

MDC Information Technology Standard**MRC-3.301-1**

Machine Readable Code (MRC) for:

Approved: 05-15-94

Last Rev. 03-15-95

Page: 1 of 18

Shipping Label - Basic

Author: MRC Self-Directed
Work Team**SUBJECT: BAR CODED SHIPPING LABEL STANDARD for Unit Loads and Transport Packages (Basic Label)****A. SCOPE**

1. This Machine Readable Code Standard specifies the requirements for bar coded shipping labels. It establishes the requirements and instructions for printing and placement of bar coded shipping labels on all supplier shipments.
2. This requirement applies to all suppliers of material, supplies or components. These products require specific identification and handling to facilitate correct part usage and traceability & storage.
3. All sections of this document define minimum requirements. Any increased supplier controls deemed necessary by a supplier for the successful implementation and control of the process shall be instituted and maintained, if necessary for successful implementation.
4. This MRC shall be used when specified by an authorized McDonnell Douglas Corporation (MDC) purchase order document.
5. Suppliers may use any materials, solutions and instructions that result in meeting the requirements of the MDC and industry standards documents listed in Section C.

B. DEFINITIONS

1. Bar Code Symbol - Code 39 (also known as Code 3 of 9) used as specified by ANSI/AIM-BC1 Uniform Symbology Specification - Code 39.
2. Shipment - An incremental delivery for one part number, purchase order number (PO), work order number (WO), and item number.
3. Quiet zone - The area before the first character and the area following the last character. A quiet zone is required before and after a bar code symbol.

4. Human readable characters - A readable interpretation of the bar code symbol characters, without the data identifiers or the start/stop (*) characters. This interpretation shall appear directly above the bar code symbol.
5. Bar Code Character - A bar code character is composed of vertical elements (dark bars & light spaces). A Code 39 bar code character has nine vertical elements, five bars & four spaces. Three of these nine elements are wide, and the other six are narrow.
6. SCAC - Standard Carrier Alpha Code. All major carriers (land, air, sea) have a SCAC code, which is assigned through the National Motor Freight Traffic Association. (Telephone No. 703-838-1810).
7. PRO number - The unique progressive (PRO) tracking number used by a commercial motor freight carrier. The total number of positions used and the format of the number will vary depending on which carrier is used.
8. Airwaybill number (AWB) - The unique tracking number used by a commercial air freight carrier.
9. Electronic Data Interchange (EDI) - Computer - to - computer communication of data in a standard business format.
10. ASN 856 - An advanced ship notice transmitted via computer - to - computer relating to the specifics of a shipment.
11. ANSI - American National Standards Institute is an organization which creates and maintains national standards in the United States.
12. Data Identifier - A specified character, or string of characters, that defines the intended use of the data element that follows. The data identifier will be the alphanumeric identifiers as defined in ANSI MH10.8.2.
13. SUFFIX - Numbers added to some P.O. numbers, by the MDC buyer at some MDC components, which indicates information about the transaction. (Note: These suffix numbers will eventually be phased out of use.)

C. APPLICABLE DOCUMENTS

1. Suppliers shall comply with the latest revision of the following documents:

MRC-3.301-1 Bar Coded Shipping Label Standard for MDC Unit Loads and Transport Packages (Basic Label)

ANSI MH10.8M Unit Loads and Transport Packages - Bar Code Symbols (Shipping Label)

(Revised and Published as MRC-3.301-1, Dec. 15, 1996, Page 2)

ANSI MH10.8.2	Data Application Identifier Standard
ANSI X3.182	Bar Code Print Quality - Guidelines
ANSI/AIM-BC1	Uniform Symbology Specification - Code 39
ICC NMF101 Series	Standard Multi-Modal Carrier and Tariff Agents codes (SCAC-STAC); National Motor Freight Traffic Association, Inc. (NMFTA) and Association of American Railroads, Transportation Division (AAR)

D. MATERIAL & SPECIAL EQUIPMENT - Producing Bar Code Labels

1. Create a bar code label with a personal computer (PC), a printer and software.
2. Use your existing hardware/software to meet this MRC requirement. It is required that only thermal transfer label printers, laser printers, or ink jet printers be used.
3. When a supplier is unable to create these labels themselves, the supplier may procure them from an outside source.

E. REQUIREMENTS - For Shipping Label Approvals

1. All shipping labels shall require a first sample approval.
2. After the suppliers bar code labels have been approved, suppliers shall bar code all future shipments to those MDC locations identified on the face of the purchase/work order.
3. Suppliers shall provide bar coded labels that meet this Process specification and MDC shall alert suppliers of any label non-conformance. Quality is an important aspect of any bar code system. When labels cannot be decoded quickly and accurately, the advantages of bar coding are lost.
4. Suppliers shall maintain a review process to ensure that the labels meet the requirements of this MRC. Equipment is available to verify that bar code labels meet requirements. It is recommended that suppliers perform verification audits in conjunction with statistical process control to assure label quality.
5. A quality bar code scan shall be achieved when a bar code is read with three or fewer attempts using a wand-type scanner or two or fewer attempts with a laser scanner. These requirements apply when the scanners are being used in accordance with correct operating procedures as specified by the scanner manufacturer.

F. SHIPPING LABEL REQUIREMENTS - By Rows (or blocks)

1. The basic bar code label is the minimum requirement for a shipping label and shall be used for all shipments from suppliers. Refer to Figures 1, 2 and 3 on Pages 13, 14 & 15 for label and bar code examples.
2. Labels shall have black lines, lettering and bar codes printed on a white background.
3. The basic label shall contain a minimum of eight rows. Each row shall contain specific information as identified per the following paragraphs.

Note: All human readable characters shall be no less than 0.10 inch (2.54mm) in height and shall be upper case characters.

4. ROWS ONE and TWO

- 4.1 The top two rows shall contain only human readable print and shall be full width.
- 4.2 The first row shall contain the full name and address of the supplier and the weight of the packages/boxes used for shipment.

Note: The first row shall be divided with a vertical line, to separate the weight of the packages from the name and address of the supplier.

- 4.3 The second row shall contain the "deliver to" name and address for shipping to a MDC facility (including the address, building number, floor and column / post location).

5. ROW THREE

- 5.1 The third row shall contain the commercial carriers preassigned SCAC code and PRO or AWB number. If the supplier is delivering the parts via the suppliers truck, then enter "NONE" (for the SCAC) and the date the parts will be shipped (for PRO or AWB #). See also Table 1.

Note: Date of shipment entered shall be six characters (i.e. 062196). The first two characters shall be the month, the third and fourth characters shall be the day and the fifth and sixth characters shall be the year.

- 5.2 When MDC trucks / vans are used for pickup and delivery the SCAC code shall be "-MDC" and the PRO number shall be the "expected date of shipment" as specified by the Note in paragraph 5.1 and as shown in Table 1.

- 5.3 When commercial carriers are used for pickup and delivery, the Standard Carrier Alpha Code (SCAC) for the carrier (see Table 1) and the PRO number used to track the shipment shall be entered.

Note: Preassigned freight bills / airway bills can be obtained from the carrier specified on the purchase document.

CARRIER SCAC & PRO # EXAMPLE: **EWCF2473764172**

"EWCF" is the SCAC code and "2473764172" is the PRO number

TABLE 1

EXAMPLES OF SOME CARRIERS' SCAC, PRO # & BAR CODE

<u>CARRIER</u>	<u>/</u>	<u>SCAC</u>	<u>PRO #</u>	<u>BAR CODE DATA</u>
Airborn	/	AIRB	123456	12KAIRB123456
Burlington Air Express	/	-BAE	228 874 590	12K-BAE228874590
Consolidated Freightways	/	CFWY	925-219752	12KCFWY925-219752
Dart International	/	DINL	(use date; MMDDYY)	12KDINL010297
DHL		DHLX	12345	12KDHLX12345
Emery Worldwide a CF Co	/	EWCF	2473764172	12KEWCF2473764172
Federal Express	/	-FDE	324-0846 046	12K-FDE324-0846046
MSAS Cargo Intrntnl. Inc		MSAS	125-12341234	12KMSAS125-12341234
(Supplier Delivers)	/	NONE	(use date; MMDDYY)	12KNONE010297
McDonnell Douglas Truck	/	-MDC	(use date; MMDDYY)	12K-MDC010297
Roadway Express	/	RDWY	8280192131	12KRDWY8280192131
Roadway Packaging System		RPSI	123 456 003 439 2	12KRPSI1234560034392
South Coast Transportation		SKST	12345678	12KSKST12345678
Viking Freight Systems	/	VIKG	758331011	12KVIKG758331011
UPS Consignee Billing	/	UPSN	C345 0692 017	12KUPSNC3450692017
UPS Next Day Air	/	UPSN	1Z 486 371 01 0232 0140	12KUPSN4863170102320140
UPS 2nd Day Air	/	UPSN	1Z 486 371 02 0232 0140	12KUPSN4863710202320140
UPS Groundtrac	/	UPSN	1Z 486 371 03 0232 0140	12KUPSN4863710302320140

(Where UPS uses "1Z" prefix, the "1Z" is dropped & not included in this bar code.)

Notes: If a SCAC code is "less than four positions", then a hyphen(s) (-) shall be used in the first position(s) in order to keep the SCAC at "four positions".

The "12K" is a "data identifier" and is appended to the SCAC and PRO # data in the bar code symbol. (Ref. Table 2.)

P.O. BAR CODE EXAMPLES:

PO # + ITEM # = **14KU12345+001**

"14K" is the data identifier
 "U12345" is the purchase order number
 "+" is the data separator
 "001" is the item number

PO # + SUFFIX + ITEM # = **14K5BR123456+-9A+01**

"14K" is the data identifier
 "5BR123456" is the purchase order number
 "+" are the data separators
 "-9A" is the suffix number (**if applicable**)
 "01" is the item number

- 6.4 The work order (WO) number shall be assigned by entering the work order "contract" number, a suffix (**if applicable**) and the item number as stated on the work order. The WO number shall be entered on the fourth row of the shipping label.

Note: For these Labels the WO number will be treated the same as a PO number. (Ref. Para. 6.3 and Figure 1.)

W.O. BAR CODE EXAMPLES:

WO # + ITEM # = **14K12345-54321+01**

"14K" is the data identifier
 "12345-54321" is the WO contract number
 "+" is the data separator
 "01" is the item number

WO # + SUFFIX + ITEM # = **14K12345-54321+0001+01**

"14K" is the data identifier
 "12345-54321" is the WO contract number

"+" are the data separators
 "0001" is the suffix number (**if applicable**)
 "01" is the item number

7. ROW FIVE

- 7.1 The fifth row shall contain the suppliers packing list number or invoice number as a record of transaction. This information shall be entered on the fifth row of the shipping label. If the packing list number exceeds nine characters, then only the last nine characters shall be included in the bar code. If packing sheet forms are not used, then enter the date of shipment. (as specified by the Note in para. 5.1.)

PACKING LIST # BAR CODE EXAMPLE: = **11K12345678**

"11K" is the data identifier
 "12345678" is the "supplier's Packing List No."

8. ROW SIX

- 8.1 The sixth row shall contain two fields of data; the number of packages / boxes, and the description of the item (e.g. **1 / 9** and **FASTENER**).

Note: 1 = box number 1 of a total of 9 boxes. FASTENER is the item description.

OF BOXES BAR CODE EXAMPLES: = **13Q1/1 , 13Q1/9**

"13Q" is the data identifier
 "1/1" is "box 1 of 1 box" being shipped
 "1/9" is "box 1 of 9 boxes" being shipped

9. ROW SEVEN

- 9.1 The seventh row shall contain the quantity (QTY) and unit of measure (UOM), as defined by the purchase order, which is always two characters (e.g., each = EA). The quantity and the UOM shall be combined in a single line with no data separators.

QTY & UOM EXAMPLES: **5EA, 2FT, 125LB**

QTY & UOM BAR CODE EXAMPLES: = **7Q5EA , 7Q125LB**

"7Q" is the data identifier

"5" and "125" are the quantities
 "EA" and "LB" are the units of measure

Note: The UOM "EA" is preferred, but "PC" will be accepted.

10. ROW EIGHT

10.1 The eighth row shall contain the part number **exactly as specified** on the MDC Purchase Order.

PART # CUST. BAR CODE EXAMPLES: =

P520100-2 , P40021184 , P68A123456-1001

"P" is the data identifier
 "520100-2" , "40021184" , "68A123456-1001" are the part numbers

Note: If the purchase order is for material that is called out by description and / or by size, and there is no "real part number" -- then this bar code field is "left blank".

11. ADDITIONAL ROWS

11.1 Additional bar coded rows may be included on (or added to) the Bar Code Label if required. (See Figure 4 on Page 16)

Note: Any additional rows must follow ANSI standards MH10.8M and MH10.8.2 and be by mutual agreement between MDC and the Supplier.

Some possible additional bar coded rows are listed below and shown on Figure 4 on Page 16.

11.1.1 A Supplier Part Number.

11.1.2 A Serial Number.

11.1.3 A Lot or Batch Number.

11.1.4 Unique Package Identification Number, or a Supplier I.D. plus a Package I.D. Number (combined).

12. CAUTIONS:

12.1 When formatting the data in the bar codes, all alpha characters shall be "upper case" only. Do not interchange a numeric "zero" (0) with an alpha "oh" (O), or a numeric "one" (1) with a lower case alpha "el" (l).

12.2 Do not add or include unnecessary "space characters" (or "blanks") in the bar codes.

G. LABEL FORMAT - Size

1. The label shall have a minimum height of 5.5 inch (140mm) with horizontal lines separating the rows or blocks. The supplier of the label shall determine the height based upon printer technology and the requirements of this document.
2. The label shall have a minimum width of 4.0 inch (102mm) and be capable of containing all the information in each row. The supplier shall determine the width based upon printer technology and the requirements of this document. (See Figures 1, 2 and 3 on Pages 13, 14 and 15.)

H. BAR CODE CHARACTERISTICS

1. The width of the narrow elements (bars & spaces) and the "intercharacter" gaps shall be .010 inch (.254mm) to .017 inch (.432mm). The ratio of wide elements to narrow elements shall be 2.4:1 to 3.2:1.
2. A quiet zone (or clear area) is required before and after a bar code. The bar code shall not start or stop within 0.25 inch (6.35mm) of the edge of the label. No other information, lines or marking shall appear within 0.25 inch (6.35mm) on either end of the bar code.
3. The height of the bar code shall be 0.4 inch (10.2mm) minimum to 0.5 inch (12.7mm) maximum.
4. Each label shall contain a title for all of the pieces of data. The title shall be upper case (capitals) and have a height of no less than 0.10 inch (2.54mm) and shall be in the upper left hand corner of the row or block containing the data.
5. The preferred shape of the human readable data, including the interpretation of the bar code, is Optical Character Recognition - A (OCR-A), but any font with characters (upper case alpha characters) no less than 0.10 inch (2.54mm) in height will be acceptable.
6. Bar code symbols shall comply with ANSI X3.182. They shall be measured at B660 nanometers (nm) and shall meet the following:
 - 6.1 Print contrast signal greater than 75 percent.
Minimum print quality grade shall be C/10/660.
 - 6.2 Minimum reflectance difference greater than 37.5 percent.

- 6.3 Inspection wave length 660 (+ or - 10) nanometers.
- 6.4 Aperture measurement shall be 0.010 inch .
- 6.5 Code 39 (3 of 9) per ANSI/AIM-BC1. The FULL ASCII character set shall not be used. CHECK CHARACTERS shall not be used.

I. DATA IDENTIFIERS (DIs)

1. Each bar code shall begin with a "data identifier".
2. The data identifiers are per ANSI MH10.8.2 and as specified in this document.
3. The data identifiers (DIs) used on the shipping labels shall be as specified in Table 2.

Note: The data identifiers (1P), (S), (1T), (3S) and (19S), shown in Table 2 below, are possible (not mandatory) additions to the bar code label.

TABLE 2

DATA IDENTIFIERS (DIs)

<u>DI</u>	<u>TITLE</u>	<u>BAR CODE DATA</u>	<u>HUMAN READABLE</u>
(12K)	SCAC & PRO#	12KEWCF228874590	EWCF228874590
(14K)	PO # + ITEM#	14KU12345+001	U12345+001
or (14K)	PO + SUFFIX + ITEM	14K5BR123456+-9A+01	5BR123456+-9A+01
(11K)	PACKING LIST #	11K(supplier's pkg. list no.)	(supplier's pkg. list no.)
(13Q)	# OF BOXES	13Q1/9	1 / 9
(7Q)	QTY AND UOM	7Q5EA	5EA
(P)	PART # CUST.	P520100-2	520100-2
<i>Possible, but not mandatory additional bar code fields may be as follows.</i>			
(1P)	PART # SPLR.	1P(supplier's part no.)	(supplier's part no.)
(S)	SERIAL # SPLR.	S(supplier's serial no.)	(supplier's serial no.)
(1T)	BATCH # SPLR.	1T(supplier's batch no.)	(supplier's batch no.)
(3S)	UNIQUE PKG. ID	3S(splr's. assigned pkg. ID)	(splr's. assigned pkg. ID)
or (19S)	SPLR. ID + PKG. ID	19S(splr's DUNS # + pkg. ID)	(splr's. DUNS # + pkg. ID)

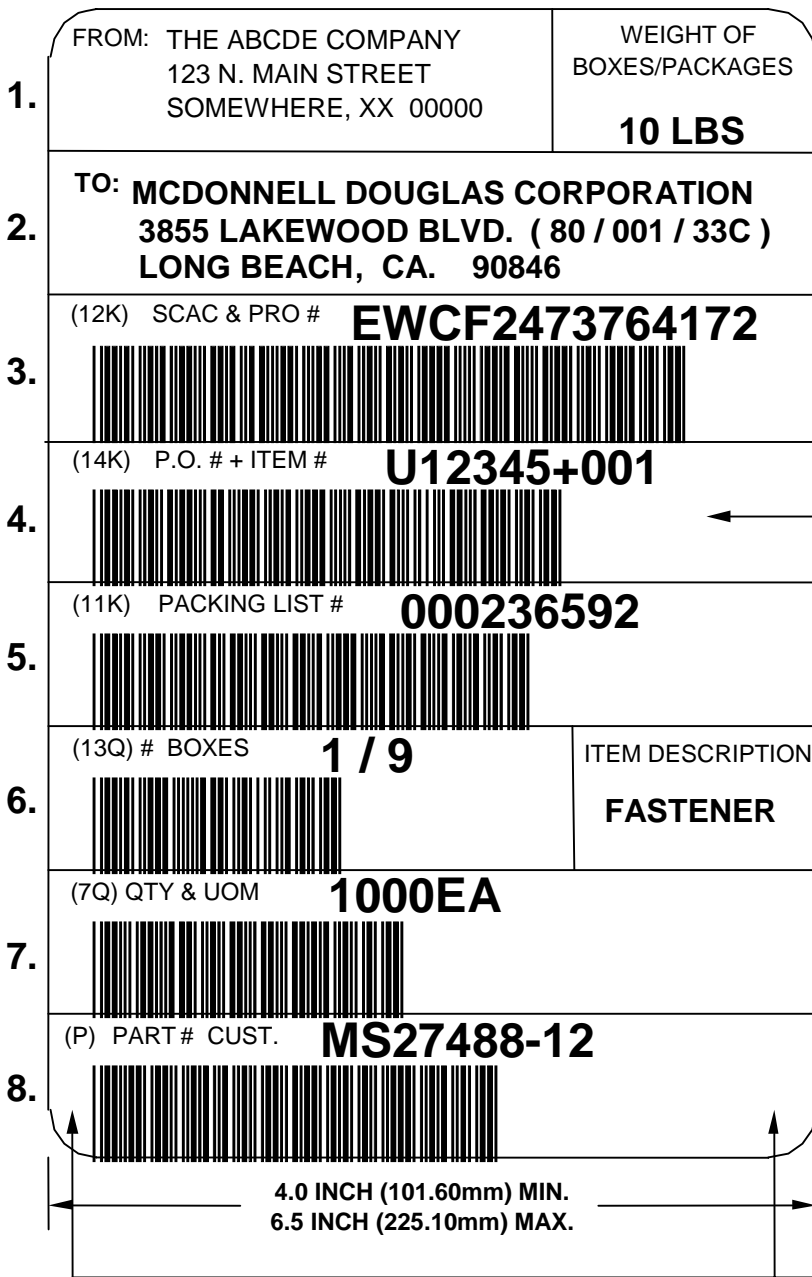
Note: Do not encode the parenthesis () in the bar code.

J. LABEL LOCATION & PROTECTION

1. A label shall be located and affixed to the outer shipping container (box 1 of x) and a duplicate shall be attached to the packing sheet. When shipping more than one container per purchase order, the bar code label shall be applied to the container marked "1" of the total count. For example, if one order consists of three boxes (all the same part numbers), the containers shall be marked "1 of 3", "2 of 3", "3 of 3" and the bar code label indicating a total quantity of all three boxes shall be applied to the container marked "1 of 3". The remaining boxes shall be identified in a legible manner with the purchase order number, part number, and packing list number marked on each package or box.
2. Multiple purchase orders consolidated into one shipping container shall be individually packaged and properly identified.
3. All boxes shall be large enough so that the bar code label can be affixed to the side of the container. The bar code label shall not wrap around the edge of the container.
4. The label shall be affixed to an upper corner of a container. The leading and trailing edge of the quiet zones shall be at least 0.25 inch (19.05mm) away from all edges of the container.
5. All packaged items shall have the label or tag affixed with the label placed in an easily accessible location with the following consideration. (See Figure 5 on Page 17.)
 - 5.1 Survivability of the label or marking.
 - 5.2 Scanning front / top / side, etc.
 - 5.3 Label affixing.
 - 5.4 Container type and multiple labels.
 - 5.5 Labels shall be protected against moisture, weathering, abrasion or other harsh environments and remain scannable.
 - 5.6 Labels shall be applied wrinkle free.
6. For returnable containers or reused transport packages, care shall be taken that any previous labels have been removed. If removal is not possible, previous labels shall be completely obliterated. Ensure that previous labels do not affect the readability of the new labels.

K. QUALITY ASSURANCE PROVISIONS

1. Acceptance Inspection - Inspect as necessary to verify conformance to the requirements of this MRC.
2. Nonconformances - Process nonconformances in accordance with standard practice.



.75 INCH - 1.0 INCH
(19.05mm - 25.4mm)
Typical 8 places

ROWS 1 and 2 - Display full name and address in human readable print. Include (bldg. no. / level / col. or post) location when shipping to MDC facility

ROW 3 - Display SCAC for the Carrier and the carrier's assigned shipment PRO no. (identification/tracking no.)

ROW 4 - Display P.O. # + Item #
The number of characters and the format of the P.O. # can vary. The (+) symbol is used as a data separator.

ROW 5 - Display Packing List number. If this number exceeds 9 characters, only the last 9 shall be bar coded.

ROW 6 - Display the # of Boxes, packages or containers used for shipping each item. The (/) symbol is used as a data separator.

ROW 7 - Display QTY & UOM (unit of measure). The UOM shall always be 2 positions. (e.g. EA, FT, LB, etc.) No "space" characters or data separators between QTY and UOM.

ROW 8 - Display the Part Number. This Part Number shall be exactly as it is specified on the MDC P.O. If there is no part number (only a material size / description) then leave this field blank.

These areas are referred to as the "quiet zones" of the bar code. The quiet zones are "clear areas" and should be at least 0.25 inch (6.35mm) on both ends of each bar code symbol.

FIGURE 1
BASIC LABEL



ROW 4 - Display P.O. # + SUFFIX Item # (when applicable). The number of characters and the format of the P.O. # can vary. The (+) symbols are used as data separators.

FIGURE 2

WHEN SHIPMENTS ARE FOR "WORK ORDERS" (instead of "purchase orders")

4. 

ROW 4 - Display W.O. # + Item #
The "hyphen" (-) is part of the WO # on Outside Manufacturing WOs. There is no Suffix. The (+) symbol is used as a data separator.

Outside Manufacturing Work Orders (495)

4. 

ROW 4 - Display W.O. # + SUFFIX Item # . On Service & Supply contracts, the "contract item #" will always be the "suffix". The Item # used in this bar code will always be "01". The (+) symbols are used as data separators.

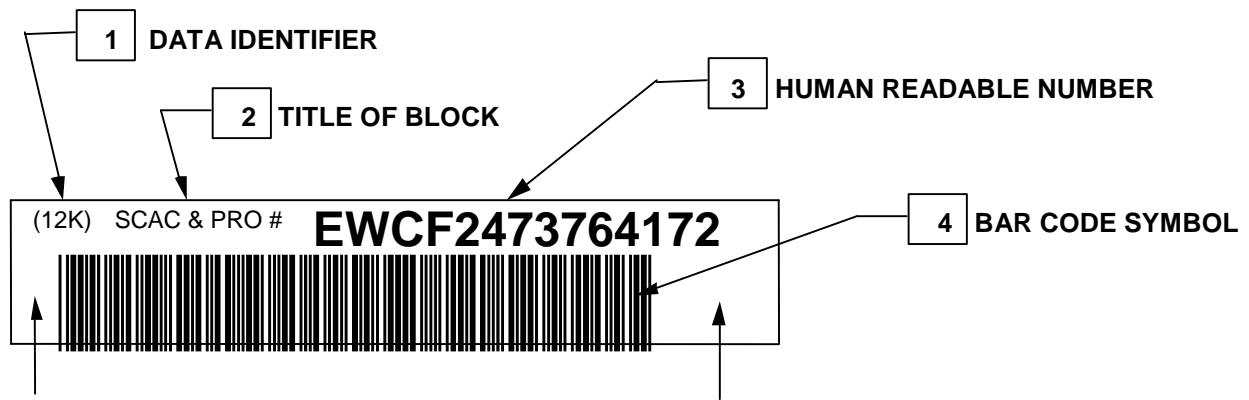
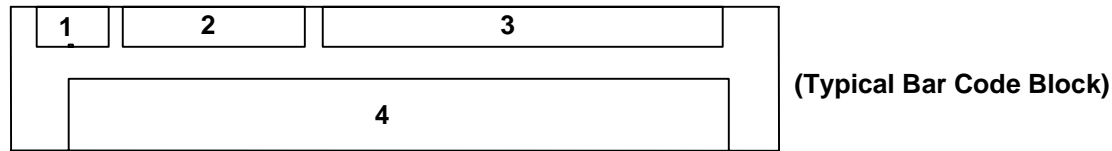
Service & Supply Contract Work Orders (424)

4. 

ROW 4 - Display W.O. # + SUFFIX Item # . Sometimes WO Service Agreements have more than 1 Item, a Bar Code Label is required for each Item. The (+) symbols are used as data separators.

Work Order Service Agreement (494)

FIGURE 3
TYPICAL LAYOUT OF BAR CODED ROWS/BLOCKS



These areas are referred to as the "quiet zones" of Bar Code. Quiet zones are "clear areas" on both ends the Bar Code symbol, and for optimum scanning should be at least 0.25 inch (6.35mm).

1 DATA IDENTIFIER Each Block shall begin with the proper Data Identifier(DI) as specified by this MRC. The DIs are in accordance with ANSI MH10.8.2 Standard. The parenthesis () are not part of the DI and are not included in the BarCode.

2 TITLE OF BLOCK Each Block shall be appropriately Titled as shown on this MRC.

3 HUMAN READABLE NUMBER The Human readable number shall not include the start stop (*) character of the BarCode or the DI prefix.

4 BAR CODE SYMBOL The BarCode symbol should be left justified in the lower half of block and quiet zones must be maintained as shown.

IF it is required to include a Bar Code(s) for a “SUPPLIER PART No.”, a “SERIAL No.”, a “LOT” or “BATCH No.”, and/or a “UNIQUE PACKAGE ID No.” or a “SUPPLIER ID No. + a PACKAGE ID No.” – they are to be added at the bottom of (or following) the Basic Bar Code Label as shown below.

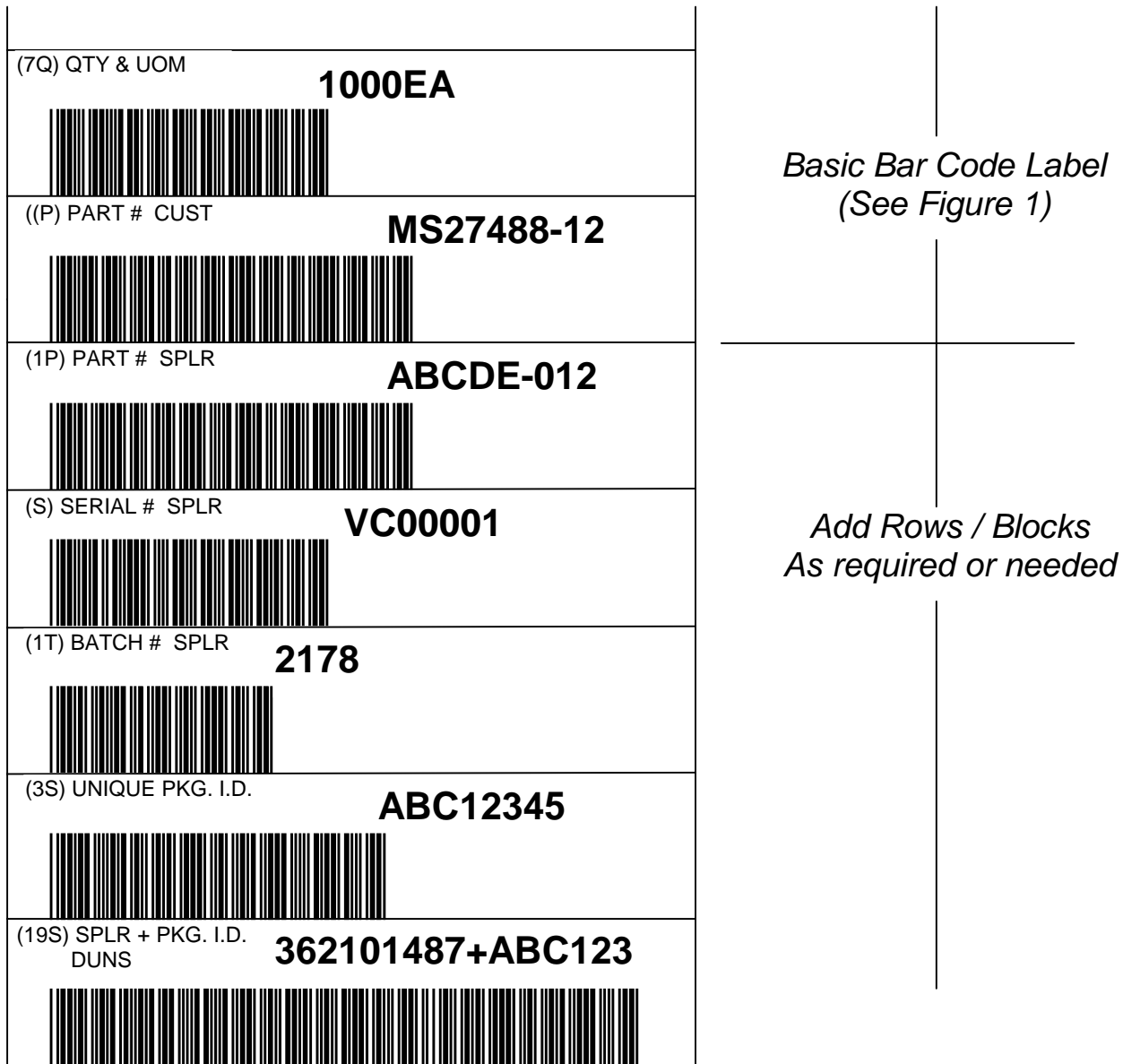
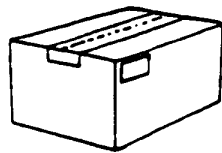
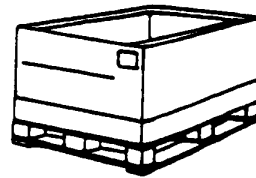


FIGURE 4

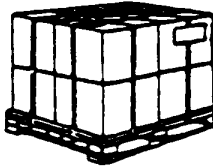
Possible Additions to the Basic Bar Code Label



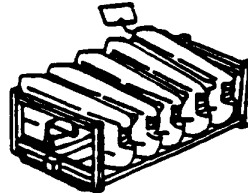
BOX OR CARTON
 LABEL SHOULD BE LOCATED ON UPPER CORNER.



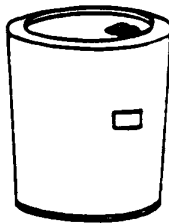
PALLET BOX
 LABEL SHOULD BE LOCATED ON UPPER CORNER.



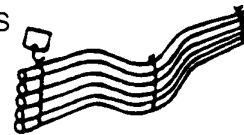
CARTONS ON PALLET



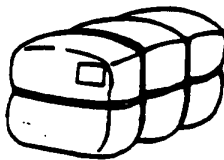
RACK
 TAG WITH LABEL ON ONE VISIBLE PIECE NEAR TOP.



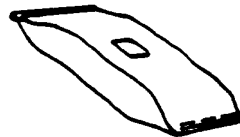
DRUMS, BARRELS, OR CYLINDRICAL CONTAINERS
 LABEL SHOULD BE LOCATED NEAR CENTER AS SHOWN.



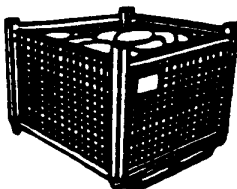
BUNDLE
 TAG WITH LABEL SHOULD BE LOCATED AT ONE END.



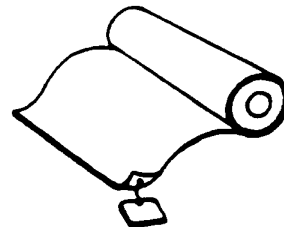
BALES
 LABEL SHOULD BE LOCATED ON UPPER CORNER.



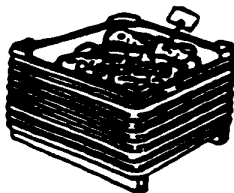
BAG
 PLACE ONE LABEL AT CENTER OF FACE.



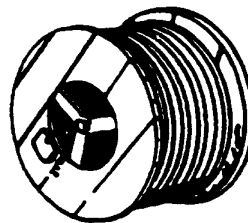
BASKET, WIRE MESH CONTAINER
 LABEL SHOULD BE LOCATED ON UPPER CORNER.



ROLL
 HANG TAG WITH LABEL NEAR END OF MATERIAL AND IF WRAPPED, ON OUTER WRAPPER.



METAL BIN OR TUB
 TAG WITH LABEL ATTACHED TO ONE PIECE IN TOP OF BIN.



CABLE REEL
 PLACE A LABEL ON A TAG ATTACHED TO THE START END OF THE CABLE AS SHOWN.

LABEL LOCATION
FIGURE 5