

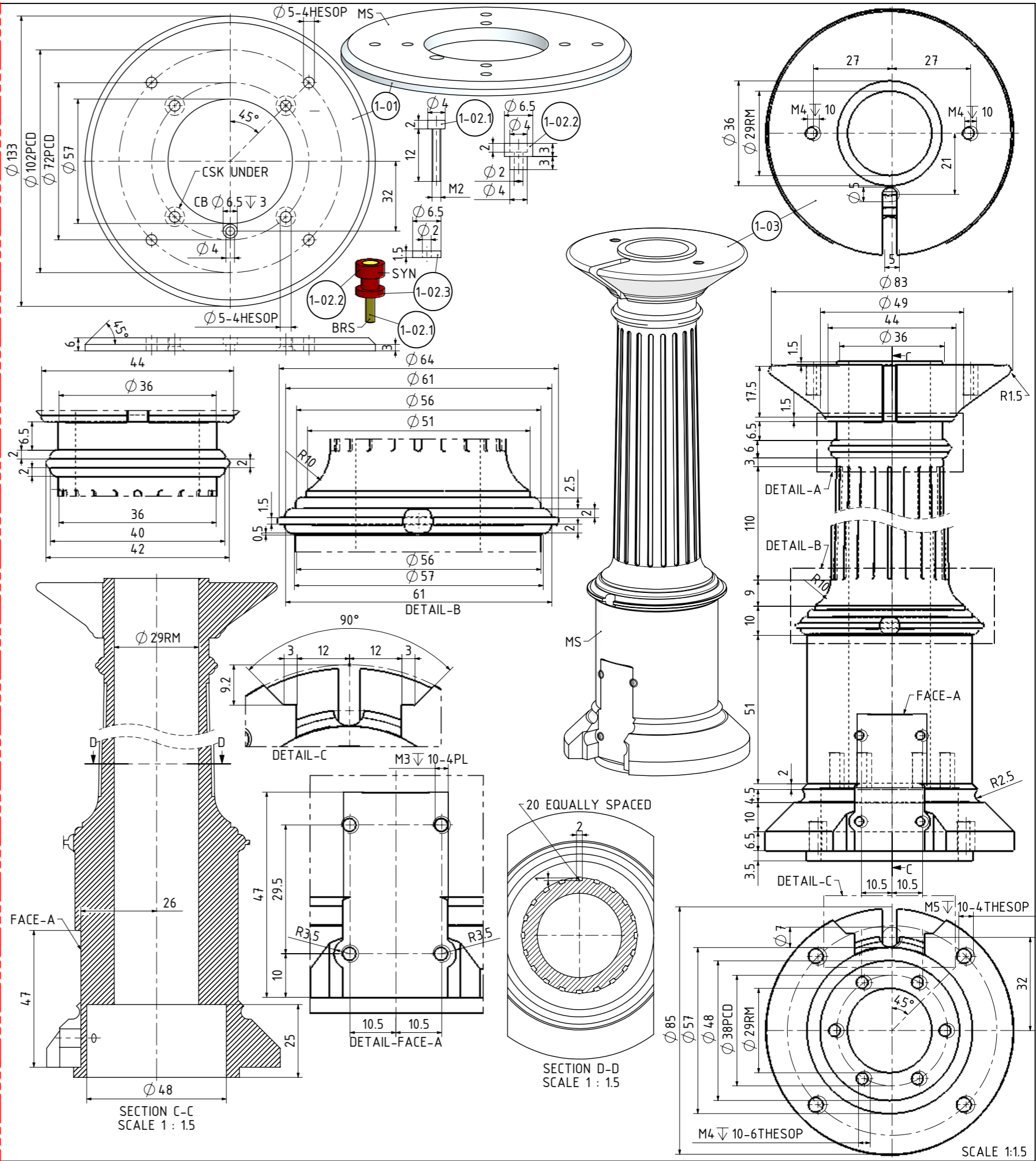
QTY.	PART NUMBER
1	01-31-00-1-01-BASE PLATE
1	01-31-00-1-02-BASE PLATE CONTACT POINT
1	01-31-00-1-03-BASE COLUMN-CYLINDER
1	01-31-00-1-04-CYLINDER HEAD
1	01-31-00-1-05-SPARK PUG
1	01-31-00-1-06-COLUMN TOP MOUNTING PLATE
2	01-31-00-1-07-CROSSHEAD GUIDE BASE AND SHAFT
1	01-31-00-1-08-CROSSHEAD GUIDE TOP CROSS BAR
2	01-31-00-1-09-CROSSHEAD GUIDE BAR NUT
8	01-31-00-1-10-BEARING BLOCK ANCHOR BOLT
2	01-31-00-1-11-FLYWHEEL BEARING BLOCK
2	01-31-00-1-12-VALVE SHAFT BEARING BLOCK
1	01-31-00-1-13-LEVER MOUNTING BLOCK
1	01-31-00-1-14-LEVER STOP BLOCK
1	01-31-00-1-15-VALVE SPRING
1	01-31-00-1-16-PORT FACE
1	01-31-00-1-17-PORT FACE VALVE COVER
4	01-31-00-1-18-PORT FACE ANCHOR STUD
1	01-31-00-1-19-EXHAUST VALVE
1	01-31-00-1-20-EXHAUST RECEIVER
1	01-31-00-1-21-EXHAUST THROTTLE PLUG
4	01-31-00-1-22-VALVE SPRING+NUT
1	01-31-00-1-23-WOODEN CONSOLE
1	01-31-00-2-01-RACK GEAR+PISTON
1	01-31-00-2-02-RACK GUIDE BAR
1	01-31-00-2-03-ECCENTRIC PAWL LEVER
1	01-31-00-2-04-ECCENTRIC VALVE LEVER
1	01-31-00-2-05-FLYWHEEL SHAFT
1	01-31-00-2-06-SPUR GEAR
2	01-31-00-2-07-SPUR GEAR SIDE PLATE
1	01-31-00-2-08-FLYWHEEL
1	01-31-00-2-09-DRIVE PULLEY
1	01-31-00-2-10-FLYWHEEL SHAFT DRIVE GEARWHEEL
1	01-31-00-2-11-ECCENTRIC SHAFT
1	01-31-00-2-12-ECCENTRIC SHAFT DRIVE GEARWHEEL
1	01-31-00-2-13-ECCENTRIC VALVE SHEAVE
1	01-31-00-2-14-ECCENTRIC VALVE STRAP
1	01-31-00-2-15-SLIDE VALVE
1	01-31-00-2-16-SLIDE VALVE IGNITION PIN
1	01-31-00-2-17-SLIDE VALVE IGNITION PIN SPRING
1	01-31-00-2-18-SLIDE VALVE IGNITION PIN NUT
1	01-31-00-2-19-PAWL ECCENTRIC SHEAVE
1	01-31-00-2-20-PAWL ECCENTRIC STRAP
1	01-31-00-2-21-PAWL RATCHET
1	01-31-00-2-22-PAWL
1	01-31-00-2-23-PAWL SPRING
2	01-31-00-M2.5 NUT
1	01-31-00-M2.5 WASHER-BRASS
8	01-31-00-M2.5x6 A-K CYL HEAD SCREW
2	01-31-00-M2.5x8 A-K CYL HEAD SCREW
1	01-31-00-M2x4 A-K CYL HEAD SCREW
4	01-31-00-M2x6 A-K CYL HEAD SCREW
1	01-31-00-M2x10 A-K CYL HEAD SCREW
1	01-31-00-M2x14 A-K CYL HEAD SCREW
8	01-31-00-M3 DOME NUT
4	01-31-00-M3x8 A-K CYL HEAD SCREW
1	01-31-00-M4 WASHER-BRASS
7	01-31-00-M4x14 A-K CYL HEAD SCREW
4	01-31-00-M5x14 A-K C-SINK SCREW
4	01-31-00-M5x20-ROUND HEAD WOOD SCREW
1	01-31-00-M6 DOME NUT

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.

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

OTHER ABBREVIATIONS
DP = DEEP
DAA= DRILL AFTER ASSEMBLY
D&TAA= DRILL AND TAP AFTER ASSEMBLY
CB = COUNTER BORE
CF = CLOSE FIT (SIZE FOR SIZE)
PF = PRESS FIT
PFAA= PRESS FIT AFTER ASSEMBLY
PCD = PITCH CIRCLE DIAMETER
RM = REAM
HEX = HEXAGON, 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
[SA-xxx]= SUB ASSEMBLY-xxx

WARNING: THESE DRAWINGS WERE PRODUCED USING THE ORIGINAL IMPERIAL DIMENSIONED DRAWINGS WHICH I CONVERTED TO METRIC. SOME OF THE METRIC DIMENSIONS MIGHT BE SLIGHTLY UNDER OR OVER THAN THE EQUIVALENT IMPERIAL DIMENSIONS.



NOTES: DOWN LOADED THE ORIGINAL DRAWINGS FROM THE INTERNET. THE DRAWINGS DID NOT HAVE THE DESINGERS NAME(S) OR THE DRAFTERS NAME(S) ON THE DRAWINGS

TITLE
A MODEL OF AN OTTO LANGEN ATMOSPHERIC ENGINE OF 1867 (INTERNAL COMBUSTION)

DRAWING CONTENTS
BILL OF MATERIALS, NOTES, PARTS AND ASSEMBLIES

PROJECT No 01-31-00
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PROJECTION

DATE **JUNE 2018**

MODEL SCALE: 1:1
DWG SCALE: 1:1 @A3 OR AS SHOWN
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SHEET: 02 OF 05 **A3** No: 01-31-00-SHT02