

REFERENCE:	Nova Bus Manuals
SECTION:	18: Articulation System
RS N°:	MQR 7621-1178
EFFECTIVE IN PROD.:	N/A

APPLICATION DEADLINE:N/A

SUBJECT:	Articulation hydraulic cylinder pin
JUSTIFICATION:	Procedure and tooling to remove the articulation cylinder pin is inadequate.

LEVEL	DESCRIPTION	DIRECT CHARGES		TIME
		LABOUR	MATERIAL	
1	New procedure and tooling for articulation hydraulic cylinder pin removal.	Client	Client	–
2	–	–	–	–

MATERIAL

QTY	PART N°	REV.	DESCRIPTION	REPLACES PART N°
LEVEL 1				
1	N8906290	–	Articulation cylinder pin puller kit	–
LEVEL 2				
–	–	–	–	–

Materials will be available within 42 days once your order has been placed. To order, please contact Prevost Parts by phone at 1-800-771-6682, by fax at 1-888-668-2555 or by email at prevostparts.commandes@volvo.com. Specify document number, quantity of parts required and shipping address.

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	2017AU31	Initial release	Luc Carignan

APPROVED BY: Daniel Theriault

Digitally signed by Daniel Theriault
DN: cn=Daniel Theriault, o=Nova Bus, ou, email=daniel.theriault@volvo.com, c=CA
Date: 2017.08.31 18:08:43 -0400

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
Ames Transportation Agency - Iowa	L707	660	661	S92U5C4500159	S92U1C4500160	2
Ames Transportation Agency - Iowa	L904	6101	6104	S92J1G9775221	S92J7G9775224	4
Austin - CMTA - Texas	L635	5001	5001	S92U7C4500163	S92U7C4500163	1
Austin - CMTA - Texas	L636	5002	5022	S92U1D4500306	S92U0D4500328	21
Austin - CMTA - Texas	LA17	5101	5107	S92J2H9775763	S92J3H9775769	7
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
CT Transit - Connecticut	L814	1462	1473	S92LXE4500717	S92L4E4500728	12
CT Transit - Connecticut	L815	1426	1429	S92L0E4500709	S92L0E4500712	4
Démo US	L724	7300	7301	S92Y1D4500275	S92Y3D4500276	2
Duke University - North Carolina	L651	—	—	S92Y1B4000145	S92Y3B4000146	2
Halifax - Nova Scotia	L558	717	731	S92UXA3000293	S92U6A3000307	15
Halifax - Nova Scotia	L613	732	741	S92UXB3000019	S92UXB3000028	10
Halifax - Nova Scotia	L708	742	761	S92UXC3000782	S92U3C3000803	20
Houston - Texas	L737	1510	1510	S92U4D4500297	S92U4D4500297	1
Houston - Texas	L755	1511	1579	S92U4D4500333	S92U8D4500402	69
Houston - Texas	L952	1580	1580	S92J5G9775318	S92J5G9775318	1
Houston - Texas	L982	1581	1599	S92J5G9775514	S92J5G9775545	19
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	S92U9B4000147	S92UXC4500061	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
New York City Transit - New York	L958	5439	5442	S92J9G9775533	S92J9G9775631	4
New York Demo	L940	—	—	S92J7F4501257	S92J7F4501257	1
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	L741	7355	7355	S92L4E4500504	S92L4E4500504	1
SEPTA - Pennsylvania	L742	7371	7414	S92L6E4500729	S92L7E4500772	44
SEPTA - Pennsylvania	L743	7356	7370	S92L1E4500489	S92L2E4500503	15
SEPTA - Pennsylvania	L745	7415	7415	S92L0F4500873	S92L0F4500873	1

CLIENT	ORDER	ROAD NUMBER		VIN (2NVY/4RKY...)		QTY
		FROM	TO	FROM	TO	
SEPTA - Pennsylvania	L746	7416	7454	S92L7F4500952	S92L8F4501012	39
SEPTA - Pennsylvania	L749	7302	7354	S92Y7D4500409	S92L2E4500470	53
SEPTA - Pennsylvania	L861	7300	7484	S92L5G9775188	S92L8G9775220	32
St. Catharines Ontario	L898	1560	1560	S92J4F3001663	S92J4F3001663	1
St. John - New Brunswick	L272	—	—	S92U483000011	S92U483000011	1
St. John - New Brunswick	L273	—	—	S92U383000050	S92U383000050	1
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	9152	S92J7E3001123	S92J6E3001372	126
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
York Regional Transit - Ontario	L964	1770	1774	S92J6G3750420	S92J3G3750424	5

**WARNING**

Follow your internal safety procedures.

PROCEDURE

**NOTE**

The following procedure is provided by Hubner Manufacturing Corporation. Nova Bus cannot be held responsible for its content. ❖

Doc. No.:180001810	Hydraulic Pin Removal Procedure	 HUBNER Manufacturing Corp 450 Wando Park Blvd. Mt. Pleasant, SC 29464 Tel.: 843-849-9400 Fax: 843-849-9404
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Hydraulic Pin Removal Procedure

	Name	Signature	Date (yyyy/mm/dd)
Prepared	Evan Livengood		2017/06/16
Reviewed			
Approved			

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Revision	Date (yyyy/mm/dd)	Prepared By	Description of Revision	
			pg.	
-	2017/03/01	E. Livengood	All	Initial release

Technical changes reserved.

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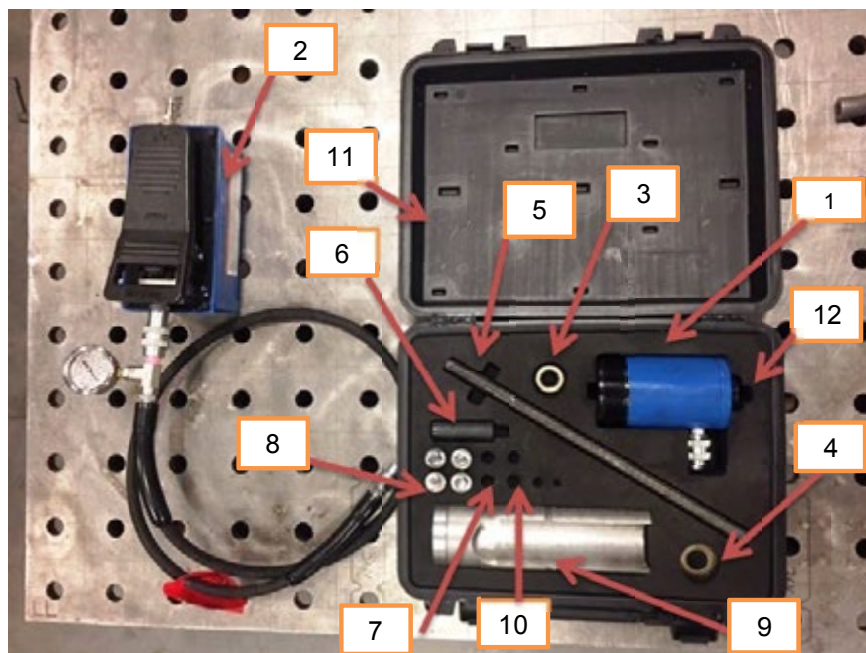
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1. Introduction

This procedure will provide the steps necessary to remove the threaded pins from the front casting or rear bulkhead.

2. Required Materials and Tools



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Item Number	Description	Hubner Part Number
-	Pin Puller Complete (shown in picture)	14550015200
1	20 Ton Hollow Cylinder	14550015806
2	Pump with hose	14550017100
3	Hex Nut	14550016000
4	Washer	14550016100
5	Threaded Rod - long	14550016200
6	Bolt adapter	14550015900
7	Threaded adapter	14550016400
8	Weld on adapter	14550016300
9	Spacer Tube	14550015600
10	Hex Jam Nut	14430016700
11	Plastic Case	14550017200
12	Foam Insert	14550017300

3. Safety

Carefully read this document prior to taking the hydraulic pin removal tool into operation and/or proceeding with tasks in order to avoid accidents or damage.

**Attention!**

Information about a risk, which when not being obeyed can lead to bodily injury and/or extensive material damage.

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4. Procedure

4.1 Removing center bolt from the pin

Using an 8mm allen wrench remove the center bolt from the pin. During this time apply an anti-corrosion spray lubricant to the pin.



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4.2 Metric adapter pin

Thread the metric adapter pin into the cylinder pin until tight.



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4.3 Coupler Adapter

- Thread the coupler adapter onto the metric exactor pin until tight.



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4.4 Threaded Rod

Screw the threaded rod into the coupler adapter until the threaded rod bottoms out inside the coupler adapter.



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4.5 Spacer Tube

Slide the spacer tube over the Threaded rod long



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4.6 Twenty Ton Hollow Cylinder

Slide the 20 Ton Hollow Cylinder over the threaded rod and thread 20 Ton Hollow Cylinder into the Spacing Tube.



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4.7 Final assembly

Install the washer and hex nut onto the threaded rod. At this time connect the hydraulic pump hose into the 20 Ton Hollow Cylinder. Make sure the pressure gauge on the hose is connected on the pump side NOT the cylinder side.



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4.8 Extracting process

Apply hydraulic pressure ensuring hands and body are not in line with the cylinder and threaded draw bar.

**Attention!**

Information about a risk, which when not being obeyed can lead to bodily injury and/or extensive material damage.

Attention!

Do not exceed 4,000 PSI – Applying too much pressure can cause the tool to become airborne over pressuring can lead to bodily injury and/or material damage

1. To extend the cylinder, depress on the foot pedal marked "Pump" (horizontal portion) until desired pressure, load or position is reached.
2. To hold the cylinder in position, release the foot pedal to deactivate the pump.
3. To retract the cylinder, depress the release valve by stepping on the foot pedal marked "Release" (raised, stirrup shaped portion).

Apply 4,000 pounds of pressure to the hydraulic cylinder. Using a hammer strike the rear castings to help break the pin break loose. Remove pressure and the tool. Then using a hammer drive the threaded pin back into the casting. Repeat until the thread pin has been removed from the casting. This process will take multiple attempts – the first attempt the pin will move near or around 1/8".



Assure that the spherical bearing remains level inside the pin. If this bearing starts to become angled release the pressure and move the bearing until it is level.

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**Attention!**

Do not exceed 4,000 PSI – Applying too much pressure can cause the tool to become airborne over pressuring can lead to bodily injury and/or material damage



Once the cylinder has reached the end of its stroke (2") release hydraulic pressure allowing the piston to retract. Tighten the hex nut against the 20 Ton Hollow Cylinder. Repeat as necessary until pin is removed.

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4.9 Stripped out threaded pin

If the threads on the threaded pin have stripped and you can no longer use the metric extractor.



Attention!

Follow your internal procedures or Nova Bus procedures to prepare the bus before performing any welding.

Remove all rust, dirt and grease from the top surface of the pin. Using a certified welder following the AWS A5.18 standard weld the corresponding adapter to the cylinder pin and then thread the coupler adapter into the weld-on adapter. Next, thread the draw bar into the coupler adapter. Repeat step 4.4-4.8.

