

MULTI-RANGE and DUAL-RANGE VARI FLOW (02/07/07)

READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING OR CALLING FOR TECHNICAL ASSISTANCE

KEEP THESE INSTRUCTIONS; give to the sled's new owner when selling.

Safety Considerations Gasoline is flammable and explosive. Do not smoke or allow open flames or sparks near areas where gasoline is used. If you get gasoline in your eyes swallow gasoline, get immediate medical attention. If you spill gasoline on your skin or clothing, wash immediately with soap and water and change clothing. Never run the engine in an enclosed area. Exhaust fumes are poisonous and can result in loss of consciousness and death in a short time. When drilling, wear safety glasses. Do not drill where sparks can reach gasoline. **To avoid injury, always check free throttle operation before starting engine. THIS PRODUCT IS NOT FOR AIRCRAFT USE. WARNING:** Installation/use of this product requires mechanical and carburetor tuning skills and may result in engine damage caused by decreased fuel flow. We are unable to verify every product application and installation.

Principle of Operation This carburetor compensator decreases fuel flow by applying a regulated vacuum to the float bowls. **This product will not work with '01 and '02 Ski Doo twins with Mikuni TM flatslide carbs.**

INSTALLATION

1. Determine Your Existing Carb Venting Carbs have one or more vent (overflow) fittings connected to their float bowls. In **air box venting**, these fittings are connected to barbs on the air box. All other venting is considered **outside air box venting** for application of this product. (**Note:** Some Arctic Cat's have enrichment circuit air tubes run to the air box; these are **not** vent tubes).

2. Carb Jetting Your carbs should be jetted (main jets **AND NEEDLES**) for your lowest operating altitude and temperature. This product works with almost all modifications if properly jetted.

3. Install ONE Vacuum Source per attached sheet. **Always before starting engine verify free throttle movement.**

4. Install Body and Air Inlet: The air inlet is the 1/2" hose barb on the body. The 1/2" i.d. inlet tubing should not be crimped or restricted and no foreign material should be allowed in the inlet; **this will causing leaning. Do not install the Brass inlet jet until you understand "TUNING WITH THE VARI FLOW" below; installation of this jet causes a 10% fuel reduction in the "RICH" position.** Install the center of the 5/8" tee in the inlet tube open end or an optional inlet filter is available for extreme cases of snow or belt dust. An **elbow** for 1/2" o.d. (3/8" trade size) copper tubing (**only**) may be used for tight bends (**no plastic 90's**).

The **VARI FLOW** body can be dash mounted (1/8" max. thickness). Drill a 3/4" hole, insert the knob through this hole, position the indicator disc over the knob with the preferred orientation and mark the screw holes on the dash. **Note: The disc will mount to the body in only one orientation.** Drill 3/16" holes at these marks and, **using thread locker**, screw the disc to the body. It may also be mounted under the hood, such as on an air box wall, but **locate the air inlet as below.** The knob detent action can be adjusted using a 1/16" hex key to turn the knob set screw, but overtightening will cause excessive wear.

4a. Outside Air Box Venting (see 1.) DO NOT LOCATE THE AIR INLET INSIDE THE AIR BOX IF YOU HAVE OUTSIDE AIR BOX VENTING; this will lean your baseline jetting causing engine damage. Locate the air inlet under the hood preferably lower than the **VARI FLOW**.

4b. Air Box Venting ONLY (see 1.) The air inlet must be in the same air box compartment as

the original factory vent fittings. For instance, if your vent fittings are under a single shelf, the air inlet must be under this shelf. If you have no shelves (guttered air box) anywhere in the box will work. It is **not** necessary to cap the factory vent tube barbs.

5. Outlet Install the body's outlet (the 1/4" hose barb) to the vacuum source using 30" of 1/4" i.d. tubing **and install the proper outlet jet(s)** (see "TUNING" below). **Operation with no outlet jet installed is aggressive** (20% reduction at position 4). The Dual-Range *VARI FLOW* includes an Aluminum and Copper outlet jet; the Multi-Range also includes Brass inlet and outlet jets and an Aluminum inlet jet.

6. Install Float Bowl (Vent) Lines (5/32" i.d. tubing). The entire system must be leak-free. Flooding or extreme riding can result in fuel in the float bowl lines; **tube routing should be uphill from the carbs** so the lines will **completely** drain. **Any** fuel in the lines will result in erratic operation. For extreme riding, an optional drain system is available. Rarely carbs have an overflow standpipe drain (some TMX); if present it must be sealed. If your carb vent fittings are too small for the 5/32" tubing supplied, 1/8" tubing may be used.

LIMITED WARRANTY Because of the custom nature and the limitless application variables this product is subject to, this product is sold with a limited warranty only. Holtzman Engineering, Inc. makes no warranty of any kind except we will replace this product if found to be defective in material or workmanship for one year from date of purchase. Holtzman Engineering, Inc. will not be held liable for any injuries incurred as a result of the installation or use of this product nor the parts this product may affect.

TUNING WITH THE *VARI FLOW*

The left chart below gives the fuel reduction required for altitude and temperature **CHANGES** from the temperature and altitude at which your carbs are jetted. The right chart gives approximate fuel reduction vs *VARI FLOW* knob position with different inlet (1/2" i.d. tubing) and outlet (1/4" i.d. tubing) air jet combinations. The Copper outlet jet and Aluminum inlet jet are the same as having tubing with no jet. The inlet and outlet air jets may be installed anywhere in their tubing. **ALUM&BRASS** means **both** Aluminum and Brass outlet jets in series with at least 1" spacing between. Remember your **A, B, C's** (Aluminum, Brass, Copper), **A** being the least aggressive, **B** the middle, **C** the most aggressive. Use the least aggressive range possible for best accuracy in using the *VARI FLOW*.

REQUIRED FUEL REDUCTION vs ALTITUDE AND TEMPERATURE CHANGE

ALTITUDE CHANGE		TEMPERATURE CHANGE				
FEET	METERS	0F(0C)	20F(11C)	40F(22C)	60F(33C)	80F(44C)
0	0	0%	2%	4%	6%	8%
1000	300	2%	4%	6%	8%	10%
2000	600	4%	6%	8%	10%	12%
3000	900	5%	8%	10%	11%	13%
4000	1200	7%	9%	11%	13%	15%
5000	1500	9%	11%	13%	15%	16%
6000	1800	11%	13%	14%	16%	18%
7000	2100	12%	14%	16%	18%	20%
8000	2400	14%	16%	18%	19%	21%
9000	2700	15%	17%	19%	21%	23%
10000	3000	17%	19%	21%	22%	24%
11000	3400	19%	21%	22%	24%	25%
12000	3700	20%	22%	24%	25%	27%

***VARI FLOW* FUEL REDUCTION vs KNOB POSITION**

INLET JET	OUTLET JET	APPROXIMATE FUEL FLOW REDUCTION				
		RICH POS.	POS. 1	POS. 2	POS. 3	POS. 4
NONE	ALUM&BRASS	<1%	1.5%	3.5%	5%	7%
NONE	ALUM	<1%	2.5%	5%	7.5%	10%
NONE	BRASS	<1%	4%	7.5%	11%	15%
NONE	COPPER	<1%	5%	10%	15%	20%
NONE	NONE	<1%	5%	10%	15%	20%
ALUM	ALUM&BRASS	<1%	1.5%	3.5%	5%	7%
ALUM	ALUM	<1%	2.5%	5%	7.5%	10%
ALUM	BRASS	<1%	4%	7.5%	11%	15%
ALUM	COPPER	<1%	5%	10%	15%	20%
ALUM	NONE	<1%	5%	10%	15%	20%
BRASS	BRASS	10%	12.5%	15%	17.5%	20%
BRASS	COPPER	12%	16%	19.5%	23%	27%
BRASS	NONE	12%	16%	19.5%	23%	27%

For instance, if you are jetted for -20F and sea level (0 feet) and you ride at up to 40F and 2000 feet, the temperature and altitude **change from your carb jetting** is 60F and 2000 feet. The left chart above says the required fuel reduction is 10%. The *VARI FLOW* should be set up with the Aluminum outlet jet and no inlet jet (or the Aluminum inlet jet) for a maximum fuel reduction of 10%.

USE OF BRASS INLET JET: If you have the above jetting (-20F and 0 feet) and you then go to the mountains and unload at 6000 feet and it is 0F, the temperature and altitude **change from your carb jetting** is 20F and 6000 feet. The left chart says the required *VARI FLOW* fuel reduction is 13% which can be achieved by installing the Brass inlet jet and the Brass outlet jet with the *VARI FLOW* knob in position "1". If you then climb to 10000 feet and 20F, the temperature and altitude **change from your carb jetting** is 40F and 10000 feet, and the left chart shows you need a 21% fuel reduction, which the right chart shows can be approximately achieved by progressively turning the *VARI FLOW* knob from "RICH" to position "4" as you climb.