

Advanced Equipment Sales

VAC220 / VAC320:

User Manual



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1.0 Preface:

This manual is intended to provide the user with proper operational instructions and maintenance protocols for the Advanced Equipment Sales VAC220 and VAC320 products (henceforth referenced as “the Vac”). Adhering to the information provided will help ensure operator safety, while maximizing the longevity and effectiveness of the unit. All information, illustrations and technical specifications in this manual are based on the most recent product information available at the time of printing.

The VAC220 and VAC320 are designed to displace a variety of materials from sand to leaves and everything in between and they should only be used for this purpose. Correct usage of the unit also includes following the defined preparation, operation and maintenance instructions.

Advanced Equipment Sales reserves the right to change the design and specifications and/or make additions and improvements to the product without notice. If additional information is required, contact:

Advanced Equipment Sales; 21 Birch Street, Seaforth ON, N0K 1W0 (1-519-527-2929).

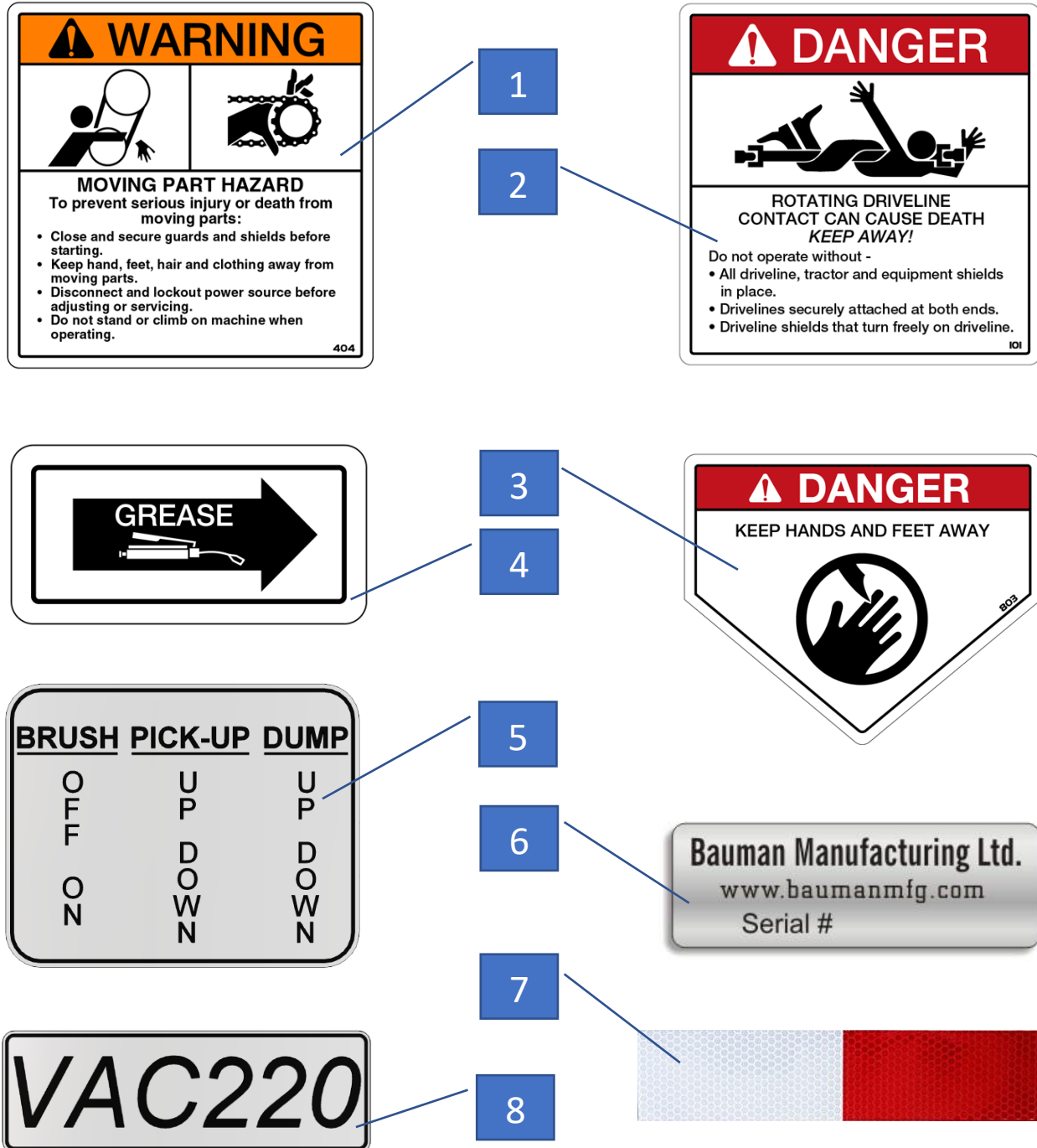
2.0 Safety and Maintenance:

To ensure the safe operation of the vacuum units, **it is critical that this manual is read and understood prior to use.** This section highlights multiple important Vac safety features: the labels which are found on the equipment, safe operating conditions and guidelines, as well as requirements to maintain Vac functionality. Contact Advanced Equipment Sales for any needed clarifications, as safety is an integral part of maintaining product life and operator well-being.



2.1 Labels:

See below for the list of labels which can be found on any given Vac unit. **It is critical that these hazards are understood, and their associated precautions are adhered too.** Failure to do so could result in serious injury and/or product damage. Approximate label/hazard locations can be found on the drawing in [Section 2.1.9](#). Note: Label images are not to scale.



2.1.1 Moving Parts Hazard (Label 1):

The Vac unit must have one warning label stuck to the front of the impeller assembly, where the PTO connects. Ensure this label clearly indicates that enclosed behind the shield are moving parts which could cause bodily harm. In the event the label has been damaged, replace immediately.

(Code: DECAL SW404)

2.1.2 Rotating Driveline (Label 2):

Extreme caution should be used anywhere near a rotating shaft. No loose clothing should be worn near the shafts, and all safety shields must be in place prior to powering the device. This label is noted on the impeller assembly. Refer to [Section 2.2.2](#) for more information on PTO safety. (Code: DECAL SW101)

2.1.3 Pinch Point Hazard (Label 3):

When the Vac collector box returns to its resting position after unloading, it creates a large pinch point between the top lip of the impeller and the base of the collector box. Another large pinch point exists beneath the pick-up head. Ensure all loose clothing and/or limbs are kept away from these areas. Use extreme caution if working near these areas while operating the hydraulics. In the event the label has been damaged, replace immediately. (Code: DECAL SW803)

2.1.4 Grease Label (Label 4):

To help prevent unnecessary wear on this equipment, it is important to follow the maintenance schedule listed in [Section 2.3](#) and apply lubrication to various locations on the Vac unit. Though many of these key locations are marked, ensure the joints of all moving components are well greased.

2.1.5 Hydraulic Control Label (Label 5):

This label indicates how to control the hydraulic features of the Vac unit. Each word must be clearly displayed at all times. See [Section 2.2.4](#) for hydraulic control instructions.

2.1.6 Identification Label (Label 6):

A serial number label can be found on the right side of the PTO shield (looking from front end to back). The serial number should be used as a reference when ordering new parts or inquiring about the product.

2.1.7 Reflective Tape (Label 7):

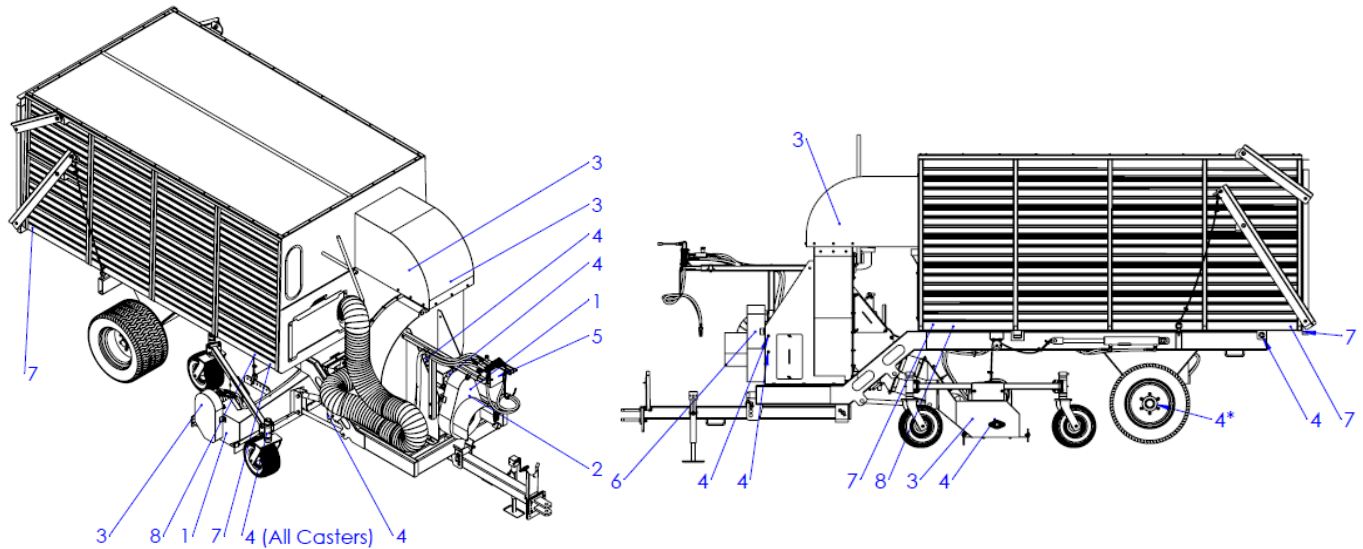
Reflective tape is added to the bottom corners and along the door of the collector box. Ensure tape is clean and clearly visible.

2.1.8 Model Number (Label 8):

This label will either display VAC220 or VAC320 depending on the Vac model. This label in combination with the Identification Label is important to reference when searching for information in the user manual and when ordering replacement parts.

2.1.9 VAC220 Label Locations:

The numbers listed below represent the label reference number. Ensure all labels are clearly displayed in the locations defined below. (4*= additional grease locations along axles, VAC320 model only)



2.2 Operating Procedures:

2.2.1 Receiving:

Upon delivery of your VAC220 and/or VAC320, inspect the unit(s) for missing parts and/or damage. Check the packing slip or bill of lading. **If you identify any missing part(s) and/or damage, contact Advanced Equipment Sales immediately.** Please provide the serial number, date of purchase and the name of the sales associate that sold the unit(s). When looking from the front of the Vac, the serial number is located on the right side of the PTO shield.

Ensure that the unit is inspected immediately. All missing or damaged parts must be recorded on the bill of lading at the time of delivery. For safety, do not use the Vac system if a component is determined missing.

2.2.2 PTO Hook-up:

Determining the appropriate PTO length is critical to ensure the safe operation and function of both the Vac unit and the tractor. If the shaft is too long or too short, the transmission of the tractor and the Vac have an increased chance of becoming damaged. A shaft is considered too short if the overlap length of the tubes drops under 4" anytime. A shaft which is too long will restrict the turning radius.

Depending on terrain and turning radius, the length of a PTO shaft will change. When power is applied to the PTO, it is recommended that the PTO does not deviate more than 30 degrees from its straight resting position. If a 3-point-lift is connected to the driving tractor, ensure the lift is raised or lowered to prevent interference with the PTO.

For a general guideline on how to shorten the PTO shaft, follow the steps listed below:

- i) Hitch the Vac onto the tractor, then turn the tractor to create a sharp angle between the tractor and the Vac. This is considered the shortest distance.
- ii) (Dimension A) Measure the distance from the PTO stub shaft and the implement PTO shaft, groove to groove, at the shortest point.
- iii) (Dimension B) Fully compress the PTO shaft and measure its length, lock pin to lock pin.
- iv) Determine the length to shorten each shaft:
(Amount to shorten = Dimension B – Dimension A + 2inches)
- v) Separate the two halves of the PTO shaft, and remove their safety covers. Shorten each of these components by the length determined in the step above.
- vi) Grease all PTO components before reassembling the shaft.
- vii) Attach the resized PTO shaft to the tractor/Vac and straighten the assembly (put into longest configuration). Verify that the minimum PTO overlap (4”) is still valid.

General PTO notes:

- Never run a PTO with a damaged PTO safety cover. Replace it first.

2.2.3 PTO RPM Control:

To enable impeller suction, the PTO must be powered. When engaging the PTO, do so at a low rpm.

Engaging at higher speeds may cause the drive belt to slip and burn.

Depending on the operating environment and the material to be vacuumed, the rpm may need to be adjusted to maintain suction. For any case, **the PTO rotation speed should not exceed 540 rpm.** If at max rpm the Vac is still experiencing difficulty displacing material, reduce ground/drive speed accordingly. Typical materials which require stronger suction include: very dry sand, loose soil, very wet debris or heavy leaves, as well as twigs and clippings.

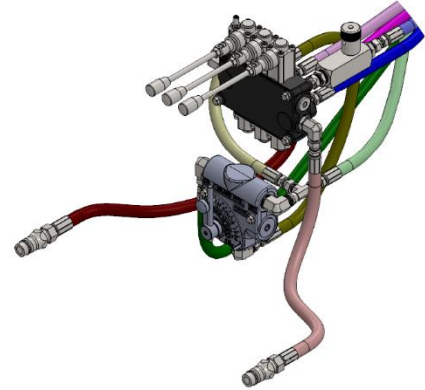
2.2.4 Hydraulic Controls:

The hydraulic functions of the Vac are controlled via three levers near the front end of the unit. With the exception of the brush lever, all levers naturally rest in the horizontal position and will “spring back” to its resting position if the lever is released from any other orientation. Both the VAC220 and the VAC320 utilize the same hydraulic lever system, however the VAC320 contains an additional control valve which can be adjusted as needed.

BRUSH	PICK-UP	DUMP
OFF	UP	UP
ON	DOWN	DOWN

Before linking any hydraulic hoses up to the tractor, ensure a routine check of all the hose lines has been done. The stock Vac units will have two hydraulic hoses connected at the control valves, which are to be linked to the tractor. **Failure to heed safe hydraulic connection practices could result in serious injury and/or damage to the equipment.** Use extra caution when disconnecting hydraulic hoses if done so immediately after use, the working fluid may be very hot.

As the label indicates, the left, middle, and right levers control the state of the vacuum brush, the pick-up head height, and the dump function respectively.



Brush: This valve initiates the spin function of the pick-up head. It has two positions, either “On” or “Off”. When in the horizontal position, the brush will remain stationary. When in the down position, the brush will spin. For safety and improved product lifespan, it is recommended that when the machine is left to idle, the brush should be shut off.

Pick-up: This valve controls the height of the vacuum pick-up head, relative to the ground. It has three positions, up, down, and neutral (horizontal). In the horizontal position, the head will remain at its current level. By pushing the lever up or down the head will raise or lower. When in use, the pick-up head must be fully lowered until its weight is entirely supported by the pick-up head tires. This will allow for greater vacuum suction. To account for terrain and the material(s) to be sucked up, any fine adjustments to the operating height of the pick-up head should be done by tweaking the casters (see [Section 3.2](#)) not the control valve.

Dump: This valve controls the tilting angle of the bucket, otherwise known as the dump function. In the neutral horizontal position, the collector box will remain at its current position. In the “up” position, the box will tilt upwards, causing the back gate to automatically open and material to slide towards the newly opened end. Conversely, to lower and close the collector box, push the lever downwards. **Before adjusting the angle of this section, ensure the area is clear of all people and potential interfering objects.** In order to maintain suction, the Vacs collector box must be in the fully lowered position.

As a general rule, avoid holding the control valves in the up or down position once the collector box or pick-up head has reached its max raised or lowered position.

2.2.5 [Maneuverability and Transportation:](#)

Before moving the Vac, ensure the collector box has been lowered and its rear lid has closed. If the Vac unit came with the optional “Manual Suction Hose”, ensure this hose is secured in its storage location. **The operator must always be alert and aware of his/her surroundings when operating this equipment.**

During operation when the PTO is powered, the only direction the Vac should travel is forward. Do not reverse the tractor without first shutting the PTO off. As per [Section 2.2.2](#), the minimum turning radius is dictated by the PTOs maximum angle of deflection (30 degrees from center). Do not exceed this value unless the PTO is shut off.

Each Vac model is rated for travel speeds up to 16km/h. If there is a need to transport the Vac unit off-site, it should be anchored on a trailer and towed to its desired location.

2.2.6 Storage:

Position the Vac at the desired storage location. Before disconnecting the tractor, relieve the pressure in the hydraulic cylinders by lowering the pick-up head until it rests on the ground and there is slack in the lifting cable. Additionally, adjust the hydraulics until the collector box rests flat on the chassis.

Once the PTO has been disconnected on the tractor end, the PTO brace located near the Vac hitch can be raised (see item 16 of [Section 6.3](#)), allowing the shaft to rest in its groove. This helps maintain the integrity of the shaft by keeping it off the ground, while providing safer ergonomics for the operator.

To help improve the life expectancy of the Vac, it is recommended that the Vac unit is stored indoors, in a dry atmosphere, away from precipitates. If this is not an option, once the tractor has been disconnected, raise the front end (hitch end) of the Vac via the mechanical jack. The slight slope created will help prevent water and moisture from pooling inside the collector box. For extended outdoor storage the PTO shaft should be removed from the assembly and stored in a dry location.

2.3 Maintenance:

The following section describes maintenance tasks which should be performed to ensure the safe operation of the VAC220 and VAC320. Proper maintenance is also important when considering the lifespan of the equipment. **Always ensure the Vac has fully cooled from operation before performing maintenance of any kind.** If a part is to be replaced, reference [Section 6](#) for its associated part number. Only products approved by Advanced Equipment Sales should be installed on the Vac.

2.3.1 General Maintenance, Pre-Use:

Before operating the Vac, perform routine maintenance to ensure the safety and integrity of the system:

- All tires on Vac unit have been inflated to their rated maximum, this correlates to 18psi for the large tires (mounted to the chassis) and 28psi for the small tires (mounted to the pick-up head). Do not exceed the tires rated pressure. Verify that there is no excessive wear on these tires.
- Hydraulic hoses and connections are leak free.
- All shields and chain guards are securely fastened in place.
- All controls are clean, not damaged, and ready to use.
- Moving components are lubricated as per maintenance guide. See [Section 2.1.9](#) for essential grease locations.
- All hardware, clamps, hoses, electrical connections, etc. are correctly secured.

2.3.2 General Maintenance, Post-Use:

When finished vacuuming, clean the machine with steam or with pressurized water. The components washed should include anything which makes excessive contact with the materials being vacuumed: the Pick-up Head, Impeller (inner faces), and the interior of the Collector Box.

2.3.3 Long Term Maintenance:

Over time and as the Vac unit is used, components will wear down and may require maintenance. It is important to regularly check them every couple of months. Perform checks more frequently depending on the equipment usage.

Pick-up Head Skirts: The rubber skirts will wear over time due to friction with the ground. Since these skirts are held in position using slotted holes, a replacement component is not necessarily needed right away. Simply loosen the mounting bolts and slide the skirts lower. The offset from the ground is chosen based on terrain and materials to be vacuumed. (For VAC220 see item 1 of [Section 6.5](#), for VAC320 see item 14 of [Section 6.12](#))

Impeller Sock: This is the fabric sleeve which connects the pick-up head to the impeller. Over time with the raising and lowering of the pick-up head, as well as from sucking up sharp and abrasive objects, small tears in the material may occur. (See [Section 6.7](#))

Impeller Ledger Plate: The ledger plate is a rectangular metal sheet with slotted holes, mounted inside the Vac impeller. Due to vibrations, this sheet may slide closer to the impeller fan blades. Verify that there is still a safe clearance between the blades and the bottom edge of the impeller ledger. (See item 10 of [Section 6.4](#))

Rust: All components which are susceptible to rusting are painted during the manufacturing process. Due to general wear however, the raw metal can become exposed and slowly deteriorate. Visually inspect the entire unit and ensure no section has been subjected to heavy rusting.

3.0 Set-up and Adjustable Components:

3.1 VAC220 700 Manual Suction Hose:

This hose is designed to mount onto any Vac unit and to provide the operator with extended vacuum mobility. It can be used to suck up materials in hard to reach places, or in sections where the Vac cannot be easily towed over. One end of the hose is connected to the impeller while the other end is held by the operator.

3.1.1 Installation Instructions:

First reference [Section 6.9](#) for the schematic drawing and components used to mount this suction hose. When shipped the majority of the hose components should already be assembled as a unit, it is simply a matter of attaching it to the Vac. Using the hardware provided, secure Item 12 of S6.9 to the control support arm (Item 20 of [S6.1](#)) already fixed to the Vac. Using the hose clamp, secure the open end of the hose to the circular impeller opening. Ensure this hose does not pull loose. The hose has now been installed. When not in use the hose may be stored beside the impeller, with the handle resting up against Item 32 of [S6.4](#) on the Vac unit.

3.1.2 Operation Instructions:

When the operator intends to use the manual suction hose, the steps listed below must be followed to ensure operator safety and hose functionality:

- i) Turn the PTO off, preventing the impeller from spinning.
- ii) Simultaneously pull the spring pin located on the impeller and slide the sheet metal wall upwards. The pin will stick through the small hole in the sheet, holding it in place. See items 30, 31 of [Section 6.4](#). The hose now has an open channel to the impeller and will be able to suck air.
- iii) Obtain the pick-up head diverter sheet and wedge it between the sock and the end of the impeller assembly. This will prevent air from sucking in from the pick-up head and improve the vacuum strength of the manual hose.
- iv) The manual hose is mounted to a swing arm which can be released to allow greater hose reach, while supporting the shape of the channel for steady airflow. Enable movement in the swing bar by pulling the locking spring pin.
- v) The PTO may now be engaged as per safety guidelines.
- vi) The open hose end/hose handle may now be unattached from the Vac unit and used to suck up the desired material(s).
- vii) When finished, return the hose to its mounted location and run the PTO for a few seconds longer. This will help prevent buildup of debris in the hose. Shut the PTO off, then return all airflow diverters to their original position.

3.2 Pick-up Head Adjustment:

Depending on the material intended to be sucked up and the terrain, the height the pick-up head rests above the ground may need to be adjusted. This can be done by evenly removing the spacer rings around each caster/wheel. See [Section 6.6](#) for a visual representation of this component.

3.3 Vac Hitch Hook-up:

When mounted to a towing vehicle, the Vac unit will function most effectively when the body/chassis is level with the ground. Depending on the size of the vehicle, the angle of the hitch arm may need to be adjusted. This can be done by pulling the pin near the front of the hitch, pivoting the hitch arm, then reinserting the pin into the adjustment plates. See Items 3 and 15 of [Section 6.3](#) for a visual reference. Further adjustment may be made by shifting the position of item 14.

3.4 Alternate Brush Heads:

For both the VAC220 and the VAC320, two different styles of brush heads may be purchased. One style utilizes a circular array of four long plastic brushes with durable bristles. The other style consists of four rows of multiple rubber tines, arranged in a circular array. See [Section 6.8](#) for VAC220 schematics, and [Section 6.13](#) for VAC320 schematics. Contact Advanced Equipment Sales to help determine which style is best for a given application.

4.0 VAC Operating Cycle:

The steps in this section should be followed to verify that all components have been installed correctly, and to ensure the safe connection and operation of the Vac unit.

4.1 Quality Checklist:

IMPORTANT: VERIFY CHECK LIST PRIOR TO APPLYING POWER TO SYSTEM

- i) Before connecting the Vac to the towing unit, perform the routine maintenance and visual check as outlined in [Section 2.3.1](#).
- ii) Ensure that the towing tractor has the appropriate power ratings and is in accordance with the tractor manufacturers recommendations.

4.2 Vac Hook-up:

- i) Ensure vicinity around the Vac unit is clear of people and obstacles, then hitch the Vac to the tractor. The Vac unit should be level with the ground when mounted. If this is not the case, the angle of the hitch arm should be adjusted. See [Section 3.3](#) for details on this process. Once connected, pivot the jack near the hitch 180 degrees to prevent it from dragging on the ground during operation.
- ii) If not already connected to the Vac unit, obtain the correctly sized PTO shaft and install it. Verify that this PTO shaft has clearance to pivot side to side and will not intersect any externally mounted equipment (such as a 3-point-lift). **It is unsafe to use a PTO which has not been properly sized for this application**, if this has not been verified, refer to [Section 2.2.2](#) for instructions.
- iii) Gather the hydraulic input and output lines from the tractor and connect them to their respective hose on the Vac. Without engaging the PTO, confirm there is an appropriate amount of pressure in the hose lines. This can be done by pulling the controller levers and cycling through the vacuum functions. Ensure the collector bucket tilts up and down, the pick-up head can be raised and lowered, and the brush spins and stops. Return all hydraulic components to their original position.

4.3 Powering Vac:

- i) Tow the Vac unit to the area to be vacuumed.
- ii) Using the hydraulic levers, lower the pick-up head until there is slack in the cables.
- iii) Engage the PTO, allowing the impeller to draw in air. (As per safety instructions, ensure the PTO engages at a low rpm).
- iv) Enable the brushes to spin.
- v) The Vac is now ready for operation. Be sure to follow all safety guidelines as defined in [Section 2](#).
- vi) In cases where the manual suction hose is required, shut off the PTO then follow the series of steps defined in [Section 3.1.2](#).

4.4 Unloading Vac:

- i) When ready to unload the collector box, disengage the PTO and raise the pick-up head.
- ii) Maneuver the Vac unit to the desired material disposal zone. **Before proceeding with the unloading process, ensure the area is clear of people and obstacles.**
- iii) With the tractor in park, use the hydraulic controls to slowly tilt the collector box upwards. The rear door will automatically open as the box tips.
- iv) If the collected materials are resistive to unloading, the tractor may carefully be driven forwards to help vibrate the goods out of the box. If necessary, the Vac may be unloaded by hand. **Note: it is not safe to stand behind the collector box during the unloading process. The operator must always stand to the side of the unit when unloading to prevent the vacuumed materials from potentially crushing or burying the user.**

4.5 Shutting Down Vac:

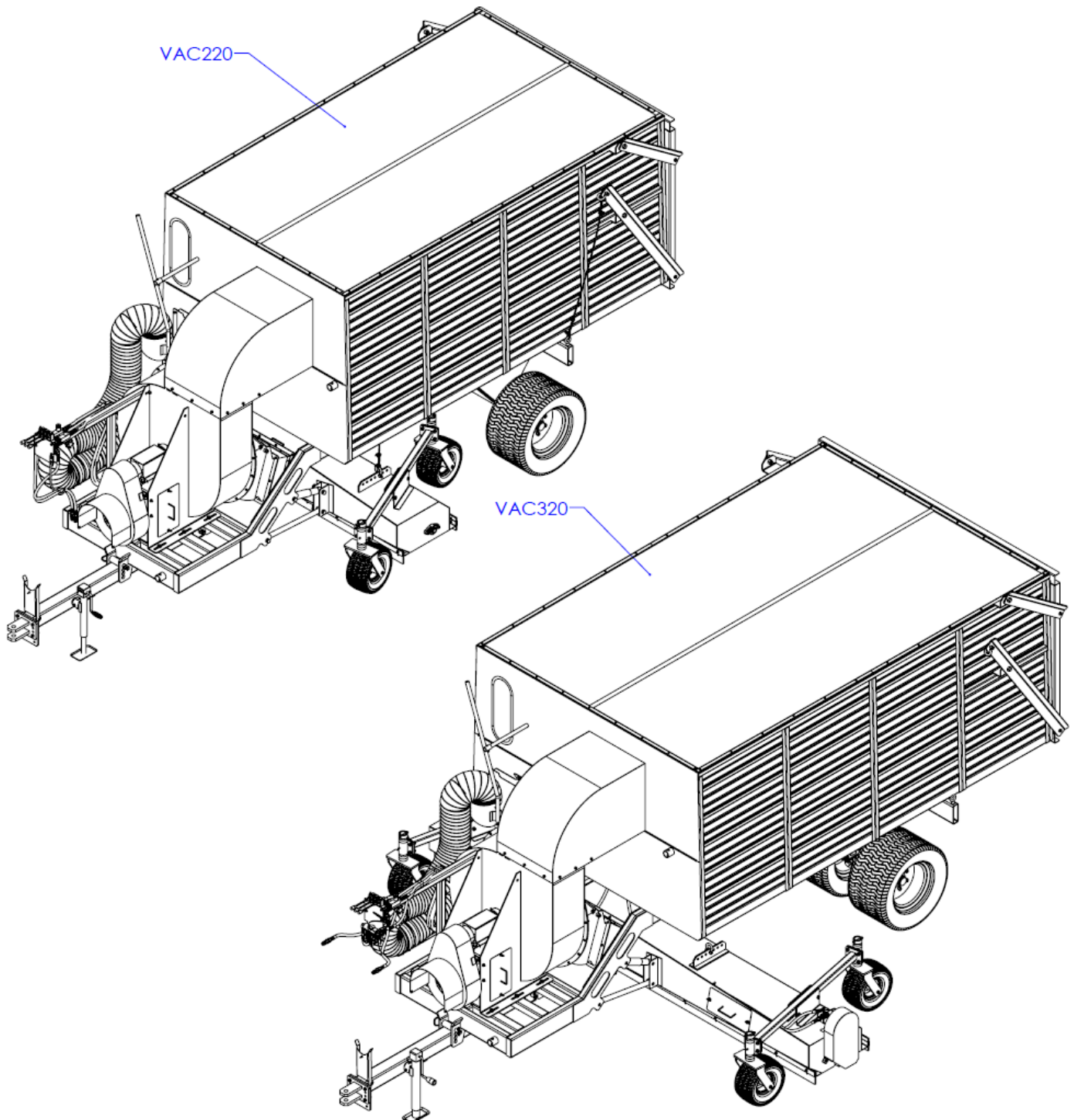
- i) After the Vac has been unloaded, it is important to follow the post-use maintenance processes noted in [Section 2.3.2](#). This largely includes the cleaning of key functioning components.
- ii) When complete, the Vac is ready for storage. The proper method for this has been outlined in [Section 2.2.6](#).

5.0 Troubleshooting:

#	Problem	Possible Issues
1	All hydraulics on Vac not functioning	- Hydraulic control on tractor switched off - Hydraulic oil level on tractor too low - Couplings on Vac hoses loose or missing connection - Hose lines damaged/leaking - Max collector box load exceeded
2	Collector Box will not tilt	- See problem 1 - External obstructions (eg. Tree above unit)
3	Collector Box will not open automatically	Door cables broken or missing
4	Vacuum cannot displace material	- The PTO/impeller not turned on - Impeller drive belts damaged - Material clogged somewhere between pick-up head and collector box - Vacuumed material too close to front of collector box (blocking air channel) - Impeller ledger plate intersecting fan blades - Brush head not spinning - Brush bristles/tines worn or broken - An air flow diverter is in the wrong position
5	Excessive wear on brush heads	Pick-up head set too low to ground

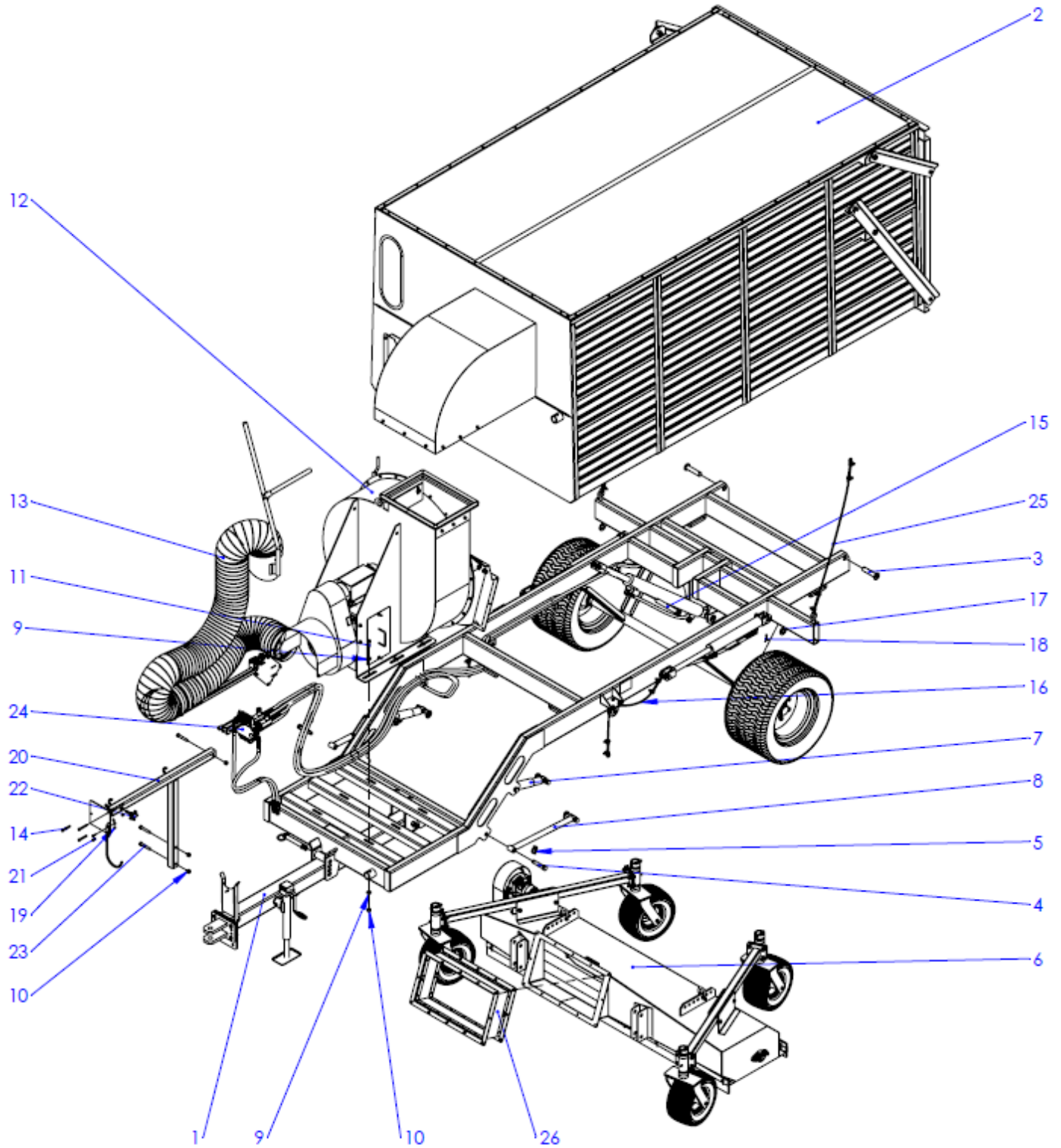
6.0 Parts Manual

The following section should be used as a reference to help locate and determine replacement components. Though the VAC220 and the VAC320 are different models, they utilize much of the same components. In general, an exploded view of a Vac will be displayed for a given assembly, then the following sheet will list the related components for each model.



6.1 VAC220 & VAC320 Assembly:

Note: The drawing below shows the VAC220 assembly. Due to similar components and appearances, this model is used to represent the VAC320 as well. See BOM for details.

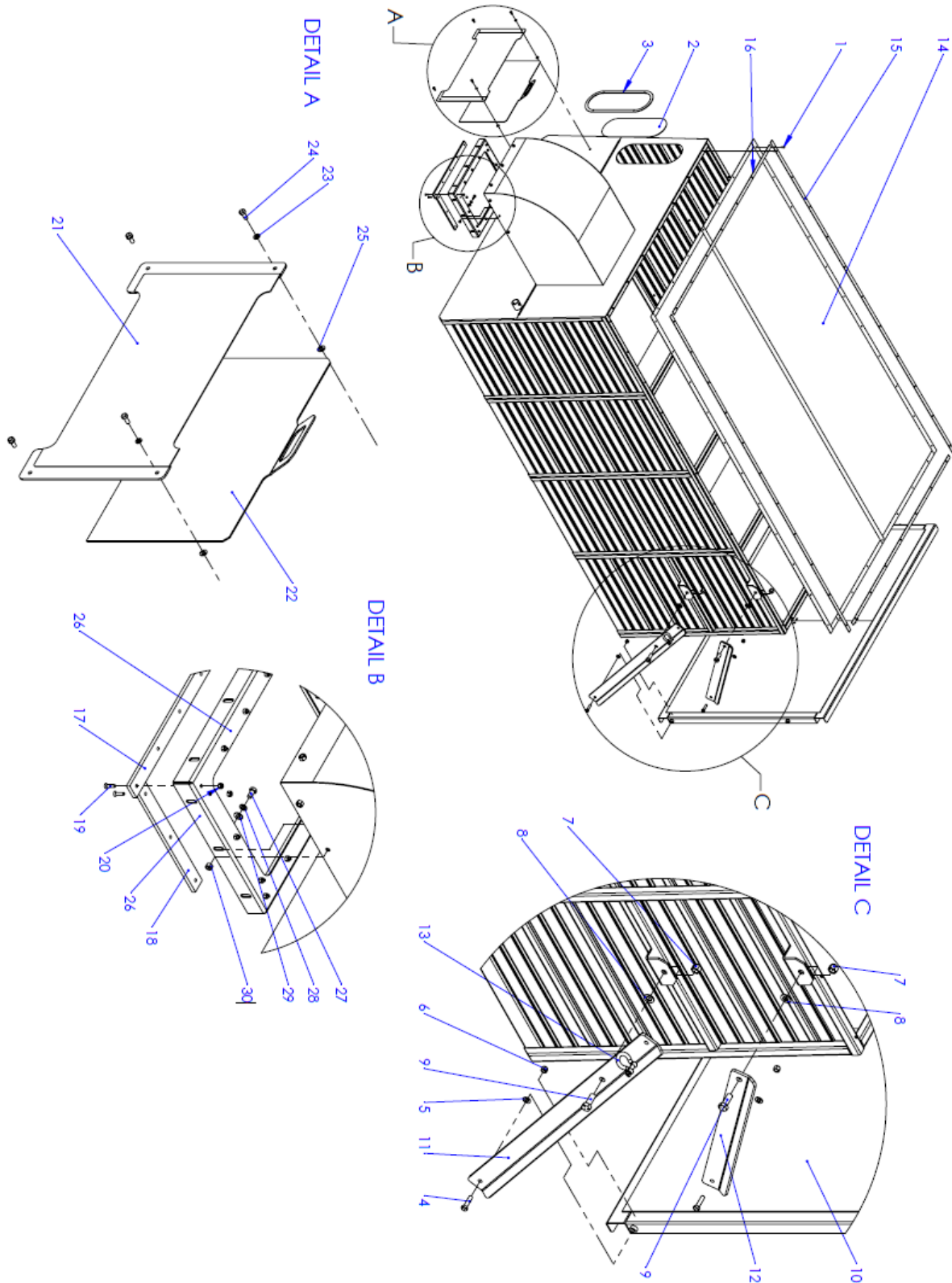


6.1.1 VAC220 & VAC320 BOM:

ITEM #	PART CODE: VAC220	PART CODE: VAC320	DESCRIPTION	QTY
1	VAC220 200	VAC320 200	CHASSIS ASSEMBLY	1
2	VAC220 100	VAC320 100	COLLECTOR BOX ASSEMBLY	1
3	VAC220 901	VAC220 901	REAR HINGE PIN	2
4	ETLP19076	ETLP19076	HITCH PIN 3/4" x 4 1/2"	8
5	ELP11045	ELP11045	LINCH PIN 7/16" x 1 3/8"	8
6	VAC220 600	VAC320 600	PICK UP HEAD ASSEMBLY	1
7	VAC220 001	VAC220 001	SHOCK ABSORBER	2
8	VAC220 920	VAC220 920	LINKAGE	2
9	02307 008	02307 008	1/2" FLAT WASHER	12
10	02312 008	02312 008	1/2" NY/LOCK NUT	9
11	02301 008 108	02301 008 108	1/2" x 1 1/2" HEX CAPSCREW	6
12	VAC220 400	VAC220 400	IMPELLER ASSEMBLY	1
13	VAC220 700	VAC220 700	HAND HOSE ASSEMBLY	1
14	02301 005 208	n/a	5/16" x 2 1/2" HEX CAPSCREW	3
15	VAC220 903	VAC220 903	MAIN CYLINDER PIN	2
16	VAC220 002	VAC220 002	LIFTING CABLE	2
17	02307 016	02307 016	1" FLAT WASHER	2
18	2317 3/16 112	2317 3/16 112	3/16" COTTER PIN x 1 3/4"	2
19	02312 004	n/a	1/4" NY/LOCK NUT	2
20	VAC220 810	VAC320 810	HYDRAULIC VALVE MOUNT	1
21	02301 004 012	n/a	1/4" x 3/4" HEX CAPSCREW	2
22	03501 007	n/a	5 STAR KNOB 1/2" x 1 3/4"	1
23	02301 008 300	02301 008 300	1/2" x 3" HEX CAPSCREW	3
24	VAC220 800	VAC320 800	HYDRAULIC COMPONENTS	1
25	VAC220 003	VAC220 003	TAILGATE CABLE	2
26	VAC220 650	VAC220 650	HEAD-TO-IMPELLER SOCK	1

6.2 VAC220 100 & VAC320 100, Collector Box Assembly:

Note: The drawing below shows the VAC220 100 assembly. Due to similar components and appearances, this model is used to represent the VAC320 100 as well. See BOM for details.

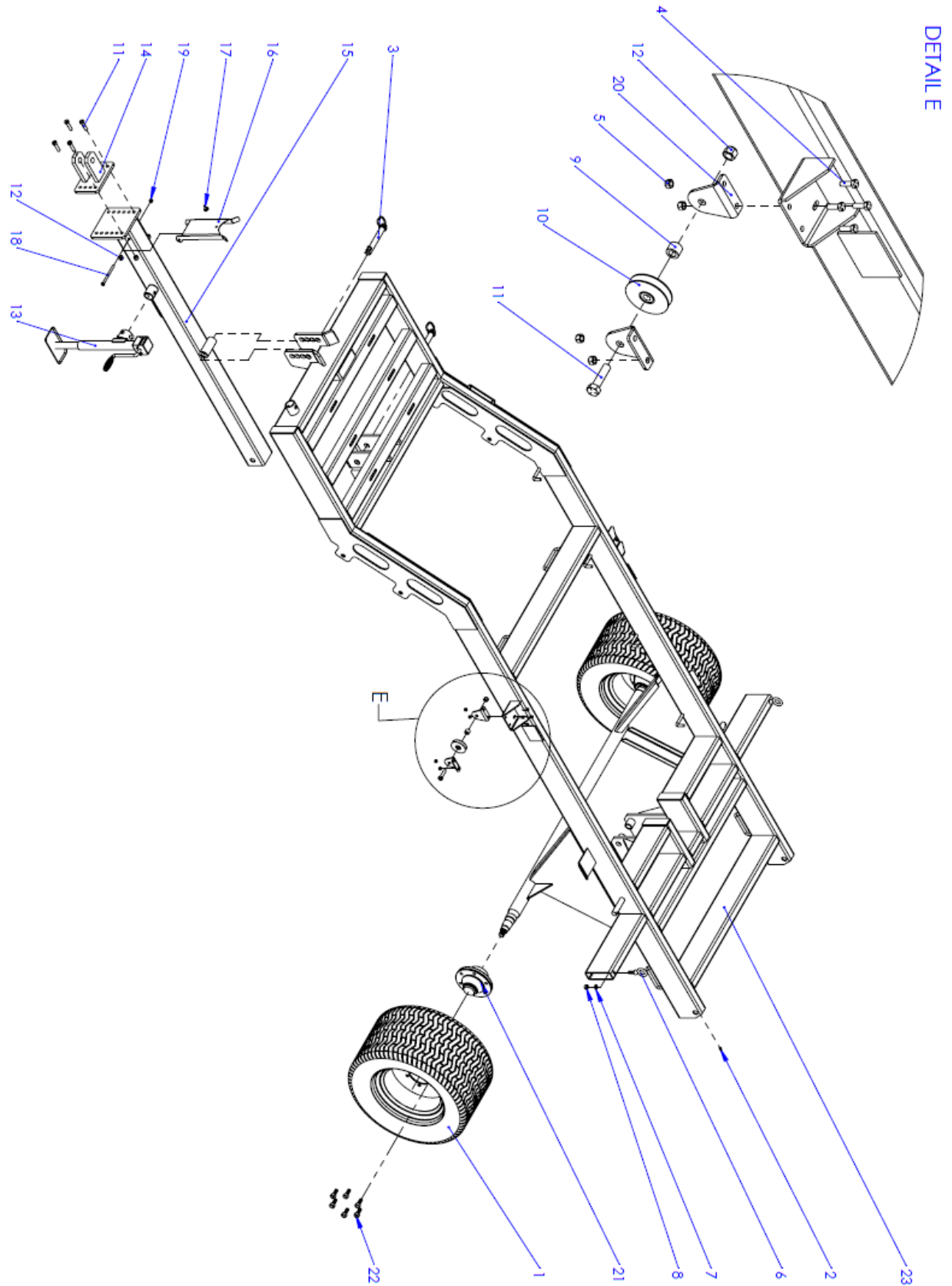


6.2.1 VAC220 100 & VAC320 100, Collector Box BOM:

Note: Item 15 of VAC320 is actually two strips (per side) positioned end-to-end, then anchored in place.
The VAC220 utilizes a single strip per side.

ITEM #	PART CODE: VAC220 100	PART CODE: VAC320 100	DESCRIPTION	220 QTY	320 QTY
1	02317 012	02317 012	#12-3/4" METAL SCREW	36	42
2	VAC220 102	VAC220 102	VIEWING WINDOW	1	1
3	VAC220 103	VAC220 103	WINDOW SEAL 5'	1	1
4	02301 008 200-SS	02301 008 200-SS	1/2" x 2" HEX CAPSCREW	4	4
5	02307 008	02307 008	1/2" FLAT WASHER	4	4
6	02312 008	02312 008	1/2" NY/LOCK NUT	4	4
7	02312 012	02312 012	3/4" NY/LOCK NUT	4	4
8	02307 012	02307 012	3/4" FLAT WASHER	4	4
9	02301 012 200	02301 012 200	3/4" x 2" HEX CAPSCREW	4	4
10	VAC220 130	VAC320 130	TAILGATE WELDMENT	1	1
11	VAC220 131	VAC220 131	TAILGATE BAR-LONG	1	1
12	VAC220 132	VAC220 132	TAILGATE BAR-SHORT	1	1
13	4408-40042	4408-40042	SCREWPIN SHACKLE 1/2"	2	2
14	VAC220 101	VAC320 101	TARP - VAC220	1	1
15	VAC220 104	VAC320 104	TARP STRIP-LONG	2	4
16	VAC220 105	VAC320 105	TARP STRIP-SHORT	2	2
17	VAC220 404-01	VAC220 404-01	HOOD SHORT RUBBER STRIP	2	2
18	VAC220 404-02	VAC220 404-02	HOOD LONG RUBBER STRIP	2	2
19	02315 004 100	02315 004 100	1/4" x 1" FLAT HEAD QUADREX	16	16
20	02312 004	02312 004	1/4" NY/LOCK NUT	16	16
21	VAC220 451	VAC220 451	STORAGE PLATE	1	1
22	VAC220 450	VAC220 450	DIVERter PLATE	1	1
23	02308 005	02308 005	5/16" LOCK WASHER	4	4
24	02301 005 012	02301 005 012	5/16" x 3/4" HEX CAPSCREW	4	4
25	02307 005	02307 005	5/16" FLAT WASHER	2	2
26	VAC220 106	VAC220 106	ADJUSTABLE HOOD OPENING	1	1
27	02301 006 012	02301 006 012	3/8" x 3/4" HEX CAPSCREW	12	12
28	02308 006	02308 006	3/8" LOCK WASHER	12	12
29	02307 006	02307 006	3/8" FLAT WASHER	12	12
30	02305 006	02305 006	3/8" REG. NUT	12	12

6.3 VAC220 200, Chassis Assembly:

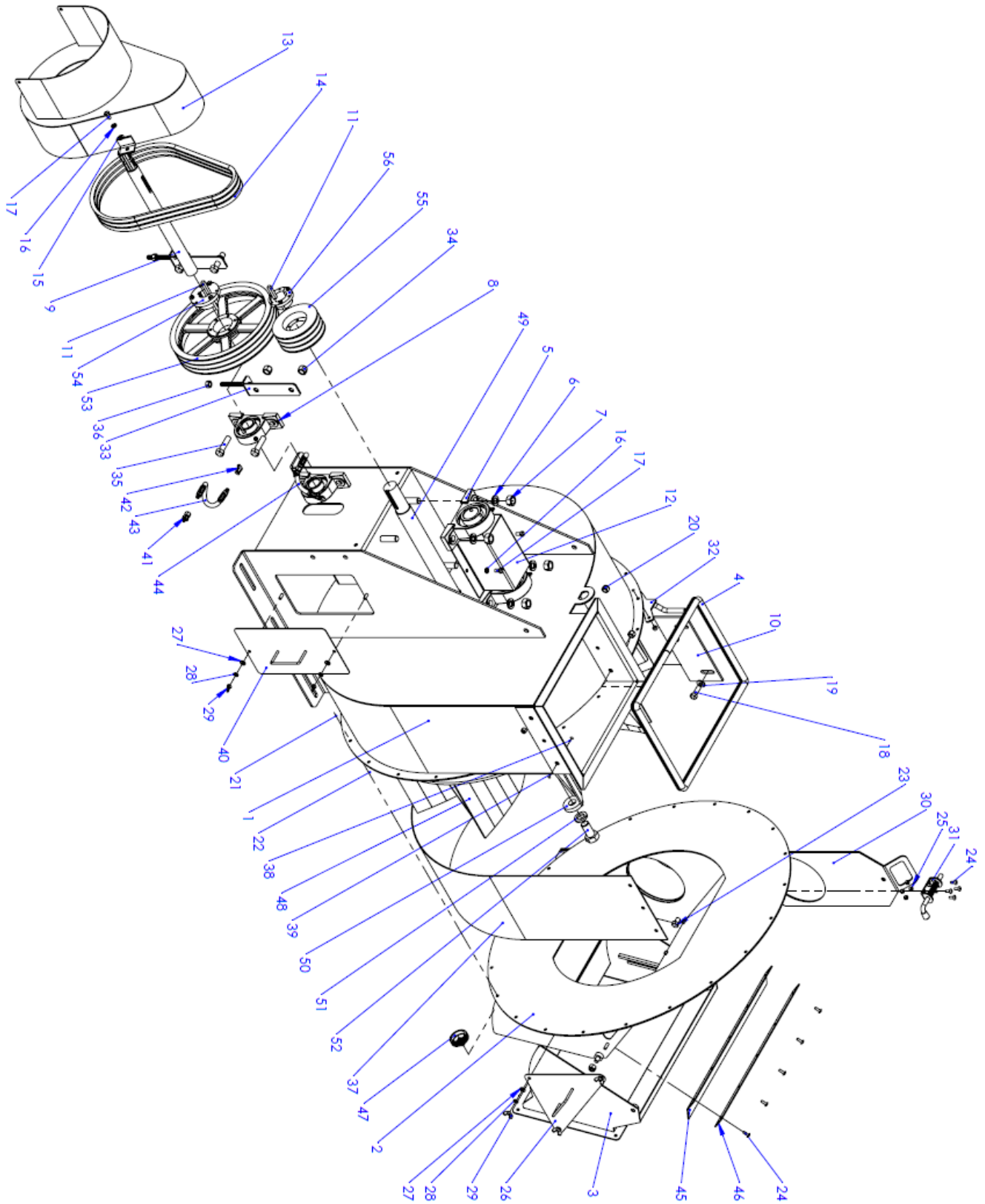


6.3.1 VAC220 200, Chassis BOM:

ITEM #	PART CODE: VAC220 200	DESCRIPTION	QTY
1	WHL48651	26.50x14.00 TIRE	2
2	11105	GREASE FITTING	2
3	EHPWC25196	1" x 6 1/4" HITCH PIN	2
4	02301 005 100-SS	5/16" x 1" SS HEX CAPSCREW	8
5	02312 005-SS	5/16" SS NY/LOCK NUT	8
6	02301 008 108 EYE	EYEBOLT 1/2" x 1-1/2"	2
7	02308 008	1/2" LOCK WASHER	2
8	02305 008	1/2" REG. NUT	2
9	151-0821	STEEL BUSHING 7/8 x 1/2 x 21/32	2
10	150-4821	3" PULLEY	2
11	02301 008 200-SS	1/2" x 2" HEX CAPSCREW	6
12	02312 008	1/2" NY/LOCK NUT	6
13	BE-050	SIDEWIND JACK 10" 5000 LBS	1
14	VAC220 320	HITCH WELDMENT	1
15	VAC220 310	TONGUE WELDMENT	1
16	VAC220 301	PTO SHAFT SUPPORT	1
17	03501 1220	RUBBER BUMPER	1
18	02301 006 500	3/8" x 5" HEX CAPSCREW	1
19	02312 006	3/8" NY/LOCK NUT	1
20	150-B5603008	WIRE ROPE PULLEY BRACKET	4
21	H 05000 6 600	5000 LBS HUB	2
22	02301 009 104WB	9/16" x 1 1/4" WHEEL BOLT	12
23	VAC220 220	CHASSIS WELDMENT	1

6.4 VAC220 400, Impeller Assembly:

VAC220/320 Common Component

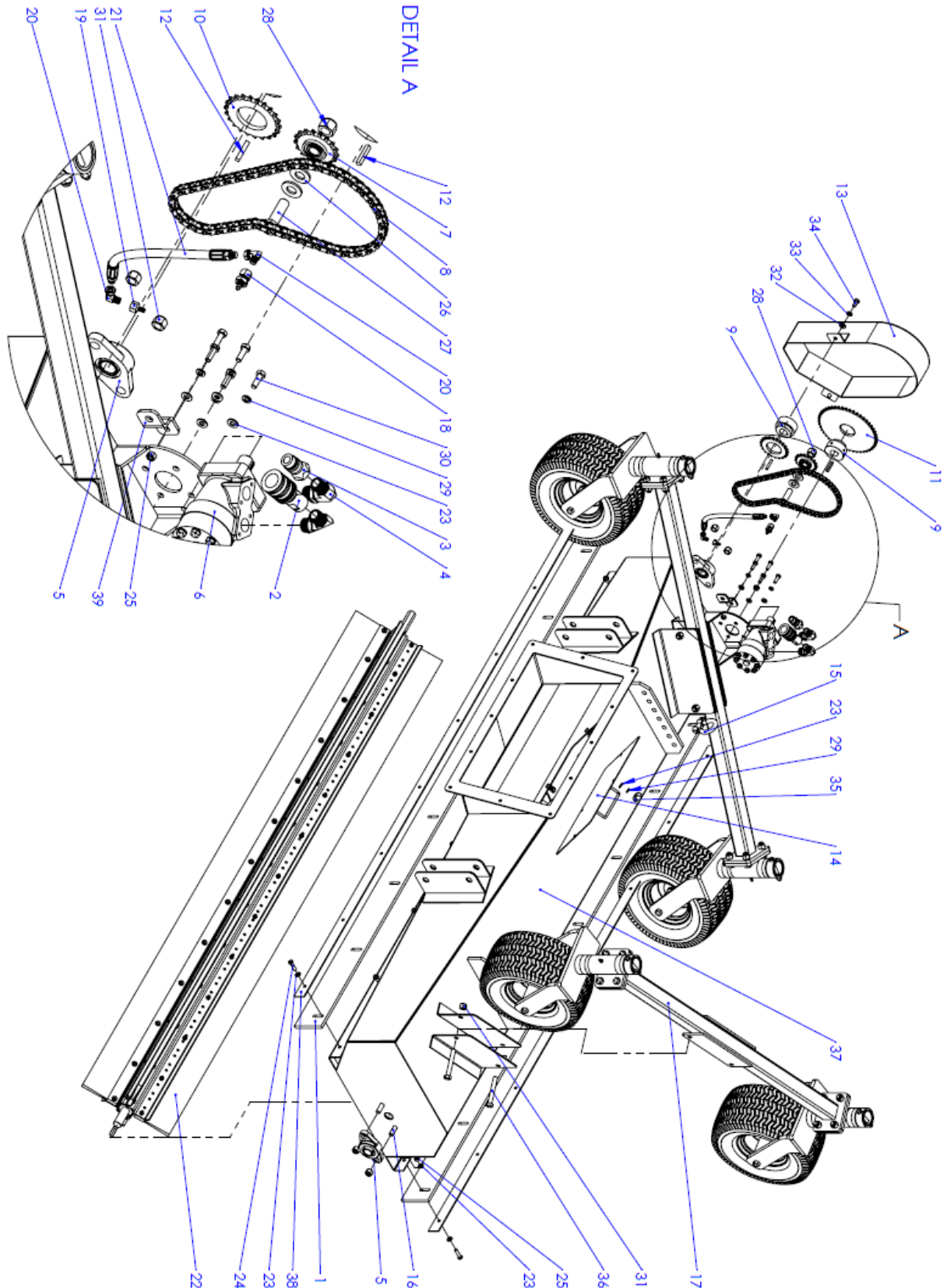


6.4.1 VAC220 400, Impeller BOM:

VAC220/320 Common Component

ITEM #	PART CODE: VAC220 400	DESCRIPTION	QTY		ITEM #	PART CODE: VAC220 400	DESCRIPTION	QTY
1	VAC220 410	IMPELLER HOUSING	1		29	02311 005	5/16" WING NUT	5
2	VAC220 420	IMPELLER INLET	1		30	VAC220 450	SLIDE GATE	1
3	VAC220 430	IMPELLER CHUTE	1		31	01900	SPRING BOLT	1
4	VAC220 404	SEAL FOR DUMP BOX	1		32	VAC220 720	HOSE HANGER BRKT	1
5	UCP 211-32	PILLOW BLOCK BEARING	2		33	VAC220 470	BELT TENSIONER	2
6	02308 012	3/4" LOCK WASHER	4		34	02312 010	5/8" NY/LOCK NUT	4
7	02305 012	3/4" REG. NUT	4		35	02301 010 208	5/8" x 2 1/2" HEX CAPSCREW	4
8	UCP 208-24	PILLOW BLOCK BEARING	2		36	02305 008	1/2" REG. NUT	4
9	VAC220 402	1-1/2"x13-1/2" 540 SPLINE SHAFT	1		37	VAC220 406	SS HOUSING LINER	1
10	VAC220 405	LEDGER PLATE	1		38	02301 006 100	3/8" x 1" HEX CAPSCREW	3
11	407-0600	KEYSTOCK 3/8"	2		39	02312 006	3/8" NY/LOCK NUT	3
12	VAC220 530	SHAFT GUARD	1		40	VAC320 660	SIDE ACCES PANEL	1
13	VAC220 510	IMPELLER BELT SHIELD	1		41	HYD A-0402 7/16NC	GREASE WHIP ADAPTER	2
14	BLTB053	VEE BELT 53"	3		42	HYD1501-2-2	PIPE ELBOW - MP X SWIVEL FP 90°	2
15	02307 006	3/8" FLAT WASHER	2		43	HYD GW-10	GREASE WHIP-10"	1
16	02308 006	3/8" LOCK WASHER	4		44	HYD GW-14	GREASE WHIP-14"	1
17	02301 006 012	3/8" x 3/4" HEX CAPSCREW	4		45	VAC220 403	RUBBER INLET FLAP	1
18	02301 008 108	1/2" x 1 1/2" HEX CAPSCREW	2		46	VAC220 407	INLET RUBBER RETAINER	1
19	02307 008	1/2" FLAT WASHER	2		47	6450-020	2" METAL PLUG	1
20	02312 008	1/2" NY/LOCK NUT	4		48	VAC220 440	IMPELLER BLADE WELDMENT	8
21	02301 005 100	5/16" x 1" HEX CAPSCREW	21		49	VAC220 441	IMPELLER SHAFT	1
22	02312 005	5/16" NY/LOCK NUT	21		50	VAC220 443	BUSHING END CAP	1
23	02301 008 200-SS	1/2" x 2" HEX CAPSCREW	2		51	02308 100	1" LOCK WASHER	1
24	03901 004 012	1/4" TRUSS HEAD BOLT x 3/4"	9		52	02301 100 208	1" x 2 1/2" HEX CAPSCREW	1
25	02312 004	1/4" NY/LOCK NUT	9		53	3B136	3 BELT PULLEY	1
26	VAC220 460	IMPELLER INLET ACCESS PANEL	1		54	SK-108	BUSHING 1-1/2"	1
27	02307 005	5/16" FLAT WASHER	5		55	3B62	3 BELT PULLEY	1
28	02308 005	5/16" LOCK WASHER	5		56	SDS-112	BUSHING 1-3/4"	1

6.5 VAC220 600, Pick-up Head Assembly:



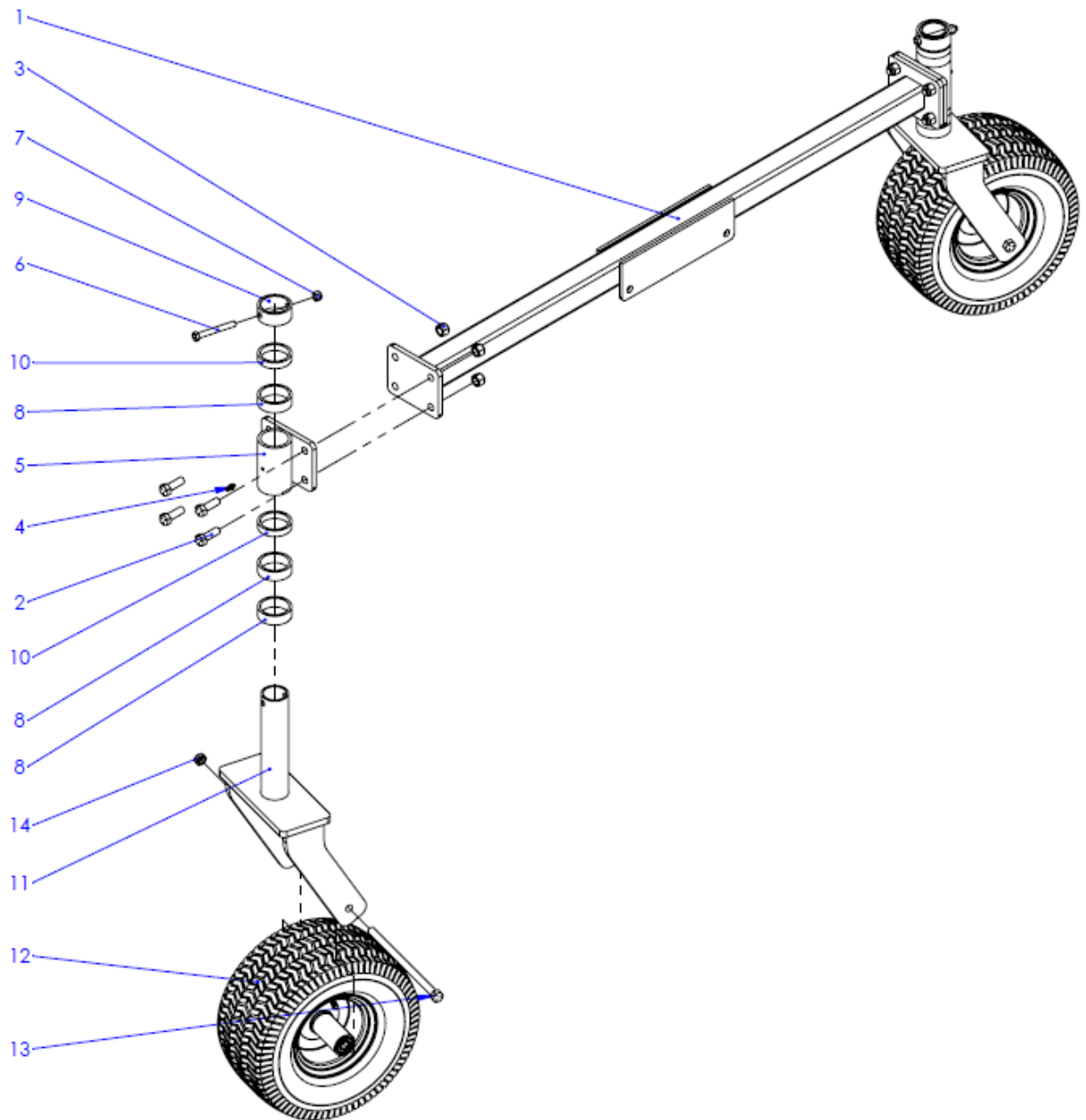
6.5.1 VAC220 600, Pick-up Head BOM:

Note: There are two types of brushes available for the Pick-up Head assembly (Item 22a,b). Contact Advanced Equipment Sales to determine the most appropriate option for a given application.

ITEM #	PART CODE: VAC220 600	DESCRIPTION	QTY		ITEM #	PART CODE: VAC220 600	DESCRIPTION	QTY
1	VAC220 601	RUBBER FLAP	2		21	HYD GW-10	GREASE WHIP - 10"	1
2	HYDPQC-F	PIONEER QUICK COUPLER-FEMALE	1		22a	VAC220 640	BRISTLE BRUSH (Option 1)	1
3	HYDPQC-M	PIONEER QUICK COUPLER-MALE	1		22b	VAC220 660	RUBBER TINE BRUSH (Option 2)	1
4	HYD6806-10-8	MALE PIPE ELBOW - MORB x MP 90°	2		23	02307 005	5/16" FLAT WASHER	40
5	UFCL 205-16	TWO BOLT FLANGE BEARING	2		24	02301 005 104	5/16" x 1 1/4" HEX CAPSCREW	16
6	HYD EMH HM100-H4	HYDRAULIC MOTOR - 5/8" ORB PORTS	1		25	02312 005	5/16" NY/LOCK NUT	17
7	04017E10	IDLER SPROCKET 5/8"	1		26	02307 010	5/8" FLAT WASHER	2
8	0A040	#40 ROLLER CHAIN	1		27	02301 010 200	5/8" x 2" HEX CAPSCREW	1
9	00030016	X HUB 1" BORE	2		28	02312 010	5/8" NY/LOCK NUT	1
10	00104022	SPROCKET #40 22T	1		29	02308 005	5/16" LOCK WASHER	8
11	00104048	SPROCKET #40 48T	1		30	02301 005 100	5/16" x 1" HEX CAPSCREW	5
12	407-0400	KEYSTOCK 1/4"	2		31	02312 008	1/2" NY/LOCK NUT	8
13	VAC220 520	HYDRAULIC MOTOR SHIELD	1		32	02307 006	3/8" FLAT WASHER	2
14	VAC220 630	PICK UP HEAD ACCESS PANEL	1		33	02308 006	3/8" LOCK WASHER	2
15	4408-40042	SCREWPIN SHACKLE 1/2"	2		34	02301 006 012	3/8" x 3/4" HEX CAPSCREW	2
16	02301 008 108	1/2" x 1 1/2" HEX CAPSCREW	4		35	02311 005	5/16" WING NUT	4
17	VAC220 620	STABILIZER ASSEMBLY	2		36	02301 008 308	1/2" x 3 1/2" HEX CAPSCREW	4
18	HYD A-0402 7/16NC	GREASE WHIP ADAPTER	1		37	VAC220 610	PICK UP HEAD BODY WELDMENT	1
19	HYD A-04NF02NPT	ADAPTER 1/8" NPT x 1/4"-28	1		38	VAC220 602	RUBBER MOUNT STRIP	2
20	HYD1501-2-2	PIPE ELBOW - MP X SWIVEL FP 90°	2		39	VAC220 603	GREASE WHIP BRACKET	2

6.6 VAC220 620 Caster Assembly:

VAC220/320 Common Component



6.6.1 VAC220 620 Caster BOM:

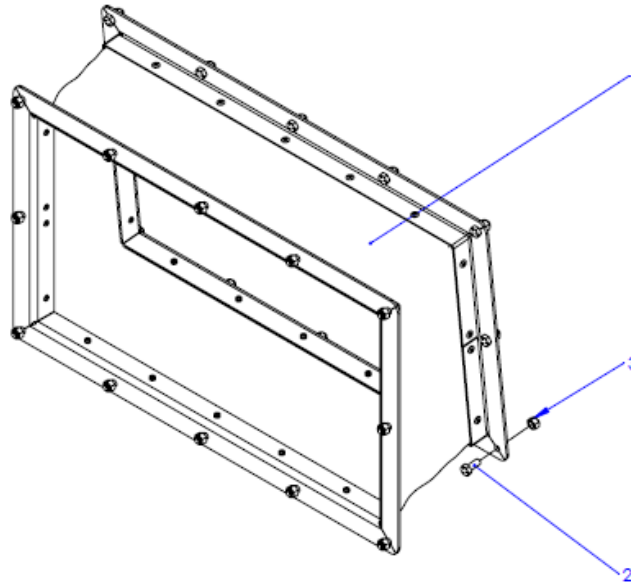
VAC220/320 Common Component

ITEM #	PART CODE: VAC220 620	DESCRIPTION	QTY
1	VAC220 622	STABILIZER ARM	1
2	02301 008 108	1/2" x 1 1/2" HEX CAPSCREW	8
3	02312 008	1/2" NY/LOCK NUT	8
4	11105	GREASE FITTING	2
5	VAC220-STABILIZER PARTS	CASTER TUBE	2
6	02301 006 300	3/8" x 3" HEX CAPSCREW	2
7	02312 006	3/8" NY/LOCK NUT	2
8	VAC220 621-01	SPACER TUBE	6
9	VAC220 621-02	LOCK COLLAR	2
10	VAC220 621-03	SPACER TUBE	4
11	VAC220 621-04	WHEEL MOUNT WELDMENT	2
12	WHL891881	13x6.50-6NHS 4PR Turf Saver TL	2
13	02301 008 900	1/2" x 9" HEX CAPSCREW	2
14	02312 008T	1/2" THIN NY/LOCK NUT	2

BAUMAN
 6202-2RS
 6202-2RS x1/2" Bearing for Caster Wheel on
 VAC220/VAC320
 (4 in each wheel -16 required total)

6.7 VAC220 650, Head-to-Impeller Sock Assembly:

VAC220/320 Common Component



6.7.1 VAC220 650, Head-to-Impeller Sock BOM:

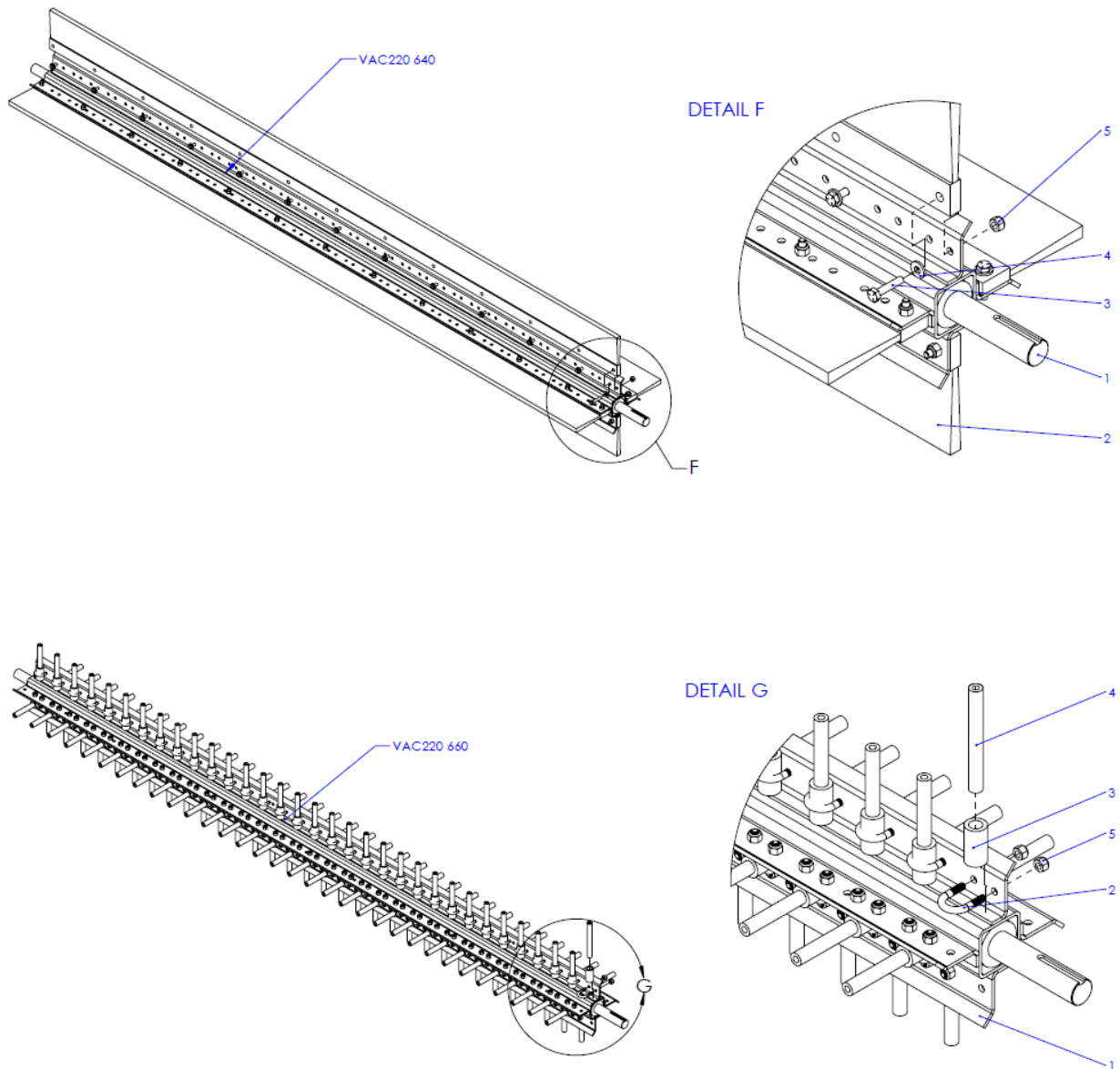
VAC220/320 Common Component

Note: Hardware is included for mounting between the pick-up head and the impeller.

ITEM #	PART CODE: VAC220 650	DESCRIPTION	QTY
1	VAC220 650	VAC SOCK ASM	1
2	02301 005 012-SS	5/16" x 3/4" SS HEX CAPSCREW	24
3	02312 005	5/16" NY/LOCK NUT	24

6.8 VAC220 640 & VAC220 660, Pick-up Head Brush Asm.:

Note: There are two types of brushes available for the Pick-up Head assembly (Item 22a,b). Contact Advanced Equipment Sales to determine the most appropriate option for a given application.



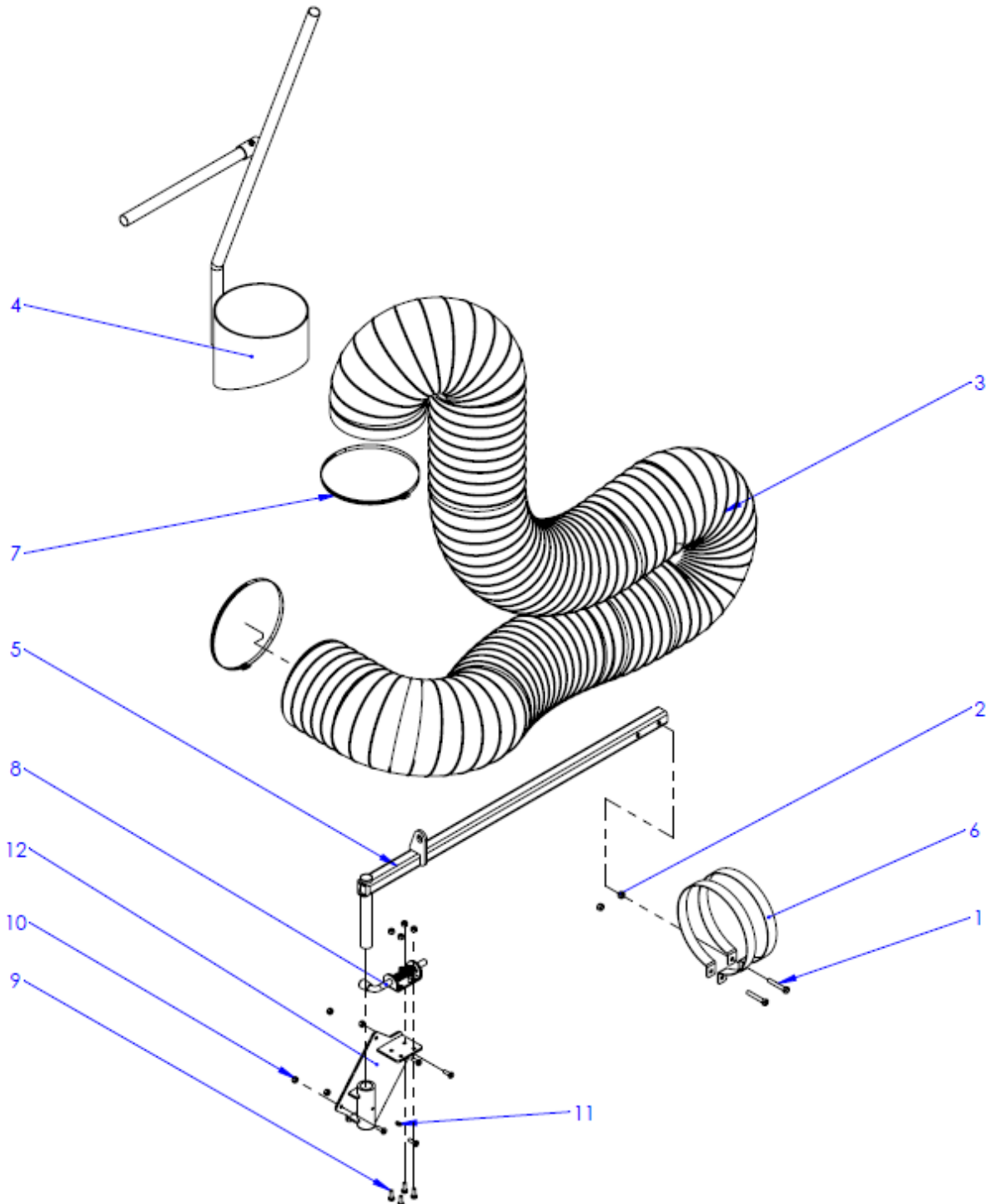
6.8.1 VAC220 640 & VAC220 660, Pick-up Head Brush BOM:

ITEM #	PART CODE: VAC220 640	DESCRIPTION	QTY
1	VAC220 661	BRUSH CORE	1
2	VAC220 T218	7 FT BRISTLE BRUSH	4
3	02301 004 104	1/4" x 1 1/4" HEX CAPSCREW	52
4	02307 004	1/4" FLAT WASHER	52
5	02312 004	1/4" NY/LOCK NUT	52

ITEM #	PART CODE: VAC220 660	DESCRIPTION	QTY
1	VAC220 661	BRUSH CORE	1
2	02611 004 012	U BOLT 1/4"-20 x 3/4" ID	129
3	VAC220 TINE SLEEVE	RUBBER TINE SLEEVE	129
4	VAC220 TINE	RUBBER TINE	129
5	02312 004	1/4" NY/LOCK NUT	258

6.9 VAC220 700, Manual Hose Assembly:

VAC220/320 Common Component

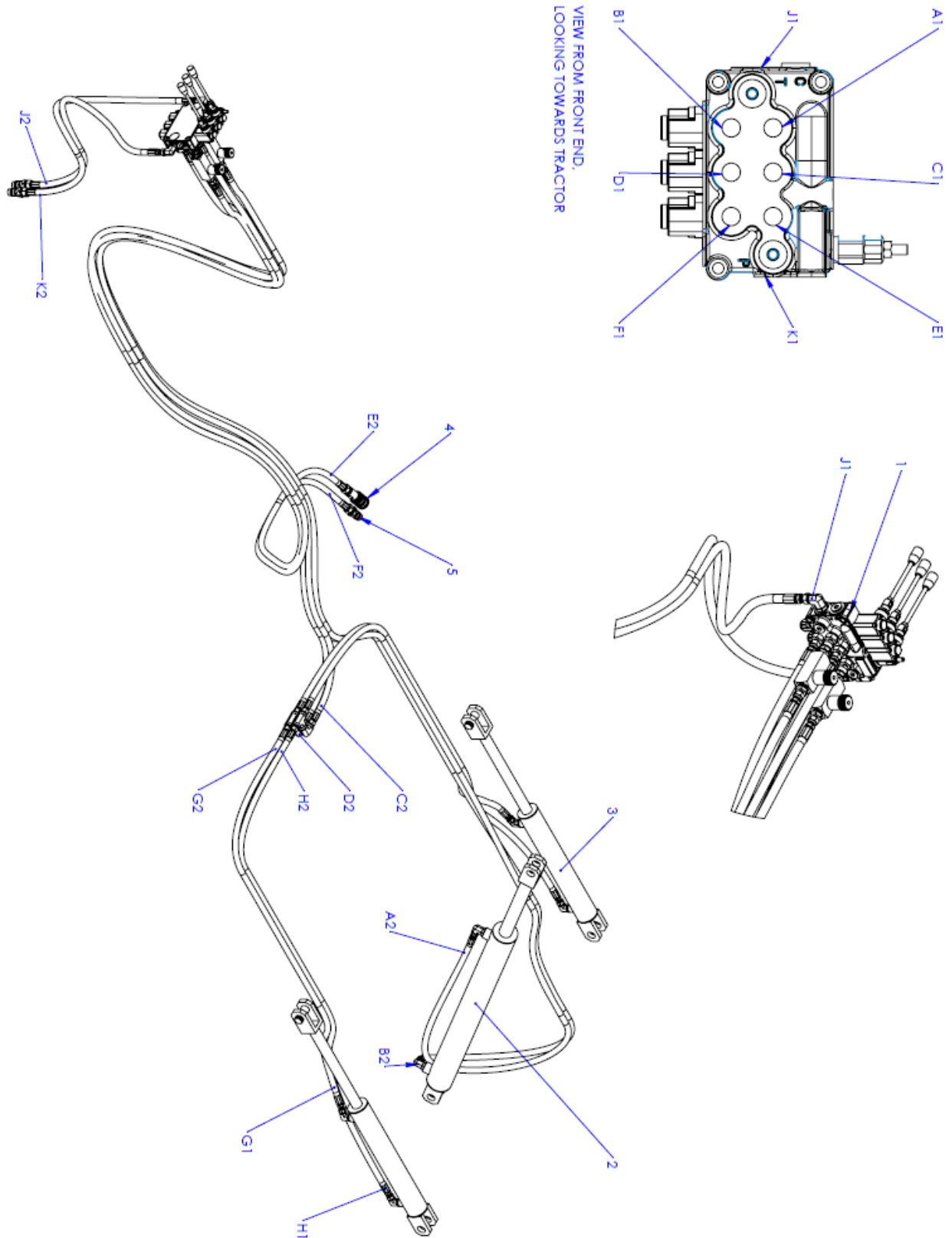


6.9.1 VAC220 700, Manual Hose BOM:

VAC220/320 Common Component

ITEM #	PART CODE: VAC220 700	DESCRIPTION	QTY
1	02301 005 200	5/16" x 2" HEX CAPSCREW	2
2	02312 005	5/16" NY/LOCK NUT	2
3	VAC220 706	WIRE REINFORCED HOSE	1
4	VAC220 740	HAND HOSE NOZZLE	1
5	VAC220 710	SWING ARM WELDMENT	1
6	VAC220 730	FORMED HAND HOSE CLAMP	2
7	VAC220 731	HOSE CLAMP	2
8	01900	SPRING BOLT	1
9	02301 004 012	1/4" x 3/4" HEX CAPSCREW	8
10	02312 004	1/4" NY/LOCK NUT	8
11	11105	GREASE ZERK 1/4-28	1
12	VAC220 751	MOUNTING PLATE WELDMENT	1

6.10 VAC220 800, Hydraulics Assembly.:

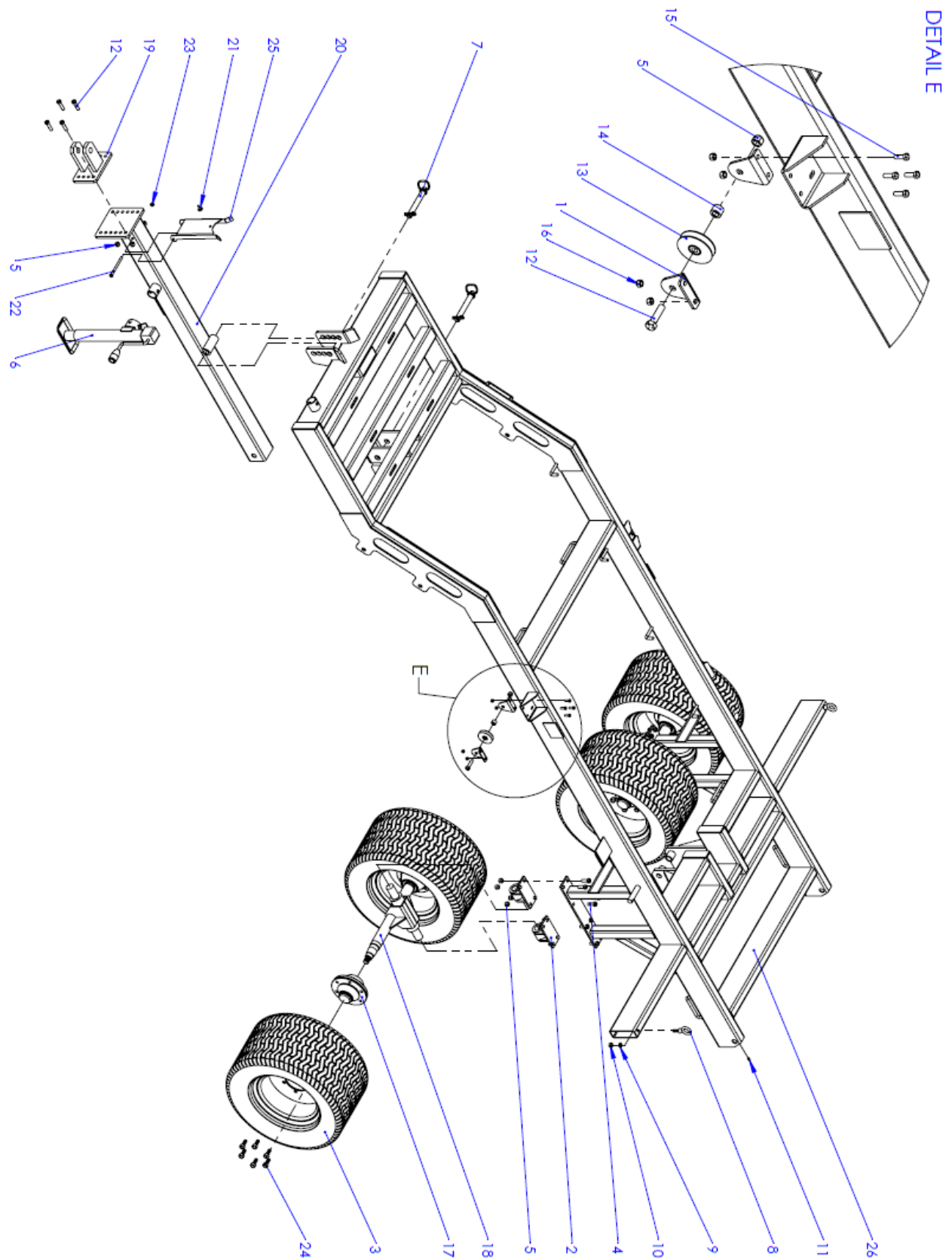


6.10.1 VAC220 800, Hydraulics BOM:

Note: The item letters A-K represent the various hydraulic hose kits used to control the Vac. For each case, the start (eg. A1) and finish (eg. A2) locations are indicated. Each hose kit includes all the end fittings needed to connect the hose from location “1” to location “2”. If specific fittings are required or unknown, contact Advanced Equipment Sales for details.

ITEM #	PART CODE: VAC220 800	DESCRIPTION	QTY
1	HYDVLV-MB12-3	HYD. CONTROL VALVE-1/2" ORB PORTS	1
2	HYDCYL-2-1/2X28	HYDRAULIC CYLINDER 2-1/2"-28" - 1/2" ORB	1
3	HYDCYL-2X12	HYDRAULIC CYLINDER 2"-12" - 1/2" ORB	2
4	HYDPQC-F	PIONEER QUICK COUPLER-FEMALE	1
5	HYDPQC-M	PIONEER QUICK COUPLER-MALE	1
A	HYDVACBC250	COLLECTOR BOX HYD (INPUT)	1
B	HYDVACBC225	COLLECTOR BOX HYD (OUTPUT)	1
C	HYDVACLC146	CONTROL TO PICK-UP HEAD HOSE	1
D	HYDVACLC146	CONTROL TO PICK-UP HEAD HOSE	1
E	HYDVACMH160	BRUSH HOSE KIT (OUTPUT)	1
F	HYDVACMH160	BRUSH HOSE KIT (INPUT)	1
G	HYDVACSC54	PICK-UP HEAD HYD (OUTPUT)	2
H	HYDVACSC68	PICK-UP HEAD HYD (INPUT)	2
J	HYDVACTH40	TRACTOR HOSE (INPUT-LINE)	1
K	HYDVACTH40	TRACTOR HOSE (RETURN-LINE)	1

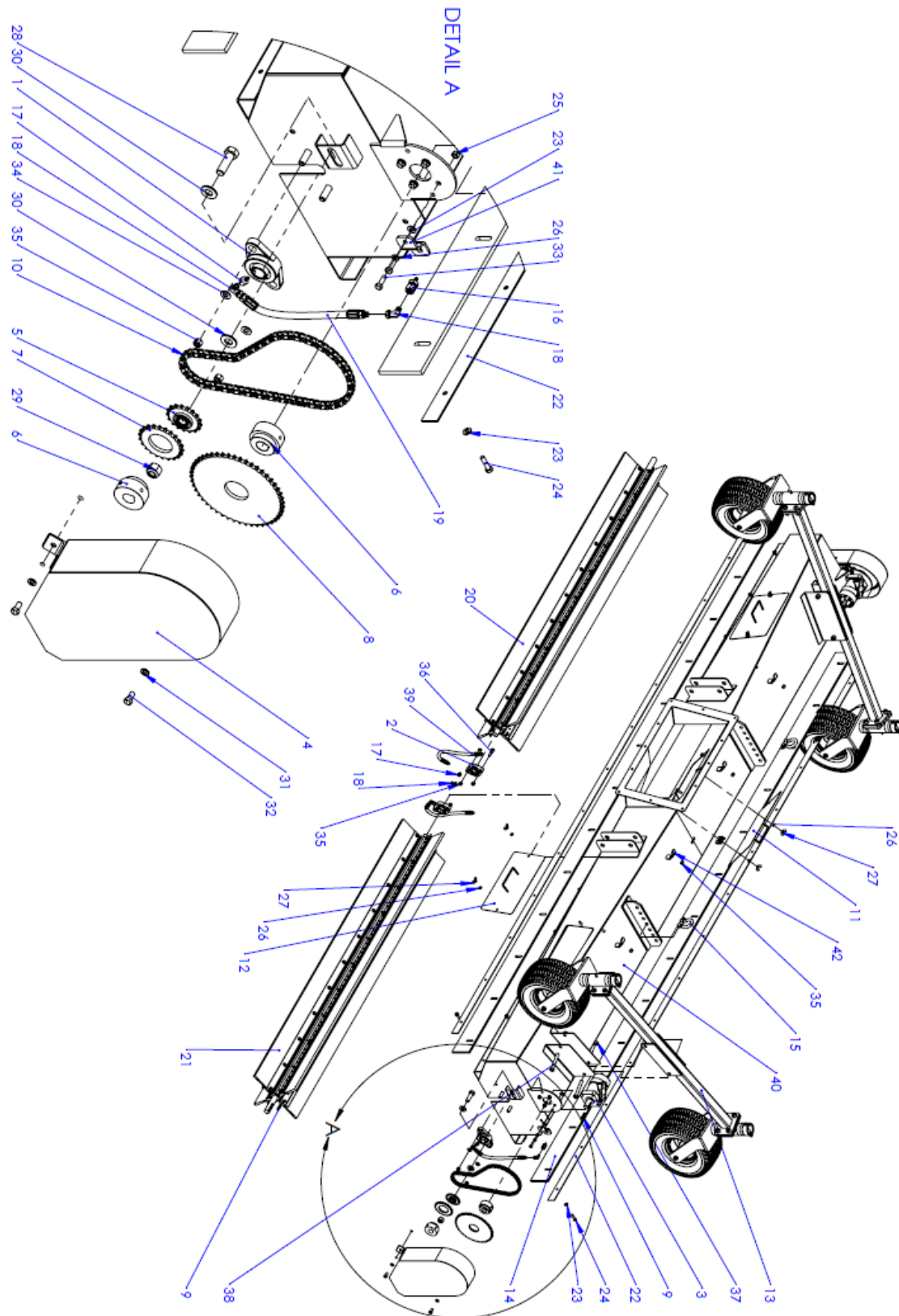
6.11 VAC320 200, Chassis Assembly:



6.11.1 VAC320 200, Chassis BOM:

ITEM #	PART CODE: VAC320 200	DESCRIPTION	QTY
1	150-B5603008	WIRE ROPE PULLEY BRACKET	4
2	DT610 310	AXLE MOUNT	4
3	WHL48651	26.50x14.00 TIRE	4
4	02301 008 108	1/2" x 1 1/2" HEX CAPSCREW	16
5	02312 008	1/2" NY/LOCK NUT	22
6	BE-050	SIDEWIND JACK 5000 LBS	1
7	EHPWC25196	1" x 6 1/4" HITCH PIN	2
8	02301 008 108 EYE	EYEBOLT 1/2" x 1-1/2"	2
9	02308 008	1/2" LOCK WASHER	2
10	02305 008	1/2" REG. NUT	2
11	11105	GREASE FITTING	2
12	02301 008 200-SS	1/2" x 2" HEX CAPSCREW	6
13	150-4821	3" PULLEY	2
14	151-0821	STEEL BUSHING 7/8 x 1/2 x 21/32	2
15	02301 005 100	5/16" x 1" HEX CAPSCREW	8
16	02312 005	5/16" NY/LOCK NUT	8
17	H 05000 6 600	5000 LBS HUB	4
18	S 05000 200 DE 26	5000LBS DOUBLE END SPINDLE	2
19	VAC220 320	HITCH WELDMENT	1
20	VAC220 310	TONGUE WELDMENT	1
21	03501 1220	RUBBER BUMPER	1
22	02301 006 500	3/8" x 5" HEX CAPSCREW	1
23	02312 006	3/8" NY/LOCK NUT	1
24	02301 009 104WB	9/16" x 1 1/4" WHEEL BOLT	24
25	VAC220 301	PTO SHAFT SUPPORT	1
26	VAC320 200	CHASSIS WELDMENT	1

6.12 VAC320 600, Pick-up Head Assembly:

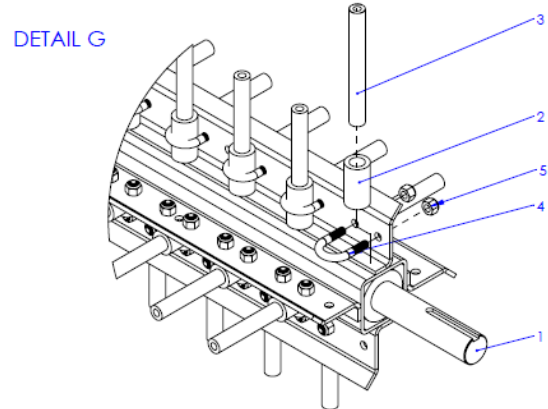
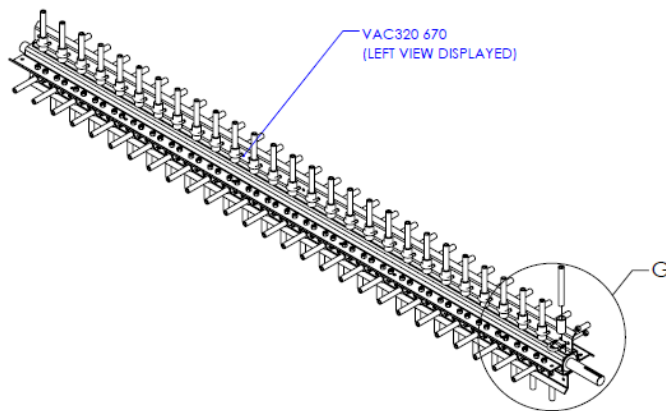
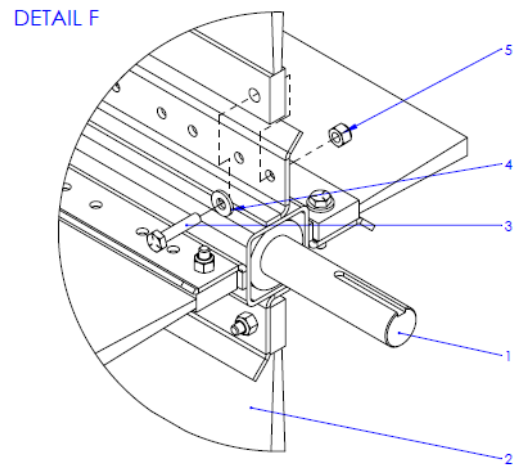
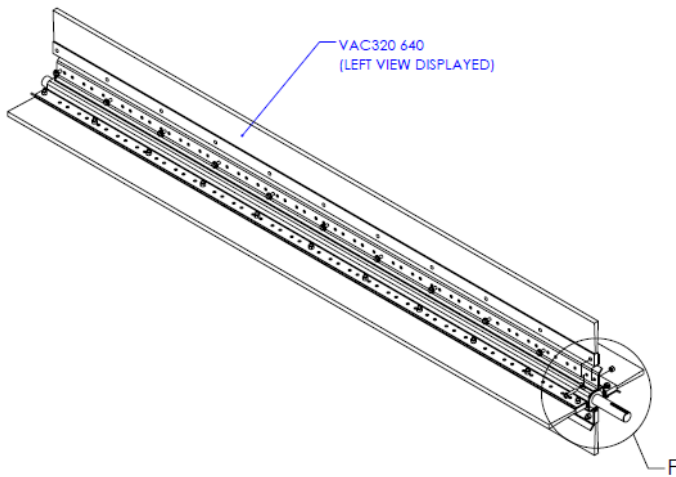


6.12.1 VAC320 600, Pick-up Head BOM:

Note: There are two types of brushes available for the Pick-up Head assembly (Item 20-21a,b). For best results, each left/right pair of brushes should be either both style "a" or both style "b", not a combination of the two. Contact Advanced Equipment Sales to determine the most appropriate option for a given application.

ITEM #	PART CODE: VAC320 600	DESCRIPTION	QTY		ITEM #	PART CODE: VAC320 600	DESCRIPTION	QTY
1	UFCL 205-16	TWO BOLT FLANGE BEARING	2		22	VAC320 602	RUBBER MOUNT STRIP	2
2	SBFD 205-16	TWO BOLT FLANGE BEARING	2		23	02307 005	5/16" FLAT WASHER	10
3	HYD EMH HM100-H4	HYDRAULIC MOTOR - 5/8" ORB PORTS	2		24	02301 005 104	5/16" x 1 1/4" HEX CAPSCREW	2
4	VAC220 520	HYDRAULIC MOTOR SHIELD	2		25	02312 005	5/16" NY/LOCK NUT	4
5	04017E10	IDLER SPROCKET 5/8"	2		26	02308 005	5/16" LOCK WASHER	16
6	0030016	X HUB 1" BORE	4		27	02311 005	5/16" WING NUT	8
7	00104022	SPROCKET #40 22T	2		28	02301 010 200	5/8" x 2" HEX CAPSCREW	2
8	00104048	SPROCKET #40 48T	2		29	02312 010	5/8" NY/LOCK NUT	2
9	407-0400	KEYSTOCK 1/4"	4		30	02307 010	5/8" FLAT WASHER	4
10	0A040	#40 ROLLER CHAIN	2		31	02308 006	3/8" LOCK WASHER	4
11	VAC220 630	PICK UP HEAD ACCESS PANEL	1		32	02301 006 012	3/8" x 3/4" HEX CAPSCREW	4
12	VAC320 660	SIDE ACCES PANEL	2		33	02301 005 100	5/16" x 1" HEX CAPSCREW	10
13	VAC220 620	STABILIZER ASSEMBLY	1		34	02307 006	3/8" FLAT WASHER	4
14	VAC320 601	RUBBER FLAP	2		35	02312 006	3/8" NY/LOCK NUT	12
15	4408-40042	SCREWPIN SHACKLE 1/2"	2		36	02301 006 108	3/8" x 1 1/2" HEX CAPSCREW	8
16	HYD A-0402 7/16NC	GREASE WHIP ADAPTER	4		37	02312 008	1/2" NY/LOCK NUT	4
17	HYD A-04NF02NPT	ADAPTER 1/8" NPT x 1/4"-28	4		38	02301 008 308	1/2" x 3 1/2" HEX CAPSCREW	4
18	HYD1501-2-2	PIPE ELBOW - MP X SWIVEL FP 90°	6		39	HYD GW-10	GREASE WHIP - 10"	2
19	HYD GW-10	GREASE WHIP - 10"	2		40	VAC320 610	PICK-UP HEAD BODY WELDMENT	1
20a	VAC320 640L	LEFT BRISTLE BRUSH (Option 1)	1		41	VAC220 603	GREASE WHIP BRACKET	2
20b	VAC320 670L	LEFT RUBBER TINE BRUSH (Option 2)	1		42	VAC320 603	HYD HOSE CLAMP-DOUBLE	4
21a	VAC320 640R	RIGHT BRISTLE BRUSH (Option 1)	1					
21b	VAC320 670R	RIGHT RUBBER TINE BRUSH (Option 2)	1					

6.13 VAC320 640 & VAC320 670, Pick-up Head Brush Asm.:



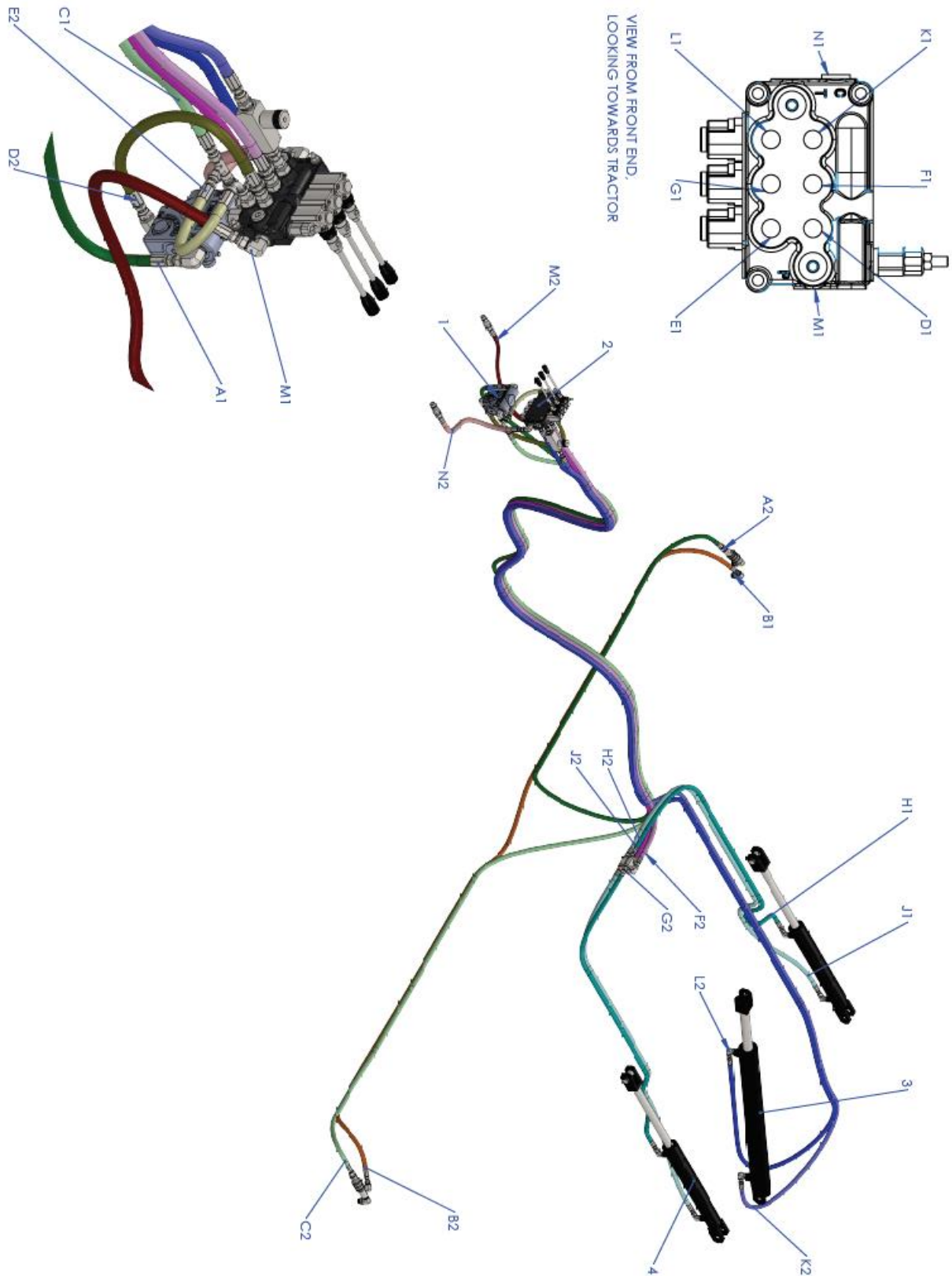
6.13.1 VAC320 640 & VAC320 670, Pick-up Head Brush BOM:

Material quantities reflect one configuration of the brush (either LEFT or RIGHT). The difference between the left and right component(s) is the end that the keyed shaft sticks out on. See drawings on the previous page for view of LEFT configuration.

ITEM #	PART CODE: VAC320 640	DESCRIPTION	QTY
1	VAC320 671	BRUSH CORE (LEFT/RIGHT)	1
2	VAC320 T188	6 FT BRISTLE BRUSH	4
3	02301 004 104	1/4" x 1 1/4" HEX CAPSCREW	44
4	02307 004	1/4" FLAT WASHER	44
5	02312 004	1/4" NY/LOCK NUT	44

ITEM #	PART CODE: VAC320 670	DESCRIPTION	QTY
1	VAC320 671	BRUSH CORE (LEFT/RIGHT)	1
2	VAC220 TINE SLEEVE	RUBBER TINE SLEEVE	109
3	VAC220 TINE	RUBBER TINE	109
4	02611 004 012	U BOLT 1/4"-20 x 3/4" ID	109
5	02312 004	1/4" NY/LOCK NUT	218

6.14 VAC320 800, Hydraulics Assembly:



6.14.1 VAC320 800, Hydraulics BOM:

Note: The item letters A-N represent the various hydraulic hose kits used to control the Vac. For each case, the start (eg. A1) and finish (eg. A2) locations are indicated. Each hose kit includes all the end fittings needed to connect the hose from location "1" to location "2". If specific fittings are required or unknown, contact Advanced Equipment Sales for details.

ITEM #	PART CODE: VAC320 800	DESCRIPTION	QTY
1	HYD BRAND FC51-1/2	FLOW CONTROL 1/2 8GPM	1
2	HYDVLV-MB12-3	HYD. CONTROL VALVE-1/2" ORB PORTS	1
3	HYDCYL-2-1/2X28	HYDRAULIC CYLINDER 2-1/2"-28" - 1/2" ORB	1
4	HYDCYL-2X12	HYDRAULIC CYLINDER 2"-12" - 1/2" ORB	2
A	HYDVACMH210	BRUSH HOSE KIT (INPUT)	1
B	HYDVACHH152	BRUSH HOSE KIT (COUPLING)	1
C	HYDVACMH222	BRUSH HOSE KIT (RETURN)	1
D	HYDVACCF24	24" CONTROL HOSE KIT (COUPLING)	1
E	HYDVACCR18	18" CONTROL HOSE KIT (COUPLING)	1
F	HYDVACLC146	CONTROL TO PICK-UP HEAD HOSE	1
G	HYDVACLC146	CONTROL TO PICK-UP HEAD HOSE	1
H	HYDVACSC54	PICK-UP HEAD HYD (OUTPUT)	2
J	HYDVACSC68	PICK-UP HEAD HYD (INPUT)	2
K	HYDVACBC237	COLLECTOR BOX HYD (INPUT)	1
L	HYDVACBC262	COLLECTOR BOX HYD (OUTPUT)	1
M	HYDVACTF40	TRACTOR HOSE (RETURN-LINE)	1
N	HYDVACTH40	TRACTOR HOSE (INPUT-LINE)	1