

ARTICLE

MAJOR NORTH AMERICAN AIRLINE CUTS DELAYS & COSTS WITH ChipCHECK

To a large commercial aircraft operator, every minute an asset is delayed equals significant costs. Traditionally, the discovery of wear debris “chips” during an aircraft inspection results in delays filled with extra monitoring costing thousands of dollars. ChipCHECK changed all that.



Conventionally, Finding Wear Debris Leads to Costly Time Delays

When Aircraft Maintenance Technicians (AMTs) find metal chips during routine aircraft inspection, they must determine if the debris is benign or indicative of serious damage. This is accomplished by way of a thorough analysis of each chip’s size and composition to understand which component is shedding material, and how fast.

Ordinarily, chip analysis was available only from specialized laboratories which could take up to several days to return their report.

While waiting for the laboratory results, an aircraft is placed on watch with usually less than five cycles permitted before completing the aircraft disposition. During this time, magnetic chip detector (MCD) inspections are required after each flight leg to ensure there is no additional debris discovered. Further debris can drive added delays, laboratory and out-of-service costs. If laboratory results are not obtained within the 5-cycle limit, the aircraft is no longer airworthy.

This traditional chip analysis process, considered industry-standard, causes airlines significant operational disturbances by adding logistical stress, extra inspections, and an aircraft to be potentially grounded without cause.

ChipCHECK Brings the Lab into the Hangar

ChipCHECK is a leading ground support tool for the aviation industry which analyzes wear debris recovered during engine inspections. Instead of sending chips away to a lab, operators are able to disposition the aircraft directly at the flight line with ChipCHECK's conclusive analysis. Within minutes, the maintenance technician knows whether engine service is required or, as in the majority of cases, whether the wear debris is benign and the aircraft can safely return to service.



ChipCHECK Empowers AMTs to Check Chips at the Flight Line

Our client, a major North American operator, has been using ChipCHECK at several of their major hub installations since March 2020, while operating a fleet of over 600 narrow-body and 100 wide-body aircrafts.

With ChipCHECK now in the hangar, operations can resume within one hour of finding a wear debris chip thus eliminating the 5-cycle limit and additional maintenance checks between each flight leg. The results lead to significant cost reductions for the airline (see Figure 2 on next page).

“ChipCHECK is very easy to use and has made a big difference for us. With less than two hours of training, our AMTs have been able to produce lab-quality reports right in the hangar. We are now able to properly disposition an aircraft within one hour.”

– CFM56 Powerplant Engineer, Major North American Airline

Aircraft Back in Service within the Hour

During the first year of use, ChipCHECK identified wear debris on multiple occasions during routine 500-hour inspections. Below is an example of debris found on a 737NG equipped with a CFM56 engine on March 11, 2020.

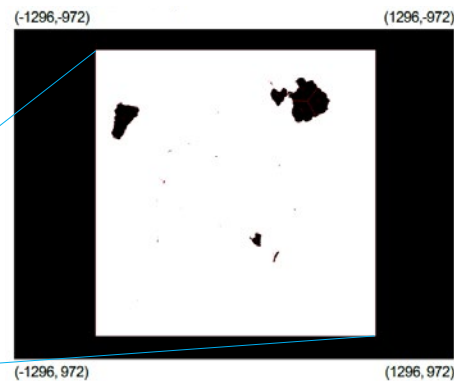


Figure 1: March 11, 2020, Patch Image

A patch analysis was conducted and a total of seven particles were identified. For this particular platform, all particles less than 100 microns max ferret diameter can be ignored; particles in the range of 100 to 250 microns should be sent to a laboratory if the total number is more than 4; and any particles greater than 250 must be sent to a laboratory. The particles in question here were > 250 microns which would normally require a laboratory analysis.

ChipCHECK identified these particles to be low alloy steel or AISI 10XX which is not an actionable material for this platform. With the ChipCHECK report, the powerplant engineer was able to safely return the aircraft to service within one hour of extracting the debris from the MCD.

“The AMTs that have used ChipCHECK so far love it.”

– CFM56 Powerplant Engineer, Major North American Airline

Savings Go Beyond Laboratory Fees with ChipCHECK

Conventional disposition procedure	Estimated cost without ChipCHECK
Laboratory fee for event (multiple analyses required) <i>Estimate based on an average cost of \$500 to \$1,000</i> <i>Some operators have reported paying up to \$1,400 per analysis for quicker turnaround time</i>	\$2,500
MCD inspection between flights (4 times over 5 legs) <i>Estimate based on an average of AMT hourly wage</i>	\$500
3-hour accumulated delay for 5 legs (737NG; 180 passengers) <i>FAA/Nextor assumes \$47/hour/passenger as the cost of delays¹</i>	\$25,380
TOTAL COST OF ONE CHIP DETECTED	\$28,380

¹ www.airlines.org/dataset/per-minute-cost-of-delays-to-u-s-airlines/#

Figure 2: Estimated total cost of one chip to an operator.

Having ChipCHECK at the flight line not only eliminates the need for laboratory analysis, it also brings the aircraft immediately back into full service, ensuring efficient operations and minimal delays.

To an operator the size of this client, who performs over 4,000 A-Checks per year on their narrow-body fleet alone, the value of ChipCHECK is \$5.68M per year. This is based on operator feedback suggesting debris requiring laboratory analysis is discovered, on average, once every 20 A-Checks.

**Total estimated yearly
annual savings with
ChipCHECK = \$5,680,000.**



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