WOODWARD

INVESTIGATION/8D REPORT

Class 1 Published: 4-APR-2014

CUSTOMER HONEYWELL ENGINES & SYSTEMS			INVESTIGATION NO [redacted]
CUSTOMER ORDER NONE	WOODWARD SALES ORDER [redacted]		WOODWARD WORK ORDER [redacted]
CUSTOMER REJECTION DOCUMENT (CAR,QN,RFA,DMR,ETC.) N/A	WARRANTY DISPOSITION N/A		PRODUCT STATUS N/A
PROGRAM/ENGINE TYPE GARRETT		ITEM RECEIVED 8070-604	ENGINE MFR MODEL RECEIVED N/A
PROGRAM CODE 82228	SERIAL NUMBER 1440734	ITEM SHIPPED 8070-604	ENGINE MFR MODEL SHIPPED 897800-4
PARENT ITEM NUMBER 8070-604	PARENT ITEM SERIAL NUMBER 1440734	FIRST SHIPPED 23-NOV-1984	LAST SHIPPED 23-NOV-1984
CUSTOMER SERIAL NUMBER 306	APPLICATION TPE331	VESSEL TYPE & VESSEL NUMBER MU-2B-25, N856JT	SITE & LOCATION GRID ID N/A
TIME/CYCLES SINCE NEW, OVERHAUL, OR REPAIR N/A			
DATE REPORT OPENED 24-JAN-2014	DATE PART REMOVED N/A		DATE RECEIVED 14-JAN-2014

TEAM MEMBERS (D1)

[redacted]

PROBLEM DESCRIPTION (D2)

Reported Problem: UNIT WAS REPORTEDLY INVOLVED IN AN INCIDENT IN OWASSA, OK ON NOVEMBER 10, 2013

CONTAINMENT/IMMEDIATE ACTIONS (D3)

N/A

INVESTIGATION SUMMARY (D4)

The unit was inspected upon removal from the shipping container. The investigation was under the oversight of the NTSB and FAA. Unit had impact and fire damage. The unit cover was dented in the cover and cracked due to impact damage. The housing around the Pt2 bellows was dented inward. The unit had lock wire which indicate the unit was not last worked on by Woodward as the lock wire did not have Woodward marked seals on it.

Initial Testing

The unit was installed on a test stand and the acceptance test was run. The test run results are shown in Appendix 1.

Acceleration Schedule

The data showed the sea level acceleration schedule had a Pt2 bias. (This was later determined due to the Pt2 bellows having a leak caused by fire damage). The altitude acceleration was not run due to the leak in the cover. The test stand could not depressurize the control due to the leakage of the cover and the lack of capacity of the vacuum pump. The hot and cold day acceleration schedules were run and the results showed the acceleration schedule was biased by the same Pt2 pressure shift due to the bellows. The flows matched the cam profile at station 0 which is at a 0 psia Pt2 pressure condition.
The acceleration schedule showed a high level of hysteresis. Test point 3.7 indicated the flow hysteresis was 54 pph. This is normally 5 pph. This was caused by the friction in the P3 (Compressor discharge pressure (CDP)) sensor. When the bellows lost its evacuation, the bellows drives the acceleration cam against the wall of the housing. The cam rubbing against the housing causes the CDP sensor to have drag and not schedule consistently and to have high hysteresis. This corresponds to about 7 psi to 10 psi. (This was not evident in test point 3.9 for this test point is on a flat of the cam at the Pt2 bias of the leaking bellows so the hysteresis cannot be measured with fuel flow.)

Decel Schedule

The decel schedule was high above the overhaul test point limits throughout the schedule. This is most likely due to the hysteresis in the CDP sensor. The flows are on average 10 pph above the high limit of the overhaul test point limits. With the 10 psi shift high in CDP sensor this would account for 9 pph of the shift.

Underspeed Governor Schedule

The unit was run at 65% and 96 % governor settings. Both of these settings tested above overhaul test point limits. The 65% underspeed governor point appears to have been set at 74.3% when the unit was set at a speed that corresponded to the 108 pph set point. Data from the rigging instructions on the aircraft normally set the low idle speed setting at 75%. This setting appears to be a rigging adjustment. The 96% governor setting was run and also was higher than the test point limit. The graph below shows the governor test points. The 96% underspeed governor speed to obtain 180 pph was 4582 CRPM (which is actually on the decel schedule). The graph shows the 96% underspeed governor (96% underspeed) operated about 90 rpm or 1.9% above the nominal setting. In addition, the graph shows the governor setting was interfered with by the decel schedule. Since the decel schedule is high due to the CDP sensor hysteresis described above, the full range of the underspeed governor could not be tested before the decel limit was obtained.

Underspeed Governor Test Data

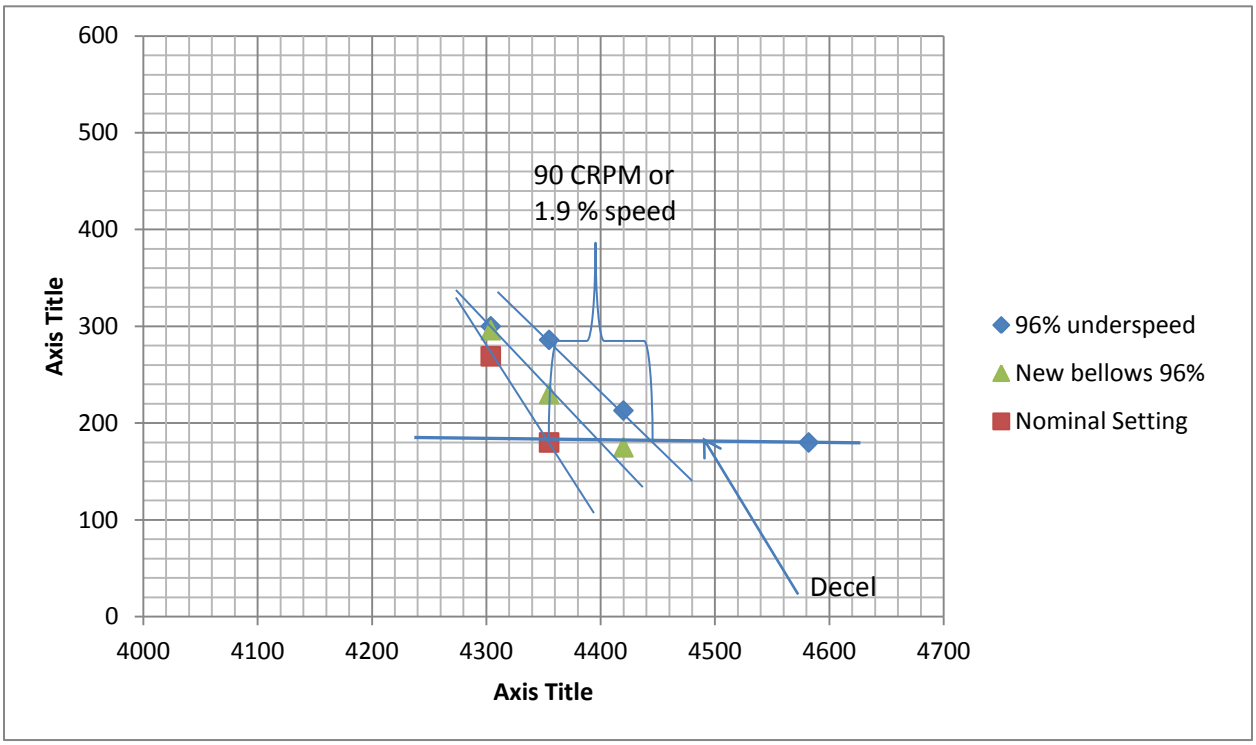

Figure 1

The engine is rigged with a 5% separation between the propeller governor and the underspeed governor. This shift of 1.9% would not have caused an issue on the aircraft.

It should be noted the test point 9.1 did not line up on the governor line for the 96% underspeed test points. Further testing described in later runs of the control found there was a hysteresis in the governor setting. By cycling the power lever (Manual Fuel Valve MFV) the underspeed governor setting would reduce by 39 CRPM. This appears to be why this point is not on the governor set point line. This first point does not show the hysteresis but the following point exhibit the characteristic. It is unknown if this hysteresis would be evident on the engine as the vibration on the engine would be more than on the test stand, but this would most likely make the 1.9% shift less.

Overspeed Governor

The overspeed governor test was set to 4695 rpm to meet the 220 pph required for test point 10.3 This is low by 0.5% speed of the 104% set point. This variation in set point would not have been identified or observed during normal operation of the unit.

Power lever schedule

The power lever schedule was run and found to be below overhaul test point limits at most test points. This is due to the Pt2 bias caused mostly by the leak in the Pt2 sense bellows. This reduction matches the output of the unit with a bellows leak. Power lever schedules with correction for altitude were not run due to the cover and bellows condition.

Partial Disassembly

The unit was removed from the test cell and the cover and Pt2 bellows removed. It was determined the unit would be retested with a new cover and a new bellows assembly (as it was determined by inspection the bellows was longer than it should be at a near sea level condition). The housing had impact damage at the Pt2 bellows bore and was machined to allow a new bellows to be installed. Additional notes of the assembly showed the nameplate which is attached with a high temperature epoxy was heat damaged. The epoxy is specified to withstand short term exposure to temperatures of 400 degrees F and the cover appears to have seen temperatures above the 400 degree F condition.

Pt2 Sense Bellows Disassembly and Inspection

The bellows was machined to allow the insert of a capillary tube into the cap of the assembly. A capillary tube was epoxied into cap. The capillary tube was pressurized with helium and put in a tank of MIL-PRF-7024 fluid to inspect for leaks. There was a leak observed at the joint between the cap and the end of the bellows. (The bellows is attached to the end cap using solder whose eutectic temperature is 430 degrees F.)
The bellows was x-rayed to inspect the integrity of the bellows and for any abnormalities. The x-ray showed there was a solder flow deposit on the inside of the cap. This deposit would have been rejected if it were there during the manufacturing process. This x-ray was compared to the x-rays from the production lot inspection. The comparison showed that none of the bellows from the manufacturing lot had a solder deposit as shown on the incident unit. It is concluded the solder joint degraded in the post crash fire.

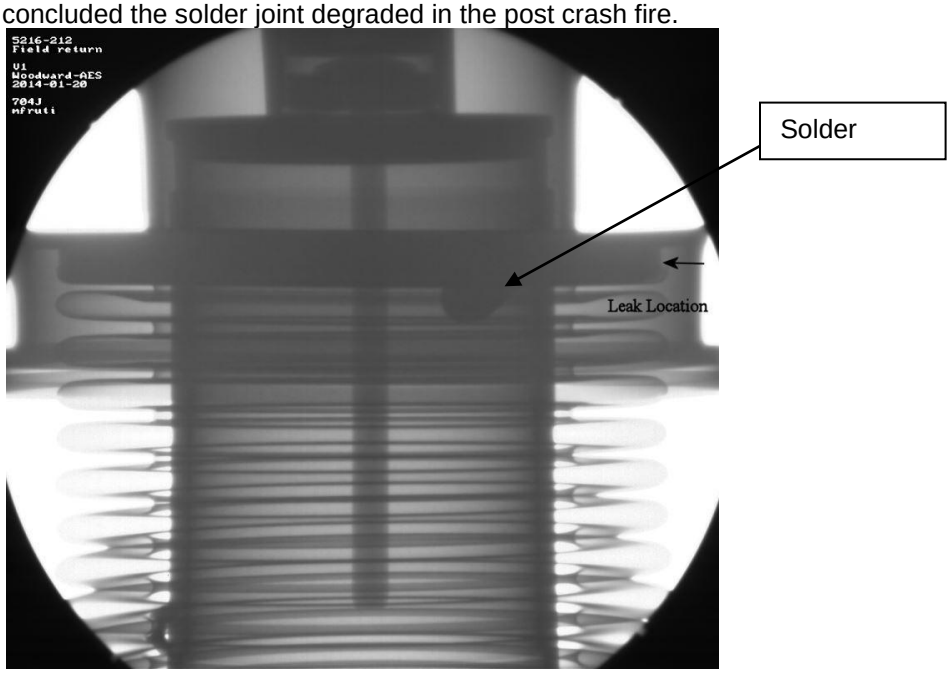

Figure 2

Retesting of the unit with New Pt2 sense bellows and Cover

The test results for the unit are in appendix 2.

Acceleration schedule

The results showed the acceleration test points section 3.0 through 7.0 were within a 4 pph of overhaul test point limits except for 3.11 which was 13 pph low and 7.5 which was 7pph low. This shows the acceleration schedule and the Pt2 bias and temperature bias were functionally acceptable with the new cover and bellows assembly. The two test points appear to be low due to the low setting of Maximum flow stop on the unit but this was not verified as it was not pertinent to the investigation.

Decel Schedule

The decel schedule was within test point limits.

Underspeed Governor Schedule

The 65% speed setting was still high. The speed necessary to obtain the fuel flow of 108 pph in this configuration was not tested. The results of the 96% setting are shown in figure 1. The test results were about 1% lower than the initial run and about 1% above the nominal setting. It is believed the difference between this run and the initial was due to hysteresis which was observed in the initial run and identified in the final test run.

Overspeed Governor Schedule

The overspeed governor set point was still low. The speed necessary to obtain the fuel flow of 220 pph in this configuration was not tested.

Power Lever Schedule

The power lever schedule improved from the initial run however schedule did not come into overhaul test point limits. It was determined the unit still had a Pt2 bias on the of the power lever schedule. The control linkage which sets the multiplication for the Pt2 bias had shifted. The unit was disassembled to determine the amount of shift of the power lever shaft bias. An indicator WT-68705 S/N 3 was installed on the unit. It was determined the required dimension (L2) which determines position of the lever had shifted .097 in. (C-A dimension was .438, requirement is .530-.540.) This will happen during operation of the bellows in the un-evacuated condition. In the un-evacuated condition the Pt2 bellows amplifier overpowers a torqued adjustment in the unit and changes this set point. This can also happen due to impact loads on the unit. This was the cause of the shift in the power lever test points.

Reassembly of Unit and Retest

The unit was reassembled to further investigate the underspeed governor condition. The results of the test run are in appendix 3. The results show the unit repeated consistently after reassembled. The only difference of note was the decel schedule decreased by about 12 pph. This is expected as the decel adjustment screw needs to be removed to measure the L2 dimension. This also changed the flow allowed in test point 9.4 of the underspeed governor.

X-ray of unit

The unit was x-rayed to determine if there was anything unusual in the underspeed governor assembly area. Nothing was observed that indicated any anomaly with the operation of the assembly.

Retest of unit

The unit was reinstalled on the test stand and the results of the test are shown in appendix 4. The units repeated very closely with the before the x-ray run. The underspeed governor data plots are shown in figure 3. The plot contains the data from the replacement of the Pt2 bellows in the second run of the unit and runs 3 and 4. The plot shows the underspeed governor setting was the same except for when the decel schedule interfered with the low flow settings.

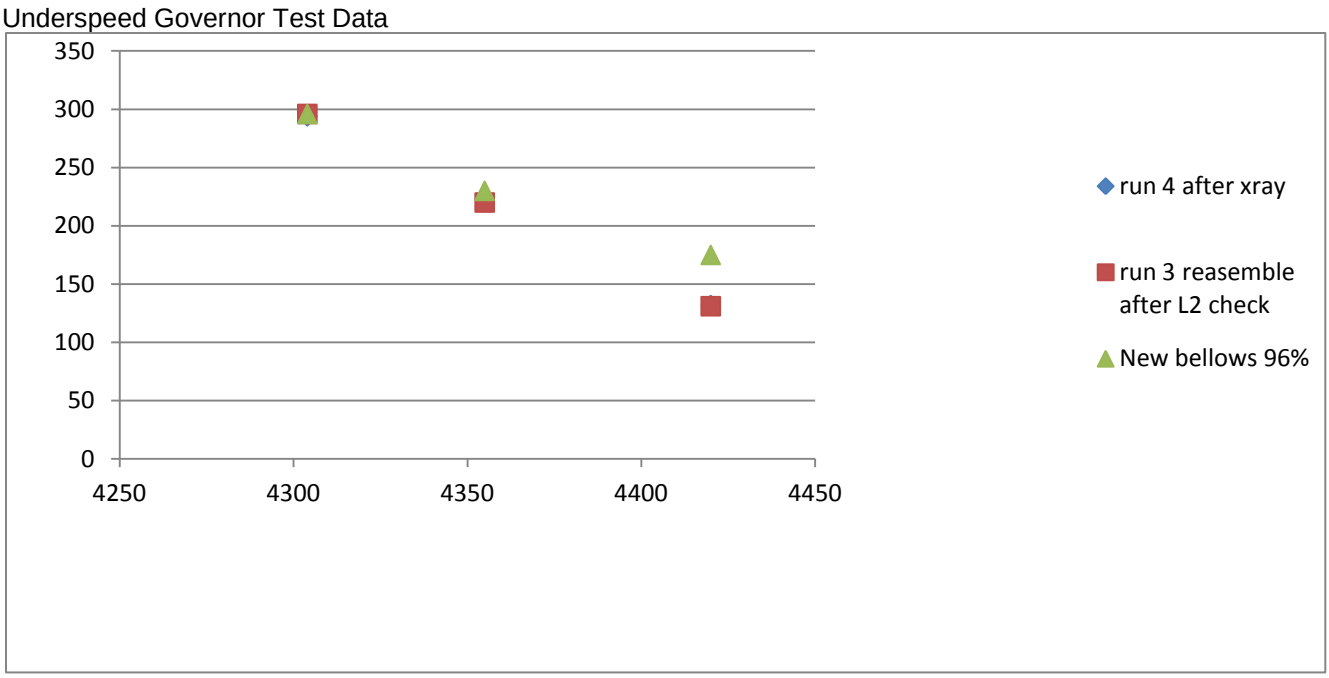

Figure 3

Further testing was completed at the underspeed governor setting. The underspeed governor was set by setting the other parameters in different orders in order to try to see if a different value of the underspeed governor could be obtained. P3 was set high and reduced slowly, the power lever was cycled, and Pt2 was adjusted to various conditions. The governor remained consistent except is was noted that if the P3 was set high, the initial underspeed governor set point would be high by 39 crpm and then cycling the power lever would decrease underspeed governor set point to the value in the test run. The phenomenon was recreated numerous times. This seemed to coincide with the original run which was about 1% higher. No cause for the 1% speed shift was determined.

Conclusions

The unit was damaged by fire and impact but functioned normally when the bellows and cover were replaced. The shift in the power lever schedule was caused by operating the Pt2 bias in an out of specification condition caused by the leak in the Pt2 bellows or due to impact. Resetting this to the 0.535 inch dimension would cause the power lever schedule points to be close to overhaul test point limits. No other anomalies were observed on the unit which would have prevented proper operation.

WOODWARD GOVERNOR COMPANY
ROCKFORD, IL
CAGE 66503

TSP-8858
ECL: B
PAGE : 1 OF 1

Desc: TSP - HONEYWELL TPE331 FCU ACCEPTANCE TEST
Date: 26-MAR-2014
IMTPC - TEST SPECIFICATION RESULTS PRINT REPORT

Serial No: 1440734 Run No: 1 Work Order: 9265758 Item No: 8070-604
Current Status: A Run Status: F Test Type: AR Test Date: 14-JAN-2014

Test Point		Record	Units	Formula Tag	Min	Value	Max	Pass Fail
1.0	CASE SERIAL NUMBER	Case SN				4423		P
2.0	USG AND PL MIN AND MAX SETTINGS							
2.1	USG Min	USG	deg	USG_MIN	1	6	6	P
2.2	USG Max	USG	deg	USG_MAX	39	40	41	P
2.3	PL Min	PL	deg	PL_MIN	0	0	0	P
2.4	PL Max	PL	deg	PL_MAX	101	102	102	P
3.0	STANDARD ACCELERATION SCHEDULE							
3.1	Standard Accel	Wf	pph		44.0	42.0	48.0	FAIL
3.2	Standard Accel - Sea level start flow.	Wf	pph		44.0	42.0	48.0	FAIL
3.3	Standard Accel	Wf	pph		110.0	56.0	120.0	FAIL
3.4	Standard Accel	Wf	pph		195.0	128.0	211.0	FAIL
3.5	Standard Accel	Wf	pph		260.0	243.0	282.0	FAIL
3.6	Standard Accel							
3.6.1	Standard Accel	Wf	pph	WF_1	306.0	417.0	332.0	FAIL
3.6.2	Standard Accel	Wf	pph	WF_2	412.0 (Calc)	471.0	422.0 (Calc)	FAIL
3.7	Standard Accel Hysteresis	=WF_1-WF_2			-5.0	-54.0	5.0	FAIL
3.8	Standard Accel							
3.8.1	Standard Accel	Wf	pph	WF_3	392.0	488.0	424.0	FAIL
3.8.2	Standard Accel	Wf	pph	WF_4	478.0 (Calc)	488.0	498.0 (Calc)	P
3.9	Standard Accel Hysteresis	=WF_3-WF_4			-10.0	0.0	10.0	P
3.10	Standard Accel	Wf	pph		437.0	489.0	473.0	FAIL
3.11	Standard Accel	Wf	pph		543.0	490.0	589.0	FAIL
4.0	15,000 FOOT ACCEL SCHEDULE							
4.1	15,000 Foot Accel	Wf	pph		40.0	Skip	52.0	S
4.2	15,000 Foot Accel	Wf	pph		117.0	Skip	127.0	S
4.3	15,000 Foot Accel	Wf	pph		195.0	Skip	211.0	S
4.4	15,000 Foot Accel	Wf	pph		250.0	Skip	270.0	S
4.5	15,000 Foot Accel	Wf	pph		325.0	Skip	353.0	S
5.0	30,000 FOOT ACCEL SCHEDULE							
5.1	30,000 Foot Accel	Wf	pph		87.0	Skip	95.0	S
5.2	30,000 Foot Accel	Wf	pph		113.0	Skip	123.0	S
5.3	30,000 Foot Accel	Wf	pph		199.0	Skip	215.0	S
6.0	HOT DAY ACCEL SCHEDULE							
6.1	Hot Day Accel	Wf	pph		42.0	41.0	54.0	FAIL
6.2	Hot Day Accel	Wf	pph		206.0	133.0	224.0	FAIL
6.3	Hot Day Accel	Wf	pph		319.0	429.0	345.0	FAIL
6.4	Hot Day Accel	Wf	pph		455.0	507.0	493.0	FAIL
7.0	COLD DAY ACCEL SCHEDULE							
7.1	Cold Day Accel	Wf	pph		38.0	38.5	50.0	P
7.2	Cold Day Accel	Wf	pph		174.0	111.0	188.0	FAIL
7.3	Cold Day Accel	Wf	pph		269.0	370.0	291.0	FAIL
7.4	Cold Day Accel	Wf	pph		402.0	432.0	436.0	P
7.5	Cold Day Accel	Wf	pph		531.0	433.0	575.0	FAIL
8.0	UNDERSPEED GOVERNOR 65% SPEED							
8.1	Underspeed Governor 65% Speed	Wf	pph		160.0	160.5	725.0	P
8.2	Underspeed Governor 65% Speed	Wf	pph	WF_5	103.0	153.0	113.0	FAIL
8.3	Underspeed Governor 65% Speed	Wf	pph	WF_24	50.0	146.0	148.0 (Calc)	P

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8.4	Underspeed Governor 65% Speed	Wf	pph		145.0 (Calc)	148.0	161.0 (Calc)	P
9.0	UNDERSPEED GOVERNOR 96.0% SPEED							
9.1	Underspeed Governor 96.0% Speed	Wf	pph		252.0	300.0	725.0	P
9.2	Underspeed Governor 96.0% Speed	Wf	pph	WF_6	175.0	286.0	185.0	FAIL
9.3	Underspeed Governor 96.0% Speed	Wf	pph		50.0	213.0	281.0 (Calc)	P
9.4	Underspeed Governor 96.0% Speed	Wf	pph		276.0 (Calc)	231.0	296.0 (Calc)	FAIL
9.5	Underspeed Governor 75.0% Speed	USG	deg		13	14	15	P
10.0	OVERSPEED GOVERNOR							
10.1	Overspeed Governor - Initial Speed	Wf	pph	WF_7	50.0	286.0	725.0	P
10.2	Overspeed Governor - Final Speed	Wf	pph	WF_23	274.0 (Calc)	284.0	298.0 (Calc)	P
10.3	Overspeed Governor - Increasing Speed	Wf	pph	WF_8	210.0	170.0	230.0	FAIL
10.4	Overspeed Governor	Wf	pph		104.0	93.0	114.0	FAIL
10.5	Overspeed Governor - Decreasing Speed	Wf	pph	WF_9	160.0 (Calc)	170.0	180.0 (Calc)	P
11.0	DECEL SCHEDULE							
11.1	Decel Schedule	Wf	pph		145.0	170.0	159.0	FAIL
11.2	Decel Schedule	Wf	pph		86.0	110.0	100.0	FAIL
11.3	Decel Schedule	Wf	pph		66.0	87.0	80.0	FAIL
12.0	POWER LEVER SCHEDULE - TT2 CORRECTION							
12.1	Power Lever Schedule	Wf	pph	WF_12	463.0	256.0	483.0	FAIL
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_10	525.0	278.0	545.0	FAIL
12.3	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_11	264.0 (Calc)	284.0	292.0 (Calc)	P
12.4	Tt2 Hysteresis	=WF_10-WF_11			-14.0	-6.0	14.0	P
12.5	Power Lever Schedule	Wf	pph		339.0 (Calc)	290.0	355.0 (Calc)	FAIL
12.6	Power Lever Schedule	Wf	pph		171.0	174.0	181.0	P
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_13	180.0	166.0	190.0	FAIL
12.8	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_14	162.0 (Calc)	166.0	170.0 (Calc)	P
12.9	Tt2 Hysteresis	=WF_13-WF_14			-4.0	0.0	4.0	P
12.10	Power Lever Schedule	Wf	pph		199.0	149.0	219.0	FAIL
13.0	POWER LEVER SCHEDULE - Tt2 CORRECTION - 10,000 ft.							
13.1	Fuel Flow - Standard Day	Wf	pph	WF_20	315.0	Skip	325.0	S
13.2	Fuel Flow - Hot Day	Wf	pph	WF_21	UNAVAILABLE	Skip	UNAVAILABLE	S
13.3	Delta Flow	=WF_20-WF_21			22.0	Skip	52.0	S
13.4	Fuel Flow - Cold Day	Wf	pph	WF_22	UNAVAILABLE	Skip	UNAVAILABLE	S
13.5	Delta Flow	=WF_22-WF_20			104.0	Skip	134.0	S
14.0	POWER LEVER SCHEDULE - PT2 CORRECTION							
14.1	Fuel Flow	Wf	pph		154.0	Skip	166.0	S
14.2	Fuel Flow - Increasing Pt2	Wf	pph	WF_15	568.0	342.0	596.0	FAIL
14.3	Fuel Flow - Decreasing Pt2	Wf	pph	WF_16	332.0 (Calc)	342.0	352.0 (Calc)	P
14.4	Pt2 Hysteresis	=WF_15-WF_16			-10.0	0.0	10.0	P
14.5	Fuel Flow	Wf	pph		106.0	Skip	116.0	S
14.6	Fuel Flow - Increasing Pt2	Wf	pph	WF_17	216.0	155.0	226.0	FAIL
14.7	Fuel Flow - Decreasing Pt2	Wf	pph	WF_18	151.0 (Calc)	155.0	159.0 (Calc)	P
14.8	Pt2 Hysteresis	=WF_17-WF_18			-4.0	0.0	4.0	P
15.0	LEVER SHAFT TORQUE	PLT	lb_in		0	3	7	P
16.0	LEVER SHAFT TORQUE	USGT	lb_in		0	6	10	P
17.0	POWER LEVER ANGULAR TRAVELS							
17.1	Flight Idle Max	PL	deg		43	45	45	P
17.2	Flight Idle Min	PL	deg		35	37	37	P
17.3	Max Power Min	PL	deg		93	96	97	P
17.4	Power Lever Max Stop	PL	deg		101	102	102	P
17.5	Power Lever Ground Idle (Min Point)	PL	deg		0	0	0	P

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18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0	488.0	555.0	FAIL
19.0	MAX POWER ADJUSTMENT CHECK							
19.1	Max. Power Adjustment	Wf	pph	WF_19	315.0	Skip	325.0	S
19.2	Max. Power Adjustment Upward	Wf	pph		UNAVAILABLE	Skip	725.0	S
19.3	Max. Power Adjustment Downward	Wf	pph		50.0	Skip	UNAVAILABLE	S
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj				PASS		P
21.0	T2 Linkage Check	T2 Link	inches		0.890	0.981	1.000	P

AUDIT SCHEDULE

2.1	USG Min	USG	deg		1		6	
2.2	USG Max	USG	deg		39		41	
2.3	PL Min	PL	deg		0		0	
2.4	PL Max	PL	deg		101		102	
3.1	Standard Accel	Wf	pph		44.0		48.0	
3.10	Standard Accel	Wf	pph		437.0		473.0	
5.3	30,000 Foot Accel	Wf	pph		199.0		215.0	
6.4	Hot Day Accel	Wf	pph		455.0		493.0	
8.2	Underspeed Governor 65% Speed	Wf	pph		103.0		113.0	
9.2	Underspeed Governor 96.0% Speed	Wf	pph		175.0		185.0	
10.3	Overspeed Governor - Increasing Speed	Wf	pph		210.0		230.0	
11.1	Decel Schedule	Wf	pph		145.0		159.0	
11.2	Decel Schedule	Wf	pph		86.0		100.0	
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph		525.0		545.0	
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph		180.0		190.0	
13.1	Fuel Flow - Standard Day	Wf	pph		315.0		325.0	
13.2	Fuel Flow - Hot Day	Wf	pph		UNAVAILABLE		UNAVAILABLE	
13.3	Delta Flow	=WF_20-WF_21			22.0		52.0	
13.4	Fuel Flow - Cold Day	Wf	pph		UNAVAILABLE		UNAVAILABLE	
13.5	Delta Flow	=WF_22-WF_20			104.0		134.0	
14.1	Fuel Flow	Wf	pph		154.0		166.0	
17.1	Flight Idle Max	PL	deg		43		45	
18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0		555.0	
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj						
21.0	T2 Linkage Check	T2 Link	inches		0.890		1.000	
22.0	OVERSPEED LOW FLOW CHECK	Wf	pph		160.0	172.0	200.0	P

The following criteria were used to run this report:
Serial No: 1440734
Run Number: 1
Status: A
Run Type: AR
Order By: 1

****
* End of IMTPC *
****

3/26/2014

Attachment 18

4-14-3712

WOODWARD GOVERNOR COMPANY
ROCKFORD, IL
CAGE 66503

TSP-8858
ECL: B
PAGE : 1 OF 1

Desc: TSP - HONEYWELL TPE331 FCU ACCEPTANCE TEST
Date: 26-MAR-2014
IMTRC - TEST SPECIFICATION RESULTS PRINT REPORT

Serial No: 1440734 Run No: 2 Work Order: 9265758 Item No: 8070-604
Current Status: A Run Status: F Test Type: AR Test Date: 15-JAN-2014

Test Point		Record	Units	Formula Tag	Min	Value	Max	Pass Fail
1.0	CASE SERIAL NUMBER	Case SN				4423		P
2.0	USG AND PL MIN AND MAX SETTINGS							
2.1	USG Min	USG	deg	USG_MIN	1	6	6	P
2.2	USG Max	USG	deg	USG_MAX	39	40	41	P
2.3	PL Min	PL	deg	PL_MIN	0	0	0	P
2.4	PL Max	PL	deg	PL_MAX	101	101	102	P
3.0	STANDARD ACCELERATION SCHEDULE							
3.1	Standard Accel	Wf	pph		44.0	40.0	48.0	FAIL
3.2	Standard Accel - Sea level start flow.	Wf	pph		44.0	40.0	48.0	FAIL
3.3	Standard Accel	Wf	pph		110.0	109.0	120.0	FAIL
3.4	Standard Accel	Wf	pph		195.0	194.0	211.0	FAIL
3.5	Standard Accel	Wf	pph		260.0	262.0	282.0	P
3.6	Standard Accel							
3.6.1	Standard Accel	Wf	pph	WF_1	306.0	305.0	332.0	FAIL
3.6.2	Standard Accel	Wf	pph	WF_2	300.0 (Calc)	307.0	310.0 (Calc)	P
3.7	Standard Accel Hysteresis	=WF_1-WF_2			-5.0	-2.0	5.0	P
3.8	Standard Accel							
3.8.1	Standard Accel	Wf	pph	WF_3	392.0	390.0	424.0	FAIL
3.8.2	Standard Accel	Wf	pph	WF_4	380.0 (Calc)	392.0	400.0 (Calc)	P
3.9	Standard Accel Hysteresis	=WF_3-WF_4			-10.0	-2.0	10.0	P
3.10	Standard Accel	Wf	pph		437.0	435.0	473.0	FAIL
3.11	Standard Accel	Wf	pph		543.0	530.0	589.0	FAIL
4.0	15,000 FOOT ACCEL SCHEDULE							
4.1	15,000 Foot Accel	Wf	pph		40.0	41.0	52.0	P
4.2	15,000 Foot Accel	Wf	pph		117.0	118.0	127.0	P
4.3	15,000 Foot Accel	Wf	pph		195.0	196.0	211.0	P
4.4	15,000 Foot Accel	Wf	pph		250.0	249.0	270.0	FAIL
4.5	15,000 Foot Accel	Wf	pph		325.0	336.0	353.0	P
5.0	30,000 FOOT ACCEL SCHEDULE							
5.1	30,000 Foot Accel	Wf	pph		87.0	90.0	95.0	P
5.2	30,000 Foot Accel	Wf	pph		113.0	113.0	123.0	P
5.3	30,000 Foot Accel	Wf	pph		199.0	198.0	215.0	FAIL
6.0	HOT DAY ACCEL SCHEDULE							
6.1	Hot Day Accel	Wf	pph		42.0	41.0	54.0	FAIL
6.2	Hot Day Accel	Wf	pph		206.0	206.0	224.0	P
6.3	Hot Day Accel	Wf	pph		319.0	322.0	345.0	P
6.4	Hot Day Accel	Wf	pph		455.0	452.0	493.0	FAIL
7.0	COLD DAY ACCEL SCHEDULE							
7.1	Cold Day Accel	Wf	pph		38.0	38.0	50.0	P
7.2	Cold Day Accel	Wf	pph		174.0	172.0	188.0	FAIL
7.3	Cold Day Accel	Wf	pph		269.0	273.0	291.0	P
7.4	Cold Day Accel	Wf	pph		402.0	412.0	436.0	P
7.5	Cold Day Accel	Wf	pph		531.0	524.0	575.0	FAIL
8.0	UNDERSPEED GOVERNOR 65% SPEED							
8.1	Underspeed Governor 65% Speed	Wf	pph		160.0	177.0	725.0	P
8.2	Underspeed Governor 65% Speed	Wf	pph	WF_5	103.0	138.0	113.0	FAIL
8.3	Underspeed Governor 65% Speed	Wf	pph	WF_24	50.0	122.0	133.0 (Calc)	P

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8.4	Underspeed Governor 65% Speed	Wf	pph		130.0 (Calc)	138.0	146.0 (Calc)	P
9.0	UNDERSPEED GOVERNOR 96.0% SPEED							
9.1	Underspeed Governor 96.0% Speed	Wf	pph		252.0	296.0	725.0	P
9.2	Underspeed Governor 96.0% Speed	Wf	pph	WF_6	175.0	230.0	185.0	FAIL
9.3	Underspeed Governor 96.0% Speed	Wf	pph		50.0	175.0	225.0 (Calc)	P
9.4	Underspeed Governor 96.0% Speed	Wf	pph		220.0 (Calc)	230.0	240.0 (Calc)	P
9.5	Underspeed Governor 75.0% Speed	USG	deg		13	14	15	P
10.0	OVERSPEED GOVERNOR							
10.1	Overspeed Governor - Initial Speed	Wf	pph	WF_7	50.0	533.0	725.0	P
10.2	Overspeed Governor - Final Speed	Wf	pph	WF_23	521.0 (Calc)	525.0	545.0 (Calc)	P
10.3	Overspeed Governor - Increasing Speed	Wf	pph	WF_8	210.0	195.0	230.0	FAIL
10.4	Overspeed Governor	Wf	pph		104.0	97.0	114.0	FAIL
10.5	Overspeed Governor - Decreasing Speed	Wf	pph	WF_9	185.0 (Calc)	195.0	205.0 (Calc)	P
11.0	DECEL SCHEDULE							
11.1	Decel Schedule	Wf	pph		145.0	153.0	159.0	P
11.2	Decel Schedule	Wf	pph		86.0	89.0	100.0	P
11.3	Decel Schedule	Wf	pph		66.0	67.0	80.0	P
12.0	POWER LEVER SCHEDULE - TT2 CORRECTION							
12.1	Power Lever Schedule	Wf	pph	WF_12	463.0	535.0	483.0	FAIL
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_10	525.0	534.0	545.0	P
12.3	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_11	520.0 (Calc)	534.0	548.0 (Calc)	P
12.4	Tt2 Hysteresis	=WF_10-WF_11			-14.0	0.0	14.0	P
12.5	Power Lever Schedule	Wf	pph		618.0 (Calc)	535.0	634.0 (Calc)	FAIL
12.6	Power Lever Schedule	Wf	pph		171.0	231.0	181.0	FAIL
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_13	180.0	243.0	190.0	FAIL
12.8	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_14	239.0 (Calc)	244.0	247.0 (Calc)	P
12.9	Tt2 Hysteresis	=WF_13-WF_14			-4.0	-1.0	4.0	P
12.10	Power Lever Schedule	Wf	pph		199.0	276.0	219.0	FAIL
13.0	POWER LEVER SCHEDULE - Tt2 CORRECTION - 10,000 ft.							
13.1	Fuel Flow - Standard Day	Wf	pph	WF_20	315.0	434.0	325.0	FAIL
13.2	Fuel Flow - Hot Day	Wf	pph	WF_21	382.0 (Calc)	398.0	412.0 (Calc)	P
13.3	Delta Flow	=WF_20-WF_21			22.0	36.0	52.0	P
13.4	Fuel Flow - Cold Day	Wf	pph	WF_22	538.0 (Calc)	477.0	568.0 (Calc)	FAIL
13.5	Delta Flow	=WF_22-WF_20			104.0	43.0	134.0	FAIL
14.0	POWER LEVER SCHEDULE - PT2 CORRECTION							
14.1	Fuel Flow	Wf	pph		154.0	196.0	166.0	FAIL
14.2	Fuel Flow - Increasing Pt2	Wf	pph	WF_15	568.0	536.0	596.0	FAIL
14.3	Fuel Flow - Decreasing Pt2	Wf	pph	WF_16	526.0 (Calc)	536.0	546.0 (Calc)	P
14.4	Pt2 Hysteresis	=WF_15-WF_16			-10.0	0.0	10.0	P
14.5	Fuel Flow	Wf	pph		106.0	165.0	116.0	FAIL
14.6	Fuel Flow - Increasing Pt2	Wf	pph	WF_17	216.0	279.0	226.0	FAIL
14.7	Fuel Flow - Decreasing Pt2	Wf	pph	WF_18	275.0 (Calc)	279.0	283.0 (Calc)	P
14.8	Pt2 Hysteresis	=WF_17-WF_18			-4.0	0.0	4.0	P
15.0	LEVER SHAFT TORQUE	PLT	lb_in		0	3	7	P
16.0	LEVER SHAFT TORQUE	USGT	lb_in		0	6	10	P
17.0	POWER LEVER ANGULAR TRAVELS							
17.1	Flight Idle Max	PL	deg		43	45	45	P
17.2	Flight Idle Min	PL	deg		35	37	37	P
17.3	Max Power Min	PL	deg		93	96	97	P
17.4	Power Lever Max Stop	PL	deg		101	102	102	P
17.5	Power Lever Ground Idle (Min Point)	PL	deg		0	0	0	P

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18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0	533.0	555.0	FAIL
19.0	MAX POWER ADJUSTMENT CHECK							
19.1	Max. Power Adjustment	Wf	pph	WF_19	315.0	Skip	325.0	S
19.2	Max. Power Adjustment Upward	Wf	pph		UNAVAILABLE	Skip	725.0	S
19.3	Max. Power Adjustment Downward	Wf	pph		50.0	Skip	UNAVAILABLE	S
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj				PASS		P
21.0	T2 Linkage Check	T2 Link	inches		0.890	0.981	1.000	P

AUDIT SCHEDULE

2.1	USG Min	USG	deg		1		6
2.2	USG Max	USG	deg		39		41
2.3	PL Min	PL	deg		0		0
2.4	PL Max	PL	deg		101		102
3.1	Standard Accel	Wf	pph		44.0		48.0
3.10	Standard Accel	Wf	pph		437.0		473.0
5.3	30,000 Foot Accel	Wf	pph		199.0		215.0
6.4	Hot Day Accel	Wf	pph		455.0		493.0
8.2	Underspeed Governor 65% Speed	Wf	pph		103.0		113.0
9.2	Underspeed Governor 96.0% Speed	Wf	pph		175.0		185.0
10.3	Overspeed Governor - Increasing Speed	Wf	pph		210.0		230.0
11.1	Decel Schedule	Wf	pph		145.0		159.0
11.2	Decel Schedule	Wf	pph		86.0		100.0
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph		525.0		545.0
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph		180.0		190.0
13.1	Fuel Flow - Standard Day	Wf	pph		315.0		325.0
13.2	Fuel Flow - Hot Day	Wf	pph		382.0 (Calc)		412.0 (Calc)
13.3	Delta Flow	=WF_20-WF_21			22.0		52.0
13.4	Fuel Flow - Cold Day	Wf	pph		538.0 (Calc)		568.0 (Calc)
13.5	Delta Flow	=WF_22-WF_20			104.0		134.0
14.1	Fuel Flow	Wf	pph		154.0		166.0
17.1	Flight Idle Max	PL	deg		43		45
18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0		555.0
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj					
21.0	T2 Linkage Check	T2 Link	inches		0.890		1.000
22.0	OVERSPEED LOW FLOW CHECK	Wf	pph		160.0	168.0	200.0 P

The following criteria were used to run this report:

Serial No: 1440734
Run Number: 2
Status: A
Run Type: AR
Order By: 1

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* End of IMTPC *
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3/26/2014

WOODWARD GOVERNOR COMPANY
ROCKFORD, IL
CAGE 66503

TSP-8856
ECL: B
PAGE : 1 OF 1

Desc: TSP - HONEYWELL TPE331 FCU ACCEPTANCE TEST
Date: 26-MAR-2014
IMTPC - TEST SPECIFICATION RESULTS PRINT REPORT

Serial No: 1440734 Run No: 3 Work Order: 9265758 Item No: 8070-604
Current Status: A Run Status: F Test Type: AR Test Date: 05-FEB-2014

Test Point		Record	Units	Formula Tag	Min	Value	Max	Pass Fail
1.0	CASE SERIAL NUMBER	Case SN				4423		P
2.0	USG AND PL MIN AND MAX SETTINGS							
2.1	USG Min	USG	deg	USG_MIN	1	6	6	P
2.2	USG Max	USG	deg	USG_MAX	39	40	41	P
2.3	PL Min	PL	deg	PL_MIN	0	0	0	P
2.4	PL Max	PL	deg	PL_MAX	101	101	102	P
3.0	STANDARD ACCELERATION SCHEDULE							
3.1	Standard Accel	Wf	pph		44.0	41.0	48.0	FAIL
3.2	Standard Accel - Sea level start flow.	Wf	pph		44.0	41.0	48.0	FAIL
3.3	Standard Accel	Wf	pph		110.0	110.0	120.0	P
3.4	Standard Accel	Wf	pph		195.0	195.0	211.0	P
3.5	Standard Accel	Wf	pph		260.0	265.0	282.0	P
3.6	Standard Accel							
3.6.1	Standard Accel	Wf	pph	WF_1	306.0	311.0	332.0	P
3.6.2	Standard Accel	Wf	pph	WF_2	306.0 (Calc)	311.0	316.0 (Calc)	P
3.7	Standard Accel Hysteresis	=WF_1-WF_2			-5.0	0.0	5.0	P
3.8	Standard Accel							
3.8.1	Standard Accel	Wf	pph	WF_3	392.0	388.0	424.0	FAIL
3.8.2	Standard Accel	Wf	pph	WF_4	378.0 (Calc)	391.0	398.0 (Calc)	P
3.9	Standard Accel Hysteresis	=WF_3-WF_4			-10.0	-3.0	10.0	P
3.10	Standard Accel	Wf	pph		437.0	432.0	473.0	FAIL
3.11	Standard Accel	Wf	pph		543.0	528.0	589.0	FAIL
4.0	15,000 FOOT ACCEL SCHEDULE							
4.1	15,000 Foot Accel	Wf	pph		40.0	40.0	52.0	P
4.2	15,000 Foot Accel	Wf	pph		117.0	118.0	127.0	P
4.3	15,000 Foot Accel	Wf	pph		195.0	196.0	211.0	P
4.4	15,000 Foot Accel	Wf	pph		250.0	248.0	270.0	FAIL
4.5	15,000 Foot Accel	Wf	pph		325.0	335.0	353.0	P
5.0	30,000 FOOT ACCEL SCHEDULE							
5.1	30,000 Foot Accel	Wf	pph		87.0	90.0	95.0	P
5.2	30,000 Foot Accel	Wf	pph		113.0	114.0	123.0	P
5.3	30,000 Foot Accel	Wf	pph		199.0	196.0	215.0	FAIL
6.0	HOT DAY ACCEL SCHEDULE							
6.1	Hot Day Accel	Wf	pph		42.0	43.0	54.0	P
6.2	Hot Day Accel	Wf	pph		206.0	207.0	224.0	P
6.3	Hot Day Accel	Wf	pph		319.0	323.0	345.0	P
6.4	Hot Day Accel	Wf	pph		455.0	451.0	493.0	FAIL
7.0	COLD DAY ACCEL SCHEDULE							
7.1	Cold Day Accel	Wf	pph		38.0	38.0	50.0	P
7.2	Cold Day Accel	Wf	pph		174.0	173.0	188.0	FAIL
7.3	Cold Day Accel	Wf	pph		269.0	275.0	291.0	P
7.4	Cold Day Accel	Wf	pph		402.0	411.0	436.0	P
7.5	Cold Day Accel	Wf	pph		531.0	524.0	575.0	FAIL
8.0	UNDERSPEED GOVERNOR 65% SPEED							
8.1	Underspeed Governor 65% Speed	Wf	pph		160.0	175.0	725.0	P
8.2	Underspeed Governor 65% Speed	Wf	pph	WF_5	103.0	136.0	113.0	FAIL
8.3	Underspeed Governor 65% Speed	Wf	pph	WF_24	50.0	116.0	131.0 (Calc)	P

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8.4	Underspeed Governor 65% Speed	Wf	pph		128.0 (Calc)	137.0	144.0 (Calc)	P
9.0	UNDERSPEED GOVERNOR 96.0% SPEED							
9.1	Underspeed Governor 96.0% Speed	Wf	pph		252.0	296.0	725.0	P
9.2	Underspeed Governor 96.0% Speed	Wf	pph	WF_6	175.0	220.0	185.0	FAIL
9.3	Underspeed Governor 96.0% Speed	Wf	pph		50.0	131.0	215.0 (Calc)	P
9.4	Underspeed Governor 96.0% Speed	Wf	pph		210.0 (Calc)	214.0	230.0 (Calc)	P
9.5	Underspeed Governor 75.0% Speed	USG	deg		13	11	15	FAIL
10.0	OVERSPEED GOVERNOR							
10.1	Overspeed Governor - Initial Speed	Wf	pph	WF_7	50.0	533.0	725.0	P
10.2	Overspeed Governor - Final Speed	Wf	pph	WF_23	521.0 (Calc)	526.0	545.0 (Calc)	P
10.3	Overspeed Governor - Increasing Speed	Wf	pph	WF_8	210.0	189.0	230.0	FAIL
10.4	Overspeed Governor	Wf	pph		104.0	97.0	114.0	FAIL
10.5	Overspeed Governor - Decreasing Speed	Wf	pph	WF_9	179.0 (Calc)	198.0	199.0 (Calc)	P
11.0	DECEL SCHEDULE							
11.1	Decel Schedule	Wf	pph		145.0	142.0	159.0	FAIL
11.2	Decel Schedule	Wf	pph		86.0	76.0	100.0	FAIL
11.3	Decel Schedule	Wf	pph		66.0	57.0	80.0	FAIL
12.0	POWER LEVER SCHEDULE - TT2 CORRECTION							
12.1	Power Lever Schedule	Wf	pph	WF_12	463.0	536.0	483.0	FAIL
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_10	525.0	536.0	545.0	P
12.3	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_11	522.0 (Calc)	536.0	550.0 (Calc)	P
12.4	Tt2 Hysteresis	=WF_10-WF_11			-14.0	0.0	14.0	P
12.5	Power Lever Schedule	Wf	pph		619.0 (Calc)	536.0	635.0 (Calc)	FAIL
12.6	Power Lever Schedule	Wf	pph		171.0	230.0	181.0	FAIL
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_13	180.0	242.0	190.0	FAIL
12.8	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_14	238.0 (Calc)	242.0	246.0 (Calc)	P
12.9	Tt2 Hysteresis	=WF_13-WF_14			-4.0	0.0	4.0	P
12.10	Power Lever Schedule	Wf	pph		199.0	278.0	219.0	FAIL
13.0	POWER LEVER SCHEDULE - Tt2 CORRECTION - 10,000 ft.							
13.1	Fuel Flow - Standard Day	Wf	pph	WF_20	315.0	433.0	325.0	FAIL
13.2	Fuel Flow - Hot Day	Wf	pph	WF_21	381.0 (Calc)	396.0	411.0 (Calc)	P
13.3	Delta Flow	=WF_20-WF_21			22.0	37.0	52.0	P
13.4	Fuel Flow - Cold Day	Wf	pph	WF_22	537.0 (Calc)	478.0	567.0 (Calc)	FAIL
13.5	Delta Flow	=WF_22-WF_20			104.0	45.0	134.0	FAIL
14.0	POWER LEVER SCHEDULE - PT2 CORRECTION							
14.1	Fuel Flow	Wf	pph		154.0	205.0	166.0	FAIL
14.2	Fuel Flow - Increasing Pt2	Wf	pph	WF_15	568.0	537.0	596.0	FAIL
14.3	Fuel Flow - Decreasing Pt2	Wf	pph	WF_16	527.0 (Calc)	537.0	547.0 (Calc)	P
14.4	Pt2 Hysteresis	=WF_15-WF_16			-10.0	0.0	10.0	P
14.5	Fuel Flow	Wf	pph		106.0	164.0	116.0	FAIL
14.6	Fuel Flow - Increasing Pt2	Wf	pph	WF_17	216.0	280.0	226.0	FAIL
14.7	Fuel Flow - Decreasing Pt2	Wf	pph	WF_18	276.0 (Calc)	280.0	284.0 (Calc)	P
14.8	Pt2 Hysteresis	=WF_17-WF_18			-4.0	0.0	4.0	P
15.0	LEVER SHAFT TORQUE	PLT	lb_in		0	3	7	P
16.0	LEVER SHAFT TORQUE	USGT	lb_in		0	6	10	P
17.0	POWER LEVER ANGULAR TRAVELS							
17.1	Flight Idle Max	PL	deg		43	46	45	FAIL
17.2	Flight Idle Min	PL	deg		35	38	37	FAIL
17.3	Max Power Min	PL	deg		93	96	97	P
17.4	Power Lever Max Stop	PL	deg		101	102	102	P
17.5	Power Lever Ground Idle (Min Point)	PL	deg		0	1	0	FAIL

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18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0	532.0	555.0	FAIL
19.0	MAX POWER ADJUSTMENT CHECK							
19.1	Max. Power Adjustment	Wf	pph	WF_19	315.0	Skip	325.0	S
19.2	Max. Power Adjustment Upward	Wf	pph		UNAVAILABLE	Skip	725.0	S
19.3	Max. Power Adjustment Downward	Wf	pph		50.0	Skip	UNAVAILABLE	S
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj				Skip		S
21.0	T2 Linkage Check	T2 Link	inches		0.890	0.990	1.000	P

AUDIT SCHEDULE

2.1	USG Min	USG	deg	1	6
2.2	USG Max	USG	deg	39	41
2.3	PL Min	PL	deg	0	0
2.4	PL Max	PL	deg	101	102
3.1	Standard Accel	Wf	pph	44.0	48.0
3.10	Standard Accel	Wf	pph	437.0	473.0
5.3	30,000 Foot Accel	Wf	pph	199.0	215.0
6.4	Hot Day Accel	Wf	pph	455.0	493.0
8.2	Underspeed Governor 65% Speed	Wf	pph	103.0	113.0
9.2	Underspeed Governor 96.0% Speed	Wf	pph	175.0	185.0
10.3	Overspeed Governor - Increasing Speed	Wf	pph	210.0	230.0
11.1	Decel Schedule	Wf	pph	145.0	159.0
11.2	Decel Schedule	Wf	pph	86.0	100.0
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph	525.0	545.0
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph	180.0	190.0
13.1	Fuel Flow - Standard Day	Wf	pph	315.0	325.0
13.2	Fuel Flow - Hot Day	Wf	pph	381.0 (Calc)	411.0 (Calc)
13.3	Delta Flow	=WF_20-WF_21		22.0	52.0
13.4	Fuel Flow - Cold Day	Wf	pph	537.0 (Calc)	567.0 (Calc)
13.5	Delta Flow	=WF_22-WF_20		104.0	134.0
14.1	Fuel Flow	Wf	pph	154.0	166.0
17.1	Flight Idle Max	PL	deg	43	45
18.0	MAX FUEL FLOW LIMIT	Wf	pph	545.0	555.0
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj			
21.0	T2 Linkage Check	T2 Link	inches	0.890	1.000
22.0	OVERSPEED LOW FLOW CHECK	Wf	pph	160.0 Skip	200.0 S

The following criteria were used to run this report:

Serial No: 1440734
Run Number: 3
Status: A
Run Type: AR
Order By: 1

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* End of IMTPC *
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3/26/2014

WOODWARD GOVERNOR COMPANY
ROCKFORD, IL
CAGE 66503

TSP-8858
ECL: B
PAGE : 1 OF 1

Desc: TSP - HONEYWELL TPE331 FCU ACCEPTANCE TEST
Date: 26-MAR-2014
IMTPC - TEST SPECIFICATION RESULTS PRINT REPORT

Serial No: 1440734 Run No: 4 Work Order: 9265758 Item No: 8070-604
Current Status: A Run Status: F Test Type: AR Test Date: 05-FEB-2014

Test Point		Record	Units	Formula Tag	Min	Value	Max	Pass Fail
1.0	CASE SERIAL NUMBER	Case SN				4423		P
2.0	USG AND PL MIN AND MAX SETTINGS							
2.1	USG Min	USG	deg	USG_MIN	1	6	6	P
2.2	USG Max	USG	deg	USG_MAX	39	40	41	P
2.3	PL Min	PL	deg	PL_MIN	0	1	0	FAIL
2.4	PL Max	PL	deg	PL_MAX	101	102	102	P
3.0	STANDARD ACCELERATION SCHEDULE							
3.1	Standard Accel	Wf	pph		44.0	41.0	48.0	FAIL
3.2	Standard Accel - Sea level start flow.	Wf	pph		44.0	41.0	48.0	FAIL
3.3	Standard Accel	Wf	pph		110.0	110.0	120.0	P
3.4	Standard Accel	Wf	pph		195.0	196.0	211.0	P
3.5	Standard Accel	Wf	pph		260.0	265.0	282.0	P
3.6	Standard Accel							
3.6.1	Standard Accel	Wf	pph	WF_1	306.0	311.0	332.0	P
3.6.2	Standard Accel	Wf	pph	WF_2	306.0 (Calc)	311.0	316.0 (Calc)	P
3.7	Standard Accel Hysteresis	=WF_1-WF_2			-5.0	0.0	5.0	P
3.8	Standard Accel							
3.8.1	Standard Accel	Wf	pph	WF_3	392.0	391.0	424.0	FAIL
3.8.2	Standard Accel	Wf	pph	WF_4	381.0 (Calc)	393.0	401.0 (Calc)	P
3.9	Standard Accel Hysteresis	=WF_3-WF_4			-10.0	-2.0	10.0	P
3.10	Standard Accel	Wf	pph		437.0	433.0	473.0	FAIL
3.11	Standard Accel	Wf	pph		543.0	529.0	589.0	FAIL
4.0	15,000 FOOT ACCEL SCHEDULE							
4.1	15,000 Foot Accel	Wf	pph		40.0	41.0	52.0	P
4.2	15,000 Foot Accel	Wf	pph		117.0	117.0	127.0	P
4.3	15,000 Foot Accel	Wf	pph		195.0	196.0	211.0	P
4.4	15,000 Foot Accel	Wf	pph		250.0	248.0	270.0	FAIL
4.5	15,000 Foot Accel	Wf	pph		325.0	334.0	353.0	P
5.0	30,000 FOOT ACCEL SCHEDULE							
5.1	30,000 Foot Accel	Wf	pph		87.0	88.0	95.0	P
5.2	30,000 Foot Accel	Wf	pph		113.0	113.0	123.0	P
5.3	30,000 Foot Accel	Wf	pph		199.0	195.0	215.0	FAIL
6.0	HOT DAY ACCEL SCHEDULE							
6.1	Hot Day Accel	Wf	pph		42.0	41.0	54.0	FAIL
6.2	Hot Day Accel	Wf	pph		206.0	207.0	224.0	P
6.3	Hot Day Accel	Wf	pph		319.0	323.0	345.0	P
6.4	Hot Day Accel	Wf	pph		455.0	450.0	493.0	FAIL
7.0	COLD DAY ACCEL SCHEDULE							
7.1	Cold Day Accel	Wf	pph		38.0	39.0	50.0	P
7.2	Cold Day Accel	Wf	pph		174.0	172.0	188.0	FAIL
7.3	Cold Day Accel	Wf	pph		269.0	273.0	291.0	P
7.4	Cold Day Accel	Wf	pph		402.0	410.0	436.0	P
7.5	Cold Day Accel	Wf	pph		531.0	525.0	575.0	FAIL
8.0	UNDERSPEED GOVERNOR 65% SPEED							
8.1	Underspeed Governor 65% Speed	Wf	pph		160.0	174.0	725.0	P
8.2	Underspeed Governor 65% Speed	Wf	pph	WF_5	103.0	136.0	113.0	FAIL
8.3	Underspeed Governor 65% Speed	Wf	pph	WF_24	50.0	114.0	131.0 (Calc)	P

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8.4	Underspeed Governor 65% Speed	Wf	pph		128.0 (Calc)	136.0	144.0 (Calc)	P
9.0	UNDERSPEED GOVERNOR 96.0% SPEED							
9.1	Underspeed Governor 96.0% Speed	Wf	pph		252.0	293.0	725.0	P
9.2	Underspeed Governor 96.0% Speed	Wf	pph	WF_6	175.0	223.0	185.0	FAIL
9.3	Underspeed Governor 96.0% Speed	Wf	pph		50.0	132.0	218.0 (Calc)	P
9.4	Underspeed Governor 96.0% Speed	Wf	pph		213.0 (Calc)	220.0	233.0 (Calc)	P
9.5	Underspeed Governor 75.0% Speed	USG	deg		13	16	15	FAIL
10.0	OVERSPEED GOVERNOR							
10.1	Overspeed Governor - Initial Speed	Wf	pph	WF_7	50.0	534.0	725.0	P
10.2	Overspeed Governor - Final Speed	Wf	pph	WF_23	522.0 (Calc)	526.0	546.0 (Calc)	P
10.3	Overspeed Governor - Increasing Speed	Wf	pph	WF_8	210.0	197.0	230.0	FAIL
10.4	Overspeed Governor	Wf	pph		104.0	97.0	114.0	FAIL
10.5	Overspeed Governor - Decreasing Speed	Wf	pph	WF_9	187.0 (Calc)	194.0	207.0 (Calc)	P
11.0	DECEL SCHEDULE							
11.1	Decel Schedule	Wf	pph		145.0	142.0	159.0	FAIL
11.2	Decel Schedule	Wf	pph		86.0	81.0	100.0	FAIL
11.3	Decel Schedule	Wf	pph		66.0	61.0	80.0	FAIL
12.0	POWER LEVER SCHEDULE - TT2 CORRECTION							
12.1	Power Lever Schedule	Wf	pph	WF_12	463.0	535.0	483.0	FAIL
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_10	525.0	535.0	545.0	P
12.3	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_11	521.0 (Calc)	535.0	549.0 (Calc)	P
12.4	Tt2 Hysteresis	=WF_10-WF_11			-14.0	0.0	14.0	P
12.5	Power Lever Schedule	Wf	pph		618.0 (Calc)	535.0	634.0 (Calc)	FAIL
12.6	Power Lever Schedule	Wf	pph		171.0	228.0	181.0	FAIL
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph	WF_13	180.0	240.0	190.0	FAIL
12.8	Power Lever Schedule - Decreasing Tt2	Wf	pph	WF_14	236.0 (Calc)	241.0	244.0 (Calc)	P
12.9	Tt2 Hysteresis	=WF_13-WF_14			-4.0	-1.0	4.0	P
12.10	Power Lever Schedule	Wf	pph		199.0	277.0	219.0	FAIL
13.0	POWER LEVER SCHEDULE - Tt2 CORRECTION - 10,000 ft.							
13.1	Fuel Flow - Standard Day	Wf	pph	WF_20	315.0	433.0	325.0	FAIL
13.2	Fuel Flow - Hot Day	Wf	pph	WF_21	381.0 (Calc)	397.0	411.0 (Calc)	P
13.3	Delta Flow	=WF_20-WF_21			22.0	36.0	52.0	P
13.4	Fuel Flow - Cold Day	Wf	pph	WF_22	537.0 (Calc)	474.0	567.0 (Calc)	FAIL
13.5	Delta Flow	=WF_22-WF_20			104.0	41.0	134.0	FAIL
14.0	POWER LEVER SCHEDULE - PT2 CORRECTION							
14.1	Fuel Flow	Wf	pph		154.0	205.0	166.0	FAIL
14.2	Fuel Flow - Increasing Pt2	Wf	pph	WF_15	568.0	537.0	596.0	FAIL
14.3	Fuel Flow - Decreasing Pt2	Wf	pph	WF_16	527.0 (Calc)	537.0	547.0 (Calc)	P
14.4	Pt2 Hysteresis	=WF_15-WF_16			-10.0	0.0	10.0	P
14.5	Fuel Flow	Wf	pph		106.0	168.0	116.0	FAIL
14.6	Fuel Flow - Increasing Pt2	Wf	pph	WF_17	216.0	283.0	226.0	FAIL
14.7	Fuel Flow - Decreasing Pt2	Wf	pph	WF_18	279.0 (Calc)	283.0	287.0 (Calc)	P
14.8	Pt2 Hysteresis	=WF_17-WF_18			-4.0	0.0	4.0	P
15.0	LEVER SHAFT TORQUE	PLT	lb_in		0	3	7	P
16.0	LEVER SHAFT TORQUE	USGT	lb_in		0	6	10	P
17.0	POWER LEVER ANGULAR TRAVELS							
17.1	Flight Idle Max	PL	deg		43	46	45	FAIL
17.2	Flight Idle Min	PL	deg		35	38	37	FAIL
17.3	Max Power Min	PL	deg		93	96	97	P
17.4	Power Lever Max Stop	PL	deg		101	102	102	P
17.5	Power Lever Ground Idle (Min Point)	PL	deg		0	1	0	FAIL

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18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0	534.0	555.0	FAIL
19.0	MAX POWER ADJUSTMENT CHECK							
19.1	Max. Power Adjustment	Wf	pph	WF_19	315.0	Skip	325.0	S
19.2	Max. Power Adjustment Upward	Wf	pph		UNAVAILABLE	Skip	725.0	S
19.3	Max. Power Adjustment Downward	Wf	pph		50.0	Skip	UNAVAILABLE	S
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj				PASS		P
21.0	T2 Linkage Check	T2 Link	inches		0.890	0.990	1.000	P

AUDIT SCHEDULE

2.1	USG Min	USG	deg		1		6	
2.2	USG Max	USG	deg		39		41	
2.3	PL Min	PL	deg		0		0	
2.4	PL Max	PL	deg		101		102	
3.1	Standard Accel	Wf	pph		44.0		48.0	
3.10	Standard Accel	Wf	pph		437.0		473.0	
5.3	30,000 Foot Accel	Wf	pph		199.0		215.0	
6.4	Hot Day Accel	Wf	pph		455.0		493.0	
8.2	Underspeed Governor 65% Speed	Wf	pph		103.0		113.0	
9.2	Underspeed Governor 96.0% Speed	Wf	pph		175.0		185.0	
10.3	Overspeed Governor - Increasing Speed	Wf	pph		210.0		230.0	
11.1	Decel Schedule	Wf	pph		145.0		159.0	
11.2	Decel Schedule	Wf	pph		86.0		100.0	
12.2	Power Lever Schedule - Increasing Tt2	Wf	pph		525.0		545.0	
12.7	Power Lever Schedule - Increasing Tt2	Wf	pph		180.0		190.0	
13.1	Fuel Flow - Standard Day	Wf	pph		315.0		325.0	
13.2	Fuel Flow - Hot Day	Wf	pph		381.0 (Calc)		411.0 (Calc)	
13.3	Delta Flow	=WF_20-WF_21			22.0		52.0	
13.4	Fuel Flow - Cold Day	Wf	pph		537.0 (Calc)		567.0 (Calc)	
13.5	Delta Flow	=WF_22-WF_20			104.0		134.0	
14.1	Fuel Flow	Wf	pph		154.0		166.0	
17.1	Flight Idle Max	PL	deg		43		45	
18.0	MAX FUEL FLOW LIMIT	Wf	pph		545.0		555.0	
20.0	FINAL SPECIFIC GRAVITY ADJUSTER SETTING	SpGr Adj						
21.0	T2 Linkage Check	T2 Link	inches		0.890		1.000	
22.0	OVERSPEED LOW FLOW CHECK	Wf	pph		160.0	Skip	200.0	S

The following criteria were used to run this report:
Serial No: 1440734
Run Number: 4
Status: A
Run Type: AR
Order By: 1

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* End of IMTPC *
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ROOT CAUSE (D4)
Investigation Type: Product Return

General Cause: No Cause Found Cause: Cause Not Isolated or Determined Cause Notes:
CORRECTIVE ACTION PLAN (D5) Corrective Action:
CORRECTIVE ACTION IMPLEMENTATION (D6) Corrective Action Status: NO ACTION