VMRS TMC 2000

Implementation Handbook

Version 1.05

Published by

Technology & Maintenance Council
of
American Trucking Associations

2200 Mill Road
Alexandria, VA 22314

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NEW CODE REQUEST FORM

Return this form to:
TMC/ATA
2200 Mill Road
Alexandria, VA 22314
FAX: (703) 684-4328
email: tmc@trucking.org

(Please Complete the Following)

(REQUESTOR)
Name: _____

Title: _____

Company: _____

Address: _____

_____

Phone: _____

FAX: _____

Please Describe Your New Code Request. Attach additional sheets if necessary.

- **FOR COMPONENT CODE REQUEST (Code Key 33)—Include a description and/or drawing of the component.**
- **FOR MANUFACTURER / BRAND CODE REQUEST(Code Key 34)—Include manufacturer/supplier/brand name, address, phone number, etc.**
- **FOR ALL OTHER CODE REQUESTS—State your request with as much detail as possible.**
- **If you have any questions, please call TMC offices at (703) 838-1763.**

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Product Price Sheet

Item Number	Description	Quanity	Price ($)
T0600 (Mem)	Complete Code Key Diskette Set (Single User)	1	149.25
T0700 (NonMem)	Complete Code Key Diskette Set (Single User)	1	199.00
T0601 (Mem)	Code Key 33/34 Diskette Set (Single User)	1	99.75
T0602 (NonMem)	Code Key 33/34 Diskette Set (Single User)	1	133.00
T0625 (Mem)	VMRS 2000 Electronic Media—Enterprise Version	1	1500.00
(NonMem)	(Unlimted Multi-User Version, Codes and Handbook)	1	2000.00
T0626 (Mem)	VMRS 2000 Electronic Media—Developer Version	1	2499.75
(NonMem)	(Unlimted Multi-User Version, Codes and Handbook)	1	3333.00
T0612 (Mem)	VMRS Implementation Handbook	1	195.00
T0712 (NonMem)	VMRS Implementation Handbook	1	260.00
T0617 (Mem)	Printed Code Key 33/34 Inserts	1	75.00
T0717 (NonMem)	Printed Code Key 33/34 Inserts	1	100.00
T0605 (Mem)	VMRS Repair Order Code Wall Chart	10	2.50 each
	(25 x 19 size)	11+	2.00 each
T0705 (NonMem)	VMRS Repair Order Code Wall Chart	10	3.33 each
	(25 x 19 size)	11	2.67 each
T0608 (Mem)	VMRS Repair Order Code Wall Chart	10	1.50 each
	(8.5 x 11 size)	11+	1.25 each
T0708 (NonMem)	VMRS Repair Order Code Wall Chart	10	2.00 each
	(25 x 19 size)	11+	1.67 each
T0610 (Mem)	Repair Order Log (Form 20)	100	24
		200	46
		500	110
		1000	200
T0710 (NonMem)	Repair Order Log (Form 20)	100	32
	(Two-Part Form)	200	61
		500	147
		1000	267
T0611 (Mem)	Repair Order Log (Form 21)	100	21
	(One-Part Form)	200	36
		500	75
		1000	130
T0711 (NonMem)	Repair Order Log (Form 21)	100	28
		200	48
		500	100
		1000	173

Product Price Sheet

Item Number	Description	Quanity	Price ($)
T0606(Mem)	Repair Order (Form 6)	100	30
		200	50
		500	95
		1000	150
T0706 (Non-Mem)	Repair Order (Form 6)	100	40
		200	67
		500	127
		1000	200
T0607 (Mem)	Special Repair Order (Form 7)	100	30
		200	50
		500	95
		1000	150
T0707 (NonMem)	Special Repair Order (Form 7)	100	40
		200	67
		500	127
		1000	200
T0604 (Mem)	Repair Order Continuation (Form 13)	100	18
		200	30
		500	60
		1000	90
T0704 (NonMem)	Repair Order Continuation (Form 13)	100	24
		200	40
		500	80
		1000	120
T0609 (Mem)	Equipment File (Form 30)	1-99	1.00 each
		100+	.75 each
T0709 (NonMem)	Equipment File (Form 30)	1-99	1.33 each
		100+	1.00 each
T0603 (Mem)	Equipment File Inserts (Form 31)	1-99	.50 each
		100+	.30 each
T0604 (NonMem)	Equipment File Inserts (Form 31)	1-99	.67 each
		100+	.40 each
T0613 (Mem)	Equipment Master Record (Form 1)	100	39
		200	76
		300	99
		400	128
		500	150

Product Price Sheet

Item Number	Description	Quanity	Price ($)
T0713 (NonMem)	Equipment Master Record (Form 1)	100	52
		200	101
		300	132
		400	171
		500	200
T0614 (Mem)	Equipment Master Record (Form 2)	Same as T0613	
T0714 (NonMem)	Equipment Master Record (Form 2)	Same as T0713	
T0615 (Mem)	Equipment Master Record (Form 3)	Same as T0613	
T0715 (NonMem)	Equipment Master Record (Form 3)	Same as T0713	
T0616 (Mem)	Equipment Master Record (Form 4)	Same as T0613	
T0716 (NonMem)	Equipment Master Record (Form 4)	Same as T0713	

Welcome to VMRS 2000™!

This handbook is designed to help motor carriers, software designers, information specialists and industry suppliers implement the Vehicle Maintenance Reporting Standards (VMRS)—*the* industry standard coding convention for tracking equipment and maintenance information. This book provides an outline of VMRS, its advantages to equipment users and industry suppliers, and guidance on the basic implementation requirements.

The development of VMRS began in 1969, undertaken jointly by the Maintenance Committee of the Regular Common Carriers Conference, the National Accounting and Finance Council, and the Management Systems Committee of American Trucking Associations (ATA). The Union 76 Division of Union Oil of California—through its participation in the ATA Foundation—sponsored the initial VMRS study. The VMRS Committee's report was published in 1970, and its recommendations to the industry — establishing a standard coding convention for universally tracking equipment and maintenance costs and functions — were approved and adopted by the Executive Committee of American Trucking Associations in October 1970. Since 1970, American Trucking Associations has served as the official custodian of VMRS—updating this dynamic standard to meet motor carrier and industry supplier needs. In 1997, The Maintenance Council (TMC) of American Trucking Associations became custodian of VMRS, embarking on a thorough review of VMRS at the commercial vehicle industry's request. VMRS 2000™ is *the* latest version of this successful standard. In 2001, TMC expanded its mission to include information technology and logistics, becoming the Technology & Maintenance Council.

VMRS 2000™ is a universal coding language that can be implemented successfully by any industry which must track the costs of maintaining and operating equipment.

The development of VMRS 2000™ is owed in large part to the volunteer efforts of many segments of the equipment maintenance industry. Thanks to the work of many dedicated individuals, VMRS 2000™ is a universal coding system that can be implemented successfully by any industry which must maintain and operate equipment — whether it be trucking, transit, off-road, agricultural, or utility operations.

The ultimate utility and application of VMRS 2000™ is limited only by the creativity of the user. Welcome onboard!

Lew Flowers
VMRS Codes Committee Chairman
United States Postal Service

Carl T. Kirk
Executive Director
Technology & Maintenance Council

Robert M. Braswell
Technical Director
Technology & Maintenance Council

1. An Introduction to VMRS 2000™

What is VMRS?

Since 1970, the purpose of VMRS has been to provide a vital communication link between maintenance personnel, computers, and management. It establishes a "universal" language for fleets, original equipment manufacturers' (OEMs), industry suppliers, computers, and those people whose responsibility it is to specify, purchase, operate, and maintain equipment.

Developed by and for equipment users under the auspices of American Trucking Associations, VMRS provides the discipline necessary for different industry segments to communicate with each other. VMRS is the shorthand of maintenance reporting, eliminating the need for extensive written communications with all the inherent problems of miscommunication normally associated with the written word.

To meet the ever-changing needs of the equipment industry, the Technology & Maintenance Council (TMC) of American Trucking Associations serves as the official custodian of VMRS. TMC provides OEMs, manufacturers, part suppliers, and equipment users with updated codes on an "as needed" basis reflective of current equipment design and the informational needs of the VMRS user.

What is VMRS 2000™?

VMRS 2000™ is the latest version of the VMRS coding convention, established more than 25 years ago. VMRS 2000™ represents a significant step forward in the evolution of VMRS.

Based on user requests, TMC has:

- Expanded Code Key 31 to acccommodate an ever-increasing interest in the unique reporting needs of the "off-highway" or "stationary equipment" market. As a result, TMC has made full use of the expanded three-digit code so that these equipment types are addressed. For example, System Code (X6X) has been created to accommodate "equipment dependent attachments." The introduction of this system allows users to track the expense associated with major attachments (those that warrant their own asset number) that are only operational when attached to a "host" piece of equipment (i.e. a truck mounted snow blower, or perhaps a plow).
- Increased the total number of codes in Code Key 33, "Component Codes" to over 15,700.
- Expanded to Code Key 15, "Work Accomplished" and Code Key 18, "Technician Failure Code" to satisfy customer demands.
- Updated Code Key 40, Brake System Type Code, and created Code Key 20, Equipment Status Code. We've also added Code Key 82, a condition report code for drivers.
- Expanded Code Key 34, which is used to identify manufacturers, suppliers, and brands.
- Expanded Code Keys 1, 2 , 10 and 48, which describe equipment vocations, categories and body types. These codes now accommodate many industries beyond trucking, such as transit, off-highway and construction industries.
- Added Position Codes to VMRS. Code Key 79 allows VMRS users to identify position based on industry-accepted conventions.
- Added warranty-related Code Keys, such as Code Key 81: Type of Claim.
- Improved the *VMRS Implementation Handbook*, by upgrading text and graphics, and making available an electronic version of VMRS, for easy implementation into existing computer systems.
- Established a VMRS 2000™ licensing program to encourage consistent industry use of VMRS.

A Structured Coding System

VMRS is a structured coding system, providing the discipline necessary to operate in today's computer-based information age or — where desired — as a completely manual system. Simple in concept, VMRS can be used at any level, from total operating systems down to the

individual part level. The level of coding used is entirely up to the user. One can select the level of reporting detail at any time without the need to redesign the coding structure or implement costly new programs. No matter which level the user selects, the data collected can be compared directly to data collected by others at the same or higher VMRS coding level.

The coding structure encompasses most equipment found within today's transportation activities including trucks, tractors, trailers, forklifts, shop equipment, off-road vehicles, utility vehicles, etc.

Recognized Internationally

Today, equipment users worldwide use VMRS to capture and report their equipment maintenance activities. Equipment manufacturers and maintenance software suppliers use VMRS coding for parts, thus providing additional impetus for fleets to adopt this universal coding scheme.

A complete service industry has grown up around VMRS, with a number of firms offering VMRS computerized reporting systems and/or services to fleets. This manual will help your software provider utilize VMRS to your mutual benefit.

15 Distinct Advantages to VMRS

There are 15 distinct advantages to using VMRS:

1. **VMRS is Easy to Use—**VMRS was designed for use at the shop level. Accurate and easily understood reporting by the mechanic is essential if any information system is to succeed. At the higher level, management must understand what the mechanic has accomplished. VMRS meets both criteria.

2. **VMRS is Cost Effective**—TMC has undertaken the initial cost normally associated with developing such a system. The practicality of the system has been proven, in that VMRS has been in continuous use since 1970. TMC keeps the system dynamic, thus eliminating the need for individual users to continually research and update their systems.

3. **Follows Accepted Accounting Practices**—The VMRS code structure allows the user to comply with the needs of most recognized accounting disciplines. VMRS provides the flexibility to properly massage data to meet both immediate and long-term needs.

4. **VMRS Enables Sound Budgeting**—VMRS provides a sound basis for budget preparation and forecasting based on fleet mix, projected utilization, and historic performance. Requests for additional mechanics, increased parts inventory, special equipment, or expanded facilities can readily be supported by data captured using VMRS. VMRS is invaluable in determining how many pieces of equipment are required to support a given workload. The same data can be used to determine the mechanic/parts mix required to support various equipment mixes and utilization criteria.

5. **VMRS Helps Control Costs**—VMRS provides detailed records of the maintenance activity comprising both equipment and facilities. It identifies where monies were spent, at which point in the life of a piece of equipment repairs were performed, and details the expenses incurred in the supporting activity. Distribution between parts and labor is an inherent part of the VMRS reporting structure, thus allowing analysis of what occurred and when. This is important in determining the cause-and-effect relationship of maintenance.

6. **VMRS Improves Facility Management**—VMRS provides the ideal basis for establishing a facility management program. The coding structure provides the basis for complete labor and material distribution, direct and indirect, thus allowing management the opportunity to analyze in detail each cost segment. With this information, management can take whatever action is deemed appropriate to correct those situations which appear out of line. This information provides the necessary input for most purchasing decisions.

7. **VMRS Tracks Labor Distribution**—VMRS provides complete labor distribution covering both direct and indirect labor.

8. **VMRS Helps Control Parts Inventory** —VMRS was developed, and is used within the industry, as the basis of many successful parts inventory control systems. Some fleets have developed their own systems using VMRS, while others utilize off-the-shelf programs designed and built around the VMRS coding structure. VMRS provides complete details as to parts use, thus identifying which part should be inventoried and which should be procured on an "as needed" basis. For those states having an Inventory Tax, VMRS provides documented back-up.

9. **VMRS Supports Warranty Claims**—The VMRS coding structure incorporates the capability to record and isolate those costs normally associated with warranty. Being a universal language, accepted and endorsed by equipment manufacturers and industry suppliers, VMRS provides the ideal audit trail for instituting and supporting warranty claims. New Code Keys have been developed exclusively for warranty, such as Code Key 81 - Type of Claim, Code Key 83 - Response Reason Code and Code Key 84 - Claim Response Status Code.

10. **VMRS Improves Preventive Maintenance Programs**—VMRS provides the ideal basis for determining the effectiveness of the PM program. Are PMs being performed too often or not often enough? Should PM intervals or their scopes be modified based on specific failures reported through maintenance reporting? What staffing is required to perform PMs? VMRS provides the answers.

11. **VMRS Helps Benchmark Equipment and Labor Productivity**—The standards provide data necessary for measuring labor productivity. The relationship between direct and indirect labor can be evaluated and changes implemented as needed. Parts/labor ratios can be established that provide the lowest overall maintenance costs. VMRS provides the basis for establishing the economic breakpoint between parts replacement and parts repair. Equipment utilization, an important ingredient in transportation, is impacted by maintenance. VMRS provides the means for recording downtime and identifying the specific reason for excessive delays.

12. **VMRS Helps Benchmark Component Performance**—VMRS provides the data for measuring performance and reliability of specific components and/or parts. A determination can be made of first failure (normally attributed to the equipment manufacturer) and subsequent failure (normally attributed to maintenance).

13. **VMRS Assists in Equipment Replacement Decisions**—VMRS can substantiate requests for new or replacement equipment based on current rather than historic information. Maintenance support requirements can be determined for each class of equipment being operated. This allows management to quickly determine whether it is more economical to replace or repair and what support is required in the way of labor and material for any combination of new and/or used equipment.

14. **VMRS Satisfies Reporting Requirements**—VMRS allows fleets to fulfill the ever-changing reporting requirements dictated by government agencies.

15. **VMRS-Compatible Software is Widely Available**—Many software suppliers currently offer complete turnkey VMRS-based maintenance programs. Many of these can provide custom-made reports to suit the specific needs of the user. Software is also available from a number of sources allowing in-house processing of VMRS.

VMRS 2000™ Licensing

Description of Licensing Agreements

There are four levels of licensing agreements associated with the use of VMRS 2000™ in electronic media format:

- Single User
- Enterprise
- Developer
- Mass Distribution

Let's examine each of the four to understand how they apply to your organization.

A. Single User License Agreement

Under this agreement, the licensee is entitled to use the electronic media version on a single computer workstation; the materials may not be used by more than one user on a computer network. The licensee may not modify the materials or make copies, except copies made incidental to use of the materials on the single computer (i.e., loading it onto the computer for use). The licensee may say that they are VMRS 2000™ compliant only if they follow the guidelines in the *VMRS 2000 Implementation Handbook*.

B. Enterprise License Agreement

Under this agreement, the licensee may make copies of the materials for use by multiple users within the enterprise or place the materials on a computer network for use within the enterprise The licensee may not modify the materials. The licensee may say that they are VMRS 2000™ compliant only if they follow the guidelines in the *VMRS 2000 Implementation Handbook*. Subsidiaries of Licensee also may use the materials, but parent and sister organizations may not.

C. Developer License Agreement

Under this agreement, the licensee may make copies of the materials and distribute them solely as part of another product. The licensee must use all of any of the Code Keys used in the product in order to state that the product is VMRS™ 2000 compliant. The licensee must distribute pursuant to license terms.

D. Distribution Agreement

This agreement allows a distributor to reproduce and distribute a set number of copies of the *VMRS 2000™ Implementation Handbook* and single-user and enterprise copies of the materials in return for a fixed fee. No right to use the materials other than to reproduce and distribute. The distributor must include with every copy the appropriate standard license terms provided by TMC / ATA and may not make any other warranties on behalf of TMC / ATA.

E. Use of the Implementation Handbook

No license is needed / offered. Additional copies of the *VMRS 2000™ Implementation Handbook* may be obtained from TMC / ATA.

Frequently Asked Questions on VMRS 2000 Licensing

Q. I have been using the VMRS system for years. Why is ATA suddenly requiring license agreements?

A. TMC / ATA has always owned proprietary rights in the VMRS system and its trademarks. TMC / ATA is now making clear how VMRS 2000™ may be used by ATA members and others. This will help ensure the integrity and utility of the VMRS system.

Q. Why are there different types of licenses?

A. Different members use the VMRS 2000™ product in different ways. Having different types of licenses, with prices determined by the type of usage, is a fair way to permit appropriate levels of usage by members.

Q. Can I make copies of the electronic media and put the materials on my computer network for use by my employees?

A. Under an Enterprise License Agreement, a licensee may copy the electronic media and put the materials on an internal network. A licensee may not do that if they have only a Single-User License Agreement or a Developer License Agreement.

Q. I obtained a copy of the Handbook. Can I type the Code Keys into my own computer?

A. Purchasing a copy of the Handbook does not provide you with the right to create your own electronic database. You may purchase a license to use the electronic media if you want to use the Code Keys on your computer.

Q. Do I have to use all of the Code Keys?

A. TMC / ATA does not intend to dictate any particular usage of the VMRS 2000™ product by members or others. However, a licensee can only say that they or their product are VMRS 2000™ compliant if they utilize all of the particular Code Key values for the Code Key(s) that they use. If you wish TMC / ATA to assign a new code not listed in the Code Keys or if you want a customized version, you may call TMC / ATA's offices at (703) 838-1763.

Q. Can I add my own information to the Code Keys?

A. TMC / ATA has rights in the Code Keys and in its trademarks, such as VMRS 2000™. To maintain the integrity of the Code Keys the significance and good will TMC / ATA has obtained through it's trademarks, TMC / ATA prohibits members who add material to the Code Keys from using any TMC / ATA trademarks in conjunction with the modified material. For example, if you were to add new part numbers to Code Key 33, then you would not be permitted to call it part of the VMRS 2000™ system. If you wish TMC / ATA to assign a new code not listed in the Code Keys or if you want a customized version, you may call TMC / ATA's offices at (703) 838-1763.

Q. Can I distribute copies of the Code Keys to others in the industry?

A. TMC / ATA does not normally permit distribution of copies of the electronic materials or the Handbook to any entity outside your enterprise. Software containing the Code Keys may be distributed as part of a separate software product under a Developer License Agreement. Copies of the electronic version may be distributed within your enterprise pursuant to an Enterprise License Agreement. In certain circumstances, TMC / ATA may consider a distribution arrangement. Please call TMC / ATA at (703) 838-1763 if you are interested in such an arrangement.

1999 - present VMRS 2000™ logo

1998 Logo

The VMRS 2000™ symbol identifies products that use the new VMRS 2000™ coding convention. Products bearing these logos meet certain minimum criteria set by TMC/ATA as key to using VMRS. For more information, see VMRS 2000™ Licensing in Section I of this Handbook.

2. Requirements for Using VMRS 2000™

What Are the Basic Requirements for Implementing VMRS?

All external reporting and data interchange must adhere to VMRS coding conventions as defined herein or further described in this *VMRS 2000™ Implementation Handbook*.

Internal reporting may use other techniques; however, all external interchange of information must be converted to VMRS using direct correlations. No assumptions, prorations, or averages can be used in any conversions.

Full implementation of VMRS 2000™ uses nine key VMRS components. Unless each of the nine items listed below can be checked "yes," the user is not implementing VMRS 2000™ correctly and will be unable to obtain credible or meaningful direct comparisons from any VMRS data base or other VMRS participant.

YES	Does the System Do the Following?
❑	Use the VMRS Equipment Master Record.
❑	Identify Equipment Vocation — Code Key 1.
❑	Segregate costs by Reason for Repair—Code Key 14
❑	Identify work accomplished using VMRS Coding—Code Key 15
❑	At minimum, identify systems via the three-digit VMRS System Code —Code Key 31
❑	For more detail, identify assemblies via the three-digit VMRS Assembly Code—Code Key 32
❑	For even more detail, identify individual parts via the three-digit VMRS Component Code—Code Key 33.
❑	Identify part/equipment manufacturers, suppliers or brands universally using Code Key 34.
❑	Have the capability to record VMRS Technician Failure Codes—Code Key 18.

Let's now look at each of these nine VMRS components to see how VMRS works.

The Equipment Master Record

What is a piece of equipment? It is not just a year, make, and model, but rather a unique series of components assembled to perform a specific task. Under VMRS, each of these components can be followed and monitored on an independent basis or as a total piece of equipment. The sum of the costs of maintaining the components represents total equipment maintenance cost.

VMRS uses a Equipment Master Record (similar to a birth certificate) to record many of the items appearing on the manufacturer's line set tickets. The Equipment Master Record Form allows for consolidation of data from all manufacturers into a uniform format.

Equipment Vocation Codes: Code Key 1

Each piece of equipment must be clearly identified as being assigned to a specific mission, identifiable within the VMRS coding system. To this end, TMC has expanded these codes to meet additional equipment user needs. Using Code Key 1, for example, allows linehaul costs to be identified and separated from pickup and delivery and/or other equipment assignments.

Code Key 1 identifies the primary activity or vocation to which a unit has been assigned—"what the equipment does." Additional codes are available through TMC for those equipment operations that do not fall into the following categories. What follows is a sampling of codes that appear in Code Key 1.

Code	Equipment Activity
10	Linehaul (non-refrigerated)
11	Combination Service (predominately linehaul, non-refrigerated)
12	Linehaul (refrigerated)
13	Combination Service (predominately linehaul, refrigerated)
20	Pickup and Delivery (non-refrigerated)
21	Combination Service (predominately pickup and delivery, non-refrigerated)
22	Pickup and Delivery (refrigerated)

23	Combination Service (predominately pickup and delivery, refrigerated)
30	Billing and Collecting
40	Platform
50	Terminal / Warehouse / Plant
60	Maintenance
80	Insurance and Safety
90	General and Administration
A1	Airport / Airport Support / Ground Support Vehicles
B1	Construction
C1	Farm / Agriculture
D1	Fire Service
E1	Heavy Haul
F1	Logging
G1	Mining
H1	Oil Field
L1	Refuse / Recycle Vehicle
M1	Rescue / Crash Vehicle
N1	Utility
P1	Wrecker / Recovery Vehicle
Q1	Military Vehicle
S1	Earth Moving / Land Clearing
T1	Demolition
U1	Public Transportation
V1	Construction - Redi-Mix

Combinations of Code Keys can be used as a numerical sentence to describe various aspects of labor or equipment. For example, Code Keys 1, 2, and 48 can be used together to generate a single code that describes what the equipment does, what it is, and what special body type it has.

"1-10-185" identifies a truck (Code Key 2), used in pickup and delivery service (Code Key 1), with a special walk-in refrigerated van type body (Code Key 48). VMRS 2000™ calls these numerical sentences "Instructional Sets."

Reason for Repair Codes: Code Key 14

Identifying what caused a piece of equipment to come in for repair is essential to proper equipment management. VMRS provides for the segregation of this activity in one of the three following areas:

1. **Maintenance**—This represents all monies spent on equipment to keep it operational, and could be used to affect management's decision to purchase that piece of equipment again. Monies spent in this category directly influence the replacement decision.
2. **Management Decision**—This category identifies and isolates all monies spent which are neither the equipment's nor manufacturer's fault and over which management has direct control. An example would be the cost of adding new logos onto a piece of equipment.
3. **Outside Influence**—Those items, over which neither the manufacturer nor the user have direct control, are classified in this category.

Under VMRS, each of the major groupings listed previously is further subdivided into a series of specific "Reason for Repair" codes.

Maintenance

Code	Item
01	Breakdown
02	Consumption, Fuel
03	Consumption, Oil
04	Driver's Report
05	Routine Inspection
06	Lubrication
07	Pre-Delivery
08	PM
09	Rework
10	Road Call
11	Routine

Management Decision

Code	Item
21	Capital Improvement
22	Conversion
23	Modification
24	Special Study

Outside Influence

Code	Item
31	Accident, Non-Reported
32	Accident, Reported
33	Manufacturer's Recall
34	Statutory Inspection
35	Statutory Modification
36	Theft
37	Vandalism
38	Warranty
39	Natural Causes
41	Abuse of Equipment
42	Decommissioned / Sold

Work Accomplished Codes: Code Key 15

Classifying the work performed by the mechanic is important. For example, there is considerable difference between inspecting, adjusting, or repairing brakes. The original VMRS Codes Committee determined, and rightfully so, that use of such terms as major and minor would not suffice, as these terms left too much interpretation to the user. As a result, a series of two-digit work accomplished codes were developed. Each code specifically identifies what work was accomplished by the mechanic at the time the work was performed. The codes are briefly summarized below:

Code	Work Accomplished
01	Adjust
02	Clean
03	Replace New
04	Replace Rebuilt
05	Replace Used
06	Inspect
07	Lubricate
08	Overhaul
09	Troubleshooting
13	Other Maint. Repair
14	Install
15	Paint Prep, & Repaint
17	Add Fluids
18	Road Test
19	Rewire / Wire
20	Towing
21	Fabricate / Weld / Burn
24	Repair
25	Remove
30	Work Incomplete
31	Rotate
32	Torque
98	In Frame Overhaul
99	Out of Chassis Overhaul
A	PM Level A
B	PM Level B
C	PM Level C
D	PM Level D
E	PM Level E
F	PM Level F
G	PM Level G
H	PM Level H
O	PM Level O

VMRS System Level Codes: Code Key 31

VMRS 2000™ uses a series of three-digit descriptor codes that readily and consistently identify the specific systems involved. While these codes are the heart of the "common language" of VMRS and are a vital part of the VMRS concept, they are by themselves nothing more than coding conventions designed for use at all levels within the industry, from fleets to mechanics to manufacturers to suppliers of parts. For example, brakes are identified as a system by Code Key 31 System Code 013.

A brief listing of Code Key 31 codes follows:

Cab, Climate Control, Instrumentation and Aerodynamic Devices

Code	System
001	Air Conditioning, Heating, and Ventilating System
002	Cab and Sheet Metal
003	Instruments, Gauges (All), and Meters
004	Aerodynamic Devices

Chassis

011	Axles Front—Non-Driven
012	Axles Rear—Non-Driven
013	Brakes
014	Frame
015	Steering
016	Suspension
017	Tires
018	Wheels, Rim, Hubs, and Bearings
019	Automatic / Manual Chassis Lubricator
111	Undercarriage
112	Stabilization

Drivetrain

021	Axle Driven—Front Steering
022	Axle Driven—Rear
023	Clutch
024	Drive Shaft(s)
025	Transfer Case
026	Transmission—Main, Manual
027	Transmission—Main, Automatic
028	Transmission—Auxiliary and Transfer Case
029	Auxiliary Section (Transmission—Main, Manual)

Electrical

Code	System
031	Charging System
032	Cranking System
033	Ignition System
034	Lighting System

Engines

041	Air Intake System
042	Cooling System
043	Exhaust System
044	Fuel System
045	Power Plant
046	Electric Propulsion System
047	Filter Kits (Multi-Piece)

Accessories

051	General Accessories (for power units, trailers, etc.)
052	Electrical Accessories (for power units, trailers, etc.)
053	Expendable Items (for power units, trailers, etc.)
054	Horns and Mounting and Reverse Signal Alarms
055	Cargo Handling, Restraints and Lift Systems (for power units, trailers, etc.)
056	Power Take Off
057	Spare Wheel Mounting
058	Winch (for power units, trailers, etc.)
059	Vehicle Coupling

Equipment Dependent Attachments

061	Terminal Equipment Systems and Accessories
063	Satellite Communications Systems
065	Hydraulic Systems, Multifunctional
066	Scrapping
067	Buckets
068	Lifting
069	Conveyance
161	Sweeping
162	Spreading
163	Chipping
164	Blowing
165	Vacuuming
166	Trenching
167	Tilling
168	Mowing
169	Ripping
261	Raking
262	Breaking
263	Hammering
264	Grappling
265	Magnetic
267	Drilling and Boring
268	Pulling
269	Dust & Debris Collecting

Bodies and Vessels

071	Body (except bulk carrier body)
072	Rear Wall and Door
073	Tank Vessel, inner shell
074	Tank Vessel, outer jacket
075	Manholes
076	Rings and Bolsters
077	Trailer Frame and Support
078	Trim and Miscellaneous Hardware
079	Safety Devices
171	Mixers
172	Compaction Bodies
173	Tilt Bodies

Heating and Refrigeration

081	Heating Unit (for power units, trailers, etc.)
082	Refrigeration, Mechanical (for power units, trailers, etc.)
083	Refrigeration, Nitrogen (for power units, trailers, etc.)
084	Refrigeration, Holdover Plate (for power units, trailers, etc.)

Bulk Product Transfer Systems

091	Blowers, Conveyors, and Vibrators (for power units, trailers, etc.)
092	Compressor, Bulk Product Systems (for power units, trailers, etc.)
094	Engine, Auxiliary (for power units, trailers, etc.)
095	Manifold (for power units, trailers, etc.)
096	Power Shaft (for power units, trailers, etc.)
097	Pump (for power units, trailers, etc.)
098	Valves and Controls (for power units, trailers, etc.)
099	Safety Devices, Instruments and Gauges (for power units, trailers, etc.)
191	Batch Mobile Processing Plant
192	Conveying Systems

Assembly Level Codes: Code Key 32

Through the use of assembly level codes, VMRS provides additional capability to further define Code Key 31's System Codes. The first classification below the system level is referred to as the assembly. At this level, all major groupings within each system are broken out and reported through the use of a three digit code. These, when used with their system prefix, identify the specific assembly within a piece of equipment. For example, front brakes and drums can be identified by a combination of the System and Assembly Code 013-001. A complete listing of Code Key 32 appears elsewhere in this *Handbook*.

Component Level Codes: Code Key 33

In order to provide a common generic term for each part within a piece of equipment, the system and assembly codes are further subdivided to the component level. This is accomplished through the use of an additional three digit part identifier code. These codes should not be confused with the manufacturers' or suppliers' unique identification (part) numbers, but rather should be considered universal identifiers or generic terms for the part. For example, a front brake lining can be identified by the following combination of System / Assembly / Component codes—013-001-015. A complete listing of Code Key 33 appears elsewhere in this *Handbook*.

Manufacturer/Supplier/Brand Identification: Code Key 34

In order not to disturb either the manufacturers' or suppliers' unique numbering system, VMRS uses its own generic means of identifying manufacturers / suppliers or their brands. Two identifiers are offered: a nine-digit numeric code based on the Dun and Bradstreet "DUNS Number," and a five-character alpha code, assigned by TMC.

Both are used as a prefix to the manufacturers' and / or suppliers' unique number. It is not the intent of VMRS to supplant the manufacturers' / suppliers' unique part numbering systems, but rather to supplement them.

When a Code Key 34 manufacturer's (or brand) code and part number are used in conjunction with the VMRS System / Assembly / Component level codes (Code Key 33), precise identification of a specific part is possible on a universal basis. This commonality of identification on a consistent basis is a prerequisite to developing an industry data base for analysis of maintenance information or for mutually exchanging information on a meaningful basis. A complete listing of Code Key 34 appears elsewhere in this *Handbook*.

Technician Failure Codes: Code Key 18

VMRS has the additional capability of identifying why a mechanic or supervisor thinks a part failed and why.

An example of a technician part failure code is: 22 = Part Misaligned.

Code Key 18 is listed briefly below:

Code	Description
00	No Failure
01	Battered, Hammered
02	Burned, Scorched, Melted, Blistered
03	Crushed, Pinched, Folded, Crimped
04	Dented
05	Elongated, Stretched
06	Faded, Dulled Finish
07	Improper Fluid Level
08	Improper Electrical Value
09	Insufficient Clearance, Rubs
10	Bent
11	Binds, Sticks
12	Broken
13	Chipped, Pitted
14	Cracked
15	Foreign Material Present
16	Glazed
17	Insufficient Lubrication
18	Leaking
19	Loose
20	Lubrication or Oil Soaked
21	Misadjusted
22	Misaligned
23	Not Connected
24	Not Drilled
25	Out of Balance
26	Out of Round

27 Overheated
28 Part Improperly Installed
29 Part Omitted
30 Poor Fit, Wrong Size
31 Poor Metal Finish
32 Porosity
33 Registers Incorrectly
34 Rough
35 Rusted or Corroded
36 Scored or Scratched
37 Seized
38 Shorted
39 Soiled or Stained
40 Stripped / Cross Threaded
41 Torn, Punctured or Split
42 Warped, Twisted
43 Weak
44 Worn
45 Wrong Part
46 Lost or Missing
47 High Pressure
48 Low Pressure
49 Cut or Rubbed
50 Hard or Brittle
51 Inoperative
52 Leaking Air
53 Leaking Compression
54 Leaking Exhaust
55 Leaking Fuel
56 Leaking Oil
57 Leaking Refrigerant
58 Leaking Water
59 Moisture, Condensation
60 Noisy
61 Oil Passing
62 Improper Fabrication
63 Improper Weld
64 Plugged
66 Vibration
70 Underspray
71 Overspray
72 Peeled, Flaked, Bubbled
73 Orange Peel
74 Runs, Sags
75 Thin Paint or Unpainted
80 Underinflated
81 Flat
82 Needs Repair
83 Mismatched Height / Tread
84 Irregular Wear
85 Curbed
86 Brake Skid
87 Chain Damage
88 Vehicle Mechanical Damage
94 Leaking Coolant
95 Reprogram
96 Primer Peeling from Part
97 Paint Peeling from Primer
98 Wrong Color
99 Replaced Before Failure

Summary

In summary, there are nine basic, integral parts to VMRS 2000™, each interrelated to the other. Independently they cannot be considered VMRS any more than a chassis by itself can be considered a truck. VMRS, by its very concept, requires complete integration of all elements in the same manner that all parts of a piece of equipment must be considered when reviewing the entire piece of equipment. The basic VMRS elements are:

1. The VMRS Equipment Master Record—an equipment birth certificate.
2. Code Key 1: Equipment Vocation Codes—used to identify the specific work assignment of the piece of equipment.
3. Code Key 14: Reason for Repair Codes—used for segregating repair expenditures.
4. Code Key 15: Work Accomplished Codes—used to denote what tasks were performed to the piece of equipment.
5. Code Key 31: System Level Coding—used to identify equipment systems.
6. Code Key 32: Assembly Level Coding—used to identify equipment subsystems.*
7. Code Key 33: Component Level Coding—used to identify equipment components.*

   *SPECIAL NOTE: If coding to the assembly or part level is exercised, no substitution or deviation of coding structure is permitted.

8. Code Key 34: Manufacturer / Supplier / Brand Code—used to identify the actual manufacturer / supplier or brand of a given part.
9. Code Key 18: Technician Failure Code—used to record the technician's / supervisor's best estimate as to why a specific component failed.