

Installation & Troubleshooting guide

For GL1000 and GL1100 Goldwings



CYCLE

*Performance Systems
for Motorcycles*

Innovations, Inc.

About Cycle Innovations, Inc.

Cycle Innovations, Inc. Is a strong and debt free company that is rapidly growing and strives to provide quality performance systems for motorcycles. It is our goal to keep our prices affordable and to continue growing our product line while maintaining the highest possible customer satisfaction.

Most of the parts that make up the Invader and Eliminator kits are Manufactured or purchased within a 50 mile radius of our home town Winter Haven Florida. The parts are delivered to our Winter Haven facility where they are packaged and shipped from. This is one way we keep our prices low and affordable for our customers.

Cycle Innovations, Inc. currently holds the only patents for intake manifolds on both the four and six cylinder Gold Wing engines. All other manifolds being manufactured for the four or six cylinder horizontally opposed motorcycle engines are an infringement on our patents.

Cycle Innovations, Inc. was created out of sheer frustration caused from working on stock GoldWing carburetors and having to pay the extremely high prices for replacement parts. This is why it is so important for us to keep our prices affordable.

What will the Invader and Eliminator kits do for my GoldWing

- They will provide smoother handling and power response throughout the entire power band.
- They will provide extremely easy starting. Just bump the starter button and your engine is running.
- They will provide more power. Because of a single Holley carburetor and a specially designed intake manifold, all cylinders are balanced and do not need to be adjusted. All cylinders pulling together makes a world of difference when it comes to power and performance.
- They will provide you with a new and clean air intake system, fuel intake system and carburetor that is tuned just for your Gold Wing.
- Most important of all, It will get your bike back on the road again performing at least as good as it did when it was new



Figure 1-A
1977 GL1000



Figure 1-B Removing side covers



Figure 1-C
Removing air box

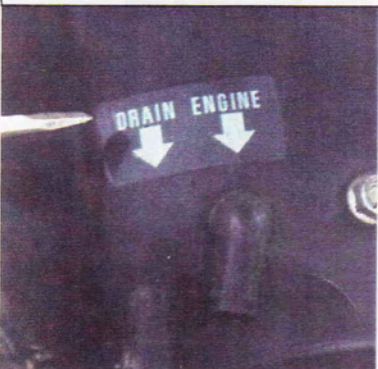


Figure 2-A Air Box drain and engine connections



Figure 2-B Casing Vent



Figure 2-C Removal of the Air Box



Figure 3-A Spark plug wire and boot tied out of the way

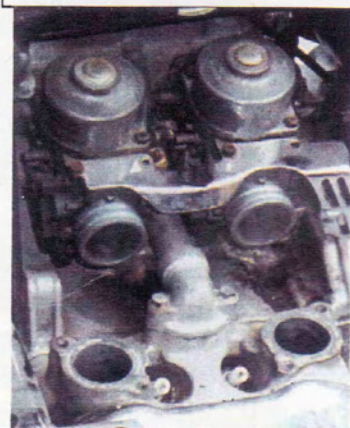


Figure 3-B Removal of 90 deg. intakes

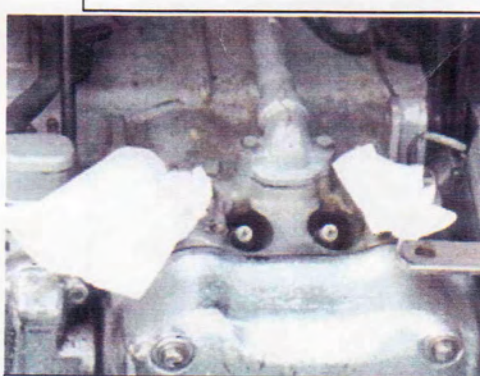
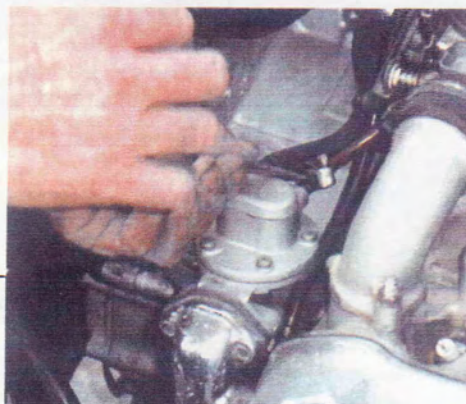


Figure 3-C rags stuffed in holes to prevent foreign object entry



Figure 4-A Fuel cock. Shown in the "ON" position.

Figure 4-B Removal of fuel line to existing Carburetors



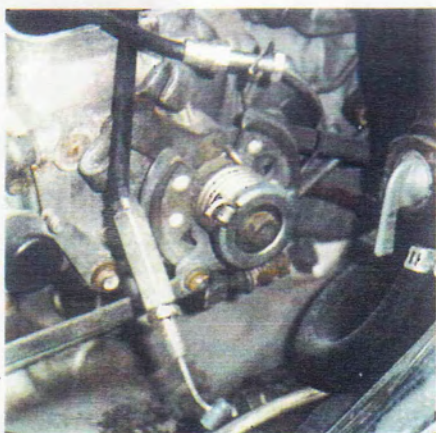


Figure 5-A Removing the throttle cables

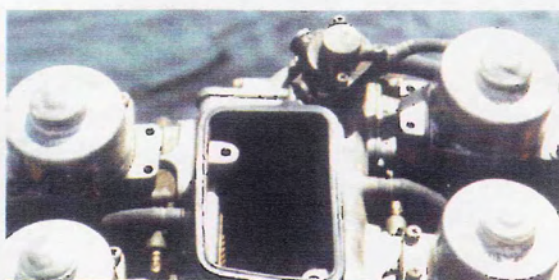


Figure 5-B Air break valve at top of this illustration



Figure 5-C Removing the Air Break Valve



Figure 6-A Cap, Spring and Diaphragm

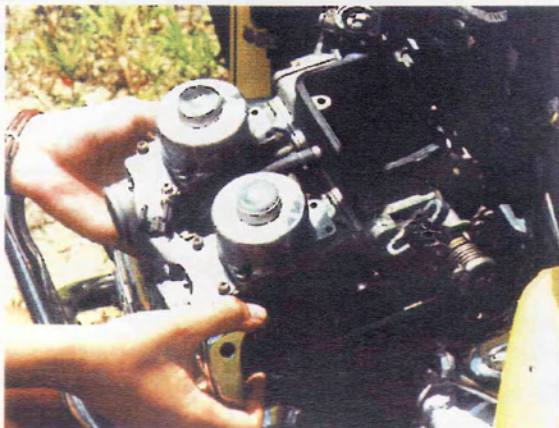


Figure 6-B removing stock carburetors from left side.



Figure 7-A Draining old fuel from tank



Figure 7-B Attaching fuel lines to filter before mounting the filter will make a trouble free installation



Figure 8-A Fuel filter mounted into position after lines are attached.



Figure 8-B Make sure your manifold is free from dirt and materials.

Frequently Asked Questions

Do your kits have less air volume than the originals?

- No, our manifolds are of a special design that prevents fuel pooling, aids in fuel particle atomization and maintains even fuel / air flow to all cylinders with less total air restriction than original carbs.

Which Holley carb is used? Is it a single barrel? is the new air cleaner something that is available in parts stores?

- Yes, the carburetor is a single barrel. Holley builds them special for us. All air cleaner parts are available at your local parts stores. The replacement air filter is a Mr. Gasket number 1486A

How do I set my timing?

- Remove your timing cover. Loosen the two locking screws. Rotate the timing back-plate "clockwise" until the grooves align as they do in *Figure 21-A*. Tighten the two locking screws, replace the points cover, start the bike and allow it to warm up. Adjust the idle to 1150 RPM. Note: Adjust idle to 1150 RPM with the idle adjustment screw "located on the left side of the carburetor" careful not to adjust the mixture screw, "located on the front-right of the carburetor". Shut down the bike and restart it. If the timing has been advanced too much, the starter will not turn over correctly. If this is the case, rotate the timing back-plate counter clockwise in very small increments until the starter works correctly again. Note: this is an initial place to set the timing, refer to our troubleshooting guideline if further adjustments are required.

What should my points be set at?

- The points remain at the OEM recommendation of .014

How do I get a recommended idle?

- Start the bike and allow it to warm up. Adjust the idle to 1150 RPM. Note: Adjust idle to 1150 RPM with the idle adjustment screw "located on the left side of the bike" careful not to adjust the mixture screw, "located on the front-right of the bike."

What should my pre-mix screw be set at?

- The carburetor air mixture screw comes preset for sea level elevations. If your air fuel mixture screw has been adjusted or you are operating your bike at high elevations, it may be necessary to adjust the air pre-mix screw, "located at the front-right of the carburetor" reset it 1 turn open from the closed seat for GL1000's and 1-1/8 turns open from the closed for GL1100's. "careful not to over tighten the needle when finding the closed seat". If Plugs burn dark at high elevations, it may be necessary to turn the air pre-mix screw clockwise 1/8 of a turn. This will lean out the mixture and cause the spark plugs to burn a lighter color thus preventing plug fouling.

Frequently Asked Questions

What kind of top end speed do you get with the Invader and Eliminator kits?

- Test have shown average top end speeds of 5 to 10 MPH higher than new conditions. We have found that most classic wings are not stable at speeds above 105 MPH.

How do the kits affect the bikes ability to pull a trailer, etc?

- Test have shown an increased pulling ability. This is due to all cylinders being balanced.

Do the kits affect the temperature of the engine?

- Yes. In most cases, temps are cooler than existing defective carbs. Due to the cylinders being balanced, each cylinder pulls the same load, causing a more even burning temp. Temperatures do vary from bike to bike due to varying cooling system conditions.

How is the gas mileage affected by the kits?

- Fuel economy varies between bikes depending on the condition of each bike. On an average, test bikes received an minimum rating of 38 MPG with hard riding conditions, while 42 MPG was obtained with moderate riding conditions.

Do you have tech support?

- Yes. If it's not in our online troubleshooting guide, you can get tech support by calling (863) 294-7500 Monday through Friday from 9:00am to 5:00pm Eastern time. Although E-mail is our preferred method of support. tech@cycleinnovations.com. Feel free to call us and talk directly to a knowledgeable person rather than a machine.

How long does it take to get my order?

- In most cases less than one week from time of order. The response to these products has been overwhelming. There have been occasions when it took two weeks to receive the kits. Manufacturing has been increased to meet the demand. Feel free to call toll free for availability and delivery times 1-877-294-7500

Can I install the kit myself or do I need to have it done at a shop?

- The average mechanic can install this kit with the detailed installation instructions that are provided with the kits. It is recommended that you have a qualified shop install the kit if you are not comfortable with the installation yourself. Our tech support is available to answer questions and help with installation. (863)294-7500

I noticed you recommend Amoco 93 octane fuel. Can I use other fuels such as 87 octane?

- Yes, 87 octane will work very well with the carburetor conversion kits. Although it is not recommended to use 87 octane for a put away fuel.

Recommendations

For trouble free installation and operation

- To start the engine cold, crack throttle with one hand "Note: do not twist throttle repeatedly, the accelerator pump will flood the bike" With the other hand press the starter button, your engine will fire immediately. Maintain approximately a 2000 rpm idle with the hand on the throttle for approximately 40 seconds then release the throttle. The bike will drop into an 1150 rpm idle. Note: no choke is needed above 45 degrees.
- When storing your bike for any period of time over three weeks, drain your fuel tank, including the reserve. Crank your engine and run the carburetor dry then shut off the fuel valve.
- Follow your installation instructions in order and pay close attention to detail. Refer to our troubleshooting guideline if any problems are encountered.
- Use all the parts sent with your kit. Even if you have new spark plugs already in your bike. Use the plugs sent with the kit. If you have experienced carburetor problems, chances are your plugs are not all in the same condition
- Make sure all fuel in your gas tank is drained out and replaced with fresh Gas "if gas has been in the tank for more than three months" prior to introducing fuel to the carburetor. Note: Old fuel can cause smoking, rough engine operation and cause your engine not to start. Also Damage can occur to the new carburetor. It will be worth the extra time to replace the old fuel. Which ever grade of fuel you choose is up to you.
- If any problems are encountered, refer to the troubleshooting guide on our web site. This will be the most up to date version and will most often take care of any problems you have.
- Do not operate the bike with the choke on any longer than necessary. "this is usually 40 seconds on very cold mornings"
- It is our recommendation to follow the OEM preventive maintenance guidelines pertaining to timing belts. Note: if a bike has been sitting for years, the belts may need replacing due to being stretched in one position for an excessive amount of time.
- We recommend to check the condition of your throttle cables prior to installing the carburetor conversion kits. Replace if frayed or dragging.
- When adjusting the idle air mixture screw, "located on the front right side of the carburetor" do not over tighten when finding the closed seat. Note: the needle will push through the seat and damage the lower portion of the carburetor.
- If problems are encountered, consult the Cycle Innovations, inc. web site troubleshooting page or contact Cycle Innovations, inc. tech support (863)294-7500 to obtain your repair information rather than consulting news groups etc. Note: with the conversion kits installed on your bike, it is no longer OEM. The most knowledgeable source of information is from the designers and developers of the kits "Cycle Innovations, inc."

Removal of existing Carburetors

Tools Needed

| | |
|---------------------------------------|---|
| 8 mm open end wrench | One small flat blade screwdriver |
| 10 mm open end wrench | One small Philips screwdriver |
| 10 mm socket with extension | One 18 mm spark plug socket with extension |
| A very short 1/2 inch open end wrench | One 5/16 inch wrench and a 5/16 inch socket |

*Note: If your battery is not up to full charge,
Remove it and place it on a low charge for 24 hours.*

- Place your bike on its center stand and remove the side covers and knobs to allow access to the air filter assembly, *See figure 1-B*. If removing GL1100 carburetors skip this step
- To remove the entire air filter assembly, remove the two wing nuts on top of the air filter. Remove the Cover and filter. Remove the existing vent lines from the air box, *See Figure 2-A*. Using a 10 mm socket and extension, remove the two bolts inside the housing, *See Figure 1-C*. Lift out the entire air filter assembly. At this point, you should be able to view the top of your factory carburetors.
- The next few steps take you through removing the factory carburetors. You can refer to your owners Manual if needed.
- Remove the spark plug wires from the spark plugs and tie the wires and boots up out of the way, *See Figure 3-A*. Be sure to remember which side of the bike each set of wires belong on.
- Using the 10 mm socket with extension and a small Philips screwdriver, remove the 90 deg. intake fittings that attach your carburetors to the cylinder heads. Remove all four intakes, *See Figure 3-B*. Stuff a rag in all four intake holes leading into the cylinders. This will prevent foreign object entry *See Figure 3-C*.
- Turn off the fuel valve from your fuel tank, *See Figure 4-A*. Using the small Philips screwdriver, remove the fuel line from the fuel pump to the carburetors, *See Figure 4-B*
- The above steps will allow the carburetors to drop down and rest on top of your engine. Slide the carburetors as far to the right side of the bike as possible.
- Disconnect the choke cable. Now slide the carburetors to the left side of the bike as far as possible. Remove the two throttle cables and the vacuum line from the carburetors, *See Figure 5-A* Note: *The GL1000 does not have a vacuum line.*
- Remove the carburetors by pulling them out the left side of the bike. Note: some maneuvering may be necessary to get the carburetors to come out. Note: *On GL1000's, it may be necessary to remove the cap, spring, and diaphragm of the air break valve to remove the carburetors, See Figures 5-B, 5-C, 6-A and 6-B.* On GL1100's it may be necessary to remove the slide covers, slides and needles to remove the carburetors. Reassemble the caps, springs, and diaphragms, covers, slides and needles after the carburetors have been removed.

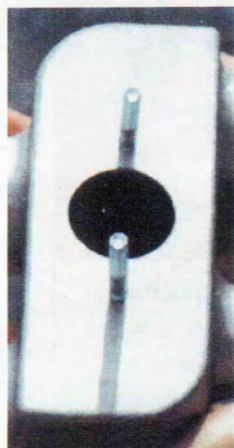


Figure 9-A
Manifold with
two 5/16"
studs



Figure 9-B
Manifold
with gasket



Figure 9-C
Manifold with
riser.



Figure 9-D
gasket on top of
riser



Figure 9-E Note:
lip inside
manifold. Mount
toward back of
bike.



Figure 10-A Sliding new
manifold into position

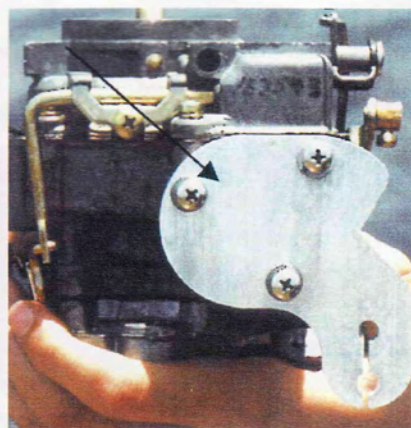


Figure 10-B cable support
bracket installed with 1/2"
screws



Figure 10-C choke cable
bracket removed

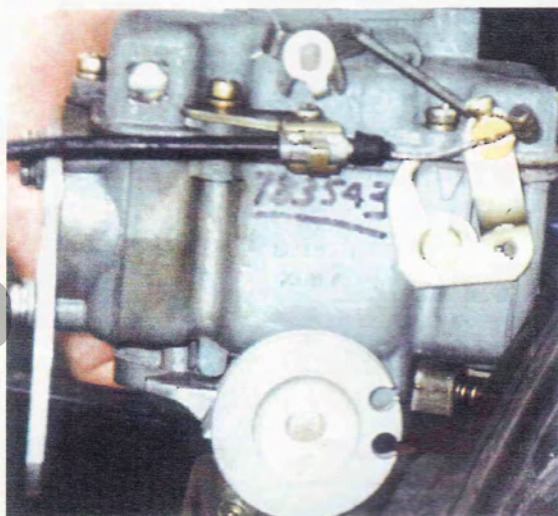


Figure 11-A Choke cable connected to
carburetor

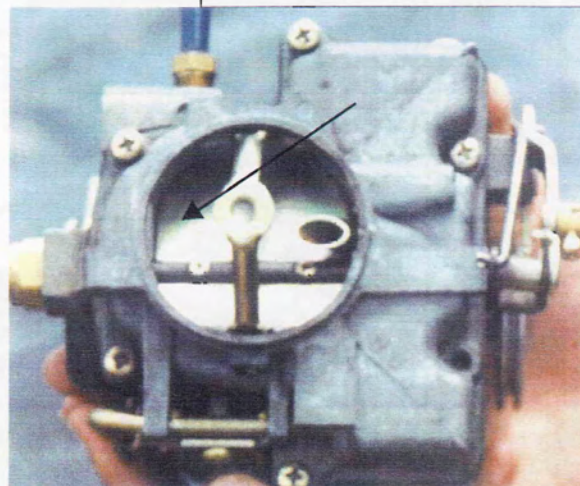


Figure 11-B choke flapper fully closed



Figure 12-A Lowering carburetor into place with choke cable attached



Figure 12-B slack adjuster located in the middle of the pull cable



Figure 12-C Throttle cables, Pull cable is the short one when throttle grip is twisted



Figure 13-B Push cable installed in lower hole of cable support bracket and lower hole of throttle lever cam

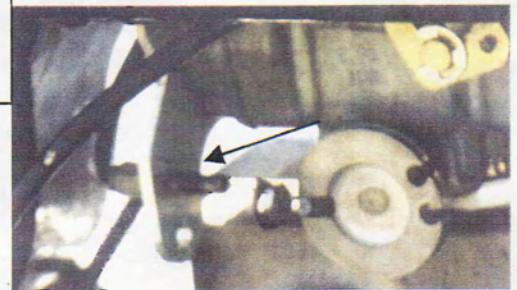


Figure 13-C Pull cable is secured in top hole of throttle lever cam

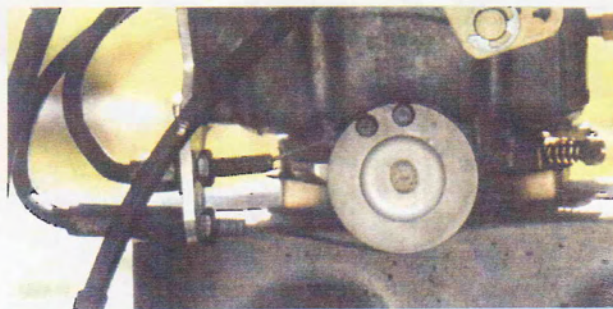


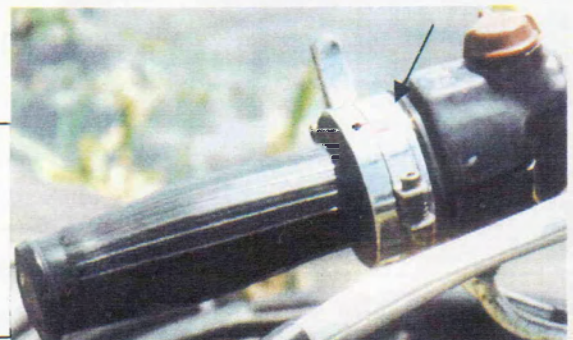
Figure 14A push and pull cables installed. Illustrated with throttle in full open position



Figure 14-B Throttle linkage resting against the idle screw adjustment.



Figure 14-C and 14-D
Note 1/8th inch of play at marks



Installation of your new performance kit

Tools Needed

| | |
|--|---|
| 8 mm open end wrench | One small flat blade screwdriver |
| 10 mm open end wrench | One small Philips screwdriver |
| 10 mm socket with extension | One 18 mm spark plug socket with extension |
| A very short 1/2 inch open end wrench | One 5/16 inch wrench and a 5/16 inch socket |
| A hacksaw to cut a piece of 1/4 " all-thread | Gapping tool for spark plugs |

Note: Do not use any type of sealant or lubricants anywhere during installation, unless directed too.

*Note: If your battery is not up to full charge,
Remove it and place it on a low charge for 24 hours.*

- Turn your fuel valve to the reserve position and drain all existing fuel from your fuel tank into a gas can, See **Figure 7-A**. Then turn the fuel valve to the off position. Replace the fuel with Amoco 93 octane, or equivalent fuel. Note: 87 octane will work fine. This step ensures there is fresh fuel in the tank and that fuel will flow out of the tank to the engine.
- Using the 5/16 " socket and extension, remove and replace your existing fuel filter with the one from your kit. *Note: it will make a less difficult installation to attach and clamp all fuel lines to your new fuel filter prior to remounting it, See **Figure 7-B**.* *Note: Pay close attention to the direction arrow on the filter. The arrow should point to the fuel pump. Note: not all fuel filters have an arrow, some are marked "IN" on one end of the fuel filter. The end that is stamped "IN" will attach to the fuel line running from the fuel cock on your fuel tank, See **Figure 8-A**.*
- Using the 1/4 inch fuel line sent with your kit, replace the fuel line from the fuel cock on the gas tank to your new fuel filter. Cut the hose to the required length and attach using the squeeze clamps provided, See **Figure 23-A**.
- Replace the fuel line from your newly installed fuel filter to the fitting on the fuel pump closest to the back of the bike. Cut the hose to the required length and attach using the squeeze clamps provided.
- Remove existing spark plugs and replace them with the ones sent with your performance kit. **No matter which type of coils you are using, Make sure you gap the new spark plugs at .022 for correct operation.** Do not re-install plug wires until after your performance kit is installed.
- Make sure your new intake manifold is free from dirt and materials that could enter your engine. Clean if necessary, See **Figure 8-B**.
- Screw the two 5/16 X 2 " studs into the manifold. Note: the short threaded end should screw into the manifold, See **Figure 9-A**.

Installation of your new performance kit

- Place one of the supplied gaskets on top of the manifold, using the 5/16" studs to center it, See **Figure 9-B** *Note: Do not use any type of sealant or lubricant anywhere during the installation of this kit unless directed too.* Now place the 3/8 inch riser on top of the gasket, See **Figure 9-C** for correct orientation. *Note: The 10-32 idle adjustment screw and spring which should already be installed into the riser should be on the left hand side of the bike and closest to the front of the bike. The head of the screw should be pointing down.* Place the second gasket on top of the riser plate using the two 5/16 inch studs to center it, See **Figure 9-D**.
- With you bike still on the center stand, slide your new intake manifold into position and let it rest on the engine, See **Figure 10-A**. *Note: Manifolds purchased after April 2001 cannot be installed backwards. Manifolds purchased prior to April 2001 can be installed backwards. Located just inside the top hole of the manifold is a lip that is part of the casting. Manifolds purchased prior to April 2001 have only one lip and is to be mounted toward the back of your bike. Manifolds purchased after April 2001 have 2 lips just inside the top hole, which prevents the manifold from being installed backwards.* See **Figure 9-E**.
- The cable support bracket should come already attached to the carburetor with the three 10-32 X 1/2 " screws, See **Figure 10-B**.
- Prior to lowering your new carburetor onto the manifold, remove the black plastic air filter adapter ring and rubber gasket from the top of the carburetor. See **Figure 17-C**. Do not re-install this plastic adapter ring until requested to do so in a later step of these installation instructions. Remove the choke cable bracket by removing the Philips head screw on top of the carburetor. See **Figure 10-C**.
- With the choke cable bracket in your hand, pull the choke cable up through the false tank and attach the housing of the choke cable to the cable clamp, See **Figure 10-C**. *Note: the metal portion of the cable housing should be placed flush against the end of the clamp in your hand.* Tighten down the cable clamp onto the cable housing. Reinstall the bracket onto the carburetor and replace the Philips head screw into the carburetor, See **Figure 11-A**. Loosen the choke cable retaining screw and slide the choke cable into the slotted area of the choke linkage with barbed end of the choke cable against the front side of the choke linkage. Tighten the choke cable retaining screw down onto the choke cable holding it in place. Pull your choke out and make sure the choke flapper on top of the carburetor closes all the way, See **Figure 11-B**. Push the choke in and make sure the choke flapper on top of the carburetor opens all the way. *Note: some GL1100's require the use of a small cable tie on the handlebar choke lever to keep the cable in its groove.*
- With the manifold in approximately the center of the bike, Make sure your new carburetor is orientated so that the fuel inlet is located on the left-hand side of the bike. The throttle cables will attach to the carburetor on the right hand side of the bike in a later step of these installation instructions.

Installation of your new performance kit

- Carefully lower your new carburetor "with the choke cable attached" down onto the studs, *See Figure 12-A*. Secure the carburetor to the manifold using the two 5/16 " star washers and nuts *See Figure 22-D*. *Note: It will be necessary to use the very short 1/2 inch wrench to tighten the front 5/16 inch nut.*
- It will be necessary to adjust the length of your throttle cable. Using the 8mm and 10 mm open end wrench, loosen the locking nut on the slack adjuster, *See Figure 12-B*. Adjust the cable all the way together. This will cause the throttle cable to be as long as possible. *Note: it also may be necessary to further increase the length of your throttle cable by adjusting the length adjustment located on the throttle grip. Note: only the pull cable will adjust, there is no adjustments for the return cable or "push cable".*
- Hold the ends of both throttle cables in one hand. With the other hand twist the throttle to the wide open position. Choose the cable that is the shortest length *See Figure 12-C*. Also note: the cable with the washer on it is the pull cable and should be the short cable when the throttle grip is twisted. Slide the cable "pull cable" up into the cable support bracket, past the lower hole and secure it in the top hole using the 10 mm wrench, *See Figure 13-A*. *Note: the metal washer looking piece, "located on the throttle pull cable" should be mounted on the same side of the cable support bracket as the nut.*
- Secure the second cable "return or push" into the lower hole of the cable support bracket using the 10 mm wrench. *Note: tighten the nuts on the push and pull cables, thus securing both cables to the cable support bracket. No cable adjustments will be made at this location in the future.*
- Insert the barbed end of the lower cable "push or return cable" into the lower hole in the throttle lever cam, *See Figure 13-B*. Let the cable lay outside the groove in the lever cam until the top cable barbed end is in place.
- Insert the top cable "pull cable" barbed end into the top hole of the throttle lever cam by turning the lever cam with your hand "counter clock wise" until the hole is aligned, *See Figure 13-C*. It may be necessary to twist the throttle on the handle bar to the idle position. This will provide the extra cable length needed to insert the pull cable barbed end.
- Make sure all cables are laying in the groove of the throttle lever cam. *See Figure 14-A*.
- Twist the throttle as if you were accelerating, and watch the throttle lever cam "which your cables are attached" to insure it turns smoothly. The throttle should operate freely. *Note: The throttle return spring will not provide a hard snap back when the throttle is released. For those that prefer the hard snap back when the throttle is released, the use of a customer supplied spring assist will be needed.*

Installation of your new performance kit

- Now that the throttle cables are in place, check and make sure the throttle linkage is resting against the idle adjustment screw located on the left side of the carburetor. If it is not, Using the 5/16 inch open end wrench, adjust the screw up until it makes contact with the throttle linkage, *See Figure 14-B.*
- Now that your Throttle linkage is resting against the idle adjustment screw, it is time to take the extra slack out of your throttle cables. Using the 8mm and 10 mm open end wrench's , adjust the slack adjuster " *Figure 12-B*" located in the middle of the pull cable, until there is approximately 1/8 inch of play at the throttle grip, *See figure 14-C and 14-D*". When you turn the throttle grip you should have 1/8 inch of play before the throttle lever cam begins to operate. While adjusting the cable length, frequently check and make sure your throttle linkage is still resting against the idle adjustment screw. This should give you the proper amount of slack in you throttle cables and prevent you from idling on your cables instead of the idle adjustment screw. *Note: improper adjustment of the cables can cause your engine to die when chopping the throttle or exiting an interstate.*
- If installing the GL1000 Invader Kit, your vacuum fitting "located on the front of the carburetor" should already be capped off. Check this vacuum fitting to make sure it is capped off. If Installing the GL1100 Eliminator kit connect the vacuum line supplied with your kit to this vacuum fitting "located on the front of the carburetor". *See Figure 15-A.* Run the new vacuum line under the manifold to the right side of the bike toward the fuel pump, until you intercept the old vacuum line "which use to connect to the stock carbs" . Cut the two vacuum lines in a convenient place and connect them together using the vacuum line splicing block. *See Figure 15-B.* " There are several different types of splicing blocks. However they all do the same job. The splicing block is a small plastic piece with a hole through the middle."
- Replace the four O-rings located on the 90 deg. Intake fittings "which was connected to the cylinder heads" with the O-rings supplied with your kit, *See Figure 15-C.* *Note: a small amount of grease can be used to hold the new O-rings in place during installation. Not silicone!*
- Remove the rags or duct tape from the intake holes on the cylinder heads. While lifting up the new carburetor and manifold, Slip all four 90 deg intake fittings "with the new O-rings installed" onto the new manifold flow tube ends, *See Figure 15-D.* *Note: Do Not use any type of sealant or lubricant when attaching the flow tubes to the manifold other than a small amount of WD-40 if required.* Reinstall the 8 bolts that hold the 90 deg. Intake fittings to the head. *Note: do not tighten any of the bolts, until all 8 bolts are started.* *See Figure 16-A.* Secure the 90 deg. intake fittings to the cylinders using the 10 mm socket and extension. *Note: tighten the bolts using the 10 mm socket and extension to the heads prior to tightening the bands around the flow tubes with the Philips screwdriver.* Once the intake fittings are secured to the heads, tighten the bands around the ends of the flow tubes using the Philips screwdriver, *See Figure 16-B.* This will secure the carburetor and manifold into place.

Installation of your new performance kit

- Install the new fuel line from your fuel pump to your newly installed carburetor. Route the fuel line from the fuel pump under the manifold to the left side of the carburetor and up between the flow tubes and connect it to the fuel inlet tubing, *See Figure 16-C*. Cut the hose to the required length and secure it on both ends using the squeeze clamps provided.
- Untie your spark plug wires and route them to the appropriate side of your bike. Note, spark plug wires should be routed underneath the throttle cables on the left side of the bike. Make sure the plug wires are securely seated into the spark plug boots. Cylinders #1 and #3 are on the right hand side of the bike and cylinders #2 and #4 are on the left hand side of the bike.
- The black plastic air filter adapter ring should have come already attached to your carburetor neck, with a black rubber gasket. This adapter ring should have been removed in an earlier step of these instructions, prior to installing the choke cable. If the adapter ring is still installed, remove it and put a hole in the end of the nipple using a drill or equivalent, *See Figure 17-C and Figure 17-D*. Reinstall the plastic adapter ring to the neck of the carburetor using the black rubber gasket. *Note: care should be taken to prevent getting plastic shavings or other foreign objects into the carburetor throttle body.*
- A few models of GL1000's have only one line that connected from the engine casing vent to the old factory air box, *See Figure 2-B*. If this is the model you have, connect one end of the 1/2 " hose provided with your kit, to the engine casing vent "located on the top of your engine, left side". Route the other end of the 1/2" hose to the black air filter adapter ring, "route the hose away from the accelerator pump linkage on the carburetor" Connect the hose over the nipple of the adapter ring where you drilled the hole. Twist the throttle grip to full open position and observe that the accelerator pump linkage range of motion is not restricted. **Note: do not cap off the casing vent line!**
- Some models of GL1000's have the casing vent, *See Figure 2-B*, "located on the top of your engine, left side" routed across the bike to the right side and connected to a collector box, *See Figure 17-A*. Then a second line ran from the collector box to the old factory air box. If this is the model you have, leave the casing vent line attached to the collector box and connect one end of your new 1/2" line supplied with your kit to the second nipple on the collector box and route the other end of the 1/2" line to the black air filter adapter ring, *See Figure 17-B*. "route the hose away from the accelerator pump linkage on the carburetor." Connect the hose over the nipple of the adapter ring where you drilled the hole. Twist the throttle grip to the full open position and observe that the accelerator pump linkage range of motion is not restricted. **Note: do not cap off the casing vent line!**

Installation of your new performance kit

- Other models of GL1000's and all models of GL1100's have a second line that was connected to the old factory air box "DRAIN" fitting, *See Figure 2-A*. If this is the model of bike you have, connect one end of the 1/2" hose provided to the engine casing vent *Figure 2-B* and route the other end of the 1/2" hose to the black plastic air filter adapter ring, *See Figure 17-D*. *Note: care should be exercised when routing the 1/2 hose from the casing vent line to the black plastic air filter adapter ring. The hose can interfere with the range of motion of the accelerator pump linkage on the carburetor. This can cause a loss of power when trying to accelerate. Also it can cause a stumble when starting to roll from a stand still condition. Route the hose clear of this area.* The second hose ran from the old factory air box "Drain" fitting to a collector box, "located on the left side of the bike". If your bike is equipped with this extra hose, Some states may require it to be connected. If your state is one of these, you will need to purchase a 1/2 " TEE fitting and splice it into the casing vent line that connects to the black plastic air filter adapter ring. Otherwise, discard the hose and collector box. **Note: do not cap off the casing vent line!**
- We are now ready to install the air cleaner assembly. Open the Mr. Gasket box and remove your new air cleaner, *See Figure 18-A*. Cut the 1/4-20 threaded rod "using a hacksaw or equivalent" to 2-3/4 inch's, *See Figure 18-B*. Discard the rest of the rod. Thread the portion of the rod that is 2-3/4 inch's long into the top of the carburetor. *Note: only thread the rod into the carburetor until the threads start to come through the yoke.* Now, screw the 1/4-20 jam nut supplied with your kit, onto the threaded rod and run the nut down and tighten it against the yoke of the carburetor. "notice the jam nut installation in *Figure 19-B*."
- Place the base plate of the air filter assembly onto the air filter adapter ring, *See Figure 19-A*. Next place the air filter onto the base plate, *See Figure 19-B*. Next place the top of the air filter assembly onto the air filter and secure it with the wing nut or equivalent provided in your Mr. Gasket box, *See Figure 19-C*.
- Use the tie-wraps "cable ties supplied with your kit " *See Figure 20-A*. Ensure all cables and foreign objects are securely tied away from all moving parts of your carburetor. **Note: Cables or foreign objects can become lodged in your throttle linkages causing your throttle to stick which can cause injury or death. Make sure all cables are clear from all moving parts.**
- After your battery has been charging on a 2 amp charge for 24 hours, reinstall the battery into the bike.
- If you have a GL1000 remove your timing cover, *See Figure 20-B*. Loosen the two locking screws, *See Figure 20-C*. Rotate the timing back-plate "clockwise" until the grooves align as they do in *Figure 21-A*. Tighten the two locking screws, replace the points cover. *Note: this is an initial place to set the timing, refer to our troubleshooting guideline if further adjustments are required.*

Installation of your new performance kit

- Install all covers etc. that were removed when your old carburetors were taken out.
- All cables and fuel lines should be connected at this time. The carburetor has been installed and you are ready to put fuel into your new performance system for the first time.
- Turn on the fuel shut off valve at your gas tank. Let the bike sit with the fuel valve on for five minutes. During this time, check for fuel leaks at all fittings and tighten if needed. Waiting for five minutes, helps to prime the fuel pump and fill the carburetor bowl. Make sure your kill switch is in the "on" position. Pull the choke cable to the full choke position, "choking the bike will help pull fuel into the empty carburetor for the first time." Choking the bike will not be required after the initial starting of the engine when temperatures are above 45 deg. F.
- With one hand, twist the throttle about 1/2 way. With the other hand depress the starter button and allow the engine to turn over several times, *See Figure 21-B.*
Note: if the starter does not sound as if it is turning the bike over normally, remove the timing cover, loosen the two locking screws and rotate the timing back-plate counter clockwise in very small increments, retighten the two locking screws and try to start the engine again. If the starter still does not turn the engine over normally, repeat this step as needed until the starter sounds normal and the engine does not kick back against the starter. Reinstall the timing cover.
- It will take some time for the fuel pump to prime, fill the fuel lines and fill the empty carburetor. Once the engine has started, Push in the Choke and maintain the RPM above 2,000 with the throttle grip, until you are positive the fuel system has been purged. Allow the engine to warm up for approximately five minutes.
- After your engine has warmed up for five minutes or more, using the 5/16 inch open end wrench adjust your idle to 1150 RPM. Once your idle is set, shut down your engine and note how easily it starts with the touch of the button. *Note: double check the throttle linkage to make sure it is resting on the idle adjustment screw and re-check the throttle cables for the proper amount of cable slack.*
- With the engine operating, check once more to make sure there are no fuel leaks and that all cables and foreign objects are securely tied out of the way of all moving parts of the carburetor linkages on both sides of the carburetor.

If any problems are encountered with the operation of your bike, refer to our troubleshooting guide first. Then try our tech support Tech@cycleinnovations.com or call our Technical Support Department at 863-294-7500

. This completes the installation guide

Troubleshooting

My bike lopes "surges in RPM" excessively at idle. *A small air vacuum leak, spark plugs in a near fouled condition or your timing not being advanced enough can cause this lobe at idle speeds. Also, stretched belts and incorrect gap settings on the points along with poor or uneven compression can cause a low speed lobe.*

- *If your air fuel mixture screw has been adjusted, "located at the front-right of the carburetor" reset it 1 turn open from the closed seat for GL1000's and 1-1/8 turns open from the closed for GL1100's. "careful not to over tighten the needle when finding the closed seat".*
- *Set your plug gaps to .022, no matter what kind of coils you are running.*
- *Ride the bike hard "run a lower gear" for 20 to 30 minutes to clean out cylinders, warm bike etc. > When you return from your ride, If the lobe still exist, check for vacuum leaks. Check the O-rings between the intake's and the heads for cracks and flatness. Replace with new O-rings if integrity is in question. Be sure when re-assembling, to tighten the intakes to the heads before tightening the clamps to the manifold flow tubes.*
- *Adjust your idle to 1150 RPM with the idle adjustment screw "located on the left side of the bike " careful not to adjust the mixture screw, "located on the front-right of the bike.*
- *If the lobe is still present, and you do not have electronic ignition, remove your timing cover and check the gap on the points to insure they are set at .014 Refer to your owners manual for correct procedure when setting the gap.*
- *If the lobe is still present, with the bike running, loosen the two locking screws. Rotate the timing back-plate "clockwise" in very small increments until the lobe no longer exist or until it is at an acceptable range. Once you find the "right spot" tighten the two locking screws and readjust the idle to 1150 RPM. Shut down the bike and restart it, If the timing has been advanced too much, the starter will not turn over correctly. If this is the case, rotate the timing back-plate counter clockwise in very small increments until the starter works correctly again.*
- *If the Lobe still exist, Warm the engine to normal operating temperature and shut down engine.. Ensure the choke is pushed in all the way, hold the throttle completely open, remove spark plugs and perform a compression check on each cylinder. Connect the compression tester to one cylinder following manufacturer's instructions. Have an assistant crank the engine over until there is no further rise in pressure. Remove the tester and record the reading. Repeat this step for each cylinder. Good readings should be in the 170 PSI range with each cylinder within 15 psi from each other. Readings below 140 PSI could indicate that an engine overhaul is due. A Maximum difference of 15 psi between any 2 cylinders is acceptable. Greater differences indicate worn or broken rings, leaky or sticky valves, or a combination of all. Note: if a bike has been setting for a long period of time, the rings could be stuck. Sometimes the rings can be freed up with oil and gas treatments.*

Troubleshooting

- If compression is not the cause of your lope, remove the camshaft belt covers "located behind the radiator". Turn the kill switch to the off position. Remove the timing mark cap "located on top of the engine near the fuel filter". Do Not start the engine, turn the engine over until the T1 mark is visible and lined up with the case marker. This puts cylinder No. 1 at top dead center. Look at each cam shaft pulley, making sure the UP mark on each cam shaft pulley are near the top. "if the UP mark is near the bottom, rotate the engine again until the T1 mark is visible and lined up with the case marker. This should place the UP mark near the top of the cam shaft pulley. The small arrow should line up EXACTLY with the mark on the pulley backing plate. If the small arrow does not line up exactly with the mark on the pulley backing plate your bike is out of time. This is an indication your belt has stretched or has been installed a tooth off etc. Consult your owners manual and replace belts if needed. For 1975 to 1977 use Honda belt number 14400-371-014 for 1978 and 1979 use belt number 11400-679-014X. Once belts have been replaced, reinstall the timing mark cap and return the kill switch to the run position. Recheck the timing of the bike and start the engine.
- If the lope returns to your bike after a week or so, pull one of your spark plugs, If it is dark or starting to foul, clean them and make sure the gap is set at .022, adjust the idle mixture screw 1/8 of a turn "clockwise" toward the closed seat. This will lean out the mixture and prevent your plugs from fouling and stop the lope from returning.

Note: Do not use any type of silicones or sealers during installation. Note: the Idle mixture screw on a GL1000 should never be more than 1 turn open from the closed seat.

Note: You should not be able to obtain an idle of 950 if your timing is advanced enough for the Invader kit. The new idle RPM should be 1100 to 1150. This will give you a smooth idle, and not jerk or stretch the belts.

My bike does not have quick acceleration. For GL1000's the most common cause of this is when the timing is not advanced far enough. For GL1100 and GL1000's other cause can be low compression on cylinders or loose / corroded wires on the ballast resistor, coils or wiring connectors from the coils leading back to the ignition system..

- For GL1000's, remove your timing cover. With the bike running, loosen the two locking screws. Rotate the timing back-plate "clockwise" in very small increments until the desired throttle response is obtained. Once you find the "right spot" tighten the two locking screws and readjust the idle to 1150 RPM. Shut down the bike and restart it, If the timing has been advanced too much, the starter will not turn over correctly "the battery will sound as if it is dead." If this is the case, rotate the timing back-plate counter clockwise in very small increments " 1/16 of an inch" until the starter works correctly again. Twist the throttle quickly, observing the motion of the accelerator pump linkage. The linkage should move smoothly through its allowable range of motion. If the linkage is not smooth "jerky" this could be the cause of the problem. Contact Cycle Innovations, inc. tech support toll free at 1-877-294-7500 for repair instructions or replacement.

Troubleshooting

My plugs are very black even when I adjust the mixture screw. Once the mixture screw has been turned more than 1 turn open from the closed seat for the GL1000, the plugs will begin to foul rapidly.

- *Note: the mixture screw is a trim screw and will not shut off total fuel to the idle circuit even if closed against the seat.*
- *Refer to troubleshooting symptom "My spark plugs are very black and even growing hair"*

My number four cylinder spark plug seems to foul after only a short time of operation. This is often caused by "kits sold before April 2001" either the manifold being installed backwards or weak fire to the number 4 cylinder example "plug wires not being seated properly"

- *Check to make sure the manifold is not installed backwards. The lip inside the intake hole should face the back of the bike. This lip helps atomize the fuel as it enters the manifold.*
- *If the Plug is fouled and wet, this is an indication of weak fire. Check the spark plug wires to make sure they are seated in the plug boots properly. Check the integrity of the plug wires and the connections to the coils.*
- *Note: A good way to check for electrical break down of spark plug wires is to place the bike on the center stand, open the center false tank cover and remove the side covers. In complete darkness, start the bike, holding in the clutch and place in first gear. Holding the foot break, give the bike a little gas. Ease the clutch out to place a little strain on the bike. Look for sparks jumping to ground from the high voltage system. Repair as necessary.*

My engine will not start after installing the new manifold and carburetor kit. The most common cause of this is fuel not getting to the carburetor.

- *Check the fuel cock to be in the on position.*
- *Check to make sure there is new fresh gas in the tank*
- *Make sure the fuel filter is installed correctly, with the arrow pointing to the fuel pump.*
- *Check the fuel line hose clamps for proper installation. The fuel pump can suck air, and losing prime.*
- *Check to make sure the kill switch is in the on position.*
- *Make sure plug wires were restored and seated correctly.*
- *Check the ignition fuse.*
- *Try choking the bike to help pull fuel into the carburetor for the first time.*

My bike will not go faster than 95 miles per hour. A common cause of this symptom is low tire air pressure.

- *Check your tire pressure. Tires with even a little low pressure can easily cause a 15 MPH loss in the top end and also cause the bike to be unstable at those speeds.*

Troubleshooting

- *Some carburetors allow the butterfly to open past the full open position. This restricts the air flow slightly. Try backing off the throttle slightly.*
- *Make sure all the spark plugs sent with the kit are installed. If all plugs are not in the same condition or if one is breaking down at high rpm it could cost you performance.*
- *Run a compression check on all cylinders per your owners manual. Low compression will cost power and performance.*

My throttle cables sometimes come off the throttle cam. *The common cause of this symptom is incorrect throttle cable tension.*

- *Adjust the slack adjuster located in the middle of the pull cable per installation instruction. Note: be careful not to remove too much slack. There should be approximately 1/8 inch of play in the throttle.*

My throttle stuck at a very high RPM. *The most common cause of this symptom is cables and foreign objects hanging up in the carburetor linkage's.*

- *Check to make sure cables and other foreign objects are not lodged in the moving parts of the carburetor linkage. Use the cable ties sent with your performance kit to tie cables and foreign objects out of the way.*
- *Damaged or partially broken / frayed cables will create drag in the cable housing causing the throttle to hang.*

My GL1100 has to be beat with a stick to get 70 miles per hour out of it. *The most common cause of this symptom is inadequate vacuum or incorrect spark plug gap settings.*

- *The GL1100 use vacuum to advance the timing. Check to make sure the vacuum line is attached at both ends and its integrity is good. Note: if your timing does not get advanced, you will be lucky to get 70 miles per hour out your bike.*
- *Make sure the spark plug gap is set at Cycle Innovations, inc. Recommended setting of .022 no matter what kind of coils you are using.*
- *Check to make sure the throttle is opening the butterfly valve all the way.*
- *Make sure the choke flapper is open all the way.*

My GL1100 engine does not have a vacuum line. *Sometimes people install GL1100 valve covers on GL1000 engines. If your bike has points, then it is a GL1000 which does not require a vacuum line attachment. The GL1000 engine uses balance weights located behind the points to advance the timing.*

Troubleshooting

My bike stumbles when starting from a stand still. The two most common things that cause this to happen is a fouled or near fouled spark plugs or for the GL1000's, the timing not being advanced enough.

- Clean and gap spark plugs to .022, no matter what kind of coils you are using. Note: too large of gaps on the plugs can cause them to foul over a short time.
- For GL1000's, remove your timing cover. With the bike running, loosen the two locking screws. Rotate the timing back-plate "clockwise" in very small increments. Tighten the two locking screws and readjust the idle to 1150 RPM. Test ride the bike, repeat this step as required, until the stumble no longer exist.. Shut down the bike and restart it, If the timing has been advanced too much, the starter will not turn over correctly, "it will sound as if the battery is dead." If this is the case, rotate the timing back-plate counter clockwise in very small increments " 1/16 of an inch" until the starter works correctly again. Note: timing not being advanced enough will cause the plugs to foul or even cause some backfire.
- If any of the spark plugs are in a near fouled condition, turn the mixture screw located on the front of the carburetor "clockwise" 1/8 of a turn. This will lean out the mixture and cause the plug to burn a lighter color. The desired color is a medium to light Tan color on the tip of the electrode. Ride the bike several miles between each adjustment of the mixture screw, until the correct plug color is obtained. Never turn the mixture screw more than 1/8 of a turn at a time. Never operate the bike very long with a bright white colored sparkplug.
- For GL1000's another thing that can cause a stumble when starting off from a stand still, is the balance weights and springs not working correctly. "located behind the points back plate. These weights advance the timing via mechanical forces. These weights and springs should operate freely. Note: too weak of springs, will allow the timing to advance too soon which can also cause a stumble.
- Another cause of stumbles is, if the accelerator pump is not squirting a good steady stream of fuel into the engine when the throttle is twisted. This stumble will be noticeable at most speeds, not just when starting from a stand still. Remove the air cleaner assembly. With the engine off, twist the throttle quickly while looking down into the carburetor neck and observe a tiny steady stream of fuel being squirted toward the center of the carburetor "inside the throttle bore". If this fuel is not being squirted or is not steady and just kind of runs down the side of the carburetor, there is accelerator pump problems. First check to make sure there are no wires or hoses restricting the range of motion of the accelerator pump linkage on the left and rear corner of the carburetor. If the linkage is not restricted, call our Tech support at 863-294-7500 for instructions or replacement.

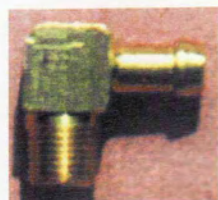


Figure 15-A
vacuum
fitting for
GL1100

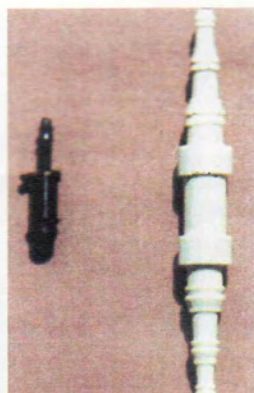


Figure 15-B either of two types
of vacuum line splicing blocks
are supplied with kits



Figure 15-C o-ring
in 90 deg. Intake
fitting

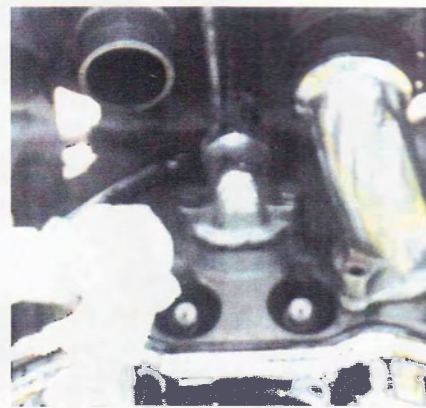


Figure 15D remove rags and
install 90 deg. intakes



Figure 16-A tighten intake bolts
after all eight bolts have been
started



Figure 16-B Tighten
bands around ends of the
flow tubes

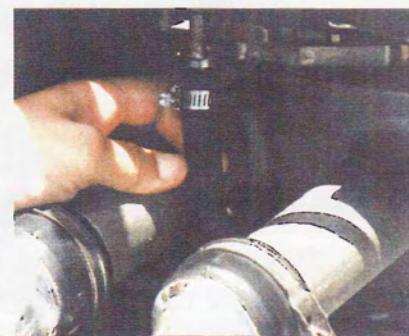


Figure 16-C connect the fuel
line to the fuel inlet tubing on
the left side of the carb.

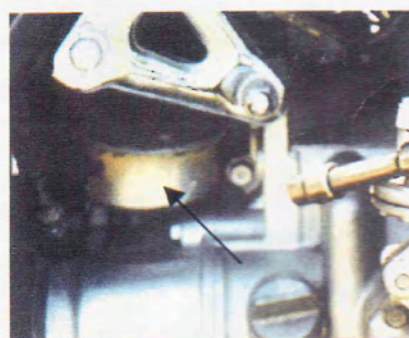


Figure 17A collector box
located on right side of
GL1000's

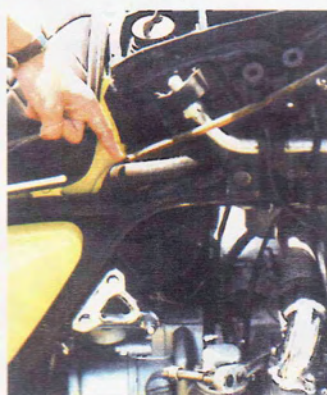


Figure 17-B routing
hose from collector
box to air filter
adapter ring



Figure 17-C
drilling hole
in air filter
adapter ring



Figure 17-D
air filter
adapter ring
with hold
drilled out



Figure 18-A
Mr. Gasket
air cleaner
assembly

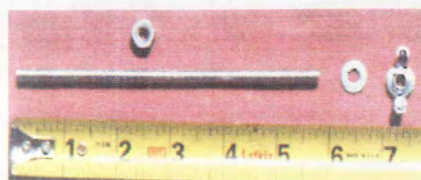


Figure 18-B 1/4-20
threaded rod, cut to
2-3/4 inch's

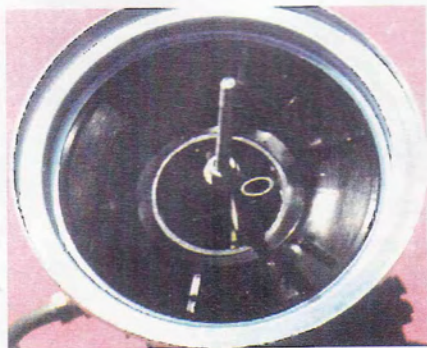


Figure 19-A base of air filter assembly setting on air filter adapter ring

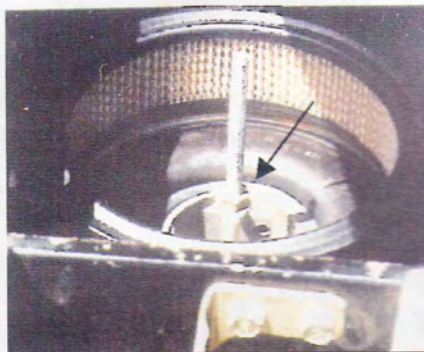


Figure 19-B air filter setting on base of air filter assembly
Note: Jam nut on 1/4-20 rod

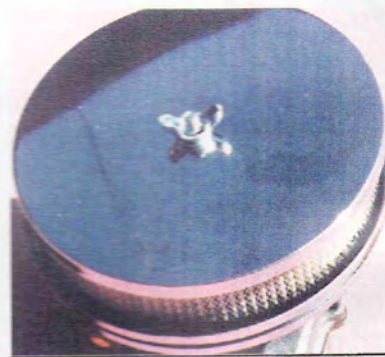


Figure 19-C air filter assembly top, secured to air filter with wing nut



Figure 20-A tie-wraps also called plastic cable ties



Figure 20-B removing timing cover

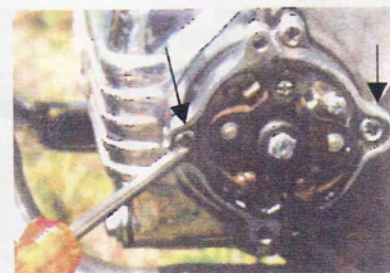


Figure 20-C loosen two locking screws

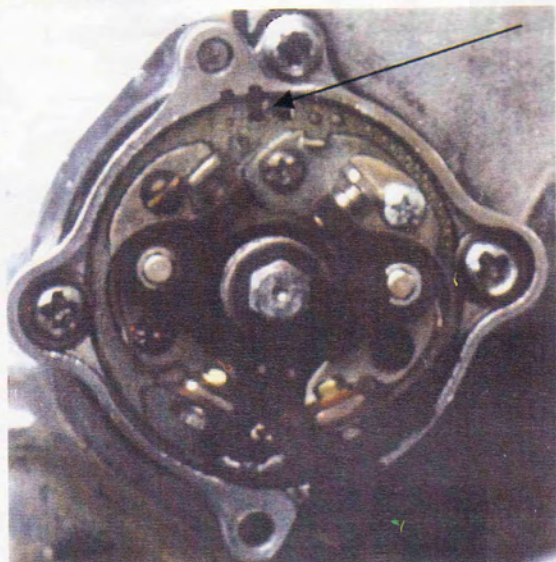


Figure 21-A Align the timing marks to this position prior to starting your bike for the first time. Refer to troubleshooting guide line for further timing adjustments if problems are encountered.



Figure 21-B recommended two hand starting procedure, to prevent flooding bike with accelerator pump

Troubleshooting

My bike runs pretty good but sometimes backfires. *The two most common cause of a backfire is holes in the exhaust system or for the GL1000's, the timing not being advanced far enough. Other causes range from small vacuum leaks to degraded electrical systems.*

- *If your bike has leaks in the exhaust system, this can cause the backfire you are hearing. Repair the exhaust leaks before proceeding with this troubleshooting guideline*
- *Check to make sure the spark plug wires are properly seated in the plug boots and that the left coil feeds the two rear cylinders No. 3 and No. 4. The right coil should feed the two front cylinders No. 1 and No. 2.*
- *Check for vacuum leaks and proper installation / condition of the O-rings located between the head and ninety degree intake fittings. A small vacuum leak can cause a leaner mixture at the one cylinder where the leak is, causing a backfire when the throttle is chopped. Replace O-rings if integrity is in question. For GL1000's, also check to insure the vacuum cap is installed on the carburetor and all intake bolts, fittings etc. Are tight.*
- *The mixture screw is adjusted to maintain the correct spark plug electrode color. Once it is set, it never has to be touched again. However, if someone turned the screw way open, it would put excess fuel into the cylinders, which would ignite in the exhaust system which could cause a backfire. Make sure the idle air mixture screw is not open more than one turn from the closed seat for GL1000's and 1-1/8 turns for the GL1100. If the screw was in this range, return it to its previous setting.*
- *For GL1000's, If the backfire still exist after performing the first four steps, remove your timing cover. Loosen the two locking screws. Rotate the timing back-plate "clockwise" in very small increments. Tighten the two locking screws and start the bike. Readjust the idle to 1150 RPM. Test ride the bike, repeat this step as required, until the backfire no longer exist.. Shut down the bike and restart it, If the timing has been advanced too much, the starter will not turn over correctly, " it will sound as if the battery is dead ". If this is the case, rotate the timing back-plate counter clockwise in very small increments "1/16 of a inch" until the starter works correctly again.*
- *There have been a few occasions when the three prong wire connecting plug leaving the alternator, plugging into the bikes electrical system melts "located behind the battery to the left". Once one of the three phases "wires" have been severed, the bike's rpm will have to be much higher to produce the same RMS voltages. With this type of degraded electrical system and spark, Backfiring and spark plug fouling can occur.*

Troubleshooting

My bike used to be really easy to start but it's progressively getting harder and harder to start. *The most common cause of this is using a spark plug gap other than the Cycle Innovations, inc. recommended setting of .022 and the use of sparkplugs other than the Honda recommended NGK plug.*

- Remove spark plugs, clean and gap them to .022, no matter what type of coils you are using. Reinstall the spark plugs. This should make your bike very easy to start again.
- Check to make sure the spark plug wires are properly seated in the plug boots.
- If this problem occurs again, repeat the above steps. Then, turn the idle air mixture screw "located on the front - right of the carburetor" clockwise 1/8 of a turn toward the closed seat. This will lean out the idle mixture, preventing the plugs from fouling again..

My spark plugs are very black and even growing hair. *There are three main causes for carbon fouling. First, using a spark plug gap greater than the Cycle Innovations, inc. recommended setting of .022, Second, Having the air mixture screw too far open from the closed seat. Third, for GL1000's the timing not being advanced enough.*

- Clean and gap the spark plugs at .022 no matter what type of coils you are using. Reinstall the spark plugs.
- Make sure the idle air / fuel mixture screw is set no further than 1 turn open from the closed seat for GL1000's and no further than 1-1/8 turns open from the closed seat for the GL1100. "exercise extreme caution when locating the closed seat, be careful not to push the needle through the seat or (over tighten) the screw." Note: these mixture screw settings are a maximum value. One turn can still be too far open from the closed seat, which can foul plugs. The mixture screw is adjusted to set the color of the sparkplug electrode tip to a medium or light tan color. Once it has been set, it will never need to be adjusted again. Adjustments should never be more than 1/8 of a turn at a time and the bike should be ridden several miles between each adjustment. "clockwise or IN" will lean the plug and cause it to burn a lighter color and vise versa.
- If your bike starts easy, has quick acceleration and does not stumble when pulling out from a stand still your timing is set correctly. If you are experiencing one of these symptoms after performing the above two steps, For GL1000's, remove your timing cover. With the bike running, loosen the two locking screws. Rotate the timing back-plate "clockwise" in very small increments. Tighten the two locking screws and readjust the idle to 1150 RPM. Test ride the bike for several miles, repeat this step as required, until the symptom no longer exist.. Shut down the bike and restart it, If the timing has been advanced too much, the starter will not turn over correctly " it will sound as if the battery is dead. " If this is the case, rotate the timing back-plate counter clockwise in very small increments "1/16 of an inch" until the starter works correctly again. Note: if the timing was not advanced enough, the spark plug color should be rechecked and set by the above step using the mixture screw adjustment.

Troubleshooting

- If only one or two of the spark plugs are black, for models before April 2001 Make sure the manifold was not installed backwards. " The lip inside the manifold, located at main fuel entry hole should be closest to the back of the bike. This lip helps atomize fuel and re-direct the flow to the other cylinders.
- Note: other causes for black spark plugs are plug wires not being seated into boots, leaky high voltage wires "grounding to frame", ring condition, valve seals, poor electrical connections and weak coils.

My bike smokes on the left side when I start it. This is a common problem with Goldwings. When kept on the side stand, a very small amount of oil will leak past the piston rings into the left cylinders, causing the left side to smoke for a short while when started from cold.

My bike smokes white out of both tail pipes for a very long time after starting then clears up. There are two common causes to this problem. First, if the bike has been sitting for a long period of time, the piston rings may be stuck. Second, the head gaskets may be shot, leaking water into each cylinder, thus causing the white smoke.

- Note: one common cause for head gasket failure, is water pump failure. Water does not always leak out of the pump when it fails. It is possible for the pump to fail "broken veins etc. This will cause the water not to fully circulate through the radiator. The engine temperature may read slightly hot, and the radiator feel cold to the touch when the engine is actually hot.
- If you suspect the rings may be stuck, due to the bike sitting for several years, An oil treatment and gas treatment may Possibly help loosen the rings along with miles of riding.

My bike dies when chopping the throttle while exiting an Interstate. The most common cause of this condition is incorrect tension on the throttle and return cables.

- Make sure your bike is idling against the idle speed set screw, not the throttle cables.
- Make sure you have 1/8 of an inch play in the throttle before the carburetor linkage moves, thus increasing rpm.
- Set the Idle speed set screw to obtain 1150 RPM.

My bike will only run above 3000 rpm . When I cut the throttle below 3000 RPM the bike will die. The most common cause of this condition is incorrect tension on the throttle and return cables.

- Adjust the idle speed set-screw "located on the left side of the bike" up until the RPM begins to rise above 3000 RPM.
- Using the slack adjuster located in the middle of the throttle pull cable. Shorten the cable to increase the amount of slack in the pull cable.
- Now lower the RPM of the bike to 1150 using the idle speed set screw "located on the left side of the bike". Note: if the rpm will not drop all the way to 1150 shorten the pull cable more. It may be necessary to use the adjustment at the handlebar grip.
- Another cause could be a weak or dead battery or a loose connection from your battery that feeds power to your electrical system. Your RPM must be above 2200 for

Troubleshooting

your charging system to support the electrical load. RPM less than 2200 without the support of the battery may cause your engine to misfire or even quit.

- *Note: if the engine ground to frame is corroded or loose, or main electrical connections from the battery are degraded, Only the alternator is supporting the electrical load and RPM will have to be at least 2200. Lower RPM can cause misfire and engine failure.*
- *There have been a few occasions when the three prong wire connecting plug leaving the alternator, plugging into the bikes electrical system melts "located behind the battery to the left". Once one of the three phases "wires" have been severed, the bike's rpm will have to be much higher to produce the same RMS voltages. This will cause batteries to require frequent charging. If you are on a long trip, your battery will get weaker, until it will no longer support the electrical load required by the bike. Once this happens, the bike will only operate above 2200 to 3000 RPM.*
- *Loose fuel lines, can cause the fuel pump to suck air at low RPM.*

When I start my bike it goes straight to 3000 RPM and will not run any slower, no matter where I adjust the idle or throttle. *The cause of this is most often a large vacuum leak. The excess air from the vacuum leak will cause a lean condition in all cylinders "because the manifold is balanced". This lean condition will cause the RPM of the bike to shoot directly to the 3000 range.*

- *Check to make sure the 4 vacuum test screws are all installed in the 90 deg. Intakes.*
- *Check the carburetor gaskets for tightness and integrity.*
- *Check the ninety degree intake to head O-rings for proper installation.*
- *For GL1000's. Check to make sure the vacuum cap on the carburetor is installed*
- *Check the manifold to 90 deg. Intake clamps for tightness.*

My spark plugs are very white when I check them after a good run. *The cause of this condition is the idle air mixture screw not being open from the closed seat far enough. Cycle Innovations maximum settings are 1 turn open from the closed seat for GL1000's and 1-1/8 turns open from the closed seat for GL1100's.*

- *Turn the mixture screw "counter clockwise or OUT" 1/8 of a turn. Take the bike for another spin and check the plugs again. Repeat this step until the plugs are a medium to light tan color on the electrode tip.*

I have adjusted the air mixture screw and I don't know where it belongs; does it come preset. *Yes, for GL1000's the maximum setting is one turn open from the closed seat. For GL1100's the maximum setting is 1-1/8 turn open from the closed seat. Turning the screw in will cause the mixture to be more lean, "causing the plugs to burn a lighter color" thus turning the screw out, will cause the mixture to become more rich "causing the plugs to burn a darker color." The desired color on the sparkplug electrode tip is a medium to light tan color. The bike must be ridden for several miles and the plugs pulled and checked for color between each adjustment. Note: do not turn the mixture screw more than 1/8 of a turn per adjustment.*



Figure 22-A riser plate with idle adjustment screw and spring



Figure 22-B choke cable bracket



Figure 22-C fuel inlet tubing

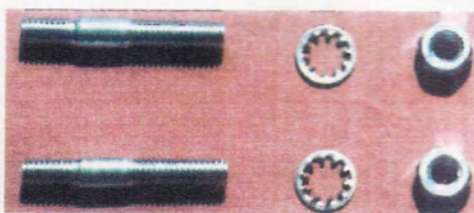


Figure 22-D 5/16 " studs, star washers and nuts

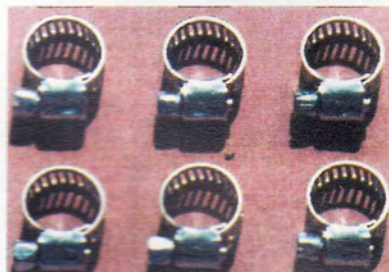


Figure 23-A fuel line hose clamps



Figure 23-B three types of vacuum line caps

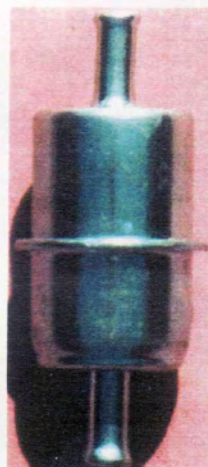


Figure 23-C fuel filter

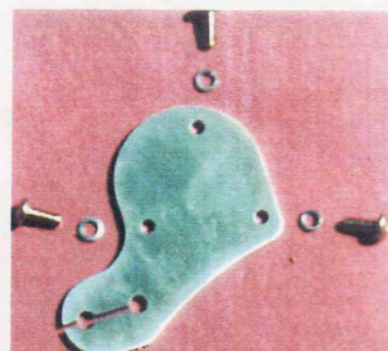


Figure 23-D cable support bracket and 1/2 inch mounting screws

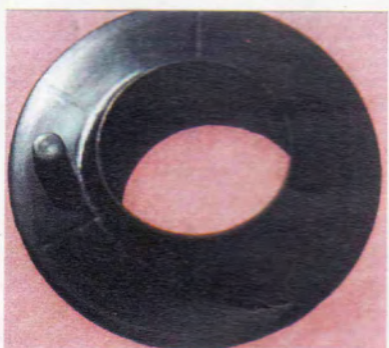


Figure 24-A air filter adapter ring



Figure 24-B three fuel lines 6", 9" and 21"



Figure 24-C air filter adapter ring gasket



Figure 24-D casing vent line



Figure 25-A vacuum line for GL1100

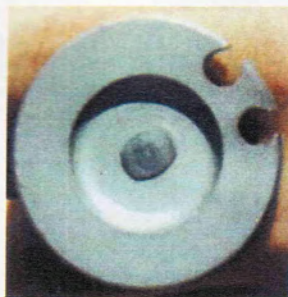


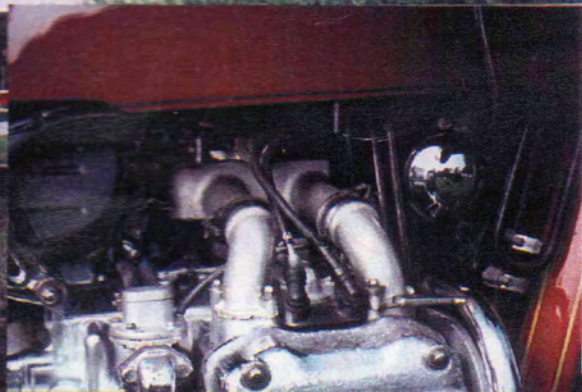
Figure 25-B throttle lever cam



Figure 25-C spark plugs



Figure 25-D vacuum line splicing block



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My engine is hard to start in the mornings, but starts extremely easily after it is warmed up. The most common cause of this symptom is incorrect spark plug gaps

- Check to ~~make~~ sure the spark plug gap is set to the Cycle Innovations, inc. recommended setting of .022, no matter what kind of coils you are using.
- The GL series carburetor conversion kits are known for their ease of starting. On cold mornings with cold engines it may be necessary to choke the engine for a short time. This should enable your engine to start easily.
- Note: do not choke the bike any longer than the time required to start it. Hold the throttle to obtain approximately 2000 rpm without the use of the choke until bike is warm. This should take approximately a minute or so. Then release the throttle and allow the bike to drop into an idle.

My GL1100 choke will not open fully after choking the bike.

- The most common cause of this is dragging choke cables. This is evident by looking at the choke lever located on the handle bar. If the cable is coming off of the cam, and bunching up "that's the problem". The use of a small wire tie will most always cure the problem when attached to the lever at the handle bar. Note: using too big of wire tie will restrict the range of motion of the choke lever causing the bike not to fully choke.

NOTES:

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

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