INSTRUCTIONS FOR THE ERECTION, OPERATION AND MAINTENANCE OF THE TREE 2UVR VERTICAL MILL

I FORWARD

The Tree 2UVR Vertical Milling Machine is a quality-built machine designed for efficient operation under conditions of hard usage. To maintain accuracy and proper operation characteristics it is necessary to observe certain rules of erecting and maintenance as set forth in this manual.

Periodic lubrication as specified and regular mechanical inspections are very important; neglect or abuse may cause permanent damage and the necessity of replacement of parts.

II UNPACKING

The Tree 2UVR Vertical Mill is skidded, crated, covered with waterproof paper and has all finished surfaces protected with a slushing compound.

Carefully remove the crating and paper in such a manner that the machine and its parts are not marred, scratched, or impaired. All handles, collets, cranks, and wrenches are packed in a separate box fastened to the skid. The packing slip is also in this box and should be immediately checked against the goods received. Any shortage should be reported at once to the representative from whom the machine was purchased. The machine should be moved to its final location before removing the skid.

III ERECTING

After removing the skid, place the 2 UVR Mill on a flat surface. The bottom of the base has been machined to aid in leval installation. The machine is shipped with the head inverted for compactness in crating. Loosen the three nuts which secure the head adapter to the ram, and move the head to its upright position by means of the worm adjustment and handle provided, assisting by hand so entire weight of head is not on worm wheel.

CAUTION: Follow lubrication instructions before operating head.

Thoroughly clean the slushing compound from all exposed surfaces with a good solvent, being careful not to move any part until it has been cleaned and oiled. Move the table, saddle, and knee to extreme stops in one direction, clean and lubricate the exposed ways, screws, etc., repeating the process after moving each unit to the other extreme stop.

Center the saddle to the knee and the table to the saddle, and level the machine table crosswise and lengthwise. Taper wedges at the four corners will facilitate the leveling operation. When properly leveled, place additional wedges around the entire base and secure the machine to its foundation with heavy lag screws. The time spent in correct leveling will be repaid in long accurate operation of the machine.

IV ELECTRICAL CONNECTIONS

The 2UVR Mill is shipped with all electrical equipment wired for the current characteristics specified on your order. Connect the power supply to the line terminals of the spindle-motor magnetic starter. The feed motor starter has been wired to the line terminals of the spindle-motor magnetic starter.

AFTER CONNECTING THIS MACHINE TO YOUR POWER SUPPLY, CHECK THE FEED MOTOR DIRECTION OF ROTATION. THE MOTOR COVER CAN BE REMOVED BY LOOSENING THE SIX SCREWS AROUND THE LARGE DIAMETER. AN ARROW ON THE GEAR BOX INDICATES THE CORRECT DIRECTION OF ROTATION - COUNTERCLOCKWISE. IF AT ANY TIME THE FEEDS AND RAPID TRAVERSE FAIL TO OPERATE, CHECK THE MOTOR DIRECTION OF ROTATION BEFORE LOOKING FOR THE TROUBLE ELSEWHERE.

The spindle motor and feed motor starters are the magnetic type with built-in push button controls for starting and stopping. In addition, the spindle motor has a reversing switch mounted thereon.

V LUBRICATION

Before operating the 2 UVR Mill, check the points of lubrication as illustrated on Fig. 1, and explained below.

As the 2UVR head has been inverted for shipment, the oil has been drained from the back gear compartment. A can of Socony-Mobile Etna BB oil is provided to refill this gear box. Approximately one pint is required and the speed range lever must be in the back gear (slow speed) position when checking the oil level in the front glass.

The following numbers refer to Fig. 1 describing the points and giving the frequency of lubrication:

1. Oil filler for back gear compartment - maintain level in front glass with speed range lever in back gear position. Capacity - approximately one pint. Socony-Mobile DTE Oil-BB or equivalent (viscosity 85 sec. at 210° F.) oil. To drain oil from this compartment, remove pipe plug provided on underside of aluminum housing.

2. Grease fittings - lubricate variable pulleys two or three times weekly with No. 1 grease.

3. Oil cup - lubricates horizontal worm shaft and quill feed pinion shaft. Requires oil once each day of operation. SAE 20.

4. Oiler - lubricates ram adjusting pinion shaft. Oil every week. SAE 20.

5. Oil cup - lubricates vertical movement of knee. Fill once a week. SAE 20.

6. Bijur one-shot pump - lubricates the table ways, table screw and nut, saddle ways, forward and reverse gearing to the table feed, and the table reversing feed lever. One-shot required each day of operation. SAE 20.

7. Oil reservoir for Bijur pump - fill as necessary. SAE 20.

8. Knee elevating screw - apply oil as necessary for free operation. SAE 20.

9. Remove pipe plug and move quill down to expose roller drive unit. A few drops of oil periodically will adequately lubricate this drive. SAE 20.

10. Oil cup - lubricates quill feed pinion shaft. Requires oil once each day of operation. SAE 20.

11. Oil cup - lubricates vertical movement of knee. Fill once a week. SAE 20.

12. Oil filler for gear box. Splash system lubricates entire gear feed box. Maintain oil level to show in glass. Change oil and flush after first week of operation, and then every four months. Plug 13 is provided to drain gear box oil. SAE 20.

13. Oil cup - lubricates cross feed screw. Oil daily. SAE 20.

15. Oil cup - lubricates gear box gib bearing. Oil as necessary. SAE 20.

All other bearings are ball bearings - greased and sealed at the factory. No further lubrication is necessary. Motor lubrication is given in the motor manual included in this book.

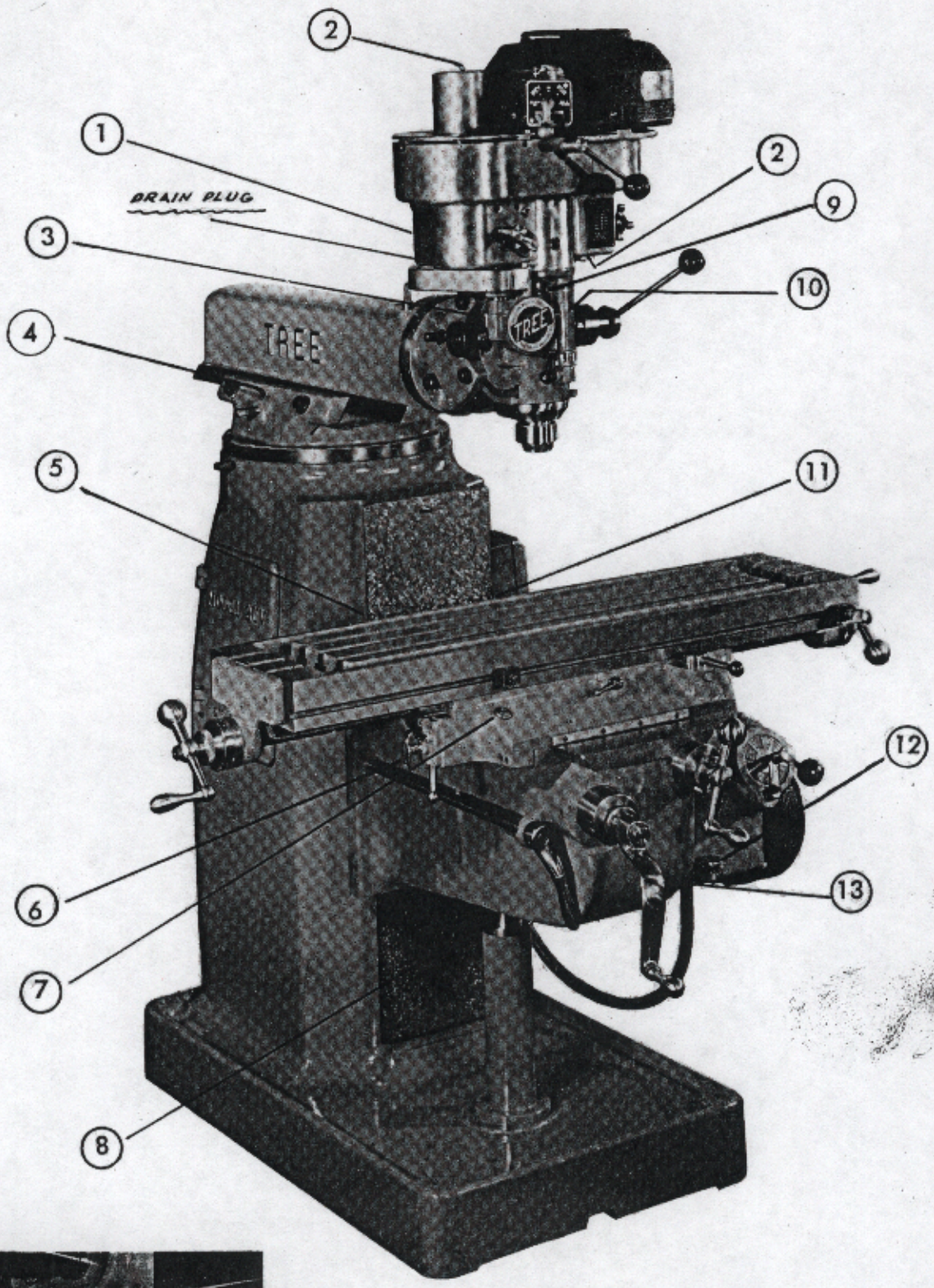
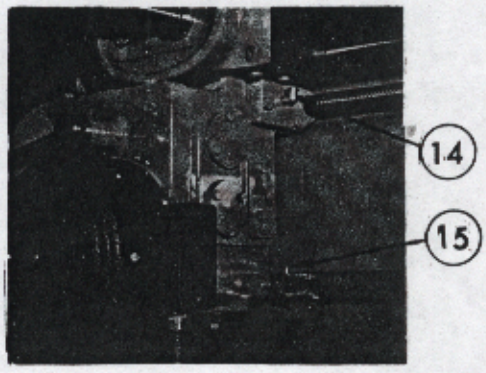


FIG. 1



VI 2UVR MILLING MACHINE NOMENCLATURE

1. Motor
2. Motor Reverse Switch
3. Spindle Speed Plate
4. Spindle Speed Range Lever (Back Gear)
5. Power Quill Feed Knurled Adj. Ring
6. Head Adapter Worm Adjusting Shaft
7. Head Angular Adjusting Clamp Bolts (4)
8. Head Angular Adjusting Gear Shaft
9. Ram Clamp Bolts (2)
10. Ram Gear Adjusting Shaft
11. Turret Clamping Shaft
12. Spindle Power Feed Clutch Knob
13. Table Hand Feed Handle
14. Table Graduated Dial
15. Table - Dial Lock Screw
16. Bijur Lubricating Pump
17. Saddle Lock Lever
18. Elevating Graduated Dial
19. Elevating Dial Lock Screw
20. Knee Lock Handle
21. Elevating Crank Handle
22. Spindle Brake
23. Variable Spindle Speed Change Knob
24. Quill Feed Indicator
25. Spindle Drive Adjusting Access Plug
26. Spindle Hand Feed Lever
27. Spindle Hand Feed Graduated Dial
28. Graduated Dial Lock Screw
29. Depth Stop Micrometer Dial Lock
30. Depth Stop Micrometer Dial
31. Quill Lock Handle
32. Collet Closer Operating Yoke
33. Collet Closer Adjusting Nose
34. Adjustable Table Stop (2)
35. Table Feed Engaging Lever
36. Rapid Traverse Lever
37. Table Feed Selector Dial (IN./MIN.)
38. Table Feed Selector Handle
39. Cross Feed Handle
40. Cross Feed Graduated Dial
41. Cross Feed Dial Lock
42. Table Feed Motor
43. Table Lock Handle
44. Head Adapter Angular Adjusting Clamp Bolts (3)

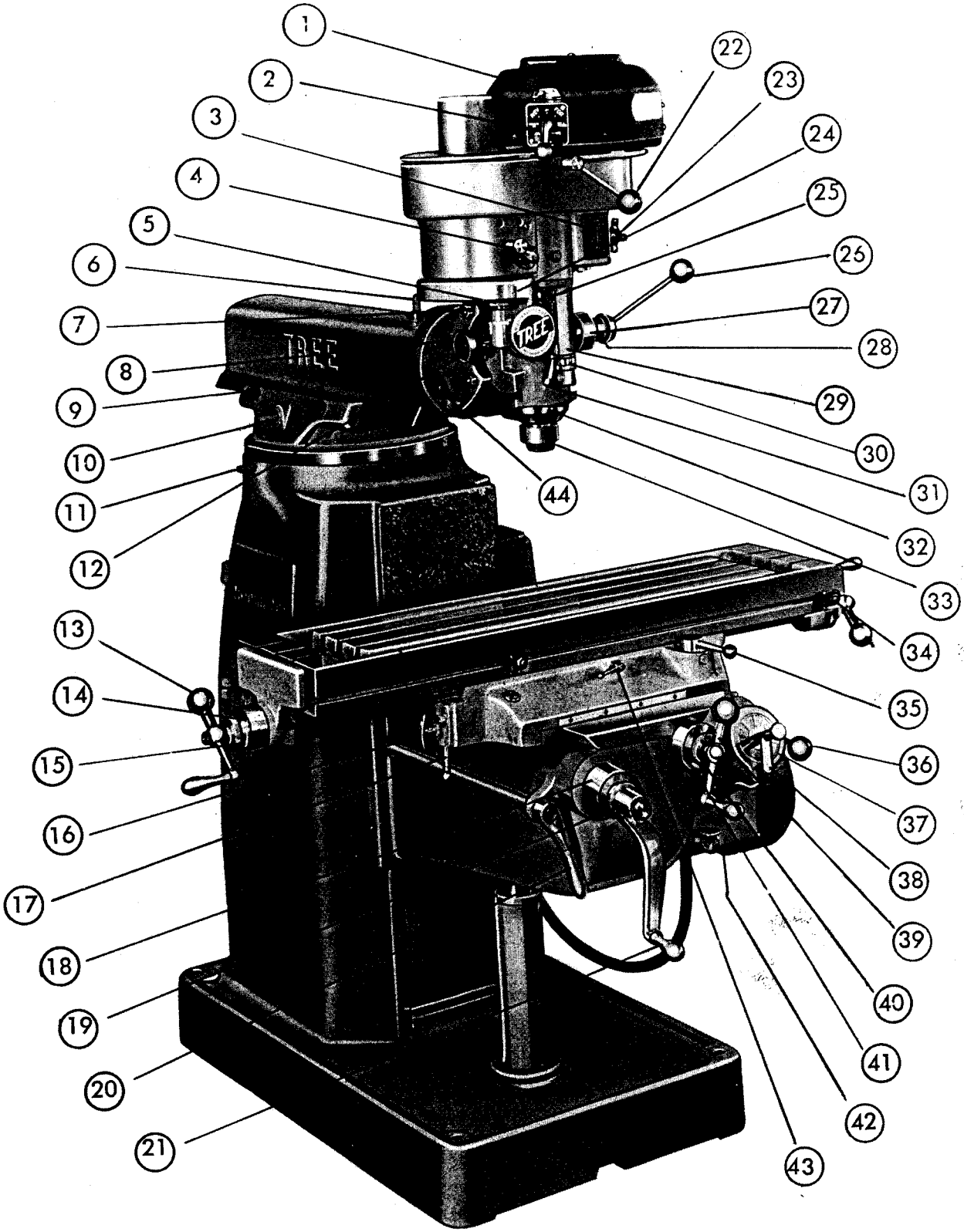

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
TREE

FIG. 2

VII OPERATING INSTRUCTIONS

In the following instructions for operating the 2UVR Mill reference will be made to the numbered parts shown on Figure 2 and further explained on page 4.

1. UNIVERSAL HEAD (Motor instructions will be found in section X)

   A. Changing Speeds - Spindle speeds are variable, adjusted by knob (23). The range in back gear is 60-420 RPM and in open belt 450-3300 RPM. Lever (4) is shifted as shown on speed plate (3) to obtain desired range.

   CAUTION - SPEED KNOB (23) SHOULD BE ADJUSTED ONLY WHEN MOTOR IS RUNNING.

   SPEED RANGE LEVER (4) SHOULD BE MOVED ONLY WHEN MOTOR IS STOPPED. IF DIFFICULT TO ENGAGE TURN SPINDLE SLIGHTLY BY HAND.

   B. Using the Automatic Collet Closer - The Automatic Collet Closing mechanism mounted on the spindle nose is actuated by using the Yoke (32) provided on the main head casting and the Hand Feed Lever (26). Illustrations Figure 3 and Figure 4 and the following procedure will enable the operator to fully understand the operation of this unique tool holding mechanism.

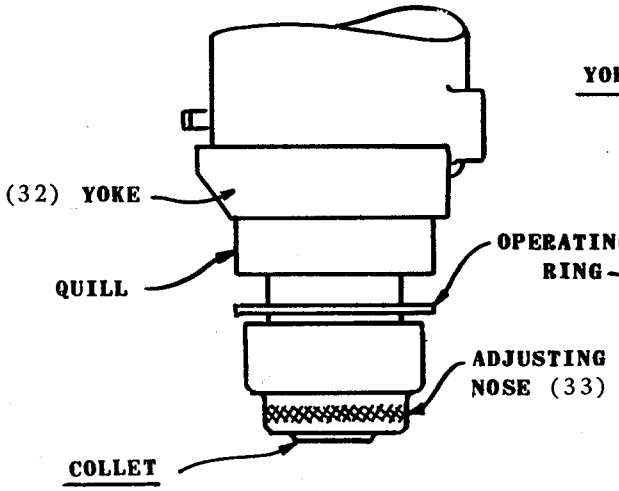


FIG. 3

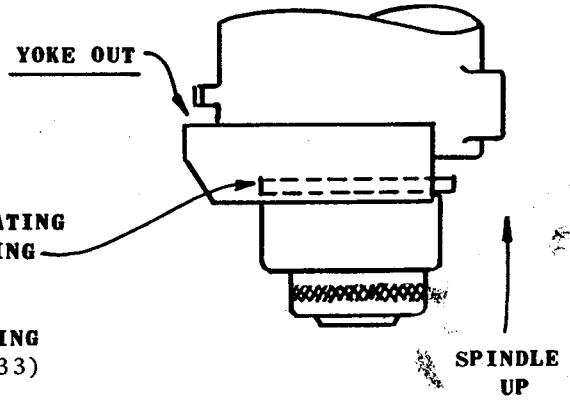


FIG. 4

1. Place Hand feed Lever (26) in extreme up position.

2. Pull out Yoke (32) approximately 3/4" Fig. 4. Lower groove in Yoke contacts the Operating Ring, confining it so that it remains stationary when Quill moves up and down by means of the Hand Feed Lever.

3. Pull down Hand Feed Lever to release collet tension. Tools can be inserted and removed from Collet when in this position. To remove Collet, unscrew Adjusting Nose (33) while Hand Feed Lever is in this position.

4. With Collet in place, insert tool and hold in desired position. Turn Adjusting Ring counter-clockwise until snug, and then back it off approximately 1/2 turn.

5. Push Hand Feed Lever to up position. If tool is not tightened move Lever down and turn Adjusting Ring until a definite locking action is felt when Hand Feed Lever is moved to up position.

6. With tool in place, push Yoke back into original position Fig. 3, and the milling attachment is ready for work. Changing tools or collets takes only a few seconds when the operator becomes familiar with the operation of this closer.

C. Power Quill Feed - The power quill feed is infinitely variable within the range of .0015" - .008" per rev. Adjustment is made by turning knurled ring (5). The feed is visually indicated (24).

Engage feed by turning knurled knob (12) on left end of pinion feed shaft clockwise. Feed can be engaged at any point throughout quill travel.

Disengage feed by loosening knurled knob (12).

D. Quill Lock - The quill lock (31) provided is a separate unit which when operated, does not disturb the quill housing adjustment.

E. Enclosed Micrometer Depth Stop - The enclosed micrometer depth stop is graduated in thousandths of an inch and has a hardened and accurately ground acme screw. To increase quill travel, turn graduated dial (30) to left; to decrease, turn dial to the right. To lock in position turn lock nut (29) to left. Unit is so constructed that when power feed is in operation, feeding against depth stop will not cause damage. Consequently this may be used as a positive stop for boring operations. Bronze friction clutch will slip under pressure.

F. Hand Spindle Feed - Lever (26) is provided to facilitate operations that do not require the power feed. This lever is also used to bring the tool into position for power feeding and rapidly returning after the operation is completed. This lever can be positioned as desired by pulling out at the hub and repositioning in the notches provided.

A dial (27) graduated in 1/32's is provided for depth operations that do not require the accuracy of the micrometer depth stop.

G. Angular Setting of the Head - The head can be moved 45° each way from the vertical position across the table. An arc graduated in degrees is provided for accurate angular setting.

To make this angular adjustment loosen the four clamp bolts (7). The gear adjustment shaft (8) can then be operated and the desired angle obtained.

2. RAM

A. The adapter fastened to the ram can be rotated parallel with the table to position the spindle angularly in that plane. A circle graduated in degrees is provided for accurate setting.

To move the adapter loosen the three clamp bolts (44). The gear adjustment shaft (6) can then be operated and the desired angle obtained.

B. The entire ram assembly is movable to greatly increase the range of the machine. To move this ram loosen the two clamp bolts (9) and operate gear shaft (10).

3. TURRET

A. The turret can be swung through 360° if necessary. Graduation in degrees are provided for 90° movement in each direction.

To move the turret loosen clamp (11). This clamp locks the turret solidly through an internal clamping ring which also secures the turret to the column top for greater rigidity.

4. TABLE - Hand and Power Feed

A. The table screw has a 5 pitch acme thread and is hardened and ground for long life. Ball-handles (13) are provided at each end together with movable dials (14) graduated in thousandths.

B. The power feed is obtained through a gear box driven by an individual motor (42). Five rates of feed are provided and indicated in in/min. by dial (37). The rate of feed can be changed at any time the gear box motor is in operation whether the table is feeding or not. Changing the rate of feed is done by crank (38). One turn in either direction brings into operation another rate of feed.

The rapid traverse to the table is operated by lever (36). The rate of travel is approximately 75"/min.

The table feed is engaged by directional lever (35). Two adjustable stops (34) are provided to limit the feed in both directions. The stops are constructed so that after stopping the table feed the table can be hand fed or rapid traversed beyond the stops without having to move the stops. The ball-handle on the feed lever is pushed in the direction to be fed. When the table is feeding the rapid traverse can be operated at any time by pulling up on lever (36), and holding as long as the rapid feed is desired. When released this lever drops out of rapid traverse and the table is again feeding.

An overload device is provided in the feed gear train to protect the gears if an obstruction is encountered when the table feed is in operation. This device is evidenced by a clicking noise which stops when the obstruction is no longer contacted. The feed automatically returns to normal operation.

NOTE: Should the rapid traverse and feeds fail to operate, check direction of feed motor rotation as the first step in determining the source of trouble.

Table lock (43) is provided to hold the table in position for drilling and boring operations.

5. SADDLE

The saddle cross feed screw has a 5 pitch Acme thread and a movable dial (40) graduated in thousandths.

Locking lever (17) is provided to lock the cross feed movements.

6. KNEE

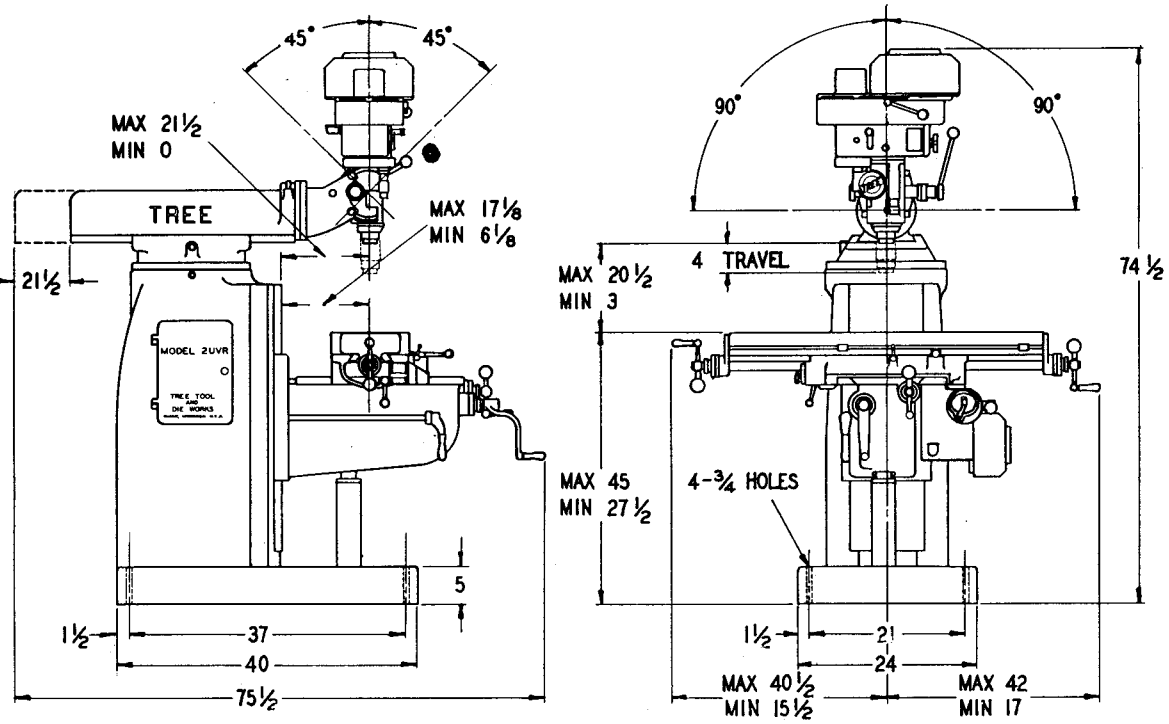
The knee is raised and lowered by crank handle (21). Movable dial (18) is graduated in thousandths.

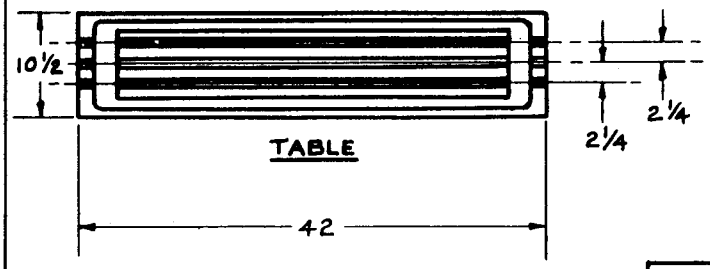
The knee is locked in position by the lock handle (20).

MODEL 2UVR

VERTICAL MILLING MACHINE

DIMENSIONAL DRAWING





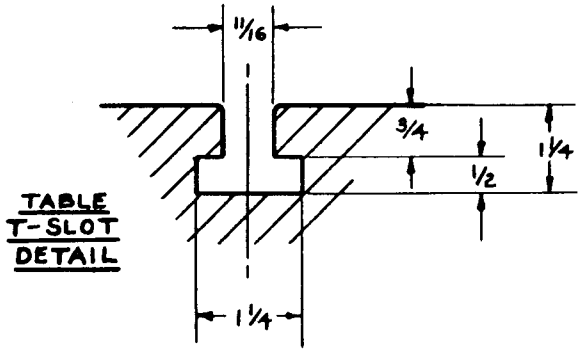
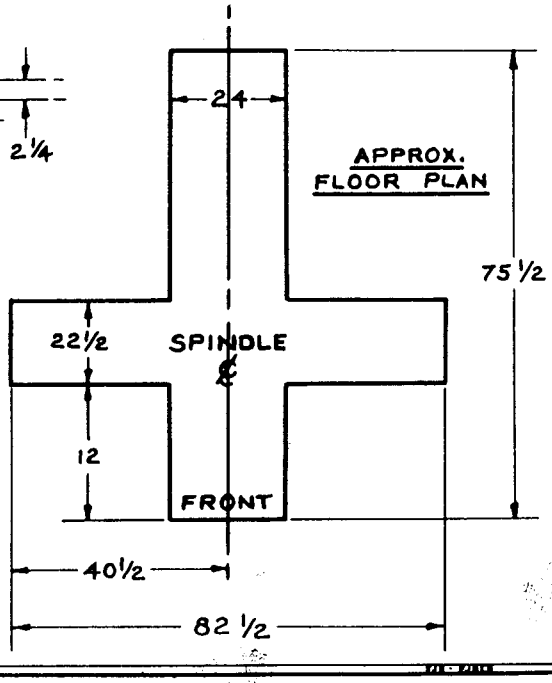
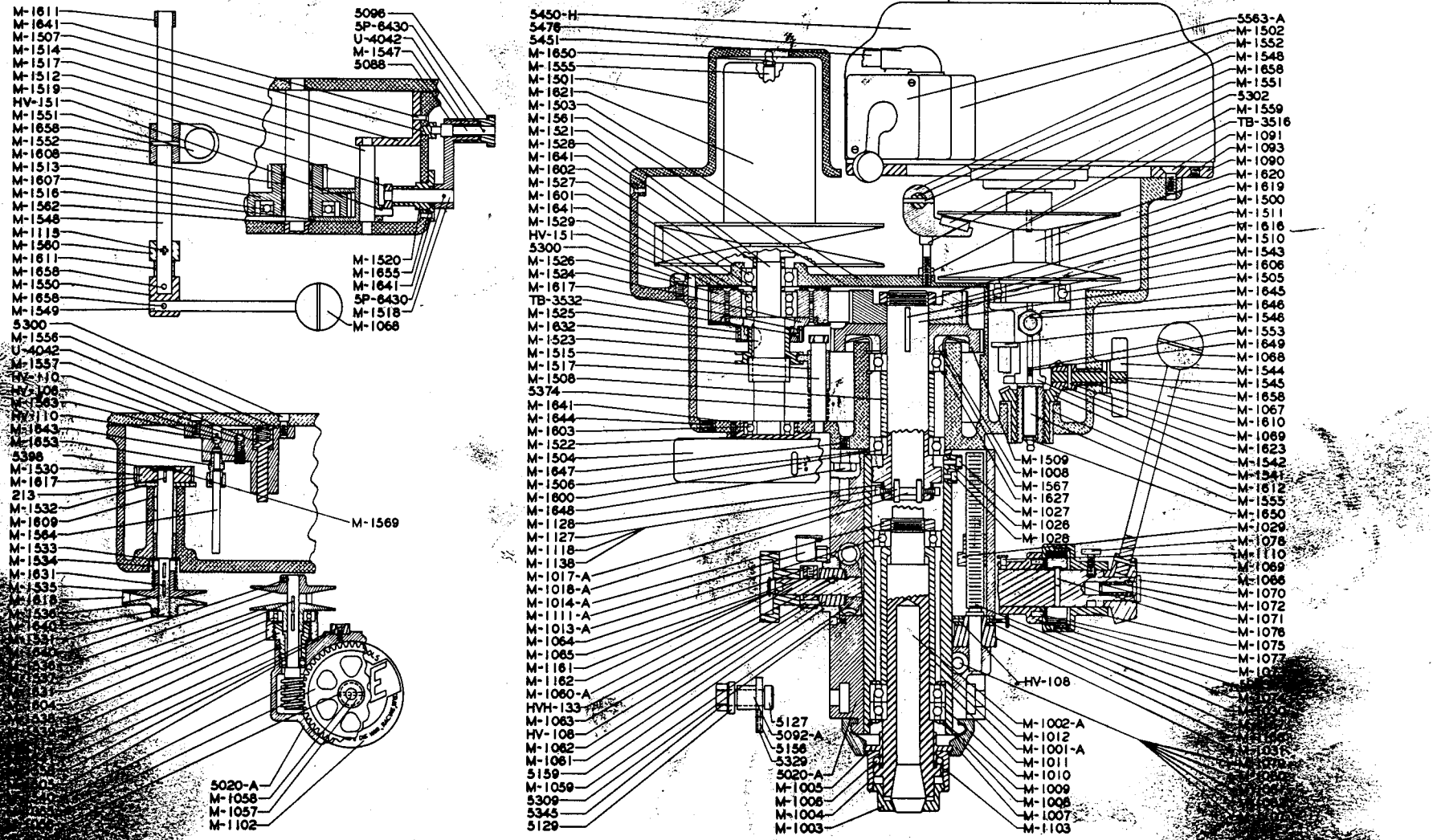


TABLE T-SLOT DETAIL




M-1611
M-1641
M-1507
M-1514
M-1517
M-1512
M-1519
HV-151
M-1551
M-1658
M-1552
M-1608
M-1513
M-1607
M-1516
M-1562
M-1548
M-1113
M-1560
M-1611
M-1658
M-1550
M-1658
M-1549
5096
5P-6430
U-4042
M-1547
5088
M-1520
M-1655
M-1641
5P-6430
M-1518
M-1068
5300
M-1556
U-4042
M-1557
HV-110
HV-108
M-1563
HV-110
M-1643
M-1653
5398
M-1530
M-1617
213
M-1532
M-1609
M-1564
M-1533
M-1534
M-1631
M-1535
M-1618
M-1536
M-1640
M-1539
M-1569
5020-A
M-1056
M-1057
M-1102
5450-H
5476
5451
M-1650
M-1555
M-1501
M-1621
M-1503
M-1561
M-1521
M-1528
M-1641
M-1602
M-1527
M-1601
M-1641
M-1529
HV-151
5300
M-1526
M-1524
M-1617
TB-3532
M-1525
M-1632
M-1523
M-1515
M-1517
M-1508
5374
M-1641
M-1644
M-1603
M-1522
M-1504
M-1647
M-1506
M-1600
M-1648
M-1128
M-1127
M-1118
M-1138
M-1017-A
M-1018-A
M-1014-A
M-1111-A
M-1013-A
M-1064
M-1065
M-1161
M-1162
M-1060-A
HVH-133
M-1063
HV-108
M-1062
M-1061
5159
M-1059
5309
5345
5129
5127
5092-A
5158
5329
5020-A
M-1005
M-1006
M-1004
M-1003
M-1509
M-1008
M-1567
M-1627
M-1027
M-1026
M-1028
HV-108
M-1002-A
M-1012
M-1001-A
M-1011
M-1010
M-1009
M-1008
M-1007
M-1103
5563-A
M-1502
M-1552
M-1548
M-1658
M-1551
5302
M-1559
TB-3516
M-1091
M-1093
M-1090
M-1620
M-1619
M-1500
M-1511
M-1616
M-1510
M-1543
M-1606
M-1505
M-1645
M-1646
M-1548
M-1553
M-1649
M-1068
M-1544
M-1545
M-1658
M-1067
M-1610
M-1069
M-1623
M-1542
M-1541
M-1612
M-1555
M-1650
M-1029
M-1078
M-1110
M-1069
M-1088
M-1070
M-1072
M-1071
M-1078
M-1075
M-1077

The

TREE

MODEL 2UVR VERTICAL MILLING MACHINE

PARTS LIST

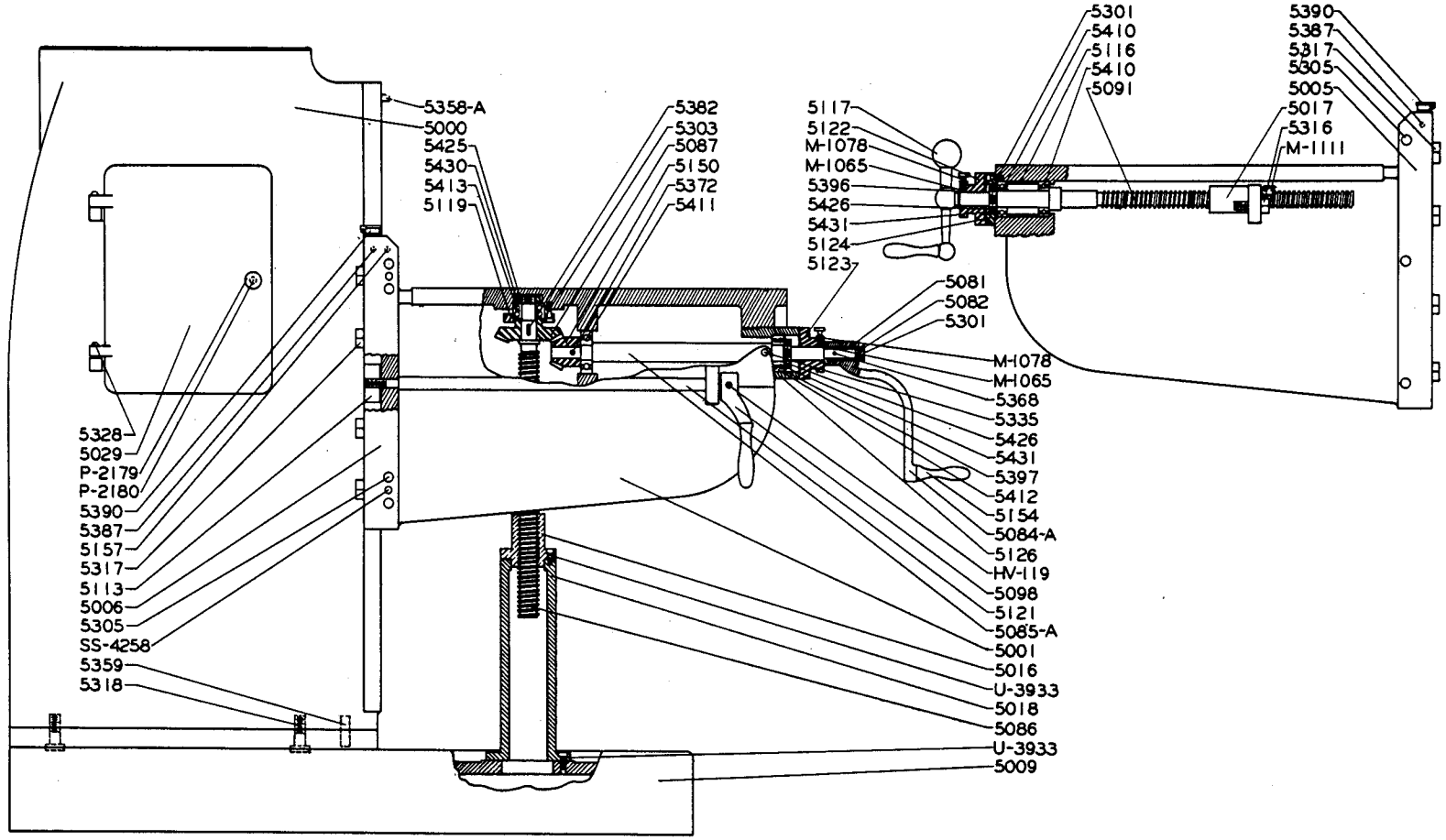
NUMBER	NAME
M-1513	
M-1514	dler Gear
M-1515	racket for Shifter Pins
M-1516	lutch Shifter
M-1517	ear Shifter
M-1518	hifter Pin
M-1519	hifter Link Shaft
M-1520	hifter Link
M-1521	ushing for Shifter
M-1522	lutch Shaft
M-1523	earing Cap
M-1524	lutch - Male
M-1525	lutch - Female
M-1526	iming Pulley - 30 Grooves
M-1527	dler Timing Pulley
M-1528	lutch Shaft Spacer
M-1529	ariable Pulley Spacer
M-1530	ulley Flange - Idler
M-1531	iming Pulley - 25 Grooves
M-1532	eed Shaft
M-1533	lange for 25 Groove Pulley
M-1534	etaining Washer for Spring
M-1535	pring for Feed Pulley
M-1536	ulley Flange - Spring Loaded
M-1537	ulley Flange - Stationary
M-1538	ulley Flange - Adjustable
M-1539	eed Adjustment Nut
M-1540	ormshaft Bushing
M-1541	ertical Wormshaft
M-1542	peed Selector Bevel Gear
M-1543	peed Selector Screw
M-1544	ey 3/16 x 3/16 x 1-1/2
M-1545	peed Selector Knob
M-1546	evel Gear Shaft
M-1547	peed Selector Screw Stop
M-1548	ear Selector Plunger
M-1549	rake Shaft
M-1550	rake Rod
M-1551	rake Shaft Knob
M-1552	rake Cork
M-1553	rake Cork Bracket
M-1554	peed Indicator Needle
	peed Plate (Not shown)

NUMBER	NAME
M-1555	Grease Pipe
M-1556	Oil Pump Housing
M-1557	Oil Pump Plunger
M-1558	Feed Pulley Guard Bracket
M-1559	Key 3/16 x 3/16 x 11/16
M-1560	Brake Shaft Bushing
M-1561	Bear Housing Cover Gasket
M-1562	Idler Shaft Bushing
M-1563	Spring
M-1564	Oil Pump Pipe - Intake
M-1565	Oil Pump Pipe - Outlet (Not shown)
M-1567	Oil Shield
M-1568	Speed Control Lock Screw (Not shown)
M-1569	Feed Shaft Washer
M-1600	993L07 New Departure Bearing
M-1601	55504 New Departure Bearing
M-1602	77504 New Departure Bearing
M-1603	773L04 New Departure Bearing
M-1604	77-R-10 New Departure Bearing
M-1605	77-R-6 New Departure Bearing
M-1606	773L08 New Departure Bearing
M-1607	51108 SKF Thrust Bearing
M-1608	B-1210 Torrington Needle Bearing
M-1609	AA-742 Oilite Bronze Bearing
M-1610	AA-630 Oilite Bronze Bearing
M-1611	AA-628-10 Oilite Bronze Bearing
M-1612	FF-1506-4 Oilite Bronze Bearing
M-1616	210L-100 Gilmer Timing Belt
M-1617	9246 x ½ R3D1 Gilmer Timing Belt
M-1618	1150 Gates V Belt
M-1619	MS 7419 FS 20317 Reeves Belt
M-1620	#20 Reeves Flexi-Speed Constant
M-1621	#20-25 Reeves Flexi-Speed Variable
M-1623	L 149 Pinion Boston Gear
M-1627	5000-244 Tru Arc Ring
M-1631	HP-403 Hi Pro Key
M-1632	HP-606 Hi Pro Key
M-1640	#10-24 x ¼ Cup Point Set Screw
M-1641	#10-24 x ½ Flat Hd. Sock. Screw
M-1643	1/8 Pipe Plug
M-1644	1/4 Pipe Plug
M-1645	7/16-14 x [illegible] Set Screw

CONSECUTIVE NUMBER PARTS LIST FOR 2UVR MILLING HEAD - Page 13

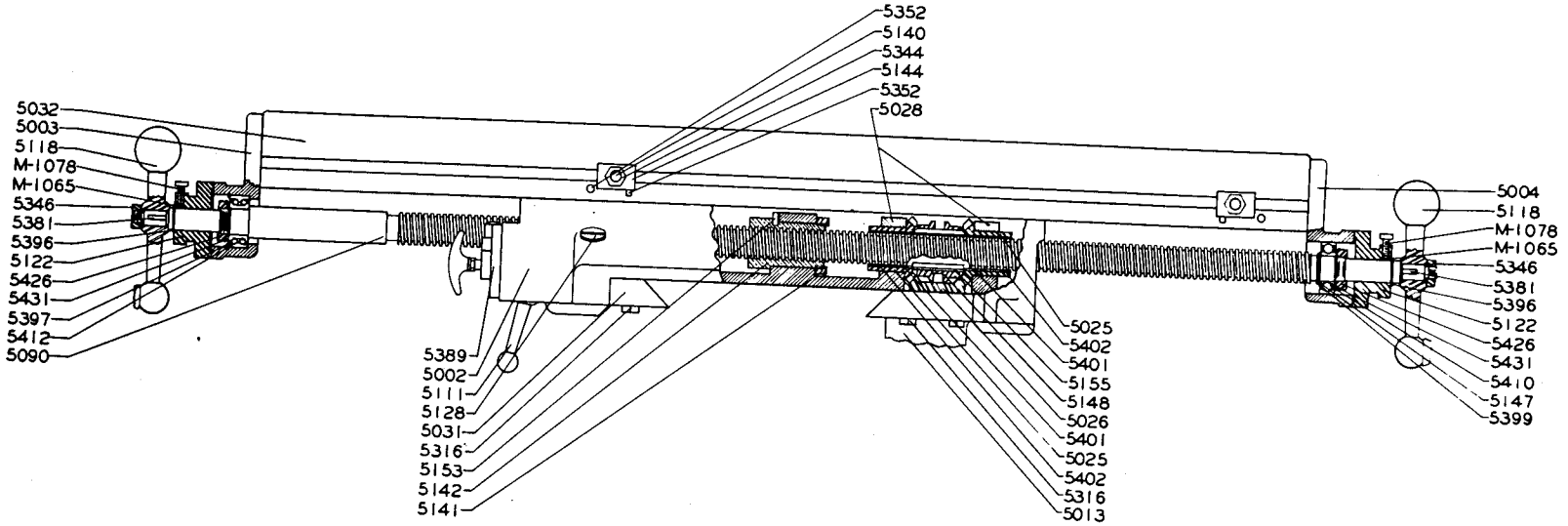
NUMBER	NAME
M-1001-A	Universal Mill Head Sleeve
M-1002-A	Universal Mill Head Spindle
M-1003	Collet Closer Nose
M-1004	Collet Closer Adapter
M-1005	Collet Closer Shifter Sleeve
M-1006	Collet Closer Ball
M-1007	Collet Closer Yoke
M-1008	Lower Bearing Retaining Ring
M-1009	Lower Grease Shield
M-1010	Lower Spindle Bearing
M-1011	Upper Grease Shield
M-1012	Spindle Bearing Spacer
M-1013-A	Upper Spindle Bearing
M-1014-A	Upper Spindle Bearing Nut
M-1017-A	Spindle Drive Roller
M-1018-A	Spindle Drive Eccentric Pin
M-1026	Sleeve Stop Key
M-1027	Stop Key Screw - Long
M-1028	Stop Key Screw - Short
M-1029	Depth Stop Screw Nut
M-1030	Depth Stop Screw
M-1031	Depth Stop Micrometer
M-1055	Feed Wormwheel
M-1056	Spring Pin for Wormwheel
M-1057	Horizontal Worm Bushing
M-1058	Horizontal Wormshaft
M-1059	Pinion Shaft Wormwheel
M-1060-A	Pinion Shaft
M-1061	Power Feed Clutch
M-1062	Power Feed Clutch Pin Retainer
M-1063	Power Feed Clutch Operating Wheel
M-1064	Pin Retainer Screw
M-1065	Pin Retainer Brass Plug
M-1066	Hand Feed Clutch
M-1067	Handle Rod
M-1068	Handle Ball
M-1069	Handle Rod Pin
M-1070	Handle Spring Retaining Pin
M-1071	Retaining Pin Washer
M-1072	Handle Clutch Spring
M-1073	Return Spring
M-1074	Return Spring Housing
M-1075	Return Spring Cover
M-1076	Return Spring Retaining Pin
M-1077	Return Spring Housing Retaining Pin
M-1078	Return Spring Cover Screw
M-1079	Quill Lock Handle
M-1080	Quill Lock Screw
M-1081	Quill Lock Bushing - Plain
M-1082	Quill Lock Bushing - Threaded
M-1090	Motor Adapter Plate
M-1091	Motor Adapter Plate Screw
M-1093	Motor Mounting Screw
M-1102	Cover for Wormwheel
M-1103	Collet Closer Key
M-1107	Quill Lock Handle Screw
M-1110	Pinion Shaft Oiler
M-1111-A	Horizontal Wormshaft Oiler
M-1114	Speed Plate Mounting Screw (Not shown)
M-1115	Power Feed Pulley Screw ¼-20 x ¼
M-1116	Quill Pressure Set Screw (Not shown)
M-1117	Quill Pressure Lock Screw (Not shown)
M-1118	#8 Lockwasher
M-1127	Screw for Spindle Drive
M-1128	Spring Clip for Spindle Drive
M-1129	Pipe Plug for Eccentric Adjustment (Not shown)
M-1138	Lockwasher for Spring Clip
M-1161	Tru Arc Ring 3100-43
M-1162	Retaining Plug for Operating Wheel
M-1166	Micrometer Lock Collar
M-1167	Micrometer Lock Screw
M-1500	Housing
M-1501	Pulley Cover
M-1502	Junction Block
M-1503	Gear Housing Cover
M-1504	Feed Pulley Guard
M-1505	Spindle Driver
M-1506	Locator
M-1507	High and Low Gear Plug
M-1508	Bearing Spacer
M-1509	Driver Spur Gear
M-1510	Driver Timing Pulley
M-1511	Spindle Driver Nut
M-1512	Idler Gear Shaft

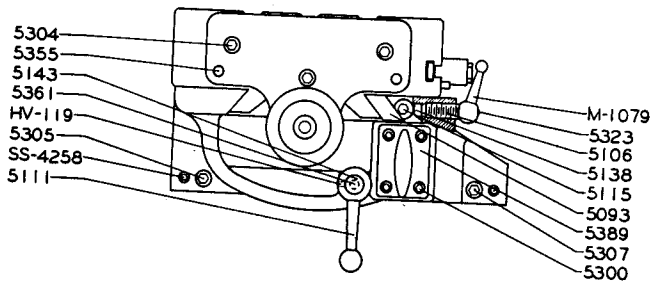
5000	Column
5007	Ram
5012	Ram & Head Adapter
5107	Ram Safety Worm
5127	Ram & Head Adapter Bolt
5129	Adapter Bolt Washer
5130	Ram Safety Worm Shaft
5131	Head Safety Pinion
5139	Ram Worm Spacer
5149	Ram Adjusting Rack
5345	1/2-13 Hex Standard Nut
5382	#9 Woodruff Key
M-1119	Power Feed Bushing Retaining Screw
5369	21-S-250-0750 Spring Pin
5008	Ram Saddle
5027	Ram Saddle Lock Ring
5037	Ram Saddle Lock Thrust Bar
5038	Ram Saddle Lock Segment
5132	Ram Adjusting Pinion Shaft
5133	Ram Saddle Lock Segment Shaft
5134	Ram Adjusting Pinions
5136	Ram Saddle Washer
5319	5/8-11 x 3" Hex Head Cap Screw
5370	21-S-187-1000 Spring Pin
HVH-150	Spindle Oiler
5445	#731-A 3/4 x 7/8 Engineers Wrench - Not Shown
5446	#6 Finished Armstrong Crank Handle 1/2 Broached Holes

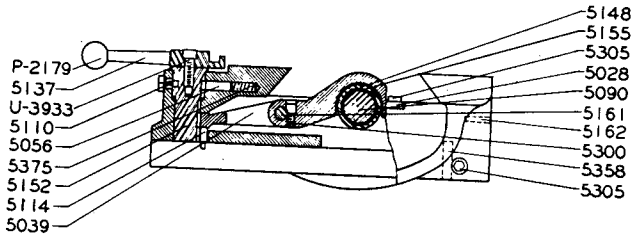

5358-A
5000
5425
5430
5413
5119
5382
5303
5087
5150
5372
5411
5301
5410
5116
5410
5091
5390
5387
5317
5305
5005
5017
5316
M-1111
5117
5122
M-1078
M-1065
5396
5426
5431
5124
5123
5081
5082
5301
M-1078
M-1065
5368
5335
5426
5431
5397
5412
5154
5084-A
5126
HV-119
5098
5121
5085-A
5001
5016
U-3933
5018
5086
U-3933
5009
5328
5029
P-2179
P-2180
5390
5387
5157
5317
5113
5006
5305
SS-4258
5359
5318

PARTS LIST

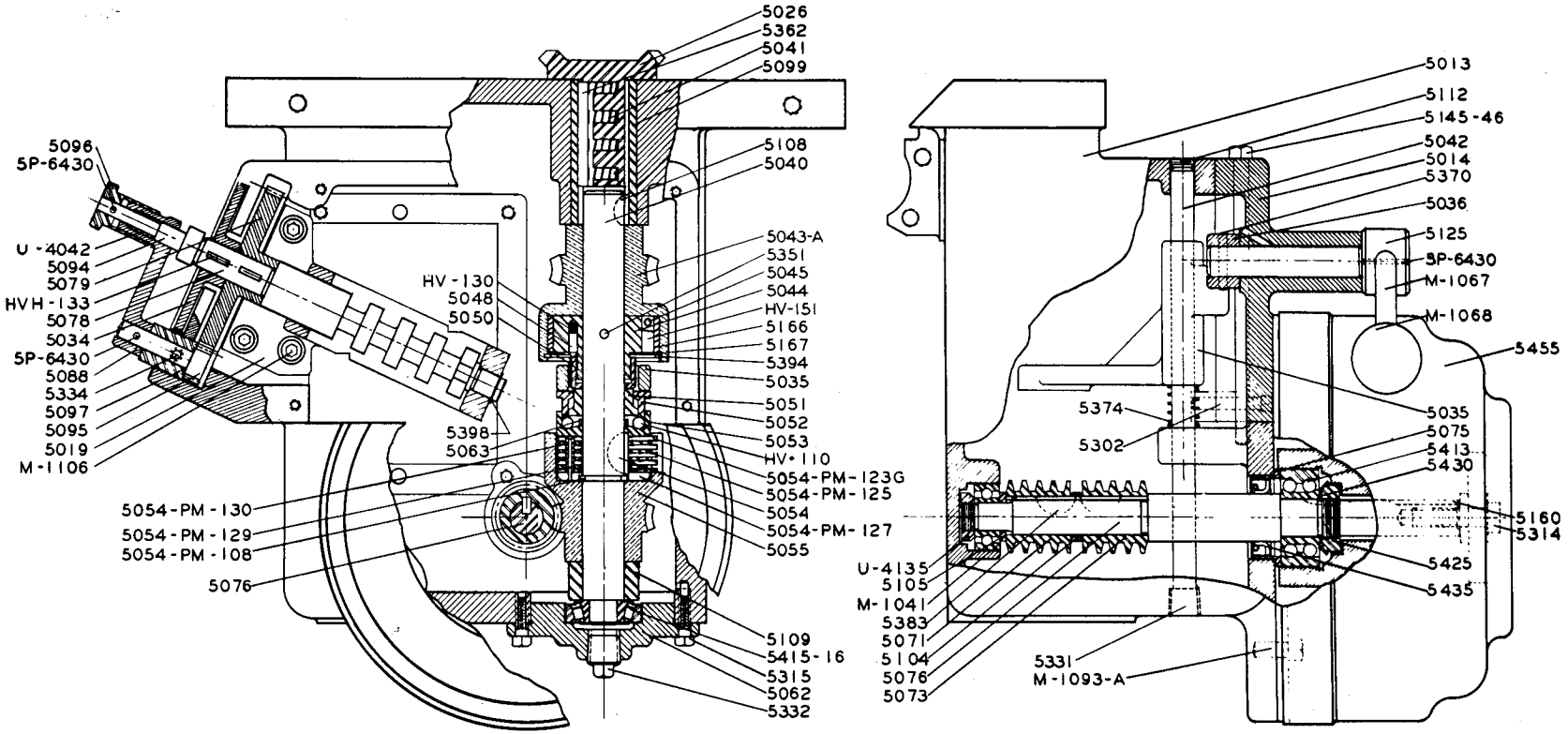
5000	Column
5001	Knee
5005	Knee Stationary Gib
5006	Knee Adjusting Gib
5009	Column Base
5016	Nut for Knee Elevating Shaft
5017	Cross Feed Nut
5018	Post for Vertical Screw Nut
5029	Column Door
5081	Clutch for Elevating Crank
5082	Retaining Plug for 5084-A
5084-A	Knee Elevating Crank
5085-A	Knee Elevating Shaft
5086	Knee Elevating Screw
5087	Knee Elevating Screw Bevel Gear
5091	Cross Feed Screw
5098	Vertical Knee Lock Handle
5113	Knee Lock Block
5116	Knee Cross Feed Bearing Spacer
5117	Cross Feed Handle
5119	Elevating Screw Bearing Retainer Plate
5121	Knee Lock Shaft
5122	Dial-200 Graduations
5123	Dial-100 Graduations
5124	Cross Feed Bearing Retaining End Plate
5126	Elevating Shaft Bearing Housing
5150	Knee Elevating Shaft Bevel Gear
5154	Knee Elevating Crank Handle
5157	Oil Plug for Adj. Gib
5301	1/4-20 x 3/4 Socket Head Cap Screw
5303	5/16 - 18 - 1-1/4 Aller Cap Screw
5305	3/8-16 x 1" Socket Head Cap Screw
5316	3/8-16 x 1-1/2 Hex Cap Screws
5317	1/2-13 x 1-5/8 Hex Head Cap Screw
5318	5/8-11 x 1-3/4 Hex Head Cap Screw
5328	1/4 dia. x 1-3/4 Round Head Rivet
5335	1/2-13 x 1/2 Socket Set Screw
5358-A	3/8 dia. x 1-1/2 Dowel Pins
5359	21-S-500-1750 Spring Pin
5368	21-S-187-0875 Spring Pin
5372	21-S-187-1750 Spring Pin
5382	#9 Woodruff Key
5387	Felt Plug
5390	#324 Style "R" Gits Oiler
5396	#5100-87 Tru Arc Ring
5397	#5100-206 Tru Arc Ring
5410	#77505XIC New Departure Bearing
5411	#77605XIC New Departure Bearing
5412	#55505XIC New Departure Bearing
5413	#55604XIC New Departure Bearing
5425	N-04 New Departure Locknut
6526	N-05 New Departure Locknut
5430	W-04 New Departure Lock Washer
5431	W-05 New Departure Lock Washer
M-1065	Pin Retainer Brass Plug
M-1078	Return Spring Cover Screw
M-1111	Oiler
HV-119	Collet Closer Adjusting Ring Screw
SS-4258	Set Screw for Dog
U-3933	Screw for Worm Housing
P-2179	Belt Guard Knob
P-2180	Belt Guard Clip Screw


5032
5003
5118
M-1078
M-1065
5346
5381
5396
5122
5426
5431
5397
5412
5090
5389
5002
5111
5128
5031
5316
5153
5142
5141
5352
5140
5344
5144
5352
5028
5025
5402
5401
5155
5148
5026
5401
5025
5402
5316
5013
5004
5118
M-1078
M-1065
5346
5381
5396
5122
5426
5431
5410
5147
5399


5304
5355
5143
5361
HV-119
5305
SS-4258
5111
M-1079
5323
5106
5138
5115
5093
5389
5307
5300

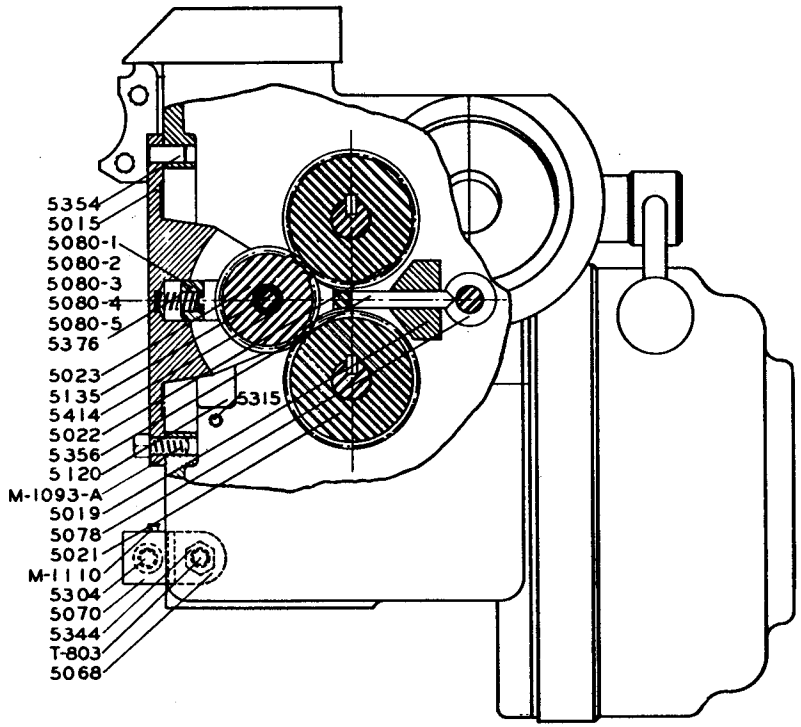

P-2179
5137
U-3933
5110
5056
5375
5152
5114
5039
5148
5155
5305
5028
5090
5161
5162
5300
5358
5305

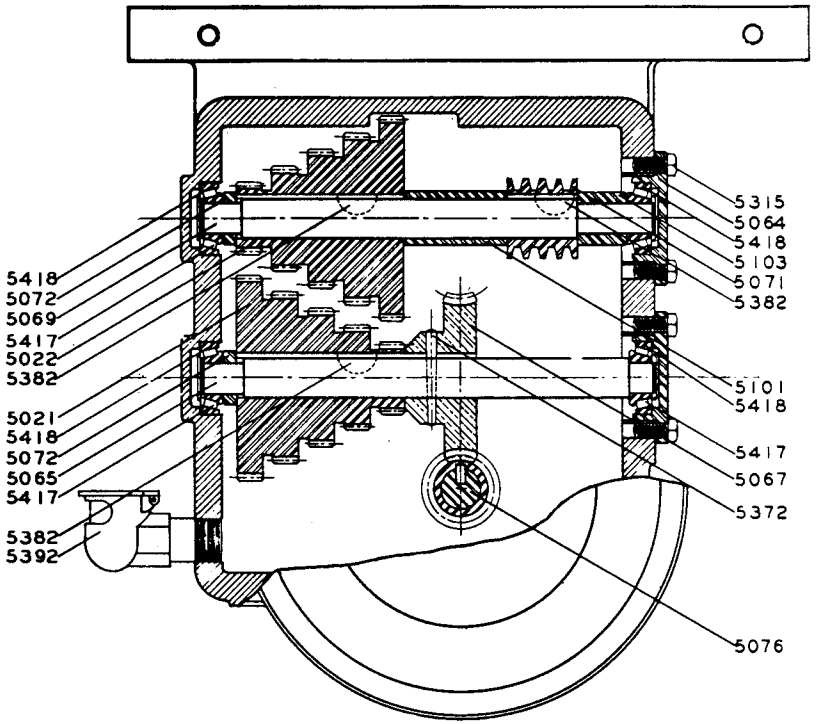
5003	Table Bracket-Left Hand
5004	Table Bracket-Right Hand
5032	Table
5090	Table Screw
5122	Dial-200 Graduations
5140	Table Stop Block "T" Bolts
5144	Table Adjusting Stop Blocks
5147	Snap Ring Backing Collar
5304	3/8-16 x 3/4 Socket Cap Screw
5346	1/2-20 Hex Jam Nut
5352	1/4 dia. x 1-1/4 Dowel Pins
5355	5/16 dia. x 1-1/4 Dowel Pins
5381	#8 Woodruff Key
5396	#5100- Tru Arc Ring
5397	5002-206 Tru Arc Ring
5399	#5100-98 Tru Arc Ring
5410	#77505XIC New Departure Bearing
5412	#55505XIC New Departure Bearing
5426	N-05 New Departure Lock Nut
5431	W-05 New Departure Lock Washer
5344	3/8-16 Hex Semi-Finished Full Nut
M-1065	Pin Retainer Brass Plug
M-1078	Return Spring Cover Screw
5002	Saddle
5025	Table Clutch Gears
5028	Reverse Gear Cap
5031	Saddle Gib-Adj.
5039	Table Shifter Rack
5056	Saddle Pinion Pawl
5093	Table Gib
5106	Table Lock Screw
5110	Retaining Screw for Table Feed Pinion
5111	Saddle Lock Lever
5114	Table Shifter Back Rest Pin
5115	Saddle Gib Screw-Long
5115-A	Saddle Gib Screw-Short - Not Shown
5128	Oil Reservoir Cover
5137	Table Feed Lever
5138	Table Lock Pin
5141	Lock Nut for Table Feed Nut
5142	Table Screw Nut
5143	Saddle Lock Screw
5148	Table Reversing Clutch
5152	Table Shifter Pinion
5153	Table Screw Nut Pin
5155	Feed Screw Drive Bushing
5161	Table Shifter Pin
5300	1/4-20 x 5/8 Socket Head Cap Screw
5305	3/8-16 x 1 Socket Head Cap Screw
5307	3/8-16 x 1-3/4 Socket Head Screws
5316	3/8-16 x 1-1/2 Hex Cap Screws
5323	#6-32 x 1 Flat Head Machine Screw
5358	3/8 x 1-1/2 Dowel Pin
5361	5/16 dia. x 1-3/4 Dowel Pin
5375	#4 Compression Spring
5389	C-2367 KIC (1" Stroke) Bijur Lubricator
5401	A-1349-1 Oilite Bushing
5402	A-1349-2 Oilite Bushing
P-2179	Belt Guard Knob
SS-4258	Set Screw for Dog
U-3933	Screw for Worm Housing
M-1079	Quill Lock Handle
HV-119	1/4-20 x 5/16 Hold Head Half Dog Set Screw
5118	Table Handle
5026	Clutch Safety Gear
5013	Feed Gear Box
5162	Oil Hole Plug on 5002
5163	Metering Oil Plug (Not Shown)


5026
5362
5041
5099
5096
5P-6430
5108
5040
U-4042
5094
5079
HVH-133
5078
5034
5P-6430
5088
5334
5097
5095
5019
M-1106
5043-A
5351
5045
5044
HV-151
5166
5167
5394
5035
5051
5052
5053
HV-110
5054-PM-123G
5054-PM-125
5054
5054-PM-127
5055
HV-130
5048
5050
5398
5063
5054-PM-130
5054-PM-129
5054-PM-108
5076
5109
5415-16
5315
5062
5332
5013
5112
5145-46
5042
5014
5370
5036
5125
5P-6430
M-1067
M-1068
5455
5374
5302
5035
5075
5413
5430
5160
5314
5425
5435
U-4135
5105
M-1041
5383
5071
5104
5076
5073
5331
M-1093-A

PARTS LIST

5013	Feed Gear Box
5014	Feed Gear Box Cover
5019	Selector Cam Bracket
5026	Clutch Safety Gear
5034	Selector Cam Dial
5035	Clutch Yoke
5036	Clutch Yoke Operating Finger
5040	Clutch Shaft_
5041	Clutch Safety Gear Spring
5042	Clutch Yoke Guide Pin
5043-A	Over Run Clutch Housing
5044	Over Run Clutch
5045	Over Run Clutch Spring
5048	Adjusting Ring Pawl
5050	Clutch Adjusting Nut
5051	Clutch Operating Cone
5052	Clutch Operating Shifter Sleeve
5053	Clutch Operating Ball Retainer
5054	Clutch
5055	Clutch Housing
5062	Clutch Shaft End Plate
5063	Clutch Cone Ball Spacer
5071	Driven Shaft & Motor Shaft Worm
5073	Motor Shaft Worm
5075	Motor Seal Housing
5076	Motor Shaft
5078	Selector Cam Shaft
5079	Cam Shaft Spur Gear
5088	Speed Selector Crank
5094	Selector Handle Plunger
5095	Selector Handle Pinion
5096	Selector Handle Plunger Housing
5097	Selector Handle Bushing
5099	Clutch Safety Gear Sleeve
5104	Motor Shaft Gear Spacer
5105	Motor Shaft Bearing Spacer
5108	Clutch Shaft Key
5109	Spacer on Clutch
5112	Guide Pin Retaining Screw
5125	Rapid Traverse Operating Post
5145	Gear Box Cover Screw
5146	Gear Box Cover Screw Nut
5160	Motor Pulley Key
5166	Over Running Clutch Insert
5167	Over Running Clutch Washer
5302	1/4-20 x 1-1/2 Socket Head Cap Screw
5314	3/8-16 x 1-1/4 Hex Head Machine Screw
5315	1/4 x 20 x 5/8 Hex Head Machine Screw
5331	3/8 Pipe Plug
5332	3/8 Square Head Pipe Plug
5334	1/4-20 x 5/16 Socket Set Screw Cup Point
5351	21-S-187-2000 Spring Pin
5362	1/4 x 2-1/2 Dowel Pins
5370	21-S-187-1000 Spring Pin
5374	#21 Compression Spring (Cut in two for gear box)
5383	#11 Woodruff Key
5394	#5000-237 Tru Arc Ring
5398	#5100-50 Tru Arc Ring
5413	#55604XIC New Departure Bearing
5415	A-6062 Timken Cone
5416	A-6162 Timken Cup
5425	#W-04 Lockwasher
5430	#N-04 Locknut
5435	#50219 National Grease Shield
5455	OZAU Partial Motor 1/2HP 1800RPM 3-60-220 less Shaft & Bearing
M-1041	#88502XIC New Departure Bearing
M-1067	Handle Rod
M-1068	Handle Ball
M-1093-A	5/16-18 x 3/4 Hex Head Machine Screw
M-1106	5/16-18 x 1 Socket Head Cap Screw
HV-110	1/4 dia. Balls
HV-130	Spring
HVH-133	#3 Woodruff Key
HV-151	1/4 dia. x 3/4 Dowel Pin
5P-6430	Pin
U-4042	Spring
U-4135	#N-02 Locknut
5054-PM 108	Split Ring
5054-PM 123G	Outer Disc
5054-PM 125	Inner Disc
5054-PM 127	Thrust Plate
5054-PM 129	Spring Pin
5054-PM 130	Spring


5354
5015
5080-1
5080-2
5080-3
5080-4
5080-5
5376
5023
5135
5414
5022
5356
5120
M-1093-A
5019
5078
5021
M-1110
5304
5070
5344
T-803
5068
5315


5418
5072
5069
5417
5022
5382
5021
5418
5072
5065
5417
5382
5392
5315
5064
5418
5103
5071
5382
5101
5418
5417
5067
5372
5076

PARTS LIST

5015	Plunger Guide Box
5019	Selector Cam Bracket
5021	Driven Gear Cluster
5022	Driven Gear Cluster
5023	Gear Cluster Idler Gear
5064	Drive Shaft Bearing Housing
5065	Drive Shaft
5067	Drive Worm Gear
5068	3/8-16 x 2 Hollow Hd. Set Screw
5069	Driven Shaft
5070	Gib for Gear Box
5071	Driven Shaft & Motor Shaft Worm
5072	Driven Shaft Worm Spacer
5076	Motor Shaft
5078	Selector Cam Shaft
5080-1	Selector Plunger No. 1
5080-2	Selector Plunger No. 2
5080-3	Selector Plunger No. 3
5080-4	Selector Plunger No. 4
5080-5	Selector Plunger No. 5
5101	Driven Shaft Gear Spacer
5103	Driven Shaft Bearing Spacer
5120	Cover for Gear Box Clutch Adjustment Opening
5135	Gear Selector Plunger Pin
5304	End Plate for Gear Box Gib
5315	1/4-20 x 5/8 Hex Head Machine Screw
5344	3/8-16 x 3/4 Socket Head Cap Screw
5354	5/16 dia. x 2 Dowel Pins
5356	5/16 dia. x 2 Dowel Pins
5372	21-S-187-1750 Spring Pin
5376	.048 x 23/64 O.D. x 1-1/32 long Compression Spring
5382	#9 Woodruff
5392	#4253 Style SGB Gits Oiler
5414	B-66 Torrington Needle Bearing
5417	A-4059 Timken Cone
5418	A-4138
M-1093-A	5/16-18 x 3/4 Hex Head Machine Screw
M-1110	Oiler
T-803	3/8-16 x Hex. S. F. Full Nut