

WC5 ASSEMBLY

AUTHOR: J. RANDLE



This section contains drawings and instructions for assembling clock WC5. The instructions are written assuming that all of the required parts listed in the WC5 Parts Fabrication section have been purchased or fabricated.

Tools you will need for assembling the clock will be the tools you had available for parts fabrication plus an assortment of screwdrivers, a pair of needle nose pliers, a small hammer, and an assortment of small wood clamps. A small vise would also be useful.

Required materials not listed in the parts list will be:

- A small bottle of Gorilla TM glue.
- A spray can of acrylic wood sealer, Deft TM or equal.
- A small can of glossy spray paint (for the dial numbers and hands).
- A small can of wood stain (for the wall shelf).
- A small can of semi gloss polyurethane or preferred wood finish (for the wall shelf).

For design and drawing purposes this clock was organized as a master assembly which contains a number of subassemblies. Drawing WC5, the master assembly drawing, lists all of the subassemblies and shows their relationships to each other. Where practical, traditional clock terminology was used to describe the parts, i.e. gear assemblies are referred to as arbors, gears as wheels, shaft bearing surfaces as pivots, ratchets pawls as clicks, etc.

Assembly of WC5, B/M items 3 thru 11 must be completed prior to completing the assembly of the Frame & Dial Assembly, B/M Item 2. Notes and suggestions pertaining to the individual subassemblies are listed below. Numbers shown in parentheses are subassembly item numbers:

WC5-03 – ARBOR T-1 ASSEMBLY Arbor T-1 has a ratchet (click) assembly built into it which allows you to wind the clock by pulling down on the drive rope on the counterweight side of the arbor. To assemble:

- Insert the five click pivot pins (1) into wheel T-1(2). The pins should fit snugly in place without any glue. If not, a drop of Gorilla glue will lock them in place.
- Insert the center shaft (3) into wheel T-1 (2); align the cross holes in the shaft and the wheel; then insert a spring pin (7). The spring pin will positively lock the shaft in the wheel to keep it from working out as the wheel rotates under the load of the clock drive weight.
- Insert eight rope pins (6) into the rope pulley (5). A drop of Gorilla glue in each hole is recommended. When installed properly, the tapered tips of the pins should stick out of the holes only about 3/32".
- Assemble the five click assemblies (4) as noted below and install them making certain they are oriented as shown on the drawing. They must rotate freely on the click pivot pins (1).
- Turn the arbor assembly so that wheel T-1 is horizontal (ring up) and push all of the clicks out against the ring.
- Slip the rope pulley (5) onto the arbor shaft so that the click wheel on the pulley is inside the circle of clicks.
- Hold the assembly with wheel T-1 vertical and the rope pulley to the front. Attempt to rotate the rope pulley. It should rotate freely in the clockwise direction and lock when rotated counterclockwise. Rotate the assembly and test it in several positions to make sure that at least one click will drop into the click wheel at any wheel position.

Congratulations, your first arbor is now complete and ready for installation into the main clock assembly.

WC5-03-03 – CLICK ASSEMBLY The five click assemblies are part of the Arbor T-1 assembly. They are weighted to ensure that they will drop by gravity to engage the click wheel as Arbor T-1 rotates.

- Insert the five weight pins (2), into the five wooden clicks (1). If the pins do not fit snugly in the holes, put a drop of Gorilla glue in each hole prior to inserting the pin. The glue will expand as it cures to lock the pins in place.

WC5-04 – ARBOR T-2 (MIN) ASSEMBLY Arbor T-2 is equipped with a slip clutch which allows the minute shaft to turn inside the wheel while the wheel is restrained by the gear train. This allows you to set the clock by pushing the minute hand.

- Insert the twelve pinion pins (1) into the holes in wheel T-2 (4). Use Gorilla glue as necessary to secure the pins in place.
- Test the fit of the shaft (2) in the center hole of wheel T-2 (4). The shaft should be sanded as necessary for it to turn freely in the wheel.
- Remove the shaft and insert the back pivot (3) into the end of the shaft. This pivot must go into the end of the shaft with the shallow hole (the shaft end holes are drilled to different depths).
- Align the cross holes in the shaft and the pivot and insert the first spring pin (7). The pin should be centered in the shaft with its slot turned toward the end of the shaft.
- Stack three washers (6), one spring (5), and the wheel (4) on the shaft in the order shown on the drawing.
- Compress the spring and install the second spring pin (7) thru the shaft. Make sure the slot in the pin is turned away from the washer.
- Test the rotation of the center shaft in the wheel. It should rotate smoothly with a small amount of resistance. All of the resistance that is needed here is enough to ensure that the hands move with the wheel during normal operation of the clock. Too much resistance will make setting the clock difficult.
- Locate the cotter pin (8) to be inserted in the remaining shaft cross hole, but do not install it yet. This pin is to be installed at final assembly after the front pivot of the hand assembly is inserted into the minute arbor shaft.

WC5-05 – HAND ASSEMBLY The hand assembly is a continuation of the Arbor T-2 assembly. The minute hand is mounted directly to the outer end of the arbor T-2 front pivot and rotates once per hour along with the arbor T-2 shaft. Also mounted on the pivot is a pinion which drives through the motion works to turn the hour hand once every 12 hours. The hour hand is glued to the motion works output gear and both together turn freely on the front pivot restricted only by the motion works gear train.

- Insert the front pivot (3) thru the center hole of the pinion disc (4).
- Align the cross holes in the disc and pivot and install pin (2).
- Insert the fifteen pinion pins (1) into the pinion disc (4). Use Gorilla glue to secure any loose pins.
- Glue the hour hand (7) to the hub of the hour wheel (5).
- Modify two flanged bearings (8) to the length shown in the bill of materials and insert them into each end of the hour gear/hour hand center hole.
- Ream the bearings as required for them to turn freely on the front pivot.
- Slide the hour hand with its attached wheel onto the front pivot.

- Slide the minute hand (6) onto the end of the front pivot with its hub turned out; align the cross holes; and install pin (2). Use Gorilla glue as necessary to keep pin (2) in place. When installed properly the minute hand will be locked solidly on the front pivot. A little play in this joint won't affect the operation of the clock but could make it difficult to set accurately.

WC5-06 – ARBOR T-3 ASSEMBLY Arbor T-3 consists of a wheel and a separate pinion glued to a common shaft all turning as a unit.

- Insert the nine pinion pins (3) into the holes in the pinion disc (4). Glue as required.
- Mark the position of the pinion disc (4) and the wheel (5) on the shaft (1).
- Cut two small grooves around the surface of the shaft where they will be covered by the disc and the wheel. This can be done by rotating the shaft against a running scroll saw blade. The grooves don't have to be precise.
- Spread Gorilla glue in the grooves and install the wheel and the pinion. When the glue cures it will expand to lock them to the shaft.
- Insert the pivots (2) into the ends of the shaft. Glue as required.

WC5-07 – ARBOR T-4 ASSEMBLY Arbor T-4 is similar to arbor T-3 except that the pinion pins fit directly into the wheel hub.

- Install the nine pinion pins (3) in the holes in the wheel (4).
- Mark the location of the wheel on the shaft (1).
- Cut a glue groove.
- Glue the wheel to the shaft.
- Install the pivots (2).

WC5-08 – ARBOR T-5 (ESC) ASSEMBLY Arbor T-5 is the same as the other arbors except it has an outer circle of pins instead of gear teeth.

- Install the eleven pinion pins (3) into the inner circle of holes in the wheel (5).
- Turn the wheel over, support it on blocks, and install the 15 escapement pins (4) into the outer circle of holes.
- Mark the location of the wheel on the shaft (1).
- Cut a glue groove.
- Glue the escape wheel to the shaft.
- Install the pivots (2).

WC5-09 – ARBOR T-6 (SEC) ASSEMBLY

- Insert the pivot (2) into the center hole of the second disc (4).
- Line up the cross holes in the disc and the pivot and install pin (1). Use glue as necessary to keep the pin in place.
- Locate wheel T-6 (3) and the cotter pin (5), but do not install them until arbor T-6 is installed into the front plate of the clock's frame assembly.

WC5-10 – ARBOR T-INT ASSEMBLY This arbor is the intermediate gear of the motion works which drives the hour hand from the minute hand. This wheel must turn freely on its stationary pivot. It is to be driven by the pinion in the hand assembly and drives the hour gear attached to the hour hand.

- Insert the 12 pinion pins (1) into the circle of holes in the wheel (3). Make sure the wheel hub is on the same side as the protruding pins.
- Modify two flanged bearings (4) to the length shown in the Bill of Materials and insert them into each end of the wheel center hole.
- Ream the bearings as required for them to turn freely on the pivot (2).
- Insert a spring pin (6) into the front cross hole of the pivot (1). The front cross hole is the one nearest the end of the pivot.
- Slide a washer (5) onto the pivot, then insert it into the wheel center hole.
- Provide additional washers as required to shim between the wheel and the clock frame at final assembly.

WC5-11 – ANCHOR ASSEMBLY The anchor assembly is really two assemblies which come together at final assembly.

Anchor assembly:

- Insert the back pivot (2) into one end of the shaft (1).
- Drill a 5/64" diameter cross hole thru the shaft and the pivot, and drive a spring pin (7) into the hole. See the assembly drawing for the cross hole location. Locking the back pivot firmly into the shaft is important. Any looseness here will impede the ability of the anchor assembly to transfer force impulses from the gear train to the pendulum.
- Insert the front pivot (3). Glue as necessary.
- Mark the location of the anchor (5) on the shaft (1).
- Cut a glue groove in the shaft under the anchor.
- Glue the anchor to the shaft. Make sure it is oriented correctly.

Impulse lever assembly:

- Insert the impulse pin (4) into the hole at the bottom of the impulse lever (6). Glue as necessary.
- Insert the clamping screw (9), washers (8), and hex nut (10) into the top of the impulse lever. Leave loose until the impulse lever is installed on the back pivot at final assembly.

WC5-12 – PENDULUM ASSEMBLY A pendulum is simply a mass hanging some distance below a supporting point, oscillating back and forth. The frequency of oscillation is determined by the distance between the center of mass and the support point. The pendulum has a length adjustment built into it to allow changing its frequency and thus the speed of the clock.

Since the pendulum frequency is sensitive to length, it is important that the pendulum rod be protected from environmental factors such as temperature and humidity which will change its length.

- Glue the pendulum leader (1) to the top of the pendulum rod (5).

- Glue the bob guide (2) to the bottom end of the pendulum rod. Make sure its faces are parallel to the faces of the leader. Note that the guide is wider than it is deep and that its 5/64" diameter cross pin hole in the bob guide runs side to side.

To make sure that all of the components of the pendulum rod line up correctly, it is a good idea to clamp the leader and the bob guide to a flat board or your workbench while the glue cures.

- When the glue has cured, clean up any drips and spray the rod assembly with several coats of wood sealer to keep out moisture.
- After the pendulum rod is sealed against moisture, insert the adjusting rod (3) into the hole in the bottom of the bob guide, align the cross hole in the rods end with the cross hole in the bob guide, and install a spring pin (7). Make sure that the pin does not protrude out of the guide on either side.
- Modify the purchased suspension spring (6) as shown on the drawing and slip it into the slot at the top of the pendulum leader.
- Install dowel pin (8) to hold the suspension spring in place. This pin should be loose enough to slide easily into and out of its hole and should not be glued in place. It will have to be removed to connect the pendulum to the pendulum support bridge at final assembly and to replace the suspension spring if it ever gets damaged or breaks.
- Assemble the bob as noted below and slip it onto the adjusting rod and bob guide. Hold it in place with a washer (9) and the speed adjusting thumb nut (10).
- Adjust the length of the pendulum as shown on the drawing. The dimension shown is for startup only. The pendulum's length will have to be adjusted to set the clock to correct speed after startup.

WC5-12-04 – BOB ASSEMBLY The pendulum bob is designed to add mass to the pendulum assembly while minimizing the drag created as the pendulum swings through the air. Variances in bob weight can be compensated for by simply changing the pendulum length. However drag must be compensated for by changing the amount of weight driving the clock. The bob needs to be heavy enough to make the pendulum insensitive to disturbances such as air movement in the room but not so heavy as to take a large impulse force to accelerate the pendulum each time the clock ticks. For this clock a bob weighing 1.5 pounds works well.

- Glue the halves of the bob body (1) to one of the cover plates (2). Make sure the width of the center slot is the same from top to bottom. A temporary spacer cut to the width of the slot will help.
- Fill the two cavities in the body with enough #8 lead shot to bring the total weight of the assembled bob to 1.5 pounds. Distribute the shot equally between the bob cavities.
- Glue the other cover plate (2) to the bob body.
- Sand the edges of the cover plates to fit the contour of the body.
- Drill the adjusting rod hole in the bottom of the bob as shown on the drawing.
- Spray the bob with wood sealer and decorate it as you like.

WC5-13 – DRIVE WEIGHT ASSEMBLY The drive weight is the power source for this clock. The amount of weight required to keep the clock running depends on a number of factors such as gear train inertia, gear tooth profile, escapement design, bearing friction, pendulum drag, etc. The clock has been designed to minimize the amount of weight required. However, a major factor affecting the weight required to drive a hand made wooden clock is the accuracy of construction of the various parts, so the actual required drive weight is very difficult to determine.

For long life and quiet operation, you will want to use the minimum amount of weight necessary to keep the clock running. That will have to be determined by experimentation. The weight box is oversized and has a plug in the bottom to allow the weight to be adjusted as needed.

- Lay out the shell top (3), the shell bottom (6), and both shell side panels (5) on a flat surface and glue them together.
- Glue on the front and back panels (4).
- Sand the edges of the front and back panels for a smooth fit to the side panels
- Seal the box with wood sealer.
- Modify two flanged bearings (9) to the length shown in the bill of materials and install them in each end of the rope sheave (1) center hole.
- Insert a spring pin (10) into the cross hole in one end of shaft (2)
- Slip a washer onto the shaft and insert the shaft through the holes in the shell top and the rope sheave.
- Check that the rope sheave rotates freely on the shaft. If not, remove the rope sheave and ream the bearings.
- When satisfied that the rope sheave rotates freely, install another washer and another spring pin at the other end of the shaft.
- Turn the weight box upside down and pour in #8 lead shot to get to the desired amount of drive weight. Seven to eight pounds is recommended as a starting point.
- Twist a wine bottle cork into the fill hole and cut it off flush with the bottom of the box.

WC5-14 – COUNTERWEIGHT ASSEMBLY The purpose of the counterweight assembly is solely to keep the drive rope tight on the arbor T-1 rope pulley as the clock runs. Weight added to the counterweight subtracts from the driving force provided by the drive weight, so you will want to keep the weight of the counterweight to a minimum. One pound total weight should be heavy enough.

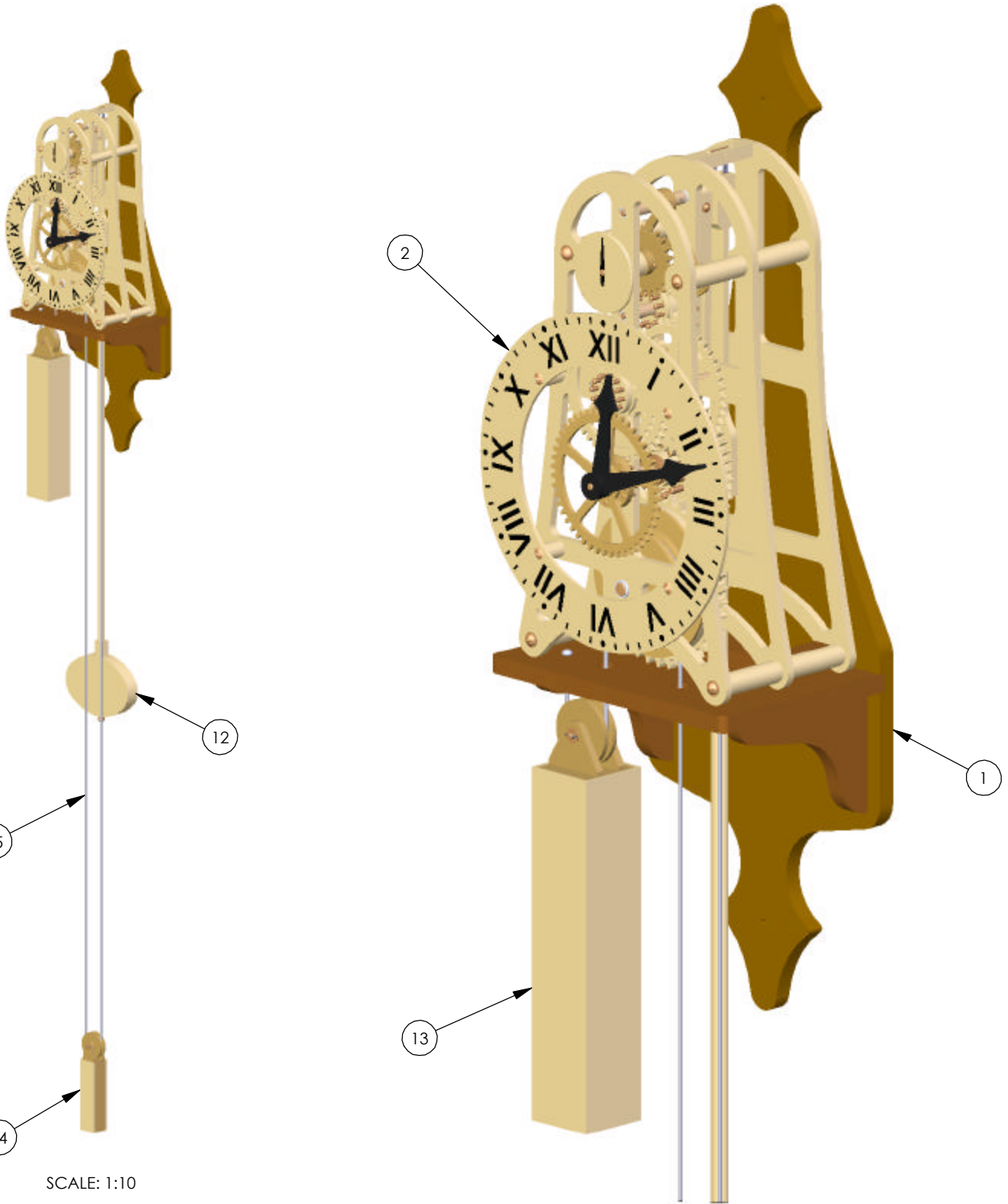
- The assembly procedure for the counterweight is exactly the same as the procedure for the drive weight.

WC5-02 FRAME ASSEMBLY Because of the design of this clock it is necessary to assemble most of the other clock subassemblies into the clock as the frame is being assembled, the only exceptions being the pendulum assembly and the drive weights. Those should not be installed until the clock is setting on the wall shelf.

- Locate the middle and front bearing plates (2) and (3) and insert the flanged bearings (9) and (10) into them. Pay attention that the bearing flanges are on the correct sides of the plates.
- Ream the bearings as required for the arbor pivots to turn freely in them. Depending on the size of the drill bit used to drill the holes in the bearing plates, the large bearings (10) may not require reaming. The small bearings will almost certainly be too tight without reaming.
- Screw the four threaded rods (11) into four of the frame posts (5).
- Insert the threaded rods through the middle frame plate (2) as shown and screw the remaining frame posts onto them to secure the posts to the middle plate. Tighten hand tight. DO NOT over tighten. Metal screw threads in hardwood will provide a strong joint but the threads aren't strong enough to stretch the screws as threads in metal could.
- Use four round head machine screws (13) with washers (12) to fasten the rear frame plate (1) to the rear frame posts. DO NOT over tighten the screws.

- Fit the pendulum support bridge (7) into the notches at the top of the middle and rear frame plates. Note that the notch and the slot in the bridge are not located at its center. The bridge should be oriented with the notch as close as possible to the rear of the clock. DO NOT glue the bridge in place.
- Lay the frame assembly on its back and insert the arbors into the bearings in the middle plate. Leave out the anchor assembly for now.
- Locate the front bearing plate (3) and insert the pivot of arbor T-6 through the double bossed hole near its top. The front bearing plate has two bosses on its back side and one on its front side. Make sure the second wheel is on the front.
- Slip the arbor T-6 wheel (WC5-09, Item 3) onto the T-6 pivot, align the cross holes in the pivot and the wheel and install the cotter pin (WC5-09, Item 5).
- Insert the pivot of arbor T-INT into the front bearing plate hole with the single boss. Make sure that the proper number of shim washers are installed between the T-INT wheel and the bearing plate (See WC5-10).
- Align the cross hole in the pivot with the cross hole in the bearing plate boss and insert the L-shaped pin (8) to secure arbor T-INT in place.
- Rotate arbor T-6 and arbor T-INT to make sure they turn freely.
- Lay the front plate (3) on top of the arbors and carefully work all of the pivots into the front plate bearings. Insert a temporary pivot into the front of arbor T-2 to align it.
- Insert four round head machine screws (13) with washers (12) thru the front plate and into the front frame posts (5) and tighten finger tight.
- Stand the assembly upright and rotate the gear train in its normal running direction. It should run smoothly with no noticeable binding. If any binding occurs disassemble and adjust the parts as necessary. Any binding will have to be corrected or overcome by increasing the clock driving weight which will result in a noisy clock and rapid wear.
- When satisfied that all of the gears mesh properly and rotate without binding, loosen the front plate mounting screws, add the anchor to the assembly, and replace the screws.
- Put the dial posts (6) and dial (4) into position and secure them with oval head machine screws (14) and hex nuts (15).
- Tighten all screws. DO NOT over tighten.
- Remove the temporary front pivot from arbor T-2 and replace it with the hand assembly. Turn both hands to the twelve o'clock position and mesh the arbor T-INT gears with the hand assembly gears. You may have to try arbor T-INT in several positions to find the position that best aligns the hour and minute hands in the twelve o'clock position.
- Align the cross holes in the front pivot and the arbor T-2 shaft, and insert cotter pin (WC5-04, Item 8).
- Install the anchor's impulse lever on the rear pivot of the anchor assembly. Tighten the clamp only enough to hold the lever in place.

The clock should now be ready to place on the wall shelf for final assembly and run in. See the installation section for continuation.



SCALE: 1:10

SEE SHEET 2 FOR GEAR TRAIN ASSEMBLY

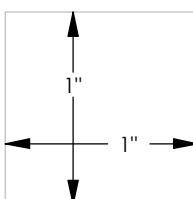
SEE SHEET 3 FOR BILL OF MATERIALS

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 Drawing Scale: 1:4

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Third angle projection.



Description:

ASSEMBLY

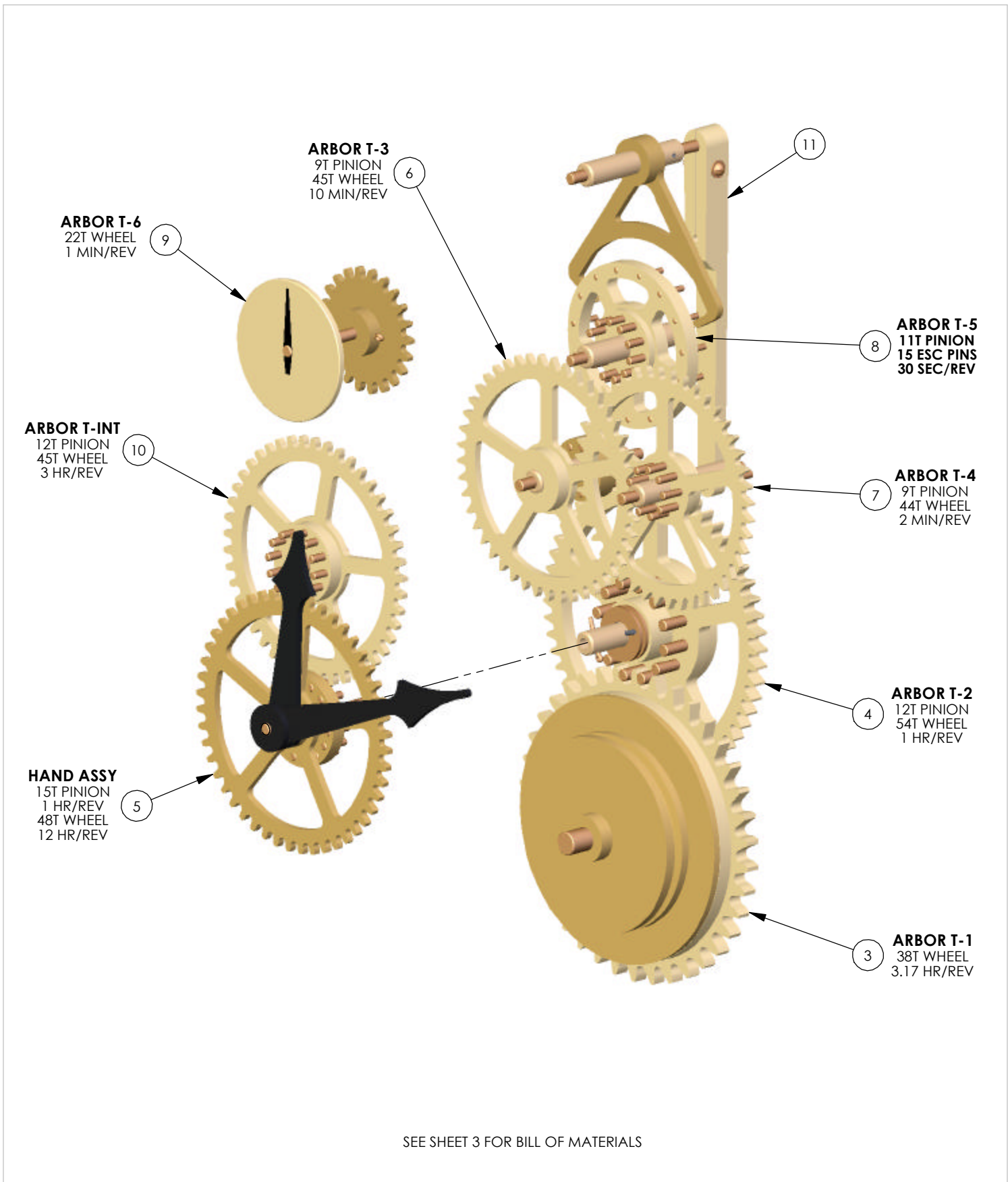
Project:

WOOD CLOCK WC5

Drawing No:

WC5

Sheet 1 of 3



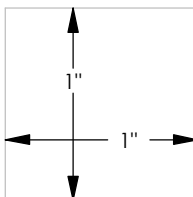
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Description:

ASSEMBLY

Project:

WOOD CLOCK WC5

Drawing No:

WC5

Sheet 2 of 3



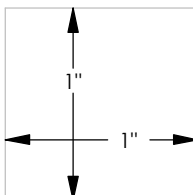
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-01	WALL SHELF		1
2	WC5-02	FRAME & DIAL ASSEMBLY		1
3	WC5-03	ARBOR T-1 ASSEMBLY		1
4	WC5-04	ARBOR T-2 (MIN) ASSEMBLY		1
5	WC5-05	HAND ASSEMBLY		1
6	WC5-06	ARBOR T-3 ASSEMBLY		1
7	WC5-07	ARBOR T-4 ASSEMBLY		1
8	WC5-08	ARBOR T-5 (ESC) ASSEMBLY		1
9	WC5-09	ARBOR T-6 (SEC) ASSEMBLY		1
10	WC5-10	ARBOR T-INT ASSEMBLY		1
11	WC5-11	ANCHOR ASSEMBLY		1
12	WC5-12	PENDULUM ASSEMBLY		1
13	WC5-13	DRIVE WEIGHT ASSEMBLY		1
14	WC5-14	COUNTERWEIGHT ASSEMBLY		1
15	ROPE	1/8" DIA X 10'-6" LG (BRAIDED)	NYLON	1

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Description:

ASSEMBLY

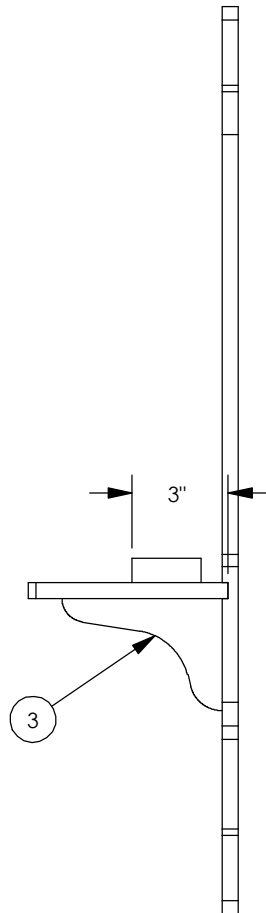
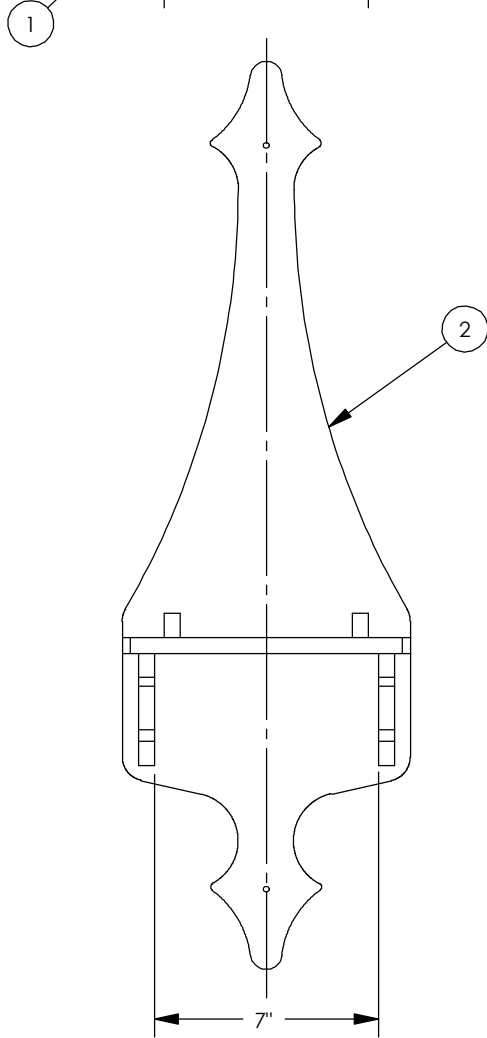
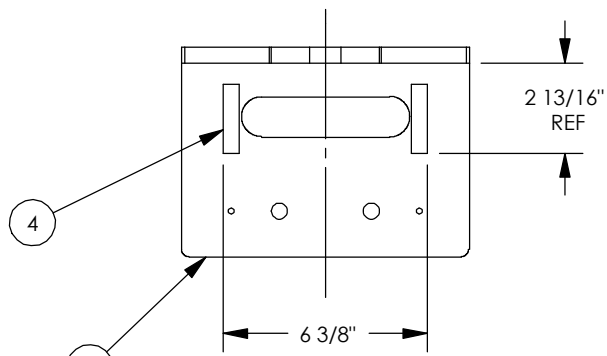
Project:

WOOD CLOCK WC5

Drawing No:

WC5

Sheet 3 of 3



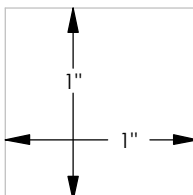
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-01-01	SHELF	OAK	1
2	WC5-01-02	BACK PLATE	OAK	1
3	WC5-01-03	BRACE	OAK	2
4	BLOCK	1/2" W X 3/4" H X 2 5/32" LG	OAK	2

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Description:

WALL SHELF

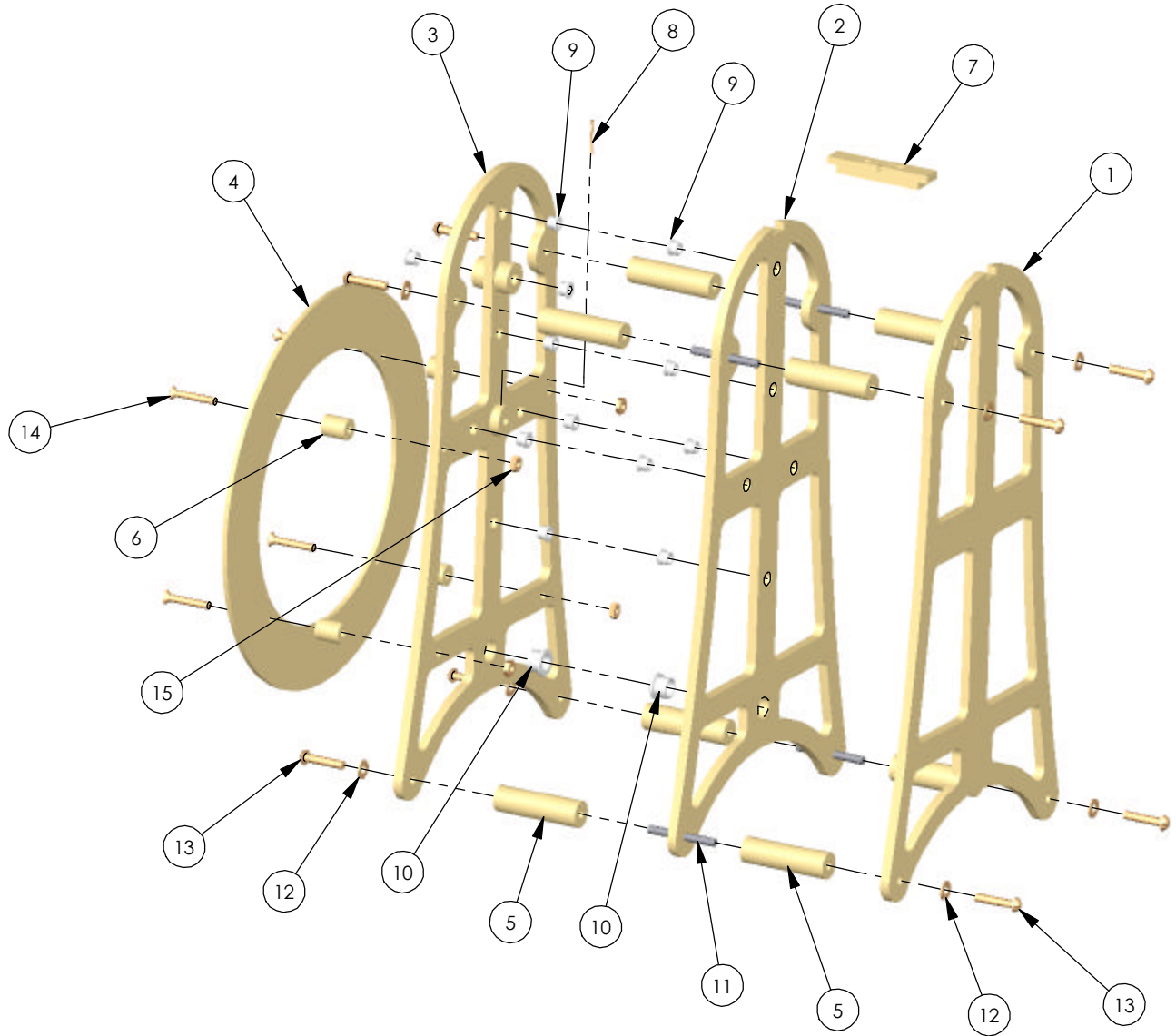
Project:

WOOD CLOCK WC5

Drawing No:

WC5-01

Sheet 1 of 1



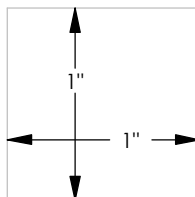
SEE SHEET 2 FOR BILL OF MATERIALS

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Description:

FRAME & DIAL ASSEMBLY

Project:

WOOD CLOCK WC5

Drawing No:

WC5-02

Sheet 1 of 2



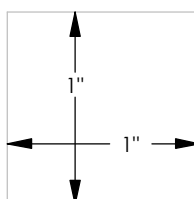
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-02-01	FRAME PLATE, REAR	BALTIC BIRCH PLYWOOD	1
2	WC5-02-02	FRAME PLATE, MIDDLE	BALTIC BIRCH PLYWOOD	1
3	WC5-02-03	FRAME PLATE, FRONT	BALTIC BIRCH PLYWOOD	1
4	WC5-02-04	DIAL	BALTIC BIRCH PLYWOOD	1
5	WC5-02-05	FRAME POST	OAK	8
6	WC5-02-06	DIAL POST	OAK	4
7	WC5-02-07	PENDULUM SUPPORT BRIDGE	BALTIC BIRCH PLYWOOD	1
8	WC5-02-08	PIN	360 H02 BRASS	1
9	FLANGED BEARING	MC # 6294K86, 3/16" ID x 5/16" OD x 1/4" LG	MDS-FILLED NYLON	12
10	FLANGED BEARING	MC # 6294K89, 3/8" ID X 1/2" OD X 3/8" LG	MDS-FILLED NYLON	2
11	THREADED ROD	#10-24UNC X 1 3/4" LG	STEEL	4
12	FLAT WASHER, SMALL OD	#10 NOM	BRASS	8
13	ROUND HD MACHINE SCREW	#10-24 UNC x 1" LG	BRASS	8
14	OVAL HD MACHINE SCREW	#8-32 UNC x 1 1/8" LG	BRASS	4
15	MACHINE SCREW HEX NUT	#8-32UNC	BRASS	4

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 OK to scale drawing only if
 box to right is full scale.

Third angle projection.



Description:

FRAME & DIAL ASSEMBLY

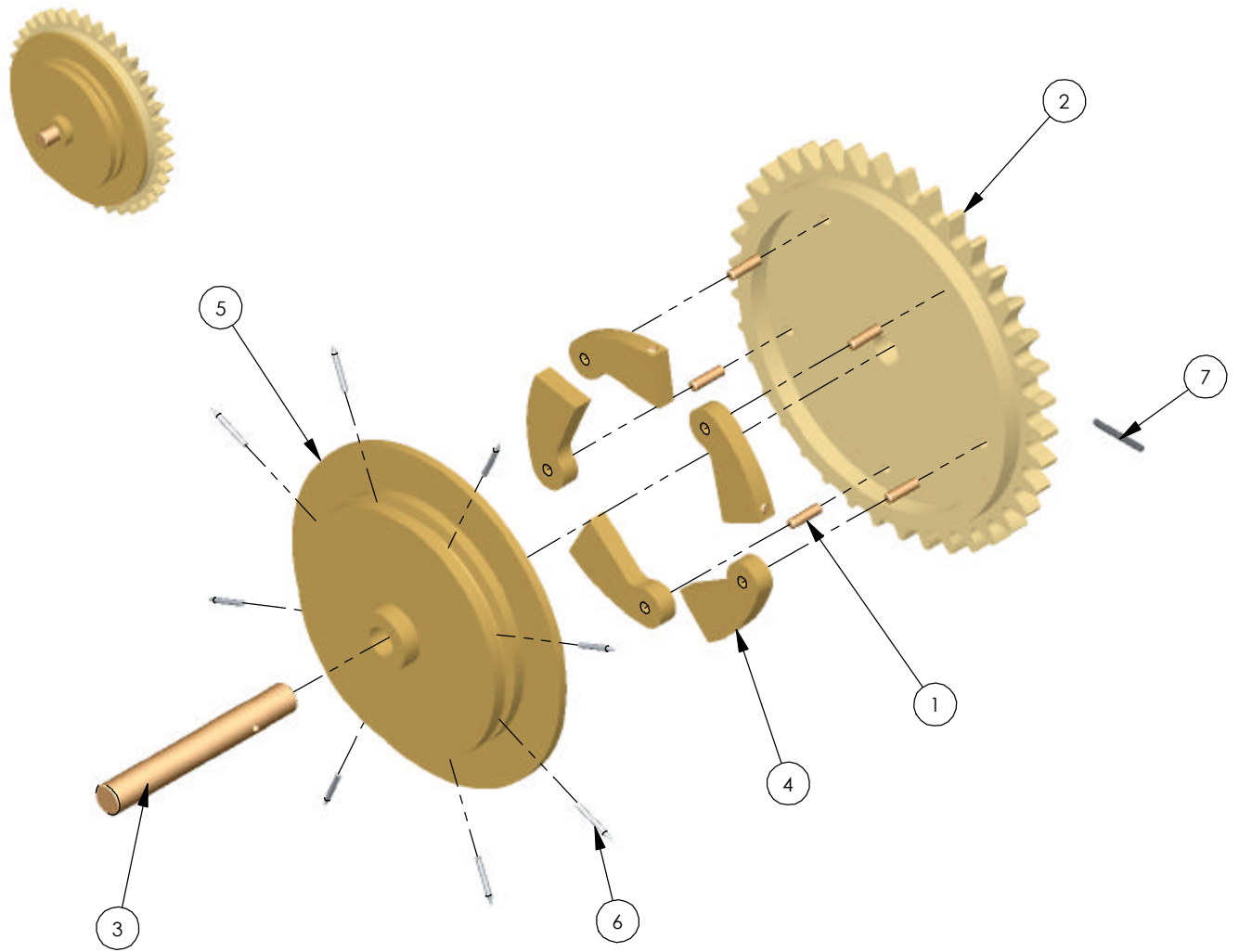
Project:

WOOD CLOCK WC5

Drawing No:

WC5-02

Sheet 2 of 2



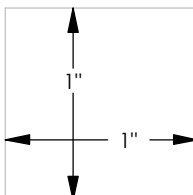
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-02-J	PIN	360 H02 BRASS	5
2	WC5-03-01	WHEEL T-1	BALTIC BIRCH PLYWOOD	1
3	WC5-03-02	PIVOT	360 H02 BRASS	1
4	WC5-03-03	CLICK ASSEMBLY		5
5	WC5-03-04	ROPE PULLEY	BALTIC BIRCH PLYWOOD	1
6	WC5-03-05	ROPE PIN	STAINLESS STEEL	8
7	SPRING PIN (SLOTTED)	5/64 DIA X 3/4" LG	STAINLESS STEEL	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ARBOR T-1 ASSEMBLY

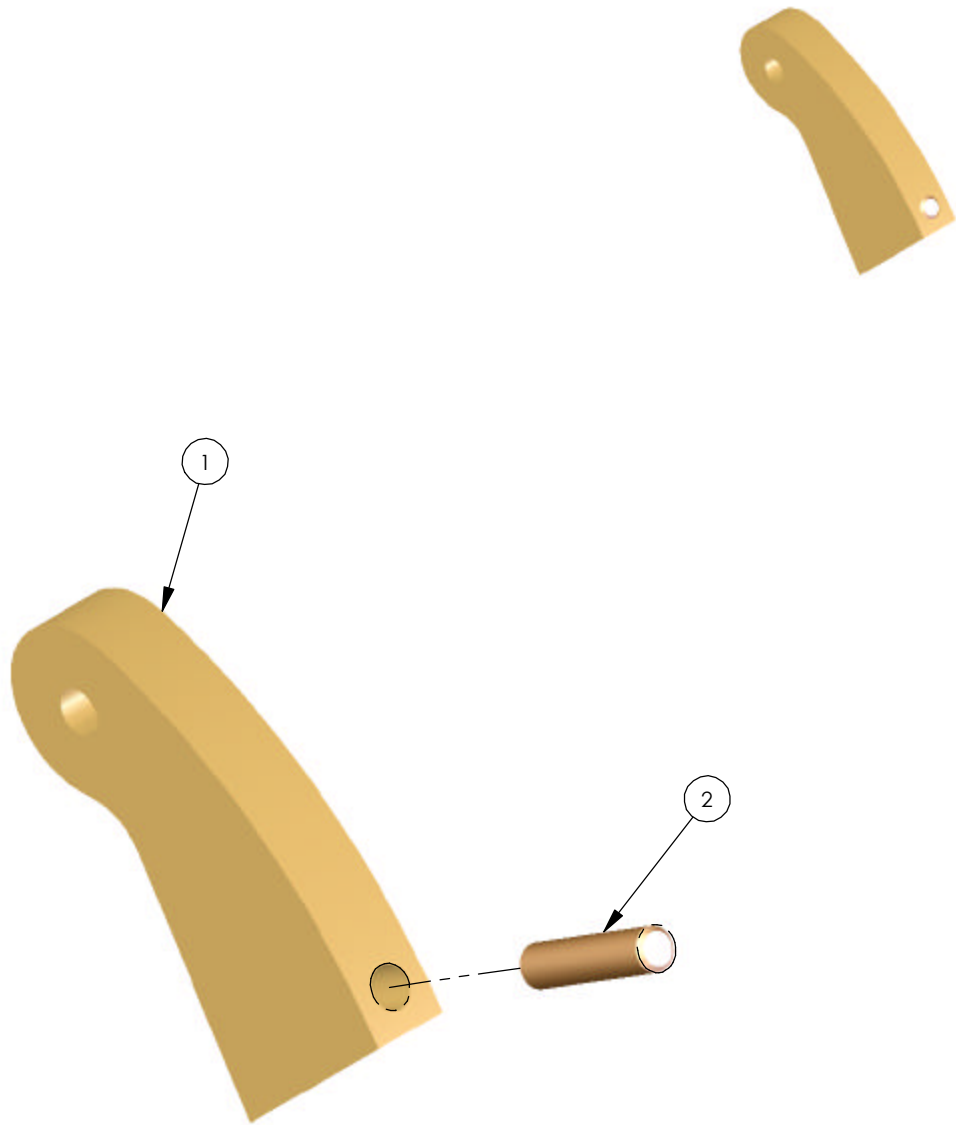
Project:

WOOD CLOCK WC5

Drawing No:

WC5-03

Sheet 1 of 1



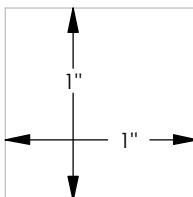
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-03-03-01	CLICK	BALTIC BIRCH PLYWOOD	1
2	WC5-00-02-H	PIN	360 H02 BRASS	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 2:1

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Third angle projection.



Description:

CLICK ASSEMBLY

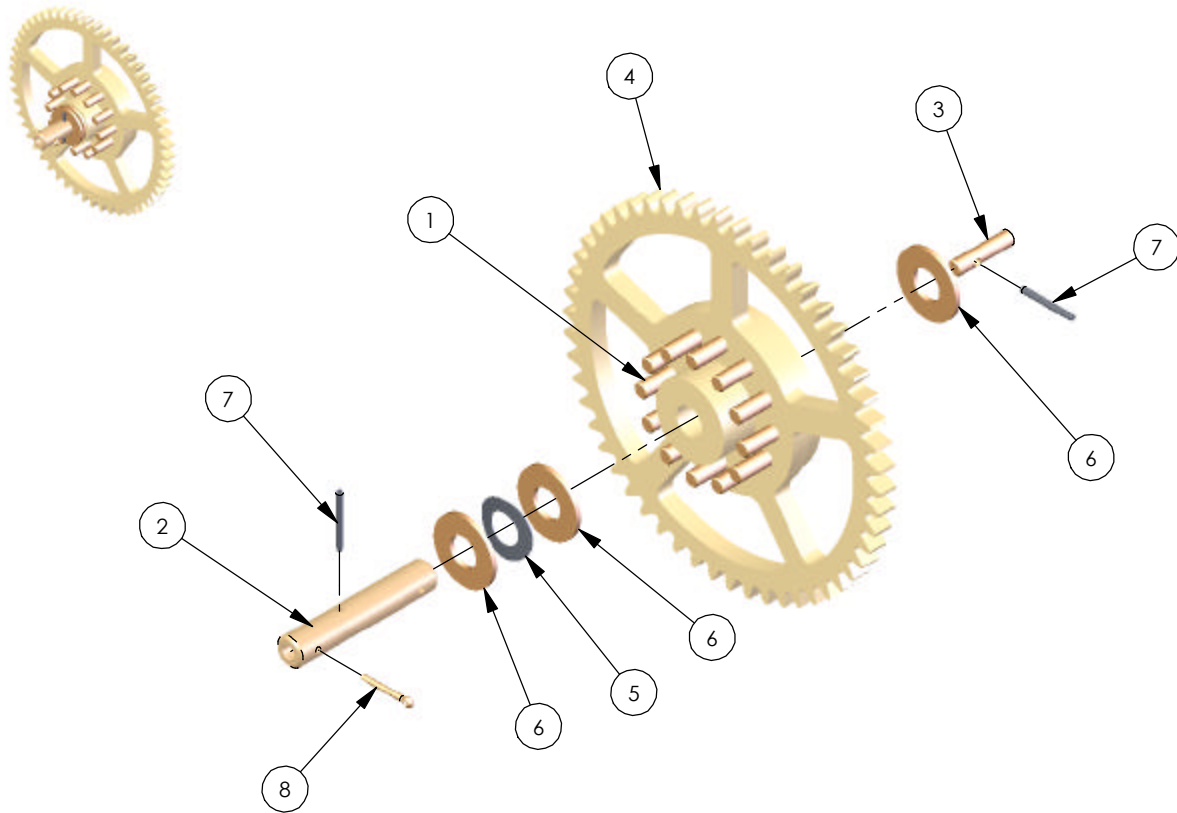
Project:

WOOD CLOCK WC5

Drawing No:

WC5-03-03

Sheet 1 of 1



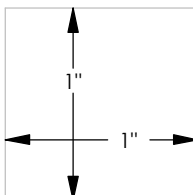
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-02-B	PIN	360 H02 BRASS	12
2	WC5-04-01	SHAFT	OAK	1
3	WC5-04-02	PIVOT (BACK)	360 H02 BRASS	1
4	WC5-04-03	WHEEL T-2	BALTIC BIRCH PLYWOOD	1
5	CURVED DISC SPRING	MC # 9716K52	301 STAINLESS STEEL	1
6	FLAT WASHER, SMALL OD	3/8 NOM	BRASS	3
7	SPRING PIN (SLOTTED)	5/64 DIA X 3/4" LG	STAINLESS STEEL	2
8	SPLIT PIN	M2 x 12 MM LG	BRASS	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ARBOR T-2 (MIN) ASSEMBLY

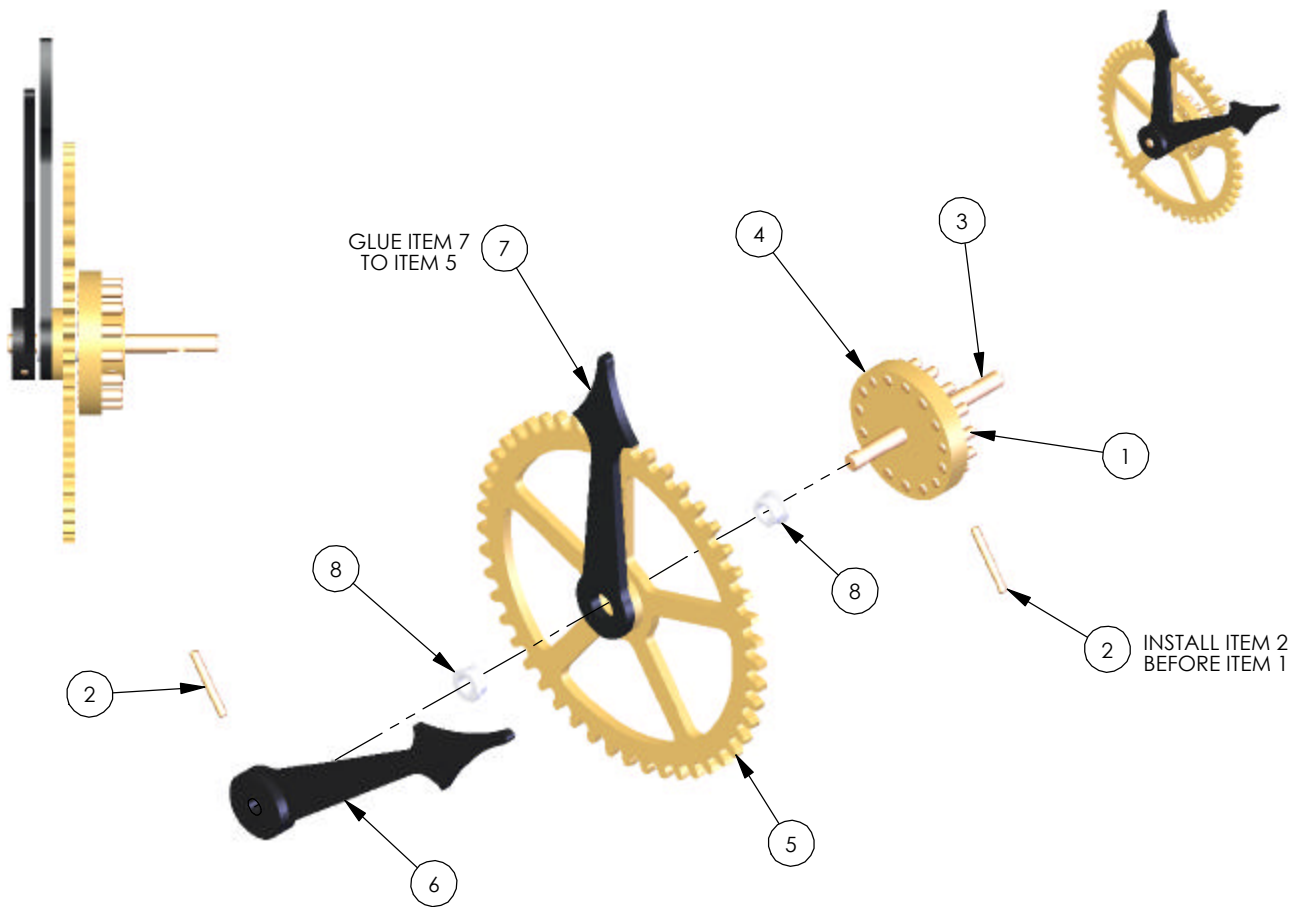
Project:

WOOD CLOCK WC5

Drawing No:

WC5-04

Sheet 1 of 1



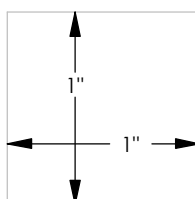
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-02-J	PIN	360 H02 BRASS	15
2	WC5-00-02-K	PIN	360 H02 BRASS	2
3	WC5-05-01	PIVOT (FRONT)	360 H02 BRASS	1
4	WC5-05-02	DISC	BALTIC BIRCH PLYWOOD	1
5	WC5-05-03	WHEEL T-HR	BALTIC BIRCH PLYWOOD	1
6	WC5-05-04	HAND (MINUTE)	BALTIC BIRCH PLYWOOD	1
7	WC5-05-05	HAND (HOUR)	BALTIC BIRCH PLYWOOD	1
8	FLANGED BEARING	MC # 6294K86 (MOD), 3/16" ID x 5/16" OD x 3/16" LG	MDS-FILLED NYLON	2

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

HAND ASSEMBLY

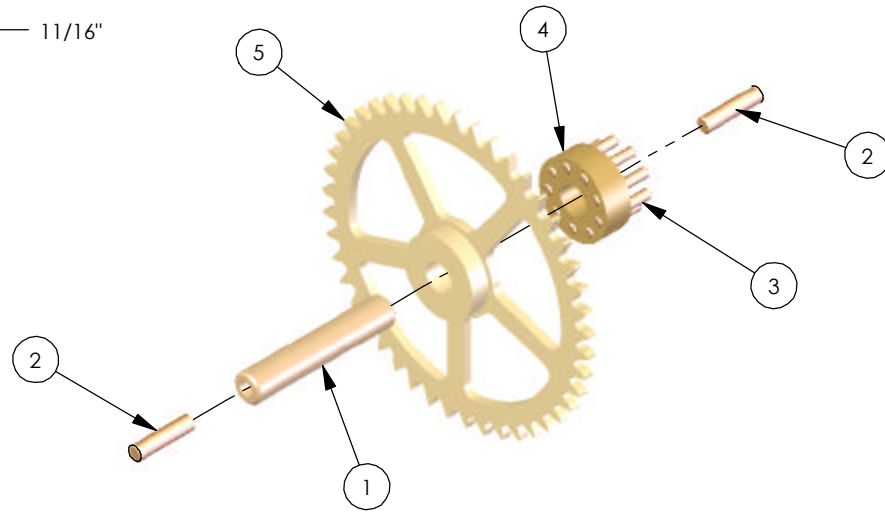
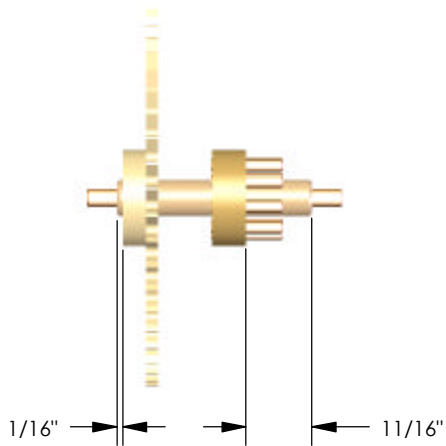
Project:

WOOD CLOCK WC5

Drawing No:

WC5-05

Sheet 1 of 1



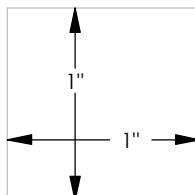
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-01	SHAFT	OAK	1
2	WC5-00-02-C	PIN	360 H02 BRASS	2
3	WC5-00-02-E	PIN	360 H02 BRASS	9
4	WC5-06-01	DISC	BALTIC BIRCH PLYWOOD	1
5	WC5-06-02	WHEEL T-3	BALTIC BIRCH PLYWOOD	1

Drawn By: J. RANDLE
 Drawn Date: 12/06/04
 Drawing Scale: 1:2

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 box to right is full scale.

Third angle projection.



Description:

ARBOR T-3 ASSEMBLY

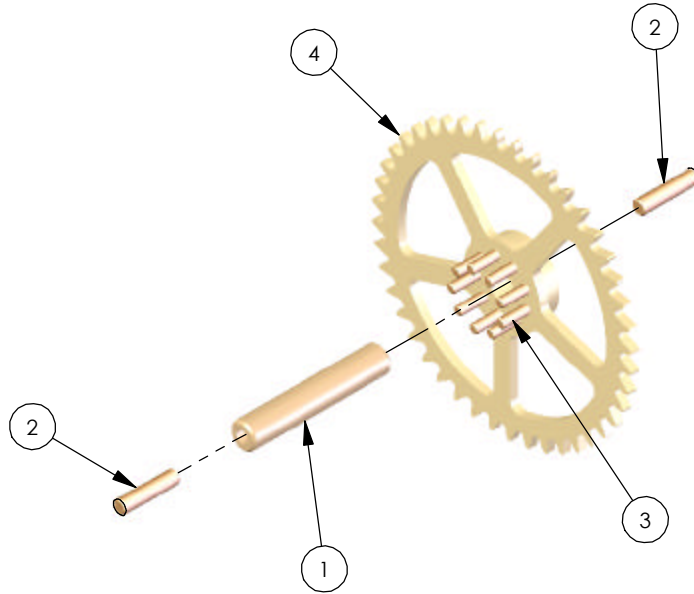
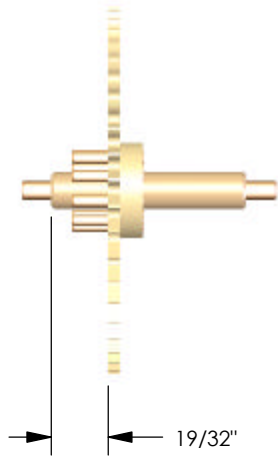
Project:

WOOD CLOCK WC4

Drawing No:

WC5-06

Sheet 1 of 1



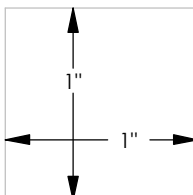
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-01	SHAFT	OAK	1
2	WC5-00-02-C	PIN	360 H02 BRASS	2
3	WC5-00-02-E	PIN	360 H02 BRASS	9
4	WC5-07-01	WHEEL T-4	BALTIC BIRCH PLYWOOD	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ARBOR T-4 ASSEMBLY

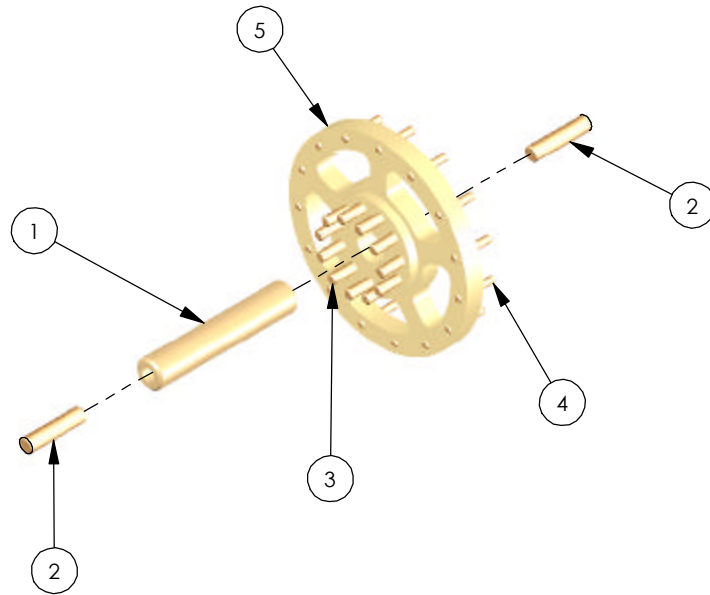
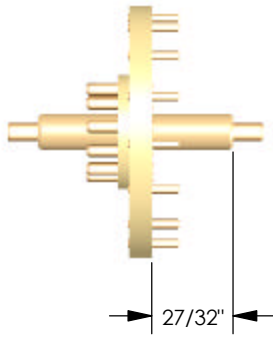
Project:

WOOD CLOCK WC5

Drawing No:

WC5-07

Sheet 1 of 1



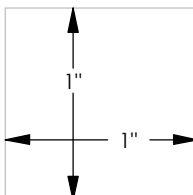
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-01	SHAFT	OAK	1
2	WC5-00-02-C	PIN	360 H02 BRASS	2
3	WC5-00-02-F	PIN	360 H02 BRASS	11
4	WC5-00-02-L	PIN	360 H02 BRASS	15
5	WC5-08-01	ESCAPE WHEEL	BALTIC BIRCH PLYWOOD	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ARBOR T-5 (ESC) ASSEMBLY

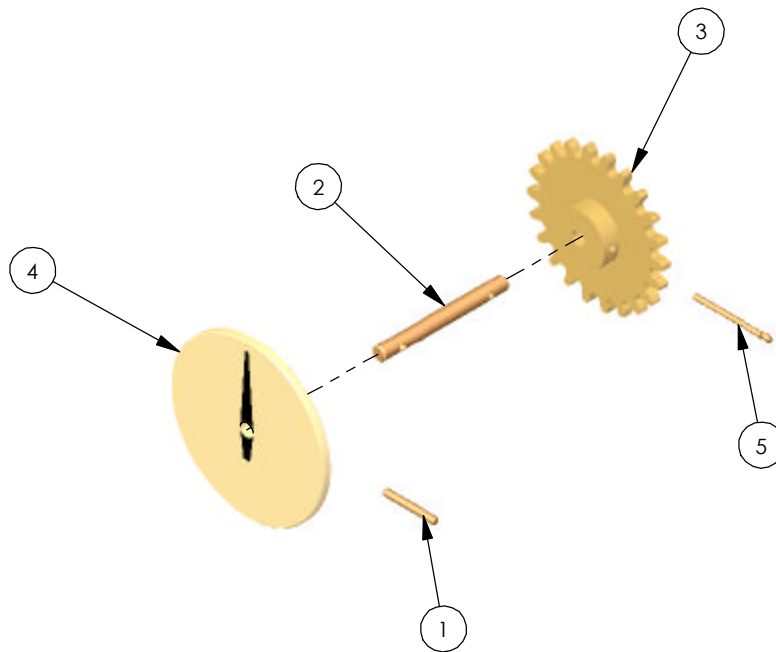
Project:

WOOD CLOCK WC5

Drawing No:

WC5-08

Sheet 1 of 1



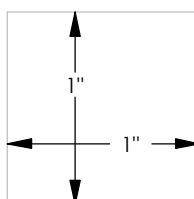
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-02-K	PIN	360 H02 BRASS	1
2	WC5-09-01	PIVOT	360 H02 BRASS	1
3	WC5-09-02	WHEEL T-6	BALTIC BIRCH PLYWOOD	1
4	WC5-09-03	SECOND DISC	BALTIC BIRCH PLYWOOD	1
5	SPLIT PIN	M2 x 22 MM LG	BRASS	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ARBOR T-6 (SEC) ASSEMBLY

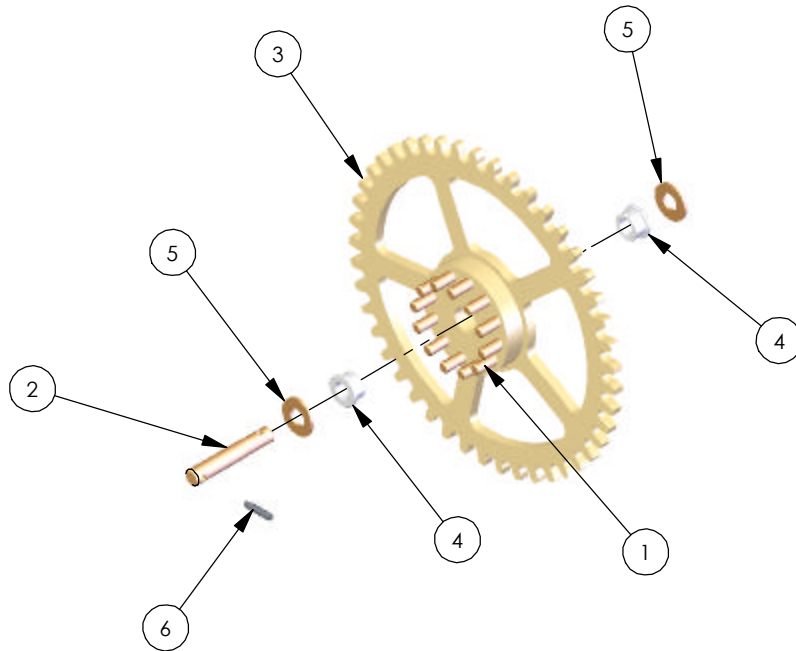
Project:

WOOD CLOCK WC5

Drawing No:

WC5-09

Sheet 1 of 1



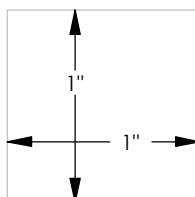
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-02-G	PIN	360 H02 BRASS	12
2	WC5-10-01	PIVOT	360 H02 BRASS	1
3	WC5-10-02	WHEEL T-INT	BALTIC BIRCH PLYWOOD	1
4	FLANGED BEARING	MC # 6294K86 (MOD), 3/16" ID x 5/16" OD x 3/16" LG	MDS-FILLED NYLON	2
5	FLAT WASHER, SMALL OD	#10 NOM	BRASS	2
6	SPRING PIN (SLOTTED)	5/64" DIA X 3/8" LG	STAINLESS STEEL	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ARBOR T-INT ASSEMBLY

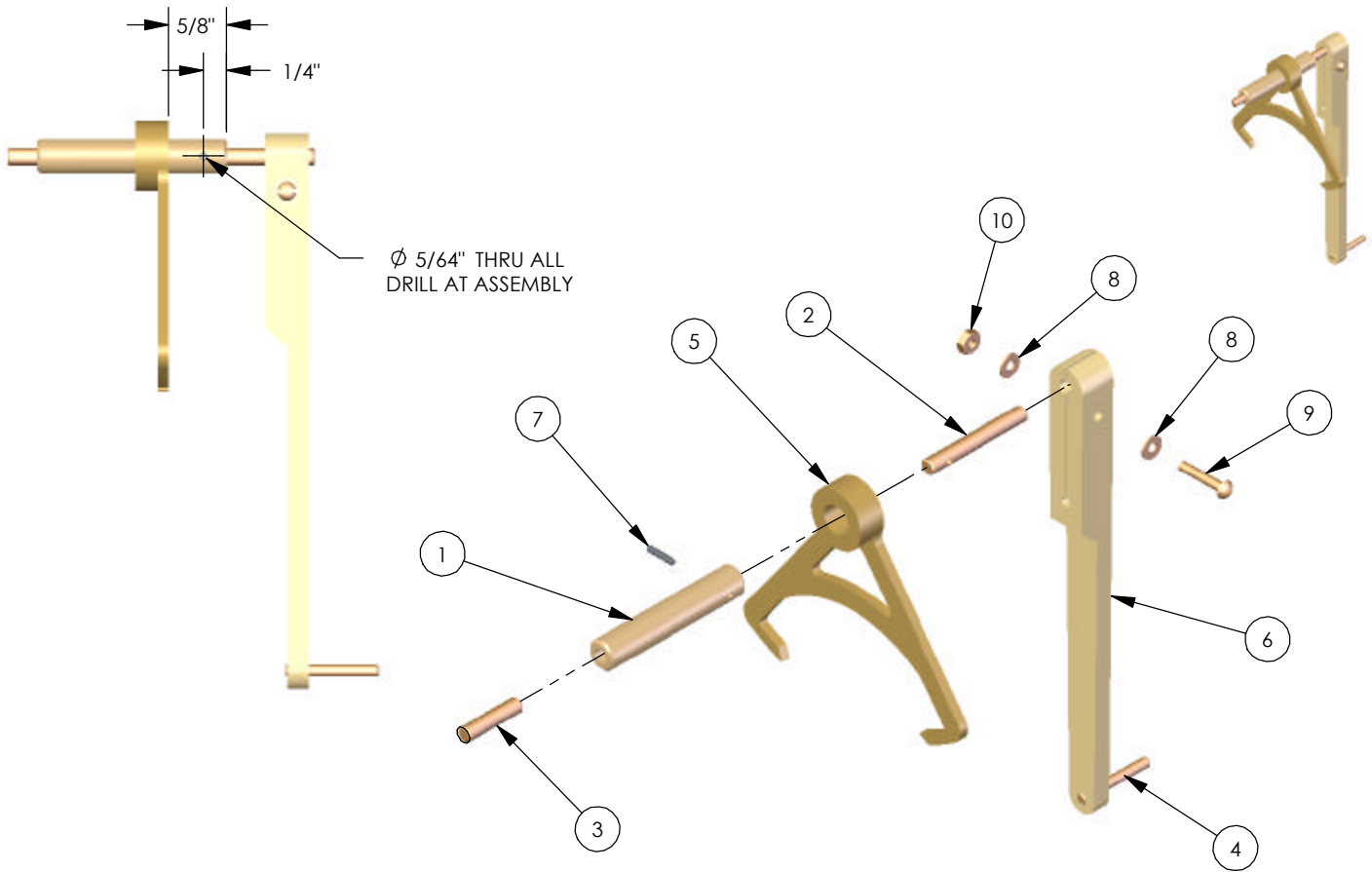
Project:

WOOD CLOCK WC5

Drawing No:

WC5-10

Sheet 1 of 1



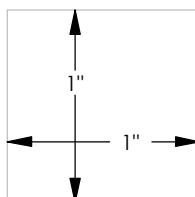
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-01	SHAFT	OAK	1
2	WC5-00-02-A	PIN	360 H02 BRASS	1
3	WC5-00-02-C	PIN	360 H02 BRASS	1
4	WC5-00-02-D	PIN	360 H02 BRASS	1
5	WC5-11-01	ANCHOR	BALTIC BIRCH PLYWOOD	1
6	WC5-11-02	IMPULSE LEVER	BALTIC BIRCH PLYWOOD	1
7	SPRING PIN (SLOTTED)	5/64" DIA X 3/8" LG	STAINLESS STEEL	1
8	FLAT WASHER, SMALL OD	#4 NOM	BRASS	2
9	ROUND HD MACHINE SCREW	#4-40 UNC x 5/8" LG	BRASS	1
10	MACHINE SCREW HEX NUT	#4-40 UNC	Brass	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

ANCHOR ASSEMBLY

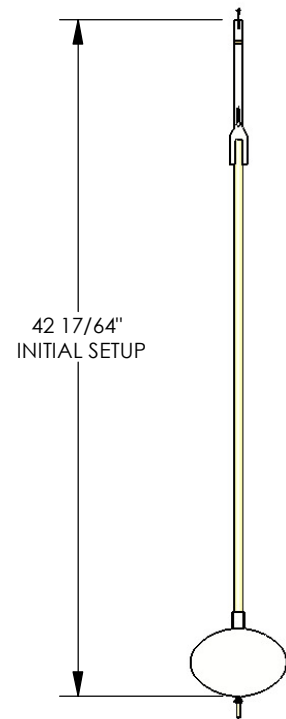
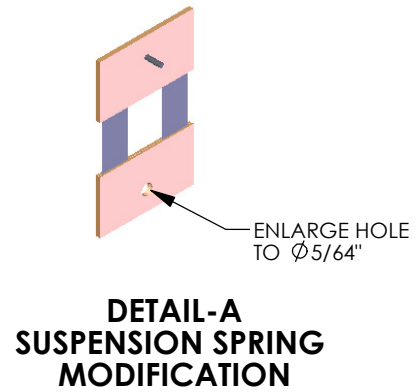
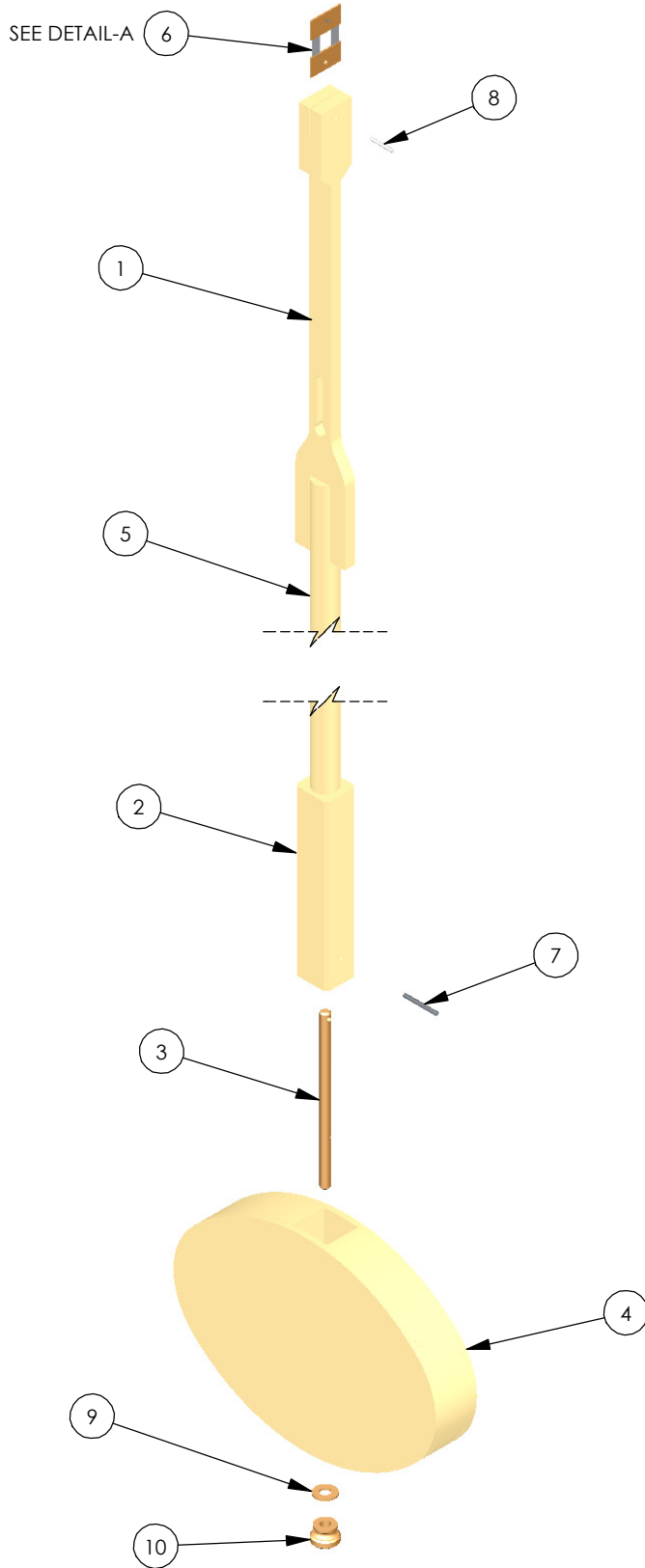
Project:

WOOD CLOCK WC5

Drawing No:

WC5-11

Sheet 1 of 1



SEE SHEET 2 FOR BILL OF MATERIALS

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:4

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Third angle projection.

Description:	PENDULUM ASSEMBLY	
Project:	WOOD CLOCK WC5	
Drawing No:	WC5-12	Sheet 1 of 2



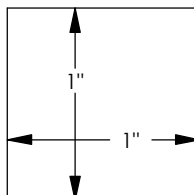
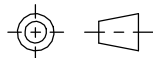
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-12-01	LEADER	BALTIC BIRCH PLYWOOD	1
2	WC5-12-02	BOB GUIDE	OAK	1
3	WC5-12-03	ADJUSTING ROD	360 H02 BRASS	1
4	WC5-12-04	BOB ASSEMBLY		1
5	PENDULUM ROD	1/2" DIA X 31" LG	OAK	1
6	SUSPENSION SPRING	#41 (TIME SAVERS PN 12055)		1
7	SPRING PIN (SLOTTED)	5/64 DIA X 3/4" LG	STAINLESS STEEL	1
8	DOWEL PIN	0.0625 DIA X 1/2" LG	BRASS	1
9	FLAT WASHER, SMALL OD	#10 NOM	BRASS	1
10	THUMB NUT	#10-32UNF	BRASS	1

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:8

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Third angle projection.



Description:

PENDULUM ASSEMBLY

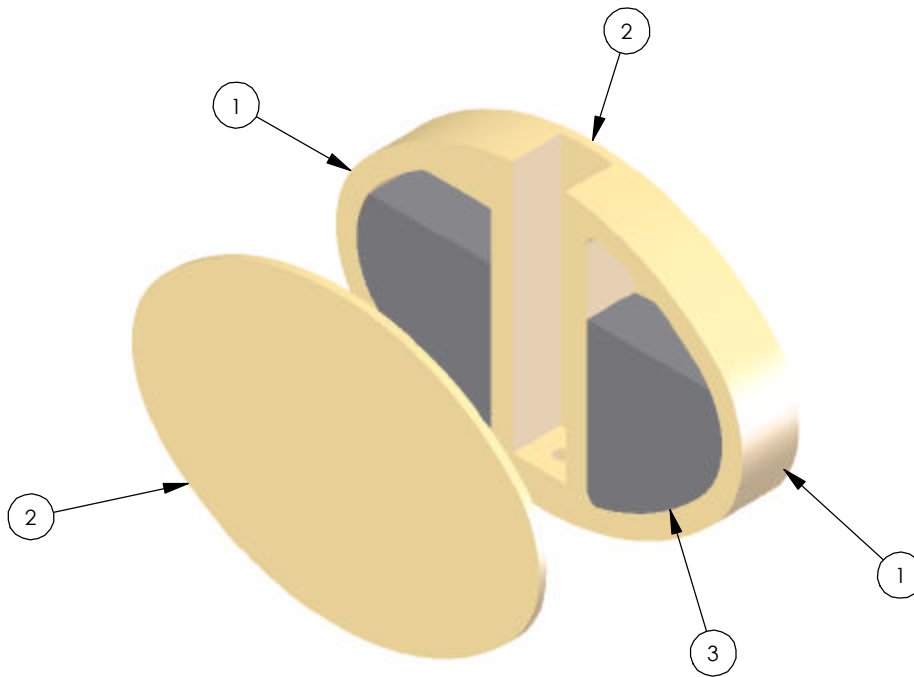
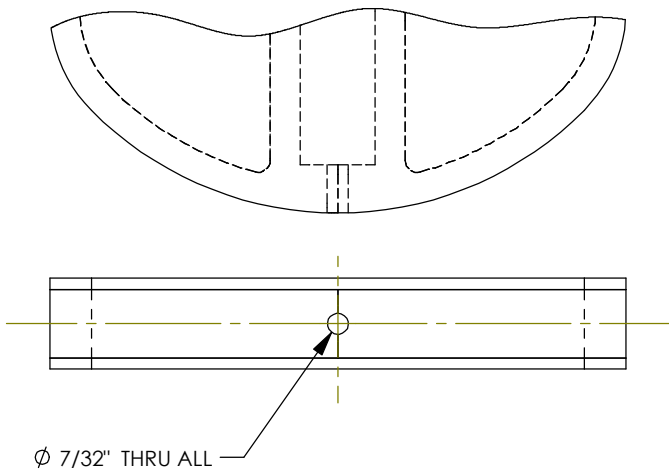
Project:

WOOD CLOCK WC5

Drawing No:

WC5-12

Sheet 2 of 2



TOTAL WEIGHT: 1.500 LBS

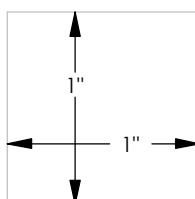
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-12-04-01	SHELL HALF	BALTIC BIRCH PLYWOOD	2
2	WC5-12-04-02	SHELL COVER	BALTIC BIRCH PLYWOOD	2
3	LEAD FILL	MC # 9030K34	#8 LEAD SHOT (1.308 LBS)	-

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Third angle projection.



Description:

BOB ASSEMBLY

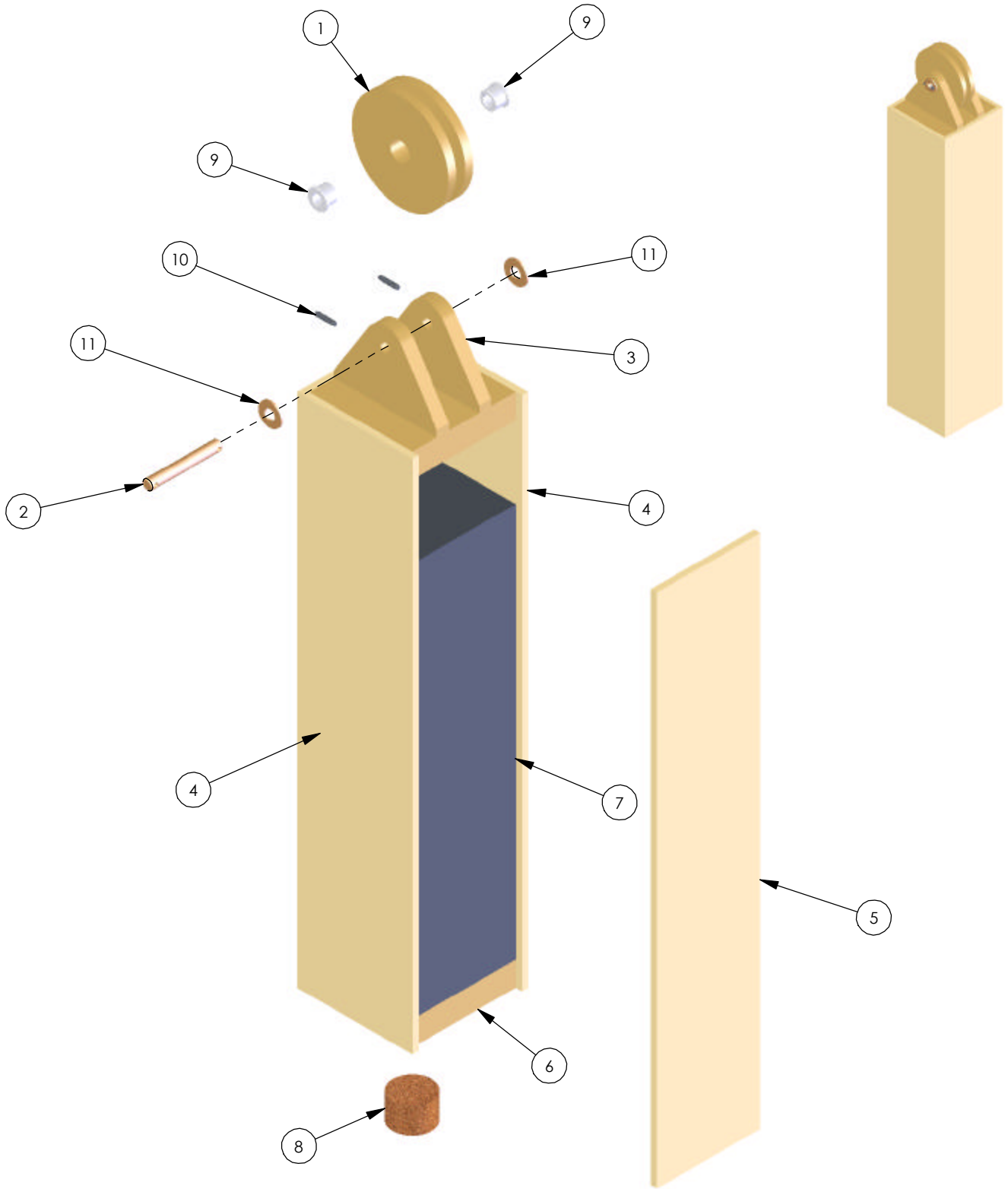
Project:

WOOD CLOCK WC5

Drawing No:

WC5-12-04

Sheet 1 of 1

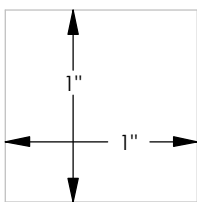
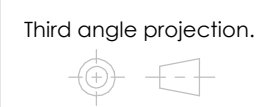


TOTAL WEIGHT: 8.000 LBS
 SEE SHEET 2 FOR BILL OF MATERIALS

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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Description:
DRIVE WEIGHT ASSEMBLY

Project:
WOOD CLOCK WC5

Drawing No:
WC5-13

Sheet 1 of 2



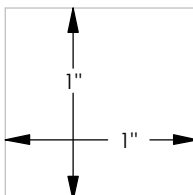
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-03	ROPE SHEAVE	BALTIC BIRCH PLYWOOD	1
2	WC5-00-04	SHAFT	360 H02 BRASS	1
3	WC5-13-01	SHELL TOP	BALTIC BIRCH PLYWOOD	1
4	WC5-13-02-A	FRONT/BACK PANEL	BALTIC BIRCH PLYWOOD	2
5	WC5-13-02-B	SIDE PANEL	BALTIC BIRCH PLYWOOD	2
6	WC5-13-03	SHELL BOTTOM	BALTIC BIRCH PLYWOOD	1
7	LEAD FILL	MC # 9030K34	#8 LEAD SHOT (7.669 LBS)	-
8	PLUG	3/4" DIA [COMPRESSED] x 1/2" LG	CORK	1
9	FLANGED BEARING	MC # 6294K86, 3/16" ID x 5/16" OD x 1/4" LG	MDS-FILLED NYLON	2
10	SPRING PIN (SLOTTED)	5/64" DIA X 3/8" LG	STAINLESS STEEL	2
11	FLAT WASHER, SMALL OD	#10 NOM	BRASS	2

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:3

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 box to right is full scale.

Third angle projection.



Description:

DRIVE WEIGHT ASSEMBLY

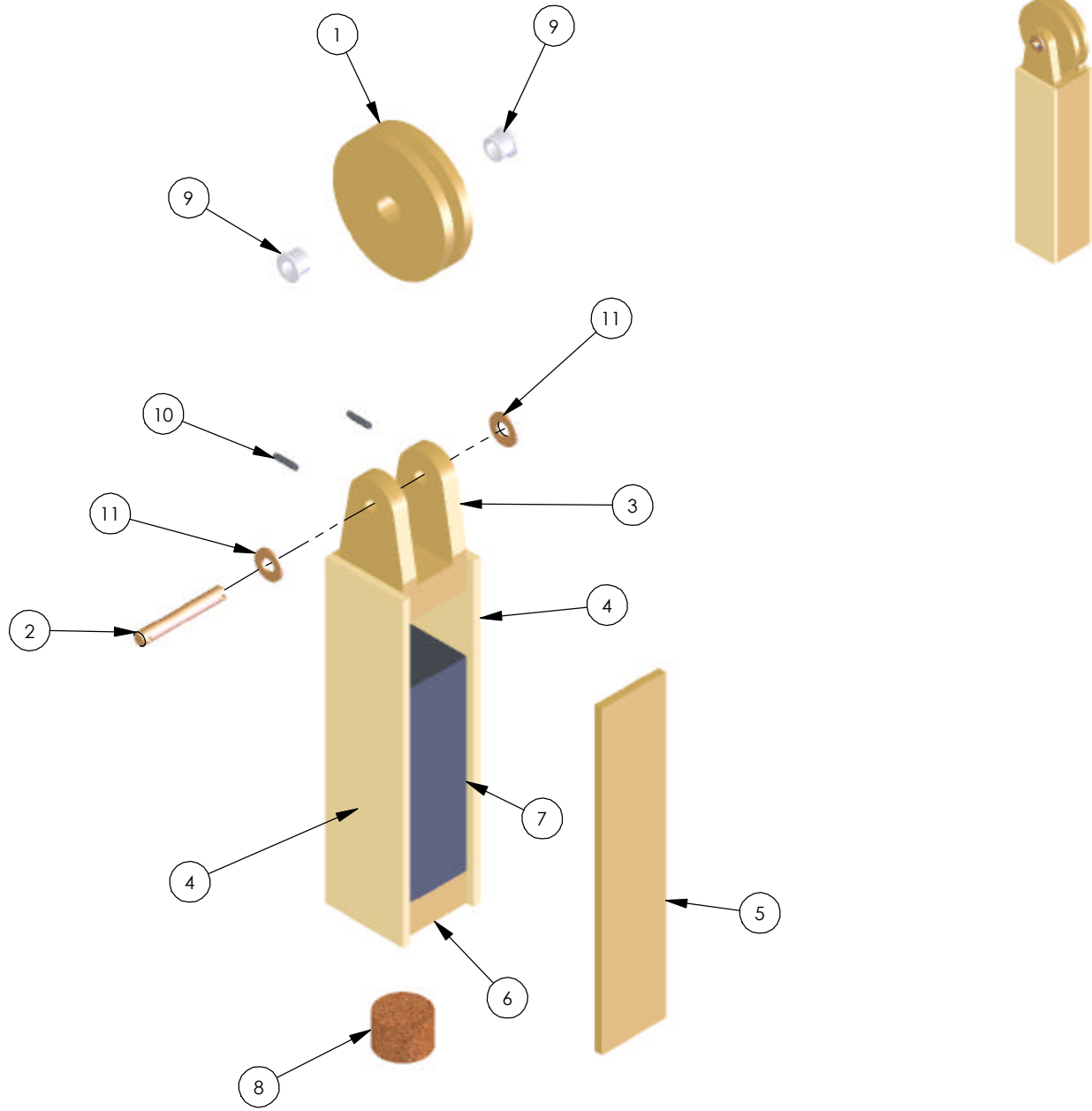
Project:

WOOD CLOCK WC5

Drawing No:

WC5-13

Sheet 2 of 2



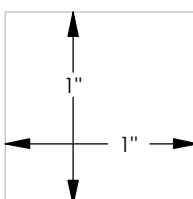
TOTAL WEIGHT: 1.000 lbs
 SEE SHEET 2 FOR BILL OF MATERIALS

Drawn By: J. RANDLE
 Drawn Date: 09/12/05
 Drawing Scale: 1:2

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All dimensions are in inches
 Tolerance +/- .005" typical.
 OK to scale drawing only if
 box to right is full scale.

Third angle projection.



Description:

COUNTERWEIGHT ASSEMBLY

Project:

WOOD CLOCK WC5

Drawing No:

WC5-14

Sheet 1 of 2



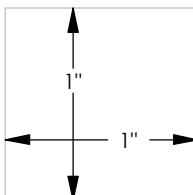
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
1	WC5-00-03	ROPE SHEAVE	BALTIC BIRCH PLYWOOD	1
2	WC5-00-04	SHAFT	360 H02 BRASS	1
3	WC5-14-01	SHELL TOP	BALTIC BIRCH PLYWOOD	1
4	WC5-14-02-A	FRONT/BACK PANEL	BALTIC BIRCH PLYWOOD	2
5	WC5-14-02-B	SIDE PANEL	BALTIC BIRCH PLYWOOD	2
6	WC5-14-03	SHELL BOTTOM	BALTIC BIRCH PLYWOOD	1
7	LEAD FILL	MC # 9030K34	#8 LEAD SHOT (0.876 LBS)	-
8	PLUG	3/4" DIA [COMPRESSED] x 1/2" LG	CORK	1
9	FLANGED BEARING	MC # 6294K86, 3/16" ID x 5/16" OD x 1/4" LG	MDS-FILLED NYLON	2
10	SPRING PIN (SLOTTED)	5/64" DIA X 3/8" LG	STAINLESS STEEL	2
11	FLAT WASHER, SMALL OD	#10 NOM	BRASS	2

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Description:

COUNTERWEIGHT ASSEMBLY

Project:

WOOD CLOCK WC5

Drawing No:

WC5-14

Sheet 2 of 2