Mighty On the Line

Air Filter Inspections

What Does Your Filter Inspection Include?

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Does your air filter inspection involve more than the presence of bugs or debris collected on the media? It should include a thorough inspection of the integrity of the airbox/housing, related ducts, and latching components necessary to provide a secure seal.

Lack of Maintenance Can Be Costly

Improper filter maintenance on a normally aspirated gas engine can result in poor engine performance, poor fuel economy and high emission output. If the application is a turbocharged diesel engine, some major mechanical damage may be incurred. Turbocharged diesel engines can consume more than air when the filter becomes restricted. A restricted air filter can be dislodged from its mounted position in the airbox resulting in unfiltered air entering the engine, promoting accelerated engine wear and major mechanical damage. We have seen cases where the air filter will disintegrate and is sucked into the turbocharger, causing major mechanical damage to both the turbocharger and engine. Fragments of the filter, debris or even a large bug hitting a turbo compressor wheel spinning at 130,000 RPMs results in a major and costly event.

When conducting an air filter inspection, it is imperative that the following should be included:

1) **Housing Inspection…**Examine the filter housing for any distortion or damage of any type that could prevent a good filter seal. A damaged housing can allow unfiltered air to enter and cause premature wear on the engine components or turbocharger.

2) **Latches and Retainers…**All latches and retainers must be secured to provide a good filter seal to the housing. Never allow a vehicle to leave with a damaged housing or a missing latch unless the customer is aware, and documentation is noted on the repair order. Either condition can result in major engine or turbocharger repairs.

3) **Filter Bypass…**Examine the filter seal and airbox lid for dust trails, which would indicate air is bypassing the filter.

4) **Dusting…**Extreme filter contamination can result in the debris being pulled through the filter media. This condition can be confirmed by an accumulation of debris deposits on the clean air side of the filter housing.

Hydro-Lock Condition

Air filters subjected to water encounter the same performance symptoms as a filter restricted with debris. Media subjected to water results in a hydro-lock condition, resulting in restricted airflow, promoting an engine stalling condition. Further, the filter may collapse or get sucked into the engine and turbocharger resulting in some expensive repairs.

Snow can create the same symptoms as a filter heavily contaminated with water or debris. Stalling conditions due to a filter subjected to snow can be elusive when attempting to make a diagnosis. For example, a vehicle may encounter a stalling condition due to snow encapsulation and then gets towed to a repair facility where the evidence melts and evaporates, removing all clues. Any filter subjected to water or snow should be replaced, as it is compromised.

Summary: General maintenance schedules can be misleading, as they fail to take into consideration vehicles that operate in extreme conditions such as construction sites, road building, farming, etc. Some applications may require an air filter replacement every 3K miles. Give the air filter housing and related ducts a thorough inspection to make certain the system is properly sealed. Pay special attention for evidence of dust bypassing the filter. Approximately 100,000 cubic feet of air passes through the filter, housing, and related ducts for every 1,000 miles driven. There is a lot of dirt in that volume of air.