

Greenslade & Company, Inc.

Inspection Products for Industry



Greenslade & Company, Inc.

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Thread Gages, External Variable Gages

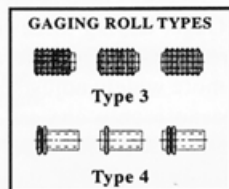
The gages on the following pages meet all of the specific thread characteristic measuring requirements of ANSI/ASME Systems 21, 22, and 23 and MIL-S-7742 and MIL-S-8879 "Other" and "Safety Critical" inspection levels.

These easy-to-use gages provide accurate, repeatable, and reproducible measurements. They can all be changed from size to size in less than 3 minutes. Electronic digital readouts are standard, which eliminates reading errors and allows these gages to be connected to computerized data collection systems for maximum inspection efficiency.

"TRI-ROLL" External Thread Gage

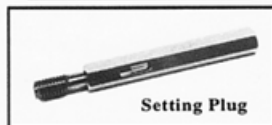


Gaging Rolls



Type 3

Type 4



Setting Plug

This gage is ideally suited to thread measuring applications where the gage is to be dedicated to only one thread size or is used to measure a narrow range of sizes. This gage comes in a number of different frame sizes providing a total measurement range of #0-80 (M1.6) through 6" (M150). Each frame size will cover 2 to 4 standard thread diameters in both inch and metric sizes. For example, the #4 frame size covers #10, #12, 1/4" and 5/16" sizes. This design is best suited to manufacturing applications.

The "TRI-ROLL" Gage is a three roll, 120 degree contact position design. The following gaging roll types are available:

Thread Characteristic	Roll Type	ANSI/ASME #
Functional Diameter (UNR)	3	4.3
Functional Diameter (UNJ)	3 "J"	4.3 Modified
Pitch Diameter (cone & vee)	4	4.5
Minor Diameter	Minor	5.2
Lead & Flank Angle	Differential	4.8
Runout (P.D. to major)	Runout	4.7

A different set of gaging rolls is required for each thread size to be measured.

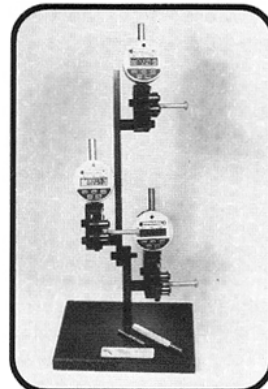
"TRI-ROLL" Gages are set with Gage Class "W" single end, full form, threaded setting plugs. Users having ring gage setting plugs can use them if only the full formed section is used. For the greatest measuring accuracy always set the "TRIROLL" Gage using the calibrated size of the setting plug instead of the nominal size marked on its handle.

The result of a long form Gage Repeatability and Reproducibility Study of the TRI-ROLL Gage was 15% with functional diameter gaging rolls and 20% with pitch diameter gaging rolls.

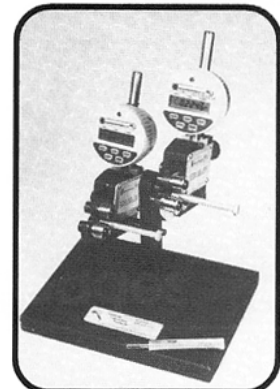
TRI-ROLL Gages with Base, Frame and Electronic Indicator with S.P.C. output:

Inch	Metric	Single Frame Unit*
#0 thru #1	M1.....	TRU-100E
#2 thru #3	M2 thru 2.5.....	TRU-101E
#4 thru #8	M3 thru M4.....	TRU-102E
#10 thru 5/16	M5 thru M6.....	TRU-103E
3/8 thru 1/2	M8 thru M12.....	TRU-104E
9/16 thru 3/4	M14 thru M16.....	TRU-105E
7/8 thru 1-1/8	M20 thru M24.....	TRU-106E
1-1/4 thru 1-1/2	M30 thru M38.....	TRU-107E
1-5/8 thru 1-7/8	M39 thru M47.....	TRU-108E
2 thru 2-1/4	M48 thru M56.....	TRU-109E

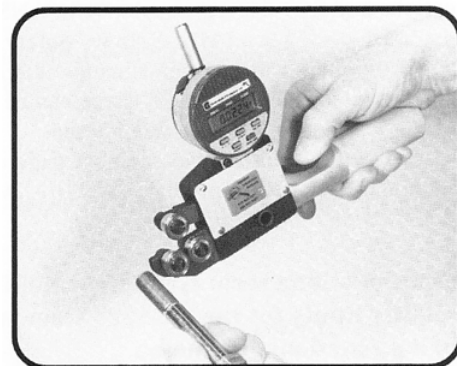
* NOTE: Double Frame Unit, TRU-2XX, Triple Frame Unit, TRU-3XX



Triple Stand Tri-Roll Gage for measuring pitch diameter, functional diameter and minor diameter



Double Stand Tri-Roll Gage for measuring pitch diameter and functional diameter.



Handheld Tri-Roll Gage



Greenslade & Company, Inc.

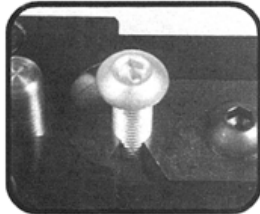
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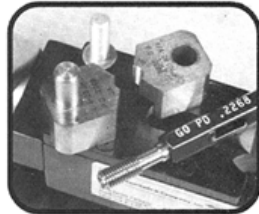
Thread Gages, External Variable Gages

X-180™

**Segment External Thread Gage
(ANSI/ASME Gage #4.1)**



**Functional
Diameter
Segments**



**One setting plug and set
of segments are required
for each thread size.**

The "X-180" Gage is of the two-segment, 180 degree contact design. The single frame size covers #2 (M2) through 3/4" (M 18).

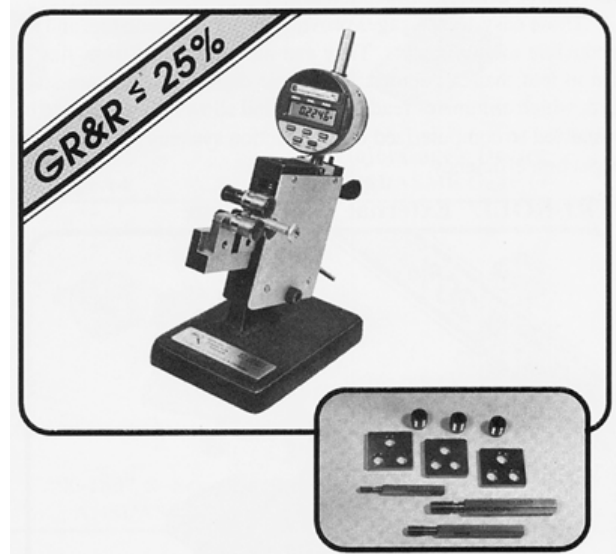
This design can be used to measure functional diameter in all specifications and 180 degree circularity in ANSI/ASME System 23 and MIL-S-7742 and MIL-S-8879 "Safety Critical" inspection. A different set of gaging segments is required to measure each thread size. The "X-180" Gage can be changed from one size to another in less than one minute.

The use of the three roll or two segment gage design to measure functional diameter is optional in ANSI/ASME, MILS-7742 and MIL-S-8879.

The result of a long form Gage Repeatability and Reproducibility Study for the "X-180" Gage was 11 % for measuring functional diameter.

X-120®

Adjustable Tri-Roll Thread Gage



**"X-120" Adjustable Tri-Roll Thread Gage
Patent #4,974,327**

The "X-120" Gage is the same basic design as the "TRIROLL" Gage, having three rolls which contact the thread at 120 degrees apart. The differences are that the "X-120" gage is much more widely adjustable and fewer gaging rolls are required because only one set of rolls is needed for each TPI (threads per inch). There are two gage frame sizes; small, #4 (M3) through 1" (M24) and large, 1-1/8" (M30) through 2" (M50).

The thread size can be changed in less than three minutes by simply loosening four screws, adjusting the gaging roll axis pin position with a screw diameter template, retightening the four screws, attaching the gaging rolls, and setting the gage with the threaded setting master.

The "X-120" Gage is best suited for use in incoming and final inspection. The following gaging rolls are available:

Thread Characteristic	ANSI/ASME #
Functional Diameter	4.3
Pitch Diameter (cone & vee)	4.5
"VARIMINOR" (minor diameters 32 TPI & less)	5.2 Variable

The "X-120" Gage is set with a Class "W", single end, threaded plug gage.

The result of a long form Gage Repeatability and Reproducibility Study for the "X-120" Gage was 17% with functional diameter gaging rolls and 25% with pitch diameter gaging rolls.



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Fixed Limit External Thread Gages



Thread Ring Gages and Setting Plugs

Greenslade supplies a full line on inch and metric fixed limit, adjustable ring gages and the associated setting plugs.

Standard Inch Gages:

Standard Inch gages are available in classes 2A and 3A in sizes from #0-80 through 2 1/2-12. Inch gages are manufactured according to the requirements of ASME B1.2.

Standard Metric Gages:

Standard metric gages are available in classes 6g and 6h in sizes from M1.6 through M50. Metric gages are manufactured according to the requirements of ASME B1.16M unless otherwise specified. Metric gages can also be provided according to ISO and JIS specifications upon request.

Special Inch and Metric Gages:

Non-standard ring and setting plug gages can be supplied according to specific customer requirements in both inch and metric sizes.

Calibration:

All Greenslade thread gages come with ISO 17025, A2LA Accredited calibration certificates at no additional charge.



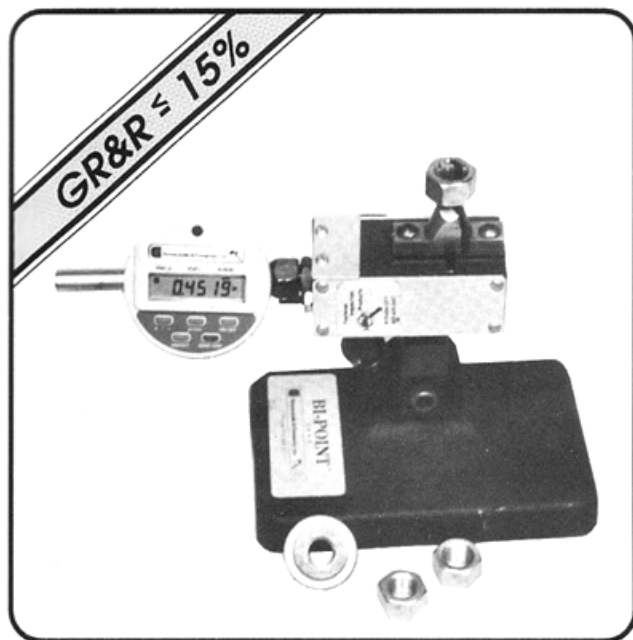
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Thread Gages, Internal Variable Gages

Bi-Point™ Gage



The "BI-POINT" Internal Thread Gage is a widely adjustable thread measuring instrument. Only two frame sizes are required to measure from #10 (M5) through 5" (M125). One goes from # 10 through 2-1/2" and the other from 2-5/8" through 5". The measurement resolution is .0001". It can be used bench mounted or hand held.

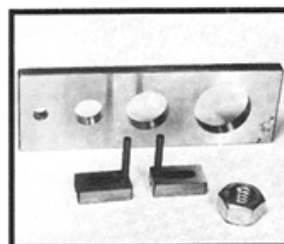
A specific set of gaging fingers is required for each thread size. The "BI-POINT" Gage can be changed from one thread size to another in less than three minutes. The following gaging fingers are available:

Thread Characteristic	ANSI/ASME Gage #
Functional Diameter	4.1
Pitch Diameter (per size)	4.5
Minor Diameter (per size)	5.2
"VARIMINOR"	
(.190"-2.5" adjustable)	5.2 Variable
Runout (P. D. to minor)	4.7
Lead and Flank Angle	4.8

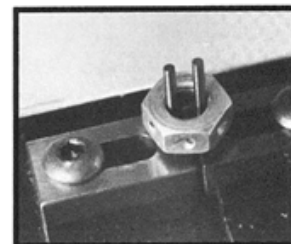
The "BI-POINT" Gage meets all of the requirements of ANSI/ASME B 1.3M, MIL-S-7742, and MIL-S-8879.

The "BI-POINT" Gage is set using a solid threaded master ring gage. The master ring has three certified sizes on it: pitch diameter, functional diameter, and minor diameter. The gaging fingers must be set to the corresponding master ring certified size.

The result of a long form Gage Repeatability and Reproducibility Study for the BI-POINT Gage was 13% with the pitch diameter gaging fingers and 15% with the functional diameter gaging fingers.



"Variminor" Fingers



Minor diameter



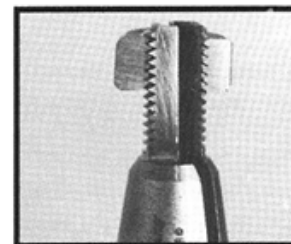
Pitch Diameter Fingers



Pitch Diameter



Functional Diameter Fingers



Functional Diameter

	Internal Screw Threads							
	UNR Thread Form				UNJ Thread Form			
	ASME B1.3M			Other	MIL-S-8879C		SAE AS8879A (Proposed)	
	System 21	System 22	System 23		Safety Critical	Method A	Method B	Method C
Functional Diameter	X	X	X	X	X	X	X	X
Pitch Diameter		X	X	X	X		X	X
Minor Diameter	X	X	X	X	X		X	X
P.D. Runout to Minor			X		X			X
P.D. Roundness			X		X			X
P.D. Taper			X		X			X
Lead			X		X			X
Flank Angle			X		X			X
Surface Roughness			X		X			X



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Fixed Limit Internal Thread Gages



Thread Work Plug and Minor Diameter Plug Gages

Greenslade supplies a full line on inch and metric fixed limit, plug gages..

Standard Inch Gages:

Standard Inch gages are available in classes 2B and 3B in sizes from #0-80 through 2 ½-12 . Inch gages are manufactured according to the requirements of ASME B1.2.

Standard Metric Gages:

Standard metric gages are available in classes 6H in sizes from M1.6 through M50. Metric gages are manufactured according to the requirements of ASME B1.16M unless otherwise specified. Metric gages can also be provided according to ISO and JIS specifications upon request.

Special Inch and Metric Gages:

Non-standard plug gages can be supplied according to specific customer requirements in both inch and metric sizes.

Calibration:

All Greenslade fixed limit gages come with ISO 17025, A2LA Accredited calibration certificates at no additional charge.



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Recess Penetration Gages



Definitions:

Penetration Depth - this is the distance a precisely made gaging element enters a fastener's recess. This is usually less than the "recess depth". This measurement is an indication of how deeply a driving bit will engage in the recess.

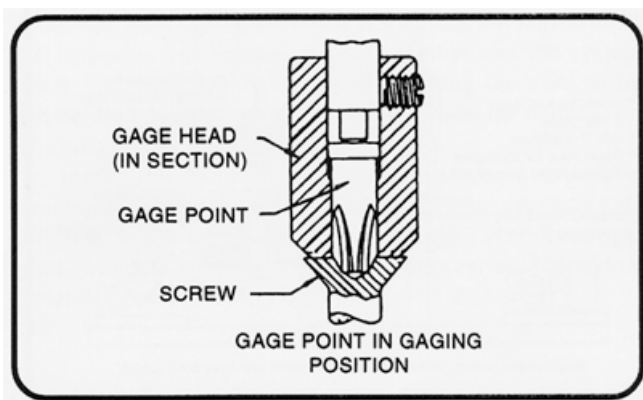
Recess Depth - the deepest point in a fastener's recess. This is usually a sharp point in the center of the recess.

Recess Torsional Strength - this is the ability of a recess to resist damage from driver bit camout or reaming when a rotational force (torque) is applied to the bit engaged in the recess with a specific amount of end load pressure applied to keep the driver engaged in the recess. This requirement is defined in MIL-S-87114A.

Individual Recess Gages:

These are gages designed to measure only one type and size of recess, rivet hole or slot. The standard gages are equipped with electronic, digital indicators that will read out in either inches or millimeters. Gages are available with dial indicators upon special request.

- ANSI/ASME Type 1: Phillips #0, #1, #2, #3, #4
- ANSI/ASME Type 1A: POZI-DRIVE #0, #1, #2, #3, #4 (registered trademark of the Phillips Screw Co.)
- ANSI/ASME Type III: Square socket #1, #2, #3, #4
- Hex Socket (GO element) .050" through 9/16"; 1.5mm through 14mm
- 6-Lobe Recess (GO element) T-6 through T-55



RECESS INSPECTION GAGES

Fastener recesses should be inspected to assure the user that the fasteners can be driven properly and effectively during assembly.

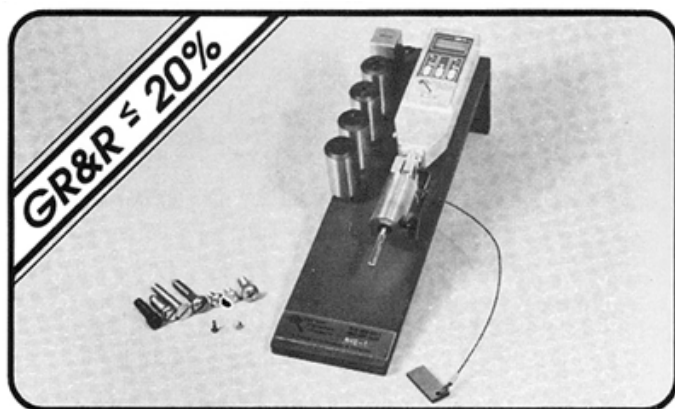


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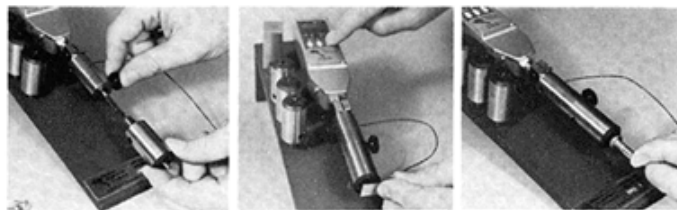
RecessCheker® Measuring System



RecessCheker Measuring System

Patent #4,936,024

This patented system provides fast interchangeability of all recess measuring elements listed below on a single base having one digital electronic indicator. This system is ideal for use in manufacturing applications where the recess measurements need to be recorded electronically and for incoming or final inspection applications where space, storage and total gage costs are important. When four or more of the above elements are required, it is less expensive to purchase the "RecessCheker" System instead of individual gages. Customers need to order one "RecessCheker" Base and specify the types of gages needed as "RecessCheker" Elements. The simple and fast element gaging procedure is shown below:



BASIC COMPONENTS

Base UnitRCB-1

GAGING ELEMENTS

Slot Depth.....RCSL-0

Phillips Recess:

#1.....RCP-1
#2.....RCP-2
#3.....RCP-3
#4.....RCP-4

Pozidriv Recess:

#1.....RCPz-1
#2.....RCPz-2
#3.....RCPz-3
#4.....RCPz-4

Square Recess:

#1.....RCSq-1
#2.....RCSq-2
#3.....RCSq-3
#4.....RCSq-4

Hex Recess:

1/16.....RCH-062
thru 3/8.....RCH-375
M1.....RCHM-1.5
thru M10.....RCHM-10

6-Lobe Recess:

T-6.....RC6L-T5
thru T-55.....RC6L-T55



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Recess Gaging: Wobble, Strength, and TIR

Wobble Gaging Fixture and Plug Gages

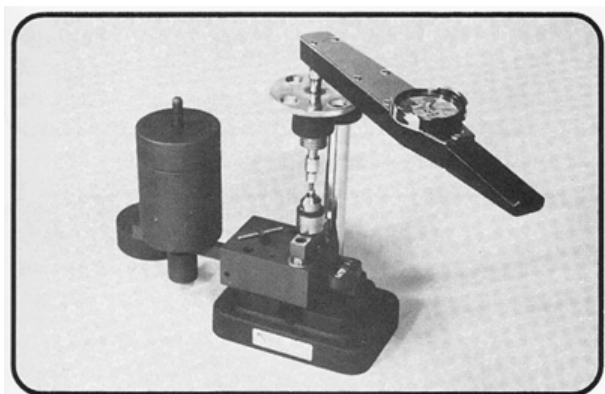


Wobble gaging provides a means for determining the compatibility of cross recesses in the heads of machine, tapping and wood screws with companion screw drivers and will indicate the point where deviations in the recess contours affect satisfactory driver engagement. Recesses which exhibit excessive wobble characteristics will cause poor screw drivability because of driver camout prior to attaining normal torque level, damage to recesses, and/or accelerated driver wear.

WOBBLE GAGE FIXTURE

(Plug Gages not included).....WG-100
Recess Wobble Gage Plug (use with WG-100)

#1 Phillips.....	WGP-1
#2 Phillips.....	WGP-2
#3 Phillips.....	WGP-3
#4 Phillips.....	WGP-4
#1 POZIDRIVE.....	WGPz-1
#2 POZIDRIVE.....	WGPz-2
#3 POZIDRIVE.....	WGPz-3
#4 POZIDRIVE.....	WCPz-1

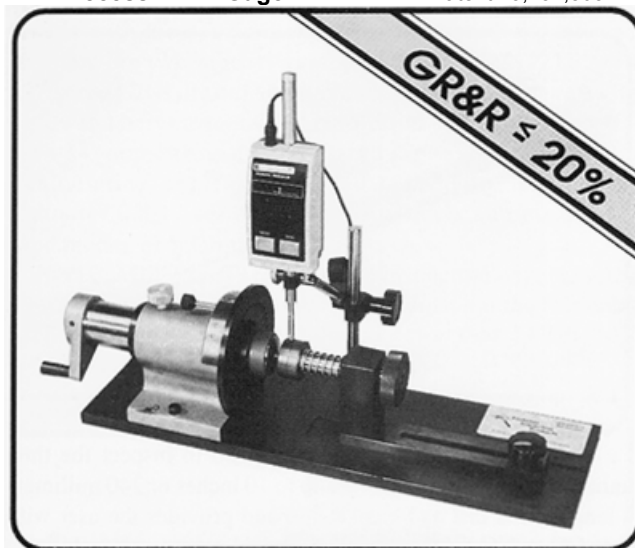


Recess Torsional Strength Tester Model STF-87114

This device is suitable for testing #6 through 1/2" screws according to MIL-S-87114A and other similar specifications. This tester comes with a set of weights of 15, 20 and 25 pounds. The end load pressure is not affected when the torque is applied. The required torque wrenches must be purchased separately.

Recess "TIR" Gage

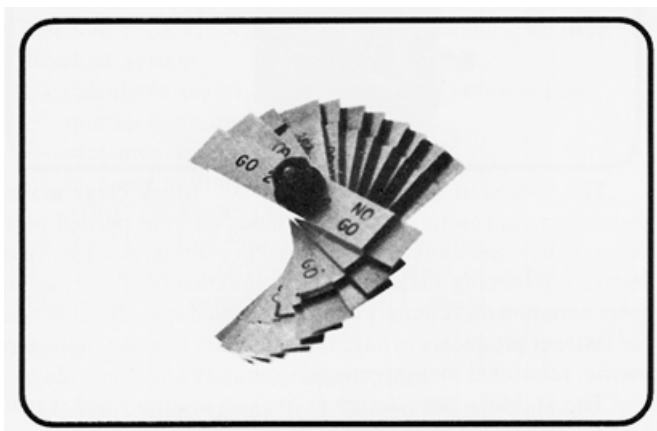
Patent #5,182,865



This gage was specifically developed to measure the concentricity of a screw's shank to its recess or external drive system quickly and accurately. This fastener characteristic is becoming more critical with the widening use of automatic screw feeding and driving assembly equipment. If a screw's recess is too far from the axis of its shank the automatic equipment's driver can not engage the recess and the equipment will jam, ruining its efficiency.

This gage's single recess measuring element will inspect all styles of recesses in all screw sizes #4 through 1/4" (M3M6). The gage comes with an 11 piece collet set and an electronic indicator that provides .0001" resolution and the absolute TIR measurement without adding or subtracting.

This easy-to-use gage provides Gage Repeatability and Reproducibility Study results of less than 20%.



Slot Width Gage Sets

Inch: 11 pc. set for GO and NO-GO inspecting #2 through 3/8 inch screw size.....SGW-2

Metric: 9 pc. set for GO and NO-GO for inspecting M2 through M10 screw sizes.....SGW-M



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Wrenching Height Gages for Hex Heads

WRENCHGT™

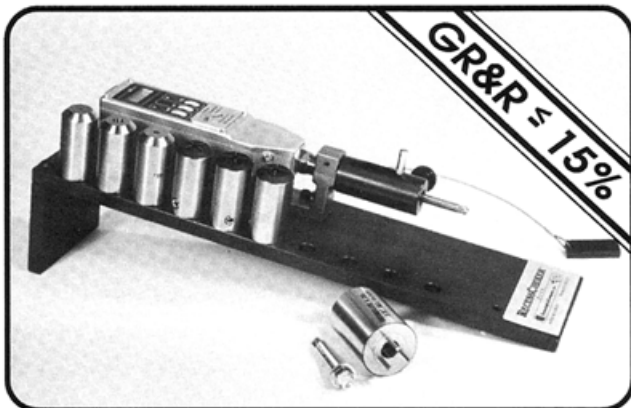
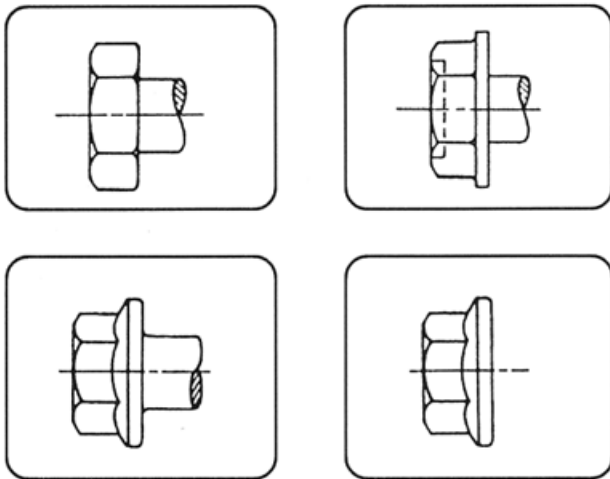
G A G E

(PATENT PENDING)

*** Fast * Accurate * Repeatable**

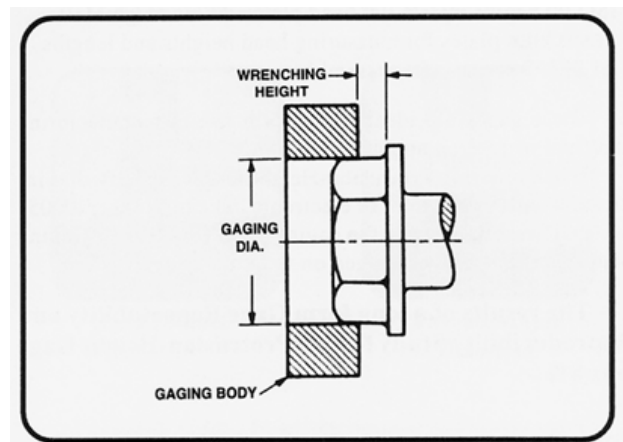
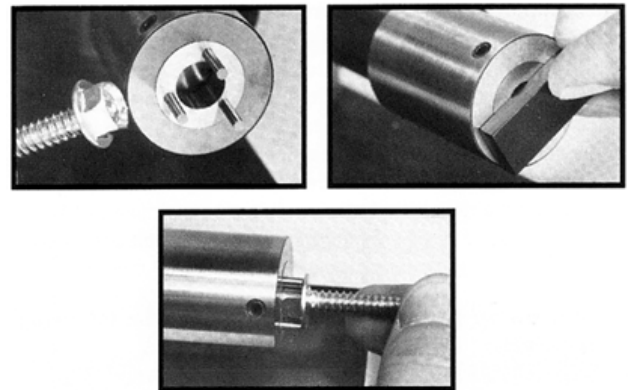
Measures:

**Hex Heads, Hex Washer Heads,
and
Hex Flange Heads**



A bolt or nut's wrenching height is one of its most important characteristics. If the wrenching height is too low the corners are likely to round off when driving torque is applied leaving the bolt or nut improperly tightened.

The new WrenchHgt Gage makes this important measurement quickly and accurately. **The Gage Repeatability and Reproducibility results are 15 %.** The WrenchHgt Gage eliminates the clumsiness of the old ring gaging methods.



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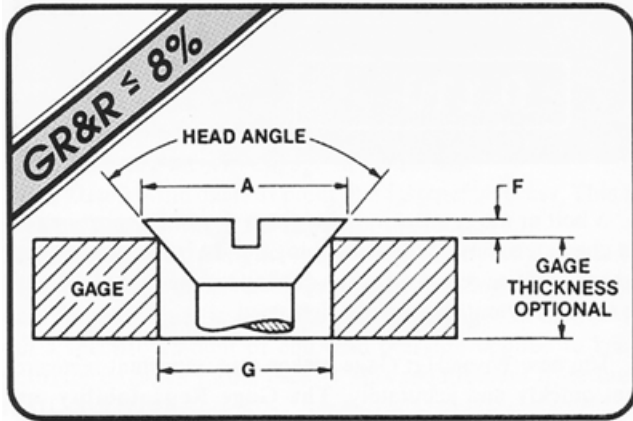


Protrusion-Head Height Gages

Definitions:

Flat Head Protrusion (also called flushness) - the distance the top of a flat head screw extends above the mouth of a specified gaging hole diameter (F dimension in the illustration shown below).

Head Height - the distance from the bottom of a screw head to its extreme highest point.



These gages are designed to measure the protrusion height of flat head screws and the head heights of non-flat head screws with accuracy and speed. The protrusion heights are measured by placing a flat head screw in the appropriate gaging hole and positioning it under the indicator foot for measurement after having "Zeroed" the indicator on the gaging plate surface. The foot is raised. The screw is placed in the "V". The foot is rested on the screw's head and the measurement is taken. These multipurpose gages can be used to measure all types of outside dimensions of fasteners such as head diameters, body diameters, thread major diameters, across flats and across corners of hex heads, washer diameters, and nut thicknesses.

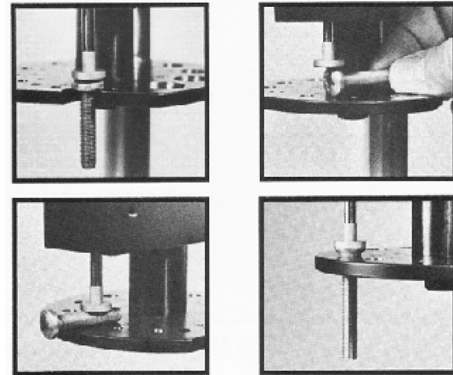
Protrusion Heights are available with the following gaging plates:

- ANSI/ASME 82 degree flat head plates: #2 through 3/8"
- ANSI/ASME 100 degree flat head plates: #2 through 3/8"
- ISO 90 degree metric flat head plates: M2 through M10
- SEMsCHEK plates for measuring head heights and lengths of SEMS screws after assembly.

These gages are ideally suited for use in manufacturing and final inspection applications. When ordering Protrusion-Height Gages, specify dial indicator (.001" resolution) or electronic indicator (either .0005" or .0001" resolution) and the gaging plate you require. Gaging plates can be quickly changed on the same gage.

The results of a long form Gage Repeatability and Reproducibility Study for the Protrusion-Height Gage was 8 %.

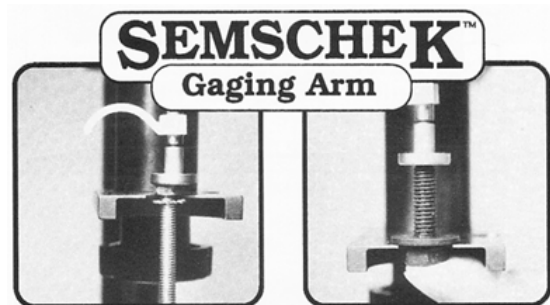
NOTE: NAS fasteners are measured with a variation of these gages. Contact us for specific information.



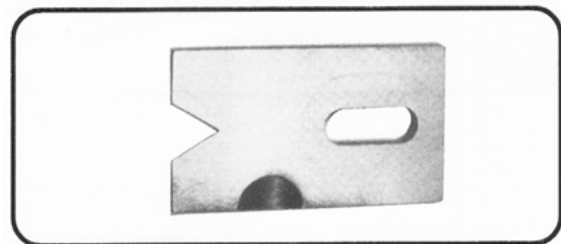
ELECTRONIC PROTRUSION-HEIGHT GAGE



DIAL PROTRUSION-HEIGHT GAGE



This new accessory for the patented DIMENSION-ALL™ System makes measuring the head heights and lengths of SEMs products easier than ever before.

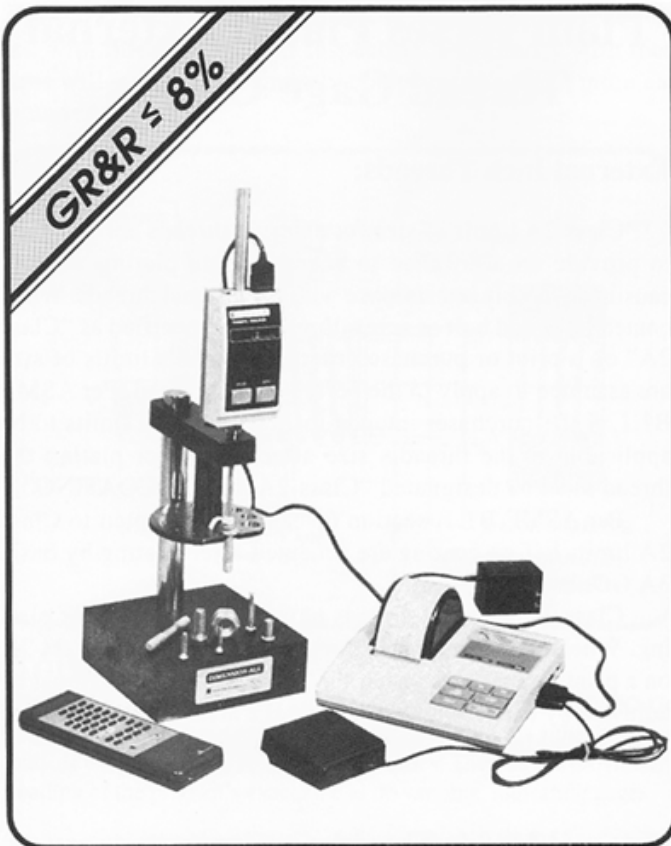


Greenslade & Company, Inc.

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E-mail: greensladeandcompany@sbcglobal.net Web site: www.greensladeandcompany.com



DIMENSION-ALL System



DIMENSION-ALL®

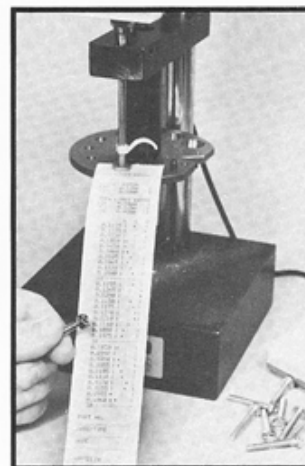
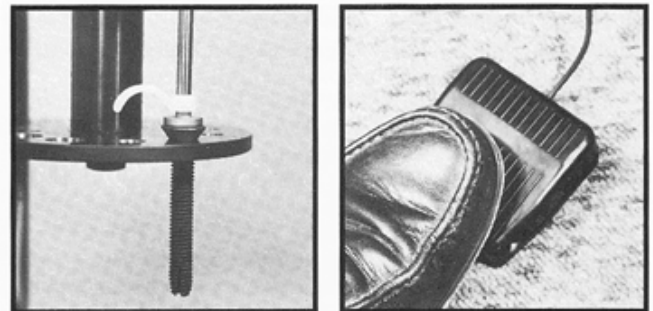
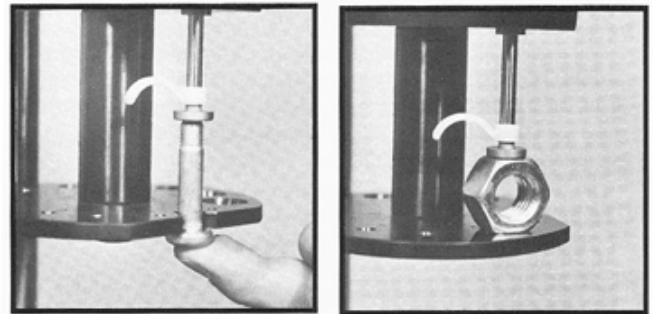
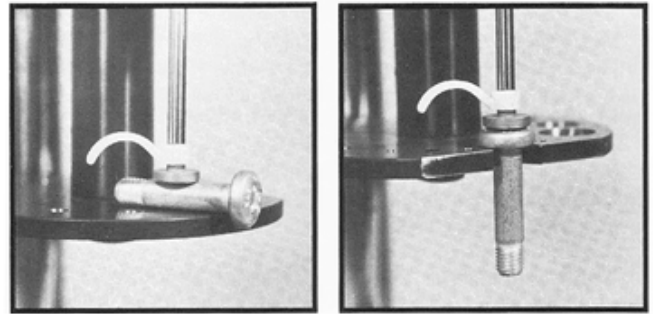
Fastener Measuring System

Patent #5,012,592

The "DIMENSION-ALL" Gage can measure all of the outside dimensions of fasteners, including lengths up to 2 inches, and record them quickly and accurately. This system is faster to use and more accurate than using hand-held measuring instruments. This system is ideally suited for incoming or final inspection applications.

This patented gage comes as a complete measuring system including a 2.000" (50mm) travel indicator having .0001" resolution, an 82 degree flat-head gaging plate (plate substitutions are allowed), presetter for setting tolerance limits in the system, a gage connecting cable, a foot switch, and a DP-1 data collector-printer. A master-test report form is part of the operator's manual allowing up to 4 characteristic inspections to be easily and neatly saved for future reference or presentation to customers.

When the "FASTENERTEST" Computerized Data Collection System is ordered, the "DIMENSION-ALL" Gage should be ordered, less DP-I, cable, and foot switch, because the gage is connected directly to the computer's interface.



DIMENSION-ALL SYSTEM			
FOR INSPECTION OF FASTENERS			
Part No.	Part Name	Part No.	Part Name
1	1/4-20 x 1/2	1	1/4-20 x 1/2
2	1/4-20 x 3/4	2	1/4-20 x 3/4
3	1/4-20 x 1	3	1/4-20 x 1
4	1/4-20 x 1 1/4	4	1/4-20 x 1 1/4
5	1/4-20 x 1 1/2	5	1/4-20 x 1 1/2
6	1/4-20 x 1 3/4	6	1/4-20 x 1 3/4
7	1/4-20 x 2	7	1/4-20 x 2
8	1/4-20 x 2 1/4	8	1/4-20 x 2 1/4
9	1/4-20 x 2 1/2	9	1/4-20 x 2 1/2
10	1/4-20 x 2 3/4	10	1/4-20 x 2 3/4
11	1/4-20 x 3	11	1/4-20 x 3
12	1/4-20 x 3 1/4	12	1/4-20 x 3 1/4
13	1/4-20 x 3 1/2	13	1/4-20 x 3 1/2
14	1/4-20 x 3 3/4	14	1/4-20 x 3 3/4
15	1/4-20 x 4	15	1/4-20 x 4
16	1/4-20 x 4 1/4	16	1/4-20 x 4 1/4
17	1/4-20 x 4 1/2	17	1/4-20 x 4 1/2
18	1/4-20 x 4 3/4	18	1/4-20 x 4 3/4
19	1/4-20 x 5	19	1/4-20 x 5
20	1/4-20 x 5 1/4	20	1/4-20 x 5 1/4
21	1/4-20 x 5 1/2	21	1/4-20 x 5 1/2
22	1/4-20 x 5 3/4	22	1/4-20 x 5 3/4
23	1/4-20 x 6	23	1/4-20 x 6
24	1/4-20 x 6 1/4	24	1/4-20 x 6 1/4
25	1/4-20 x 6 1/2	25	1/4-20 x 6 1/2
26	1/4-20 x 6 3/4	26	1/4-20 x 6 3/4
27	1/4-20 x 7	27	1/4-20 x 7
28	1/4-20 x 7 1/4	28	1/4-20 x 7 1/4
29	1/4-20 x 7 1/2	29	1/4-20 x 7 1/2
30	1/4-20 x 7 3/4	30	1/4-20 x 7 3/4
31	1/4-20 x 8	31	1/4-20 x 8
32	1/4-20 x 8 1/4	32	1/4-20 x 8 1/4
33	1/4-20 x 8 1/2	33	1/4-20 x 8 1/2
34	1/4-20 x 8 3/4	34	1/4-20 x 8 3/4
35	1/4-20 x 9	35	1/4-20 x 9
36	1/4-20 x 9 1/4	36	1/4-20 x 9 1/4
37	1/4-20 x 9 1/2	37	1/4-20 x 9 1/2
38	1/4-20 x 9 3/4	38	1/4-20 x 9 3/4
39	1/4-20 x 10	39	1/4-20 x 10
40	1/4-20 x 10 1/4	40	1/4-20 x 10 1/4
41	1/4-20 x 10 1/2	41	1/4-20 x 10 1/2
42	1/4-20 x 10 3/4	42	1/4-20 x 10 3/4
43	1/4-20 x 11	43	1/4-20 x 11
44	1/4-20 x 11 1/4	44	1/4-20 x 11 1/4
45	1/4-20 x 11 1/2	45	1/4-20 x 11 1/2
46	1/4-20 x 11 3/4	46	1/4-20 x 11 3/4
47	1/4-20 x 12	47	1/4-20 x 12
48	1/4-20 x 12 1/4	48	1/4-20 x 12 1/4
49	1/4-20 x 12 1/2	49	1/4-20 x 12 1/2
50	1/4-20 x 12 3/4	50	1/4-20 x 12 3/4
51	1/4-20 x 13	51	1/4-20 x 13
52	1/4-20 x 13 1/4	52	1/4-20 x 13 1/4
53	1/4-20 x 13 1/2	53	1/4-20 x 13 1/2
54	1/4-20 x 13 3/4	54	1/4-20 x 13 3/4
55	1/4-20 x 14	55	1/4-20 x 14
56	1/4-20 x 14 1/4	56	1/4-20 x 14 1/4
57	1/4-20 x 14 1/2	57	1/4-20 x 14 1/2
58	1/4-20 x 14 3/4	58	1/4-20 x 14 3/4
59	1/4-20 x 15	59	1/4-20 x 15
60	1/4-20 x 15 1/4	60	1/4-20 x 15 1/4
61	1/4-20 x 15 1/2	61	1/4-20 x 15 1/2
62	1/4-20 x 15 3/4	62	1/4-20 x 15 3/4
63	1/4-20 x 16	63	1/4-20 x 16
64	1/4-20 x 16 1/4	64	1/4-20 x 16 1/4
65	1/4-20 x 16 1/2	65	1/4-20 x 16 1/2
66	1/4-20 x 16 3/4	66	1/4-20 x 16 3/4
67	1/4-20 x 17	67	1/4-20 x 17
68	1/4-20 x 17 1/4	68	1/4-20 x 17 1/4
69	1/4-20 x 17 1/2	69	1/4-20 x 17 1/2
70	1/4-20 x 17 3/4	70	1/4-20 x 17 3/4
71	1/4-20 x 18	71	1/4-20 x 18
72	1/4-20 x 18 1/4	72	1/4-20 x 18 1/4
73	1/4-20 x 18 1/2	73	1/4-20 x 18 1/2
74	1/4-20 x 18 3/4	74	1/4-20 x 18 3/4
75	1/4-20 x 19	75	1/4-20 x 19
76	1/4-20 x 19 1/4	76	1/4-20 x 19 1/4
77	1/4-20 x 19 1/2	77	1/4-20 x 19 1/2
78	1/4-20 x 19 3/4	78	1/4-20 x 19 3/4
79	1/4-20 x 20	79	1/4-20 x 20
80	1/4-20 x 20 1/4	80	1/4-20 x 20 1/4
81	1/4-20 x 20 1/2	81	1/4-20 x 20 1/2
82	1/4-20 x 20 3/4	82	1/4-20 x 20 3/4
83	1/4-20 x 21	83	1/4-20 x 21
84	1/4-20 x 21 1/4	84	1/4-20 x 21 1/4
85	1/4-20 x 21 1/2	85	1/4-20 x 21 1/2
86	1/4-20 x 21 3/4	86	1/4-20 x 21 3/4
87	1/4-20 x 22	87	1/4-20 x 22
88	1/4-20 x 22 1/4	88	1/4-20 x 22 1/4
89	1/4-20 x 22 1/2	89	1/4-20 x 22 1/2
90	1/4-20 x 22 3/4	90	1/4-20 x 22 3/4
91	1/4-20 x 23	91	1/4-20 x 23
92	1/4-20 x 23 1/4	92	1/4-20 x 23 1/4
93	1/4-20 x 23 1/2	93	1/4-20 x 23 1/2
94	1/4-20 x 23 3/4	94	1/4-20 x 23 3/4
95	1/4-20 x 24	95	1/4-20 x 24
96	1/4-20 x 24 1/4	96	1/4-20 x 24 1/4
97	1/4-20 x 24 1/2	97	1/4-20 x 24 1/2
98	1/4-20 x 24 3/4	98	1/4-20 x 24 3/4
99	1/4-20 x 25	99	1/4-20 x 25
100	1/4-20 x 25 1/4	100	1/4-20 x 25 1/4

The result of a long form Gage Repeatability and Reproducibility Study for the "DIMENSION-ALL" System was 8%.



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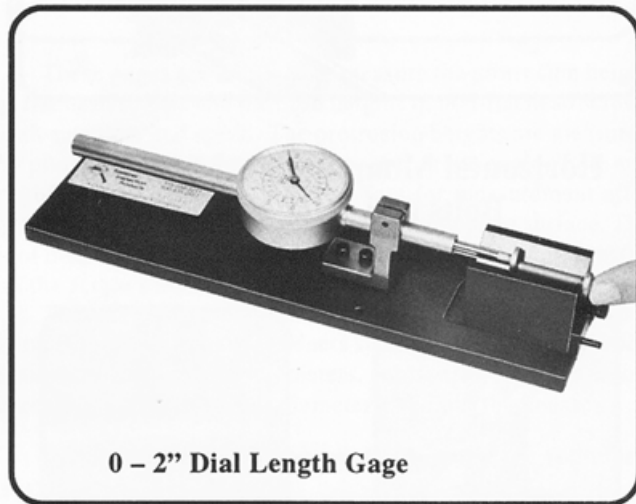
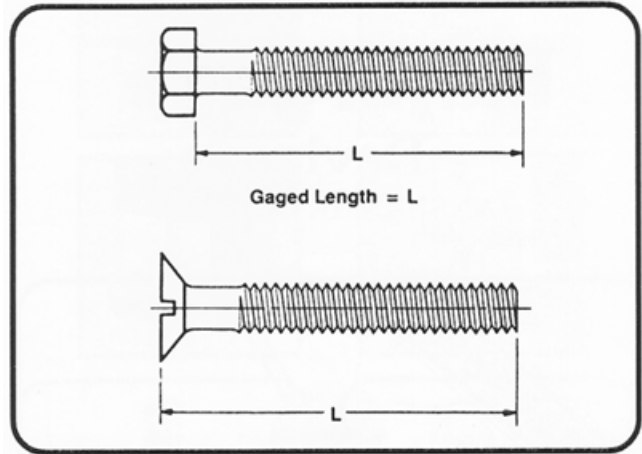
Length Gages

LENGTH GAGES for Fastener Measuring:

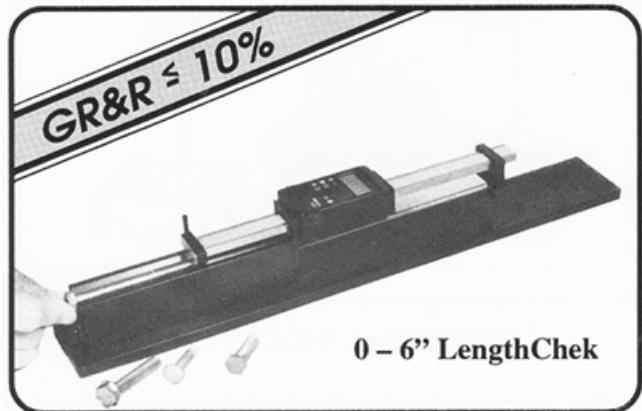
Greenslade LENGTH GAGES make measuring the lengths of fasteners fast, easy, and accurate. These gages offer major improvements over the past practices of measuring fastener lengths with the back end of calipers, scales or rulers. Such methods are crude, slow, cumbersome and frequently inaccurate. The most popular LENGTH GAGE is the electronic, digital model LG-006E that has a 6" (150mm) capacity with .0005" resolution. There are also two 2" capacity models: LG-002E, 0-2" (50mm), electronic with .0001" resolution and the LG002, 0-2", dial indicator type with .001" resolution.

The LENGTH GAGES are ideally suited for use in production as well as in incoming and final inspection applications. Fastener lengths can be measured up to 4 times faster with LENGTH GAGES than with other less suitable instruments.

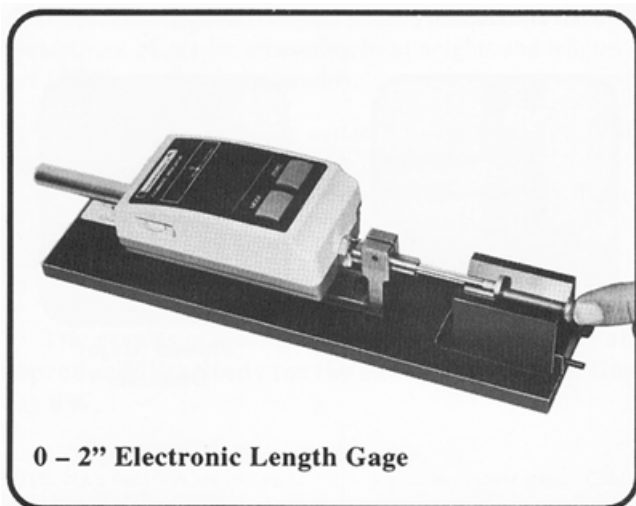
The result of a long form Gage Repeatability and Reproducibility Study for the Length Gage was 10%.



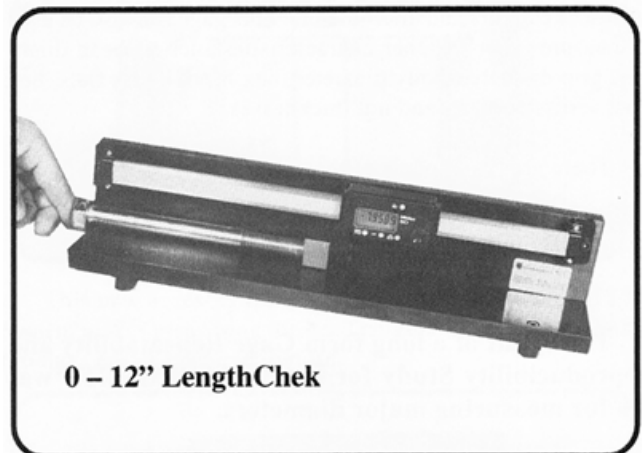
0 - 2" Dial Length Gage



0 - 6" LengthChek



0 - 2" Electronic Length Gage



0 - 12" LengthChek



Greenslade & Company, Inc.

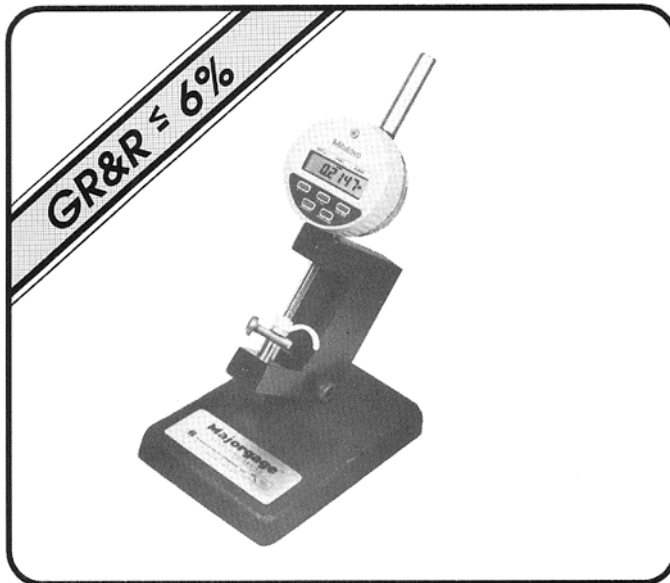
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MAJORGAGE™ Device

Majorgage™ Device

(ANSI/ASME Gage #14)



VERTICAL MOUNTING

This gage was developed to make the measurement of screw blank diameters and thread major diameters faster, easier, more accurate, more repeatable, and more reproducible than the use of calipers and micrometers. This gage can also be used to measure other fastener characteristics such as head diameter, grip diameter, body diameter, hex head across flats, hex head across corners, and nut thicknesses.

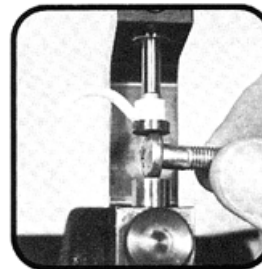
There are two models of the "MAJORGAGE" Device:

Travel	Resolution
0-1.0000" (24mm)	.0001"
0-.50000" (12mm)	.00005"

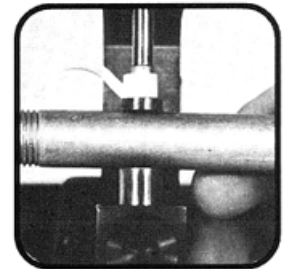
The result of a long form Gage Repeatability and Reproducibility Study for the "MAJORGAGE" was 6% for measuring major diameters.



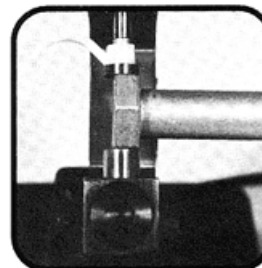
Horizontal Mounting for Measuring Bolts and Long Screws



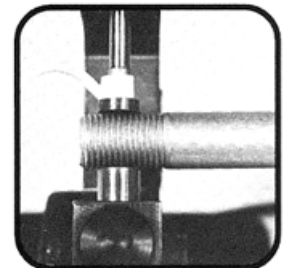
Head Diameter



Body Diameter



Head Diameter



Thread Major
Diameter



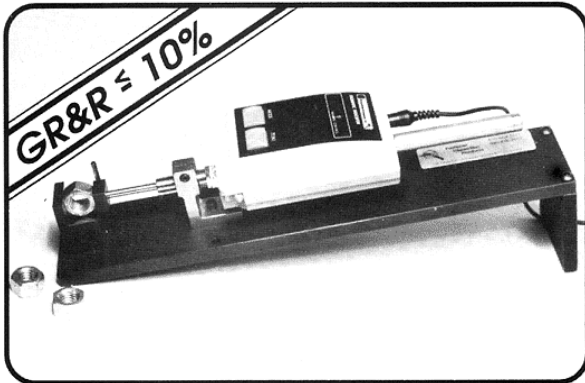
Greenslade & Company, Inc.

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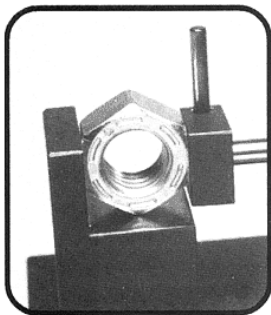


Nut Measuring Gage/Groove Measuring Gage

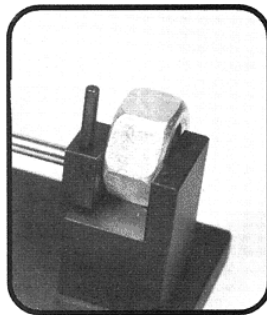
HEXCHEK™ G A G E



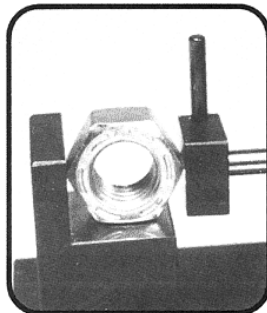
Horizontal Mounting



Across Flats



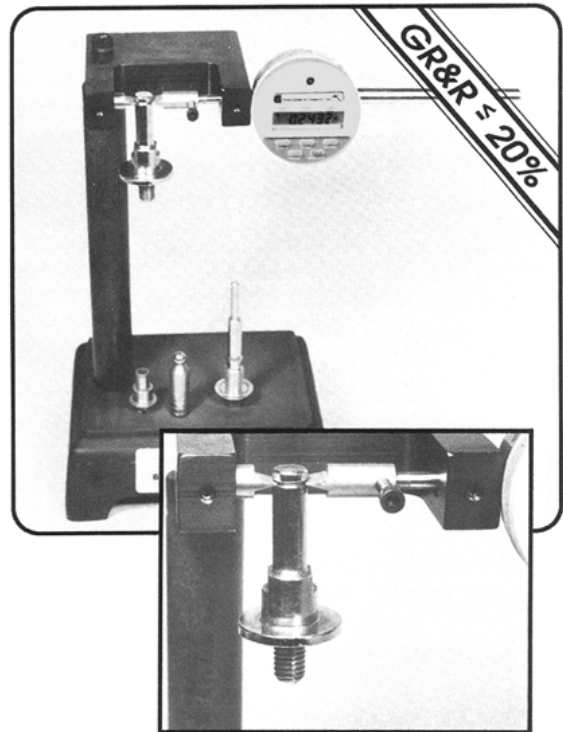
Thickness



Across Corners

Range: 0 - 1" (0-25mm)
Resolution: .0001" (.001mm)
Gage R&R: 10%

GROOVCHek™ G A G E



The GroovChek Gage is designed to accurately and repeatedly measure the minor diameter of rolled and shaved annular rings and grooves.

This gage measures the groove diameter while suspending the part vertically. This eliminates the inaccuracies caused by the prying action exerted on the gage when long parts are measured horizontally.

The GroovChek Gage measures a range of diameters from .040 to 1.000 inches (1 to 25mm). The gage's resolution is .0001 inches (0.001mm). This gage is capable of measuring groove widths as small as .010 inches (0.25mm). The gage's electronic indicator has SPC output suitable for connecting to all data collection systems.

The Gage Repeatability and Reproducibility is less than 20% based on the long study method using two measurement rounds with three operators.



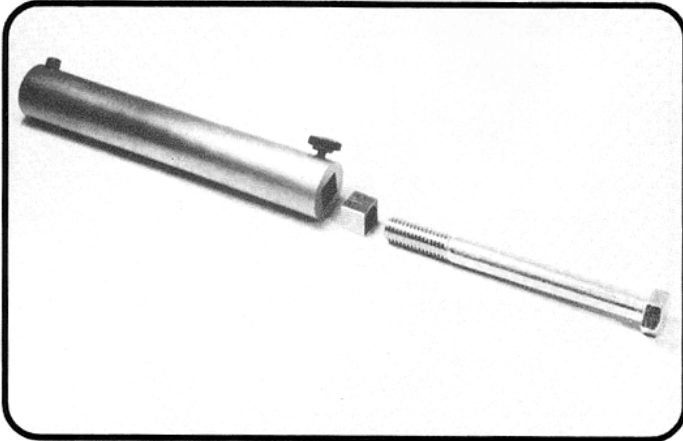
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Straightness Gaging Products

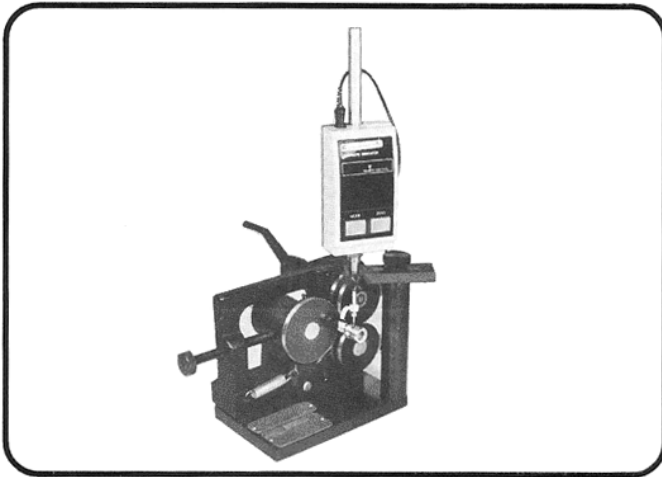
Thread RunoutChek™ Gaging System



The RunoutChek system is designed to inspect the thread runout on inch and metric bolts up to 10 inches or 240 millimeters in length. It is fast and easy to use and provides the user with a clear GO or NO-GO indication of thread runout acceptability.

The thread RunoutChek gaging system is an alternative to the gage design illustrated in the Appendix of ASME B18.2.1 and ASME B18.2.3.1M. This innovative system greatly decreases the number of components needed to inspect a wide range of bolt diameters and lengths.

CONCENTRICITY GAGE

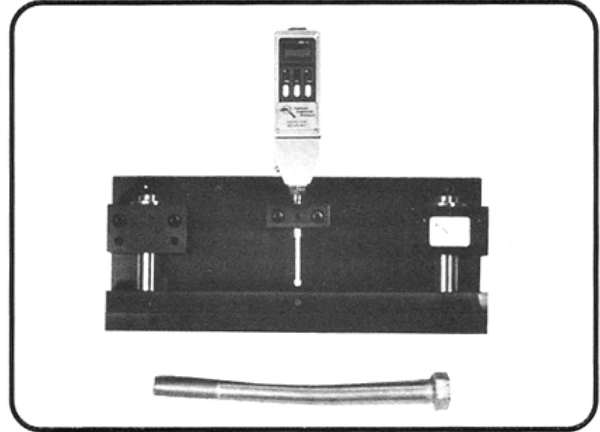


The precision St. Mary Rotary "V" Block Gage makes measuring concentricity characteristics on cold headed parts faster, easier, and more precise than other similar devices. Geometric tolerancing measurement requirements are becoming more common on fasteners and cold formed specials. It is vital for fastener producers to have the capability to make these geometric, relational measurements accurately and repeatably.

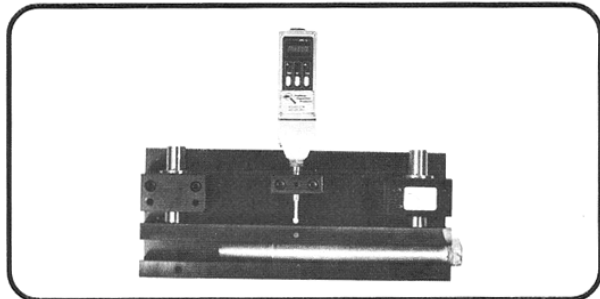
The St. Mary gage design derives its accuracy and repeatability from its patented intermeshing three part contacting roll design. Other features contributing to its precision are an adjustable length stop, and adjustable spring loaded hold-down arm, sealed bearings, and lapped contact rolls. On the smallest gage model, concentricity measurements as precise as .00005 inches can be made.

CAMBERCHEK™ G A G E

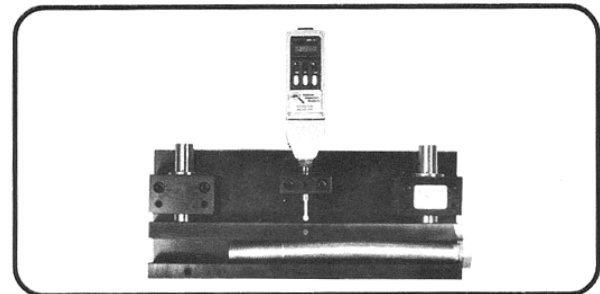
for
Measuring Bolt Straightness



The new CamberChek' ' Gage provides the actual measurement of the amount of bow or camber in a bolt or screw quickly and easily. This gage is suitable for use in SPC programs for controlling manufacturing processes as well as for final inspection. CamberChek can be connected to a printer or computerized inspection systems for recording results.



Step 1 - Zeroing Gage



**Step 2 - Bow of bolt turned to bottom of gage.
Camber indicated on gage indicator.**



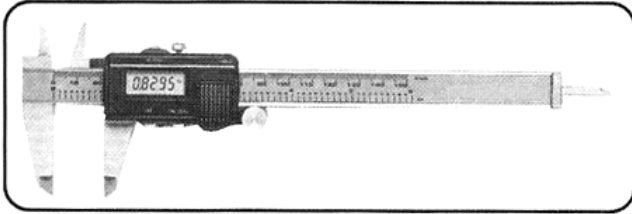
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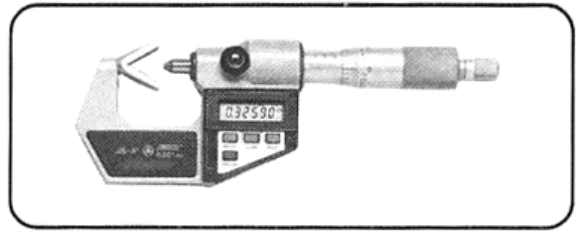
Handheld Digital Measuring Instruments

Easy to Learn - Fast to Use – Accurate S.P.C. Output



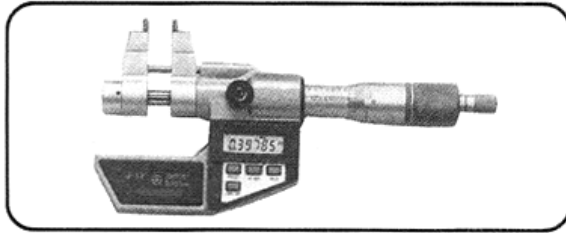
CALIPER

Model: CAL-500171. Capacity: 0-6 inch (0-150mm)
Resolution: .0005
Use: General measuring, O.D. and I.D.



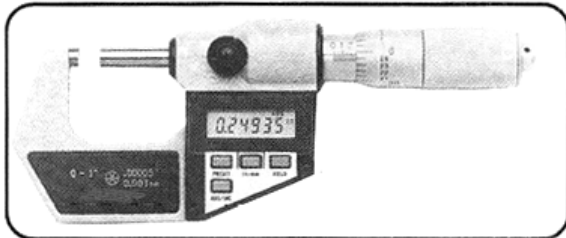
TT THREAD MICROMETER

Model: MTT 314711
Resolution: .00005
Use: Measuring Tri-Roundular Screws



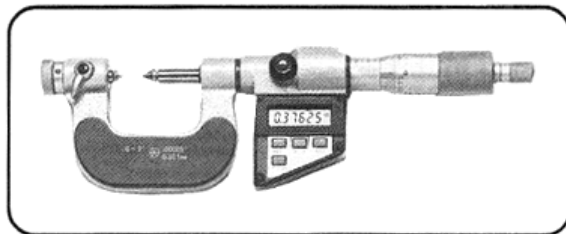
INSIDE MICROMETER

Model: MID-345711 Capacity: .2-1.2 inch (5-30mm)
Model: MID-345712 Capacity: 1-2 inch (25-50mm)
Resolution: .00005
Use: Measuring nut and washer I.D.s



OUTSIDE MICROMETER

Model: MIC-293725 Capacity: 0-1 inch (0-25mm)
Model: MIC-293726 Capacity: 1-2 inch (25-50mm)
Resolution: .00005
Use: O.D. measurements



THREAD PITCH MICROMETER

Model: MTI-326711 Capacity: 0-1 inch (0-25mm)
Resolution: .00005
Use: Measuring external pitch diameters
Note: Interchangeable pitch anvils required
(Part No. MTI-126800)



DP-1 Data Collection System Components:

1. DP-1 data collector-printer.....DPI-264503
2. DP-1 foot switch.....DPI-937179
3. DP-1 presetter, for quickly and easily designating the high and low product tolerance limits in the DP-1.....DPP-543003
4. DP-1 connecting cables for Greenslade gages:
Tri-Roll, "X-120", "X-180", Bi-Point, "RecessCheker", 6" Length Gage, Protrusion Height Gage, 12" Optical Comparator, "Majorgage", Minorgage.....DPCC-905338
New Caliper (171 Series)..... DPCC-959149
Micrometer.....DPCC-937387
DIMENSION-ALL, 2" Length Gage.....DPCC-936937
5. DP-1 printer paper (10 rolls per box)..... DPP-271071
6. DP-1 printer ribbons (5 per box).....DPR-197216



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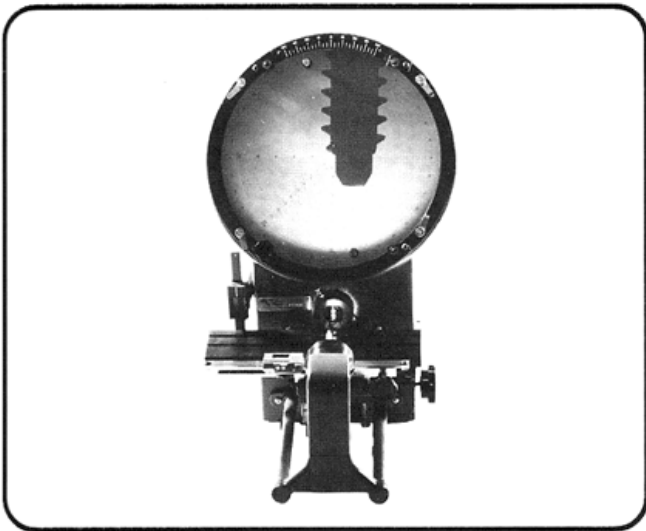


Optical Comparators

Some critical fastener characteristics must be inspected using optical comparators. These features include under head fillets, thread root radii, flat head and point angles. Additionally, optical comparators are very useful in measuring special features such as groove depths and widths, shoulder lengths, distance of first full thread to the head, and chamfer diameters.

The optical comparator is probably the most versatile instrument available for fastener measuring. There are very few fastener features which an optical comparator cannot measure. No fastener inspection laboratory is really complete without an optical comparator.

Optical comparators use two types of illumination. When using profile illumination, the comparator's light shines past a part and casts its shadow on the comparator's screen, only showing its outline. When using surface illumination, the surface of the part is shown on the comparator's screen as though it were on television. This allows measurement of characteristics such as chamfer diameters and letter sizes.



Model OC-121E specifications

- Screen: 12", one quadrant protractor glass screen
- Magnification: 10X or 20X (specify when ordering)
- Table Travel: 2-1/2" vertical, 6" horizontal
- Illumination: profile and surface
- Readout Type: X and Y axis Digital Scales, .0005" (0.01mm) resolution
- Readout Increments: inches and millimeters
- Electrical: 115 volts/50-60Hz, single phase
- Accessories included: V-block and part holding magnet

Options

- Screens: toolmaker's, plain, 90 degrees crosslines only
- 50X magnification lens (ref. MIL-S-8879)
- Overlays: Micro-radius, Inch Thread, Metric Thread (specify magnification when ordering)
- Bulbs: profile and surface illumination (one spare of each should be bought with each comparator)

Optical comparators can be used to match a projected part image against an overlay on the comparator screen such as for inspecting angles, or radii, or actual feature measurements can be made with the comparator's digital scales or digital readout. There are two models available: Model OC-121E, with a 12" screen and digital scale readout capable of measuring lengths and heights to .0005" resolution and Model OC-1400, with a 14" screen and computerized digital readout capable of calculating angles, radii, and measuring lengths and heights to .0001" resolution. Both models can measure in either inches or millimeters.

NOTE: MIL-S-8879 requires the inspection of root radius. This can be done using overlays or readouts, but the following minimum magnifications are required: fewer than 14 TPI, 20X; 14-40 TPI, 50X; more than 40 TPI, 100X



Model OC-1400 specifications

- Screen: 14", 90 degree crosslines, 5 minutes arc scale, glass
- Magnification: 10X or 20X (specify when ordering)
- Table Travel: 3" vertical, 6" horizontal
- Illumination (tungsten-halogen): profile and fiber-optic surface
- Readout Type: QUADRA-CHEK II Geometric Digital
- Readout System -
 - calculates angles, radii, centerlines, point-to-point intersections, and skew
 - measures diameters and lengths
 - inch and millimeter readings
 - .0001" (0.002mm) resolution
 - RS-232 output for connecting to printer or to the Greenslade "FASTENERTEST" Data Collection Package
- Electrical: 115 volts/50-60Hz, single phase

Options:

- Edge Locator: repeatable within .0002"
- Overlays: Micro-radius, Inch Thread, Metric Thread (specify magnification when ordering)
- Part holding fixture with rotating base
- Magnifications: 10X, 20X, 50X, 100X
- Bulb: profile/surface illumination tungsten-halogen bulb (one spare should be bought with each comparator)



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2234 Wenneka Ave., Fort Worth, TX 76102 USA Phone: 817-870-8888 Fax: 817-870-9199
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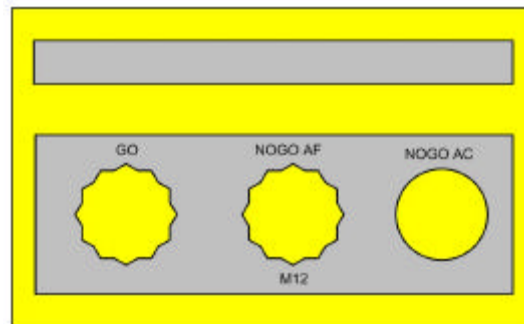
Special Gage Designs By Greenslade



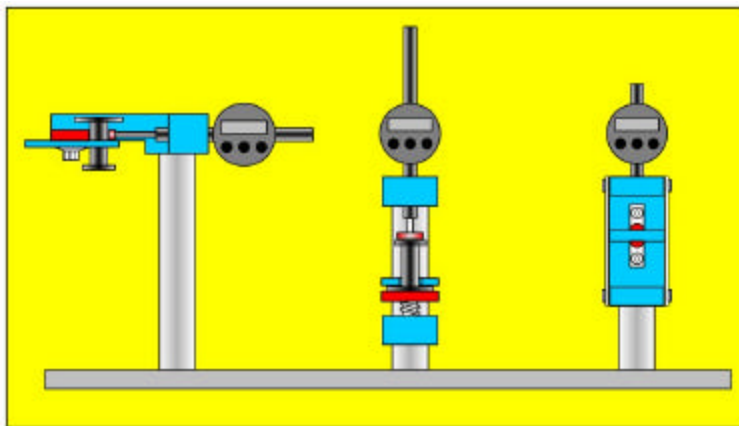
Special Gage Design Philosophy: **Less is More!**

Greenslade gage designs are based on the idea that the **simplest gage** that meets a specific inspection objective is the **best gage**.

Some inspection objectives can be adequately met using attribute (Go/NoGo) gages.



Some inspection objectives, such as those related to SPC, can only be met using variable gages.



Take advantage of our twenty years of gage design experience when you have special inspection requirements. Let us help you decide on the simplest, most practical gage design to meet your specific inspection objectives.

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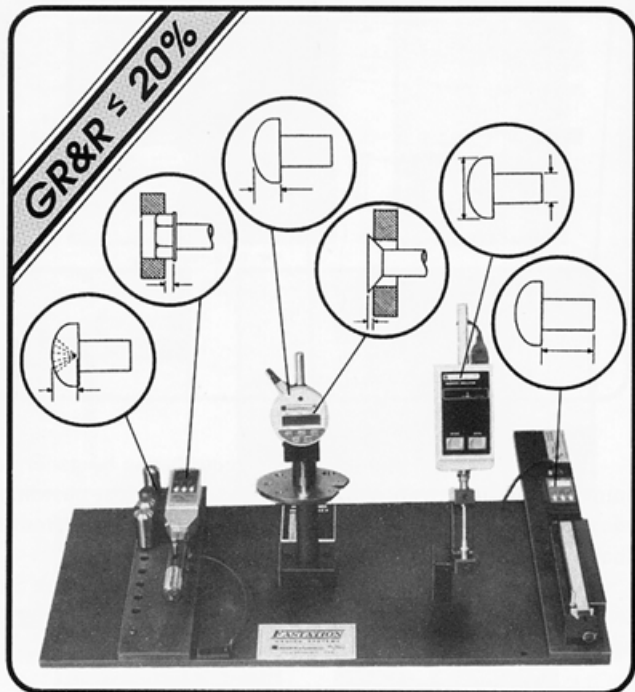
Local: 817-870-8888, Fax 817-870-9199

Toll FREE: 800-435-2657, Fax 866-922-2002

FASTATION®

FASTATION®

Systems improve measurement speed, accuracy and GR&R results dramatically!



FASTATION MEASUREMENT SYSTEMS

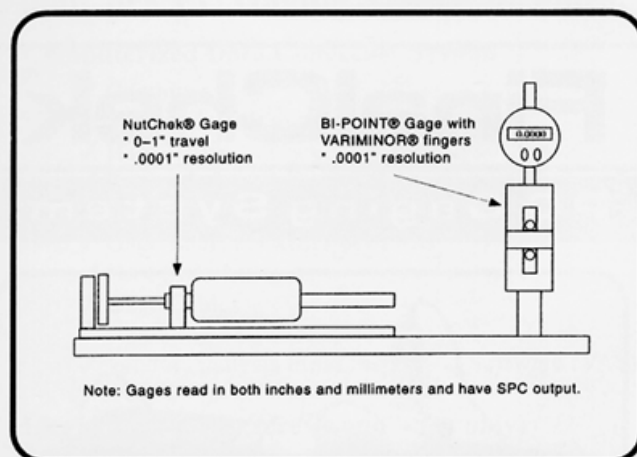
- Ideal for SPC • All GR&R less than 20%
- Other system configurations available based on review of part prints

Join many of the fastener industry's largest manufacturers by adopting the use of FASTATION Systems for making in-process measurements. SPC data is only as good as the measurements that go into the formulas. FASTATION Systems generally provide GR&R results one half those of handheld gages. **All GR&R values are less than 20%, with most below 10%.**

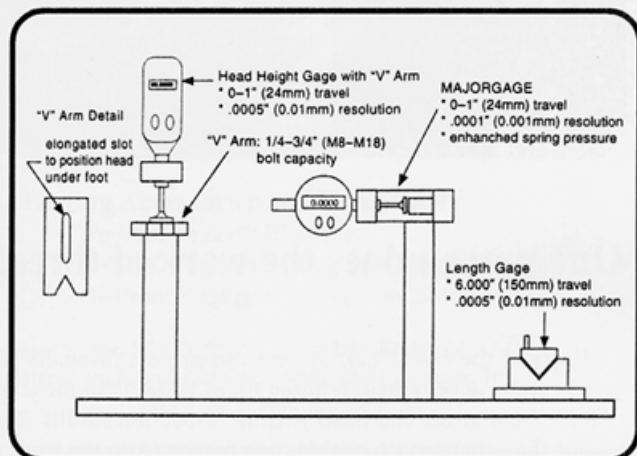
The use of FASTATION Systems in fastener production is enthusiastically accepted by machine operators. Their use reduces internal measurement controversies. In many cases machine capability study results improve because the FASTATION Systems remove most of the gage error that adversely effect Cp and Cpk studies.

The FASTATION System shown above is for screw and rivet production. Other configurations are supplied to meet specific manufacturer's needs based on the review of the prints for parts to be measured by Greenslade personnel.

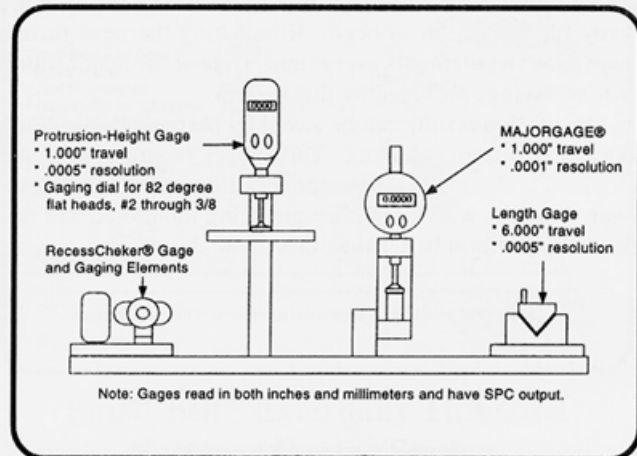
Upgrade your measurement approach to state-of-the-art by adopting FASTATION Systems!



Two Position Nutformer FASTATION®



Three Position Bolt Inspection FASTATION®



Four Position Screw Inspection FASTATION®

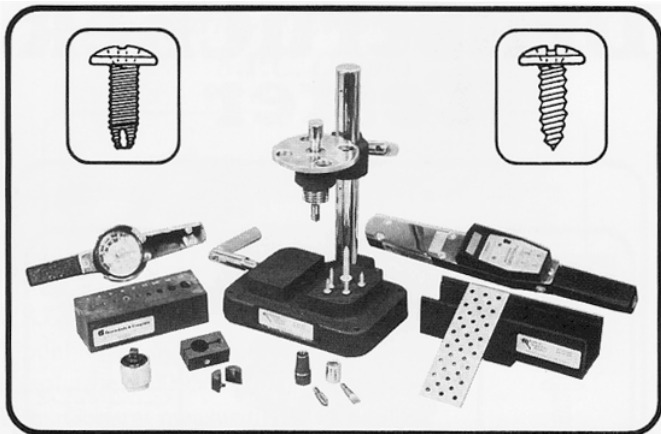


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Tapping Screw Testing Products

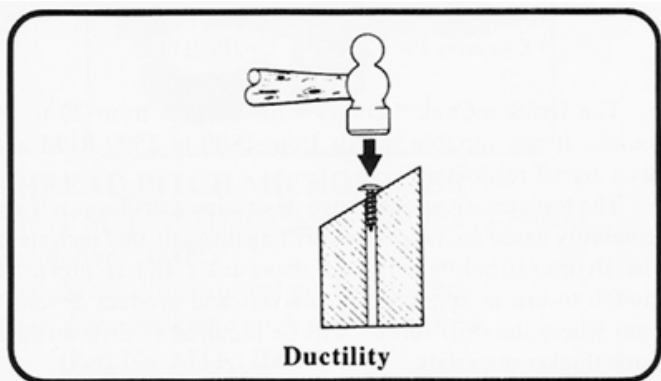


TAPPING SCREW PERFORMANCE TESTING PRODUCTS

Tapping Screws are widely used fasteners in high volume assembly applications because they are designed to either reduce the number of components used or to eliminate production operations such as tapping and/or drilling. The performance requirements of tapping screws are covered by ANSI, SAE, GM, Ford, Chrysler, JIS, ISO, and others. These standards require that tapping screws must be tested for ductility, torsional strength, drive test, drive torque, drill-drive time, and hydrogen embrittlement. These requirements vary depending on the screw's type. Specific equipment is required to conduct these tests properly. Greenslade provides all of the testing products needed to perform these required tests. Below are brief definitions of the various tapping screw tests.

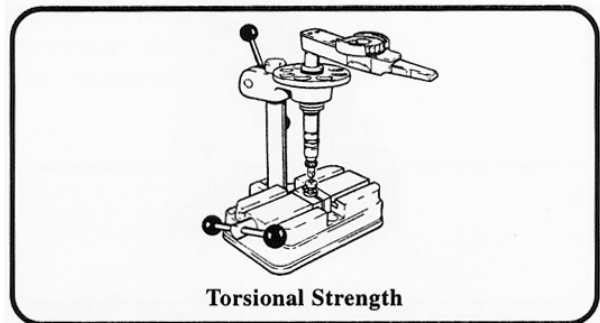
Ductility Testing

A product's ductility is its ability to be deformed without fracturing. In tapping screws this is determined by a simple test in which the screw is placed in a hardened test block with a specific test angle on its face and the screw is struck on its head to make it conform to the test angle. If the head breaks off the part it is not ductile enough and should be rejected. This type of failure indicates that the screw is either too hard, the recess is too deep, or the thread is too close to the screw's head.



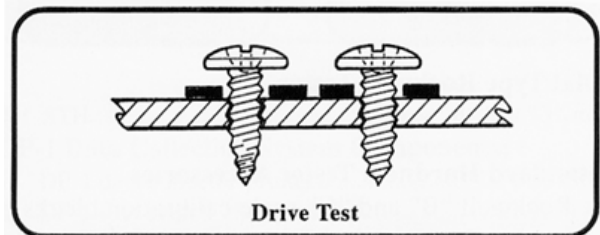
Torsional Strength Testing

A part's torsional strength is its ability to resist being twisted in two. Minimum torsional strength requirements are specified in the various standards governing tapping screws. This is tested by clamping a screw in a tapped split collet in a torsional strength testing fixture and applying twisting force (torque) with a torque wrench until the screw twists in two. The part fails if it does not exceed the required minimum torque value specified. A failure indicates that the screw is too soft or the minor diameter is too small.



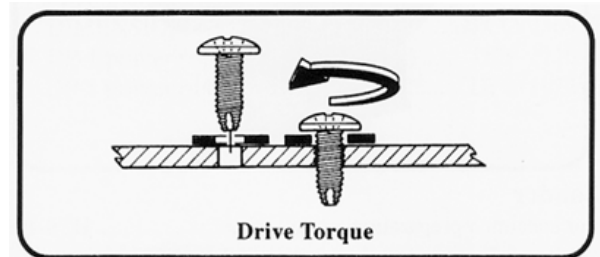
Drive Testing

This test is conducted by driving a tapping screw into a "test plate" having a specific hardness, thickness, and hole size. The set fails if its threads are deformed after it has been driven through the "test plate". This failure indicates that the screw's case hardness is too shallow and/or too soft.



Drive Torque Testing

This is a requirement for thread rolling screws only. When conducting the "drive test", the maximum driving torque required to create the thread in the test plate is observed. The screw fails if that torque exceeds the values specified in the standards based on its size and surface finish. A failure indicates that the screw's surface finish does not have enough lubricity or its thread forming feature is inadequate to lower driving torque.



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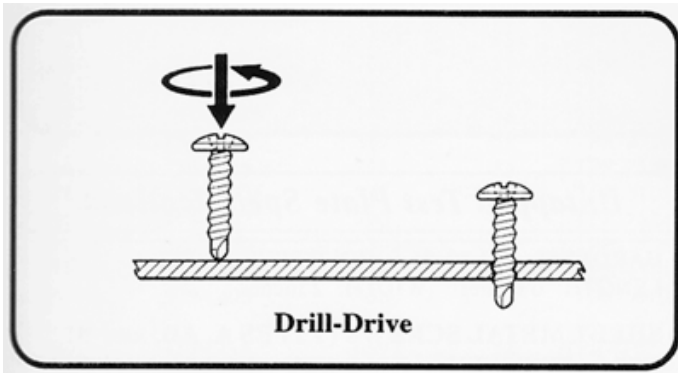
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Tapping Screw Testing Products

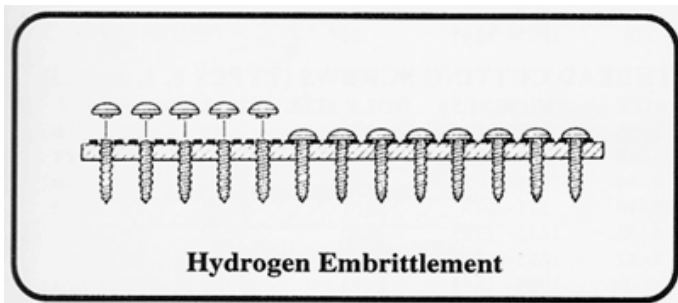
Drill-Drive Time Testing

This is a test requirement for self drilling screws only. This test is conducted by placing a screw in a drill-drive tester which exerts a specific amount of end pressure on the screw while it is driven at a specific drill speed, through a test plate of a specific hardness and thickness. The part fails if it does not drill through and fully engage the first thread in the test plate in less than a specified time. A failure indicates that the drill point not properly formed.



Hydrogen Embrittlement

This test should be performed on all tapping screws which receive an electroplated surface finish. This test is conducted by following a testing procedure to determine an optimum tightening torque and then seating screws at that calculated value for 24 hours after which they are retightened to the same value. A part fails if the screw breaks before or during the retightening process. A failure indicates that parts were not properly baked after plating and hydrogen has been trapped in the steel.



NOTE: Request a FREE copy of the Greenslade FIP-1000 Tapping Screw Performance Specification and wall chart for more details about testing requirements and procedures.

Tapping Screw Testing Products

Torsional strength test equipment:

- A. Screw test fixture- 5/16 max.....STF-250
- B. Screw test fixture- 1/2 max.....STF-500
- C. Split collet holder (only 1 req'd.).....STCH-250
- D. Split collets – sheet metal screws:
STC4-24, STC5-20, STC6-18, STC6-20, STC7-16, STC7-19,
STC8-15, STC9-14, STC10-12, STC10-16,
STC12-11, STC12-14, STC14-10, STC14-14, STC5/16-12,
STC3/8-12.
- E. Split collets - inch machine screw series:
STC4-40, STC5-40, STC6-32, STC8-32, STC10-24, STC10-32,
STC12-24, STC14-20, STC5/16-18, STC5/16-24, STC3/8-16,
STC7/16-20 STC 1/2-13
- F. Split collets - metric machine screw series: STCM3x0.5,
STCM3.5x0.6, STCM4x0.7, STCM5x0.8, STCM6x1.0,
STCM8x1.25, STCM10x1.5, STCM12x1.75

Drive, drive torque and hydrogen embrittlement:

- A. Test plate holder (fits into STF).....STPH-200
- B. Test ratchet (speeds up and simplifies drive torque and hydrogen embrittlement tests).....STRA-101
- C. Test plates – See following page.

Note: Test plates are 2 x 6 inches with from 13 to 52 holes depending on screw size. All plates are held in the STPH-200.

Ductility test blocks - sizes #4 through 1/2 diameter in each block:

- A. 10 DegreeDB-010
- B. 5 DegreeDB-005
- C. 7 DegreeDB-007

Ductility hammer.....DBH-100

Torque wrenches

A. Dial type with memory needles (inch and metric):

- 0-30 inch pounds 1/4 DriveTWI-030
- 0-75 inch pounds 1/4 DriveTWI-075
- 0-150 inch pounds 3/8 DriveTWI-150
- 0-300 inch pounds 3/8 DriveTWI-300
- 0-600 inch pounds 3/8 DriveTWI-600



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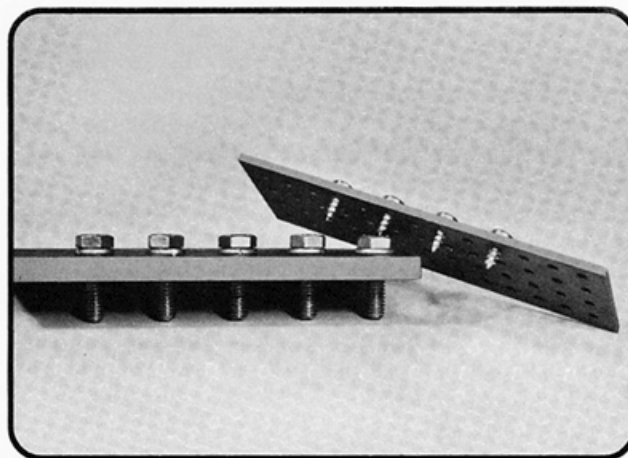
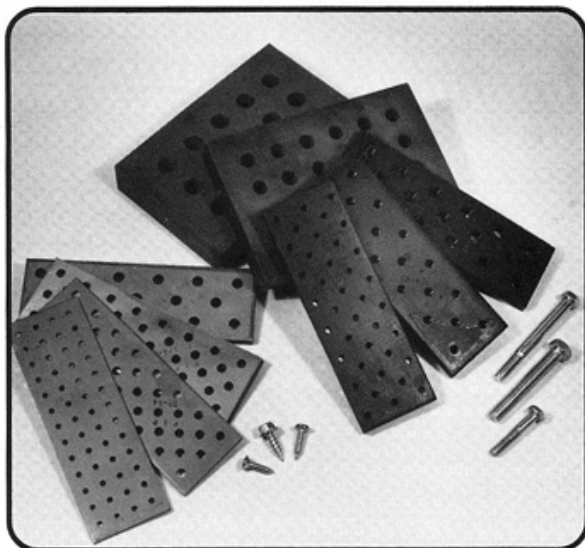
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Test Plates

TEST PLATES

*For
Screws and Bolts*



Untapped Test Plate Specifications

HARDNESS: RB 70-85 HOLE SIZE: +/- .001
LENGTH: 6 inches WIDTH: 2 inches

SHEET METAL SCREWS (TYPES A, AB, and B)

SIZE	THICKNESS	HOLE SIZE	#HOLES	NEW#
2	.050-.046	.076	52	TP-02
3	.050-.046	.081	52	TP-03
4	.050-.046	.086	52	TP-04
5	.050-.046	.1065	52	TP-05
6	.077-.073	.116	52	TP-06
7	.077-.073	.1285	52	TP-07
8	.077-.073	.136	52	TP-08
9	.077-.073	.149	52	TP-09
10	.127-.123	.159	52	TP-10
12	.127-.123	.1875	38	TP-12
14	.127-.123	.2165	38	TP-14
1/4	.1905-.1845	.2165	38	TP-25
5/16	.1905-.1845	.272	17	TP-31
3/8	.1905-.1845	.328	17	TP-37

THREAD CUTTING SCREWS (TYPES F, 1, and 23)

SIZE	THICKNESS	HOLE SIZE	#HOLES	NEW #
2-56	.080-.076	.073	52	TPT-256
3-48	.096-.092	.081	52	TPT-0348
4-40	.111-.107	.096	52	TPT-440
5-40	.111-.107	.101	52	TPT-540
6-32	.1425-.1385	.120	52	TPT-0632
8-32	.1425-.1385	.147	52	TPT-0832
10-24	.1905-.1845	.173	52	TPT-1024
10-32	.1905-.1845	.177	52	TPT-1032
12-24	.1905-.1845	.199	38	TPT-1224
1/4-20	.253-.247	.228	38	TPT-2520
1/4-28	.253-.247	.234	38	TPT-2528
5/16-18	.3155-.3095	.290	17	TPT-3118
5/16-24	.3155-.3095	.295	17	TPT-124
3/8-16	.378-.372	.358	17	TPT-3716
3/8-24	.378-.372	.358	17	TPT-724
M2	.080-.076	.0669	52	TPT-M02
M2.5	.096-.092	.0827	52	TPT-M02.5
M3	.111-.107	.1024	52	TPT-M03
M3.5	.1425-.138	.1220	52	TPT-M03.5
M4	.1425-.138	.1378	52	TPT-M04
M5	.1905-.184	.1772	52	TPT-M05
M6	.253-.247	.2126	38	TPT-M06
M8	.3157-.3094	.2913	17	TPT-M08
M10	.3779-.3717	.3661	17	TPT-M10

Test plates are important inspection items. Their proper use will call attention to problems before the fasteners cause assembly or warranty problems.

Untapped test plates are required to properly test tapping screws (Types A, AB, B, F 1, 23, TT, SF, etc.) for their ability to drive and to detect the presence of hydrogen embrittlement.

Tapped test plates are required to test machine screws and bolts which are electroplated and Rockwell C30 or harder to detect the presence of hydrogen embrittlement.

Greenslade Fastener Test Plates are stocked for immediate shipment. They meet the following requirements:

- ANSI B 18.6.4, B 18.6.5M
- DIN 7500-1, 7513, 7516
- FIP-1000.1 - .7
- Ford ES-M 1 A 160-A, ES-20003-S 1000
- GM 6010M, 617M, 6171M
- ISO 2702
- JIS 1055
- SAE J81, J478a, J993, J1237

**All test plates come with Certificates of Quality
at no extra charge.**



Greenslade & Company, Inc.

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Test Plates

Untapped Test Plate Specifications

THREAD ROLLING SCREWS (TYPES TT, SF, ETC.)

SIZE	THICKNESS	HOLE SIZE	#HOLES	NEW #
2-56	.127-.123	.075	52	TPR-0256
3-48	.127-.123	.087	52	TPR-0348
4-40	.127-.123	.098	52	TPR-0440
5-40	.127-.123	.110	52	TPR-0540
6-32	.127-.123	.120	52	TPR-0632
8-32	.1905-.1845	.147	52	TPR-0832
10-24	.1905-.1845	.166	52	TPR-1024
10-32	.1905-.1845	.172	52	TPR-1032
12-24	.1905-.1845	.191	38	TPR-1224
1/4-20	.254-.246	.219	38	TPR-2520
1/4-28	.254-.246	.228	38	TPR-2528
5/16-18	.3175-.3075	.277	17	TPR-3118
5/16-24	.3175-.3075	.290	17	TPR-3124
3/8-16	.380-.370	.339	17	TPR-3716
7/16-14	.4425-.4325	.394	17	TPR-4314
1/2-13	.505-.495	.456	17	TPR-5013
M2	.133-.118	.0697	52	TPR-M02
M2.5	.133-.118	.0886	52	TPR-M02.5
M3	.133-.118	.1063	52	TPR-M03
M3.5	.133-.118	.1240	52	TPR-M03.5
M4	.2165-.1969	.1417	52	TPR-M04
M5	.2165-.1969	.1791	52	TPR-M05
M6	.2559-.2362	.2126	38	TPR-M06
M8	.338-.315	.2874	17	TPR-M08
M10	.4210-.3937	.3622	17	TPR-M10
M 12	.500-.4724	.4331	17	TPR-M12

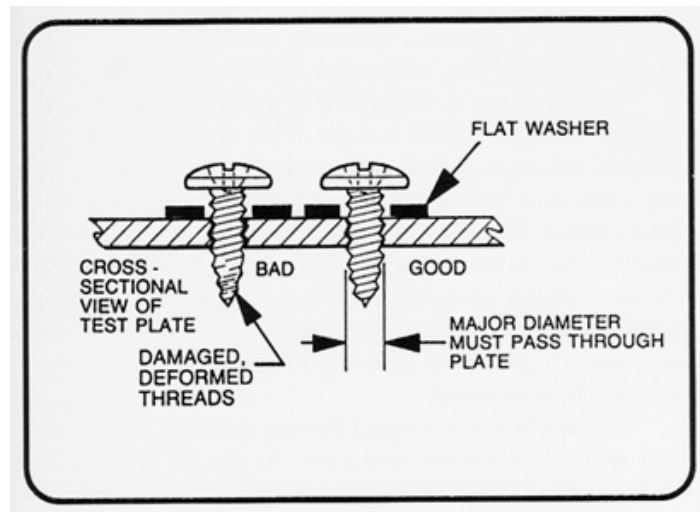
Hydrogen Embrittlement Test Plates for Bolts and Machine Screws

TAPPED AND HARDENED TEST PLATE SPECIFICATIONS

SIZE	DIMENSIONS	#HOLES	NEW PART #
2-56	2x6x 3/16	38	TPHE-0256
4-40	2x6x 3/16	38	TPHE-0440
6-32	2x6x 1/4	38	TPHE-0632
8-32	2x6x 1/4	38	TPHE-0832
10-24	2x6x 5/16	38	TPHE-1024
10-32	2x6x 5/16	38	TPHE-1032
12-24	2x6x 5/16	17	TPHE-1224
1/4-20	2x6x 3/8	17	TPHE-2520
1/4-28	2x6x 3/8	17	TPHE-2528
5/16-18	2x6x 3/8	17	TPHE-3118
5/16-24	2x6x 3/8	17	TPHE-3124
3/8-16	2x6x 3/8	17	TPHE-3716
3/8-24	2x6x 3/8	17	TPHE-3716
7/16-14	4x6x 3/4	24	TPHE-4314
7/16-20	4x6x 3/4	24	TPHE-4320
1/2-13	4x6x 3/4	24	TPHE-5013
1/2-20	4x6x 3/4	24	TPHE-5020
9/16-12	4x6x 1"	15	TPHE-5612
9/16-18	4x6x 1"	15	TPHE-5618
5/8-11	4x6x 1"	15	TPHE-6211
5/8-18	4x6x 1"	15	TPHE-6218
3/4-10	4x6x 1-1/4	15	TPHE-7510
3/4-16	4x6x 1-1/4	15	TPHE-7516

METRIC TAPPED TEST PLATE SPECIFICATIONS

SIZE	DIMENSIONS	#HOLES	NEW PART#
M2.50x45	2x6x 3/16	38	TPHE-M02504
M3x0.5	2x6x 1/4	38	TPHE-M0305
M3.50.6	2x6x 1/4	38	TPHE-M03506
M4x0.7	2x6x 1/4	38	TPHE-M0407
M5x0.8	2x6x 5/16	17	TPHE-M0508
M6x1.0	2x6x 3/8	17	TPHE-M0610
M8x 1.0	2x6x 3/8	17	TPHE-M0810
M8x1.25	2x6x 3/8	17	TPHE-M08125
M10x1.25	4x6x3/4	24	TPHE-M10125
M10x 1.5	4x6x 3/4	24	TPHE-M1015
M12x1.25	4x6x 3/4	24	TPHE-M12125
M12x1.75	4x6x 3/4	24	TPHE-M12175
M14x1.5	4x6x 1"	15	TPHE-M1415
M14x2.0	4x6x 1"	15	TPHE-M1420
M16x1.5	4x6x 1-1/4	15	TPHE-M1615
M16x2.0	4x6x 1-1/4	15	TPHE-M1620
M18x1.5	4x6x 1-1/4	15	TPHE-M1815
M18x20	4x6x 1-1/4	15	TPHE-M1820



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Tri-Rnd™ Gage for Measuring Tri-round Thread Rolling Screws

Tri-Rnd™ Gage



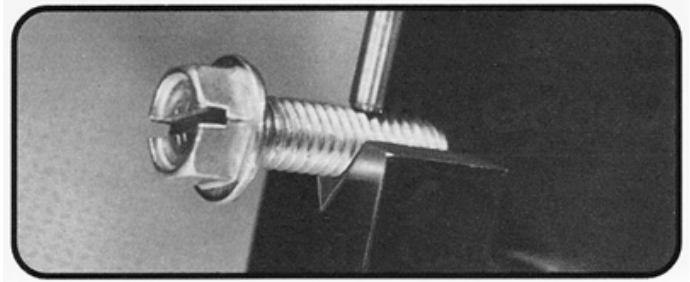
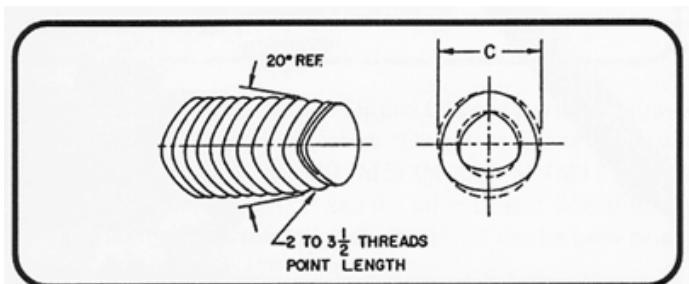
"Tri-Rnd" Gage for Measuring TAPTITE® Screws
Patent #5,165,176

The "Tri-Rnd" Gage was specifically developed to measure the "C" dimension of TAPTITE screws from sizes #4 through 1/2 inch (M3-M 12). The "C" dimension is the circumscribing circle connecting the three high points on the lobes of TAPTITE screws. This is an important dimension to inspect to be assured of the screw's proper driving and stripping torque performance.

The use of the "Tri-Rnd" Gage is much easier, faster, and more accurate than the previous gages used in making this measurement. It is ideal for final inspection as well as in-process measuring in the heading and threading operations. The indicator has .0001" resolution and can be connected to all electronic SPC data collection systems.

Gage Repeatability and Reproducibility Study results are 9.5%.

TAPTITE is a registered trademark of REMIC.



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Torque Wrenches / Torque & Tension Testing Equipment

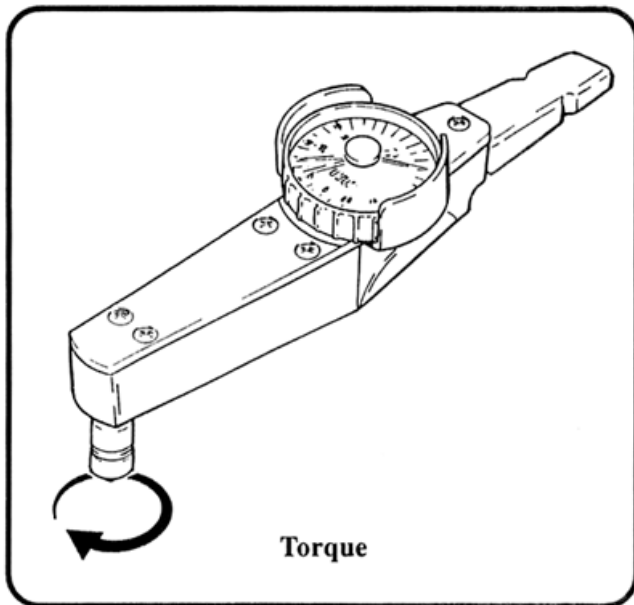
Torque Wrenches

Torque wrenches are used in a variety of fastener tests such as:

1. Torsional strength testing of tapping screws
2. Drive torque testing thread rolling screws
3. Hydrogen embrittlement testing electroplated screws and bolts
4. Prevailing torque, installation and removal torque, on torque, on lock nuts and lock screws
5. Torque-tension testing tapping screws, lock nuts, lock screws, and structural bolts

Greenslade torque wrenches meet the accuracy requirement of $\pm 1\%$. A general rule is that torque wrenches should not be used in the lower 20% of their maximum torque rating.

Torque wrenches are available with either an easy-to-read, large dial face with a memory needle or a digital display. The digital wrenches can be connected to the Greenslade data collectors for recording test results.



Dial Torque Wrenches:

TWI-030; 6-30 inch pounds

TWI-075; 15-75 inch pounds

TWI-300; 60-300 inch pounds

TWF-025; 5-25 foot pounds

TWF-050; 10-50 foot pounds

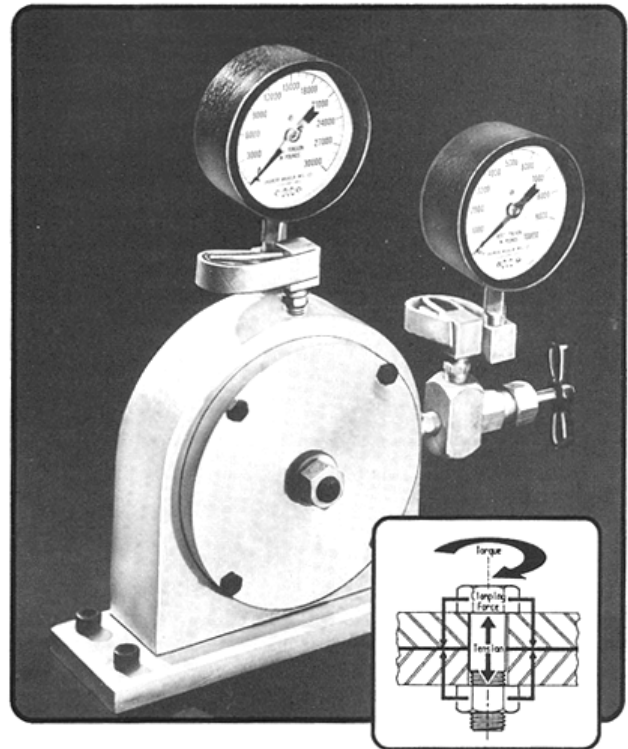
TWF-100; 20-100 foot pounds

TWF-150; 30-150 foot pounds

TWF-250; 50-250 foot pounds

TWF-600; 120-600 foot pounds

TWF-1000; 200-1000 foot pounds



Tension Tester

Some fastener test specifications require that a bolt must achieve a given tension value when less than a maximum amount of torque is applied. When bolts are tightened in assemblies by applying torque they actually stretch and act like a spring to keep the components of the assembly firmly together. As a general rule, bolts should be tightened until their tension (stretching force) is about 50-60% of their minimum required tensile strength.

Tension cannot be determined with a torque wrench. The same amount of torque applied to bolts of the same size with different finishes will create entirely different tension forces. When tightening a bolt over 50% of the applied torque is used up in the under head friction. The only way to determine how much tension is created in a bolt is to test the bolts and nuts to be used in a Tension Tester. With this device plus a torque wrench, the Torque-tension relationship can be precisely determined. How much applied torque is required to generate a desired number of pounds of bolt tension can also be determined.

To test a bolt, it is inserted through the tester's hydraulic load cell area and assembled into a nut. As the nut is tightened, the increasing bolt tension is shown on the tester's pressure indicator.

TESTER MODEL S:

Tooling: #6, #8, #10, 1/4

Tension capacity: 5,000 pounds

TESTER MODEL J:

Tooling: #10, 1/4, 5/16, 3/8, 7/16, 1/2, 9/16

Tension capacity: 30,000 pounds

TESTER MODEL RL:

Tooling: 5/8, 3/4, 7/8, 1, 1-1/8, 1-1/4

Tension capacity: 110,000 pounds



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2234 Wenneca Ave., Fort Worth, TX 76102 USA Phone: 817-870-8888 Fax: 817-870-9199

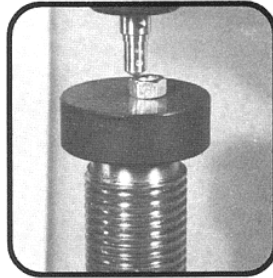
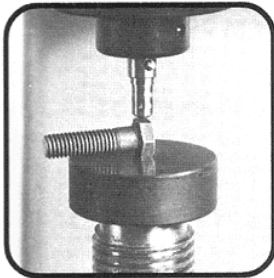
E-mail: greensladeandcompany@sbcglobal.net

Web site: www.greensladeandcompany.com



Hardness Tester / Drill Screw Tester

Rockwell Hardness Testing Equipment

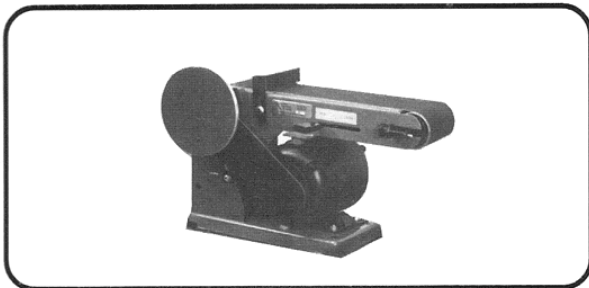


Dial Type Rockwell Tester

For "C" and "B" scales.....HTR-100

Standard Hardness Tester Accessories

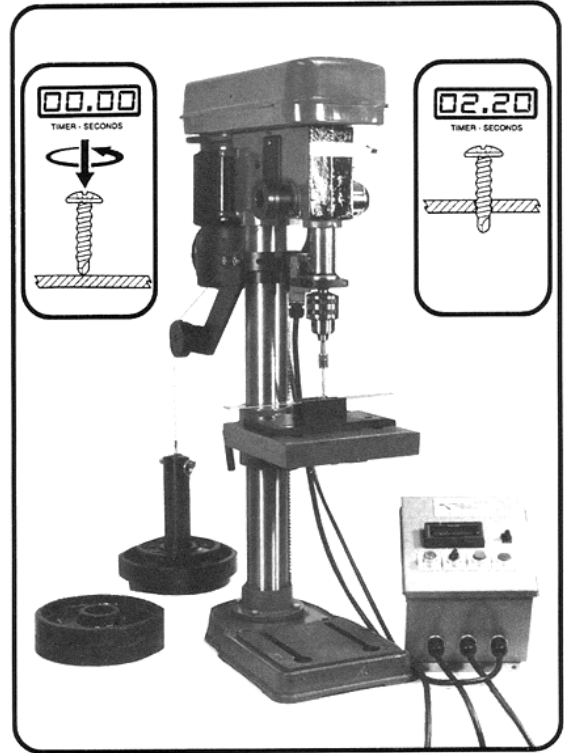
- Rockwell "B" and "C" scale calibration blocks
- Rockwell "B" scale 1/16th ball penetrator
- Rockwell "C" diamond penetrator
- Flat anvil
- "V" anvil
- Operations manual



Sander

For specimen preparation.....HTS-100

DrilScruChek™ Tester



Another Innovation from Greenslade & Company

The DrilScruChek™ Tester meets the testing requirements of the following specifications:

- SAE J 78
- Ford Motor ES-2002-5100
- DIN 7504
- GM 6172M
- Chrysler PF-7251
- JIS B1125

The DrilScruChek™ comes with weights from 20 to 60 pounds. It has variable speeds from 1800 to 2500 RPM and has a digital readout.

The test specifications above determine a drill screw's acceptability based on its speed of drilling through .062 inch steel. The DrilScruChek™ performs these tests and is powerful enough to use in applications analysis and product development where the drill screws will be required to drill through much thicker materials.



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Proof Load Gage & Fixture, Bolts

Bolt Proof Testing Elongation Gage Model EG-10

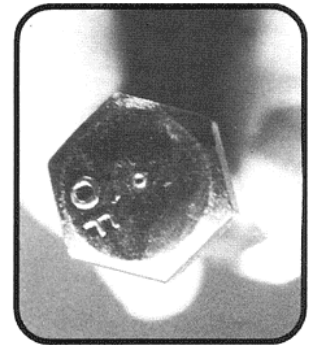
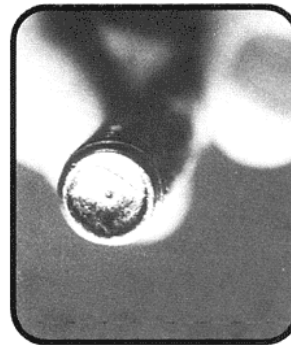
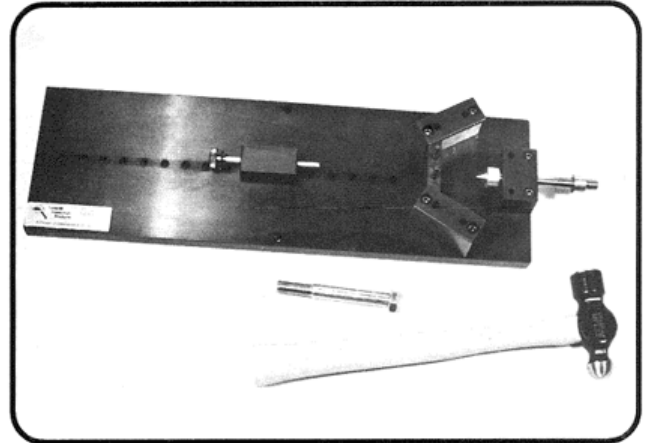


This electronic gage is specifically designed to meet the elongation measurement requirements of ASTM F606. The indicator resolution is .0001 inch. The length capacity is 10 inches.

TRUCNTR™

Bolt Indenting Fixture

Makes proof testing faster and easier



Greenslade and Company's new TRUCNTR™ fixture makes indenting both ends of a bolt on its "true center" fast and easy. The unique TRUCNTR™ fixture design incorporates two opposing V blocks that slide into two tracks which form a wedge. The V blocks move closer together or further apart depending on where they are along the axis of the tracks. This enables one set of blocks to hold and center a wide range of bolt diameters. The standard blocks will hold bolts from 1/4" (M6) through 3/4" (M20). The optional small blocks hold screws from #6 (M3.5) through 3/8" (M10). The TRUCNTR™ fixture enables the user to indent both ends of a bolt on its "true center" in 10 to 20 seconds.



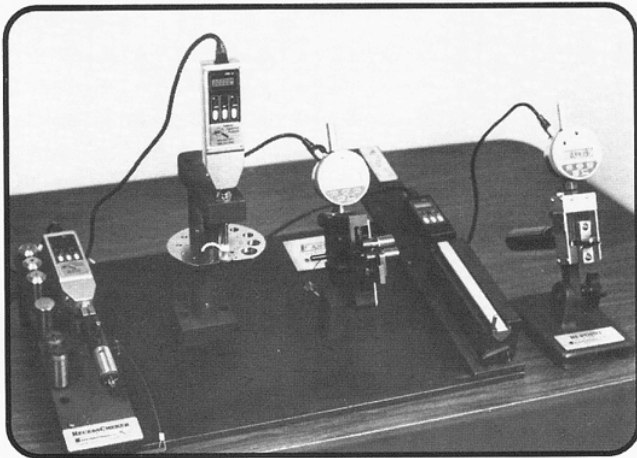
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Turn-Key Inspection System with N-Spekt® Software

FinalChek™ **PC Gaging System**

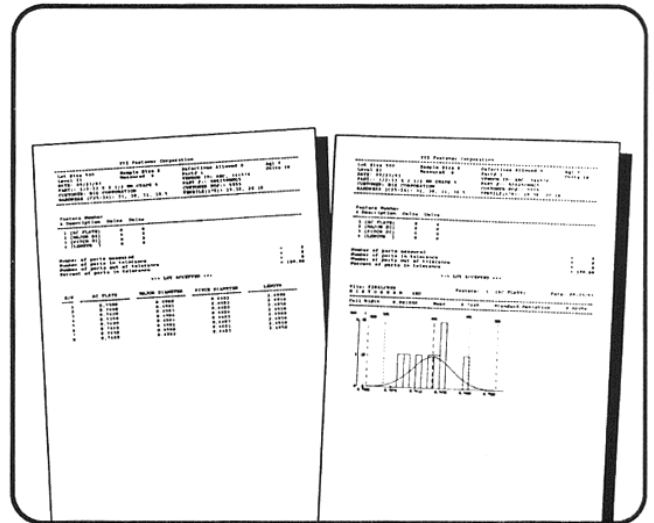


One person does the work of three!

Users of the FinalChek System can inspect fasteners and record results approximately three times faster than those using hand-held gages and hand writing inspection results. This state-of-the-art approach enables one person to do the work of three using older equipment and methods.

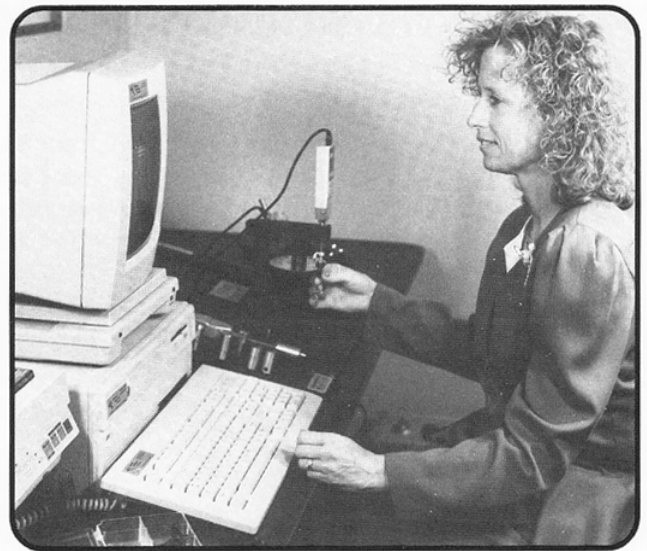
Users input a given part's inspection requirements into the computer only one time. When inspecting the part after this, the inspector only enters the part number and the system is ready for inspection to begin. Eliminating the need to input inspection requirements every time is one of the major sources of time savings provided by this system.

Inspection results can be saved by part number and/or by vendor for future reference. This makes record saving more efficient. It also allows the user to develop a vendor rating program. Vendors who know they are being monitored and rated generally perform better than those who do not.



Professional-looking inspection records can be generated immediately after testing or at a future date. Most customers view computer-generated inspection reports as more credible than those hand written or typed.

The saying "time is money" is still valid. FinalChek Systems provide users financial savings by greatly reducing inspection and record keeping time.



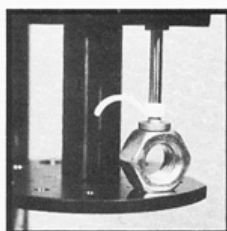
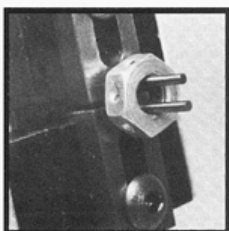
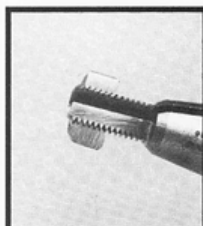
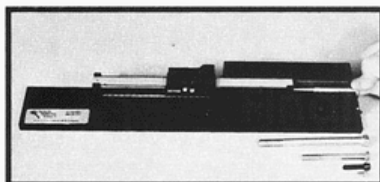
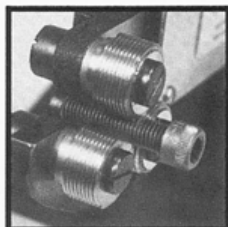
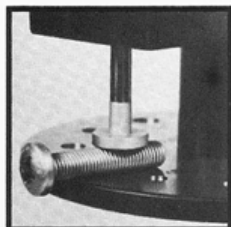
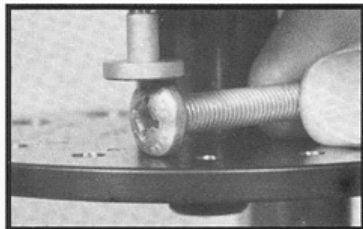
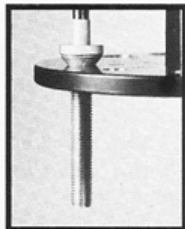
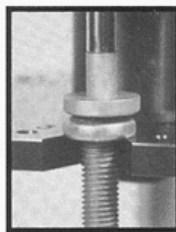
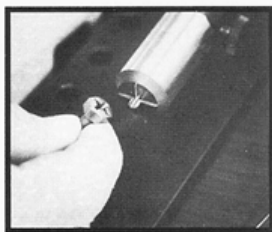
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Turn-Key Inspection System with N-Spekt® Software

Inspect all of these characteristics with FinalChek PC Gaging System



FinalChek PC Gaging System includes:

Computerized Data Collection System

- PC Computer
- SVGA Color Monitor, Printer
- Gage Interface with Four Ports & Foot Switch
- Gage Cables
- Operating Software
- N-Spekt® Inspection Software (Windows)

Gaging System E (screws and bolts only)

- Position 1 **RecessCheker®**
- Position 2 **DIMENSION-ALL®**
- Position 3 **X-120®** Adjustable Tri-Roll Gage, or **X-180®** Segment Gage
- Position 4 Length Gage, 0-6"

Gaging System EI (screws, bolts and nuts)

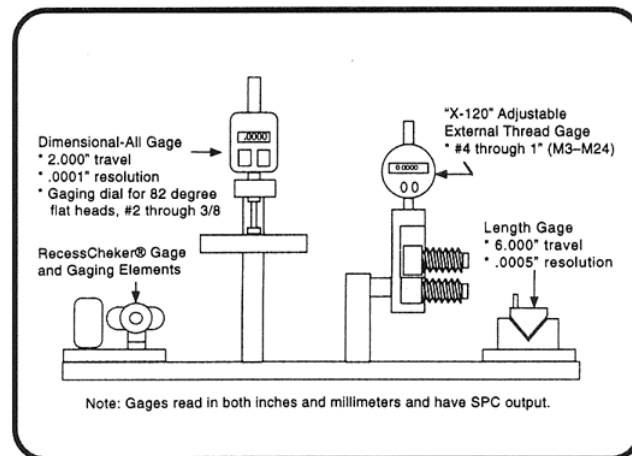
- Positions 1 through 4, same as System E
- Position 5 **Bi-Point®** Internal Thread Gage

Note: All gages mounted on one metal base plate.

Gaging Accessories (sold separately)

- **RecessCheker®** Elements
- **X-120®** Templates, Gaging Rolls and Setting Plugs
- **X-180®** Segments and Setting Plugs
- **Bi-Point®** Gaging Fingers and Setting Rings

RecessCheker, X-120, Bi-Point and DIMENSION-ALL are registered trademarks of Greenslade and Company, Inc.



FinalChek® Externally Threaded Fastener Gaging Station



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