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Abstract

The era post-WWII to the 1970s was a period in which those who were hired at a job at a young age often held it to the age of retirement. The company's pension plan was granted if service exceeded ten years. OEM companies, or Original Equipment Manufacturers, of different natures were positioned to grow and compete in domestic and international markets.

But today, many OEM companies are not well-established because of rapidly changing technologies, burdensome bureaucratic fees, and quick-exiting employees.

It is an idea, conceived by a person or a group of people, that passes proof of concept and beta testing to become a viable product for use by the world! In order for a start-up or small OEM company to grow and compete, it is necessary to cultivate innovation, embrace talent, and instill cooperative effort to reach both its short-term and long-term goals. Every employee must feel energetic towards contributing 100% effort, and must be wholly acknowledged. A sound philosophical business plan can include fun times too! After all, an employee is at the workplace 1/3 of the day!

Importantly, a talented person is not necessarily one who has attained a university degree. Who said, "imagination is more important than knowledge?" It wasn't me!

There are two dynamic functions within an OEM to be adhered: the *philosophy* and the *rules*. See chapters 1 and 5. (Aka: Standard Operating Procedure)

Most of the time, the engineering department is the root source of technical information. With that in mind, accurate and stable documentation management is paramount, and it is of utmost importance to keep documentation management simple and workable for ALL company departments. Here's why—as told to me by an engineering manager, "engineering must always be strategic in functioning in an offensive mode and not in a defensive mode."

The explanations in this booklet for establishing a bona fide part numbering scheme and general documentation management for an engineering department, is based on the *intelligent ID numbering system*, because this method benefits ALL departments.

There are people, including some in the engineering department, that do not favor the intelligent ID numbering system. First of all, the EZAL part numbering scheme outlined in this book is the best one that they have never seen! Second, these people are generally *'me, myself and I'* thinkers. The notion translates, "Other people's opinions are not acknowledged."

1. Introduction

This booklet is an outline to assist a start-up original equipment manufacturer (OEM) or an already established but growing OEM company that requires an efficient method to document engineering parts and assemblages, as well as a method to electronically organize other facets of the business. Others who are producing a product may find this booklet useful as well, although it is not suitable for an A/E/C company (Architectural, Electrical and Construction).

It is imperative for a manufacturer of a product to be efficient at optimizing a means of producing without compromising quality. Is this a realistic standard company philosophy?

The customer will appreciate a prompt answer to their request and on-time delivery of their order. Therefore, all employees of the company must be provided a progressive path for implementing the workflow process—engineering, to planners, to manufacturing, to accounting, to customer service. Also, accurate inventory status must be controlled and monitored regularly to meet delivery dates.

The ideas described in this booklet are based on my 48 years work journey at ten OEMs that produced food processing machinery, food packaging machinery, food service equipment, flat deck air conveyance, rock crushing machinery, and more. During this work window period, I did various tasks in both the factory and the office. Thus, my understanding of machine design procedure and the manufacturing process was elevated beyond what most others ever experience.

To maximize the profit margin and remain competitive is vital. That means the workflow process must be kept lean; not complex. Because to create another department requires to add staff, and too many departments or staff can jeopardize the profit picture and derail the long-term growth plan of the company. A thorough engineering documentation method and digital organizational filing system must be in place in order to avoid information retrieval turmoil.

Issuing two or more documents for manager's signatures should not be a requirement to purchase a new hammer or a new mop. This scenario does not benefit anyone. If this begins to happen, then the CEO, CFO, and the accounting manager must quickly be instructed to step away, because their support for a complex workflow process will hinder pedal-to-the-floor manufacturing and on-time shipments. ELIMINATE the $100.00 purchase requisition!

An employee must be able to retrieve information on-the-fly, in order to issue or forward it to the next operative stage. This is an important streamline matter for company growth, as well as survival!

Establish a documentation and organizational system that management deems will work and that all personnel will adhere to. I worked at companies in which newly hired engineers were allowed to create their own documentation system. This will surely confound employees in other departments to correctly differentiate each system created by Moe, Larry, and Curly, and cause mental aches. In the meantime, Moe, Larry, and Curly have left the company or changed careers! And you're left with egg on your face!

DO NOT allow a new employee to deviate. All employees must adhere.

2. Two Search Scenarios

Scenario 1

200 people are roaming around at a convention in the Red Room. Without signage or annunciation, you are asked to identify two people to obtain two phone numbers.

Locate Rick and Beth, of whom:

One is male . . . about age 45, 6'1", weight proportional, dark hair, wears ball cap.

One is female . . . about age 30, 5'6", slender figure, blond hair, wears glasses.

The description of the two people gives several Feature Codes (predominate physicality).

Scenario 2

200 people are roaming around at a convention in the Blue Room. Each person has their phone number printed in large size on a bib positioned on their chest. Without signage or annunciation, you are asked to identify two people by two different phone numbers to obtain their names.

Person A = 415.123.7654

Person B = 916.321.4567

Conclusion

Scenario 1 - You probably will quickly identify both Rick and Beth and then know their phone numbers within two minutes.

Scenario 2 - You will struggle many minutes long before identifying even one person and knowing his or her name.

The EZAL intelligent ID part numbering scheme will curtail time consumed by constant computer use to lookup a part or assembly to answer an inquiry.

3. Intelligent ID vs. Non-Intelligent ID

For the accounting department, any sequential non-intelligent ID part numbering method will suffice (i.e., 00001, 00002, 00003 . . .), because the accounting department doesn't care about what the item is or where it is. Generally, the CEO and CFO will side with the accounting department because neither can see the *big-picture logistics* of manufacturing.

Be aware that the CEO, CFO, and accounting manager are numbers-oriented people.

The engineering department and manufacturing department are the staple branches of the company. They create and produce.

The EZAL part numbering scheme is simply about categorizing, similar to the Dewey Decimal Classification System used by libraries, or *taxonomy,* the classification scheme used in the science field.

Imagine a grocery store that just randomly shelves foods here and there; anywhere! You will not ever return. But like the organized grocery store, an OEM must be organized too.

An employee of an OEM company should NOT ALWAYS have to rely on a computer to lookup what the part is and where it is stored. Unfortunately, some top management executives do not understand the logistics of engineering and manufacturing. They only understand shipment dates.

I base the validity of the EZAL part numbering scheme upon my direct experience as already presented. I also base my knowledge on OEMs with less than 100 employees.

Other support departments of the company will have their own documentation methodology, but there is some organizational protocol outlined in this book that could benefit these departments, too!

ASME references as "*significant* ID and *non-significant* ID" in place of the form--i*ntelligent*.

4. Engineering File Management

Accurate record keeping of operations is to evaluate the tangible elements of the product line or services of the business in order to critique the present and plan for the future. An engineering file management program that I apply for recording R&D and legacy product(s) is [redacted].

There are dedicated engineering documentation management programs. Some are imbedded in the CAD app. To me, they are cumbersome and inhibit fast hand-offs.

Note, the MS Excel program is not relevant, here. It is useful for accounting-like tasks or numeric computation, for which why it was created in the first place.

5. Rules Are Like Laws

SOP is Standard Operating Procedure. Implement rules! Rules are good for an organization. In fact, they are essential! When you drive your vehicle, there are *rules of the road*. When you break a rule, you get a citation and pay a fine, or maybe even go to jail!

I think of rules as a *disciplinary factor*. Militaries have many disciplinary factors. Manufacturing businesses should have many rules, as well. I have seen people bring their muddled home habits to the job. Consider to display several large vinyl signs on the premises.

To be courteous need not have conditions.
Thank you.

Check and check again.
An oversight can cost $ $ $.

Do not borrow a pen or pencil from someone.
It likely won't get returned!

6. Feature Code (alpha)

Every part has an obvious physicality feature. An assemblage of parts with fasteners is an obvious physicality feature. By that distinction, a specific Feature Code will be issued to define the predominate feature of a part or assemblage.

This is where the intelligent ID part numbering method begins. The Feature Code enables people in engineering, manufacturing, or order processing to quickly identify what the physicality of the part is and where the part is staged without doing a tedious search in the computer every time!

The *alpha* **Feature Code** will consist of three letters. This alpha code may be better suited as location signage in the parts room.

Feature Code (number)

The *numeric* **Feature Code** will consist of two digits. Again, a computer should not be necessary to quickly identify what the part is and where it is staged.

Information to identify where the part was made (subcontractor/vendor), and the cost to make it is where the computer becomes useful, as obviously, detailed info about the part is not put in the storage bin or on the shelf.

Objective

To allow a person who requires to investigate a part or assemblage without having to spend long minutes searching its location whether it be in the computer or the parts room. As the custodian easily knows where the broom and dust pan are staged, so should the location of any part or assemblage be easily known.

At chapter 2, I tried to illustrate the advantage of utilizing a smart system for identification.

7. FC for OEM Parts

Reference the table of feature definitions below to identify an appropriate numeric Feature Code to apply to an engineering drawing document and linked documents. See chapter 9.

FC ALPHA	FC NUMBER	NAME	PREDOMINATE FEATURE
PRT	**01**	PART 1	One item entity. Basically, one piece of bar, plate, fabric or sheet material machine crafted to a described shape. Exception is two separate pieces that are deemed a *set*. A set is drawn on the same drawing sheet. A set is pieces crafted simultaneously and match-marked or packaged together. May appear like twin parts or have variation. Do not include parts that are STP and FOR.
PAR	**02**	PART 2	Multiple item entity. A part created by affixing multiple pieces (i.e., weldment, pressed bushing, PEM nut, spring or roll pin. Or application of rivet, crimp, stake, swage, glue, etc.). Cannot unjoin with common hand tools or hammer. Exclude locker solutions here.
MOD	**04**	MODIFY	Buy article that requires modification. May be modified in-house or outsourced (i.e., sprocket, gear, coupling, motor, etc.). Still OEM identified.
OFW	**06**	OF WELDMENT	Similar to PAR and PRT but actually child to PAR top level weldment. First top line in drawing sheet title block— OF WLDMNT, _____ (or OW) Or detail as ITEM 1, (2, 3 . . .) on same weldment drawing by use of multiple sheets, possibly.
MOL	**11**	MOLD 1	One item entity. Process of injection mold, thermal/vacuum form, sand or investment casting. Include 3D print.

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FC ALPHA	FC NUMBER	NAME	PREDOMINATE FEATURE
SPC	**30**	SPECIFICATION	Description predominately by text or chart (i.e., compression spring, conveyor belt, transformer, etc.).
PCB	**32**	PRINTED CIRC BOARD	Board to which integrated circuits and other components are attached. 2D okay.
PRG	**34**	PROGRAM	Programmable Computer Logic (PLC), HMI software, etc.
SYS	**36**	SYSTEM	General plan of production or process line. Indicates footprint and/or utilities. May be used for construction or sales presentation.
LAY	**38**	LAYOUT	Accurate scaled 2D or solid model of proposed article. Created without detail. General use for R&D or sales presentation.
PIK	**40**	PHOTOENG	Photo or video specific of engineering work (i.e., R&D, FEA, testing, etc.).
PIC	**42**	PHOTOMFG	Photo or video specific of means to manufacture (i.e., weld bead, potting, safety wiring, etc.).
TEC	**44**	TECHNICAL	Engineering pictorial rendering, notation or calculation. Include hand generated document (convert .pdf).
MAN	**46**	MANUAL	Specific for manual book; mostly text for set-up, adjustment, assembly drawings and general tech literature. Photo file—ref PIK.
PRO	**48**	PROCEDURE	Standard applied to a manufacturing condition by a descriptive diagram or by written explanation. A methodology or strategic plan. SOP.

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8. General Format

The placement of the numeric Feature Code will be in the drawing sheet title block as part of the part number. Any other document related to the drawing should denote the same part number for ID.

The drawing's author or documentation clerk will issue or authorize the appropriate Feature Code number to each engineering model and drawing.

Prior to issuing a document to the workflow process, a department manager or supervisor can contest which FC is better suited for the document. Not any employee can change a FC after it has been issued.

A manual or free-hand engineering sketch for R&D shall also be issued a FC. The Feature Code will be applied in a box created by an *inked stamp*. The box should be positioned in the same area as a computer-generated drawing sheet—at the lower right-hand corner. By this method the part number will stand out. This should be converted as a .pdf file.

1. Drawing Sheet Title Block.

   A. **Refrain** use of terms for which the document relates to a specific product. Although after receiving a work order, a notation on the engineering document copy can be more specific by use of an inked stamp (e.g., work order number, quantity required, for inventory, etc.).

   B. **Refrain** specific finish. Use general term (e.g.., PAINT, ZINC, ANODIZE, etc.) A customer may elect to select something other than an OEM standard. Thus, a Work Order form shall denote the agreed finish specification. A notation on the engineering document copy for manufacturing can be specific by use of an inked stamp. Then, too, a request for a finish that is not OEM standard may not be acceptable; price increase.

2. Database Preference

Equally critical to the accuracy required to record this important data, is the means. At chapter 4, I recommend a software program specific for recording OEM engineering and inventory data. There are other robust EDMS (engineering document management system) and MRP (materials requirements planning) programs. However, many are cumbersome as well as pricey.

3. Customer Work Order History

Each customer work order should consist of a top-level Parts List in hardcopy form. Include notations and references of custom parts. Place all hard copies of the customer work order *history* in a 3-ring binder or manila folder for the specific job accomplished. This will allow a tech person or sales person to access the pertinent information about what a past customer actually acquired and answer a request from someone with firm in-hand evidence. See chapter 19.

9. Part Number Scheme

Several years ago, companies drew many different parts on one sheet of vellum. Thus, established was a part number for each part and a different drawing number for the sheet! A rather bizarre method unless vellum was in very short supply.

Today, one OEM part is described on a drawing sheet, and the part number and sheet number are one and the same.

Organizing engineering drawing documents by an orderly method based on a simple scheme will allow for quick processing of an inquiry, work order or sales order.

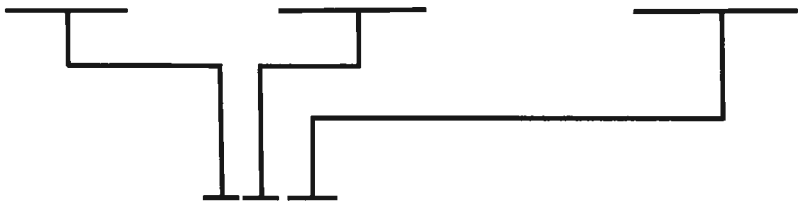
The four basic terms for defining an engineering drawing document's ID are:

1. -
2. -
3. **Revision** initial release by – (dash) located in the **REV** box of the drawing sheet. *
4. **Description** words may be separated by a comma in the drawing title block. But use the underscore as space for the computer filename.

1. Basic Part Number

Each engineering-related document will have a unique number assigned. The number on the document will be referred to as the part or drawing number, or the document ID number; all references are the same.

Basic seven-digit part number designator:



noun or noun phrase adjective

* Software program people have instilled to CAD applications the letter A = first production release. It was fine the way it was; **initial release by** – (dash).

Refer to ASME Y-14.5, MIL-STD-100 or DOD-D-1000 book.

5. Configuration within Parametric Model

Warning! Keep a configured part or configured assembly non-complex. Too many variables will produce a discombobulated model. Consider making a new copy to simplify and make a new part number.

Make use of a Table with columns and rows on the drawing to display one or two variable dimensions. (two variables maximum)

Dimension variable designator (table variable; 10, 17)

Apply the letter **T** in front of the Table row's dimension variable option.

P/N **2218-001-T10** See drawing Sample 017.

Create two or three standard Tables (template or block). Consistency is best!

Do not include **both** the mirror part designator (page 12) and dimension variable designator (above) in the part number. Instead, issue two different part numbers if a part does involve the mirror part designator and dimension variable designator. Make it simple for everyone!

6. Material Options

In cases of material options. Simply list them within a two or three row table placed upon the drawing and check [X] next to the relevant row to submit for a work order. Clearly denote this to the buyer about the required material criteria. The planner probably already knows.

If units of sales are low, then this option of material choice should be avoided. Much easier to create an up/down charge on the sales contract; 10% . . . 20%.

7. Finishing Options

In cases of finishing options. To paint, chrome, anodize, passivate, etc., is an essential process. Similar scenario as material options. Guesstimate a *lot charge* based on past sales orders. Extensive time to define to the penny the charges for finishing 10, 20 or 50 different items will confound people and cause unnecessary workflow turbulence.

Unwise use of time is loss of money.

8. Old Tech

Old technologies like the rubber stamp, pin feed paper (dot matrix), carbon trace tablet, pen and pencil, ham radio, 4-color print greeting cards, etc., to me, are still viable and available. In other words, no need to be digitally punch drunk all the time. When computers and cell towers go down for a day or a week, so will the business!

11. Engineering Central and MRP Central

The primary folder for storing all engineering department related documents in the computer is named **Engineering Central**. All engineering department related documents will be under the Engineering Central - Company, City folder whether it be the in-house computer server or the global server. A primary folder may contain sub-folder(s), of course.

Refrain from creating too many sub-folders. It is likely not necessary to be so specific, as a new folder must be authorized. **No folders with employee names.**

- **Engineering Central – Jesse John Co., Campbell**
  - **Manufactured Part, OEM**
    - All OEM parts defined by a Feature Code to be placed in this **one** folder. See chapter 7 and the drawing samples. Only technical drawing and related parametric model or relevant sketch files placed here.

- **MRP Central**
  - **OEM**
    - Current Inventory count
    - Part cost history
    - Units produced/sold per 12 or 18 months
  - **Buy Out**
    - Current inventory count
    - Part delivery lead time
    - Price break
    - Units sold per 12 or 18 months
    - Vendor(s) and cost history

12. Categories for Buy Out

Listed are suggested categories for **Buy Out** articles. These categories may require altering per an OEM's specific product line. Place an article that is unique or not common in the **Other** category. Assume many of these articles will be used in a Parts List. Also, note the spread of the numbers to allow for expansion.

Consumables for use in--offices, manufacturing or facilities are not to be listed here. What are examples of indirect costs? See chapter 13.

0000 - Buy Out, Raw Material

Linear

- Angle, Metal
  - 0009-000 Architectural
  - 0013-000 Structural
- 0021-000 Angle, Non-metal
- Bar, Metal
  - 0029-000 Flat
  - 0033-000 Hex
  - 0037-000 Round (not shafting)
  - 0041-000 Square
  - 0045-000 Bar, Metal, Other
- 0053-000 Bar, Non-metal
- 0061-000 Beam, I and H
- Channel, Metal
  - 0069-000 Architectural
  - 0073-000 Structural
- 0081-000 Channel, Non-metal
- 0089-000 Conduit
- 0097-000 Duct
- Extrusion
  - 0105-000 Trim, Alum
  - 0109-000 T-Slot, Alum
  - 0113-000 Extrusion, Other
- 0121-000 Lumber, Framing

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Bulk or Volume

- 0715-000 Case
- 0723-000 Container
- 0731-000 Volume
- 0739-000 Weight
- 0747-000 Bulk or Volume, Other

1000 - Buy Out, Mechanical Transmission

- Bearing
  - 1010-000 Babbitt
  - Ball, Radial (single row or double row)
    - 1016-000 Imperial
    - 1020-000 Metric
  - 1026-000 Bronze, Sintered (plain cylindrical or flanged)
  - 1032-000 Cam or Track Follower
  - 1038-000 Cartridge (for housing; self-aligning)
  - 1044-000 Cylindrical Roller, Needle
  - 1050-000 Housed (with cartridge; self-aligning)
  - Linear
    - 1056-000 Ball
    - 1060-000 Sleeve
  - 1066-000 Rod End, Spherical Plain
  - 1072-000 Sleeve, Metal
  - 1078-000 Sleeve, Non-metal
  - 1084-000 Taper Roller (conical)
  - 1090-000 Thrust, Ball (unit or set)
  - 1096-000 Thrust, Washer
  - 1102-000 Water Pump
  - 1108-000 Bearing, Ancillary (lock sleeve, washer, nut, etc.)
  - 1114-000 Bearing, Other
- 1120-000 Chain, Bicycle
- Chain, Conveyor
  (see 4000 – Buy Out, Ancillary)
- 1126-000 Chain, Connector Link (various)

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- 1312-000 Shaft Collar
- 1318-000 Shaft Coupling
- Sheave, Pulley
  - 1324-000 Adjustable
  - 1330-000 Fixed
- 1336-000 Shock Absorber
- Sprocket
  - 1342-000 A Type
  - 1348-000 B Type
  - 1354-000 C Type (equal or offset hub)
  - 1360-000 Idler
  - 1366-000 QD Type (requires bushing)
  - 1372-000 Sprocket, Other
- 1378-000 Taper Lock Bushing (for QD sprocket)
- 1384-000 Tensioner, Take-Up Frame (for housed bearing)
- 1390-000 Torque Limiter, Overload Guard
- 1396-000 Trantorque
- 1402-000 Universal Joint
- 1408-000 Kit Spares, Mechanical Transmission
- 1412-000 Non-class, Mechanical Transmission

1500 - Buy Out, Power Source

- Air Supply
  - 1512-000 Filter and Dryer
  - 1518-000 Regulator and Lubricator
- Battery
  - 1524-000 Household
  - 1530-000 Industrial
  - 1536-000 Vehicle
  - 1542-000 Accessory
  - 1548-000 Battery, Other
- 1554-000 Blower
- 1560-000 Fan
- 1566-000 Compressor

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2000 - Buy Out, Electrical

- Adaptor
  - 2015-000 BNC
  - 2021-000 DC Coax
  - 2027-000 Phone
  - 2033-000 RCA
  - 2039-000 Serial
  - 2045-000 UHF
  - 2051-000 Adaptor, Other
- Amplifier
  - 2057-000 Distributed
  - 2063-000 Operational
  - 2069-000 Power
  - 2075-000 Transistor
  - 2081-000 Amplifier, Other
- 2087-000 Antenna
- 2093-000 Barrier Strip
- 2099-000 Bulkhead, Grip, Strain Relief
- 2105-000 Busbar
- 2111-000 Bridge Rectifier
- Capacitor
  - 2117-000 Ceramic
  - 2123-000 Electrolytic
  - 2129-000 Film
  - 2135-000 Mica
  - 2141-000 Paper
  - 2147-000 Polypropylene
  - 2153-000 Surface Mount
  - 2159-000 Tantalum
  - 2165-000 Capacitor, Other
- Circuit Breaker
  - 2171-000 Circuit Breaker, GFI
  - 2177-000 Fuse, AC
  - 2183-000 Fuse, DC

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- 2469-000 Neon
- 2475-000 Lamp, Other
- 2481-000 Laser Beam
- 2487-000 Mount, Motor
- 2493-000 Motherboard
- 2499-000 Motor Control, Soft Start, Starter
- 2505-000 PLC, Controller, Driver
- 2511-000 Potentiometer
- 2517-000 Power Supply, Voltage Convertor
- 2523-000 Power Cord, Receptacle, Plug
- 2529-000 PC Board
- 2535-000 Relay, Timer
- Resistor (apply 3-digit ohm code at center)
  - 2541-000-000 Fixed
  - 2547-000-000 Variable
- 2553-000 Servo, Stepper
- Sensor/Switch
  - 2559-000 Hall Effect, Reed
  - 2565-000 Liquid
  - 2571-000 Motion
  - 2577-000 Photoelectric, Reflector
  - 2583-000 Pressure, Thermal
  - 2589-000 Proximity
  - 2595-000 Sensor/Switch, Other
- 2601-000 Shunt Trip
- Switch, Mechanical
  - 2607-000 E Stop (emergency)
  - 2613-000 Ethernet
  - 2619-000 Limit
  - 2625-000 Micro
  - 2631-000 Rotary
  - 2637-000 Timer
  - 2643-000 Toggle, Push Button
  - 2649-000 Switch, Mechanical, Other

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4000 - Buy Out, Ancillary

- Accessory, Modular Frame (joint piece, bracket, etc.)
  - 4010-000 T-Slot
  - 4016-000 Unistrut
  - 4022-000 Pipe
- 4030-000 Burner, Igniter
- 4038-000 Camera
- Chain, Roller, Double Pitch (conveyor)
  - 4046-000 No Attachments
  - 4052-000 With Attachments
- 4060-000 Chain, Agricultural, Drop Forged, Welded, etc. (conveyor)
- 4068-000 Chain, Other (not drive)
- Cylinder, Hydraulic
  - 4076-000 Double Acting
  - 4082-000 Single Acting
- Cylinder, Pneumatic
  - 4090-000 Double Acting
  - 4096-000 Single Acting
- 4104-000 Cylinder, Rodless
- 4112-000 Cylinder, Mounts
- 4120-000 Heat Element, Electric
- 4128-000 Hot Melt Glue System (auto dispense machine)
- 4136-000 Lead Screw and Nut (acme thread)
- Light, Alarm
  - 4144-000 Alarm, Buzzer, Horn
  - 4150-000 Beacon, Stacked Light
- 4158-000 Line Vacuum
- 4166-000 Linear Actuator
- 4174-000 Lip Seal, Oil
- 4182-000 Lubricator, Drip
- 4190-000 Lubrication System
- 4198-000 Packing
- 4206-000 Rotary Actuator

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- ❑ 5387-000 Tape, Adhesive (not office film tape)
- ❑ 5395-000 Washer w/ Shoulder or Bushing (electrical insulator)
- ❑ 5403-000 Wire, Binding, Safety
- ❑ 5411-000 Wheel & Tire
- ❑ 5419-000 Zerk Fitting
- ❑ 5423-000 Non-class, General Hardware

5600 - Buy Out, Fastener Hardware

- ❑ Bolt Shapes
  - ❑ 5610-000 Eye
  - ❑ 5615-000 Hanger
  - ❑ 5620-000 Hook or J shape
  - ❑ 5625-000 L or S shape
  - ❑ 5630-000 U shape
  - ❑ 5635-000 Bolt Shapes, Other
- ❑ 5640-000 Hook and Loop, Snap, Zipper
- ❑ _____ Nut, Imperial *
- ❑ _____ Nut, Metric *
- ❑ 5655-000 Nut, Other
- ❑ _____ PEM (use Penn Engineering & Mfg. Corp. part number)
- ❑ 5665-000 Rivet
- ❑ 5670-000 Screw, Anchor
- ❑ _____ Screw, Machine Thread, Imperial *
- ❑ _____ Screw, Machine Thread, Metric *
- ❑ 5685-000 Screw, Machine, Other
- ❑ 5690-000 Screw, Sheet Metal
- ❑ Screw, Wood
  - ❑ 5695-000 #10 $\leq$ Diameter
  - ❑ 5700-000 ¼ $\geq$ Diameter
- ❑ 5705-000 Screw, Other (not machine thread)
- ❑ 5710-000 Stud
- ❑ 5715-000 Thread Insert, Imperial
- ❑ 5720-000 Thread Insert, Metric

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22. Manila Folder

For 3-tab division label scheme

How do you choose which tabbed folder to use so all three tabs deplete evenly from the box?

Apply label at appropriate division tab of manila folder by the first alpha letter of the label's name.

For numerals use left tab. Numerals in front of A. File descending; front to back.

LFT TAB	%	MID TAB	%	RGT TAB	%
1 . . .	-	**H**	4.20	**R**	2.83
A	11.68	**I**	7.29	**S**	6.69
B	4.23	**J**	.51	**T**	15.98
C	5.24	**K**	.46	**U**	1.18
D	3.17	**L**	2.42	**V**	0.82
E	2.80	**M**	3.83	**W**	5.50
F	4.03	**N**	2.28	**X**	0.05
G	1.64	**0**	7.63	**Y**	0.76
		P	4.32	**Z**	0.05
		Q	0.22		

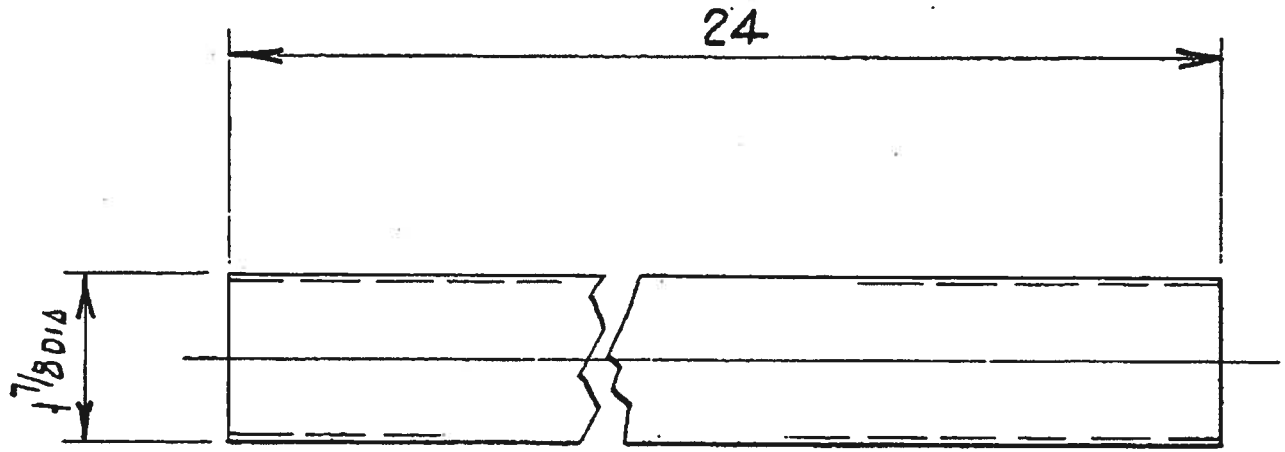
TOTAL

	32.79		33.16		33.86

Symbol **%** indicates frequency of alpha letter applied at beginning of English words

ITEM	QTY	DESCRIPTION / MAT'L	SIZE
1	1	TUBING, ROUND / DOM STEEL	1.88 x 16 GA X 24.00

PLATE



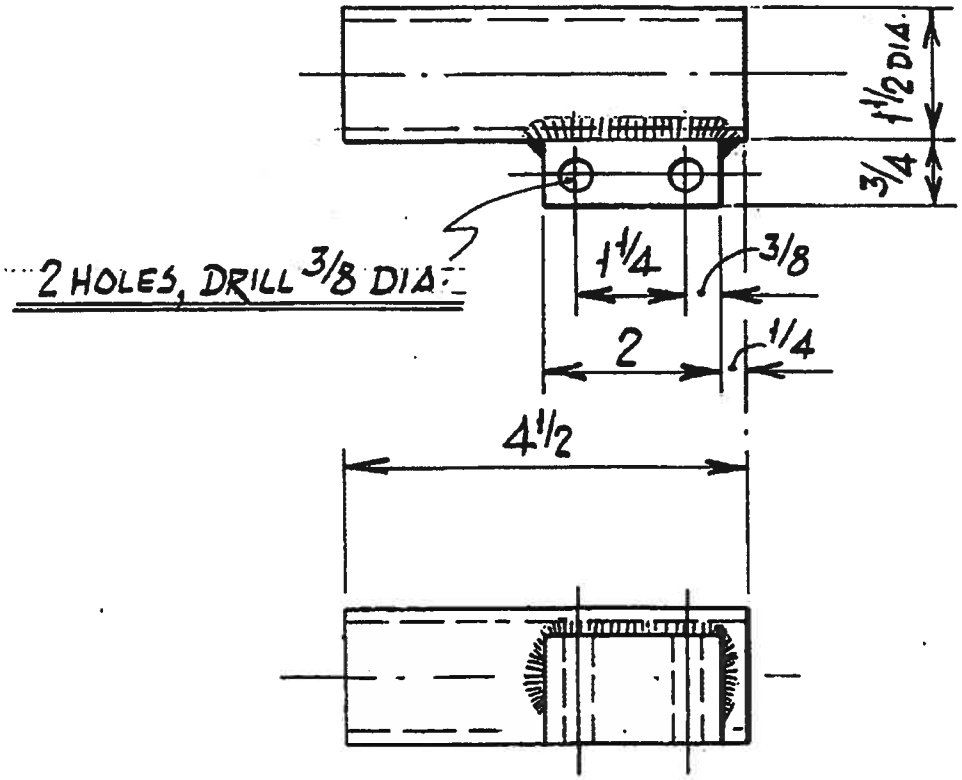
1. DEBURR OR BREAK SHARP EDGES

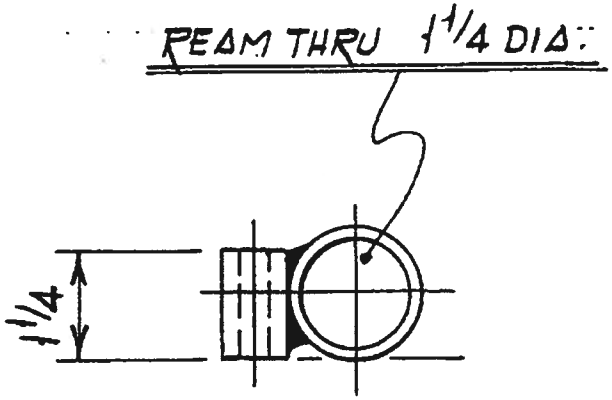
NOTES:

K&R	SAMPLE 001		
1993			
ALL DIMS INCHES	1:2	P/N –	–

ITEM	QTY	DESCRIPTION / MAT'L	SIZE
1	1	TUBING, RND / CF STEEL	1.50 OD x .13 W x 4.50
2	1	BAR, FLAT / CF STEEL	.75 x 2.00 x 1.31

PLATE





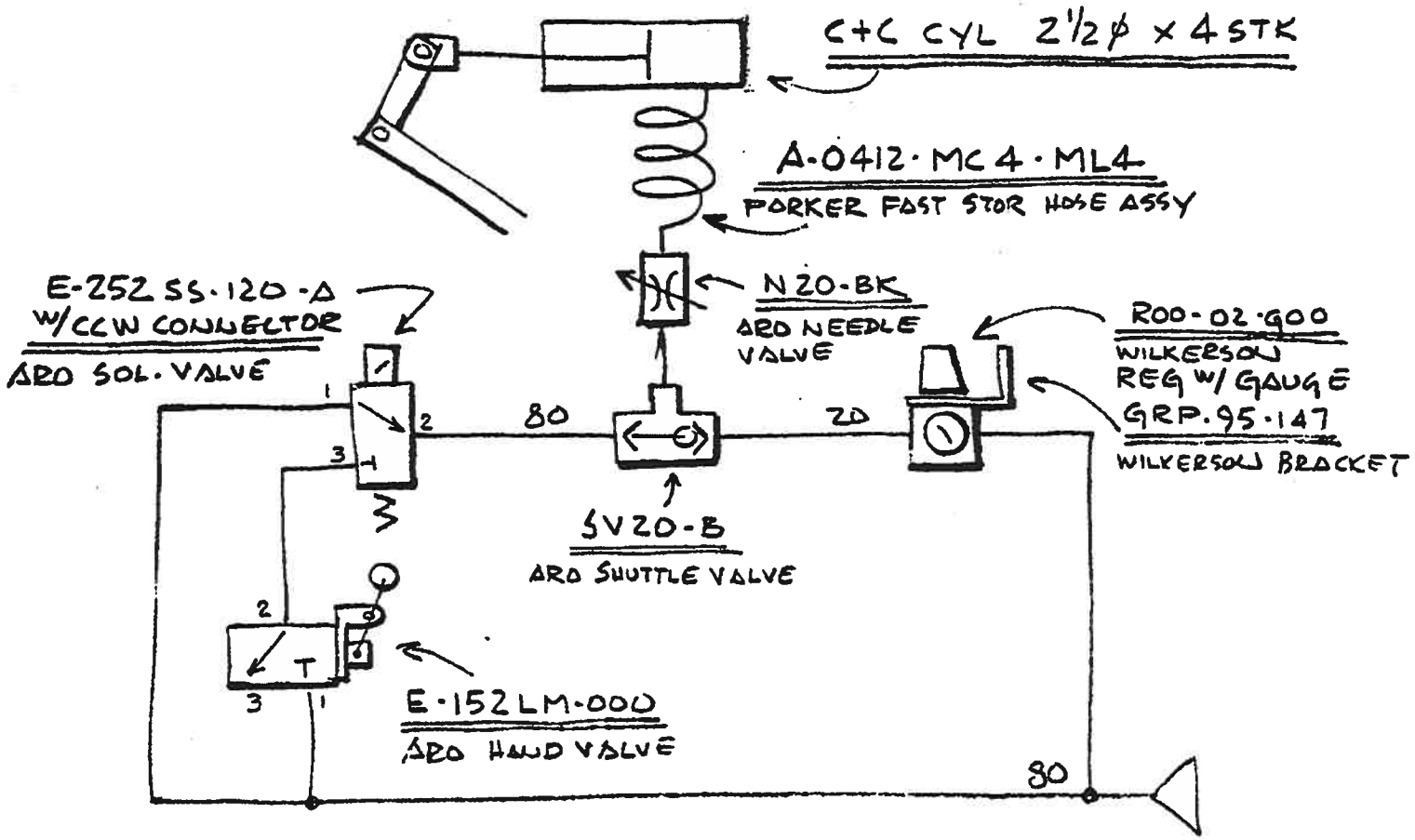
AS DRAWN -01
MIRROR OF -10

2. WELD COMPLETE BY AWS CERTIFICATION
1. DEBURR OR BREAK SHARP EDGES
NOTES:

K&R	SAMPLE 011		
1996			
ALL DIMS INCHES	1:2	P/N –	—

09

ITEM	QTY	DESCRIPTION / MAT'L	SIZE
1	1	SEE DRAWING, PNEUMATIC CIRCUIT	–



1. DEBURR OR BREAK SHARP EDGES

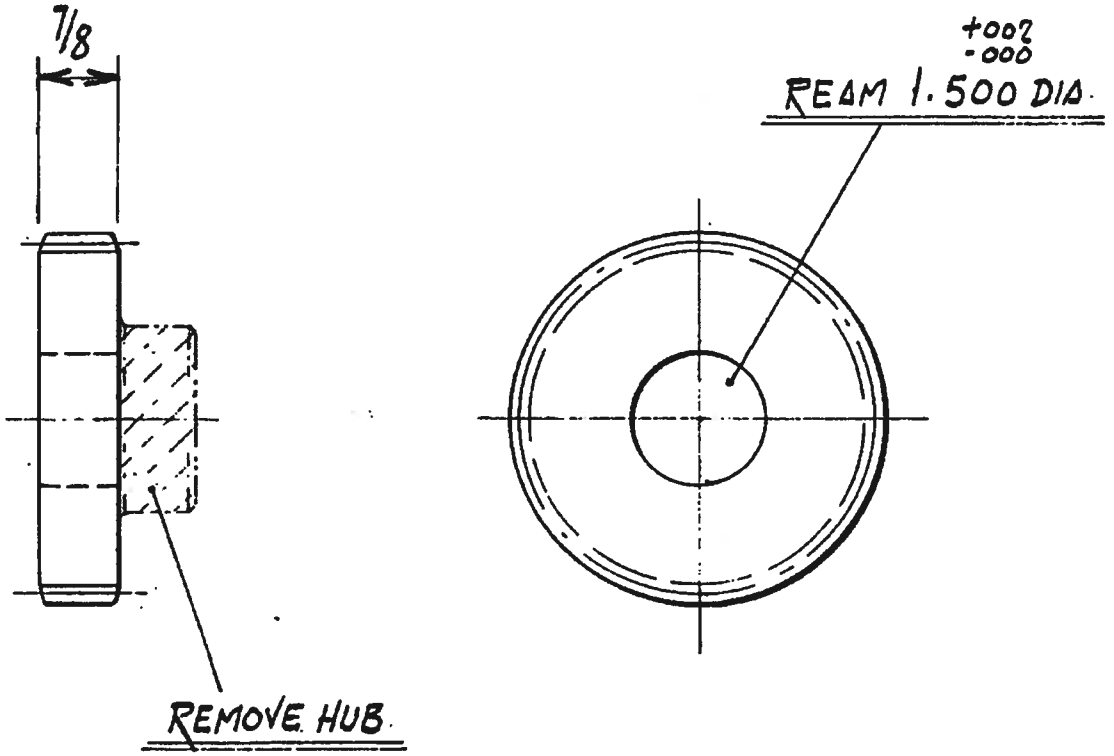
NOTES:

K&R	SAMPLE 012	
1991		
ALL DIMS INCHES	NTS	P/N –

ITEM	QTY	DESCRIPTION / MAT'L	SIZE
1	1	GEAR, SPUR / STEEL	BOSTON #NF-40

GEAR DATA

10 PITCH
40 TEETH
14-1/2° PA
4.00 PD



2. FOR USE OF .75 TRANTORQUE, STANDARD SERIES
1. DEBURR OR BREAK SHARP EDGES
NOTES:

K&R	SAMPLE 013	
1992		
ALL DIMS INCHES	1:2	P/N –