

Submitted for recognition as an American National Standard

Implementation of Lean Operation User Manual

- 1. Scope**—SAE J4001 provides instruction for evaluating levels of compliance to SAE J4000. Component text (Sections 4 to 9) from SAE J4000 is included for convenience during the evaluation process. Applicable definitions and references are contained in SAE J4000.

SAE J4000 tests lean implementation within a manufacturing organization and includes those areas of direct overlap with the organization's suppliers and customers. If applied to each consecutive organizational link, an enterprise level evaluation can be made. SAE J4001 relates the following approximate topic percentages to the implementation process as a whole:

Element 4	Management/Trust	25%
Element 5	People	25%
Element 6	Information	} 25% (combined)
Element 7	Supplier/Organization/Customer	
Element 8	Product	
Element 9	Process/Flow	25%

SAE J4001 is to be applied on a specific component basis. Each of the fifty-two components tests part of, one, or multiples of the specific requirements of lean implementation. Implementation throughout an organization may be measured by evaluating all of the components. The level of compliance for each component relative to best practice may be used as a reference by an organization to compare itself to current best practice in establishing lean operation. Examples of current best practice are available in SAE publication RR003, Automotive Lean Enterprise Conversion Best Practice Examples.

An organization may evaluate only selected components without affecting validity of results.

2. References

- 2.1 Applicable Publications**—The following publication forms a part of this specification to the extent specified herein. Unless otherwise indicated, the latest version of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE RR003—Automotive Lean Enterprise Conversion Best Practice Examples
SAE J4000—Identification and Measurement of Best Practice in Implementation of Lean Operation

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3. **How to Survey a Component**—Certain information for each component is needed to evaluate the level at which conduct of that component is taking place. The levels of conduct are:

Level 0	The component is not in place at all or there are major inconsistencies in implementation.
Level 1	The component is in place but there are minor inconsistencies in implementation.
Level 2	The component is fully in place and effectively implemented.
Level 3	The component is fully in place, effectively implemented and exhibits improvement in execution over the past 12 months.

Each component will call for its own set of specific attributes within an organization. Levels 2, 3, and 4 conduct for a component will consist of differing specifics within different organizations. The evaluator will determine the specific component attributes for the organization being evaluated. Following each of the SAE J4000 components (Sections 4 to 9), are generic evaluation criteria for that component. After determining the applicable specific component attributes for the organization and obtaining the required information, the component is assigned a level of conduct and an explanation of the evaluator's analysis is recorded. The evaluation shall include the evaluator's written observations, including the specific component attributes determined and supporting the level assigned.

4. **Management/Trust**

4.1 **Continuous Progress in Implementing Lean Operating Methods is the Organization's Primary Tool in Pursuing its Strategic Objectives.**

- L0 Lean methods are not included as part of the organization's operating philosophy.
- L1 Advantages of lean techniques are recognized but are not a priority.
- L2 Attainment of organization's strategic objectives are dependent upon successful lean progress and are addressed as such in its operating plan.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

4.2 **Structured Policy Deployment Techniques are used to Plan the Organization's Lean Deployment Actions.**

- L0 No formal policy deployment mechanism exists.
- L1 Business planning exists within the organization but without an adequate deployment mechanism.
- L2 Policy deployment is formalized, including specific lean policy objectives, with accountability for completion and timing extending through the entire organization.
- L3 L2 plus evidence of refinement over the past 12 months.

4.3 **Lean Progress Targets are Defined and have been Effectively Communicated.**

- L0 Lean targets are not included in the organization's planning process.
- L1 Lean targets are defined but not communicated.
- L2 Lean targets are defined and included in all levels of operating targets.
- L3 L2 plus evidence of refinement over the past 12 months.

4.4 **Knowledge of the Philosophy and Mechanics of Lean Operation has been Obtained and Effectively Communicated.**

- L0 No requirement exists within the organization as to knowledge of the subject.
- L1 Informational-level knowledge is expected.
- L2 Formal, scheduled training in the appropriate lean techniques is required at all levels within the organization.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

4.5 The Organization's Senior Managers are Actively Leading the Deployment of Lean Practices—Senior managers are the senior managers on-site at the location being evaluated.

- L0 Senior management is disconnected from the operating workforce with only incidental contact; little or no direct involvement. Contact is primarily through organizational chart arrangement.
- L1 Involvement consists primarily of periodic operating reviews in large group settings.
- L2 Regularly scheduled review of team lean accomplishments, review of team-applicable sections of policy deployment plan with teams and individuals, at all levels within the organization.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

4.6 Lean Progress is Reviewed by Senior Management Against Planned Targets on a Regular Basis—Senior managers are the senior managers on-site at the location being evaluated.

- L0 Targets are not in place or progress against lean targets is not reviewed.
- L1 Lean targets are included in review process but given a low priority
- L2 Progress against lean targets is included in scheduled operating reviews, at all levels within organization.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

4.7 Meaningful Incentives that Reward Organizational Lean Progress are in Place.

- L0 No recognition of lean progress contribution exists within the organization.
- L1 Recognition of lean progress contribution is present within organization.
- L2 Members of the organization are recognized for and share directly and individually in the financial benefits of lean progress. Benefits shared are specifically attributable to lean progress within the organization.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

4.8 Individual Managers' Performance is Evaluated and Rewarded Relative to Lean Progress.

- L0 No accountability for lean progress is required.
- L1 Accountability for lean progress is an incidental part of managers' evaluation.
- L2 Accountability for lean progress is a requirement of and forms a major portion of each manager's performance evaluation and basis of reward.
- L3 L2 plus evidence of refinement over the past 12 months.

4.9 A Non-Blaming, Performance Oriented, Process-Driven Organizational Atmosphere Exists—(4.9) is a prerequisite for lean implementation.

- L0 The component is not in place.
- L2 The component is in place.

4.10 There is Regular, Direct Personal Involvement by Senior Managers with the Operating Workforce Concerning Lean Practices—Senior managers are the senior managers on-site at the location being evaluated.

- L0 Senior management is disconnected from the operating workforce with only incidental contact; little or no direct involvement. Contact is primarily through organization chart channels.
- L1 Involvement consists primarily of periodic operating reviews in large group settings.
- L2 Frequent, scheduled review of team lean accomplishments, review of team applicable section of policy deployment plan with teams and individuals.
- L3 Senior management interacts daily and directly with each level of the operating workforce. Level 3 includes personal recognition of team and individual lean accomplishment and personal instruction in lean curriculum by senior managers, to all levels of the organization.

4.11 Consistent Policy for Disposition of Individuals Made Surplus by Lean Progress is in Place and Followed—(4.11) is a prerequisite for lean implementation.

- L0 The component is not in place.
- L2 Publicized policies of workforce management are in place and being followed, with a continuing history sufficient to establish stability and believability by organization.

4.12 No Employee has Reason to Perceive their Livelihood to be Jeopardized by Contributing to Organizational Lean Progress—(4.12) is a prerequisite for lean implementation.

- L0 The component is not in place.
- L2 The component is in place.

4.13 Management has Chosen to Adhere to Lean Principles in the Face of Short Term Operating Objectives Inconsistent with Lean Progress—(4.13) is a prerequisite for continuation of lean implementation.

- L0 The component is not in place.
- L2 Choices, discernible by the organization, are made by management to preserve lean progress verses short term operating objectives.

5. People

5.1 Adequate Training Resources are Provided and Paid Employee Training Time is Made Available.

- L0 Training consists primarily of on-the-job functional training during scheduled work activities.
- L1 Opportunities for skills improvement training are available.
- L2 Formal training program is conducted. Employees are required to meet continuous, advancing training standards. Training is conducted during regular working hours or outside of regular working hours, on a paid basis. Training facility is available on site. Professional instruction is made available as a supplement to in-house instruction by organization's staff.
- L3 L2 plus evidence of refinement over the past 12 months.

5.2 The Training Syllabus includes Training in the Lean-Specific Tools and Measurables Suitable to the Organization's Needs, at all Levels within the Organization.

- L0 No lean training is offered.
- L1 The component is in place but there are minor inconsistencies in training content.
- L2 Appropriate and complete training is offered.
- L3 L2 plus evidence of refinement or improvement in execution over the past 12 months.

5.3 Training is Conducted as Scheduled, Records of Training are Kept, and Training Effectiveness is Regularly Evaluated.

- L0 Training is not scheduled, records are not kept or are inadequate or no measure of training effectiveness exists.
- L1 The component is in place but there are minor inconsistencies in training execution.
- L2 Training is scheduled, schedule is followed, records are accurate and complete, training effectiveness is measured.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

5.4 Organization is Structured to Correspond to the Structure and Sequence of the Value Chain Through the Enterprise.

- L0 Organization reports by function, without cross-functional accountability.
- L1 The component is in place but there are inconsistencies in desired structure.
- L2 Operating disciplines report according to each individual's assigned responsibility within the organization's value chain. Individual accountability corresponds to an identified section of the organization's value chain.
- L3 L2 plus evidence of refinement or improvement in execution over the past 12 months.

5.5 Each Employee Participates in the Structure as Corresponds to His Work Role.

- L0 Participation in lean progress activities is not encouraged.
- L1 Participation is incidental to work role.
- L2 Each member of the organization participates in and contributes to the lean activities being undertaken within his area of the organization.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

5.6 Labor and Employment Policies and Agreements are in Place which Allow Lean Progress within the Organization—(5.6) is a prerequisite for lean implementation.

- L0 Labor agreements and employment policies in place prohibit flexibility required for lean progress.
- L2 Agreements and policies allow lean progress.

5.7 Team Authority Level and Accountability Level is Clearly Defined.

- L0 Team organization does not exist.
- L1 Team organization in place but with indefinite authority and/or accountability.
- L2 Authority and accountability level of each team is written, understood, and followed
- L3 L2 plus evidence of refinement over the past 12 months.

5.8 Employee Development through Quality Circles/Continuous Improvement teams is Encouraged and Supported at All Levels.

- L0 Team organization does not exist.
- L1 Team organization in place but with indefinite authority and/or accountability.
- L2 A functioning, organization-wide Quality Circle/CI team system is in place with accountability for specific results identified and included in organization's operating plan.
- L3 L2 plus evidence of refinement over the past 12 months.

5.9 Team is Accountable for Continuous Improvement in its Segment of the Value Chain.

- L0 No team accountability exists.
- L2 Team accountability for specific continuous improvement results is identified and included in organization's operating plan.
- L3 L2 plus evidence of refinement over the past 12 months.

5.10 Team Decision-Making Authority and Authority to Act Corresponds to the Level of Team Accountability—(5.10) is a prerequisite for lean implementation.

- L0 Team has no authority or is accountable for events or results over which it has no control or influence.
- L2 Authority and accountability level of each team is written, understood, and followed.

5.11 Management Does Not Supersede Team Decisions and Actions When Within the Team's Authority—
(5.11) is a prerequisite for lean implementation.

- L0 Team has no authority or is accountable for events or results over which it has no control or influence. Team actions are not recognized or supported by management.
- L2 Authority and accountability level of each team is written, understood, and supported by management.

5.12 Management Supports Team Decisions and Actions with Required Resources, Consistent with Good Business Practices—
(5.12) is a prerequisite for lean implementation.

- L0 Team has no authority or is accountable for events or results over which it has no control or influence. Team actions are not recognized or supported by management.
- L2 Authority and accountability level of each team is written, understood, and supported by management. Resources are made available as consistent with needs of the business.

6. Information

6.1 Adequate and Accurate Operating Data and Information is Available to Members of the Organization as Needed.

- L0 Adequate data does not exist or is not accurate or is not available for use.
- L1 Data exists but is incomplete or difficult to access.
- L2 Adequate and accurate operating data exists and is available without restriction to members of the organization.
- L3 L2 plus evidence of refinement over the past 12 months.

6.2 Knowledge is Shared Across the Organization—
(6.2) is a prerequisite for lean implementation.

- L0 The component is not in place.
- L2 The component is in place.

6.3 Data Collection and its Use are the Responsibility of the Individuals Most Closely Associated with that Part of the Process.

- L0 Minimal or no data is collected.
- L1 Data collection is performed by non-operating personnel unassociated with the generation of the data or its use in evaluating the operation.
- L2 Operating data is compiled, recorded, and used by the operating personnel responsible for that part of the process.
- L3 L2 plus evidence of refinement over the past 12 months.

6.4 The Operating Financial System is Structured to Present Correctly the Results of Lean Progress.

- L0 Traditional financial techniques are in use; i.e., operating earnings are recorded as a result of inventory accumulation, historic burden rates are in use which do not reflect changes due to lean progress, etc.
- L2 Costing is activity based and mirrors value stream activities. Operating financial data is available on a current basis, operating income is recognized at time of shipment, focus is on minimizing inventory.
- L3 L2 plus evidence of improvement in execution over the past 12 months.

7. Supplier/Organization/Customer

7.1 Both Suppliers and Customers Participate at the Earliest Possible Stage in the Organization's Undertaking of a Product/Process/Project.

- L0 Neither suppliers nor customers are included in planning process.
- L1 Incidental involvement by supplier and customers.
- L2 Both suppliers and customers participate at the earliest possible stage in the organization's undertaking of a product/process/project.
- L3 L2 plus evidence of refinement over the past 12 months.

7.2 Both Suppliers and Customers are Appropriately Represented on the Organization's Product/Process/Project Teams.

- L0 Neither suppliers nor customers are included in teams.
- L1 Incidental involvement by suppliers and customers.
- L2 Both suppliers and customers are appropriately represented on the organization's product/process/project teams.
- L3 L2 plus evidence of refinement over the past 12 months.

7.3 Both Suppliers and Customers Participate in Regular Reviews of Product/Process/Project Progress.

- L0 Neither suppliers nor customers are included in review process.
- L1 Incidental involvement by supplier and customers.
- L2 Both suppliers and customers participate in regular reviews of product/process/project progress.
- L3 L2 plus evidence of refinement over the past 12 months.

7.4 Effective Incentives for Supplier, Organization, and Customer are in Place that Reward Shared Performance Improvements or Cost Reductions.

- L0 No reward system in place for improvements.
- L1 Informal recognition of performance improvements or cost reductions. Incentives consist primarily of opportunity for repeat business.
- L2 Financial benefits of cost, schedule, or quality improvements are shared among suppliers, organization, and customer. Formal co-share programs are in place; long-term agreements are seen.
- L3 L2 plus evidence of refinement over the past 12 months.

8. Product

8.1 Product and Process Design is Conducted by Fully Integrated Teams with Team Representation by All Stakeholders.

- L0 The component is not in place at all or there are major inconsistencies in implementation.
- L1 The component is in place but there are minor inconsistencies in implementation.
- L2 Suppliers, customers and all internal and external stakeholders are appropriately represented on the organization's product/process/project teams.
- L3 L2 plus evidence of refinement or improvement in execution over the past 12 months.

8.2 Cost, Performance, and Attribute Specifications for Product and Process are Unambiguous, Measurable, and Agreed to by All Stakeholders.

- L0 The component is not in place at all or there are major inconsistencies in implementation.
- L1 The component is in place but there are minor inconsistencies in implementation.
- L2 Cost, performance, and attribute specifications for product and process are unambiguous, measurable, and agreed to by all stakeholders.
- L3 L2 plus evidence of refinement or improvement in execution over the past 12 months.

8.3 Product and Process Design is Conducted from a Life-Cycle Systems Approach, Fully Adhering to DFM/DFA Principles and Consistent with Lean Principles.

- L0 The component is not in place at all or there are major inconsistencies in implementation.
- L1 The component is in place but there are minor inconsistencies in implementation.
- L2 Product and process design is conducted from a life-cycle systems approach, fully adhering to DFM/DFA principles and consistent with lean principles.
- L3 L2 plus evidence of refinement or improvement in execution over the past 12 months.

8.4 Product Design and Process Capability Parameters are Set to be as Robust as Possible, Consistent with Good Business Practice.

- L0 The component is not in place at all or there are major inconsistencies in implementation.
- L1 The component is in place but there are minor inconsistencies in implementation.
- L2 Product design and process capability parameters are set to be as robust as possible, consistent with good business practice.
- L3 L2 plus evidence of refinement over the past 12 months.

8.5 Provision is Made for Continuity of Team Knowledge for Duration of Product/Process Launch.

- L0 No provision is made for continuity of team personnel, document control system is unreliable.
- L1 Continuity is dependent upon integrity of document control system, some personnel continuity.
- L2 Provision is made for continuity of team knowledge for duration of product/process launch. Constancy of team personnel assigned is maintained in addition to integrity of document control system.
- L3 L2 plus evidence of refinement over the past 12 months.

8.6 Lead Times for Product and Process Design are Measured and Being Continually Shortened.

- L0 Design lead times are not measured or do not undergo examination for improvement.
- L1 Design activities are measured by means of program time-line charting.
- L2 Lead times are measured with formal, ongoing continuous improvement of the design process taking place and lead times shortening.
- L3 L2 plus evidence of refinement or improvement in execution over the past 12 months.

9. Process/Flow

9.1 The Work Environment is Clean, Well Organized, and Audited Regularly Against Standardized 5S Practices.

- L0 Procedures are not in place or there are major inconsistencies in implementation.
- L1 Procedures are in place but there are minor inconsistencies in implementation. Procedures are not maintained or consistently followed.
- L2 The component is fully in place and effectively implemented. Structured 5S program in place and followed.
- L3 5S program is fully in place, effectively implemented and exhibits improvement in execution over the past 12 months.

9.2 An Effective Planned Preventive Maintenance System is in Place with the Appropriate Maintenance Conducted at the Prescribed Frequencies for All Equipment.

- L0 Maintenance is conducted on a breakdown basis
- L1 Some planned maintenance is conducted, no predictive maintenance in place.
- L2 An effective planned preventive maintenance system is in place with the appropriate maintenance conducted at the prescribed frequencies for all equipment and predictive maintenance being practiced where appropriate.
- L3 L2 plus evidence of refinement and improvement in execution over the past 12 months.

9.3 Bills of Material are Accurately Catalogued and Standard Operations are Accurately Routed, Timed, and have been Value Engineered.

- L0 Bills of material and/or standard operations are not recorded or not in use.
- L1 BOM and SO in use but are inaccurate or outdated.
- L2 Manufacturing activities correspond to BOM and SO for process. Evidence of value engineering of BOM and SO is present.
- L3 L2 plus evidence of refinement over the past 12 months.

9.4 Value Stream is Fully Mapped and Products are Physically Segregated into Like-Process Streams.

- L0 Value stream is not defined or not recorded.
- L1 Value stream is partially or inaccurately mapped or lack of product segregation is seen.
- L2 Current value stream is fully mapped and corresponds to Bills of Material and Standard Operations in use. Product segregation is in place.
- L3 L2 plus evidence of refinement over the past 12 months.

9.5 Production Sequence is Load-Smoothed to Customer Pull, and Demand is Leveled Over the Manufacturing Planning Period.

- L0 Production scheduling is reactive to immediate customer order pattern without regard to smoothing or leveling. Marked fluctuations present in production activity levels and manpower requirements.
- L1 Some machine load planning is done over a production planning period. Deviations from MRP plan occur regularly, if MRP is in use.
- L2 Production sequence is load-smoothed to customer pull, and demand is leveled over the manufacturing planning period.
- L3 L2 plus evidence of refinement over the past 12 months.