

New United Motor Manufacturing Inc. (NUMMI)

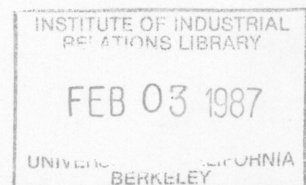
NEW UNITED MOTOR SYSTEM OF PRODUCTION and MANAGEMENT

New United Motor Manufacturing Inc. (NUMMI)



[Fremont, CA]

AUGUST 84



WELCOME TO THE NEW UNITED MOTOR TEAM

You are about to begin the New Team Member Orientation program. Study this package of material. Take notes and write your questions on the question sheet provided. Bring this material and all notes, as well as your written questions to our next class meeting.

Our New Member Orientation program is an indepth study of New United Motor, Its' Production Systems, Management Philosophy, Work Rules, Attendance Policies and Objectives.

QUESTIONS REGARDING NEW MEMBER ORIENTATION PROGRAM

SUBJECT: KAIZEN —

MUDA (waste, unevenness, overburden) —

FIVE WHYS—

FOUR "S'" --

KANBAN --

ANDON --

Work and Attendance Rules and Other Subjects --

THE NEW UNITED MOTOR SYSTEM
OF
PRODUCTION AND MANAGEMENT

I

WELCOME: WELCOME TO THE NUMMI TEAM..

II

WHAT IS NUMMI?

NUMMI is "New United Motor Manufacturing, Incorporated." We are a new, independent company established by Toyota Motor Corporation and General Motors. We are a manufacturing entity. The automobiles we produce are to be sold to the Chevrolet division of General Motors Corporation.

III

OUR GOAL:

"BETTER AUTOMOBILES AT BETTER PRICES"

As members of the NUMMI team, it is our responsibility to produce high quality automobiles at low cost. There are five essential ingredients needed to reach our goal of "Better automobiles at better prices":

1. Develop human potential.
2. Pursue maximum productivity.
3. Produce automobiles at low cost.
4. Produce automobiles of high quality.
5. Produce appealing automobiles.

Each Team Member is an important part of the process of pursuing and accomplishing our goal of "Better automobiles at better prices."

IV

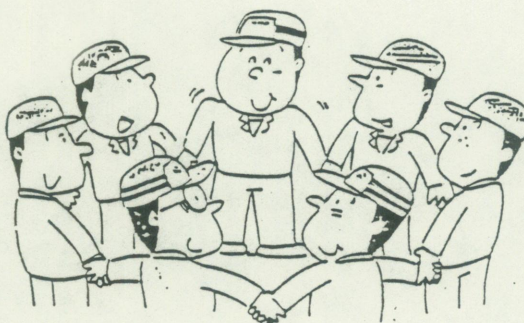
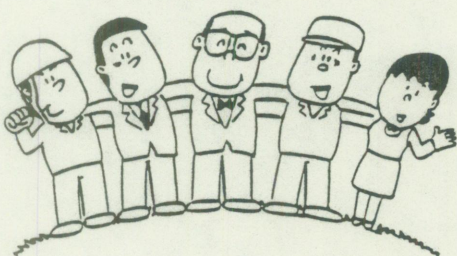
HUMAN RELATIONS PHILOSOPHY

Our NUMMI human relations philosophy will be our guide. We have broken down the barriers that have traditionally separated hourly and salaried employees. We are all members of the NUMMI team. We have structured an innovative employee relations environment built upon mutual trust. Communications are "bottom up, top down". Our environment enables hourly and salaried Team Members to work together toward our goal of efficiently producing quality automobiles at the lowest possible cost to the American consumer. "Better automobiles at better prices." It is our responsibility as members of the NUMMI team to personally commit ourselves to full involvement in our company.

Our human relations philosophy guides us in the development of our full human potential to enable us to build the highest quality automobiles at low cost by:

- . Recognizing our worth and dignity.
- . Developing our individual performance.
- . Developing our team performance.
- . Improving our work environment.

Labor / Management Mutual Trust



New United Motor Manufacturing, Incorporated (NUMMI) is designed upon the Toyota method of manufacturing. We have created a working environment built upon mutual trust between management and labor.

The company is managed through a skillful blending of top down and bottom up interaction among personnel. We motivate by instilling a positive worth ethic.

We operate on a philosophy of teamwork first. Each team operates on its own, taking full responsibility for production, quality, cost, safety and other concerns of its worksite. The individual members of a worksite team help each other as they move to reach the goals of their team.

Management has established concrete goals. It makes a point of giving the teams a full explanation of the state of the organization on a regular basis. This creates an increased understanding of the needs and requirements of NUMMI. Through interpersonal communication, the teams will readily cooperate and be flexible to changes in demand and production. The work of each team is evaluated by a management team on a regular basis. It is essential to have highly motivated teams that work to achieve a high quality performance level. It is necessary that team members share their wisdom, skills and energies to correct the problems of unevenness, overburden, and waste through the practice of Kaizen.

V

KAIZEN: The Search for Constant Improvement

Each team member must have pride and confidence in being an expert in automobile manufacturing. It is the responsibility of all team members to increase their efficiency and productivity.

The attitude of every team member can best be expressed through the slogan "Good Thinking", "Good Products". Each member must practice Kaizen. Each successful improvement will lead to a better quality product at lower cost.

It is our responsibility as members of the NUMMI Team to incorporate Kaizen thought and practice into our daily lives. Our personal future and the future of our company depends upon us as individuals and as members of the NUMMI team to perform Kaizen daily. We must remember NUMMI is Kaizen-- Kaizen is NUMMI. The Kaizen philosophy is the cornerstone to a profitable and successful company. In order for the company to succeed, team members must improve their worksite operations through implementation and modification to achieve efficiency and quality at lower cost. It is each team member's responsibility to seek constant and continuous improvement by eliminating waste, unevenness, overburden and safety hazards.

The first step to worksite Kaizen is to analyze the situation. Determine what improvements are needed. Look for the four problem areas; waste, unevenness, overburden and safety hazards.

Each team member must ask himself, "Is there waste?"

- a. Waste: due to defective parts.
- b. Waste: due to correcting parts.
- c. Waste: due to over production.
- d. Waste: of work or handling that does not contribute to the product.
- e. Waste: of motion. Any human or machine movement that does not add value to the product.
- f. Waste: of waiting. Waiting for material, product or a machine to finish a process.
- g. Waste: of inventory, any unneeded or extra parts or unplanned storage.

Each team member must ask himself, "Is there unevenness?"

- A. Unevenness: Is worksite job cycle equal? Does one side of the operation workload have more or less movements than the other in order to complete the job cycle.
- B. Unevenness: of uniformity; do all operators perform the same operation the same way?
- C. Unevenness: of stock or material placement; are excessive steps needed to get to stock or material different from other side of same operation.
- D. Unevenness: of tools and equipment. Are the placement of tools or equipment to perform the operation set in unequal or awkward positions.

Each team member must ask himself, "Is there overburden?"

- A. Overburden: of parts and tools: Is holding ten bolts in the left hand and the torque gun in the right. hand overburden?
- B. Overburden: of machines; is a machine processing six parts overburden?

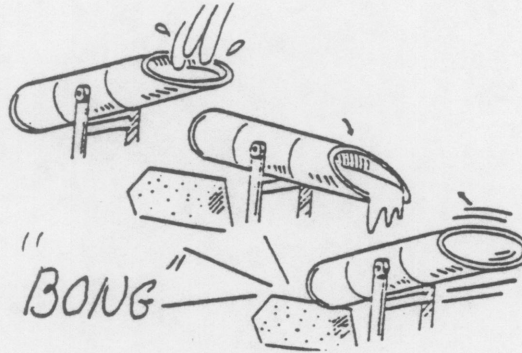
Each member must ask himself, in any given situation, "Is this a safety problem?"

- A. A machine leaking oil from a pressure hose.
- B. A punch press machine going through its hit cycle without the operator having touched the controls.
- C. Oil on the floor of operator's work area.

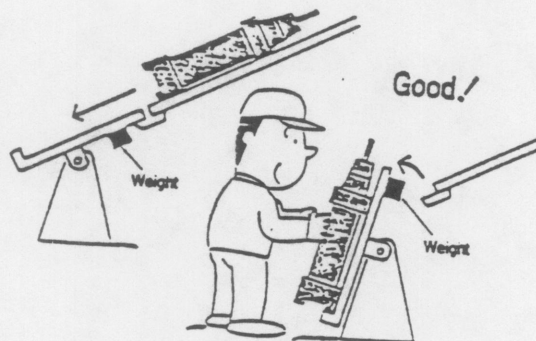
Each team member is obligated to meet with his Team Members and Team Leader and discuss what he has discovered at the worksite. The team member with the improvement suggestion will describe to the best of his abilities (verbally, in writing, in diagrams, or all three ways) the problem and his solution. Each team member is encouraged to give input in solving the problem. Improving and correcting worksite problems can't always be accomplished by one person. In most cases, it takes the joint effort of the team. Example, team member A operates a welding process where he had to pick up an assembled unit at the bottom of a chute.



While on vacation in Japan, he saw an old device made of bamboo, used to scare off wild boar, with water flowing into a bamboo pipe filled to a certain level. The weight of the water automatically tilted the pipe over, spilling the water. The heavy bottom bamboo pipe then tilts back empty and strikes a rock, producing a sound to scare away the wild boar.



Upon returning to the plant, he proposed his idea to his team. Member A could not write well. Member B wrote the proposed solution. Member C figured it out mathematically. The team leader drew the diagram. The group leader assisted engineering in the design of this time and health saving apparatus. The group leader wrote the new work standards and approved the operation. Team member A will receive a suggestion award for a time, safety and labor saving suggestion. Team members B and C will receive assistance awards.



Through this simple example, you can see how Kaizen works. The example demonstrates (1) The elimination of waste. (The wasted effort used in bending down to pick up the part). (2) The elimination of overburden. (3) Safety: the possibility of future major back problems. There is also the possibility of time being saved, which in the long run, could be value added to the completed product.

VI

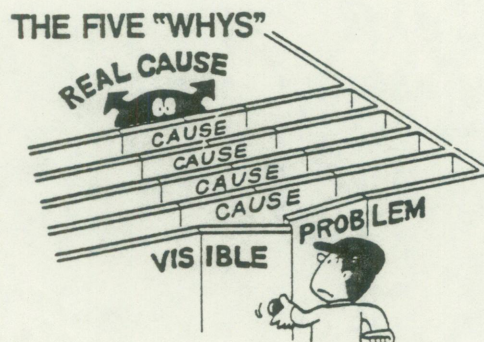
THE FIVE "WHYS"

We at NUMMI never ask just one question, "Why a situation has occurred." We ask five whys. We ask the five whys in order to arrive at the root cause of a problem. We have adopted this philosophy of problem solving from the Toyota Production System, "The Five Whys."

There are two ways of repairing defective machinery and equipment:

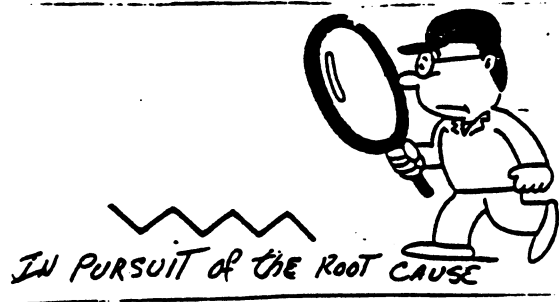
- (1) Emergency corrective measures.
- (2) Corrective measures to prevent recurrence.

Both methods are at times necessary. Under emergency conditions, corrective measures may have to be accomplished. If we only rely on emergency measures and allow that to be our standard, we will continue to have the same problem repeating itself. By our using the Toyota STANDARD RECURRENCE PREVENTION COUNTERMEASURES, we fully investigate possible causes of defects by asking the five "whys".



We begin asking the "five whys" once we discover the visual problem. Through the process of working backwards from the visual problem we ask why, why, why, investigating the cause and effect until we discover the root cause of the problem. Example: A pump burned out - why?

There were metal filings in the bearings - Why? The filter screen was not on the filter - Why? Because it fell off and was at the bottom of the coolant basin - Why? The nut that secures the filter fell off - Why? The maintenance man did not put a lock nut on the filter.



Recurrence prevention countermeasures accompanied with the "five whys" is an indispensable method of maintenance. It ensures built-in quality and provides an efficient and safe worksite environment.

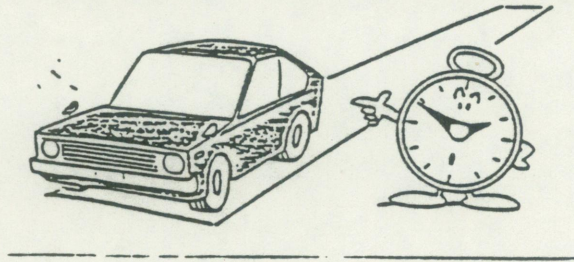
VII

"TAKT" TIME

It is crucial to the success of NUMMI's production systems to produce only what is necessary. Overproduction must be controlled. In order to achieve this, we have utilized the Toyota concept of "Takt" time. "Takt" time refers to how many minutes and seconds are required to produce one part (unit of product).

TAKT TIME

The Minutes and Seconds Required
To Produce One Part, or One Unit Product



"Takt" time guarantees no overproduction.

We set exact "takt" time for each process. Each process then produces each part or segment exactly when and in the amount needed. For example; at Toyota, "takt" time is set according to the number of customer orders for Corollas per month at the rate of 20,000 units. Based on twenty operating days a month, then 1,000 Corollas must be produced each day. Eight operating hours each day amounts to 480 minutes, thus one Corolla must be produced every 0.48 minutes.

It is important to remember "takt" time is the measurement of actual time it takes to produce one unit of product. We exclude waiting time, walking time, and time that does not add to the actual product.

Example: "fender liner installation". The chart describes the elemental break down of the operation. The total cycle time is 180 seconds.

	Return tools to bench	- 60	
*	Install screws to fender liner	50	
		40	
*	Install fender liner	30	
		20	
		10	
*	Install screw grommets (7 pcs.)	- 60	
		50	
		40	
	Return to job	30	
	Go to bench for tools	20	
		10	
*	Temporary intallation of material	- 60	
	Carry material to job	50	
		40	
	Walk to material rack	30	
		20	
	Read manifest	10	Ten second intervals

You can see by the chart that only 80 seconds are actually used in the installation of the fender liner. Those 80 seconds will be the "takt" time of this specific operation. The reading of the manifest, the time it takes to go to the material rack, the time it takes to carry material to the job,

the time it takes to go to the bench for screws and tools, the time to return to the job, and the time it takes to return to the bench is not "takt" time. "It does not add to the product". Your job is to continuously work for reduction and elimination of these non-productive elements of a job cycle. This is Kaizen.

VIII THE FOUR "S's"

Another of the Toyota management philosophies we at NUMMI have adopted is the utilization of the four S's: "Seiri", "Seiton", "Seiso", and "Seiketsu".

"Seiri" means clearing. Get rid of the things that are not needed. Waste, extra storage bins, is waste. More than just enough parts for production is waste. More than enough material and tools needed to do the operation is waste.

"Seiton" means arrangement. All tools, parts, materials, machines and equipment must be arranged in a utilitarian manner with a place for everything and everything in its place.

"Seiso" means to sweep, wash and clean.

"Seiketsu" is the result of the practice of the four S's.

In order to increase quality and productivity, each team member has the responsibility to maintain a clean and efficient worksite. The practice of good housekeeping is everyones job, a clean work site makes work easier, healthier and safer. Housekeeping is an ongoing process. It is not an after production catch up project. "If you drop it - pick it up! It is your responsibility to keep a clean and orderly worksite, with everything in its place, and a place for everything".

Smoking is not permitted in the aisles, nor at the worksites. Smoking areas will be designated, and this is the only area where it will be permitted.

Food and beverages are not allowed to be consumed at the worksite, nor in the products we manufacture. There are designated areas provided for the consumption of food and beverages.

The possession and reading of newspapers, magazines, books, and pamphlets are prohibited at the worksite, and in the products we manufacture. Each member of the NUMMI Team will be provided with a complete list of work and attendance rules. It is your obligation to follow these rules. These and all shop rules will be strictly enforced.

IX

KANBAN:

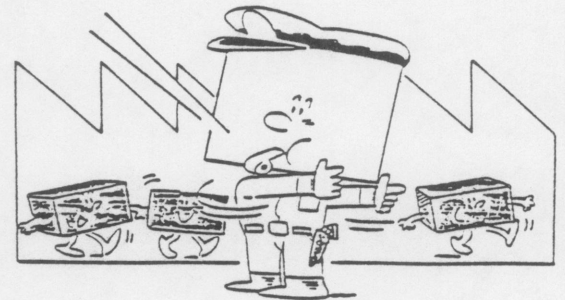
The control tool that insures that each process makes and conveys only what is needed, when it is needed, in the amount needed is "Kanban".

The word "Kanban" is used frequently around the world. Thirty years ago, it simply meant signboard in Japanese. The Toyota Production System has made "Kanban" famous as a system of signs and procedures that has revolutionized production efficiency.

The "Kanban" was conceived by Toyota prompted by supermarket success. The secret of success in supermarket systems is the concept of stocking only what customers actually buy. The result of applying the success of supermarket stocking systems to automobile manufacturing created the Just-in-Time Production System.

The advantages of using the "Kanban" system is that: (1) Each consecutive following process takes only what it needs, (2) Just when it is needed, (3) In exactly the right amount needed, (4) The preceeding process replenishes only what has been taken away. This prevents "waste of overproduction."

There must always be a "Kanban" with the parts as they move on to the next processes. The "Kanban provides "master instructions" for production and conveyance.



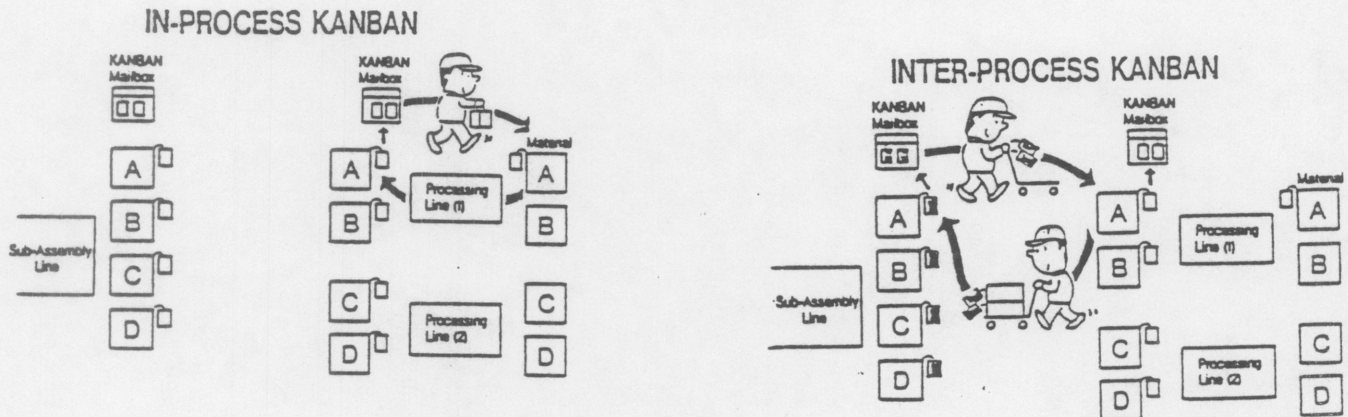
No production or conveyance is done without a KANBAN



Without "Kanban" materials, parts and products cannot be moved from processes to processes. This system guarantees no surplus.

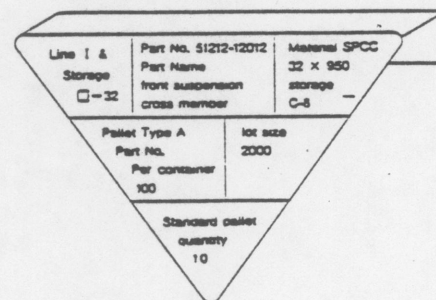
The "Kanban" is an information mechanism that explains at a glance what, when, in what amount, and what method it should be produced and conveyed. "Kanban" always move together with the parts they control. "Kanban" makes it easier to practice Kaizen. If there is a surplus, shortage or mistake, it can be spotted immediately by reading the "Kanban" and checking the parts to which it is attached.

How Kanban are used;



The information on a Signal "Kanban" includes: (1) The name of the stamping process and the storage location code for completed parts; (2) the part name and part number; (3) the materials to be processed, their dimensions and storage location code; (4) the type of pallet and the number of containers per pallet; (5) the quantity of materials processed in each lot; and (6) the standard quantity of pallets.

Signal KANBAN



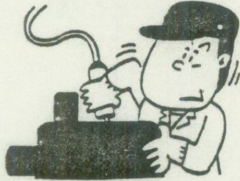
By using "Kanban" as a tool, the production system is regulated in such a way that we make exactly what is needed, when it is needed, and at the time it is needed -- "Just-in-Time."

BUILDING IN QUALITY

Insuring quality is the responsibility of each member of the team. We build in quality at each process of the manufacturing operation. At NUMMI, we use two methods that guarantee quality is built in at each worksite.

BUILDING IN QUALITY AT EACH PROCESS

- Equipment Operations
- Manual Operations



We build in quality on equipment and manual operations.

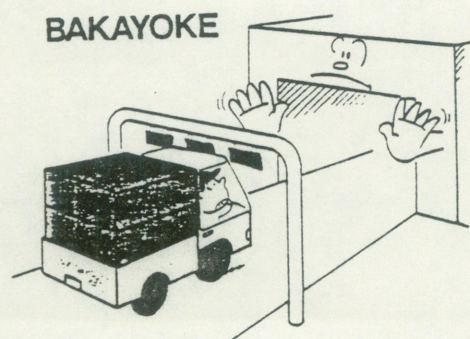
We have incorporated two quality assurance methods, "Jidoka" and "andon".

"Jidoka" has three objectives:

1. To produce 100% quality by preventing defects from being passed on to the next process.
2. The prevention of machinery and equipment breakdowns.
3. The use of manpower efficiently.

The "Jidoka" method will be applied to manual operations on the assembly line. When a Team Member discovers a problem, he uses the "andon", the electric signboard to alert the Team Leader and Group Leader by pulling the red rope for stopping the line. The fixed position stop system insures the line will remain stopped until the problem has been corrected. The "andon" board also is used for calling maintenance men to the problem area. Music may be added to make sure the problem area is noticed and corrected immediately.

In order to improve in process quality, many worksites will be equipped with one or more "bakayoke" devices.



"Bakayoke" devices are foolproof sensors that identify malfunctions of equipment and machines.

"Bakayoke" also is designed to be used as a back-up for human error. It will identify missing parts and improper assembly by rejecting the parts, thus causing the conveyor or machine to stop functioning.

XI

LABOR MANAGEMENT RELATIONS:

NUMMI and the U.A.W. strive for a wholesome and stable relationship based upon mutual trust, which can only be developed through constant dialogue. The U.A.W. and NUMMI must work together to improve conditions for all members of the NUMMI team at the worksite and in the community. This can only be accomplished through mutual cooperation. The U.A.W. and NUMMI share a common understanding that harmony and stability will create job security, productivity, and insure prosperity for each member of the NUMMI team. Sincerity accompanied with mutual trust underlines the fundamental spirit of labor management relations at all levels of the company and the union.

XII

THE NUMMI SPIRIT

The cornerstone of the NUMMI spirit is Kaizen. The daily practice of this concept of looking for ways to improve ourselves, our team and NUMMI is the number one responsibility of all of us, "as members of the team." Each Team Member must accept the obligation of cooperative, flexibility and dedication to the total team. It is the responsibility of each Team Member to support, without reservations, other members of the team. Our present and future job security can only be achieved through our individual dedication and participation in the effort of our team. It is each of our responsibility to build a quality product at low cost to our company.

If you wish to be part of the NUMMI team, you must be dedicated to the NUMMI spirit. To be willing to practice our philosophies and follow our NUMMI guidelines, our emphasis is on good thinking and good products built upon mutual trust. In order to achieve our goals, we place great importance

on conducting all worksite activities exactly. We are guided by the rules established by the team. We take a stern attitude toward infractions of these rules. Each operation is carried out according to the exact standards set by the team.

We do not accept:

1. Excessive absenteeism.
2. The use of alcohol or drugs on company property.
3. The presence of a Team Member under the influence of drugs or alcohol.
4. The presence of a Team Member with alcohol or drug hangover.
5. The misappropriation of company property.
6. The wanton destruction or sabotage of company property.
7. Physical assault upon a fellow Team Member of his personal property.
8. Poor quality workmanship after proper training.

The result of committing an infraction of these specific rules will result in the forfeiture of a Team Member's right to be a part of the NUMMI Team.

Mutual trust is the foundation of the NUMMI spirit. If you feel you can live up to our standards and have the NUMMI spirit, WELCOME TO THE TEAM!