

NOTES: ORIGINAL DRAWINGS WERE PUBLISHED IN THE "MODELBOUWERS" OF 1990 UNDER THE TITLE "DE VREEWIJK 21", BY J.J. VAN ROOIJEN, KRIMPEN a/d IJSSEL

TITLE
1-CYLINDER HORIZONTAL STEAM ENGINE AND
BOILER CALLED " THE FREEDOM"

DRAWING CONTENTS
GENERAL ARRANGEMENT,
ISOMETRIC VIEW

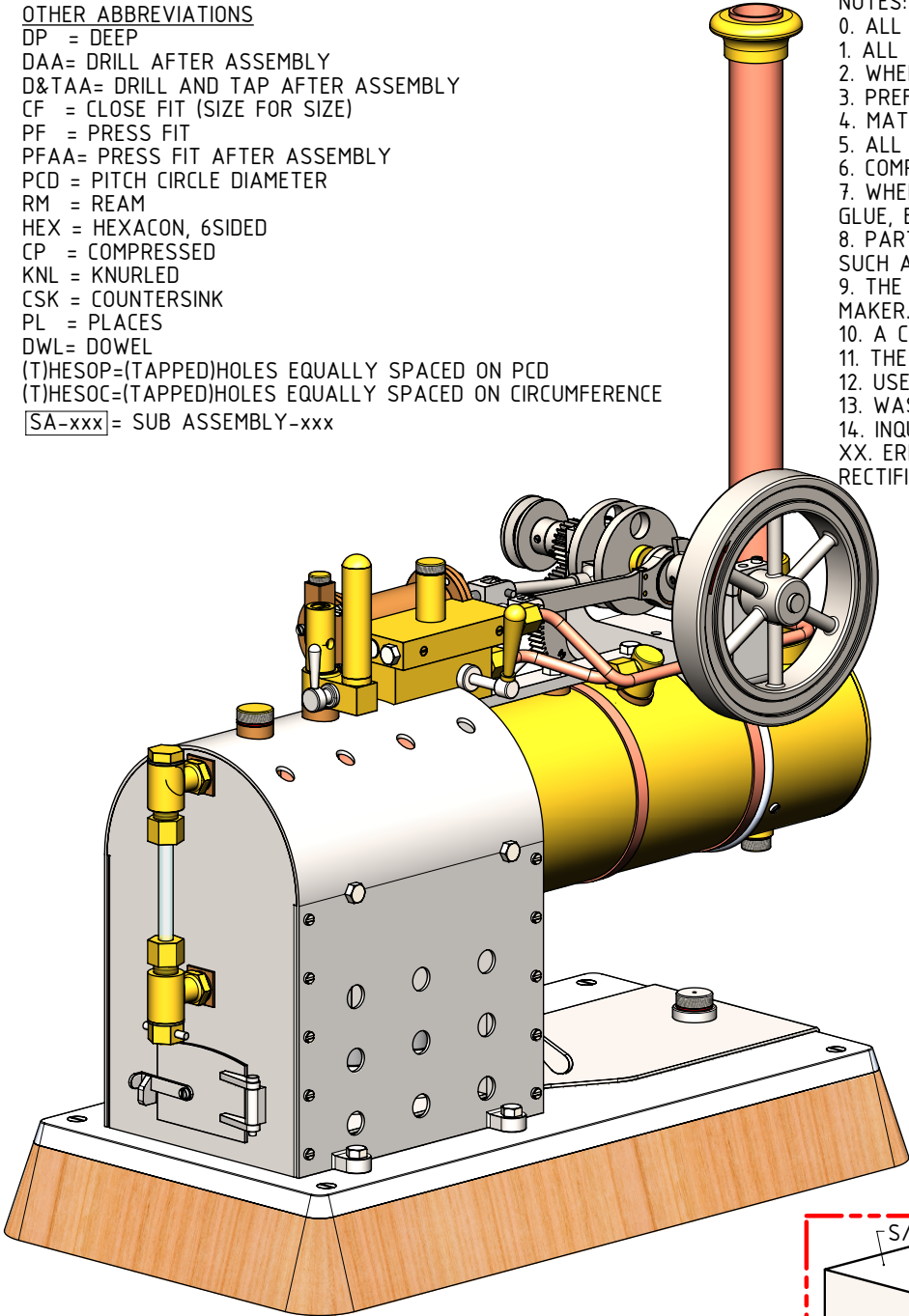
PROJECT No 09B-16-00
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PROJECTION
DATE MARCH-2017
SHEET: 01 OF 05

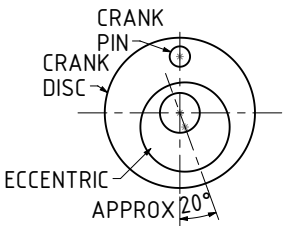
MODEL SCALE: 1:1
DWG SCALE: 1:1 @A3 OR AS SHOWN
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A3 No: FREEDOM-01

QTY.	PART NUMBER
1	FREEDOM-1-01-WOOD BASE+BASE PLATE
1	FREEDOM-1-02-FUEL TANK+BURNER
1	FREEDOM-1-03-FUEL TANK COVER
1	FREEDOM-1-04-FUEL TANK FILLER CAP
1	FREEDOM-1-05-FIRE BOX MANTEL
1	FREEDOM-1-06-FIRE BOX FRONT PLATE
1	FREEDOM-1-07-FIRE BOX REAR PLATE
1	FREEDOM-1-08-FIRE DOOR LEDGE
1	FREEDOM-1-09-FIRE DOOR
1	FREEDOM-1-10-FIRE DOOR HINGE PIN
1	FREEDOM-1-11-FIRE DOOR LOCKING BRACKET
1	FREEDOM-1-12-FUEL TANK SECURITY LOCK
1	FREEDOM-1-13-FUEL TANK SECURITY LOCK SCREW
1	FREEDOM-1-14-BOILER
2	FREEDOM-1-15-BOILER BUSH TYPE-A M4x8x11
3	FREEDOM-1-16-BOILER BUSH TYPE-B M5x10x14
1	FREEDOM-1-17-BOILER BUSH TYPE-C M8x12x15
1	FREEDOM-1-18-BOILER BUSH TYPE-D M8x10x15
1	FREEDOM-1-19-BOILER BUSH TYPE-E M10x12x15
1	FREEDOM-1-20-BOILER BUSH TYPE-F M10x12x15
2	FREEDOM-1-21-BOILER SUPPORTING BAR
1	FREEDOM-1-22-WTR. LVL. GAUGE TOP BODY
1	FREEDOM-1-23-WTR. LVL. GAUGE BOTTOM BODY
2	FREEDOM-1-24-WTR. LVL. GAUGE GLASS TUBE NUT
1	FREEDOM-1-25-WTR. LVL. GAUGE GLASS TUBE
1	FREEDOM-1-26-BOILER WATER FILLER CAP
1	FREEDOM-1-27-BOILER HEAT INSULATION BLANKET
1	FREEDOM-1-28-BOILER GLADDING
1	FREEDOM-1-29-SMOKE BOX END RING
1	FREEDOM-1-30-SMOKE BOX
1	FREEDOM-1-31-CHIMNEY BASE
1	FREEDOM-1-32-CHIMNEY
1	FREEDOM-1-33-SMOKE BOS DRAIN CAP
1	FREEDOM-1-34-SMOKE BOX DOOR SCREW LOCK
1	FREEDOM-1-35-SAFETY VALVE-WHISTLE BASE BODY
1	FREEDOM-1-36-SAFETY VALVE BALL VALVE
1	FREEDOM-1-37-SAFETY VALVE SPRING
1	FREEDOM-1-38-SFETY VALVE SPRING TENSIONER
1	FREEDOM-1-39-WHISTLE VALVE BASE
1	FREEDOM-1-40-WHISTLE TUBE
1	FREEDOM-1-41-WHISTLE VALVE HANDLE
1	FREEDOM-1-42-DUMMY WTR.FD.PMP HOUSING
1	FREEDOM-1-43-DUMMY WTR.FD.PMP MOUNTING PLATE
1	FREEDOM-1-44-ENGINE BED PLATE
1	FREEDOM-1-45-CRANK SHAFT BEARING STAND
2	FREEDOM-1-46-CRANK SHAFT BEARING
1	FREEDOM-1-50-LOWER SUPPORT PORT BLOCK
1	FREEDOM-1-51-STEAM SUPPLY VALVE SPINDLE
1	FREEDOM-1-52-VALVE CHEST
1	FREEDOM-1-53-OIL POT
1	FREEDOM-1-54-CYLINDER
1	FREEDOM-1-55-CYLINDER FRONT COVER
1	FREEDOM-1-56-CYLINDER REAR COVER
1	FREEDOM-1-57-STEAM SUPPLY ELBOW CONNECTER
1	FREEDOM-1-58-STEAM SUPPLY PIPE
3	FREEDOM-1-59-STEAM SUPPLY PIPE NUT
1	FREEDOM-1-60-STEAM EXHAUST PIPE PART-1
1	FREEDOM-1-61-STEAM EXHAUST PIPE PART-2
1	FREEDOM-1-62-LARGE GEAR WHEEL AXLE SCREW
1	FREEDOM-2-01-CRANK SHAFT
1	FREEDOM-2-02-FLYWHEEL
1	FREEDOM-2-03-ECCENTRIC SHEAVE
1	FREEDOM-2-04-ECCENTRIC SLIP DISC
1	FREEDOM-2-05-CRANKSHAFT GEAR WHEEL 24T
1	FREEDOM-2-06-PMP CRANK GEAR WHEEL 60T
1	FREEDOM-2-07-WATER PUMP RAM
1	FREEDOM-2-08-WATER PUMP CON-ROD
1	FREEDOM-2-09-PULLEY
1	FREEDOM-2-10-PISTON+ROD
1	FREEDOM-2-11-CON-ROD
1	FREEDOM-2-12-CYLINDERICAL SLIDE VALVE
1	FREEDOM-2-13-ECCENTRIC STRAP
31	FREEDOM-M3 NUT
1	FREEDOM-M3 WASHER
7	FREEDOM-M3x4 GRUB SREW
2	FREEDOM-M3x6 GRUB SREW
33	FREEDOM-M3x6 PAN HEAD SCREW
8	FREEDOM-M3x8 PAN HEAD SCREW
2	FREEDOM-M3x14 PAN HEAD SCREW
4	FREEDOM-M3x18 PAN HEAD SCREW
2	FREEDOM-M3x24 C-SINK SCREW
1	FREEDOM-M4 NUT
1	FREEDOM-M4 WASHER
2	FREEDOM-M4x4 GRUB SREW
4	FREEDOM-M4x10 C-SINK SCREW
2	FREEDOM-M4x14 HEX BOLT
1	FREEDOM-M5x8 HEX BOLT
4	FREEDOM-M5x12 HEX BOLT
7	FREEDOM-M5x14 HEX BOLT
4	FREEDOM-M5x30-COUNTERSINK WOOD SCREW

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
(T)HESOP=(TAPPED)HOLES EQUALLY SPACED ON PCD
(T)HESOC=(TAPPED)HOLES EQUALLY SPACED ON CIRCUMFERENCE
[SA-xxx]= SUB ASSEMBLY-xxx

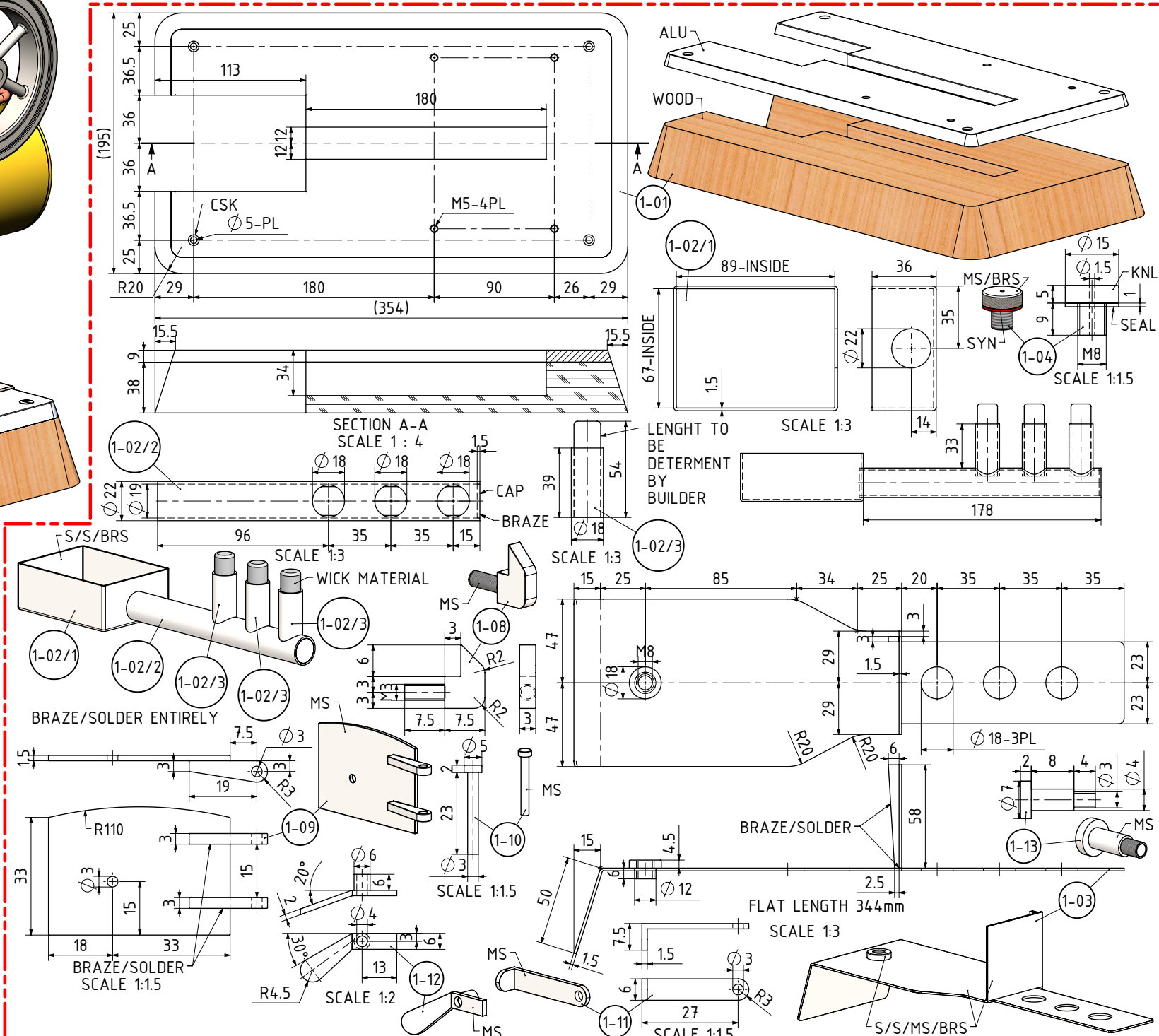


MATERIAL ABBREVIATIONS:
ALU = ALUMINIUM
BRS = BRASS
BRZ = BRONZE OR GUNMETAL (BRZ/GM)
CI = CAST IRON
CU = COPPER
GRA = GRAPHITE
MS = MILD STEEL/BRIGHT MILD STEEL
S/S = SILVER STEEL OR STAINLESS STEEL
SPS = SPRING STEEL
PEEK= POLYETHER ETHER KETONE
SYN = SYNTHETIC MATERIAL SUCH AS VETON, NYLON, TEFLON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



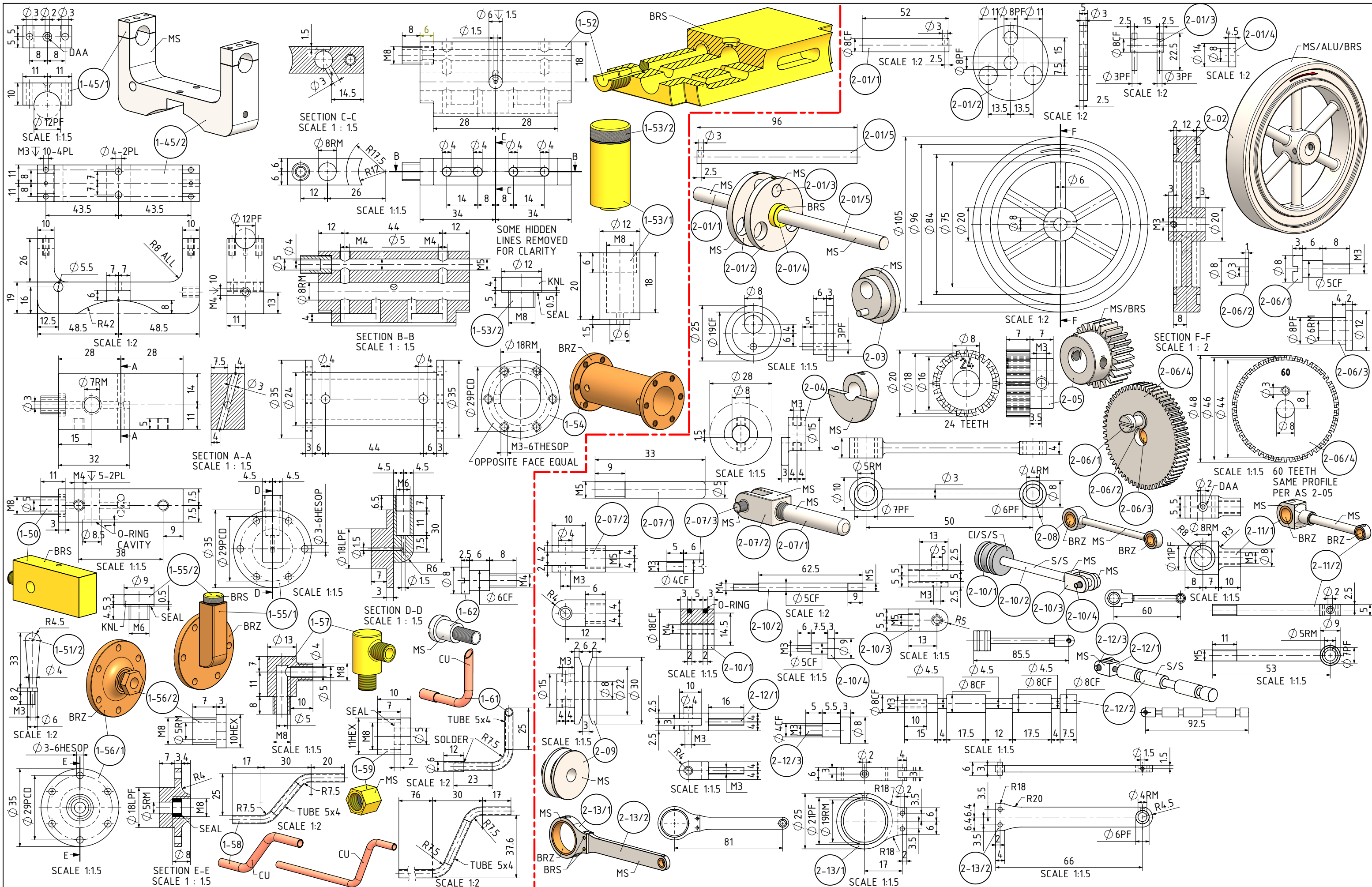
THE OFF SET ANGLE OF THE ECCENTRIC IN RELATION TO THE CRANK AXIS TO BE EXPERIMENTALLY DETERMINED FOR THE SMOOTH RUNNING OF THE ENGINE AND SATISFACTION OF THE BUILDER

NOTES:
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. WASHER SHALL BE USED WHERE DEEMED NECESSARY.
14. INQUIRE AT THE APPROPRIATE AUTHORITIES WHETHER OR NOT THIS BOILER REQUIRES A PRESSURE TEST CERTIFICATE
XX. ERRORS AND/OR OMISSIONS MAY OCCUR IN THE DRAWINGS, DO NOT HESITATE TO CONTACT ME SO THAT THE ERRORS/OMISSIONS CAN BE RECTIFIED.



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1-CYLINDER HORIZONTAL STEAM ENGINE AND BOILER CALLED " THE FREEDOM"	BILL OF MATERIALS, NOTES, PARTS AND ASSEMBLIES	JDW DRAUGHTING SERVICES J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAKAPURA 2110. NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0217191000 E-MAIL: dewaal@xtra.co.nz.	JDWDS	MARCH-2017	DWG SCALE: 1:1 @A3 OR AS SHOWN Copyright © J.A.M. DE WAAL PAKAPURA NZ
			SHEET: 02 OF 05		A3 No: FREEDOM-02



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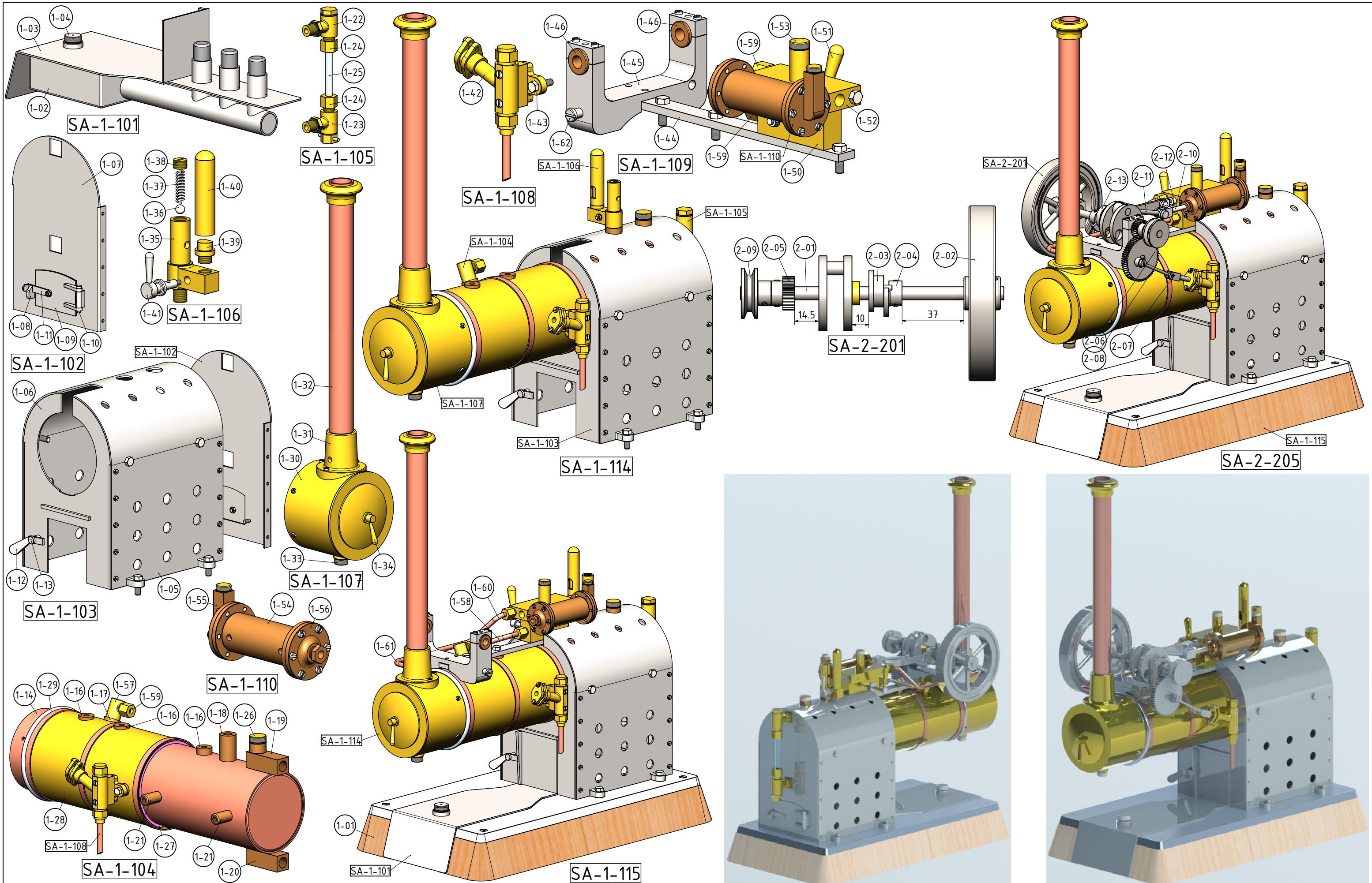
TITLE
1-CYLINDER HORIZONTAL STEAM ENGINE AND PARTS AND ASSEMBLIES
BOILER CALLED " THE FREEDOM"

DRAWING CONTENTS
1-CYLINDER HORIZONTAL STEAM ENGINE AND PARTS AND ASSEMBLIES

PROJECT No 09B-16-00
JDW DRAUGHTING SERVICES
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PROJECTION
JDWDS
DATE MARCH-2017
SHEET: 04 OF 05

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DRAWING CONTENTS

PROJECT No 09B-16-00

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PROJECTION

JDWDS

DATE MARCH-2017

SHEET: 05 OF 05

MODEL SCALE: 1:1

DWG SCALE: 1:1 @A3 OR AS SHOWN

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A3 No: FREEDOM-05