Parts Manager Instructions
Document #221206a
Revised December 6, 2022

This guide will walk you through the process of generating a Bill of Materials (BoM) and ensuring parts are in hand at the right time.

COMPONENT PROPERTIES

A component's properties should contain the following information:
Part number: Manufacturer part number (or the name of the part if we are machining it)

Part name: This value shouldn't need to be changed often—it should clearly and succinctly describe the part as well as include the mfg. part number for clarity.

Description: A link to the part source on a vendor website. Note; alternate vendors can be found in the purchasing stage for price/availability reasons.

To access and/or change the properties, right click a component, click "Properties" and click a textbox to change its value. If the component is within a linked assembly or is itself a linked component, right click the linked assembly or component and click "Edit in Place" then right click the component to edit properties.

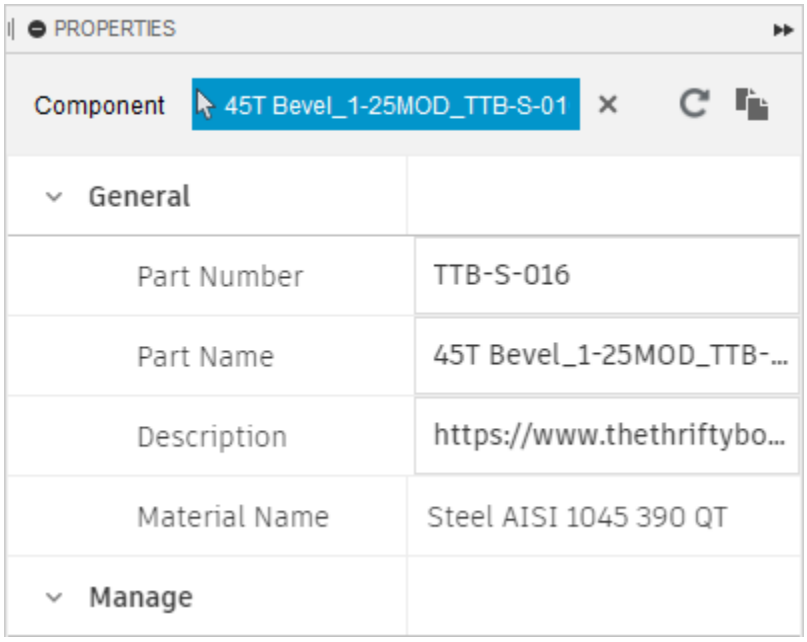

Fig. 1: An example properties list with mfg. part number, part name, and link to web page from which it can be purchased.

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BoM GENERATION

Follow the following steps to quickly generate a Bill of Materials (BoM).

1. When a subassembly is ready for manufacturing, click “Design>Drawing>From Design” as shown. Choose the options shown below.

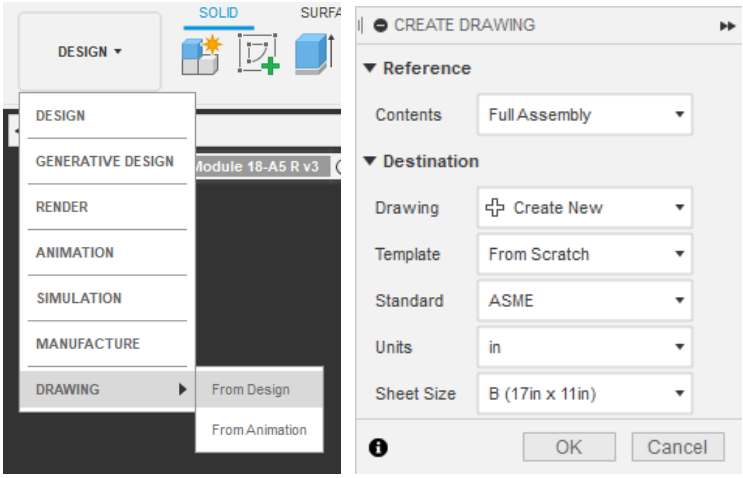

Fig. 2: How to generate a drawing.

2. Place the base view wherever you want—it doesn’t matter, then click “Ok” on the “Drawing View” box. Click “Tables>Parts List” and select “All Level” in structure to show all components, not just the top level components. Click anywhere on the drawing to place the table.

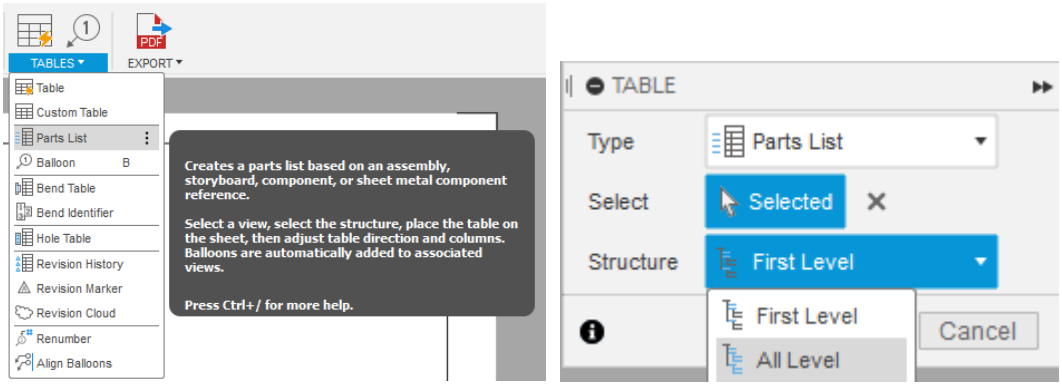

Fig. 3: How to generate a parts list table.

3. Double click anywhere on the table, then ensure the following columns are shown: Item, Qty, Part Number, Part Name, Description, Material.

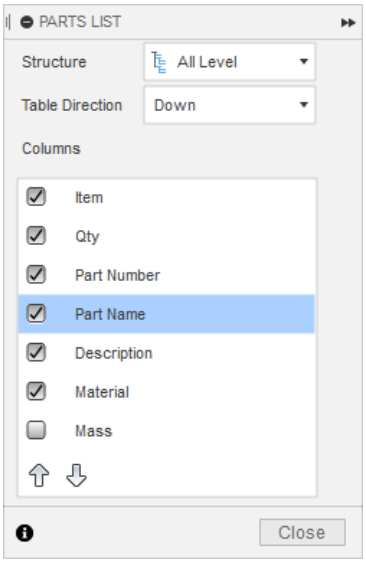

Fig. 4: Parts list columns dialog box.

4. Right click the table, then click “Export>Export CSV”. Name the file after the assembly name and include how many of that assembly we will be needing if we need more than one. In this example, we need four swerve modules.

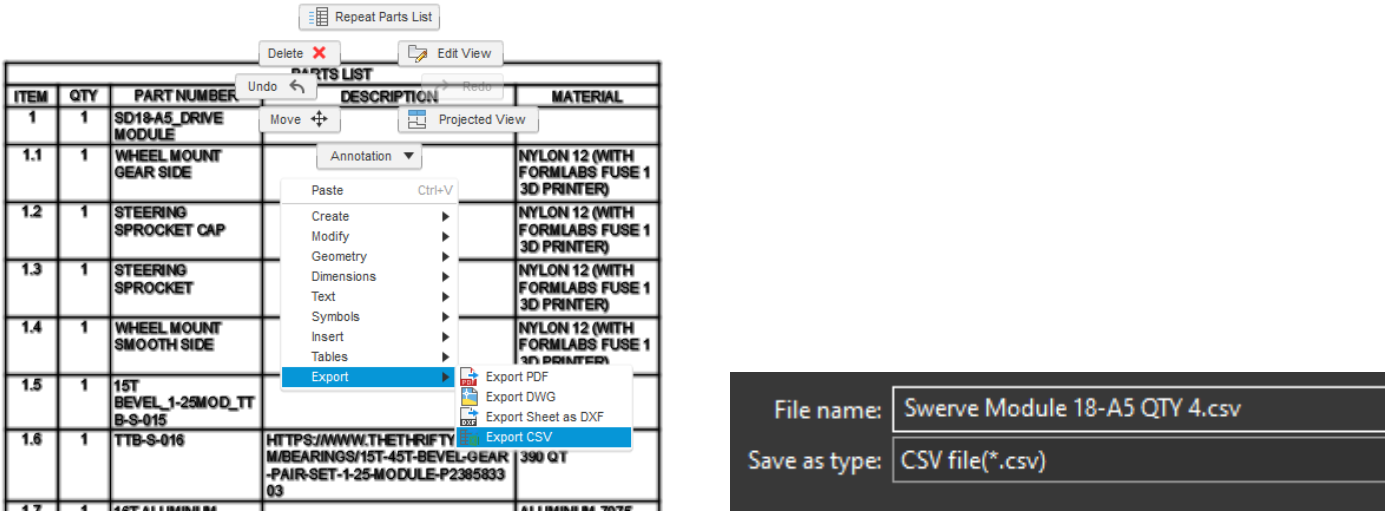

Fig. 5: How to export a .csv parts list.

5. Open the .csv file in Excel, Google Sheets, or other spreadsheet software. Note all items with missing information most be filled in within Fusion 360. This spreadsheet can be used to know which parts need their properties filled. Please note: If the Part Number and Part Name are the same, it means the Part Number has not been properly filled out.

PARTS LIST					
ITEM	QTY	PART NUMBER	PART NAME	DESCRIPTION	MATERIAL
1	1	SD18-A5_DRIVE MODULE	SD18-A5_DRIVE MODULE V3		
1.1	1	WHEEL MOUNT GEAR SIDE	WHEEL MOUNT GEAR SIDE		NYLON 12 (W
1.2	1	STEERING SPROCKET CAP	STEERING SPROCKET CAP		NYLON 12 (W
1.3	1	STEERING SPROCKET	STEERING SPROCKET		NYLON 12 (W
1.4	1	WHEEL MOUNT SMOOTH SIDE	WHEEL MOUNT SMOOTH SIDE		NYLON 12 (W
1.5	1	15T BEVEL_1-25MOD_TTB-S-015	15T BEVEL_1-25MOD_TTB-S-015 V2		STEEL AISI 10
1.6	1	TTB-S-016	45T BEVEL_1-25MOD_TTB-S-016	HTTPS://WWW.THETHRIF	STEEL AISI 10
1.7	1	16T ALUMINUM SPUR GEAR (20 DP, 3_8 HEX BORE) (217-5450)	16T ALUMINUM SPUR GEAR (20 DP, 3_8 HEX BORE) (217-5450) V2		ALUMINUM
1.8	1	20T ALUMINUM SPUR GEAR (20 DP, 1_2 HEX BORE) (217-2702)	20T ALUMINUM SPUR GEAR (20 DP, 1_2 HEX BORE) (217-2702) V2		ALUMINUM
1.9	1	18-A5_WHEEL_HUB A	18-A5_WHEEL_HUB A		NYLON 12 (W
1.1	1	18-A5_WHEEL_TREAD	18-A5_WHEEL_TREAD		RUBBER, NIT
1.11	1	18-A5_WHEEL_HUB B	18-A5_WHEEL_HUB B		NYLON 12 (W
1.12	6	92949A270_10-32X0.875_18-8 STAINLESS STEEL BUTTON HEAD HEX DRIVE SCREW	92949A270_10-32X0.875_18-8 STAINLESS STEEL BUTTON HEAD HEX DRIVE SCREW V2		STAINLESS S
1.13	1	94669A129_M4X30MM_ALUMINUM SPACER (DRILLED TO 5 MM)	94669A129_M4X30MM_ALUMINUM SPACER (DRILLED TO 5 MM) V3		ALUMINUM
1.14	4	TTB-0006-F688Z-FLANGED-8MM-BEARING	TTB-0006-F688Z-FLANGED-8MM-BEARING V3		STEEL
1.15	1	KA025XPO_3INODX2.5INIDX0.25INT	KA025XPO_3INODX2.5INIDX0.25INT V1		SOLIDWORK
1.16	1	8MM TO 1_2 HEX ADAPTER (217-3255) V2	8MM TO 1_2 HEX ADAPTER (217-3255) V2		ALUMINUM
1.17	1	3_8 HEX X .165 ID THUNDERHEX STOCK (36) (217-5837) DRIVE SHAFT	3_8 HEX X .165 ID THUNDERHEX STOCK (36) (217-5837) DRIVE SHAFT		ALUMINUM
1.18	1	DRIVE SHAFT SPACER	DRIVE SHAFT SPACER		NYLON 12 (W
1.19	1	688Z-8MM-BEARING	688Z-8MM-BEARING V2		STEEL
1.2	1	HEX BORE MAG ENCODER HOUSING (217-6785)	HEX BORE MAG ENCODER HOUSING (217-6785)		NYLON 6/6
1.20.1	1	217-6785-100 REV1	217-6785-100 REV1		NYLON 6/6
1.20.1.1	1	217-6785-001 REV5	217-6785-001 REV5		NYLON 6/6
1.20.1.2	1	217-6785-002 REV4	217-6785-002 REV4		NYLON 6/6
1.20.1.3	1	217-6785-003 REV7_18T STEEL	217-6785-003 REV7_18T STEEL		NYLON 6/6

Fig. 6: Sample Parts List with plenty of missing information.

FINDING MISSING INFORMATION

Look at each component with missing information within Fusion 360. It will often be obvious whether it is a part we will machine or not. If you have ANY doubts, ask a mentor. Some listings in the Parts List, such as “1: SD18-A5_DRIVE MODULE”, are entire assemblies and are to be treated like internally manufactured parts—they don’t need manufacturer’s part numbers or vendor links in the description as these values don’t exist. It is not critical to have the “material” filled out for each component, it is just there for reference.

For components which are determined to be COTS components (normally hinted at by the presence of an obvious part number somewhere in the part name), copy the section of the name that seems most like a part number and Google it. It may take a couple attempts to copy the right portion of the Part Name. 9 times out of 10, the first search result will be correct. Do a common sense check to confirm the part on the website is actually the part in the CAD file. If in doubt, ask a mentor. Proceed to fill in the missing information in the relevant component properties in the assembly in Fusion 360. Once complete, repeat the process of exporting the Parts List/BoM.

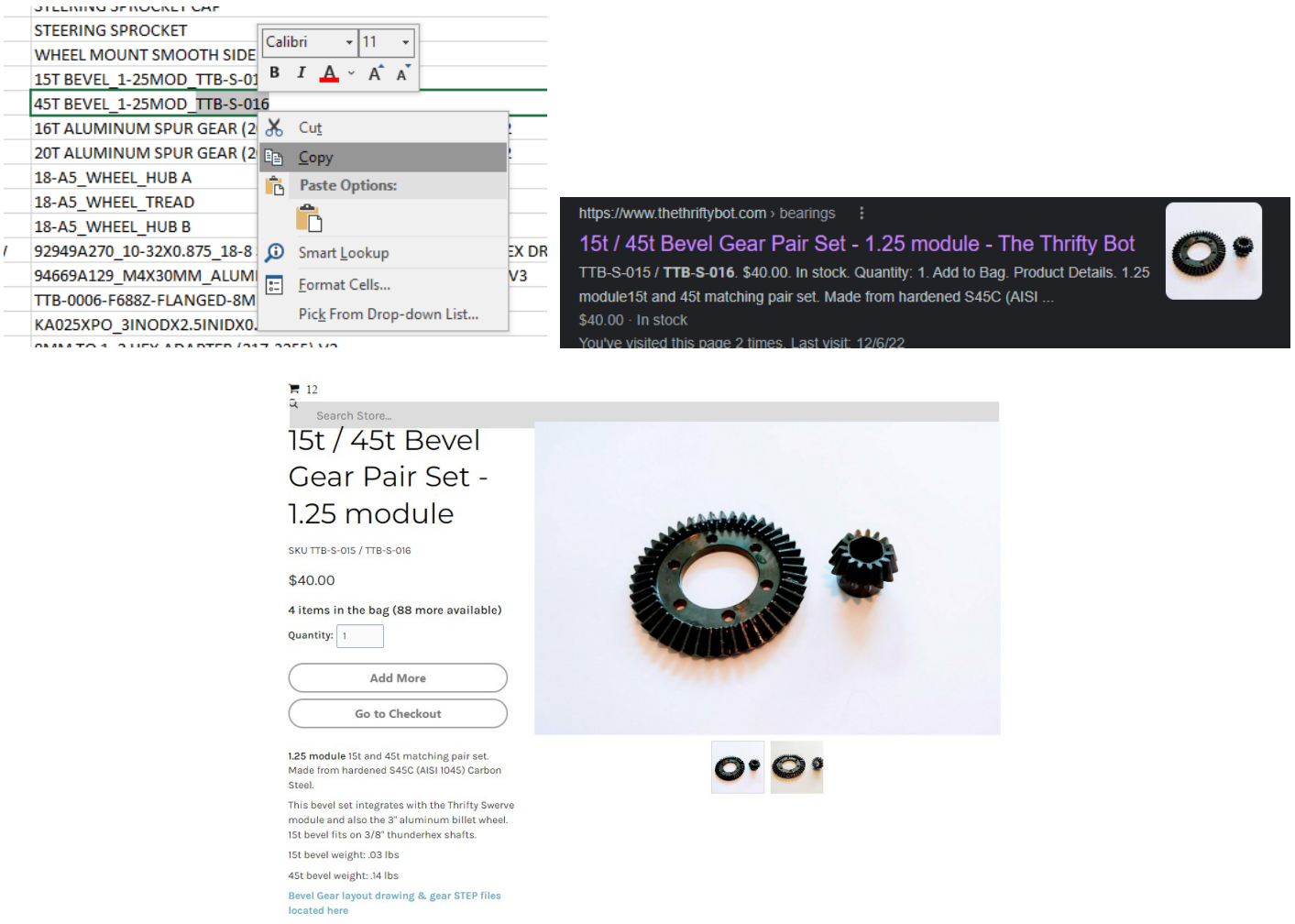

Fig. 7: How to find vendor links and implicitly find part numbers by searching the web.

VERIFYING STOCK

The easiest way to verify the existence of COTS components and raw materials is to have it right in front of you, enabling you to count objects for each listing and highlight the row green once you've confirmed it's in stock. Highlight yellow if you are unsure, or red if you know we don't have enough.

Create a new column named "TOTAL QTY" and set it to the following formula and expand to fill out the column:

=B3[SUBASSEMBLY QTY LISTED IN .CSV FILE NAME]*

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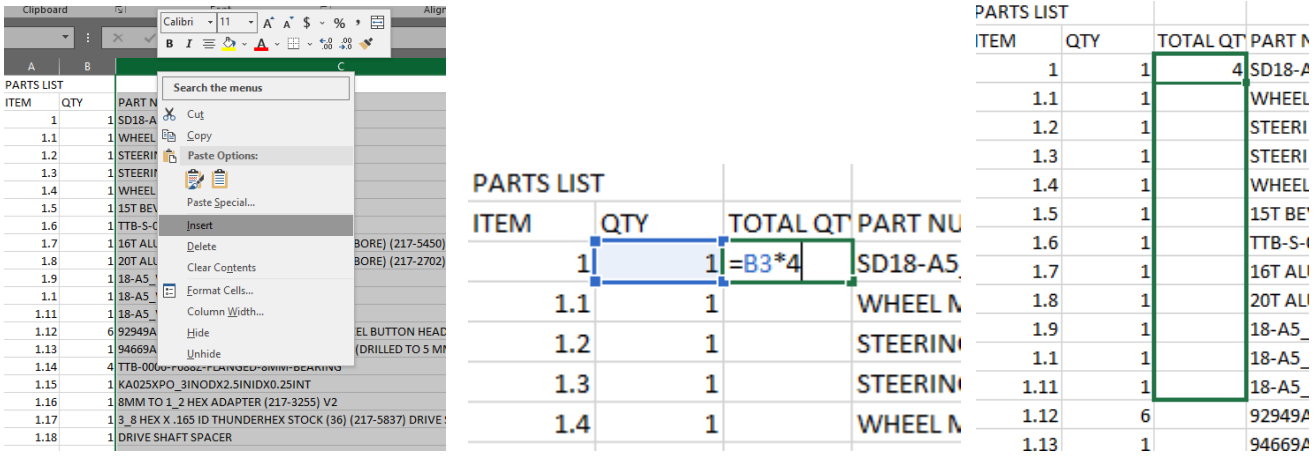

Fig. 8: How to make the "TOTAL QTY" column, using the "Swerve Module 18-A5 ***QTY 4****" as reference.*

Then in a new column named "QTY NEEDED", write how many additional units we need. Please keep in mind that this value should be equal to "TOTAL QTY" minus [How many units we have].

PARTS LIST

ITEM	QTY	TOTAL QT	PART NUMBER	PART NAME	DESCRIPTION	MATERIAL	QTY NEEDED
1	1	4	SD18-A5_DRIVE MODULE	SD18-A5_DRIVE MODULE V3			4
1.1	1	4	WHEEL MOUNT GEAR SIDE	WHEEL MOUNT GEAR SIDE		NYLON 12 ?	
1.2	1	4	STEERING SPROCKET CAP	STEERING SPROCKET CAP		NYLON 12 ?	
1.3	1	4	STEERING SPROCKET	STEERING SPROCKET		NYLON 12	0

Fig. 9: Sample parts listings (note missing descriptions and part numbers since these are either assemblies or internally manufactured parts) - the QTY needed and colors here are simulated to show examples of missing parts, parts of unknown quantity, and parts we have.

If a part is NOT in front of you and you are unsure if it is out of stock, mark it yellow. When a mentor looks at the sheet to purchase parts, they can determine if the parts have already been purchased and modify the sheet accordingly.

Once this process is complete, please notify John Taylor.