COMPONENTE | *Component*	**O.S** | *W.O*	**MODELO** | *Model*	**PN**	**SN**
FUEL CONTROL UNIT		DP-F2 Main Fuel Control Unit		

IDENTIFICAÇÃO \| *IDENTIFICATION*

TÍTULO *TITLE* **FICHA PARA REGISTROS DE TESTE DA FUEL CONTROL UNIT** *FUEL CONTROL UNIT TEST SHEET*

PUBLICAÇÃO | *PUBLICATION*	**REFERÊNCIA** | *REFERENCE*	**TLN**	**DATA** | *DATE*
COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST	73-20-43	TLN02332	Nov. 18,2020 Revision 01

CONJUNTO MAIOR | *MAIN PART*	
PN	**SN**

TESTE APLICÁVEL AOS PART NUMBERS | *TEST APPLICABLE TO PART NUMBERS*							
3244786-2	3244786-3	3244786-4	3244786-5	3244786-6	3244786-7	3244786-8	3244786-8 MOD 9

TESTE DA UNIDADE DE CONTROLE DE COMBUSTÍVEL \| *FUEL CONTROL UNIT TEST*

ITEM *Item*	**PROCEDIMENTOS | TOLERÂNCIAS** *Procedures | Serviceable limits*	**Resultado** *Result*	**Data** *Date*	**Executante** *Performed by*
2.A.(11)	Monte a FCU na bancada de teste, usando o adaptador estriado e o adaptador de montagem. *Assemble the Main Fuel Control Unit to the test stand, using spline adapter and mounting adapter, or equivalent.*			
	Remova o plugue e instale o acessório especial de teste. Remova o plugue e instale um adaptador padrão nas portas. *Remove plug and assemble, special testing fixture. Remove plug and install a standard adapter into ports.*			
2.B.(1)	Remova o contra pino, porca e espaçador do eixo de aceleração. Instale o Quadrante de Aceleração na extremidade do eixo de aceleração e torqueie de 40-45 lb.in. *Remove cotter pin, nut, and spacer from throttle shaft. Assemble throttle quadrant and pointer on the end of throttle shaft and tighten to 40-45 lb.in.*			
2.C.(1)	Mantenha uma pressão Po de 10-30 psig na conexão de Po, exceto quando houver outra especificação. Mantenha a pressão P2 dentro de ± 10 psi do valor especificado em pressões abaixo de 300 pph e dentro de ± 25 psig em pressões mais altas, usando a válvula reguladora de contrapressão Pn. *Maintain a Po pressure of 10 - 30 psig on Po pressure gage, except where otherwise specified.* *Maintain P2 pressure within ± 10 psi of the value specified at pressures below 300 pph and within ± 25 psig at higher pressures, using Pn back pressure regulator valve.*			
2.C.(4)	Ajuste o parafuso de pressão diferencial P1-P2 para uma pressão de 26 – 42 in.Hg. Ajuste o orifício da *sleeve* da *metering valve* até a pressão diferencial P1-P2 e o fluxo de injeção estarem de acordo com os limites especificados. *Adjust P1-P2 pressure differential adjustment screw for a pressure of 26 - 42 in.Hg. Adjust metering valve sleeve assembly orifice until P1-P2 pressure differential and nozzle flow are within the limits specified.*			
	Torqueie as porcas de 35 – 40 lb.in. Registre todas as pressões diferenciais de P1-P2 e o fluxo de injeção e, adicionalmente, as pressões Pc-Px, Px-PY e P2. *Torque nuts to 35 – 40 lb.in. Record all P1-P2 pressures differentials and nozzle flows and additionally, Pc-Px, Px-Py, and P2 pressures.*			

TESTE DA UNIDADE DE CONTROLE DE COMBUSTÍVEL | *FUEL CONTROL UNIT TEST*				
ITEM *Item*	**PROCEDIMENTOS | TOLERÂNCIAS** *Procedures | Serviceable limits*	**Resultado** *Result*	**Data** *Date*	**Executante** *Performed by*
2.C.(5)	Ajuste a porca até que o fluxo de injeção leia 13-17 pph. *Adjust nut until the nozzle flow reads 13 – 17 pph.*			
2.C.(6)	Se o fluxo do injetor não estiver de acordo com os limites especificados, troque o fluxo de ar Py. Torqueie o fluxo de ar Py de 9 - 11 lb.in. *If the nozzle flow is not within the specified limits, change Py air flow jet. Torque air flow jet to 9 - 11 lb.in.*			
2.C.(7)	Após ajustar o parafuso de ajuste da velocidade de marcha lenta, torqueie a porca de 20 – 25 lb.in. *After adjustment of idle speed adjustment screw, torque nut to 20 – 25 lb.in.*			

TESTE AETS 48393 | *AETS 48393 TEST*

TEST SPECIFICATION

Number: AETS 48393 — Rev.: F

Sheet 1 of 6

Orig By: G. Chan	Chk By: W.H. Foster	Project Leader: W.H. Foster	MFG Approval:
Date:	Test Stand No.:	Operator:	S/N:
Unit: Automatic Fuel Control		Model: DP-F2/A-27	P/N: 3244786

REL DATE | REV. | PREVIOUS REL. DATE | REV. | 10 JUNE 98 | E | 04-8-04 | F

SHT REV STATUS | SHT REV | F F F F F F | 1 2 3 4 5 6 7 8 9 10 11 12 | 13 14 15 16 17 18 19 20 21 22 23 24

A. See AEEI 48403 for location of adjustments and pressure taps.

B. Connect TS-E2 Slave Sensor to control. Mechanically position sensor needle to dial indicator readings as designated on sensor for +105°, +59°, and -50° temp. stations.

C. (1) Install throttle quadrant fixture with a 4.0 lbs. load applied to throttle stop lever to hold lever against max. throttle stop.

(2) Index throttle quadrant to 90° T.A. Torque throttle quadrant fixture to 40-45 in. lbs.

D. Control rotation CW as viewed from control shaft end.

E. Maintain Po pressure of 10 to 30 PSIG at control by-pass tap.

F. P2 must conform to AEEI 48403 Fig. 3 at all nozzle flow test points, except where Pn limit is required.

G. Set test conditions (temp., RPM, supply, & Pc) in the sequence indicated by numbers 1, 2, 3, etc.
(a) When two numbers are listed, set and then trim test condition in the sequence indicated.
(b) Approach all speeds, total fuel supplies, and Pc settings from a lower value, except at hysteresis points.

H. All adjustments are to be properly torqued.
Test points indicated (*) require special attention and are to be checked below following proper torquing.

1.	Metering valve orifice torque	35		40 in. lbs.
2.	By-pass setting torque	25		35 in. lbs.
3.	Min. M.V. stop (breakaway) torque	4		20 in. lbs.
4.	Max. flow M.V. stop torque	20		25 in. lbs.
5.	Max. gov. eccentric torque	7		7.5 in. lbs.
6.	Max. thro. stop torque	20		25 in. lbs.
7.	Idle speed stop torque	20		25 in. lbs.
8.	Flow body to drive body	20		25 in. lbs.
9.	Drive body adapter to drive body	25		30 in. lbs. – in 5 in. lbs. increments
10.	Bleeds	9		11 in. lbs.
11.	Man. Override stop nut	20		25 in. lbs.

TEST SPECIFICATION	AETS 48393		
	SHEET 2 OF SHEETS 6		REV. F

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi

I. Speed for tests points indicated (#) (3.02, 5.01, 5.02, 6.01, 6.02, 8.01), is to be set to ± 2 RPM of specified value. All other points are to be set within ± 20 RPM of specified value.

J. Total supply is to be set to ± 20 PPH of the specified value or within limits when shown. When aircraft pump is used and speed is specified, ignore total supply flow and Po pressure settings.

K. Before calibration, check for external air leakage using M73/9. Slow bubbling is permitted at the joint of drive body and flow body, at the joint of drive body and drive body adapter, at the torsion shaft cover and at the bellows and torsion shaft locknuts. No leakage is permitted at any other point. Pc = 100 psia. If leakage is considered excessive measure Px-Py when Pc = 100 psia, RPM = 0 and T/A = Max. Px to be measured at the bellows ratio lever cover.

Px-Py ☐ ± 1.2" Hg. Max.

L. Maintain manual override fully c.c.w. except where otherwise indicated

Checked by: _____

TEST SPECIFICATION	AETS 48393		
	SHEET 3 OF SHEETS 6		REV. F

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi
	1	5	2	3	4					
1.01	0	200-275	Max.	+105	85.0					

Relief valve opening P1-Po 950 ☐ 1000 psi

CHECK RELIEF VALVE OPENING

(a) Cap outlet port.

(b) Increase P1 pressure until fuel supply is within supply limits specified and observe P1-Po differential.

(c) If P1-Po differential is out of limits, shim as required.
(1) Add shims to increase differential.

METERING VALVE ORIFICE AND BY-PASS HEAD (P1-P2 "HG) SETTING

(a) Test point 2.01 thru 2.03 are interrelated and should be recorded after all three (3) adjustments have been made.

(b) If at test point 2.03 P1-P2 is higher than 41 in. Hg. Remove by-pass valve cover and replace existing spacer P/N 3240905 with thicker spacer P/N 3240905-1. If P1-P2 is less than 33 in. Hg. Remove and discard existing spacer.

(c) Re-torque the by-pass valve retaining screws to 20 in. lb. in increments of 5 in. lb. and recalibrate T.P. 2.01 to 2.03.

	3	4-6	1	2	5					
2.01*	5800	1350	Max.	+105	40	203	☐	212	☐	
	Adjust head and orifice. P1 - P2 = 26-42 in. Hg.									
2.02*	2900	720	30-32	+105	40	80	☐	84	☐	
	Set Min. M.V. stop after removing Py line.					Pn 75 – 90 psig.				
2.03*	5800	1350	Max.	+105	70	367	☐	373	☐	
	Retrim head and re-adjust 2.01 & 2.02 if out of limits					Pc-Px ☐ 1.0" Hg. Max.				
						P2 365 ☐ 415 psig.				
						Px-Py ☐ 1.2" Hg. Max.				

As per note (b) Check appropriate box

Original spacer ☐

Spacer removed ☐

Spacer replaced ☐

	TEST SPECIFICATION	AETS 48393 SHEET 4 OF SHEETS 6	REV. F

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	REC	MAX	P1 - P2 "Hg	P_2 psi
2.04*	5800 Set Max. M.V. stop	1350	Max.	+105	100	506		520		
2.05	5800	1350	Max.	+105	40	-10		+10		
								Hysteresis of Pt. 2.01		
ENRICHMENT SPRING SETTING										
	3-7	4-6	1	2	5					
3.01	5800	1350	Max.	-50	55	X		X	Record Nozzle Flow	
3.02#	5100	1170	Max.	-50	55	-13		-17		
Set speed enr. –13 -17 PPH less than 3.01 increasing spring tension (CW on Adj. nut) increases difference. (Re-check T.P. 3.01 and 3.02 after adj.).										
	3	4-6	1	2	5					
4.01	4000	1000	Max.	-50	40	172		183		
								Pn 100-110 psig.		
					Pc-Px	8.5		11.5"Hg.		
MAX. GOVERNOR SPRING SETTING										
(a) Adjust eccentric shaft to meet flow limits.										
(b) If unable to set with eccentric, max. T.A. may be varied within T.A. limits.										
(c) If unable to set with eccentric or max. T.A., maintain eccentric on scribe line and determine amount of RPM off.										
(d) Split control and adjust gov. spring as required. (CW adj. of gov. spring delays break-approx. 1 flat on adj. nut per 50 RPM).										
(e) If gov. slope is not in limits, select Py bleed. P/N 2525107 #58								066 (Higher number bleed to increase difference in flow).		
	5	4-7	1	2	3-6					
5.01#*	6350	1440		+59	85	335		345		
	Set Gov. Break T.A. at 89° - 91°					Px-Py		"Hg.		
5.02#	6500	1530		+59	85	105		125		
								Diff. From Pt. 5.01 (Gov. Slope)		
						Px-Py		"Hg.		

TEST SPECIFICATION

AETS 48393

SHEET 5 OF SHEETS 6 REV. F

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi
5.03		1440		+59	85	X		X		

Hysteresis within -50 [ ] +0 RPM of Pt. 5.01

Px-Py [ ] "Hg.

IDLE SPEED STOP SETTING AND PICK UP ANGLE

(a) At test point 6.02 increase T.A. until 4 pph max. fuel flow from 6.01 is observed. (T.A. where flow starts to increase is pick-up angle).

(b) If throttle cam pick-up angle is out of limits, replace governor spring.
(1) Use a higher numbered spring if pick-up angle exceeds 56° diff. From Pt. 5.01.
(2) Use a lower numbered spring if pick-up angle is less than 52° diff. From Pt. 5.01.
(3) Adjust spring tension to same load as set on spring removed.
(4) Re-set governor break at test point 5.01 and re-run test points 5.02 and 5.03.
(5) Re-set idle stop screw at test point 6.01.

	4	1-7	5	2	3-6			
6.01#*	3200	800	30-32	+59	30	104		112

Set idle stop screw (CW adj. Incr. Flow) Dec. and reset speed after adj.

6.02#	3200	800		+59	30

Throt. Cam pick-up angle. Diff. 52° [ ] 56° of test point 5.01

Spring [ ] Stripe

LOW END OF ACCEL. CURVE AND THROTTLE MOVEMENT EFFECT

	3	5	4	2	1			
7.01	815	200	40	+59	Local	60		X

Pn 75 – psig Min.

7.02	2100	670	40	+59	25	113		124

Pn 95 – 105 psig.

Move T.A.to 30° [ ] 5 PPH max. dec.

(a) After recording nozzle flow at test point 7.02 move throttle to 30° T.A.
(1) Observe nozzle flow change and record.

TEST SPECIFICATION — AETS 48393 — SHEET 6 OF 6 — REV. F

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi
MANUAL OVER-RIDE										
At test point 8.01 set max. manual override flow. Rotate override lever C.W. and maintain in contact with max. flow adjusting screw. Rotate adjusting screw C.C.W. to increase flow.										
8.01	1 5000	5 1170	2 32	3 +59	4 Amb.	405		415 pph		
8.02	Record manual over-ride total angular travel					94°		104°		
EXTERNAL LEAKAGE CHECK										
A. Cap Po at drive flange by-pass tap. B. Remove Po line to control and install Po plug C. Cap outlet port. D. Set P1 pressure to 1000 PSIG E. Observe leakage for 2-3 minutes. F. No leakage permitted.										
						OK		REJ.		

TESTE AETS 48392 | *AETS 48392 TEST*

TEST SPECIFICATION — Number AETS 48392 — Rev. E — Sheet 1 of 4

Orig By: G. Chan	Chk By: W.H. Foster	Project Leader: M. Taylor	MFG Approval:
Date:	Test Stand No.:	Operator:	S/N:
Unit: Automatic Fuel Control		Model: DP-F2/A-27	P/N: 3244786

REL DATE	REV.	SHT	REV STATUS	SHT	REV
04-19-94	E	1	E	13	
9 JUNE 98	D	2	E	14	
PREVIOUS REL OMITTED		3	E	15	
		4	E	16	
		5		17	
		6		18	
		7		19	
		8		20	
		9		21	
		10		22	
		11		23	
		12		24	

A. See AEEI 48403 for location of adjustments and pressure taps.

B. Connect TS-E2 Slave Sensor to control. Mechanical position sensor needle to dial indicator readings as designated on sensor for +105°, +59° and -50° temp. stations.

C. (1) Install throttle quadrant fixture with a 4.0 lb. load applied to throttle stop lever to hold lever against maximum throttle stop.

(2) Index throttle quadrant to 90° T.A. Torque throttle quadrant fixture to 40-45 in-lbs.

D. Control rotation CW as viewed from control shaft end.

E. Maintain Po pressure of 10 to 30 PSIG at control by-pass tap.

F. P2 must conform to AEEI 48403 Fig. 3 at all nozzle flow test points, except where Pn limit is required.

G. Set test conditions (temp., supply and Pc) in the sequence indicated by numbers 1, 2, 3, etc.

a) When two numbers are listed, set and then trim test condition in the sequence indicated.

b) Approach all speeds, total fuel supplies, and Pc settings from a lower value, except at hysteresis points.

H. Speed for Test Points 3.02, 5.01, 6.01, 6.02, and 8.01 is to be set to ± 2 RPM of specified value. All other points are to be set within ± 20 RPM of specified value.

I. Total fuel supply is to be set to ± 20 PPH of the specified value or within limits when shown. When aircraft pump is used and speed is specified ignore total supply flow and Po pressure settings.

J. Maintain manual override fully C.C.W. except where otherwise indicated.

	TEST SPECIFICATION	AETS 48392 SHEET 2 OF 4 SHEETS	REV. E

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi
	1	5	2	3	4					
1.01	0	200-275	MAX	+105	85.0					

CHECK RELIEF VALVE OPENING

(a) Cap outlet port.

(b) Increase P1 pressure until fuel supply is within supply limits specified and observe P1-Po differential.

Relief valve opening P1-Po 950 [ ] 1000 PSIG

METERING VALVE ORIFICE AND BYPASS HEAD (P1-P2"HG) SETTING

	3	4-6	1	2	5				
2.01	5800	1350	MAX	+105	40.0	201	[ ]	214	[ ]
	P1 – P2 = 24 – 43 "HG								
2.02	2900	720	30-32	+105	40.0	80	[ ]	85	[ ]
	Remove Py line. Pn = 75 – 90 PSIG.								
2.03	5800	1350	MAX	+105	70.0	363	[ ]	376	[ ]
	Px-Py [ ] 1.2" Hg. Max.								
	Pc-Px [ ] 1.5" Hg. Max.								
	P2 365 [ ] 415 PSIG.								
2.04	5800	1350	MAX	+105	100.0	505	[ ]	525	[ ]
2.05	5800	1350	MAX	+105	40.0	-10	[ ]	+10	[ ]
	Hysteresis of T.P. 2.01.								

ENRICHMENT SPRING SETTING

	3-7	4-6	1	2	5			
3.01	5800	1350	MAX	-50	55.0	X	[ ]	X
	Record Nozzle Flow.							
3.02	5100	1170	MAX	-50	55.0	-9	[ ]	-21

TEST SPECIFICATION

AETS 48392 | SHEET 3 OF 4 SHEETS | REV. E

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi
	3	4-6	1	2	5					
4.01	4000	1000	MAX	-50	40.0	168	[ ]	187		
						Pc-Px	8.5	[ ]	11.5"HG	

MAX. GOVERNOR SPRING SETTING

	5	4-7	1	2	3-6					
5.01	6350	1440	Max.	+59	85.0	310	[ ]	370		
5.02	6500	1530	Max.	+59	85.0	100	[ ]	130		
									Diff. from T.P. 5.01	
5.03	[ ]	1440	Max.	+59	85.0	X	[ ]	X		

Hysteresis within - 50 [ ] 0 of T.P. 5.01

IDLE SPEED STOP SETTING AND PICK-UP ANGLE

(a) At test point 6.02 Increase T.A. until 4 PPH max. fuel flow from 6.01 is observed. (T.A. where flow starts to increase is pick-up angle).

	4	1-7	5	2	3-6					
6.01	3200	800	30-32	+59	30.0	103	[ ]	113		
									Pn = 75 – 90 PSIG	
6.02	3200	800		+59	30.0					

Throttle cam pick-up angle. Diff. 52° [ ] 56° of T.P. 5.01

LOW END OF ACCEL. CURVE AND THROTTLE MOVEMENT EFFECT

	3	5	4	2	1					
7.01	815	200	40	+59	Local	60	[ ]	X		

Pn = 75 PSIG min.

TEST SPECIFICATION

AETS 48392

SHEET 4 OF SHEETS 4 REV. F

TEST POINT	SPEED RPM	SUPPLY PPH	THRO DEG.	TEMP °F	Pc psia	NOZZLE FLOW, PPH MIN	NOZZLE FLOW, PPH REC	NOZZLE FLOW, PPH MAX	P1 - P2 "Hg	P_2 psi
7.02	3 2100	5 670	4 40	2 +59	1 25.0	111		126		

Move T.A. to 30° ☐ 5 PPH maximum decrease

(a) After recording nozzle flow at test point 7.02 move throttle to 30° T.A.
(1) Observe nozzle flow change and record.

MANUAL OVERRIDE

At test point 8.01 rotate override lever C.W. and maintain in contact with lever stop.

8.01	1 5000	5 1170	2 32	3 +59	4 Amb.	400	☐	420 PPH
8.02	Record manual override total angular travel					94°	☐	104°

EXTERNAL LEAKAGE CHECK

A. Cap Po at drive flange by-pass tap.
B. Remove Po line to control and install Po plug.
C. Cap outlet port.
D. Set P1 pressure to 1000 PSIG.
E. Observe leakage for 2-3 minutes.
F. No leakage permitted.

OK ☐ REJECT

Observações *Remarks*	

Aprovação *Approval*	**Nome** *Name*	**Data** *Date*	**Assinatura** *Signature*