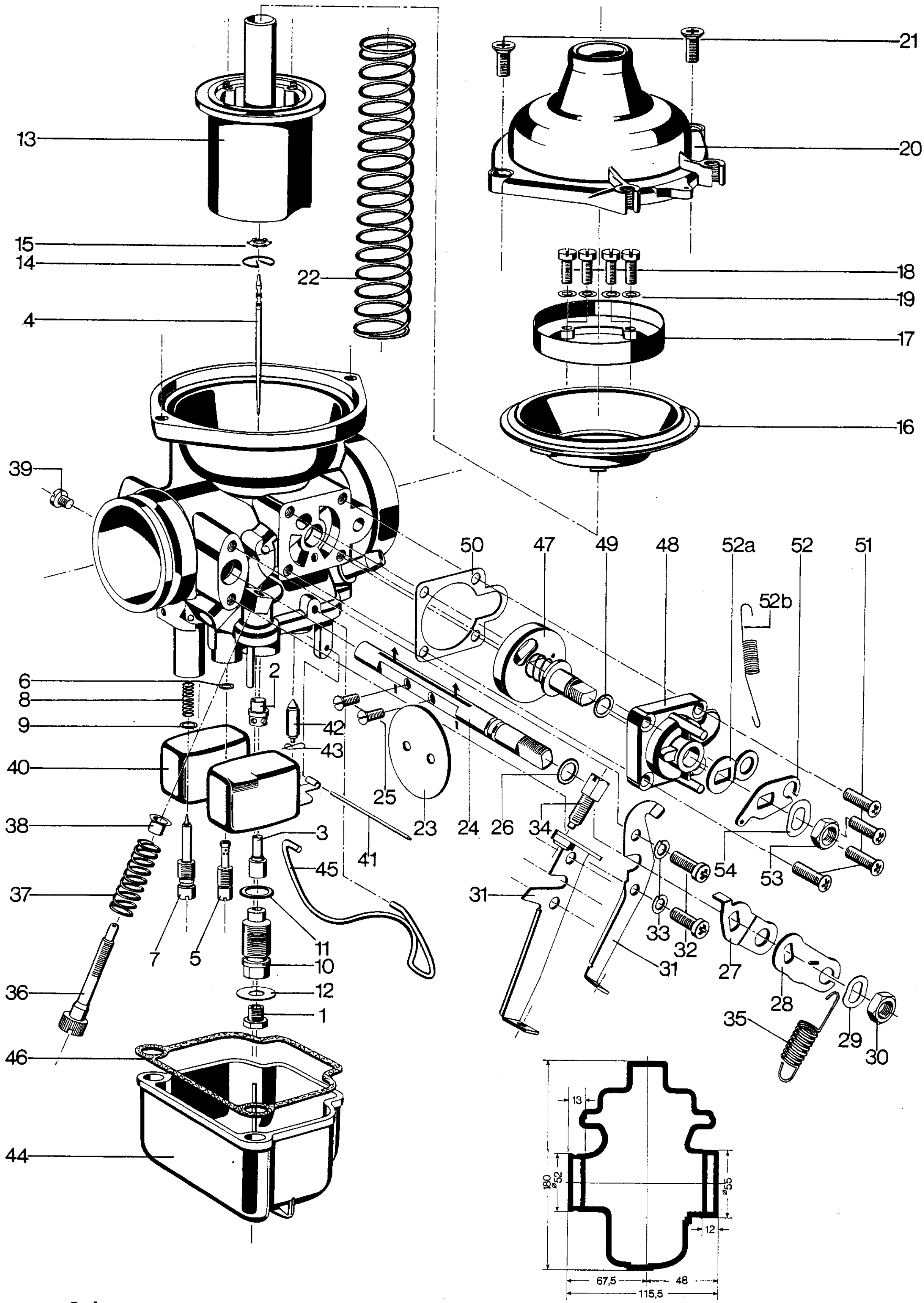
During idling and low-load running the throttle valve (23) is closed to such an extent that the air flow underneath plunger (13) no longer forms a sufficient vacuum. The fuel is then supplied via an auxiliary system, the idling system, which consists of the **idling jet (5)**, the **idling air jet (LLD)** – no spare part – and the **mixture control screw (7)** which is sealed off against the carburettor housing by the **rubber ring (9)** and secured by **spring (8)** to prevent it from becoming slack. The fuel passes through the idling jet (5) whose bore will determine the amount of fuel. Behind the jet bore the fuel mixes with air which is supplied via cross ducts in the jet throat from the idling air channel, the amount of air admitted being determined by the size of the idling air jet at the inlet of this duct. This initial mixture then flows through the **idling outlet bore (LA)**, the cross-sectional area of which can be adjusted by the mixture control screw (7); it then reaches the choke tube via **bypass** or **transition passages (BP)** where it is mixed further with pure air.

Idling should always be adjusted with the engine at operating temperature. First the mixture control screw (7) is turned fully clockwise and then backed off by the number of turns specified for the particular engine. Turning in clockwise direction results in a leaner mixture and turning in anti-clockwise direction in a richer mixture. The idling setting quoted serves as a guide only. The optimum will generally differ slightly. First select the desired idling speed by using the idling stop screw (34). When subsequently adjusting the mixture control screw – starting from the basic setting – a speed drop will be noticed in both directions. The optimum setting will generally be found half-way between the two settings at which this speed drop was noticed. To facilitate the idling setting on engines having several carburettors where it is important that they are evenly adjusted, it is possible to connect a pressure gauge (in the simplest case a "U-tube pressure gauge") to a nipple below the throttle valve shaft bearing point which is normally closed off by **screw (39)**. To select the idling speed, the idling stop screw (34) is in this case adjusted until the same vacuum is indicated for all carburettors. By slightly opening the throttle valve via a turning handle or the accelerator it is also possible to adjust Bowden cables or linkages evenly by making this vacuum comparison.

STARTING CARBURETTOR

BING constant depression carburettor is provided with a rotary valve starting carburettor as an aid for starting a cold engine using a Bowden cable. A disc (47) resting against the carburettor housing is turned via a shaft in the **starting carburettor housing (48)** so that the starting carburettor chamber into which air enters from the air filter side of the carburettor is connected to the engine side of the carburettor via a duct. The airport in the **disc (47)** is shaped in such a way that depending on the disc position, more or less air is drawn in. At the same time the disc opens the fuel system of the starting carburettor via bores matched to the disc position. The fuel flows from the float chamber through the starting jet into the vented starting chamber also contained in the float chamber (44) and from there through a riser where it is pre-mixed with air via transverse bores, into the starting carburettor. There it forms a particularly rich mixture with the air drawn in, and this mixture bypasses the main carburettor to flow into the intake manifold of the engine direct. During starting the throttle valve has to be closed to make sufficient vacuum available for the starting carburettor. When the engine is at a standstill and also during normal operation the fuel level in the float chamber compartment incorporating the riser will be the same as in the rest of the float chamber. When starting with opened-up starting carburettor, the fuel will initially be drawn in from this compartment which forms a very rich mixture. The fuel supplied subsequently will only be the amount allowed through by the starting jet. This ensures that, once the engine has started, it is not supplied with an excessively rich mixture and stalled. The starting carburettor is therefore matched to any given engine by modifying the starting jet and matching the space behind it.

The starting carburettor is secured to the carburettor housing by four **screws (51)** and protected against ingress of dirt and water by the **seal (50)** between the two. The starting shaft is also sealed against the starting carburettor housing by a **rubber ring (49)**.



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