CUSTOMS, EXCISE & SERVICE TAX APPELLATE TRIBUNAL
MUMBAI

REGIONAL BENCH - COURT NO. I

Customs Appeal No. 85736 of 2023

[Arising out of Order-in-Original CAO No. CC-GSS/19/2022-23 Adj. (I) ACC dated 08.02.2023 passed by the Commissioner of Customs (Import), Air Cargo Complex (ACC), Sahar, Andheri (East), Mumbai.]

Cummins Technologies India Private Limited .... Appellants
Tower A, 2nd, 4th and 8th Floors, Survey No.21,
Balewa, Pune – 411 045.

Versus

Commissioner of Customs (Import) .... Respondent
Air Cargo Complex (ACC), Sahar
Andheri (East), Mumbai – 400 099.

APPEARANCE:

Shri Lakshmi Kumaran, Advocate for the Appellants

Shri Ram Kumar, Authorized Representative for the Respondent

CORAM:

HON'BLE MR. S.K. MOHANTY, MEMBER (JUDICIAL)
HON'BLE MR. M.M. PARTHIBAN, MEMBER (TECHNICAL)

FINAL ORDER NO. A/86272/2025

Date of Hearing: 24.02.2025
Date of Decision: 14.08.2025

Per: M.M. PARTHIBAN

This appeal has been filed by M/s Cummins Technologies India Private Limited, Pune (herein after, referred to as 'the appellants', for short), assailing Order-in-Original CAO CC-GSS/19/2022-23 Adj. (I) ACC dated 08.02.2023 (herein after, referred to as 'the impugned order') passed by the Commissioner of Customs (Import), Air Cargo Complex (ACC), Sahar, Andheri (East), Mumbai – 400 099.

2.1 Briefly stated, the facts of the case are that the appellants herein is, *inter alia* engaged in manufacture and supply of diesel engines used for automobile and non-automobile applications. The appellants is also a regular importer of parts and accessories required for manufacture of such engines. The appellants had filed various Bills of Entry (B/Es) for import of goods viz., 'NOx Sensor, Nitrogen Oxide Sensor, Oxygen Sensor, Ammonia (NH3) Sensor and KPO3 Sensor' by classifying the same under Customs Tariff Item (CTI) 8409 9990, 9031 1000, 9031 8000, 9031 9000, 9032

8990 and 9032 9000 of the First Schedule to the Customs Tariff Act, 1975 by paying applicable duties of customs including 7.5% Basic Customs Duty (BCD).

2.2 During the post-clearance audit of the import transactions that have occurred during the period March, 2015 to February, 2020, the audit officers of the Department had noticed that the appellants had mis-classified the imported goods, and the correct classification of such goods would be under CTI 9027 1000 as 'gas or smoke analysis apparatus' chargeable to BCD at the rate of 10% advalorem. On the basis of above understanding and since in some of the invoices issued by suppliers from USA had mentioned classification of the impugned goods as 9027.10.2000, the Department had initiated the pre-consultative notice proceedings and subsequently issued Show Cause Notice dated 15.06.2020. In the said SCN, the Department had proposed for reclassification of the imported goods and the consequent demand of short payment of duty under Section 28(4) of the Customs Act, 1962 along with interest, besides confiscation of the same under Section 111(m) ibid and for imposition of penalties on the appellants under Section 114A ibid. In adjudication of the said SCN, learned Commissioner of Customs (Import), vide impugned order had confirmed all the proposals made in the SCN dated 15.06.2020. Feeling aggrieved with the impugned order dated 08.02.2023, the appellants have preferred this appeal before the Tribunal.

3.1 The Learned Advocate appearing for the appellants submitted that the disputed goods i.e., NOx (Oxides of Nitrogen) Sensor and other sensors viz., ammonia sensor, oxygen sensor and KPO3 sensor, had been imported by the appellants for use in the 'Engine After Treatment System' under self-assessment basis, by filing various Bills of Entries (B/Es) during the disputed. The appellants had correctly and completely described the imported goods in the B/Es filed along with invoices, packing lists of the overseas suppliers. The aforesaid declarations submitted by the appellants were examined by the jurisdictional customs authorities at the time of their import. The dispute in classification of the impugned goods have arisen only when the audit officers on account of the interpretation adapted by them have raised this issue with the Department. He stated that mention of the tariff classification in some of the invoices for import from USA, as CTI 9027 1000 is not relevant for classification of goods in India. Therefore, he submitted that in case of classification dispute extended period of limitation cannot be invoked, especially when multiple

legal forums have considered the classification of the products in question and arrived at a different views.

3.2 He further submitted that the sensors in dispute are used to measure the level of nitrous gases in the automobile exhaust system to ensure that the same is compliant with the prescribed emission standards/norms under Central Motor Vehicle Rules, 1989. The NOx sensor is placed in two spots in the 'Engine After Treatment System' i.e., at the start of the after-treatment system (called as engine out NOx sensor) and at the end of the after-treatment system (called as System out NOx sensor). Illustrative pictures of the placement of the above said NOx sensor were submitted by him as a part of the written submissions.

3.3 In support of the classification of the impugned goods under CTI 9026 8090 he stated that the impugned goods are instrument/apparatus for measuring the variables of gases. In terms of the scope and coverage of entries given for classification of goods under Customs tariff and HSN being identical, the Explanatory Notes (EN) to HSN under heading 9026 covers such measuring or checking apparatus. He submitted that the sensors in question measuring the variation of the gas and such variation being converted to electrical signals and is further conveyed; on the basis of which the quantum of NOx present in the exhaust gases is determined and thus the classification of goods as 'measuring are checking apparatus' under CTI 9026 8090 has been correctly declared by the appellants. Further, he stated that in the case of *Bosch India Ltd., Vs. Commissioner of Customs, Bangalore* – 2021 (375) E.L.T. 227, the goods have been classified under heading 90.26.

3.4 Learned Advocate has also submitted that the imported goods are not functional units capable of performing any stand-alone function. The sensors cannot operate on their own and required to be fitted along with other components of the engine, Engine After Treatment System in order to perform the intended operation. The sensors individually does not automatically regulate exhaust gas control, and it merely measures the NOx content present in exhaust gas and passes on such information to the Control Unit. Therefore, he submitted that the sensors are an integral part of the system to control/regulate the composition of exhaust gas, and accordingly he claimed that the imported goods are classifiable alternatively under CTH 9032.

3.5 Learned Advocate submitted a list of various instruments and apparatus covered under CTH 9027 to state that the impugned goods are not covered by such category of goods listed therein; the imported goods are simple measuring apparatus and are incapable of any physical or chemical analysis, in order to classify such goods under CTH 9027. Therefore, he submitted that the classification of the impugned goods is correctly declared by the appellants.

3.6 In support of the appellants stand, he relied upon the following case laws:

(i) *S.T. Enterprises Vs. Commissioner of Customs (Chennai-VII)* – 2021 (378) E.L.T. 514 (Tri. – Chennai);

(ii) *Commissioner of Central Excise & Customs, Vishakhapatnam Vs. Reliance Infrastructure Limited* – 2022-VIL-90-CESTAT-CHE-CU;

(iii) *Devraj M. Salian Vs. Commissioner of Customs (I), Mumbai* – 2015 (316) E.L.T. 139 (Tri. – Mumbai);

(iv) *Signet Chemical Pvt. Ltd. Vs. Commissioner of Customs, NS-I, Mumbai-II and Commissioner of Customs (imports), Mumbai* – 2020 (10) TMI – CESTAT MUMBAI.

Therefore, he prayed that the appeal filed by the appellants be allowed.

4.1 On the other hand, the Learned Authorised Representative (AR) appearing for the Revenue has contended that NOx Sensors are covered by specific description 'Gas or Smoke analysis apparatus' in CTI 9027 1020 as they are used for determining the content of gases viz., carbon dioxide, oxygen, nitrogen or other hydrocarbons. The method in which the NOx Sensor function was explained by him, stating that it is an electrochemical reaction in cells with solid (specially zirconium oxide for oxygen analysis) or liquid electrolytes. He also explained the working principle of NOx Sensor in terms of the textbooks of chemistry and submitted the following: NOx Sensor uses to electrochemical cells in adjacent chambers as shown in the pictorial diagram in the Paper Book-Vol.I compilation submitted by the appellants (at page 120). The said electrochemical cells use solid zirconia electrolyte and two porous platinum electrodes centred on opposite sides of solid zirconia electrolyte exposed to exhaust gases and reference/ ambience/ atmospheric gases. The exhaust gases/combustion by-products (burnt gases) diffuse the first electrochemical cell wherein products like hydrocarbons (HO), carbon mono oxide (CO), hydrogen (H_2) are oxidised on the platinum electrode and are converted into CO_2 and

H_2O. The basic purpose of oxidation of the said compounds is that they should not get oxidised in the second electrochemical cell, otherwise at high temperature of 850˚C, the said compounds will react with the oxygen in the second electrochemical cell and will decrease the concentration of oxygen accordingly and the sensor will reflect incorrect concentration of oxygen and correspondingly incorrect NOx reading. Further, as the partial pressure of oxygen in the ambient/atmospheric/reference air is more than the partial pressure of oxygen in the exhaust/sample gases, the oxygen molecules of the reference air get adsorbed on the reference platinum electrode. Here a certain voltage is applied to the reference platinum electrode and 'reduction' chemical reaction takes place which reduces the O_2 into O^{2-} (oxygen anions). The said oxygen anions travel from reference platinum electrode (anode) to exhaust gas platinum electrode (cathode) through zirconia electrolyte which has got high oxygen ion electrical conductivity at high temperature. The oxygen anions at the exhaust gas platinum electrode lose electrons and converted into O^2 which is pumped out from the first electrochemical cell so that it does not interfere with the O^2 of the second electrochemical cell. The O^{2-} (oxygen anions) while passing through the solid zirconia (zirconium oxide, ZrO^2) electrolyte generates current/voltage which can be measured by an ammeter/galvanometer. The said the current/voltage generated is proportional to the O^2 concentration. Further, the remaining exhaust gases diffuse into the second electrochemical cell. The NO_2 present in the exhaust gases is reduced and converted into NO (nitric oxide). The NO present in the exhaust gases is further decomposed into N_2 and O_2. The said O_2 concentration is measured through exactly the same process as in the case of first electrochemical cell which is indicated in parts per million (ppm) or in percentage. Thus, based on the concentration of oxygen in the second electrochemical cell, corresponding concentration of Nox in the exhaust gas is analysed/determined. The other sensors (Ammonia sensors and KPO_3 sensors) also work on the same principle. In the above manner, learned AR stated that the impugned sensor analyses and measures the concentration of the oxygen and oxides of nitrogen in the exhaust gases. Therefore, he submitted that the impugned goods are correctly classifiable under CTH 9027 as 'Gas or Smoke analysis apparatus'.

4.2 He further submitted that as per Note 2(a) to Chapter 90, parts and accessories which are goods included in any of the headings of this Chapter i.e., Chapter 90 or of Chapter 84, 85 or 91 (other than heading 8487,

8548, 9033) are in all cases to be classified in the respective headings. The impugned sensors may be part of Engine After Treatment System (EATS) of the diesel engine/ generator, but these are goods having their own independent identity and specifically are covered under CTH 9027, the classification of these goods would continue to be governed under their respective headings and not as a part of EATS under CTH 9032. Thus, he claimed that in terms of the aforesaid chapter note and the impugned goods are correctly classifiable under CTI 9027 1000. In respect of other charges alleged in the SCN, learned Authorised Representative reiterated the findings made by the adjudicating authority in the impugned order.

5. We have heard both sides and perused the case records and additional paper books submitted in this case by both sides.

6.1 The issue involved herein is to decide the classification of impugned goods imported by the appellants as to whether, the same merits classification under Customs Tariff Heading/Item (CTH/CTI) 9026, 9032 9000 as claimed by the appellants; or, is it classifiable under Customs Tariff Heading (CTI) 9027 1000 as determined by the learned Commissioner of Customs, for deciding on the appropriate levy of customs duty, in respect of various Bills of Entries filed during the disputed period. Further, it is also required to be decided whether the confirmation of the demand by invoking the extended period of limitation, imposition of consequent redemption fine and penalty is legally sustainable on the basis of the determination of the classification of impugned goods.

6.2 In order to address the above issue of classification of imported goods, we would like to refer the relevant legal provisions contained in Section 12 of the Customs Act, 1962; the Customs Tariff Act, 1975 and rules framed thereunder for consideration of proper and appropriate classification of the subject goods under dispute.

> *"**Section 12. Dutiable goods.** -*
>
> *(1) Except as otherwise provided in this Act, or any other law for the time being in force, duties of customs shall be levied at such rates as may be specified under the Customs Tariff Act, 1975 (51 of 1975), or any other law for the time being in force, on goods imported into, or exported from, India.*
>
> *(2) The provisions of sub-section (1) shall apply in respect of all goods belonging to Government as they apply in respect of goods not belonging to Government."*

"Section 1. Short title, extent and commencement. *-*

(1) This Act may be called the Customs Tariff Act, 1975.

(2) It extends to the whole of India.

(3) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

Section 2. Duties specified in the Schedules to be levied. *-*

The rates at which duties of customs shall be levied under the Customs Act, 1962 (52 of 1962), are specified in the First and Second Schedules.

xxx xxx xxx xxx

THE FIRST SCHEDULE – IMPORT TARIFF

(Refer Section 2)

THE GENERAL RULES FOR THE INTERPRETATION OF IMPORT TARIFF

Classification of goods in this Schedule shall be governed by the following principles:

1. The titles of Sections, Chapters and sub-chapters are provided for ease of reference only; ***for legal purposes, classification shall be determined according to the terms of the headings and any relative Section or Chapter Notes and, provided such headings or Notes do not otherwise require, according to the following provisions****:*

2. (a) Any reference in a heading to an article shall be taken to include a reference to that article incomplete or unfinished, provided that, as presented, the incomplete or unfinished articles has the essential character of the complete or finished article. It shall also be taken to include a reference to that article complete or finished (or falling to be classified as complete or finished by virtue of this rule), presented unassembled or disassembled.

(b) Any reference in a heading to a material or substance shall be taken to include a reference to mixtures or combinations of that material or substance with other materials or substances. Any reference to goods of a given material or substance shall be taken to include a reference to goods consisting wholly or partly of such material or substance. The classification of goods consisting of more than one material or substance shall be according to the principles of rule 3.

3. When by application of rule 2(b) or for any other reason, goods are, prima facie, classifiable under two or more headings, classification shall be effected as follows:

(a) The heading which provides the most specific description shall be preferred to headings providing a more general description. However, when two or more headings each refer to part only of the materials or substances contained in mixed or composite goods or to part only of the items in a set put up for retail sale, those headings are to be regarded as equally specific in relation to those goods, even if one of them gives a more complete or precise description of the goods.

(b) Mixtures, composite goods consisting of different materials or made up of different components, and goods put up in sets for retail sale, which cannot be classified by reference to (a), shall be classified as if they consisted of the material or component which gives them their essential character, in so far as this criterion is applicable.

(c) When goods cannot be classified by reference to (a) or (b), they shall be classified under the heading which occurs last in numerical order among those which equally merit consideration.

4. Goods which cannot be classified in accordance with the above rules shall be classified under the heading appropriate to the goods to which they are most akin.

5. In addition to the foregoing provisions, the following rules shall apply in respect of the goods referred to therein:

(a) Camera cases, musical instrument cases, gun cases, drawing instrument cases, necklace cases and similar containers, specially shaped or fitted to contain a specific article or set of articles, suitable for long-term use and presented with the articles for which they are intended, shall be classified with such articles when of a kind normally sold therewith. This rule does not, however, apply to containers which give the whole its essential character;

(b) Subject to the provisions of (a) above, packing materials and packing containers presented with the goods therein shall be classified with the goods if they are of a kind normally used for packing such goods. However, this provisions does not apply when such packing materials or packing containers are clearly suitable for repetitive use.

6. For legal purposes, the classification of goods in the sub-headings of a heading shall be determined according to the terms of those sub headings and any related sub headings Notes and, mutatis mutandis, to the above rules, on the understanding that only sub headings at the same level are comparable. For the purposes of this rule the relative Section and Chapter Notes also apply, unless the context otherwise requires.

THE GENERAL EXPLANATORY NOTES TO IMPORT TARIFF

1. Where in column (2) of this Schedule, the description of an article or group of articles under a heading is preceded by "-", the said article or group of articles shall be taken to be a sub-classification of the article or group of articles covered by the said heading. Where, however, the description of an article or group of articles is preceded by "- -", the said article or group of articles shall be taken to be a sub-classification of the immediately preceding description of the article or group of articles which has "-". where the description of an article or group of articles is preceded by "---" or "----", the said article or group of articles shall be taken to be a sub-classification of the immediately preceding description of the article or group of articles which has "-" or "--".

2. The abbreviation "%" in any column of this Schedule in relation to the rate of duty indicates that duty on the goods to which the entry relates shall be charged on the basis of the value of the goods as defined in section 14 of the Customs Act, 1962 (52 of 1962), the duty being equal to such percentage of the value as is indicated in that column.

3. In any entry, if no rate of duty is shown in column (5), the rate shown under column (4) shall be applicable.

ADDITIONAL NOTES

In this Schedule,—

(1)(a) "heading", in respect of goods, means a description in list of tariff provisions accompanied by a four-digit number and includes all sub-headings of tariff items the first four-digits of which correspond to that number;

(b) "sub-heading", in respect of goods, means a description in the list of tariff provisions accompanied by a six-digit number and includes all tariff items the first six-digits of which correspond to that number;

(c) "tariff item" means a description of goods in the list of tariff provisions accompanying eight digit number and the rate of customs duty;

(2) the list of tariff provisions is divided into Sections, Chapters and Sub-Chapters;

(3) in column (3), the standard unit of quantity is specified for each tariff item to facilitate the collection, comparison and analysis of trade statistics."

6.3 From plain reading of the above legal provisions, it transpires that in order to determine the appropriate duties of customs payable on any imported goods, one has to make an assessment of the imported goods for its correct classification under the First Schedule to Customs Tariff Act, 1975 in accordance with the provisions of the Customs Tariff Act by duly following the General Rules for Interpretation (GIR) and the General Explanatory notes (GEN) contained therein. The First Schedule to the Customs Tariff Act, 1975 specifies the various categories of imported goods in a systematic and well-considered manner, in accordance with an international scheme of classification of internationally traded goods, i.e., 'Harmonized Commodity Description and Coding System' (HS). Accordingly, goods are to be classified taking into consideration the scope of headings / sub-headings, related Section Notes, Chapter Notes and the General Rules for the Interpretation (GIR) of the First Schedule to the Customs Tariff Act, 1975. Rule 1 of the GIR provides that the classification of goods shall be determined according to the terms of the headings of the tariff and any relative Section notes or Chapter notes and thus, gives precedence to this while classifying a product. Rules 2 to 6 provide the general guidelines for classification of goods under the appropriate sub-heading. In the event of the goods cannot be classified solely on the basis of GIR 1, and if the headings and legal notes do not otherwise require, the

remaining Rules 2 to 6 may then be applied in sequential order. Further, while classifying goods, the foremost consideration is the 'statutory definition', if any, provided in the Customs Tariff Act. In the absence of any statutory definition, or any guideline provided by HS explanatory notes, the trade parlance theory is to be adopted for ascertaining as to how the goods are known in the common trade parlance for the purpose of dealing between the parties.

7. In the case before us, the contending classification of imported goods discussed in the impugned order are either under CTH/CTI 9026, 9032 9000 or under CTI 9027 1000 of the First Schedule to the Customs Tariff Act. Thus, it is clear that at the Chapter level i.e., at the first two digits (90), there is no difference of opinion among the department and the appellants; it is only at the level of heading i.e., CTH 9026, 9032 or CTH 9027 (at the third and fourth digit indicating headings), there is a difference of opinion. The dispute in classification therefore lies in the narrow compass of analysis of the appropriate Headings under which the impugned goods are covered as per the Customs Tariff and then classifying the impugned product under the corresponding Sub-heading, Tariff Item which is appropriate as per the legal principles of classification of goods. Now, we may closely examine the scope of the contending classification for determining correct classification of the imported goods. The various headings of entire Chapter 90 and the relevant headings and their tariff entries of contending Chapter headings 9026, 9027 and 9032, as provided in the First Schedule to the Customs Tariff Act are extracted as below:

"SECTION XVII

OPTICAL, PHOTOGRAPHIC, CINEMATOGRAPHIC, MEASURING, CHECKING, PRECISION, MEDICAL OR SURGICAL INSTRUMENTS AND APPARATUS; CLOCKS AND WATCHES; MUSICAL INSTRUMENTS; PARTS AND ACCESSORIES THEREOF

CHAPTER 90

Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof

Notes :

1. This Chapter does not cover :

(a) articles of a kind used in machines, appliances or for other technical uses, of vulcanised rubber other than hard rubber (heading 4016), of leather or of composition leather (heading 4205) or textile material (heading 5911);

xxx xxx xxx xxx xxx

2. Subject to Note 1 above, parts and accessories for machines, apparatus, instruments or articles of this Chapter are to be classified according to the following rules :

(a) parts and accessories which are goods included in any of the headings of this Chapter or of Chapter 84, 85 or 91 (other than heading 8487, 8548 or 9033) are in all cases to be classified in their respective headings;

(b) other parts and accessories, if suitable for use solely or principally with a particular kind of machine, instrument or apparatus, or with a number of machines, instruments or apparatus of the same heading (including a machine, instrument or apparatus of heading 9010, 9013 or 9031) are to be classified with the machines, instruments or apparatus of that kind;

(c) all other parts and accessories are to be classified in heading 9033.

3. The provisions of Notes 3 and 4 to Section XVI apply also to this Chapter.

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5. Measuring or checking optical instruments, appliances or machines which, but for this Note, could be classified both in heading 9013 and in heading 9031 are to be classified in heading 9031.

Chapter Heading	**Description of goods**
(1)	(2)
9001	Optical fibres and optical fibre bundles; optical fibre cables other than those of heading 8544; sheets and plates of polarising material; lenses (including contact lenses), prisms, mirrors and other optical elements, of any material, unmounted, other than such elements of glass not optically worked
9002	Lenses, prisms, mirrors and other optical elements, of any material, mounted, being parts of or fittings for instruments or apparatus, other than such elements of glass not optically worked
9003	Frames and mountings for spectacles, goggles or the like, and parts thereof
9004	Spectacles, goggles and the like, corrective, protective or other
9005	Binoculars, monoculars, other optical telescopes, and mountings therefor; other astronomical instruments and mountings therefor, but not including instruments for radio-astronomy
9006	Photographic (other than cinematographic) cameras; photographic flashlight apparatus and flash bulbs other than discharge lamps of heading 8539
9007	Cinematographic cameras and projectors, whether or not incorporating sound recording or reproducing apparatus
9008	Image projectors, other than cinematographic; photographic (other than cinematographic) enlargers and reducers
9009	* * * *
9010	Apparatus and equipment for photographic (including cinematographic) laboratories, not specified or included elsewhere in this chapter; negatoscopes; projection screens
9011	Compound optical microscopes, including those for photomicrography, cine photo micrography or micro projection
9012	Microscopes other than optical microscopes; diffraction apparatus
9013	Lasers, other than laser diodes; other optical appliances and instruments, not specified or included elsewhere in this Chapter
9014	Direction finding compasses; other navigational instruments and appliances

Chapter Heading	Description of goods
9015	Surveying (including photo grammetrical surveying), hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances, excluding compasses; rangefinders
9016	Balances of a sensitivity of 5 cg or better, with or without weights
9017	Drawing, marking-out or mathematical calculating instruments (for example, drafting machines, pantographs, protractors, drawing sets, slide rules, disc calculators); instruments for measuring length, for use in the hand (for example, measuring rods and tapes, micrometers, callipers), not specified or included elsewhere in this chapter
9018	Instruments and appliances used in medical, surgical, dental or veterinary sciences, including scienti graphic apparatus, other electromedical apparatus and sight-testing instruments
9019	Mechano-therapy appliances; massage apparatus; psychological aptitude-testing apparatus; ozone therapy, oxygen therapy, aerosol therapy, artificial respiration or other therapeutic respiration apparatus
9020	Other breathing appliances and gas masks, excluding protective masks having neither mechanical parts nor replaceable filters
9021	Orthopaedic appliances, including crutches, surgical belts and trusses; splints and other fracture appliances; artificial parts of the body; hearing aids and other appliances which are worn or carried, or implanted in the body, to compensate for a defect or disability
9022	Apparatus based on the use of X-rays or of alpha, beta, gamma or other ionising radiations, whether or not for medical, surgical, dental or veterinary uses, including radiography or radiotherapy apparatus, X-ray tubes and other X-ray generators, high tension generators, control panels and desks, screens, examination or treatment tables, chairs and the like
9023	Instruments, apparatus and models, designed for demonstrational purposes (for example, in education or exhibitions), unsuitable for other uses
9024	Machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials (for example, metals, wood, textiles, paper, plastics)
9025	Hydrometers and similar floating instruments, thermometers, pyrometers, barometers, hygrometers and psychrometers, recording or not, and any combination of these instruments
9026	Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases (for example, flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 9014, 9015, 9028 or 9032
9027	Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meters); microtomes
9028	Gas, liquid or electricity supply or production meters, including calibrating meters therefor
9029	Revolution counters, production counters, taximeters, mileometers, pedometers and the like; speed indicators and tachometers, other than those of heading 9014 or 9015; stroboscopes
9030	Oscilloscopes, spectrum analysers and other instruments and apparatus for measuring or checking electrical quantities, excluding meters of heading 9028; instruments and apparatus for measuring or detecting alpha, beta, gamma, X-ray, cosmic or other ionising radiations

Chapter Heading	Description of goods
9031	Measuring or checking instruments, appliances and machines, not specified or included elsewhere in this chapter; profile projectors
9032	Automatic regulating or controlling instruments and apparatus
9033	Parts and accessories (not specified or included elsewhere in this chapter) for machines, appliances, instruments or apparatus of chapter 90

In plain reading of the various entries providing the description of the goods covered under respective headings of Chapter 90, starting from 9001 to 9033, it transpires that all instruments and apparatus and its parts & accessories are covered under this Chapter, irrespective of its usage in various fields/technology areas or for various purposes. Further, these instruments can be broadly grouped depending upon its usage and other factors as given below:

(i) **Optical instruments/apparatus**, including Liquid Crystal Devices, laser instruments, covered under headings 9001 to 9005, 9012 and 9013;

(ii) **Photographic instruments/apparatus**, covered under headings 9006 and 9008;

(iii) **Cinematographic instruments/apparatus**, covered under headings 9007, and those used both in (ii) & (iii) under headings 9010 and 9011;

(iv) **instruments and apparatus for measuring, checking**, including those for navigational, surveying, weighing, drawing, flow, level, pressure or other variables of liquids, gases mathematical calculation, covered under headings 9014, 9015, 9016, 9017 and 9026;

(v) **precision instruments and apparatus** including thermometers, pyrometers, barometers, hygrometers and psychrometers etc.; physical or chemical analysis instruments; measuring or checking viscosity, porosity, expansion, surface tension, heat, sound, light, electrical quantities, alpha, beta, gamma, cosmic and other ionising radiations etc.; Gas, liquid or electricity supply or production meters, tacho meters and speed indicators, models, instruments, apparatus, designed for educational, demonstrational purposes; instruments, apparatus for testing mechanical properties such as hardness, strength, compressibility, elasticity etc., of various materials and automatic regulating or controlling instruments and apparatus; parts and accessories thereof, covered under heading 9023, 9024, 9025, 9027, 9028, 9029, 9030, 9031, 9032 and 9033.

(vi) **medical or surgical instruments and apparatus** including dental, veterinary science, various therapies such as mechano, psychological, ozone, oxygen, aerosol etc., breathing, orthopaedic etc., including complex and highly advanced medical instruments using technology of X-Ray, Radiography, Computerized Tomography (CT), Gamma ray etc.; parts and accessories thereof, covered under headings 9018, 9019, 9020, 9021 and 9022.

From the details of the goods covered as explained above, it could be seen that the general content and arrangement of the goods classified under Chapter 90 covers a wide variety of instruments and apparatus which are, as a rule, characterised by their high finish and high precision. Further, it is also explained in the WCO's HS Explanatory notes that most of the goods covered under Chapter 90 are used mainly for scientific purposes (laboratory research work, analysis, astronomy, etc.), for specialised technical or industrial purposes (measuring or checking, observation, etc.) or for medical purposes. Some of these instruments are specified in certain headings, for example, compound optical microscopes (heading 90.11), electron microscopes (heading 90.12), other instruments and apparatus are covered by more general descriptions in headings which refer to a particular science, industry, etc. (e.g., astronomical instruments of heading 90.05, surveying instruments and appliances of heading 90.15, X-ray, etc., apparatus of heading 90.22). There are certain exceptions to the general rule that the instruments and apparatus of this Chapter are high precision types. For example, the Chapter also covers ordinary goggles (heading 90.04), simple magnifying glasses and non-magnifying periscopes (heading 90.13), divided scales and school rules (heading 90.17) and fancy hygrometers, irrespective of their accuracy (heading 90.25).

From the above, it could be seen that the various instruments and apparatus have been grouped in a manner that serves the purpose of classifying these goods as a homogenous group of similar articles, convenient for transacting in the international trade and not on the basis single or few parameters such as technology, complexity of the apparatus, material for which or on which it is used, etc. Therefore, we find that simple binoculars and complex refracting telescopes are classified under heading 9005. As the impugned goods precisely measures the NOx content present in exhaust gas, which provides valuable input to the Exhaust After-Treatment System designed to reduce emissions of oxides of nitrogen (NOx), these are appropriately classifiable under the broad sub-group of Precision instruments and apparatus. However, as all the contending classification of the impugned goods are contained in this sub-group, it requires further detailed study of the individual entries for various tariff items (TIs) to determine the appropriate classification.

The contending classification in the present dispute is falling under CTH 9026 or CTH 9027 or 9032, and the respective tariff entries are given below:

"Tariff Item	Description of goods
(1)	(2)
9026	**Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases (for example, flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 90.14, 90.15, 90.28 or 90.32**
9026 10	*- For measuring or checking the flow of level of liquids:*
9026 1010	--- Flow meters
9026 1020	--- Level gauges
9026 1090	--- Other
9026 2000	- For measuring or checking pressure
9026 80	*- Other instruments or apparatus:*
9026 8010	--- Heat meters
9026 8090	--- Other
9026 90	*- Parts and accessories"*

And

"Tariff Item	Description of goods
(1)	(2)
9027	**Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meters); microtomes**
9027 1000	- Gas or smoke analysis apparatus
9027 2000	- Chromatographs and electrophoresis instruments
9027 30	*- Spectrometers, spectrophotometers and spectrographs using optical radiations (UV, visible, IR) :*
9027 3010	--- Spectrometers
9027 3020	--- Spectrophotometers
9027 3090	--- Other
9027 50	*- Other instruments and apparatus using optical radiations (UV, visible, IR) :*
xxx	*xxx*
9027 80	*- Other instruments and apparatus :*
xxx	*xxx*
9027 90	*- Microtomes; parts and accessories :*
9027 9010	--- Microtomes, including parts and accessories thereof
9027 9020	--- Printed circuit assemblies for the goods of sub-heading 9027 80
9027 9090	--- Other"

And

"Tariff Item	Description of goods
(1)	(2)
9032	**Automatic regulating or controlling instruments and apparatus**
9032 10	- *Thermostats* :
xxx	*xxx*
9032 20	- *Manostats* :
xxx	*xxx*
	- Other instruments and apparatus :
9032 9000	- Parts and accessories"

8.1 It could be seen that by applying the GIR 1, the position is made clear that Chapter Heading 90.26 covers within its scope and ambit, mainly of five broad categories of goods:

(i) first one i.e., "flow meters" which are instruments and apparatus for measuring or checking **flow of liquids or gases** covered under CTI 9026 1010;

(ii) the second one i.e., "Level gauges" which are instruments and apparatus for measuring or checking **level of liquids or gases** covered under CTI 9026 1020;

(iii) the third one i.e., instruments and apparatus for measuring or checking **pressure of liquids or gases**; covered under CTI 9026 2000;

(iii) the fourth one i.e., "heat meters" for **measuring or checking thermal energy of liquids or gases**; covered under CTI 9026 8010; and

(iv) the fifth one i.e., "Other instruments and apparatus" for measuring or checking (a) flow or level of liquids or gases covered under CTI 9026 1090; (b) other variables of liquids or gases covered under CTI 9026 8090 and (c) parts and accessories of all the above goods, covered under CTI 9026 9000.

8.2. Similarly, by applying same GIR 1, it could also be seen that Chapter Heading 9027 covers within its scope and ambit, mainly of four broad categories of goods:

(i) first one i.e., "**Gas or smoke analysis** apparatus," covered under CTI 9027 1000;

(ii) the second one i.e., "**chromographs and electrophoresis** instruments," covered under CTI 9027 2000 are high precision gas or liquid analysis apparatus working on photometric device or by analysing the liquid in passing through layers of absorbent material and measuring by means of detector;

(iii) the third one i.e., "**Other instruments**," (a) using optical radiations covered under CTH 9027 30; 9027 50 (b) other types of instruments and apparatus under CTI 9027 80 and microtomes under CTI 9027 90.

It is seen that a number of precision instruments and apparatus are exhaustively covered under CTH 9027 including 'Gas or smoke analysis apparatus', which are used to analyse combustible gases or combustion by-products (burnt gases) for determining their content of carbon dioxide, carbon monoxide, oxygen, hydrogen, nitrogen or other hydrocarbons. Though the description of the tariff items does not explain in detail the principles on the basis of such instruments and apparatus function, these

have been elaborated in the HSN Explanatory Notes for chapter heading 9027. Accordingly, the following are the different types or models of apparatus or instruments used for physical or chemical analysis including analysis of gas or smoke.

(i) Orsat's apparatus consisting mainly of an aspirating bottle, one or more absorption bulbs and a measuring burette;

(ii) Combustion or explosion apparatus equipped with pipette

(iii) instruments or apparatus working on the principle of heat conductivity of a gas

(iv) instruments or apparatus working on the principle of heat effect of combustible gases on an electrode

(v) instruments or apparatus working on the principle of selective absorption of ultra-violet, visible, infra-red or microwave radiations by the gas

(vi) instruments or apparatus for measuring the different in the magnetic permeability of gases

(vii) instruments or apparatus working on chemiluminescent reactions of the gas with a suitable auxiliary gas component

(viii) instruments or apparatus working on the principle of flame ionisation of hydrocarbons in a hydrogen flame

(ix) instruments or apparatus working on difference in the conductivity of a suitable liquid reagent before and after reaction with the gas

(x) instruments or apparatus working on the **principle of electrochemical reaction in cells with solid (especially zirconium oxide for oxygen analysis)** or liquid electrolytes.

8.3 From the above discussion on the scope of coverage of goods under the two contending CTHs in Chapter 90, in terms of GIR-1, we find that the CTI 9027 1000 deals with specific "instruments and apparatus for gas or smoke analysis", including those working on the principle of electrochemical reaction, whereas the CTH 9026 deals with instruments and apparatus for measuring or checking certain aspects of liquid or gas such as "flow, level, pressure or other variables indicating quantitative aspects". Therefore, we are of the *prima facie* view that on the basis of scope and coverage of various tariff items of the contending classification as discussed above, the impugned goods are appropriately classifiable under CTI 9027 1000.

9.1 In the detailed reply given by the appellants vide their letter dated 07.09.2020, at the very beginning of issue of SCN, they have explained the working principle of the NOx sensors as follows:

"13. NOx sensor is a critical component of the Engine after treatment system which ensures automatic regulation of the

harmful gases within such specified norms. NOx sensor generates a voltage in proportion to the presence of NOx in the emission gases and accordingly sends a CAN message signal to the ECM on the basis of which the amount of Diesel Exhaust Fluid (DEF/AUS 32) to be injected in the engine is decided. DEF is used in the selective catalytic reduction (SCR) process to lawyers nitrogen oxide content in the exhaust emissions from the diesel engine.

14. NOx sensor is an integral/critical part of the Engine after treatment system, which is a catalytic converter to reduce the content of harmful gases and other particles in the exhaust gases. To maintain proper emission norms, it is important to limit the amount of NOx content in exhaust gases. NOx sensor generates an electrical signal in proportion to NOx present in the gas, that is fed to sensor control module. The NOx measurement value then fed to engine control module (ECM), in this case the Electronic Control Module (ECM) to control other apparatus such as heat, injectors, pump etc., in the after treatment. NOx sensor is therefore a critical component of the engine after treatment system for regulating content of NOx in engine emission.

15. NOx sensors work on 12V DC or 24V DC power supply usually powered from vehicle battery supply. It consists of an Electronic box and measurement probe. When powered on, sensors electronic box triggers the heater element in probe and maintains the temperature at a desired limit. At this temperature the gas passes through the probe chambers with electrodes, across which voltage (Nernst Voltage) is generated proportional to NOx present in exhaust which in-turn is converted to PPM and communicated to ECM by electronic box. Additionally, this sensor can determine internal failures related to sensing probe damage, harness connection, via breakage which are critical for determining the operational status of the system.

16. Based on architecture, more than one NOx sensor is used in system, NOx amount is periodically measured at the input and exit of after treatment system, these details along with inputs from other sensors are processed continuously to control devices which are designed to bring NOx and other emission factor. Desired value, stabilised against disturbances, by constantly measuring its actual value….”

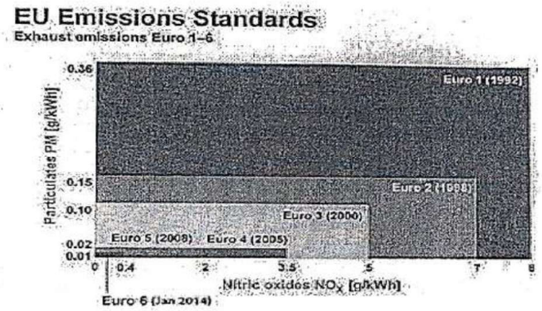
9.2 Further, the working principle of the NOx sensors have been explained by the appellants in the diagram as given below:

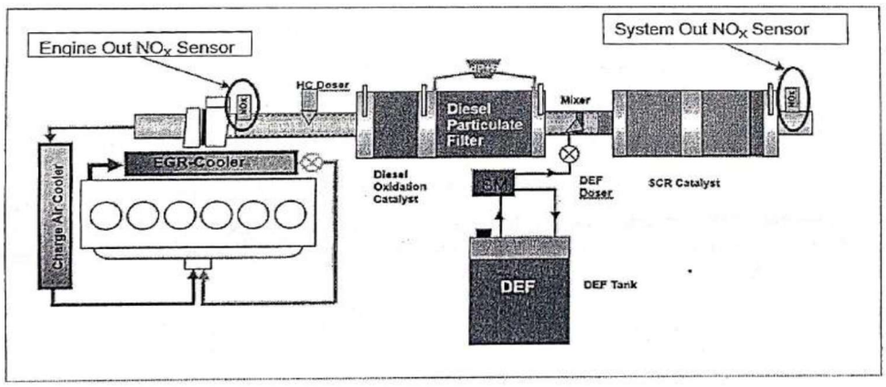
Annexure - 4 117

Technical Write Up On role played by the NOX Sensor in the aftertreatment system

Need of Aftertreatment Systems:

To meet BSVI regulations of NOx i.e greater than 85% reduction required from BSIV to BSVI. To meet this requirement we need to have Diesel oxidation catalyst (DOC), diesel particulate filter (DPF) and selective catalyst reactor (SCR).





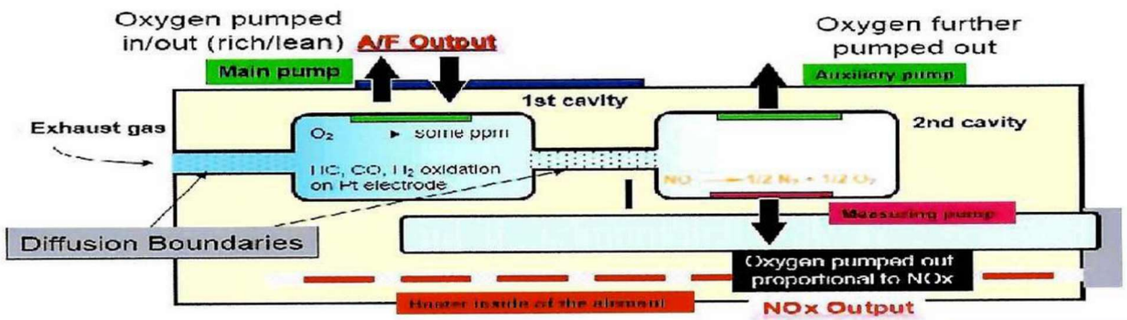
NOx sensors are used to monitor NOx conversion rate of the SCR catalytic convertor.

Engine out NOx sensor (EONOx) monitors amount of NOx generated by Engine and System out (SONOx) monitors amount of NOx coming out of Aftertreatment system after ATS processing.

To satisfy various OBD (on-board diagnostics) requirements, SCR systems typically use a NOx sensor downstream of the SCR catalyst.

If excessive NOx or ammonia concentrations exist at the SCR outlet, an OBD malfunction will be triggered, as NOx sensors are sensitive to both gases.

NOx Sensor



Measuring Principle (NOx)

1. Chemical equilibrium, NO ‹ › $N_2 + O_2$ is shifted to right hand side by removing O_2 from the cavities.

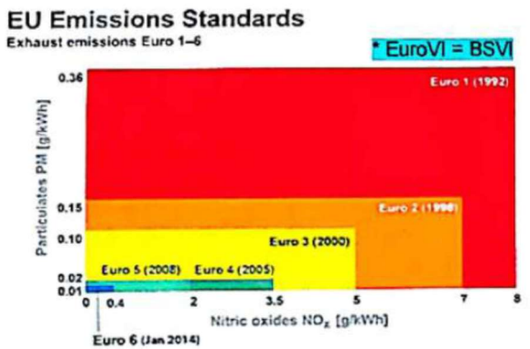
2. The oxygen current at the measuring pump represents the original NOx concentration.

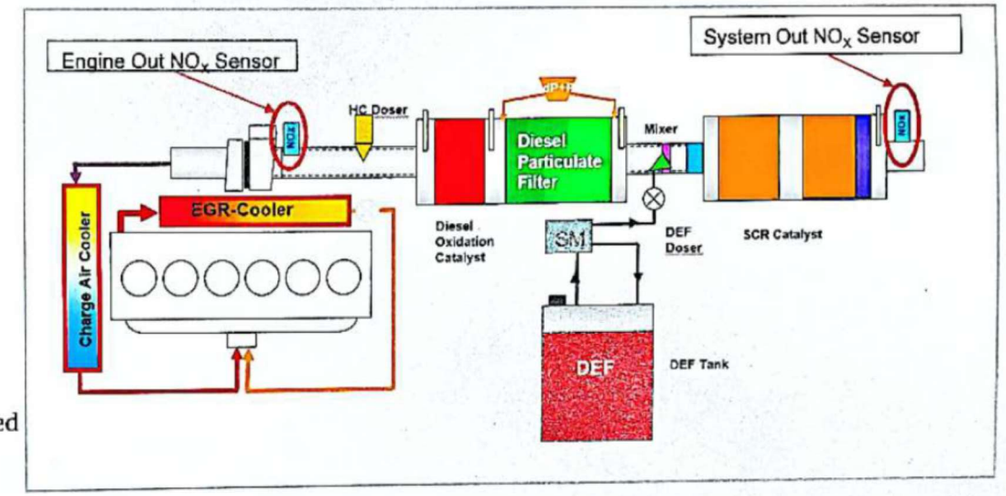
- NOx sensor calculate amount of NOx coming out of Engine and Aftertreatment system
- NOx Sensor does not read NOx; it reads oxygen concentration and determine corresponding NOx present in the system
- Sensing element is made up of Zirconia, effectiveness of NOx sensor starts at 850C during full operation, to initiate heater due point determination required to avoid thermal crack.
- It is made up of 2 chamber cavities where first chamber is used to Pump out O2 and Second chamber decompose NO into ½N2 and ½ O2.
- Decomposed O2 pumped out of second chamber generate Nernst voltage which is further converted to NOx PPM values. NOx is considered as equivalent to amount of O2 present in second chamber.
- Measured NOx values being monitored by Electronic control unit to determine amount of ammonia injection required to meet Regulations.

EXHIBIT-B

C/85736/2023

Aftertreatment system





- To meet emission regulation requirements, we need Aftertreatment system that reduce pollutants coming out of engine combustion

- Aftertreatment consists of DOC, DPF and SCR along with Doser injection system to reduce NOx in SCR and reduce PM using DPF system. The role of each of the components in the system is as follows:
  - DOC : This reduces harmful emissions by oxidizing carbon monoxide and hydrocarbons
  - DPF : DPFs, combined with DOCs, use wall-flow substrates typically made of porous ceramic media that capture exhaust gas and remove PM or soot particles
  - SCR : The exhaust progresses into the SCR system which converts the toxic NOx and urea mixture into harmless nitrogen gas (N2) and water vapor (H2O), which effectively eliminates harmful emissions resulting in near zero emissions from the exhaust.
- NOx sensors are used to monitor NOx conversion rate of the SCR catalytic convertor. Engine out NOx sensor (EONOx) monitors amount of NOx generated by Engine and System out (SONOx) monitors amount of NOx coming out of Aftertreatment system after ATS processing.
- To satisfy various OBD (on-board diagnostics) requirements, SCR systems typically use a NOx sensor downstream of the SCR catalyst.
- If excessive NOx or ammonia concentrations exist at the SCR outlet, an OBD malfunction will be triggered, as NOx sensors are sensitive to both gases.

EXHIBIT A

9.3 It is a fact on record, as seen from the technical write-up of the impugned product' Nox Sensors' and 'After Treatment System' placed in the case file and shown in the representative diagrams with explanation of its functioning at pages 20 and 21 above, that the impugned NOx sensors *inter-alia* measures the oxygen gas and indirectly measures the Nitrogen oxide gas. Further, the working principle of NOx sensors for such measurement of gases is the electrochemical reaction in cells with zirconium electrode. Therefore, in terms of the technical details about the functioning of the product, as submitted by the appellants themselves, it is clearly brings out that these goods are appropriately classifiable under CTI 9027 1000 and not under CTH 9026.

9.4 We further note that in terms of automotive standards prescribed under AIS-137 (Part 4) for specified motor vehicles for compliance with Bharat Stage VI (BS-VI) Emission Norms as per Central Motor Vehicle Rules, 1989, use of different terms have been defined thereunder as follows:

> *"**deNOx system**" means an exhaust after-treatment system designed to reduce emissions of oxides of nitrogen (NOx) (e.g. passive and active lean NOx catalysts, NOx absorbers and selective catalytic reduction (SCR) systems).*
>
> *"**Exhaust after-treatment system**" means a catalyst (oxidation, 3-way or another), particulate filter, deNOx system, combined deNOx particulate filter, or any other emission reducing device, that is installed downstream of the engine;*
>
> *"**Gaseous pollutants**" means the exhaust gas emissions of carbon monoxide, NOx, expressed in NO2 equivalent, hydrocarbons (i.e. total hydrocarbons, non-methane hydrocarbons and methane).*
>
> ***"On-board diagnostic system"** (OBD system) means a system onboard of a vehicle or engine which has the capability of: (a) Detecting malfunctions, affecting the emission performance of the engine system; (b) Indicating their occurrence by means of an alert system. (c) Identifying the likely area of the malfunction by means of information stored in computer memory and communicating that information off board.*
>
> *"**Exhaust After-Treatment Systems** The function and combination of the following devices are regarded as membership criteria for an engine family: a) Oxidation catalyst; b) Three-way catalyst; c) de NOx system with selective reduction of NOx (addition of reducing agent); d) Other de NOx systems; e) Particulate trap with passive regeneration; f) Particulate trap with active regeneration; g) Other particulate traps; h) Other devices…*

Even though the NOx sensors may be treated as part of deNOx system or device which in turn could be a sub-system of Exhaust After Treatment

System, such grouping has been done only for the purpose of Central Motor Vehicle Rules and monitoring emission norms, and these would not have any impact on the function of classification of impugned goods for the purpose of Customs Act, 1962 and Customs Tariff Act, 1975 in determination of appropriate duty to be paid on its importation. Therefore, the alternative classification claimed by the learned Senior Advocate under CTI 9032 9000 as 'parts of exhaust after treatment system' does not have any valid legal basis.

9.5 In this regard, we have carefully gone through the legal provisions of the Act of 1975 as referred above, and find that for legal purposes, the classification of goods shall be determined according to the terms of the headings of the tariff and any relative Section notes or Chapter notes. We also find upon careful reading of the Chapter Note 2 to Chapter 90, which provide that, parts and accessories mentioned as specific goods included in any of the headings of Chapter 90 (other than heading 9033) are in all cases to be classified in their respective headings only. Accordingly, apparatus or instrument used for analysis of gas are smoke, working on the principle of electrochemical reaction in cells with solid (especially zirconium oxide for oxygen analysis) having a specific description under CTI 9027 1000, would therefore stand covered under CTH 9027, and such goods cannot be classifiable under CTH 9032 as general 'parts and accessories' under CTI 9032 9000.

9.6 In other words, on applying Note 2 above to Chapter 90, it would mean that among the contending classification under CTI 9027 1000 and alternative CTI 9032 9000, even after taking into account the fact that such NOx analyser would work in conjunction with Engine After Treatment System, we come to a considered opinion that the impugned goods would remain as the 'gas or smoke analysis apparatus', since in terms of functionality and conformity to the Indian standards, the essential function of the said goods remain as measuring the nitrogen oxide, oxygen etc. in the exhaust gas flow of the automobile/vehicles. Therefore, in terms of the above discussion on facts and on the basis of explanatory notes to HS and the Chapter Note 2 to Chapter 90, we are of the considered view that the imported NOx analysers and other similar analysers are appropriately classifiable under CTI 9027 1000, and not under the CTH 9026 or CTH 9032.

10.1 We also find that the adjudicating authority, without any basis had concluded that the appellants had resorted to mis-classification of the impugned goods, as they are not naive to misread the headings and corresponding explanatory notes. No evidence have been placed on record to state that vital information relating to the product have been suppressed mis-declared for invocation of the extended period of limitation. On the contrary, the facts on record show that various B/Es have been filed by the appellants over a period of about 5 years in hundreds of occasions and the jurisdictional customs authorities have never questioned the self-assessment made by the appellants. It is only on account of the different interpretation on classification of the goods adopted by the audit wing of the Department, the entire process of show cause proceedings had been initiated.

10.2 In this regard we find that on identical set of facts, the Tribunal in the case of *Signet Chemical Pvt. Ltd.* (supra) have held that inasmuch as the appellant have been continuously declaring the classification of the product under a particular classification after providing full description of the goods in the various bills of entry, the allegation of suppression of facts cannot be sustained for classifying the goods in a different chapter. The relevant paragraph of the said order is extracted and given below:

> *"18. We do not see substance in the argument of the Revenue inasmuch as the appellant have been continuously declaring classification of the product under Heading 1702 after providing full and description of the goods in their Bills of Entry; duly filed all literatures on process of manufacture, its usage etc. as and when called for by the department during assessment proceedings. In such circumstance, allegation of suppression of facts or mis-declaration solely on the basis that the correct classification which according to the Department would fall under different Tariff Heading i.e. 1701 attracting higher rate of duty during the period under dispute cannot be sustained. This is the principle of law laid down by the Tribunal and courts in a series of cases. Consequently, the demand confirmed in the impugned Order invoking extended period relating to Appeal No. C/85493/2019 is set aside on the ground of limitation.*

10.3 In an appeal filed by the Department against the above order of the Tribunal vide Customs Appeal No.5 of 2021, the Hon'ble High Court of Bombay in its judgement delivered on 21.09.2022 have upheld the views of the Tribunal and held that there is no case for deliberate and wilful attempt to suppress the facts or make any wilful mis-statement for the purpose of evading payment of duty by the appellants in that case. Therefore, we are of the considered view that the adjudged demands

confirmed by the adjudicating authority by invoking extended period of limitation would not stand the scrutiny of law.

11.1 In the case of *Bosch India Ltd. Vs. Commissioner of Customs, Bangalore* – 2021 (375) E.L.T. 227 (Tri. – Bang.) relied upon by the appellants for classification of impugned goods under CTH 9026, the product under dispute was imported 'Water Signal Sensors' for use in automobile; and the classification under CTH 9026 was held by the Tribunal on the ground that Revenue could not establish the controlling feature of the instruments for classifying it under CTH 9032. However, in the case before us, the Revenue had clearly by quoting the function of the NOx sensor as submitted by the appellants in their letter dated 07.09.2020 and in showing the specific coverage of the instruments and apparatus working on the principle of electrochemical reaction in cells with solid (especially zirconium oxide for oxygen analysis) having been covered under the Explanatory Notes to HSN under sub-clause (8) covering the scope of goods under Chapter Heading 9027, have proved the appropriate classification of the impugned goods. Therefore, the case law relied upon by the appellants does not have relevant to the present case.

11.2 As regards the classification of 'oxygen sensors' under CTH 9031 in the Order of the Tribunal in the case of *Denso Haryana Private Limited Vs. Commissioner of Customs (I&G), New Delhi* – 2015 (325) E.L.T. 179 (Tri. Del.) relied upon by the appellants, we find that the Tribunal was provided with the write-up material available in Wikipedia on oxygen sensors. Thus, on the basis of such material indicating the following, the Tribunal held that the classification of oxygen sensors would land up under CTH 9031.

> *"As per the same Wikipedia page, "oxygen sensor is an electronic devise that measure the proportion of oxygen in the gas or liquid." Thus it is obvious that oxygen sensors are not instruments or apparatus for physical or chemical analysis as they do not do any analysis and are not capable of doing so either. Indeed, these are quite unlike polarimeters, refractomters, spectrometers, gas or smoke analysis apparatus which are mentioned as examples in the said Chapter Heading 9027. These sensors also cannot be said to be instruments and apparatus for measuring or checking viscosity, porosity, expansion surface tension or the like because what they do is nothing at all like checking viscosity porosity, expansion or surface tension. These also do not check the quantities of heat, sound or light. Thus, the impugned goods do not belong to Chapter Heading 9027. Once their classification under Chapter Heading 9027 is ruled out, they would land up under CTH 9031 as admittedly that is the only competing entry.*
>
> ***5.*** *Revenue relied upon the HSN Explanatory Notes under Chapter 9027 to say that gas or smoke analysis apparatus is covered under*

Chapter Heading 9027. But the fact is that the impugned goods are not gas or smoke analysis apparatus; they are merely sensors. On the other hand we find that as per HSN Explanatory Note under Chapter Heading 9031, "apparatus for testing and regulating vehicle motors, for checking all parts of the ignition system, for ascertaining the best carburetter setting (by analysing exhaust gases) or for measuring the compression in the cylinders" are covered thereunder. The sensors in question are essentially a part or component of the apparatus for ascertaining the best carburetter setting as these sensors enable such apparatus to detect the oxygen levels in the exhaust gases."

We find that in arriving at the above conclusion in the above referred case, the Tribunal was not provided with details of the functioning of the product in dispute, as has been done in the present case before us. We have gone into the details of the functioning of the impugned product 'NOx sensors' as explained by the appellants, with illustrative diagram showing the 'NOx Sensor' and 'After Treatment System'. Further, learned AR has also explained the functioning of NOx sensors in terms of the electrochemical reaction using the amperometric detection technique as elaborated in Electrochemistry text books, along with 'Nernst equation' as follows:

"The NOx sensor will have at least two chambers or cells. The first cell pumps out the oxygen present in the exhaust so that it does not interfere with NOx measurement in the second cell and also detects the exhaust oxygen level. On applying a bias voltage of -200mV to -400mV, O_2 ions are pumped through Yttria Stabilized Zirconia (YSZ). Oxygen concentration can be found out on calibrating the pumping current in the first cell. The reducing catalyst in the second cell cause the NOx in the remaining gas to decompose into N_2 and O_2. Similar to the first pump cell, a bias voltage of 400mV is applied to the electrode, and the pumping current of this cell would represent the NOx concentration in the exhaust (gas). To avoid cross-interference all HC and CO should be oxidised before the NOx cell and all NO_2 should be converted into NO before the sensing cell."

"Equation 1 describes the reduction of oxygen molecules to oxygen ions which occurs in the higher pressure chamber:

$$O_2 + 4_{e^-} = 2O^{2-} \qquad \text{(Equation 1)}$$

Based on Equation 1, the sensor voltage can be calculated using the Nernst equation as shown in Equation 2

$$U_8 = (RT/4F)\int n\ (p_{ref}/p_{exh})$$

Where U_8 represents the sensor signal (V), T is the temperature (K), p is the partial pressure of oxygen, R is the gas constant = 8.314 J/mol-K and F is the Faraday's constant = 96485 A-s/mol. NOx sensors should include at least two oxygen pump cells. The purpose of the first pump is to remove excess oxygen from the exhaust gas and the second pump measures the oxygen concentration from the NOx decomposition."

Though, the learned AR has quoted aforesaid scientific equations which is complex and not easy to understand for a common person, it would suffice to draw from such quoted text that the function of NOx sensors include an activity of measuring the oxides of Nitrogen NOx present in parts per million (ppm) and the same message sent to the after treatment system, engine control unit to determine the amount of ammonia that is required to be injected in order to meet the emission norms as per the extant regulatory requirements under CMVR. Therefore, it is amply demonstrated that NOx sensors are a type of gas or smoke analysis apparatus which work on the principle of electrochemical reaction in cells with zirconium oxide for analysis of oxygen and thereby measuring the oxides of nitrogen (NOx) for further action in the After Treatment System. We are also of the view that such detailed presentation of the functioning of the sensors and the electrochemical reaction that takes place in analysis and measurement of the gases, as presented before us, perhaps have not been produced before the Tribunal in the case of *Denso Haryana Private Limited* (supra), in order to arrive at proper classification of the goods under dispute. Accordingly, we find that the decision of the Tribunal in the case of *Denso Haryana Private Limited* (supra), is distinguishable for the aforesaid reasons.

11.3 Further, the order dated 05.12.2022 passed by Principal Commissioner of Customs, Bangalore in the case of Bosch Limited quoted by the appellants, for classification of oxygen sensors by relying on the decision of *Denso Haryana Private Limited* (supra), also does not have relevance to the facts of the present case, for the aforesaid reasons discussed at paragraph 11.2 above.

11.4 We also find that the decision of the Tribunal in the case of *Femco Filters (P) Ltd. Vs. Commissioner of Customs, Bangalore* - 2006 (203) E.L.T. 494 (Tri.- Bang.) was in respect of the product 'particle counter' for which the classification was decided under CTH 9026, on the basis that the impugned goods therein were different from the counters covered by the classification under CTH 9029. As the facts of the case relating to the impugned goods in the present case are entirely different from the 'particle counter' dealt in the referred case, we are of the view that the aforesaid decision of the Tribunal does not have any relevance to the present case.

12. In view of the foregoing discussions and analysis, and on the basis of the judgement of the Hon'ble High Court and the decision of the Tribunal as discussed above, we are of the considered view that the impugned goods are classifiable under CTI 9027 1000 of the First Schedule to the Customs Tariff Act, 1975. Accordingly, the impugned order dated 08.02.2023 is partly upheld to the extent it had classified the imported goods under heading CTI 9027 1000. However, as regards confirmation of adjudged demands by invoking extended period of limitation is concerned, there is no ground for such action and accordingly the order to this extent is partly liable to be set aside. Accordingly, we set aside the impugned order dated 08.02.2023 to the extent it had confirmed the adjudged demands on the basis of such mis-representation of facts, mis-statement, suppression of facts etc. and imposed fine and penalty on the appellants.

13. In the result, we partly set aside the impugned order dated 08.02.2023 to the extent of confirmation of the adjudged demands for extended period of limitation and consequent imposition of fine and penalty on the appellants. Further, we only uphold that part of the impugned order dealing with the classification of impugned goods under CTI 9027 1000 of the First Schedule to the Customs Tariff Act, 1975 and therefore, the demand of duty for the normal period alone would sustain. Thus, the appeal filed by the appellant-importer is partly allowed in their favour on the grounds of limitation.

(Order pronounced in open court on 14.08.2025)

(S.K. MOHANTY)
MEMBER (JUDICIAL)

(M.M. PARTHIBAN)
MEMBER (TECHNICAL)

Sinha