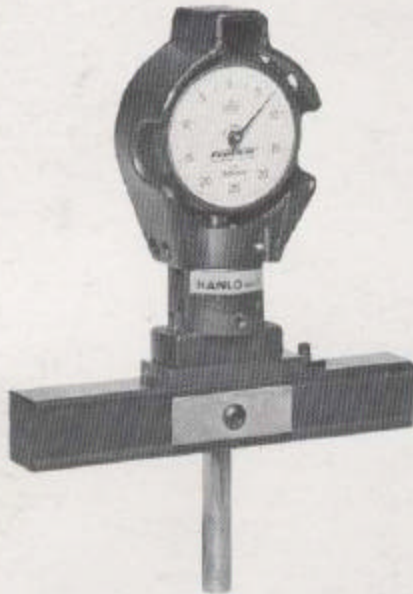
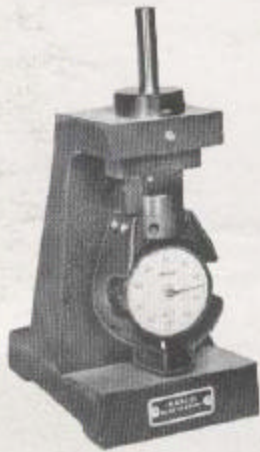


HANLO

INDICATOR
COMPONENTS

CATALOG 82B



HANLO
GAGES

HANLO

GAGE & ENGINEERING CO.

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MODELS 7 AND 4



ENGINEERING DATA

HANLO GAGE UNITS FOR PRECISION MEASURING

The Hanlo Gage Unit has all the qualities required in accurate and dependable gaging equipment. The wide adaptability of these units with their accuracy, simplicity of operation and rugged construction make them an important asset wherever accurate gaging is essential.

FEATURES

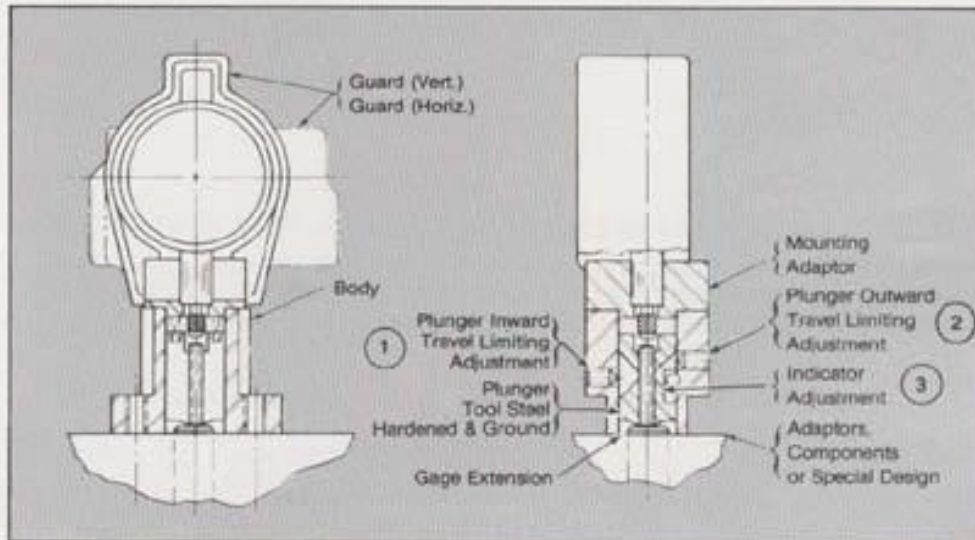
- Sturdy aluminum guard for maximum protection of the indicator.
- Steel constructed gage body for maximum durability.
- Interchangeability of Hanlo Guard Units with Hanlo Mounting Units.
- Hanlo Mounting Units may be top or bottom mounted for standard or special gaging.
- Easy, fast adjustment for setting indicator to master, to protect indicator from jamming and insure against full revolution misreading.
- Secure indicator mounting eliminates vibration and false readings.
- Preload spring pressure assures accurate repeat readings.
- All parts are replaceable without effecting the accuracy of the standard units.
- When a standard or special gage becomes obsolete, remove standard Hanlo Units and use in new design.

SAVINGS ORIGINATE IN DESIGN

Standard Hanlo Gage Units must be incorporated in the special gage design to effect saving in both design and manufacturing costs.



MODEL 7 SERIES GAGE UNITS



ADJUSTMENT OF MODEL 7

Position travel limiting adjustments (1) and (2) and indicator adjustment (3) out of contact with plunger and indicator as shown.

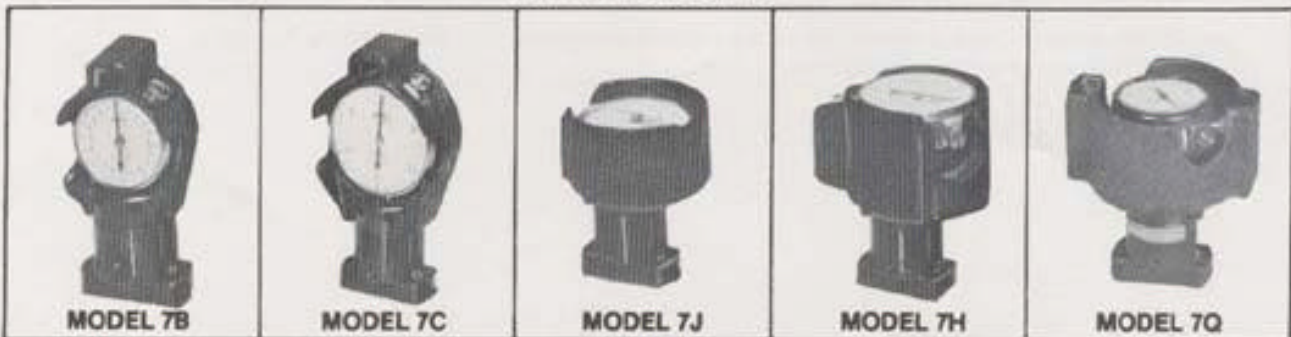
Set gage on master and bring adjustment (1) inward to contact plunger and then move adjustment (2) inward to lock plunger.

Turn indicator adjustment (3) inward to move indicator hand preferably through one and one-quarter revolution to "zero" on dial.

Retract adjustment (1) and (2) sufficiently to allow indicator hand to move preferably within one-half revolution on either side of zero mark on dial.

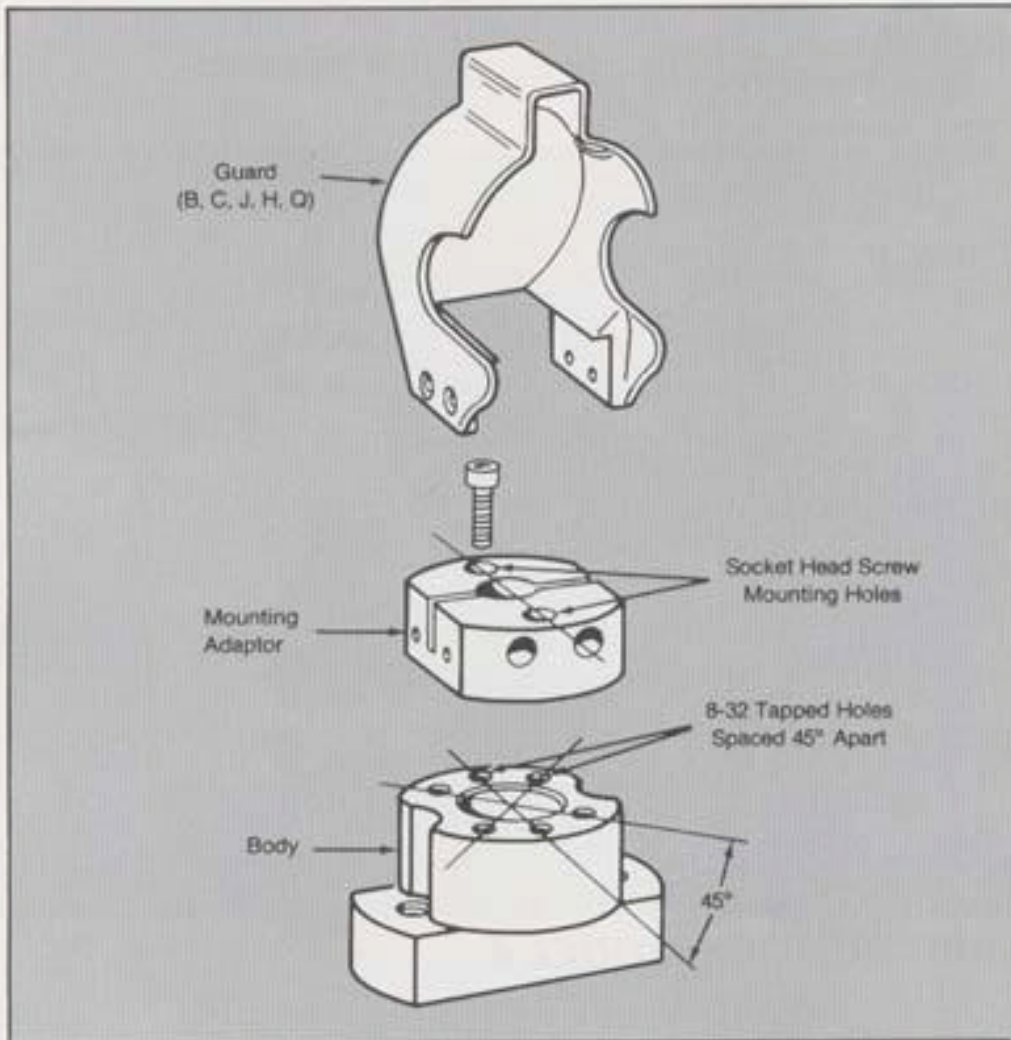
NOTE: When adjusting indicator adjustment (3), remove gage extension and insert standard wrench through opening or adjust before mounting when necessary.

INDICATOR UNITS



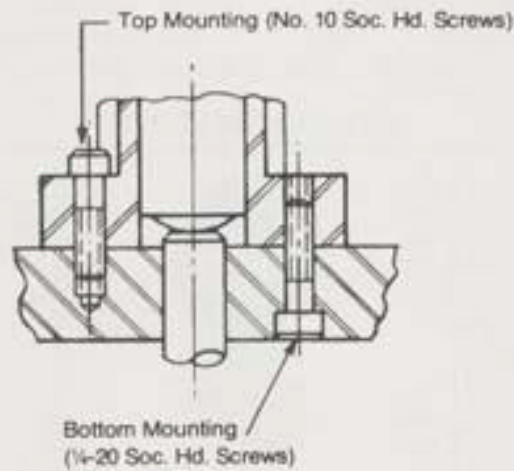
NOTE — NEW MODEL 7M AVAILABLE FOR FEDERAL MAXUMS.

The Indicator Mounting Adaptor can be positioned and secured to the body in increments of 45°. This feature permits viewing of the indicator in six different locations in 360°. This unique design is standard on all Model 7 Gage Units.



No alterations to Hanlo Gage Units are required for either bottom or top mounting of the gage unit to the special design application.

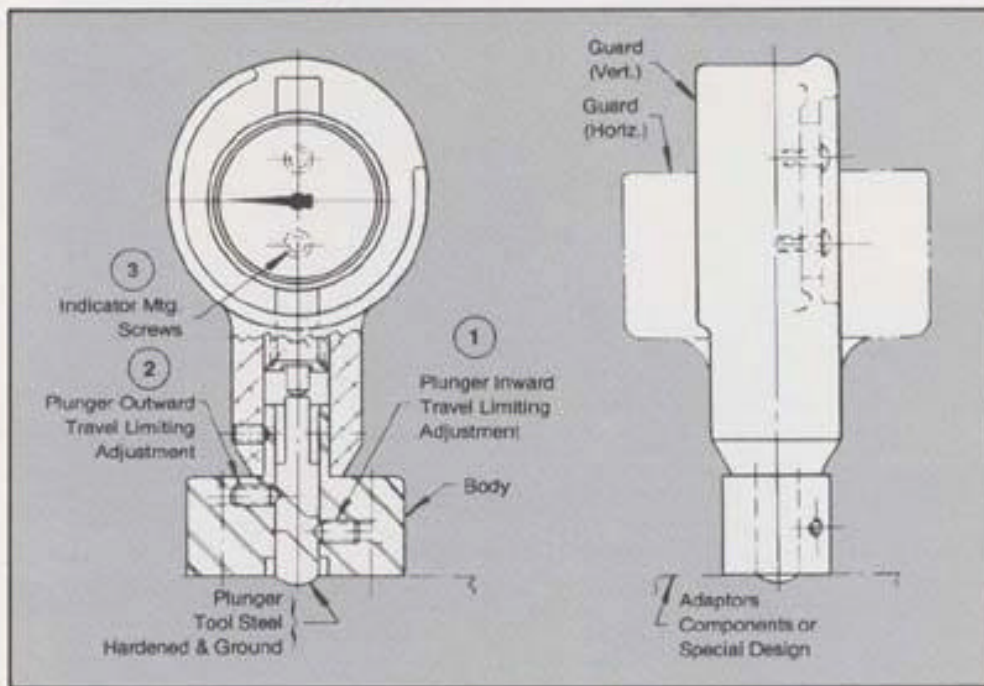
Interchangeability thru Standard Dimensioning



Tracing Templates Available



MODEL 4 SERIES GAGE UNITS



ADJUSTMENT OF MODEL 4

Position indicator with mounting screws ③ in guard and travel limiting adjustment screws ① and ② out of contact with plunger.

Set gage on master and bring adjustment screw ① inward to contact plunger and then move adjustment screw ② inward to lock plunger.

Loosen indicator mounting screws ③ and slide indicator down to move indicator hand preferably through one and one-quarter revolutions to "zero" on dial. Then, lock indicator.

Retract adjustment screw ① and ② sufficiently to allow indicator hand to move preferably within one-half revolution on either side of "zero" mark on dial.

INDICATOR UNITS



NOTE — NEW MODEL 4M AVAILABLE FOR FEDERAL MAXUMS.

ORDERING

Select gage unit and range of indicator required.

Example: Model 4 Gage Unit with A.G.D. Group 1 Indicator .0005 Graduation
Specify: Hanlo 4B-.0005

Example: Model 7 Gage Unit with A.G.D. Group I Indicator or .0005 Graduation.
Specify: Hanlo 7B-.0005

Example: Model 4 Gage Unit less Indicator.
Specify: Hanlo Model 4B, 4C, or 4J

Note: Model 4 Unit only—Hanlo will supply indicator back, spring, spring retainer, and seal when unit is ordered without indicator.

DIAL INDICATOR SELECTOR GUIDE

MODEL NO.	GRADUATION	RANGE	BALANCE DIAL
B-SIZE (AGD-1)			
B21	.0001"	.025"	0 - 5 - 0
B2Q	.00025"	.025"	0 - 5 - 0
B3K	.00025"	.050"	0 - 10 - 0
B3Q	.0005"	.050"	0 - 10 - 0
B5M	.0005"	.075"	0 - 15 - 0
B6K	.0005"	.100"	0 - 20 - 0
B71	.0005"	.125"	0 - 25 - 0
B3W	.001"	.050"	0 - 10 - 0
B70	.001"	.125"	0 - 25 - 0
B8 I	.001"	.250"	0 - 50 - 0
01 I	.002 mm	.500 mm	0 - 10 - 0
03 I	.005 mm	1.250 mm	0 - 25 - 0
06 I	.010 mm	2.500 mm	0 - 50 - 0
08 I	.025 mm	6.250 mm	0 - 125 - 0
C-SIZE (AGD-2)			
C1/2K	.00005"	.010"	0 - 2 - 0
C1K	.0001"	.020"	0 - 4 - 0
C2 I	.0001"	.025"	0 - 5 - 0
C2Q	.00025"	.025"	0 - 5 - 0
C3K	.00025"	.050"	0 - 10 - 0
C3Q	.0005"	.050"	0 - 10 - 0
C5M	.0005"	.075"	0 - 15 - 0
C6K	.0005"	.100"	0 - 20 - 0
C7 I	.0005"	.125"	0 - 25 - 0
C3W	.001"	.050"	0 - 10 - 0
C6Q	.001"	.100"	0 - 20 - 0
C70	.001"	.125"	0 - 25 - 0
C8 I	.001"	.250"	0 - 50 - 0
P1 I	.002 mm	.500 mm	0 - 10 - 0
P3 I	.005 mm	1.250 mm	0 - 25 - 0
P6 I	.010 mm	2.500 mm	0 - 50 - 0
P8 I-RI	.025 mm	6.250 mm	0 - 100 - 0
PERPENDICULAR			
J1K	.0001"	.008"	0 - 4 - 0
J6K	.0005"	.040"	0 - 20 - 0
J8 I	.001"	.100"	0 - 50 - 0
W1 I	.002 mm	.200 mm	0 - 10 - 0
W6 I	.010 mm	1.000 mm	0 - 50 - 0
W8 I	.025 mm	2.500 mm	0 - 125 - 0
A-SIZE—MINIATURE			
A1/2Q	.0001"	.010"	0 - 2 - 0
A2 I	.0001"	.025"	0 - 5 - 0
A3Q	.0005"	.050"	0 - 10 - 0
A6Q	.001"	.100"	0 - 20 - 0
N6 I	.010 mm	2.500 mm	0 - 50 - 0

INDICATOR GUARDS

Guard "B"
For A.G.D. Group 1
Indicators



Guard "Q"
For Standard Indicators



Guard "C"
For A.G.D. Group 2
Indicators



Guard "F"
For Horizontal Indicators
Mounted on Federal
Adj. Mounting Bracket



Guard "J"
For Federal Indicators
Model J & W



Guard "B-CG"
Cup Guard for A.G.D.
Group 1 Indicators



Guard "H"
For Ames Indicators



Guard "C-CG"
Cup Guard for A.G.D.
Group 2 Indicators



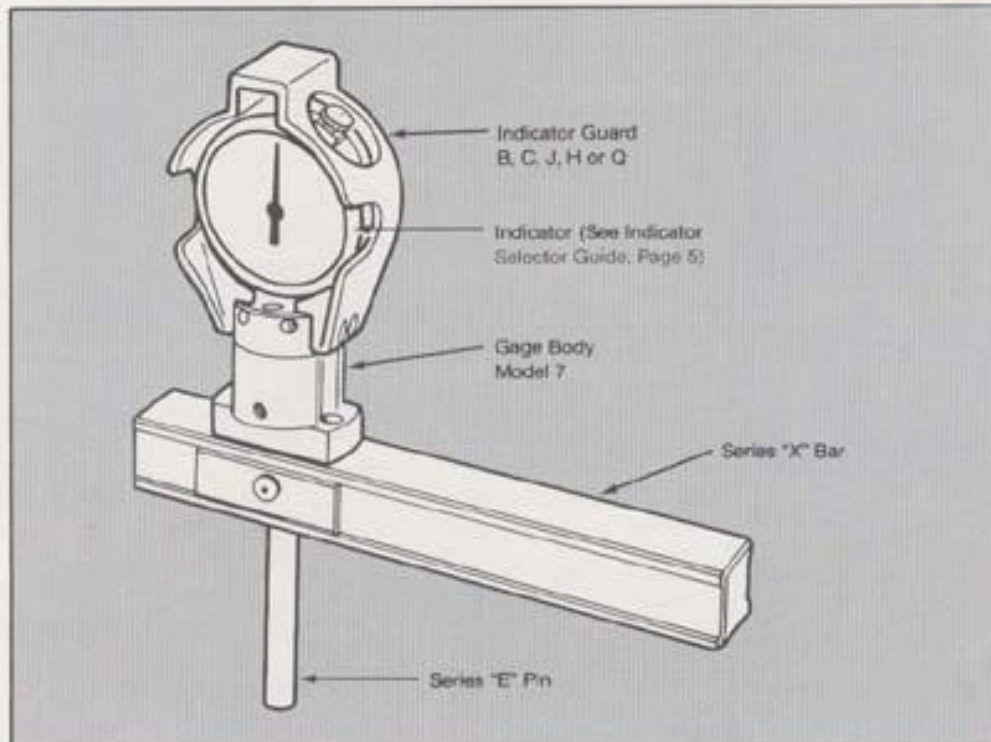
NOTE — NEW MODEL "M" GUARD FOR FEDERAL MAXUMS AVAILABLE.

Tracing Templates Available

"X" BAR SERIES



ENGINEERING DATA

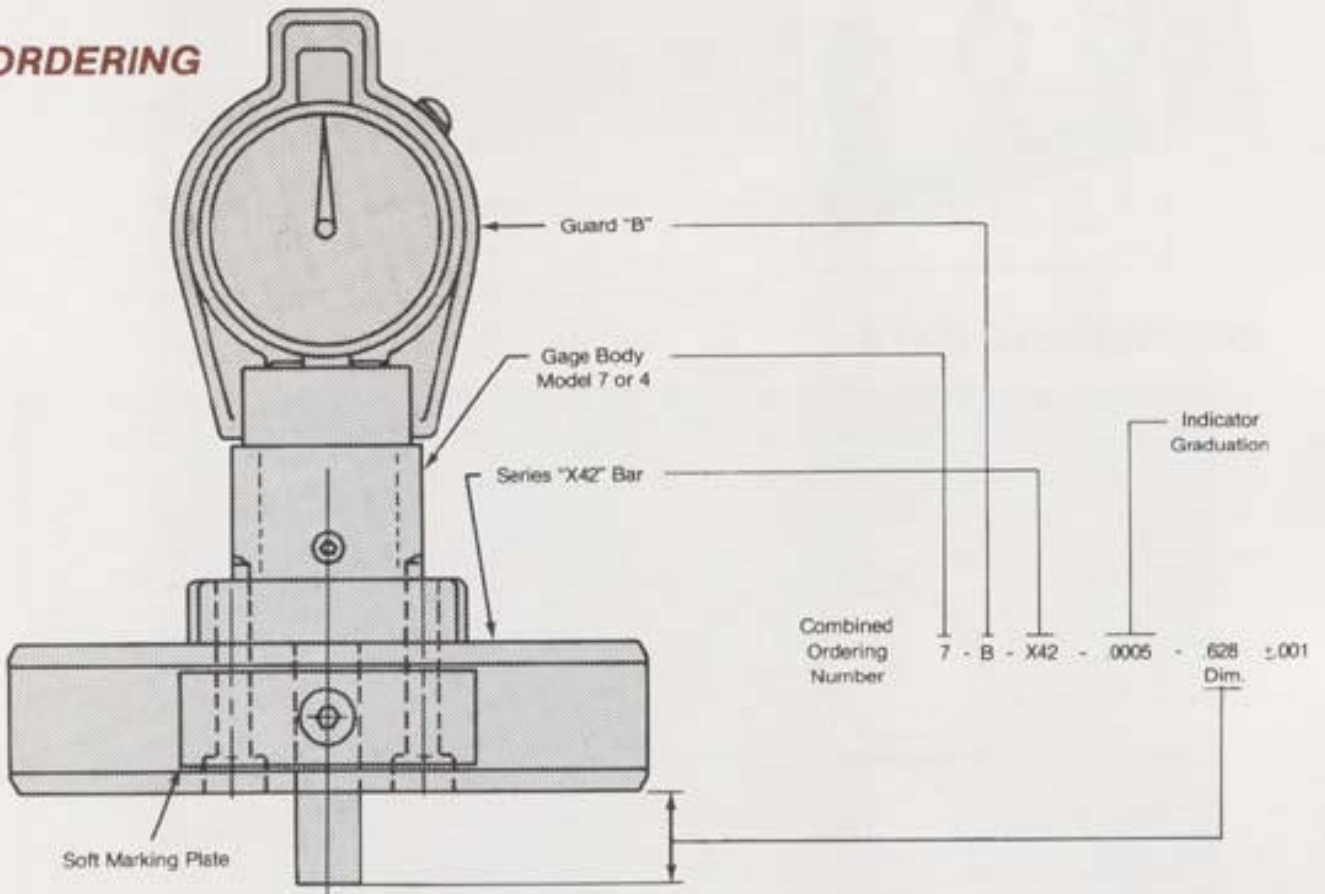


FEATURES

- GAGING SURFACES:** The gaging surfaces of the bar are ground and lapped to be square and parallel. Gage pins are interchangeable and they are equivalent of a gage fit in the bar.
- MATERIAL:** Series "X" bar components and the series "E" pins are manufactured of the highest grade tool steel.
- FINISH:** All non-gaging surfaces of the bar attachments are treated with a rust preventative black oxide.
- MOUNTING:** Mounting hole dimensions are the same for all standard bar attachments to assure interchangeability.
- FINGER GROOVES:** A finger groove is provided on both sides of the series "X" bar for easy handling under all gaging conditions.
- STAMPING:** A soft marking plate is provided for stamping gage identification.
- HEAT TREAT:** All gage pins and bar attachments are Rockwell "C" 62-65.

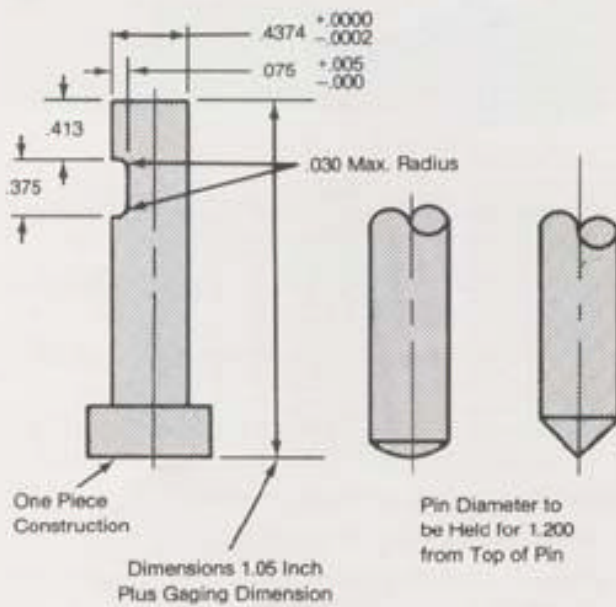
NOTE: All Model 4 Units are interchangeable with corresponding Model 7 Units for "X" and "W" Series.

ORDERING

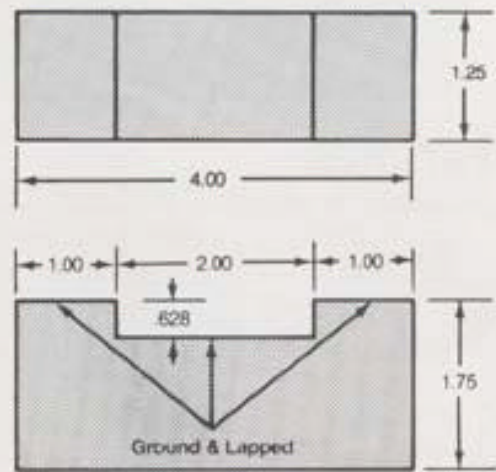


MISCELLANEOUS

SPECIAL PINS

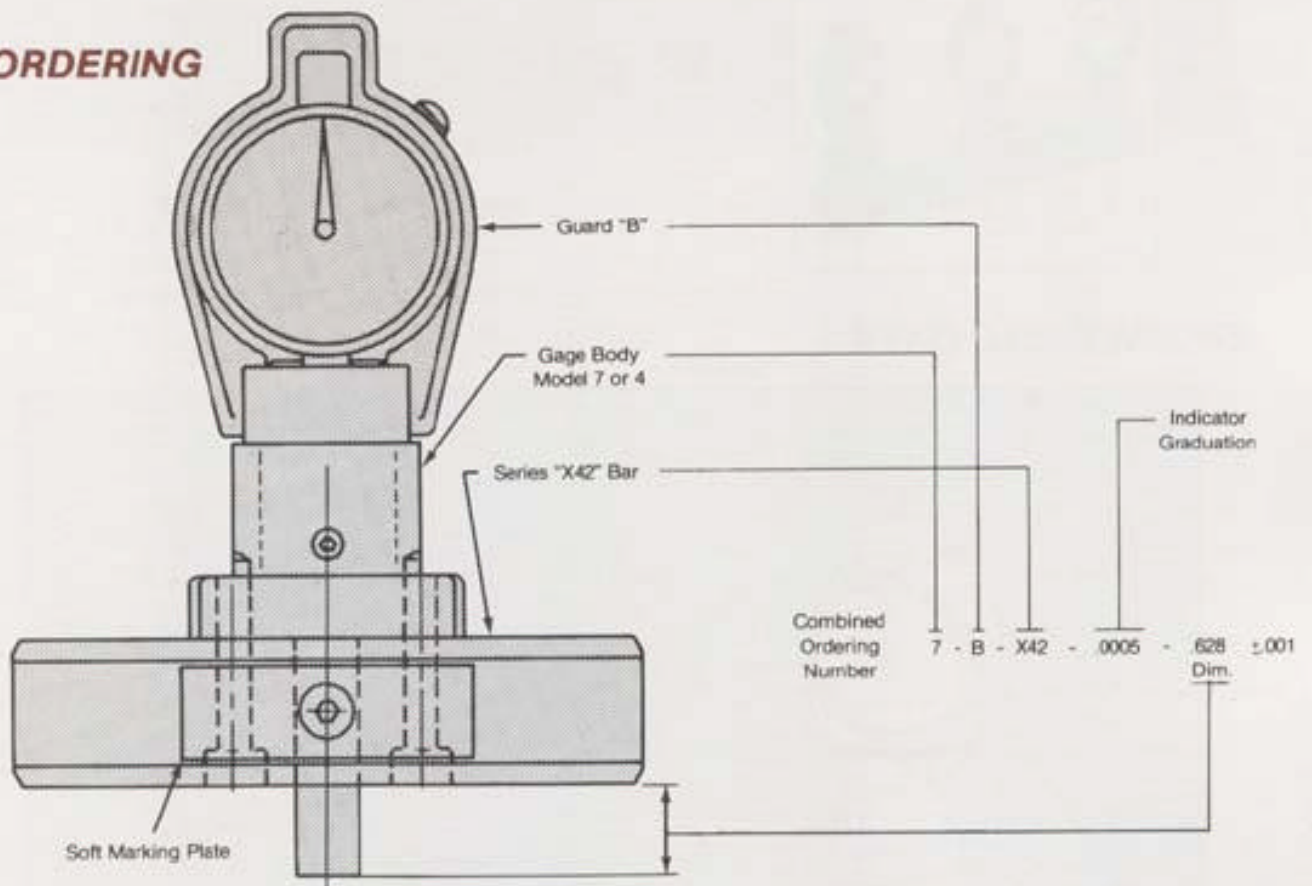


TYPICAL MASTER



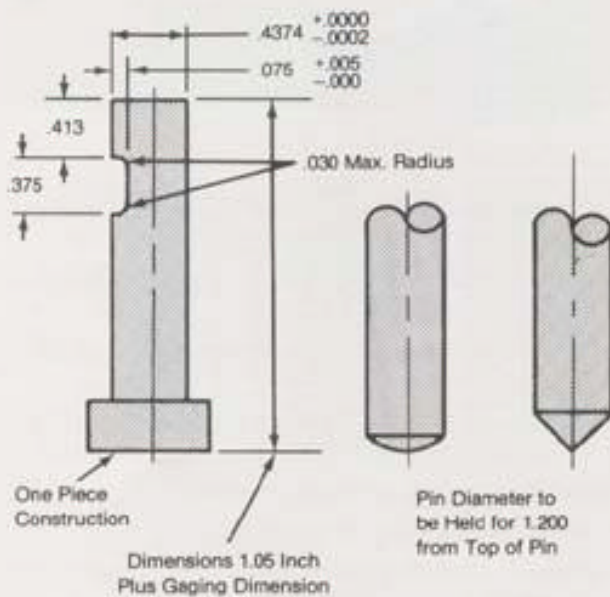
Master O.H.T.S. Hardened & Ground
Rockwell "C" 62-64

ORDERING

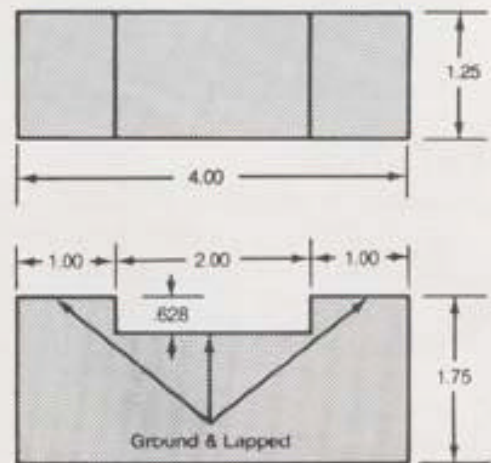


MISCELLANEOUS

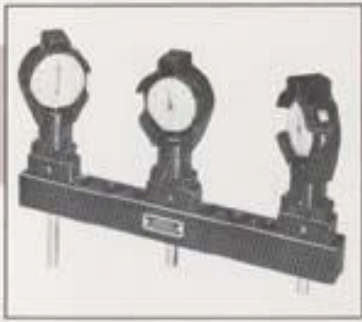
SPECIAL PINS



TYPICAL MASTER

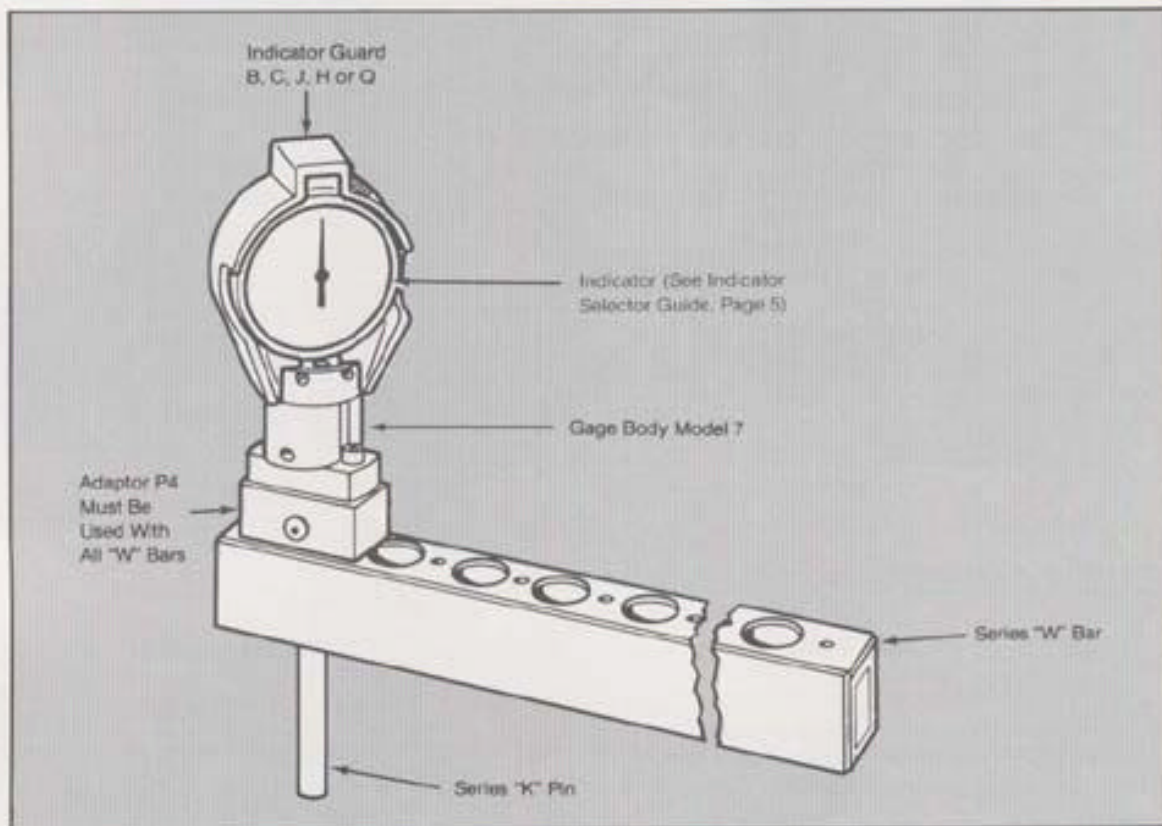


Master O.H.T.S. Hardened & Ground
Rockwell "C" 62-64



"W" BAR SERIES

ENGINEERING DATA

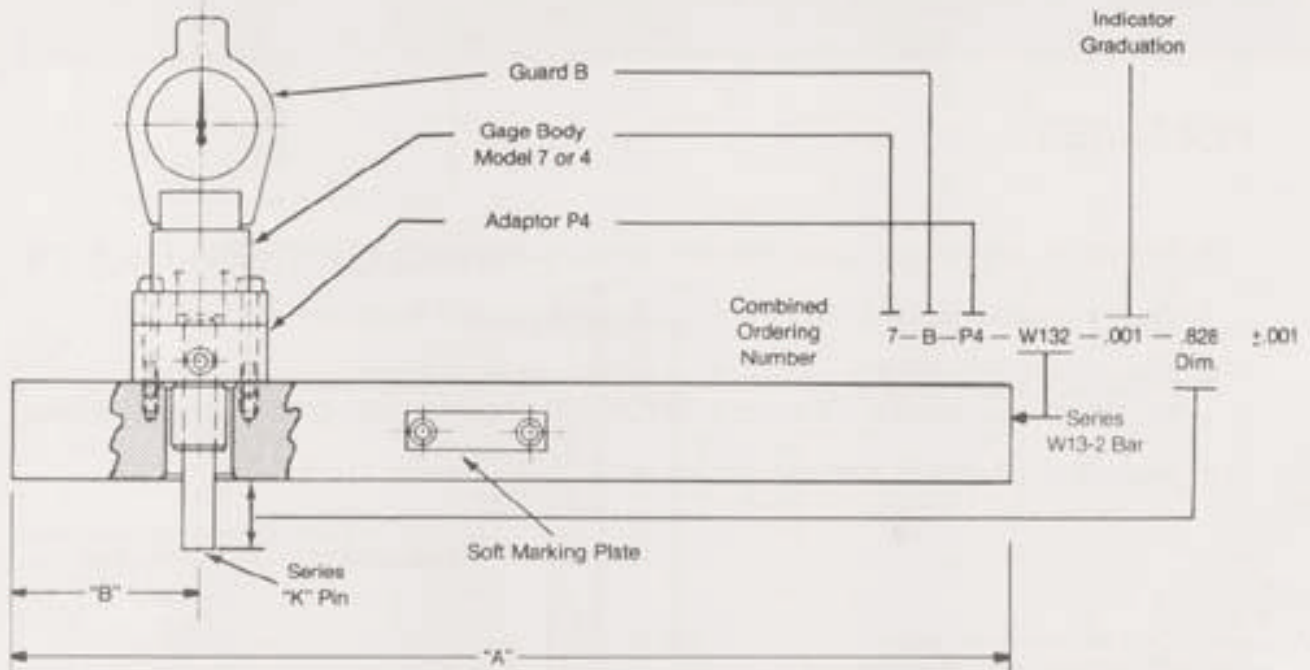


FEATURES

- GAGING SURFACES:** The gaging surfaces of the bar are ground and lapped to be square and parallel. Gage pins are interchangeable and they are equivalent of gage fit in the bar.
- MATERIAL:** Series "W" bar components are manufactured from 8620 steel and the series "K" pins are manufactured of a high grade tool steel.
- FINISH:** All non-gaging surfaces of the bar attachments are treated with a rust preventative black oxide.
- MOUNTING:** Mounting hole dimensions are the same for all standard bar attachments to assure interchangeability.
- STAMPING:** A soft marking plate is provided for stamping gage identification.
- HEAT TREAT:** All gage pins and bar attachments are Rockwell "C" 62-65.

NOTE: All Model 4 Units are interchangeable with corresponding Model 7 Units for "X" and "W" series.

ORDERING



SERIES "W" BARS (SEE TEMPLATE FOR VARIATIONS)											
SERIES	A	B GAGE LOCATION FROM END OF BAR									
		1.31	2.62	3.94	5.25	6.56	7.88	9.19	10.50	11.82	13.12
W-13	13.12	1	2	3	4	5					
W-15	15.75	1	2	3	4	5	6				
W-18	18.38	1	2	3	4	5	6	7			
W-21	21.00	1	2	3	4	5	6	7	8		
W-23	23.62	1	2	3	4	5	6	7	8	9	
W-25	26.25	1	2	3	4	5	6	7	8	9	10

NOTE: Series "W" Bars have mounting holes full length of bar.

SERIES "K" PINS

4375 DIA. GAGE PINS									
DET	RANGE	DET	RANGE	DET	RANGE	DET	RANGE	DET	RANGE
K-1	.00 - 10	K-11	1.0 - 1.1	K-21	2.0 - 2.1	K-31	3.0 - 3.1	K-41	4.0 - 4.1
K-2	.10 - 20	K-12	1.1 - 1.2	K-22	2.1 - 2.2	K-32	3.1 - 3.2	K-42	4.1 - 4.2
K-3	.20 - 30	K-13	1.2 - 1.3	K-23	2.2 - 2.3	K-33	3.2 - 3.3	K-43	4.2 - 4.3
K-4	.30 - 40	K-14	1.3 - 1.4	K-24	2.3 - 2.4	K-34	3.3 - 3.4	K-44	4.3 - 4.4
K-5	.40 - 50	K-15	1.4 - 1.5	K-25	2.4 - 2.5	K-35	3.4 - 3.5	K-45	4.4 - 4.5
K-6	.50 - 60	K-16	1.5 - 1.6	K-26	2.5 - 2.6	K-36	3.5 - 3.6	K-46	4.5 - 4.6
K-7	.60 - 70	K-17	1.6 - 1.7	K-27	2.6 - 2.7	K-37	3.6 - 3.7	K-47	4.6 - 4.7
K-8	.70 - 80	K-18	1.7 - 1.8	K-28	2.7 - 2.8	K-38	3.7 - 3.8	K-48	4.7 - 4.8
K-9	.80 - 90	K-19	1.8 - 1.9	K-29	2.8 - 2.9	K-39	3.8 - 3.9	K-49	4.8 - 4.9
K-10	.90 - 1.00	K-20	1.9 - 2.0	K-30	2.9 - 3.0	K-40	3.9 - 4.0	K-50	4.9 - 5.0

Available
from
Stock

NOTE: Pins longer than shown quoted on request.





Tracing Templates Available

INDICATOR ADAPTORS

FEATURES

- Protection, adjustability and retention of dial indicator.
- Gage interchangeability thru transfer of gaging action from part to gage.
- Adaptor body and gage pin are constructed of high grade tool steel. All non-gaging surfaces are treated with rust preventative black oxide.
- Availability of special features thru multiplicity of models.

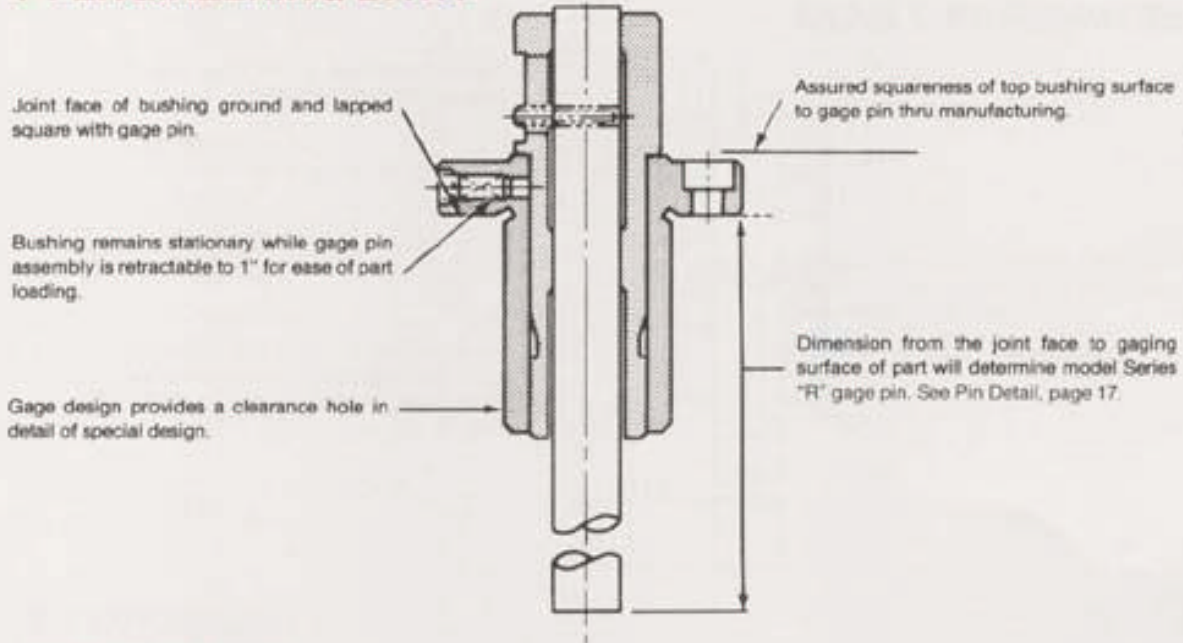
INDICATOR ADAPTOR ASSEMBLIES

TYPE P1R ADAPTOR BODY MODEL P1 SERIES "R" GAGE PINS	TYPE P2S ADAPTOR BODY MODEL P2 SERIES "S" GAGE PINS	TYPE P3S ADAPTOR BODY MODEL P3 SERIES "S" GAGE PINS	TYPE P4T ADAPTOR BODY MODEL P4 SERIES "T" GAGE PINS
 A cylindrical metal adaptor body with a dial indicator mounted on top. The body has a central vertical hole and a smaller hole on the side. The dial indicator is positioned to measure the diameter of the central hole.	 A rectangular metal adaptor body with a dial indicator mounted on top. The body has a central vertical hole and two circular holes on the front face. The dial indicator is positioned to measure the distance between the two front holes.	 A cylindrical metal adaptor body with a dial indicator mounted on top. The body has a central vertical hole and a smaller hole on the side. The dial indicator is positioned to measure the diameter of the central hole.	 A rectangular metal adaptor body with a dial indicator mounted on top. The body has a central vertical hole and a smaller hole on the side. The dial indicator is positioned to measure the diameter of the central hole.

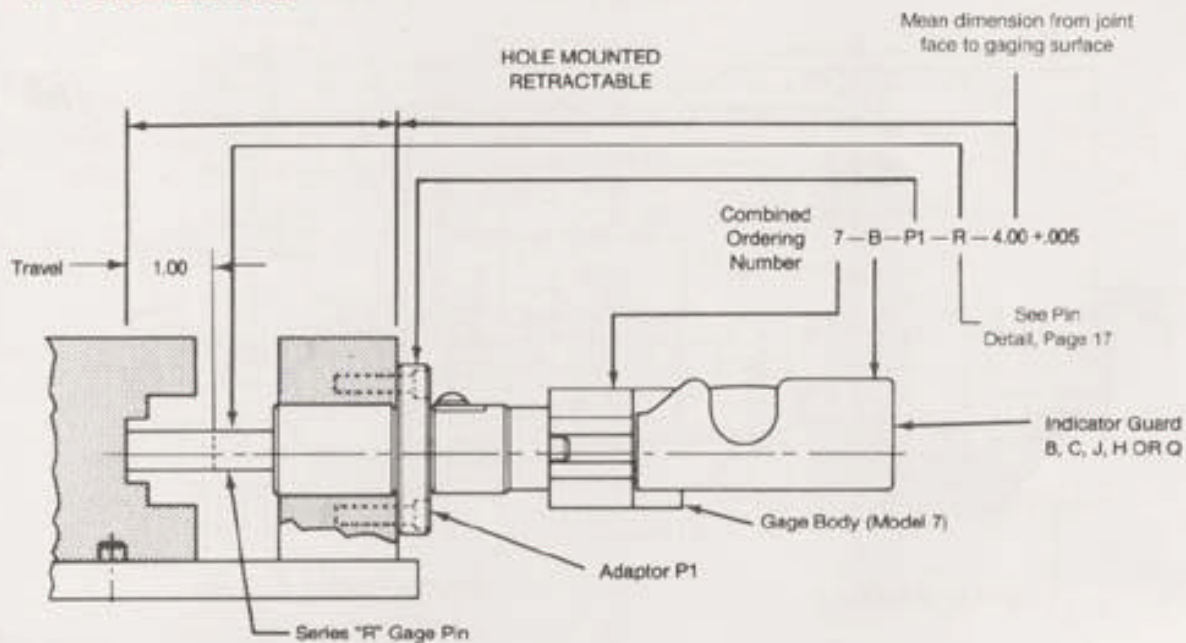


ADAPTOR P1

P1 ENGINEERING DATA



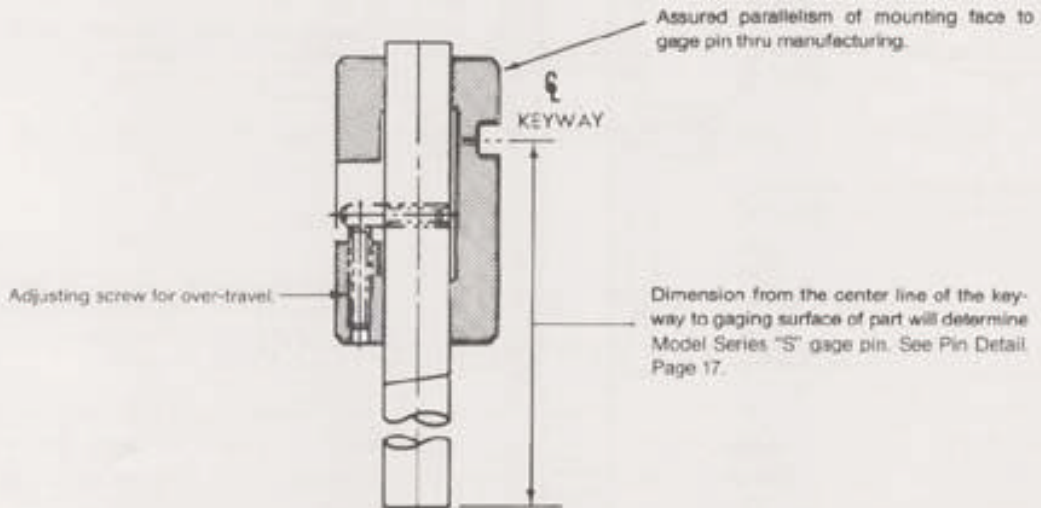
P1 ORDERING



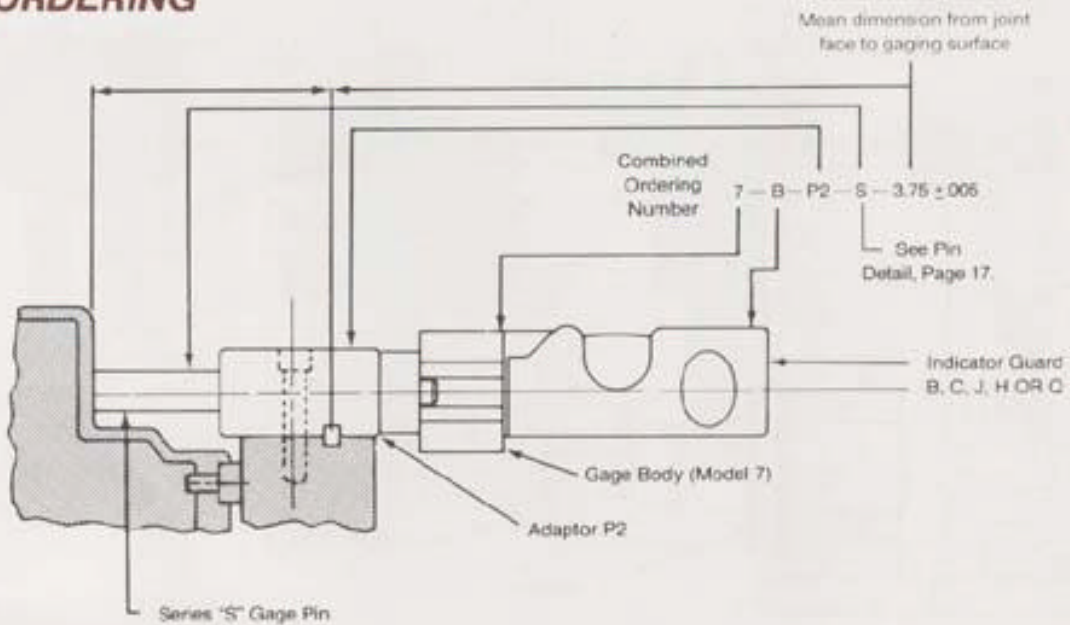


ADAPTOR P2

P2 ENGINEERING DATA



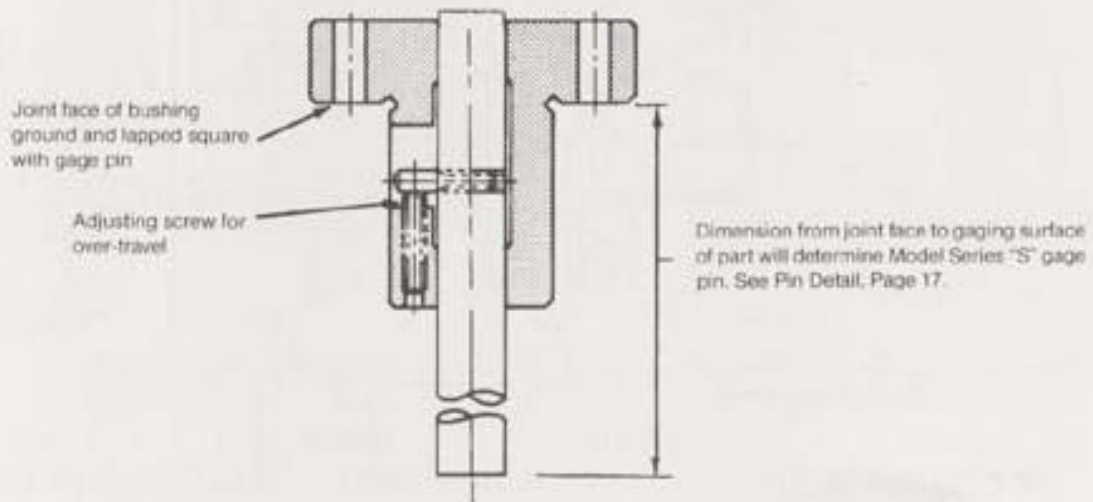
P2 ORDERING



ADAPTOR P3

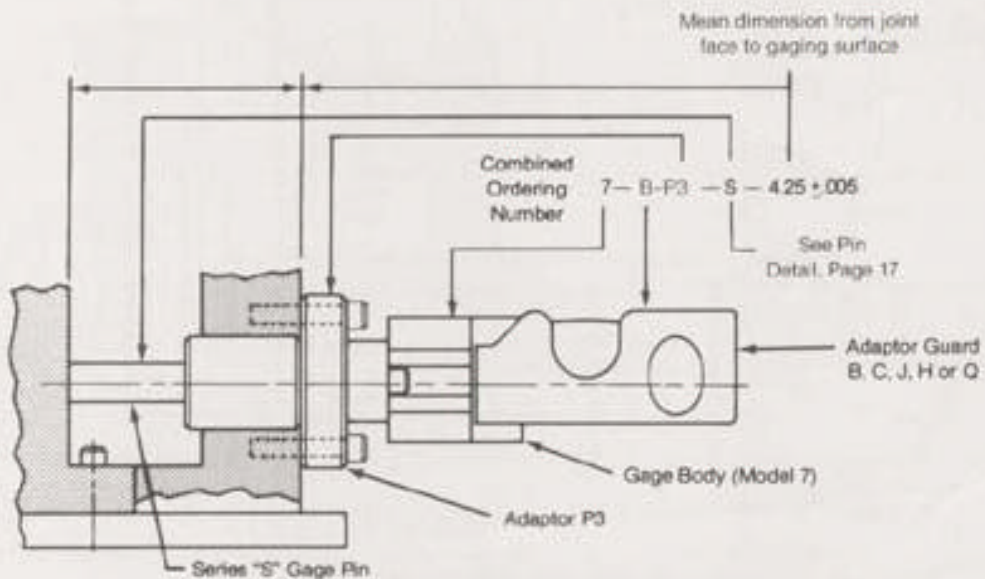


P3 ENGINEERING DATA



P3 ORDERING

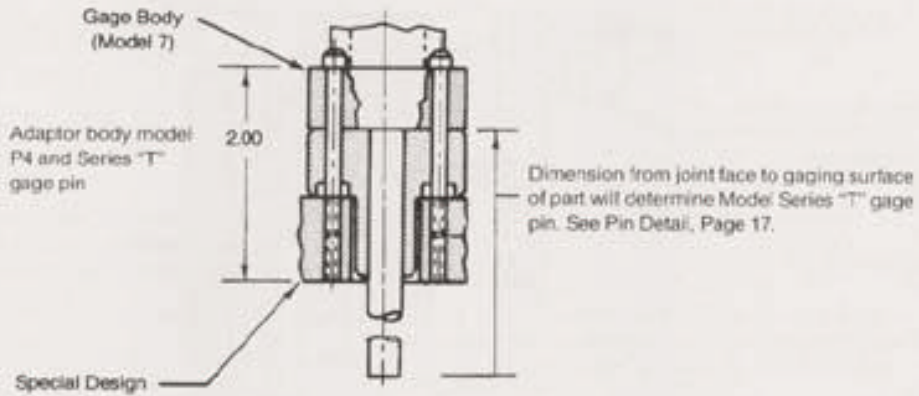
HOLE MOUNTED



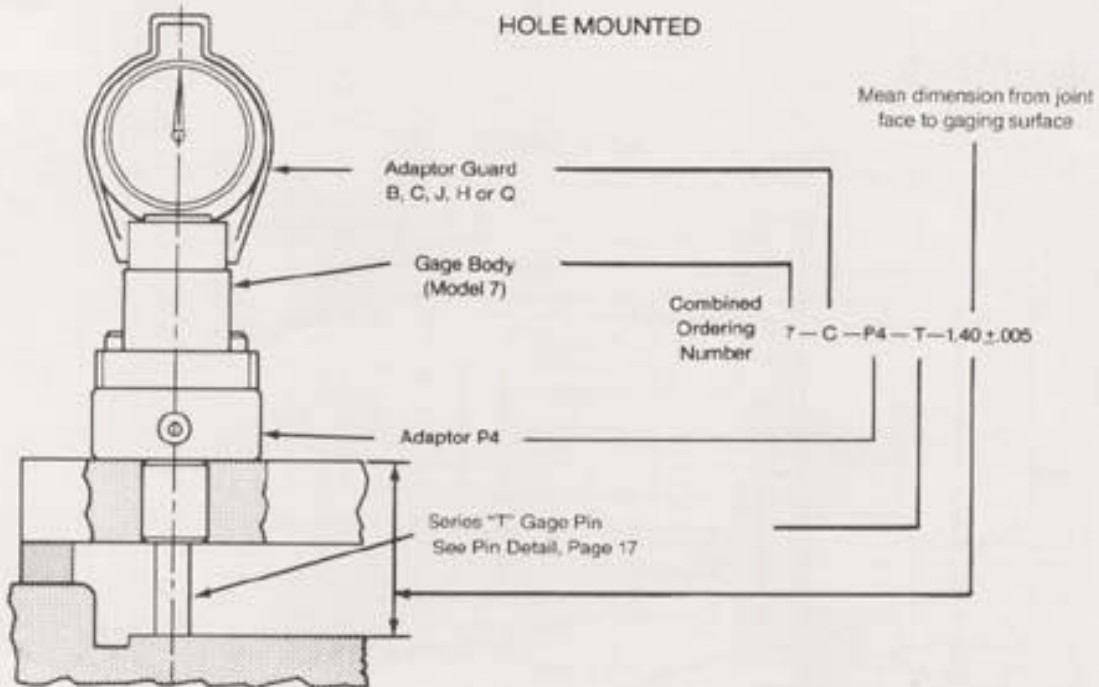


ADAPTOR P4

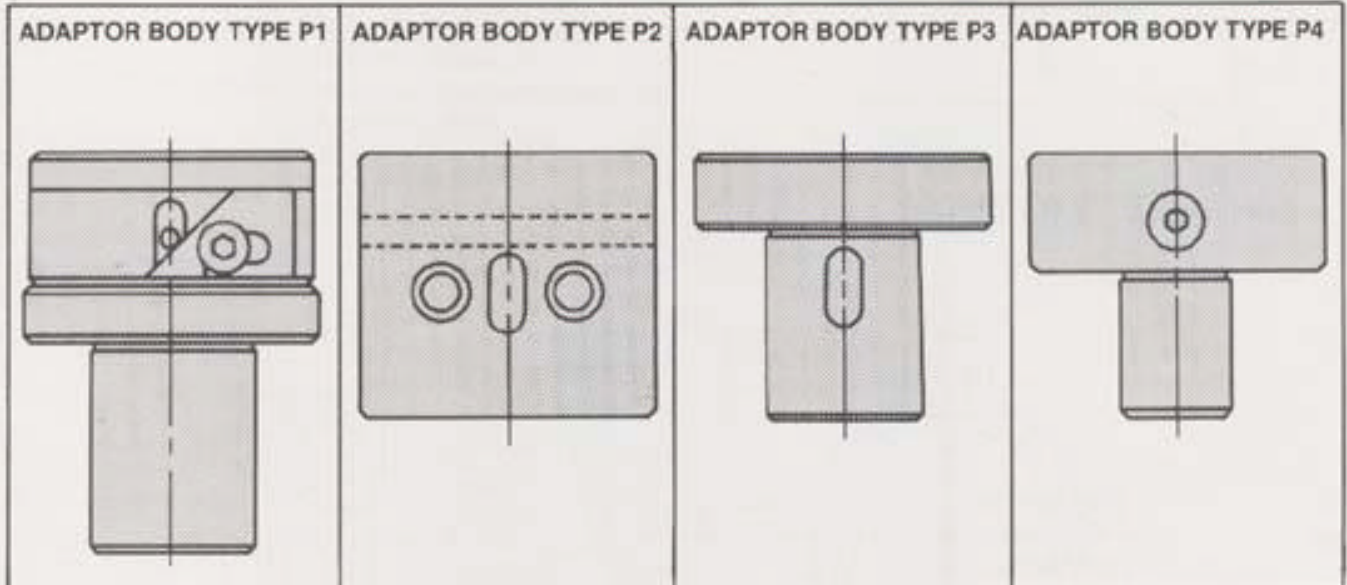
P4 ENGINEERING DATA



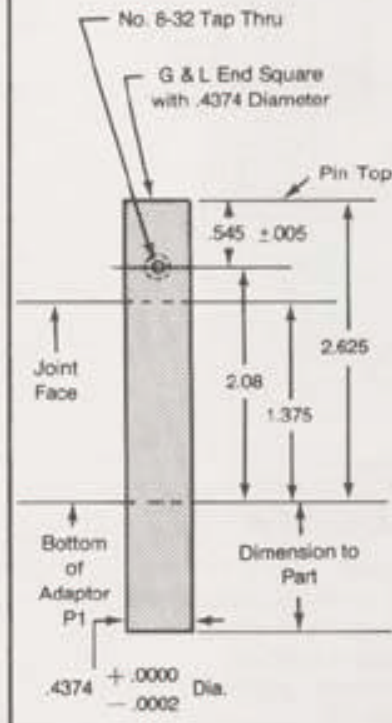
P4 ORDERING



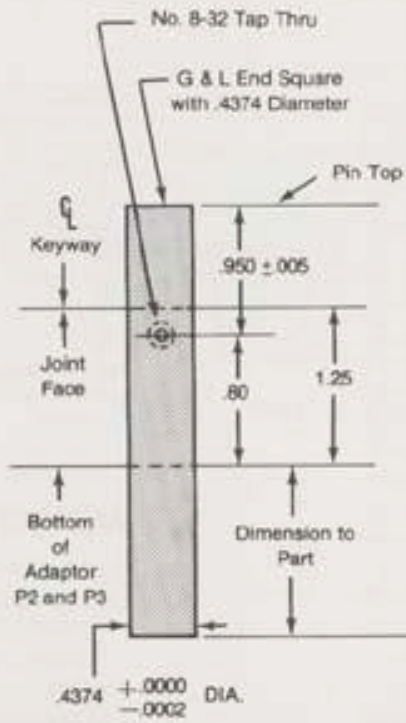
ADAPTOR PINS



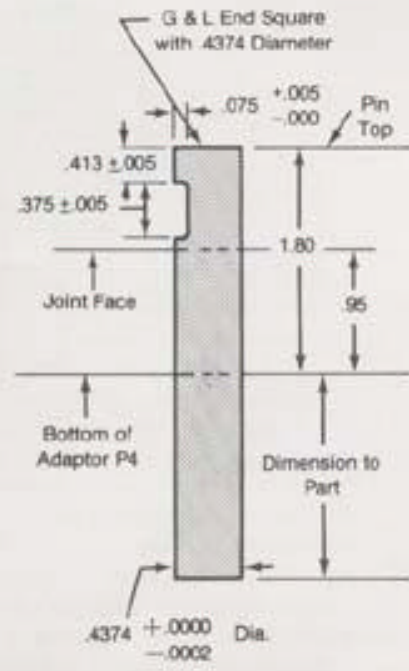
**TYPE P1
SERIES "R" PIN**



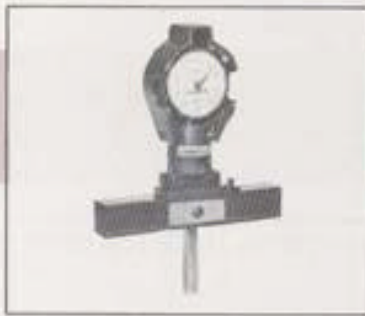
**TYPE P2 TYPE P3
TYPE SERIES "S" PIN**



**TYPE 4
SERIES "T" PIN**

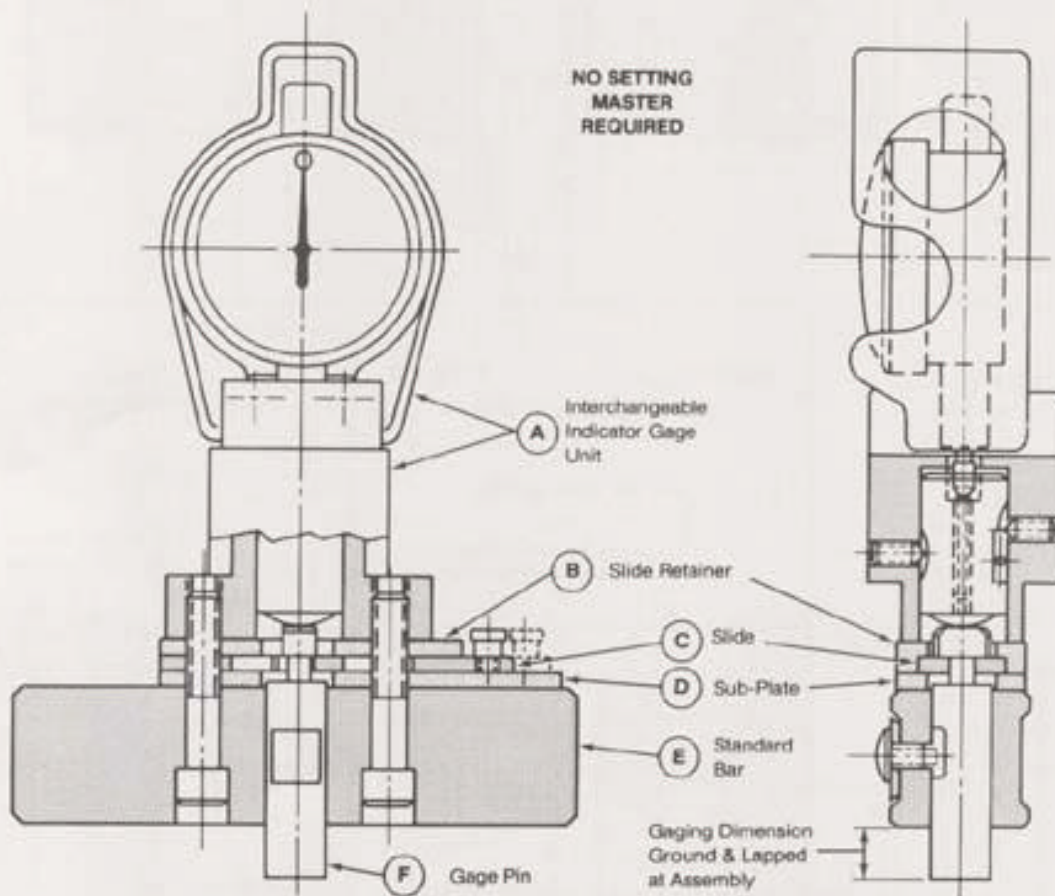


To order Series "R", "S" or "T" gage pins, give mean dimension from joint face to gaging surface. For additional information, see pages 13 thru 16.



SELF MASTERING UNIT

ENGINEERING DATA



FEATURES

- Economical and accurate.
- Simple to operate.
- Sturdy construction.
- Interchangeable indicator gage units.
- Surface of all moving components of the unit are hardened, ground & lapped.
- The unit will never become obsolete—rework or replace gage pin as necessary.

FUNCTIONAL DATA

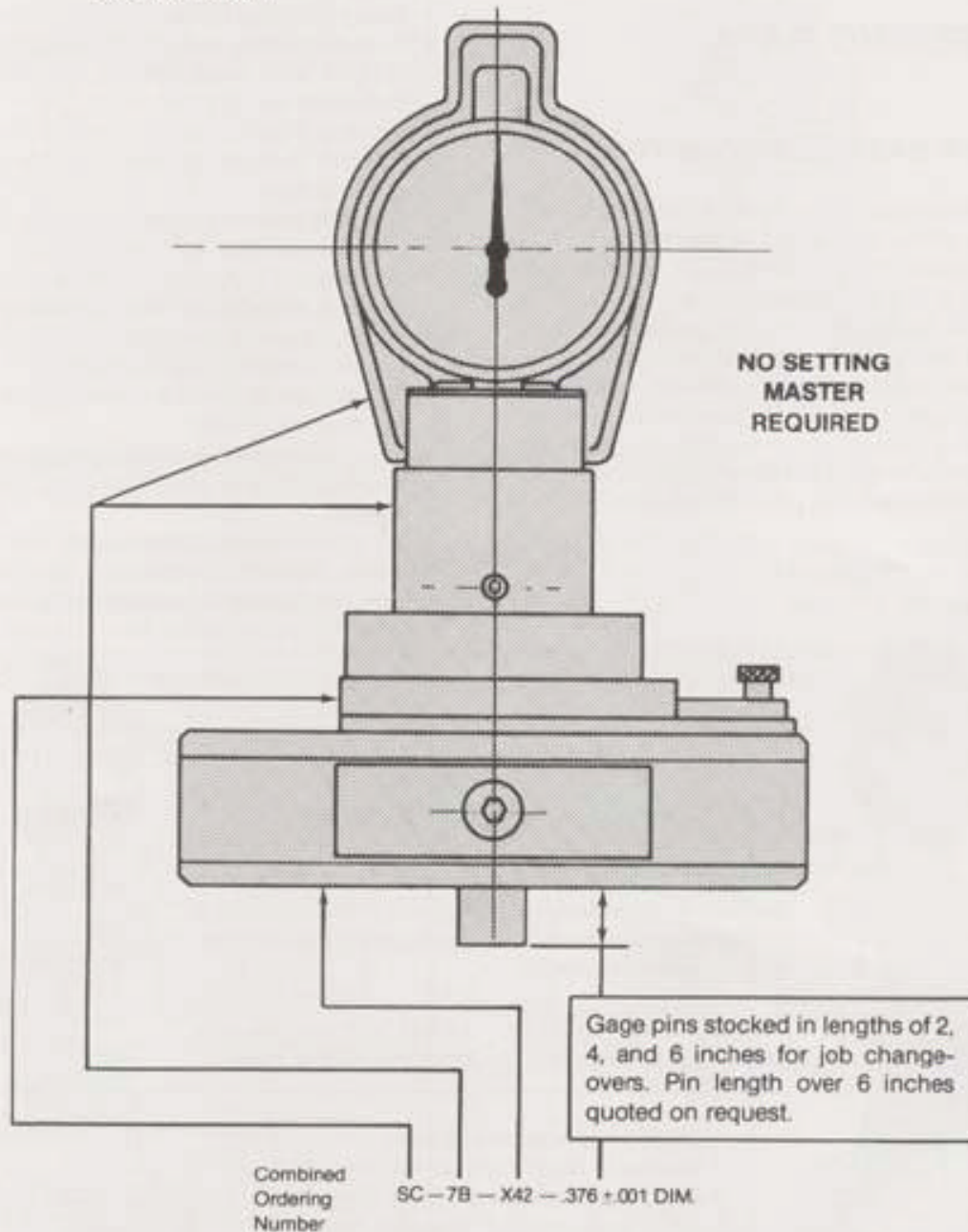
- To set indicator at mean gaging dimension:
- Push slide (C) toward indicator gage unit (A) to engage head of gage pin (F) (shown in engaged position).
 - Position dial indicator at zero.
 - Disengage slide (C).
 - Self-Calibrating unit is now ready to be used as a depth gage.

ORDERING

EXAMPLE:

REQUIRED: Self-mastering gage unit with
Hanlo Series "X42" bar to check
.375-.377 dimension.

SPECIFY: Hanlo Self-mastering gage unit
as shown below.



Use Full Size
Tracing Template
Model "SC"



BENCH COMPARATOR

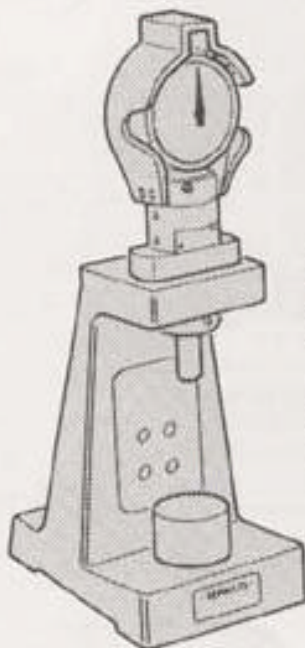
ENGINEERING DATA

FOUR BASIC COMPONENTS

1. BASE—Aluminum, with finished surfaces on 10 degree angle for easy indicator reading.
2. HANLO INDICATOR GAGE UNIT — Patented, Model 7B or 7C, less indicator.
3. ADAPTOR BUSHING — High grade tool steel, hardened and ground square with pin hole.
4. GAGE PIN BLANK — High grade tool steel hardened Rockwell "C" 62-64 with the outside diameter ground. The gage pin blank may be finish ground in the user's tool room or at Hanlo Gage Company to specific dimension. See application below.

FEATURES

- Compact, accurate and economical unit with a wide range of adaptability.
- Easily modified for multi-purpose applications.
- Accommodates any A.G.D. Group I Indicators with 1-11/16 inch bezel dia. or any A.G.D. Group II indicators with 2 1/4 inch bezel dia.
- Protects indicator with a sturdy guard.
- Positive method of clamping dial indicator, split bushing type.
- Restricts indicator travel within one revolution. This prevents damage and misreading.
- Shockproof — Any impact from external or internal shock is absorbed by unit and not by indicator.
- Constant spring pressure against work part assures greater precision and accuracy.
- All parts are standard and replaceable without affecting function of unit.
- Sturdy construction. All moving parts are fully enclosed and well protected from dust and foreign matter.
- All adjustments can be locked.
- Hanlo indicator bench type comparator is never obsolete by model or engineering changes — simply alter necessary details for new application.



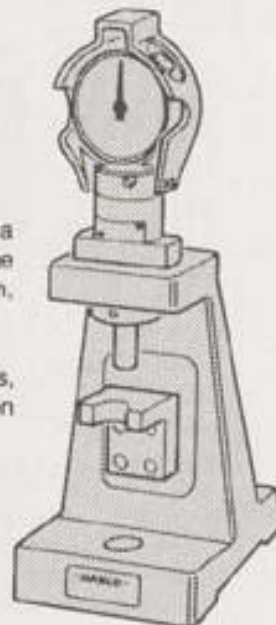
1-11/16 inch bezel diameter

TYPICAL MODIFICATIONS

HANLO COMPARATOR may be easily modified into a multi-purpose unit by mounting Hanlo Indicator Gage on top of base and same adaptor bushing from bottom, to suit special requirements.

Auxiliary attachments such as rest buttons, brackets, locators and pins may be mounted to the base on finished surfaces.

- Gaging capacity: 0-3.50 inch.
- Maximum depth from center line 1 inch.
- Adaptor bushing embodies adjustable over-travel control of the gage pin.

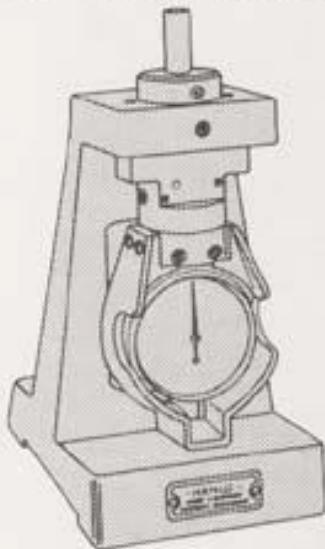


2 1/4 inch bezel diameter

Tracing Templates Available

ORDERING

MODEL 200B BOTTOM MOUNTED SHOWN

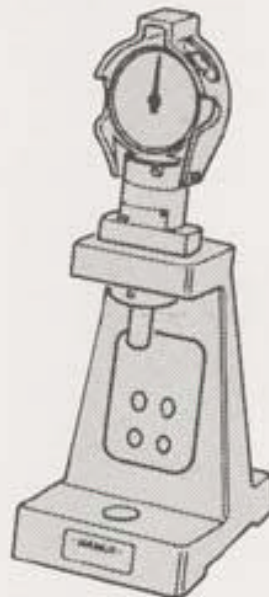


HANLO COMPARATOR MODEL 200B will accommodate any of the following A.G.D. indicators:

GROUP I INDICATORS: Ames 100 Series
Federal "B" Series
Standard 100 Series

When ordering Comparator Model 200B with indicator installed: Specify 200B plus indicator make and model.

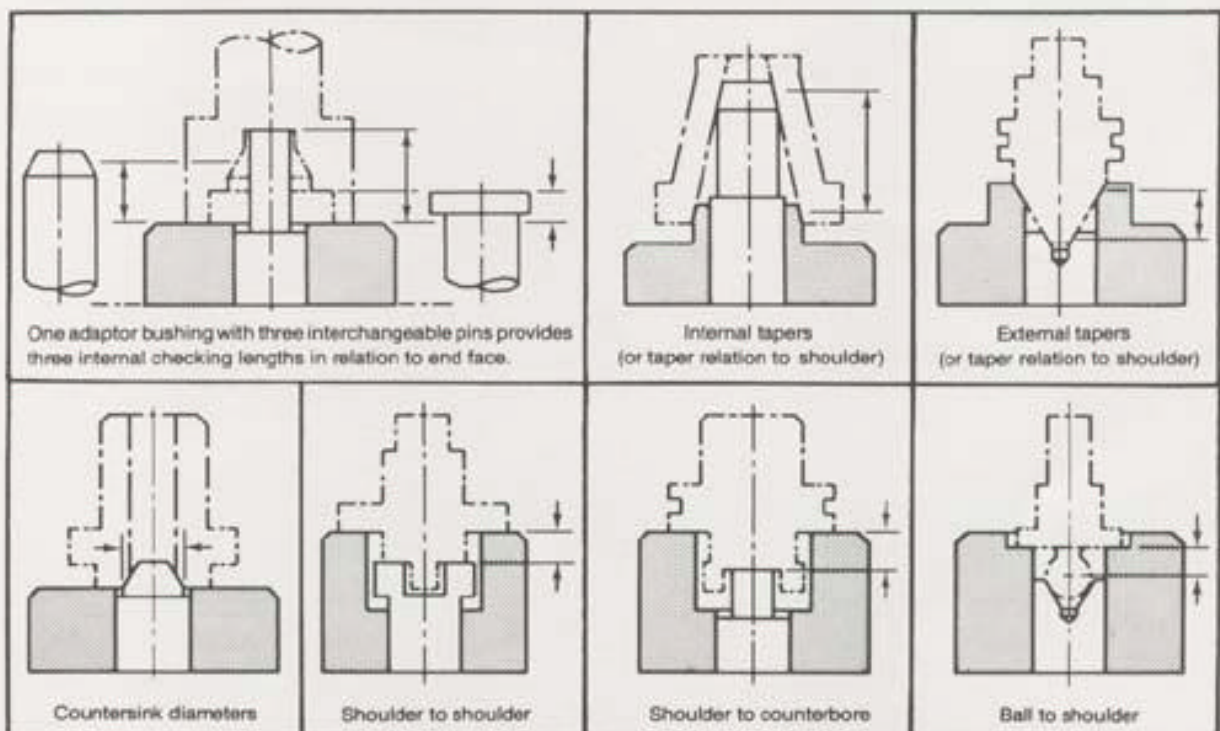
MODEL 200C TOP MOUNTED SHOWN



HANLO COMPARATOR MODEL 200C will accommodate any of the following A.G.D. indicators:

GROUP II INDICATORS: Ames 200 Series
Federal "C" Series
Standard 200 Series

When ordering Comparator Model 200C with indicator installed: Specify 200C plus indicator make and model.



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