ESSEX 1925-1930

Motor Tune-Up & Specifications

Essex 1925-1930

Motor Tune-Up

When tuning the motor, the carburetor is the last unit that should be checked. With present day motors and fuels, there are many symptoms of trouble caused by improper timing, compression and valve adjustment which resembles closely, carburetor trouble. On Essex motors care should be exercised not to confuse symptoms caused by improper ignition timing, distributor and spark plug adjustments with carburetor trouble. However, if the trouble is finally traced to the carburetor, the carburetor should be removed and thoroughly cleaned before making any changes.

If difficulty is experienced when tuning up an Essex motor, refer to the special information following the tune-up operations.

Tune-Up Operations

1. Clean and adjust distributor and spark plug points.
2. Check timing chain for slack; adjust if necessary.

Note: When adjusting the timing chain, special care should be exercised not to damage the gasket between the eccentric assembly and the engine case. If this gasket is damaged an oil leak will occur. (See Timing Chain adjustment).

3. Check the ignition timing; adjust if necessary.
4. Adjust the valve tappets and free up valves.
5. Clean gas line strainers and screens. Also check gas lines for loose fittings.
6. Check fan belt; adjust if necessary.
7. Adjust carburetor; clean if necessary.

Note: If difficulty is experienced in obtaining a correct carburetor adjustment on either Marvel or Stewart equipment, check to see that the air valve is working properly. On Marvel carburetors, faulty air valve action will generally be found to be the result of a weak air valve spring. On Stewart carburetors, faulty air valve action is generally caused by sticking of the dash pot piston which controls the action of the air valve or aspirating valve assembly.

8. Road test car.

Note: The ignition should never be advanced beyond a point where a spark knock occurs except under full load conditions.

Ragged Idle

Ignition Timing and Distributor Points. - Of all the motor tune-up operations for Essex, the most critical is ignition timing, spark plug and contact point settings. If the points are not properly cleaned and adjusted, the motor will run rough. The symptoms are similar to those caused by a too rich carburetor mixture and are especially noticeable at idling speeds.

Carburetor Air Valve (Stewart Carburetors). A lean mixture that will prevent a correct idling adjustment may be caused by dirt or grit between the dash pot piston and cylinder wall thus causing the air valve to stick in the open position. If the trouble is not exaggerated enough to cause the valve to stick open but just retards its free action trouble will probably be experienced at all motor speeds. The air valve sticking open may also cause a condition of hard starting.

To determine whether the air valve is stuck in the open position, pull out carburetor choke and crank the motor. If a pronounced sucking noise is heard, the air valve is not stuck open. However, if a sucking noise is not heard the air valve will be found to be in the open position. If the air valve is stuck in the open position, a few sharp raps on the carburetor body will generally cause it to settle into position.

To correct a condition of a sticking air valve, remove the carburetor from the car and clean thoroughly. Polish the valve with any good grade of metal polish. Do not use sandpaper or any rough abrasive under any consideration.

Bent Carburetor Metering Pin (Stewart Carburetors). - A bent carburetor metering pin may cause the air valve to stick and result in a poor idling condition. This trouble is usually the result of careless handling in assembling or dismantling the carburetor.

To correct, replace the bent metering pin with a new one.

Pinion Gland Shaft too Tight (Stewart Carburetor). - A poor idling condition may be the result of a rich mixture caused by a pinion gland that is too tight on the pinion shaft, Fig. 4, at the bottom of the carburetor. The pinion shaft is attached rigidly to the pinion which in turn is in contact with the rack and raises and lowers the metering pin. At the outer end of the pinion shaft an arm is attached, against which the adjusting screw operates. In order to prevent a leak around the pinion shaft a packing gland is used. Care should be exercised when adjusting the gland nut to see that the nut is not tightened sufficiently to cause the shaft to bind and thus prevent the hand regulated bell crank from coming to rest against the adjusting screw when the dash control button is pushed in. To correct this condition, loosen the gland.

Carburetor Dash Control Wire too Short (Stewart Carburetors). - A poor idling condition may be the result of a rich mixture caused by a dash control wire that is too short. Make sure that the control wire is long enough to force the hand regulated bell crank attached to the pinion shaft at the bottom of the carburetor, firmly against the adjusting screw when the control button on the dash is pushed in all the way.

Air Valve Piston Sticking (Marvel Carburetors). - A condition of poor idle may be caused by the air valve piston sticking on cars equipped with Marvel carburetors. This air valve piston is located directly under the air valve adjusting screw and operates against the air valve spring. The trouble

is generally indicated by the fact that it is difficult to obtain a correct adjustment, also movement of the air valve adjusting screw does not have the proper effect on the air valve action.

To correct, dismantle the carburetor and recondition the air valve piston cylinder by the use of a special reamer. The clearance between the piston and cylinder wall should not exceed .006". (See Specification Diagnosis Section).

Spark Plug Gap Clearance. - On early models of Essex cars equipped with low compression cylinder heads a poor idling condition may be caused by setting the spark plug points too close together. On these early models, a setting of not less than .027" nor more than .030" is recommended.

On late model Essex cars, the spark plug gap setting should be not less than .022".

Air Leaks. - A poor idling condition on cars equipped with Marvel carburetors may be caused by loose manifold nuts due to the influence of heat. This condition can be checked out by means of a squirt can full of gasoline. If motor performance is affected when gasoline is squirted over the manifold gasket, the manifold nuts will probably be found to be loose and should be tightened. If tightening does not relieve the trouble, replace the gasket.

Carburetor. - When tuning up the motor, the carburetor is the last unit that should be checked. Do not, under any consideration, change or tamper with the carburetor until after the ignition, valve timing and motor compression have been checked. Follow closely all recommendations relative to timing given in the paragraphs above. If the trouble is finally traced to the carburetor, first make certain that the carburetor has been properly adjusted (see carburetor adjustment instructions in Carburetor Adjustment section).

If the trouble still persists, remove and thoroughly clean all jets and passages. If cleaning and correctly adjusting the carburetor does not eliminate the trouble, a poor idling condition may be caused by someone tampering with the idling openings. Turn to Idle jets in Carburetor Specification Diagnosis.

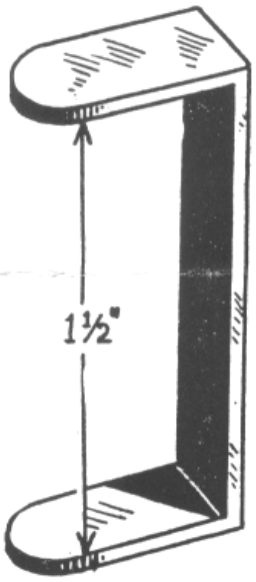
Poor Acceleration

Air Valve Failure (Marvel and Stewart Carburetors). - A decided flat spot on acceleration may be caused by a weak air valve spring. The trouble is generally indicated by the fact that the air valve screw must be screwed in an excessive amount. To correct this trouble, replace the air valve spring.

A gauge is supplied as illustrated in Fig. 1 for the purpose of measuring the length of Marvel carburetor air valve spring. Air valve spring action is only correct when the spring has the proper temper tension and length. Never stretch the air valve spring if it is too short. Always replace with a new spring. The correct length is 1½".

A decided flat spot on acceleration on cars equipped with Stewart carburetors may be caused by failure of the ball valve in the piston head at the bottom of the aspirating valve assembly. This trouble is generally caused by damage to the ball valve seat as the result of someone unfamiliar with Stewart carburetor repair procedure inserting a Spanner wrench in the ball valve seat.

Fig. I



As shown in the figure, an air valve spring measuring gauge can be formed from a piece of sheet metal for Marvel air valve springs. Two types of springs have been used, one has a number of closed coils at the center and is zinc plated. The other type does not have closed coils at the center, but all coils are wound equally spaced. The type of spring having closed coils at the center should have a free length of 1½" while the other type should have a free length of 1-1/16". Air valve springs, for Marvel carburetors should never be stretched under any consideration. The spring is balanced to exert a certain tension at the different range positions of the air valve and distorting the spring in any manner whatsoever will upset this balance and make the correct operation of the carburetor impossible.

Accelerating Pump. - A condition of poor acceleration on Essex cars equipped with Marvel carburetors may be caused by the accelerating pump sticking or by the connecting link pin that connects the actuating arm with the pump plunger rod working out. When this pin is lost there is no action of the accelerating pump when the throttle valve is suddenly opened.

To correct a condition of accelerating pump failure due to the plunger sticking, dismantle the carburetor and clean thoroughly.

Lack of Power

Ignition and Valve Timing. - A lack of power may be caused by improper ignition timing and pitted or incorrectly adjusted contact points. The contact points should be removed, thoroughly cleaned and squared up.

Lack of power may also be caused from incorrect valve timing due to a loose timing chain jumping a sprocket tooth. To correct, retime the motor and check the timing chain adjustment.

Carburetor. - When tuning a motor the carburetor is the last unit that should be checked. Do not, under any consideration, change or tamper with the carburetor until after the ignition and valve timing and motor compression have been checked. Follow closely, all tune-up recommendations in the paragraphs above.

If the trouble is finally traced to carburetor, first make certain that the carburetor has been properly adjusted (see carburetor adjustment instructions in the Carburetor Adjustment section).

If the trouble still persists, after the carburetor has been correctly adjusted, remove and thoroughly clean all jets and passages.

Lack of power may be caused by faulty carburetor air valve action. See information above I for carburetor air valve, bent carburetor metering pin, pinion shaft gland too tight, etc., under the heading of Poor Acceleration.

Motor Cuts Out on Pull

Spark Plug Gap Clearance. - Misfiring or cutting out of the motor on a pull may be caused by a too wide spark plug gap setting on the late models or motors equipped with high compression heads. This trouble can be eliminated by reducing the spark plug gap clearance to .022".

On Essex 1927 models or cars equipped with low compression cylinder heads, a rough running condition may be caused by a spark plug point setting that is too close. On these early models, a setting of not less than .027" nor more than .030" is recommended.

OIL PRESSURE

Model and Year	Min.	Max.
Six 1925	1 lb.	5 lbs.
Six 1926	1 lb.	5 lbs.
Six 1927	1 lb.	5 lbs.
Six 1928	1 lb.	5 lbs.
Super Six 1929	1 lb.	5 lbs.
Super Six 1930	1 lb.	5 lbs.

IGNITION TIMING

Ignition Timing Table

The following table contains complete ignition timing specifications for Essex 1925-30. Spark control on all models of Essex from 1925 to 1930 is automatic.

IGNITION TIMING

Year	Model	Contact Point Clearance	Fly-Wheel Travel	Spark Lever Position	Plug Gap	Firing Order
1925	Six	.020”	TDC	Auto.	.028”	1-5-3-6-2-4
1926	Six	.020”	TDC	Auto.	.028”	1-5-3-6-2-4
1927	Six	.020	TDC	Auto.	.028”	1-5-3-6-2-4
1928	Six	.020”	TDC	Auto.	.028”	1-5-3-6-2-4
1929	Super-Six	.018” .020”	TDC	Auto.	.028	1-5-3-6-2-4
1930	Super-Six	.018” .020”	TDC	Auto.	.022” .023	1-5-3-6-2-4

Auto. - Automatic spark advance

Essex Six all Models 1925.30.-The contact points should just start to break when Piston No. 1 entering compression stroke, is at top dead center and the flywheel mark indicating top dead center for piston No. 1 and No. 6 registers with the lower edge of the peephole in the flywheel housing. The distributor is of the full automatic advance type with no manual control.

Motors using Ethyl or treated gasoline should be timed so that the spark occurs 7/8" before top dead center of the compression stroke. (See Ignition Timing Table for contact point clearance and ignition data).

VALVE TIMING

Valve Timing Table

The following table contains valve timing specifications for Essex 1925-30. All valve tappet adjustments are for hot settings unless otherwise indicated.

		TAPPET ADJUSTMENT			VALVE TIMING	
		For			Fly-	
Year	Model	Timing, Exh.	Running Int.	Running Exh.	Wheel Travel	Exh. Valve
1925	Six	.007”	.005”	.007”	*8ºA	Closes
1926	Six	.007”	.005”	.007”	*8ºA	Closes
1927	Six	.007	.005	.007”	*8ºA	Closes
1928	Six	.007”	.005	.007”	*8ºA	Closes
1929	Super-Six	.007”	.005	.007”	*8ºA	Closes
1930	Super-Six	.007”	.005	.007”	*8ºA	Closes

A - After top dead center

* - Eight degrees of flywheel travel is approximately three flywheel Teeth on the rim of the flywheel.

Essex all Models 1925-30. - To check the valve timing set the tappet clearance for No. 1 exhaust valve at .007". Crank the motor until No. 1 exhaust valve just closes. At this point, the flywheel mark indicating top dead center of pistons 1 and 6 should be approximately three flywheel teeth past the indicator of the peephole in the flywheel housing. Unless otherwise designated, the indicator is the lower edge of the square peephole in the flywheel housing.

CHAIN ADJUSTMENT

Essex Six all Models 1925-30. - Slack in the timing chain is removed by means of an eccentric adjustment built into the distributor drive gear housing. To adjust the timing chain, loosen the three bolts that secure the distributor drive gear housing to the timing case and turn the notched adjusting nut so that the top moves away from the motor. When the chain is properly adjusted, there should be 1/8" movement of the generator drive coupling when rotated with the fingers.

A point may be reached in the adjustment of the timing chain at which the inside top and lower support bolts will interfere with the movement of the adjusting nut. When this happens, remove the bolts, make the adjustment and allow the bolt to pass through a notch in the adjusting nut. Care should be exercised not to damage the gasket between the eccentric housing and the timing chain case. To avoid damaging the gasket, the housing flange should be forced away from the housing just far enough to clear the gasket before adjustment is made.

GAS LINE SCREENS

Essex Six all Models 1925-27 equipped with vacuum tank fuel feed have two gasoline strainers in the gas line from the supply tank to the carburetor. One strainer is located in the top of the vacuum tank, Fig. 2, and the other is at the carburetor. To clean the strainer in the top of the vacuum tank, disconnect the gas line from the point at which it enters the vacuum tank and remove the elbow and bushing together with the gasoline

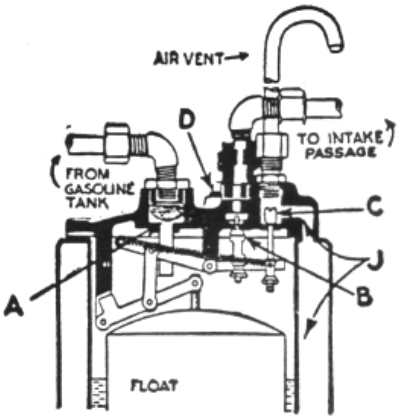


Fig. 2

Upper half of vacuum showing position of gas line screens. To remove, disconnect the feed line from the gasoline tank and screw out the hexagon bushing.

strainer. Wash with gasoline and blow clear with air.

To clean the gasoline strainer at the carburetor, remove tile strainer plug, take out the screen, wash the screen and strainer plug in gasoline and blow clear with air. Make sure when reassembling, that the gaskets are in place and that all connections are tight.

Essex Six 1928-30 equipped with vacuum tank fuel feed, have a glass sediment bowl under the vacuum tank which contains a gasoline strainer and another screen at the carburetor. To clean the glass bowl at the bottom of the vacuum tank, loosen the thumb screw, swing the bracket to one side and remove the bowl. The flow of gasoline from the tank is automatically shut off when the glass bowl is removed.

To clean the strainer at the carburetor, remove the strainer plug, take out the screen and see that the strainer body gas connection fittings are free from dirt. Wash the strainer in gasoline and blow clear with air,

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Carburetor Specifications
FLOAT LEVEL

Two makes of carburetors have been used on Essex automobiles from 1925 to 1930 inclusive. The early models were equipped with Stewart carburetors. The later 1929 and 1930 models are equipped with Marvel carburetors.

Stewart Model CR-1925. - On the early models equipped with Stewart carburetors, very little difficulty was experienced with float level adjustment, If the float level changed in service, check for worn counterweight levers. The constant contact of the counterweight levers against the top of the float will cause them to wear after a long period of service to a point of where the gasoline height in the float bowl may change. When this condition is encountered, the float needle assembly may be removed by removing the float bowl cover. Remove the pins holding the counterweight levers in place and reverse the counterweight levers. If both sides of the counterweight levers are worn, replace the levers with new parts.

The correct level of gasoline in the float chamber is 3/4" below the top of the float bowl. This measurement can be taken by shutting off the flow of gasoline into the carburetor. Remove the float chamber cover and depress the float with a flat steel scale until the gasoline meets the end of the scale, then note the distance from the top of the float to the top of the float bowl.

If it should be found necessary to change the height of the gasoline level and reversing the counterweight levers above the float will not correct the trouble, unsolder the collar on the gasoline needle valve and slide the collar up or down to the desired position, then resolder the collar to the needle valve.

Marvel Model V. - The float level height on Marvel carburetors is measured at a point directly under the air adjustment screw with the float in the raised position. The correct float level measurement is 5/16" from the top edge of the float bowl to the top of the float.

CARBURETOR
SPECIFICATION DIAGNOSIS

Two makes of carburetors came as equipment on Essex Six automobiles from 1925 to 1930 inclusive. On the early models equipped with Stewart carburetors, all fuel adjustment changes are made through manual or automatic adjustment so that the specification diagnosis information consists mainly of a thorough inspection for wear of all parts when trouble is experienced. The desired fuel metering effect is accomplished by extending the lower end of the main nozzle (A) down over a tapered metering pin (J) Fig. 4. The fuel nozzle is mounted in and moves with the air valve, therefore, as the valve lifts, the size opening at the metering point-is gradually increased so as to admit an increased amount of fuel with the increased opening of the air valve.

In the case of the Marvel carburetor used on late models Essex 1928-29-30, jet specifications are determined by flow meter measurement. These carburetors are correctly calibrated at the factory and are not easily changed. The specification diagnosis consists mainly of inspecting parts for wear.

STEWART CARBURETORS

Inspection Instructions. - In cases where trouble is experienced in obtaining a correct adjustment or where the car owner complains of lack of mileage, hard starting, etc., remove the carburetor from the car, dismantle and inspect as follows:

1. The air valve should work freely in the air valve guide. If the valve sticks in the guide, the motor will be hard to start and will not idle properly. Sticking in the guide is most generally caused by dirt or grit.

2. See that the metering pin is not bent or loose in the rack. Cases may be encountered where someone unfamiliar with the proper repair procedure has dismantled the carburetor and in assembling, jammed the metering pin into the aspirating valve with such force that an attempt at adjustment may have broken the metering pin loose from its anchor in the metering

pin rack. Also the metering pin may have been bent by careless handling when assembling the carburetor.

3. If the pinion gear is badly worn, it should be re placed with a new gear.
4. Check for worn or leaky needle valve and seat.

MARVEL CARBURETORS

A Marvel Model V carburetor was used on Essex cars in 1929 and 1930. This model carburetor introduced the first by-pass installation which carries the mixture from the low speed nozzle to a point above the throttle valve during the part choke period after starting, (see Fig. 6 and 7). This device is to provide an increased idling speed with a cold engine automatically without opening the throttle.

The carburetor construction employs a main body or mixing chamber in which are mounted two nozzles which proportion the amount of gasoline used in the mixture. These nozzles are both of the fixed opening non-adjustable type. One is called the low speed nozzle (S) Fig. 9 and is situated in a fixed air opening and is controlled by the venturi while the other called the high speed nozzle (I) ' is controlled by the automatic air valve and is located under same. An air valve screw is provided which regulates the pressure of the air valve spring against the air valve plunger. This constitutes the only mixture adjustment on the carburetor. The air valve is connected to the plunger through the medium of a rod and the whole assembly is called the dash pot.

Jet sizes for the jets used in the carburetors used on Essex cars are determined by flow meter measurement. These carburetors are correctly calibrated at the factory and are not intended to be changed. The specification diagnosis consists mainly of inspecting parts for wear.

Specification Diagnosis (Marvel Model V)

Inspection Instruction. - In cases where trouble is experienced in obtaining a correct adjustment or where the car owner complains of lack of mileage, hard starting, etc., remove the carburetor from the car, dismantle, thoroughly clean all jets and passages and inspect as follows:

Air Adjustment Screw: Inside of screw should be smooth. Clearance between plunger and shell should not exceed .006". Cases may be encountered in service where the air valve plunger sticks in the air valve screw due to the fact that there is not sufficient clearance between the plunger and screw. When this trouble occurs, the air valve screw should be reamed out with a special stub reamer .719" in diameter as shown in Fig. 3. Extreme care should be exercised when reaming out the air valve adjustment screw not to get the clearance too great between the inner surface of the screw and the air valve plunger.

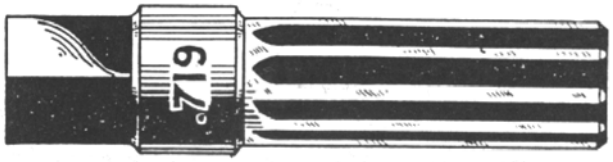


Fig. 3

Special stub reamer used to ream out air valve adjusting screws as used on Marvel carburetors for Essex cars. Care should be exercised when reaming out the adjusting screw that the clearance between the inner surface of the screw and the air valve plunger does not exceed .006".

Air Valve Spring Specifications: If the air valve spring is made with a number of closed coils at the center section and is zinc plated, it should have a free length of 1-1/2". If the air valve spring is made without a number of closed coils at the center, it should have a free length of 1-1/16". (See information below under Air Valve Spring).

Air Valve: The air valve should be free on its shaft but have very little play. Contact of the valve on the carburetor body should show contact for the entire curved portion.

Air Valve Spring (Marvel Model V). - The air valve spring is located in the air valve adjusting screw between the air valve plunger and the head of the adjusting screw. The purpose of the air valve spring is to control the action of the air valve through the full range of operation of the motor.

Diagnosis, Air Valve Spring Weak or too Short - If the air valve spring is weak or too short, the car owner will probably complain of a poor idling condition and that the motor has no power or pick up. The idle adjustment should be approximately correct when the head of the adjusting screw is flush with the ratchet spring and if it should be necessary in order to make the car idle properly to screw the adjusting screw in an excessive amount, the air valve spring will probably be found to be weak.

On the other hand, if someone has stretched the air valve spring or has replaced it with a spring of the wrong dimension, the car may idle properly but hesitate and Roll at speeds and on acceleration.

Do not, under any consideration, attempt to correct a condition caused by a weak air valve spring by stretching the spring. These springs are specially constructed to deliver a certain amount of resistance to the air valve plunger at various speeds and if the original spring is stretched or distorted in any way, it will not work properly and will throw the carburetor out of balance.

Main Discharge Jet (Marvel Model V). - The main discharge jet or low speed nozzle furnishes fuel to the motor at idling and low speeds. This nozzle is mounted in the center of the venturi block as shown at (S) Fig. 9.

Diagnosis, Low Speed -Nozzle too Small-A low speed nozzle that is too small will cause the motor to Hunt or run rough from a lean mixture. To check out this condition, start with the air valve screw set flush with the ratchet spring. That is, the end or head of the air valve adjusting screw should be just even with the end of the ratchet spring. Next, screw the air valve screw in one turn. If the motor still runs rough, the main discharge jet is probably too small. When the carburetor is properly adjusted, the air valve just hangs off its seat and screwing the air valve adjusting screw in one full turn pushes the air valve over against the wall of the carburetor. This shuts off the air and has a tendency to draw more gasoline from the main jet.

Caution: Before changing the jet to a larger size, make sure that the nozzle opening is not plugged up with dirt.

Diagnosis, Low Speed Nozzle too Large. - A low speed nozzle that is too large will generally cause the motor to Roll and load. To check for a low speed nozzle that is too large, set the head of the air valve adjusting screw flush with the end of the ratchet spring. Next, screw the air valve screw out one full turn from this position. If the motor has a tendency to smooth out, the low speed nozzle may be too large, but in extreme cases the motor may still Roll and load even after the spring tension has been relieved.

In either case whether the main discharge jet is too large or too small, the motor may have a tendency to die after acceleration.

High Speed Jet (Marvel Model V). - The function of the high speed jet or nozzle is to supply fuel to the motor at high speeds, in conjunction with the low speed jet. The action of the high speed jet is controlled by the automatic air valve and the fuel metering valve which is operated by the carburetor throttle. The metering valve provides the maximum fuel feed to the high speed nozzle when the throttle is fully open for high speed, hill power and for quick pick up. This valve is entirely automatic and requires no adjustment.

Diagnosis, High Speed Nozzle too Small. - A high speed jet or nozzle that is too small will cause the motor to run rough at intermediate speed and lack power under full load or at high speed, generally accompanied by backfiring through the carburetor and fittings. This condition will also have a tendency to cut down the revolutions per minute of the motor under a full throttle service floor test.

Diagnosis, High Speed Nozzle too Large. - A high speed nozzle that is too large will generally be indicated by low gasoline mileage. In extreme cases where the jet is much too large, the carburetor may have a tendency to roll and load on a hill. However, if the trouble is not exaggerated enough to cause the motor to roll and load the only symptoms will be low gasoline mileage. To check the trouble, try a smaller high speed nozzle.

Carburetor Adjustment

MOTOR SPECIFICATIONS

The following table lists the model and year of car, engine specifications, make, model and size of carburetor.

Car and Year	Model	Engine	No. cyl.	Bore and stroke	Carb. Model and size
ESSEX					**STEWART**
1925	Six	Own	6	2 11/16" x 4 1/4"	CR-25 1"
1926	Six	Own	6	2 11/16" x 4 1/4"	CR-25 1"
1927	Six	Own	6	2 11/16" x 4 1/2"	CR-25 1"
1928	Six	Own	6	2 11/16" x 4 1/2"	CR-25 1"
					MARVEL
1929	Super Six	Own	6	2 3/4" x 4 1/2"	V1 1/8"
1930	Super Six	Own	6	2 3/4" x 4 1/2"	V1 1/4"

ADJUSTMENT PRECAUTIONS

The adjustment information for carburetors used on Essex automobiles from 1925 to 1930 inclusive is given by carburetor model rather than by car model. Refer to the table of Motor Specifications above if it is desired to know what make and model of carburetor was used on any particular car model.

Gasoline mileage and motor performance are dependent more than ever before upon correct tune-up and carburetor adjustment. Therefore, it is suggested that the special information with reference to tune-up at the front of this section and the special adjustment information found below, be closely observed.

Affect of Manifold on Carburetor Adjustment. - It is important when making a carburetor adjustment that from 10 to 15 seconds' time be allowed after each movement of the adjusting screw for fuel that has accumulated in the manifold to pass into the motor. The tendency is for the fuel to pile up on the walls and in the corners of the manifold so that unless sufficient time is allowed for this fuel accumulation to pass into the motor, an accurate adjustment cannot be obtained. Insufficient time allowance is generally indicated by the motor performance gradually improving as the adjustment is changed and then the motor suddenly dying during the adjustment operation.

Adjustment for Gasoline Mileage. - The best adjustment for gasoline economy is obtained by leaning the mixture down until the motor runs rough and then richening it up just to the point where the motor runs smoothly. This is especially true of idle and range adjustments and should be done with care for best results. When adjusting the carburetor from a lean to a richer condition, it will be found that due to the flexibility of adjustment there is a wide range between the point where the motor smooths out from a lean mixture to a point of where the adjustment is too rich. Richening of

the mixture beyond the point of smooth motor operation adds nothing to the performance of the car and lowers the gasoline mileage.

Special Points (Stewart Carburetor). - Carburetor adjustment on Stewart carburetors is accomplished by means of a metering pin that is raised and lowered through the medium of a pinion and rack. In practice it is necessary sometimes in order to obtain a correct adjustment, to change the relationship of the rack to the pinion. Complete information for the correct adjustment procedure when this change is necessary, will be found under the heading Hand Regulator Bell Crank adjustment in the Stewart Carburetor section below.

If the carburetor has been dismantled for any reason, and the hand regulator bell crank has been removed, it will be found necessary to reset the metering pin adjustment. Complete information on the correct procedure for this operation will be found under the heading Resetting Hand Control Bell Crank after the carburetor has been dismantled for cleaning or repairs, in the section under Stewart Carburetors below.

Air Valve Failure. - On Essex cars equipped with either Marvel or Stewart carburetors, difficulty may be experienced in obtaining a correct adjustment due to a failure of the air valve action.

On Stewart carburetors, this trouble may be the result of a sticky air valve, Fig. 4, caused by dirt between the dash pot piston and the cylinder walls. To correct this trouble, dismantle and thoroughly clean the carburetor. A sticky air valve may also be caused by a bent metering pin in which case the metering pin should either be trued up or replaced with a new part.

On Essex cars equipped with Marvel carburetors, a failure of the air valve action may be the result of a weak air valve spring. This spring is located just under the air valve adjustment screw and provides the tension against which the air valve piston works. If this spring becomes weakened in service or if too short, the action of the air valve will be affected.

Never, under any consideration, should this spring be stretched. If it is found to be too short or has weakened in service, replace with a new spring of the correct dimensions (see Carburetor Specifications).

STEWART CARBURETORS

A proper adjustment cannot be obtained unless all parts of the carburetor are working properly. If difficulty is experienced in obtaining a correct carburetor adjustment, see information under Inspection Instructions in the Carburetor Specification Diagnosis Section.

Adjustment. - There is but one point of adjustment (V) Fig. 4 and 5 to the carburetor. This adjustment varies the relative height of the metering pin to the opening of the aspirating tube or spray nozzle (0) when the dash control ratchet on the instrument board is in regular running position.

The tapered metering pin (J) is subject to control within fixed limits by means of the dash control button located on the instrument board for the purpose of obtaining a rich mixture for starting. Run the motor until it is thoroughly warm. Accelerate the engine by opening the throttle quickly. If a "popping" sound is not heard, turn the adjusting screw (V) anti-clockwise (up) until a popping sound is heard when the throttle is opened quickly. After the popping sound is heard the screw should be turned clockwise (down) a few notches at a time until the popping is just overcome. The best adjustment will usually be found at this point. It is very important when making this adjustment that the spark lever be retarded half way. In some cases, it may be found necessary to remove and reset the arm on pinion shaft (Y). If sufficient adjustment cannot be obtained by the travel of the adjusting screw, the following adjustment should be made:

Pinion Shaft and Lever Adjustment. - Ordinarily, a sufficient range of adjustment can be obtained by means of the screw (V) Fig. 4 and 5. In the event, however, that the mixture cannot be made sufficiently lean by turning the

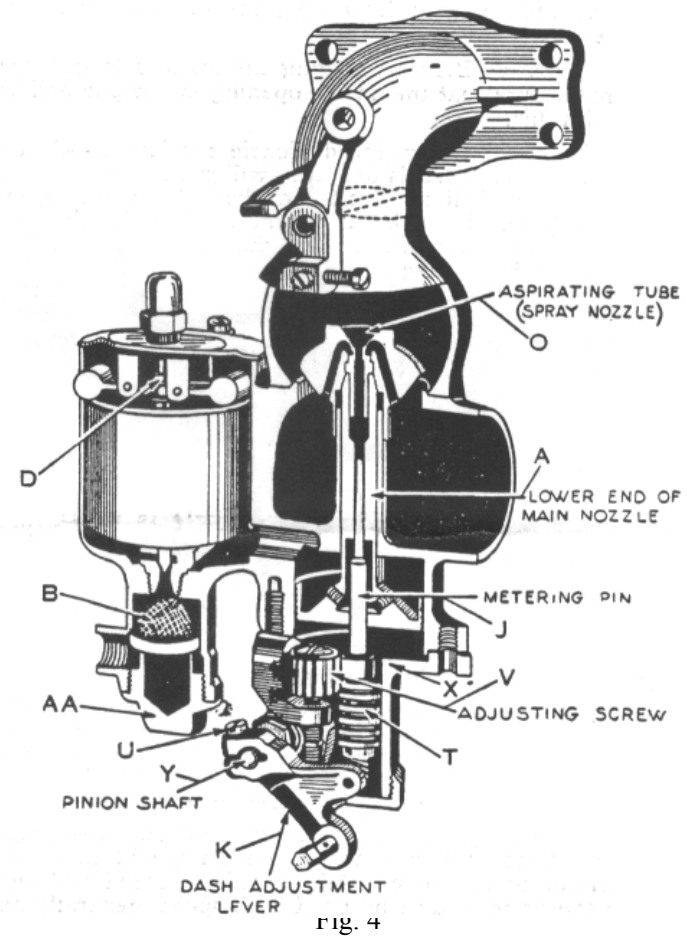


Fig. 4

Cross section view of Stewart carburetors used on Essex automobiles. Only one adjusting screw is provided on this carburetor as shown at (Y). This adjusting screw controls the height of the metering pin (1) through the medium of the dash adjusting lever (K).

screw all the way up or sufficiently rich by turning it all the way down, this condition can be overcome by shifting the pinion shaft (Y) in relation to the lever (K). To make this adjustment, first mark the present position, then loosen the adjusting lever clamp screw (U). With the engine warmed up and running with retarded spark, make the adjustment by rotating the pinion shaft by the screwdriver slot in its end to the left for a lean mixture and to the right for a richer mixture. Next, tighten the adjusting arm clamp screw and make final adjustment in the regular manner with the adjusting screw (V). It is well to have the adjusting screw (V) in the center of its adjusting range while changing the position of the bellcrank arm as described above.

In case the location of the adjustment arm is completely lost, it can be restored by the following method:

Resetting Hand Control Bell Crank after Carburetor has been Dismantled for Cleaning or Repairs. - If the carburetor has been dismantled for any reason and the hand regulator bell crank (K) Fig. 4 has been removed, reset in the following way. Turn the pinion shaft (Y) to the right until the air valve just lifts off its seat then turn to the left until the

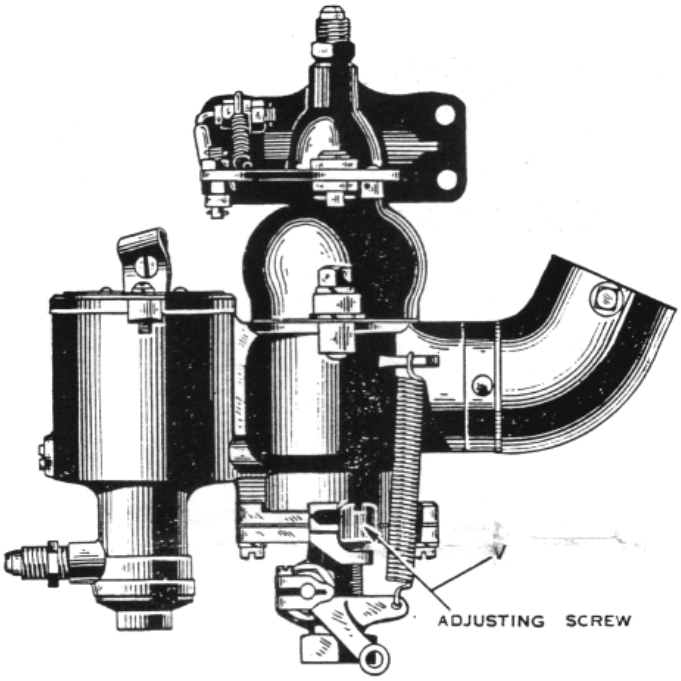


Fig. 5

External view of Stewart carburetor used on Essex cars showing position of throttle valve levers and adjusting screw. Only one adjustment is provided on these carburetors at the bottom as shown at (V). Screwing this screw up leans the mixture and screwing it down richens the mixture.

valve comes to rest on its seat. Continue turning to the left a very small fraction of a turn or until there is a very slight clearance between the upper end of the metering pin and its seat. With the pinion shaft in this position, install the dash adjustment lever (K). Another more accurate way to make this adjustment is as follows: Detach the carburetor from the motor and remove the throttle body or upper half by unscrewing the two cap screws that hold the upper and lower bodies together. This will expose the metering valve head, then with the adjusting arm (K) released by loosening the clamp screw (U) and the cap of the gear housing removed, the pinion shaft should be turned so that the metering pin will be forced up until it just starts to lift the air valve from its seat. Measure the distance between the end of the gear housing and the bottom of the rack, which carries the metering pin and slides within the gear housing. With a steel rule, next turn the pinion shaft just enough to lower the metering pin rack down 1/16" then with the adjusting screw (V) down one half its travel, replace the dash adjustment lever (K) and clamp it tight by means of the screw (U). This will give an approximate adjustment so that the motor can be easily started. After bringing the motor up to normal temperature, the final setting should be made by means of the adjusting screw (V).

Caution: Connect the dash control button wire to the dash adjustment lever (K) so that the arm stop rests against the adjusting screw, with the control button about 1/8" off the dash. Otherwise a rich mixture may be the result. At normal driving temperature, the button should be completely pushed in or depressed. When making a carburetor adjustment, see that the choke is fully in and that the dash adjusting lever arm rests firmly against the adjusting screw. If the choker wire prevents this, adjustment will not be effective.

MARVEL CARBURETOR
(Model V)

Choker and By-Pass. - A choke button is provided on the instrument board to assist in starting. Pulling out this button does two things in the carburetor. First it closes a butterfly choker valve in the air inlet of carburetor which restricts the air opening and consequently produces a very rich mixture for starting. Second, through inter-connection of the choker lever and by-pass valve, Fig. 7, this motion likewise opens a passage between mixing chamber just above low speed nozzle and the intake manifold passage just above the throttle. Due to the higher suction existing above the throttle, the over rich starting mixture is therefore immediately drawn through the fixed opening in the by-pass valve up past the throttle and on into the engine. Partial release of the choker button on the instrument board after starting, releases the choker valve so that it positions itself to the needs of the engine by the action of the compensating spring attached to the choker valve. The spring allows the valve to open or close automatically depending on the engine speed or quantity of air passing through the carburetor. This partial release of the choker button does not, however, change the position of the by-pass valve opening which remains open, and the engine therefore runs at an increased idling speed during this period the same as would be obtained if the throttle were manually opened

slightly and there was no by-pass valve. This gives the car a speed of approximately 14 to 15 miles per hour on the road automatically without the necessity of opening the throttle and is of great assistance in getting under way after starting a cold engine.

As soon as the engine is sufficiently warmed up to drive with control button completely released, the by-pass valve returns to its normal position as shown in Fig. 7 and the choker valve is automatically locked in the wide open position.

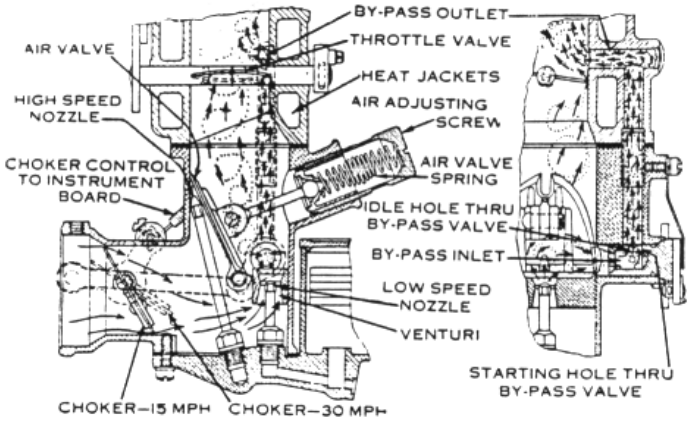


Fig. 6

Sectional view of Marvel carburetor used on Essex showing choke valve in the frilly closed position with the by-pass valve opened, so that gas passes to an opening above the throttle.

It will be noticed that there is still a very small hole in the by-pass valve in this position connecting to the passage above the throttle. This is to provide for a proportion of the idling mixture to pass above the throttle as shown in the illustration, stabilizing the idling action of the engine and insuring positive idling performance especially in cold weather.

Some idling mixture is, however, allowed to pass in a normal way past the throttle and by the regulation of this amount and adjustment of the throttle opening the desired idling speed is obtained.

Accelerating Device. - The accelerating device is of the "prolonged shot" type and consists of a positively connected disc (R) mounted on a plunger shaft (S) Fig. 8 and 8A, which is connected to the throttle and supports a loose plunger (W) which is free to move on the plunger shaft (S). On sudden opening of the throttle, the three above mentioned units move downward. The disc (R) moves away from the plunger (W) and starts forcing fuel through the high speed nozzle but allows a considerable portion to escape past it through a series of holes which fuel is then acted upon by the plunger (W) later falling by virtue of its weight, thus keeping pressure on the accelerating fuel charge over a period of several seconds.

This greatly facilitates getting into action in extreme cold weather.

The accelerating pump device also promotes the same favorable result in more moderate weather when it is desirable to have the heat control set at medium or cool for hard country driving.

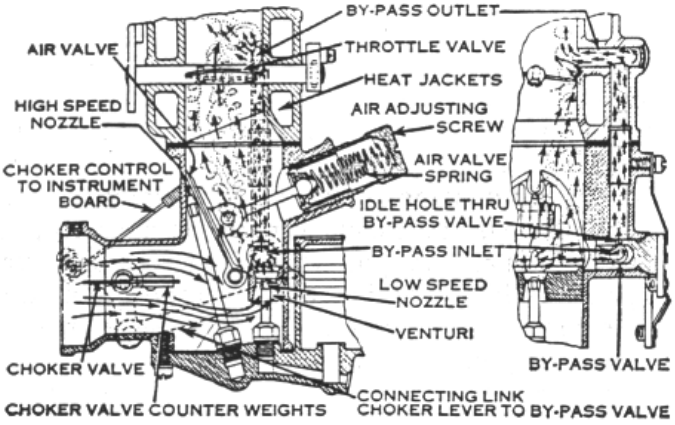


Fig. 7

Showing choker in normal open position and idle action through by-pass valve in normal running position. When the choker valve is only partially open, the by-pass valve remains in the open position thus providing a richer mixture to the intake manifold.

R) moves away from the plunger (W) and starts forcing fuel through the high speed nozzle but allows a considerable portion to escape past it through a series of holes which fuel is then acted upon by the plunger (W) later falling by virtue of its weight, thus keeping pressure on the accelerating fuel charge over a period of several seconds.

This greatly facilitates getting into action in extreme cold weather.

The accelerating pump device also promotes the same favorable result in more moderate weather when it is desirable to have the heat control set at medium or cool for hard country driving.

Seasonal Heat and Accelerating Pump Controls. - Season control on top of fuel bowl should always be set on "Winter" in cold weather and heat control in warm position.

If, as warm weather comes on, car performance appears sluggish, leave the pump control on "Winter" and put heat control in "Medium" position. If this is not sufficient then put the pump on "Summer" setting.

In very warm weather or in tropical climate or with high test fuel it may be necessary to take the final step:-Leave pump on "Summer" and put heat control in "Cool" position. This is the setting to supply the heat and the least fuel for the accelerating charge.

Carburetor Adjustment (Marvel Model V). No change should be made in carburetor adjustment until after an inspection has been made to determine whether the trouble

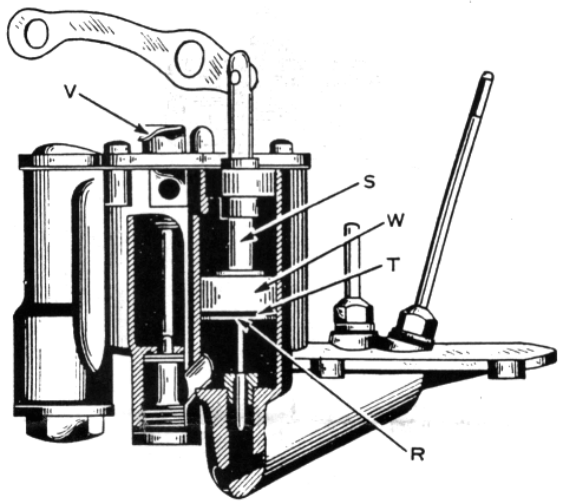


Fig. 8

Cutaway view Of section of Marvel carburetor used on Essex automobiles. The plunger (W) is free to move on the shaft (S). The disc (R) has several holes in it which permits gasoline to pass through when the plunger shaft (S) is suddenly forced down. The pressure of the gasoline passing through the disc (R) causes the plunger (W) to lag and thus a prolonged charge of gasoline is forced into the carburetor mixing chamber. (See Fig. 8A)

determine whether the trouble is in some other unit. It should be noted that the gasoline line and strainers are clear, that there is gasoline in the vacuum tank, that there

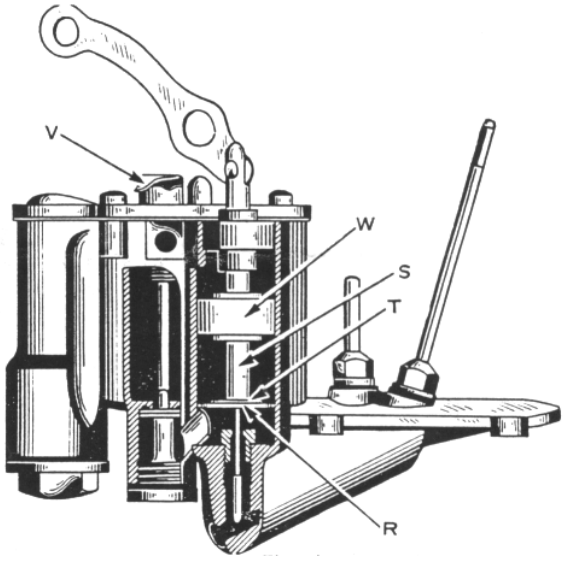
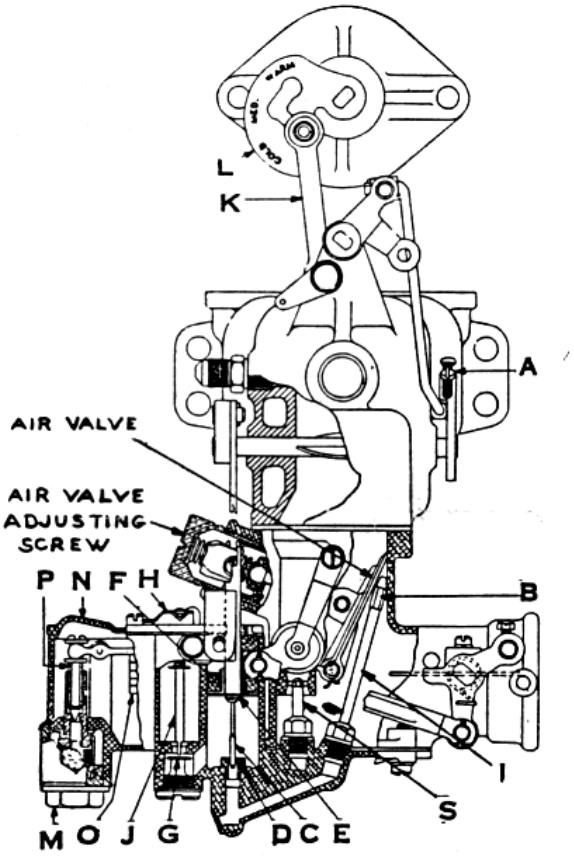


Fig. 8A.

Cutaway view of Marvel carburetor used on Essex automobiles showing the position of the plunger (W) immediately after the shaft (S) has been suddenly depressed. The plunger (W) tags behind and falls of its own weight thus prolonging the duration of the accelerating charge of gasoline. (See Fig. 8).

are no leaks in the connection between the carburetor and engine an(that the ignition system is in proper condition Also, see that the compression is even in all cylinders.



If it is necessary to test adjustment or to make a readjustment of the carburetor, proceed as follows: Set air screw, Fig. 9, so that the end is flush with the end of the ratchet spring bearing against the side of the screw.

Next, set heat control in "Warm" position and leave in this position while making adjustment. Pull out choker to closed position and start engine in usual manner. As soon as the engine has fired slightly release choker, run for a few moments until the engine has warmed up, remembering never to use the choker more than is necessary since when it is not needed, it has a tendency to foul up the engine and ruin the lubricating oil in the crankcase.

Next set the air screw for good idle by either turning in to the right a little or backing out to the left as the needs of the engine require. When the engine is warmed up, the adjustment of the air screw for proper idling is easily accomplished by using a little care. If the air screw is turned in too tight, the motor will Roll or appear sluggish. If the air screw is not tight enough, the motor will hesitate and stumble and perhaps stop entirely. To make a nice clean adjustment for idle, turn the air screw back to the left until the engine hesitates indicating that the mixture has too much air and is too lean. Next, turn the air screw in to the right three or four notches at a time until the engine runs smoothly. This idle setting, accomplished by proceeding as

directed above, the proper carburetor adjustment for the entire range of the engine will have been obtained.

If the engine idles too fast with the throttle closed, the latter may be adjusted by means of the throttle lever adjusting screw.

ALTITUDE CHANGES

No change is necessary for touring through mountainous country but for cars operating permanently in territory above 4000 feet elevation or over, we advise changing the high speed jet to a No. 77 for the best results in such territory.

Do not, under any circumstances, make this change unless operating permanently above 4000 feet elevation.

MANIFOLD HEAT CONTROL

(Marvel Model V)

The carburetor and manifolds have been designed to utilize the exhaust gases of the engine and to insure complete vaporization and consequent minimum consumption of fuel. This is accomplished by an exhaust jacket in a double walled elbow casting placed between the carburetor and the intake port in the cylinder block. This elbow casting is connected to the exhaust manifold in such a manner that the exhaust gases pass between the walls of the elbow, thru the heat jacket and back to the exhaust manifold. The amount of heat thus furnished to the elbow is controlled by a damper valve in the main exhaust above the elbow and situated between the exhaust outlet and the exhaust inlet to the elbow heat jackets.

The damper valve in the main exhaust is connected to the throttle lever of carburetor in such a manner that the greatest proportion of heat is deflected to the jackets of the elbow when the throttle is only partly open, as in idling and at low speeds, and a decreasing amount as the throttle is opened further for higher speeds. By means of the heat control lever attached to the damper valve this automatic action of the damper valve may be varied to suit weather and driving conditions.

An adjustment for seasonal control of heat also is provided on the damper valve lever (J), Fig. 10, whereby the amount of exhaust heat deflected by the damper to the elbow jackets may be decreased by moving damper adjusting stud (L) in damper connecting rod (K) from hook-up hole in damper lever marked "Warm" to hook-up hole marked "Medium", or to hook-up hole marked "Cool", thus initially opening damper valve at closed throttle positions and greatly reducing the heat application.

Gases from the exhaust manifold are deflected by the damper valve (A) and pass through the extension (C) of the exhaust manifold into elbow jackets (D), passing around dividing wall or baffle (E), circulating around carburetor throttle, and back up through passages (D), and again into the exhaust manifold on the rear side of valve (A), and thence in the normal way to the muffler.

It will be noted that the valve (A) is connected by means of damper lever (J), and damper connecting rod (K) to the driver lever (I), which is fastened to the same shaft as the throttle bell crank (G), which is connected by means of throttle connecting rod (H) to carburetor throttle lever

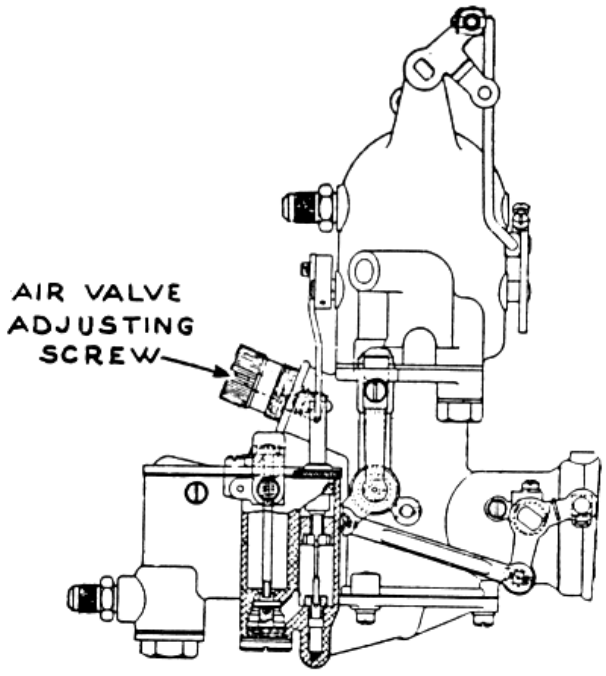
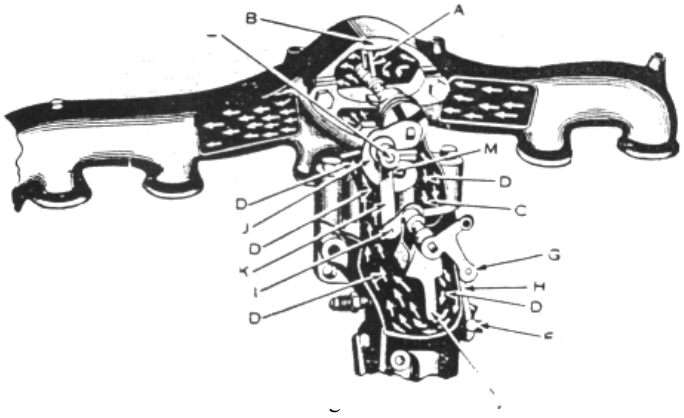


Fig. 10

Cross section view of Marvel carburetor used on 1929 Essex automobiles.



Cutaway view of Marvel carburetor heat control manifold as used on Essex automobiles. Care should be exercised to see that this manifold control properly adjusted in order to obtain most efficient carburetor operation. (See instructions for adjustment).

(F). Movement of the accelerator lever when driving, which is fastened to the throttle bell crank is therefore transmitted simultaneously to carburetor throttle and exhaust damper valve. As the throttle is opened, valve (A) is also opened, due to this interconnection. Thus the volume of heat through heat jackets of elbow will be lessened as the engine speed is increased, the amount of decrease depending upon position of damper lever adjusting stud (L) in damper lever (I)-whether in hole for "Warm", "Medium", or "Cool" position.

It should be remembered that the adjustment of heat control is purely seasonal, and this adjustment largely controls the car performance, or the effect of a "rich" or "lean" action in the carburetor. Therefore, in cold weather, drive with adjustment set at "Warm" to provide quick warm-up after starting, and sufficient heat for good performance. In extremely warm weather, place adjustment at “Cool" , and for all intermediate seasons, at "Medium" for most normal driving.