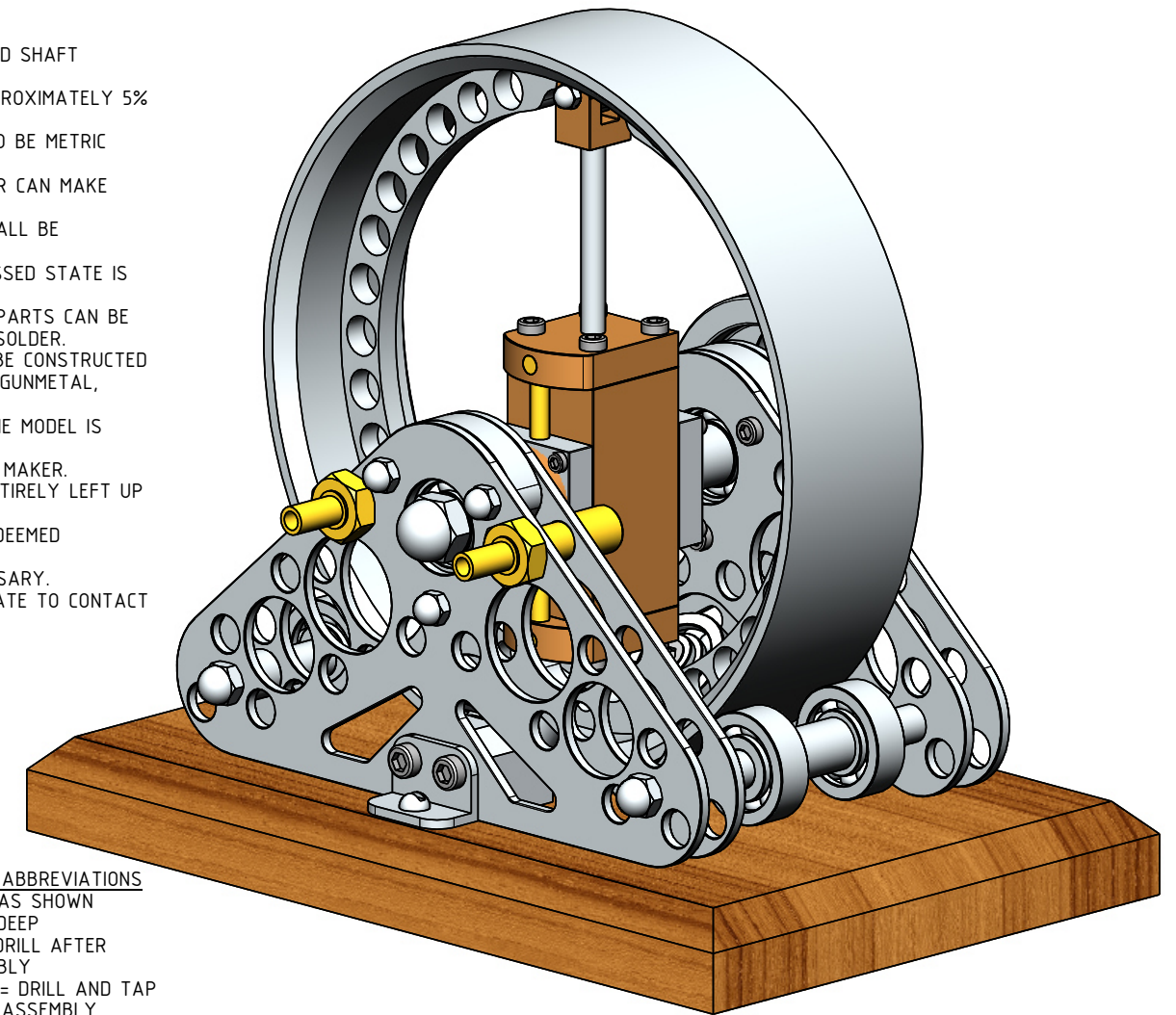
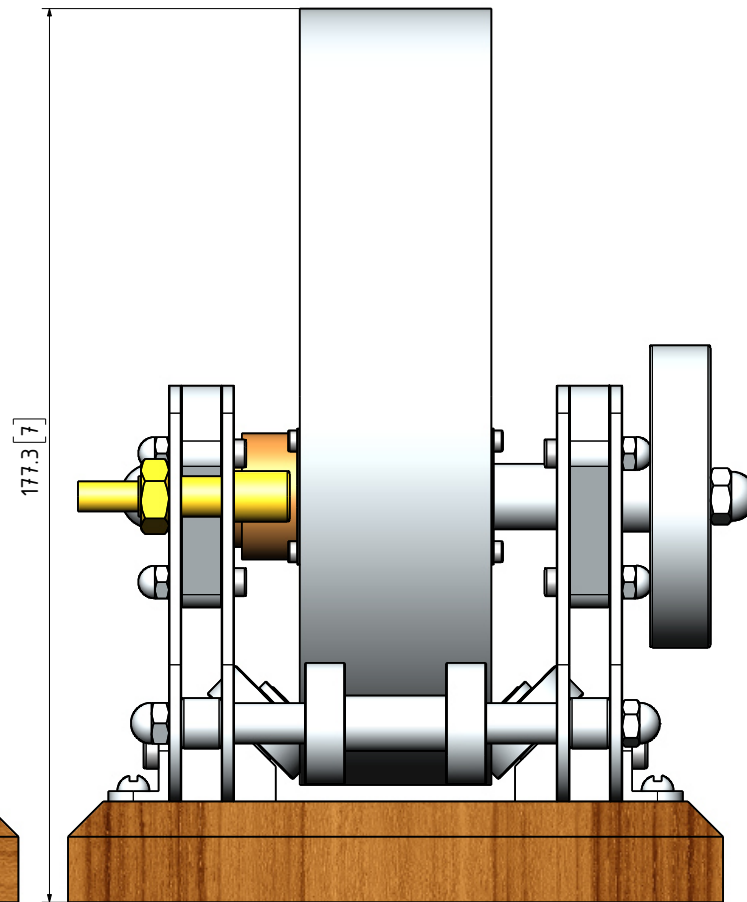
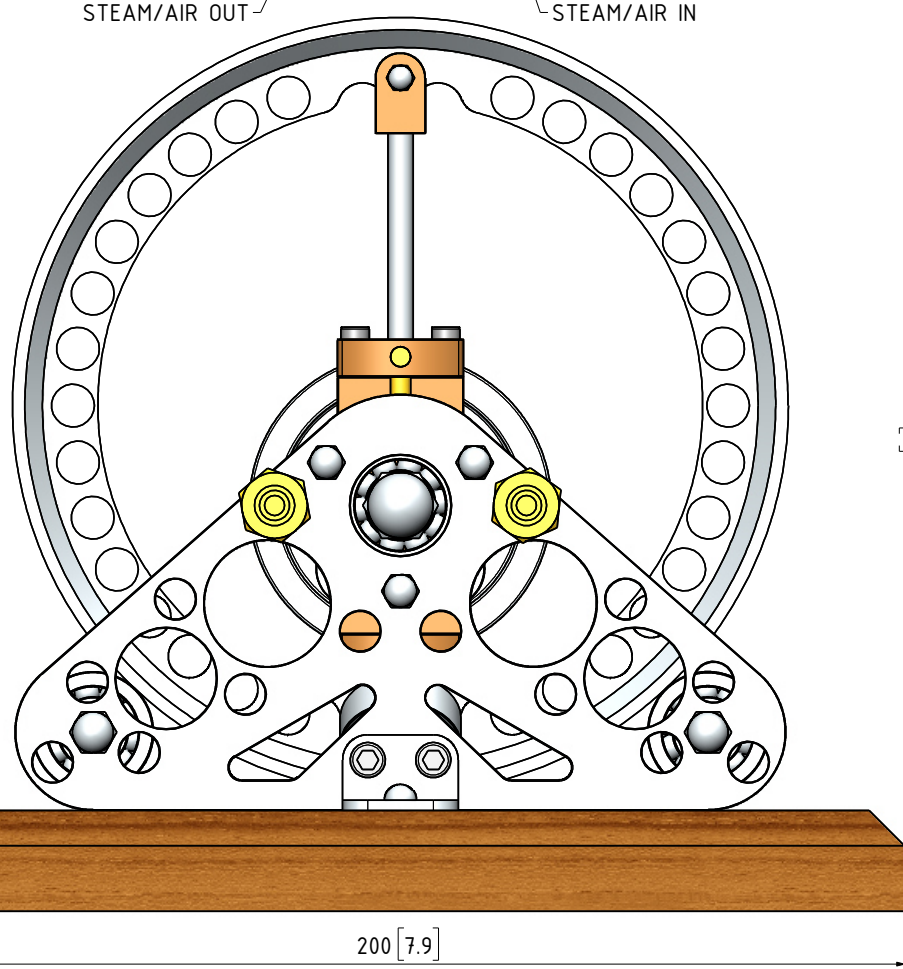


- GENERAL NOTES:
0. ALL DRAWINGS ARE IN METRIC MEASUREMENTS
  1. ALL ENGINEERING PRACTICES SHALL BE APPLIED WITH REGARDS TO HOLE AND SHAFT TOLERANCES.
  2. WHERE SCREWS OR BOLTS ARE USED THE CLEARANCE HOLES SHALL BE APPROXIMATELY 5% TO 8% LARGER THAN THE MATCHING TAPPED HOLE.
  3. PREFERABLY ALL TAPPED HOLES AND MATCHING SCREWS AND/OR BOLTS TO BE METRIC FINE (MF)
  4. MATERIALS SPECIFIED ON THE DRAWINGS ARE INDICATIVE ONLY. THE BUILDER CAN MAKE HIS/HER OWN MATERIAL CHOICE.
  5. ALL CONNECTIONS/JOINTS WHICH HAVE STEAM PRESSURE APPLIED TO IT SHALL BE SILVER/HARD SOLDERED.
  6. COMPRESSION SPRINGS ARE DRAWN IN COMPRESSED STATE (CP), UNCOMPRESSED STATE IS APPROX 40% TO 60% LONGER THEN COMPRESSED STATE.
  7. WHERE PREFERRED SCREW OR RIVETED CONNECTIONS CAN BE OMITTED AND PARTS CAN BE BONDED TOGETHER BY USING EITHER HIGH STRENGTH GLUE, EPOXY RESIN, OR SOLDER.
  8. PARTS WHICH ARE DIRECTLY EXPOSED TO STEAM AND/OR WATER SHOULD BE CONSTRUCTED USING NON-FERROUS OR NON CORROSIVE MATERIAL SUCH AS BRASS, BRONZE, GUNMETAL, STAINLESS STEEL, COPPER OR MONEL.
  9. THE ORDER IN WHICH THE PARTS/COMPONENTS ARE MANUFACTURED AND THE MODEL IS ASSEMBLED IS ENTIRELY LEFT TO THE BUILDER/MODEL MAKER.
  10. A COLOUR SCHEME FOR THIS PROJECT IS ENTIRELY LEFT UP TO THE MODEL MAKER.
  11. THE MANNER IN WHICH THE PARTS/COMPONENTS ARE MANUFACTURED IS ENTIRELY LEFT UP TO THE BUILDER.
  12. USE LOCTITE, ON SCREW OR PRESS FIT CONNECTIONS OR SURFACES, WERE DEEMED NECESSARY TO PREVENT PARTS FROM LOOSENING.
  13. WASHERS AND/OR SPRINGWASHERS SHALL BE USED WHERE DEEMED NECESSARY.
  - XX. ERRORS AND/OR OMISSIONS MAY OCCUR IN THE DRAWINGS, DO NOT HESITATE TO CONTACT ME SO THAT THE ERRORS/OMISSIONS CAN BE RECTIFIED.



- OTHER ABBREVIATIONS
- AS = AS SHOWN
  - DP = DEEP
  - DAA= DRILL AFTER ASSEMBLY
  - D&TAA= DRILL AND TAP AFTER ASSEMBLY
  - CF = CLOSE FIT (SIZE FOR SIZE)
  - PF = PRESS FIT
  - PFAA= PRESS FIT AFTER ASSEMBLY
  - PCD = PITCH CIRCLE DIAMETER
  - RM = REAM
  - HEX = HEXACON, 6SIDED
  - CP = COMPRESSED
  - KNL = KNURLED
  - CSK = COUNTERSINK
  - PL = PLACES
  - DWL= DOWEL
  - SPF= SPOTFACE
  - (T)HESOP=(TAPPED)HOLES EQUALLY SPACED ON PCD
  - (T)HESOC=(TAPPED)HOLES EQUALLY SPACED ON CIRCUMFERENCE
  - OD = OUTSIDE DIAMETER
  - ID = INSIDE DIAMETER
  - MAX/MIN = CRITICAL DIMENSION
  - [SA-xxx]= SUB ASSEMBLY-xxx

DUE TO THE LACK OF INFORMATION ON THE ORIGINAL DRAWING(S), SUCH AS VIEWS, DIMENSIONS, SECTIONS ETC AND/OR CLARITY OF COMPONENTS, OMITTED PARTS/COMPONENTS, SOME OF THE COMPONENTS MIGHT NOT BE AS CONSTRUCTED ORIGINALLY OR AS THE ORIGINAL DESIGNER INTENDED.



- ADDITIONAL NOTES ABOUT THESE DRAWINGS:
- 1) NO MATERIALS HAVE BEEN SPECIFIED ON THESE DRAWINGS. THE BUILDER TO CHOOSE ITS OWN PREFERRED MATERIAL FOR THE PARTS/COMPONENTS. THE FOLLOWING COLOURS ON THE DRAWINGS INDICATES POSSIBLE MATERIALS WHICH CAN BE USED FOR PARTS: YELLOW-BRASS, LIGHT GREY=ALUMINIUM OR MILD STEEL, REDDISH BROWN=COPPER, DARK BROWN=BRONZE OR GUN METAL, WHITISH=SILVER STEEL OR STAINLESS STEEL.
  - 2) REVERSING THE 'STEAM/AIR IN' AND 'STEAM/AIR OUT' REVERSERS THE ROTATION DIRECTION

QTY.	PART NUMBER
1	09D-26-00-1-01-BASE FRAME
1	09D-26-00-1-02-IN-OUTLET+DISTRIBUTION RING
2	09D-26-00-1-03-BEARING RETAINER
8	09D-26-00-2-01-BALL BEARING
1	09D-26-00-2-02-CRANKWHEEL
1	09D-26-00-2-03-CYLINDER
1	09D-26-00-2-04-PISTON+ROD
1	09D-26-00-M3 DOME NUT
8	09D-26-00-M3x12 A-K CYL HEAD SCREW
6	09D-26-00-M4 DOME NUT
8	09D-26-00-M4x12 A-K CYL HEAD SCREW
6	09D-26-00-M4x16 A-K CYL HEAD SCREW
2	09D-26-00-M4x16-ROUND HEAD WOOD SCREW
4	09D-26-00-M5 DOME NUT
4	09D-26-00-M5x18 A-K CYL HEAD SCREW
2	09D-26-00-M5x20 A-K C-SINK SCREW
1	09D-26-00-M6 DOME NUT
1	09D-26-00-M8 DOME NUT
2	09D-26-00-M8 NUT

NOTES: FOUND THE ORIGINAL DRAWINGS ON THE INTERNET. THE ORIGINAL DRAWINGS AND DESIGN AND BUILT WERE BY KEN IRWIN OF SOUTH AFRICA. THE ENGINE SHOWN ON THESE DRAWING IS 1.25 LARGER THAN THE ORIGINAL. TO CONTACT KEN GO TO HMEM WEBSITE AND SEND A PERSONAL MESSAGE TO "Ken I"

TITLE  
**AN EXPERIMENTAL NOVELTY CRANKLESS STEAM/AIR ENGINE.**

DRAWING CONTENTS  
**GENERAL ARRANGEMENT, NOTES, BILL OF MATERIALS, ISOMETRIC VIEW**

PROJECT No 09D-26-00  
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PROJECTION  
**JDWDS** MODEL SCALE: 1:1  
 DWG SCALE: 1:1 @A3 OR AS SHOWN  
 DATE AUGUST 2022 Copyright © J.A.M. DE WAAL PAKAPURA NZ  
 SHEET: 01 OF 03 **A3** No: 09D-26-00-SHT-01

**DRAWINGS ARE FOR PERSONAL USE ONLY NOT FOR COMMERCIAL PURPOSES**