Australian spark arrester tests: spark arrester for Fordson Dexta

Department of Agriculture, Western Australia

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FORMAL tests on spark arresters are conducted by The Tractor Testing Committee* at the Testing Station, Werribee, on behalf of those Companies concerned with tractors, engines or spark arresters who wish to have these equipments tested. The arrester is tested on the engine for which it is especially designed or if this is not convenient, it is tested on an engine having the characteristics and power for which the spark arrester is intended.

1. Test Procedure.
   The method of test is based on a procedure standardised by the Society of Automotive Engineers (U.S.A.); this consists of feeding a weighed quantity of carbon particles of given size into the exhaust of the working engine, and then catching in a trap, and weighing, the particles that the arrester allows to pass through. Separate runs are conducted with particles of larger and smaller size; in some runs the engine is working at full load, in others at fast idle under no load.

   According to the S.A.E. standard, no particles of the larger size should escape the arrester, and not more than 10 per cent. of the smaller size. At the same time the extra back pressure imposed on the exhaust system by the presence of the arrester should be no more than 10 inches in a water barometer.

2. Name and Type of Arrester:
   Fordson Dexta.


   For Particular Engine:—Fordson Dexta Tractor.

   Operating Principle:—Centrifugal separator.

   Declared Max. Horse-power:—Not stated.

   *The Australian Tractor Testing Committee is a joint body established by agreement between the Commonwealth, the States, and the University of Melbourne; under this agreement the tests are carried out by the University of Melbourne. The address of the Tractor Testing Committee is: c/o Department of Primary Industry, 301 Flinders-lane, Melbourne.

   Dimensions:—Exhaust pipe, diameter 2½ inches; Tail pipe, diameter 2½ inches, length 12 inches; Arrester, outside diameter 5½ inches, length 25 inches, weight 10 lb.

   Materials:—Body—16 g. steel; Swirling Vanes—C.I.

   Mounting:—Vertical, ahead of operator, effluent upwards.

   Details of Test Engine:—Fordson Dexta Tractor. 30 belt HP Max., 44 cu. ins.; rated speed—2,200 r.p.m.
4. Summary of Test Results.

(a) Effectiveness of Spark Arresting:
See Note below.
Particles Injected at Rate of 100 Gms.
in 18 to 20 Mins.

<table>
<thead>
<tr>
<th>Particle Size</th>
<th>Engine Load Condition</th>
<th>Carbon Passing Arrester (Percentage)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>High</td>
<td>Less than 0.1*</td>
<td>Two tests</td>
</tr>
<tr>
<td>Large</td>
<td>Low</td>
<td>Nil</td>
<td>Two tests</td>
</tr>
<tr>
<td>Small</td>
<td>High</td>
<td>2-2</td>
<td>Average of two tests</td>
</tr>
<tr>
<td>Small</td>
<td>Low</td>
<td>Less than 0.1*</td>
<td>Two tests</td>
</tr>
</tbody>
</table>

* 0-1 gm. being the limit of accuracy of the scales.

(b) Back Pressure:
—At high load 5.5 inches water. Steady throughout tests.

(c) Temperatures (°F):
—Outer casing 770°F approximately.

(d) Noise Levels:
—Not taken.

Note.—This report makes no promise about the likely performance of this spark arrester other than in the new condition for which it was supplied for test.

5. Comments.

Life:
—From inspection of a cut-away sample it appears likely that the arrester would have a minimum life in accordance with the S.A.E. requirements, i.e., equal to the life of the engine. The parts most subject to heat are of adequate size and securely fixed.

Cleaning:
—The arrester is intended to be cleaned by removing the brass cap; continued tapping of the body of the arrester is necessary to cause the contents to run out. The arrester may however be blown out, provided conditions for doing so are safe, by removing the cleaning cap and blocking the outlet pipe for a few seconds, while the engine is running.

W. F. BAILLIE,  G. H. VASEY,
Testing Officer. Officer In Charge.
University of Melbourne, 12th June, 1959.
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