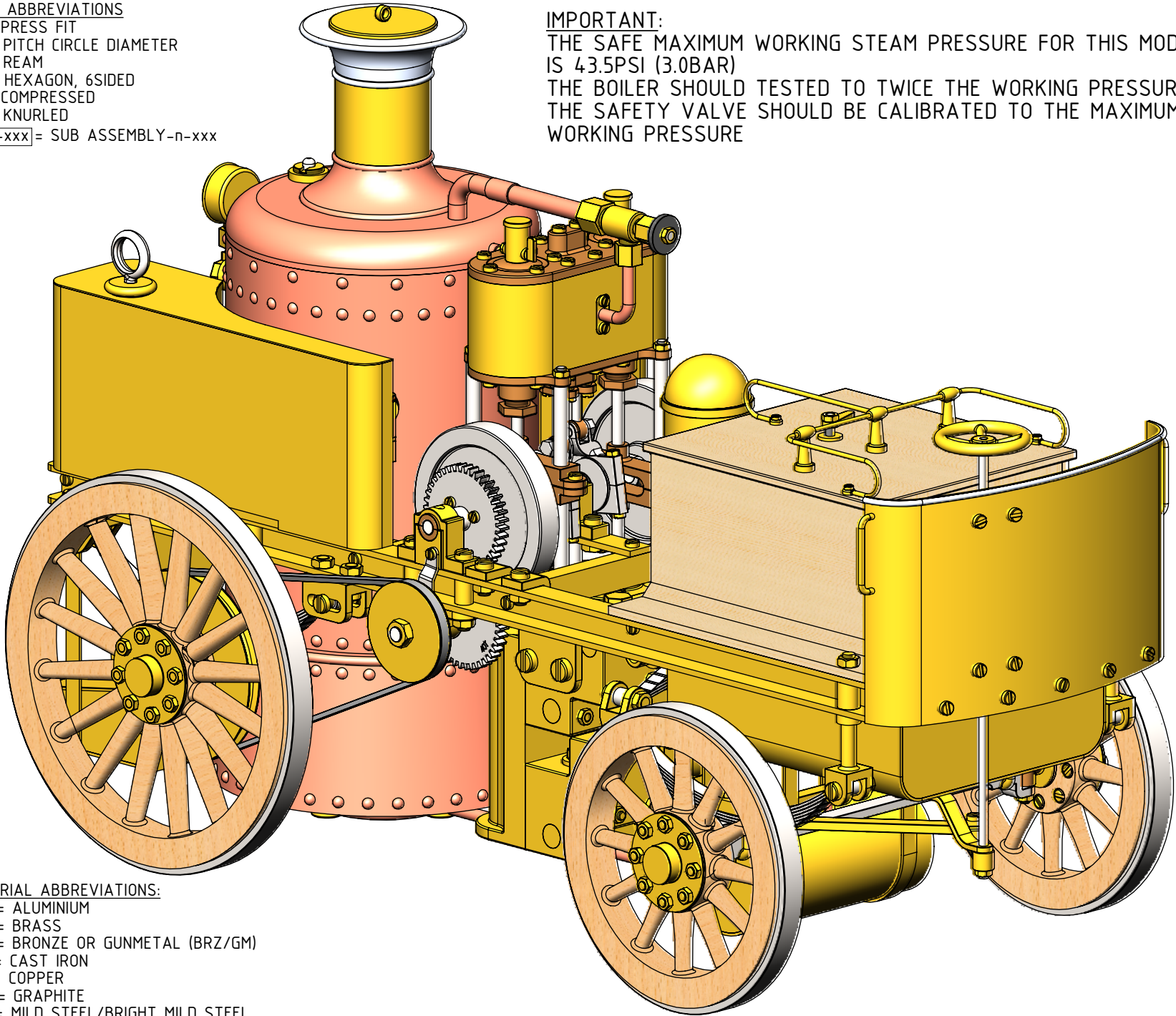


| QTY. | PART NUMBER                                  |
|------|----------------------------------------------|
| 1    | FIRE-1-01-FRAME SIDE BEAM                    |
| 2    | FIRE-1-02-REAR LEAF SPRING BRACKET-1         |
| 2    | FIRE-1-03-REAR LEAF SPRING BRACKET-2         |
| 2    | FIRE-1-04-REAR LEAF SPRING                   |
| 2    | FIRE-1-05-REAR AXLE TO SPRING FIXTURE        |
| 1    | FIRE-1-06-REAR AXLE                          |
| 2    | FIRE-1-07-FRONT LEAF SPRING                  |
| 2    | FIRE-1-08-FRONT AXLE TO SPRING FIXTURE       |
| 2    | FIRE-1-09-FRONT LEAFSPRING HANGER            |
| 2    | FIRE-1-10-FRONT LEAFSPRING HANGER SPACER     |
| 2    | FIRE-1-11-FRONT LEAF SPRING MOUNTING BRACKET |
| 1    | FIRE-1-12-TRAVERSE LEAF SPRING               |
| 1    | FIRE-1-13-FRONT AXLE                         |
| 1    | FIRE-1-14-FRONT WIND SHIELD                  |
| 2    | FIRE-1-15-STEERING COLUMN BRACKET            |
| 1    | FIRE-1-16-FUEL RESERVOIR                     |
| 1    | FIRE-1-17-FUEL SUPPLY TANK                   |
| 1    | FIRE-1-18A-FUEL SUPPLY VALVE BODY            |
| 1    | FIRE-1-18B-FUEL SUPPLY VALVE BOTTOM NUT      |
| 1    | FIRE-1-19-FUEL SUPPLY VALVE STEM             |
| 1    | FIRE-1-20-FUEL TANK FILLER AND CAP           |
| 2    | FIRE-1-21-DRIVERS SEAT FLOOR JOIST           |
| 1    | FIRE-1-22-DRIVERS SEAT FLOOR                 |
| 1    | FIRE-1-23-DRIVERS SEAT HAND RAIL             |
| 3    | FIRE-1-24-DRIVERS SEAT HAND RAIL STANDARD    |
| 1    | FIRE-1-25-FUEL VALVE HANDLE                  |
| 1    | FIRE-1-26-STEERING COLUMN BEARING            |
| 2    | FIRE-1-27-FRONT SHIELD HAND GRIP             |
| 1    | FIRE-1-28-WATER TANKS                        |
| 1    | FIRE-1-28-WATER TANKS                        |
| 2    | FIRE-1-30-PIPE CONNECTOR                     |
| 2    | FIRE-1-31-PIPE CONNECTOR NUT                 |
| 2    | FIRE-1-32-PIPE NUT                           |
| 1    | FIRE-1-33-WATER TANK CROSS PIPE              |
| 2    | FIRE-1-34-WATER TANK HAND RAIL               |
| 1    | FIRE-1-35-REAR ENGINEERS PLATFORM            |
| 1    | FIRE-1-36-REAR ENGINEERS PLATFORM BOX LID    |
| 1    | FIRE-1-37-REAR ENGINEERS PLATFORM STRAP      |
| 1    | FIRE-1-38-FEED PUMP BASE                     |
| 1    | FIRE-1-39-FEED PUMP BBODY                    |
| 2    | FIRE-1-40-FEED PUMP BALL VALVE               |
| 2    | FIRE-1-41-FEED PUMP COVER PLATE              |
| 1    | FIRE-1-42-FEED PUMP PISTON                   |
| 1    | FIRE-1-43-FEED PUMP OUTLET PIPE              |
| 1    | FIRE-1-44-BURNER CENTER WICK HOLDER          |
| 2    | FIRE-1-45-BURNER OUTER WICK HOLDER-1         |
| 2    | FIRE-1-46-BURNER OUTER WICK HOLDER-2         |
| 4    | FIRE-1-47-BURNER OUTER SUPPLY PIPE           |
| 1    | FIRE-1-48-BURNER MAIN SUPPLY PIPE            |
| 1    | FIRE-1-49-BURNER END SUPPLY PIPE             |
| 4    | FIRE-1-50-BURNER CENTER PIPE                 |
| 5    | FIRE-1-51-BURNER WICK                        |
| 3    | FIRE-1-52-CRANK SHAFT BEARING HOUSING        |
| 2    | FIRE-1-53-DRIVING PULLEY SHAFT BRACKET       |
| 2    | FIRE-1-54-PUMP SUPPORT BRACKET               |
| 6    | FIRE-1-55-6x4x9 SPACER                       |
| QTY. | PART NUMBER                                  |
| 2    | FIRE-2-01-REAR WHEEL                         |
| 2    | FIRE-2-02-FRONT WHEEL                        |
| 4    | FIRE-2-03-WHEEL NUT                          |
| 4    | FIRE-2-04-WHEEL HUB COVER                    |
| 1    | FIRE-2-05-STEERING WHEEL                     |
| 1    | FIRE-2-06-STEERING COLUMN                    |
| 1    | FIRE-2-07-STEERING ARMS                      |
| 1    | FIRE-2-07-STEERING ARMS                      |
| 1    | FIRE-2-08-STEERING ARM CROSS LINK            |
| 1    | FIRE-2-09-STEERING COLUMN LINK               |
| 1    | FIRE-2-10-STEERING ARM LINK                  |
| 2    | FIRE-2-11-DRIVE PULLEY                       |
| QTY. | PART NUMBER                                  |
| 1    | FIRE-3-01-BOILER SHELL                       |
| 1    | FIRE-3-02-BOILER TOP DOME                    |
| 1    | FIRE-3-03-BOILER SMOKE BOX RING              |
| 1    | FIRE-3-04-BOILER LOWER RING                  |
| 1    | FIRE-3-05-BOILER FOUNDATION RING             |
| 1    | FIRE-3-06-BOILER FIRE BOX CROWN              |
| 1    | FIRE-3-07-BOILER FIRE BOX INNER SKIRT        |
| 1    | FIRE-3-08-BOILER FIRE BOX OUTER SKIRT        |
| 2    | FIRE-3-09-BOILER MOUNTING BRACKET            |
| 12   | FIRE-3-10-BOILER WATER TUBE                  |
| 1    | FIRE-3-11-HEATING BAFFLE                     |
| 1    | FIRE-3-12-FIRE BOX FLUE                      |
| 1    | FIRE-3-13-CHIMNEY BASE BARREL                |
| 1    | FIRE-3-14-CHIMNEY COVER                      |
| 1    | FIRE-3-15-BOILER BLOW DOWN VALVE BUSH        |
| 1    | FIRE-3-16A-BLOW DOWN VALVE BODY              |
| 1    | FIRE-3-16B-BLOW DOWN VALVE                   |
| 1    | FIRE-3-17-BLOW DOWN VALVE OUTLET             |
| 1    | FIRE-3-18-BLOW DOWN VALVE SPINDLE            |
| 1    | FIRE-3-19-STEAM SUPPLY PIPE-1                |
| 1    | FIRE-3-20-SAFETY VALVE NIPPLE                |
| 1    | FIRE-3-21-SAFETY VALVE BODY                  |
| 1    | FIRE-3-22-SAFETY VALVE STEM                  |
| 1    | FIRE-3-23-SAFETY VALVE SPRING                |
| 1    | FIRE-3-24-SAFETY VALVE ADJUSTING NUT         |
| 1    | FIRE-3-25-SAFETY VALVE PIPE NUT              |
| 1    | FIRE-3-26-SAFETY VALVE EXHAUST PIPE          |
| 2    | FIRE-3-27-BOILER WATER GAUGE BUSH            |
| 1    | FIRE-3-28-WATER GAUGE TOP FITTING            |
| 1    | FIRE-3-29-WATER GAUGE BOTTOM FITTING         |

| QTY. | PART NUMBER                              |
|------|------------------------------------------|
| 4    | FIRE-3-30-WATER GAUGE GLAND NUT          |
| 1    | FIRE-3-31-WATER GAUGE GLASS              |
| 1    | FIRE-3-32-WATER GAUGE HAND WHEEL         |
| 1    | FIRE-3-33-WATER GAUGE VALVE SPINDLE      |
| 1    | FIRE-3-34-PRESSURE GAUGE CONNECTOR       |
| 1    | FIRE-3-35-PRESSURE GAUGE CONNECTOR SCREW |
| 1    | FIRE-3-36-PRESSURE GAUGE                 |
| 1    | FIRE-3-37-PRESSURE GAUGE PIPE NUT        |
| 1    | FIRE-3-38-BOILER PRESSURE GAUGE BUSH     |
| 1    | FIRE-3-39-REGULATOR VALVE BODY           |
| 1    | FIRE-3-40-REGULATOR VALVE SPINDLE        |
| 2    | FIRE-3-41-REGULATOR SPINDLE + PIPE NUT   |
| 1    | FIRE-3-42-REGULATOR INLET PIPE NUT       |
| 1    | FIRE-3-43-STEAM SUPPLY PIPE-2            |
| 1    | FIRE-3-44-EXHAUST STEAM PIPE             |
| 1    | FIRE-3-45-BOILER NON RETURN VALVE BUSH   |
| 1    | FIRE-3-46-NON RETURN VALVE BODY          |
| 1    | FIRE-3-47A-NON RETURN VALVE BALL         |
| 1    | FIRE-3-47B-NON RETURN VALVE SCREW TOP    |
| 1    | FIRE-3-48-NON RETURN VALVE PIE NUT       |
| 1    | FIRE-3-49-NON RETURN VALVE SUPPLY PIPE   |
| QTY. | PART NUMBER                              |
| 2    | FIRE-4-01-CYLINDER                       |
| 1    | FIRE-4-02-VALVE CAMBER PLATE-1           |
| 1    | FIRE-4-03-VALVE CAMBER PLATE-            |
| 1    | FIRE-4-04-CYLINDERS TOP COVER            |
| 1    | FIRE-4-05-CYLINDERS BOTTOM COVER         |
| 1    | FIRE-4-06-CYLINDER CLADDING              |
| 2    | FIRE-4-07-PISTIN ROD GLAND AND SEAL      |
| 2    | FIRE-4-08-VALVE ROD GLAND AND SEAL       |
| 1    | FIRE-4-09-EXHAUST PIPE AND FLANGE        |
| 1    | FIRE-4-10-STEAM INLET PIPE AND FLANGE    |
| 2    | FIRE-4-11-OILER                          |
| 2    | FIRE-4-12-OILER VALVE                    |
| QTY. | PART NUMBER                              |
| 2    | FIRE-5-01-WP CYLINDER                    |
| 2    | FIRE-5-02-WP CYLINDER TOP COVER          |
| 2    | FIRE-5-03-WP CYLINDER TOP COVER CLAND    |
| 2    | FIRE-5-04-WP CYLINDER BOTTOM PLUG        |
| 1    | FIRE-5-05-WP TOP PUMP HOUSING            |
| 1    | FIRE-5-06-WP BOTTOM PUMP HOUSING         |
| 1    | FIRE-5-07-WP HOUSING CONNECTOR PIPE      |
| 8    | FIRE-5-08-WP BALL VALVE                  |
| 4    | FIRE-5-09-WP BALVE SCREW M8x6            |
| 4    | FIRE-5-10-WP BALVE SCREW M8x7            |
| 1    | FIRE-5-11-WP AIR CHAMBER MANIFOLD        |
| 1    | FIRE-5-12-WP AIR CHAMBER                 |
| 4    | FIRE-5-13-CROSS HAFD GUIDE ROD           |
| 1    | FIRE-5-14-DELIVERY HOSE CONNECTOR        |
| 1    | FIRE-5-15-INTAKE HOSE CONNECTOR          |
| QTY. | PART NUMBER                              |
| 2    | FIRE-6-01-CRANK SHAFT END                |
| 2    | FIRE-6-02-CRANK PIN                      |
| 1    | FIRE-6-03-CRANK SHAFT CENTER             |
| 4    | FIRE-6-04-CRANK CHEEK                    |
| 2    | FIRE-6-05-ECCENTRIC SHEAVE               |
| 2    | FIRE-6-06-FLYWHEEL                       |
| 2    | FIRE-6-07-STEAM PISTON                   |
| 2    | FIRE-6-08-STEAM PISTON ROD               |
| 2    | FIRE-6-09-WATER PUMP PISTON ROD          |
| 2    | FIRE-6-10-WATER PUMP PISTON              |
| 2    | FIRE-6-11-CROSS HEAD                     |
| 2    | FIRE-6-11-CROSS HEAD                     |
| 2    | FIRE-6-12-CRANK SHAFT GEAR WHEEL         |
| 2    | FIRE-6-13-DRIVING GEAR WHEEL             |
| 2    | FIRE-6-14-DRIVE WHEEL AXLE               |
| 2    | FIRE-6-15-DRIVE PULLEY                   |
| 2    | FIRE-6-16-SLIDE VALVE                    |
| 2    | FIRE-6-17-SLIDE VALVE ROD                |
| 2    | FIRE-6-18-ECCENTRIC STRAP                |
| 2    | FIRE-6-19-DRIVE BELT                     |
| 2    | FIRE-6-20-DRIVE SHAFT LOCKING PLATE      |
| QTY. | PART NUMBER                              |
| 15   | FIRE-M2.5 NUT                            |
| 118  | FIRE-M2.5x3-ROUND HEAD RIVET             |
| 18   | FIRE-M2.5x4-ROUND HEAD RIVET             |
| 4    | FIRE-M2.5x5 GRUB SREW                    |
| 22   | FIRE-M2.5x6 PAN HEAD SCREW               |
| 12   | FIRE-M2.5x8 PAN HEAD SCREW               |
| 36   | FIRE-M2.5x12-ROUND HEAD RIVET            |
| 4    | FIRE-M2.5x18 PAN HEAD SCREW              |
| 4    | FIRE-M2.5x22 PAN HEAD SCREW              |
| 4    | FIRE-M2 NUT                              |
| 3    | FIRE-M2x6 PAN HEAD SCREW                 |
| 18   | FIRE-M3.5x3-ROUND HEAD RIVET             |
| 75   | FIRE-M3 NUT                              |
| 56   | FIRE-M3x5 PAN HEAD SCREW                 |
| 42   | FIRE-M3x8 PAN HEAD SCREW                 |
| 1    | FIRE-M3x12 PAN HEAD SCREW                |
| 16   | FIRE-M3x15 PAN HEAD SCREW                |
| 18   | FIRE-M3x22 PAN HEAD SCREW                |
| 4    | FIRE-M3x31 STUD                          |
| 8    | FIRE-M3x47 STUD                          |
| 32   | FIRE-M4 NUT                              |
| 14   | FIRE-M4x9 PAN HEAD SCREW                 |
| 10   | FIRE-M4x15 PAN HEAD SCREW                |
| 2    | FIRE-M4x20 PAN HEAD SCREW                |
| 4    | FIRE-M4x24 PAN HEAD SCREW                |
| 2    | FIRE-M5 NUT                              |
| 4    | FIRE-M5x12 PAN HEAD SCREW                |

OTHER ABBREVIATIONS

PF = PRESS FIT  
PCD = PITCH CIRCLE DIAMETER  
RM = REAM  
HEX = HEXAGON, 6SIDED  
CP = COMPRESSED  
KNL = KNURLED  
[SA-n-xxx]= SUB ASSEMBLY-n-xxx



IMPORTANT:

THE SAFE MAXIMUM WORKING STEAM PRESSURE FOR THIS MODEL IS 43.5PSI (3.0BAR)  
THE BOILER SHOULD TESTED TO TWICE THE WORKING PRESSURE.  
THE SAFETY VALVE SHOULD BE CALIBRATED TO THE MAXIMUM WORKING PRESSURE

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  
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.

NOTES:

- 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. INQUIRE AT THE APPROPRIATE AUTHORITIES WHETHER OR NOT THIS BOILER REQUIRES A PRESSURE TEST CERTIFICATE.
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 SCREWED 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. SEALS/GASKETS SHALL BE INSTALLED WHERE DEEMED NECESSARY
12. ERRORS AND/OR OMISSIONS MAY OCCUR IN THE DRAWINGS, DO NOT HESITATE TO CONTACT ME SO THAT THE ERRORS/OMISSIONS CAN BE RECTIFIED.

NOTES: ORIGINAL DRAWINGS WERE PUBLISHED IN "THE ENGINEER AND ELECTRICIAN" MAGAZINE OF 1908 OF THE FOLLOWING MONTHS: JANUARY, MARCH, JULY AND NOVEMBER 1908.

|                                                                 |                                                |                                                                                                                                                                       |                                                                                                    |                 |                                                           |
|-----------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------|
| TITLE                                                           | DRAWING CONTENTS                               | PROJECT No 08-08-00                                                                                                                                                   | PROJECTION                                                                                         | DATE            | MODEL SCALE: 1:13 (APPROXIMATELY)                         |
| WOKING MODEL OF A FIRE ENGINE. (Ca 1900)<br>(LIQUID FUEL FIRED) | ISOMETRIC VIEW, BILL OF MATERIALS<br>AND NOTES | JDW DRAUGHTING SERVICES<br>J.A.M. DE WAAL, 12 BRIGHTWELL STREET PAPA KURA 2110.<br>NEW ZEALAND. PHONE: 0064 09 2988815. MOB: 0211791000<br>E-MAIL: dewaal@xtra.co.nz. |  <b>JDWDS</b> | AUGUST-2015     | DWG SCALE: NTS @A3 OR AS SHOWN                            |
|                                                                 |                                                |                                                                                                                                                                       |                                                                                                    | SHEET: 02 OF 12 | Copyright © J.A.M. DE WAAL PAPA KURA NZ<br>A3 No: FIRE-02 |