BING CV CARBURETTORS - OPERATION, MAINTAINANCE, AND ADJUSTMENT

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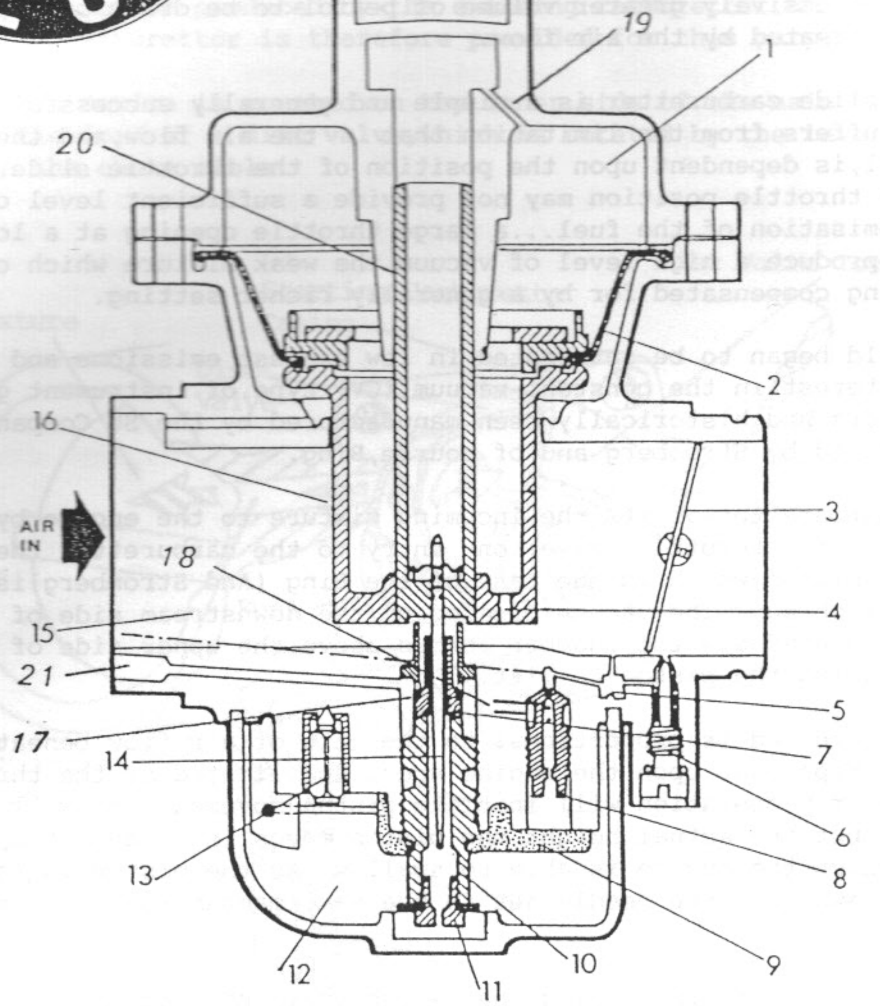


BING CV CARBURETTOR - MAIN COMPONENTS

1 Vacuum Chamber
2 Diaphragm
3 Throttle Butterfly
4 Vacuum Passages
5 Pick-Up Chamber
6 Idle Mixture Adjuster
7 Needle Jet
8 Pilot Jet
9 Float
10 Main Jet Holder
12 Float Chamber
13 Needle Valve
14 Needle
15 Throat
16 Piston
17 Mixing Chamber
18 Pilot Air Gallery
19 Orifice
20 Piston Guide Column
21 Main Air Gallery

(NB: Pilot Air Gallery partially obscured)

BASIC PRINCIPLE:

The basic purpose of the carburettor is to provide the engine with a supply of atomised petrol,metered in the correct proportion appropriate to the volume of air,the throttle position,and the engine temperature.

The traditional type of motorcycle carburettor was the slide type,in which operation of the twistgrip raised the throttle slide,so permitting an increased air flow into the engine; the slide carried a tapered needle,which was therefore retracted from the parallel bore of the needle jet,this action permitting a progressively greater volume of petrol to be drawn out by the vacuum which is created by the air flow.

While the slide carburetter is a simple and generally successful instrument,it suffers from the limitation that the air flow,and therefore the vacuum level,is dependent upon the position of the throttle slide. In other words,the throttle position may not provide a sufficient level of vacuum for optimum atomisation of the fuel...a large throttle opening at a low engine speed will not produce a high level of vacuum,the weak mixture which could be so produced being compensated for by a generally richer setting.

As the world began to be interested in low exhaust emissions and improved fuel economy,interest in the constant-vacuum (CV) type of instrument grew; these carburettors had historically been manufactured by the SU Company,and were later produced by Stromberg and,of course,Bing.

The C.V. carburettor admits the incoming mixture to the engine by means of a simple butterfly throttle valve; on entry to the carburettor the air is drawn beneath a piston,which in the case of the Bing (And Stromberg)is attached to a diaphragm. The vacuum created on the downstream side of the piston is used to evacuate the chamber formed above the upper side of the diaphragm,so causing the piston to lift.

The vacuum created is proportional to the rate of air flow beneath the piston,which is dependant upon the engine speed,and limited by the throttle position...twistgrip operation will initiate piston movement,and will set its effective limit,but the actual height the piston moves is dependent upon the amount of air which the engine is able to swallow. As the piston is raised,the needle is withdrawn from the needle jet in the same manner as in the slide carburettor.

The actual vacuum in the Mixing Chamber,which is used to atomise the fuel,is maintained at a constant level throughout the operating range...hence the name. The air velocity which produces this vacuum is also constant...they are therefore also known as Constant Velocity carburettors.

Fuel is therefore metered in proportion to the amount of air being drawn into the engine,as,even if the throttle is held fully open while climbing a steep hill in top gear,the inlet air velocity will be maintained at the optimum level for atomisation by virtue of the variable throat area below the piston.

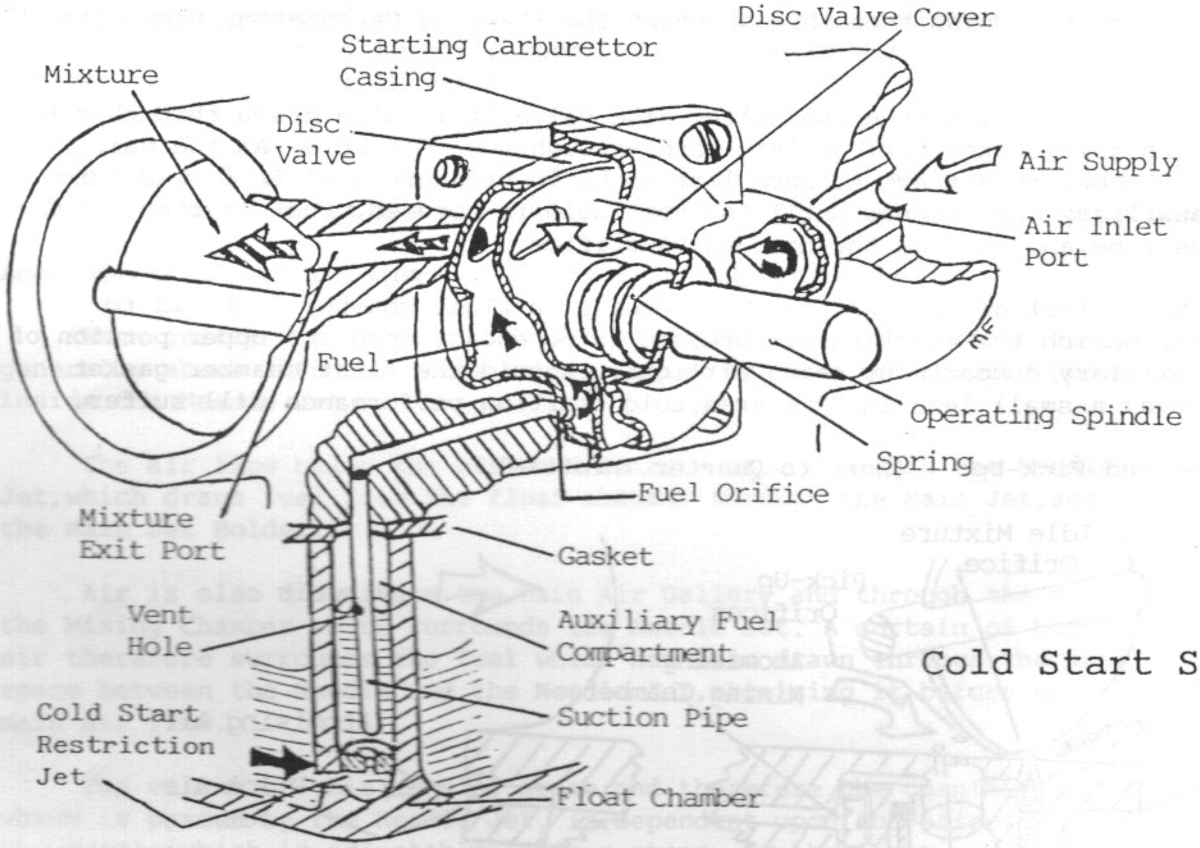
OPERATION

Things are not quite as simple as they appear,due to the requirement to provide efficient mixture control over all phases of engine operation,from cold starting and idling,through pick-up,accelleration and cruising,to full power:

Cold Starting:

The substantially enriched mixture which is necessary to start a cold engine cannot be produced by the existing carburettor,and an auxiliary Starting Carburettor is therefore provided for this purpose.

This device is mounted on the inner side of the main carburettor,and takes the form of a disc valve,which is rotated by the lever attached to the end of the choke cable.



Cold Start System

Rotation of the engine draws air into the Starting Carburettor,and through the exit port of the hollow disc valve. As it passes through,a vacuum is produced within the disc,which draws petrol from the float chamber via the orifices in the inner section of the disc. The atomised fuel therefore mixes with the air,and is drawn into the cylinder.

Early carburettors,such as are found on pre-1979 machines,have a single orifice,while the later types have four,of increasing bore.

As the Starting Carburettor is connected in parallel with the Main Unit, it is essential that the throttle be closed for at least the initial rotation of the engine, otherwise the disc valve will be bypassed by the greater flow through the Main Choke.

Fuel is admitted to the disc valve jet orifices from an auxiliary compartment at the inner side of the float chamber. Fuel enters this compartment via a small jet in its base, which limits the amount of fuel which may be supplied to the cold start system after the level within the Auxiliary Compartment has fallen; The cold starting mixture is thereby weakened after the engine has started and been run for a short period.

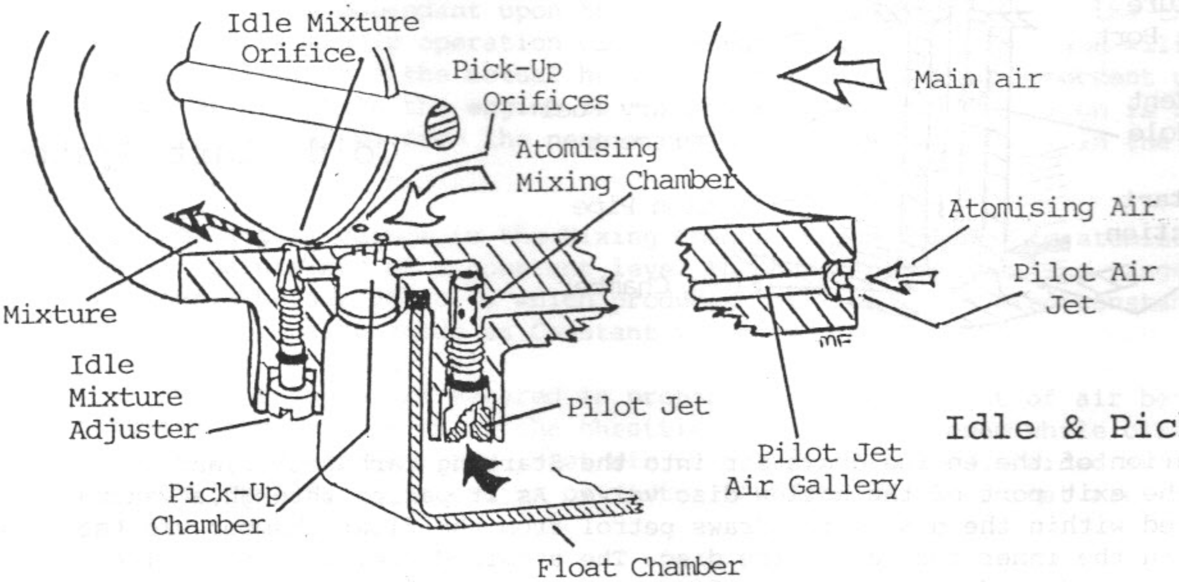
This ability to provide an extremely rich cold starting mixture can sometimes be too much of a good thing...this is why, in moderately cold conditions, it is helpful to slightly open the throttle if the engine has not fired after the initial rotation.

A little known facet of cold starting operation is that the level within the auxiliary compartment is raised, due to the presence of a tiny vent hole in the side of the brass tube through which the Starting Carburettor draws its fuel.

As air is drawn from the hollow disc valve, it is also drawn through the open jet orifice, the fuel gallery, and through the vent hole. As the main float chamber is subject to normal atmospheric pressure, fuel is forced into the auxiliary compartment, until the vent hole is covered. Fuel is then drawn up the tube, and through the disc valve orifice.

The effect of this artificial increase in float chamber level is to further enrich the starting mixture, and is dependant upon the upper portion of the auxiliary compartment being airtight...should the float chamber gasket have even a small leak in this area, cold starting performance will suffer.

Idling and Pick-Up: (Zero to Quarter Throttle)



Idle & Pick-Up System

As the engine rotates, a vacuum is formed behind the closed throttle; this draws fuel from the float chamber and through the Pilot Jet, and into the atomisation chamber formed in the upper portion of the jet body, where it is mixed with air drawn through the Pilot Air Gallery from the Pilot Air Jet at the rear end of the instrument.

The resultant mixture is passed into the idle mixture passage, from which a proportion is controlled by the Idle Mixture Adjuster,and emerges into the

The Pilot Jet also feeds directly into a small chamber,which opens into the throat via two orifices,just upstream from the throttle butterfly,when it is in the closed position.

The chamber holds a reserve of mixture,which is drawn out by the air flow below the throttle when it is initially opened; this permits a smooth transfer from the idle phase to the Needle Jet during pick-up.

Should one or both of these orifices become blocked,pick-up will suffer;the chamber is sealed,but a thin wire -ie a Primus jet pricker- may be used to clear them.

As both the idle and pick-up orifices are brought into operation by inlet vacuum,it is necessary that the idle mixture volume be reduced to the minimum possible,or gross enrichment will be felt as general roughness when running at up to 4000 rpm on tiny throttle openings. For the same reason,avoid cruising at less than a quarter throttle,below which the pick-up system will be brought into operation.

Pilot Jets are generally available in two sizes - 45 and 50cc flow rates. With the exceptions of the R75,80,and 100/7 the 45cc size is in common use.

Acceleration and Cruising: (Quarter to Half Throttle)

When sufficient vacuum is developed for the piston to begin to lift - generally about 2000 rpm - the needle is raised from its lowered position inside the Needle Jet.

The air flow below the piston creates a vacuum within the Needle Jet,which draws fuel from the float chamber through the Main Jet,and through the Main Jet Holder.

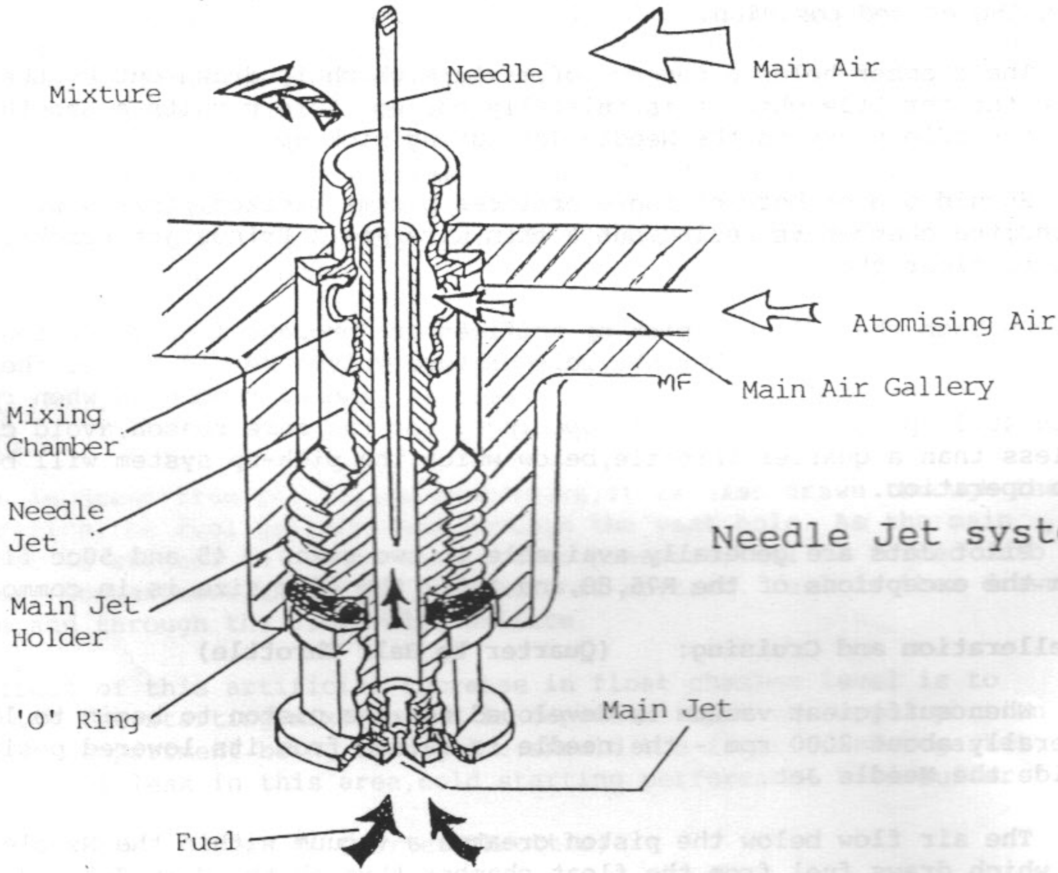
Air is also drawn from the Main Air Gallery and through the orifices in the Mixing Chamber which surrounds the Needle Jet. A curtain of high velocity air therefore surrounds the fuel which has been drawn through the annular space between the Needle and the Needle Jet,atomising it before entry into the main air flow.

The volume of this annular space,and therefore the quantity of mixture which is passed by the Needle Jet, is dependant upon the effective length of the Needle,which is adjustable in four steps. As the lower portion of the Needle is tapered,the mixture strength will be richened as the Needle is raised.

Should the Needle be adjusted to its lowest position,a greater amount of piston lift will be required before the tapered portion begins to emerge from the Needle Jet; the mixture will therefore be weaker than if the Needle were in a higher position.

When the throttle is suddenly opened,the inertia of the piston resists the rapid movement required by the suddenly increased inlet vacuum; during the short period before this correcting movement takes place,the increased vacuum level draws additional mixture from the Needle Jet,so providing the temporarily enriched mixture required for rapid accelleration.

Under more gentle use of the throttle,the piston will follow the air flow rate more closely,and the mixture will be maintained at a weaker level to provide good part-throttle economy.



Needle Jet system

Should the Needle position produce too rich a mixture,the effect will be noted over a wide range of engine speed and load conditions as a general roughness,while a weak mixture will be obvious in terms of hesitation and misfiring on load.

Lifting of the Piston is opposed by the Piston Spring,which surrounds the Column,inside the Upper Chamber. Early CV carburettors,such as are found on the /5 and/6 series,are not fitted with these springs,and therefore run slightly richer.

Needles are available in two different tapers and lengths,to suit the requirements of the basic carburettor size; the 26,28,and 32 mm sizes employ a standard type,while a special item is produced for the 40mm unit.

The overall mixture strength over this area of operation is therefore controlled by a combination of the Needle and the Needle Jet,but the position of the Needle is the predominant factor,unless a Needle Jet of incorrect size has been fitted.

Cruise: **(Half to Three-Quarter Throttle)**

As the throttle continues to be opened,the piston will continue to lift (Assuming that the engine can respond) to increase the annular space around the Needle,so maintaining the mixture strength as the volume of air being drawn into the engine increases. Mixture control is therefore still dependant on the combined effect of the Needle and Needle Jet.

In this area of throttle opening,however,the range of needle adjustment is a relativly small proportion of the total piston travel,and any change of mixture strength must therefore be made by changing the size of the Needle Jet,which is available in several sizes,from 2.64 to 2.73mm bore.

Full Power **(Three-Quarter to Full Throttle)**

Assuming that the engine will swallow sufficient air to lift the piston to its maximum,the only restriction on the rate of fuel flow between the Needle Jet and Needle is the size of the Main Jet.

Main Jets are classified by their flow rate,and are available in many sizes,from the 98cc type used in the 27 hp R45 to the 170 found in the early R100S and RS models. Certain sizes,such as 155,are listed by Bing,but are not available as BMW spares,as they have not been fitted as standard equipment.

Float Chamber Mechanism:

In order that the above processes may operate time and again with great reliability it is essential that the level of fuel in the Float Chamber be maintained,irrespective of the amount remaining in the petrol tank or the rate at which it is being passed through the carburettor.

As fuel flows into the Float Chamber the Float Unit is lifted. This unit consists of a pair of solid plastic floats,mounted on a metal bridge piece.

The bridge is pivoted,at the rear of the carburettor,on a steel pin. Upward movement of the Float Unit lifts the Needle Valve via a spring-loaded pin.

When the Needle Valve is lifted to its limit - against the Valve Seat - the rate of fuel flow is reduced,but does not stop until sufficient extra fuel has been admitted to hold the Needle firmly against its seat.

As this additional fuel is unable to lift the Needle any further it merely lifts the pin,and in so doing compresses its spring. The pressure required to compress the spring ensures a clean shut-off of the valve,and prevents fuel dribbling into the float chamber.

The secondary role of this spring is to provide a small amount of movement for the float to fall through, as the fuel level falls,before the valve is opened and more fuel is admitted to restore the level. This differential prevents the valve from constantly 'hunting' which would cause it to be influenced by small float movements such as are induced by vibration,banking,or cornering with a sidecar attached.

The pin is attached to the float bridge by a thin wire stirrup,the purpose of which is to provide a mechanical linkage between the Float Unit and the Needle Valve,to ensure that,should the valve be stuck in the closed position,the Float Chamber level would not fall too low. Under such circumstances the stirrup would pull the Needle Valve off its seating by the weight of the Float Unit.

The Needle Valve and its seating are of brass,but the tip of the Needle Valve is made of a semi-resilient hard rubber compound,which should not suffer from the rapid wear which affects similar items in the older SU carburettors.

Two types of float assembly have been used-the standard 13 gramme type,and the 10 gramme type employed in the R75/5 carburettor. This lighter float assembly (With brass floats) was also fitted to the slide-type carburettors.

MAINTAINANCE

As with any other mechanism,the carburettor deteriorates with use,and benefits from routine maintainance and replacement of parts.

The Diaphragm:

There are two sizes of diaphragm - small and large. The smaller item is used for the 24,28,and 32 mm carburettors,while the larger is reserved for the 40mm type only.

Diaphragms have been known to deteriorate,either by developing pinholes,or by transforming into something resembling black chewing gum,but are generally very long lived.

In either case,the inlet vacuum will simply draw air from the Upper Chamber without lifting the piston,until the rate of flow is sufficient to promote lift without assistance from the vacuum. Throttle response in such cases is erratic,and mixture very weak at low speeds.

The diaphragm itself is available from most motor factors for very modest cost as a spare part for the Stromberg CD (Constant Depression) series- the smaller type being from the CD150,and the larger the CD175.

Some unsuitable variations exist,in the form of diaphragms with thick edges,which also lack the locating tabs of the usual type. These can,however,be used if necessary,but are difficult to fit.

The diaphragm is clamped against the top of the piston by a plate,which is secured by four screws;replacement is therefore self-explanatory.

Certain types of carburettor,such as those fitted to the early R80/7,R45 and R65,employ a piston assembly which is guided by the carburettor body,no column being fitted. These carburettors are readily identified by their flat topped vacuum chambers,which contain a standard diaphragm,clamped against the piston by means of a nylon ring. This ring fits over a spigot on the piston crown,which is swaged over the edge of the ring.

BMW claim that these diaphragms cannot be replaced,and that it is therefore necessary to purchase a complete piston and diaphragm assembly. It is,however,not too difficult to bend back the swaged edge to permit the removal of the ring to replace the diaphragm,after which the process is reversed...rather like the once-popular procedure for opening speedometers prior to winding back the mileage recorder!

It is necessary to take care not to break the nylon ring as it is pulled over the de-swaged edge,or when it is replaced.

Needle and Needle Jet:

The carburettor is subjected to a considerable amount of vibration,caused by the air flow being suddenly halted as the inlet valve closes. This can generate a substantial amount of wear between the Needle and Needle Jet.

On the older carburettors - where the Needle is mounted in a spring clip - this vibration causes the Needle to oscillate within the Needle Jet,promoting wear over the surfaces of both components,and therefore richening the mixture. Even a slightly polished Needle is evidence of wear,which will be reflected by polishing inside the top of the Needle Jet. Replacement of both components should be made at approximately 35000 mile intervals,which will soon pay for itself in terms of lower fuel consumption,not to mention a smoother,more responsive engine.

Do not be tempted to attempt Needle Jet replacement without removing the carburettor - the Needle Jet will not seat squarely onto the Mixing Chamber unless the carburettor is inverted. Any attempt to tighten the Main Jet Holder will therefore damage these components,and probably also the carburettor body. Should the needle be in position during such an attempt,it will invariably be bent before it becomes obvious that something is wrong.

On the later carburettors-eg: from the advent of the Monolever-the Needle Groove carries a flat circlip,which is forced against the base of the column by a screwed plug. The Needle is therefore locked in position,and its movement within the Needle Jet is limited.

Needles for these later carburettors are manufactured of brass,and are the only spares now available from BMW. The use of two components made from the same material does not produce a good bearing pair,and an increased rate of wear is generally experienced when using a later needle in an early carburettor. Needles for the early carburettors-manufactured in steel-are still available from suppliers such as Moto-Bins.

'O' Rings:

When overhauling the carburettor,always replace the 'O' rings around the Pilot Jet,Idle Mixture Adjuster,and Main Jet Holder,and lubricate the new rings with grease before assembly.

Starting Carburettor:

The paper gasket between the Starting Carburettor and the Main Unit invariably becomes distorted,so promoting an air leak which will bypass the throttle. This is manifested as a tendancy for the engine to 'surge' at tiny throttle openings on light load- about 30/40 mph in top gear.

The root cause of this distortion is that the Starting Carburettor securing screws become loose,or even fall out - they should be loctited into position,and fully tightened-check these every 10000 miles or so,and replace the gasket if necessary.

The countersunk screws securing the upper portion of the Vacuum Chamber (The dome) and the Starting Carburettor tend to sieze,even if the threads have been greased on assembly. The siezure invariably is of the countersunk head itself,which is too soft to accept much increased screwdriver effort without destruction of the Philips-type drive slots. If warming the adjacent metal does not permit removal,the head is easy to drill out,but care should be taken not to remove too much metal.

An alternative to drilling,which usually works, is to heat the adjacent metal,and force a Posidrive (Cross-point screwdriver with blue handle) into the Philips slots with a hammer - the screw head is soft enough to allow the Posidrive to cut its way in,and it will not slip out. Strike the screwdriver handle as you twist it.

The real answer is to replace these screws with stainless steel items,using countersunk socket screws for the Vacuum Chamber Cover. Apply anti-seize grease to the back of the heads.

Float Mechanism:

The Float Needle Valve does not suffer from wear to any appreciable extent,but replacement,if necessary,is straightforward. The brass seating can be replaced by heating the surrounding metal,but can be recut in place with a suitable tool.

Most cases of persistant flooding are actually due to the presence of debris from deteriorated fuel pipes sticking to the rubber head of the Needle Valve,and may be cured by removing the Float Chamber to flush out the pipes. Replacement of the fuel pipes generally effects a cure.

Adjustment of the fuel level in the Float Chamber may be made by carefully bending the float bridge piece tab, upon which the Needle Valve pin rests; the Float Bridge should lie parallel to the Float chamber joint face when the float is lowered sufficiently for the fuel to begin flowing from the needle valve.

The float chamber gasket deteriorates with age,and should generally be replaced every five years or so,to prevent the formation of air leaks around the AuxiliaryFuel Compartment.

Atomising Air Galleries:

Over a long period a considerable amount of sludge is ejected from the crankcase breather into the carburettor intake elbows; this accumulates at the lower ends of the elbows,and is drawn into the Pilot and Main Jet Air Galleries.

The first result of this accumulation is that the Pilot Air Jet is blocked,so cutting off the air supply to the mixing chamber at the top of the Pilot Jet. Fuel passing through the Pilot Jet is therefore not atomised,producing a richer mixture,which will not be atomised until it emerges into the throat of the carburettor.

Sludge is also drawn down the Main Air Gallery,and eventually blocks the holes in the Mixing Chamber around the Needle Jet,with similar results for fuel atomisation.In extreme cases the entire chamber surrounding the Mixing Chamber may become totally blocked.

In general,it is reccommended that the inlet elbows be removed every six months,and any accumulation of sludge removed. If your engine burns oil at a high rate,or you use the machine for short journeys -which produce more moisture in the crankcase - clean them more regularly.

WARNING

Remember that it is easy to damage the carburettor-do not force anything! Also remember that petrol-particularly Lead Free-is not only inflamable,but is also bad for your health. White Spirit is preferable as a cleaning medium.

ADJUSTMENT

If the carburettors are to be correctly adjusted it is essential that they be in good condition,otherwise the effort involved may well be wasted in a futile attempt to cure basic problems such as wear,air leaks, and blockages by adjustment.

Given that the carburettors are in good condition,ensure that the engine is really hot - say after a 20 mile ride - that the float chambers are free of water,and the starting carburettors are in the "Off" position (Their levers should be in the lower position.)

Check that the throttle return springs are in good condition,and that the throttle spindles are well lubricated. If the throttles do not always fully close it may be necessary to bend the lower spring anchor to provide a little more pressure on the throttle arm.

The use of a metal extension between the spark plug and the cap is very useful - DO NOT remove the plug caps when the engine is running...it will damage the coils,and possibly yourself!

The use of vacuum guages is not absolutely essential - it is possible to obtain a smooth engine without their use,and the R75/5 carburettor is not,indeed,provided with a vacuum guage connection - but they do make the task easier,quicker,and far more accurate. The best type are the simple ones - tubes with one end in a reservoir of mercury,and the other connected to the vacuum take-off at the front of the carburettor. It is,of course,possible to manufacture your own,using water as the medium,but the length of the tubes will be greater.

Idle Adjustment:

1. Slack off the throttle cable adjusters to provide 2-3mm of play.

2. Adjust the Throttle Stop screws to obtain the required idle speed,and an equal level of vacuum (ie: Mercury) on each cylinder.

Remember that to raise the vacuum/mercury level for a given engine speed the throttle of that carburettor must be closed,and that this action will reduce the engine speed,so reducing the vacuum level on the other cylinder. The reverse will,of course,take place if the throttle is opened.

3. When the engine is idling at a reasonable speed and equal vacuum levels,progressivly weaken the Idle Mixture - by screwing the adjusters clockwise - until the cylinder begins to run roughly. Richen by turning the adjuster back a quarter of a turn.

4. The idle speed will probably have risen during this process - reduce to the required level.

5. Using a clean screwdriver,short circuit each spark plug extension to the cylinder head,and note the reduction in engine speed. Make small adjustments to the Idle Mixture until both cylinders are able to take the strain equally.

By shorting the spark plugs,we are comparing the power being developed by each cylinder - this is the product of the throttle opening and the mixture strength. As we know that the throttles are opened by identical amounts (ie the vacuum levels are identical) any difference must be caused by mixture.

It is therefore possible to have a very rough idle,with identical vacuum levels,if there is a large difference in mixture strength...the makers of vacuum guages never tell you!

Pick Up Adjustment:

6. Reduce the free play of the throttle cables to a minimum - about 1mm - and slowly open the throttles until movement of the mercury columns is observed.

7. Adjust the cables until both columns fall from the Idle level together, but return to the Idle level when the throttle is closed.

One column will probably rise before the other - the throttle of the 'lower'side is therefore further open than that of the 'higher' side.

At this point in the proceedings it maybe observed that one column rises and one falls - the 'falling' throttle is opening,and the 'rising' throttle is not opening.

8. Progressivly tighten the locknuts of the cable adjusters,and check the vacuum levels as you do so,making small adjustments as required. Vacuum levels should be within 0.5 of a centimetre or less.

9. Open the throttles slowly,and allow the engine to run to around 4000 rpm; observe the vacuum levels,which should be reasonably close. At this stage they are controlled by the movement of the Pistons - any gross difference is likely to be caused by defective diaphragms or air leaks into the Upper Chamber.

10. Any signs of intermittent variations in vacuum levels are usually caused by air leaks - likely sources are the rubber mounting tubes,or loose cylinder head adaptors. Leaks from either source are manifested as severe vibration when the throttles are closed at high speed,when the high vacuum levels produced will draw air through any imperfect joint.

MIXTURE ADJUSTMENT

Colourtune:

The BMW twin - at least in one litre form - has such a variable combustion characteristic that use of a Colourtune to set the mixture strength will actually result in an over rich idle mixture. It would appear that the mixture in the area of the spark plug is far weaker than in the rest of the combustion chamber,and does not represent the average conditions.

Needle Position:

In general, the BMW twin prefers to run as weak as possible, subject to performance levels not deteriorating. The benefits of using the No.2 (Next to lowest) Needle Position on the majority of engines with is now well proven (With the exception of the R80/7 and R100S & RS of 1978 vintage) in terms of power, smoothness, and economy. Even the current monolever R100RT will benefit. An American tester recorded an extra 3 bhp after similar changes to an R100GS with US-spec 32mm carburettors.

Needle Adjustment:

Adjustment of the Needle Position on the older type of carburettor is performed by pulling or pushing the Needle in the required direction, and simultaneously twisting it. The Needle grooves will then compress the wire circlip within the Column, and slide into the next position-or out of the Piston, if already at the end of its travel.

When adjusting the Needle position on these older types of carburettor it is essential that care is taken not to bend it, or damage the surface-hold it between FINGER AND THUMB only, and if necessary grip the Needle with a piece of fine abrasive paper (eg: 400 grade wet and dry) taking care to wipe the surface afterwards.

Tail Pipe Deposits:

A good guide to the overall mixture strength is the colour of the tail pipe deposit; a black, sooty deposit indicates an excessive richness, while whiteness shows an overweak mixture. When set correctly, the tail pipes should show a deposit which is medium grey at low speeds, and light grey at higher speeds. these deposits will take some little time to accumulate, unless the mixture strength is over rich; a long run, or a week of commuting will provide sufficient deposits to provide a good guide to the internal conditions.

Monolever R80 - Summary of Carburettor Types
(US Spec in Brackets)

Model Year	R80GS/ST 81-83	R80RT 81-83	R80GS/ST/RT 83-85	R80&RT 1985on
Carburettor Type -left -right	64/32/305 64/32/306	64/32/305 64/32/306	64/32/349 64/32/350	64/32/353 64/32/354
Barrel diameter	32	32	32	32
Main Jet	145 (150)	145	135 (132)	130
Needle Jet	2.68 (2.66)	2.66	2.68 (2.66)	2.68(2.66)
Jet needle number	46-241	46-241	46-242	46-242
Needle position	3 (4)	4 (3)	4 (3)	3
Idle jet	45 (40)	50 (40)	45	45

Summary of carburettor types

Model (5 & 6 Series)	R 50/5	R 60/5	R 75/5		R 60/6	R 75/6	R 90/6	R 90 S
Carburettor type – left – right	V 56 1/26/113 1/26/114	V 56 1/26/111 1/26/112	V 64/I 64/32/3 64/32/4	 /10 /9	V 56 1/26/111 1/26/112	V 64/I 64/32/9 64/32/10	V 64/I 64/32/11 64/32/12	Dellorto PHM 38 AS (BS) PHM 38 AD (BD)
Barrel diameter	26 mm	26 mm	32 mm		26 mm	32 mm	32 mm	38 mm
Main jet	135	140	140	135	135	135	150	155
Needle jet	2.68 with accel-erator pump	2.68	2.73	2.70	2.70 with accel-erator pump	2.70	2.68	2.60
Jet needle number	4	4	46-241		4	46-241	46-241	K 4
Needle position	3	2	2	3	2	3	1	3
Idle jet	35	40	45		40	45	45	60
Idle air jet	–	–	1.0 mm dia.		–	1.0	1.0	1.2
Idle air regulating screw: number of turns opened	0.5 – 1.0	0.5 – 1.0	–		1/4 – 1	–	–	–
Idle mixture regulating screw: number of turns opened	–	–	3/4 – 1 1/2		–	1/2 – 1	1	1 1/2
Bypass bore 1 2	0.8 mm dia.	0.8 mm dia.	0.7 mm dia.	1.0 mm dia.	0.8	1.0	0.7 0.65	1.4
Float valve	2.2 mm dia.	2.2 mm dia.	2.5 mm dia.		2.2	2.5	2.5	3.0
Weight of float	10 g	10 g	10 g	13 g	10 g	13 g	13 g	10 g

Summary of carburettor types

Model (7 Series 76–79)	R 60/7	R 75/7	R 100/7	R 100 S	R 100 RS
Carburettor type – left – right	V 56 1/26/123 1/26/124	V 64/I 64/32/13 64/32/14	V 64/I 64/32/19 64/32/20	V 94 94/40/103 94/40/104	V 94 94/40/105 94/40/106
Barrel diameter	26	32	32	40	40
Main jet	140	145	150	170	170
Needle jet	2,68 with accelerator pump	2,66	2,68	2,66	2,68
Jet needle number	4	46-241	46-241	46-341	46-341
Needle position	2	3	3	3	2
Idle jet	40	50	50	45	45
Idle air jet	–	Ø 1,0	Ø 1,0	Ø 1,0	Ø 1,0

Summary of carburettor types

Model (7 Series 79–80)	R 45 (20 kW)	R 45 (26 kW)	R 65	R 80/7	R 100 T	R 100 RT
Carburettor type – left – right	V 64/II 64/26/201 64/26/202	V 64/II 64/28/201 64/28/202	V 64/II 64/32/203 (0) 64/32/204 (0)	V 64/II 64/32/201 64/32/202	V 94 94/40/103 94/40/104	V 94 94/40/105 94/40/106
Barrel diameter	Ø 26	Ø 28	Ø 32	Ø 32	Ø 40	Ø 40
Main jet	118 (115)	123 (120)	140	145	170	170
Needle jet	2,66	2,66	2,66	2,66	2,66	2,68
Jet needle number	46-241	46-241	46-241	46-241	46-341	46-341
Needle position	2	2	3	3	3	2
Idle jet	45	45	45	50	45	45

Model (1981–83)	R 45 (20 kW)	R 45 (26 kW)	R 65	R 80 G/S	R 100/100 CS 100 RS/100 RT
Carburettor type – left – right	V 64/III 64/26/303 64/26/304	V 64/III 64/28/303 64/28/304	V 64/III 64/32/307 (0) 64/32/308 (0)	V 64/III 64/32/305 64/32/306	V 94 94/40/111 94/40/112
Barrel diameter	Ø 26	Ø 28	Ø 32	Ø 32	Ø 40
Main jet	98	105	145 (148)	145 (148)	160
Needle jet	2,66	2,66	2,64	2,64	2,66
Jet needle number	46-241	46-241	46-241	46-241	46-341
Needle position	2	2	4	4	3
Idle jet	45	45	45	45	45