

BLIZZARD*



'Tips on Racing'

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Lith'd in Canada

INTRODUCTION

The Blizzard snowmobile is the result of incomparable teamwork between Bombardier designers, technicians, and top racing drivers; from which has evolved a superb racing vehicle that has proven itself a winner, again and again.

However, there is always room for improvement, and this handbook will help you obtain the maximum performance of your Blizzard sled.

This manual has been published by the Racing Department of Bombardier Limited and is designed to inform experienced Blizzard mechanics/drivers of suggestions/modifications/tips, which have been formerly employed by the mechanics of the Ski-Doo Racing Team for snowmobiles ridden by professional snowmobile racers, Yvon Duhamel, Gaston Ferland and Mike Trapp.

Although content has been formerly applied to many of Bombardier's racing team vehicles, and have proven satisfactory, Bombardier Limited disclaims any and all responsibilities for damages/injury caused through, inexperienced persons utilizing/applying the content of this handbook, or any modification which renders the snowmobile unsafe.

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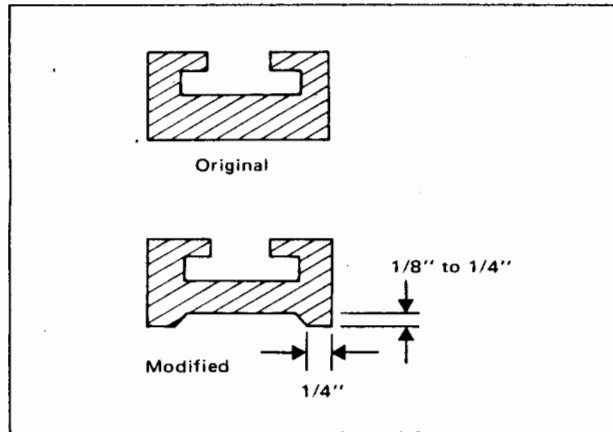
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Weight Reduction

Overall weight can contribute toward race failure or success. Undesirable components should be removed. Where possible, original parts should be interchanged with aluminum/magnesium alloy, and certain structures can be modified to eliminate 'unwanted' bulk. Here are a few examples:

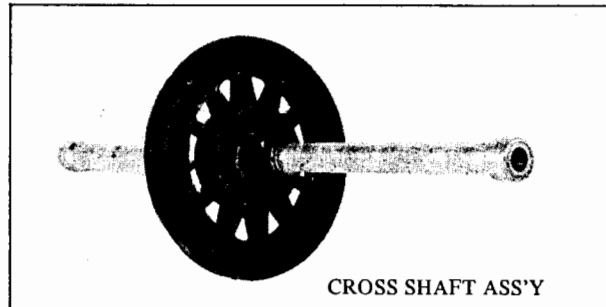
SUSPENSION

One suggestion is to 'channel' the friction surface of the slider shoes to a depth of 1/8 inch. This, of course, will not only reduce weight but cut down friction created through shoe and insert contact. A tonguing or grooving plane would be a suitable 'channelling' tool.



CROSS SHAFT ASSEMBLY

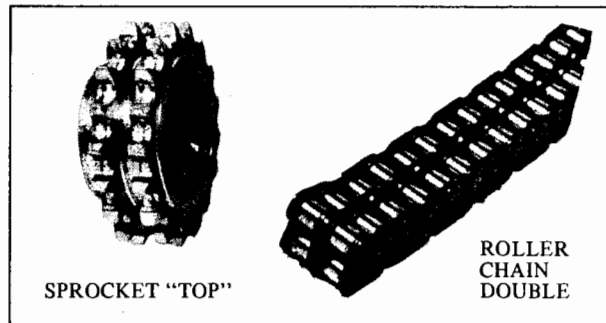
The cross shaft is another item worthy of modification. It is suggested that the shaft be machined and the flange be bored



DRIVE SPROCKET & ROLLER CHAIN

Another practiced method is to exchange the original steel drive sprockets for lightweight aluminum. The chain tensioner idler can also be replaced for similar material.

As you well know, drive chains are heavy and unfortunately must remain as is on all models except the 298 c.c. to 440 c.c. models. For these models, it is preferable to exchange the more heavy, triple chain for a double roller chain. Naturally, the drive sprockets should be modified in such a manner that the side row of teeth are eliminated.



GENERAL

Other suggested weight reduction methods are:

1. Drilling of 1/2" dia holes into bottom plate this will not only help the weight factor but enhance engine cooling.
2. Installation of an aluminum 7075 grade, end bearing housing.
3. Use of a smaller seat and gas tank.

Traction

The original Blizzard track is free running, safe, and in most instances, has the ability to provide the adhesive friction for fast over-the-snow travel. However, this traction can be improved . . .

TRACK ASSEMBLY

A new lightweight track is available for '73 models. The rubber section has a depth of approx. 140" and has a special non-stretch property to enhance free-running. For added traction, each is fitted with titanium cross links.

However, if this track is fitted, the drive axle idlers must be machined down to a 7.085" diameter.

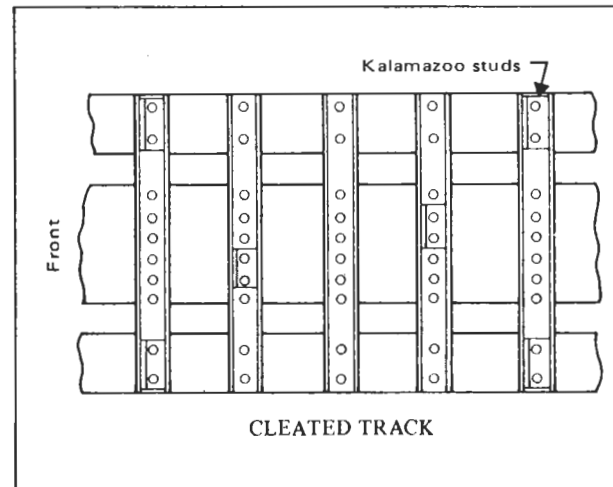
STUDS

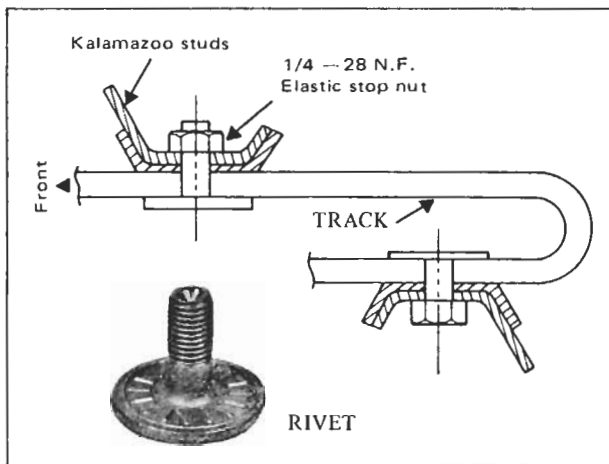
Properly located, track studs can provide that extra grip needed to negotiate hard pack surfaces. The most preferred stud for the cleated track is the "Kalamazoo-Kangaroo". It provides sharp, rigid penetration, without wobble.



Correct positioning follows logic . . . a greater number of studs on the center portion of the track . . . outside edges, for negotiating an icy oval.

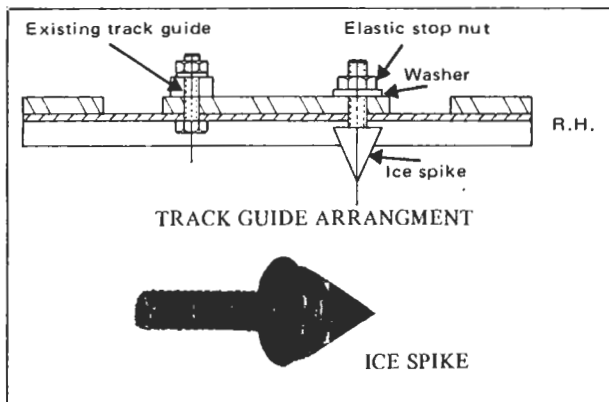
Stud positioning should not interfere with slider, on idler wheel rotation. Suggested locations: (Fig: 4-5+6)





TRACK GUIDE

Another alternative to the methods previously described, is the use of ice spikes. Remove all right hand side track guides and install spikes as shown.



Handling

The ability in negotiating those fast, tight turns is dependant solely upon sled design. The Blizzard racing sled has incorporated many of these much needed design features yet, the unit may not meet your own particular need. Here again are a few tried and proven suggestions:

FRAME

In raising the locating hole for the front portion of the slide suspension by 1 1/2", you will attain less ski/ground pressure, decrease bearing area yet, increase track bearing area pressure. This will increase the handling characteristics of the sled, and at the same time, improve fast acceleration.

SKI RUNNERS

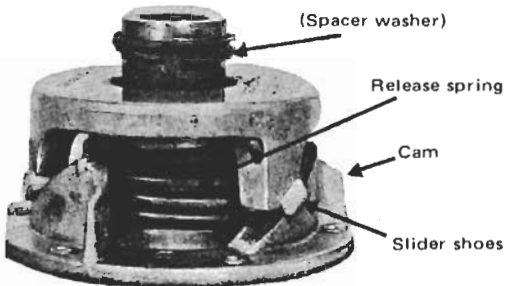
Undoubtedly, you are aware of our carbide runners and of the various configurations mentioned in former racing bulletins. For those so inclined, a host bar and carbide pieces kit is available from Performance Products Inc.

Torque-Converter System

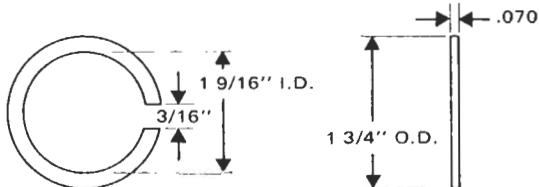
Calibration of this system is a science in itself requiring specialized equipment and knowledgeable engineers, however, the following information will serve as a guide for system improvement/adjustment in the field.

DRIVEN PULLEY

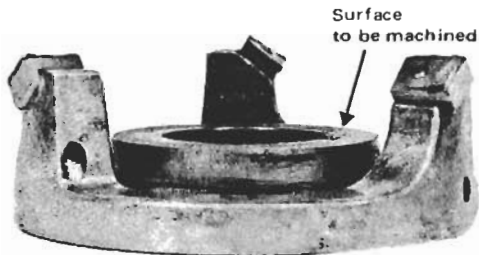
In certain cases, the slider shoes of the driven pulley cam of 298, 340, and 440 c.c. models, can disengage themselves and cause undesirable friction and damage. To eliminate this occurrence, it is suggested that a spacer washer be installed beneath the existing cam snap ring. Before doing so, however, the outer surface of the cam assembly should be machined down. (.070"). This will compensate for the thickness of the spacer.



DRIVEN ASS'Y



SPACER WASHER



OUTER CAM ASS'Y

SPRING TENSION

Recommended driven pulley spring tension for the 1973 Blizzard models are:

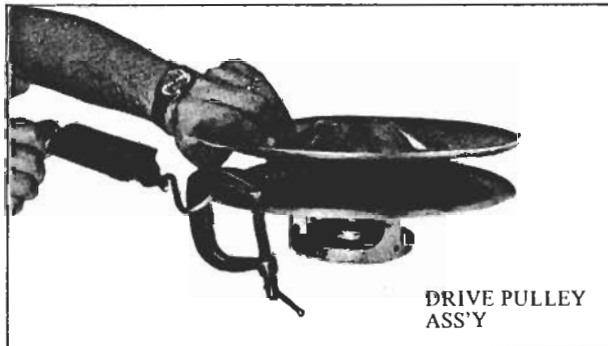
298	-	16lb.	640	-	15lb.
340	-	14lb.	800	-	13lb.
440	-	18lb.			

To check spring tension;

1. Remove drive belt, pulley guard, etc., then insert a 3/16" dia. bit between the driven pulley halves.

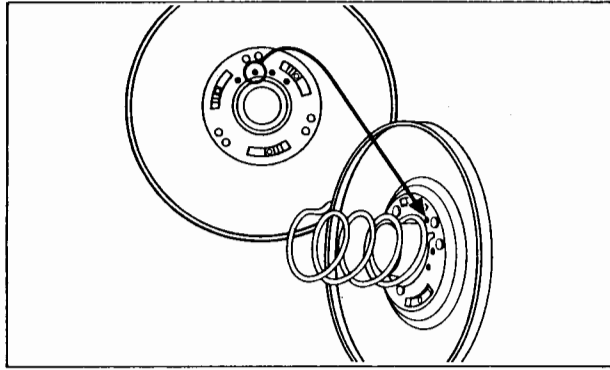
Note: It is preferable to check spring tension while the pulley assembly is installed on the drive shaft, however, if desired, the unit can be removed. The fixed half pulley, however, must be clamped, post up.

2. Install a "C" clamp on the sliding half pulley as shown.
3. Hook a small spring type weigh scale to the "C" clamp and pull until sliding half begins to move in a counter-clockwise direction. Scale needle should correspond to recommended tension.
4. If tension conflicts with recommendations, relocate spring end into alternate tang hole of sliding half.



DRIVE PULLEY ASS'Y

Note: If necessary, new holes may be drilled into sliding half.



DRIVE PULLEY

The formula for drive pulley modification comprises the following aspects;

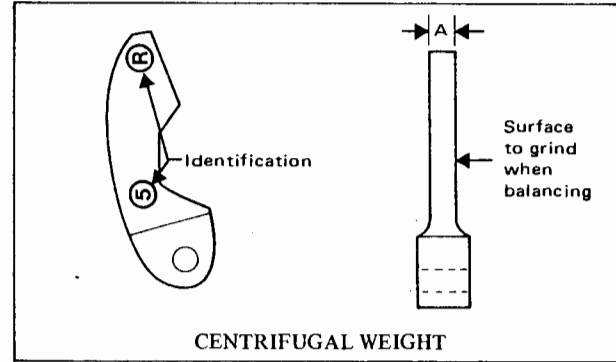
1. **Force** created by centrifugal action of crankshaft.
2. **Force** applied by centrifugal weights.
3. **Tension** exerted by the calibrated spring.
4. **Travel** of pulley assembly.

Through modification of aspects 2, 3, or 4, the engagement and shifting pattern of the pulley can be changed to fit many requirements.

RECOMMENDED WEIGHTS

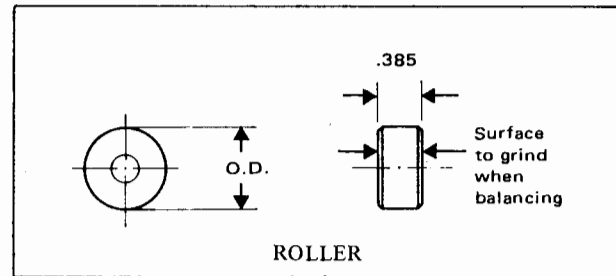
'73 Model	Identification	Dimension "A"	Part Number
298 c.c.	A-9	.210"	504-2159
340 c.c.	A-9	.210"	504-2159
440 c.c.	A-4	.230"	504-2179
640 c.c.	A-4	.230"	504-2179
800 c.c.	A-4 (special)	.260"	504-

Note: Actual precision is occasionally lost during manufacturing therefore, it may be necessary to grind material from weight sides. (Dimension "A"). Each of the three (3) weights **must** also be equal in weight.

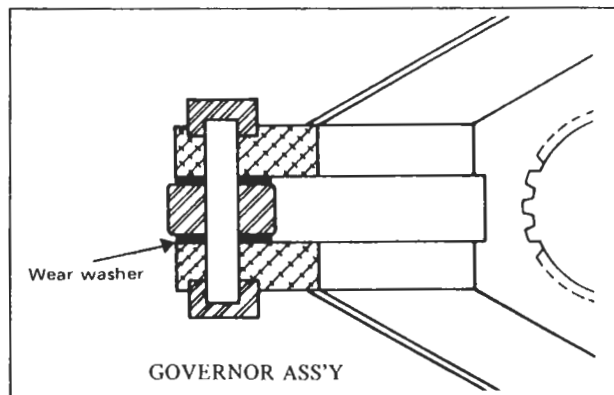


RECOMMENDED ROLLERS

Model	OD.	Part number
298 c.c.	.730"	504-2183
340 c.c.	.500"	504-2156
440 c.c.	.600"	504-2176
640 c.c.	.730"	504-2183
800 c.c.	.500"	504-2156



Note: Precision balancing may require material removal from surfaces "B". It is also advisable to remove all roller wear washers, thereby obtaining free-movement and less friction.



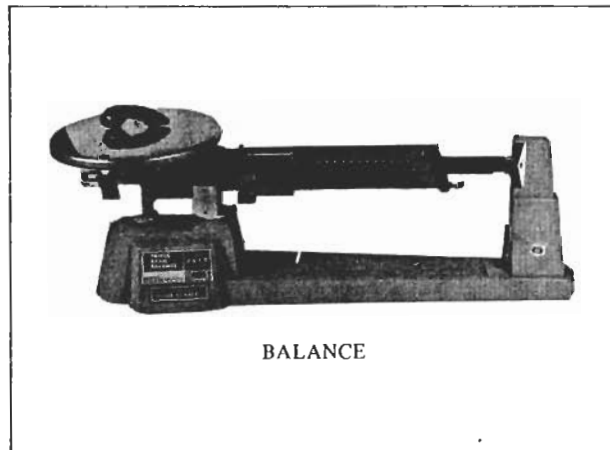
RECOMMENDED SPRING

Model	Spring Tension (at 3 1/8")	Approx. Engagement (with recommended weight)
298 c.c.	65 lb/in	5,500 RPM
340 c.c.	65 lb/in	5,500 RPM
440 c.c.	65 lb/in	5,300 RPM
640 c.c.	75 lb/in	5,400 RPM
800 c.c.	65 lb/in	5,300 RPM

Note: Spring length should be checked prior to all races. If less than 4 1/8", do not hesitate to replace.

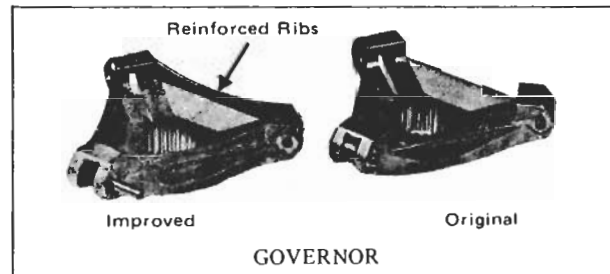
BALANCING

Precision balancing of rollers and centrifugal weights requires the use of an extremely sensitive balance . . . for example, Fisher Scientific-Triple Beam Balance. Capacity; 2,610 grammes.



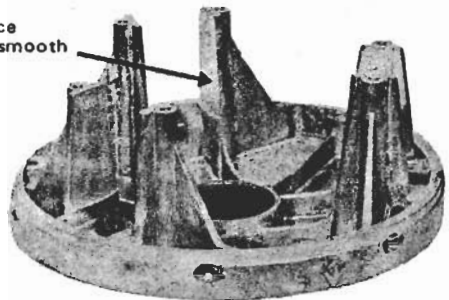
GOVERNOR/SLIDING HALF

A new governor is now available from your local Ski-Doo snowmobile dealer. It is suggested that the original governor be exchanged for the improved version, especially after clutch modifications have been performed.



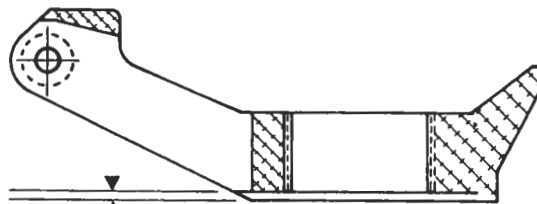
To facilitate free-movement, it is also suggested that the friction surfaces of the sliding half "pillars" be completely smooth. A good quality, fine grade sandpaper should perform this task.

Surface
to be smooth



SLIDING HALF

Since in effect, the centrifugal weight has been lowered, you must now grind the base of the governor until the .730" rollers touch the 'arch' of the weight.

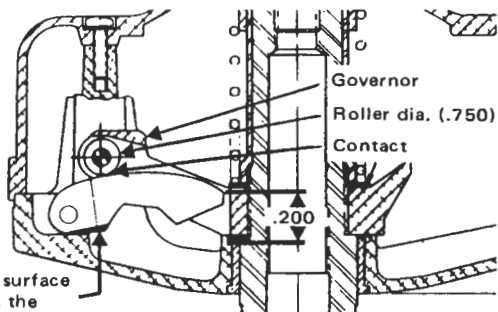


To be machining down, to permit the rollers of .750 dia. to be in contact with the centrifugal weight.

GOVERNOR

CLUTCH IMPROVEMENT (298 model)

To obtain maximum performance of this particular vehicle, it is suggested that the heel of each centrifugal weight be ground down so that the distance between the upper toe of the weight and the sliding half flange is .200". A "Vernier" tool is required for measuring this distance.



Grinding surface
to obtain the
dimension of .200

NEUTRAL POSITION

DRIVE PULLEY REMOVAL/DISASSEMBLY

This is a simple operation, however, we do recommend to observe the following steps:

To remove drive pulley, it is first necessary to raise engine from frame. Support, by inserting a block of wood between engine mount and cross support of frame.

To remove drive assembly from crankshaft, use a 'Snap-On' slide hammer no. GG-2508 and GG-2509, or equivalents.

It is important that screw and screw location are identified.

Remove six small screws from guard.

Remove three screws securing governor guard to sliding half.

Warning: Spring pressure can force assembly apart, therefore, it is imperative that the governor cup be held firmly during screw removal.

If necessary, governor guard bushing can be pressed out using an appropriate pusher and press. (Press inward).

Rollers can be removed by first removing gliders with a pair of pliers then remove axle with a drive punch. Worn gliders should be replaced when axle end is visible.

(Glider - wear washers?).

Rollers and components are available in sets of three. All components within the set must be installed. Do not interchange components.

To remove centrifugal weights use a drive punch and remove axles.

Counterweights are available in sets. Do not interchange component sets.

Sliding half bushings can be removed with use of an appropriate pusher and a press (Press inward).

Sliding half pulleys and governor guards are calibrated as matched sets. Do not interchange component parts. Appropriate bushings are installed in new components.

ASSEMBLY/INSTALLATION

Reverse the disassembly procedure taking note of the following pulley and balancing procedures:

Position sliding half on inner half shaft. Centrifugal weights, **down**.

Position governor with the 'Bombardier' mark facing up. Align governor mark with the 'Bombardier' mark stamped on sliding half.

Install washer, sleeve and spring.

Install governor guard, aligning "X" marks on governor and sliding half.

Apply "Loctite TL-242" on screws. Install and tighten to 50-65 in/lb.

Apply "Loctite TL-242" on six remaining screws. Install and tighten to 25-35 in/lb.

Torque pulley bolt to 50-60 ft/lb. Reposition engine.

MAINTENANCE

Preventative maintenance is the most economical method of ensuring the normal life-span of the system. It is strongly recommended that both the drive and driven units be disassembled, checked, lubricated, and reassembled prior to, and after, all races. Keep components dirt free at all time.

If engagement is too high, the compression spring may be too strong, or engaging mechanism may be sticking or binding . . . check centrifugal weights and rollers.

If engagement is erratic, the engagement mechanism is probably binding. This can be caused by dirt or foreign matter collecting on the shaft. In this case, remove driven belt, apply solvent to the shaft then manually move the sliding half back and forth to 'expell' the grime to a point where it can be removed with a rag. Clean and dry the shaft and pulley halves before reinstalling the drive belt.

Gear Ratio

Race tracks vary in length, condition and type of event, therefore, during the qualifying heats, observe your tachometer to determine suitability of correct gear ratio. If your r.p.m. is too high, exchange the upper drive sprocket for a larger one. If r.p.m. is too low, exchange for a smaller sprocket.

Here are a few examples of track lengths and gear ratios employed:

West Yellowstone. (Approx. 7/8 mile).

Model	Gear - Ratio
298 c.c.	13 - 44
340 c.c.	13 - 40
440 c.c.	15 - 44
640 c.c.	17 - 44
800 c.c.	18 - 40

Eagle River (Approx. 1/3 mile).

Model	Gear - Ratio
298 c.c.	12 - 44
340 c.c.	13 - 44
440 c.c.	14 - 44
640 c.c.	16 - 44
800 c.c.	17 - 40

St-Lazare (Approx. 5/8 mile)

298 c.c.	13 - 44
340 c.c.	13 - 40
440 c.c.	16 - 44
640 c.c.	17 - 44
800 c.c.	17 - 40

Drive Belt

Suggested drive belts for the Blizzard racing sled is no. 414-1884 "Dayco". A break-in period of one-half-hour must be given to each new belt, preferably, prior to the race.

Always inspect the belt whenever the vehicle is undergoing maintenance, or repair procedures, or when performance is unsatisfactory.

TROUBLE --- SHOOTING

Uneven belt wear

Improper alignment
Idle speed to high
Loose engine mount.

Belt turns over

Pulley offset incorrect
Engine over-revs.

Fails to fully disengage

Idle speed to high
Weak or broken spring
Pulleys misaligned
Sliding half sticking

Engagement speed too low

Weak or broken spring
Wrong belt installed
Incorrect flyweights governor installed

Engagement speed too high

Incorrect spring
Flyweights/rollers binding
Lack of lubricant
Incorrect flyweights governor installed

Erractic engagement

Flyweight/rollers binding
Stretched, deformed or broken spring(s)

High speed vibration

Bent shaft (s)
Incorrect flyweight/rollers

Creeping at idle

Too great of center to center distance between pulleys
Idle speed too high
Incorrect drive belt
Pulleys misaligned
Incorrect spring

Engine under or over revs. rated maximum r.p.m. (exceeds tolerance of - 300 r.p.m.)

Incorrect spring
Belt wear (less than 1" wide)
Pulley distance incorrect
Incorrect flyweights/governor installed

Poor top speed

Sliding half binds
Incorrect driven pulley spring tension

Engine loads up

Weak or broken driven pulley spring

Brake

Adjustment

No adjustment of any kind is required. The simple design offers long life and reliable operation and eliminates any need for adjustment.

Brake fluid

HB series master cylinders are designed for use with SAE type disc brake fluids or high-silicone brake fluids only, such as Kelstar SAE J, 1073, Wagner-Lockheed FC-59250, Dow 200 Silicone, Union-Carbide Y.7085 Silicone, or equal. Do not, under any circumstances, use hydraulic oil, mineral oil, aircraft type or red oil fluids since they will cause cups and seals to expand or deteriorate and the system can no longer operate properly. If at any time hydraulic oil is used, inadvertently, completely drain and flush the master cylinder and brake system.

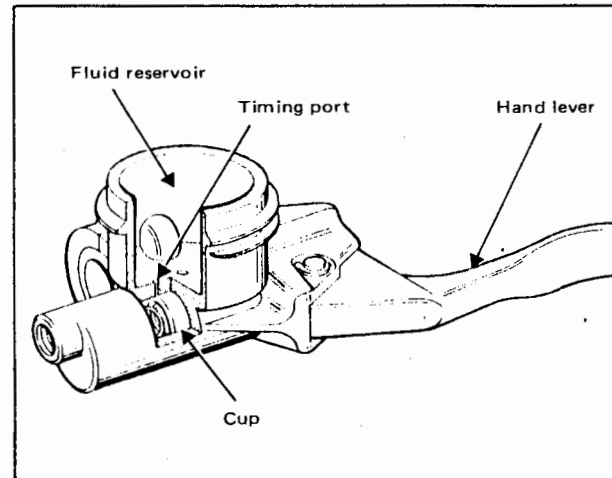
Replace all cups and seals as soon as possible and refill with fluid of the approved type.

Under normal conditions of service, with the correct type of fluid, there is no need for periodic changes of fluid. Simply keep the reservoir full at all time. Make frequent checks of fluid level (at least every 10 hours of operation) by removing the screw cap from the master cylinder and fill to within 1/32 in. of the top when additional fluid is required.

Timing Port

The unique design of the combined cylinder and reservoir includes a timing port which offers a simple, convenient method of checking brake operation. This port (shown in the cutaway view) is the smaller of the two holes connecting the fluid reservoir with the master cylinder within the one-piece body moulding. When the lever is in the released position the spring in the cylinder pushes the cup back so that this port provides a passage between the reservoir and cylinder. As the cylinder cup

moves forward, on brake application, it covers the timing port to seal off the cylinder so that it can apply hydraulic pressure to the caliper. Thus, it establishes the effective stroke of the cylinder. This little hole must be kept clear of obstructions or sediment at all time. Visually check for proper operation by first removing the cover.



As the hand lever is moved, to apply the brake, a small squirt of fluid from the timing port should be visible. If this squirt of fluid is not visible, press and release the lever rapidly several times to see if it will clear the port. If the squirt of fluid still does not occur, disassemble the master cylinder by removing one of the rings (4) and pivot pin (3) so that the lever (5), piston (6), O-ring (7), cup (8) and spring (9) may be removed. Examine the cup (8) and O-ring (7) carefully for signs of swelling, due to use of improper oil, or other deterioration. Replace spring, cup and O-ring unless you are sure that all are in good condition.

Then reassemble the parts, in the relationship shown in the exploded view, and check to be sure that the cup uncovers the timing port in the released position. This can be done by inserting a pin (less than 0.020 inch in diameter) into the port. If the port is not completely open, return to place of purchase for correction.

Inspection and Repair

All parts should be inspected periodically for signs of wear or damage and replaced as required. Repair kits are listed below. Disassembly and reassembly is shown in the exploded view. On reassembly, check operation of timing port, as directed in the preceding "Timing Port" paragraph.

BLEEDING INSTRUCTIONS

These procedures apply to hydraulic brake systems with HB series master cylinders.

All brakes are fitted with bleeder valves which seal securely when turned in tight, but will allow air or fluid to pass out through the hole in the nipple end of the valve when loosened. Check all fluid line connections before bleeding and check frequently to see that fluid level in the master cylinder reservoir is well up at all time. Add brake fluid as necessary. Proceed as follows:

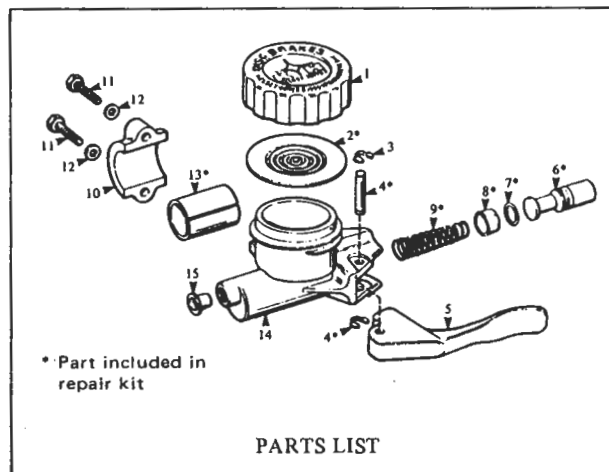
1. Remove cap from fluid reservoir of master cylinder.
2. Attach a flexible bleeder tube to the nipple of the bleeder valve on the brake. Use only the top valve if two are fitted. Place the other end of the tube in a jar containing a little clean fluid. The end of the tube must be below the surface of the fluid to prevent ingestion of air. Loosen the valve one turn.
3. Press the master cylinder hand lever slowly. Observe air bubbles rising in the fluid as the air is expelled through the bleeder tube.

4. Repeat step 3, above, until no more air bubbles appear as the lever is moved and only fluid escapes, indicating that no more air is left in the brake system. Check reservoir fluid level to avoid accidentally pumping air into the line at the master cylinder.
5. Tighten the bleeder valve as the lever is being pressed. Check the system carefully for leaks.
6. Finally, top up the fluid level to within 1/32 in. of the top of the reservoir and replace the cap securely.

Caution: Do not pour any of the purged fluid back into the reservoir since it is aerated and the air trapped within it will again enter the system.

REPAIR PARTS KITS

Kits of replacement parts are available for repairing. Parts included in kits are shown in the parts list and cover all parts that are likely to wear or deteriorate in normal service.



Engine

Model 298 Rotax

Displacement in cc's. 290.3
Bore (mm) 58.5
Stroke (mm) 54.0

Compression Ratio = $12.5 \pm 2 : 1$

Timing 1.5mm = .063 B.T.D.C. at 6000 R.P.M.

To ensure constant engine lubrication it is recommended that the oil reservoir and inlet/outlet lines be removed then both nipples be blocked off with plugs. Always check crankcase oil level before the race.

Model 340 Rotax

Displacement 436.6
Bore (mm) 63.0
Stroke 54.0

Compression Ratio = $12.5 \pm 2 : 1$

Timing 1.5mm = .063 B.T.D.C. at 6000 R.P.M.

Remove oil reservoir and inlet/outlet lines. Block off nipples. Always check crankcase oil level prior to the race.

Model 440 Rotax

Displacement 436.6
Bore (mm) 67.5
Stroke (mm) 61.0

It is suggested that the original rotary cover plate be exchanged for one having an opposing incline. (Downward). Part number 402-0256, available from your local Ski-Doo® snowmobile dealer.

Replacement will enhance acceleration and achieve a quicker response of the engine to the throttle.

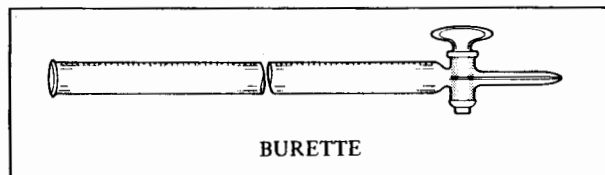
It is also recommended that the compression ratio be increased from 11.2 - 11.5 to 12.4 - 12.5.: 1

Timing = 1.5mm = .099 B.T.D.C. at 5000 R.P.M.

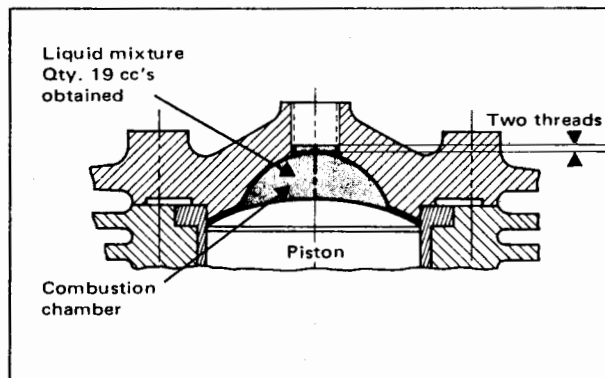
How to check compression

1. Remove one spark plug and place piston at T.D.C.
2. Obtain a c.c. graduated burette, capacity 0-50 c.c., and fill with 50% gasoline and oil.

Note: Suggested burette, 'Canlab no. 8-000/T, or equivalent.



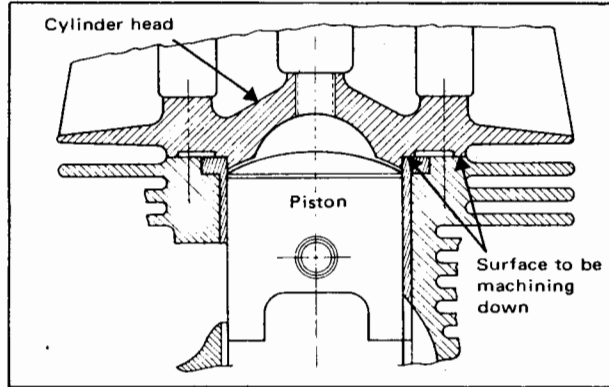
3. Divide actual displacement of 436.6 cc's by 2 and obtain a reading for one cylinder only. ($436.6 \div 2 = 218.3 \text{ c.c.}$).
4. Inject the burette content through the spark plug hole until mixture touches the 2 bottom thread of the spark plug hole. Read the burette scale and obtain quantity of c.c. injected into cylinder. (Example: 19cc's.)



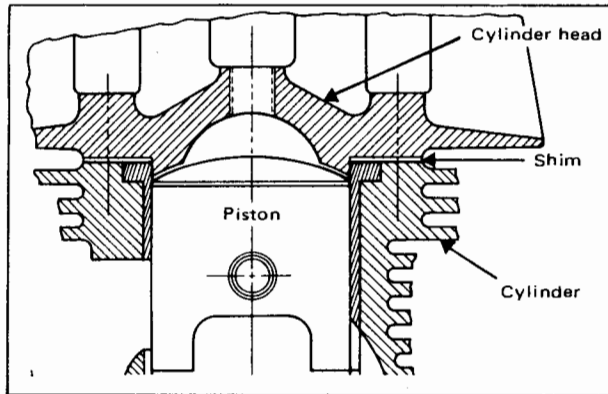
5. Add the quantity injected to the original reading.
(218.3 plus 19= 237.3 c.c.).

Actual compression, $237 \div 19 = 12.48$ ratio.

To increase compression, machine the cylinder heads
.030" - .050".



To decrease compression, add steel shims between cylinders head and cylinder.



Model 640 Rotax

Displacement	645.2
Bore (mm)	67.0
Stroke (mm)	61.0

It is recommended that original compression ratio be increased to $12.5 \pm .2$: 1 equally distributed on three cylinders.

Timing = 1.5mm = 0.130 B.T.D.C.

Model 800 Rotax

Displacement	797.7
Bore (mm)	74.5
Stroke (mm)	61.0

For best results compression ratio should be increased to $12.5 \pm .2$: 1 equally distributed on three cylinders.

Timing = 1.5mm = 0.130 B.T.D.C.

ENGINE TROUBLE SHOOTING

IRREGULARITIES

CAUSE

Rewind starter
inoperative

1. Pawls bent, broken or worn
2. Friction spring broken or stretched
3. Starting pulley worn
4. Recoil spring detached from pin or broken
5. Pulley housing warped

Engine
will not crank

1. Piston seized or rusted to cylinder wall
2. Crankshaft seized to bearing
3. Broken connecting rod
4. Engine improperly assembled after repair

FERRATUM

PAGE 2: Bottom Illustration is Fig. 4

PAGE 3: Top Illustration is Fig. 5
Bottom Illustration is Fig. 6

PAGE 6: First Paragraph, Second line, Delete "B".

PAGE 7: Roller Dia. is .730 as stipulated in text
(top R.H.S.).
Illustrations should be corrected accordingly.

Engine backfires or doesn't start

1. Spark plug wires reversed (on two set points)
2. Flywheel key sheared or missing
3. Bad condenser
4. Improper timing
5. Faulty breaker points
6. Unhooked spark retarding mechanism (or spring broken)
7. Adjustment needles stuck in seating of carburetor body

Engine cranks easily on one or both cylinders

1. Scored piston
2. Blown head gasket
3. Loose spark plugs
4. Incorrect torque of cylinder head nuts
5. Defective piston ring

Engine turns over but fails to start or starts with difficulty

1. Empty gas tank
2. Incorrect fuel oil ratio
3. Water in fuel system
4. Blocked fuel lines or fuel filter cartridge
5. Carburetor idle speed mixture adjustment incorrect
6. Flooded engine
7. Inoperative carburetor diaphragm or flapper valve
8. Spark plug incorrectly gapped, dirty or broken
9. Incorrect engine timing
10. Breaker points out of adjustment, dirty or worn

Impossible to adjust idle. Missing at low speed, doesn't idle smoothly or slowly

11. Weak coil or condenser
12. Secondary wire disconnected or defective spark plug protector

1. Carburetor idle speed mixture adjustment incorrect
2. Improper fuel mixture
3. Defective spark plug
4. Head gasket blown or leaking
5. Loose magneto plate
6. Leaking crankshaft seal
7. Weak coil or condenser

Good spark but engine runs on (1) cylinder, (double cylinder engine)

1. Leaking head gasket
2. Magneto wires broken (coil ground broken)
3. Cracked cylinder wall
4. Defective spark plug
5. Seized piston

Vibrates excessively or runs rough and smokes

1. Idle or high speed mixture adjustment too rich
2. Choke not opening properly (bent linkage)
3. Inlet control lever too high (carburetor floods)
4. Idle air bleed plugged
5. Welch plugs leaking
6. Silencer obstructed
7. Engine mount loose
8. Water in gasoline

No acceleration.
Idles well but dies
down when put to full
throttle

1. High speed mixture needle set too lean
2. High speed jet obstructed
3. Inlet lever set too low
4. Choke partly closed
5. Silencer obstructed
6. Fuel line or fuel filter cartridge obstructed
7. Carburetor: Punctured diaphragm or flapper valves bent
8. Breaker points improperly gapped or dirty
9. Engine improperly timed
10. Welch plug leaking

Hard to start, no
acceleration; low
top R.P.M.

1. Spark plugs improperly gapped or dirty
2. Magneto points improperly gapped or dirty
3. Faulty coil or condenser
4. Loose or broken magneto wires
5. Poor engine compression
6. Inlet lever adjustment too low
7. Idle speed and/or high speed mixture too rich

Engine runs by using
choke at high speed

1. Leaking fuel line
2. Dirt behind needle and seat
3. Fuel line and fuel filter cartridge obstructed
4. Malfunctioning or punctured diaphragm

Missing at high speed
or intermittent spark

1. Spark plugs improperly gapped, dirty or defective
2. Loose or broken magneto wires
3. Magneto points improperly gapped or dirty
4. Weak coil or condenser
5. Heat range of spark plug incorrect
6. Leaking head gasket

No power under
heavy load

1. Magneto points improperly gapped or dirty
2. Ignition timing too far advanced
3. Faulty carburetion

High speed back-firing

1. Lean carburetor adjustment
2. Carbon formation on spark plug
3. Crankshaft oil seal leaking
4. Condenser defective
5. Breaker points improperly gapped
6. Loose armature plate

Engine runs too hot

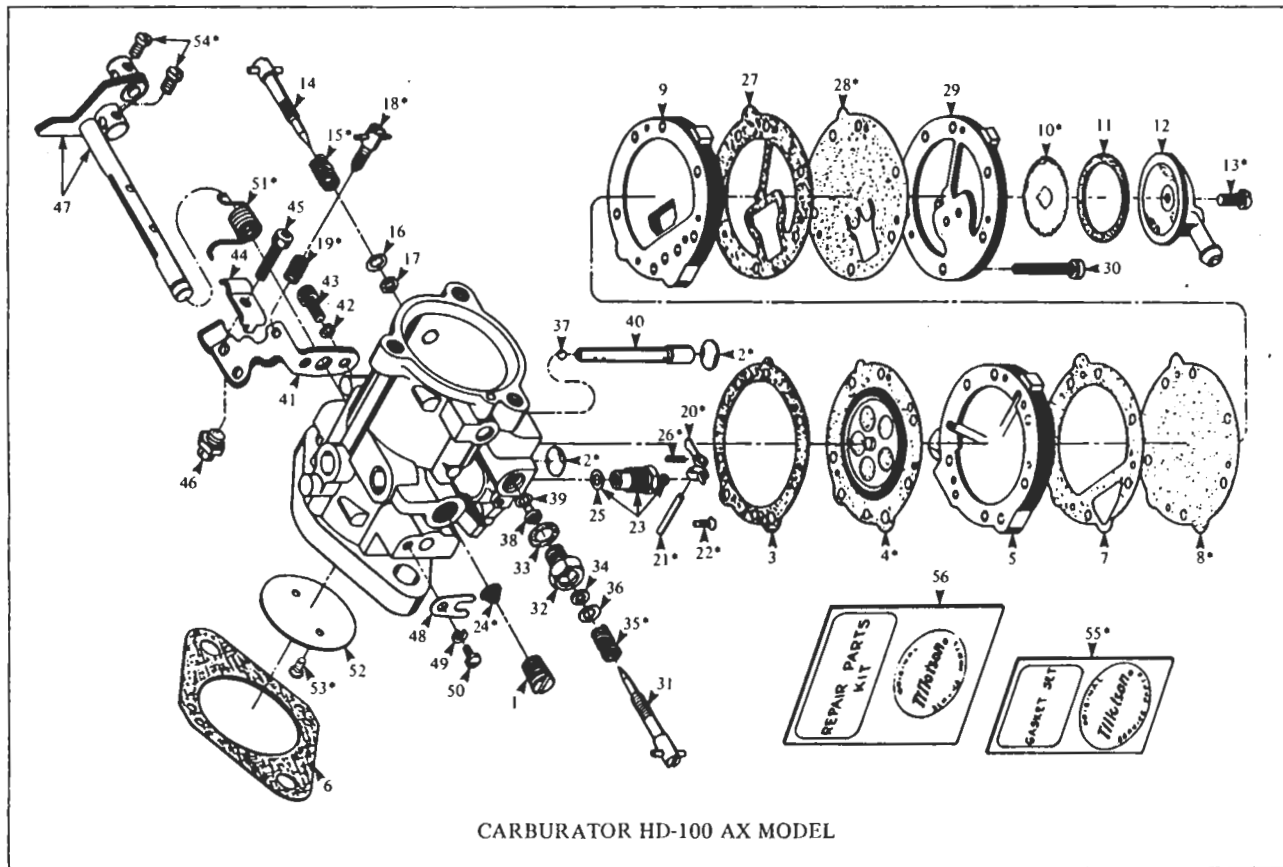
1. Carburetor mixture too lean
2. Incorrect timing
3. Too much carbon formation
4. Spark plug range too hot
5. Air deflector not installed or broken fan belt
6. Broken or dirty engine fins.

Carburetor

Carburetor calibration is another item worthy of mention in our Blizzard Tips Handbook, especially on the

Blizzard models 640 and 800 c.c., only with the HD-100-AX carbs.

The suggested modification is as follows:



Ref. No.	Part Name		
1	Body Channel Plug Screw	30	Inlet Valve Body Screw & Lockwasher (6)
2	* Body Channel Welch Plug (2)	31	High Speed Mixture Screw
3	Diaphragm Gasket	32	High Speed Mixture Screw Gland
4	* Diaphragm	33	High Speed Mixture Screw Gland Gasket
5	Diaphragm Cover	34	High Speed Mixture Screw Packing
6	Flange Gasket (2)	35	* High Speed Mixture Screw Spring
7	Fuel Pump Gasket	36	High Speed Mixture Screw Washer
8	* Fuel Pump Diaphragm	37	Lead Shot
9	Fuel Pump Body	38	Main Fuel Jet (.125)
10	* Fuel Strainer Screen	39	Main Fuel Jet Gasket
11	Fuel Strainer Cover Gasket	40	Nozzle Check Valve Assembly
12	Fuel Strainer Cover	41	Throttle Cable Bracket
13	* Fuel Strainer Cover Ret. Screw	42	Throttle Cable Bracket Lockwasher (2)
14	Idle Mixture Screw	43	Throttle Cable Bracket Retaining Screw (2)
15	* Idle Mixture Screw Spring	44	Throttle Cable Clamp
16	Idle Mixture Screw Washer	45	Throttle Cable Clamp Retaining Screw
17	Idle Mixture Screw Packing	46	Throttle Cable Clamp Retaining Nut
18	* Idle Speed Screw Assembly	47	Throttle Shaft & Lever
19	* Idle Speed Screw Spring	48	Throttle Shaft Clip
20	* Inlet Control Lever	49	Throttle Shaft Clip Lockwasher
21	* Inlet Control Lever Pin	50	Throttle Shaft Clip Ret. Screw
22	* Inlet Control Lever Pin Ret. Screw	51	* Throttle Shaft Return Spring
23	Inlet Needle, Seat & Gasket	52	Throttle Shutter
24	* Inlet Screen	53	* Throttle Shutter Screw (2)
25	Inlet Seat Gasket	54	* Throttle Wire Ret. Screw (2)
26	* Inlet Tension Spring	55	* Gasket Set
27	Inlet Valve Gasket	56	Repair Parts Kit
28	* Inlet Valve Diaphragm		Diaphragm & Gasket Set
29	Inlet Valve Body		

(*) Indicates contents of Repair Parts Kit

Removal

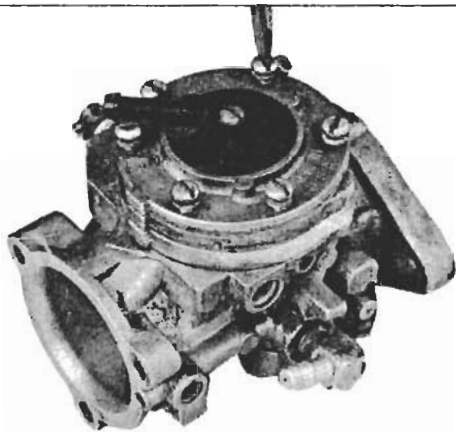
1. Disconnect fuel line(s) and throttle cable from carburetor body.
2. Remove the two (2) carburetor flange nuts and washers.
3. Remove carburetor body sleeves, gasket, isolating flange and isolating flange gaskets from the intake flange studs.

Disassembly

Select a clean working area for disassembly and assembly procedures.

A great deal of carburetor trouble can be caused by working in a dirty area and/or misplacement of small carburetor parts.

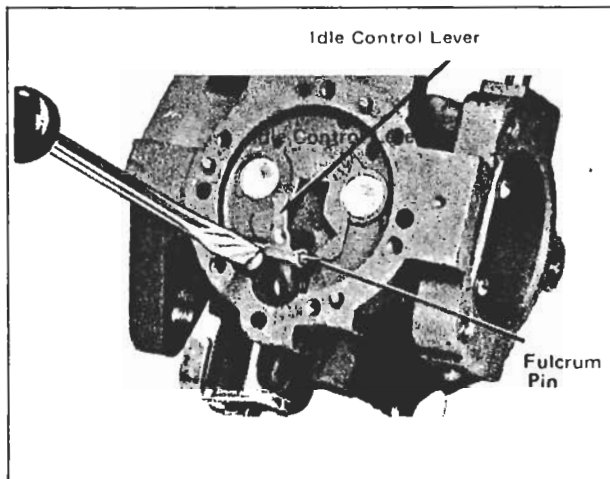
1. Unscrew the fuel filter cartridge from carburetor. Remove cartridge gasket and filter.
2. Remove the six (6) body screws.



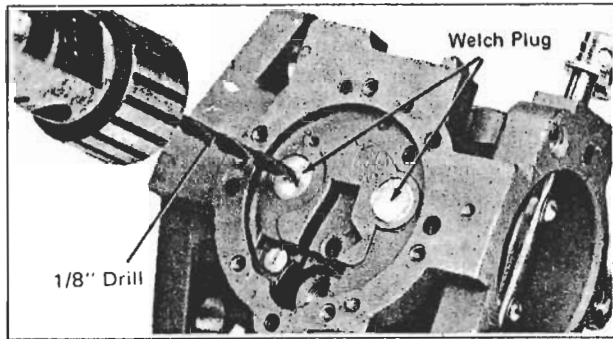
3. Remove the inlet valve body, inlet valve diaphragm, inlet valve gasket, fuel pump body, fuel pump diaphragm, fuel pump gasket diaphragm cover, diaphragm and diaphragm gasket.
4. Remove the fulcrum pin retainer screw.

Caution: Since the lever is spring loaded and can “fly out” of the casting, hold the idle control lever while removing the retainer screw.

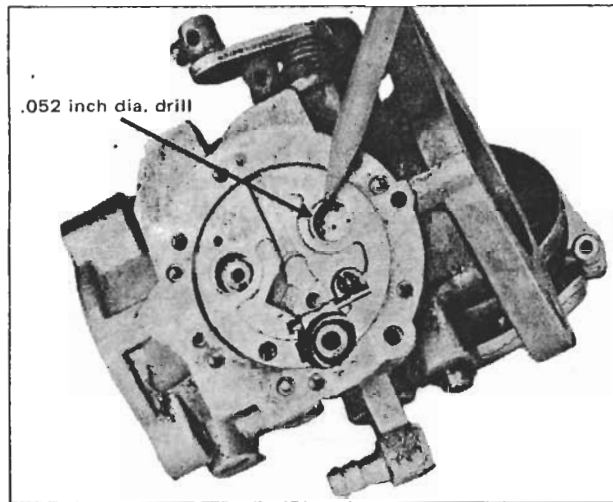
5. Remove the idle control lever and inlet control lever fulcrum pin from the carburetor body. Pull the fulcrum pin from the control lever.



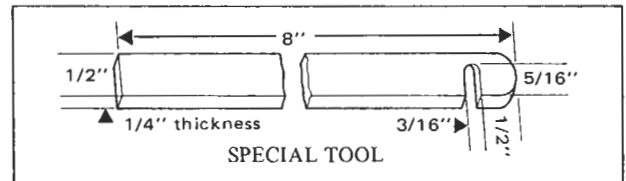
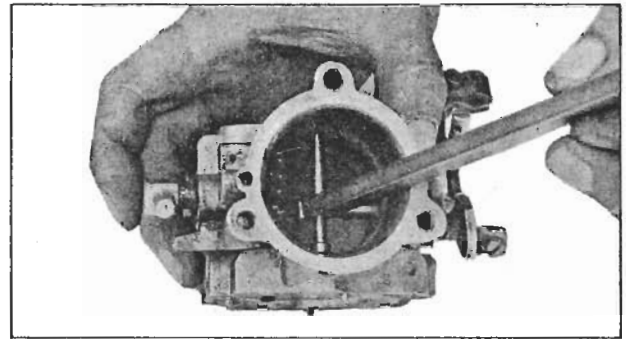
6. Remove the high speed mixture screw. Spring washer and packing from carburetor body.
7. With a 1/8 inch dia. drill, perforate the welch plug. Allow only the drill tip to break through the plug.
8. Pry the welch plugs from their seating using a small drive punch.



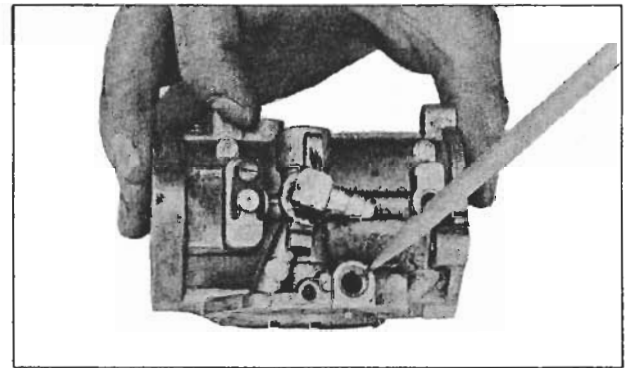
9. With a .052 inch dia. drill, perforate the carburetor body.



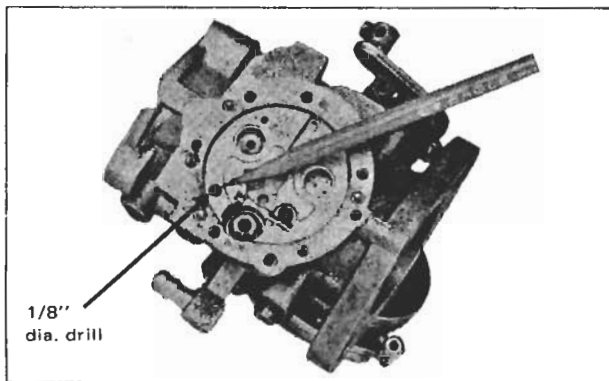
10. Using the special tool, remove nozzle check valve assembly.



11. Using a 1/8 inch dia. drill, enlarge the main fuel jet orifice.



12. Using a 1/8 inch dia. drill, enlarge the inlet hole.



13. Reface the inlet valve body, fuel pump body and diaphragm cover with 3M - "Wetordry Tri-M- It" Paper# 240, or equivalent.



CLEANING

Caution: Some solvents and cleaners have a damaging effect on the synthetic rubber parts of the carburetor. Therefore, we recommend the use of a petroleum product for cleaning. Do not use alcohol, lacquer, acetone thinner, benzol or any solvent with a blend of these ingredients. If in doubt, test a used part and observe the reaction.

1. The entire carburetor should be flushed with fuel then dried with compressed air before disassembly.
2. After disassembly, parts can be cleaned with compressed air. Carefully blow out each channel and orifice in the castings.

INSPECTION

1. The carburetor should be inspected for casting cracks, bent or broken shafts, loose levers or swivels and stripped threads.
2. Examine the shafts and the body bearings for wear. If the shafts are excessively worn, replace. If the body bearing areas are worn, replace the body casting.
3. Handle the inlet spring carefully. Do not stretch the spring, or in any way change its compression characteristics. If in doubt about its condition, replace.
4. Inspect the cover casting for nicks, dents or cracks which might interfere with operation.
5. Inspect the metering diaphragm . . . the center plate must be riveted securely to the diaphragm. The diaphragm should be free from holes or imperfections. The gasket should be replaced if holes or creases exist on its sealing surface.
6. Inspect the diaphragm . . . it must be flat and free of holes. The gasket should be replaced if there are holes or creases in its sealing surface.

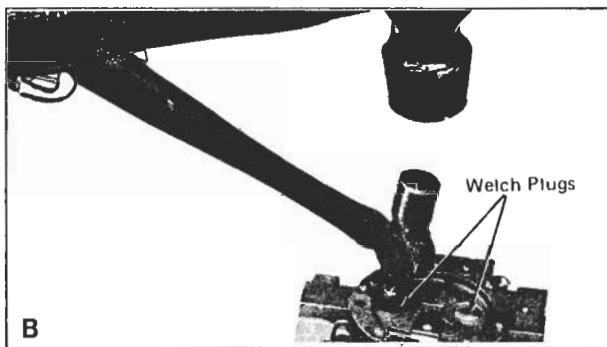
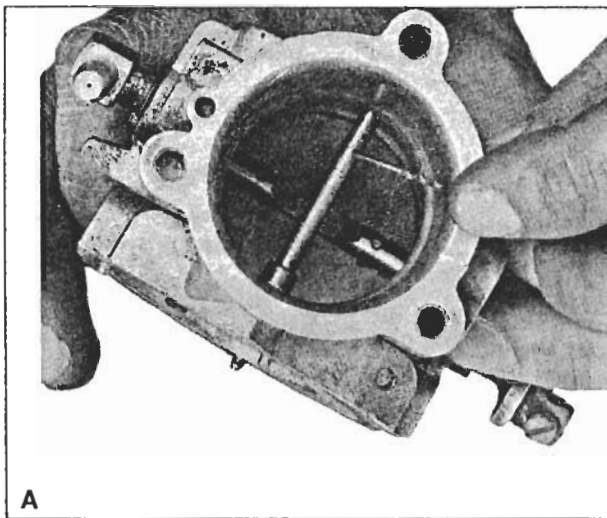
7. The filter screen should be flushed with fuel or solvent then dried with compressed air. It is advisable to replace the gasket whenever the filter screen is serviced. Flush all dirt from the plastic cover before assembly.
8. The inlet needle and seat are a matched set and have been leak tested at the factory. Parts should not be interchanged.
9. The two most likely causes of carburetor failure are dirt and a careless repair job. A clean, carefully assembled unit should be nearly as good as new.

ASSEMBLY

Install high speed mixture screw using the following procedure:

1. On H.D. carburetors, install the main fuel jet using a screwdriver blade of correct width. Position gasket on gland and screw the gland into carburetor body. Position spring, washer and packing on high speed mixture screw and install the screw assembly into gland.
2. Position the nozzle check valve assembly, then insert a small dia. drill through the shaft hole. Turn shaft until drill touches carburetor body. (Fig. A)
3. Position a new welch plug (convex side up) then using two (2) ball peen hammers, gently tap the plug until it becomes concaved. Install second plug using same procedure. The plugs must be correctly seated to avoid possible leakage. (Fig. B)
4. Leak test the carburetor by allowing controlled compressed air (max. 50) into the idle hole and into the high speed mixture hole. The carburetor must be inverted, welch plugs up and a drop or two (2) of oil laying over each plug. If the plug(s) are seated incorrectly small air bubbles will appear around the

plug diameter. In such a case, reseal the (plug(s) using the ball peen hammers then leak test once more.



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Valcourt, Québec,
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