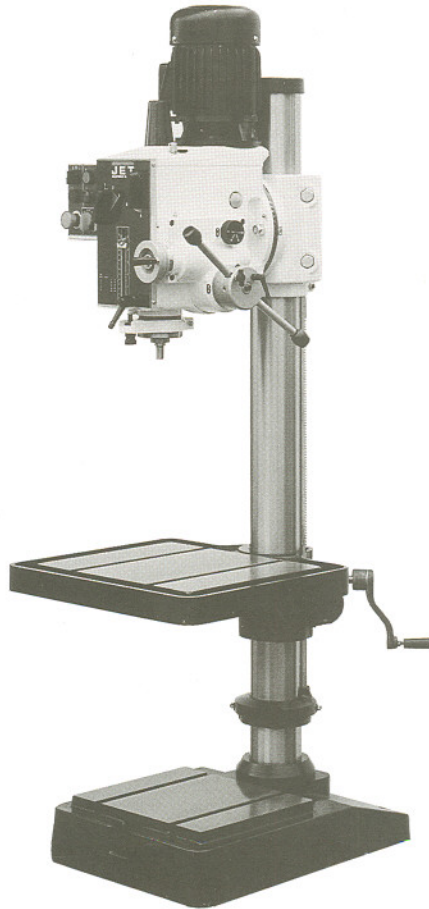




OPERATOR'S MANUAL

GHD-20/20T/20PF/20PFT Gear Head Drill/Tap



(GHD-20PFT shown)

JET EQUIPMENT & TOOLS, INC.
A WMH Company
www.jettools.com

P.O. BOX 1349
Auburn, WA 98071-1349
e-mail jet@jettools.com

253-351-6000
Fax 253-939-8001
M-354026 4/99

Important Information

1-YEAR LIMITED WARRANTY

**JET offers a one-year limited
warranty on this product**

REPLACEMENT PARTS

Replacement parts for this tool are available directly from JET Equipment & Tools.

To place an order, call 1-800-274-6848. Please have the following information ready:

1. Visa, MasterCard, or Discover Card number
2. Expiration date
3. Part number listed within this manual
4. Shipping address other than a Post Office box.

REPLACEMENT PART WARRANTY

JET Equipment & Tools makes every effort to assure that parts meet high quality and durability standards and warrants to the original retail consumer/purchaser of our parts that each such part(s) to be free from defects in materials and workmanship for a period of thirty (30) days from the date of purchase.

PROOF OF PURCHASE

Please retain your dated sales receipt as proof of purchase to validate the warranty period.

LIMITED TOOL AND EQUIPMENT WARRANTY

JET makes every effort to assure that its products meet high quality and durability standards and warrants to the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship as follows: 1 YEAR LIMITED WARRANTY ON THIS JET PRODUCT. Warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities or to a lack of maintenance. JET LIMITS ALL IMPLIED WARRANTIES TO THE PERIOD SPECIFIED ABOVE FROM THE DATE THE PRODUCT WAS PURCHASED AT RETAIL. EXCEPT AS STATED HEREIN, ANY IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS ARE EXCLUDED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG THE IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. JET SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF OUR PRODUCTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. To take advantage of this warranty, the product or part must be returned for examination, postage prepaid, to an authorized service station designated by our Auburn office. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, JET will either repair or replace the product or refund the purchase price, if we cannot readily and quickly provide a repair or replacement, if you are willing to accept such refund. JET will return repaired product or replacement at JET's expense, but if it is determined there is no defect, or that the defect resulted from causes not within the scope of JET's warranty, then the user must bear the cost of storing and returning the product. This warranty gives you specific legal rights, and you have other rights, which vary, from state to state.

JET Equipment & Tools • P.O. Box 1349, Auburn, WA 98071-1349 • (253) 351-6000

WARNING

For your own safety, read the operator's manual before operating the drill press.

Wear eye protection.

Do not wear gloves, neckties, or loose clothing.

Clamp the workpiece or brace it against the column to prevent rotation.

Use the recommended speed for drill accessories and workpiece materials.

- **KEEP GUARDS IN PLACE** and in working order.
- **REMOVE ADJUSTING KEYS AND WRENCHES.** Form a habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.
- **KEEP THE WORK AREA CLEAN.** Cluttered areas and work benches invite accidents.
- **DON'T USE IN A DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
- **KEEP CHILDREN AWAY.** All visitors should be kept a safe distance from the work area.
- **MAKE THE WORKSHOP KIDPROOF** with padlocks, master switches, or by removing starter keys.
- **DON'T FORCE THE MACHINE.** It will do the job better and safer at the rate for which it was designed.
- **USE THE RIGHT MACHINE.** Don't force a machine or attachment to do a job for which it was not designed.
- **USE THE PROPER EXTENSION CORD.** Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your machine will draw. An undersized cord will cause a drop in the line voltage resulting in power loss and overheating. If in doubt, use the next heavier gauge. Remember, the smaller the gauge number, the heavier the cord.

- **WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
- **ALWAYS USE SAFETY GLASSES.** Also use face or dust masks if the cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses; they are not safety glasses.
- **DON'T OVERREACH.** Keep proper footing and balance at all times.
- **MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.
- **ALWAYS DISCONNECT THE MACHINE FROM THE POWER SOURCE BEFORE SERVICING.**
- **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is in the off position before plugging in.
- **NEVER STAND ON A MACHINE.** Serious injury could occur if the machine tipped or if the drill bit is unintentionally contacted.
- **CHECK DAMAGED PARTS.** Before further use of the machine, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function - check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
- **NEVER LEAVE THE MACHINE RUNNING UNATTENDED. TURN POWER OFF.** Don't leave the machine until it comes to a complete stop.

Specifications:

GHD-20 Series

Stock Number	354020/354024/354022/354026
Drilling Capacity (cast iron).....	1-1/2"
Drilling Capacity (steel).....	1-1/4"
Swing	20"
Maximum Distance Spindle to Table	30-7/8"
Spindle Taper	MT-3
Spindle Travel (GHD-20/20T Manual).....	5"
Spindle Travel (GHD-20PF Manual).....	4-1/2"
Spindle Travel (GHD-20PF Power)	4-1/4"
Spindle Travel (GHD-20T/2PFT Tapping).....	4-7/8"
Quill Diameter	3"
Column Diameter	4-1/2"
Number of Spindle Speeds	12
Range of Spindle Speeds (rpm).....	60-3000
Number of Power Downfeeds (GHD-20PF only)	3
Range of Power Downfeeds (GHD-20PF only).....	.004", .007", .01"
Table Size.....	21-1/4" x 18-1/2"
Motor.....	2HP, 3Ph, 230V, 2 Speed
Net Weight (GHD-20/20T)	660 lbs.
Net Weight (GHD-20PF/20PFT)	670 lbs.

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The specifications in this manual are given as general information and are not binding. JET Equipment and Tools reserves the right to effect, at any time and without prior notice, changes or alterations to parts, fittings, and accessory equipment deemed necessary for any reason whatsoever.

Contents of the Shipping Container

- 1 Gear Head Drill Press
- 1 Lug Wrench
- 1 Touch Up Paint
- 1 Drill Chuck Arbor (MT-3 x JT-6)
- 1 Drawbar
- 1 Drift Key
- 1 Crank
- 1 Handle
- 3 Downfeed Handles (GHD-20/20T only)
- 3 Knobs (2 w/ the GHD-20PF/20PFT)
- 1 3mm Hex Wrench
- 1 4mm Hex Wrench
- 1 5mm Hex Wrench
- 1 Main Shaft Cover

Before Assembly

1. Finish removing the contents of the shipping container.
2. Compare the contents of the shipping container with the list found in this manual. Report any shortages or damage to your JET distributor.
3. Clean all rust protected surfaces with kerosene or a light solvent. Do **not** use lacquer thinner, paint thinner, or gasoline. These will damage plastic components and painted surfaces.

Assembly

1. Slide crank (A, Fig. 1) onto the table raising assembly shaft.
2. Tighten the set screw (B, Fig. 1) to hold the crank in place.
3. Install the handle (C, Fig. 1) onto the crank.
4. For the GHD-20/20T, install three handle and knobs (A, Fig. 2) into the downfeed hub. For the GHD-20PF/20PFT, screw two knobs onto the handles of the power downfeed assembly.

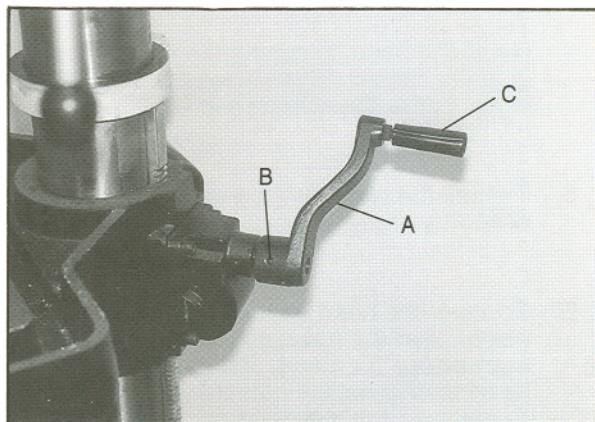


Fig. 1

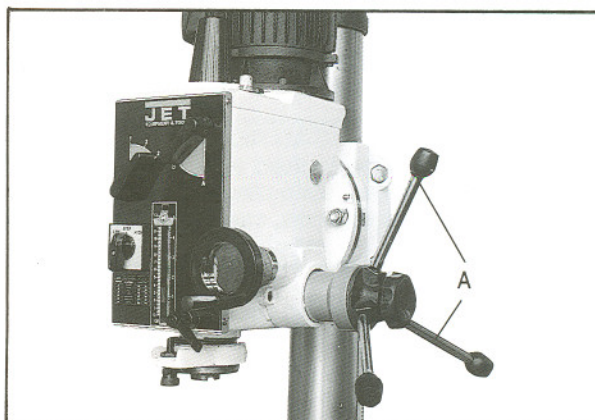


Fig. 2

Adjusting the Head Height

To facilitate shipping, the Drill Press is packed with the head adjusted down on the column. The head assembly should be moved to the top of the column before drilling operation starts.

WARNING

The head assembly is very heavy! Use caution when adjusting the head and make sure it is supported by the table or locked in place. Failure to comply may cause damage to property and/or personal injury!

1. Unlock the table by loosening handle (A, Fig. 3).
2. Lower the table until there is room to place a block of wood between the table and the head assembly (Fig. 4).
3. Loosen two nuts (A, Fig. 5) on the head assembly.
4. Raise the head by raising the table. The head is at the correct height when the top of the head is just below the column cap (B, Fig. 5).
5. Tighten the two nuts (A, Fig. 5) on the head assembly firmly.
6. To lower the head, reverse the steps above. **Do not loosen the head assembly bolts without supporting the head. This may cause the head to slip on the column and may cause damage to the machine or personal injury.**

Adjusting the Rack Assembly

After the table has been adjusted, the rack assembly will need to be raised.

CAUTION

The table must be locked when raising the rack! Failure to lock the table may cause the assembly to drop on the column, causing damage to the machine!

1. Make sure both head assembly nuts (A, Fig. 5) are tight.
2. Loosen the hex socket cap screw (A, Fig. 6) on the upper rack ring.
3. Loosen two sets screws on the bottom rack ring (A, Fig. 7).

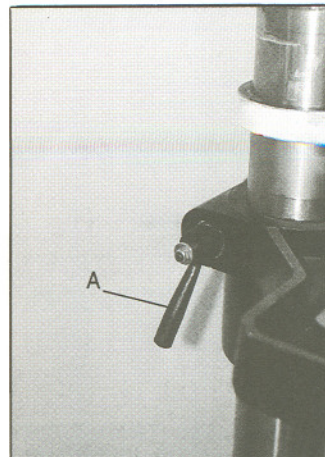


Fig. 3

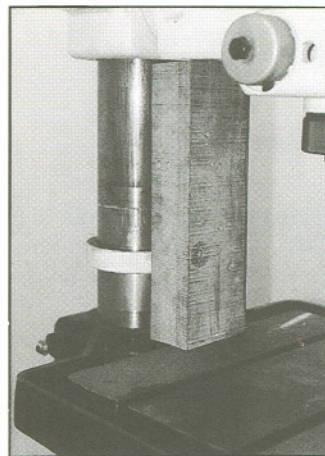


Fig. 4

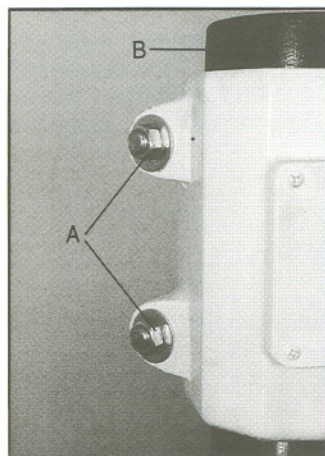


Fig. 5

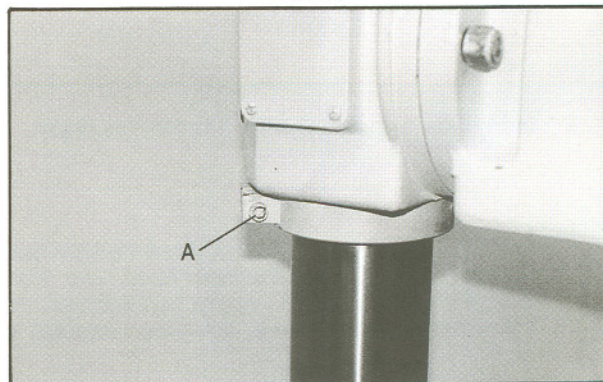


Fig. 6

4. Raise the rack assembly by turning the table raising handle clockwise.
5. The rack assembly is at its full height when the top rack ring is just below the head assembly (as illustrated in Fig. 6).
6. Tighten the hex socket cap screw on the top rack ring and two set screws on the lower rack ring.

Controls

Low / Off / High Switch (A, Fig. 8) - located top left side of the head assembly. Switch between low and high speed range. In the stop position, the spindle is stopped, but the machine still has power.

Fine Feed Handwheel (B, Fig. 8) - located on the front lower right of the head assembly. Turn clockwise to lower the quill. Turn counter-clockwise to raise the quill.

Quill Lock (C, Fig. 8) - located on the front lower right of the head assembly. Turn clockwise and tighten to lock the quill. Turn counter-clockwise and loosen to unlock the quill.

Speed Selectors (D, Fig. 8) - located on the top front of the head assembly. Used with low/off/high switch and the speed chart on the front of the head assembly to set the drill to a specific speed.

Caution: Change speeds only when the machine is stopped.

Depth Stop (GHD-20/20T) (E, Fig. 8) - located on the front bottom of the head assembly. When set, the quill will only advance to a certain depth.

Depth Stop (GHD-20PF/20PFT) (A, Fig. 9) - located on the downfeed assembly on the right side of the head assembly. When set, the quill will advance automatically or manually to a certain depth.

Power Downfeed Speed Selector (GHD-20PF/20PFT) (B, Fig. 9) - located on the right side of the head assembly. Set to advance the quill at desired speed. Engage the power downfeed by pulling the handle assembly away from the head. Disengage the power downfeed by pushing the handle assembly toward the head. Tighten **Lock Screw (C, Fig. 9)** to lock out the power downfeed and to keep the drill in manual feed only.

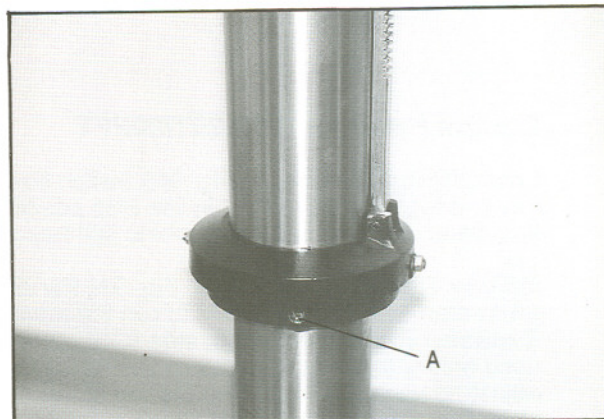


Fig. 7

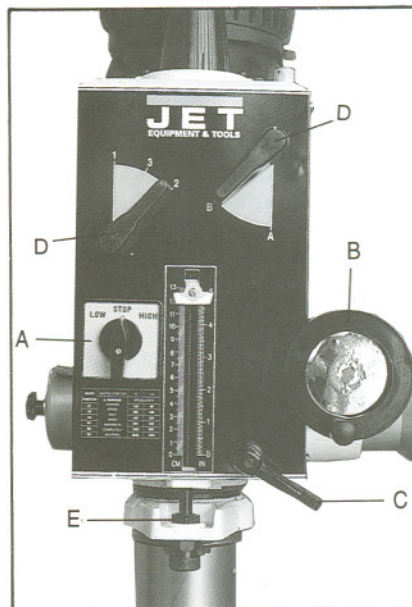


Fig. 8

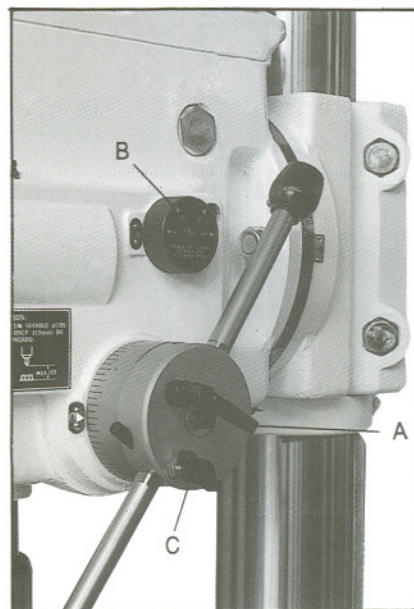


Fig. 9

Control Panel for GHD-20T/20PFT

Low/Off/High Switch (A, Fig. 9A) Switch between low and high speed range. In the stop position, the spindle is stopped, but the machine still has power.

Drilling Tapping Selector (B, Fig. 9A) For drilling press start switch (F, Fig. 9A) to run the machine.
Caution: The internal depth stop (GHD-20PFT) is used only with the tapping function. Raise the adjusting knob (B, Fig. 11) to the top of the depth stop screw so as not to interfere with power downfeed or manual feeding operations. For tapping, turn switch (B, Fig. 9A) to tapping position, press down the handle. The quill functions when upper limit switch is released. It then reverses automatically after hitting lower limit switch and will not stop until it hits the upper limit switch.

Emergency Switch (C, Fig. 9A) Press this switch to stop all operations.

Power Light (D, Fig. 9A) Indicates power is on.

Reverse Switch (E, Fig. 9A) If tapping is interrupted press the reverse switch to reverse the tap from workpiece. The button must be held down for continuous reversing.

Start Switch (F, Fig. 9A) Activates the motor in the drill or tap mode.

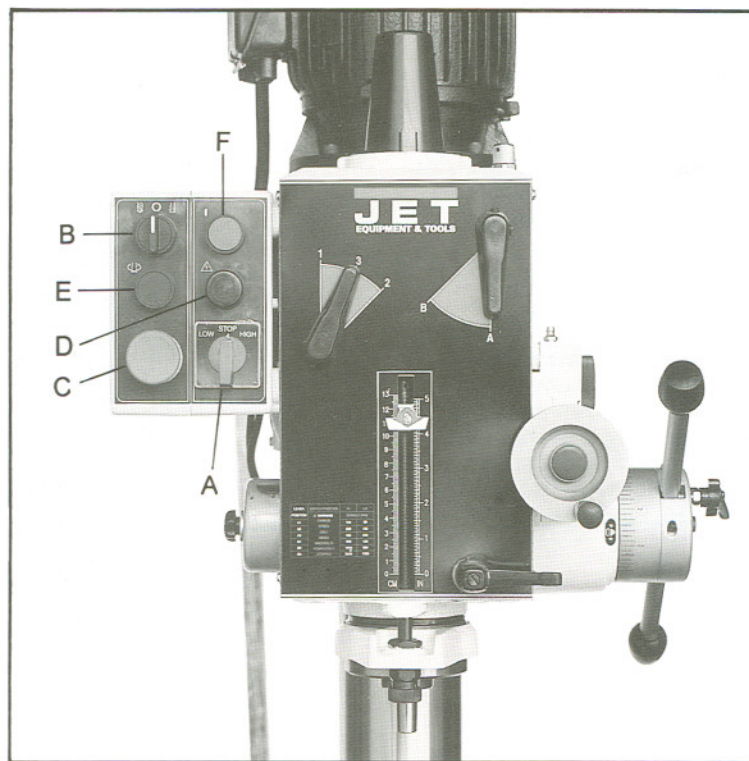


Fig. 9 A

Electrical Connections

□

, WARNING

A qualified electrician must complete all electrical connections!

**All adjustments or repairs must be done with the drill disconnected from the power source!
Failure to comply may result in serious injury!**

The motor is rated at 2 HP, 3 Ph, 230V only. Make sure the power available matches the power requirement of the drill. The drill must be properly grounded.

When the drill is connected properly, the spindle turns clockwise in a conventional drilling rotation. If the spindle does not turn clockwise, disconnect the drill from the power supply and reverse two of the three power leads.

Installing a Drill Chuck (not included)

1. Disconnect the machine from the power source.
2. Clean the arbor and the inside of the chuck.
3. Push the chuck onto the arbor.
4. Place a piece of scrap wood on the table and raise the table to just below the chuck.
5. Using the down feed handles, lower the chuck against the piece of scrap wood firmly to "seat" the chuck.

Removing the Arbor

1. Unplug the machine from the power source.
2. Make sure the drill is in gear.
3. Remove the main shaft cover (A, Fig. 11).
4. Use an adjustable wrench or box wrench to loosen the draw bar (A, Fig. 10).
5. Unscrew the draw bar approximately two revolutions. If the arbor is not loose, gently tap on top of the draw bar to loosen the arbor.
6. Continue to unscrew the draw bar with one hand on the chuck and arbor so that it doesn't drop onto the table.

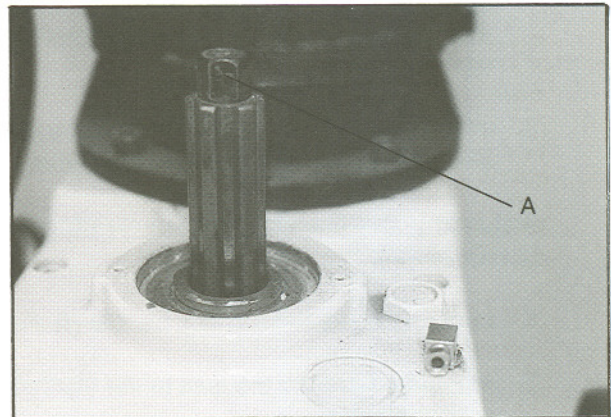


Fig. 10

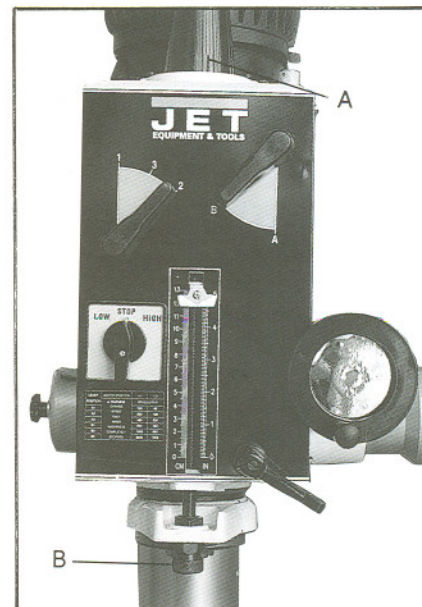


Fig. 11

Adjusting the Depth Stop for Drilling (GHD-20)

To drill multiple holes at the same preset depth, use the depth stop:

1. Turn the adjusting knob (B, Fig. 11) until the correct depth is indicated on the scale on the front of the drill head.
2. Drill several test holes to make sure the depth stop is set correctly.

Adjusting Depth Stop for Drilling and Tapping (GHD-20T)

1. Follow steps for GHD-20 drilling
2. When the tapping switch is on. The limit switch switches are active and will reverse rotation at the bottom of the stroke and stop rotation at the top.
3. When tapping switch is off, The limit switches are off and do not effect spindle rotation.

Adjusting the Depth Stop for Drilling (GHD-20PF)

1. Loosen the depth stop lock handle (A, Fig. 12).
2. Manually advance the quill to the desired depth with one hand.
3. With the other hand, turn the depth stop scale (B, Fig. 12) counter-clockwise to zero.
4. Tighten the depth stop lock handle (A, Fig. 12). The depth stop will now stop the drill at the pre-determined setting.

Adjusting the Depth Stop for Drilling (GHD-20PFT)

1. Turn the adjusting knob (B, Fig. 11) until full travel is possible. Do not use this scale as a reference when drilling. This depth stop is for tapping only and should not interfere with drilling operations.
2. Follow steps for GHD-20PF drilling.

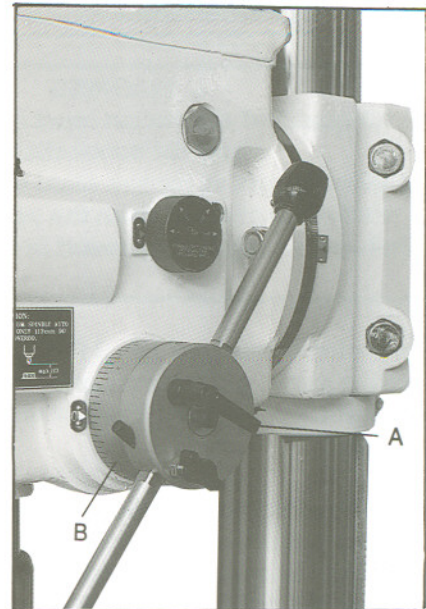


Fig. 12

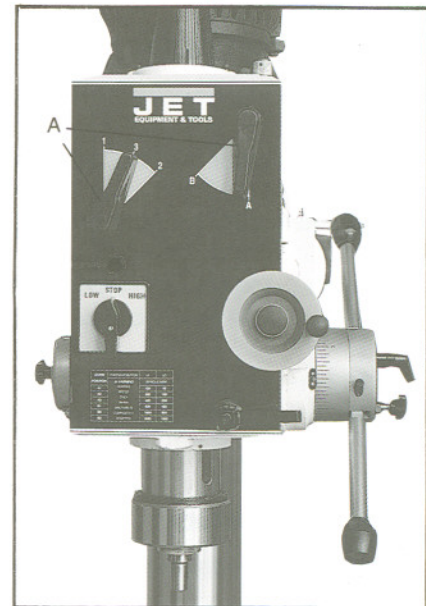


Fig. 13

Adjusting the Depth Stop for Tapping (GHD-20PFT)

1. Loosen the depth stop lock handle (A, Fig. 12) so it does not interfere with the internal depth stop located on the front of the drill head.
2. Adjust the front depth stop for the proper depth.
3. Manually advance the quill releasing the upper limit switch for tapping. This will start the motor. The quill will reverse directions upon triggering the lower limit switch.
4. **Do not** powerfeed and tap at the same time.

Changing Spindle Speeds

To change spindle speeds:

1. Stop the drill by turning the low/stop/high switch to stop.
2. Adjust the levers (A, Fig. 13) to the desired speed as indicated by the speed chart. Turning the spindle by hand will help the gear teeth mesh.

Return Spring Adjustment

The return spring is adjusted at the factory and should not need further adjustment. If adjustment is necessary:

1. Unplug the machine from the power source.
2. Loosen lock knob (A, Fig. 14) while holding the quill spring cover. Do not allow the cover to turn in your hand or the spring will unwind.
3. Pull out the cover (B, Fig. 14) and rotate until the pin (C, Fig. 14) on the return spring plate engages the next notch in the coil spring cover. Turn the cover clockwise to decrease tension and counter-clockwise to increase tension.
4. Tighten the lock knob (A, Fig. 14). Do not over-tighten. Nuts should not contact the housing when tight.

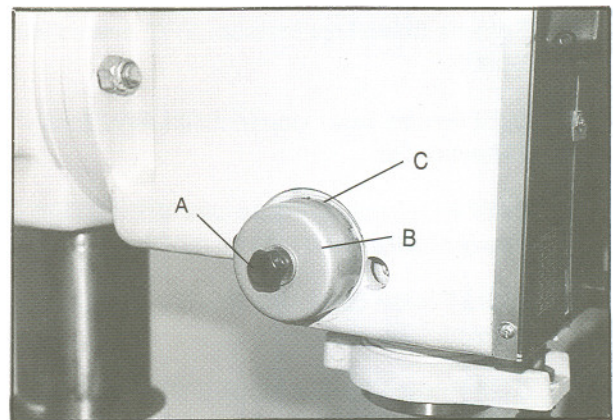


Fig. 14

Tilting the Head

To tilt the head:

1. Turn nut (A, Fig. 15) clockwise to pull out the alignment pin (B, Fig. 15).
2. Loosen hex nuts (C, Fig. 15).
3. Tilt the head to the desired angle.
4. Tighten two hex nuts (C, Fig. 15).
5. The alignment pin only works at 0° and must be reinserted when the head is returned to 0°.

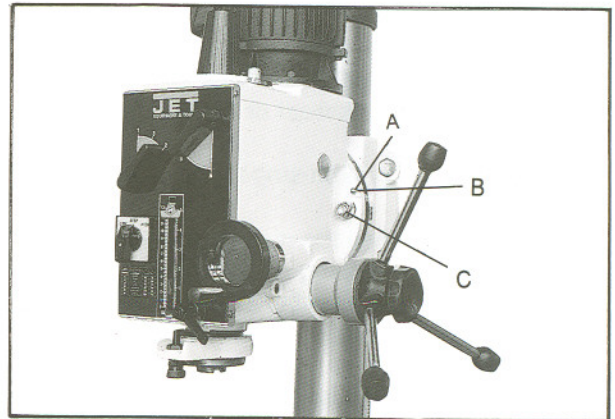


Fig. 15

Lubrication Figure 16

1. **Headstock** fill with Mobil DTE® Oil Heavy Medium. Check level daily and change yearly.
2. **Powerfeed** Use Mobilith AW2 every three months.
3. **Spindle Drive** Use Mobilith AW2 every three months.
4. **Quill Pinion Gear** Use Mobilith AW2 Every three months.
5. **Quill & Column Surface** Use Mobil DTE® Oil Heavy Medium every three months.
6. **Table Pinion Gear** Use Mobilith AW2 every three months.
7. **Quill Return Spring** Mobil DTE® Oil Heavy Medium every month. **Do not remove cover.**

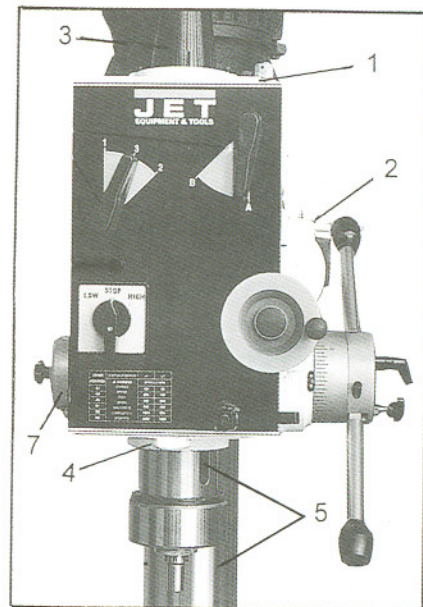


Fig. 16

Changing the Gear Box Lubricant

1. Disconnect the machine from the power source.
2. Loosen nuts (A, Fig. 17)
3. Tilt the head to access the drain plug. The drain plug is found in the head cavity behind the spindle.
4. Loosen the drain plug but do not remove.
5. Tilt the head back upright.

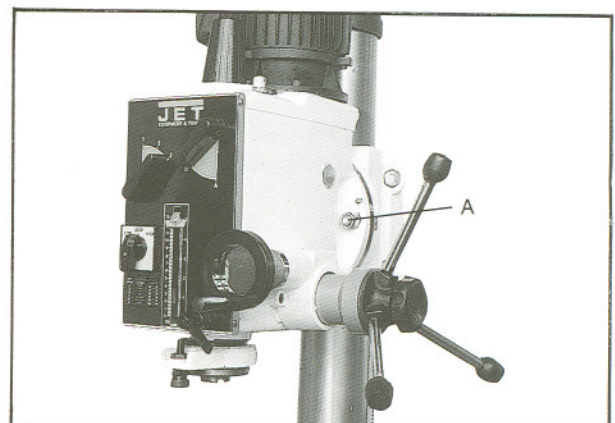


Fig. 17

6. Place a container on the table to catch the draining lubricant.
7. Remove the filler plug (A, Fig. 18).
8. Remove the drain plug.
9. Replace the drain plug after the lubricant has finished draining.
10. Pour one (1) gallon of new lubricant (Mobil DTE® Oil Heavy Medium) through the filler hole.
Caution: Use of any other type of lubricant other than that specified may cause damage to the drill press.
11. Replace the filler plug.

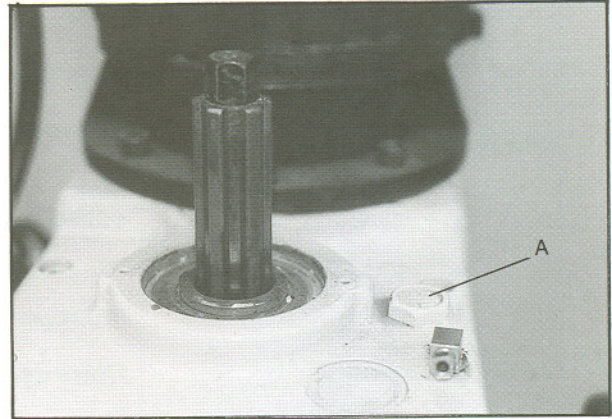


Fig. 18

Troubleshooting

Problem	Probable Cause	Solution
Excessive vibration	Motor out-of-balance.	Balance motor or replace.
Motor stalls	Over feeding. Dull drill bit. Motor not running up to speed.	Reduce feed rate. Sharpen drill bit. Replace or repair motor. Check fuses in all three legs on three phase motors and replace, if necessary.
Noisy operation	Improper quill adjustment. Noisy spindle. Noisy motor.	Adjust quill. Lubricate spindle. Check motor bearings or for a loose motor fan.
Drill or tool heats up or burns work.	Excessive speed. Dull tool. Feed rate too slow. Rotation of drill incorrect. Failure to use cutting oil or coolant (on steel).	Reduce speed. Sharpen tool or replace. Increase feed enough to clear chips. Reverse motor rotation. Use cutting oil or coolant (on steel).
Drill leads off.	No drill spot. Cutting lips on drill off center. Quill loose in head. Bearing play.	Center punch or center drill workpiece. Reground drill. Tighten quill. Reseat or replace bearings.
Excessive drill runout or wobble.	Bent drill. Bearing play. Drill not seated properly in the chuck.	Replace drill. Reseat or replace bearings. Loosen, reset, and tighten chuck.
Work or fixture comes loose or spins.	Failure to clamp work piece or work holding device to table.	Clamp workpiece or work holding device to the table service.

Parts List for the GHD-20/20T/20PF/20PFT Gear Head Drills

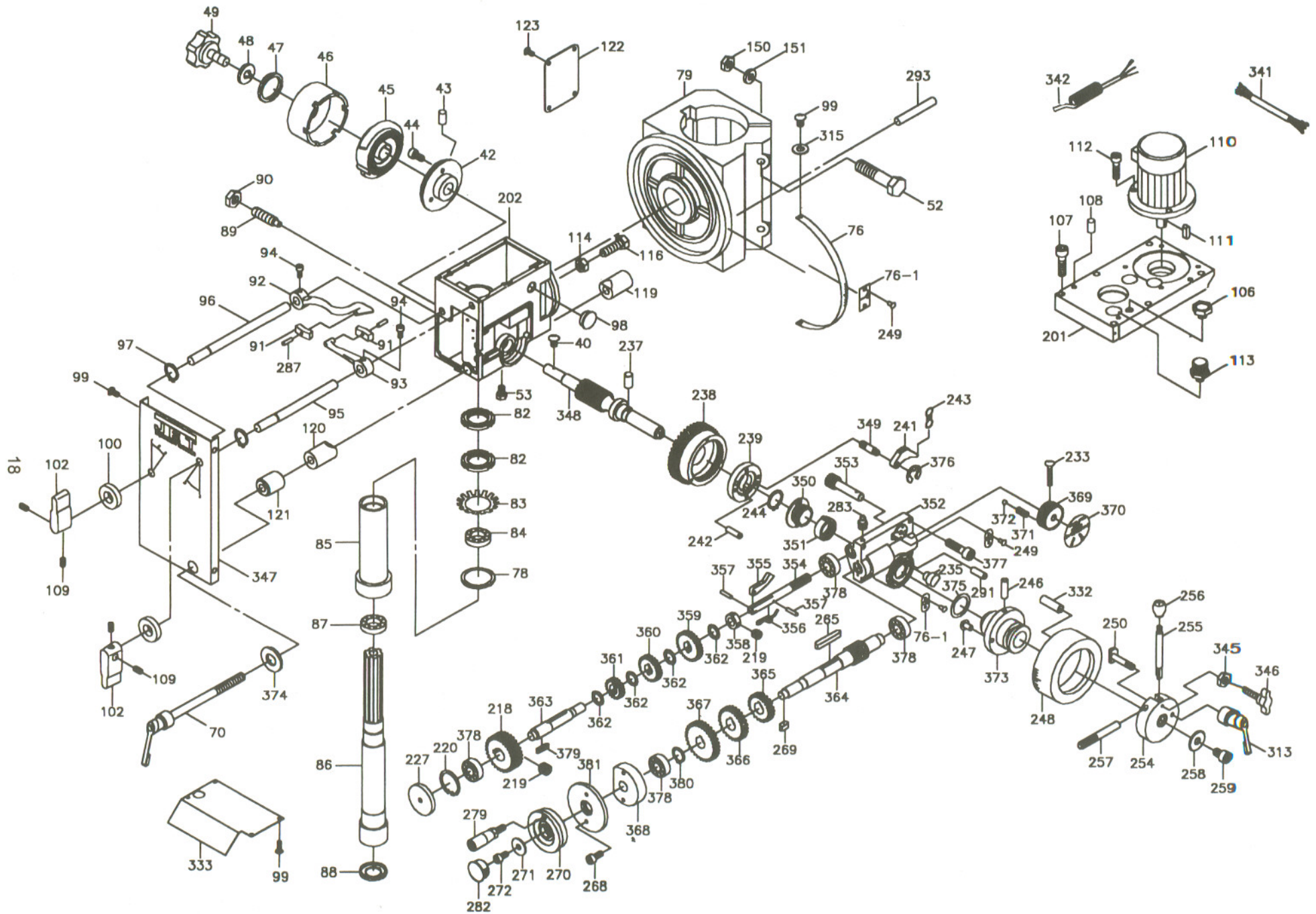
Head Assembly - GHD-20PF/20PFT

Index No.	Part No.	Description	Size	Qty.
40	GHD20PF-40	Screw	3/16 x 3/8	1
42	61105	Spring Base		1
43	GHD20PF-43	Spring Pin	3 x 12	2
44	GHD20PF-44	Screw	3/16 x 3/4	3
45	61104	Spring		1
46	61103	Spring Cover		1
47	TS-0680021	Washer	1/4	1
48	TS-0720071	Lock Washer	1/4	1
49	6185	Lock Knob		1
52	TS-0071141	Hex Cap Bolt	5/8 x 5-1/2	2
53	GHD20-53	Oil Plug	1/4"pt.	1
70	2421003	Handle Rod		1
76	2401076	Scale		1
76-1	2450060	Pointer		3
78	6112	Rubber Gasket		1
79	2412001	Casting		1
82	6114	Lock Nut		1
83	GHD20PF-83	Star Washer		1
84	BB-30206	Taper Roller Bearing		1
85	6116	Rack Sleeve	MT3	1
86	6117	Spindle Shaft		1
87	BB-30207	Taper Roller Bearing		1
88	6119	Bearing Cap		1
89	6127	Screw Key		1
90	TS-0561031	Hex Nut	3/8	1
91	2401066	Gear Lever Bracket		2
92	2401067	Gear Lever (left)		1
93	2401068	Gear Lever (right)		1
94	GHD20PF-94	Screw	1/4 x 1/2	1
95	2401070	Lever Shaft (right)		1
96	2401071	Lever Shaft (left)		1
97	GHD20PF-97	C-Ring		2
98	GHD20PF-98	Oil Sight Glass		1
99	GHD20PF-99	Screw	3/16 x 3/8	8
100	GHD20PF-100	Oil Seal	G12	2
102	2401075	Speed Lever		2
106	GHD20PF-106	Oil Plug		1
107	TS-0209081	Hex Socket Cap Screw	3/8x 3/4	6
108	GHD20PF-108	Miter Pin		2
109	TS-0267021	Set Screw	1/4 x 1/4	4
110	GHD20-86	Motor		1
111	GHD20PF-111	Key	6 x 6 x 30	1
112	TS-0209051	Hex Socket Cap Screw	3/8 x 3/4	6
113	GHD20-89	Brass Fitting		1
114	TS-0561071	Hex Nut	5/8	3
116	TS-0071041	Hex Cap Bolt	5/8 x 2-1/4	3
119	6126-1	Collar (thread)		1
120	6125-1	Collar		1

121	6125-2	Collar		1
122	61112	Cover Plate		1
123	GHD20-123	Screw		4
150	TS-0561071	Hex Nut	5/8	2
151	TS-0680081	Washer	5/8	2
201	2450001	Head Body Cover		1
202	2450002	Head Body Casting		1
218	2450008	Worm Gear		1
219	TS-1523011	Set Screw	M6 x 6	4
220	GHD20PF-220	C-Ring		4
227	2450014	Cover		1
233	GHD20PF-233	Screw	M4 x 25	1
235	2450020	Release Block		1
236	2450021	Small Pinion Shaft		1
237	2450022	Key		2
238	2450023	Worm Gear		1
239	2450024	Clutch Key Base		1
241	2450026	Clutch Key		2
243	2450028	Spring		2
244	GHD20PF-244	C-Ring		1
246	2450030	Bushing Pin		1
247	2450031	Bushing Stop		1
248	2450032	Scale Base		1
249	GHD20PF-249	Rivet		8
250	2450033	Scale Base Set Screw		1
254	2450037	Handle Body		1
255	2450038	Handle Rod		2
256	GHD20PF-256	Knob		2
257	2450039	Handle Rod Pin		2
258	2450040	Washer		1
259	TS-1504021	Hex Socket Cap Screw	M8 x 12	1
265	GHD20PF-265	Key	5 x 5 x 32	1
266	2450045	Cover		1
268	TS-1502031	Hex Socket Cap Screw	M5 x 12	2
269	GHD20PF-269	Key	4 x 4 x 10	1
270	24500470	Hand Wheel		1
271	GHD20PF-271	Washer		1
272	TS-1523031	Hex Socket Cap Screw	M6 x 12	1
279	TS-0561021	Hex Nut	5/16	1
282	GHD20PF-282	Plug	7/8	1
283	GHD20PF-283	Oil Seal		1
287	GHD20PF-287	Spring Pin		2
291	2450051	Pin		1
313	2450063	Grip		1
315	GHD20PF-315	Washer	3/16	2
330	2401085	Dust Plate		1
332	GHD20PF-332	Pin		1
333	2450069	Dust Plate		1
341	GHD20-341	Motor Cord		1
342	GHD20-342	Power Cord		1
345	GHD20PF-345	Nut		1
346	GHD20PF-346	Manual Feed Knob		1
347	GHD20-347	Name Plate		1
348	2450086A	Pinion Shaft		1
349	2450097	Spring Pin		2

350	2450096	Clutch Screw		1
351	2450095	Clutch Nut		1
352	2450068	Gear Box		1
353	2450081A	Gear Shaft		1
354	2450082A	Speed Change Lever		1
355	2450083A	Stop		1
356	2450084A	Spring Leaf		1
357	GHD20PF-357	Pin		2
358	2450089A	Bushing Bracket		1
359	2450072A	Bearing Bushing		1
360	2450071A	Bearing Bushing		1
361	2450070A	Bearing Bushing		1
362	2450074A	Washer		4
363	2450073A	Shaft		1
364	2450078A	Transmission Worm		1
365	2450075A	Bearing Bushing		1
366	2450076A	Bearing Bushing		1
367	2450077A	Bearing Bushing		1
368	2450085A	Spacer Ring		1
369	2450079	Speed Lever		1
370	GHD20PF-370	Speed Scale		1
371	290089	Spring		1
372	GHD20PF-372	Steel Ball		1
373	2450087A	Clutch Bushing		1
374	GHD20-374	Flat Washer	1/2x7/8x2	1
375	2450100	Washer		1
376	GHD20PF-376	E-Retainer Ring	E5	2
377	GHD20PF-377	Hex Socket Head Screw	5/16x1-1/4L	4
378	CA6003ZZ	Ball Bearing		4
379	GHD20PF-379	Key	5x5x28L	1
380	GHD20PF-380	C-Ring		1
381	2450088A	Graduated Bottom Ring		1

Head Assembly for GHD-20PF/20PFT

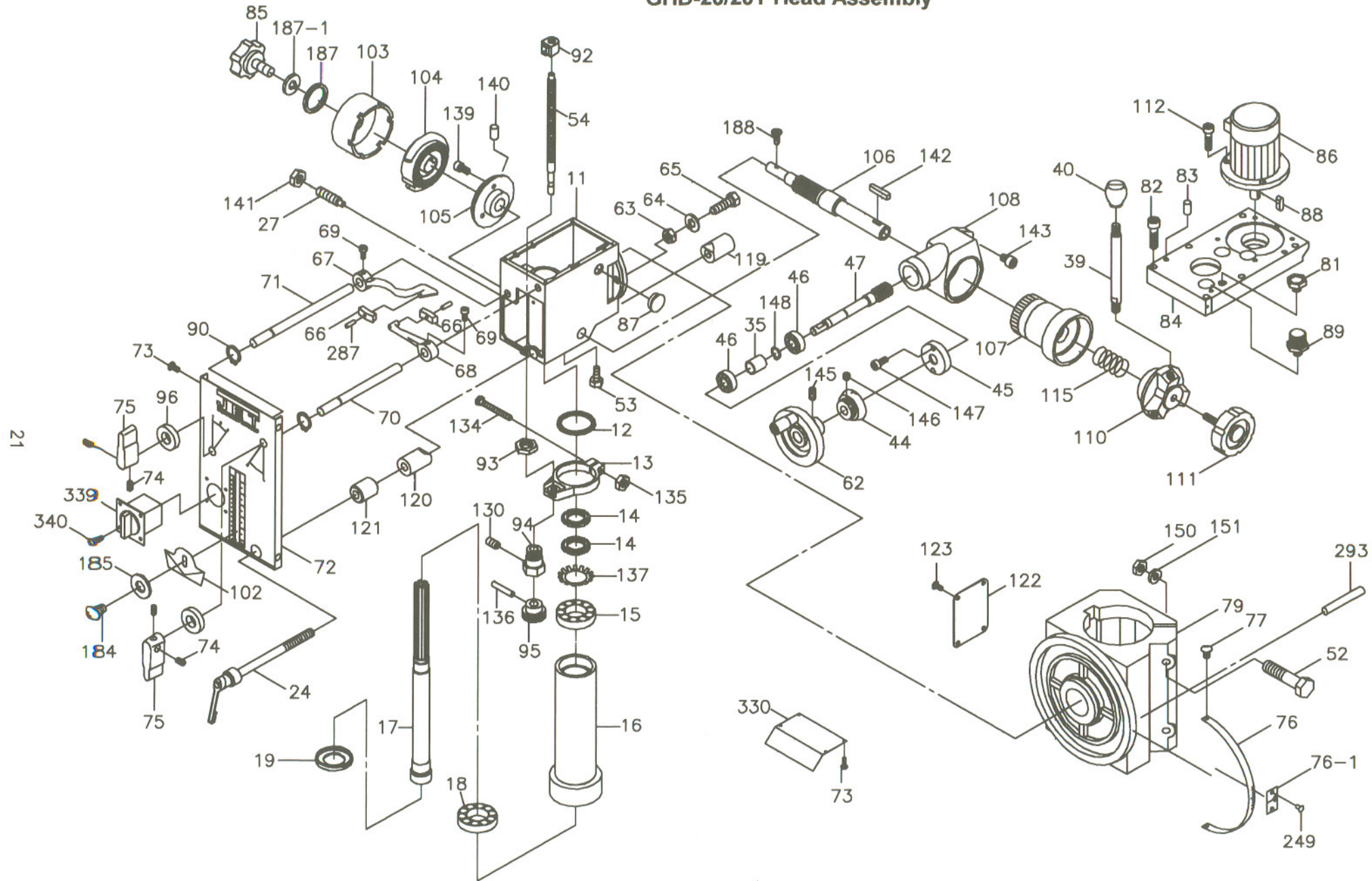


GHD-20/20T Head Assembly

Index No.	Part No.	Description	Size	Qty.
11	2401011	Head Casting		1
12	6112	Rubber Gasket		1
13	6513	Feed Base		1
14	6114	Lock Nut		2
15	BB-30206	Taper Roller Bearing		1
16	6116	Rack Sleeve	MT3	1
17	6117	Spindle Shaft	MT3	1
18	BB-30207	Taper Roller Bearing		1
19	6119	Bearing Cap		1
24	2421003	Handle Rod		1
27	6127	Screw Key		1
35	6135	Bearing Spacer		1
39	6139	Handle Rod		3
40	290086	Knob		3
44	6144	Micro Adjusting Indicator		1
45	6145	Worm Cover		1
46	BB-6202Z	Ball Bearing		2
47	6147	Worm Shaft		1
52	TS-0071141	Hex Cap Bolt	5/8 x 5-1/2	2
53	GHD20-53	Oil Plug		1
54	6195	Rod		1
62	6142-2	Head Wheel		1
63	TS-0561071	Hex Nut	5/8	3
64	TS-0680081	Washer		2
65	TS-0071041	Hex Screw	5/8 x 2-1/4	3
66	2401066	Gear Lever Bracket		2
67	2401067	Gear Lever (left)		1
68	2401068	Gear Lever (right)		1
69	GHD20-69	Screw	1/4 x 1/2	2
70	2401070	Lever Shaft (right)		1
71	2401071	Lever Shaft (left)		1
72	2401072	Name Plate		1
73	GHD20-73	Screw	3/16 x 3/8	8
74	TS-0267021	Set Screw	1/4 x 1/4	8
75	2401075	Speed Lever		2
76	GHD20-76	Scale		1
76-1	2401076-1	Pointer		1
77	GHD20-77	Screw		2
79	2412001	Block		1
81	GHD20-81	Oil Plug		1
82	TS-0209061	Hex Socket Cap Screw	3/8 x 3/4	6
83	GHD20-83	Miter Pin		2
84	2401084	Cover		1
85	6185	Lock Handle		1
86	GHD20-86	Motor		1
87	GHD20-87	Oil Sight Glass		1
88	GHD20-88	Key	6 x 6 x 30	1
89	GHD20-89	Brass Fitting		1
90	GHD20-90	C-Ring		2
92	6192	Block		1

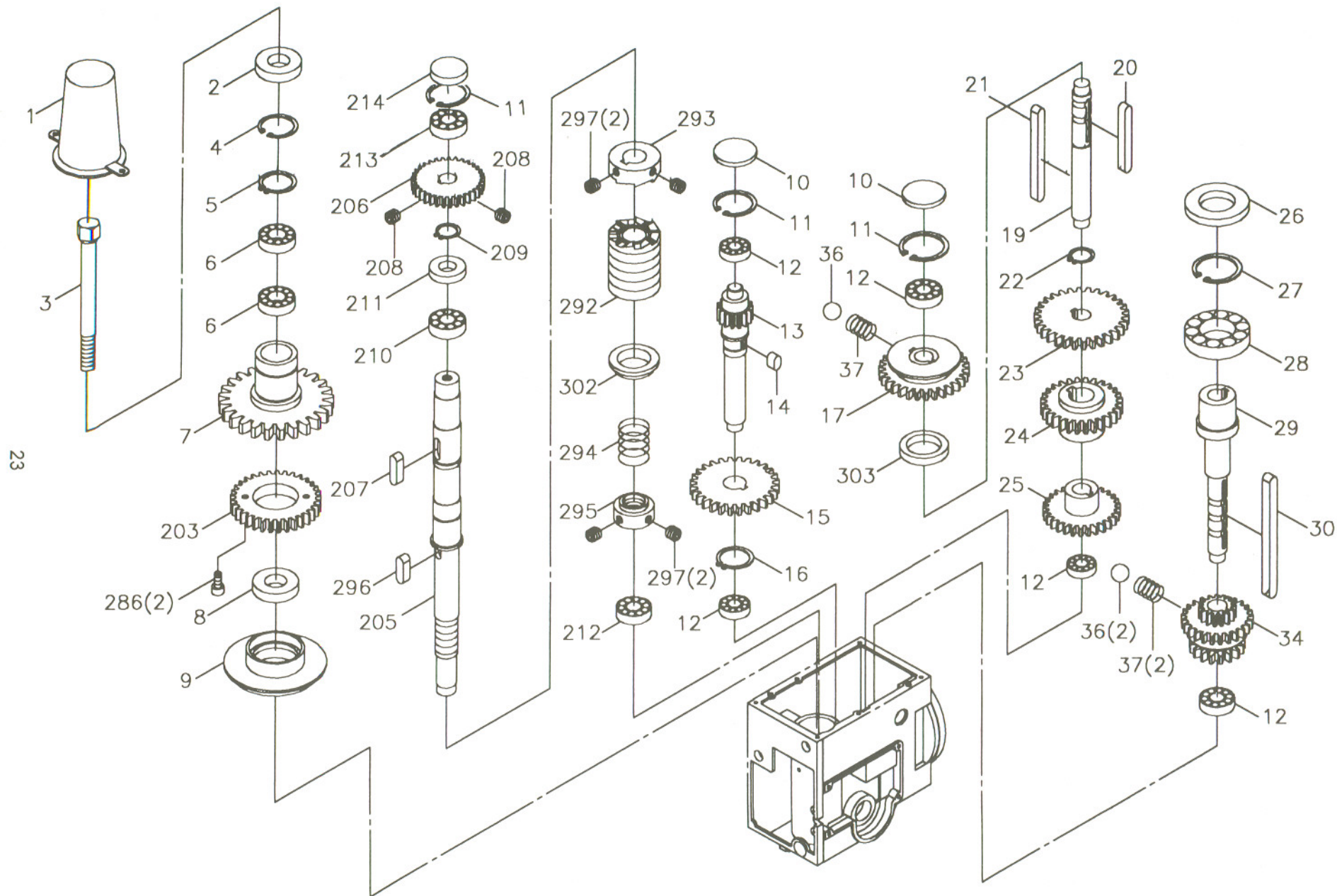
93	6193	Nut	1
94	6195	Support Base	1
95	6195	Knob Assembly	1
96	GHD20-96	Oil Seal	2
101	61101	Bracket	1
102	61102	Limit Plate	1
103	61103	Spring Cover	1
104	61104	Spring	1
105	61105	Spring Base	1
106	61106	Pinion Shaft	1
107	61107	Worm Gear	1
108	61108	Feed Cover	1
110	61110	Spring Base	1
111	6138	Lock Bolt w/ Knob	1
112	TS-0209051	Hex Socket Cap Screw	3/8 x 1 3
115	61115	Spring	1
119	6126-1	Collar (thread)	1
120	6125-1	Collar	1
121	6125-2	Collar	1
122	61112	Cover	1
123	GHD20-123	Screw	4
130	6195	Hex Socket Cap Screw	M4 x 8 1
134	TS-005091	Hex Cap Bolt	1/4 x 2 1
135	TS-0561011	Hex Nut	1/4 1
136	6195	Spring Pin	1
137	GHD20-137	Star Washer	1
139	GHD20-139	Screw	3/16 x 3/4 3
140	GHD20-140	Spring Pin	1
141	TS-0561031	Hex Nut	3/8 1
142	GHD20-142	Key	7 x 7 x 20 1
143	TS-0208021	Hex Socket Cap Screw	5/16 x 1/2 2
145	TS-0270021	Set Screw	5/16 X 5/16 1
146	TS-0267021	Set Screw	1/4 x 1/4 1
147	GHD20-147	Hex Socket Cap Screw	3/16 x 7/16 2
148	GHD20-148	C-Ring	1
150	TS-0561071	Hex Nut	5/8 2
151	TS-0680081	Washer	5/8 2
184	GHD20-184	Screw	5/32 x 1/4 1
185	GHD20-185	Washer	5/32 1
187	TS-0680021	Washer	1/4 1
187-1	TS-0720071	Lock Washer	1/4 1
188	GHD20-188	Screw	3/16 x 3/8 1
249	GHD20-249	Rivet	2
287	GHD20-287	Spring Pin	2
330	2401085	Dust Plate	1
339	GHD20-339	Switch	1
340	GHD20-340	Screw	2
341	GHD20-341	Motor Cord	1
342	GHD20-342	Power Cord	1

GHD-20/20T Head Assembly



GHD-20PF/20PFT Gear Assembly

Index No.	Part No.	Description	Size	Qty.
1	2401001-2	Main Shaft Cover		1
2	GHD20-28	Oil Seal		1
3	6101-2	Chuck Arbor Bolt	MT3	1
4	GHD20-4	Retainer Ring	R68	1
5	GHD20PF-5	Retainer Ring	S40	1
6	BB-6008ZZ	Ball Bearing		2
7	2401006	Idle Gear		1
8	GHD20-7	Oil Seal		1
9	2401008	Oil Seal Ring		1
10	GHD20-9	Dust Cover		2
11	GHD20-10	C-Ring		2
12	BB-6002ZZ	Ball Bearing		5
13	2401020	Idle Gear		1
14	GHD20-38	Key	6 x 6 x 10	1
15	2401021	Pinion Shaft		1
16	GHD20PF-16	C-Ring	S22	1
17	2401029	Idle Gear		1
19	2401031	Pinion Shaft		1
20	GHD20-32	Key	6 x 6 x 50	1
21	GHD20-32-1	Key	6 x 6 x 75	1
22	GHD20-33	C-Ring	S18	1
23	2401055	Idle Gear		1
24	2401037	Idle Gear (2 piece)		1
26	GHD20-50	Oil Seal		1
27	GHD20-42	C-Ring	R62	1
28	BB-6007ZZ	Ball Bearing		1
29	2401043	Pinion Shaft		1
30	GHD20-48	Key	5 x 5 x 80	1
34	2401049	Idle Gear		1
36	GHD20-30	Steel Ball w/ Spring	5/16"	3
203	2450003	Idle Gear		1
205	2450004	Transmission Worm		1
206	2450005	Idle Gear		1
207	GHD20PF-207	Key	5 x 5 x 16	1
208	GHD20PF-208	Set Screw	M6 x 6	2
209	GHD20PF-209	C-Ring	S17	2
210	BB-6003ZZ	Ball Bearing		1
211	GHD20PF-211	Oil Seal		1
212	BB-6001ZZ	Ball Bearing		1
213	BB-6202ZZ	Ball Bearing		1
214	GHD20-214	Oil Seal Cover		1
286	GHD20-286	Hex Socket Cap Screw	M5 x 12	2
292	2450052	Worm Shaft		1
293	2450053	Clutch Block		1
294	2450054	Spring		1
295	2450055	Adjustable Bolt		1
296	GHD20PF-296	Key	5 x 5 x 10	1
297	GHD20PF-297	Set Screw	M5 x 5	4
302	2450057	Washer		1
303	2401192	Bushing		1



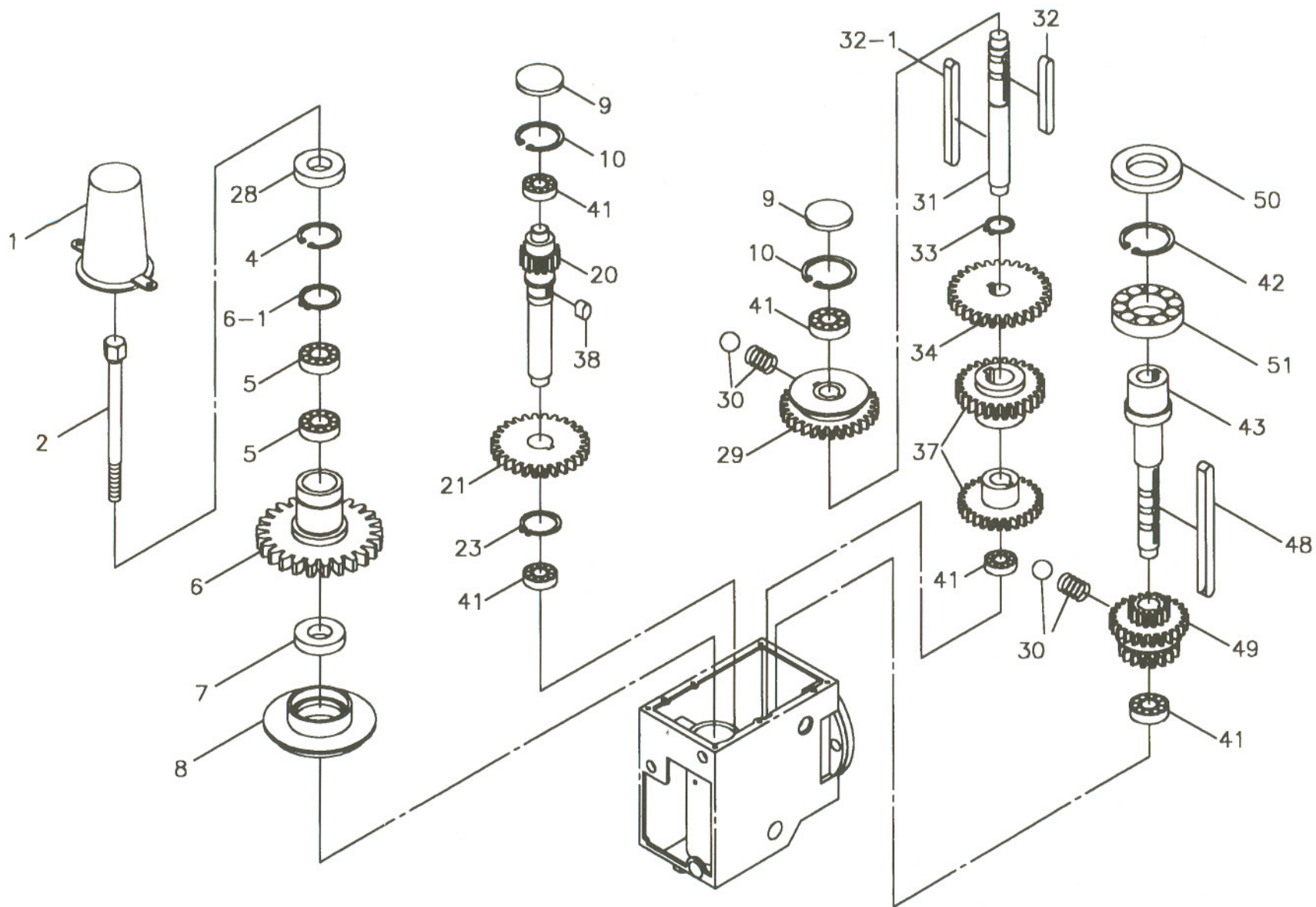
GHD-20PF/20PFT Gear Assembly

GHD-20/20T Gear Assembly

Index No.	Part No.	Description	Size	Qty.
1	2401001-2	Main Shaft Cover		1
2	6101-2	Chuck Arbor Bolt		1
4	GHD20-4	C-Ring		1
5	BB-6008ZZ	Ball Bearing		2
6	2401006	Idle Gear		1
6-1	GHD20-6-1	C-Ring		1
7	GHD20-7	Oil Seal		1
8	2401008	Oil Seal Ring		1
9	GHD20-9	Dust Cap		2
10	GHD20-10	C-Ring		2
20	2401020	Pinion Shaft		1
21	2401021	Idle Gear		1
23	GHD20-23	C-Ring		1
28	GHD20-28	Oil Seal		1
29	2401031	Pinion Shaft		1
30	GHD20-30	Spring and Ball		3
31	2401031	Pinion Shaft		1
32	GHD20-32	Key	6 x 6 x 50	1
32-1	GHD20-32-1	Key	6 x 6 x 75	1
33	GHD20-33	C-Ring		1
34	2401055	Idle Gear		1
37	2401037	Idle Gear (2 piece)		1
38	GHD20-38	Key	6 x 6 x 10	1
41	BB-6002ZZ	Ball Bearing		5
42	GHD20-42	C-Ring		1
43	2401043	Pinion Shaft		1
48	GHD20-48	Key	5 x 5 x 80	1
49	2401049	Idle Gear		1
50	GHD20-50	Oil Seal		1
51	BB-6007ZZ	Ball Bearing		1

GHD-20/20T Gear Assembly

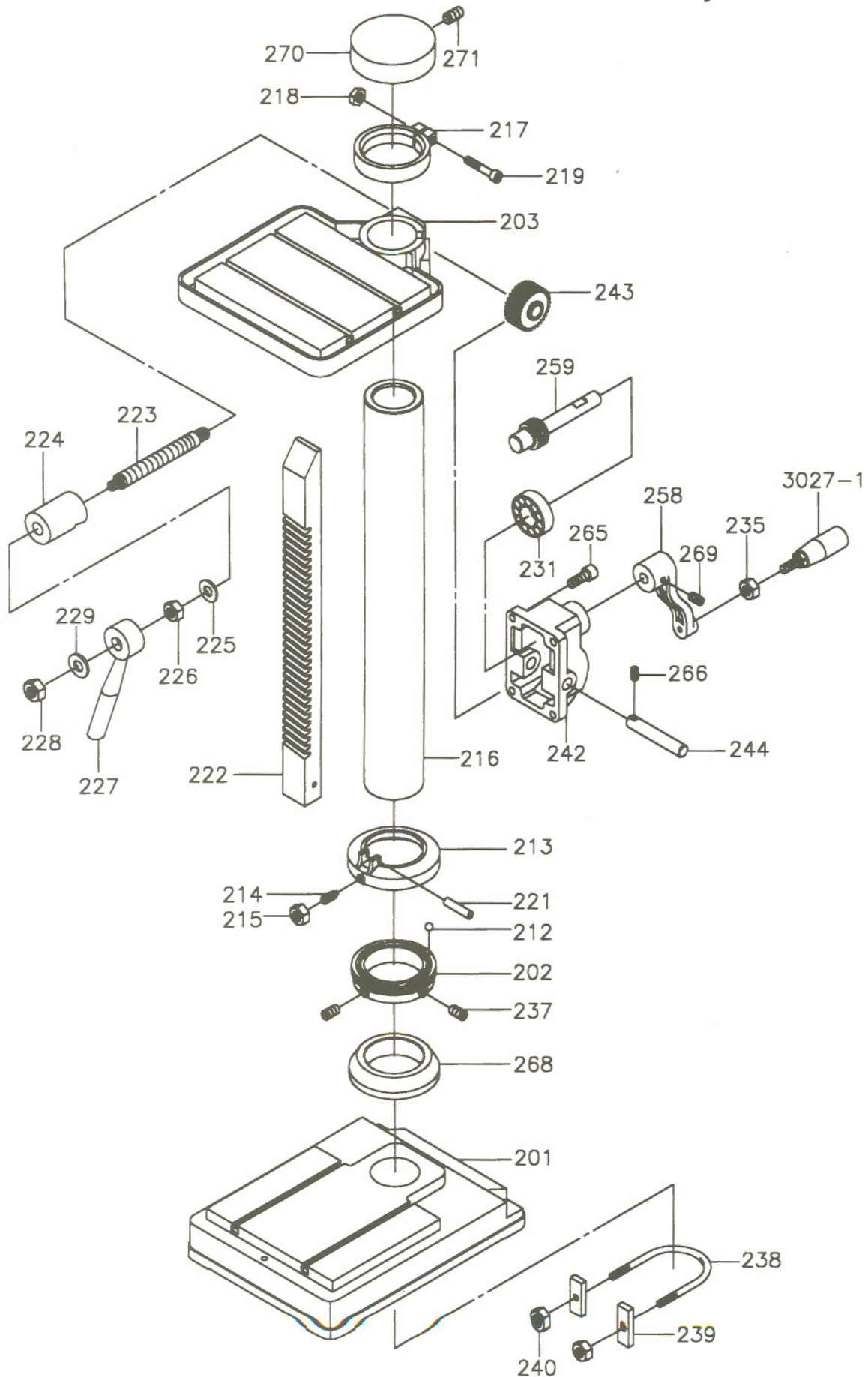
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GHD-20/20T/20PF/20PFT Base, Table, and Column Assembly

Index No.	Part No.	Description	Size	Qty.
201	62201	Base		1
202	62202	Bearing Cover (lower)		1
203	62203-1	Table		1
212	SB-3/8	Steel Ball	3/8	40
213	62213	Bearing Cover (upper)		1
214	62214	Screw		2
215	TS-0561021	Hex Nut	5/16	2
216	62216	Column Base		1
217	66217	Lock Ring		1
218	TS-0561031	Nut	3/8	1
219	TS-0209101	Hex Socket Cap Screw	3/8 x 2-1/4	1
221	GHD20-221	Pin		1
222	62222	Rack		1
223	62223	Lock Bolt		1
224	62224-1	Lock Block		1
225	TS-0680081	Washer	5/8	1
226	TS-0561031	Nut	5/8	1
227	62227	Lock Handle		1
228	TS-0561031	Nut	3/8	1
229	TS-0680041	Washer	3/8	1
231	BB-51103	Thrust Bearing		1
235	TS-0561031	Nut	3/8	1
237	TS-0267041	Set Screw	1/4 x 3/8	2
238	62238	U-Bolt		1
239	62239	Block		1
240	TS-0561051	Nut	1/2	2
242	62242	Bracket		1
243	62243	Worm Gear		1
244	62244	Shaft		1
258	6158	Handle		1
259	62259	Worm Shaft		1
265	TS-0208061	Hex Socket Cap Screw	5/16 x 1	4
266	TS-0267041	Set Screw	1/4 x 3/8	1
268	62268	Bracket		1
269	TS-0270021	Set Screw	5/16 x 5/16	1
270	6611	Column Cap		1
271	GHD20-271	Set Screw		1
3027-1	3027-1	Lever		1

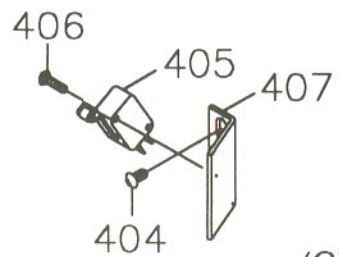
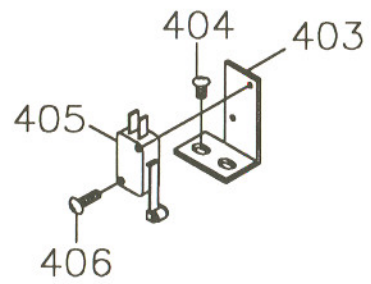
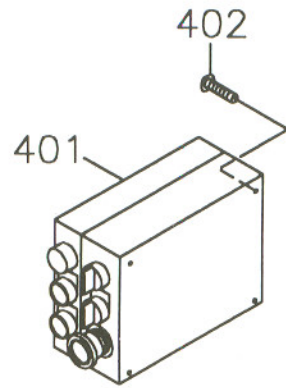
GHD-20/20T/20PF/20PFT Base, Table and Column Assembly



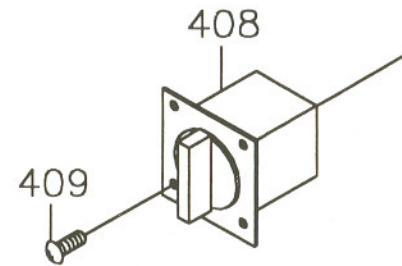
Control Box Assembly

Index No.	Part No.	Description	Size	Qty.
401	GHD20PFT-401	Control Box (GHD-20T/20PFT)		1
	GHD20PFT-CB	Control Box Complete (GHD-20PFT only)		1
	GHD20T-CB	Control Box Complete (GHD-20T only)		1
402	GHD20PFT-402	Round Head Screw (GHD-20T/20PFT)	3/16"x3/8"	4
403	GHD20PFT-403-1	Limit Support (top) (GHD-20PFT)		1
	GHD20PFT-403-2	Limit Support (top) (GHD-20T)		1
404	GHD20PFT-404	Round Head Screw (GHD-20T/20PFT)	3/16"x5/8"	4
405	ET-1610	Limit Block (GHD-20T/20PFT)		2
406	GHD20PFT-406	Round Head Screw (GHD-20T/20PFT)	M3x15	4
407	GHD20PFT-407-1	Limit Support (bottom) (GHD-20PFT)		1
	GHD20PFT-407-2	Limit Support (bottom) (GHD-20T)		1
408	GHD20-339	High-Low Switch (GHD-20/20PF)		1
409	GHD20-340	Round Head Screw (GHD-20/20PF)	M4x20	4

Control Box Assembly



(GHD-20T/20PFT only)

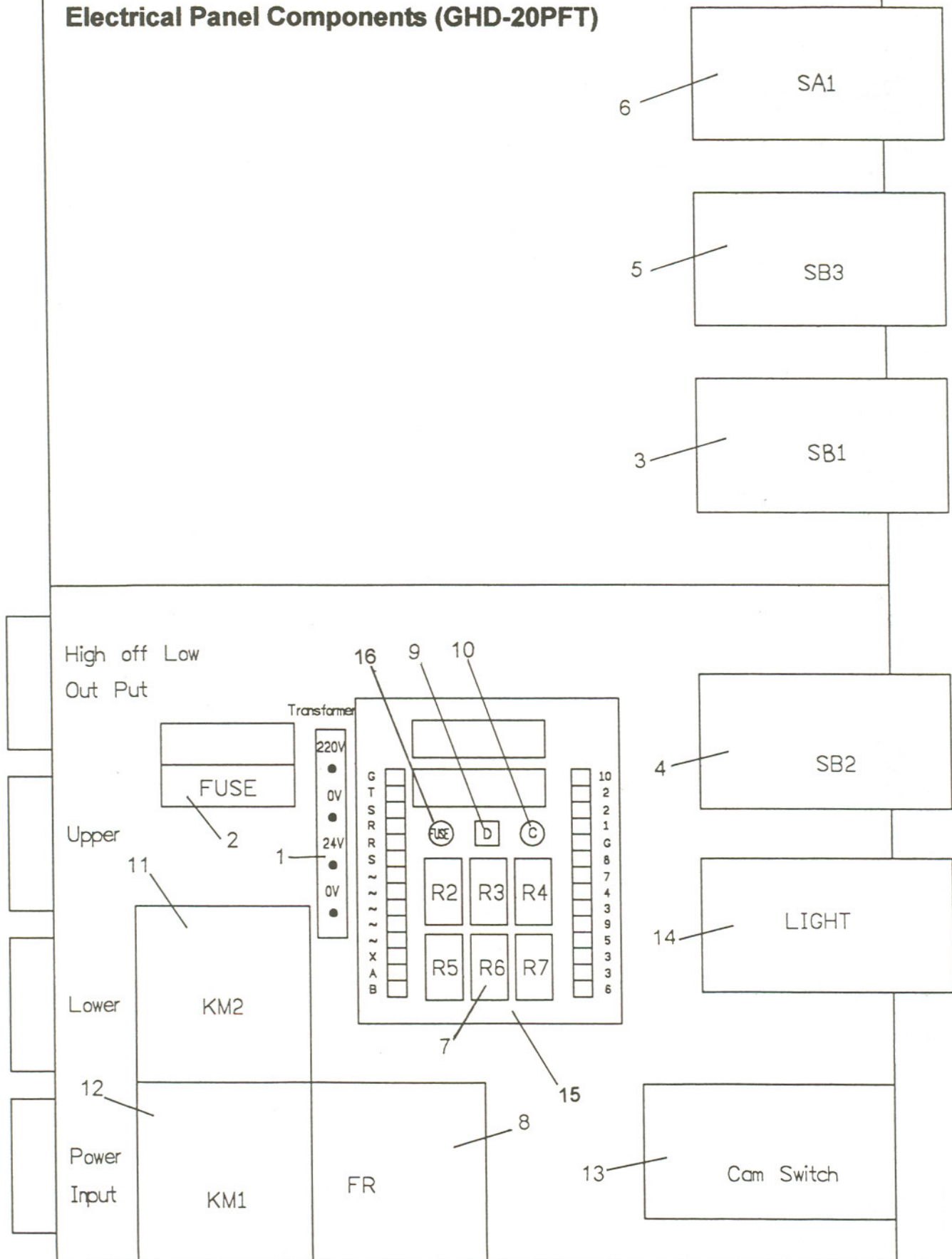


(GHD-20/20PF only)

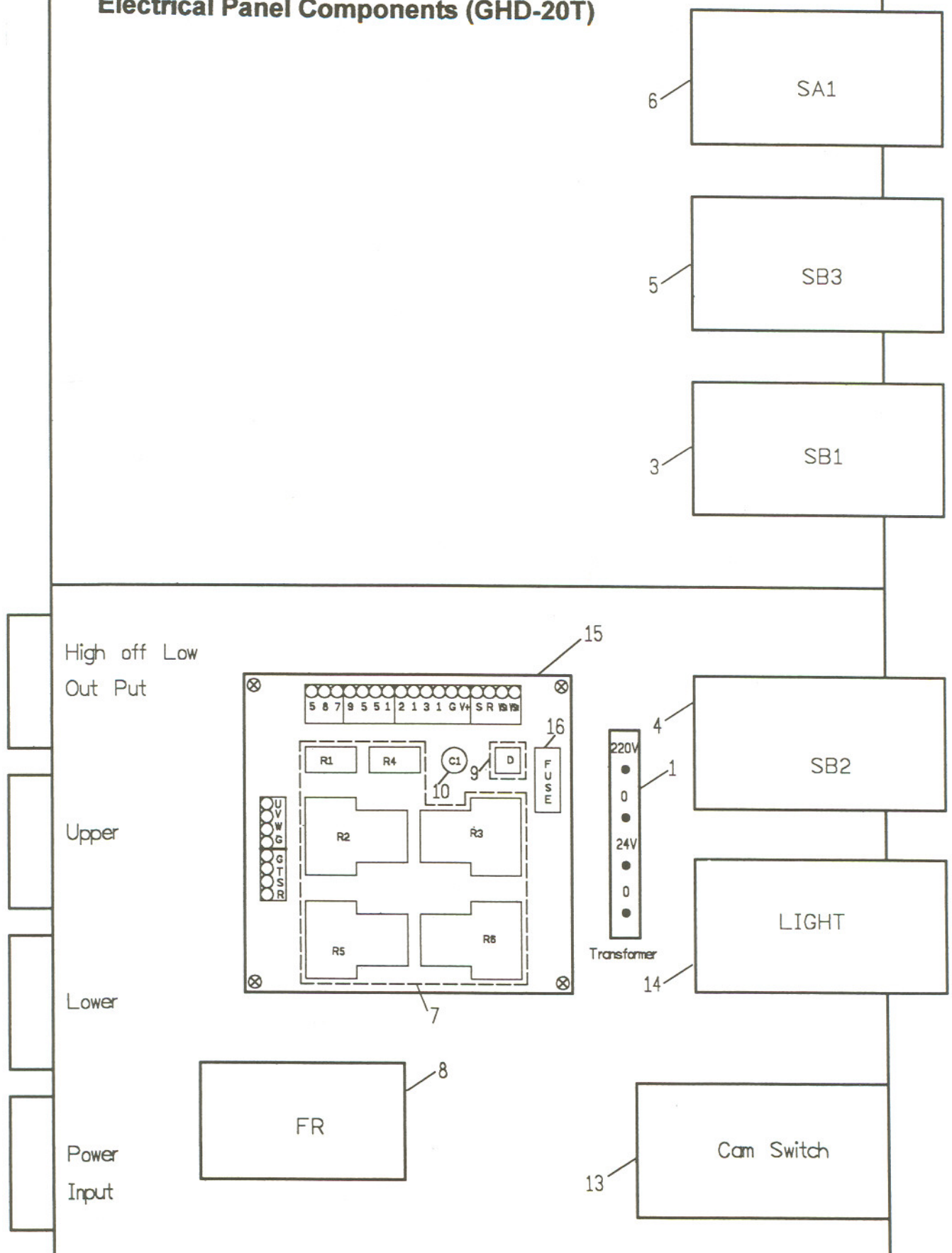
GHD-20T/20PFT Electrical Panel

Index No.	Part No.	Description	Size	Qty.
1	ET-1311	Transformer	24V	1
2	ET-1814	Fuse		1
3	ET-1215	Emergency Switch		1
4	ET-1217	Start Switch		1
5	ET-1221	Reverse Switch		1
6	ET-1223	Selecting Switch		1
7	RSA-24A	Control Relay (include. R2, R3, R4, R5, R6, R7)(20PFT)		6
	RSA-24B	Control Relay (include. R1, R2, R3, R4, R5, R6)(20T)		6
8	ET-2003A	Overload (20PFT)		1
8	ET-2003B	Overload (20T)		1
9	DI-106	Bridge		1
10	33UF-35V	Capacitor		1
11	ET-1110-F	Contactor		1
12	ET-1110-R	Contactor		1
13	GN-20	High-Low Cam Switch		1
14	ET-1414	Power Light		1
15	ET-2502A	Wiring Board Completely Assembly(inc.# 7,9,10,16)(20PFT)		1
15	ET-2502B	Wiring Board Completely Assembly(inc.# 7,9,10,16)(20T)		1
16	ET-1814A	Fuse (20PFT)		1
16	ET-1814B	Fuse (20T)		1

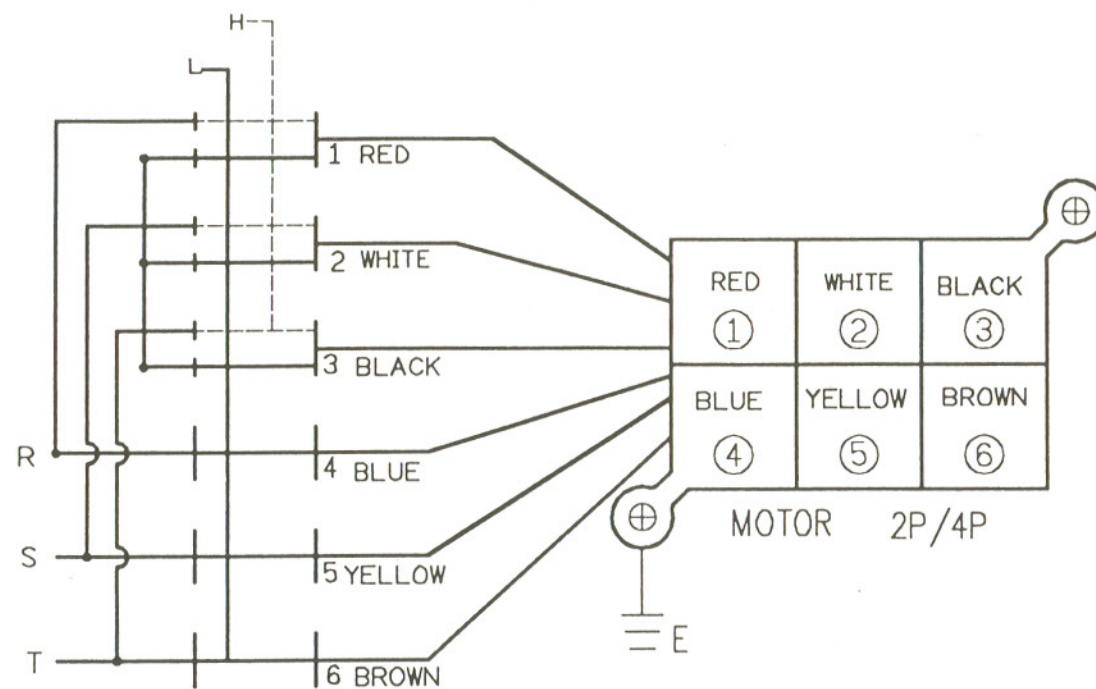
Electrical Panel Components (GHD-20PFT)



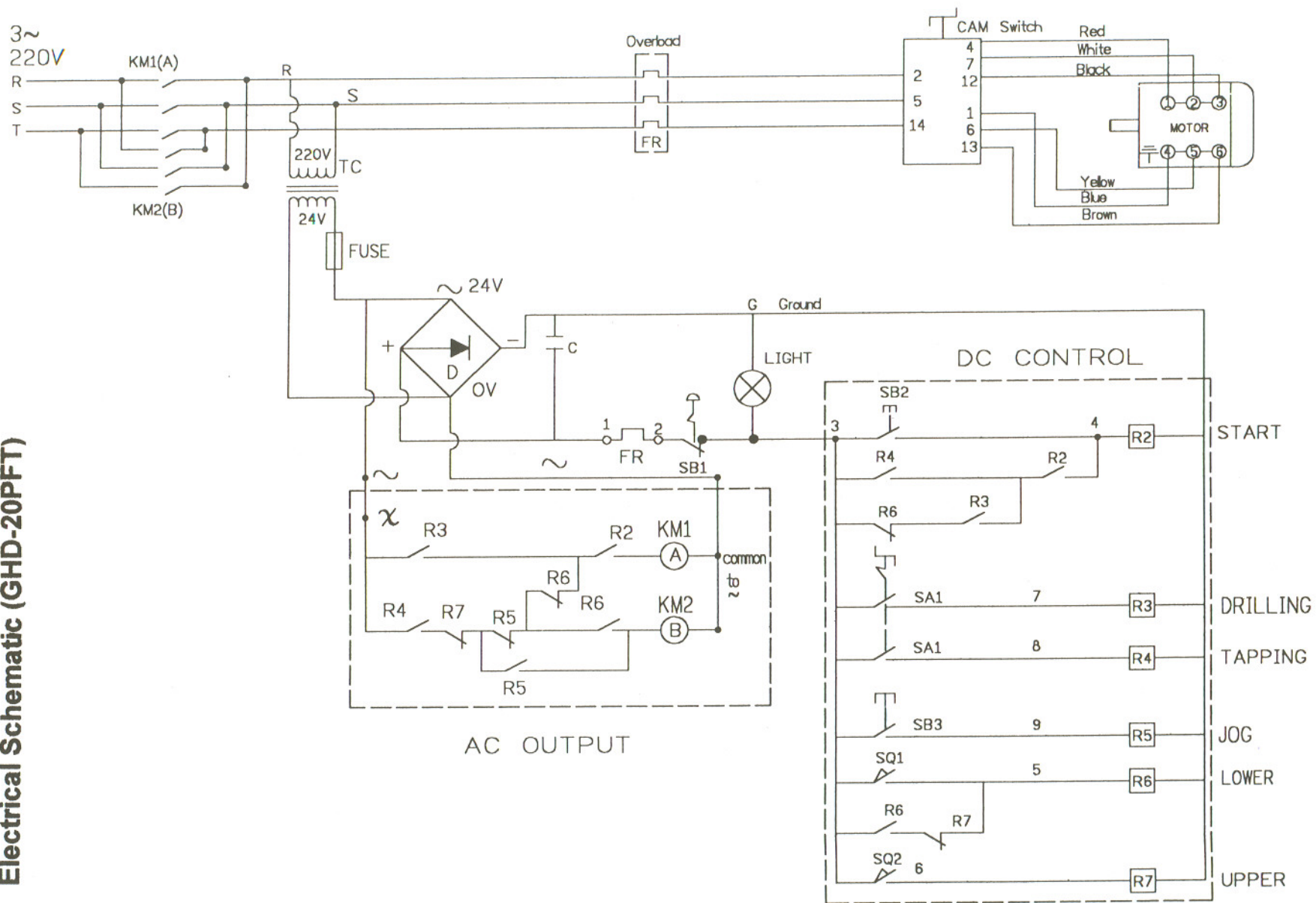
Electrical Panel Components (GHD-20T)



Electrical Schematic (GHD-20/20PF only)



Electrical Schematic (GHD-20PFT)



Electrical Schematic (GHD-20T)

