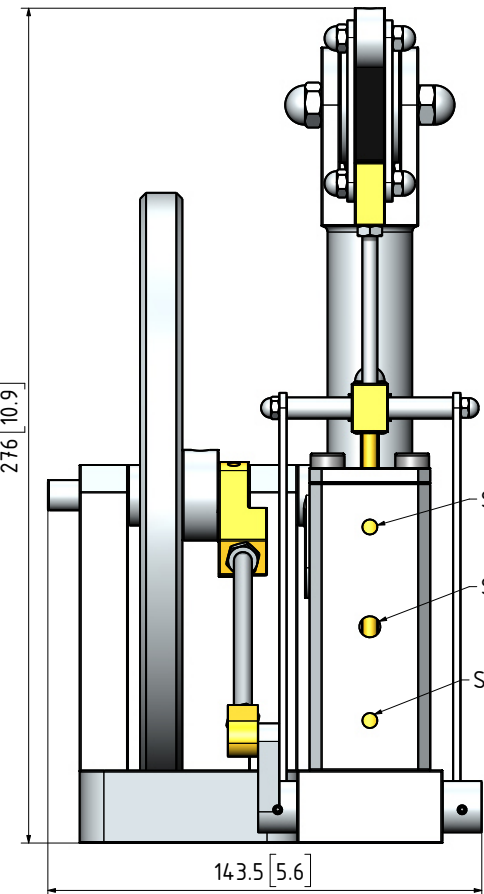
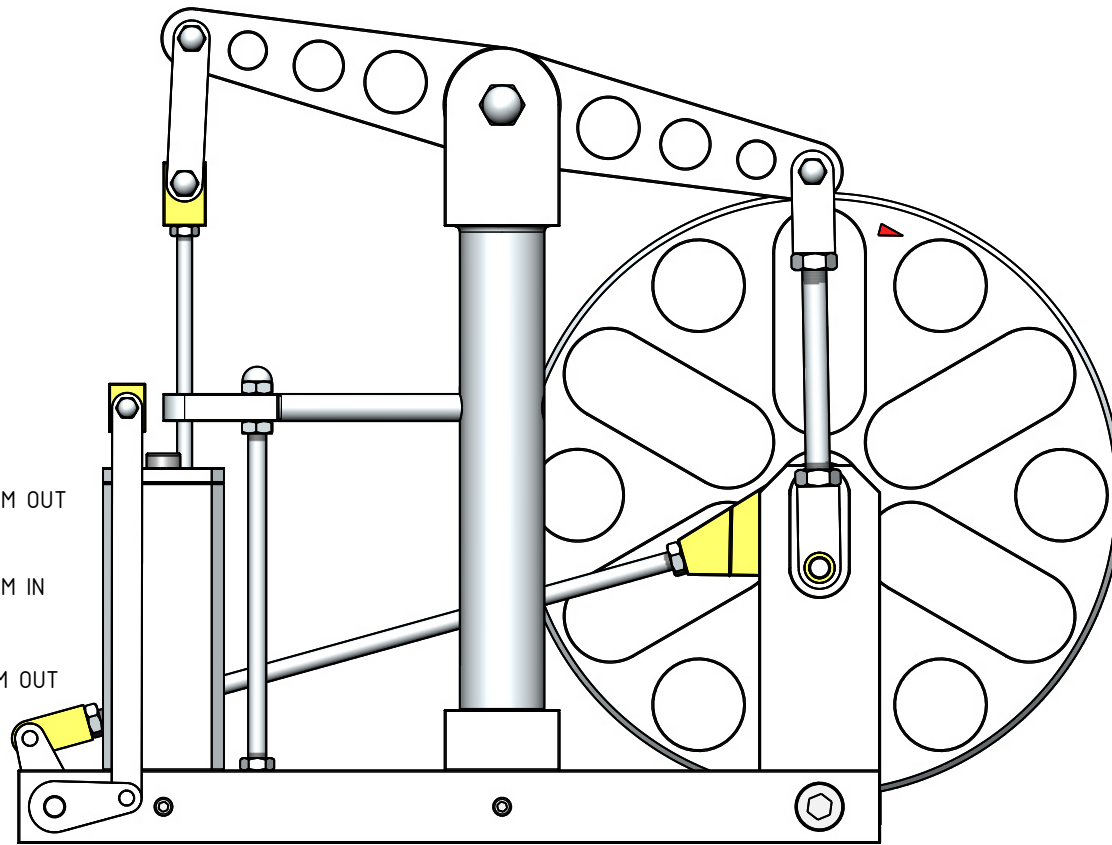


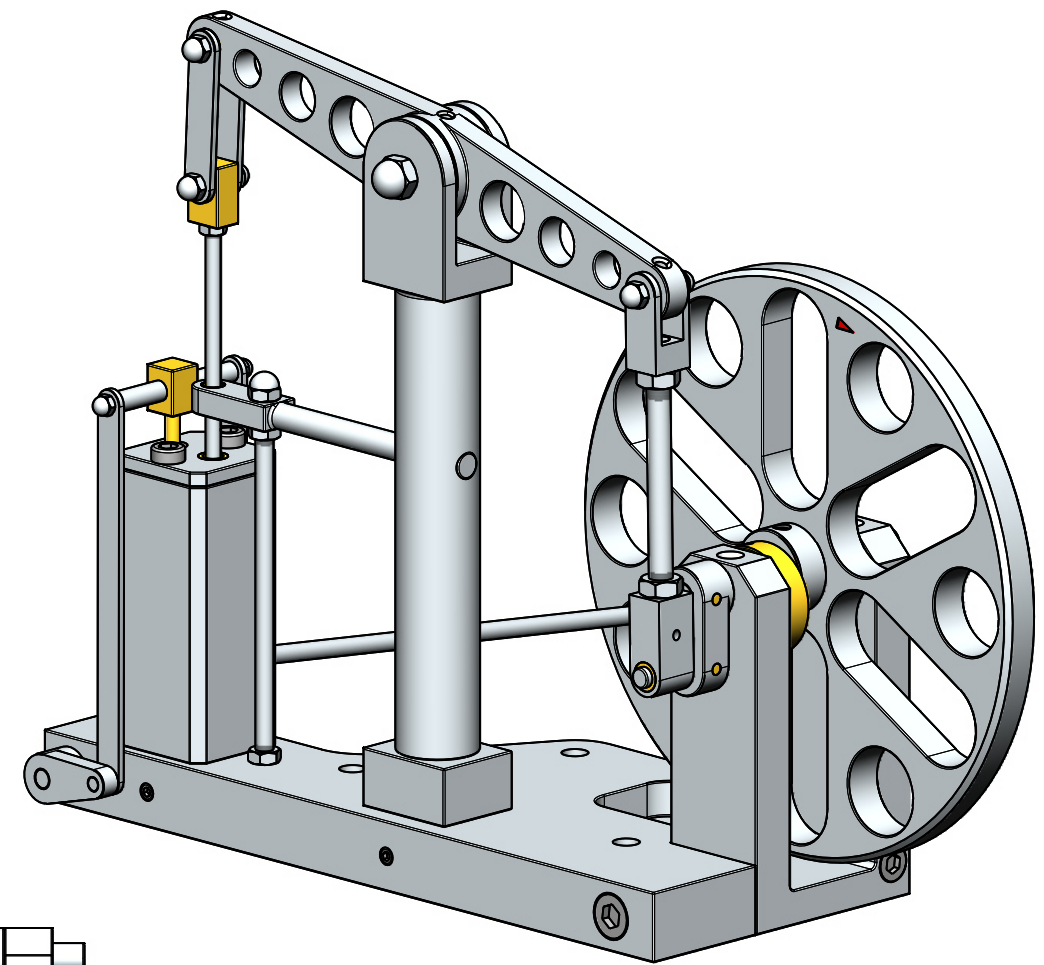
367.1 [14.5]



276 [10.9]

143.5 [5.6]

STEAM OUT
STEAM IN
STEAM OUT



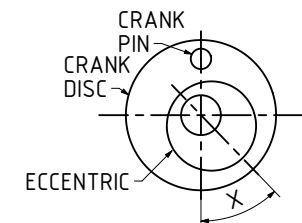
QTY.	PART NUMBER
1	09E-46-00-1-01-BASE PLATE
1	09E-46-00-1-02-CYLINDER
1	09E-46-00-2-01-BALANCED BEAM
1	09E-46-00-2-02-CRANK SHAFT+FLYWHEEL
1	09E-46-00-2-03-CON-ROD
1	09E-46-00-2-04-PISTON+CROSSHEAD
1	09E-46-00-2-05-CROSSHEAD LINK
1	09E-46-00-2-06-VALVE LEVER SHAFT
1	09E-46-00-2-07-ECCENTRIC STRAP
1	09E-46-00-2-08-SPOOL VALVE
1	09E-46-00-2-09-SPOOL VALVE LINKAGE
1	09E-46-00-M10x64 A-K C-SINK SCREW
2	09E-46-00-M3x15 A-K GRUB SCREW
2	09E-46-00-M4 DOME NUT
6	09E-46-00-M5 DOME NUT
1	09E-46-00-M5 NUT
1	09E-46-00-M6 DOME NUT
4	09E-46-00-M6 NUT
2	09E-46-00-M6x14 A-K GRUB SCREW
2	09E-46-00-M6x9 A-K GRUB SCREW
2	09E-46-00-M8 DOME NUT
2	09E-46-00-M8 NUT
2	09E-46-00-M8x20 A-K CYL HEAD SCREW
1	09E-46-00-M8x58 A-K C-SINK SCREW

- NOTES:
- ALL DRAWINGS ARE IN METRIC MEASUREMENTS
 - ALL ENGINEERING PRACTICES SHALL BE APPLIED WITH REGARDS TO HOLE AND SHAFT TOLERANCES.
 - WHERE SCREWS OR BOLTS ARE USED THE CLEARANCE HOLES SHALL BE APPROXIMATELY 5% TO 8% LARGER THAN THE MATCHING TAPPED HOLE.
 - PREFERABLY ALL TAPPED HOLES AND MATCHING SCREWS AND/OR BOLTS TO BE METRIC FINE (MF)
 - MATERIALS SPECIFIED ON THE DRAWINGS ARE INDICATIVE ONLY. THE BUILDER CAN MAKE HIS/HER OWN MATERIAL CHOICE.
 - ALL CONNECTIONS/JOINTS WHICH HAVE STEAM PRESSURE APPLIED TO IT SHALL BE SILVER/HARD SOLDERED.
 - COMPRESSION SPRINGS ARE DRAWN IN COMPRESSED STATE (CP), UNCOMPRESSED STATE IS APPROX 40% TO 60% LONGER THEN COMPRESSED STATE.
 - 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.
 - 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.
 - THE ORDER IN WHICH THE PARTS/COMPONENTS ARE MANUFACTURED AND THE MODEL IS ASSEMBLED IS ENTIRELY LEFT TO THE BUILDER/MODEL MAKER.
 - A COLOUR SCHEME FOR THIS PROJECT IS ENTIRELY LEFT UP TO THE BUILDER.
 - THE MANNER IN WHICH THE PARTS/COMPONENTS ARE MANUFACTURED IS ENTIRELY LEFT UP TO THE BUILDER.
 - USE LOCTITE, ON SCREW OR PRESS FIT CONNECTIONS OR SURFACES, WERE DEEMED NECESSARY TO PREVENT PARTS FROM LOOSENING.
 - 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
 - [SA-xxx]= SUB ASSEMBLY-xxx

- MATERIAL ABBREVIATIONS:
- ALU = ALUMINIUM
 - HALU= HARD ALUMINIUM
 - BRS = BRASS
 - BRZ = BRONZE OR GUNMETAL (BRZ/GM)
 - CI = CAST IRON
 - CU = COPPER
 - GRA = GRAPHITE
 - MS = MILD STEEL/BRIGHT MILD STEEL
 - SS = 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 SHOULD BE ABLE TO WITHSTAND THE HEAT AND PRESSURE(S) APPLIED TO THEM.
- nnn/nnn MEANS THAT EITHER MATERIAL CAN BE USED

THE OFF SET ANGLE OF THE ECCENTRIC IN RELATION TO THE CRANK AXIS TO BE EXPERIMENTALLY DETERMINED FOR THE SMOOTH RUNNING OF THE ENGINE AND SATISFACTION OF THE BUILDER



NOTES: THE ORIGINAL DRAWINGS WERE GIVEN TO ME. THE ORIGINAL DESIGN WAS BY BRIAN RUPNOW AND DATED 25/07/2008. MY DESIGN IS 1.5 TIMES LARGER THAN THE ORIGINAL. SOME ADJUSTMENTS/ALTERATIONS ARE INCORPORATED.

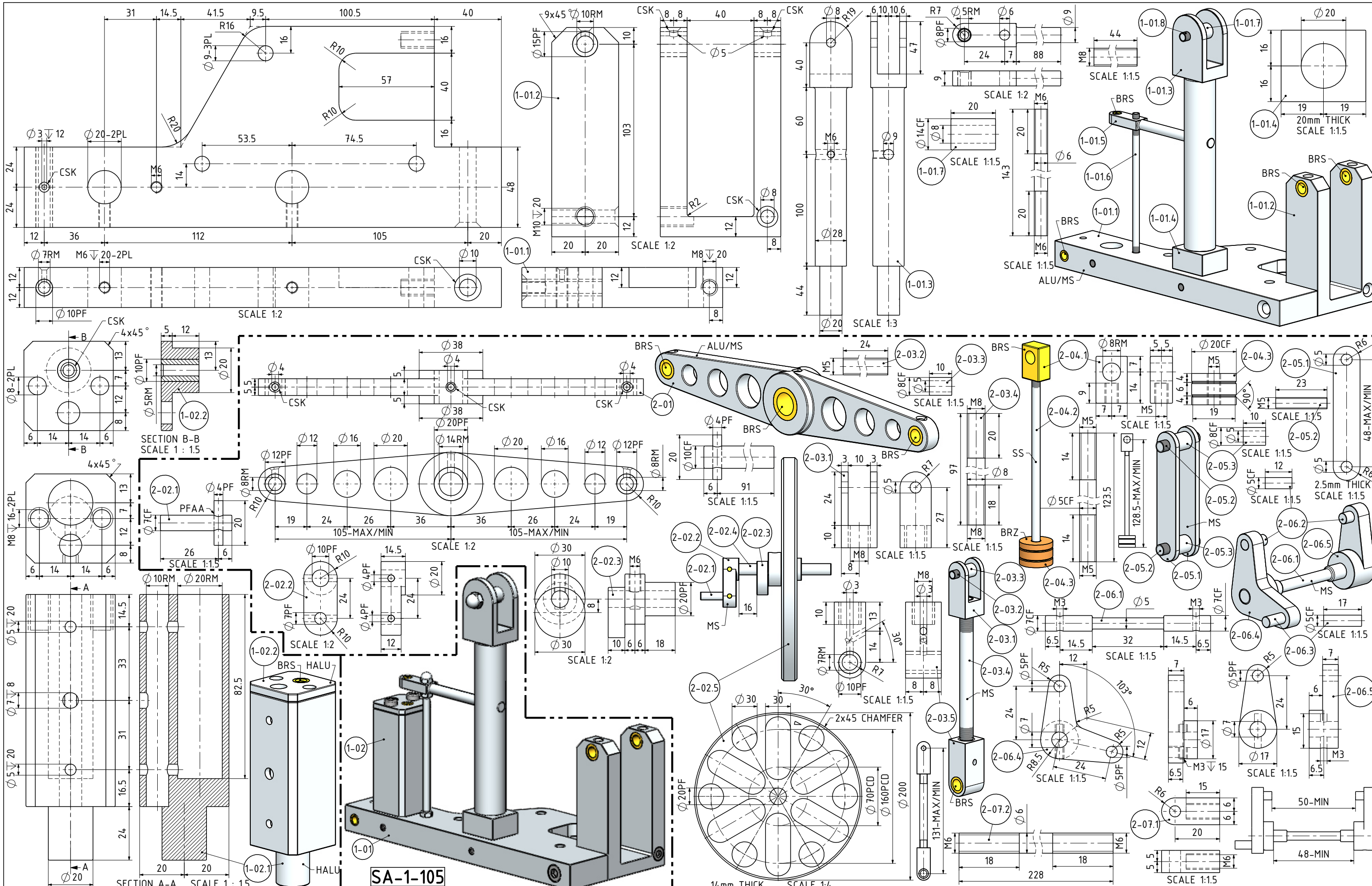
TITLE
A SIMPLE 1 CYLINDER BALANCED BEAM
STEAM ENGINE (BORE=20mm STROKE=48mm}

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

PROJECT No 09E-46-00
JDW DRAUGHTING SERVICES
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2110, NEW ZEALAND. PHONE: 0064 09 2988815. MOB:
0211791000 E-MAIL: dewaal@xtra.co.nz.

PROJECTION
DATE JULY 2020
SHEET: 01 OF 03
JDWDS
MODEL SCALE: 1:1
DWG SCALE: 1:1 @A3 OR AS SHOWN
Copyright © J.A.M. DE WAAL PAPAOKURA NZ
A3 No: 09E-46-00-SHT01

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TITLE
A SIMPLE 1 CYLINDER BALANCED BEAM STEAM ENGINE (BORE=20mm STROKE=48mm)

DRAWING CONTENTS
PARTS AND ASSEMBLIES

PROJECT No 09E-46-00
 JDW DRAUGHTING SERVICES
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PROJECTION **JDWDS** MODEL SCALE: 1:1
 DWG SCALE: 1:1 @A3 OR AS SHOWN
 DATE JULY 2020 Copyright © J.A.M. DE WAAL PAPAOKURA NZ
 SHEET: 02 OF 03 **A3** No: 09E-46-00-SHT02

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