

| Cert | Annex | Drg | Total |
|------|-------|-----|-------|
| 1 | 7 | 0 | 8 pgs |

CERTIFICATE
FOR COMPLIANCE TO THE CENTRAL MOTOR VEHICLES RULES

M/s. ARO Equipments Pvt. Ltd.
805, Udyog Vihar, Phase-V
Gurgaon 122 016

Exhaust Gas Analyzer Model GA 4040 from M/s Coral Equipments, New Delhi, was type approved vide Certificate No. ARAI/TA(4G)/CORAL/GA 4040/2005-05 dated 3rd March 2005, as per the test procedure approved by Ministry of Road Transport and Highways, Government of India, New Delhi, and specified in MoRTH/CMVR/TAP-115/116, Issue No.3, Part-VIII for 4-gas analyzer.

M/s. Coral Equipments requested vide letter dated 2nd Jan 2006 to change the Company name from "Coral Equipments" to "ARO Equipments Pvt. Ltd.". Accordingly, Certificate No. ARAI/TA(4G)/ARO/GA 4040/2006-10 Dated 10th Mar 2006, was issued in the name of M/s ARO Equipments Pvt. Ltd., Gurgaon.

The initial type approval certificate No. ARAI/TA(4G)/CORAL/GA 4040/2005-05 dated 3rd March 2005, referred above was valid upto 2nd March 2010.

Based on the verification and tests carried out, it is certified that the 4-Gas Analyser Model GA 4040, manufactured and marketed by M/s ARO Equipments Pvt. Ltd., Gurgaon, meets the requirements of the provisions of Rule 116(3) of the Central Motor Vehicles Rules 1989, as amended up-to-date, for the 4-Gas Analyzer.

The 4-Gas Analyzer Model GA 4040 is suitable for measurement of idling CO and HC of in-use vehicles fitted with SI engines as per CMVR 115(2), subject to following conditions :

- i. The supplier shall abide by the Code of Practice attached herewith as Annexure-A. The supplier has already submitted an affidavit to this effect.
- ii. The supplier shall enter into AMC agreement on annual basis with the authorized PUC Test Centres to whom this model is supplied. The AMC terms shall be as per the Code of Practice referred in (i) above.

This Type Approval Certificate is valid for the period of 5 years from 3rd March 2010 or any amendment in the test procedure, whichever is earlier.

The latest Conformity of Production (COP) testing was carried out for the 4-gas analyser units produced upto 2nd March 2009.

The next COP testing should be completed on or before 2nd Sep 2011 or production of next 200 4-gas analyzer units from 3rd March 2009, whichever is earlier.

Authorised Signatory

A. B. Komawar
Sr. Deputy Director

Shrikant R.Marathe
Director

Place of Issue : Pune

Ref : Test Report No.ARAI/AED/CT/OC-1011-3187/120 Dt.10.6.2011

ANNEXURE - A

CODE OF PRACTICE FOR PUC EQUIPMENT MANUFACTURER / SUPPLIER

1. PUC equipment manufacturer / supplier should include the description of the test procedure described in Part I or Part II, whichever is applicable, amended from time to time of the document MOST/CMVR/TAP 115/116 in the user's manual of the PUC equipment. PUC equipment manufacturer / supplier shall keep PUC operator informed about the changes in the test procedure in future.
2. PUC equipment manufacturer/ supplier shall supply copy of type- approval certificate with date of validity along with the PUC equipment.
3. The validity of the type approval certificate of the PUC equipment shall be 5 years, after the expiry of which the PUC equipment manufacturer/ supplier shall get it re-validated from the test agency.
4. PUC equipment manufacturer / supplier shall provide the status of production/ supply of PUC equipment at a regular interval of 1 year to the test agency from where the equipment has been certified.
5. PUC equipment manufacturer / supplier shall submit the equipment for COP as per procedure mentioned above.
6. PUC equipment manufacturer / supplier shall enter into AMC on annual basis with the authorised PUC test agency based on charges as approved and finalized in EECG meeting as per Annexure-4. This AMC contract shall include 3 visits and equipment calibration as per field calibration procedure given in Annexure-1. PUC equipment manufacturer/ supplier shall provide calibration certificate as per format given in the Annexure-2.
7. PUC equipment manufacturer / supplier shall train minimum 3 operators of PUC test agency and shall provide training certificate as per format given in Annexure 3.

ANNEXURE – 1 TO ANNEXURE – A

**FIELD CALIBRATION PROCEDURE FOR TESTING OF
GAS ANALYSERS**

1.0 INTRODUCTION

This procedure has to be carried out on gas analysers after they are commissioned in the field and for the subsequent calibration.

2.0 TESTING

The test procedure for gas analysers is as follows:

- i) Check that the power supply is as per specifications of the manufacturer and electrical earthing is proper.
- ii) Check that all the accessories as per manufacturer are available and are functioning properly.
- iii) Check the span and zero calibration using sample gas of suitable value for CO as well as HC.
- iv) Check the electrical calibration.
- v) Check that the sampling system is leak proof.
- vi) The printer is working correctly and the print out details are correct.
- vii) Checking of 1 no. of vehicle for idling emission measurement using this analyzer.

ANNEXURE – 1 TO ANNEXURE – A (contd.....)
FIELD CALIBRATION PROCEDURE FOR TESTING OF
SMOKE METERS

1.0 INTRODUCTION

This procedure has to be carried out on meters after they are commissioned in the field and for the subsequent calibration.

2.0 TESTING

The test procedure for smoke meters is as follows:

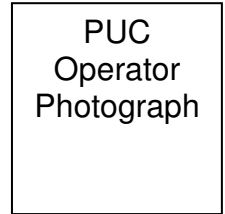
- i) After the warm-up of the meter, the calibration of the meter has to be checked at zero and midscale point with the neutral density filter available. The value must lie within 0.1 m^{-1} .
- ii) The meter shall have the standard accessories as specified by the manufacturer. It shall be checked that the sample hose, internal pipes etc are not deteriorated or damaged to ensure that there is no leakage.
- iii) The functionality of oil temperature and RPM sensor.
- iv) The heating system for the optical chamber is functioning.
- v) The purge air system is working correctly.
- vi) Visual displays are functioning correctly.
- vii) The printer is working correctly and the printout details are correct.
- viii) The instrument casing is proper and has proper electrical earthing.
- ix) Free acceleration test is carried out using a vehicle and the print out details are checked.

ANNEXURE – 2 TO ANNEXURE - A
CALIBRATION CERTIFICATE FORMAT

| | | |
|---|---|---------------------------------|
| 1.0 | Component: PUC equipment model: Sr. No. | |
| 2.0 | PUC Center Registration No.: | |
| 3.0 | Objective of the test: To carry out Physical check and calibration of gas Analyser / Smoke meters as per the test procedure specified in Annexure 1 of CMVR / TAP 115-116 Part-8. | |
| 4.0 | Detailed Observations | |
| 4.1 | Checking of supply/ earthing | |
| 4.2 | Checking of accessories: | Details of accessories checked. |
| 4.3 | Span Calibration | |
| | 1. Details of span gas concentration _____ % 2. Calibration gas cylinder No.: _____ 3. Calibration gas cylinder make: _____ 4. Calibration gas validity date: _____ | |
| | OR | |
| | 5. Details of Natural Density filters used for mid point calibration | |
| 4.4 | Electrical Calibration | OK/ Not OK |
| 4.5 | Leak test: | Passed/ Failed |
| 5.0 | One no of petrol / diesel vehicle checked for idling Emission / Free acceleration, measurement | |
| 6.0 | Conclusion: | |
| 7.0 | Next Calibration Due Date: | |
| Signature & Seal of manufacturer/ Supplier | | |

ANNEXURE – 3 TO ANNEXURE - A

TRAINING CERTIFICATE



It is to certify that Mr. / Mrs. _____ has attended the training and knows all required operation of the smoke meter / Gas Analyser model _____ to perform PUC tests.

Training is given in the following areas:

Understanding of procedure for testing of Idling emission/ free acceleration smoke as CMVR/ TAP/ 115/116 procedure.

1. Normal thermal condition of the vehicle
2. Actual testing procedure
3. Procedural understanding of issue of PUC certificate

Operation of smoke meter / Gas analyzer

- | | |
|---------------------------|----------------------|
| 1. Vehicle testing mode | <input type="text"/> |
| 2. Zero Calibration | <input type="text"/> |
| 3. Span calibration | <input type="text"/> |
| 4. Electronic calibration | <input type="text"/> |
| 5. Leak test | <input type="text"/> |

Maintenance

- | | |
|--------------------------|----------------------|
| 1 Replacement of filters | <input type="text"/> |
| 2 General maintenance | <input type="text"/> |

Authorized Signature & seal of manufacturer / supplier

ANNEXURE-4 TO ANNEXURE-A**AMC CHARGES**

| Sr. No. | Details | 2 Gas Analyser | 4 Gas Analyser | Smoke Meter |
|---------|--|-----------------------------|----------------|-------------|
| | | Amount in Rs. (Taxes Extra) | | |
| 1. | AMC Charges with Spares and 3 Calibrations | 12500 * | 17500 * | 11500 * |
| 2. | AMC Charges without Spares and with 3 Calibrations | 7000 | 10000 | 7500 |

Note:

- * List of spare parts included in AMC is given below :

2-Gas & 4-Gas Analyser

| Sl. No. | Component |
|---------|---|
| 1 | Controller PCB |
| 2 | Communication module |
| 3 | Power module |
| 4 | Display |
| 5 | Keypad |
| 6 | Pneumatic fittings (connectors and tubes) |
| 7 | Remote (If provided) |

Smoke Meter

| Sl. No. | Component |
|---------|--|
| 1 | Smoke head |
| 2 | Light detector |
| 3 | Heater |
| 4 | Controller PCB |
| 5 | Power module |
| 6 | Communication Module |
| 7 | Display |
| 8 | Keypad/Remote |
| 9 | RPM / oil temperature module (In case of alternate rpm sensor) |

Spare parts not included in the list will be provided by the PUC equipment manufacturer/supplier on chargeable basis.

ANNEXURE – 4 TO ANNEXURE – A (contd.....)

In case of 2-gas analyser and 4-gas analyser, both the AMC options include cost of calibration gases which will be provided by the PUC equipment manufacturer/supplier. In case of smoke meters, both the AMC options include calibration with neutral density filter (NDF) by PUC equipment manufacturer/supplier.

ARAI issues Type Approval Certificates for vehicles / components / parts / assemblies etc., based on the documents produced / submitted by the customer and on these basis, the vehicles / components / parts / assemblies, etc., are examined and if approved, the certificate is issued. ARAI is in no way responsible for any misuse of copying of any design / type / system in connection with entire vehicle / components / parts and assemblies. Breach of any statutory provision of Indian laws or laws of other countries, will be the sole responsibility of the customer and ARAI shall not be liable for any claims or damages, made by the party, whatsoever. The customer shall alone be liable for the same and undertakes to indemnify ARAI in this regard. Further, the ARAI has the right to initiate cancellation / withdrawal of the certificate issued, in case of any fraud, misrepresentation, when it surfaces and comes in the knowledge of ARAI. The appropriate local courts at Pune shall have the jurisdiction in respect of any dispute, claim or liability arising out of this certificate.
