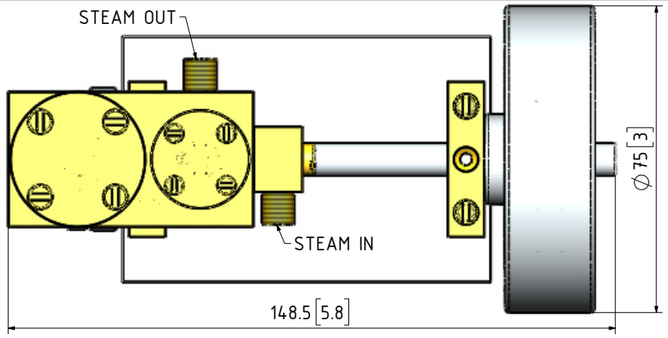
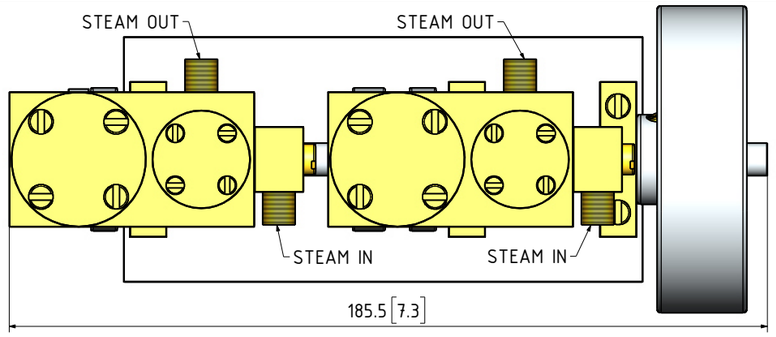
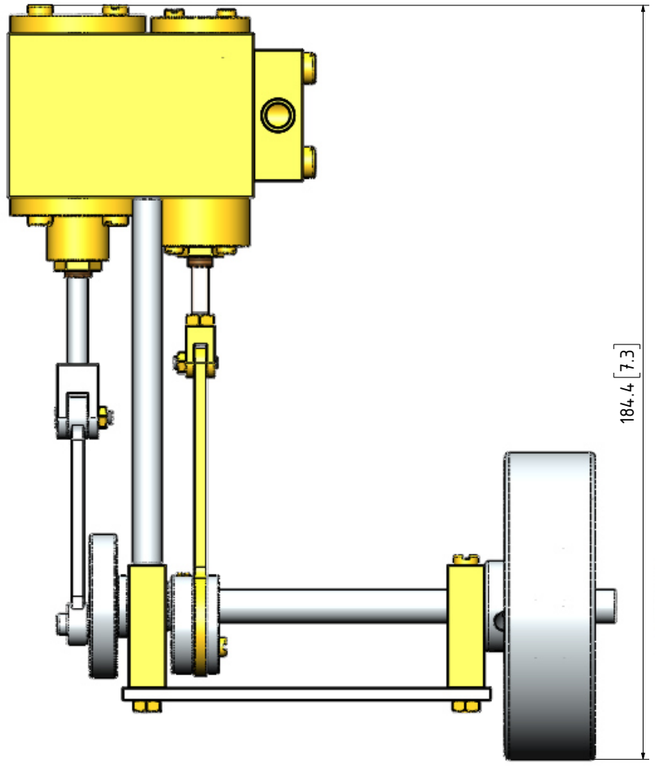
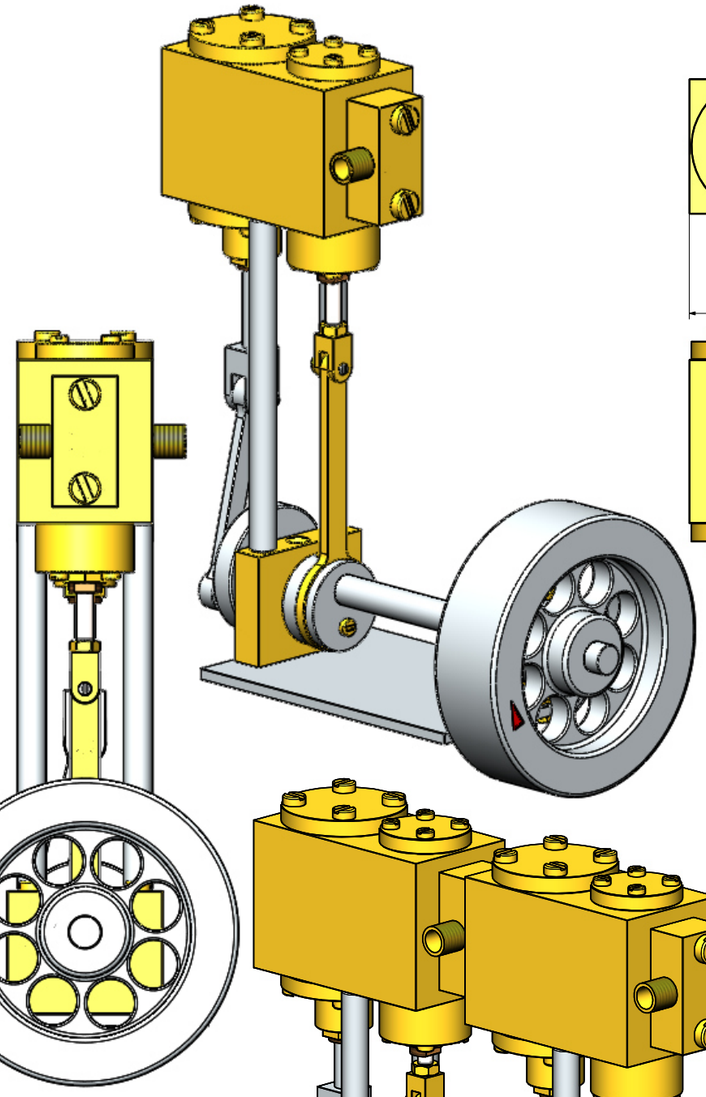
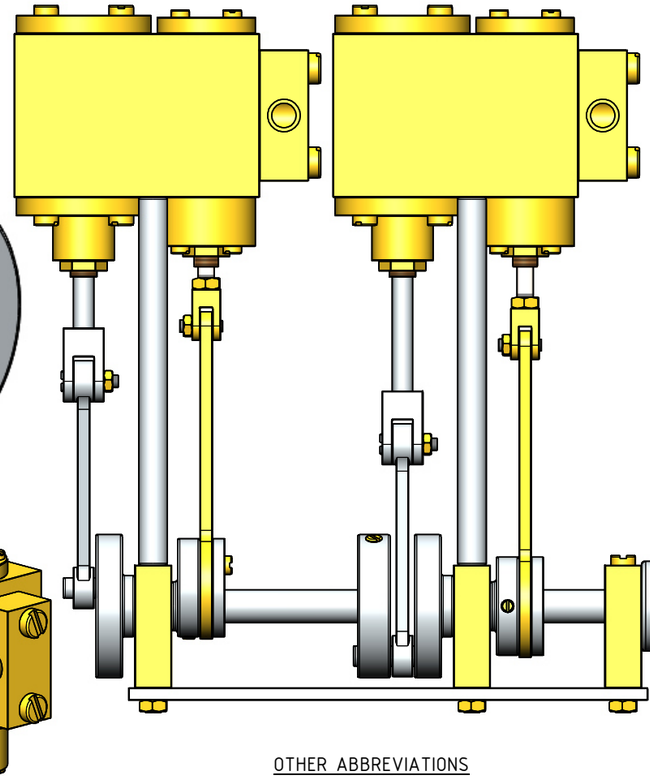
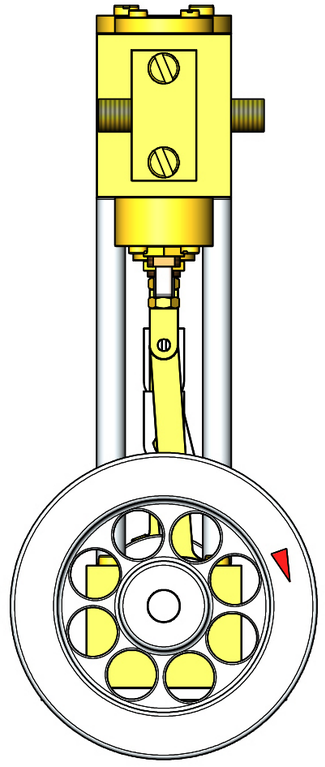




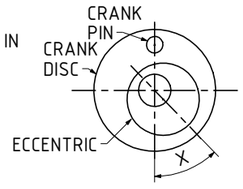








THE OFF SET ANGLE OF THE ECCENTRIC IN RELATION TO THE CRANK AXIS TO BE EXPERIMENTALLY DETERMINED FOR THE SMOOTH RUNNING OF THE ENGINE AND SATISFACTION OF THE BUILDER



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 SOULD BE ABLE TO WITHSTAND THE HEAT AND PRESSURE(S) APPLIED TO THEM.
ppp/ppp MEANS THAT EITHER MATERIAL CAN BE USED

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

QTY.	1-CYLINDER
1	09C-46-00-1-01-1-CYL. BASEPLATE
1	09C-46-00-1-02-CYLINDER
1	09C-46-00-2-01-CRANKSHAFT+FLYWHEEL
1	09C-46-00-2-02-PISTON+CROSSHEAD
1	09C-46-00-2-03-CON-ROD
1	09C-46-00-2-04-SPOOL VALVE
1	09C-46-00-2-05-ECCENTRIC STRAP
2	09C-46-00-M3 NUT
1	09C-46-00-M3x10 PAN HEAD SCREW
4	09C-46-00-M3x14 PAN HEAD SCREW
4	09C-46-00-M3x20 PAN HEAD SCREW
1	09C-46-00-M3x4 GRUB SREW
5	09C-46-00-M4 NUT
8	09C-46-00-M4x14 PAN HEAD SCREW
2	09C-46-00-M4x36 PAN HEAD SCREW
2	09C-46-00-M5x20 PAN HEAD SCREW
1	09C-46-00-M5x7 GRUB SREW

QTY.	2 CYLINDER
2	09C-46-00-1-02-CYLINDER
1	09C-46-00-1-03-2-CYL. BASEPLATE
2	09C-46-00-2-02-PISTON+CROSSHEAD
2	09C-46-00-2-03-CON-ROD
2	09C-46-00-2-04-SPOOL VALVE
2	09C-46-00-2-05-ECCENTRIC STRAP
1	09C-46-00-2-06-2 CYL. CRANKSHAFT+FLYWHEEL
4	09C-46-00-M3 NUT
2	09C-46-00-M3x10 PAN HEAD SCREW
8	09C-46-00-M3x14 PAN HEAD SCREW
8	09C-46-00-M3x20 PAN HEAD SCREW
2	09C-46-00-M3x4 GRUB SREW
8	09C-46-00-M4 NUT
16	09C-46-00-M4x14 PAN HEAD SCREW
1	09C-46-00-M4x15 GRUB SREW
2	09C-46-00-M4x36 PAN HEAD SCREW
4	09C-46-00-M5x20 PAN HEAD SCREW
1	09C-46-00-M5x7 GRUB SREW

NOTES: THE ORIGINAL DRAWINGS WERE GIVEN TO ME. THE AUTHOR OF THE ORIGINAL DESIGN AND THE DATE ARE UNKOWN. THE ACCOMPANIED BUILDING INSTRUCTIONS WERE IN GERMAN. THIS ENGINE IS 1.5 TIMES LARGER THAN THE ORIGINAL

TITLE
A SIMPLE 1 CYLINDER AND 2 CYLINDER VERTICAL STEAM ENGINE FOR BEGINNERS

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

PROJECT No 09C-46-00
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 JUNE 2020
MODEL SCALE: 1:1
DWG SCALE: 1:1 @A3 OR AS SHOWN
Copyright © J.A.M. DE WAAL PAPAKURA NZ
SHEET: 01 OF 03 A3 No: 09C-46-00-SHT01

DRAWINGS ARE FOR PERSONAL USE ONLY NOT FOR COMMERCIAL PURPOSES

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.

1-01.1 3mm THICK SCALE 1:1.5

1-01.2 MS BRS

1-01.3

1-02.1 SCALE 1:1.5

1-02.2

1-02.3 SCALE 1:1.5

1-02.4 SCALE 1:1.5

1-02.5 SCALE 1:1.5

1-02.6

1-02.7 SCALE 1:1.5

1-02.8

1-02.9 SCALE 1:1.5

1-02.10 SCALE 1:1.5

1-02.11 SCALE 1:1.5

1-02.12 SCALE 1:1.5

1-02.13 SCALE 1:1.5

OPPOSITE FACE EQUAL

SECTION A-A

SECTION C-C SCALE 1 : 1.5

SECTION D-D

SOME HIDDEN LINES REMOVED FOR CLARITY

1-03.1 3mm THICK SCALE 1:2

1-03 SA-1-102

SA-1-101

2-01.1 2-01.2 2-01.3 2-01.4 2-01.5 2-01.6

SECTION E-E SCALE 1 : 1.5

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

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TITLE
A SIMPLE 1 CYLINDER AND 2 CYLINDER VERTICAL STEAM ENGINE FOR BEGINNERS

DRAWING CONTENTS
NOTES, PARTS AND ASSEMBLIES

PROJECT No 09C-46-00
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 JUNE 2020
MODEL SCALE: 1:1
DWG SCALE: 1:1 @A3 OR AS SHOWN
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SHEET: 02 OF 03 A3 No: 09C-46-00-SHT02

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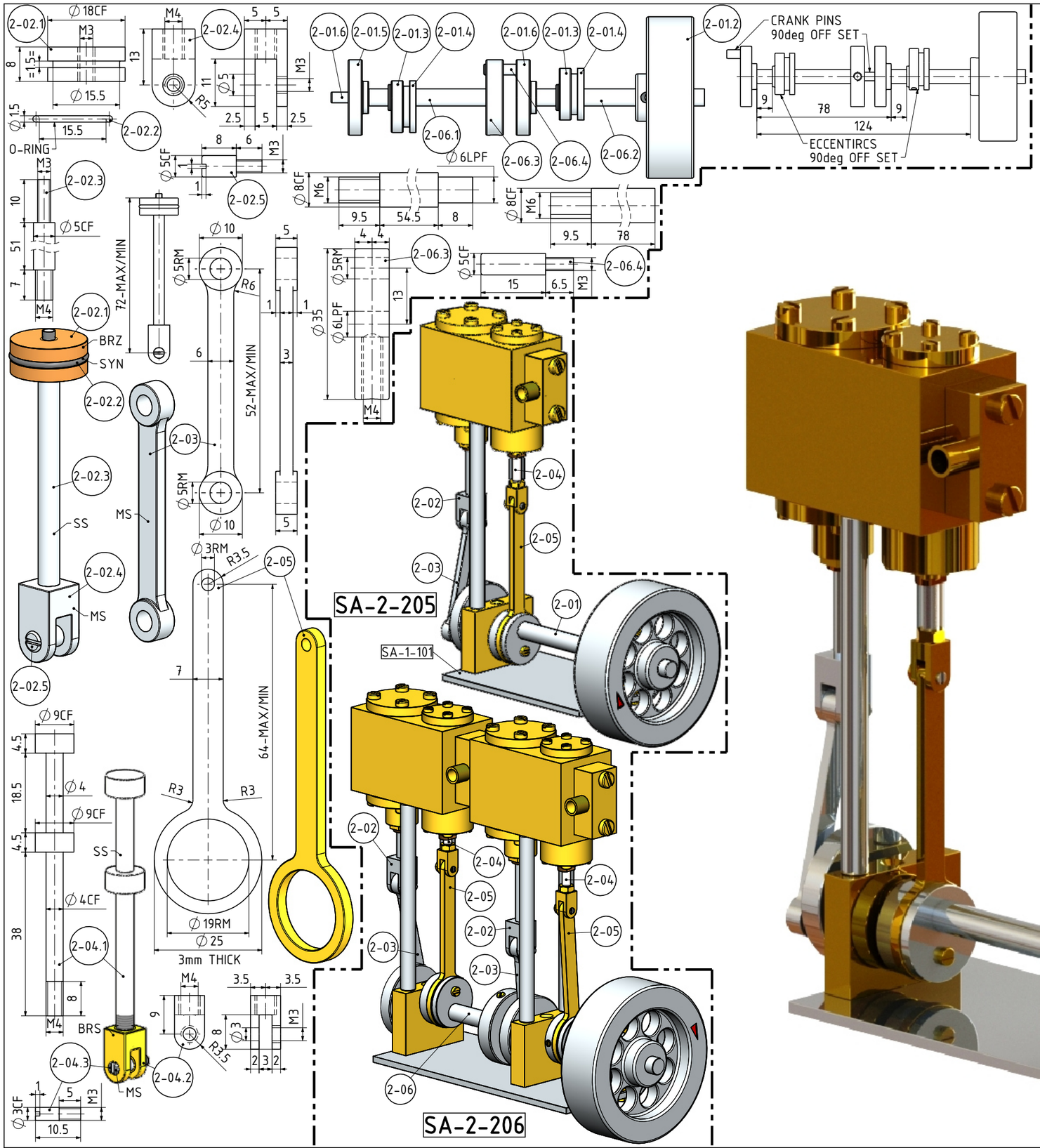

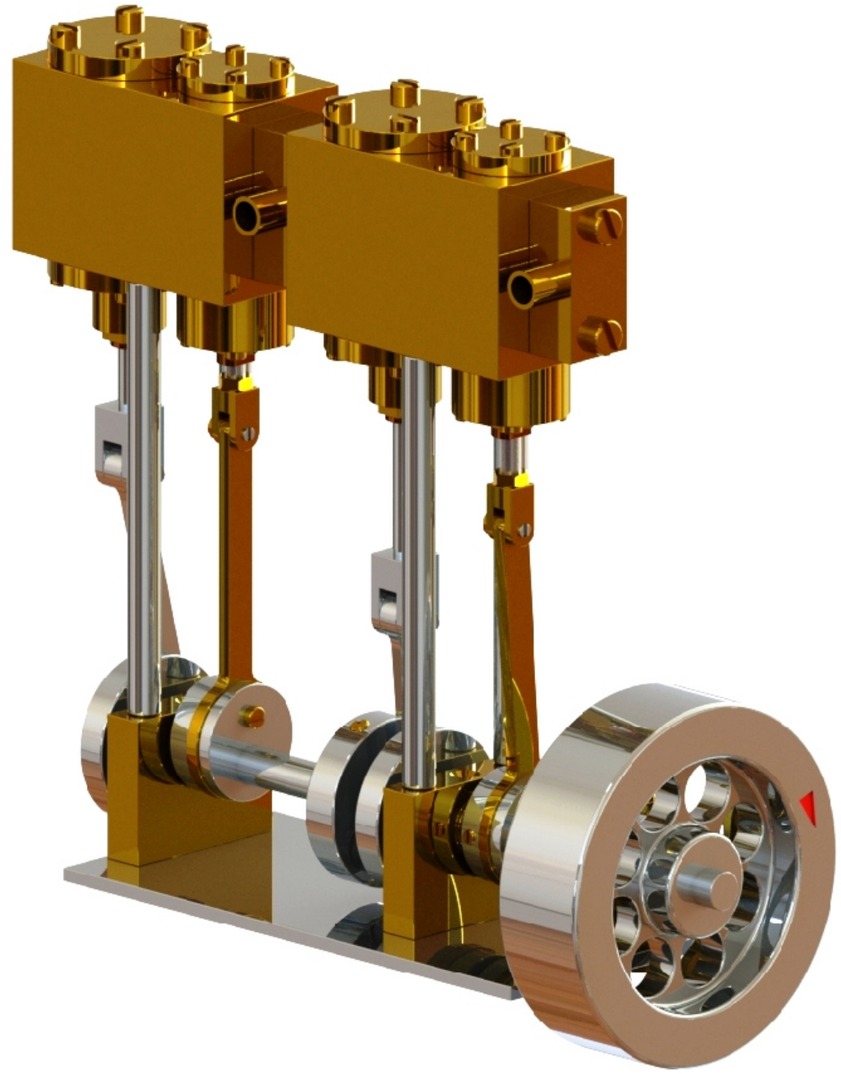

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TITLE

A SIMPLE 1 CYLINDER AND 2 CYLINDER VERTICAL STEAM ENGINE FOR BEGINNERS

DRAWING CONTENTS

PARTS AND ASSEMBLIES AND RENDERED PICTURES

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.

PROJECT No 09C-46-00

PROJECTION JDWDS

DATE JUNE 2020

MODEL SCALE: 1:1

DWG SCALE: 1:1 @A3 OR AS SHOWN

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SHEET: 03 OF 03 | A3 | No: 09C-46-00-SHT03

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