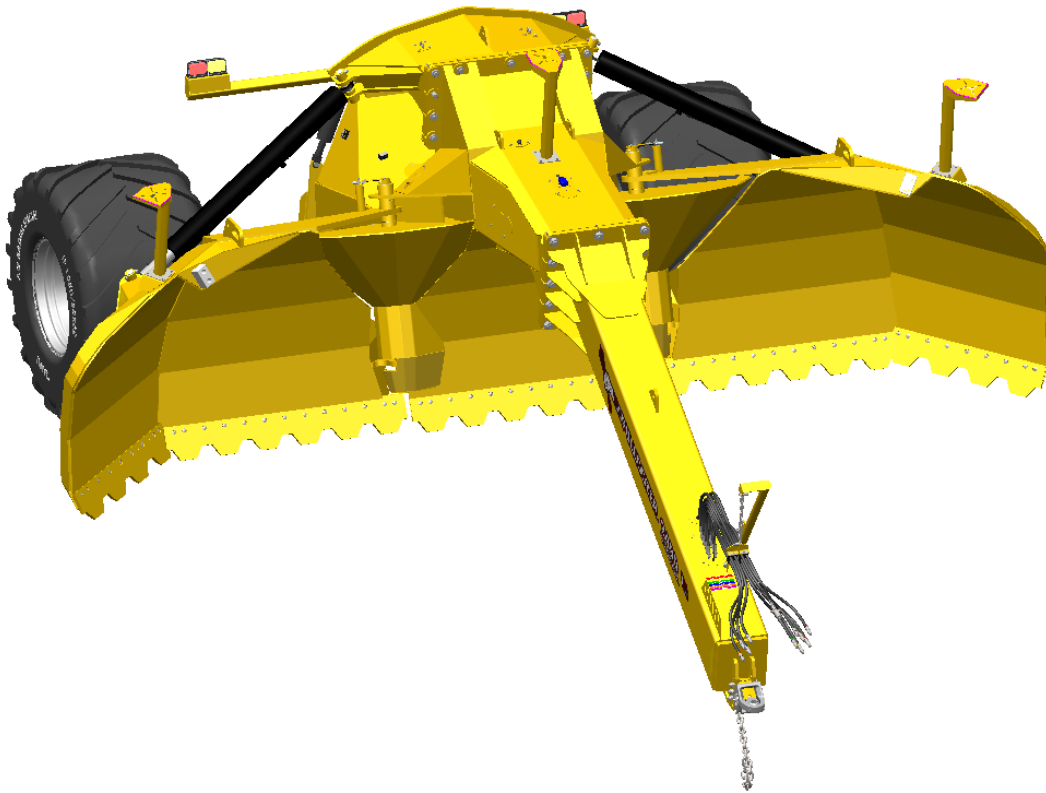




BRIDGEVIEW MFG. INC.



PULLDOZER TRANSFORMER

2490

Operator & Parts Manual

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Your Authorized Dealer
Your Serial Number

The serial number is located on the front of the middle blade on the left side of the machine.

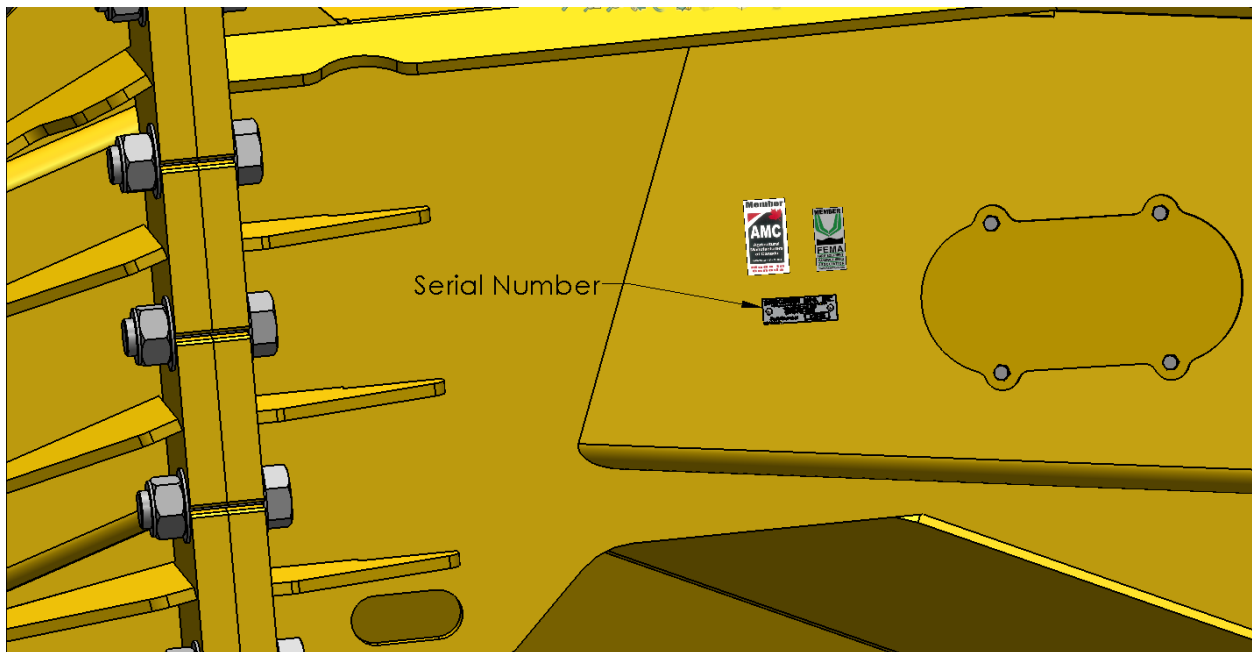


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Introduction

Thank you for purchasing a Pulldozer Transformer from Bridgeview Manufacturing. With the proper operation and service as outlined in this manual, the Pulldozer Transformer will provide you with years of trouble-free operation.

This is a complete safety, operation, and parts manual for the Pulldozer Transformer. The manual covers in detail how to use your new machine safely and effectively. The procedures outlined in this manual should be followed to ensure safe operation and longevity of your machine. The parts and assembly manual covers all parts you may need to order in case of accident or breakdown and how to install them. Please read completely through this manual before beginning operation of your new machine.

Left and right as used in the parts book is as viewed from the rear of the Pulldozer Transformer while looking in the direction of travel.

Safety Precautions

The following safety precautions **MUST** be followed to ensure the safe operation of the Pulldozer Transformer.

- **Tow at speeds not exceeding 31 miles/hour (50 km/h) when unloaded.** Slow down for hills, curves, rough area, and in advance of braking to prevent loss of control and possible injury or death.
- Read and follow the **Highway Transport** section before towing on public roads.
- **Always** turn off tractor, ensure parking brake is applied before leaving the operating platform, and remove key when working on machine
- **Always** leave cutting edge on the ground when not operating.
- **Always** leave hydraulic cylinders, when not operating, in the de-stroked position.
- **Stand clear** of the Pulldozer Transformer while in operation.
- **Beware** of pinch points at all articulating joints.
- **Support Raised Equipment** when working on machine
- **Do Not** over load Pulldozer Transformer and tractor design limits



Power Requirements

The Pulldozer Transformer is designed to utilize the pulling power of a large four-wheel-drive tractor. The following table shows the recommended drawbar horsepower required to pull a Pulldozer Transformer. Pulling with too large a tractor risks damaging the machine, while too small a tractor risks overloading and damaging the tractor.

	Horsepower	Maximum Tractor Weight
24 Foot	400 - 600 HP	67,000 lbs.

Call Before You Dig:

Every time you dig in the ground, wherever it may be, **THERE IS DANGER BELOW!** You run the risk of loss of life or damage to property if you hit any of the many buried cables, conduits, gas or oil pipelines and/or other underground facilities that serve our cities, towns, and rural areas.

Contact the nearest **ONECALL (Call Before You Dig)** services for optimal diligence towards preventing damage to underground infrastructure.



Canada		
Province	Number	Website
British Columbia	1.800.474.6886	http://www.bconecall.bc.ca/
Alberta	1.800.242.3447	http://www.alberta1call.com/
Saskatchewan	1.866.828.4888	http://www.sask1stcall.com/
Manitoba	1.800.827.5094	www.callb4udig.mb.ca/
Ontario	1.800.400.2255	http://www.on1call.com/
Quebec	1.800.663.9228	http://www.info-ex.com/
United States		
All states	811	http://www.call811.com/
TransCanada Pipelines		
Canada	1.888.982.7222	
United States	1.800.447.8066	

Transportation

Check with local authorities regarding transport on public roads. Follow all applicable laws and regulations.

Note the transportation dimensions shown below:

	2490
Total Weight	31,000 lb.
Hitch Weight	10,000 lb.
Axle Weight	21,000 lb.
Transport Height	12'-3"
Flat Height Blade to Top	10'-7"
Transport Blade Clearance	33"
Transport Width (Blade)	11'-7"
Transport Width (Tires)	11'-10"
Transport Length	28'-10"

When transporting the Pulldozer Transformer on public roads, the following precautions should be taken:

- **AVOID** transporting at night whenever possible
- **ALWAYS** ensure that the flashers and tail lights are clean and operational
- **ALWAYS** ensure that the Slow-Moving Vehicle (SMV) sign is visible
- **NEVER** exceed speeds of 25 mph (40 km/h)
- **ALWAYS** ensure that the safety chain is properly installed
- **DO NOT** tow with a vehicle that cannot handle the massive weight of the Pulldozer Transformer
- **CHECK** for the oversize or overload permit with the authorities for transportation on public highways.
- **ENSURE** that blade is fully lifted, level, and not in contact with the road (maintain a safe level from the ground).
- **ENSURE** that all safety locks are in place
- **ENSURE** that the hydraulic hoses are properly secured (not dragging on the ground)

Field to Transport Position

1. Position machine on level ground. Stop tractor, and engage parking brake. Make sure wings are in the flat position as shown below



2. Engage lift cylinder remote and lower machine onto ground. Ensure the lift cylinders are fully retracted, telescopic tubes are free to retract, and tires are off the ground.



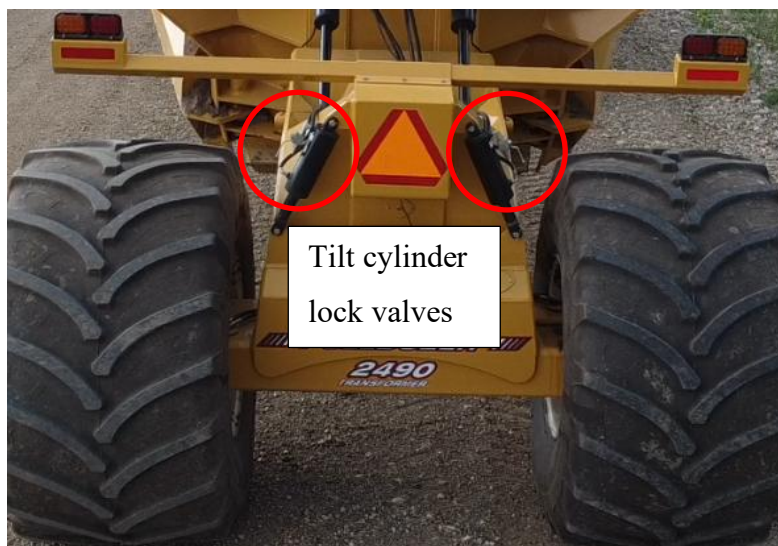
3. Retract tires to transport position



4. Raise the machine extending lifting cylinders



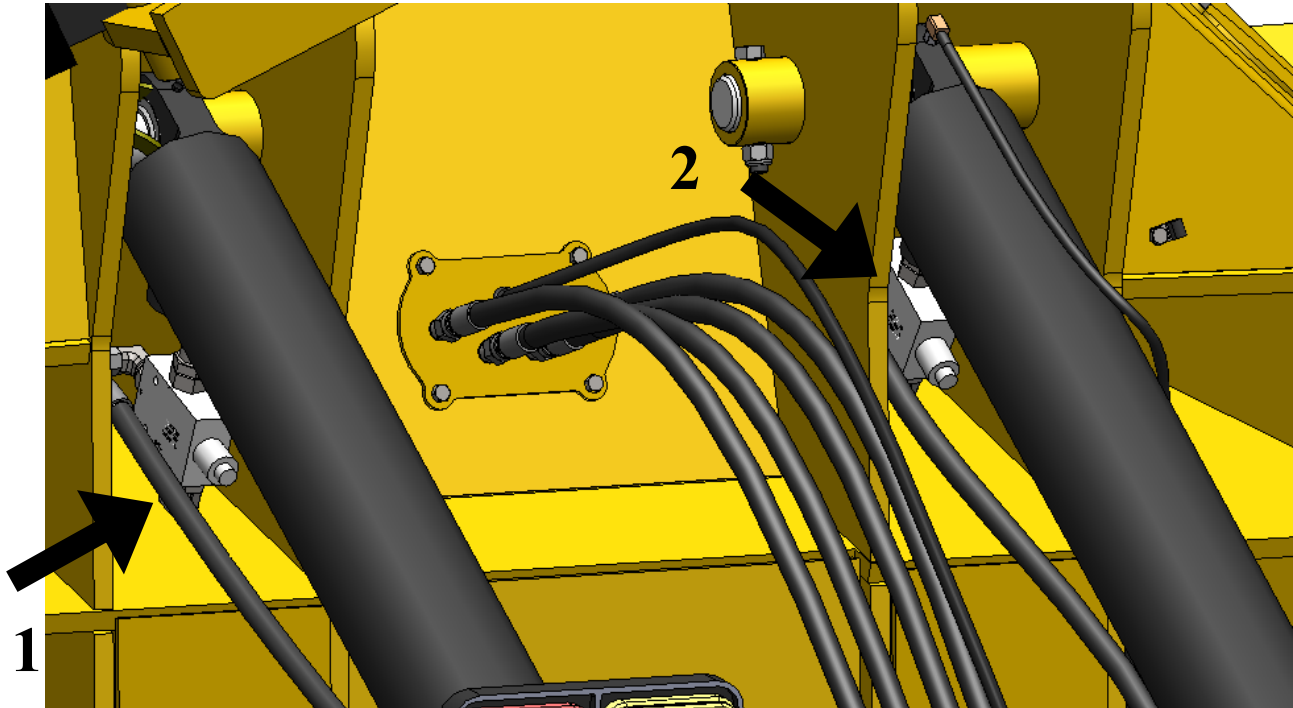
5. Operate the wing lift hydraulics to raise the wings fully into transport position.
Use a safety chain to lock the wings in transport position. Apply transportation locks on the tilt cylinders



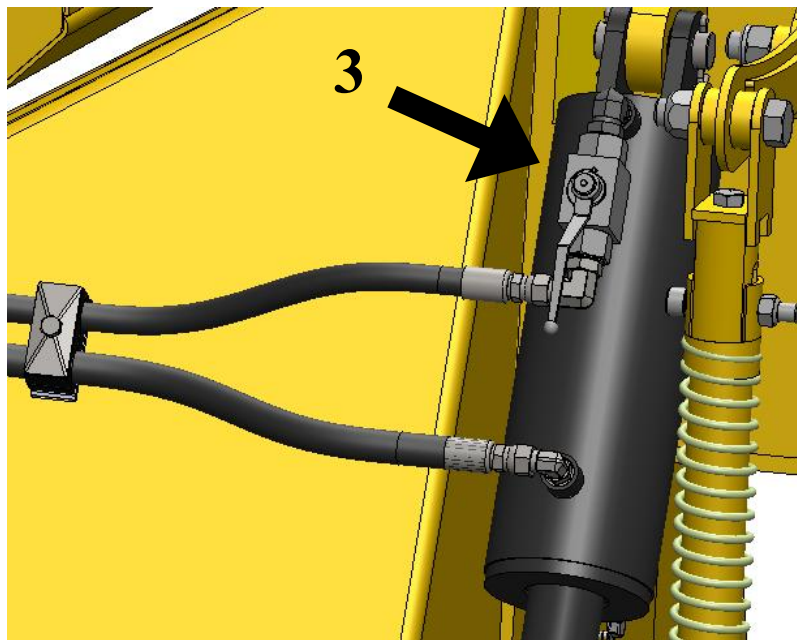
Transportation Locks:

The lifting cylinders of the Pulldozer are held in position by self-locking valves. This prevents the machine from creeping downwards when raised.

1. Blade lift cylinder locking valves



2. Tilt cylinder hydraulic on/off valve (One on each side)



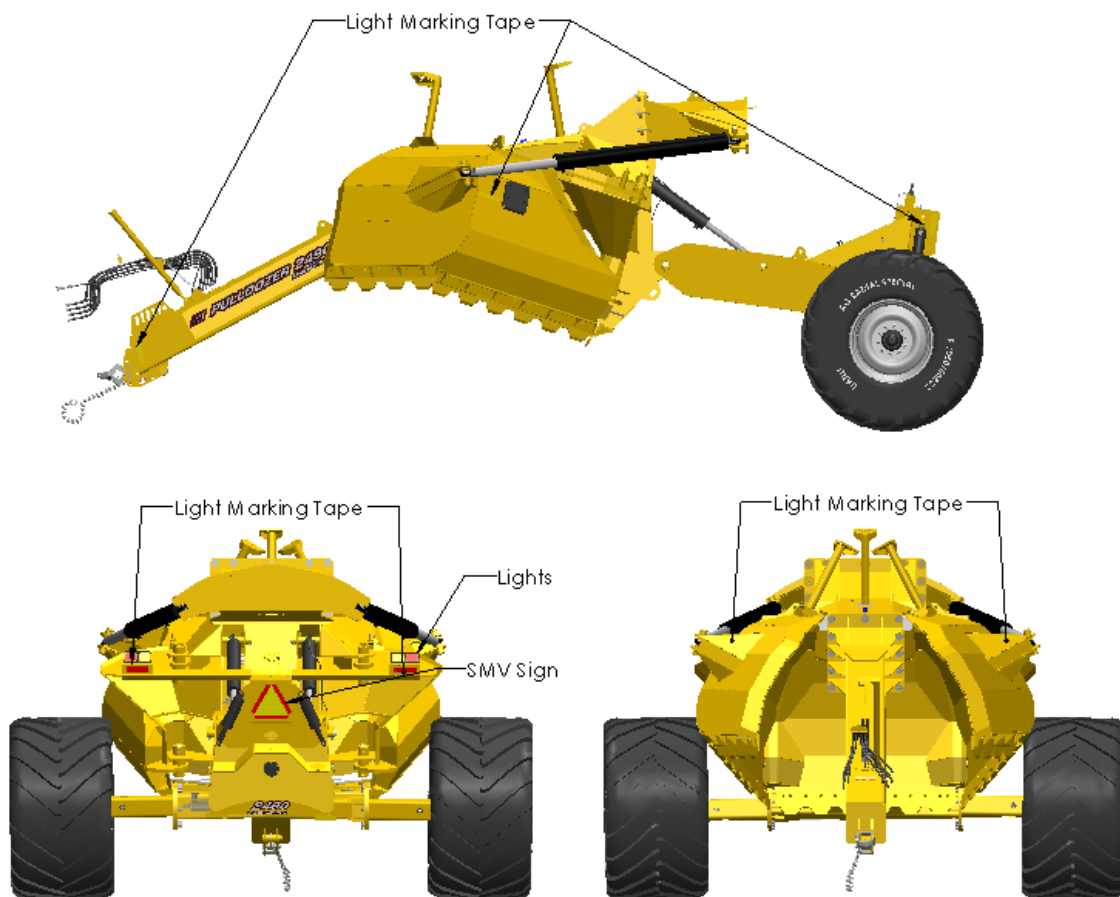
Storage

When storing the 2490 Pulldozer Transformer set the blades with wooden blocks underneath so they do not sit in the ground. Apply grease to all exposed hydraulic cylinder shafts.

Lights and Marking

The Pulldozer Transformer comes standard with light kit for better visibility. The lights can be plugged into the standard 7-pin round trailer plug on a tractor. The lights function as flashing lights, with solid red tail lights. Ensure that they are functioning properly before towing.

Ensure that the SMV (Slow Moving Sign) sign is in place and visible.



Features and Operation

The Pulldozer Transformer land shaper operates as a dozer, scraper, and grader, all in one complete, efficient, and virtually indestructible package.

The Pulldozer Transformer is capable of reclaiming unproductive land to allow for more seeded acreage. It can also drag dirt to elevate sloughs and potholes, level land, back-slope, clean and contour existing ditches and drains to improve draining and allow for earlier access by seeding equipment.

When mated with a GPS leveling system, the Pulldozer Transformer is excellent at making perfectly contoured fields for maximum drainage, or water retention.

Operators have reported 1 acre per hour of land reclamation, leaving it seed bed ready.

The Pulldozer Transformer allows for up to 25 cubic yards of dirt movement over short distances for the 24-foot unit.

This Unit comes equipped with an electronic system to accurately show the Pulldozer's wing and blade positions. This will be shown on the in-cab display.

Enjoy operating your new Pulldozer Transformer.

Hydraulic Systems

Hydraulic systems store considerable energy. They are used to:

- lift and change the position of attachments
- operate hydraulic motors
- assist in steering and braking



Leaks from hydraulic systems are a serious hazard because of the high pressure and temperature of the fluid contained in the system. Even fine jets of hydraulic fluid can burn or pierce skin and tissue. Workers should:

- Never inspect hydraulic hoses with bare hands;
- Wear long sleeves, heavy gloves and safety glasses when checking for leaks;
- Follow the instructions (blade to be on the ground and no pressure in hydraulic lines during maintenance) because the specific procedures for servicing these systems are very important for one's safety.

Where appropriate, a properly qualified and certified mechanic should perform repairs and maintenance.

Work should not be performed under raised hydraulic equipment.

There are five sets (2490) of hydraulic hoses to connect to the tractor. Each hose has a colored marker to identify its function. They should be connected for the best convenience at the tractor's controls.

Note: the hoses are paired by colour and the following table show the operation when pushing oil into the corresponding hoses.

Machine	Marker	Function
Pulldozer Transformer 2490	Long Red	Lift cylinder (lowers machine)
	Short Red	Lift cylinder (raises machine)
	Long Yellow	Left wing cylinder (opens wing-field)
	Short Yellow	Left wing cylinder (closes wing-transport)
	Long Green	Right cylinder (opens wing-field)
	Short Green	Right hand cylinder (closes wing-transport)
	Long Blue	Tilt cylinder
	Short Blue	Tilt cylinder
	Long Orange	Telescope cylinder (extends wheel width)
	Short Orange	Telescope cylinder (retracts wheel width)

Hitch Options:

Your Pulldozer Transformer comes with a choice of two different articulating implement hitches. Category 4 has draw pin sizes of 1-1/2 (optional) and 2" (interchangeable) and Category 5 has a standard draw pin size of 2-3/4".

Draw Pin Size (inches)	Hitch Required	Part NO
1.50	Flanged Bushing	27373
2.00	Category 4 * with 2" bushing installed, 3 Hole Pattern	27372
2.75	Category 5, 3 Hole Pattern	30128

The articulating joint reduces drawbar and draw pin wear, thereby increasing the life of drawbar. This hitch allows for more control, especially with GPS navigation.

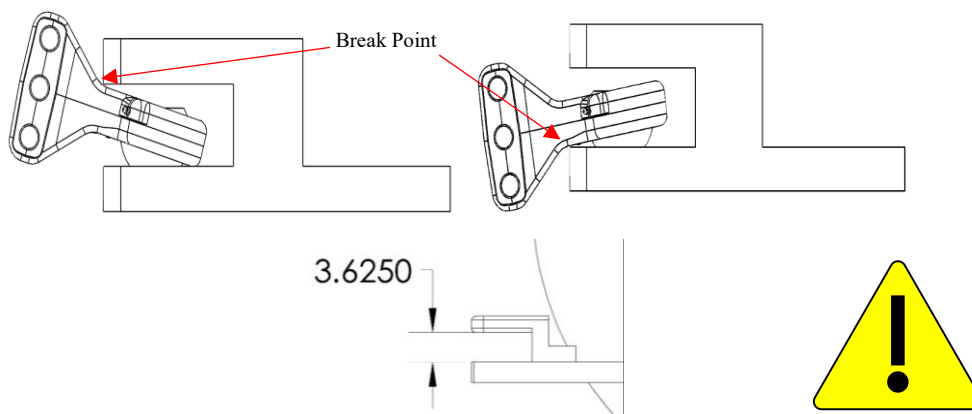
Also important is the hitch height. For maximum articulation, the hitch must be set to the correct height based on your tractor's drawbar height as follows.

Holes Used	Drawbar Height (inches)
1,2,3	21.25"
2,3,4*	19.00"
3,4,5*	16.75"

** Factory setting*

For maximum articulation, a 3-5/8" clearance between the drawbar and hammer strap is also recommended. This will allow for 35 degrees front to back and 40 degrees side to side. This translates into a 10% grade (or 17-degree slope).

- NOTE: Exceeding this articulation range may damage or break the hitch – Breakage due to exceeding articulation range will no be covered by warranty!



Tires

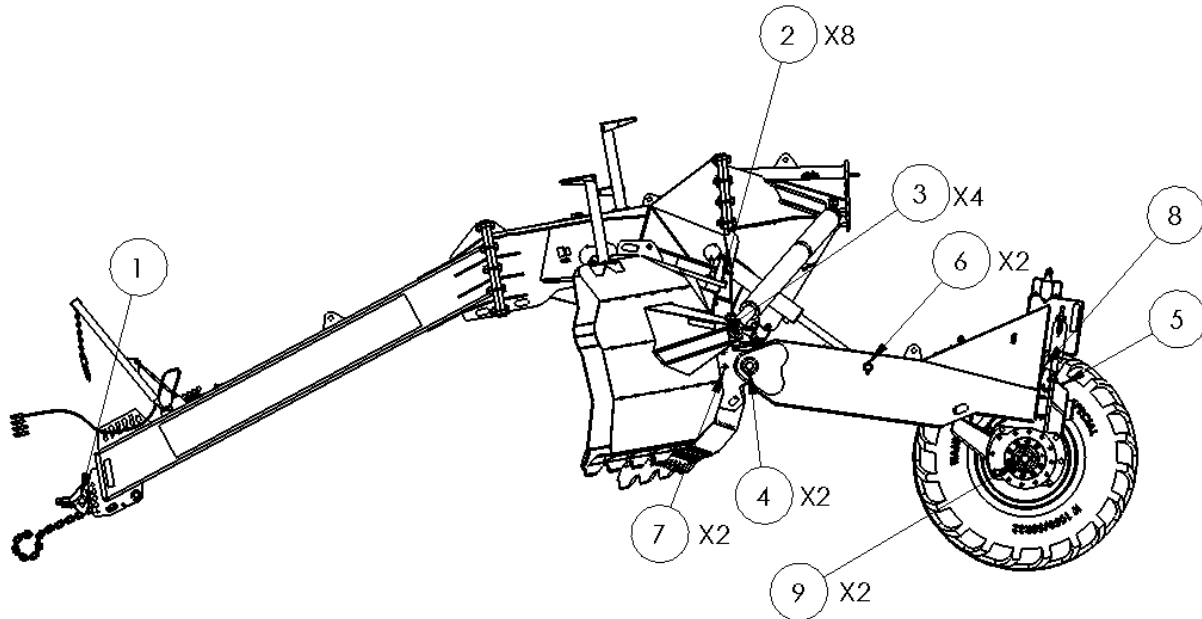
Agricultural tread tires provide excellent flotation characteristics and minimal soil disturbance for packing and hauling applications. The speed and pressure on these tires should not exceed 30 mph (50 km/h) and 35 psi (241 kPa).

Check tire pressure and wheel torque on a regular basis.

Specifications	2490
Tire Size	1050/50R32
Tire Type	Tianli AG Radial Special
Rim Size	32
Tire Pressure	35 psi
Wheel Nut Torque	280 ft-lb

Lubrication

There are several pivot points on your Pulldozer that require lubrication for continuing performance. Lubrication is to be done on a regular basis. The grease points are in the following areas:



		Location	Interval
1	Hitch	Each side of casting	20 hours
2	Wing Pivot	Top and Bottom	10 hours
3	Wing Cylinder	Ball Joint Ends of Cylinders	10 hours
4	Blade Pivot	Front of Main Frame	10 hours
5	Rear Tilt Ring	Top of Axle	10 hours
6	Lift Cylinder Bottom	Facing towards top	20 hours
7	Lift Cylinder Top	Near Blade Pivot	20 hours
8	Front Tilt Ring	Back side of Main Frame	10 hours
9	Wheel Hub	Remove dust cap and pack with grease	100 hours or seasonally

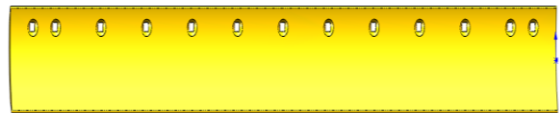
Grease using Mobil UNIREX EP2 GC-LB or equivalent.

Cutting Edge Options

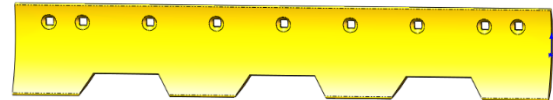
Efficient machine applications require the proper dozer attachments for the job at hand. Dozers are used in a wide variety of construction and maintenance applications for which several cutting edge types have been developed. Soil characteristics, moisture content, compaction, ambient temperatures, and terrain are just some of the variables that will influence proper cutting edge selection for optimal dozing productivity.

Using the right Cutting Edge for the job will result in fuel savings, higher productivity, less wear on the tractor and a better finished product. Some dozer cutting edges are designed for a specific application, while others have a broader range of uses and are more often employed. The Pulldozer Transformer comes with a choice of two cutting edges.

1. Regular Cutting Edge: General purpose operation. It has a penetration force of 1000 lb./ft. This is the factory standard. (6ft: 34153, 4ft: 34152)



2. Notched Cutting Edge: More suitable for higher penetration requirements. It can withstand penetration force up to 2000 lb./ft. Operators have noted that this blade leaves the field in better condition for immediate seeding. (6ft: 33053, 4ft: 33052)



NOTE: These cutting edges wear over time. Contact your nearest Pulldozer representative to order any additional cutting edges.

GPS Option

This GPS mounting tower kit (**24763**) is designed to be installed on any Pulldozer where GPS functionality is desired. On new machines three mounting locations are provided: in the center of the blade on top of the machine, and one on each wing.

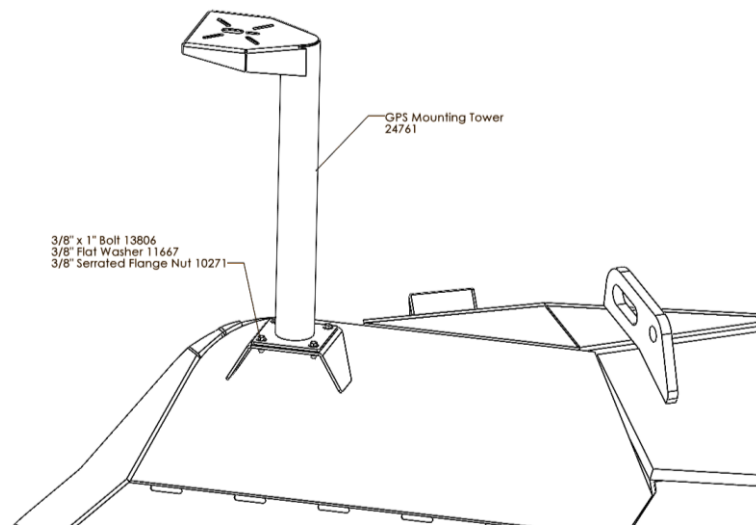
Before starting, ensure that all required components are present:

ID#	Description	QTY
24761	GPS Mounting Tower	1
13806	3/8" x 1-1/4" Bolt	4
11667	3/8" Flat washer	4
10271	3/8" Serrated flange nut	4

The following tools are required to install this kit:

Lifting device
Impact socket, 9/16"
Hand wrench, 9/16"

Before installing the mounting bracket, install the GPS antenna to the top (hardware is not supplied). Use the nuts and bolts to hold the tower in place.

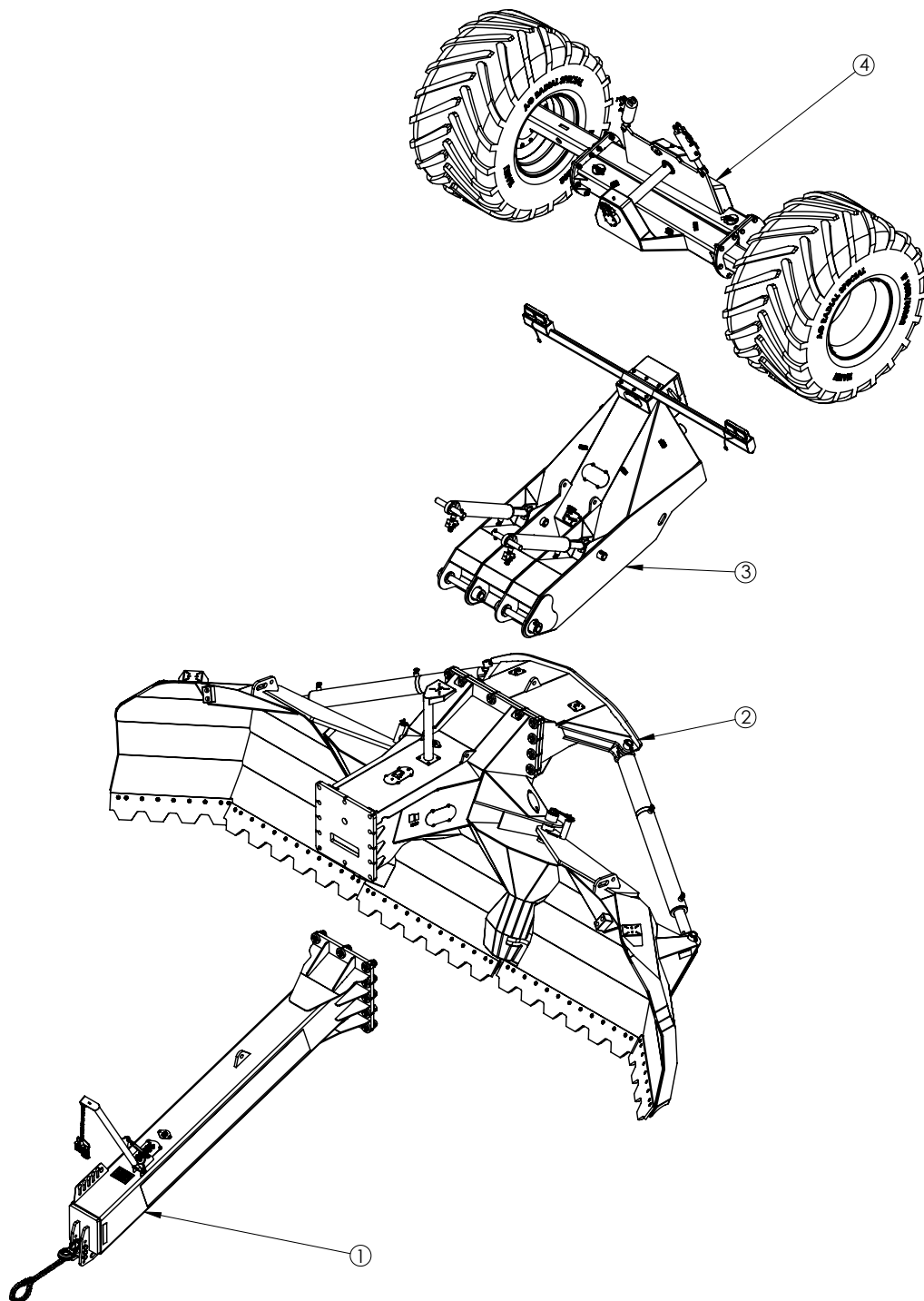


Route the electrical wires to the tractor cab through the Pulldozer hitch.

Parts Manual

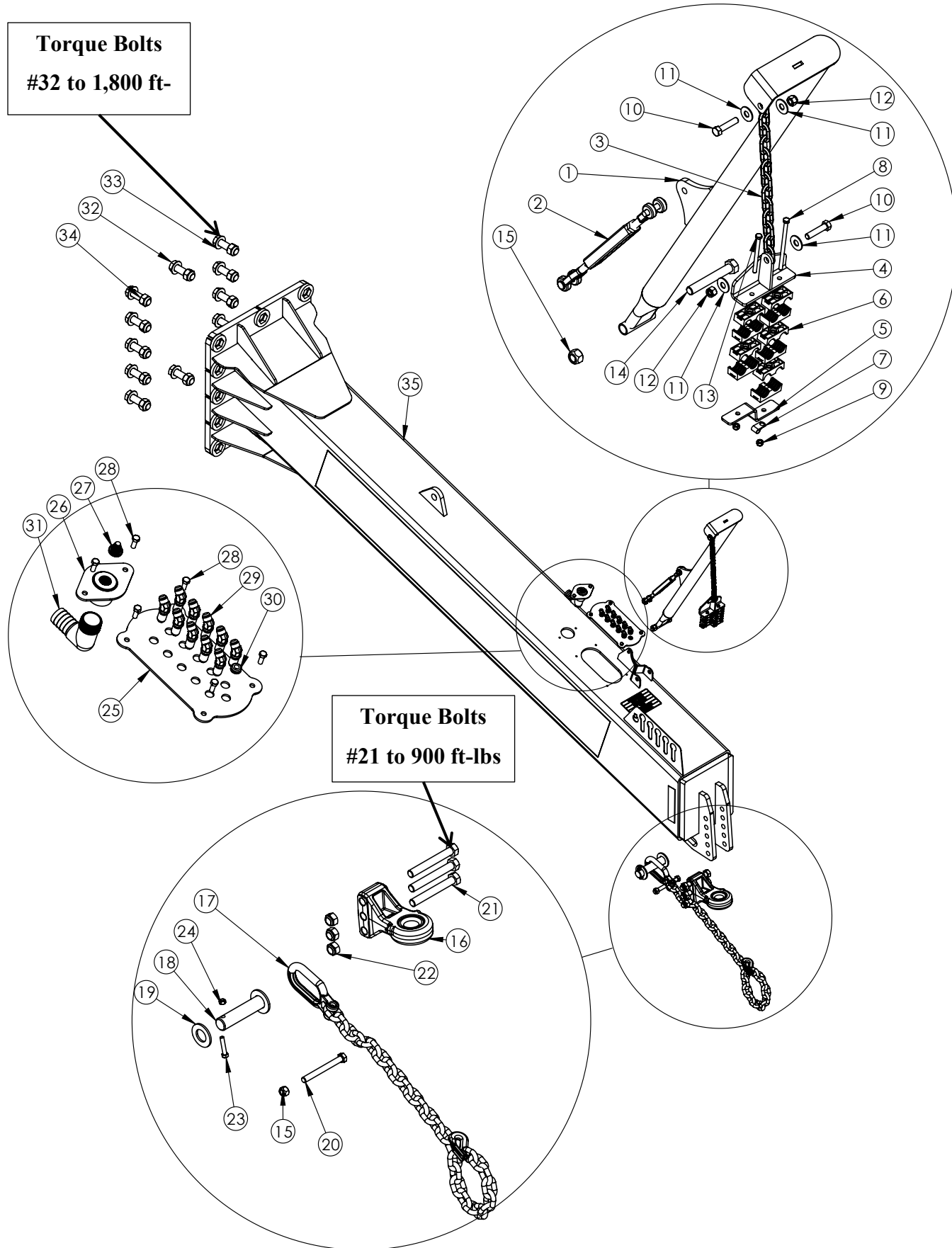
Machine Overview

NOTE: Parts may not be exactly as shown.



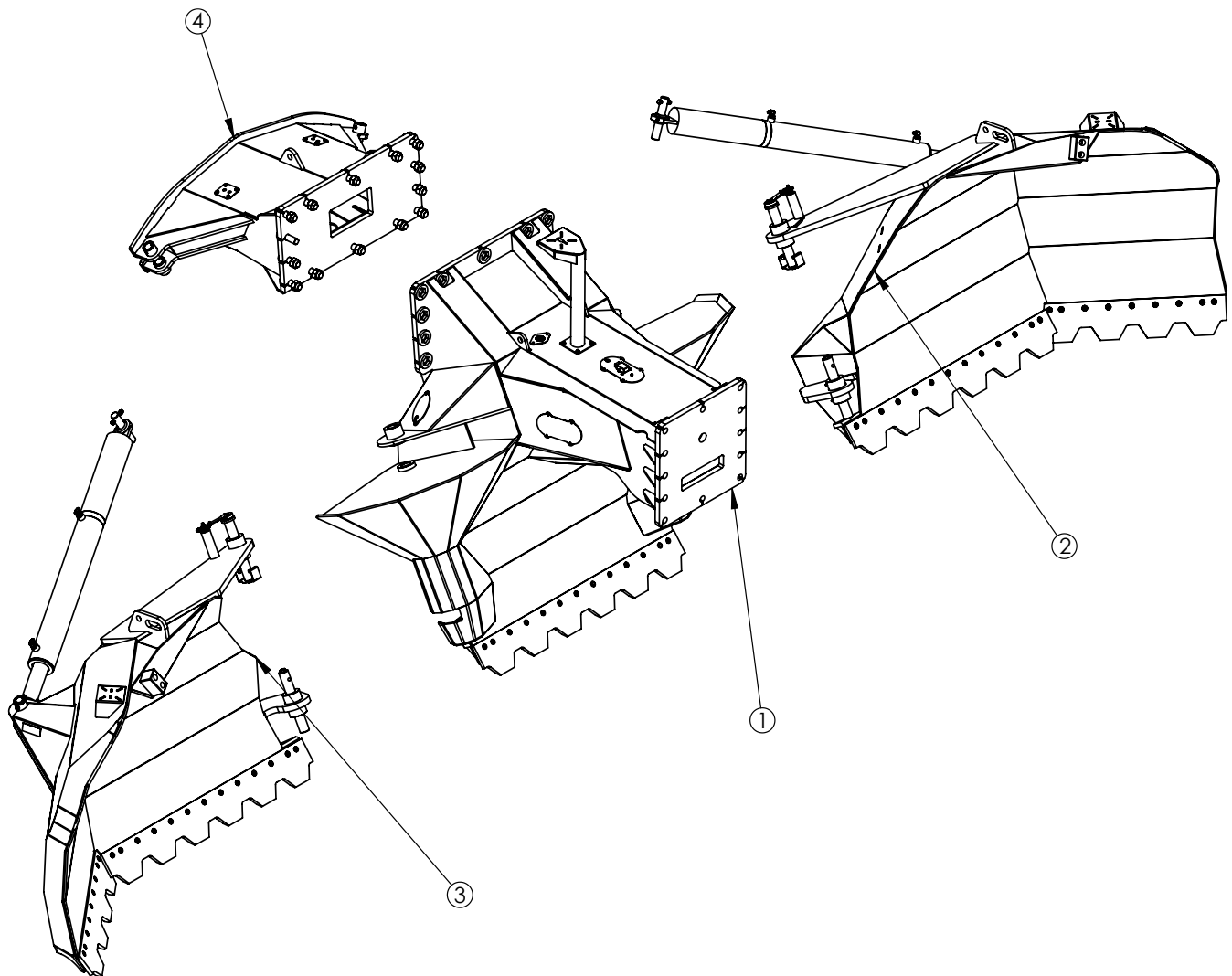
#	DESCRIPTION	PART #	QTY
1	Hitch Section	-	1
2	Blade Section	-	1
3	Frame Section	-	1
4	Axle Section	-	1

Hitch Section



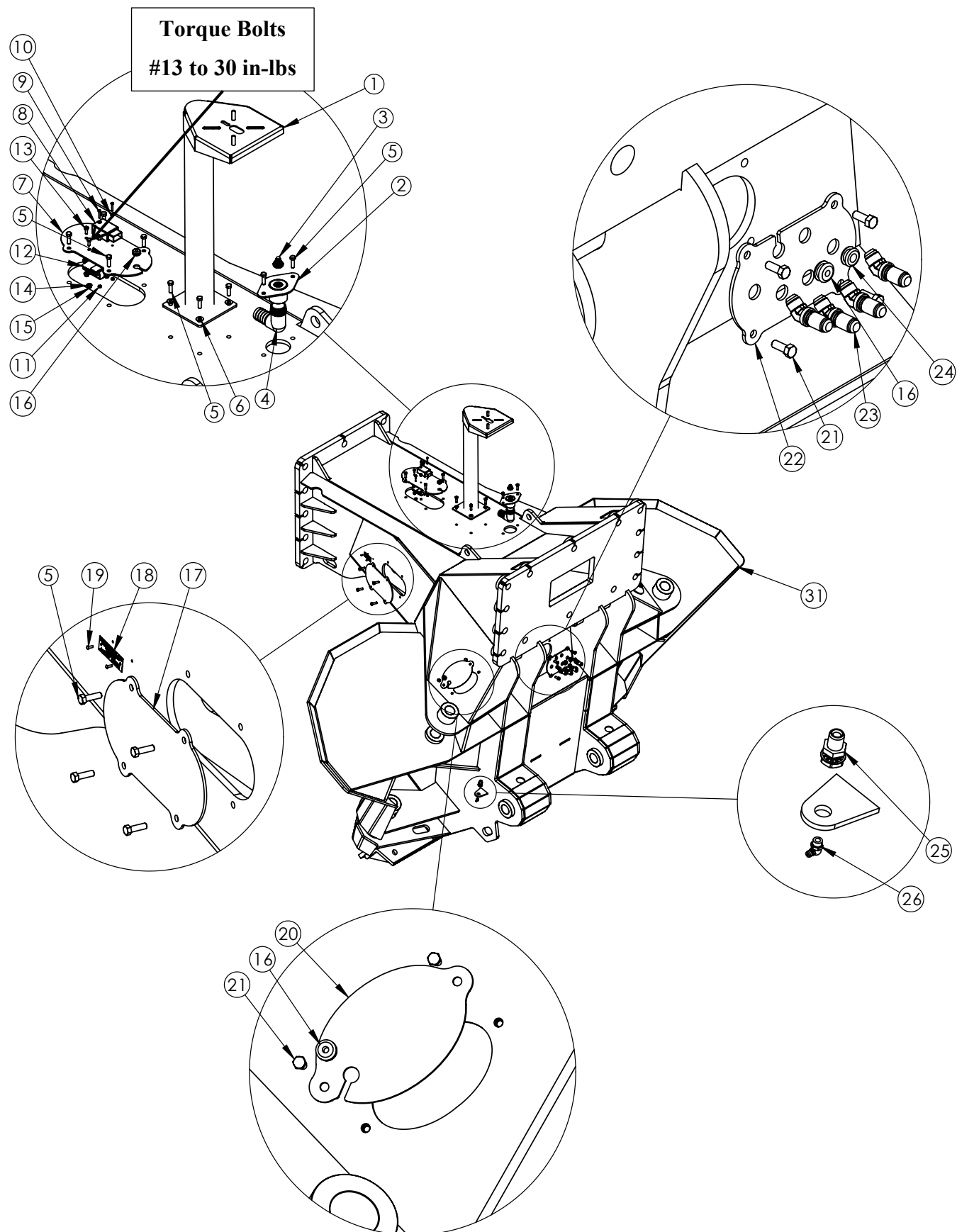
#	DESCRIPTION	PART #	QTY
1	Hydraulic Hose Holder	34493	1
2	Turnbuckle	14276	1
3	Hose Holder Chain (5/16")	32168	1
4	Hose Holder Top Clamp	34507	1
5	Bottom Hose Holder Plate	34520	1
6	Plastic Hose Clamp	21561	10
7	Cable Clamp	13629	1
8	Bolt, 5/16" x 5-1/2"	31109	1
9	Nylon Lock Nut, 5/16"	11815	2
10	Bolt, 1/2" x 2-1/4" Fully Threaded	13232	2
11	Flat washer, 1/2"	11668	4
12	Nut, 1/2" Nylon Lock	10241	2
13	Bolt, 5/16" x 4"	31837	1
14	Bolt, 3/4" x 5"	10803	1
15	Nut, 3/4" Stover Lock	11823	1
16a	Hitch, CAT 4 – 1.5" Sleeve	27373	1
16b	Hitch, CAT 4 – 2.0" 3-Hole	27372	1
16c	Hitch, CAT 5 – 2.75" 3-Hole	30128	1
17	Safety Chain 5/8" Grade 100 5'	26609	1
18	Safety Chain Pin	27224	1
19	Safety Chain Washer	26712	1
20	Bolt, 3/4" x 7"	18032	1
21	Bolt, 1" x 7-1/2" Gr.8 NF	21103	3
22	Nut, 1" Stover NF	21104	3
23	Bolt, 1/2" x 2-1/2"	10804	1
24	Nut, 1/2" Stover Lock	14393	1
25	Hitch Hose Plate	35436	1
26	GPS Cable Bracket	35671	1
27	Stepped Grommet {Essentra 462041}	30036	1
28	Bolt, 3/8" x 1"	13806	6
29	Fitting, 8MJBH-8MJ45	-	10
30	Grommet, 7/16" x 1/4" (RB-234)	21428	1
31	Plastic Barbed Elbow for 1-1/2" Water Hose ID	33027	1
32	Bolt, 1-1/2" x 5" GR. 8 NF	20653	12
33	Washer, 1-1/2" Fat GR. 8	20434	12
34	Nut, 1-1/2" Hex NF	20654	12
35	Hitch Weldment	35651	1

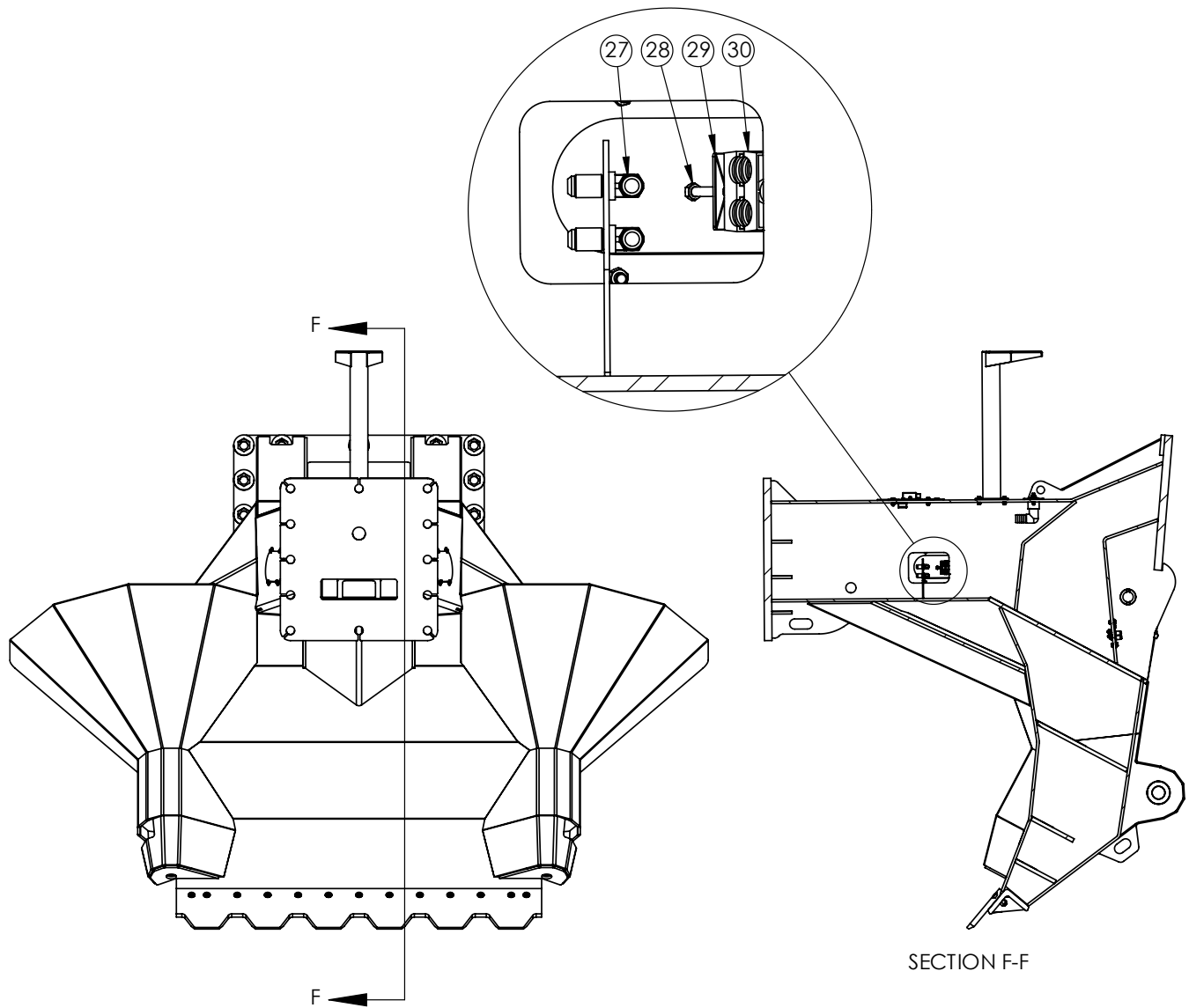
Blade Section



#	DESCRIPTION	PART #	QTY
1	Middle Blade	-	1
2	Left Wing	-	1
3	Right Wing	-	1
4	Back Wing	-	1

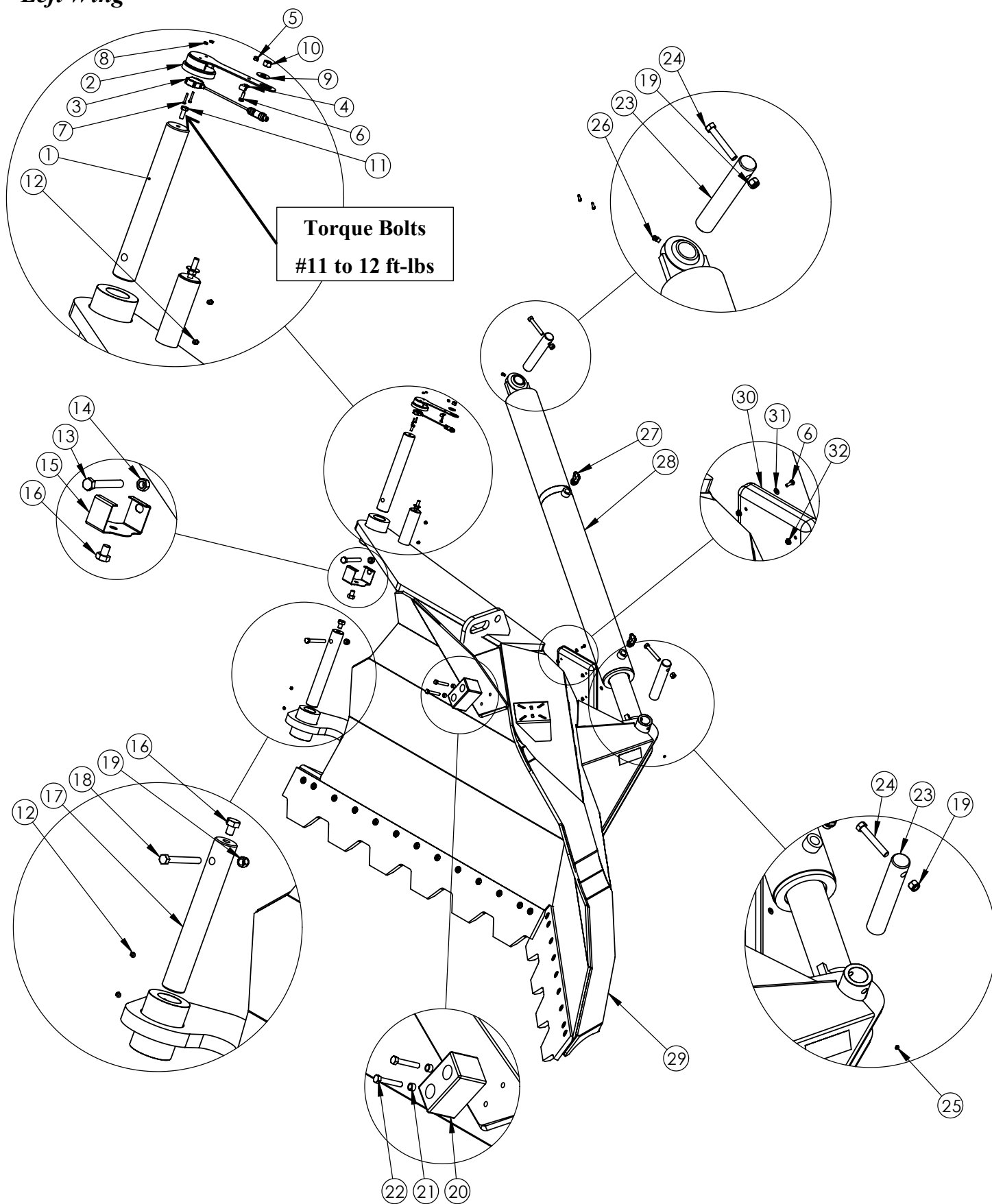
Middle Blade





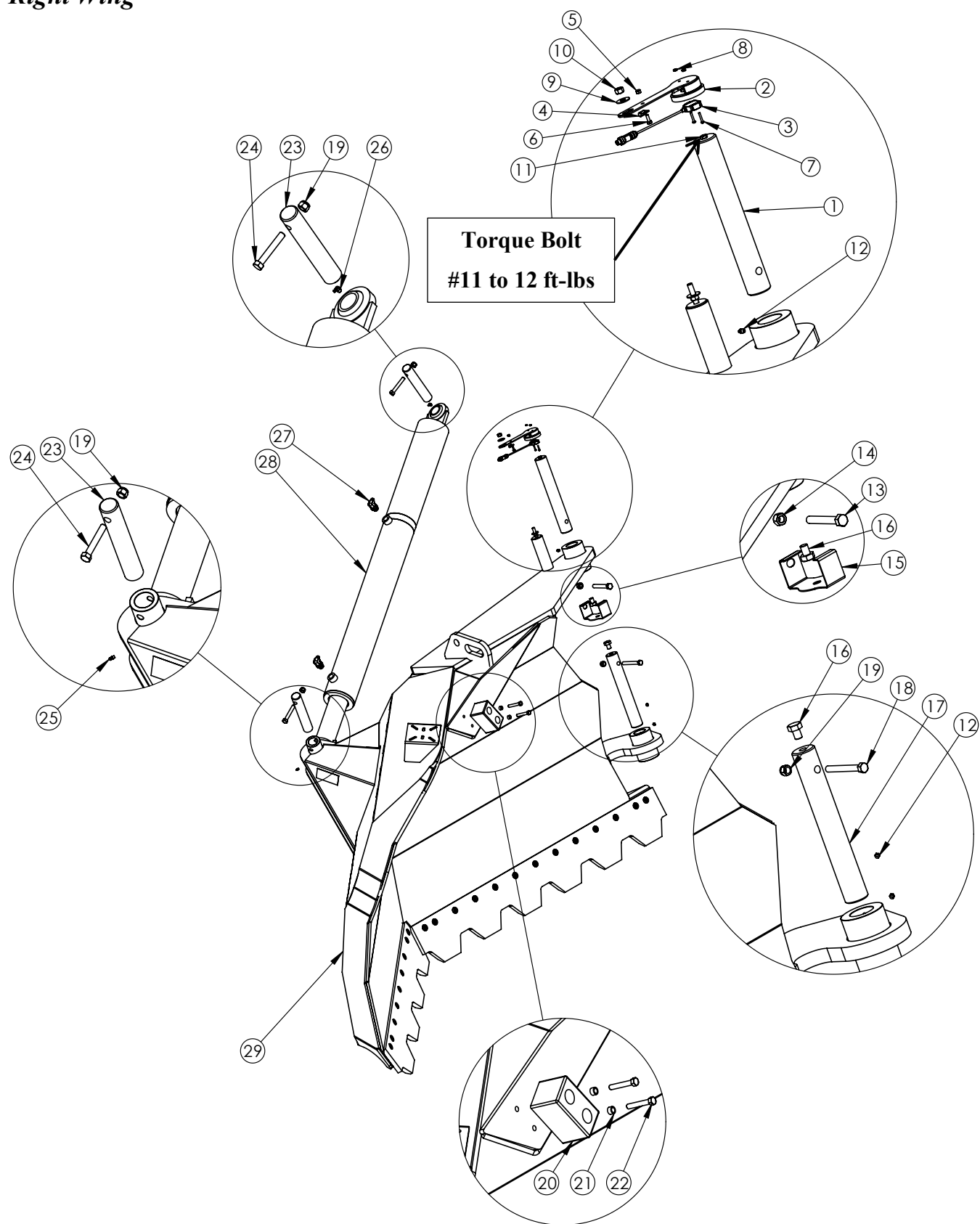
#	DESCRIPTION	PART #	QTY
1	GPS Mounting Tower	24761	1
2	Pipe Connector Weldment	33032	1
3	Stepped Grommet {Essentra 462041}	30036	1
4	Plastic Barbed Elbow for 1-1/2" Water Hose ID	33027	1
5	Bolt, 3/8" x 1-1/4"	10253	18
6	Washer, 3/8" Flat	11667	4
7	Wing Hose Access Plate (S)	35503	1
8	Protocol Converter	34856	1
9	Bolt, #8 x 1"	34854	2
10	Washer, #8 Flat	-	2
11	Nut, #8 Hex	-	2
12	Inclinometer Sensor	34853	1
13	Bolt, 1/4" x 3/4"	11809	3
14	Washer, 1/4" Flat	11666	3
15	Nut, 1/4" Nylon Lock	11664	3
16	Grommet Rubber, 5/16 ID x 1 OD x 1/4	13179	4
17	Wing Hose Access Plate	26717	2
18	Serial Number Plate	-	1
19	Rivet, 1/8" x 1/2"	13825	2
20	S. Lift Cylinder Pin Cover	35502	2
21	Bolt, 3/8" x 1"	13806	8
22	Middle Blade S. Rear Bulkhead	35499	1
23	Fitting, 8MJBH-8MJ45	-	4
24	Grommet, 7/16" x 1/4" (RB-234)	21428	1
25	Grease Bulkhead Fitting	16830	2
26	Grease Zerk, 1/8" NPT 90	25536	2
27	Fitting, 8MJBH-8MJT	-	2
28	Bolt, 5/16" x 1-3/4"	21726	2
29	Cover Plate	217525	2
30	Hose Clamp, 1/2" Plastic	21561	4
31	Middle Blade	35653	1

Left Wing



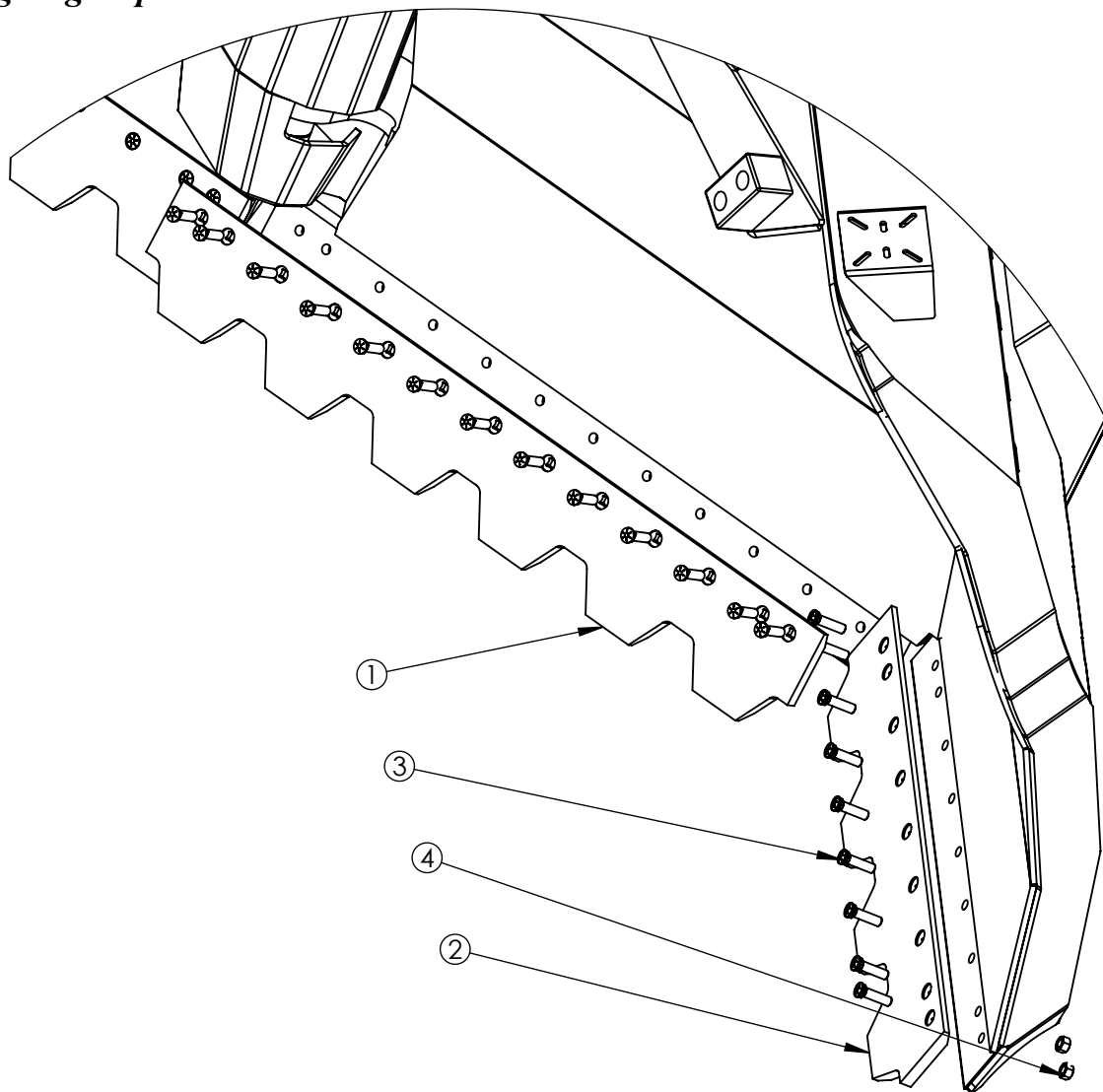
#	DESCRIPTION	PART #	QTY
1	Wing Sensor Pivot Pin	35491	1
2	Rotary Sensor Mount	35676	1
3	Rotary Sensor	34849	1
4	Cable Clamp	13629	1
5	Nylon Lock Nut, 1/4"	11664	1
6	Bolt, 1/4" x 3/4"	11809	5
7	Bolt, #8 x 1"	34854	2
8	Nut, #8 Hex	-	2
9	Washer, 1/2" Flat	11668	2
10	Nut, 1/2" NC	20148	2
11	Magnetic Bolt	34854	1
12	Grease Zerk, 1/8" NPT Straight	10270	4
13	Bolt, 3/4" x 5-1/2"	26406	1
14	Nut, 3/4" Stover Lock	11823	1
15	Bushing Pin Support	36425	1
16	Bolt, 3/4" x 1"	36312	2
17	Wing Pivot Pin	35438	1
18	Bolt, 5/8" x 5-1/2"	33036	1
19	Nut, 5/8" Nylon Lock	10364	3
20	Wing Bumper 6" x 3-1/2" x 3-1/2"	34142	1
21	Wing Bumper Bushing	35485	2
22	Bolt, 1/2" x 3"	10321	2
23	Wing Cylinder Pin	35437	2
24	Bolt, 5/8" x 4"	33037	2
25	Grease Zerk, 1/4"-28 Self-Tapping	16364	1
26	Grease Zerk, 1/4"-28 Self-Tapping 90 Degrees	-	1
27	6 x 32 x 4 Hydraulic Cylinder	33104	1
28	Fitting, 12MB-8MJ90	-	2
29	Left Hand Wing	35668	1
30	Manual Holder Box	33509	1
31	Washer, 1/4" Flat	11666	4
32	Nut, 1/4" Serrated Flange	11812	4

Right Wing



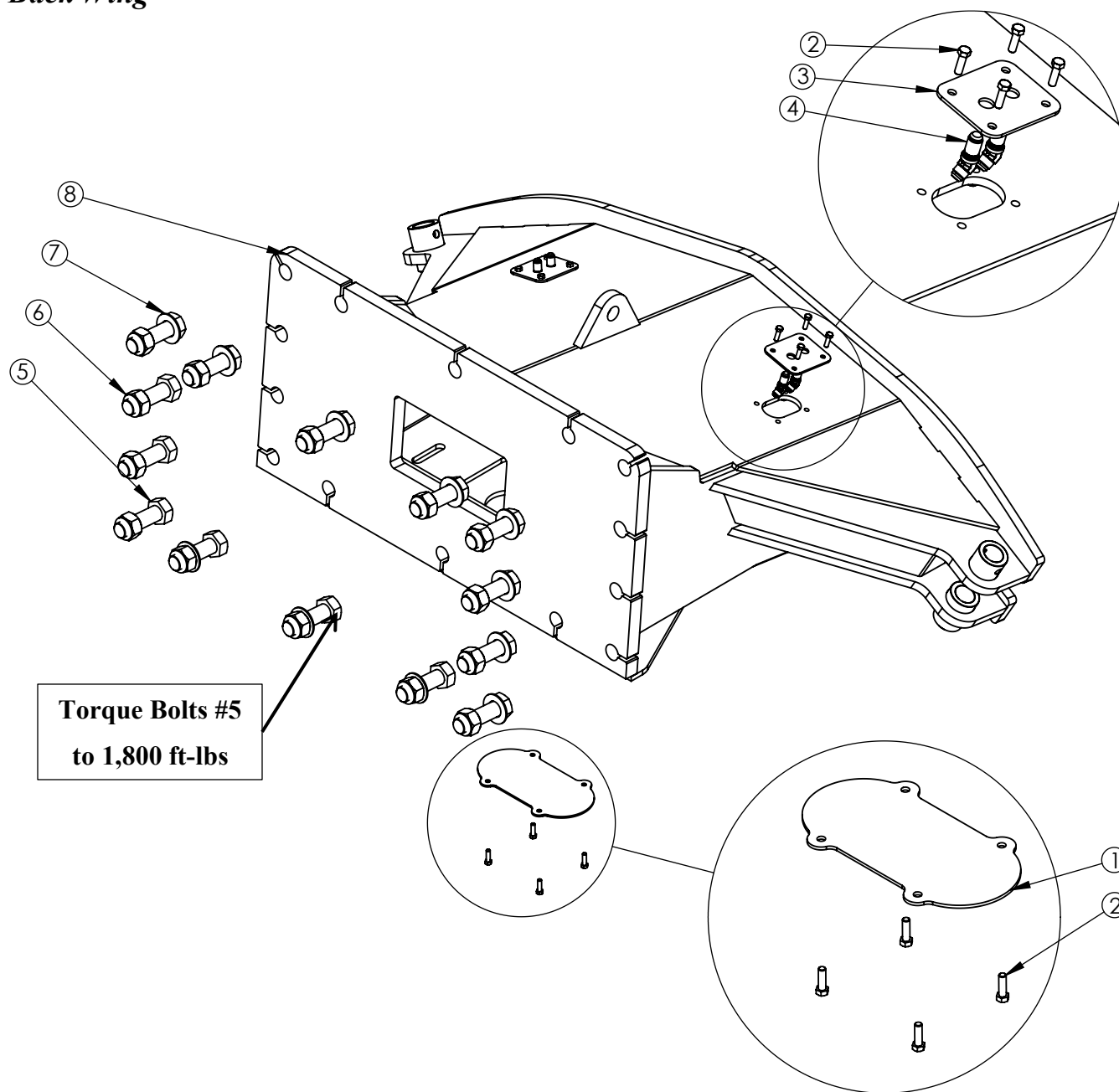
#	DESCRIPTION	PART #	QTY
1	Wing Sensor Pivot Pin	35491	1
2	Rotary Sensor Mount	35676	1
3	Rotary Sensor	34849	1
4	Cable Clamp	13629	1
5	Nylon Lock Nut, 1/4"	11664	1
6	Bolt, 1/4" x 3/4"	11809	1
7	Bolt, #8 x 1"	34854	2
8	Nut, #8 Hex	-	2
9	Washer, 1/2" Flat	11668	2
10	Nut, 1/2" NC	20148	2
11	Magnetic Bolt	34854	1
12	Grease Zerk, 1/8" NPT Straight	10270	4
13	Bolt, 3/4" x 5-1/2"	26406	1
14	Nut, 3/4" Stover Lock	11823	1
15	Bushing Pin Support	36425	1
16	Bolt, 3/4" x 1"	36312	2
17	Wing Pivot Pin	35438	1
18	Bolt, 5/8" x 5-1/2"	33036	1
19	Nut, 5/8" Nylon Lock	10364	3
20	Wing Bumper 6" x 3-1/2" x 3-1/2"	34142	1
21	Wing Bumper Bushing	35485	2
22	Bolt, 1/2" x 3"	10321	2
23	Wing Cylinder Pin	35437	2
24	Bolt, 5/8" x 4"	33037	2
25	Grease Zerk, 1/4"-28 Self-Tapping	16364	1
26	Grease Zerk, 1/4"-28 Self-Tapping 90 Degrees	-	1
27	6 x 32 x 4 Hydraulic Cylinder	33104	1
28	Fitting, 12MB-8MJ90	-	2
29	Right Hand Wing	35670	1

Cutting Edge Options



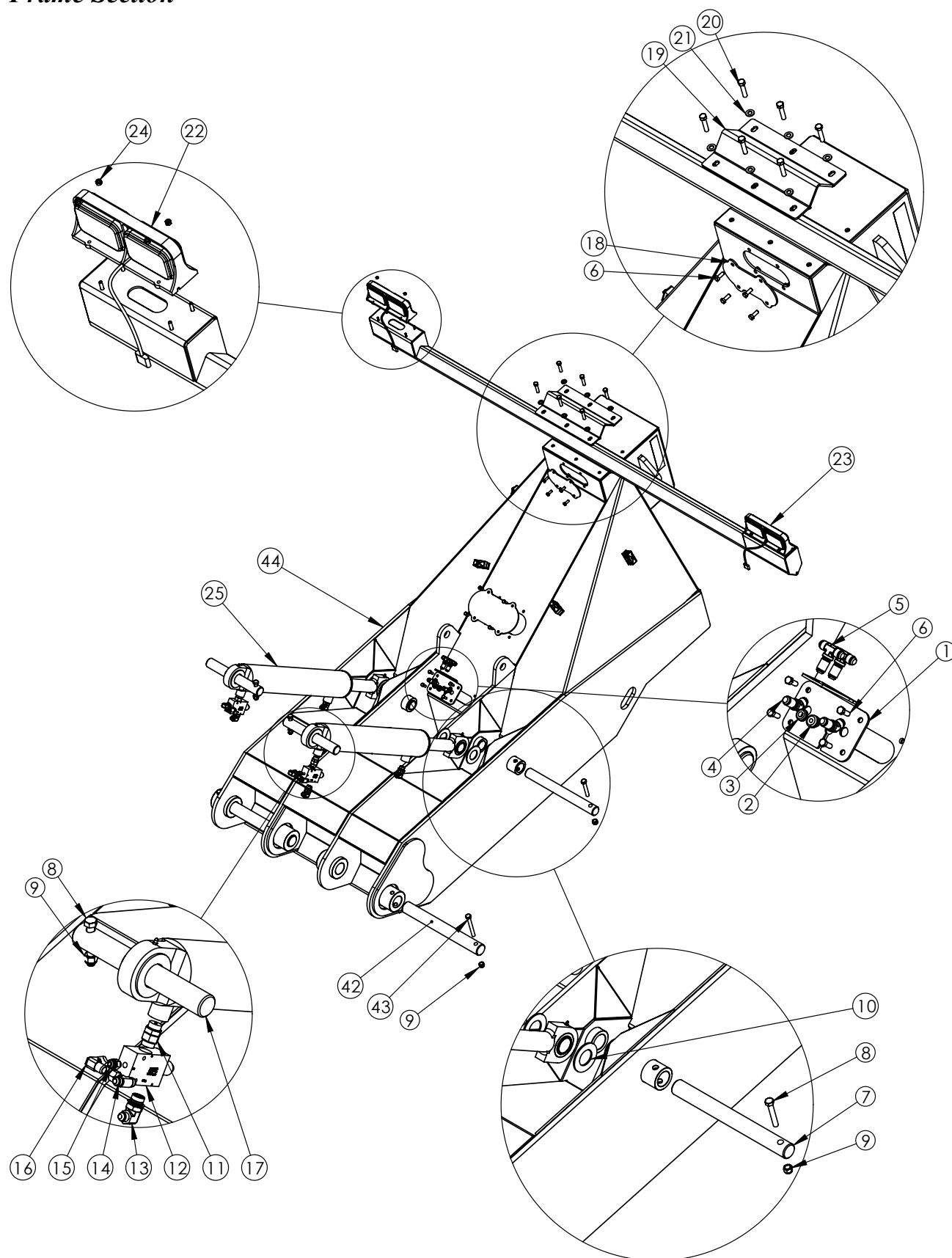
#	DESCRIPTION	PART #	QTY
1a	Straight Cutting Edge 6'	34153	3
1b	Serrated Cutting Edge 6'	34053	3
2a	Straight Cutting Edge 4'	33152	2
2b	Serrated Cutting Edge 4'	33052	2
3	Bolt, 3/4" x 2-3/4" Plough	20488	57
4	Nut, 3/4" Hex	20606	57

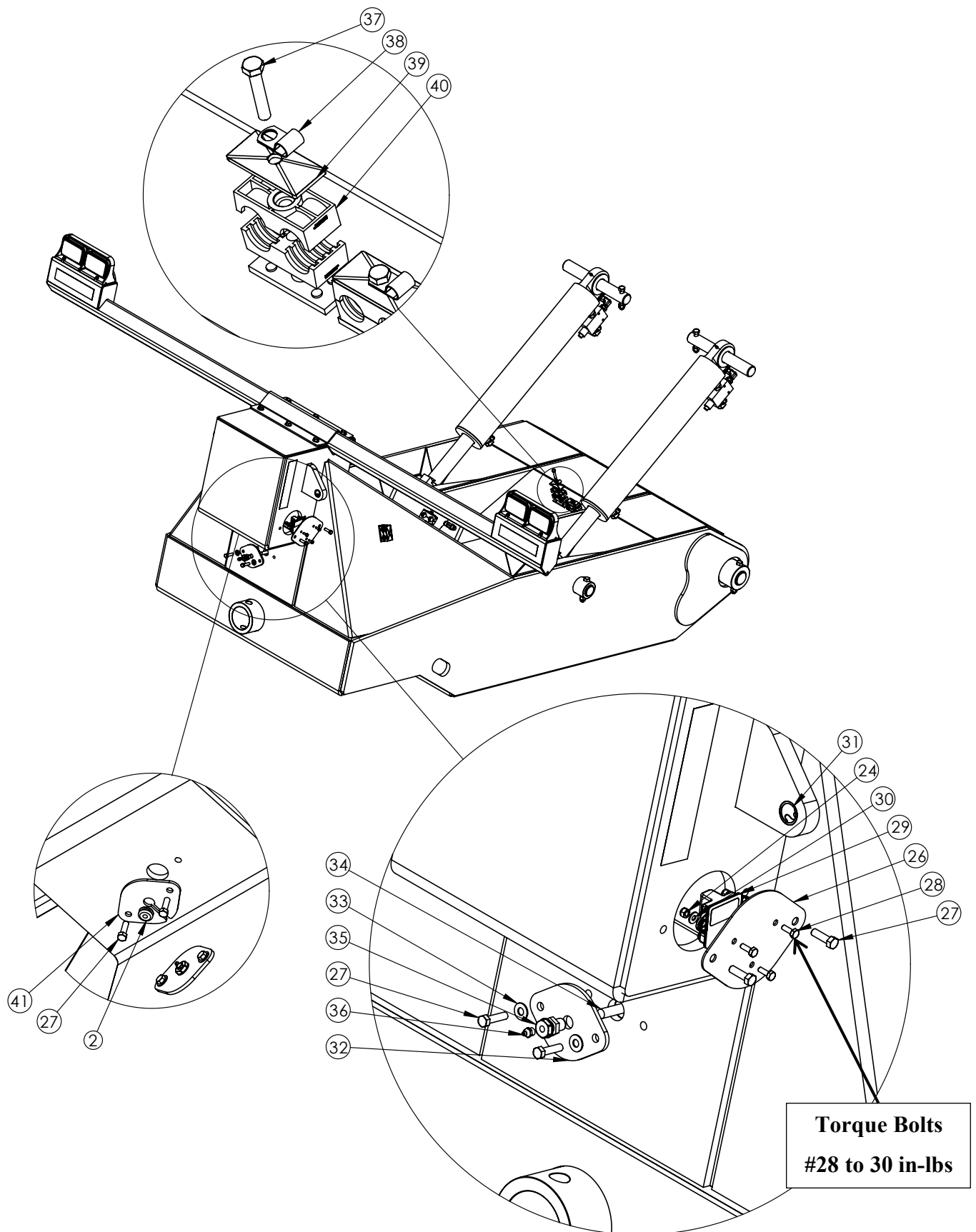
Back Wing



#	DESCRIPTION	PART #	QTY
1	Wing Hose Access Plate	267171	1
2	Bolt, 3/8" x 1-1/4"	10253	12
3	Back Axle Cover C	-	2
4	Fitting: 8MJBH - 8MJ45	-	4
5	Bolt, 1-1/2" x 5" Gr.8 NF	20653	16
6	Nut, 1-1/2" Hex NF	20654	16
7	Washer, 1-1/2" Flat	20434	16
8	Back Wing	35666	1

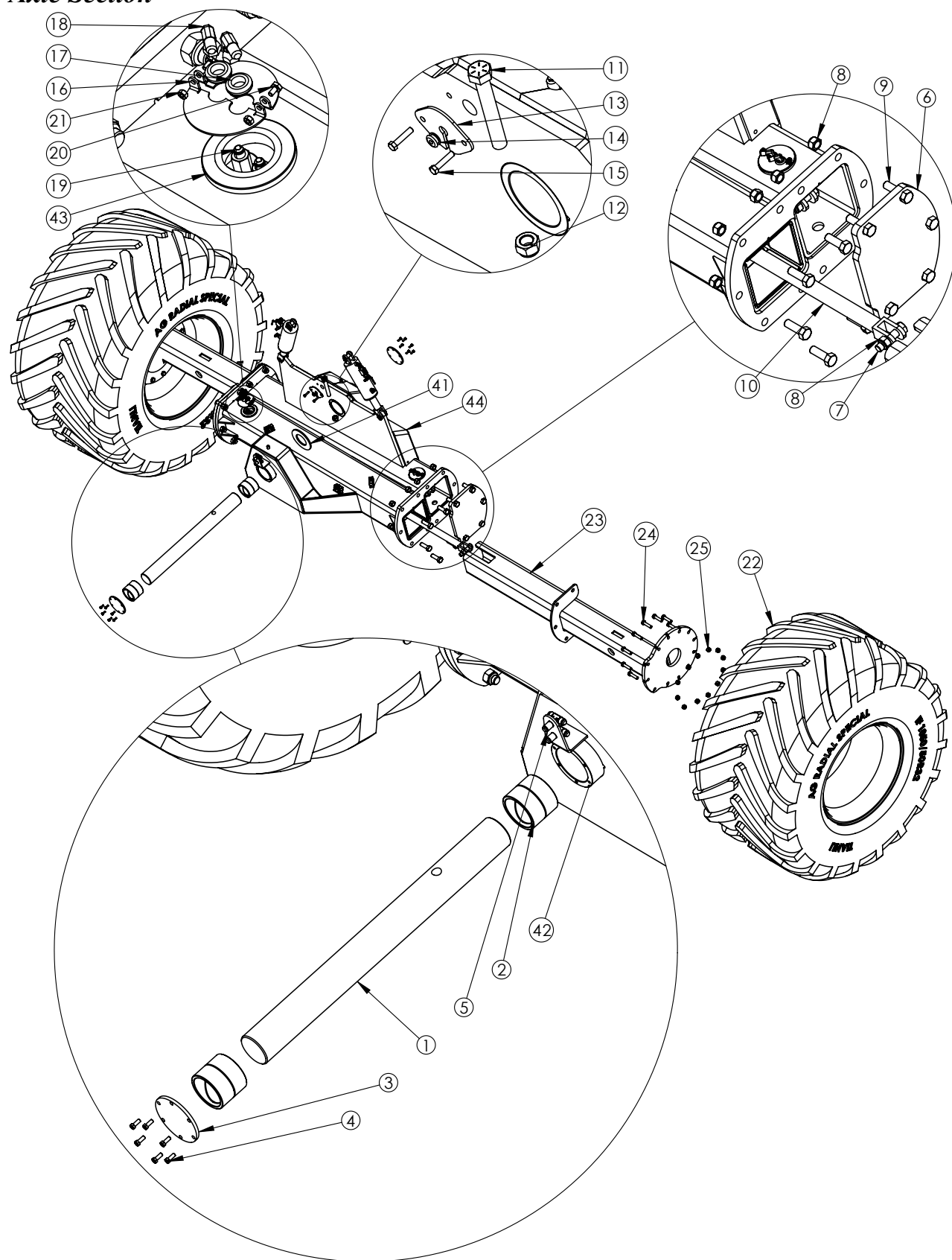
Frame Section

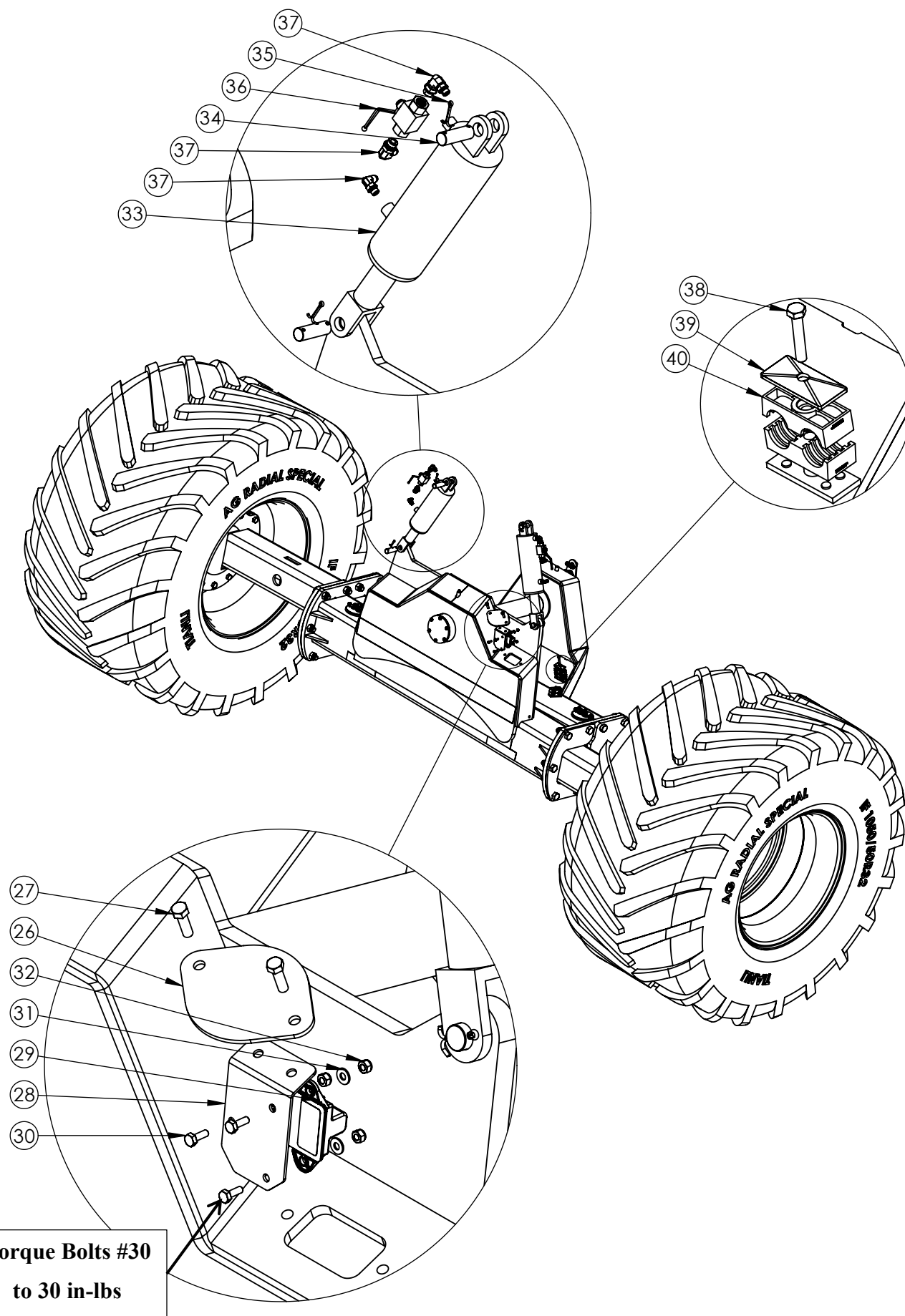




#	DESCRIPTION	PART #	QTY
1	Main Frame S. Bulkhead Plate	35501	1
2	Grommet Rubber, 5/16 ID x 1 OD x 1/4	13179	1
3	Grommet, 7/16" x 1/4" (RB-234)	21428	1
4	Fitting 8MJBH - 8MJ45	-	2
5	Fitting 8MJBH - 8MJT	-	2
6	Bolt, 3/8" x 1"	13806	8
7	Lift Cylinder Shaft End Pin	35440	2
8	Bolt, 5/8" x 4-1/2" Gr. 8	14255	4
9	Nylon Lock Nut, 5/8" Gr. 8	10364	6
10	Flat Washer, 2"	23304	8
11	Fitting 12MB – 12MB	-	2
12	32 GPM Counterbalance Valve	33074	2
13	Fitting 12MB – 8MJ90	-	4
14	Fitting 8FJXL – 8MJT	-	2
15	Fitting 4MB – 8MJ	-	2
16	Fitting 8MJ – 8FJX90	-	2
17	Lift Cylinder Base End Pin	35439	2
18	Access Plate	35447	1
19	Light Bar Cover	35435	1
20	Bolt, 1/2" x 2"	10322	6
21	Flat Washer, 1/2"	11668	6
22	Light assy LED dual ag light, RH w/ brake function	32255	1
23	Light assy LED dual ag light, LH w/ brake function	31088	1
24	Nylon Lock Nut, 1/4"	11664	10
25	5 x 24 x 2-1/2 Hydraulic Cylinder	23310	2
26	Main Frame Sensor Plate	35506	1
27	Bolt, 3/8" x 1-1/4"	10253	6
28	Bolt, 1/4" x 3/4"	11809	3
29	Inclinometer Sensor	34853	1
30	Washer, 1/4" Flat	11666	3
31	Bushing, Press-in, 1" Pin	23708	2
32	Main Frame Grease Plate	35457	1
33	Washer, 3/8" Flat	11667	2
34	Grease Tube, 34" Long	30094	1
35	Grease Bulkhead Fitting	16830	1
36	Grease Zerk, 1/8" NPT Straight	10270	1
37	Bolt, 5/16" x 1-3/4"	21726	6
38	Cable Clamp	13629	2
39	Cover Plate	21725	6
40	Hose Clamp, 1/2" Plastic	21561	12
41	Sensor Wiring Bulkhead	35500	1
42	Main Frame Pivot Pin	35441	2
43	Bolt, 5/8" x 5-1/2" Gr. 8	33036	2
44	Main Frame Weldment	35655	1

Axle Section

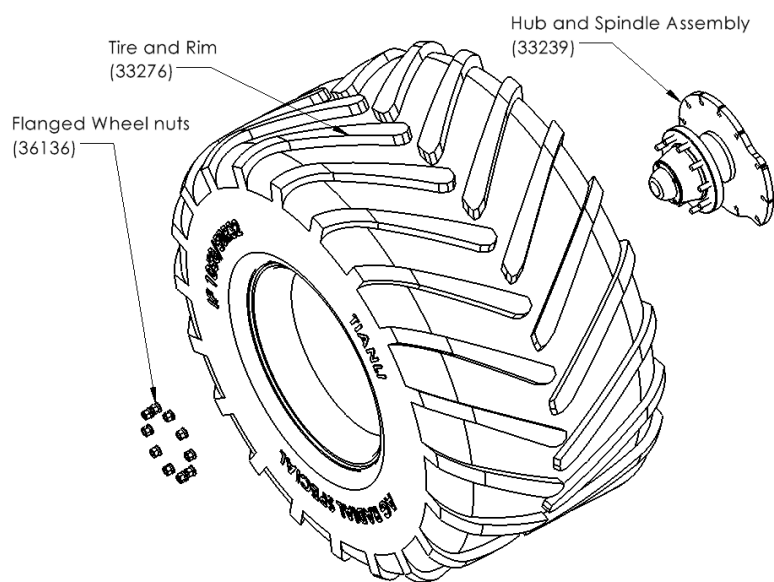
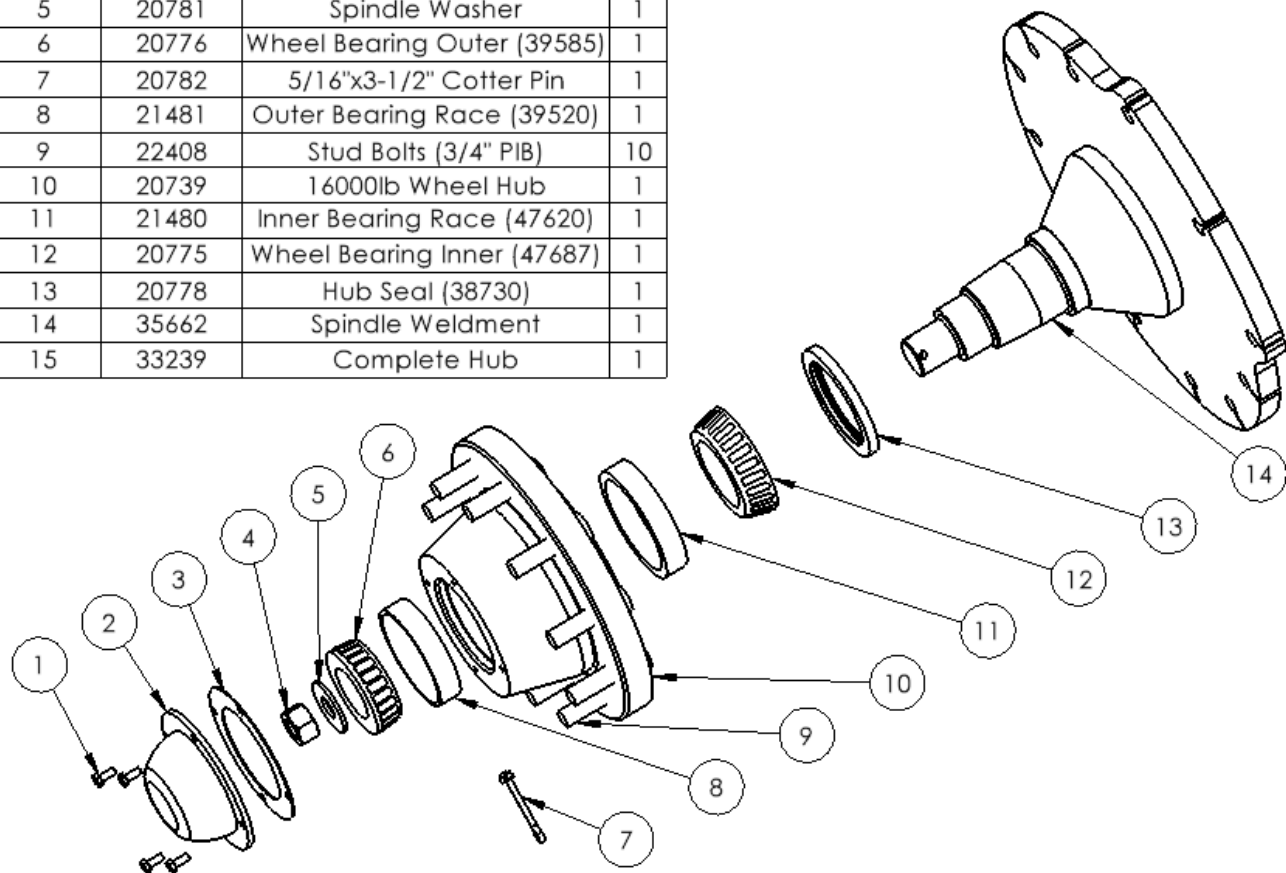




#	DESCRIPTION	PART #	QTY
1	Main Frame/Axle Pivot Pin	35442	1
2	Hardened Steel Bushing	33035	4
3	Axle End Cap	30878	2
4	Bolt, 3/8" x 1" Gr. 8 Fine Thread	-	12
5	Fitting 8MJBH – 8MJT	-	2
6	Telescoping Cylinder Flange	35664	2
7	Bolt, 1" x 4" UNF Gr. 8	28555	4
8	Nut, 1" Stover NF	21104	24
9	Bolt, 1" x 3" GR.8 YZ	24641	20
10	4 x 48 x 2 Hydraulic Cylinder	26578	2
11	Bolt, 1" x 7" Gr. 8	33039	1
12	Nylon Lock Nut, 1" Gr. 8	15436	1
13	Sensor Wiring Bulkhead	35500	1
14	Grommet Rubber, 5/16 ID x 1 OD x 1/4	13179	1
15	Bolt, 3/8" x 1-3/4"	16040	2
16	Axle Hose Holder Plate	35479	4
17	3/4" ID x 1/8" Hyd Hose Grommet	33961	4
18	Fitting 6MJ – 6FJX90	-	4
19	Fitting 6MB – 8MJXL	-	4
20	Bolt, 1/4" x 1/2"	-	4
21	Nut, 1/4" Hex	20891	4
22	Tire & Spindle	-	2
23	Left Hand Telescoping Tube Right Hand Telescoping Tube	35659 35661	1 1
24	Bolt, 3/4" x 3" Fine Thread Gr. 8	34144	24
25	Nut, 3/4" Stover Lock	11823	24
26	Axle Sensor Mounting Plate	35506	1
27	Bolt, 3/8" x 1-1/4"	10253	2
28	Axle Sensor Holder	35504	1
29	Inclinometer Sensor	34853	1
30	Bolt, 1/4" x 3/4"	11809	3
31	Washer, 1/4" Flat	11666	3
32	Nut, 1/4" Nylon Lock	11664	3
33	4 x 8 x 2 Hydraulic Cylinder	33083	2
34	Cylinder Pin, 1" x 2-7/8"	10339	4
35	Cotter Pin, 3/16" x 2"	11670	4
36	Ball Valve	33041	2
37	Fitting 8MB – 6MJ90	-	4
38	Bolt, 5/16" x 1-3/4"	21726	4
39	Cover Plate	21725	4
40	Hose Clamp, 1/2" Plastic	21561	8
41	Axle Pin Washer	35520	1
42	Axle Weld Bushing	35368	2
43	Push-In Pipe and Tubing Grommet for 4.01 Hole Diameter	34145	2
44	Axle	35657	1

Tire and Spindle

Item No.	ID Number	Description	QTY
1	20903	5/16"x3/4" Bolt	4
2	20777	Dust Cap (D16000)	1
3	20779	Dust Cap Gasket	1
4	20780	Spindle Castle Nut (SF17512)	1
5	20781	Spindle Washer	1
6	20776	Wheel Bearing Outer (39585)	1
7	20782	5/16"x3-1/2" Cotter Pin	1
8	21481	Outer Bearing Race (39520)	1
9	22408	Stud Bolts (3/4" PIB)	10
10	20739	16000lb Wheel Hub	1
11	21480	Inner Bearing Race (47620)	1
12	20775	Wheel Bearing Inner (47687)	1
13	20778	Hub Seal (38730)	1
14	35662	Spindle Weldment	1
15	33239	Complete Hub	1



Hydraulics

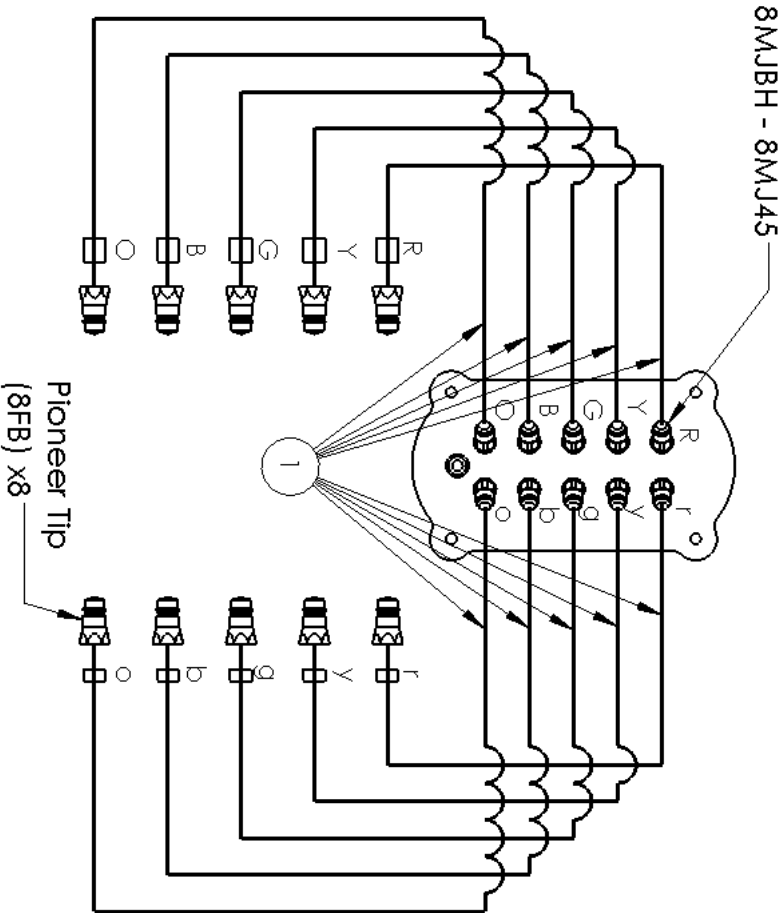
Note: All hoses are 1/2” double braided.

Tractor

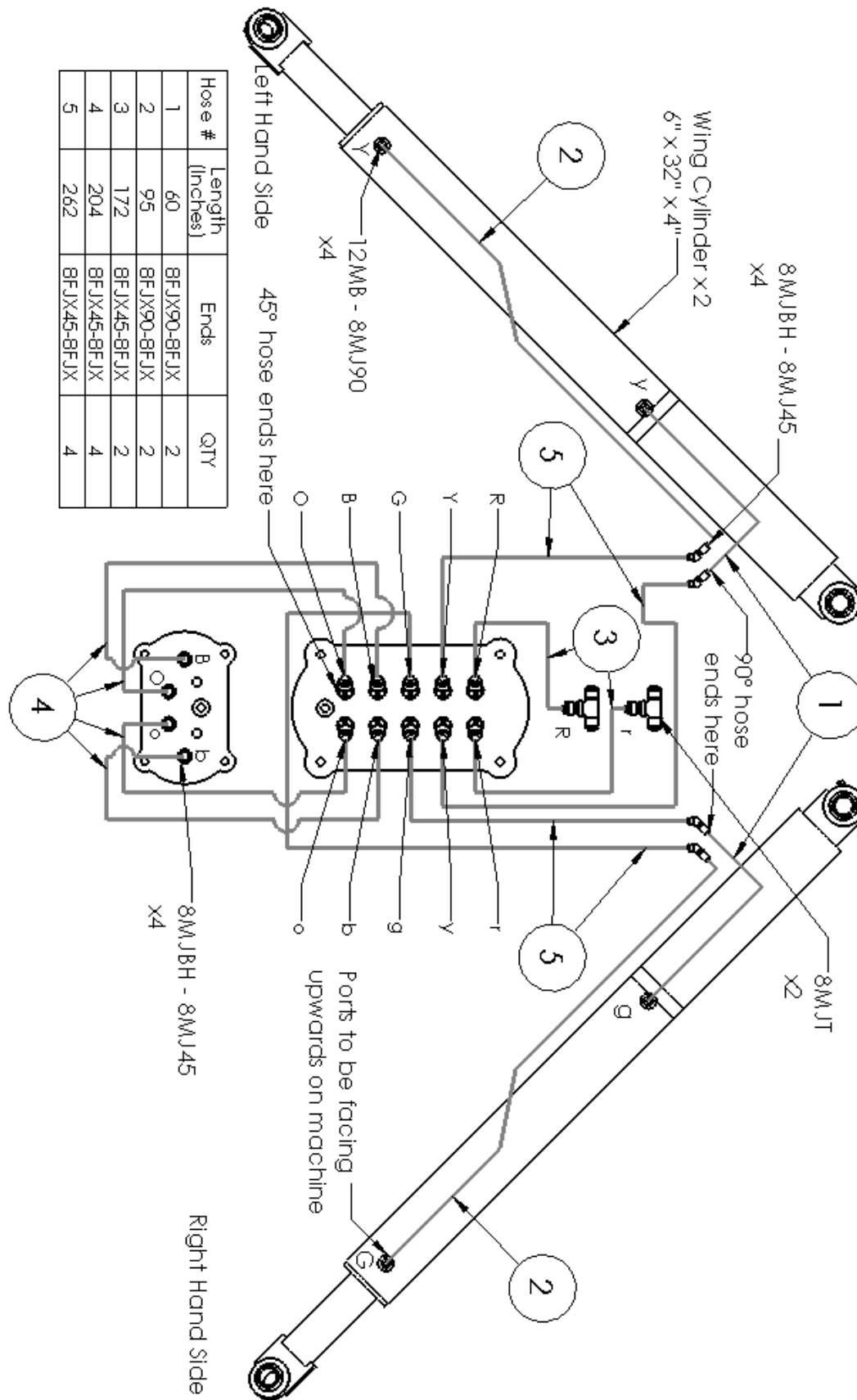
Legend

R	- Long Red Shrink Wrap
r	- Short Red Shrink Wrap
Y	- Long Yellow Shrink Wrap
y	- Short Yellow Shrink Wrap
G	- Long Green Shrink Wrap
g	- Short Green Shrink Wrap
B	- Long Blue Shrink Wrap
b	- Short Blue Shrink Wrap
O	- Long Orange Shrink Wrap
o	- Short Orange Shrink Wrap

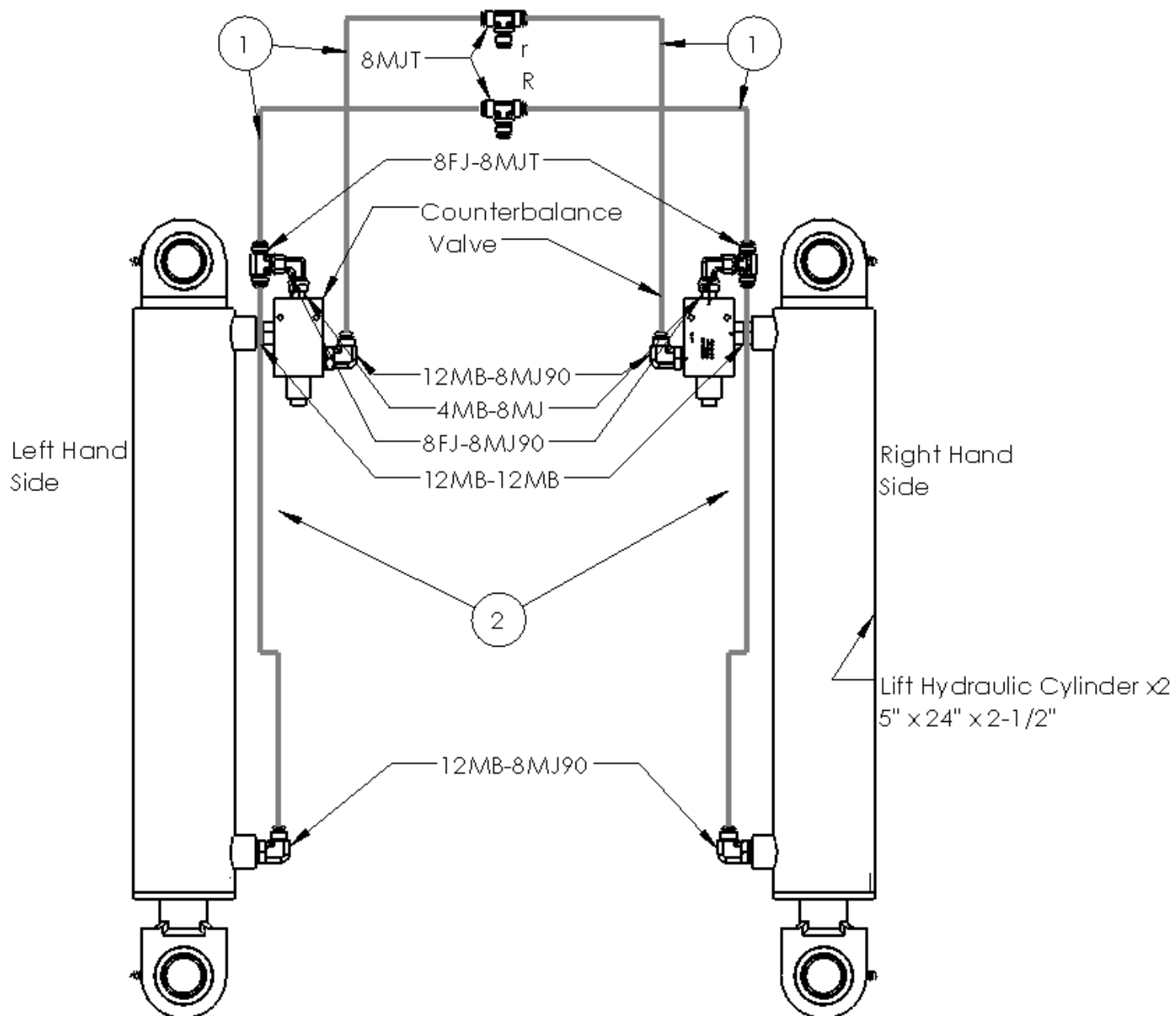
Hose #	Length (inches)	Ends	QTY
1	115	8MB-8FJX	10



Wing Cylinders

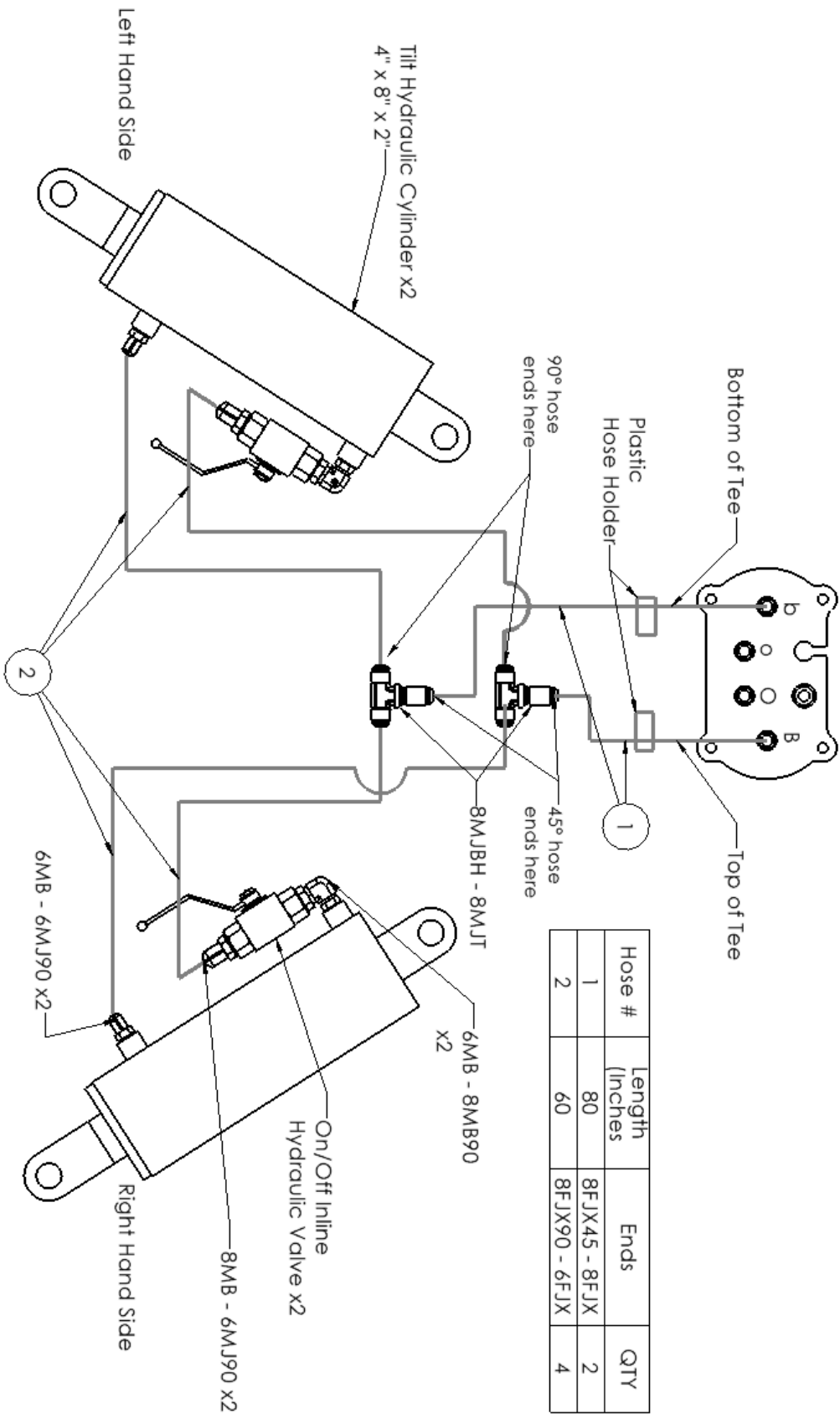


Lift Cylinders

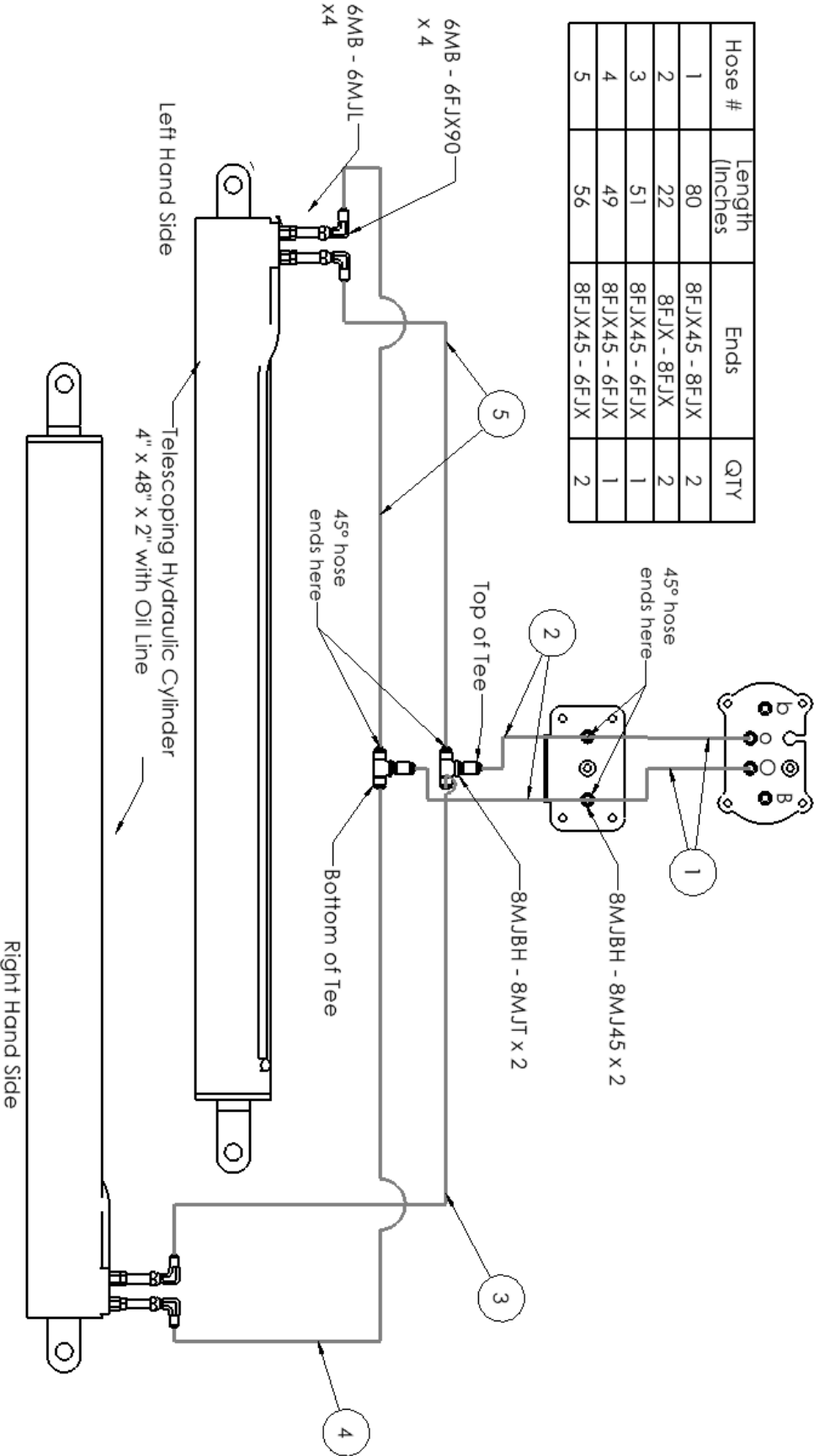


Hose #	Length (inches)	Ends	QTY
1	62	8FJX-8FJX	4
2	31.5	8FJX-8FJX	2

Tilt Cylinders



Axle Cylinders

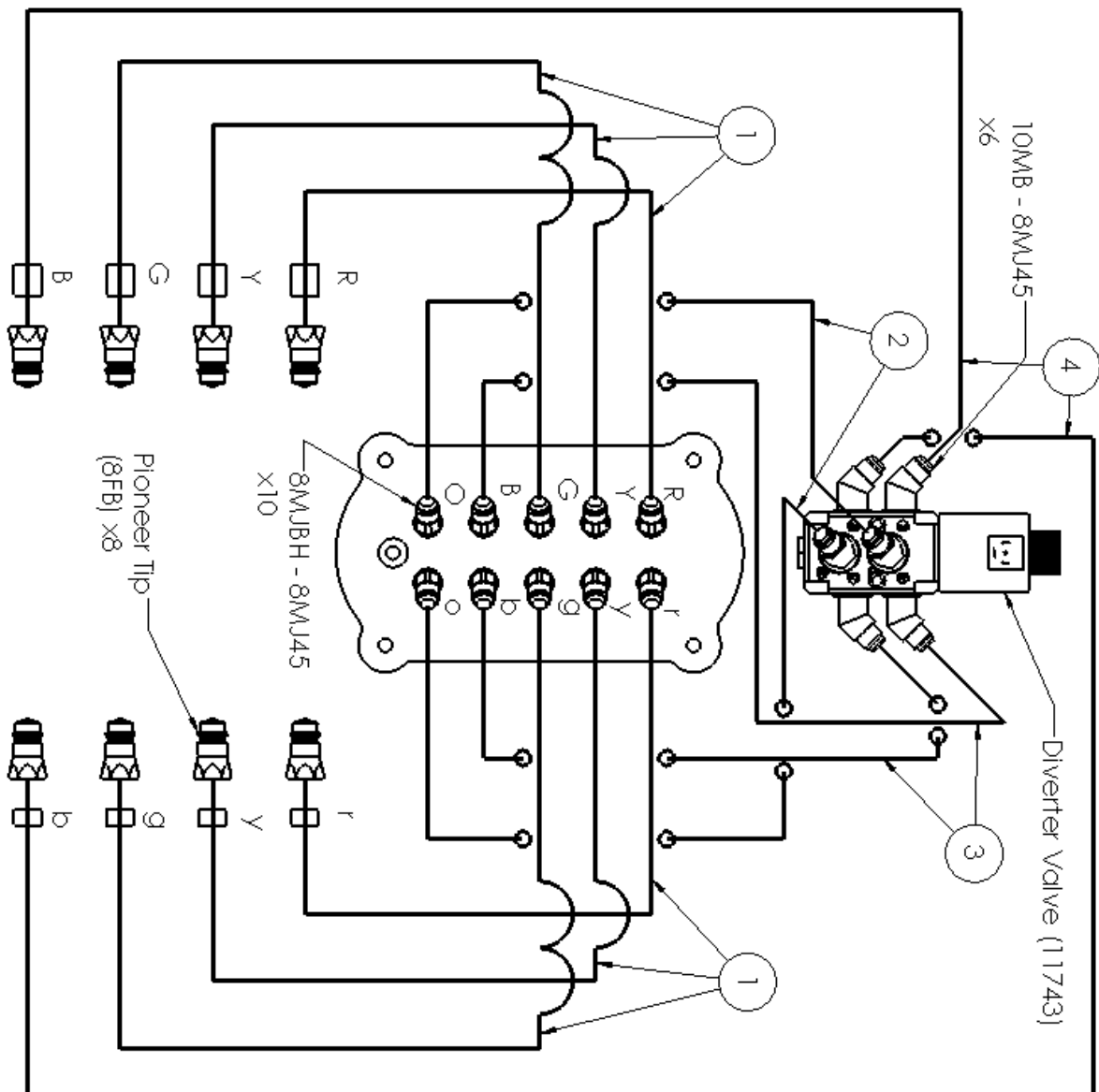


Remote Kit

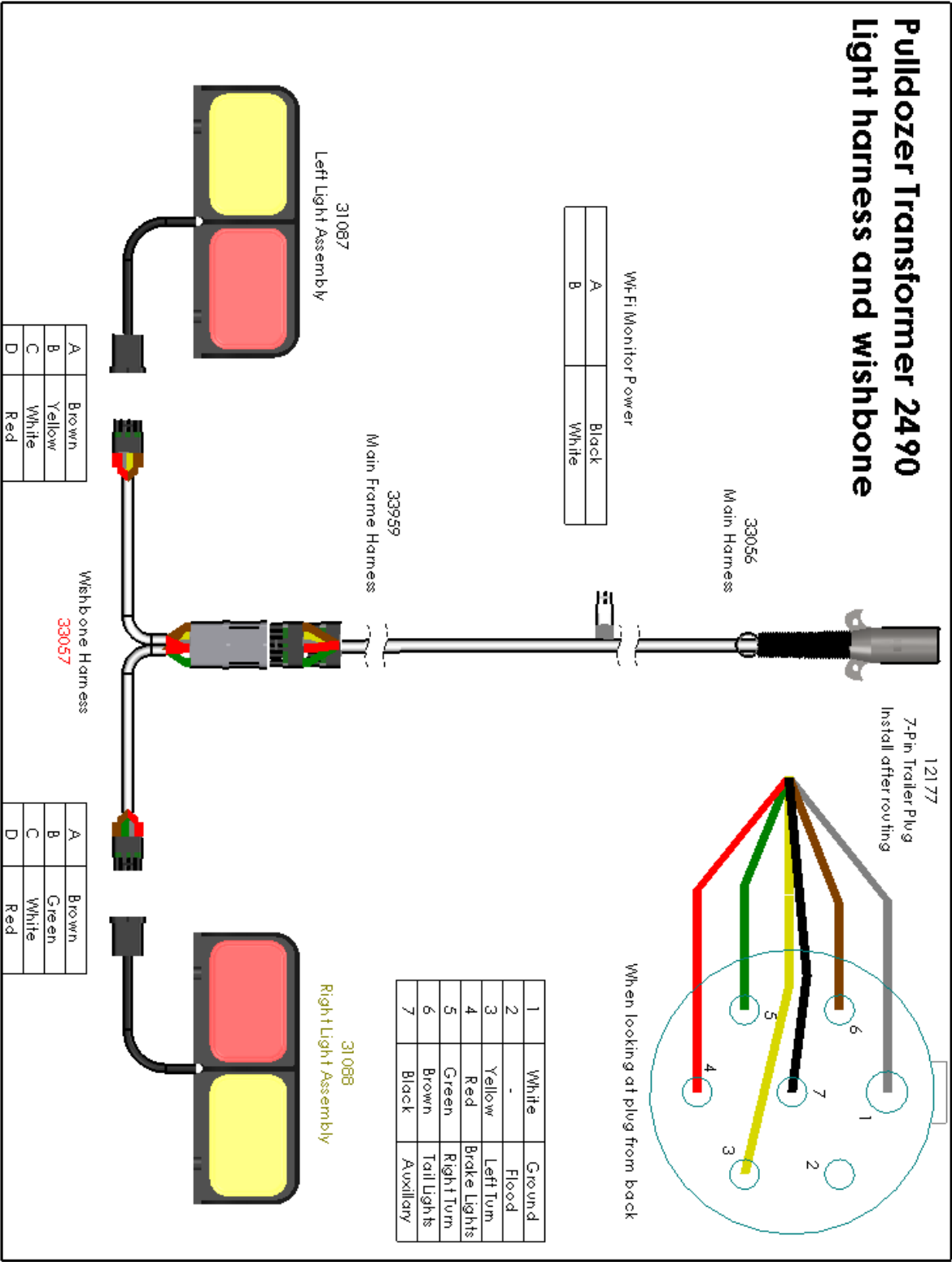
Hose #	Length (Inches)	Ends	QTY
1	100	8MB-8FJX	6
2	25	8FJX - 8FJX45	2
3	34	8FJX - 8FJX90	2
4	90	8FJX - 8FJX	2

Legend

- R - Long Red Shrink Wrap
- r - Short Red Shrink Wrap
- Y - Long Yellow Shrink Wrap
- y - Short Yellow Shrink Wrap
- G - Long Green Shrink Wrap
- g - Short Green Shrink Wrap
- B - Long Blue Shrink Wrap
- b - Short Blue Shrink Wrap
- O - Long Orange Shrink Wrap
- o - Short Orange Shrink Wrap



Electrical



Decals

Pulldozer Transformer:

12228	Slow Moving Vehicle Sign	1
28383	Red Reflective Decal (2" x 9")	2
28384	Yellow Reflective Decal (2" x 9")	8
12239	Decal, AMC	1
25347	Decal, FEMA	1
33149	Transformer Hydraulic Hose Decal	1

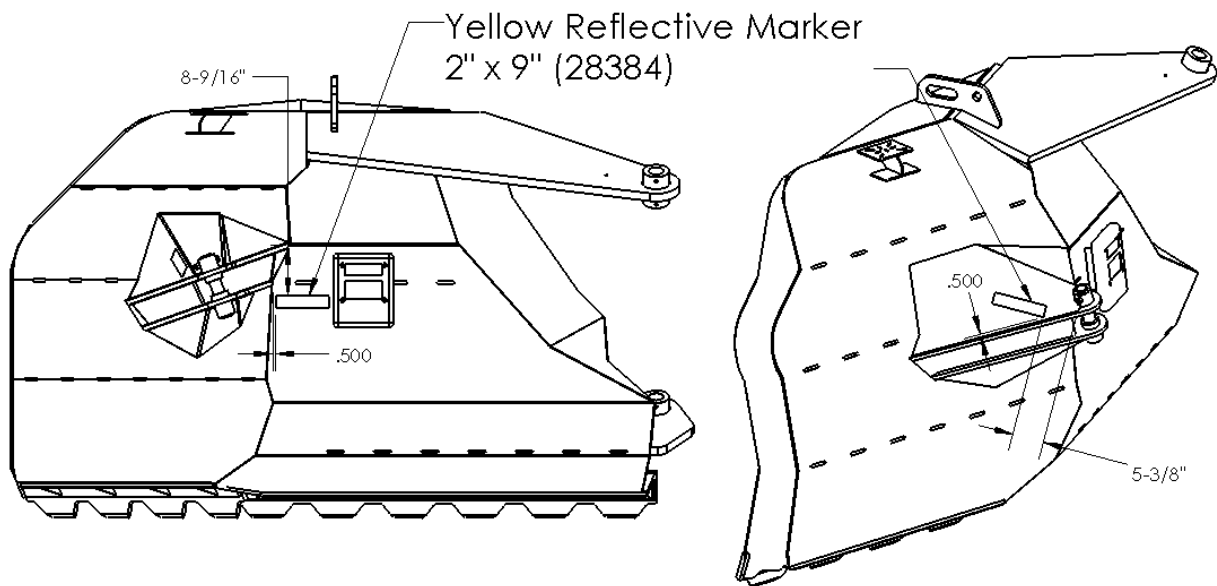
"2490"

33078	REAR AXLE 2490	"//// PULLDOZER 2490 ////"	RED
33076	RIGHT HITCH, 2490	"FIST PULLDOZER 2490 \\\\"	RED
33077	LEFT HITCH, 2490	"//// PULLDOZER 2490 FIST"	RED

Installation:

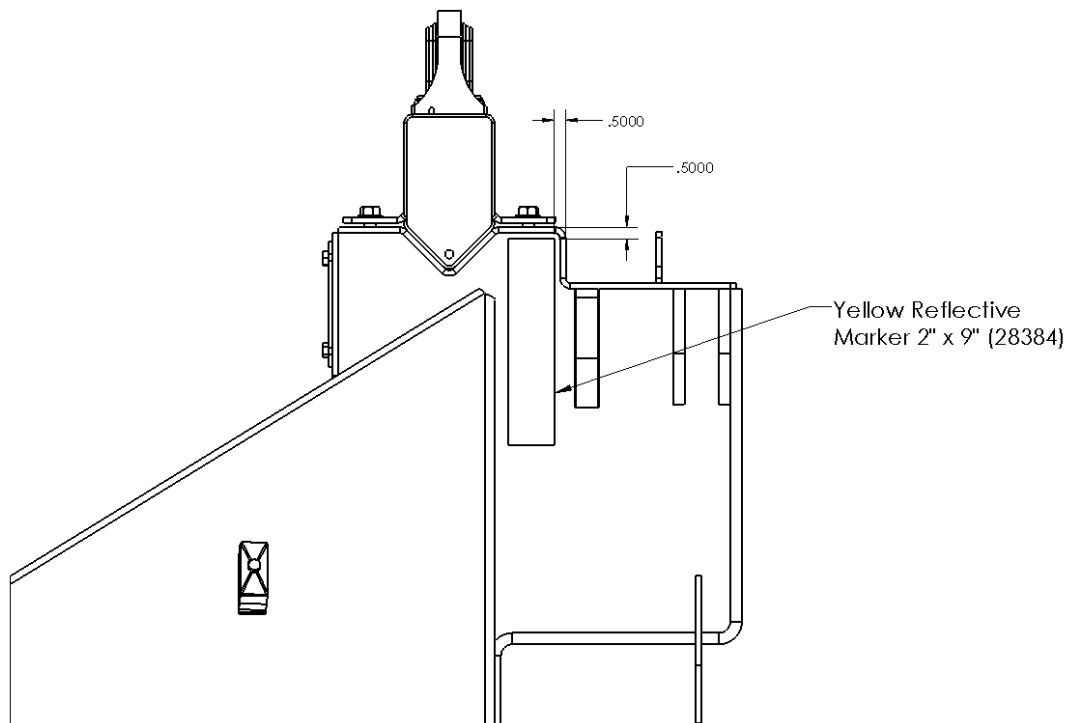
24 Foot Pulldozer Transformer Wing

Repeat for Right Side



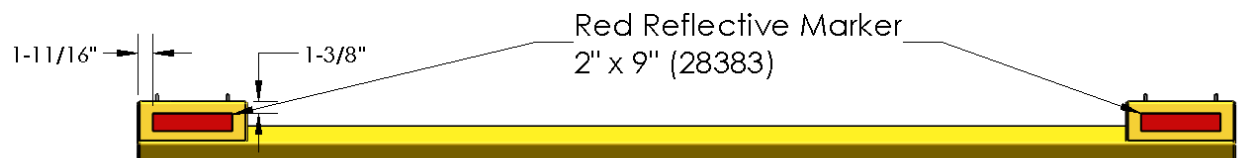
Pulldozer Transformer Main Frame

Repeat for Right Side

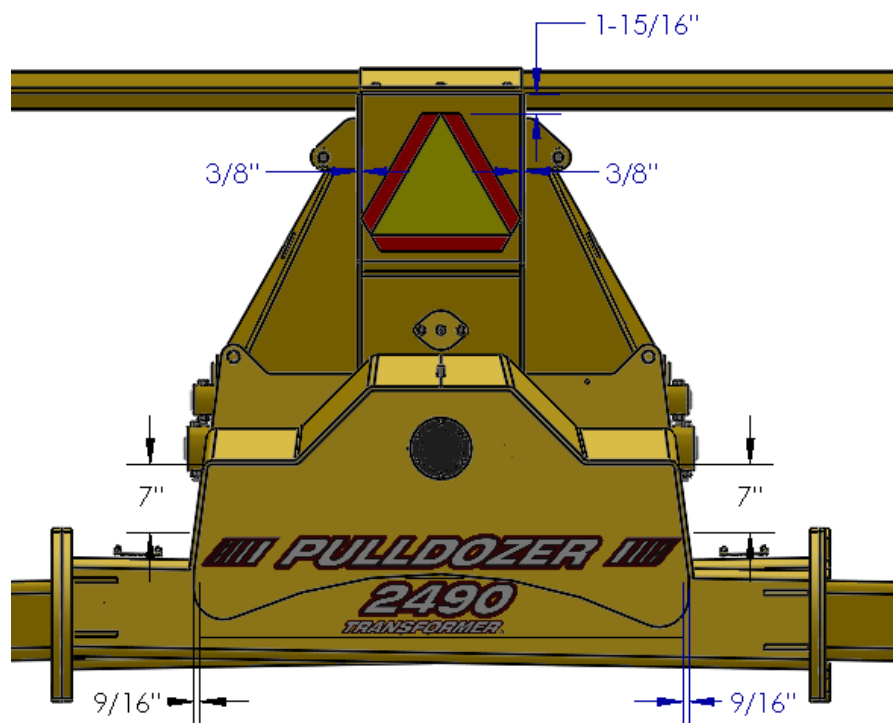


Pulldozer Transformer Light Bar

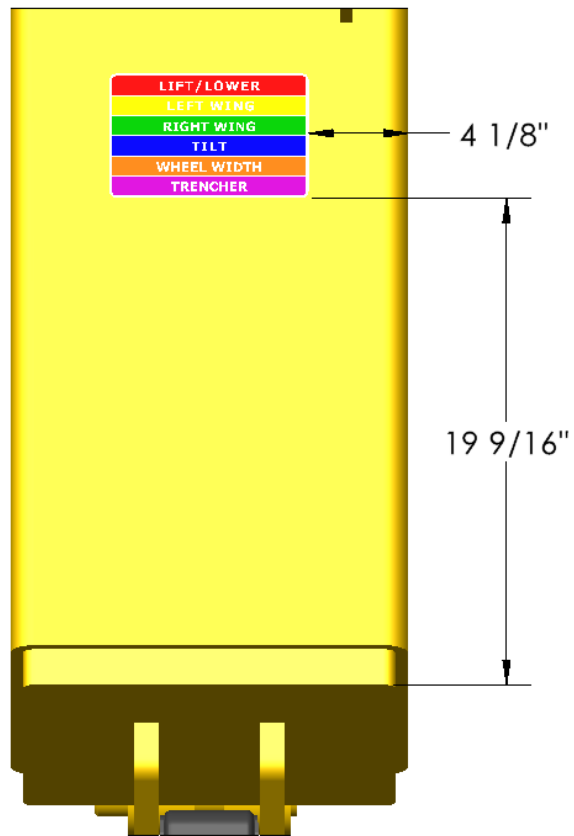
Rear View



Pulldozer Transformer SMV Sign and Rear 2490 Decal

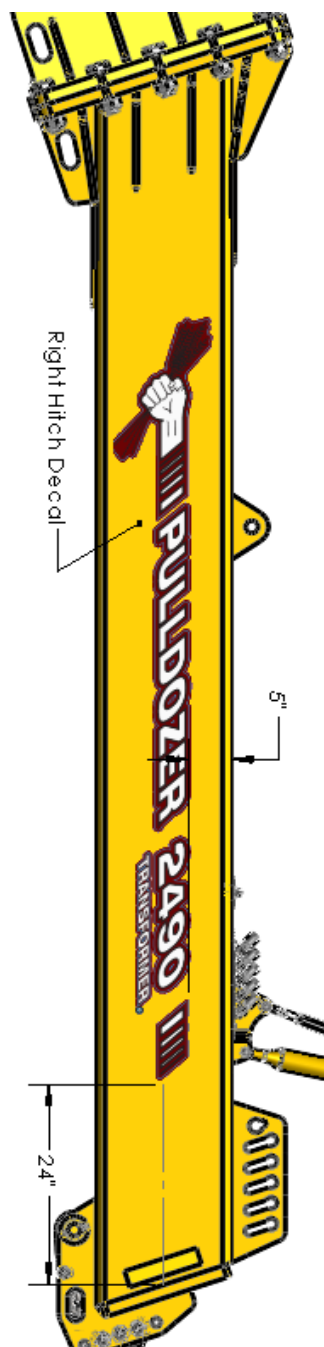


Pulldozer Transformer Hydraulic Hose Decal 5-6 Remotes (33149)



Pulldozer Transformer Hitch

Repeat for Left Side



Bolt Torque Values

FASTENER TORQUE CHARTS

	BOLT CLAMP LOADS Suggested Assembly Torque Values 									
	USS/SAE GRADE 5					USS/SAE GRADE 8				
DIAMETER & THREADS PER INCH	TENSILE STRENGTH MIN. PSI	PROOF LOAD LB	CLAMP LOAD LB	TORQUE DRY FT LB	LUBRICATED FT LB	TENSILE STRENGTH MIN. PSI	PROOF LOAD LB	CLAMP LOAD LB	TORQUE DRY FT LB	LUBRICATED FT LB
1/4-20 28	120,000	2,700	2,020	8	6.3	150,000	3,800	2,850	12	9
	120,000	3,100	2,320	10	7.2	150,000	4,350	3,250	14	10
5/16-18 24	120,000	4,450	3,340	17	13	150,000	6,300	4,700	24	18
	120,000	4,900	3,700	19	14	150,000	6,950	5,200	27	20
3/8-16 24	120,000	6,600	4,950	30	23	150,000	9,300	6,980	45	35
	120,000	7,450	5,600	35	25	150,000	10,500	7,900	50	35
7/16-14 20	120,000	9,050	6,780	50	35	150,000	12,800	9,550	70	50
	120,000	10,100	7,570	55	40	150,000	14,200	10,650	80	60
1/2-13 20	120,000	12,100	9,050	75	55	150,000	17,000	12,750	110	80
	120,000	13,600	10,200	85	65	150,000	19,200	14,400	120	90
9/16-12 18	120,000	15,500	11,600	110	80	150,000	21,800	16,350	150	110
	120,000	17,300	12,950	120	90	150,000	24,400	18,250	170	130
5/8-11 18	120,000	19,200	14,400	150	110	150,000	27,100	20,350	210	160
	120,000	21,800	16,350	170	130	150,000	30,700	23,000	240	180
3/4-10 16	120,000	28,400	21,300	260	200	150,000	40,100	30,100	380	280
	120,000	31,700	23,780	300	220	150,000	44,800	33,500	420	310
7/8-9 14	120,000	39,300	29,450	430	320	150,000	55,400	41,600	600	450
	120,000	43,300	32,450	470	350	150,000	61,100	45,800	670	500
1-8 14	120,000	51,500	38,600	640	480	150,000	72,700	54,500	910	680
	120,000	57,700	43,300	720	540	150,000	81,500	61,100	1,020	760

When using anti-seize, reduce the lubed chart reading by 20% to properly torque.
Always lubricate and use lubed torque values.

NOTES:

The above recommended assembly torques are offered as a guide only. Torque specifications, especially for critical joints, should be determined under actual assembly conditions due to the many variables involved which are difficult to predict and do affect the torque-tension relationship.

The above recommended clamp loads are based on 75% of the minimum specified proof loads for each grade and size.

Torques for Grades 5 and 8 were calculated based on the following relationship:

$$T = R D P$$

Where: T = Torque (ft lb)

D = Nominal Diameter (in)

P = Clamp Load (lb)

R = Tightening Coefficient

The value of R is assumed to be equal to .20 for dry, unplated conditions and equal to .15 for lubricated, including plated, conditions. Actual values of R can vary between .05 and .35 for commonly encountered conditions.

STRENGTH GRADE	APPLICABLE SIZES	PROOF LOAD STRESS (PSI)	YIELD STRENGTH MIN. STRESS (PSI)	TENSILE STRESS MIN. (PSI)
SAE Gr. 5	1/4 to 1" diameter	85,000	92,000	120,000
	over 1" diameter to 1-1/2 diameter	74,000	81,000	105,000
SAE Gr. 8	1/4 to 1" diameter	120,000	130,000	150,000

Pounds to Inch Pound Conversion

lb x 12 = inch lb

Example: 9 lb x 12 = 108 inch lb

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FRACTIONAL MEASUREMENT		
BOLT DIAMETER	CAP SCREW WRENCH SIZE	NUT WRENCH SIZE
1/4	7/16	7/16
5/16	1/2	1/2
3/8	9/16	9/16
7/16	5/8	11/16
1/2	3/4	3/4
9/16	13/16	7/8
5/8	15/16	15/16
3/4	1-1/8	1-1/8
7/8	1-5/16	1-5/16
1"	1-1/2	1-1/2
1-1/8	1-11/16	1-11/16
1-1/4	1-7/8	1-7/8
1-3/8	2-1/16	2-1/16
1-1/2	2-1/4	2-1/4
1-3/4	2-5/8	2-5/8
2"	3"	3"
2-1/4	3-3/8	3-3/8
2-1/2	3-3/4	3-3/4
2-3/4	4-1/8	4-1/8
3"	4-1/2	4-1/2



FASTENER TORQUE CHARTS

GUIDE FOR PREVAILING-TORQUE LOCK NUT ASSEMBLY TORQUES (CAD AND WAX, GRADE B, C, AND GRADE G FLANGE NUTS) LOCK NUT STANDARDS FROM IFI-100 REQUIREMENTS

Torque-Tension Requirements

Size Threads Per Inch	GRADE B			GRADE C			GRADE G		
	CLAMP LOAD (Lb)	ASSEMBLY TORQUE MAX.	MIN.	CLAMP LOAD (Lb)	ASSEMBLY TORQUE MAX.	MIN.	CLAMP LOAD (Lb)	ASSEMBLY TORQUE MAX.	MIN.
1/4-20	2,000	85**	60**	2,850	125**	85**	2,850	150**	100**
1/4-28	2,300	90**	65**	3,250	125**	85**	3,250	160**	105**
5/16-18	3,350	150**	110**	4,700	190**	130**	4,700	240**	155**
5/16-24	3,700	160**	120**	5,200	200**	140**	5,200	230**	155**
3/8-16	4,950	20	14.5	6,950	28	20	6,950	32	21
3/8-24	5,600	22	16	7,900	29	21	7,900	33	22
7/16-14	6,800	32	23	9,600	43	31	9,600	51	34
7/16-20	7,550	34	24	10,700	43	31	10,700	60	40
1/2-13	9,050	50	37	12,800	62.5	45	12,800	85	55
1/2-20	10,200	52.5	37.5	14,440	70	50	14,440	89	59
9/16-12	11,600	70	50	16,400	95	70	16,400	120	80
9/16-18	13,000	77.5	57.5	18,300	95	70	18,300	132	88
5/8-11	14,500	95	70	20,300	122.5	90	20,300	143	95
5/8-18	16,300	97.5	72.5	23,000	125	90	23,000	175	115
3/4-10	21,300	165	125	30,100	210	155	30,100	240	160
3/4-16	23,800	165	120	33,600	210	155	33,600	270	170
7/8-9	29,500	250	185	41,600	312.5	225	41,600	360	260
7/8-14	32,400	270	200	45,800	312.5	225	45,800	402	247
1-8	38,700	375	275	54,600	462.5	360	54,600	530	410
1-12	42,300	395	290	59,750	490	360	59,750	—	—
1-14	43,000	400	300	61,100	500	362.5	61,100	645	398
1-1/8-7	42,100	404	294	69,000	585	454	69,000	—	—
1-1/8-12	47,500	437	327	76,800	622	453	76,800	—	—
1-1/4-7	53,500	513	375	87,000	736	573	87,000	—	—
1-1/4-12	59,700	549	412	96,600	782	570	96,600	—	—
1-3/8-6	63,800	612	445	104,000	880	685	104,000	—	—
1-3/8-12	72,900	670	503	118,000	955	696	118,000	—	—
1-1/2-6	77,600	745	545	127,000	1,075	837	127,000	—	—
1-1/2-12	87,700	807	605	142,000	1,150	837	142,000	—	—

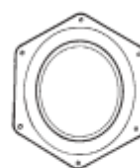
* Clamp loads for the Grade B lock nuts equal 75% of the bolt proof loads specified for SAE J-429 Grade 5, and ASTM A-449 bolts.

Clamp loads for Grade C lock nuts equal 75% of the bolt proof loads specified for SAE J-429 Grade 8, and ASTM A-354 Grade BD bolts.

* IFI-100 does not govern lock nuts above 1". The values shown in the chart are to be used as a mid-range guideline.

** Torque values for 1/4" and 5/16" sizes are in inch lb. All other torque values are in foot lb.

Grade C



Grade B



Grade G



METRIC TORQUE CHART FOR HEX HEAD CAP SCREWS

Size	CLASS	NEWTON METERS		FOOT POUNDS (APPROX.)		CLASS
		ZINC PLATED	UNPLATED	ZINC PLATED	UNPLATED	
M4 x .70 Pitch	8.8	3.1	2.2	2.30	1.65	
M5 x .80 Pitch	8.8	6.1	5.5	4.58	4.13	
M6 x 1.00 Pitch	8.8	10.4	9.5	7.80	7.13	
M7 x 1.00 Pitch	8.8	17.0	15.5	12.75	11.63	
M8 x 1.25 Pitch	8.8	25.0	23.0	18.75	17.25	
M8 x 1.00 Pitch	8.8	27.0	24.5	20.25	18.38	
M10 x 1.50 Pitch	8.8	51.0	46.0	38.25	34.50	
M10 x 1.00 Pitch	8.8	57.0	52.0	42.75	39.00	
M10 x 1.25 Pitch	8.8	54.0	49.0	40.50	36.75	
M12 x 1.75 Pitch	8.8	87.0	79.0	65.25	59.25	
M12 x 1.25 Pitch	8.8	96.0	87.0	72.00	65.25	
M12 x 1.50 Pitch	8.8	92.0	83.0	69.00	62.25	
M14 x 2.00 Pitch	8.8	140.0	125.0	105.00	93.75	
M14 x 1.50 Pitch	8.8	150.0	135.0	112.50	101.25	
M16 x 2.00 Pitch	8.8	215.0	195.0	161.25	146.25	
M18 x 2.50 Pitch	8.8	300.0	280.0	225.00	210.00	
M20 x 2.50 Pitch	8.8	430.0	390.0	322.50	292.50	
M22 x 2.50 Pitch	8.8	580.0	530.0	435.00	397.50	
M24 x 3.00 Pitch	8.8	740.0	670.0	555.00	502.50	
M6 x 1.00 Pitch	10.9	15.5	14.0	11.63	10.50	
M8 x 1.25 Pitch	10.9	37.0	34.0	27.75	25.50	
M10 x 1.50 Pitch	10.9	75.0	68.0	56.25	51.00	
M12 x 1.75 Pitch	10.9	160.0	117.0	97.50	87.75	
M14 x 2.00 Pitch	10.9	205.0	185.0	153.75	138.75	
M16 x 2.00 Pitch	10.9	310.0	280.0	232.50	210.00	

TORQUE CHART FOR STAINLESS STEEL CAP SCREWS

Size	316 INCH-LB	18/8 INCH-LB
6-32	10.1	9.6
6-40	12.7	12.1
8-32	20.7	19.8
8-36	23.0	22.0
10-24	23.8	22.8
10-32	33.1	31.7
1/4-20	78.8	75.2
1/4-28	99.0	94.0
5/16-18	138.0	132.0
5/16-24	147.0	142.0
3/8-16	247.0	236.0
3/8-24	271.0	259.0
7/16-14	393.0	376.0
7/16-20	418.0	400.0
1/2-13	542.0	517.0
1/2-20	565.0	541.0
9/16-12	713.0	682.0
9/16-18	787.0	752.0
5/8-11	1,160.0	1,110.0
5/8-18	1,301.0	1,244.0
3/4-10	1,582.0	1,530.0
3/4-16	1,558.0	1,490.0
7/8-9	2,430.0	2,328.0
7/8-14	2,420.0	2,318.0
1-8	3,595.0	3,440.0
1-14	3,250.0	3,110.0

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