

FUNDAMENTALS OF TOOL DESIGN

Gaging & Inspection Tool Design

SCENE 1.

GI32A, tape FTD25, 05:35:37:00-05:36:05:00

plug gage being used

GI32B, CGS: Screw-Pitch Gages

Plug Gages

Ring Gages

Snap Gages

NARRATION (VO) :

A WIDE VARIETY OF GAGES ARE AVAILABLE TO VISUALLY INSPECT AND GAGE PARTS, WITH A FEW OF THE BASIC TYPES INCLUDING: SCREW-PITCH GAGES, PLUG GAGES, RING GAGES, AND SNAP GAGES.

--- TOUCH BLACK ---

SCENE 2.

GI33A, CGS: Screw-Pitch Gages

GI33B, tape FTD46, 19:05:57:00-19:06:10:00

zoom out, screw-pitch gage being used

GI33C, zoom in, screw-pitch gage

NARRATION (VO) :

SCREW-PITCH GAGES ARE USED TO DETERMINE THE PITCH OF A SCREW BY PLACEMENT ON THE THREADED PORTION. SUCH GAGES ARE AVAILABLE FOR THE MOST COMMON THREAD-PITCH FORMS.

SCENE 3.

continue previous shot

GI34A, tape FTD46, 19:07:07:00-19:07:32:00

zoom out, precision thread gaging operation

NARRATION (VO) :

HOWEVER, SCREW-PITCH GAGES DO NOT CHECK THREAD SIZE AND ARE NOT ADEQUATE FOR CHECKING THREAD FORM FOR PRECISION PARTS.

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SCENE 4.

GI35A, CGS: Plug Gages

GI35B, tape FTD40, 13:23:02:00-13:02:35:00

zoom in, go no-go plug gage being used

NARRATION (VO) :

PLUG GAGES USUALLY CONSIST OF TWO

MEMBERS: THE GO END AND THE NO-GO END.
MOST DESIGNS ARE COVERED BY AMERICAN
GAGE DESIGN STANDARDS BUT THERE ARE MANY
SPECIALS.

SCENE 5.
continue previous shot
GI36B, CGS: Single-End
 Double-End
 Progressive

NARRATION (VO) :

IN GENERAL THERE ARE THREE TYPES:
SINGLE-END,
DOUBLE-END,
AND PROGRESSIVE.

SCENE 6.
GI37A, CGS: Single-End
GI37B, single end plug gages

NARRATION (VO) :

THE SINGLE-END PLUG GAGE HAS TWO
SEPARATE MEMBERS, A GO AND A NO-GO, EACH
WITH ITS OWN HANDLE.

SCENE 7.
GI38A, CGS: Double-End
GI38B, tape **FTD37, 10:28:30:00-10:28:46:00**
double end plug gage being used

NARRATION (VO) :

THE DOUBLE-END PLUG GAGE HAS THE GO AND
NO-GO MEMBERS ON A SINGLE HANDLE, WITH
ONE MEMBER ON EACH END.

SCENE 8.
GI39A, CGS: Progressive
GI39B, ANI: zoom in, progressive gage

NARRATION (VO) :

THE PROGRESSIVE PLUG GAGE HAS A SINGLE
MEMBER ON A SINGLE HANDLE. THE FRONT
TWO-THIRDS IS GROUND TO THE GO SIZE, AND
THE REMAINDER TO THE NO-GO SIZE.

SCENE 9.
GI40A, tape **FTD40, 13:17:03:00-13:17:15:00**
zoom out, go no-go gage being used

NARRATION (VO) :

STANDARD PLUG GAGES USUALLY HAVE THREE
METHODS OF MOUNTING GAGE MEMBERS ON THE
HANDLE.

SCENE 10.

GI41A, tape FTD40, 13:32:30:00-13:33:35:00

zoom out, small plug gages being used

GI41B, tape FTD40, 13:58:58:00-13:59:09:00

plug gage being reversed

NARRATION (VO) :

THE SMALLER SIZES ARE OFTEN WIRE-TYPE GAGES, COMPRISING A STRAIGHT BLANK OR NIB WITHOUT SHOULDER, TAPER OR THREADS. IT IS HELD IN THE PLUG GAGE HANDLE BY A SETSCREW OR COLLET CHUCK. WITH SUCH MOUNTING, GAGE MEMBERS ARE REVERSIBLE, INCREASING GAGE LIFE.

SCENE 11.

GI42A, tape FTD40, 13:23:46:00-13:24:10:00

taper lock design thread gage being used

GI42B, tape FTD40, 13:59:41:00-13:59:52:00

zoom out, taper lock design

NARRATION (VO) :

THE SECOND TYPE, WHICH IS NOT REVERSIBLE, HAS A TAPER-LOCK DESIGN. THE TAPER, GROUND ON ONE END, FITS A TAPERED HOLE IN THE HANDLE.

SCENE 12.

GI43A, ANI: zoom in, trilock type plug gage

NARRATION (VO) :

THE THIRD TYPE, THE TRILOCK DESIGN, IS USUALLY FOR LARGER GAGES. THE GAGE MEMBER HAS A HOLE THROUGH THE CENTER AND IS COUNTERBORED ON BOTH ENDS TO ACCEPT A STANDARD SOCKET-HEAD SCREW.

SCENE 13.

GI44A, tape FTD40, 14:00:22:00-14:00:37:00

zoom out, trilock type plug gage taken apart

GI44B, tape FTD40, 14:02:33:00-14:02:55:00

trilock type plug gage put together

NARRATION (VO) :

THIS TYPE OF GAGE, WHICH IS TYPICALLY REVERSIBLE, HAS THREE SLOTS MILLED RADIALLY IN EACH END OF THE GAGE MEMBER. THE GAGE IS HELD TO THE HANDLE BY THE SOCKET-HEAD SCREW WITH THE THREE SLOTS ENGAGING THREE LUGS ON THE HANDLE END.

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SCENE 14.

GI45A, CGS: Ring Gages

GI45B, tape **FTD40**, 13:11:35:00-13:12:23:00
zoom out, ring gages being used

GI45C, tape **FTD37**, 10:22:11:00-10:22:26:00
ring gage being used

NARRATION (VO) :

RING GAGES ARE FIXED GAGES USUALLY USED
IN PAIRS OF GO AND NO-GO MEMBERS. THEY
ARE AVAILABLE IN MANY SIZES, AND ARE
KNURLED ON THE OUTSIDE DIAMETER AND
LAPPED TO CLOSE TOLERANCE ON THE INSIDE
DIAMETER.

SCENE 15.

GI46A, tape **FTD40**, 13:15:35:00-13:15:55:00
ring gages, zoom in, no-go ring gage

GI46B, tape **FTD32**, 12:45:59:00-12:46:28:00
small ring gage used for small screw

GI46C, tape **FTD46**, 19:01:34:00-19:02:04:00
ring gage being lapped

NARRATION (VO) :

THE NO-GO MEMBER IS IDENTIFIED BY A
GROOVE AROUND THE OUTSIDE DIAMETER OF
THE RING. RING GAGES ARE ALSO USED TO
GAGE EXTERNAL THREADS AND SPLINES. THESE
GAGES ARE DESIGNED IN ACCORDANCE TO
CERTAIN AMERICAN SOCIETY OF MECHANICAL
ENGINEERS OR 'ASME' STANDARDS.

--- TOUCH BLACK ---

SCENE 16.

GI47A, CGS: Snap Gages

GI47B, tape **FTD37**, 10:13:33:00-10:13:48:00
zoom out, snap gage being used

NARRATION (VO) :

SNAP GAGES ARE FIXED GAGES WITH INSIDE
MEASURING SURFACES FOR CALIPERING
DIAMETERS, LENGTHS, THICKNESSES OR
WIDTHS.

SCENE 17.

GI48A, tape **FTD37**, 10:12:10:00-10:12:24:00
thread-roll snap gage

GI48B, tape **FTD37**, 10:08:24:00-10:08:36:00
thread-roll snap gage being used

GI48C, tape **FTD46**, 19:06:15:00-19:06:53:00
thread-roll snap gage being used

NARRATION (VO) :

ONE TYPE OF SNAP GAGE, THE THREAD-ROLL
SNAP GAGE IS A COMPLETE EXTERNAL-CALIPER
GAGE, EMPLOYED TO INSPECT THE SIZE OF
THREAD-PITCH DIAMETER, THREAD LEAD, AND
THREAD FORM. ONE OR MORE PAIRS OF GAGING

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MEMBERS CAN BE SET AND LOCKED TO A
PREDETERMINED SIZE WITHIN RANGE OF THE
THREAD TO BE CHECKED.

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