



WCS AIR FLOW TESTS AT GE

6/25/85

EFFECT OF O/B FILTER AND MUFFLER

	<u>FAN SEP</u>	<u>URINAL AIR FLOW (CFM)</u>	<u>COMMODOE AIR FLOW (CFM)</u>
CASE 1A WCS IN NORMAL CONFIG, SLIDE VALVE CLOSED	#1	10.0	—
	#2	10.0	—
1B CASE 1A WITH O/B FILTER REMOVED	#1	10.6	—
	#2	10.6	—
1C CASE 1B WITH O/B FILTER CAVITY TAPED OVER	#1	10.3	—
	#2	10.4	—
CASE 2A WCS IN NORMAL CONFIG, SLIDE VALVE OPEN	#1	9.3	34.4
	#2	9.6	33.4
2B CASE 2A WITH O/B FILTER REMOVED	#1	9.7	35.6
	#2	10.0	35.8
2C CASE 2B WITH O/B FILTER CAVITY TAPED OVER	#1	9.5	35.8
	#2	9.8	35.9

EFFECT ON COMMODOE AIR FLOW BY PLUGGING URINE INLET

CASE 3A WCS WITH URINAL PLUGGED	#1	—	35.4
	#2	—	34.1
3B CASE 3A WITH O/B FILTER REMOVED	#1		39.3
	#2		37.5
3C CASE 3B WITH O/B FILTER CAVITY TAPED	#1		38.0
	#2		36.5

CONCLUSIONS

1. IN NORMAL CONFIG, EFFECT OF O/B FILTER REMOVAL IS ~1 CFM INCREASE, EFFECT OF MUFFLER IS NEGLIGIBLE.
2. WITH O/B FILTER IN PLACE, EFFECT OF PLUGGING URINAL ON COMMODOE AIR FLOW IS ~1 CFM INCREASE.
3. WITH O/B FILTER REMOVED, EFFECT OF PLUGGING URINAL IS ~4 CFM INCREASE OF COMMODOE AIR FLOW



42-381 50 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
42-389 200 SHEETS 5 SQUARE
MADE IN U.S.A.

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EFFECT OF PREFILTER ON URINAL AIR FLOW

URINAL AIR FLOW
(CFM)

REF	1A	WCS IN NORMAL CONFIG, SL. VALVE CLOSED	#1	10.0	
REF	2A	" " " " " " " OPEN	#2	10.0	
			#1	9.3	
			#2	9.6	
17B		WCS IN NORMAL CONFIG, SL. VALVE CLOSED	#1	8.7	1.3
		PREFILTER IN URINAL	#2	8.6	1.4
17A		WCS IN NORMAL CONFIG, SL. VALVE OPEN	#1	8.1	1.2
		PREFILTER IN URINAL	#2	8.4	1.2

CONCLUSION:

PREFILTER RESTRICTS URINAL AIR FLOW BY 1.2 - 1.4 CFM



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EFFECT OF BYPASSING PHS VALVE AND
FAN SEP SELECT VALVE ON URINAL AIR FLOW
ALSO, EFFECT OF BLOCKING BALLAST AIR

REF

CASE 1A WCS IN NORMAL CONFIG, SLIDE VALVE CLOSED

FAN SEP	PRE FILTER	URINAL (CFM)	Δ	COMMODOE (CFM)
#1	IN	8.6		—
	OUT	10.0		—
#2	IN	8.7		—
	OUT	10.0		—

CASE 4A WCS WITH TEE TO F.S. #2, PRI. URINE
PORT PLUGGED, SLIDE VALVE CLOSED

#1	IN	—		—
	OUT	—		—
#2	IN	10.1	1.4	—
	OUT	11.8	1.8	—

REF

CASE 2A WCS IN NORMAL CONFIG, SLIDE VALVE OPEN

#1	IN	8.1		NM
	OUT	9.3		34.4
#2	IN	8.4		NM
	OUT	9.6		33.4

CASE 5A WCS WITH TEE TO F.S. #2, PRI URINE
PORT PLUGGED, SLIDE VALVE OPEN

#1	IN	—		—
	OUT	—		—
#2	IN	9.0	0.6	32.7 0.7
	OUT	10.4	0.8	32.3 1.1

CASE 6D CASE 4A WITH BALLAST PLUGGED

#2	IN	10.4	1.7	—
	OUT	12.3	2.3	—

CONCLUSIONS

1. BYPASSING THESE VALVES RESULTS IN 0.6 TO 1.8 CFM INCREASE IN URINAL AIR FLOW AND 0.7 TO 1.1 DECREASE IN COMMODOE AIR FLOW.
2. BYPASSING THESE VALVES AND BLOCKING BALLAST RESULTS IN 1.7 TO 2.3 CFM INCREASE IN URINAL AIR FLOW



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EFFECT OF RUNNING BOTH FAN SEPS, ONE FOR URINAL, ONE FOR COMMODORE

CASE 2A WCS IN NORMAL CONFIG, SLIDE VALVE OPEN

FAN SEP

URINAL
(CFM)
PREFILTER
IN/OUT

COMMODORE
(CFM)
PREFILTER
IN/OUT

8.1/9.3

34.4

8.4/9.6

33.4

NM/9.7

35.6

NM/10.0

35.8

NM/9.5

35.8

NM/9.8

35.9

CASE 9A TEE TO F.S. #2, PRI URINE PORT PLUGGED
F.S. #1 SELECTED, BOTH F.S. RUNNING

BOTH

NM/NM

NM/NM

9B 9A WITH O/B FILTER REMOVED

BOTH

10.1/11.8

38.3/38.5

9C 9B WITH O/B FILTER CAVITY TAPED

BOTH

9.7/11.4

37.2/36.5

CONCLUSION

1. MISSING DATA FOR CASE 9A
2. IF O/B FILTER IS OUT, RUNNING DEDICATED FAN SEPS RESULTS IN INCREASE OF ~2 CFM FOR URINAL, ~3 CFM FOR COMMODORE.



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EFFECT OF BYPASSING PHS VALVES, BLOCKING BALLAST
WITH 1" ID URINAL HOSE FROM FAN SEP #2 TO URINAL

		FAN SEP	URINAL (CFM) PREFILTER IN/OUT	COMMODORE (CFM) PREFILTER IN/OUT
REF	CASE 1A WCS IN NORMAL CONFIG, SLIDE VALVE CLOSED	#2	8.6 / 10.0	NM / 0
	CASE 2A " " " " " " " OPEN	#2	8.4 / 9.6	NM / 34.4
	CASE 16A 1" ID HOSE TO F.S. #2, PRI URINE PORT PLUGGED, BALLAST BLOCKED, F.S. # RUNNING, SLIDE VALVE CLOSED	#2	13.0 / <u>19.6</u> * (980)	0
	CASE 16D CASE 16A WITH BALLAST OPEN	#2	12.8 / <u>17.8</u> * (890)	0
	CASE 16I CASE 16A WITH SLIDE VALVE OPEN	#2	10.9 / <u>16.6</u> * (830)	32.6 / 31.0
	CASE 16J CASE 16I WITH O/B FILTER REMOVED	#2	11.9 / <u>17.8</u> (890)	35.8 / 33.8
	CASE 16K CASE 16J WITH O/B FILTER REMOVED AND CAVITY TAPED	#2	11.8 / <u>17.8</u> (890)	34.4 / 33.7

CONCLUSIONS:

1. MORE TEST POINTS WITH 1" HOSE SHOULD BE OBTAINED.
2. LARGER URINAL HOSE, LARGER URINAL AND PREFILTER BORE WILL MAKE A SIGNIFICANT INCREASE IN URINAL AIR FLOW.

* FROM EXTRAPOLATING CAL CURVE. FLOW METER NEEDS TO BE CALIBRATED FOR THIS FLOW RANGE.

TEE TO F.S. #2, PRIMARY URINE INLET PLUGGED

CASE No.	TEST CONFIGURATION	FS#	URINAL			COMMUNE			PRE FILTER
			ΔP IN H ₂ O	VEL	Q CFM	ΔP IN H ₂ O	VEL	Q CFM	
4A	FAN SEP #2 SELECTED AND RUNNING SLIDE VALVE CLOSED	FS#2	6.2	500	9.34				IN
			5.6	581	10.97				OUT
4B	4A WITH ODOR/BACTERIA FILTER REMOVED	FS#2	7.0	535	10.06				IN
			6.4	620	11.77				OUT
4C	4B WITH FILTER CAVITY TAPED	FS#2	6.8	520	9.76				IN
			6.2	610	11.57				OUT
5A	FAN SEP. #2 SELECTED AND RUNNING SLIDE VALVE OPEN	FS#2	5.7	483	9.0	3.90	466	32.7	IN
			5.1	555	10.4	3.90	462	32.3	OUT
5B	5A W/ ODOR/BACT. FILTER REMOVED	FS#2	6.5	521	9.77	4.80	506	35.5	IN
			5.9	596	11.3	4.70	510	35.8	OUT
5C	5B W/ FILTER CAVITY TAPED	FS#2	6.2	498	9.27	4.50	502	35.3	IN
			5.7	579	10.9	4.40	501	35.2	OUT
6A	FS. #1 SELECTED, NOT RUNNING FS #2 RUNNING VIA BYPASS SWITCH SLIDE VALVE CLOSED	FS#2	7.2	565	10.6				IN
			7.1	658	12.5				OUT
6B	6A W/ ODOR/BACT. FILTER REMOVED	FS#2	7.9	566	10.7				IN
			7.2	668	12.7				OUT
6C	6B W/ FILTER CAVITY TAPED	FS#2	8.0	560	10.56				IN
			7.2	660	12.58				OUT
6D	FS. #1 SELECTED, NOT RUNNING FS #2 RUNNING VIA BYPASS SWITCH SLIDE VALVE CLOSED BALLAST OPENING TAPED	FS#2	7.7	555	10.4				IN
			7.0	648	12.3				OUT

[illegible]

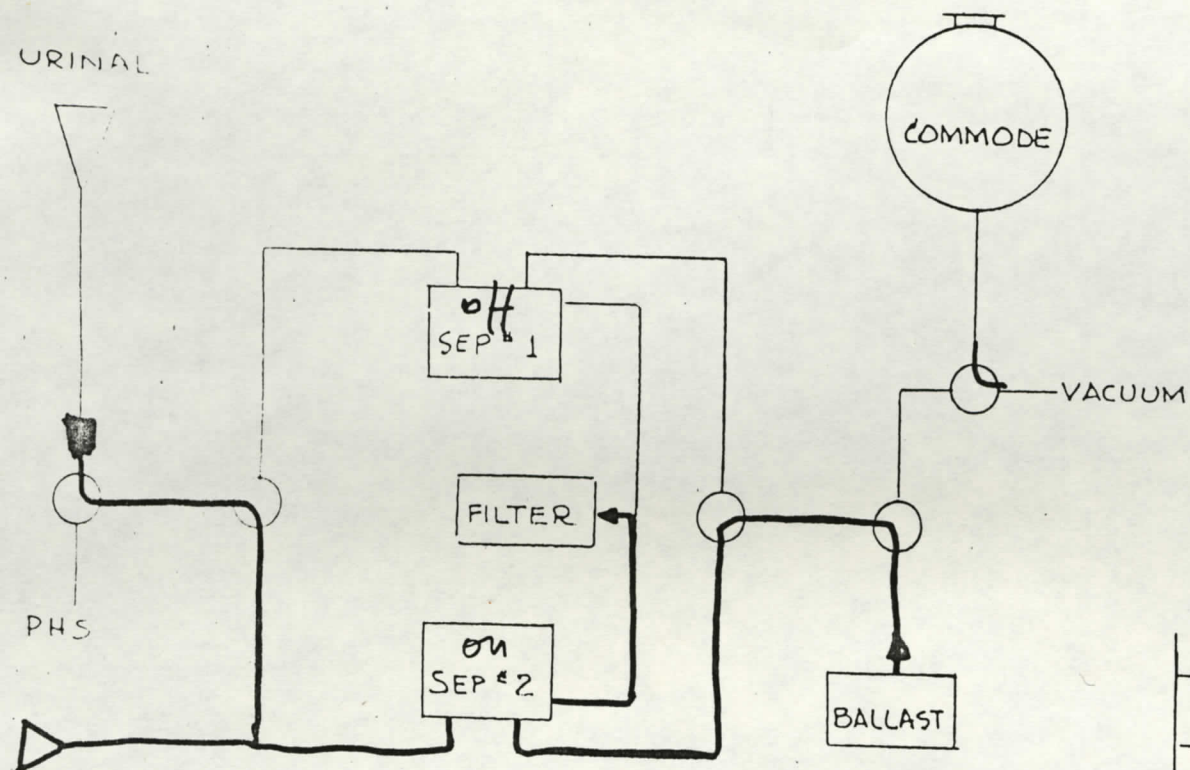
TEE TO FS #2 PRIMARY URINE INLET PLUGGED

CASE No.	TEST CONFIGURATION	FS#	URINAL			COMMUNE			PREFILTER
			AP IN H ₂ O	VEL	Q CFM	AP IN H ₂ O	VEL	Q CFM	
7A	FS#1 SELECTED, NOT RUNNING FS#2 RUNNING VIA BYPASS SWITCH SLIDE VALVE OPEN	FS#2	7.1	552	10.56	7.0	2		IN
									OUT
7B	7A WITH ODOB/ BACTERIA FILTER REMOVED	FS#2	7.9	559	10.56	7.9	0	0	IN
			7.2	653	12.4	7.9	0	0	OUT
7C	7B WITH FILTER CAVITY TAPED	FS#2	7.9	552	10.37	8.0	20	0	IN
			7.1	650	12.3	7.9	0	0	OUT
8A	FAN SEP #1 SELECTED, RUNNING IS FAN SEP #2 RUNNING VIA BYPASS SWITCH SLIDE VALVE CLOSED	BOTH	7.0	530	9.9				IN
			6.4	616	11.6				OUT
8B	8A WITH ODOB/ BACTERIA FILTER REMOVED	BOTH	7.4	540	10.16				IN
			6.7	631	11.97				OUT
8C	8B WITH FILTER CAVITY TAPED	BOTH	7.0	527	9.9				IN
			6.4	615	11.6				OUT
9A	FAN SEP #1 SELECTED, RUNNING FAN SEP #2 RUNNING VIA BYPASS SWITCH SLIDE VALVE OPEN	BOTH							IN
									OUT
9B	9A WITH ODOB/ BACT. FILTER REMOVED	BOTH	7.1	535	10.06	7.0	544	38.25	IN
			6.6	620	11.77	7.0	548	38.5	OUT
9C	9B WITH FILTER CAVITY TAPED	BOTH	6.6	517	9.67	6.4	530	37.2	IN
			6.0	605	11.40	6.3	520	36.5	OUT

CASE NO.	TEST CONFIGURATION	FS#	URINAL			COMP. L.F.			PREFILTER
			ΔP IN H ₂ O	$\dot{V}$ GPM	Q CFM	ΔP IN H ₂ O	VEL	Q CFM	
16A	FS #2 SELECTED AND RUNNAGE BALLAST BLOCKED, SLIDE VALVE CLOSED NASA URINAL - 1" HOSE FROM FS#2 TO URINAL	#2	6.6	684	13	7.2	0	0	IN
		#2	3.2	980			0	0	OUT
16B	16A - WITH ODOR BACT. FILTER REMOVED	#2	6.9	698	13.3	7.5	0	0	IN
		#2	3.4	1020			0	0	OUT
16C	16B WITHOUT NASA URINAL IN PLACE USE GE. STE METHOD.	#2	1.9	DVM			DVM		
		#2	2.6	2.23	45.3				
16D	16A WITH BALLAST OPEN	#2	2.6	670	12.8	0	0	0	IN
		#2	5.6	890					OUT
16E	16B SLIDE VALVE OPEN	#2	3.7	635	12	4.5	503	35.3	IN
		#2	4.2	900		4.2	476	33.3	OUT
16G	16C WITH FLIGHT URINAL IN PLACE ON 1" DIA HOSE	#2	4.4	2.83	17.25				
16H	16C WITH BALLAST CLOSED	#2	5.6	2.10	17.25				
16I	16A - SLIDE VALVE OPEN NASA URINAL	#2	4.8	575	10.87	3.8	461	32.6	IN
		#2	2.3	830		3.6	442	31	OUT
16J	16I - ODOR BACT FILTER REMOVED AND CAVITY TAPED	#2	5.6	625	11.9	4.6	510	35.8	IN
		#2	2.7	890		4.3	482	33.8	OUT
16K	16J CAVITY TAPED	#2	5.3	620	11.8	4.4	495	34.4	IN
		#2	2.5	890		4.0	480	33.7	OUT

TEST IMPROVED AIRFLOW -

TEST BED - WCS # 123

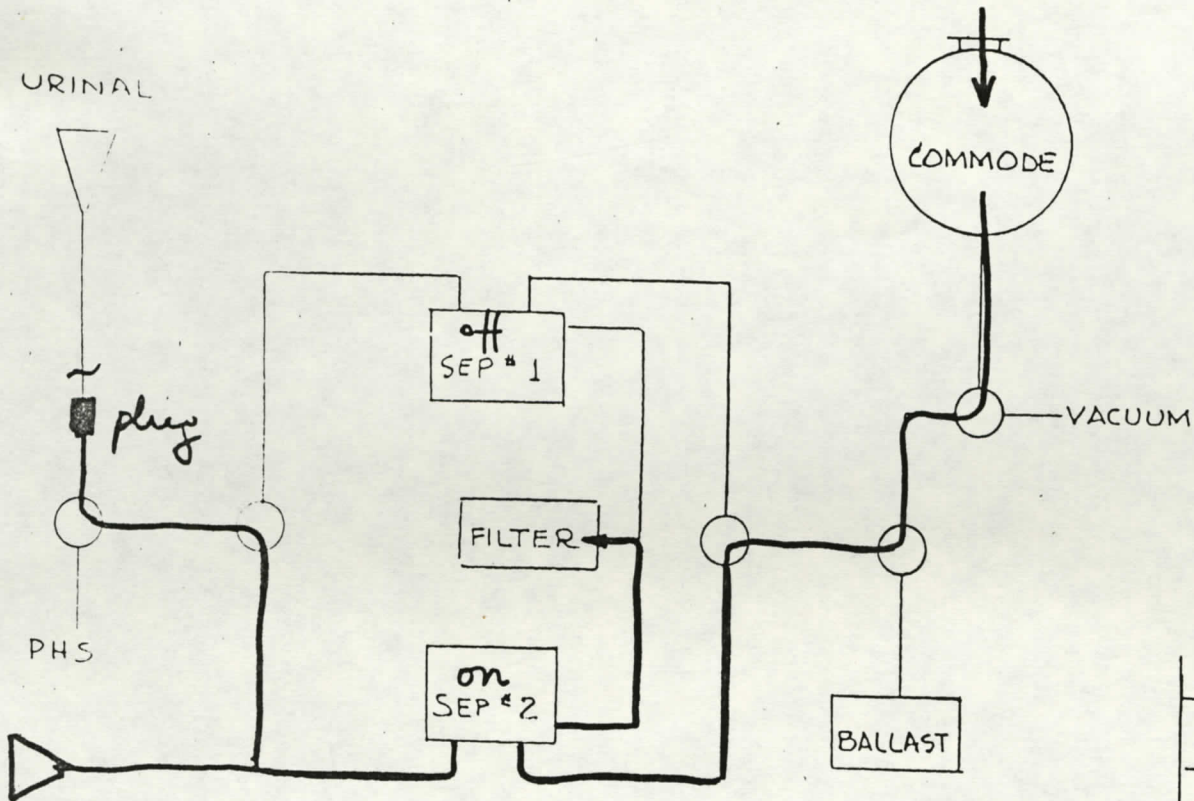


RESULTS	CFM
URINAL FLOW	
COMMODE FLOW	

CASE # 4

TEST IMPROVED AIRFLOW -

TEST BED - WCS # 123

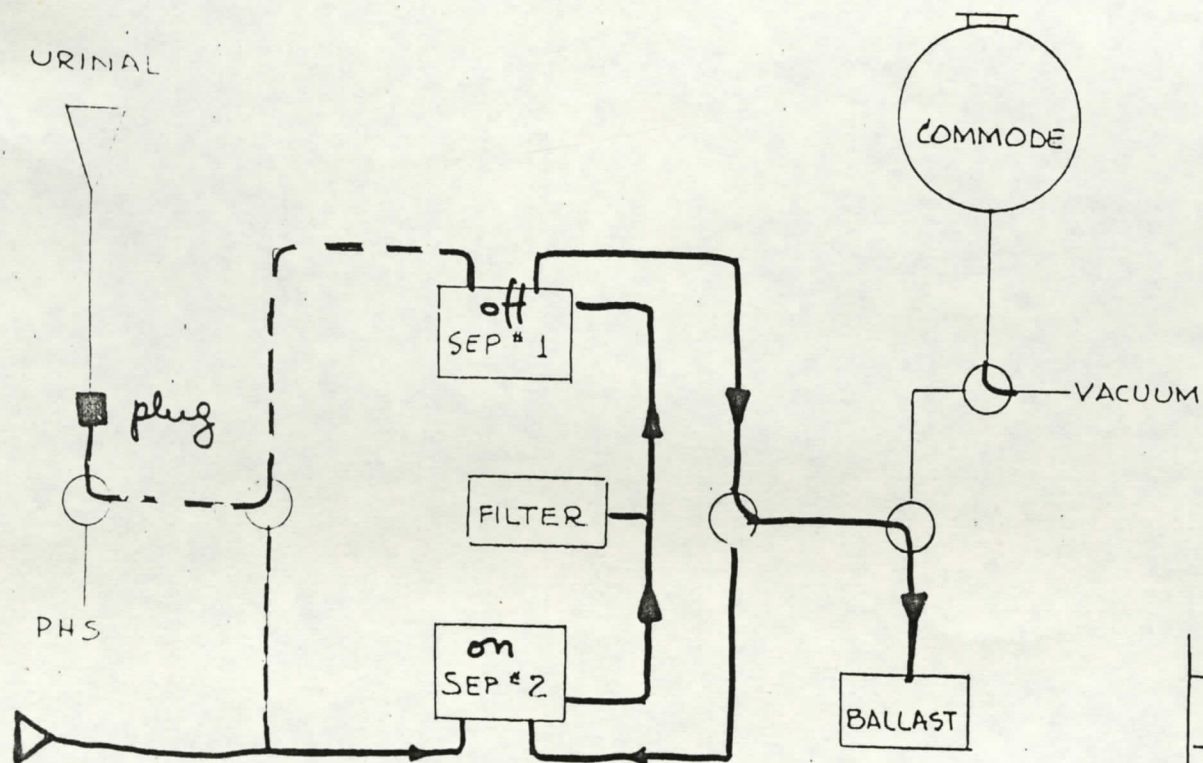


RESULTS	
URINAL FLOW	CFM
COMMODE FLOW	

CASE # 5

TEST IMPROVED AIRFLOW -

TEST MED - WCS # 123

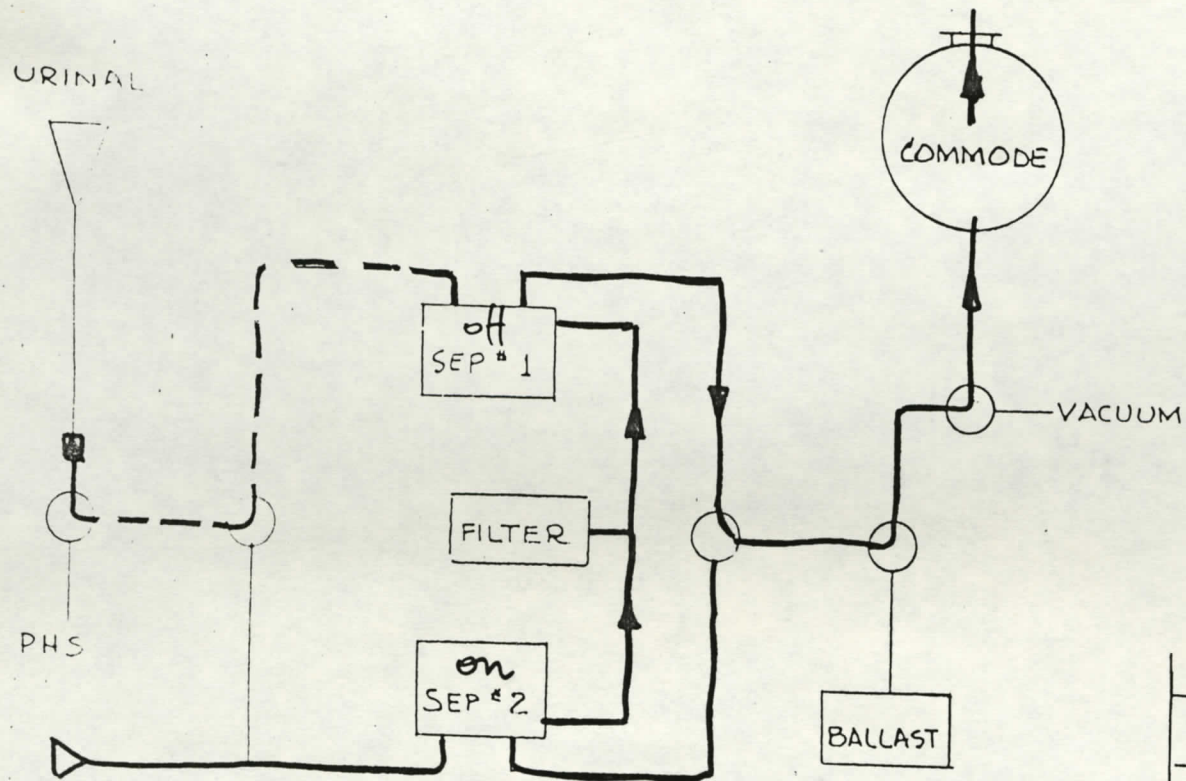


RESULTS	CFM
URINAL FLOW	
COMMODE FLOW	

CASE # 6

TEST IMPROVED AIRFLOW -

TEST MED - WCS # 123

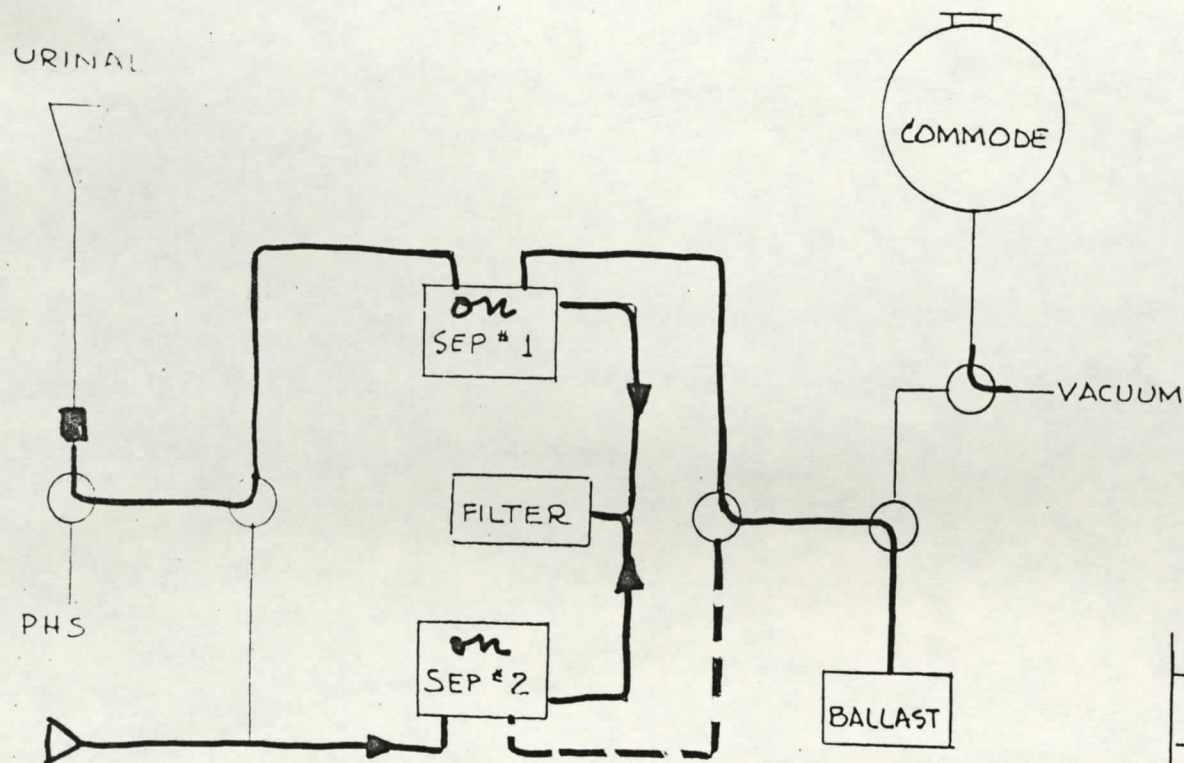


RESULTS	
URINAL FLOW	CFM
COMMODE FLOW	

CASE #7

TEST IMPROVED AIRFLOW -

TEST BED - WCS # 123



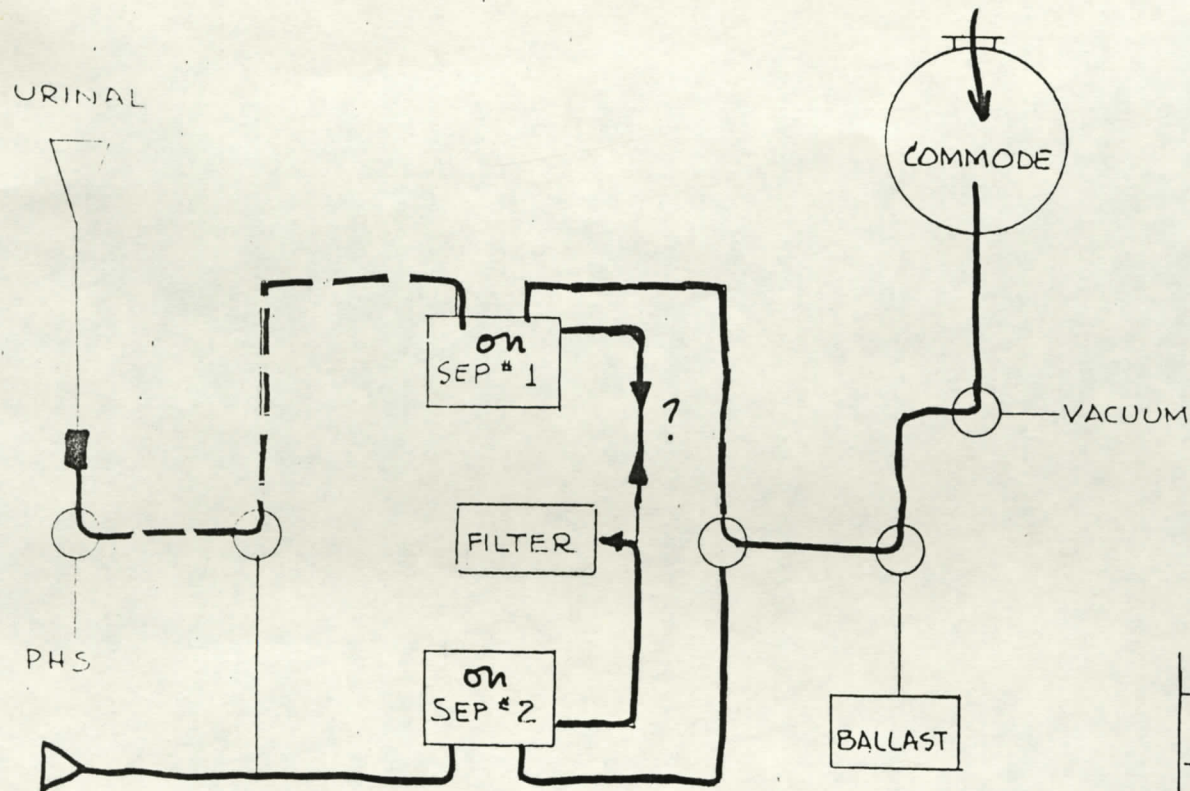
RESULTS	CFM
URINAL FLOW	
COMMODE FLOW	

CASE # 8

21113

TEST : IMPROVED AIRFLOW -

TEST MED - WCS # 123

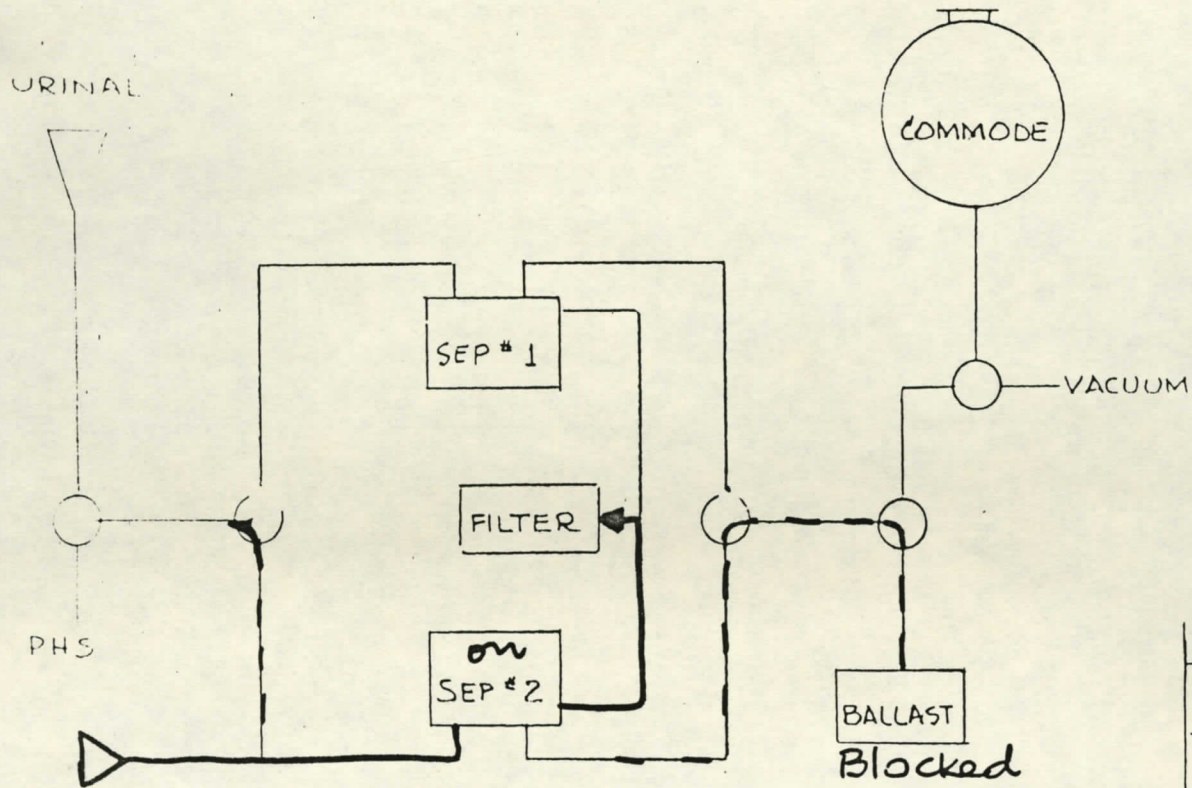


RESULTS	CFM
URINAL FLOW	
COMMODE FLOW	

CASE # 9

TEST IMPROVED AIRFLOW -

TEST BED - WCS # 123



RESULTS	CFM
URINAL FLOW	
COMMODE FLOW	

CASE # 16 BALLAST BLOCKED - FILTER REMOVED - 1" HOSE -