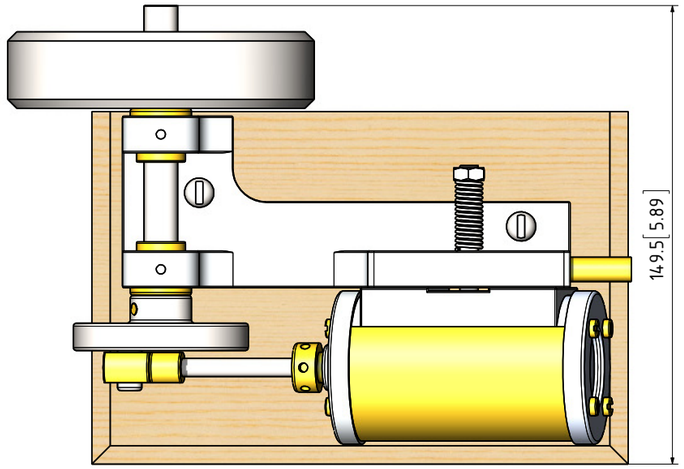
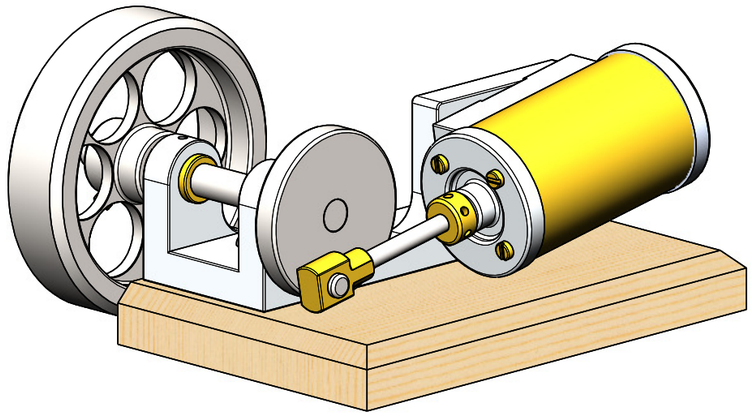
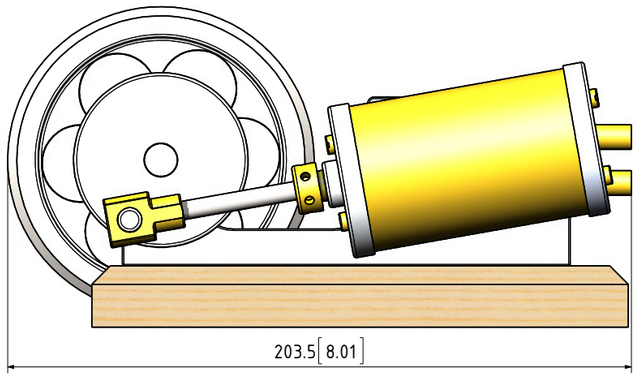
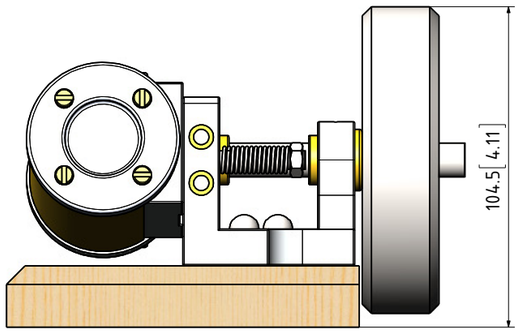




NOTES:
0. ALL DRAWINGS ARE IN METRIC MEASUREMENTS
1. ALL ENGINEERING PRACTICES SHALL BE APPLIED WITH REGARDS TO HOLE AND SHAFT TOLERANCES.
2. WHERE SCREWS OR BOLTS ARE USED THE CLEARANCE HOLES SHALL BE APPROXIMATELY 5% TO 8% LARGER THAN THE MATCHING TAPPED HOLE.
3. PREFERABLY ALL TAPPED HOLES AND MATCHING 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.
XX. ERRORS AND/OR OMISSIONS MAY OCCUR IN THE DRAWINGS, DO NOT HESITATE TO CONTACT ME SO THAT THE ERRORS/OMISSIONS CAN BE RECTIFIED.

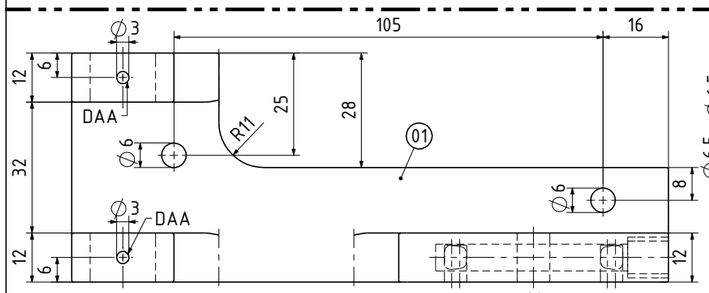


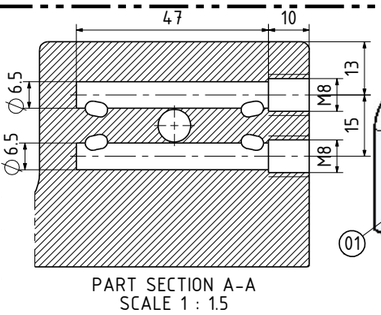


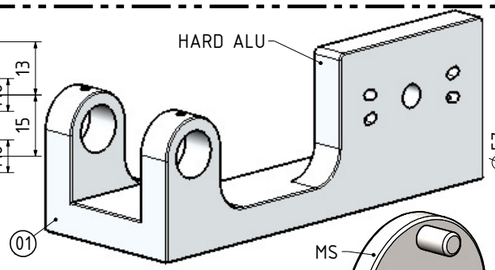
OTHER ABBREVIATIONS
DP = DEEP
DAA= DRILL AFTER ASSEMBLY
D&TAA= DRILL AND TAP AFTER ASSEMBLY
CF = CLOSE FIT (SIZE FOR SIZE)
PF = PRESS FIT
PFAA= PRESS FIT AFTER ASSEMBLY
PCD = PITCH CIRCLE DIAMETER
RM = REAM
HEX = HEXACON, 6SIDED
CP = COMPRESSED
KNL = KNURLED
CSK = COUNTERSINK
PL = PLACES
DWL= DOWEL
HESOP=HOLES EQUALLY SPACED ON PCD
SA-n-xxx= SUB ASSEMBL-n-xxx

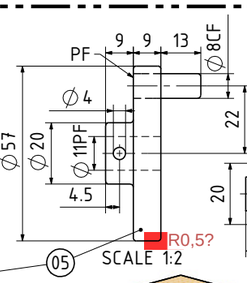
MATERIAL ABBREVIATIONS:
ALU = ALUMINIUM
BRS = BRASS
BRZ = BRONZE OR GUNMETAL (BRZ/GM)
CI = CAST IRON
CU = COPPER
GRA = GRAPHITE
MS = MILD STEEL/BRIGHT MILD STEEL
S/S = SILVER STEEL OR STAINLESS STEEL
SPS = SPRING STEEL
PEEK= POLYETHER ETHER KETONE
SYN = SYNTHETIC MATERIAL SUCH AS VETON, NYLON, TEFLON OR RUBBER
IN GENERAL SYNTHETIC MATERIALS SOULD BE ABLE TO WITHSTAND THE HEAT AND PRESSURE(S) APPLIED TO THEM.
nnn/nnn MEANS THAT EITHER MATERIAL CAN BE USED

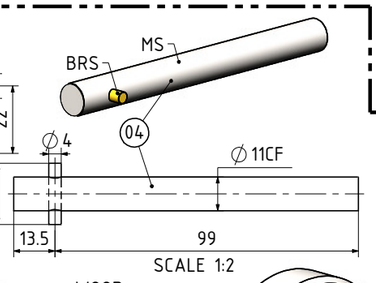
QTY.	PART NUMBER
1	NO21-01-BASE FRAME
2	NO21-02-CRANKSHAFT BEARING BUSH
1	NO21-03-CYLINDER PIVOT BUSH
1	NO21-04-CRANKSHAFT
1	NO21-05-CRANK DISC
1	NO21-06-FLYWHEEL
1	NO21-07-CYLINDER
1	NO21-08-CYLINDER FRONT LID
1	NO21-09-CYLINDER REAR LID
1	NO21-10-CYLINDER PIVOT SHAFT
1	NO21-11-PIVOT SHAFT SPRING
1	NO21-12-PISTON ROD GLAND
1	NO21-13-PISTON ROD
1	NO21-14-PISTON
1	NO21-15-PISTON ROD BIG END
2	NO21-16-INLET-OUTLET PIPE
1	NO21-17-WOOD BASE
1	NO21-18-CYLINDER LAGGING
1	NO21-M4x9 PAN HEAD SCREW
8	NO21-M4x25 PAN HEAD SCREW
2	NO21-M6 NUT
2	NO21-M6x25-WOOD SCREW

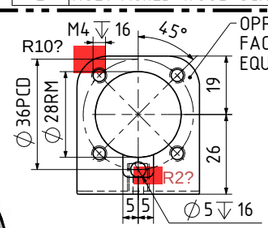


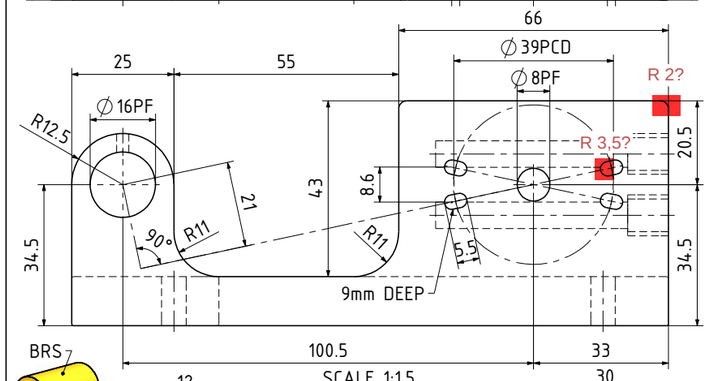


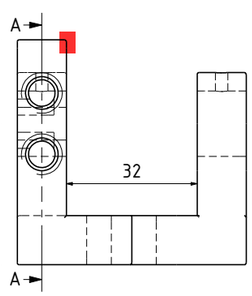


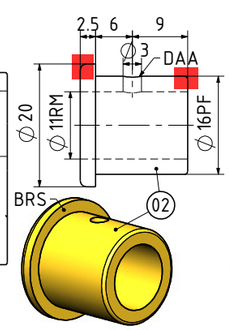


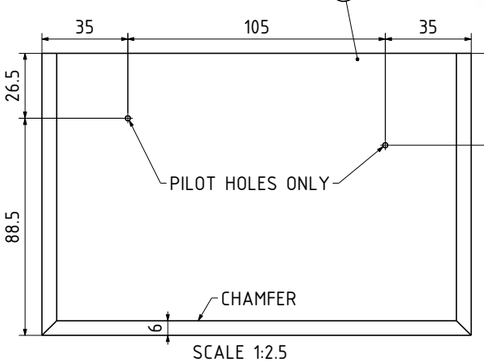


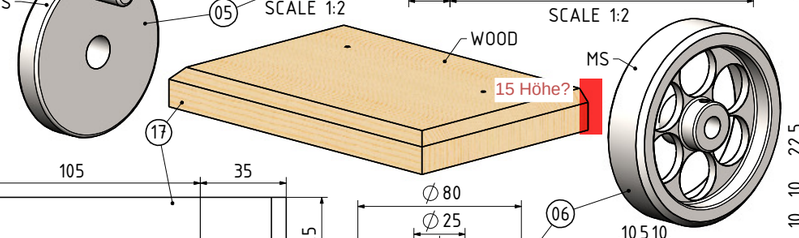


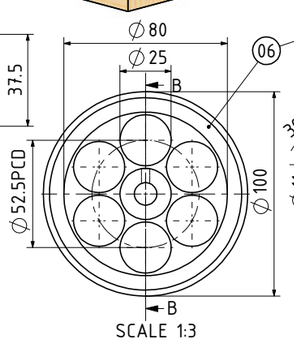


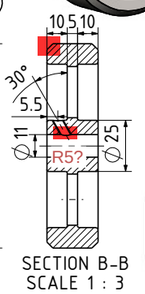


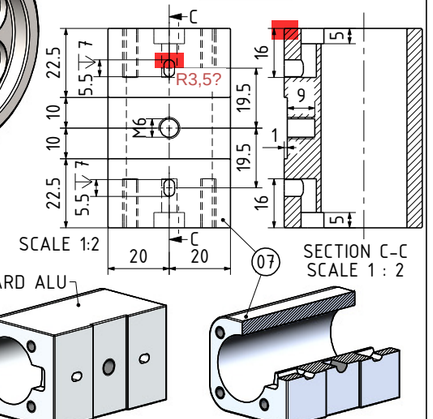


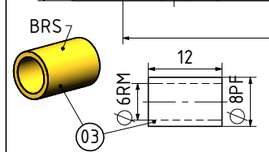


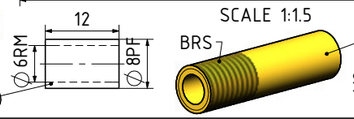


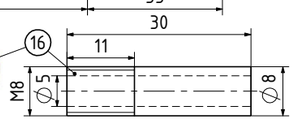












NOTES: FOUND THIS ENGINE ON THE INTERNET. CLASSIC STEAM ENGINE ENGINEERING WEBSITE.DESIGNER AND DRAFTER UNKNOWN.

TITLE
SIMPLE 1 CYLINDER OSCILLATING STEAM ENGINE CALLED No21 BY CSEE

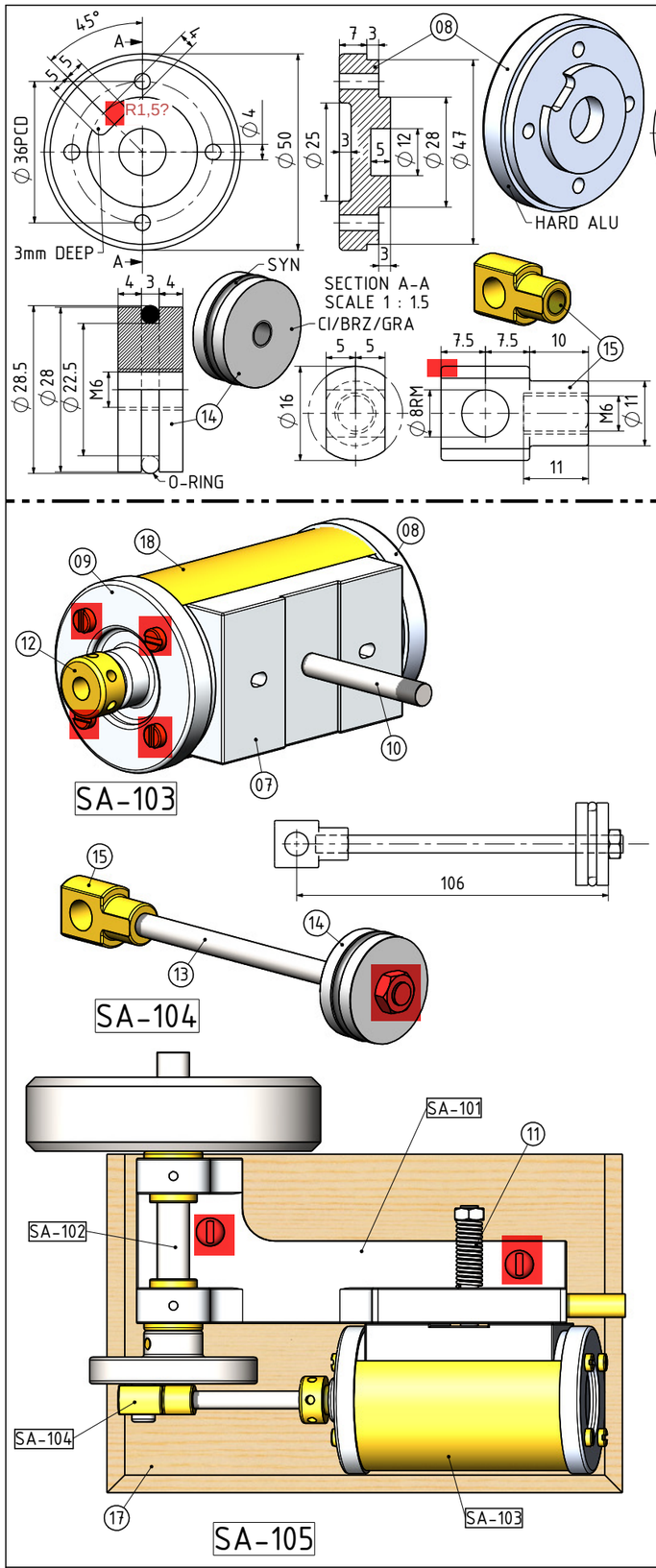
DRAWING CONTENTS
G.A, ISOMETRIC VIEW, BOM, NOTES, PARTS AND ASSEMBLIES

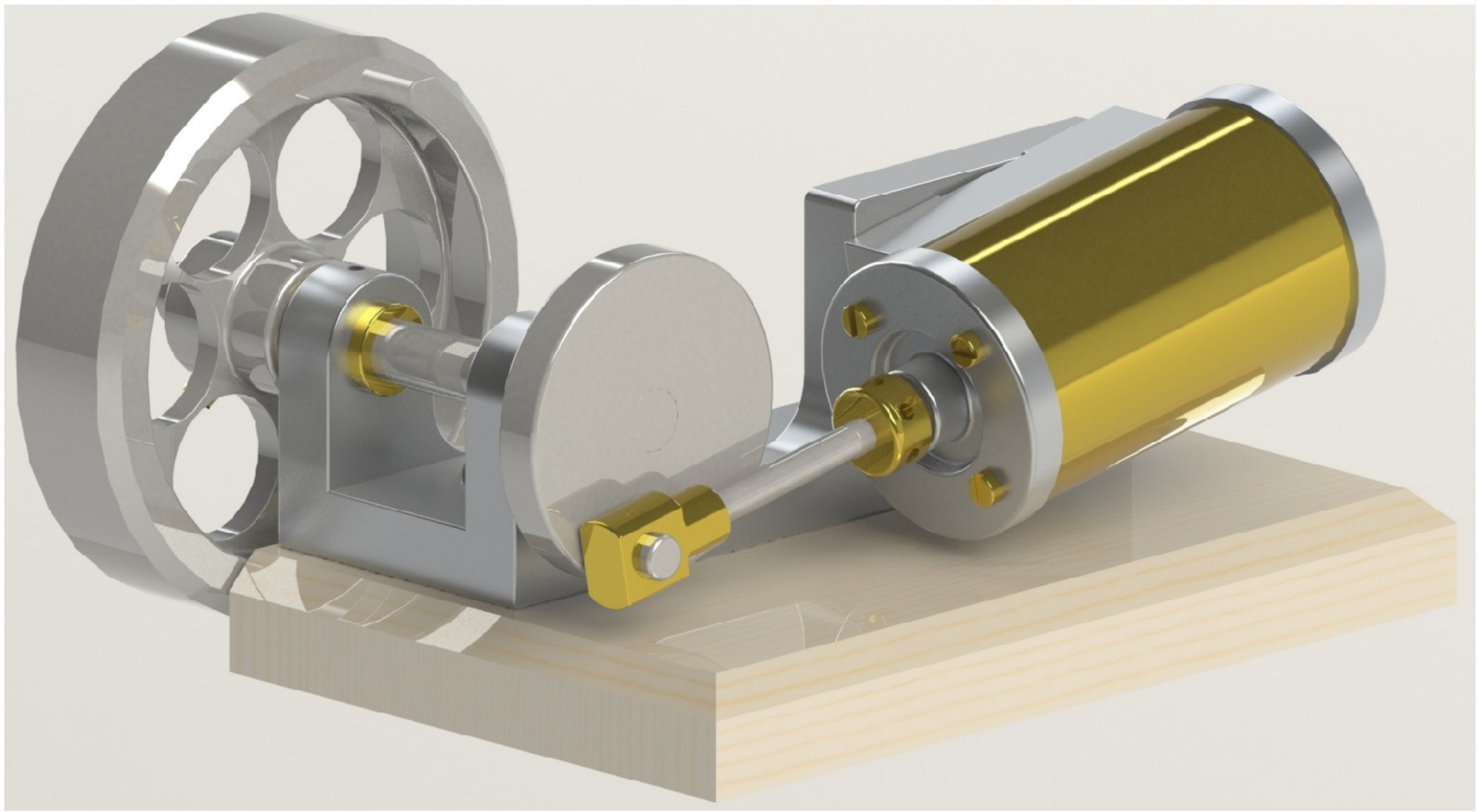
PROJECT No 09A-20-00
JDW DRAUGHTING SERVICES
J.A.M. DE WAAL. 12 BRIGHTWELL STREET PAPAKURA 2110. NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000
E-MAIL: dewaal@xtra.co.nz.

PROJECTION JDWDS
DATE JULY-2016
SHEET: 01 OF 02

MODEL SCALE: 1:1
DWG SCALE: 1:1 @A3 OR AS SHOWN

A3 No: No21-01





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TITLE
SIMPLE 1 CYLINDER OSCILLATING STEAM ENGINE CALLED No21 BY CSEE

DRAWING CONTENTS
PARTS AND ASSEMBLIES AND RENDERED PICTURE

PROJECT No 09A-20-00

JDW DRAUGHTING SERVICES
J.A.M. DE WAAL. 12 BRIGHTWELL STREET PAPAKURA 2110. NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000
E-MAIL: dewaal@xtra.co.nz.

PROJECTION JDWDS

DATE JULY-2016

SHEET: 02 OF 02

MODEL SCALE: 1:1

DWG SCALE: 1:1 @A3 OR AS SHOWN

A3 No: No21-02