

MIMIK SINGLE AXIS TRACER
(For Planer Slides)
INSTALLATION and OPERATION
INSTRUCTIONS

SECTION I	<u>GENERAL DESCRIPTION OF SYSTEM</u>	
	General Description	1
	Tracer Valve	1
	Stylus	2
	Tracer Cylinder	3
	Hydraulic Power Supply	3
	Hydraulic Oil	3
	Valve Adjustment Slide	4
	Template Bracketry	4
SECTION II	<u>INSTALLATION</u>	
	Installation Procedure	4
SECTION III	<u>SET-UP FOR CUTTING</u>	
	Instructions	6
	Rough and Finish Cutting	7
SECTION IV	<u>MAINTENANCE</u>	
	Care and Maintenance	8
	Gib Setting Procedure	9
	Infeed Rate Setting on Tracer Valve	9
	Infeed Assembly Drawing	11
SECTION V	<u>TROUBLE SHOOTING CHARTS</u>	
	Vibration	12
	Surface Finish Problem	12
	Part-to-Part Variations	13
	Template-to-Part Variations	14
	Slide Hang-Up	15
	Valve Hang-Up	16

MIMIK SINGLE AXIS TRACER
For Planer Heads

INSTALLATION and OPERATOR INSTRUCTIONS

1. GENERAL DESCRIPTION OF SYSTEM

The MIMIK tracer is a single-axis hydraulic servo controlled attachment designed to suit your planer. The tracing cylinder is mounted to the planer head, and the tracer valve is mounted to an x-y co-ordinate adjustment slide connected to the planer slide by a pivoting valve carrier arm. The operator may thus position the tracer valve at any desired location.

The template bracket is attached to the planer cross-rail, and can be a "clamp-on" style, or bolted to the crossrail top rear surface

Deflection of the tracer valve stylus as it is fed along the template contour directs hydraulic fluid to either side of the piston. The resulting slide movement, combined with the basic machine pick-feed, moves the cutting tool in a path identical to the template profile.

The main components of this system and their functions are as follows:-

TRACER VALVE

The tracer valve controls the amount and direction of oil flowing to the hydraulic cylinder.

This is accomplished by deflection of the stylus which bears against the template.

MIMIK tracer valves are equipped with the following controls:-

a) Ininitely Variable Infeed Rate Control

To adjust the infeed rate of the slide, rotate the knurled slow feed knob located on the tracer valve.

- Clockwise will decrease infeed rate
- Counterclockwise will increase infeed rate.

The correct setting should provide an infeed slightly greater than needed to follow the template contour.

b) Retract Control Lever

This two position control allows normal infeed for tracing, and rapid retract.

c) Stylus Pressure Control

Stylus actuating pressure is a function of the spool return spring pressure and frictional resistance. Stylus pressure adjustment on the tracer valve provides a stylus pressure of approximately 4 ounces to 2 pounds. A light stylus pressure provides maximum sensitivity and good surface finish, but must be heavy enough to ensure positive spool return.

Recommended stylus pressure is between 4 and 8 ounces. (Dot on adjusting screw about 3/16" counterclockwise from 'L' position).

STYLUS

To ensure accurate template-to-part reproduction the following basic rule must be observed.

Stylus and tool must be ground to a matching radius slightly less than the smallest radius to be traced. Most applications can be traced with the wedge-shaped stylus normally supplied.

As is normal with any tracer valve when a tool is cutting on more than 90° of its configuration, compensation has to be made for "stylus deflection". Stylus radius must be increased approximately .005", depending on the infeed setting, feed rate and tracer slide angle.

NOTE: When the correct compensation has been determined, the major variables noted above which affect this type of error, must not be changed.

TRACER CYLINDER

The cylinder mounts vertically from the top of the planer slide base, with the piston rod anchored to the moving clapper box slide.

The planer slide must have adequate lubrication to ensure minimum slide friction.

HYDRAULIC POWER SUPPLY

- a) 18 U.S. gallon capacity reservoir
- b) 5 U.S. gpm pump
- c) 1 1/2 hp, 220-440-550 volt three-phase electric motor
- d) operating pressure 250 - 275 psi

All hydraulic power units are equipped with 5 micron filtration.

The oil level should always be visible in the center of the sight glass, located on the side of the hydraulic reservoir.

KEEP YOUR HYDRAULIC SYSTEM CLEAN!

HYDRAULIC OIL

Sunvis 747 is the hydraulic oil recommended by MIMIK.

It is a detergent-dispersant type of oil with rust oxidation and anti-wear inhibitors having a viscosity of 200 SSU at 100°F.

If not available, other makes having the above characteristic may be used.

VALVE ADJUSTMENT SLIDE

The tracer valve is attached to an x-y co-ordinate slide with large easily read graduated dials to allow valve adjustments in .005" increments. Dials permit zero reset.

Dial indicators graduated in .0001" increments complete with mounting accessories are available. These items are optional equipment.

TEMPLATE BRACKETRY

Two types of template bracketry are available:-

- 1) Crossrail brackets clamp on the front of the ways of the planer. This type is adjustable along the length of the crossrail.
- 2) A second style of bracketry mounts to the top of the crossrail, behind the ways. This is a fixed mounting type.

II. INSTALLATION

To obtain correct and lasting operation, read complete instructions before attempting installation.

STEP 1 - Supply Tank

- a) Assemble one end of hydraulic hose fittings to tank. Assemble pressure gauge and tighten all Tru-Seals.
- b) Fill tank to center of sight glass with hydraulic oil (Sunvis 747)
- c) With open end of hoses exhausting into tank start pump. Make sure electric motor is running in proper direction. Check direction arrow on pump.

NOTE: Do not run pump in reverse rotation.

- d) Allow hydraulic supply tank to run with oil discharging to the tank while completing installation to Step 4.

STEP 2

Your planer slide has had the tracing cylinder and valve arm fitted at the MIMIK Plant. Therefore, it is only necessary to re-mount the slide assembly on its crossrail adapter.

STEP 3 - Install Tracer Valve

- a) Assemble tracer valve and valve adjustment slide to the pivoting valve arm.
- b) Make sure safety screw is installed in valve arm to prevent the tracer valve from being dropped accidentally.

STEP 4

- a) Connect pressure, return and drain hoses to the tracer valve fittings where marked "P.R. and D" respectively. Lock all Tru-Seals.
- b) Connect the two short hoses to opposite side of tracer valve where marked "A" and "B", leaving other end open to tank or clean container.
- c) Start tank motor, flush alternatively through the two short hoses (one or two minutes) by moving the retract control lever of the tracer valve up and down.
- d) Stop tank and connect hoses to cylinder at A and B. Lock all Tru-Seals.

NOTE: Re-check all previous steps.

STEP 5

- a) Loosen tapered gib - See Page 9 - Gib Setting Procedure.

STEP 6

- a) Pump pressure should be set with the cylinder fully retracted.
- b) Cycle unit back and forth through the full stroke ten times to purge air from the system.

Step 6 continued...

Correct operating pressure is 250 - 275 p.s.i.

STEP 7 - Template Bracket Installation

- a) Mount template bracket on crossrail top, or across cross-rail ways, depending on style. Set to desired location and clamp or bolt in place.

STEP 8 - Re-check Installation

- a) The tracer is now ready to operate.
- b) Before attempting to produce parts, familiarize yourself with the operation of the tracer and its controls.

The customer must provide the following items for initial installation:

1. Electric wiring to the electrical box on the supply unit.
2. Necessary tooling and templates.

If installation is to be done by a MIMIK serviceman, these items should be ready when he arrives.

III. SET-UP FOR CUTTING

INSTRUCTIONS

- a) Position planer slide to most suitable angle to produce contour.

Wherever possible, slide angle should bisect minimum contained angle of contour.

- b) Clamp tool in clapper box.

Included angle of tool point must be less than minimum contained angle of part contour. Tool geometry must suit all part contours. Check tool against template to be certain.

- c) Retract tracer slide and position crossrail so tool clears highest portion of workpiece.

Position saddle so tool almost contacts workpiece at highest portion.
- d) Insert stylus in stylus collect on tracer valve.
- e) Set template along rail until stylus contacts template in approximately the same relative position as tool to workpiece. Clamp template in place. Adjust rail and indicate template for parallelism.
- f) Adjust tool-to-workpiece and stylus-to-template relationship using valve adjustment slides.
- g) Take desired depth of cut by turning valve adjustment slide clock-wise and start tracing by engaging the pickfeed. Continue taking desired cut increments with adjustment slide until close to finish size. Check part dimensions and adjust for finish cut.

ROUGH and FINISH CUTTING

For workpieces requiring a certain amount of stock removal, the following methods, allowing successive cuts, may be applied:-

- a) Use a step stylus, or step bushing fitted to the stylus. After each pass, move stylus or bushing to the next smaller step.
- b) Overlay templates, which are a series of rough templates held in position to the finishing template by dowels, are removed one at a time after each cut down to the finish size.
- c) Manually adjust valve settings (described on previous pages).
- d) Move planer crossrail up until tracer is in full forward position and can only reach high points on template. Crossrail is moved forward after each cut so that cutting area increases until complete part is traced. This method requires a final cut to be taken either by valve adjustment after stylus contacts entire template or by indexing to a pre-set tool.

Care and Maintenance continued...

- c) Prevent the entry of foreign particles, since they can cause undue wear or scored ways. Make sure the way wipers are installed properly.
- d) Keep the hydraulic oil clean. Replace hydraulic oil and filter every 6 months (1000 hours).
- e) Do not overtighten fittings. Turn them in finger-tight. Use wrench to lock Tru-Seals.
- f) Actuate the stylus several times when starting tracer. Avoid long idle periods which allow oil to gum up inside the valve. This may cause spool to hang up, in which case the tracer will not feed toward the template or will continue to retract after leaving the template.

GIB SETTING PROCEDURE -- Planer Slide

Set pump pressure with cylinder fully retracted. Adjustment must be made with tracer in forward seek.

- a) Set pump pressure to 50 p.s.i.
- b) Open slow feed knob wide counterclockwise or position control lever in rapid infeed.
- c) Unlock gib, and re-adjust to a tightened position. Then loosen gib until slide will just creep with 50 p.s.i. on pump.
- d) Lock gib, being careful not to overtighten. Tracer slide must still creep under 50 p.s.i. hydraulic pressure.

INFRED RATE SETTING ON TRACER VALVE

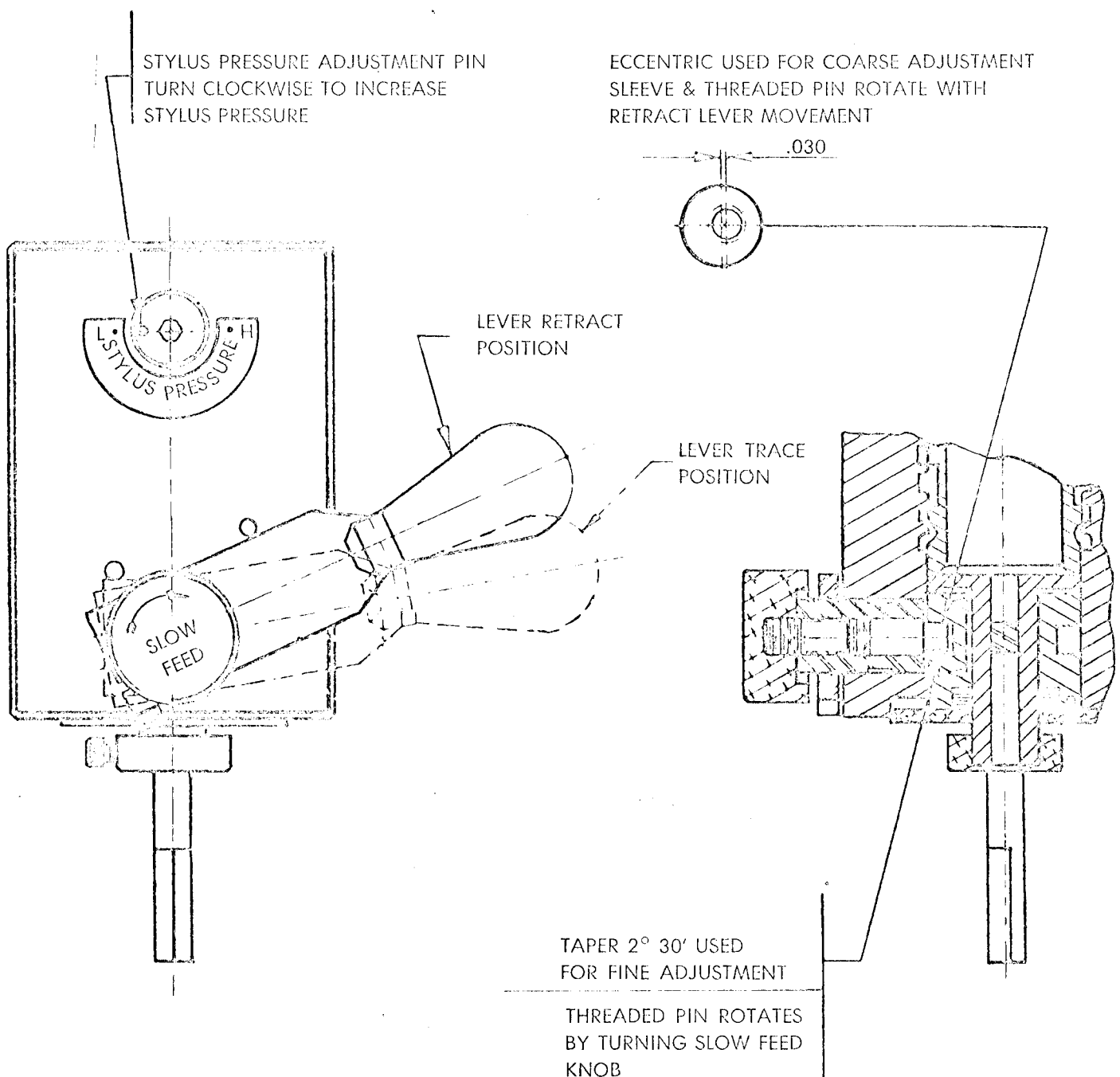
If the normal range of infeed cannot be obtained through "slow feed knob" rotation, the eccentric tapered pin may be out of position. To reset, proceed exactly as follows:

Before making any adjustments, be sure hoses are connected correctly.

- a) Turn slow feed knob fully in (clockwise)

- b) Loosen retract lever clamping screw and turn slow feed knob further clockwise. Continue turning until tracer slide begins feeding toward template. (It is possible for slide to retract before infeed stroke begins).
- c) With retract lever in trace position, tighten clamping screw. Move retract lever slowly toward retract position until tracer slide just begins to retract.
- d) Hold slow feed knob, loosen clamp screw and return retract lever to trace position. Tighten clamping screw.
- e) Turn slow feed knob counterclockwise to obtain desired infeed rate.

Proper infeed rate adjustment automatically puts retract - trace - mechanism into proper relationship.



STYLUS PRESSURE ADJUSTMENT PIN
TURN CLOCKWISE TO INCREASE
STYLUS PRESSURE

ECCENTRIC USED FOR COARSE ADJUSTMENT
SLEEVE & THREADED PIN ROTATE WITH
RETRACT LEVER MOVEMENT

.030

LEVER RETRACT
POSITION

LEVER TRACE
POSITION

SLOW
FEED

TAPER 2° 30' USED
FOR FINE ADJUSTMENT

THREADED PIN ROTATES
BY TURNING SLOW FEED
KNOB

SCALE = 1/1

- 12 -

MIMIK TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDIES
1. <u>VIBRATION</u>	a) Infeed rate too high	Reduce by adjusting infeed rate knob. See page 2 (a)
Occurring when stylus feeds into template or meets profile change.	b) Air in hydraulic system	Cycle slide full stroke. Check for leakage at valve and tank fittings. Check for adequate oil level in reservoir.
	c) Hydraulic pressure too high	Reduce for proper setting. See page 4 (d) Check for broken pressure gauge.
	d) Stylus pressure too high or too low	Adjust, see Page 2 (c)
	e) Mechanical looseness	Check mounting bolts, cross-slide, toolholder, template bracket and tool insert for tightness. Check tracer gib adjustment and piston rod connection.
	f) Machine Vibration	Eliminate by balancing or levelling.
2. <u>SURFACE FINISH PROBLEMS</u>	a) Vibration in tracer system	See (1) above
	b) Template contour not smooth	File, grind or polish
	c) Valve hang-up	See page 16
	d) Air in hydraulic system	Section 1 (b) above
	e) Mechanical looseness	Section 1 (e) above

TROUBLE	CAUSE	REMEDIES
<u>2. SURFACE FINISH PROBLEMS</u>	f) Uneven tracer slide movement	Reduce hydraulic pressure to 50 psi and check for uniform movement. Check for distortion and lubrication.
		If tracing small taper, increase slide angle to provide faster tracer slide movement.
	g) Excessive stylus pressure	Reduce.
	h) Incorrect tool geometry	Check for adequate clearance and correct rake and relief angle.
<u>3. PART-TO-PART VARIATIONS</u>	i) Looseness or vibration in machine	Check for spindle run out, loose carriage or cross-slide. Take straight cut with tracer in full forward or retract position and inspect for similar marks.
	a) Varying cutting load	Provide uniform allowance for finish cut over entire contour.
	b) Excessive tool wear	Use throw-away carbide inserts. Use separate tool for finish cut. Check proper speed and feed.
c) Operator errors	Use preset tools, turret stop, overlay templates, etc.	

TROUBLE	CAUSE	REMEDIES
Part-to-part variations continued...	d) Mechanical looseness	Eliminate operator settings. Section 1 (e) Page 12 Section 2 (i) Page 13
	e) Valve hang-up	See Page 16
	f) Uneven tracer slide movement	Section 2 (f) Page 13
	g) Air in hydraulic system	Section 1 (b) Page 12
	h) Excessive variation in oil temperature	Let oil warm up before tracing. Cycle slide frequently. Install oil temperature control. Contact MIMIK for details.

4. TEMPLATE-TO-PART VARIATIONS

a) Template not aligned in horizontal plane	Adjust template using a dial indicator
b) Variation in cutting load over length of part	Section 3 (a) Page 13
c) Incorrect tool-stylus relationship	Stylus-tool to have same profile and proper alignment. See Page 3
d) Incorrect tool geometry	Section 2 (h) Page 13
e) Incorrect tracer slide angle	Reset slide to ensure full contour coverage
f) Excessive stylus deflection	Reduce infeed rate to approximately 10 - 20 ipm

TROUBLE	CAUSE	REMEDIES
4. <u>TEMPLATE-TO-PART VARIATIONS</u> continued...	h) Mechanical looseness	Section 1 (e) Page 12 12
	i) Valve hang-up	Section 6 Page 16 16
	j) Uneven tracer slide movement	Section 2 (f) Page 13 13
	k) Excessive machine feed or insufficient tracer slide infeed	Reduce machine feed increase tracer infeed or change slide angle so stylus will follow contour without floating off template or over-deflecting.
5. Slide will not feed forward with valve set to infeed and stylus off template - or slide continues to retract when stylus meets a reduced slope.	a) Incorrect feed setting	Adjust infeed to desired rate.
	b) Slide at end of stroke	Reposition cross-slide to regain stroke.
	c) Hose lines installed incorrectly	Connect hoses properly
	d) No oil flow from pump	Check for loose motor - pump coupling, burnt out motor, broken fittings inside tank, faulty relief valve or plugged filter
	e) Slide hang-up	Section 2 (f) Page 13 13
	f) Valve hang-up	Section 6 Page 16 16

TROUBLE	CAUSE	REMEDIES
6. <u>VALVE HANG-UP</u>	a) Insufficient stylus pressure	Increase stylus pressure and actuate stylus by hand. If tracer does not begin to infeed immediately hang-up may be due to dirt.
	b) Dirt or gummy oil deposits in valve	Drain tank, flush complete system and replace hydraulic oil and filter. Run tank until oil warms up. Actuate stylus by hand until smooth stylus action and positive spool return are obtained.
	c) Distortion from overtight fittings	Back off Tru-Seals, make sure fittings are just finger tight. Snug up Tru-Seals gently.
	d) Air lock in valve	Cycle tracer slide full stroke several times by activating stylus.
	e) Incorrect hydraulic oil	Change to Sunvis 747

If tracer valve continues to hang-up, contact MIMIK.

The tracer valve is factory sealed. Any attempt to dismantle the tracer valve can result in damage and will void its guarantee!