

Association of American Railroads
Mechanical Division

**MANUAL OF STANDARDS
AND
RECOMMENDED PRACTICES**

**EQUIPMENT IDENTIFICATION AND
WARRANTY ADMINISTRATION**

Specification
M-xxx-xxx

Adopted: (date)

DRAFT #18

Compiled by the ISM-RIF-WWG
(Institute of Supply Management-Rail Industry Forum-Warranty Working Group)
For review by the various committees responsible for the subjects shown herein.

EQUIPMENT IDENTIFICATION AND WARRANTY ADMINISTRATION

Specification

M-xxx-xxx

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1.0 PURPOSE AND SCOPE

The purpose of this specification is to establish industry standards for equipment identification and administration of contract warranty provisions.

- 1.1 First, it establishes a standard method of component labeling so that each item is uniquely identified. This will better support the management, administration and maintenance of railroad equipment assets by providing traceability and configuration control down to the Lowest Level Replaceable Unit (LLRU). The specification will apply to new and reconditioned serialized components and any other components specified by the purchaser.

The unique identification requires that the Serial Number of the part be unique within the CAGE Code of the manufacturer – no longer just unique within the part family, which is typical, but far too limiting. The combination of the CAGE Code plus the unique Serial Number creates a universal ‘social security number’ for that particular unit.

- 1.2 Secondly, it defines a consistent process for administering contract warranty provisions resulting from in-service component failures and nonconforming conditions identified at the time of delivery. Together with the nonconformance reporting provisions of AAR Quality Assurance Specification M-1003 (Chapter 7), this will help facilitate the resolution of commercial issues and foster product and process improvement within the railroad industry. This part of the specification will also apply to non-serialized components.
- 1.3 This specification is applicable to all equipment and components as stipulated in purchase agreements between a railroad and a supplier or between two suppliers. It should be used in a cooperative effort to achieve improved data accuracy, productivity and cost reduction.

2.0 DEFINITIONS

- 2.1 **Supplier:** the party under contract to furnish a component to a purchaser
- 2.2 **Manufacturer:** the party that originally made the component
- 2.3 **Purchaser:** the party under contract to buy a component







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- 2.4 Re-Manufacturer:** (reconditioner/rebuilder) party that restores a component to its originally manufactured condition or to another condition specified by a purchaser
- 2.5 Repair Facility:** a facility authorized, qualified to replace or repair components that are in railroad service, whether owned by the repairing organization or another party.
- 2.6 Bar Code :** A pattern of information encoding symbols (Symbology) that is machine readable in real time. Linear Bar Code “Symbology” is a single row of dark bars and light spaces, usually variable in width, sometimes variable in height. 2-D Stacked “Symbology” (not used in this specification) uses multiple rows of variable width bars and spaces. 2-D Matrix “Symbology” encodes information in a two dimensional pattern of data cells. “Code” refers to the actual data, which the Bar Code contains, whereas “Symbol” refers to the arrangement of the bars and spaces or data cells. Bar Coding reduces errors in data capture, speeds up data acquisition and is part of an “Automatic Identification Technology” designed to identify, track, document and control material and processes.
- 2.7 CAGE Code:** A Commercial and Government Entity (CAGE) code required to identify the manufacturer of each component. CAGE code is a five-character identification code assigned by the Department of Defense - specifically the Defense Logistics Information Service (DLIS, formerly DLSC) located in Battle Creek, MI. Many companies already have a Cage code number. Suppliers without a CAGE code can contact the DLIS at 616-961-4358 or request it via the CCR Web site <http://www.ccr2000.com/govt.cfm>. Registration is free.
- 2.8 Warranty:** Responsibility for repair or replacement of a component that is noncompliant at the time of receipt or fails within the contractually designated period or function. Additional cost such as handling, shipping and extra labor will be governed by contractual agreements between parties.
- 2.8.1 Pre-Service Warranty:** A component that has failed or is non-compliant before being applied into full service.
- 2.8.2 In-Service Warranty:** A component that has failed or is non-compliant while in service but premature to the contractually designated period or function
- 2.9 Text Element Identifier:** The Text Element Identifier (TEI) will be included in the data and is four characters in length, consisting of three letters followed by a space. All data in the bar code, including the Text Element Identifier (TEI), will be displayed in the human readable text that is printed near the bar code. If this TEI code is not desired in the receiving company's data field, the application program can remove the characters and retain only the number. The TEIs are directly related to those defined in the Spec 2000 Data Dictionary (www.spec2000.com), forming a data foundation for supply chain e-Business processes.

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2.9.1 TEI codes will be as follows:

Identifier	Description	Field Length & Type
MFR	(CAGE Code)	5 chars, A/N
SER	(Serial Number, unique within CAGE Code)	1→15 char, A/N
PNR	(OEM Part Number)	1→15 char, A/N
DMF	(Date of Manufacture)	MMYYYY
WDT	(Warranty Date)	MMYYYY
RMG	(Re-Manufacturer)	5 chars, A/N

Data Elements	1-D Linear Barcode (Preferred on Data Plates)	2-D Data Matrix (Preferred on Direct Part Marking)
MFR / SER	MFR 12345  SER ABC123 	 MFR 12345 SER ABC123 (see Note) Encoded in Data Matrix MFR 12345/SER ABC123
DMF	DMF 082001 	DMF 082001 (MMYYYY format)
PNR (This may change at the time of remanufacture)	PNR F100F200 	PNR F100F200
WDT (This may change at the time of remanufacture)	WDT 082003 	WDT 082003 (MMYYYY format)

Data Elements	1-D Linear Barcode (Preferred on Data Plates)	2-D Data Matrix (Preferred on Direct Part Marking)
RMG (Used for In-Service or Remanufactured Serialized Parts)	RMG 54321 	 RMG 54321 (see Note) Encoded in Data Matrix RMG 54321

Note:

Human Readable Interpretation does NOT include embedded slash “/” but the data does include it. A Carriage Return is not embedded in the 2D Data Matrix.

3.0 EQUIPMENT IDENTIFICATION

Components may be identified by attaching a label containing Identification Coding (IDC) or alternatively by Direct Part Marking (DPM) involving stamping or etching methods.

3.1 Labeling

3.1.1 Label Application: The Original Equipment Manufacturer (OEM) shall apply a two-section label to each component. The first section shall contain permanent OEM and unique component identifying information. The second section shall contain the Part number, which is changeable, warranty information and any additional rebuild information when applicable. This OEM Label shall remain with the component for its entire life cycle. (See Section 3.1.3) The second section of the label may be multiple tags.

3.1.1.1 When remanufacturing or reconditioning a component, the Remanufacturer shall apply pertinent information on the second section of the OEM label. The part number must be changed when the component has changed in fit, form or function. The replacement label shall contain the appropriate Remanufacturer's Cage Code and if applicable, new remanufacture warranty date. It shall be applied over or replace original second section of the OEM label. (See Section 3.1.4)

3.1.1.2 Should the OEM Label be damaged or unreadable, the Remanufacturer shall replace the OEM label in accordance to the intent of the specification with an equivalent or superior label in size, shape, material, location and data content.

3.1.2 Label Materials: At minimum, the label shall be made of non-brittle polyester face-stock, high performance adhesive, resin ribbon ink, matte finished and clear polyester over-laminate in conformance with the latest specifications for materials manufactured. Metal-backed labels will be utilized for components subject to severe handling and environmental conditions when specified by the purchaser. This can include aluminum or stainless steel nameplates.

3.1.2.1 Labels shall maintain physical integrity, adhesion and readability for the life of the component or a minimum period of ten years under the normal design operating conditions.

3.1.2.2 The supplier shall be fully responsible for providing and attaching the labels to each component and for the accuracy of attachment to the correct component. Other labels or tags of a more durable nature may be used, but must meet the minimum specifications outlined in this section 3.0.

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- 3.1.3 Label Locations :** One label shall be affixed to each component. When specified, labels shall be installed in locations designated by the purchaser. When no standard location has been designated, the labels shall be affixed or applied in a way that does not interfere with the operation of the component; in a conspicuous location to facilitate ease of reference while in service, while disassembled and while in transport.
- 3.1.4 OEM Identity Label Information:** The label shall contain the following specified information in human readable format as well as machine-readable one-dimensional and/or two-dimensional bar code symbology unless otherwise specified below (see Section 3.3, Bar-coding). The bar code information will consist of a Text Element Identifier (TEI) and the corresponding data. To enable the machine readable (bar) code to be properly identified, a Text Element Identifier (TEI) will immediately precede and be a part of the bar code.
- 3.1.4.1 OEM Manufacturer Name and/or Logo** (human readable format only)
- 3.1.4.2 OEM CAGE Code (MFR + space + 5 characters)** See section 2.7
- 3.1.4.3 OEM Serial Number: (SER +space +15 characters maximum)**
It is a unique serial number within that cage code or manufacturer. Characters may be alpha or numeric with the only special character permitted being the dash (-) symbol. A space is not permitted within the number as it is used as a delimiter after each Text Element Identifier (TEI).
- 3.1.4.4 Manufacture date:** defined as month (**DMF** + space + 2 characters for the month followed by 4 characters for the year).
- 3.1.4.5 Part Number Information:** shall contain one part number in human readable and bar code symbology. (**PNR** + space + 15 characters maximum). Characters may be alpha or numeric with the only special character permitted being the dash(-) symbol. A space is not permitted within the number as it is used as a delimiter after each Text Element Identifier (TEI). Only one part number should be displayed.
- 3.1.4.6 Warranty Expiration Date:** defined as month (**WDT** + space + 2 characters for the month followed by 4 characters for the year). Unless otherwise specified, warranty shall start from the date of manufacture. Only most recent date should be displayed.
- 3.1.5 Remanufacturer or rebuilder label:** shall be added to the second part of the OEM label, will be defined as the old or a revised Part Number (**PNR** + space + no more than 20 characters) followed by new Warranty Expiration Date defined as month (**WDT** + space + 2 characters for the month followed by 4 characters for the year the warranty expires), and ending with the Remanufacturer's CAGE Code (**RMG** + space + 5 characters).

- 3.1.5.1 The Remanufacturer Label can be removed and changed if required during the remanufacturing process. However, the OEM Tag must be preserved and maintained on or attached to the component as much as practical. The original OEM label or tag must be replaced if it is removed.

3.2 Direct Part Marking (DPM)

When utilizing DPM in lieu of label attachment, every effort will be used to provide the same information on the component in both human readable and bar-coded format, but all information shall be stamped or etched into the component using approved technology rather than being contained on a label. Size and placement of the DPM will be the limiting factors. The human readable format can be done in one continuous string of information as long as TEIs are used.

3.3 Bar-coding

- 3.3.1 Accuracy of information transfer within the railroad industry can be improved by using methods other than manual keying. An alternative is machine-readable code as exemplified by bar code. The specific bar code methods referenced within this section are intended to be standard within the railroad industry. These standards should be used among railroad industry trading partners in a cooperative effort to achieve improved data accuracy, productivity and cost reduction.

- 3.3.2 **Symbology:** Bar code symbologies should be in accordance with Automatic Identification Manufacturers (AIM) Uniform Symbology specifications. The sizes of components requiring identification vary from approximately eight (8) cubic inches to car body size. There may be limited space available for attaching a bar code. The shapes of components may be complex.

- 3.3.2.1 The manufacturer shall select bar code symbologies from either bar code Code128 (preferred) or Code 39 at a medium density, or Data Matrix ECC-200 at a medium density, depending on the component's size, shape, available space and accessibility. Data Matrix symbologies can be used when the linear bar code is prohibited by space availability.

- 3.3.2.2 When using the Data Matrix symbology, a slash delimiter (/) must be used to separate data elements. Both the square and rectangular formats are acceptable. The Data Matrix Error Correction Code 200 (ECC200) specified by AIM is the only acceptable version.

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3.3.2.3 For Code 128 (preferred) and Code 39, the bar code itself should be minimum 0.125 inch (3.2 mm) high, plus a minimum 0.06 inch (1.5 mm) high human readable characters printed directly adjacent to the bar code symbol. Data Matrix codes should also have a minimum 0.06 inch high human readable characters printed adjacent to the Matrix code.

3.3.3 Print Quality: The print quality should be in accordance with American National Standards Institute (ANSI) Bar Code Quality – Guideline [ANSI X3.182-1990(R1995)]. The ANSI print quality grade of ‘C’ is the minimum acceptable standard. The X-dimension shall not be smaller than 10 mils.

3.3.3.1 For both prototype and new production labels using the offered symbologies, the expected first read rate shall exceed 95%. A mis-read or no read shall be considered as one failure toward the percentage calculation for the first-read rate for new tags.

Typical Label Example



Example of stacked information

3.3.3.2 The label shall be affixed or applied in a way that does not interfere with the operation of the component; in a conspicuous location to facilitate ease of reference while in service, disassembled and while in transport.

4.0 WARRANTY ADMINISTRATION

- 4.1 **Summary:** When a purchaser or repair facility determines that an component covered by AAR QA Specification M-1003, described in the AAR Manual of Standards and Recommended Practices or specified by the purchaser does not conform to prescribed requirements or has failed in-service prematurely, the following actions shall be taken.
- 4.1.1 The purchaser or repair facility or owner shall prepare an AAR Form QA-7.1 and forward to the supplier. A copy must be sent to the AAR if the component is covered under the AAR Specification M1003, Chapter 7 Appendix-A Commodity Groups. Warranty claims may be submitted via E-Mail (Electronic Mail) using the standard QA-7.1 forms. The purchaser or repair facility shall determine if component warranty is still in effect. If warranty is still in effect or a premature failure (noncompliance) has occurred, the supplier shall be contacted for a Return Material Authorization and if necessary a joint inspection of the nonconforming or failed component will be conducted to determine a commercial resolution.
- 4.1.2 The supplier shall respond to the AAR Form QA-7.1 by preparing an AAR Form QA-7.2 (refer to AAR Specification M1003, Chapter 7). This requires determination of the root cause of the nonconformance or failure and initiation of corrective measures to prevent reoccurrence. Within 45 days, the purchaser and the AAR QA Coordinator shall be notified of the resolution via copies of the completed Form QA-7.2 if the component is covered under the AAR Specification M1003, Chapter 7 Appendix-A Commodity Groups.
- 4.2 **Warranty Determination:** When a component fails in service, the repair facility is responsible to determine if the warranty is still in effect. This shall be done by reviewing the component label and/or contacting the equipment owner.
- 4.3 **Purchaser Claim Administration:** With respect to claims of components or material determined to be defective (non-compliant) upon receipt or prematurely failed in service, the purchaser shall perform the following:
- 4.3.1 Tag and segregate the component.
- 4.3.2 Determine if warranty is still in effect (refer to paragraph 4.2).
- 4.3.3 Contact the supplier for a Return Material Authorization (if warranty) or to schedule a joint inspection (if premature failure). Ship component to supplier, if applicable.
- 4.3.4 Prepare AAR Nonconformance Report Form QA-7.1. Send copies to the supplier and to the AAR QA Committee Coordinator.

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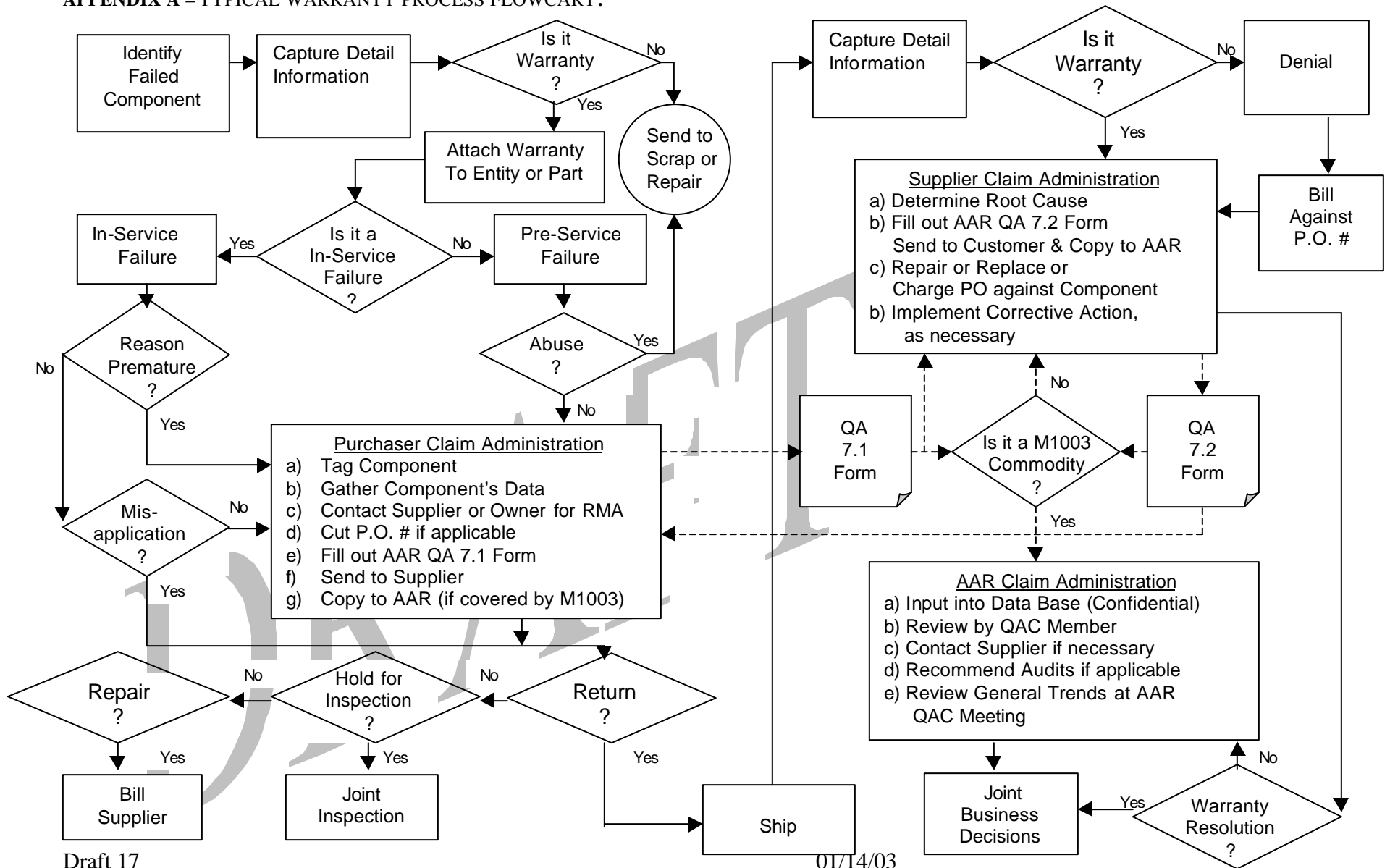
- 4.3.5 Resolve commercial issues with the supplier, such as: component replacement, credit, handling cost and etc.
- 4.4 Supplier Claim Administration:** For components or material reported as nonconforming at time of delivery to purchaser or prematurely failed in-service, the supplier shall perform the following.
- 4.4.1 Provide a Return Material Authorization to the purchaser or repair facility, for components under warranty.
- 4.4.2 Inspect components to determine root cause of nonconformance or premature failure.
- 4.4.3 Initiate AAR Form QA-7.2 with root cause determination and corrective action defined within 45 days of receiving the Form QA-7.1. Furnish copies to the purchaser, the AAR QA Committee Coordinator and the repair facility if applicable.
- 4.4.4 Resolve commercial issues with the purchaser.
- 4.4.5 Repair or replace the component, if applicable.
- 4.5 Repair Facility Claim Administration:** For components or material determined to have prematurely failed in service, the repair facility shall perform the following.
- 4.5.1 Tag and segregate the component.
- 4.5.2 Contact the equipment owner to determine if warranty is still in effect (refer to paragraph 4.2).
- 4.5.3 Contact the supplier for a Return Material Authorization (if warranty) or to schedule a joint inspection (if premature failure). Ship component to supplier, if applicable.
- 4.5.4 The repair facility or owner prepares the AAR Nonconformance Report Form QA-7.1. Send copies to the supplier, equipment owner and to the AAR QA Committee Coordinator.
- 4.5.5 Repair or replace component and bill equipment owner. Repair facility retains the repaired or replaced component and handles per owner's instructions.

See Appendix A for Warranty Flow Chart.

See Appendix B for an example of a Warranty Claim within the Car Repair Billing Process .

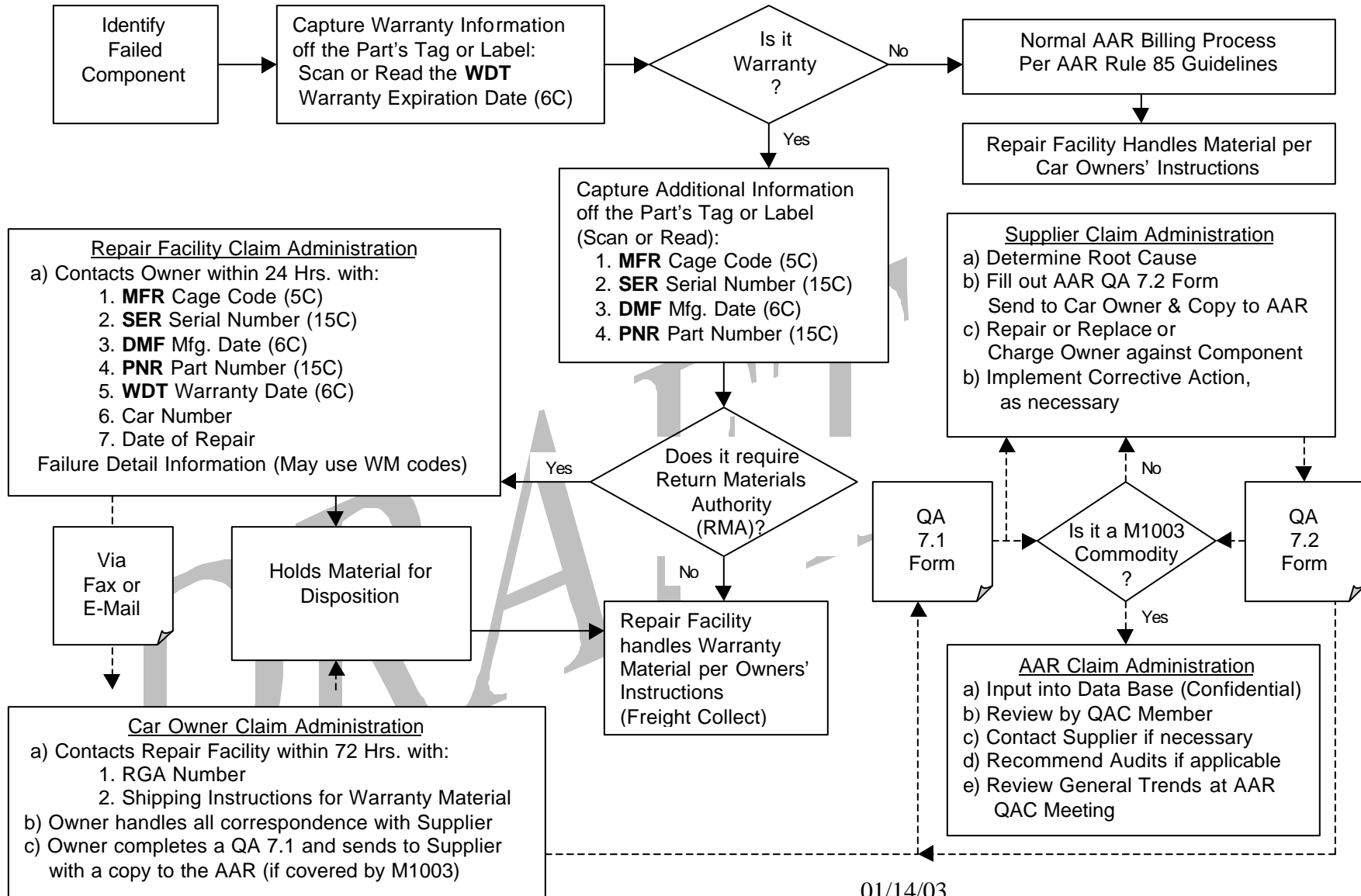
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APPENDIX A – TYPICAL WARRANTY PROCESS FLOWCHART:



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APPENDIX B – WARRANTY CLAIM EXAMPLE within the CAR REPAIR BILLING PROCESS:



01/14/03

LIST DRAFT 18 COMMENTS BELOW: