

TOOL USE INSTRUCTION

RIVIAN

TOOL NUMBER TSN01447-100-A

TITLE GL TECHNICS EBS-100

REV - DATE 07/03/2025

CONTENTS

[OVERVIEW](#)

[SAFETY](#)

[INITIAL SETUP](#)

[TOOL USE INSTRUCTION](#)

[MAINTENANCE & STORAGE](#)

[SPARE PARTS](#)

[TROUBLESHOOTING](#)

[SYMBOL GLOSSARY](#)

TOOL FUNCTION

To perform service and repairs to the Kinetic suspension system on the R1 vehicles.



07/03/25 REV B

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OVERVIEW

SPECIFICATIONS

Weight: 220 lbs (100 kg)

Overall Dimensions: 27 x 24 x 39.5 in (690 x 608 x 1002 mm):

Voltage Rating: 230v/110v

LABOR CODES

187690024 Hydraulic Fluid (Drain and Fill)

RiDE service procedure: 187690024 - Hydraulic Fluid (Drain and Refill)- GL Technics

OTHER TOOLS REQUIRED

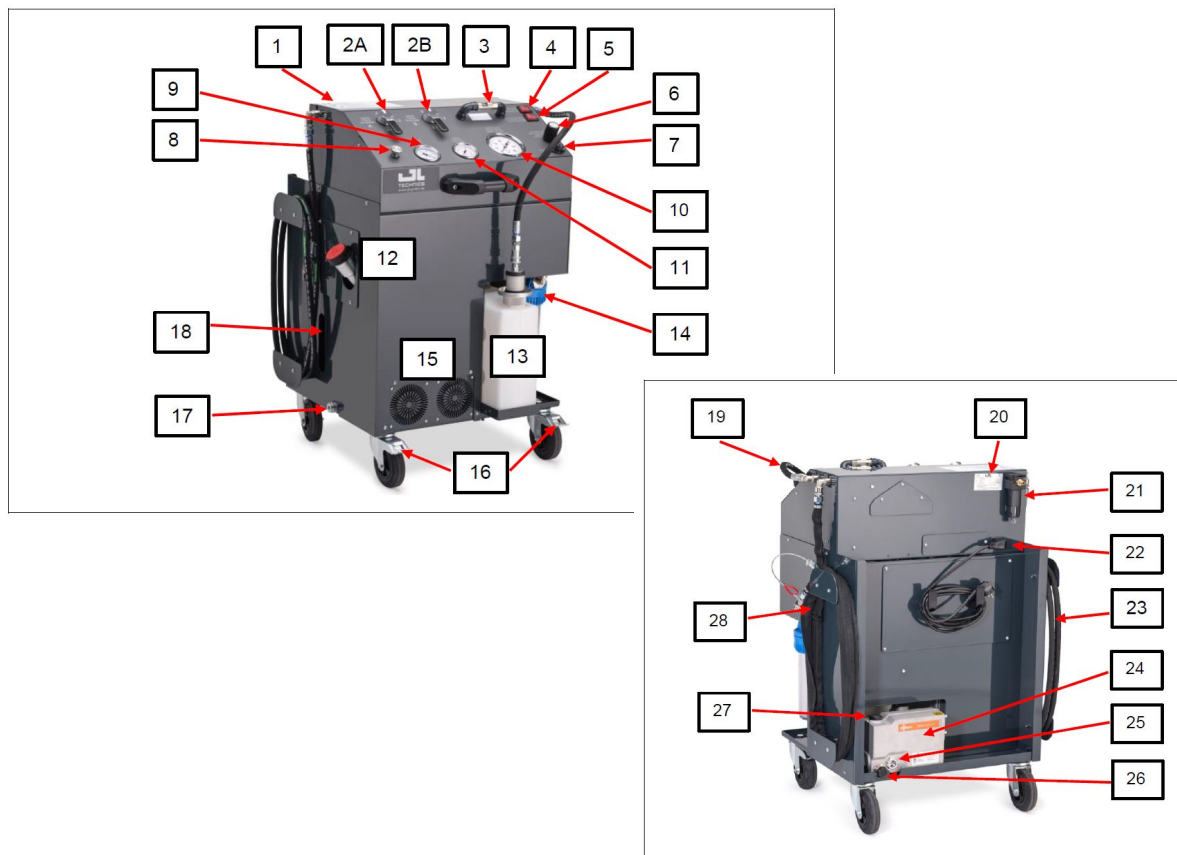
TSN01428-300-A Kinetic Drain Adapter

TSN01433-300-A APMU line release tool

TSN01109-100 Flexible Spout Measure: 2 Qt/ 2L. Capacity, High Density Polyethylene

COMPONENT GUIDE

The machine consists of the following components:




OVERVIEW

ITEM	COMPONENT	ITEM	COMPONENT
1	Lever position guide	10	Hydraulic pressure gauge 0-60 BAR
2	Lever for valves A (2A) and B (2B)	11	Air pressure gauge 0-16 BAR
3	Kinetic fluid inspection sight glass	12	Fresh oil tank filler
4	Hydraulic pump ON/OFF	13	Drain tank
5	Vacuum pump ON/OFF	14	Oil separator
6	Hydraulic pressure regulator	15	Exhaust fan for power unit and vacuum pump
7	Circuit breaker (Fuse)	16	Locking brake
8	Vacuum vent/bleed	17	Hydraulic power unit oil drain plug
9	Vacuum gauge 0 Bar to -1.0 Bar	18	Hydraulic power unit inspection glass filling level (fresh fluid level sight)



OVERVIEW

ITEM	COMPONENT	ITEM	COMPONENT
19	Hose to drain tank	24	Vacuum pump unit (350 ml, 2 mbar)
20	Manufacturer name plate and device identification	25	Min./max. vacuum pump oil inspection glass
21	Shop air filtration system (air filter/mist separator/desiccant)  Rivian specific setup	26	Vacuum pump oil drain plug
22	Power cable connection 110V (230V were applicable)	27	Vacuum pump oil filler
23	<u>SDE</u> hose 2 (H2)	28	SDE hose 1 (H1)





WARNING *Go to Slide > Edit Theme to change severity of standard note as needed*

Do not perform procedure if tool is damaged or missing parts. Consult the Rivian Service Tool Catalog for replacement components.

Failure to follow guidelines outlined in this document could result in injury and/or property damage.

SAFETY GUIDELINES

1	Wear eye protection and gloves.	
2	The vehicle kinetic system is under high pressure. Follow the service procedures to safely work on the suspension system.	
3		<div>Insert Image</div>



INITIAL SETUP-BRAND NEW UNITS

1	The machine must be powered down before starting the setup.	
2	Position the device close to the hydraulic system connections and tighten the locking brakes.	
3	Plug the EBS-100 power cable (22) into a 110V socket (230V where applicable).	
4	Check the power unit and vacuum pump (25) oil levels (18) and refill oil as necessary (12). It will require about 0.6L of oil in the tank to show initially on the scale.	Vacuum pump oil: ISO VG 32 Approved oil: Ravenol J1V8001-001 Purchase LINK





INITIAL SETUP-BRAND NEW UNITS

5	The oil level for the hydraulic power unit (18) should be close to maximum.	
6	Rivian approved Kinetic Fluid: Fuchs Titan CHF 202 (formerly Pentosin CHF 202) Automotive lubricants FUCHS LUBRICANTS CO. (United States)	
3		
4		

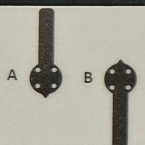


















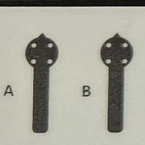
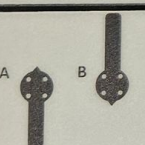
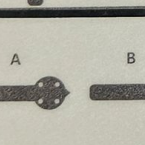


BEFORE EVERY USE

1	<p>Inspect the Fine Particulate Screen inside the Fresh Oil Tank Filler for debris.</p> <p>Clean with brake cleaner as needed.</p>	
2	<p>Oil separator must be emptied before each use of the kinetic cart</p>	
3	<p>Inspect the Air Filter, Mist Separator and Desiccant for collected debris and moisture from the incoming shop air. Replace Filters and Desiccant as needed.</p>	
4	<p>Be sure that both switches for the Vacuum pump and the Hydraulic pump are in the OFF position prior to plugging in the unit into outlet!</p>	




EBS-100 Lever Position Guide:

	<p>Altöl ablassen und mit Druckluft entleeren Drain off old oil and empty with compressed air Vidanger l'huile usée et l'évacuer avec de l'air comprimé Drenar el aceite usado y vaciarlo con aire comprimido Scaricare l'olio esausto e svuotare con aria compressa Drenar o óleo usado e esvaziar com ar comprimido</p>	<table><tr><th>Piktogramm</th><th>Bedeutung</th></tr><tr><td></td><td>Allgemeines Warnzeichen General warning sign Signes d'alerte généraux Señal de advertencia general Segnale di avvertimento generale Sinal de aviso geral</td></tr><tr><td></td><td>Warnzeichen für heiße Oberflächen Warning of hot surfaces Avertissement de surface chaude Advertencia de superficie caliente Aviso di superficie calda Aviso de superficie quente</td></tr><tr><td></td><td>Fußschutz benutzen Use foot protection Utiliser une protection pour les pieds Utilizar protección para los pies Utilizzare una protezione per i piedi Utilizar proteção para os pés</td></tr><tr><td></td><td>Augenschutz benutzen Use eye protection Utiliser une protection oculaire Utilizar protección ocular Utilizzare una protezione per gli occhi Utilizar proteção para os olhos</td></tr><tr><td></td><td>Handschutz benutzen Use hand protection Utiliser une protection pour les mains Utilizar protección para las manos Utilizzare una protezione per le mani Utilizar proteção para as mãos</td></tr><tr><td></td><td>Gebrauchsanweisung beachten Follow user's manual Respecter le mode d'emploi Siga las instrucciones de uso Seguire le istruzioni per l'uso Seguir as instruções de utilização</td></tr></table>	Piktogramm	Bedeutung		Allgemeines Warnzeichen General warning sign Signes d'alerte généraux Señal de advertencia general Segnale di avvertimento generale Sinal de aviso geral		Warnzeichen für heiße Oberflächen Warning of hot surfaces Avertissement de surface chaude Advertencia de superficie caliente Aviso di superficie calda Aviso de superficie quente		Fußschutz benutzen Use foot protection Utiliser une protection pour les pieds Utilizar protección para los pies Utilizzare una protezione per i piedi Utilizar proteção para os pés		Augenschutz benutzen Use eye protection Utiliser une protection oculaire Utilizar protección ocular Utilizzare una protezione per gli occhi Utilizar proteção para os olhos		Handschutz benutzen Use hand protection Utiliser une protection pour les mains Utilizar protección para las manos Utilizzare una protezione per le mani Utilizar proteção para as mãos		Gebrauchsanweisung beachten Follow user's manual Respecter le mode d'emploi Siga las instrucciones de uso Seguire le istruzioni per l'uso Seguir as instruções de utilização
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	<p>Evakuieren / Vakuum Test Vacuum / Vacuum Test Évacuer / tester le vacuum Evacuación / prueba de vacío Evacuazione / prova di vuoto Evacuação / teste de vácuo</p>															
	<p>Fahrzeug mit frischem Öl befüllen Fill vehicle with fresh oil Remplir le véhicule d'huile fraîche Echar aceite nuevo en el depósito del vehículo Rabboccare il veicolo con olio fresco Abastecer o veículo com óleo novo</p>															
	<p>Gerät drucklos machen Depressurise device Dépressuriser l'appareil Poner el aparato a presión ambiental Depressurizzare il dispositivo Despressurizar o aparelho</p>															

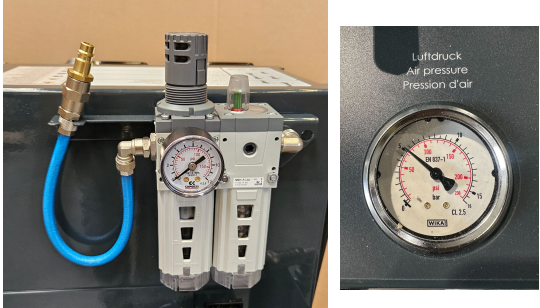
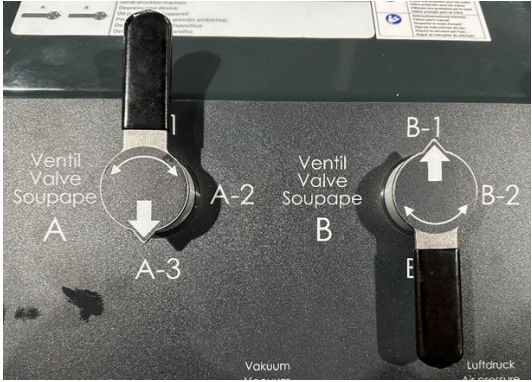
Guide to lever positions that will be used during the Evacuation/ Fill process with the EBS-100. It is located on top of the unit (Top Left)

EVACUATION/DRAIN STEPS:

1	<p>Depressurize the system in the vehicle using RiDE.</p> <p>Allow system pressure to go below 3 Bar before working on the vehicle.</p>	
2	<p>Disconnect line from APMU and connect drain hose adaptor</p> <p>TSN01454-300-A Kinetic Fluid Drain Kit</p> <p>TSN01433-300-A APMU line release tool</p>	
3	<p>Run RiDE procedure to drain the tank. You will need to START TANK DRAIN procedure to begin draining the oil from the tank and STOP TANK DRAIN the routine once the pump runs dry and you can see light foaming inside the clear line adaptor.</p> <p>Drain the kinetic fluid from the reservoir into a measured drain container used ONLY WITH KINETIC FLUID! (TSN01454-300-A KINETIC DRAIN TANK KIT)</p> <p>This process may require the need for an additional tech to aide with running and stopping the tank drain (in RiDE) while the other tech drains the kinetic fluid into the measuring container.</p>	

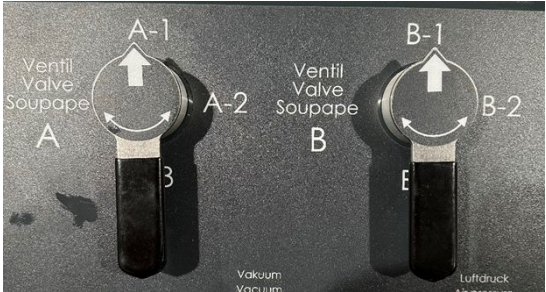


TOOL USE INSTRUCTION

4	Re-connect the kinetic tank drain line back to the APMU	
5	Connect SDE1 (H1) on the kinetic cart to H1 (Passenger side) and SDE2 (H2) on the kinetic cart to H2 (driver side) lines to the vehicle.	
6	Connect air line to the back of the unit (regulate it to 70 psi) and check air pressure gauge on kinetic cart to ensure it matches the regulated gauge side.	
7	Turn Lever A to A3 and Lever B to B1	

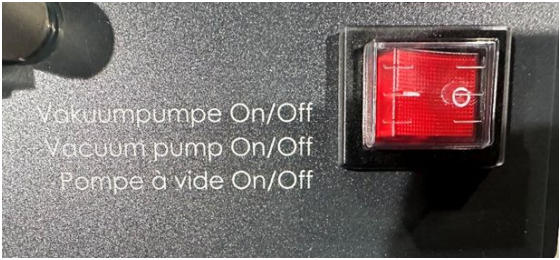
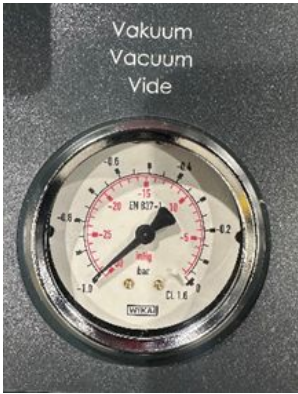



TOOL USE INSTRUCTION

8	Run kinetic bleed procedure (valves open/close) in RiDE for 15 min to ensure drain is complete.	
9	After 15 min of evacuation, you can STOP the kinetic bleed routine in RiDE	
10	Open valves on RiDE to prepare for Vacuum	
11	Switch Lever A to A1 and Lever B to B1	 <p>The diagram shows two lever valves, A and B, with their positions for Vacuum and Air Pressure. Lever A has positions A-1 (up), A-2 (middle), and A-3 (down). Lever B has positions B-1 (up), B-2 (middle), and B-3 (down). The text 'Ventil Valve Soupape' is written above each lever. Below lever A, the text 'Vakuum Vacuum' is written. Below lever B, the text 'Lufldruck Air pressure' is written.</p>





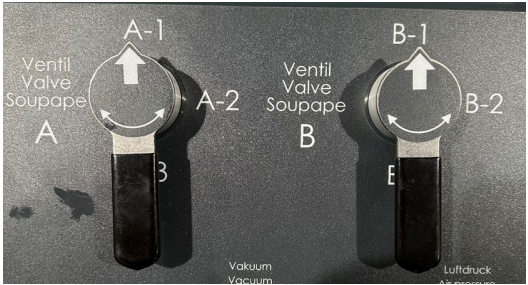

TOOL USE INSTRUCTION

12	Turn ON Vacuum pump on the kinetic cart and let it run for 1-2 minutes	
13	Once - 0.9 to -1.0 Bar indicated on the gauge has been achieved, turn OFF vacuum pump (this will help remove any remaining fluid in the system)	
14	Vent vacuum system (pressing the button) and ensuring system is at 0 Bar before removing drain tank.	
15	<p>Disconnect both SDE1 from H1 and SDE2 from H2 lines from the vehicle.</p> <p>It Is now OK to perform repairs/replacements to the kinetic system on the vehicle</p>	

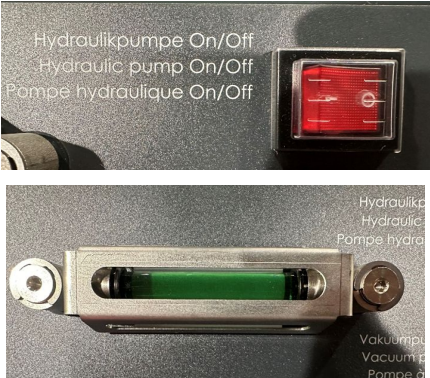


FILLING PROCEDURE STEPS:

1	<p>Ensure that you have sufficient level in the fill tank by inspecting the tank scale on the side of the EBS-100.</p> <p>When the Fill tank is full, the kinetic level will be at the upper Dark GREEN line.</p>	
2	<p>Ensure the oil separator tank is empty before performing fill procedure.</p>	
3	<p>Connect SDE1 (H1) to Passenger side and SDE2 (H2) to Driver side.</p>	
4	<p>Use RiDE OPEN VALVES to perform Vacuum test.</p>	



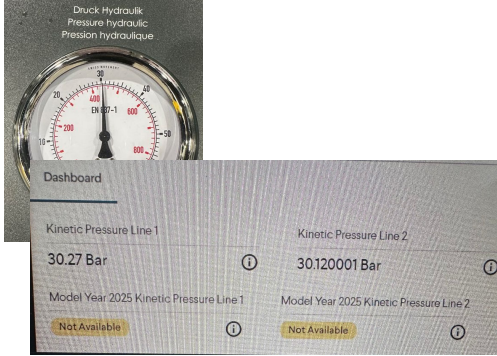
<p>5</p>	<p>Vacuum the system.</p> <p>Set levers on kinetic cart to: Lever A A1 and Lever B B1</p>	
<p>6</p>	<p>Turn ON the Vacuum pump.</p> <p>Run the Vacuum test for 1-2 min (-0.9 - -1.0 Bar)</p> <p>If Vacuum of -0.9 Bar to -1.0 Bar cannot be achieved and sustained, this is an indication of a leak in the system while the Vacuum pump is running, STOP Vacuum pump and investigate the leak in the system on Vehicle side.</p> <p>When the Vacuum pump is switched OFF on the kinetic cart, there is a magnetic switch which will immediately hold vacuum, This is NOT Vacuum on the vehicle kinetic system but on the machine side. This is not relevant to a leak on the vehicle side!</p>	

TOOL USE INSTRUCTION

7	<p>Once -0.9 BAR - -1.0 BAR of vacuum is achieved (run time of 1-2 min), turn OFF the vacuum pump on the cart.</p>	
8	<p>Using RiDE perform Vacuum test. This will use the sensors on the vehicle to determine a leak rate over time and determine a PASS/FAIL criteria.</p>	
9	<p>After a Vacuum test is performed and vehicle has Passed, turn ON Hydraulic pump on cart and inspect sight glass for "air" in the hydraulic fluid (let the hydraulic pump continue to run). Continue to keep the Hydraulic pump ON.</p>	
10	<p>Turn the regulator valve all the way down (counterclockwise) to ensure minimal pressure is in the lines.</p> <p>If 30 Bar pressure position was already set from a previous kinetic fill, you do not have to turn the regulator back down to minimal pressure.</p>	




TOOL USE INSTRUCTION

11	Disconnect H2 line from the vehicle (Driver side).	
12	<p>With the Hydraulic pump continuing to be ON and running, Turn Lever B to B-3 (going through position B-2)</p> <p>Lever Position:</p> <p>Lever A A1 and Lever B B3</p>	
13	As fluid starts to go in to the vehicle, turn the Hydraulic pressure regulator clockwise slowly to allow pressure to build in the system and regulate it to 30 Bar.	
14	Check RiDE pressure signal (lower Dashboard on the procedure) matches the Hydraulic Pressure gauge on the cart.	



TOOL USE INSTRUCTION

15	<p>Once the hydraulic gauge displays the set pressure of 30 BAR (Hydraulic pressure gauge should match RiDE pressure signal), CLOSE the valves in the system via RiDE</p>	
16	<p>Perform TANK FILL in RiDE and wait for the procedure to complete (procedure turns GREEN)</p>	
17	<p>Once the Tank Fill procedure is complete, disconnect the remaining H1 line (Passenger side) from the vehicle.</p> <p>When disconnecting the remaining H1 line, it will be under pressure (30 Bar) and may have some tension upon release.</p>	
18	<p>Once the remaining SDE1 (H1) line is disconnected from vehicle, switch the hydraulic pump OFF on the kinetic cart</p>	

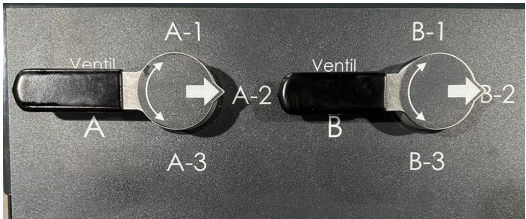



TOOL USE INSTRUCTION



19	Vehicle fill with the Kinetic cart is completed.	
20	Using RiDE, Pressurize the kinetic system on the vehicle to 50 BAR to ensure that vehicle system is OK (procedure turns GREEN)	
21	Using RiDE, perform Internal valve leakage test. If leakage test is successful, the procedure will turn GREEN	
22	Test drive vehicle (15-20 min) and perform FILL GRADE CHECK after test drive with RiDE (can be performed on ground or on a lift)	



DEPRESSURIZING THE KINETIC CART


1	First, switch Lever A to Position 2 (A2) and right after switch Lever B to position 2 (B2) to release pressure from all hoses	
2	To ventilate the vacuum pump, press the Vacuum ventilation button until the vacuum gauge is at 0 Bar.	
3	Depressurization of the kinetic cart is complete	

MAINTENANCE

COMPONENT	TASK	Interval
Entire machine	Function check, check for leaks and damage	Before use
Hydraulic oil level	Top off as necessary	Before use
Hydraulic Hoses	Replace	6 years
Fresh tank filler screen, particulate filter	Wipe and/or clean out with compressed air 	Before use
Oblique filter (inside unit before the hydraulic pump)	Open and clean with compressed air 	



MAINTENANCE

COMPONENT	TASK	Interval
Shop air filters/desiccant	Check or exchange 	Annually or when component is compromised
Vacuum pump oil	Visual check or change	Bi-annually or when oil looks compromised



SPARE PARTS

FOR OTHER ITEMS NOT SHOWN, CONTACT RIVIAN SERVICE TOOL ENGINEERING

GL EBS-100 contact:

RAE (Reliable Automotive Equipment)

Request Service

Phone number: 1 (732) 495-7900

Email: Bill@rae1.com

Refer to RAE website for spare parts available on the GL EBS-100R

[RAE Kinetic Service Cart & Service Cart Parts](#)



SPARE PARTS

FOR OTHER ITEMS NOT SHOWN, CONTACT RIVIAN SERVICE TOOL ENGINEERING

ITEM	DESCRIPTION	SUPPLIER + PART NUMBER (220v/110v)
1	Drain Canister 10L including scale	400.511.013
2	Oil separator filter for drain canister	400.501.014
3	Assembly filling hose 4M (SDE1)	400.509.017
4	Assembly return hose 4M (SDE2)	400.509.018
5	Plastic bracket	090.000.020
6	Drain Hose to waste oil drain canister	400.501.018
7	Kinetic cart handle	090.000.019
8	Hose connection Coupling to vehicle	090.002.028
9	Fan	090.001.533/090.001.767
10	Hydraulic Power Unit	090.001.572/090.001.964
11	Swivel castor with brake	090.001.747
12	Swivel castor without brake	090.001.748
13	Vacuum pump	090.001.913/090.001.965
14	Power Cord	090.001.591/090.001.593
15	Container ring for oil separator	090.001.983
16	Filter sieve (inside of Fresh Oil Tank Filler)	090.001.984
17	Main Switch	090.000.309
18	Fuse holder	090.001.905
19	Built in plug C20	090.001.590
20	Power socket C14	090.001.422
21	Fuse 10.3x38mm, 25A	090.001.906
22	Power socket C20	090.001.973
23	Pressure guage: 0 Bar to 16 Bar	090.001.902
24	Pressure/Vacuum guage: -1 bar to 0 Bar	090.001.903



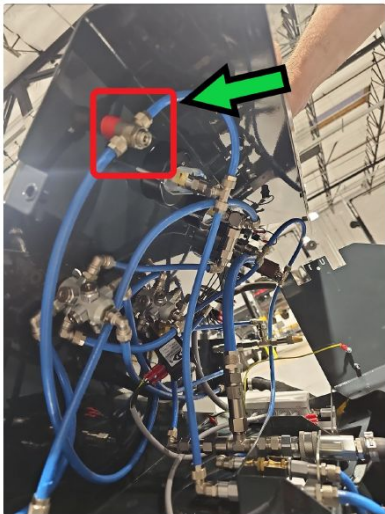
SPARE PARTS

FOR OTHER ITEMS NOT SHOWN, CONTACT RIVIAN SERVICE TOOL ENGINEERING


ITEM	DESCRIPTION	SUPPLIER + PART NUMBER (220v/110v)
25	Pressure gauge: 0 Bar to 60 Bar	090.001.904
26	Filter for compressed air	090.002.037
27	Pressure relief valve	090.001.907
28	Magnetic Valve	090.00.733/090.001.766
29	Plastic box	090.002.030
30	Vacuum Pump Oil	ISO VG 32 Spec (Ravenol J1V8001-001 Vacuum Pump Oil)
31	Oil Separator O-Ring Oil Resistant Buna-N O-Ring 3.5mm wide, 88mm ID	1302N659 MCMaster



TROUBLESHOOTING

PROBLEM	SOLUTION
During the Evacuation step, no oil is drained into the Drain tank	<p>Re-connect the shop air line to the device and ensure tight connection</p> <p>Lever A in position A-3 and lever B in Position B-1</p> <p>Ensure connection of the hose to the drain tank is correct and secure</p> <p>Unbend the hose and replace the faulty hose</p> <p>Re-connect SDE hoses 1 and 2 to the vehicle and ensure a tight connection</p>
Vacuum pump works but the vacuum vent doesn't hold vacuum when vacuum pump is running	<p>Remove top panel to gain access to lower side of the vacuum vent valve and loosen the nut (highlighted in image) to adjust spring tension on the plunger</p> 
Vacuum vent works but the vacuum pump doesn't work	Send unit to RAE or GL GmbH
Vacuum doesn't reach -0.9 BAR to -1.0 BAR	<ul style="list-style-type: none"> • Check if both Lever A and Lever B are in position 1 (A1/B1) • Leakage in the system on the vehicle side. To check this, disconnect SDE hose 2 (H2) from the vehicle, then run vacuum pump on the kinetic cart. If the vacuum goes to -0.9 BAR to -1.0 BAR, then there is a leakage on the vehicle side.

TROUBLESHOOTING

PROBLEM	SOLUTION
After switching ON the Hydraulic pump, no oil can be seen in the machine inspection sight glass	Check whether both lever A and lever B are in position 1 (A1/B1)
Hydraulic Power Unit doesn't build any pressure	<ul style="list-style-type: none"> • Remove SDE hose 2 (H2) from the vehicle before performing the fill process • Verify that Lever A is in position 1 and lever B is in position 3 (A1/B3) • Unbend the hose, if necessary replace the faulty hose • Access the oblique filter near the hydraulic pump and clean the strainer with compressed air  <ul style="list-style-type: none"> • Check if oil is visually leaking anywhere and inspect hoses for damages or cracks. • Remove SDE Hose 1 from the vehicle and check if pressure builds up (via the hydraulic pressure gauge on the kinetic cart) • Fill the fresh oil tank with Rivian approved kinetic fluid



TROUBLESHOOTING

PROBLEM	SOLUTION
Depressurize of the unit doesn't work (Hydraulic or Vacuum)	<ul style="list-style-type: none">• Leave lever B in position 3 and lever A for a longer period in position 2 (A2/B3), If pressure is not reduced, reach out to RAE or GL GmbH service hotline• Press vacuum ventilator again.• Spray dry lube on the ventilator to help reduce the possibility of sticking• If needed, disassemble unit and adjust hex nut to allow ventilator spring tension on the backside.• If pressure is not reduced, call RAE or GL GmbH service hotline
Hydraulic power unit does not run	<ul style="list-style-type: none">• Check power cable connection 110V (230V where applicable)• Electrical faults- reachout to RAE or GL GmbH service
Operating pressure of 30 BAR cannot be retained	<ul style="list-style-type: none">• Disconnect SDE hose 2 (H2) from the vehicle and build pressure again• Call RAE or GL GmbH service





DANGER

Risk of electrocution or electric shock



WARNING

Risk of minor injury



DANGER

Risk of major injury such as

- fire
- chemical or poison
- crushing / maiming
- death



CAUTION

Risk of

- damage to vehicle or property
- data disruption
- voiding warranty



CAUTION

Risk of Pinch Point

- keep hands and fingers clear of all moving parts.



PPE REQUIRED

IMPORTANT

Instructions to successfully complete a task

NOTE

Useful information

REVISION LOG

REV	DATE	CHANGE DESCRIPTION
A	11/08/2024	Initial release

