

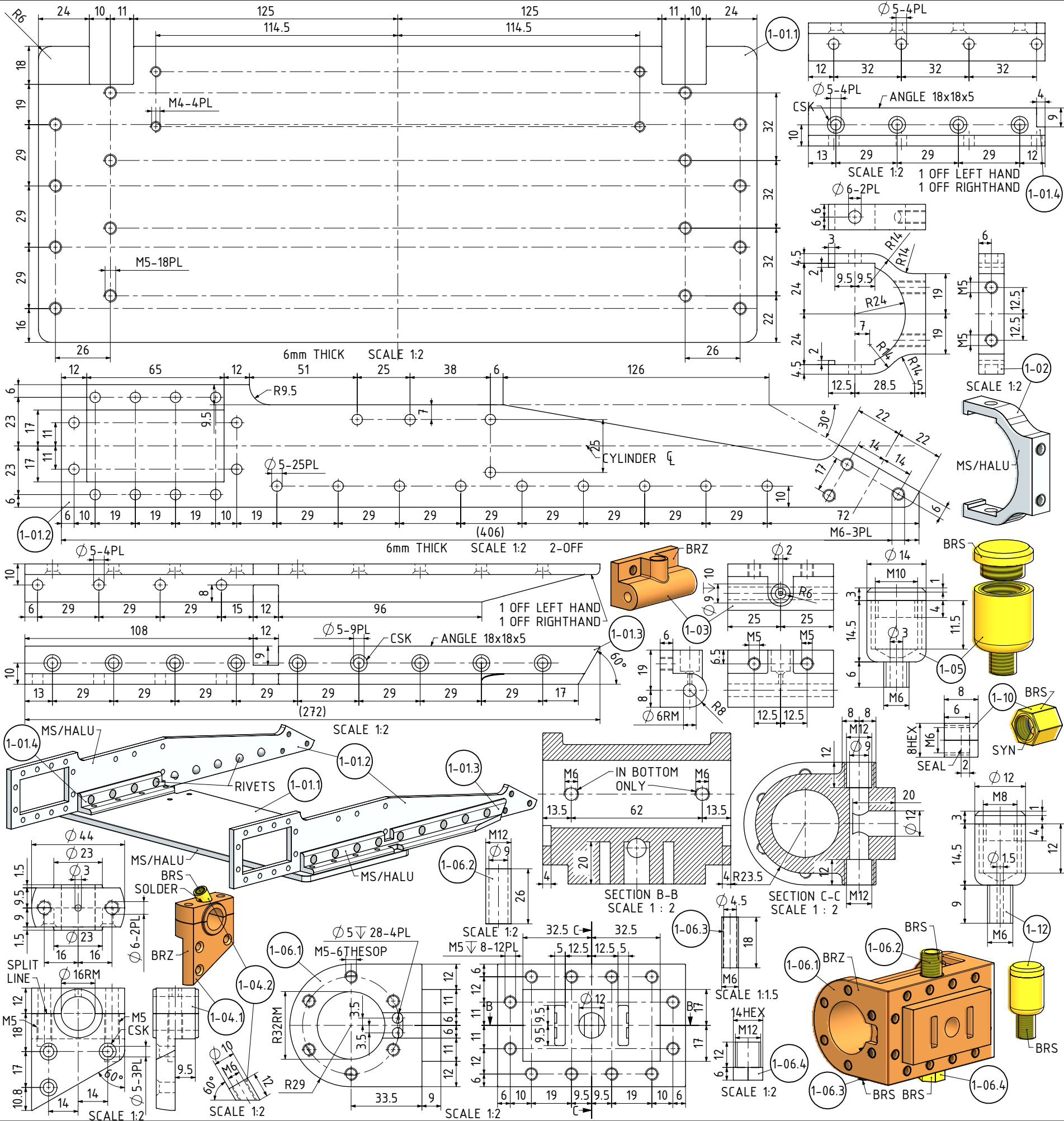
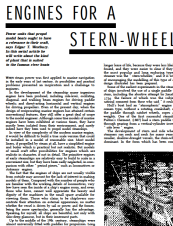
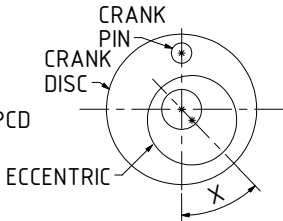
QTY.	PART NUMBER
1	STERN-1-01-BASE FRAME
2	STERN-1-02-CROSSHEAD SLIDE BAR BRACKET
2	STERN-1-03-SLIDE VALVE SPINDLE GUIDE
1	STERN-1-04-MAIN BEARING
1	STERN-1-04-MAIN BEARING
4	STERN-1-05-MAIN BEARING OILER
2	STERN-1-06-CYLINDER
2	STERN-1-07-CYLINDER FRONT COVER
2	STERN-1-09-CYLINDER REAR COVER
4	STERN-1-10-DRAIN SCREW STOP
2	STERN-1-11-CROSSHEAD GUIDE BAR
2	STERN-1-11-CROSSHEAD GUIDE BAR
2	STERN-1-12-CROSSHEAD GUIDE OILER
2	STERN-1-13-EXHAUST PIPE NUT
2	STERN-1-14-VALVE CHEST
1	STERN-1-15-STEAM EXHAUST PIPE
1	STERN-1-16-STEAM SUPPLY PIPE
2	STERN-1-17-REVERSING SHAFT STAND
1	STERN-1-18-STAND CROSS STAY
1	STERN-2-01-CRANKSHAFT
2	STERN-2-02-PISTON+ROD+CROSSHEAD
2	STERN-2-03-CON-ROD
4	STERN-2-04-ECCENTRIC SHEAVE
1	STERN-2-05A-ECCENTRIC STRAP
1	STERN-2-05A-ECCENTRIC STRAP
1	STERN-2-05B-ECCENTRIC STRAP
1	STERN-2-05B-ECCENTRIC STRAP
2	STERN-2-06-SLIDE VALVE+SPINDLE
2	STERN-2-07-EXPANSION LINK
2	STERN-2-08-DIE BLOCK
1	STERN-2-09-WEIGH SHAFT+ARMS
2	STERN-2-10-LIFTING LINK
1	STERN-2-11-REACH ROD
1	STERN-2-12-L-H PADDLE WHEEL HUB+SPOKES
1	STERN-2-12-R-H PADDLE WHEEL HUB+SPOKES
12	STERN-2-13-PADDLE WHEEL PADDLE BOARD
16	STERN-M4 NUT
5	STERN-M4 WASHER-BRASS
48	STERN-M4x6-ROUND HEAD RIVET
28	STERN-M4x8 A-K CYL HEAD SCREW
12	STERN-M4x18 A-K CYL HEAD SCREW
8	STERN-M4x22 A-K CYL HEAD SCREW
24	STERN-M5 NUT
16	STERN-M5x10 A-K CYL HEAD SCREW
8	STERN-M5x12 A-K CYL HEAD SCREW
10	STERN-M5x15 A-K C-SINK SCREW
24	STERN-M5x15 A-K CYL HEAD SCREW
24	STERN-M5x48 STUD
4	STERN-M6 NUT
4	STERN-M6x10 A-K CYL HEAD SCREW
4	STERN-M6x16 GRUB SREW
4	STERN-M6x22 A-K CYL HEAD SCREW
2	STERN-M6x30 A-K CYL HEAD SCREW
6	STERN-M8 NUT
2	STERN-M8 WASHER-BRASS
2	STERN-M8x40 A-K CYL HEAD 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
SPF=	SPOTFACE
(T)HESOP=	(TAPPED)HOLES EQUALLY SPACED ON PCD
(T)HESOC=	(TAPPED)HOLES EQUALLY SPACED ON CIRCUMFERENCE
[SA-xxx]=	SUB ASSEMBLY-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, ARE 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 SOULD 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: THE ORIGINAL DRAWINGS AND ARTICLE WERE GIVEN TO ME. THE ORIGINAL ARTICLE AND DRAWINGS WERE FIRST PUBLISHED IN THE "MODEL ENGINEER" MAGAZINE OF AUGUST 1965 UNDER THE TITLE "ENGINES FOR A STERN-WHEELER" BY E.T.WESTBURY										
TITLE			DRAWING CONTENTS				PROJECT No 09E-26-00		PROJECTION	MODEL SCALE: 1:1
A 2x1 CYLINDER STEAM ENGINE FOR A STERN-WHEEL PADDLE STEAMER			BILL OF MATERIALS, NOTES, PARTS AND ASSEMBLIES				JDW DRAUGHTING SERVICES		 JDWDS	DWG SCALE: 1:1 @A3 OR AS SHOWN
							J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAPAKURA 2110. NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000 E-MAIL: dewaal@xtra.co.nz.		DATE	Copyright © J.A.M. DE WAAL PAPAKURA NZ
							JULY 2018		SHEET: 02 OF 05	A3