Float Carburetors

- Manufacturers
  - Marvel-Schebler
  - Bendix/Stromberg
  - Bing
Float Carburetors

- Model identification systems
  - Marvel/Schebler
    - MA = updraft
    - HA = sidedraft
  - Bigger secondary numbers mean larger engine application.
  - Use specific Marvel/Schebler P/N
Float Carburetors

• Model identification systems
  – Stromberg-Bendix
  – 5 to 6 groups
  – First Group:
    • NA - Natural Atomization
    • P - Pressure
    • Q - Small Pressure
Float Carburetors

• Model identification systems
  – Second Group:
    • Barrel types
  – Third Group
    • Barrel Size from 1 3/16”, 1/4” increments
Float Carburetors

• Model identification systems
  – Fourth Group:
    • Model letter = major modification signifying model change.
  – Fifth Group:
    • Model number = minor modification not enough for new model change.
Float Carburetors

• Model identification systems
  – Sixth Group:
    • Sub-mod letter = very minor change.
Float Carburetors

• Model identification systems
  – Bing
    • Uses a number commonly
    • Describes the throttle bore in millimeters.
    • Usually cable slide throttle type.
    • Can be vacuum slide with butterfly
Float Carburetors

• Float carburetors are so named because they maintain a fuel staging area at approximately ambient pressure with a float valve.

• Fuel level is maintained to tight tolerances because fuel metering is a function of float level.

• Higher levels make it richer.
Float Carburetors

- As fuel is drawn for the bowl area the float drops opening the float valve.
- Fuel pump pressure causes the bowl to refill, floating the valve closed.
- Under normal operations the float valve remains slightly open to very open, keeping the level constant.
Float Carburetors

Airbleed

Primary Venturi

Main Venturi

Float Bowl

Throttle plate
Float Carburetors

- Floats can be concentric or eccentric.
- Concentrics are levers, first or second class.
- Eccentrics are a slide float.
- Floats can be adjusted by shims under the valve, or by adjusting a valve contact tab.
Float Carburetors

- Floats need to be carefully inspected for leaks and possible deterioration.
- Be very exact in using the manufacturer’s guidelines, and in float level measurements.
- Always leave the float chamber spotless.
Float Carburetors

• The main source of fuel metering force comes from the pressure differential between the low pressure area within the venturi and the ambient pressure in the float chamber, or bowl.

• This is called air metering force.
Float Carburetors

• This fuel metering force draws fuel into a discharge nozzle, or venturi nozzle that introduces fuel into the center of the airstream.

• Air bubbles can be bled into the fuel gallery just before the discharge device to assist in atomization and distribution.
Float Carburetors

Airbleed

Primary Venturi

Main Venturi

Float Bowl

Main fuel metering jet

Low pressure fuel
Float Carburetors

• Idle circuits will exist that feed fuel through separate ports.
• These are located just down stream of the throttle plate.
• There may also be transition ports to assist throttle transition from idle to midrange.
Float Carburetors

• Idle and transition ports will only be active when throttle plate is closed or transitioning.
• They may drip slightly.
• Are usually a completely separate fuel circuit from the main fuel metering.
• May also have air bleed systems.
Float Carburetors

- Idle and transition circuits will only function when throttle plate is causing high velocity air to flow close to the port.
- Once throttle plate opens enough the port stops delivering fuel flow.
Float Carburetors

Airbleed

Primary Venturi

Main Venturi

Idle/transition circuit

Float Bowl
Float Carburetors

Airbleed

Primary Venturi

Main Venturi

Float Bowl

Idle/transition circuit
Float Carburetors

Airbleed

Primary Venturi

Main Venturi

Float Bowl

Idle/transition circuit
Float Carburetors

• Most of these carburetors are up draft or side draft.

• The systems are identical with the position of the fuel discharge venturis and idle circuits upstream of the throttle valve regardless of the airflow direction.
Float Carburetors

Airbleed

Throttle plate

Main Venturi

Float Bowl
Float Carburetors

• Float lever arrangements are the same for all carbs.
• Some use a first class lever, others use a second class lever.
• Acceleration systems, when used are similar.
  – Some early auto systems use a diaphragm pump rather than a piston.
Float Carburetors

• Fuel enrichment circuits for Marvel-Schebler units.
• Mixture control is accomplished by a rotary valve that regulates fuel flow to the power jet.
• This valve acts as the main fuel metering jet
Float Carburetors

• Enrichment/economizer is caused by full throttle linkage and a needle valve restricting bleed air.
• This causes more fuel and less air to be drawn to the discharge nozzle.
• The additional high velocity air makes up for the loss of bleed atomization.
Float Carburetors

• Early Stromberg can have a back suction mixture control.

• This provides lower venturi pressure into the fuel bowl area with an adjustable bowl vent to reduce fuel metering force.

• Idle cut-off won’t work well or at all when engine is at low RPM.
Float Carburetors

• Later Strombergs use a needle valve assembly to create mixture control.

• They also use a separate needle valve assembly as an “economizer” valve.

• Its purpose is to provide less fuel when not at full throttle.
Float Carburetors

• Both full power enrichment and mixture control systems can be configured with automatic adjusters.

• These are usually some form of aneroid bellows moving a needle valve pintle.
Float Carburetors

• Idle circuits very similar on all models.
• Some use throttle transition ports.
• Most will have a idle fuel ratio adjusting screw that regulates fuel flow.
• Some rare applications may use an air screw to adjust idle fuel ratio.
• Metering jet and tube may be one unit.
Float Carburetors

- Typical acceleration pumps are piston type.
- Piston may be fixed while cylinder moves.
- Or piston moves in cylinder bore.
- Primarily actuated by throttle linkage.
- Diaphragm type on rare applications.
Float Carburetors

• The three major disadvantages of float carburetors are:
  – Various flight attitudes may cause the float system to malfunction.
  – Carburetor icing is most prevalent with this type.
  – Fuel metering and throttle transition is less accurate.
Float Carburetors

SECTION END