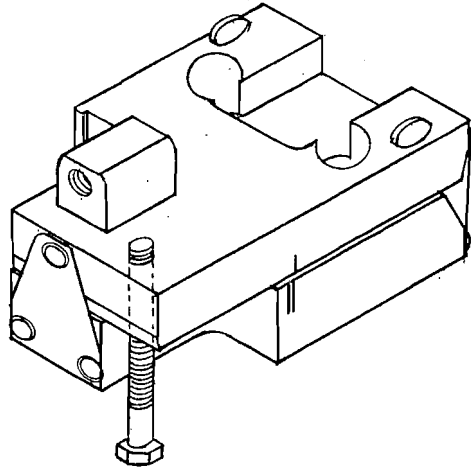


SECTION III

Installation Hardware

A - THE M-5 MOUNTING BASE

An M-5 Mounting Base comes with each Trav-A-Dial or TRAK Sensor.

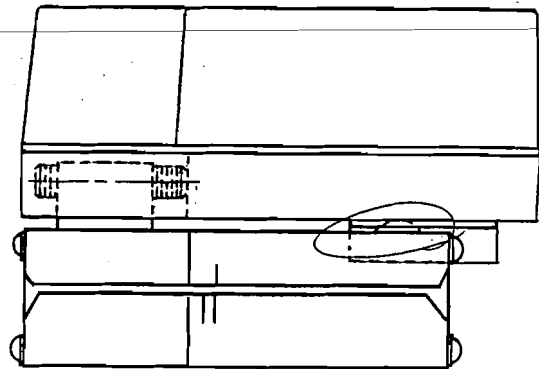
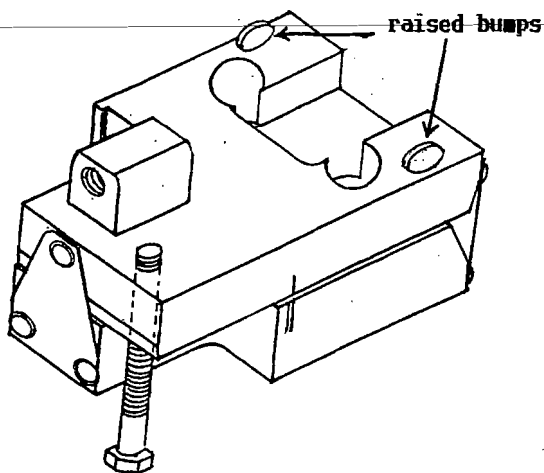


The M-5 Mounting Base holds the Trav-A-Dial or TRAK Sensor. It is attached firmly to the Bracket.

The M-5 Mounting Base performs the following important functions:

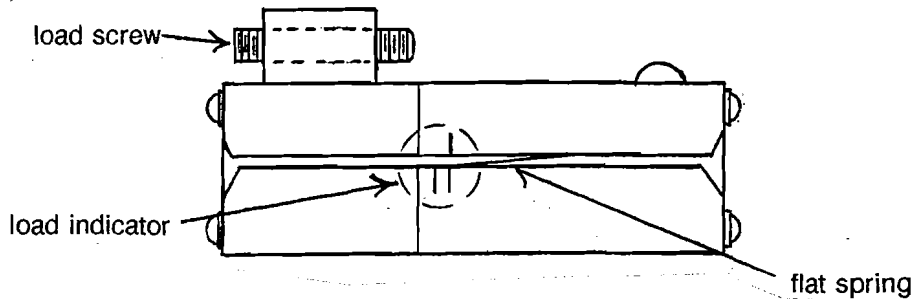
1. Precision in alignment and tilt.

The two raised bumps in the front of the base match the slots on the underside of the Trav-A-Dial and TRAK Sensor. They provide a stable surface for the Trav-A-Dial and TRAK Sensor. Their radius allows the Trav-A-Dial to tilt during calibration.



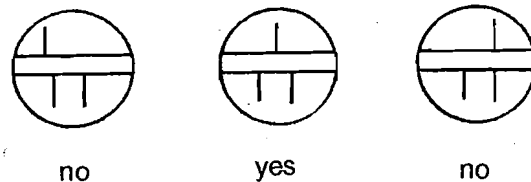
2. Loading force on Gage Wheel.

Between the two parts of the M-5 Mounting Base, there is a flat spring. It is visible when the M-5 Base is viewed from the side, as in the drawing below.



The flat spring provides the 18Kg of force for the Gage Wheel. When the Gage Wheel is in contact with the running surface, the load screw of the M-5 is tightened.

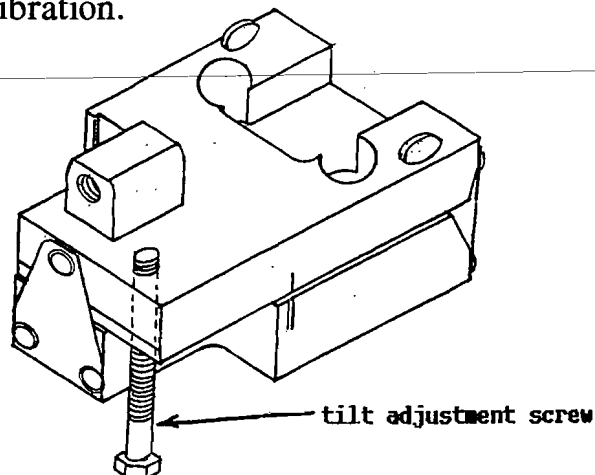
The load indicator shows when the load is correct.



When the load indicator is in the "yes" condition, the force of the Gage Wheel against the Running Surface is 18Kg.

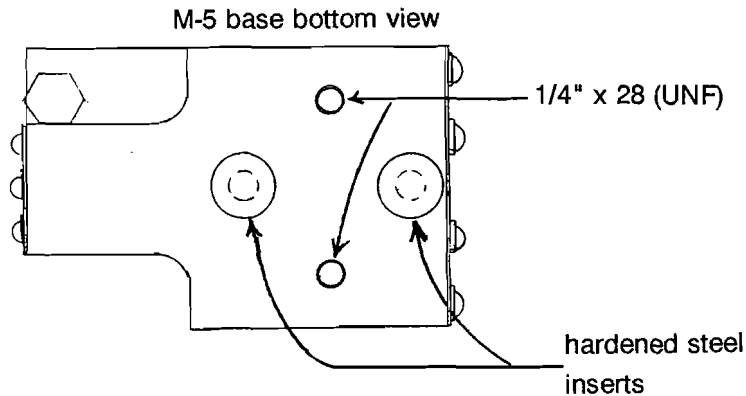
3. Fine adjustments in tilt (angle) of Trav-A-Dial.

The Tilt Adjustment screw is used to make fine adjustments to the angle of the Trav-A-Dial for calibration.



Note: The TRAK Sensor is calibrated electronically.

4. Attachment to Bracket and adjustment of level.



On the bottom of the M-5 Base are two tapped holes for the screws which hold the Base to the Bracket.

Also on the bottom are two hardened steel inserts for the leveling screws to push against.

The opposing action of these screws makes possible adjustments of the level of the base side to side and front to back, while the M-5 Base is tightened rigidly to the bracket.

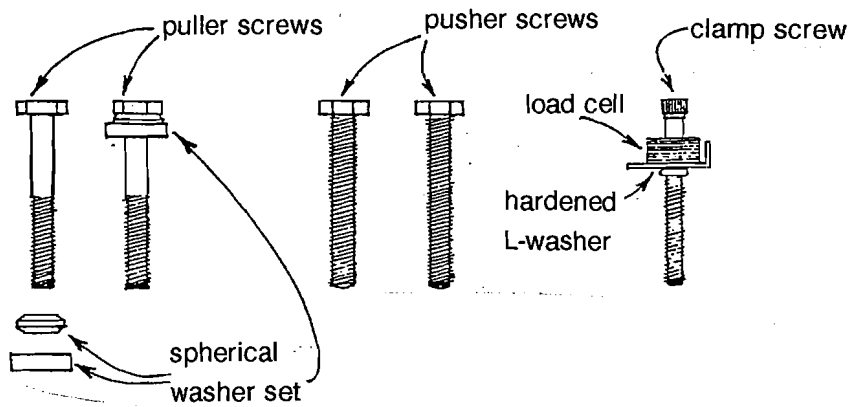
5. Protect Trav-A-Dial or TRAK Sensor.

The M-5 Base is designed to break and relieve stress on the Trav-A-Dial or TRAK Sensor if there is an accident (for example, a machine "crash").

This way, a cheap part is sacrificed in order to save an expensive part.

B - THE M-5 HARDWARE

The M-5 Hardware comes with each Trav-A-Dial and TRAK Sensor.

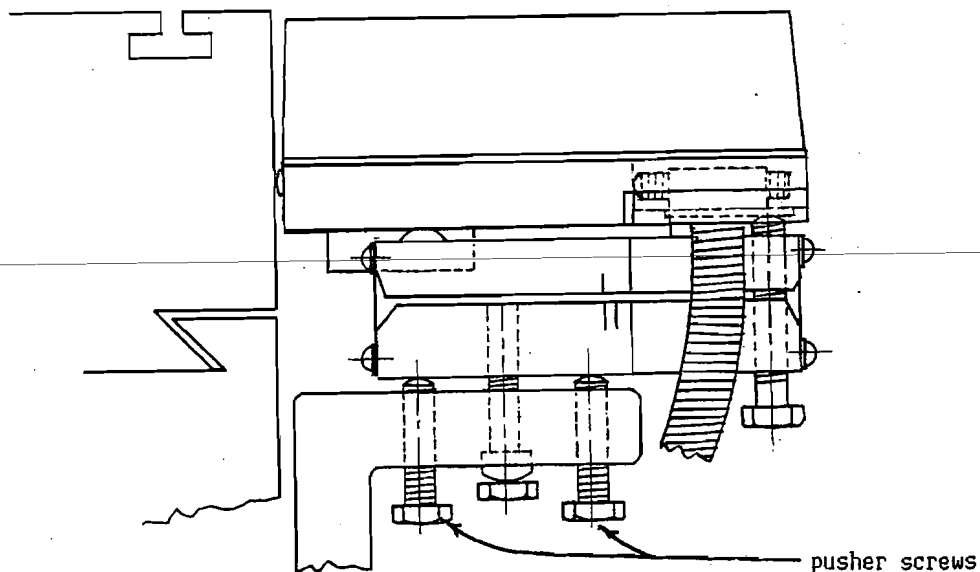


1. The Pusher Screws (2 each)

The Pusher Screws are 1/4" x 28 UNF Hex Head bolts with the ends rounded.

The Pusher Screws thread into the bracket and push against the hardened inserts on the bottom of the M-5 base.

Their function is to keep the M-5 Base from touching the bracket, and to allow front to back adjustment of the level of the M-5 Base.



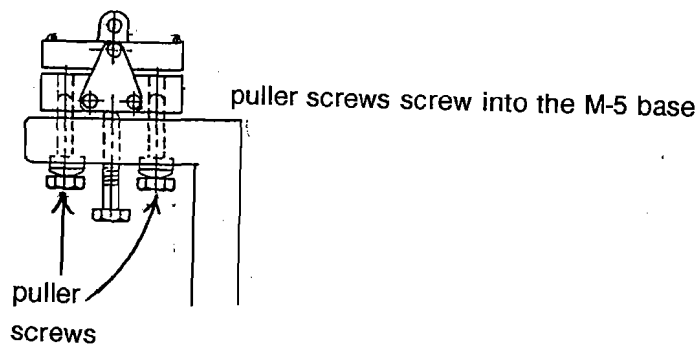
PUSHER SCREWS PUSH AGAINST THE M-5 BASE

2. The Puller Screws

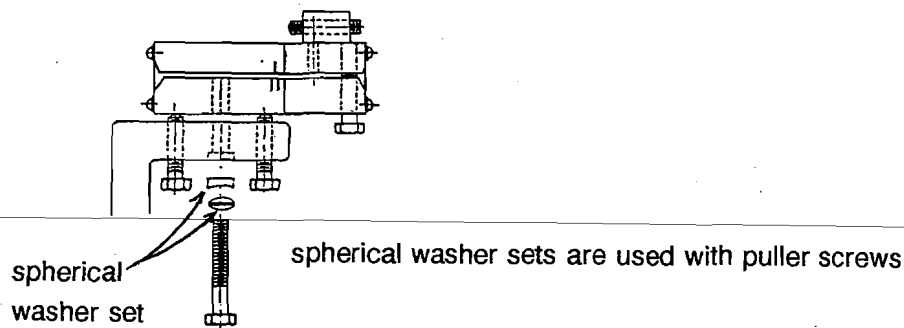
The Puller Screws are 1/4" x 28 UNF Hex Head bolts. They are used with the Spherical Washer Sets.

The Puller Screws go through the clearance holes in the bracket and thread into the tapped holes in the M-5 Mounting Base.

Their function is to hold the M-5 Base rigidly in contact with the Pusher Screws, and to allow side-to-side adjustment of the level of the M-5 Base.



The Spherical Washer sets are used with the Puller Screws. Their function is to allow uniform seating of the bolt against the bottom of the Bracket, even when the Bracket position is at a slight angle, or the Bracket surface is uneven.



The Puller and Pusher Screws allow fine adjustments to the level of the M-5 Base to be made and eliminates the need to position a Bracket precisely.

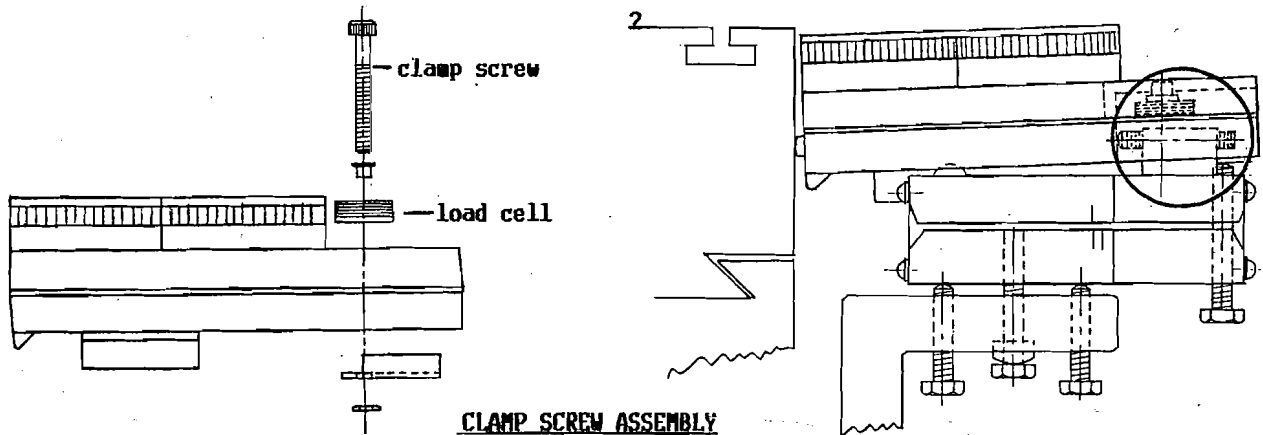
3. The Clamp Screw

The Clamp Screw is an 8-32 (UNF) socket head cap screw. It is used with the load cell for Trav-A-Dial installations, and with a single washer for TRAK Sensor installations. It is also used with the Hardened L-Washer.

The Clamp Screw goes through the slot on the back of the Trav-A-Dial or TRAK Sensor. It screws into the tapped hole in the M-5 Mounting Base.

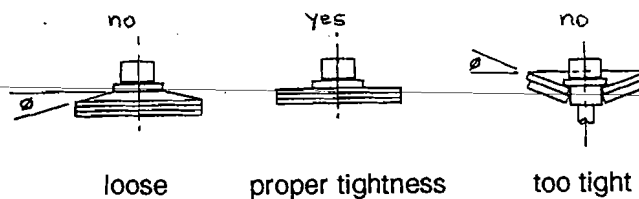
The function of the Clamp Screw is to hold the Trav-A-Dial or TRAK Sensor onto the M-5 Mounting Base.

1.



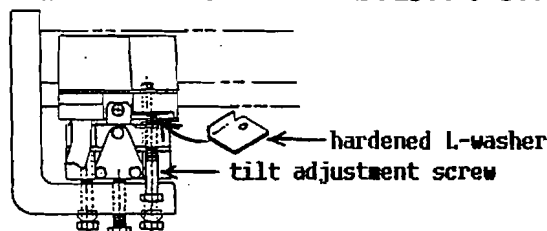
The function of the Load Cell is to keep a constant amount of force on the back of the Trav-A-Dial (the Load Cell is not used with the TRAK Sensor). The Load Cell enables the Trav-A-Dial to be removed for maintenance and replaced without changing the tilt angle and, therefore, the calibration.

The Load Cell is of proper tightness when the washers become flat.



The Hardened L-Washer fits between the Trav-A-Dial or TRAK Sensor and the Tilt Adjustment screw of the M-5 Mounting Base. The Clamp Screw passes through it on the underside of the Trav-A-Dial or TRAK Sensor.

The function of the Hardened L-Washer is to prevent the Tilt Adjustment screw from deforming the Trav-A-Dial or TRAK Sensor case.



C - BRACKETS

Brackets do not come with each Gage Wheel product, they must be purchased separately or made.

1. Function of the Bracket

The Bracket holds the Trav-A-Dial or TRAK Sensor with M-5 Base rigidly so that the Gage Wheel is able to form the "micro-rack-and-pinion" system with the running surface.

The Bracket positions the Trav-A-Dial where the operator can easily see and use it, does not limit machine travel, and where it does not create an obstruction or hazard.

The Bracket positions the TRAK Sensor so that it is not exposed to excessive contamination, does not limit the travel of the machine, and does not create an obstruction or hazard.

The Bracket must be strong and rigid to perform its function.

2. Manufacture of Brackets

Brackets are simple in design. SWI recommends that brackets be made in the domestic markets outside the U.S. because of the high costs of shipping.

Bracket designs follow in the next sections.

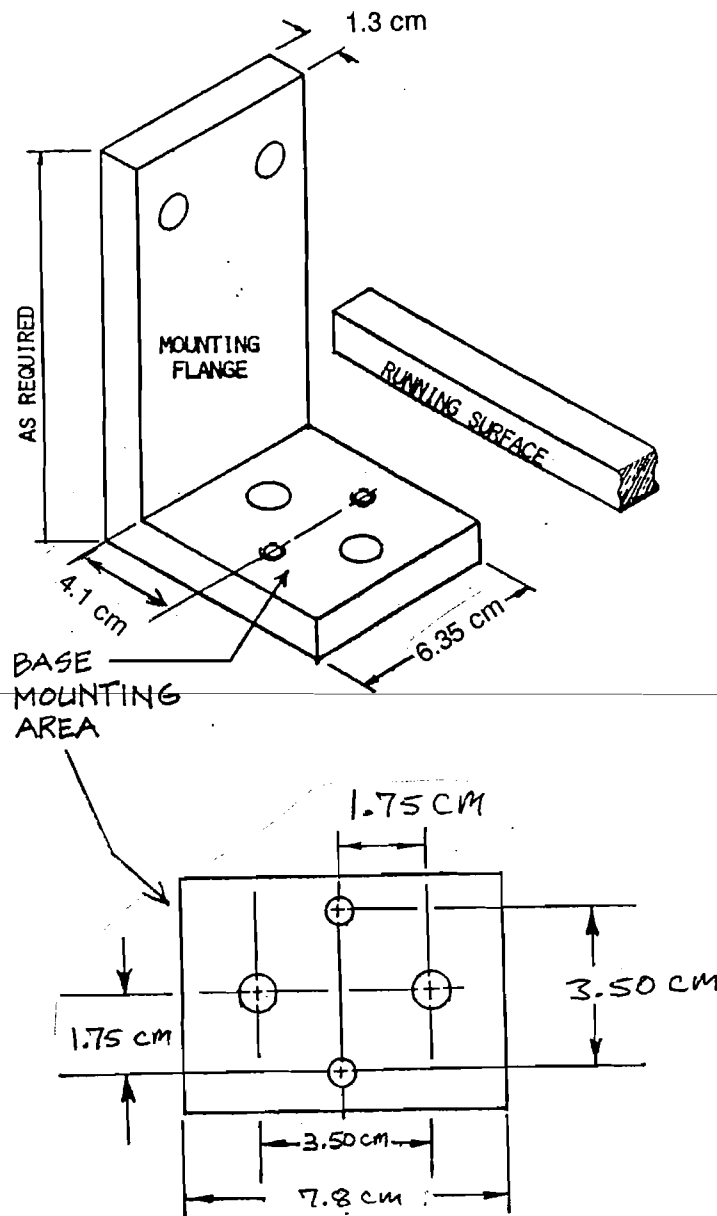
For manufacture, please apply the following conditions:

-
- Allow enough room for the Trav-A-Dial or Sensor to fit between the bolt hole pattern and the mounting flange.
 - Brackets must be extremely strong and rigid.
 - Minimum thickness of material is 1.3cm; maximum is 2cm.
 - Minimum width of the Bracket is 6.35cm.

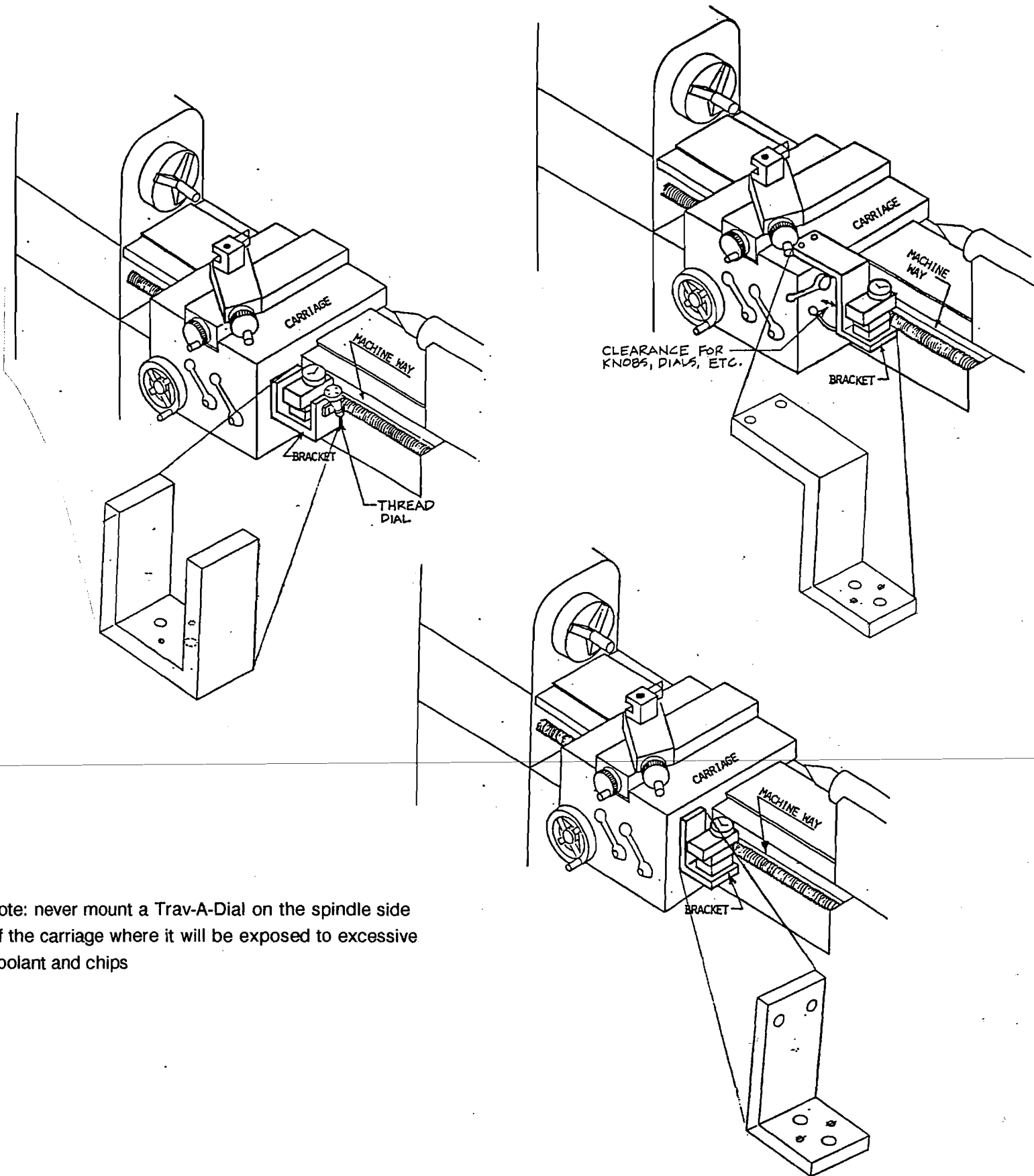
■ Suggested material:

- Aluminum alloy, 6356-T6 SAE (used by SWI)
- Aluminum alloy 6061-T6 SAE
- Most other aluminum alloy
- Steel (harder to drill)

NOTE: Weak, bent or poorly welded brackets may cause reading errors!

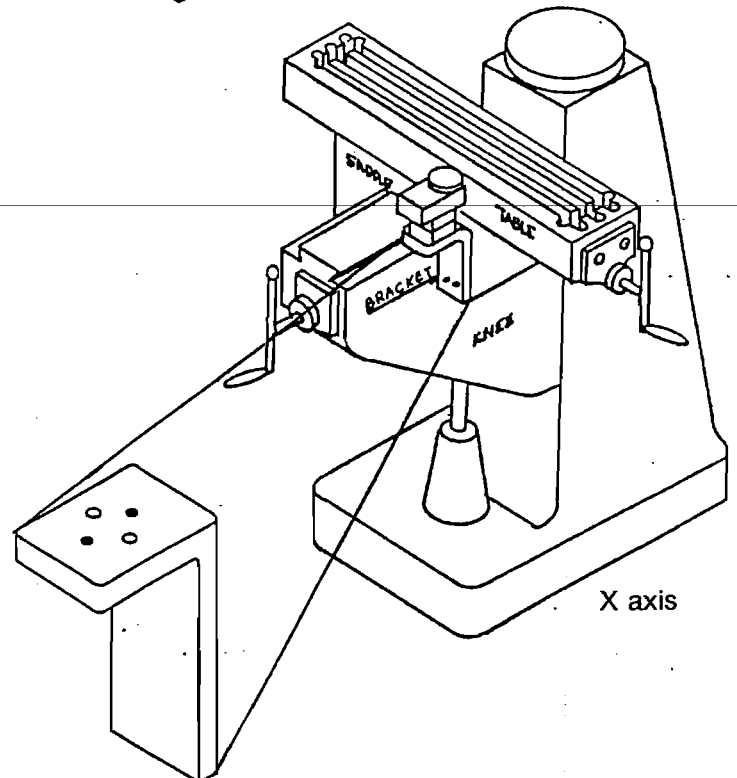
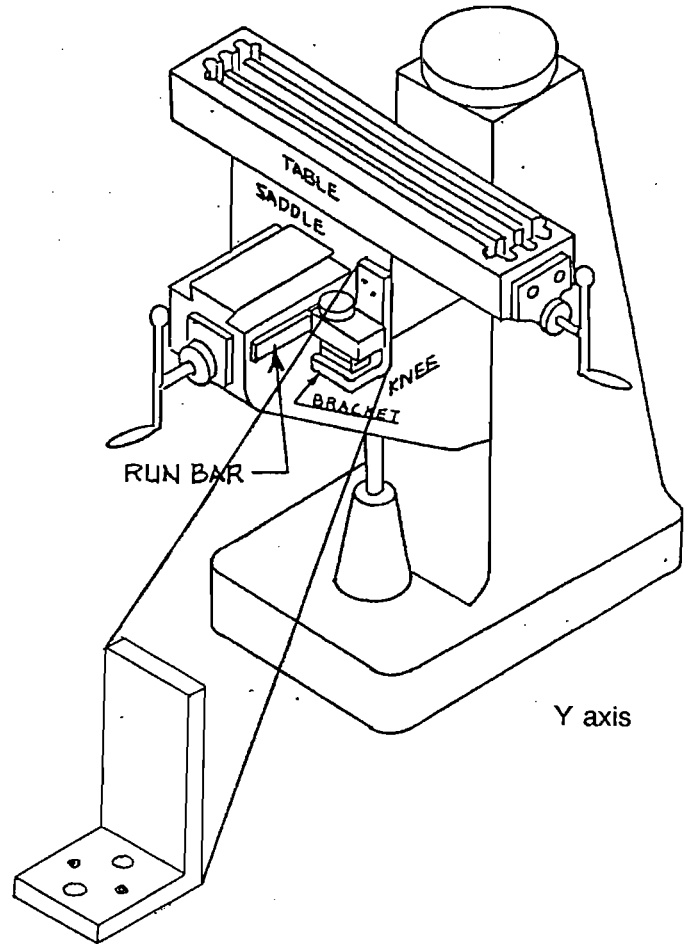
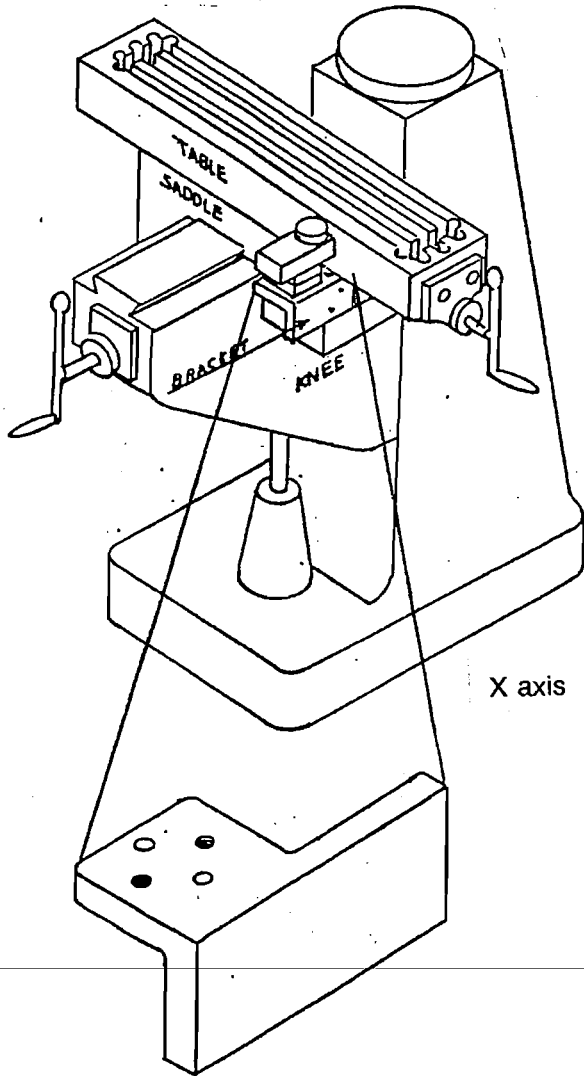


3. Examples of Trav-A-Dial Brackets for Lathes



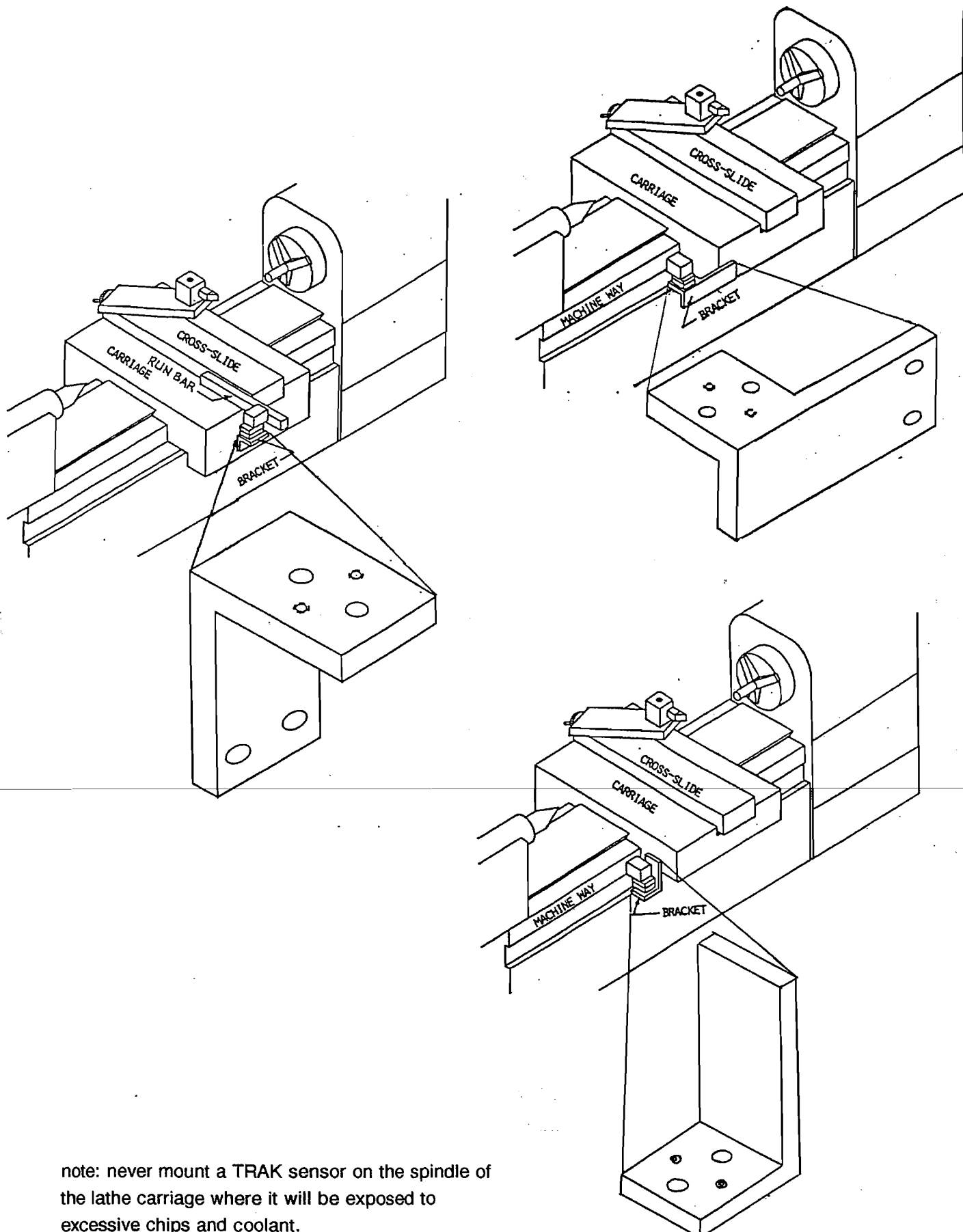
note: never mount a Trav-A-Dial on the spindle side of the carriage where it will be exposed to excessive coolant and chips

4. Examples of Trav-A-Dial Brackets for Mills



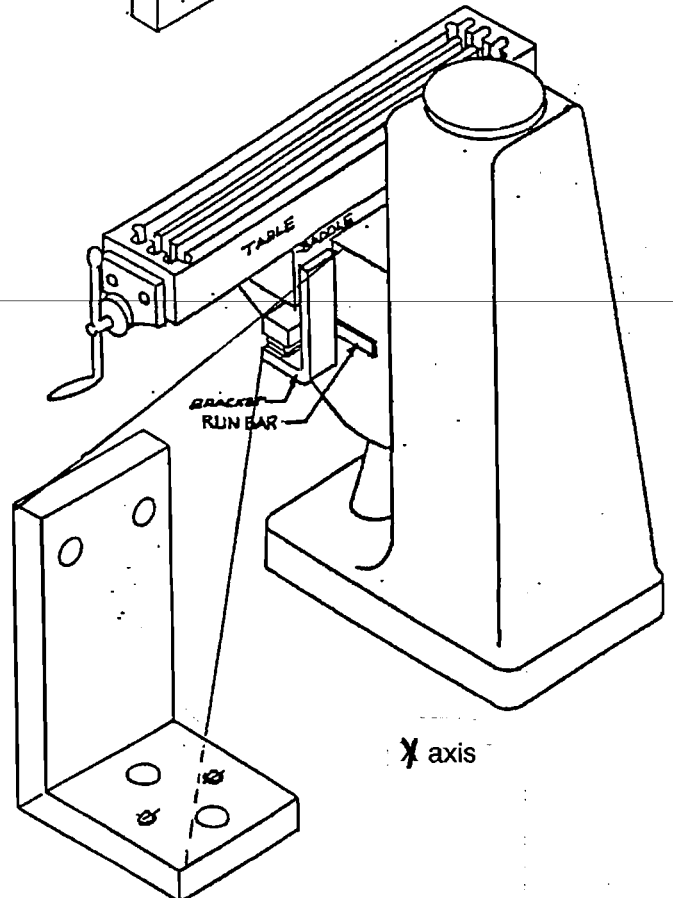
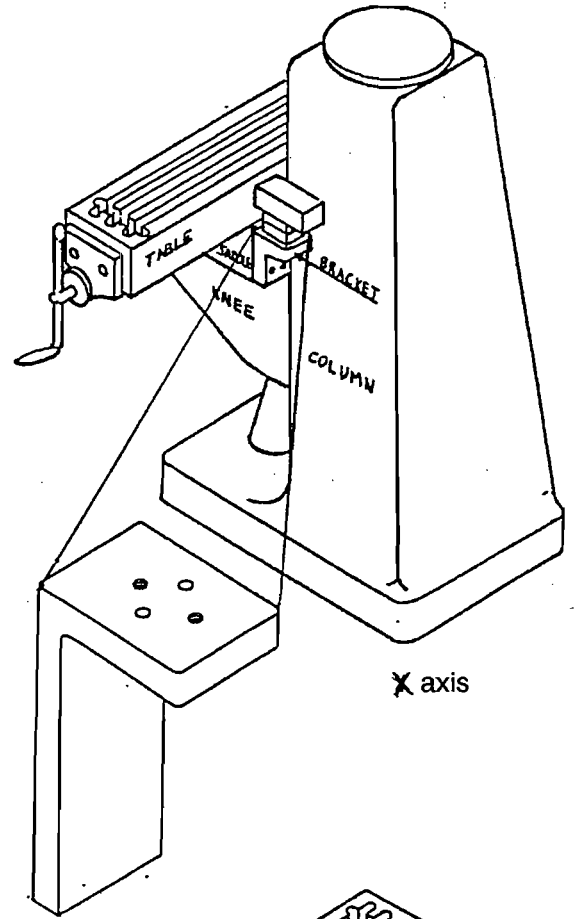
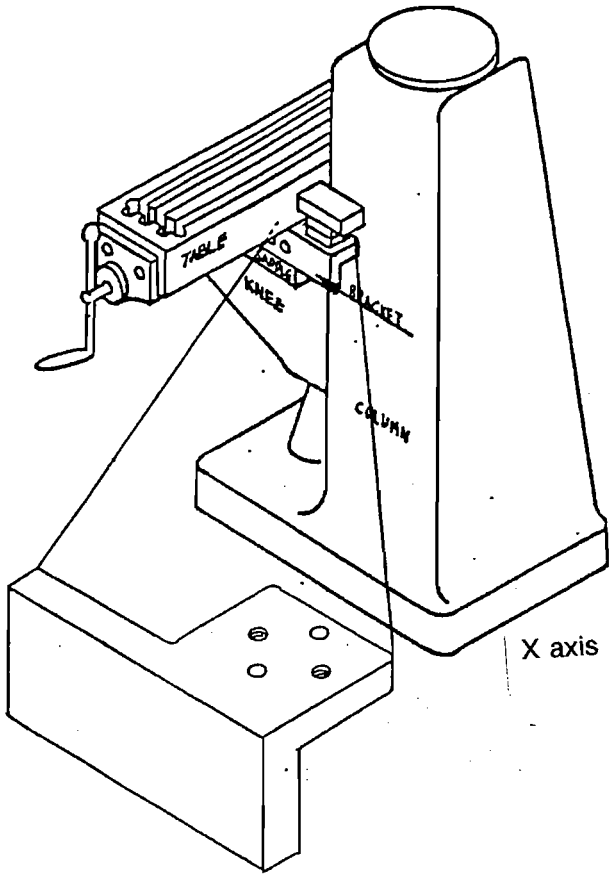
note: always mount the Trav-A-Dial so that it is below the table surface.

5. Examples of TRAK Sensor Brackets for Lathes



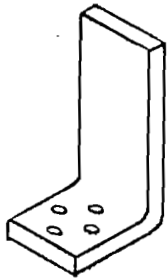
note: never mount a TRAK sensor on the spindle of the lathe carriage where it will be exposed to excessive chips and coolant.

6. Examples of TRAK Sensor Brackets for Mills



note: always mount the TRAK sensor so that it is below the table surface.

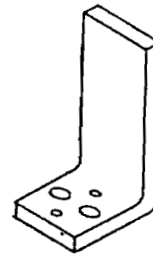
D - THE MOST COMMON BRACKET DESIGNS



BR17



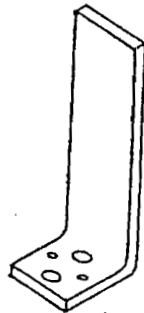
BR17-1



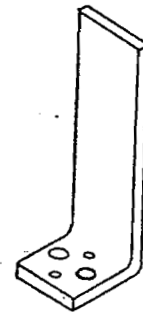
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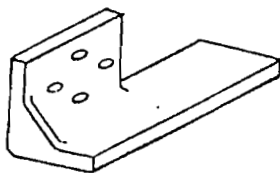
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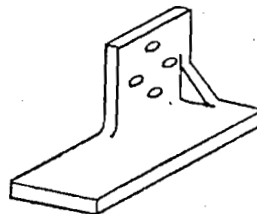
BR17D-1



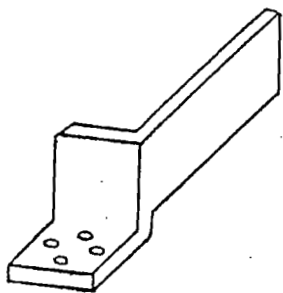
BR17D-2



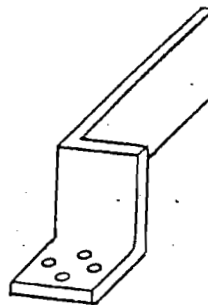
BR17c



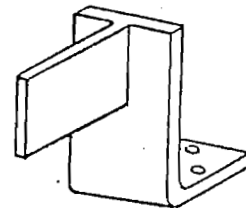
BR17E



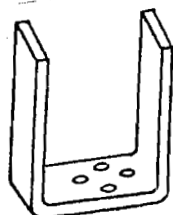
BR17F



BR17G

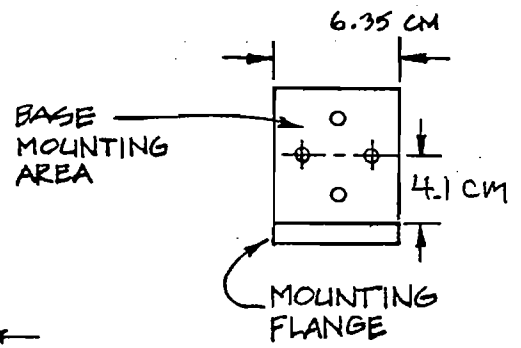
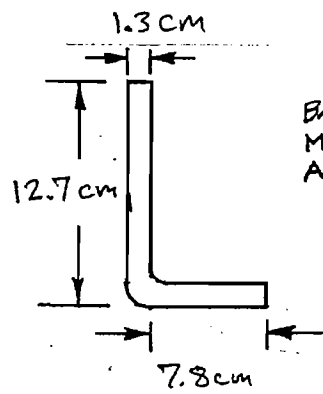
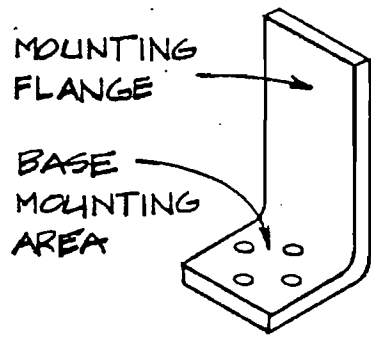


BR17H

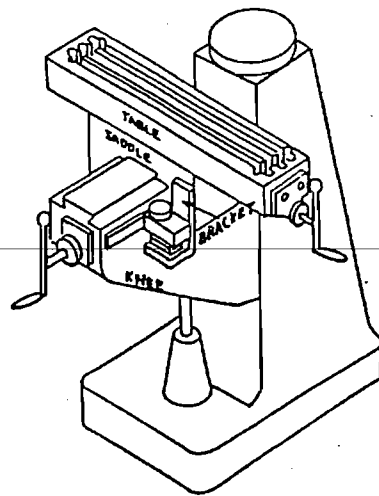
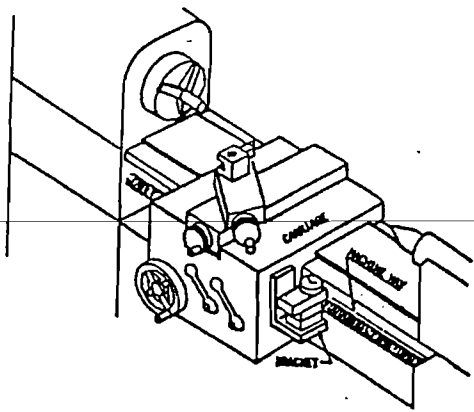
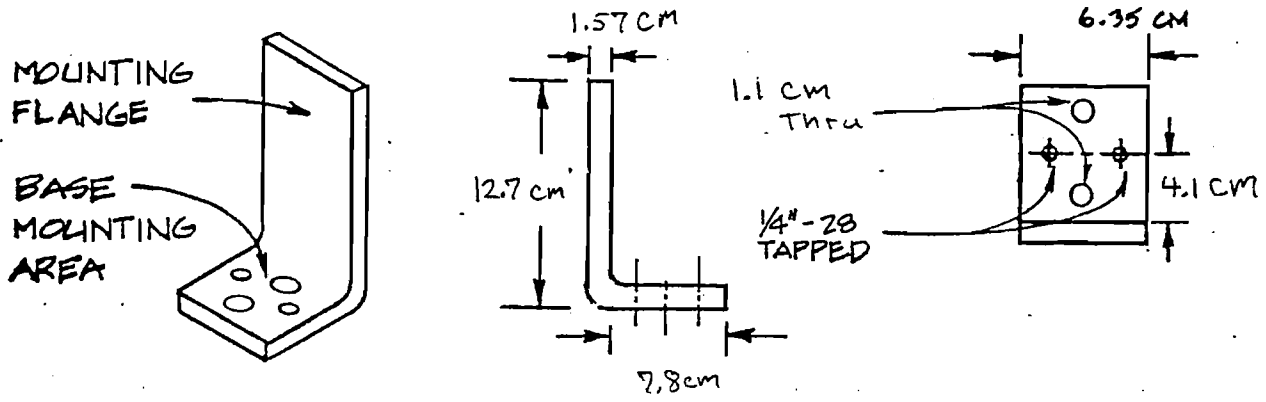


BR17J

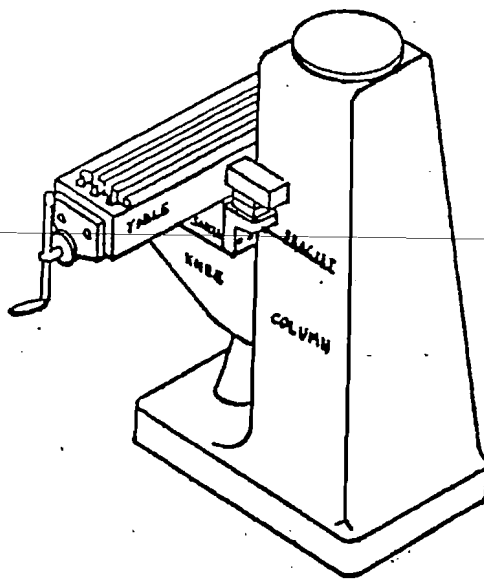
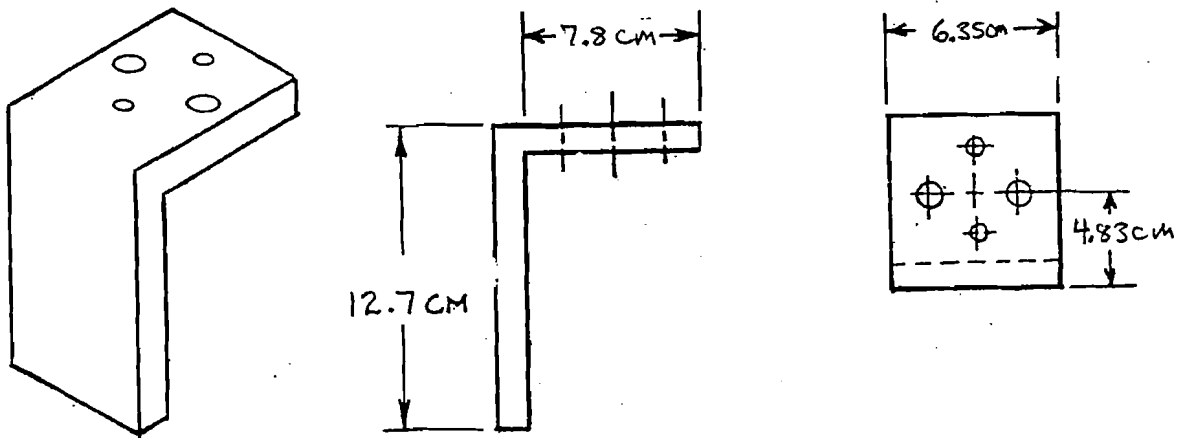
1. BR-17 Bracket



2. BR 17-1 Bracket

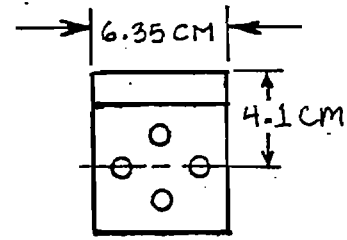
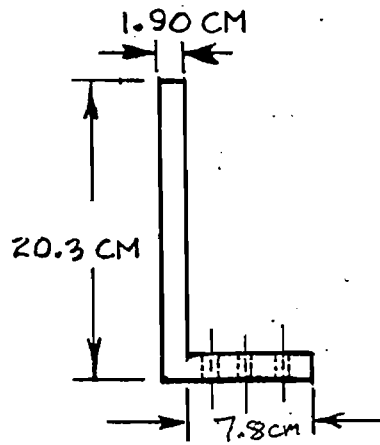
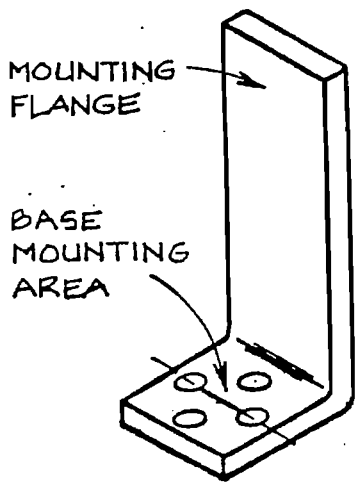


3. BR 17-2 Bracket

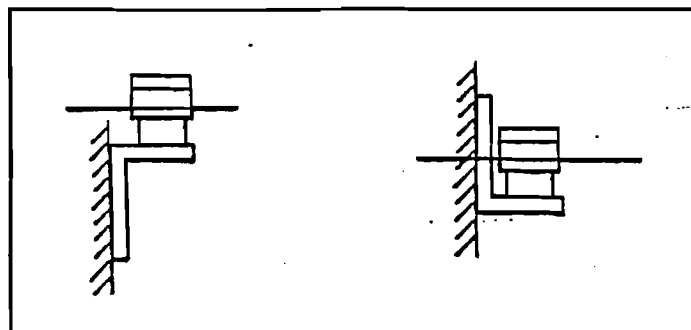
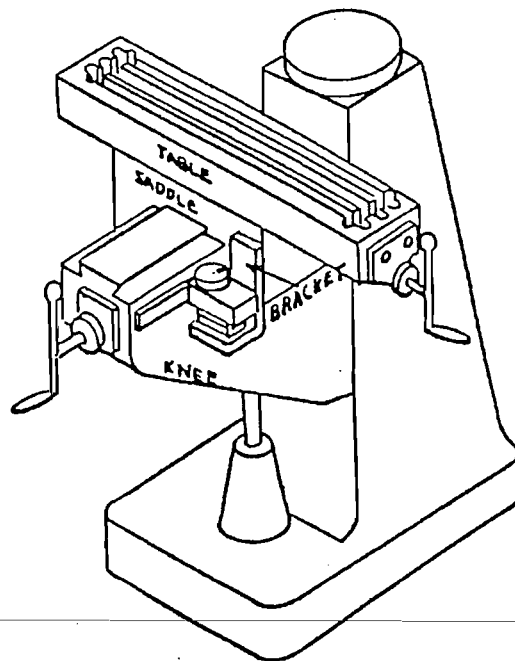
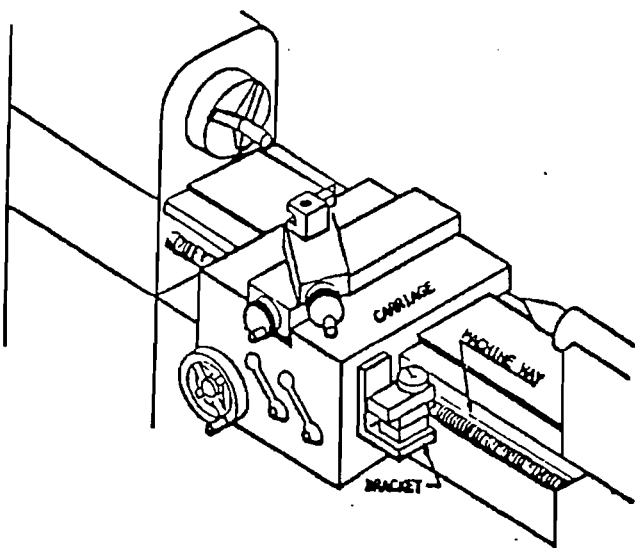
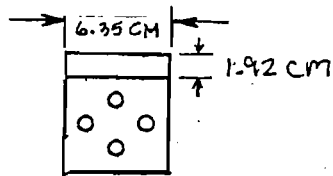
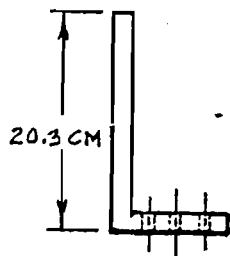
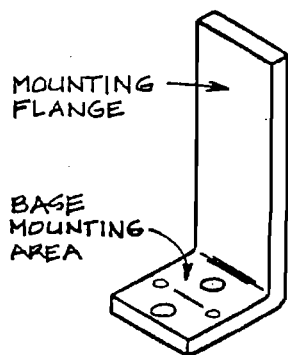


Common TRAK Sensor mounting with a BR17-2

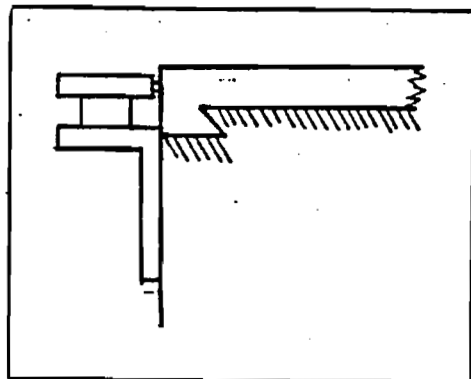
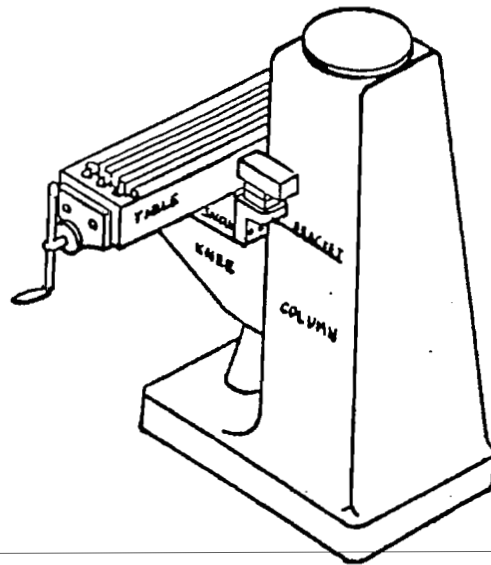
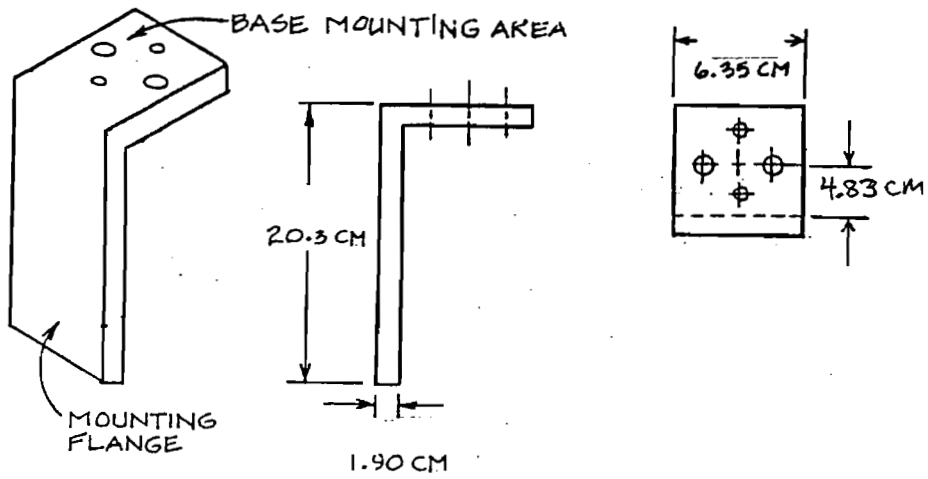
4. BR 17D Bracket



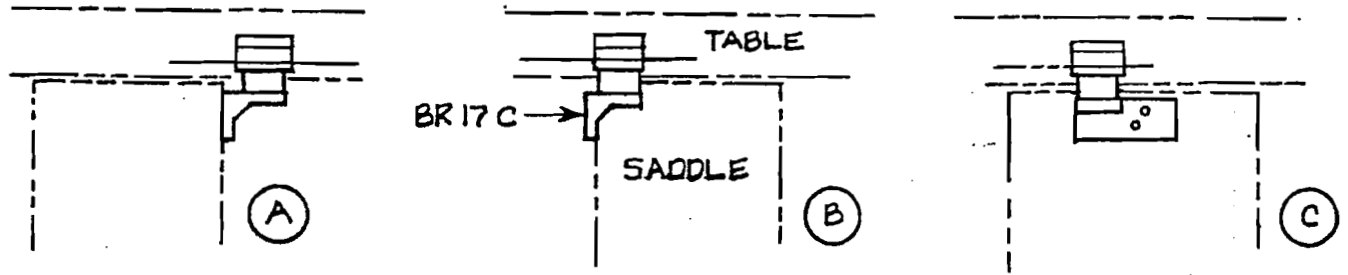
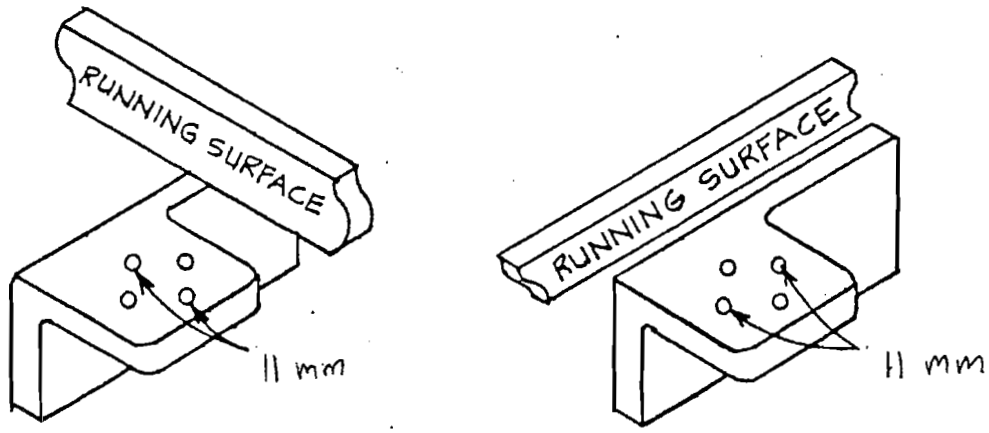
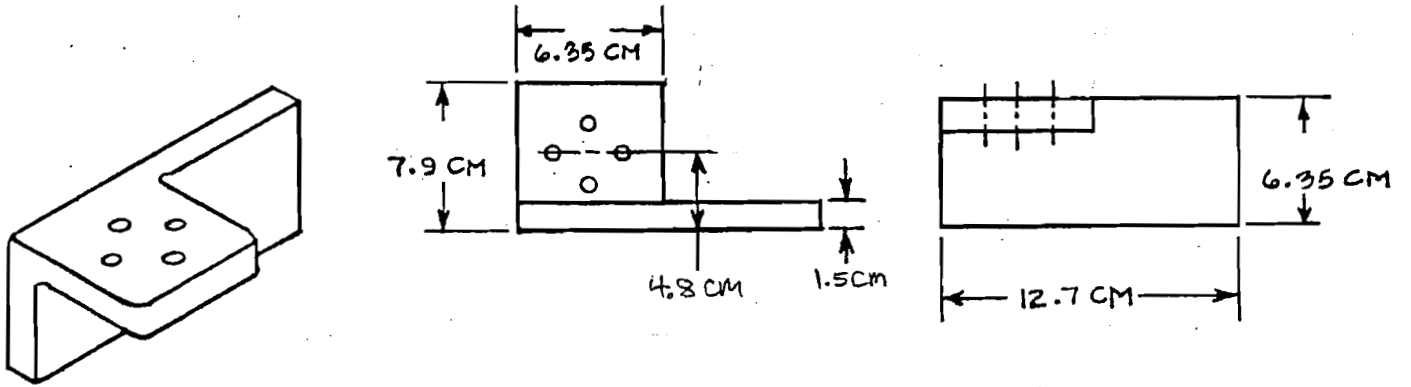
5. BR 17D-1 Bracket



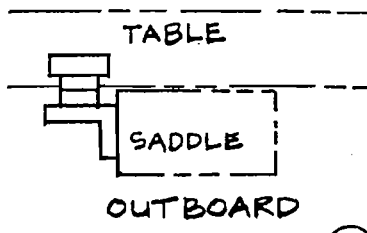
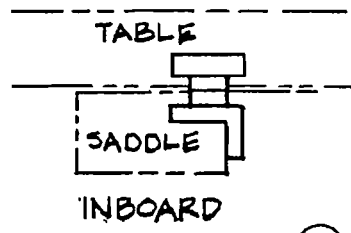
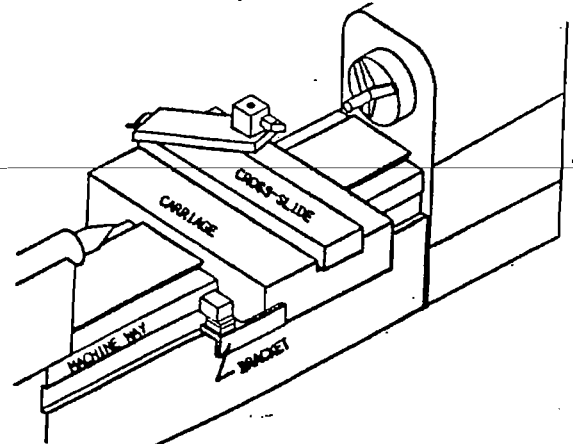
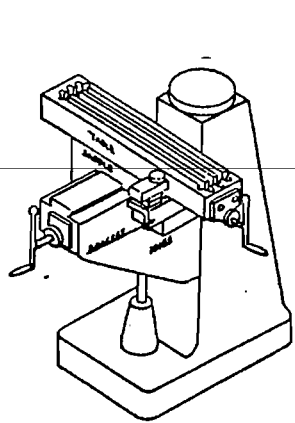
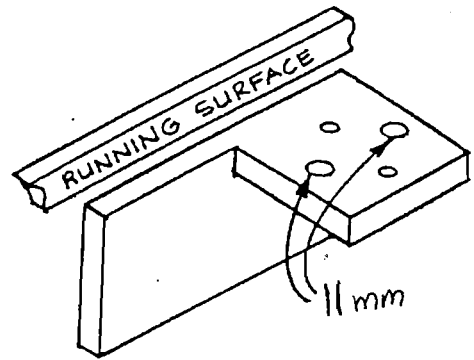
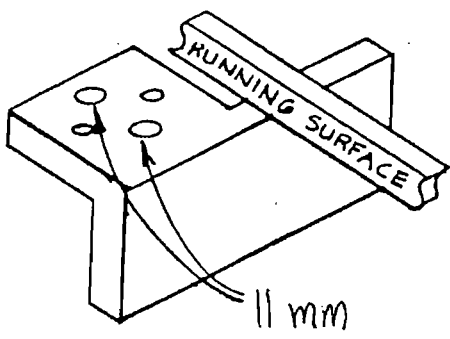
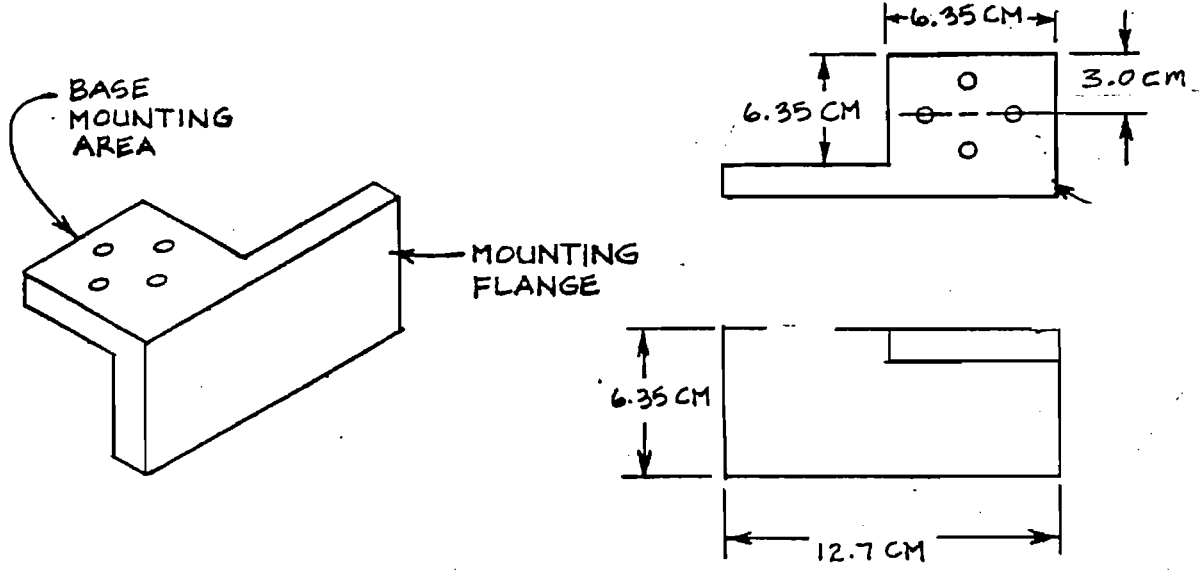
6. BR 17D-2 Bracket



7. BR 17C Bracket



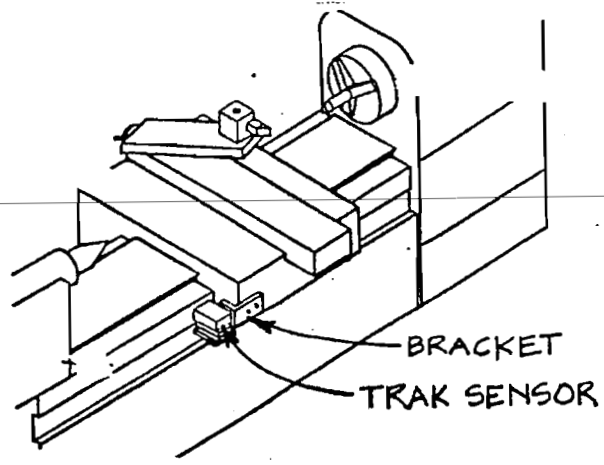
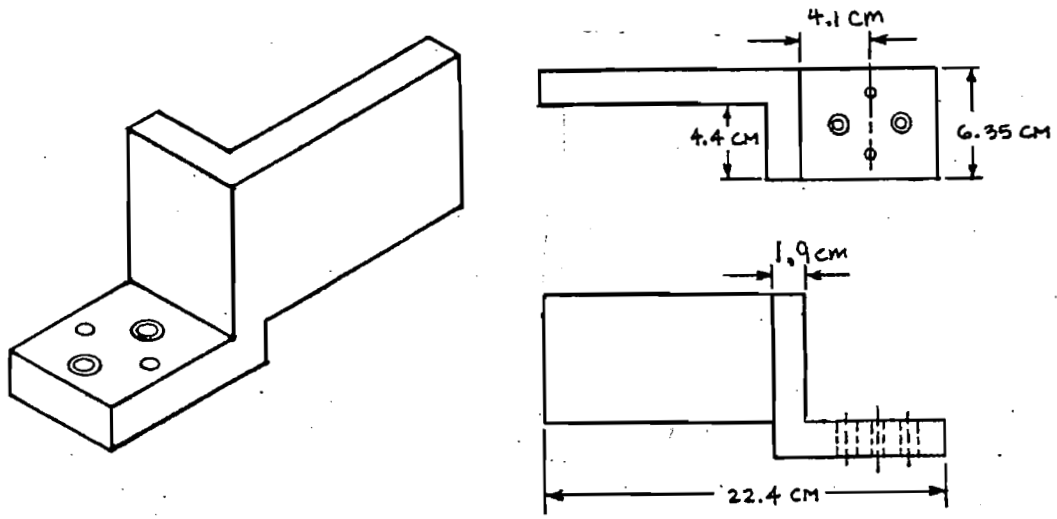
8. BR 17E Bracket



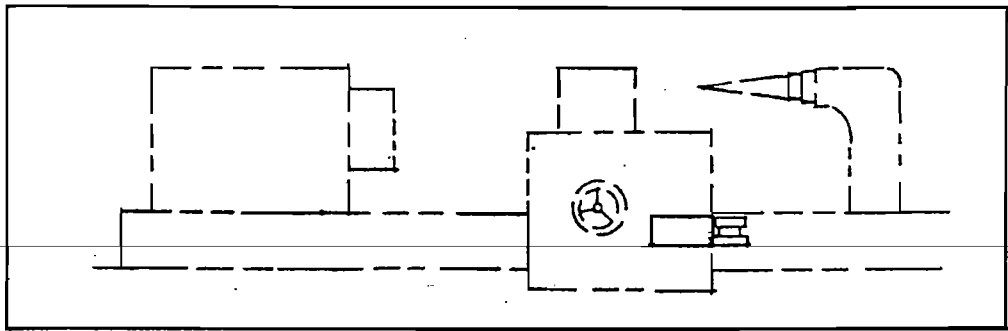
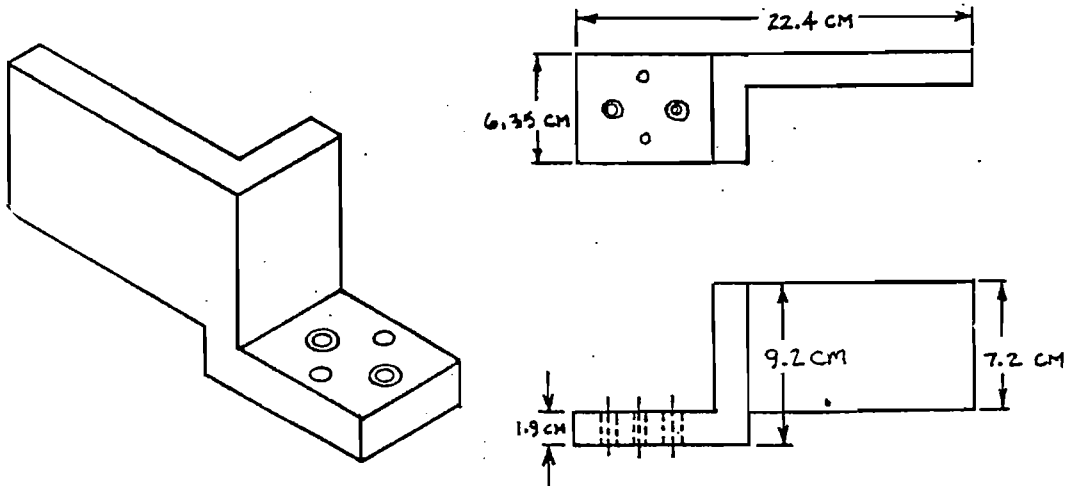
(A)

(B)

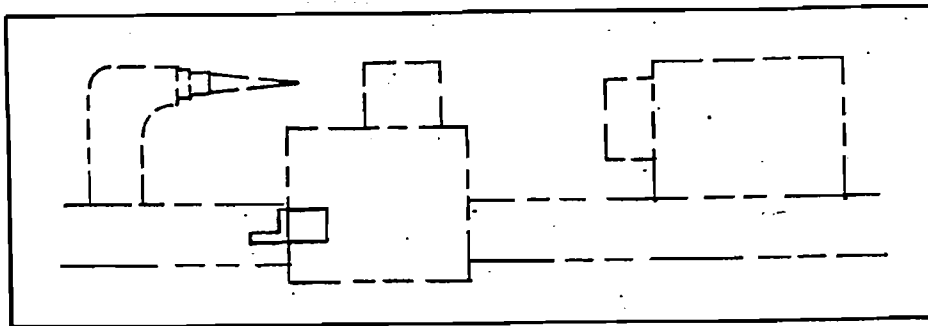
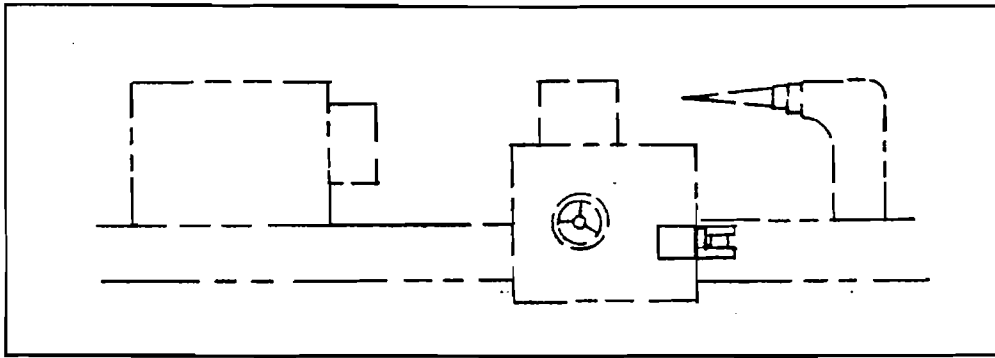
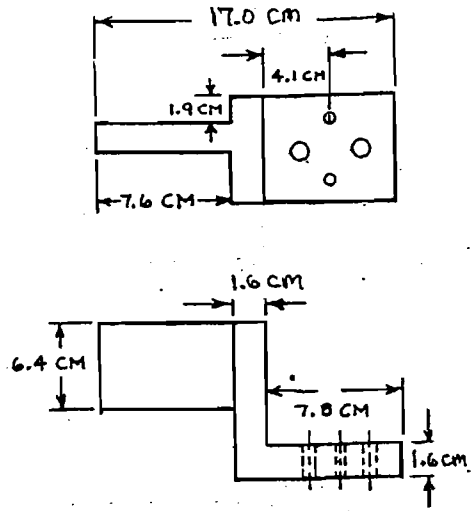
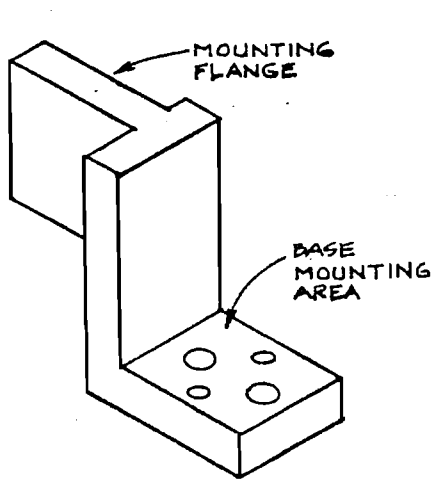
9. BR 17F Bracket



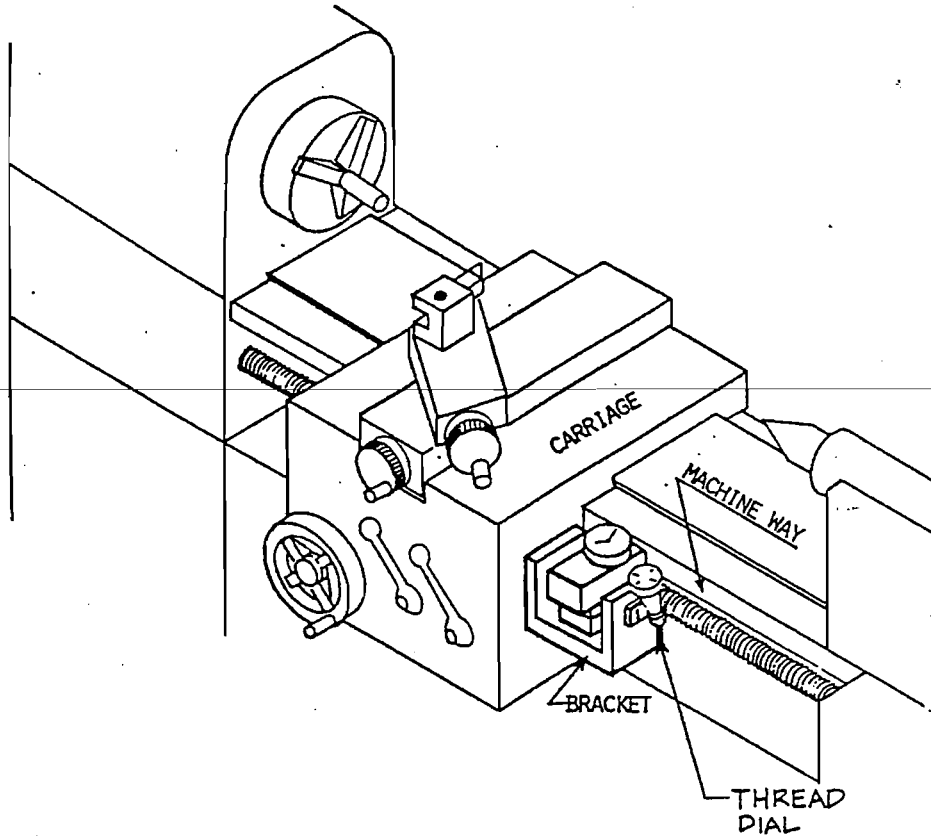
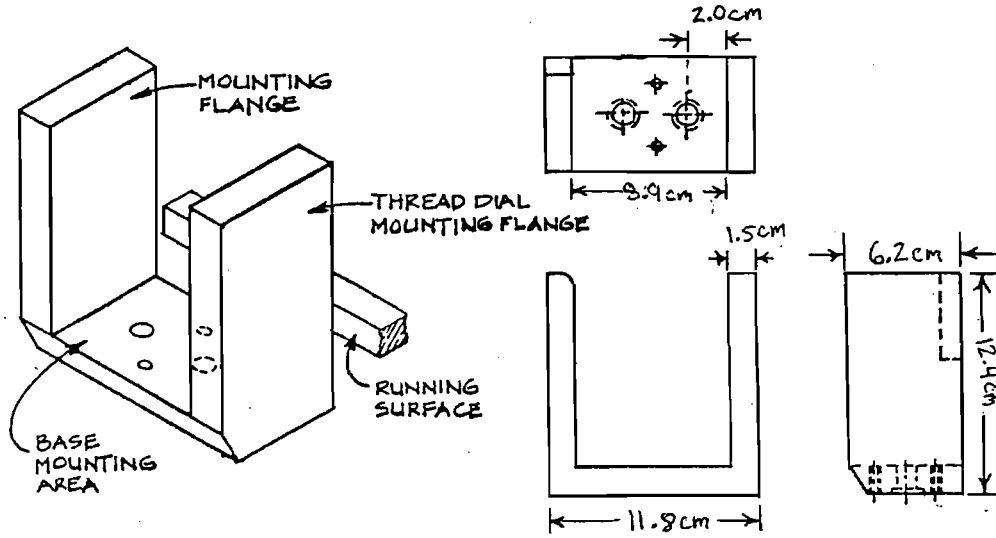
10. BR 17G Bracket



11. BR 17H Bracket



12. BR 17J Bracket

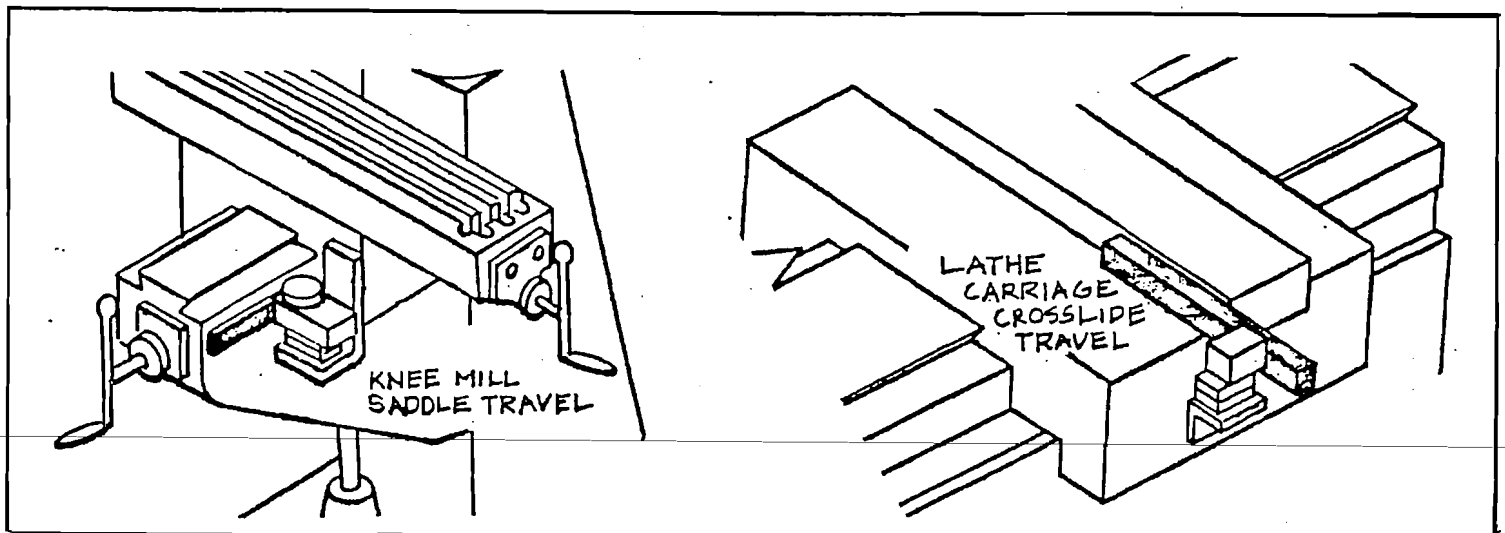


E - THE RUN BAR

The Run Bar provides a suitable running surface for the Gage Wheel for applications where no surface of the machine tool is suitable.

The Run Bar should have the following characteristics:

- Flat, smooth
- Free of twist
- Without paint
- Hardness does not exceed Rockwell 40C
- Allows parallel, unbroken travel of Gage Wheel along the entire travel
- Is indicated parallel to the machine tool axis travel within .010" (.3mm)



1. Fabrication of Run Bar

Run Bars may be easily fabricated.

- Hardness of stock should not exceed Rockwell 40C.
- Suggested Material: C1018 (AISI) Mild Steel

IMPORTANT: Run Bar stock should be flat and free from twist within .0005in/.01mm. Inspect carefully with a machinist's square!

- Suggested size of Run Bar Stock:
 - Thickness = 2.5cm
 - Width (running surface side) = 3.8cm

NOTE: Longer Run Bars should be made from thicker stock to avoid flexure.

- Run Bars should generally have no more than two holes.

