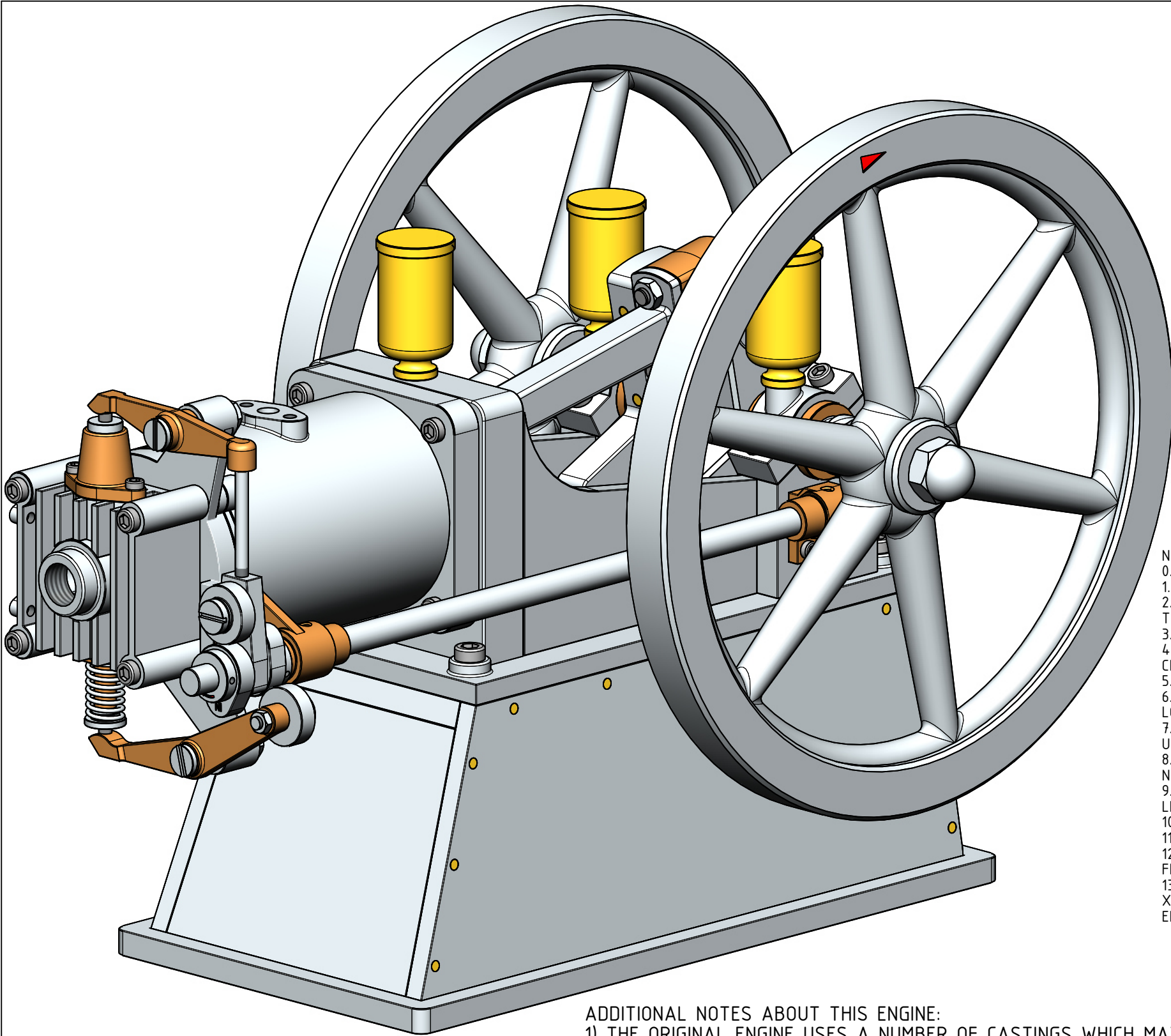




MATERIAL ABBREVIATIONS:	
ALU = ALUMINIUM	
HALU= HARD ALUMINIUM	
BRS = BRASS	
BRZ = BRONZE OR	
GUNMETAL (BRZ/GM)	
CI = CAST IRON	
CU = COPPER	
GRA = GRAPHITE	
MS = MILD	
STEEL/BRIGHT MILD	
STEEL	
SS = SILVER STEEL OR	
STAINLESS STEEL	
SPS = SPRING STEEL	
PEEK= POLYETHER	
ETHER KETONE	
SYN = SYNTHETIC	
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	
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	01-37-00-1-01-MOUNTING BASE
1	01-37-00-1-02-ENGINE BEDPLATE
2	01-37-00-1-03-CRANKSHAFT BEARING
3	01-37-00-1-04-OILER
1	01-37-00-1-05-CYLINDER WATER JACKET
1	01-37-00-1-06-CYLINDER HEAD
1	01-37-00-1-07-INLET VALVE GUIDE
1	01-37-00-1-08-EXHAUST VALVE GUIDE
1	01-37-00-1-09-CAMSHAFT FRONT BEARING BRACKET
1	01-37-00-1-10-CAMSHAFT REAR BEARING BRACKET
1	01-37-00-2-01-CRANK SHAFT
2	01-37-00-2-02-FLYWHEEL
1	01-37-00-2-03-CRANK SHAFT SKEW GEAR
1	01-37-00-2-04-CAM SHAFT
1	01-37-00-2-05-INLET VALVE
1	01-37-00-2-06-INLET VALVE ROCKER ARM
1	01-37-00-2-07-INLET VALVE LIFTER
2	01-37-00-2-08-CAM FOLLOWER ROLLER
1	01-37-00-2-09-EXHAUST VALVE
1	01-37-00-2-10-EXHAUST VALVE ROCKER ARM
1	01-37-00-2-11-PISTON
1	01-37-00-2-12-CON-ROD
2	01-37-00-M3 NUT
6	01-37-00-M3x6 A-K CYL HEAD SCREW
4	01-37-00-M4 NUT
4	01-37-00-M4x12 A-K CYL HEAD SCREW
4	01-37-00-M4x20 A-K CYL HEAD SCREW
2	01-37-00-M4x26 A-K CYL HEAD SCREW
4	01-37-00-M4x32 A-K CYL HEAD SCREW
4	01-37-00-M5x14 A-K CYL HEAD SCREW
6	01-37-00-M6x14 A-K C-SINK SCREW
2	01-37-00-M8 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.

- ADDITIONAL NOTES ABOUT THIS ENGINE:
- 1) THE ORIGINAL ENGINE USES A NUMBER OF CASTINGS WHICH MAY OR MAY NOT BE AVAILABLE.
 - 2) THIS DESIGN IS BASED ON READILY AVAILABLE BAR STOCK MATERIAL.
 - 3) FOR THIS ENGINE TO BE ABLE TO RUN THE FOLLOWING ADDITIONAL PARTS/COMPONENTS HAVE TO BE INSTALLED:
 - A) IGNITION SYSTEM INCLUDING POWER SOURCE SUCH AS A LOW VOLTAGE BATTERY.
 - B) SUITABLE SPARKPLUG.
 - C) A CONTACT BREAKER, WHICH INITIATE THE IGNITION SYSTEM TO FIRE THE SPARKPLUG. THE CONTACT BREAKER TO BE OPERATED BY THE CAMSHAFT.
 - 4) THE BUILDER SHOULD EXPERIMENTALLY DETERMINE THE DIRECTION OF ROTATION OF THE CRANKSHAFT.
 - 5) THE BUILDER SHOULD EXPERIMENTALLY DETERMINE THE TIMING OF OPENING AND CLOSING OF THE INLET AND EXHAUST VALVES FOR THE SMOOTH RUNNING OF THE ENGINE

NOTES: THIS DESIGN IS BASED ON DRAWINGS WHICH WERE GIVEN TO ME BY DAVID CARPENTER (MODELENGINEERINGWEBSITE). THE ORIGINAL DESIGN AND DRAWINGS WERE BY EDGAR T. WESTBURY AND PUBLISHED IN THE FOLLOWING "MODEL ENGINEER" MAGAZINE(S): VOL 129 1-05-1963 No 3224, 15-05-1963 No 3225, 1-06-1963 No 3226, 1-07-1963 No 3228, 3-06-1966 No 3298, 1-07-1966 No 3300

TITLE	DRAWING CONTENTS	PROJECT No	PROJECTION	DATE	MODEL SCALE:
WYVERN GAS-PETROL ENGINE (IC)	ISOMETRIC VIEW, NOTES, BILL OF	01-37-00	JDWDS	NOVEMBER 2019	1:1
32mmBOREx51mmSTROKE (CAPACITY 40c.c)	MATERIALS	JDW DRAUGHTING SERVICES			DWG SCALE: 1:1 @A3 OR AS SHOWN
		J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAPA KURA			Copyright © J.A.M. DE WAAL PAPA KURA NZ
		2110, NEW ZEALAND. PHONE: 0064 09 2988815. MOB:			
		0211791000 E-MAIL: dewaal@xtra.co.nz.			
				SHEET: 02 OF 05	A3 No: 01-37-00-SHT02

DRAWINGS ARE FOR PERSONAL USE ONLY NOT FOR COMMERCIAL PURPOSES