



INSTALLATION INSTRUCTIONS

For Rivera Engineering's Dual 42mm Mikuni Carburetor kit



DUAL CARB INSTALLATION

SAFETY PROCEDURES

NOTES, CAUTIONS and WARNINGS

Instructions in this manual preceded by these words are very important.

NOTE

Means information that can make a job easier.

CAUTION

Means there is the possibility of damage to the vehicle.

WARNING

Means there is the possibility of personal injury to yourself or others.

Read the installation instructions thoroughly prior to the installation of this Rivera dual-carb kit. All procedures should be followed exactly as described in this manual, paying particular attention to the following:

WARNING

1. THIS TYPE OF CARBURETOR REQUIRES THE USE OF A PULL/PULL THROTTLE ASSEMBLY to assure positive closing of the throttle valve (slide). The high vacuum encountered, as well as dirt ingested into the carburetor when running without an air filter, may hinder the throttle valve from closing promptly.

2. On installation, the THROTTLE CABLES SHOULD BE ROUTED FREELY (WITHOUT SHARP BENDS) BETWEEN THE THROTTLE TWIST GRIP AND THE CARBURETOR. The throttle cables should not be pinched by the installed fuel tank, and they should not be pinched, pulled or restricted by the motorcycle body work and/or the front fork assembly when it is turned through the full range of motion.

3. GASOLINE IS EXTREMELY FLAMMABLE. GASOLINE VAPORS ARE EXPLOSIVE. Before attempting to install or service your Rivera dual-carbs, please follow these fire safety procedures:

- **Make sure your work area is well ventilated and free from any source of flame or sparks, i.e., appliances with pilot lights, such as water heaters, clothes dryers or space heaters, etc.**

- **Before removing the motorcycle fuel tank, be sure the fuel petcock is in the "OFF" position and the cross-over fuel line is well clamped. Clean up any fuel spills immediately.**

4. Never look directly into the bores of the carburetors while the engine is running as injury may result from backfires.

CAUTION

A moderate degree of mechanical skill is required to properly install this dual-carb kit. If after reading these instructions you have any doubts about your ability to correctly install it we recommend that you have a professional install it for you. If you install the kit yourself we recommend that you also use the applicable Shop Manual for your model motorcycle as a reference.

TYPICAL TOOLS REQUIRED

These are the tools typically required to remove the stock carburetor and install the Rivera dual-carb kit.

1. Allen wrenches, 1/8", 5/32", 1/4" & 5/16"
2. Standard wrenches, 1/2", 9/16"
3. Diagonal cutters (dykes)
5. Slotted and #2 Phillips screwdrivers
5. Blue Loctite or equivalent
6. T25 TORX, '96-'98 models only
7. Shop Manual (for your model)

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DISASSEMBLY

1. Disconnect the negative (-) battery terminal.
2. Turn the fuel petcock to the "OFF" position.
3. Remove the fuel tank from the motorcycle, or elevate the rear of the tank for better access to the intake manifold.
4. Completely remove the existing air cleaner assembly.
5. Disconnect the vacuum hoses and fuel hose from the carburetor.
6. Remove the carburetor assembly (and choke cable assembly) from the motorcycle. The throttle cable adjusters will need to be slackened to allow the cables to be disconnected from the carburetor. The Rivera dual-carb was designed to be operated with standard 1990 and later Harley-Davidson throttle cables.
7. Remove the intake manifold and clamps; these parts will not be reused.

INSTALLATION

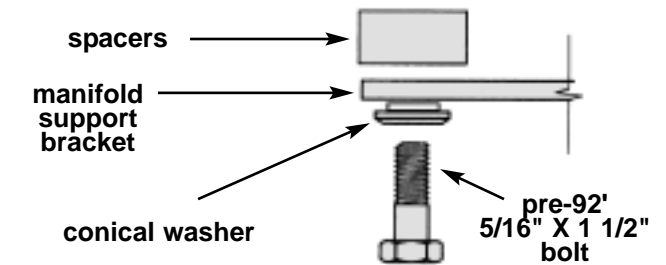
1. INTAKE MANIFOLD

A. Attach the Rivera dual-carb manifold using the enclosed flanges and seals. The rear cylinder flange is marked with "R" and the front with "F". Place the flanges and seals onto the manifold and loosely attach the manifold to the cylinder heads using the stock bolts.

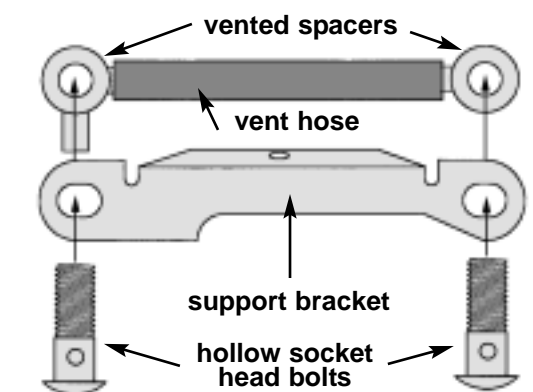
B. Attach the Rivera manifold support bracket to the cylinders in the appropriate method for your type engine:

Pre '92 engines use 2ea. 5/16" X 11/2" bolts, 2ea. conical washer, and 2ea. 1/2" long spacers with 5/16" holes from this kit.

'92 and later engines (with 1/2" mounting/breather holes) use 2ea. 1/2" hollow socket head bolts, and 2ea. 1/2" long vented spacers. Install the vented spacers as illustrated with the enclosed 5/16" ID hose.



SUPPORT BRACKET ATTACHMENT FOR PRE '92 MODELS



SUPPORT BRACKET ATTACHMENT FOR '92 AND LATER MODELS

C. Once you have determined the correct support bracket mounting for your model, attach the bracket loosely and secure the manifold to the support bracket with the enclosed 3/8" X 3/4" bolt, flat and lock washers.

NOTE

Center the intake manifold between the cylinder head and securely tighten the mounting hardware (i.e., manifold clamp bolts, support bracket bolts, and manifold bolt).

2. CARBURETOR INSTALLATION

A. Place the enclosed carburetor spigot seals onto the intake manifold spigots.

DUAL CARB INSTALLATION

NOTE

Before inserting the carburetors into the intake manifold, make certain that the choke cable is positioned pointing downward, between the carburetors and intake manifold.

B. Insert the carburetor spigots into the manifold spigot seals with a slight rocking motion.

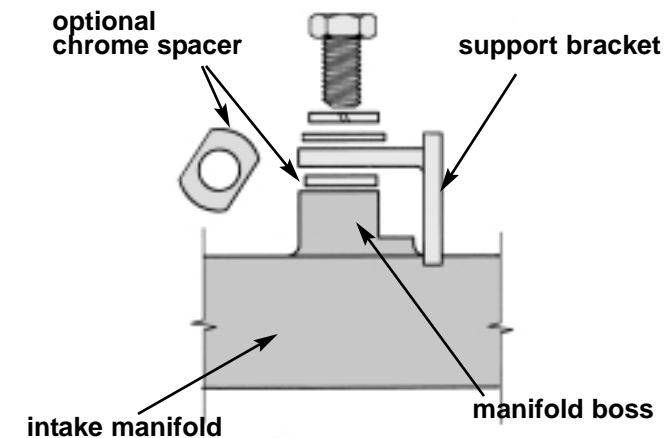
NOTE

Putting a small amount of grease on the spigot seals will ease installation.

D. Secure the carburetors to the manifold by inserting the 3/8" X 5 1/2" bolt with the 3/8" lock and flat washers through the mounting hole in the backing plate and threading it into the manifold. As the mounting nut is tightened, assure that the carburetors are sliding into the spigot seals smoothly and evenly; wiggle the carburetors by hand to help the process. Tighten the mounting bolt until the capped carburetor fitting (close to the mounting bolt) contacts the intake manifold. The mounting bolt threads should bottom at the same time.

CAUTION

On rubber mounted engines, check the clearance between the gas tank and the carburetors, there should be a minimum of 3/8" at the closest point. If the clearance is less than this amount, place the 1/8" thick chrome spacer, included in the kit, between the intake manifold boss and the support bracket to create more gas tank clearance.



Having less than 3/8" gas tank clearance may allow the carburetors to contact the gas tank as the engine moves during normal operation.

CAUTION

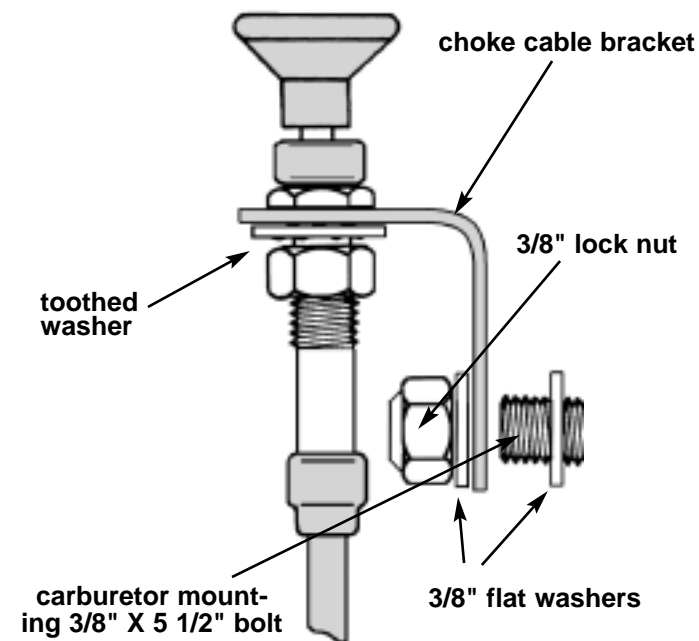
It is very important that the carburetor mounting bolt is not over-tightened to prevent damage to the seals.

3. CHOKE CABLE

A. Route the choke cable knob up through the triangular space in the manifold. If the carburetor mounting bolt blocks the hole too much, back it out until the knob fits through then re-tighten the mounting bolt.

B. The nut that secures the choke bracket to the manifold is also the jam-nut for the carburetor mounting bolt. Place the 3/8" flat washers onto the carburetor mounting bolt and thread on the locknut, leaving enough space to slide the choke bracket onto the bolt. Slide the bracket onto the mounting bolt and tighten the locknut.

C. Slide the knob into the cable bracket slot as in the illustration and tighten the jam nut.



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CHOKE CABLE INSTALLATION

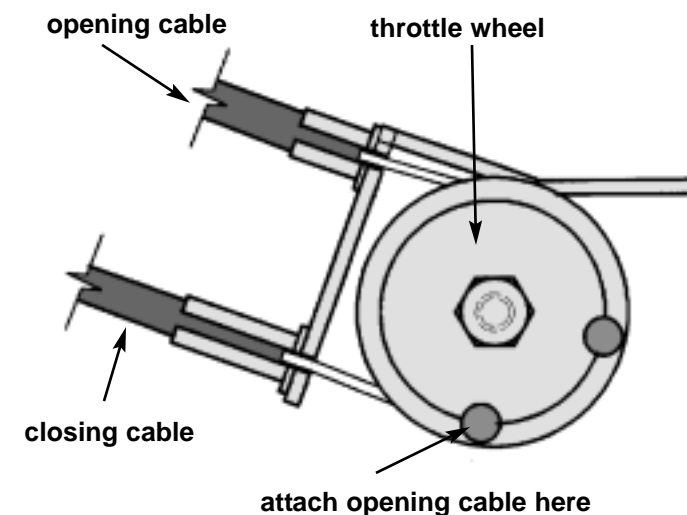
4. THROTTLE CABLES

CAUTION

The Rivera dual-carb kit was designed to use the stock 1990 and later throttle cables. Before attaching the throttle cables, assure that they are in good operating condition and well lubricated.

A. Check to assure that the throttle cable adjusters are completely backed-off. Insert the end of the opening cable into the throttle wheel in the position indicated; do-not insert the cable housing into the cable bracket at this time. Insert the end of the closing cable in the remaining throttle wheel hole (hold the opening cable out of the way as necessary) and insert the cable housing into the cable bracket.

B. Insert the opening cable housing into the cable bracket. The cables overlap in the throttle wheel between the two holes but do-not rub against each other during operation.

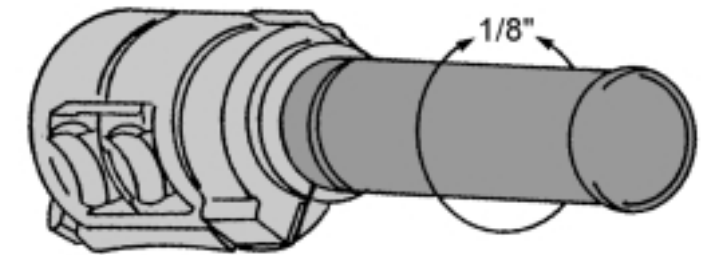


ATTACHING THE THROTTLE CABLES

C. Check the throttle for smooth operation. Open the throttle to the full open position and look into the bore of the carburetors to verify that the throttle valves are fully raised

out of the bores. If they are not, adjust the opening throttle cable until the throttle valves clear the bores.

D. Adjust the throttle "free-play" to approximately 1/8" as indicated by using the closing throttle cable adjuster to remove excess cable play.



ADJUSTING THROTTLE FREE-PLAY

4. HOSES

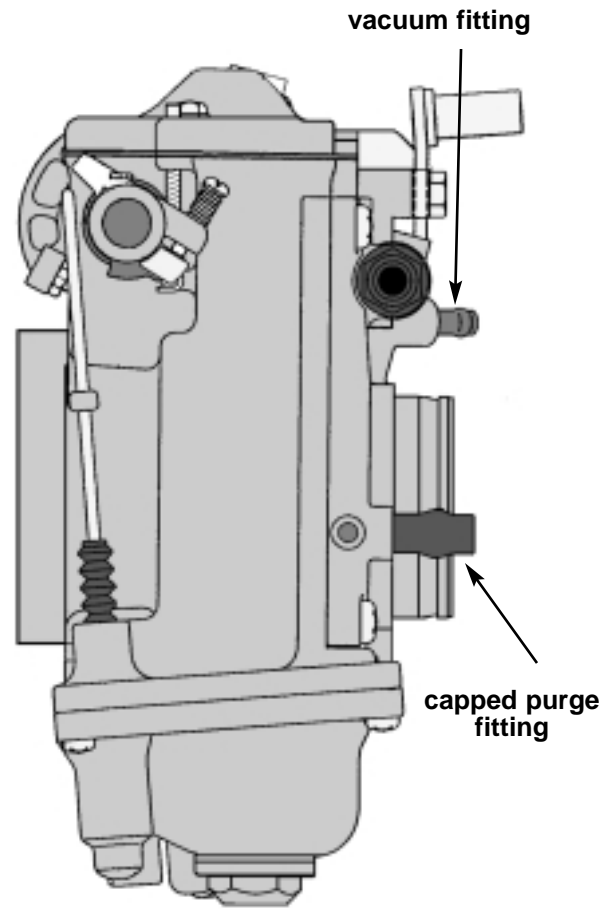
A. FUEL HOSE - Connect the enclosed fuel hose to the petcock and secure it with an enclosed hose clamp. Route the fuel line between the cylinders, below the intake manifold. Cut off any excess hose before attaching it to the carburetors. Secure the hose with the remaining enclosed clamp.

B. V.O.E.S - As required, attach the vacuum hose for the V.O.E.S. to the vacuum fitting on the closest carburetor (after removing the cap). If required, a longer piece of 3/16" vacuum hose is included in the kit.

C. VENT HOSE '92 AND LATER- Connect the remaining fuel hose to the open fitting on the vented space and secure with a hose clamp. Route the hose down between the engines and transmission. Cut the hose off flush with the bottom of the engine.

D. CARBURETOR DRAIN HOSES - Route the two carburetor drain hoses along the front push rod tube and in front of the crankcase. Secure them as necessary with cable ties from the kit.

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E. PURGE FITTINGS - These are installed in both carburetors and factory capped (as illustrated above). To connect your evaporative emission system to the dual-carbs, remove a cap from one of the carburetors and connect the purge hose to one of the carburetor fittings. If a longer purge hose is required, use the remaining piece of vacuum hose. Use an enclosed small cable tie to secure the hose.

5. AIR CLEANER ASSEMBLY

A. Assemble the air cleaner by placing the filter into the groove in the carburetor backing plate and secure it in place with the air cleaner cover and screws.

CAUTION

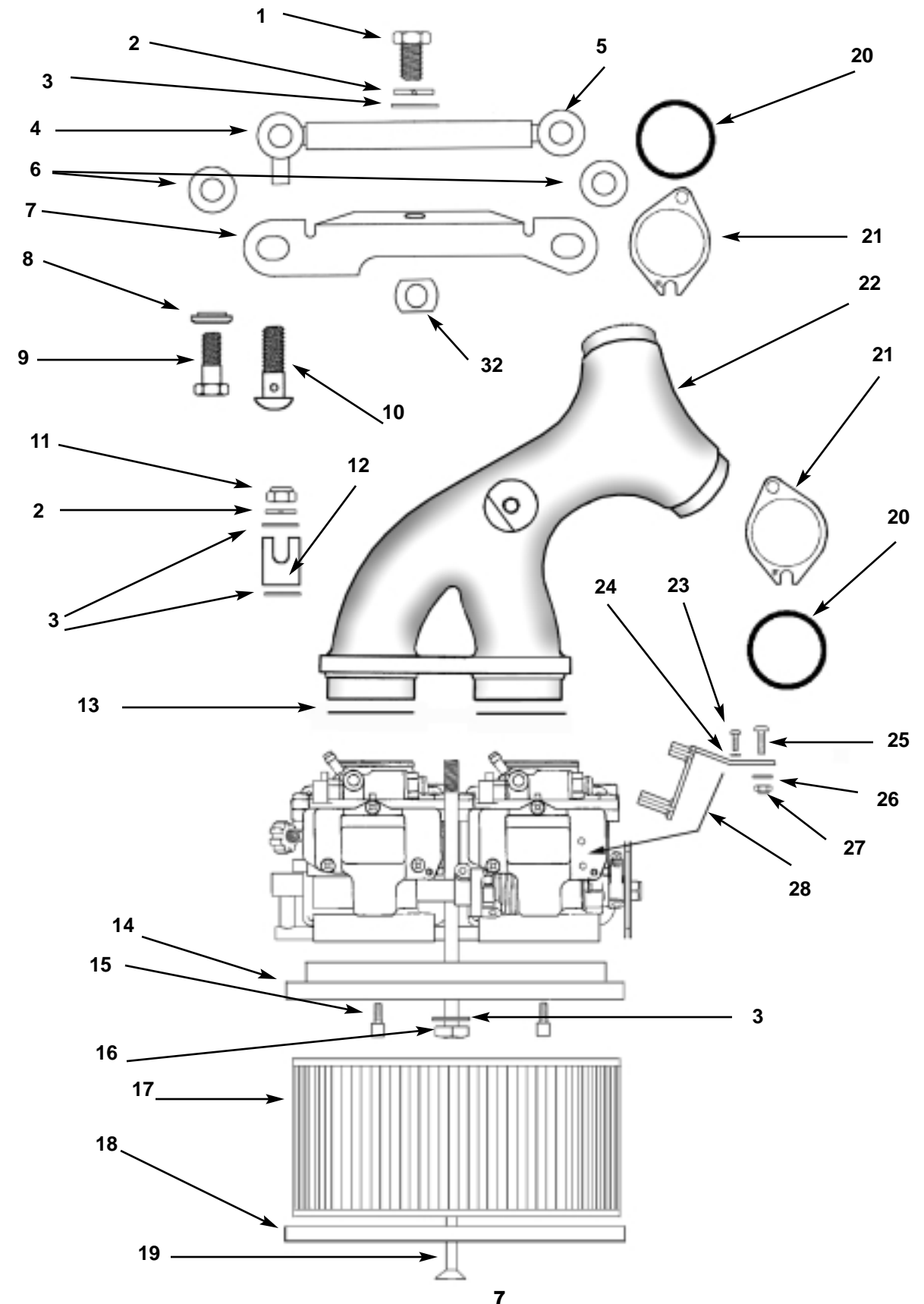
USE BLUE LOCTITE ON THE AIR CLEANER SCREWS TO KEEP THEM FROM VIBRATING LOOSE.

KIT PARTS LIST

Item	Part no	Description	Qty
1	RIV-014	Bolt	1
2	RIV-016	Lockwasher	2
3	RIV-015	Flatwasher	3
4	RIV-009A	Breather	1
5	RIV-009	Breather	1
6	RIV-010	Spacer	2
7	RIV-006	Support bracket	1
8	SM-013	Stepped washer	2
9	SM-19	5/16" Bolt	2
10	SM-010	1/2" Hollow bolt	2
11	RIV-023	3/8" Locknut	1
12	RIV-005	Choke bracket	1
13	RIV-022	O-rings	2
14	ME-0005	A/C base	1
15	ME-0012	Socket screw	2
16	ME-0013	3/8" Bolt X 5.5"	1
17	RIV-012	Air filter	1
18	ME-0006	A/C cover	1
19	RIV-013	A/C screw	2
20	RE-90-R	Seal set	1
21	RE-90-F	Clamp set	1
22A	RIV-011	Cast manifold	1
22B	RIV-011-P	Polished manifold	1
22C	RIV-011-C	Chrome manifold	1
23	ME-0014	4mm screw	1
24	ME-0015	4mm washer	1
25	ME-0016	5mm screw	1
26	ME-0017	5mm washer	1
27	ME-0018	5mm locknut	1
28	RIV-004	Cable bracket	1
29	RIV-017	Fuel/breather hose 24"	2
30	RIV-018	Hose clamp	2
31	RIV-021	Cable tie	4
32	RIV-024	Spacer	1

Note: 29, 30, & 31 not shown

DUAL CARB INSTALLATION

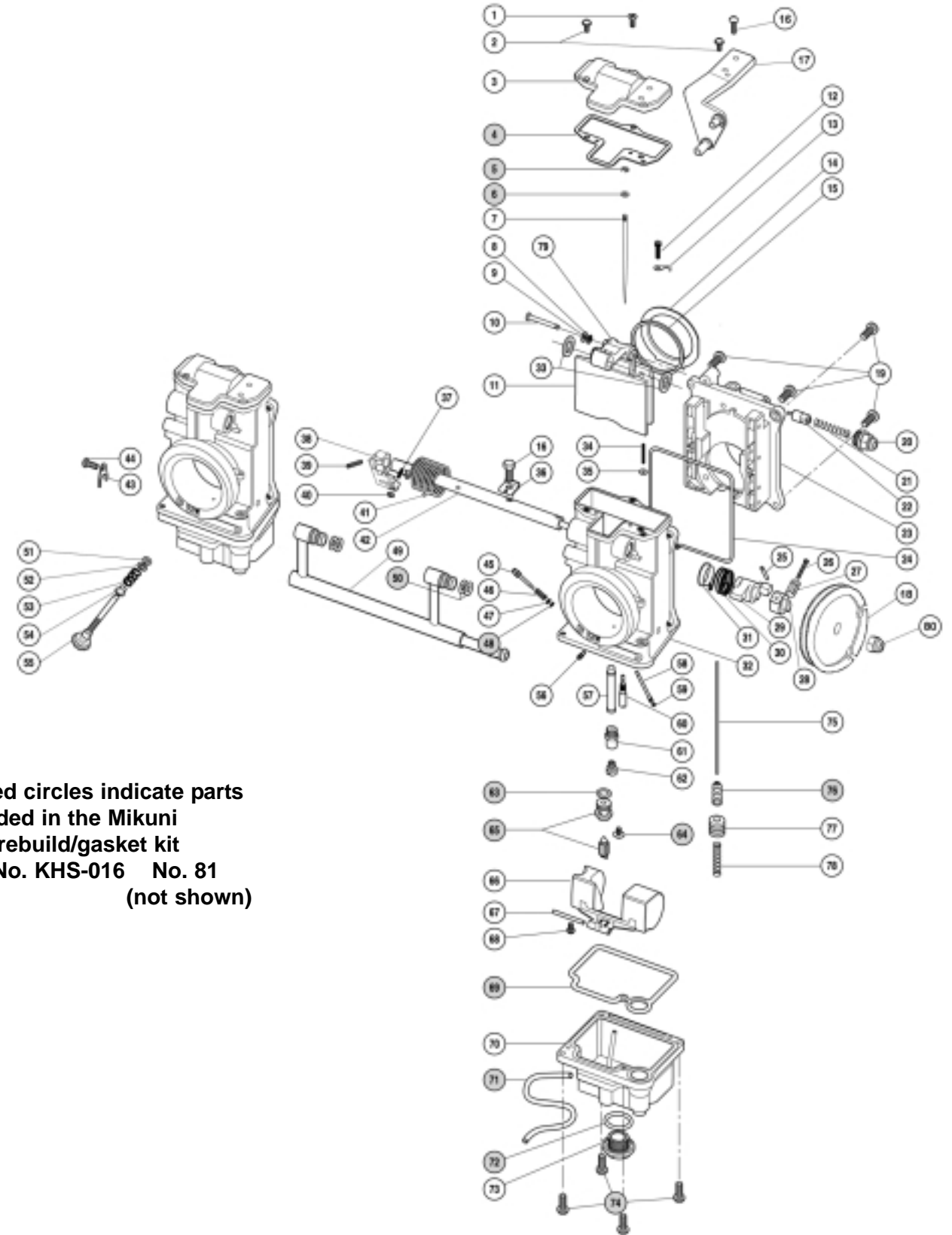


DUAL CARB INSTALLATION

CARBURETOR PARTS LIST

- | | |
|--|--|
| 1. C5=0410-B Screw, Top Cover | 48. N133.037 O-Ring, Pilot Air Screw |
| 2. CW2=0414-B Screw, Top Cover | 49. ME-0020 Fuel Log |
| 3. 776-39005 Top Cover | 50. KV/10 O-Ring, Fuel Joint |
| 4. TM42/04 Gasket, Top Cover | 51. B30/398 Packing, Idle Adjuster |
| 5. BS32/126 E-clip, Jet Needle | 52. VM22/138 Washer, Idle Adjuster (Steel) |
| 6. 826-03002 Washer, Needle Clip | 53. 730-09018 Spring, Idle Adjuster |
| 7. J8-8DDY01-96 Jet Needle | 54. 925-15001 Ring, Idle Adjuster (Brass) |
| 8. B401/56 E-clip | 55. 990-605-065 Idle Adjuster Screw (Short) |
| 9. B401/10 Packing, Link Lever | 56. BS30/97 Air Jet (Blank) |
| 10. 834-23041 Pin, Link Lever | 57. 784-430000 Y-6Needle Jet (723 Series) |
| 11. TM42/08 Throttle Valve | 58. TM42/11-70 Nozzle, Accelerator Pump |
| 12. 739-13001 Screw, Needle Retainer Clip | 59. N124.063 O-Ring, A/P |
| 13. TM42/16 Clip, Needle Retainer | 60. VM28/486-30 Pilot Jet |
| 14. TM42/13 Sealing Ring, T.V. | 61. TM42/12 Extender, Main Jet |
| 15. TM42/10 Seal, Throttle Valve | 62. N100.604-160 Main Jet |
| 16. ME-0016 Screw 5mm | 63. 616-33003 O-Ring, N.V. |
| 17. RIV-004 Cable Bracket | 64. VM13/216 Screw, N.V. Retainer |
| 18. PP-5 Throttle Wheel | 65. 786-27001-4.2 Needle Valve Ass'y
w/O-Ring |
| 19. C2=0514-B Screw | 66. 859-32027 Float Ass'y |
| 20. 640-12001 Guide Holder (Starter) | 67. BV26/22 Pin, Float |
| 21. VM14/241 Spring, Starter Plunger | 68. C2=0410 Screw, Float Pin |
| 22. N189.192 Starter Plunger | 69. 616-94028 Packing, Float Bowl |
| 23. TM42/06 Body Ass'y N/A | 70. TM42/05 Float Chamber Body |
| 24. 616-94029 Seal, Spigot Body | 71. N122.028 Hose, Overflow |
| 25. BN38/43 Pin, A/P Lever | 72. VM28/254 O-Ring, Drain Plug |
| 26. MC-0316-B Screw, A/P Adjuster | 73. TM32/41 Drain Plug |
| 27. M12F/46-BB Spring, A/P Adjuster | 74. C2=0412-B Screw, Float Chamber (4) |
| 28. TM42/28 Lever, A/P (Zinc) | 75. TM36/44-1A Rod, A/P |
| 29. TM42/21 Lever, A/P (Plastic) | 76. TM36/64 Boot, A/P Rod |
| 30. TM42/37 Spring A/P | 77. TM36/60 Plunger A/P |
| 31. E204.040 Ring (Steel) | 78. VM14SC13/89 Spring A/P |
| 32. TM42SS1/01-0 Mixing Body N/A | 79. TM42/03 Lever, T.V. |
| 33. B36/95 Packing, Shaft (Plastic) | 80. Lock nut 1/4" |
| 34. TM42/36 Adjusting Screw A/P | 81. carburetor rebuild kit part No. KHS-016 |
| 35. B30/205 O-Ring, A/P Screw | |
| 36. TM42/17 Plate, Lock Tab for Shaft | |
| 37. B30/1069 Screw, Throttle Stop | |
| 38. ME-0021 Lever Ass'y, Throttle (modified) | |
| 39. N138.019 Pin, Throttle Lever | |
| 40. N3=04Nut, Throttle Stop Screw | |
| 41. TM42/19 Spring, Throttle Return | |
| 42. ME-0022 Throttle Shaft | |
| 43. TM42/15 Plate, Fuel Joint Retainer | |
| 44. C2=0410-B Screw, Fuel Joint Retainer | |
| 45. 604-26014 Screw, Pilot Air Adjusting | |
| 46. N133.206 Spring, Pilot Air Screw | |
| 47. VM12/205 Washer/ Pilot Air Screw | |

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Shaded circles indicate parts included in the Mikuni carb rebuild/gasket kit part No. KHS-016 No. 81 (not shown)

DUAL CARB INSTALLATION

BASIC PRINCIPLES OF CARBURETOR OPERATION

As air passes through a carburetor, fuel is introduced to obtain the correct air-fuel ratio. This is accomplished with the help of a venturi. A venturi is a restriction in the size of the carb body that air flows through. As air flows through the venturi, its speed increases because of the smaller area of the passage. An increase in air speed causes a corresponding reduction in air pressure. So, at any given engine speed, the smaller the venturi, the higher the air speed; the higher the air speed, the lower the air pressure. HSR carbs use a slide (technically, a variable venturi) to take maximum advantage of this relationship.

The primary advantage of slide type carburetor over a butterfly type is that as fuel is introduced into the flow of air it is able to mix with all of the incoming air and not just the portion of air that passes below the butterfly throttle valve. Additionally, the HSR incorporates 5 tunable circuits as compared to the butterfly type carburetor, which utilizes only 3 circuits. The 5 circuits of the HSR work progressively as the throttle is opened, creating seamless throttle response and acceleration.

TUNING COMPONENTS

In this segment of the Tuning Section, each of the HSR's tunable components is outlined and its function described. Actual tuning procedures are covered in the next segment: General Tuning Procedures.

IDLE CIRCUIT (PILOT SYSTEM)

The idle circuit supplies fuel at idle speeds and has a major influence on fuel flow up to 1/4 throttle. There are two tunable parts in the idle circuit; the pilot jet and air screw.

1. PILOT JET-controls fuel flow through the idle circuit.
2. AIR SCREW-controls idle mixture. Turn the screw out to lean the mixture, turn it in to richen the mixture. The engine should have a

smooth, steady idle with the screw between 1 turn and 2 turns out from fully bottomed (gently!). If the engine requires more than 3 turns out, the pilot jet is too rich (large). If it requires less than 1/2 turn, the jet is too lean (small).

As the throttle is opened, the air screw's position becomes less important than the sizes of the pilot jet. A larger pilot jet richens the mixture from just off idle to 1/4 throttle. A smaller jet leans it. After changing the pilot jet, it will be necessary to re-adjust the air screw for best idle.

MAIN SYSTEM

The main system delivers fuel from 1/16 to full throttle, the idle circuit delivers the majority of the fuel near 1/16 throttle. The main system becomes the primary mixture control from about 1/4 throttle.

The main system has three tunable parts:

1. NEEDLE JET-controls mixture from 1/16 to approximately 1/4 throttle (varies with needle position).
2. JET NEEDLE-controls mixture from 1/8 to 3/4 throttle.
3. MAIN JET-controls mixture from 3/4 to full throttle.

The jet needle has a constant (straight) diameter section and a tapered section. The outside diameter of the jet needle and the inside diameter of the needle jet form an orifice through which all main system fuel must flow.

Until about 1/4 throttle, the constant diameter section of the jet needle is within the needle jet and main fuel flow is controlled by the size of the jet needle.

Notches at the top of the jet needle allow it to be raised or lowered. Raising or lowering the needle will determine at what throttle opening the tapered part of the needle is raised out of the needle jet.

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Main system fuel is controlled by the taper from where it begins to lift out of the needle jet until 3/4 throttle. Raising or lowering the needle will respectively richen or lean the mixture.

At 3/4 throttle the orifice formed by the needle jet becomes large enough that the size of the main jet begins to control fuel flow. Until this point the main jet has no effect on mixture strength. At full throttle the needle taper has no influence.

ACCELERATOR PUMP

Mikuni HSR's are fitted with an accelerator pump. The purpose of the pump is to inject fuel into the throat of the HSR when the throttle is opened. As the throttle is opened, especially at low rpm, air velocity through the carburetor drops and the mixture naturally leans out. Fuel from the pump maintains a more correct air-fuel mixture until air velocity increases.

The accelerator pump can be adjusted to inject fuel into the throat of the carburetor over a wide range of throttle openings. The rate at which it injects fuel can be controlled with different size pump nozzles. Total fuel volume depends upon the pump's beginning and end point adjustments.

For the best performance from the accelerator pump, the nozzle spray should be directed toward the jet needle.

STARTER SYSTEM

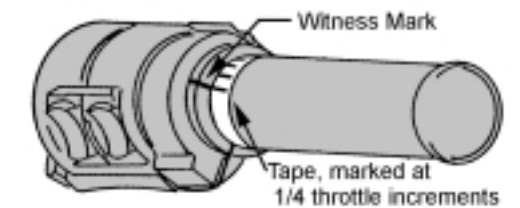
The HSR's starter system is actually a small auxiliary carburetor designed to supply a rich mixture that is required for starting and warm-up. The starter system works when the choke knob is pulled out and the throttle is in the closed position.

If the throttle is opened with the choke knob pulled out, air will cease flowing through the starter system and it will stop delivering a rich fuel mixture to the engine. If the engine begins to load up while the starter system is engaged, it may be cleared by opening the throttle. When the throttle is closed, the starter system will resume operation.

GENERAL TUNING PROCEDURES: MIKUNI HSR CARBURETORS

NOTE

For the quickest and most accurate results fine tuning your dual HSR's, we recommend using "witness" marks, indicating the amount of throttle opening, on the throttle grip and throttle housing. Use masking tape on the grip and an indicator mark on the throttle, with the grip tape marked off in increments of 1/4 throttle openings. In this way, you will be able to identify the throttle opening where a tuning change may be required and can adjust the correct carburetor components.



Your Mikuni HSR is fitted with the tuning parts we found to work with a majority of engine tuning combinations. However, the tremendous number of differing exhaust systems and cams available for Harley engines makes it impossible to accommodate all possible combinations with one carburetor set-up. You will probably find that the HSR will run perfectly on your engine without exchanging any parts. But if it doesn't, you may alter its tuning to suit your engines needs by following this guide.

NOTE

There are many more replaceable parts that affect tuning in the HSR than in the stock Harley carburetor. With these parts you will be able to precisely tailor the HSR42 to your engine's requirements throughout its rpm and throttle setting range. Each tuning system is easy to modify and diagnose, but only when you understand what each system does and how it works. Before making any alterations to the HSR, if any are needed at all, read the section of this manual describing the various tuning components and their functional range.

CAUTION

There is little point in attempting to tune carburetors unless the engine is completely sound. Valves and rings must seal properly, the ignition timing must be correct and the spark plugs clean and gapped. Some exhaust systems may also make carburetor tuning difficult. For instance, it is very difficult to get smooth responsive carburetion with straight and open pipes. If you have any doubts about the condition of your engine, tune and test it before beginning what could be a frustrating and unproductive effort to fix another problem with the carburetor.

PILOT SYSTEM

TUNING THE PILOT CIRCUIT

The first step in tuning this carburetor is to get the idle circuit correctly adjusted. And the first step in this procedure is to adjust the air screws for the best idle. Mikuni sets the air screw at two turns out during assembly. This is the position we have found to be right most of the time. If the screw position had been altered, gently bottom it and re-open it to two turns out from the fully closed position. The knurled knob above the air cleaner is the adjuster for the second carburetor. Set both air screws to the same number of turns during tuning.

Next, ride the bike until the engine is at its normal operating temperature. This may require several miles at highway speeds. If you have an oil temperature gauge, ride until the oil temperature is at or near 150 degrees.

With the machine vertical and the engine idling near 1,000 rpm, adjust the air screws in slowly until the idle either slows or becomes irregular, then begin turning them out until the engine again slows or begins an irregular idle. Count the number of turns between the too rich and too lean positions.

Set the air screw mid-way between the too rich and too lean positions. You may further refine the air screw position with further riding experience, but this will provide you with the perfect idle mixture setting.

If you allow the engine to get too hot during the

air screw adjustment procedure, the resulting adjustment will probably be on the lean side of correct. If you have a large fan, use it while adjusting the mixture. If you do not have one, you may need to take time out for a short ride to cool the engine back to normal temperature.

NOTE

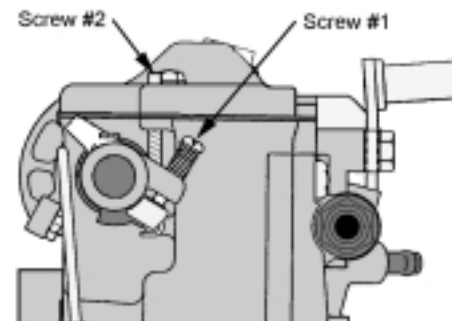
If the best idle is achieved with the air screw less than 1/4 turn out, the pilot jet is too small and will need to be changed. On the other hand, if the air screw must be more than three turns out for best idle, the pilot jet is too large and will need to be changed. Once you have a good idle with the air screw within its range, you may proceed to the next step.

ACCELERATOR PUMP SYSTEM TUNING THE ACCELERATOR PUMP

The purpose of the accelerator pump is to inject a metered amount of fuel into the engine at small throttle openings. This is the time where air velocity is the lowest and this additional amount of fuel enables the engine to rev up smoothly and quickly. Mikuni HSR's use an accelerator pump in order to achieve maximum fuel economy during cruise throttle settings and still create a rich enough condition for brisk throttle response.

Your dual HSR carburetors have the accelerator pump installed in only one carburetor, this is the carburetor closest to the engine. The accelerator pump is factory set and should not require adjustment under normal conditions.

The HSR's accelerator pump can be adjusted to begin and end operation in response to the fuel requirements of your particular engine.



The beginning point of the pump stroke is adjusted with the adjusting screw #1 on the white plastic pump lever. To start the pump sooner, back the screw out. Turn the screw in to make the pump start its stroke at a larger throttle opening. Dual carburetors perform best if the pump begins its stroke as soon as the throttle is moved from the idle position.

The end of the accelerator pump stroke is adjusted by the adjusting screw #2 located on the top of the carburetor just behind the pump lever. Best performance is generally achieved when the pump stroke ends before 1/2 throttle.

As a test to see if the accelerator pump is opening at the correct time, screw in the #1 screw (delaying opening) until there is a noticeable engine hesitation as the throttle is opened. Then, back the screw out until the hesitation disappears, this should be the correct opening adjustment.

To set the correct stopping point, screw in the #2 adjuster until the engine hesitates when the throttle is opened. Then, back the screw out until the hesitation disappears.

MAIN SYSTEM

TUNING THE JET NEEDLE (Initial straight portion)

It is unlikely that you will need to change the jet needle from the one supplied in your HSR42. However, in case you do, you should be aware of how it works and how to tell if the one you have is too large (leaner) or too small (richer) for your particular engine set up.

The initial straight portion of the jet needle affects the mixture from idle to approximately 1/4 throttle, at which point the needle's tapered portion takes over.

LEAN CONDITION

If the jet needle is too lean (large), part throttle acceleration will be flat. There may also be some

detonation during part throttle acceleration, although this can also be caused by other factors. A lean jet needle will also result in a slow warm-up.

If part throttle acceleration is flat, install a one size smaller jet needle and compare the performance. If acceleration is improved, leave the smaller jet needle in and take a ride at steady speeds to give the spark plugs time to color evenly.

Take a spark plug wrench with you and after a few miles, stop and remove a plug for inspection. Be careful as you stop not to operate the throttle. The extra fuel from the accelerator pump can cause a false plug reading. The porcelain around the electrode should be from a light gray to brown to dark gray. If the plug body is black and has a sooty appearance the jet needle is probably too rich and a larger one will need to be fitted.

RICH CONDITION

While a black sooty spark plug is a sure sign of richness, there are others that are a bit more subtle. If your engine responds crisply at low throttle when it is cold, chances are the jet needle is one size smaller than it needs to be. Assuming, of course, that the idle circuit is correctly tuned.

Poor fuel mileage is another sign of richness and because of the way most of us ride our Harleys, that richness is usually the result of a jet needle that is too small. The color of the end of the exhausts is a sign of mixture strength. Dark gray with some black is normal for today's lead free gasolines. If the exhaust color is black, chances are you can enlarge the size of the jet needle.

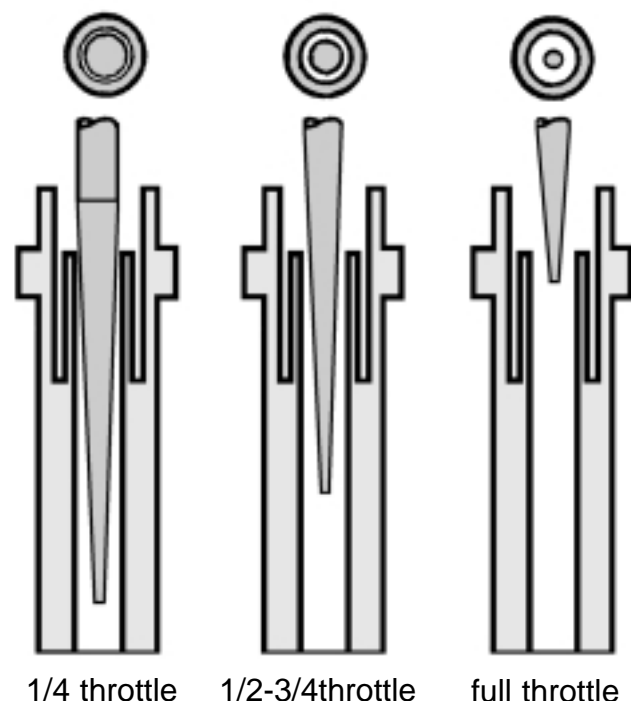
A slightly over-rich condition lets a Harley accelerate better at very low rpm's and from very low throttle settings. It may be that you prefer a jet needle or accelerator pump setting that is slightly on the rich side of the correct range. Be aware that you will lose some fuel economy if you choose to do this.

TUNING THE JET NEEDLE (Tapered portion)

Like the idle circuit of the jet needle, the tapered

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portion has its range of operation. The tapered portion has an increasing effect on fuel mixture from about 1/4 throttle opening as the tapered section leaves the opening of the needle jet. Between 1/2 and 3/4 throttle the influence of the jet needle is the greatest and it controls most of the fuel flow.

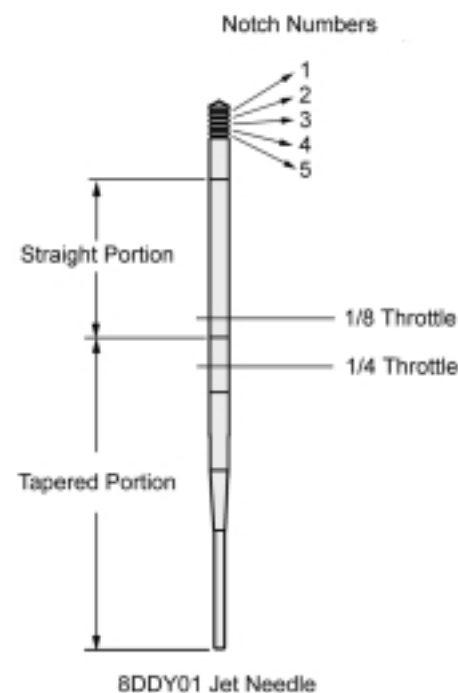


Jet needle and main jet testing should be done with the engine near the middle of its rpm range. Start your acceleration tests at about 50 mph. The best jet needle position will give the strongest acceleration.

With the engine at operating temperature, accelerate at 1/2 to 3/4 throttle, in top gear from 50 mph or so. If acceleration seems soft or flat and the engine is slow to respond when the throttle is quickly opened from 1/2 to 3/4 throttle position, the mixture is too lean. Raise the jet needle one notch and repeat the test.

On the other hand, if acceleration is crisp but the engine hesitates or staggers as the throttle is suddenly shut down from 3/4 to 1/2 throttle, the mixture is too rich. Lower the jet needle one notch and repeat the test.

The jet needle position will be near correct when acceleration is crisp at mid rpm yet the engine does not load up during throttle shut down.



TUNING THE MAIN JET

You could in fact remove the main jet from your Mikuni HSR and the engine would run fine until the throttle was near the 3/4 mark. The jet needle and needle jet restrict the amount of fuel getting into the engine until about that point. There is no point in changing main jets if a mixture problem exists below the 3/4 throttle position.

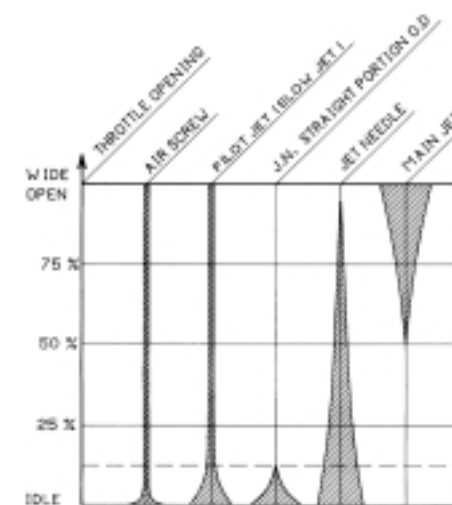
The main jet is the last jet you need to deal with and is the easiest to get right. If you have the room, the most effective method for getting the main jet right is to measure the time required to accelerate between two points. The start and end markers should be spaced so that starting at about 35 mph at the first marker will have you going past the second at near 55 mph.

Set up markers that are far enough apart, on a safe road, to meet the conditions mentioned above. When you pass the first marker roll the throttle fully open and have a friend (it's easier with help) measure the time need to get to the second marker.

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The jet that gives the shortest time is the correct jet. This method is simple but effective.

FUNCTIONAL TUNING RANGE OF COMPONENT PARTS



NOTE

For best results, the accelerator pump nozzle should be pointed directly at the jet needle. The nozzle is held in place by the friction of an O-ring and can be turned easily with a pair of long nosed pliers. Nozzle adjustment should be made with a minimum of pump strokes to avoid flooding the engine.

SERVICING

There are very few moving parts in the HSR series carburetor so it will not require much servicing. There are a few items to be mentioned to assure good performance season after season.

CAUTION

If it is ever necessary to disassembly your dual carburetors, be certain to assembly all of the parts back into the carburetor they were removed from as some parts are not interchangeable because of the custom nature of these carburetors.

A. If the motorcycle is to be stored for any length of time drain the floatbowl.

B. The float drain plug (main jet access) should be removed periodically and cleaned of any sediment that may have settled during long periods of use.

C. DO NOT drill or modify any part of these carburetors for any reason as the result will surely be more problems. Refer to this Tuning Section to correct any problems that you may have.

D. If a jet or passage does become plugged, use only carburetor cleaner and compressed air. DO NOT push a drill or any other object through the jet or passage to clean them.

E. Typical air filter service is done after about 2,000 miles of use. If the air filter is dirty (50% dirt coverage) and requires servicing, follow these steps.

1. PRE-CLEANING: Tap the element to dislodge any large embedded dirt, then gently brush with a soft bristle brush.

2. PAN CLEANING: Soak or roll element in a large shallow pan of K&N air filter cleaner (1/4 the depth of 1 pleat). Remove immediately and let sit for approximately 10 minutes.

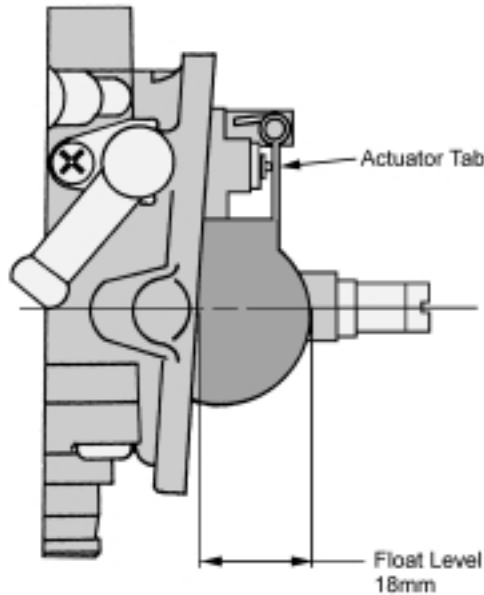
3. RINSE OFF: Rinse off the element with low pressure water, tap water is OK. Always flush from the inside of the filter out. This removes the dirt and does not drive it into the filter. IMPORTANT: Air dry only.

4. OILING: After the filter has dried always re-oil before using. Apply K&N air filter oil with one pass per pleat. Wait 10 minutes and re-oil any white spots still showing. IMPORTANT: Do not use gasoline or cleaning solvent to service the filter element as this will damage the filter.

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FLOAT LEVEL ADJUSTMENTS

The fuel level of the carburetors will probably never need adjusting; however, if a problem has been diagnosed as a fuel level that is too high or too low, adjustment can be done as shown.



A. Invert the carburetor and remove the float bowl.

B. The float assembly's actuator tab should just begin contact with the Needle Valve assembly when the bottom of the float is 18mm from the carburetor bottom surface as shown.

C. If adjustment is required, adjust by bending the actuator tab.

NOTE

Before replacing the float bowl, check the condition of the float bowl O-ring. If it is worn or does not fit in the groove correctly it should be replaced. Refer to the External View illustration for float bowl screw torque.

DISASSEMBLY

1. Remove the air cleaner assembly by removing the chrome outer cover and the air filter element.
2. Remove the two socket headed alignment screws. Remove the air cleaner backing plate by removing the center bolt after loosening the choke cable bracket nut.

ASSEMBLY

1. Install the velocity stack backing plate in the same location as the air cleaner backing plate and secure it by re-installing the two socket head screws and the center mounting bolt (use blue Loctite to secure the socket head screws). Re-attach the choke cable to the center mounting bolt with the original nut and washers.

NOTE: If the velocity stack backing plate does not fit easily in place on the carburetors it may be necessary to remove some casting flash. The flashing occurs at the 6 o'clock and 12 o'clock positions on the carburetor intakes. A flat file can easily smooth out this area.

CAUTION: AFTER SECURING THE VELOCITY STACK PLATE CHECK THROTTLE OPERATION FOR ANY SIGNS OF BINDING. IF THE CARBURETORS DO NOT OPEN & CLOSE EASILY, LOOSEN THE SCREWS, RE-ALIGN THE CARBURETORS & RETIGHTEN THE SCREWS.

2. Attach the velocity stacks to the mounting bracket with the 4 bolts from this kit. Once again, use the blue Loctite to secure the bolts against vibration.

