Murdoch's Wooden Horse on Wheels

An Extension to "Thinking Like Murdoch"

V1.5, Nov. 30/16 (Part "F" – File 17f)

Document Revision History

Ver #	Date	Description of Changes (Section # and Summary Points)	Author
1.0	Nov. 11/16	Part A Project introduction and initial version (file 17a) reflecting preliminary design of the crossbar in the master.ipt file	D.B. McCowan
1.1	Nov. 15/16	Part B File 17b addresses finishing the crossbar and rear left leg and beginning to break down the vehicle into sub-systems	D.B. McCowan
1.2	Nov. 22/16	Part C File 17c begins to address the front end of the Wooden Horse on Wheels	D.B. McCowan
1.3	Nov. 23/16	Part D File 17d addresses: -mirroring solids across a plane using Join and New Solid -Make Components: generating individual part files (*.ipt) for each selected solid in any sub-assembly of the Master.ipt file -Generating an *.iam Assembly file: for the entire product or for any particular sub-assembly of solids within the Master.ipt -Generating an *.idw 3-view drawing file: for the entire product or for any particular sub-assembly of solids within the Master.ipt -A high level format for a Design Review. NOTE: You were also given detailed marking schemes: Inventor_Marking_Criteria.doc and MarkingScheme_Probl_Solving_3DCAD.doc **-NOTE: DO NOT MAKE ANY DESIGN CHANGES IN ANY FILE OTHER THAN IN THE *.Master.ipt** **-NOTE: On Nov. 24/16 there will be another Moodle quiz on thinkproblemsolving.org – "Problem Solving and Curriculum Connections"**	D.B. McCowan
1.4	Nov. 29/16	Part E … File 17e… Steering Frame Continued... getting ready to integrate the "Driving" subsystem	D.B. McCowan
1.5	Nov. 30/16	Part F … File 17f… Starting to integrate the "Driving" subsystem into the Steering Sub-System	D.B. McCowan

CONTENTS

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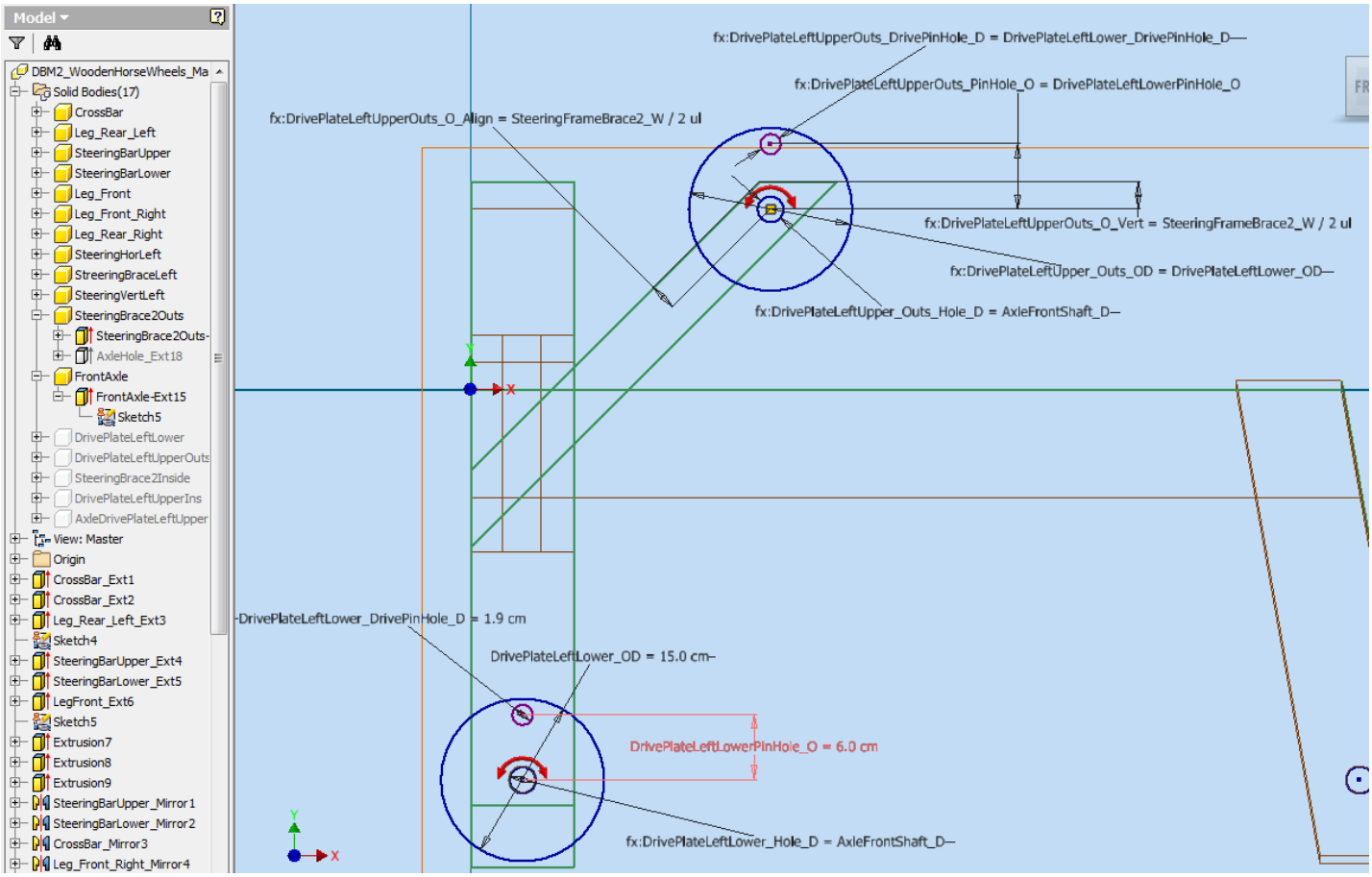
Resources

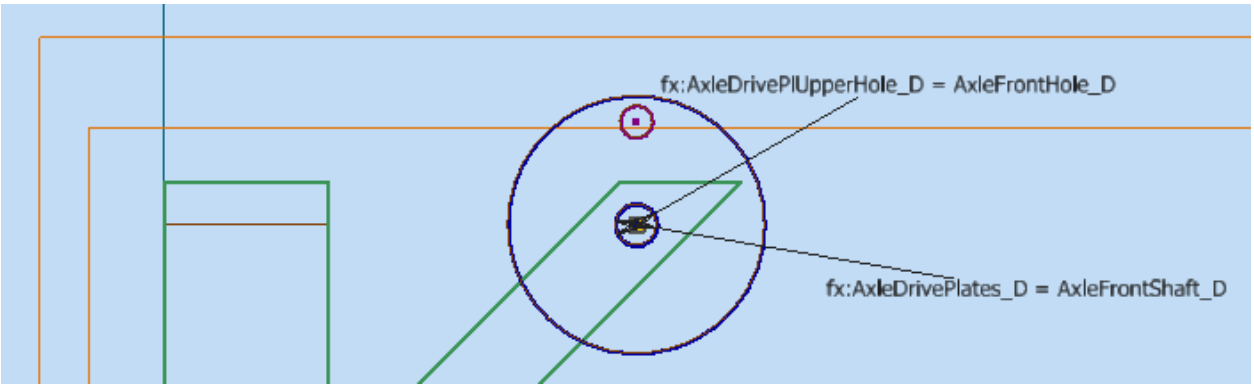
Reference Document / Filename	Description / Key Concepts	Author	For Vn
Rubric_Information_Processing.doc	Information Processing is an element of the Thinking Achievement Category	D.B. McCowan	1
Written_Report_Rubric.doc	Written reports are an element of the Communication Achievement Category (Technical Communication is key)	D.B. McCowan	1
Inventor_Marking_Criteria.doc	Following best practices for computer aided design (CAD)	D.B. McCowan	1
MarkingScheme_Probl_Solving_3DCAD.doc	Regarding how thoroughly you solved the Problem during the design stage	D.B. McCowan	1
thinkproblemsolving.org	TDJ3M Quizzes	D.B. McCowan	1
Design_Process_Stages_Details.doc	The Design Process – A Problem-Solving Strategy	D.B. McCowan	1

1 "Driving Sub-System" – The Early Steps

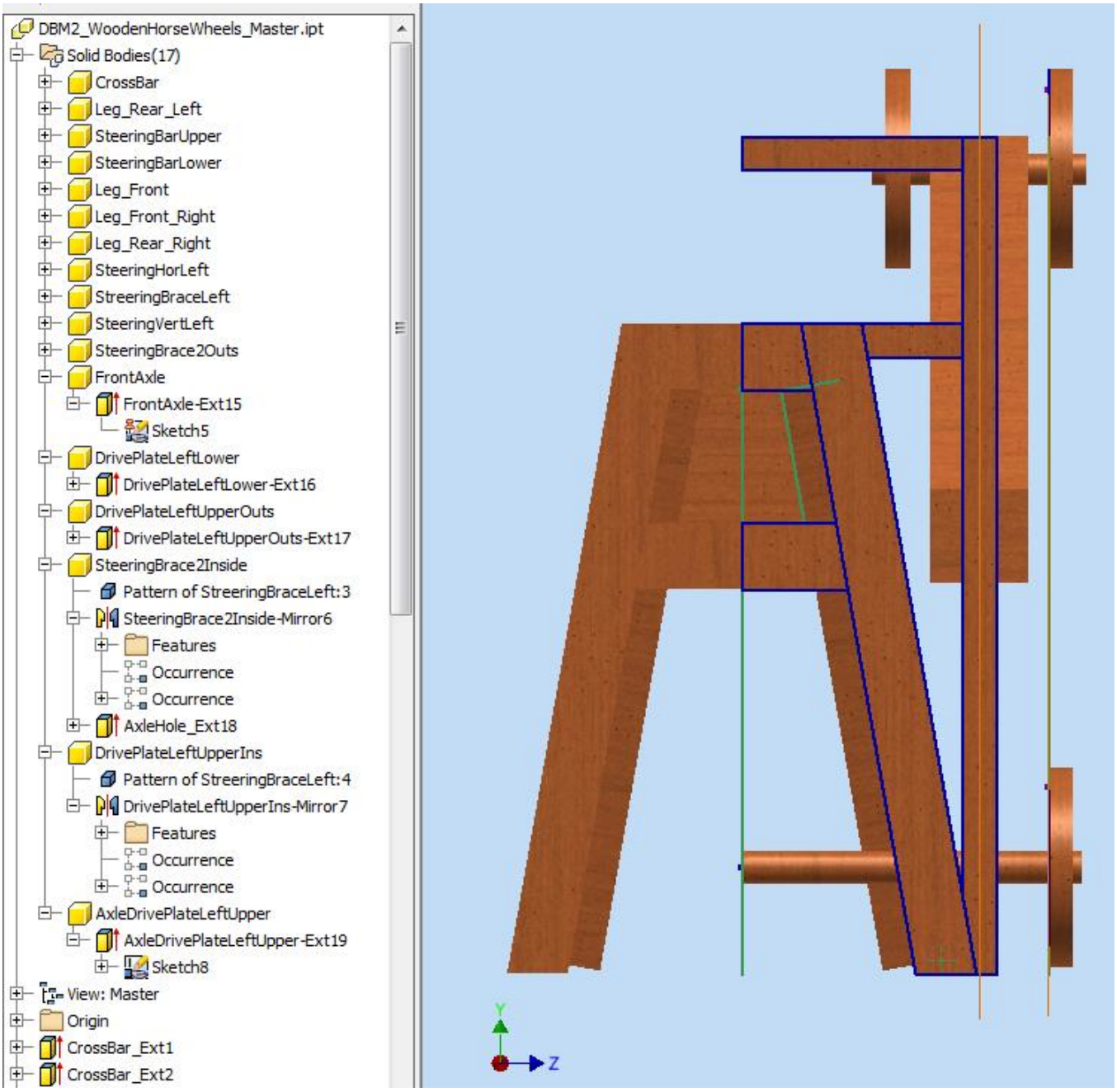
1) Two new Workplanes
   a) DrivePlate_WkPl1_XYOff – offset from the XY plane
      i) Sketch8 for the outside drive plates



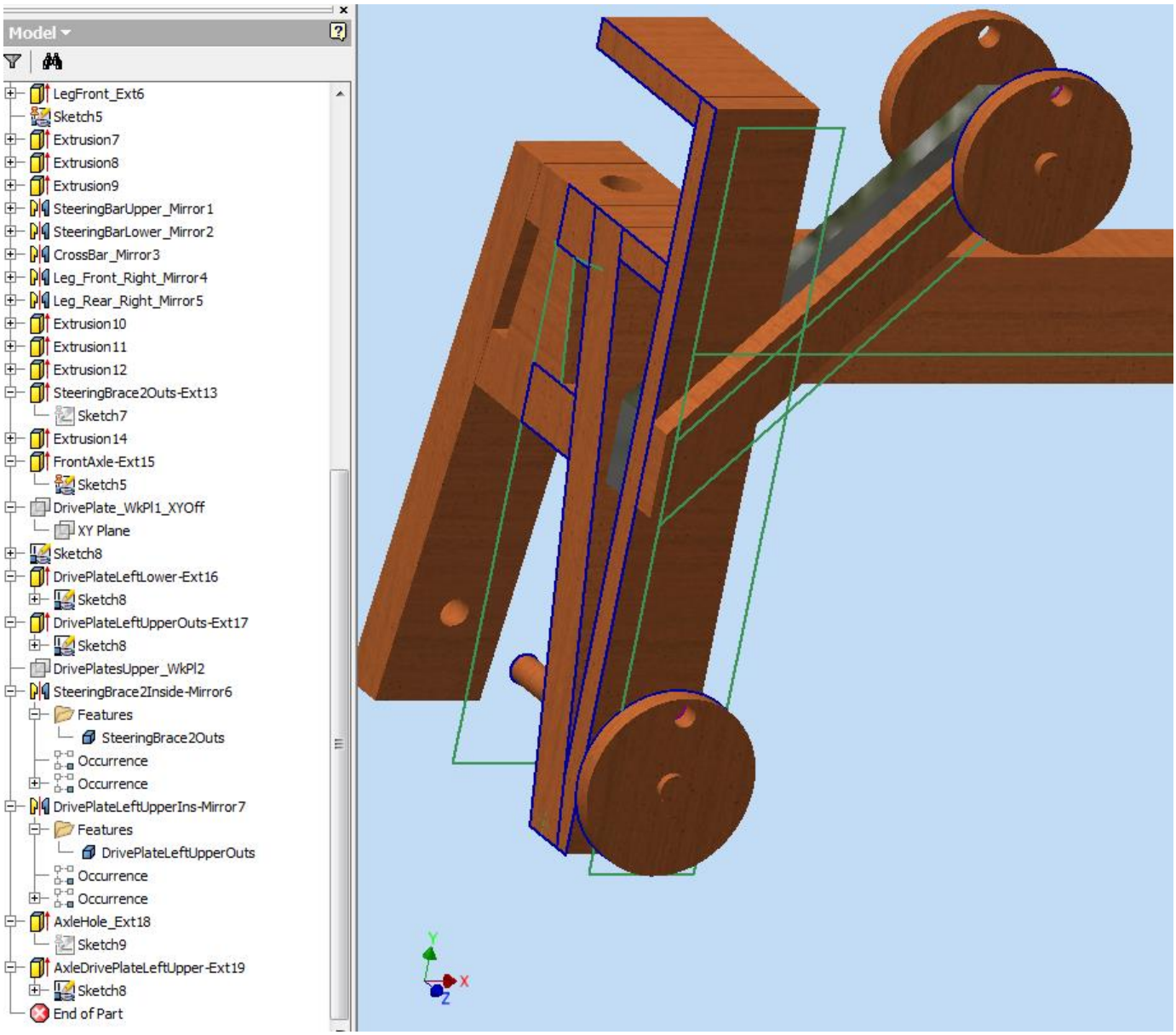
b) DrivePlatesUpper_WkPl2 – midway between the two parallel faces of SteeringVertLeft
   i) Sketch9 for mirroring for the upper inside drive plate and axle



2) Note that StreeringBraceLeft has been re-dimensioned so that it moves upwards to allow for the addition of SteeringBrace2Inside
   a) You should be thinking of an improvement in this regard – improved lateral bracing for the "Driving" sub-system



3)


Model
LegFront_Ext6
Sketch5
Extrusion7
Extrusion8
Extrusion9
SteeringBarUpper_Mirror1
SteeringBarLower_Mirror2
CrossBar_Mirror3
Leg_Front_Right_Mirror4
Leg_Rear_Right_Mirror5
Extrusion10
Extrusion11
Extrusion12
SteeringBrace2Outs-Ext13
Sketch7
Extrusion14
FrontAxle-Ext15
Sketch5
DrivePlate_WkPl1_XYOff
XY Plane
Sketch8
DrivePlateLeftLower-Ext16
Sketch8
DrivePlateLeftUpperOuts-Ext17
Sketch8
DrivePlatesUpper_WkPl2
SteeringBrace2Inside-Mirror6
Features
SteeringBrace2Outs
Occurrence
Occurrence
DrivePlateLeftUpperIns-Mirror7
Features
DrivePlateLeftUpperOuts
Occurrence
Occurrence
AxleHole_Ext18
Sketch9
AxleDrivePlateLeftUpper-Ext19
Sketch8
End of Part
Y
X
Z

4)

SteeringFrameBrace2_Ang	deg	45.0 deg	45.000000
SteeringFrameBrace2_W	cm	5.0 cm	5.000000
Handle_O	cm	17.0 cm	17.000000
SteeringFrameBrace2_T	cm	2.5 cm	2.500000
d54	deg	0.0 deg	0.000000
SteeringVertLeftShaft_D	cm	AxleFrontHole_D	2.500000
d57	deg	0.0 deg	0.000000
AxleFrontShaft_D	cm	AxleFrontHole_D - 0.1 cm	2.400000
AxleFrontHalf_L	cm	FrontEndStance_Half_L_Ref + 8.0 cm + SteeringFrameBrace2_T	25.567319
d60	deg	0.0 deg	0.000000
DrivePlateLeft_WkPl1_Oxy	cm	SteeringFrameBrace2_T + FrontEndStance_Half_L_Ref + SteeringVertLeft_T + 3.0 cm	23.067319
DrivePlateLeftLower_Hole_D	cm	AxleFrontShaft_D	2.400000
DrivePlateLeftLower_OD	cm	15.0 cm	15.000000
DrivePlateLeftLower_DrivePinHole_D	cm	1.9 cm	1.900000
DrivePlateLeftLowerPinHole_O	cm	6.0 cm	6.000000
DrivePlateLeftLower_T	cm	1.9 cm	1.900000
d68	deg	0.0 deg	0.000000
DrivePlateLeftUpper_Outs_OD	cm	DrivePlateLeftLower_OD	15.000000
DrivePlateLeftUpper_Outs_Hole_D	cm	AxleFrontShaft_D	2.400000
DrivePlateLeftUpperOuts_DrivePinHole_D	cm	DrivePlateLeftLower_DrivePinHole_D	1.900000
DrivePlateLeftUpperOuts_PinHole_O	cm	DrivePlateLeftLowerPinHole_O	6.000000
DrivePlateLeftUpperOuts_O_Align	cm	SteeringFrameBrace2_W / 2 ul	2.500000
DrivePlateLeftUpperOuts_O_Vert	cm	SteeringFrameBrace2_W / 2 ul	2.500000
DrivePlateLeftUpperOuts_T	cm	DrivePlateLeftLower_T	1.900000
d76	deg	0.0 deg	0.000000
AxleDrivePlUpperHole_D	cm	AxleFrontHole_D	2.500000
d78	cm	SteeringFrameBrace2_T * 3 ul	7.500000
d79	deg	0.0 deg	0.000000
AxleDrivePlates_D	cm	AxleFrontShaft_D	2.400000
AxleDrivePlate_Lout	cm	DrivePlateLeftUpperOuts_T * 1.5 ul	2.850000
AxleDrivePlate_Lins	cm	DrivePlateLeftUpperOuts_T * 3 ul + SteeringFrameBrace2_T * 3 ul	13.200000
d83	deg	0.0 deg	0.000000
d84	deg	0.0 deg	0.000000
Reference Parameters			
CrossBarBott_L_Ref	cm	81.76 cm	81.760000
SteeringBarUpper_HAlign_Ref	cm	4.66 cm	4.662765
FrontEndStance_Half_L_Ref	cm	15.07 cm	15.067319
User Parameters			

5)

2 Self and Peer Assessment of This Version of the Report

Assessor's Name and Additional Notes in Red Font: by John Doe