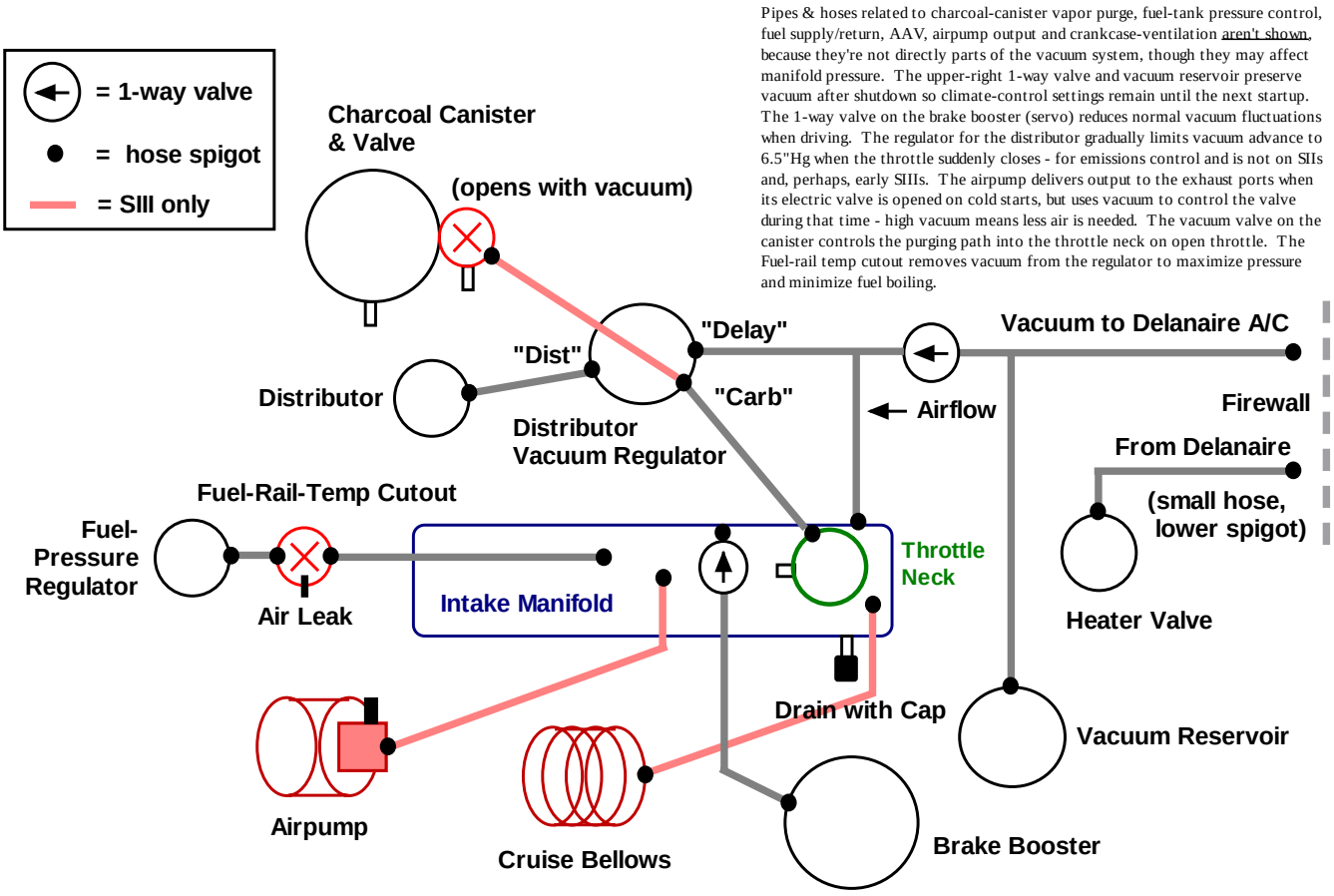
The following diagram shows the vacuum hoses installed on fuel-injected XJ6 cars with Delanaire climate control. Note that pipes & hoses related to charcoal-canister vapor purge, fuel-tank pressure control, fuel supply/return, AAV, airpump output and crankcase-ventilation aren't shown, because they're not directly parts of the vacuum system, though they may variously affect vacuum pressure.

XJ6 SII & SIII EFI Vacuum Diagram
(Exclusive of Delanaire Internals, 1/25/07)



The A/C 1-Way Valve (upper-right) and the Vacuum Reservoir are intended to preserve vacuum after shutdown so that climate-control settings remain until the next startup.

The Brake Booster (Servo) 1-Way Valve reduces vacuum fluctuations that occur normally for throttle changes when driving.

The Airpump only delivers output to the exhaust ports when its electric valve is open on cold starts, but it uses vacuum pressure to control the valve during that time – high vacuum means less air is needed.

The Canister Vacuum Valve controls the vapor-purging path into the throttle neck when the throttle is open (see XJ6 Purge diagram).

The Fuel-Temp Cutout mounted on the fuel rail passes vacuum to the Fuel-Pressure Regulator below a certain maximum rail temperature. At higher temps, the valve inhibits input vacuum and its small air leak then brings the regulator spigot to atmospheric pressure, thus increasing rail pressure and reducing fuel boiling tendencies. In the SII and early SIII, the cutout is absent and the pressure regulator is directly connected to the manifold spigot.

The Distributor Vacuum Regulator, for vacuum advance, limits distributor vacuum to 6.5"Hg, with a calibrated delay when the throttle suddenly closes – this is for emissions control and is not included on the SII and, perhaps, early SIIIs. The valve was a standard GM part at the time that had the needed delay function.

Manifold vacuum goes up to about 21" Hg when the throttle closes, controlled by the overrun valve in the Air Block (item #5 in parts picture below), which dumps excess vacuum to the outside. This limits mixture leanness under those circumstances. Otherwise, there would be backfiring into the exhaust when decelerating on closed throttle. The distributor's vacuum control tops out at 10" Hg, where it adds 13 crankshaft degrees of advance. Vacuum over 10" won't add more advance.

If you do away with this regulator and connect the throttle's "Carb" spigot directly to the distributor, the effect is much as before -- distributor port vacuum is controlled by the "Carb" spigot vacuum. But the delay action is gone -- for a brief time, when the throttle closes, a higher vacuum than what the "Carb" port gives is needed, so is borrowed from manifold vacuum via the regulator's "Delay" spigot. If the valve goes bad, as when its internal membrane that separates the manifold vacuum chamber from the distributor vacuum chamber is torn, now full manifold vacuum goes to the distributor at all times. That results in off-scale advance at idle and high NO_x readings.

Not shown is the **Vacuum Throttle Switch**. Supposedly, when manifold vacuum falls below 4" Hg, it triggers the ECU to supply extra fuel for maximum power operation and was only fitted to UK/European models -- #8 in the parts picture below.

Item #3 in the SII (and early SIII) parts picture below is the AAV. Item #4 is the AFM. Switch #7 is the SPDT switch on the throttle shaft to indicate closed or wide throttle positions to the ECU. Item #9 is the Fuel-Pressure Regulator, which was moved to the front of newer SIII fuel rails:

ENGINE COMPONENT LOCATION (U.K. AND EUROPEAN)

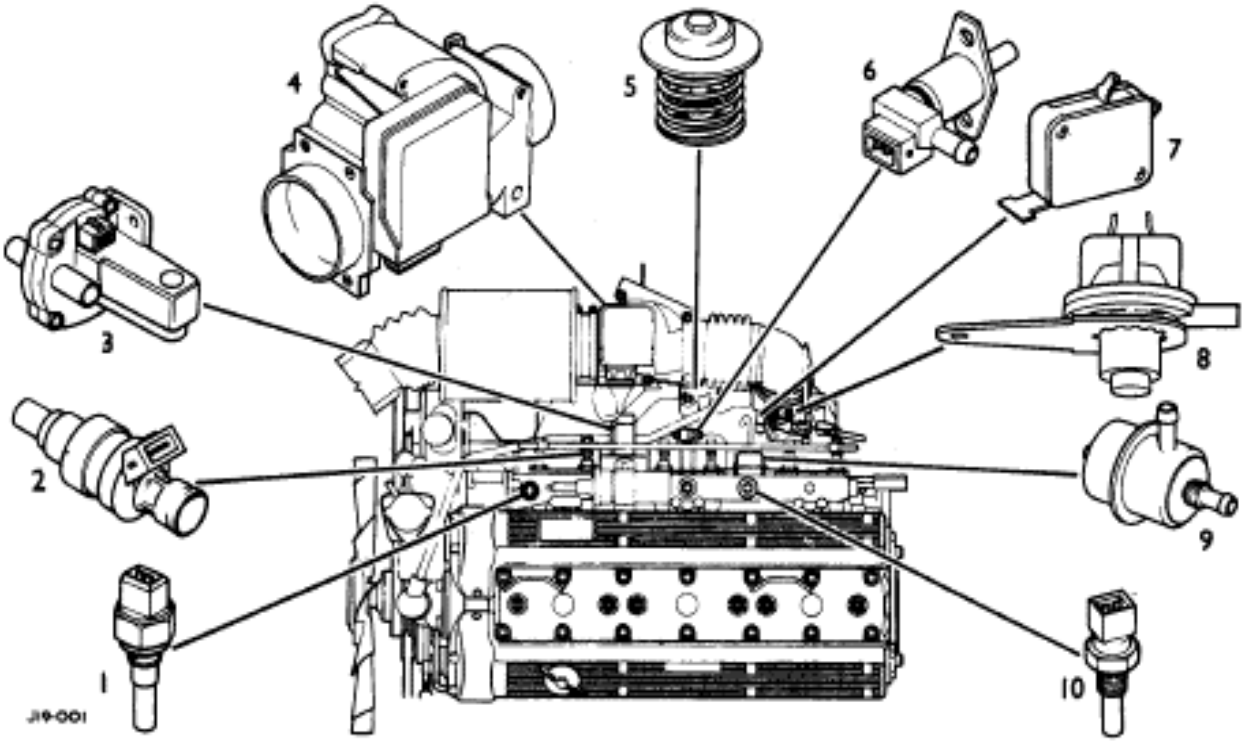


Fig. 2