Application Note

Application Note Number	A-ECSA315-316-2020E-TR
Revision	1
Function	Tail Rotor Balance
Airframe	SA315 Lama and SA316 Alouette
Engine	N/A
E-Setup Number	A-ECSA315-316-2020E-TR.asf
ACES Systems Analyzer	Model 2020 w/Tail Rotor Enhanced Software
Firmware Version	2.00 or greater
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 2020 with Enhanced Tail Rotor Performance Software option to perform tail rotor balance on the Alouette and Lama helicopters. General instructions for the use of the Model 2020 can be found in user manual #2020OM-01. All procedures for track and balance and adjustments should be made in accordance with the Eurocopter Maintenance Manual.

A. Required Equipment

The following ACES Systems' equipment is required.

Item	Quantity	Description	Part Number
1.	1	Model 2020 Analyzer	10-100-2020
2.	1	Phototach	10-100-1773
3.	1	Cable, Tachometer, 50 ft.	10-320-0126
4.	1	Sensor, Vibration, 991D-1	69-100-0075
5.	1	Cable, Sensor, 991D, 50'	10-320-0163
6.	1	Mount , Tach/Vibe SA315/316	22-430-0133
7.	1	Reflective Tape	10-400-0176

Miscellaneous Equipment

Tape, tie wraps or cable clamps to secure cables to airframe.

B. Equipment Installation

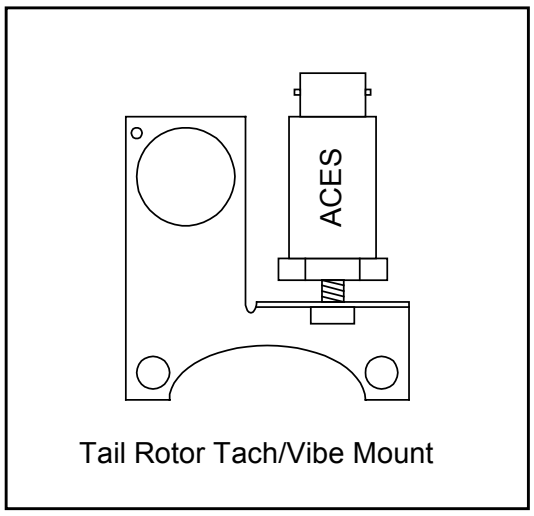
1. Park the helicopter on a flat surface with the nose facing into the wind.
2. Install tach/vibe mount (P/N 22-430-0133) at the 12:00 position on the tail gearbox output flange. Thread 991D-1 sensor (P/N 69-100-0075) into phototach tach mount and tighten. Sensor connector should face up. Install phototach (P/N 10-100-1773) into mount and secure with nut.
3. Connect phototach cable (P/N 10-320-0126) to phototach and connect sensor cable (P/N 10-320-0163) to sensor and route cables into cabin area. Connect sensor cable to channel A of balancer. Connect phototach cable to Tach 1 channel of balancer.

Note

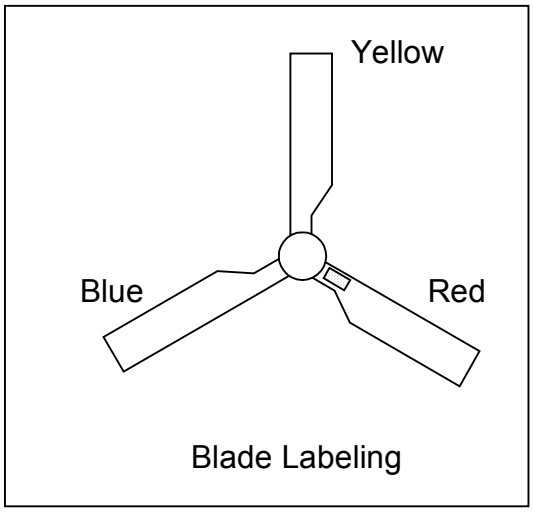
Route all cables as not to interfere with hot or rotating components.

4. Apply a piece of reflective tape to the aft side of the **red** tail rotor blade. Ensure the reflective target is in-line with the phototach.

Equipment Installation Diagram



Tail Rotor Tach/Vibe Mount

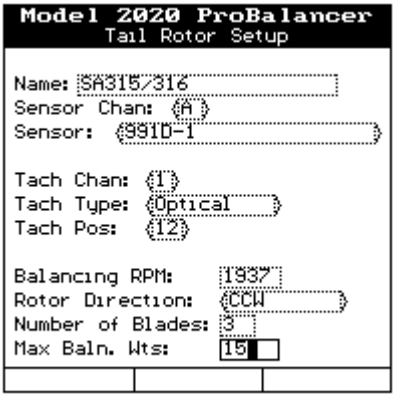


Blade Labeling

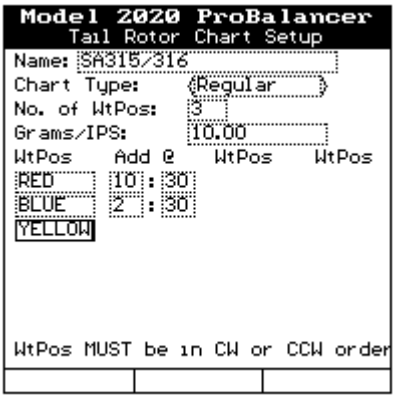
C. Analyzer Set Up

1. Turn the analyzer "ON"
2. From the "Main Menu", select "Tail Rotor Balance" and press **[Enter]**. From the "Tail Rotor Balance" menu, select "Manage Setups" and press **[Enter]**. From the "Manage Setups" menu, select "New" and press **[Enter].**
3. If setups are already stored in the analyzer, a setup list will be presented. If the SA315/316 is not among this list, press the **[F-1]** key for a "New" setup.

   The "Tail Rotor Setup" screen now appears. Enter the tail rotor job setup information as shown in the appropriate fields. Enter 1937 rpm for the SA315 and 1965 for the SA316. When completed, press **[Enter].**



4. The Tail Rotor Chart screen now appears. Enter the setup chart influence information exactly as shown. When finished, press **[Enter].**



5. Setup complete. When finished press **[Enter]**, **[Backup],** and **[Start Job]**.

Warning

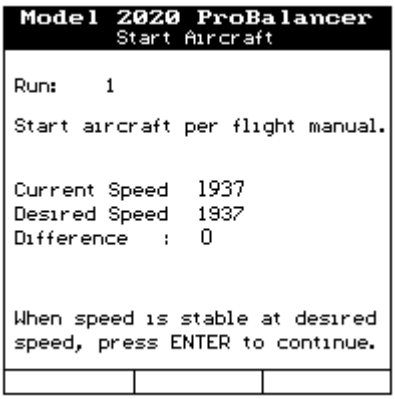
It is important that the following setup information be entered exactly as shown, as errors may lead to possible failure of jobs performed with this setup.

D. Data Acquisition

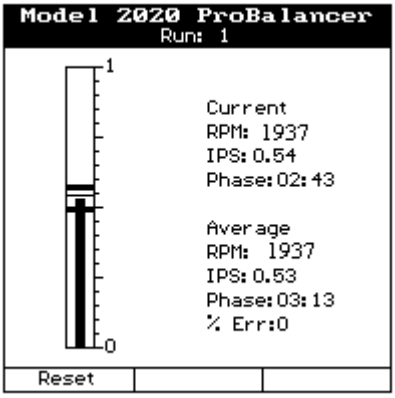
1. Turn the analyzer **[ON].** From the "Main Menu", select "Tail Rotor Balance" and press **[Enter].** From the "Tail Rotor Balance menu, select "Start a Job" and press **[Enter].**
2. Next, select the SA315/316 setup from the analyzer's setup list, select it and press **[Enter].**
3. The "Customer Information" screen appears. You may enter this optional customer information and press **[Enter].** If you have used the analyzer prior to this job, you will be able to recall a list of names to select from by pressing the **[F-1]** "Names" key. It is recommended that you enter at least a customer name, as it will aid in recalling the data at a later date.

4. The equipment setup screen will appear next, directing you to install and connect the vibration sensor and tachometer sensor to the channels assigned in the job setup. Press **[Enter]** to continue.

5. The "Start Aircraft" screen as shown is presented next. This screen has an rpm monitor to allow verification of the tail rotor speed prior to acquiring data. When the rotor speed is as desired, press **[Enter]** to continue.

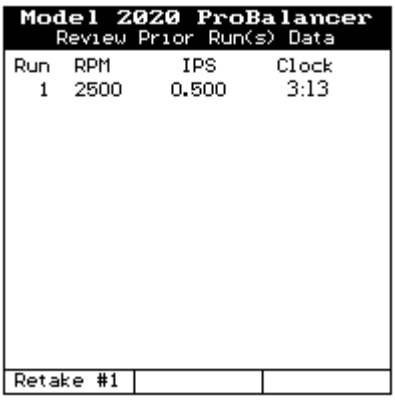


6. The analyzer will present the data acquisition screen. This screen allows you to monitor both the current and averaged vibration readings. While monitoring the measurement, you may press the **[F-1]** "Reset" key to restart the averaging process. When the % error shown has reached its lowest point, press **[Enter]** to stop the acquisition process.

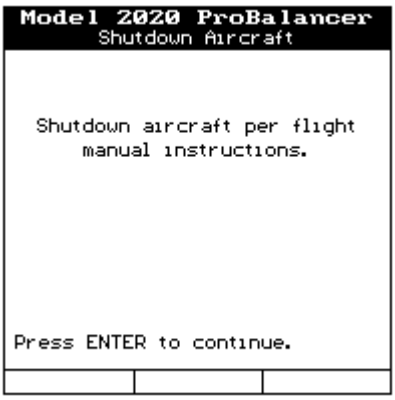


7. The balancer will now display the imbalance reading. After review press **[Enter].**

8. The analyzer will now present the "Review Prior Run(s) Data". If you wish to re-measure the data just acquired, you may press **[F-1]** "Retake". If you wish to continue, press **[Enter].**



9. Shutdown aircraft and press **[Enter].** The solution screen as shown will now present the recommended corrections for the current run.



10. The example shows the solution of subtracting 5.6 grams from the Red blade and subtracting 4.1 grams from the Blue blade. Record the actual weight installed between runs and its location. If you opt to remove weight from an opposite position, you may either enter a negative weight installation (by using the – sign) or leave the positive value in the original position. If you enter the negative value, you must erase the opposite value from the screen or the analyzer will total both values and the influence will be calculated incorrectly for the next run.

11. To continue to the next run press **[Enter].** If you wish to terminate the job, press the **[F-3]** "Quit Job" key and the job will be stored as completed. Using the quit job option will terminate the ability to re-start the job later. If you wish to leave the job and be able to restart it later, press the **[Main Menu]** key.
12. When you have finished with the solution process, press **[Enter]**, you will be taken the "Start Aircraft" screen to start the next run.

Note

It is important to remember that when installing or removing weights and recording their positions that the influence used for the next run will be updated by the result from the previous run's solution, therefore be as accurate as possible when recording adjustments made regardless whether the recommended solution is implemented. The only entries on this screen should reflect the actual solution implemented.

Application Note

Eurocopter SA315-SA316

Tail Rotor Balance

Part Number: 11-200-0099

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