

## Instruction Sheet 51-1007

Revised 5-2-06

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Because every industry has a leader

## Installation Instructions: S&S® MGL Carburetor

### DISCLAIMER:

S&S parts are designed for high performance, off road, racing applications and are intended for the very experienced rider only. The installation of S&S parts may void or adversely effect your factory warranty. In addition such installation and use may violate certain federal, state, and local laws, rules and ordinances as well as other laws when used on motor vehicles used on public highways, especially in states where pollution laws may apply. Always check federal, state, and local laws before modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine the suitability of the product for his or her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties, and risks associated therewith.

The words Harley®, Harley-Davidson®, H-D®, Sportster®, Evolution®, and all H-D part numbers and model designations are used in reference only. S&S Cycle is not associated with Harley-Davidson, Inc.

### SAFE INSTALLATION AND OPERATION RULES:

Before installing your new S&S part it is your responsibility to read and follow the installation and maintenance procedures in these instructions and follow the basic rules below for your personal safety.

- Gasoline is extremely flammable and explosive under certain conditions and toxic when inhaled. Do not smoke. Perform installation in a well ventilated area away from open flames or sparks.
- If motorcycle has been running, wait until engine and exhaust pipes have cooled down to avoid getting burned before performing any installation steps.
- Before performing any installation steps disconnect battery to eliminate potential sparks and inadvertent engagement of starter while working on electrical components.
- Read instructions thoroughly and carefully so all procedures are completely understood before performing any installation steps. Contact S&S with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a S&S part on it.
- Consult an appropriate service manual for your motorcycle for correct disassembly and reassembly procedures for any parts that need to be removed to facilitate installation.
- Use good judgement when performing installation and operating motorcycle. Good judgement begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgement. Start installation when you are fresh.
- Be sure all federal, state and local laws are obeyed with the installation.
- For optimum performance and safety and to minimize potential damage to carb or other components, use all mounting hardware that is provided and follow all installation instructions.
- Motorcycle exhaust fumes are toxic and poisonous and must not be inhaled. Run motorcycle in a well ventilated area where fumes can dissipate.

### IMPORTANT NOTICE:

Statements in this instruction sheet preceded by the following words are of special significance.

#### WARNING

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

#### CAUTION

Means there is the possibility of damage to the part or motorcycle.

#### NOTE

*Other information of particular importance has been placed in italic type.*

**S&S recommends you take special notice of these items.**

### WARRANTY:

All S&S parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of twelve (12) months from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at S&S's option if the parts are returned to us by the purchaser within the 12 month warranty period or within 10 days thereafter.

In the event warranty service is required, the original purchaser must call or write S&S immediately with the problem. Some problems can be rectified by a telephone call and need no further course of action.

A part that is suspect of being defective must not be replaced by a Dealer without prior authorization from S&S. If it is deemed necessary for S&S to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from S&S. The parts must be packaged properly so as to not cause further damage and be returned prepaid to S&S with a copy of the original invoice of purchase and a detailed letter outlining the nature of the problem, how the part was used and the circumstances at the time of failure. If after an evaluation has been made by S&S and the part was found to be defective, repair, replacement or refund will be granted.

### ADDITIONAL WARRANTY PROVISIONS:

- (1) S&S shall have no obligation in the event an S&S part is modified by any other person or organization.
- (2) S&S shall have no obligation if an S&S part becomes defective in whole or in part as a result of improper installation, improper maintenance, improper use, abnormal operation, or any other misuse or mistreatment of the S&S part.
- (3) S&S shall not be liable for any consequential or incidental damages resulting from the failure of an S&S part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or for any other breach of contract or duty between S&S and a customer.
- (4) S&S parts are designed exclusively for use in Harley-Davidson® and other American v-twin motorcycles. S&S shall have no warranty or liability obligation if an S&S part is used in any other application.

The S&S® MGL series carburetor has been designed for performance applications to be used on large displacement Harley-Davidson® big twin and Sportster® models. We do not recommend using this carburetor on stock Sportster® models and 74's. The carburetor has a fixed main jet, fixed intermediate jet and intermediate air bleed, and an adjustable idle mixture screw. It is made in the 1 $\frac{7}{8}$ " throat size only. This carburetor has a conventional choke for starting.

The S&S MGL series carburetor kit contains the following items:

- Carburetor
- Intake manifold and bolts
- Air cleaner w/mounting bracket
- Fuel line w/two clamps
- Two extra main jets
- One tie strap

1. The old carburetor and manifold must be removed and the manifold supplied with the kit installed. If the carburetor is to be used on a knucklehead or panhead, a bracket that goes from the center crankcase stud to the bottom manifold bolt is furnished. The bottom manifold bolt supplied is  $\frac{1}{4}$ " longer (1 $\frac{1}{4}$ " overall length) and must be used in the bottom hole only. The top manifold bolt is 1" long. For installation on Sportster® models, a bracket is furnished that goes from the front intake cam stud to the air cleaner backplate. On shovelheads, a bracket that goes from the front cylinder rocker box cover to the backplate is used. Temporarily bolt the carburetor in place.
2. An English type throttle must be used since the MGL has a built-in throttle return spring. The stock Harley-Davidson® throttle on 1974 and later models can be adapted by soldering the last 1 $\frac{1}{2}$ " of inner cable before cutting the ball or barrel fitting off the end. The soldering is done to prevent the strands from separating. Once this operation is done, remove the carburetor and feed the cables through the throttle cable boss on the carburetor body, the soldered portion of the braided cable extending into the throttle cable clamp on the throttle arm. A little freeplay should be left in the throttle when the screw on the throttle cable clamp is tightened. Any excessive play can be adjusted out at the throttle grip before engine start-up.

For those bikes that are not already equipped with an English throttle, one can be purchased separately. To install, remove the old throttle by loosening the screw at the end of the handlebar. Drive the ring the twistgrip is shouldered against off the handlebar. Slip the furnished spacer on the handlebar. If 1" handlebars are used, do not use the spacer. Next, install the throttle assembly on the handlebar and temporarily tighten in the desired position. The throttle cable supplied is extra long to compensate for different length handlebars. Turn the handlebars to the extreme left position so that the length of the cable needed can

be determined. Hold the throttle cable housing in position at the throttle grip and at the throttle cable boss on the carburetor and adjust to the desired length. Cut the cable housing only. Install the throttle cable into the throttle cable housing and throttle grip and thread them through the boss and throttle cable clamp. Note where the throttle cable clamp comes on the cable. This portion should be soldered to prevent the strands from separating. Any additional cable must be cut off. Lubricate the throttle assembly and cable during the final installation. Leave a little freeplay in the throttle when tightening the throttle cable clamp screw so the throttle will close all the way. Any excessive play can be adjusted out at the throttle grip before engine start-up. *Important: After all cable adjustments are made, be sure that the throttle works freely and returns to the fully closed position when the throttle is released*

#### **WARNING**

Most English type throttles have a friction screw that dampens the self-closing feature on these throttles. When over-tightened, the throttle will not close to the idle position when the hand is removed from the throttle grip. Operation under this condition is not recommended because of the possible hazard involved when the engine will not stop automatically in an emergency.

#### **WARNING**

We do not recommend the use of quick or  $\frac{1}{4}$  turn throttles. They are not only dangerous but also adversely affect the throttling characteristics of the carburetor.

3. After installing the throttle assembly, make certain that the O-ring is in place at the end of the carburetor and bolt the carburetor in place using the allen head bolts provide.

*NOTE: For installation in big twins, the stock wire fuel line bracket should be used to position the fuel line between the cylinders.*

4. The fuel line supplied should be used in place of the stock line. For Harley-Davidson® Sportster® models with the straight feed type petcock, the line is bent sharply over the throttle cable housing boss toward the air cleaner backplate between the carburetor body and the throttle cable. It should then bend around, forward, to the bowl inlet fitting. A tie strap is provided to hold the line tight to the carburetor body. It must be fastened directly behind the air cleaner backplate around the carburetor body and fuel line. Secure both ends of the fuel line with the clamps provided.

**⚠ WARNING**

The fuel line must not interfere with the operation of the throttle in any way. See Picture 1 for proper installation.

For Sportster® models equipped with the 90-degree bend, feed type petcock, the line is angled slightly forward toward the air cleaner backplate, bending down between the bowl and the throttle cable to the bowl inlet fitting. Secure both ends of the fuel line with the clamps provided. See Picture 2 for proper installation.

The fuel line on big twins can normally be routed between the cylinders.

Check for leaks before starting the engine.

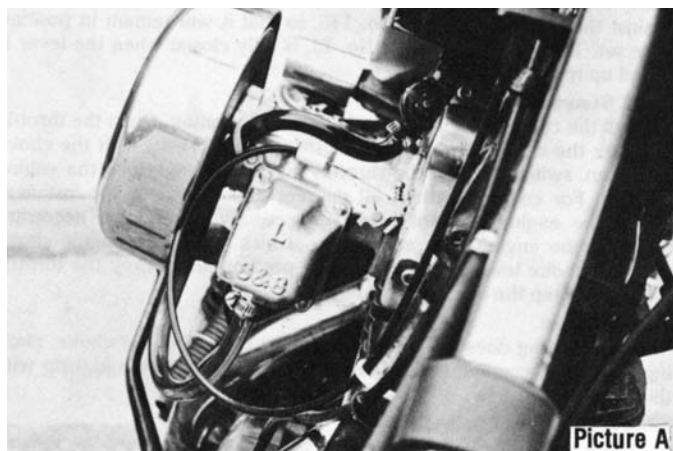
**⚠ WARNING**

Some bikes are equipped with exhaust systems that curve around the gear cover directly under the carburetor. The fuel line must not touch the pipe or be placed in a position where it is exposed to extreme heat.

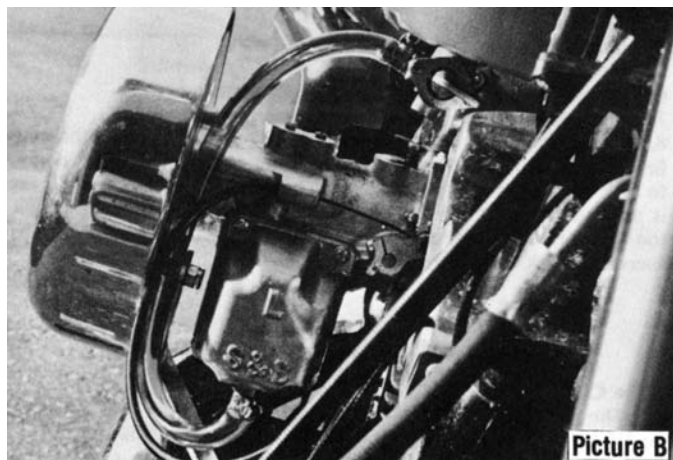
5. With the fuel line in place, the air cleaner backplate and mounting bracket can be installed. The Sportster® models bracket bolts to the front intake cam cage stud and the shovelhead bracket bolts to the front rocker box cover. A short spacer is provided with the air cleaner bracket mounting hardware that must be installed between the bracket and backplate. Immerse the foam portion of the air cleaner element in a light weight engine oil and squeeze out. Before final assembly of the air cleaner, check the needle and seat for possible leakage. Lean the motorcycle over slightly to the right and turn the fuel petcock on. If gas does not leak out of the end of the carburetor after 10 seconds, the element and air cleaner cover can be installed. If the needle and seat do not hold, the bowl should be removed and checked.

6. Special instructions for engines equipped with breather vent line to the air cleaner:

S&S® air cleaners have a special boss cast into the air cleaner backplate designed especially for this vent. The backplate should be drilled and tapped for a 1/8" pipe nipple. This can be purchased at most any hardware store. After the air cleaner backplate modification is done, the vent line should be secured with a clamp.



Picture 1



Picture 2

#### A. Starting Procedure

1. This carburetor has a conventional choke type starting mechanism. It has a tension spring, Part No. 144 that constantly applies pressure against the choke lever, Part No. 146 so that it will remain in position once set. The choke plate, Part No. 73, is fully closed when the lever is pulled up to the stop.

## B. Cold Starts:

1. Pull the choke lever up to the fully closed position. Open the throttle and kick the engine through two or three times. Then, with the choke half open, switch on, and the throttle slightly cracked, kick the engine through. For colder weather, 50° and below, or for instances where the engine has not been run recently, it may be necessary to prime the engine with an additional kick. After the engine starts, push the choke lever to the wide open position and jockey the throttle slightly to keep the engine running.

## C. Hot Start:

1. Hot starting does not normally require the use of the choke. Starting is usually accomplished by turning on the ignition and kicking with the throttle closed.

## D. Electric Start Models:

1. Close the choke halfway, turn on the ignition, and with the throttle slightly cracked engage the starter. After the engine starts, open the choke and work the throttle slightly until the engine will idle by itself.

## E. Troubleshooting Tip - Engine will not start:

1. Fuel supply empty.
2. Weak or no spark - discharged battery or faulty magneto.

*NOTE: We do not recommend the use of magnetos.*

3. Plug gap too wide - we use .020 to .022 plug gap on our point type ignition engines.
4. Improper ignition timing.
5. Tight tappet adjustment.
6. Improper idle mixture and/or engine RPM setting.
7. Intermediate air bleed loose.
8. Improper diagnosis of a rich or lean mixture condition. If the engine fires in the carb, it is too lean and must be re-primed. Do not continue to kick the engine over with the switch on until it is re-primed. If there is no response after three kicks or if it pops in the exhaust pipes, it is too rich. Leave the switch on and open the throttle a ¼ turn with each successive kick until it fires.

## Adjusting the Carburetor

### Idle Circuit:

The idle mixture screw, Part No. 54, is initially set during assembly to 1½ turns out from the fully closed position. Check this and reset the screw to 1½ turns before attempting to start the engine.

### CAUTION

**Never close the idle mixture screw tightly as damage to the needle and seating area in the carburetor body may result.**

The throttle stop engine RPM adjustment screw located on the throttle arm, Part No. 48, is initially set by holding the throttle closed and turning the screw until it contacts the throttle arm stop boss. At this point it is turned an additional ½ turn clockwise. Start the engine and warm it up to operating temperature. Adjust the engine RPM to a slow idle, approximately 600 to 800 RPM. Then turn the idle mixture screw in, leaning it, until the engine starts to die. Next, turn the screw back out, richening it, until it starts to die. A position about halfway between these points, or a setting of about ¼ to ½ a turn out from the lean side of the range is the correct setting. From the fully closed position this would be approximately 1¼ to 1¾ turns. Then set the throttle stop screw to give final desired RPM idle speed. Idle speeds will vary according to the individual and the use to which the machine is put.

*NOTE Whenever an intermediate jet change is made, the idle mixture screw should be readjusted.*

### Troubleshooting Tip - Engine will not idle:

1. Improper idle mixture and/or engine RPM setting.
2. Intake manifold air leak.
3. Sticky timing automatic advance mechanism.
4. Foreign material obstructing gas flow to idle circuit.

### Intermediate System—

#### Intermediate jet:

For normal riding conditions, the intermediate range is used the most. Therefore, close attention must be paid to jetting the midrange to achieve optimum performance and gas mileage. Once the engine is warmed up and the idle mixture and engine RPM screws set, the bike must be road tested. The intermediate range is used from right off idle up to approximately 3500 RPM or 50 to 60 MPH depending on gearing. If, while maintaining a steady speed, popping or spitting occurs regularly in the air cleaner, the intermediate jet, Part No. 153, should be changed to the next larger size.

(The size is stamped on the end of the tube.) This spitting is a lean condition and must be corrected. The smallest idle tube that eliminates this condition should provide the best gas mileage. For better throttling characteristics and performance, a richer idle tube, one or two sizes larger, may be necessary. This is especially true if the bike is to be used exclusively on a drag strip. Larger jets or richer mixtures will enable one to run a colder engine which is sometimes desirable. This is best determined by experimentation with the particular engine to be used. Gas mileage is oftentimes determined by an individual's riding habits. Snapping the throttle open in the lower RPM ranges is an inefficient way of operating the bike. S&S® carbs are not equipped with accelerator pumps. Consequently, poor throttling characteristics may occur since the intermediate system is effectively bypassed. The engine will respond better if the throttle is rolled on.

### Intermediate Air Bleed

The intermediate air bleed, Part No. 151, is located directly adjacent to the intermediate jet. All carburetors have an intermediate air bleed because it is necessary to correct the air/fuel ratio over the whole intermediate range. For most practical purposes, a .040 intermediate air bleed is used to do this. Larger (more air or leaner fuel mixture) or smaller (less air or richer fuel mixture) air bleeds are available, but caution must be exercised when changing these. Example: a larger air bleed could cause a leaner fuel mixture in a riding range that over a period may destroy the engine due to detonation or seizing. The best advice is to leave the air bleed alone.

### Main Jet - from 3500 RPM or 55-60 MPH on up:

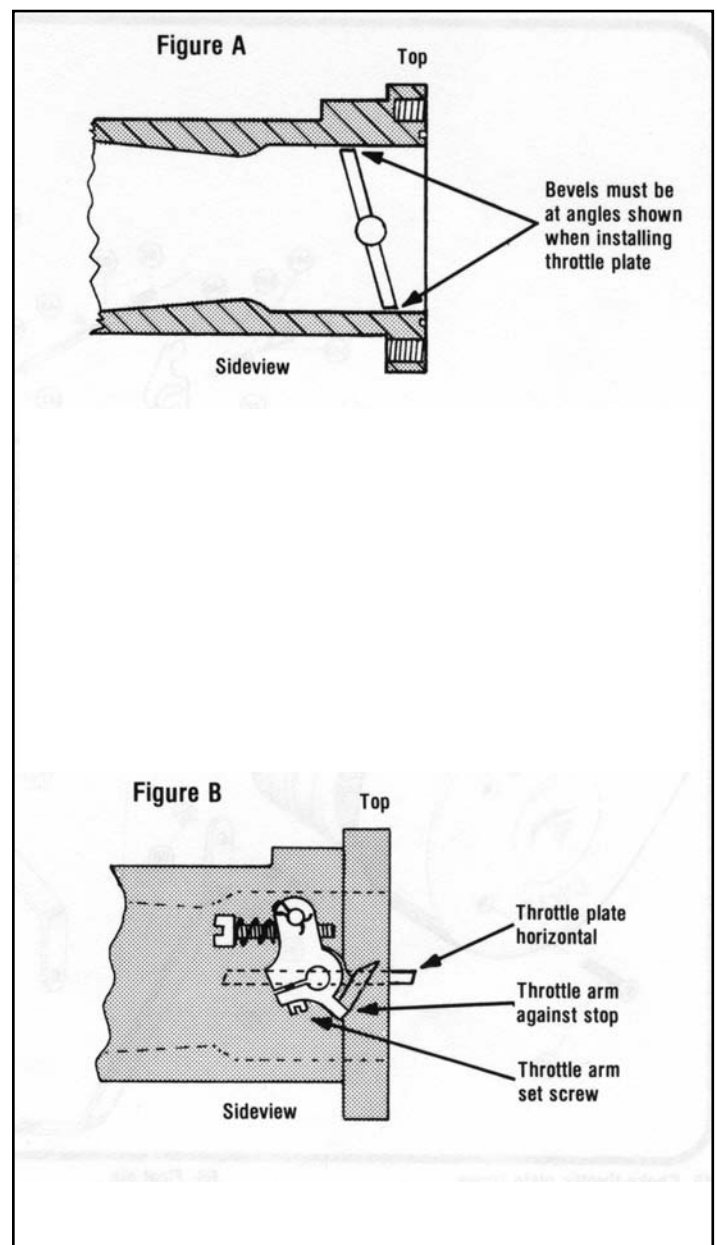
Main jetting is best determined by testing at the drag strip. Jetting should always be done at operating temperature. After a run is made, the engine RPM and final speed should be noted. A second run should be made with a .004 larger (richer) jet installed. Again, RPM and final speed is noted. This procedure should be continued until the miles per hour falls off. The main jet should then be made smaller (leaner) to gain the best maximum RPM and MPH. When making these runs, do not strive for ETs, but for consistent miles per hour. We have found that maximum miles per hour and RPM have been the best indicators of proper jetting.

If the engine is buttoned off after each run, the sparkplugs may be inspected for richness or leanness. Plug color is not always a good indication of carb jetting on quarter mile tests. We have found that different brands of gasoline, gasoline additives, engine heat (due to ignition timing), and type of plugs and heat range used alter readings drastically. New plugs usually require the time involved in a road test to properly develop the plug color. It is best to use a proven combination and to consult the sparkplug manufacturer for more specific information if

one desires to become proficient at plug reading. Champion Racing Division has a very informative booklet. For details write:

Champion Spark Plug Co.  
P.O. Box 910  
Toledo, Ohio 43601

If main jetting tests cannot be conducted at the drag strip, the "RPMing" method can be used. This procedure would be to run the bike through the gears noting how quickly and smoothly the engine reaches the RPM level where gears are shifted. Under racing conditions this level is where horsepower peaks and begins to taper off. The main jet that makes the engine pull the strongest or RPM through the gears best is the correct one. Our experience is that a jet about .006 smaller (leaner) in size will make the engine pop and sputter or "break up" in the carburetor and die. A jet about .006 larger (richer) will make the engine run flat and sluggish or "blubber".



### **Troubleshooting Tip— Engine will not run at Steady Speed:**

1. Restriction in fuel supply system - gas tank vent plugged, gas petcock too small (stock Harley-Davidson® petcock is adequate, but might require running on “reserve” to provide adequate supply for big inch engines), needle and seat assembly not working properly.
2. Faulty ignition system - fouled plugs, worn points, defective coil.
3. Incorrect intermediate and/or high speed jetting.
4. Foreign material in air bleeds, intermediate jet, main jet, and/or passageways in carb causing flow restriction.
5. Air cleaner is other than S&S®, or no cleaner is used. Some air cleaner designs are such that the carb cannot draw air freely as it is needed.
6. Valve train defect - bad valves, sticky valves, bad or broken springs, improper clearances for high lift cams.

### **Engine will not RPM:**

1. Restriction in fuel system.
2. Faulty ignition system.
3. Incorrect high speed jetting.
4. Foreign material in air and/or gas passageways in carb causing flow restriction .
5. Air horn being used without shrouding bowl vent. (If the bowl vent is not shrouded, the air pressure in the bowl is different from atmospheric pressure.)
6. Incorrect air cleaner being used.
7. Too much gear. (Not enough horsepower to pull the gearing.)
8. Valve train defect.

### **General Information**

1. Do not chrome the carburetor as extensive damage will result.
2. The carburetor has several drilled passages that are permanently sealed with three drive plugs. Do not attempt to remove these plugs.
3. Do not over-tighten the idle mixture screw, intermediate jet, or intermediate air bleed.
4. Do not attempt to remove the small 1/8" diameter tube near the choke in the carburetor body. This is the main jet air bleed and is permanently pressed into the body.
5. The float level is 3/4" when measured from the top of the float to the scribed line on the bowl gasket surface. This is done with needle in the closed position.
6. When the motorcycle is not running, the fuel shutoff valve should be turned off.

7. The throttle plate, Part No. 55, and throttle shaft, Part No. 83, should be checked annually for signs of wear. Replace, if necessary. If they are removed, be sure that the throttle plate is reinstalled correctly. **See Figure A.**
8. If the throttle arm, Part No. 48, is removed from the throttle shaft, it must be reinstalled in the wide open position with the butterfly at 90-degrees to the fully closed position. **See Figure B.**
9. If an air cleaner other than ours must be used, make sure the bowl vent hole on the inlet end of the carburetor is not covered and sealed off.
10. Cams and exhaust systems make some engines difficult to carburate. A combination of cam overlap and back pressure, or lack of back pressure will cause mixture dilution at certain engine RPMs. This dilution will cause engine roughness or misfiring when the engine is held in this range. To attempt to carburate for this condition usually destroys the carburation over the rest of the range. It is best under these conditions to change the cam and/or the exhaust system.

The MGL has an adjustable idle mixture screw, a fixed intermediate jet, a fixed intermediate air bleed, and a fixed main jet.

The idle mixture screw, Part No. 54, is located on top of the carburetor. Turning the screw in, clockwise, will lean the mixture. A counterclockwise motion, out, will richen the mixture.

The intermediate jet, Part No. 153, is screwed into the carburetor on the top of the body. It is made in sizes .028, .029, .030, .031, .032, .033 a .035; .035 being the richest.

The intermediate air bleed, Part No. 151, works in conjunction with the idle screw and intermediate jets and is located adjacent to the intermediate jet. The air bleed required on all of our test engines was .040. For those who must have larger or smaller ones, they can be ordered on special request.

The main jet, Part No. 72, is made in increments of .002 and range in size from .060 to .104. It can be reached by removing the bowl assembly.

Below is a chart with some basic guidelines to follow while jetting your MGL.

### Jetting Tips

	Stock CID	Mild Stokers	Stokers	Stokers
Big Twin	74"	80" - 84"	86" - 94"	96"-Up
Sportster® models	*	Up to 77"	78" - 87"	89"-Up
Idle Mixture Screw	1¼ -1¾ Turns	1¼ -1¾ Turns	1¼ -1¾ Turns	1¼ - 1¾ Turns
Intermediate Jet	No. 29 - No. 32	No. 29 - No. 33	No. 31 - No. 33	No. 32 - No. 35
Intermediate Air Bleed	40	40	40	40
Main Jet	68 - 76	70 - 76	72 - 80	74 - 84

*NOTE: We have determined that the MGL works best on large displacement engines with valve train, headwork and/or exhaust changes. Stock or small displacement engines do not throttle as well.*

- |     |  |      |   |
|-----|--|------|---|
| 45. | Choke-throttle plate screw   | 79.  | Air cleaner element   |
| 48. | Throttle arm assembly  | 82.  | Throttle return spring  |
| 52. | Idle mixture screw spring  | 83.  | Throttle shaft  |
| 54. | Idle mixture screw   | 91.  | Air cleaner backing plate screw   |
| 55. | Throttle plate   | 92.  | Air cleaner support bracket - shovelhead  |
| 56. | O-ring   | 93.  | Air cleaner support bracket - CH  |
| 57. | 1" spacer  | 95.  | Needle  |
| 58. | Y manifold - (all Harley-Davidson® Sportster® models shovelheads up to 1980) | 96.  | Support bracket - Panhead   |
| 59. | Manifold screw - top, 2"   | 97.  | Support bracket bolt  |
| 60. | Manifold screw - bottom, 2¼"   | 98.  | Support bracket locknut   |
| 62. | Manifold screw - top, 1"   | 101. | Support bracket spacer  |
| 63. | Manifold screw - bottom - 1¼"  | 143. | Choke arm screw   |
| 64. | Panhead manifold (1955-1965 only)  | 144. | Choke spring  |
| 65. | Seat   | 146. | Choke shaft assembly  |
| 66. | Lock washer  | 147. | Body  |
| 67. | Bowl screw   | 149. | Choke washer  |
| 69. | Float pin  | 151. | Intermediate air bleed  |
| 70. | Bowl gasket  | 153. | Intermediate jet  |
| 72. | Main jet   | 158. | Y manifold - for late 1980 to present shovelheads, manifold available but not pictured) |
| 73. | Choke plate  | 168. | Bowl  |
| 74. | Main discharge tube  | 171. | Float   |
| 75. | Bottom plug  | 180. | Air cleaner backing plate   |
| 77. | Air cleaner cover screw  | 199. | Air cleaner - complete assembly   |
| 78. | Air cleaner cover  |      |   |

