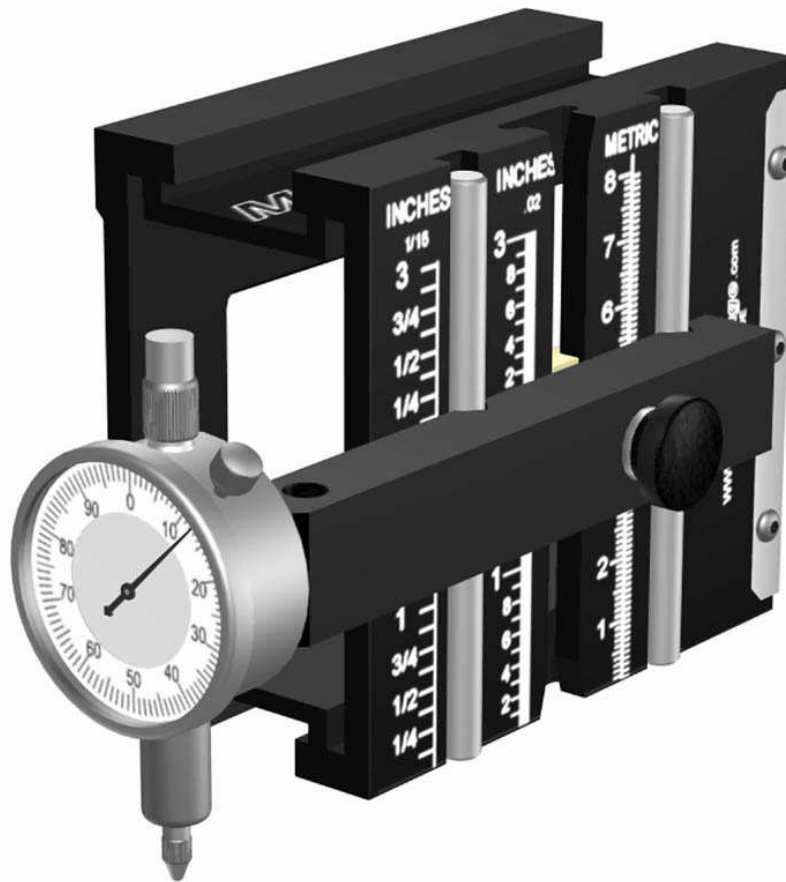


MasterGage/Classic

Owner's Manual



“Master Your Machinery”™

Getting control of all of your woodworking machinery with the powerful features of the *MasterGage/Classic*

Award

**We are proud to announce that the
MasterGage/Classic
won the distinguished
Wood Magazine “TOP TOOL” Award
in August, 2003**

Preface

Machinery illustrated in this Manual is generic. There is a vast range of woodworking machinery available, both domestic, imported - new and old. It is impossible to show all makes and models of these machines, along with their adjustment features. Consult your machines Owner's Manual for methods of adjustment, etc. If you do not have a Manual, contact the manufacturer's dealer

Legal Notice

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Patents

MasterGage/Classic and other *MasterGage* products have been awarded, and are protected by the following eight United States Patents. Additional patents pending.

5,491,906	6,665,946	6,766,584	7,245,199
5,826,346	6,594,913	D574,862	6,901,672

No rights are extended to any entity to reproduce these patented features at any time or place.

Product Improvement

We at *MasterGage Corporation* are constantly striving to improve our products. We reserve the right to change specifications, modify products and/or prices at any time, and without notice.

SAFETY INSTRUCTIONS

ALWAYS TURN OFF AND UNPLUG the tool/machinery.**BEFORE** using the *MasterGage/Classic System* on any power tool/machinery

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Welcome to *MasterGage*

Dear Customer:

I'd like to welcome you into our family of valued customers. *MasterGage Corporation* is a manufacturer of high quality, precision tooling for those who demand the very best tools for their craft.

All *MasterGage* products are innovative and original. To illustrate this point, I have been awarded **eight** United States Patents, with other patents pending, in the development of the *MasterGage* system. The tools that I present to you are the result of my 45+ years as a practicing mechanical engineer involved in many industries designing precision tools and mechanisms. As a woodworker, I found aligning, tuning and troubleshooting my machines to be unnecessarily difficult. I also found setting the machines up for various operations and set-ups time consuming and exasperating. This frustration led me to develop the *MasterGage* system.

The *MasterGage/Classic* is a powerful tool, as this *Manual* will demonstrate. It will allow you to align, calibrate, trouble shoot and reduce set up time on any piece of equipment found in the wood shop with ease. With the *MasterGage/Classic* you have control over any machine you presently own – or any you plan to acquire in the future. Easily portable, you can use the *MasterGage/Classic* on any machine in the production shop, in the field or in the home shop. No need to rely on any machine scales, since you are always reading the laser precision scales on the *MasterGage/Classic* or the super accurate Dial Indicator. You will also get automatic conversions of any dimension from one system to another, whether it is in fractions, decimal inches, millimeters or centimeters. Now you will have control of all your machinery.

Do keep in mind that all machines must be aligned and calibrated on a regular basis – **IT IS NOT A ONE TIME EVENT**. The *Classic* really shines when it comes to set up and re-setup of your machinery for any operation you desire. Machine set up that took hours, will now only take minutes. With the user-friendly *MasterGage/Classic*, you can to get to the fun/business of woodworking **fast!**

For even more versatility, I've developed many optional Accessories that allow you to "customize" the *MasterGage/Classic* to your particular needs. As you grow in your measurement and calibration needs, you will always find an Accessory to fit your requirements.

Craftsmen involved in any of the following disciplines will find these tools invaluable.

- | | | |
|----------------------|----------------------|------------------------------|
| 1. Woodworkers | 5. Furniture makers | 9. Machinists |
| 2. Model makers | 6. Cabinet makers | 10. Tool makers |
| 3. Pattern makers | 7. Serious hobbyists | 11. Sheet metal workers |
| 4. Finish carpenters | 8. Boat builders | 12. And many other craftsmen |

Thank you for your business!

Paul Reilly
President, Founder & Inventor
MasterGage.com

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Your **MasterGage/Classic** Package

This package contains the following:

1. The **MasterGage/Classic** unit
2. The **MasterGage/Classic** Manual
3. A precision Dial Indicator, 0.001 [1/1000 inch] accuracy with ¼ inch travel
4. A 1.0 inch and 2.0 inch stainless steel dial indicator extension – extends the reach of the Dial Indicator (Page A9)
5. A 0.300 inch diameter flat, 400C stainless steel Dial Indicator tip – hardened to Rockwell 52. Perfect for adjusting or replacing knives on jointers and planers. Also for checking run out on drill presses and routers, etc. (Page A9)
6. Dial Indicator Adapter Assembly – allows you to position the Dial Indicator in different directions. (Page A8)
7. A ¼ inch diameter x 3 ½ inch long stainless precision Depth Gauge Rod, designed for measuring depths of dado cuts, mortise slots, blind drilled holes, etc.(Page A6 & A6.1)
8. A stainless steel Precision Dowel Rod, ½ inch diameter x 4 inches long. Perfect for calibrating drill presses, routers, horizontal mortisers and lathes. (Page E1)
9. Magnetic Miter Slot Cradle Bar – Attaches to the bottom [and top] of the *Classic*. It is used with the *Classic* to align the tablesaw blade and rip fence easily. (Page A7)
10. Hex wrench is used to secure the Magnetic Miter Slot Cradle Bar in the desired position.(Page A7)
11. Hex wrench for calibrating the “Knife Edge” to 90 degrees, as required. (Page A3)
12. A rugged, double walled carrying case, with handle. It is lined with custom cut foam that nests and protects your **MasterGage/Classic** system. As an added feature, the foam is removable – simply remove the bottom foam and store your **MasterPlate** safely on the bottom of the carrying case, beneath the foam. Now, your valuable **MasterGage/Classic** and accessories are now housed together in one safe place.
13. A roll of transparent tape for working surface protection. See Section K.
14. An enclosed stamped self addressed Post Card, asking you to supply us with a name. We will engrave that name into a solid brass nameplate, ready for mounting onto the **MasterGage/Classic** – free of charge. A nice way to personalize your *Classic*.
15. A 30 day Money Back Guarantee plus a One Year Guarantee on materials and workmanship – including the dial indicator.

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MasterGage/Classic System

SECTION

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B TABLE SAW + ADD-ON SLIDING TABLE KIT + SLIDING TABLE PANEL SAW

C RADIAL ARM SAW + CHOP SAW + SLIDING COMPOUND SAW

D ROUTER + ROUTER TABLE + SHAPER + CNC ROUTERS & MILLS

E DRILL PRESS

F BAND SAW

G JOINTER

H PLANER

I DISK SANDERS + DRUM ROLLER SANDER

J HORIZONTAL MORTISER + DOWELER

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P ONE YEAR GUARANTEE

SECTION A

Getting Acquainted with your *MasterGage/Classic*

***MasterGage/Classic* Features**

Your ***MasterGage/Classic*** is packed with exciting patented features that are built to last!

The body of the *Classic* is fabricated from rugged aircraft quality extruded aluminum. All sides are ground flat and parallel to each other to within 0.001 [1/1000] inches [as a reference, the human hair is 0.002 inches thick. Once ground, the body is then machined to exacting tolerances [0.0004 inches] on computer numerically controlled machinery [CNC], the *Classic* is then plated with a protective black anodized finish that also presents a superb black non-glare surface for easy reading.

The unit is then precisely and permanently laser etched into its black non-glare surface with scales that are in inches, millimeters and centimeters. This allows the *Classic* to be used on any equipment worldwide, regardless of the measurement standards used

The *Classic* body has extruded "T" slots in both the top and bottom surfaces, allowing the owner to use special magnets. This magnet accessory is a very powerful rare earth [neodymium boron] magnet that fit into the "T" slots. A valuable Accessory that ensures rock solid rigidity while making critical measurements.

The front edge of the *Classic* has a stainless steel working edge called a "knife edge". This 1/16 thick piece of stainless steel is set precisely to 90 degrees. The thin knife edge makes it easy to measure the squareness of saw blades, since it projects 1/16" forward of the base and fits between the carbon tips of the saw blade. This feature allows the knife edge to fit flat against the body of the saw blade giving you an exact 90 degree reading

The Level Arm is made of 1/2" x 3/4" x 3 3/8 inch aircraft quality aluminum, hard anodized for durability [hardness equal to sapphire]. The arm is spring loaded so that it automatically levels itself for precise measuring. It never goes out of alignment. The Level Arm is self-cleaning, it glides through sawdust and never clogs up.

Since all parts are so precisely made and interchangeable, a part made last year will fit a *Classic* made today, next year and years to come! If a part is lost or damaged, it can be quickly replaced by our factory.

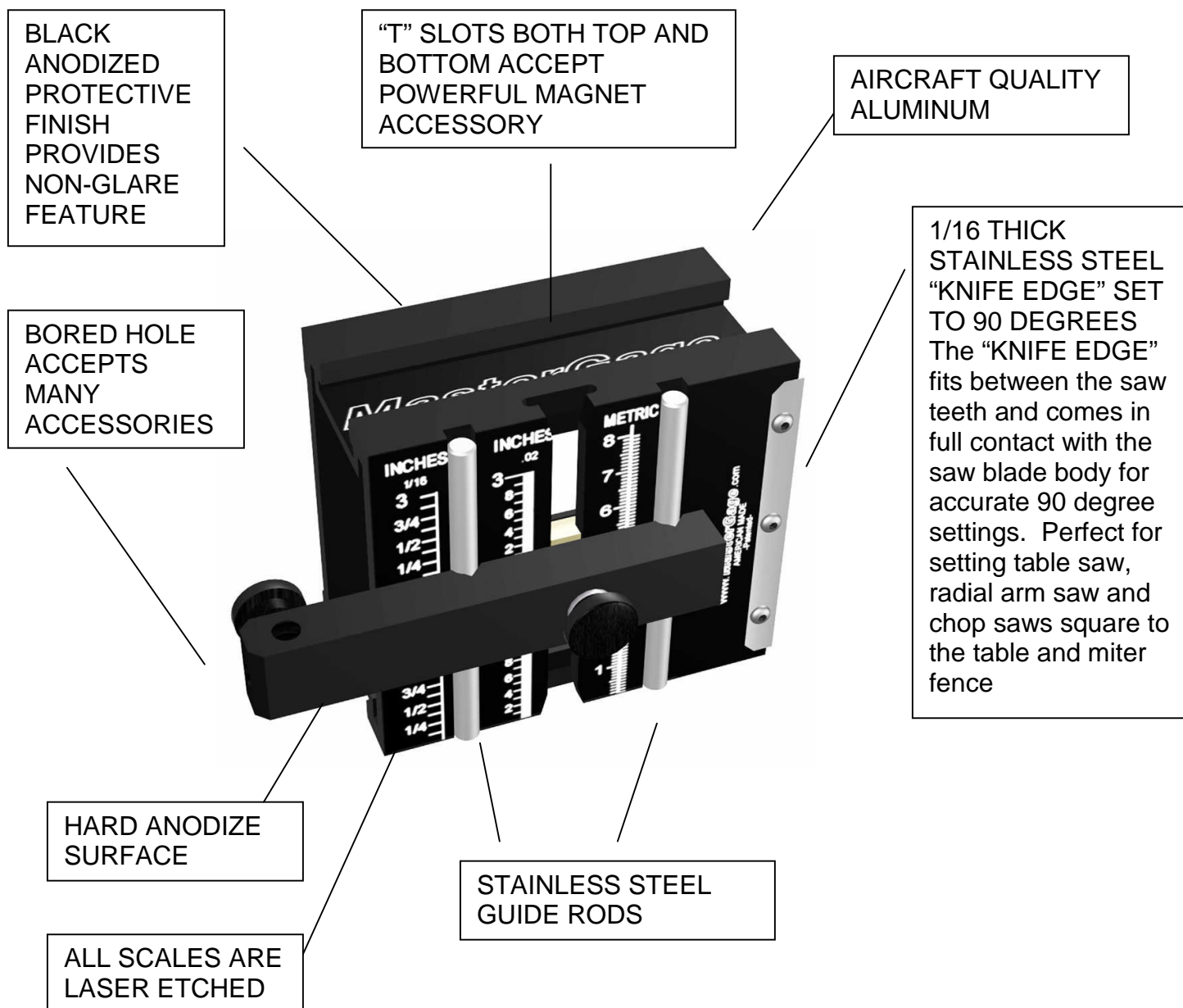
As a new proud owner, we felt you would like to have your ***MasterGage/Classic*** personalized. Simply fill out the enclosed post card with the name you would like to have engraved. We will engrave that name on a solid brass nameplate for you - free of charge.

Your ***MasterGage/Classic*** has an embedded red aluminum medallion seal, laser etched with the year your ***MasterGage/Classic*** was fabricated. Your *Classic* now becomes a collectable!

Your ***MasterGage/Classic*** comes with a written **ONE YEAR GUARANTEE POLICY** (Page O)

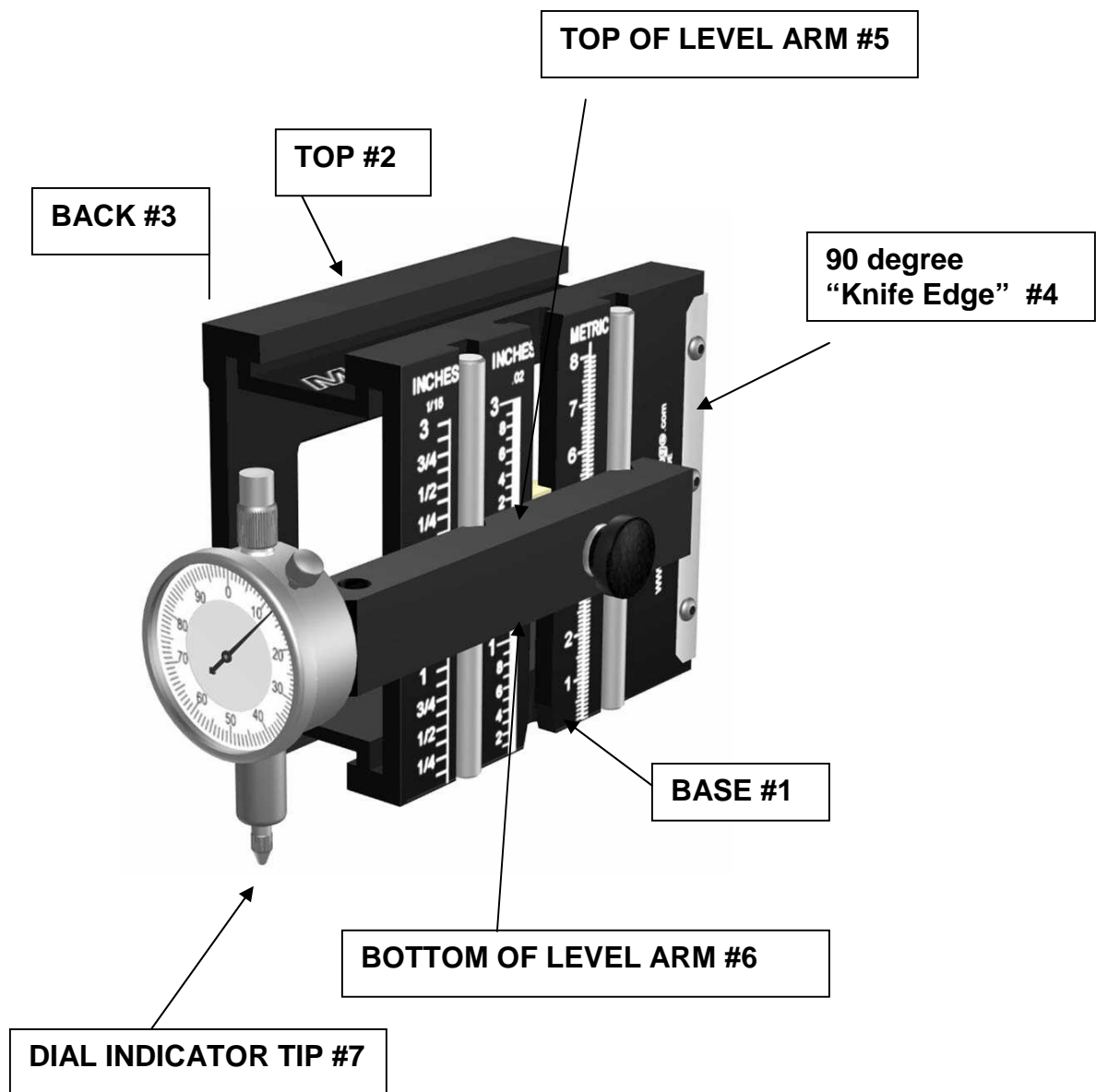
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ILLUSTRATED FEATURES

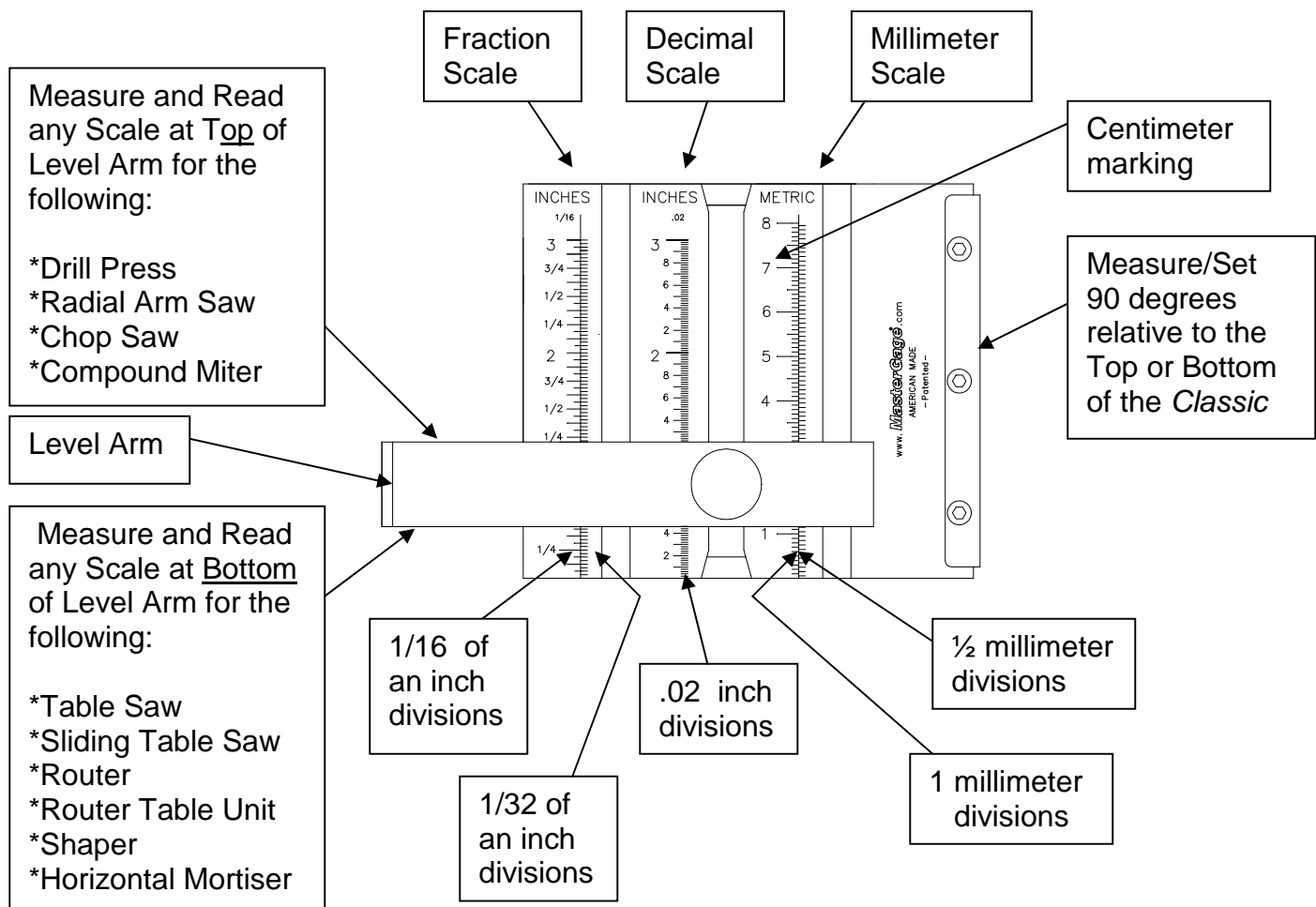


Measuring and Reference Surfaces Defined

YOU CAN MEASURE AND CALIBRATE FROM ANY ONE OF **SEVEN** REFERENCE SURFACES SHOWN BELOW. ALL REFERENCE SURFACES ARE GROUND FLAT TO LESS THAN 0.001 INCHES (1/1000")



Description of the Three Measuring Scales



All scales on the *MasterGage/Classic* are precision laser etched into an anti-glare black surface. Notice that both the Fractional and Millimeter scales are specially designed, with each having a vertical line to distinguish the coarse readings from the fine readings.

With the fractional, decimal and millimeter scales side by side - you can automatically translate and/or compare one scale reading to another – another innovative feature.

- Example:
1. 23 millimeters = .91 inches
 2. 3/4 of an inch = 19 millimeters

The Level Arm is spring activated and automatically aligns itself level to all scales, and never needs calibration. Readings can be taken from the top or bottom surface of the Level Arm - depending on the machine you are working with.

The *MasterGage/Classic* can measure in any **X**, **Y** and **Z** axis.

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CONVERSION CHART

Convenient conversions of fractions, decimals and millimeters

Fractional Inches – Decimal Inches - Millimeters					
Fraction of Inch	Decimal of Inch	Decimal of Millimeters	Fraction of Inch	Decimal of Inch	Decimal of Millimeters
1/64	.016	0.397	(NO FRACTION)	0.512	13.000
1/32	.031	0.793	33/64	0.516	13.097
(NO FRACTION)	.039	1.000	17/32	0.531	13.494
3/64	.047	1.190	35/64	0.547	13.891
1/16	.063	1.588	(NO FRACTION)	0.551	14.000
5/64	.078	1.984	9/16	0.563	14.288
(NO FRACTION)	.079	2.000	37/64	0.578	14.684
3/32	.094	2.381	(NO FRACTION)	0.591	15.000
7/64	.109	2.778	19/32	0.594	15.081
(NO FRACTION)	.118	3.000	39/64	0.609	15.478
1/8	.125	3.175	5/8	0.625	15.875
9/64	.141	3.572	(NO FRACTION)	0.630	16.000
5/32	.156	3.969	41/64	0.641	16.272
(NO FRACTION)	.158	4.000	21/32	0.656	16.669
11/64	.172	4.366	(NO FRACTION)	0.669	17.000
3/16	.188	4.763	43/64	0.672	17.066
(NO FRACTION)	.197	5.000	11/16	0.688	17.463
13/64	.203	5.159	45/64	0.703	17.859
7/32	.219	5.556	(NO FRACTION)	0.709	18.000
15/64	.234	5.953	23/32	0.719	18.256
(NO FRACTION)	.236	6.000	47/64	0.734	18.653
1/4	.250	6.350	(NO FRACTION)	0.748	19.000
17/64	.266	6.747	3/4	0.750	19.050
(NO FRACTION)	.276	7.000	49/64	0.766	19.447
9/32	.281	7.144	25/32	0.781	19.843
19/64	.297	7.541	(NO FRACTION)	0.787	20.000
5/16	.313	7.938	51/64	0.797	20.240
(NO FRACTION)	.315	8.000	13/16	0.813	20.638
21/64	.328	8.334	(NO FRACTION)	0.827	21.000
11/32	.344	8.731	53/64	0.828	21.034
(NO FRACTION)	.354	9.000	27/32	0.844	21.431
23/64	.359	9.128	55/64	0.859	21.828
3/8	.375	9.525	(NO FRACTION)	0.866	22.000
25/64	.391	9.922	7/8	0.875	22.225
(NO FRACTION)	.393	10.000	57/64	0.891	22.622
13/32	.406	10.319	(NO FRACTION)	0.905	23.000
27/64	.422	10.716	29/32	0.906	23.019
(NO FRACTION)	.433	11.000	59/64	0.922	23.416
7/16	.438	11.113	15/16	0.938	23.813
29/64	.453	11.509	(NO FRACTION)	0.945	24.000
15/32	.469	11.906	61/64	0.953	24.209
(NO FRACTION)	.472	12.000	31/32	0.969	24.606
31/64	.484	12.303	(NO FRACTION)	0.984	25.000
1/2	.500	12.700	63/64	0.984	25.003
			1 inch	1.000	25.400

For dimensions greater than 1.000 inch [25.400 mm]

Example: 1 9/32 inches is 1.000 inch + .281 inches [9/32] = 1.281 inches

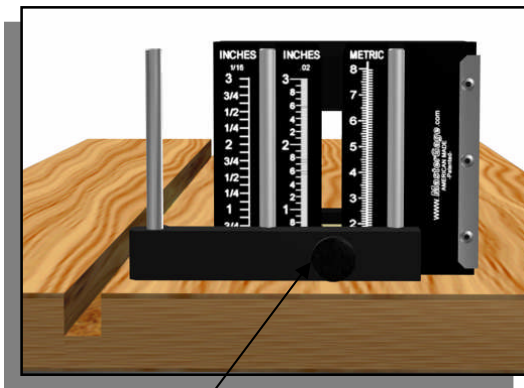
1 9/32 in millimeters is 25.400 mm [1.000 inch] + 7.143 mm [9/32] = 32.543 mm

Using the *Depth Gauge Rod*

The following illustrations show how the Depth Gauge Rod adds additional capabilities to your **MasterGage/Classic**. Keep in mind that this feature can be used in all X, Y and Z axis. A typical use in the Z axis would be checking/setting the infeed/outfeed offset on a split fence for a Shaper or Router Table system.



The following three illustrations show how the Depth Gauge Rod can be used to determine dado depth, mortise depth or the depth of a blind-drilled hole. It then becomes easy to measure and cut the required tendon or mating part.



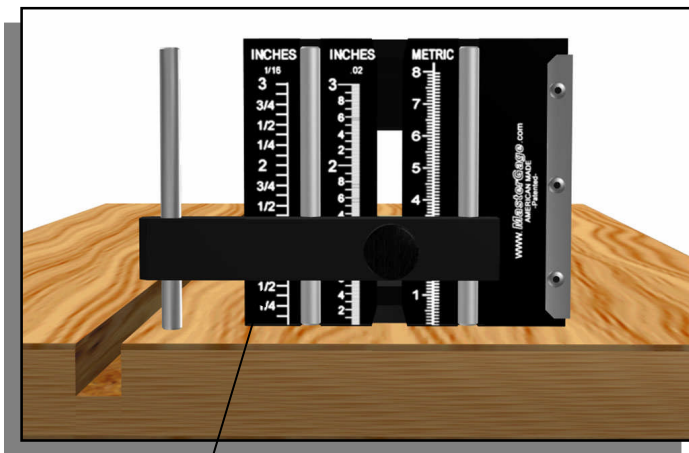
Lock Screw

Move the Level Arm down against the wood [zero position] and tighten the Lock Screw. Insert the depth Gauge Rod, leaving the Lock Screw loose.

Using the *Depth Gauge Rod*

Move the Depth Gauge Rod over the groove-slot-hole and allow it to bottom out.

Tighten the Lock Screw



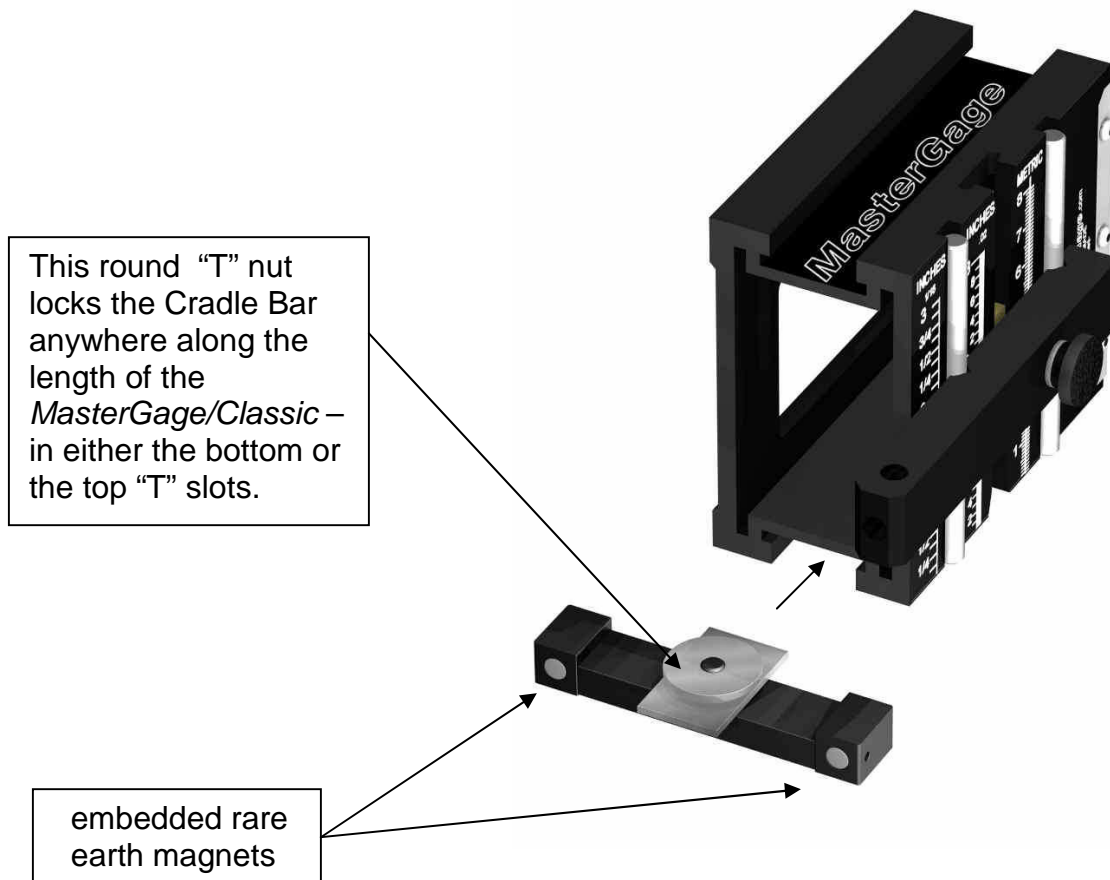
Read scale of choice for groove/slot/hole depth dimension

Reposition the **Classic** to a flat surface. Raise the Level Arm and bottom out the Depth Gauge Rod on the flat surface. Then simply read the selected scale under the Level Arm for the groove-slot-hole depth

MOUNTING AND USING THE “*MAGNETIC MITER SLOT CRADLE BAR*” ON THE *MasterGage/Classic*

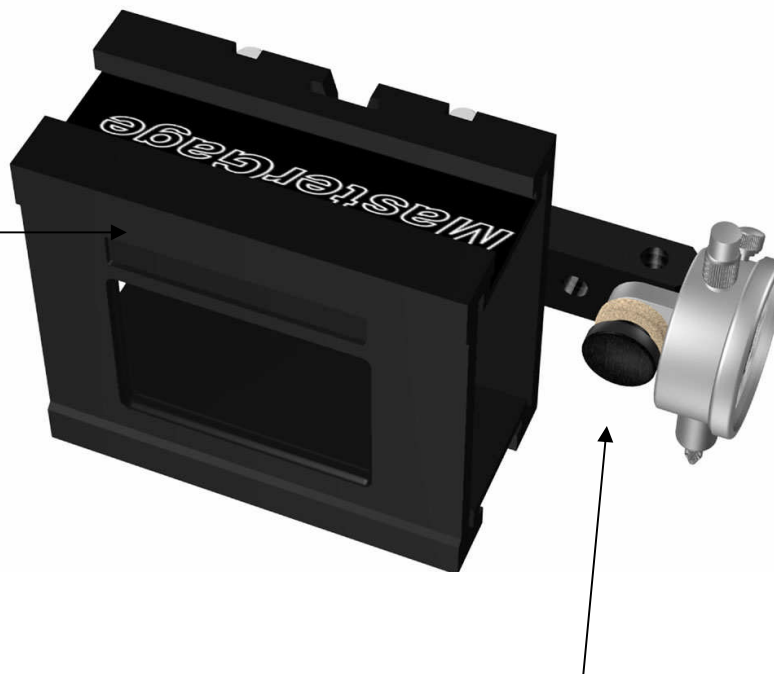
The Patented, *Magnetic Miter Slot Cradle Bar* attaches to either the top or bottom “T” slot, anywhere along the full length of the *MasterGage/Classic*. Two powerful rare earth magnets are embedded into one side of the Cradle Bar, which is fabricated from Delrin, a special “space age” polymer selected for its low friction properties. This innovative design achieves the following:

- On steel table tops, it ensures absolute contact with only one miter slot wall. This approach eliminates all tolerances and misalignments
- As the *Magnetic Miter Slot Cradle Bar* glides smoothly along the full length of the miter slot, the magnets cling to the miter slot wall, insuring constant contact with the side wall.
- The magnetic feature allows the *Magnetic Miter Slot Cradle Bar* to be used on almost any miter slot width without concern for miter slot width variations.

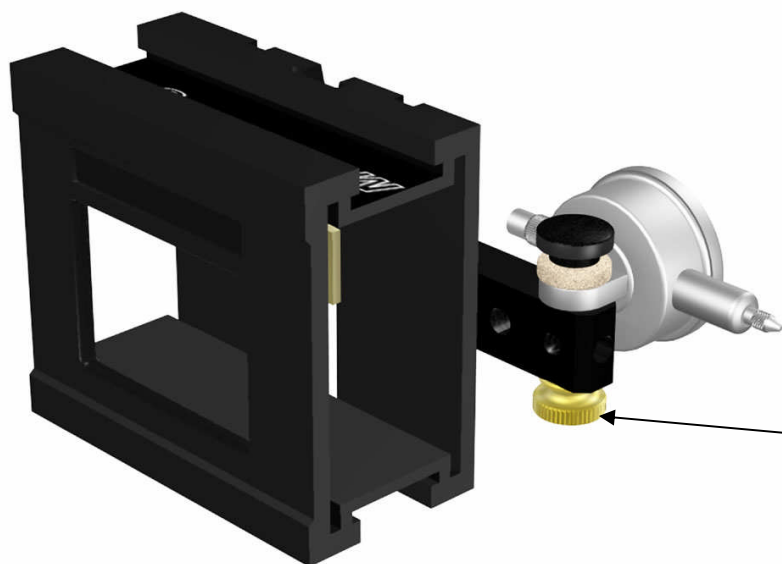


ATTACHING THE DIAL INDICATOR

Your customized
brass nameplate
location

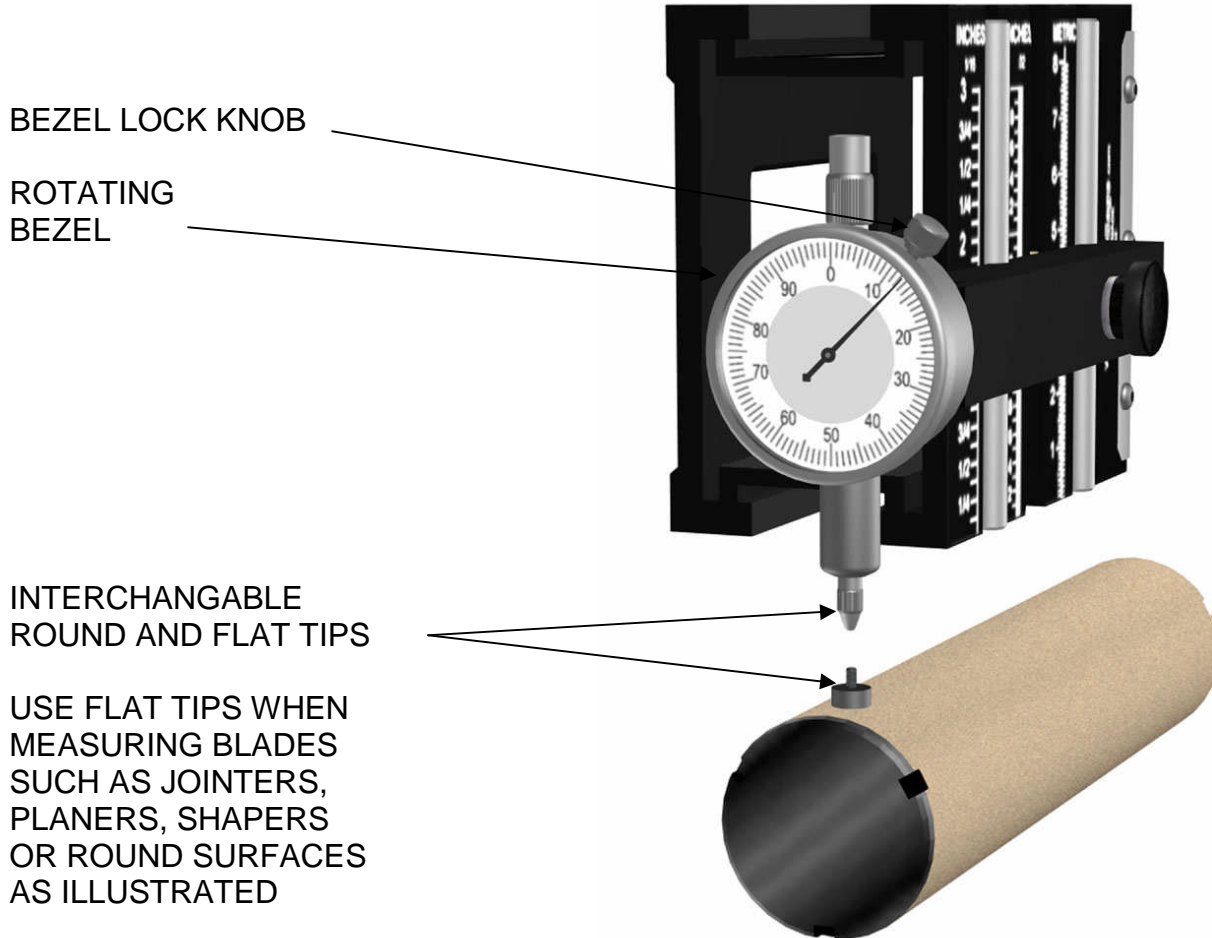


ATTACH DIAL INDICATOR WITH
THE STEM IN EITHER DOWN
POSITION [SHOWN] OR UP
POSITION WITH THIS LOCK KNOB



ATTACH DIAL INDICATOR IN THE
HORIZONTAL POSITION
[SHOWN] USING THE DIAL
INDICATOR ADAPTER
HARDWARE AS ILLUSTRATED

USING THE DIAL INDICATOR



1.0 AND 2.0 INCH EXTENSIONS ARE ALSO SUPPLIED

HOW THE DIAL INDICATOR WORKS

THE DIAL INDICATOR IS VERY EASY TO USE

- THE DIAL INDICATOR HAS A TRAVEL RANGE OF .25 INCHES [1/4 INCH]
- THE BLACK NUMBERS ON THE DIAL REPRESENT .010 [TEN THOUSANDTHS OF AN INCH]
- EACH BLACK GRADUATION ON THE DIAL REPRESENTS .001 INCH [ONE THOUSANDTHS OF AN INCH]
- EACH TIME THE INDICATOR ARM ROTATES 360 DEGREES [.100 INCH TRAVEL] THE SMALL DIAL MOVES TO A NUMBER ON THE SMALL DIAL.
- EXAMPLE: WHEN THE LARGE INDICATOR ARM ROTATES TWO TIMES, THE SMALL DIAL ARM WILL INDICATE 2, WHICH IS .100 TIMES 2 OR .2 INCHES.

PROCEDURE FOR USING THE DIAL INDICATOR

- MOVE THE DIAL INDICATOR SO THAT THE TIP OF THE INDICATOR IS TOUCHING THE DESIRED SURFACE.
- ALLOW THE TIP TO DEFLECT THE DIAL INDICATOR ARM SLIGHTLY. THIS IS CALLED "PRELOADING" THE DIAL INDICATOR
- LOOSEN THE BEZEL LOCK SCREW AND ROTATE THE BEZEL SO THAT THE "0" ON THE DIAL LINES UP WITH THE INDICATOR ARM - LOCK THE BEZEL KNOB.
- YOU ARE NOW CALIBRATED TO MEASURE FROM THE DESIRED SURFACE.

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A NOTE ABOUT TOLERANCES

A common question customers ask is: "What kind of accuracy should I expect from my woodworking machinery? How close should I measure, 1, 5, 10, 15 thousandths of an inch? (A reference, a human hair measures 0.002 inches - this page is 0.004 to 0.005 inches thick.)

The answer is as follows. Machines come in all sizes and quality levels. Many are built with stout cast iron bodies and components, others with sheet metal and plastic. Obviously, one can expect the cast iron fabrication to hold tight tolerances and for longer periods than a sheet metal fabricated machine. The general answer is to align and calibrate as close as possible, without making it a 3 day project. Then monitor the dimensions over time. Obviously, the cast iron machine will stand more abuse over time, and still keep the tolerances versus the sheet metal unit.

Here is a **general** overview of machinery available today.

Table top models: designed for high portability and minimum storage space
typical customer – home owners & trim carpenters
weight range – 25 to 75 pounds
construction: sheet metal, castings and plastic
expected accuracy: 0.010 to 0.015 inches

Contractor models: designed for mobility at home and to the job site
typical customer – home owners & job site carpenters
weight range – 50 to 200 pounds
construction: sheet metal and some castings
expected accuracy: 0.005 to 0.010 inches

Stationary machinery: designed for high production and are seldom moved
typical customer – cabinet shops, mill work houses, etc.
weight range – 500 to 5,000 pounds
construction: very heavy castings and machined parts
expected accuracy: 0.001 to 0.002 inches

Also asked is: "How often should I monitor my machinery for alignment and calibration?"

I would suggest setting up a written schedule for every machine alignment check. The schedule would depend upon machine usage. Is your shop on a 8 hour/5 day or 16 hour/6 day work week? How many different people use the equipment, etc. My feeling is to consider your shop like an airplane. Before you "take off" on your business day, all machines should be checked for running condition and accuracy. After all, your business and livelihood rely on these machines.

SECTION B

TABLESAW

+

ADD-ON SLIDING TABLE KIT

+

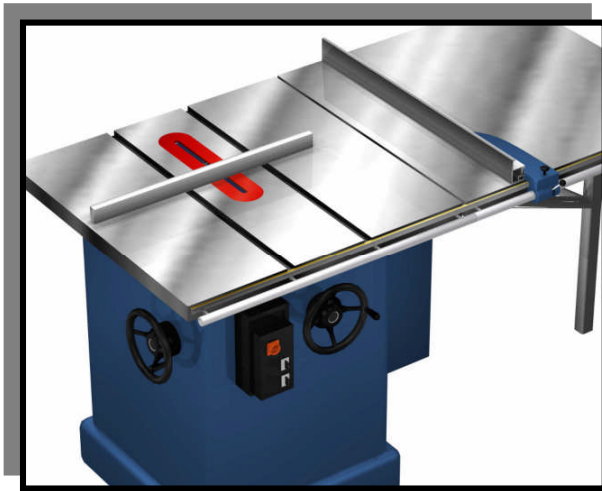
SLIDING TABLE PANEL SAW

TABLE SAW

– OVERVIEW OF TABLESAW ALIGNMENT –

Here are a few facts that become very obvious, once explained. A standard tablesaw has a miter slot machined into the table top. Obviously it is a fixed reference feature that cannot be adjusted. The manufacturers have built in adjustments into: A/ saw blade trunnion B/, the rip fence assembly and C/ the miter gauge assembly. They all need to be adjusted and aligned **relative to the machined miter slot**.

Adjusting the saw blade parallel to the miter slot: In the Contractors [motor outside of frame] type saw, the trunnion is adjustable. On the Cabinet saw, [saw is totally enclosed] the table top can be loosened for adjustability.



Using an accurate straight edge steel rule, check the flatness of the table top. TIP #1: Sprinkle talcum powder on the table and drag the straight edge across the surface carefully. Much like a concrete mason dragging his top leveler across the cement to get it flat. This method will give you a visual indication of the high and low spots of the table top. When finished rub the talcum powder into the table top. It will absorb any moisture within the pores of the table top. The talcum will not harm the tablesaw
TIP #2: Use feeler gauges with the straight edge.

Use the 2.0 inch dial indicator extension with ¼ inch dial indicator flat tip. Contact arbor shaft on smooth surface [not threads]. Rotate arbor by hand. Readings should be in the 0.001 inch range.



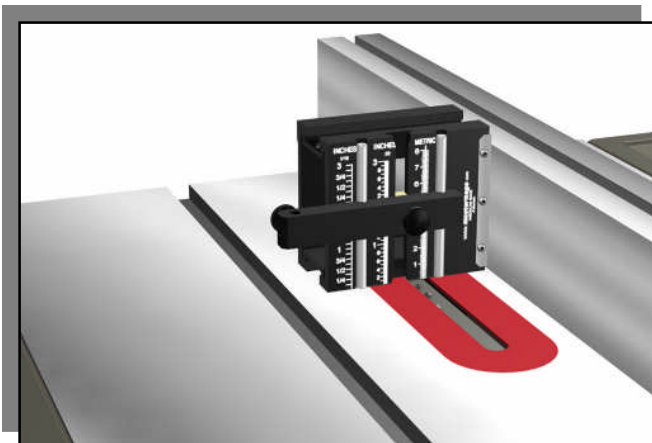
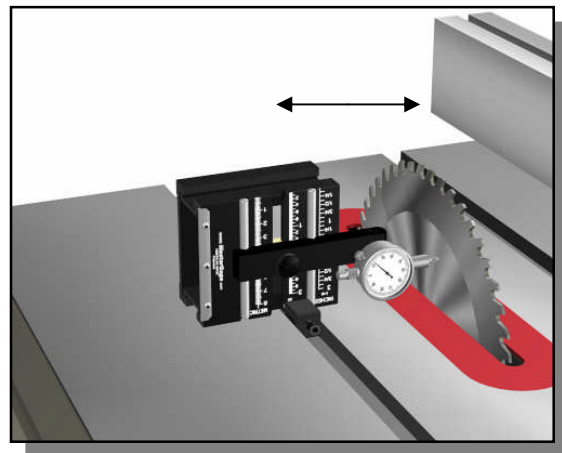
TABLE SAW



Wipe face flange clean and run fingers across flange to insure there are no burrs. If there are – carefully remove them with a file.

HINT: Rotate the saw motor assembly 45 degree so that the face of the flange is directly 90 degrees to the Dial Indicator stem for the most accurate readings. Rotate the flange by hand and read the run out. It should be within 0.001 inches

Using the round tip on the dial indicator, make contact with the saw blade near the top of blade. Rock the blade gently side to side to check bearing wear. Check with the saw manufacturer for bearing wear allowances.

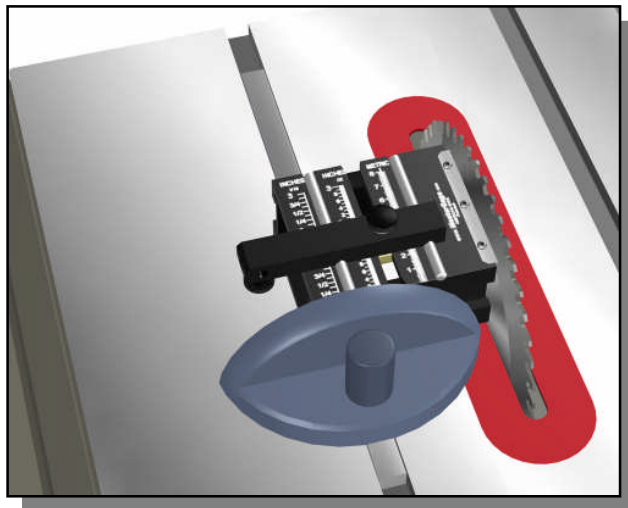
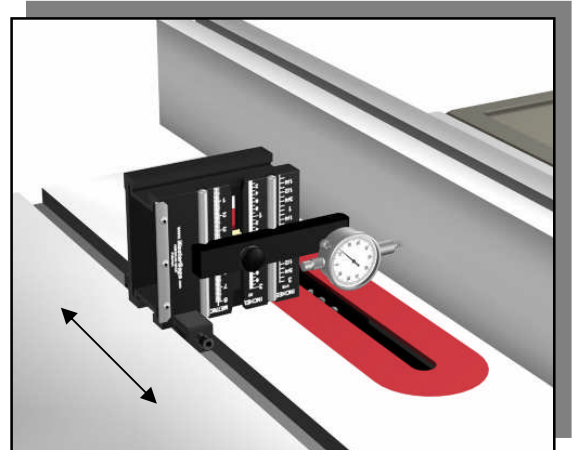


Square the rip fence with the **MasterGage/Classic** knife edge.

TABLE SAW

FENCE ALIGNMENT: Attach the Miter Slot Cradle Bar to the **MasterGage/Classic**. Traverse the length of the fence and adjust parallel to the miter slot. Check for any fence distortion or warpage. Also, use a straight edge for checking for any fence warpage

TIP: Adjust the fence so that the fence is 0.004 to 0.006 further away from the back of the fully extended blade, relative to the front of the blade.



Square the miter protractor gauge to the saw blade using the **MasterGage/Classic** "KNIFE EDGE". Set and lock the miter gauge indicator arrow on zero. Adjust and lock the stop screw to zero position.

TIP #1: Use the **MasterPlate** for this calibration. It will give you a precision flat surface to accurately establish squareness and set any desired angle very accurately.

With the Miter Slot Cradle Bar attached to the **MasterGage/Classic**, traverse the length of the blade to check and adjust the saw blade parallel to the miter slot.

Suggestion: Use the **MasterPlate** to accomplish this task

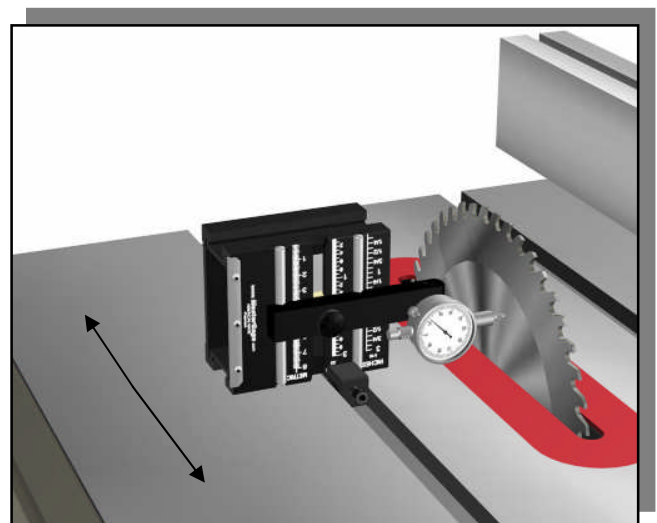
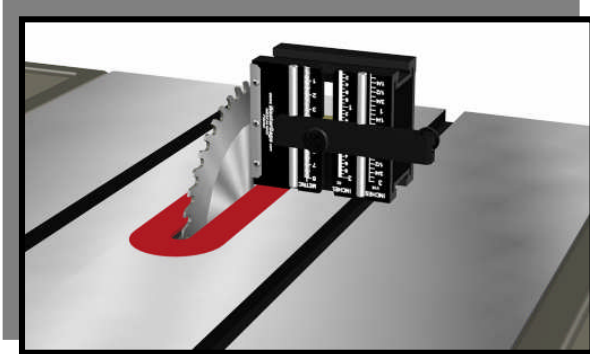


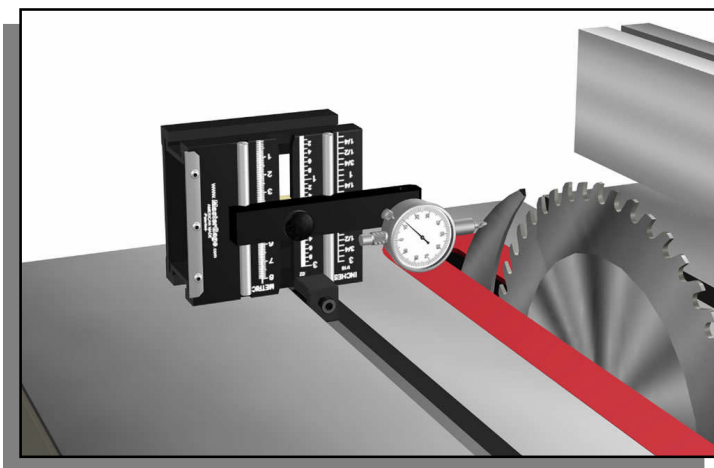
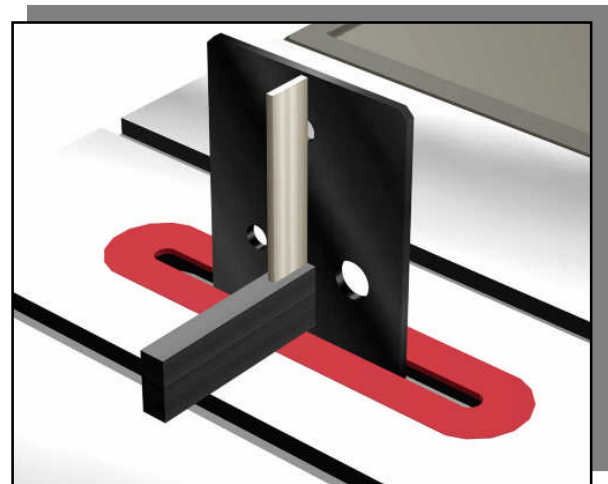
TABLE SAW



check/set the blade 90 degrees perpendicular to the table top.

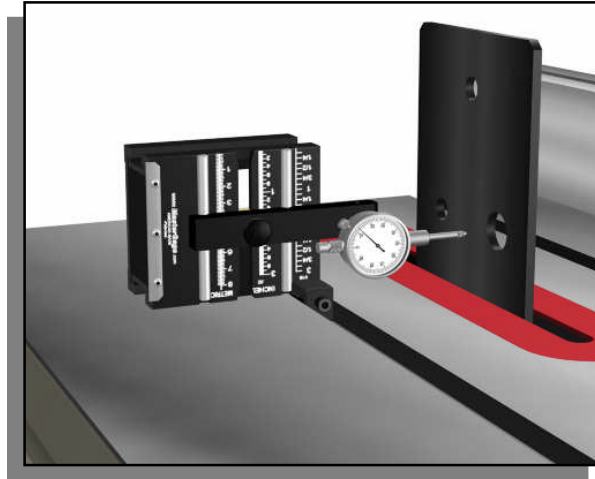
OPTIONAL: Use a precision machinist square to verify **MasterPlate** perpendicularity to the table top

Once perpendicularity is established, set the pointer to zero on the bevel (tilt) protractor. Next, set and lock the stop screw.



Align the splitter unit both parallel and center to the saw blade

TABLE SAW



If your saw is equipped with a scoring blade, we suggest the following procedure:

1. Mount the **MasterPlate** to the scoring blade arbor. You may find that the **MasterPlate** will have to be rotated slightly, to clear the table slot opening. This is due to the fact that the scoring blade may be located lower and behind the insert plate opening.
2. Using the **MasterGage/Classic**, with the Magnetic Miter Slot Cradle Bar, you can now set the scoring blade parallel to the miter slot and the **MasterPlate**.
3. Finally, mount the main cutting blade and adjust the scoring blade parallel and centered to the main cutting blade using the **MasterGage/Classic**

CHECKING THE SAW BLADE MECHANISM FOR TRACKING ACCURACY

Once the tablesaw has been aligned, it is important to verify that both the vertical motion and tilting motion mechanisms tracks accurately. Below are illustrations on verifying these motions.

After your align the **MasterPlate** is 90 degrees perpendicular to the table top, perform the following. With the dial indicator stem registered against the **MasterPlate**, move the saw blade mechanism to the maximum up and maximum down position. This will tell you if the mechanism is tracking true through the full vertical motion.

This calibration is also shown in all SawStop® Manuals

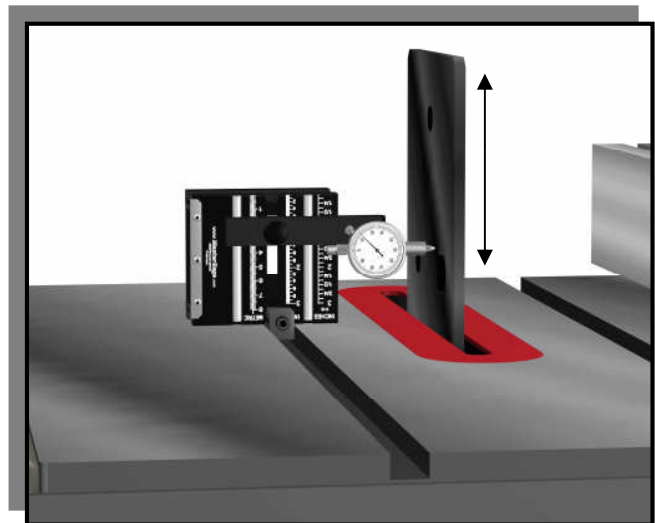
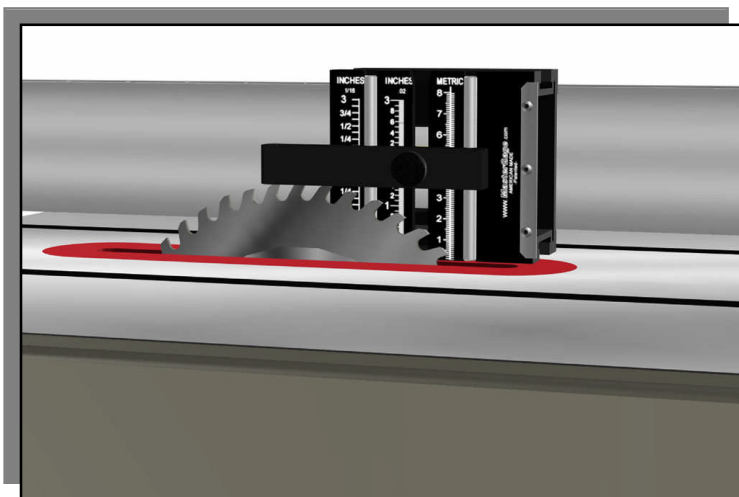
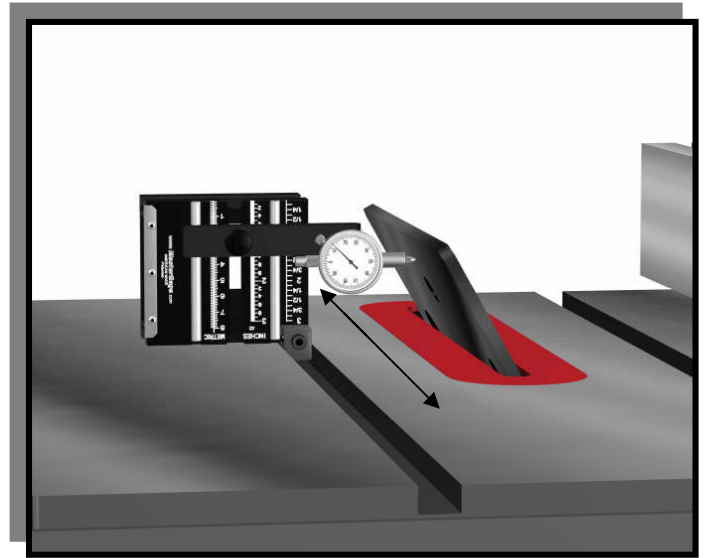


TABLE SAW

CHECKING THE ACCURACY OF THE TILT (TRUNNION) MECHANISM. Once the **MasterPlate** is aligned parallel to the miter slot, the following procedure should be performed to verify the accuracy of the blade tilt mechanism. The measurement is to be taken over the full length of the **MasterPlate**. Measure across the **MasterPlate** as shown approximately every 15 degrees, from 0 to 45 degrees. This exercise will verify that the tilting mechanism is tracking true, through the full tilt cycle of 0 to 45 degrees.

This calibration is also shown in all SawStop® Manuals



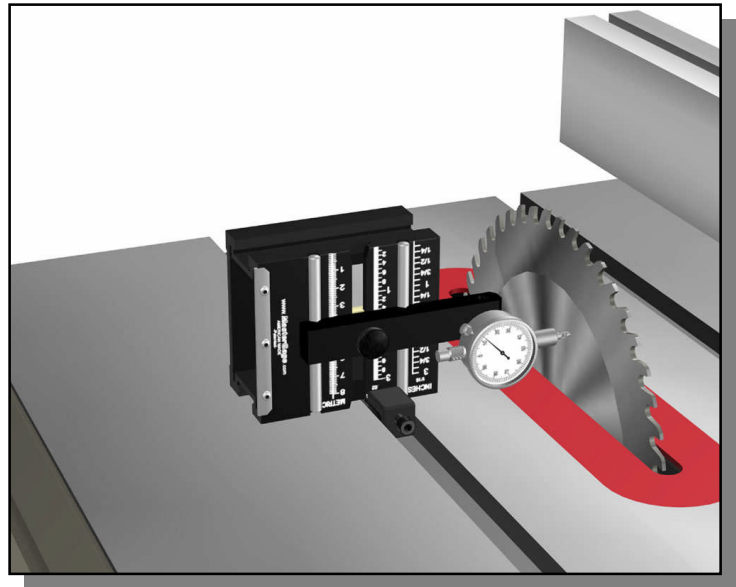
SET ANY HEIGHT:

1. Set the Level Arm at the desired height [do not lock the locking knob]
2. Raise the blade till it almost touches the Level Arm.
3. Carefully rotate the blade toward the back of the saw [this keeps the cutting edge of the blade from damaging the level Arm]. Allow the blade tip to glance the Level Arm to establish height desired.

TABLE SAW

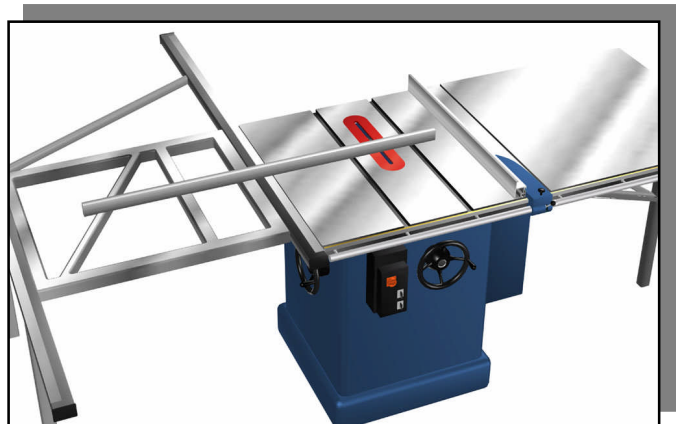
Lastly, after all of the elements of your tablesaw are aligned and calibrated, install your saw blade and check it for run out by rotating the blade by hand and reading the run out. Now you know with confidence that you can check the accuracy of your saw blade

TIP: When changing saw blades, be sure to clean the saw flange thoroughly. Check for burrs by passing your fingers over the flange surface. Dirt, sawdust and burrs could cause the blade to wobble.

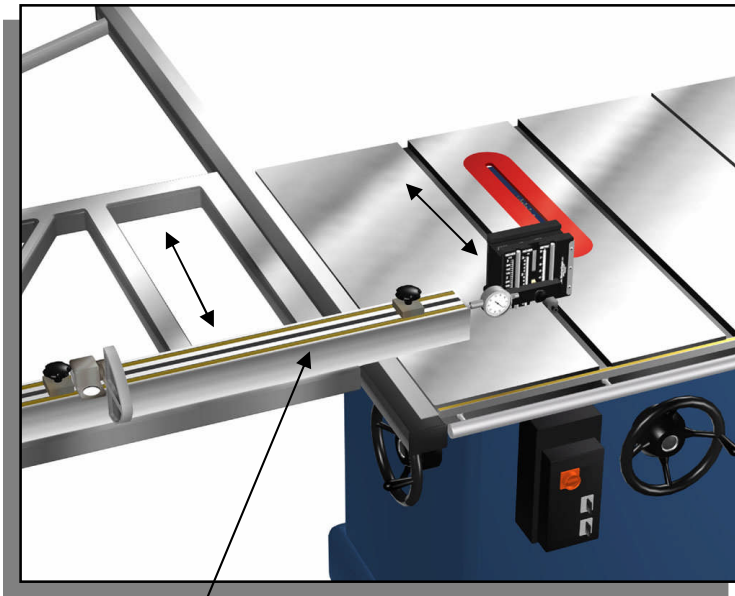


ADD-ON SLIDING TABLE SAW

Adjust the sliding table parallel to the saw table top using an accurate straight edge. The sliding table should be slightly higher than the tablesaw table surface. Fold a crisp dollar bill once [approx .010 inches thick] and use it as a feeler gauge and adjust the sliding table so that it is approximately .010 inches higher than the tablesaw table surface, along its total travel distance.



ADD-ON SLIDING TABLE SAW



Cross Cut Fence

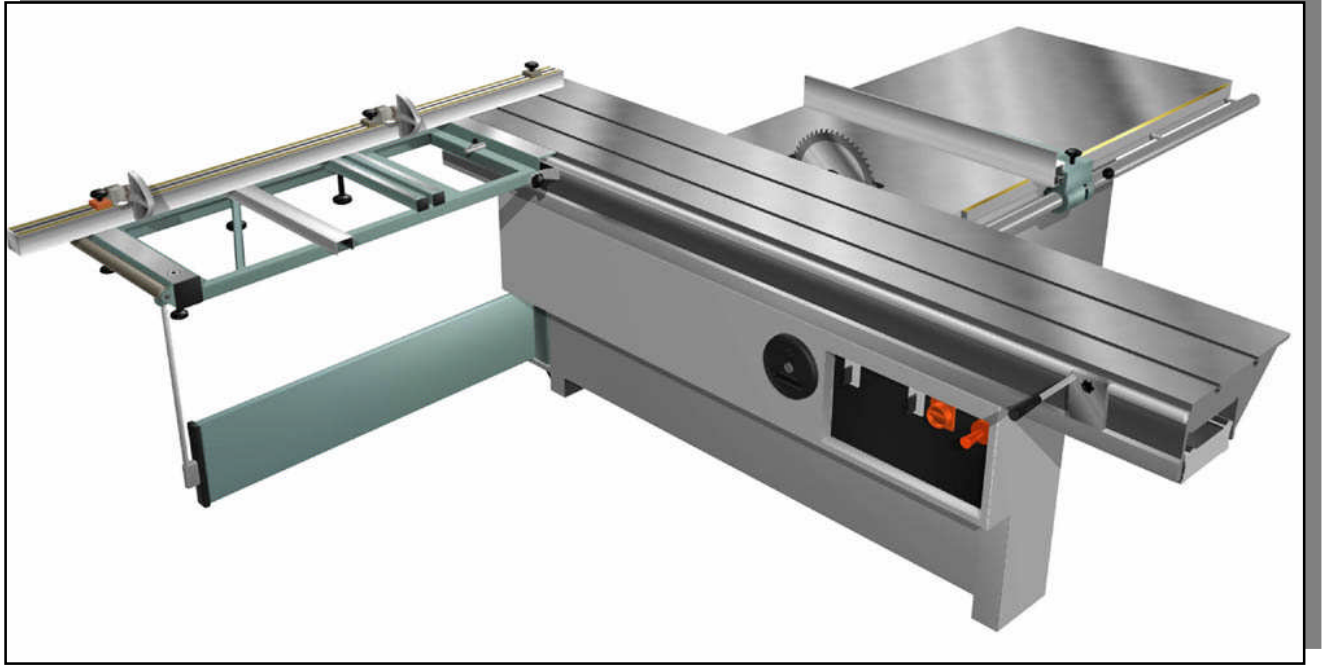
Align all elements of the tablesaw with the **MasterGage/Classic** as shown in the tablesaw section

The sliding table must be parallel to the miter slot [along with the saw blade and rip fence]. Once completed, position the *Classic* as shown. Bring the Cross Cut Fence in contact with the Dial Indicator tip. Move the *Classic* and Fence together along the length of the miter slot. Adjust the sliding table to bring it parallel to the miter slot. Now you can be assured of clean 90 degree cuts using either the miter gauge or the sliding table

The **MasterGage/Classic** can also set up and align special equipment such as the Incra fence system and the Saw Train fence system very easily.

- The Incra fence system is a registered trademark of the Taylor Design Company.
- The Saw Train fence system is a registered trademark of JOINTECH.

SLIDING TABLE PANEL SAW



A little background on sliding table saws. They were originally developed by European saw manufacturers for the 32 mm system for construction of cabinets and case goods. The 32 mm system requires precision machining of sheet goods such as MDF (medium density fiberboard) and melamine for the fabrication of case goods.

Many of the *MasterGage/Classic* calibration techniques used on the tablesaw can be performed on the sliding table saw. See the Tablesaw section for the following procedures.

- | | |
|---|--|
| 1. Checking arbor shaft run out – page B1 | 4. Checking bearing wear – page B1 |
| 2. Checking face flange run out – page B1 | 6. Squaring blade to table top – page B2 |
| 3. Setting saw blade height - page B5 | 7. Checking blade run out – page B5 |

Generally, there is no miter slot in the main table of sliding table saws, as in standard tablesaws. Therefore, different alignment and calibration techniques are required.

NOTE: We recommend that alignment of the sliding table itself to the main table be performed by manufacturer/dealer qualified technicians.

SLIDING TABLE PANEL SAW

Sliding Table Panel Saws were designed to cut large sheet goods such as 4 ft x 8 ft (1,219 mm x 2,438 mm) materials. The sliding table is used for both cross cuts and ripping operations. Calibrating the cross cut fence to square to the saw blade is critical. We call this calibration technique the “Five Sided Cut”. The illustrations below, numbered 1, 2, 3, 4 and 5 demonstrate this method.

Use a piece of MDF or melamine – approximately 24 x 24 inches (609mm x 609mm) - the larger piece, the more accurate the readings. Preferably ½ inch (13 mm) thick material.

Mark one edge “A” for orientation. Perform the following steps.

Step 1 – Make a clean cut (dust cut) along side “A”

Step 2 – Rotate the stock counterclockwise (to the left) so side “A” is against the cross cut fence and make a full length clean cut

Step 3 – Repeat Step 2

Step 4 – Repeat Step 3

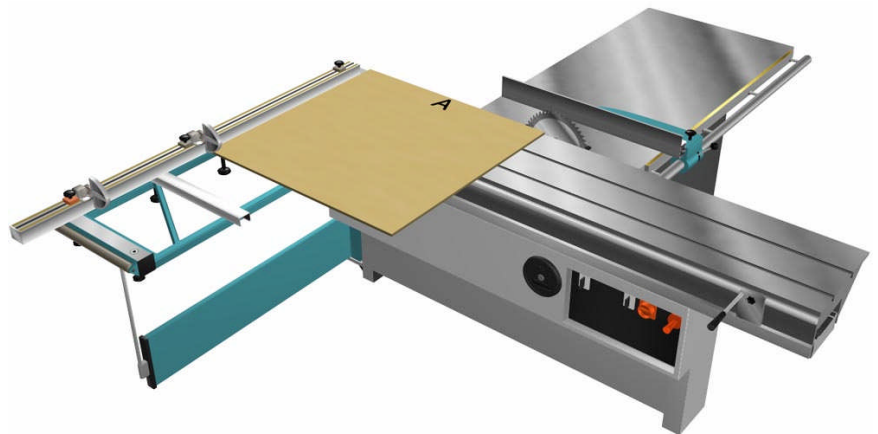
Step 5 – The panel is back with side “A” next to the saw blade. Make a cut approximately ½ inch (12,7 mm)

Step 6 - Measure the width at both ends of the strip. Subtract the difference and divide by four. This will give you the amount of adjustment to make in the cross cut fence to bring it into square.

Once your saw is aligned, repeat this procedure occasionally to verify your saws squareness.

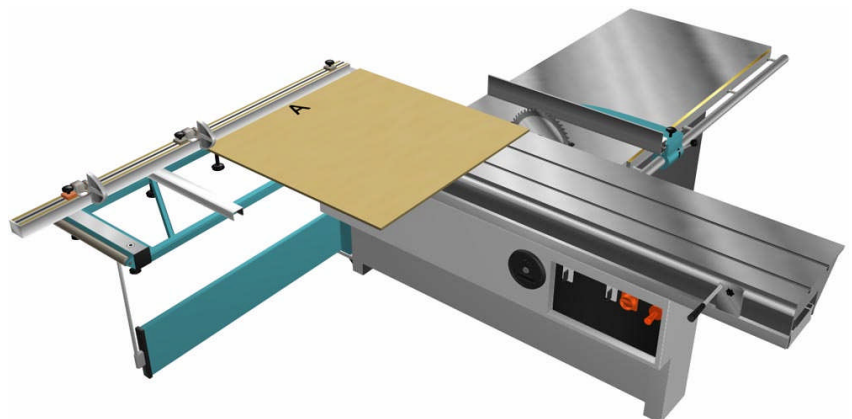
STEP 1

Make a clean full cut along edge “A”



STEP 2

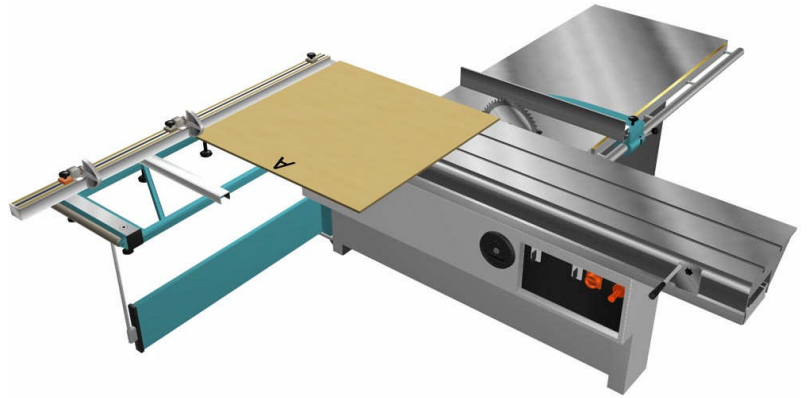
Rotate stock counterclockwise, with edge “A” against cross cut fence and make a clean cut, full length.



SLIDING TABLE PANEL SAW

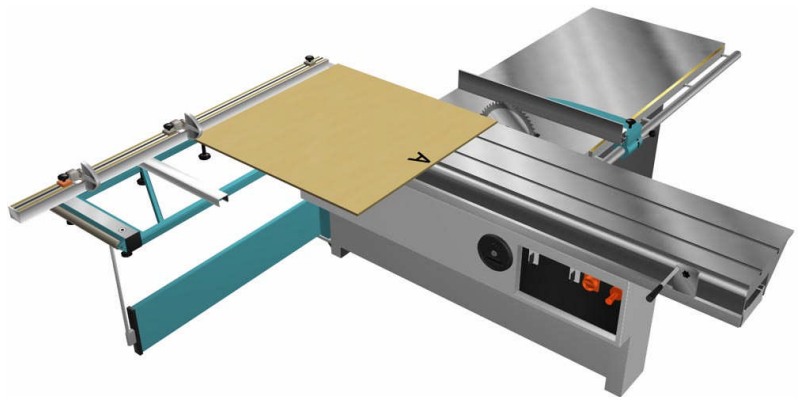
STEP 3

Repeat Step #2



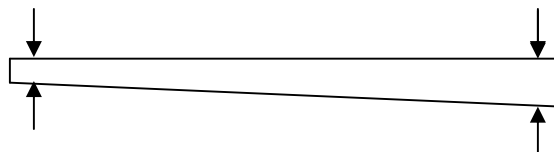
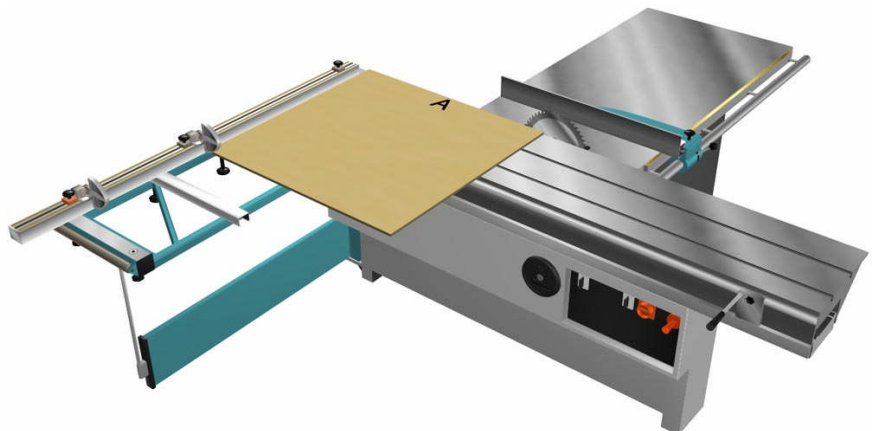
STEP 4

Repeat Step #2



STEP 5

With edge "A" back to original position, make a cut approximately $\frac{1}{2}$ inch (13mm)



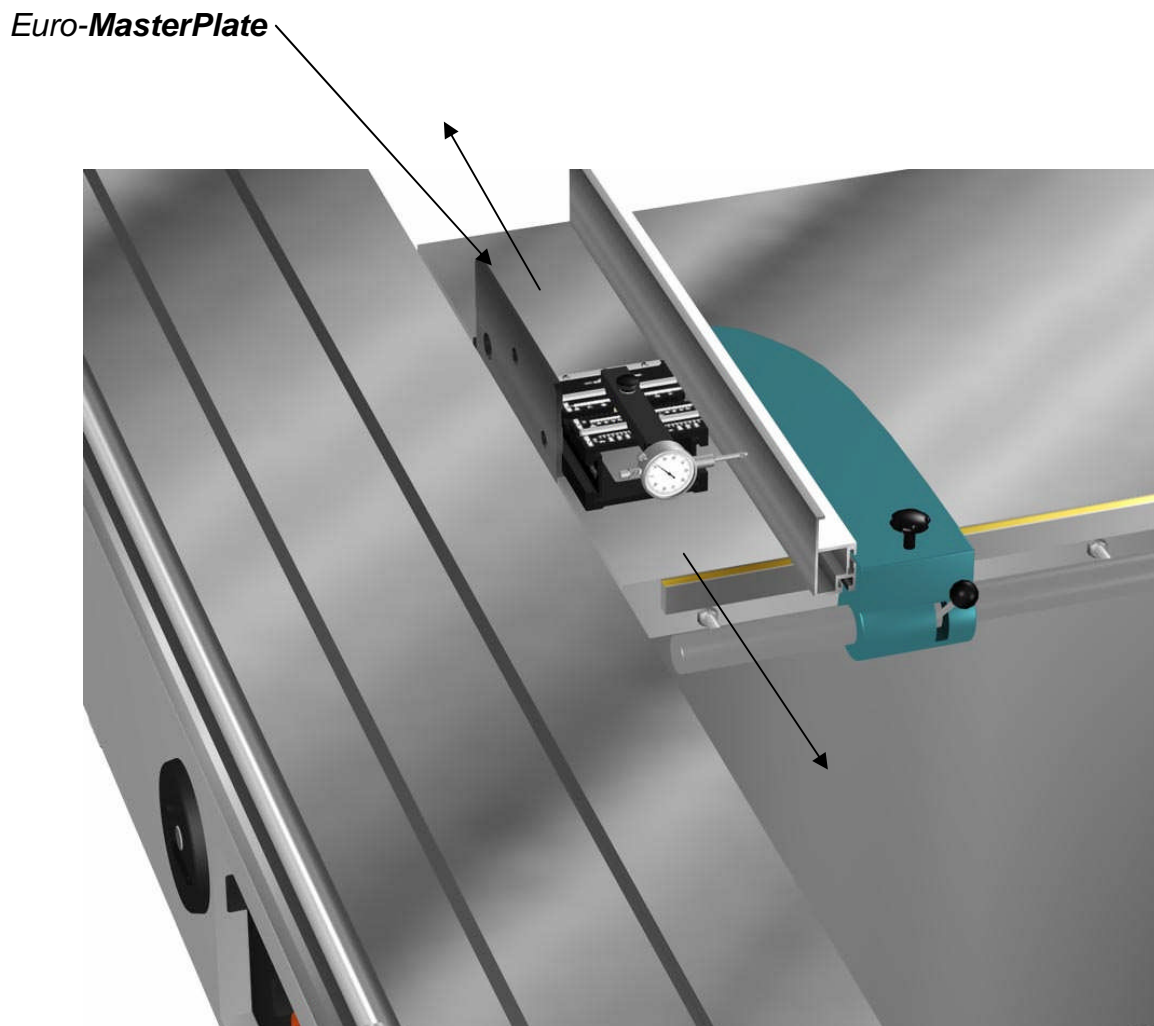
STEP 6 Lastly, measure the width of each end of cut strip, subtract the difference and divide by 4. This is the required adjustment needed on the cross cut fence to bring it in square.

SLIDING TABLE PANEL SAW

Rip Fence Alignment

The rip fence alignment is achieved with the **MasterGage/Classic** and **MasterPlate**. We offer a special **Euro-MasterPlate** with 30mm mounting holes and clearance holes for the anti-rotation pins found on most European sliding table saws. It is the same price as the standard **MasterPlate**.

First, replace the saw blade with the **Euro-MasterPlate**. Position the **Classic** with its back on the tabletop and the top against the **Euro-MasterPlate**, with the dial indicator indexed against the rip fence. Slide the **Classic** fore and aft to set rip fence parallel or to any toe out dimension desired.



SECTION C

RADIAL ARM SAW

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CHOP SAW

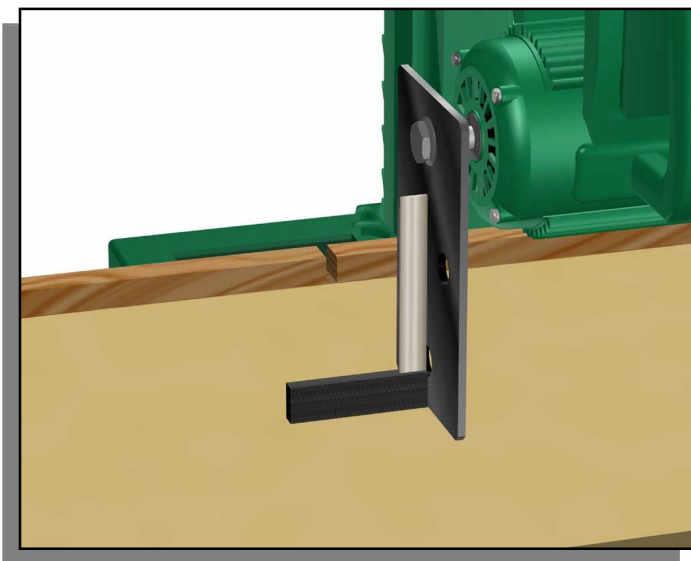
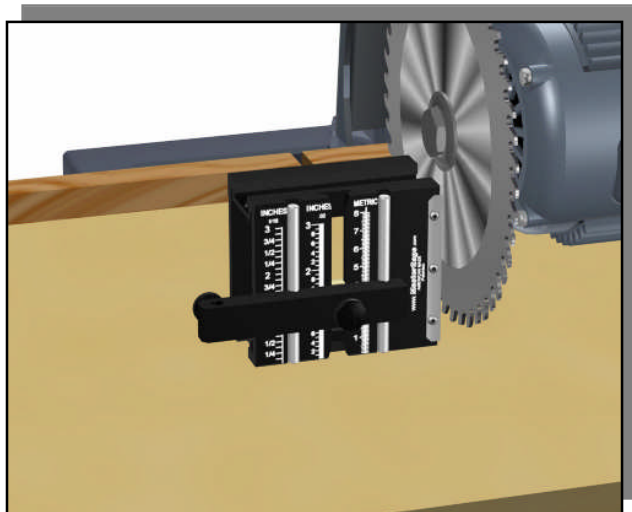
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SLIDING COMPOUND MITER SAW

RADIAL ARM SAW PLUS CHOP SAW PLUS SLIDING COMPOUND MITER SAW

All pictures and illustrations are showing the **MasterGage/Classic** with the Radial Arm Saw. These techniques and methods are also applicable to Radial Arm Saws, Chop Saws and Sliding Compound Miter Saws.

Square saw blade to table top



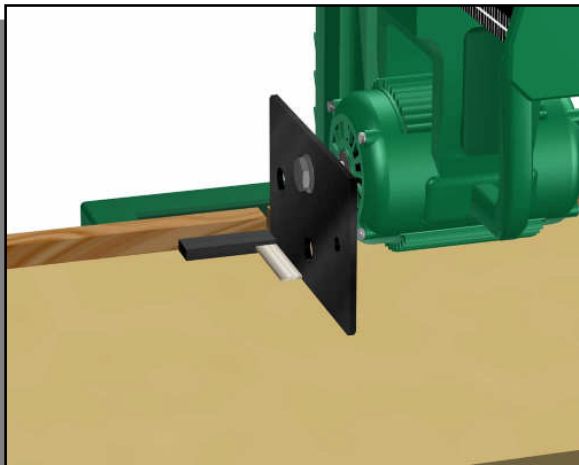
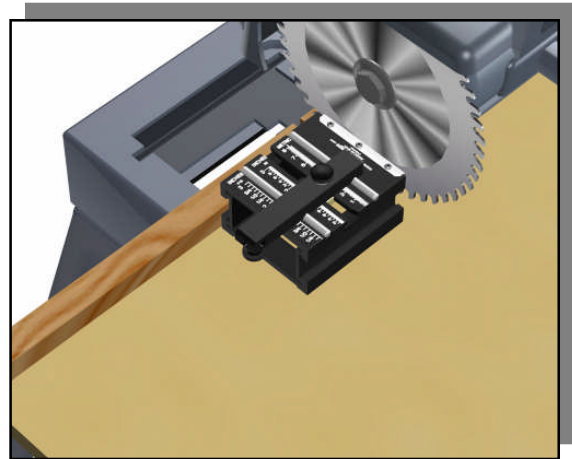
OPTION: Use a machinist square with the **MasterPlate** to square blade to table top

The **MasterPlate** is a natural for the Radial Arm Saw, Chop Saw and Sliding Compound Saw since the full flat 10 inch [or in the illustration, 6 inch] surface lies full flat on the surface. Normally, only the tip of the saw blade touches the table, making it very difficult to align the machine.

RADIAL ARM SAW PLUS CHOP SAW PLUS SLIDING COMPOUND MITER SAW

All pictures and illustrations are showing the **MasterGage/Classic** with the Radial Arm Saw. These techniques and methods are also applicable to Chop Saws and Sliding Compound Miter Saws.

Set saw blade square to fence.



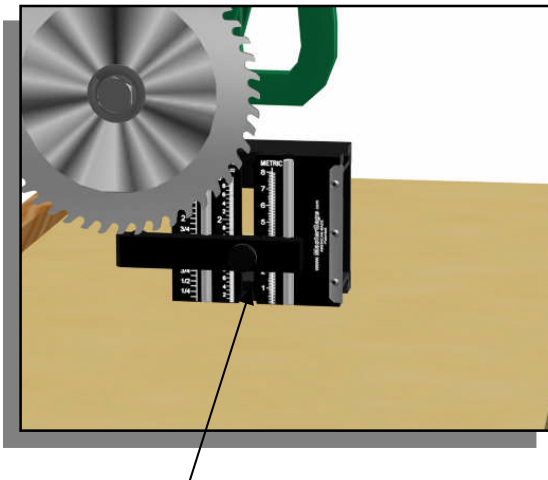
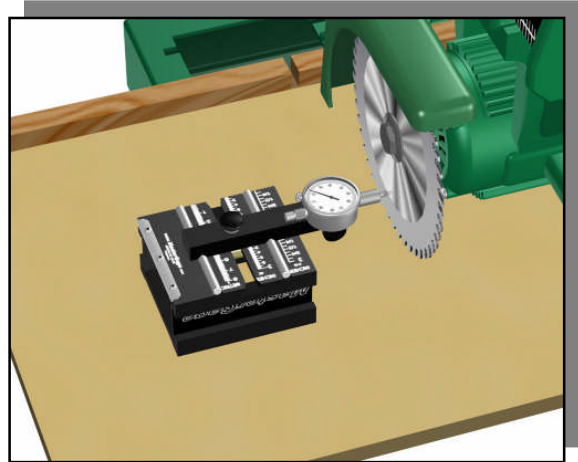
OPTION: Set **MasterPlate** square to fence using a machinists square

Note that the **MasterPlate** offers a full, flat 10 inch surface to measure against – versus a saw blade that only allows one tooth to touch the table at a time.

RADIAL ARM SAW PLUS CHOP SAW PLUS SLIDING COMPOUND MITER SAW

All pictures and illustrations are showing the **MasterGage/Classic** with the Radial Arm Saw. These techniques and methods are also applicable to Chop Saws and Sliding Compound Miter Saws.

Rotate blade by hand and
check for blade run out



Level Arm

SET ANY HEIGHT:

1. Set the Level Arm at the desired height [do not lock the lock screw].
2. Lower the blade until it almost touches the Level Arm.
3. Carefully rotate the blade toward you [counter clockwise]. This stops the blade tooth from damaging the Level Arm. Allow the blade tooth to glance the Level Arm to establish any height desired.

GUIDELINES FOR CARBIDE SAW BLADES

Courtesy of Forrest Manufacturing Company

Wear eye protection, use the saw blade safety guard and splitter, use sharp saw blades.

KICK BACK – Pinching of wood between the blade and rip fence – SOLUTION: Align fence and saw blade [*MasterPlate*] with the *MasterGage/Classic* as shown on pages B2 and B3.

SAWDUST THROWN TOWARD OPERATOR – Often comes from the fence being too loose or too tight. This crowds the wood against the rear side of the teeth, forcing a cut on the UP rotation on the left or right side of the blade. SOLUTION: Adjust the fence as shown on page B3.

BURNING OF WOOD – [especially hard wood] SOLUTION #1 – Raise the saw blade 1-2 inches above the surface of the wood and feed faster. This method produces 300 – 500 degrees cooler cuts, and stops scorching. Most effective on hardwoods such as cherry and hard maple. On soft woods, the blade may be kept low [1/4 inch above the wood] and should not experience scorching. SOLUTION #2 – When ripping, too many teeth on blade causes slow feed and excessive side friction. The blade rubbing at 100 MPH rim speed heats and scorches the wood surface – keep the wood moving. Suggest 24 to 40 teeth for ripping. 60 to 80 teeth for cross cutting. SOLUTION #3 Wood getting caught on raised throat plate. Level entire throat plate surface to table top.

SPLINTERING – Ripping on table saws – slower feed speed or use more teeth on blade or use reduced face hook on blade. Inspect for possible high sides or tips on carbide tips. Also try lowering blade. Cross cut – splintering on bottom edge and final vertical surface. Lower the blade and feed more slowly. Also, use a blade with more teeth and/or higher Alternate Top Bevels [ATB], instead of a square tooth or Triple Chip Grind [TCG-square and chamfered style]. Radial arm saws and chop saws – High Alternate Top Bevel [ATB] blades give much better control of bottom splintering than a square top or TCG Triple Chip Grind blades.

SAW LIFE – Use an inexpensive saw blade for rough ripping chores on flake board and Formicas, these materials dull blades faster than soft or hard woods. Save your best blades for finish cuts. Raise the blade higher [table saw] and feed faster to minimize the arc of contact. This decreases heat and abrasion and the number of rotations required to cut the piece. This is especially true on ripping plywood and particleboard.

NOTE: For best results, use the correct saw blade designed for that particular saw, such as a tablesaw, chop saw, etc..

SECTION D

ROUTER

+

ROUTER TABLE

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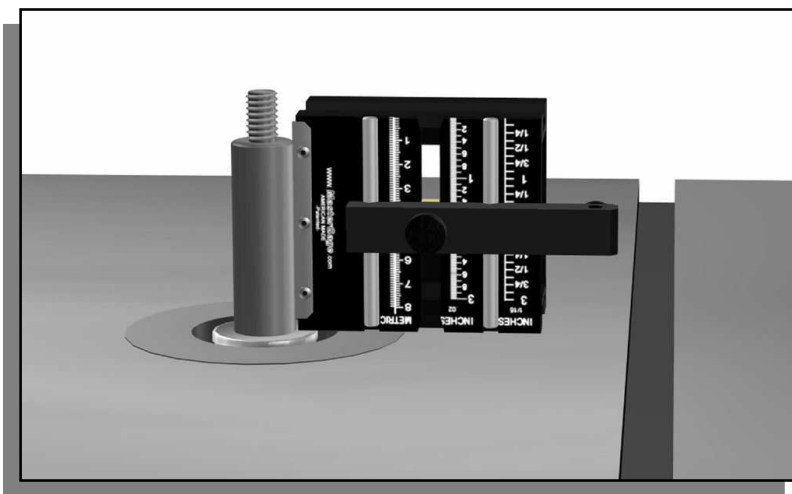
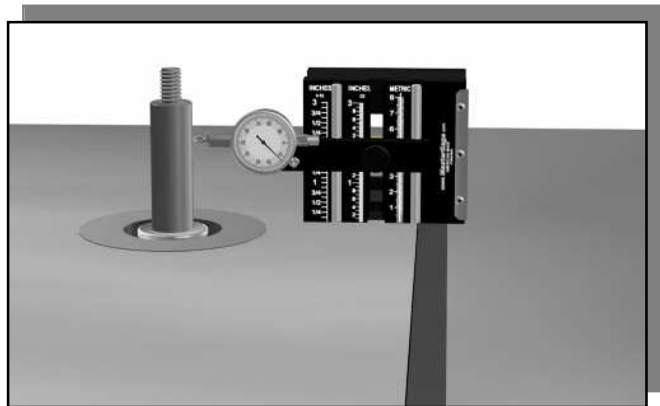
SHAPER

ROUTER PLUS ROUTER TABLE PLUS SHAPER

All pictures and illustrations are showing the **MasterGage/Classic** with the Shaper. These techniques and methods are also applicable to the hand held Router and the Router Table systems.

Checking spindle run out by rotating spindle by hand.
Use flat dial indicator tip for this operation

ROUTERS: Consider using the ½ inch diameter x 4 inch long Precision Rod for this operation



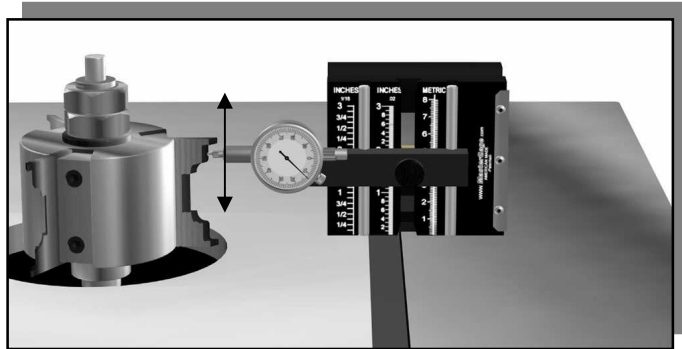
Square spindle to table top

ROUTER PLUS ROUTER TABLE PLUS SHAPER

All pictures and illustrations are showing the **MasterGage/Classic** with the Shaper. These techniques and methods are also applicable to the hand held Router and the Router Table systems.

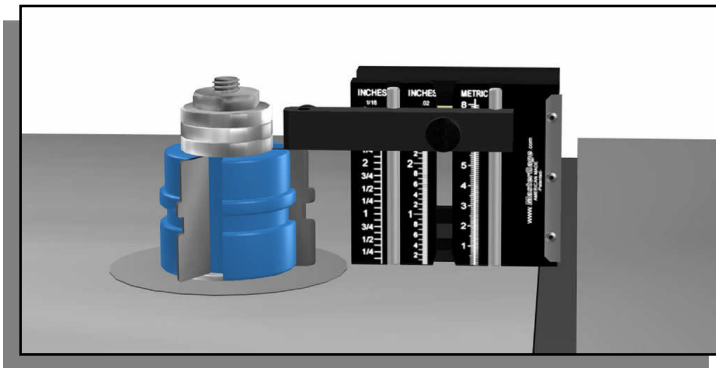
Check each feature on every cutter for absolute accuracy. An excellent way to verify accuracy of resharpened corrugated cutters or other replaceable cutters. An easy way to check every cutter head whether new or resharpened

TIP: Consider using our Accessory Magnets to hold the *Classic* firmly to the steel table to eliminate movement when taking precise readings



Applicable for the following cutters

- * Insert cutters
- * Corrugated back cutters
- * Solid head cutters



Set cutter bit height easily.

A great way to set and reset cope and stick cutter heads [rail and stile also] quickly –
- with no down time!

The **MasterGage/Classic** is extremely versatile and can also be used on machines such as single end and double end tenoners for setting cutter height.

Machines such as CNC router systems experience difficulty when new and resharpened router bits are used in the same router bit magazine. The resharpened bits may be shorter than the new bits. These router bits require the machine to be reset for height to compensate for their new resharpened length. *MasterGage Corporation* offers special Accessories that work with the *Classic* to accomplish this task easily.

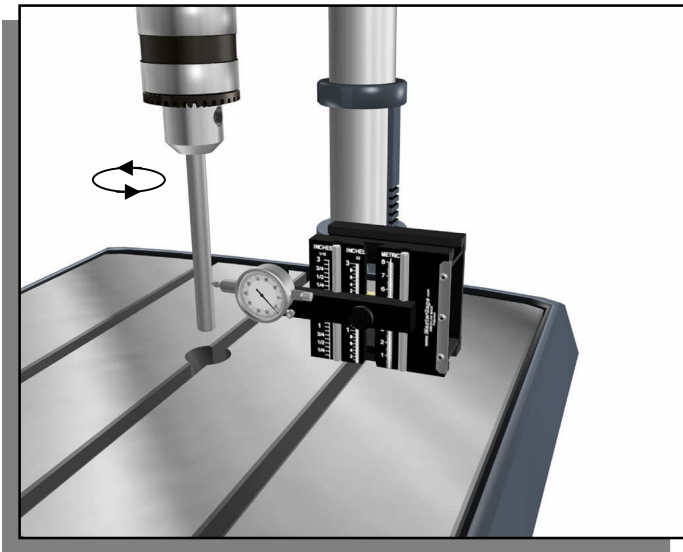
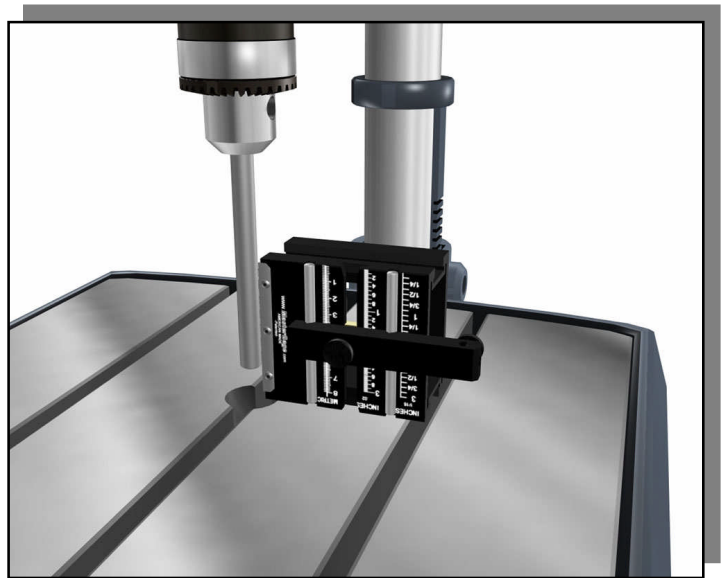
SECTION E

DRILL PRESS

DRILL PRESS

Square table to spindle precisely

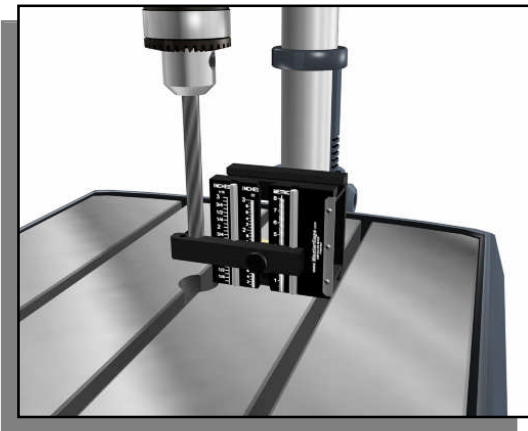
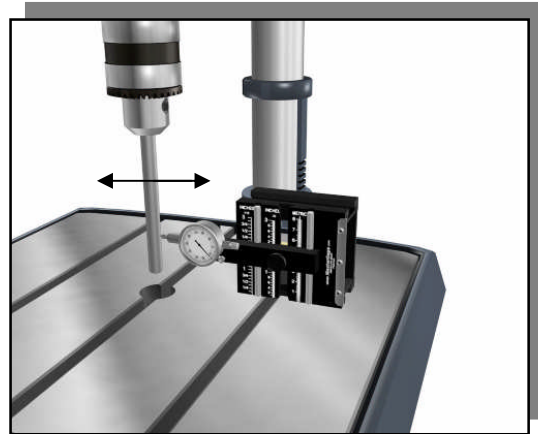
TIP: Utilize the ½" diameter Precision Rod that offers a polished smooth and straight surface to get accurate results.



Check spindle run out by rotating the check by hand and reading the dial indicator at the tip if the Precision Rod

DRILL PRESS

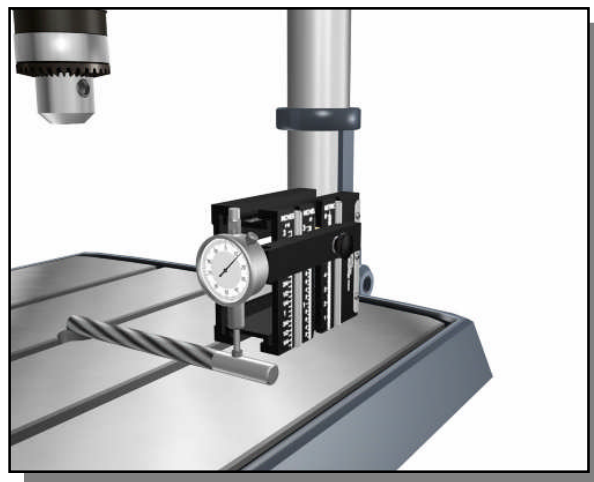
Check spindle bearing run out by moving the tip of the Precision Rod side to side and reading the dial indicator.



Measure/set any drill bit height accurately. Establish depth of drilled hole quickly

Check and measure drill bit diameters very accurately with the dial indicator and flat tip dial indicator tip.

TIP: Always measure the smooth end of the bit – not the flutes.

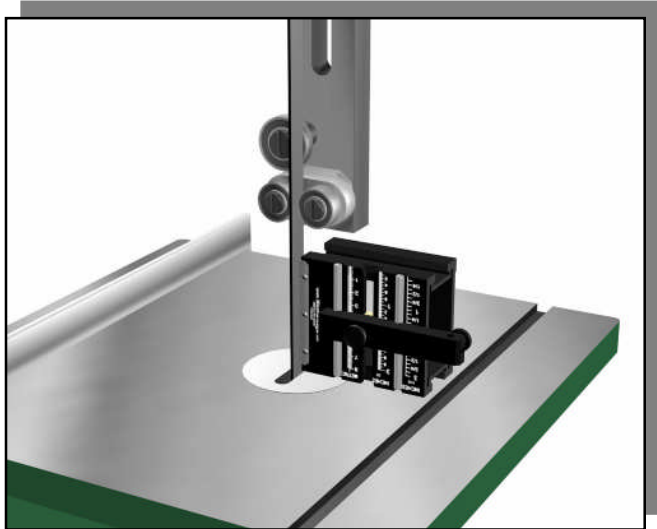


SECTION F

BANDSAW

BANDSAW

Square table to saw blade.



ADDITIONAL USES ON THE BANDSAW

CHECKING THE WHEELS FOR CONCENTRICITY [ROUNDNESS]:

1. Remove the Level Arm (See Useful Tips and Techniques Section)
2. Mount the dial indicator in the horizontal position [stem in line with the Level Arm].
3. Mount [clamp] the Level Arm with dial indicator so that the tip of the dial indicator is facing - and in contact with the face of the wheel [top or bottom].
4. Mark the wheel at the start point and rotate the wheel by hand one complete turn back to the mark and note the reading variation.

CHECKING THE WHEELS FOR RUN OUT, OR SIDE MOTION

1. Duplicate notes 1 & 2 above.
2. Mount [clamp] the Level arm with dial indicator so that tip of the dial indicator is in contact with the side surface of the wheel [top or bottom].
3. Duplicate note 4 above.

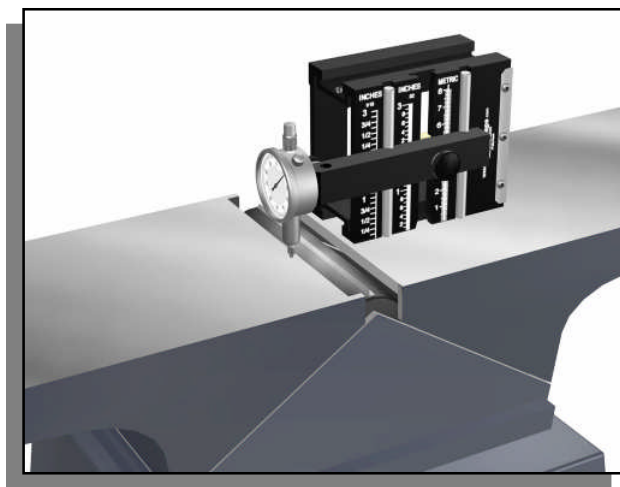
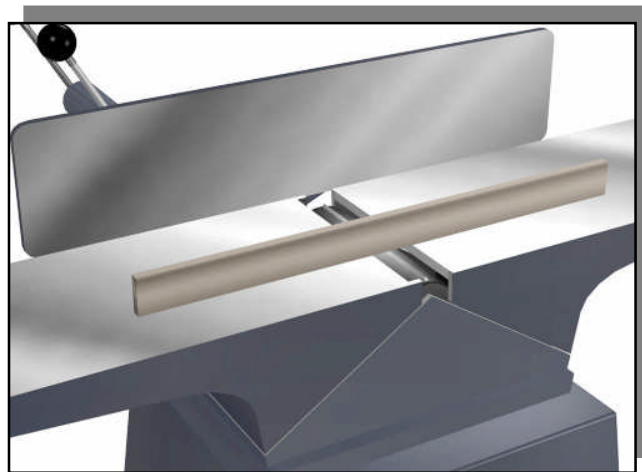
SECTION G

JOINTER

JOINTER

Perform the following procedures in tuning your jointer.

1. Using an accurate straight edge steel rule, check the flatness of both the Infeed and the Outfeed Tables. HINT: Sprinkle baby talc powder on the tables and drag the straight edge across the surface carefully. Much like concrete a mason dragging his top leveler across the cement to get it flat. This will give you a visual indication of where the hills and valleys are on the beds. Use this same technique on your tablesaw.
2. Bring the Infeed Table up to its maximum height, which should be equal to the height of the Outfeed Table. Place the straight edge across both the Infeed and Outfeed Tables. They should be absolutely parallel with each other. If not, make the appropriate adjustments.



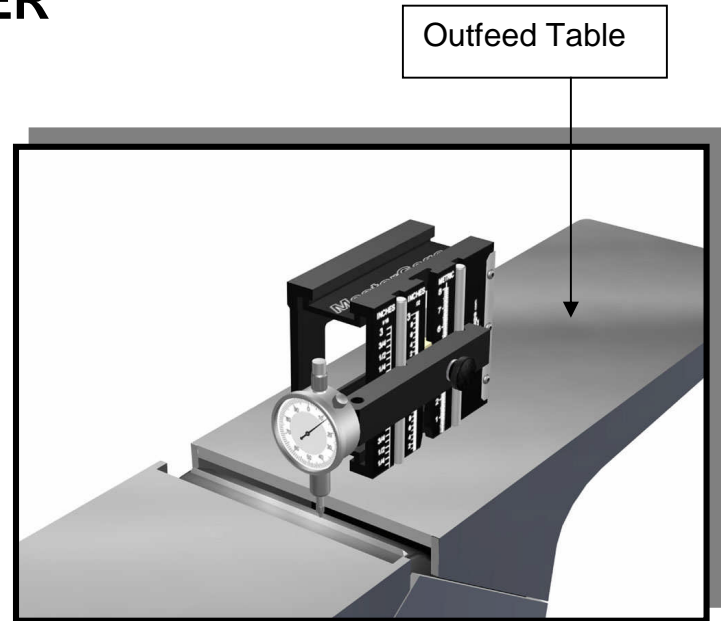
Outfeed Table

With the Dial Indicator tip touching the Infeed Table, sweep the *Classic* back and forth across the width of the Infeed Table to verify that the Infeed Table is parallel to the Outfeed Table. Adjust to bring it in parallel

JOINTER

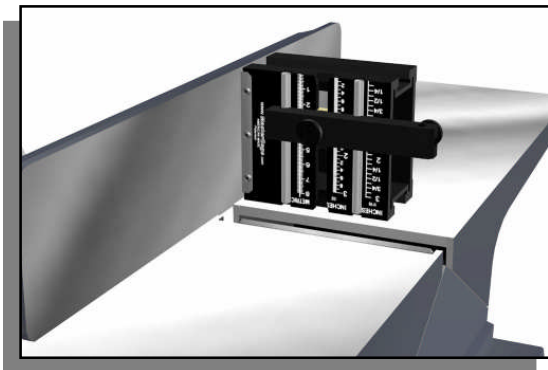
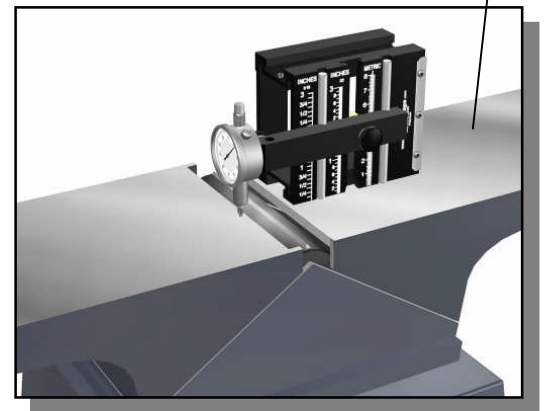
PROCEDURE FOR CHECKING AND ADJUSTING THE EXISTING BLADES – OR INSTALLING NEW BLADES.

1. Install the dial indicator flat tip.
2. Position the *Classic* on the outfeed table and “zero out” the dial indicator on the outfeed table surface. [This establishes the maximum height of the blade]
3. Using the *Classic*, rotate the cutter until the blade is at Top Dead Center [TDC]. Secure the cutter head at that position [tape will do it nicely] by spanning the tape from the Outfeed Table, to the cutter head to the Infeed Table.
4. Check and set the blade to zero on the dial indicator. Repeat steps 2 and 3
5. NOTE: Change one blade at a time.



Outfeed Table

Finding the Infeed/Outfeed Table offset is fast and easy with the *Classic*. Simply zero-out the Dial Indicator on the Outfeed Table, place the Dial Indicator on the Infeed Table-PRESTO, the off set is given to you in thousandths of an inch! You no longer have to rely on the inaccurate jointer scales for the offset readings.



Square fence to table

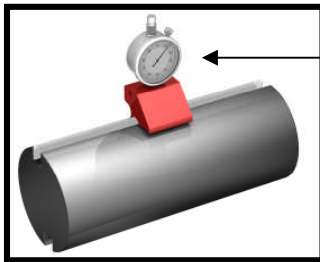
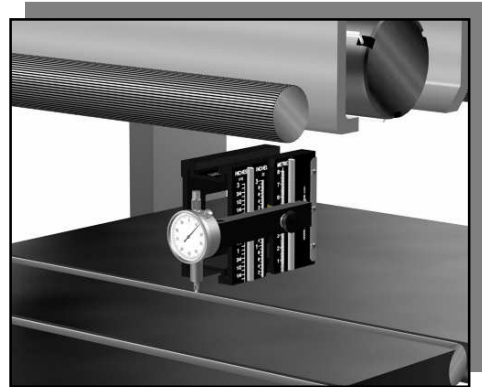
SECTION H

PLANER

PLANER

Check/set bed rollers to correct height and parallel to the table top

TIP: Use the flat dial indicator tip



We now offer a precision PLANER BLADE SETTING JIG for accurately setting planer blades relative to the cutter head to within .001 inches [1/1000 inches]. Contact us for details, or check our website at www.mastergage.com

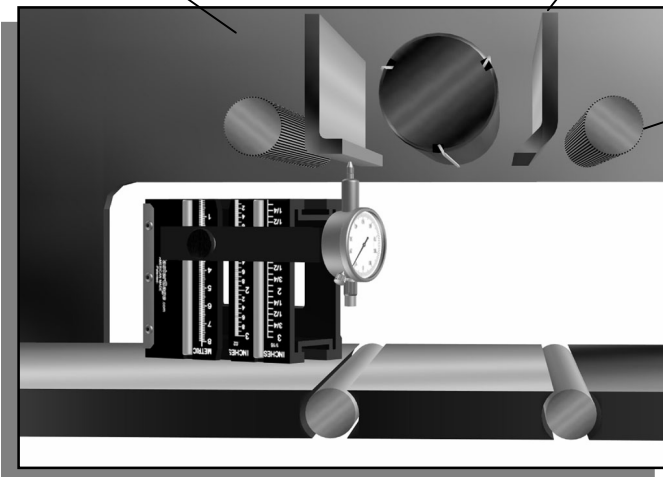
CUTTER HEAD

INFEED ROLLER

CHIP BREAKER

PRESSURE BAR

OUTFEED ROLLER



Rotate the **MasterGage/Classic** so that the Dial Indicator is facing up and check all the labeled elements in the illustration for correct height and parallelism

PLANER

GENERAL NOTE: *The planer is a complex machine with many components, both moving and stationary, that work in conjunction with each other. All of these components must be aligned and calibrated accurately to get the desirable results you expect. As the word “planer” implies, all of these components must be absolutely parallel with each other.*

NOTE: *ALL ADJUSTMENTS MUST BE MADE WITH THE POWER PLUG REMOVED FROM THE ELECTRICAL SOURCE.*

PLANER COMPONENTS DEFINED

BED ROLLERS – Most planers have two bed rollers mounted in the base table. One is located in the front of the cutter head, the other mounted in the back, behind the cutter head. The rollers are generally made of rubber or urethane. Their role is to reduce the friction as boards are pushed through the planer. They are spring loaded and non powered, and are raised slightly above the base table. Approximately 0.005 inches [5/1000 inches] for pre-finished stock and about 0.015 inches [15/1000 inches] for rough stock. It is important to maintain these heights completely across the full length of the BED ROLLERS.

INFEED ROLLER – This roller is generally a powered steel serrated steel roller mounted above the base table, forward of the cutter head. It is serrated so that it can grip the incoming board and move it forward through to the cutter. Tension on this roller should be stiff enough so that it leaves slight depression lines across the board. This ensures that the INFEED ROLLER will advance the board through to the cutter head smoothly. The cutter knives will remove these slight pressure lines as the board completes its passage through the planer.

CHIP BREAKER – It is a solid metal stationary piece and is located forward of the INFEED ROLLER and before the CUTTER HEAD. The CHIP BREAKER keeps the board from tilting at an upward angle and hitting the spinning cutter head prematurely. Both the INFEED ROLLER and the CHIP BREAKER must be adjusted even with the bottom of the CUTTER HEAD KNIVES at the cutter knives lowest point [arc]. If the INFEED ROLLER AND CHIP BREAKER are too high, the board will vibrate and have a rippled surface.

CUTTER HEAD & KNIVES – The CUTTER HEAD is a long cylindrical steel roller that holds 2, 3 or 4 long cutter blades [knives]. The CUTTER HEAD must be parallel across its full length to the base table to approximately 0.001 to 0.003 inches. The cutter blades in turn must be parallel to the cutter head. Again to approximately 0.001 to 0.003 inches. As you can see, the accumulated parallelism tolerances will reflect on the finished product – your finished planed wood. Be aware that the CUTTER HEAD bearings must be in good condition. If you can feel movement when you try to lift the cutter head at each end or if you hear a clunk noise when the planer is turned on - it is a sign of bad bearings.

PLANER COMPONENTS DEFINED (CONTINUED)

PRESSURE BAR – It is located forward of the CUTTER HEAD and is generally made of a solid metal stationary piece. The role of the PRESSURE BAR is to keep pressure on the board and hold the timber down on the table to decrease vibration, thereby giving the spring loaded OUTFEED ROLLER some extra help. It also keeps the board from tilting upward after being cut by the cutter head knives. If the PRESSURE BAR is adjusted too high, it does not hold the board down and the board can bounce and be gouged by the CUTTER HEAD. If it is too low, it will rub on the new surface or even hinder the board from exiting the planer. The PRESSURE BAR should be the same height as the CHIP BREAKER and the bottom arc of the CUTTER HEAD KNIVES. If it is too low, it will stop the board passing through. If it is too high, the board will vibrate and have a cupped cut effect.

OUTFEED ROLLER – This roller is smooth, so as not to mar the machined board surface. It is designed to keep downward pressure on the finished board surface and guide it as the board exits the planer. The OUTFEED ROLLER must also be parallel and at the same height as the INFEED ROLLER, the CHIP BREAKER, the CUTTER HEAD KNIVES, and the PRESSURE BAR.

FINAL NOTE – All of these measurements can be made with the *MasterGage/Classic* as illustrated. The one measurement that cannot be made with the *Classic* is setting the planer blades to the CUTTER HEAD. However, we have designed a special tool for that purpose called the *Planer Blade Setting Gauge*. This precision tool is designed specifically for this purpose. Please contact us for more information regarding this tool.

TROUBLESHOOTING PLANER PROBLEMS

PROBLEM: The board is tapered across its width after passing through the planer

SOLUTION: 1. Check the bed rollers for parallelism to the table
2. Check parallelism of the cutter head and knives to the base table

PROBLEM: The finished board has a washboard [cupped] effect on surface.

SOLUTION: 1. Sharpen the knives. If the knives are not sharp they tend to act as a blunt surface against the board, burnishing the surface and not cutting as required.

PROBLEM: The finished board has a glazed or burned surface

SOLUTION: 1. The planer knives are dull and need to be resharpened

PROBLEM: There are ridges in the finished board

SOLUTION: 1. One or more of the planer knives have a chip and need to be resharpened

PROBLEM: The finished board has rough and irregular ridges.

SOLUTION: 1. The pressure bar is not holding the board to the table

PROBLEM: The board turns diagonal while progressing through the planer

SOLUTION: 1. The feed roller is applying uneven pressure along its length

PROBLEM: The board stops or hesitates as it is being passed through the planer

SOLUTION: 1. Either the pressure bar and/or the chip breaker is set too low relative to the cutter head knife arc
2. The table is offering too much friction, wax the table top surface

PROBLEM: The planed surfaces are chipped

SOLUTION: 1. The planed material waste is being forced back into the planed surface. Check the vacuum exhaust system for clogged material. The material waste is not being evacuated adequately.
2. The chip breaker is set too low and is affecting the board surface.

TROUBLESHOOTING PLANER PROBLEMS

- Continued -

PROBLEM: One or both ends of the board has snipe. Snipe is when a slightly deeper cut appears in the leading or/and trailing areas of the board.

SOLUTION:

1. The pressure bar or chip breaker is not set correctly
2. The Pressure bar spring tension may be too light
3. Put a scrap piece of wood of the same thickness in front of and/or behind the board being passed through the planer.
4. Place two long narrow pieces of board, one on each side of the board to be planed. These narrow pieces to be the same thickness as the primary board
5. Create a base extension so that the timber is completely level upon exit of the planer.

PROBLEM: Vertical cut lines across the width of the board

SOLUTION: 1. Check the serrated INFEED ROLLER for both depth [height] and proper spring tension

PROBLEM: Wave marks on the board.

SOLUTION: One or more of the knives are improperly set.

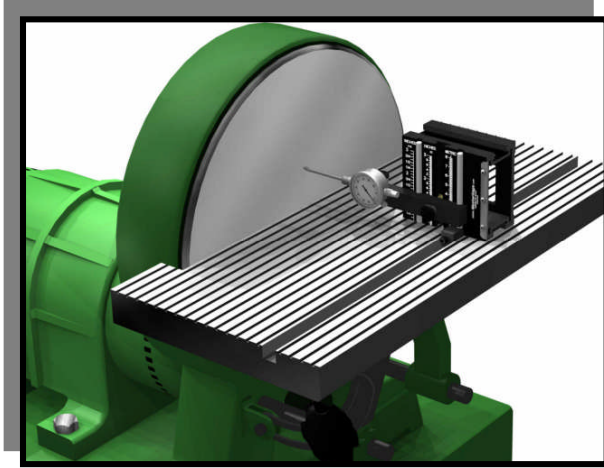
SECTION I

DISK SANDER

+

DRUM ROLLER SANDER

DISK SANDER

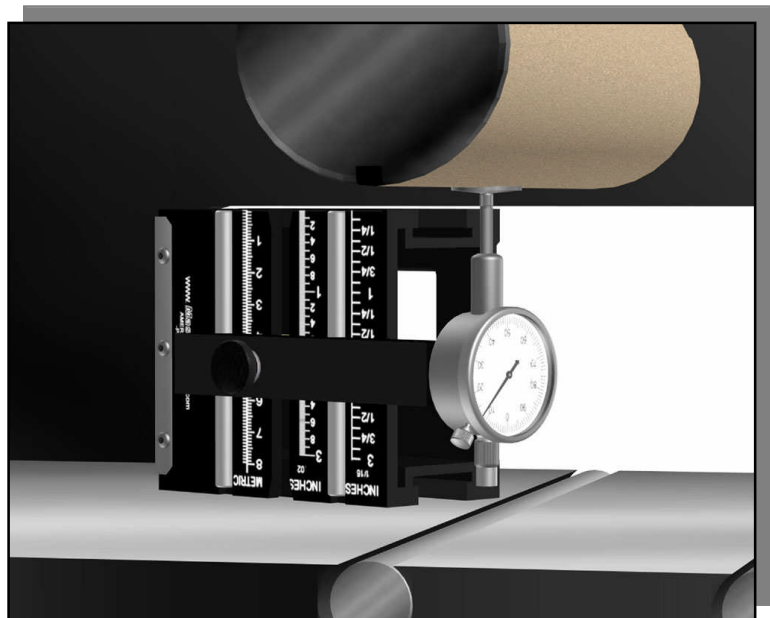


Checking and adjusting the sanding disk face plate parallel to the miter slot is easily accomplished with the **MasterGage/Classic**

DRUM SANDER

Check and set roller[s] parallel to base table top. Also check and set bottom feed rollers for parallelism and required height

TIP: Use a flat dial indicator diameter tip



SECTION J

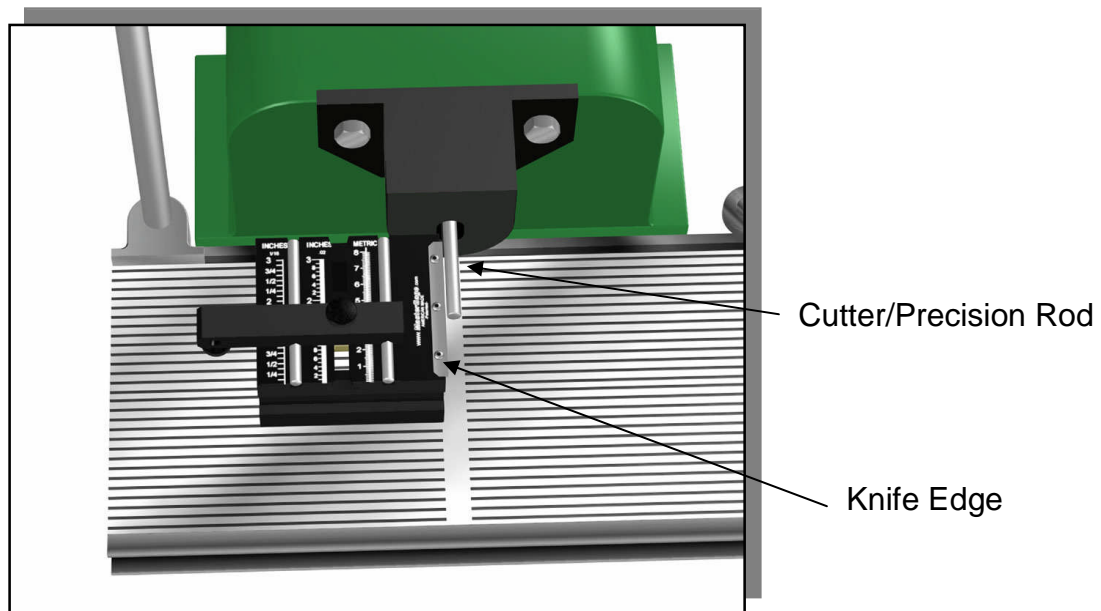
HORIZONTAL MORTISER

+

DOWELER

HORIZONTAL MORTISER + DOWELER

Horizontal Mortisers present a particular challenge since many of the tables are independent of the cutter head. Usually on separate tables that can move vertically, horizontally and back and forth. [X, Y and Z]. As such it becomes difficult to align the table to the cutter head and mortise cutter for a correct mortise cut on the wooden part. The **MasterGage/Classic** handles this problem easily.



Use the ½ inch by 4 inch Precision Rod for alignment. The Precision Rod with its straight, smooth surface is far more accurate than using a cutter for alignment.

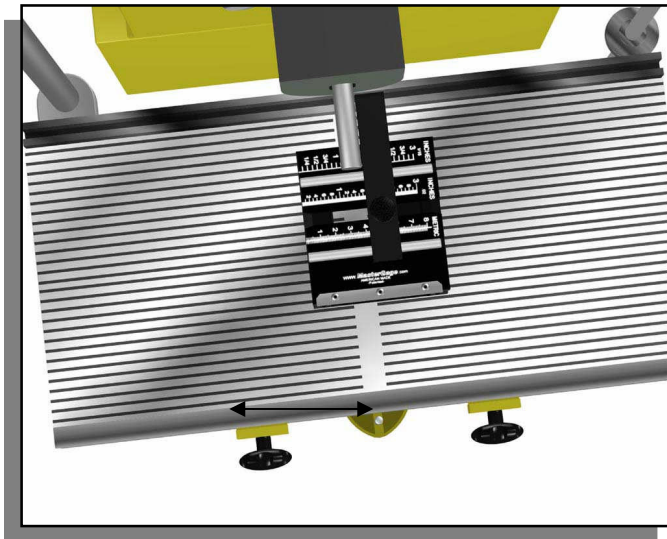
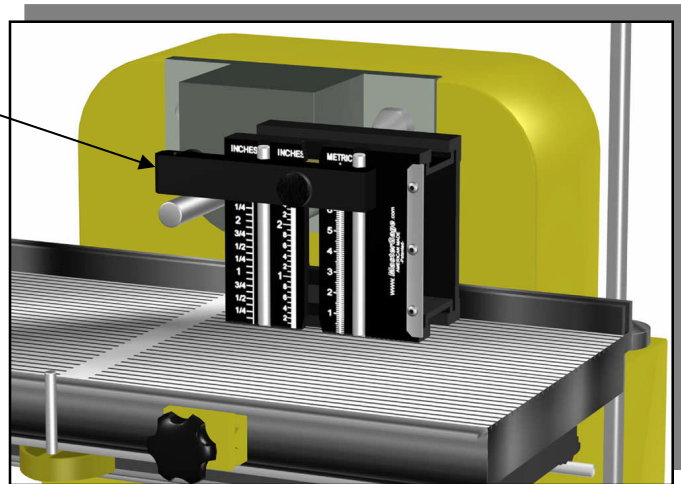
Square the Mortise table to the cutter head using the knife edge of the **MasterGage/Classic**

HORIZONTAL MORTISER + DOWELER

LEVEL ARM

Setting the cutter height.

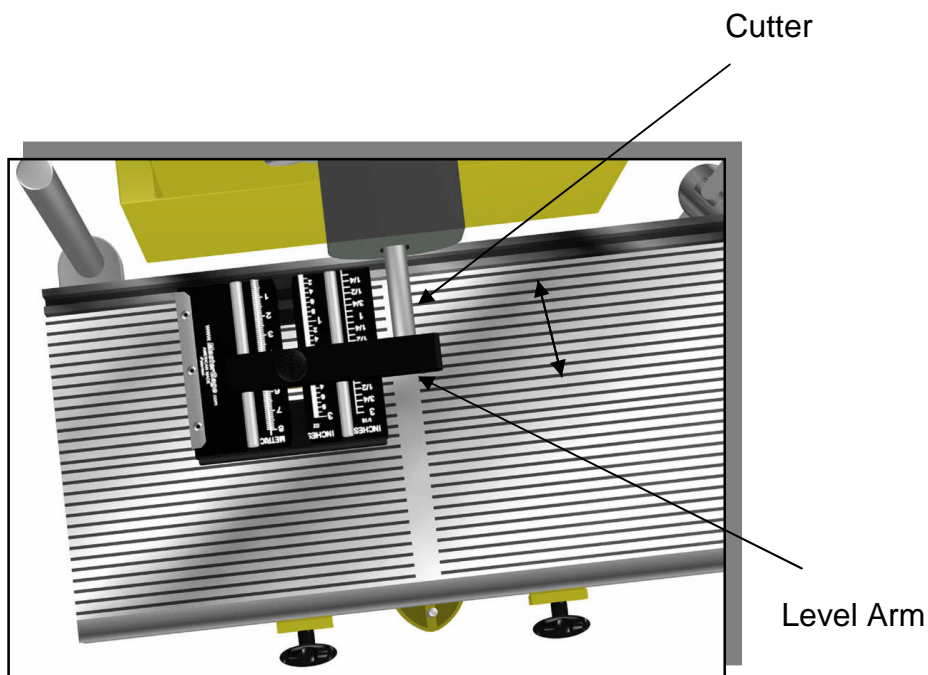
TIP: When using the Precision Rod, simply subtract $\frac{1}{4}$ inch to find the center of the mortise required.



Set the length required for the mortise length and lock table stops.

TIP: Use the actual cutter intended for the mortise slot

HORIZONTAL MORTISER + DOWELER



Set the cutter depth required and lock table stops.

TIP: Use the actual mortise cutter bit for this set up.
set the Mortise/Doweler table travel for the
depth cut.

Machines similar to horizontal mortisers, such as the Multi-Router and the MATCHMAKER can be aligned, set up and reset up quick and easy with the **MasterGage/Classic**

* The Multi-Router is a registered trademark of the JDS Company.

* The MATCHMAKER is a registered trademark of the Woodworkers Supply Company.

SECTION K

CARE AND MAINTENANCE

CARE

Your **MasterGage/Classic** comes to you fully calibrated. If it ever needs recalibration, simply perform the following procedure.

Calibrating the 90-degree Knife Edge.

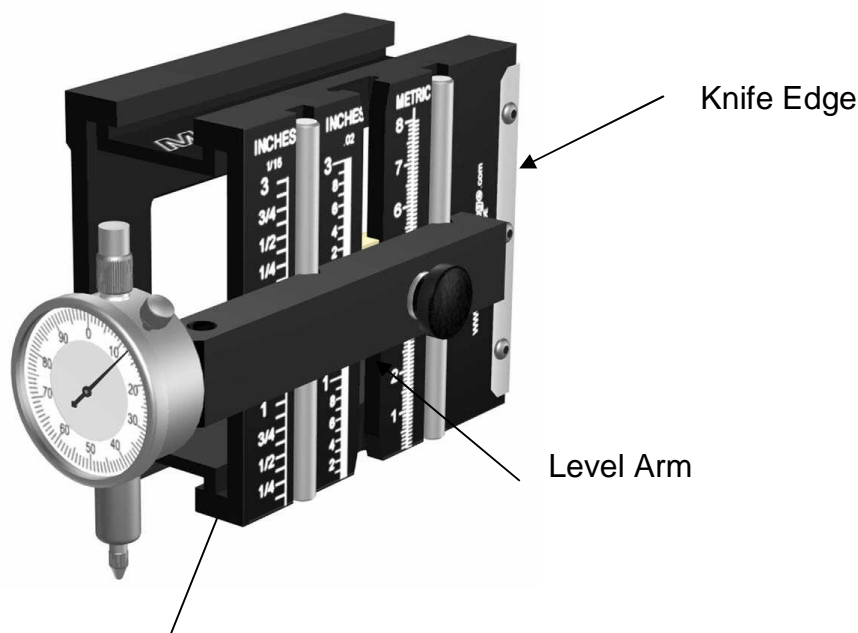
1. Select a flat surface - a piece of $\frac{1}{4}$ thick glass is a good choice.
2. Loosen the three button head screws. Using a precision machinist square, align the Knife Edge and tighten the screws. Calibration completed.

Dial Indicator. With normal care it will stay as accurate as the day you purchased it. Word of caution - dust and particularly sawdust will cause the unit to malfunction. Use care to minimize raising sawdust when using this delicate instrument.

The Level Arm is spring-loaded and will always return to its zero position automatically. With this unique design, your *Classic* always stays calibrated.

MAINTENANCE

Lubrication - simply wipe the vertical stainless steel rods clean with your fingers - - the natural oils from your fingers will provide all the lubrication needed.



Applying Magic Mending Tape or Scotch tape [not masking tape] to the working surfaces adds great protection and can be easily replaced when worn. The .002 inch thick tape allows the *Classic* to glide over the machine table tops with ease without scratching the black anodize coating.

SECTION L

USEFUL TIPS

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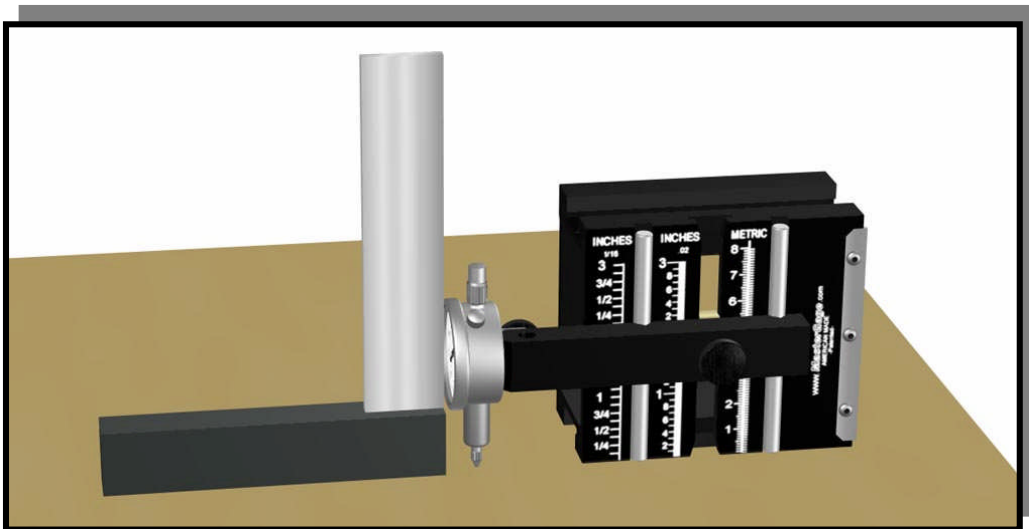
TECHNIQUES

USEFUL TIPS & TECHNIQUES

This Manual was designed to be a “working” Manual. With the open spaces on the printed pages, we encourage you to write any information you need, such as the following:

- Record settings required for each of your machines
 - Sketch/doodle any thoughts you have for a particular adjustment
 - Make a chart for an inspection schedule for that particular machine
 - Make notes for any particular set up or calibration procedures
 - Any other information you want to record
-

When using the dial indicator on the **MasterGage/Classic**, verify that the dial indicator is perpendicular to the table surface. Do this by aligning the face of the indicator against a machinists square as shown below.



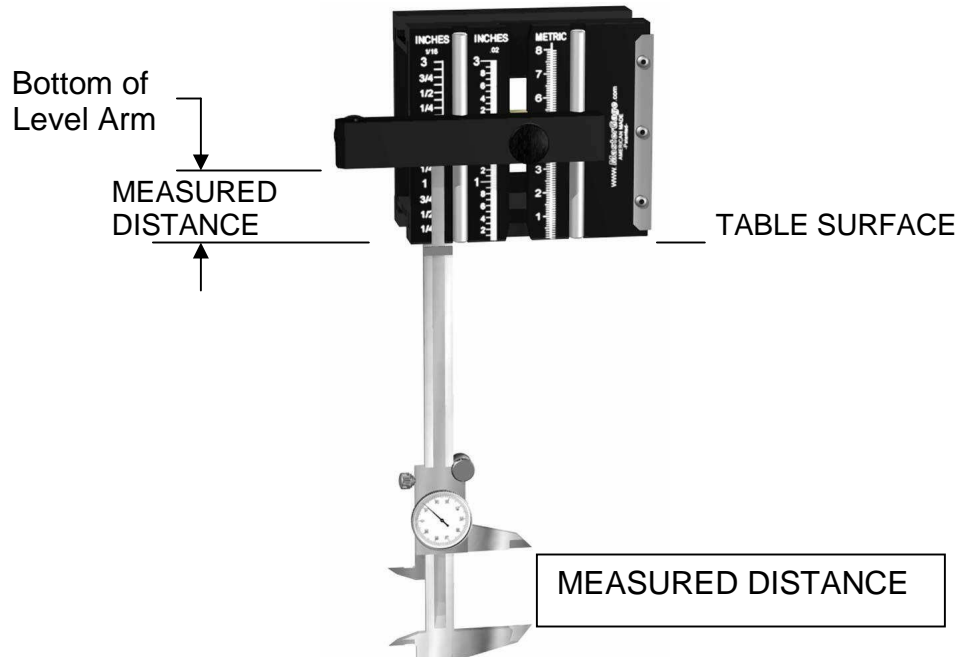
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Check with the **MasterGage.com** website for updates to this Manual. The edition of your Manual is shown on the lower right of the front page with the month and year of printing. You can download the latest version from the website. The latest edition will be visible on the lower front page also. You will have to enlarge the front page on your monitor to see this information

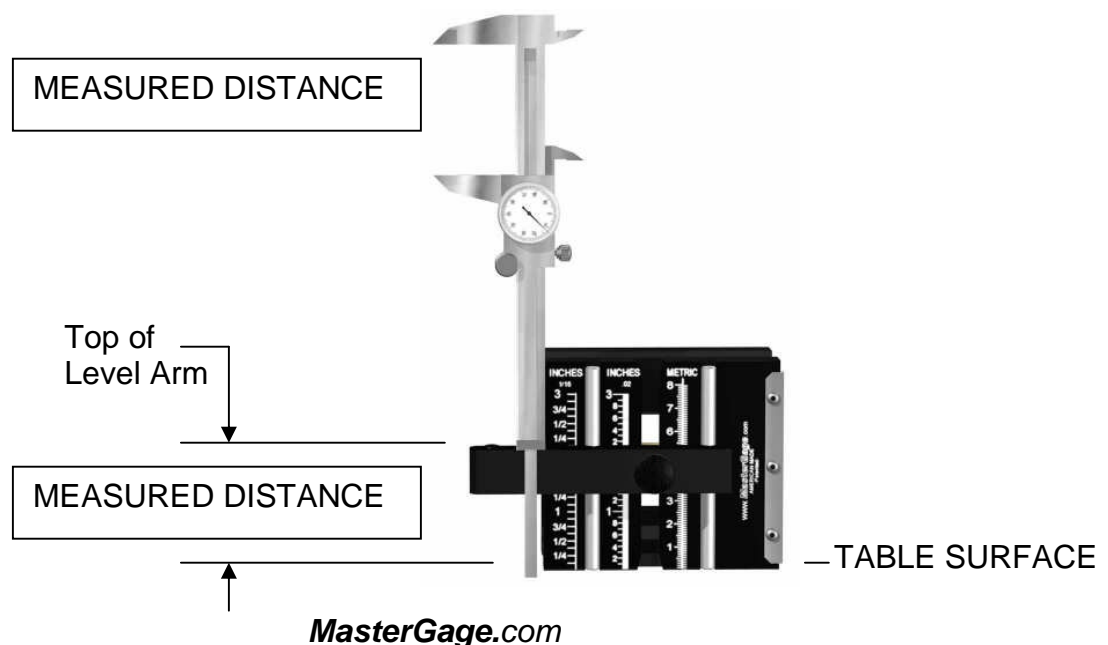
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We encourage you to contact us with any tips you may have discovered using your *Classic*.

Very precise settings can be attained using dial calipers with the **MasterGage/Classic**. This illustration shows how you can select any height required to within one thousandth of an inch (.001 inches/.025mm). This technique is great for measuring/setting the height of a cutting tool that comes up from BELOW and registers against the BOTTOM of the Level Arm. For example, measuring/setting router bit heights, table saw blade heights, etc.



Another variation of this technique is shown below. Measuring/setting cutting tools coming from ABOVE and registering against the TOP of the Level Arm. For example, measuring/setting the height of drill bits when used on a drill press. Also, radial arm saws, chop saws, compound miter saws, where the blade is coming down from above.



Using the *MasterGage/Classic* as a “Story Stick” for machine set up.

Many of us know of the “Story Stick” concept, where the cabinetmaker uses a vertical and horizontal stick to layout the wall where the cabinet is to reside. He marks the sticks for window clearings, plumbing, electrical outlets and other elements that he has to contend with on the wall. Instead of making a drawing of the wall, with the dimensions of these elements, he simply marks the story sticks. One stick for the vertical elements and the other stick for the horizontal elements. Once that is done, he brings the Story Sticks back to the shop to assist him in designing and building a cabinet to fit that particular wall.

We have a bit of the same concept with the technique shown below. When you have several set ups on any machine, we suggest the following method.

First, remove the Level Arm and tape over one of the three scales you do not normally use, then replace the Level Arm onto the *Classic*.

As an example, let's say you are making doors and are continually exchanging cope and stick cutters on your shaper or router table system. Simply mark the tape for each cutter height needed. Perhaps a red color for the cope cutter and black for the stick cutter.

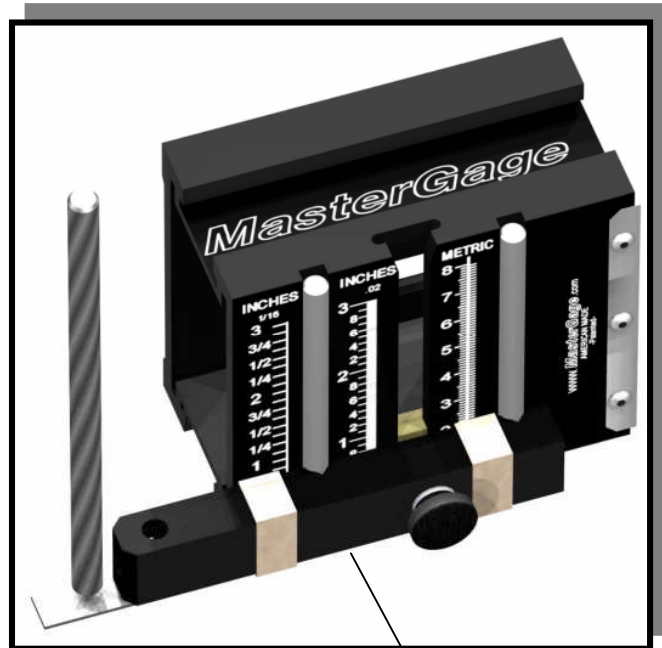
Another example would be various drill bit heights for a project. Not only can you mark the tape to show the height needed, you could also make a note on the tape for the size of the drill bit size, etc.

Once you finish with the project at hand, simply peel off the tape. Give it a try, the variations are endless.

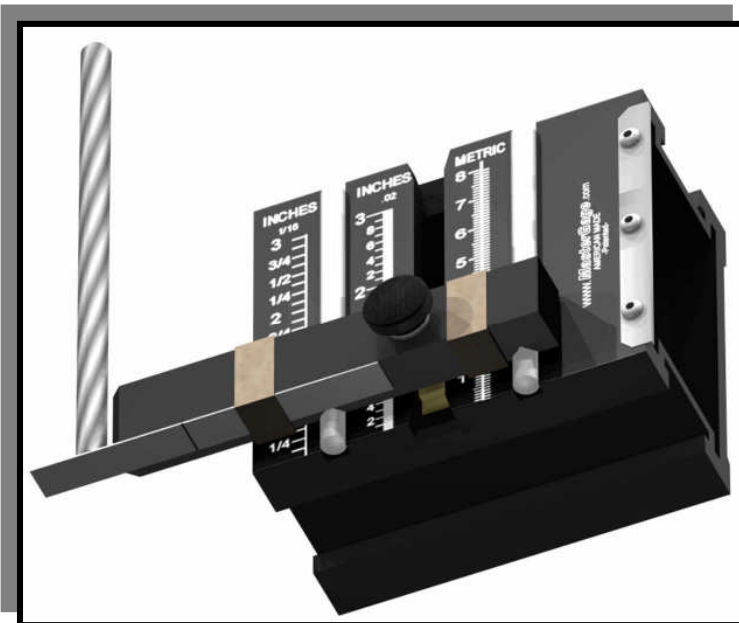


USEFUL TIPS & TECHNIQUES

When measuring the height of items, such as drill bits for hole depths, the height of the Level Arm [3/4"] limits measuring from .000" to .750 [3/4"]. To overcome this restriction, simply choose a desired height dimension and tape a stick or better yet a 6.0 inch steel scale to the bottom of the Level Arm.

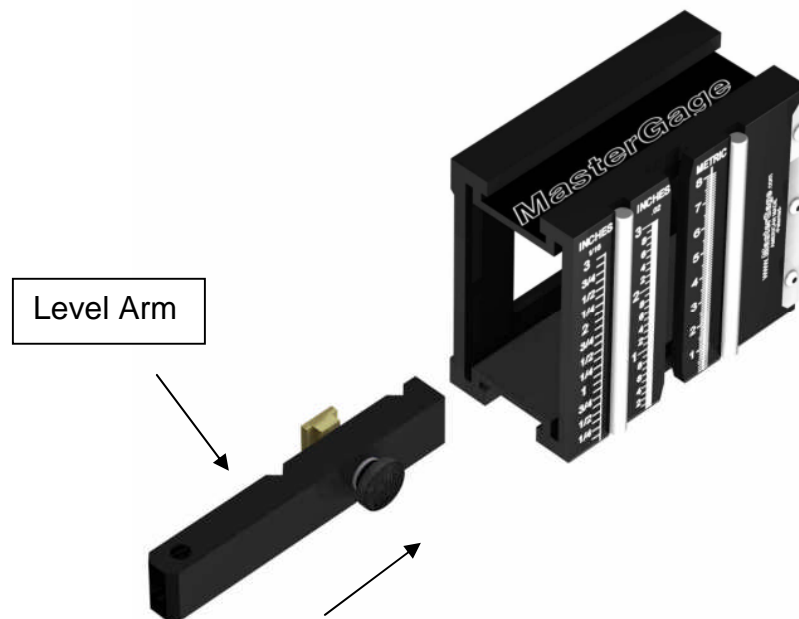


Level Arm



Note that the top of the scale [or other item] taped to the Level Arm – is actually the bottom of the Level Arm where you selected the height dimension you desired

USEFUL TIPS & TECHNIQUES



PROVIDING MORE ROOM IN YOUR SHIPPING CONTAINER OR CARRYING CASE

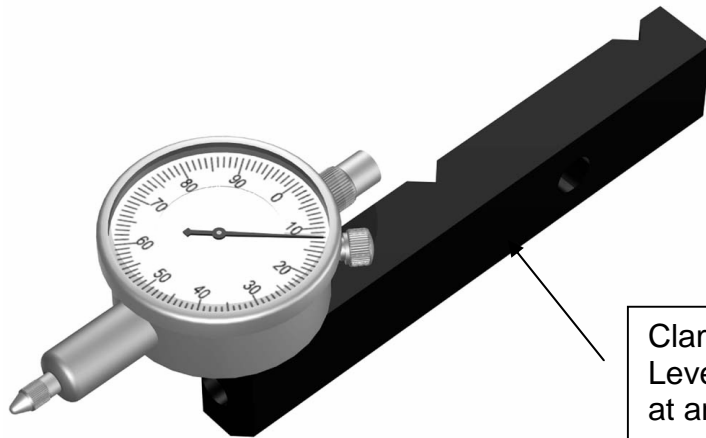
With the **MasterGage/Classic** plus the **Manual** plus the **MasterPlate** in the container/Case, the lid/cover may become more difficult to close tightly. The solution is to simply slide the Level Arm off of the **MasterGage/Classic** body and slip it into the center cavity of the body extrusion. Doing this will give you an extra $\frac{3}{4}$ inches of height in the container, making it easier to close the lid.

USEFUL TIPS & TECHNIQUES

Getting the MAXIMUM use of your dial indicator

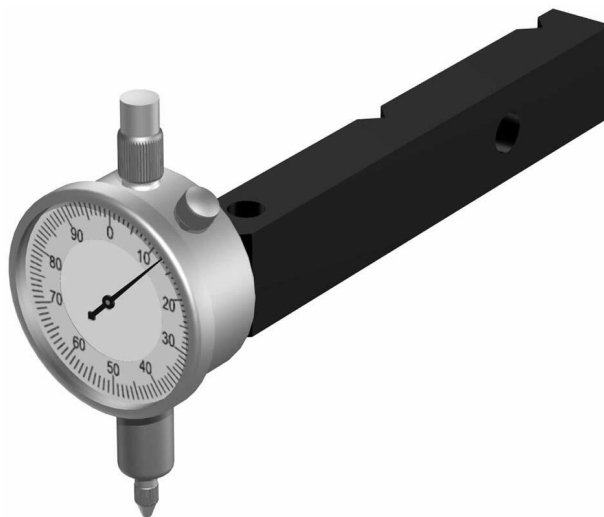
Detach the Level Arm along with the dial indicator attached from the *Classic*. This gives you a small package with a lot of capabilities for checking the precision of your machinery. Simply clamp the Level Arm assembly in any confined area to take measurements. An example would be checking the flange face on a table saw. Place the Level Arm/dial indicator assembly down inside the saw structure and position the dial indicator stem directly against the flange and take accurate readings.

With the dial indicator facing forward

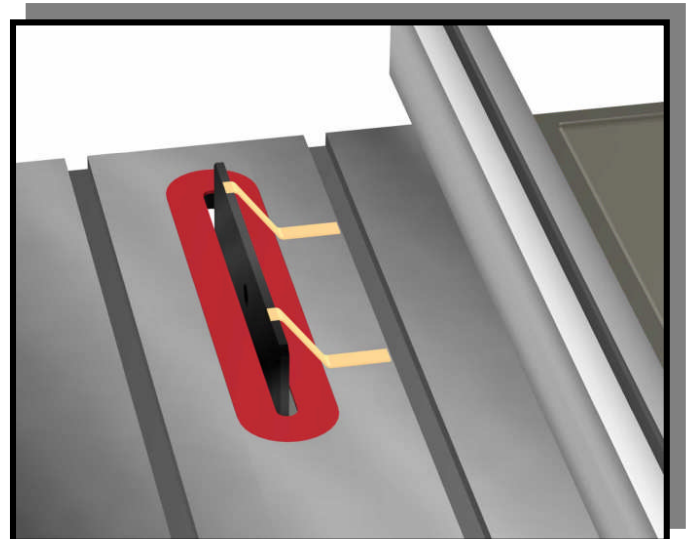
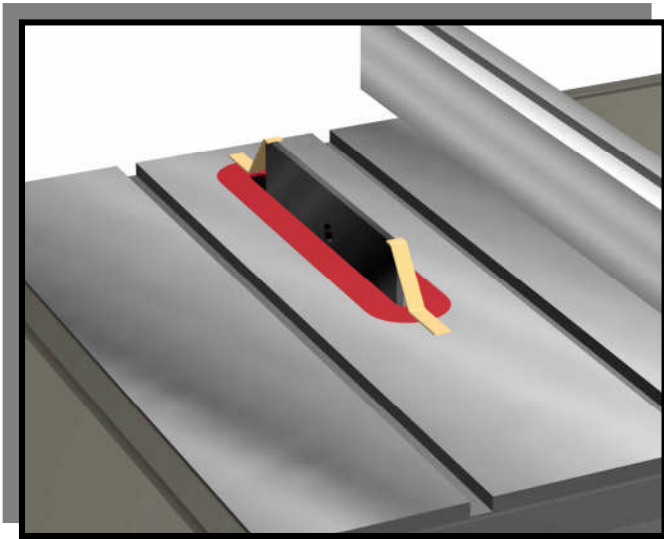


Clamp the Level Arm at any convenient location

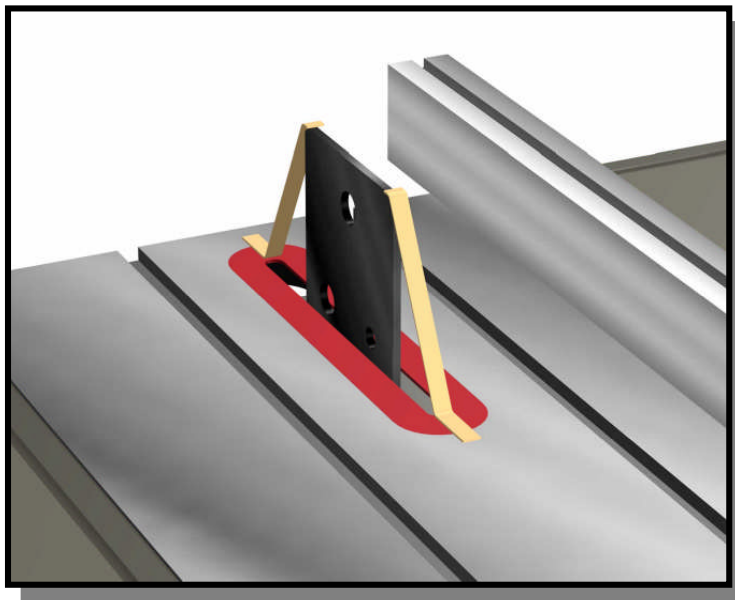
With the dial indicator facing downward



USEFUL TIPS & TECHNIQUES



To keep the **MasterPlate** positioned correctly and prevent it from rotating on the arbor shaft, tape the ends or edges as shown. This will keep the **MasterPlate** stable while you are measuring/setting with your **MasterGage/Classic**.



With the **MasterPlate** in the vertical position, it becomes more difficult to keep it in position. The above illustration shows how to keep the **MasterPlate** stable with tape.

SECTION M

FREQUENTLY ASKED QUESTIONS “FAQ”

FREQUENTLY ASKED QUESTIONS “FAQ”

QUESTION: *What kind of accuracy should I expect on my woodworking machinery? How close should I measure, 1, 2, 3, 4 thousandths of an inch?*

ANSWER: Machines come in all sizes and quality levels. Many are built with stout cast iron bodies and components, others with sheet metal. Obviously, one can expect the cast iron fabrication to hold tight tolerances and for longer periods, than a sheet metal fabricated machine. The general answer is to align and calibrate as close as possible, without making it a 3 day project. Then monitor the dimensions over time. Naturally the cast iron machine will stand more abuse over time, and still keep the tolerances, versus the sheet metal unit.

QUESTION: *How often should I monitor my machinery for alignment and calibration?*

ANSWER: I would suggest setting up a written schedule for every machine alignment check. The schedule would depend upon machine usage. Is your shop on a 8 hour/5 day or 16 hour/6 day work week? How many different people use the equipment, etc. My feeling is to consider your shop like an airplane. Before you “take off” on your business day, like the plane, all machines are checked for running condition and accuracy. After all, your business relies on the accuracy and output of these machines. They are your bread and butter.

SECTION N

ACCESSORIES

ACCESSORIES

Our list of Tooling Accessories for the **MasterGage/Classic** and **MasterGage/Professional** is constantly growing. All pictures and information on existing and new Accessories are posted on our web site, making it easy for you to keep up with the latest developments.

Shown below are just a few of the many Accessories that can enhance your **MasterGage/Classic**.

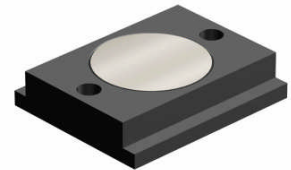
Be sure to bookmark: www.mastergage.com



POINT INDICATOR



3 INCH HEIGHT
EXTENSION



MAGNET
ASSEMBLY

SECTION 0

ORDERING INFORMATION

ORDERING INFORMATION

You may order any **MasterGage** product by any of the following methods - 24 hours a day, 7 days a week,

All payment must be in US dollars

- PHONE or FAX: -TOLL FREE 888/893-8300



- WEB SITE: - PRINT OUT THE ORDER FORM FROM OUR WEB SITE: www.mastergage.com AND FAX OR MAIL THE ORDER



- MAIL YOUR ORDER TO:
MasterGage.com
1534 N. Moorpark Road #505
Thousand Oaks,
California 91360 USA



MasterGage.com

P

P

SECTION P

ONE YEAR GUARANTEE

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REFUND POLICY

SECTION P

ONE YEAR GUARANTEE

MasterGage Corporation extends a **Life Time Guarantee** on all **MasterGage** products, including our Dial Indicators. This **Guarantee** covers materials and workmanship only and will not apply to damages arising from neglect, accidental or intentional damage or misuse of the product. This Guarantee is not transferable.

Repairs or replacement under this warranty shall be made through **MasterGage Corporation**, at no charge to the original customer.

We have registered your name in our database as the owner of this **MasterGage/Classic**.

REFUND POLICY

If this **MasterGage/Classic** is not satisfactory for any reason, return it **within 30 days of purchase** in the condition you purchased it, postage paid. We will refund you the full purchase price. We require a "Proof of Purchase", so please be sure to include a copy of your purchase receipt.