

REFERENCE:	Nova Bus Manuals
SECTION:	18: Articulation System
RS N°:	n/a
EFFECTIVE IN PROD.:	n/a

APPLICATION DEADLINE:NA

SUBJECT:	Articulation Potentiometer
JUSTIFICATION:	New Potentiometer available in service

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	Replacement of the current articulation potentiometer	Client	Client	
2	–	–	–	–

MATERIAL

QTY	PART N°	REV.	DESCRIPTION	REPLACES PART N°
LEVEL 1				
	N80023	–	ARTICULATION POTENTIOMETER	N45874
LEVEL 2				
–	–	–	–	–

DISPOSAL OF PARTS

REMOVED PARTS ARE:	DISCARDED *	RETAINED	* Dispose of the unused parts and the defective parts in accordance with local environmental standards in effect.
	Yes	–	

REVISION HISTORY

REV.	DATE	CHANGE DESCRIPTION	WRITTEN BY
NR	2015JA20	Initial release	Marc Rougeau

APPROVED BY: Daniel Theriault

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Date: 2015.01.21 13:41:58 -05'00'

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CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Ames Transportation Agency - Iowa	L707	660	661	S92U5C4500159	S92U1C4500160	2
ATUQ pré-série BAE 60	L790	—	—	S92L5E3001235	S92L5E3001235	1
Austin - CMTA - Texas	L635	5001	5001	S92U7C4500163	S92U7C4500163	1
Austin - CMTA - Texas	L636	5002	5022	S92U1D4500306	S92U0D4500328	21
Clemson Area Transit - South Carolina	L617	—	—	S92U5C4500002	S92U5C4500002	1
Clemson Area Transit - South Carolina	L769	—	—	S92U1D4500418	S92U1D4500418	1
CT Transit - Connecticut	L554	1041	1065	S92U1A4000139	S92U0A4000164	25
CT Transit - Connecticut	L571	1101	1110	S92YXB4000144	S92Y4B4000169	10
Demo - Articulated Bus	L433	—	—	S92UX93000029	S92UX93000029	1
Duke University - North Carolina	L651	—	—	S92Y1B4000145	S92Y3B4000146	2
Fredericton - New Brunswick	L812	—	—	L82J4E3001202	L82J4E3001202	1
Halifax - Nova Scotia	L558	717	731	S92UXA3000293	S92U6A3000307	15
Halifax - Nova Scotia	L613	732	741	S92UXB3000019	S92UXB3000028	10
Halifax - Nova Scotia	L708	742	761	L92UXC3000782	S92U3C3000803	20
Houston - Texas	L737	1510	1510	S92U4D4500297	S92U4D4500297	1
Houston - Texas	L755	1511	1579	S92U4D4500333	S92U8D4500402	69
LYNX - Florida	L725	—	—	S92Y9D4500329	S92Y5D4500330	2
LYNX - Florida	L764	—	—	S92Y7D4500331	S92Y9D4500332	2
LYNX - Florida	L785	—	—	S92L6E4500505	S92L8E4500506	2
MTD - Santa Barbara, California	L730	—	—	S92J8E4500567	S92J1E4500569	3
New York City Transit - New York	L536	1200	1201	S92U793000490	S92U993000491	2
New York City Transit - New York	L545	1202	1289	S92U5A4000001	S92U0A4000098	88
New York City Transit - New York	L643	5895	5895	S92U1B4000143	S92U1B4000143	1
New York City Transit - New York	L670	5770	5894	S92U4C4500024	S92U3B4000242	125
New York City Transit - New York	L681	5896	5283	S92U2C4500023	S92U9C4500195	122
New York City Transit - New York	L692	5284	5363	S92U3C4500158	S92U3D4500274	80
Niagara Falls - Ontario	L652	—	—	S92U3C3000607	S92U6C3000617	11
Niagara Parks Commission - Ontario	L685	—	—	S92U9C3000644	S92U8C3000652	9
San Joaquin County - California	L768	—	—	S92L4D4500422	S92L3D4500427	6
Saskatoon - Saskatchewan	L359	—	—	S92U583000289	S92U583000289	1
Saskatoon - Saskatchewan	L551	1005	1007	S92UXA3000178	S92U8A3000180	3
Saskatoon - Saskatchewan	L568	—	—	S92U9B3000013	S92U9B3000013	1
Saskatoon - Saskatchewan	L618	—	—	S92U1C3000377	S92U1C3000377	1
SEPTA - Pennsylvania	L724	7300	7301	S92Y1D4500275	S92Y3D4500276	2
SEPTA - Pennsylvania	L741	—	—	S92L4E4500504	S92L4E4500504	1
SEPTA - Pennsylvania	L743	—	—	S92L1E4500489	S92L2E4500503	15
SEPTA - Pennsylvania	L749	7302	7354	S92Y7D4500409	S92L2E4500470	53
St. John - New Brunswick	L272	—	—	S92U483000011	S92U483000011	1
St. John - New Brunswick	L273	—	—	S92U383000050	S92U383000050	1

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Toronto Transit Commission - TTC - Ontario	L729	9000	9000	S92U9D3000905	S92U9D3000905	1
Toronto Transit Commission - TTC - Ontario	L738	9001	9026	S92J6D3001094	S92J7D3001119	26
Toronto Transit Commission - TTC - Ontario	L777	9027	9113	S92J7E3001123	S92J4E3001306	87
University of Colorado - Colorado	L427	—	—	S92U693000027	S92U693000027	1
University of Colorado - Colorado	L428	—	—	S92U893000028	S92U893000028	1
University of Colorado - Colorado	L627	—	—	S92UXB4000139	S92U6B4000140	2
Walt Disney World - Florida	L763	—	—	S92U0D3001019	S92U4D3001024	6
York Regional Transit - Ontario	L562	1080	1082	S92U2A3000420	S92U6A3000422	3
York Regional Transit - Ontario	L572	1083	1094	S92U3A3000569	S92U2A3000580	12
York Regional Transit - Ontario	L654	1370	1390	S92U1D3000946	S92U2D3000986	21
York Regional Transit - Ontario	L761	1391	1396	S92U6D3001008	S92UXD3001013	6

**WARNING**

Follow your internal safety procedures.

PROCEDURE

NOTE:

The instructions included in this document have been provided by Hubner Manufacturing Corporation. Nova Bus cannot be held responsible under any circumstances for the content of this procedure.

Date: 2014/07/30

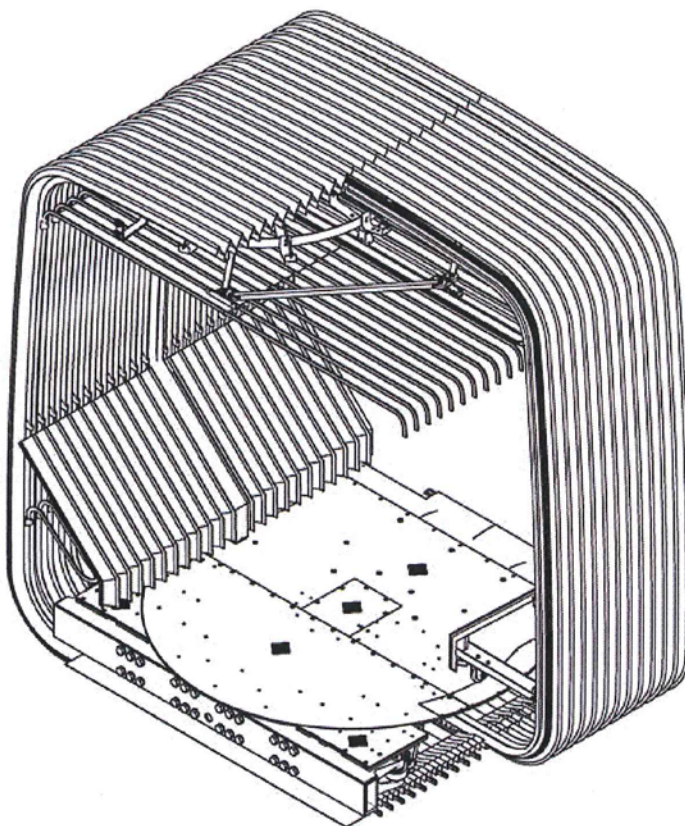
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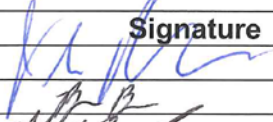
HUBNER Manufacturing Corp
450 Wando Park Blvd.
Mt. Pleasant, SC 29464
Tel.: 843-849-9400 Fax: 843-849-9404

Field Modification Instructions

Nova Bus
Potentiometer

15.3 Articulation

04229970100 for
14220020100

	Name	Signature	Date (yyyy/mm/dd)
Prepared	Adam Reece		2014/07/30
Reviewed	Ryan Bauer		2014/07/30
Approved	Mark Burgess		2014/07/30

Doc. No.: 180001317	Field Modification Instructions	 HUBNER Manufacturing Corp 450 Wando Park Blvd. Mt. Pleasant, SC 29464 Tel.: 843-849-9400 Fax: 843-849-9404
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Revision	Date (yyyy/mm/dd)	Prepared By	Description of Revision	
			pg.	
-	2014/07/30	Adam Reece		Initial Release

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1. Objective

The objective of this document is to provide step by step instructions on how to exchange the potentiometer. The potentiometer will be replaced by a new potentiometer with a brass shaft. The potentiometer bracket must be modified to allow for the proper fit of the potentiometer with a brass shaft.

2. Special Instructions

2.1. Part Configuration

Supplier Part Number		Modification Level	
From	To	From	To
04229970100	14220020100	N/A	N/A

2.2. Disposition of Affected Parts

Part Number	Replace, Repair, Modify, Return to Vendor	Quantity per Articulation
04229970100	Replace	1

2.3. Weight Impact

There is no weight impact to the bellow assembly.

3. Documentation

3.1. Impact of the Change on Safety

This FMI shall be carried out in accordance with all Nova Bus and transit authorities' safety policies and procedures, and shall be performed by qualified personnel. Materials handling shall be carried out in accordance with appropriate MSDS.

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3.2. List of Required Materials

Hubner Part Number	Description	Quantity
14220020100	Potentiometer with Brass Shaft	1

3.3. Tools (Special and Calibrated)

Tool	Quantity
6 mm Allen Wrench	1
Flat Head Screw Driver	1
10 mm Socket for M6 Bolt	1
7 mm Socket for M Bolt	1
Black Electrical Tape	1 ft
10.5 mm Drill Bit	1
Drill	1
Torque Seal	1

3.4. Specific Skills

Knowledge of the removal and installation of the platform and potentiometer are necessary for performing the task outlined in this FMI.

4. Estimation of Total Time to Complete the Field Modification Instructions

It will take approximately 15 to 20 minutes to remove the existing potentiometer and replace it with the new potentiometer with a brass shaft.

5. Step by Step Procedure with Safety Warnings

5.1. Removal of the Service Plate

Using a 6 mm allen wrench remove the eight M8x12 countersunk bolts that secure the service plate to the platform (See Figure 1).

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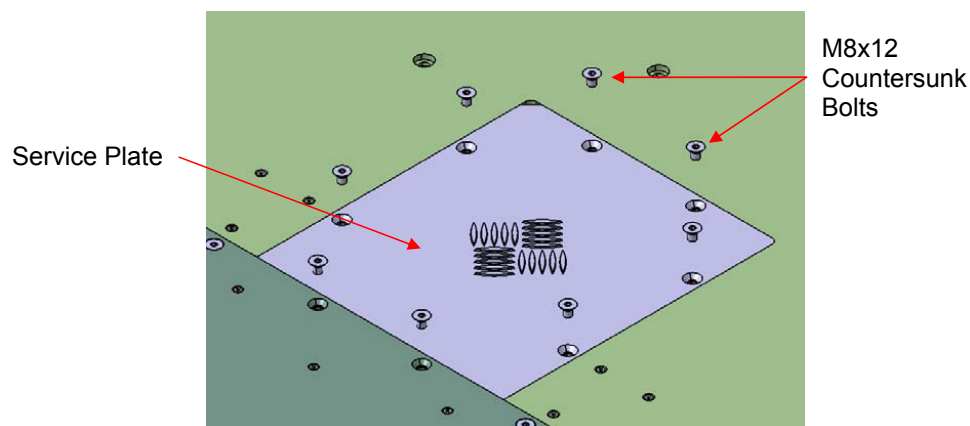


Figure 1 Removal of Service Plate

Using the flat head screw driver, lift the service plate from within the platform.

5.2. Removal of the Potentiometer Assembly

Disconnect the potentiometer from the wiring harness.

Using a 10 mm socket, remove the two M6x12 bolt and washer that secures the inverted bracket to the articulation assembly (See Figure 2). Do not discard the bolts as they will be used for reinstallation.

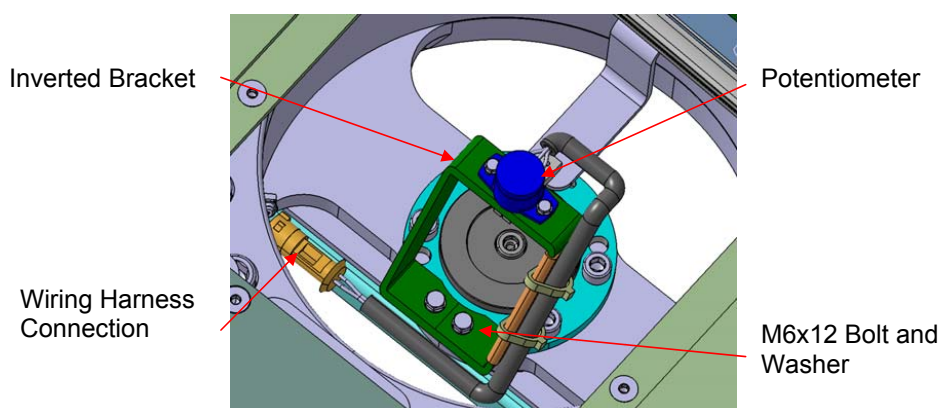


Figure 2 Removal of Potentiometer Assembly

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5.3. Removal of the Potentiometer

Using a 7 mm socket, loosen the M4x20 bolt and nut that secures the clamping lever to the potentiometer (See Figure 3). The clamping lever will be needed for installation to the new potentiometer with a brass shaft.

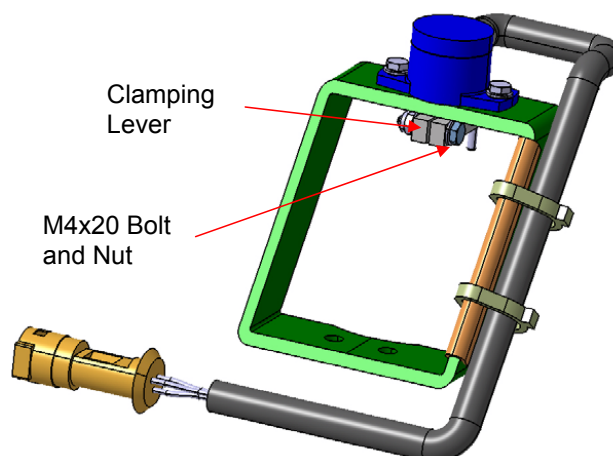


Figure 3 Clamping Lever Removal

Using the same 7 mm socket, remove the two M4x10 bolts and washers that secure the potentiometer to the inverted bracket (See Figure 4). Do not discard.

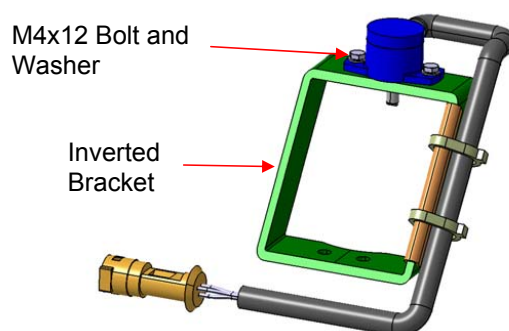


Figure 4 Potentiometer Removal

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Cut the two cable ties that secure the split loom conduit to the inverted bracket. Remove the split loom conduit from the wiring of the potentiometer (See Figure 5). This will be reused for the new potentiometer with a brass shaft.

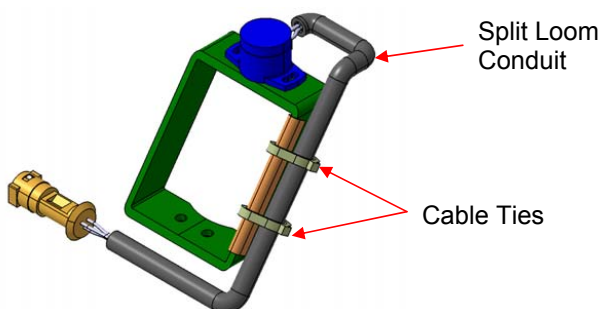


Figure 5 Cable Ties and Conduit Identification

Depending on the reasoning for removal of the potentiometer, please make the necessary steps for disposal or warranty, if applicable.

5.4. Enlarging the Potentiometer Clearance Hole

Using a 10.5 mm drill bit and drill, enlarge the center hole of the inverted bracket from 10 mm to 10.5 mm (See Figure 6).

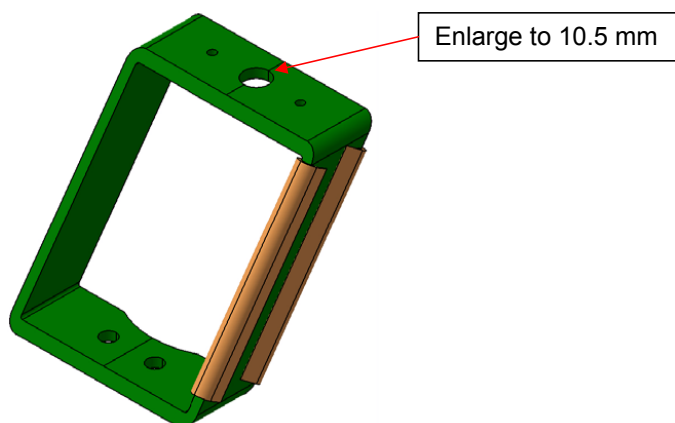


Figure 6 Clearance Hole Enlargement

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5.5. Installing the New Potentiometer

Install the previously removed split loom conduit over the wiring of the potentiometer. Using new electrical tape, wrap each end of the conduit with electrical tape. The electrical tape will contact both the wires and the conduit.

Next place the new potentiometer with the brass shaft on the inverted bracket with the wires of the potentiometer facing the direction indicated below (See Figure 7).

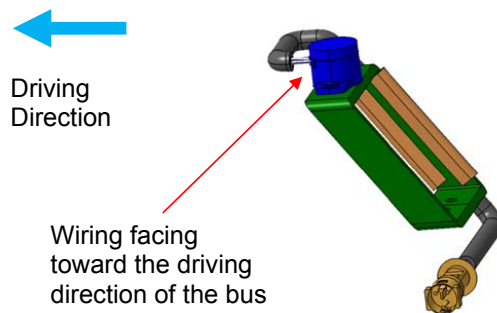


Figure 7 Placement of Potentiometer

Install the two M4x12 bolts and washers that were previously removed to secure the new potentiometer to the inverted bracket (See Figure 8). Torque each bolt to 10 Nm.

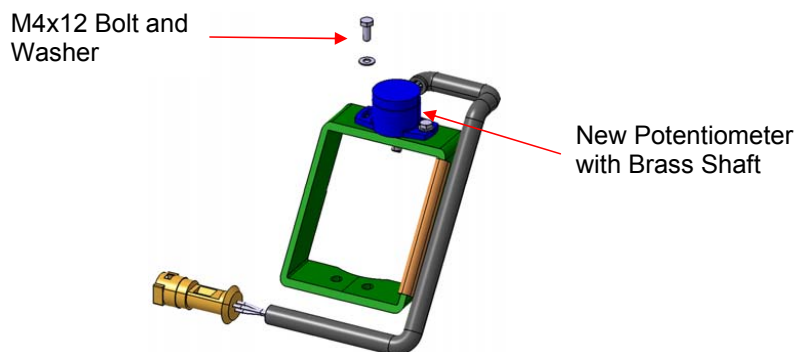


Figure 8 Potentiometer Installation

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5.6. Installation of the Clamping Lever

Install the clamping lever to the underside of the potentiometer. **The position of the clamping lever and the notch on the potentiometer is very critical to the functionality of the potentiometer.** The notch on the potentiometer should face the driving direction of the bus. Therefore, the notch will be closest to the dowel of the clamping lever (See Figure 9). Torque the bolt to 3 Nm.

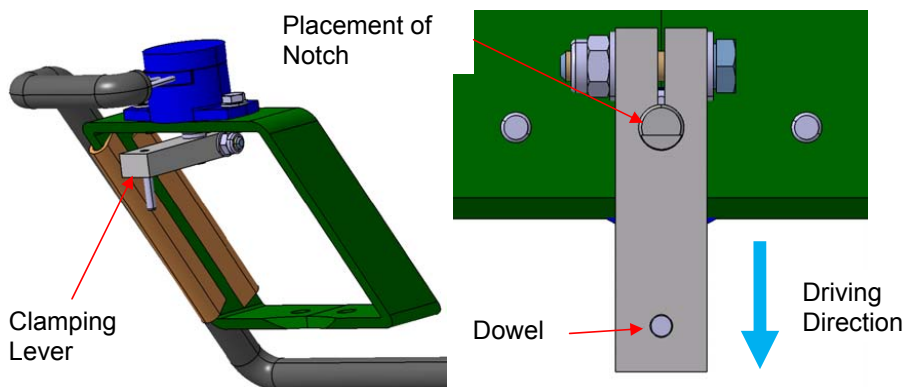


Figure 9 Clamping Lever Positioning

5.7. Installation of the Potentiometer Assembly

Place the potentiometer into the mounting position on the articulation. Carefully insert the dowel of the clamping lever into the potentiometer drive arm. Insert the two M6x20 bolts and washers to secure the inverted bracket to the articulation (See Figure 10). Torque each bolt to 10 Nm.

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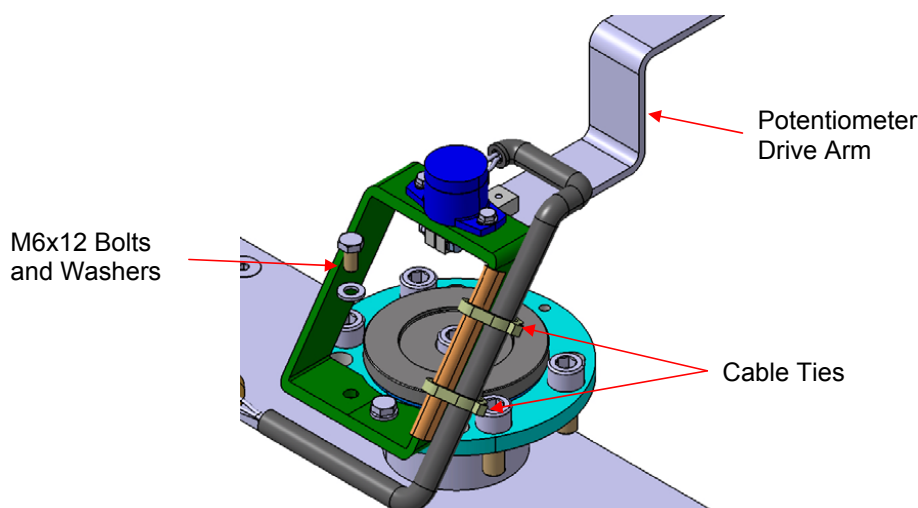


Figure 10 Installation of the Potentiometer Assembly

Connect the potentiometer to the wiring harness of the bus. Install two new cable ties around the inverted bracket and the split loom conduit.

Apply torque seal to all hardware that has been installed.

6. Testing

Follow the Hubner Manufacturing Corporation procedure for initializing the potentiometer with each bus.



Warning!
Not initializing the potentiometer may lead to error codes with the ACU.

7. Installation of the Service Plate

Clean any debris or dirt build up from the service plate and the platform. Insert the service plate into the platform and install the M8x12 countersunk bolts. Verify that all hardware is properly installed.

8. Disposition of Components

Properly dispose of any hardware and/or components that have been removed. ❖