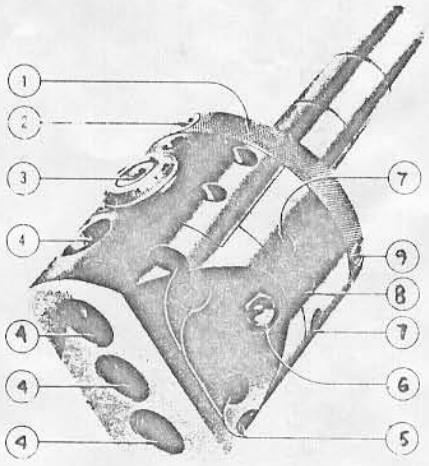
Enco®

AUTOMATIC BORING AND FACING HEAD

OPERATING INSTRUCTIONS

1. Automatic feed knurled ring.
2. Fixed cam for automatic feed (round hole).
3. Adjustable vernier.
4. Hole for fixing boring bar.



5 Screw for clamping boring bar (the clamping screws for the vertical tools are on the opposite face of the carriage).

6. Lubrication point.

7 Adjusting screw for tool carriage.

8. Locking screw for tool carriage.

9 Automatic feed retractable cam (hexagon hole).

IMPORTANT - BEFORE MAKING AN ADJUSTMENT, THE SLIDE LOCK SCREW (8) SHOULD BE RELEASED AND THE LARGE KNURLED RING (1) ON THE BODY MUST BE ROTATED IN A CLOCKWISE DIRECTION UP TO THE STOP WHICH RELEASES THE CROSS-SLIDE CONTROL SCREW FROM THE AUTOMATIC FEED MECHANISM.

WHEN ADJUSTING THE TOOL CARRIAGE FOR PLAIN BORING OR TURNING OPERATIONS, CARE SHOULD BE TAKEN TO LOOSEN THE CARRIAGE LOCK SCREW (8) BEFORE ADJUSTMENT AND RE-TIGHTEN AFTER EACH ADJUSTMENT.

THE VERNIER (3) IS FRICTION MOUNTED AND MAY BE SET TO ZERO WITHOUT AFFECTING THE POSITION OF THE CROSS-SLIDE. BEFORE SETTING THE VERNIER, MAKE SURE THAT THE SCREW (3) IS ENGAGED ON THE FEED SLIDE (I.E. ELIMINATE BACKLASH). IT IS ALSO IMPORTANT ALWAYS TO MAINTAIN THE ADJUSTING GIB OF THE CROSS-SLIDE SUFFICIENTLY TIGHT TO AVOID ANY MALADJUSTMENT WHILE THE VERNIER IS BEING OPERATED. EACH GRADUATION OF THE VERNIER IS EQUIVALENT TO A RADIAL MOVEMENT OF THE CARRIAGE OF 0.0005", I.E. .001" IN DIAMETER. THE PRECISION OF THE GROUND THREAD CONTROL SCREW (3), THE RIGIDITY OF THE WIDE TRACK CARRIAGE, AS WELL AS THE CLEAR GRADUATIONS OF THE VERNIER ENABLE TOLERANCES TO BE OBTAINED ON THE BORES OF LESS THAN .0005".

MANUAL ADJUSTMENT IS ACHIEVED BY INSERTING THE KEY IN THE HEXAGONAL HOLE AT THE CENTER OF THE CIRCULAR VERNIER (3), TURNING IN A COUNTER CLOCKWISE DIRECTION TO MOVE THE CROSS-SLIDE OUTWARDS AND CLOCKWISE TO RETURN.

AUTOMATIC FEED TO THE CROSS-SLIDE IS PERFORMED, WHILE THE MACHINE SPINDLE IS ROTATING, BY STOPPING THE ROTATION OF THE KNURLED RING (1) ON THE BODY. THIS MAY BE DONE MANUALLY OR BY INSERTING A BAR IN THE BLIND HOLE (2) PROVIDED IN THE KNURLED RING AND ALLOWING THE BAR TO REST AGAINST A STATIONARY PART OF THE MACHINE (E.G. THE COLUMN). AUTOMATIC FEED WILL STOP IMMEDIATELY ON RELEASE OF THE KNURLED RING.

THREE RATES OF AUTOMATIC FEED ARE PROVIDED ON THE MODELS #1200 AND #1300. TWO RATES OF FEED ARE PROVIDED ON THE SMALLER MODEL #1100 HEAD. SELECTION OF THE REQUIRED RATE OF AUTOMATIC FEED IS OBTAINED BY ENGAGING THE APPROPRIATE FEED CAM (9) LOCATED WITHIN THE KNURLED FEED RING.

THE FIXED MINIMUM FEED OF .0025" PER REVOLUTION IS OBTAINED AUTOMATICALLY BY MEANS OF A PERMANENTLY ENGAGED CAM WHICH IS LOCATED DIRECTLY BEHIND THE BLIND HOLE (2) IN THE KNURLED RING.

AN ADDITIONAL .0025" FEED PER REVOLUTION IS OBTAINED BY ENGAGING EITHER OF THE ADJUSTABLE CAMS (12) WHICH ARE SIMILARLY LOCATED AROUND THE KNURLED RING. THESE ADJUSTABLE CAMS MAY BE SET BY MEANS OF THE HEXAGON KEY AND BY ROTATING THROUGH 180^0. A LINE GROOVE ON THE CAM HEAD IS PROVIDED TO INDICATE ENGAGEMENT OR DISENGAGEMENT. WITH THE LINE DOWNWARDS (I.E. AWAY FROM SHANK) AUTOMATIC FEED IS OBTAINED.

AS A GUIDE TO THE SELECTION OF THE AMOUNT OF FEED TO BE APPLIED IT IS RECOMMENDED THAT THE MAXIMUM FEED SHOULD BE USED ONLY IN CASES OF VERY LIGHT CUTS OR WHEN MACHINING SOFT NON-FERROUS MATERIALS. THE FIXED MINIMUM FEED SHOULD BE USED ON HEAVIER WORK AND ON GROOVING OPERATIONS.

WHEN THE TRAVERSE OF THE ATTACHMENT IS NOT SUFFICIENT TO TRUE A FACE COMPLETELY, CHANGE THE POSITION OF THE TOOLHOLDER. IF THIS IS DONE CAREFULLY THE HIGH PRECISION OF THE ATTACHMENT PERMITS RE-STARTING WITHOUT PERCEPTIBLE TRACE ON THE WORKPIECE.

THE CUTTING OF GROOVES TO A CERTAIN DEPTH IS EXTREMELY SIMPLE. AS A PRECAUTION, IT IS RECOMMENDED THAT THE SPEED OF THE MACHINE BE LIMITED TO 100 R.P.M. AND THAT ONLY THE FIXED CAM BE USED TO FEED THE CROSS-SLIDE. KNOWING THAT THE CAM GIVES THE CROSS-SLIDE A FEED OF .0025", IT IS SUFFICIENT TO BRING THE TOOL INTO CONTACT, THEN TO STOP THE KNURLED RING AND TO COUNT THE NUMBER OF AUDIBLE "CLICKS" IN ORDER TO OBTAIN THE DESIRED DEPTH WITH THE GREATEST ACCURACY. FOR EXAMPLE, TO MAKE A GROOVE OF .060" DEPTH IT WILL BE NECESSARY TO COUNT 24 CLICKS. RELEASING THE KNURLED RING AND ALLOWING THE HEAD TO REVOLVE FOR A FEW MOMENTS, WITHOUT FEED, TAKES UP THE DEFLECTION OF THE TOOL.

LUBRICATION - AS LUBRICATION OF THE ENCO HEADS IS CENTRALISED (9) ONLY A FEW STROKES OF A GREASE GUN ARE NECESSARY TO COMPLETELY LUBRICATE THE SLIDES, THE CONTROL SCREW AND THE AUTOMATIC FEED MECHANISM. THE FREQUENCY OF THE LUBRICATION DEPENDS ON THE OPERATING CONDITIONS; BUT BE SURE THAT THE SLIDES ARE ALWAYS COVERED WITH A FILM OF THICK, GOOD QUALITY LUBRICANT.

ADJUSTMENT OF THE SLIDES - TO TAKE UP THE PLAY IN THE SLIDES, TIGHTEN UP THE TWO SCREWS (7) LOCATED AT EACH END OF THE GIB WHILE ENSURING THAT THE CROSS-SLIDE IS QUITE FREE. CHECK THIS POINT AFTER ADJUSTMENT, BY MOVING THE CROSS-SLIDE CONTROL SCREW BY HAND OVER THE WHOLE TRAVERSE OF THE CROSS-SLIDE.

CHATTERING - IF THE ATTACHMENT CHATTERS WHEN IT IS PUT INTO OPERATION IT IS IMPORTANT TO CHECK THE CORRECT LOCATION OF THE SHANK IN THE SPINDLE. ERRORS IN THE TAPER OR IN THE STATE OF THE SURFACE OF THE SPINDLE OF THE MACHINE MAY RESULT IN A POOR FINISH. ALSO ENSURE THAT TOOLS AND TOOLHOLDERS ARE FIRMLY LOCKED. IF THE ATTACHMENT CHATTERS AFTER BEING IN OPERATION FOR SOME TIME, CHECK OVER THE ADJUSTMENT OF THE CROSS-SLIDE AND TAKE-UP GIB AS PREVIOUSLY EXPLAINED.

TRAVEL OF THE CROSS-SLIDE - IT IS NOT RECOMMENDED TO EXCEED THE RADIAL STROKE INDICATED IN THE TABLE. A MARK IS CUT ON THE UPPER PART OF THE DOVE-TAIL AND THIS IS EXPOSED WHEN THE MAXIMUM RECOMMENDED TRAVEL IS REACHED. EXTRA LOAD BEYOND ITS CAPACITY MAY INVOLVE IMPOSING EXCESSIVE STRAIN ON THE CONTROL SCREW AND POSSIBLE DAMAGE TO THE BRONZE NUT THREADS. HOWEVER, FOR LIGHT WORK, THIS LIMIT MAY BE EXCEEDED BY A SMALL AMOUNT IN EXCEPTIONAL INSTANCES.

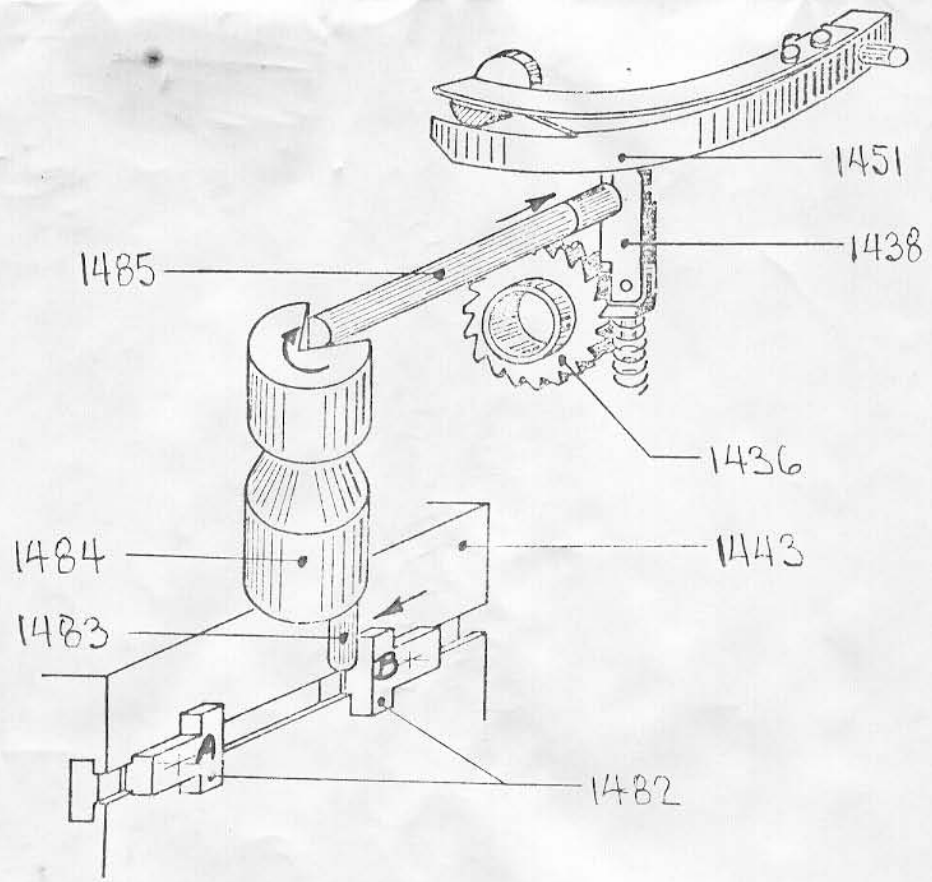
IF DUE TO INCORRECT OPERATION, THE TRAVERSE IS CONTINUED SO THAT THE CONTROL SCREW DISENGAGES, A SAFETY STOP SCREW IS PROVIDED TO PREVENT THE CROSS-SLIDE FROM COMING OFF UNDER THE EFFECT OF THE CENTRIFUGAL FORCE. THIS SCREW IS SUNK IN THE CROSS-SLIDE ON THE OPPOSITE SIDE TO THE VERNIER AND MUST BE REMOVED WHEN DISMANTLING THE CROSS-SLIDE FOR CLEANING.

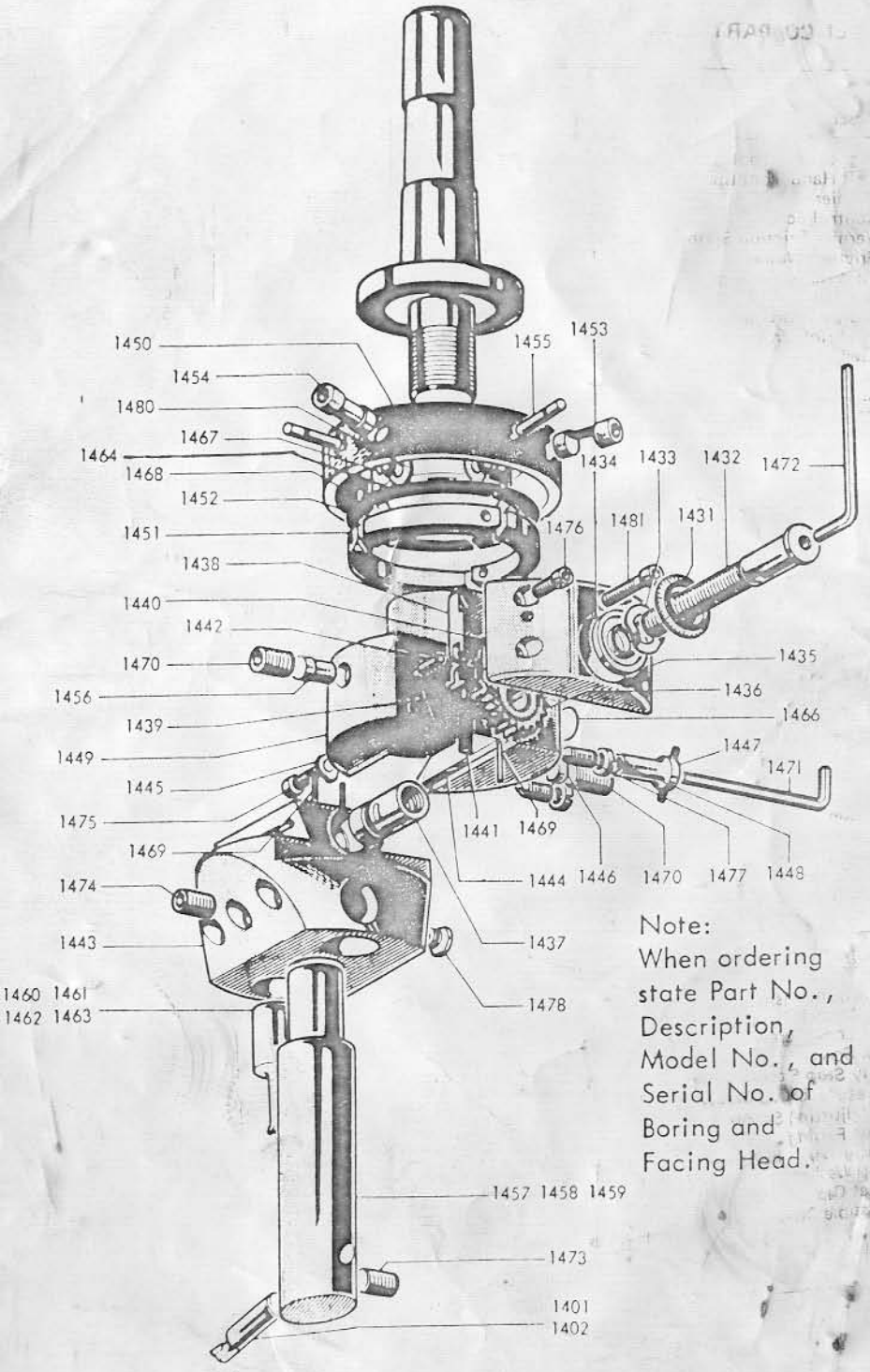
USE OF THE AUTOMATIC FEED STOPS:

DURING OPERATION OF THE AUTOMATIC FEED, THE PAWL HOLDER (#1438) ENGAGES THE RAMP (#1451), AND IS PUSHED DOWN AND ENGAGES THE RATCHET (#1436). THE RATCHET ROTATES UNDER THIS ACTION AND RADIALLY DISPLACES THE TOOL CARRIAGE (#1443) THROUGH THE CONTROL SCREW (#1432).

THE TOOL CARRIAGE HAS TWO ADJUSTABLE STOPS (#1482). THE MOVEMENT OF THE TOOL CARRIAGE BRINGS STOP (B) IN CONTACT WITH PIN (#1483) IN SPOOL (#1484). WHEN STOP (B) COMES IN CONTACT WITH THE PIN, IT CAUSES THE SPOOL TO ROTATE AND PUSH ROD (#1485) AGAINST THE PAWL HOLDER. THE PAWL HOLDER IS THEREBY STOPPED AND THE AUTOMATIC FEED OF THE TOOL CARRIAGE STOPS.

STOP (A) IS USED TO LIMIT THE TRAVEL OF THE TOOL CARRIAGE WHEN RETURNING TO THE STARTING POSITION.





Note:
When ordering state Part No., Description, Model No., and Serial No. of Boring and Facing Head.

ENCO PARTS LIST – Automatic Boring and Facing Head

Part	Description	# 1100 Qty.	# 1100 Price Ea.	# 1200 Qty.	# 1200 Price Ea.	# 1300 Qty.	# 1300 Price Ea.
1401	Right Hand Tool Bit	1	$ 7.75	1	$ 8.10	1	$ 12.10
1402	Left Hand Tool Bit	1	7.75	1	8.10	1	12.10
1431	Vernier	1	16.15	1	16.15	1	16.15
1432	Control Screw	1	30.95	1	42.35	1	69.95
1433	Vernier Friction Spring	1	.50	1	.50	1	.50
1434	Friction Washer	1	2.45	1	2.45	1	2.45
1435	Control Screw Support	1	26.20	1	26.20	1	47.00
1436	Ratchet	1	10.75	1	13.15	1	16.15
1437	Bronze Bushing	1	3.40	1	3.40	1	6.70
1438	Pawl Holder	1	9.75	1	9.75	1	24.60
1439	Pawl	1	5.40	1	5.40	1	14.80
1440	Pawl Pin	1	.85	1	.85	1	1.20
1441	Pawl Spring	1	1.50	1	1.50	1	1.50
1442	Dowel Pin	2	.50	2	.50	2	.50
1443	Tool Carriage	1	91.10	1	100.75	1	277.50
1444	Gib Plate	1	6.45	1	7.45	1	8.10
1445	Stop Washer	1	4.10	1	4.10	1	4.10
1446	Gib Lock	1	1.70	1	1.70	1	1.70
1447	Spanner Wrench	1	4.45	1	4.45	1	6.45
1448	Lock Nut	2	2.05	2	2.05	2	2.05
1449	Body	1	52.10	1	68.20	1	181.90
1450	Knurled Ring	1	21.20	1	35.65	1	55.10
1451	Ramp	2	14.80	3	14.80	3	24.20
1452	Ramp Spring Adjustable	2	1.05	2	1.05	2	2.40
1453	Cam	1	5.40	2	5.40	2	6.45
1454	Fixed Roller	1	2.70	1	2.70	1	3.40
1455	Ramp Pin	2	.85	3	2.05	3	2.05
1456	Shank Lock	1	.75	1	.75	1	4.70
1457	Tool Extension (short)	–	–	1	9.75	1	13.15
1458	Tool Extension (medium)	–	–	1	13.15	1	15.50
1459	Tool Extension (long)	1	14.50	1	15.50	1	18.80
1460	Carbide Tipped Tool (short)	1	8.60	1	14.15	1	23.25
1461	Carbide Tipped Tool (medium)	1	9.40	–	–	–	–
1462	Carbide Tipped Tool (long)	1	10.10	1	18.00	1	26.25
1463	High Speed Steel Tool	1	10.40	1	17.50	–	–
1464	Ramp Spring – fixed	–	–	–	–	1	2.45
1465	Wooden Box – not shown	1	17.85	1	21.20	1	22.85
1466	Enco Nameplate	1	1.70	1	1.70	1	1.70
1467	Ramp Pin Stop	2	2.05	3	2.05	3	2.05
1468	Ramp Rivet	2	2.05	3	2.05	3	2.05
1469	Bronze Bushing Pin	3	.55	3	.55	3	.85
1470	Lock Screw	1	.45	1	.50	1	.85
1471	Hex Wrench (small)	1	.55	1	.70	1	.85
1472	Hex Wrench (large)	1	.55	1	.70	1	.85
1473	Tool Lock Screw	1	.45	3	.50	3	.85
1474	Lock Screw	3	.45	3	.50	3	.85
1475	Safety Stop Screw	1	.50	1	.70	1	.85
1476	Socket Head Cap Screw	1	.50	4	.50	4	.50
1477	Gib Adjusting Screw	2	.45	2	.45	2	.85
1478	Grease Fitting	1	1.05	1	1.05	1	1.05
1479	Tommy Bar – not shown	–	–	–	–	1	8.10
1480	Ramp Washer	2	.80	3	.85	3	.85
1481	Socket Cap Screw	1	.50	1	.50	–	–
1482	Adjustable Stop	2	11.65	2	13.30	2	17.50
1483	Pin	1	.55	1	.55	1	.85
1484	Spool	1	3.35	1	3.35	1	6.65
1485	Rod	1	2.20	1	3.35	1	5.55

MINIMUM CHARGE PER $7.00

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(2–75F)