	Client: VotingWorks	Doc. No.: VWX-001-D020
	Project: Ballot Receptacle	Revision: X01
	Doc. Title: Tube Nut Assembly Instruction	Date: 11/04/2024

1.0 PURPOSE

The purpose of this document is to describe the required parts, assemblies, tools and preparation, for installing star nuts into tubes for assembly of the Rear Bottom Tube Assembly (VX~01-10003), Front Bottom Tube Assembly (VX~01-10035), Rear Vertical Tube Assembly (VX~01-10004), Front Vertical Tube Assembly (VX~01-10036) and Door Hinge Tube Assembly (VX~01-10115)


2.0 PARTS & ASSEMBLIES

2.1 Made-To-Spec (MTS)

Item Number	Description
VX~01-10005	Assy, Rear Bottom Weld
VX~01-10037	Assy, Front Bottom Weld
VX~01-10009	Tube, Rear Vertical
VX~02-10041	Tube, Front Vertical
VX~02-10086	Tube, Door Hinge

2.2 Off-The-Shelf (OTS)

Item Number	Description
VX~99-10021	Tube Nut, M6, 0.75 IN tube
VX~99-10020	Tube Nut, M6, 1.0 IN tube

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3.0 TOOLS

3.1 Made-To-Spec (MTS)

Item Number	Description
VWX-001-P051	Cup, 1.0IN Tube
VWX-001-P053	Pusher, 1.0IN Tube
VWX-001-P052	Cup, 0.75IN Tube
VWX-001-P054	Pusher, 0.75IN Tube

3.2 Off-The-Shelf (OTS)


Supplier	Part Number	Description
-	-	Lathe
-	-	4MM Hex wrench

4.0 PREPARATION

none

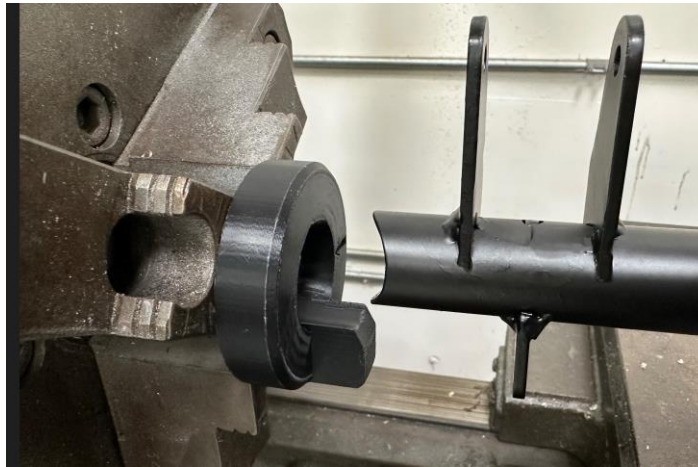
5.0 ASSEMBLY PROCESS

Assemble the Rear Bottom Tube Assembly (VX~01-10003), Front Bottom Tube Assembly (VX~01-10035), Rear Vertical Tube Assembly (VX~01-10004), Front Vertical Tube Assembly (VX~01-10036) and Door Hinge Tube Assembly (VX~01-10115) as defined in the following steps.

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STEP 1 ASSEMBLY OF TUBE NUTS INTO REAR BOTTOM WELD ASSY (VX~02-10005) AND FRONT BOTTOM WELD ASSY (VX~02-10037)

1.1 Install the 1.0 IN tube cup (VWX-001-P051) into the lathe 3 jaw chuck.




1.2 Thread the tube nut (VX~99-10020) onto the screw of the 1.0 IN tube pusher (VWX-001-P053) and lightly tighten with 4MM hex wrench.



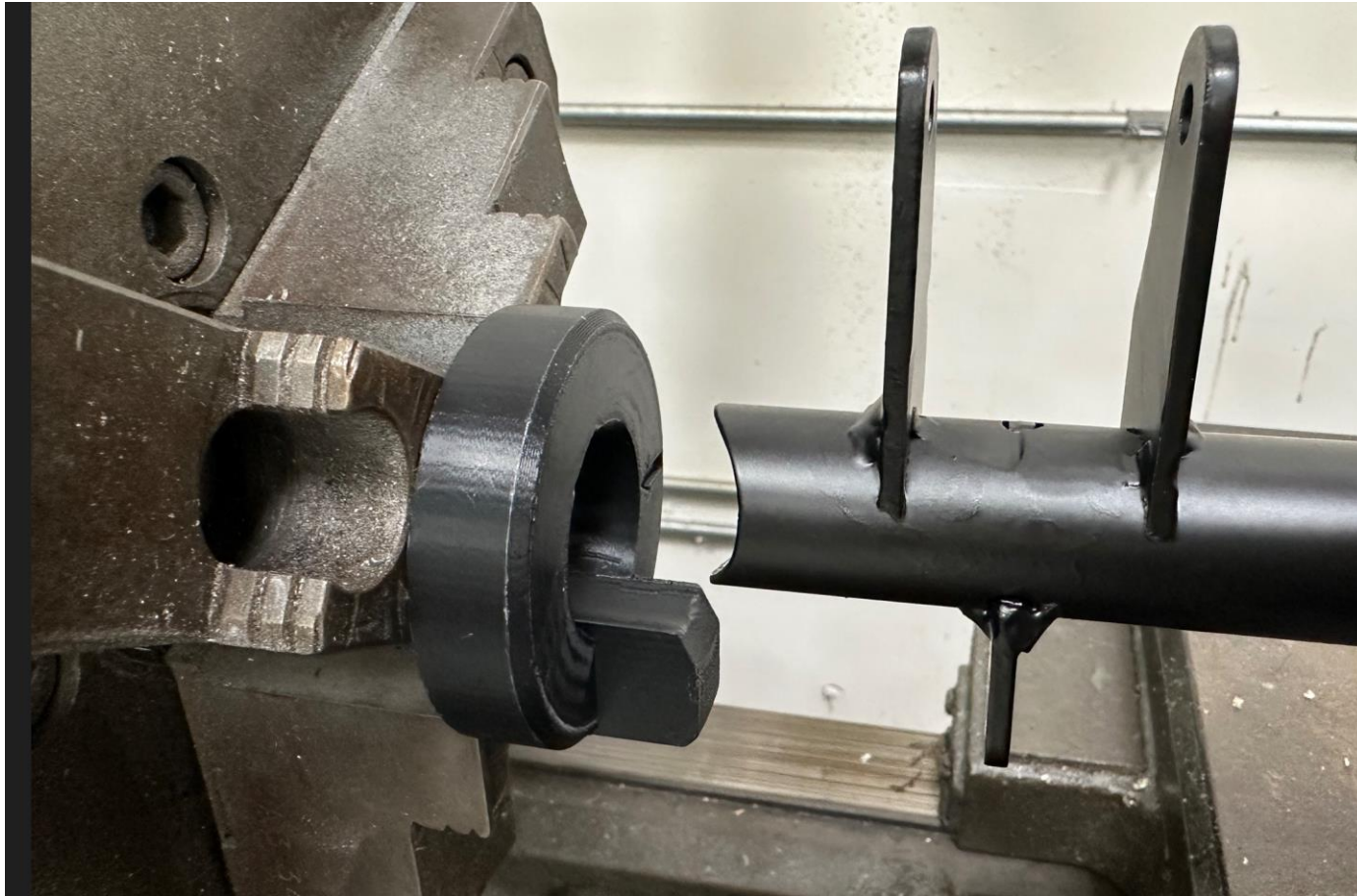
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1.3 Slide the bottom tube into the 1.0 IN tube cup.




NOTE: Orient the tube notch with the arrow on the cup as shown

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- 1.4 Place the pusher with attached tube nut into position at the free end of the bottom tube.



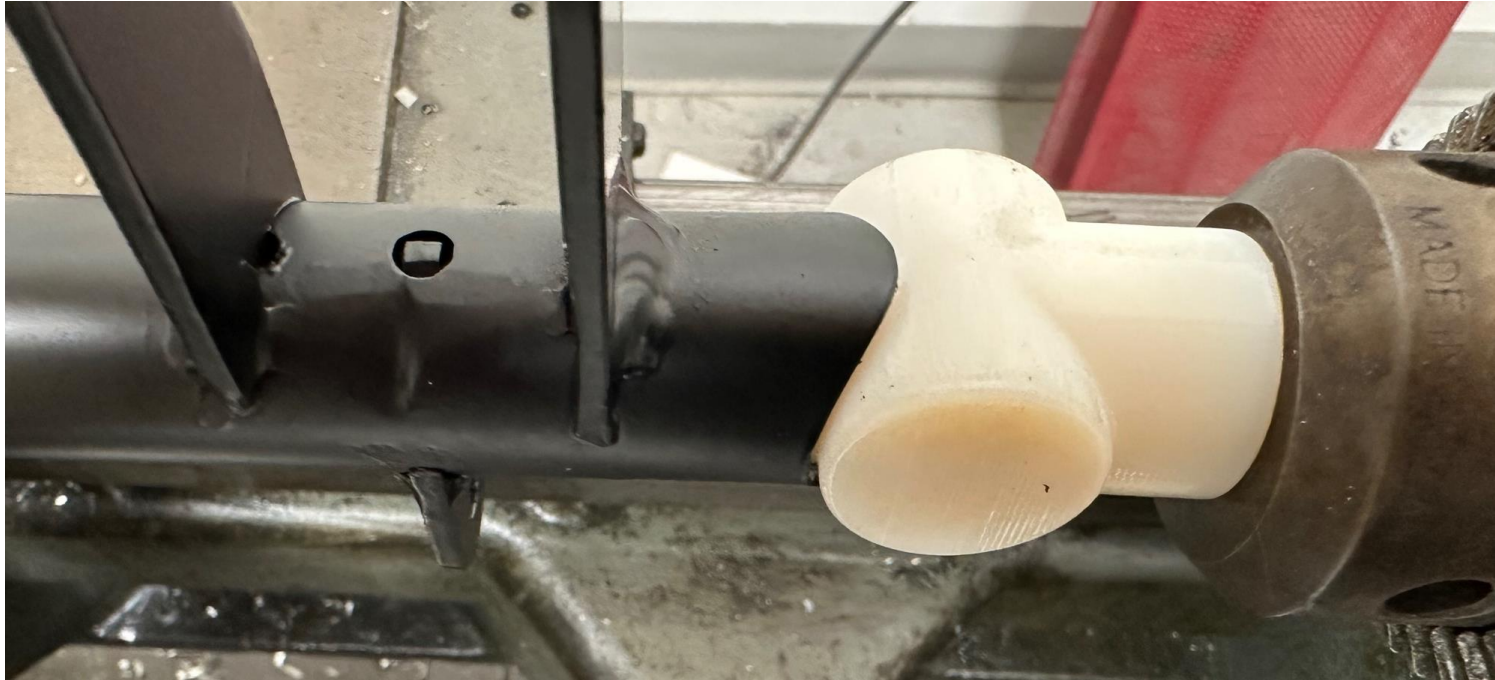
NOTE: Orient the pusher so it aligns with the tube's notch as shown

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- 1.5 Push the tube nut into the bottom tube by advancing the lathe's drill chuck until the pusher bottoms out on the tube.



- 1.6 While holding the tube assy with one hand, use the other to move the lathe's drill chuck out of the way.
- 1.7 Remove the tube assy.
- 1.8 Using a 4MM hex wrench, remove the pusher from the tube assy.
- 1.9 Repeat with the opposite end of the tube.

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STEP 2 ASSEMBLY OF TUBE NUTS INTO REAR VERTICAL TUBE (VX~02-10009), FRONT VERTICAL TUBE (VX~02-10041) AND DOOR HINGE TUBE (VX~02-10086)

2.1 Install the 0.75 IN tube cup (VWX-001-P052) into the lathe 3 jaw chuck.




2.2 Thread the tube nut (VX~99-10021) onto the screw of the 0.75 IN tube pusher (VWX-001-P054) and lightly tighten with 5MM hex wrench.



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2.3 Slide the bottom tube into the 0.75 IN tube cup.




NOTE: If the tube end is notched, orient the tube such that the notch is aligned with the arrow on the cup.

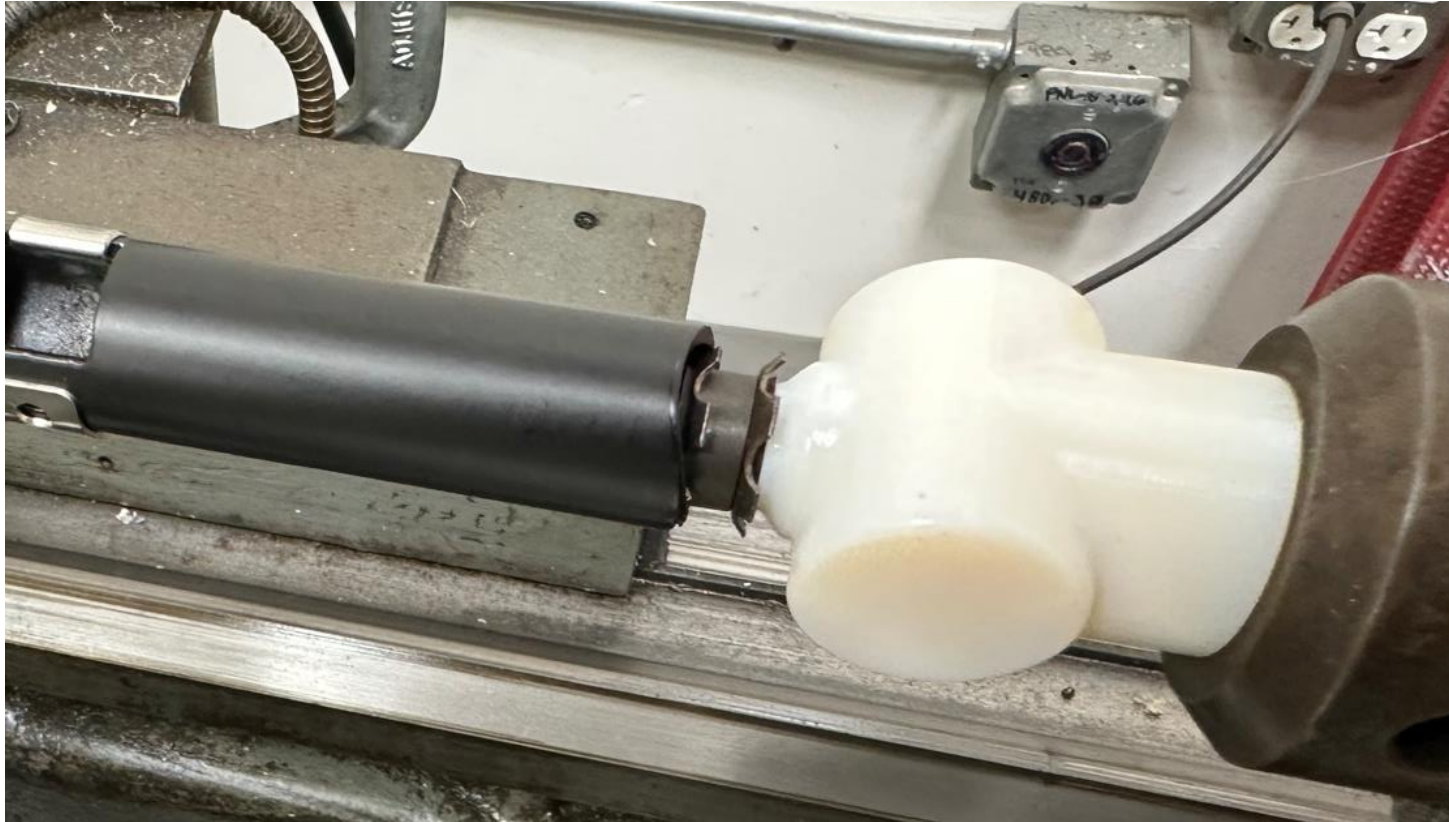
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2.4 Place the pusher with attached tube nut into position at the free end of the bottom tube.




NOTE: If the tube end is notched, orient the pusher such that its transverse cylindrical feature is aligned with it. There are no notches in the Door Hinge Tube.

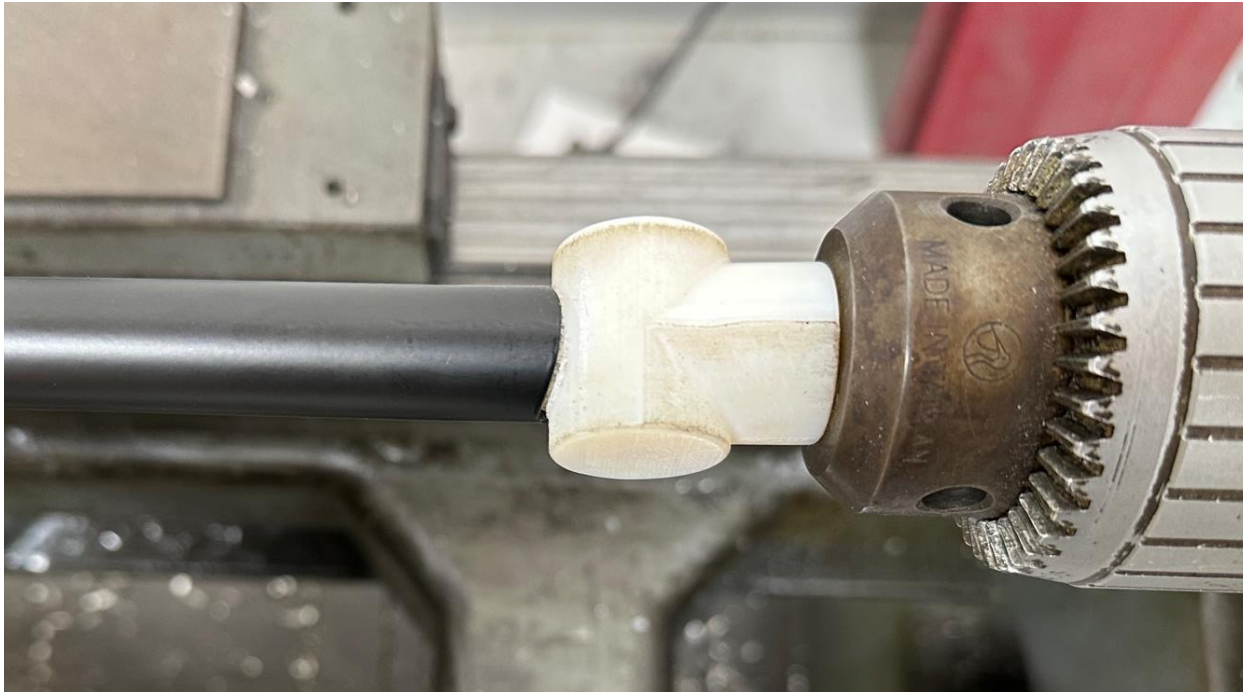
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- 2.5 Push the tube nut into the bottom tube by advancing the lathe's drill chuck until the pusher bottoms out on the tube.



- 2.6 While holding the tube assy with one hand, use the other to move the lathe's drill chuck out of the way.
- 2.7 Remove the tube assy.
- 2.8 Using a 4MM hex wrench, remove the pusher from the tube assy.
- 2.9 Repeat with the opposite end of the tube.

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REVISION HISTORY AND APPROVALS

If this document is a released alpha-revision, a record of the approvers and specifics of the approval process associated with each released version of this document is contained in the CR# listed in the table, and available for review on NOVO's online CR system.

Rev	Description	CR#	Date	Submitted By
X01	Initial Draft	N/A		