



*The Road Knows.....*

# Heat/AC Dash Control and Vacuum Controls

How to be Comfortable while  
“On The Road”  
*presented at*  
2018 Spring GMCMI Convention  
Tucson, Arizona

The objective of this session is to...**provide a through understanding of the dash Heat/ AC controls and how that knowledge can be used to help in troubleshooting.**

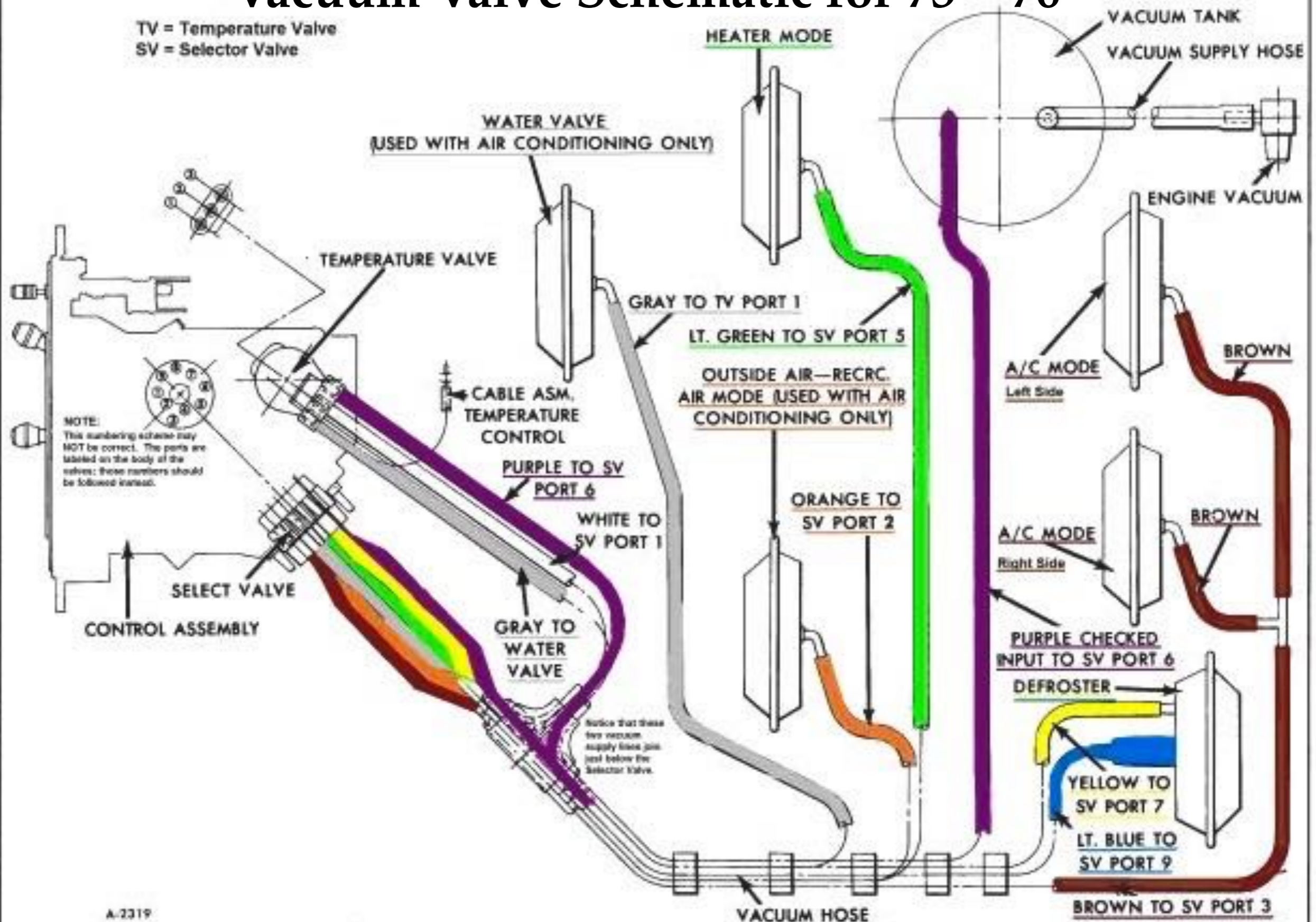
- To familiarize you with how the factory intended the Heat/ AC control systems were meant to operate.
- To provide a understanding of what is meant to happen at each selection of the Heat/ AC control front panel.
- To indicate some tools to make it easier to troubleshoot the HVAC Control System.
- I will not be covering the refrigerating part of the Cockpit Air Conditioning system.  
If there is time at the end I can answer questions; or you can catch me later.

**I have provided as much accurate information as I could; However the information provided here is not warrantied and the use of it is solely at the risk of the user.**

NOTICE:

TV = Temperature Valve  
SV = Selector Valve

# Vacuum Valve Schematic for 73' - 76'



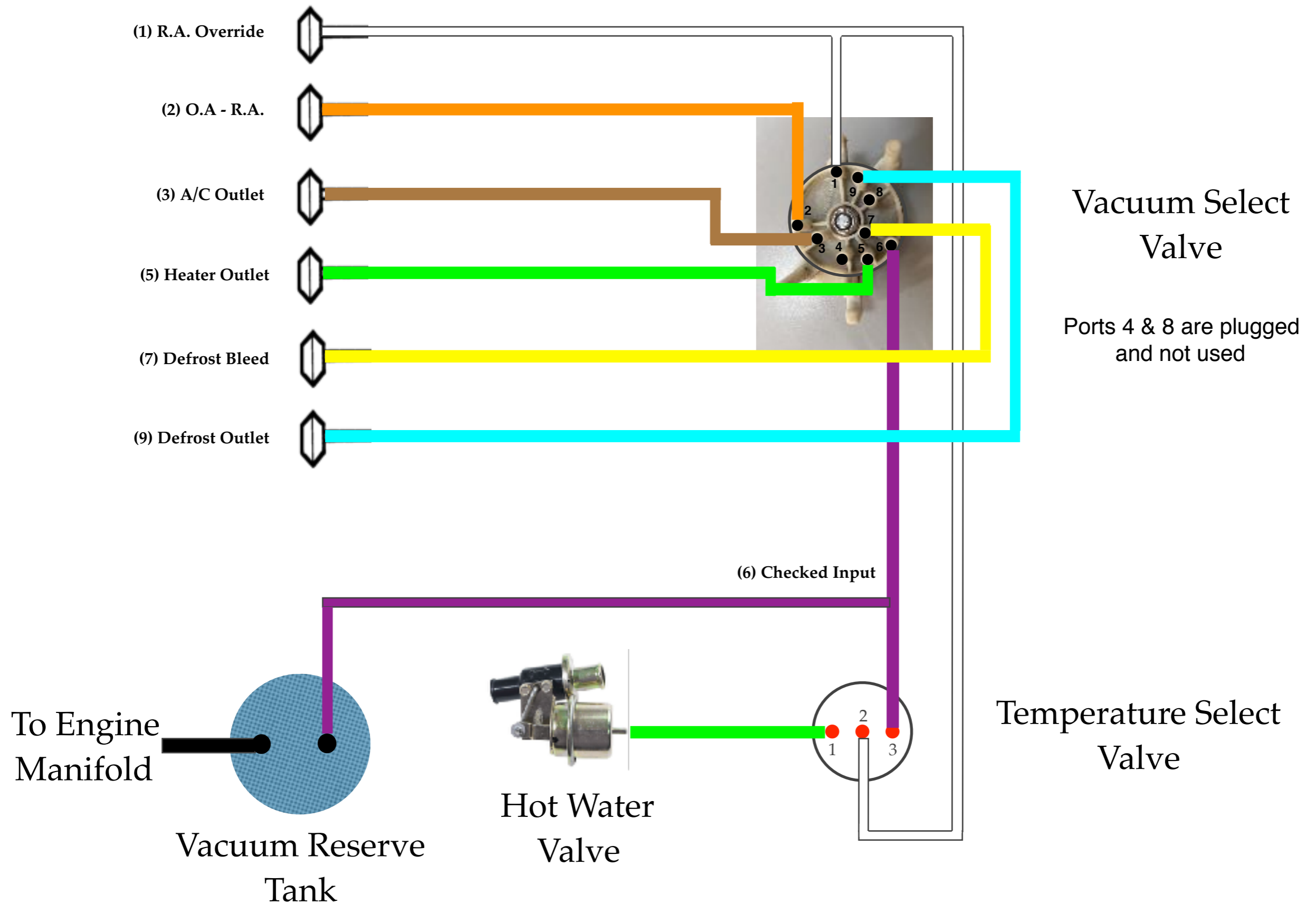
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**Figure 110 - Vacuum Control Diagram**

Drawing borrowed from [gmcmhphotos.com](http://gmcmhphotos.com)

[gmcmhphotos.com/photos/type-ii-dash-air-condition-modification/p19227.html](http://gmcmhphotos.com/photos/type-ii-dash-air-condition-modification/p19227.html)

# Vacuum Valve Schematic for 73' - 76'



# Vacuum Valve Charts for 73' - 76'

## Select Valve Operating Chart

Port #	CONN	OFF	A/C	VENT	HEATER		DEF.	COLOR
1	R.A OVERRIDE	SEAL	CONN 2	SEAL	SEAL	SEAL	SEAL	WHITE
2	O.A - R.A	VENT	CONN 1	VENT	VENT	VENT	VENT	ORANGE
3	A/C OUTLET	VENT	VAC	VAC	VENT	VAC	VENT	BROWN
	NO CONNECTION							
5	HEAT OUTLET	VENT	VENT	VAC	VAC	VAC	VAC	LT. GREEN
6	CHECKED INPUT	SEAL	VAC	VAC	VAC	VAC	VAC	PURPLE
7	DEFROST BLEED	VENT	VENT	VENT	VAC	VENT	VAC	YELLOW
8	NO CONNECTION							
9	DEFROST OUT	VENT	VENT	VENT	VENT	VENT	VAC	LT. BLUE

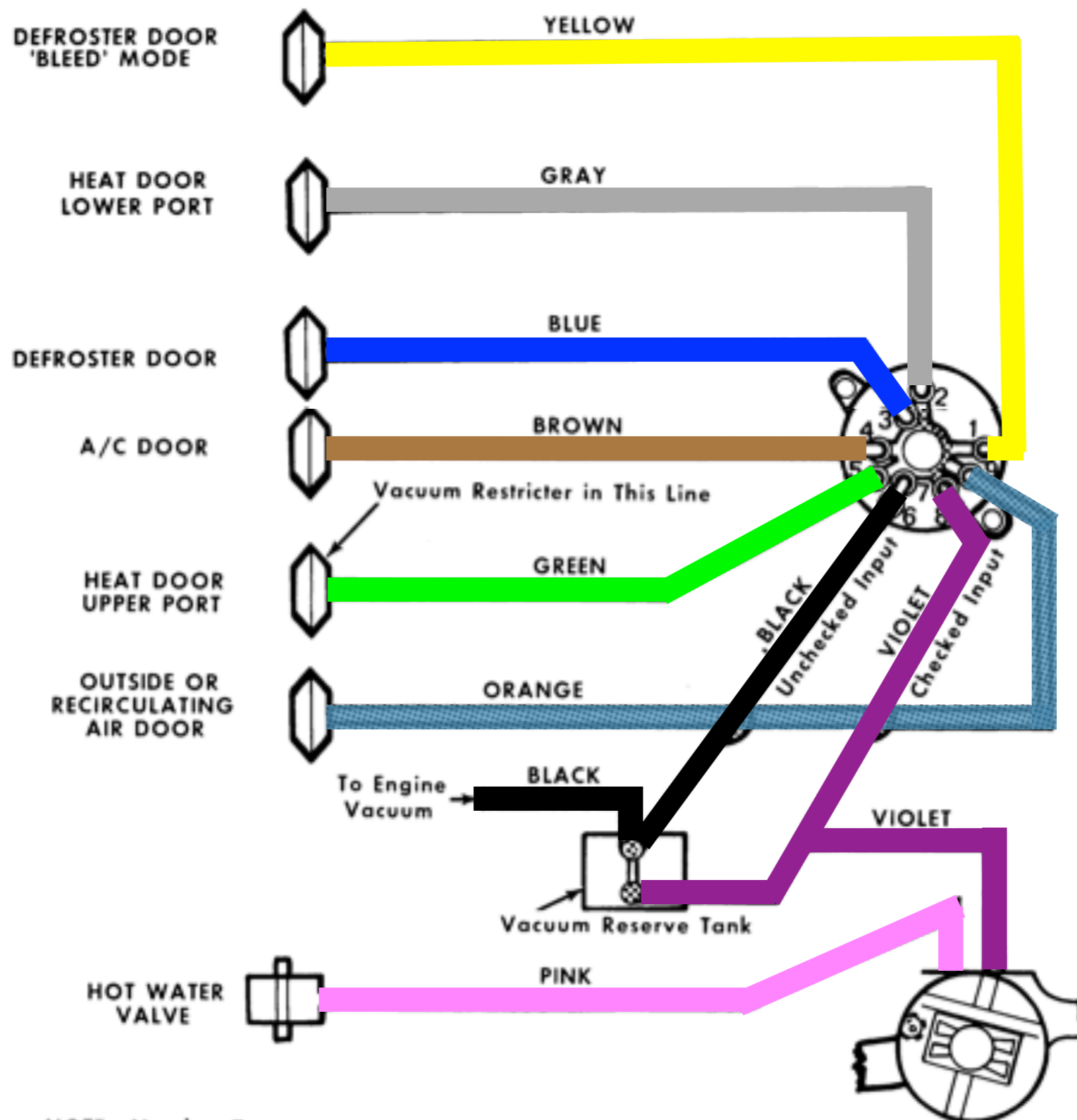
## Water Valve Operating Chart

Port #	Connection	Recirculate	Cold	Hot	Color
1	HTR. VALVE	VAC	VAC	VENT	GREY
2	R.A. Override	VAC	Vent	VENT	WHITE
3	VACUUM INPUT	VAC	VAC	SEAL	PURPLE

## Temperature Select Valve - Early



# Vacuum Valve Schematic for 77' - 78'



NOTE: Number 7 port at vacuum valve is not used.

# Vacuum Valve Charts for 77' - 78'

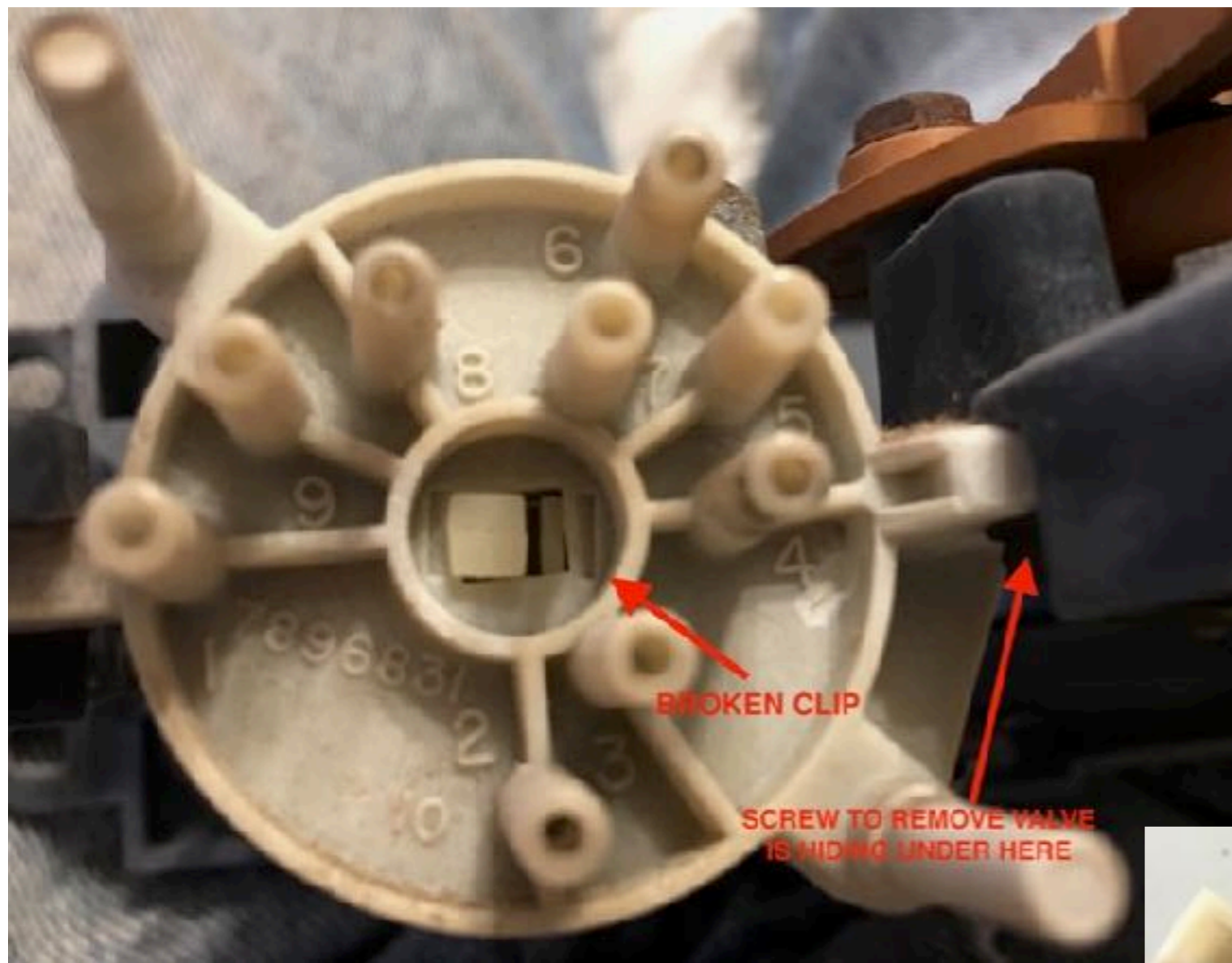
## Select Valve Operating Chart

Port #	CONN	OFF	MAX	NORM (AC)		VENT	HEAT	DEFROST	STRIPE
1	DEFROSTER BLEED	VENT	VENT	VENT	VENT	VENT	CONN. 6	CONN. 6	YELLOW
2	HEAT DOOR (LOWER)	VENT	CONN. 8 9	CONN. 8	VENT	VENT	VENT	VENT	GRAY
3	DEFROST	VENT	VENT	VENT	VENT	VENT	VENT	CONN. 4 8	BLUE
4	A/C DOOR	CONN. 8	VENT	VENT	VENT	VENT	CONN. 5 8	CONN. 3 8	BROWN
5	HEAT DOOR (UPPER)	VENT	VENT	VENT	VENT	VENT	CONN.4 8	VENT	GREEN
6	INPUT UNCHECKED	SEAL	SEAL	SEAL	SEAL	SEAL	CONN. 1	CONN.	
7				Not Used - Seal in Harness					
8	INPUT CHECKED	CONN. 4	CONN. 2 9	CONN. 2	SEAL	SEAL	CONN. 4 5	CONN. 3 4	VIOLET
9	O/AIR R/AIR	VENT	CONN. 2 8	VENT	VENT	VENT	VENT	VENT	ORANGE

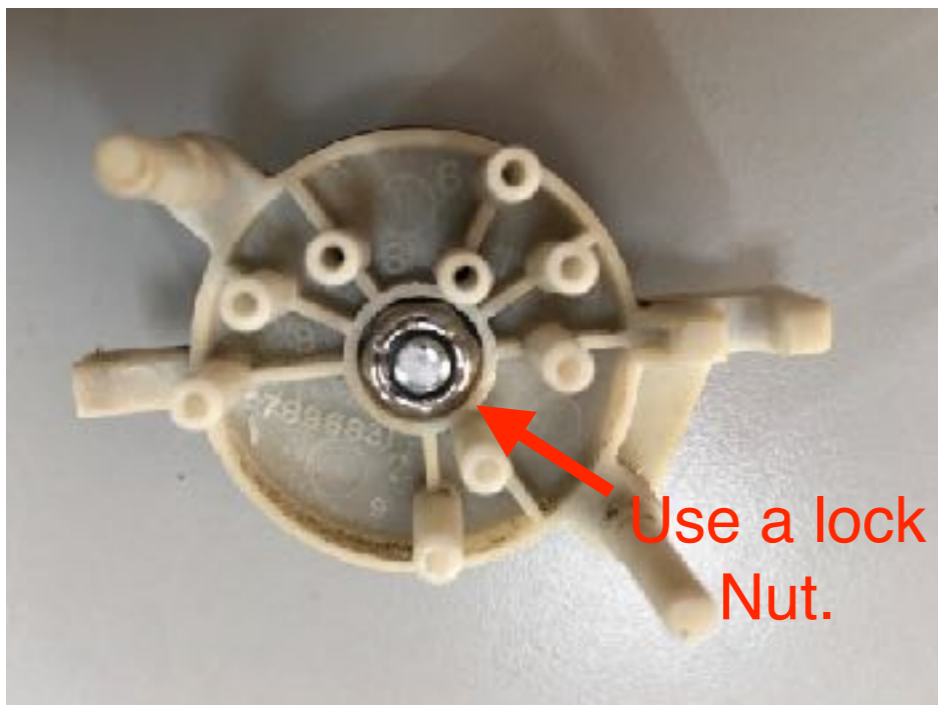
## Water Valve Operating Chart

Port #	Function	Position 1	Position 2	Stripe
1	Input	Conn 2	Seal	Violet
2	Water Valve Signal	Conn 1	Vent	Pink





- One of the most common faults is a broken clip
- Remove the Valve
- Do not clean the valve with anything you wouldn't use on rubber or Plastic
- Lubricate with silicone grease, or plumbers grease - don't goop it.
- Don't use silicone if you have oxygen sensor.
- I recommend you lube the outside of the ports also.



## Silverline Pump Kit

### MV8500 Silverline Elite Automotive Kit

Designed with proven features from the renowned Mityvac pumps, the MV8500 Silverline Elite Automotive Kit delivers both vacuum and pressure. The dual capability of the new Mityvac hand pump combines two pumps into one. It will streamline your tool inventory while greatly extending its vehicle service applications.

#### Features/Benefits

- Provides either vacuum or pressure with equal precision and convenience
- Features modern, ergonomic design for comfortable, long-term use
- Performs engine performance diagnostics, brake bleeding, fluid transfer, evacuation, sampling, windshield repair and more
- Includes components needed to perform numerous diagnostic and mechanical tests
- Field serviceable - standard maintenance kits and replacement parts are available

#### Kit Includes:

- Silverline Elite hand vacuum/pressure pump (Model MV8510) with 2 in. (50 mm) diameter compound gauge and rubber boot
- 4.5 oz. (135 ml) fluid reservoir bottle with fluid transfer and storage lids
- Four (4) tapered adapters for connecting to tubing from .09 to .50 in. (2.3 to 13 mm) ID
- 2 tapered manifold plugs
- 2 tapered bleed screw adapters
- 2 universal bleed screw adapters
- 12 vacuum cap plugs
- Vacuum line T-adaptor
- $\frac{5}{32}$  in. (4 mm) ID x  $\frac{1}{4}$  in. (6.4 mm) ID tubing adapter
- Rubber cupped adapter
- (2)  $\frac{1}{4}$  in. (6.4 mm) ID x 24 in. (610 mm) long connection tubes
- $\frac{1}{4}$  in. (6.4 mm) ID x  $1\frac{1}{2}$  in. (40 mm) long connection tube
- $\frac{1}{4}$  in. (6.4 mm) ID x  $3\frac{3}{8}$  in. (90 mm) long fluid pick-up tubes
- $\frac{5}{32}$  in. (4 mm) ID x 3 in. (75 mm) long vacuum test tube
- Master cylinder refill kit (Model MVA6825)
- Custom molded case
- User's manual (English, French, Spanish)

#### Specifications:

Packaged weight:	5.5 lbs. (2.5 kg)
Packaged size:	12.9 x 9.8 x 4.5 in. (330 x 250 x 115 mm)

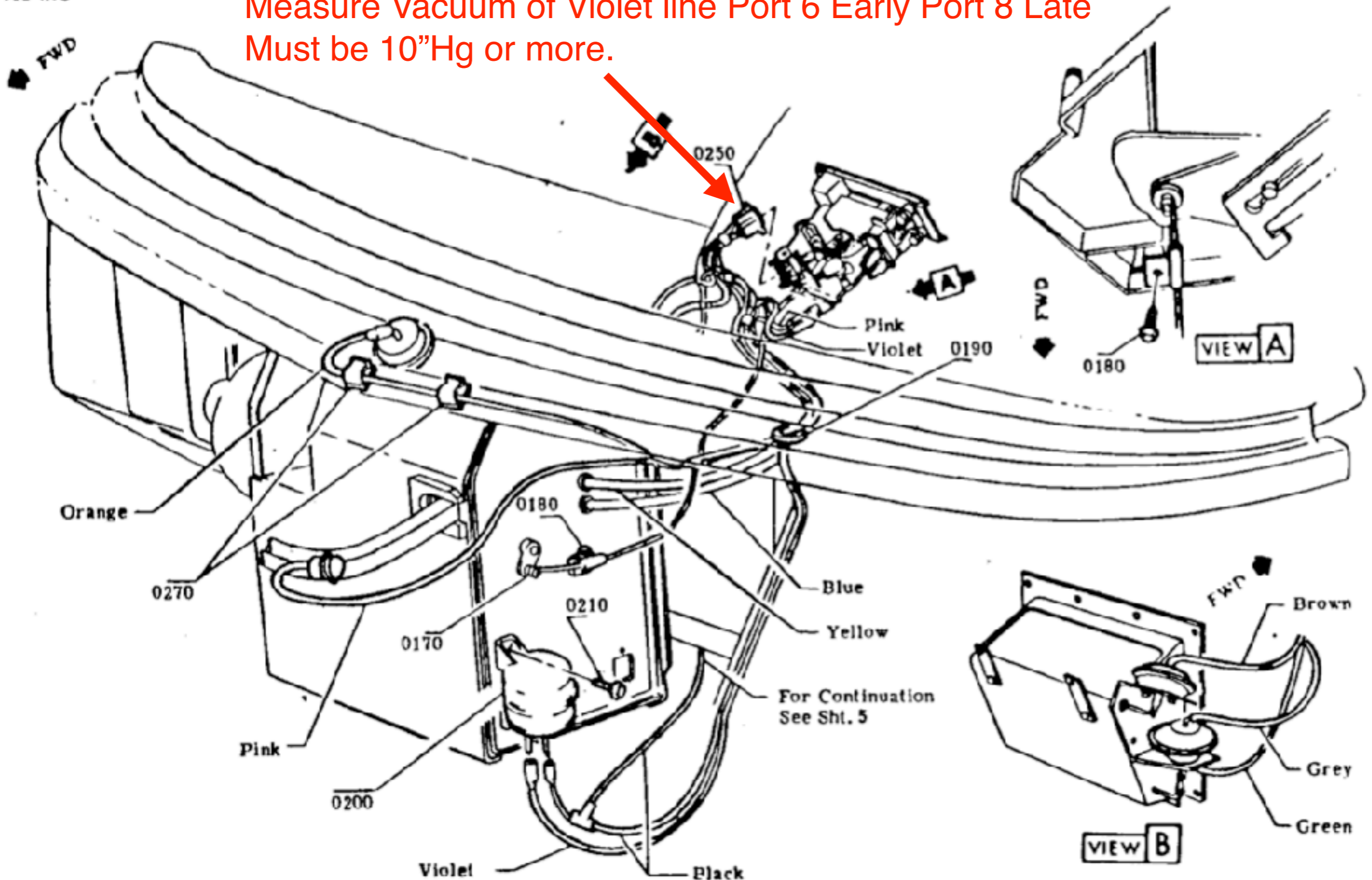


MV8500

# No AC/Heat Door Selection

Remove Vacuum connector at Vacuum Select Valve.  
Measure Vacuum of Violet line Port 6 Early Port 8 Late  
Must be 10"Hg or more.

GMT 922 1/75



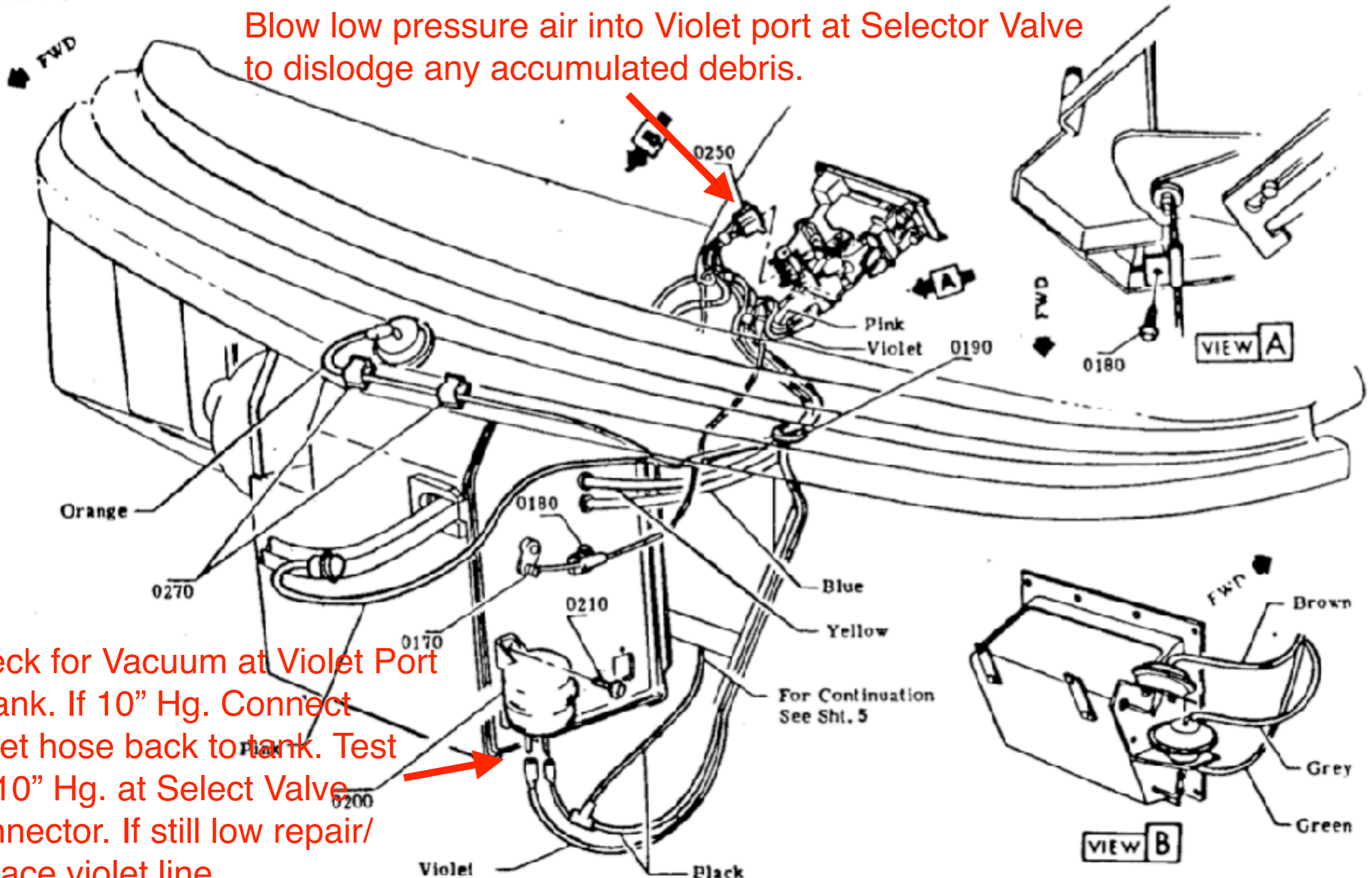
# No AC/Heat Door Selection

If less than 10"Hg:

Remove Violet line from end of reserve tank

Blow low pressure air into Violet port at Selector Valve to dislodge any accumulated debris.

GMT 922 1/75



Check for Vacuum at Violet Port of tank. If 10" Hg. Connect Violet hose back to tank. Test for 10" Hg. at Select Valve Connector. If still low repair/replace violet line.

# No AC/Heat Door Selection

If Vacuum is low at tank remove other line and test for Vacuum in line with engine running and warmed up. If lower than 10" Hg. repair/replace line.

GMT 922 1/75

FWD

Orange

0270

0170

0210

Blue

Yellow

For Continuation  
See Sht. 5

Violet

Black

0250

Pink

Violet

0190

0180

VIEW A

FWD

FWD

Brown

Grey

Green

VIEW B

If Engine Vacuum is OK but Tank Vacuum is not there is a leak in the Vacuum Tank. This is fairly common.



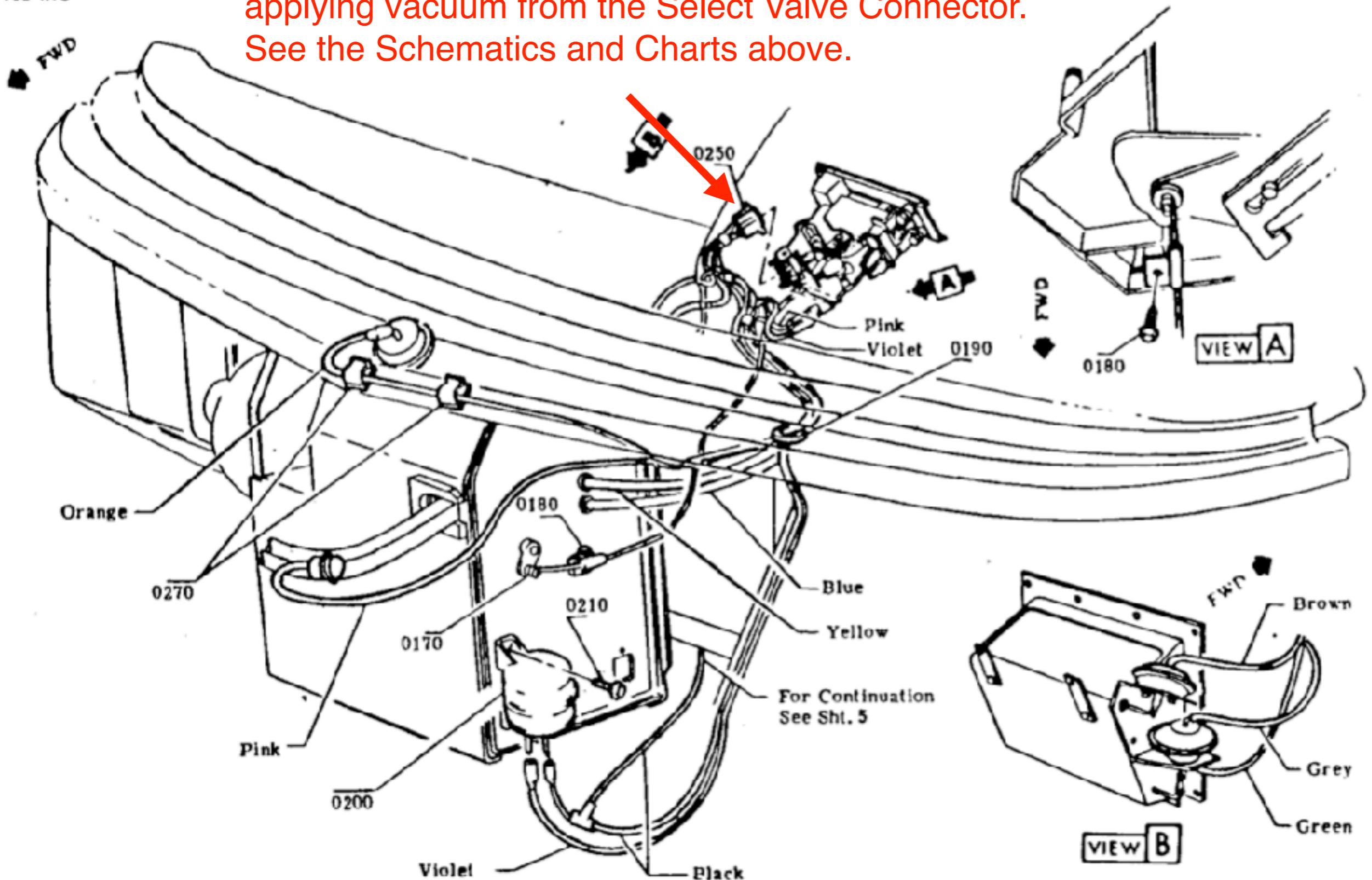
I have seen this problem numerous times in older tanks when the shiny coating wears off. This is a obvious leak.

You can either replace the tank or repair it. Since they are made of ABS plastic, a dab of ABS pipe cement has worked many times for me.

# No AC/Heat Door Selection

The individual Actuators (Doors) can be tested by applying vacuum from the Select Valve Connector. See the Schematics and Charts above.

GMT 922 1/75



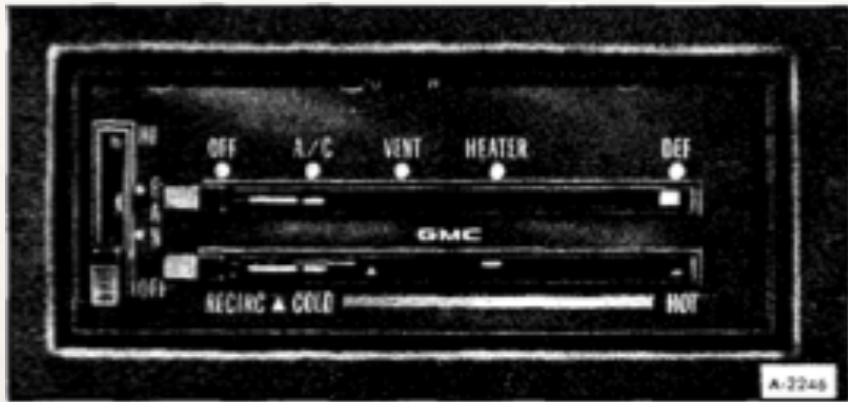
# ITEMS TO KEEP IN MIND ABOUT THE COCKPIT HVAC SYSTEM

Hot water valve N.O. - closed by Vacuum - Why did GM do this? To keep your Heater Core from Rotting like an Apple.

The Violet Vacuum line has a small check valve in it to keep air flowing in one way only. It also limits the amount of vacuum to allow the “Defroster Bleed” to reduce the door opening to about half. That helps provide for the air outlet from the Defroster and Heat outlets at the same time. If you replace the line, save the check valve. If it is missing you can probably find one online hiding in with Hot Tub parts, or Fish Tank parts. It keeps fuel vapors from traveling up the line when you shut off the Engine.

Late models have a “Restrictor” in the line going to the Heater Control Valve. Its purpose is to slow the movement of that door. This can often be the cause of that doors lack of movement. Blow it out with low pressure air. Don't use carburetor cleaner on it.

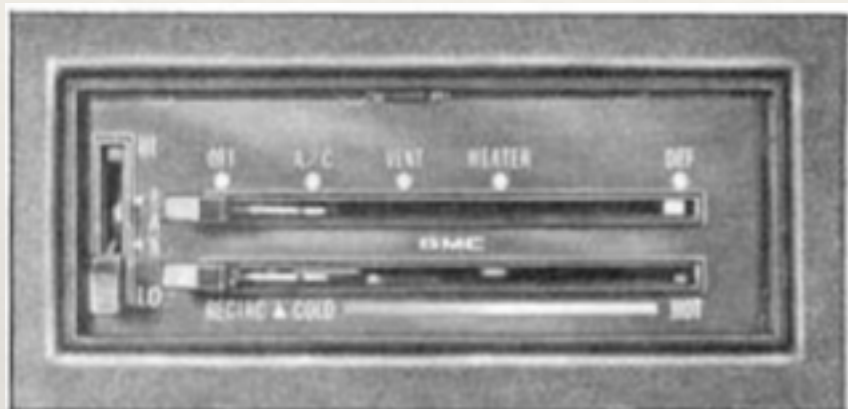
# Electrical Troubleshooting Depends on Year



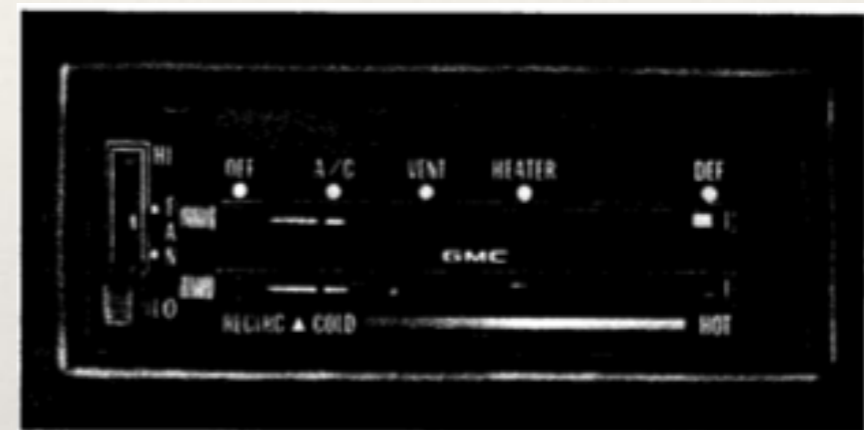
73'



74'



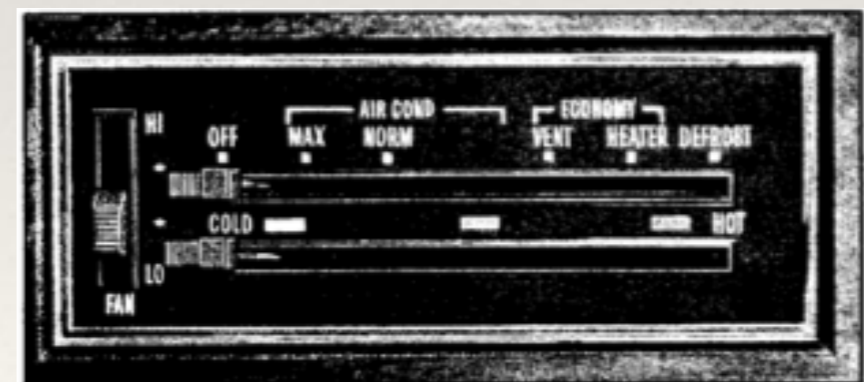
75'



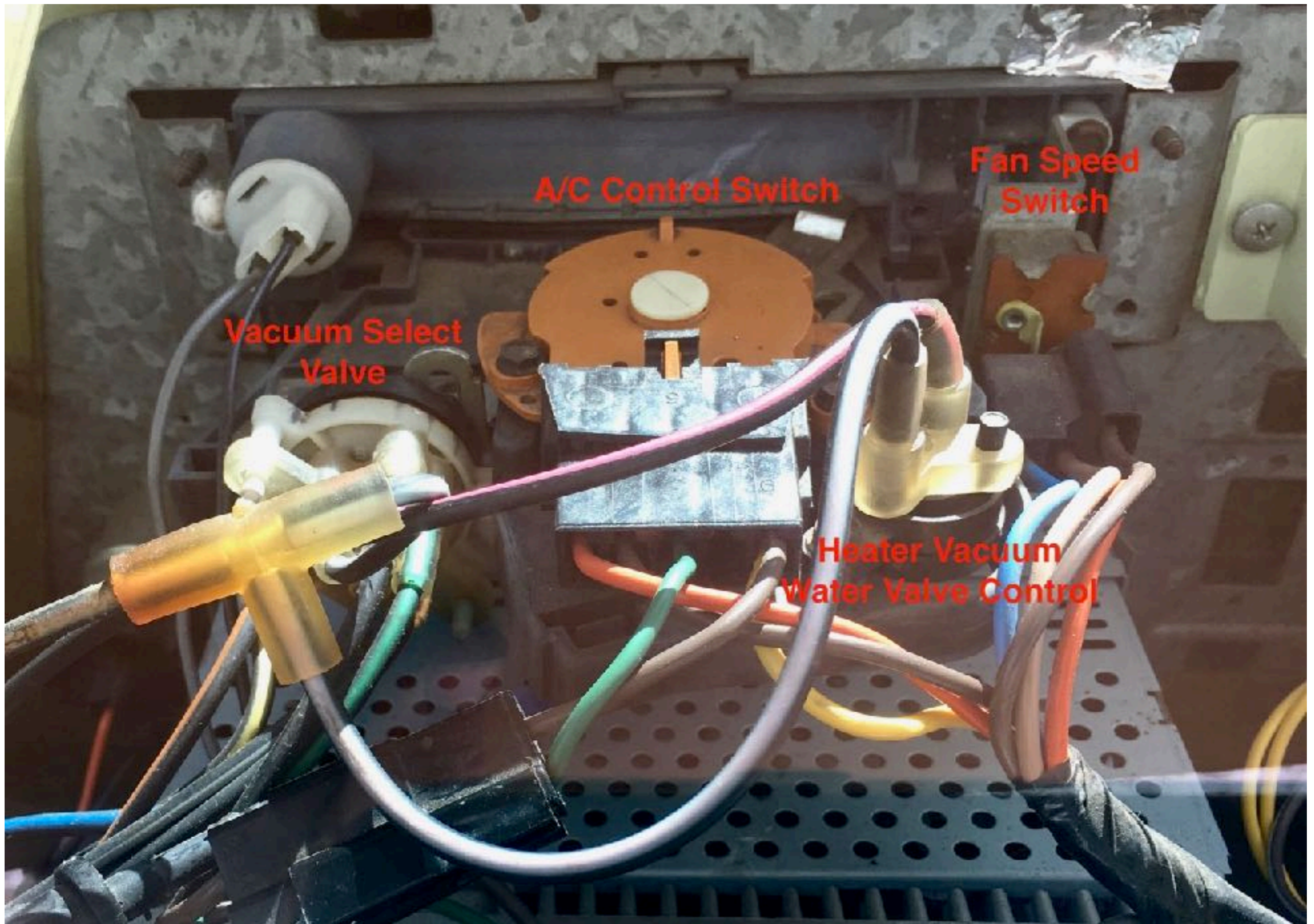
76'



77'



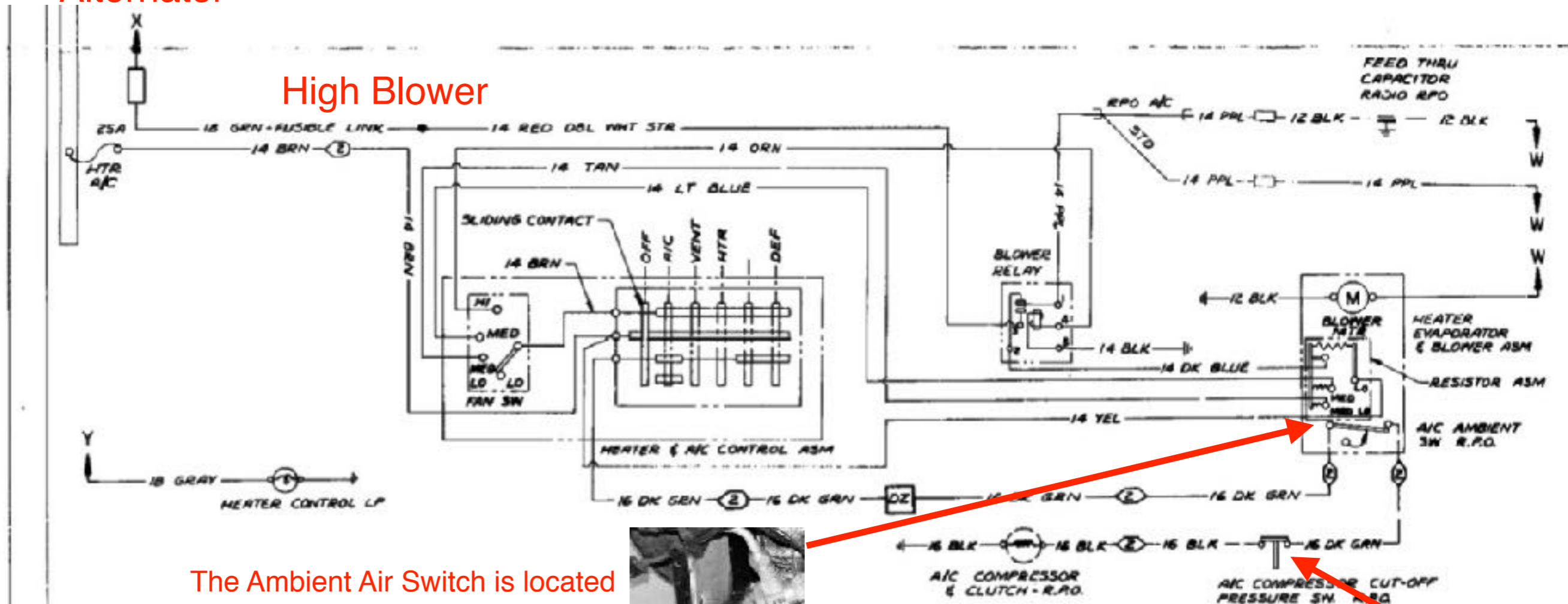
78'



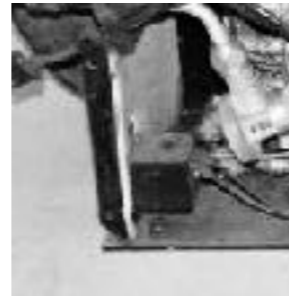
## GMC did not Properly Update for Every Year

## To Alternator

# High Blower



The Ambient Air Switch is located inside the “Box” at the bottom passenger side.



If the Compressor does not engage check the Cut off switch and the connection to the Ambient air switch. Both should be N.C.

# Inside of AC Select Switch



Springs tend to loose height over time

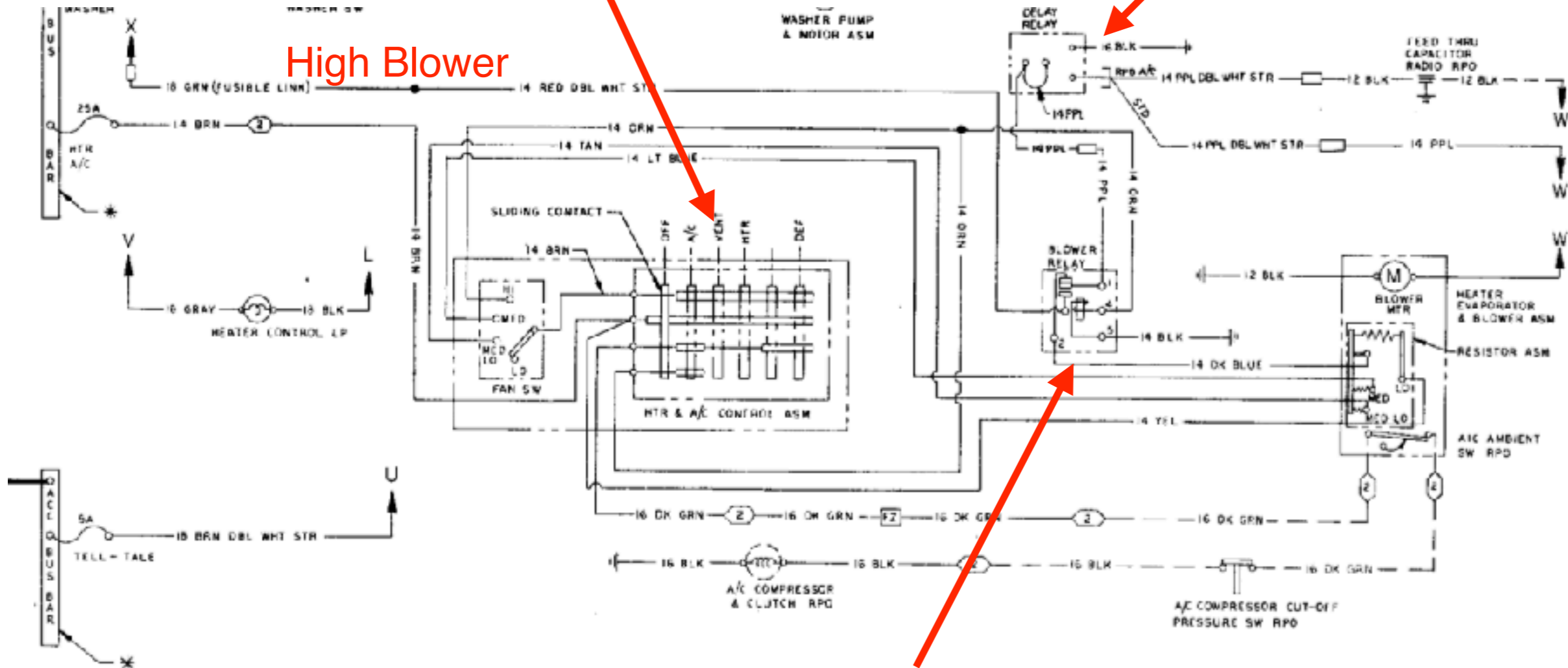
# Electrical Schematic

To  
Alternator

Schematics were never updated  
to reflect "MAX" AC

Delay Relay - High Blower only  
Allows Vacuum driven Doors  
to finish moving before High Fan

High Blower



Blower Relay - affects all but High

For Reference only. User is solely responsible for accuracy of material.

Part	Condition	Year	Parts Book	AcDelco	Notes	4 Seasons		
<b>Assembly</b>		77-78			Harrison Air Conditioning HEB-204-776			
<b>Compressor W/O Clutch</b>	New	78	6598423	15-2171				
	Reman	78		15-27				
	New	74-77	6598423	15-2171				
	Reman	74-77		15-27				
	New	73	6598423	15-2171				
<b>Compressor O-Ring kit</b>		All	6591956	15-237				
<b>Pulley, Clutch W/Bearing</b>	Reman	73		15-27				
	New	78	5914745	15-216				
	New	75-77	5914745	15-216				
<b>Condenser</b>	New	73-74	3014961	15-238				
		78	3034647	15-6147				
		77	3034647	15-6147				
		75-76	3034647	15-623	After May 75			
<b>Evaporator</b>		73-74		15-623				
		76		15-6216				
		75		15-6216				
<b>Drier</b>		73-74	3012944	15-6216				
		78		15-1232	1st Design w/o switch			
		OR		15-1334	1st Design w/o switch. Adapter 15-3387 required			
		78		15-1238	2nd Design W/Switch			
		OR		15-1334	2nd Design W/Switch. Adapter 15-3387 required			
		73-77		15-1232				
<b>Motors, Blower</b>		73-77		15-1334				
		74-77		15-894				
		76		15-839				
<b>Control, Heater &amp; AC</b>		73-74	9340926	15-7665	Prior to 76			
		??-75	9343695		Prior to 75			
		75-??	9345085		Effective W/75			
		75-76		15-7488*				
		75-76	9345095	15-7842	Effective W/75			
		77-??	7898865	15-7989	Effective W/77 [in assembly manual}			
<b>Replacement</b>			7895845					
		78	7895845					
<b>Controller Parts</b>								
<b>Dial, Calibrated</b>		73-74		15-7665				
<b>Dial PKG.(incl. Knobs &amp; Retainers</b>		73		15-7666				
		77-78		15-7005				
		75-76		15-874				

Part	Condition	Year	Parts Book	AcDelco	Notes	4 Seasons		
<b>Knob Select (Temp &amp; Blower)</b>		74		15-7728				
<b>Lever</b>		73-78		15-7296				
		78		15-7968				
		75		15-7768				
		74-75		15-7699				
		73-74		15-7472				
<b>Spring, Dial Retainer</b>		73		15-7636				
<b>Switches</b>		74-75		15-7668				
		78		15-7004				
		77-78		15-7999				
		75-77		15-7689				
		75-76		15-7832				
<b>Vacuum Select Valve</b>		74-75		15-7731				
		78		15-7003	Select 9 Port		7898859	78-82 Chev Truck
		78		15-7975	Temp 3 Port	36693	07897420	
		77		15-7003	Select 9 Port			
		77		15-7975	Temp 3 Port	36693	07897420	See 15A-99 pg117
		73-76		15-7667	Select 9 Port			
		73-76		15-7474	Temp 3 Port			See 15A-99 pg114
<b>Switch, Thermostatic</b>		OR		15-8131				
		76-77		15-5181				
<b>Actuator Assy.</b>		73-75		15-5190				
<b>Base Plate</b>								
<b>Cam, Cable Drive</b>		76		15-7897				
<b>Cam, Temperature</b>		75		15-7487				
<b>SW. Assy Heater to Blower</b>			3028795					
		??-75	1223127	15-7832	Used with 9343695 control			
		75-??	1223590	15-7832	Used with 9345085 control			
		75-76	9340540		Part of 9345085,9345095			
<b>Heater blower relay</b>			366408					
<b>Harness, Vac Hose</b>			2005985					
<b>Valve, Heater</b>			494192					
<b>Replacement</b>			697664					