



Application Note

MDHI 520 N and 600 N Models

Tail Rotor Balance (NOTAR Fan)

Part Number: 11-200-0204

AppNote Number: A-MD520600N-4040-TR (Rev. 0, Sep 2005)

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Application Note

Application Note Number	A-MD520600N-4040-TR
Revision	0 (From Airframe Rev 36)
Function	Tail Rotor Balance (NOTAR Fan)
Airframe	MDHI 520 N and 600 N Models
Engine	N/A
E-Setup Number	a-md520600n-4040-tr.asf
ACES Systems Analyzer	Model 4040
Boot/App Version	1.04/1.05p3 or later
Procedure	N/A

Introduction

This Application Note covers the required equipment, equipment installation, analyzer setup, data acquisition and solution process for using the ACES Systems Model 4040 with the Tail Rotor Enhanced Performance Option to perform a NOTAR fan balance on the airframe listed above. General instructions for the use of the Model 4040 can be found in the Model 4040 User Manual #4040-OM-01 (P/N 75-900-4040) and Optical Tracker Operational Supplement #540-OM-1 (P/N 75-900-2021). All procedures for track and balance and all adjustments should be made in accordance with the Airframe Maintenance Manual.

A. Equipment Setup

Required Equipment: The following equipment is required to perform a NOTAR Fan Balance:

Item	Quantity	Description	Part Number
1.	1	Analyzer, Model 4040	10-100-4040
2.	1	Sensor, Vibe, Accel, 991D-1	69-100-0075
3.	1	Cable, Sensor 991D-1, 25'	10-320-0162
4.	1	Cable, Magnetic Pick-Up, 25'	10-320-0052
5.	1	Option, 4040 Main and Tail Rotor	11-900-0005



Miscellaneous Equipment

Tape or tie wraps to secure cables to airframe.

If adjustments are made to the tail rotor balance, use only hardware or balance weights that are specified in the applicable airframe maintenance manual.

B. Equipment Installation

1. Park the aircraft on a flat level surface with the nose into the wind. Place the Analyzer (Item 1) in the flight compartment.
2. Remove the air inlet screen.
3. Remove the upper portion of the fan/hub transmission fairing.
4. Number the balance studs as shown using a permanent marker. (Figure 1)
5. Connect the Magnetic Pickup Cable (Item 4) to the magnetic pickup.
6. Install the 991D-1 Sensor (Item 2) on the mount located at the 6:00 position.
7. Connect the Vibration Sensor Cable (Item 3) to the Vibration Sensor.

NOTE

Secure and route cables as not to interfere with hot or rotating components and prevent ingestion by the fan during run-up.

8. Route cables safely to flight compartment. Connect the Magnetic Pickup Cable to “Tach 1” on the Analyzer. Connect the Vibration Sensor Cable to “Channel A” on the Analyzer.
9. Reinstall any previously removed cowlings as necessary.

Equipment Installation Diagram

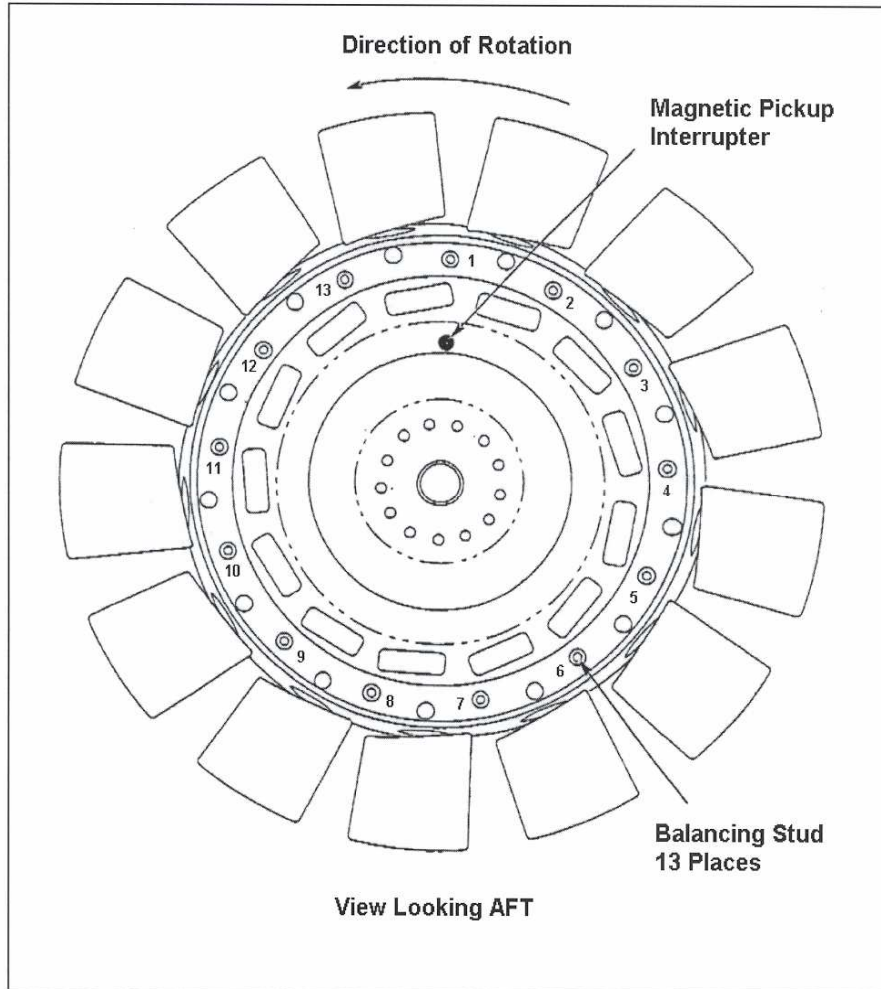
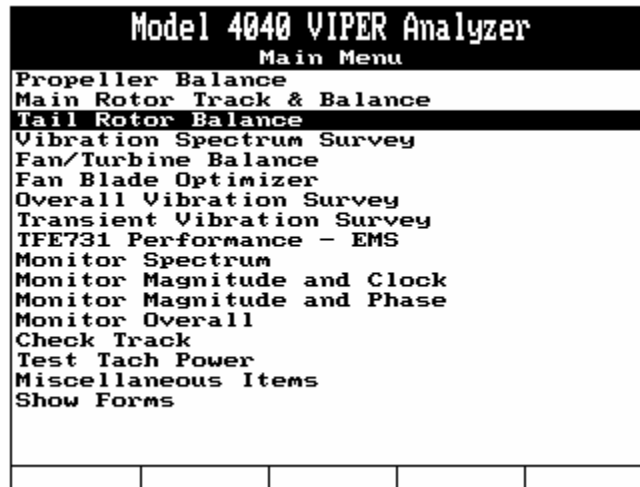


Figure 1



C. Analyzer Set Up

1. Insure the analyzer battery is charged prior to starting the job. See the Model 4040 User Manual #4040-OM-01 (P/N 75-900-4040) Chapter 2 for detailed instructions on battery charging.
2. Turn the analyzer ON by pressing the [ON/OFF] key.
3. From the Main Menu shown below, select “Tail Rotor Balance” and press the [ENTER] key.



4. From the Tail Rotor Balance Menu shown below, select “Start Job” and press the [ENTER] key.



5. If the MDHI 520 N or 600 N is listed in the Setup List, select it using the [↓] key, press [ENTER] and go to Section D below. If the MDHI 520 N or 600 N is not in the Setup List, press the [F1], “New” key and go to step 6 below.

D. Data Acquisition

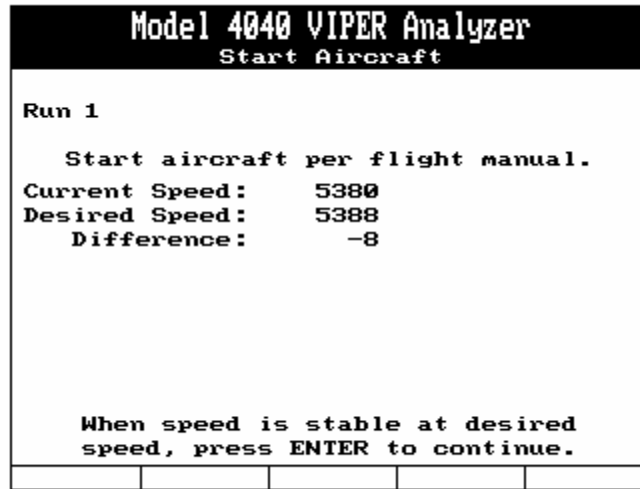
- The “Job Identification” Screen will be displayed, as shown below. Use the analyzer keypad to enter a customer name in the “Name:” field. The analyzer will maintain a list of customer names as new names are entered. If names have been previously entered into this analyzer, you may press the [F1] “Names” key and select a customer's name from the provided list. Press the [↓] key to move to the next field and use the analyzer keypad to enter the optional aircraft registration and aircraft total time as required. When all fields are complete, press the [ENTER] key to accept and continue.

Model 4040 VIPER Analyzer				
Job Identification				
Name : CUSTOMER NAME				
A/C Registration: N1234				
A/C Total Time: 123.4				
Press ENTER to continue				
Names				

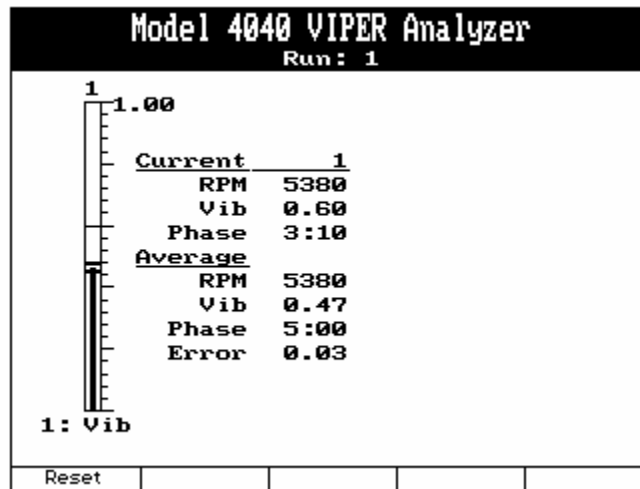
- The next screen to be displayed will be the “Tail Rotor Equipment Setup” screen as illustrated below. This screen gives instructions on installing sensors and cables. Power to the Tach will be activated automatically when this screen is exited; the [F1] “Tach On” key is only for alignment purposes when using the Phototach and reflective tape. Press [ENTER] to continue with the balance job.

Model 4040 VIPER Analyzer				
Tail Rotor Equipment Setup				
Install the speed sensor and connect to tach channel 1				
Install vibration sensor and connect to vib. channel A				
Tach power is Off				
Tach On				

3. The “Start Aircraft” screen will be displayed with instructions to “Start Aircraft per Flight Manual”. When the aircraft is started and normal operating conditions have been established, press the [ENTER] key to continue.



4. The analyzer will present the data acquisition screen as shown. This screen allows you to monitor both the current and averaged vibration readings. While monitoring the measurement, you may press the [F1] “Reset” key to restart the averaging process. Use this feature as a way to validate the quality of the measurement. If the averaged readings return to a value similar to that prior to being “Reset”, the measurement can be considered good. If the measurement is not similar, you may choose to “Reset” the average again.



See the Model 4040 User Manual #4040-OM-01 (P/N 75-900-4040) Chapter 20 for detailed instructions on how to read the “Converging Vibration Indicator and Scale.”



5. You will be prompted to “Shut Down Aircraft” as shown above. Press [F5] to proceed. The “Review Prior Run(s) Data” screen will appear as shown below. This screen allows the user to view the vibration readings that were acquired during the condition. Press [F1] to “Retake” the data or [ENTER] to continue. Pressing [F5] will “Quit Job”.

Model 4040 VIPER Analyzer				
Review Prior Run(s) Data				
Run	RPM	IPS	Clock	
1	5380	0.470	5:00	
Retake #1				

6. The “T/R Sugg. & Inst. Wts” screen will present a suggested solution based on the chart created in the original setup and the vibration IPS and clock reading. You have the opportunity to install the suggested weight corrections or decide on a different corrective action. It is important that the entry under the “Enter Installed Wts” reflect the actual weight amounts and locations used.

CAUTION

At no point should a correction be made that contradicts information in the maintenance manual.

Model 4040 VIPER Analyzer			
T/R Suggested/Installed Weights			
Run 1		Suggestion:	
Chart : a-md520600n-4040-tr			
11	0.9	12	1.7
Enter Installed Weights:			
1	0.0	11	1.0
2	0.0	12	2.0
3	0.0	13	0.0
4	0.0		
5	0.0		
6	0.0		
7	0.0		
8	0.0		
9	0.0		
10	0.0		
Inst=Sugg	Inst=None		Quit Job

Using the keypad, record the actual weight(s) installed between runs and their location. In the example above the closest available weight combination to the suggestion was to add 1.0 grams to the #11 weight location and to add 2.0 grams to the #12 weight location. If you choose to remove weight from an opposite or alternate position, enter the negative adjustment. Do this by moving the highlight to the appropriate field, press the [SPACE+/-] key to produce a (-).

To remove all values in the suggested column use the [F2] "Inst=None" key. If you decide you would like to revert back to the suggested weights use [F1] "Inst=Sugg" key.

The [F5] "Quit Job" exits the balance job with no provisions to resume the job at a later point in time. If you wish to leave the job and be able to resume it later, press the [MAIN MENU] key.

- When you have finished with the solution process, press [ENTER] and you will be taken to the "Start Aircraft" screen as shown in Paragraph 3 of this section to continue the balance process.

E. Quit Job

- Repeat steps D.3 through D.7 applying the solutions as necessary. When you are satisfied with the balance results, you can quit the job from any screen displaying the [F5] "Quit Job" key. Pressing this key will mark the job as complete.