

AUTOMOTIVE INDUSTRY STANDARD

End-of-Life Vehicles

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ON BEHALF OF

AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE

UNDER

CENTRAL MOTOR VEHICLE RULES – TECHNICAL STANDING COMMITTEE

SET-UP BY

MINISTRY OF ROAD TRANSPORT & HIGHWAYS
(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)

GOVERNMENT OF INDIA

March 2015

INTRODUCTION

The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel when the work on the preparation of the standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the standard and commissioning of test facilities. To this end, the erstwhile Ministry of Surface Transport (MOST) has constituted a permanent Automotive Industry Standards Committee (AISC) vide order No. RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India, (ARAI), Pune, being the Secretariat of the AIS Committee, has published this standard. For better dissemination of this information ARAI may publish this standard on their web site.

A need was realised to minimise the impact of End-of-Life Vehicles (ELV) on environment, thus contributing to the protection, preservation and improvement of the quality of the environment and energy conservation.

Several consultations were carried out by the group members within their organisations as well as without. Seminars were conducted, wherein the concerned stakeholders in the country as well as International experts on the topic presented papers. SIAM participated in various international conferences organised by reputed organisation such as International Automobile Recycling Congress (IARC) and International Congress & Marketing (ICM AG). A study was also done on the existing ELV recycling models in the countries of Europe, Japan and China. The lessons learnt from those recycling models were keenly studied considering the Indian scenario.

It was also realised that the ELV regulation cannot be the only solution towards making automobile recycling an organised sector in the country and it is not the only measure for making auto recycling an environment friendly process. However, this can be one of the many steps required for this purpose and a very important one too. The benefits of this regulation can only be reaped in conjunction with the infrastructure development such as, inspection & maintenance of in service vehicles, setting up ELV collection and dismantling centres across the country, modernisation of existing recycling facilities, modernisation of vehicle registration and de-registration system in the country as well as formulation and enforcement of motor vehicle and environmental rules boosting the automotive recycling industry.

Considering the need to formulate the standard, an effort is being made by the SIAM to formulate a regulation for the safe disposal of ELVs and reduction of heavy metals in the vehicles. However, considering the Indian scenario, certain modifications in the Automotive Industry Standard have been carried out.

The first part of the standard lays down the requirements for the collection and dismantling centres, while the second part (Parts 2(A) and 2(B)) of the standard lay down requirements for the vehicle manufacturers to comply with the RRR calculations, to restrict the heavy metals in their vehicles, to suitably code the plastic components and to provide dismantling information to the authorised collection and dismantling centres.

The significant differences between the European regulation (2000/53, 2005/64) and this AIS are as follows:

1. Considering the significant population of two wheelers in India, it was decided to cover the 2-wheelers along with the M1 category vehicles in the scope. On the other hand, the European directive covers M1 and N1 category in the scope.
2. The inclusion of N1 category in India was debated at length. Based on the experience with implementation of M1 category, a decision will be taken for inclusion of N1 category vehicles.
3. The marking of the parts is limited to only plastic components unlike Europe where rubber components are also required to be marked.
4. The concept of an assessment to be carried out by appropriate agency before type approval certificate is issued to the manufacturer has been captured.
5. To the extent possible, the criteria for approval of extension and reference vehicle are defined for additional clarity in certification process.
6. EU directive covers spare parts also. However, in India, there is no regulation in existence controlling the after market parts. Hence this regulation does not cover any of the requirements for after market parts covered by EU.

7. The extended producer responsibility was considered to be unviable in an emerging market like India, where the industry is not developed to that maturity level. However, it is understood that it takes a lot of work from the existing unorganised sector and hence, a demo centre has been set up by the Govt of India under the NATRIP project with a comprehensive support from SIAM and its members.
8. It is strongly believed that the market economy must take care of the final ELV value offered to the customer.

Need for Modernisation of Vehicle Fleet in India

At present, India does not have a robust national policy on retirement of vehicles or end-of-life of vehicles. Hence, it is important to capitalise on the developments that the industry has catalysed in the country, over the last two decades. Vehicle users in India tend to continue the usage well beyond the expected life of the product. Such vehicles have higher emission content, lower fuel efficiencies and also have lower safety standards. The government with the OEMs can promote an incentive scheme to drive vehicle owners to replace older vehicles with new generation products. Whilst the new vehicles are cleaner and meeting stringent emission requirements, and a continuous plan is being evolved by the Government of India to further improve the emission performance of these newly manufactured vehicles. However, the benefits are not getting reflected in the ambient air quality due to the presence of a large number of old and ill maintained polluting vehicles.

Approach - Replacement based on Vintage of the Vehicle

In order to mitigate immediate air quality problems and decreasing the menace of road accidents, a one-time incentive scheme for retirement of old vehicles is required and there is a need for Modernizing the Vehicle Fleet. An age based fleet modernisation programme appears to be an effective option to tackle the problem of emission from in-use vehicles on a one-time basis.

Given the profile of vehicle population in India, the suggested scheme would offer an effective solution to the problem of vehicular pollution faced by India. And it would be apt to focus the first phase in the eight major States of India, namely Delhi, Maharashtra, West Bengal, Tamil Nadu, Karnataka, Gujarat, Telangana and Seemandhra.

The last owner of the vehicle will be issued a Certificate of Destruction (CoD) by Regional Transport Authority; this certificate will be a tradable in nature.

Other Approach for supplementing the Fleet Modernisation Scheme

In order to discourage people from running old polluting vehicles, the rate of Road Tax and rate of premium on Motor Vehicle Insurance could be increased progressively with the age of the vehicle. As a pilot, it can be first used for Commercial Vehicles, which have been languishing for more than a year, with market have been contracted significantly.

The Automotive Industry Standards Committee (AISC) responsible for preparation of this standard is given in Annexure-L given in Part 2 (B).

REFERENCES:

1. 2005/64/EC Directive : Type approval of motor vehicles with regard to their reusability, recyclability and recoverability
2. 2009/1/EC Directive: Amendments to 2005/64/EC.
3. 2000/53/EC Directive : End-of-life Vehicles
4. ISO 22628:2002 (E) : Road Vehicles – Recyclability and recoverability – Calculation Method
5. IS 9211 : 2003 : Terms and definitions of Road Vehicles

End-of-Life Vehicles

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End-of-Life Vehicles

PART –1

COLLECTION AND DISMANTLING OF END-OF-LIFE VEHICLES

1.0 SCOPE

These rules shall apply to:

- a) Last owner of End-of-Life Vehicles (ELV)
- b) Collection and dismantling centers treating M1, L1 and L2 category end-of-life vehicles.

Note: This does not preclude processing of end-of-life vehicle of other categories provided that all the conditions prescribed in Annex A of this standard are met.

2.0 REFERENCE

ISO 14001 (Environmental Management System)

3.0 DEFINITIONS

For the purpose of this standard definitions given in AIS-129: Part-2 B shall be applicable to this Part-1 of the standard also. In addition, the following definitions shall also apply.

- 3.1 **Authorization** means the process of evaluating, assessing and approving the capabilities and capacities of the collection and dismantling centre involved in the dismantling of end-of-life vehicles.
- 3.2 **Authorized Collection and Dismantling centre** means the establishment / undertaking authorized by the Government certifying agency to collect and treat the end-of-life vehicles as per the provisions laid under this standard.
- 3.3 **Government Certifying Agency** means the agency appointed by the Government for authorization of collection and dismantling centres in accordance with these rules.
- 3.4 **Last owner** is the person(s) who has (have) the legal possession of the End-of-Life Vehicle.
- 3.5 **Certificate of Destruction** means the certificate issued by the collection and dismantling centre to the last owner confirming that the treatment on the vehicle will be carried out as per the provisions mentioned in this standard.

4.0 MANDATORY COMPLIANCE

4.1 Responsibilities of the last owner of an ELV

4.1.1 The last owner, when he/she considers disposition of vehicle, shall hand over the end-of-life vehicle only to the Authorized Collection and Dismantling centre or his authorised agent.

4.1.2 The last owner shall ensure that the ELV does not contain any other waste other than an ELV.

4.1.3 Except as provided for in clause 4.2.2 (c), the last owner shall ensure that the ELV contains the following vehicle aggregates while submitting ELV to the Collection and Dismantling Centre.

4.1.3.1 In the case of M1 category vehicles:

- i) Body shell / Chassis
- ii) Engine
- iii) Transmission
- iv) Front and rear axles with wheels and tyres
- v) Battery
- vi) Catalytic convertor (if fitted)

4.1.3.2 In the case of L1 and L2 category vehicles:

- i) Engine
- ii) Transmission
- iii) Front and rear axles with wheels and tyres

4.1.4 The last owner shall make an application in Form 3 prescribed in Annex B while submitting the vehicle as an ELV to the concerned authorized collection and dismantling centre.

4.2 Responsibilities of Collection and Dismantling Centre

Any person(s) operating Collection Centre(s) and Dismantling Centre(s):-

4.2.1 Shall obtain an authorization in accordance with the procedures prescribed in this standard from the concerned Government Certifying Agency.

4.2.2 a) shall offer the last owner a price, as stipulated by the Government of India from time to time or in absence of such stipulation shall offer the last owner a mutually agreed price based on the evaluation of ELV. In any case collection and dismantling centre shall not charge any money from the last owner.

b) shall accept vehicle even when some of the parts fitted are not OE parts, but are from replacement market.

c) shall accept vehicles retrofitted with CNG/LPG/Hybrid kits, provided the same is endorsed in the registering certificate.

- d) shall accept the accident vehicles irrespective of the state of vehicle, provided that such vehicle is in continued legal possession of the last owner.
 - e) shall accept prototype/ research vehicle/ unregistered vehicles.
- 4.2.3 shall issue “Certificate of Destruction” of ELV in Form 4 as per Annex B to the last owner, on receipt of the ELV. Maintain records of the same and the records should be available for scrutiny by the appropriate authority.
- 4.2.4 shall fulfill the minimum requirements in accordance with Annex A.
- 4.2.5 shall store the ELV (even temporarily) and treat in accordance with Annex A without endangering human health and without using processes or methods which could harm environment.
- 4.2.6 shall carry out operations for depollution of end-of life vehicles as mentioned in Annex A as soon as possible.
- 4.2.7 shall strip down the ELV before further treatment or make other equivalent arrangements in order to reduce any adverse impact on the environment. Components or materials as per the dismantling information shall be stripped off, before further treatment.
- 4.2.8 shall not sell the components mentioned in clause 4.2.8.1 and 4.2.8.2 below to any person(s) for reuse in the After-Sales market and shall dispose off in an environmentally friendly manner.
- 4.2.8.1 **In the case of M1 category vehicles:**
- i) all airbags including cushions, pyrotechnic actuators, electronic control units and sensors
 - ii) automatic or non-automatic seat belt assemblies, including webbings, buckles, retractors, pyrotechnic actuators
 - iii) seats (only in case where safety belt anchorage and / or airbags are incorporated in the seat)
 - iv) steering lock assemblies acting on the steering column
 - v) immobilizers, including transponders and electronic control units
 - vi) emission after-treatment systems (e.g. catalytic converters, particulate filters)
 - vii) keys and lock components
 - viii) sections of bodywork bearing the vehicle identification number
 - ix) electronic brake components.

- 4.2.8.2 In the case of L1 and L2 category vehicles:
- i) Steering lock assemblies acting on the steering column
 - ii) Immobilizers, including transponders and electronic control units
 - iii) Emission after-treatment systems (e.g. catalytic convertor, particulate filters)
 - iv) Keys and lock components
 - v) Sections of bodywork bearing the vehicle identification number
 - vi) Engine parts bearing the engine number
 - vii) Electronic brake components
 - viii) Suspension system
 - ix) Any item other than those recommended for re-use by the vehicle manufacturer in the dismantling information
- 4.2.9 shall have a mechanism for updating to the latest authenticate dismantling information for de-pollution and dismantling purposes.
- 4.2.10 shall apply for de-registration of the ELV in Form 20a as per rule 47a of CMVR, 1989 to the registration authority within a period of 1 month of issue of Certificate of Destruction to the last owner.
- 4.2.11 shall file annual returns in Form 2 to the Government Certifying Agency.
- 4.2.12 may accreditate their centres/ units as per ISO 14001 (Environmental Management System)
- 5.0 PROCEDURE FOR AUTHORISATION BY GOVERNMENT CERTIFYING AGENCY**
- 5.1 Application for Authorization**
- 5.1.1 For obtaining the approval as per 4.2.1, the application shall be made to the Government Certifying Agency in the prescribed application Form 1.
- 5.1.2 The application shall be accompanied with the prescribed application fee as decided from time to time by the Government of India.
- 5.2 Before application for Authorization, the Collection and Dismantling Centre:**
- 5.2.1 shall fulfill the minimum technical requirement for Collection and Dismantling centers specified in Annex A regarding storage, equipments and infrastructural facilities.
- 5.2.2 shall have competent manpower to carry out the depollution and dismantling activities.

5.2.3 shall have compliance mechanism to the applicable hazardous waste disposal regulations notified by Ministry of Environment and Forest (MoEF)/ Competent Authorities.

5.3 Acknowledgement, Scrutiny and processing of Application

5.3.1 On receipt of the application complete in all respects for the authorization, the Government Certifying Agency shall issue an acknowledgement along with the receipt to the applicant within 15 working days.

5.3.2 The preliminary scrutiny of the application shall be done by the Government Certifying Agency.

5.4 Audit of the Collection and Dismantling Centers

5.4.1 On completion of the preliminary scrutiny, the Government Certifying Agency coordinates with the auditors and the applicant for planning the audit schedule.

5.4.2 At least two auditors shall be appointed for carrying out the audit.

5.4.3 The applicant is informed about the final audit schedule and the information about audit team.

5.4.4 The Audit Team is informed well in advance about the schedule with a copy of the application form to the auditors.

5.4.5 The Audit Team shall review the capability of the Collection and Dismantling Centre for the requirements specified in the clause 4.2 and Annex A of this standard.

5.4.6 Once the audit is completed, the team shall submit the audit report to the Government Certifying Agency within 15 working days. The final audit report shall be jointly prepared and signed by the auditors and shall be countersigned by the representative of the applicant. The audit report shall give clear recommendation for the grant of authorization or otherwise with due justification and without any ambiguity.

5.4.7 Non conformance found during assessment shall be recorded by the auditors and are informed to the applicant. The applicant decides about the proposed corrective action with the definite time schedule but within a maximum period of 3 months.

5.4.8 Depending on the nature/severity of non-conformances, these are closed by the auditors on the submission of documentary evidence of corrective action, or sometime may need verification visit.

5.4.9 The final recommendation is placed before the MoRT&H for approval.

5.4.10 On grant of authorization, Government Certifying Agency Secretariat prepares an authorization certificate in Form 1A mentioning there in the date of issue and date of validity of Certificate.

5.5 Validity of Authorization and Surveillance Audits

- 5.5.1 The authorization certificate shall be valid for a period of 4 years.
- 5.5.2 The Government Certifying Agency shall conduct surveillance audit every 2 years and re-audit of the Collection and Dismantling center before the expiry of authorization. During the validity of authorization, the Collection and Dismantling center shall continuously comply with the requirements of this standard.
- 5.5.3 Surveillance is aimed at examining whether the Authorized Collection and Dismantling Centre is maintaining all the requirements as specified in this standard.
- 5.5.4 Government Certifying Agency shall inform the Authorized Collection and Dismantling center about the surveillance audit and the surveillance fee to be paid in advance, at least three months before the due date for surveillance visit. The Collection and Dismantling center shall confirm its readiness within 30 days.

5.6 Renewal of Authorization and Re-audit

- 5.6.1 The Collection and Dismantling Centre may apply for renewal of authorization by submitting an application in the prescribed Form 1 in two copies.
- 5.6.2 The application shall be accompanied with the prescribed renewal fee, as required. The Collection and Dismantling Centre may request for change in scope of authorization or category which should explicitly be mentioned in the application form.
- 5.6.3 The request for renewal must be submitted at least 6 months before the expiry of the validity of authorization. If the Collection and Dismantling center does not apply for renewal of authorization, 3 months before the expiry of validity of authorization, it shall be presumed that the Collection and Dismantling center is no longer interested in authorization and authorization status of the Collection and Dismantling center shall expire on the validity date mentioned in the Certificate. In such case, the Collection and Dismantling center shall have to apply afresh and the continuity of the Certificate stands cancelled.

However dismantler must ensure before expiry of the authorization that he/she has completed all the activity related to ELV as per the requirements of this standard and must take approval as per Form 5 from Government Certifying Agency for the same.

- 5.6.4 The procedure for processing of renewal application is similar to that of fresh application.
- 5.6.5 A new certificate of authorization is issued on renewal; however the Certificate number remains same.

5.7 Voluntary Withdrawal

5.7.1 The Authorized Collection and Dismantling center at any time during the validity of authorization may discontinue their authorization voluntarily by making a written request to Government Certifying Agency.

Before making such an application, he/she shall,

- (a) complete all the activities related to the ELV, he/she has received.
- (b) file annual returns as per 4.2.12 for the balance time period.
- (c) Must take approval as per Form 5 from Government Certifying Agency.

5.7.2 If the Collection and Dismantling center decides to regain the authorization status, after it has sought voluntary withdrawal, it will be treated as a fresh authorization, and has to pay all the fees for application and authorization and assessment expenses, as applicable at that time.

ANNEX-A
MINIMUM TECHNICAL REQUIREMENTS FOR
COLLECTION AND DISMANTLING CENTRE

A.1 Sites for storage (including temporary storage) of End-of-Life Vehicles prior to their dismantling

The Collection and Dismantling Centers shall have:

A.1.1 impermeable surfaces like concrete flooring, etc for appropriate areas (including areas where vehicles are stored prior to depollution as necessary) with the provision of spillage collection facilities, decanters and cleanser-degreasers.

A.2 Sites for dismantling

The Collection and Dismantling centers shall have:

A.2.1 impermeable surfaces like concrete, etc for appropriate areas with the provision of spillage collection facilities, decanters and cleanser-degreasers,

A.2.2 appropriate storage for dismantled spare parts, including impermeable storage for oil-contaminated spare parts,

A.2.3 appropriate containers for storage of batteries (with electrolyte neutralization on site or elsewhere), and filters/ PCB/PCT-containing condensers (if applicable),

A.2.4 appropriate storage tanks for the segregated storage of End-of-Life Vehicle fluids: fuel, motor oil, gearbox oil, transmission oil, hydraulic oil, cooling liquids, antifreeze, brake fluids, air-conditioning system fluids and any other fluid contained in the End-of-Life Vehicle,

A.2.5 appropriate storage for used tyres, including the prevention of fire hazards and excessive stockpiling.

A.3 Dismantling operations for depollution of End-of-Life Vehicles:

The Collection and Dismantling centers shall possess the equipments and facilities required for:

A.3.1 removal of batteries,

A.3.2 removal of liquefied gas tanks,

A.3.3 neutralization of potential explosive components, (e.g. air bags),

A.3.4 removal and separate collection and storage of fuel, motor oil, transmission oil, gearbox oil, hydraulic oil, cooling liquids, antifreeze, brake fluids, air-conditioning system fluids and any other fluid contained in the end-of-life vehicle, unless they are necessary for the re-use of the parts concerned,

A.3.5 removal, as far as feasible, of all components identified as containing heavy metals as identified in Annex A of AIS-129 : Part - 2 A.

A.4 Dismantling operations in order to promote recycling:

The Collection and Dismantling Centers shall possess the equipments and facilities required for:

A.4.1 removal of catalysts, to facilitate further extraction of noble metals by recyclers.

A.4.2 removal of metal components containing copper, aluminum and magnesium in such a way that they can be effectively recycled as materials, if the End-of-Life Vehicle is not going to be treated in a shredder.

A.4.3 removal of tyres and large plastic components (bumpers, dashboard, fluid containers, etc) in such a way that they can be effectively recycled as materials.

Note: removal of large plastic components is recommended only if they can be dismantled and recycled in an economical and profitable manner.

A.4.4 removal of glass in such a way that it can be effectively recycled as materials.

Note: removal of glass is recommended only if the glass can be dismantled and recycled in an economical and profitable manner.

A.5 Storage operations shall be carried out to avoid damage to components containing fluids or to recoverable components and reusable parts.

A.6 Recommended Tools & Equipment for Pre-treatments (Draining and Dismantling):

Shredder/ Bailing press for compacting / any suitable device

AC gas Recovery unit

Vehicle Lift

Auto Shear machine for cutting catalytic converter

Air Bag Deployment unit

Filter wrench/ Oil Filter Removal Tool

Wheel Popper

Piercing equipment for damper oil

Suction equipment for fluid

Bleeding system for brake fluid

Dedicated fluid collection container

Hydraulic tube cutter

Pneumatic saw

Portable power tool

Draining Tray

Pry bar/Spanner/Ratchet/ Mallet

Screw driver/Slot screwdriver/ Impact screwdriver

Cutter/cutting pliers/ Special Plier

Center Punch & bag (for glass breakage & collection)

Windshield removal tool

Pneumatic air gun

Water supply

ANNEX-B

FORM – 1

(See clause 5.1)

**APPLICATION FOR OBTAINING AUTHORIZATION FOR
COLLECTION AND DISMANTLING OF END-OF-LIFE VEHICLE**

From:

To

The Government Certifying Agency

.....

.....

Sir,

I/We hereby apply for authorization/renewal of authorization under CMVR, Rules 1989 for collection and dismantling of End-of-Life Vehicle.

To be filled in by Applicant

1. (a) Name and full address, telephone nos. e-mail and other contact details of the unit :

(b) In case of renewal of authorization previous authorization no. and date
2. (a) Total capital invested on the project :

(b) Year of commencement:

(c) Date of grant of the Consent to Establish:

(d) Date of grant of the Consent to Operate:

(e) Mode of storage within the plant:

(f) Method of dismantling and disposal:

(g) Installed capacity of the plant:

3. Detailed proposal of the facility (to be attached) to include:

- (i) Location of site (provide map)
- (ii) Details of processing technology
- (iii) Quantity of waste to be processed per day
- (iv) Site clearance (from local authority, if any)
- (v) Method of disposal of residues (details to be given)
- (vi) Quantity of ELV to be processed or disposed per day
- (vii) Methodology and operational details
- (viii) Measures to be taken for prevention and control of environmental pollution including dismantling of leachates.....
- (ix) Investment on Project and expected returns
- (x) Measures taken for safety of workers working in the plant.....

Place : _____ Signature _____

(Name _____)

Date : _____

Designation : _____

FORM 1(A)

(See clause 5.4.10)

**FORM FOR GRANTING AUTHORIZATION FOR
COLLECTION AND DISMANTLING OF END-OF-LIFE VEHICLE**

1. (a) Authorization No.....

(b) Date of issue

2.of.....is hereby granted an authorization for Collection and Dismantling of ELV and /or their components on the premises situated at.....

3. The Authorization shall be valid fromto

4. The Authorization is subject to the conditions stated below and the conditions as may be specified in the rules at the time of being in force under the CMVR, 1989

Signature-----

Designation ----- Date: -----

Terms and conditions of authorization

1. The authorized collection and dismantler shall comply with all the provisions laid down in this standard, even after grant of authorization.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorized by the Government Certifying Agency.
3. The authorized collection and dismantler shall not rent, lend, sell, or transfer the End-of-Life Vehicle to any person or any organization.
4. Any unauthorized change in personnel, equipment as working conditions as mentioned in the application by the Collection and Dismantling Centre shall constitute a breach of his authorization.
5. It shall be the duty of the Collection and Dismantling Centre to take prior permission of the Government Certifying Agency to close down the operations.

FORM-2

(See clause 4.2.11)

**FORM FOR FILING ANNUAL RETURNS OF
COLLECTION AND DISMANTLING OF END-OF-LIFE VEHICLE**

(To be submitted by Collection and Dismantling Centre before 31st March of every year for the preceding period April to March.)

1. Trade name & full address of the Collection and Dismantling Centre.....
2. Name of the authorized person and complete address with telephone and fax number and e-mail address.....
3. Total number of ELVs collected in the previous year.....
4. Total number of vehicles completed ELV activity in the previous year.....
5. Total number of De-registration applications made for the dismantled ELVs in the previous year.....
6. If there is difference between the S. No. 3 and 5, reason for the same to be specified.....

Place : _____ Signature _____

(Name _____)

Date : _____

Designation : _____

FORM 3

(See clause 4.1.4)

**FORM OF APPLICATION FOR SUBMITTING A VEHICLE
AS AN END OF LIFE VEHICLE AND REQUEST FOR
CERTIFICATE OF DESTRUCTION (CoD)**

To,
The Collection and Dismantling Centre,

I/We hereby submit my/our vehicle bearing following details as an “End-of-Life Vehicle”
to the Collection and Dismantling Centre for safe and environmental friendly disposal.
Requesting hereby for a Certificate of Destruction,

- 1. Full name
- Son /wife /daughter of
- 2. Age.
- 3. Permanent address.....
- 4. Temporary address
- 5. Body Style (Sedan/Estate/MUV/SUV).....
- 6. Chassis number (Affix pencil print/photograph)
- 7. Make and Model
- 8. Month and year of manufacture
- 9. Engine number
- 10. Vehicle Registration Number*

I/We, hereby declare
that all the particulars furnished by me / us in this form are true and correct; the subject
vehicle is not engaged in any kind of criminal activity and realize that a false declaration is
punishable.

Date:

Place:

.....

Signature or thumb impression of the last owner and/or holder.

Enclosures to be attached:

- 1) Original copy of Registration Certificate (*not applicable if the vehicle is not registered)
- 2) Address proof of the last owner and holder
- 3) Identity proof of the last owner and holder
- 4) Additional proof of ownership for unregistered vehicles by last owner and/or holder.

FORM 4
(See clause 4.2.3)
CERTIFICATE OF DESTRUCTION

Trade Name of the Collection and Dismantling Centre:

Authorization Number:

Validity of Authorization:

This is to certify that, ELV with the following details has been disposed of in an environmentally friendly manner as specified by ELV Regulation AIS-129.

1. Full name of last owner
- Son /wife /daughter of
2. Permanent / Temporary address of the last owner
3. Telephone number.....
4. Make and Model
5. Body Style (Sedan/Estate/MUV/SUV).....
6. Chassis number of the vehicle (Affix pencil print)
7. Month and year of manufacture
8. Engine number
9. Vehicle registration number

I/We..... hereby declare that all the particulars furnished by me in this form are true and correct; and realize that a false declaration is punishable.

Remarks (if any):

Place:

Date:

.....

Seal & Signature of the

Authorized Signatory of the Collection and Dismantling Centre

(Attach photographs of ELV. Front, side and rear view with bonnet, trunk and doors opened.)

FORM 5

(See clause 5.6 & 5.7)

**CERTIFICATE FOR COLLECTION AND DISMANTLING CENTRE IN
CASE VOLUNTARY WITHDRAWAL OR EXPIRY OF AUTHORISATION**

Trade Name of the Collection and Dismantling Centre:

Authorization Number:

Expiry / Voluntary withdrawal date of Authorization:

This is to certify that, Collection and Dismantling Centre has completed the ELV activity as specified in this standard and all the particulars furnished by Collection and Dismantling Centre has been verified and audited.

Place:

Date:

.....

Seal & Signature of the

Authorized Signatory of the Government Certifying Agency

End-of-Life Vehicles

PART-2 A

HEAVY METAL RESTRICTION, DISMANTLING INFORMATION

1.0 SCOPE

- 1.1 The requirements specified in this standard are applicable to vehicle categories of M1, L1 and L2, produced in India or imported to India for sale in India and type approved as per CMV Rule 126.
- 1.2 The requirements of this Part - 2A of the standard shall not apply to
- a) **‘Special Purpose Vehicles’** as defined in AIS-053, as amended from time to time.
 - b) **‘Small volume production models’** as defined in AIS-017, as amended from time to time.

2.0 DEFINITIONS

For the purpose of this standard definitions given in AIS-129: Part - 2 B shall be applicable to this Part - 2A of the standard also.

3.0 RESTRICTION OF HEAVY METALS

- 3.1 The vehicle manufacturers shall strive to ensure that the vehicles type approved after the mandated date shall not contain lead, mercury, cadmium or hexavalent chromium other than in cases listed in Annex A under the conditions specified therein.

The above requirements do not apply to the vehicles and their variants which are type approved before the above mentioned mandated date.

4.0 DISMANTLING INFORMATION TO BE SUPPLIED BY VEHICLE MANUFACTURERS

General specifications for Dismantling Information

- 4.1 The ‘Dismantling Information’ shall contain minimum details as specified in Annex B.
- 4.2 The vehicle manufacturer shall make available the “Dismantling Information” in the form of manuals or by means of electronic media (e.g. CD ROM, on-line services, etc.) to the authorised dismantling centres on request after six months from the launch of the model in India.

ANNEX-A

(See clause 3)

MATERIALS AND COMPONENTS EXEMPTED FROM CLAUSE 3

TABLE 1 – FOR M1 CATEGORY OF VEHICLES

Sr. No.	Materials and components exempted from clause 3.1	Scope and expiry date of exemption	To be remarked in the dismantling information
Lead as alloying element			
1	Steel for machining purposes and galvanized steel (lead \leq 0.35%)	-----	-----
2a	Aluminum (lead \leq 2%)	Vehicles type approved before dd.mm.yyyy (X + 3)	-----
2b	Aluminum (lead \leq 0.4%)	-----	-----
3	Copper alloy (lead \leq 4%)	-----	-----
4a	Bearing shells and bushes	Vehicles type approved before dd.mm.yyyy (X + 5)	-----
4b	Bearing shells and bushes in engines (motor) and transmission (gear box) and air conditioner compressors	-----	-----
Lead and lead compounds in components			
5	Batteries	-----	Yes
6	Vibration dampers	-----	Yes
7	Vulcanizing agents and stabilizers for elastomers/metal parts in braking hose, fuel hose, ventilation hose and chassis as well as for elastomers in engine suspension (lead \leq 0.5%)	Vehicles type approved before dd.mm.yyyy (X + 2)	-----
8	Adhesives for elastomers in powertrain (lead \leq 0.5%)	Vehicles type approved before dd.mm.yyyy (X + 3)	-----
9	Solder in electronic circuit boards and other electric components	-----	-----
10	Valve seats	Vehicles type approved before dd.mm.yyyy (X + 2)	-----
11	Electrical components which contain lead in a glass or ceramic matrix compound except glass in bulbs and glaze of spark plugs	-----	-----

Sr. No.	Materials and components exempted from clause 3.1	Scope and expiry date of exemption	To be remarked in the dismantling information
12	Pyrotechnic initiators	Vehicles type approved before dd.mm.yyyy (X + 3)	-----
13	Lead-plated steel sheet for vehicle fuel tanks	Vehicles type approved before dd.mm.yyyy (X +2)	-----
14	Wheel balance weights	Vehicles type approved before dd.mm.yyyy (X + 3)	Yes
15	Carbon brushes for electric motors	Vehicles type approved before dd.mm.yyyy (X + 3)	-----
16	Lead in Copper alloys in frictional materials of brake linings (lead \leq 0.5%)	-----	-----
17	Lead containing thermoelectric materials in automotive electrical applications to reduce CO2 emissions by recuperation of exhaust heat	-----	-----
Hexavalent chromium			
18	Corrosion preventive coatings	Vehicles type approved before dd.mm.yyyy (X + 3)	-----
19	Corrosion-proof plating layers of bolts, nuts and fasteners for chassis assembling	Vehicles type approved before dd.mm.yyyy (X + 3)	-----
20	As an anti-corrosion agent of the carbon steel cooling system in absorption refrigerators	-----	Yes
Mercury			
21	Discharge lamps in headlamps	-----	Yes
22	Fluorescent tubes for displays illumination	-----	Yes
Cadmium			
23	Batteries for electric and hybrid vehicles	Vehicles type approved before dd.mm.yyyy (X + 5)	Yes

Sr. No.	Materials and components exempted from clause 3.1	Scope and expiry date of exemption	To be remarked in the dismantling information
General Exemption			
24	A maximum concentration value up to 0.1% by weight and in homogeneous material, for lead, hexavalent chromium and mercury and up to 0.01% by weight in homogeneous material for cadmium shall be tolerated. An equipped electronic circuit board is considered as homogeneous material, if limits above are fulfilled.	-----	-----
<p>Note:</p> <ol style="list-style-type: none"> 1) Limit of concentration in brackets is expressed in mass fraction. 2) X = Date of implementation of the heavy metal restriction as mentioned in clause 3.1 			

TABLE 2
FOR L1 AND L2 CATEGORY OF VEHICLES

S. No.	Materials and components exempted from clause 3.1	To be remarked in the dismantling information
1	Lead as an alloying element	
1.1	Steel (including galvanised steel) containing up to 0.35 % lead by weight	-----
1.2	Aluminium containing up to 0.4 % lead by weight	-----
1.3	Aluminium (in wheel rims, engine parts) containing up to 4 % lead by weight	-----
1.4	Copper alloy containing up to 4 % lead by weight	-----
1.5	Bearing-shells and bushes	-----
2	Lead and lead compounds in components	
2.1	Batteries	Yes
2.2	Vibration dampers	Yes
2.3	Bonding agents for elastomers containing up to 0.5% lead by weight	-----
2.4	Stabilizer in protective paints	-----
2.5	Solder in electronic circuit boards and other applications	-----
2.6	Electrical components which contain lead in a glass or ceramic matrix compound except glass in bulbs and glaze of spark plugs	-----
2.7	Lead-plated steel sheet for vehicle fuel tanks	-----
2.8	Vulcanising agents and stabilizers for elastomers/metal parts in braking hose, fuel hose, ventilation hose and chassis as well as for elastomers in engine suspension (lead ≤ 0.5%)	-----
2.9	Wheel balance weights	Yes
2.10	Pyrotechnic initiators	-----
2.11	Valve seats	-----
2.12	Carbon brushes for electric motors	-----
2.13	lead containing thermoelectric materials in automotive electrical applications to reduce CO2 emissions by recuperation of exhaust heat	-----

2.14	Lead in copper alloy in frictional material of brake liners	-----
2.15	0.1 % by weight and per homogeneous material	-----
3	Hexavalent chromium	
3.1	Corrosion preventative coating	-----
3.2	Corrosion-proof plating layers of bolts, nuts and fasteners for chassis assembling	-----
3.3	0.1 % by weight and per homogeneous material	-----
4	Mercury	
4.1	Bulbs and instrument panel displays	Yes
4.2	Discharge lamps for headlight applications	Yes
4.3	Fluorescent tubes used in instrument panel displays	Yes
4.4	0.1 % by weight and per homogeneous material	-----
5	Cadmium	-----
5.1	0.01 % by weight and per homogeneous material	-----
5.2	Batteries for electric and hybrid vehicles	Yes

ANNEX-B

GUIDELINES FOR DISMANTLING INFORMATION

(See clause 4)

Section – 1, General Information:

- Vehicle Details (Variants, etc.)
- Specific Safety Precautions, if any
- Tools /Special tools details

Section – 2, Pre-treatment /Depollution:

- Batteries
- Pyrotechnic Components (Airbag, etc.)
- Fluid/ Draining (Fuel, oils, AC gas, etc.)
- Tyre
- Catalysts (Catalysts, DPF, etc.)
- Other controlled parts (e.g. Bulb containing Hg)

Section – 3, Dismantling:

Components, other than ferrous and non-ferrous metals (which can be easily removed from the vehicle prior to shredding like Plastic and Glass Components and if they can be dismantle and recycled in an economical profitable way).

Note: Component applicable to Section 2 and 3 should contain information as follows:

- Tool
- Removal Method
- Component Location

Section – 4, Other specific guidelines as applicable:

- Pyrotechnic Deployment Device and Method
- Hazardous component and handling
- LPG/CNG, components, sub-systems and systems removal and handling
- EV or HEV batteries removal and handling

Section – 5, only in case of L1 and L2 categories

- Components that can be reused and instruction thereof.

End-of-Life Vehicles

PART-2 B

TYPE APPROVAL OF VEHICLES WITH REGARD TO THEIR REUSABILITY, RECYCLABILITY AND RECOVERABILITY (RRR)

1.0 SCOPE

- 1.1 The requirements specified in this standard are applicable to vehicle categories of M1, L1 and L2, produced in India or imported to India for sale in India and type approved as per CMV Rule 126.
- 1.2 The requirements of this Part - 2B of the standard shall not apply to
- a) **‘Special Purpose Vehicles’** as defined in AIS-053, as amended from time to time.
 - b) **‘Small volume production models’** as defined in AIS-017, as amended from time to time.

2.0 REFERENCE

1. IS 9211 : 2003 : Terms and definitions of road vehicles
2. IS 2:1960 Rules for rounding off numerical values
3. IS 11422:2011 Terms and definitions of weights of 2 wheeled motor vehicles
4. ISO 1043 – 1: Symbols and abbreviated terms Part 1: Basic polymers and their special characteristics.
5. ISO 1043 – 2: Symbols and abbreviated terms Part 2: Fillers and reinforcing materials
6. ISO 11469: Generic identification and marking of plastic products.
7. ISO 22628: Road vehicles - Recyclability and Recoverability — Calculation method

3.0 DEFINITIONS

3.1 Competent Agency

The competent agency shall be either:

- a) Testing agencies (see 3.15) or
- b) Agency complying with standard EN 45012: 1989 or ISO/IEC Guide 62: 1996 on the general criteria for certification bodies operating quality system certification as regards the management systems implemented by the manufacturer.

- 3.2 **Component Part** means any part or any assembly of parts which is included in a vehicle at the time of its production.

- 3.3 **Disposal** means any operation which does not lead to recycling, recovery or reuse and includes physical-chemical or biological treatment, incineration and deposition in secured landfill.
- 3.4 **End-of-life Vehicle (ELV) means:** a vehicle which at the discretion of its last owner is ready to be scrapped.
- 3.5 **Energy recovery** means the use of combustible waste as a means to generate energy through direct incineration with or without other waste but with recovery of the heat.
- 3.6 **Recoverability** means the potential for recovery of component parts or materials diverted from an end-of-life vehicle.
- 3.7 **Recoverability rate of a vehicle (Rcov)** means the percentage by mass of a vehicle, potentially able to be reused and recovered
- 3.8 **Recovery** means, reprocessing of the waste materials in a production process, for the original purpose or for other purposes including processing as a means of generating energy.
- 3.9 **Recyclability** means the potential for recycling of component parts or materials diverted from an end-of-life vehicle.
- 3.10 **Recyclability rate of a vehicle (Rcyc)** means the percentage by mass of a new vehicle, potentially able to be reused and recycled
- 3.11 **Recycling** means reprocessing of the waste materials in a production process, for the original purpose or for other purposes, excluding processing as a means of generating energy.
- 3.12 **Reference vehicle** means the version within a type of vehicle/vehicle family, which is identified by the vehicle manufacturer and test agency in mutual agreement that represents the most unfavourable in terms of reusability, recyclability and recoverability as explained in clause 8.
- 3.13 **Reusability** means the potential for reuse of component parts diverted from an end-of-life vehicle.
- 3.14 **Reuse** means any operation by which components of end-of-life vehicles are used for the same purpose for which they were conceived.
- 3.15 **Testing Agency** means the agency notified under the rule 126 of central motor vehicle rules, 1989.
- 3.16 **Treatment** means any activity after the end-of-life vehicle has been handed over to authorised collection and dismantling centre. This may include activities such as depollution, dismantling, shearing, shredding, recovery or preparation for disposal of the shredder wastes, and any other operation carried out for the recovery and / or disposal of the End-of-Life Vehicle and its components.

- 3.17 **Vehicle mass** means the kerb mass of the vehicle as defined in IS 9211-2003 or IS 11422, as applicable.
- 3.18 **Vehicle** means a motor vehicle of categories mentioned in the scope of this standard (clause 1.1).
- 3.19 **Proven Technology** means technology which has been successfully tested on a laboratory scale.

4.0 REQUIREMENTS

4.1 Manufacturer's Arrangements

- 4.1.1 The Competent Agency shall assess the manufacturer's arrangement as per Annex G.
- 4.1.2 After satisfactory completion of the assessment the Competent Agency shall issue a certificate of compliance as per Annex H.

4.2 Vehicle Requirements

- 4.2.1 Vehicles shall be so constructed as to be:
- 4.2.1.1 reusable and / or recyclable to a minimum of **80 %** by mass, and
- 4.2.1.2 reusable and / or recoverable to a minimum of **85 %** by mass
- 4.2.2 Vehicle manufacturer shall submit requisite calculations for the reference vehicle demonstrating compliance to clause 4.2.1.1 and clause 4.2.1.2 in Annex C for M1 category and in Annex K for L1 and L2 category.

The guidelines for preparing calculations are prescribed in Annex B for M1 category and in Annex J for L1 and L2 category.

5.0 APPLICATION FOR TYPE APPROVAL

- 5.1 The application for type approval of a vehicle type with regard to its reusability, recyclability and recoverability shall be submitted by the vehicle manufacturer or by his authorised representative to the testing agency.
- 5.2 Following shall be submitted to approving test agency for approval:
- 5.2.1 Necessary information as per Annex A and C for M1 category and as per Annex A and K for L1 and L2 category reference vehicle as detailed out in clause 8.0 below.
- 5.2.2 List of the dismantled component parts declared by the manufacturer with respect to the dismantling stage, and the process recommended for their treatment as per clause A.7.3 of Annex A for M1 category vehicles.
- 5.2.3 In case where such information is covered by intellectual property rights or constitute specific know-how of the manufacturer or his suppliers, the manufacturer or his supplier shall supply sufficient information to enable those calculations to be made properly.

6.0 TYPE APPROVAL

- 6.1 Based on the Assessment certificate (see 4.1.2) and demonstration of calculations for the reference vehicle as per Annex C for M1 category and as per Annex K for L1 and L2 category vehicles for compliance to clause 4.2, testing agency shall issue the type approval certificate.
- 6.2 The RRR calculations demonstrated on such a reference vehicle shall be deemed valid for all the vehicles amongst the family of vehicles to which the reference vehicle represents.
- 6.3 In the case vehicle models complying with corresponding EEC/ECE regulation, such models are deemed to comply with the requirements of this standard. Based on the EEC/ECE type approval certificate, the test agency shall issue type approval certificate for compliance to this standard.

7.0 CHANGES IN THE TECHNICAL SPECIFICATION OF ALREADY TYPE APPROVED VEHICLE

- 7.1 Every modification pertaining to the information declared in accordance with Annex A shall be intimated by the manufacturer to the testing agency.
- 7.2 If a type approved reference vehicle has RR rate of 85% or more and RRR rate of 90% or more then all its variants/ versions, and change in technical specifications are deemed to meet required standard without any further verification.
- 7.3 If the changes are in parameters not related to the provisions, no further action needs to be taken. If the changes are in parameters related to the provisions, the testing agency shall then consider, whether based on criteria for extension of approval as specified in Annex E, the model with the changed specifications still complies with provisions; or any RRR calculations need to be re-approved.

8.0 SELECTION OF REFERENCE VEHICLE FOR DEMONSTRATING RRR CALCULATIONS

- 8.1 M1 category vehicle possessing the following specification amongst the group of vehicles shall be considered to be the reference vehicle. The reference vehicle generally may not be available for sale, but it has to be buildable/ producible.
- i) lightest engine
 - ii) lightest manual gearbox
 - iii) smallest tires, no spare wheel
 - iv) no trailer coupling
 - v) standard drive (no all-wheel drive)
 - vi) shortest version of body work amongst hatchback, saloon and station wagon etc.
 - vii) leather trim

Reference vehicle for demonstration of RRR calculation may also be selected based on the parameters given in Annex E.

- 8.2 In the case of L1 and L2 categories of vehicles, the Reference vehicle for demonstration of RRR calculation shall be selected based on the parameters given in Annex E. The reference vehicle generally may not be available for sale, but it has to be buildable/ producible.

9.0 MATERIAL IDENTIFICATION MARKING ON PLASTIC COMPONENTS

- 9.1 Vehicle manufacturers shall use component and material coding standards referred below to facilitate the identification of those plastic components having weight more than 100 gms as per the following standards which are suitable for reuse and recovery.

1. ISO 1043 – 1: Symbols and abbreviated terms Part 1: Basic polymers and their special characteristics.
2. ISO 1043 – 2: Symbols and abbreviated terms Part 2: Fillers and reinforcing materials
3. ISO 11469: Generic identification and marking of plastic products.

ANNEX- A

(See clause 5 and 7)

**TECHNICAL SPECIFICATIONS FOR TYPE APPROVAL OF VEHICLE
WITH REGARDS TO THEIR REUSABILITY, RECYCLABILITY AND
RECOVERABILITY**

A.1 The following information, if applicable, shall be submitted including a list of contents.

Photographs, if any, shall show sufficient detail.

A.2 GENERAL**A.2.1 Make (trade name of manufacturer)**

A.2.1.1 Type

A.2.1.2 Chassis

A.2.1.3 Commercial name (s) (if available)

A.2.1.4 Means of identification of type, if marked on the vehicle

A.2.1.5 Location of that marking

A.2.1.6 Category of vehicle

A.2.1.7 Name of manufacturer

A.2.1.8 Address(es) of manufacturer

A.2.2 General Construction Characteristics of the Vehicle

A.2.2.1 Photographs and / or drawings of a representative vehicle

A.2.2.2 Dimensional drawing of the whole vehicle

A.2.2.3 Number of axles and wheels

A.2.2.4 Number and position of axles with double wheels

A.2.2.5 Powered axles (number, position, interconnection)

A.2.2.6 Driving cab (Forward control or bonneted)

A.3 POWER PLANT

A.3.1 Manufacturer

A.3.2 Internal combustion engine

A.3.2.1 Specific Engine information

A.3.2.1.1 Working principle: positive ignition / compression ignition, four stroke / two stroke

A.3.2.1.2 Number and arrangement of cylinders

A.3.2.1.3 Engine capacity cm³

A.3.2.1.4 Weight (kg)

A.3.2.2 Fuel : Diesel / Petrol /LPG /NG / Ethanol

A.4 TRANSMISSION

A.4.1 Type (mechanical, hydraulic, electric etc)

A.4.2 Gearbox Type (Manual/Automatic/CVT)

A.4.3 Weight (kg)

A.4.4 Differential lock: yes / no/ optional

A.5 BODYWORK

A.5.1 Type of Body work

A.5.2 Door configuration and number of doors

A.6 SEATS

A.6.1 Number

A.7 REUSABILITY, RECYCLABILITY AND RECOVERABILITY

A.7.1 Version to which the reference vehicle belongs

A.7.2 Mass of the reference vehicle with bodywork or mass of the chassis with cab, without bodywork and / or coupling device if the manufacturer does not fit the bodywork and / or coupling devices (including liquids, tools, spare wheel if fitted) without driver.

A.7.3 Mass of materials of the reference vehicle

A.7.3.1 Mass of material taken into account at the pre-treatment step

A.7.3.2 Mass of material taken into account at the dismantling step

A.7.3.3 Mass of material taken into account at the non-metallic residue treatment step, considered as recyclable

A.7.3.4 Mass of material taken into account at the non-metallic residue treatment step, considered as energy recoverable

A.7.3.5 Materials breakdown

A.7.3.6 Total mass of materials, which are reusable and /or recyclable

A.7.3.7 Total mass of materials, which are reusable and / or recoverable

A.7.4 Rates

A.7.4.1 Recyclability rate R_{cyc} (%)

A.7.4.2 Recoverability rate R_{cov} (%)

A.8 INFORMATION REQUIRED FOR CRITERIA FOR EXTENSION OF APPROVAL

- A.8.1 Engine weight decrease
- A.8.2 Gearbox weight decrease
- A.8.3 Decrease in tyre weight
- A.8.4 Spare wheel fitted or not
- A.8.5 Vehicle Type Sedan/ Station Wagon/ Hatchback
- A.8.6 Trailer coupling fitted or not
- A.8.7 With all-wheel drive (Permanent / Selectable)/ without all-wheel drive

ANNEX- B

(See clause 4.2.2)

RRR CALCULATION METHOD FOR M1 CATEGORY

B.1 This Annex specifies the method for calculating recyclability rate and the recoverability rate of a new vehicle, each expressed as percentage by mass (mass fraction in percent) of the vehicle, which can potentially be

- a) Recycled, reused or both (recyclability rate)
- b) Recovered, reused or both (recoverability rate)

B.2 CALCULATION METHOD

The calculation of the recyclability and recoverability rates is carried out through the following four steps on a new vehicle, for which component parts, materials or both can be taken into account at each step:

- a) Pre-treatment
- b) Dismantling
- c) Metal separation
- d) Non-metallic residue treatment

A partial mass, m_P , m_D or m_M is determined respectively at each of the first three steps, while the partial masses m_{Tr} and m_{Te} are determined at the final step. Annex C, D give data presentation and a schematic representation of the method.

B.3 MATERIAL BREAKDOWN

The materials breakdown of the vehicle is established by classifying all the materials composing the vehicle into the following seven categories:

- a) Metals;
- b) Polymers, excluding elastomers;
- c) Elastomers;
- d) Glass;
- e) Fluids;
- f) Modified Organic Natural Materials (MONM), such as leather, wood, cardboard and cotton fleece;
- g) Others (components, materials or both, for which a detailed material breakdown cannot be established such as compounds, electronics, electrical).

The total mass of each category can then be determined (see Annex C). This breakdown may be done at each step of the calculation for each partial mass mentioned in B.2 above.

B.4 DETERMINATION OF PARTIAL MASSES m_p , m_D , m_M , m_{Tr} and m_{Te} .

B.4.1 Pre-treatment – Determination of m_p

At this step, the following vehicle component parts, material or both shall be taken into account:

- All fluids;
- Batteries
- Oil filters
- Liquefied petroleum gas (LPG) tanks
- Compressed natural gas (CNG) tanks
- Tyres;
- Catalytic converters

Note: Fluids include fuel, engine oil, transmission / gearbox oil (including rear differential or transfer box or both), power steering oil, coolant, brake fluid, shock absorber fluid, air conditioning refrigerant, windscreen washer fluid, engine mounting oil and hydraulic suspension fluid.

For the purpose of the calculation, these component parts and materials are considered reusable or recyclable.

Determine the mass m_p , as the sum of the masses of these component parts and materials.

B.4.2 Dismantling – Determination of m_D

At this step, certain other of the vehicle's reusable or recyclable component parts may be taken into account by the manufacturer, based on the following.

- a) As a general requirement, a component part shall be considered as reusable, recyclable or both, based on its dismantability, assessed by:
 - Accessibility
 - Fastening technology and
 - Corresponding proven technologies for dismantling.
- b) As a specific requirement, a component part shall be considered as recyclable, based on :
 - Its material composition and
 - corresponding proven technologies for recycling

In order to be recyclable, a component part or material shall be linked to a corresponding proven technology for recycling. An additional requirement is that the reusability of a component part shall be subject to consideration of safety and environmental hazards.

Determine the mass m_D as the sum of the masses of all parts considered accordingly as reusable or recyclable.

B.4.3 Metals separation – Determination of m_M

At this step, all metals ferrous and non ferrous which have not already been accounted for in the previous steps shall be taken into account. Both ferrous and non-ferrous metals are considered as recyclable.

- Determine the mass m_M as the mass of the metal remaining in the vehicle after the previous steps.

B.4.4 Non-metallic residue treatment – Determination of m_{Tr} and m_{Te} .

The remaining other materials (i.e. materials not taken into account at the pre-treatment, dismantling and metals separation steps) constitute the non-metallic residue. At this step, the residual non-metallic recyclable materials or both these materials and the residual non-metallic recoverable materials may be taken into account.

- Determine m_{Tr} as the sum of masses of non-metallic residue considered as recyclable on the basis of proven recycling technologies (see Annex C Table C.1).
- Determine m_{Te} as the sum of the remaining masses that can be potentially be used for energy recovery after determination of m_p , m_D , m_M and m_{Tr} .

Note: Technologies for energy recovery of polymers and elastomers are industrialized on a large scale world-wide. Therefore polymers, elastomers and other modified organic natural materials can potentially be recovered through those technologies.

B.5 CALCULATION FOR RECYCLABILITY / RECOVERABILITY RATE

B.5.1 Recyclability rate

Calculate the recyclability rate R_{cyc} of the vehicle as a percentage by mass (mass fraction in percent) using the formula,

$$R_{cyc} = (m_p + m_D + m_M + m_{Tr}) \times 100 / m_V$$

B.5.2 Recoverability rate

Calculate the recoverability rate, R_{cov} , of the vehicle as a percentage by mass (mass fraction in percent), using the formula:

$$R_{cov} = (m_p + m_D + m_M + m_{Tr} + m_{Te}) \times 100 / m_V$$

ANNEX-C
DATA PRESENTATION

The data for the calculation shall be reported using the following table, either on paper or in electronic form (the materials breakdown section is optional)

Table C.1- Presentation of Data for M1 category vehicles

Brand Name					Vehicle Mass (kg), m_v				
Model (type /variant)									
Material Breakdown (mass in kg)	Metals	Polymers (excluding elastomers)	Elastomers	Glass	Fluids	M.O.N.M	Others		
	Mass (kg)								
Pretreatment (m_p)	Fluids			m_{p1}					
	Battery			m_{p2}					
	Oil filters			m_{p3}					
	L.P.G. Tanks			m_{p4}					
	C.N.G. Tanks			m_{p5}					
	Tyres			m_{p6}					
	Catalytic converters			m_{p7}					
				m_p total (sum m_{p1} to m_{p7})					
Dismantling (m_D)									
Sr. no.	Part name	Mass (kg)	Sr. no.	Part name	Mass (kg)	Mass (sr no. 11 to x) (kg)			
1			6			m_{px} total (sum 11 to x)			
2			7			Please add separate list for sr. no. 11 to x			
3			8						
4			9						
5			10						
m_{D1} total (sum 1 to 5)					m_{D2} total (sum 6 to 10)		m_D total (m_{D1} total + m_{D2} total + m_{Dx} total)		
Metal Separation (m_M)									
Remaining metal content of the vehicle						Mass (kg)			
						m_M total			
Non-metallic residue treatment (m_{Tr} and m_{Te})									
m_{Tr} = recyclable material						Mass (kg)			
Technology no.		Name							
1				m_{Tr1}					
2				m_{Tr2}					
3				m_{Tr3}					
4 to x				m_{Tr4-x}					
Please add separate list for technologies 4 to x						m_{Tr} total (sum m_{Tr} to m_{Trx})			
m_{Te} = energy recoverable materials						Mass (kg)			
Remaining quantity of organic materials (polymers, elastomers, MONM etc)						m_{Te}			
Recyclability rate		$R_{cyc} (\%) = ((m_p + m_D + m_M + m_{Tr}) / m_v) * 100$							
Recoverability rate		$R_{cov} (\%) = ((m_p + m_D + m_M + m_{Tr} + m_{Te}) / m_v) * 100$							

NOTE:

Final results, in percentage shall be an integer (whole number). For the purpose of rounding off IS 2:1960 'Rules for rounding off numerical values' as amended from time to time, shall be used.

ANNEX-D
(For reference)
CALCULATION METHOD

Below table shows the schematic representation of calculation for M1 category vehicles

Calculation steps (sub clause)	Vehicle elements		Assumptions	Mass of vehicle elements ^a kg		
	General character	List		Reusable or Recyclable	Energy recoverable	Undefined residue
1 Pre-treatment (5.3.1)	Component parts and fluids	All fluids Batteries Oil filters LPG tanks CNG tanks Tyres Catalytic converters	Reusable recyclable or both	m_P		
2 Dismantling (5.3.2)	Component parts	As declared by vehicle manufacture	Reusable recyclable or both	m_D		
3 Metal separation (5.3.3)	Materials	Metals (ferrous and non-ferrous)	Recyclable	m_M		
4 Non-metallic residue treatment (5.3.4)	Materials	Glass	Recyclable	m_{Tr}	m_{Te}	
		Polymers (excluding elastomers)	Recyclable, recoverable or both ^a			
		Elastomers	Recyclable, recoverable or both ^a			
		MONM	Recyclable, recoverable or both ^a			
		Others	^a			
				Vehicle mass, m_V		
		Recyclability rate, R_{cyc} (%) =		$\frac{m_{P+} + m_{D+} + m_{M+} + m_{Tr}}{m_V} \times 100$		
		Recyclability rate, R_{cov} (%) =		$\frac{m_{P+} + m_{D+} + m_{M+} + m_{Tr}}{m_V} \times 100$		

^a In step 4, the apportionment among the three treatment possibilities is as declared by the vehicle manufacturer.

ANNEX-E
CRITERIA FOR EXTENSION OF APPROVAL

(See Clause 7)

- E.1** Tables E1 and E2 list respectively for M1 category and L1, L2 category vehicles the verifications to be carried out in case of changes in the parameters declared at the time of submitting for the earlier type approval.
- E.2** Changes other than those listed in the table are considered to have no adverse effect on the Recyclability, Reusability and Recoverability rates of the vehicle

Table E-1 Verifications may be carried out in case of changes in the parameters for M1 category vehicles		
	Change in Parameter	Verification to be done
1.	Engine weight decrease by more than 10%	RRR calculation
2.	Gearbox weight decrease by more than 10%	RRR calculation
3.	Decrease in tyre weight by more than 10%	RRR calculation
4.	Deletion of spare wheel	RRR calculation
5.	Reserved	-
6.	Deletion of trailer coupling	RRR calculation
7.	Drive change from all wheel drive (Permanent / Selectable) to two wheel drive	RRR calculation
8	Additional fitment of component with non recyclable/ non re-usable/ non-recoverable component having weight more than 1% of vehicle unladen weight.	RRR calculation
9.	Addition of model/ variant	RRR calculation if affected by parameters 1 to 7 above.
10.	Change in existing arrangements (clause 4.1)	Manufacturer assessment as per clause 4.1.
11.	Addition of new plants	Manufacturer assessment as per clause 4.1, if the arrangements are different.

Table E-2		
Verifications to be carried out in case of changes in the parameters for L1 and L2 category vehicles		
	Change in Parameter	Verification to be done
1.	Engine and gearbox weight decrease by more than 10%	RRR calculation
2.	Decrease in tyre weight by more than 10%	RRR calculation
3.	Deletion of spare wheel	RRR calculation
4	Additional fitment of component with non recyclable/ non re-usable/ non-recoverable component having weight more than 1% of vehicle unladen weight.	RRR calculation
5.	Addition of model/ variant	RRR calculation if affected by parameters 1 to 3 above.
6.	Change in existing arrangements (4.1)	Manufacturer's assessment as per clause 4.1.
7.	Addition of new plants	Manufacturer's assessment as per clause 4.1, if the arrangements are different.

ANNEX-F

COMPONENT PARTS DEEMED TO BE NON-REUSABLE

F.1 Introduction

This Annex addresses the component parts of vehicles belonging to category M1 which must not be reused in the construction of new vehicles.

F.2 List of component parts:

- All airbags⁽¹⁾ including cushions, pyrotechnic actuators, electronic control units and sensors
- Automatic or non-automatic seat belt assemblies, including webbings, buckles, retractors, pyrotechnic actuators
- Seats (only in case where safety belt anchorage and / or airbags are incorporated in the seat)
- Steering lock assemblies acting on the steering column
- Immobilisers, including transponders and electronic control units
- Emission after-treatment systems (e.g. catalytic converters, particulate filters)
- Exhaust silencers

(1) When the airbag is inserted inside the steering wheel, the steering wheel itself.

ANNEX-G
ASSESSMENT OF THE MANUFACTURER

(See clause 4.1)

Assessment requirements

G.1.1 The manufacturer shall have arrangements and procedures (QMS) for the following:

- (a) collect appropriate data through the full chain of supply, in particular the nature and the mass of all materials used in the construction of the vehicles, in order to perform the calculations required under this standard;
- (b) keep at his disposal all the other appropriate vehicle data required by the calculation process such as the volume of the fluids, etc.;
- (c) check adequately the information received from suppliers;
- (d) manage the breakdown of the materials;
- (e) be able to perform the calculation of the recyclability and recoverability rates in accordance with AIS-129 Part - 2 B.
- (f) mark the component parts made of plastic in accordance clause 9 of AIS-129 Part - 2 B.
- (g) verify that no component part listed in Annex F of this standard is reused in the construction of new vehicles.
- (h) demonstrate through arrangements with his suppliers, compliance with clause 3 of AIS-129 Part - 2 A.
- (j) shall establish procedures for the following:
 - (i) to communicate the applicable requirements to his relevant suppliers;
 - (ii) to monitor and ensure that suppliers act in accordance with those requirements;
 - (iii) to collect the relevant data through the full supply chain;
 - (iv) to check and verify the information received from suppliers;
 - (v) to react adequately where the data received from the suppliers indicate noncompliance with the requirements of clause 3 of AIS-129 Part - 2 A.

G.1.2 For the purposes of paragraph G.1.1 above the vehicle manufacturer may use, ISO 9000/TS16949/ ISO14000 or other standardized quality assurance programme.

- G.1.3** The competent body shall verify adequacy of the quality management system and the steps taken in implementation.
- G.1.4** The manufacturer shall provide the competent body with all relevant information, in documentary form. In particular, recycling and recovery of materials shall be properly documented.
- G.2.0** The assessment carried out in one plant shall to be applicable to all the plants of the manufacturers if the arrangements and procedures (QMS) are same.

ANNEX-H
CERTIFICATE OF COMPLIANCE
(See clause 4)

No [..... Reference number]

[..... the competent body]

Certifies that

(Manufacturer):

.....

(Address of the manufacturer):

.....

.....

.....

complies with the requirements of AIS-129 :Part -2 B.

Checks have been performed on:

by (name and address of the competent body):

Number of report:

Done at [.....Place]

On [.....Date]

[.....Signature]

Attachments: Description of the strategy recommended by the manufacturer in the area of reuse, recycling and recovery.

ANNEX – J

RRR CALCULATION METHOD FOR L1 and L2 CATEGORY

(See clause 4.2)

J.1 This Annex specifies the method for calculating recyclability rate and the recoverability rate of a new vehicle, each expressed as percentage by mass (mass fraction in percent) of the vehicle, which can potentially be

- a) Recycled, reused or both (recyclability rate)
- b) Recovered, reused or both (recoverability rate)

J.2 CALCULATION METHOD

The calculation of the recyclability and recoverability rates is carried out using the weight of the following constituents of the vehicle

J.2.1 All fluids;

Note: Fluids include fuel, engine oil, transmission / gearbox oil (including rear differential or transfer box or both), power steering oil, coolant, brake fluid, shock absorber fluid, air conditioning refrigerant, windscreen washer fluid, engine mounting oil and hydraulic suspension fluid.

For the purpose of the calculation, these component parts and materials are considered reusable or recyclable.

J.2.2 Batteries

J.2.3 Oil filters

J.2.4 Liquefied petroleum gas (LPG) tanks

J.2.5 Compressed natural gas (CNG) tanks

J.2.6 Tyres and tubes

J.2.7 Catalytic converters

J.2.8 ferrous metals

J.2.9 non-ferrous metals

Note: Both ferrous and non-ferrous metals are considered as recyclable.

J.2.10 non-metallic recyclable materials

J.2.11 Reusable parts

J.2.12 non-metallic recoverable

Note: Technologies for energy recovery of polymers and elastomers are industrialized on a large scale world-wide. Therefore polymers, elastomers and other modified organic natural materials can potentially be recovered through those technologies.

J.3 MATERIAL BREAKDOWN

Details as per B-3 of Annex B.

Method of Determination of masses are detailed in Table K-1.

J.4 CALCULATION FOR RECYCLABILITY / RECOVERABILITY RATE**J.4.1** Recyclability rate

Calculate the recyclability rate R_{cyc} of the vehicle as a percentage by mass (mass fraction in percent) using the formula,

$$R_{cyc} = (\text{Total mass of items listed in J-2.1 to J-2.11}) \times 100 / m_v$$

J.4.2 Recoverability rate

Calculate the recoverability rate, R_{cov} , of the vehicle as a percentage by mass (mass fraction in percent), using the formula:

$$R_{cov} = (\text{J-2.1 to J-2.12}) \times 100 / m_v$$

ANNEX-K

The data for the calculation shall be reported using the following table, either on paper or in electronic form (the materials breakdown section is optional)

Table K.1- Presentation of Data for L1 and L2 category vehicles

Brand Name				Vehicle Mass (kg), m_v			
Model (type /variant)							
Material Breakdown (mass in kg)	Metals	Polymers (excluding elastomers)	Elastomers	Glass	Fluids	M.O.N.M	Others
Sr. No	Item					Mass (kg)	
1	Fluids			M_{x1}			
2	Battery			M_{x2}			
3	Oil filters			M_{x3}			
4	Tyres			M_{x4}			
5	Catalytic Converters			M_{x5}			
				Total mass (m_x)			
Metallic parts							
Sr. no.	Part name	Mass (kg)	Sr. no.	Part name	Mass (kg)	Mass (sr no. 17 to x) (kg)	
1			9			M_{yx} total (sum 11 to x)	
2			10			Please add separate list for sr. no. 17 to x	
3			11				
4			12				
5			13				
6			14				
7			15				
8			16				
				m_{yx} total (sum 1 to 16)			
Residue							
		M_{Tr} = recyclable material				Mass (kg)	
		Technology no.	Name				
		1			m_{Tr1}		
		2			m_{Tr2}		
		3			m_{Tr3}		
		4 to x			m_{Tr4-x}		
		Please add separate list for technologies 4 to x				m_{Tr} total (sum m_{Tr} to m_{Trx})	
		m_{Te} = energy recoverable materials				Mass (kg)	
		Remaining quantity of organic materials (polymers, elastomers, MONM etc)				m_{Te}	
		Recyclability rate	$R_{cyc} (\%) = ((m_x + m_{yx} + m_{Tr}) / m_v) * 100$				
		Recoverability rate	$R_{cov} (\%) = ((m_x + m_{yx} + m_{Tr} + m_{Te}) / m_v) * 100$				

Note: Final results, in percentage shall be an integer (whole number). For the purpose of rounding off IS 2:1960 'Rules for rounding off numerical values' as amended from time to time, shall be used.

ANNEX-L

(See Introduction)

COMMITTEE COMPOSITION *
Automotive Industry Standards Committee

Chairperson	
Mrs. Rashmi Urdhwareshe	Director The Automotive Research Association of India, Pune
Members	Representing
Representative from	Ministry of Road Transport and Highways (Dept. of Road Transport and Highways), New Delhi
Representative from	Ministry of Heavy Industries and Public Enterprises (Department of Heavy Industry), New Delhi
Shri S. M. Ahuja	Office of the Development Commissioner, MSME, Ministry of Micro, Small and Medium Enterprises, New Delhi
Shri Shrikant R. Marathe	Former Chairman, AISC
Shri N. K. Sharma	Bureau of Indian Standards, New Delhi
Director/ Shri D. P. Saste (Alternate)	Central Institute of Road Transport, Pune
Director	Indian Institute of Petroleum, Dehra Dun
Director	Vehicles Research and Development Establishment, Ahmednagar
Representatives from	Society of Indian Automobile Manufacturers
Shri T. C. Gopalan	Tractor Manufacturers Association, New Delhi
Shri Uday Harite	Automotive Components Manufacturers Association of India, New Delhi

Member Secretary

Mr. A. S. Bhale

General Manager

The Automotive Research Association of India, Pune

* At the time of approval of this Automotive Industry Standard (AIS)