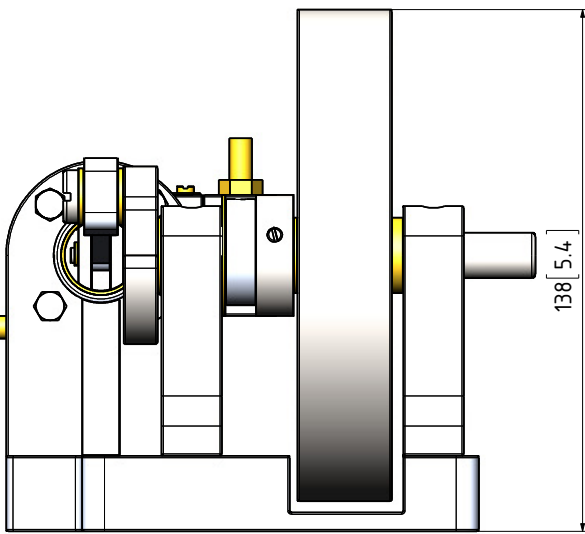


NOTES:

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. N/A
6. ALL CONNECTIONS/JOINTS WHICH HAVE STEAM PRESSURE APPLIED TO IT SHALL BE SILVER/HARD SOLDERED.
7. COMPRESSION SPRINGS ARE DRAWN IN COMPRESSED STATE (CP), UNCOMPRESSED STATE IS APPROX 40% TO 60% LONGER THEN COMPRESSED STATE.
8. 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.
9. 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.
10. THE ORDER IN WHICH THE PARTS/COMPONENTS ARE MANUFACTURED AND THE MODEL IS ASSEMBLED IS ENTIRELY LEFT TO THE BUILDER/MODEL MAKER.
11. ERRORS AND/OR OMISSIONS MAY OCCUR IN THE DRAWINGS, DO NOT HESITATE TO CONTACT ME SO THAT THE ERRORS/OMISSIONS CAN BE RECTIFIED.
12. A COLOUR SCHEME FOR THIS PROJECT IS ENTIRELY LEFT UP TO THE MODEL MAKER.
13. THE MANNER IN WHICH THE PARTS/COMPONENTS ARE MANUFACTURED IS ENTIRELY LEFT UP TO THE BUILDER.



OTHER ABBREVIATIONS

DP = DEEP  
PF = PRESS FIT  
PCD = PITCH CIRCLE DIAMETER  
RM = REAM  
HEX = HEXAGON, 6SIDED  
CP = COMPRESSED  
KNL = KNURLED  
CSK = COUNTERSINK  
PL = PLACES  
CF = CLOSE FIT (SIZE FOR SIZE)  
DAA= DRILL AFTER ASSEMBLY  
PFAA= PRESSFIT AFTER ASSEMBLY  
LCT = USE LOCTITE  
LPF = LIGHT PRESS FIT  
SA-xxx= SUB ASSEMBLY-xxx

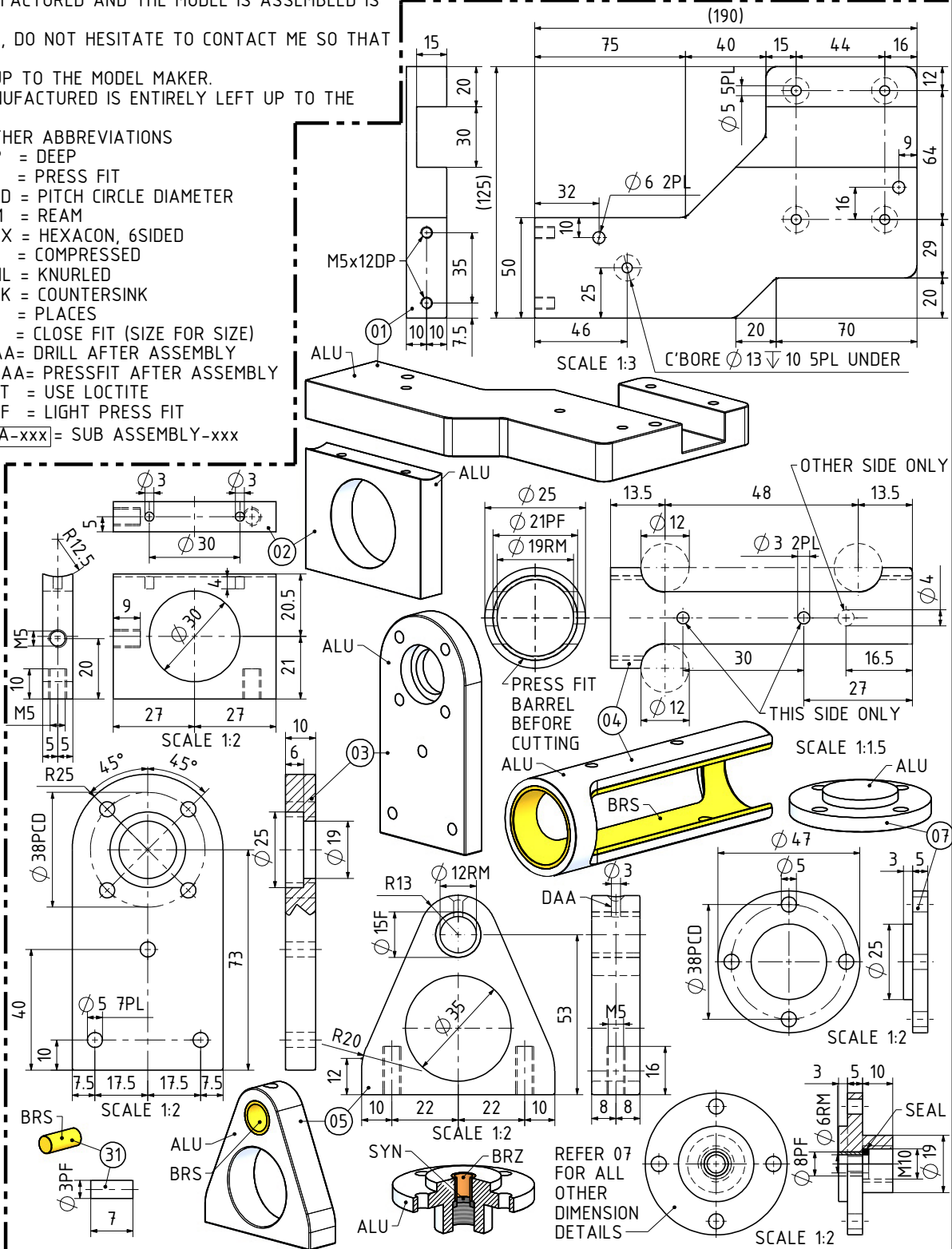
MATERIAL ABBREVIATIONS:

ALU = ALUMINIUM OR DURAL(MIN)  
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 SOULD BE ABLE TO WITHSTAND THE HEAT AND PRESSURE(S) APPLIED TO THEM.

nnn/nnn MEANS THAT EITHER MATERIAL CAN BE USED

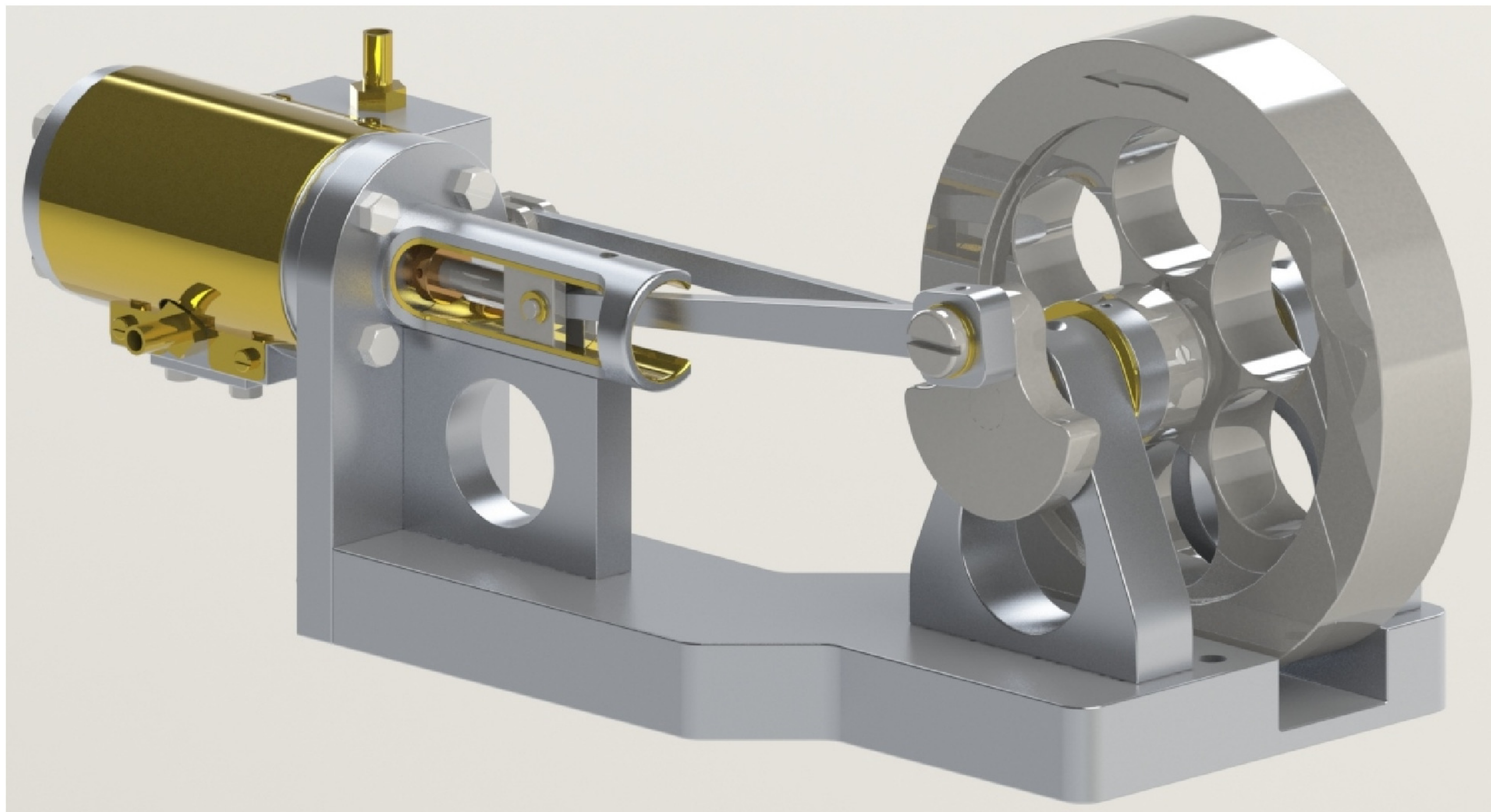
QTY.	PART NUMBER
1	EVG-P48-01-BASE PLATE
1	EVG-P48-02-CROSSHEAD GUIDE SUPPORT PLATE
1	EVG-P48-03-CYLINDER SUPPORT PLATE
1	EVG-P48-04-CROSSHEAD GUIDE
2	EVG-P48-05-CRANKSHAFT BEARING SUPPORT BLOCK
1	EVG-P48-06-CYLINDER BLOCK
1	EVG-P48-07-CYLINDER FRONT COVER
1	EVG-P48-08-CYLINDER REAR COVER
1	EVG-P48-09-PISTON ROD PACKNUT
1	EVG-P48-10-VALVE CHEST
2	EVG-P48-11-STEAM INLET PIPE
1	EVG-P48-12-EXHAUST HOLE COVER
1	EVG-P48-13-CYLINDER LAGGING
1	EVG-P48-14-CRANK PLATE
1	EVG-P48-15-CRANK SHAFT
1	EVG-P48-16-CRANK PIN
2	EVG-P48-17-CRANK PIN SPACER
2	EVG-P48-18-CRANK SHAFT SPACER
1	EVG-P48-19-ECCENTRIC SHEAVE
1	EVG-P48-20-ECCENTRIC SHEAVE SPACER
1	EVG-P48-21-FLYWHEEL
1	EVG-P48-22-FLYWHEEL SPACER
1	EVG-P48-23-PISTON
1	EVG-P48-24-PISTON ROD
1	EVG-P48-25-CON-ROD
1	EVG-P48-26-CON-ROD PIN
1	EVG-P48-27-POPPET VALVE
1	EVG-P48-28-POPPET VALVE CLEVIS
1	EVG-P48-29-ECCENTRIC STRAP
1	EVG-P48-30-VALVE CLEVIS PIN
2	EVG-P48-31-CROSSHEAD GUIDE LOCATING PIN
4	EVG-P48-M3x5 PAN HEAD SCREW
2	EVG-P48-M3x7 GRUB SCREW
2	EVG-P48-M4x10 GRUB SCREW
4	EVG-P48-M4x10 HEX BOLT
4	EVG-P48-M4x28 HEX BOLT
1	EVG-P48-M5 NUT
4	EVG-P48-M5x15 HEX BOLT
4	EVG-P48-M5x20 HEX BOLT
8	EVG-P48-M5x25 HEX BOLT











NOTES: THE ORIGINAL DRAWINGS AND ARTICLE OF THIS ENGINE WERE BY ELMER VERBURG AND PUBLISHED IN A BOOK AS CHAPTER 48. THE ORIGINAL DRAWINGS WERE POSTED ON: WWW.JOHN-TOM.COM (THIS ENGINE IS 2 TIMES LARGER THAN THE ORIGINAL)			
TITLE	DRAWING CONTENTS	PROJECTION	DATE
1 CYLINDER HORIZONTAL UNA-FLOW STEAM ENGINE.	RENDERED PICTURE	JDWDS	APRIL-2016
		J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAKAPURA 2110. NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000 E-MAIL: dewaal@xtra.co.nz.	Copyright © J.A.M. DE WAAL PAKAPURA NZ
		PROJECT No 10-48-00	SHEET: 03 OF 03
		JDW DRAUGHTING SERVICES	A3 No: EVG-P48-03