

HSR 42/45

Owner's Manual

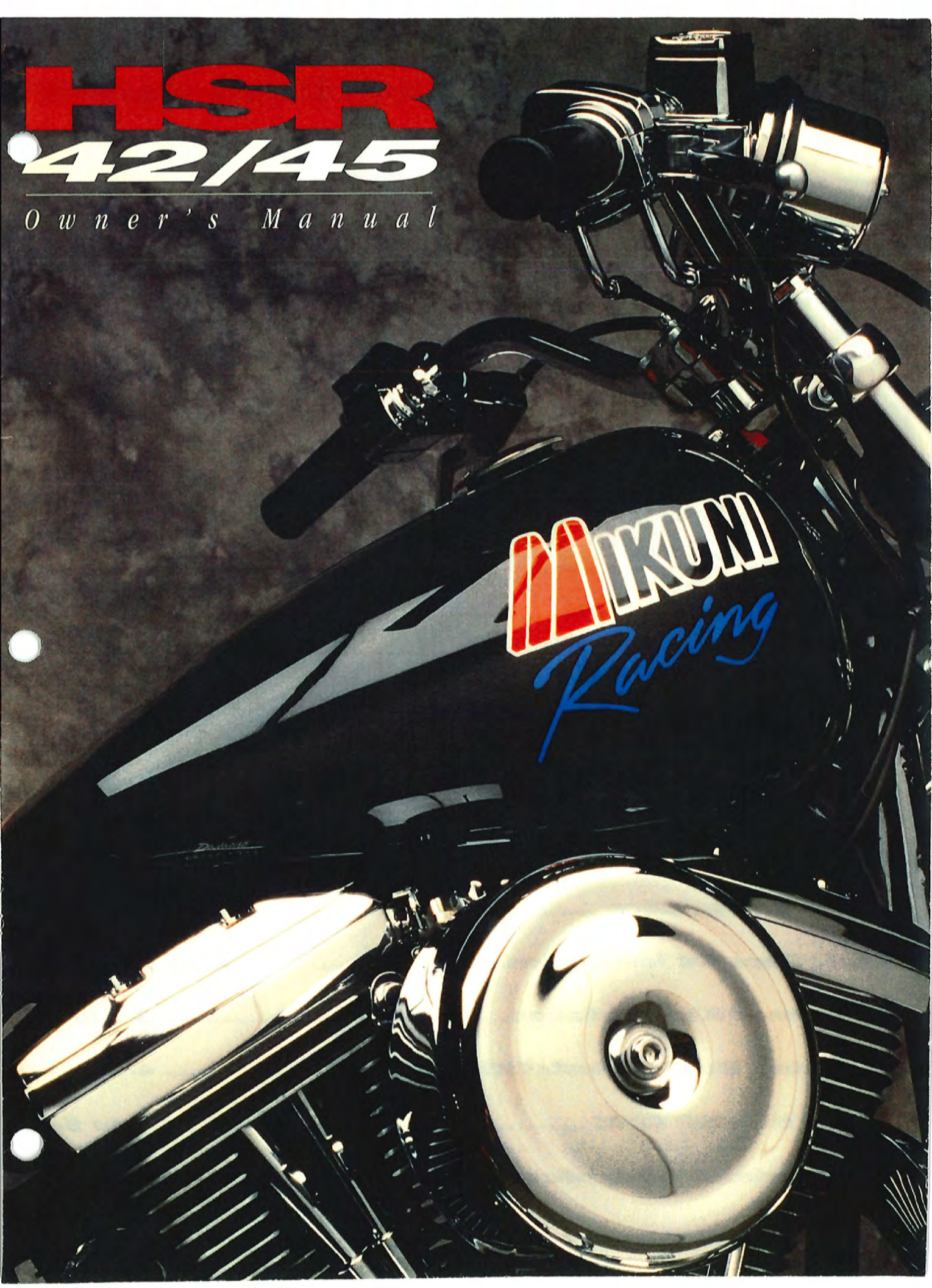




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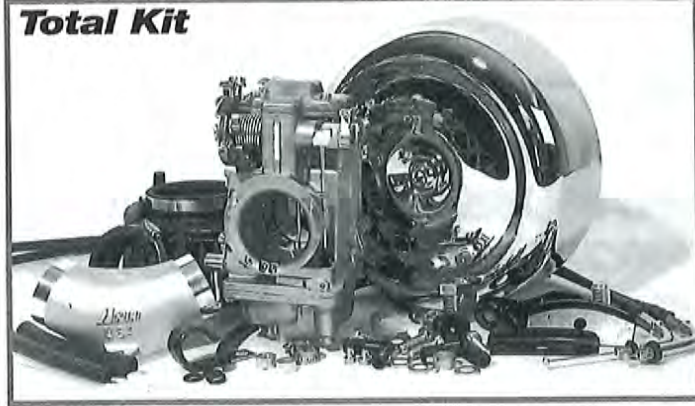
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Mikuni HSR Series Carburetor Kits

Easy Kit



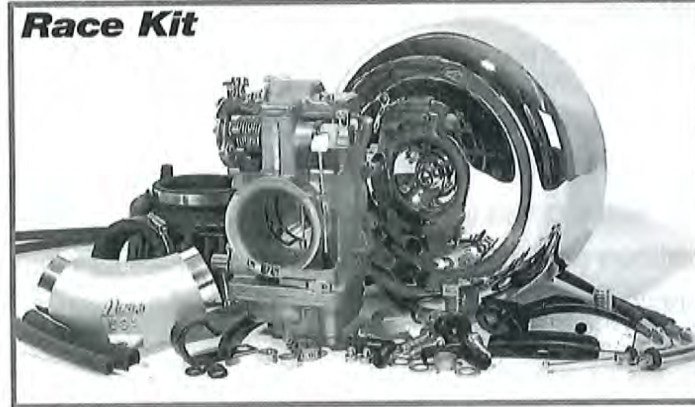
Total Kit



Legal Kit



Race Kit



Easy Kits

Keep your stock look with our uniquely designed Easy Kit. Continue to use your stock manifold, choke cable and black plastic air box or the Screamin' Eagle performance filter. Each kit includes the Mikuni HSR42 Carburetor, throttle cables, air box adapter, chrome cover and instructions.

Total Kits

Go for high flow, with the complete Total Kit. Everything you need from the heads to the filter. Each kit includes a special manifold, rubber flange, Mikuni HSR42 carb, choke cable, high flow K&N filter, chrome cover, throttle cables, and all necessary hardware with easy-to-follow instructions. Please note: It is necessary to use stock mounting flanges and seals as they are not included in the kit.

Legal Kits

In California you may install this Legal Kit with all stock components and meet current emission standards while enjoying 8 more horsepower. Each kit includes a special emissions exempt Mikuni HSR42 carb and all necessary hardware with easy-to-follow instructions.

Race Kits

The Mikuni HSR45 carb flows a great deal of air and therefore is the choice of many high performance engine builders. Choose the #2 Race Kit for engines not needing a stroker manifold and the #3 Race Kit if you already have a manifold. Consult your engine builder for additional details.

For a complete applications guide, see inside back page A-2

"Carburetor kits not designated as C.A.R.B. exempt, are not legal for motor vehicles operated on public highways in the state of CA, or in other states and countries where similar anti-pollution laws may apply."

Mikuni HSR Series Carburetor Kits

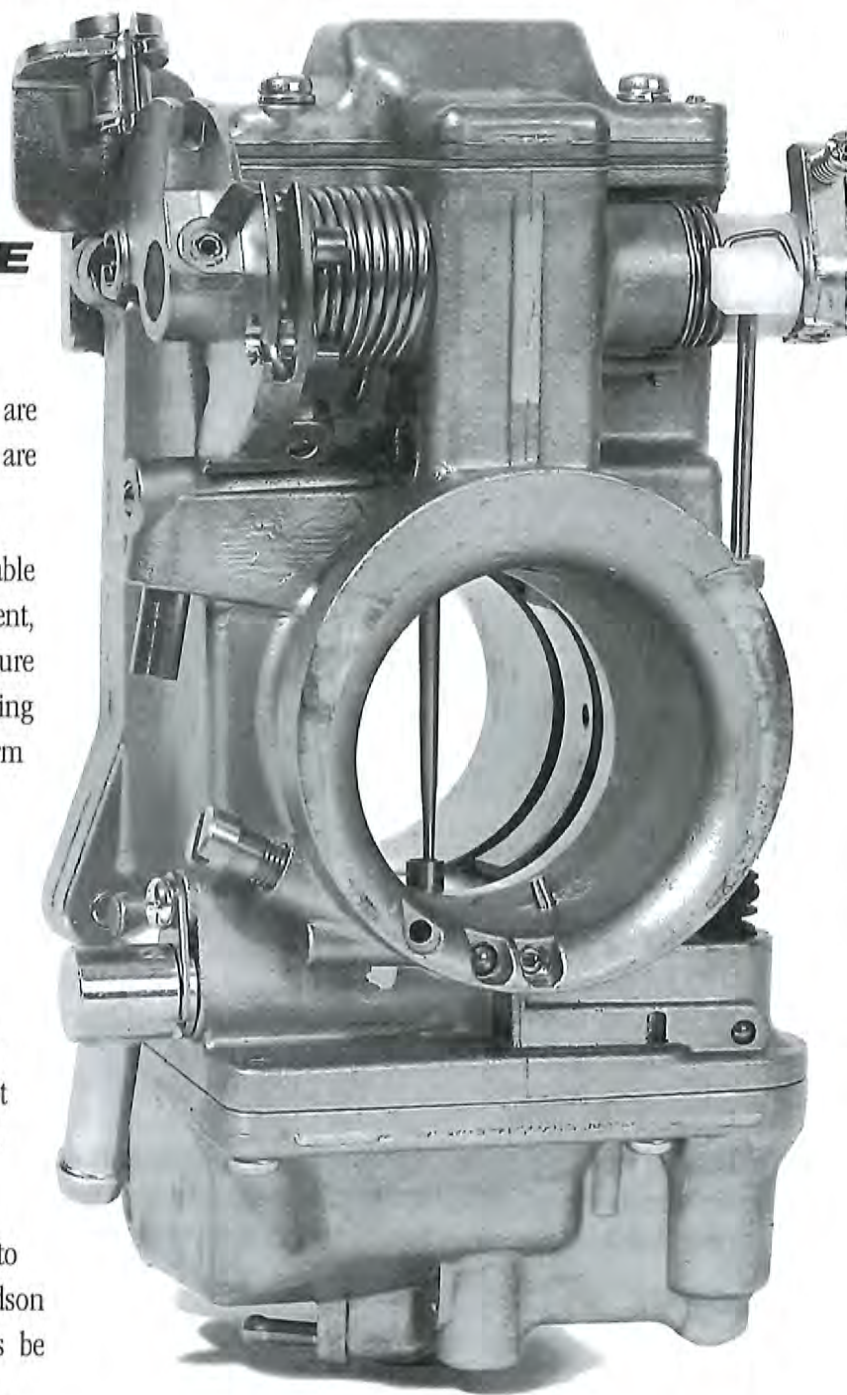
INSTALLATION & TUNING MANUAL FOR HSR SERIES HIGH - PERFORMANCE CARBURETOR KITS

THANK YOU for choosing a Mikuni Carburetor. We are the leader in high performance carburetion systems and are confident that you will agree.

The HSR series carburetors are precise yet durable instruments. However, like any other piece of fine equipment, they require correct installation and reasonable care to assure optimum performance and long life. Extra time spent during installation will pay off in both short and long term performance and reliability.

Included in this Owners' Manual are four installation instruction sections and a tuning manual. Each instruction section matches a particular kit. Please read the section that applies to your particular Mikuni HSR 42/45 kit before beginning the work. Doing so will make the task easier and quicker. Check the kit description on the outside of the box as a reference to the correct installation section.

Mikuni HSR carburetors seldom need alteration to perform correctly. However, since many Harley-Davidson motors are highly modified, re-tuning may sometimes be necessary. We include the Tuning section for that purpose.



REQUIRED TOOLS

These are the tools typically required to remove the stock carburetor and install the HSR carburetor kit. With proper installation and service, your Mikuni HSR carburetor will deliver years of trouble-free service.

- | | |
|---|---|
| 1. Allen wrenches, 1/8", 5/32", 1/4" & 5/16" | 5. Slotted and #2 Phillips screwdrivers |
| 2. Standard wrenches, 1/2", 9/16" | 6. Blue Loctite™ or equivalent |
| 3. Metric wrenches, 8, 10mm (or small adjustable) | 7. T25 TORX ('96-'97 models only) |
| 4. Diagonal cutters (dykes) | 8. Shop Manual (for your model) |
-

Safety PROCEDURES

NOTES, CAUTIONS and WARNINGS

Statements 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.

Carburetor kits not designated as C.A.R.B. exempt, are not legal for motor vehicles operated on public highways in the state of Calif., or in other states and countries where similar anti-pollution laws may apply.

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

WARNING

1. MIKUNI HSR SERIES CARBURETORS REQUIRE THE USE OF A PUSH/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 AND IS EXPLOSIVE UNDER CERTAIN CONDITIONS. Before attempting to install or service your Mikuni HSR series carburetor, follow these fire safety procedures:

- A) 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, space heaters, etc.
- B) 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 bore of the carburetor while the engine is running as injury may result from possible backfire.

CAUTION

A moderate number of mechanical skills are required to properly install this carburetor kit. If after reading these instructions you have any doubts, 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 motorcycle.

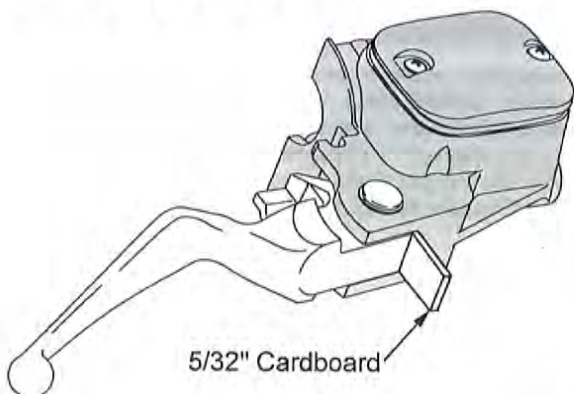
Mikuni Easy Kit Installation

APPLICATIONS

This installation section applies to HSR42-1-K, HSR42-7-K and HSR42-1-K-NC carburetor kits for 1340 EVO's. These kits were designed to use the stock '90 and later intake manifold along with the stock type air cleaner backing plate or aftermarket air cleaner assemblies such as the Screamin'Eagle™ Standard length throttle cables are included in these kits.

DISASSEMBLY

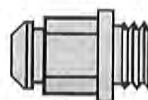
1. Disconnect the negative (-) battery terminal.
2. Turn the fuel petcock to the "OFF" position.
3. Remove the fuel tank from the motorcycle, or elevate the rear of the tank for better access.
4. Remove the air cleaner assembly, including the backing plate.
5. Disconnect the choke cable from the carburetor.
6. Disconnect the vacuum hoses and fuel hose from the carburetor.
7. Remove the carburetor from the motorcycle.
8. On '96 and later models, before removing the throttle housing, place a 5/32" piece of cardboard between the brake lever and the lever bracket to prevent damage to the rubber boot and plunger of the front brake light switch during disassembly and re-assembly.
9. Completely remove the stock throttle cables from the motorcycle by unscrewing the cables from the throttle housing; on '96 and later models, use a rocking motion and pull the cables out of the throttle housing. Retain the stock brass cable ferrules for use on the Mikuni cables.



INSTALLATION

1. STARTER SYSTEM (CHOKE)

- A. The HSR42 carb uses the stock choke cable and black plastic nut from your Harley, and the Mikuni choke spring and plunger (items 21 & 22 Exploded View). Remove the black plastic nut from the HSR42 along with the spring and plunger it holds in place. Attach the Mikuni spring and plunger to the stock choke cable and attach it to the carb. Do not over tighten the nut.



PLASTIC NUT



SPRING



PLUNGER

2. THROTTLE CABLES

CAUTION

Because of differences in gas tanks and handlebars, check to make certain that the new cable elbows clear the gas tank as the handlebars are turned from lock to lock.

CAUTION

Refer to item 2, SAFETY PROCEDURES AND CAUTIONS Page III

NOTE

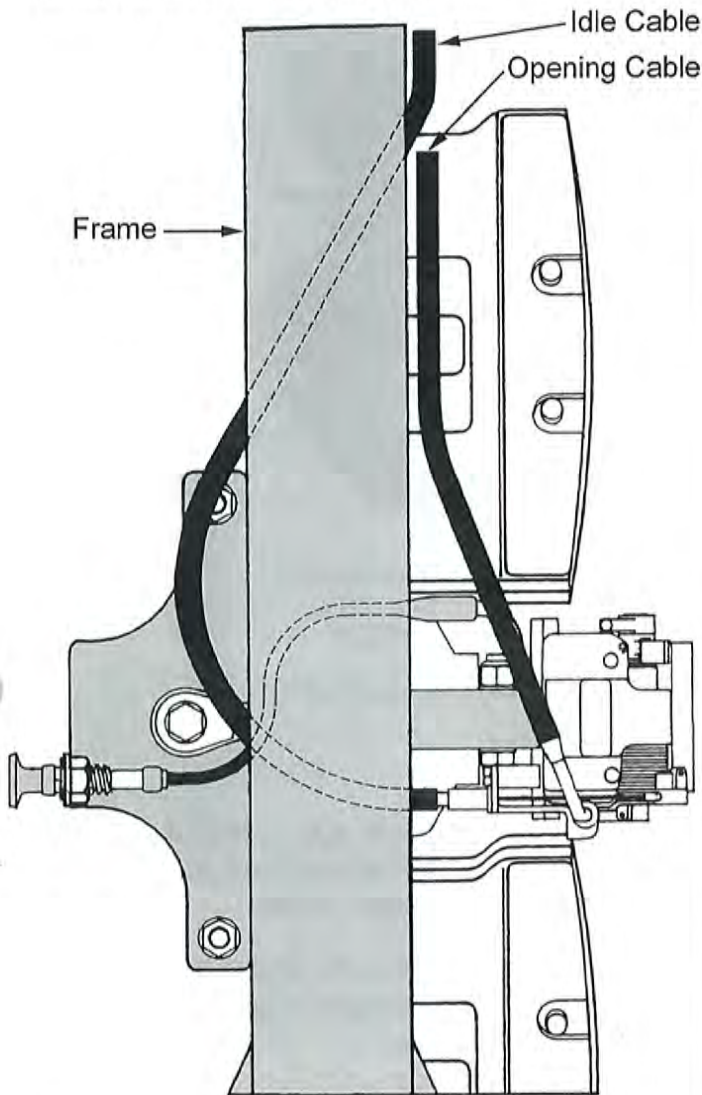
If you need longer throttle cables than the ones included in this kit, you can order the cables listed in the Accessory Section. If you have an FLHTC, FLHR or FLTC, you will need the longer cables.

Pre '96 models, screw the throttle cable elbows into the throttle housing, idle (closing) cable first; the one with the smaller diameter threads.

'96 and later models, push the cable elbow ends into the throttle housing. Note that the two cables have different diameter elbow ends.

- A. Use the stock cable ferrules with the Mikuni cables. Re-assemble the throttle housing taking care to correctly align the front brake light switch.

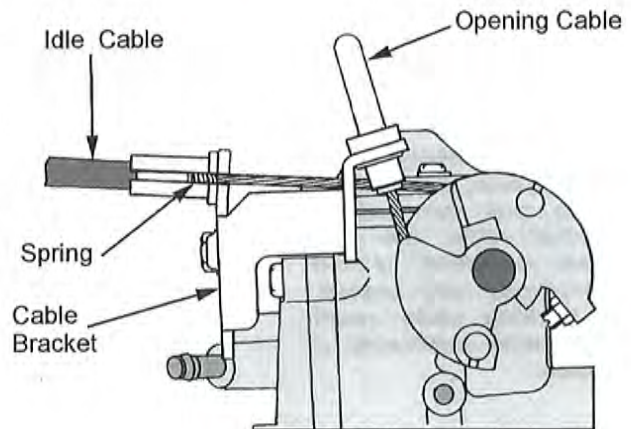
- B. Route the throttle cables to the carb along the right side of the frame (just like stock). Next, route the idle (closing) cable around the motor mount to the carb.



NOTE

This kit contains a cable guide clamp, that can be attached to one of the tapped holes in the front of the frame, and used to secure the throttle cables. Additionally, there are three cable ties in this kit that can be used to secure the throttle cables.

- C. Connect the throttle cables to the carburetor bracket as illustrated; first the idle (closing) cable, then the opening cable.



3. CARBURETOR

CAUTION

Before inserting the carburetor into the stock intake manifold, check the condition of the rubber seal; if it appears damaged, it should be replaced to prevent air leakage.

- Insert the carburetor into the stock Harley-Davidson manifold. As the carb is being inserted, check the choke cable routing so it doesn't become kinked. The carb will fit very snugly into the stock manifold; use grease as a lubricant.
- Attach the V.O.E.S. (Vacuum Operated Electronic Switch) vacuum hose to the fitting on the carburetor; ref: Tuning Section.
- Slip the fuel hose onto the HSR42's fuel nipple and secure with the enclosed hose clamp, ref: Tuning Section.

4. BACKING PLATE

- Insert the enclosed large diameter O-ring into the Mikuni adapter. Attach the adapter to the stock plastic backing plate with the enclosed screws. Use a small amount of thread lock on each of the screws.

CAUTION

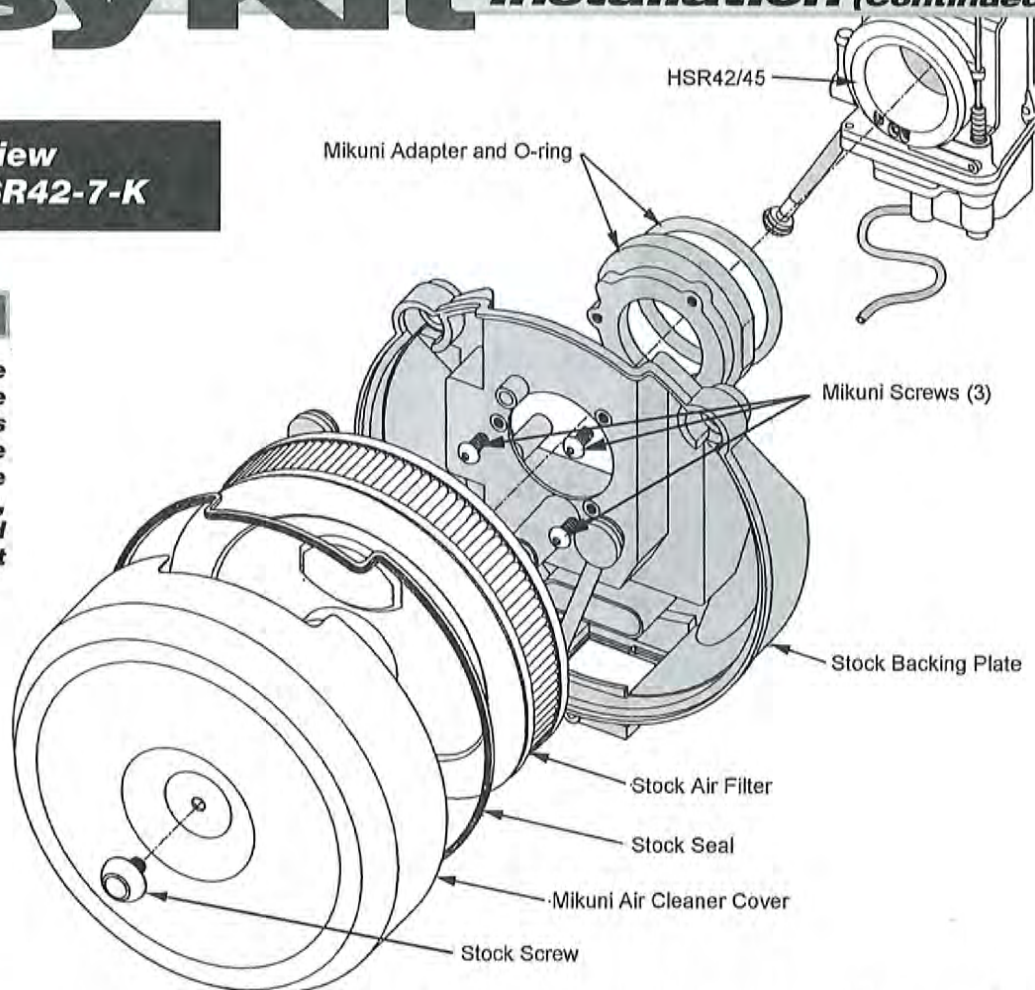
Do not use the original screws, they're too long.

Easy Kit Installation (Continued)

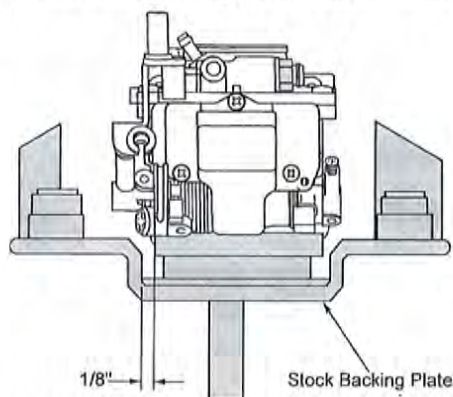
Exploded View HSR42-1-K & HSR42-7-K

CAUTION

Before attaching the backing plate, check to be certain that the carb is inserted fully into the intake manifold. If the carb is not fully seated, the backing plate could break while tightening it in place.



- B. Secure the backing plate with the stock bolts. While securing the backing plate, align the carburetor so that there is approximately 1/8" clearance between the throttle lever and the corner of the backing plate; refer to illustration below:

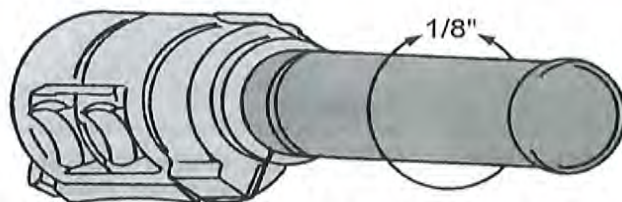


5. THROTTLE CABLES - ADJUSTMENT

- A. Rotate the throttle grip to the full open position and check to see that the throttle valve (slide) opens completely by looking into the carb bore. If the throttle valve doesn't open fully, unscrew the adjuster on the opening cable until it does.

This adjustment should be made carefully to get the maximum performance from the carburetor. After the adjustment is made, tighten the adjuster jam nut.

- B. After adjusting the opening cable, adjust the throttle free-play with the closing cable to approximately 1/8" as indicated in the following illustration.



NOTE

It is important to adjust the cable in the above manner to ensure that the idle cable operates correctly and can close the carburetor fully.

- C. After you have adjusted the throttle cables, make sure that all of the cable jam nuts are tightened securely.

WARNING

Check to make sure that the throttle cables are routed properly by rechecking the throttle play as the handlebars are turned from side to side; the play should remain constant.

6. AIR CLEANER

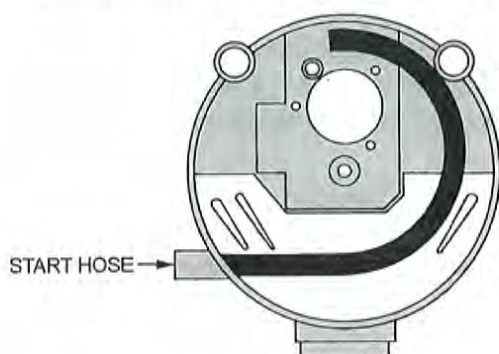
A. Remove the seal from the stock air cleaner cover and attach it to the Mikuni cover.

'93 through current models, re-install the stock air cleaner element with the stock breather hoses. Install the Mikuni air cleaner cover with the stock socket head bolt.

'90 through '92 models, refer to the diagram for installation of an internal breather hose. Install the breather hose as per the illustration, then install the Mikuni air cleaner cover with the stock socket head bolt.

7. INTERNAL BREATHER HOSE INSTALLATION

A. Feed one end of the enclosed breather hose through the existing breather hose fitting. Start from the outside and push the hose in so that the natural curvature will wrap it around the air filter and end up directly over the top of the filter element. The air cleaner cover will hold the hose in position.



B. After the internal breather hose is installed, re-connect the stock breather hose to the backing plate cover

NOTE

The reason for installing the internal breather hose is because of the air inlet holes in the bottom of the Mikuni air cleaner cover. In stock form, oil can collect at the bottom of the cover. With the Mikuni cover in place any oil deposited by the breather, without the hose, would simply run out of the inlet holes.

A "healthy" engine should not emit but a very small amount of oil through the breather system which actually comes out in a vaporous form. The internal breather hose will deliver any oil vapor to the top of the air cleaner where it can be safely drawn into the engine.

CAUTION

To properly maintain the HSR42's high performance ability, it is recommended that the air cleaner be inspected at each 5,000 mile interval. Replace or clean the filter as necessary.

8. HOSE ROUTING

CAUTION

If you are not using the V.O.E.S, be sure to cap the vacuum fitting on the carb.

A. The HSR's overflow hose runs from the bottom of the float bowl behind the rear push rod tubes and in between the crankcases and transmission. Do Not connect it to any other hoses.

NOTE

You will notice that in many instances you will have some remaining hoses. Since this is a "performance" application only, any remaining hoses and related hardware can be removed as they are not required for use with the HSR42.

9. STARTING

Reconnect the battery at this time and re-assemble the remainder of the motorcycle. Turn on the fuel and start the motorcycle as you normally would. After the engine is warmed up adjust the idle to the recommended rpm's, 1,000 to 1,500.

NOTE

To learn more about your HSR42 refer to the Tuning Section of this manual.

PARTS LIST HSR42-1-K & HSR42-7-K

PART #	DESCRIPTION	QTY.	KIT
TM42-1	CARB ASSEMBLY	1	1, 7
HS42/001	ADAPTER	1	1, 7
HS42/002	SCREW	3	1, 7
HS42/003	O-RING	1	1, 7
HS42/006	COVER, CLEANER	1	1, 7
HS42/009	1/4" LOCKNUT (CABLE)	1	1
HS42/010	5/16" LOCKNUT (CABLE)	1	1
HS42/028-A	OPENING CABLE	1	1
HS42/029-A	IDLE CABLE	1	1
KHS/043	OPENING CABLE	1	7
KHS/044	IDLE CABLE	1	7
HS42/015-014	VENT HOSE 14"	1	1
N100.604-155	MAIN JET #155	1	1, 7
N100.604-165	MAIN JET #165	1	1, 7
Z70/045	HOSE CLAMP	2	1, 7
Z70/102	CABLE GUIDE	1	1, 7
Z70/146	CABLE TIE	3	1, 7

Mikuni Total/Race Kit Installation

APPLICATIONS

This installation section applies to HSR42-2-K, HSR42-8-K, HSR45-2-K and HSR45-3-KR carburetor kits for 1340 EVO's. A Mikuni K&N high performance air filter, intake manifold, mounting hardware and standard length cables are included.

NOTE

The HSR45-3-KR kit does not include a manifold; it is intended to be used with a "high performance" after-market intake manifold. The mounting hardware in this kit may have to be modified to allow correct installation with your particular intake manifold. This also applies to the HSR42-2-K and HSR42-8-K if they are installed with an intake manifold other than a stock '90-'97 or the Mikuni intake manifold included in the kits.

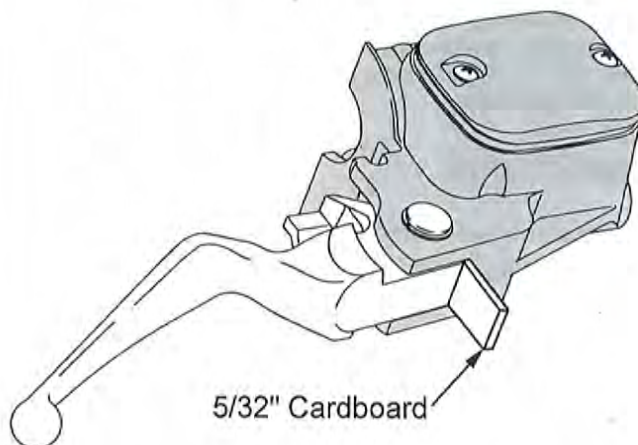
NOTE

The Mikuni intake manifold, included in these kits, require the flanges and seals from a '90 and later "Big Twin". If you don't have these parts, you will need to get them from your local H-D dealer. Part numbers for the parts are as follows:

1. 27009-86A Flange 1 ea.
2. 27010-86A Flange 1 ea.
3. 26995-86A Seal 2 ea.

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.
4. Remove the air cleaner assembly, including the backing plate.
5. Disconnect the choke cable from the carburetor.
6. Disconnect the vacuum hoses and fuel hose from the carburetor.
7. Remove the carburetor from the motorcycle.
8. On '96 and later models, before removing the throttle housing, place a 5/32" piece of cardboard between the brake lever and the lever bracket to prevent damage to the rubber boot and plunger of the front brake light switch during disassembly and re-assembly.



5/32" Cardboard

9. Completely remove the stock throttle cables from the motorcycle by unscrewing the cables from the throttle housing; on '96 and later models, use a rocking motion and pull the cables out of the throttle housing. Retain the stock brass cable ferrules for use on the Mikuni cables.

INSTALLATION

1. INTAKE MANIFOLD

- A. Attach the enclosed rubber flange to the Mikuni intake manifold with 2 ea. 5/16" x 3/4" bolts and flat washers.
- B. Attach the Mikuni manifold assembly to the engine in place of the stock manifold. Do not torque the bolts tight at this time; later, installation of the air filter will help align the manifold.

NOTE

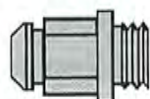
To ease installation, use liquid detergent to lubricate the manifold seals.

2. CHOKE ASSEMBLY

- A. The choke cable assembly is factory installed.

NOTE

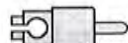
If you choose, on '90 through current models, you can use the stock choke cable by replacing the stock spring and plunger with the Mikuni parts. Use the stock plastic nut in the HSR carb. The spring and plunger are located in the carb under the plastic nut, ref: Tuning Section.



PLASTIC NUT



SPRING



PLUNGER

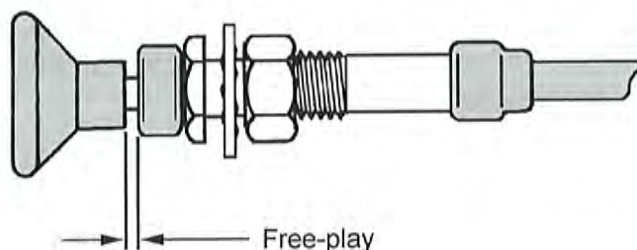
- B. Install the assembled choke mechanism into the carb. Don't over tighten the plastic nut.

3. CARBURETOR INSTALLATION

- A. Insert the carb spigot into the rubber flange and tighten the clamp screw securely.
- B. Route the choke cable to its mounting bracket and tighten the jam nut securely. After the cable is securely fastened, adjust the choke cable for 1mm free-play with the adjuster located under the rubber cover.

NOTE

An optional choke cable mounting bracket is included in this kit for custom installations



4. THROTTLE CABLES

CAUTION

Because of differences in gas tanks and handlebars, check to make certain that the new cable elbows clear the gas tank as the handlebars are turned from lock to lock.

CAUTION

Refer to item 2, SAFETY PROCEDURES AND CAUTIONS page III

NOTE

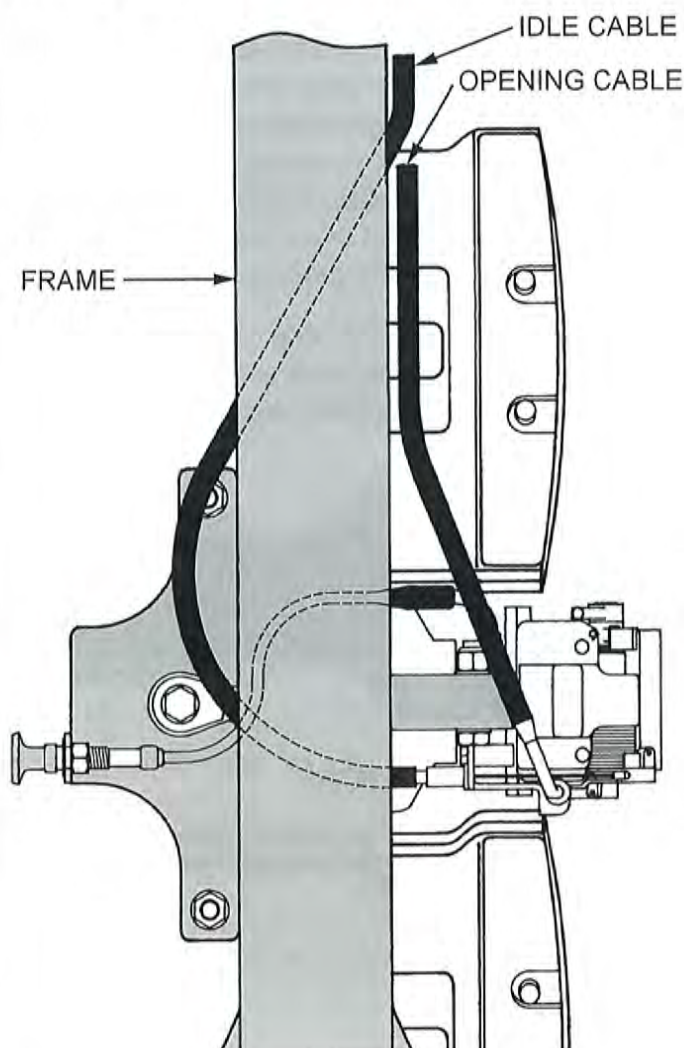
If you need longer throttle cables than the ones included in this kit, you can order the cables listed in the Accessory Section. If you have an FLHTC, FLHR or FLTC, you will need the longer cables.

Pre '96 models, screw the throttle cable elbows into the throttle housing, closing (idle) cable first; the one with the smaller diameter threads.

'96 and later models, push the cable elbow ends into the throttle housing. Note that the two cables have different diameter elbow ends.

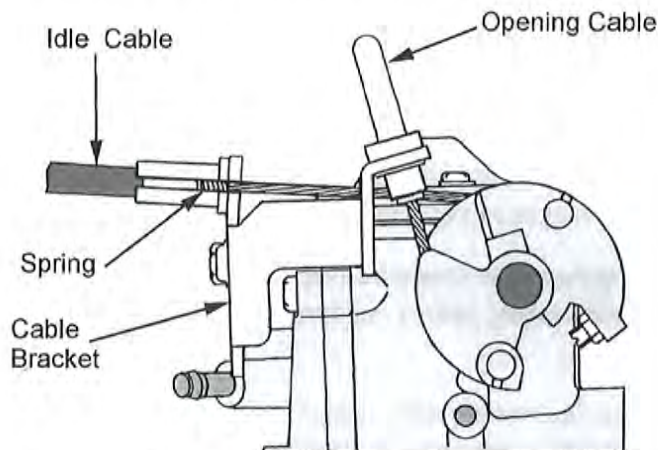
- A. Use the stock cable ferrules with the Mikuni cables. Re-assemble the throttle housing taking care to correctly align the front brake light switch.

- B. Route the throttle cables along the right side of the frame (just like stock). Next, route the idle (closing) cable around the top motor mount to the carb.



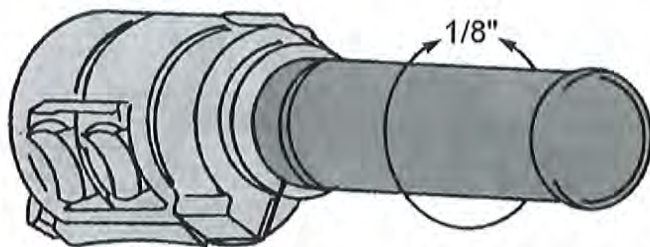
Mikuni Total / Race Kit Installation

- C. Connect the throttle cables to the carburetor bracket as illustrated; first the closing (idle) cable, then the opening cable.



5. THROTTLE CABLES - ADJUSTMENT

- A. Rotate the throttle grip to the full open position and check to see if the throttle valve (slide) opens completely by looking into the carb bore. If the throttle valve doesn't open fully, unscrew the adjuster on the opening cable until it does. This adjustment should be made carefully to assure the maximum performance from the carburetor. After the adjustment is made, tighten the adjuster jam nut.
- B. After adjusting the opening cable, adjust the throttle free-play with the idle (closing) cable to approximately 1/8" as indicated in the following illustration.



NOTE

It is important to adjust the cable in the above manner to ensure that the idle cable operates correctly and can close the carburetor fully.

- C. After you have adjusted the throttle cables make sure that all of the cable jam nuts are tightened securely.

CAUTION

Check to make sure that the throttle cables are routed properly by rechecking the throttle play as the handlebars are turned from side to side; the play should remain constant.

6. AIR CLEANER AND BREATHER

NOTE

The air filter is attached to the cylinders by 2 "Z" shaped brackets in one of 3 ways.

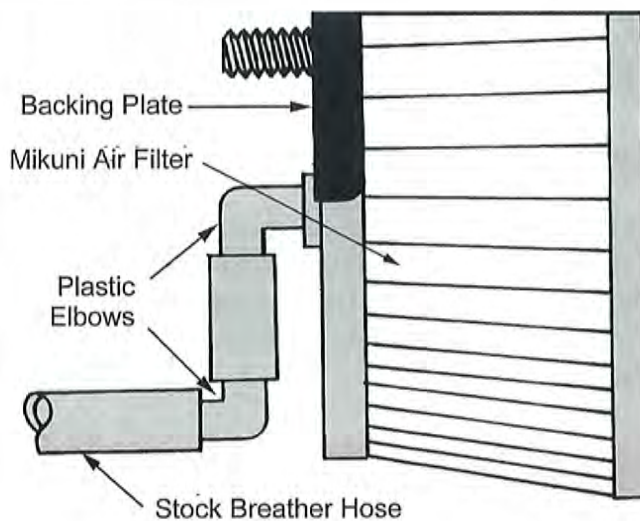
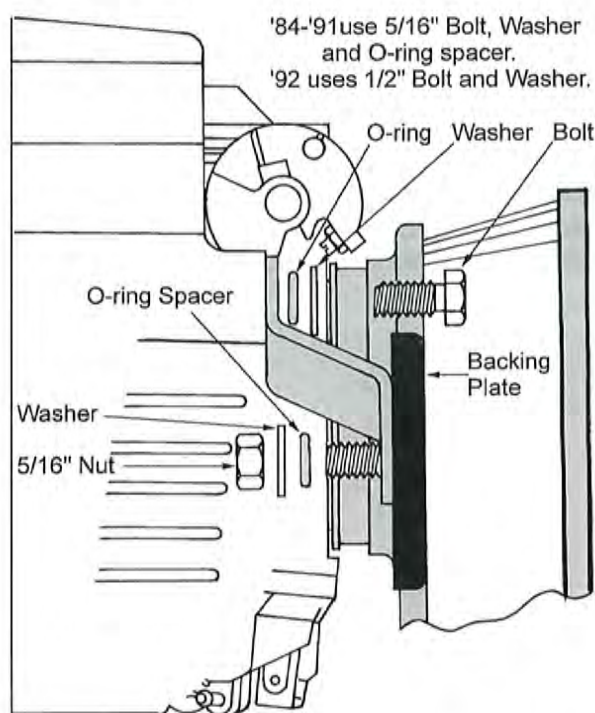
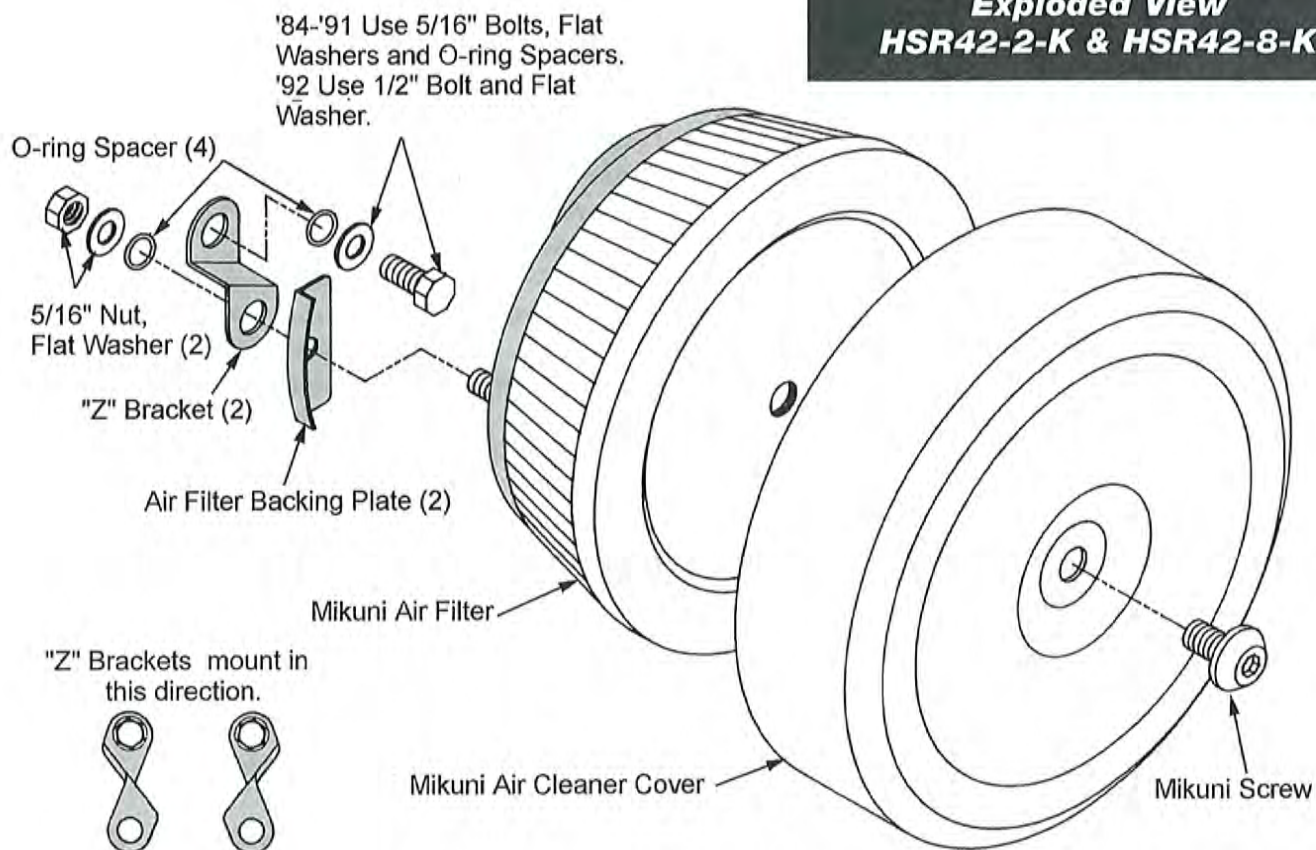
'84-'91 uses 2 ea. 5/16" x 3/4" bolts, flat washers and O-ring spacers..

'92 uses 2 ea. 1/2" x 3/4" bolts and flat washers.

'93 to current requires an additional breather bolt kit, part # KHS-020; available from your dealer. The KHS-020 kit comes with additional installation instructions.

- A. '84-'92 Loosely attach the "Z" brackets to your cylinder heads using the appropriate hardware for your year model; the "Z" brackets align outwards; see following illustrations.
- B. '84-'92 Remove the rubber stud protectors from the Mikuni air filter and place the two backing plates on the studs. Position the air filter up to the carb while aligning the "Z" brackets with the filter studs. The intake manifold should still be just snug and can be rotated slightly to help with the alignment. Once the filter is in place, securely tighten the filter clamp; then secure the filter to the "Z" brackets with the enclosed 5/16" nuts, flat washers and O-ring spacers; see following illustrations
- C. '84-'92 year models, attach the breather to the Mikuni air filter by cutting out one of the thin membranes in the back of the filter and inserting one of the enclosed plastic elbows. Use a short piece of the enclosed 5/16" ID hose to connect a second elbow to the first and connect this elbow to your breather; see illustration following page.

Exploded View HSR42-2-K & HSR42-8-K



NOTE

During assembly, it may be necessary to carefully remove the air filter, after aligning the intake manifold, in order to be able to tighten the manifold bolts.

Mikuni Total / Race

Kit Installation

- D. Securely tighten the manifold clamp bolts.
- E. Use the enclosed small hose clamps to secure the fuel hose to the petcock and the HSR carb. The screw clamp goes on the petcock end and the spring clamp attaches the carb end.
- F. Use the enclosed cover screw to attach the Mikuni air cleaner cover to the air filter.

7. HOSE ROUTING

- A. Attach the V.O.E.S. (Vacuum Operated Electronic Switch) hose to the fitting on the carburetor, ref: Tuning Section. If it is required, there is a 9" piece of vacuum hose included in this kit.

CAUTION

If you are not using a V.O.E.S., be sure that you cap off the vacuum fitting on the carburetor.

- B. The overflow hose, runs from the bottom of the float bowl and in between the crankcases and transmission. Do Not connect it to any other hoses.

NOTE

You will notice that in many instances you will have some remaining hoses. Since this is a "performance" application only, any remaining hoses and related hardware are not required for use with the HSR carb.

8. STARTING

Reconnect the battery at this time and re-assemble the remainder of the motorcycle. Turn on the fuel and start the motorcycle as you normally would. After the engine is warmed up adjust the idle to the recommended rpm's, 1,000 to 1,100. To learn more about your HSR42 refer to the Tuning Section.

CAUTION

To properly maintain the HSR's high performance ability, it is recommended that the air cleaner be inspected at each 5,000 mile interval. Replace or clean the filter as necessary.

PARTS LIST for HSR42-2-K & HSR42-8-K

PART #	DESCRIPTION	QTY	KIT
TM42-1	CARB ASSEMBLY	1	2, 8
HS42/017-45	MANIFOLD	1	2, 8
HS42/018-42	RUBBER FLANGE	1	2, 8
TMX/002-32	CLAMP, HOSE	1	2, 8
Z70/042	FLAT WASHER, 5/16"	6	2, 8
RS36/27-075	BOLT, 5/16 X 3/4"	4	2, 8
RS36/23	CHOKE BRACKET	1	2, 8
990-662-002	CHOKE CABLE ASS'Y	1	2, 8
HS42/012	AIR FILTER, K&N	1	2, 8
HS42/021-250	COVER A/C (CHR)	1	2, 8
HS42/019	BRACKET, AIR FILTER	2	2, 8
HS42/034	O-RING	4	2, 8
RS36/47	PLATE, BACK	2	2, 8
RS36/28	NUT, 5/16"	2	2, 8
RS36/37	ELBOW, PLASTIC	2	2, 8
RS36/54	SCREW, COVER	1	2, 8
Z70/045	CLAMP, HOSE	1	2, 8
RS36/02-17	CLAMP, HOSE	1	2, 8
KHS/043	OPENING CABLE	1	8
KHS/044	IDLE CABLE	1	8
HS42/028-A	OPENING CABLE	1	8
HS42/029-A	IDLE CABLE	1	2
HS42/009	1/4" LOCK NUT	1	2
HS42/010	5/16" LOCK NUT	1	2
Z70/146	CABLE TIE	4	2, 8
Z70/102	HOSE HOLDER	1	2, 8
N100.604-165	MAIN JET #165	1	2, 8
N100.604-155	MAIN JET #155	1	2, 8
RS36/36-09	3/16" HOSE, 9"	1	2, 8
HS42/036-5	7/32" HOSE, 5"	1	2, 8
Z70/055-5	5/16" HOSE, 5"	1	2, 8
HS42/037	1/2"-13 X 1" BOLT	2	2, 8
HS42/038	1/2" FLAT WASHER	2	2, 8

Shovelhead

Kit Installation

Section 3

APPLICATIONS

This installation section applies to the HSR42-3-K carburetor kits for "Shovelhead Big Twins". Standard length throttle cables, intake manifold, all necessary mounting hardware and a high performance Mikuni K&N® air filter are included.

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.
4. Remove the air cleaner assembly, including the backing plate.
5. Disconnect the choke cable from the carburetor.
6. Disconnect the vacuum hoses and fuel hose from the carburetor.
7. Remove the carburetor from the motorcycle.
8. Completely remove the stock throttle cables from the motorcycle by unscrewing the cables from the throttle housing. Retain the stock brass cable ferrules for use on the Mikuni cables.

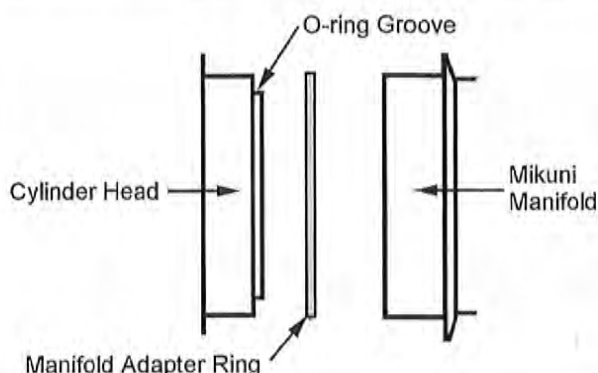
INSTALLATION

1. INTAKE MANIFOLD

- A. Attach the enclosed rubber flange to the Mikuni intake manifold with 2 ea. 5/16" x 3/4" bolts and flat washers.
- B. Attach the Mikuni manifold assembly to the engine in place of the stock manifold. Do not torque the clamps tight at this time; later, installation of the air filter will align the manifold.

NOTE

A special Adapter Ring is included for use on models manufactured in 1978 and earlier. These models will also require later model rubber bands and large diameter clamps, see illustration.

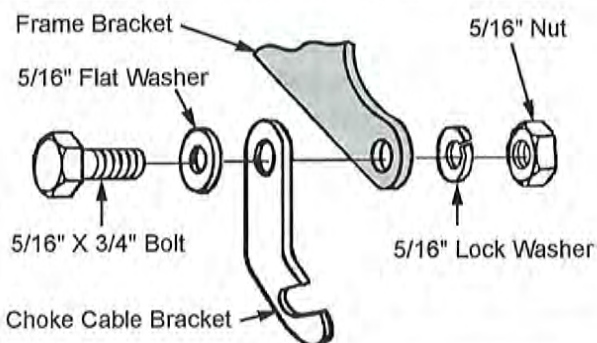


2. CARBURETOR INSTALLATION

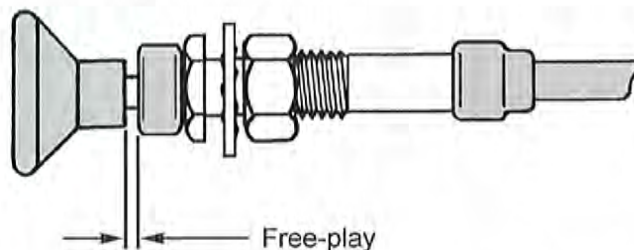
- A. Insert the carb spigot into the rubber flange and tighten the clamp screw securely.

3. CHOKE CABLE INSTALLATION

- A. Attach the Mikuni choke cable bracket to the original choke cable bracket on the frame with the enclosed hardware as illustrated.



- B. Route the choke cable to its mounting bracket and tighten the jam nut securely. After the cable is securely fastened, adjust the choke cable 1mm free-play with the adjuster located under the rubber cover.



Shovelhead

Kit Installation

4. THROTTLE CABLES

CAUTION

Because of differences in gas tanks and handlebars, check to make certain that the new cable elbows clear the gas tank as the handlebars are turned from lock to lock.

CAUTION

Refer to item 2, SAFETY PROCEDURES AND CAUTIONS.

NOTE

If you need longer throttle cables than the ones included in this kit, you can order the cables listed in the Accessory Section. If you have an FLHTC or FLTC, you will need the longer cables.

WARNING

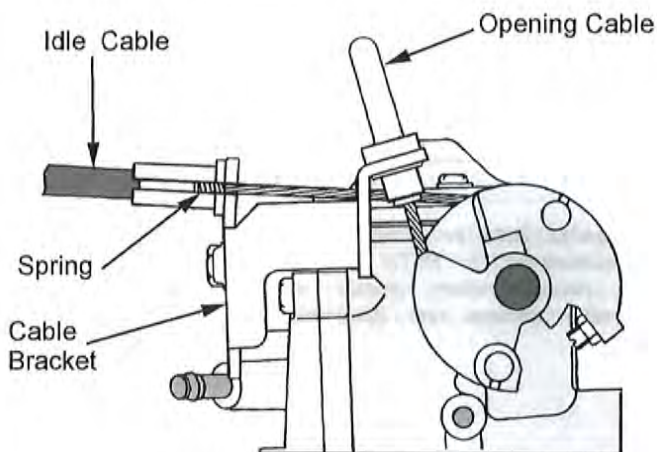
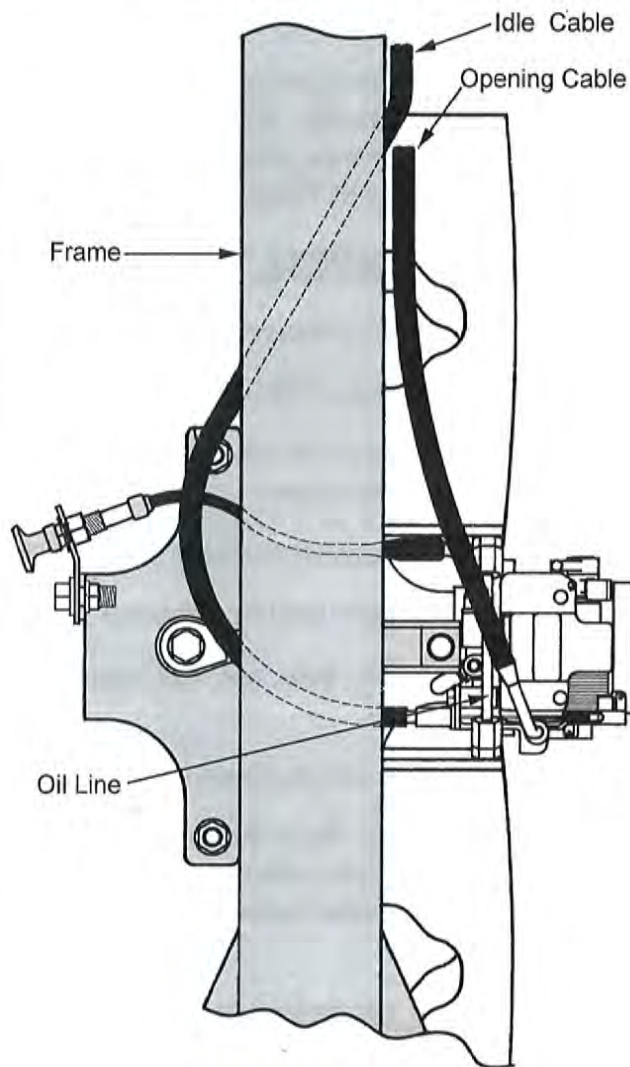
Two throttle cables are required for the HSR carb, if your model does not already use a push-pull throttle arrangement use the enclosed throttle assembly.

- A. Screw the throttle cable elbows into the throttle housing, idle (closing) cable first. Use the stock cable ferrules with the Mikuni cables. Reassemble the throttle; taking care to correctly align the front brake light switch if applicable.
- B. Route the cables to the carb along the right side of the frame (just like stock). Next, route the idle (closing) cable around the top motor mount to the carb.

NOTE

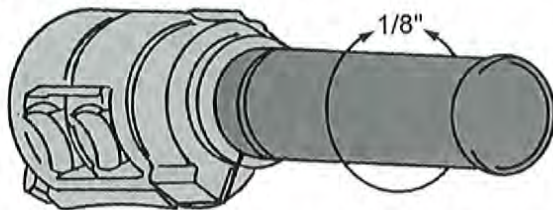
The opening throttle cable should be routed, over the oil line between the valve covers, as illustrated.

- C. Connect the cables to the carburetor bracket as illustrated; first the idle (closing) cable, then the opening cable.



5. THROTTLE CABLES - ADJUSTMENT

- A. Rotate the throttle grip to the full open position and check to see if the throttle valve (slide) opens completely by looking into the carb bore. If the throttle valve doesn't open fully, unscrew the adjuster on the opening cable until it does. This adjustment should be made carefully to assure the maximum performance from the carburetor. After the adjustment is made, tighten the adjuster jam nut.
- B. After adjusting the opening cable, adjust the throttle freeplay with the closing (idle) cable to approximately 1/8" as indicated in the following illustration.



NOTE

It is important to adjust the cable in the above manner to ensure that the idle cable operates correctly and can close the carburetor fully.

CAUTION

Check to make sure that the cables are routed properly by rechecking the throttle play as the handlebars are turned from side to side; the play should remain constant.

- C. After you have adjusted the throttle cables make sure that all of the cable locknuts are tightened securely.

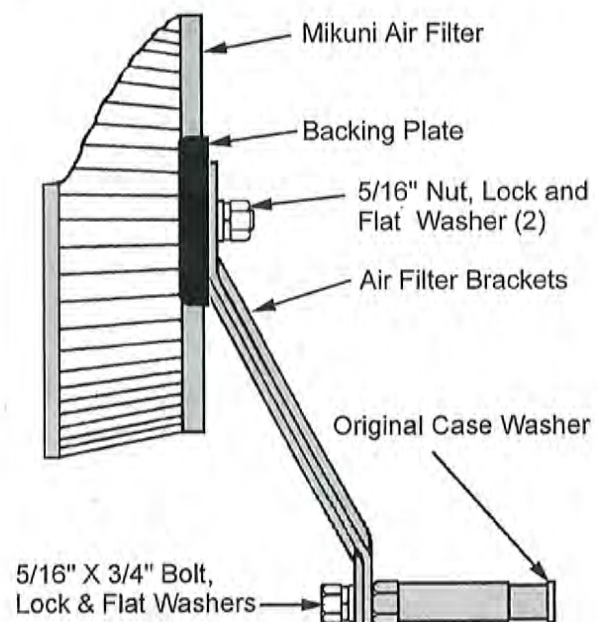
6. AIR CLEANER

- A. The air filter is attached to the crankcases with 2 long brackets and a bracket spacer. Remove the crankcase nut located between the tappet blocks and replace it with the enclosed bracket spacer; tighten the spacer securely.
- B. Remove the stud protectors from the K&N filter and place the two backing plates on the studs then slip the filter onto the carb.

- C. Attach the two long brackets to the air filter studs with the enclosed nuts and flat washers and to the bracket spacer with the enclosed bolt, lock and flat washers. When the carb and air filter are properly aligned securely tighten all of the mounting hardware including the intake manifold clamps.

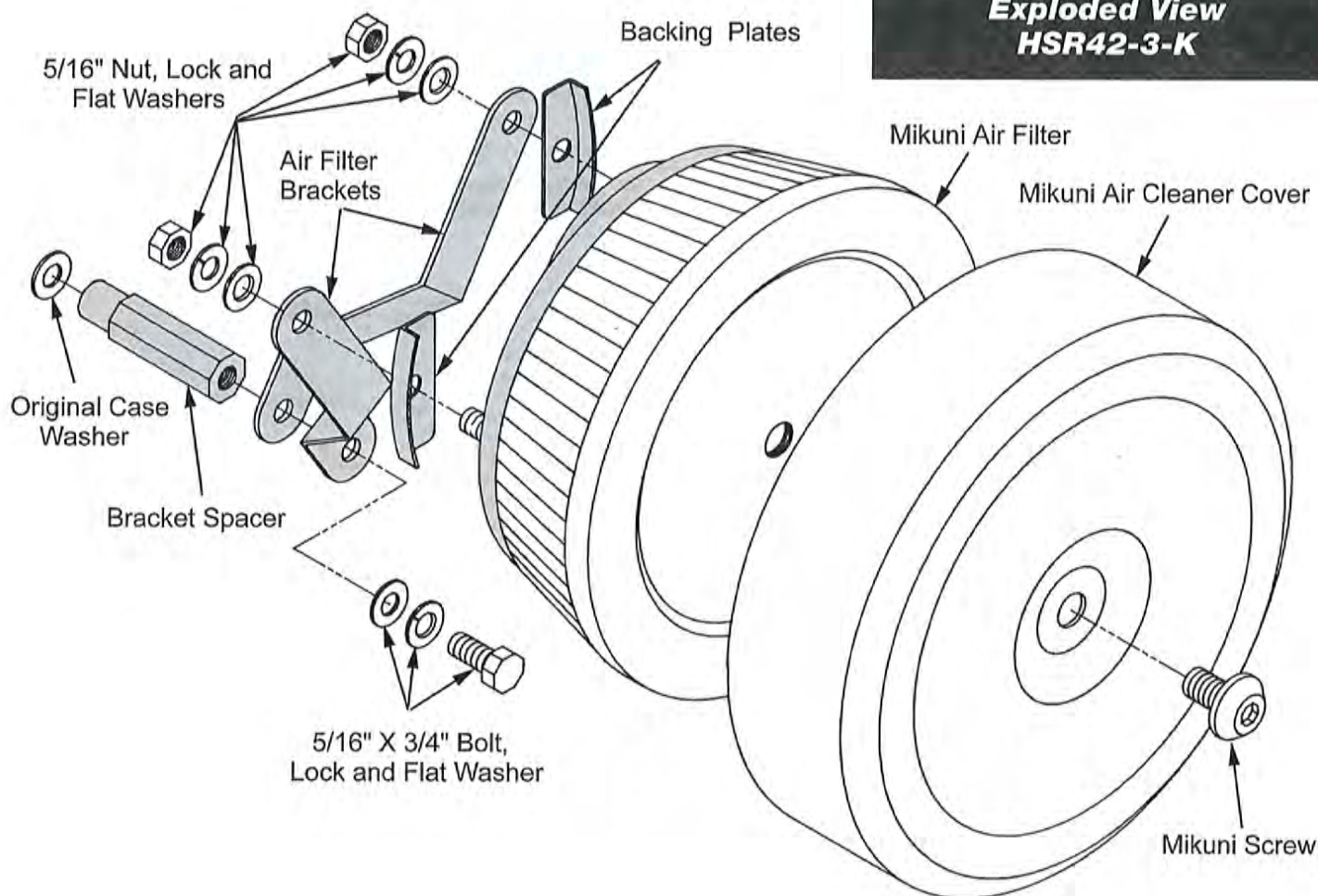
NOTE

In some cases, it may be necessary to bend the brackets slightly to obtain the right fit.



Shovelhead

Kit Installation



- D. Use the enclosed hose clamps to secure the fuel hose to the petcock and the HSR carb. The screw clamp goes on the petcock end and the spring clamp attaches the carb end.
- E. Attach the chrome air filter cover with the enclosed socket head screw.

NOTE

Shovelhead models do not require the use of the HSR vacuum fitting; use the enclosed rubber cap and small clamp to cap off the vacuum fitting.

7. OVERFLOW HOSE

- A. Route the overflow hose between the pushrod tubes and the rear cylinder, then down toward the frame.

8. STARTING

Reconnect the battery at this time and reassemble the remainder of the motorcycle. Turn on the fuel and start the motorcycle as you normally would. After the engine is warmed up adjust the idle to the desired Rpm's. To learn more about your HSR42 refer to the Tuning and Technical portion of this manual.

CAUTION

To properly maintain the HSR42's high performance ability, it is recommended that the air cleaner be inspected at each 5,000 mile interval. Replace or clean the filter as necessary.

HSR42-3-K PARTS LIST

PART #	DESCRIPTION	QTY.
1. TM42-1	CARB ASSEMBLY	1
2. HS42/020-42	MANIFOLD	1
3. HS42-018-42	RUBBER FLANGE	1
4. TMX/002-32	CLAMP, HOSE	1
5. Z70/042	FLAT WASHER, 5/16"	6
6. RS36/27-075	BOLT, 5/16" x 3/4"	4
7. RS36/58	RING, MANIFOLD	2
8. RS36/23	CHOKE BRACKET	1
9. 990-662-002	CHOKE CABLE ASS'Y	1
10. HS42/012-250	AIR CLEANER, K&N	1
11. HS42/021-250	COVER A/C (CHR)	1
12. HS42/027	BRACKET, AIR FILTER	2
13. RS36/55	SPACER, BRACKET	1
14. RS36/47	PLATE, BACK	2
15. RS36/28	NUT, 5/16"	3
16. RS36/54	SCREW, COVER	1
17. Z70/045	CLAMP, HOSE	1
18. RS36/02-17	CLAMP, HOSE	1
19. HS42/028-A	THROTTLE CABLE	1
20. HS42/029-A	IDLE CABLE	1
21. HS42/009	1/4" LOCK NUT	1
22. HS42/010	5/16" LOCK NUT	1
23. Z70/146	CABLE TIE	4
24. Z70/102	HOSE HOLDER	1
25. N100.604-165	MAIN JET #165	1
26. N100.604-155	MAIN JET #155	1
27. N119.054	CAP	1
28. BVK28/128	CLIP	1
29. Z70/043	LOCK WASHER, 5/16"	4
30. RS36/59	THROTTLE ASSEMBLY	1
31. N148.013	RUBBER CAP	1
32. BVK28/128	CLAMP	1

Sportster/Buell

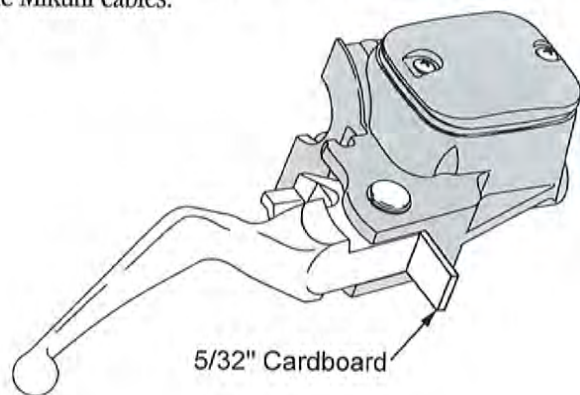
Installation

APPLICATIONS

This installation section applies to HSR42-9-K, HSR42-10-K and HSR42-11-K carburetor kits for 1200 Sportster and Buell S2. These kits were designed for use with the stock '88 and later intake manifold together with Mikuni air cleaner components or the Screamin' Eagle™ air cleaner assembly. Standard length throttle cables are included with these kits.

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.
4. Remove the air cleaner assembly, including the backing plate.
5. Disconnect the choke cable from the carburetor.
6. Disconnect the vacuum hoses and fuel hose from the carburetor.
7. Remove the carburetor from the motorcycle.
8. On '96 and later models, before removing the throttle housing, place a 5/32" piece of cardboard between the brake lever and the lever bracket to prevent damage to the rubber boot and plunger of the front brake light switch during disassembly and re-assembly.
9. Completely remove the stock throttle cables from the motorcycle by unscrewing the cables from the throttle housing; on '96 and later models, use a rocking motion and pull the cables out of the throttle housing. Retain the stock brass cable ferrules for use on the Mikuni cables.



INSTALLATION

1. STARTER SYSTEM (CHOKE)

- A. The HSR42 carb uses the stock choke cable and black plastic nut from your Harley, and the Mikuni choke spring and plunger (items 21 & 22 Exploded View). Remove the black plastic nut from the HSR42 along with the spring and plunger it holds in place. Attach the Mikuni spring and plunger to the stock choke cable and attach it to the carb. Do not over tighten the nut.



PLASTIC NUT



SPRING



PLUNGER

2. THROTTLE CABLES

CAUTION

Because of differences in gas tanks and handlebars, check to make certain that the new cable elbows clear the gas tank as the handlebars are turned from lock to lock.

CAUTION

Refer to item 2, SAFETY PROCEDURES AND CAUTIONS section page III.

NOTE

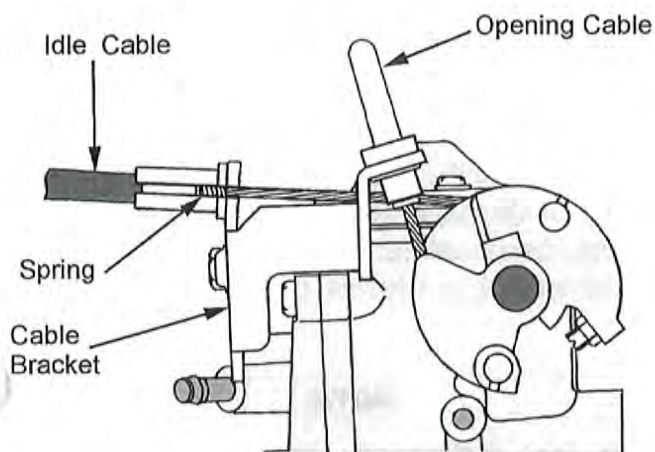
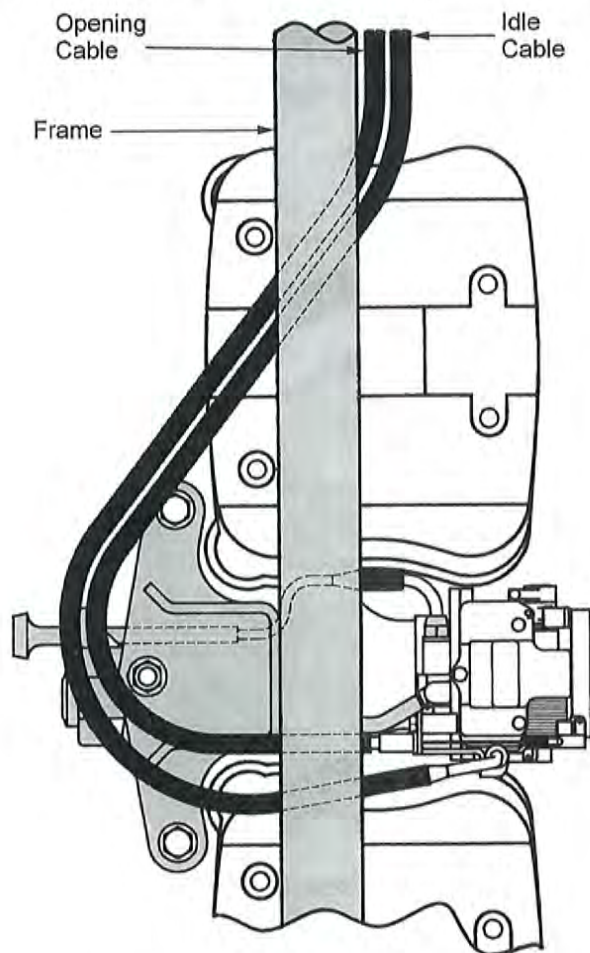
If you need longer throttle cables than the ones included in this kit, you can order the cables listed in the Accessory Section.

Pre '96 models, screw the throttle cable elbows into the throttle housing, closing (idle) cable first; the one with the smaller diameter threads.

'96 and later models, push the cable elbow ends into the throttle housing. Note that the two cables have different diameter elbow ends.

- A. Use the stock cable ferrules with the Mikuni cables. Re-assemble the throttle housing taking care to correctly align the front brake light switch.

- B. Route the throttle cables to the carb along the right side of the frame (as viewed from the rider's position). The cables will make a gentle bend around the top motor mount.



- C. Connect the throttle cables to the carburetor bracket as illustrated; first the closing (idle) cable, then the opening cable.

3. CARBURETOR

CAUTION

Before inserting the carburetor into the stock intake manifold, check the condition of the seal; if it appears damaged, it should be replaced to prevent air leakage.

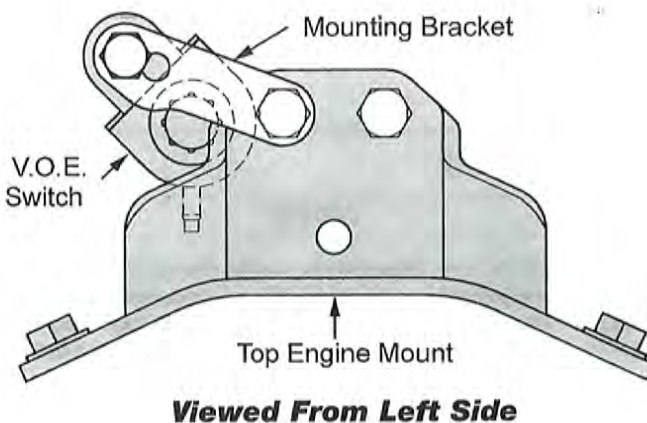
NOTE

Buell models: Before installing the carburetor connect the V.O.E.S. (Vacuum Operated Electronic Switch) to the HSR42's vacuum fitting. The V.O.E.S. rests on the intake manifold like stock, ref: Tuning Section.

- A. Insert the carburetor into the stock Harley-Davidson manifold. As the carb is being inserted, check the choke cable routing so it doesn't become kinked. The carb will fit very snugly into the stock manifold; use grease as a lubricant.

4. V.O.E.S. (Vacuum Operated Electronic Switch)

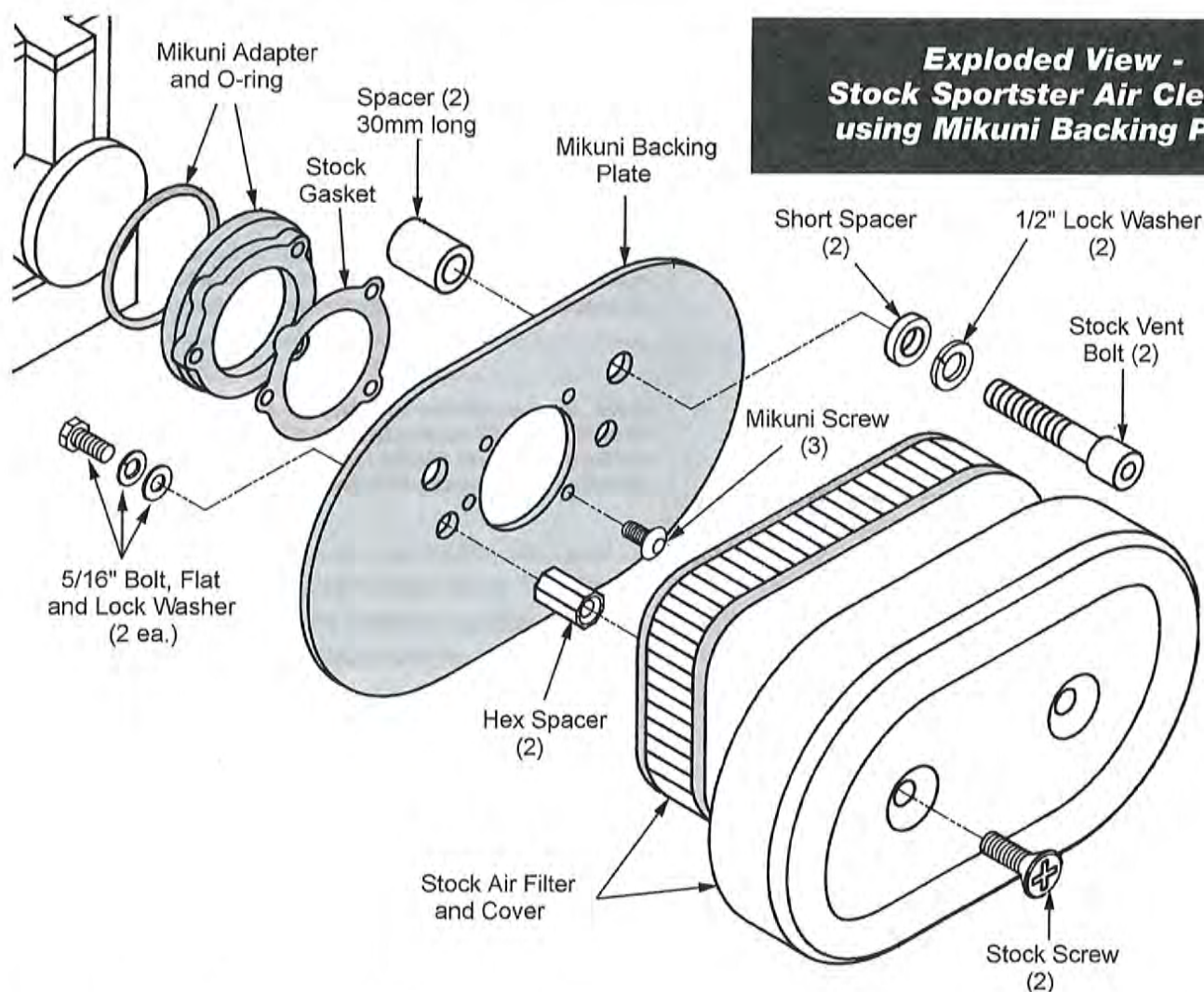
Sportster models: Use the enclosed Mounting Bracket and 5/16" x 3/4" bolt, nut, flat and lock washer to re-attach the V.O.E.S. as illustrated. Connect the vacuum hose to the vacuum fitting on the HSR42, ref: Tuning Section.



- A. Slip the fuel hose onto the HSR42's fuel nipple and secure with the enclosed hose clamp, ref: Tuning Section.

Sportster/Buell

Installation



**Exploded View -
Stock Sportster Air Cleaner
using Mikuni Backing Plate**

5. AIR CLEANER

NOTE

Buell models and Sportsters with Screamin' Eagle air cleaner assemblies use the Mikuni adapter, O-ring and adapter screws with your existing backing plate only. Use the stock mounting hardware for the remainder.

- Insert the enclosed large diameter O-ring into the Mikuni adapter. Attach the adapter to the Mikuni Backing Plate with the enclosed screws.

CAUTION

Do not use the original screws, they're too long.

- Attach the Hex Spacers to the backing plate with the enclosed 5/16" bolts, flat and lock washers as illustrated.
- Attach the Backing Plate to the engine with the stock vent bolts along with the enclosed lock washers and short spacers on the filter side of the Backing Plate and the long (30mm) spacers on the engine side; center the carburetor as the Backing Plate is installed. Securely tighten all the hardware. Do not install the air filter and cover at this time.

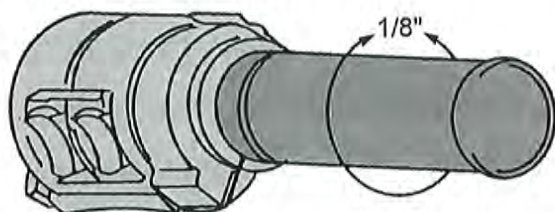
NOTE

For the best performance, we recommend a high performance K&N air filter element.

6. THROTTLE CABLES - ADJUSTMENT

A. Rotate the throttle grip to the full open position and check to see that the throttle valve (slide) opens completely by looking into the carb bore. If the throttle valve doesn't open fully, unscrew the adjuster on the opening cable until it does. This adjustment should be made carefully to get the maximum performance from the carburetor. After the adjustment is made, tighten the adjuster jam nut.

B. After adjusting the opening cable, adjust the throttle free-play with the closing cable to approximately 1/8" as indicated in the following illustration.



NOTE

It is important to adjust the cable in the above manner to ensure that the idle cable operates correctly and can close the carburetor fully.

C. After you have adjusted the throttle cables, make sure that all of the cable jam nuts are tightened securely. Replace the air filter and air cleaner cover.

WARNING

Check to make sure that the throttle cables are routed properly by rechecking the throttle play as the handlebars are turned from side to side; the play should remain constant.

CAUTION

To properly maintain the HSR42's high performance ability, it is recommended that the air cleaner be inspected at each 5,000 mile interval. Replace or clean the filter as necessary.

7. HOSE ROUTING

A. The HSR's overflow hose runs from the bottom of the float bowl behind the rear push rod tubes and in between the crankcases and transmission. Do Not connect it to any other hoses.

NOTE

You will notice that in many instances you will have some remaining hoses. Since this is a "performance" application only, any remaining hoses and related hardware can be removed as they are not required for use with the HSR42.

8. STARTING

Reconnect the battery at this time and reassemble the remainder of the motorcycle. Turn on the fuel and start the motorcycle as you normally would. After the engine is warmed up adjust the idle to the recommended rpm's, 1,000 to 1,100.

PARTS LIST for HSR42-9-K, HSR42-10-K & HSR42-11-K

PART #	DESCRIPTION	QTY.	KIT
TM42-1	CARB ASSEMBLY	1	9, 10, 11
HS42/001	ADAPTER	1	9, 10, 11
HS42/048	SCREW	3	9, 10, 11
HS42/003	O-RING	1	9, 10, 11
HS42/045	BACK PLATE	1	9, 10
HS42/009	1/4" LOCKNUT	1	9 11
HS42/010	5/16" LOCKNUT	1	9 11
HS42/028-A	OPENING CABLE	1	9 11
HS42/029-A	IDLE CABLE	1	9 11
KHS/043	OPENING CABLE	1	10
KHS/044	IDLE CABLE	1	10
HS42/047	SPACER	2	9, 10
N100.604-155	MAIN JET #155	1	9, 10, 11
N100.604-165	MAIN JET #165	1	9, 10, 11
Z70/045	HOSE CLAMP	1	9, 10, 11
Z70/102	CABLE GUIDE	1	9, 10, 11
Z70/146	CABLE TIES	3	9, 10, 11
RS36/27-075	5/16" BOLT	3	9, 10
Z70/042	5/16" FLAT WASHER	2	9, 10
Z70/043	5/16" LOCK WASHER	2	9, 10
HS42/049	SPACER	2	9, 10
RS36/21	BRACKET	1	9, 10
HS42/046	COLLAR, 30MM	2	9, 10

Mikuni Tuning the HSR 42/45

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.

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.

NOTE

The Accessory Section lists the sizes and part numbers of available accelerator pump nozzles.

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.

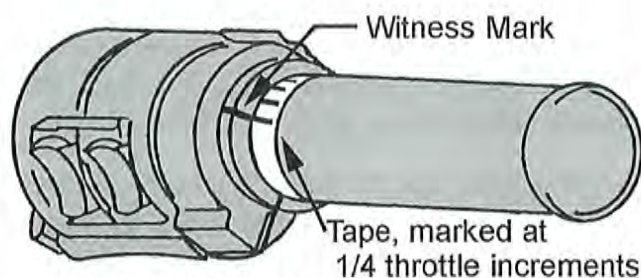
If the throttle is opened with the choke knob pulled out, air will cease flowing through the starter system and it will stop delivering a rich fuel mixture to the engine.

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 HSR, 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.

Mikuni Tuning the HSR42/45

CAUTION

There is simply no point in attempting to tune any carburetor 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 screw 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.

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°F.

With the machine vertical and the engine idling at 1,000 rpm, adjust the air screw in slowly until the idle either slows or becomes irregular, then begin turning the screw 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, this procedure 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.

MAIN SYSTEM

TUNING THE JET NEEDLE: $1/8 - 1/4 \pm$ (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.

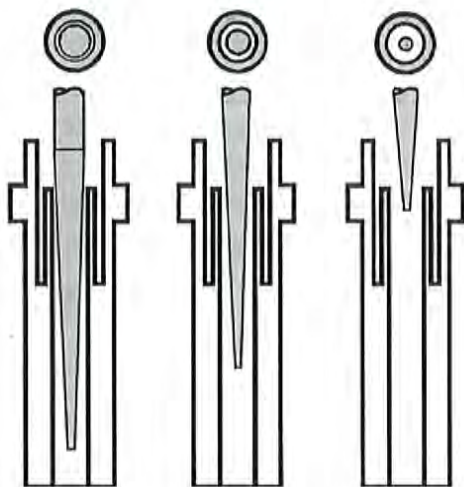
Poor fuel mileage is another sign of richness and because of the way most of us ride our Harleys, that richness is usually the result of a jet needle that is too small. The color of the end of the exhausts is a sign of mixture strength. Dark gray with some black is normal for today's lead free gasolines. 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: $1/4 \pm - 3/4$

(Tapered portion)

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

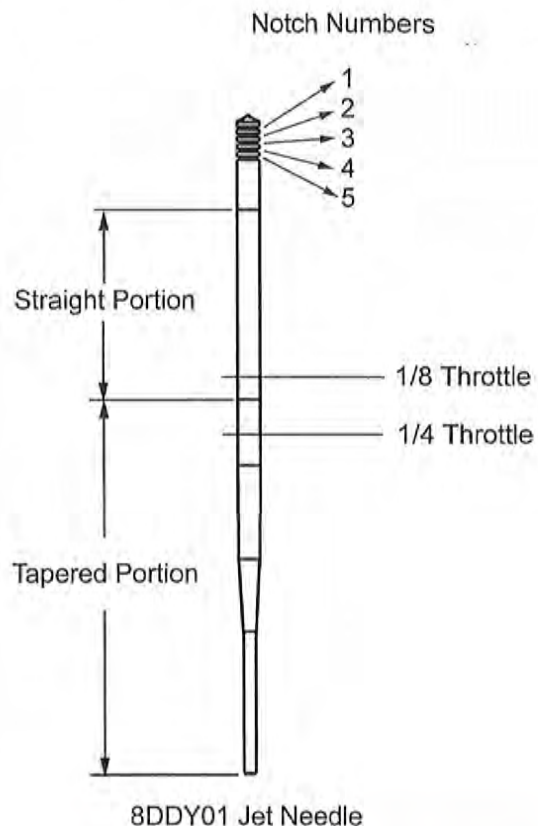


All jet needle and main jet testing should be done with the engine near the middle of its rpm range. Start your acceleration tests in top gear at about 50 mph. The best jet needle position will give the strongest acceleration.

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.



WARNING

If you remove the throttle shaft bolt (item #16 on page 5-9), be certain that you:

- 1) Apply a drop of Blue Loctite™ to the threads.**
- 2) Torque the bolt to 18in./lb.**
- 3) Replace the tab washer and bend it up until it is flush against one of the bolt head flats. It is not normally necessary to remove the bolt to change position of the jet needle.**

Mikuni Tuning the HSR 42/45

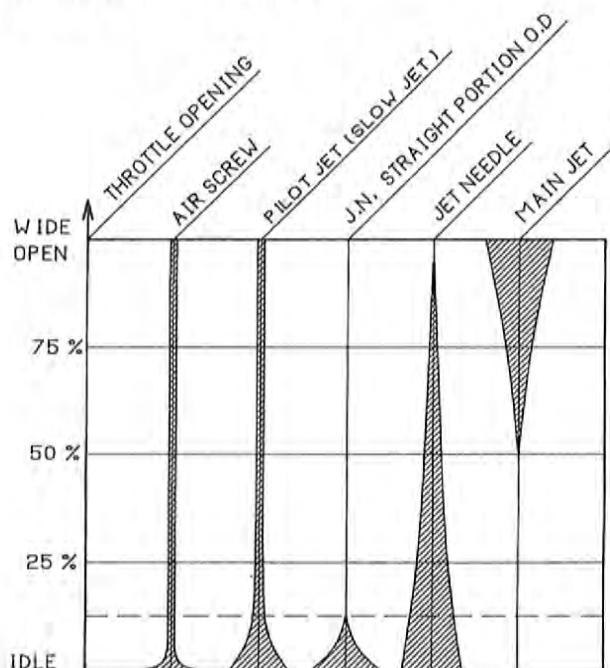
TUNING THE MAIN JET: 3/4 - full

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

FUNCTIONAL TUNING RANGE OF COMPONENT PARTS



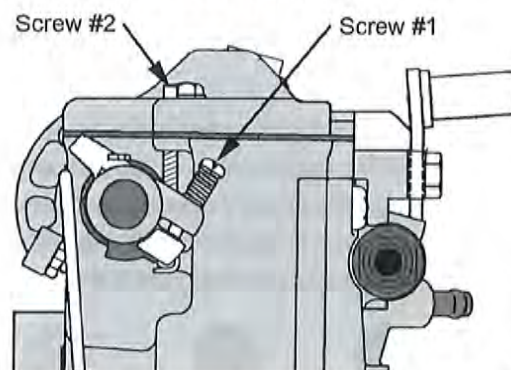
ACCELERATOR PUMP SYSTEM

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.

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

Engines of smaller displacement tend to require the pump stroke to begin with the movement of the throttle. Larger displacement engines require less pump stroke, so the pump can be adjusted to start slightly after the initial throttle movement.



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. Some engines 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 3/4 throttle.

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.

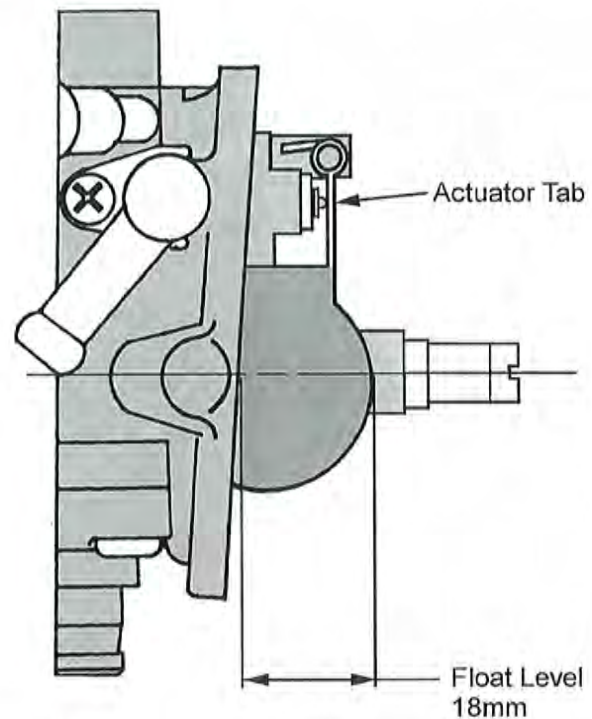
- A. If the motorcycle is to be stored for any length of time the carburetor float bowl should be drained.
- B. The float drain plug (main jet access) should be removed periodically and cleaned of any sediment that may have settled during long periods of use.
- C. DO NOT drill or modify any part of this carburetor 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 5,000 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. Do not use compressed air
4. OILING: After it has dried, re-oil the filter. Sparingly 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.

FLOAT LEVEL ADJUSTMENTS

The fuel level of the carburetor 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.

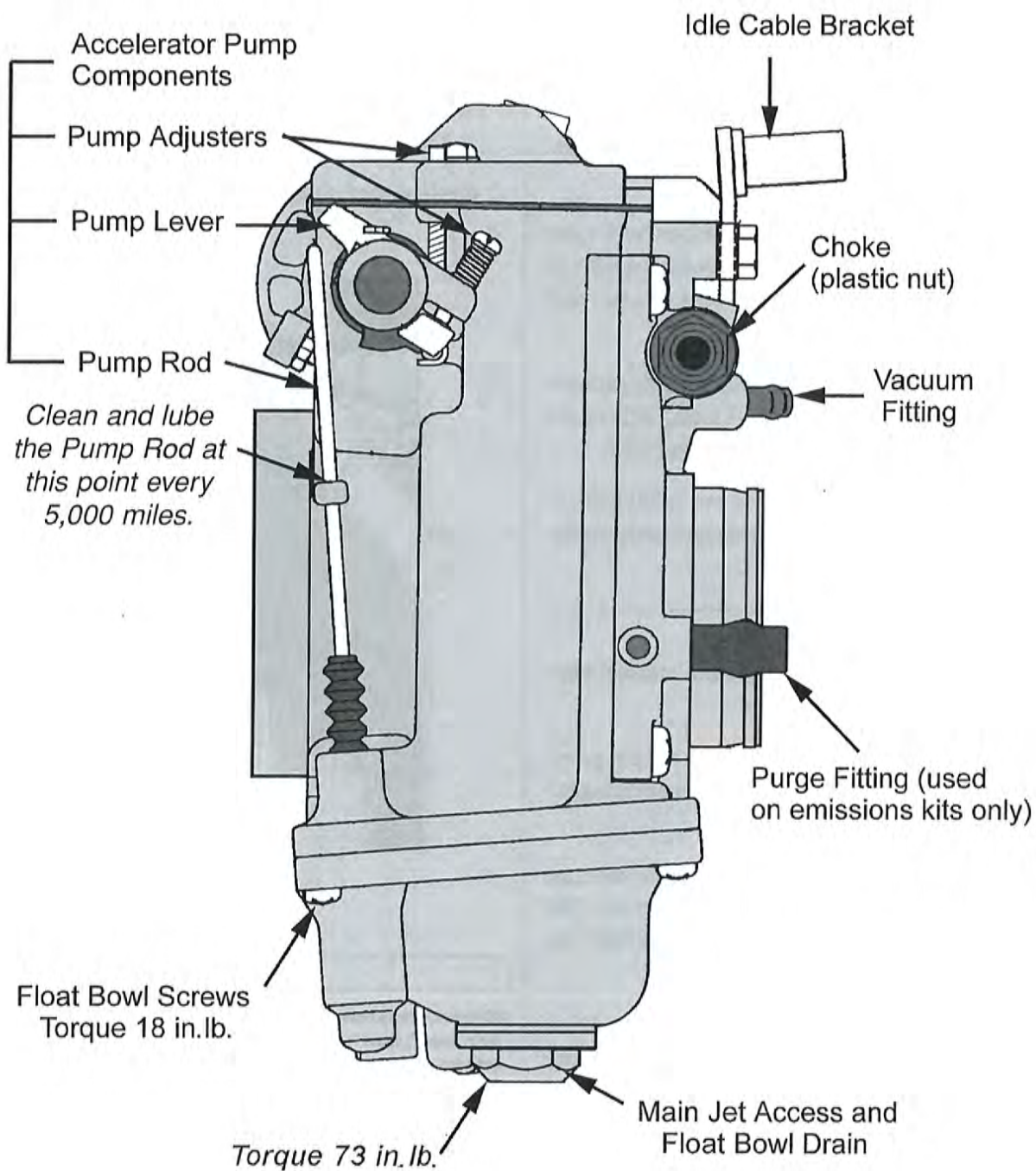
- A. Invert the carburetor and remove the float bowl.
- B. The float assembly's actuator tab should just begin contact with the Needle Valve assembly when the bottom of the float is 18mm from the carburetor bottom surface as shown.
- C. If adjustment is required, adjust by bending the actuator tab

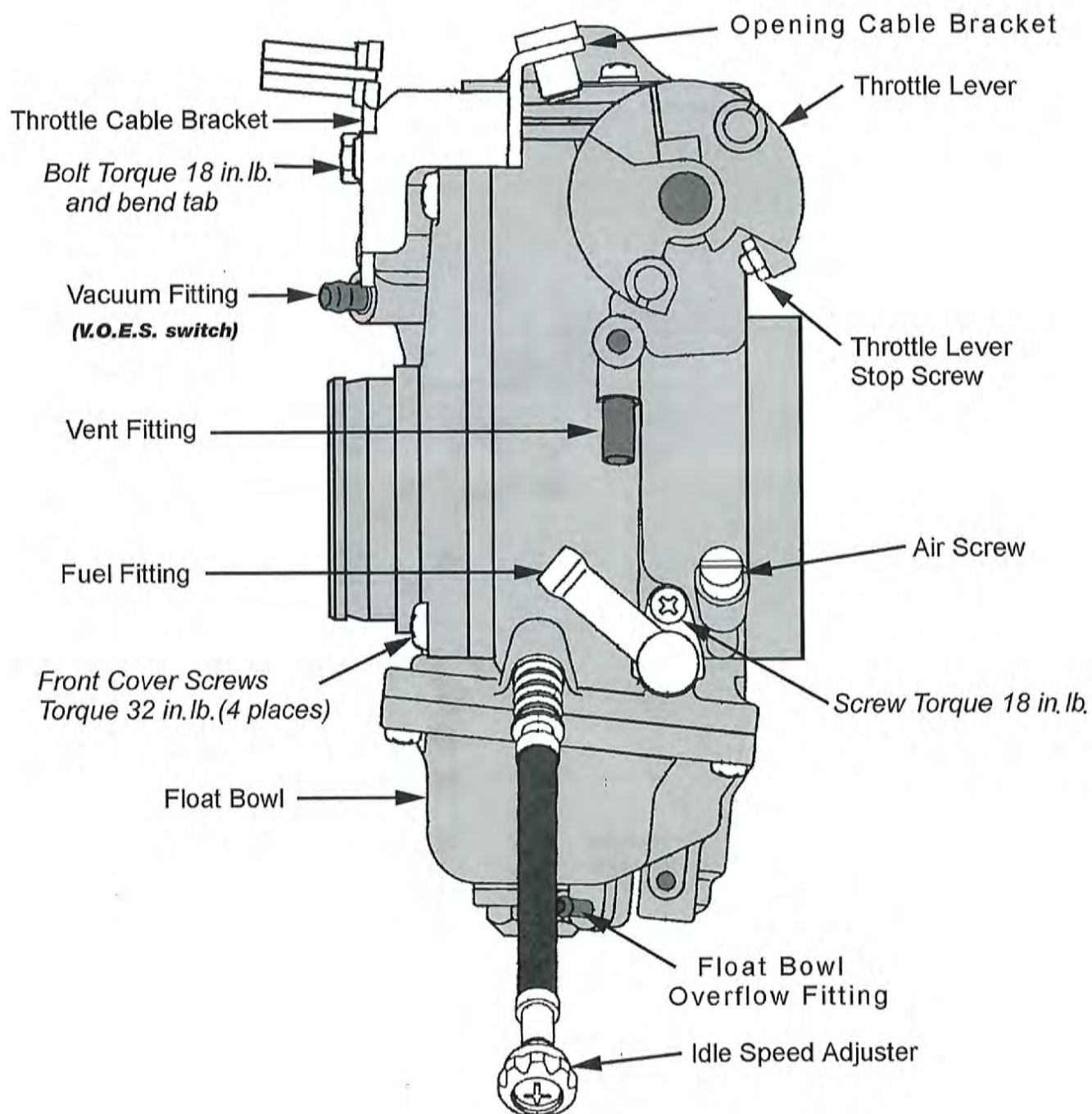


NOTE

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.

HSR External Components



HSR External Components

Mikuni HSR Series Exploded View

HSR42 /45 SMOOTHBORE CARBS

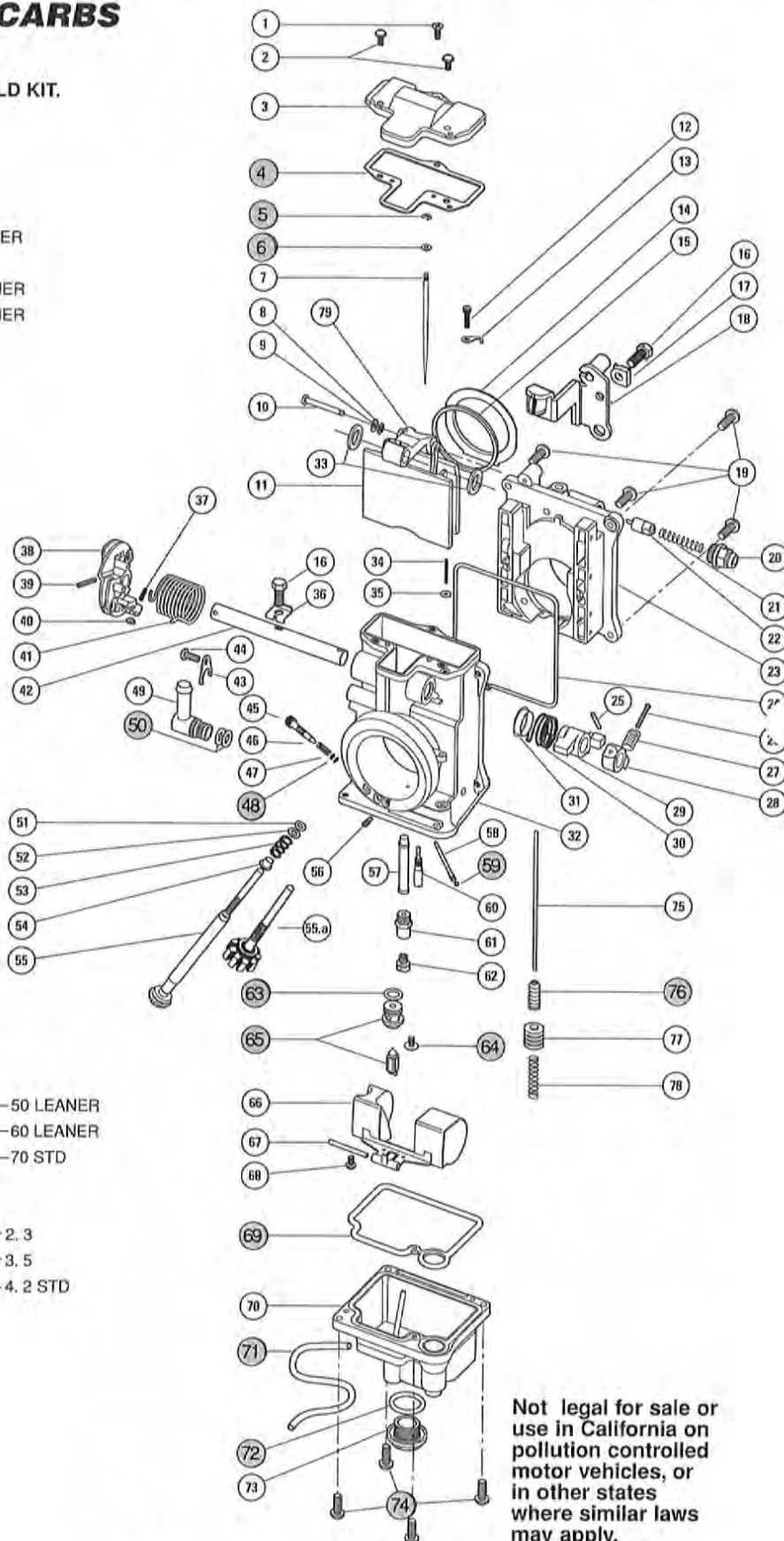
PART NUMBER (000-000)= NO AVAILABLE STOCK

HSR 42/45 REBUILD KIT (KHS-016)

PART NUMBERS CIRCLED ARE INCLUDED IN REBUILD KIT.

NO.	PART NO.	DESCRIPTION
1.	C5-0410-B	Screw, Top Cover (flathead)
2.	CW2-0414-B	Screw, Top Cover
3.	776-39005	Top Cover
4.	TM42/04	Gasket, Top Cover
5.	BS32/126	E-Ring, Jet Needle
6.	826-03002	Washer, Needle Clip
7.	J8-8DDY01-96	Jet Needle
8.	B40/56	E-Ring
9.	B40/10	Packing, Link Lever
10.	834-23041	Pin, Link Lever
11.	TM42/08	Throttle Valve
12.	739-13001	Screw, Needle Retainer Clip
13.	TM42/-16	Clip, Needle Retainer
14.	TM42/13	Sealing Ring, T.V.
15.	TM42/10	Seal, Throttle Valve
16.	TM40/89	Bolt
17.	TM42/38	Plate, Lock Tab
18.	TM42/34A	Bracket, Cable
19.	C2-0514-B	Screw
20.	640-12001	Guide Holder (Starter)
21.	VM14/241	Spring, Starter Plunger
22.	N189.192	Starter Plunger
23.*	TM42/05	Body Ass'y, Bearing & Spigot (N/A)
24.	616-94029	Seal, Spigot Body
25.	BN38/43	Pin, A/P Lever
26.	MC-0316-B	Screw, A/P Adjuster
27.	M12F/46-BB	Spring, A/P Adjuster
28.	TM42/28	Lever, A/P (Zinc)
29.	TM42/21	Lever, A/P (Plastic)
30.	TM42/37	Spring, A/P
31.	E204-040	Ring (Steel)
32.*	TM42SS1/01-0	Mixing Body Ass'y (N/A)
33.	B36/95	Packing, Shaft (Plastic)
34.	TM42/36	Adjusting Screw, A/P
35.	830/205	O-Ring, A/P Screw
36.	TM42/17	Plate, Lock Tab for Shaft
37.	B30/1068	Screw, Throttle Stop
38.	TM42/20	Lever Ass'y, Throttle
39.	N138.019	Pin, Throttle Lever
40.	N3-04	Nut, Throttle Stop Screw
41.	TM42/19	Spring, Throttle Return
42.	700-15011	Shaft, Throttle
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
48.	N133.037	O-Ring, Pilot Air Screw
49.	TM40/27	Fuel Joint
50.	KV/10	O-Ring, Fuel Joint
51.	B30/398	Packing, Idle Adjuster
52.	VM22/138	Washer, Idle Adjuster (Steel)
53.	730-09018	Spring, Idle Adjuster
54.	925-15001	Ring, Idle Adjuster (Brass)
55.	TM42/32	Idle Adjuster Ass'y (Long)
55a.	990-605-065	Idle Adjuster Screw (Short)
56.	BS30/97-00	Air Jet (Blank)
57.	784-430000-Y-6	Needle Jet (723 Series)
58.	TM42/11-70	Nozzle, Accelerator Pump
59.	N124.063	O-Ring, A/P
60.	VM28/486-30	Pilot Jet
61.	TM42/12	Extender, Main Jet
62.	N100.604-160	Main Jet
63.	616-33003	O-Ring, N.V.
64.	VM13/218	Screw w/Washer, N.V. Retainer
65.	786-27001-4.2	Needle Valve Ass'y w/ O-Ring
66.	859-32027	Float Ass'y
67.	BV26/22	Pin, Float
68.	C2-0410	Screw, Float Pin
69.	616-94028	Packing, Float Bowl
70.	TM42/05	Float Chamber Body
71.	N122.028	Hose, Overflow
72.	VM28/254	O-Ring, Drain Plug
73.	TM32/41	Drain Plug
74.	C2-0412-B	Screw, Float Bowl (4)
75.	TM36/44-1A	Rod, A/P
76.	TM36/64	Boot, A/P Rod
77.	TM36/60	Plunger, A/P
78.	VM14SC13/89	Spring, A/P
79.	TM42/03	Lever, T.V.

95 RICHER
96 STD
97 LEANER
98 LEANER



Not legal for sale or use in California on pollution controlled motor vehicles, or in other states where similar laws may apply.

*Denotes parts for HSR45 that have different part numbers than shown for HSR42. Further, jetting components for HSR45 (such as main jet, pilot jet, jet needle, needle jet, etc.) may be different from those in HSR42.

OVERFLOW

Check for:	Remedy:
1. Worn needle valve	1. Replace.
2. Improper fuel level in float bowl	2. Adjust level.
3. Damaged float bowl O-ring gasket.	3. Replace O-ring.
4. Loose float bowl screws.	4. Tighten screws.
5. Pressurized fuel tank.	5. Check for proper fuel tank venting.
6. Broken needle valve O-ring.	6. Replace O-ring.
7. Foreign matter in needle valve	7. Clean.

POOR IDLING

Check for:	Remedy:
1. Fuel filler cap not venting.	1. Replace filler cap.
2. Idle speed improperly adjusted.	2. Adjust idle speed.
3. Clogged bypass or outlet.	3. Clean carburetor.
4. Clogged pilot jet.	4. Clean jet.
5. Loose pilot jet.	5. Tighten jet.
6. Air leak in system.	6. Tighten manifold or hose clamps.
7. Choke not fully closed.	7. Adjust cable.
8. Tank vent blocked.	8. Remove blockage from hose or passage.

POOR FUEL ECONOMY

Check for:	Remedy:
1. Fuel filler cap not venting.	1. Replace filler cap.
2. Fuel level too high - (overflows)	2. Adjust level.
3. Loose jets.	3. Tighten jets.
4. Choke not fully closed.	4. Adjust cable.
5. Dirty air cleaner.	5. Clean or replace.
6. Accelerator pump rod sticking	6. Clean and lube rod

POOR ACCELERATION

Check for:	Remedy:
1. Clogged accelerator system.	1. Clean
2. Clogged pilot jet.	2. Clean.
3. Fuel level too low.	3. Adjust level.

HARD STARTING

Check for:	Remedy:
1. Choke not operating properly.	1. Adjust cable.
2. Dirt in carburetor.	2. Clean.
3. Air leak in system.	3. Tighten manifold or hose clamps.
4. Pumping of throttle before starting engine.	4. Do not open throttle before starting.

POOR PART THROTTLE PERFORMANCE

Check for:	Remedy:
1. Fuel filler cap not venting.	1. Replace filler cap.
2. Fuel level incorrect.	2. Adjust level.
3. Main jet loose.	3. Tighten jet.
4. Air leak in system.	4. Tighten manifold or hose clamps.
5. Dirt in float bowl.	5. Clean.
6. Dirty air filter.	6. Clean or replace.

POOR HIGH SPEED PERFORMANCE

Check for:	Remedy:
1. Fuel filler cap not venting.	1. Replace filler cap.
2. Loose main jet.	2. Tighten jet.
3. Incorrect fuel level.	3. Adjust level.
4. Strainer in fuel tank dirty.	4. Clean.
5. Clogged main jet	5. Clean

OPTIONAL TUNING COMPONENTS AND ACCESSORIES FOR HSR42/45

1. Low and high speed jets for HSR42/45

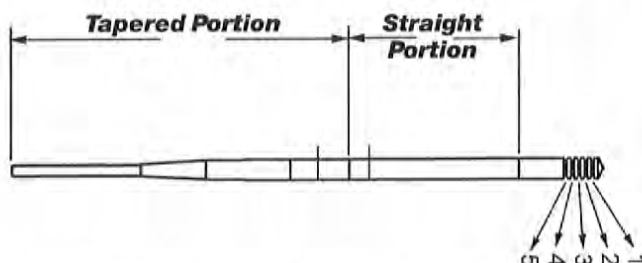
VM28/486-(Size) Pilot (Low), increments of 2.5
(standard - 30, normal range - 20 to 35)

N100.604-(Size) Main (High), increments of 2.5
(standard - 160, normal range - 150 to 180)

2. JET NEEDLES

HSR42		HSR45
J8-8DDY01-95	Richer	J8-8CFY02-95
J8-8DDY01-96	Standard	J8-8CFY02-96
J8-8DDY01-97	Leaner	J8-8CFY02-97
J8-8DDY01-98	Leaner	J8-8CFY02-98

Standard HSR42/45 Jet Needle straight diameter is 2.96mm. This portion of the jet needle affects tuning from idle to approximately 1/4 throttle opening.



3. ACCELERATOR PUMP NOZZLES

TM42/11-50	Leaner
TM42/11-60	Leaner
TM42/11-70	Std HSR42/45

4. SHORT IDLE SCREW (Optional)

990-605-065 - Idle screw (Short)
(See Item #55a in exploded view of carb.)

NOTE: Do not modify the idle screw or any of its component pieces. If the screw is removed, be sure it is re-installed with the components in place as illustrated.

5. REPLACEMENT K&N AIR FILTER AND CHROME COVERS

HS42/012	K&N air filter for HSR carb kits
HS42/021-250	Cover used with K&N filter
HS42/006	Cover used with stock airbox

6. EVOLUTION HEAD BREATHER KIT (Optional) (1991 to present Sportsters, '93 to present 1340's)

KHS-020	Head breather bolts kit
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7. HSR CARBURETOR REBUILD KIT

KHS-016	Carb rebuild kit
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8. Throttle Cables

Fitment: 1970-95 Harley-Davidson Throttles

HS42/028-A	OPEN - Standard Length (38")
HS42/029-A	CLOSE - Standard Length (38")
KHS/039	OPEN - Dresser Length (47")
KHS/040	CLOSE - Dresser Length (47")

Fitment: 1996 to present Harley-Davidson

KHS/043	OPEN - Standard Length (38")
KHS/044	CLOSE - Standard Length (38")
KHS/041	OPEN - Dresser Length (47")
KHS/042	CLOSE - Dresser Length (47")

Note: Open = Throttle Close = Idle

9. APPAREL (Sport shirts, T shirts and hats)

Sports shirts, asst'd colors MK-407-8-(size)
Embroidered Mikuni Logo

T-shirts, white MK-407-5-(size)
"Diamond" Mikuni Logo

T-shirts, white MK-407-9-(size)
"Oval" Mikuni Logo

(Available sizes: S, M, L & XL)

Hats (white and black) MK-408-8-UNV
Embroidered logo, cotton

NOTE: These parts may be ordered through your local Mikuni dealer.

Thanks, and enjoy the ride!

Mikuni HSR Series Applications

All Big Twin 1340 Evolutions Easy Kits

1990 to 1995 HSR42-1-K

1990 to 1995 HSR42-1-K-NC

(Note: This kit has no chrome cover.)

1996 to 1997 HSR42-7-K

(Note: This kit has the new style push-in cables.)

Total Kits

1984 to 1995 HSR42-2-K

(Note: The '93-95 models will require the optional breather kit number KHS-020.)

1996 to 1997 HSR42-8-K

(Note: This kit comes complete with the breather kit and includes new push-in cables.)

Legal Kits

1990 to 1994 1340 Evolution HSR42-4-K

1995 only 1340 Evolution HSR42-5-K

(Note: 1995 models have screw-in cables.)

1996 to 1997 1340 Evolution HSR42-6-K

(Note: 1996-97 models have push-in cables.)

Race Kits

Built 80ci and up Evolutions HSR45-2-K

(Note: This kit includes everything in Total Kit. Manifold may not fit a stroker motor. The '93 and later models will require the optional breather kit number KHS-020.)

Built Customs / Stokers HSR45-3-KR

(Note: This kit does not have a manifold. Other aftermarket manifolds can be used, ask your dealer. '96 and later models require push-in cables.)

1200 Sportster and Buell S2

Easy Kits

1994 to 1995 1200 Sportster HSR42-9-K

1996 to 1997 1200 Sportster HSR42-10-K

(Note: Kits include special air filter backing-plate and hardware.)

1994 to 1995** 1200 Sportster and Buell S2 HSR42-11-K

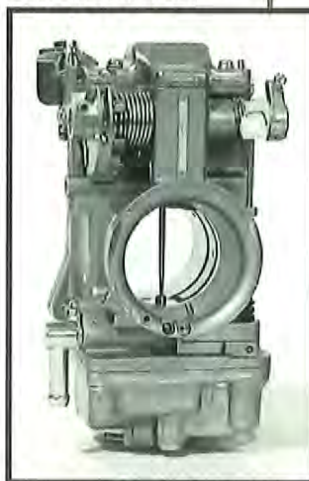
(Note: Kit is designed to use Screamin' Eagle air filter system on Sportsters. Your Buell retains the stock air cleaner assembly.)

Shovelheads

Total Kit

1970 to 1984 All Models HSR42-3-K

Standard



Polished

Individual Carburetors

42mm Carb Only TM42-1

42mm Carb Polished TM42-1P

45mm Carb Only TM45-1

45mm Carb Polished TM45-1P

Note: Individual carbs sold without choke cables. All optional choke cables are sold separately (Part Number 990-662-002) or use stock H-D CVK carb choke cable.

Throttle Cables

Fitment: 1970-95 Harley-Davidson Throttles

HS42/028-A OPEN - Standard 38" Length

HS42/029-A CLOSE - Standard 38" Length

KHS/039 OPEN - Longer 47" Length

KHS/040 CLOSE - Longer 47" Length

Fitment: 1996 to present Harley-Davidson

KHS/043 OPEN - Standard 38" Length

KHS/044 CLOSE - Standard 38" Length

KHS/041 OPEN - Longer 47" Length

KHS/042 CLOSE - Longer 47" Length

Note: Open = Throttle Close = Idle

Please note: All Carb Kits come with standard length 38" cables. Your dresser or custom may require longer 47" cables. Ask your dealer for details.



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