



MALAWI BUREAU OF STANDARDS

Promoting Standardization and Quality Assurance in Malawi

Head Office
Ali Hassan Mwinyi Road
P.O.Box 946, Blantyre, Malawi

Tel: +265 (0) 1 870 488
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Email: mbs@mbsmw.org

Our Ref code: BS/LAB/49/5

Our Date: 2024-02-01

Eco-Systems Malawi,
PO Box 1956
Lilongwe, Malawi

Dear Sir

REPORT ON THE TESTING OF VEHICLE FUEL AND EMISSION ENHANCER

We are pleased to inform you that our Report No. **ISS/24/BB07** on the analysis of the above mentioned sample which you brought to the Bureau is ready for collection.

Our Invoice **No: 21401 for MK307,181.38** respectively being the costs of testing and reporting is attached for your kind attention. Kindly prepare payment and collection of the report from Malawi Bureau of Standards.

We thank you for using our facilities and look forward to serving you again in future.

Yours faithfully,

Stephen M Kuyeli
Director, Testing Services
FOR: DIRECTOR-GENERAL

SMK/dcb



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Sample type : VEHICLE FUEL ENANCER
MBS No(s) : BB 673
Sample ID/Code/Reference No(s): ECO-4 on Toyota Dyna reg No. NU6140
Date sampled : Not Stated
Sampled by : Client
Date samples received : 2023-06-05
Date tests started : 2023-09-06
Date tests completed : 2023-09-27
Time taken : 21 Days
Sample condition : Received in good condition
Accreditation : N/A

1.0 TESTS REQUIRED

To assess impact on performance of motor vehicle in terms of fuel consumption and smoke emission after incorporation of a fuel and emission enhancer device.

2.0 TEST METHODS

2.1 Reference:

- (a) Bharat Stage (BS) VI emission standards.
- (b) ISO 8178-9:2019



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3.0 Results For Eco-4 Fuel And Emission Enhancer

3.1 Performance test results

In table 1 below is a record of distances covered during the testing and amount of fuel used. And in table 2 is a record of measured values of emitted smoke opacity and K-value (density).

Table 1. Record of Distances covered and fuel used

Parameter	Mileage 01 (Km)	Mileage 02 (km)	Distance covered (km)	Fuel Used (L)	Fuel Usage (litres/km)
Before Enhancer was installed	359539.2	359659.0	119.8	17	0.142
After Enhancer was installed	360281.0	360410.0	129.0	11	0.085

Table -2: Table of tested opacity and density of emitted smoke

Measured Parameter	Before Enhancer	With Enhancer	Deviation	BS IV Specification (%)	Remark
Average Exhaust Fumes Opacity (%)	59.9	26.2	-56.26 %	50	Passed
Exhaust fumes Density(K Value (1/m))	2.12	0.7	-33.02 %	1.61	Passed



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4.0 DECISION RULE

In this report, statements of conformity (Pass/Fail in **3.1**) are made without taking measurement uncertainty into account. Where statements of conformity are made in this report, the following decision rules are applicable:

- a) **Pass** – Results within limits/specifications
- b) **Fail** – Results below limits/specifications

5.0 OPINION AND INTERPRETATION OF RESULTS

The tests have concluded that installation of the fuel enhancer has contributed to lowering of fuel consumption by 40.1%. On the emissions, it is observed that there is improvement in opacity by almost 57% and smoke density (the K-value) reduced by about 33% thereby improving the cleanliness of emission from the engine.

6.0 CONDITIONS /DISCLAIMER

This report relates only to the sample tested and does not imply approval by the Malawi Bureau of Standards of the quality and/or performance of the commodity that has been tested. It shall not be reproduced except in full without written approval of the Malawi Bureau of Standards.

Stephen M. Kuyeli
Director of Testing Services
For: DIRECTOR GENERAL

Deus Byson
Senior Scientific Officer - Electronics

