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HIGHLIGHTS

REVISION NO. 54 May 01/08

Pages which have been revised are outlined below, together with the Highlights of the Revision

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Engine 1			244	
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Loss of the feedback Signal from			217	ALL
the VSV through the Channel B on			,	ALL
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the VSV through the Channel B on				
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1				
Nacelle Temperature above 310			213	ALL
deg.C (590 deg.F) or Loss of the				
Nacelle Temperature Data on Engine				
2				

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AIR - FAULT SYMPTOMS

	WARNINGS/MALFUNCTIONS		FAULT ISOLATION			
	WARNINGS/MALFUNCTIONS	SOURCE	MESSAGE	ATA	С	PROCEDURE
R R R R	ENGINE - ENG 1 NACELLE TEMP indication flashing green associated with ENGINE - ENG 1 NACELLE TEMP indication flashing green					754100 P 201 T 810 805
R R R R	ENGINE - ENG 2 NACELLE TEMP indication flashing green associated with ENGINE - ENG 2 NACELLE TEMP indication flashing green					754100 P 206 T 810 806

EFF: ALL
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AIR - FAULT SYMPTOMS

	LIADNINGS /MALEUNGITONS		FAULT			
	WARNINGS/MALFUNCTIONS	SOURCE	MESSAGE	ATA	С	ISOLATION PROCEDURE
		EIU1FAD	BLD SNSR, J15, ECU ENG1A	753180	3	753000 P 237 T 810 831
		EIU1FAD	BLD SNSR, J15, ECU ENG1B	753180	3	753000 P 251 T 810 839
R		EIU1FAD	HPTC VLV, J11, ECU ENG1A	752110	S	752100 P 217 T 810 809
R		EIU1FAD	HPTC VLV, J12, ECU ENG1B	752110	S	752100 P 223 T 810 811
		EIU1FAD	LPTC VLV, J11, ECU	752210	S	752200 P 201 T 810 801
		EIU1FAD	LPTC VLV, J12, ECU	752210	S	752200 P 209 T 810 803
		EIU1FAD	NAC VLV, J11, ECU ENG1A	752310	S	752500 P 221 T 810 826
		EIU1FAD	NAC VLV, J12, ECU ENG1B	752310	S	752500 P 225 T 810 827
		EIU1FAD	RAC VLV (BLD), HMU ENG1A	752110	1	752100 P 229 T 810 813
		EIU1FAD	RAC VLV (BLD), HMU ENG1B	752110	1	752100 P 233 T 810 821
		EIU1FAD	RAC VLV, J11, ECU	752310	S	752300 P 211 T 810 809A
		EIU1FAD	RAC VLV, J12, ECU	752310	S	752300 P 217 T 810 811A
		EIU1FAD	TBV VLV, J11, ECU ENG1A	752310	S	752600 P 201 T 810 801
		EIU1FAD	TBV VLV, J12, ECU ENG1B	752310	S	752600 P 204 T 810 802
		EIU1FAD	VBV ACT, HMU ENG1A	753110	1	753000 P 201 T 810 801

EFF: ALL

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WARNINGS/MALFUNCTIONS		FAULT ISOLATION			
WARNINGS/ MALFONCTIONS	SOURCE	MESSAGE	ATA	С	!
	EIU1FAD	VBV ACT, HMU ENG1B	753110	1	753000 P 239 T 810 837
	EIU1FAD	VBV SNSR, J11, ECU	753170	S	753000 P 219 T 810 813
	EIU1FAD	VBV SNSR, J11, ECU	753170	1	753000 P 219 T 810 813
	IDENT:	EIU1FAD			1 0 10 0 13
	EIU1FAD	VBV SNSR, J12, ECU	753170	S	753000 P 227 T 810 815
	EIU1FAD	VBV SNSR, J12, ECU	753170	1	753000 P 227 T 810 815
	IDENT:	EIU1FAD			
	EIU1FAD	VSV ACT, J11, ECU	753210	S	753200 P 211 T 810 805
	EIU1FAD	VSV ACT, J11, ECU	753210	1	753200 P 211 T 810 805
	IDENT:	EIU1FAD			
	EIU1FAD	VSV ACT, J12, ECU	753210	S	753200 P 217 T 810 807
	EIU1FAD	VSV ACT, J12, ECU	753210	1	753200 P 217 T 810 807
	IDENT:	010 001			
	EIU1FAD	VSV, ACT, HMU ENG1A	753210	1	753200 P 201 T 810 801
	EIU1FAD	VSV, ACT, HMU ENG1B	753210	1	753200 P 223 T 810 811
	EIU1FAD	VTURI, BLD SNSR, ECU ENG1A	753180	3	753000 P 235 T 810 829
	EIU1FAD	VTURI, BLD SNSR, ECU ENG1B	753180	3	753000 P 253 T 810 841
	EIU2FAD	BLD SNSR, J15, ECU ENG2A	753180	3	753000 P 238 T 810 832

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	WARNINGS/MALFUNCTIONS	1	CFDS FAULT MESSAGES	FAULT ISOLATION		
	WARNINGS/MALFORCTIONS	SOURCE	MESSAGE	ATA	С	!
		EIU2FAD	BLD SNSR, J15, ECU ENG2B	753180	3	753000 P 252 T 810 840
R		EIU2FAD	HPTC VLV, J11, ECU ENG2A	752110	S	752100 P 220 T 810 810
R		EIU2FAD	HPTC VLV, J12, ECU ENG2B	752110	S	752100 P 226 T 810 812
		EIU2FAD	LPTC VLV, J11, ECU	752210	S	752200 P 205 T 810 802
		EIU2FAD	LPTC VLV, J12, ECU	752210	S	752200 P 213 T 810 804
		EIU2FAD	NAC VLV, J11, ECU ENG2A	752310	S	752500 P 229 T 810 828
		EIU2FAD	NAC VLV, J12, ECU ENG2B	752310	S	752500 P 233 T 810 829
		EIU2FAD	RAC VLV (BLD), HMU ENG1A	752110	1	752100 P 231 T 810 814
		EIU2FAD	RAC VLV (BLD), HMU ENG2B	752110	1	752100 P 235 T 810 822
		EIU2FAD	RAC VLV, J11, ECU	752310	S	752300 P 214 T 810 810A
		EIU2FAD	RAC VLV, J12, ECU	752310	S	752300 P 220 T 810 812A
		EIU2FAD	TBV VLV, J11, ECU ENG2A	752310	S	752600 P 207 T 810 803
		EIU2FAD	TBV VLV, J12, ECU ENG2B	752310	S	752600 P 210 T 810 804
		EIU2FAD	VBV ACT, HMU ENG2A	753110	1	753000 P 207 T 810 802
 		EIU2FAD	VBV ACT, HMU ENG2B	753110	1	753000 P 245 T 810 838

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WARNINGS/MALFUNCTIONS		FAULT ISOLATION			
WARNINGS/ MALFUNCTIONS	SOURCE	MESSAGE	ATA	С	i :
	EIU2FAD	VBV SNSR, J11, ECU	753170	S	753000 P 223 T 810 814
	EIU2FAD	VBV SNSR, J11, ECU	753170	1	753000 P 223 T 810 814
	IDENT: I	EIU2FAD			010 014
	EIU2FAD	VBV SNSR, J12, ECU	753170	S	753000 P 231 T 810 816
	EIU2FAD	VBV SNSR, J12, ECU	753170	1	753000 P 231 T 810 816
	IDENT: EIU2FAD			1 8 10 8 16 	
	EIU2FAD	VSV ACT, J11, ECU	753210	S	753200 P 214 T 810 806
	EIU2FAD	VSV ACT, J11, ECU	753210	1	753200 P 214 T 810 806
	IDENT: I	EIU2FAD			
	EIU2FAD	VSV ACT, J12, ECU	753210	S	753200 P 220 T 810 808
	EIU2FAD	VSV ACT, J12, ECU	753210	1	753200 P 220 T 810 808
 	IDENT: I	EIU2FAD			
	EIU2FAD	VSV, ACT, HMU ENG2A	753210	1	753200 P 203 T 810 802
	EIU2FAD	VSV, ACT, HMU ENG2B	753210	1	753200 P 225 T 810 812
	EIU2FAD	VTURI, BLD SNSR, ECU ENG2A	753180	3	753000 P 236 T 810 830
	EIU2FAD	VTURI, BLD SNSR, ECU ENG2B	753180	3	753000 P 254 T 810 842

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HPT ACTIVE CLEARANCE CONTROL SYSTEM - FAULT ISOLATION PROCEDURES

- R TASK 75-21-00-810-803
- Failure of the HPTCC Valve Channel A on Engine 1
- 1. Possible Causes
- R - TCC sensor(s)
- High Pressure Turbine Clearance Control (HPTCC) Valve
- Hydromechanical Unit (HMU)
- ECU (4000KS)
- harness HJ7
- High Pressure Turbine Clearance Control (HPTCC) valve
- R 2. Job Set-up Information
- R A. Referenced Information

R R	REFE	RENCE	DESIGNATION
R	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
R	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
R	AMM	73-21-50-000-040	Removal of the HJ7 Harness
R	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
R	AMM	73-21-50-400-040	Installation of the HJ7 Harness
R	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
R	AMM	73-21-60-400-001	Installation of the Electronic Control Unit
R			(ECU)(4000KS)
R	AMM	73-21-70-000-002	Removal of the High Pressure Turbine Clearance
R			Control (HPTCC) Sensor
R	AMM	73-21-70-400-002	Installation of the High Pressure Turbine Clearance
R			Control (HPTCC) Sensor
R	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
R			Engine Motoring)
R	AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance
R			Control (HPTACC) Valve
R	AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active
R			Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine R motoring) (Ref. AMM TASK 73-29-00-710-040).

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R 4. Fault Isolation

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R R R	Α.	acti	failure message is triggered if there is a difference between the lal position and the feedback position of the valve of more than 5% the fault continues for more than 7 seconds.
R R		(1)	If the failure message HPTC VLV (POS), HMU on channel 1A, on both channels is not confirmed:
R			(a) No maintenance action required.
R R		(2)	If the failure message HPTC VLV (POS), HMU on channel 1A, on one or both channels is not confirmed but is repetitive:
R R			(a) Do the following trouble shooting at next maintenance opportunity:
R R R R			Do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for TCC SNSR, HJ13, ECU. If the failure message is present: – disconnect the TCC sensor(s).

<u>NOTE</u>: Engines post SB 73-046 are equipped with only one sensor.

- Do a cleaning of the harness connectors and receptacles using a bristle brush with stoddart solvent (CP 2011) (Ref. AMM TASK 73-21-50-210-002).
- reconnect the connectors to the TCC sensor(s).

<u>NOTE</u>: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- a If the fault continues:
 - replace the TCC sensor(s) (Ref. AMM TASK 73-21-70-000-002) and (Ref. AMM TASK 73-21-70-400-002).

NOTE : Engines post SB 73-046 are equipped with only one sensor.

- 2 If the fault continues:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
- 3 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).

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R R R	4 If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	5 If the fault continues: - replace the harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
R R	(3) If the failure message HPTC VLV (POS), HMU on channel 1A is confirmed:
R R R	(a) Disconnect the harness HJ7 from the ECU and do a check of resistance between:pins 23 and 24 (17 to 23 0hms).
R R R	If the resistance values are in the specified limits: - replace the High Pressure Turbine Clearance Control (HPTCC) valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
R R R	 <u>a</u> If the fault continues: replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-400-002).
R R R	b If the fault continues: replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	<pre>c If the fault continues: - replace the harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).</pre>
R R R	 (b) If the resistance values are out of the specified limits: disconnect the harness HJ7 from the HMU and do a check of the HMU resistance between: pins 23 and 24 (17 to 23 0hms).
R R R	If the resistance values are in the specified limits: - replace the harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
R R R	If the resistance values are out of the specified limits: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002).
R R	NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

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R B. Do the test given in para. 3.

R (1) No additional maintenance action is required if the fault is not confirmed.

R (2) Continue the fault isolation procedure if the fault continues.

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- R TASK 75-21-00-810-804
- R Failure of the HPTCC Valve Channel A on Engine 2
- R 1. Possible Causes
- R TCC sensor(s)
- R High Pressure Turbine Clearance Control (HPTCC) Valve
- R Hydromechanical Unit (HMU)
- R ECU (4000KS)
- R harness HJ7
- R High Pressure Turbine Clearance Control (HPTCC) valve
- R 2. Job Set-up Information
- R A. Referenced Information

ĸ					
R	REFE	RENCE	DESIGNATION		
R					
R	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)		
R	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)		
R	AMM	73-21-50-000-040	Removal of the HJ7 Harness		
R	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses		
R	AMM	73-21-50-400-040	Installation of the HJ7 Harness		
R	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)		
R	AMM	73-21-60-400-001	Installation of the Electronic Control Unit		
R			(ECU)(4000KS)		
R R	AMM	73-21-70-000-002	Removal of the High Pressure Turbine Clearance Control (HPTCC) Sensor		
R	AMM	73-21-70-400-002	Installation of the High Pressure Turbine Clearance		
R	AMM	73-21-70-400-002	Control (HPTCC) Sensor		
R	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with		
R			Engine Motoring)		
R	AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance		
R			Control (HPTACC) Valve		
R	AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active		
R			Clearance Control (HPTACC) Valve		

R 3. Fault Confirmation

R A. Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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R 4. Fault Isolation

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- R A. The failure message is triggered if there is a difference between the actual position and the feedback position of the valve of more than 5% and the fault continues for more than 7 seconds.
 R (1) If the failure message HPTC VLV (POS), HMU on channel 2A, on both
 - (1) If the failure message HPTC VLV (POS), HMU on channel 2A, on both channels is not confirmed:
 - (a) No maintenance action required.
 - (2) If the failure message HPTC VLV (POS), HMU on channel 2A, on one or both channels is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - Do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for TCC SNSR, HJ13, ECU.

If the failure message is present:

- disconnect the TCC sensor(s).

NOTE: Engines post SB 73-046 are equipped with only one sensor.

- Do a cleaning of the harness connectors and receptacles using a bristle brush with stoddart solvent (CP 2011) (Ref. AMM TASK 73-21-50-210-002).
- reconnect the connectors to the TCC sensor(s).

<u>NOTE</u>: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- a If the fault continues:
 - replace the TCC sensor(s) (Ref. AMM TASK 73-21-70-000-002) and (Ref. AMM TASK 73-21-70-400-002).

NOTE : Engines post SB 73-046 are equipped with only one sensor.

- 2 If the fault continues:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
- 3 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).

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R R R	4 If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	5 If the fault continues: replace the harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
R R	(3) If the failure message HPTC VLV (POS), HMU on channel 2A is confirmed:
R R R	(a) Disconnect the harness HJ7 from the ECU and do a check of resistance between:pins 23 and 24 (17 to 23 0hms).
R R R	If the resistance values are in the specified limits: - replace the High Pressure Turbine Clearance Control (HPTCC) valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
R R R	a If the fault continues: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-400-002).
R R R	b If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	<pre>c If the fault continues: - replace the harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).</pre>
R R R	 (b) If the resistance values are out of the specified limits: disconnect the harness HJ7 from the HMU and do a check of the HMU resistance between: pins 23 and 24 (17 to 23 0hms).
R R R	If the resistance values are in the specified limits: - replace the harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
R R R	If the resistance values are out of the specified limits: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002).
R	<u>NOTE</u> : Tighten the connector by hand plus one eighth of a

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- R B. Do the test given in para. 3.
- R (1) No additional maintenance action is required if the fault is not confirmed.
- R (2) Continue the fault isolation procedure if the fault continues.

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TASK 75-21-00-810-807

Loss of the Feedback Signal from the HPTCC Valve through the two Channels on Engine 1

1. Possible Causes

- High Pressure Turbine Clearance Control (HPTCC) Valve
- ECU (4000KS)
- harness HJ11
- harness HJ12
- harness CJ11R
- harness CJ12R

2. Job Set-up Information

A. Referenced Information

REFE	RENCE	DESIGNATION
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance
		Control (HPTACC) Valve
AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active
		Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1 on the ground with engine non motoring (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. This failure message is triggered when there is a disagreement between channels A and B position signals from the HPTCC Valve or one or both signals is out of range.
 - (1) If the failure message HPTC VLV, J11, ECU and HPTC VLV, J12, ECU is not confirmed:
 - (a) No maintenance action required.
 - (2) If the failure message HPTC VLV, J11, ECU and HPTC VLV, J12, ECU is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
 - 1 If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- (3) If the failure message HPTC VLV, J11, ECU and HPTC VLV, J12, ECU is confirmed:
 - (a) Disconnect the harnesses HJ11 and HJ12 from the ECU and do a resistance check of the harnesses HJ11 and HJ12 between:
 - . pins 34 and 35 (68 to 102 0hms)
 - . pins 18 and 36 (30 to 42 0hms)
 - . pins 16 and 33 (22 to 30 0hms)
 - pins 34 and 17 (> 10 Megohms)
 - pins 18 and 17 (> 10 Megohms)
 - pins 16 and 17 (> 10 Megohms)
 - pin 34 and the ground (> 10 Megohms)
 - . pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are not in the specified limits:
 - disconnect the harnesses CJ11R and CJ12R from the HPTCC
 Valve and do a resistance check of the HPTCC Valve between:
 - . pins 2 and 3 (68 to 102 0hms)
 - . pins 4 and 5 (30 to 42 0hms)
 - . pins 6 and 7 (22 to 30 0hms)

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- pin 2 and the ground (> 10 Megohms)
- pin 4 and the ground (> 10 Megohms)
- . pin 6 and the ground (> 10 Megohms).

<u>NOTE</u>: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- J If the resistance values are not in the specified limits: - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK
- 4 If the resistance values are in the specified limits:
- disconnect the harnesses HJ11 and HJ12 from the harnesses
 CJ11R and CJ12R at the 6 o'clock junction box and do a check of the resistance of the harnesses CJ11R and CJ12R between:
 - for harness CJ11R

75-21-10-400-002).

- . pins 29 and 30 (68 to 102 ohms)
- . pins 18 and 31 (30 to 42 ohms)
- . pins 16 and 28 (22 to 30 ohms)
- . pins 29 and 17 (> 10 Megohms)
- pins 18 and 17 (> 10 Megohms)
- pins 16 and 17 (> 10 Megohms)
- pin 29 and the ground (> 10 Megohms)
- . pin 18 and the ground (> 10 Megohms)
- . pin 16 and the ground (> 10 Megohms).
- for harness CJ12R
- . pins 16 and 6 (68 to 102 ohms)
- . pins 19 and 18 (30 to 42 ohms)
- pins 20 and 8 (22 to 30 ohms)
- pins 17 and 7 (> 10 Megohms)
- pins 19 and 7 (> 10 Megohms)
- pins 20 and 7 (> 10 Megohms)
- pin 17 and the ground (> 10 Megohms)
- pin 19 and the ground (> 10 Megohms)
- . pin 20 and the ground (> 10 Megohms).
- a If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) and/or harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- <u>b</u> If the resistance values are not in the specified limits: - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026) and/or harness CJ12R (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).

<u>NOTE</u>: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

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- B. Do the test given in para. 3.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Continue the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-21-00-810-808

Loss of the Feedback Signal from the HPTCC Valve through the two Channels on Engine 2

1. Possible Causes

- High Pressure Turbine Clearance Control (HPTCC) Valve
- ECU (4000KS)
- harness HJ11
- harness HJ12
- harness CJ11R
- harness CJ12R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance
,	. 7 2 6 666 662	Control (HPTACC) Valve
AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active
Ailli	13 21 10 400 002	Clearance Control (HPTACC) Valve
		ctear ance controc (in race) valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2 on the ground with engine non motoring (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. This failure message is triggered when there is a disagreement between channels A and B position signals from the HPTCC Valve or one or both signals is out of range.
 - (1) If the failure message HPTC VLV, J11, ECU and HPTC VLV, J12, ECU is not confirmed:
 - (a) No maintenance action required.
 - (2) If the failure message HPTC VLV, J11, ECU and HPTC VLV, J12, ECU is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
 - 1 If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- (3) If the failure message HPTC VLV, J11, ECU and HPTC VLV, J12, ECU is confirmed:
 - (a) Disconnect the harnesses HJ11 and HJ12 from the ECU and do a resistance check of the harnesses HJ11 and HJ12 between:
 - . pins 34 and 35 (68 to 102 0hms)
 - . pins 18 and 36 (30 to 42 0hms)
 - . pins 16 and 33 (22 to 30 0hms)
 - pins 34 and 17 (> 10 Megohms)
 - pins 18 and 17 (> 10 Megohms)
 - pins 16 and 17 (> 10 Megohms)
 - pin 34 and the ground (> 10 Megohms)
 - . pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are not in the specified limits:
 - disconnect the harnesses CJ11R and CJ12R from the HPTCC
 Valve and do a resistance check of the HPTCC Valve between:
 - . pins 2 and 3 (68 to 102 0hms)
 - . pins 4 and 5 (30 to 42 0hms)
 - . pins 6 and 7 (22 to 30 0hms)

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- pin 2 and the ground (> 10 Megohms)
- pin 4 and the ground (> 10 Megohms)
- . pin 6 and the ground (> 10 Megohms).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- If the resistance values are not in the specified limits: - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
- 4 If the resistance values are in the specified limits:
- disconnect the harnesses HJ11 and HJ12 from the harnesses
 CJ11R and CJ12R at the 6 o'clock junction box and do a check of the resistance of the harnesses CJ11R and CJ12R between:
 - for harness CJ11R
 - . pins 29 and 30 (68 to 102 ohms)
 - . pins 18 and 31 (30 to 42 ohms)
 - . pins 16 and 28 (22 to 30 ohms)
 - pins 29 and 17 (> 10 Megohms)
 - . pins 18 and 17 (> 10 Megohms)
 - . pins 16 and 17 (> 10 Megohms)
 - pin 29 and the ground (> 10 Megohms)
 - pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - for harness CJ12R
 - . pins 16 and 6 (68 to 102 ohms)
 - . pins 19 and 18 (30 to 42 ohms)
 - . pins 20 and 8 (22 to 30 ohms)
 - pins 17 and 7 (> 10 Megohms)
 - pins 19 and 7 (> 10 Megohms)
 - pins 20 and 7 (> 10 Megohms)
 - pin 17 and the ground (> 10 Megohms)
 - pin 19 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) and/or harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - <u>b</u> If the resistance values are not in the specified limits: - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026) and/or harness CJ12R (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).

NOTE : Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

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- B. Do the test given in para. 3.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Continue the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-21-00-810-809

Loss of the Feedback Signal on the Channel A of the HPTCC Valve on Engine 1

1. Possible Causes

- High Pressure Turbine Clearance Control (HPTCC) Valve
- ECU (4000KS)
- harness HJ11
- harness CJ11R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance Control (HPTACC) Valve
AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1 on the ground with engine non motoring (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. This failure message is triggered when there is a disagreement between channels A and B position signal from the HPTCC Valve or the signal is out of range.
 - (1) If the failure message HPTC VLV, J11, ECU is not confirmed:
 - (a) No maintenance action required.

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- (2) If the failure message HPTC VLV, J11, ECU is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
 - 1 If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- (3) If the failure message HPTC VLV, J11, ECU is confirmed:
 - (a) Disconnect the harness HJ11 from the ECU and do a resistance check of the harness HJ11 between:
 - . pins 34 and 35 (68 to 102 0hms)
 - . pins 18 and 36 (30 to 42 0hms)
 - . pins 16 and 33 (22 to 30 0hms)
 - . pins 34 and 17 (> 10 Megohms)
 - pins 18 and 17 (> 10 Megohms)
 - pins 16 and 17 (> 10 Megohms)
 - . pin 34 and the ground (> 10 Megohms)
 - . pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - <u>1</u> If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are not in the specified limits:
 - disconnect the harness CJ11R from the HPTCC Valve and do a resistance check of the HPTCC Valve between:
 - . pins 2 and 3 (68 to 102 0hms)
 - pins 4 and 5 (30 to 42 0hms)
 - . pins 6 and 7 (22 to 30 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - 3 If the resistance values are not in the specified limits:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).

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- 4 If the resistance values are in the specified limits:
 - disconnect the harness HJ11 from the harness CJ11R at the 6 o'clock junction box and do a check of the resistance of the harness CJ11R between:
 - . pins 29 and 30 (68 to 102 ohms)
 - . pins 18 and 31 (30 to 42 ohms)
 - . pins 16 and 28 (22 to 30 ohms)
 - pins 29 and 17 (> 10 Megohms)
 - . pins 18 and 17 (> 10 Megohms)
 - . pins 16 and 17 (> 10 Megohms)
 - . pin 29 and the ground (> 10 Megohms)
 - pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - b If the resistance values are not in the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- B. Do the test given in para. 3.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Continue the fault isolation procedure if the fault continues.

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TASK 75-21-00-810-810

Loss of the Feedback Signal on Channel A of the HPTCC Valve on Engine 2

1. Possible Causes

- High Pressure Turbine Clearance Control (HPTCC) Valve
- ECU (4000KS)
- harness HJ11
- harness CJ11R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance Control (HPTACC) Valve
AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2 on the ground with engine non motoring (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. This failure message is triggered when there is a disagreement between channels A and B position signals from the HPTCC Valve or one or both signals is out of range.
 - (1) If the failure message HPTC VLV, J11, ECU is not confirmed:
 - (a) No maintenance action required.

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- (2) If the failure message HPTC VLV, J11, ECU is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
 - 1 If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- (3) If the failure message HPTC VLV, J11, ECU is confirmed:
 - (a) Disconnect the harness HJ11 from the ECU and do a resistance check of the harness HJ11 between:
 - . pins 34 and 35 (68 to 102 0hms)
 - . pins 18 and 36 (30 to 42 0hms)
 - . pins 16 and 33 (22 to 30 0hms)
 - pins 34 and 17 (> 10 Megohms)
 - ${\color{red} \textbf{.}}$ pins 18 and 17 (> 10 Megohms)
 - pins 16 and 17 (> 10 Megohms)
 - pin 34 and the ground (> 10 Megohms)pin 18 and the ground (> 10 Megohms)
 - pin 16 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are not in the specified limits:
 - disconnect the harness CJ11R from the HPTCC Valve and do a resistance check of the HPTCC Valve between:
 - . pins 2 and 3 (68 to 102 0hms)
 - . pins 4 and 5 (30 to 42 0hms)
 - pins 6 and 7 (22 to 30 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - 3 If the resistance values are not in the specified limits:
 - replace the High Pressure Turbine Clearance Control (HPTCC)
 Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).

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- 4 If the resistance values are in the specified limits:
 - disconnect the harness HJ11 from the harness CJ11R at the 6 o'clock junction box and do a check of the resistance of the harness CJ11R between:
 - . pins 29 and 30 (68 to 102 ohms)
 - . pins 18 and 31 (30 to 42 ohms)
 - pins 16 and 28 (22 to 30 ohms)
 - . pins 29 and 17 (> 10 Megohms)
 - pins 18 and 17 (> 10 Megohms)
 - pins 16 and 17 (> 10 Megohms)
 - . pin 29 and the ground (> 10 Megohms)
 - pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - b If the resistance values are not in the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- B. Do the test given in para. 3.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Continue the fault isolation procedure if the fault continues.

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TASK 75-21-00-810-811

Loss of the Feedback Signal on the Channel B of the HPTCC Valve on Engine 1

1. Possible Causes

- High Pressure Turbine Clearance Control (HPTCC) Valve
- ECU (4000KS)
- harness HJ12
- harness CJ12R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance Control (HPTACC) Valve
AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1 on the ground with engine non motoring (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

ALL

- A. This failure message is triggered when there is a disagreement between channels A and B position signal from the HPTCC Valve or the signal is out of range.
 - (1) If the failure message HPTC VLV, J12, ECU is not confirmed:
 - (a) No maintenance action required.

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- (2) If the failure message HPTC VLV, J12, ECU is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
 - 1 If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- (3) If the failure message HPTC VLV, J12, ECU is confirmed:
 - (a) Disconnect the harness HJ12 from the ECU and do a resistance check of the harness HJ12 between:
 - . pins 34 and 35 (68 to 102 0hms)
 - . pins 18 and 36 (30 to 42 0hms)
 - . pins 16 and 33 (22 to 30 0hms)
 - pins 34 and 17 (> 10 Megohms)
 - . pins 18 and 17 (> 10 Megohms)
 - pins 16 and 17 (> 10 Megohms)
 - pin 34 and the ground (> 10 Megohms)
 - pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - $\underline{1}$ If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are not in the specified limits:
 - disconnect the harness CJ12R from the HPTCC Valve and do a resistance check of the HPTCC Valve between:
 - . pins 2 and 3 (68 to 102 0hms)
 - pins 4 and 5 (30 to 42 0hms)
 - pins 6 and 7 (22 to 30 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - 3 If the resistance values are not in the specified limits:
 - replace the High Pressure Turbine Clearance Control (HPTCC)
 Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).

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- 4 If the resistance values are in the specified limits:
 - disconnect the harness HJ12 from the harness CJ12R at the 6 o'clock junction box and do a check of the resistance of the harness CJ12R between:
 - . pins 16 and 6 (68 to 102 ohms)
 - . pins 19 and 18 (30 to 42 ohms)
 - . pins 20 and 8 (22 to 30 ohms)
 - . pins 17 and 7 (> 10 Megohms)
 - . pins 19 and 7 (> 10 Megohms)
 - pins 20 and 7 (> 10 Megohms)
 - pin 17 and the ground (> 10 Megohms)
 - pin 19 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - b If the resistance values are not in the specified limits:
 - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- B. Do the test given in para. 3.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Continue the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-21-00-810-812

Loss of the Feedback Signal on the Channel B of the HPTCC Valve on Engine 2

1. Possible Causes

- High Pressure Turbine Clearance Control (HPTCC) Valve
- ECU (4000KS)
- harness HJ12
- harness CJ12R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance Control (HPTACC) Valve
AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2 on the ground with engine non motoring (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

ALL

- A. This failure message is triggered when there is a disagreement between channels A and B position signal from the HPTCC Valve or the signal is out of range.
 - (1) If the failure message HPTC VLV, J12, ECU is not confirmed:
 - (a) No maintenance action required.

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- (2) If the failure message HPTC VLV, J12, ECU is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
 - 1 If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- (3) If the failure message HPTC VLV, J12, ECU is confirmed:
 - (a) Disconnect the harness HJ12 from the ECU and do a resistance check of the harness HJ12 between:
 - . pins 34 and 35 (68 to 102 0hms)
 - . pins 18 and 36 (30 to 42 0hms)
 - . pins 16 and 33 (22 to 30 0hms)
 - pins 34 and 17 (> 10 Megohms)
 - . pins 18 and 17 (> 10 Megohms)
 - . pins 16 and 17 (> 10 Megohms)
 - . pin 34 and the ground (> 10 Megohms)
 - pin 18 and the ground (> 10 Megohms)
 - . pin 16 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are not in the specified limits:
 - disconnect the harness CJ12R from the HPTCC Valve and do a resistance check of the HPTCC Valve between:
 - . pins 2 and 3 (68 to 102 0hms)
 - pins 4 and 5 (30 to 42 0hms)
 - . pins 6 and 7 (22 to 30 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - 3 If the resistance values are not in the specified limits:
 - replace the High Pressure Turbine Clearance Control (HPTCC)
 Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).

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- 4 If the resistance values are in the specified limits:
 - disconnect the harness HJ12 from the harness CJ12R at the 6 o'clock junction box and do a check of the resistance of the harness CJ12R between:
 - . pins 16 and 6 (68 to 102 ohms)
 - . pins 19 and 18 (30 to 42 ohms)
 - pins 20 and 8 (22 to 30 ohms)
 - pins 17 and 7 (> 10 Megohms)
 - pins 19 and 7 (> 10 Megohms)
 - . pins 20 and 7 (> 10 Megohms)
 - . pin 17 and the ground (> 10 Megohms)
 - . pin 19 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - b If the resistance values are not in the specified limits:
 - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).

NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- B. Do the test given in para. 3.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Continue the fault isolation procedure if the fault continues.

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TASK 75-21-00-810-813

Failure of the RACSB Valve in the Start Bleed Position on Engine 1

- 1. Possible Causes
 - ECU (4000KS)
 - Rotor Active Clearance Start Bleed (RACSB) valve (4038KS)
 - Hydromechanical Unit (HMU)
 - harness HJ7
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM AMM	73-21-10-400-002 73-21-50-000-040	Installation of the Hydromechanical Unit (HMU) Removal of the HJ7 Harness
AMM		Visual Inspection of the Wiring Harnesses
AMM AMM	73-21-50-400-040 73-21-60-000-001	<pre>Installation of the HJ7 Harness Removal of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM		Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

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- A. If the test gives the maintenance message RAC VLV (BLD), HMU:
 - Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 ohms)
 - (a) If the resistance values are in the specified limits:
 - replace the Rotor Active Clearance Start Bleed (RACSB) valve (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms)
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TASK 75-21-00-810-814

Failure of the RACSB Valve in the Start Bleed Position on Engine 2

1. Possible Causes

- ECU (4000KS)
- Rotor Active Clearance Start Bleed (RACSB) valve (4038KS)
- Hydromechanical Unit (HMU)
- harness HJ7

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV (BLD), HMU:
 - Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 ohms)
 - (a) If the resistance values are in the specified limits:
 - replace the Rotor Active Clearance Start Bleed (RACSB) valve (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms)
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TASK 75-21-00-810-821

Failure of the RACSB Valve in the Start Bleed Position on Engine 1

1. Possible Causes

- ECU (4000KS)
- Rotor Active Clearance Start Bleed (RACSB) valve (4038KS)
- Hydromechanical Unit (HMU)
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV (BLD), HMU:
 - Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 ohms)
 - (a) If the resistance values are in the specified limits:
 - replace the Rotor Active Clearance Start Bleed (RACSB) valve (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms)
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TASK 75-21-00-810-822

Failure of the RACSB Valve in the Start Bleed Position on Engine 2

1. Possible Causes

- ECU (4000KS)
- Rotor Active Clearance Start Bleed (RACSB) valve (4038KS)
- Hydromechanical Unit (HMU)
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV (BLD), HMU:
 - Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 ohms)
 - (a) If the resistance values are in the specified limits:
 - replace the Rotor Active Clearance Start Bleed (RACSB) valve (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms)
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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- TASK 75-21-00-810-823
- R Failure of the HPTCC Valve Channel B on Engine 1
- R 1. Possible Causes
- TCC sensor(s) R
- High Pressure Turbine Clearance Control (HPTCC) Valve
- Hydromechanical Unit (HMU)
- ECU (4000KS)
- harness HJ8
- R 2. Job Set-up Information
- R A. Referenced Information

R	REFE	RENCE	DESIGNATION
R			
R	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
R	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
R	AMM	73-21-50-000-041	Removal of the HJ8 Harness
R	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
R	AMM	73-21-50-400-041	Installation of the HJ8 Harness
R	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
R	AMM	73-21-60-400-001	Installation of the Electronic Control Unit
R			(ECU)(4000KS)
R	AMM	73-21-70-000-002	Removal of the High Pressure Turbine Clearance
R			Control (HPTCC) Sensor
R	AMM	73-21-70-400-002	Installation of the High Pressure Turbine Clearance
R			Control (HPTCC) Sensor
R	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
R			Engine Motoring)
R	AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearance
R			Control (HPTACC) Valve
R	AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active
R			Clearance Control (HPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1 on the ground (with engine R motoring) (Ref. AMM TASK 73-29-00-710-040).

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R 4. Fault Isolation

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- R A. The failure message is triggered if there is a difference between the actual position and the feedback position of the valve of more than 5% and the fault continues for more than 7 seconds.
 R (1) If the failure message HPTC VLV (POS), HMU on channel 1B, on both
 - (1) If the failure message HPTC VLV (POS), HMU on channel 1B, on both channels is not confirmed:
 - (a) No maintenance action required.
 - (2) If the failure message HPTC VLV (POS), HMU on channel 1B, on one or both channels is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - Do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for TCC SNSR, J13, ECU.

If the failure message is present:

- disconnect the TCC sensor(s).

NOTE : Engines post SB 73-046 are equipped with only one sensor.

- do a cleaning of the harness connectors and receptacles using a bristle brush with stoddart solvent (CP 2011) (Ref. AMM TASK 73-21-50-210-002).
- reconnect the connectors to the TCC sensor(s).

<u>NOTE</u>: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- 2 If the fault continues:
 - replace the TCC sensor(s) (Ref. AMM TASK 73-21-70-000-002) and (Ref. AMM TASK 73-21-70-400-002).

<u>NOTE</u>: Engines post SB 73-046 are equipped with only one sensor.

- 3 If the fault continues:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
- 4 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).

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R R R	5 If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	6 If the fault continues: replace the harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
R R	(3) If the failure message HPTC VLV (POS), HMU on channel 1B is confirmed:
R R R	(a) Disconnect the harness HJ8 from the ECU and do a check of resistance between:pins 23 and 24 (17 to 23 ohms).
R R R	If the resistance values are in specified limits: replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
R R R	a If the fault continues: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-400-002).
R R R	b If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	<pre>c If the fault continues: - replace the harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).</pre>
R R R	 (b) If the resistance values are out of the specified limits: disconnect the harness HJ8 from the HMU and do a check of the HMU resistance between: pins 23 and 24 (17 to 23 ohms).
R R R	1 If the resistance values are in the specified limits: - replace the harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
R R R	If the resistance values are out of the specified limits: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002).
R R	NOTE: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

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R B. Do the test given in para. 3.

R (1) No additional maintenance action is required if the fault is not confirmed.

R (2) Continue the fault isolation procedure if the fault continue.

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- R TASK 75-21-00-810-824
- R Failure of the HPTCC Valve Channel B on Engine 2
- R 1. Possible Causes
- R TCC sensor(s)
- R High Pressure Turbine Clearance Control (HPTCC) Valve
- R Hydromechanical Unit (HMU)
- R ECU (4000KS)
- R harness HJ8
- R 2. Job Set-up Information
- R A. Referenced Information

	REFE	RENCE	DESIGNATION
2	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
	AMM	73-21-50-000-041	Removal of the HJ8 Harness
?	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
2	AMM	73-21-50-400-041	Installation of the HJ8 Harness
2	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
} }	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
} }	AMM	73-21-70-000-002	Removal of the High Pressure Turbine Clearance Control (HPTCC) Sensor
!	AMM	73-21-70-400-002	<pre>Installation of the High Pressure Turbine Clearance Control (HPTCC) Sensor</pre>
l !	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine Motoring)
} }	AMM	75-21-10-000-002	Removal of the High Pressure Turbine Active Clearanc Control (HPTACC) Valve
₹ ₹	AMM	75-21-10-400-002	Installation of the High Pressure Turbine Active Clearance Control (HPTACC) Valve

R 3. Fault Confirmation

R A. Do the operational test of the FADEC 2 on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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R 4. Fault Isolation

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- R A. The failure message is triggered if there is a difference between the actual position and the feedback position of the valve of more than 5% and the fault continues for more than 7 seconds.
 - (1) If the failure message HPTC VLV (POS), HMU on channel 2B, on both channels is not confirmed:
 - (a) No maintenance action required.
 - (2) If the failure message HPTC VLV (POS), HMU on channel 2B, on one or both channels is not confirmed but is repetitive:
 - (a) Do the following trouble shooting at next maintenance opportunity:
 - Do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for TCC SNSR, J13, ECU.

If the failure message is present:

- disconnect the TCC sensor(s).

NOTE : Engines post SB 73-046 are equipped with only one sensor.

- do a cleaning of the harness connectors and receptacles using a bristle brush with stoddart solvent (CP 2011) (Ref. AMM TASK 73-21-50-210-002).
- reconnect the connectors to the TCC sensor(s).

<u>NOTE</u>: Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

- 2 If the fault continues:
 - replace the TCC sensor(s) (Ref. AMM TASK 73-21-70-000-002) and (Ref. AMM TASK 73-21-70-400-002).

NOTE: Engines post SB 73-046 are equipped with only one sensor.

- 3 If the fault continues:
 - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
- 4 If the fault continues:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).

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R R R	5 If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	6 If the fault continues: - replace the harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
R R	(3) If the failure message HPTC VLV (POS), HMU on channel 2B is confirmed:
R R	(a) Disconnect the harness HJ8 from the ECU and do a check of resistance between:
R	. pins 23 and 24 (17 to 23 ohms).
R R R	If the resistance values are in specified limits: - replace the High Pressure Turbine Clearance Control (HPTCC) Valve (Ref. AMM TASK 75-21-10-000-002) and (Ref. AMM TASK 75-21-10-400-002).
R R R	 <u>a</u> If the fault continues: replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-400-002).
R R R	 b If the fault continues: replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
R R R	<pre>c If the fault continues: - replace the harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).</pre>
R R R	 (b) If the resistance values are out of the specified limits: disconnect the harness HJ8 from the HMU and do a check of the HMU resistance between: pins 23 and 24 (17 to 23 ohms).
R R R	1 If the resistance values are in the specified limits: - replace the harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
R R R	If the resistance values are out of the specified limits: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002).
R R	NOTE : Tighten the connector by hand plus one eighth of a turn. If necessary use soft nose pliers.

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R B. Do the test given in para. 3.

R (1) No additional maintenance action is required if the fault is not confirmed.

R (2) Continue the fault isolation procedure if the fault continues.

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LPT ACTIVE CLEARANCE CONTROL SYSTEM - FAULT ISOLATION PROCEDURES

TASK 75-22-00-810-801

Loss of the Feedback Signal from the LPTC Valve - Engine 1 - Channel A

1. Possible Causes

- LPTC valve
- ECU (4000KS)
- harness HJ11
- harness CJ11R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
A M M	77 24 50 000 027	Paraval of the CIAAR Harasa
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance
		Control (LPTACC) Valve
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active
		Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The fault message is generated if the channel A signal is invalid, out of range.
 - (1) If the failure message LPTC VLV, J11, ECU is not confirmed:

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(a) No maintenance action is required.

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- (2) If the failure message LPTC VLV, J11, ECU is not confirmed but is repetitive:
 - disconnect the CJ11R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (c) If the fault continues during the subsequent flights:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (d) If the fault continues during the subsequent flights:
 - replace the harness HJ11 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).
- (3) If the failure message LPTC VLV, J11, ECU is confirmed:
 - disconnect the CJ11R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the CJ11R wire harness connector receptacles and the LPTC valve connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do an electrical resistance test through the LPTC valve between:
 - pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).

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(d) If the resistance values are in the specified limits:

reconnect the CJ11R harness (LPT-A) connector to the LPTC valve,

- disconnect the HJ11 harness (channel A) from the ECU (4000KS) and visually examine the receptacle for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
- 1 If damage is found:
 - repair or replace as required.
- 2 If no damage is found:
 - do an electrical resistance test through the HJ11 harness between:
 - . pins 4 and 5 (80 to 109.5 ohms)
 - pins 6 and 7 (85 to 115 ohms)
 - pins 2 and 3 (85 to 115 ohms)
 - . pins 4 and 1 (> 10 megohms)
 - . pins 6 and 1 (> 10 megohms)
 - . pins 2 and 1 (> 10 megohms)
 - . pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- 4 If the resistance values are out of the specified limits:
 - disconnect the HJ11 harness from the CJ11R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ11R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - \cdot pins 7 and 19 (85 to 115 ohms)
 - . pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - . pins 7 and 8 (> 10 megohms)
 - . pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - . pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 5 If the resistance values are in the specified limits:
 - replace the harness HJ11 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- 6 If the resistance values are out of the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026)
 and (Ref. AMM TASK 73-21-50-400-026).

EFF: ALL

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- R B. Do the test given in Para. 3.A.
- R (1) No additional maintenance action is required if the fault is not confirmed.
- R (2) Repeat the fault isolation procedure if the fault continues.

EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-802

Loss of the Feedback Signal from the LPTC Valve - Engine 2 - Channel A

1. Possible Causes

- LPTC valve
- ECU (4000KS)
- harness HJ11
- harness CJ11R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance
		Control (LPTACC) Valve
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active
		Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

R

- A. The fault message is generated if the channel A signal is invalid, out of
- (1) If the failure message LPTC VLV, J11, ECU is not confirmed:
- R (a) No maintenance action is required.

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(2) If the failure message LPTC VLV, J11, ECU is not confirmed but is R R repetitive: - disconnect the CJ11R harness (LPT-A) connector (located in the R right core compartment) from the LPTC valve and visually examine R the receptacles and the connectors for damaged pins or R contamination (Ref. AMM TASK 73-21-50-210-002). R R (a) If damage is found: - repair or replace as required. R (b) If no damage is found: R - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and R R (Ref. AMM TASK 75-22-10-400-002). (c) If the fault continues during the subsequent flights: R - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and R R (Ref. AMM TASK 73-21-60-400-001). R (d) If the fault continues during the subsequent flights: - replace the harness HJ11 (ECU to the 6 o'clock junction box) R (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-R 400-044). R (e) If the fault continues during the subsequent flights: - replace the harness CJ11R (located in the right core R compartment) (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM R TASK 73-21-50-400-026). (3) If the failure message LPTC VLV, J11, ECU is confirmed: R - disconnect the CJ11R harness (LPT-A) connector (located in the R right core compartment) from the LPTC valve and visually examine R R the CJ11R wire harness connector receptacles and the LPTC valve connectors for damaged pins or contamination (Ref. AMM TASK 73-21-R 50-210-002). R (a) If damage is found: R - repair or replace as required. (b) If no damage is found: R - do an electrical resistance test through the LPTC valve R R between: R pins 2 and 3 (80 to 109.5 ohms) pins 4 and 5 (85 to 115 ohms) R . pins 6 and 7 (85 to 115 ohms) R . pin 2 and the ground (> 10 megohms) R R pin 4 and the ground (> 10 megohms) . pin 6 and the ground (> 10 megohms). R (c) If the resistance values are out of the specified limits: R - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and R R (Ref. AMM TASK 75-22-10-400-002).

EFF: ALL

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(d) If the resistance values are in the specified limits: R R - reconnect the CJ11R harness (LPT-A) connector to the LPTC valve, R - disconnect the HJ11 harness (channel A) from the ECU (4000KS) R and visually examine the receptacle for damaged pins or R contamination (Ref. AMM TASK 73-21-50-210-002). R R If damage is found: - repair or replace as required. R R If no damage is found: R - do an electrical resistance test through the HJ11 harness R between: pins 4 and 5 (80 to 109.5 ohms) R pins 6 and 7 (85 to 115 ohms) R pins 2 and 3 (85 to 115 ohms) R R pins 4 and 1 (> 10 megohms) R pins 6 and 1 (> 10 megohms) pins 2 and 1 (> 10 megohms) R pin 4 and the ground (> 10 megohms) R pin 6 and the ground (> 10 megohms) R R pin 2 and the ground (> 10 megohms). R If the resistance values are in the specified limits: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) R and (Ref. AMM TASK 73-21-60-400-001). R If the resistance values are out of the specified limits: R - disconnect the HJ11 harness from the CJ11R harness located R at the 6 o'clock junction box and do an electrical R resistance test through the CJ11R harness between: R . pins 20 and 21 (80 to 109.5 ohms) R . pins 7 and 19 (85 to 115 ohms) R pins 2 and 9 (85 to 115 ohms) R pins 20 and 8 (> 10 megohms) R pins 7 and 8 (> 10 megohms) R \cdot pins 2 and 8 (> 10 megohms) R pin 20 and the ground (> 10 megohms) R . pin 7 and the ground (> 10 megohms) R pin 2 and the ground (> 10 megohms). R R If the resistance values are in the specified limits: - replace the harness HJ11 (ECU to the 6 o'clock junction box) R (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-R 50-400-044). If the resistance values are out of the specified limits: R - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) R and (Ref. AMM TASK 73-21-50-400-026). R R

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B. Do the test given in Para. 3.A. R

> (1) No additional maintenance action is required if the fault is not confirmed.

(2) Repeat the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-803

Loss of the Feedback Signal from the LPTC Valve - Engine 1 - Channel B

1. Possible Causes

- LPTC valve
- ECU (4000KS)
- harness HJ12
- harness CJ12R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-028	Removal of the HJ12 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The fault message is generated if the channel B signal is invalid, out of
 - (1) If the failure message LPTC VLV, J12, ECU is not confirmed:

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(a) No maintenance action is required.

EFF: ALL **SROS**

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- (2) If the failure message LPTC VLV, J12, ECU is not confirmed but is repetitive:
 - disconnect the CJ12R harness (LPT-B) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (c) If the fault continues during the subsequent flights:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (d) If the fault continues during the subsequent flights:
 - replace the harness HJ12 (ECU to the 6 o'clock junction box)
 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - (e) If the fault continues during the subsequent flights:
 - replace the harness CJ12R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).
- (3) If the failure message LPTC VLV, J12, ECU is confirmed:
 - disconnect the CJ12R harness (LPT-B) connector (located in the right core compartment) from the LPTC valve and visually examine the CJ12R wire harness connector receptacles and the LPTC valve connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do an electrical resistance test through the LPTC valve between:
 - . pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).

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(d) If the resistance values are in the specified limits:

- reconnect the CJ12R harness (LPT-B) connector to the LPTC valve,
- disconnect the HJ12 harness (channel B) from the ECU (4000KS) and visually examine the receptacle for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
- 1 If damage is found:
 - repair or replace as required.
- 2 If no damage is found:
 - do an electrical resistance test through the HJ12 harness between:
 - . pins 4 and 5 (80 to 109.5 ohms)
 - pins 6 and 7 (85 to 115 ohms)
 - pins 2 and 3 (85 to 115 ohms)
 - pins 4 and 1 (> 10 megohms)
 - . pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- 4 If the resistance values are out of the specified limits:
 - disconnect the HJ12 harness from the CJ12R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ12R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - $\boldsymbol{.}$ pins 7 and 19 (85 to 115 ohms)
 - . pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - . pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 5 If the resistance values are in the specified limits:
 - replace the harness HJ12 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 6 If the resistance values are out of the specified limits:
 - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-028)
 and (Ref. AMM TASK 73-21-50-400-028).

EFF: ALL

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R B. Do the test given in Para. 3.A.

(1) No additional maintenance action is required if the fault is not confirmed.

(2) Repeat the fault isolation procedure if the fault continues.

R R

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EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-804

Loss of the Feedback Signal from the LPTC Valve - Engine 2 - Channel B

1. Possible Causes

- LPTC valve
- ECU (4000KS)
- harness HJ12
- harness CJ12R

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The fault message is generated if the channel B signal is invalid, out of R
- (1) If the failure message LPTC VLV, J12, ECU is not confirmed:
- R (a) No maintenance action is required.

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(2) If the failure message LPTC VLV, J12, ECU is not confirmed but is R R repetitive: - disconnect the CJ12R harness (LPT-B) connector (located in the R right core compartment) from the LPTC valve and visually examine R the receptacles and the connectors for damaged pins or R contamination (Ref. AMM TASK 73-21-50-210-002). R R (a) If damage is found: - repair or replace as required. R (b) If no damage is found: R - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and R R (Ref. AMM TASK 75-22-10-400-002). (c) If the fault continues during the subsequent flights: R - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and R R (Ref. AMM TASK 73-21-60-400-001). R (d) If the fault continues during the subsequent flights: - replace the harness HJ12 (ECU to the 6 o'clock junction box) R (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-R 400-045). R (e) If the fault continues during the subsequent flights: - replace the harness CJ12R (located in the right core R compartment) (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM R TASK 73-21-50-400-028). (3) If the failure message LPTC VLV, J12, ECU is confirmed: R - disconnect the CJ12R harness (LPT-B) connector (located in the R right core compartment) from the LPTC valve and visually examine R R the CJ12R wire harness connector receptacles and the LPTC valve connectors for damaged pins or contamination (Ref. AMM TASK 73-21-R 50-210-002). R (a) If damage is found: R - repair or replace as required. (b) If no damage is found: R - do an electrical resistance test through the LPTC valve R R between: R pins 2 and 3 (80 to 109.5 ohms) pins 4 and 5 (85 to 115 ohms) R . pins 6 and 7 (85 to 115 ohms) R . pin 2 and the ground (> 10 megohms) R R pin 4 and the ground (> 10 megohms) . pin 6 and the ground (> 10 megohms). R (c) If the resistance values are out of the specified limits: R - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and R R (Ref. AMM TASK 75-22-10-400-002).

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(d) If the resistance values are in the specified limits: R R - reconnect the CJ12R harness (LPT-B) connector to the LPTC valve, R - disconnect the HJ12 harness (channel B) from the ECU (4000KS) R and visually examine the receptacle for damaged pins or R contamination (Ref. AMM TASK 73-21-50-210-002). R R If damage is found: - repair or replace as required. R R If no damage is found: R - do an electrical resistance test through the HJ12 harness R between: pins 4 and 5 (80 to 109.5 ohms) R . pins 6 and 7 (85 to 115 ohms) R pins 2 and 3 (85 to 115 ohms) R R pins 4 and 1 (> 10 megohms) R pins 6 and 1 (> 10 megohms) pins 2 and 1 (> 10 megohms) R pin 4 and the ground (> 10 megohms) R pin 6 and the ground (> 10 megohms) R R pin 2 and the ground (> 10 megohms). R If the resistance values are in the specified limits: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) R and (Ref. AMM TASK 73-21-60-400-001). R If the resistance values are out of the specified limits: R - disconnect the HJ12 harness from the CJ12R harness located R at the 6 o'clock junction box and do an electrical R resistance test through the CJ12R harness between: R . pins 20 and 21 (80 to 109.5 ohms) R . pins 7 and 19 (85 to 115 ohms) R pins 2 and 9 (85 to 115 ohms) R pins 20 and 8 (> 10 megohms) R pins 7 and 8 (> 10 megohms) R \cdot pins 2 and 8 (> 10 megohms) R pin 20 and the ground (> 10 megohms) R . pin 7 and the ground (> 10 megohms) R pin 2 and the ground (> 10 megohms). R R If the resistance values are in the specified limits: - replace the harness HJ12 (ECU to the 6 o'clock junction box) R (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-R 50-400-045). If the resistance values are out of the specified limits: R - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-028) R and (Ref. AMM TASK 73-21-50-400-028). R R

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B. Do the test given in Para. 3.A.

(1) No additional maintenance action is required if the fault is not confirmed.

(2) Repeat the fault isolation procedure if the fault continues.

R R

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EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-805

Failure of the LPTC Valve on Engine 1

1. Possible Causes

- LPTC valve
- HMU
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with
		Engine Motoring)
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance
		Control (LPTACC) Valve
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active
		Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. This fault is generated if the actual valve position disagrees with the demanded valve position for a set time interval.
 - (1) If the failure message LPTC VLV (POS), HMU is not confirmed:

R R R

- (a) No maintenance action is required.
- (2) If the failure message LPTC VLV (POS), HMU is not confirmed but is R repetitive:

NOTE: No maintenance action is required unless the fault becomes too repetitive.

- do the following steps until the fault is corrected.

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- (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
- (b) If the fault continues during the subsequent flights: - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the failure message LPTC VLV (POS), HMU is confirmed:
 - (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (b) If the fault continues:
 replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (c) If the fault continues:
 replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and
 (Ref. AMM TASK 73-21-60-400-001).
 - B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-806

Failure of the LPTC Valve on Engine 2

- 1. Possible Causes
 - LPTC valve
 - HMU
 - ECU (4000KS)
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with
		Engine Motoring)
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance
		Control (LPTACC) Valve
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active
		Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. This fault is generated if the actual valve position disagrees with the demanded valve position for a set time interval.
 - (1) If the failure message LPTC VLV (POS), HMU is not confirmed:

R (a) No maintenance action is required.

- (a) no manifectance accion to required
- R (2) If the failure message LPTC VLV (POS), HMU is not confirmed but is repetitive:

NOTE : No maintenance action is required unless the fault becomes too repetitive.

- do the following steps until the fault is corrected.

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- (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
- (b) If the fault continues during the subsequent flights: - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (c) If the fault continues during the subsequent flights:replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (3) If the failure message LPTC VLV (POS), HMU is confirmed:
 - (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (b) If the fault continues:
 replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (c) If the fault continues:
 replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and
 (Ref. AMM TASK 73-21-60-400-001).
 - B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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EFF:

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-807

R Loss of the Feedback Signals from the LPTC Valve - Engine ${\bf 1}$ - Channel A and R Channel B

1. Possible Causes

R - LPTC valve
R - ECU (4000KS)
R - harness J11
R - harness CJ11R
R - harness J12
R - harness CJ12R
R - harness HJ11

2. Job Set-up Information

- harness HJ12

A. Referenced Information

REFERENCE DESIGNATION 73-21-50-000-002 Removal of the CJ11R Harness AMM R 73-21-50-000-004 Removal of the CJ12R Harness R AMM AMM 73-21-50-000-010 Removal of the J11 Harness R 73-21-50-000-011 Removal of the J12 Harness R AMM AMM 73-21-50-000-026 Removal of the CJ11R Harness R 73-21-50-000-028 Removal of the CJ12R Harness R AMM 73-21-50-000-044 Removal of the HJ11 Harness AMM R AMM 73-21-50-000-045 Removal of the HJ12 Harness AMM 73-21-50-210-001 Visual Inspection of the Wiring Harness 73-21-50-210-002 Visual Inspection of the Wiring Harnesses R AMM AMM 73-21-50-400-002 Installation of the CJ11R Harness R 73-21-50-400-004 Installation of the CJ12R Harness AMM R R AMM 73-21-50-400-010 Installation of the J11 Harness 73-21-50-400-011 Installation of the J12 Harness AMM R Installation of the CJ11R Harness R AMM 73-21-50-400-026 Installation of the CJ12R Harness 73-21-50-400-028 R AMM Installation of the HJ11 Harness R AMM 73-21-50-400-044 R AMM 73-21-50-400-045 Installation of the HJ12 Harness AMM 73-21-60-000-001 Removal of the Electronic Control Unit (ECU)(4000KS) R Removal of the Electronic Control Unit (ECU) R AMM 73-21-60-000-001 73-21-60-400-001 Installation of the Electronic Control Unit R AMM R (ECU)(4000KS) 73-21-60-400-001 Installation of the Electronic Control Unit (ECU) R AMM R 73-29-00-710-040 Operational Test of the FADEC on the Ground (with AMM R Engine non Motoring) AMM 75-22-10-000-001 Removal of the Low Pressure Turbine Active Clearance R R Control Valve (LPTACC).

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REFERENCE	DESIGNATION	
ANN 75 33 40 000 003		
AMM 75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve	
AMM 75-22-10-400-001	Installation of the Low Pressure Turbine Active Clearance Control Valve (LPTACC).	
AMM 75-22-10-400-002	Installation of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve	

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A and 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

R **ON A/C 201-225, 227-227, 229-253, 276-281, 426-432, 476-480, 503-549, R 551-564, 701-749,

- A. The failure messages are generated if the channels A and B signals are invalid, out of range, or both channels disagree.
 - (1) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed:
 - (a) No maintenance action is required.
 - (2) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed but are repetitive:
 - disconnect the CJ11R and CJ12R harnesses from the LPTC valve (LPT-A and LPT-B connectors) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-001) and (Ref. AMM TASK 75-22-10-400-001).
 - (c) If the fault continues during the subsequent flights:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (d) If the fault continues during the subsequent flights:
 - replace the harness J11 (Ref. AMM TASK 73-21-50-000-010) and (Ref. AMM TASK 73-21-50-400-010).

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TROUBLE SHOOTING MANUAL

- (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-002) (Ref. AMM TASK 73-21-50-400-002).
- (f) If the fault continues during the subsequent flights:
 - replace the harness J12 (Ref. AMM TASK 73-21-50-000-011) and (Ref. AMM TASK 73-21-50-400-011).
- (g) If the fault continues during the subsequent flights:
 - replace the harness CJ12R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-004) (Ref. AMM TASK 73-21-50-400-004).
- (3) If the failure message LPTC VLV, J11, ECU is confirmed on channel A: - disconnect the CJ11R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve between:
 - pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)

contamination (Ref. AMM TASK 73-21-50-210-001).

- pin 4 and the ground (> 10 megohms)
- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-001) and (Ref. AMM TASK 75-22-10-400-001).
- (d) If the resistance values are in the specified limits:
 - connect the CJ11R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the J11 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - do an electrical resistance test through the J11 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - . pins 6 and 7 (85 to 115 ohms)

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- . pins 2 and 3 (85 to 115 ohms)
- pins 4 and 1 (> 10 megohms)
- pins 6 and 1 (> 10 megohms)
- . pins 2 and 1 (> 10 megohms)
- pin 4 and the ground (> 10 megohms)
- . pin 6 and the ground (> 10 megohms)
- . pin 2 and the ground (> 10 megohms).
- 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- 4 If the resistance values are out of the specified limits:
 - disconnect the J11 harness from the CJ11R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ11R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - . pins 7 and 19 (85 to 115 ohms)
 - . pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 5 If the resistance values are in the specified limits:
 - replace the harness J11 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-010) and (Ref. AMM TASK 73-21-50-400-010).
- 6 If the resistance values are out of the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-002) and (Ref. AMM TASK 73-21-50-400-002).
- (4) If the failure message LPTC VLV, J12, ECU is confirmed on channel B:
 - disconnect the CJ12R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve between:
 - . pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)

EFF: 201-225, 227-227, 229-253, 276-281, 426-432, 476-480, 503-549, 551-564, 701-749,

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- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-001) and (Ref. AMM TASK 75-22-10-400-001).
- (d) If the resistance values are in the specified limits:
 - connect the CJ12R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the J12 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - do an electrical resistance test through the J12 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pins 2 and 3 (85 to 115 ohms)
 - . pins 4 and 1 (> 10 megohms)
 - pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
 - 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - 4 If the resistance values are out of the specified limits:
 - disconnect the J12 harness from the CJ12R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ12R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - . pins 7 and 19 (85 to 115 ohms)
 - . pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - . pins 7 and 8 (> 10 megohms)
 - . pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
 - 5 If the resistance values are in the specified limits:
 - replace the harness J12 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-011) and (Ref. AMM TASK 73-21-50-400-011).

EFF: 201-225, 227-227, 229-253, 276-281, 426-432, 476-480, 503-549, 551-564, 701-749,

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<u>6</u> If the resistance values are out of the specified limits: - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-004) and (Ref. AMM TASK 73-21-50-400-004).

**ON A/C 254-275, 282-299, 433-475, 481-499, 565-599,

- A. The failure messages are generated if the channels A and B signals are invalid, out of range, or both channels disagree.
 - (1) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed:
 - (a) No maintenance action is required.
 - (2) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed but are repetitive:
 - disconnect the CJ11R and CJ12R harnesses from the LPTC valve (LPT-A and LPT-B connectors) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (c) If the fault continues during the subsequent flights:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (d) If the fault continues during the subsequent flights:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-026) (Ref. AMM TASK 73-21-50-400-026).
 - (f) If the fault continues during the subsequent flights:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - (g) If the fault continues during the subsequent flights:
 - replace the harness CJ12R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-028) (Ref. AMM TASK 73-21-50-400-028).

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- (3) If the failure message LPTC VLV, J11, ECU is confirmed on channel A: - disconnect the CJ11R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve
 - . pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (d) If the resistance values are in the specified limits:
 - connect the CJ11R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the HJ11 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - do an electrical resistance test through the HJ11 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pins 2 and 3 (85 to 115 ohms)
 - pins 4 and 1 (> 10 megohms)
 - pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
 - If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

254-275, 282-299, 433-475, 481-499, EFF:

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- If the resistance values are out of the specified limits:
 - disconnect the HJ11 harness from the CJ11R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ11R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - . pins 7 and 19 (85 to 115 ohms)
 - pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 5 If the resistance values are in the specified limits:
 - replace the harness HJ11 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- 6 If the resistance values are out of the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).
- (4) If the failure message LPTC VLV, J12, ECU is confirmed on channel B:
 - disconnect the CJ12R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve
 - . pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (d) If the resistance values are in the specified limits:
 - connect the CJ12R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the HJ12 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).

254-275, 282-299, 433-475, 481-499, EFF:

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- If damage is found:
 - repair or replace as required.
- If no damage is found:
 - do an electrical resistance test through the HJ12 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pins 2 and 3 (85 to 115 ohms)
 - pins 4 and 1 (> 10 megohms)
 - pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- If the resistance values are out of the specified limits:
 - disconnect the HJ12 harness from the CJ12R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ12R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - pins 7 and 19 (85 to 115 ohms)
 - pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- If the resistance values are in the specified limits:
 - replace the harness HJ12 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- If the resistance values are out of the specified limits:
 - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).

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- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-22-00-810-808

Loss of the Feedback Signals from the LPTC Valve - Engine 2 - Channel A and Channel B

1. Possible Causes

- LPTC valve
- ECU (4000KS)
- harness J11
- harness CJ11R
- harness J12
- harness CJ12R
- harness HJ11
- harness HJ12

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-002	Removal of the CJ11R Harness
AMM	73-21-50-000-004	Removal of the CJ12R Harness
AMM	73-21-50-000-010	Removal of the J11 Harness
AMM	73-21-50-000-011	Removal of the J12 Harness
AMM	73-21-50-000-026	Removal of the CJ11R Harness
AMM	73-21-50-000-028	Removal of the CJ12R Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-002	Installation of the CJ11R Harness
AMM	73-21-50-400-004	Installation of the CJ12R Harness
AMM	73-21-50-400-010	Installation of the J11 Harness
AMM	73-21-50-400-011	Installation of the J12 Harness
AMM	73-21-50-400-026	Installation of the CJ11R Harness
AMM	73-21-50-400-028	Installation of the CJ12R Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
Ailli	13 27 00 110 040	Engine non Motoring)
AMM	75-22-10-000-001	Removal of the Low Pressure Turbine Active Clearance Control Valve (LPTACC).

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REFE	RENCE	DESIGNATION	
AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance	
		Control (LPTACC) Valve	
AMM	75-22-10-400-001	Installation of the Low Pressure Turbine Active Clearance Control Valve (LPTACC).	
AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve	

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A and 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

R **ON A/C 201-225, 227-227, 229-253, 276-281, 426-432, 476-480, 503-549, R 551-564, 701-749,

- A. The failure messages are generated if the channels A and B signals are invalid, out of range, or both channels disagree.
 - (1) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed:
 - (a) No maintenance action is required.
 - (2) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed but are repetitive:
 - disconnect the CJ11R and CJ12R harnesses from the LPTC valve (LPT-A and LPT-B connectors) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-001) and (Ref. AMM TASK 75-22-10-400-001).
 - (c) If the fault continues during the subsequent flights:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (d) If the fault continues during the subsequent flights:
 - replace the harness J11 (Ref. AMM TASK 73-21-50-000-010) and (Ref. AMM TASK 73-21-50-400-010).

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- (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-002) (Ref. AMM TASK 73-21-50-400-002).
- (f) If the fault continues during the subsequent flights:
 - replace the harness J12 (Ref. AMM TASK 73-21-50-000-011) and (Ref. AMM TASK 73-21-50-400-011).
- (g) If the fault continues during the subsequent flights:
 - replace the harness CJ12R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-004) (Ref. AMM TASK 73-21-50-400-004).
- (3) If the failure message LPTC VLV, J11, ECU is confirmed on channel A:
 disconnect the CJ11R harness (LPT-A) connector (located in the
 - right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve between:
 - pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-001) and (Ref. AMM TASK 75-22-10-400-001).
 - (d) If the resistance values are in the specified limits:
 - connect the CJ11R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the J11 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - do an electrical resistance test through the J11 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - . pins 6 and 7 (85 to 115 ohms)

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- . pins 2 and 3 (85 to 115 ohms)
- pins 4 and 1 (> 10 megohms)
- pins 6 and 1 (> 10 megohms)
- pins 2 and 1 (> 10 megohms)
- pin 4 and the ground (> 10 megohms)
- pin 6 and the ground (> 10 megohms)
- pin 2 and the ground (> 10 megohms).
- If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- If the resistance values are out of the specified limits:
 - disconnect the J11 harness from the CJ11R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ11R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - pins 7 and 19 (85 to 115 ohms)
 - . pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - pin 2 and the ground (> 10 megohms).
- If the resistance values are in the specified limits:
 - replace the harness J11 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-010) and (Ref. AMM TASK 73-21-50-400-010).
- If the resistance values are out of the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-002) and (Ref. AMM TASK 73-21-50-400-002).
- (4) If the failure message LPTC VLV, J12, ECU is confirmed on channel B:
 - disconnect the CJ12R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve between:
 - . pins 2 and 3 (80 to 109.5 ohms)
 - . pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)

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- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-001) and (Ref. AMM TASK 75-22-10-400-001).
- (d) If the resistance values are in the specified limits:
 - connect the CJ12R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the harness J12 from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - do an electrical resistance test through the J12 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - pins 6 and 7 (85 to 115 ohms)
 - . pins 2 and 3 (85 to 115 ohms)
 - pins 4 and 1 (> 10 megohms)
 - pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
 - 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 4 If the resistance values are out of the specified limits:
 - disconnect the J12 harness from the CJ12R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ12R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - . pins 7 and 19 (85 to 115 ohms)
 - . pins 2 and 9 (85 to 115 ohms)
 - . pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - . pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
 - 5 If the resistance values are in the specified limits:
 - replace the harness J12 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-011) and (Ref. AMM TASK 73-21-50-400-011).

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<u>6</u> If the resistance values are out of the specified limits: - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-004) and (Ref. AMM TASK 73-21-50-400-004).

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- A. The failure messages are generated if the channels A and B signals are invalid, out of range, or both channels disagree.
 - (1) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed:
 - (a) No maintenance action is required.
 - (2) If the failure messages LPTC VLV, J11, ECU and LPTC VLV, J12, ECU are not confirmed but are repetitive:
 - disconnect the CJ11R and CJ12R harnesses from the LPTC valve (LPT-A and LPT-B connectors) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (c) If the fault continues during the subsequent flights:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (d) If the fault continues during the subsequent flights:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-026) (Ref. AMM TASK 73-21-50-400-026).
 - (f) If the fault continues during the subsequent flights:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - (g) If the fault continues during the subsequent flights:
 - replace the harness CJ12R (located in the right core compartment) (Ref. AMM TASK 73-21-50-000-028) (Ref. AMM TASK 73-21-50-400-028).

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- (3) If the failure message LPTC VLV, J11, ECU is confirmed on channel A: - disconnect the CJ11R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve
 - . pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (d) If the resistance values are in the specified limits:
 - connect the CJ11R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the HJ11 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - do an electrical resistance test through the HJ11 harness between:
 - pins 4 and 5 (80 to 109.5 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pins 2 and 3 (85 to 115 ohms)
 - pins 4 and 1 (> 10 megohms)
 - pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
 - If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- If the resistance values are out of the specified limits:
 - disconnect the HJ11 harness from the CJ11R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ11R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - . pins 7 and 19 (85 to 115 ohms)
 - pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)
 - pin 20 and the ground (> 10 megohms)
 - pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 5 If the resistance values are in the specified limits:
 - replace the harness HJ11 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- 6 If the resistance values are out of the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).
- (4) If the failure message LPTC VLV, J12, ECU is confirmed on channel B:
 - disconnect the CJ12R harness (LPT-A) connector (located in the right core compartment) from the LPTC valve and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do the electrical resistance test through the LPTC valve
 - . pins 2 and 3 (80 to 109.5 ohms)
 - pins 4 and 5 (85 to 115 ohms)
 - . pins 6 and 7 (85 to 115 ohms)
 - . pin 2 and the ground (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms).
 - (c) If the resistance values are out of the specified limits:
 - replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (d) If the resistance values are in the specified limits:
 - connect the CJ12R harness (LPT-A) connector to the LPTC valve receptacle (located in the right core compartment),
 - disconnect the HJ12 harness from the ECU (4000KS) and visually examine the receptacles and the connectors for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).

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- 1 If damage is found:
 - repair or replace as required.
- 2 If no damage is found:
 - do an electrical resistance test through the HJ12 harness between:
 - . pins 4 and 5 (80 to 109.5 ohms)
 - pins 6 and 7 (85 to 115 ohms)
 - . pins 2 and 3 (85 to 115 ohms)
 - pins 4 and 1 (> 10 megohms)
 - . pins 6 and 1 (> 10 megohms)
 - pins 2 and 1 (> 10 megohms)
 - pin 4 and the ground (> 10 megohms)
 - . pin 6 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 3 If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- 4 If the resistance values are out of the specified limits:
 - disconnect the HJ12 harness from the CJ12R harness located at the 6 o'clock junction box and do an electrical resistance test through the CJ12R harness between:
 - . pins 20 and 21 (80 to 109.5 ohms)
 - . pins 7 and 19 (85 to 115 ohms)
 - pins 2 and 9 (85 to 115 ohms)
 - pins 20 and 8 (> 10 megohms)
 - \cdot pins 7 and 8 (> 10 megohms)
 - pins 2 and 8 (> 10 megohms)pin 20 and the ground (> 10 megohms)
 - . pin 7 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms).
- 5 If the resistance values are in the specified limits:
 - replace the harness HJ12 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 6 If the resistance values are out of the specified limits:
 - replace the harness CJ12R (Ref. AMM TASK 73-21-50-000-028) and (Ref. AMM TASK 73-21-50-400-028).

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- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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TASK 75-22-00-810-809

Failure of the LPTC Valve on Engine 1

1. Possible Causes

- LPTC valve
- HMU
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
R R		73-21-10-000-002 73-21-10-400-002	Removal of the Hydromechanical Unit (HMU) Installation of the Hydromechanical Unit (HMU)	
R		73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
R		73-21-60-400-001 73-29-00-710-040	Installation of the Electronic Control Unit (ECU) Operational Test of the FADEC on the ground (with Engine Motoring)	
R R	AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve	
R R	AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve	

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : If ECU 1820M36P02 or 1820M89P02 is installed, the confirmation test is not required.

4. Fault Isolation

- A. This fault is generated if the actual valve position disagrees with the demanded valve position for a set time interval.
 - (1) If the failure message LPTC VLV (POS), HMU is not confirmed:
 - (a) No maintenance action is required.
 - (2) If the failure message LPTC VLV (POS), HMU is not confirmed but is repetitive:

NOTE : No maintenance action is required unless the fault becomes too repetitive.

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- do the following steps until the fault is corrected.
- R (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002). R
 - (b) If the fault continues during the subsequent flights: - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If the fault continues during the subsequent flights: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (3) If the failure message LPTC VLV (POS), HMU is confirmed:
 - (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (b) If the fault continues: - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - B. Do the test given in Para. 3.A.

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TASK 75-22-00-810-810

Failure of the LPTC Valve on Engine 2

1. Possible Causes

- LPTC valve
- HMU
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION
R	ΔΜΜ	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
R		73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
R		73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
R	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
R R	AMM	75-22-10-000-002	Removal of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve
R R	AMM	75-22-10-400-002	Installation of the Low Pressure Turbine Active Clearance Control (LPTACC) Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : If ECU 1820M36P02 or 1820M89P02 is installed, the confirmation test is not required.

4. Fault Isolation

- A. This fault is generated if the actual valve position disagrees with the demanded valve position for a set time interval.
 - (1) If the failure message LPTC VLV (POS), HMU is not confirmed:
 - (a) No maintenance action is required.
 - (2) If the failure message LPTC VLV (POS), HMU is not confirmed but is repetitive:

NOTE : No maintenance action is required unless the fault becomes too repetitive.

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- do the following steps until the fault is corrected.

- R (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. R AMM TASK 75-22-10-400-002).
 - (b) If the fault continues during the subsequent flights: - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).

 - (3) If the failure message LPTC VLV (POS), HMU is confirmed:
 - (a) Replace the LPTC valve (Ref. AMM TASK 75-22-10-000-002) and (Ref. AMM TASK 75-22-10-400-002).
 - (b) If the fault continues:
 replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If the fault continues:
 replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - B. Do the test given in Para. 3.A.

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ROTOR ACTIVE CLEARANCE CONTROL SYSTEM (RACC) - FAULT ISOLATION PROCEDURES

TASK 75-23-00-810-805-A

Failure of the RACSB Valve on Engine 1

1. Possible Causes

- ECU (4000KS)
- rotor active-clearance-control and Start Bleed (RACSB) valve
- HMU
- harness HJ7

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, HMU:
 - Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the rotor active-clearance-control and Start Bleed (RACSB) valve (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-806-A

Failure of the RACSB Valve on Engine 2

1. Possible Causes

- ECU (4000KS)
- rotor active-clearance-control and Start Bleed (RACSB) valve
- harness HJ7

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, HMU:
 - Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the rotor active-clearance-control and Start Bleed (RACSB) valve (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-807-A

Loss of the feedback signal from the RACSB Valve through the two channels on Engine 1

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness HJ12
- harness CJ11L
- harness CJ12L
- RACSB valve

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1A and 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, J11, ECU and RAC VLV, J12, ECU:
 - Disconnect the HJ11 and HJ12 harnesses from the J11 and J12 receptacles on the ECU (4000KS). Make sure that the electrical contacts of the J11 and J12 receptacles are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (2) Do a resistance check of the RACSB valve circuits through the HJ11 and HJ12 harnesses, between:
 - . pins 40 and 41 (80 to 100 0hms)
 - . pins 20 and 39 (32 to 40 0hms)
 - . pins 8 and 22 (23 to 29 0hms)
 - . pins 40 and 21 (> 10 Megohms)
 - . pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - . pin 40 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables HJ11 and HJ12 from the cables CJ11L and CJ12L at the 6 o' clock junction box and do a resistance check of the cables CJ11L and CJ12L between: for cable CJ11L
 - . pins 8 and 10 (80 to 100 ohms)
 - . pins 11 and 12 (32 to 40 ohms)
 - . pins 13 and 14 (23 to 29 ohms)
 - pins 8 and 9 (> 10 Megohms)
 - pins 11 and 9 (> 10 Megohms)
 - pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> to Megohms)
 - . pin 11 and the ground (> 10 Megohms)
 - . pin 13 and the ground (> 10 Megohms)

for cable CJ12L

- . pins 2 and 3 (80 to 100 ohms)
- . pins 11 and 12 (32 to 40 ohms)
- . pins 13 and 14 (23 to 29 ohms)
- pins 2 and 1 (> 10 Megohms)
- pins 11 and 1 (> 10 Megohms)
- pins 13 and 1 (> 10 Megohms)
- . pin 2 and ground (> to Megohms)
- pin 11 and ground (> 10 Megohms)

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- . pin 13 and ground (> 10 Megohms).
- 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11L and CJ12L from the RACSB valve and do a resistance check of the RACSB valve between:
 - pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - . pins 6 and 7 (23 to 29 0hms)
 - pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - pin 6 and the ground (> 10 Megohms)
 - a If the resistance values are in the specified limits:
 - replace the defective: harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025) or harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - <u>b</u> If the resistance values are out of the specified limits: - replace the RACSB valve (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-808-A

Loss of the feedback signal from the RACSB Valve through the two channels on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness HJ12
- harness CJ11L
- harness CJ12L
- RACSB valve

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2A and 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, J11, ECU and RAC VLV, J12, ECU:
 - Disconnect the HJ11 and HJ12 harnesses from the J11 and J12 receptacles on the ECU (4000KS). Make sure that the electrical contacts of the J11 and J12 receptacles are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (2) Do a resistance check of the RACSB valve circuits through the HJ11 and HJ12 harnesses, between:
 - . pins 40 and 41 (80 to 100 0hms)
 - . pins 20 and 39 (32 to 40 0hms)
 - . pins 8 and 22 (23 to 29 0hms)
 - . pins 40 and 21 (> 10 Megohms)
 - . pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - pin 40 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables HJ11 and HJ12 from the cables CJ11L and CJ12L at the 6 o'clock junction box and do a resistance check of the cables CJ11L and CJ12L between: for cable CJ11L
 - . pins 8 and 10 (80 to 100 ohms)
 - . pins 11 and 12 (32 to 40 ohms)
 - . pins 13 and 14 (23 to 29 ohms)
 - pins 8 and 9 (> 10 Megohms)
 - pins 11 and 9 (> 10 Megohms)
 - pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> to Megohms)
 - . pin 11 and the ground (> 10 Megohms)
 - . pin 13 and the ground (> 10 Megohms)

for cable CJ12L

- . pins 2 and 3 (80 to 100 ohms)
- . pins 11 and 12 (32 to 40 ohms)
- . pins 13 and 14 (23 to 29 ohms)
- pins 2 and 1 (> 10 Megohms)
- pins 11 and 1 (> 10 Megohms)
- . pins 13 and 1 (> 10 Megohms)
- . pin 2 and ground (> to Megohms)
- pin 11 and ground (> 10 Megohms)

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- . pin 13 and ground (> 10 Megohms).
- 1 If the resistance values are in the specified limits:
- replace the defective harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11L and CJ12L from the RACSB valve and do a resistance check of the RACSB valve between:
 - pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - . pins 6 and 7 (23 to 29 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - . pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the defective: harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025) or harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - <u>b</u> If the resistance values are out of the specified limits: - replace the RACSB valve (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-809-A

Loss of the feedback signal from the RACSB Valve through the channel A on Engine 1

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness CJ11L
- VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	71-13-00-010-040	Opening of the Fan Cowl Doors
AMM	71-13-00-410-040	Closing of the Fan Cowl Doors
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040)

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, J11, ECU:
 - open the fan cowl doors 437AL and 438AR (Ref. AMM TASK 71-13-00-010-040).
 - disconnect the HJ11 harness from the J11 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J11 receptacle are not bent or have not moved.

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- (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do a resistance check of the RACSB valve circuits (channel A), through HJ11 and CJ11L harnesses, between :
 - pins 40 and 41 (80 to 100 0hms)
 - pins 20 and 39 (32 to 40 0hms)
 - pins 8 and 22 (23 to 29 0hms)
 - pins 40 and 21 (more than 10 Megohms)
 - pins 20 and 21 (more than 10 Megohms)
 - pins 8 and 21 (more than 10 Megohms)
 - pin 40 and the ground (more than 10 Megohms)
 - pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ11 from the cable CJ11L at the 6 o'clock junction box and do a resistance check of the RACSB valve circuits (channel A), through the CJ11L harness between:
 - pins 8 and 10 (80 to 100 ohms)
 - . pins 11 and 12 (32 to 40 ohms)
 - . pins 13 and 14 (23 to 29 ohms)
 - pins 8 and 9 (more than 10 Megohms)
 - pins 11 and 9 (more than 10 Megohms)
 - . pins 13 and 9 (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - pin 11 and the ground (more than 10 Megohms)
 - pin 13 and the ground (more than 10 Megohms)
 - If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - If the resistance values are out of the specified limits:
 - disconnect the CJ11L harness from the RACSB valve and do a resistance check of the RACSB valve circuits (channel A) between:
 - . pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - pins 6 and 7 (23 to 29 0hms)
 - pin 2 and Ground (more than 10 Megohms)
 - pin 4 and Ground (more than 10 Megohms)
 - . pin 6 and Ground (more than 10 Megohms).
 - If the resistance values are in the specified limits:
 - replace the harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).

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- <u>b</u> If the resistance values are out of the specified limits: - replace the VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
- (3) Connect the disconnected harnesses.
- (4) Close the fan cowl doors 437AL and 438AR (Ref. AMM TASK 71-13-00-410-040).
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-810-A

Loss of the feedback signal from the RACSB Valve through the channel ${\bf A}$ on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness CJ11L
- VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	71-13-00-010-040	Opening of the Fan Cowl Doors
AMM	71-13-00-410-040	Closing of the Fan Cowl Doors
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed
		Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start
		Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, J11, ECU:
 - open the fan cowl doors 447AL and 448AR (Ref. AMM TASK 71-13-00-010-040).
 - disconnect the HJ11 harness from the J11 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J11 receptacle are not bent or have not moved.

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- (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do a resistance check of the RACSB valve circuits (channel A), through HJ11 and CJ11L harnesses, between:
 - pins 40 and 41 (80 to 100 0hms)
 - pins 20 and 39 (32 to 40 0hms)
 - pins 8 and 22 (23 to 29 0hms)
 - pins 40 and 21 (more than 10 Megohms)
 - pins 20 and 21 (more than 10 Megohms)
 - pins 8 and 21 (more than 10 Megohms)
 - pin 40 and the ground (more than 10 Megohms)
 - pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ11 from the cable CJ11L at the 6 o'clock junction box and do a resistance check of the RACSB valve circuits (channel A), through the CJ11L harness between:
 - pins 8 and 10 (80 to 100 ohms)
 - . pins 11 and 12 (32 to 40 ohms)
 - . pins 13 and 14 (23 to 29 ohms)
 - pins 8 and 9 (more than 10 Megohms)
 - pins 11 and 9 (more than 10 Megohms)
 - . pins 13 and 9 (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - pin 11 and the ground (more than 10 Megohms)
 - pin 13 and the ground (more than 10 Megohms)
 - If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - If the resistance values are out of the specified limits:
 - disconnect the CJ11L harness from the RACSB valve and do a resistance check of the RACSB valve circuits (channel A) between:
 - . pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - pins 6 and 7 (23 to 29 0hms)
 - pin 2 and Ground (more than 10 Megohms)
 - pin 4 and Ground (more than 10 Megohms)
 - . pin 6 and Ground (more than 10 Megohms).
 - If the resistance values are in the specified limits:
 - replace the harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).

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- <u>b</u> If the resistance values are out of the specified limits: - replace the VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
- (3) Connect the disconnected harnesses.
- (4) Close the fan cowl doors 447AL and 448AR (Ref. AMM TASK 71-13-00-410-040).
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-811-A

Loss of the feedback signal from the RACSB Valve through the channel ${\bf B}$ on Engine 1

1. Possible Causes

- ECU (4000KS)
- harness HJ12
- harness CJ12L
- VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	71-13-00-010-040	Opening of the Fan Cowl Doors
AMM	71-13-00-410-040	Closing of the Fan Cowl Doors
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, J12, ECU:
 - open the fan cowl doors 437AL and 438AR (Ref. AMM TASK 71-13-00-010-040).
 - disconnect the HJ12 harness from the J12 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J12 receptacle are not bent or have not moved.

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- (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do a resistance check of the RACSB valve circuits (channel B), through HJ12 and CJ12L harnesses, between:
 - pins 40 and 41 (80 to 100 0hms)
 - pins 20 and 39 (32 to 40 0hms)
 - pins 8 and 22 (23 to 29 0hms)
 - pins 40 and 21 (more than 10 Megohms)
 - . pins 20 and 21 (more than 10 Megohms)
 - pins 8 and 21 (more than 10 Megohms)
 - pin 40 and the ground (more than 10 Megohms)
 - pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ12 from the cable CJ12L at the 6 o'clock junction box and do a resistance check of the RACSB valve circuits (channel B), through the CJ12L harness between:
 - . pins 2 and 3 (80 to 100 ohms)
 - . pins 4 and 5 (32 to 40 ohms)
 - . pins 12 and 13 (23 to 29 ohms)
 - . pins 2 and 1 (more than 10 Megohms)
 - pins 4 and 1 (more than 10 Megohms)
 - pins 12 and 1 (more than 10 Megohms)pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - pin 6 and ground (more than 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the CJ12L harness from the RACSB valve and do a resistance check of the RACSB valve circuits (channel B) between:
 - . pins 2 and 3 (80 to 100 0hms)
 - . pins 4 and 5 (32 to 40 0hms)
 - . pins 6 and 7 (23 to 29 0hms)
 - pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - . pin 6 and ground (more than 10 Megohms).
 - $\underline{\underline{a}}$ If the resistance values are in the specified limits:
 - replace the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).

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- <u>b</u> If the resistance values are out of the specified limits: - replace the VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
- (3) Connect the disconnected harnesses.
- (4) Close the fan cowl doors 437AL and 438AR (Ref. AMM TASK 71-13-00-410-040).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-23-00-810-812-A

Loss of the feedback signal from the RACSB Valve through the channel ${\bf B}$ on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ12
- harness CJ12L
- VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	71-13-00-010-040	Opening of the Fan Cowl Doors
AMM	71-13-00-410-040	Closing of the Fan Cowl Doors
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, J12, ECU:
 - open the fan cowl doors 447AL and 448AR (Ref. AMM TASK 71-13-00-010-040).
 - disconnect the HJ12 harness from the J12 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J12 receptacle are not bent or have not moved.

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- (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do a resistance check of the RACSB valve circuits (channel B), through HJ12 and CJ12L harnesses, between:
 - pins 40 and 41 (80 to 100 0hms)
 - pins 20 and 39 (32 to 40 0hms)
 - pins 8 and 22 (23 to 29 0hms)
 - pins 40 and 21 (more than 10 Megohms)
 - pins 20 and 21 (more than 10 Megohms)
 - pins 8 and 21 (more than 10 Megohms)
 - pin 40 and the ground (more than 10 Megohms)
 - pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ12 from the cable CJ12L at the 6 o'clock junction box and do a resistance check of the RACSB valve circuits (channel B), through the CJ12L harness between:
 - . pins 2 and 3 (80 to 100 ohms)
 - . pins 4 and 5 (32 to 40 ohms)
 - . pins 12 and 13 (23 to 29 ohms)
 - pins 2 and 1 (more than 10 Megohms)
 - pins 4 and 1 (more than 10 Megohms)
 - . pins 12 and 1 (more than 10 Megohms)
 - pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - pin 6 and ground (more than 10 Megohms)
 - If the resistance values are in the specified limits:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - If the resistance values are out of the specified limits:
 - disconnect the CJ12L harness from the RACSB valve and do a resistance check of the RACSB valve circuits (channel B) between:
 - . pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - pins 6 and 7 (23 to 29 0hms)
 - pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - . pin 6 and ground (more than 10 Megohms).
 - If the resistance values are in the specified limits:
 - replace the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).

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- <u>b</u> If the resistance values are out of the specified limits: - replace the VALVE-ROTOR ACTIVE CLEARANCE START BLEED (RACSB) (4038KS) (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
- (3) Connect the disconnected harnesses.
- (4) Close the fan cowl doors 447AL and 448AR (Ref. AMM TASK 71-13-00-410-040).
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-817

Failure of the RACSB Valve on Engine 1

1. Possible Causes

- ECU (4000KS)
- rotor active-clearance-control and Start Bleed (RACSB) valve
- HMII
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, HMU:
 - Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the rotor active-clearance-control and Start Bleed (RACSB) valve (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TASK 75-23-00-810-818

Failure of the RACSB Valve on Engine 2

1. Possible Causes

- ECU (4000KS)
- rotor active-clearance-control and Start Bleed (RACSB) valve
- HMII
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-23-10-000-002	Removal of the Rotor Active Clearance Start Bleed Valve (4038KS)
AMM	75-23-10-400-002	Installation of the Rotor Active Clearance Start Bleed Valve (4038KS)

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message RAC VLV, HMU:
 - Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

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- (2) Do a resistance check of the RACSB valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the rotor active-clearance-control and Start Bleed (RACSB) valve (Ref. AMM TASK 75-23-10-000-002) and (Ref. AMM TASK 75-23-10-400-002).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

ECU COOLING SYSTEM - FAULT ISOLATION PROCEDURES

TASK 75-24-00-810-805

Failure of the Control of the ECU Cooling Eductor Valve through the Two Channels on Engine 1

- 1. Possible Causes
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE DESIGNATION

AMM 73-29-00-710-040

Operational Test of the FADEC on the Ground (with Engine non Motoring)

- 3. Fault Confirmation
 - A. Do the operational test of the FADEC 1A and 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).
- 4. Fault Isolation
 - A. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-24-00-810-806

Failure of the Control of the ECU Cooling Eductor Valve through the two Channels on Engine 2

- 1. Possible Causes
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE	DESIGNATION
AMM 73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)

- 3. Fault Confirmation
 - A. Do the operational test of the FADEC 2A and 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).
- 4. Fault Isolation
 - A. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

NACELLE COMPARTMENT AND ACCESSORY COOLING - FAULT ISOLATION PROCEDURES

TASK 75-25-00-810-819

Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 1 Channel A

1. Possible Causes

- HJ7 harness
- ECU (4000KS)
- HMU

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
АММ	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

<u>NOTE</u>: The fault is generated if there is an open or short to ground in the NAC system torque motor current loop.

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4. Fault Isolation

- A. If the test does not give the maintenance message J7, HMU (NAC TM), ECU
 - (1) If the maintenance message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ7 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the HJ7 harness connector - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - If something is found on the ECU receptacle
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If nothing is found, reconnect the HJ7 harness to the ECU then disconnect the HJ7 harness from the HMU receptacle and visually examine the HJ7 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the harness HJ7 connector, replace the HJ7 harness (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - If something is found on the HMU receptacle, replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If nothing is found, reconnect the HJ7 harness to the HMU and replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 4 If the fault continues during subsequent flights replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 5 If the fault continues during subsequent flights - replace the HJ7 harness (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
- B. If the test gives the maintenance message J7, HMU (NAC TM), ECU
 - (1) Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ7 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).

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- (a) If something is found on the HJ7 harness connector
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
- (b) If something is found on the ECU receptacle
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (c) If nothing is found
 - do an electrical resistance check through the HJ7 harness between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - pins 20 and the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ7 harness to the ECU (4000KS) and continue the trouble shooting as follows
- (2) Disconnect the HJ7 harness from the HMU and visually examine the wiring harness connector and the HMU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (a) If something is found on the HJ7 harness connector
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - (b) If something is found on the HMU receptacle
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If nothing is found
 - do an electrical resistance check on the HMU receptacle between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - 1 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 2 If the resistance values are in the specified limits:
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).

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- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-820

Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 1 Channel B

1. Possible Causes

- HJ8 harness
- ECU (4000KS)
- HMU

2. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
AMM 73-21-10-000-002 AMM 73-21-10-400-002 AMM 73-21-50-000-041 AMM 73-21-50-210-001 AMM 73-21-50-400-041 AMM 73-21-60-000-001 AMM 73-21-60-400-001 AMM 73-29-00-710-040	Removal of the Hydromechanical Unit (HMU) Installation of the Hydromechanical Unit (HMU) Removal of the HJ8 Harness Visual Inspection of the Wiring Harness Installation of the HJ8 Harness Removal of the Electronic Control Unit (ECU) Installation of the Electronic Control Unit (ECU) Operational Test of the FADEC on the Ground (with
	Engine non Motoring)

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE: The fault is generated if there is an open or short to ground in the NAC system torque motor current loop.

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4. Fault Isolation

- A. If the test does not give the maintenance message J8, HMU (NAC TM), ECU
 - (1) If the maintenance message is not confirmed and is not repetitive:

 no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ8 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the HJ8 harness connector - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - If something is found on the ECU receptacle
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If nothing is found, reconnect the HJ8 harness to the ECU then disconnect the HJ8 harness from the HMU receptacle and visually examine the HJ8 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the harness HJ8 connector, replace the HJ8 harness (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - If something is found on the HMU receptacle, replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If nothing is found, reconnect the HJ8 harness to the HMU and replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 4 If the fault continues during subsequent flights replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 5 If the fault continues during subsequent flights - replace the HJ8 harness (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
- B. If the test gives the maintenance message J8, HMU (NAC TM), ECU
 - (1) Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ8 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If something is found on the HJ8 harness connector
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
- (b) If something is found on the ECU receptacle
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (c) If nothing is found
 - Do an electrical resistance check through the HJ8 harness between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - pins 20 and the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ8 harness to the ECU (4000KS) and continue the trouble shooting.
- (2) Disconnect the HJ8 harness from the HMU and visually examine the wiring harness connector and the HMU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (a) If something is found on the HJ8 harness connector
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - (b) If something is found on the HMU receptacle
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If nothing is found
 - do an electrical resistance check on the HMU receptacle between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - 1 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 2 If the resistance values are in the specified limits:
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).

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- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-821

Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 2 Channel A

1. Possible Causes

- HJ7 harness
- ECU (4000KS)
- HMU

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Demoved of the Hydromechenical Heit (HMII)
	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU) Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-004	Removal of the CJ12R Harness
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : The fault is generated if there is an open or short to ground in the NAC system torque motor current loop.

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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance message J7, HMU (NAC TM), ECU
 - (1) If the maintenance message is not confirmed and is not repetitive:

 no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ7 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the HJ7 harness connector - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If something is found on the ECU receptacle
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If nothing is found, reconnect the HJ7 harness to the ECU then disconnect the HJ7 harness from the HMU receptacle and visually examine the HJ7 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the harness HJ7 connector, replace the HJ7 harness (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - If something is found on the HMU receptacle, replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If nothing is found, reconnect the HJ7 harness to the HMU and replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 4 If the fault continues during subsequent flights replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 5 If the fault continues during subsequent flights - replace the HJ7 harness (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
- B. If the test gives the maintenance message J7, HMU (NAC TM), ECU
 - (1) Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ7 wiring harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If something is found on the HJ7 harness connector
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-004) and (Ref. AMM TASK 73-21-50-400-040).
- (b) If something is found on the ECU receptacle
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (c) If nothing is found
 - do an electrical resistance check through the HJ7 harness between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - pins 20 and the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ7 harness to the ECU (4000KS) and continue the trouble shooting as follows:
- (2) Disconnect the HJ7 harness from the HMU and visually examine the wire harness connector and the HMU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (a) If something is found on the HJ7 harness connector
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - (b) If something is found on the HMU receptacle
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If nothing is found
 - do an electrical resistance check on the HMU receptacle between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - 1 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 2 If the resistance values are in the specified limits:
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040)
 and (Ref. AMM TASK 73-21-50-400-040).

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- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-822

Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 2 Channel B

1. Possible Causes

- HJ8 harness
- ECU (4000KS)
- HMU

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM AMM AMM AMM AMM AMM	73-21-10-000-002 73-21-10-400-002 73-21-50-000-041 73-21-50-210-001 73-21-50-400-041 73-21-60-000-001 73-21-60-400-001 73-29-00-710-040	Removal of the Hydromechanical Unit (HMU) Installation of the Hydromechanical Unit (HMU) Removal of the HJ8 Harness Visual Inspection of the Wiring Harness Installation of the HJ8 Harness Removal of the Electronic Control Unit (ECU) Installation of the Electronic Control Unit (ECU) Operational Test of the FADEC on the Ground (with Engine non Motoring)

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE: The fault is generated if there is an open or short to ground in the NAC system torque motor current loop.

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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance message J8, HMU (NAC TM), ECU
 - (1) If the maintenance message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive: - do the following steps until the fault is corrected
 - (a) Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ8 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the HJ8 harness connector - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If something is found on the ECU receptacle
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If nothing is found, reconnect the HJ8 harness to the ECU then disconnect the HJ8 harness from the HMU receptacle and visually examine the HJ8 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - If something is found on the harness HJ8 connector, replace the HJ8 harness (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - If something is found on the HMU receptacle, replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If nothing is found, reconnect the HJ8 harness to the HMU and replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 4 If the fault continues during subsequent flights replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 5 If the fault continues during subsequent flights - replace the HJ8 harness (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
- B. If the test gives the maintenance message J8, HMU (NAC TM), ECU
 - (1) Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS) and visually examine the ECU (4000KS) receptacle and the HJ8 wiring harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If something is found on the HJ8 harness connector
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
- (b) If something is found on the ECU receptacle
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (c) If nothing is found
 - do an electrical resistance check through the HJ8 harness between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - pins 20 and the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ8 harness to the ECU (4000KS) and continue the trouble shooting as follows:
- (2) Disconnect the HJ8 harness from the HMU and visually examine the wiring harness connector and the HMU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (a) If something is found on the HJ8 harness connector
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - (b) If something is found on the HMU receptacle
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (c) If nothing is found
 - do an electrical resistance check on the HMU receptacle between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - 1 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 2 If the resistance values are in the specified limits:
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).

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- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-823

Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 1 Dual Channels

1. Possible Causes

- ECU (4000KS)
- HMU
- HJ7 harness
- HJ8 harness

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
75_2	5_00_910_910	Failure of the Torque Motor Current of the Nacelle
75-25-00-810-819		Cooling System, on Engine 1 Channel A
75-2	5-00-810-820	Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 1 Channel B
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A and 1B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

<u>NOTE</u>: The fault is generated if there is an open or short to ground in the NAC system torque motor current loop, on both channel A and channel B. There is no known single failure mode that will generate a dual channel fault. Investigation of each channel independently is required.

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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance messages J7, HMU (NAC TM), ECU and J8, HMU (NAC TM), ECU
 - (1) If the maintenance messages are not confirmed and are not repetitive: - no maintenance action is required.
 - (2) If the maintenance messages are not confirmed but are repetitive: replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001)
 - (a) If the fault continues during subsequent flights
 - replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 1 If the fault continues during subsequent flights
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
- B. Do this procedure:
 - (1) If the test gives the maintenance message J7, HMU (NAC TEMP), ECU on channel A only:
 - do the fault isolation procedure Para. 4. B. (Ref. TASK 75-25-00-810-819).
 - (2) If the test gives the maintenance message J8, HMU (NAC TEMP), ECU on channel B only:
 - do the fault isolation procedure Para. 4.B. (Ref. TASK 75-25-00-810-820).
 - (3) If the test gives the maintenance messages J7, HMU (NAC TEMP), ECU and J8, HMU (NAC TEMP), ECU
 - do the fault isolation procedures Para. 4. B. (Ref. TASK 75-25-00-810-819) and (Ref. TASK 75-25-00-810-820).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:- no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-824

Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 2 Dual Channels

1. Possible Causes

- ECU (4000KS)
- HMU
- HJ7 harness
- HJ8 harness

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION DESIGNATION
75.0	5 00 040 004	
75-25-00-810-821		Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 2 Channel A
75-2	5-00-810-822	Failure of the Torque Motor Current of the Nacelle Cooling System, on Engine 2 Channel B
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A and 2B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

<u>NOTE</u>: The fault is generated if there is an open or short to ground in the NAC system torque motor current loop, on both channel A and channel B. There is no known single failure mode that will generate a dual channel fault. Investigation of each channel independently is required.

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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance messages J7, HMU (NAC TM), ECU and J8, HMU (NAC TM), ECU
 - (1) If the maintenance messages are not confirmed and are not repetitive: - no maintenance action is required.
 - (2) If the maintenance messages are not confirmed but are repetitive: replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001)
 - (a) If the fault continues during subsequent flights
 - replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - 1 If the fault continues during subsequent flights
 - replace the HJ7 harness, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - replace the HJ8 harness, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
- B. Do this procedure:
 - (1) If the test gives the maintenance message J7, HMU (NAC TEMP), ECU on channel A only:
 - do the fault isolation procedure Para. 4. B. (Ref. TASK 75-25-00-810-821).
 - (2) If the test gives the maintenance message J8, HMU (NAC TEMP), ECU on channel B only:
 - do the fault isolation procedure Para. 4.B. (Ref. TASK 75-25-00-810-822).
 - (3) If the test gives the maintenance messages J7, HMU (NAC TEMP), ECU and J8, HMU (NAC TEMP), ECU
 - do the fault isolation procedures Para. 4. B. (Ref. TASK 75-25-00-810-821) and (Ref. TASK 75-25-00-810-822).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:- no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-826

Loss of the Feedback Signal from the Nacelle Cooling Valve, on Engine 1 Channel ${\bf A}$

- 1. Possible Causes
 - NAC VALVE
 - ECU (4000KS)
 - CJ11L harness
 - HJ11 harness
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE	DESIGNATION
AMM 73-21-50-000-025	Removal of the CJ11L Harness
AMM 73-21-50-000-044	Removal of the HJ11 Harness
AMM 73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM 73-21-50-400-025	Installation of the CJ11L Harness
AMM 73-21-50-400-044	Installation of the HJ11 Harness
AMM 73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM 73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM 73-29-00-710-040	Operational Test of the FADEC on the Ground (with
	Engine non Motoring)
AMM 75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM 75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE: The fault message is generated if the channel A LVDT signal is invalid, out of range, or the difference with the channel B signal is too large.

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4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV, J11, ECU
 - (1) If the maintenance message is not confirmed and is not repetitive:

 no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive: - do the following steps until the fault is corrected:
 - (a) Visually examine the NAC VALVE receptacle and the CJ11L wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If nothing is found:
 - visually examine the ECU (4000KS) and HJ11 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - if nothing is found, replace the NAC VALVE, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
 - If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If the fault continues during subsequent flights replace the CJ11L harness, (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
 - 4 If the fault continues during subsequent flights replace the HJ11 harness, (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- B. If the test gives the maintenance message NAC VLV, J11, ECU
 - (1) Disconnect the CJ11L harness from the NAC valve
 - (2) Visually examine the CJ11L wire harness connector and the NAC valve receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (3) Do an electrical resistance check on the NAC valve receptacle between:
 - pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - pins 6 and 7 (23 to 29 0hms)
 - . pins 2 and the ground (> 10 Megohms)
 - . pins 4 to the ground (> 10 Megohms)
 - . pins 6 to the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If the resistance values are out of the limits:
 - replace the NAC valve (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
- (b) If the resistance values are in the specified limits:
 - reconnect the CJ11L harness to the NAC valve and continue the trouble shooting
- (4) Disconnect the HJ11 harness from the ECU (4000KS)
 - (a) Visually examine the HJ11 wire harness connector and the ECU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (b) Do an electrical resistance check of the HJ11 harness between:
 - pins 40 and 41 (80 to 100 0hms)
 - . pins 20 and 39 (32 to 40 0hms)
 - . pins 8 and 22 (23 to 29 0hms)
 - \cdot pins 40 and 21 (> 10 Megohms)
 - pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - pin 40 to the ground (> 10 Megohms)
 - . pin 20 to the ground (> 10 Megohms)
 - . pin 8 to the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ11 harness and continue the trouble shooting as follows:
- (5) Disconnect the HJ11 harness from the CJ11L harness at the 6 o'clock junction box
 - (a) Visually examine the HJ11 harness and the CJ11L wire harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (b) Do an electrical resistance check of the CJ11L harness between:
 - pins 8 and 10 (80 to 100 0hms)
 - pins 11 and 12 (32 to 40 0hms)
 - . pins 13 and 14 (23 to 29 0hms)
 - \cdot pins 8 and 9 (> 10 Megohms)
 - \cdot pins 9 and 11 (> 10 Megohms)
 - \cdot pins 13 and 9 (> 10 Megohms)
 - pin 8 and the ground (> 10 Megohms)
 - . pin 11 and the gorund (> 10Megohms)
 - . pin 13 and the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- 1 If the resistance values are out of the specified limits: - replace the CJ11L harness, (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
- 2 If the resistance values are in the specified limits: - replace the HJ11 harness, (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:- no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-827

Loss of the Feedback Signal from the Nacelle Cooling Valve, on Engine 1 Channel ${\bf B}$

- 1. Possible Causes
 - NAC VALVE
 - ECU (4000KS)
 - CJ12L harness
 - HJ12 harness
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE		DESIGNATION	
A MM	77 24 50 000 027	Removal of the CJ12L Harness	
AMM	73-21-50-000-027		
AMM	73-21-50-000-045	Removal of the HJ12 Harness	
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness	
AMM	73-21-50-400-027	Installation of the CJ12L Harness	
AMM	73-21-50-400-045	Installation of the HJ12 Harness	
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with	
		Engine non Motoring)	
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve	
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve	

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE: The fault message is generated if the channel B LVDT signal is invalid, out of range, or the difference with the channel A signal is too large.

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4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV, J12, ECU
 - (1) If the maintenance message is not confirmed and is not repetitive:

 no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive:do the following steps until the fault is corrected:
 - (a) Visually examine the NAC VALVE receptacle and the CJ12L wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If nothing is found:
 - visually examine the ECU (4000KS) and HJ12 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - if nothing is found, replace the NAC VALVE, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
 - If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If the fault continues during subsequent flights replace the CJ12L harness, (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - 4 If the fault continues during subsequent flights - replace the HJ12 harness, (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- B. If the test gives the maintenance message NAC VLV, J12, ECU
 - (1) Disconnect the CJ12L harness from the NAC valve
 - (2) Visually examine the CJ12L wire harness connector and the NAC valve receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (3) Do an electrical resistance check on the NAC valve receptacle between:
 - pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - . pins 6 and 7 (23 to 29 0hms)
 - . pins 2 and the ground (> 10 Megohms)
 - . pins 4 to the ground (> 10 Megohms)
 - pins 6 to the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If the resistance values are out of the limits:
 - replace the NAC valve (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
- (b) If the resistance values are in the specified limits:
 - reconnect the CJ12L harness to the NAC valve and continue the trouble shooting
- (4) Disconnect the HJ12 harness from the ECU (4000KS)
 - (a) Visually examine the HJ12 wire harness connector and the ECU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (b) Do an electrical resistance check of the HJ11 harness between:
 - pins 40 and 41 (80 to 100 0hms)
 - . pins 20 and 39 (32 to 40 0hms)
 - . pins 8 and 22 (23 to 29 0hms)
 - pins 40 and 21 (> 10 Megohms)
 - pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - pin 40 to the ground (> 10 Megohms)
 - . pin 20 to the ground (> 10 Megohms)
 - pin 8 to the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ12 harness and continue the trouble shooting as follows:
- (5) Disconnect the HJ12 harness from the CJ12L harness at the 6 o'clock junction box
 - (a) Visually examine the HJ12 harness and the CJ12L wire harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (b) Do an electrical resistance check of the CJ12L harness between:
 - pins 8 and 10 (80 to 100 0hms)
 - . pins 11 and 12 (32 to 40 0hms)
 - . pins 13 and 14 (23 to 29 0hms)
 - \cdot pins 8 and 9 (> 10 Megohms)
 - \cdot pins 9 and 11 (> 10 Megohms)
 - \cdot pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms)
 - . pin 11 and the gorund (> 10Megohms)
 - pin 13 and the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- 1 If the resistance values are out of the specified limits: - replace the CJ12L harness, (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
- 2 If the resistance values are in the specified limits: - replace the HJ12 harness, (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed: - no additional maintenance action is required.
 - (2) If the fault continues: - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-828

Loss of the Feedback Signal from the Nacelle Cooling Valve, on Engine 2 Channel ${\bf A}$

- 1. Possible Causes
 - NAC VALVE
 - ECU (4000KS)
 - CJ11L harness
 - HJ11 harness
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE		DESIGNATION
	77 24 50 000 025	
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE: The fault message is generated if the channel A LVDT signal is invalid, out of range, or the difference with the channel B signal is too large.

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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV, J11, ECU
 - (1) If the maintenance message is not confirmed and is not repetitive:

 no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive:do the following steps until the fault is corrected:
 - (a) Visually examine the NAC VALVE receptacle and the CJ11L wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If nothing is found:
 - visually examine the ECU (4000KS) and HJ11 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - if nothing is found, replace the NAC VALVE, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
 - If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If the fault continues during subsequent flights replace the CJ11L harness, (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
 - 4 If the fault continues during subsequent flights replace the HJ11 harness, (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- B. If the test gives the maintenance message NAC VLV, J11, ECU
 - (1) Disconnect the CJ11L harness from the NAC valve
 - (2) Visually examine the CJ11L wire harness connector and the NAC valve receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (3) Do an electrical resistance check on the NAC valve receptacle between:
 - pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - pins 6 and 7 (23 to 29 0hms)
 - . pins 2 and the ground (> 10 Megohms)
 - . pins 4 to the ground (> 10 Megohms)
 - . pins 6 to the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If the resistance values are out of the limits:
 - replace the NAC valve (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
- (b) If the resistance values are in the specified limits:
 - reconnect the CJ11L harness to the NAC valve and continue the trouble shooting
- (4) Disconnect the HJ11 harness from the ECU (4000KS)
 - (a) Visually examine the HJ11 wire harness connector and the ECU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (b) Do an electrical resistance check of the HJ11 harness between:
 - pins 40 and 41 (80 to 100 0hms)
 - . pins 20 and 39 (32 to 40 0hms)
 - pins 8 and 22 (23 to 29 0hms)
 - \cdot pins 40 and 21 (> 10 Megohms)
 - pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - pin 40 to the ground (> 10 Megohms)
 - . pin 20 to the ground (> 10 Megohms)
 - . pin 8 to the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ11 harness and continue the trouble shooting as follows:
- (5) Disconnect the HJ11 harness from the CJ11L harness at the 6 o'clock junction box
 - (a) Visually examine the HJ11 harness and the CJ11L wire harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (b) Do an electrical resistance check of the CJ11L harness between:
 - pins 8 and 10 (80 to 100 0hms)
 - pins 11 and 12 (32 to 40 0hms)
 - . pins 13 and 14 (23 to 29 0hms)
 - \cdot pins 8 and 9 (> 10 Megohms)
 - pins 9 and 11 (> 10 Megohms)
 - \cdot pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms)
 - pin 11 and the gorund (> 10Megohms)
 - pin 13 and the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- 1 If the resistance values are out of the specified limits: - replace the CJ11L harness, (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
- If the resistance values are in the specified limits: - replace the HJ11 harness, (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:- no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-829

Loss of the Feedback Signal from the Nacelle Cooling Valve, on Engine 2 Channel

- 1. Possible Causes
 - NAC VALVE
 - ECU (4000KS)
 - CJ12L harness
 - HJ12 harness
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE	DESIGNATION
AMM 73-21-50-000-027	Removal of the CJ12L Harness
AMM 73-21-50-000-045	Removal of the HJ12 Harness
AMM 73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM 73-21-50-400-027	Installation of the CJ12L Harness
AMM 73-21-50-400-045	Installation of the HJ12 Harness
AMM 73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM 73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM 73-29-00-710-040	Operational Test of the FADEC on the Ground (with
	Engine non Motoring)
AMM 75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM 75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE: The fault message is generated if the channel B LVDT signal is invalid, out of range, or the difference with the channel A signal is too large.

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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV, J12, ECU
 - (1) If the maintenance message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the maintenance message is not confirmed but is repetitive: - do the following steps until the fault is corrected:
 - (a) Visually examine the NAC VALVE receptacle and the CJ12L wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If nothing is found:
 - visually examine the ECU (4000KS) and HJ12 wire harness connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - if nothing is found, replace the NAC VALVE, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
 - If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001)
 and (Ref. AMM TASK 73-21-60-400-001).
 - If the fault continues during subsequent flights replace the CJ12L harness, (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - 4 If the fault continues during subsequent flights replace the HJ12 harness, (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- B. If the test gives the maintenance message NAC VLV, J12, ECU
 - (1) Disconnect the CJ12L harness from the NAC valve
 - (2) Visually examine the CJ12L wire harness connector and the NAC valve receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (3) Do an electrical resistance check on the NAC valve receptacle between:
 - pins 2 and 3 (80 to 100 0hms)
 - pins 4 and 5 (32 to 40 0hms)
 - pins 6 and 7 (23 to 29 0hms)
 - . pins 2 and the ground (> 10 Megohms)
 - . pins 4 to the ground (> 10 Megohms)
 - . pins 6 to the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (a) If the resistance values are out of the limits:
 - replace the NAC valve (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
- (b) If the resistance values are in the specified limits:
 - reconnect the CJ12L harness to the NAC valve and continue the trouble shooting
- (4) Disconnect the HJ12 harness from the ECU (4000KS)
 - (a) Visually examine the HJ12 wire harness connector and the ECU receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - (b) Do an electrical resistance check of the HJ12 harness between:
 - pins 40 and 41 (80 to 100 0hms)
 - . pins 20 and 39 (32 to 40 0hms)
 - . pins 8 and 22 (23 to 29 0hms)
 - \cdot pins 40 and 21 (> 10 Megohms)
 - pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - pin 40 to the ground (> 10 Megohms)
 - . pin 20 to the ground (> 10 Megohms)
 - . pin 8 to the ground (> 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - 2 If the resistance values are out of the specified limits:
 - reconnect the HJ12 harness and continue the trouble shooting as follows:.
- (5) Disconnect the HJ12 harness from the CJ12L harness at the 6 o'clock junction box
 - (a) Visually examine the HJ12 harness and the CJ12L wire harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (b) Do an electrical resistance check of the CJ11L harness between:
 - pins 8 and 10 (80 to 100 0hms)
 - . pins 11 and 12 (32 to 40 0hms)
 - . pins 13 and 14 (23 to 29 0hms)
 - \cdot pins 8 and 9 (> 10 Megohms)
 - pins 9 and 11 (> 10 Megohms)
 - \cdot pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms)
 - . pin 11 and the gorund (> 10Megohms)
 - pin 13 and the ground (> 10 Megohms)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- 1 If the resistance values are out of the specified limits: - replace the CJ12L harness, (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
- If the resistance values are in the specified limits: - replace the HJ12 harness, (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:- no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-830

Loss of the Feedback Signal from the Nacelle Cooling Valve, on Engine 1 Dual Channels

1. Possible Causes

- NAC VALVE
- CJ11L harness
- CJ12L harness
- HJ11 harness
- HJ12 harness
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
75-25-00-810-826		Loss of the Feedback Signal from the Nacelle Cooling
		Valve, on Engine 1 Channel A
75-25-00-81	0-827	Loss of the Feedback Signal from the Nacelle Cooling
		Valve, on Engine 1 Channel B
AMM 73-21-	50-000-025	Removal of the CJ11L Harness
AMM 73-21-	50-000-027	Removal of the CJ12L Harness
AMM 73-21-	50-000-044	Removal of the HJ11 Harness
AMM 73-21-	50-000-045	Removal of the HJ12 Harness
AMM 73-21-	50-210-001	Visual Inspection of the Wiring Harness
AMM 73-21-	50-400-025	Installation of the CJ11L Harness
AMM 73-21-	50-400-027	Installation of the CJ12L Harness
AMM 73-21-	50-400-044	Installation of the HJ11 Harness
AMM 73-21-	50-400-045	Installation of the HJ12 Harness
AMM 73-21-	60-000-001	Removal of the Electronic Control Unit (ECU)
AMM 73-21-	60-400-001	Installation of the Electronic Control Unit (ECU)
AMM 73-29-	00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM 75-25-	10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM 75-25-	10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A and 1B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

 $\underline{{\tt NOTE}}$: The fault message is generated if one or both channel LVDT signals are invalid or out of range.

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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4. Fault Isolation

- A. If the test does not give the maintenance messages NAC VLV, J11, ECU and NAC VLV, J12, ECU
 - (1) If the maintenance messages are not confirmed and are not repetitive: - no maintenance action is required.
 - (2) If the maintenance message are not confirmed but are repetitive:do the following steps until the fault is corrected:
 - (a) Visually examine the NAC VALVE receptacle, the CJ11L and CJ12L wire harnesses connectors for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If nothing is found:
 - visually examine the ECU (4000KS), the HJ11 and HJ12 wire harnesses connectors for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - if nothing is found, replace the NAC VALVE, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
 - If the fault continues during subsequent flights
 replace the CJ11L harness, (Ref. AMM TASK 73-21-50-000-025)
 and (Ref. AMM TASK 73-21-50-400-025).
 - If the fault continues during subsequent flights replace the CJ12L harness, (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - 4 If the fault continues during subsequent flights replace the HJ11 harness, (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - If the fault continues during subsequent flights - replace the HJ12 harness, (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 6 If the fault continues during subsequent flights - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do this procedure:
 - (1) If the test gives the fault maintenance message NAC VLV, J11, ECU only on channel A:
 - do this fault isolation procedure Para. 4. B. (Ref. TASK 75-25-00-810-826).

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (2) If the test gives the fault maintenance message NAC VLV, J11, ECU only on channel B:
 - do this fault isolation procedure Para. 4. B. (Ref. TASK 75-25-00-810-827).
- (3) If the test gives the fault maintenance messages NAC VLV, J11, ECU and NAC VLV, J12, ECU on both channels:
 - do these fault isolation procedures Para. 4. B. (Ref. TASK 75-25-00-810-826) and (Ref. TASK 75-25-00-810-827) .
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:
 - no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-832

Loss of the Feedback Signal from the Nacelle Cooling Valve, on Engine 2 Dual Channels

1. Possible Causes

- NAC VALVE
- CJ11L harness
- CJ12L harness
- HJ11 harness
- HJ12 harness
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

REFE	RENCE	DESIGNATION
75-25-00-810-828		Loss of the Feedback Signal from the Nacelle Cooling
		Valve, on Engine 2 Channel A
75-25-00-810-829		Loss of the Feedback Signal from the Nacelle Cooling
		Valve, on Engine 2 Channel B
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A and 2B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : The fault message is generated if one or both channel LVDT signals are invalid or out of range.

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EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS
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TROUBLE SHOOTING MANUAL

4. Fault Isolation

- A. If the test does not give the maintenance messages NAC VLV, J11, ECU and NAC VLV, J12, ECU
 - (1) If the maintenance messages are not confirmed and are not repetitive: - no maintenance action is required.
 - (2) If the maintenance message are not confirmed but are repetitive:do the following steps until the fault is corrected:
 - (a) Visually examine the NAC VALVE receptacle, the CJ11L and CJ12L wire harnesses connectors for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If nothing is found:
 - visually examine the ECU (4000KS), the HJ11 and HJ12 wire harnesses connectors for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001)
 - if nothing is found, replace the NAC VALVE, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001).
 - If the fault continues during subsequent flights
 replace the CJ11L harness, (Ref. AMM TASK 73-21-50-000-025)
 and (Ref. AMM TASK 73-21-50-400-025).
 - If the fault continues during subsequent flights replace the CJ12L harness, (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - 4 If the fault continues during subsequent flights replace the HJ11 harness, (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - If the fault continues during subsequent flights - replace the HJ12 harness, (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 6 If the fault continues during subsequent flights - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do this procedure:
 - (1) If the test gives the fault maintenance message NAC VLV, J11, ECU only on channel A:
 - do this fault isolation procedure Para. 4. B. (Ref. TASK 75-25-00-810-828).

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (2) If the test gives the fault maintenance message NAC VLV, J12, ECU only on channel B:
 - do this fault isolation procedure Para. 4. B. (Ref. TASK 75-25-00-810-829).
- (3) If the test gives the fault maintenance messages NAC VLV, J11, ECU and NAC VLV, J12, ECU on both channels:
 - do these fault isolation procedures Para. 4. B. (Ref. TASK 75-25-00-810-828) and (Ref. TASK 75-25-00-810-829) .
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:
 - no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-833

Loss of the Nacelle Cooling Valve Actuation, on the Engine 1

- 1. Possible Causes
 - NAC valve
 - HMU
 - ECU (4000KS)
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

- A. Test
 - (1) Do the operational test of the FADEC 1A or 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : The fault message is generated if the actual valve position disagrees with the demanded valve position, for a set time interval.

4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV, HMU
 - (1) If the fault message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the fault message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (b) If the fault continues during subsequent flights - replace the HMU, (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002)
- (c) If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and
 (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message NAC VLV, HMU replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)
 - - (a) Repeat the Para. 3. A., if the fault continues:
 replace the ECU, (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-834

Loss of the Nacelle Cooling Valve Actuation, on the Engine 2

1. Possible Causes

- NAC valve
- HMU
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A or 2B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : The fault message is generated if the actual valve position disagrees with the demanded valve position, for a set time interval.

4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV, HMU
 - (1) If the fault message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the fault message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (c) If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and
 (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message NAC VLV, HMU replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)
 - - (a) Repeat the Para. 3. A., if the fault continues:
 replace the ECU, (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-835

Loss of the Nacelle Cooling Valve-Bleed Actuation, on the Engine 1

1. Possible Causes

- NAC valve
- HMU
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
	77 24 40 000 002	Democrat of the Undermark stical Unit (UMU)
	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A or 1B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : The fault message is generated if the actual valve position disagrees with the demanded valve position, for a set time interval.

4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV (BLD), HMU
 - (1) If the fault message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the fault message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (c) If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and
 (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message NAC VLV (BLD), HMU replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)
 - - (a) Repeat the Para. 3. A., if the fault continues:
 replace the ECU, (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-25-00-810-836

Loss of the Nacelle Cooling Valve-Bleed Actuation, on the Engine 2

1. Possible Causes

- NAC valve
- HMU
- ECU (4000KS)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
		Engine non Motoring)
AMM	75-25-10-000-001	Removal of the Nacelle Air Cooling (NAC) Valve
AMM	75-25-10-400-001	Installation of the Nacelle Air Cooling (NAC) Valve

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A or 2B on the ground (with engine non - motoring) (Ref. AMM TASK 73-29-00-710-040).

NOTE : The fault message is generated if the actual valve position disagrees with the demanded valve position, for a set time interval.

4. Fault Isolation

- A. If the test does not give the maintenance message NAC VLV (BLD), HMU
 - (1) If the fault message is not confirmed and is not repetitive: - no maintenance action is required.
 - (2) If the fault message is not confirmed but is repetitive:do the following steps until the fault is corrected
 - (a) Replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)

EFF: 202-202, 209-225, 245-253, 276-276, 280-280, 282-282, 284-299, 429-450, 479-499, 503-549, 551-599, 701-749, SROS

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- (c) If the fault continues during subsequent flights
 replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and
 (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message NAC VLV (BLD), HMU replace the NAC valve, (Ref. AMM TASK 75-25-10-000-001) and (Ref. AMM TASK 75-25-10-400-001)
 - - (a) Repeat the Para. 3. A., if the fault continues:
 replace the ECU, (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:no additional maintenance action is required.
 - (2) If the fault continues:
 repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TRANSIENT BLEED VALVE SYSTEM - FAULT ISOLATION PROCEDURES

TASK 75-26-00-810-801

Loss of the feedback signal from the TBV valve through the channel ${\bf A}$ on Engine ${\bf 1}$

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness CJ11L
- Transient Bleed Valve (TBV)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040)

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, J11, ECU:
 - disconnect the HJ11 harness from the J11 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J11 receptacle are not bent or have not moved.
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (2) Do a resistance check of the TBV valve circuits (channel A), through HJ11 and CJ11L harnesses, between:
 - pins 40 and 41 (67 to 75 0hms)
 - . pins 20 and 39 (23 to 27 0hms)
 - pins 8 and 22 (23 to 27 0hms)
 - pins 40 and 21 (more than 10 Megohms)
 - . pins 20 and 21 (more than 10 Megohms)
 - . pins 8 and 21 (more than 10 Megohms)
 - . pin 40 and the ground (more than 10 Megohms)
 - . pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ11 from the cable CJ11L at the 6 o'clock junction box and do a resistance check of the RACSB valve circuits (channel A), through the CJ11L harness between:
 - pins 8 and 10 (67 to 75 ohms)
 - . pins 11 and 12 (23 to 27 ohms)
 - . pins 13 and 14 (23 to 27 ohms)
 - . pins 8 and 9 (more than 10 Megohms)
 - pins 11 and 9 (more than 10 Megohms)
 - pins 13 and 9 (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - pin 11 and the ground (more than 10 Megohms)
 - . pin 13 and the ground (more than 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the CJ11L harness from the TBV valve and do a resistance check of the TBV valve circuits (channel A) between:
 - . pins 2 and 3 (67 to 75 0hms)
 - pins 4 and 5 (23 to 27 0hms)
 - . pins 6 and 7 (23 to 27 0hms)
 - . pin 2 and Ground (more than 10 Megohms)
 - pin 4 and Ground (more than 10 Megohms)
 - . pin 6 and Ground (more than 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
 - b If the resistance values are out of the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-802

Loss of the feedback signal from the TBV valve through the channel B on Engine $\mathbf{1}$

1. Possible Causes

- ECU (4000KS)
- harness HJ12
- harness CJ12L
- Transient Bleed Valve (TBV)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMN	1 73-21-50-000-027	Removal of the CJ12L Harness
AMN	1 73-21-50-000-045	Removal of the HJ12 Harness
AMN	1 73-21-50-400-027	Installation of the CJ12L Harness
AMN	1 73-21-50-400-045	Installation of the HJ12 Harness
AMN	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMN	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMN	1 73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMN	1 75-26-10-000-001	Removal of the Transient Bleed Valve
AMN	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, J12, ECU:
 - disconnect the HJ12 harness from the J12 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J12 receptacle are not bent or have not moved.
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (2) Do a resistance check of the TBV valve circuits (channel B), through HJ12 and CJ12L harnesses, between:
 - . pins 40 and 41 (67 to 75 0hms)
 - . pins 20 and 39 (23 to 27 0hms)
 - pins 8 and 22 (23 to 27 0hms)
 - pins 40 and 21 (more than 10 Megohms)
 - pins 20 and 21 (more than 10 Megohms)
 - pins 8 and 21 (more than 10 Megohms)
 - . pin 40 and the ground (more than 10 Megohms)
 - . pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ12 from the cable CJ12L at the 6 o'clock junction box and do a resistance check of the TBV valve circuits (channel B), through the CJ12L harness between:
 - . pins 2 and 3 (67 to 75 ohms)
 - . pins 4 and 5 (23 to 27 ohms)
 - . pins 12 and 13 (23 to 27 ohms)
 - pins 2 and 1 (more than 10 Megohms)
 - . pins 4 and 1 (more than 10 Megohms)
 - . pins 12 and 1 (more than 10 Megohms)
 - . pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - pin 12 and ground (more than 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the CJ12L harness from the TBV valve and do a resistance check of the TBV valve circuits (channel B) between:
 - . pins 2 and 3 (67 to 75 0hms)
 - pins 4 and 5 (23 to 27 0hms)
 - . pins 6 and 7 (23 to 27 0hms)
 - . pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - . pin 6 and ground (more than 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - b If the resistance values are out of the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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(3) Connect the disconnected harnesses.

B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-803

Loss of the feedback signal from the TBV valve through the channel ${\bf A}$ on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness CJ11L
- Transient Bleed Valve (TBV)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AM	M 73-21-50-000-025	Removal of the CJ11L Harness
AM	M 73-21-50-000-044	Removal of the HJ11 Harness
AM	M 73-21-50-400-025	Installation of the CJ11L Harness
AM	M 73-21-50-400-044	Installation of the HJ11 Harness
AM	M 73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AM	M 73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AM	M 73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AM	M 75-26-10-000-001	Removal of the Transient Bleed Valve
AM	M 75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, J11, ECU:
 - disconnect the HJ11 harness from the J11 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J11 receptacle are not bent or have not moved.
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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TROUBLE SHOOTING MANUAL

- (2) Do a resistance check of the TBV valve circuits (channel A), through HJ11 and CJ11L harnesses, between:
 - pins 40 and 41 (67 to 75 0hms)
 - . pins 20 and 39 (23 to 27 0hms)
 - pins 8 and 22 (23 to 27 0hms)
 - . pins 40 and 21 (more than 10 Megohms)
 - . pins 20 and 21 (more than 10 Megohms)
 - pins 8 and 21 (more than 10 Megohms)
 - . pin 40 and the ground (more than 10 Megohms)
 - . pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ11 from the cable CJ11L at the 6 o'clock junction box and do a resistance check of the TBV valve circuits (channel A), through the CJ11L harness between:
 - pins 8 and 10 (67 to 75 ohms)
 - . pins 11 and 12 (23 to 27 ohms)
 - . pins 13 and 14 (23 to 27 ohms)
 - pins 8 and 9 (more than 10 Megohms)
 - pins 11 and 9 (more than 10 Megohms)
 - . pins 13 and 9 (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - . pin 11 and the ground (more than 10 Megohms)
 - pin 13 and the ground (more than 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the CJ11L harness from the TBV valve and do a resistance check of the TBV valve circuits (channel A) between:
 - . pins 2 and 3 (67 to 75 0hms)
 - pins 4 and 5 (23 to 27 0hms)
 - pins 6 and 7 (23 to 27 0hms)
 - . pin 2 and Ground (more than 10 Megohms)
 - pin 4 and Ground (more than 10 Megohms)
 - . pin 6 and Ground (more than 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
 - b If the resistance values are out of the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-804

Loss of the feedback signal from the TBV valve through the channel B on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ12
- harness CJ12L
- Transient Bleed Valve (TBV)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, J12, ECU:
 - disconnect the HJ12 harness from the J12 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J12 receptacle are not bent or have not moved.
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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TROUBLE SHOOTING MANUAL

- (2) Do a resistance check of the TBV valve circuits (channel B), through HJ12 and CJ12L harnesses, between:
 - pins 40 and 41 (67 to 75 0hms)
 - . pins 20 and 39 (23 to 27 0hms)
 - pins 8 and 22 (23 to 27 0hms)
 - . pins 40 and 21 (more than 10 Megohms)
 - pins 20 and 21 (more than 10 Megohms)
 - . pins 8 and 21 (more than 10 Megohms)
 - . pin 40 and the ground (more than 10 Megohms)
 - . pin 20 and the ground (more than 10 Megohms)
 - pin 8 and the ground (more than 10 Megohms)
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable HJ12 from the cable CJ12L at the 6 o'clock junction box and do a resistance check of the TBV valve circuits (channel B), through the CJ12L harness between:
 - . pins 2 and 3 (67 to 75 ohms)
 - . pins 4 and 5 (23 to 27 ohms)
 - . pins 12 and 13 (23 to 27 ohms)
 - pins 2 and 1 (more than 10 Megohms)
 - pins 4 and 1 (more than 10 Megohms)
 - . pins 12 and 1 (more than 10 Megohms)
 - . pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - pin 12 and ground (more than 10 Megohms)
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the CJ12L harness from the TBV valve and do a resistance check of the TBV valve circuits (channel B) between:
 - . pins 2 and 3 (67 to 75 0hms)
 - pins 4 and 5 (23 to 27 0hms)
 - . pins 6 and 7 (23 to 27 0hms)
 - . pin 2 and ground (more than 10 Megohms)
 - pin 4 and ground (more than 10 Megohms)
 - . pin 6 and ground (more than 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - b If the resistance values are out of the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749, SROS

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-805

Loss of the TBV torque motor control through the channel A on Engine 1

1. Possible Causes

- ECU (4000KS)
- harness **HJ7**
- Hydromechanical Unit (HMU)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)

3. Fault Confirmation

- A. Test
 - (1) Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message J7, HMU(TBV TM), ECU: disconnect the harness HJ7 from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:

479-499, 503-549, 551-599, 701-749,

- replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do resistance check of the TBV valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 0hms)

203-225, 240-275, 283-299, 426-475,

- pins 20 and 39 (> 10 Megohms)
- . pin 20 and the ground (> 10 Megohms).

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- (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the HMU receptacle resistance between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ7, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU), (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- B. Do the test given in Para. 3.A.(1).

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-806

Loss of the TBV torsque motor control through the channel B on Engine 1

- 1. Possible Causes
 - ECU (4000KS)
 - harness HJ8
 - Hydromechanical Unit (HMU)
- 2. Job Set-up Information
 - A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)

3. Fault Confirmation

- A. Test
 - (1) Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
- 4. Fault Isolation
 - A. If the test gives the maintenance message J8, HMU(TBV TM), ECU: disconnect the harness HJ8 from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:

479-499, 503-549, 551-599, 701-749,

- replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do resistance check of the TBV valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 0hms)

203-225, 240-275, 283-299, 426-475,

- pins 20 and 39 (> 10 Megohms)
- . pin 20 and the ground (> 10 Megohms).

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- (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the HMU receptacle resistance between:
 - . pins 20 and 40 (17 to 23 0hms)
 - . pins 20 and 39 (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ8, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU), (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- B. Do the test given in Para. 3.A.(1).

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-807

Loss of the TBV torque motor control through the channel A on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness **HJ7**
- Hydromechanical Unit (HMU)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)

3. Fault Confirmation

- A. Test
 - (1) Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message J7, HMU(TBV TM), ECU: disconnect the harness HJ7 from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (2) Do resistance check of the TBV valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).

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- (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the HMU receptacle resistance between:
 - . pins 20 and 40 (17 to 23 0hms)
 - pins 20 and 39 (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ7, (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU), (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- B. Do the test given in Para. 3.A.(1).

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-808

Loss of the TBV torque motor control through the channel B on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ8
- Hydromechanical Unit (HMU)

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-041	Removal of the HJ8 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-041	Installation of the HJ8 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)

3. Fault Confirmation

- A. Test
 - (1) Do the operational test of the FADEC 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message J8, HMU(TBV TM), ECU: disconnect the harness HJ8 from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (2) Do resistance check of the TBV valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 0hms)
 - . pins 20 and 39 (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).

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- (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the HMU receptacle resistance between:
 - . pins 20 and 40 (17 to 23 0hms)
 - . pins 20 and 39 (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness HJ8, (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU), (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- B. Do the test given in Para. 3.A.(1).

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-809

Failure of the TBV valve on Engine 1

1. Possible Causes

- ECU (4000KS)
- Transient Bleed Valve (TBV)
- HMU
- harness HJ7

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with
		Engine Motoring)
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, HMU:
 - Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (2) Do a resistance check of the TBV valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-810

Failure of the TBV valve on Engine 1

1. Possible Causes

- ECU (4000KS)
- Transient Bleed Valve (TBV)
- HMU
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION	
AMM	73-21-10-000-002	Demoval of the Hydromechanical Hait (HMH)	
		Removal of the Hydromechanical Unit (HMU)	
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
AMM	73-21-50-000-041	Removal of the HJ8 Harness	
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
AMM	73-21-50-400-041	Installation of the HJ8 Harness	
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>	
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve	
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve	

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, HMU:
 - Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (2) Do a resistance check of the TBV valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-811

Failure of the TBV valve on Engine 2

1. Possible Causes

- ECU (4000KS)
- Transient Bleed Valve (TBV)
- HMU
- harness HJ7

Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with
		Engine Motoring)
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, HMU:
 - Disconnect the HJ7 harness from the J7 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J7 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (2) Do a resistance check of the TBV valve circuits (channel A) through the HJ7 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-812

Failure of the TBV valve on Engine 2

1. Possible Causes

- ECU (4000KS)
- Transient Bleed Valve (TBV)
- HMU
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION	
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)	
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
AMM	73-21-50-000-041	Removal of the HJ8 Harness	
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
AMM	73-21-50-400-041	Installation of the HJ8 Harness	
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>	
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve	
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve	

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, HMU:
 - Disconnect the HJ8 harness from the J8 receptacle on the ECU (4000KS). Make sure that the electrical contacts of the J8 receptacle are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).
 - (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (2) Do a resistance check of the TBV valve circuits (channel B) through the HJ8 harness, between:
 - . pins 20 and 40 (17 to 23 ohms).
 - (a) If the resistance values are in the specified limits:
 - replace the Transient Bleed Valve (TBV) (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).
 - 1 If the fault continues:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and do a check of the resistance of the HMU between:
 - . pins 20 and 40 (17 to 23 ohms).
 - If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
 - 2 If the resistance values are out of the specified limits:
 - replace the HMU (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (3) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-813

Loss of the feedback signal from the TBV valve through the two channels on Engine 1

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness HJ12
- harness CJ11L
- harness CJ12L
- TBV valve

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 1A and 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, J11, ECU and TBV VLV, J12, ECU:
 - Disconnect the HJ11 and HJ12 harnesses from the J11 and J12 receptacles on the ECU (4000KS). Make sure that the electrical contacts of the J11 and J12 receptacles are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do a resistance check of the TBV valve circuits through the HJ11 and HJ12 harnesses, between:
 - . pins 40 and 41 (67 to 75 0hms)
 - . pins 20 and 39 (23 to 27 0hms)
 - . pins 8 and 22 (23 to 27 0hms)
 - pins 40 and 21 (> 10 Megohms)
 - pins 20 and 21 (> 10 Megohms)
 - . pins 8 and 21 (> 10 Megohms)
 - . pin 40 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables HJ11 and HJ12 from the cables CJ11L and CJ12L at the 6 o' clock junction box and do a resistance check through the CJ11L and CJ12L harnesses between: for cable CJ11L
 - . pins 8 and 10 (67 to 75 ohms)
 - . pins 11 and 12 (23 to 27 ohms)
 - . pins 13 and 14 (23 to 27 ohms)
 - pins 8 and 9 (> 10 Megohms)
 - pins 11 and 9 (> 10 Megohms)
 - pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> to Megohms)
 - . pin 11 and the ground (> 10 Megohms)
 - . pin 13 and the ground (> 10 Megohms)
 - for cable CJ12L
 - . pins 2 and 3 (67 to 75 ohms)
 - . pins 4 and 5 (23 to 27 ohms)
 - . pins 12 and 13 (23 to 27 ohms)
 - pins 2 and 1 (> 10 Megohms)
 - pins 4 and 1 (> 10 Megohms)
 - . pins 12 and 1 (> 10 Megohms)
 - pin 2 and ground (> to Megohms)
 - pin 4 and ground (> 10 Megohms)
 - . pin 12 and ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11L and CJ12L from the TBV valve and do a resistance check of the TBV valve between:
 - . pins 2 and 3 (67 to 75 0hms)
 - . pins 4 and 5 (23 to 27 0hms)
 - . pins 6 and 7 (23 to 27 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - pin 6 and the ground (> 10 Megohms)
 - a If the resistance values are in the specified limits:
 - replace the defective: harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025) or harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - <u>b</u> If the resistance values are out of the specified limits: - replace the TBV valve (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).
- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-26-00-810-814

Loss of the feedback signal from the TBV valve through the two channels on Engine 2

1. Possible Causes

- ECU (4000KS)
- harness HJ11
- harness HJ12
- harness CJ11L
- harness CJ12L
- TBV valve

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-26-10-000-001	Removal of the Transient Bleed Valve
AMM	75-26-10-400-001	Installation of the Transient Bleed Valve

3. Fault Confirmation

A. Do the operational test of the FADEC 2A and 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message TBV VLV, J11, ECU and TBV VLV, J12, ECU:
 - Disconnect the HJ11 and HJ12 harnesses from the J11 and J12 receptacles on the ECU (4000KS). Make sure that the electrical contacts of the J11 and J12 receptacles are not bent or have not moved (Ref. AMM TASK 73-21-50-210-002).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- (1) If you find damage:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (2) Do a resistance check of the TBV valve circuits through the HJ11 and HJ12 harnesses, between:
 - . pins 40 and 41 (67 to 75 0hms)
 - . pins 20 and 39 (23 to 27 0hms)
 - . pins 8 and 22 (23 to 27 0hms)
 - pins 40 and 21 (> 10 Megohms)
 - pins 20 and 21 (> 10 Megohms)
 - pins 8 and 21 (> 10 Megohms)
 - . pin 40 and the ground (> 10 Megohms)
 - . pin 20 and the ground (> 10 Megohms)
 - . pin 8 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables HJ11 and HJ12 from the cables CJ11L and CJ12L at the 6 o' clock junction box and do a resistance check through the CJ11L and CJ12L harnesses between: for cable CJ11L
 - . pins 8 and 10 (67 to 75 ohms)
 - . pins 11 and 12 (23 to 27 ohms)
 - . pins 13 and 14 (23 to 27 ohms)
 - pins 8 and 9 (> 10 Megohms)
 - pins 11 and 9 (> 10 Megohms)
 - pins 13 and 9 (> 10 Megohms)
 - . pin 8 and the ground (> to Megohms)
 - . pin 11 and the ground (> 10 Megohms)
 - pin 13 and the ground (> 10 Megohms)
 for cable CJ12L
 - TOI CADLE CTIZE
 - . pins 2 and 3 (67 to 75 ohms)
 - . pins 4 and 5 (23 to 27 ohms)
 - . pins 12 and 13 (23 to 27 ohms)
 - pins 2 and 1 (> 10 Megohms)
 - pins 4 and 1 (> 10 Megohms)
 - . pins 12 and 1 (> 10 Megohms)
 - . pin 2 and ground (> to Megohms)
 - pin 4 and ground (> 10 Megohms)
 - . pin 12 and ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the defective harness HJ11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness HJ12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).

EFF: 203-225, 240-275, 283-299, 426-475, 479-499, 503-549, 551-599, 701-749,

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- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11L and CJ12L from the TBV valve and do a resistance check of the TBV valve between:
 - . pins 2 and 3 (67 to 75 0hms)
 - . pins 4 and 5 (23 to 27 0hms)
 - . pins 6 and 7 (23 to 27 0hms)
 - pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - pin 6 and the ground (> 10 Megohms)
 - a If the resistance values are in the specified limits:
 - replace the defective: harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025) or harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - <u>b</u> If the resistance values are out of the specified limits: - replace the TBV valve (Ref. AMM TASK 75-26-10-000-001) and (Ref. AMM TASK 75-26-10-400-001).
- (3) Connect the disconnected harnesses.
- B. Do the test given in Para. 3.A.

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COMPRESSOR CONTROL - FAULT ISOLATION PROCEDURES

TASK 75-30-00-810-801

Failure of the Control of the VBV Actuator on Engine 1

1. Possible Causes

- VBV ballscrew actuator
- flexible shaft
- VBV gear motor
- VBV stop mechanism
- VBV master door actuator
- main flexible shaft
- VBV Gear Motor
- VBV sensor (RVDT)
- VBV Gear Motor.
- ECU (4000KS)
- Hydromechanical Unit (HMU)
- harness HJ7

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
AMM	73-21-50-000-040	Removal of the HJ7 Harness
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses
AMM	73-21-50-400-040	Installation of the HJ7 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
AMM	75-31-00-200-001	Manual Operation Check of the Variable Bleed Valve Doors
AMM	75-31-10-000-002	Removal of the Bleed Valve Fuel Gear Motor Assembly
AMM	75-31-10-400-002	Installation of the Bleed Valve Fuel Gear Motor Assembly
AMM	75-31-20-000-002	Removal of the Bleed Valve Stop Mechanism
AMM	75-31-20-400-002	Installation of the Bleed Valve Stop Mechanism
AMM	75-31-30-000-001	Removal of a VBV Inter-connecting Flexible Shaft (Typical).
AMM	75-31-30-000-002	Removal of the VBV System Main Flexible Shaft
AMM	75-31-30-200-002	Visual Inspection of the VBV Main Flexible Shaft and the VBV Inter-connecting Flexible Shafts
AMM	75-31-30-400-001	<pre>Installation of a VBV Inter-connecting Flexible Shaft (Typical)</pre>

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REFERENCE		DESIGNATION	
AMM	75-31-30-400-002	Installation of the VBV System Main Flexible Shaft	
AMM	75-31-50-000-002	Removal of the Bleed Valve and Master Ballscrew Actuator Assembly	
AMM	75-31-50-400-002	Installation of the Bleed Valve and Master Ballscrew Actuator Assembly	
AMM	75-31-60-000-002	Removal of the Bleed Valve and Ballscrew Actuator Assembly	
AMM	75-31-60-400-002	Installation of the Bleed Valve and Ballscrew Actuator Assembly	
AMM	75-31-70-000-001	Removal of the Variable Bleed Valve Position Sensor	
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor	
AMM	75-31-70-400-001	Installation of the Variable Bleed Valve Position Sensor	
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor	

3. Fault Confirmation

- A. Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
 - <u>NOTE</u>: The failure message is generated if the actual position and the demanded position of the VBV system disagree (only the position of VBV Master actuator door is monitored).
 - NOTE: There is no expected position of the VBV actuators on a non running engine. The position of the VBV actuators must be uniform but can be either open, closed or in an intermediate position.

4. Fault Isolation

- A. If the test does not give the maintenance message "VBV ACT, HMU":
 - do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (1) If an offset between VBV doors or damage to VBV flexible shafts is observed:
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors shall be inspected and manually operated.

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(c) Operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.

NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).

- (2) If nothing is found, following Trouble Shooting must be performed at first opportunity within 10 cyles (except if the fault re-occurs):

 do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated.
 - (c) Operate each of the 11 VBV actuators both directions and make sure that each moves smoothly and freely.
 - NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).
 - (d) Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-20-000-002).
 - (e) Check for free rotation of the VBV gear motor. If it does not move freely
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - (f) Check for free rotation of the stop mechanism. If it does not move freely
 - replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
 - (g) Check for free rotation of the VBV master door actuator. If it does not move freely
 - replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
 - (h) Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).

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(i) Pre SB 75-007

- 1 If no fault is found:
 - disconnect the harness from the ECU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - disconnect the harness J7 connector from the HMU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
- 2 If no fault is found:
 - a If the VBV Gear Motor Part Number is 396800-7 or 396800-9, replace the VBV Gear Motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - b If not,
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU.
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (j) Post SB 75-007
 - 1 If no fault is found:
 - replace the VBV Gear Motor. (Ref. AMM TASK 75-31-10-000-002)
 and (Ref. AMM TASK 75-31-10-400-002)
 - 2 If the fault continues:
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU.
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (k) If the fault continues during subsequent flight:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message VBV ACT, HMU:
 - (1) Do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (2) Do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).

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- (3) Operate the VBV system manually and make sure that it moves smoothly and freely (Ref. AMM TASK 75-31-00-200-001).
 - (a) If the system is hard to rotate or does not move freely (non constant torque) or is offset of position is observed between VBV doors:
 - remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated. If nothing is found:
 - operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.
 - NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).
 - Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-10-000-002).
 - <u>a</u> Check for free rotation of the VBV gear motor. If it does not move freely replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - <u>b</u> Check for free rotation of the stop mechanism. If it does not move freely replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
 - <u>c</u> Check for free rotation of the VBV master door actuator. If it does not move freely replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
 - Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).
 - (b) If the system is not hard to rotate and moves freely and smoothly:
 - disconnect the harness HJ7 from the ECU receptacle:
 - Visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)

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- <u>2</u> Do an electrical resistance check through the HJ7 harness between:
 - . pins 29 and 30 (17 to 23 0hms).
 - a If the resistance values are in the specified limits:
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - if the fault continues, replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If the fault continues, replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
 - If the fault continues, replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - b If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)
 - do a check of the HMU resistance between:
 - . pins 29 and 30 (17 to 23 0hms).
 - * If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040) or * If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:
 - no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-802

Failure of the Control of the VBV Actuator on Engine 2

1. Possible Causes

- VBV ballscrew actuator
- flexible shaft
- VBV gear motor
- VBV stop mechanism
- VBV master door actuator
- main flexible shaft
- VBV Gear Motor
- VBV sensor (RVDT)
- ECU (4000KS)
- Hydromechanical Unit (HMU)
- harness HJ7

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)	
	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
	AMM	73-21-50-000-040	Removal of the HJ7 Harness	
	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
	AMM	73-21-50-400-040	Installation of the HJ7 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
R	AMM	75-31-00-200-001	Manual Operation Check of the Variable Bleed Valve Doors	
	AMM	75-31-10-000-002	Removal of the Bleed Valve Fuel Gear Motor Assembly	
	AMM	75-31-10-400-002	Installation of the Bleed Valve Fuel Gear Motor Assembly	
	AMM	75-31-20-000-002	Removal of the Bleed Valve Stop Mechanism	
	AMM	75-31-20-400-002	Installation of the Bleed Valve Stop Mechanism	
	AMM	75-31-30-000-001	Removal of a VBV Inter-connecting Flexible Shaft (Typical).	
	AMM	75-31-30-000-002	Removal of the VBV System Main Flexible Shaft	
	AMM	75-31-30-200-002	Visual Inspection of the VBV Main Flexible Shaft and the VBV Inter-connecting Flexible Shafts	
	AMM	75-31-30-400-001	Installation of a VBV Inter-connecting Flexible Shaft (Typical)	
	AMM	75-31-30-400-002	Installation of the VBV System Main Flexible Shaft	
	AMM	75-31-50-000-002	Removal of the Bleed Valve and Master Ballscrew Actuator Assembly	

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REFERENCE		DESIGNATION
AMM	75-31-50-400-002	Installation of the Bleed Valve and Master Ballscrew Actuator Assembly
AMM	75-31-60-000-002	Removal of the Bleed Valve and Ballscrew Actuator Assembly
AMM	75-31-60-400-002	Installation of the Bleed Valve and Ballscrew Actuator Assembly
AMM	75-31-70-000-001	Removal of the Variable Bleed Valve Position Sensor
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor
AMM	75-31-70-400-001	Installation of the Variable Bleed Valve Position Sensor
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor

3. Fault Confirmation

- A. Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
 - NOTE: The maintenance message is generated if the actual position and the demanded position of the VBV system disagree (only the position of VBV master actuator door is monitored).
 - NOTE: There is no expected position of the VBV actuators on a running engine. The position of the VBV actuators must be uniform but can be either open, closed or in an intermediate position.

4. Fault Isolation

- A. If the FADEC test does not give the maintenance message "VBV ACT, HMU": do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (1) If an offset between VBV doors or damage to VBV flexible shafts is observed:
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors shall be inspected and manually operated.

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(c) Operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.

NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).

- (2) If nothing is found, following Trouble Shooting must be performed at first opportunity within 10 cyles (except if the fault re-occurs):

 do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated.
 - (c) Operate each of the 11 VBV actuators both directions and make sure that each moves smoothly and freely.

NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).

- (d) Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-20-000-002).
- (e) Check for free rotation of the VBV gear motor. If it does not move freely
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
- (f) Check for free rotation of the stop mechanism. If it does not move freely
 - replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
- (g) Check for free rotation of the VBV master door actuator. If it does not move freely
 - replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
- (h) Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).

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(i) Pre SB 75-007

- 1 If no fault is found:
 - disconnect the harness from the ECU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - disconnect the harness HJ7 connector from the HMU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
- 2 If no fault is found:
 - <u>a</u> If the VBV Gear Motor Part Number is 396800-7 or 396800-9, replace the VBV Gear Motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - b If not,
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (j) Post SB 75-007
 - 1 If no fault is found:
 - replace the VBV Gear Motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - 2 If the fault continues
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (k) If the fault continues during subsequent flight:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message VBV ACT, HMU:
 - (1) Do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (2) Do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).

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- (3) Operate the VBV system manually and make sure that it moves smoothly and freely (Ref. AMM TASK 75-31-00-200-001).
 - (a) If the system is hard to rotate or does not move freely (non constant torque) or if offset of position is observed between VBV doors:
 - remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated. If nothing is found:
 - operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.
 - NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).
 - Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-10-000-002).
 - <u>a</u> Check for free rotation of the VBV gear motor. If it does not move freely replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - <u>b</u> Check for free rotation of the stop mechanism. If it does not move freely replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
 - <u>c</u> Check for free rotation of the VBV master door actuator. If it does not move freely replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
 - Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).
 - (b) If the system is not hard to rotate and moves freely and smoothly:
 - disconnect the harness HJ7 from the ECU receptacle:
 - Visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)

EFF: ALL

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- <u>2</u> Do an electrical resistance check through the HJ7 harness between:
 - . pins 29 and 30 (17 to 23 0hms).
 - a If the resistance values are in the specified limits:
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - if the fault continues, replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If the fault continues, replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
 - If the fault continues, replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - b If the resistance values are out of the specified limits:
 - disconnect the harness HJ7 from the HMU and visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)
 - do a check of the HMU resistance between:
 - . pins 29 and 30 (17 to 23 0hms).
 - * If the resistance values are in the specified limits:
 - replace the defective harness HJ7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040) or * If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:
 - no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-811

Loss of the feedback Signal from the VBV through the two Channels on Engine 1

1. Possible Causes

- VBV sensor (RVDT)
- ECU (4000KS)
- harness J11
- harness J12
- harness CJ11L
- harness CJ12L

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with
		Engine Motoring)
AMM	75-31-70-000-001	Removal of the Variable Bleed Valve Position Sensor
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor
AMM	75-31-70-400-001	Installation of the Variable Bleed Valve Position
		Sensor
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position
		Sensor
ASM	73-25/18	

3. Fault Confirmation

A. Do the operational test of the FADEC 1A and 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

EFF: ALL

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4. Fault Isolation

- A. If the test gives the maintenance messages VBV SNSR, J11, ECU + VBV SNSR, J12, ECU:
 - do a check for open or short to ground of the harnesses J11 and J12 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock juntion box and the VBV sensor (RVDT) (Ref. ASM 73-25/18).
 - (1) If one of these wirings is not correct:
 - repair the defective above wirings.
 - (2) If these wirings are correct:
 - disconnect the cables J11 (Channel A) and J12 (Channel B) from the ECU (4000KS) and do a resistance check of the cables J11 and J12 between:
 - . pins 13 and 29 (80 to 110 0hms)
 - . pins 30 and 31 (80 to 120 0hms)
 - . pins 15 and 32 (80 to 120 0hms)
 - pins 13 and 14 (> 10 Megohms)
 - pins 30 and 14 (> 10 Megohms)
 - pins 15 and 14 (> 10 Megohms)
 - pin 13 and the ground (> 10 Megohms)
 - pin 30 and the ground (> 10 Megohms)
 - . pin 15 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
 - if the problem is still reported after the VBV sensor replacement, replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables J11 and J12 from the cables CJ11L and CJ12L at the 6 o'clock junction box and do a resistance check of the cables CJ11L and CJ12L between: for cable CJ11L
 - . pins 5 and 6 (80 to 110 0hms)
 - pins 2 and 7 (80 to 120 0hms)
 - pins 3 and 4 (80 to 120 0hms)
 - . pins 5 and 1 (> 10 Megohms)
 - . pins 2 and 1 (> 10 Megohms)
 - pins 3 and 1 (> 10 Megohms)
 - . pin 5 and the ground (> 10 Megohms)
 - pin 2 and the ground (> 10 Megohms)
 - . pin 3 and the ground (> 10 Megohms).

for cable CJ12L

- . pins 17 and 6 (80 to 110 0hms)
- . pins 18 and 19 (80 to 120 0hms)
- pins 8 and 20 (80 to 120 0hms)
- . pins 17 and 7 (> 10 Megohms)
- . pins 18 and 7 (> 10 Megohms)

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- pins 8 and 7 (> 10 Megohms)
- pin 17 and the ground (> 10 Megohms)
- . pin 18 and the ground (> 10 Megohms)
- . pin 8 and the ground (> 10 Megohms).
- 1 If the resistance values are in the specified limits:
 - replace the defective harness J11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness J12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11L and CJ12L from the VBV sensor and do a resistance check of the VBV sensor between:
 - pins 2 and 3 (80 to 110 0hms)
 - pins 4 and 5 (80 to 120 0hms)
 - . pins 6 and 7 (80 to 120 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the defective harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025) or harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - b If the resistance values are out of the specified limits:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
- B. Do the test given in Para. 3.A.

EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-812

Loss of the feedback Signal from the VBV through the two Channels on Engine 2

1. Possible Causes

- VBV sensor (RVDT)
- ECU (4000KS)
- harness J11
- harness J12
- harness CJ11L
- harness CJ12L

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION
	77 24 50 000 025	Daniel of the OMM Harris
AMM	73-21-50-000-025	Removal of the CJ11L Harness
AMM	73-21-50-000-027	Removal of the CJ12L Harness
AMM	73-21-50-000-044	Removal of the HJ11 Harness
AMM	73-21-50-000-045	Removal of the HJ12 Harness
AMM	73-21-50-400-025	Installation of the CJ11L Harness
AMM	73-21-50-400-027	Installation of the CJ12L Harness
AMM	73-21-50-400-044	Installation of the HJ11 Harness
AMM	73-21-50-400-045	Installation of the HJ12 Harness
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
AMM	73-21-60-400-001	Installation of the Electronic Control Unit
		(ECU)(4000KS)
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with
		Engine Motoring)
AMM	75-31-70-000-001	Removal of the Variable Bleed Valve Position Sensor
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor
AMM	75-31-70-400-001	Installation of the Variable Bleed Valve Position
A	13 31 10 400 001	Sensor
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position
Allin	13 31 10 400 002	Sensor
ASM	73-25/18	3011301
_		
ASM	73-25/18	
ASM	73-25/18	

3. Fault Confirmation

A. Do the operational test of the FADEC 2A and 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. If the test gives the maintenance message VBV SNSR, J11, ECU + VBV SNSR, J12, ECU:
 - do a check for open or short to ground of the harnesses J11 and J12 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VBV sensor (RVDT) (Ref. ASM 73-25/18) and (Ref. ASM 73-25/18).
 - (1) If one of these wirings is not correct:
 - repair the defective above wirings.
 - (2) If these wirings are correct:
 - disconnect the cables J11 (Channel A) and J12 (Channel B) from the ECU (4000KS) and do a resistance check of the cables J11 and J12 between:
 - . pins 13 and 29 (80 to 110 0hms)
 - . pins 30 and 31 (80 to 120 0hms)
 - . pins 15 and 32 (80 to 120 0hms)
 - pins 13 and 14 (> 10 Megohms)
 - pins 30 and 14 (> 10 Megohms)
 - . pins 15 and 14 (> 10 Megohms)
 - pin 13 and the ground (> 10 Megohms)
 - . pin 30 and the ground (> 10 Megohms)
 - . pin 15 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
 - if the problem is still reported after the VBV sensor replacement, replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables J11 and J12 from the cables CJ11L and CJ12L at the 6 o'clock junction box and do a resistance check of the cables CJ11L and CJ12L between: for cable CJ11L
 - . pins 5 and 6 (80 to 110 0hms)
 - . pins 2 and 7 (80 to 120 0hms)
 - . pins 3 and 4 (80 to 120 0hms)
 - . pins 5 and 1 (> 10 Megohms)
 - pins 2 and 1 (> 10 Megohms)
 - pins 3 and 1 (> 10 Megohms)
 - pin 5 and the ground (> 10 Megohms)
 - . pin 2 and the ground (> 10 Megohms)
 - . pin 3 and the ground (> 10 Megohms).

for cable CJ12L

- . pins 17 and 6 (80 to 110 0hms)
- . pins 18 and 19 (80 to 120 0hms)
- pins 8 and 20 (80 to 120 0hms)
- . pins 17 and 7 (> 10 Megohms)

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- pins 18 and 7 (> 10 Megohms)
- pins 8 and 7 (> 10 Megohms)
- . pin 17 and the ground (> 10 Megohms)
- . pin 18 and the ground (> 10 Megohms)
- pin 8 and the ground (> 10 Megohms).
- 1 If the resistance values are in the specified limits:
 - replace the defective harness J11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness J12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11L and CJ12L from the VBV sensor and do a resistance check of the VBV sensor between:
 - pins 2 and 3 (80 to 110 0hms)
 - . pins 4 and 5 (80 to 120 0hms)
 - . pins 6 and 7 (80 to 120 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - . pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the defective harness CJ11L (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025) or harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - <u>b</u> If the resistance values are out of the specified limits: - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
- B. Do the test given in Para. 3.A.

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TASK 75-30-00-810-813

Loss of the VBV Feedback Signal - Engine 1 - Channel A

1. Possible Causes

- VBV sensor (RVDT)
- ECU (4000KS)
- harness HJ11
- harness CJ11L

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION	
AMM	73-21-50-000-025	Removal of the CJ11L Harness	
AMM	73-21-50-000-044	Removal of the HJ11 Harness	
AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness	
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
AMM	73-21-50-400-025	Installation of the CJ11L Harness	
AMM	73-21-50-400-044	Installation of the HJ11 Harness	
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with	
		Engine non Motoring)	
AMM	75-31-00-200-002	Manual Operation Check of the Variable Bleed Valve	
		Doors	
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor	
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position	
		Sensor	

3. Fault Confirmation

A. Do the operational test of the FADEC 1A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The failure message is generated if the channel A signal is invalid, out of range, or both channels disagree.
 - (1) If the failure message VBV SNSR, J11, ECU is not confirmed:

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(a) No maintenance action is required.

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- (2) If the failure message VBV SNSR, J11, ECU is not confirmed but is repetitive:
 - disconnect the CJ11L harness from the VBV sensor (VBV-A connector) located in the left core compartment and visually examine the receptacle and the harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002)
 and (Ref. AMM TASK 75-31-70-400-002).

NOTE : After new VBV sensor is installed, a rigging of the VBV system is required (Ref. AMM TASK 75-31-00-200-002).

- (c) If the fault continues during the subsequent flights:
 - disconnect the HJ11 harness from the ECU (4000KS) and visually examine the receptacle and the connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (d) If the fault continues during the subsequent flights:
 - replace the harness HJ11 (ECU to the 6 o'clock jonction box) (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11L (located in the left core compartment) (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
- (3) If the failure message VBV SNSR, J11, ECU is confirmed:
 - disconnect the CJ11L harness from the VBV sensor (VBV-A connector) located in the left core compartment and visually examine the CJ11L harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do an electrical resistance test through the VBV sensor between:
 - . pins 2 and 3 (80 to 110 ohms)

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- . pins 4 and 5 (80 to 120 ohms)
- pins 6 and 7 (85 to 120 ohms)
- . pin 2 and the ground (> 10 megohms)
- pin 4 and the ground (> 10 megohms)
- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance test values are out of the specified limits:
 - replace the VBV sensor (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
- (d) If the resistance test values are in the specified limits:
 - reconnect the harness CJ11L (VBV-A connector) to the VBV sensor (RVDT),
 - disconnect the harness HJ11 from the ECU (4000KS) receptacle and visually examine the HJ11 harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-002).
- (e) If damage is found:
 - repair or replace as required.
- (f) If no damage is found:
 - do an electrical resistance test through the J11 harness between:
 - . pins 13 and 29 (80 to 110 ohms)
 - . pins 30 and 31 (80 to 120 ohms)
 - . pins 15 and 32 (85 to 120 ohms)
 - pins 13 and 14 (> 10 megohms)
 - . pins 30 and 14 (> 10 megohms)
 - pins 15 and 14 (> 10 megohms)
 - pin 13 and the ground (> 10 megohms)
 - pin 30 and the ground (> 10 megohms)
 - . pin 15 and the ground (> 10 megohms).
 - (g) If the resistance test values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (h) If the resistance test values are out of the specified limits:
 - disconnect the HJ11 harness (located at the 6 o'clock junction box) from the CJ11L and do an electrical resistance test through the CJ11L harness between:
 - . pins 5 and 6 (80 to 110 ohms)
 - . pins 2 and 7 (80 to 120 ohms)
 - pins 3 and 4 (85 to 120 ohms)
 - pins 5 and 1 (> 10 megohms)
 - . pins 2 and 1 (> 10 megohms)
 - pins 3 and 1 (> 10 megohms)
 - . pin 5 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms)
 - . pin 3 and the ground (> 10 megohms).

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- (i) If the resistance test values are out of the specified limits:
 replace the CJ11L harness (Ref. AMM TASK 73-21-50-000-025) and
 (Ref. AMM TASK 73-21-50-400-025).
- (j) If the resistance test values are in the specified limits:
 replace the HJ11 harness (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-814

Loss of the VBV Feedback Signal - Engine 2 - Channel A

1. Possible Causes

- VBV sensor (RVDT)
- ECU (4000KS)
- harness HJ11
- harness CJ11L

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
	AMM	73-21-50-000-025	Removal of the CJ11L Harness	
	AMM	73-21-50-000-044	Removal of the HJ11 Harness	
	AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness	
	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
	AMM	73-21-50-400-025	Installation of the CJ11L Harness	
	AMM	73-21-50-400-044	Installation of the HJ11 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with	
			Engine non Motoring)	
R R	AMM	75-31-00-200-001	Manual Operation Check of the Variable Bleed Valve Doors	
N	AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor	
	AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor	

3. Fault Confirmation

A. Do the operational test of the FADEC 2A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The failure message is generated if the channel A signal is invalid, out of range, or both channels disagree.
 - (1) If the failure message VBV SNSR, J11, ECU is not confirmed:
 - (a) No maintenance action is required.

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- (2) If the failure message VBV SNSR, J11, ECU is not confirmed but is repetitive:
 - disconnect the CJ11L harness from the VBV sensor (VBV-A connector) located left core compartment and visually examine the receptacle and the harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).

NOTE : After new VBV sensor is installed, a rigging of the VBV system is required (Ref. AMM TASK 75-31-00-200-001).

- (c) If the fault continues during the subsequent flights:
 - disconnect the HJ11 harness from the ECU (4000KS) and visually examine the receptacle and the connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (d) If the fault continues during the subsequent flights:
 - replace the harness HJ11 (ECU to the junction box 6 o'clock) (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- (e) If the fault continues during the subsequent flights:
 - replace the harness CJ11L (located on the left core compartment) (Ref. AMM TASK 73-21-50-000-025) and (Ref. AMM TASK 73-21-50-400-025).
- (3) If the failure message VBV SNSR, J11, ECU is confirmed:
 - disconnect the CJ11L harness from the VBV sensor (VBV-A connector) located in the left core compartment and visually examine the CJ11L harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-002).
 - (a) If dammge is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do an electrical resistance test through the VBV sensor between:
 - . pins 2 and 3 (80 to 110 ohms)

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- . pins 4 and 5 (80 to 120 ohms)
- . pins 6 and 7 (85 to 120 ohms)
- . pin 2 and the ground (> 10 megohms)
- pin 4 and the ground (> 10 megohms)
- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance test values are out of the specified limits:
 - replace the VBV sensor (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
- (d) If the resistance test values are in the specified limits:
 - reconnect the harness CJ11L (VBV-A connector) to the VBV sensor (RVDT),
 - disconnect the harness HJ11 from the ECU (4000KS) receptacle and visually examine the HJ11 harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-002).
- (e) If damage is found:
 - repair or replace as required.
- (f) If no damage is found:
 - do an electrical resistance test through the J11 harness between:
 - . pins 13 and 29 (80 to 110 ohms)
 - . pins 30 and 31 (80 to 120 ohms)
 - . pins 15 and 32 (85 to 120 ohms)
 - pins 13 and 14 (> 10 megohms)
 - . pins 30 and 14 (> 10 megohms)
 - pins 15 and 14 (> 10 megohms)
 - pin 13 and the ground (> 10 megohms)
 - pin 30 and the ground (> 10 megohms)
 - . pin 15 and the ground (> 10 megohms).
 - (g) If the resistance test values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (h) If the resistance test values are out of the specified limits:
 - disconnect the HJ11 harness (located at the 6 o'clock junction box) from the CJ11L and do an electrical resistance test through the CJ11L harness between:
 - . pins 5 and 6 (80 to 110 ohms)
 - . pins 2 and 7 (80 to 120 ohms)
 - pins 3 and 4 (85 to 120 ohms)
 - pins 5 and 1 (> 10 megohms)
 - . pins 2 and 1 (> 10 megohms)
 - pins 3 and 1 (> 10 megohms)
 - . pin 5 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms)
 - . pin 3 and the ground (> 10 megohms).

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- (i) If the resistance test values are out of the specified limits:
 replace the CJ11L harness (Ref. AMM TASK 73-21-50-000-025) and
 (Ref. AMM TASK 73-21-50-400-025).
- (j) If the resistance test values are in the specified limits:
 replace the HJ11 harness (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

EFF: ALL

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TASK 75-30-00-810-815

Loss of the VBV Feedback Signal - Engine 1 - Channel B

1. Possible Causes

- VBV sensor (RVDT)
- ECU (4000KS)
- harness HJ12
- harness CJ12L

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
		77 24 50 000 027		
	AMM	73-21-50-000-027	Removal of the CJ12L Harness	
	AMM	73-21-50-000-045	Removal of the HJ12 Harness	
	AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness	
	AMM	73-21-50-400-027	Installation of the CJ12L Harness	
	AMM	73-21-50-400-045	Installation of the HJ12 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)	
R R	AMM	75-31-00-200-002	Manual Operation Check of the Variable Bleed Valve Doors	
	AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor	
	AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor	

3. Fault Confirmation

A. Do the operational test of the FADEC 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The failure message is generated if the channel B signal is invalid, out of range, or both channels disagree.
 - (1) If the failure message VBV SNSR, J12, ECU is not confirmed:

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(a) No maintenance action is required.

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- (2) If the failure message VBV SENS, J12, ECU is not confirmed but is repetitive:
 - disconnect the CJ12L harness from the VBV sensor (VBV-B connector) located in the left core compartment and visually examine the receptacle and the harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).

NOTE : After new VBV sensor is installed, a rigging of the VBV system is required (Ref. AMM TASK 75-31-00-200-002).

- (c) If the fault continues during the subsequent flights:
 - disconnect the HJ12 harness from the ECU (4000KS) and visually examine the receptacle and the connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (d) If the fault continues during the subsequent flights:
 - replace the harness HJ12 (ECU to the 6 o'clock junction box) (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- (e) If the fault continues during the subsequent flights:
 - replace the harness CJ12L (located in the left core compartment) (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
- (3) If the failure message VBV SENS, J12, ECU is confirmed:
 - disconnect the CJ12L harness from the VBV sensor (VBV-B connector) located in the left core compartment and visually examine the CJ12L harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do an electrical resistance test through the VBV sensor between:
 - . pins 2 and 3 (80 to 110 ohms)

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- . pins 4 and 5 (80 to 120 ohms)
- pins 6 and 7 (85 to 120 ohms)
- . pin 2 and the ground (> 10 megohms)
- pin 4 and the ground (> 10 megohms)
- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance test values are out of the specified limits:
 - replace the VBV sensor (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
- (d) If the resistance test values are in the specified limits:
 - reconnect the harness CJ12L (VBV-B connector) to the VBV sensor (RVDT),
 - disconnect the harness HJ12 from the ECU (4000KS) receptacle and visually examine the HJ12 harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
- (e) If damage is found:
 - repair or replace as required.
- (f) If no damage is found:
 - do an electrical resistance test through the HJ12 harness between:
 - . pins 13 and 29 (80 to 110 ohms)
 - . pins 30 and 31 (80 to 120 ohms)
 - . pins 15 and 32 (85 to 120 ohms)
 - pins 13 and 14 (> 10 megohms)
 - pins 30 and 14 (> 10 megohms)
 - pins 15 and 14 (> 10 megohms)
 - pin 13 and the ground (> 10 megohms)
 - pin 30 and the ground (> 10 megohms)
 - . pin 15 and the ground (> 10 megohms).
 - (g) If the resistance test values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (h) If the resistance test values are out of the specified limits:
 - disconnect the HJ12 harness (located at the 6 o'clock junction box) from the CJ12L and do an electrical resistance test through the CJ12L harness between:
 - . pins 5 and 6 (80 to 110 ohms)
 - . pins 2 and 7 (80 to 120 ohms)
 - pins 3 and 4 (85 to 120 ohms)
 - pins 5 and 1 (> 10 megohms)
 - . pins 2 and 1 (> 10 megohms)
 - pins 3 and 1 (> 10 megohms)
 - . pin 5 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms)
 - . pin 3 and the ground (> 10 megohms).

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- (i) If the resistance test values are out of the specified limits:
 replace the CJ12L harness (Ref. AMM TASK 73-21-50-000-027) and
 (Ref. AMM TASK 73-21-50-400-027).
- (j) If the resistance test values are in the specified limits:
 replace the HJ12 harness (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-816

Loss of the VBV Feedback Signal - Engine 2 - Channel B

1. Possible Causes

- VBV sensor (RVDT)
- ECU (4000KS)
- harness HJ12
- harness CJ12L

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
		77 24 50 000 027		
	AMM	73-21-50-000-027	Removal of the CJ12L Harness	
	AMM	73-21-50-000-045	Removal of the HJ12 Harness	
	AMM	73-21-50-210-001	Visual Inspection of the Wiring Harness	
	AMM	73-21-50-400-027	Installation of the CJ12L Harness	
	AMM	73-21-50-400-045	Installation of the HJ12 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)	
R R	AMM	75-31-00-200-002	Manual Operation Check of the Variable Bleed Valve Doors	
	AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor	
	AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor	

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. The failure message is generated if the channel B signal is invalid, out of range, or both channels disagree.
 - (1) If the failure message VBV SNSR, J12, ECU is not confirmed:

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(a) No maintenance action is required.

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- (2) If the failure message VBV SENS, J12, ECU is not confirmed but is repetitive:
 - disconnect the CJ12L harness from the VBV sensor (VBV-B connector) located in the left core compartment and visually examine the receptacle and the harness for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002)
 and (Ref. AMM TASK 75-31-70-400-002).

NOTE : After new VBV sensor is installed, a rigging of the VBV system is required (Ref. AMM TASK 75-31-00-200-002).

- (c) If the fault continues during the subsequent flights:
 - disconnect the HJ12 harness from the ECU (4000KS) and visually examine the receptacle and the connector for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - 1 If damage is found:
 - repair or replace as required.
 - 2 If no damage is found:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- (d) if the fault continues during the subsequent flights:
 - replace the harness HJ12 (ECU to the 6 o'clock junction box)
 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- (e) If the fault continues during the subsequent flights:
 - replace the harness CJ12L (located in the left core compartment) (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
- (3) If the failure message VBV SENS, J12, ECU is confirmed:
 - disconnect the CJ12L harness from the VBV sensor (VBV-B connector) located in the left core compartment and visually examine the CJ12L harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
 - (a) If damage is found:
 - repair or replace as required.
 - (b) If no damage is found:
 - do an electrical resistance test through the VBV sensor between:
 - . pins 2 and 3 (80 to 110 ohms)

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- pins 4 and 5 (80 to 120 ohms)
- . pins 6 and 7 (85 to 120 ohms)
- . pin 2 and the ground (> 10 megohms)
- pin 4 and the ground (> 10 megohms)
- . pin 6 and the ground (> 10 megohms).
- (c) If the resistance test values are out of the specified limits:
 - replace the VBV sensor (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
- (d) If the resistance test values are in the specified limits:
 - reconnect the harness CJ12L (VBV-B connector) to the VBV sensor (RVDT),
 - disconnect the harness HJ12 from the ECU (4000KS) receptacle and visually examine the HJ12 harness connector and the VBV sensor (RVDT) receptacle for damaged pins and contamination (Ref. AMM TASK 73-21-50-210-001).
- (e) If damage is found:
 - repair or replace as required.
- (f) If no damage is found:
 - do an electrical resistance test through the HJ12 harness between:
 - . pins 13 and 29 (80 to 110 ohms)
 - . pins 30 and 31 (80 to 120 ohms)
 - . pins 15 and 32 (85 to 120 ohms)
 - pins 13 and 14 (> 10 megohms)
 - pins 30 and 14 (> 10 megohms)
 - pins 15 and 14 (> 10 megohms)
 - pin 13 and the ground (> 10 megohms)
 - . pin 30 and the ground (> 10 megohms)
 - . pin 15 and the ground (> 10 megohms).
 - (g) If the resistance test values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (h) If the resistance test values are out of the specified limits:
 - disconnect the HJ12 harness (located at the 6 o'clock junction box) from the CJ12L and do an electrical resistance test through the CJ12L harness between:
 - . pins 5 and 6 (80 to 110 ohms)
 - . pins 2 and 7 (80 to 120 ohms)
 - pins 3 and 4 (85 to 120 ohms)
 - pins 5 and 1 (> 10 megohms)
 - . pins 2 and 1 (> 10 megohms)
 - pins 3 and 1 (> 10 megohms)
 - . pin 5 and the ground (> 10 megohms)
 - . pin 2 and the ground (> 10 megohms)
 - . pin 3 and the ground (> 10 megohms).

EFF: ALL

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- (i) If the resistance test values are out of the specified limits:
 replace the CJ12L harness (Ref. AMM TASK 73-21-50-000-027) and
 (Ref. AMM TASK 73-21-50-400-027).
- (j) If the resistance test values are in the specified limits:
 replace the HJ12 harness (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-829

Bleed Bias System on Engine 1

1. Possible Causes

- Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required
- Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 1A:

Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-830

Bleed Bias System on Engine 2

1. Possible Causes

- Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required
- Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 2A:

Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-831

Bleed Bias System on Engine 1

1. Possible Causes

- Ignore the BLD SNSR, J15, ECU message. No maintenance action is required
- Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 1A:

Ignore the BLD SNSR, J15, ECU message. No maintenance action is required Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-832

Bleed Bias System on Engine 2

1. Possible Causes

- Ignore the BLD SNSR, J15, ECU message. No maintenance action is required
- Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 2A:

Ignore the BLD SNSR, J15, ECU message. No maintenance action is required Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-837

Failure of the Control of the VBV Actuator on Engine 1

1. Possible Causes

- VBV ballscrew actuator
- flexible shaft
- VBV gear motor
- VBV stop mechanism
- VBV master door actuator
- main flexible shaft
- VBV sensor (RVDT)
- ECU (4000KS)
- Hydromechanical Unit (HMU)
- harness HJ8

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)	
	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
	AMM	73-21-50-000-041	Removal of the HJ8 Harness	
	AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
	AMM	73-21-50-400-041	Installation of the HJ8 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
R	AMM	75-31-00-200-001	Manual Operation Check of the Variable Bleed Valve Doors	
	AMM	75-31-10-000-002	Removal of the Bleed Valve Fuel Gear Motor Assembly	
	AMM	75-31-10-400-002	Installation of the Bleed Valve Fuel Gear Motor Assembly	
	AMM	75-31-20-000-002	Removal of the Bleed Valve Stop Mechanism	
	AMM	75-31-20-400-002	Installation of the Bleed Valve Stop Mechanism	
	AMM	75-31-30-000-001	Removal of a VBV Inter-connecting Flexible Shaft (Typical).	
	AMM	75-31-30-000-002	Removal of the VBV System Main Flexible Shaft	
	AMM	75-31-30-200-002	Visual Inspection of the VBV Main Flexible Shaft and the VBV Inter-connecting Flexible Shafts	
	AMM	75-31-30-400-001	Installation of a VBV Inter-connecting Flexible Shaft (Typical)	
	AMM	75-31-30-400-002	Installation of the VBV System Main Flexible Shaft	
	AMM	75-31-50-000-002	Removal of the Bleed Valve and Master Ballscrew Actuator Assembly	

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REFE	RENCE	DESIGNATION
AMM	75-31-50-400-002	Installation of the Bleed Valve and Master Ballscrew
AMM	7 7 - 3 1 - 30 - 400 - 002	Actuator Assembly
AMM	75-31-60-000-002	Removal of the Bleed Valve and Ballscrew Actuator Assembly
AMM	75-31-60-400-002	Installation of the Bleed Valve and Ballscrew Actuator Assembly
AMM	75-31-70-000-001	Removal of the Variable Bleed Valve Position Sensor
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor
AMM	75-31-70-400-001	Installation of the Variable Bleed Valve Position Sensor
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor

3. Fault Confirmation

- A. Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
 - NOTE: The maintenance message is generated if the actual position and the demanded position of the VBV system disagree (only the position of VBV master actuator door is monitored).
 - NOTE: There is no expected position of the VBV actuators on a running engine. The position of the VBV actuators must be uniform but can be either open, closed or in an intermediate position.

4. Fault Isolation

- A. If the FADEC test does not give the maintenance message "VBV ACT, HMU": do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (1) If an offset between VBV doors or damage to VBV flexible shafts is observed:
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors shall be inspected and manually operated.

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(c) Operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.

NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).

- (2) If nothing is found, following Trouble Shooting must be performed at first opportunity within 10 cyles (except if the fault re-occurs):

 do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated.
 - (c) Operate each of the 11 VBV actuators both directions and make sure that each moves smoothly and freely.
 - NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).
 - (d) Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-20-000-002).
 - (e) Check for free rotation of the VBV gear motor. If it does not move freely
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - (f) Check for free rotation of the stop mechanism. If it does not move freely
 - replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
 - (g) Check for free rotation of the VBV master door actuator. If it does not move freely
 - replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
 - (h) Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).

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(i) Pre SB 75-007

- 1 If no fault is found:
 - disconnect the harness from the ECU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - disconnect the harness HJ8 connector from the HMU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
- 2 If no fault is found:
 - a If the VBV Gear Motor Part Number is 396800-7 or 396800-9, replace the VBV gear motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - b If not,
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU.
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (j) Post SB 75-007
 - 1 If no fault is found:
 - replace the VBV gear motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - 2 If the fault continues:
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU.
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (k) If the fault continues during subsequent flight:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message VBV ACT, HMU:
 - (1) Do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (2) Do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).

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- (3) Operate the VBV system manually and make sure that it moves smoothly and freely (Ref. AMM TASK 75-31-00-200-001).
 - (a) If the system is hard to rotate or does not move freely (non constant torque) or if offset of position is observed between VBV doors:
 - remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated. If nothing is found:
 - operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.
 - NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).
 - Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-10-000-002).
 - <u>a</u> Check for free rotation of the VBV gear motor. If it does not move freely replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - <u>b</u> Check for free rotation of the stop mechanism. If it does not move freely replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
 - Check for free rotation of the VBV master door actuator. If it does not move freely replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
 - 3 Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).
 - (b) If the system is not hard to rotate and moves freely and smoothly:
 - disconnect the harness HJ8 from the ECU receptacle:
 - Visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)

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- <u>2</u> Do an electrical resistance check through the J8 harness between:
 - . pins 29 and 30 (17 to 23 0hms).
 - a If the resistance values are in the specified limits:
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - if the fault continues, replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If the fault continues, replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
 - If the fault continues, replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - b If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)
 - do a check of the HMU resistance between:
 - . pins 29 and 30 (17 to 23 0hms).
 - * If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041) or * If the resistance values are out of the specified limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:
 - no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-838

Failure of the Control of the VBV Actuator on Engine 2

1. Possible Causes

- VBV ballscrew actuator
- flexible shaft
- VBV gear motor
- VBV stop mechanism
- VBV master door actuator
- main flexible shaft
- VBV sensor (RVDT)
- VBV Gear Motor
- ECU (4000KS)
- Hydromechanical Unit (HMU)
- harness HJ8

2. Job Set-up Information

A. Referenced Information

REFERENCE		DESIGNATION	
AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)	
AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
AMM	73-21-50-000-041	Removal of the HJ8 Harness	
AMM	73-21-50-210-002	Visual Inspection of the Wiring Harnesses	
AMM	73-21-50-400-041	Installation of the HJ8 Harness	
AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)	
AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)	
AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
AMM	75-31-00-200-001	Manual Operation Check of the Variable Bleed Valve Doors	
AMM	75-31-10-000-002	Removal of the Bleed Valve Fuel Gear Motor Assembly	
AMM	75-31-10-400-002	Installation of the Bleed Valve Fuel Gear Motor Assembly	
AMM	75-31-20-000-002	Removal of the Bleed Valve Stop Mechanism	
AMM	75-31-20-400-002	Installation of the Bleed Valve Stop Mechanism	
AMM	75-31-30-000-001	Removal of a VBV Inter-connecting Flexible Shaft (Typical).	
AMM	75-31-30-000-002	Removal of the VBV System Main Flexible Shaft	
AMM	75-31-30-200-002	Visual Inspection of the VBV Main Flexible Shaft and the VBV Inter-connecting Flexible Shafts	
AMM	75-31-30-400-001	<pre>Installation of a VBV Inter-connecting Flexible Shaft (Typical)</pre>	
AMM	75-31-30-400-002	Installation of the VBV System Main Flexible Shaft	
AMM	75-31-50-000-002	Removal of the Bleed Valve and Master Ballscrew Actuator Assembly	

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REFE	RENCE	DESIGNATION	
AMM	75-31-50-400-002	Installation of the Bleed Valve and Master Ballscrew Actuator Assembly	
AMM	75-31-60-000-002	Removal of the Bleed Valve and Ballscrew Actuator Assembly	
AMM	75-31-60-400-002	Installation of the Bleed Valve and Ballscrew Actuator Assembly	
AMM	75-31-70-000-001	Removal of the Variable Bleed Valve Position Sensor	
AMM	75-31-70-000-002	Removal of the Variable Bleed Valve position Sensor	
AMM	75-31-70-400-001	Installation of the Variable Bleed Valve Position Sensor	
AMM	75-31-70-400-002	Installation of the Variable Bleed Valve position Sensor	

3. Fault Confirmation

- A. Do the operational test of the FADEC 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
 - NOTE: The maintenance message is generated if the actual position and the demanded position of the VBV system disagree (only the position of VBV master actuator door is monitored).
 - NOTE: There is no expected position of the VBV actuators on a running engine. The position of the VBV actuators must be uniform but can be either open, closed or in an intermediate position.

4. Fault Isolation

- A. If the FADEC test does not give the maintenance message "VBV ACT, HMU": do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (1) If an offset between VBV doors or damage to VBV flexible shafts is observed:
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors shall be inspected and manually operated.

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(c) Operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.

NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).

- (2) If nothing is found, following Trouble Shooting must be performed at first opportunity within 10 cyles (except if the fault re-occurs):

 do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).
 - (a) Remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - (b) Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated.
 - (c) Operate each of the 11 VBV actuators both directions and make sure that each moves smoothly and freely.

NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).

- (d) Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-20-000-002).
- (e) Check for free rotation of the VBV gear motor. If it does not move freely
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
- (f) Check for free rotation of the stop mechanism. If it does not move freely
 - replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
- (g) Check for free rotation of the VBV master door actuator. If it does not move freely
 - replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
- (h) Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).

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(i) Pre SB 75-007

- 1 If no fault is found:
 - disconnect the harness from the ECU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
 - disconnect the harness HJ8 connector from the HMU receptacle and visually examine the receptacle and the connector for damaged pins or contamination (Ref. AMM TASK 73-21-50-210-002).
- 2 If no fault is found:
 - a If the VBV Gear Motor Part Number is 396800-7 or 396800-9, replace the VBV gear motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - b If not,
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU.
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (j) Post SB 75-007
 - 1 If no fault is found:
 - replace the VBV Gear Motor, (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - 2 If the fault continues:
 - do a check of the Post Flight Report (PFR) and the Schedule Maintenance Report (SMR)/Class 3 report for the maintenance message(s) VBV SNSR, J11, ECU and/or VBV SNSR, J12, ECU.
 - replace the VBV sensor (RVDT), (Ref. AMM TASK 75-31-70-000-001) and (Ref. AMM TASK 75-31-70-400-001).
- (k) If the fault continues during subsequent flight:
 - replace the ECU (4000KS), (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. If the test gives the maintenance message VBV ACT, HMU:
 - (1) Do a visual inspection of all the VBV doors actuators and flexible shafts through the fan duct panels, check for offset of position between all VBV doors (all VBV doors not set in the same position):
 - (2) Do a check of the rigging of the feedback rod to the VBV position sensor (RVDT) (Ref. AMM TASK 75-31-70-400-002).

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- (3) Operate the VBV system manually and make sure that it moves smoothly and freely (Ref. AMM TASK 75-31-00-200-001).
 - (a) If the system is hard to rotate or does not move freely (non constant torque) or if offset of position is observed between VBV doors:
 - remove all the flexible shafts (Ref. AMM TASK 75-31-30-000-001).
 - Inspect the rod ends of each flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace any flexible shaft exhibiting excessive wear (Ref. AMM TASK 75-31-30-000-001) and (Ref. AMM TASK 75-31-30-400-001). In case of wear on the flexible shafts ends, all VBV doors must be inspected and manually operated. If nothing is found:
 - operate each of the 11 VBV actuator both directions and make sure that each moves smoothly and freely.
 - NOTE: During this check, apply a manual load tending to force the door towards its open position. Replace any suspect VBV ballscrew actuator (Ref. AMM TASK 75-31-60-000-002) and (Ref. AMM TASK 75-31-60-400-002).
 - Remove the VBV gear motor/stop mechanism assembly (Ref. AMM TASK 75-31-10-000-002).
 - <u>a</u> Check for free rotation of the VBV gear motor. If it does not move freely replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - <u>b</u> Check for free rotation of the stop mechanism. If it does not move freely replace the VBV stop mechanism (Ref. AMM TASK 75-31-20-000-002) and (Ref. AMM TASK 75-31-20-400-002).
 - <u>c</u> Check for free rotation of the VBV master door actuator. If it does not move freely replace the VBV master door actuator (Ref. AMM TASK 75-31-50-000-002) and (Ref. AMM TASK 75-31-50-400-002).
 - Inspect the rod ends of the main flexible shaft (Ref. AMM TASK 75-31-30-200-002). Replace the main flexible shaft in case of excessive wear (Ref. AMM TASK 75-31-30-000-002) and (Ref. AMM TASK 75-31-30-400-002).
 - (b) If the system is not hard to rotate and moves freely and smoothly:
 - disconnect the harness HJ8 from the ECU receptacle:
 - Visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)

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- <u>2</u> Do an electrical resistance check through the HJ8 harness between:
 - . pins 29 and 30 (17 to 23 0hms).
 - a If the resistance values are in the specified limits:
 - replace the VBV gear motor (Ref. AMM TASK 75-31-10-000-002) and (Ref. AMM TASK 75-31-10-400-002).
 - if the fault continues, replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
 - If the fault continues, replace the VBV sensor (RVDT) (Ref. AMM TASK 75-31-70-000-002) and (Ref. AMM TASK 75-31-70-400-002).
 - If the fault continues, replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - b If the resistance values are out of the specified limits:
 - disconnect the harness HJ8 from the HMU and visually examine the receptacle and connector for damage pin or contamination (Ref. AMM TASK 73-21-50-210-002)
 - do a check of the HMU resistance between:
 - . pins 29 and 30 (17 to 23 0hms).
 - * If the resistance values are in the specified limits:
 - replace the defective harness HJ8 (Ref. AMM TASK 73-2150-000-041) and (Ref. AMM TASK 73-21-50-400-041) or
 * If the resistance values are out of the specified
 limits:
 - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- C. Do the test given in Para. 3.A.
 - (1) If the fault is not confirmed:
 - no additional maintenance action is required.
 - (2) If the fault continues:
 - repeat the fault isolation procedure.

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TROUBLE SHOOTING MANUAL

TASK 75-30-00-810-839

Bleed Bias System on Engine 1

1. Possible Causes

- Ignore the BLD SNSR, J15, ECU message. No maintenance action is required
- Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 1B:

Ignore the BLD SNSR, J15, ECU message. No maintenance action is required Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-840

Bleed Bias System on Engine 2

1. Possible Causes

- Ignore the BLD SNSR, J15, ECU message. No maintenance action is required
- Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 2B:

Ignore the BLD SNSR, J15, ECU message. No maintenance action is required Ignore the BLD SNSR, J15, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-841

Bleed Bias System on Engine 1

1. Possible Causes

- Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required
- Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 1B:

Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required.

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TASK 75-30-00-810-842

Bleed Bias System on Engine 2

1. Possible Causes

- Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required
- Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required

2. Job Set-up Information

Not Applicable

3. Fault Confirmation

A. Not applicable, the Bleed Bias System is not installed.

4. Fault Isolation

A. On Channel 2B:

Ignore the VTURI, BLD SNSR, ECU message. No maintenance action is required Ignore the VTURI, BLD SNSR, ECU* message. No maintenance action is required.

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TROUBLE SHOOTING MANUAL

VARIABLE STATOR VANE SYSTEM (VSV) - FAULT ISOLATION PROCEDURES

TASK 75-32-00-810-801

Failure of the VSV System on Engine 1

- 1. Possible Causes
 - harness J7

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- Hydromechanical Unit (HMU)
- ECU (4000KS)
- 2. Job Set-up Information
 - A. Referenced Information

	REFERENCE		DESIGNATION	
	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)	
	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
R	AMM	73-21-50-000-040	Removal of the HJ7 Harness	
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••	AMM	73-21-50-400-040	Installation of the HJ7 Harness	
R				
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
	ASM	73-25/18	=	

- 3. Fault Confirmation
 - A. Test

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(1) Do the operational test of the FADEC 1A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

- 4. Fault Isolation
 - A. If the test gives the maintenance message VSV ACT, HMU:
 - manually operate the VSV system and make sure that the system moves smoothly and freely.
 - (1) If the fault continues:
 - do a check for line to line short circuit of the harness J7 between the ECU (4000KS) and the VSV torque-motor (Ref. ASM 73-25/18).

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- (2) If the fault continues:
 - disconnect the cable J7 from the ECU and do a check of the ECU resistance between:
 - . pins 25 and 26 (17 to 23 0hms).
 - (a) If the resistance values are in the specified limits:open the VSVs and make sure that they move freely.
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable J7 from the HMU and do a check of the HMU resistance between:
 - . pins 25 and 26 (17 to 23 0hms).
 - 1 If the resistance values are in the specified limits: - replace the defective harness J7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - <u>2</u> If the resistance values are out of the specified limits: - replace the Hydromechanical Unit (HMU).
- (3) If the resistance checks are correct and the VSVs move freely: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (4) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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EFF: ALL

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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-802

Failure of the VSV System on Engine 2

- 1. Possible Causes
 - harness J7

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- Hydromechanical Unit (HMU)
- ECU (4000KS)
- 2. Job Set-up Information
 - A. Referenced Information

	REFE	RENCE	DESIGNATION	
	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)	
	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)	
R R	AMM	73-21-50-000-040	Removal of the HJ7 Harness	
R	AMM	73-21-50-400-040	Installation of the HJ7 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)	
	ASM	73-25/18		

3. Fault Confirmation

A. Test

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- (1) Do the operational test of the FADEC 2A on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
- 4. Fault Isolation
 - A. If the test gives the maintenance message VSV ACT, HMU:
 - manually operate the VSV system and make sure that the system moves smoothly and freely.
 - (1) If the fault continues:
 - do a check for line to line short circuit of the harness J7 between the ECU (4000KS) and the VSV torque-motor (Ref. ASM 73-25/18).

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- (2) If the fault continues:
 - disconnect the cable J7 from the ECU and do a check of the ECU resistance between:
 - . pins 25 and 26 (17 to 23 0hms).
 - (a) If the resistance values are in the specified limits:open the VSVs and make sure that they move freely.
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable J7 from the HMU and do a check of the HMU resistance between:
 - . pins 25 and 26 (17 to 23 0hms).
 - 1 If the resistance values are in the specified limits: - replace the defective harness J7 (Ref. AMM TASK 73-21-50-000-040) and (Ref. AMM TASK 73-21-50-400-040).
 - <u>2</u> If the resistance values are out of the specified limits: - replace the Hydromechanical Unit (HMU).
- (3) If the resistance checks are correct and the VSVs move freely: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
- (4) If the fault continues:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
- B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-803

Loss of the feedback Signal from the VSV through the two Channels on Engine 1

- 1. Possible Causes
 - ECU (4000KS)
 - harness J11
 - harness J12
 - harness CJ11R
 - harness CJ12L
 - VSV actuator
- 2. Job Set-up Information
 - A. Referenced Information

	REFERENCE		DESIGNATION	
R	AMM	73-21-50-000-026	Removal of the CJ11R Harness	
R	AMM	73-21-50-000-027	Removal of the CJ12L Harness	
R	AMM	73-21-50-000-044	Removal of the HJ11 Harness	
	AMM	73-21-50-000-045	Removal of the HJ12 Harness	
R	AMM	73-21-50-400-026	Installation of the CJ11R Harness	
R	AMM	73-21-50-400-027	Installation of the CJ12L Harness	
R	AMM	73-21-50-400-044	Installation of the HJ11 Harness	
R	AMM	73-21-50-400-045	Installation of the HJ12 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
	AMM	75-32-10-000-002	Removal of the Variable Stator Vane (VSV) Actuators	
	AMM	75-32-10-400-002	<pre>Installation of the Variable Stator Vane (VSV) Actuators</pre>	
	ASM	73-25/18		

3. Fault Confirmation

- A. Test
 - (1) Do the operational test of the FADEC 1A and 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. If the test gives the maintenance messages VSV ACT, J11, ECU and VSV ACT, J12, ECU:
 - do a check for open or short to ground of the harnesses J11 and J12 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VSV LVDT (Ref. ASM 73-25/18).
 - (1) If one of these wirings is not correct:
 - repair the defective wiring.
 - (2) If these wirings are correct:
 - disconnect the cables J11 (Channel A) and J12 (Channel B) from the ECU (4000KS) and do a resistance check of the cables J11 and J12 between:
 - . pins 12 and 28 (400 to 600 0hms)
 - . pins 26 and 27 (100 to 180 0hms)
 - . pins 10 and 25 (100 to 180 0hms)
 - pins 12 and 11 (> 10 Megohms)
 - pins 26 and 11 (> 10 Megohms)
 - pins 10 and 11 (> 10 Megohms)
 - pin 12 and the ground (> 10 Megohms)
 - pin 26 and the ground (> 10 Megohms)
 - . pin 10 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables J11 and J12 from the cables CJ11R and CJ12L at the 6 o'clock junction box and do a resistance check of the cables CJ11R and CJ12L between:

For cable CJ11R

- . pins 4 and 14 (400 to 600 0hms)
- pins 1 and 6 (100 to 180 0hms)
- . pins 15 and 27 (100 to 180 0hms)
- pins 4 and 5 (> 10 Megohms)
- . pins 1 and 5 (> 10 Megohms)
- . pins 15 and 5 (> 10 Megohms)
- pin 4 and the ground (> 10 Megohms)
- . pin 1 and the ground (> 10 Megohms)
- . pin 15 and the ground (> 10 Megohms).

for cable CJ12L

- pins 24 and 11 (400 to 600 0hms)
- . pins 23 and 22 (100 to 180 0hms)
- . pins 21 and 9 (100 to 180 0hms)
- pins 24 and 10 (> 10 Megohms)
- pins 23 and 10 (> 10 Megohms)
- pins 21 and 10 (> 10 Megohms)
- . pin 24 and the ground (> 10 Megohms)
- . pin 23 and the ground (> 10 Megohms)

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- . pin 21 and the ground (> 10 Megohms).
- 1 If the resistance values are in the specified limits: - replace the harness J11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness J12 (Ref. AMM
 - (Ref. AMM TASK 73-21-50-400-044) or harness J12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11R and CJ12L from the VSV actuator and do a resistance check of the VSV actuator between:
 - . pins 2 and 3 (400 to 600 0hms)
 - pins 4 and 5 (100 to 180 0hms)
 - . pins 6 and 7 (100 to 180 0hms)
 - pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026) or the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - <u>b</u> If the resistance values are out of the specified limits: - replace the VSV actuator (Ref. AMM TASK 75-32-10-000-002) and (Ref. AMM TASK 75-32-10-400-002).
- R B. If the test does not give the maintenance messages VSV ACT, J11, ECU and VSV ACT, J12, ECU:
 - No maintenance action is required.
- R C. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-804

Loss of the feedback Signal from the VSV through the two Channels on Engine 2

- 1. Possible Causes
 - ECU (4000KS)
 - harness J11
 - harness J12
 - harness CJ11R
 - harness CJ12L
 - VSV actuator
- 2. Job Set-up Information
 - A. Referenced Information

	REFERENCE		DESIGNATION	
_		77 24 50 000 027	Paraval of the CIAAR Hannes	
R	AMM	73-21-50-000-026	Removal of the CJ11R Harness	
R	AMM	73-21-50-000-027	Removal of the CJ12L Harness	
R	AMM	73-21-50-000-044	Removal of the HJ11 Harness	
	AMM	73-21-50-000-045	Removal of the HJ12 Harness	
R	AMM	73-21-50-400-026	Installation of the CJ11R Harness	
R	AMM	73-21-50-400-027	Installation of the CJ12L Harness	
R	AMM	73-21-50-400-044	Installation of the HJ11 Harness	
R	AMM	73-21-50-400-045	Installation of the HJ12 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	Installation of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)	
	AMM	75-32-10-000-002	Removal of the Variable Stator Vane (VSV) Actuators	
	AMM	75-32-10-400-002	Installation of the Variable Stator Vane (VSV) Actuators	
	ASM	73-25/18		

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A and 2B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).

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4. Fault Isolation

- A. If the test gives the maintenance messages VSV ACT, J11, ECU and VSV ACT, J12, ECU:
 - do a check for open or short to ground of the harnesses J11 and J12 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VSV LVDT (Ref. ASM 73-25/18).
 - (1) If one of these wirings is not correct:
 - repair the defective wiring.
 - (2) If these wirings are correct:
 - disconnect the cables J11 (Channel A) and J12 (Channel B) from the ECU (4000KS) and do a resistance check of the cables J11 and J12 between:
 - . pins 12 and 28 (400 to 600 0hms)
 - . pins 26 and 27 (100 to 180 0hms)
 - . pins 10 and 25 (100 to 180 0hms)
 - pins 12 and 11 (> 10 Megohms)
 - pins 26 and 11 (> 10 Megohms)
 - pins 10 and 11 (> 10 Megohms)
 - pin 12 and the ground (> 10 Megohms)
 - pin 26 and the ground (> 10 Megohms)
 - . pin 10 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cables J11 and J12 from the cables CJ11R and CJ12L at the 6 o'clock junction box and do a resistance check of the cables CJ11R and CJ12L between:

For cable CJ11R

- . pins 4 and 14 (400 to 600 0hms)
- pins 1 and 6 (100 to 180 0hms)
- . pins 15 and 27 (100 to 180 0hms)
- pins 4 and 5 (> 10 Megohms)
- pins 1 and 5 (> 10 Megohms)
- . pins 15 and 5 (> 10 Megohms)
- pin 4 and the ground (> 10 Megohms)
- pin 1 and the ground (> 10 Megohms)
- . pin 15 and the ground (> 10 Megohms).

for cable CJ12L

- pins 24 and 11 (400 to 600 0hms)
- . pins 23 and 22 (100 to 180 0hms)
- . pins 21 and 9 (100 to 180 0hms)
- pins 24 and 10 (> 10 Megohms)
- pins 23 and 10 (> 10 Megohms)
- pins 21 and 10 (> 10 Megohms)
- . pin 24 and the ground (> 10 Megohms)
- . pin 23 and the ground (> 10 Megohms)

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- . pin 21 and the ground (> 10 Megohms).
- If the resistance values are in the specified limits:
 - replace the harness J11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044) or harness J12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
- 2 If the resistance values are out of the specified limits:
 - disconnect the cables CJ11R and CJ12L from the VSV actuator and do a resistance check of the VSV actuator between:
 - . pins 2 and 3 (400 to 600 0hms)
 - pins 4 and 5 (100 to 180 0hms)
 - pins 6 and 7 (100 to 180 0hms)
 - pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - If the resistance values are in the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026) or the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - b If the resistance values are out of the specified limits:
 - replace the VSV actuator (Ref. AMM TASK 75-32-10-000-002) and (Ref. AMM TASK 75-32-10-400-002).
- R B. If the test does not give the maintenance messages VSV ACT, J11, ECU and VSV ACT, J12, ECU:
 - No maintenance action is required.
- R C. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-805

Loss of the feedback Signal from the VSV through the Channel A on Engine 1

1. Possible Causes

- harness J11
- ECU (4000KS)
- harness CJ11R
- VSV actuator

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
R	AMM	73-21-50-000-026	Removal of the CJ11R Harness	
R	AMM	73-21-50-000-044	Removal of the HJ11 Harness	
R	AMM	73-21-50-400-026	Installation of the CJ11R Harness	
R	AMM	73-21-50-400-044	Installation of the HJ11 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)	
	AMM	75-32-10-000-002	Removal of the Variable Stator Vane (VSV) Actuators	
	AMM	75-32-10-400-002	<pre>Installation of the Variable Stator Vane (VSV) Actuators</pre>	
	ASM	73-25/18		

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message VSV ACT, J11, ECU:
 - do a check for open or short to ground of the harness J11 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VSV LVDT (Ref. ASM 73-25/18).
 - (1) If the wiring is not correct:
 - repair the above wiring.

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- (2) If the wiring is correct:
 - disconnect the cable J11 from the ECU (4000KS) and do a resistance check of the cable J11 between:
 - . pins 12 and 28 (400 to 600 0hms)
 - . pins 26 and 27 (100 to 180 0hms)
 - . pins 10 and 25 (100 to 180 0hms)
 - pins 12 and 11 (> 10 Megohms)
 - . pins 26 and 11 (> 10 Megohms)
 - . pins 10 and 11 (> 10 Megohms)
 - pin 12 and the ground (> 10 Megohms)
 - . pin 26 and the ground (> 10 Megohms)
 - . pin 10 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable J11 from the cable CJ11R at the 6 o'clock junction box and do a resistance check of the cable CJ11R between:
 - pins 4 and 14 (400 to 600 0hms)
 - pins 1 and 6 (100 to 180 0hms)
 - . pins 15 and 27 (100 to 180 0hms)
 - \cdot pins 4 and 5 (> 10 Megohms)
 - pins 1 and 5 (> 10 Megohms)
 - . pins 15 and 5 (> 10 Megohms)
 - . pin 4 and the ground (> 10 Megohms)
 - pin 1 and the ground (> 10 Megohms)
 - . pin 15 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness J11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the cable CJ11R from the VSV actuator and do a resistance check of the VSV actuator between:
 - . pins 2 and 3 (400 to 600 0hms)
 - pins 4 and 5 (100 to 180 0hms)
 - pins 6 and 7 (100 to 180 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).
 - b If the resistance values are out of the specified limits:
 - replace the VSV actuator (Ref. AMM TASK 75-32-10-000-002)
 and (Ref. AMM TASK 75-32-10-400-002).

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R
 B. If the test does note give the maintenance message VSV ACT, J11, ECU:
 R
 No maintenance action is required.

C. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-806

Loss of the feedback Signal from the VSV through the Channel A on Engine 2

1. Possible Causes

- harness J11
- ECU (4000KS)
- harness CJ11R
- VSV actuator

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
R	AMM	73-21-50-000-026	Removal of the CJ11R Harness	
R	AMM	73-21-50-000-044	Removal of the HJ11 Harness	
R	AMM	73-21-50-400-026	Installation of the CJ11R Harness	
R	AMM	73-21-50-400-044	Installation of the HJ11 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)	
	AMM	75-32-10-000-002	Removal of the Variable Stator Vane (VSV) Actuators	
	AMM	75-32-10-400-002	<pre>Installation of the Variable Stator Vane (VSV) Actuators</pre>	
	ASM	73-25/18		

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 2A on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message VSV ACT, J11, ECU:
 - do a check for open or short to ground of the harness J11 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VSV LVDT (Ref. ASM 73-25/18).
 - (1) If the wiring is not correct:
 - repair the above wiring.

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- (2) If the wiring is correct:
 - disconnect the cable J11 from the ECU (4000KS) and do a resistance check of the cable J11 between:
 - . pins 12 and 28 (400 to 600 0hms)
 - . pins 26 and 27 (100 to 180 0hms)
 - . pins 10 and 25 (100 to 180 0hms)
 - pins 12 and 11 (> 10 Megohms)
 - . pins 26 and 11 (> 10 Megohms)
 - pins 10 and 11 (> 10 Megohms)
 - pin 12 and the ground (> 10 Megohms)
 - pin 26 and the ground (> 10 Megohms)
 - . pin 10 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable J11 from the cable CJ11R at the 6 o'clock junction box and do a resistance check of the cable CJ11R between:
 - . pins 4 and 14 (400 to 600 0hms)
 - pins 1 and 6 (100 to 180 0hms)
 - . pins 15 and 27 (100 to 180 0hms)
 - \cdot pins 4 and 5 (> 10 Megohms)
 - pins 1 and 5 (> 10 Megohms)
 - pins 15 and 5 (> 10 Megohms)
 - . pin 4 and the ground (> 10 Megohms)
 - pin 1 and the ground (> 10 Megohms)
 - . pin 15 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness J11 (Ref. AMM TASK 73-21-50-000-044) and (Ref. AMM TASK 73-21-50-400-044).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the cable CJ11R from the VSV actuator and do a resistance check of the VSV actuator between:
 - pins 2 and 3 (400 to 600 0hms)
 - pins 4 and 5 (100 to 180 0hms)
 - pins 6 and 7 (100 to 180 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - . pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ11R (Ref. AMM TASK 73-21-50-000-026) and (Ref. AMM TASK 73-21-50-400-026).
 - b If the resistance values are out of the specified limits:
 - replace the VSV actuator (Ref. AMM TASK 75-32-10-000-002)
 and (Ref. AMM TASK 75-32-10-400-002).

EFF: ALL

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- No maintenance action is required.

R C. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-807

Loss of the feedback Signal from the VSV through the Channel B on Engine 1

1. Possible Causes

- harness J12
- ECU (4000KS)
- harness CJ12L
- VSV actuator

2. Job Set-up Information

A. Referenced Information

	REFERENCE		DESIGNATION	
R	AMM	73-21-50-000-027	Removal of the CJ12L Harness	
	AMM	73-21-50-000-045	Removal of the HJ12 Harness	
R	AMM	73-21-50-400-027	Installation of the CJ12L Harness	
R	AMM	73-21-50-400-045	Installation of the HJ12 Harness	
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)	
	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>	
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)	
	AMM	75-32-10-000-002	Removal of the Variable Stator Vane (VSV) Actuators	
	AMM	75-32-10-400-002	<pre>Installation of the Variable Stator Vane (VSV) Actuators</pre>	
	ASM	73-25/18		

3. Fault Confirmation

A. Test

(1) Do the operational test of the FADEC 1B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message VSV ACT, J12, ECU:
 - do a check for open or short to ground of the harness J12 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VSV LVDT (Ref. ASM 73-25/18).
 - (1) If the wiring is not correct:
 - repair the above wiring.

EFF: ALL **SROS**

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- (2) If the wiring is correct:
 - disconnect the cable J12 from the ECU (4000KS) and do a resistance check of the cable J12 between:
 - . pins 12 and 28 (400 to 600 0hms)
 - . pins 26 and 27 (100 to 180 0hms)
 - . pins 10 and 25 (100 to 180 0hms)
 - . pins 12 and 11 (> 10 Megohms)
 - pins 26 and 11 (> 10 Megohms)
 - . pins 10 and 11 (> 10 Megohms)
 - . pin 12 and the ground (> 10 Megohms)
 - . pin 26 and the ground (> 10 Megohms)
 - . pin 10 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable J12 from the cable CJ12L at the 6 o'clock junction box and do a resistance check of the cable CJ12L between:
 - . pins 24 and 11 (400 to 600 0hms)
 - . pins 23 and 22 (100 to 180 0hms)
 - pins 21 and 9 (100 to 180 0hms)
 - pins 24 and 10 (> 10 Megohms)
 - pins 23 and 10 (> 10 Megohms)
 - pins 21 and 10 (> 10 Megohms)
 - . pin 24 and the ground (> 10 Megohms)
 - pin 23 and the ground (> 10 Megohms)
 - . pin 21 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness J12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the cable CJ12L from the VSV actuator and do a resistance check of the VSV actuator between:
 - pins 2 and 3 (400 to 600 0hms)
 - . pins 4 and 5 (100 to 180 0hms)
 - . pins 6 and 7 (100 to 180 0hms)
 - . pin 2 and the ground (> 10 Megohms)
 - pin 4 and the ground (> 10 Megohms)pin 6 and the ground (> 10 Megohms)
 - a If the resistance values are in the specified limits:
 - replace the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - b If the resistance values are out of the specified limits:
 - replace the VSV actuator (Ref. AMM TASK 75-32-10-000-002) and (Ref. AMM TASK 75-32-10-400-002).

EFF: ALL

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 B. If the test does not give the maintenance message VSV ACT, J12, ECU:
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 No maintenance action is required.

C. Do the test given in Para. 3.A.

EFF: ALL
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TROUBLE SHOOTING MANUAL

TASK 75-32-00-810-808

Loss of the feedback Signal from the VSV through the Channel B on Engine 2

1. Possible Causes

- harness J12
- ECU (4000KS)
- harness CJ12L
- VSV actuator

2. Job Set-up Information

A. Referenced Information

	REFE	RENCE	DESIGNATION
R	AMM	73-21-50-000-027	Removal of the CJ12L Harness
	AMM	73-21-50-000-045	Removal of the HJ12 Harness
R	AMM	73-21-50-400-027	Installation of the CJ12L Harness
R	AMM	73-21-50-400-045	Installation of the HJ12 Harness
	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with Engine non Motoring)
	AMM	75-32-10-000-002	Removal of the Variable Stator Vane (VSV) Actuators
	AMM	75-32-10-400-002	<pre>Installation of the Variable Stator Vane (VSV) Actuators</pre>
	ASM	73-25/18	

3. Fault Confirmation

A. Do the operational test of the FADEC 2B on the ground (with engine non motoring) (Ref. AMM TASK 73-29-00-710-040).

4. Fault Isolation

- A. If the test gives the maintenance message VSV ACT, J12, ECU:
 - do a check for open or short to ground of the harness J12 between the ECU (4000KS) and the 6 o'clock junction box, between the 6 o'clock junction box and the VSV LVDT (Ref. ASM 73-25/18).
 - (1) If the wiring is not correct:
 - repair the above wiring.

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SROS		

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- (2) If the wiring is correct:
 - disconnect the cable J12 from the ECU (4000KS) and do a resistance check of the cable J12 between:
 - . pins 12 and 28 (400 to 600 0hms)
 - . pins 26 and 27 (100 to 180 0hms)
 - . pins 10 and 25 (100 to 180 0hms)
 - pins 12 and 11 (> 10 Megohms)
 - pins 26 and 11 (> 10 Megohms)
 - pins 10 and 11 (> 10 Megohms)
 - pin 12 and the ground (> 10 Megohms)
 - pin 26 and the ground (> 10 Megohms)
 - . pin 10 and the ground (> 10 Megohms).
 - (a) If the resistance values are in the specified limits:
 - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
 - (b) If the resistance values are out of the specified limits:
 - disconnect the cable J12 from the cable CJ12L at the 6 o'clock junction box and do a resistance check of the cable CJ12L between:
 - . pins 24 and 11 (400 to 600 0hms)
 - . pins 23 and 22 (100 to 180 0hms)
 - . pins 21 and 9 (100 to 180 0hms)
 - pins 24 and 10 (> 10 Megohms)
 - . pins 23 and 10 (> 10 Megohms)
 - pins 21 and 10 (> 10 Megohms)
 - . pin 24 and the ground (> 10 Megohms)
 - pin 25 and the ground (> 10 Megohms)
 - . pin 21 and the ground (> 10 Megohms).
 - 1 If the resistance values are in the specified limits:
 - replace the harness J12 (Ref. AMM TASK 73-21-50-000-045) and (Ref. AMM TASK 73-21-50-400-045).
 - 2 If the resistance values are out of the specified limits:
 - disconnect the cable CJ12L from the VSV actuator and do a resistance check of the VSV actuator between:
 - pins 2 and 3 (400 to 600 0hms)
 - pins 4 and 5 (100 to 180 0hms)
 - pins 6 and 7 (100 to 180 0hms)
 - pin 2 and the ground (> 10 Megohms)
 pin 4 and the ground (> 10 Megohms)
 - . pin 6 and the ground (> 10 Megohms).
 - a If the resistance values are in the specified limits:
 - replace the harness CJ12L (Ref. AMM TASK 73-21-50-000-027) and (Ref. AMM TASK 73-21-50-400-027).
 - b If the resistance values are out of the specified limits:
 - replace the VSV actuator (Ref. AMM TASK 75-32-10-000-002) and (Ref. AMM TASK 75-32-10-400-002).

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56 B. If the test does not give the maintenance message VSV ACT, J12, ECU: R

C. Do the test given in Para. 3.A.

- No maintenance action is required.

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TROUBLE SHOOTING MANUAL

- R TASK 75-32-00-810-811
- R Failure of the VSV System on Engine 1
- R 1. Possible Causes
- R harness J8

REFERENCE

- R Hydromechanical Unit (HMU)
- R ECU (4000KS)
- R 2. Job Set-up Information
- R A. Referenced Information

R			
R	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
R	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
R	AMM	73-21-50-000-041	Removal of the HJ8 Harness
R	AMM	73-21-50-400-041	Installation of the HJ8 Harness
R	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
R R	AMM	73-21-60-400-001	<pre>Installation of the Electronic Control Unit (ECU)(4000KS)</pre>
R R	AMM	73-29-00-710-040	Operational Test of the FADEC on the ground (with Engine Motoring)
R	ASM	73-25/18	

DESIGNATION

- R 3. Fault Confirmation
- R A. Test

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- R (1) Do the operational test of the FADEC 1B on the ground (with engine motoring) (Ref. AMM TASK 73-29-00-710-040).
- R 4. Fault Isolation
- R A. If the test gives the maintenance message VSV ACT, HMU:
 - manually operate the VSV system and make sure that the system moves smoothly and freely.
 - (1) If the fault continues:
 - do a check for line to line short circuit of the harness J8 between the ECU (4000KS) and the VSV torque-motor (Ref. ASM 73-25/18).
 - (2) If the fault continues:
 - disconnect the cable J8 from the ECU and do a check of the ECU resistance between:
 - pins 25 and 26 (17 to 23 0hms).

EFF: ALL

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R R	(a) If the resistance values are in the specified limits:open the VSVs and make sure that they move freely.
K	open the vovs and make sure that they move heety.
R	(b) If the resistance values are out of the specified limits:
R	- disconnect the cable J8 from the HMU and do a check of the HMU
R	resistance between:
R	. pins 25 and 26 (17 to 23 Ohms).
R	1 If the resistance values are in the specified limits:
R	- replace the defective harness J8 (Ref. AMM TASK 73-21-50-
R	000-041) and (Ref. AMM TASK 73-21-50-400-041).
R	2 If the resistance values are out of the specified limits:
R	- replace the Hydromechanical Unit (HMU).
R	(3) If the resistance checks are correct and the VSVs move freely:
R	- replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-
R	002) and (Ref. AMM TASK 73-21-10-400-002).
R	(4) If the fault continues:
R	- replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref.
R	AMM TASK 73-21-60-400-001).
R	B. Do the test given in Para. 3.A.

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TROUBLE SHOOTING MANUAL

- R TASK 75-32-00-810-812
- Failure of the VSV System on Engine 2
- 1. Possible Causes
- harness J8

REFERENCE

- R - Hydromechanical Unit (HMU)
- ECU (4000KS)
- R 2. Job Set-up Information
- A. Referenced Information

К			
R	AMM	73-21-10-000-002	Removal of the Hydromechanical Unit (HMU)
R	AMM	73-21-10-400-002	Installation of the Hydromechanical Unit (HMU)
R	AMM	73-21-50-000-041	Removal of the HJ8 Harness
R	AMM	73-21-50-400-041	Installation of the HJ8 Harness
R	AMM	73-21-60-000-001	Removal of the Electronic Control Unit (ECU)(4000KS)
R	AMM	73-21-60-400-001	Installation of the Electronic Control Unit
R			(ECU)(4000KS)
R	AMM	73-29-00-710-040	Operational Test of the FADEC on the Ground (with
R			Engine non Motoring)
R	ASM	73-25/18	

DESIGNATION

- 3. Fault Confirmation
- R A. Test

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- (1) Do the operational test of the FADEC 2B on the ground (with engine R R motoring) (Ref. AMM TASK 73-29-00-710-040).
- R 4. Fault Isolation
- A. If the test gives the maintenance message VSV ACT, HMU: R
 - manually operate the VSV system and make sure that the system moves smoothly and freely.
 - (1) If the fault continues:
 - do a check for line to line short circuit of the harness J8 between the ECU (4000KS) and the VSV torque-motor (Ref. ASM 73-25/18).
 - (2) If the fault continues:
 - disconnect the cable J8 from the ECU and do a check of the ECU resistance between:
 - . pins 25 and 26 (17 to 23 0hms).

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R R	(a) If the resistance values are in the specified limits:open the VSVs and make sure that they move freely.
R R R	 (b) If the resistance values are out of the specified limits: disconnect the cable J8 from the HMU and do a check of the HMU resistance between: pins 25 and 26 (17 to 23 0hms).
R R R	1 If the resistance values are in the specified limits: - replace the defective harness J8 (Ref. AMM TASK 73-21-50-000-041) and (Ref. AMM TASK 73-21-50-400-041).
R R	If the resistance values are out of the specified limits:replace the Hydromechanical Unit (HMU).
R R R	(3) If the resistance checks are correct and the VSVs move freely: - replace the Hydromechanical Unit (HMU) (Ref. AMM TASK 73-21-10-000-002) and (Ref. AMM TASK 73-21-10-400-002).
R R R	(4) If the fault continues: - replace the ECU (4000KS) (Ref. AMM TASK 73-21-60-000-001) and (Ref. AMM TASK 73-21-60-400-001).
D	B No the test given in Para 3 A

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TROUBLE SHOOTING MANUAL

NACELLE TEMPERATURE INDICATING - FAULT ISOLATION PROCEDURES

TASK 75-41-00-810-805

High Nacelle Temperature Indication on Engine 1

1. Possible Causes

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R - hot air leaks from the ECSR - hot air leaks from the engine
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- aircraft wiring

- SENSOR-TEMP, ENG 1 NACELLE (13KS1)

R - EIU-1 (1KS1)

2. Job Set-up Information

R A. Consumable Materials

R REFERENCE DESIGNATION

R Material No. CP2170 * leak-tek 16-0X (Ref. 70-30-00)
R Material No. CP3010 USA MIL-I-25135

R Ardrox 9D4A (Ref. 70-30-00)

R B. Referenced Information

REFERENCE DESIGNATION

R	AMM	71-00-00-710-001	Dry Motoring Check
R	AMM	71-00-00-710-006	Minimum Idle Check
R	AMM	71-00-00-710-028	Engine Shutdown
R	AMM	73-11-40-790-002	Leak Check of the Fuel Nozzles
R	AMM	73-21-70-400-001	Installation of the High Pressure Turbine Clearance
R			Control (HPTCC) Sensor
	AMM	73-25-34-000-040	Removal of the Engine Interface Unit (EIU)
	AMM	73-25-34-400-040	Installation of the Engine Interface Unit (EIU)
	AMM	75-41-15-000-041	Removal of the Nacelle Temperature Sensor
	AMM	75-41-15-400-041	Installation of the Nacelle Temperature Sensor
R	AMM	77-21-10-200-002	Inspection/Check of the T495 Thermocouple Wiring
R			Harness
R	AMM	77-23-10-400-002	Installation of the Compressor Discharge Temperature
R			(T3) Sensor
R	AMM	78-36-00-010-040	Opening of the Thrust Reverser Doors
R	AMM	78-36-00-410-040	Closing of the Thrust Reverser Doors

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3. Fault Confirmation

A. Test

(1) Not applicable.

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NOTE: The following trouble shooting procedure must be completed at first opportunity not interfering with revenue service operation within subsequent 10 days or 150 flight hours of operation that follow the first exceedance of nacelle temperature above 240 deg.C (464 deg.F) pending there is no ECAM warning related to ENG1 FIRE LOOP A (B) FAULT.

4. Fault Isolation

- A. Do the following checks:
 - <u>NOTE</u>: The maintenance message CHECK HOT AIR LEAKS ENG1 is generated and the advisory for nacelle temperature is flashing green on the upper ECAM if the air temperature at the top of the core compartment area is higher than 240 deg.C (464 deg.F).
 - (1) Open both reverser cowls (Ref. AMM TASK 78-36-00-010-040).
 - (2) Do a check for hot air leaks from the ECS:
 - make sure that the engine bleed ducts are in the correct condition and correctly installed (ECS and engine bleed ducts and pneumatic valves). Pay particular attention to clamp installation.
 - (3) Do a check for evidence of overheat on the inner wall of both reverser cowls. If hot spots are visible, do a check for leaks in the area next to the spot.
 - (4) Do a check for excessive presence of black deposit streaks on the hot section of the engine. If black streaks are visible, do a check for leaks in the area next to the spot.
 - (5) Make sure that the 12 o'clock EGT probe deflector is correctly installed.
 - <u>NOTE</u>: The purpose of this deflector is to avoid EGT probe hot air impingement onto the nacelle temperature sensor.
 - (6) Do a check of the cooling holes in the inner wall of the reverser cowls for blockage.
 - (7) Do a check for proper installation of all engine and bleed valves located in the core compartment.
- R (8) Do a visual check for cracks in the combustor casing, HP compressorR casing and turbine casing.

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- (9) Do a visual inspection of the nacelle temperature sensor and wiring for any signs of external damage. Do a check on connectors of the nacelle temperature sensor (13KS1) and associated harness for contamination/corrosion and for damaged pins. Clean repair wiring or replace the sensor as required (Ref. AMM TASK 75-41-15-000-041) and (Ref. AMM TASK 75-41-15-400-041).
- (10) If nothing is found:
 - do a check for correct installation and sealing of the EGT probes (Ref. AMM TASK 77-21-10-200-002).
- (11) Do a check for correct installation and sealing of the TCC sensor(s)
 (Ref. AMM TASK 73-21-70-400-001):
 replace the gasket seal if suspect.
- (12) Do a check for correct torquing and sealing of the borescope plugs located on the HP compressor, HP and LP turbines and combustor case.
- (14) Do a check for correct torquing and sealing of the 2 LPT pipes fitted
 at 11:30 and 2:30 on the HPT case:
 replace the gasket seal if suspect.
- (15) Do a check for correct torquing and sealing of the cover plates and bleed bias adaptor installed on the combustor case just upfront of the fuel manifold:
 - replace the gasket seal if suspect.
- (16) If no evidence of hot air leaks from the engine is found:do one of the following procedures for leakage identification
 - (leakage identification with engine at idle using aluminum foil or leakage identification with engine motoring or leakage identification with engine at idle using leak developer).
- B. Leakage Identification at Idle using Aluminum Foil.
- R NOTE: This procedure is mainly applicable if you suspect a leak located at a piping or duct joint.
 - (1) Install aluminum foils around all pneumatic bleed ducts and engine air piping connections.
- R (2) Close the thrust reverser doors (Ref. AMM TASK 78-36-00-410-040).

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- (3) Do a minimum idle leak check (Ref. AMM TASK 71-00-00-710-006).
 - On the AIR COND panel 30VU, push the ENG 1 BLEED pushbutton switch (4HA1) to operate the engine bleed system.
 - On the ANTI-ICE section of the panel 25VU, push the ANTI ICE/ENG 1
 pushbutton switch (2DN1) to operate the engine anti-ice system.
- (4) Stop the engine (Ref. AMM TASK 71-00-00-710-028).
- (5) Open the thrust reverser doors (Ref. AMM TASK 78-36-00-010-040).
 - (6) Do a visual inspection of the aluminum foil condition. Correct the hot air leaks where applicable.
 - (7) If no leak identified:
 - repeat the inspection of the aluminum foils after a few flights.
- R C. Leakage Identification with Engine Motoring.

WARNING: AVOID PHYSICAL CONTACT WITH THE HARDWARE LOCATED IN THE CORE COMPARTMENT (MAINLY ON THE TOP AREA) IF THE ENGINE IS STILL HOT. ENGINE HARDWARE MAY BE VERY HOT IN THIS AREA IF THE TROUBLE SHOOTING IS PERFORMED WITHIN 2 HOURS AFTER AN ENGINE SHUTDOWN.

NOTE: It is preferable to do this procedure on a cold engine.

- (1) Secure the fan rotor blades with straps.
 - NOTE: Use straps between one fan blade and a fan frame strut at two locations to block the rotation of the fan rotor. Make sure no metallic locking device is in contact with the fan blade, the OGV or the fan frame strut to avoid damage.
- (2) Do a dry motoring of the engine for 2 minutes (Ref. AMM TASK 71-00-00-710-001).
 - NOTE: Several air motoring runs may be required to allow all checks to be done per next steps.
- (3) While the engine is motoring, spray a soap base leak-tek 16-0X (Material No. CP2170) on all hardware connections (ducts, pipes, valves, sensor pads, fuel nozzle pads) and look for evidence of an air leak.
 - NOTE: Two mechanics are required (one located on each side of the engine core) to properly perform this task.
- (4) If a leak developer is not available, an air leak can usually be detected by a tactile test (an air stream can be felt by hand).

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(5) Correct the hot air leaks where applicable.

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- R (6) Remove the straps from the fan rotor blades.
 - D. Leakage Identification at Idle using Leak Developer.
 - (1) Apply a leak developer Ardrox 9D4A (Material No. CP3010) around duct/air pipe joints and on valves, sensor seatings on combustor, HP compressor and turbine cases.
 - (2) Do a minimum idle leak check (Ref. AMM TASK 71-00-00-710-006).
 - On the AIR COND panel 30VU, push the ENG 1 BLEED pushbutton switch (4HA1) to operate the engine bleed system.
 - On the ANTI-ICE section of the panel 25VU, push the ANTI ICE/ENG 1 pushbutton switch (2DN1) to operate the engine anti-ice system.
 - (3) Stop the engine (Ref. AMM TASK 71-00-00-710-028)
 - (4) Do a visual inspection of the hardware and check for evidence of an air leak. Correct the hot air leaks where applicable.
 - Remove the material used to check leaks.
 - E. If the fault continues or if no leak is found:
 - Do a check for correct sealing and torquing of the fuel nozzles (Ref. AMM TASK 73-11-40-790-002). Fuel nozzles located on the top of the engine must be inspected first.
 - (1) If the fault continues:
 - Do a resistance and insulation check of the electrical wiring between the nacelle temperature sensor (13KS1) and the EIU1 (1KS1) (Ref. ASM 73-25/07). The wiring resistance must be less than 2.4 ohms. Repair the aircraft wiring as required.
 - (2) If nothing is found:
 - replace the SENSOR-TEMP, ENG 1 NACELLE (13KS1) (Ref. AMM TASK 75-41-15-000-041) and (Ref. AMM TASK 75-41-15-400-041).
 - (3) If the fault continues:
 - replace the EIU-1 (1KS1) (Ref. AMM TASK 73-25-34-000-040) and (Ref. AMM TASK 73-25-34-400-040) (less probable cause for this failure).
- R F. Do a check that the fault does not continue on subsequent flight.
 - (1) If the fault continues:
 - repeat the fault isolation procedure.

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TASK 75-41-00-810-806

High Nacelle Temperature Indication on Engine 2

1. Possible Causes

R - hot air leaks from the ECSR - hot air leaks from the engine

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- aircraft wiring

R - SENSOR-TEMP, ENG 2 NACELLE (13KS2)

R - EIU-2 (1KS2)

2. Job Set-up Information

R A. Consumable Materials

B. Referenced Information

	REFERENCE		DESIGNATION
R	AMM	71-00-00-710-001	Dry Motoring Check
R	AMM	71-00-00-710-006	Minimum Idle Check
R	AMM	71-00-00-710-028	Engine Shutdown
R	AMM	73-11-40-790-002	Leak Check of the Fuel Nozzles
R	AMM	73-21-70-400-001	Installation of the High Pressure Turbine Clearance
R			Control (HPTCC) Sensor
	AMM	73-25-34-000-040	Removal of the Engine Interface Unit (EIU)
	AMM	73-25-34-400-040	Installation of the Engine Interface Unit (EIU)
	AMM	75-41-15-000-041	Removal of the Nacelle Temperature Sensor
	AMM	75-41-15-400-041	Installation of the Nacelle Temperature Sensor
R	AMM	77-21-10-200-002	Inspection/Check of the T495 Thermocouple Wiring
R			Harness
R	AMM	77-23-10-400-002	Installation of the Compressor Discharge Temperature
R			(T3) Sensor
R	AMM	78-36-00-010-040	Opening of the Thrust Reverser Doors
R	AMM	78-36-00-410-040	Closing of the Thrust Reverser Doors

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3. Fault Confirmation

A. Test

(1) Not applicable.

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NOTE: The following trouble shooting procedure must be completed at first opportunity not interfering with revenue service operation within subsequent 10 days or 150 flight hours of operation that follow the first exceedance of nacelle temperature above 240 deg.C (464 deg.F) pending there is no ECAM warning related to ENG2 FIRE LOOP A (B) FAULT.

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4. Fault Isolation

- A. Do the following checks:
 - NOTE: The maintenance message CHECK HOT AIR LEAKS ENG2 is generated and the advisory for nacelle temperature is flashing green on the upper ECAM if the air temperature at the top of the core compartment area is higher than 240 deg.C (464 deg.F).
- (1) Open both reverser cowls (Ref. AMM TASK 78-36-00-010-040).
- (2) Do a check for hot air leaks from the ECS:
 - make sure that the engine bleed ducts are in the correct condition and correctly installed (ECS and engine bleed ducts and pneumatic valves). Pay particular attention to clamp installation.
 - (3) Do a check for evidence of overheat on the inner wall of both reverser cowls. If hot spots are visible, do a check for leaks in the area next to the spot.
 - (4) Do a check for excessive presence of black deposit streaks on the hot section of the engine. If black streaks are visible, do a check for leaks in the area next to the spot.
 - (5) Make sure that the 12 o'clock EGT probe deflector is correctly installed.
 - NOTE: The purpose of this deflector is to avoid EGT probe hot air impingement onto the nacelle temperature sensor.
 - (6) Do a check of the cooling holes in the inner wall of the reverser cowls for blockage.
- (7) Do a check for proper installation of all engine and bleed valves R R located in the core compartment.

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(8) Do a visual check for cracks in the combustor casing, HP compressor casing and turbine casing.

- (9) Do a visual inspection of the nacelle temperature sensor and wiring for any signs of external damage. Do a check on connectors of the nacelle temperature sensor (13KS2) and associated harness for contamination/corrosion and for damaged pins. Clean repair wiring or replace the sensor as required (Ref. AMM TASK 75-41-15-000-041) and (Ref. AMM TASK 75-41-15-400-041).
- (10) If nothing is found:
 - do a check for correct installation and sealing of the EGT probes (Ref. AMM TASK 77-21-10-200-002).
- (11) Do a check for correct installation and sealing of the TCC sensor(s)
 (Ref. AMM TASK 73-21-70-400-001):
 - replace the gasket seal if suspect.
- (12) Do a check for correct torquing and sealing of the borescope plugs located on the HP compressor, HP and LP turbines and combustor case.
- (14) Do a check for correct torquing and sealing of the 2 LPT pipes fitted
 at 11:30 and 2:30 on the HPT case:
 replace the gasket seal if suspect.
- (15) Do a check for correct torquing and sealing of the cover plates and bleed bias adaptor installed on the combustor case just upfront of the fuel manifold:
 - replace the gasket seal if suspect.
- (16) If no evidence of hot air leaks from the engine is found:
 do one of the following procedures for leakage identification
 (leakage identification with engine at idle using aluminum foil or
 leakage identification with engine motoring or leakage
 identification with engine at idle using leak developer).
- B. Leakage Identification at Idle using Aluminum Foil.
- <u>NOTE</u>: This procedure is mainly applicable if you suspect a leak located at a piping or duct joint.
- R (1) Install aluminum foils around all pneumatic bleed ducts and engine R air piping connections.
- R (2) Close the thrust reverser doors (Ref. AMM TASK 78-36-00-410-040).

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- (3) Do a minimum idle leak check (Ref. AMM TASK 71-00-00-710-006).
 - On the AIR COND panel 30VU, push the ENG 2 BLEED pushbutton switch (4HA2) to operate the engine bleed system.
 - On the ANTI-ICE section of the panel 25VU, push the ANTI ICE/ENG 2 pushbutton switch (2DN2) to operate the engine anti-ice system.
- (4) Stop the engine (Ref. AMM TASK 71-00-00-710-028).
- (5) Open the thrust reverser doors (Ref. AMM TASK 78-36-00-010-040).
 - (6) Do a visual inspection of the aluminum foil condition. Correct the hot air leaks where applicable.
 - (7) If no leak identified:
 - repeat the inspection of the aluminum foils after a few flights.
- C. Leakage Identification with Engine Motoring.
 - WARNING: AVOID PHYSICAL CONTACT WITH THE HARDWARE LOCATED IN THE CORE COMPARTMENT (MAINLY ON THE TOP AREA) IF THE ENGINE IS STILL HOT. ENGINE HARDWARE MAY BE VERY HOT IN THIS AREA IF THE TROUBLE SHOOTING IS PERFORMED WITHIN 2 HOURS AFTER AN ENGINE SHUTDOWN.
 - NOTE: It is preferable to do this procedure on a cold engine.
 - (1) Secure the fan rotor blades with straps.
 - NOTE: Use straps between one fan blade and a fan frame strut at two locations to block the rotation of the fan rotor. Make sure no metallic locking device is in contact with the fan blade, the OGV or the fan frame strut to avoid damage.
 - (2) Do a dry motoring of the engine for 2 minutes (Ref. AMM TASK 71-00-00-710-001).
 - NOTE: Several air motoring runs may be required to allow all checks to be done per next steps.
 - (3) While the engine is motoring, spray a soap base leak-tek 16-0X (Material No. CP2170) on all hardware connections (ducts, pipes, valves, sensor pads, fuel nozzle pads) and look for evidence of an air leak.
 - NOTE: Two mechanics are required (one located on each side of the engine core) to properly perform this task.
 - (4) If a leak developer is not available, an air leak can usually be detected by a tactile test (an air stream can be felt by hand).
 - (5) Correct the hot air leaks where applicable.

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R (6) Remove the straps from the fan rotor blades.

- D. Leakage Identification at Idle using Leak Developer.
 - (1) Apply a leak developer Ardrox 9D4A (Material No. CP3010) around duct/air pipe joints and on valves, sensor seatings on combustor, HP compressor and turbine cases.
 - (2) Do a minimum idle leak check (Ref. AMM TASK 71-00-00-710-006).
 - On the AIR COND panel 30VU, push the ENG 2 BLEED pushbutton switch (4HA2) to operate the engine bleed system.
 - On the ANTI-ICE section of the panel 25VU, push the ANTI ICE/ENG 2 pushbutton switch (2DN2) to operate the engine anti-ice system.
 - (3) Stop the engine (Ref. AMM TASK 71-00-00-710-028)
 - (4) Do a visual inspection of the hardware and check for evidence of an air leak. Correct the hot air leaks where applicable.
 - Remove the material used to check leaks.
- E. If the fault continues or if no leak is found:
 - Do a check for correct sealing and torquing of the fuel nozzles (Ref. AMM TASK 73-11-40-790-002). Fuel nozzles located on the top of the engine must be inspected first.
 - (1) If the fault continues:
 - Do a resistance and insulation check of the electrical wiring between the nacelle temperature sensor (13KS2) and the EIU2 (1KS2) (Ref. ASM 73-25/07). The wiring resistance must be less than 2.4 ohms. Repair the aircraft wiring as required.
 - (2) If nothing is found:
 - replace the SENSOR-TEMP, ENG 2 NACELLE (13KS2) (Ref. AMM TASK 75-41-15-000-041) and (Ref. AMM TASK 75-41-15-400-041).
 - (3) If the fault continues:
 - replace the EIU-2 (1KS2) (Ref. AMM TASK 73-25-34-000-040) and (Ref. AMM TASK 73-25-34-400-040) (less probable cause for this failure).
- R F. Do a check that the fault does not continue on subsequent flight.
 - (1) If the fault continues:
 - repeat the fault isolation procedure.

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TASK 75-41-00-810-807

Nacelle Temperature above 310 deg.C (590 deg.F) or Loss of the Nacelle Temperature Data on Engine 1

1. Possible Causes

- SENSOR-TEMP, ENG 1 NACELLE (13KS1)
- EIU-1 (1KS1)
- aircraft wiring

2. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION	
75-41-00-810-805	High Nacelle Temperature Indication on Engine 1	
AMM 73-25-34-000-040	Removal of the Engine Interface Unit (EIU)	
AMM 73-25-34-400-040	Installation of the Engine Interface Unit (EIU)	
AMM 73-25-34-710-043	Operational Test of the Engine Interface Unit	
AMM 75-41-15-000-041	Removal of the Nacelle Temperature Sensor	
AMM 75-41-15-400-041	Installation of the Nacelle Temperature Sensor	
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3. Fault Confirmation

A. Test

(1) Check the Post Flight Report (PFR), crew report and do the operational test of the Engine Interface Unit (EIU) through the Centralized Fault Display System (CFDS) (Ref. AMM TASK 73-25-34-710-043).

4. Fault Isolation

- A. If the maintenance message CHECK HOT AIR LEAKS is shown at the end of test or in the Post Flight Report (PFR) or if the crew reported that nacelle temperature was flashing on ECAM:
 - do the relevant trouble shooting procedure (Ref. TASK 75-41-00-810-805) for failure message CHECK HOT AIR LEAKS (TSM CFDS chapter 36-22).
 - (1) If nothing is confirmed:
 - replace the SENSOR-TEMP, ENG 1 NACELLE (13KS1) (Ref. AMM TASK 75-41-15-000-041) and (Ref. AMM TASK 75-41-15-400-041).
 - (2) If the fault continues:
 - do a check of the electrical wiring between the EIU-1 (1KS1) and the nacelle temperature sensor (13KS1) (Ref. ASM 73-25/07), wiring resistance must be lower than 2.4 ohms.

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- (a) Check the electrical connectors for absence of contamination, corrosion or loose pins:
 - clean or repair aircraft wiring as required.
- (3) If the fault continues:
 - replace the EIU-1 (Ref. AMM TASK 73-25-34-000-040) and (Ref. AMM TASK 73-25-34-400-040).
- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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TASK 75-41-00-810-808

Nacelle Temperature above 310 deg.C (590 deg.F) or Loss of the Nacelle Temperature Data on Engine 2

1. Possible Causes

- SENSOR-TEMP, ENG 2 NACELLE (13KS2)
- EIU-2 (1KS2)
- aircraft wiring

2. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
75-41-00-810-806	High Nacelle Temperature Indication on Engine 2
AMM 73-25-34-000-040	Removal of the Engine Interface Unit (EIU)
AMM 73-25-34-400-040	Installation of the Engine Interface Unit (EIU)
AMM 73-25-34-710-043	Operational Test of the Engine Interface Unit
AMM 75-41-15-000-041	Removal of the Nacelle Temperature Sensor
AMM 75-41-15-400-041	Installation of the Nacelle Temperature Sensor
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3. Fault Confirmation

A. Test

(1) Check the Post Flight Report (PFR), crew report and do the operational test of the Engine Interface Unit (EIU) through the Centralized Fault Display System (CFDS) (Ref. AMM TASK 73-25-34-710-043).

4. Fault Isolation

- A. If the maintenance message CHECK HOT AIR LEAKS is shown at the end of test or in the Post Flight Report (PFR) or if the crew reported that nacelle temperature was flashing on ECAM:
 - do the relevant trouble shooting procedure (Ref. TASK 75-41-00-810-806) for failure message CHECK HOT AIR LEAKS (TSM CFDS chapter 36-22).
 - (1) If nothing is confirmed:
 - replace the SENSOR-TEMP, ENG 2 NACELLE (13KS2) (Ref. AMM TASK 75-41-15-000-041) and (Ref. AMM TASK 75-41-15-400-041).
 - (2) If the fault continues:
 - do a check of the electrical wiring between the EIU-2 (1KS2) and the nacelle temperature sensor (13KS2) (Ref. ASM 73-25/07), wiring resistance must be lower than 2.4 ohms.

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- (a) Check the electrical connectors for absence of contamination, corrosion or loose pins:
 - clean or repair aircraft wiring as required.
- (3) If the fault continues:
 - replace the EIU-2 (Ref. AMM TASK 73-25-34-000-040) and (Ref. AMM TASK 73-25-34-400-040).
- B. Do the test given in Para. 3.A.
 - (1) No additional maintenance action is required if the fault is not confirmed.
 - (2) Repeat the fault isolation procedure if the fault continues.

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