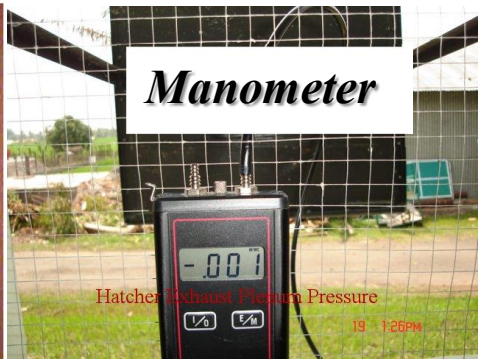
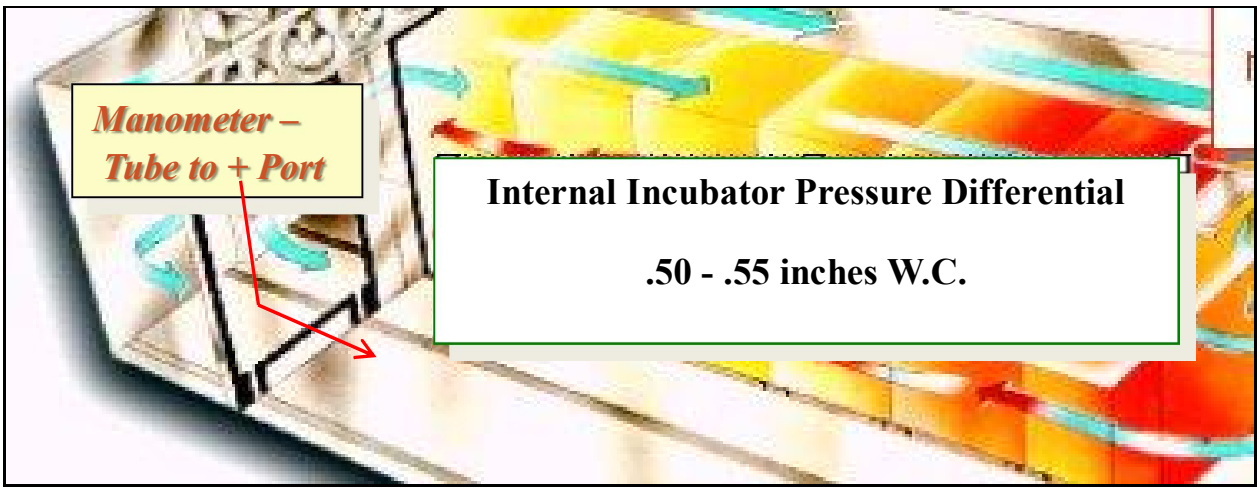
“Instruments for Checking Incubator Pressure”



The preferred instrument for proper monitoring the Jamesway Incubator Cabinet Pressure is the digital Manometer as shown. A proper Magnehelic can be used but must be the scale as shown and must leveled and zeroed for accurate reading.

The Procedure “How to Do the Incubator Cabinet Pressure”

“The Total Incubator Cabinet Pressure Check”



The first check is the Total Pressure Differential. Enter the incubator from the exit end, down the aisle and through the aisle doors to the entrance end. Standing in the entrance end insert ¼ò plastic tubing (airline tubing) under the right side bottom gasket into the exit end under the #1 position as shown. Put the tube on the plus (+) port of the instrument. The reading for Super J should be .50 ï 55 inches W.C. Then repeat the procedure on the left side. The reading must be the same side to side.

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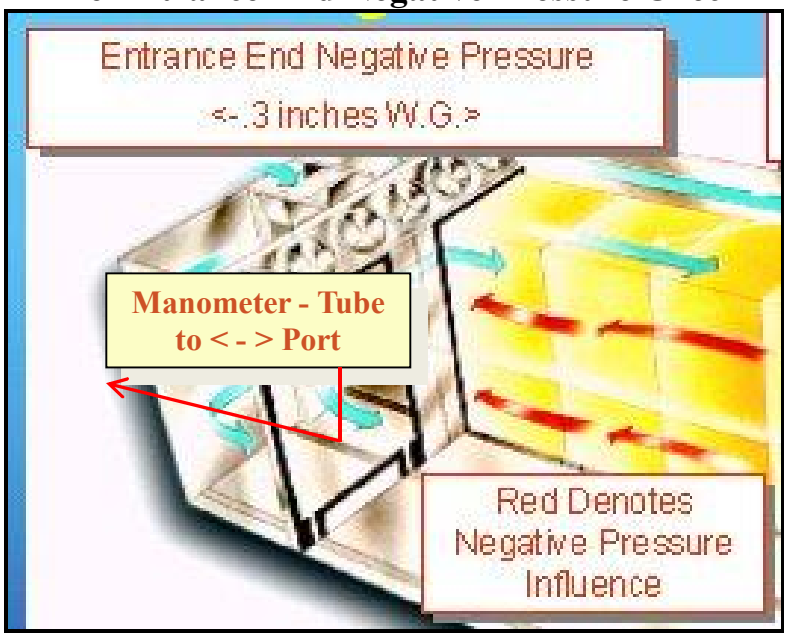
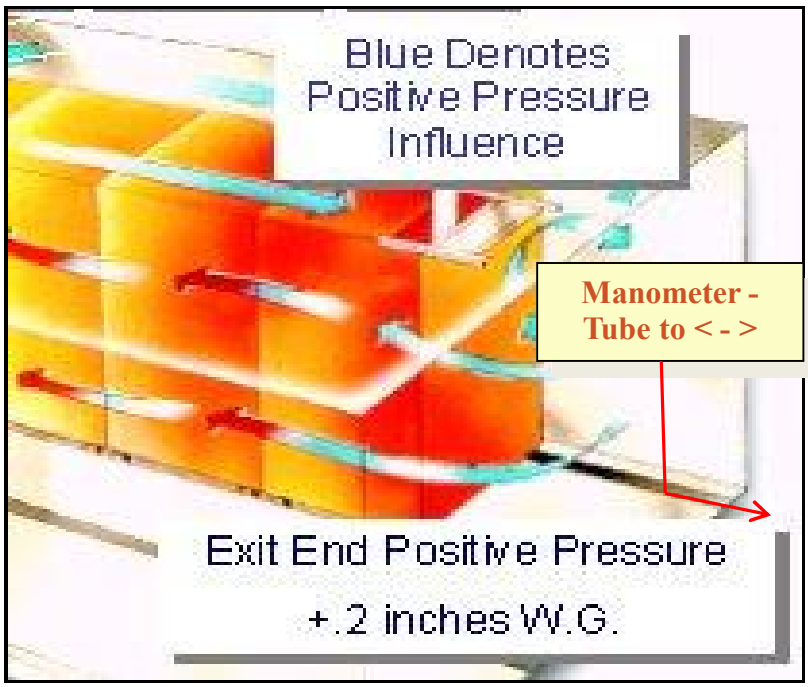
“The Entrance End Negative Pressure Check”



The second incubator pressure check is entrance end negative pressure. While still in the entrance end of the incubator take the tube and run it under the threshold at the track into the hall. Put the tube on the negative (-) port of the instrument. This reading must be 60% of the total i.e. @ .50 inches W.C. total incubator pressure the correct entrance end pressure is <-.30> inches W.C.

“The Exit End Positive Pressure Check”



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The third incubator pressure check is the exit end positive pressure. Proceed back through the aisle doors, up the aisle to the exit end of the incubator then take the tube and run it under the threshold at the track into the hall. Put the tube on the negative (-) port of the instrument. This reading must be 40% of the total i.e. @ .50 inches W.C. total incubator pressure the correct entrance end pressure is +.20 inches W.C.

"The Incubator Pressure Explanation"

The normal incubator total pressure for the Super J incubator loaded with an average mix of eggs is .50 inches W.C. with -.30 inches W.C. entrance end and +.20 inches W.C. exit end representing 60% negative entrance end and 40% positive exit end.

Setting the incubators loaded with the average mix should yield a constant total incubator pressure. Concerns such as improper turning, skipped sets, missing eggs, improper fan blades and adjustment, air leakage, gasket concerns, improper curtains, gap between buggies and etc. affects the total cabinet pressure. For information if an incubator is loaded with young flocks, smaller eggs are less restrictive and the total cabinet pressure (i.e. +.46 - .48 inches WC) will be less than average whereas the older flocks, larger eggs will be more restrictive and the total cabinet pressure (i.e. +.52 - .55 inches WC) will be more than average.

The fans and fan blades establishes the air flow in the incubator. The location (adjustment) of the fan blades related to venture creates the proper push (positive pressure) and pull (negative pressure) of the air in the incubators.

The damper controls the incubator pressures. Both intake and exhaust dampers must be properly adjusted and square in the opening to allow for proper negative and positive pressure. Also cleanliness (build up) in the damper opening can and will affect the negative and positive pressure ratio if excessive.

Simply if the 60% negative and 40% positive ratio is altered there is a concern either with the damper adjustment and squareness or air leakage at the doors.

- If the negative pressure is more i.e. @ 75% and the positive pressure less @ 25% ratio means there is more exhaust than intake.
    a) Exhaust Damper more open than Intake Damper
    b) Excessive air leakage at the Exit End Doors
- If the negative pressure is less i.e. @ 40% and positive pressure is more @ 60% ratio means there is more intake than exhaust.
    a) Intake Damper more open than Exhaust Damper
    b) Excessive air leakage at the Entrance End Doors
    Note: This of course would also have drastic effect on the temperature in the incubator

Note: To properly check the incubator pressure in regard to damper consideration I recommend the damper cotter pin be removed and both intake and exhaust damper be set at 11/2ò (normal expected operating position) . This allows for the damper to be stationary and not move when checking the incubator cabinet pressures. Also to check damper adjustment and squareness I recommend this be done when the dampers are closed. The best time for this check is immediately after set when dampers are closed.

The net effect of either scenario is the egg pack is overheated in the neutral thermic phase of incubation (4^{th} and 3^{rd} positions and some in the 2^{nd} position). In respect this is the most forgiving thermic phase in regard to overheating and embryonic mortality. Although the chick quality and embryo stress is negatively influence by such and will contribute to late embryonic mortality especially 15 ï 18 day lost. A major concern to me is the

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fact the entrance end temperatures (cross bar) is misleading especially as when used to alter and change the set point to maintain a desired entrance end temperature explaining possibly the higher than normally observed industry set points.

Actual Checks Done at a Hatchery for Example and Further Explanation

Incubator Pressure Taken at Your Hatchery					
Incubator #	# Buggies per Side	Total		Entrance	Exit
		Right	Left	Negative	Positive
3	5	+.45	+.45	-.24 (53%)	+.21 (47%
6	5	+.50	+.48	-.31 (63%)	+.19 (37%)
9	5	+.46	+.46	-.28 (59%)	+.19 (41%)
12	5	+.49	+.49	-.26 (53%	+.23 (47%)
18 SS	6	+.42	+.44	-.21 (49%)	+.22 (51%)
21 SS	6	+.45	+.46	-.26 (57%)	+.21 (46%)
24	6	+.48	+.48	-.23 (48%)	+.25 (52%)
28	6	+.49	+.49	-.21 (43%	+.28 (57%)
33	5	+.54	+.54	-.37 (68%)	+.18 (32%)
36	5	+.50	+.50	-.32 (64%)	+.19 (37%)
39	5	+.46	+.48	-.24 (51%)	+.23 (49%)
42	5	+.47	+.48	-.25 (52%)	+.23 (48%)
Mean 60% Negative & 40% Positive of the Total					

The total pressure was generally low indicating maintenance concerns and observed fan blade cleanliness issues. The side to side differences in some incubators reflect concerns in regard to air leakage, gasket, turning, curtains and etc. issues on the affected side.

The negative pressure being less than the 60% normal and positive pressure more than the 40% normal denotes more intake than exhaust in eight of the twelve incubators checks. The #6, 33 and 36 incubator with 63% - 68% negative and 32 - 37% positive pressure indicated more exhaust than intake. The #9 was very close to 60% negative and 40% positive pressure ratio. Although #6 and 9 incubators were had the most acceptable ratio there were obvious damper and air leakage concerns and means there are similar concerns but the air leakage and improper are pretty equal intake and exhaust.

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“Incubator Cabinet Pressure Worksheet”

Incubator Pressure Worksheet				
	Total Pressure	Entrance End	Exit End	
	Positive	Negative	Positive	
1	0.550	0.330	0.220	
2	0.540	0.324	0.216	
3	0.530	0.318	0.212	
4	0.520	0.312	0.208	
5	0.510	0.306	0.204	
6	0.500	0.300	0.200	Super J
7	0.490	0.294	0.196	
8	0.480	0.288	0.192	
9	0.470	0.282	0.188	
10	0.460	0.276	0.184	
11	0.450	0.270	0.180	Big J
12	0.440	0.264	0.176	
13	0.430	0.258	0.172	
14	0.420	0.252	0.168	
15	0.410	0.246	0.164	
16	0.400	0.240	0.160	
17	0.390	0.234	0.156	
18	0.380	0.228	0.152	
19	0.370	0.222	0.148	
20	0.360	0.216	0.144	
21	0.350	0.210	0.140	
22	0.340	0.204	0.136	
23	0.330	0.198	0.132	
24	0.320	0.192	0.128	
25	0.310	0.186	0.124	
26	0.300	0.180	0.120	

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