

FUNDAMENTAL MANUFACTURING PROCESSES

Workholding - WH

SCENE 1.

WH07A, SME4303, 03:12:12:00-03:12:22:00
zoom out, part being held, machined

NARRATION (VO) :

WORKHOLDING IS A FUNDAMENTAL ISSUE WHEN
PERFORMING ANY MACHINING PROCESS.

SCENE 2.

WH08A, SME4315, 09:19:03:00-09:19:22:00
zoom out, work clamped, being machined
WH08B, SME4383, 14:51:00:00-14:51:06:00
zoom out, clamp
WH08C, SME4302, 01:54:48:00-01:55:00:00
part clamped to vise
WH08D, SME4356, 09:41:00:00-09:41:10:00
tombstone
WH08E, SME4350, 02:43:08:00-02:43:18:00
zoom out, chuck, rotating large workpiece

NARRATION (VO) :

WORKHOLDING TOOLS INCLUDE ANY DEVICE
USED TO GRIP A WORKPIECE WHILE IT IS
MACHINED IN A MACHINE TOOL. IT INCLUDES
CLAMPS...,
VISES...,
FIXTURES...,
CHUCKS, AND MORE.

SCENE 3.

WH09A, SME4317, 11:04:55:00-11:05:15:00
zoom in, part being secured
WH09B, CGS: Which Surfaces/Holes are
Designated as Reference
Measurement Surfaces/Datums
WH09C, SME4317, 11:11:30:00-11:12:13:00
part being machined using two cutting
tools, edit at multiple points
WH09D, CGS: Which Surfaces can be Machined
in a Setup
WH09E, CGS: Accuracy of the Machining
Process
**WH09F, CGS: Allowable Cutting Forces/
Cutting Feeds & Speeds**
WH09G, CGS: Cutting Tool Path/Tool's Size
& Shape

NARRATION (VO) :

THE DECISION ON HOW TO HOLD A PART
INFLUENCES A NUMBER OF FACTORS IN THE
OVERALL MILLING OR TURNING PROCESS,
INCLUDING:
WHICH SURFACES OR HOLES ARE DESIGNATED
AS REFERENCE MEASUREMENT SURFACES, OR
DATUMS...,
WHICH SURFACES CAN BE MACHINED IN A
SINGLE SETUP...,
THE ACCURACY OF THE MACHINING
PROCESS...,
THE ALLOWABLE CUTTING FORCES - AND
POTENTIALLY THE CUTTING FEEDS &

SPEEDS...,

AND THE CUTTING TOOL PATH, AND SOMETIMES
THE TOOL'S SIZE AND SHAPE.

SCENE 4.

WH10A, SME4026, 11:29:09:00-11:29:20:00
zoom out, worker at machine while running
WH10B, SME4026, 11:46:50:00-11:47:26:00
worker unloading, loading workpiece,
closing door of machine
WH10C, SME4026, 11:48:05:00-11:48:17:00
worker gaging same workpiece
WH10D, SME4025, 10:18:00:00-10:18:20:00
unloading, loading workpiece, edit at
multiple points
WH10E, SME4091, 07:24:36:00-07:24:43:00
milling of transmission housing
WH10F, SME4091, 07:26:20:00-07:27:02:00
drilling and tapping of transmission
housing, edit at multiple points
WH10G, SME4355, 07:20:35:00-07:20:57:00
zoom out, milling various parts loaded in
chuck on machine table

NARRATION (VO) :

WORKHOLDING DEVICES MUST ALSO SUIT
PRODUCTION DEMANDS IN A LEAN
MANUFACTURING ENVIRONMENT. THE ULTIMATE
GOAL BEING THE MINIMIZATION OF TIME AN
OPERATOR SPENDS MANIPULATING THE
WORKHOLDING, LEAVING HIM FREE TO TEND
OTHER MACHINES OR HIGHER-VALUE
OPERATIONS.
PARTS SHOULD BE EASY TO UNLOAD...,
AND LOAD...,
THE WORKHOLDING MUST PERMIT ACCESS OF
VARIOUS CUTTING TOOLS TO THE WORKPIECE,
SO THAT MULTIPLE OPERATIONS CAN BE
PERFORMED IN A SINGLE CLAMPING...,
AND WORKHOLDING SHOULD ALLOW OPTIMUM USE
OF THE MACHINE TOOL'S MACHINING
CAPACITY, SO THAT AS MANY PARTS AS
POSSIBLE CAN BE MACHINED IN ONE SETUP.

SCENE 5.

WH11A, SME2638, 01:16:02:00-01:16:09:00
workholding being setup
WH11B, SME2638, 01:14:36:00-01:14:43:00
workholding being torn down
WH11C, web pages with standard order
workholding tools, 5 pages
WH11D, web pages with standard order
workholding tools, 4 pages

NARRATION (VO) :

MOREOVER, THE WORKHOLDING SETUP...,
AND TEARDOWN PROCESS SHOULD BE SIMPLE
AND FAST...,
AND, TO MINIMIZE WORKHOLDING COSTS,
STANDARD ORDER ITEMS SHOULD BE USED WHEN

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POSSIBLE.

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