FUNDAMENTAL MANUFACTURING PROCESSES

Milling & Machining Centers

SCENE 1.
ML57A, CGS: Workholding & Workchanging
white text, centered on background

SCENE 2.
ML58A, SME2502, 01:23:50:00-01:24:03:00
zoom out, workpiece clamped on knee mill table, being machined
ML58B, FMP012, 12:42:15:00-12:42:32:00
zoom in, horizontal machining center

NARRATION (VO):

WORKHOLDING DEVICES IN 'CNC' MILLING INCLUDE THE STANDARD VICES, CLAMPS, AND T-SLOTS FOUND ON KNEE MILLS, AS WELL AS FIXTURES SPECIFICALLY DESIGNED FOR 'CNC' MACHINING CENTERS.

SCENE 3.
ML59A, FTD90, 06:27:22:00-06:27:43:00
tombstone used on horizontal milling machine
ML59B, SME2646, 01:01:39:00-01:01:51:00
tombstone with chucks
ML59C, FTD90, 06:28:02:00-06:28:15:00
zoom in, machining of part on tombstone
ML59D, FMP008, 09:42:38:00-09:43:00:00
part set up on tombstone

NARRATION (VO):

FOR INSTANCE, TOMBSTONES MOUNTED ON THE MACHINING CENTER TABLE ARE USED TO HOLD MULTIPLE PARTS. THEY COME IN A WIDE VARIETY OF CONFIGURATIONS AND ARE COMMONLY USED ON HORIZONTAL MACHINING CENTERS. THE MACHINING PROGRAM IS WRITTEN TO MACHINE ALL PARTS ON THE TOMBSTONE BEFORE SHUTTLING IT OUT OF THE MACHINE.

SCENE 4.
ML60A, SME4024, 09:15:29:00-09:16:08:00
zoom out, multi-vise on machining center
ML60B, SME2514, 01:09:35:00-01:09:48:00
multi-vice on indexer, rotary table

NARRATION (VO):

SETUPS ON MACHINING CENTERS OFTEN UTILIZE MULTIPLE VISES IN A VARIETY OF ARRANGEMENTS TO MACHINE MORE PARTS PER CYCLE. MULTIPLE VISES MAY BE ARRANGED ON

AN INDEXING DEVICE TO FURTHER EXPAND THE PARTS-CARRYING CAPACITY OF THE MACHINE TABLE.

--- TOUCH BLACK ---

SCENE 5.
ML61A, FTD88, 04:44:03:00-04:44:17:00
pallet of finished parts taken from mill
ML61B, FTD88, 04:41:15:00-04:41:41:00
wide, finished pallet pulled from mill, pallets rotated to new workpieces
ML61C, FTD88, 04:44:39:00-04:44:54:00
pallet of raw work stock placed in mill
ML61D, FTD90, 06:31:39:00-06:31:51:00
part set up on tombstone
ML61E, FTD90, 06:27:26:00-06:27:41:00
zoom in, milling operation on part

NARRATION (VO):

WORKCHANGING REPRESENTS ANOTHER OPPORTUNITY TO GET MORE MACHINING DONE WITH LESS WASTED TIME. WORKCHANGING METHODS ALLOW UNPROCESSED WORKPIECES TO BE SET UP WHILE THE SPINDLE IS CUTTING OTHER WORKPIECES.

SCENE 6.
ML62A, SME4024, 09:14:52:00-09:15:15:00
multiple clamps set up on mill

NARRATION (VO):

MOREOVER, A LONG MACHINE BED MAY PERMIT THE FIXTURING OF SEVERAL WORKPIECES, WHICH ARE MACHINED SEQUENTIALLY.

SCENE 7.
ML63A, FMP008, 09:31:31:00-09:31:52:00
swapping tombstones
ML63B, FMP008, 09:34:48:00-09:35:16:00
part being milled
ML63C, FMP008, 09:45:38:00-09:45:49:00
zoom in, new part on tombstone

NARRATION (VO):

PALLET-CHANGERS EXCHANGE FIXTURES HOLDING MULTIPLE PARTS FROM THE SETUP AREA TO THE MACHINING AREA. HERE, ONE FIXTURE OF PARTS IS MACHINED WHILE PARTS ON THE PREVIOUS FIXTURE ARE REMOVED AND NEW WORKPIECES ARE INSTALLED.

--- FADE TO BLACK ---