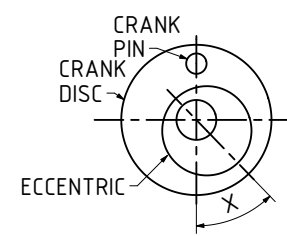


- NOTES:
0. ALL DRAWINGS ARE IN METRIC MEASUREMENTS
  1. ALL ENGINEERING PRACTICES SHALL BE APPLIED WITH REGARDS TO HOLE AND SHAFT TOLERANCES.
  2. WHERE SCREWS OR BOLTS ARE USED THE CLEARANCE HOLES SHALL BE APPROXIMATELY 5% TO 8% LARGER THAN THE MATCHING TAPPED HOLE.
  3. PREFERABLY ALL TAPPED HOLES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



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

- 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

- 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
  - 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

QTY.	PART NUMBER
1	09C-39-00-1-01-BRICK BASE
1	09C-39-00-1-02-ENGINE BED PLATE
1	09C-39-00-1-03-ENGINE A-FRAME-1
1	09C-39-00-1-04-ENGINE A-FRAME-2
1	09C-39-00-1-05-CRANK SHAFT BEARING-1
1	09C-39-00-1-06-CRANK SHAFT BEARING-2
1	09C-39-00-1-07-GOVERNOR TOP BEARING PLATE
1	09C-39-00-1-08-CROSSHEAD GUIDE
1	09C-39-00-1-09-CYLINDER+VALVE CHEST
1	09C-39-00-1-10-CYLINDER TOP COVER
1	09C-39-00-1-11-VALVE CHEST COVER
1	09C-39-00-1-12-STEAM INLET PIPE
1	09C-39-00-1-13-STEAM EXHAUST PIPE
1	09C-39-00-1-14-GOVERNOR LOWER BEARING STAND
1	09C-39-00-1-15-DISPLACEMENT PUMP
1	09C-39-00-1-16-LADDER+PLATFORM
2	09C-39-00-1-17-LADDER HANDRAIL
1	09C-39-00-2-01-CRANK SHAFT
1	09C-39-00-2-02-PISTON+CROSSHEAD
1	09C-39-00-2-03-CON-ROD
1	09C-39-00-2-04-SLIDE VALVE+SPINDLE
1	09C-39-00-2-05-SLIDE VALVE ROCKING LINK SHAFT
1	09C-39-00-2-06-ECCENTRIC
1	09C-39-00-2-07-ECCENTRIC STRAP
1	09C-39-00-2-08-PUMP PLUNGER
1	09C-39-00-2-09-ROCKING SHAFT ECCENTRIC STRAP LINK
1	09C-39-00-2-10-GOVERNOR SPINDLE
2	09C-39-00-2-11-GOVERNOR FLYWEIGHT
4	09C-39-00-2-12-GOVERNOR FLYWEIGHT LINK
1	09C-39-00-2-13-GOVERNOR SLIDE COLLAR
1	09C-39-00-2-14-GOVERNOR SLIDING COOLLAR FORK
1	09C-39-00-2-15-GOVERNOR FORK LINK
1	09C-39-00-2-16-GOVERNOR ADJUST LINK PLATE
1	09C-39-00-2-17-STEAM REGULATOR FLAP
1	09C-39-00-2-18-STEAM REGULATOR CONTROL LINK
1	09C-39-00-M2 NUT
2	09C-39-00-M2.5 NUT
2	09C-39-00-M2.5 WASHER
4	09C-39-00-M2.5x10 A-K CYL HEAD SCREW
2	09C-39-00-M2.5x4 A-K GRUB SCREW
1	09C-39-00-M2x4 A-K CYL HEAD SCREW
1	09C-39-00-M2x6 A-K CYL HEAD SCREW
10	09C-39-00-M3 NUT
6	09C-39-00-M3 WASHER
13	09C-39-00-M3x10 A-K CYL HEAD SCREW
6	09C-39-00-M3x12 A-K CYL HEAD SCREW
8	09C-39-00-M3x6 A-K CYL HEAD SCREW
4	09C-39-00-M3x6 A-K GRUB SCREW
15	09C-39-00-M3x8 A-K CYL HEAD SCREW
5	09C-39-00-M4 NUT
12	09C-39-00-M4x12 A-K CYL HEAD SCREW
4	09C-39-00-M4x18 A-K CYL HEAD SCREW
6	09C-39-00-M4x8 A-K CYL HEAD SCREW
8	09C-39-00-M5 NUT
6	09C-39-00-M5x12 A-K CYL HEAD SCREW
4	09C-39-00-M5x15 A-K CYL HEAD SCREW
4	09C-39-00-M5x24 A-K CYL HEAD SCREW
2	09C-39-00-M5x34 A-K CYL HEAD SCREW
4	09C-39-00-M6x40 A-K CYL HEAD SCREW

NOTES: THIS DESIGN IS BASED ON DRAWINGS WHICH WERE FOUND ON THE INTERNET. THE AUTHOR OF THE ORIGINAL DESIGN AND DRAWINGS IS UNKNOWN

TITLE  
**B. HICK & SON CRANK OVERHEAD STEAM ENGINE (DATE UNKNOWN)**

DRAWING CONTENTS  
**ISOMETRIC VIEW, NOTES AND BILL OF MATERIAL**

PROJECT No 09C-39-00  
 JDW DRAUGHTING SERVICES  
 J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAPA KURA  
 2110, NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000 E-MAIL: dewaal@xtra.co.nz.

PROJECTION  
**JDWDS** MODEL SCALE: 1:1  
 DWG SCALE: 1:1 @A3 OR AS SHOWN  
 DATE SEPTEMBER 2019 Copyright © J.A.M. DE WAAL PAPA KURA NZ  
 SHEET: 03 OF 09 **A3** No: 09C-39-00-SHT03