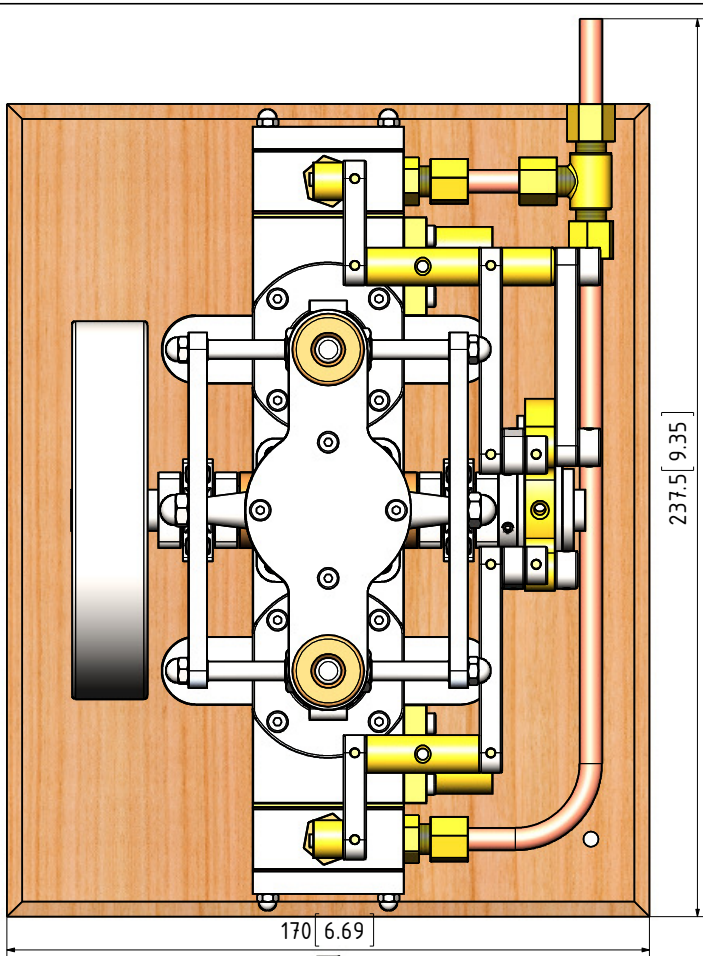




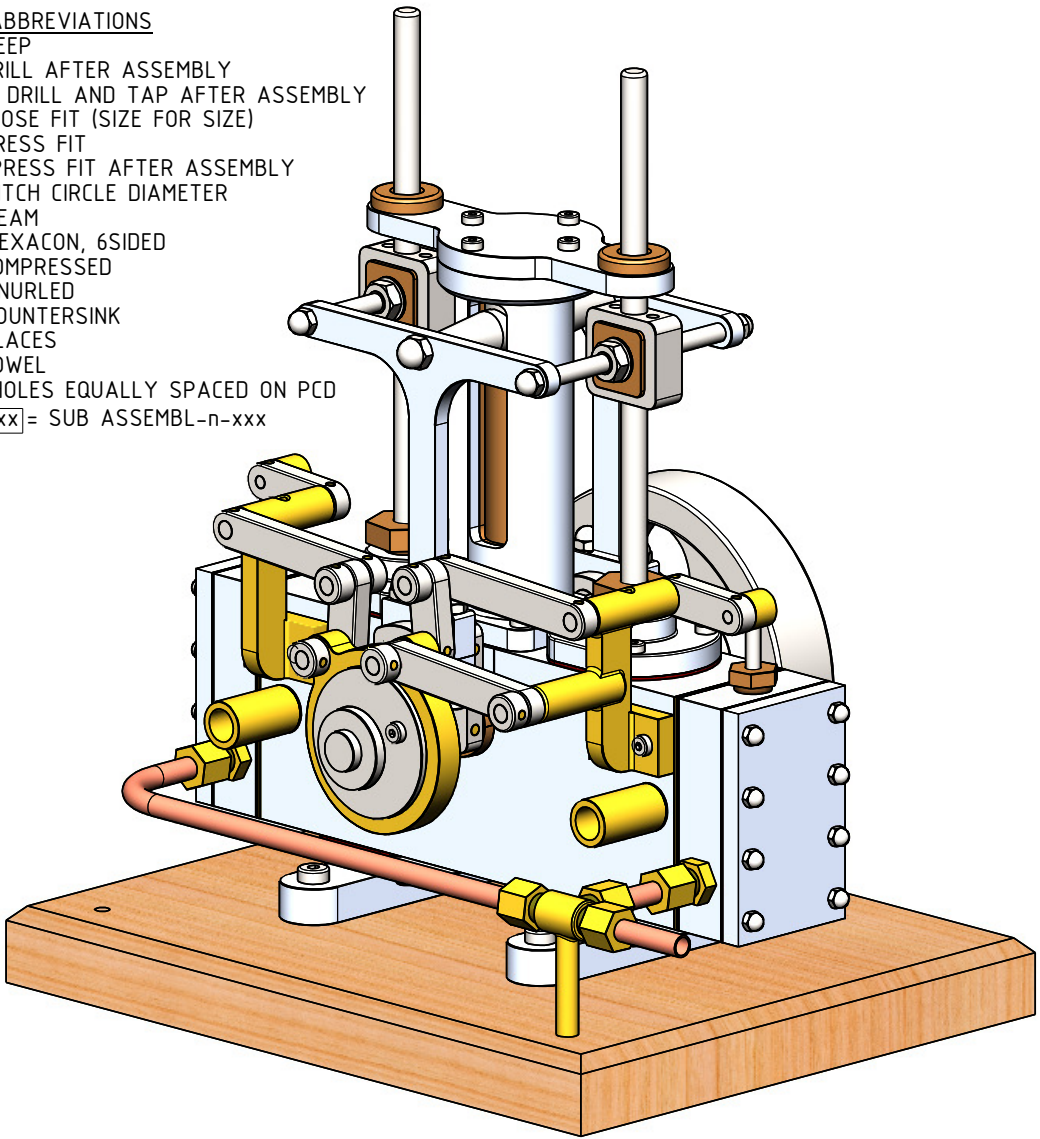
QTY.	PART NUMBER	QTY.	PART NUMBER
1	BERNAY-01-WOOD BASE	1	BERNAY-36-CROSSHEAD PIN
2	BERNAY-02-CYLINDER BLOCK SUPPORT FOOT	2	BERNAY-37-CONNECTING ROD SHAFT
1	BERNAY-03-CYLINDER BLOCK	2	BERNAY-38-CONNECTING ROD
2	BERNAY-04-CRANK SHAFT BEARING	4	BERNAY-39-PISTON ROD SLIDER
1	BERNAY-05-CYL. BEARING TOP BLOCK	1	BERNAY-40-ECCENTRIC STRAP
2	BERNAY-06-EXHAUST PIPE CONNECTOR	2	BERNAY-41-SLIDE VALVE
4	BERNAY-07-CYLINDER BLOCK GASKET	2	BERNAY-42-SLIDE VALVE ROD
2	BERNAY-08-CYLINDER LOWER COVER	4	BERNAY-43-VALVE ROD RETAINER BUSH
2	BERNAY-09-CYLINDER UPPER COVER	2	BERNAY-44-VALVE GEAR LINK #1
2	BERNAY-10-PISTON ROD GLAND NUT	2	BERNAY-45-VALVE GEAR LINK #2
1	BERNAY-11-CROSSHEAD GUIDE	1	BERNAY-46-VALVE GEAR LINK #3
1	BERNAY-12-PISTON ROD GUIDE PLATE	1	BERNAY-47-VALVE GEAR LINK #4
2	BERNAY-13-PISTON ROD GUIDE BUSH	1	BERNAY-48-VALVE GEAR LINK #5
2	BERNAY-14-STEAM CHEST	5	BERNAY-49-RETAINER RING
2	BERNAY-15-SLIDE VALVE PORT PLATE	4	BERNAY-M2.5x3 A-K GRUB SCREW
4	BERNAY-16-STEAM CHEST GASKET	16	BERNAY-M3 DOME NUT
2	BERNAY-17-STEAM CHEST COVER	4	BERNAY-M3x6 A-K GRUB SCREW
2	BERNAY-18-INLET PIPE NIPPLE	16	BERNAY-M3x44 THREADED ROD
2	BERNAY-19-VALVE ROD GLAND NUT	8	BERNAY-M4 DOME NUT
1	BERNAY-20-RH-ROCKER ARM SUPPORT BRACKET	5	BERNAY-M4x13 A-K CYL HEAD SCREW
1	BERNAY-21-LH-ROCKER ARM SUPPORT BRACKET	20	BERNAY-M4x15 A-K CYL HEAD SCREW
2	BERNAY-22-STEAM INLET PIPE-1	5	BERNAY-M4x20 A-K CYL HEAD SCREW
1	BERNAY-23-STEAM INLET PIPE-2	4	BERNAY-M4x28 A-K CYL HEAD SCREW
1	BERNAY-24-STEAM INLET T-CONNECTOR	2	BERNAY-M5 DOME NUT
5	BERNAY-25-M8x6 PIPE NUT	2	BERNAY-M5 NUT
2	BERNAY-26-CRANK SHAFT END	8	BERNAY-M6 NUT
1	BERNAY-27-CRANK SHAFT CENTER	4	BERNAY-M6 WASHER
2	BERNAY-28-CRANK SHAFT PIN	4	BERNAY-M6x10 A-K CYL HEAD SCREW
4	BERNAY-29-CRANK SHAFT WEB	4	BERNAY-M6x24 A-K CYL HEAD SCREW
1	BERNAY-30-FLYWHEEL		
1	BERNAY-31-ECCENTRIC SHEAVE		
1	BERNAY-32-ECCENTRIC SHEAVE COVER		
2	BERNAY-33-PISTON		
2	BERNAY-34-PISTON ROD		
1	BERNAY-35-CROSSHEAD		

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 SOULD 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
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
HESOP=HOLES EQUALLY SPACED ON PCD
[SA-n-xxx]= SUB ASSEMBL-n-xxx



- 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.
 - XX. ERRORS AND/OR OMISSIONS MAY OCCUR IN THE DRAWINGS, DO NOT HESITATE TO CONTACT ME SO THAT THE ERRORS/OMISSIONS CAN BE RECTIFIED.

NOTES: FOUND ORIGINAL DRAWINGS ON THE INTERNET. THE DRAWINGS WERE DATED 30-07-2012. THE INPRINTED LOGO WAS CSEE (CLASSIC STEAM ENGINE ENGINEERING). NUMBER OF ORIGINAL DRAWINGS 44xA4 (ORIGINATOR UNKNOWN)

TITLE
2 CYLINDER STEAM ENGINE TO THE BERNAY DESIGN.

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

PROJECT No 09E-19-00
JDW DRAUGHTING SERVICES
J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAPAURA 2110.
NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000
E-MAIL: dewaal@xtra.co.nz.

PROJECTION
DATE JULY-2016
SHEET: 01 OF 04

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