

NAVISTAR, INC.		
Engineering Design Standards		NUMBER: EDS-A16
TITLE: Key Control Characteristics (KCC)		CURRENT ISSUE DATE: April 2011
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Change Notice: Added Key Product Characteristic (KPC). Added definitions of acronyms. Replaced International Truck and Engine Corporation with Navistar, Inc. per corporate directive. Added paragraphs on identification of key product characteristics and the supporting key control characteristics.		

1.0 INTRODUCTION

This standard establishes that Key Control Characteristics (KCC) are the vehicle by which the Engineering community may identify, on part prints or installations, features that must be managed by Statistical Process Control (SPC).

2.0 DEFINITIONS

KCC – Key Control Characteristic - A process parameter for which variation must be controlled around a target value to ensure that variation of a KPC is minimized or maintained around its target value.

KPC – Key Product Characteristic - Reasonably anticipated variation of a Key Product Characteristic could significantly affect a products safety/compliance or is likely to significantly affect a products fit/function, or safety/compliance.

SPC – Statistical Process Control

FMEA - Failure Modes and Effects Analysis

TMS - Truck Material Specification

3.0 APPLICATION

The application of KCC should be limited to the vital few characteristics (5% of total characteristics maximum) of the part print or installation diagram. Releases of drawings that specify KCC type control on more than 5% of the characteristics must be approved by the appropriate Chief Engineer in a letter that accompanies the Release Letter. All newly released part prints may be required to indicate at least one (1) KCC per part. The selection of the characteristics should be derived from SPC, FMEA field history, or design objective. The identification of the characteristics for KCC management must be reviewed with a manufacturing representative or supplier (if they are known) as part of the design process. Low volume parts do not warrant the application of SPC and thus should have no KCC applied to the drawing. If a dimension on a low-volume part is critical to its installation, then application of 100% inspection techniques should be considered.

4.0 IDENTIFYING KEY PRODUCT CHARACTERISTICS

A cross functional team is established consisting of (but not limited to) the following: Product Engineering (leader), Manufacturing Engineering, Quality Engineering, Customer Engineering, Manufacturing, Suppliers, Supplier Management & Development, etc.

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The following tools are used during the review and Key Product Characteristic identification process:

- Past test data
- Past part quality history
- QFD
- Team input/consensus
- Product Benchmarking
- Product evaluation experience
- Blueprints and standards
- Design of experiments
- PFMEA (Potential Failure Mode and Effects Analysis)
- Process capability information

The following criteria should be used in KPC selection.

- A. A KPC is a product characteristic for which reasonably anticipated variation could significantly affect a product's safety/compliance, or is likely to significantly affect customer satisfaction with the product.

And/or

- B. A KPC is a characteristic that is particularly significant to the part performing its function and warrants additional control and/or capability studies and on-going control because the effects of manufacturing variations are significant.

And/or

- C. A KPC is a characteristic in which reduction of variation around a target value is likely to improve quality, increase customer satisfaction and/or reduce cost.

And/or

- D. A KPC is a characteristic traceable back to design/performance requirements.

The following guidelines apply in identifying KPCs:

- A product characteristic should not be designated a KPC to ensure the part is made to print, since all parts must meet print specifications.
- A KPC may be a variable or an attribute characteristic. Attribute characteristics could be go/no go, part/feature presence, etc.
- KPCs should be identified such that they add to the total quality of the component and increase customer satisfaction.
- Over application of KPCs should be avoided since one of the goals of the Key Characteristic Designation System is to aid in the economical manufacture of quality parts.
- The team approach should be used for the proper identification of KPCs. There should be a team consensus to make a characteristic a KPC. Consideration for manufacturing concerns should be given during the review whenever possible.
- Customer indicated critical characteristics shall not be revised without customer concurrence. Whenever possible, the customer should be part of the cross

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