



Fire Apparatus Recommended Practice

TC079

NOV2020

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Revised:

Ember Separator Test

Rationale

This document provides a repeatable method of testing an ember separator device for use in the engine air intake system of a fire apparatus or other on-road or off-road vehicle. It duplicates the test procedure originally developed by FARR and later by Racor Parker filtration.

Scope

To provide a method of testing the efficacy of any device intended to prevent burning embers from affecting the filter media of a truck engine air filter.

Test Fixture

Construct a test fixture as shown in figure 1 with the following criteria.

1. Size the plenum to accommodate the ember separator device in a manner similar to that in which it will be installed in the vehicle.
2. Size the connecting ducting to simulate as close as practical the diameters, lengths, and elbows that will be installed in the vehicle.
3. Size the shelf to be as wide as the ember separator device and extending from the face of the device at least 300 mm (12 in).
4. Select the blower fan and motor so that the air is drawn through the engine air filter and ember separator at the same flow rate as will be produced by the engine running at maximum governed RPM.
5. Design the accommodation for the engine air filter so that the filter can be removed, and the filter media observed with minimal disturbance to the media.
6. Seal all ducts and joints
7. Optional – Include an intake restriction indicator to measure added backpressure from separator device.

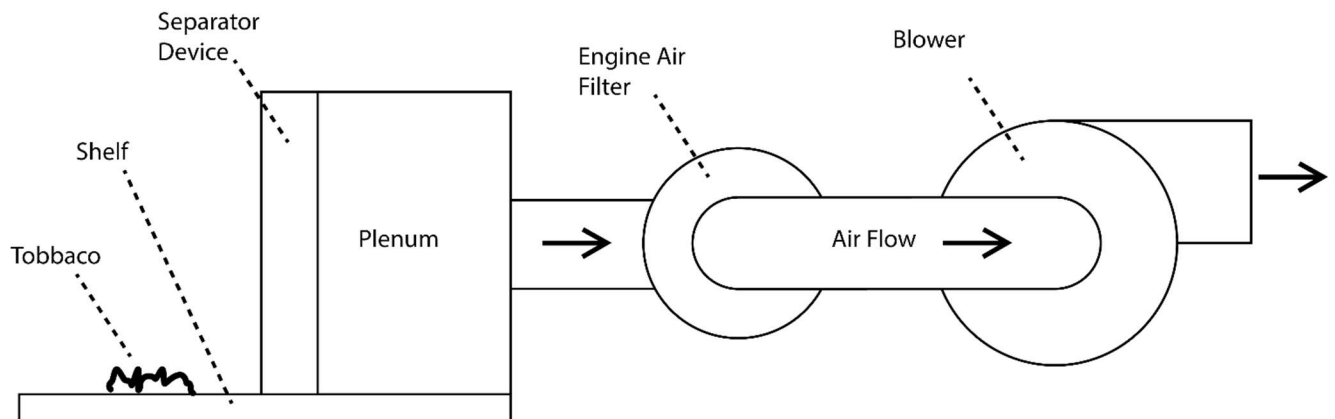


Figure 1

Procedure

1. Calibrate the blower fan to produce the required air flow and then shut it off.
2. Soak 20 grams (3.4 oz) of plain pipe or cigarette tobacco in lighter fluid for 15 minutes.
3. Pile the soaked tobacco in on the shelf evenly distributed across the width of the shelf with the leading edge of the pile 150 mm (6.0 in) from the inlet to the ember separator.
4. Light the tobacco and start timing.
5. After 15 seconds turn on the blower fan.
6. Allow the tobacco to burn completely to the ash stage.
7. Use a compressed air wand to blow in any remaining embers toward the ember separator opening.
8. Allow the blower fans to run for 15 seconds after the last of the embers or ash have been ingested into the ember separator.
9. Shut off the blower fan
10. Remove the engine air filter
11. Visually inspect and photograph the filter media, looking for any burn damage to the media.
12. Repeat this procedure a second time using the same engine air cleaner and media.

Pass/Fail Criteria

It is expected that there will be ash loading in the media after each test, but there should be no evidence of burned media.



Example Test Fixture – For Reference Only