INSTALLATION INSTRUCTIONS

TRAV-A-DIAL
and
DIGITAL TRAV-A-DIAL

The repeatability, accuracy and reliability of the Trav-A-Dial depend, as do all other systems, on accuracy of installation and care in making final alignment adjustments.

The Trav-A-Dial is frictionally engaged to the surface on which it measures. The engagement force of the wheel to the measuring surface will be about 35 lbs. This force is applied by means of a compression flexure in the frictionless M-3 mounting base, which is explained in detail in a later section of this booklet.

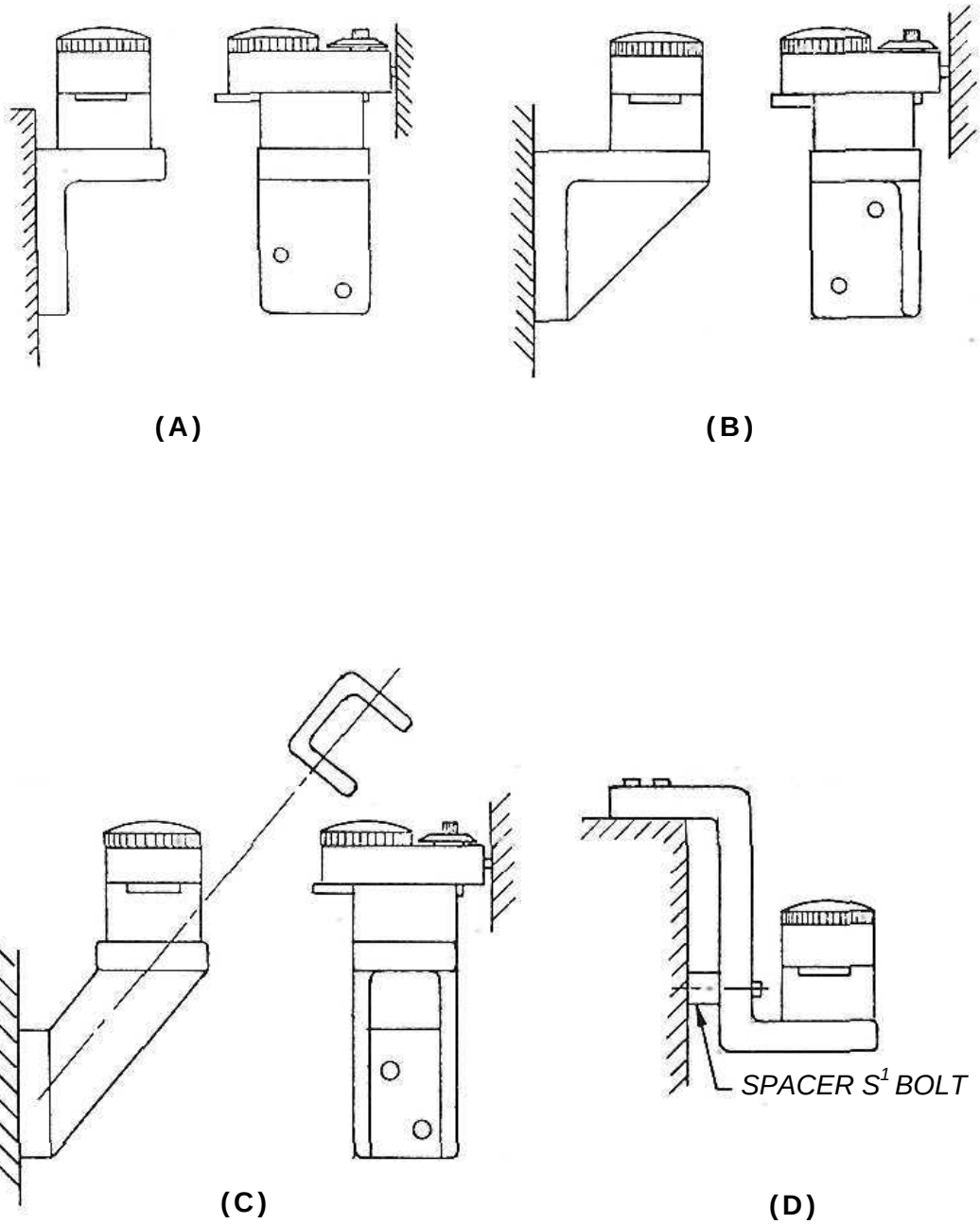
STEP NO. 1

MAKE OR BUY A BRACKET

USE SOUTHWESTERN INDUSTRIES, INC. BRACKET OR DESIGN AND FABRICATE RIGID BRACKET THAT DOES NOT FLEX.

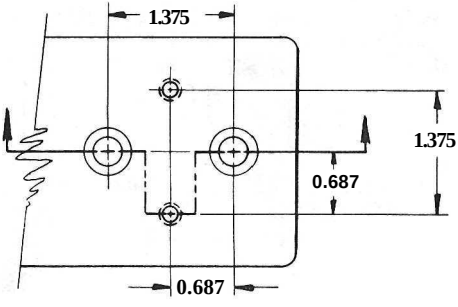
The material may be aluminum or steel, but heavy enough to assure rigidity. (See Fig. 1.)

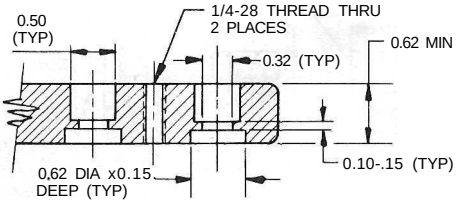
Figure 2 shows the hole pattern and the bores required for special adjusting bolts and washers. The special hardware facilitates the alignment and adjustment of the Trav-A-Dial.



PRINCIPLES OF BRACKET DESIGN

Fig. 1





HOLE PATTERN FOR ALIGNMENT MEANS.

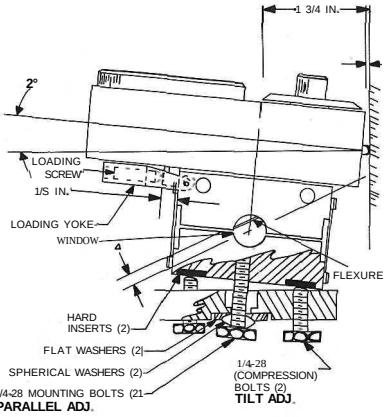
Fig. 2

STEP NO. 2

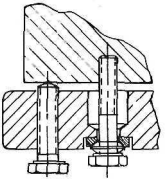
INSTALL M-3 MOUNTING BASE TO BRACKET

1/4-28 hex head bolts are used for mounting and parallelism adjustment. The bolt heads rest on spherically shaped washers, seated into flat washers which are free to move in counterbores provided in the bracket.
Hardware is supplied with Trav-A-Dial.

1/4-28 hex head bolts with spherical ends are used to push against hardened inserts in the bottom of the M-3 base for tilt adjustment. (See Fig. 3.)



INSTALLATION AND PRELIMINARY ALIGNMENT



DETAIL OF ALIGNMENT MEANS HARDWARE

Fig. 3

STEP NO. 3

ATTACH BRACKET TO MACHINE

STEP NO. 4

INSTALL TRAV-A-DIAL ONTO BASE

1) 1-3/4 inch dimension shown **(Fig.** 3) from mounting bolt centerline to the running surface will result in a dovetail projection of approximately 1/8 inch with the M-3 base.

2) Adjust gibs to obtain imperceptible side play with freedom of motion along the gib axis. Do not lubricate gibs since they will be locked after Trav-A-Dial calibration.

3) Align Trav-A-Dial with initial forward tilt angle of approximately 2° as shown. Also, align square to the running surface so that dimension "A" is the same from each front corner of the case. This adjustment can be made by leaving all four bolts just finger-tight while shifting the base angularly. Tighten bolts to prevent shifting after adjustment.

4) Insert loading yoke (with hooks up, as shown) engaging the two rollpins provided. Apply load by tightening the screw while observing the compression flexure through the windows in the base. This flexure will buckle in either direction from center. Tighten until the flexure is approximately 2/3 of distance from center to stop, at which point the Trav-A-Dial friction wheel has the proper engagement force.

Solidly tighten the gib adjustment screws to lock the dovetail in place.

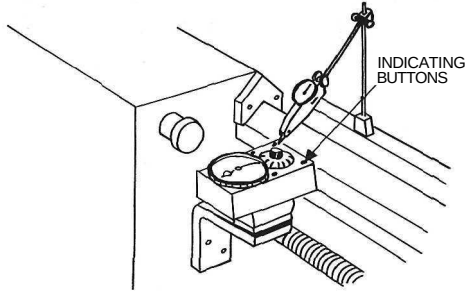
CAUTION: Continued tightening will cause the flexure to hit its stop (just disappear from the window) which is designed to protect the flexure against overstressing. Further tightening will break or bend the hooks in the loading yoke and require its replacement. See Figure 3.

The instrument is now ready for adjustment and calibration.

STEP NO. 5

PARALLELISM ADJUSTMENT

Align indicating buttons parallel to direction of machine travel within .0005" of one another as compared by a .0001" dial indicator. Mount the indicator so that its stylus contacts the tops of both buttons as the machine is traversed. Buttons are not necessarily ground flat. Compare only the highest reading of the buttons. (See Fig. 4.)



PARALLELISM ADJUSTMENT

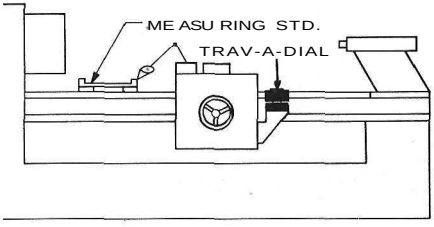
Fig. 4

STEP NO. 6

ADJUST FOR MEASUREMENT ACCURACY

6 (A) SET UP STANDARD

The SWI 6", 18" or 24" measuring standard or gage blocks should now be positioned on the machine parallel to its line of motion so that the measuring error of the Trav-A-Dial can be read (See Fig. 5).



SETUP OF STANDARD FOR MEASURING ACCURACY ADJUSTMENT

Fig. 5

This is done by using a .0001" dial test indicator on a magnetic base positioned so that the test indicator point can be zeroed against one of the measuring flats on the standard.

Be certain that the magnetic base and dial indicator are mounted so that they will not move or deflect when traversing the machine or making comparative readings. An improperly tightened or mounted dial test indicator can be responsible for many installation problems not related to the Trav-A-Dial.

6 (B) ZERO TEST INDICATOR AND TRAV-A-DIAL

When the dial indicator is zeroed, the Trav-A-Dial should then be zeroed.

6 (C) READ THE MEASUREMENT ERROR

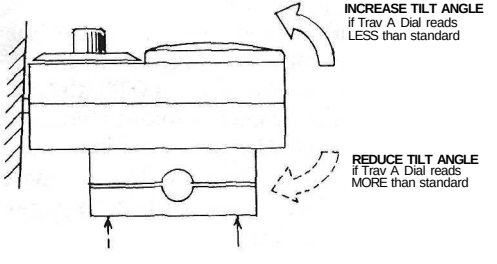
The machine should be traversed so that the dial indicator again zeroes on the second measuring flat. When thus positioned, you will read the measurement error on the Trav-A-Dial.

6 (D) ADJUST OUT THE ERROR

If the measuring error is .002" or more in each direction, unload gib screws and yoke. Make tilt adjustment, then re-engage the Trav-A-Dial prior to checking measurement. If the error is less than .002", the tilt adjustment can be made without unloading the Trav-A-Dial. Use pry tool to move Trav-A-Dial away from machine surface. Spin Trav-A-Dial wheel each time a tilt adjustment is made.

A forward tilt (toward knurled knob) will increase load and a backward tilt will diminish load.

If the error is such that the Trav-A-Dial hand reads more than the standard, adjust to reduce the tilt angle (See Figure 6) to achieve measuring accuracy at 6 or 24 inches. If on the other hand, with the dial test indicator zeroed against the measuring flat at 6 or 24 inches, the Trav-A-Dial hand does not quite read 6 or 24 inches, increase the tilt angle. This procedure should be continued until the accuracy is within .0005" at 6, 18 or 24 inches, whichever standard is used for setup.



ADJUSTMENT FOR MEASUREMENT

Fig. 6

Always be certain when making tilt adjustments that you do not allow the mounting base adjustment bolts to loosen and that tension remains about the same. This is achieved by slightly tightening one and slightly loosening the opposite adjustment bolt for relatively coarse settings. For fine settings, it is usually sufficient to merely tighten the appropriate bolt.

NOTES