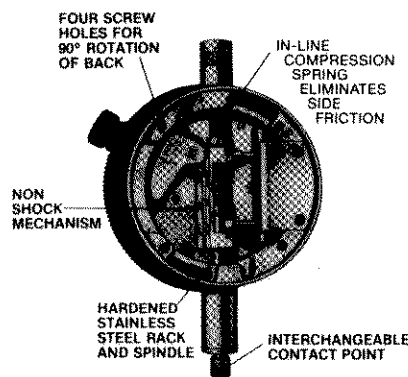


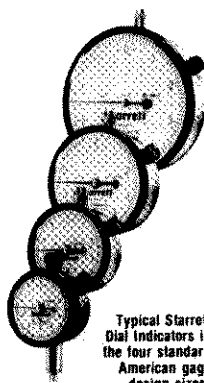
DIAL INDICATORS

One of the most widely used instruments today in layout, inspection and quality control operations is the dial indicator. Specially designed with shockless hardened stainless steel gear train and manufactured to fine watchmaking standards with jeweled bearings, the dial indicator has precisely finished gears, pinions and other working parts that make possible measurements from one-thousandth to 50 millionths of an inch, depending on accuracy requirements. Easier maintenance, longer life, and greater accuracy can be expected with the modern dial indicator because of unit-construction and simple, interchangeable design. Fewer parts mean greater efficiency, less friction and wear. Any gear unit and any case assembly can be combined to give a complete dial indicator of the style desired. Dial faces are color coded to avoid errors, white dial for English measurement and yellow face for metric.

The contact point is attached to a spindle or rack whose movement is transmitted to a pinion and then through a train of gears to a hand which sweeps the dial of the indicator. A small movement of the contact is thus greatly magnified and read directly from the dial in thousandths or as close as 50 millionths of an inch, depending on the type of indicator used. Long range indicators have direct reading count hands and a double dial. Graduations are available for reading in .001", .0005", .00025", .0001", and .00005"—with ranges from 12" down to .006"; also in .01mm, .002mm, and .001mm with ranges up to 125mm. Dials can have balanced or continuous graduations.

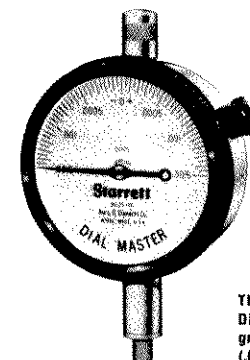


Many useful attachments are available to suit work requirements. Dial indicators can be furnished with tolerance hands; with special dials; with rubber dust guards to seal out dust and foreign matter; with anti-magnetic mechanisms when the dial indicator is used near magnetic fields; with long stems up to 12 inches for use in deep holes; with lever control for lifting the indicator spindle.

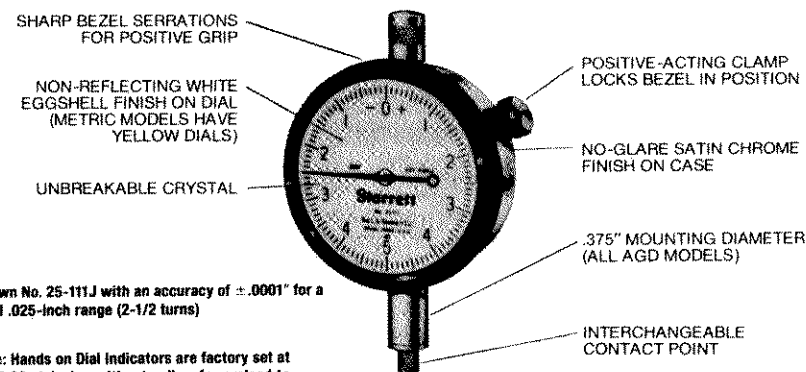


Super-precision dial indicators with graduations in 50 millionths (.00005) of an inch and accuracy to plus or minus 10 millionths ($\pm .00001$) are also available. These are used for applications requiring extreme precision such as in shop inspection to laboratory standards or in laboratory work. The long range dial indicator with ranges of 2, 3, 4, or 5 inches and on up to 12 inches (and comparable metric ranges through 125mm) makes possible all types of long range gaging such as on jig and fixture work, for production measuring on machine tools or as precision stops. Count hands and double dials permit direct reading in thousandths of an inch.

MAGNETIC BACKS. Magnetic backs provide a quick and easy means of attaching any Starrett dial indicator to flat ferrous metal surfaces. A real timesaver for machine, jig and fixture setup.

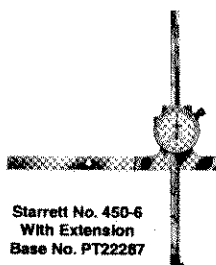


DIAL GAGES. The principle of direct reading from a pointer and graduated dial provides both the accuracy and the speed of reading essential in many of today's inspection operations, and consequently, the dial indicator has been incorporated in all types of special and standard gaging equipment, as well as in many machine tools. Some gages are direct reading and others serve as comparators showing plus or minus variations in size.



DIAL DEPTH GAGE

A dial depth gage in either a 6" or 12" (150 or 300mm) range is a quick and accurate method of measuring depth of holes, slots and recesses. All readings are taken directly from the rack and the dial indicator. Large openings can be accommodated by adding an extension base (7 in. or 12 in.) to the gage. This extension base can also be positioned to the right or left for off-center slots, close to shoulders and between obstructions. Removable hook permits readings from the edge of a work piece to edges of slots, shoulders, etc.



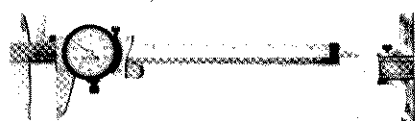
Starrett No. 450-6
With Extension
Base No. PT22267

DIAL CALIPER

A most versatile and easy to read instrument, this four-way stainless steel dial caliper has knife edge contacts for inside and outside measurements, and a rod connected to its slide for obtaining depth dimensions. The rod contact is cut out to provide a nib for gaging small grooves and recesses.

By placing the front end of the reverse side of the movable jaw against the edge of a work piece, parallel lines may be scribed against the front end of the fixed jaw.

All readings are taken directly from the bar and dial indicator. Measurements may be made with one hand, a thumb roll being provided for fine adjustment. Knurled thumb screws lock the movable jaw and adjustable indicator dial at any setting. With the addition of a depth attachment the dial caliper becomes a convenient and easy to use depth gage. Dial calipers are available in 6 and 12 inch ranges (and 150mm) with depth capabilities.

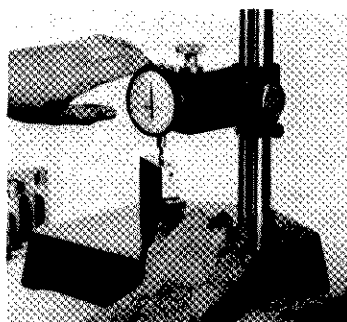


Starrett No. 120
6 inch Dial Caliper

Starrett No. PT22431
Depth Attachment

DIAL COMPARATORS

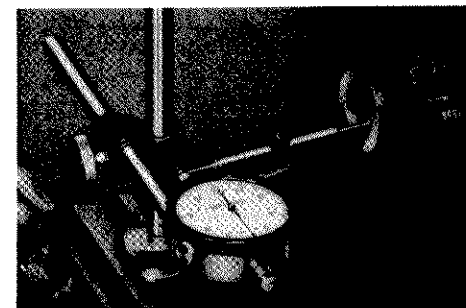
The dial comparator is used for inspecting duplicate parts and various materials, either in bench inspection or on the production line. The precision ground base accommodates all types of work as well as V blocks and fixtures. A dial indicator with fine setting adjustment is mounted on an adjustable bracket on a vertical post. A hand lever operates the indicator to contact the work and size variations are read from the dial. This unit is available mounted on a granite base.



Shown No. 653J Dial Bench Comparator

DIAL TEST INDICATOR

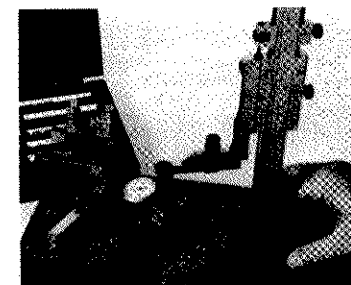
The dial test indicator is an all purpose tool used in layout, inspection and on machine tools for truing up work, checking runout, concentricity, straightness, surface alignment, and for transferring measurements. A dial indicator is mounted at the end of a horizontal arm adjustable on an upright base post. The post is adjustable on a slotted base. Another test indicator is the universal dial test indicator. Various attachments, including a tool post holder, adapt it to a wide range of applications, such as checking runout of a spindle turned on a lathe.



Shown No. 665J Dial Test Indicator using a No. 670B Right Angle Attachment

LAST WORD® INDICATORS

One of the most flexible test instruments is the No. 711 Series Last Word® Dial Test Indicators. A typical application is with a Vernier height gage on a surface plate for comparing measurements from gage blocks with the work. This type of test indicator has a jeweled lever for smooth movement, reversible action, swivel body and hard chrome-plated contact.



Starrett No. 711 Series Last Word® Dial Test Indicator with No. 255 Vernier Height Gage

DOVETAIL MOUNT INDICATORS

No. 708 and 709 Series Precision Dial Test Indicators with dovetail Mounts were designed to be positioned for easy and accurate readability. The versatility of the angled head, combined with the three dovetail mounts eliminates the need for having both vertical and horizontal style test indicators and work with existing test indicator accessories available with English and metric dials.



No. 708AZ,
Dial Indicator.



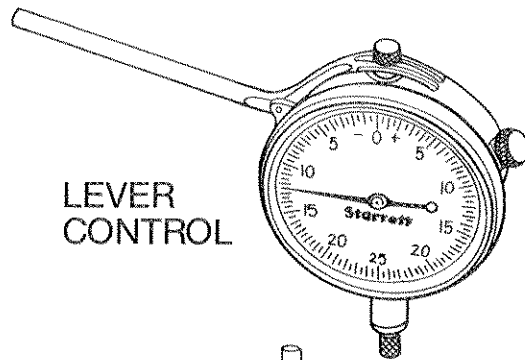
No. 709MAZ
angled head
for easy reading.

MAGNETIC BASE HOLDERS

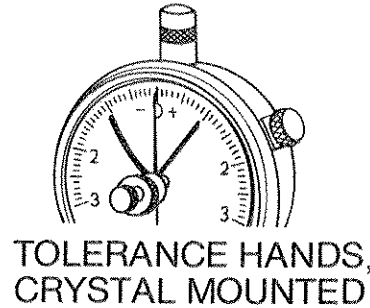
A magnetic base indicator holder greatly increases the usefulness and application of the dial indicator on all shop setup, checking and inspection jobs. The time usually spent in clamping the indicator to a machine is eliminated since its powerful, permanent magnet base holds to any flat or round steel or iron surface — horizontally, vertically, upside down or on shafts using a precision ground "V" on one face.

Starrett®

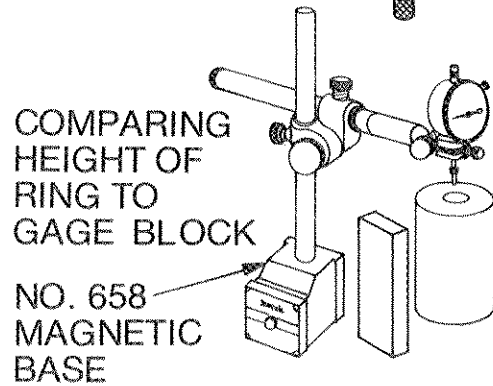
DIAL INDICATOR



LEVER CONTROL



TOLERANCE HANDS, CRYSTAL MOUNTED

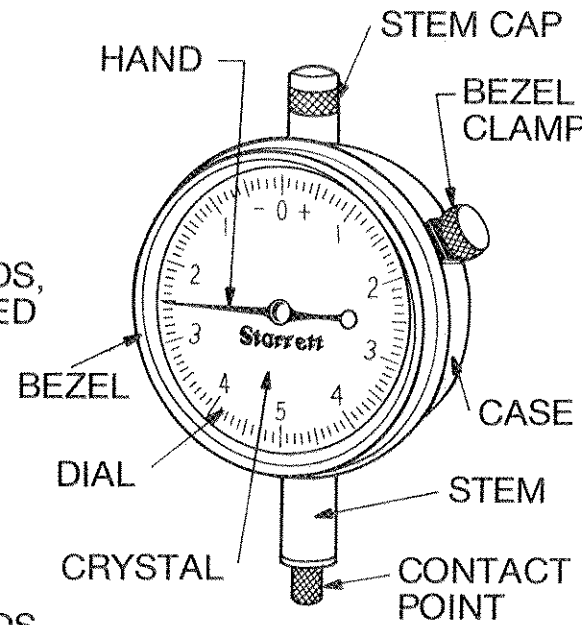


COMPARING HEIGHT OF RING TO GAGE BLOCK

NO. 658 MAGNETIC BASE

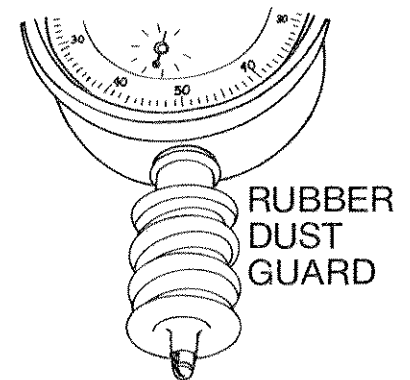
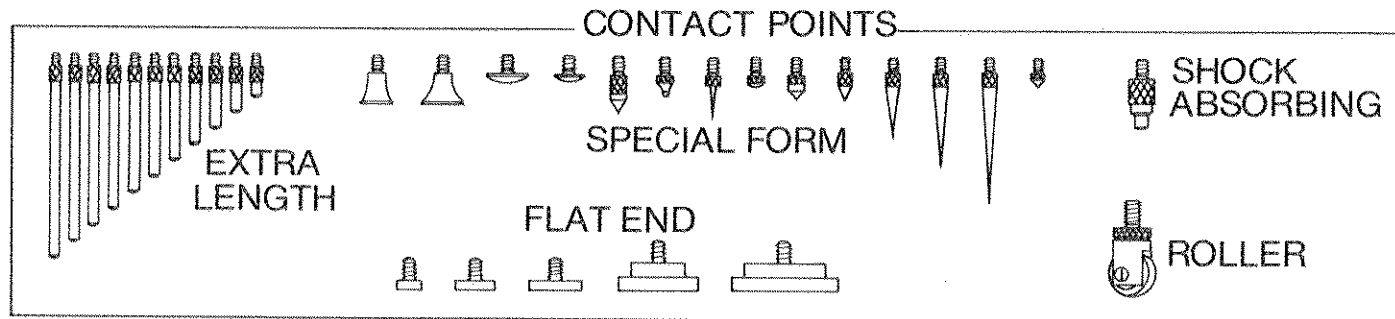
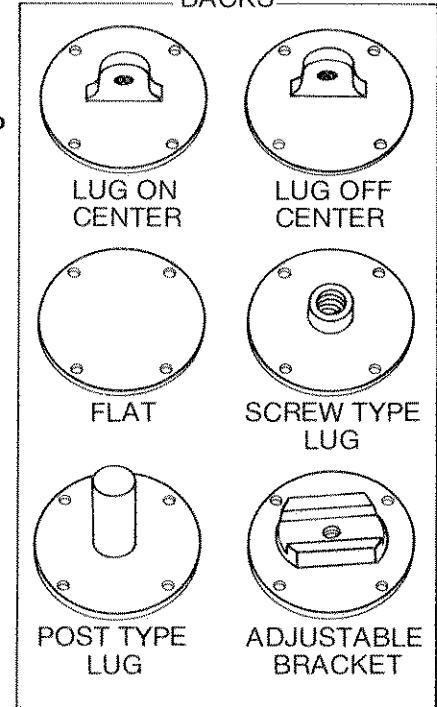


TOLERANCE HANDS, BEZEL MOUNTED



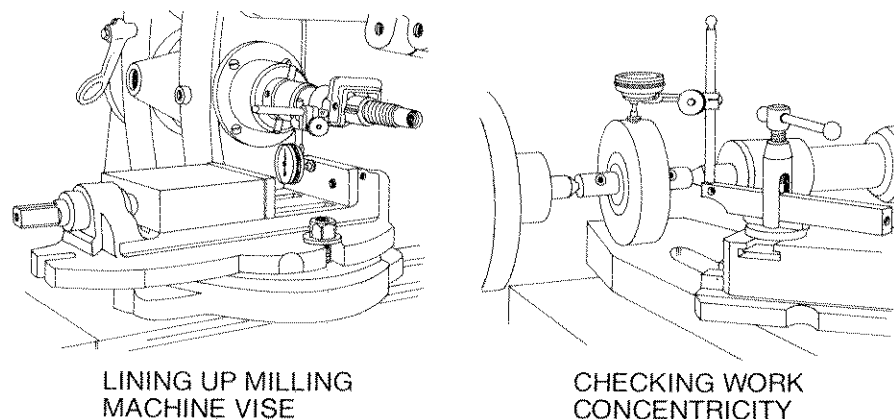
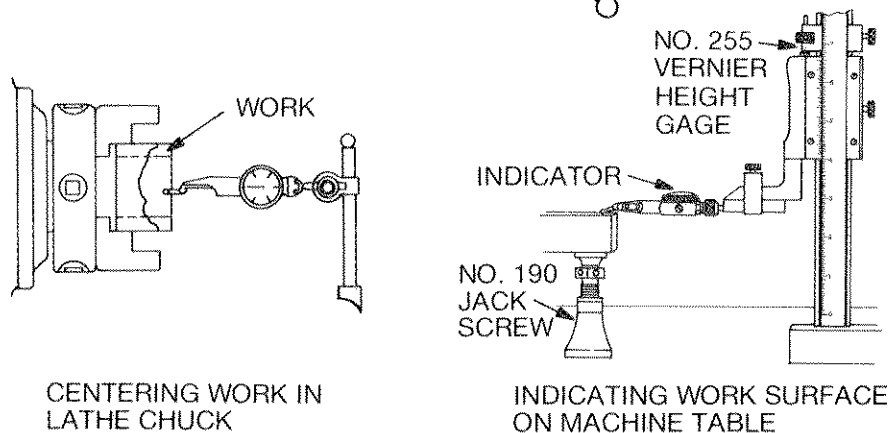
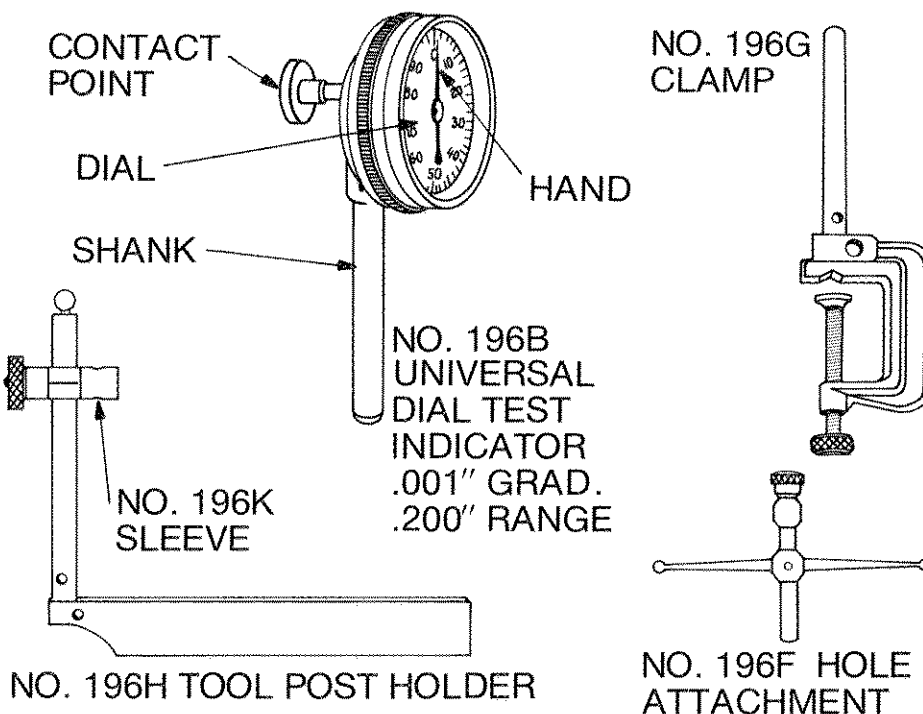
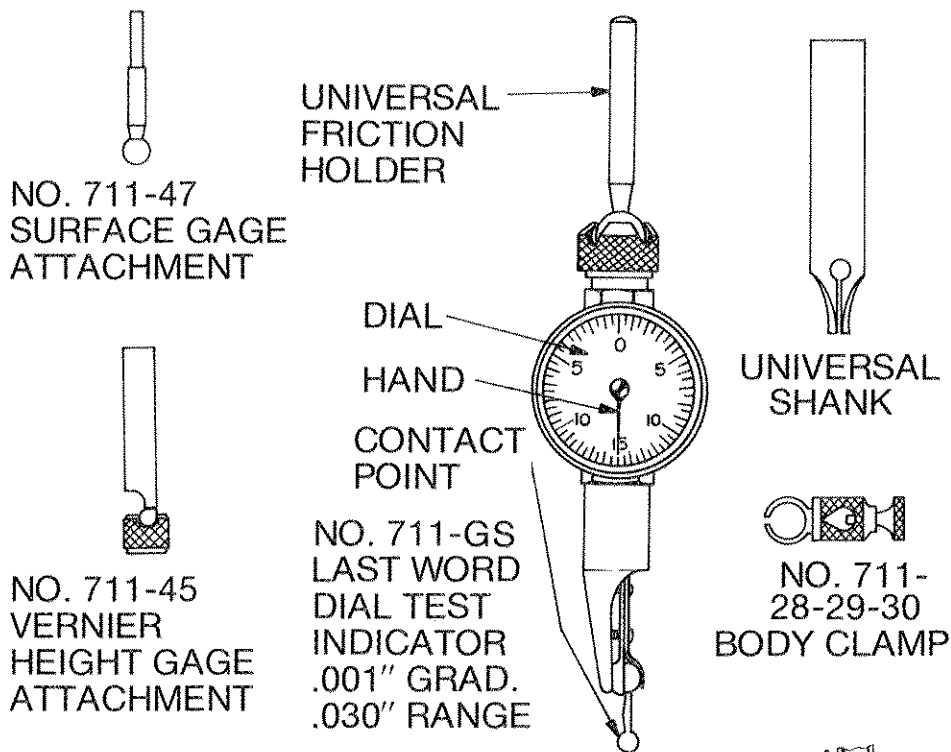
NO. 25-111

BACKS



Starrett®

DIAL TEST INDICATORS

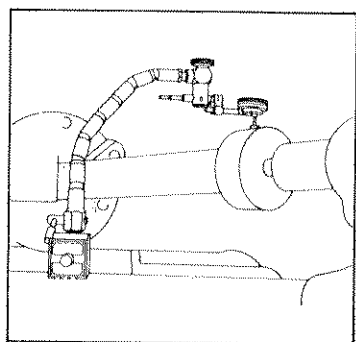
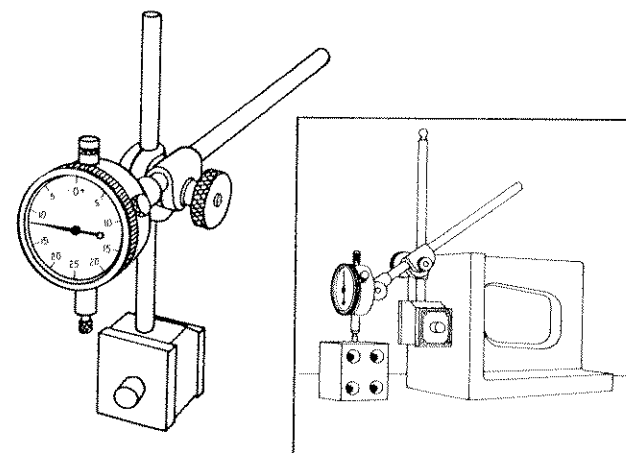
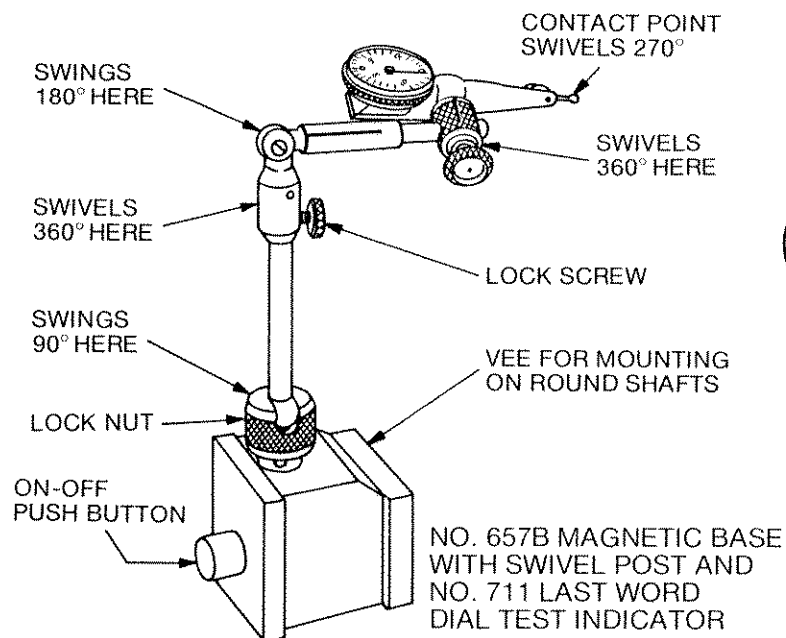
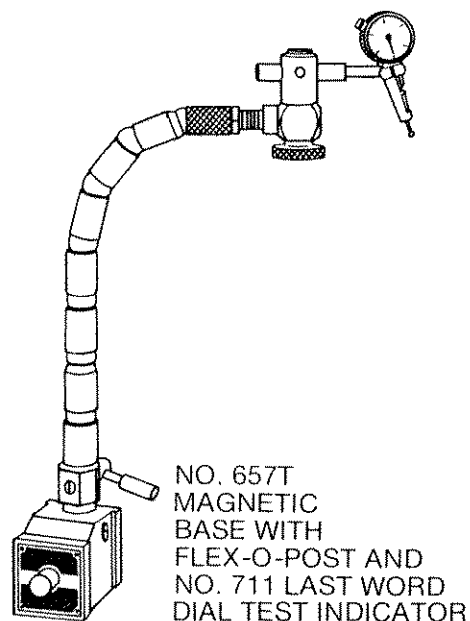


The L. S. Starrett Company, Athol, Massachusetts 01331, U.S.A.

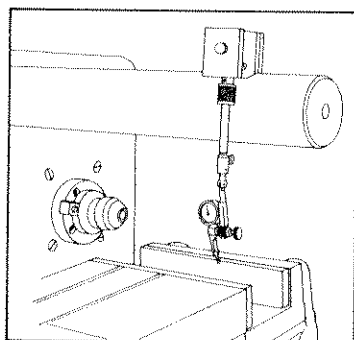
Printed in U.S.A.
3M 6/93S

Starrett®

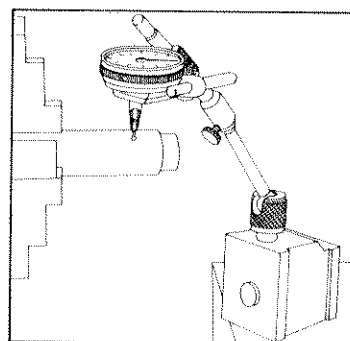
MAGNETIC BASE INDICATOR HOLDERS



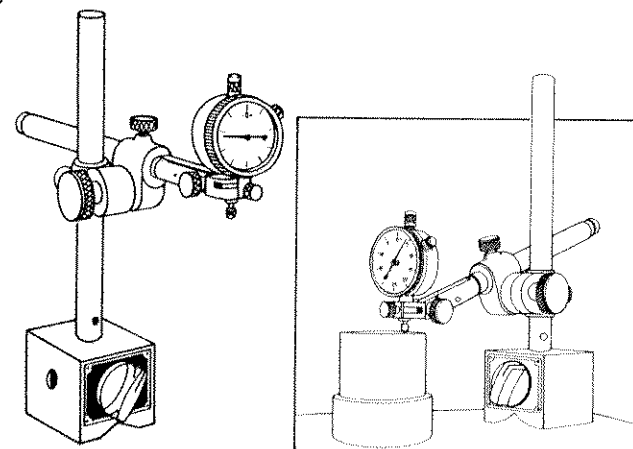
CHECKING RUNOUT ON
ENGINE LATHE WITH NO. 196
DIAL TEST INDICATOR



LINING UP MILLING MACHINE
VISE WITH NO. 711 LAST
WORD DIAL TEST INDICATOR



CENTERING WORK IN FOUR-
JAW CHUCK USING NO. 196
DIAL TEST INDICATOR



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