

# Tuning the HSR42/45/48 Carburetors

Your Mikuni HSR is fitted with the tuning parts we found to work with the great majority of engine performance modifications. However, the large number of differing exhaust systems and air cleaners available makes it virtually impossible to accommodate all possible combinations with one carburetor set-up.

Your HSR will almost certainly run correctly on your engine without exchanging any parts. But, if it doesn't, you may alter its tuning to suit your engine's needs by following this guide.

Some exhaust system designs strongly interfere with carburetor tuning. For instance, it is very difficult to get smooth and responsive carburetion through the entire rpm range with open straight pipes and other un baffled exhausts. In addition, very small volume, small diameter mufflers are often 'seen' by the engine as straight pipes and present similar tuning difficulties.

Very long duration cams often cause relatively poor running below 3,000 rpm, depending upon the individual cam's intake valve closing point. Such cams cause reverse airflow out the mouth of the carburetor (often called "reversion" or "stand-off") that can be mistaken for a carburetor tuning problem.

Harley-Davidson Screamin' Eagle performance parts are proven and predictable. If you have any doubts

about a particular exhaust system, air cleaner or ignition, you may substitute the Harley Screamin' Eagle parts as a "reality check."

When re-tuning is required, it usually involves small alterations to the idle and/or main system. The following pages supply enough information to make such alterations relatively simple.

Please note that there is no point in attempting to tune any carburetor unless the engine is sound and in a good state of tune. If you have any doubts about the general condition of your engine, have it checked by your dealer or an experienced mechanic before attempting to fine-tune your Mikuni.

## **AIR LEAKS:**

We have found that some Harley-pattern engines develop minor air leaks between the manifold and heads. These leaks affect air/fuel mixtures at low throttle settings and can be troublesome at idle. For best performance, it is important that you test for and eliminate any such leaks.

It is easy to test for intake manifold air leaks: With the engine warm and idling, spray WD-40 or similar paint-safe liquid around the junctions of the manifold, carb and heads. If the engine changes from its steady idle, if it surges or misses, then there is an air leak that should be corrected.

**NOTE:**

For the quick and accurate analysis, when fine-tuning your HSR, we recommend using "witness" marks on the throttle grip and throttle housing. Use masking tape on the grip and an indicator mark on the throttle housing. Mark the tape in  $\frac{1}{4}$  throttle increments from idle to full throttle. You can then accurately identify the throttle opening and adjust the proper tuning components.

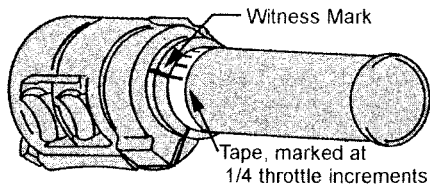


Figure: T1

### HSR TUNING SYSTEMS:

The HSR-carburetor is divided into four interdependent systems:

1. The choke system
2. The idle system
3. The main system
4. The accelerator pump system

Each of these systems has its major effects in a different throttle range. While there may be some overlap, each system can generally be treated as though it is completely responsible for its range of throttle settings. Three of the systems have replaceable components that allow fine-tuning should the need arise.

### THE CHOKE SYSTEM:

The choke system's purpose is to provide the rich air/fuel mixture an engine needs to start and run reliably when it is cold. There are no replaceable tuning parts in the HSR choke mechanism.

The choke is designed to work correctly with the throttle closed. Opening the throttle greatly reduces the action of the starter (choke).

**NOTE:**

Make sure that the stock Harley-Davidson choke cable is fully seated in the metal elbow at the carburetor end of the cable assembly (see Installation Instructions). Harley's cable is stiff and can fail to fully seat in the elbow. This condition results in poor mileage and a poor idle.

The Mikuni choke cable is more flexible and less likely to jam. Still, it is best to check to be sure the cable is installed correctly.

### TUNING THE IDLE SYSTEM: (Idle - 1/8 throttle)

The HSR idle system has two tunable components: the **Pilot Air Screw** and the **Pilot Jet**. The air screw's purpose is to fine-tune the idle mixture. The pilot jet controls the total amount of fuel passing through the idle system. The pilot jet can be exchanged for a richer or leaner one if needed (see the note on the following page).

The pilot air screw is set at two turns out from the factory. This is the position we have found to be right most of the time. If the screw position has been altered, gently bottom it and re-open it two full turns.

Next, run the engine until it reaches normal running temperature.

With the engine idling between 1,000 - 1,050 rpm, adjust the pilot 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 to idle irregularly.

## TM-3

Count the number of turns between the two positions. Set the air screw mid-way between these too-rich and too-lean positions.

Use the **Idle Adjuster** to re-set the idle speed.

If the engine starts to get too hot during the adjustment procedure, the resulting idle mixture 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:

- 1 If the best idle is achieved with the air screw less than one turn out, the pilot jet is too small and should be exchanged for a larger one.
2. If the engine speed does not slow after two-and-a-half turns out, the pilot jet is too large and should be exchanged for a smaller one.

## TUNING THE MAIN SYSTEM

### NOTE:

### Cam design effects

When testing, consider the rpm effects of any accessory cam you may have installed. Long duration cams tend to perform poorly below some critical minimum rpm. If you attempt to test below this rpm, the engine may seem soft, flat and unresponsive. No carburetor can compensate for the engine being "off the cam."

All jet needle and main jet testing should be done with the engine near the middle of its rpm range, but high enough to be "on the cam." All testing should be done with the engine at normal operating temperature.

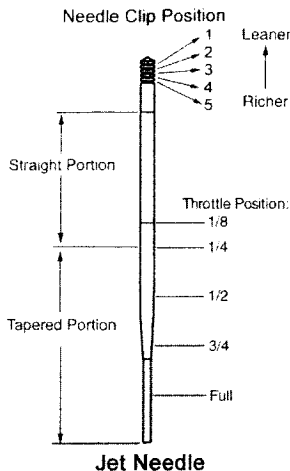


Figure: T2

**JET NEEDLE (off-idle – 1/4 throttle)**  
(see Fig. T2)

The *straight diameter portion* of the jet needle controls the mixture from just above idle to approximately 1/4 throttle. If the mixture is too rich or too lean in this throttle range, the needle will need to be exchanged for one with a larger or smaller diameter.

HSR jet needles are available in four sizes. Only the diameter of the straight part of the four jet needles differ. The richest is the "-95" and "-98" is leanest.

### LEAN CONDITION:

If the needle is too lean, part throttle acceleration will be flat (remember the possible effects of cams & exhausts). There may also be some detonation during part throttle acceleration in the 2500 - 3000 rpm range, (although this may have other causes). A lean needle also results in an abnormally slow warm-up. If any of these conditions exist, install a one size richer needle and compare the performance

**RICH CONDITION:**

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

Poor fuel mileage is another sign of an over-rich condition. Fuel mileage is usually measured at cruising speeds (60 - 70 mph) where the jet needle is the main mixture control. Poor mileage at these speeds can be corrected by fitting a leaner jet needle. Raising or lowering the jet needle has no effect on fuel mileage below about 70 mph.

**JET NEEDLE (1/4 - 3/4 THROTTLE)**

The tapered portion of the jet needle begins to rise out of the needle jet at about 1/4 throttle. From that point until the main jet takes over near 3/4 throttle, the jet needle taper is the main control of mixture strength.

**LEAN CONDITION:**

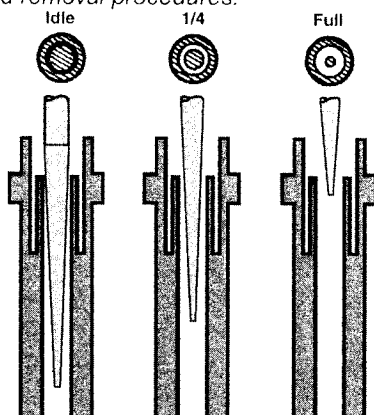
If acceleration seems soft or flat and the engine is slow to respond when the throttle is quickly opened from the 1/2 to the 3/4 position, the mixture is too lean. Raise the needle one notch and repeat the test.

**RICH CONDITION:**

If acceleration is crisp but the engine hesitates or staggers as the throttle is quickly closed from 3/4 to 1/2 throttle, the mixture is too rich. Lower the needle one notch and repeat the test. The needle will be correct when acceleration is crisp at mid-rpm yet the engine does not load up during throttle shut down.

**NOTE:**

See the "How To" section at the back of this manual for jet needle adjustment and removal procedures.



Cutaway view of the relationship between the jet needle and needle jet at various throttle openings.

**Figure: T3**

**MAIN JET 3/4 — full throttle**

The main jet controls fuel flow from 3/4 to full throttle

**METHOD ONE:**

An accurate method for choosing the correct main jet is to accelerate at full throttle between two points and note the speed at the second point.

1. Select markers that are far enough apart so the engine gains about 2,000 rpm (in third or fourth gear) between the two markers.
2. When you pass the first marker, quickly roll the throttle fully open and note the speed as you pass the second marker.
3. The jet that gives the highest speed is the correct one. This method is simple but effective.

**METHOD TWO:**

Use a dynamometer. The main jet that produces the most power is the correct one. If two jets deliver the same power, use the smaller one. Be sure to provide adequate cooling.

## ACCELERATOR PUMP

(see Fig. T4)

The accelerator pump has two adjustments and one replaceable tuning part that can be adjusted or changed to refine the performance of the accelerator pump system.

The accelerator pump injects a metered amount of fuel into the engine when the throttle is opened from or near its closed position.

Screw #1, on the throttle lever, adjusts the starting point of the pump stroke. To start the pump sooner (smaller throttle opening), back the screw out. To start it later, turn the screw in.

Screw #2 adjusts the pump's end point. Best performance is generally achieved when the pump stroke ends before 3/4 throttle.

### NOTE:

The accelerator pump nozzle size (#50, #60 or #70) determines the rate at which fuel is delivered to the throat of the carburetor. A larger nozzle delivers fuel at a higher rate (richer) over a shorter time than a smaller one.

## STANDARD SETTINGS & ADJUSTMENTS

The standard nozzle size is #70. If the engine seems to run too rich when the throttle is first opened, the nozzle may be too large and the fuel delivery rate too high. In this case, fit a smaller nozzle.

The #1 screw is normally adjusted to establish a gap of about 2mm (about the thickness of a nickel) between the white plastic lever and pump rod end. If there is a hesitation just off idle, reduce the gap.

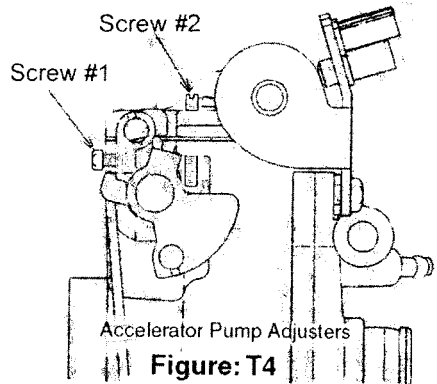


Figure: T4

The #2 screw is normally adjusted to stop the pump action at about 3/4 throttle. This setting should meet most requirements including acceleration from low rpm. If you tend to downshift before accelerating from low speeds and/or have a lighter bike then you might consider shortening the pump stroke.

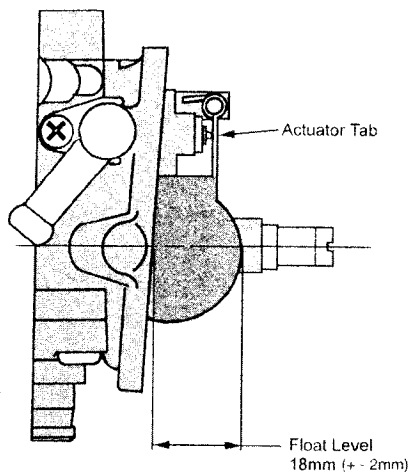
### NOTE:

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-nose pliers. Nozzle adjustment should be made with a minimum of pump strokes to avoid flooding the engine.

## MAINTENANCE

There are few moving parts in the HSR series carburetors and they do not require frequent servicing. However, here are a few suggestions that, if followed, will assure good performance season after season.

1. If the motorcycle is to be stored for more than a couple of weeks, drain the float bowl.
2. Periodically remove and clean the float bowl drain plug.
3. If a jet or passage does become plugged, use only carburetor cleaner and compressed air. Drill bits will alter the size and tuning.



**Figure T5: Float Level**

### FLOAT LEVEL ADJUSTMENT

1. Hold the carburetor so that the float pivot pin is horizontal as shown in Fig. T5 above.
2. Tilt the carb until the float touches the spring-loaded pin in the needle. Do not depress the pin.
3. The distance from the carb's bottom surface to the 'top' of the float should be 18mm, plus or minus two.
4. Bend the actuator tab to adjust float level.

### MIKUNI / K&N AIR FILTER

K&N air filters (Mikuni, Screamin' Eagle and many others) do not need frequent cleaning. A cleaning interval of once a year or 5,000 miles is often enough. However, if you ride in very dusty conditions, clean the filter when it is obviously dirty.

1. Tap the element to dislodge embedded dirt; then gently brush with a soft bristle brush.
2. Roll the filter element in a large shallow pan of K&N air filter cleaner (Simple Green, 409, etc.) with the depth set to  $\frac{1}{4}$  of a pleat. Remove immediately and let sit

for approximately 10 minutes.

**IMPORTANT:** Do not use gasoline or cleaning solvent to wash the filter element, as this will damage the filter.

3. Rinse the element with low-pressure water. Always flush from the inside of the filter to ensure that dirt is washed out of the filter and not into it. **IMPORTANT:** Air dry only; do not use compressed air.
4. When the filter is dry, sparingly apply K&N filter oil with one pass per pleat. Wait 10 minutes and re-oil any white spots.

### HOW TO REMOVE & REPLACE

#### **WARNING**

*Please do not disassemble the throttle lever linkage. It is not normally necessary to remove the throttle shaft bolt to change position of the jet needle. However, if you do remove the bolt, be certain that you:*

1. Apply blue Loctite™ to the threads.
2. Torque the bolt to 18 in. lb (1-1/2 lbs/ft)
3. Bend the tab washer flush against a flat on the bolt head.

### JET NEEDLE

1. Unscrew the Idle Adjuster to bottom the throttle valve (slide).
2. Remove the top cover.
3. Loosen the Allen screw on the slide (2.5mm wrench).
4. Swing the clip aside and remove the jet needle. Save the plastic washer under the jet needle E-ring.

### To reassemble:

Reverse steps 1 through 4. Be sure to replace the plastic washer and snug the Allen screw. Be certain that the clip is over the top of the E-Ring.



# TROUBLE SHOOTING GUIDE

**OVERFLOW:** (Fuel runs from tube on bottom of float bowl or from the breather on side of carburetor.)

**Possible causes:**

1. Foreign matter around fuel needle valve & seat including paint flakes, rust or bits of fuel hose.
2. Factory one-way tank vents can cause pressure build-up in the tank.
3. Deteriorated gasoline may cause the fuel needle valve to stick

**POOR FUEL ECONOMY:** (Mikuni HSR carbs normally deliver fuel economy very close to that of a stock Harley.)

**Possible causes:**

1. The choke cable must be fully bottomed in the metal elbow (at carburetor end). There must be some perceptible free-play in the choke knob.
2. Current stock Harley tank vents do not allow gasses to leave the tank and pressure may develop from engine heat. Open the vent to allow two-way air flow.
3. An incorrect jet needle or pilot jet for a particular tuning set-up or altitude can reduce fuel mileage. The speed range in which mileage is usually recorded is controlled by the jet needle and pilot jet.
4. Loose pilot or main jets adversely affect fuel mileage.

**POOR IDLE:** (Irregular idle speed; too rich or too lean.)

**Possible causes:**

1. Choke cable routing: (see "POOR FUEL ECONOMY" section)
2. Air leaks: A Harley-pattern engine

may have air leaks around the intake manifold seals. Such leaks result in an irregular or unreliable idle that does not respond properly to air screw adjustment.

2. The pilot air screw is not adjusted correctly resulting in a too rich or too lean idle mixture setting.
3. A pilot jet that is too large or too small can cause the engine to load-up or lean-out to the point where it stalls.
4. A loose pilot jet will adversely affect idle performance (too rich).

**POOR PART-THROTTLE (1/8-1/4)**

**PERFORMANCE:** (An overly rich or lean condition at normal cruise speeds. Detonation at part-throttle)

**Possible causes:**

1. Choke cable routing: (see "POOR FUEL ECONOMY" section)
2. A too rich or too lean jet needle for engine tuning set-up or for operating altitude. Highly tuned engines often require leaner jet needles as do motorcycles operating at high altitude.
3. Factory one-way tank vents can cause pressure build-up in the fuel tank.
4. Harley-pattern engines may have air leaks around the intake manifold seals. An air leak can lead to a lean running condition and possible detonation at part throttle.
5. A loose main jet can result in an overly rich mixture.



## TM-9

### **POOR FULL THROTTLE PERFOR-**

**MANCE:** (Detonation, flat acceleration, misfiring.)

#### **Possible causes:**

1. One-way tank vents (located in the tank cap on most models) may fail to allow enough air into the tank to replace fuel flow at high throttle openings. The result is a partial vacuum and fuel starvation.
2. A clogged fuel filter or petcock screen (located inside tank) can result in fuel starvation.
3. A too large or too small main jet can lead to poor power output.
4. A partially clogged main jet may allow enough fuel flow for part throttle operation and yet starve the engine at full throttle.
5. Air filters can become dirty enough to restrict air flow and power output. This is more likely to be a problem with the stock filter than aftermarket filters.

### **BACKFIRE OUT CARBURETOR:**

(Usually when the engine is cold)

#### **Possible causes:**

1. When an engine is cold, this can be considered normal. A cold engine does not vaporize fuel completely which can result in an overly-lean mixture and backfiring through the carburetor.
2. Cams with early (compared to stock) intake valve opening angles encourage backfiring at low rpm.
3. Some very open or incorrectly designed exhaust systems encourage backfiring. Stock length and diameter header pipes together with slip-ons, like those from Harley-Davidson, typically do not have this problem.
4. If the accelerator pump adjustment

is set to start too late, backfiring may occur due to an overly lean mixture just off idle.

### **BACKFIRING IN EXHAUST:**

#### **Possible causes:**

1. Backfiring when the throttle is closed (especially noticeable from high rpm) is not necessarily caused by lean mixtures. However, lean mixtures can contribute to its intensity.
2. High performance mufflers with large exit area or low-restriction baffles contribute to exhaust backfiring.
3. An exhaust system air leak can cause or intensify exhaust popping. Air entering at the junction of the header pipes and mufflers can cause excessive popping upon deceleration.
4. Out-of-time ignition together with misfiring may lead to loud backfiring. Such backfiring usually occurs irregularly and at large throttle openings.

## HSR Accessories:

These parts may be ordered through your local Mikuni dealer

### Pilot Jet: VM28/486-(Size)

Throttle range: 0 - 1/4

Std. size: 25

Normal range: 17.5 to 30

(Increments of 2.5)



### Main Jet: N100.604 - (Size)

Throttle range: 3/4 - full

Std. size: 160

Normal range: 150 to 210

(Increments of 2.5)



### Jet Needle:

Throttle range: 1/8 - 3/4

**HSR42**

**HSR45/48**

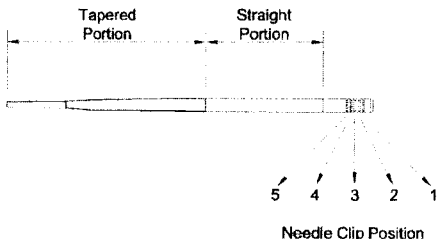
Richer: J8-8DDY01 - 95 J8-8CFY02 - 95

Richer: J8-8DDY01 - 96 J8-8CFY02 - 96

Std: J8-8DDY01 - 97 J8-8CFY02 - 97

Leaner: J8-8DDY01 - 98 J8-8CFY02 - 98

(Standard HSR Jet Needle straight diameter portion is 2.97 mm. This portion of the needle affects tuning from idle to approximately 1/4 throttle opening.)



## Accelerator Pump Nozzles

Leaner	TM42/11-50
Std. for Sportster	TM42/11-60
Standard	TM42/11-70

## Mikuni Jet Kit

Tuning Kit for HSR42/45:

### **KHS-025**

Jet Kit Contains:

- (18) Main Jets (2 each 150 thru 170)
- (10) Pilot Jets (2 each 22.5 thru 35)
- (3) Needles: -95, -96, -97 (42 only)
- (2) Pump Nozzle (#60)
- (4) Needle E-Ring Clips & Washers
- (2) O-ring, Pump Nozzle (N124.063)
- (1) Plastic Box

## HSR42/45 Carb Rebuild Kit

Carb Rebuild Kit: **KHS-016**

See exploded view drawing for contents.

## HSR48 Carb Rebuild Kit

Carb Rebuild Kit: **KHS-031**

See exploded view drawing for contents.

## Short Idle Screw

Idle Adj Screw (Short).. 990-605-065

(See item #59a in exploded view)

### **NOTE:**

*Do not modify 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 in exploded view.*

# TM-13

#	PART NO.	DESCRIPTION
1.	C5=0410-B	Screw, Top Cover
2.	CW2=0414-B	Screw, Top Cover
3.	776-39005	Top Cover (42/45)
3a.	111-776-001	Top Cover (HSR48)
4.	<b>TM42/04</b>	Gasket, Top Cover
5.	<b>BS32/126</b>	E-Ring, Jet Needle
6.	<b>82603002</b>	Washer, Jet Needle
7.	J8-8DDI01-97	Jet Needle (42)
7a.	J8-8CFY02-97	Jet Needle (45/48)
8.	TM42/03	Lever, T.V. (45/48)
8a.	TM42/08-1A	Lever, T.V. (HSR48)
9.	B401/56	E-Ring, Link Lever
10.	B401/10	Packing, Link Lever
11.	834-23041	Pin, Link Lever
12.	TM42/08-3.0	Throttle Valve (Slide)
13.	739-13002	Screw, Needle Retainer
14.	TM42/16	Clip, Needle Retainer
15.	TM42/13	Sealing Ring, T.V. (42/45)
15a.	TM48/02	Sealing Ring, T.V. (48)
16.	TM42/10	Seal, Throttle Valve
17.	925-98006	Pulley, Cable Bracket
18.	53974	E-Ring, Cable Bracket
19.	TM42/51	Bracket Ass'y, Cable
19a.	TM42/53	Bracket Ass'y, Sportster
20.	B3=0520-B	Bolt, Bracket
21.	VM28/204	Spacer, Bracket
22.	TM42/38	Plate, Lock Tab
23.	C2-0514-B	Screw
24.	640-12001	Starter Nut, Choke
25.	VM14/241	Spring, Starter Plunger
26.	N189.192	Starter Plunger
27.	<del>TM42/06</del>	<del>Body (HSR42/45)</del>
27a.	<del>TM48/02</del>	<del>Body (HSR48)</del>
28.	616-94029	Seal, Spigot Body
29.	925-19011	Ring (Steel)
30.	TM42/43	Lever, A/P
31.	N138.019	Pin, Throttle Lever
32.	TM42/48	Lever, Throttle
33.	M12F/46-BB	Spring, A/P
34.	MC-0316-B	Screw, A/P
35.	TM42/47	Spring, A/P
36.	<del>TM42SS1/01-0</del>	<del>Mixing Body (42/45)</del>
36a.	<del>TM48SS1/01</del>	<del>Mixing Body (48)</del>
37.	B36/95	Packing, Shaft (Plastic)
38.	TM42/36	Adjusting Screw, A/P
39.	B30/205	O-Ring, A/P Screw
40.	TM40/89	Bolt
40a.	TM42/17	Plate, Lock Tab for Shaft
41.	BN38/43	Pin, Return Lever
42.	TM42/46	Lever, Return
43.	B30/1069	Adjusting Screw, Throttle
44.	N3=04	Nut, Throttle Stop
45.	TM42/19	Spring, Throttle Return
46.	700-15012	Shaft, Throttle
47.	TM42/15	Plate, Fuel Joint Retainer
48.	C2-0410-B	Screw, Fuel Joint
49.	604-26014	Screw, Pilot Air

50.	N133.206	Spring, Pilot Air
51.	VM12/205	Washer, Pilot Air
52.	<b>N133.037</b>	O-Ring, Pilot Air
53.	TM40/27	Fuel Joint
54.	<b>KV/10</b>	O-Ring, Fuel Joint
55.	B30/398	Packing, Idle Adjuster
56.	VM22/138	Washer, Idle Adjuster
57.	730-09018	Spring, Idle Adjuster
58.	925-15001	Ring, Idle Adjuster
59.	TM42/32	Idle Adjuster (Long)
59a.	990-605-065	Idle Adjuster (Short)
60.	BS30/97-00	Air Jet (Blank)
61.	784-430000-Y-6	Needle Jet (723)
62.	TM42/11-70	Nozzle, Accel, Pump
63.	<b>N124.063</b>	O-Ring, A/P
64.	VM28/486-25	Pilot Jet
65.	TM42/12	Extender, Main Jet (42/45)
65a.	TM42/12-1A	Extender, Main Jet (48)
66.	N100.604-160	Main Jet
67.	<b>616-33003</b>	O-Ring N.V.
68.	<b>VM13/216</b>	Screw, N.V. Retainer
69.	<b>786-27001-4.2</b>	Needle Valve Ass'y (42/45)
69a.	<b>786-27002-1A</b>	Needle Valve Ass'y (48)
70.	859-32027	Float Ass'y
71.	BV26/22	Pin, Float
72.	C2=0410	Screw, Float Pin
73.	<b>616-94028</b>	Packing, Float Bowl
74.	TM42/05	Float, Chamber Body
75.	<b>N122.028</b>	Hose, Overflow
76.	<b>VM28/254</b>	O-Ring, Drain Plug
77.	TM32/41	Drain plug (42/45)
77a.	TM32/41-1D	Drain plug (48)
78.	<b>C2=0412-B</b>	Screw, Flt Bowl, short
79.	TM36/44-1A	Rod, A/P
80.	<b>TM36/64</b>	Boot, A/P Rod
81.	TM36/60	Plunger, A/P
82.	VM14SC13/89	Spring, A/P
83.	N198.063	Rubber Cap, Purge Port

## Alternate Parts

### Jet Needles:

HSR42	HSR45/48	
J8-8DDY01-95	J8-8CFY02-95	Richer
J8-8DDY01-96	J8-8CFY02-96	Richer
J8-8DDY01-97	J8-8CFY02-97	Std
J8-8DDY01-98	J8-8CFY02-98	Leaner

### Accelerator Pump Nozzles:

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

### Needle Valve Assemblies:

786-27002-1A-4.5	Std (HSR48)
786-27001-4.2	Std (HSR42/45)
786-27001-3.5	Smaller
786-27001-2.3	Pressure feed only

### Rebuild Kit:

HSR42/45:	<b>KHS-016</b>
HSR48:	<b>KHS-031</b>

**NOTE:**  
1. Lined through part numbers are not available.  
2. Parts in bold are included in rebuild kits.

