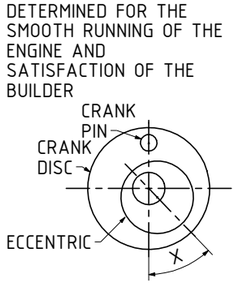
NOTES:
0. ALL DRAWINGS ARE IN METRIC MEASUREMENTS
1. ALL ENGINEERING PRACTICES SHALL BE APPLIED WITH REGARDS TO HOLE AND SHAFT TOLERANCES.
2. WHERE SCREWS OR BOLTS ARE USED THE CLEARANCE HOLES SHALL BE APPROXIMATELY 5% TO 8% LARGER THAN THE MATCHING TAPPED HOLE.
3. PREFERABLY ALL TAPPED HOLES AND MATCHING 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.

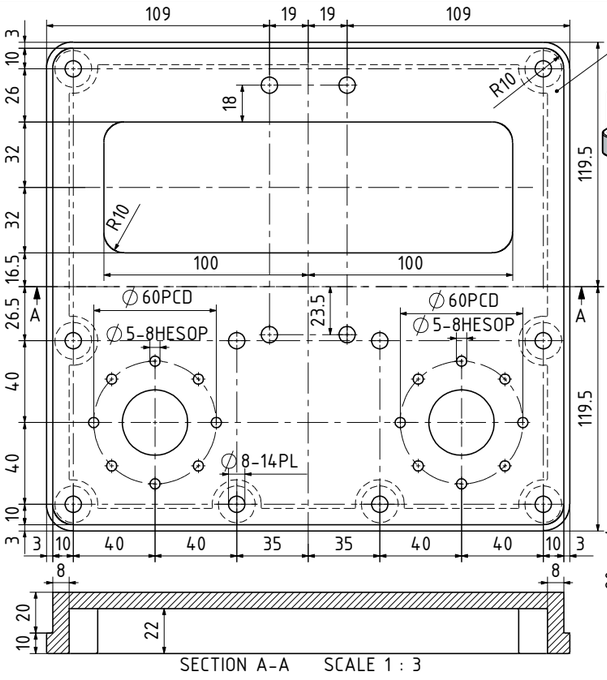
OTHER ABBREVIATIONS
AS = AS SHOWN
DP = DEEP
DAA= DRILL AFTER ASSEMBLY
D&TAA= DRILL AND TAP AFTER ASSEMBLY
CF = CLOSE FIT (SIZE FOR SIZE)
PF = PRESS FIT
PFAA= PRESS FIT AFTER ASSEMBLY
PCD = PITCH CIRCLE DIAMETER
RM = REAM
HEX = HEXACON, 6SIDED
CP = COMPRESSED
KNL = KNURLED
CSK = COUNTERSINK
PL = PLACES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

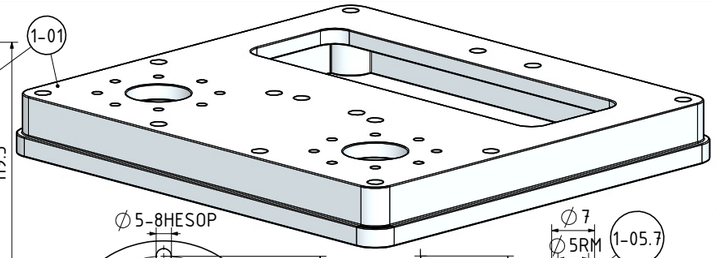
MATERIAL ABBREVIATIONS:
ALU = ALUMINIUM
HALU= HARD ALUMINIUM
BRS = BRASS
BRZ = BRONZE OR GUNMETAL (BRZ/GM)
CI = CAST IRON
CU = COPPER
GRA = GRAPHITE
MS = MILD STEEL/BRIGHT MILD STEEL
SS = SILVER STEEL OR STAINLESS STEEL
SPS = SPRING STEEL
PEEK= POLYETHER ETHER KETONE
SYN = SYNTHETIC MATERIAL SUCH AS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

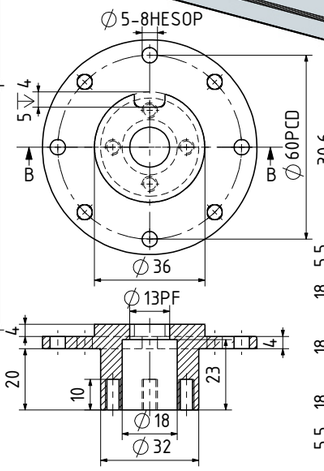
THE OFF SET ANGLE OF THE ECCENTRIC IN RELATION TO THE CRANK AXIS TO BE EXPERIMENTALLY DETERMINED FOR THE SMOOTH RUNNING OF THE ENGINE AND SATISFACTION OF THE BUILDER

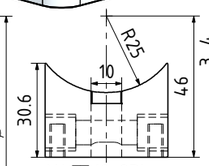


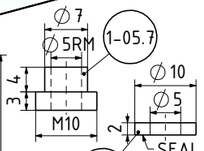
ADDITIONAL NOTES ABOUT THESE DRAWINGS:
NO MATERIALS HAVE BEEN SPECIFIED ON THESE DRAWINGS. THE BUILDER TO CHOOSE ITS OWN PREFERRED MATERIAL FOR THE PARTS/COMPONENTS. THE FOLLOWING COLOURS ON THE DRAWINGS INDICATES POSSIBLE MATERIALS WHICH CAN BE USED FOR PARTS: YELLOW=BRASS, LIGHT GREY=ALUMINIUM OR MILD STEEL, REDDISH BROWN=COPPER, DARK BROWN=BRONZE OR GUN METAL, WHITISH=SILVER STEEL OR STAINLESS STEEL

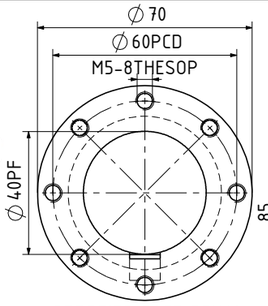


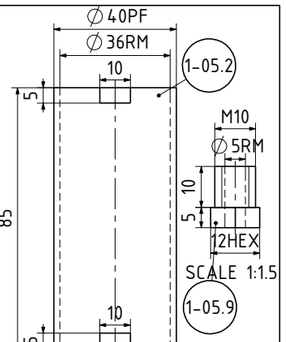


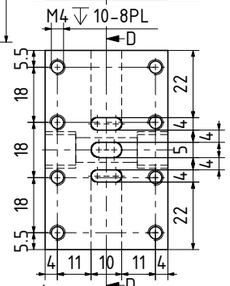


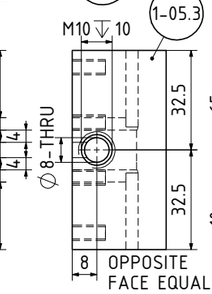


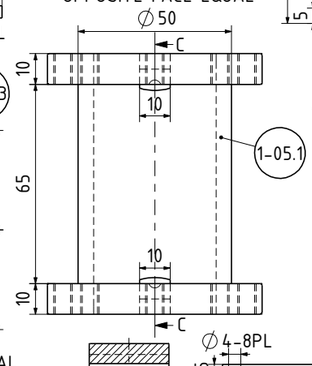


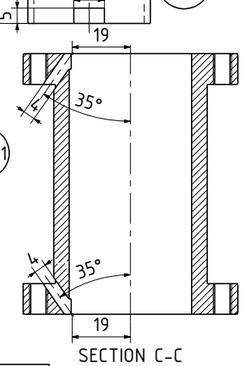


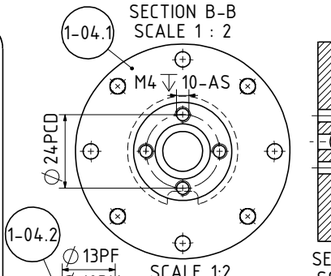


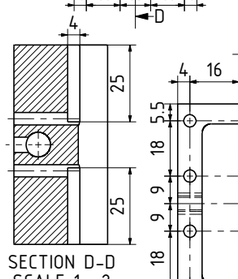


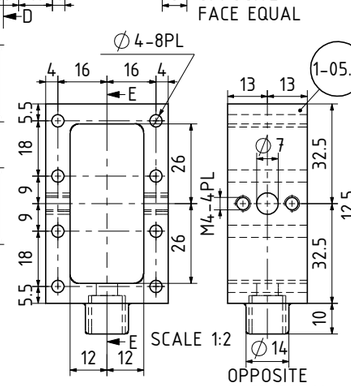


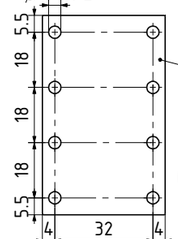


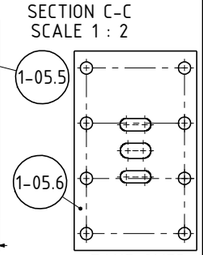


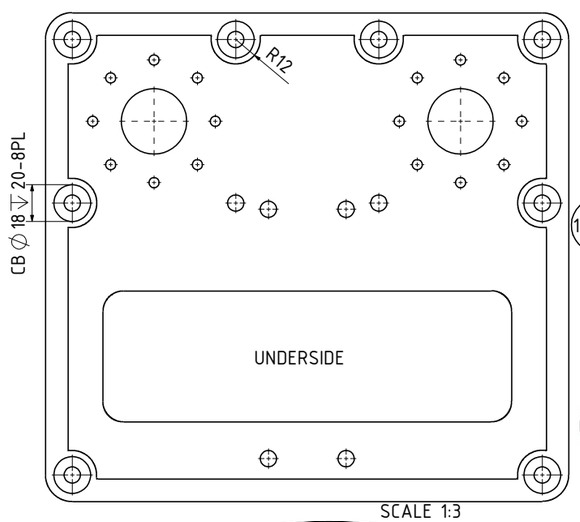


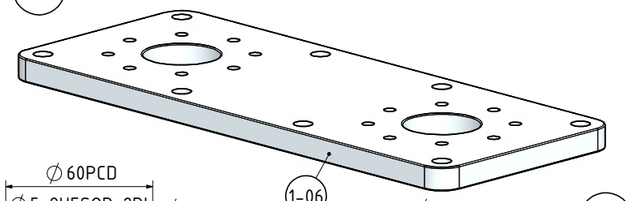


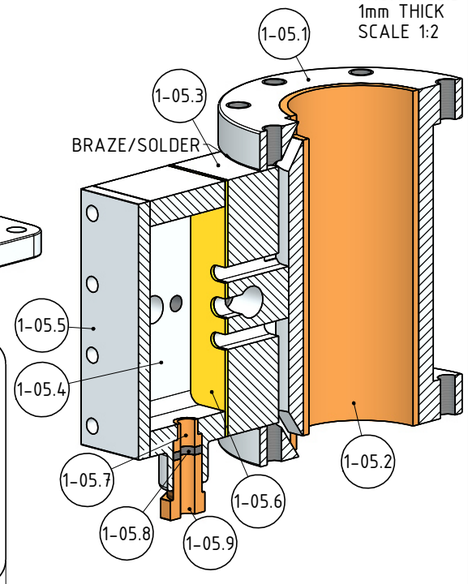


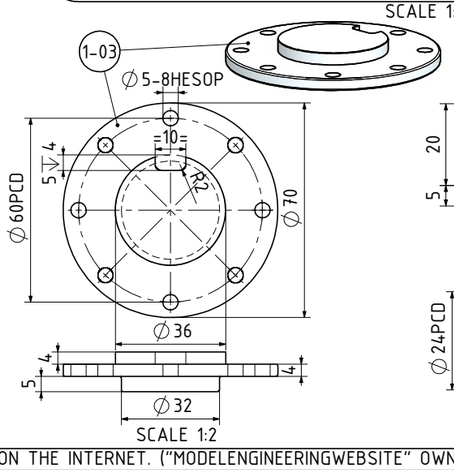


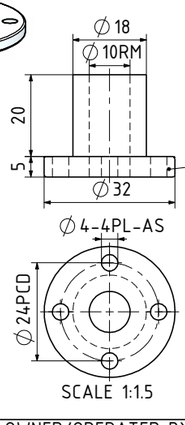


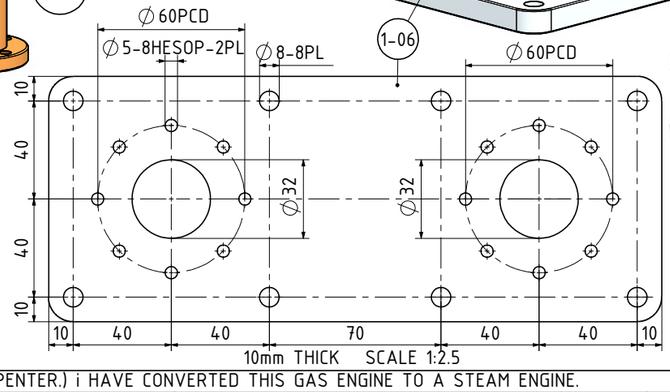












NOTES: THE ORIGINAL DESIGN/DRAWINGS OF A GAS ENGINE WERE PUBLISHED ON THE INTERNET. ("MODELENGINEERINGWEBSITE" OWNED/OPERATED BY DAVID CARPENTER.) i HAVE CONVERTED THIS GAS ENGINE TO A STEAM ENGINE.

TITLE
AN EXPERIMENTAL 4 CYL. VERTICAL STEAM ENGINE CONVERTED FROM A GAS ENGINE

DRAWING CONTENTS
NOTES, PARTS AND ASSEMBLIES

PROJECT No 09D-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 JUNE 2020
MODEL SCALE: APPROX 1:17.5
DWG SCALE: 1:1 @A3 OR AS SHOWN
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SHEET: 02 OF 04 A3 No: 09D-20-00-SHT02

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TITLE

AN EXPERIMENTAL 4 CYL. VERTICAL STEAM ENGINE CONVERTED FROM A GAS ENGINE

DRAWING CONTENTS

PARTS AND ASSEMBLIES

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 09D-20-00

PROJECTION

JDWDS

DATE JUNE 2020

MODEL SCALE: APPROX 1:17.5

DWG SCALE: 1:1 @A3 OR AS SHOWN

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SHEET: 03 OF 04 A3 No: 09D-20-00-SHT03

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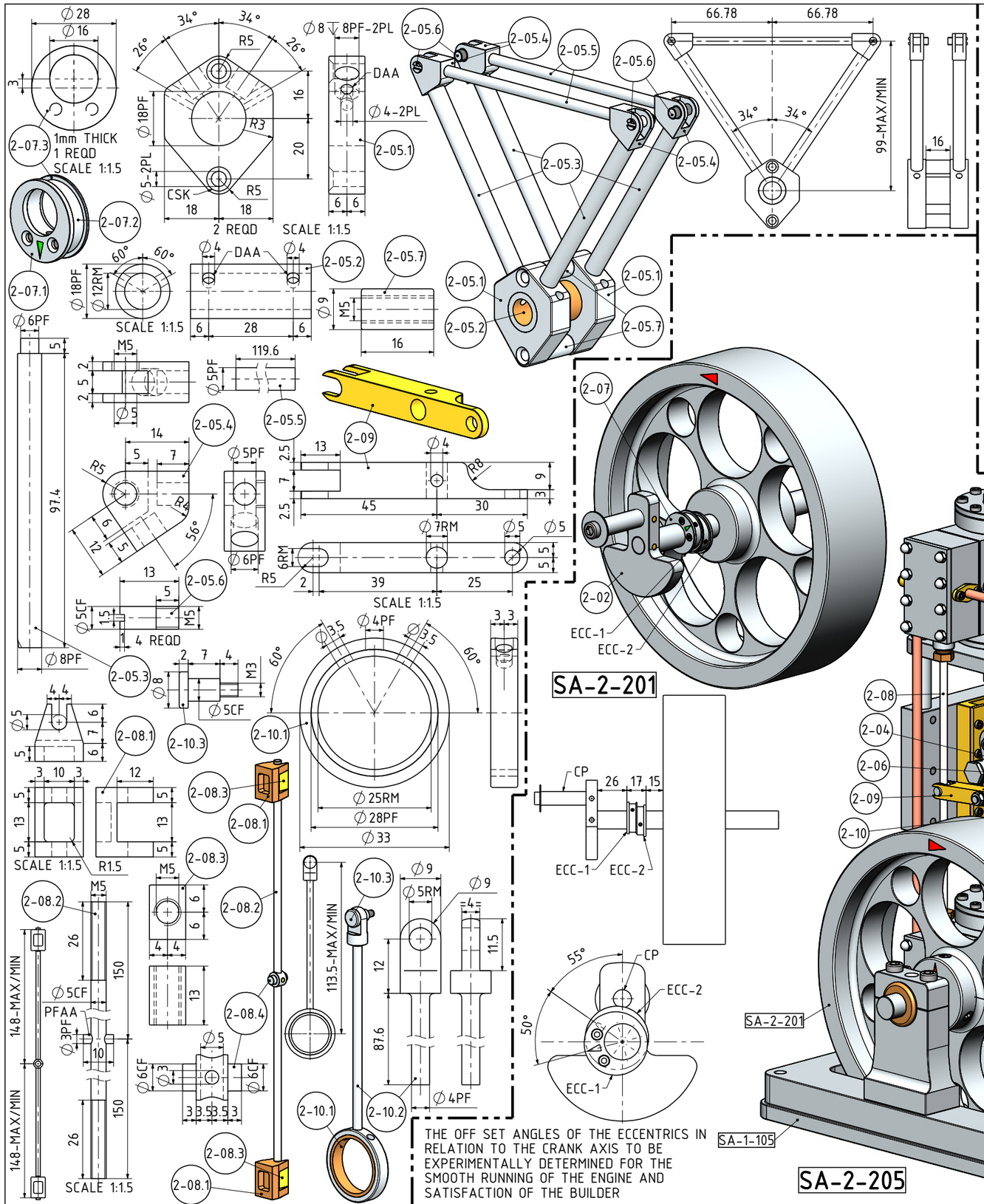

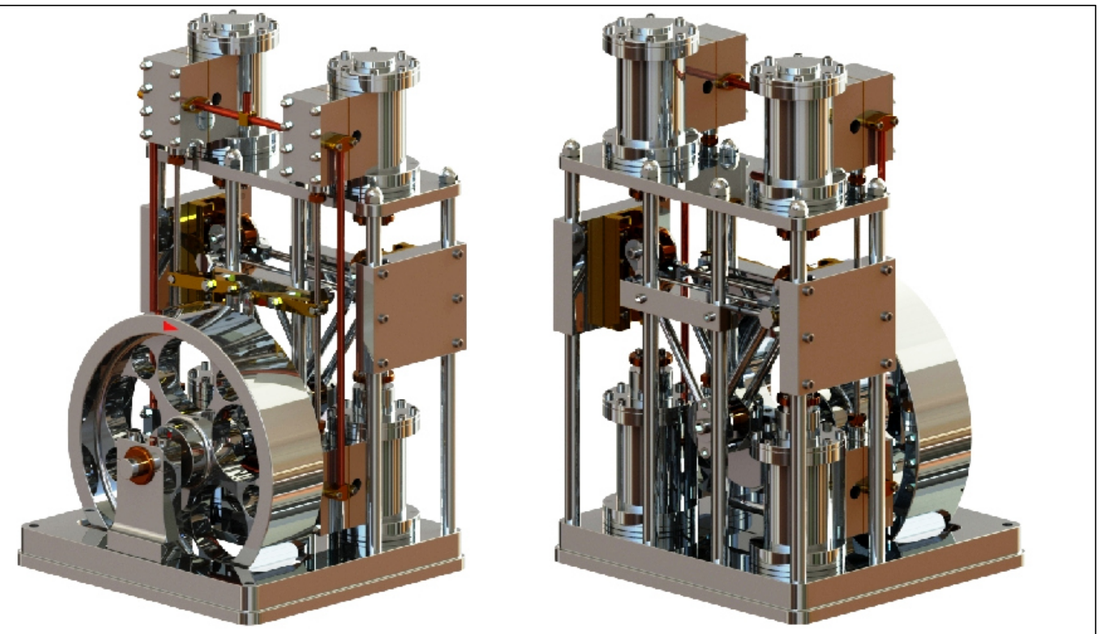

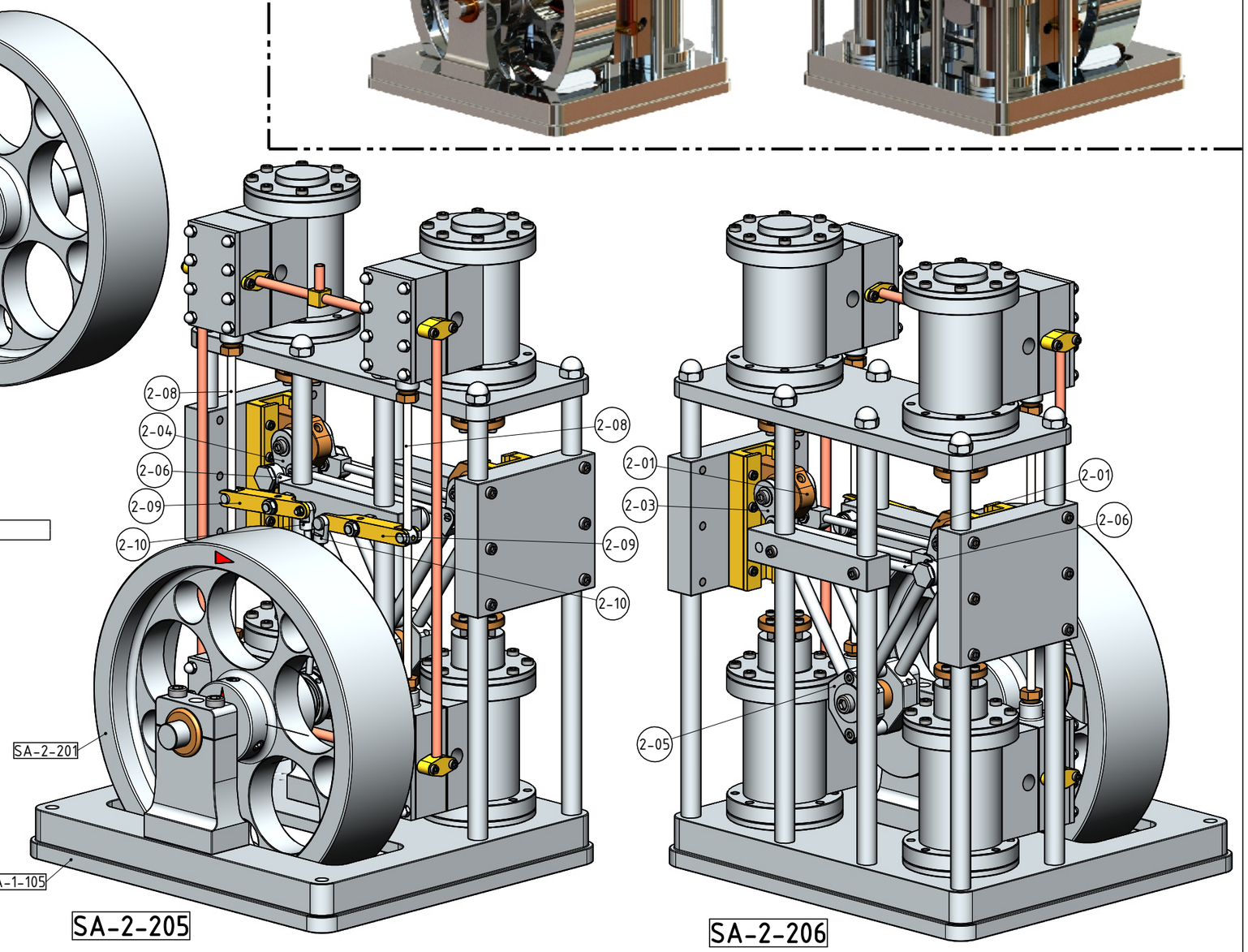

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TITLE
AN EXPERIMENTAL 4 CYL. VERTICAL STEAM ENGINE CONVERTED FROM A GAS ENGINE

DRAWING CONTENTS
PARTS AND ASSEMBLIES RENDERED PICTURES

PROJECT No 09D-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 JUNE 2020

MODEL SCALE: APPROX 1:17.5

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SHEET: 04 OF 04 A3 No: 09D-20-00-SHT04

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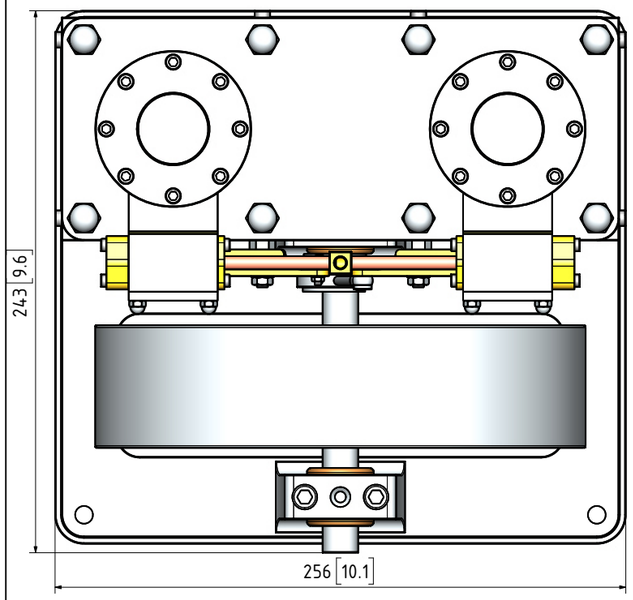
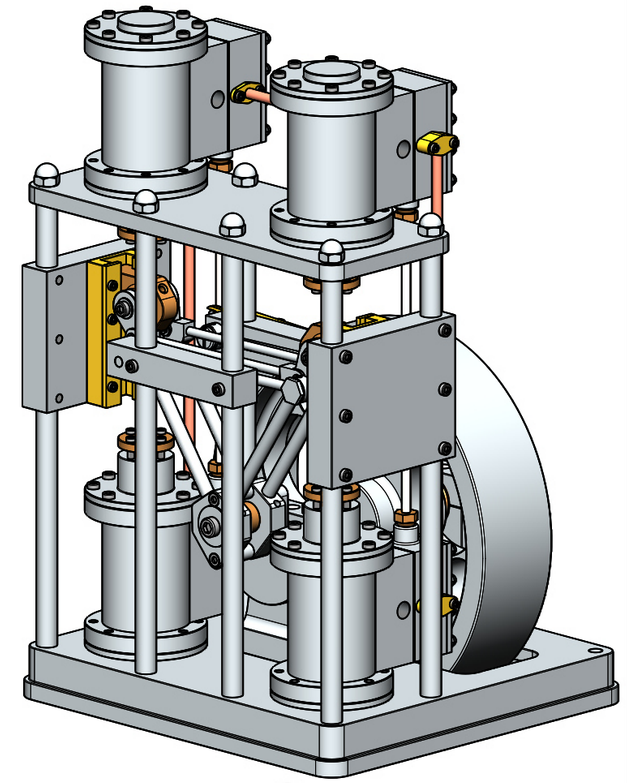
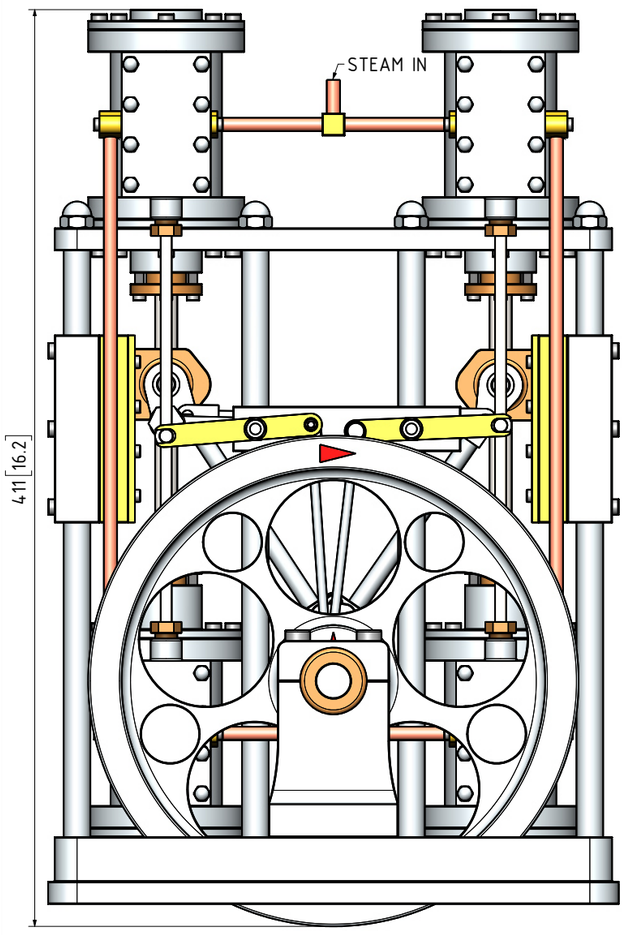
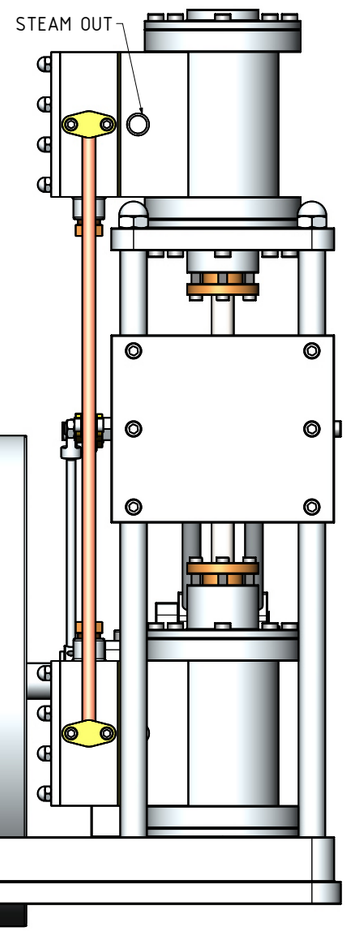


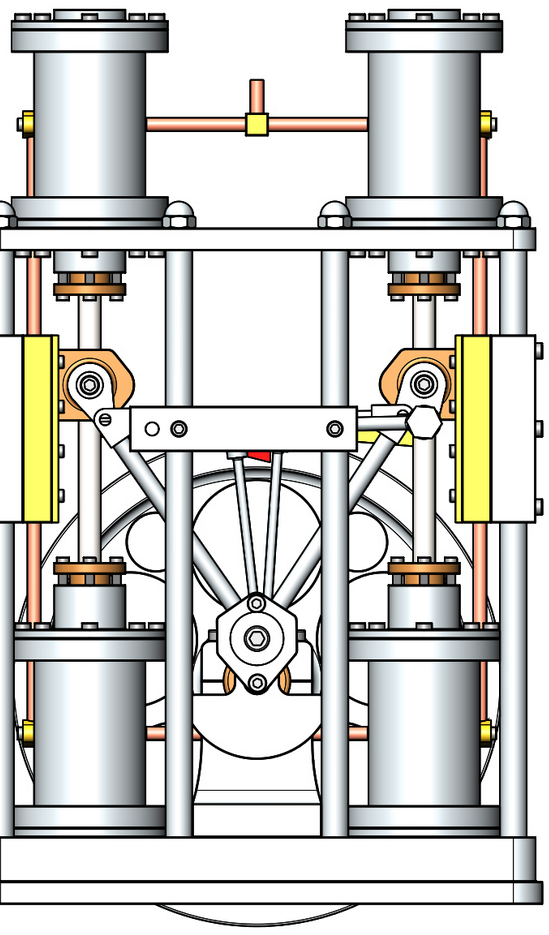
QTY.	PART NUMBER
1	09D-20-00-1-01-BASE
4	09D-20-00-1-02-PLATFORM PILLAR
4	09D-20-00-1-02-PLATFORM PILLAR
4	09D-20-00-1-03-CYLINDER COVER-1
4	09D-20-00-1-04-CYLINDER COVER-2
4	09D-20-00-1-05-CYLINDER
1	09D-20-00-1-06-UPPER CYLINDER PLATFORM
2	09D-20-00-1-07-CROSSHEAD GUIDE
2	09D-20-00-1-08-CRSANKSHAFT BEARING
1	09D-20-00-1-09-RESTRAINING SHAFT
1	09D-20-00-1-09-RESTRAINING SHAFT
1	09D-20-00-1-10-STEAM SUPPLY PIPE-1
1	09D-20-00-1-11-STEAM SUPPLY PIPE-2
2	09D-20-00-1-12-STEAM SUPPLY PIPE-3
2	09D-20-00-2-01-PISTON+ROD+CROSSHEAD
1	09D-20-00-2-02-CRANKSHAFT+FLYWHEEL
1	09D-20-00-2-03-LINK SHAFT TYPE-1
1	09D-20-00-2-04-LINK SHAFT TYPE-2
1	09D-20-00-2-05-TRIANGULAR CON-ROD
2	09D-20-00-2-06-RETAINING ROD
1	09D-20-00-2-07-ECCENTRIC
1	09D-20-00-2-07-ECCENTRIC
2	09D-20-00-2-08-SLIDE VALVE
2	09D-20-00-2-09-VALVE ROCKER ARM
2	09D-20-00-2-10-ECCENTRIC STRAP

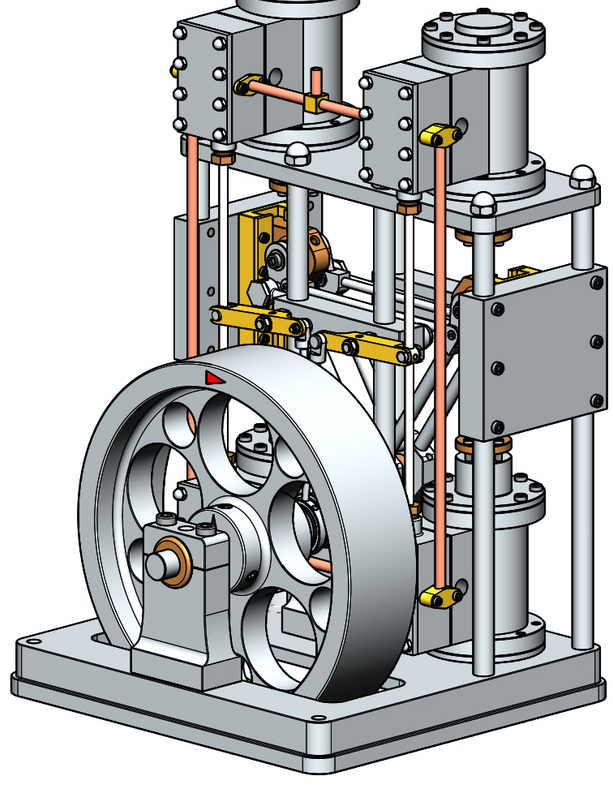
QTY.	PART NUMBER
2	09D-20-00-M3 NUT
2	09D-20-00-M3 WASHER
4	09D-20-00-M3x6 A-K C-SINK SCREW
2	09D-20-00-M3x7 A-K GRUB SCREW
32	09D-20-00-M4 DOME NUT
8	09D-20-00-M4x10 A-K CYL HEAD SCREW
40	09D-20-00-M4x18 A-K CYL HEAD SCREW
32	09D-20-00-M4x46 THREADED ROD
4	09D-20-00-M5 NUT-THIN
2	09D-20-00-M5 NUT
2	09D-20-00-M5 WASHER
32	09D-20-00-M5x14 A-K CYL HEAD SCREW
4	09D-20-00-M5x18 A-K C-SINK SCREW
14	09D-20-00-M5x20 A-K CYL HEAD SCREW
16	09D-20-00-M5x22 A-K CYL HEAD SCREW
16	09D-20-00-M5x24 A-K CYL HEAD SCREW
2	09D-20-00-M6 NUT
4	09D-20-00-M6 WASHER
4	09D-20-00-M6x14 A-K CYL HEAD SCREW
8	09D-20-00-M8 DOME NUT
8	09D-20-00-M8 NUT
1	09D-20-00-M8 WASHER SPECIAL
1	09D-20-00-M8x10 A-K CYL HEAD SCREW
3	09D-20-00-M8x16 A-K GRUB SCREW
8	09D-20-00-M8x32 A-K CYL HEAD SCREW











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AN EXPERIMENTAL 4 CYL. VERTICAL STEAM ENGINE CONVERTED FROM A GAS ENGINE

DRAWING CONTENTS
GENERAL ARRANGEMENT, ISOMETRIC VIEWS, BILL OF MATERIALS

PROJECT No 09D-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 | MODEL SCALE: APPROX 1:17.5
DWG SCALE: NTS @A3 OR AS SHOWN
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SHEET: 01 OF 04 | A3 | No: 09D-20-00-SHT01

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