TECHNICAL MANUAL

NV SERIES

(Non-Vacuum Unit)

200/ 400/ 600 Gallon Capacity

(909, 1818, 2728 Litres)

SPOKANE INDUSTRIES, INC.

MNUL-004 REVISION A

MARCH 2013

Spokane Industries
3808 N. Sullivan Road, Bldg 4
Spokane Valley, Washington 99216
3808 N. Sullivan Road, Bldg 4
Spokane Valley, Washington 99216
509-928-0720

Limited Warranty Agreement
Aviation Fuel Products

To include SealVac™ Vacuum Fuel Drain System, HandiFueler™ Ground Support Service Cart, HeliFueler™, Spokane Industries UAV Fuel Service Cart and Non-Vacuum Units

Spokane Industries of Spokane Valley, Washington (SI) hereby warrants to the purchaser (the Warrantee) that all products explicitly covered by this Warranty Agreement have been thoroughly inspected upon completion and that they and their component parts are free of defects in materials and workmanship. SI further warrants that in the event the product fails due to defects in materials and/or workmanship within a period of twenty-four (24) months from the effective date of this warranty that SI will provide replacement parts free of charge except for those components which are covered by an Original Equipment Manufacturer's (OEM) Warranty, in which case coverage will be provided by that OEM.

Coverage

The SI Aviation Fuel Products Limited Warranty Agreement covers all products manufactured for use as Aircraft Ground Support Equipment Servicing, UAV Fuel Servicing, Aircraft Fuel Draining Equipment and Non-Vacuum Units. Certain components of these products are manufactured by third party Original Equipment Manufacturers (OEMs) and are covered by these manufacturers' Warranties.
SI Warranty coverage is contingent upon proper installation, operation, maintenance and repair of the product. Refer to the appropriate manuals and documentation for assistance. In cases of uncertainty, SI must be consulted prior to any service work being performed. Failure to do so may result in the termination of Warranty coverage.

Terms and Conditions

REQUESTS FOR WARRANTY COVERAGE

Requests for Warranty Coverage should be addressed to: ***Spokane Industries, Metal Products Division, Quality Assurance Department, 3808 N Sullivan Rd Bldg 4, Spokane Valley, WA 99216****. Calls concerning Warranty Coverage should be placed to 800-541-3601, Fax: 509-927-0826. Please provide the Model Number, Ship Date, Original Purchaser, and Point of Installation, and, if possible, our original Sales Order number. The Quality Assurance Department will make a Warranty determination based upon this information and our internal records. If Warranty coverage is in effect, replacement parts will be sent provided that credit terms have been established. If Warranty coverage is not in effect, the cost of replacement parts will be quoted.*

TRANSFERABILITY

This warranty is extended only to the original purchaser, and is not transferable without the express written consent of SI. Transferability is contingent on the product being in warrantable condition. SI reserves the right to verify product warrantability by whatever means is deemed appropriate, and the right to refuse to transfer the warranty with or without cause. Warranty transfer requests must be made in advance of the sale or transfer of the product. SI accepts no responsibility for any costs associated with the transfer of existing warranties including any costs associated with verification of product warrantability. Requests for Warranty transfers should be addressed at the address above.

RETURN OF WARRANTY PARTS ("EXCHANGE")

- *For the purposes of quality assurance, SI requires that certain parts and assemblies covered under the SI Limited Warranty Agreement be returned by the Warrantee upon receipt of replacements (known as "Exchange"). In these cases, SI will authorize the shipment of replacement parts immediately and provide a Returned Merchandise Authorization (RMA) number along with a full retail invoice for the replacement parts pending receipt of the Warranty ("defective") parts. The Warranty parts must be returned to SI within 30 days with the RMA number CLEARLY marked on the outside of the shiping materials. At this time SI will inspect the Warranty parts to verify Warranty coverage. If the War ranty parts are deemed defective due to materials and workmanship, SI will issue a full credit for the replacement parts. If the Warranty parts are not returned within thirty days the Warrantee's account will not be credited. Payment in full is then due and subject to the standard terms and conditions of SI credit.*
- *In cases where returned parts are deemed not to be defective, SI reserves the right to refuse to cancel the applicable invoice.*
- *Exchange parts must be properly packed and sealed and shipped to SI by prepaid freight. Under no circumstances does SI accept C.O.D. shipments.*
- *SI Warranty replacement parts are provided subject to the terms and conditions of the SI Sales and Service Agreement which states that where no other Warranty coverage is in place, Service and Warranty parts are covered by a ninety day limited Warranty.*

LIMITATIONS

The following limitations apply to the SI Limited Warranty Agreement:

- *SI shall not be liable under any circumstances for any incidental or consequential damages including, but not limited to, loss of time, inconvenience, expenses incurred by purchaser in order to remedy defects, or liability purchaser may have with respect to any other person for loss or damage arising from the operation of the product or the product's failure to operate in any way, or any other type of consequential damage or economic loss.*
- *This warranty is limited to defects in materials and workmanship. SI assumes no liability whatsoever for damages arising from the inability of the product to perform a certain task. Damage arising during shipping and handling, improper installation, use, maintenance, repair, or any unauthorized modifications, whether performed by qualified service personnel or not, neglect, Acts of God, etc., are expressly excluded. In any case, SI's liability shall be limited only to the provision of suitable replacement parts for those which failed due to defects in materials and workmanship. Incidental damage resulting from the failure, and labor costs associated with the repair and/or replacement of the product, its assemblies, and component parts, are excluded.*
- *SI reserves the right to limit or terminate warranty coverage in instances where repeated product failures are a result of failure to correct operating conditions which are in any way abnormal or exceed operating condition specifications. It is the purchaser's responsibility to remedy such conditions as may be likely to cause initial and/or repeated failures of the equipment. SI assumes no responsibility whatsoever for any costs incurred for this purpose.*
- *The SI Limited Warranty Agreement covers only replacement parts supplied by SI. SI makes every reasonable effort to ensure an adequate supply of replacement parts. However, in cases where the exact replacement part is no longer available, SI reserves the right to provide a suitable substitute.*
- *Components such as batteries, which are subject to normal wear and tear, are pro-rated under the provisions of this Warranty. Warranty coverage shall be pro-rated according to the amount f Warranty coverage remaining.*

EXCLUSIONS

The following exclusions apply to the SI Limited Warranty Agreement:

- *The SI Limited Warranty Agreement applies only to authentic new and, where applicable, refur bished products. Products sold "As Is", demonstration units, and any other products subjected to previ- ous uses are explicitly excluded.*
- *The SI Limited Warranty Agreement excludes any and all parts and assemblies which are covered by another manufacturer's Warranty (see above).*
- *This Limited Warranty Agreement constitutes the complete and entire SI Warranty statement. Any items and/or circumstances not expressly covered by this Warranty Agreement are hereby excluded. This includes, but is not limited to, such additional offerings as SI may make available from time to time. These offerings are independent of this Agreement and, as such, do not in any way extend, modify, or otherwise alter the coverage, terms, conditions, limitations, and exclusions as they are set forth here unless explicitly stated.*
- *The failure to observe any and all of the terms and conditions of this warranty will render it null and void.*
- *Although all reasonable precautions are taken to ensure that shipping damage is avoided. Any damage incurred during the shipment, unloading, and installation of the product is explicitly excluded. Any and all damage during shipment is the sole responsibility of the transportation carrier(s). Product should be thoroughly inspected prior to acceptance from the freight carrier. All SI products are shipped F.O.B. Spokane Washington.*
- *This Warranty is in lieu of all other warranties whatsoever, express, implied and statutory, including, without limitation, the implied warranties of merchantibility and fitness for a particular purpose, and all such warranties express or implied, shall be excluded from this transaction and shall not apply to the goods sold.*

Warranty inquiries are welcomed and should be addressed to:

Spokane Industries
Metal Products Division
Quality Assurance Department
3808 N. Sullivan Road Bldg 4
Spokane Valley, WA 99216
(800) 541-3601

Section

Drawing No.

SECTION 1.0

INTRODUCTION

IMPORTANT:

YOU MUST READ THIS MANUAL IN ITS ENTIRETY BEFORE OPERATING, SHIPPING OR PERFORMING MAINTENANCE PROCEDURES. FLAMMABLE AND COMBUSTIBLE VAPORS CAN CAUSE FIRE, AND/OR EXPLOSION AND CAN LEAD TO SERIOUS INJURY OR DEATH.

The instructions in this manual cover the operation and maintenance of the Non-Vacuum Unit: 200, 400, and 600 Gallon Model Numbers NV 200S, NV 400 S, NV 600S NV 216S, NV 416S, and NV 616S, parts are manufactured by Spokane Industries, Inc. of Spokane Valley, Washington.

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The 200, 400 and 600-gallon non-vacuum units referred as NV throughout the publication as the NV, provides a convenient, safe, and efficient means to remove and store aviation fuels. The non-vacuum unit is a product of Spokane Industries, Inc.

This manual describes the NV, the safety guidelines that must be followed while operating the NV, Maintenance and Assembly instructions and a parts breakdown section that provides part numbers and all of the necessary information to order parts, as well as allow for identification of all components on the NV.

DESCRIPTION

Refer to the chart on the next page for location and identification of major components and particulars of each size. The non-vacuum unit consists of a single shell used for secondary containment. These tank depositories consist of a front undercarriage, flip-lock manway, fuel level indicator and all NV's have the option of being equipped with a telescoping funnel.

1.2 Specifications for the Non Vacuum Unit

Dimensions	200 -Gallon (Max Capacity 220 Gallons)	400 Gallon (Max Capacity 440 Gallons)	600 Gallon (Maximum Capacity 660 Gallons)
Length — (Tow Bar Up)	93 Inches	128 Inches	128 Inches
Length— (Tow Bar Down)	153 Inches	187 Inches	187 Inches
Width (Tire to Tire)	59 Inches	76 Inches	76 Inches
Height (Tow Bar Up)	72 Inches	72 Inches	72 Inches
Height (Tow Bar Down)	60 Inches	42 Inches	62 Inches
Weight—Empty	1,400 lbs.	1,650 lbs.	2,135 lbs.
Weight– Full	2,920 lbs.	4,690 lbs.	6,695 lbs.
*** Telescoping Funnel Height (Fully Collapsed)**	(Optional)	42 Inches	62 Inches
*** Telescoping Funnel Height (Fully Extended)**	(Optional)	234 Inches	254 Inches
Ground Clearance (at Tow Bar)	6 Inches	6 Inches	6 Inches
Ground Clearance (at Axle)	8 inches	8 Inches	8 Inches
Operating Temperature Range	-25 to 110 F	-25 to 110 F	-25 to 110 F
Storage Temperature Range	-40 to 150 F	-40 to 150 F	-40 to 150 F
Tire Size (B-Range with Tube Split Wheel)	20.5 x 8.0-10	20.5 x 8.0-10	20.5 x 8.0-10

* The Telescoping Funnel is an optional feature that can be purchased with the 200-gallon NV

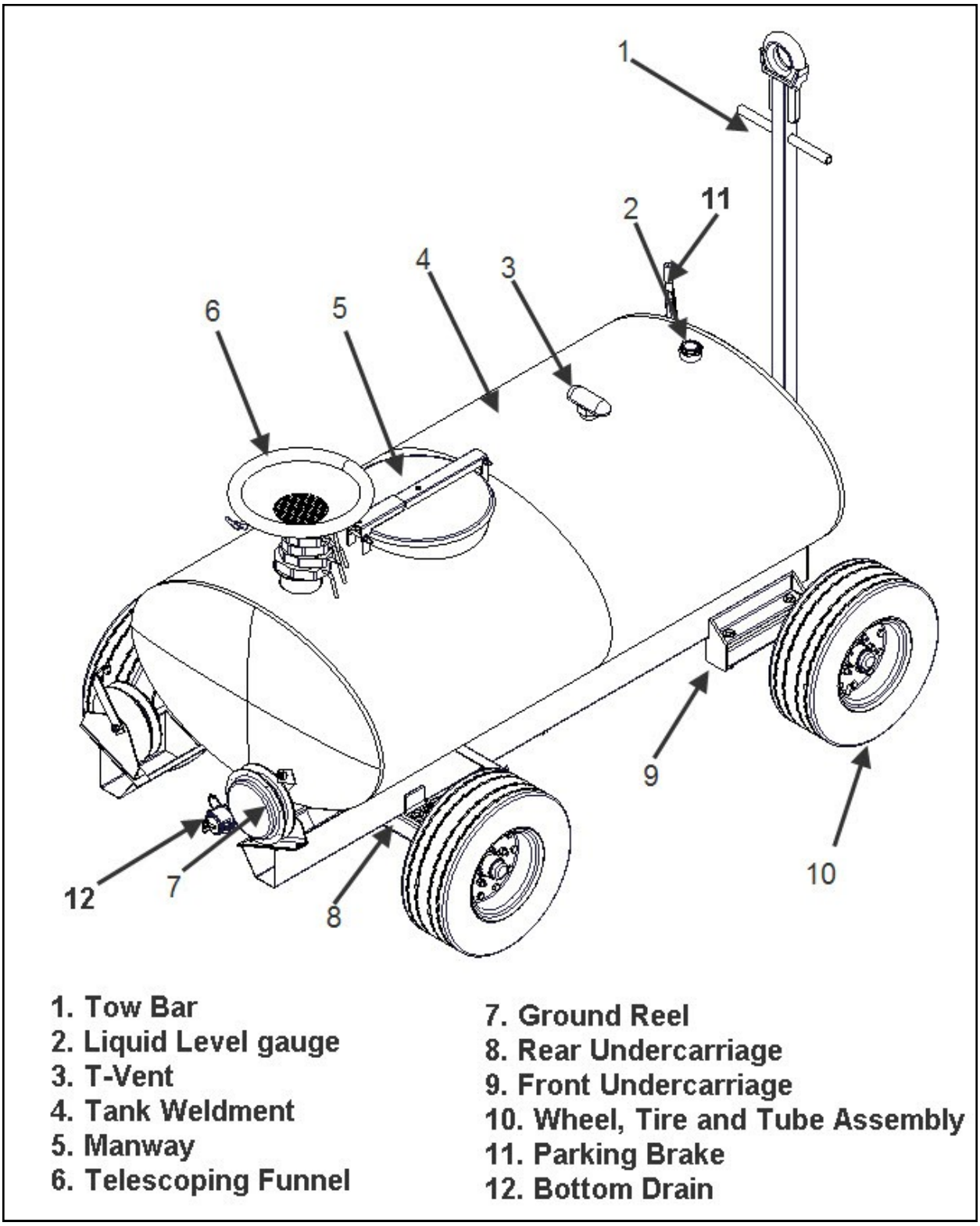

Figure 1-1 Component Identification

SECTION 2.0 SAFETY GUIDELINES

Within this manual are guidelines and safety recommendations for use of the NV. It is the responsibility of the end user to completely read this manual and comply with all local, state and federal laws and **regulations applicable for fueling and defueling aircraft. Spokane** Industries Inc. is not responsible for industry specific information on safety management, employment safety, health standards, safety codes, etc. Contact your local safety manager or industrial safety representative. It is the responsibility of the end user to ensure persons operating this equipment:

- **Are trained, authorized and permit ted to use the equipment.**
- **Have physical and the mental ability to operate this equipment safely.**
- **Are aware of the potential**
- **Hazards associated with this equipment, i.e static electricity, electrical shock, fuel spills and pinch points.**

2.1 General Safety Instructions

This manual describes physical and chemical processes which may cause injury or death to personnel, or damage to equipment if not properly followed. This safety summary includes general safety precautions that must be understood and applied during operation and maintenance to ensure safety and protection of equipment.

2.2 Protective Clothing

When fuels are being handled, approved equipment such as gloves, eye protection, face shields, etc. shall be used.

2.3 Static Bonding and Grounding and Other Fire Hazard Precautions

Improper static bonding and grounding can lead to a fire, and as with any other equipment dealing with fuel, there is always a risk of fire if all safety precautions are not followed or the equipment is not used correctly. Make sure to read and understand all instructions before operating this equipment.

2.4 Lockout / Tagout

Personnel shall be aware of the hazards associated with unguarded machinery parts, capacitators, gaseous and wet pipe systems, spring loaded devices, etc. Lockout / Tagout the energy source prior to performing maintenance, adjustment or other procedures that would bypass safety guards, barriers, or otherwise expose personnel to hazardous energy sources. Any equipment, machine or process that could unexpectedly energize, start-up or release energy will be equipped with a means to lockout / tagout the energy sources.

2.5 Recoverable Products

This equipment has been designed to operate outdoors only. Flammable and/or combustible vapors in ignitable quantities could be produced under certain circumstances. Additionally, local protocols must be consulted to determine if fuel draining equipment can be used in the location being considered.

SECTION 3.0 OPERATION INSTRUCTIONS

3.1 Using the Non-Vacuum Unit When Draining Fuel

a. Position the unit near the item to be drained.
b. Ground unit to appropriate grounding sites.
c. Open Manway cover to gain access to NV tank.
d. Perform defuel operations as needed, monitor tank fluid level to prevent over fill conditions.
e. When finished, close the Manway cover securely.
f. Remember to disconnect the ground cables if the NV unit is to be towed.
g. Tow and position NV unit over approved waste receptacle, or connect drain hose, if available, to drain valve cam lock.
h. Open drain valve slowly.

3.2 Using the telescoping Funnel (This piece is optional)

The telescoping funnel is designed as a gravity feed system, no additional support equipment is needed.

CAUTION: Make sure the unit has enough storage capacity for the defueling operation.

a. Position telescoping funnel under the drain.
b. Ground the unit to approved grounding sites.
c. Open cover on top of funnel, clean screen if necessary.
d. Extend the funnel by raising the upper section first, tightening clamp securely. Extend the next section, if needed, and tighten clamp securely.
e. Begin the defueling process.
f. When finished, close the funnel isolation valve.
g. Lower funnel sections in reverse order.
h. Close and latch the funnel cover.

WARNING Raising telescoping funnel sections creates a pinch hazard for hands. Make sure that you have a tight grip on the sections during the lifting process and that the clamps are securely tightened before extending each section.

SECTION 4.0 MAINTENANCE AND ASSEMBLY

The NV should always be inspected prior to use to make sure it is in working order.

4.1 Repair and Replace Instructions

Remember to set the parking brake while performing maintenance procedures. Approved jack stands and wheel shocks must also be used. Serious injury or death may occur from rolling or falling equipment.

The following procedures are used for the disassembly and reassembly for equipment components.

4.2 Manway Assembly and Maintenance

The manway assembly is located on the top of the tank. The manway assembly has one adjustment point, .Use Figure 4-1 for the following maintenance steps.

Manway Disassembly/Reassembly

a. Open handle (2).
b. Open Manway Assembly.
c. Remove nut (7).
d. Remove gasket retainer (5), gasket (4), and lid (3).
e. Remove bolt (6) and nut (10) to remove cross-arm (1).
f. Repair / replace components
g. Reassemble in reverse order, leaving nut (7) only partially threaded onto cross arm (1).

Manway Adjustment

a. Open handle (2).
b. Open Manway Assembly.
c. Rotate nut (11) to adjust lid position. Turn clockwise to move lid closer to the tank. Turn counter clockwise to move the lid away from the tank.
. d. Tighten nut (7) until snug.

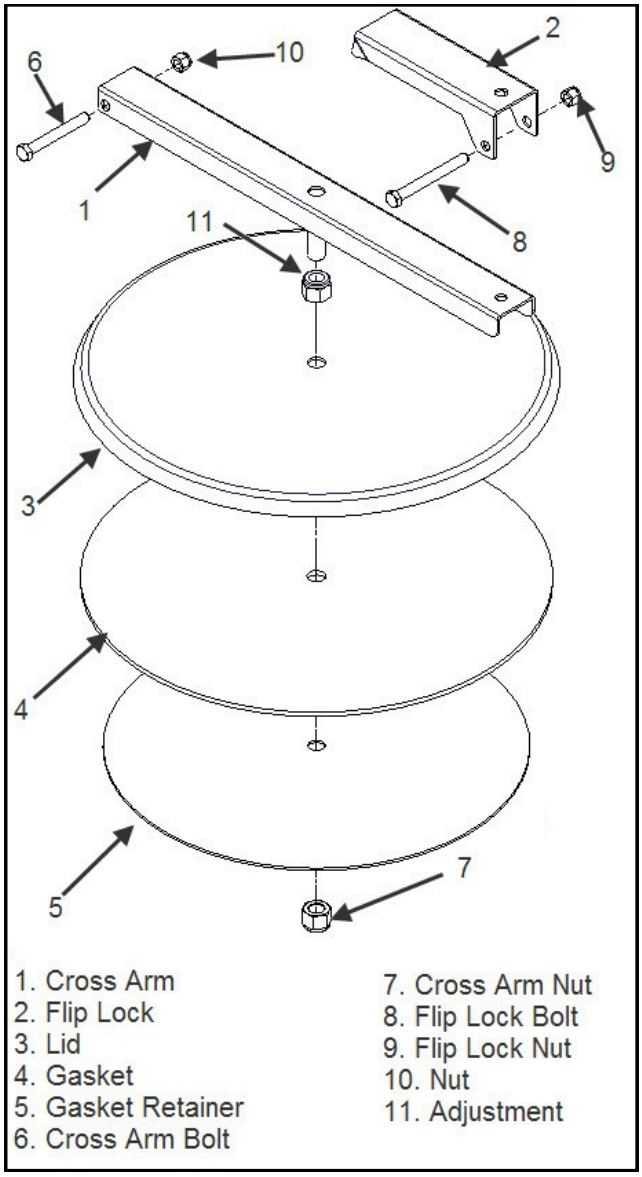

Figure 4-1 Manway Assembly

4.3 Telescoping Funnel Assembly

The instructions for assembly and maintenance for the optional Telescoping funnel can be found on this page. Please refer to Figure 4-2 for all numerical references regarding the telescoping assembly with the exception of the base clamp which is referenced in Figure 4-3

The Telescoping Funnel Assembly is located at the top, rear of the tank. The assembly consists of (starting at the top), a cover assembly, a gasket), a funnel screen , a funnel section and four telescoping sections and a base clamp.

Funnel Cover Assembly

The funnel cover (1) is removed by removing nut (6) and bolt (5).

Funnel Gasket

The funnel gasket (3) is replaced by opening funnel cover (1). Remove damaged gasket and install new one.

Funnel Screen

The funnel screen (2), prevents FOD from entering the tank. The screen is replaced by opening the funnel cover and removing nut (7). Replace screen and reinstall nut.

Funnel and Telescoping Sections

The funnel section (4) and telescoping sections are removed independently; starting at the uppermost subassembly, until the section needing repair/replacement is reached.

Base Clamp

The base clamp (4), is attached directly to the tank.

a. Rotate entire funnel assembly (all telescoping section and funnel section) 180 degrees until clamp handles are facing the front of the tank (toward the tow bar).
b. Lift entire funnel assembly by the largest telescoping section. When bottom edge of bottom telescoping section tube reaches the base clamp (4), lift firmly and rotate assembly slightly clockwise and counterclockwise to guide alignment past alignment notch in base clamp (see reference arrow A).
c. Remove bolts (5) and lock washers (6).
d. Repair / replace components.

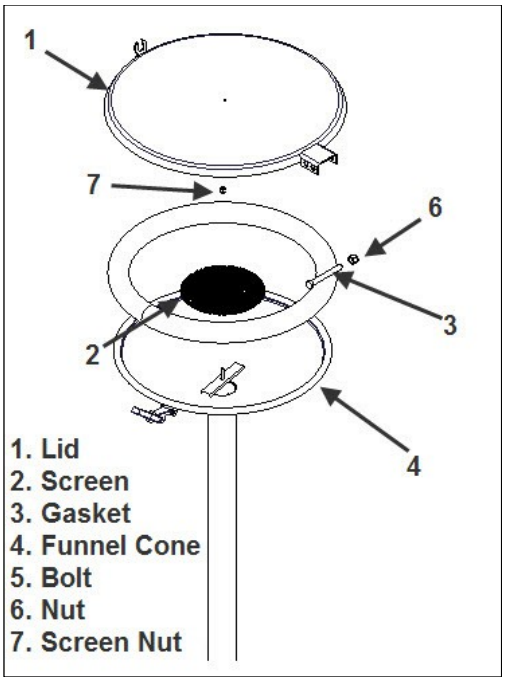

Figure 4-2 Funnel Section Assembly

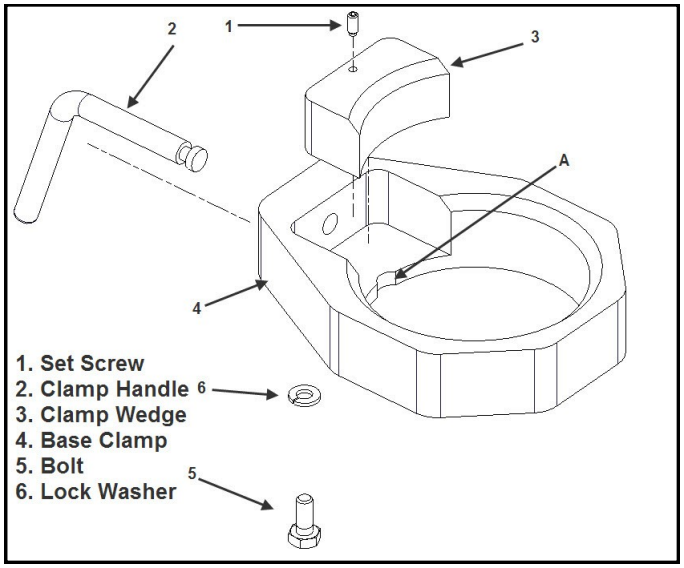

Figure 4-3 Base Clamp

4.4 Front Undercarriage Assembly

The Front Undercarriage assembly consists of a wheel assembly, a hub assembly a spindle assembly a tow latch assembly , a steering arm assembly and an adjustable tie rod assembly.

4.5 Front Wheel Assembly Removal

To remove the wheel assembly, the equipment must have the front end raised and placed on approved jack stands.

a. Loosen lug nuts on wheel assembly requiring maintenance one turn while equipment is still on the ground.
b. Raise equipment with suitable maintenance jack (see Figure 4-4, reference arrow A for jack placement) high enough to remove wheel assembly.
c. Place approved jack stands under front axle (see Figure 4-4, reference arrow for stand placement).
d. Remove lug nuts of wheel assembly

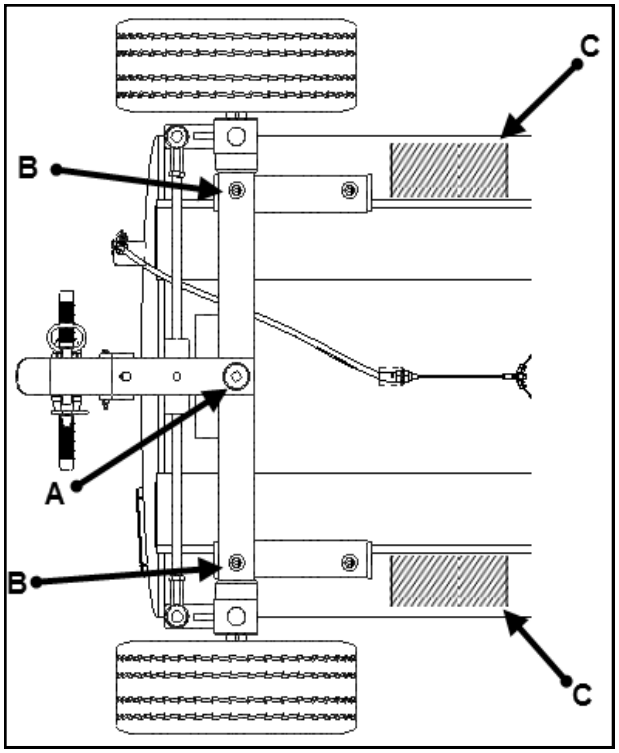

Figure 4-4 Lift Points

4.6 Front Hub Assembly

To remove the front hub assembly, follow these maintenance steps using Figure 4-5

a. Remove dust cap (1) by lightly tapping with a rubber hammer.
b. Remove cotter pin (2), castle nut (3), and washer (4).
c. Grasp front hub (7) and pull firmly. Ensure that bearing (5) doesn't separate from hub and strike the ground.
d. Remove bearing (5), seal (10), and bearing (9) from the front | hub (7). Using a suitable H-frame press, remove bearing races (6) and (8).
f. Replace components and grease bearings before reassembly.
g. When reassembling, the Castle nut (3) should be tightened until the hub assembly rotates past free.

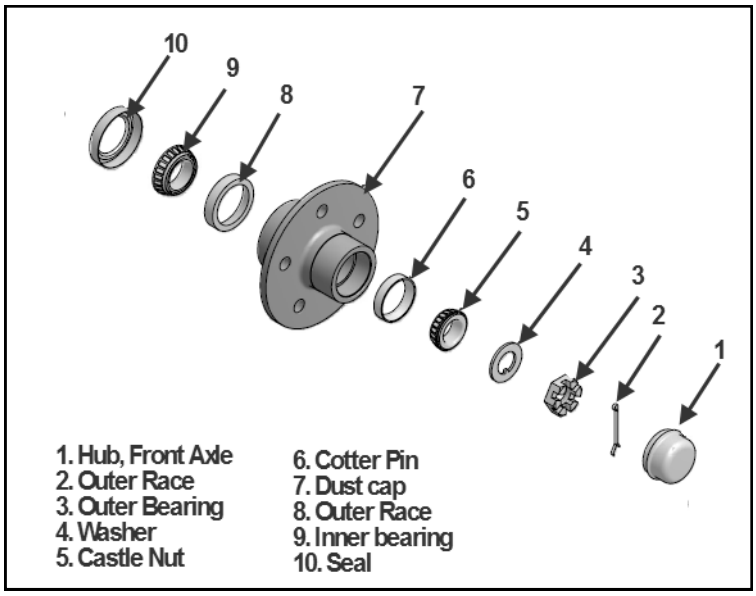

Figure 4-5 Front Hub Assembly

4.7 Tow Latch Assembly

The tow latch assembly is used to secure the tow bar in the upright position. (See Figure 4-6).

a. Remove tow bar (1) by placing the tow bar in upright, latched position. Remove pin (2). While holding onto tow bar, place foot on toe l latch assembly (See reference arrow A) and depress.

b. Pull hitch pin (3) from steering arm assembly and place tow bar to the side.

The remaining steps are illustrated in Figure 4-7.

c. .Remove bolt (7) and nut (10).

d. Rotate toe latch plate (9) downward to free from assembly.

e. Detach spring (8) from toe latch plate (9) and spring anchor (24).

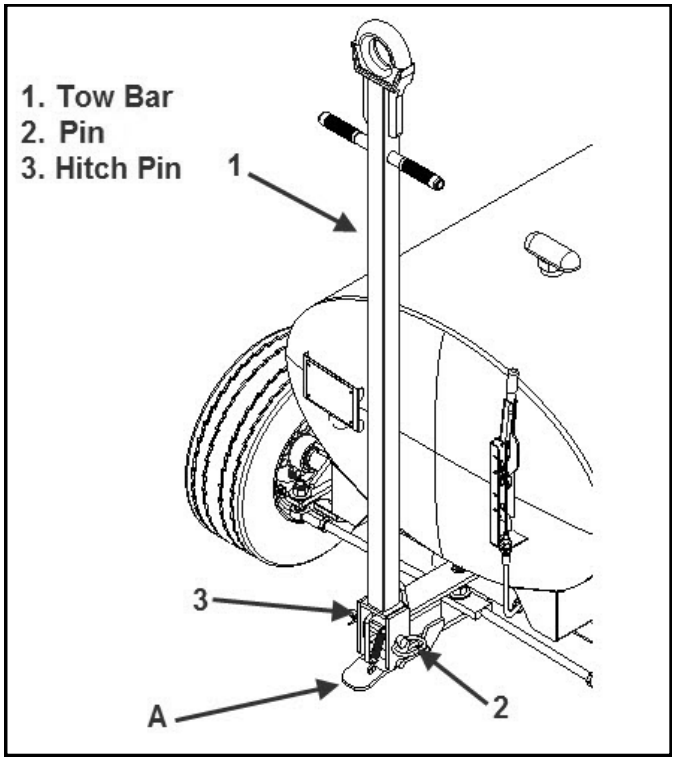

Figure 4-6 Tow Bar Removal

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NOTE:
Removing hitch pin from steering arm assembly will free tow bar. Prevent tow bar from falling by holding it firmly until free. Set aside.

4.8 Spindle Assembly

To remove the spindle assembly, follow the maintenance steps for the front hub assembly before beginning the next steps. See Figure 4-7.

a. Remove nut (17) and washer (16).
b. Remove nut (21) and washer (20).
c. Remove king pin (14) from yoke by using a rubber hammer.
d. Grasp spindle assembly (18) and rotate toward front of tank until the yoke is free.
e. Remove spindle assembly from tie rod (15).
f. Remove bushings (19) with bronze punch and hammer.
g. Repair / replace components.

4.9 Steering Arm Assembly

a. Remove the thin lock nut (1).
b. Remove nuts (17) and flat washers (16).
. c. Remove bolts (22) and nuts (5). Allow lower steering arm subassembly (11), bushing (3), and tie rod assembly (12) to drop down; place to side.
d. Lift upper steering arm subassembly vertically to clear pivot pin (reference arrow (A), then pull to clear tank and front axle tube.
e. Remove tie rod assembly (12) by removing nut (6) and flat washer (4). Note the presence of the bush ings (23).
f. Repair / replace components.

4.10 Tie Rod Assembly

Refer to Figure 4-7 for the removal of the tie rod. Before beginning this process make sure that you have followed the steps for the steering arm assembly. **Note presence and location of bushings (23) when removing tie rod assembly from steering arm assembly.**

a. Disassemble the tie rod assembly by the unthreaded components. Before disassembly mark rod length with masking tape. Note that tie rod ends angle downward when reassembling.
b. Adjust tire toe in /toe out as needed.

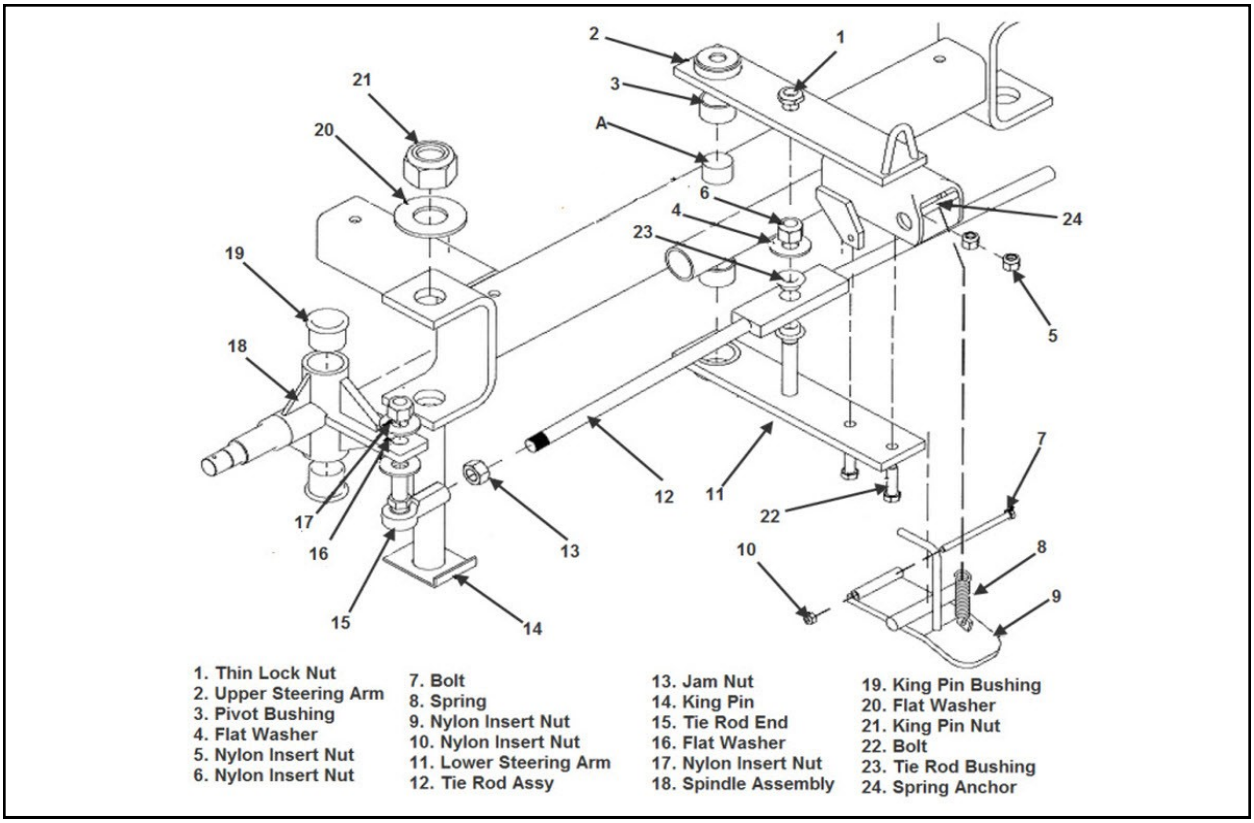

Figure 4-7 Exploded View of Undercarriage

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4.11 Front Undercarriage Removal

To remove the entire Front Undercarriage assembly, the equipment must have the front end raised. See Figure 4-4 for lift points.

a. Raise equipment with suitable maintenance jack (see Figure 4-4 arrow A for jack placement) to allow four inches of space between the wheels and ground.
b. Place cribbing under tank skids (see Figure 4-4, reference arrows C) to safely support th equipment.
c. Lower onto cribbing. Leave jack in place.
d. Raise jack to apply slight pressure on assembly. **(Tow bar must be in upright position.)**
e. Remove bolts (2) and nuts (3).
f. Carefully lower jack and assembly until wheels are on the ground and front axle tube clears tank mounts.
g. Pull Front Undercarriage forward. Note location of rubber mounting pads (5).

WARNING

Use suitable lifting and support equipment when performing these steps. Serious injury or death could occur from rolling or falling equipment.

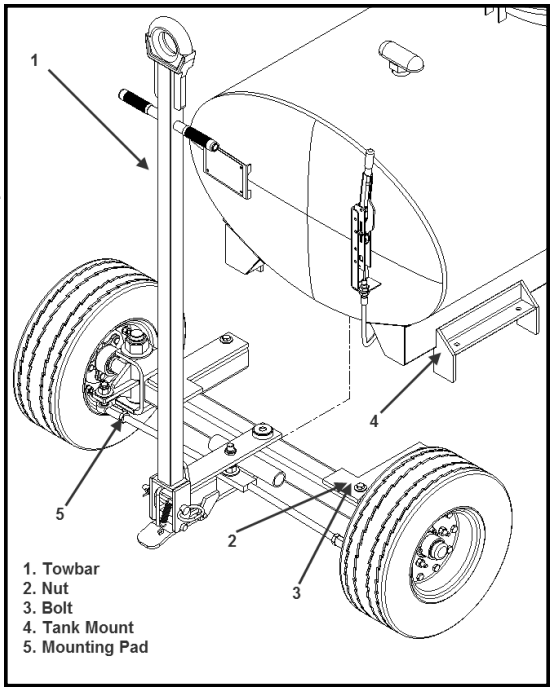

Figure 4-8 Front Undercarriage Removal

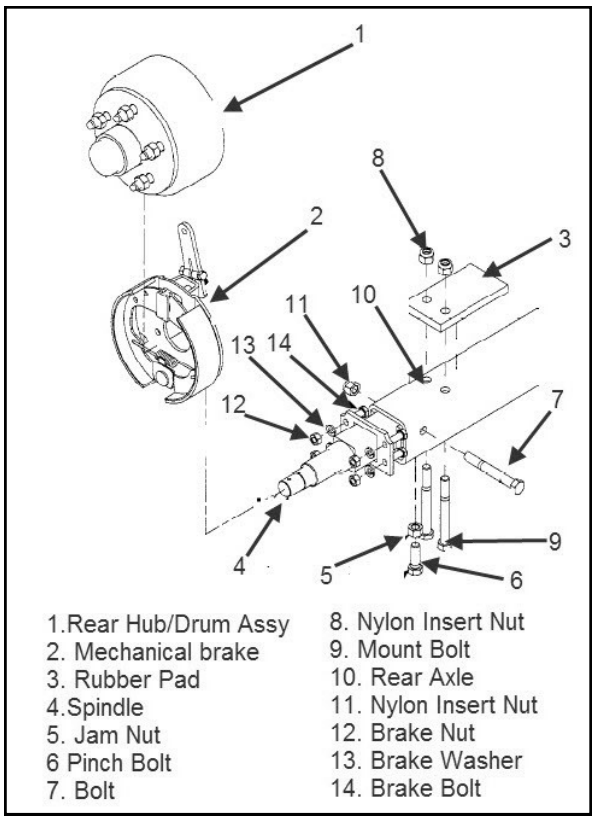

Figure 4-9 Rear Undercarriage Removal

4.12 Rear Undercarriage Assembly

See Figure 4-9 for the following maintenance steps. The rear undercarriage assembly consists of: a wheel assembly, a hub and brake drum assembly (1), a mechanical parking brake assembly (2), a rear spindle (4), and the axle (10).

4.13 Rear Wheel Assembly Removal

To remove wheel assembly, the equipment must have the back end raised and placed on approved jack stands. Points A and B are similar on both the rear and front axles.

a. Raise equipment with suitable maintenance jack high enough to remove wheel assembly. (see Figure 4-4, arrow A for jack placement) .
b. Place approved jack stands under rear axle (see Figure 4-4 , arrow B for stand place ment).
c. Remove lug nuts of wheel assembly needing maintenance.

4.14 Rear Hub / Brake Drum Assembly

To remove the rear hub and brake drum assembly, follow the maintenance steps for the rear wheel assembly removal before beginning the next steps. Figure 4-10 illustrates the process for the rear hub/ brake drum assembly.

a. Remove dust cap (1) by lightly tapping with a rubber hammer.
b. Remove cotter pin (2), castle nut (3) and washer (4).
c. Grasp front hub (7) and drum (8) and pull outward firmly. Ensure that bearing (5) doesn't fall from hub and strike the ground.
. d. Remove bearing (5), seal (11), and bearing(10) from the rear hub (7).
e. Using a suitable H-frame press, remove bearing races (6) and (9).
f. Remove drum (8) by pressing out wheel studs (12) in suitable H-frame press.
. g. Replace components and grease beaeings before reassembly.
h. Reassemble in reverse order. Castle nut (3) should be tightened until the hub assembly rotates barely past free.

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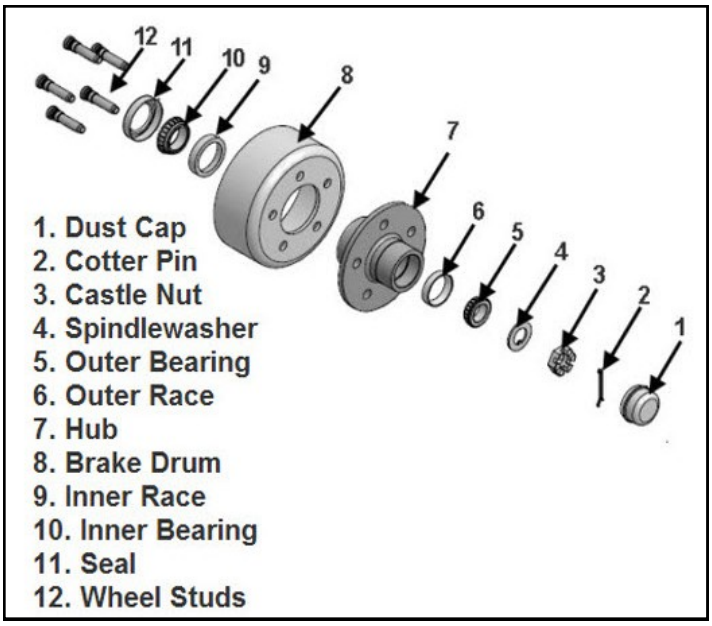


Figure 4-10 Rear Hub and Brake Drum

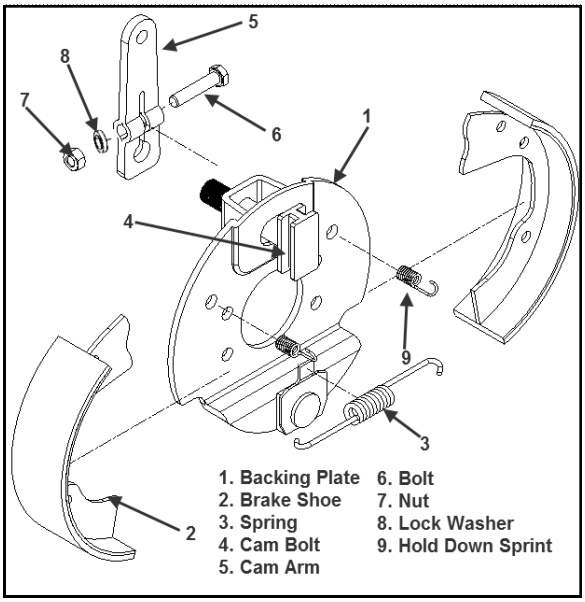


Figure 4-11 Mechanical Brake

4.15 Mechanical Brake Assembly

The assembly can be disassembled while attached to the rear spindle or removed from the unit. See Figure 4-11.

a. Remove Rear Wheel Assembly as described in section 4.13.
b. Remove Rear Hub and Brake Drum Assembly as described in section 4.14 on this page.
c. Remove brake cable end from arm (5) as described on page ?? Section 4.17, step (a).
d. Remove nuts (12), washers (13), and bolts (14) shown in Figure 4-9.
e. Remove Mechanical Brake Assembly and place on flat surface.
f. Remove spring (3).
g. Release brake shoes (2) by removing springs (9) from the backing plate (1).
h. Remove nut (7), lock washer (8), and bolt (6) to release arm (5).
i. Remove brake cam (4) by pulling directly outward.

NOTE: Steps (d) and (e) are needed only if Mechanical Brake Assembly is to be removed from the axle.

4.16 Parking Brake Assembly and Adjustment

The parking brake assembly consists of a brake handle and cable assembly and a mechanical brake assembly The parking brake can be adjusted at three different locations.

An in-field adjustment can be made at the brake handle by turning the handle cap clockwise to tighten brakes and counterclockwise to loosen the brakes (see reference arrow D in Figure 4-12.) This adjustment must be made with the brake handle in the off position. Maintenance level adjustments can be made at reference arrow E and reference arrow F of Figure 4-12 (each side).

4.17 Brake Handle and Cable Assembly

The brake handle and cable assembly only need to be disassembled to the point that the repair is needed. These instructions start at the wheel assembly and progress toward the brake handle. (11)

a. Remove cotter pin (13) and clevis pin (14) to release clevis (12).
b. Unthread clevis (12) from cable
c. Remove nut (15) and remove cable housing (10) from bracket.
d. Remove nut at opposite end of cable and disassemble cable linkage parts (6), (7), (8), and (9).
e. Repeat steps a. through d. for opposite side.
f. Remove nut (4) to release cable equalizer (5).
g. Repeat step c. for cable housing leading to brake handle.
h. Remove nut at other end of cable and release cable by disassembling cable linkage from brake handle (1).
i. Remove bolts (2) and nuts| (3) to free brake handle (1).

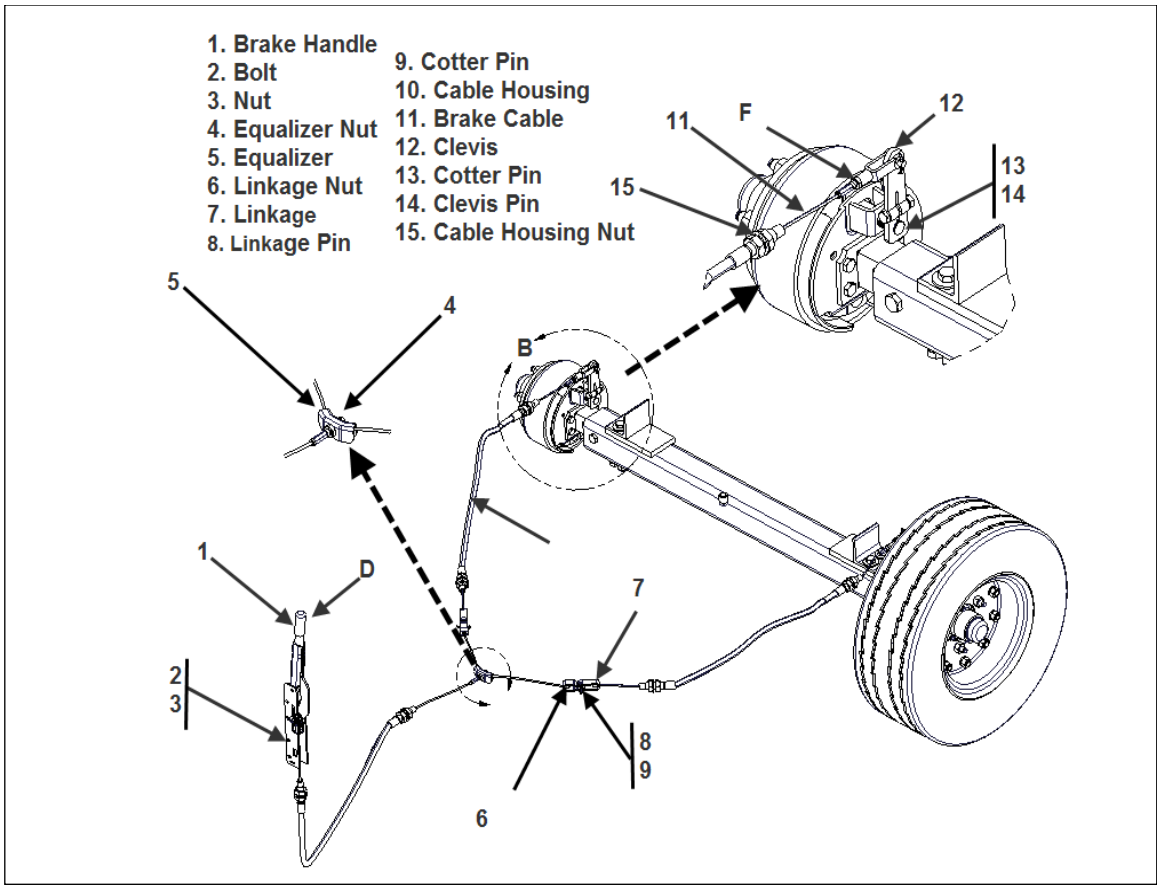


Figure 4-12 Brake and Cable Assembly

4.18 Rear Undercarriage Assembly Removal

To remove the entire Rear Undercarriage assembly, the equipment must have the back end raised. See Section 4.12 and use figure 4-13 for these instructions.

.

a. Raise equipment with suitable maintenance jack (see Figure 4-13 reference arrow A for jack place ment).
and allow for 2-inches of space between the wheels and the ground.

b. Place cribbing under tank skids to safely support the equipment. (see Figure 4-13, reference points labeled with a C).

c. Lower onto cribbing. Leave jack in place.

d. Disconnect parking brake cables at mechanical brake assembly as described in Section 4.15, step (a).

e. Raise jack to apply slight pressure on assembly.

f. Remove mounting nuts and bolts from both sides of axle assembly.

g. Carefully lower jack and assembly until wheels are on the ground and the front axle tube clears tank mounts.

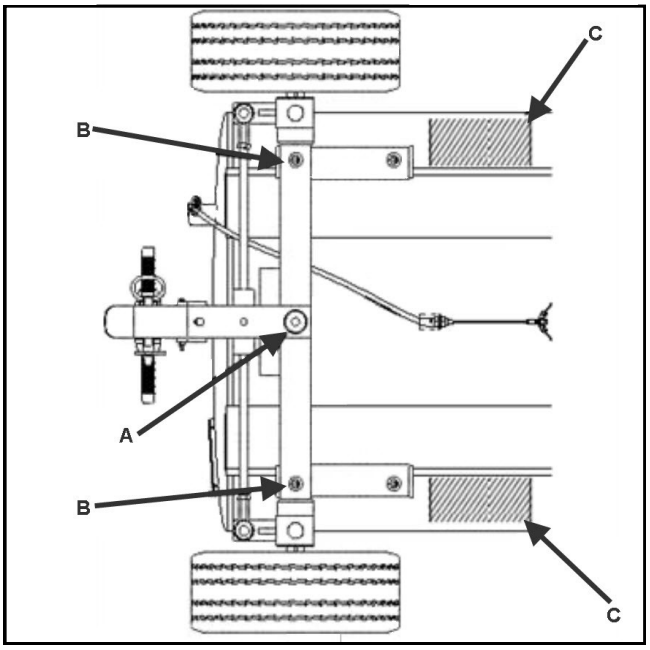


Figure 4-13 Lift Points

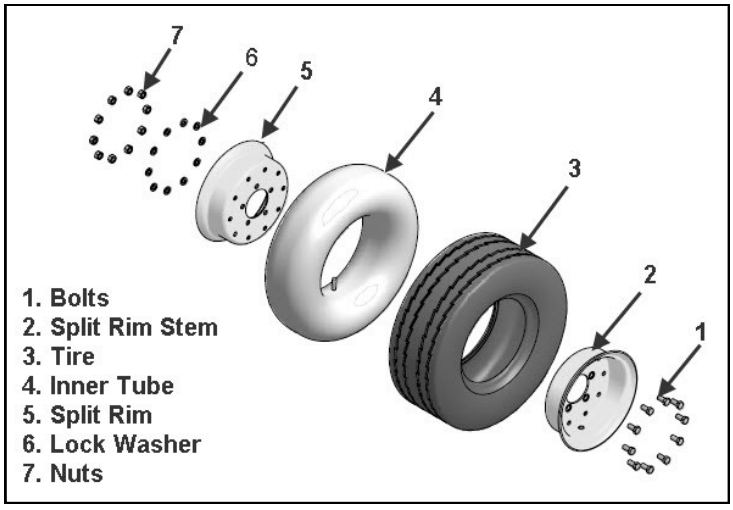


Figure 4-14 Wheel Assembly

4.19 Wheel Assembly

The Wheel assembly is a two-piece, split rim design. Use Figure 4-14 for the following maintenance steps.

a. Remove wheel assembly as de scribed in Section 4.17 for the side needing repair.

b. Release air pressure from the inner tube by depressing stem valve or by removing the stem valve.

c. Remove nuts (7), lock washers (6), and bolts (1).

d. Separate split-rims (2) and (5) from tire (3).

e. Remove inner tube (4) from tire (3). When reassembling, make sure that the inner tube stem is positioned through access hole in split-rim.

f. Torque nuts (6) to 150-foot-pounds before applying air pressure to wheel.

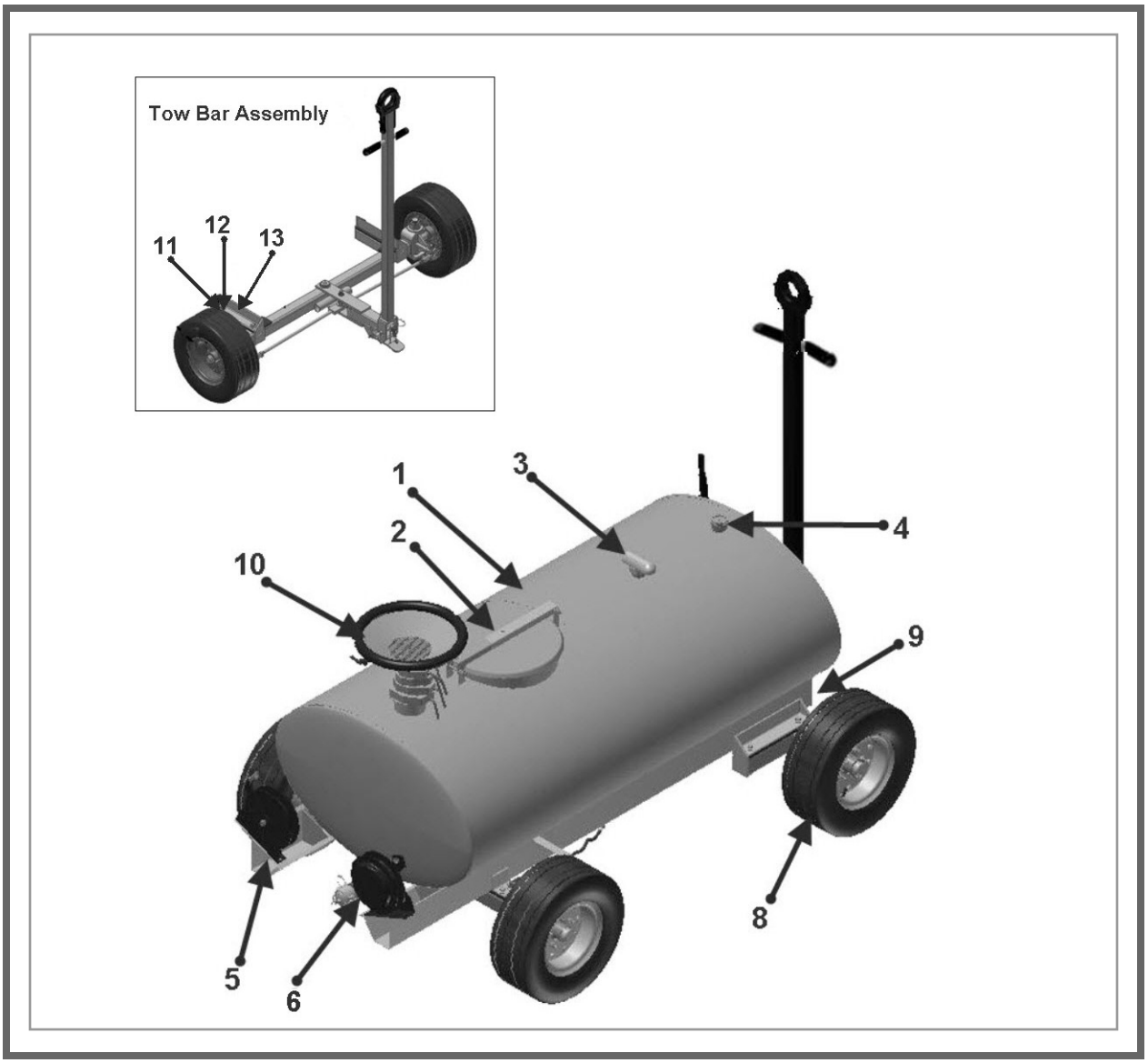
SECTION 5.0 PARTS BREAKDOWN DRAWINGS

The following figures are supplied to assist in component identification and parts reordering. When reordering, ensure the complete model number and serial number are provided to the sales representative.

You may access customer service by contacting the Metal products Division at 800-541-3601, or 509-928-0720. (The toll free number does not work internationally). If you would like more information about the Spokane metal products division of Spokane Industries you may visit the website at www.spokaneindustries.com/stainless-steel-tanks/index.php.

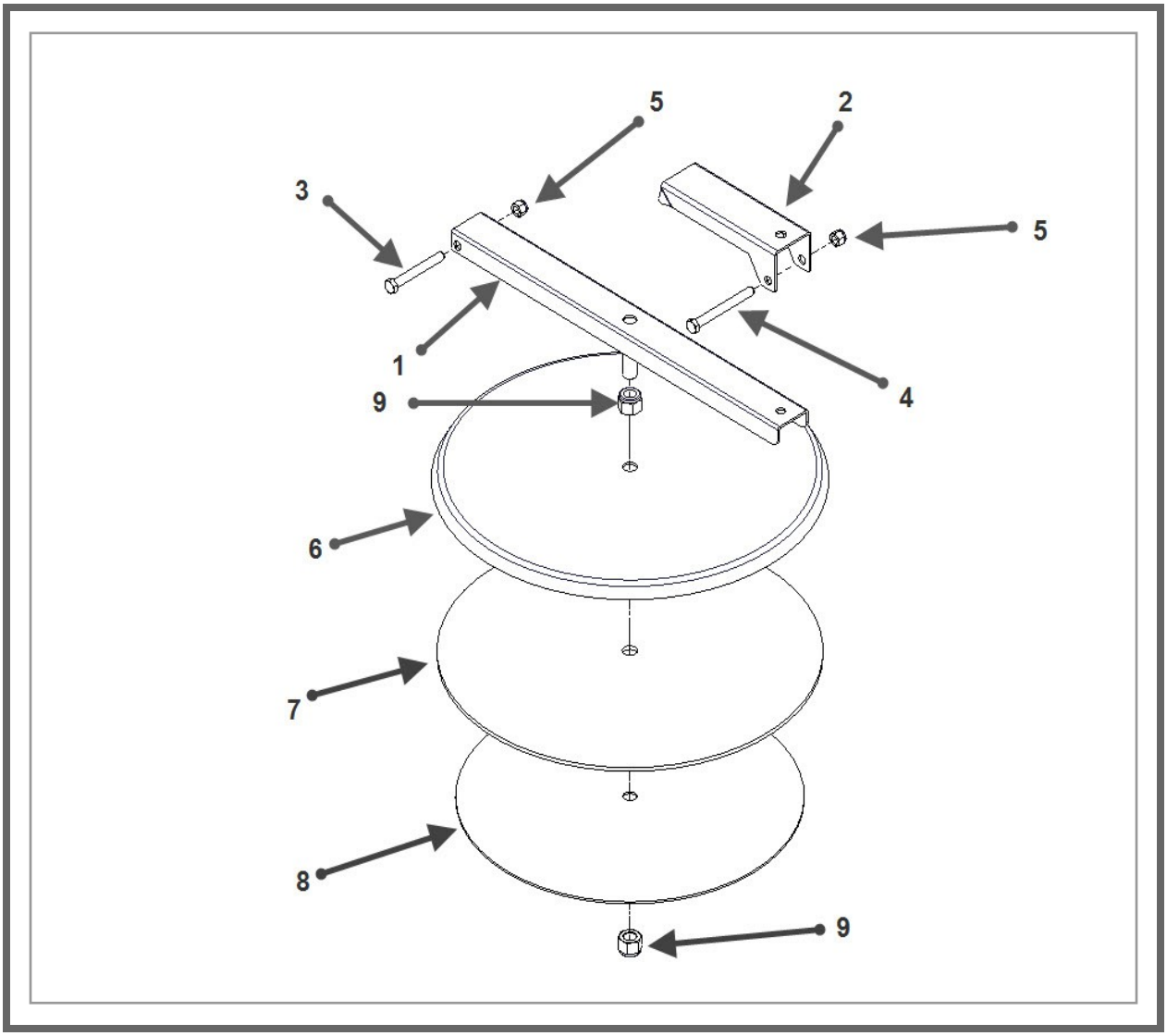
DRAWING NUMBER

1.0 Overview, Component Identification
2.0 Manway Assembly
3.0 Telescoping Funnel Assembly
4.0 Front Undercarriage
4.0 Front Undercarriage (Towbar)
5.0 Rear Undercarriage and Axle
6.0 Brake Assembly
7.0 Front Hub Assembly
8.0 Rear Hub & Drum Assembly
9.0 Wheel & Tire Assembly



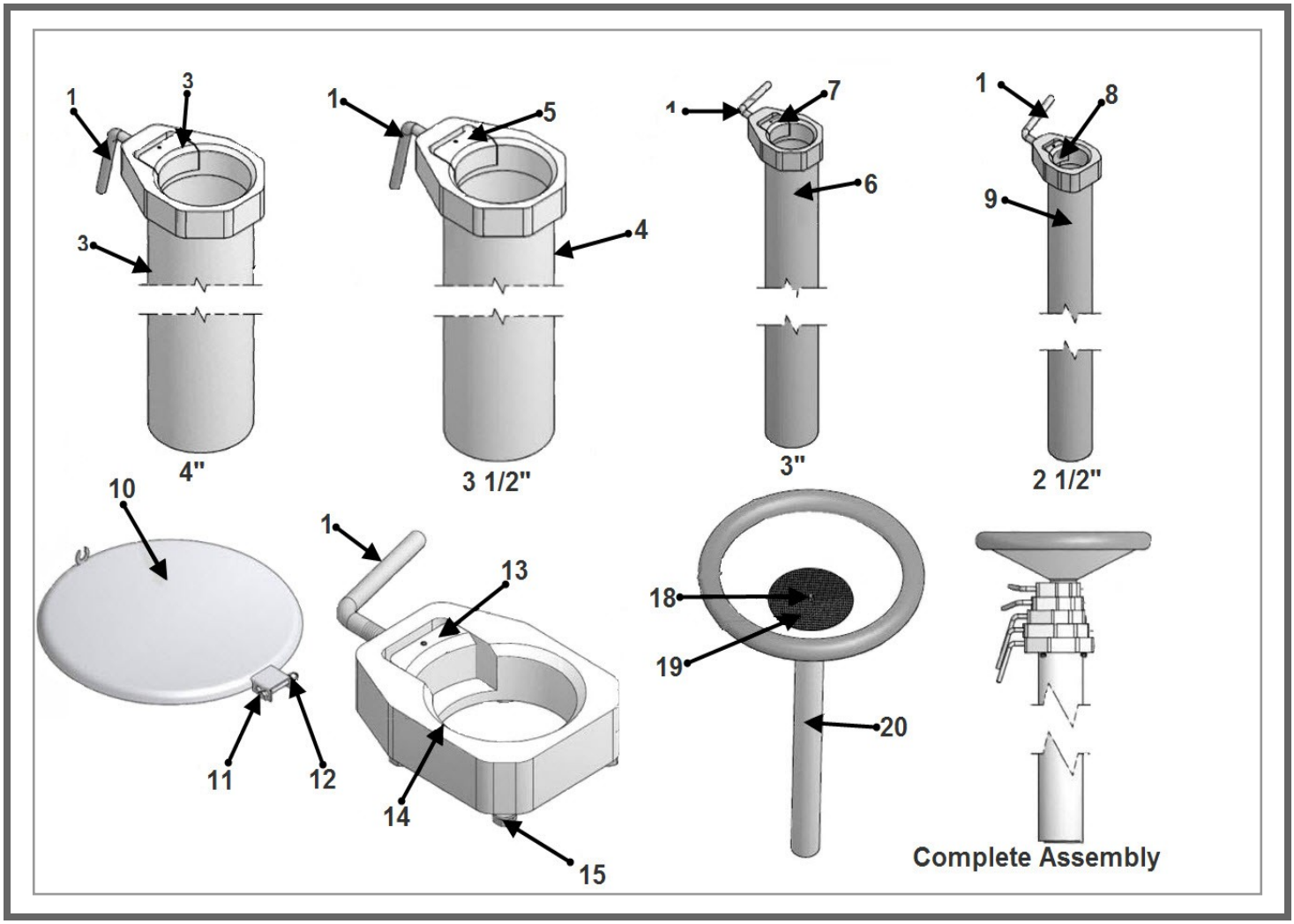
DRAWING 1.0 Overview, Component Identification

ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WEIGHT
1	1	9867-10	NV 200, 400, 600 Tank Weldment	Stainless Steel	591.61 lb.mass
2	1	08-10251	Cross Arm and Lid Assembly	Stainless Steel	15.75 lb.mass
3	1	04-1037	T-Vent, 1/2 Inch	Iron	1.99 lb.mass
4	1	04-01540	Liquid Level Gauge	Various	.08 lb.mass
5	1	04-10361 R	Grounding Reel With Plug	Various	9.39 lb.mass
6	1	04-10361	Grounding Reel With Clamp	Various	9.39 lb.mass
7	1	08-10102	Rear Undercarriage	Various	126.01 lb.mass
8	1	08-1018	Front Undercarriage	Various	182.16 lb.mass
9	4	07-10201	Wheel, Tire and Tube Assembly	Various	31.90 lb.mass
10	1	08-108-1 034U	Telescoping Funnel	Steel, Mild	20.21 lb.mass
11	6	02-12041	Nut, Nylon Insert, 1/2” UNC	Steel, Mild	.05 lb.mass
12	4	02-1503	Hex Bolt, 1/2” UNC x 41/2” LG	Steel Mild	.31 lb.mass
13	2	06-1203	Mounting Pad	Rubber	.75 lb.mass



Drawing 2.0 **Manway Assembly**

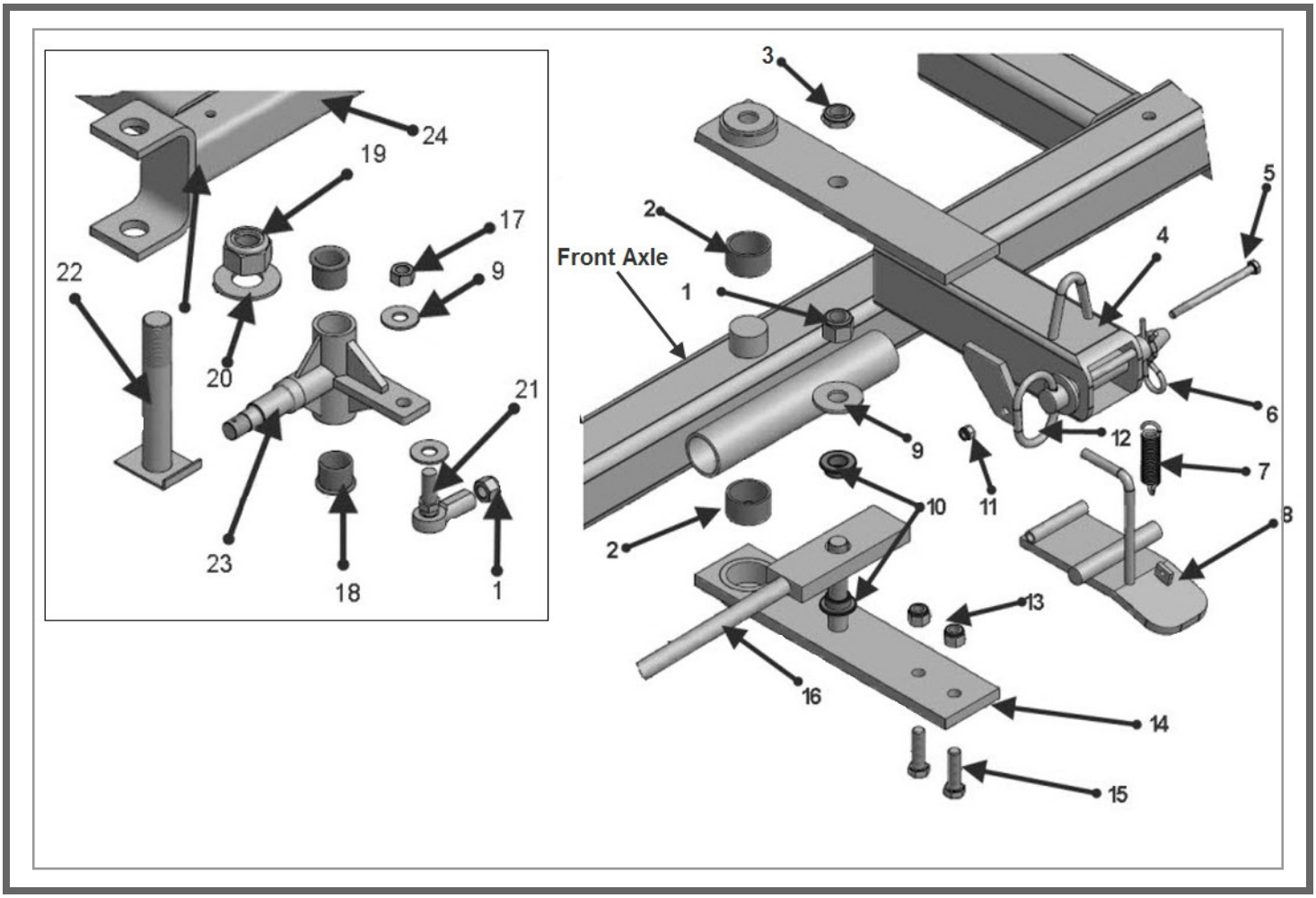
ITEM	QTY	P.N.	DESCRIPTION
1	1	07-1039S	Cross Arm
2	1	01-8222S	Flip Lock
3	1	02-3042	Bolt, 3/8-16 x3 “ LG (AP)
4	1	02-3044	Bolt, 3/8-16 x3 1/2 “ LG (AP)
5	2	02-3089	Nut, Nylon Insert, 3/8-16 (AP)
6	1	01-86001	Manway Lid, 16”
7	1	06-25025	Manway Gasket
8	1	01-8710	Retainer Gasket, SV
9	2	02-3091	Nut, Nylon Insert



Drawing 3.0 **Telescoping Assembly**

ITEM	QTY	P.N.	DESCRIPTION
1	5	05-10181	Handle
2	2	07-1014U	4” Tube (16 Ft.)
3	1	05-10041	Wedge
4	1	07-14W (12 ft.) 08-1028U (16 ft.)	3 1/2” Tube
5	1	05-10181	Wedge
6	1	07-1045 (8 ft.) 07-1013W (12 ft.) 08-1027U (16 ft.)	Tube, 3”x.065” Wall
7	1	05-10021	Wedge, Clamp 2 1/2”
8	1	05-10011	Wedge
9	1	07-1049 (8 rt.) 07-1012W (12 ft.) 08-1017U (16 ft.)	Tubing, .065” Wall, 2 1/2
10	1	01-86001	Lid

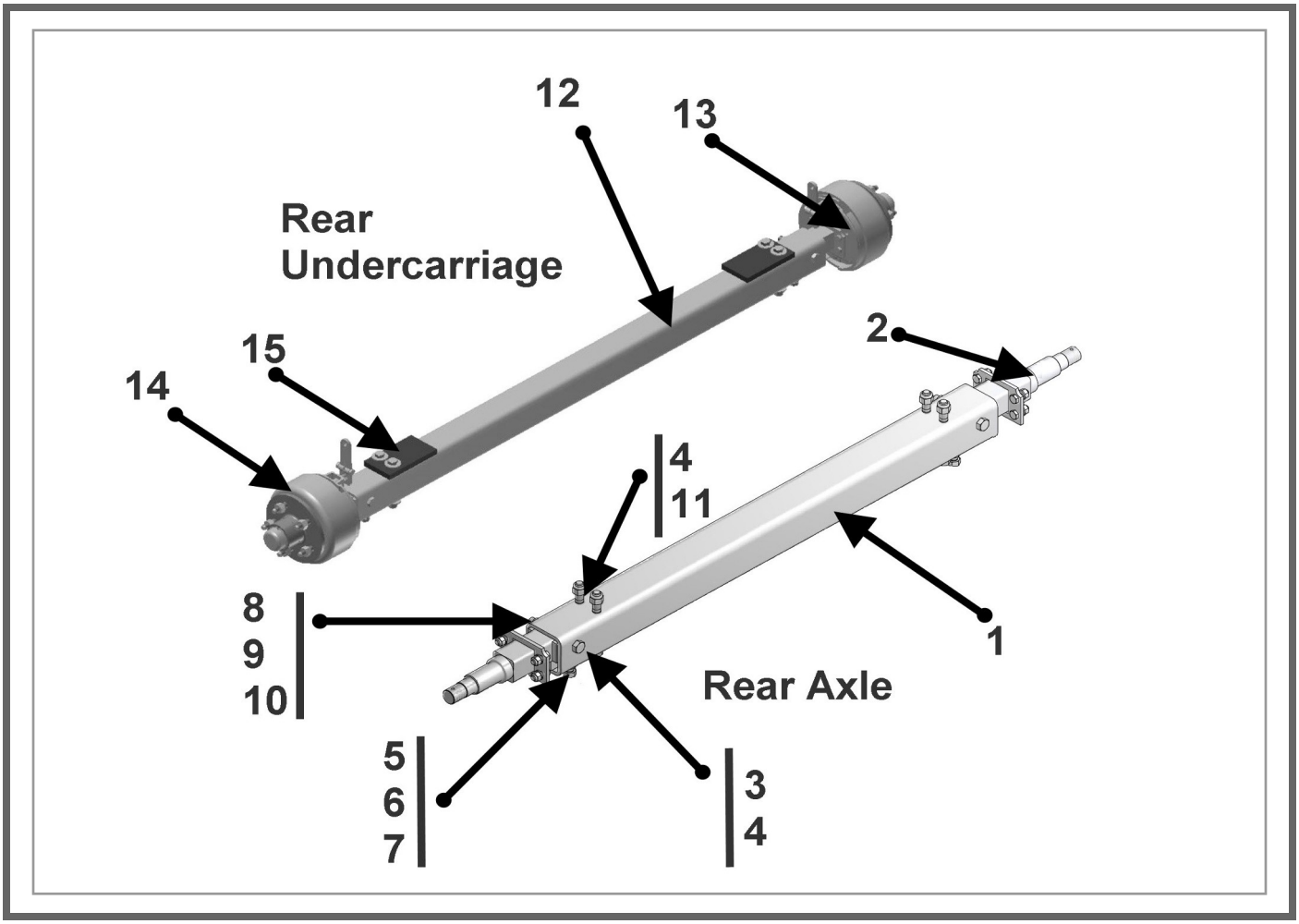
ITEM	QTY	P.N.	DESCRIPTION
11	1	02-10013	Hex Cap Screw 3/8” UNC 3” LG
12	1	02-1202	Nut, Nylon Insert 3/8” UNC
13	1	05-10051	Wedge
14	1	05-10292 (8 ft.) 07-6000W (12ft) 05-10302 (16 ft.)	Base Clamp
15	4	02-11001	Lockwasher 1/4”
16	4	02-10010	Bolt, 1/4” UNCx 5/8” LG
17	4	06-1022	Gasket
18	1	02-1200	Nut, Nylon Insert, 1/4-20 UNC
19	1	04-1039	Strainer
20	1	07-1051 (8 ft.) 07-1054 (12 ft.) 07-10541 (16 ft.)	Funnel Section



Drawing 4.0 **Front Undercarriage**

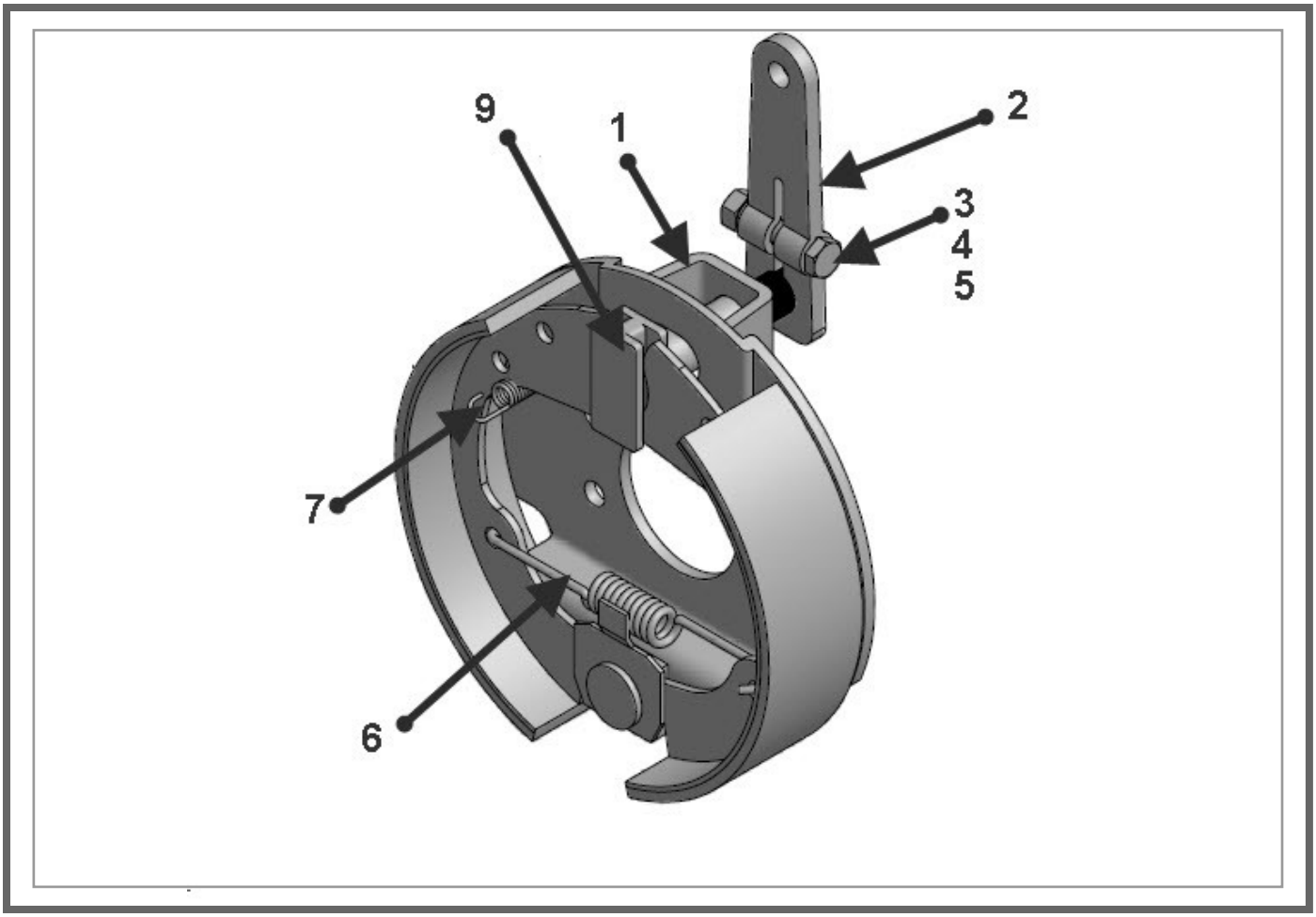
ITEM	QTY	P.N.	DESCRIPTION
1	1	02-12071	Nut, Nylon Insert, 3/4-16 UNF
2	2	03-1014	Bushing, Stewering Arm
3	1	02-12141	Jam Nut, Nylon Insert 3/4-16" UNF
4	1	07-1052	Steering Arm, (400 & 600 Only)
5	1	02-1501	Hex Bolt, 5/16-18 x 4 1/2" LG
6	1	02-1300	Pin, Cotter
7	1	03-1013	Bushing, King Pin
8	1	07-10105	Toe Latch
9	1	02-11072	Flat Washer
10	2	03-1015	Bushing, Tie Rod
11	1	02-1201	Nut, Nylon Insert, 5/16-18
12	1	02-1304	Hitch Pin
13	2	02-12041	Nut, Nylon Insert, 1/2" UNC
14	1	07-1046	Steering Arm, Lower Plate (400, 600 Only)
15	2	02-1502	Bolt, 1/2-13 x 1 3/4" LG

ITEM	QTY	P.N.	DESCRIPTION
16	1	07-1005	Tie Rod (400, 600 Only)
17	1	02-12141	Nut, 3/4-16 UNF
18	2	03-1013	Bushing, King Pin
19	1	02-12131	Nut, Nylon Insert,
20	2	03-1014	Bushing, Steering Arm
21	1	02-12141	Jam Nut, Nylon Insert 3/4-16" UNF
22	1	07-1052	Steering Arm, (400 & 600 Only)
23	1	07-1009	Housing, King Pin
24	1	07-11071	Front Axle



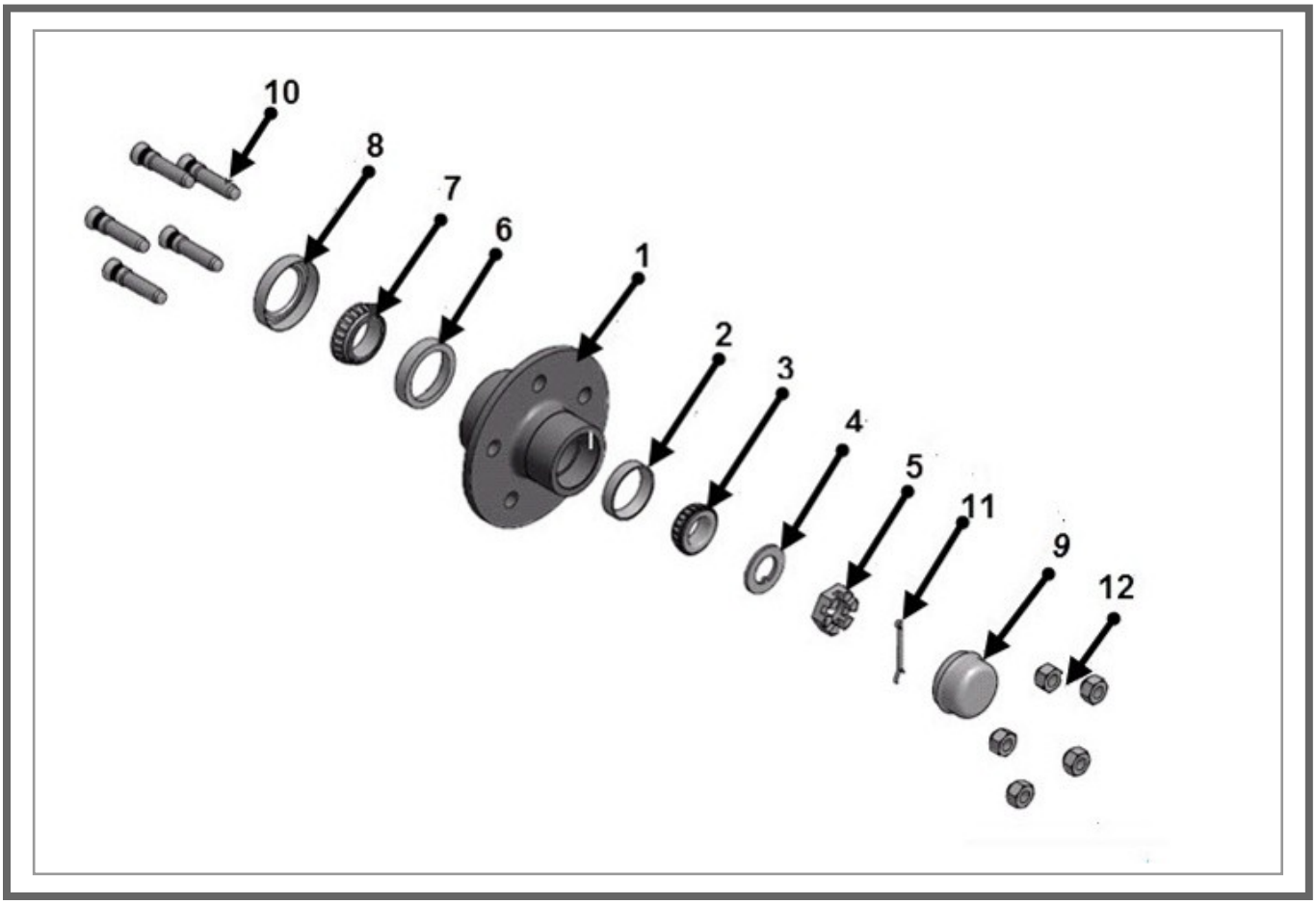
Drawing 5.0 **Rear Undercarriage and Axle**

ITEM	QTY	P.N.	DESCRIPTION
1	1	05-1023	Rear Axle Tube 400/600 Gallon
2	1	07-1010	Rear Spindle Weldment
3	8	02-3024	Bolt 1/2-13 x 4 Inch LG
4	2	02-3087	Nut, Nylon Insert 1/2-13
5	8	02-3072	Nut, 1/2-13 Plated
6	2	02-3068	Nut, 1/2-13 Plated
7	8	02-3026	Bolt, 1/2-13 by 1 1/2 Inch LG
8	8	02-3050	Bolt, 3/8-16 AP
9	8	02-3143	Lock Washer
10	2	02-3024	Bolt, 1/2-13 x 4 Inch
11	4	02-3025	Bolt
12	1	08-10301	Rear Axle Assembly
13	2	08-1007R	Brake Assembly
14	2	08-12050	Rear Hub and Drum Assembly
15	2	06-1012	Rear Mount Pad



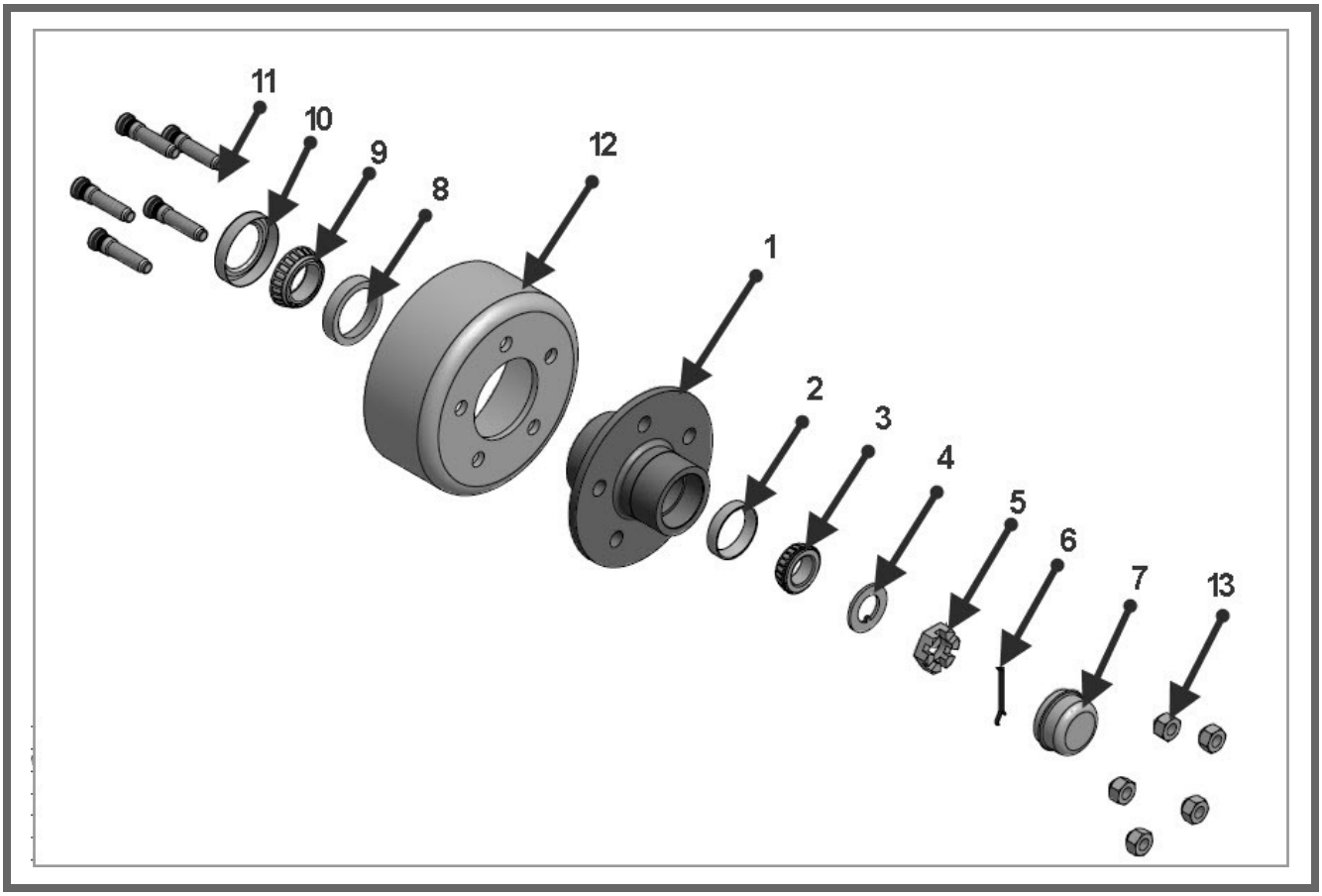
Drawing 6.0 **Brake Assembly**

ITEM	QTY	P.N.	DESCRIPTION
1	1	04-1064R	Back Plate
2	1	04-1030R	Cam Lever
3	1	02-10017R	Hex Head Cap Screw, 5/16”-UNF 1 1/2” LG
4	2	02-12011	Lockwasher 5/16”
5	1	02-11011	Return Spring
6	1	04-10265R	Brake Shoe Hold Down Spring
7	2	04-1026R	Bushing, King Pin
8	2	04-10265R	Brake Shoe
9	1	0401928R	Cam



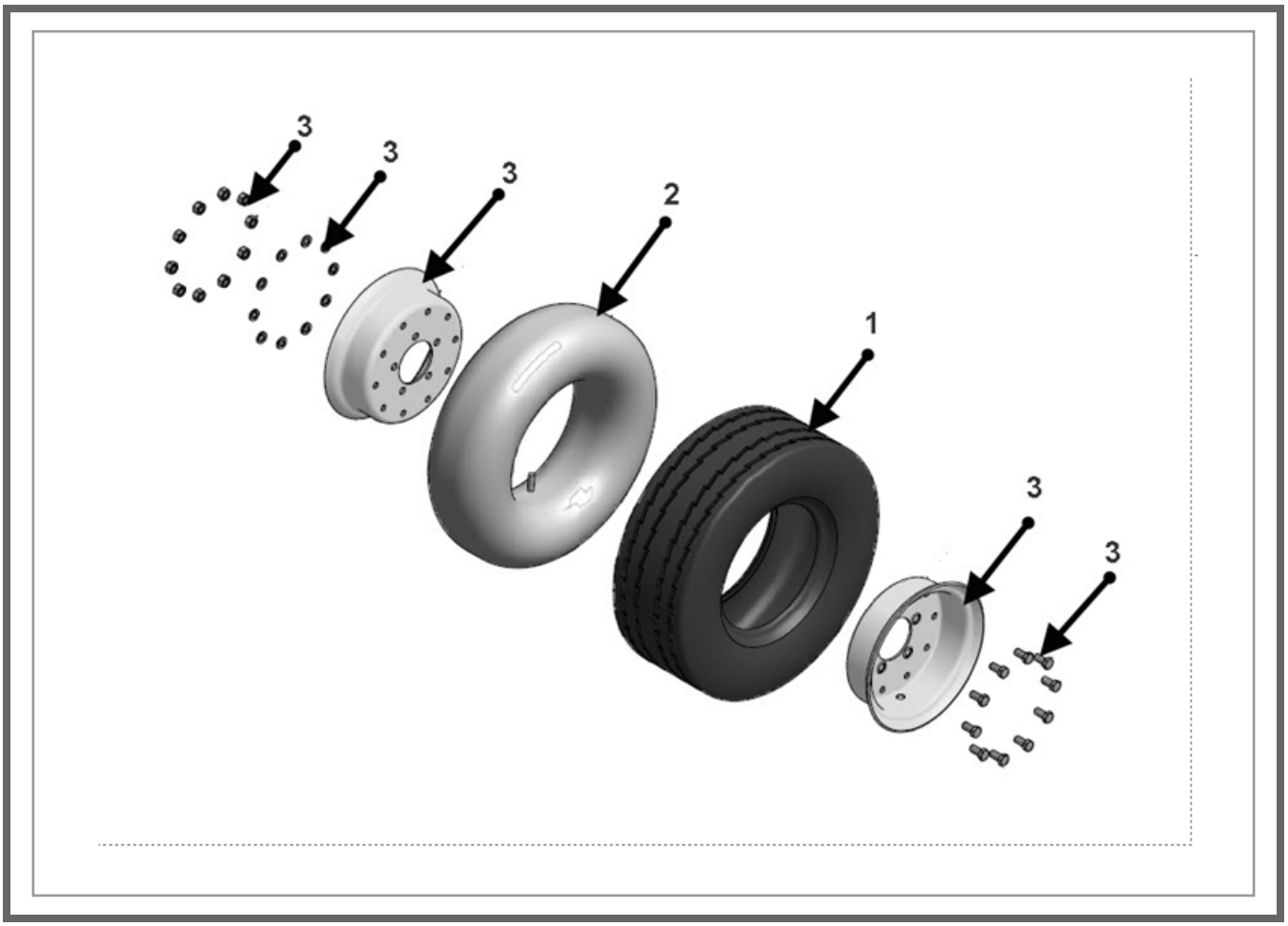
Drawing 7.0 **Front Hub Assembly**

ITEM	QTY	P.N.	DESCRIPTION
1	1	04-1017	Hub, Front Axle
2	1	04-1016	Cup, Outer Bearing
3	1	04-1014	Cone, Outer Bearing
4	2	02-12055	Washer
5	1	02-1205	Nut, Castle
6	1	04-1015	Cup, Inner Bearing
7	2	04-1013	Cone, Inner bearing
8	2	04-1012	Seal bearing
9	1	04-1019	Cap, Hub
10	1	04-1017	Stud
11	5	02-1303	Pin, Cotter
12	1	05-1021	Nut, lug



Drawing 8.0 **Rear Hub and Drum Assembly**

ITEM	QTY	P.N.	DESCRIPTION
1	1	05-1020	Hub, Rear Axle
2	1	04-1016	Cup, Outer Bearing
3	1	04-1014	Cone, Outer Bearing
4	2	02-12055	Washer
5	1	02-1205	Nut, Castle
6	1	02-1303	Pin, Cotter
7	2	04-1019	Cap, Hub
8	2	04-1015	Cup, Inner Bearing
9	1	04-1013	Cone, Inner bearing
10	1	04-1012	Seal, Bearing
11	5	02-1017	Stud
12	1	05-1021	Drum, Brake
13	5	04-1021	Nut Lug



Drawing 9.0 **Wheel and Tire Assembly**

ITEM	QTY	P.N.	DESCRIPTION
	4	07-10201	Complete Wheel Assembly (All Numbers)
1	1	04-10221	Tire, 20.5x 8.0-10, E-Range
2	1	04-1045	Inner Tube
3	2	04-1020	Split Rim Wheel Assembly