The Engineering Resource For Advancing Mobility®

A Product of the
Cooperative Engineering Program

SAE J1159 JUN86

Preparation of SAE Technical Reports — Surface Vehicles and Machines: Standards, Recommended Practices, Information Reports

SAE Recommended Practice
Revised June 1986

SAE GLOBAL MOBILITY DATABASE

This standard is indexed in the Standards Search Database

RATIONALE:

Not applicable.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

SAE J287, Driver Hand Control Reach

SAE J413, Mechanical Properties of Heat Treated Wrought Steels

SAE J780, Engine Coolant Pump Seals

SAE J848, Fifth Wheel Kingpin, Heavy Duty-Commercial Trailers and Semitrailers

SAE J916, Rules for SAE Use of SI (Metric) Units

SAE J1115, Guidelines for Developing and Revising SAE Nomenclature and Definitions

SAE J1271, Technical Committee Guideposts

HS 215, Motor Vehicle, Safety and Environmental Terminology

ASTM D2649-83, Corrosion Characteristics of Solid Film Lubricants

COMMITTEE COMPOSITION:

DEVELOPED BY THE PUBLICATIONS ADVISORY COMMITTEE:

G. J. Gaudaen, Association Professional Services, Graniteville, SC - Chairman
L. E. Barbrow, Department of Commerce, Washington, DC
J. B. Codlin, Estero, FL
G. M. Garcina, Indianapolis, IN
S. R. Jakub, S.R. Jakub Associates, West Hartford, CT
J. Long, TACOM, DRSTA - TSD, Warren, MI
G. B. Pilkington, Department of Transportation, McLean, VA

SAE The Engineering Resource For Advancing Mobility®

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

SAE J1159

Issued July, 1976
Revised June, 1986
Supersedes J1159 AUG79

Ø PREPARATION OF SAE TECHNICAL REPORTS-- SURFACE VEHICLES AND MACHINES: STANDARDS, RECOMMENDED PRACTICES, INFORMATION REPORTS

1. FOREWORD: This SAE Recommended Practice has been developed by the Publications Advisory Committee of the SAE Technical Board. The Publications Advisory Committee was formed as the Publications Policy Committee of the Technical Board in 1956. The objectives of the committee are (1) to guide and promote efficient dissemination of material produced under the Technical Board and (2) to recommend immediate and long-range policies to the Technical Board to assure that Technical Board information will be available to those who need it in a form suitable for their work.

2. PURPOSE: The purpose of this recommended practice is to establish a uniform practice for technical committees for the preparation of technical reports.

3. SCOPE: It applies to reports of Surface Vehicles and Machinery Technical Committees only. Aerospace technical reports are covered by editorial practices of the Aerospace Council. Close adherence to this recommended practice by technical committees of SAE will help to assure uniform technical reports. Should questions on format, style, or other matters pertaining to the organization and editorial practices of technical reports be raised within technical committees of the Technical Board, they should be referred to the Chairman of the Publications Advisory Committee for interpretation or for discussion by the full Publications Advisory Committee.

4. TECHNICAL COMMITTEE CHAIRMAN RESPONSIBILITIES:

4.1 A technical committee chairman is responsible for seeing that his committee and all subcommittees or working group members understand their responsibilities relative to publications, particularly:

(a) Accuracy of technical content and references,
(b) Conformance to policies and guidelines outlined in this report, and

(c) Clearance through technical committee chairman of all subcommittee or committee work, whether major or minor (including editorial changes and corrections). It is the chairman's responsibility to see that the following actions are taken relative to technical reports.

4.1.1 Classification: This shall be recommended by the time technical agreement has been reached on the content of the report. See Section 5 of this report.

4.1.2 Legal Aspects: The report shall be checked against rules prepared by the Society's legal counsel. See Technical Committee Guideposts, SAE J1271, Section 7.

4.1.3 Publication Method: This shall be recommended based on the following methods.

4.1.3.1 SAE Handbook: The Handbook is used for technical reports (Standards, Recommended Practices, and Information Reports) of value to a substantial number of SAE members.

4.1.3.2 Handbook Supplements: Supplements are used for descriptive or educational material of broad interest to SAE members and other engineers in the automotive and allied industries. They are also used to provide groups of related technical reports from the SAE Handbook.

4.1.3.3 Separate Reports: A properly approved technical report may be issued separately in addition to publishing in the Handbook, either because the subject is timely and must not wait for the next Handbook issue, or because of major interest.

4.1.4 Organization and Format: The draft of the report shall be prepared using details given in Section 6 of this report.

4.1.5 Metrication: The report shall be checked to make sure that metric units have been included or used as the basis for the report. Details of use shall be checked for conformance with Rules for SAE Use of SI (Metric) Units, SAE J916. See also Appendix A for SAE's Metric Policy.

4.1.6 Key Index Words: Along with the report, the committee shall submit a list of key words to provide a basis for index preparation by staff. A list of 3-10 words is suggested, depending on the nature of the report. Instructions are given in Section 7 of this report.

4.1.7 Explanation of Proposed Report: When the report is submitted to a council of the Technical Board, a statement shall be included outlining:

(a) Significance of report
(b) Background information (rationale),
(c) Reason for choice of classification, and
(d) Recommendation for method of distribution.

The statement will be retained in the committee file by the SAE Technical Division.

4.1.8 Cut-Off Date: When beginning the final approval process, the approved committee draft report should be submitted to SAE staff in time to meet the deadline for publication of the Handbook. Time must be allowed for approval by a cognizant council of the Technical Board and submittal of final report draft and transmittal to the Publications Division by June 30 of each year. Staff should be consulted on adequate lead time.

5. CLASSIFICATION AND NUMBERING OF TECHNICAL REPORTS[1]:

5.1 Classification: Technical reports are approved for publication by the Technical Board, and must be based on sound technology and cooperative engineering work. Before publication, a report must be classified into one of the following three classifications: (See paragraph 4.1.1 of this report.)

5.1.1 SAE Standards: These reports are a documentation of broadly accepted engineering practices or specifications for a material, product, process, procedure, or test method.

5.1.1.1 A product standard may be primarily a descriptive standard covering dimensions, composition, and other details or it may be a functional or performance standard, or both.

5.1.1.2 Performance standards involve requirements or levels against which the functions can be evaluated. This frequently involves the need to define test methods by which these requirements are measured. Preferably, performance standards and test procedure standards should be in separate reports. If this is not practical, they should be in separate sections of the same report. Where performance standards are given, it is desirable to publish the rationale simultaneously as an SAE Information Report in order to provide all users with the basis for selection of performance levels.

5.1.2 SAE Recommended Practices: These reports are documentation of practice, procedures and technology that are intended as guides to standard engineering practice. Their content may be of a more general nature, or they may propound data that have not yet gained broad acceptance.

5.1.2.1 A technical committee preparing such a report may add an introductory note stating, "This SAE Recommended Practice is intended as a guide toward standard practice and is subject to change to keep pace with experience and technical advances.

5.1.3 SAE Information Reports: These reports are compilations of engineering reference data or educational material useful to the technical community.

[1]The Society also approves and issues reports for the aerospace industry. These are called Aerospace Standards (AS), Aerospace Recommended Practices (ARP), Aerospace Information Reports (AIR), and Aerospace Material Specifications (AMS). Their definitions are similar to the above.

5.1.4 Examples:

5.1.4.1 Standard: Engine Coolant Pump Seals, SAE J780 APR84. A product standard based on dimensions.

5.1.4.2 Recommended Practice: Driver Hand Control Reach, SAE J287 FEB80. Description of the techniques of describing boundaries of hand control locations.

5.1.4.3 Information Report: Mechanical Properties of Heat Treated Steels, SAE J413. General information giving guidance on the relationship of various properties.

5.2 Numbering: Prior to submission to the appropriate council of the Technical Board, SAE staff will assign a "J" number to all reports.

5.2.1 Suffixes: When a technical report is approved by a council or the Techncial Board, the report "J" number will be supplemented by a date suffix (e.g., SAE J916 MAY85).[2] The date suffix should be shown in all indexes and should be used as appropriate in references. (See paragraph 6.6 of this report.) The date suffix will be advanced for each technical or editorial revision.

5.2.2 Integrity of SAE "J" Numbers: Changes to an SAE Standard or Recommended Practice which alter it sufficiently to affect its interchangeability or interchangeable application shall require a new "J" number identity. The superseded "J" number shall continue to exist unless retired. When an SAE technical report is retired, its "J" number shall continue in the index with its date suffix, classification, a cross reference to any superseding "J" number, and an indication of its last date and method of publication.

6. GUIDE FOR PREPARATION OF TECHNICAL REPORTS:

6.1 Organization of Report: The following recommendations for items to be included in SAE technical reports are all-inclusive. Accordingly, all items may not be required for every type of report. In addition, the sequence in which they are presented herein may be changed, for good reason, by the responsible technical committee.

6.1.1 Title: Each report shall have a title which does not duplicate an existing title. It should be as short, concise, and descriptive as possible.

6.1.2 Report Classification: See Section 5 of this report.

[2]The practice of using date suffixes for SAE technical reports was initiated with the issue of J1159 AUG79. The previous practice of using suffix letters will be phased out as SAE technical reports are revised.

6.1.3 Approval Note: Includes credit to originating committee, original approval date, and date of last revision or reaffirmation. Latest editorial revision, if any, is included. For example: Report of the Iron and Steel Technical Committee, approved April 1963, last revised June 1975, editorial change March 1979.

6.1.4 Introduction (as applicable): The introduction shall provide the basis for data or information in the report, background or general description of the report, and a brief explanation of changes from previous version of the report.

6.1.5 Purpose and/or Scope (as applicable): If both are used, the purpose shall precede the scope. The purpose will explain the objectives or end to be obtained by use of the report. The scope will briefly give the extent of treatment and applicability of the report.

6.1.6 Definitions, Glossary of Terms, Terminology, and Designations: All definitions, glossary, terminology, and designations should be reviewed for consistency with SAE reports; SAE Motor Vehicle, Safety and Environmental Terminology, HS215, and Guidelines for Developing and Revising SAE Nomenclature and Definitions, SAE J1115.

6.1.7 Test Procedures Including:

6.1.7.1 Description of facilities and environment.

6.1.7.2 Listing of instrumentation and equipment. (Where instruments must be identified by brand name, the phrase "or equivalent" must be used.)

6.1.7.3 Details for installation of instrumentation and equipment and preparation required for vehicles or machinery, tests samples or components.

6.1.7.4 Form for data sheets, graphs, and reports.

6.1.8 Dimensional data, including tables and charts.

6.1.9 General specifications which augment dimensional data.

6.1.10 Illustrations, photographs.

6.1.11 Performance requirements (if not included in a separate document)--See paragraph 7.5 of SAE Technical Board Rules and Regulations for reservations on performance requirements.

6.1.12 Component materials and mechanical and physical properties.

6.1.13 Inspection requirements

6.1.14 Appendices: As applicable, to add supplementary engineering reference data or educational material not an integral part of the basic technical report. They may also be issued as a separate SAE Information Report.

6.1.15 Rationale: The rationale which accompanies a technical report when being sent to upper committees for approval may be included as an Appendix or may be the subject of a separate SAE Information Report. The rationale will provide an expanded explanation of the reasons for decisions, conclusions, and recommendations; and a report on actual tests made which support conclusions and recommendations or which provide the basis for performance criteria.

6.1.16 References: List all SAE technical reports and other standards referenced in the report.

6.1.17 Bibliography (as required): A list of publcations from which authoritative information was gathered for inclusion in the report.

6.2 Preparation of Technical Reports:

6.2.1 Paragraph Numbering: A decimal numbering system should be used where practical to aid organization in long or complicated reports. Use decimal point to indicate successive subheadings (Example: 1., 1.1, 1.1.1).

6.2.2 New Reports: Double space drafts of new reports. Mark and date each successive draft legibly.

6.2.3 Revisions to Existing Reports[3]: Revisions may be handled in several ways. The best method depends upon the extent of the revisions. A major revision, for example, would probably best be handled by complete retyping as in paragraph 6.2.2. Other approaches in handling are:

(a) Cut and paste or mark copies of printed report, indicating deletions and insertions clearly.

(b) Double space new copy, describing clearly where it is to be inserted in existing report.

6.3 Artwork: These instructions are based on a 50% reduction for final size. A one-column figure has a final maximum width of 92 mm (3.62 in). Largest maximum final width is 178 mm (7.00 in).

(a) Typewriter lettering and pencil drawings are unacceptable as both fade and drop out in reproduction process. Please use ink.

(b) Clear, sharp glossy prints of specified original artwork are acceptable if originals must be kept in committee's files.

6.3.1 Line Drawings (excluding graphs):

Main lines--Equiv. 0 Leroy pen (0.3 mm width)
Inside lines
Dimension line leaders } Equiv. 00 Leroy pen (0.2 mm width)
Phantom line, etc.

[3]See paragraph 6.9.

6.3.2 Graphs: The heaviest line weight used on graphs should be the curves.

Curves--Equiv. 1 Leroy pen (0.4 mm width)
Ordinate and Abscissa--Equiv. 0 Leroy pen (0.3 mm width)
Grid lines, Tic marks } Equiv. 00 Leroy pen (0.2 mm width)

6.3.3 Lettering (excluding section and reference letters): All lettering to be capitals unless lower case letters are necessary for a specific term. Lettering shall be vertical except for quantity symbols which shall be in italics. Use only Roman alphabet, except where letters are recognized standard symbols.

6.3.3.1 All lettering should be placed outside visible outline of part. Label, with line and arrowhead to area being identified, should be kept reasonably close to figure.

6.3.3.2 Lettering, including Greek, numbers, fractions: 120 Leroy--Equiv. 00 pen (0.120 in [3.05 mm] letter height).

6.3.4 Section and Reference Letters: All section and reference letters: 140 Leroy--Eqiv. 0 pen (0.140 in [3.56 mm] letter height).

6.3.5 Numbers: Align column of numbers on decimal point.

6.3.6 Abbreviations: Do NOT use ", ', or ° (angular). Use in, ft, deg.

6.4 Tables: Tables shall be numbered consecutively throughout the report, and referred to in the text. Each shall be titled.

(a) Concise descriptions, measurement units, and letter symbols shall be included in column headings.
(b) Be concise in numerical ranges. Do not overlap ranges or leave gaps in ranges. An example of good practice is:

0.75 thru 1.25 mm
Over 1.25 thru 2.00 mm
Over 2.00 thru 3.25 mm

6.5 Decimal Dimensioning: The dimensions in all new and revised SAE technical reports shall be expressed in decimal units. Nominal sizes shall be expressed as decimals or fractions, as determined by their design basis or historic use. Where these considerations are not decisive, decimal nominal sizes will be used.

6.5.1 The number of significant digits used in a dimension should relate to the precision of the quantity stated. This is particularly important in decimalizing dimensions previously expressed as fractions. A dimension of $1\frac{3}{16}$ with an intended precision of about ±0.01 shall be decimalized as 1.19, not 1.1875. A discussion of the precision of a value, and the number of decimals proper to retain, is given in Rules for SAE Use of SI (Metric) Units, SAE J916.

6.5.2 Rounding Off: When it is necessary to reduce the number of decimals by rounding off, the method shown in SAE J916 shall be used.

6.5.3 Zeros: Where decimal values less than 1 apppear, a zero shall be placed to the left of the decimal point.

6.6 Cross-Referencing: As necessary, other SAE reports or reports of other organizations may be referenced.

6.6.1 References shall be made to other standards or technical reports by name of the standards writing organization, number of the standard, and optimally the date of issue (e.g., SAE J848 NOV84; ASTM 2649-83). If date is included, it is assumed that a specific report is being referenced even though it may be obsolete.

6.6.2 Where references are made, the referencing committee shall notify the committee responsible for maintaining the referenced technical report and request that the referencing committee be furnished with drafts of any proposed changes to the referenced report. Such drafts shall be sent to the chairman and SAE staff advisor of the referencing committee.

6.6.3 If the proposed changes are acceptable to the referencing committee, the chairman of the referencing committee should notify the committee responsible for the referenced technical report. The referencing technical report should then be revised to reflect the latest date of the referenced technical report.

6.6.4 If the changes are unacceptable to the referencing committee, the chairman of the referencing committee should notify the committee responsible for the referenced technical report that the proposed changes have affected applicability of the referenced report and a determination should be made between the two committees whether or not a new document number is required.

6.6.5 As an aid to committees and users of SAE Technical Reports, SAE staff shall maintain a listing of cross-referenced technical reports. The listing should give access to both the referenced and referencing technical reports.

6.6.6 If the SAE technical report corresponds to but is not identical to a technical report of another organization, it should be stated in the approval note. Example: This report conforms essentially to American National Standard B32.3.

6.6.7 Joint development of a technical report should be indicated in the approval note: Example: This is a joint report of SAE and ASTM . . .

6.7 Use of Basic Terms:

6.7.1 Surface Vehicle or Machine: The term surface vehicle or machine is preferred to automotive for use in identifying technical reports which do not apply to the aerospace industry.

6.7.1.1 Vehicle: The term vehicle pertains to self-propelled devices for carrying passengers, goods, or equipment . . . a car, bus, truck, or boat.

6.7.1.2 Machine: The term machine pertains to self-propelled or mobile devices designed to alter or transmit energy and force for the performance of useful work . . . tractor, loader, grader, ditcher, combine.

6.7.2 Mechanical Properties: Mechanical properties are those properties of a material that pertain to its elastic and plastic behavior when force is applied: For example, yield strength, ultimate strength, elongation, hardness, etc.

6.7.3 Physical Properties: Physical properties are those properties other than mechanical properties that pertain to the physics of a material: For example, density, electrical conductivity, thermal expansion, etc., often improperly used to express mechanical properties.

6.7.4 Use of Shall or Should: The use of should or shall has no bearing on the voluntary nature of SAE technical reports. Inclusion of an SAE technical report in a document, standard, or contract by a company or agency is a voluntary act. When a technical report is so cited, the report becomes a requirement within the limitations set forth by the document, standard, or contract. The following shall apply to use of these words:

Shall - Shall is to be used wherever the criterion for conformance with the specific recommendation requires that there be no deviation. Its use shall not be avoided on the grounds that compliance with the report is considered voluntary.

Should - Should is to be used wherever noncompliance with the specific recommendation is permissible. Should shall not be subsitituted for shall on the grounds that compliance with the report is considered voluntary.

6.7.5 Use of Safe and Safety: The words safe and safety shall be used in SAE technical reports only when they are in whole or in part commonly used engineering terms, such as: fail-safe, factor of safety, safety glass. To preclude any misinterpretation of the words safe and safety, more definite description words shall be used, such as:

"lock wiring" rather than "safety wiring" . . .
"lock nut" rather than "safety nut" . . .
"relief valve" rather than "safety valve" . . .
"the integrity of the painted surface" rather than "the safety of the painted surface" . . .
"to provide protection against shock" rather than "to provide safety against shock" . . .
"will provide for reliable transportation of the component" rather than "will provide for safe transportation of the component."

If circumstances arise which strongly indicate a need for the use of the words safe and safety, the Publications Advisory Committee shall be consulted.

6.8 Measurement Unit Symbols and Abbreviations: These may be found in Rules for SAE Use of SI (Metric) Units, SAE J916.

6.9 Indicating Revisions to SAE Standards, Recommended Practices, and Information Reports:

6.9.1 Indications of Technical Revisions: In drafts of revisions to existing "J" reports, the symbol Ø shall be used to indicate technical changes.[4] A technical change requires a change in the date suffix, that is, JXXX JUN80 to JXXX JUN85. This indication of change shall be put on the draft revision at the earliest circulation.

6.9.1.1 The Ø symbol is always placed in the left margin for single column copy and in the left- or right-hand margin, respectively, for double column copy. It is used to indicate change in text, tables, or figures. In the case of text, a separate symbol is used for each paragraph. In the case of tables or figures, the symbol is used once for each table or figure. In no case should it be located where it might be confused with the international symbol for diameter, which has a similar appearance.

6.9.1.2 Should the revision be so extensive that most of the report is changed, the symbol is put next to the title of the report, and the history note under the title shall read "completely revised (date)".

6.9.1.3 The Ø symbol will be carried on the published document. If the document is again revised, the old symbols are deleted and new ones appropriate to the new technical revision are added.

6.9.1.4 The SAE Handbook and any separately published "J" reports will carry the following explanatory note: "The Ø symbol is for the convenience of the user in locating the areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report."

6.9.2 Editorial Revisions: Editorial revisions shall be indicated in both draft and published technical reports by the symbol ed. the history note under the report title will also call out editorial revisions by the following: "Editorial change (date)". The Ø symbol indicating last technical revisions shall be retained.

7. INDEXING INFORMATION: Following are instructions to assist in providing key words for use by SAE staff in preparing SAE Handbook index.

7.1 Selection: Terms chosen should be taken directly or derived from the material being indexed on the basis of their relative significance and effectiveness in later retrieval of needed information. Terms should be used consistently. Terms should be as specific as the nature of the material and user's requirements allow.

[4]Symbol made on a typewriter by a combination of a zero and a slash.