



# VEICHI PIVOT

ASSEMBLY MANUAL

**VEICHI**

# VEICHI

---

Dear Valued Customer:

Congratulations on your purchase of VEICHI center pivot or linear irrigation system.

Drawing upon 11 years of experience in water delivery, VEICHI has perfected the pivot and linear to meet the expanding needs of our customers. The pivot manufactured by VEICHI is the result of several years of advanced engineering and design to develop the most reliable machine on the market. Teams of skilled technicians manufactured your machine under strict quality standards. It was packed and shipped with the care that comes with VEICHI pride.

This manual is your key to the safe operation and maintenance of your machine. We have taken special care in addressing safety throughout these pages. This manual is not intended to be an electrical trouble shooting guide. Electrical malfunctions should be turned over to a qualified VEICHI dealer or electrician.

Thank you for making VEICHI a part of your future. It's a pleasure bringing you the finest in pivot technology.

Sincerely,

VEICHI IRRIGATION

# TABLE OF CONTENTS

## VEICHI Pivot Assembly

<b>Section xi Table of Contents</b> .....	xi-1
<b>Section 1 Getting Started</b>	
Before Your Machine Arrives.....	1-3
Slope Consideration.....	1-3
Power Supply.....	1-7
Ground Rod Placement.....	1-8
Standard Pivot Pad.....	1-10
High Profile Pivot Pad.....	1-12
Towable Pivot Pad.....	1-13
Minimum Equipment for Machine Assembly / Set-up.....	1-14
<b>Section 2 Pivot Point Assembly</b>	
Pivot point Assembly Tips and Recomendations.....	2-3
Pivot Parts Identification.....	2-4
Pivot Point Assembly.....	2-6
Standpipe Installation with Tie Rod.....	2-8
Positioning Pivot.....	2-9
Bottom Elbow Installation.....	2-11
Tie Rod Adjustment.....	2-11
Collector Ring.....	2-12
Pivot Point Control Panel.....	2-14
Panel Positioning.....	2-15
High Profile Pivot Point.....	2-16
Low Profile Pivot Point.....	2-20
<b>Section 3 Span Assembly</b>	
Span Assembly Tips and Recommendations.....	3-3
Standard Spans 5"-6-5/8".....	3-6
Standard Spans 8-5/8".....	3-8
160' and 180' LEPA Span 30" Spacing.....	3-10
160' and 186.7' LEPA Span 40" Spacing.....	3-12
Span Trussing.....	3-14
Span Assembly Photos.....	3-16
Notes.....	3-18
<b>Section 4 Receiver &amp; Tower Assembly</b>	
Pivot Point Attachment (6-5/8" STD. & LEPA).....	4-3
Intermediate Receiver Assembly (6-5/8" STD.).....	4-4
Intermediate Receiver Assembly (8-5/8").....	4-6
End Receiver Assembly (6-5/8" STD.).....	4-8
Tower Assembly (6-5/8").....	4-10
Tower Assembly (8-5/8").....	4-12
Drivetrain Assembly.....	4-14
3-Wheel Drivetrain Assembly.....	4-16
High Profile Tower.....	4-18
Low Profile Tower.....	4-20
Coupler.....	4-22
Notes.....	4-23

# TABLE OF CONTENTS

Receiver & Tower-Assembly Photos.....	4-24
<b>Section 5 Overhangs</b>	
Overhang Layout.....	5-3
Span Compatability Chart.....	5-5
Overhang End Plate Plumbing.....	5-6
6 ft Overhang Assembly.....	5-7
12 ft Overhang Assembly.....	5-8
19.5 ft Overhang Assembly.....	5-9
25.5 ft Overhang Assembly.....	5-10
31.5 ft Overhang Assembly.....	5-12
39 ft Overhang Assembly.....	5-14
45 Ft Overhang Assembly.....	5-16
51 ft Overhang Assembly.....	5-18
58.5 ft Overhang Assembly.....	5-20
64.5 ft Overhang Assembly.....	5-22
78 ft Overhang Assembly.....	5-24
84 ft Overhang Assembly.....	5-26
31.5 ft Rear Cable Assembly.....	5-28
Rear Cable Assembly.....	5-29
Overhang Assembly with Compression Braces.....	5-30
End Gun Spool-For Poly Option Only.....	5-31
Cable Extension-For Poly Option Only.....	5-32
<b>Section 6 Electrical</b>	
A Word About Proper Grounding.....	6-3
Standard Panel Span Cable Connections.....	6-5
Panel Wiring- 90200-41.....	6-6
Panel Wiring Parts List.....	6-9
Standard Panel Schematic .....	6-10
CP JB Intermediate Cam 10142-01.....	6-12
Notes Section.....	6-13
End Tower Junction Box w/out Auto Reverse and Booster 90017-01.....	6-14
Stall Timer Wiring 90016-01 .....	6-15
Notes.....	6-16
Collector Ring Wiring .....	6-17
Warning.....	6-18
<b>Section 7 Options</b>	
Barricade (End Tower Auto Reverse) .....	7-2
End Tower Auto Reverse .....	7-4
CP Auto Reverse / Auto Off Option.....	7-6
CP Auto Reverse Switch Assembly.....	7-8
CP Option Auto Off-90034.....	7-9
CP Auto/ Off.....	7-10
CP Option AUTO-OFF Wiring Diagram.....	7-11
CP Option Auto-REV-OFF End Tower 90035-01 R6.....	7-12
FWD Reverse & Wet and Dry Switch.....	7-14
Notes.....	7-15

# TABLE OF CONTENTS

CP Option Auto Restart-90036-04.....	7-16
Auto Restart Switch.....	7-17
CP Option Fert-Chem Control-90036-08.....	7-18
Notes Section.....	7-19
CP OH Sand Flush Kit Manual.....	7-20
CP-P93 Sand Trap Ext. Set 72".....	7-21
Auto End Gun with and W/O Booster Pump.....	7-22
Parts List for EG with and W/O Booster Pump.....	7-25
Auto End Gun.....	7-26
CP Option Auto EG W/O Booster Pump .....	7-28
Solenoid Valve Installation.....	7-29
CP Option Auto EG W/O BP-90040.....	7-30
Notes.....	7-31
Booster Pump Assembly End Tower Detail.....	7-32
Booster Pump Assembly.....	7-33
CP Booster Pump JB ASM 2HP with Auto Reverse-90037-01.....	7-34
CP Booster Pump JB Assembly 2HP w/o Auto Reverse -90037-01 R6....	7-35
CP End Tower JB w/Booster Pump w/ and w/o Auto Reverse.....	7-36
End Tower with Auto Reverse w/out Booster 90017-01.....	7-37
End Tower Auto Reverse / Auto Shutdown Junction Box 07098-08.....	7-38
CP Option Low Pressure Shutdown-90036-10.....	7-39
Low Temperature Option 90036-09.....	7-40
End Tower Run Light 90033-01 R1.....	7-42
Pivot Run Light 03060-55.....	7-43
Wire Alignment First Tower.....	7-44
Wire Alignment Intermediate Tower .....	7-46
Wire Alignment End Tower .....	7-48
Tow Tower .....	7-52
Towable Cart and Frame Assembly.....	7-54
Towable Cart Assembly.....	7-56
Lightning Arrester.....	7-58
Gearbox Motor Cover.....	7-59

## **Section 8 General Information**

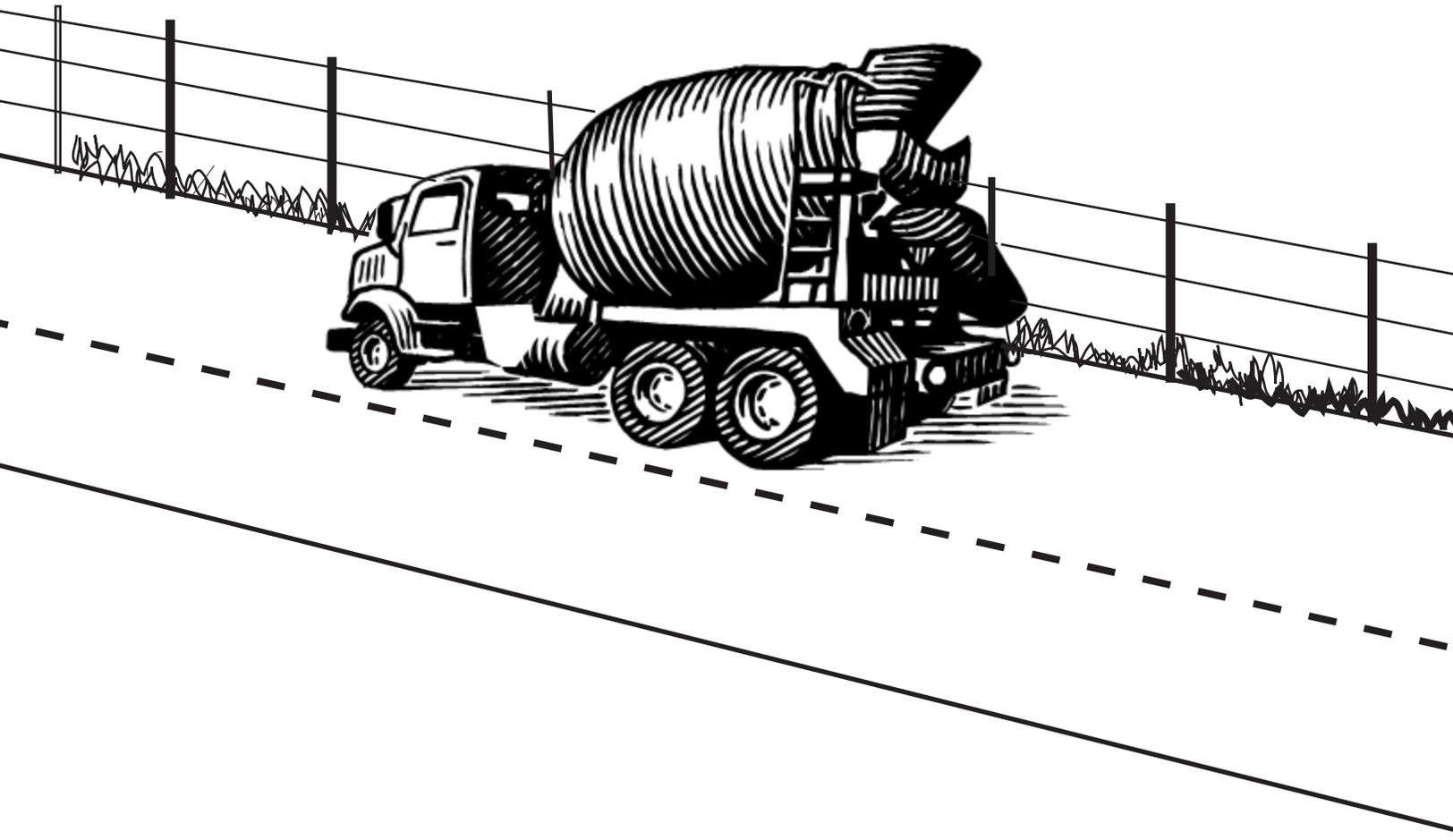
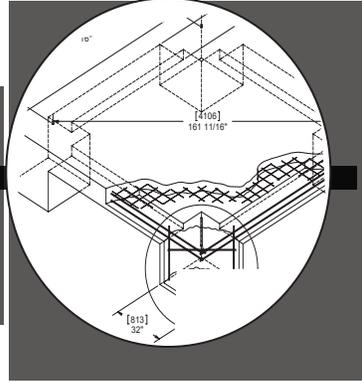
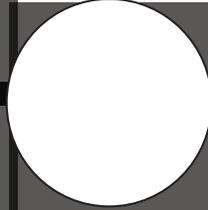
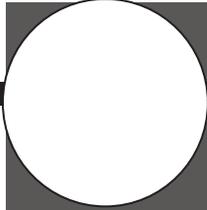
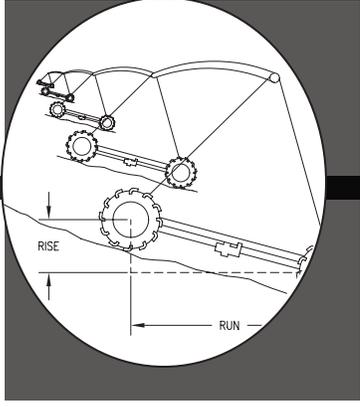
Span Tower Weights and Dimensions.....	8-3
Revolution Times and Water Application.....	8-5
Sprinkler Drops.....	8-8
Notes.....	8-9

## **Section 9 Operation, Safety, & Maintenance**

Safety Symbols, Pictures and Definitions.....	9-3
Final Checks and Initial Operation.....	9-5
Machine Alignment.....	9-6
Cam and Safety Switch.....	9-9
Maintenance Check List.....	9-12
Power Drivetrain Maintenance.....	9-14
Lockout/Tagout Procedures.....	9-21
Tire Care.....	9-25

Winterizing.....	9-26
Oil & Lube Charts.....	9-27
Service Log.....	9-29
Troubleshooting.....	9-32
<b>Section 10 Panel Operation</b>	
Panel Identification.....	10-3
Forward Operation.....	10-6
Reverse Operation.....	10-8
Auto Reverse / Auto Off Option.....	10-10
Disconnect Switch.....	10-12

# GETTING STARTED



## BEFORE YOUR MACHINE ARRIVES

Before your machine arrives at the field, verify that the terrain does not contain conditions that may cause structural damage. Refer to the Slope Limitations Table (right) and the Slope Considerations section following to ensure that your machine will run safely with your current field conditions. Slopes exceeding the limitations for specified span lengths could cause structural damage to the machine. To calculate the slope at a given point, divide the rise of the slope by the horizontal run of the slope, as shown in the slope details following. For example, if a slope rises one foot in ten feet measured horizontally, then the slope is 1/10, or 10%.

Span	Longitudinal	Transverse
125.5	18%	18%
145	16%	16%
164.5	15%	15%
184	12%	12%
203.5	9%	9%

Other more obvious considerations may include obstacles such as buildings, power poles, fences, trees, rock outcroppings, well sites, etc. Be sure that the machine will adequately clear these before assembly, or running the machine unattended. Allow adequate clearance for obstacles. The system passes over to ensure there is no contact if the machine creates wheel ruts during operation. The system may become closer to the ground as it operates.

## SLOPE CONSIDERATIONS

On flat ground, a center pivot is subjected to certain stresses in certain proportions, all of which it is designed to easily handle. However, when the machine is subjected to various slope conditions, stresses and their proportions to each other change dramatically.

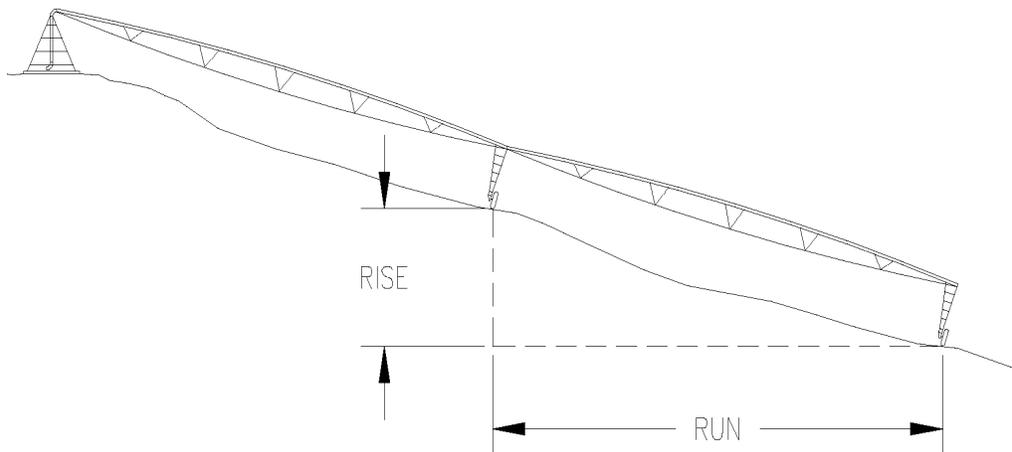


Figure 1-3. Longitudinal Slope

In a longitudinal slope situation as shown in Figure 1-6.a., the spans are placed in either tension on a descending slope (as shown) or compression on an ascending slope. Exceeding the slope limitations set forth could create excessive tension and compressive forces in both spans, and especially the pivot point.

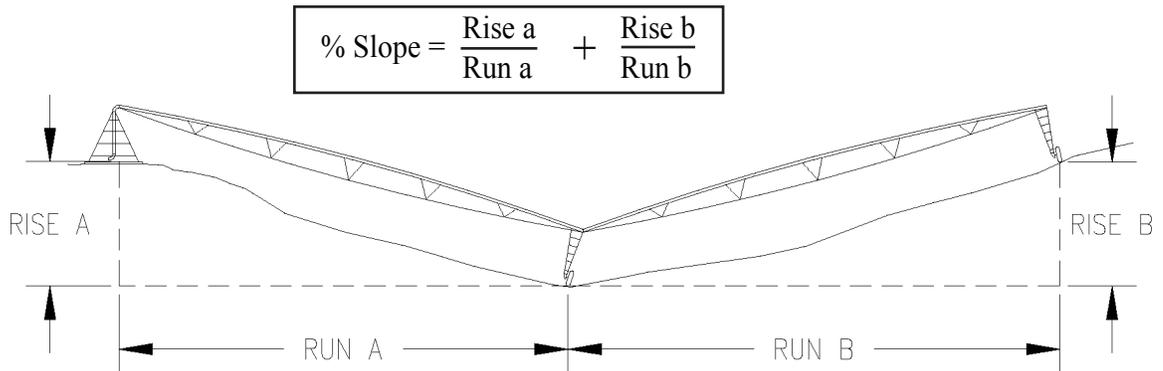


Figure 1-4a. - Dips and Ravines

In dips, or ravines, it is important that the horizontal angle between the two spans not deflect more than twice the longitudinal slope for the span from center line, to prevent damage or leakage at the joint. This situation also redistributes the weights from each span so that the tower in the ravine will be required to support more than half of the total weight of each span. While the tower structure is capable of handling this load, the extra weight may cause excessive rutting of the tires in softer soils, which could cause misalignment and/or structural damage.

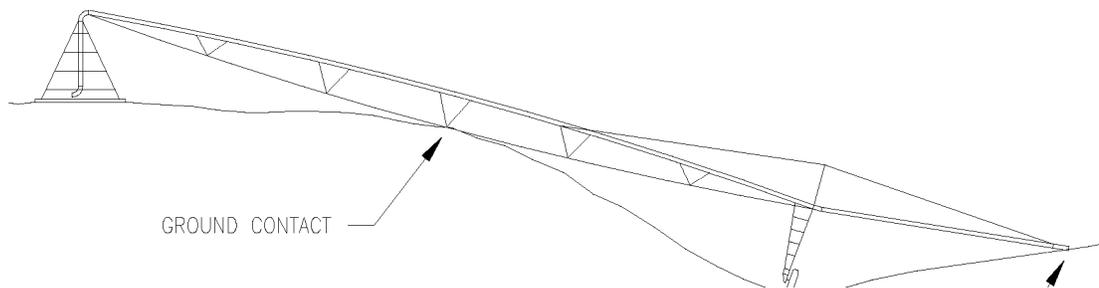


Figure 1-4b.- High Centering Danger

Another factor that should be considered with dips and ravines is the reduction of crop clearance that will occur as the span runs over the crest of the ravine. Extreme cases of dips and ravines could cause either the span under trussing or overhang to come in contact with the ground, as shown in Figure 1-4.b. This situation could occur even if the slope in question does not exceed the slope limitations for the span, so care must be taken to know where the towers will run in the field. If this situation occurs, solutions include smoothing down the slope with earth moving equipment, or reconfiguring the span lengths and tower placements of the machine to cause the towers to run over the higher spots in the field. If machine reconfiguration is chosen, be sure to consider the entire field, as changing the machine configuration to alleviate one problem may cause another problem somewhere else.

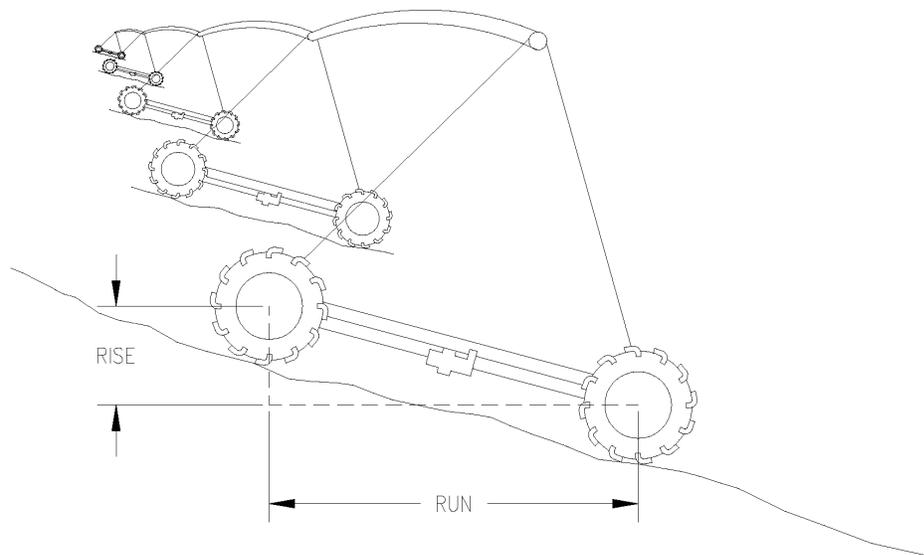


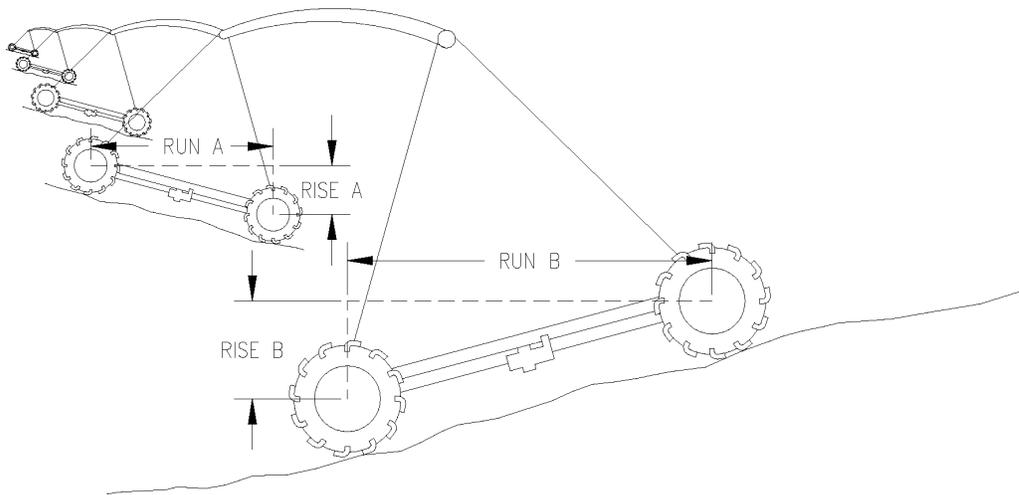
Figure 1-5. Transverse Slope

Lateral movement of a machine on a slope, as shown in Figure 1-7., is when more than one tower is on the same type of slope (i.e., ascending or descending). Exceeding slope limitations here could move the center of gravity of the span sideways enough to cause the span to roll, thus collapsing the machine. On this type of slope, more weight gets redistributed to the downhill tire than the uphill tire, which could cause excessive rutting in soft soils. This situation could further be complicated by erosion of the soil in the wheel rut due to water being channeled down the rut from the machine.



*Note: The transverse slope for the given span length is not to exceed 30%.  
Must not be more than twice the transverse slope limit and must not exceed 30%.*

## SLOPE CONSIDERATIONS



*Figure 1-6. Torsional Slope*

Torsional loading of the span caused by each tower of one span running on opposing slopes, as shown in Figure 1-6, is the most likely condition to cause actual structural damage, since the span is actually being twisted. In this situation, both slopes should be calculated and added together to determine whether or not slope limitations have been exceeded. For example, if the ascending slope was calculated at 7%, and the descending slope 6%, the overall slope would be 13%.

## POWER SUPPLY



**WARNING: IT IS HIGHLY RECOMMENDED THAT A PROFESSIONAL ELECTRICIAN BE CONTRACTED TO PERFORM THE POWER SOURCE HOOK-UP TO PREVENT SERIOUS INJURY OR POSSIBLE DEATH.**

The power supply for your VEICHI pivot can be provided by either the electric utility company or by an engine driven generator. The system requires 380 volts, 50 hz, 3 phase electric power for operation. The maximum operating voltage must not exceed 420 volts AC, nor should it be operated at less than 360 volts. Other voltage and 60 Hz power is available upon request.

If you intend to operate your pivot with an electric generator, be sure to consult with your VEICHI Dealer regarding generator specifications. A conventional generator may not be adequate to power your machine. You should also thoroughly familiarize your-self with the grounding and lockout/tag out procedures set forth in the Safety & Main-tenance sections of this manual.



*A Note on underground wire installation...*

*VEICHI Irrigation provides the electrical wiring used on the pivot itself, but the buyer will need to acquire sufficient wiring to connect the pivot to its power source. All material must be new and not secondhand, and must meet all applicable sections of the Electric Standards.*

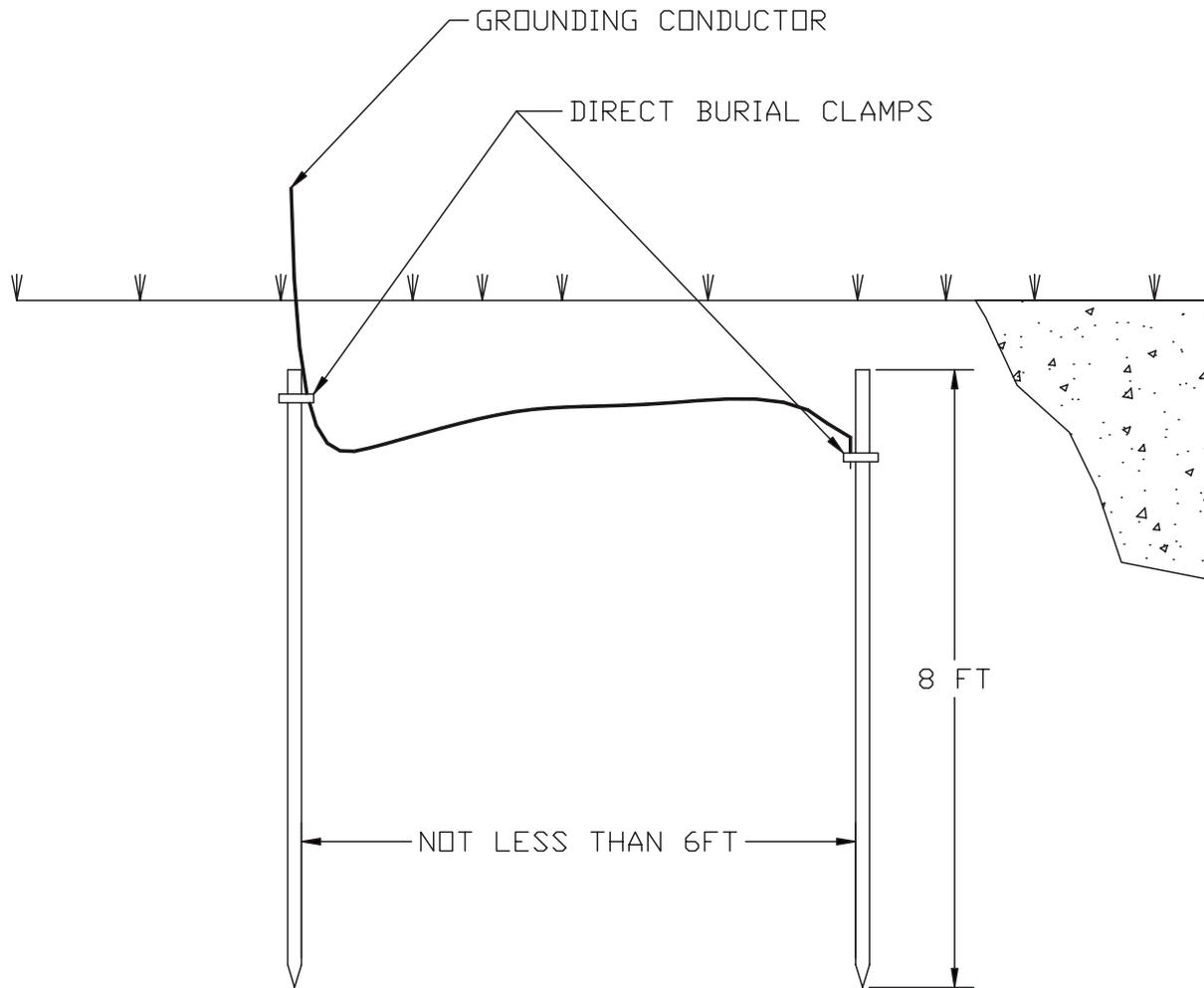


Figure 1-8.



**WARNING: DO NOT OPERATE MACHINE WITHOUT A PROPER EARTH GROUND. REFERENCE SECTION 6-3.**

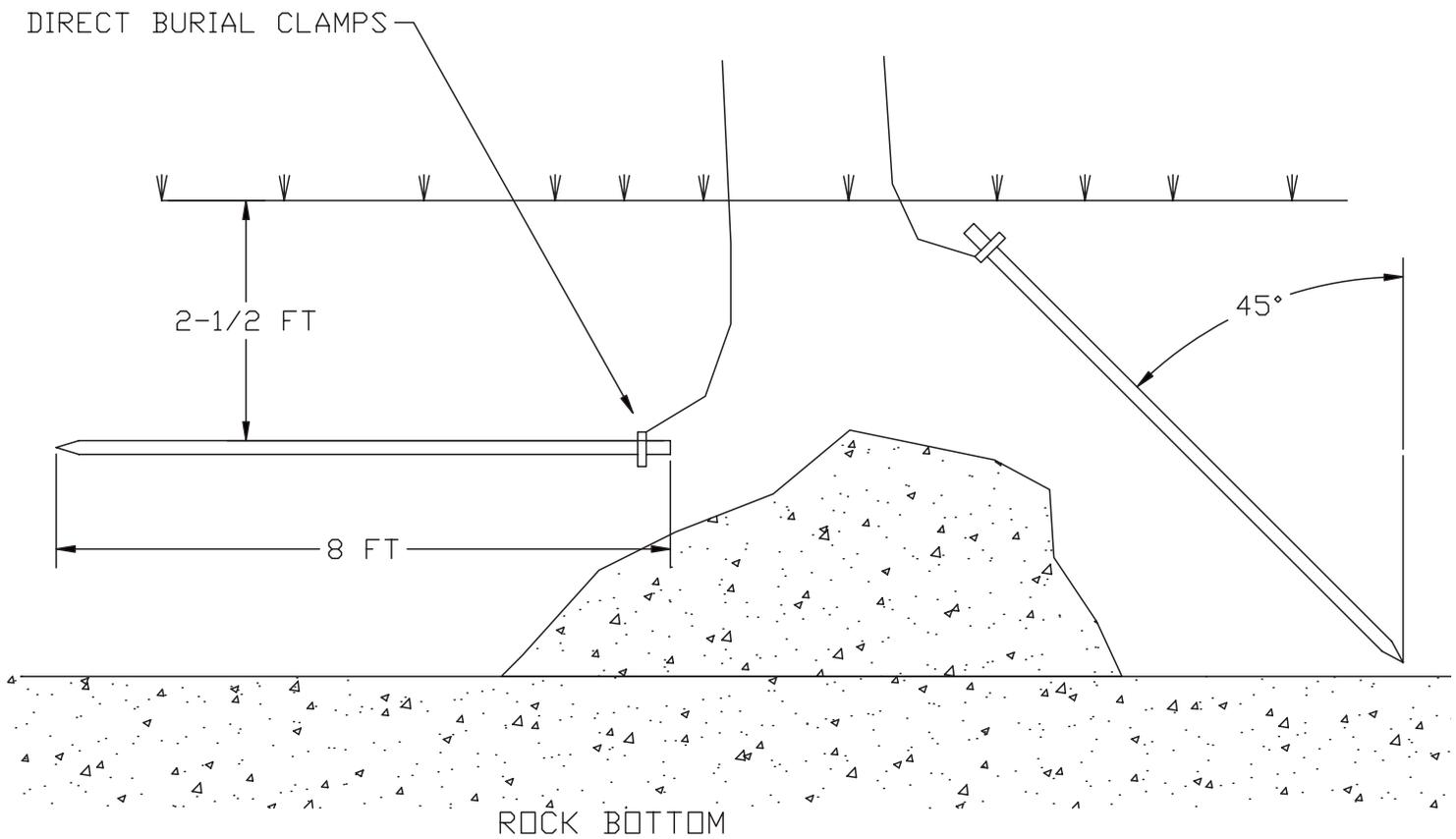


Figure 1-9.



**WARNING: DO NOT OPERATE MACHINE WITHOUT  
A PROPER EARTH GROUND. REFERENCE SECTION  
6-3.**

## PIVOT PAD (Concrete)

The pivot point is the center of the irrigation radius. Its location defines the area to be watered, so placement of the pivot point is a critical part of the planning stage. It is vitally important that the pivot point be located to maximize irrigation coverage while avoiding any potential obstacles. A survey of your property completed by a professional surveyor would be most helpful in positioning your pivot.

The center of the field should serve as only a tentative position for your pivot. Once you have determined the exact center of your field, the next step will be to review the field once more and evaluate potential hazards. You can then either clear the hazards or adjust the pivot point so that the spans maneuver around them. If you decide to adjust the pivot point off-center, ensure that the new pivot will not cross the path of any other pivots already operating in adjoining fields or other obstacles in the field.

Your pivot will be delivered on a flatbed truck. To make unloading easier, take the time to measure in a straight line out from the pivot point and place a marker where each of the towers will go. This will guide you in accurately off loading components.

The concrete pivot pad is the first item of construction. If possible, the concrete work should be done prior to delivery of the machine. Enough time should be allotted to ensure proper curing of the concrete pad.

### STANDARD PIVOT PAD (Concrete)

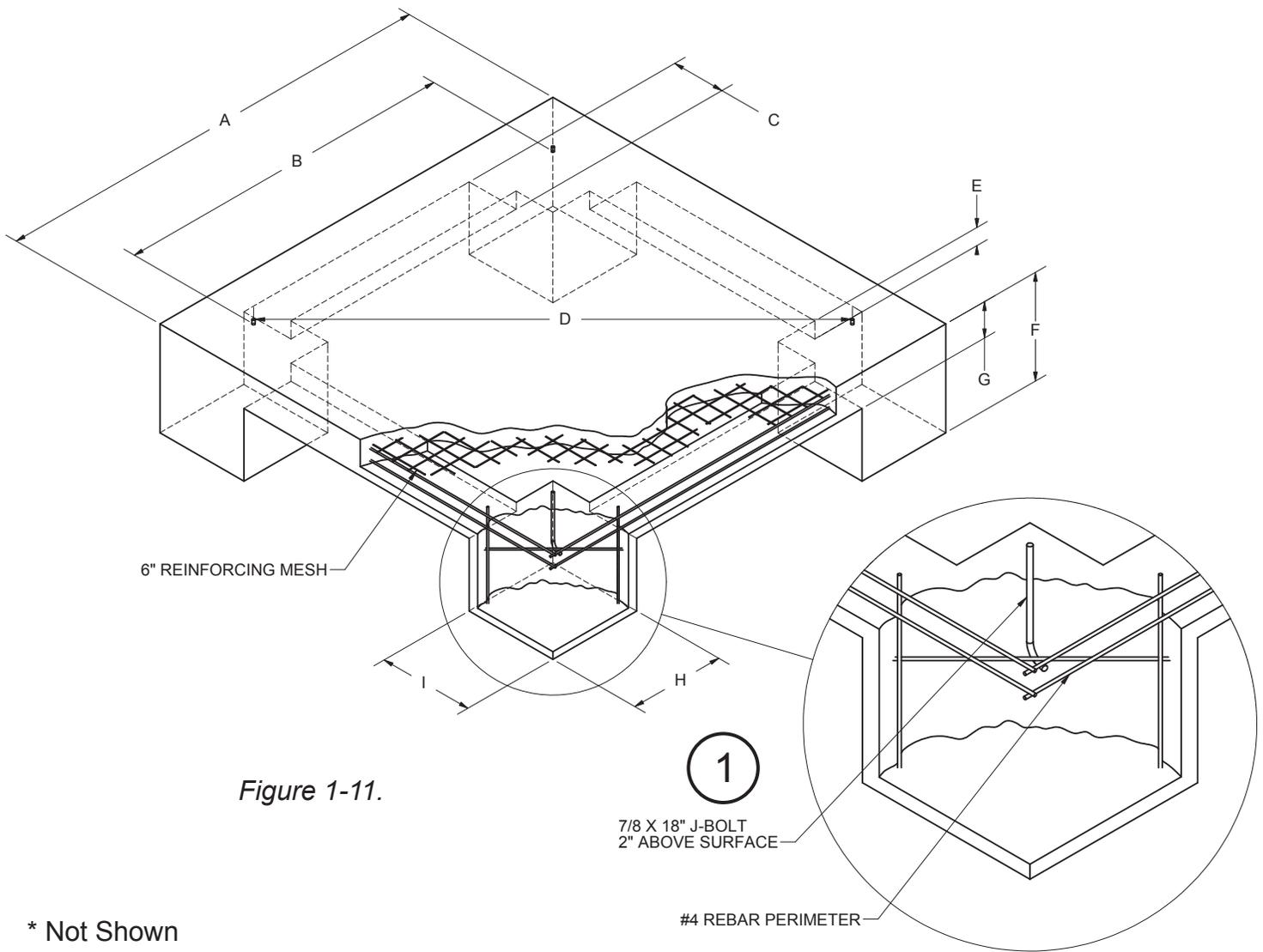


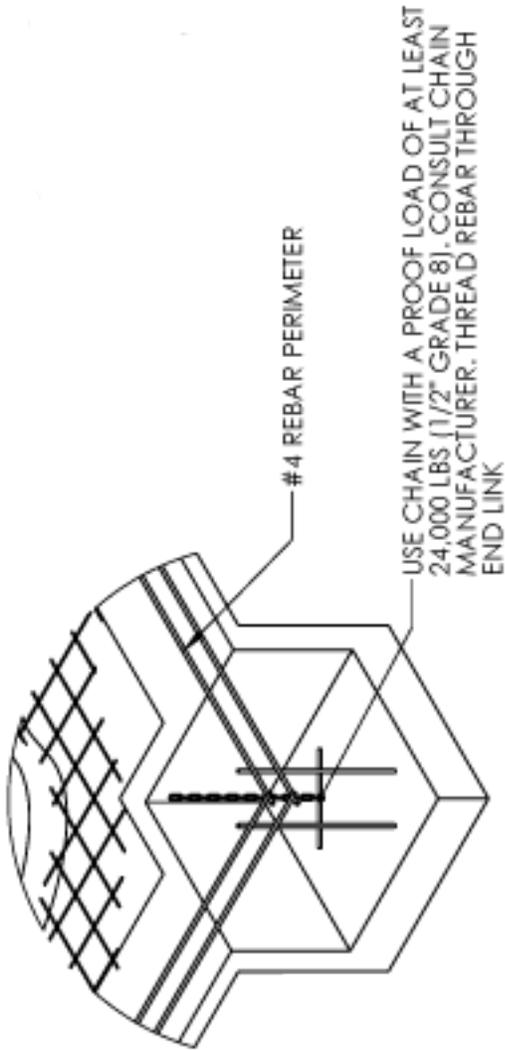
Figure 1-11.

\* Not Shown

ITEM	PART#	QTY	DESCRIPTION
1	90030-01	1	Pivot Anchor Bolt 7/8 X 18
*	02031-18	4	Nut Lock 7/8"
*	10045-11	4	Washer Plate
*	90030-01	4	J Bolt Anchor Set (4) -OR-
*	10038-11	1	J Bolt Anchor ea (1) replacement bolt
*	N/A	-	Concrete (6.5 Cubic Yards) -3000 PSI Min.
*	N/A	-	#4 Rebar (140 FT)
*	N/A	-	6" Reinforcing Wire Mesh (144 Sq. Ft.)

\* [ ] Indicates Metric, in millimeters (mm).

## Pivot Pad (Concrete)



ITEM	STD	STD (MM)	LP	LP (MM)	HP	HP (MM)	TOWABLE	TOWABLE (MM)
A	150"	3810	122"	3099	210"	5334	157"	3988
B	114 5/16"	2904	86 15/32"	2196	170 1/8"	4321	*145"	*3683
C	18"	457	18"	457	18"	457	18"	457
D	161 11/16"	4106	122 9/32"	3106	240 9/16"	6111	205 1/16"	5209
E	6"	152	6"	152	9"	229	6"	152
F	36"	914	36"	914	39"	991	36"	914
G	12"	305	12"	305	15"	381	12"	305
H	32"	813	32"	813	36"	914	32"	813
I	32"	813	32"	813	36"	914	32"	813
CONCRETE CUBIC YARD'S	6.5		5.1		13.2		6.7	
REBAR	140 FT	42.7 METERS	122 FT	37.21 METERS	186 FT	56.73 METERS	145 FT	44.23 METERS
WIRE MESH	144 SQFT	13.38 SQM	88 SQFT	8.18 SQM	290 SQFT	26.94 SQM	171 SQFT	15.89 SQM

\* Chain Locations for Towable Only

## **MINIMUM EQUIPMENT FOR MACHINE ASSEMBLY/SET-UP**

1- Boom truck capable of lifting a minimum of 6,000 lbs., to a height of 15 feet (20 feet for high profile).

1- Nylon strap with same or better rating as boom truck, in good condition (not frayed or cut). See CAUTION listed below.

1- Impact wrench, air or electric.

1- Each 9/16" through 1-1/4" impact sockets (deep well recommended).

2- Combination wrench set 7/16" through 1-1/2".

1- Deep well socket set, 3/8" drive, 7/16" through 3/4".

1- Deep well socket set, 1/2" drive, 9/16" through 1".

1- Each 3/8" and 1/2" drive ratchet.

2- Alignment bars.

1- 18" pipe wrench.

2- 12" Channel lock pliers.

1- Large pry bar (approximately 6')

1- Regular flat screwdriver.

1- Pipe dope or teflon tape for all threaded pipe connections.



**CAUTION: Lifting with chain or cable can cause damage to coated surfaces.**



*Note: Since VEICHI Irrigation recommends all wiring be completed by a professional electrician, tools involving the electrical hook-up are not included.*

The following tips and recommendations are provided to aid in the safe and efficient assembly of the pivot point. Though different methods may be used for general assembly, the following will help to ensure that the assembly will be done quickly, safely and will provide a strong sound structure.

Your VEICHI Center Pivot uses locking nuts on all bolted structural connections, so care should be taken not to overtighten nuts and bolts. If an impact wrench is used, tighten until a “ringing” sound is detected as the bolt head and nut come into contact with the metal and stop. If hand ratchets or wrenches are used, tighten until snug and stop. Further tightening will not improve the connection, and may break the bolt. Follow this procedure throughout the machine assembly.

When assembling the pivot point legs and crossties, do not tighten bolts until the structure is positioned in place on the concrete pad, then tighten all nuts and bolts. Tighten the pivot pad bolts last.

Take extreme caution when lifting the pivot point into an upright position, as the structure will tend to swing as the legs clear the ground.

Install the lower standpipe support straps when installing the number 3 crossties.

Grease bearing before attaching the first span to the pivot point. Bearing greasing procedure should be performed as follows:

- Apply grease to grease fittings in bearing until grease oozes out of either the top or bottom of the bearing.
- Rotate pivot ell two or three turns in each direction to ensure uniform spreading of grease between bearing and pivot ell.
- Apply grease again to grease fittings in bearing until grease oozes out of either top or bottom of the bearing. Bearing should now be adequately greased.

Item	Part #	QTY	Description
1	02399-01	1	Collector Ring
2	07055-11	1	StopFlange
3	10157-11	1	6-5/8 Upper Elbow -OR-
*	10854-32	1	Elbow 7 P w/nameplate
*	10186-11	1	8-5/8 Upper Elbow -OR-
*	10855-32	1	Elbow 9 P w/nameplate
4	10043-01	1	Bearing Assembly
5	10090-11	2	Half Ring
6	03219-02	1	Triple Lip Gasket
7	10087-12	2	Tie Rod
8	10039-11	1	Stand Pipe -OR-
*	10850-51	1	Stand Pipe Stainless Steel
9	10046-41	1	Conduit (J-Tube)
*10	10079-11	1	CP Inlet Elbow IF X CPF 8.63 X 8.63 - OR-
*	10079-41		CP Inlet Elbow IF X CPF 8.63 X 8.63 SS
*Option	10234-11	1	CP Inlet Elbow RM X CPF 8 X 8.63 - OR-
*	10859-31		CP Inlet Elbow RM X CPF 8 X 8.63 SS
11	10735-11	1	Plastic Flange Gasket
12	10030-11	4	Angle Brace #1 16.25
13	10031-11	4	Angle Brace #2 33.13
14	10034-11	1	Angle Brace #3 47.06
15	10032-11	4	Angle Brace #4 61
16	10035-11	1	Angle Brace #5 74.94
17	10033-11	4	Angle Brace #6 88.88
18	10036-11	1	Angle Brace #7 105.63
19	10029-11	4	Pivot Leg
20	10071-11	4	Leg mount
*	90030-01	1(set)	Aanchor Bolt Set -OR-
21	10038-11	1(ea)	Anchor bolt w/nut
22	10037-11	2	Torosional Angle
23	10127-11	2	Angle Bracket
24	02066-04	82	Hex Bolt G5 .50 X 1.50
25	02031-07	82	Nut Lock 1/2

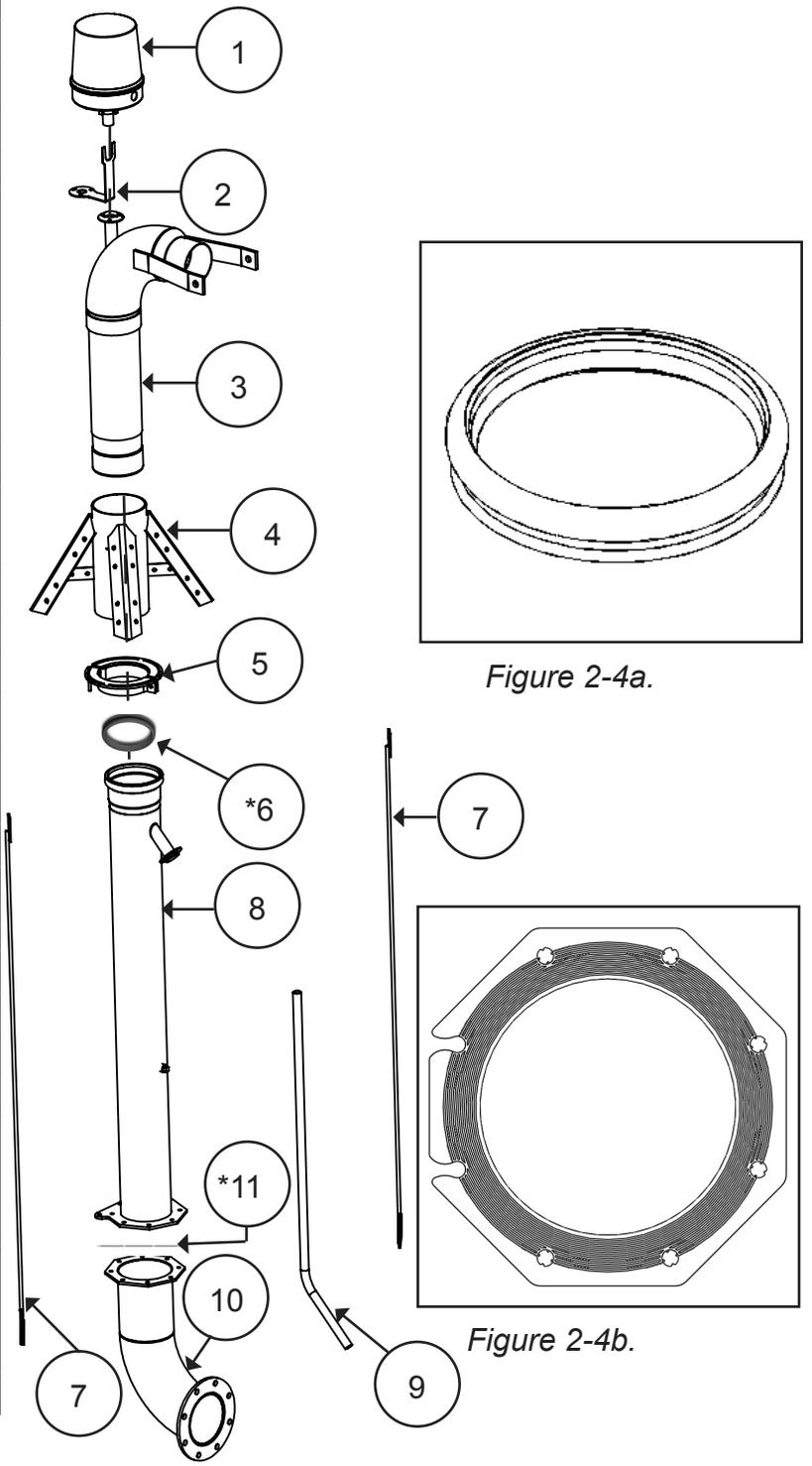


Figure 2-4a.

Figure 2-4b.

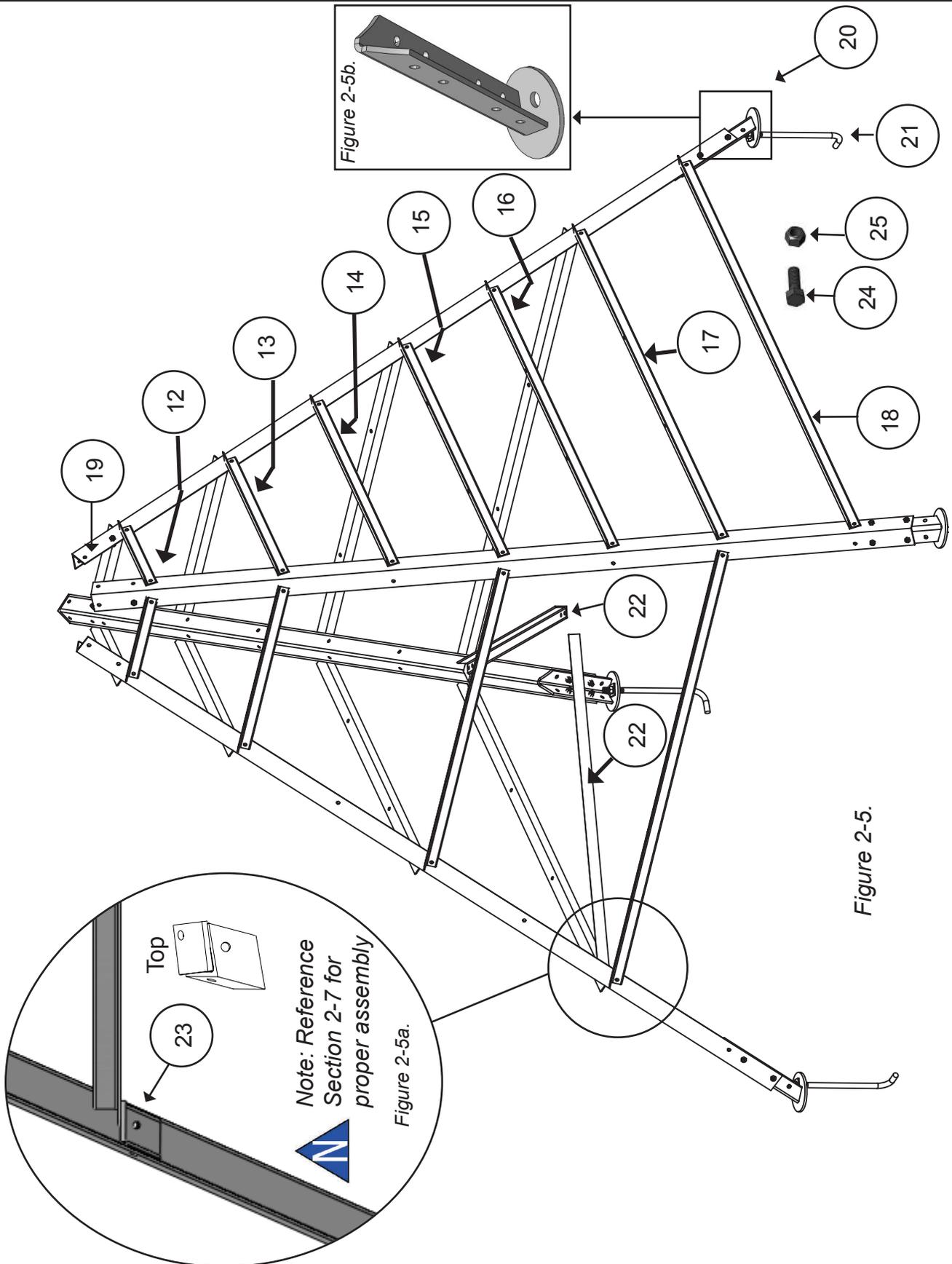


Figure 2-5.



**CAUTION:** Do not tighten bolts at this time. Tightening bolts will prevent adjustment of pivot assembly when placing on pivot pad.



**Note:** Reference parts list in Sections 2-4 and 2-5 for assembly.

1. Locate (1) bearing assembly, (4) pivot legs, and (4) leg mounts.
2. Align predrilled holes on leg mounts to predrilled holes on inside of pivot leg.
3. Insert 1-1/2" hex bolt through outside of pivot leg and leg mount.
4. Place nut on bolt end; hand tighten to secure.
5. Place pivots legs on pre-drilled holes on bearing assembly and align.
6. Insert 1-1/2" hex bolt through outside of leg and bearing.
7. Place nut on bolt end and hand tighten.
8. Repeat steps 5-7 until all pivot legs are secured to bearing assembly.

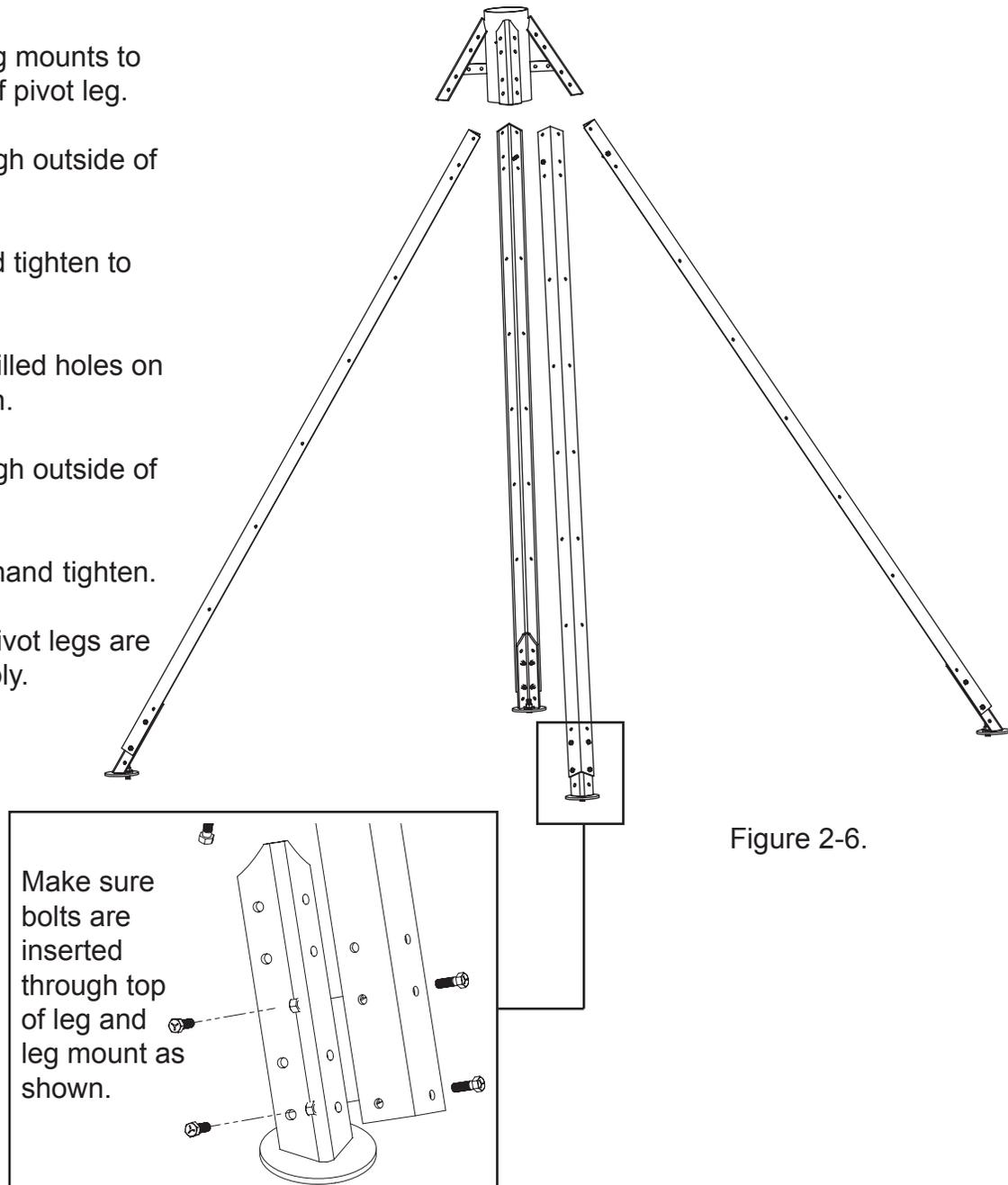
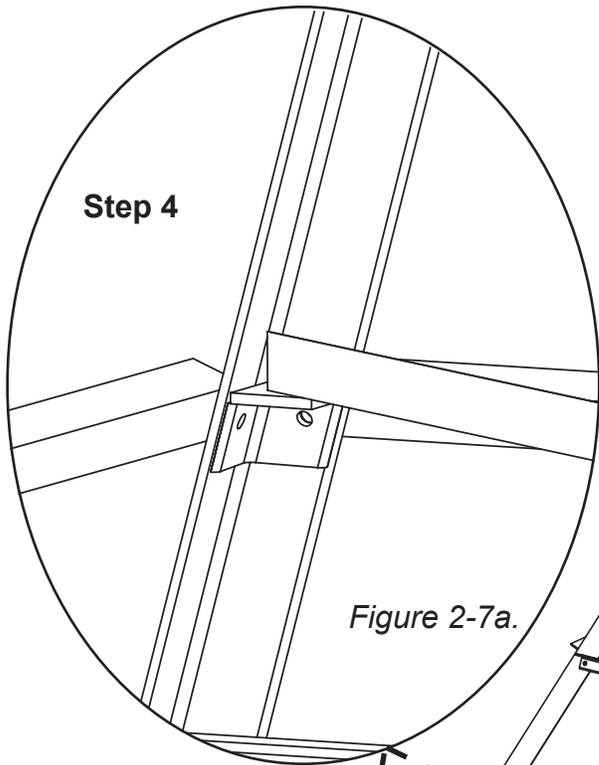


Figure 2-6.

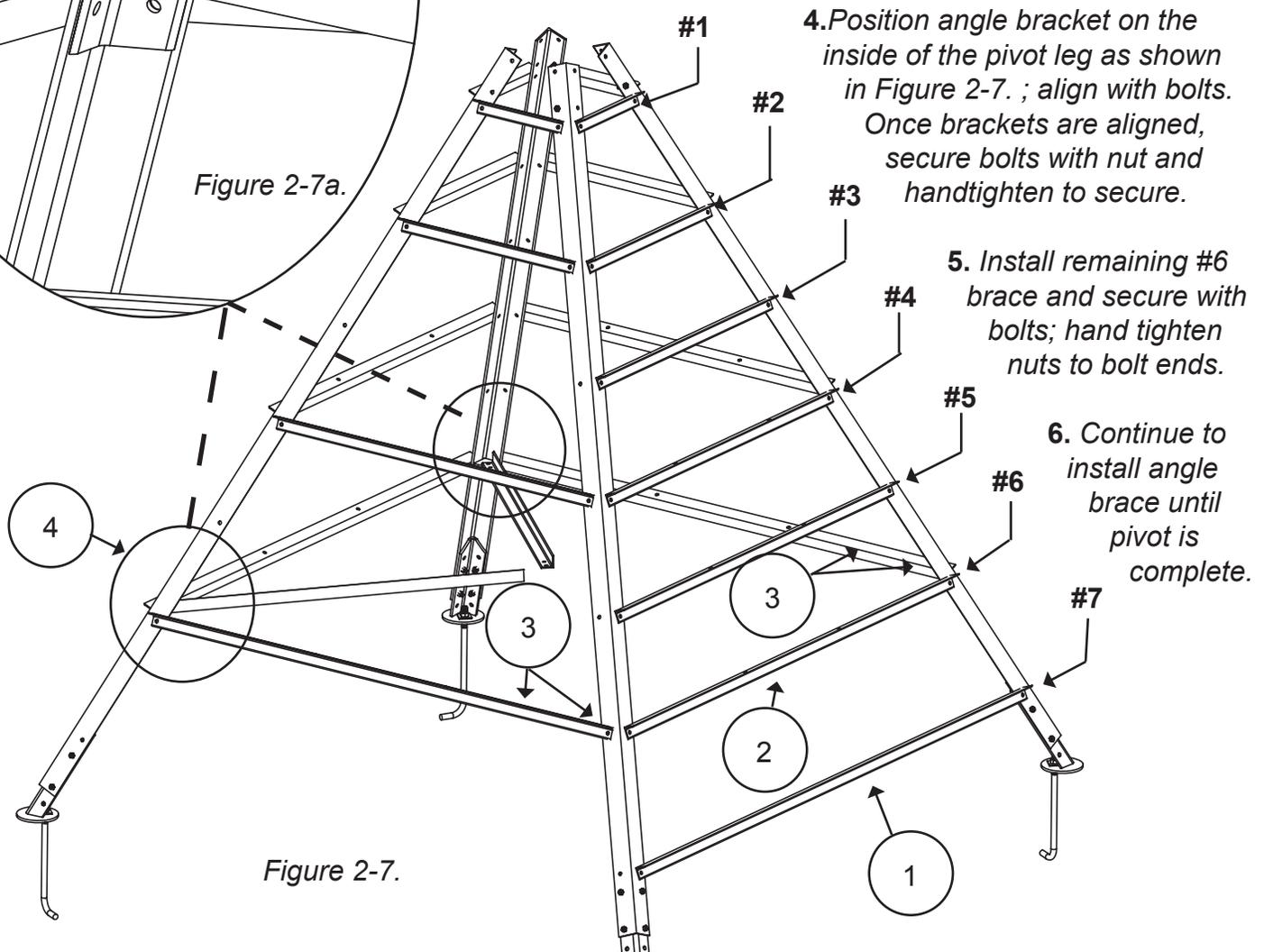
Figure 2-6a.



1. Align #7 angle brace to predrilled holes on exterior pivot leg; beginning at bottom working upwards.
2. Align #6 angle brace to predrilled holes on exterior of pivotleg.
3. Align predrilled holes on #6 angle brace to predrilled holes on exterior pivot leg. Insert bolts through holes on brace and leg. Place nut on bolt end; hand tighten to secure.



*Note: Do not secure both sides of brace see step 4.*



4. Position angle bracket on the inside of the pivot leg as shown in Figure 2-7. ; align with bolts. Once brackets are aligned, secure bolts with nut and handtighten to secure.
5. Install remaining #6 brace and secure with bolts; hand tighten nuts to bolt ends.
6. Continue to install angle brace until pivot is complete.

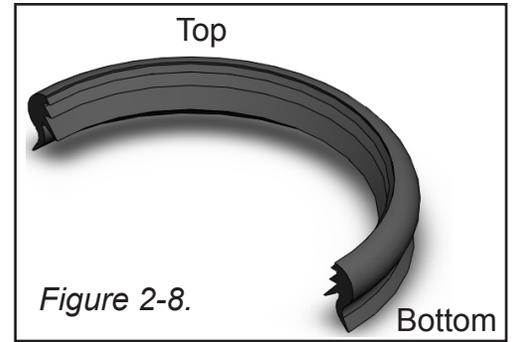
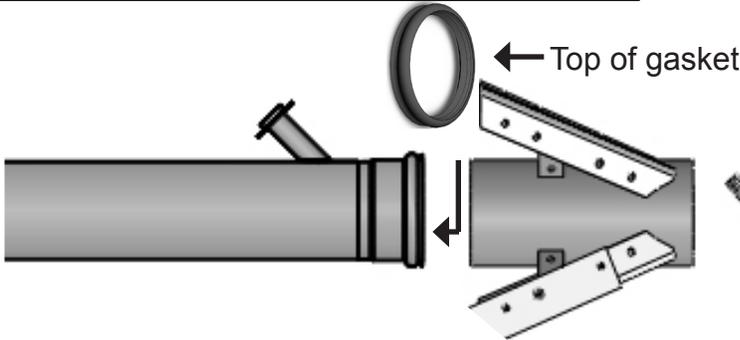


*Note: On a Standard Pivot, Only one (1) side of the pivot will have seven (7) angle brace. The remaining three sides will have a total of four(4) angle brace. If your pivot has the heavy duty cross tie kit, one(1) lower angle brace (#7) is omitted due to lower ell positioning.*

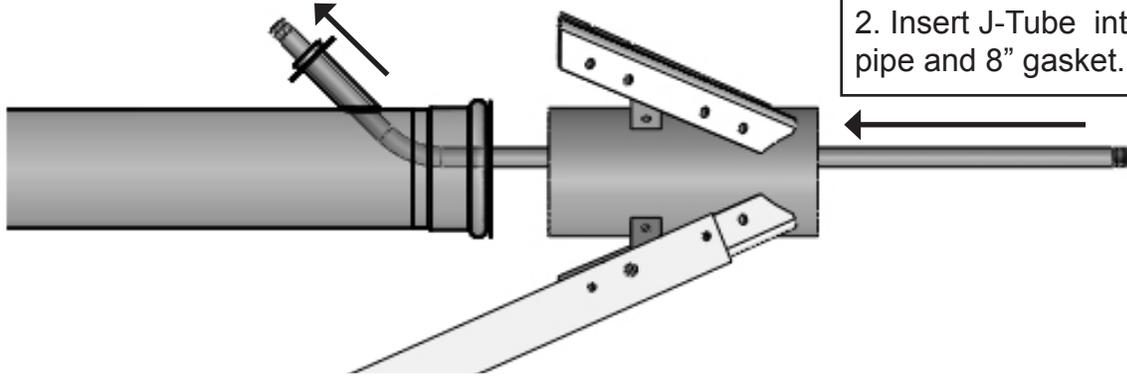
# PIVOT POINT ASSEMBLY

## Standpipe Installation with Tie Rod

1. Insert Triple Lip Gasket into Standpipe. See Figure 2-7.  
*\*TIP Lubricate gasket prior to installation with hand soap for easier install.*

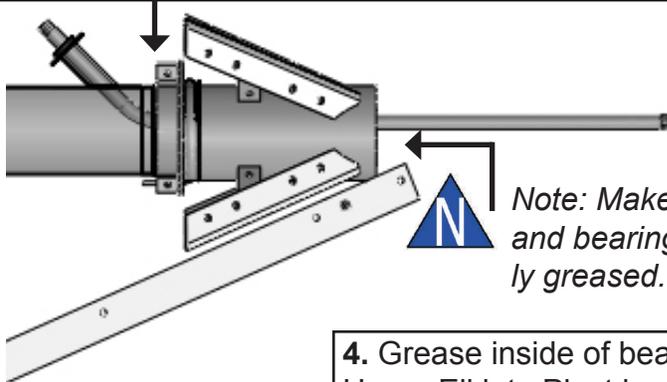


**N** Note: Adjust J-Tube end to allow for proper adjustment for collector ring.

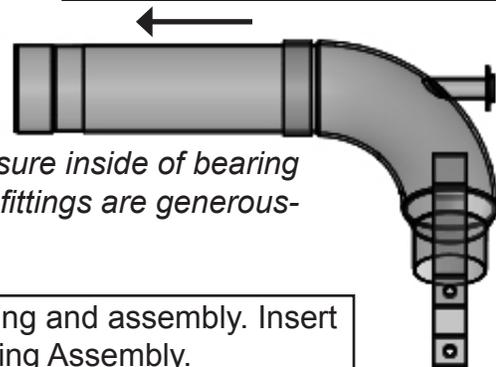


6. Attach half ring to standpipe and bearing assembly as shown below. Insert bolts on half ring; hand tighten nuts to bolt ends.

**N** Note: Do not tighten bolts at this time.



5. Insert Bearing assembly into standpipe.



4. Grease inside of bearing and assembly. Insert Upper Ell into Pivot bearing Assembly.



**WARNING!: USE CARE WHEN LIFTING PIVOT. IMPROPER LIFTING COULD CAUSE SERIOUS INJURY TO SELF OR OTHERS AND EVEN POSSIBLE DEATH**

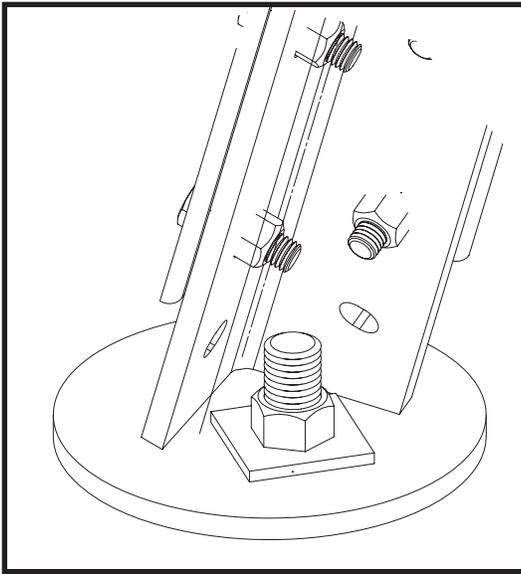
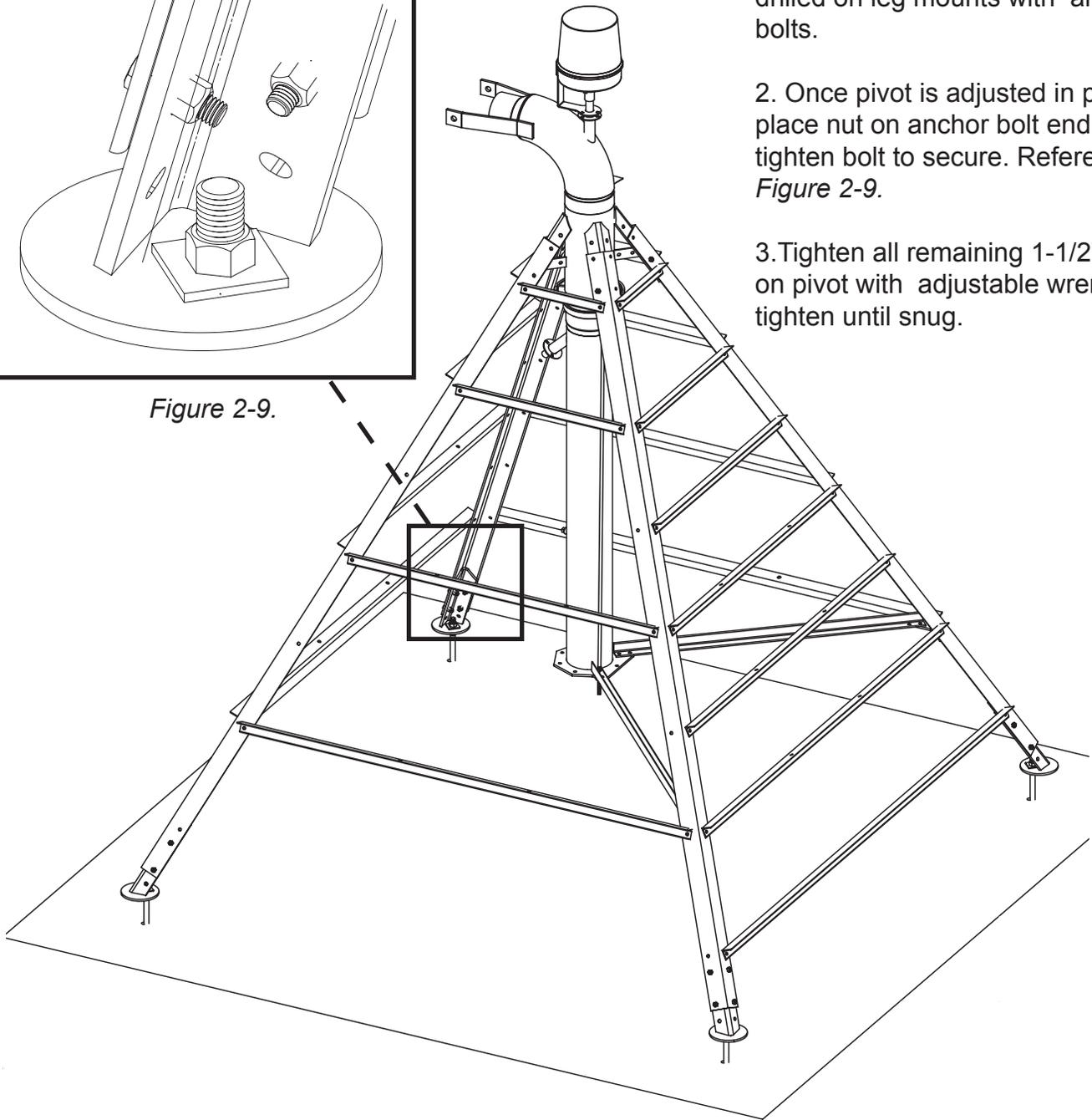


Figure 2-9.



1. Carefully lift pivot and align pre-drilled on leg mounts with anchor bolts.
2. Once pivot is adjusted in place, place nut on anchor bolt end; hand tighten bolt to secure. Reference *Figure 2-9*.
3. Tighten all remaining 1-1/2" bolts on pivot with adjustable wrench; tighten until snug.



Note: Make sure Leg Mounts are flush to pivot pad.

# PIVOT POINT ASSEMBLY

## Standpipe Installation with Tie Rod

1. Locate (2) tie rods and remove nuts from both ends; set aside.
2. Insert (1) tie rod through predrilled holes on torque angle and standpipe flange.
3. Align predrilled holes on tie rod tab to holes on bearing assembly.
4. Insert 1-1/2" bolt through holes and place nut on bolt end; hand tighten to secure.
5. Locate remaining tie and insert tie rod end through standpipe flange.
6. Align predrilled holes on tie rod tab to holes on bearing assembly.
7. Insert 1-1/2" bolt through holes and place nut on bolt end; hand tighten to secure.



*Note: Only one tie rod is secured to both torque angle and standpipe flange.*

Figure 2-10.



*Note: Make sure torque angle is sitting on top of standpipe flange*

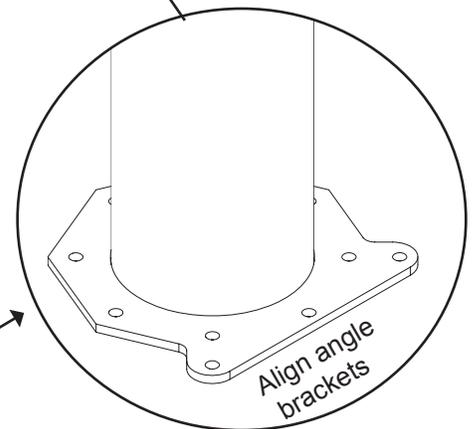
Torque Angle

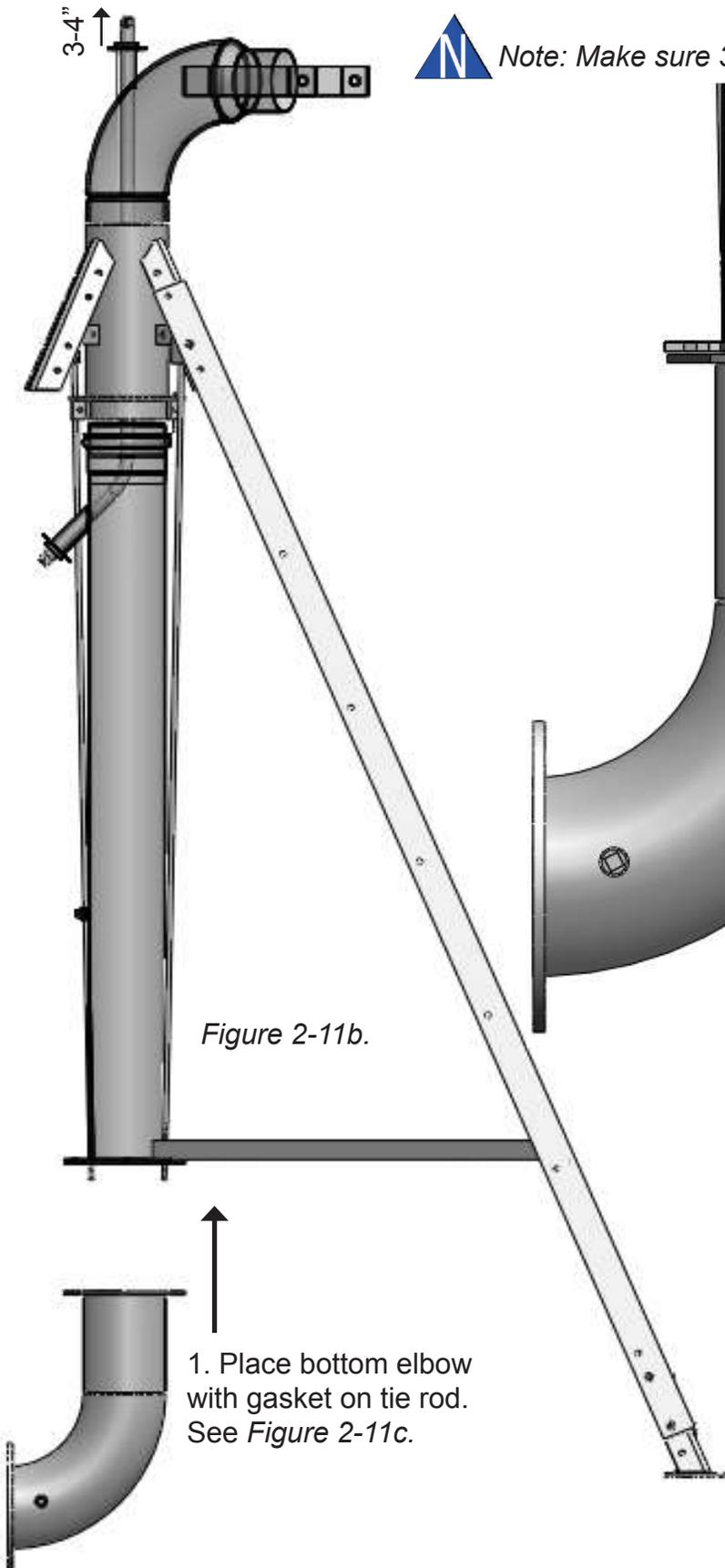


*Note: Do not secure tie rod to standpipe flange at this time.*



*Note: Make sure lip on standpipe flange is aligned with angle brackets.*





6. Tighten tie rod bolt nuts to level torque angles.



Caution: Failure to properly level torque angles will result in severe water leaks and poor machine performance and operation.

7. Install remaining nut bolts; tighten with an adjustable we.



Figure 2-11c.

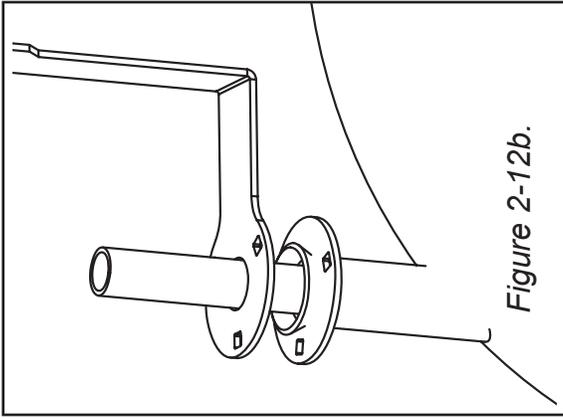


Figure 2-12b.

**Note:** Make sure stop flange is aligned with upper elbow as shown in Figure 2-12a.



1. Place Stop Flange on top of wedgetite.
2. Align predrilled holes on stop flange with holes on wedgetite Reference Figure 2-12b.
3. Insert bolts through stop flange and wedgetite; secure bolts with nut locks.



**Note:** Reference Electrical section for collector ring wiring

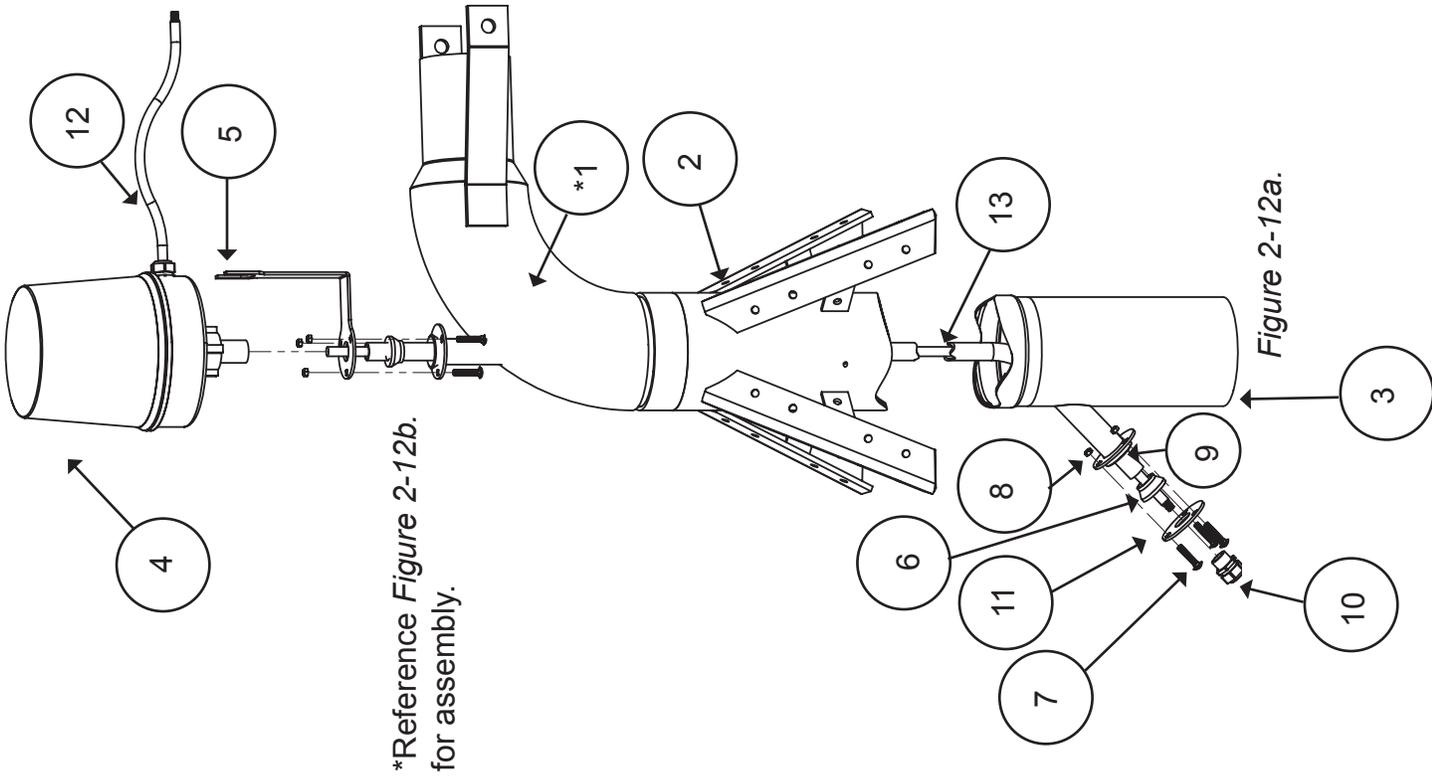


Figure 2-12a.

\*Reference Figure 2-12b. for assembly.

## Collector Ring Parts List

ITEM	PART#	QTY	DESCRIPTION
*1	10157-11	1	UPPER ELBOW 6-5/8-OR-
*	10854-32	1	UPPER ELBOW 7 P W/NAMEPLATE -OR-
*	10186-11	1	PIVOT ELBOW 8.63 G -OR-
*	10855-32	1	UPPER ELBOW 9 P W/NAMEPLATE
2	10043-11	1	BEARING ASM 6-5/8
3	10039-11	1	STAND PIPE RISER
4	02399-01	1	COLLECTOR RING
5	07055-11	1	COLLECTOR STOP FL
6	07015-02	2	WGT GASKET 1
7	02072-03	6	CARRIAGE BOLT 3/8 X 2
8	02031-05	6	NUT LOCK 3/8
9	02079-24	1	COUPLER * NOT FULLY SHOWN
10	02157-14	2	STRAIN RELIEF 1 NPT X.75
11	07014-14	1	WEDGETITE FLNG
12	03055-41	1	WIRE 130 FT
*	03055-42	1	WIRE 150 FT (NOT SHOWN)
*	03055-43	1	WIRE 170 FT (NOTSHOWN)
*	03055-46	1	WIRE 190FT
*	03055-47	1	WIRE 210 FT
13	10046-41	1	CONDUIT SS

# PIVOT POINT ASSEMBLY

## Pivot Point Control Panel

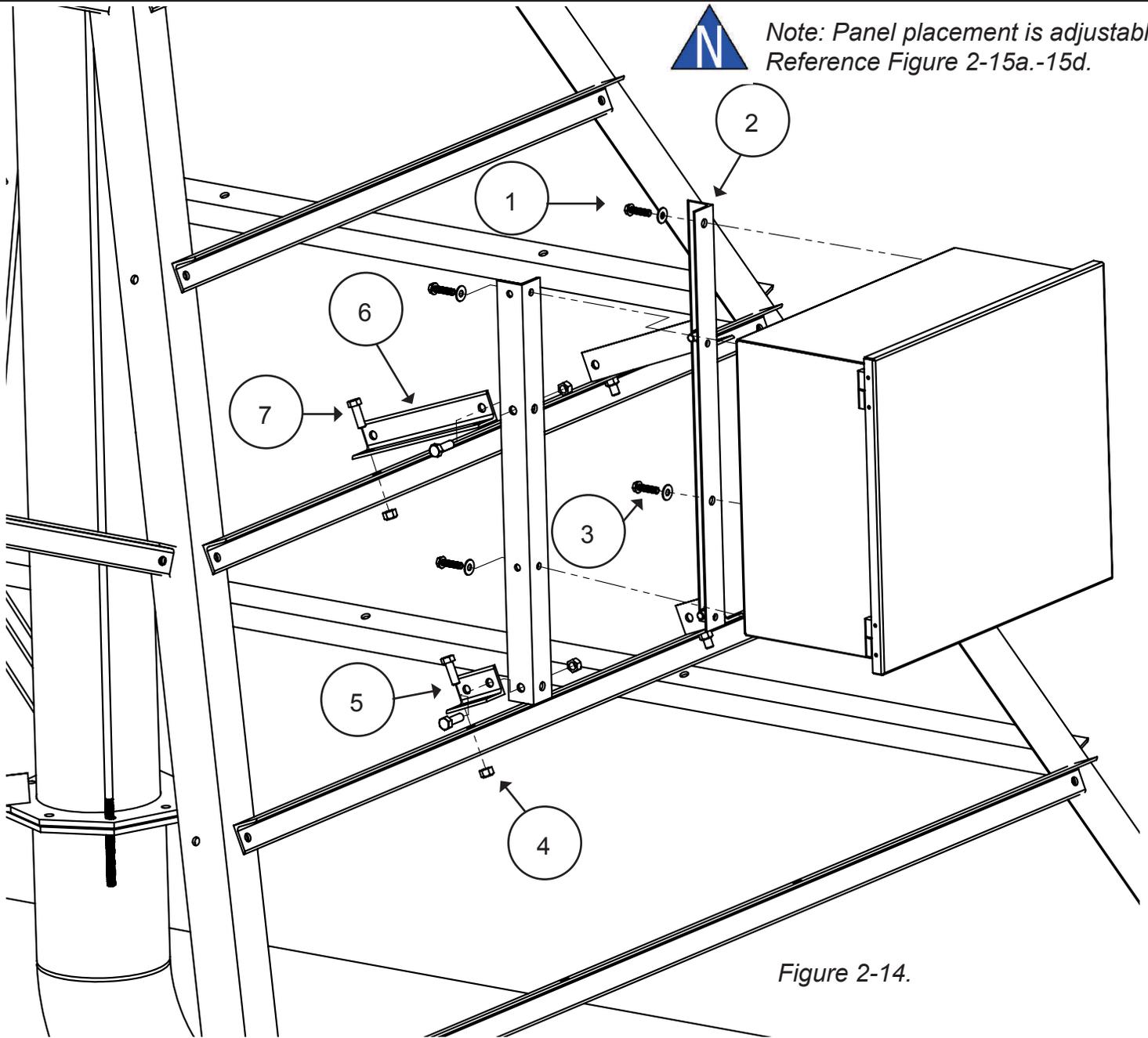


Figure 2-14.

ITEM	PART#	QTY	DESCRIPTION
1	02064-15	4	HEX BOLT 3/8" x 1/2" G5
2	10047-11	2	UPPER PANEL ATTACHMENT ( to panel mount rail)
3	02042-08	4	WASHER 3/8"
4	02031-07	8	NUT LOCK 1/2
5	10049-11	2	LOWER PANEL ATTACHMENT
6	10048-11	2	PANEL ATTACHMENT TOP (to top panel attachment)
7	02066-04	8	HEX BOLT G5 1/2" X 1-1/2"



Note: Measurements are taken from pivot pad to bottom of panel.

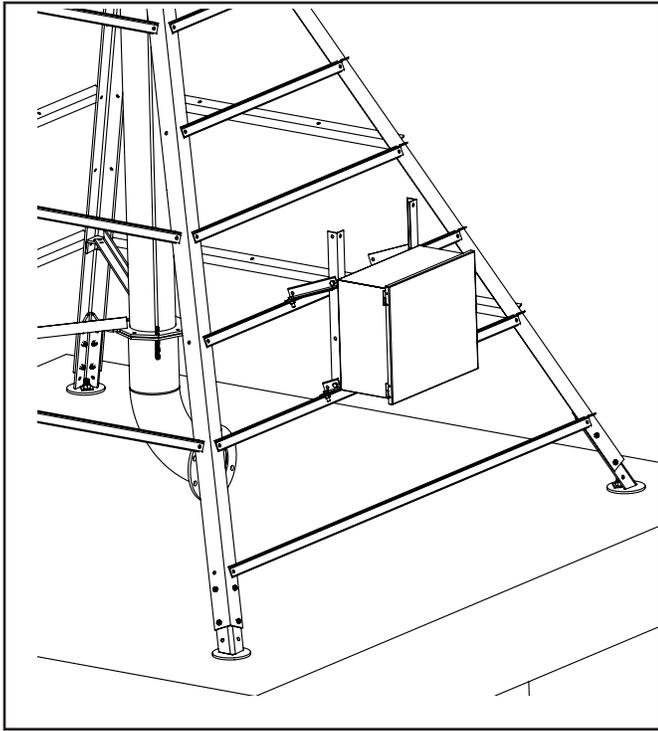


Figure 2-15a.

**34-1/2" Positioning**

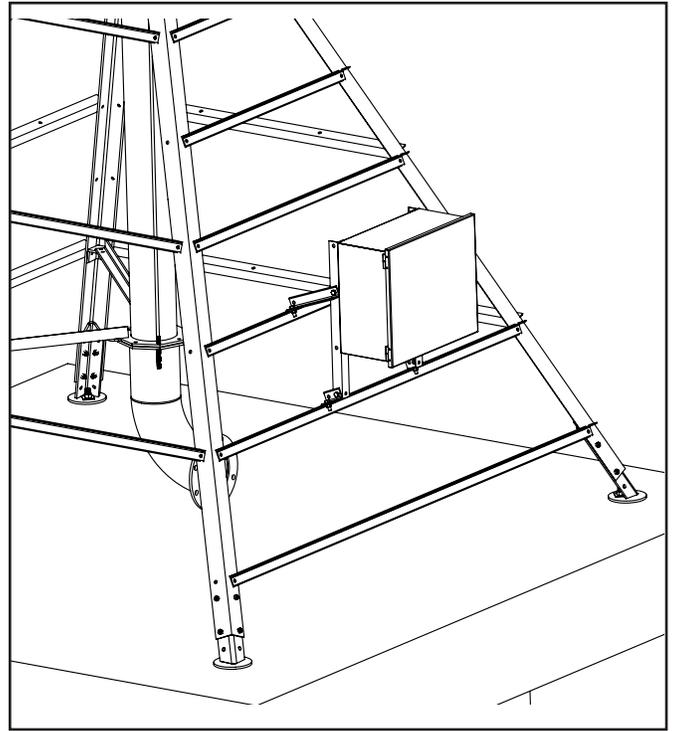


Figure 2-15b.

**43" Positioning**

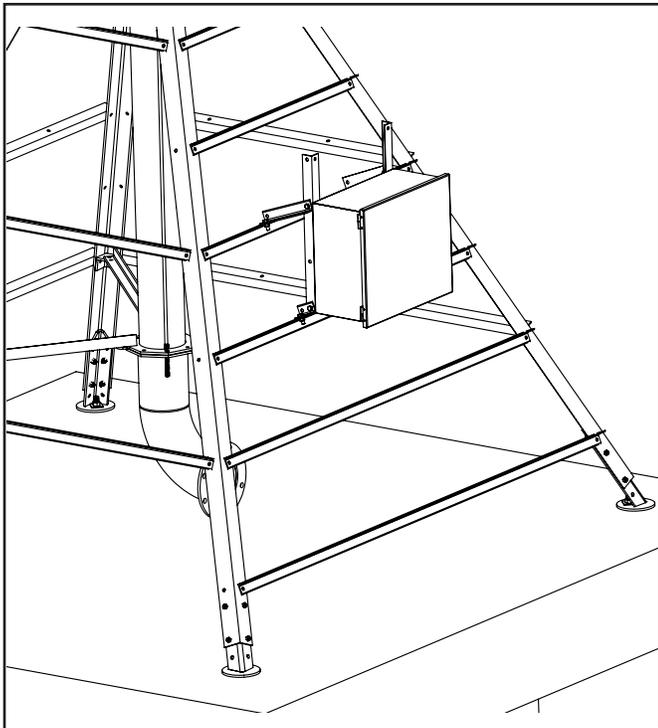


Figure 2-15c.

**50-1/2" Positioning**

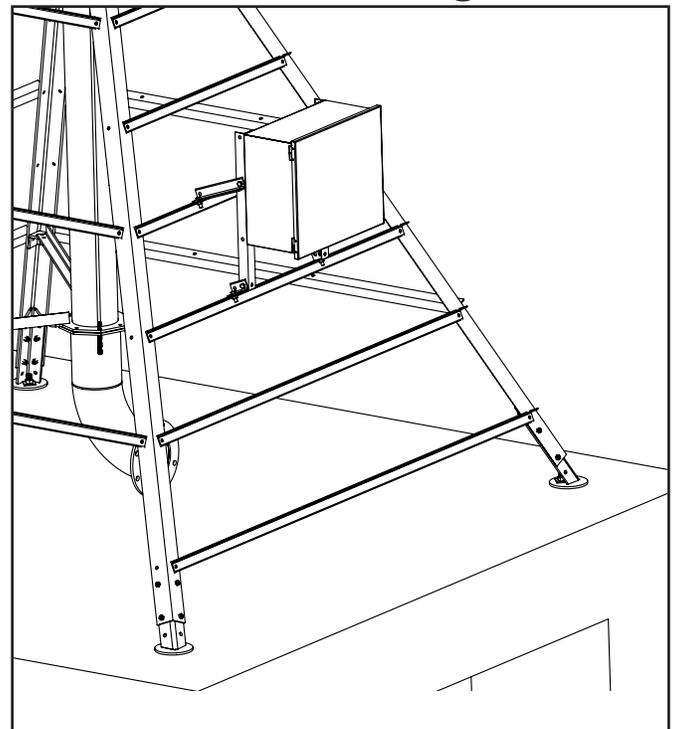
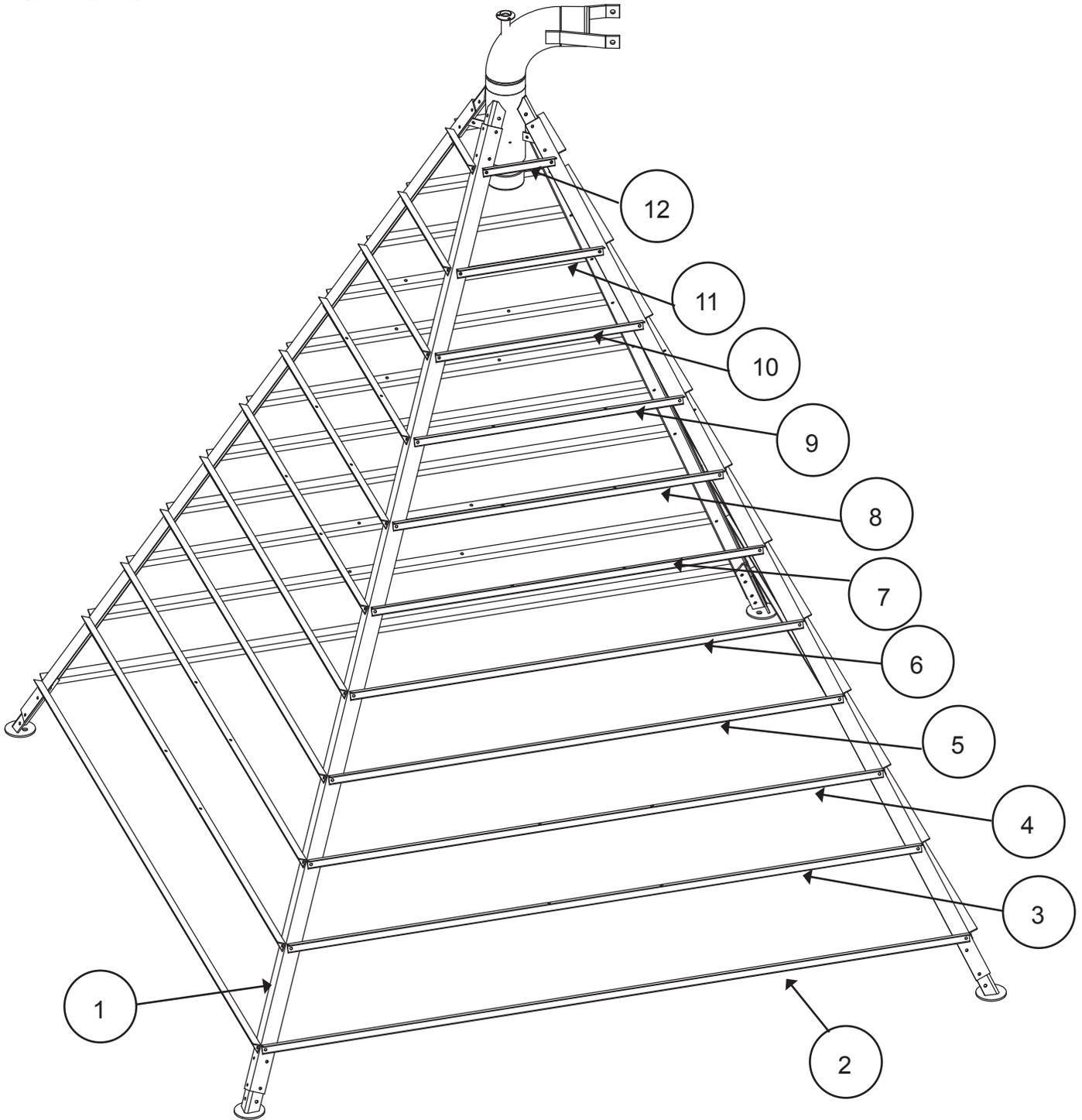


Figure 2-15d.

**59" Positioning**



Note: Reference Sections  
2-4 to 2-13 for assembly



Item	Part#	Qty	Description
1	10485-11	4	PIVOT LEG G 216 1/4
2	10490-11	4	PIVOT ANGLE BRACE #11 160 11/16
3	10489-11	4	PIVOT ANGLE BRACE #10 143 5/16
4	10488-11	4	PIVOT ANGLE BRACE #9 130 11/16
5	10487-11	4	PIVOT ANGLE BRACE #8 116 3/4
6	10486-11	4	PIVOT ANGLE BRACE #7 102 13/16
7	10033-11	4	PIVOT ANGLE BRACE #6 88.88
8	10035-11	4	PIVOT ANGLE BRACE #5 74.94
9	10032-11	4	PIVOT ANGLE BRACE #4 61
10	10034-11	4	PIVOT ANGLE BRACE #3 47.06
11	10031-11	4	PIVOT ANGLE BRACE #2 33.13
12	10030-11	4	PIVOT ANGLE BRACE #1 16.25

# PIVOT POINT ASSEMBLY

## HP Pivot Point Assembly

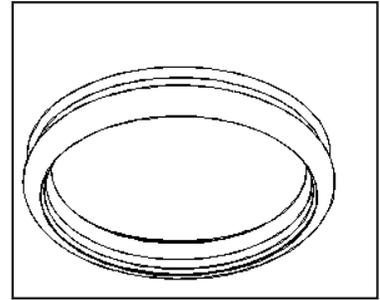
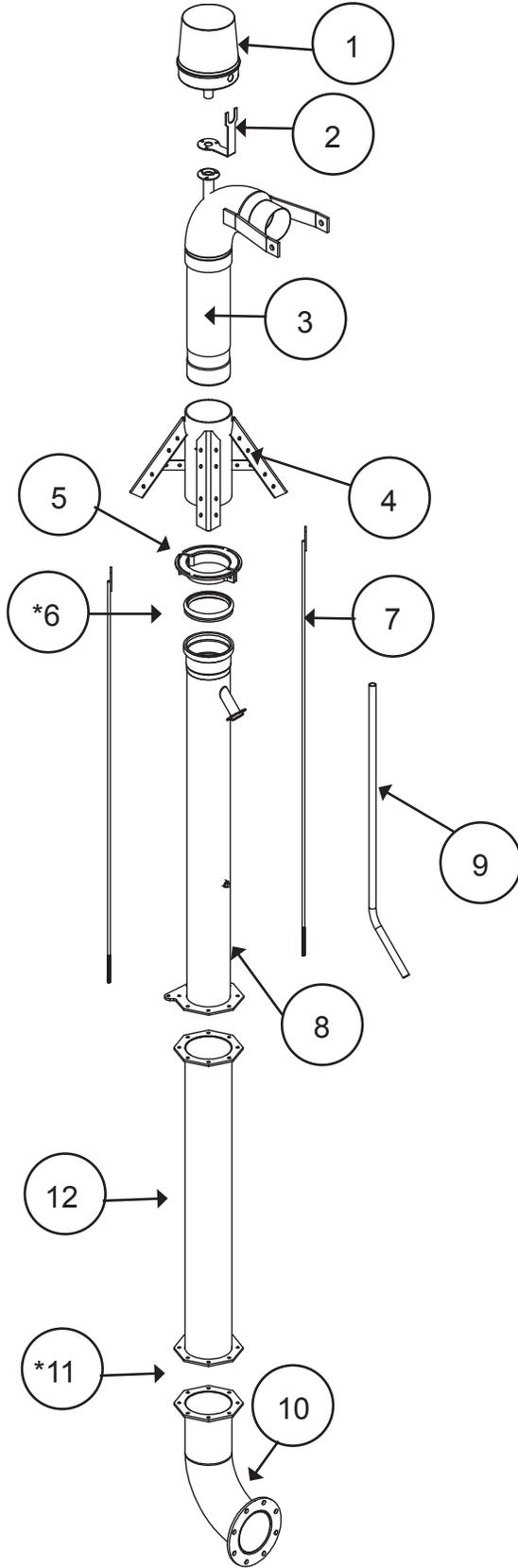


Figure 2-18a.

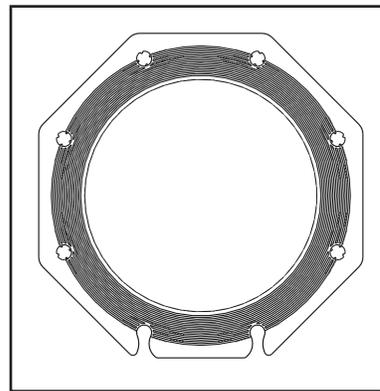
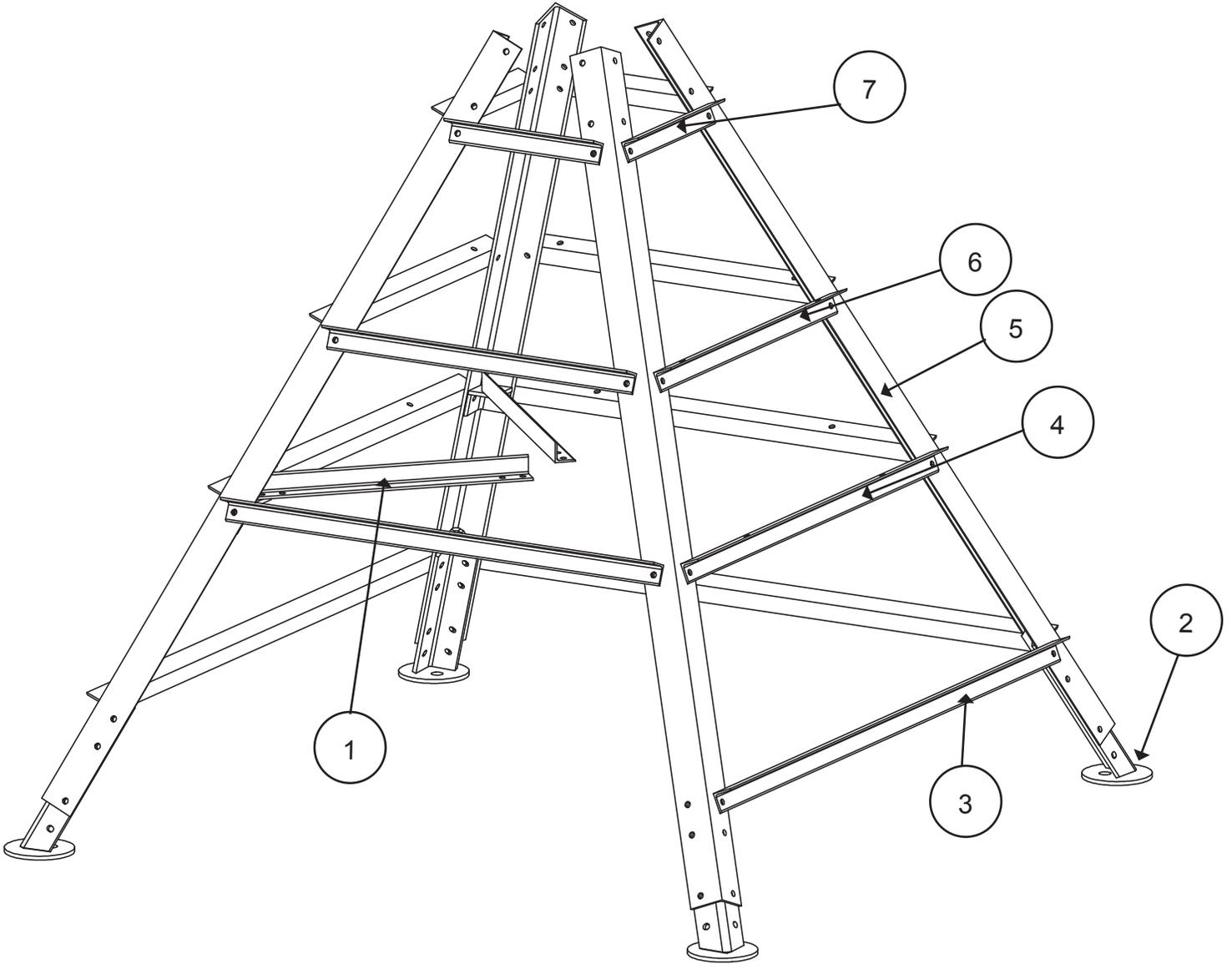


Figure 2-18b.

Item	Part #	QTY	Description
<b>1</b>	02399-01	1	Collector Ring
<b>2</b>	07055-11	1	StopFlange
<b>3</b>	10157-11	1	6-5/8 Upper Elbow -OR-
*	10854-32	1	Elbow 7 P w/nameplate
*	10186-11	1	8-5/8 Upper Elbow -OR-
*	10855-32	1	Elbow 9 P w/nameplate
<b>4</b>	10043-01	1	Bearing Assembly
<b>5</b>	10090-11	1	Half Ring
<b>6</b>	03219-02	1	Triple Lip Gasket
<b>7</b>	10087-12	2	Tie Rod
<b>8</b>	10039-11	1	Stand Pipe -OR-
*	10850-51	1	Stand Pipe Stainless Steel
<b>9</b>	10046-41	1	Conduit (J-Tube)
<b>*10</b>	10079-11	1	CP Inlet Elbow IF X CPF 8.63 X 8.63-OR-
*	10079-41		CP Inlet Elbow IF X CPF 8.63 X 8.63 SS
<b>*Option</b>	10234-11	1	CP Inlet Elbow RM X CPF 8 X 8.63 - OR-
*	10859-31		CP Inlet Elbow RM X CPF 8 X 8.63 SS
<b>11</b>	10735-11	1	Plastic Flange Gasket
<b>12</b>	10491-11	1	Standpipe Extension Spool 64 3/8



Note: Reference Sections 2-4 to 2-13 for assembly



Item	Part#	Qty	Description
1	10695-11	2	LP PIVOT TORSIONAL ANGLE 26 15/16
2	10071-11	4	PIVOT LEG MNT ASM
3	10032-11	3	PIVOT ANGLE BRACE #4 61
4	10034-11	4	PIVOT ANGLE BRACE #3 47.06
5	10698-11	4	LP PIVOT LEG 84 1/8
6	10031-11	4	PIVOT ANGLE BRACE #2 33.13
7	10030-11	4	PIVOT ANGLE BRACE #1 16.25

# PIVOT POINT ASSEMBLY

## Low Profile Pivot Assembly

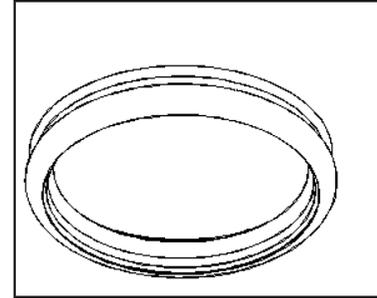
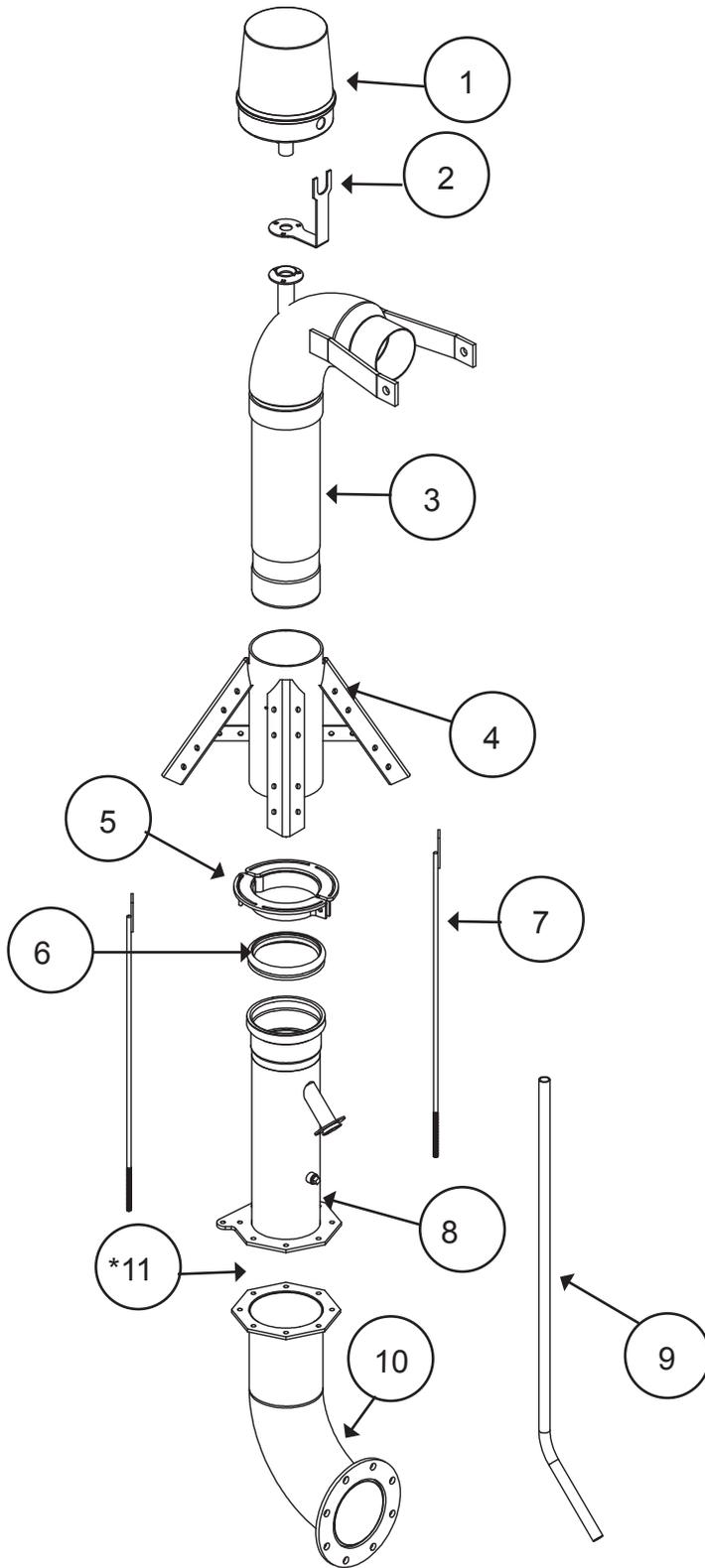


Figure 2-18a.

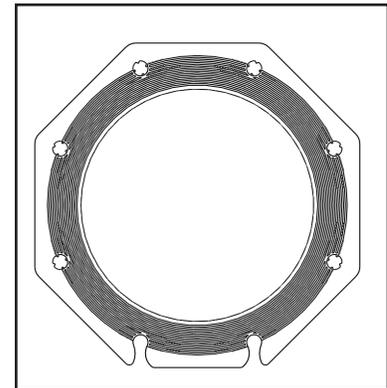
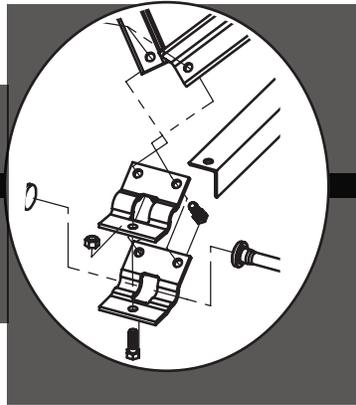
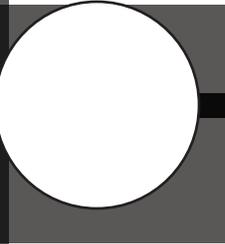
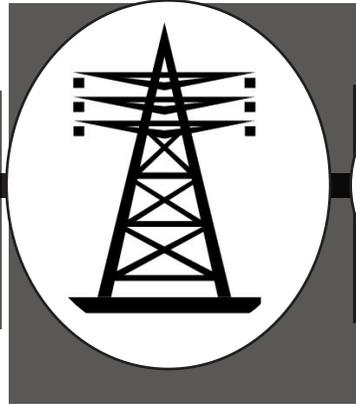
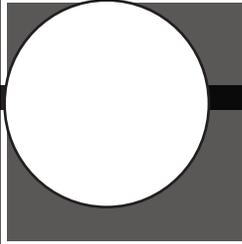
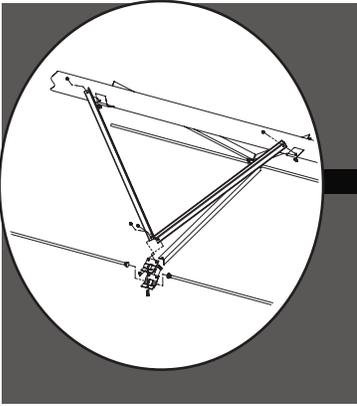


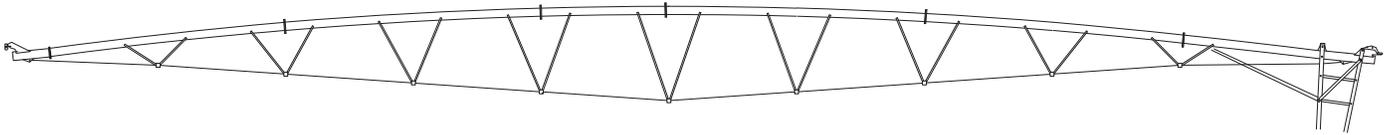
Figure 2-18b.

Item	Part #	QTY	Description
<b>1</b>	02399-01	1	Collector Ring
<b>2</b>	07055-11	1	StopFlange
<b>3</b>	10157-11	1	6-5/8 Upper Elbow -OR-
*	10854-32	1	Elbow 7 P w/nameplate
*	10186-11	1	8-5/8 Upper Elbow -OR-
*	10855-32	1	Elbow 9 P w/nameplate
<b>4</b>	10043-01	1	Bearing Assembly
<b>5</b>	10090-11	1	Half Ring
<b>6</b>	03219-02	1	Triple Lip Gasket
<b>7</b>	10696-12	2	Lp Pivot Tie Rod 43
<b>8</b>	10688-11	1	LP Stand Pipe -OR-
*	10850-51	1	Stand Pipe Stainless Steel
<b>9</b>	10046-41	1	Conduit (J-Tube)
<b>*10</b>	10079-11	1	CP Inlet Elbow IF X CPF 8.63 X 8.63 -OR-
*	10079-41		CP Inlet Elbow IF X CPF 8.63 X 8.63 SS
<b>*Option</b>	10234-11	1	CP Inlet Elbow RM X CPF 8 X 8.63 - OR-
*	10859-31		CP Inlet Elbow RM X CPF 8 X 8.63 SS
<b>11</b>	10735-11	1	Plastic Flange Gasket

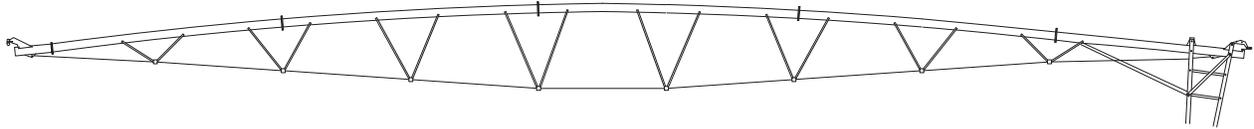
# SPAN ASSEMBLY



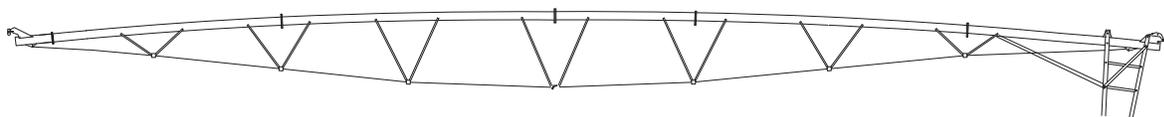
203.5' SPAN (62.0 meters)



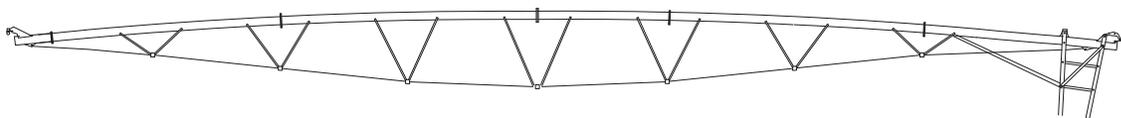
184' SPAN (56.1 meters)



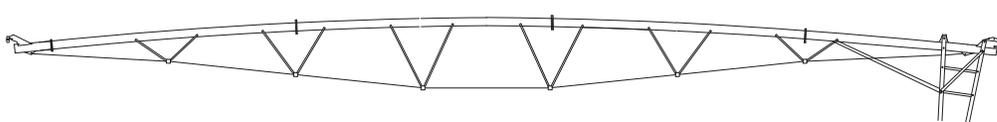
164.5' SPAN (50.1 meters)



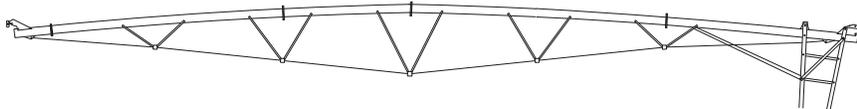
160' SPAN (LEPA) (48.8 meters)



145' SPAN (44.2 meters)



125.5' SPAN (38.3 meters)

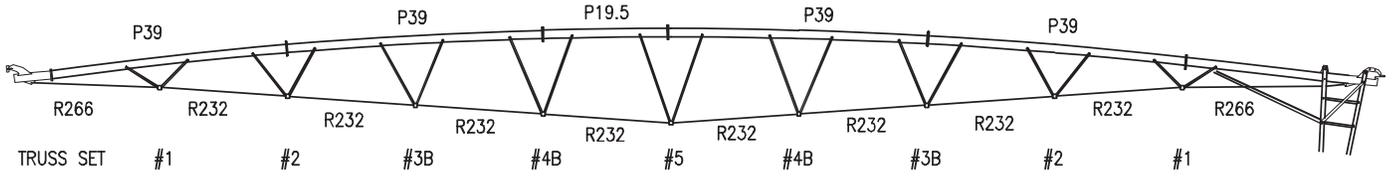


The following tips and recommendations are provided to aid in the safe and efficient assembly of pivot spans. Though different methods may vary for general assembly, the following will help to ensure the assembly will be done, quickly, safely and will provide a strong, sound structure.

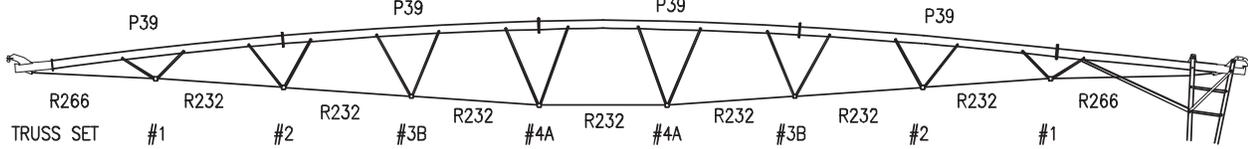
- Follow the bolt tightening procedure set forth in the Pivot Point Assembly Tips and Recommendations section..
- When laying out pipe, any 19.5' sections used (125.5', 164.5', and 203.5' spans only) should be located toward the center of the span, not at the ends.
- The first span in the machine should be assembled with the pivot point end beginning beside the pivot point, closely in line with the pivot point connection. This will allow the span to simply be swung over to the pivot point connection rather than dragging the completed span toward the pivot point.
- Extreme care should be taken to stabilize the first span with two or three people on each side, when connecting it to the pivot point, as it will possibly tend to “roll” when being lifted up toward the pivot point connection.
- It is recommended that spans be assembled “pipe-at-a-time”, that is, assembling truss sets onto pipes as the pipes are bolted together, as opposed to bolting all the pipe together at once, then assembling the trussing, or “spanning”. If the spanning technique is preferred, proper spanning cables must be used to avoid damage to the pipe flanges.
- When tightening the pipe flange and receiver flange bolts, tighten bolts tightly and uniformly using a cross-tightening pattern, but do not distort the pipe flanges! This could lead to leaking at the joint.
- Take extra care to ensure there is no dirt or debris between the two truss rod joining brackets at each truss rod connection. This could allow the truss rods to pull through the brackets, which could cause the span to collapse.

- Pay special attention to the assembly of the number 1 truss set on all spans. This truss set consists of 2 short legs and 2 long legs (varying by only 2 inches) and a special crosstie. The long legs must bolt on to the pipe toward the end of the span, and the short legs toward the middle of the span (refer to End Truss Assembly diagram).
- It is recommended that the truss sets be bolted together as follows: Join the truss rods together and tighten the 1/2" bolt; attach the cross tie to the truss rod bracket, finger tight; attach the truss legs to the truss rod bracket, finger tight; attach the truss leg to the pipe, finger tight; attach the brace to the truss legs (if used), finger tight. Now tighten the bolts in the order following: Truss legs at truss rod brackets; truss legs at pipe; crossties; and finally the Trapezoid-gusset bolts (if used).

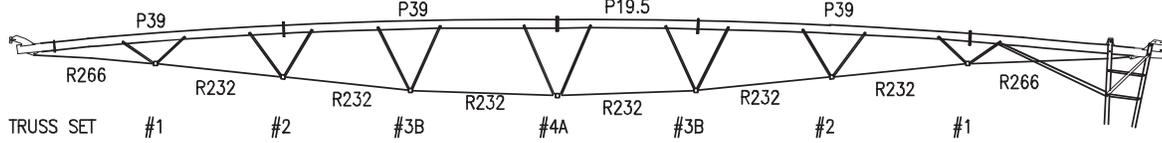
203.5' SPAN (62.0 meters)



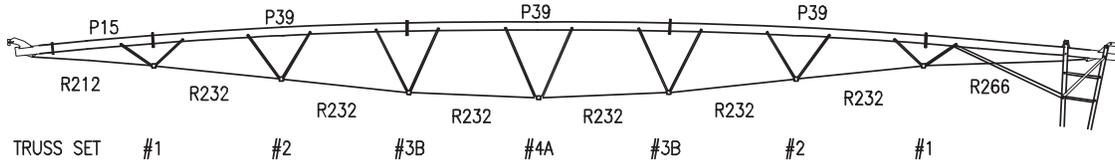
184' SPAN (56.1 meters)



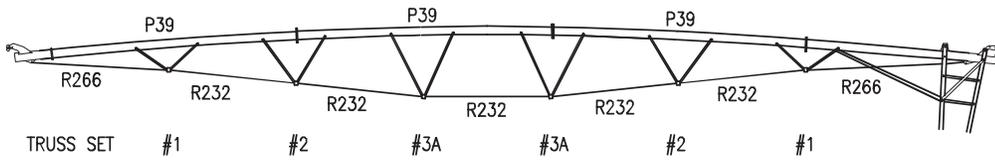
164.5' SPAN (50.1 meters)



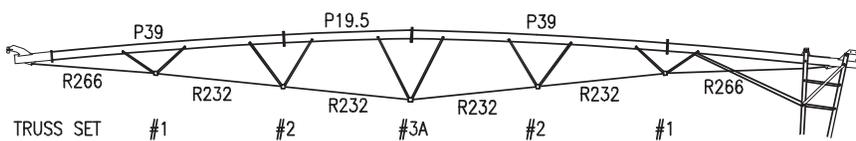
160' SPAN (48.8 meters)



145' SPAN (44.2 meters)

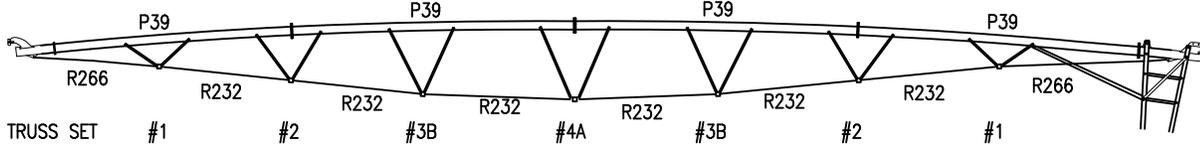


125.5' SPAN (38.3 meters)

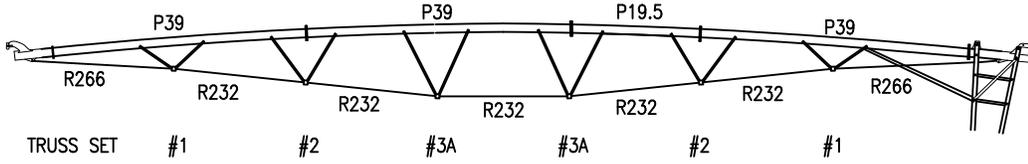


ITEM	PART#	DESCRIPTION
P39	10189-11	CP PIPE 6-5/8" X 39 R 58-1/2" G
	10405-51	CP PIPE 6-5/8" X 39 R 58-1/2" G POLY
P19.5	10190-11	CP PIPE 6-5/8" X 19.5 R 58-1/2" G
	10406-51	CP PIPE 6-5/8" X 19.5 R 58-1/2" G POLY
P15	10948-11	CP PIPE 6-5/8" X 15 R 58.5 G
R212	10949-11	CP TRUSS ROD 212-78 X 3/4
R232	10109-11	CP TRUSS ROD 232 X 3/4 ORANGE
R266	10110-11	CP TRUSS ROD 266-7/8 X 3/4 BLUE
TRUSS #1	10050-11	CP TRUSS LEG #1A 55-3/4" G
	10051-11	CP TRUSS LEG #1B 53-5/16" G
	10052-11	CP TRUSS CROSSTIE #1 67-1/8" G
TRUSS #2	10053-11	CP TRUSS LEG #2 77-3/16" G
	10054-11	CP TRUSS CROSSTIE #2 105-3/16" G
TRUSS #3A	10055-11	CP TRUSS LEG #3A 87" G
	10056-11	CP TRUSS CROSSTIE #3A 122" G
TRUSS #3B	10057-11	CP TRUSS LEG #3B 93-7/8" G
	10058-11	CP TRUSS CROSSTIE #3B 130-1/4" G
TRUSS #4A	10059-11	CP TRUSS LEG #4A 101-9/16" G
	10060-11	CP TRUSS CROSSTIE #4 143-3/16" G
TRUSS #4B	10061-11	CP TRUSS LEG #4B 103-7/16" G
	10060-11	CP TRUSS CROSSTIE #4 143-3/16" G
TRUSS #5	10062-11	CP TRUSS LEG #5 106-3/4" G
	10063-11	CP TRUSS CROSSTIE #5 147-1/4" G
*	10097-11	CP TRUSS TRAPEZOID PRE-G 6-5/8"
*	10830-11	CP TRUSS TRAPEZOID PRE-G 5"
*	91004-11	CP TRUSS BUNDLE 203.5 G
*	91003-11	CP TRUSS BUNDLE 184 G
*	91002-11	CP TRUSS BUNDLE 164.5 G
*	91001-11	CP TRUSS BUNDLE 145 G
*	91000-11	CP TRUSS BUNDLE 125.5 G

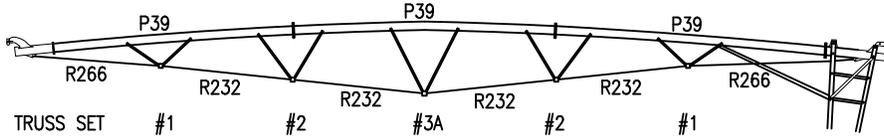
164.5' SPAN (50.1 meters)



145' SPAN (44.2 meters)



125.5' SPAN (38.3 meters)

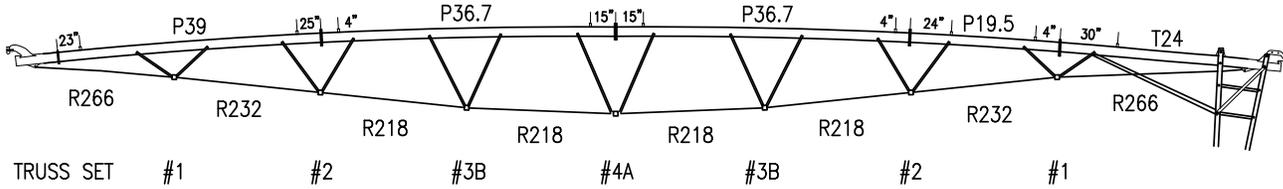


ITEM	PART#	DESCRIPTION
P39	10331-11	CP PIPE 8-5/8" X 39 R 58-1/2" G
	10415-51	CP PIPE 8-5/8" X 39 R 58-1/2" G POLY
P19.5	10333-11	CP PIPE 8-5/8" X 19.5 R 58-1/2" G
	10417-51	CP PIPE 8-5/8" X 19.5 R 58-1/2" G POLY
R232	10109-11	CP TRUSS ROD 232 X 3/4 ORANGE (USED ON 125.5 AND 145 SPANS)
	10147-11	CP TRUSS ROD 232 X 13/16 WHITE (USED ON 164.5 SPAN ONLY)
R266	10110-11	CP TRUSS ROD 266-7/8 X 3/4 BLUE USED ON 125.5 AND 145 SPANS)
	10146-11	CP TRUSS ROD 266-7/8 X 13/16 DARK GREEN (USED ON 164.5 SPAN ONLY)
TRUSS #1	10050-11	CP TRUSS LEG #1A 55-3/4" G
	10051-11	CP TRUSS LEG #1B 53-5/16" G
	10052-11	CP TRUSS CROSSTIE #1 67-1/8" G
TRUSS #2	10053-11	CP TRUSS LEG #2 77-3/16" G
	10054-11	CP TRUSS CROSSTIE #2 105-3/16" G
TRUSS #3A	10055-11	CP TRUSS LEG #3A 87" G
	10056-11	CP TRUSS CROSSTIE #3A 122" G
TRUSS #3B	10057-11	CP TRUSS LEG #3B 93-7/8" G
	10058-11	CP TRUSS CROSSTIE #3B 130-1/4" G
TRUSS #4A	10059-11	CP TRUSS LEG #4A 101-9/16" G
	10060-11	CP TRUSS CROSSTIE #4 143-3/16" G
*	10149-11	CP TRUSS TRAPEZOID G 8-5/8"
*	91002-11	CP TRUSS BUNDLE 164.5 G
*	91001-11	CP TRUSS BUNDLE 145 G
*	91000-11	CP TRUSS BUNDLE 125.5 G

# SPAN ASSEMBLY

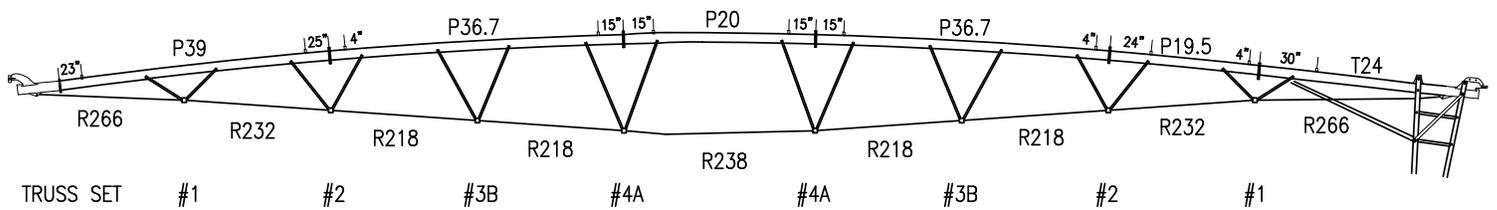
## 160' and 180' LEPA Span 30" Spacing

CP SPAN 160 X 30R (LEPA) (48.8 meters, 0.76 meters)



NOTE RISER SPACING FROM FLANGES AS SHOWN ABOVE TO ORIENT PIPE FOR PROPER SPACING

CP SPAN 180 X 30R (LEPA) (54.9 meters, 0.76 meters)



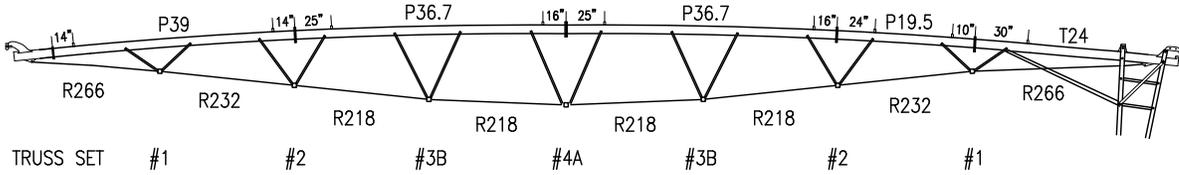
NOTE RISER SPACING FROM FLANGES AS SHOWN ABOVE TO ORIENT PIPE FOR PROPER SPACING

ITEM	PART#	DESCRIPTION
P39	10909-11	CP PIPE 6-5/8" X 39 R 30" G LEPA
P36.7	10910-11	CP PIPE 6-5/8" X 36.75 R 30" G LEPA
P20	10912-11	CP PIPE 6-5/8" X 20 R 30" G LEPA
P19.5	10911-11	CP PIPE 6-5/8" X 19.5 R 30" G LEPA
R218	10915-11	CP TRUSS ROD 218-1/2 X 3/4 G YELLOW
R232	10109-11	CP TRUSS ROD 232 X 3/4 G ORANGE
R238	10929-11	CP TRUSS ROD 238 X 3/4 G
R266	10110-11	CP TRUSS ROD 266-7/8 X 3/4 G BLUE
TRUSS #1	10050-11	CP TRUSS LEG #1A 55-3/4" G
	10051-11	CP TRUSS LEG #1B 53-5/16" G
	10052-11	CP TRUSS CROSSTIE #1 67-1/8" G
TRUSS #2	10053-11	CP TRUSS LEG #2 77-3/16" G
	10054-11	CP TRUSS CROSSTIE #2 105-3/16" G
TRUSS #3B	10057-11	CP TRUSS LEG #3B 93-7/8" G
	10058-11	CP TRUSS CROSSTIE #3B 130-1/4" G
TRUSS #4A	10059-11	CP TRUSS LEG #4A 101-9/16" G
	10060-11	CP TRUSS CROSSTIE #4 143-3/16" G
*	10097-11	CP TRUSS TRAPEZOID PRE-G 6-5/8"
*	91003-11	CP TRUSS BUNDLE 184 G
*	91002-11	CP TRUSS BUNDLE 164.5 G

# SPAN ASSEMBLY

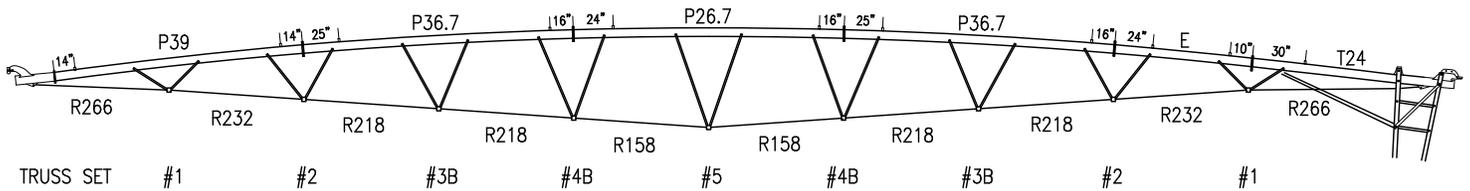
## 160' and 186.7' LEPA Span 40" Spacing

CP SPAN 160 X 40R (LEPA) (48.8 meters, 1.01 meter)



NOTE RISER SPACING FROM FLANGES AS SHOWN ABOVE TO ORIENT PIPE FOR PROPER SPACING

CP SPAN 186.7 X 40R (LEPA) (56.9 meters, 1.01 meters)



NOTE RISER SPACING FROM FLANGES AS SHOWN ABOVE TO ORIENT PIPE FOR PROPER SPACING

ITEM	PART#	DESCRIPTION
P39	10900-11	CP PIPE 6-5/8" X 39 R 40" G LEPA
P36.7	10901-11	CP PIPE 6-5/8" X 36.75 R40" G LEPA
P26.7	10904-11	CP PIPE 6-5/8" X 26.7 R40" G LEPA
P19.5	10903-11	CP PIPE 6-5/8" X 19.5 R 40" G LEPA
R158	10916-11	CP TRUSS ROD 158 X 3/4 G PURPLE
R218	10915-11	CP TRUSS ROD 218-1/2 X 3/4 G YELLOW
R232	10109-11	CP TRUSS ROD 232 X 3/4 G ORANGE
R266	10110-11	CP TRUSS ROD 266-7/8 X 3/4 G BLUE
TRUSS #1	10050-11	CP TRUSS LEG #1A 55-3/4" G
	10051-11	CP TRUSS LEG #1B 53-5/16" G
	10052-11	CP TRUSS CROSSTIE #1 67-1/8" G
TRUSS #2	10053-11	CP TRUSS LEG #2 77-3/16" G
	10054-11	CP TRUSS CROSSTIE #2 105-3/16" G
TRUSS #3B	10057-11	CP TRUSS LEG #3B 93-7/8" G
	10058-11	CP TRUSS CROSSTIE #3B 130-1/4" G
TRUSS #4A	10059-11	CP TRUSS LEG #4A 101-9/16" G
	10060-11	CP TRUSS CROSSTIE #4 143-3/16" G
TRUSS #4B	10061-11	CP TRUSS LEG #4B 103-7/16" G
	10060-11	CP TRUSS CROSSTIE #4 143-3/16" G
TRUSS #5	10062-11	CP TRUSS LEG #5 106-3/4" G
	10063-11	CP TRUSS CROSSTIE #5 147-1/4" G
*	10097-11	CP TRUSS TRAPEZOID PRE-G 6-5/8"
*	91004-11	CP TRUSS BUNDLE 203.5 G
*	91002-11	CP TRUSS BUNDLE 164.5 G

# SPAN ASSEMBLY

## Span Trussing

ITEM	PART#	QTY	DESCRIPTION
#1A	10050-11	1	TRUSS LEG #1A 55-3/4
#1B	10051-11	1	TRUSS LEG #1B 53-5/16
*Cross Tie	10052-11	1	TRUSS CROSS TIE #1 67-1/8

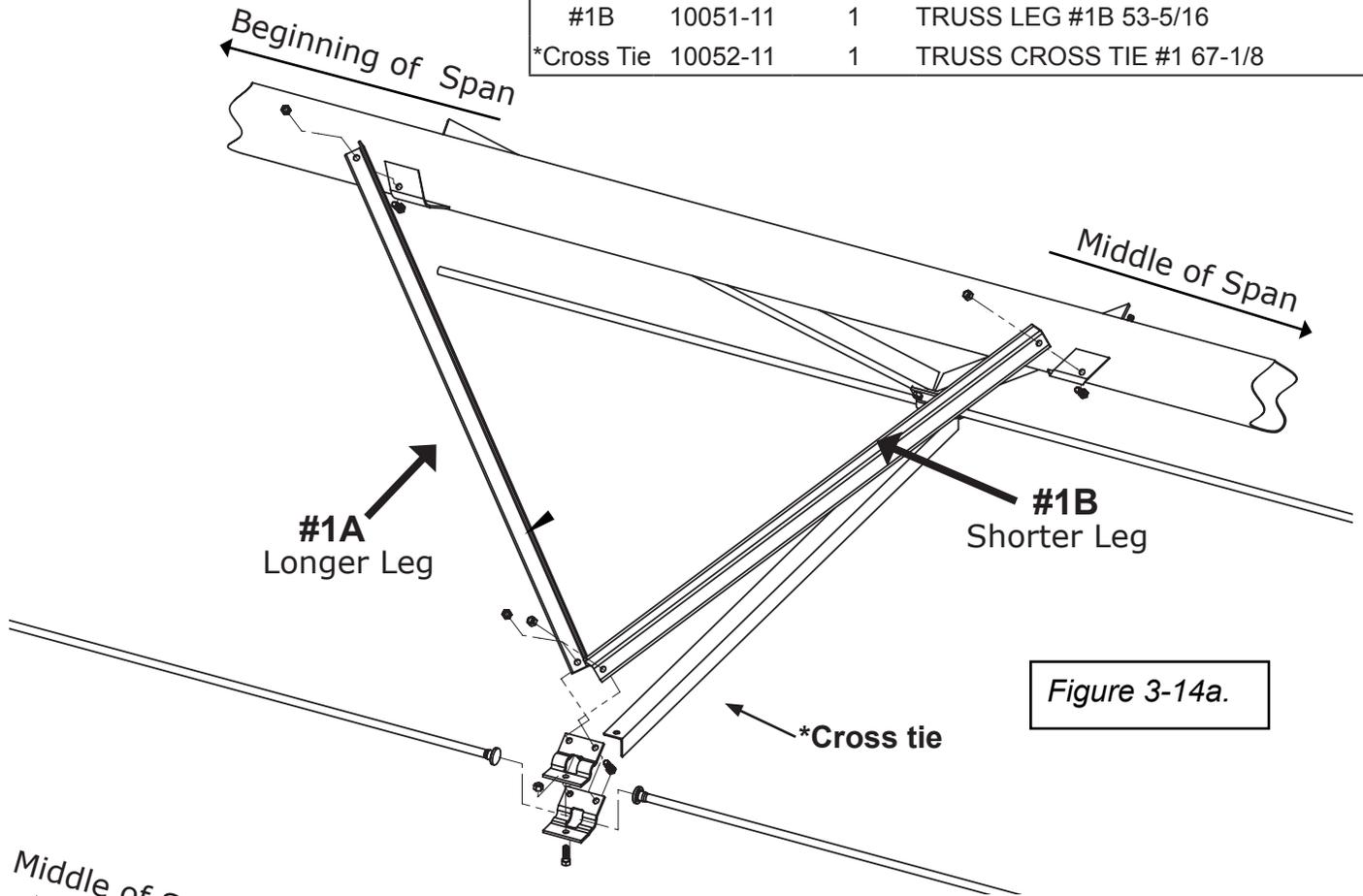


Figure 3-14a.

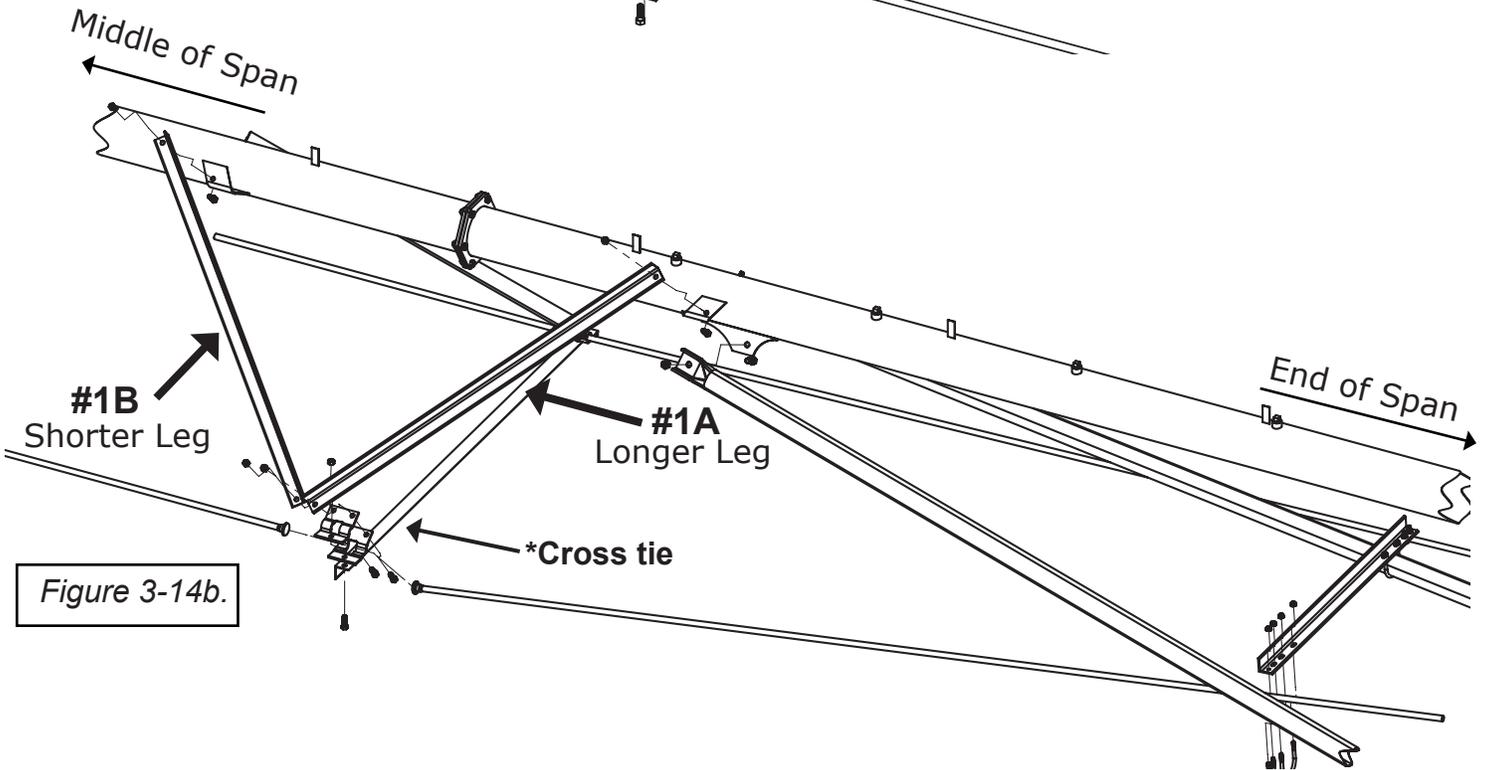


Figure 3-14b.

ITEM	PART#	DESCRIPTION	CROSS TIE	PART #	DESCRIPTION
#2	10053-11	CP TRUSS LEG #2 77.19 G	#2	10054-11	CP TRUSS CROSS TIE #2 105.19 G
#3A	10055-11	TRUSS LEG #3A 87-1/16	#3A	10056-11	TRUSS CROSS TIE #3A 122
#3B	10057-11	TRUSS LEG #3B 93-7/8	#3B	10058-11	TRUSS CROSS TIE #3B 130-1/4
#4A	10059-11	TRUSS LEG #4A 101-9/16	#4A	10060-11	TRUSS CROSS TIE #4 143-3/16
#4B	10061-11	TRUSS LEG #4B 103-7/16	#4B	10060-11	TRUSS CROSS TIE #4 143-3/16
#5	10062-11	TRUSS LEG #5 106-3/4	#5	10063-11	TRUSS CROSS TIE #5 147-1/4

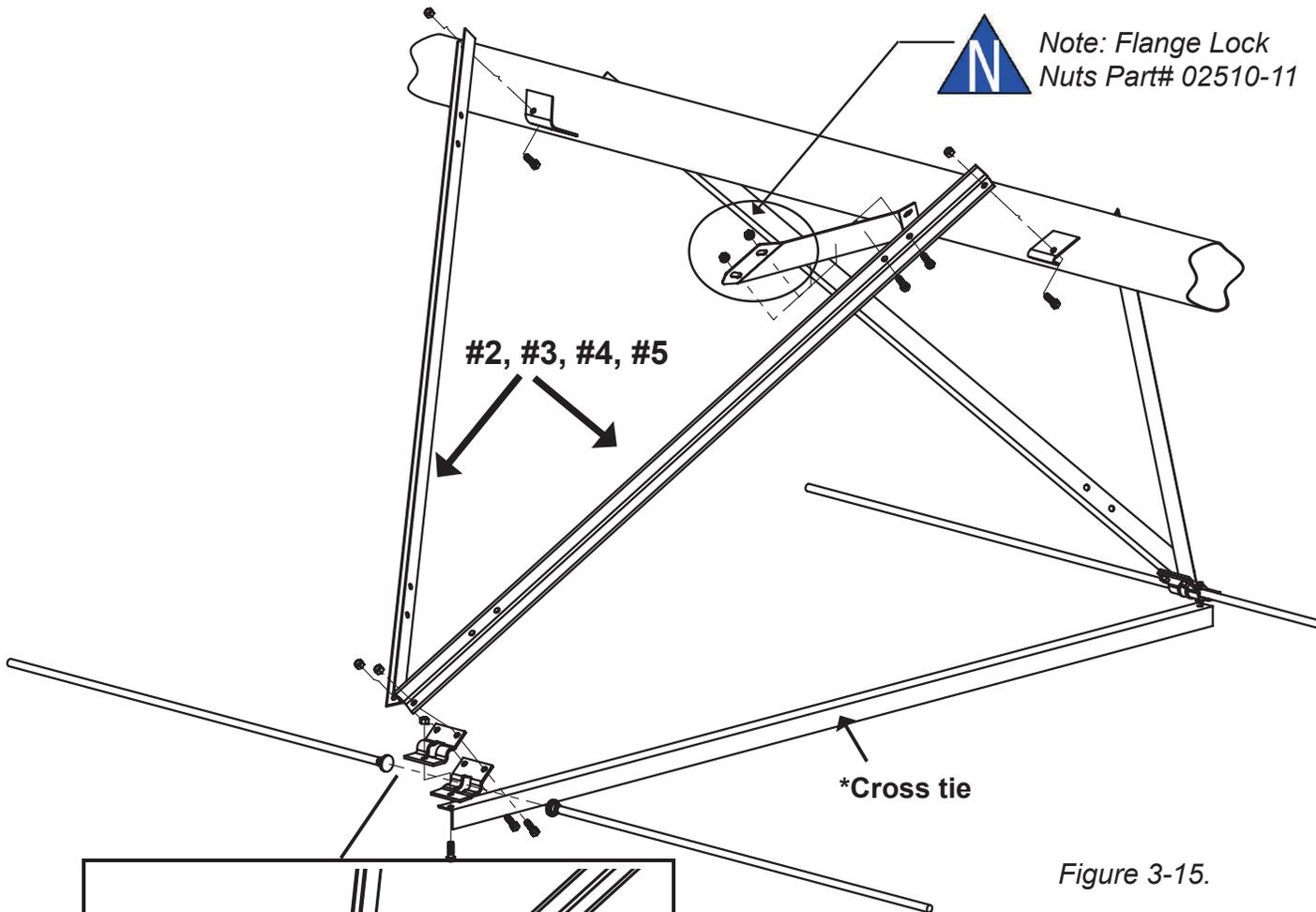
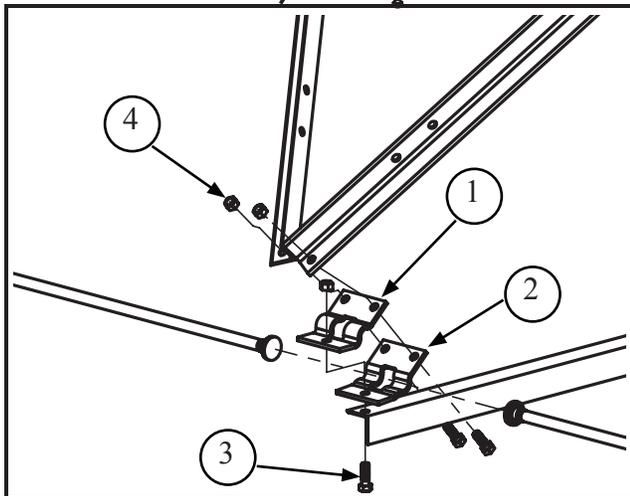


Figure 3-15.



ITEM	PART#	DESCRIPTION
1	10085-11	CP TRUSS ROD BRACKET TOP G
2	10086-11	CP TRUSS ROD BRACKET BOTTOM G
3	02066-04	BOLT HEX G5 EG NC 1/2 X 1-1/2
4	02031-07	NUT LOCK EG NC 1/2



*Figure 3-16.*



*Figure 3-17a.*



*Figure 3-17b.*



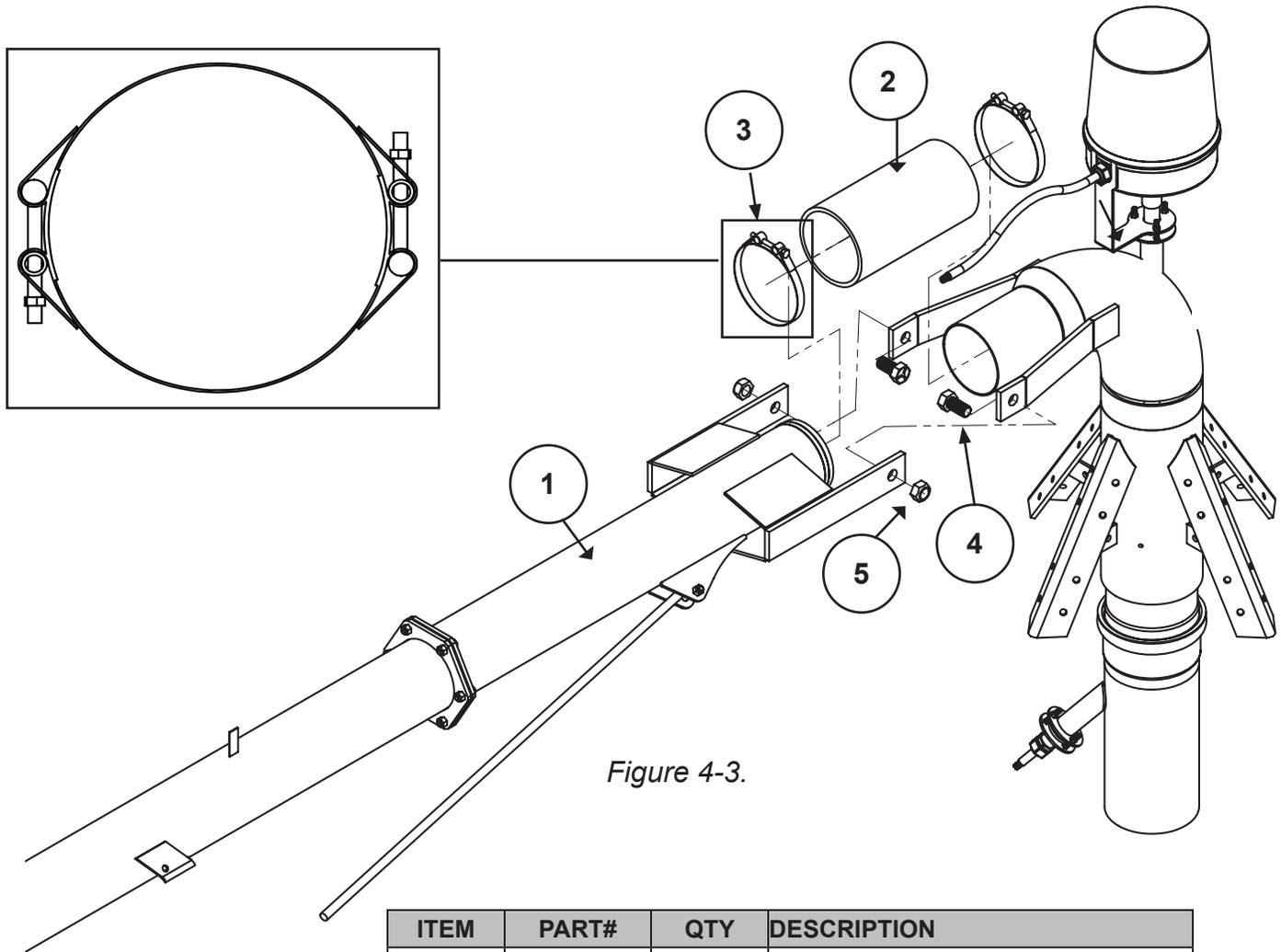


Figure 4-3.

ITEM	PART#	QTY	DESCRIPTION
1	10002-11	1	REC 6.63 STARTER
*	10302-11	1	REC STARTER 8.63 X 48
*	10402-51	1	POLY REC STARTER 6.63
*	10411-51	1	POLY REC STARTER 8.63 X 48
2	02329-07	1	HOSE 6-5/8 ID 4
*	02329-08	1	HOSE 8-5/8 ID 4
*	02329-14	1	HOSE 7 ID 4
*	02329-17	1	HOSE 9 ID 4
3	02245-15	2	CLAMP HOSE for 5, 6-5/8
	02245-18	2	CLAMP HOSE for 8-5/8
*	02245-20	2	HOSE CLAMP
*	02244-11	4	CLAMP HOSE for 6-5/8 POLY
*	02245-20	4	CLAMP HOSE for 8-5/8 POLY
4	02070-03	2	BOLT HEX G5 EG NC 1 X 2
5	02031-10	2	NUT LOCK 1

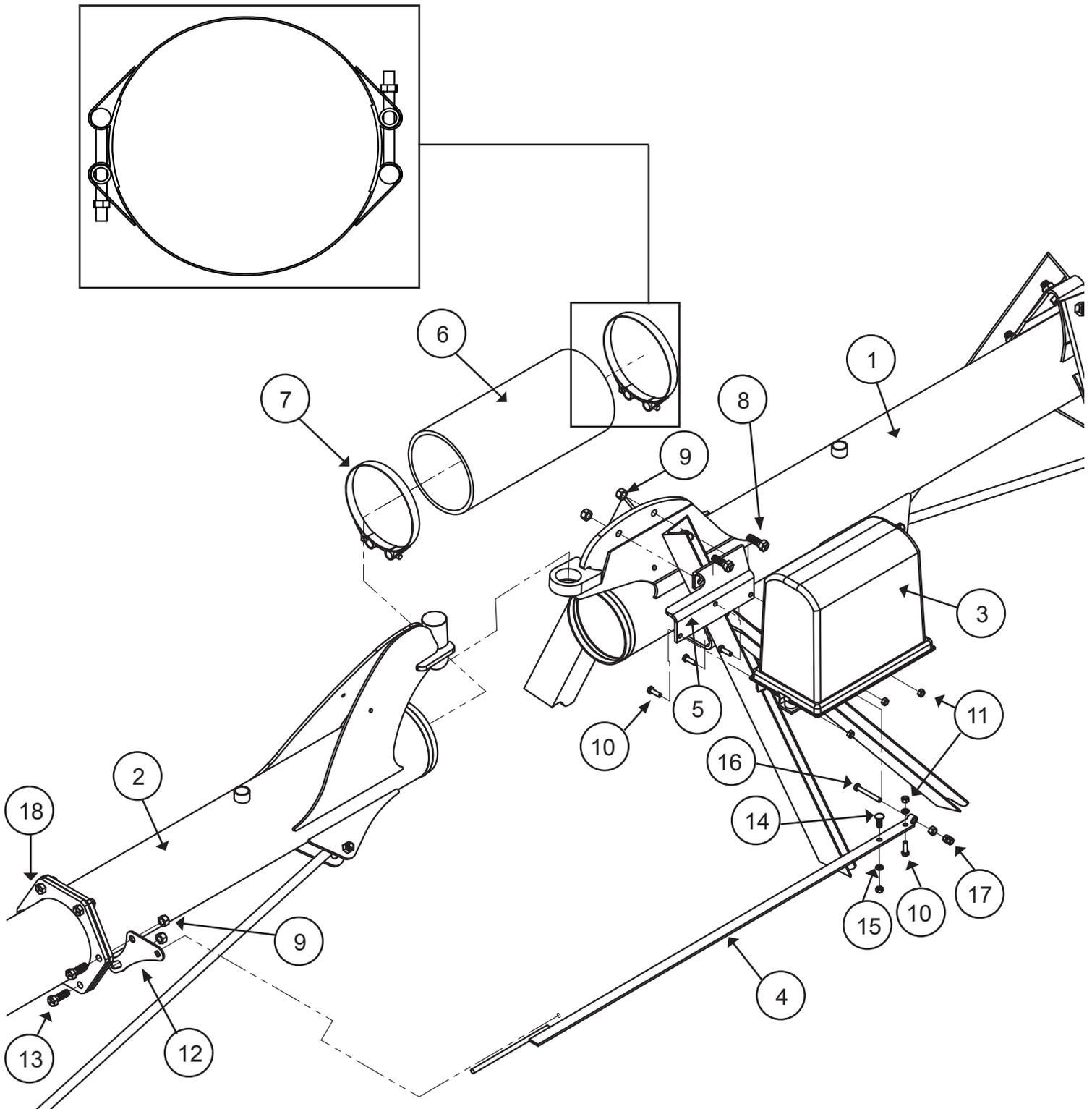


Figure 4-4.

# Receiver & Tower Assembly

## Intermediate Receiver Assembly (6-5/8" STD.)

Section 4-5

ITEM	PART#	QTY	DESCRIPTION
1	10082-11	1	REC MID TOWER LONG 6.63 X 293.5
*	10404-51	1	REC MID TOWER LONG 6.63 POLY
*	10913-11	1	REC MID TOWER LONG 6.63 LEPA 30
*	10906-11	1	REC MID TOWER LONG 6.63 LEPA 40
2	10004-11	1	REC BALL SPAN 6.63 X 42
*	10419-51	1	REC BALL SPAN 6.63 X 42- POLY
*	10908-11	1	REC BALL SPAN 6.63 X 42 LEPA 30/40
3	10142-01	1	JB INT CAM W/COVER
4	10750-11	1	ALIGNMENT BAR ASM
5	10188-11	1	JB ADAPTER
6	02329-07	1	HOSE 6.63 ID
*	02329-14	1	HOSE 7.00 ID
*	02329-18	1	HOSE SS125 5.00 ID
7	02245-15	2	HOSE CLAMP
*	02244-11	4	HOSE CLAMP 3-3/4
*	02245-21	2	HOSE CLAMP 7-1/2
8	02066-04	2	BOLT HEX .50 X 1.50
9	02031-07	2	NUT LOCK 1/2
10	02019-02	4	BOLT HEX .3125 X 1
11	02031-03	3	NUT LOCK .3125
12	10716-11	1	ALIGNMENT TAB ASM
13	02066-06	2	BOLT HEX .50 X 2
14	02072-17	1	BOLT CARRIAGE 5/16 X 1
15	02039-03	2	WASHER LOCK EG 5/16
16	02073-04	1	HEX BOLT 5/16 X 2-1/2 FULL
*	02042-07	1	WASHER .31
17	02034-06	5	NUT HEX EG NC 5/16
18	02066-04	6	BOLT 1-1/2 X 1/2

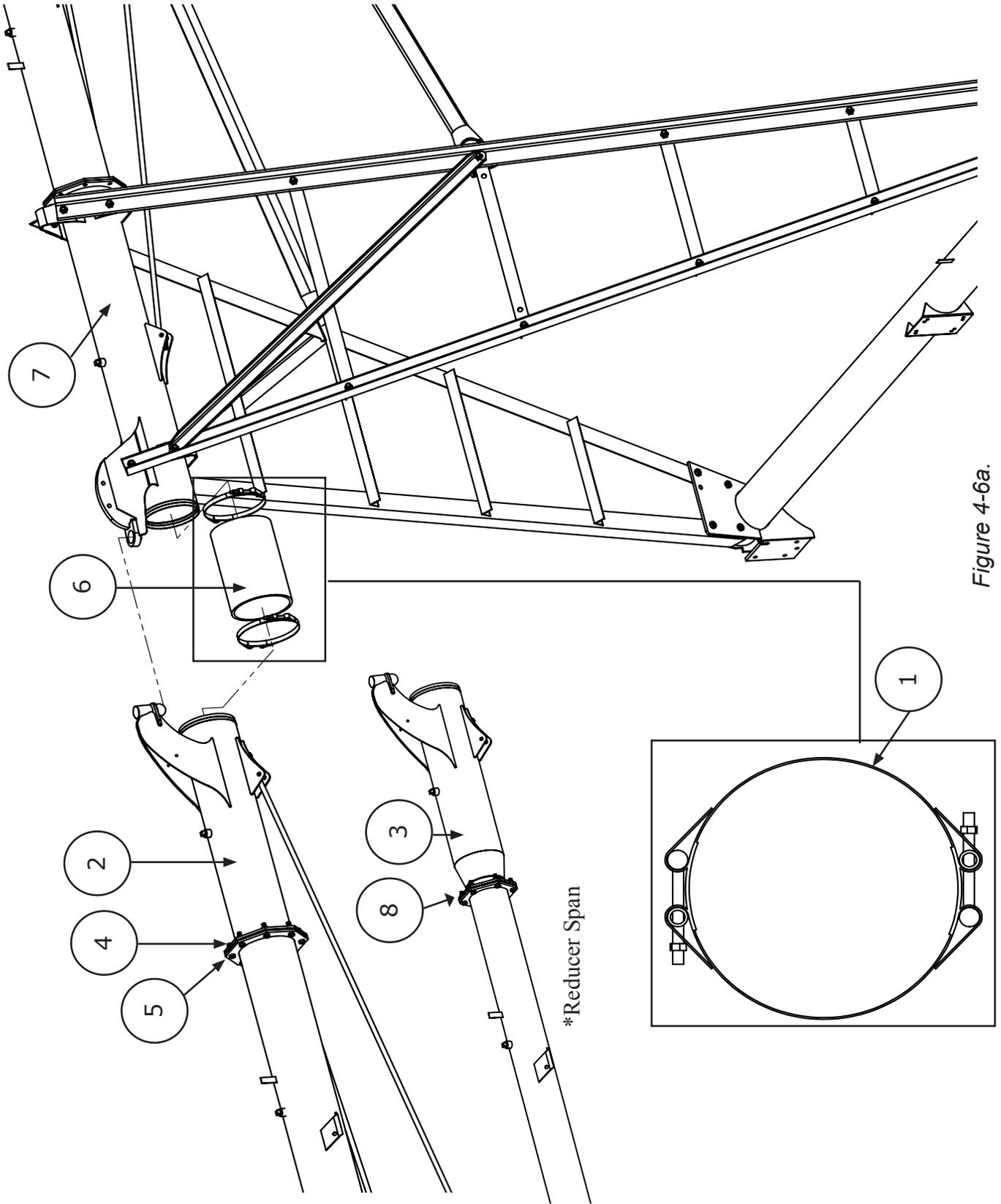
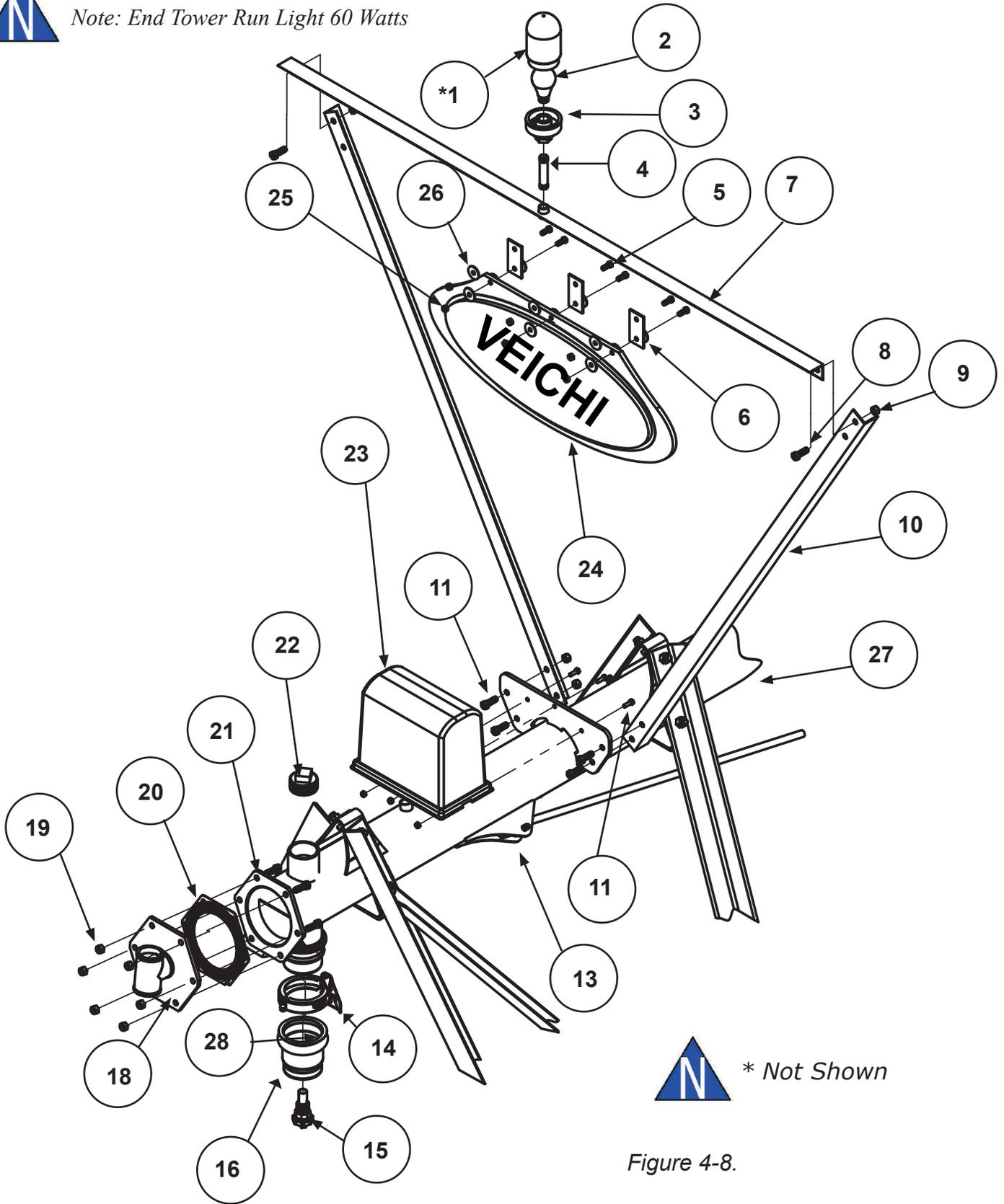


Figure 4-6a.

ITEM	PART#	QTY	DESCRIPTION
1	02245-13	2	CLAMP HOSE 8-5/8
*	02245-20	4	HOSE CLAMP
2	10304-11-OR-	1	REC BALL SPAN 8.63 X 42 G
*	10413-51	1	REC BALL SPAN 8.63 X 42-POLY
3	10305-11-OR-	12	REC SPAN 8.63-6.63 RED X 42 G
*	10414-01	12	REC SPAN 8.63-6.63 RED X 42 POLY
4	02031-07	4	NUT LOCK EG NC 1/2
5	02066-06	8	BOLT HEX G5 1/2 X 2
6	02329-08	1	HOSE 8.63 ID
*	02329-17	1	HOSE 9.00 ID
7	10303-11	1	REC MID TOWER 8.63 X 60 G
*	10412-51	1	REC MID TOWER 8.63 X 60-POLY
8	02066-04	6	BOLT 1-1/2" X 1/2"



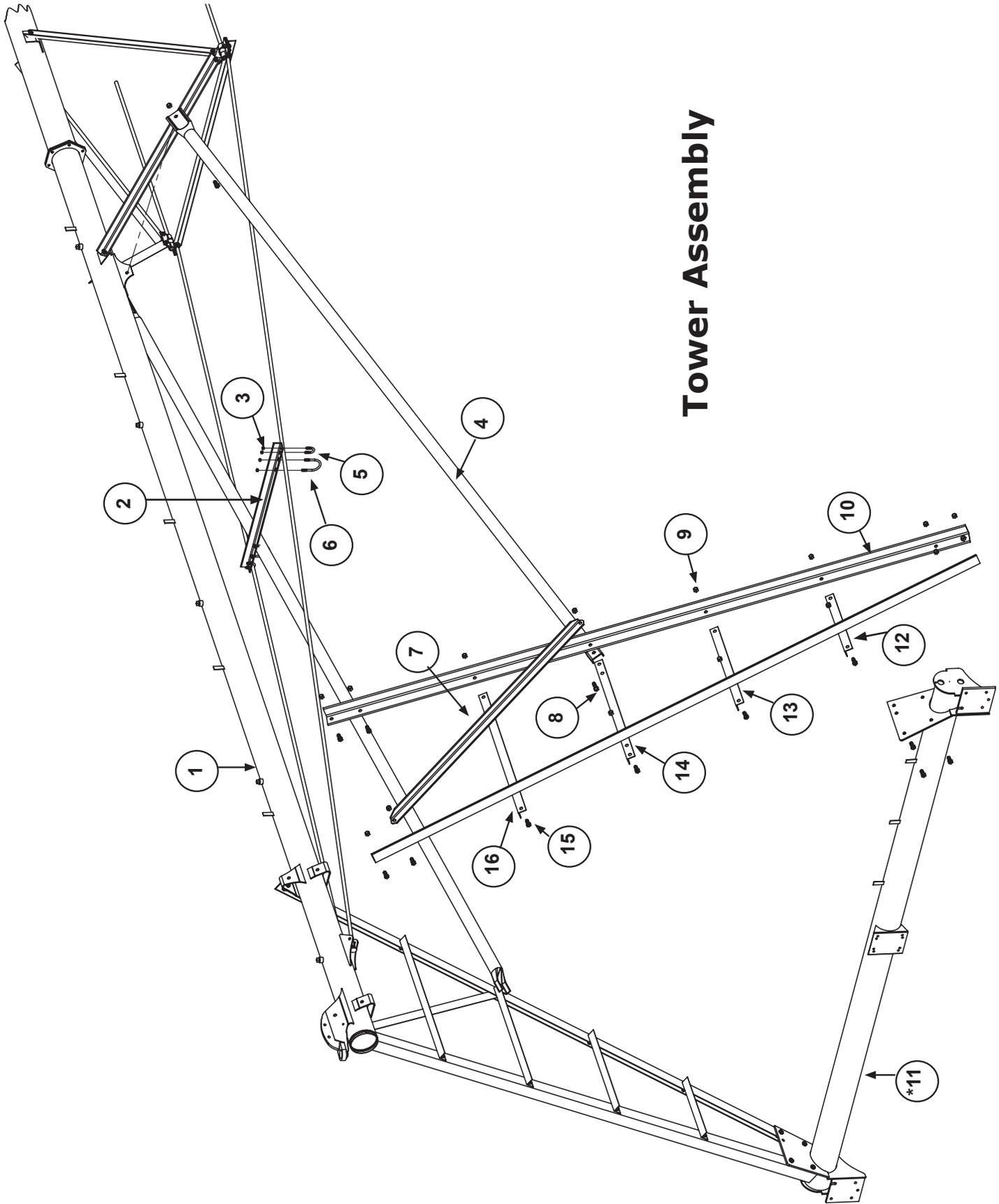
Note: End Tower Run Light 60 Watts



 \* Not Shown

Figure 4-8.

ITEM	PART#	QTY	DESCRIPTION
*1	02342-03	1	LIGHT PERFECT LINE PVP-100 GLOBE (Replacment part)
2	02155-02	1	BULB LIGHT 60W 130V 69A21-TS
3	02342-01	1	LIGHT PERFECT LINE PVP-100
4	02129-16	1	MALE THRD TBE G.50 X 4
5	02020-03	6	BOLT HEX EG NC .375 X 1
6	02733-01	3	RUBBER STRIP SIGN SUPPORT
7	10228-11	1	CP END TOWER OH MID RABBIT ASSM
8	02066-03	6	BOLT HEX G5 EG NC.50 X 1.25
9	02031-07	6	NUT LOCK 1/2
10	*10229-11	2	CP END TOWER RABBIT EAR FOR SIGN -*OH 25.5 AND LESS
11	02019-03	3	BOLT HEX G5 EG NC .3125 X 1.50
12	02031-03	3	NUT LOCK .3125
13	02066-09	2	BOLT HEX G5 EG NC.50 X 3.50
14	02123-08	1	RING RL PLT ASM CS 4
15	02139-01	1	VALV DRAIN EXTERNAL 1 NPT
16	10173-11	1	CAP END W/1" OUTLET
*17	02240-09	1	PLUG PIPE G 2 (not shown)
18	07033-11	1	CP-P93 SPAN END PLATE G
19	02031-07	6	NUT LOCK 1/2
20	10242-11	1	CP FLANGE GASKET PLASTIC 6-5/8
21	02066-04	6	BOLT HEX G5 EG NC.50 X 1.50
22	02240-10	1	PLUG PIPE G 2.50
23	10143-01	1	CP JB END W/COVER
24	10250-01	1	CP-SIGN FIBERGLASS DOUBLE FACE VEICHI
25	02510-10	6	NUT FL LOCK EG NC .38
26	02102-05	12	WASHER FENDR PLT 3/8 X 1.50 OD
27	10041-11	1	REC END TOWER 6.63 X 294.88
*	10403-51	1	REC END TOWER 6.63 X 294.88- POLY
28	01618-01	1	GASKET STD RUBBER 50 DURO 4"



**Tower Assembly**

ITEM	PART#	QTY	DESCRIPTION
1	10082-11	1	REC MID TOWER LONG 6.63 X 293.5
*	10404-51	1	REC MID TOWER LONG 6.63 X 293.5 POLY
*	10913-11	1	REC MID TOWER 6.63 X 293.5 R 30 LEPA
*	10906-11	1	REC MID TOWER 6.63 X 293.5 R 40 LEPA
2	10075-11	1	CP CROSS TIE COMPRESSION BRACE 41.5
3	02510-10	8	NUT FL LOCK .38
4	10084-11	2	CP TR COMPRESSION BRACE G TUBE 212.75
5	02075-20	2	BOLT U 3/8X2 CP GTUBE
6	02075-19	2	BOLT U 3/8 X3 CP GTUBE
7	10069-11	2	CP TR BRACE DIAGONAL ANGLE 68.63
8	02068-04	2	BOLT HEX .63 X 2
9	02031-11	34	NUT LOCK 5/8-11
10	10064-11	4	CP TOWER LEG 157.00
*11	10125-11	1	CP TR FRAME -STD
*	10180-11	1	TR GB MT THREE WHEEL
12	10065-11	2	CP TOWER CROSS TIE #1 18.00
13	10066-11	2	CP TOWER CROSS TIE #2 24.81
14	10067-11	2	CP TOWER CROSS TIE #3 31.69
15	02068-02	32	BOLT HEX .63 X 1.50
16	10068-11	2	CP TOWER CROSS TIE #4 38.50

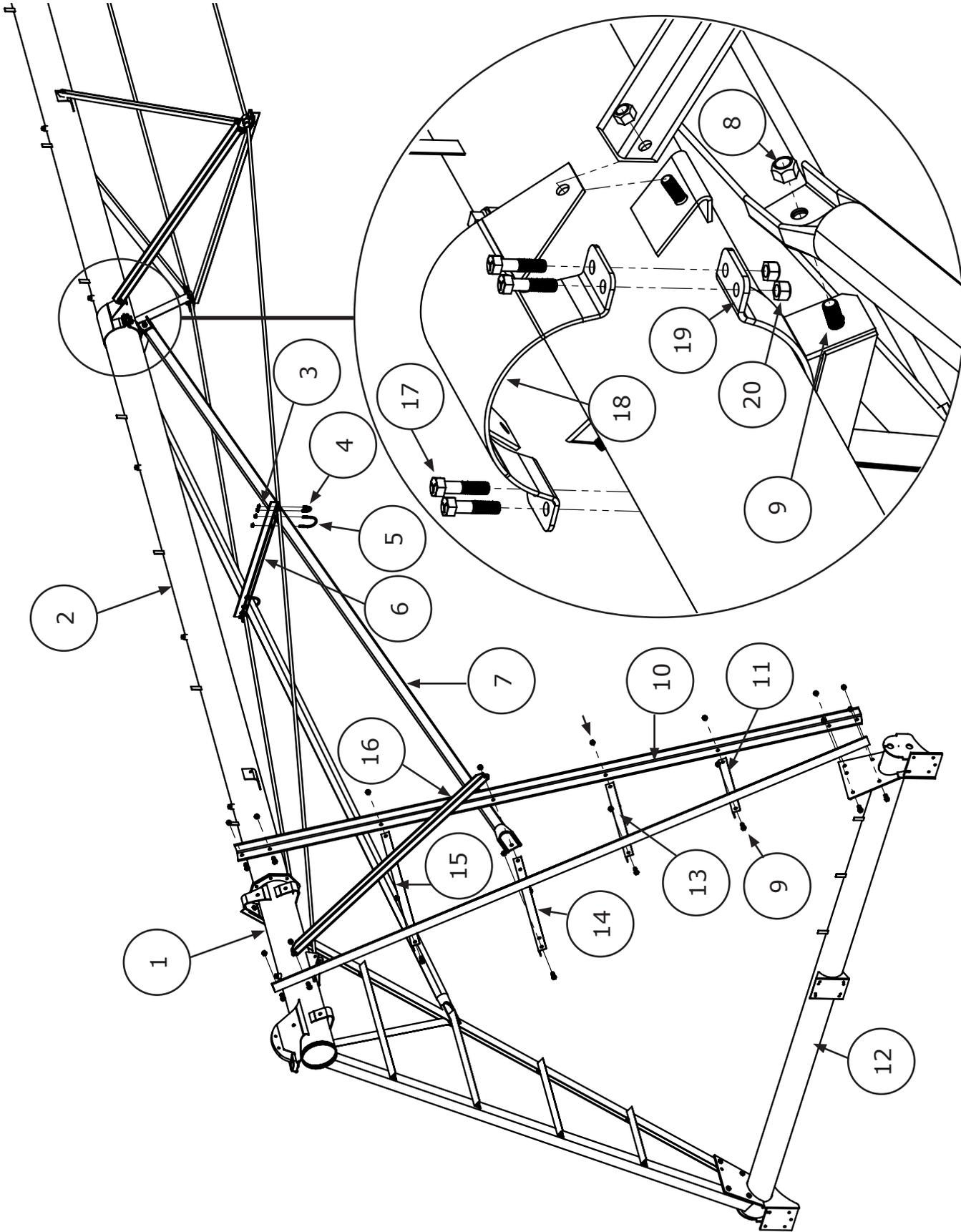
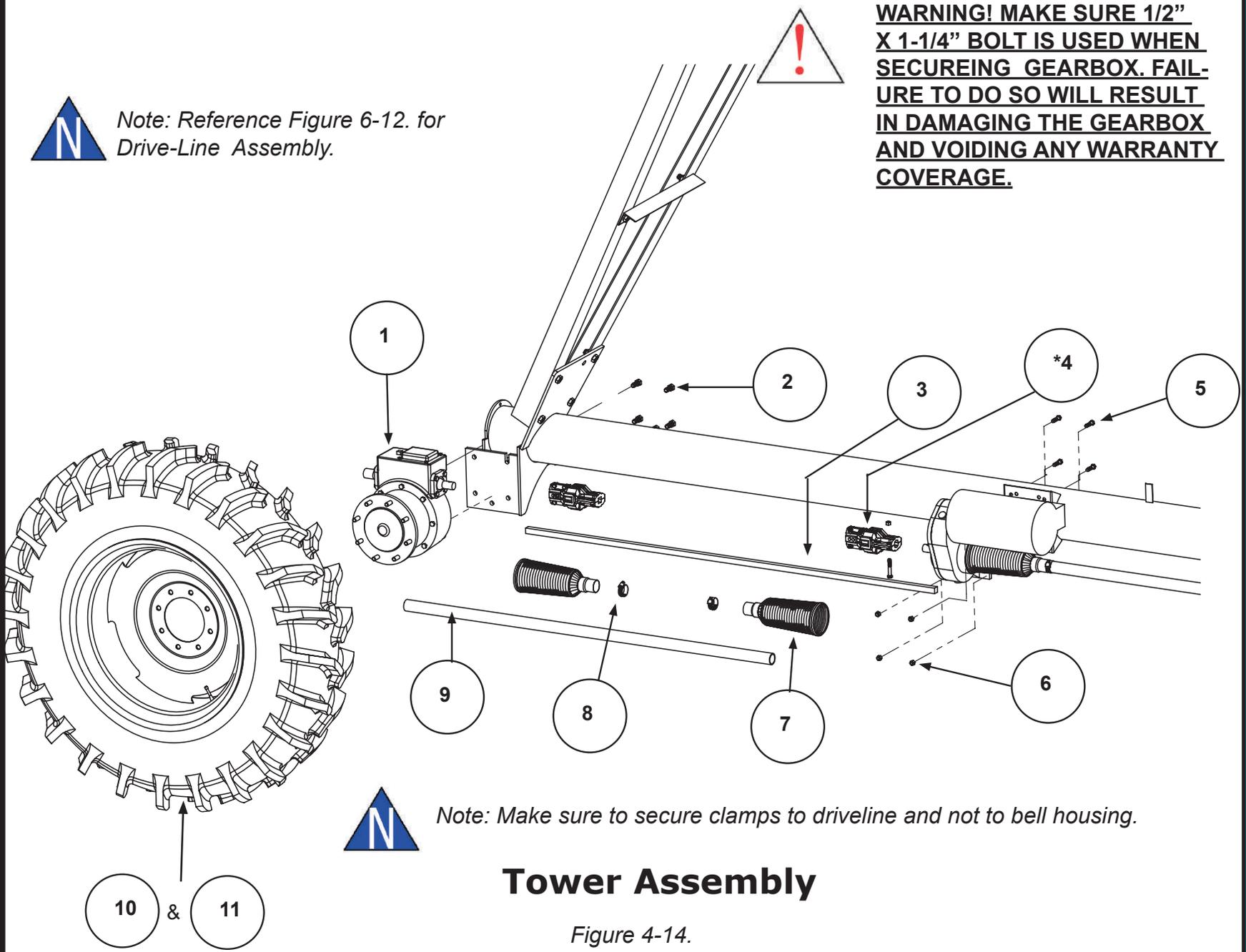


Figure 4-12.

ITEM	PART#	QTY	DESCRIPTION
1	10303-11	1	REC MID TOWER 8.63 X 60
*	10412-51	1	POLY REC MID TOWER 8.63 X 60
2	10331-11-OR-	11	PIPE 8.63 X 39 R58.5
*	10415-51-OR-	1	POLY PIPE 8.63 X 39 R58.5
*	10333-11	1	PIPE 8.63 X 19.5 R58.5
*	10417-51	1	POLY PIPE 8.63 X 19.5 R58.5
3	02510-10	8	NUT FL LOCK 3/8
4	02075-20	2	U BOLT 3/8 X 1 7/8 L X 1 W
5	02075-19	2	U BOLT 3/8 X 3 5/8 L X 3 W
6	10075-11	1	CROSS TIE COMPRESSION BRACE 40.5
7	10084-11	2	TOWER COMPRESSION BRACE 212.75
8	02031-11	36	NUT LOCK 5/8
9	02068-02	34	BOLT HEX 5/8 X 1-1/2
10	10064-11	4	TOWER LEG 157
11	10065-11	2	TOWER CROSS TIE #1
*12	10125-11	1	TOWER FRAME ASM STD
*	10180-11	1	TR GB MT THREE WHEEL
13	10066-11	2	TOWER CROSS TIE #2
14	10067-11	2	TOWER CROSS TIE #3
15	10068-11	2	TOWER CROSS TIE #4
16	10069-11	2	TOWER BRACE DIAGONAL ANGLE
17	02066-06	4	BOLT HEX 1/2 X 2
18	10330-11	1	COMP BRACE BRACKET 8-5/8 TOP
19	10335-11	1	COMP BRACE BRKT 8-5/8 BOTTOM
20	02031-07	12	NUT LOCK 1/2



Note: Reference Figure 6-12. for Drive-Line Assembly.



**WARNING! MAKE SURE 1/2" X 1-1/4" BOLT IS USED WHEN SECUREING GEARBOX. FAILURE TO DO SO WILL RESULT IN DAMAGING THE GEARBOX AND VOIDING ANY WARRANTY COVERAGE.**



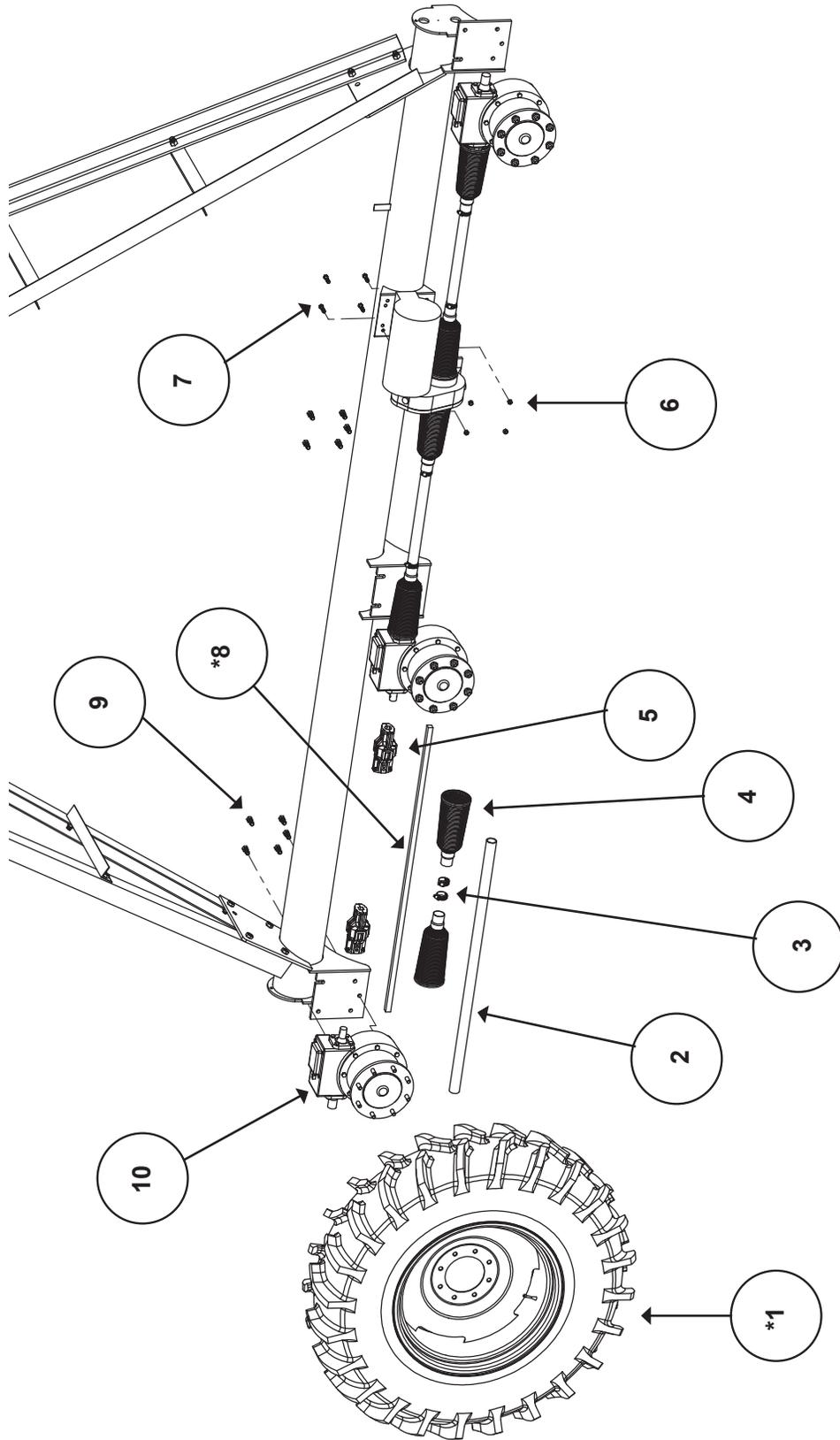
Note: Make sure to secure clamps to driveline and not to bell housing.

## Tower Assembly

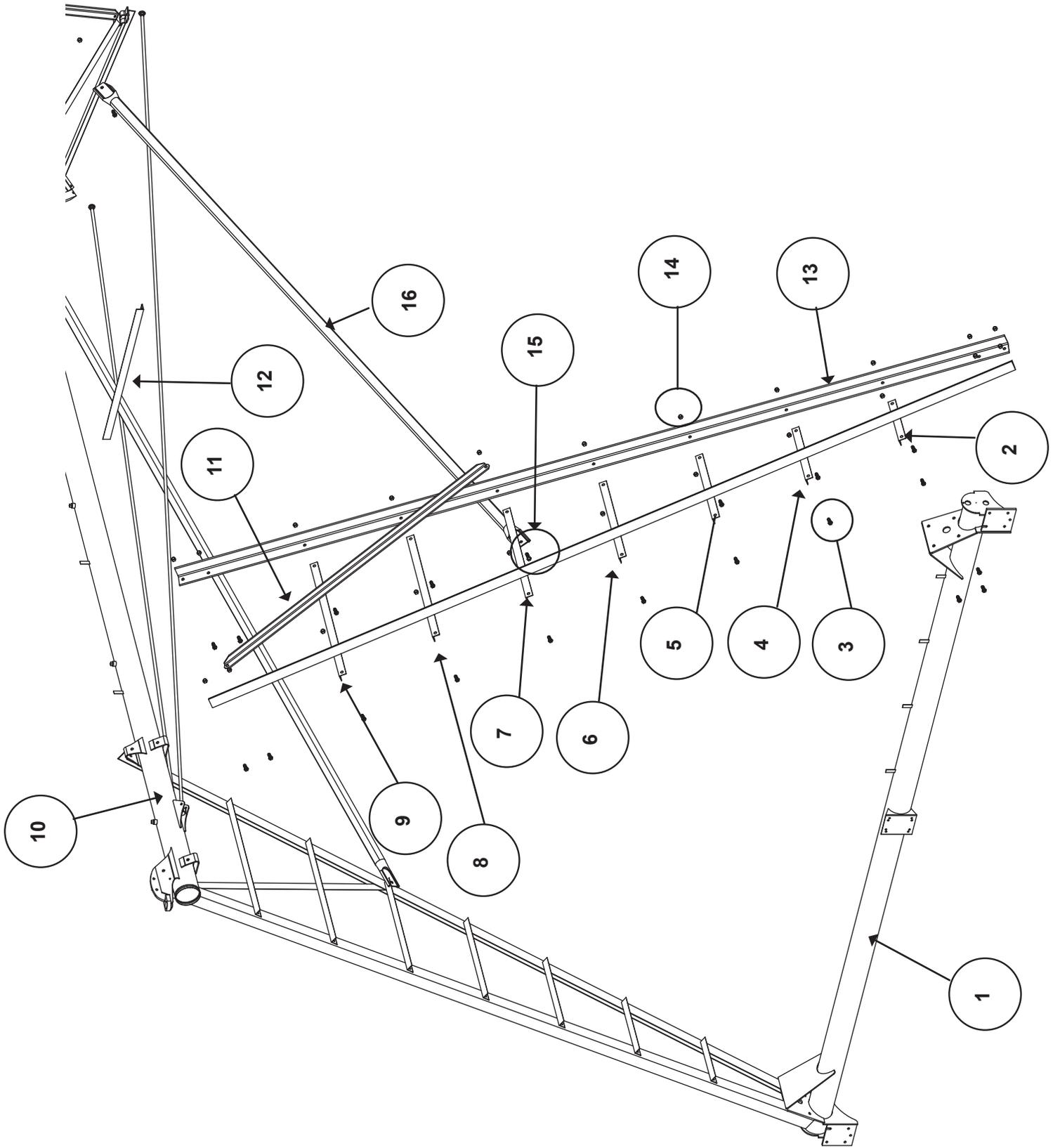
Figure 4-14.

**Tower Assembly**

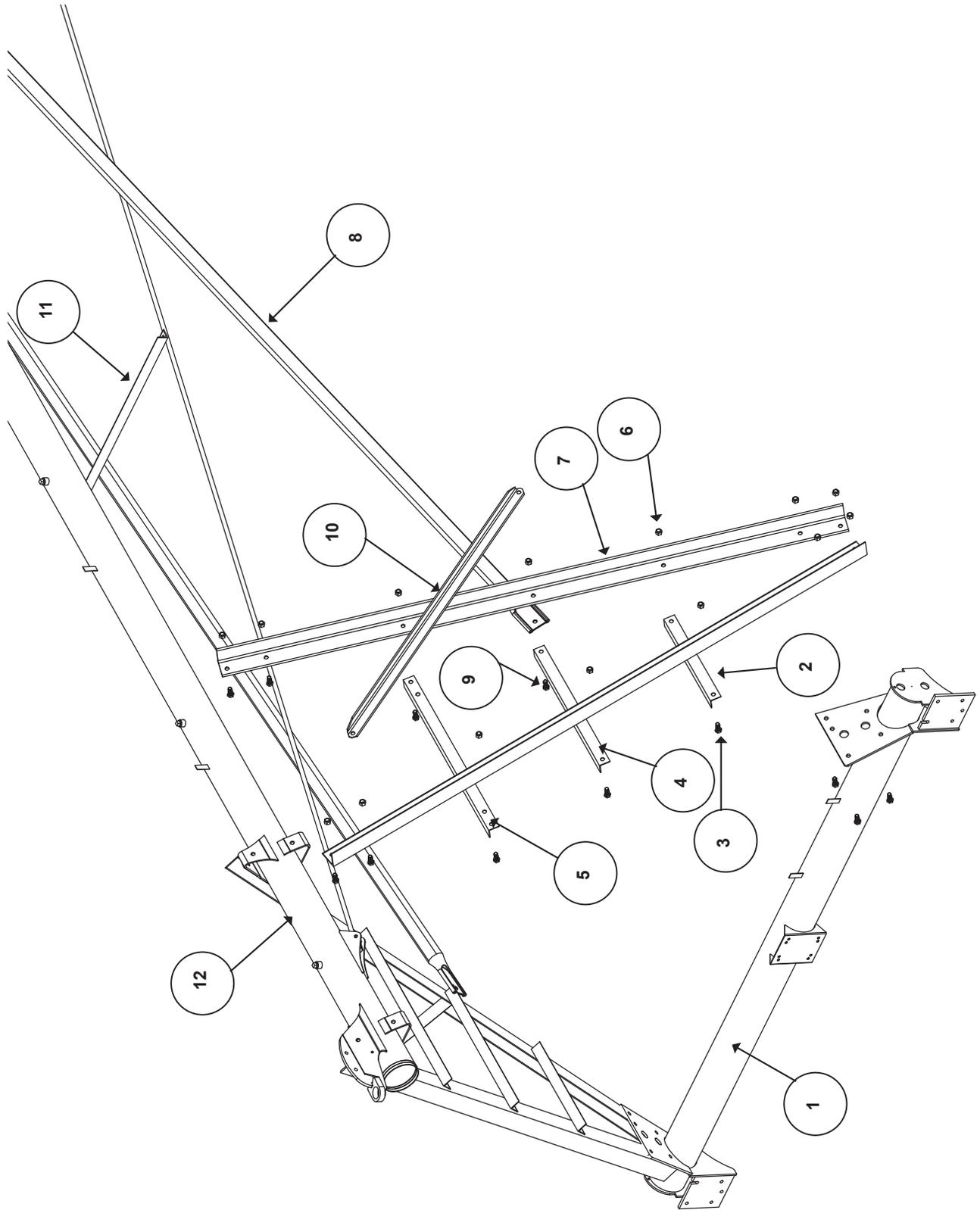
ITEM	PART#	QTY	DESCRIPTION
1	02233-01	1	GEAR BOX 50:1
2	02066-03	10	HEX BOLT 1/2" X 1-1/4"
3	10917-21	2	CP TOWER DRIVE LINE 61.5 X 7/8
*	10918-21	2	CP LP TOWER DRIVE LINE 39.25 X 7/8
*	10919-21	2	CP HP TOWER DRIVE LINE 95 X 7/8
*4	02173-02	4	FLEX COUPLER 1" X 7/8"
5	02064-02	4	HEX BOLT 3/8" X 1-1/2"
6	02031-05	4	NUT LOCK UNI-TQ 3/8"
7	02298-03	4	Drive Line BELL
8	02248-03	4	CLAMP HOSE 1-1/4"
9	02298-01	1	DRIVELINE COVER LIN
10	01923-15	1	WHEELASM LH G
11	01923-16	1	WHEELASM RH G



Item	Part#	Qty	Description
1	01923-15	2	WHEEL ASM 14.9 X 24 X 10 TBLS CW G DOM
*	01923-16	1	WHEEL ASM 14.9 X 24 X 10 CCW G DOM
2	02298-01	3	CP DL COVER 57
3	02248-03	6	CLAMP HOSE #26-1091-3 1.25
4	02298-03	6	CP DL BELL VEICHI
5	02173-02	6	CPL FLEX COUPLER 1 X.88 01355-121M
6	02031-05	4	NUT LOCK 3/8
7	02064-02	4	BOLT HEX G5 EG NC 3/8 X 1-1/2
8	10958-21	1	CP TOWER DRIVE LINE THREE WHEEL 48 X 7/8
*	10957-21	2	CP TOWER DRIVE LINE THREE WHEEL 27 1/4 X 7/8
9	02066-03	15	BOLT HEX G5 EG NC 1/2 X 1-1/4
10	02233-01	3	GB 740 50:1 NT UNI



Item	Part	Qty	Description
1	10481-11	1	CP HP TR FRAME ASM G
2	10471-11	2	CP HP TOWER CROSS TIE #1 14 5/16 G
3	02068-02	44	BOLT HEX G5 EG NC 5/8 X 1-1/2
4	10472-11	2	HP TOWER CROSS TIE #2 18 13/16 G
5	10473-11	2	HP TOWER CROSS TIE #3 23 5/16 G
6	10474-11	2	HP TOWER CROSS TIE #4 27 13/16 G
7	10475-11	2	HP TOWER CROSS TIE #5 32 5/16 G
8	10476-11	2	HP TOWER CROSS TIE #6 36 13/16 G
9	10477-11	2	HP TOWER CROSS TIE #7 41 5/16 G
10	10082-11	1	REC MID TOWER LONG 6.63 X 24.5FT G
11	10478-11	2	HP TR BRACE DIAGONAL ANGLE 88 7/8 G
12	10480-11	1	HP CROSS TIE COMPRESSION BRACE 48 G
13	10470-11	4	HP TOWER LEG 228 G
14	02031-11	46	NUT LOCK EG NC 5/8 GRADE B
15	02068-04	2	BOLT HEX G5 EG NC 5/8 X 2
16	10479-11	2	HP TR COMPRESSION BRACE G TUBE 220 7/8 G RED
*	02510-10	8	*Not Shown NUT FL LOCK EG NC 3/8
*	02075-19	2	*Not Shown BOLT U EG NC 3/8 X 3 5/8 L X 3 W
*	02075-20	2	*Not Shown BOLT U EG NE 3/8 X 1 7/8 L X 1 W



Item	Part#	Qty	Description
1	10680-11	1	LP TR FRAME ASM G
2	10683-11	2	LP TOWER CROSS TIE #1 19.75
3	02068-02	28	BOLT HEX G5 EG NC 5/8 X 1-1/2
4	10684-11	2	LP TOWER CROSS TIE #2 28.13
5	10685-11	2	LP TOWER CROSS TIE #3 36.44
6	02031-11	30	NUT LOCK EG NC 5/8 GRADE
7	10682-11	4	LP TOWER LEG 110
8	10084-11	2	TR COMPRESSION BRACE G TUBE 212.75
9	02068-04	2	BOLT HEX G5 EG NC 5/8 X 2
10	10686-11	2	LP TR BRACE DIAGONAL ANGLE 59.31
11	10075-11	1	CROSS TIE COMPRESSION BRACE 40.5
12	10082-11	1	REC MID TOWER LONG 6.63 X 24.5FT



Note: Do not overtighten bolts. Overtightening can cause assembly to crack.

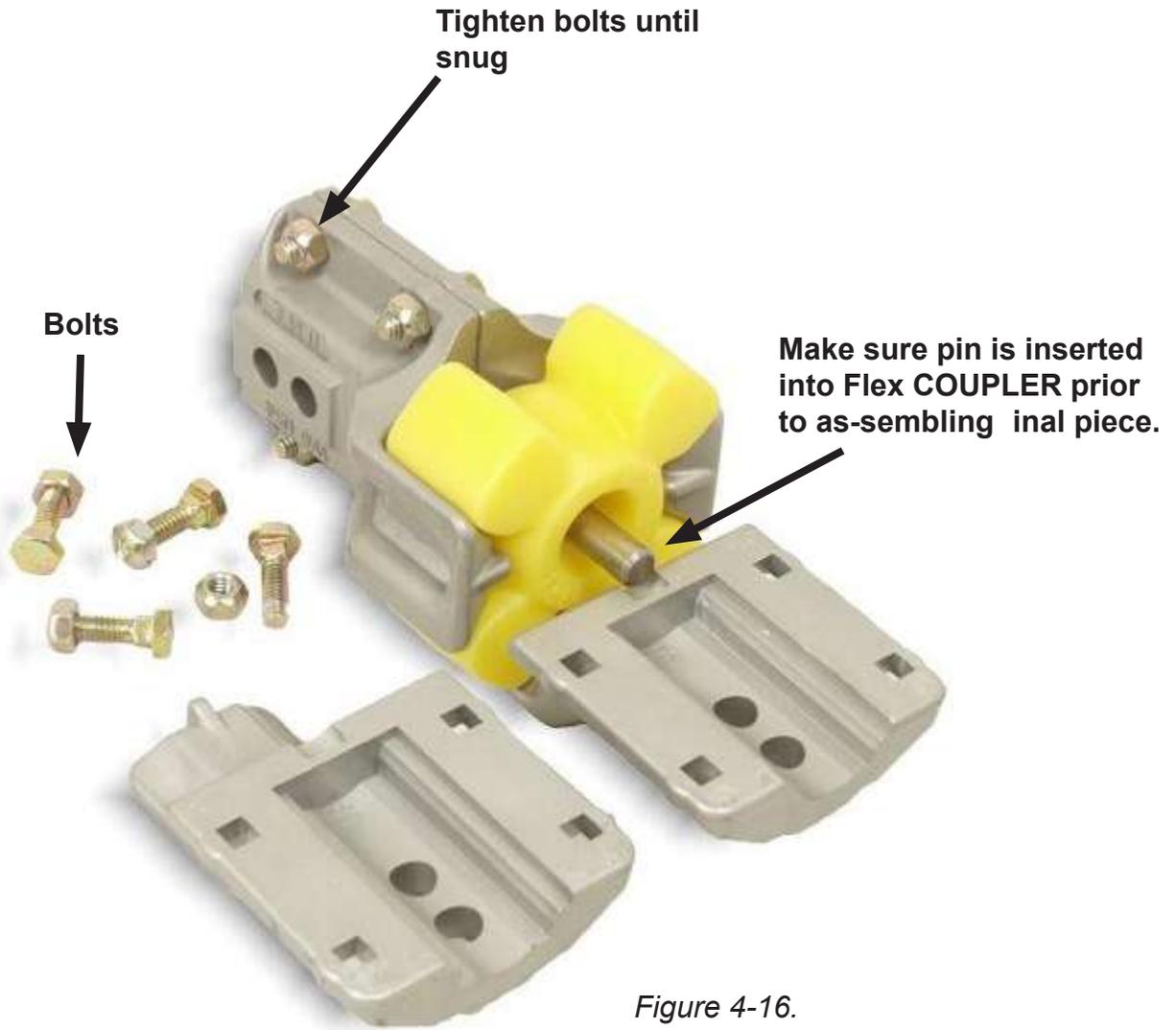


Figure 4-16.





Figure 4-18.



Figure 4-19a.



Figure 4-19b.

# OVERHANG ASSEMBLY

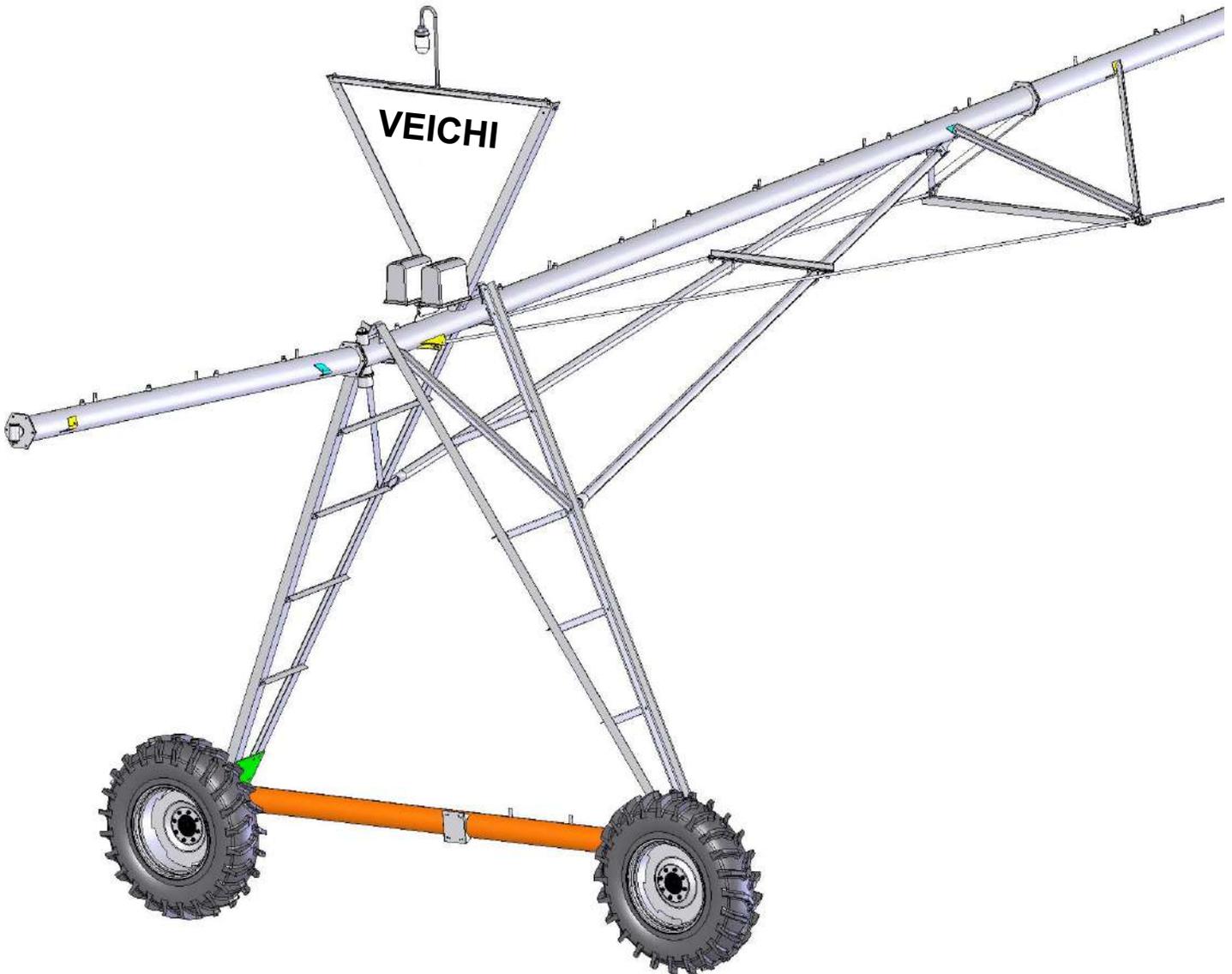
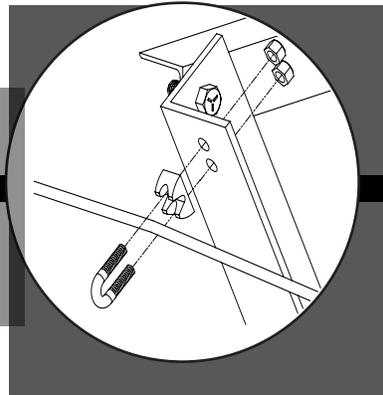
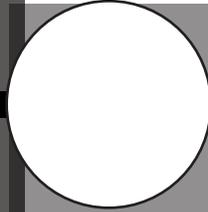
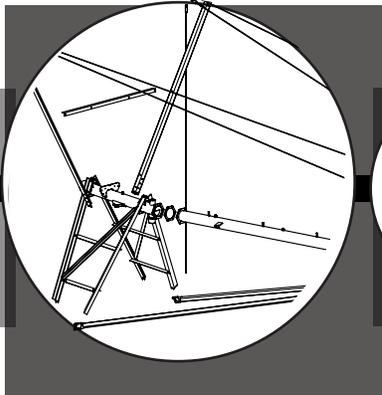
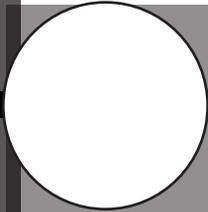
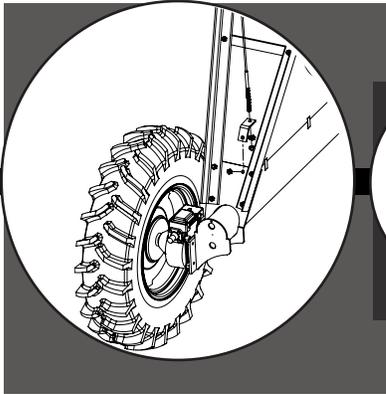
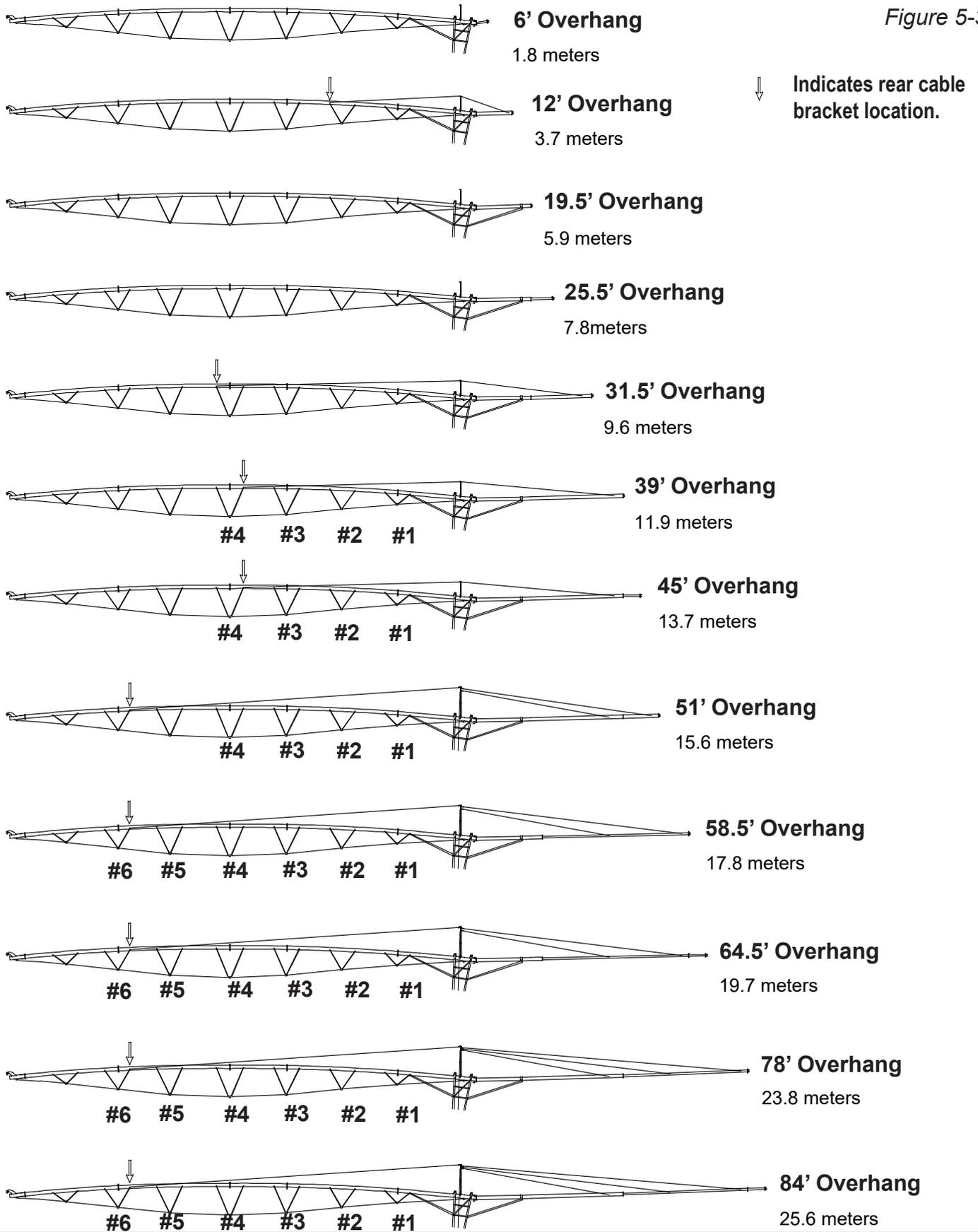
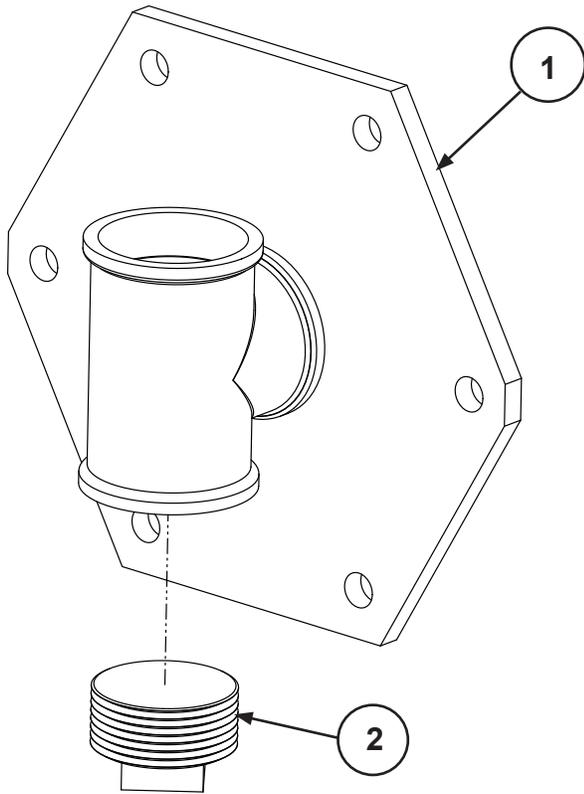


Figure 5-3.

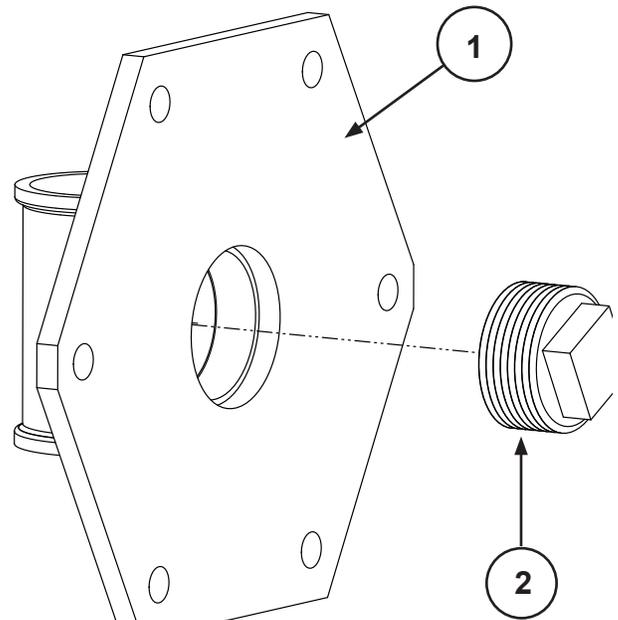


OVERHANG	SPAN LENGTH				
	125.5ft 38.1 m	145 ft 44.2 m	164.5ft 50.1 m	184ft 56.1m	203.5ft 62 m
6 ft 1.8m	✓	✓	✓	✓	✓
12 ft 3.7m	✓	✓	✓	✓	✓
19.5 ft 5.9m	✓	✓	✓	✓	✓
25.5 ft 7.7m	✓	✓	✓	✓	✓
31.5 ft 9.6m	✓	✓	✓	✓	✓
39 ft 11.9m	✓	✓	✓	✓	✓
45 ft 13.7m	✓	✓	✓	✓	✓
51 ft 15.5m	—	✓	✓	✓	✓
58.5 ft 17.8m	—	✓	✓	✓	✓
64.5 ft 19.7m	—	—	✓	✓	✓
78 ft 23.8m	—	—	✓	✓	✓
84 ft 25.6m	—	—	✓	✓	✓



With End Gun

Figure 5-6a.



Without End Gun  
Or  
Booster Pump

Figure 5-6b.

ITEM	PART	QTY	DESCRIPTION
1	07033-31	1	OVERHANG END PLATE
2	02240-09	1	PIPE PLUG

# 6 ft Assembly

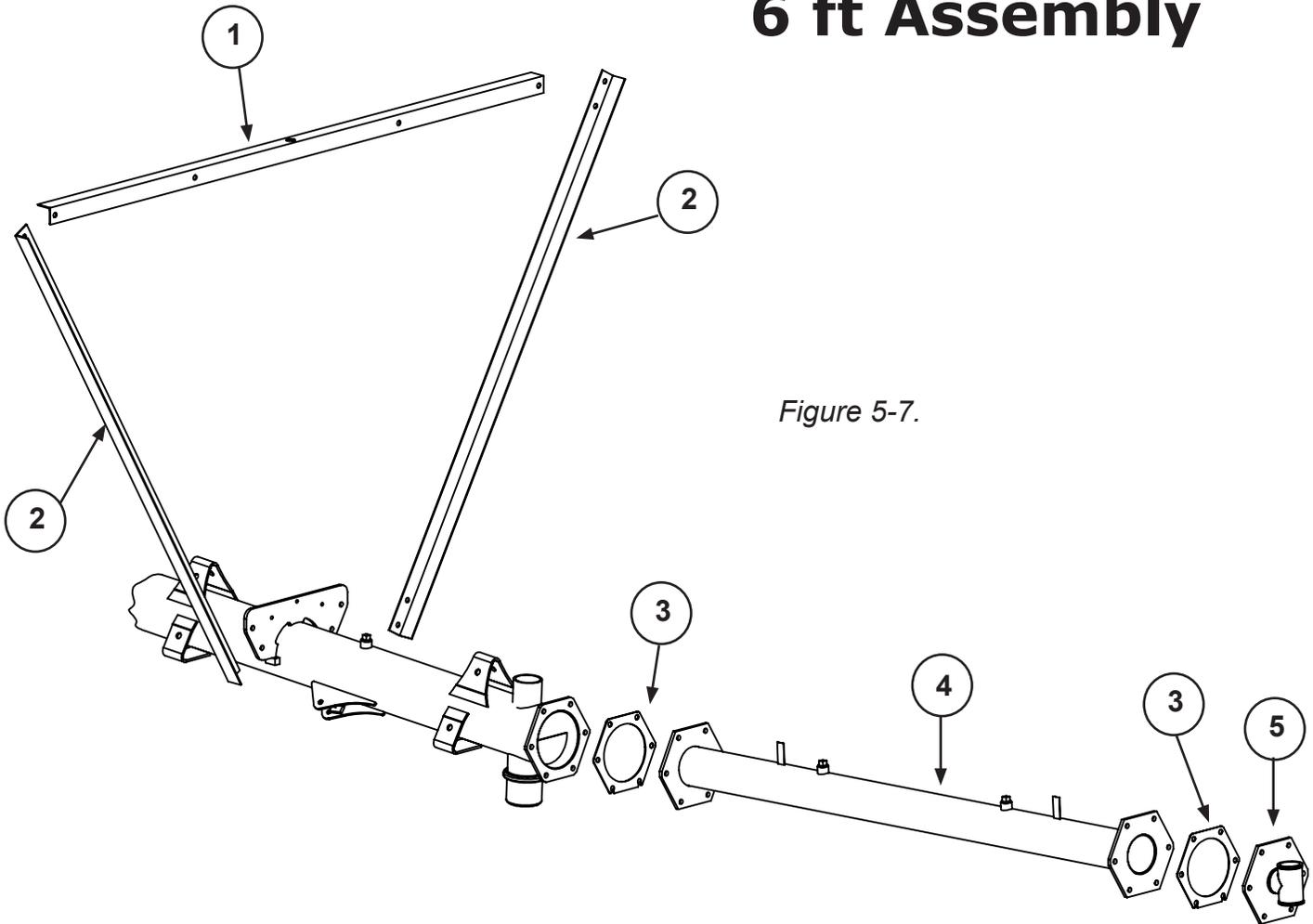


Figure 5-7.

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	END TOWER OH MID RABBIT ASSM
2	10229-11	2	END TOWER RABBIT EAR FOR SIGN
3	10242-11	2	FLANGE GASKET PLASTIC 6-5/8
4	10225-11	1	OH PIPE ASM 4.5 X 6 R 29.25
5	07033-11	1	SPAN END PLATE
*	02066-04	18	HEX BOLT G5 1/2 X 1-1/2
*	02031-07	18	NUT LOCK 1/2

\* Not Shown

# OVERHANG ASSEMBLY

## 12 ft Overhang Assembly

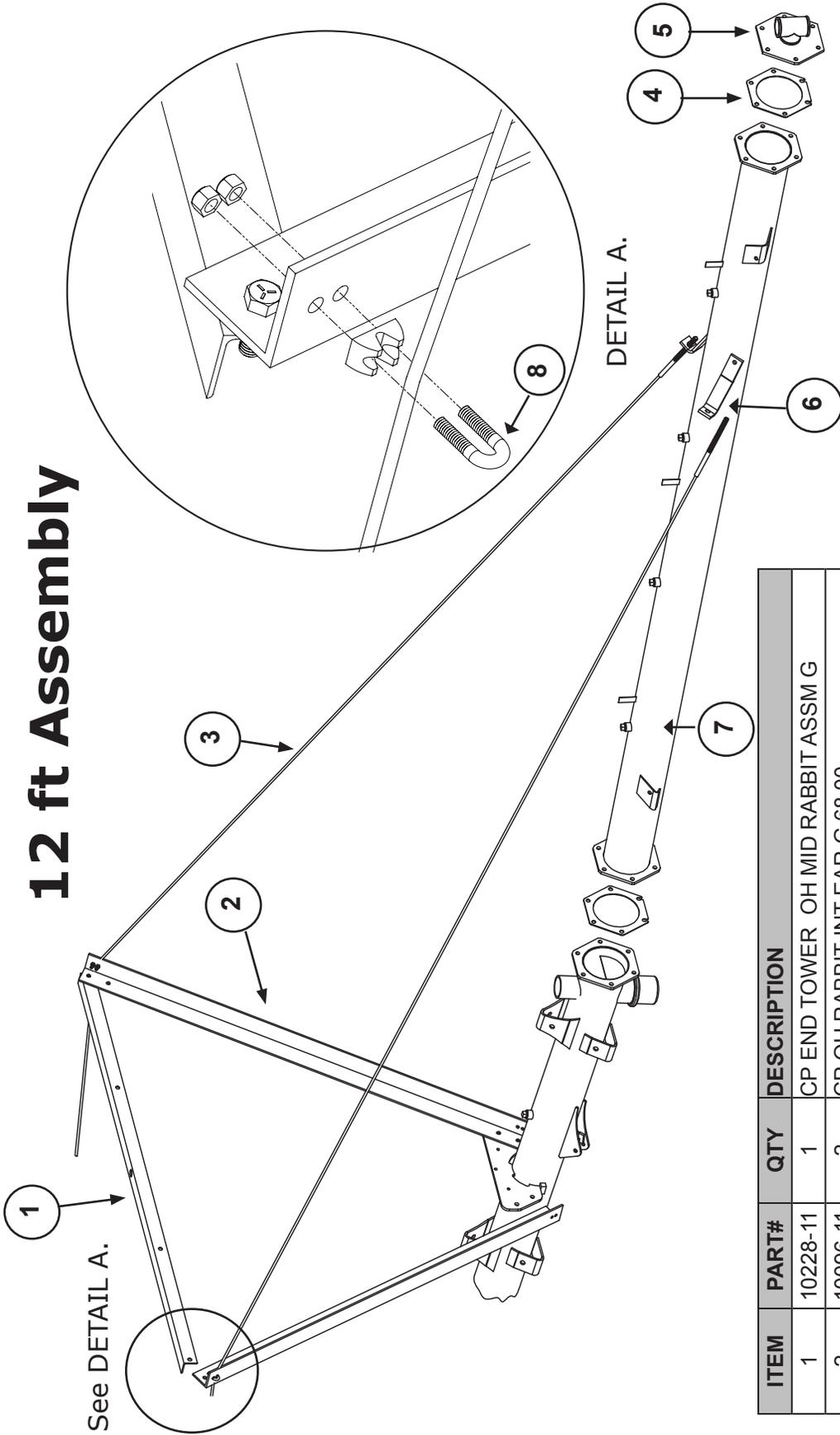


Figure 5-8.

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	CP END TOWER OH MID RABBIT ASSM G
2	10096-11	2	CP OH RABBIT INT EAR G 68.00
3	10847-01	2	CP OH CABLE ASM 57'-4" W/NUTS
4	10242-11	2	CP GASKET FLANGE PLASTIC 6-5/8
5	07033-11	1	CP SPAN END PLATE 6-5/8 G
6	10113-11	2	CP BRKT OH CABLE G
7	10223-11	1	CP OH PIPE ASM 6.63 X 12 R 29.25 G
8	02166-03	2	CLAMP CABLE
*	02066-04	20	BOLT HEX G5 EG NC.50 X 1.50
*	02031-07	20	NUT LOCK 1/2

\* Not Shown

# 19.5 ft Assembly

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	END TOWER OH MID RABBIT ASSM
2	10229-11	2	END TOWER RABBIT EAR FOR SIGN
3	10242-11	2	FLANGE GASKET PLASTIC 6-5/8
4	10190-11	1	PIPE 6-5/8 X 19-1/2 R 58-1/2
5	10128-11	1	HALF BAND GTUBE
6	07033-11	1	END PLATE
7	10091-11	1	HALF BAND GTUBE ASM
8	10084-11	2	COMPRESSION BRACE G TUBE 212-3/4
*	02031-07	22	NUT LOCK 1/2
*	02066-04	18	HEX BOLT 1/2 X 1-1/2
*	02068-02	2	HEX BOLT 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT 1/2 X 2

\* Not Shown

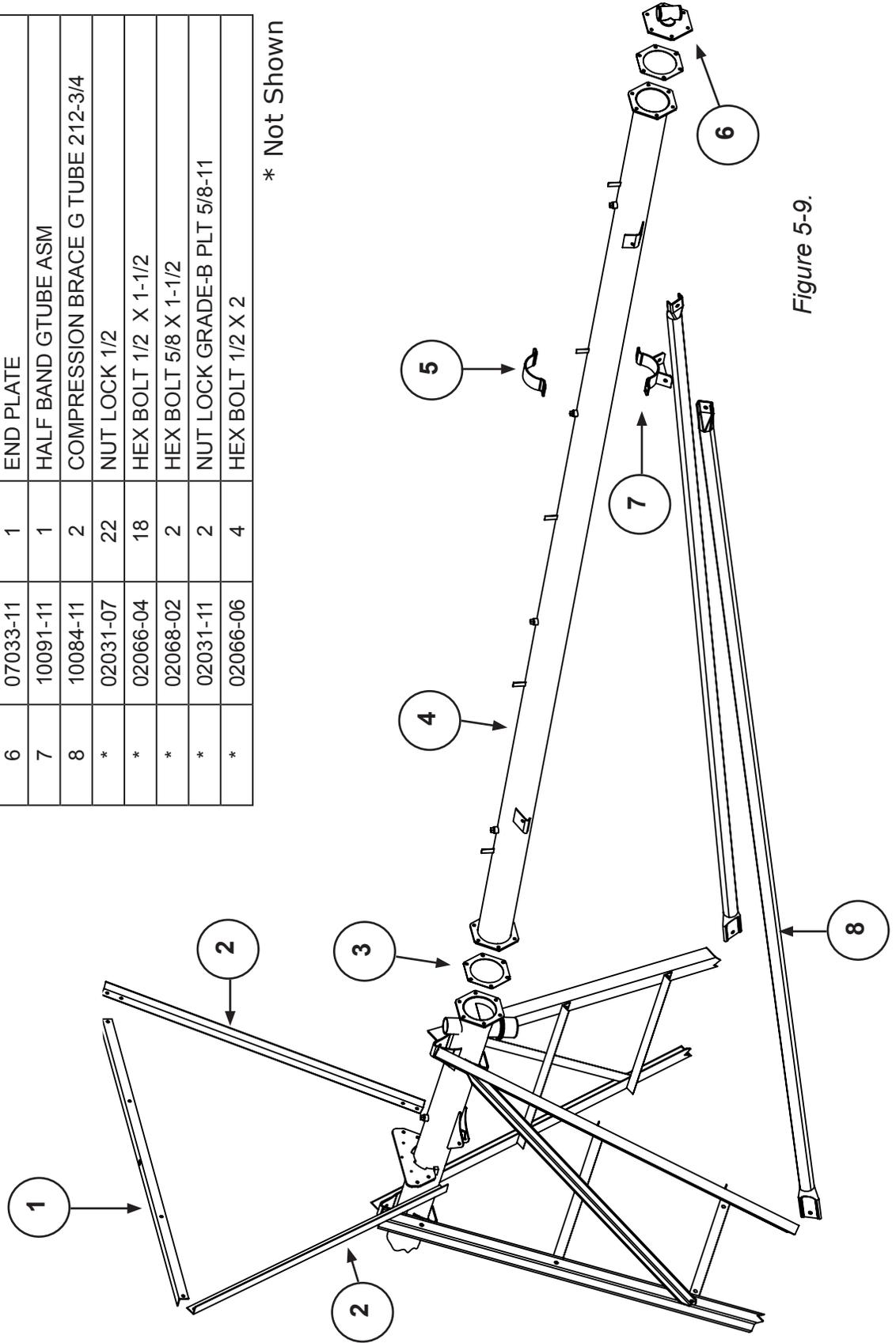


Figure 5-9.

**25.5 ft Assembly**

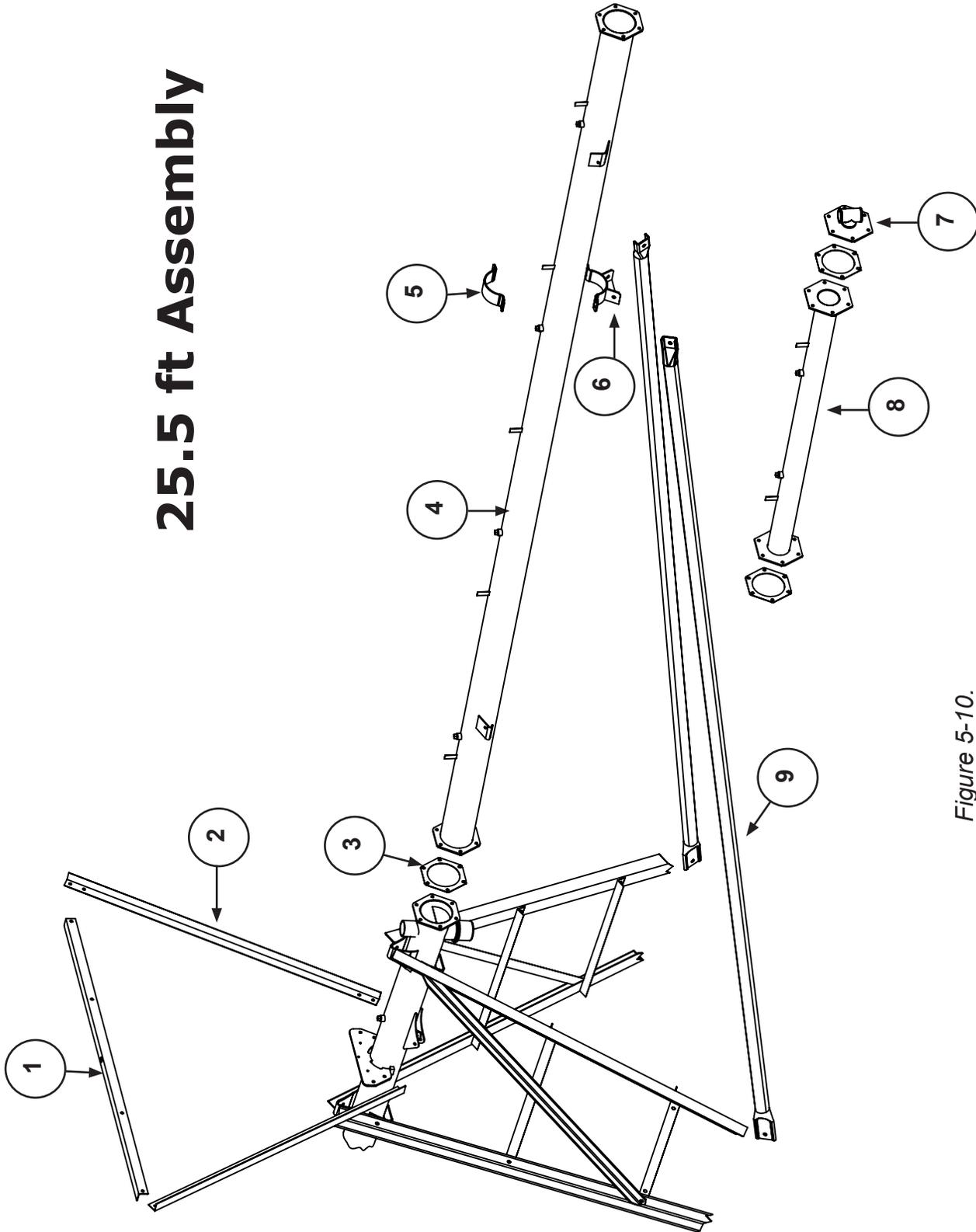


Figure 5-10.

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	END TOWER OH MID RABBIT ASSM
2	10229-11	2	END TOWER RABBIT EAR FOR SIGN
3	10242-11	3	FLANGE GASKET PLASTIC 6-5/8
4	10190-11	1	PIPE 6-5/8 X 19-1/2 R 58-1/2
5	10128-11	1	HALF BAND GTUBE
6	10091-11	1	HALF BAND GTUBE ASM
7	07033-11	1	SPAN END PLATE
8	10225-11	1	OH PIPE ASM 4-1/2 X 6 R 29-1/4
9	10084-11	2	TR COMPRESSION BRACE G TUBE 212-3/4
*	02031-07	28	NUT LOCK 1/2
*	02066-04	24	HEX BOLT 1/2 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B 5/8-11
*	02068-02	2	HEX BOLT 5/8 X 1-1/2
*	02066-06	4	HEX BOLT 1/2 X 2

\* Not Shown

# 31.5 ft Assembly

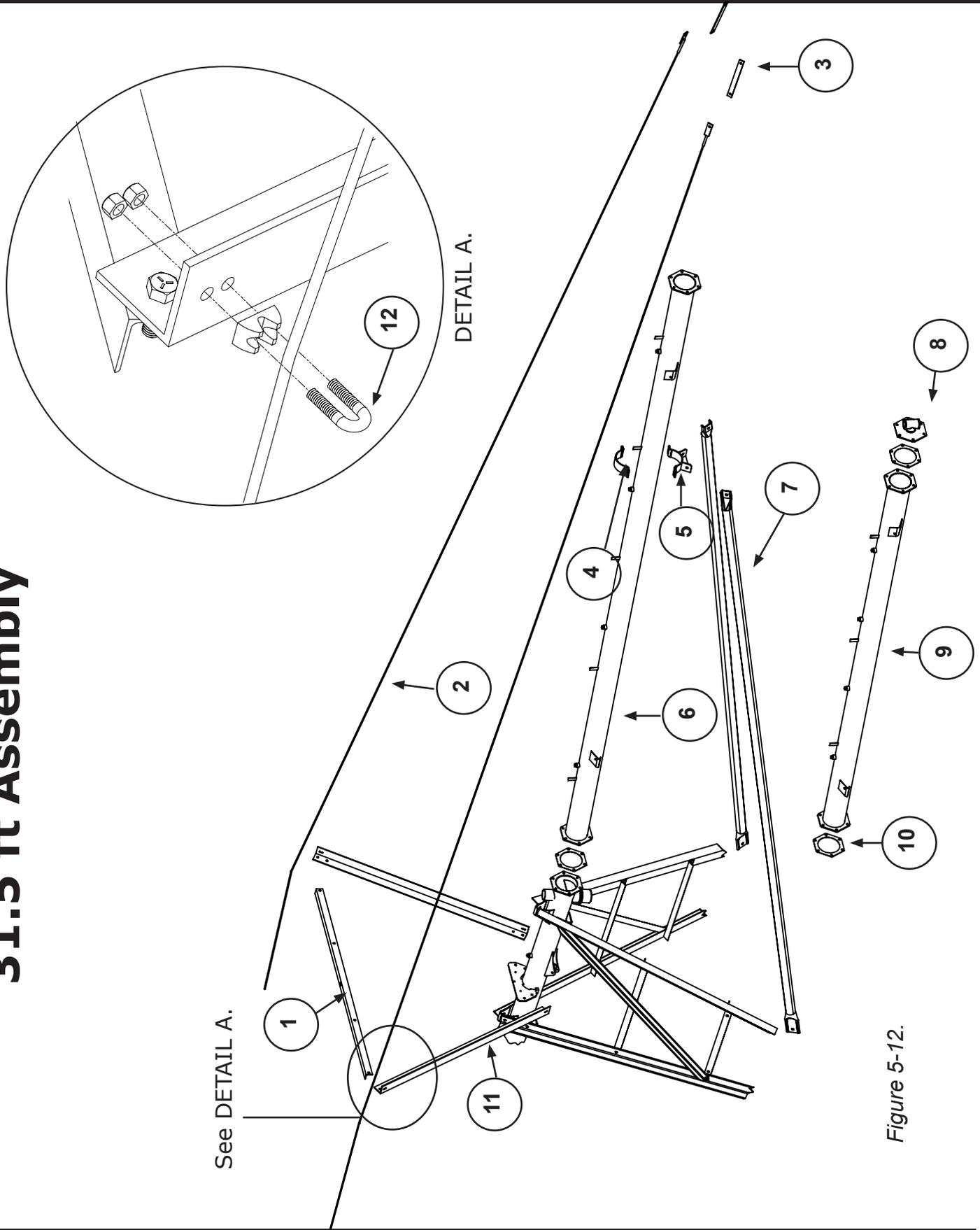


Figure 5-12.

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	END TOWER OH MID RABBIT ASSM
2	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
3	10183-11	2	14" FLAT BAR
4	10128-11	1	HALF BAND GTUBE
5	10091-11	1	HALF BAND GTUBE ASM
6	10190-11	1	PIPE 6-5/8 X 19-1/2 R 58-1/2
7	10084-11	1	TR COMPRESSION BRACE G TUBE 212-3/4
8	07033-11	1	SPAN END PLATE
9	10223-11	1	OH PIPE ASM 6-5/8 X 12 R 29-1/4
10	10242-11	3	FLANGE GASKET PLASTIC 6-5/8
11	10096-11	2	OH RABBIT INT EAR 68.00
12	02166-03	2	CABLE CLAMP
*	02066-04	30	HEX BOLT G5 1/2 X 1-1/2
*	02031-07	34	NUT LOCK 1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT G5 1/2 X 2

\* Not Shown

# 39 ft Assembly

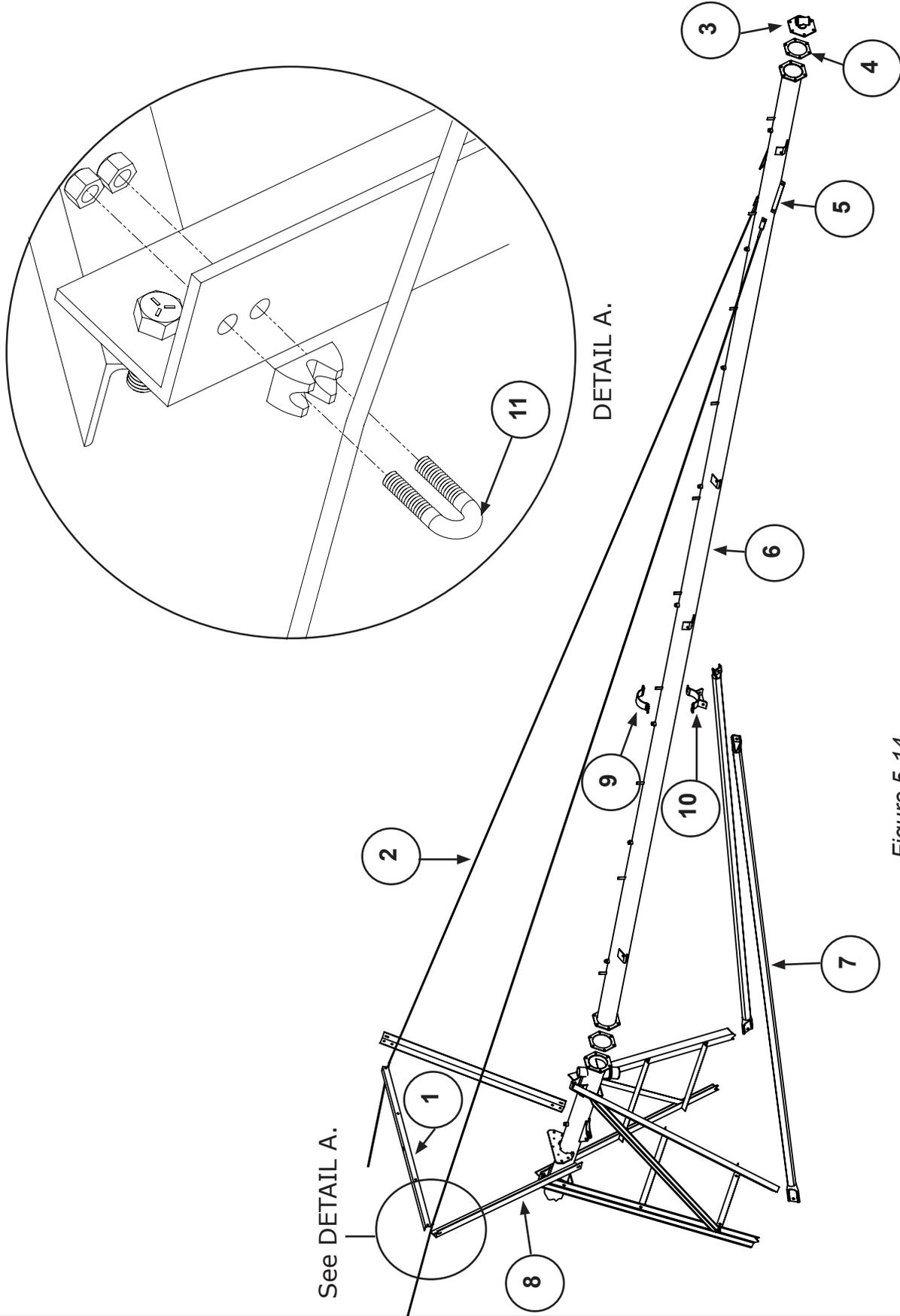


Figure 5-14.

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	END TOWER OH MID RABBIT ASSM
2	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
3	07033-11	1	SPAN END PLATE
4	10242-11	2	FLANGE GASKET PLASTIC 6-5/8
5	10183-11	2	OH FLAT BAR 14 INCHES
6	10189-11	1	PIPE 6-5/8 X 39 R 58-1/2
7	10084-11	2	TR COMPRESSION BRACE G TUBE 212-3/4
8	10096-11	2	OH RABBIT INT EAR G 68.00
9	10128-11	1	HALF BAND GTUBE
10	10091-11	1	HALF BAND GTUBE
11	02166-03	1	CABLE CLAMP
*	02066-04	18	HEX BOLT G5 1/2 X 1-1/2
*	02031-07	22	NUT LOCK 1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	BOLT HEX G5 EG NC 1/2 X 2

\* Not Shown

# 45 ft Assembly

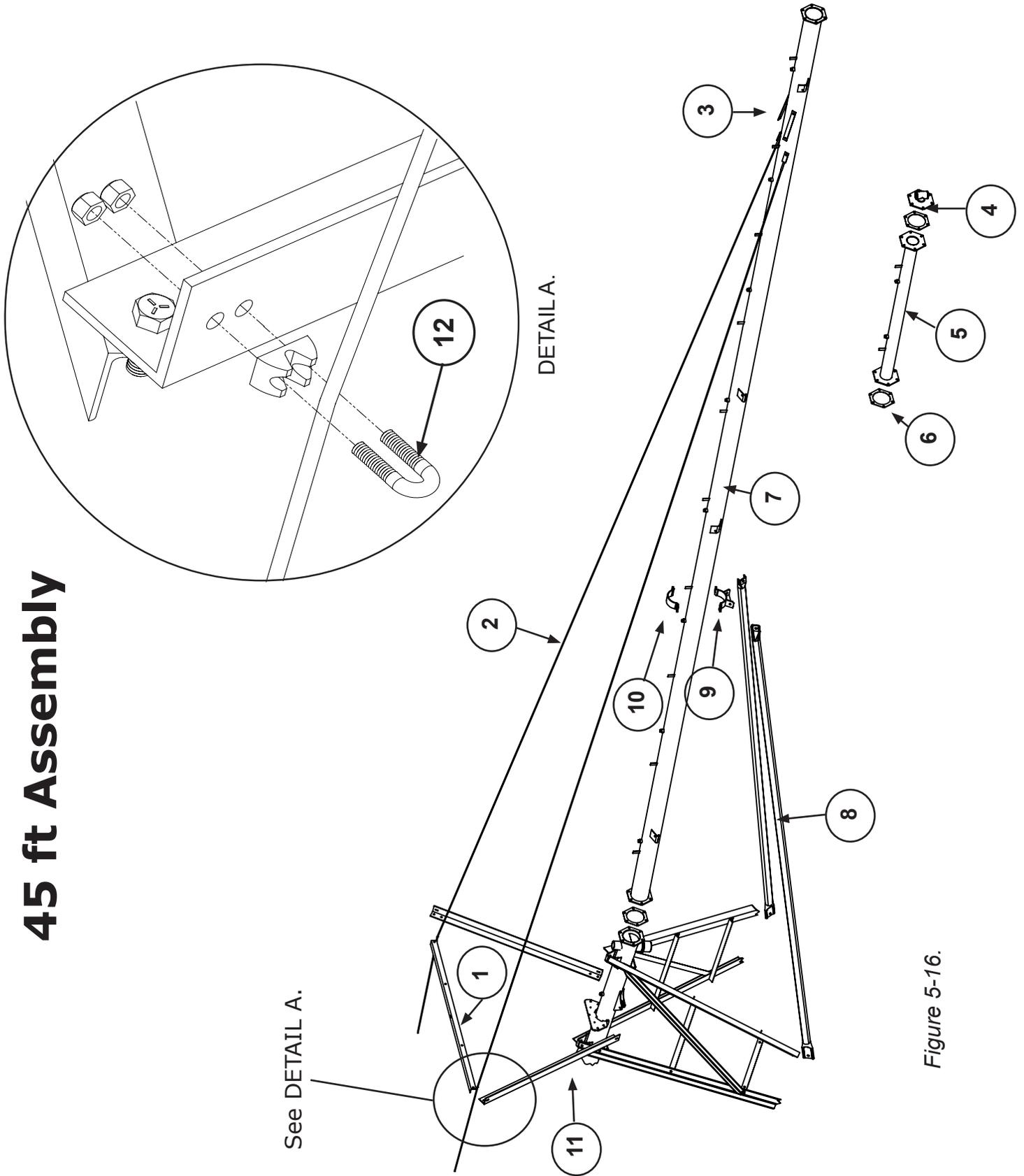


Figure 5-16.

ITEM	PART#	QTY	DESCRIPTION
1	10228-11	1	END TOWER OH MID RABBIT ASSM
2	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
3	10183-11	2	OH FLAT BAR 14 INCHES
4	07033-11	1	SPAN END PLATE
5	10225-11	1	OH PIPE ASM 4-1/2 X 6 R 29-1/4
6	10242-11	3	FLANGE GASKET PLASTIC 6-5/8
7	10189-11	1	PIPE 6-5/8 X 39 R 58-1/2
8	10084-11	2	TR COMPRESSION BRACE G TUBE 212-3/4
9	10091-11	1	HALF BAND GTUBE ASM 3
10	10128-11	1	HALF BAND GTUBE 3
11	10096-11	2	OH RABBIT INT EAR G 68.00
12	02166-03	1	CLAMP CABLE
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-04	30	HEX BOLT G5 1/2 X 1-1/2
*	02031-07	34	NUT LOCK 1/2
*	02066-06	4	HEX BOLT G5 1/2 X 2

\* Not Shown

# OVERHANG ASSEMBLY

## 51 ft Overhang Assembly

# 51 ft Assembly

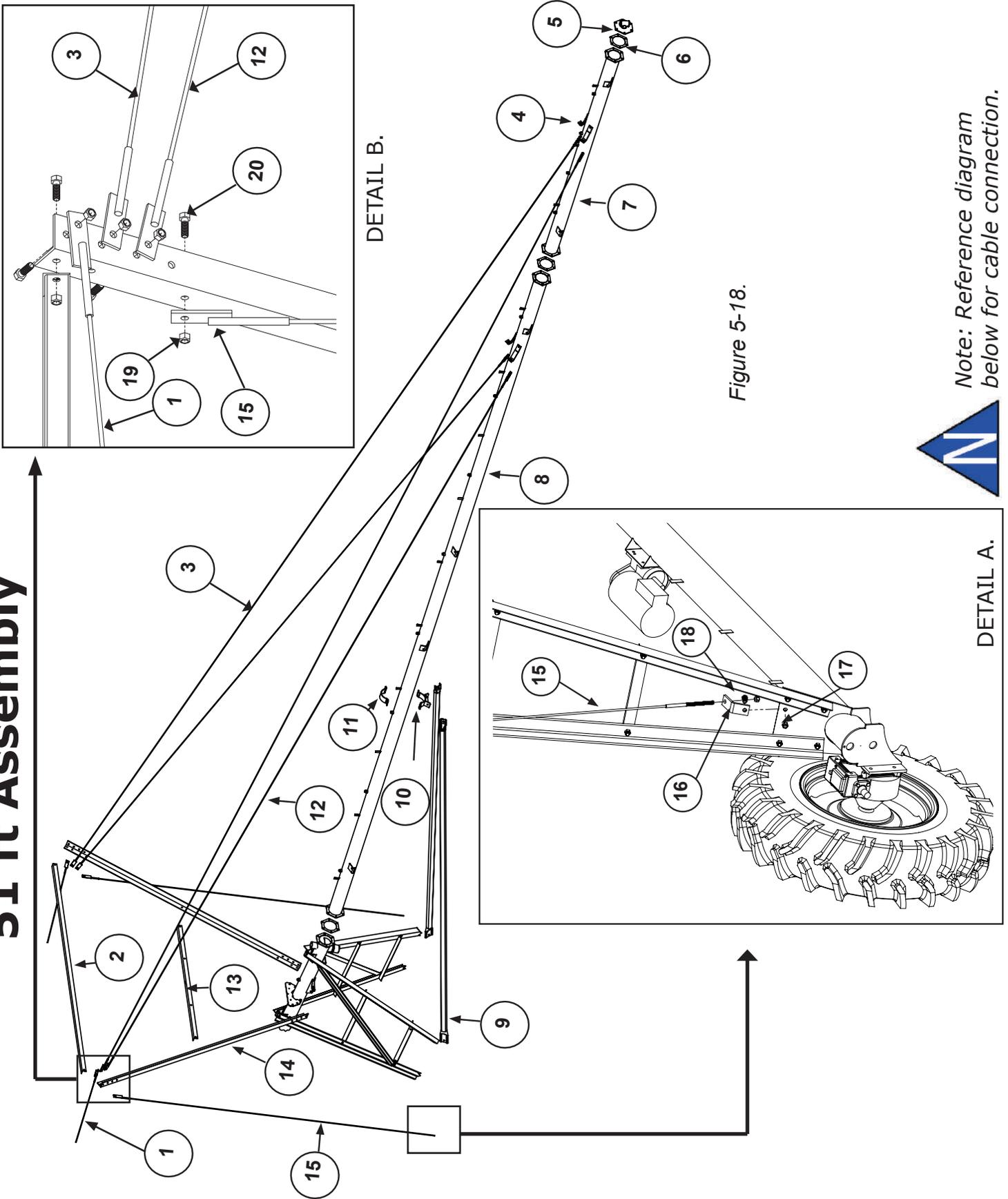


Figure 5-18.



Note: Reference diagram below for cable connection.

ITEM	PART#	QTY	DESCRIPTION
1	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
2	10150-11	1	OH TOP RABBIT CS 144-5/8
3	10169-01	2	OH CABLE ASM 53FT-9" W/NUTS
4	10113-11	6	BRKT OH CABLE
5	07033-11	1	SPAN END PLATE
6	10242-11	3	FLANGE GASKET PLASTIC 6-5/8
7	10223-11	1	OH PIPE ASM 6-5/8 X 12 R 29-1/4
8	10189-11	1	PIPE 6-5/8 X 39 R 58-1/2
9	10084-11	2	TR COMPRESSION BRACE G TUBE 212-3/4
10	10091-11	1	HALF BAND GTUBE ASM
11	10128-11	1	HALF BAND GTUBE
12	10121-01	2	OH CABLE ASM 40FT-7" W/NUTS
13	10228-11	1	END TOWER OH MID RABBIT ASSM
14	10095-11	2	OH RABBIT EAR G 134.00
15	10141-01	1	OH CABLE ASM 19FT-6" W/NUTS
16	10111-11	2	BRKT OH CABL FORM
17	02031-11	2	LOCK NUT GRADE-B PLT 5/8-11
18	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
19	02031-07	44	NUT LOCK 1/2
20	02066-04	40	HEX BOLT G5 1/2 X 1-1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT G5 1/2 X 2

\* Not Shown

# OVERHANG ASSEMBLY

## 58.5 ft Overhang Assembly

# 58.5 ft Assembly

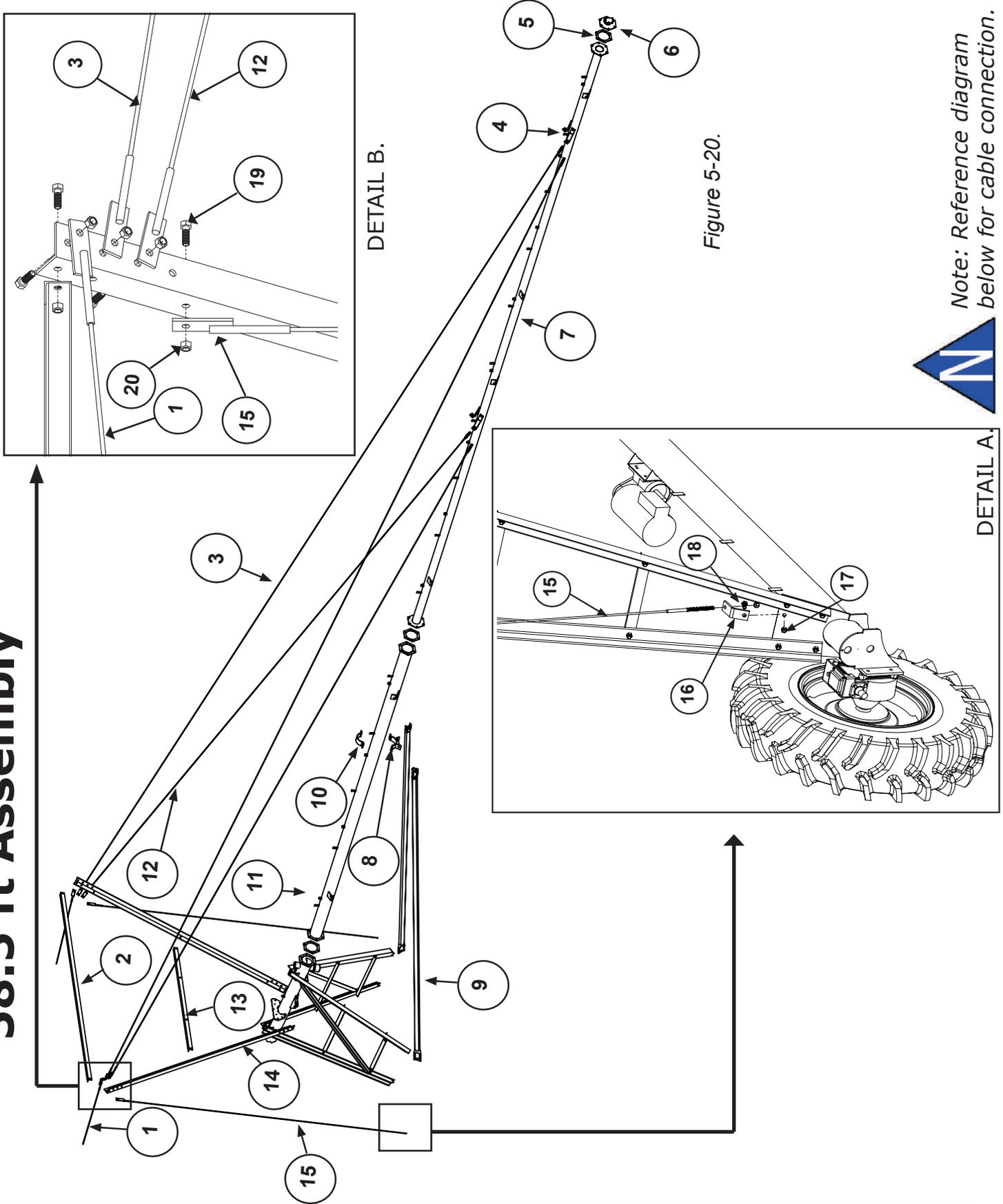


Figure 5-20.



Note: Reference diagram below for cable connection.

ITEM	PART#	QTY	DESCRIPTION
1	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
2	10150-11	1	OH TOP RABBIT CS 144-5/8
3	10154-01	2	OH CABLE ASM 59FT-8" W/NUTS
4	10113-11	6	BRKT OH CABLE
5	10242-11	3	FLANGE GASKET PLASTIC 6-5/8
6	07033-11	1	SPAN END PLATE
7	10160-11	1	OH PIPE 4-1/2 X 39 FT
8	10091-11	1	HALF BAND GTUBE ASM
9	10084-11	2	TR COMPRESSION BRACE G TUBE 212-3/4
10	10128-11	1	HALF BAND GTUBE
11	10190-11	1	PIPE 6-5/8 X 19-1/2 R 58-1/2"
12	10121-01	2	OH CABLE ASM 40FT-7" W/NUTS
13	10228-11	1	END TOWER OH MID RABBIT ASSM
14	10095-11	2	OH RABBIT EAR G 134
15	10141-01	2	OH CABLE ASM 19FT-6" W/NUTS
16	10111-11	2	BRKT OH CABL FORM G
17	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
18	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
19	02066-04	40	HEX BOLT G5 1/2 X 1-1/2
20	02031-07	44	NUT LOCK 1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT G5 EG NC 1/2 X 2

\* Not Shown

# OVERHANG ASSEMBLY

## 64.5 ft Overhang Assembly

# 64.5 ft Assembly

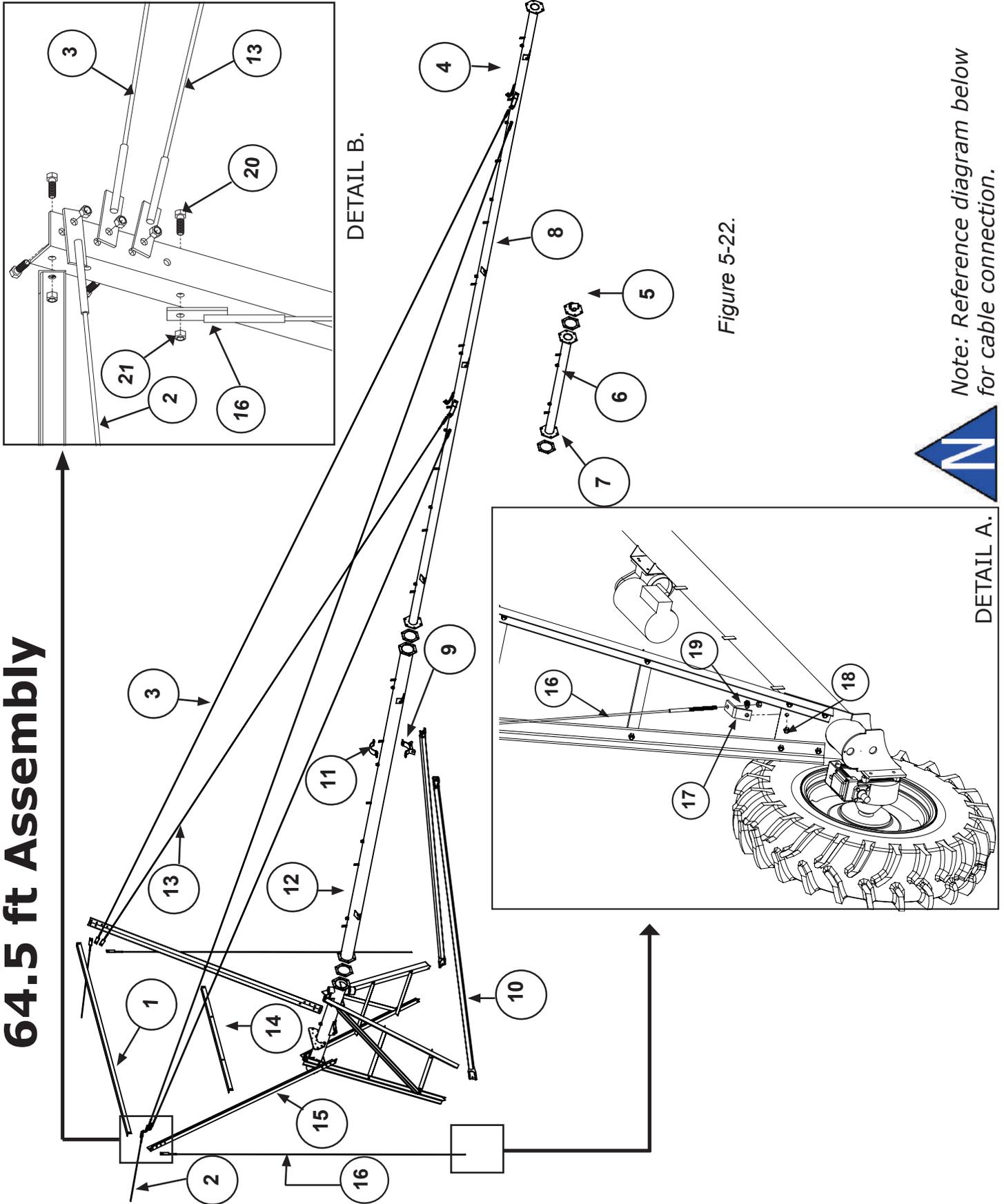


Figure 5-22.



Note: Reference diagram below for cable connection.

ITEM	PART#	QTY	DESCRIPTION
1	10150-11	1	OH TOP RABBIT CS 144-5/8
2	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
3	10154-01	2	OH CABLE ASM 59FT-8" W/NUTS
4	10113-11	6	BRKT OH CABLE
5	07033-11	5	SPAN END PLATE
6	10225-11	1	OH PIPE ASM 4-1/2 X 6 R 29-1/4
7	10242-11	4	FLANGE GASKET PLASTIC 6-5/8
8	10160-11	1	OH PIPE 4-1/2 X 39 FT
9	10091-11	1	HALF BAND GTUBE ASM
10	10084-11	2	TR COMPRESSION BRACE G TUBE 212-3/4
11	10128-11	1	HALF BAND GTUBE
12	10190-11	1	PIPE 6-5/8 X 19-1/2 R 58-1/2
13	10121-01	2	OH CABLE ASM 40FT-7" W/NUTS
14	10228-11	1	END TOWER OH MID RABBIT ASSM
15	10095-11	2	OH RABBIT EAR G 134
16	10141-01	2	OH CABLE ASM 19FT-6" W/NUTS
17	10111-11	2	BRKT OH CABL FORM
18	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
19	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
20	02066-04	46	HEX BOLT G5 1/2 X 1-1/2
21	02031-07	50	NUT LOCK 1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT G5 1/2 X 2

\* Not Shown

# OVERHANG ASSEMBLY

## 78 ft Overhang Assembly

# 78 ft Assembly

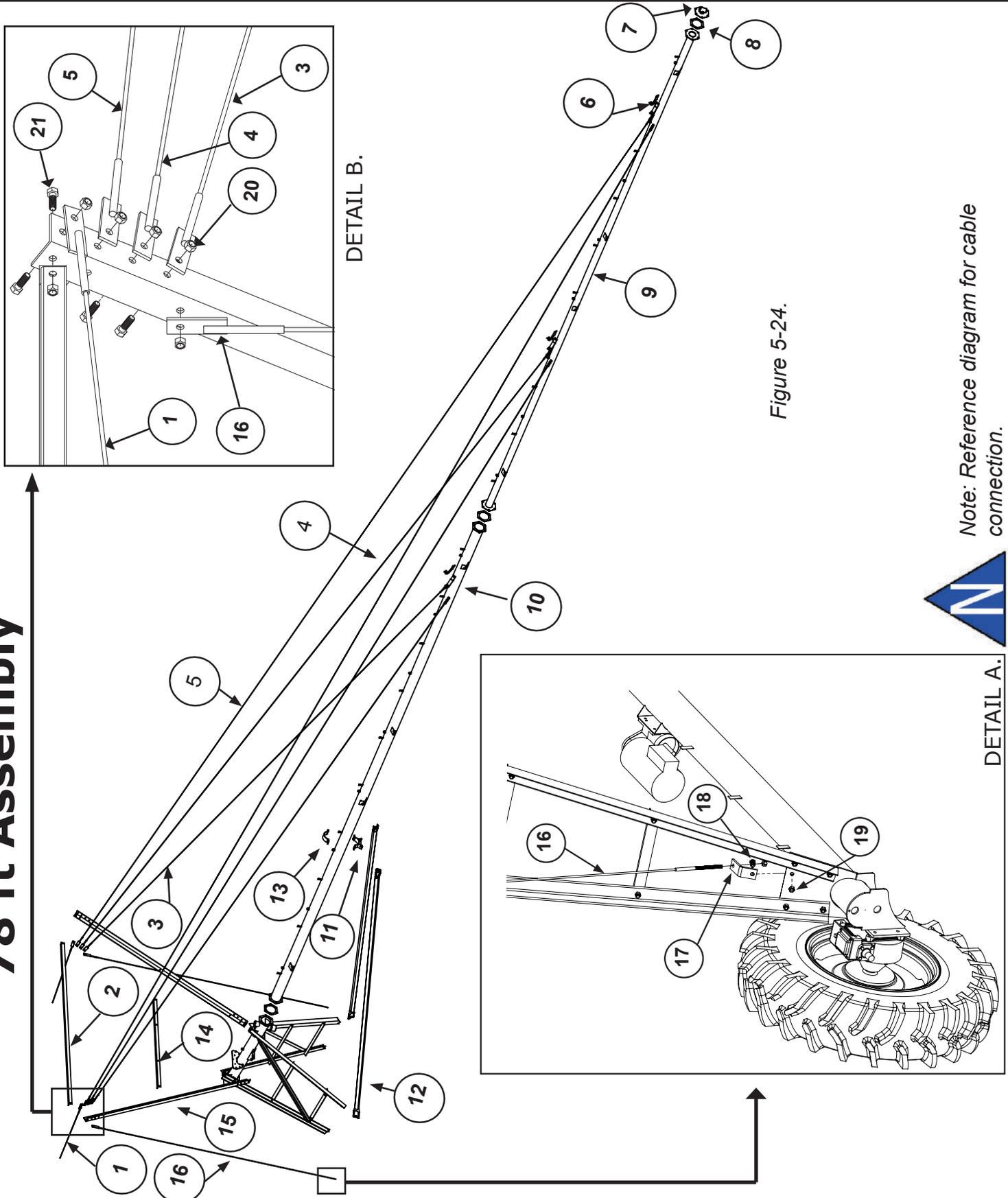


Figure 5-24.

Note: Reference diagram for cable connection.

ITEM	PART#	QTY	DESCRIPTION
1	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
2	10150-11	1	OH TOP RABBIT CS 144-5/8 G
3	10121-01	2	OH CABLE ASM 40FT-7" W/NUTS
4	10154-01	2	OH CABLE ASM 59FT-8" W/NUTS
5	10156-01	2	OH CABLE ASM 78FT-11" W/NUTS
6	10113-01	8	BRKT OH CABLE
7	07033-11	1	SPAN END PLATE
8	10242-11	3	FLANGE GASKET PLASTIC 6-5/8
9	10160-11	1	OH PIPE 4.5 X 39 FT
10	10189-11	1	PIPE 6.63 X 39 R 58.5
11	10091-11	1	HALF BAND GTUBE ASM
12	10084-11	2	TR COMPRESSION BRACE TUBE 212-3/4
13	10128-01	2	HALF BAND GTUBE
14	10228-11	1	END TOWER OH MID RABBIT ASSM
15	10095-11	2	OH RABBIT EAR G 134
16	10141-01	2	OH CABLE ASM 19FT-6" W/NUTS
17	10111-11	2	BRKT OH CABL FORM G
18	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
19	02031-11	2	LOCK NUT GRADE-B PLT 5/8-11
20	02066-04	44	HEX BOLT G5 1/2 X 1-1/2
21	02031-07	48	LOCK NUT EG NC 1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	LOCK NUT GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT G5 1/2 X 2

\* Not Shown

# OVERHANG ASSEMBLY

## 84 ft Overhang Assembly

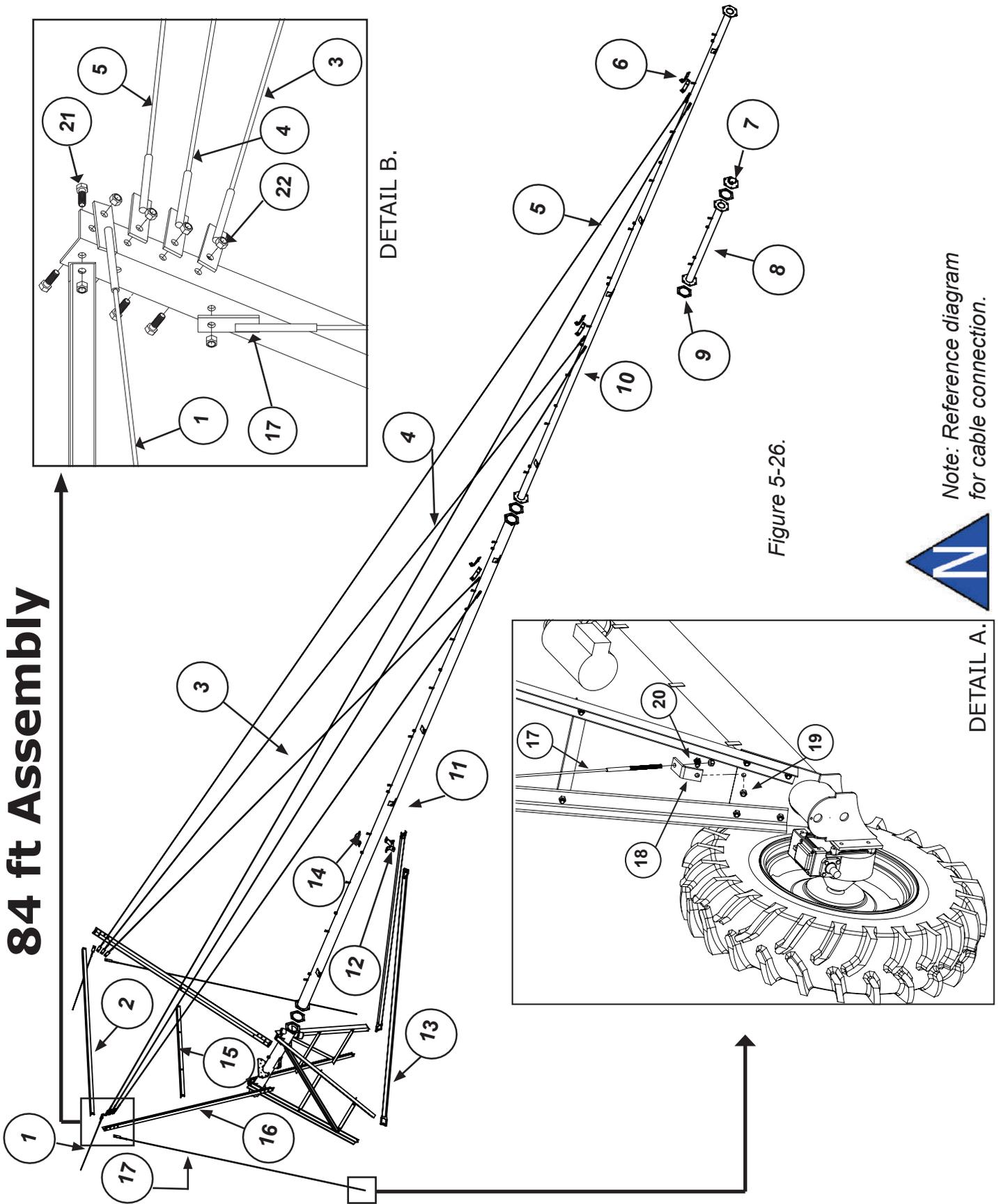


Figure 5-26.

Note: Reference diagram for cable connection.



ITEM	PART#	QTY	DESCRIPTION
1	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS
2	10150-11	1	OH TOP RABBIT CS 144-5/8
3	10121-01	2	CP OH CABLE ASM 40FT-7" W/NUTS
4	10154-11	2	OH CABLE ASM 59FT-8" W/NUTS
5	10156-01	2	OH CABLE ASM 78FT-11" W/NUTS
6	10113-11	8	BRKT OH CABLE
7	07033-11	1	SPAN END PLATE
8	10225-11	1	OH PIPE ASM 4-1/2 X 6 R 29-1/4
9	10242-11	4	FLANGE GASKET PLASTIC 6-5/8
10	10160-11	1	OH PIPE 4-1/2 X 39 FT
11	10189-11	1	PIPE 6-5/8 X 39 R 58-1/2
12	10091-11	1	HALF BAND GTUBE ASM
13	10084-11	1	TR COMPRESSION BRACE G TUBE 212-3/4
14	10128-11	1	HALF BAND GTUBE
15	10228-11	1	END TOWER OH MID RABBIT ASSM G
16	10095-11	2	OH RABBIT EAR G 134
17	10141-01	2	OH CABLE ASM 19FT-6" W/NUTS
18	10111-11	2	BRKT OH CABL FORM
19	02031-11	2	LOCK NUT GRADE-B PLT 5/8-11
20	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
21	02066-04	50	HEX BOLT G5 1/2 X 1-1/2
22	02031-07	54	LOCK NUT EG NC 1/2
*	02068-02	2	HEX BOLT G5 5/8 X 1-1/2
*	02031-11	2	NUT LOCK GRADE-B PLT 5/8-11
*	02066-06	4	HEX BOLT G5 1/2 X 2

\* Not Shown

### Rear Cable Assembly

Note: Make sure placement of rear cable assembly is on the fourth Jack from end tower on 39' and 45' lengths. The 51' 58.5', 64.5', 78', and 84' rear cable assemblies are placed on the sixth jack from end tower.

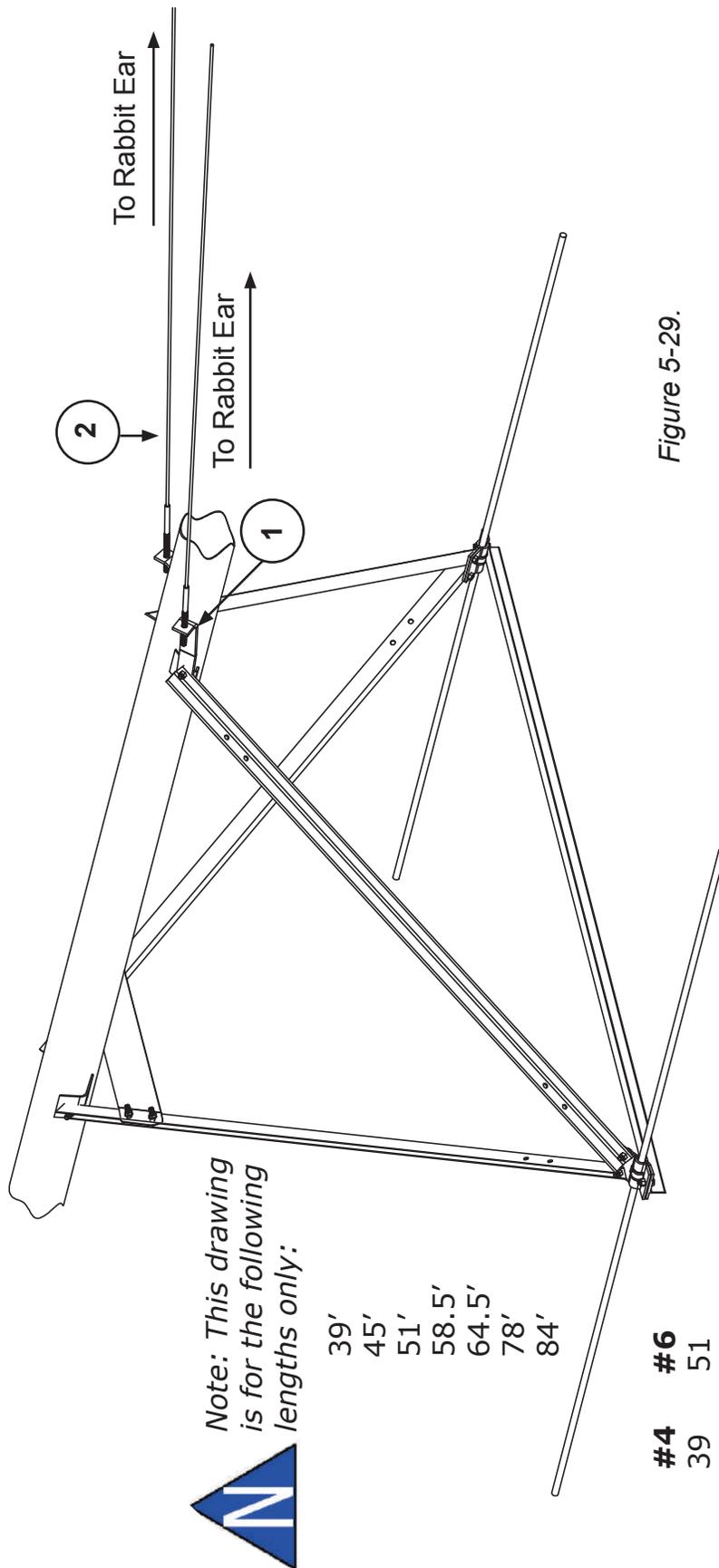


Figure 5-29.

ITEM	PART#	QTY	DESCRIPTION
1	10113-11	2	BRKT OH CABLE
2	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS

# 12 & 31.5 ft Rear Cable Assembly



Note: Make sure placement of rear cable assembly is on the fourth Jack from tower for 31.5 ft and on second jack from tower on 12ft..

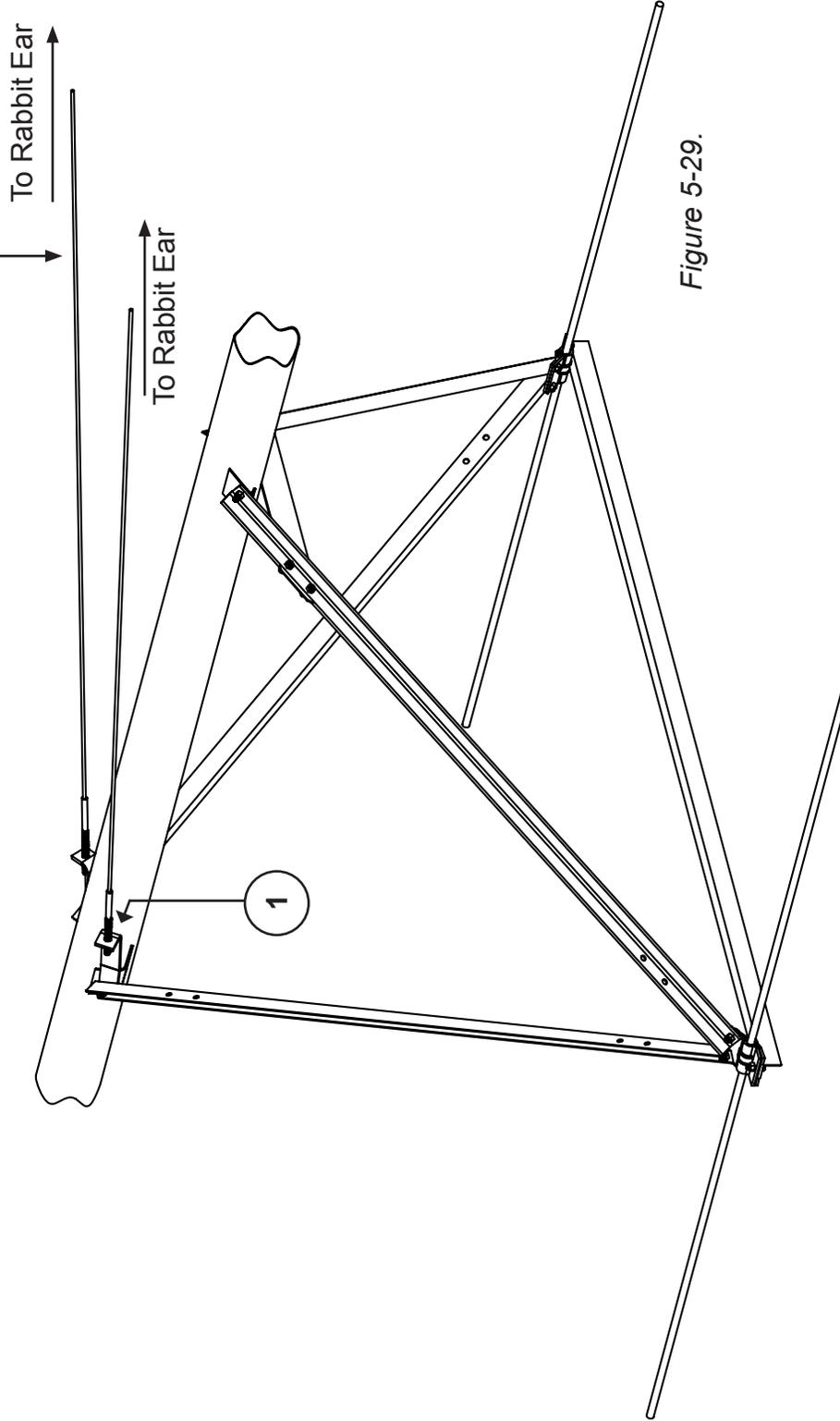
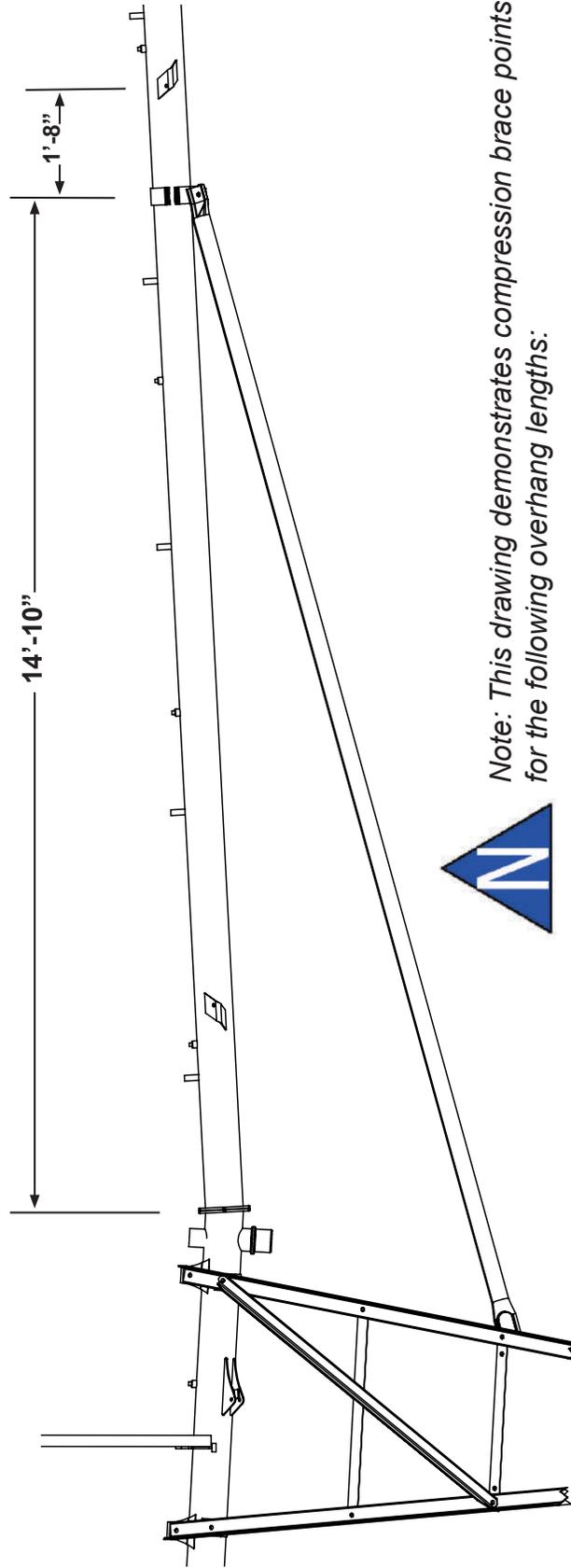


Figure 5-29.

ITEM	PART#	QTY	DESCRIPTION
1	10113-11	2	BRKT OH CABLE
2	10179-01	2	OH CABLE ASM 114FT-11" W/NUTS for 31.5'
*	10847-01	2	CP OH CABLE ASM 57'-4" W/NUTS for 12'

## Overhang Assembly With Compression Braces

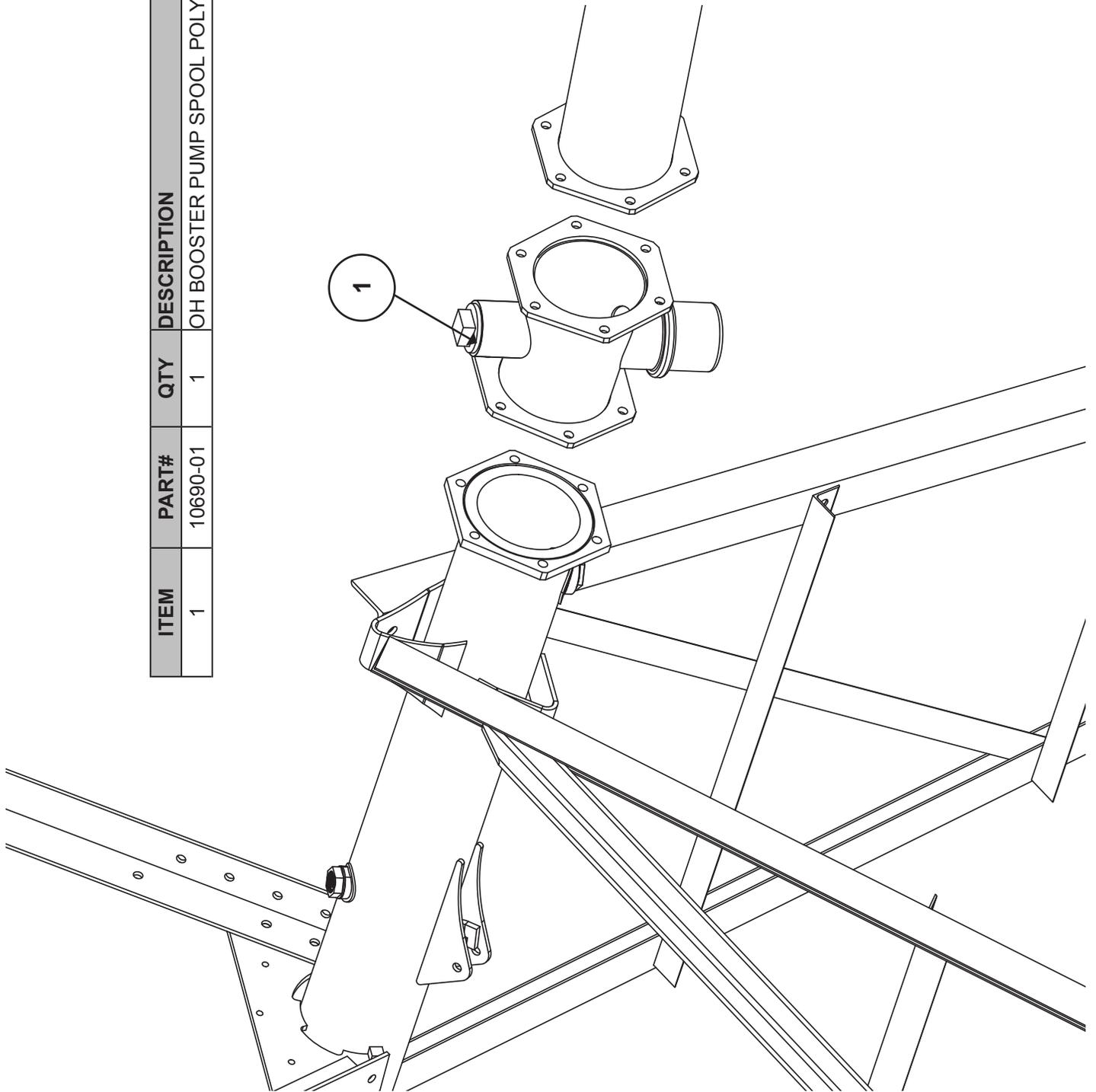


Note: This drawing demonstrates compression brace points for the following overhang lengths:

- 19.5'
- 25.5'
- 31.5'
- 39'
- 45'
- 51'
- 58.5'
- 64.5'
- 78'
- 84'

Figure 5-30.

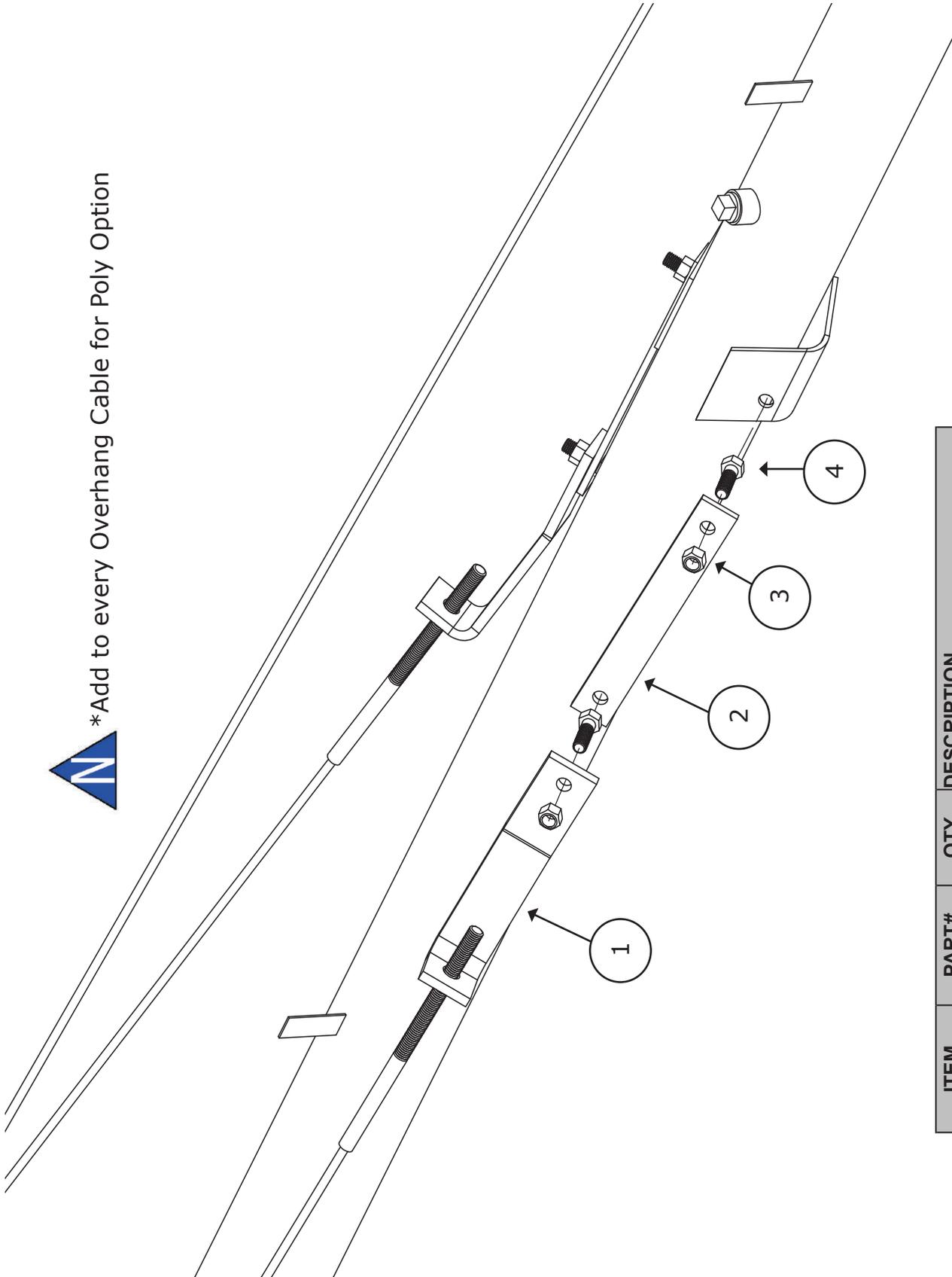
ITEM	PART#	QTY	DESCRIPTION
1	10690-01	1	OH BOOSTER PUMP SPOOL POLY P



# OVERHANG ASSEMBLY

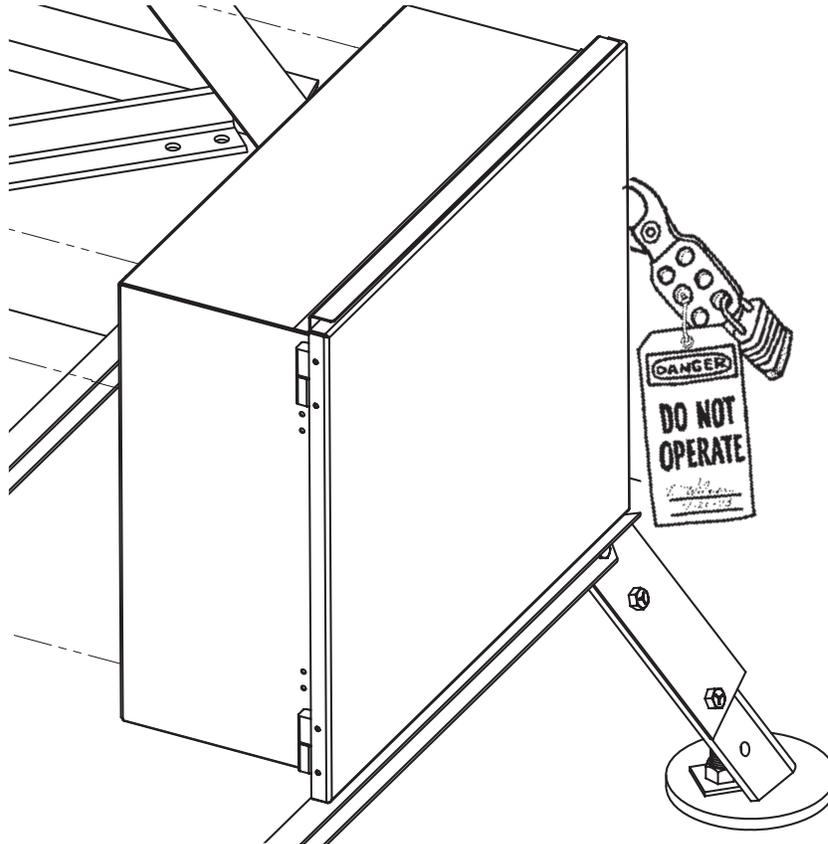
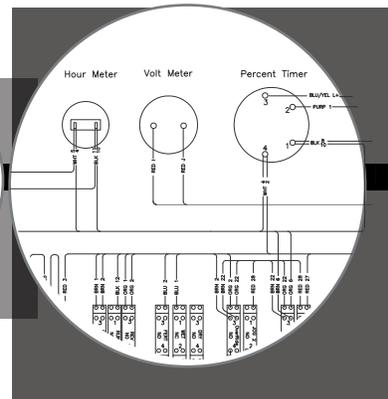
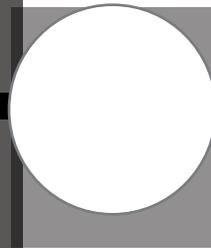
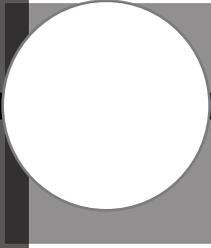
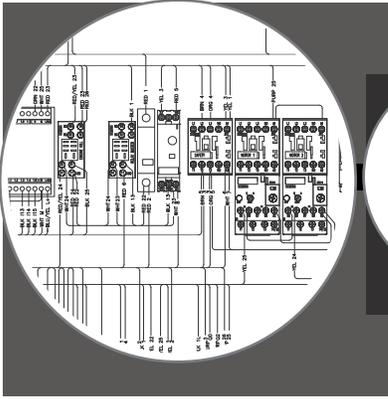
Cable Extension-For Poly Option Only

 \*Add to every Overhang Cable for Poly Option



ITEM	PART#	QTY	DESCRIPTION
1	10113-11	1	BRKT OH CABLE
2	10182-11	1	OH FLAT BAR 11 INCHES
3	02031-07	1	NUT LOCK 1/2
4	02066-04	1	BOLT HEX 1/2 X 1-1/2

# ELECTRICAL



## **A WORD ABOUT PROPER GROUNDING**

Due to the wet environment of irrigation equipment, it is very important that your VEICHI Center Pivot Irrigation System be properly grounded. The US NEC (US-National Electric Code) requires a grounded conductor of a grounded utility system to extend to every piece of equipment served. This means that for a three-phase electrical system, three power wires and one ground wire are required between your main service entrance disconnect and the pivot panel. For center pivot equipment, this service entrance should be a fused disconnect switch located before the power cable goes underground to the center pivot machine.

An irrigation system may be served from open-delta, or grounded-delta transformers. The grounded-delta three-wire transformer, however, is not recommended because there are only three wires from the transformer to the service entrance. Most newer installations will have three power leads and a ground from the transformer to the main service entrance. If only three leads are provided from the transformer, a grounding lead should be installed from the transformer to the service panel to ensure a low impedance path-to-ground required due to the long lengths of wire used on pivot machines. Consult an electrician qualified to make this installation.

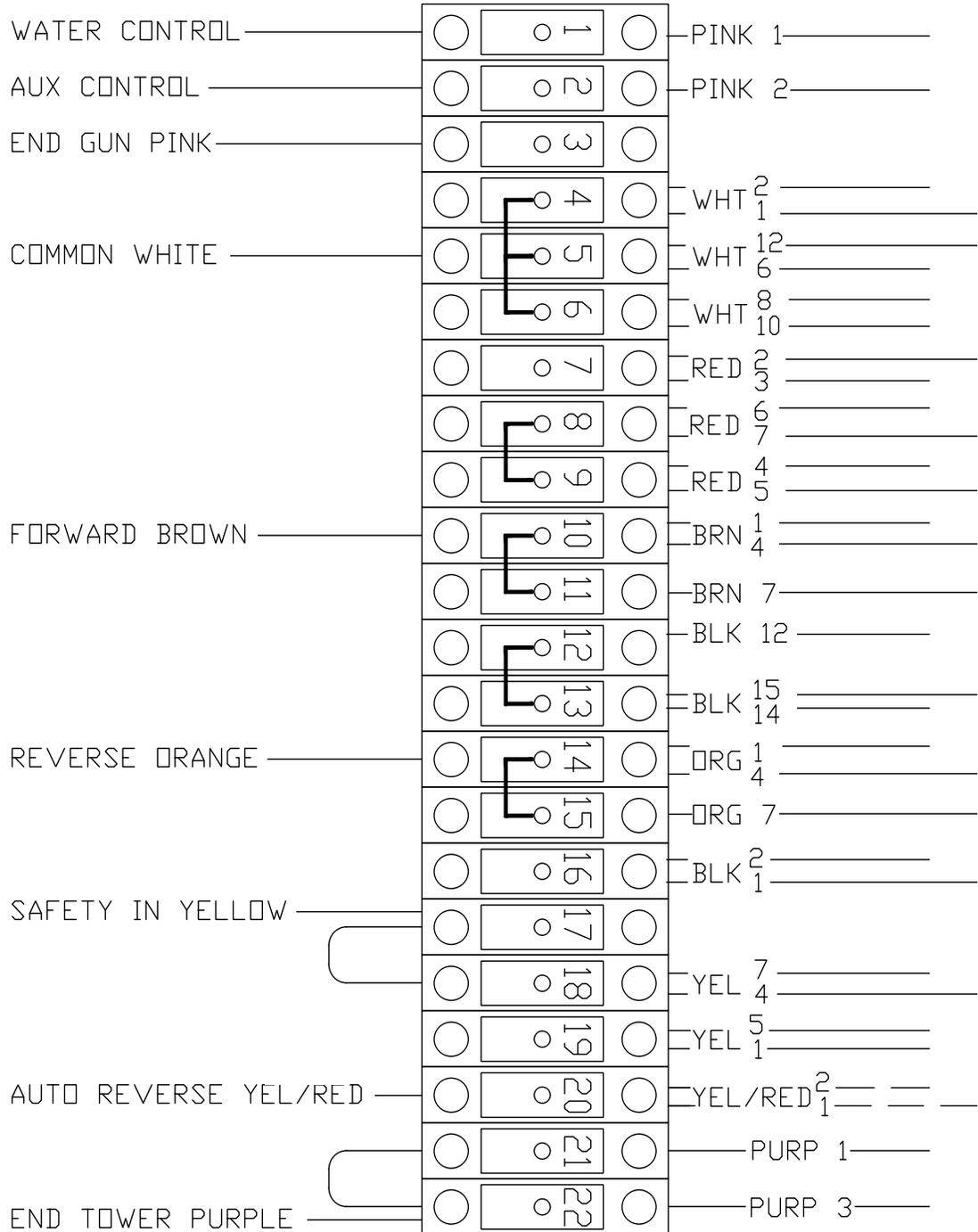
In addition to the grounding circuit, two ground rods should be driven at the transformer, service disconnect or pump panel, and at the pivot panel. The ground rods should be connected to the enclosures with a minimum of No. 6 bare copper wire, and in accordance with the US National Electric Code.

When a generator is used as a power source, it should also be grounded, and ground rod driven at both generator and pivot.

### SPAN CABLE SIDE



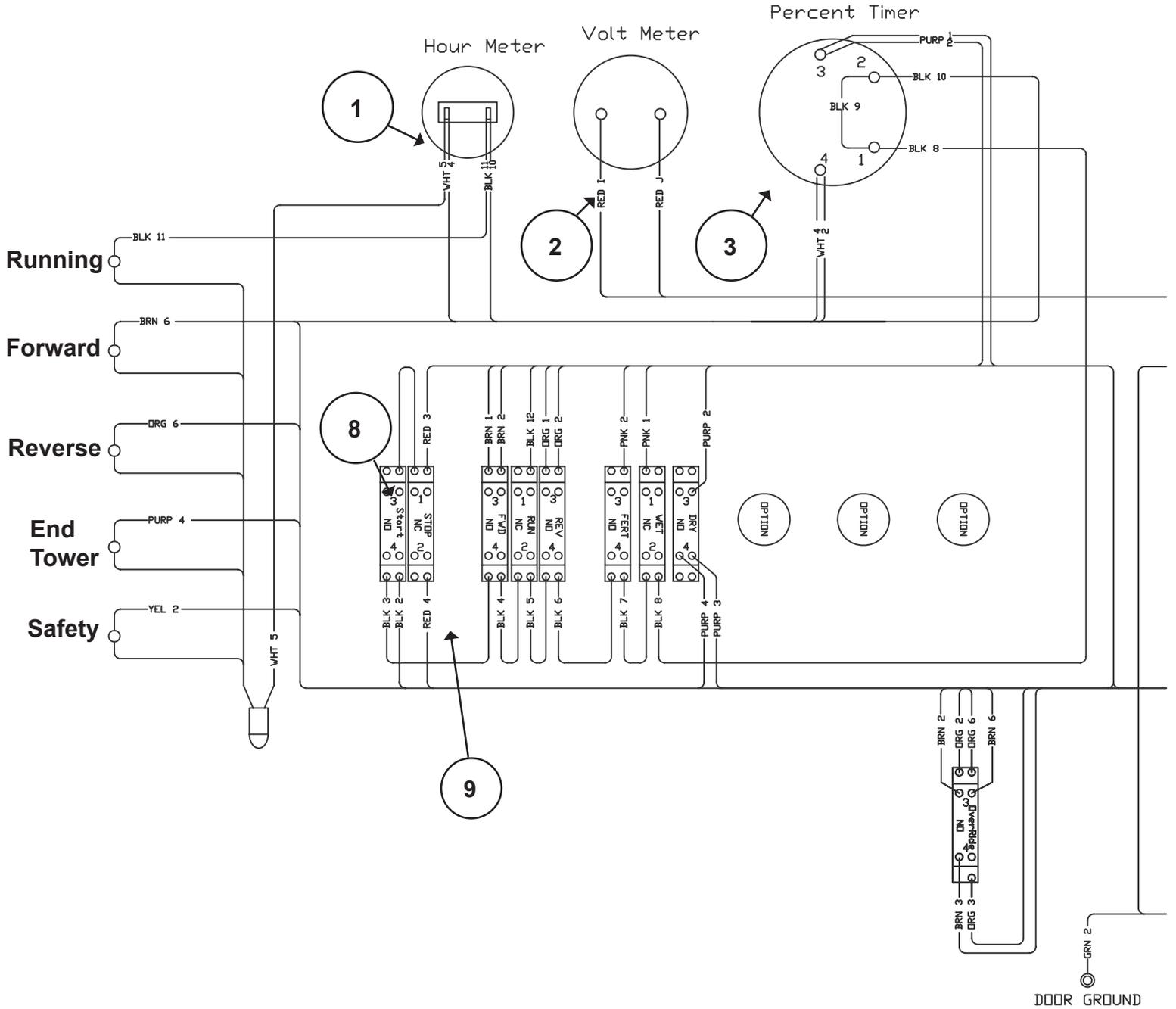
### PANEL SIDE



*Note: Field Wiring-Use Copper or Aluminum conductors for at least 60° C. Recommended screw tightening torque is 4.4 lb-in (0.5 Nm).*

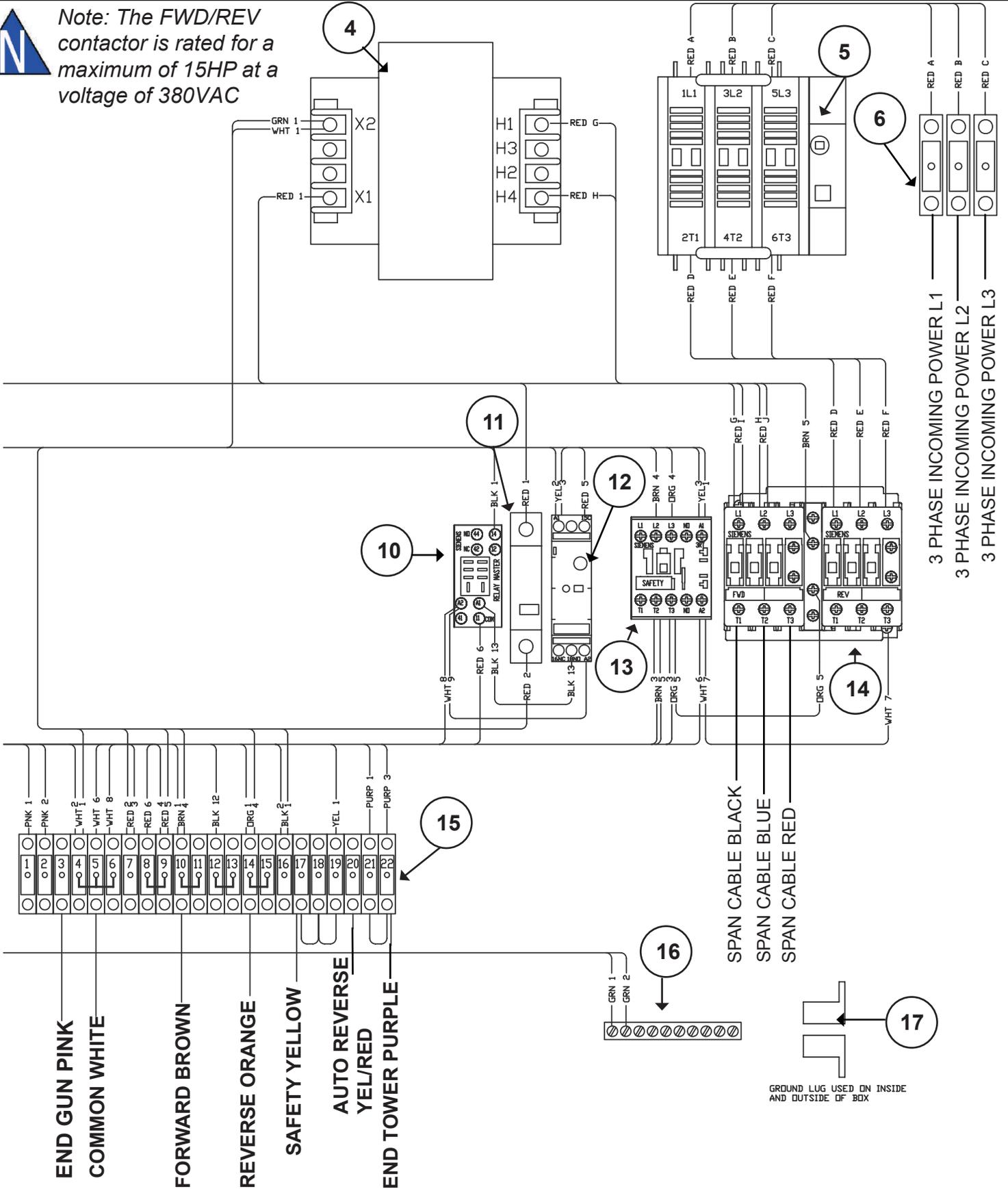


Note: Reference parts list on Section 6-9

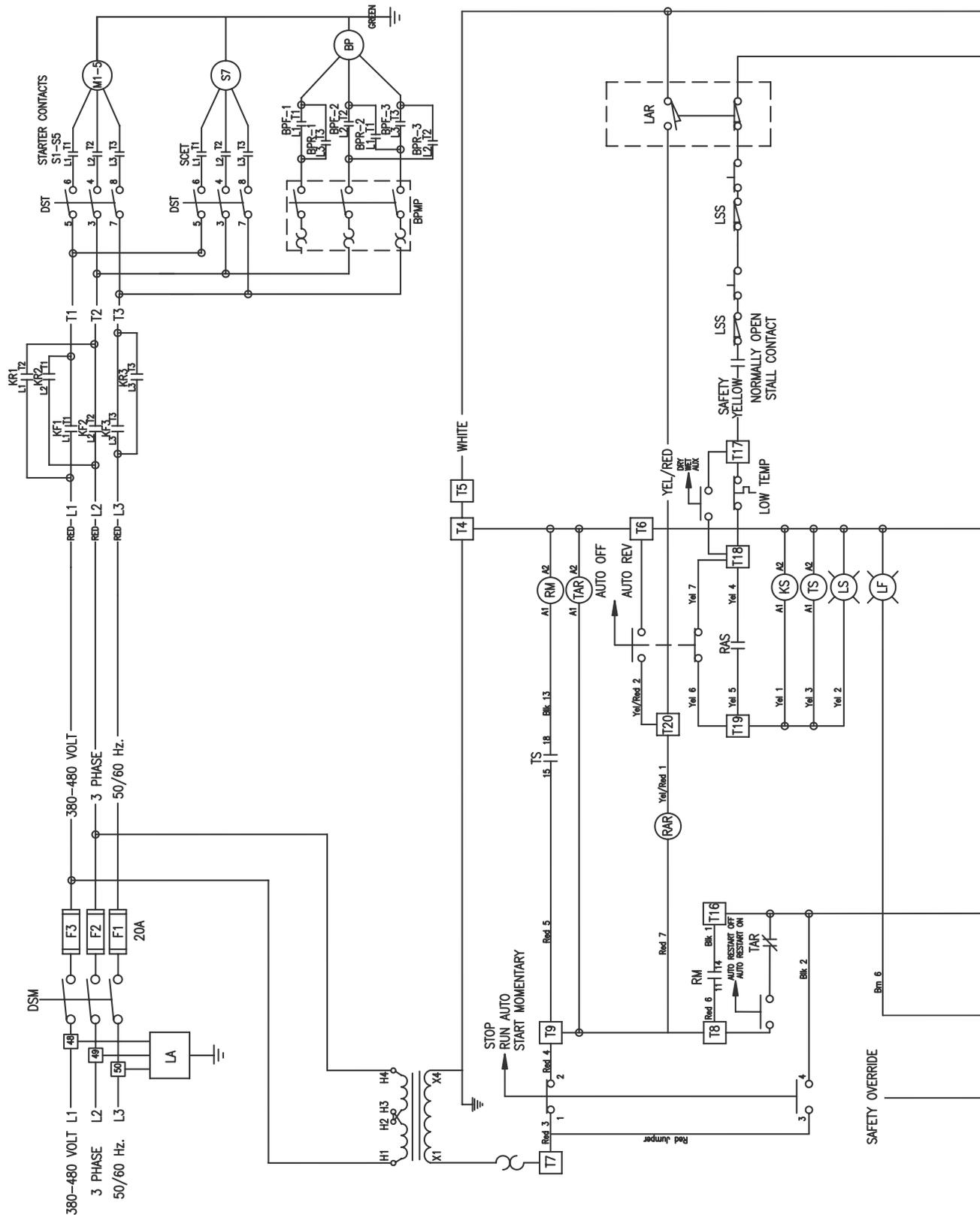


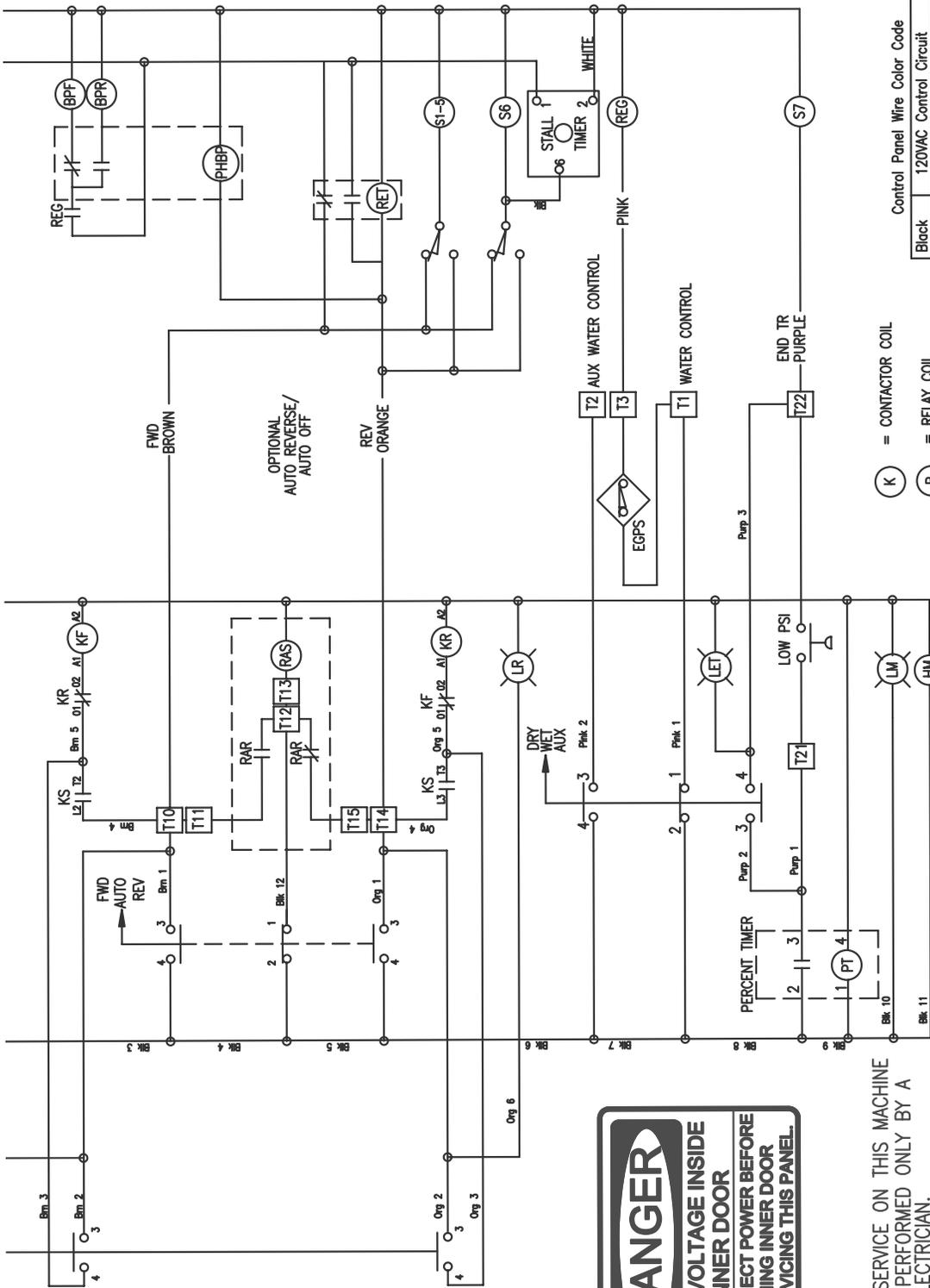


Note: The FWD/REV contactor is rated for a maximum of 15HP at a voltage of 380VAC



ITEM	PART#	QTY	DESCRIPTION
1	12006-01	1	HOUR METER
2	2210-01	1	VOLT METER 600V 3-1/2IN
3	2196-01	1	PERCENT TIMER 60 SEC
4	2197-17	1	TRANS 500VA 220/380
5	12000-01	1	30AMP DISCONNECT SWITCH
6	12008-02	3	TERM BLOCK M35/16
*	2613-01	5	INDICATOR LIGHT AMBER 1/4"
8	12007-06	6	SWITCH BLOCK NO
9	12007-08	3	SWITCH BLOCK NC
10	12005-02	1	SWITCH REL BASE
10	12005-01	1	SWITCH RELAY
11	2206-17	1	CIRCUIT BREAKER 6AMP
12	12003-01	1	SAFETY TIMER DELAY
13	12002-01	1	STARTER 18AMP 120VAC
14	12001-01	1	STARTER FWD/REV
15	12008-01	22	TERM BLOCK M4/6
16	2269-02	1	GROUND BAR 10 POS
17	2202-01	2	GROUND LUG 2-1/4 SET SCREW
*	12000-02	1	SWITCH DISCON SHAFT
*	12000-03	1	SWITCH DISCON HANDLE
*	2206-19	3	FUSE CARTRIDGE BUSS
*	12008-04	4	TERM BLOCK 2 TERMINAL
*	12008-05	1	TERM BLOCK 3 TERMINAL
*	12008-06	3	TERM BLOCK BARRIER
*	12008-03	4	TERM BLOCK END STOP
*	12007-01	2	TWIST SWITCH 3 POS A-B-C
*	12007-03	1	TWIST SWITCH 3 POS A-B<C
*	12007-05	1	PUSH BUTTON SWITCH
*	12007-09	2	PUSH BUTTON SWITCH ADPT
*	90200-41-OR-	1	COMPLETE PANEL BASIC 60HZ
*	90202-41	1	COMPLETE PANEL BASIC 50HZ





ELECTRICAL SERVICE ON THIS MACHINE SHOULD BE PERFORMED ONLY BY A QUALIFIED ELECTRICIAN.  
P90200-41 Nov. 2007

- EGPS = END GUN PROX. SWITCH
- KF = CONTACTOR FORWARD
- KR = CONTACTOR REVERSE
- KS = CONTACTOR SAFETY
- LF = LIGHT FORWARD
- LM = LIGHT MAIN POWER
- LS = LIGHT SAFETY RETURN
- LAR=LIMIT SWITCH AUTO REVERSE 2 STEP
- LSS= LIMIT SWITCH ALIGNMENT SAFETY
- PT = PERCENT TIMER

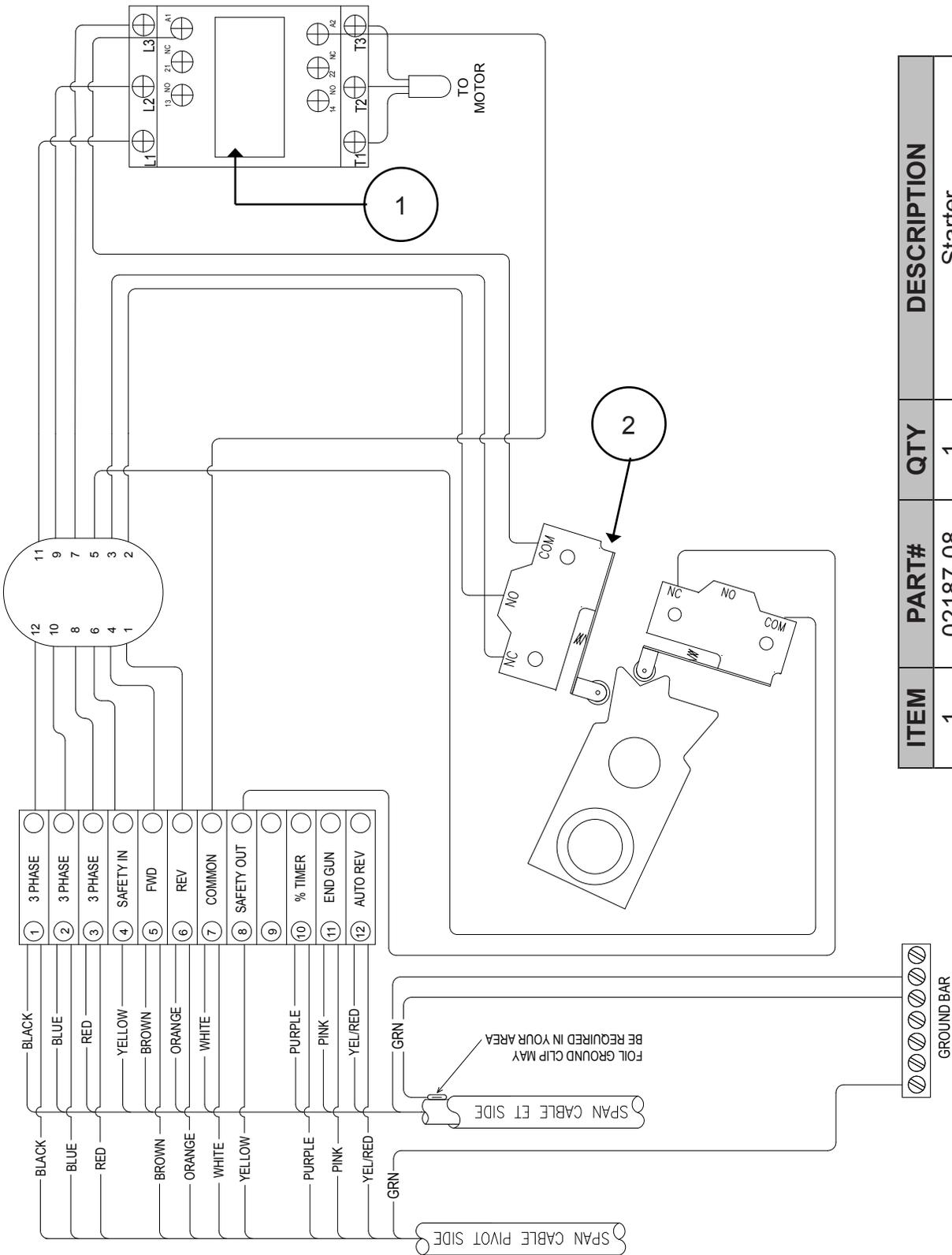
- RAR = RELAY AUTO REVERSE SEQUENCER
- RAS = RELAY AUTO STOP
- REG = RELAY END GUN
- RET = RELAY END TOWER
- RM = RELAY MAIN
- RP = RELAY PRESSURE
- TAR = TIMER AUTO RESTART PULSE TIMER
- TS = TIMER SAFETY 3 SEC DELAY OFF
- S1.5 = STARTER FIRST THRU FIFTH TOWER
- S6 = STARTER SECOND TO LAST TOWER
- S7 = STARTER END TOWER

- WITH THE FOLLOWING OPTIONS:
- AUTO REVERSE/ AUTO STOP
  - AUTO RESTART ON POWER
  - END TOWER RELAY
  - END GUN RELAY
  - SAFETY OFF DELAY
  - HOOR METER
  - LOW PRESSURE RELAY

- (K) = CONTACTOR COIL
- (R) = RELAY COIL
- (S) = STARTER COIL
- (T) = TIMER COIL
- (L) = LIGHT
- [T1] = TERMINAL BLOCK

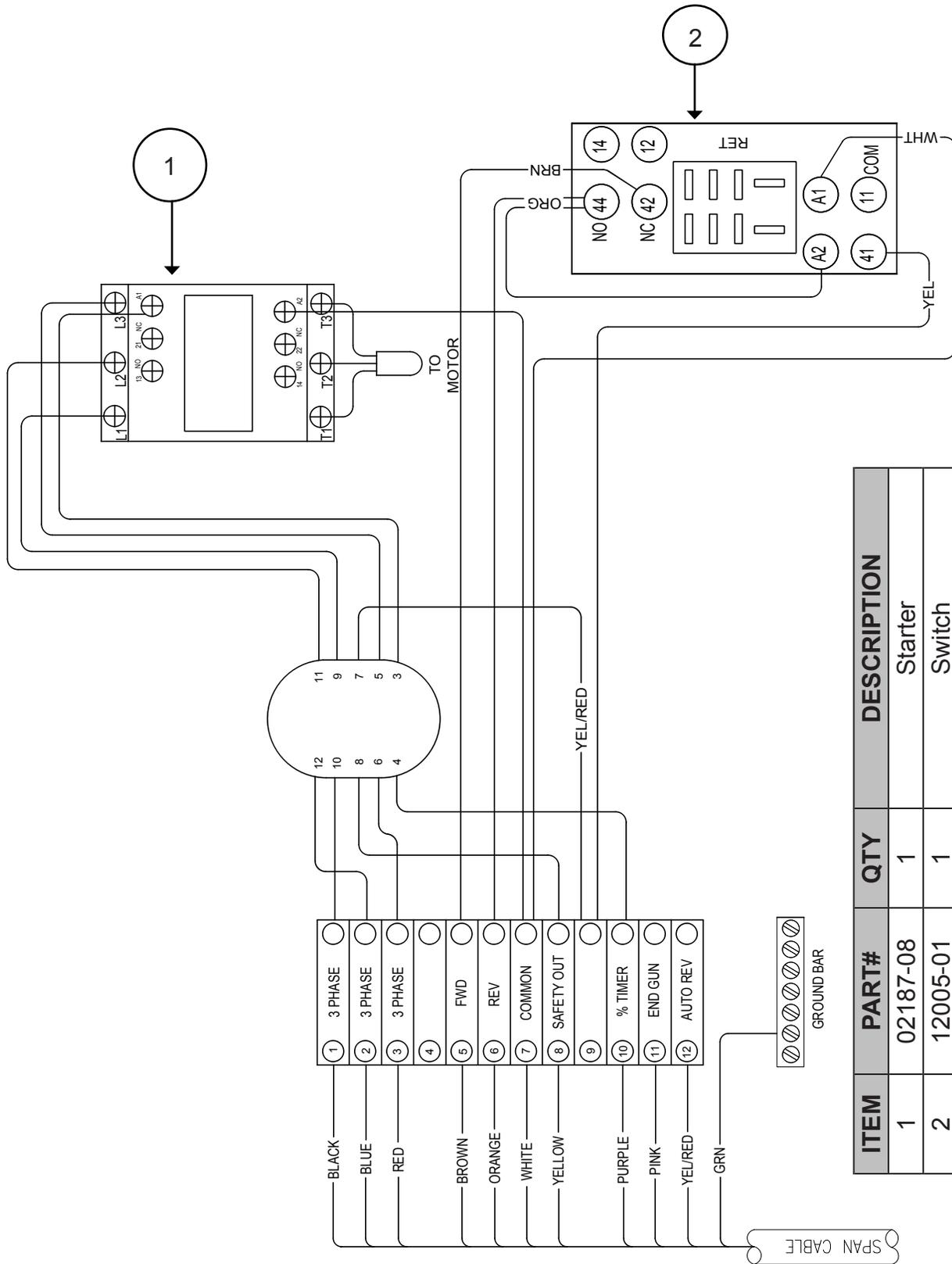
Control Panel Wire Color Code	
Black	120VAC Control Circuit
Brown	120VAC Forward Circuit
Green	Earth Ground
Orange	120VAC Reverse Circuit
Pink	120VAC Water Control Circuit
Purple	120VAC End Tower Circuit
Red	Ungrounded AC Power Circuit
White	Grounded AC Power Circuit
Yellow	120VAC Safety Circuit

VER4 10/08/08

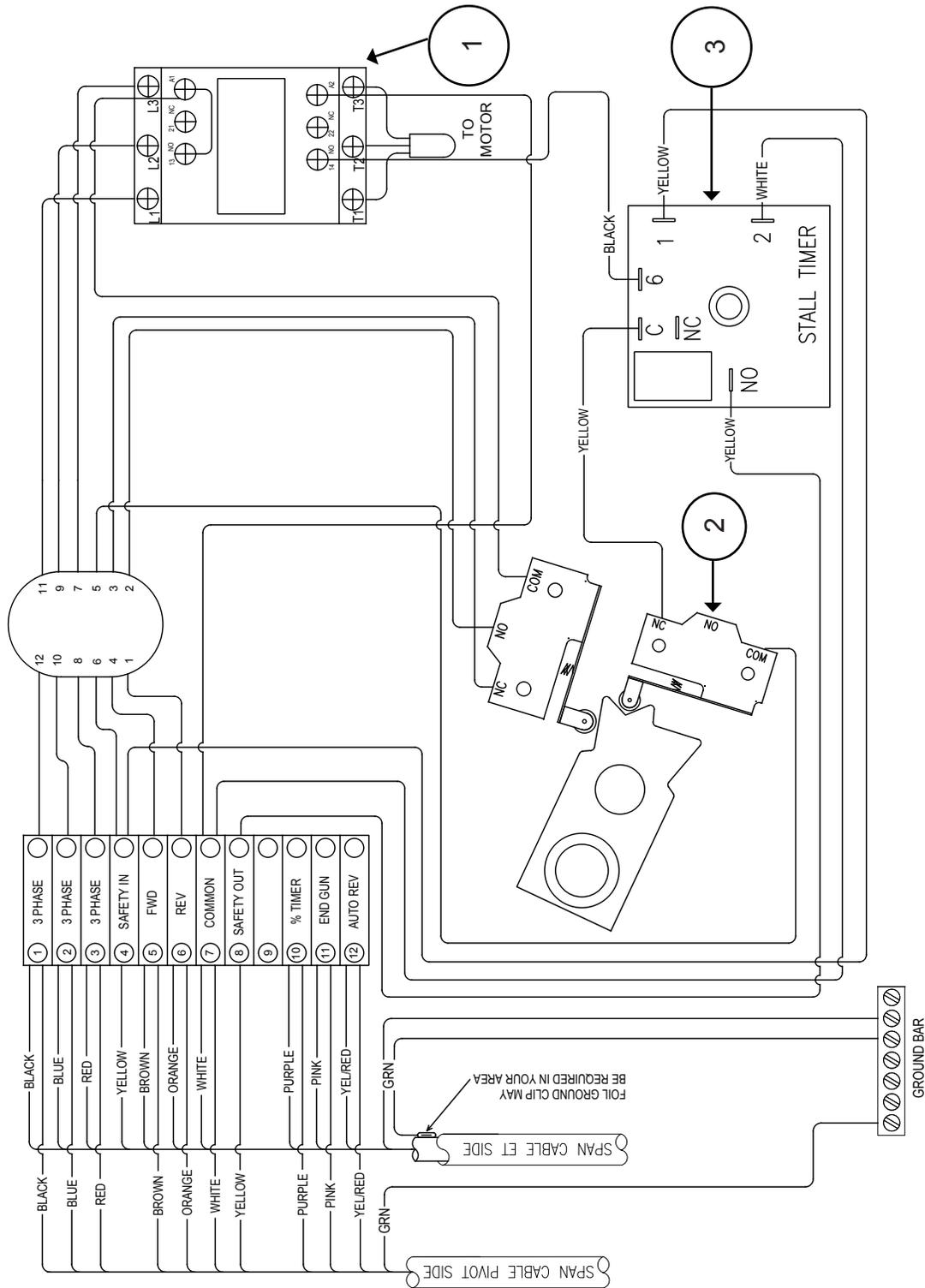


ITEM	PART#	QTY	DESCRIPTION
1	02187-08	1	Starter
2	02224-06	2	Micro Switch
*	10142-01	1	Complete Int. Tower JB





ITEM	PART#	QTY	DESCRIPTION
1	02187-08	1	Starter
2	12005-01	1	Switch
2	12005-02	1	Switch Base
*	90017-01	1	Complete End Tower JB



ITEM	PART#	QTY	DESCRIPTION
1	02187-08	1	Starter
2	02224-06	2	Micro Switch
3	02296-08	1	Stall Timer
*	90016-01	1	Complete Stall JB

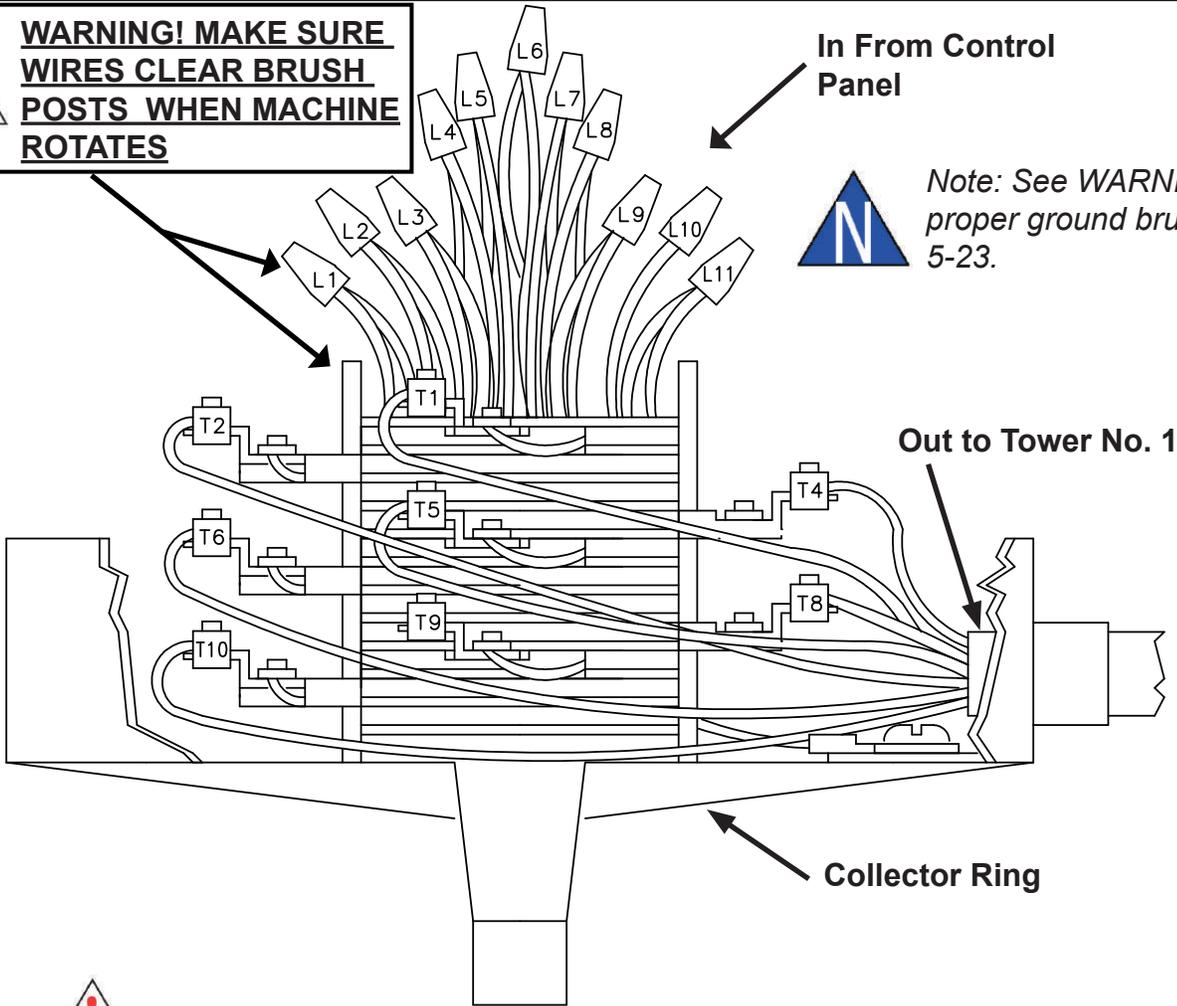


**WARNING! MAKE SURE WIRES CLEAR BRUSH POSTS WHEN MACHINE ROTATES**

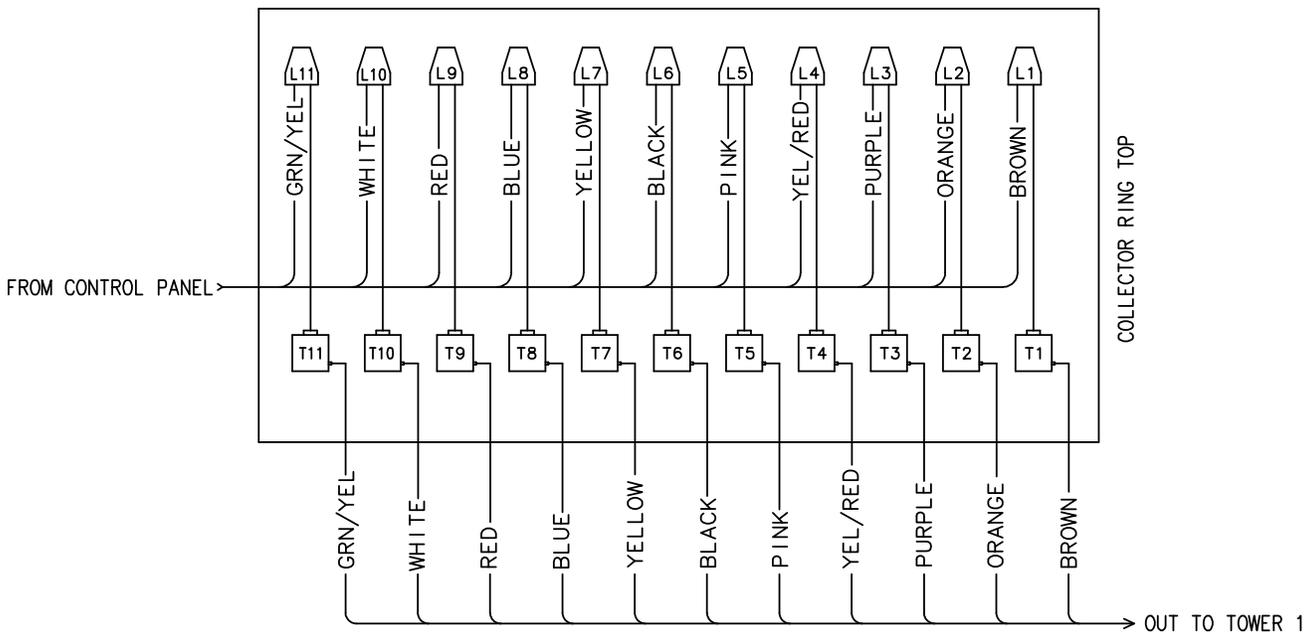
In From Control Panel



Note: See WARNING! regarding proper ground brush wiring Section 5-23.



**WARNING! DO NOT CONNECT #6 WIRE TO #9 WIRE.**



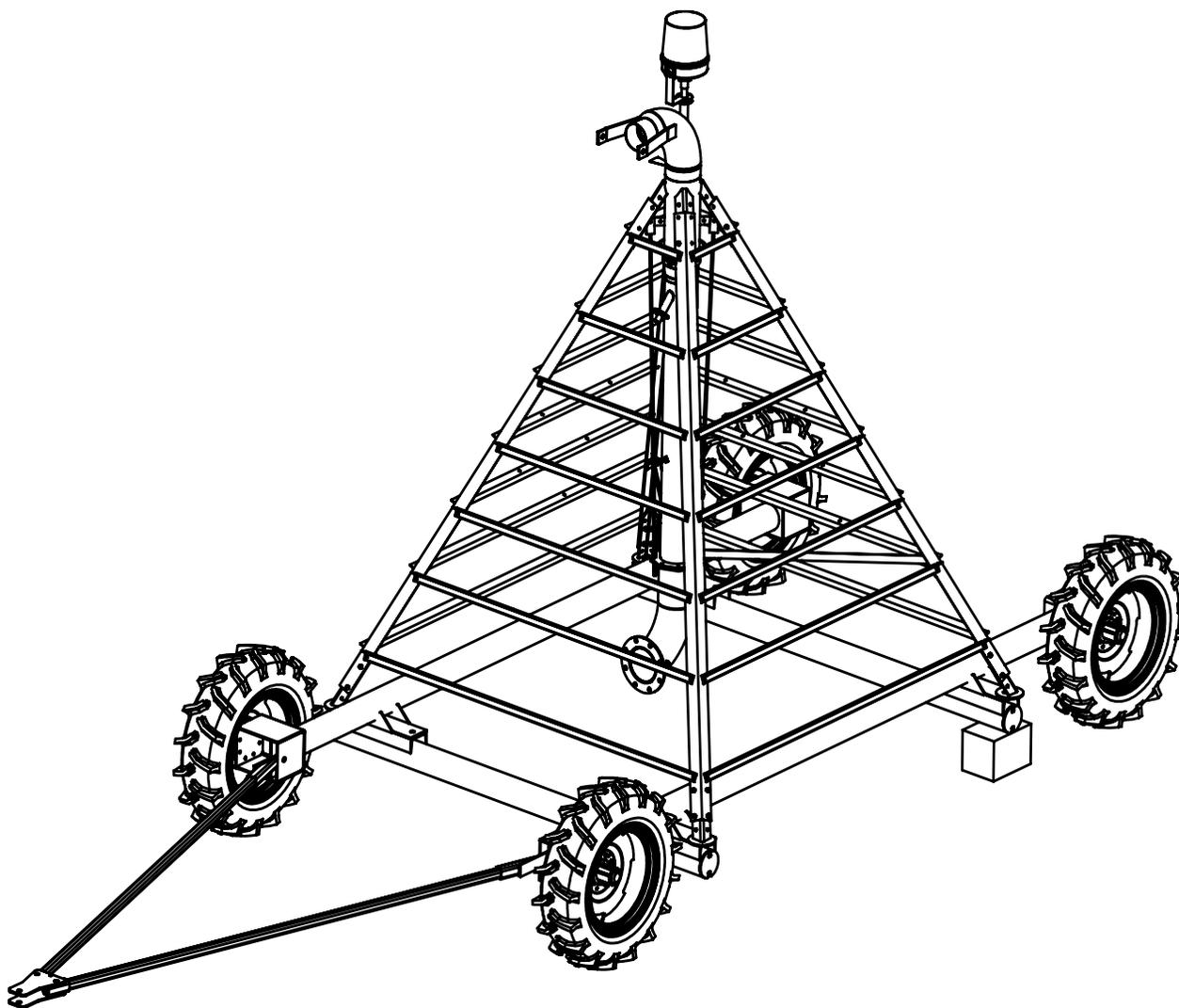
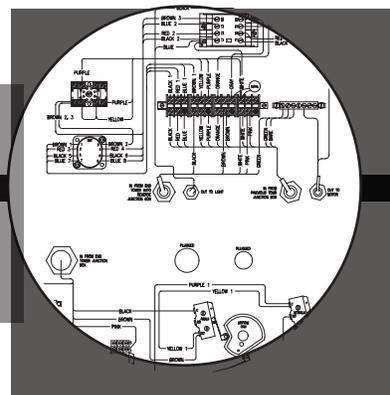
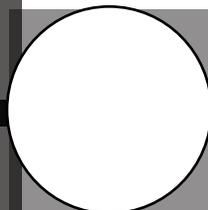
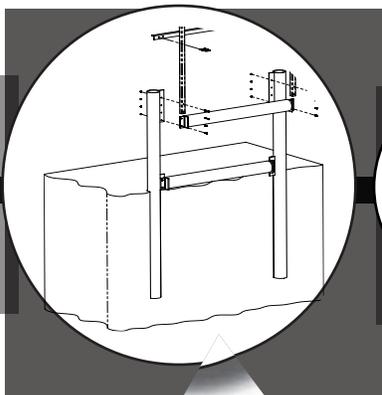
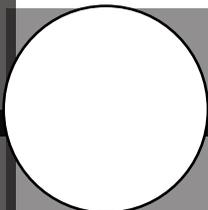
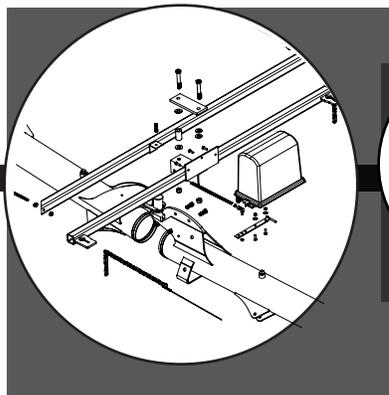


**WARNING! GREEN IS GROUND. MAKE SURE GREEN WIRE IS CON-NECTED TO L11 RACEWAY BRUSH. THE RACEWAY BRUSH IS GROUNDED TO THE COLLECTOR RING BASE. FAILURE TO PROP-ERLY GROUND YOUR PIVOT WILL RESULT IN SERIOUS INJURY OR POSSIBLE DEATH.**



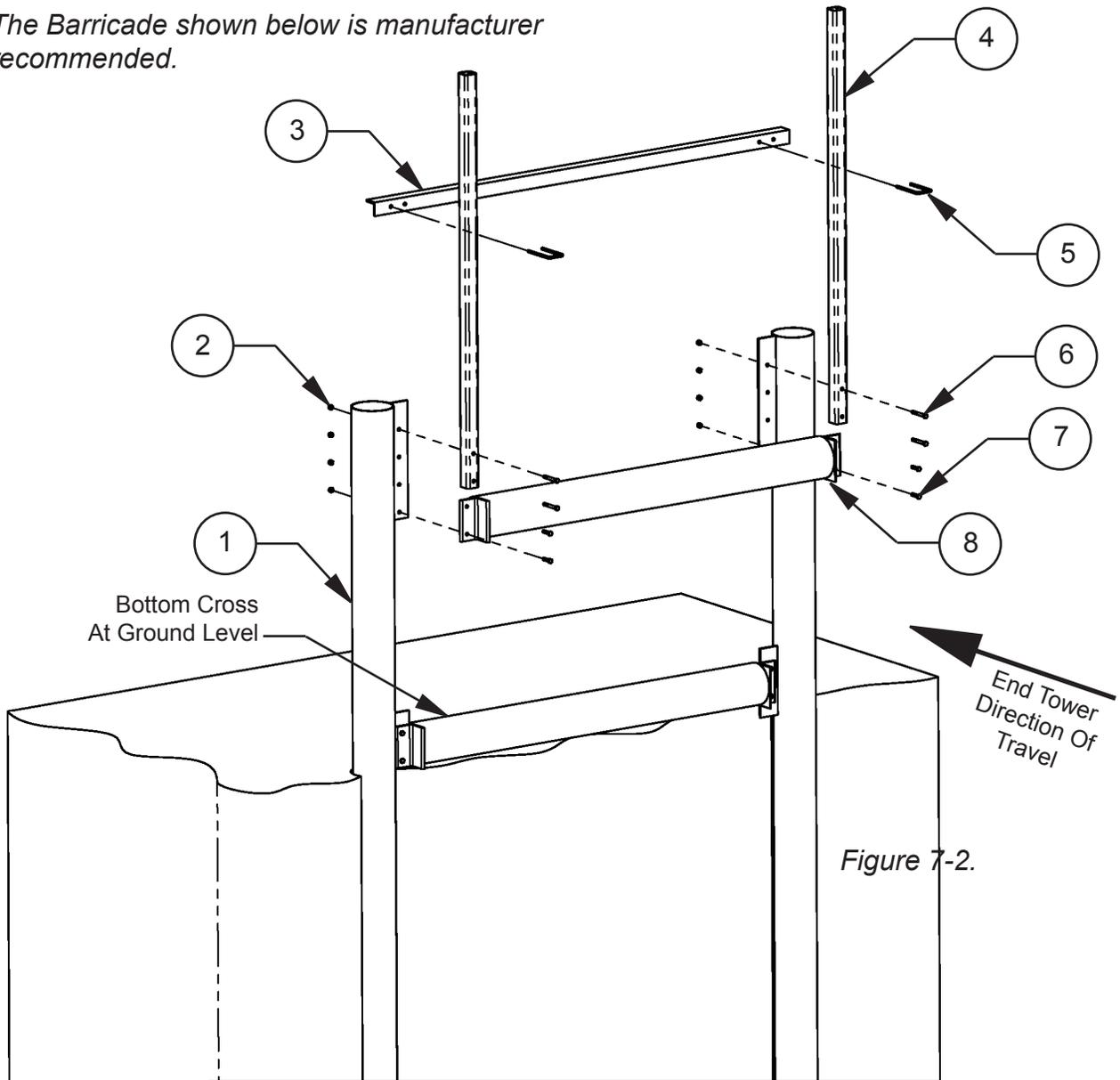
*Note: Wire color in Span Cable is subject to change without notice. Reference will be made here on out to yel/red wire. Depending upon purchase date, your Span Cable may be equipped with tan; yellow/red replaces tan.*

# OPTIONS





The Barricade shown below is manufacturer recommended.



 **WARNING!** 

**Construction of a Failsafe Barricade to stop the next-to-last drive tower is required for machines with Auto-Reverse Options**

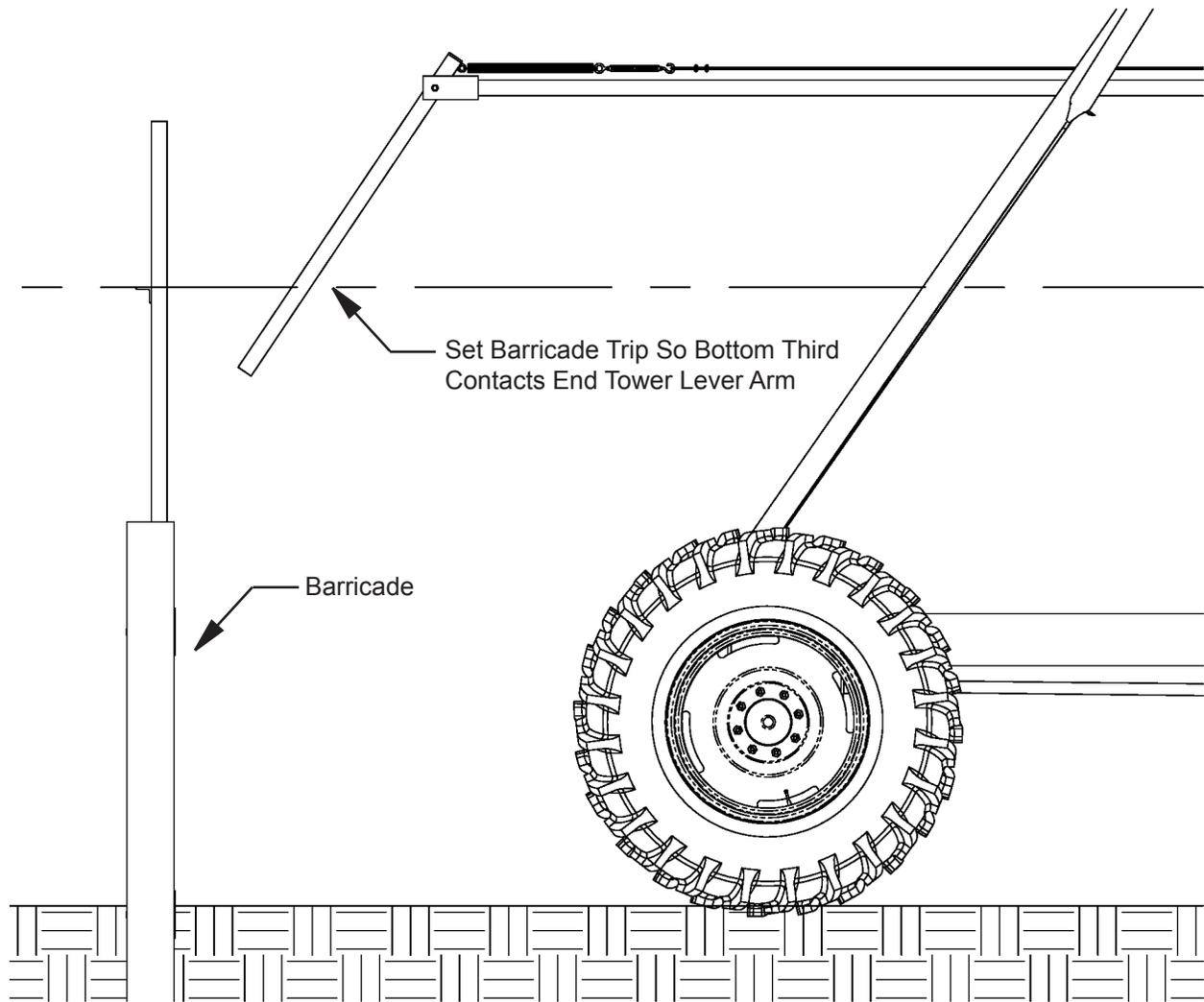
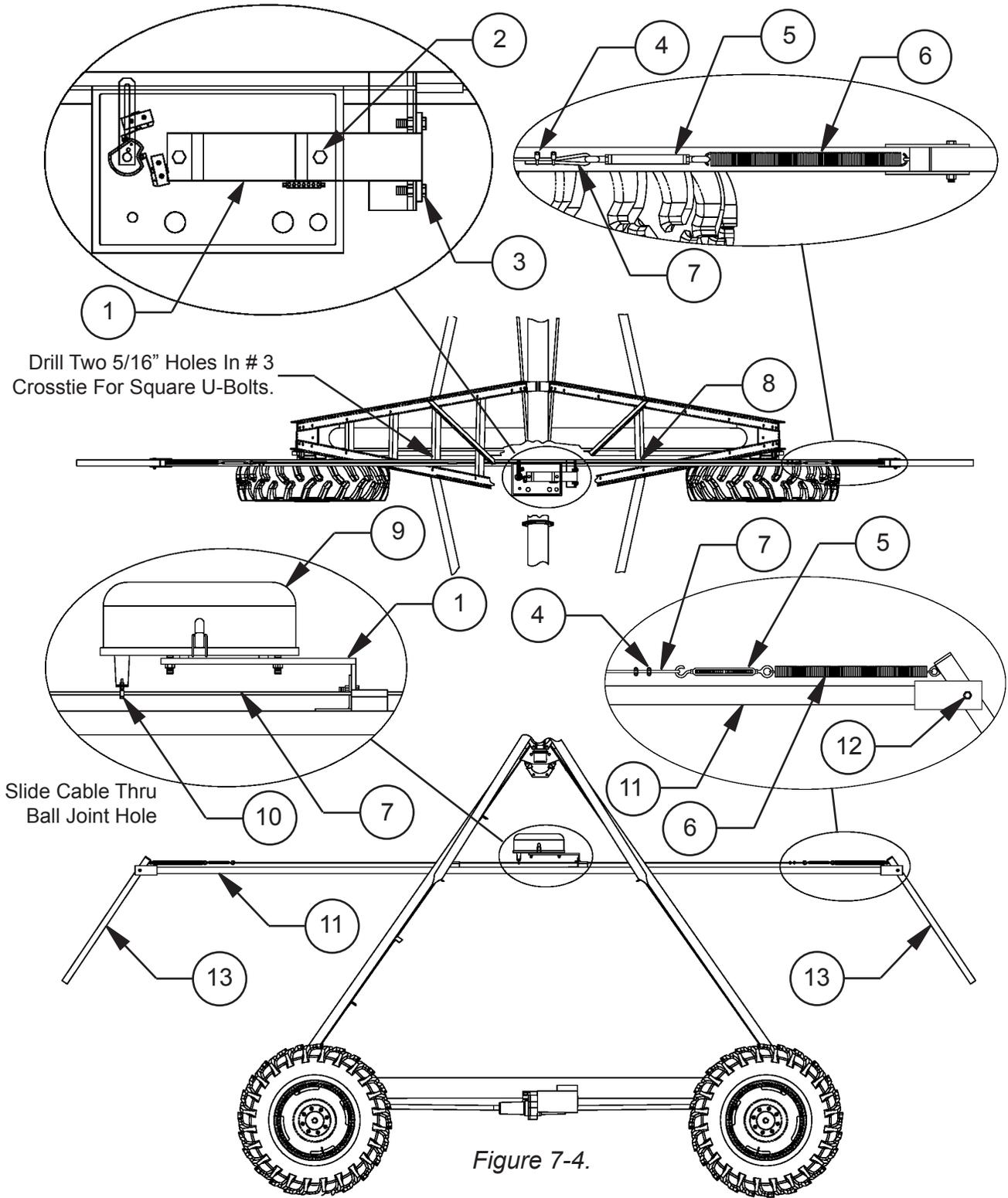


Figure 7-3.

ITEM	PART #	QTY	DESCRIPTION
1	07166-11	2	BARRICADE POST
2	02031-05	12	LOCK NUT 3/4"
3	07168-14	1	BARRICADE TRIP
4	07168-13	2	BARRICADE TRIP MOUNT
5	02075-11	2	U BOLT 5/16" X 2 SQ X 5
6	02064-06	4	BOLT G5 NC 3/8" X 3
7	02064-02	8	BOLT G5 NC 3/8" X 1.5
8	07165-11	2	BARRICADE CROSS PIECE
*	09237-01	1	OPTION BARRICADE COMPLETE (2 SETS)

\*Not Shown



**ASSEMBLY PROCEDURE**

- 1) Lay main crosspiece assembly between tower legs and on top of #3 tower crosstie, against outboard tower leg.
- 2) Drill two 5/16" holes in each crosstie for square U-bolts.
- 3) Center structure on tower and secure to crossties.

**LINKAGE ADJUSTMENT**

- 1) To properly tension the cables, you must completely loosen the turnbuckles before assembly. Attach the cables/springs as tight as possible by hand and tighten all cable clamps. Then tighten turnbuckles to evenly tension the cable/springs.
- 2) Sight down the cable and note the alignment of the cable and ball joint with the cable guides. If the cable and/or ball joint is deflected with the cam arm perpendicular to the control box, adjust the ball joint on the cam arm or, if necessary, loosen the box mounting bracket at the main mounting bracket and adjust it there.
- 3) With the set screw on the ball joint loose, move the cam arm by sliding the ball joint across the cable, until one of the two directional microswitches clicks. Note where the ball joint is on the cable at the click. Move it in the opposite direction until the other directional microswitch clicks. Note this spot. The microswitch bases may have to be adjusted to get them to click in a central position on the cable.
- 4) Move the levers to test the directional microswitches. They should both move the same amount to make each direction switch click.
- 5) To activate the Auto-Shutdown Microswitch, continue to move the lever arm in until a second click is heard from the second microswitch. This switch will click on and off with repeated in-and-out movement of each lever arm.

Item	Part#	Qty	Description
1	07067-11	1	END TOWER JUNCTION BOX MOUNT
2	02066-06	2	BOLT G5 NC 1/2" X 2
3	02066-04	2	BOLT G5 NC 1/2" X 1.5
4	02166-02	4	CABLE CLAMP
5	02349-02	2	TURNBUCKLE
6	02261-02	2	SPRING
7	02164-02	1	1/4" AIRCRAFT CABLE 18 FT
8	02075-11	2	U BOLT NC 5/16" X 2 SQ X 5
9	07098-08	1	END TOWER AUTO REVERSE JUNCTION BOX
10	02172-01	1	SWIVEL
11	07098-11	1	ETAR CROSSPIECE STANDARD
12	02066-09	2	BOLT G5 NC 1/2 X 3.5
13	07098-12	2	ETAR LEVER ARM 4 FT
*	90035-01	1	OPTION END TOWER AUTO REVERSE COMPLETE
*	02031-07	6	LOCK NUT NC 1/2
*	02164-06	1	1/4 AIRCRAFT CABLE HP 25 FT
*	07098-13	1	P93 ETAR CROSSPIECE HP 27 FT

\*Not Shown

The Pivot Auto Reverse / Off option is designed for both End Tower and Pivot Point Operation. It uses a single wire in the span cable (Yel/Red) to send a Momentary Pulse signal to the main control panel. The Auto Reverse Switch is located at the End Tower or Pivot point, and uses a Normally Open contact to switch the Yel/Red wire to Neutral (White) wire. Each time the Auto Reverse Switch is activated it alternates the pulse relay and changes the direction on the machine. Reference the following steps in combination with Figure 7-7. to assist you in the successful operation of this feature:

**Activate Auto Reverse Option:**

1. Turn the direction switch (1) to Auto position.
2. Turn Auto / Off / Dir switch (2) to Auto position.
3. Turn Run switch (3) to Start position.

When the Machine is started with the START switch (item 3) it should run in the Auto direction that it was running. If the opposite direction is desired then twist the Auto / Off / Dir (2) switch momentarily to the DIR position. This will pulse the Relay and reverse the direction of the machine.

**Auto Off Function:**

The Auto Off function is a built-in feature of the Auto Reverse Option. To operate the Auto Off function; place the Auto / Off / Dir switch (2) in the Auto position. Place the direction switch (1) in the direction of travel of the machine. When the Auto Reverse switch is operated at either the barricade or pivot point, the machine will shut down.

To restart the machine, first return the direction switch (1) to either the auto position or the new direction. Turn Run switch (3) to start position.

If the machine fails to restart with the direction switch (1) in Fwd or Rev position, turn Auto/Off/Dir switch (2) to Dir position. This will reset the pulse relay to the desired direction and allow the machine to Auto Off the next time the Auto Reverse switch is activated.

If using the Pivot Point Auto Reverse option, the Auto Reverse Switch can be overridden by placing the Auto/Off/Dir switch (2) in the Off position.

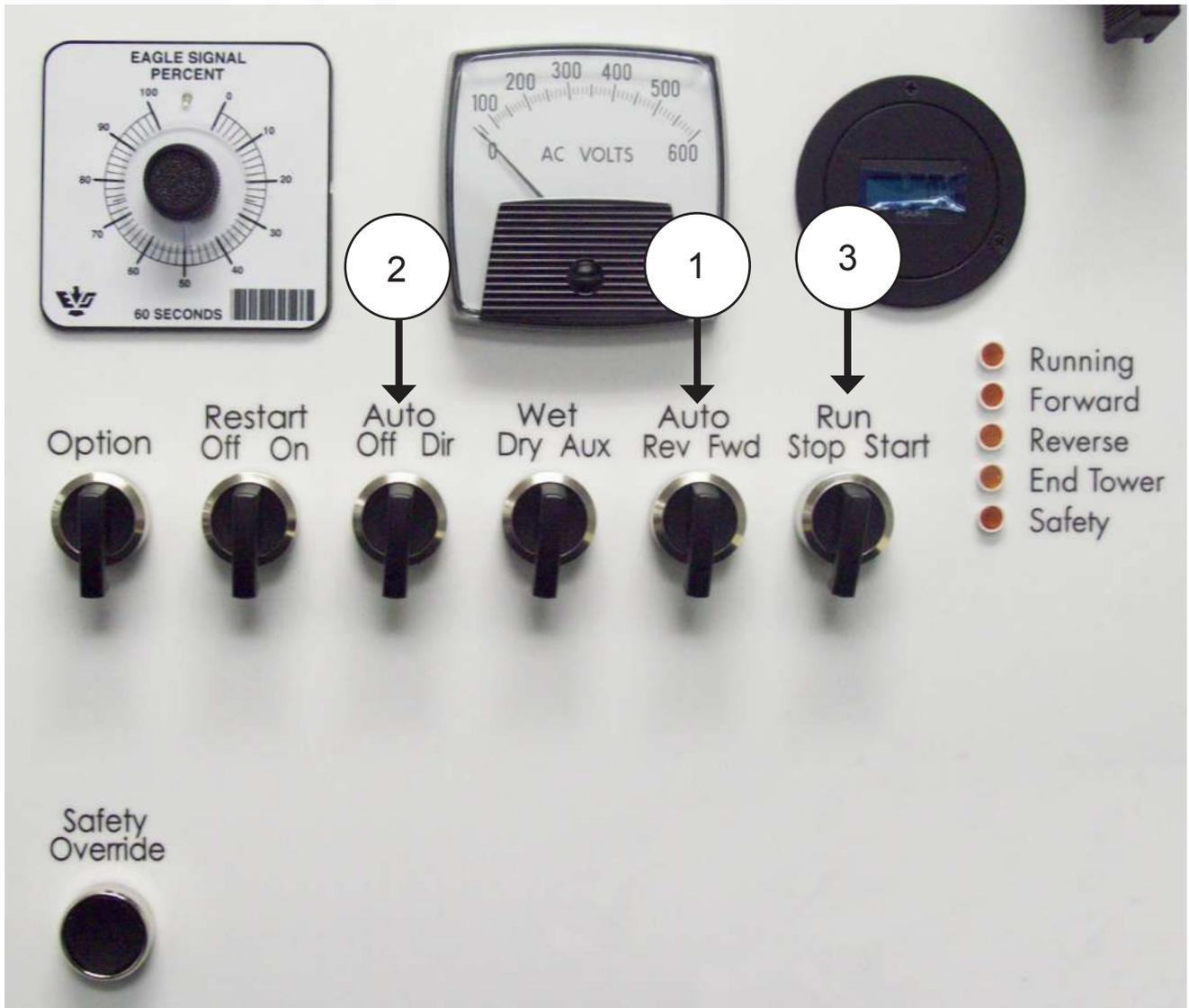


Figure 7-7.

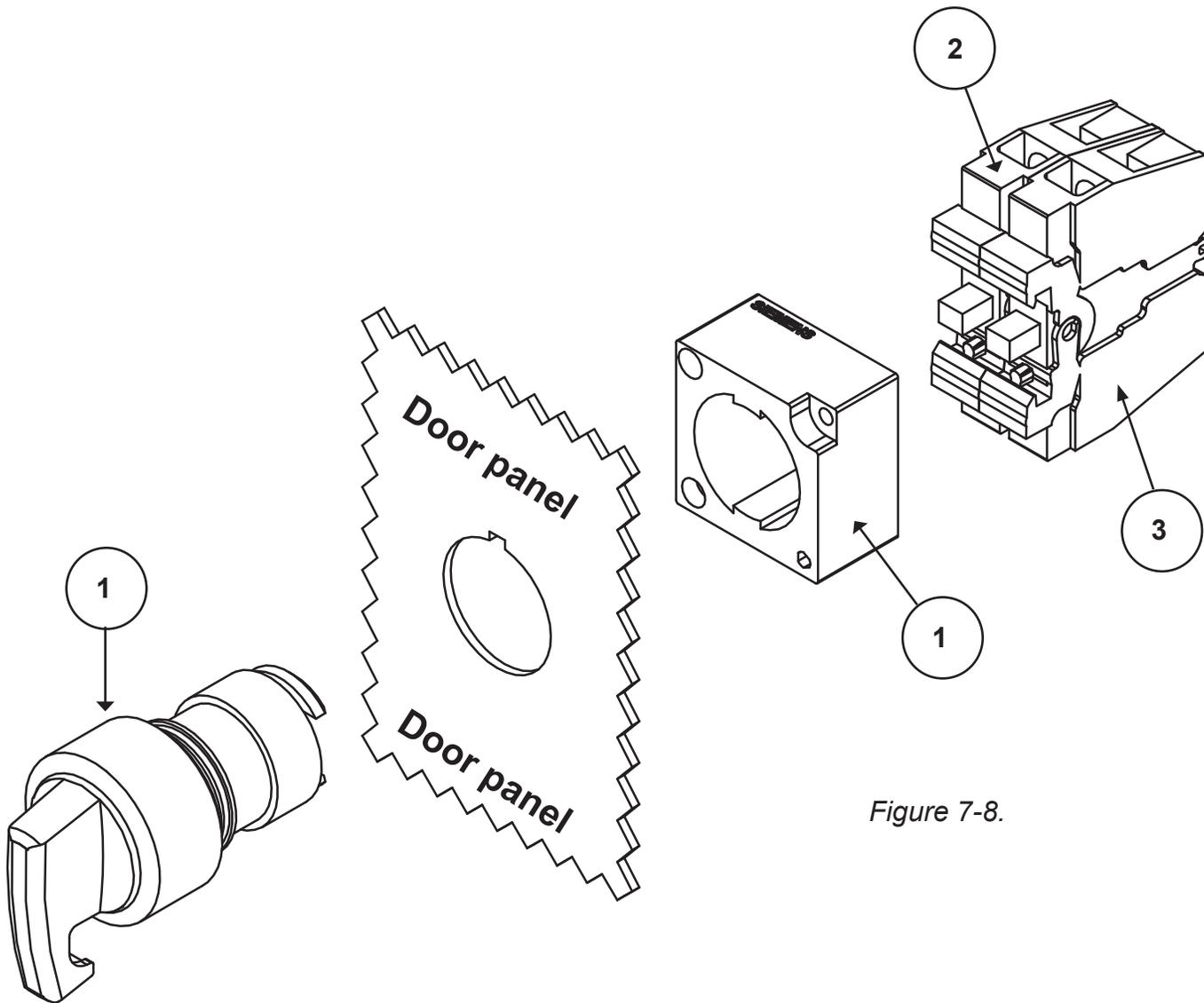


Figure 7-8.

ITEM	PART#	QTY	DESCRIPTION
1	12007-03	1	SWITCH TWIST 3 POS A-B<C
2	12007-06	1	SWITCH BLOCK SIEMENS NO
3	12007-08	1	SWITCH BLOCK SIEMENS NC <b>Auto Off</b>

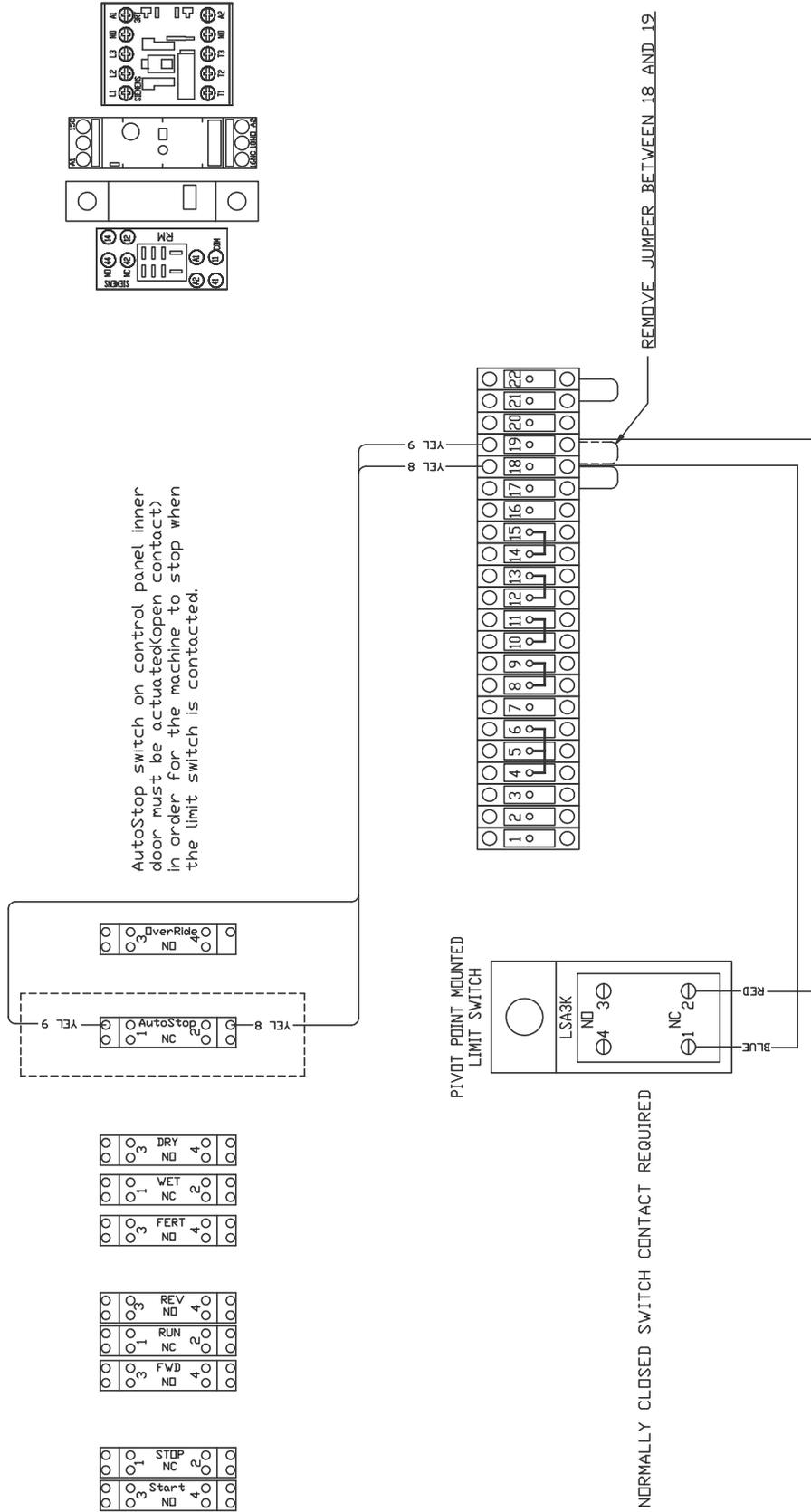


Figure 7-9.

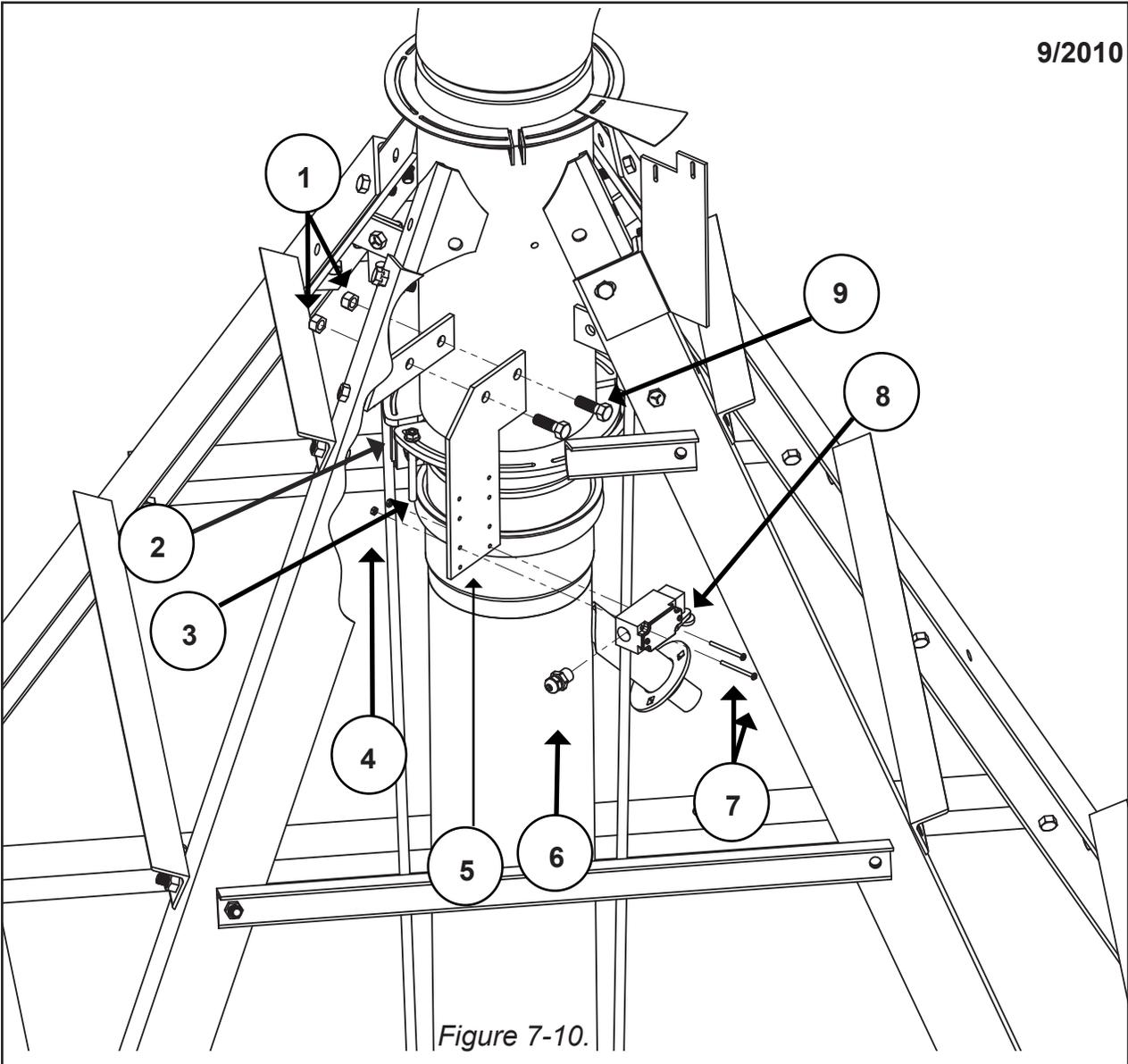
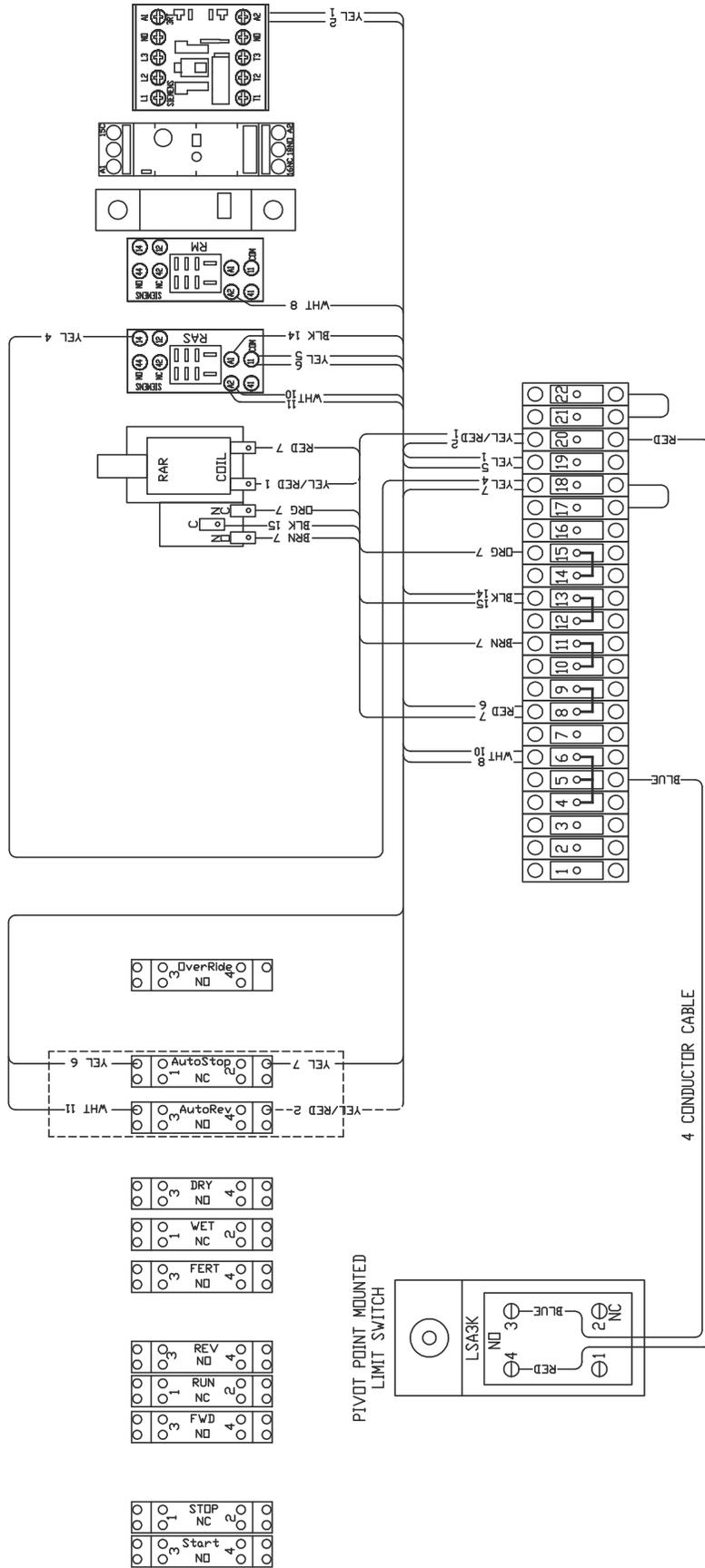
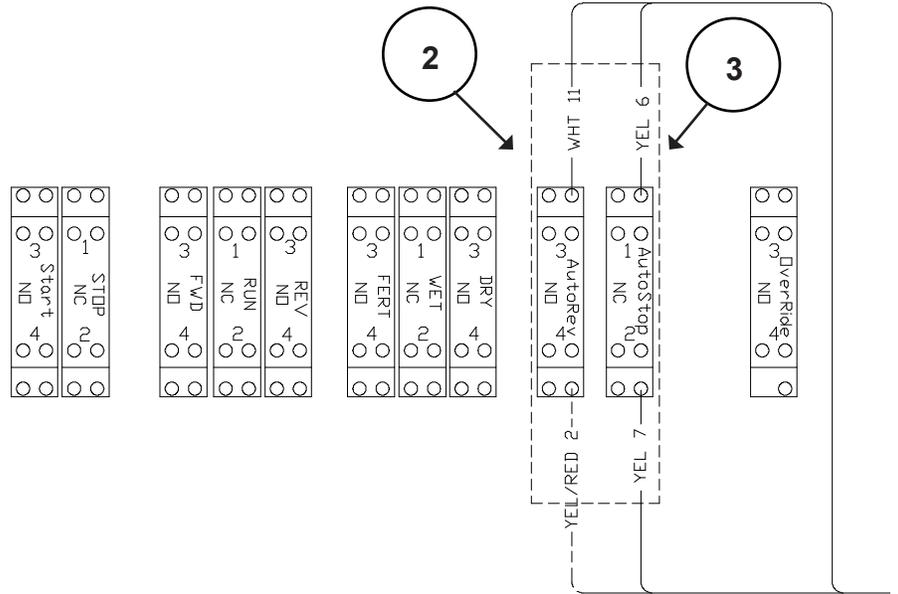


Figure 7-10.

Item	Part	Qty	Description
1	02031-07	2	1/2 NUT LOCK
2	02510-10	1	NUT FL LOCK EG NC 3/8
3	10589-11	1	PLATED PIN
4	02034-03	2	NUT HEX PLT 8-32
5	10104-11	1	AUTO OFF SWITCH - MOUNT
6	02157-13	1	STRAIN RELIEF
7	02201-18	2	BOLT SLOT H EG 8-32 X 2
8	02284-01	1	MICRO ARM SWITCH
*	02258-01	1	MICRO SWITCH
9	02066-03	2	HEX BOLT
*10	03055-50	1	WIRE 14GA 4C SHIELD CTL 14 FT* not shown
*	90034-01	1	CP OPTION AUTO OFF COMPLETE

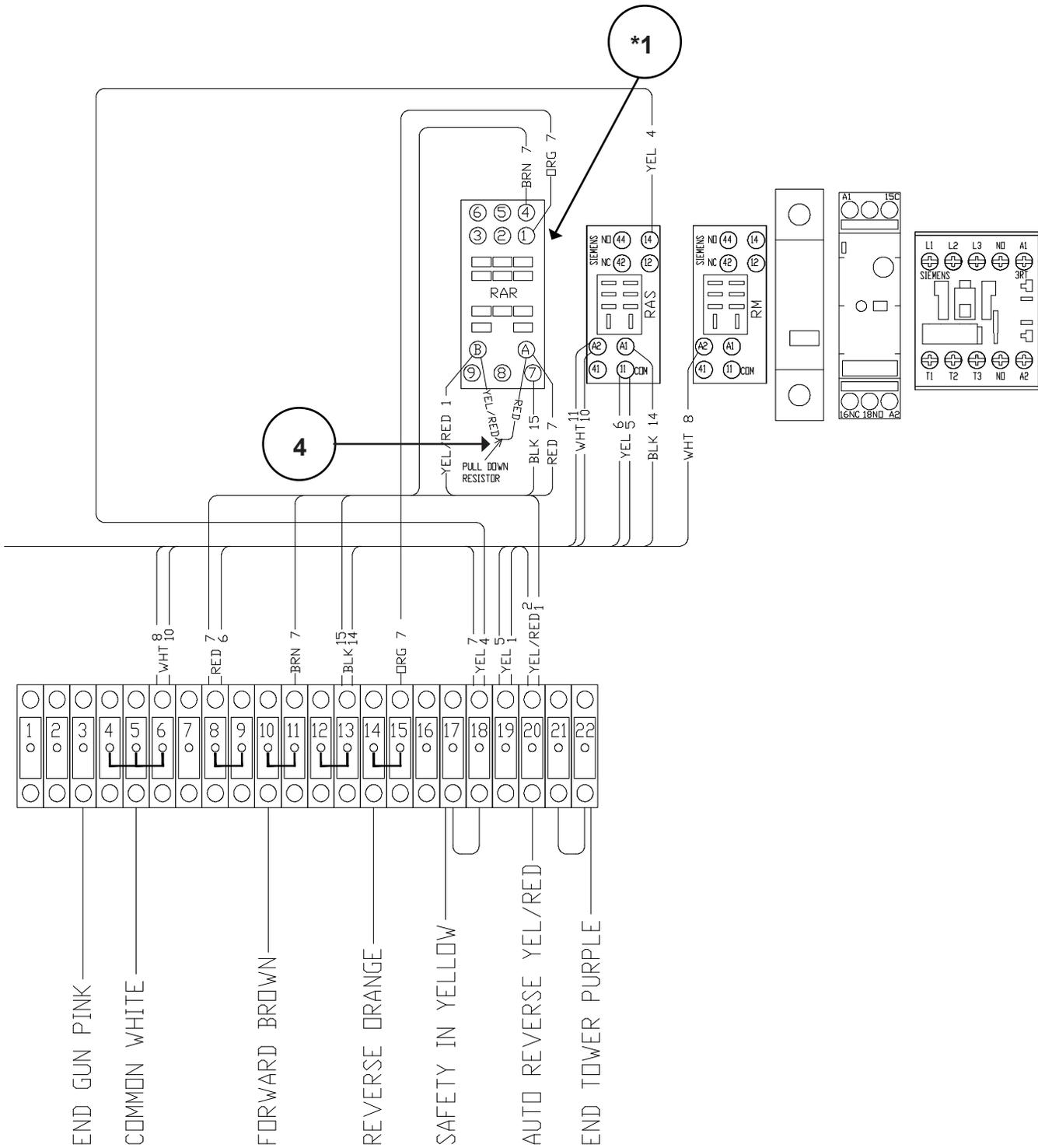
CP Option Auto Reverse-OFF Pivot Point 90034-02





Item	Part	Qty	Description
1	12009-04	1	IMPULSE RELAY SWITCH
*	12009--05	1	IMPULSE RELAY BASE
2	12007-06	1	SWITCH BLOCK NO
3	12007-08	1	SWITCH BLOCK NC
4	12104-01	1	PULL DOWN RESISTOR KIT

Figure 7-12.



ITEM	PART#	QTY	DESCRIPTION
1	12007-01	1	3 POS TWIST SWITCH
2	12007-09	1	SWITCH ADAPTER
3	12007-06	2	SWITCH BLOCK NO
4	12007-08	1	SWITCH BLOCK NC

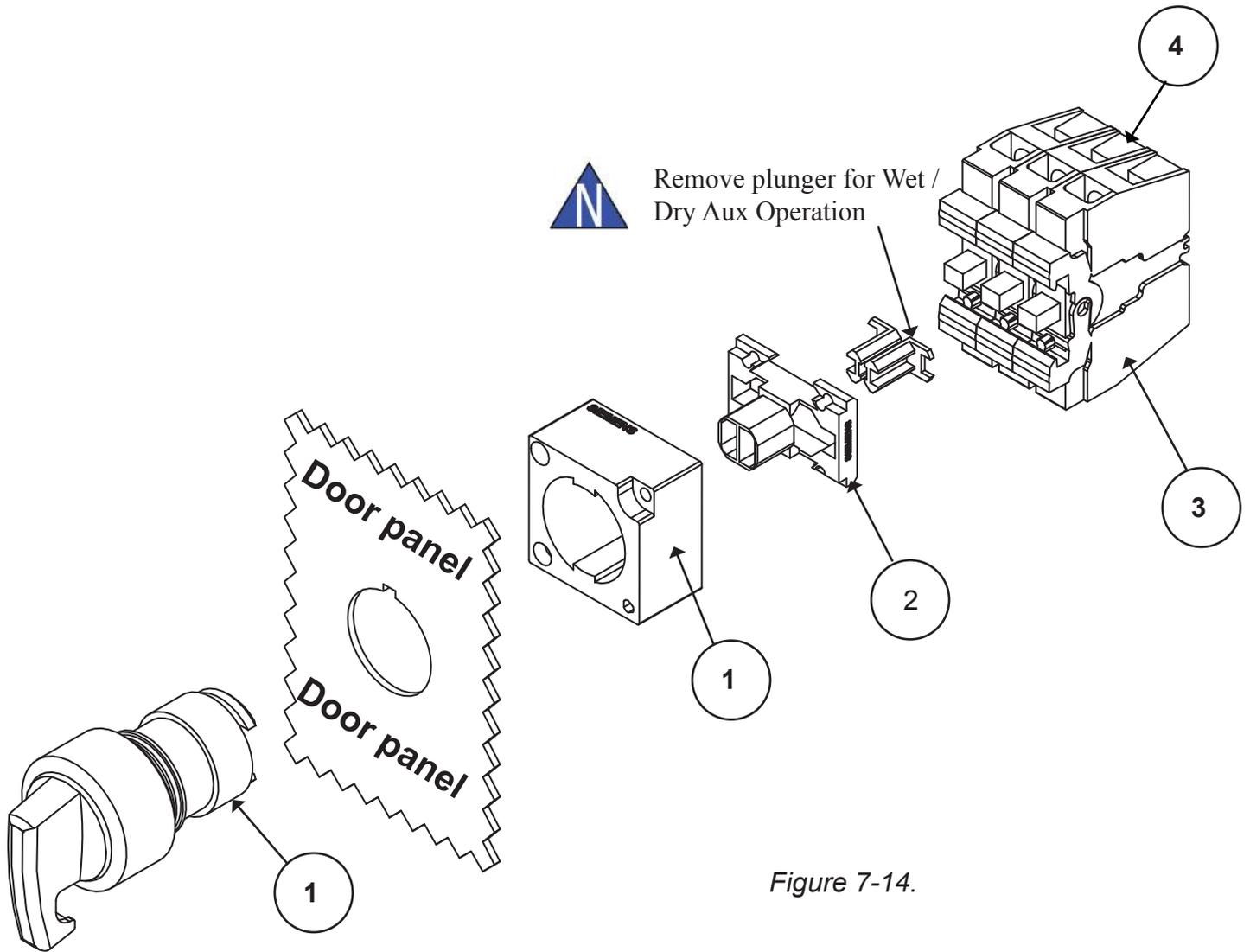


Figure 7-14.



Item	P/N	Description	Qty
1	12003-02	Auto Restart Timer Delay	1

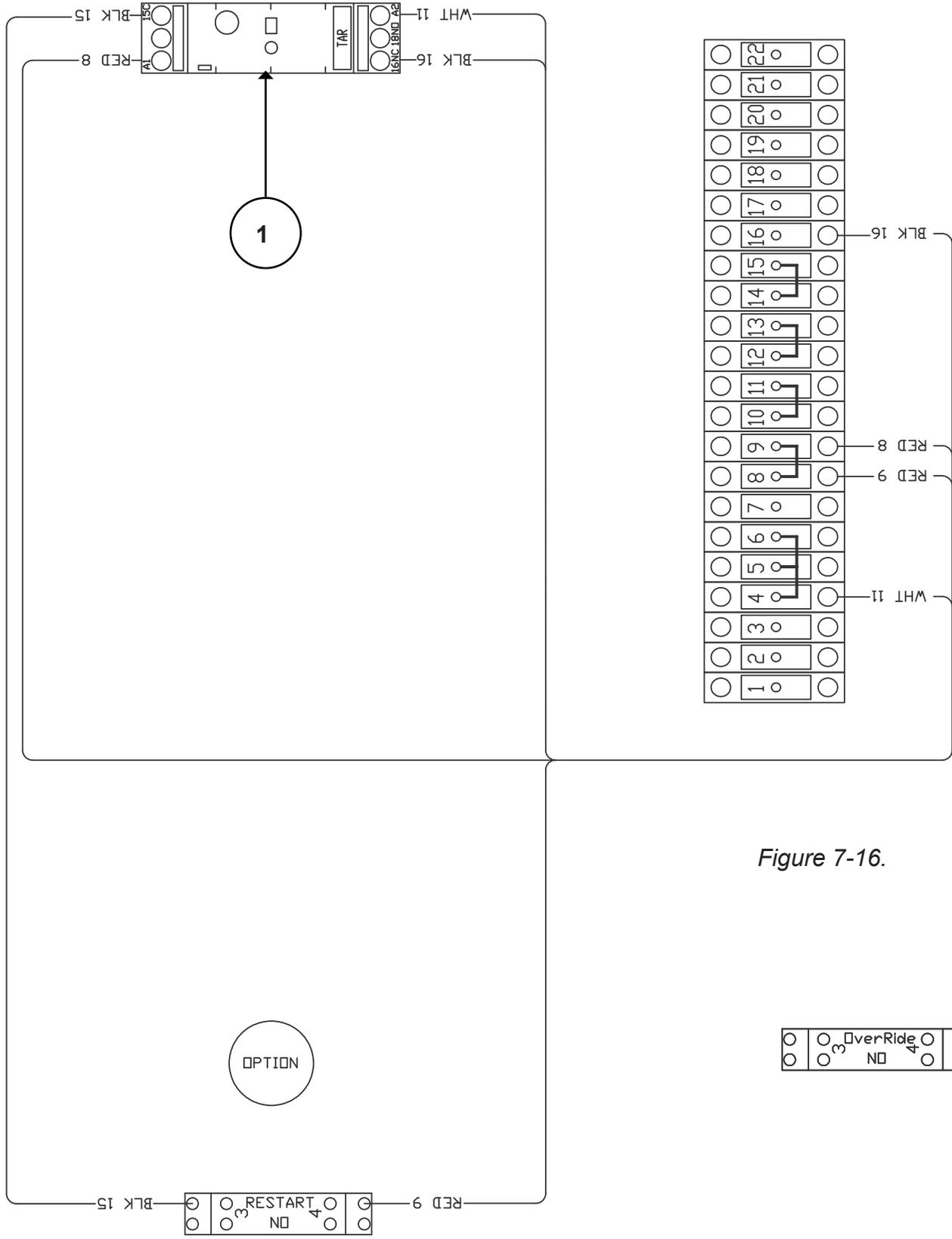


Figure 7-16.

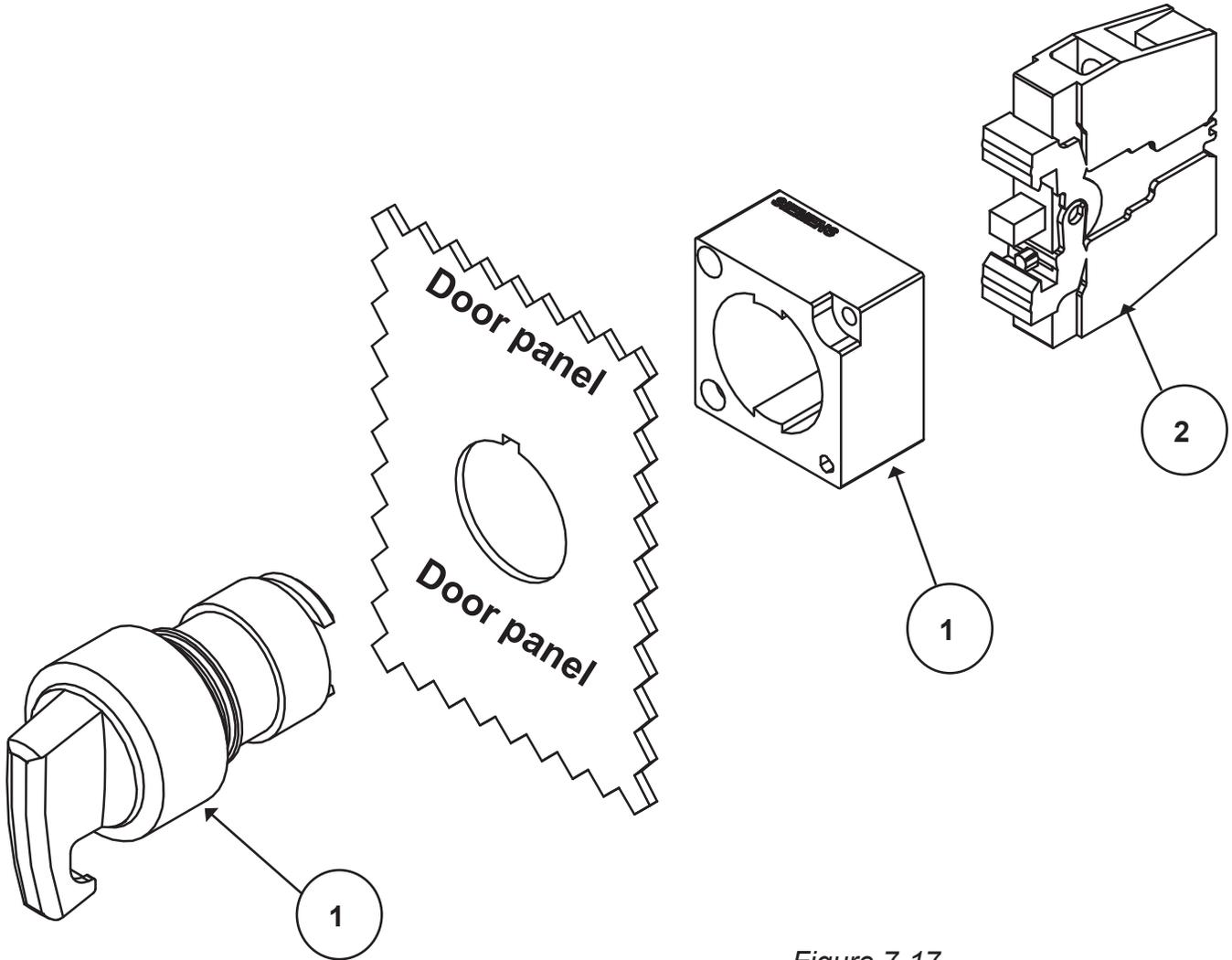


Figure 7-17.

ITEM	PART#	QTY	DESCRIPTION
1	12007-02	1	2 POS TWIST SWITCH
2	12007-06	1	SWITCH BLOCK NO
*	90036-04	1	CP OPTION AUTO RESTART

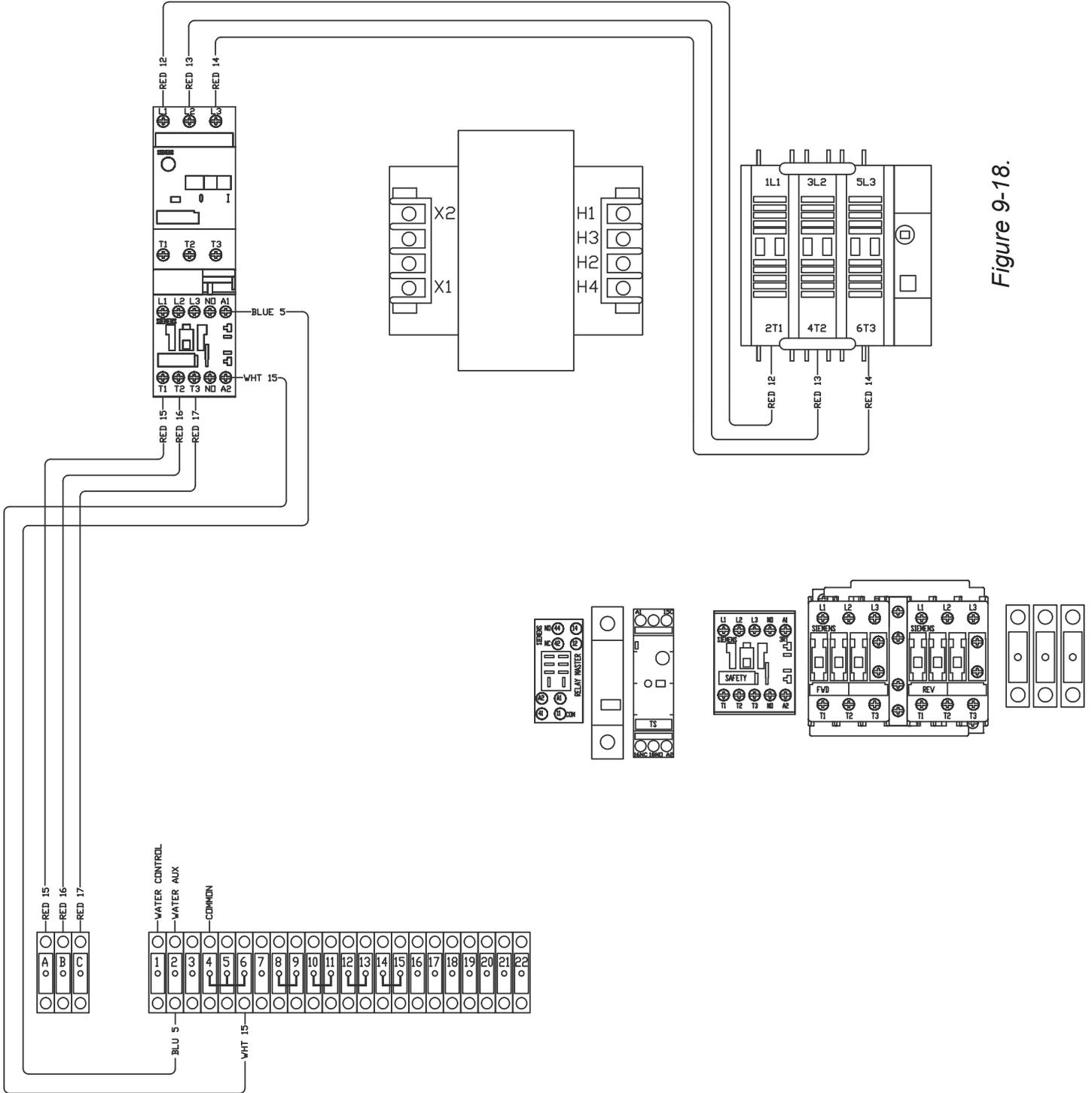
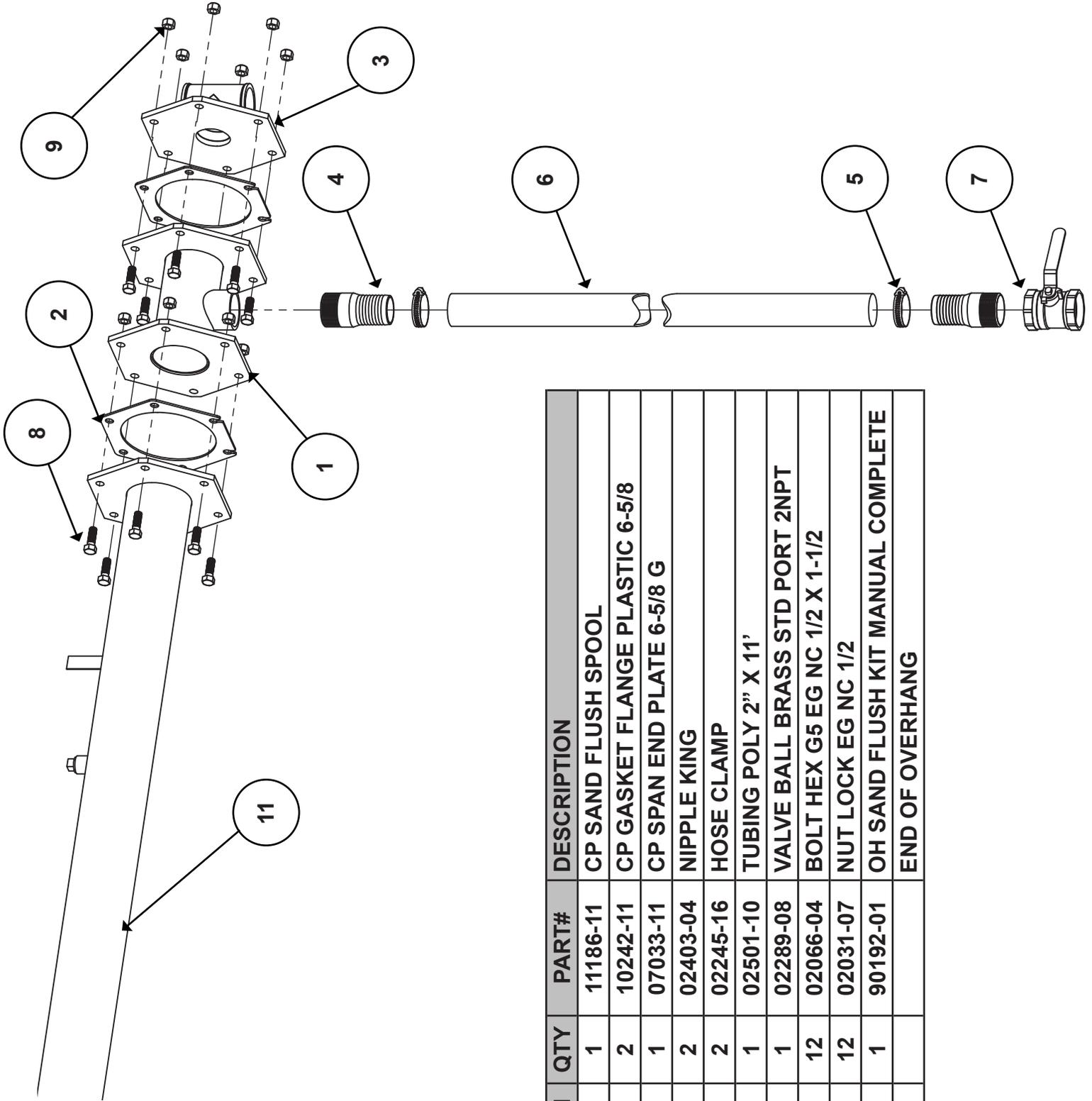
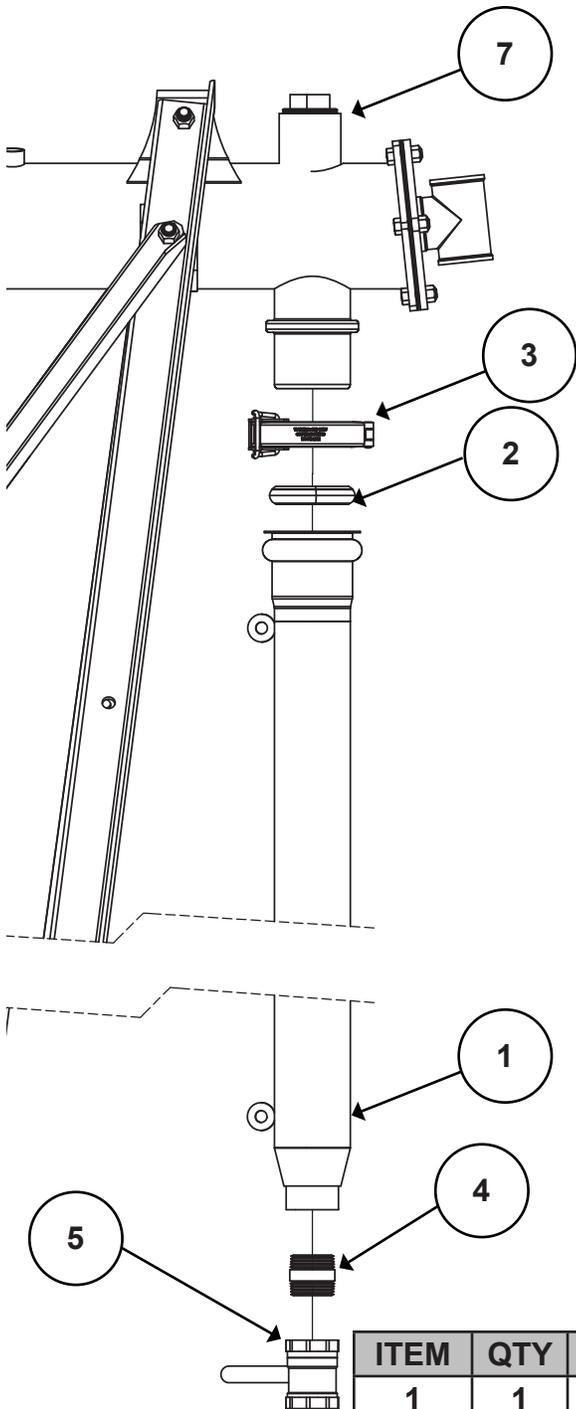


Figure 9-18.



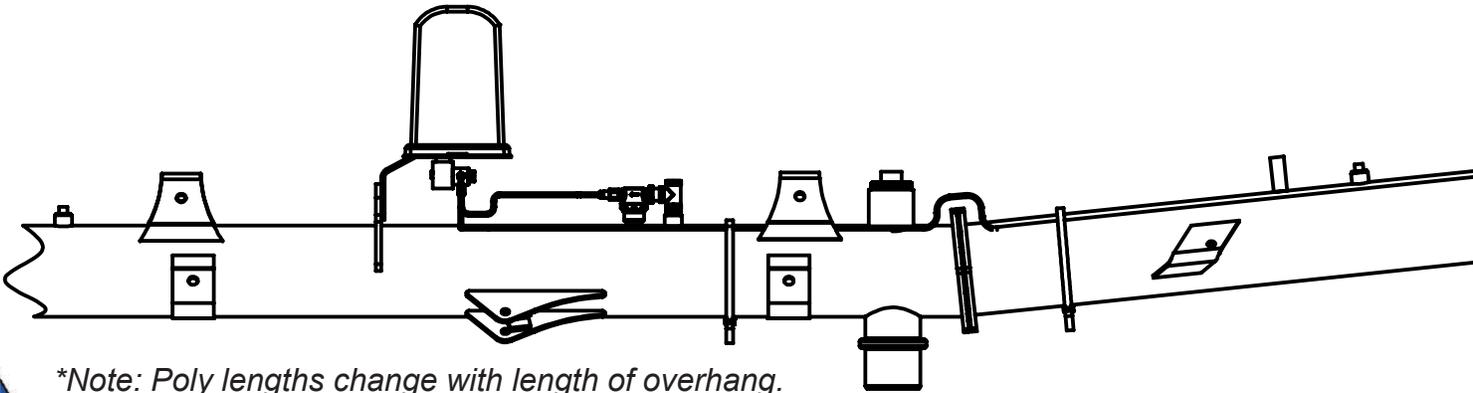


ITEM	QTY	PART#	DESCRIPTION
1	1	11186-11	CP SAND FLUSH SPOOL
2	2	10242-11	CP GASKET FLANGE PLASTIC 6-5/8
3	1	07033-11	CP SPAN END PLATE 6-5/8 G
4	2	02403-04	NIPPLE KING
5	2	02245-16	HOSE CLAMP
6	1	02501-10	TUBING POLY 2" X 11'
7	1	02289-08	VALVE BALL BRASS STD PORT 2NPT
8	12	02066-04	BOLT HEX G5 EG NC 1/2 X 1-1/2
9	12	02031-07	NUT LOCK EG NC 1/2
10	1	90192-01	OH SAND FLUSH KIT MANUAL COMPLETE
11			END OF OVERHANG

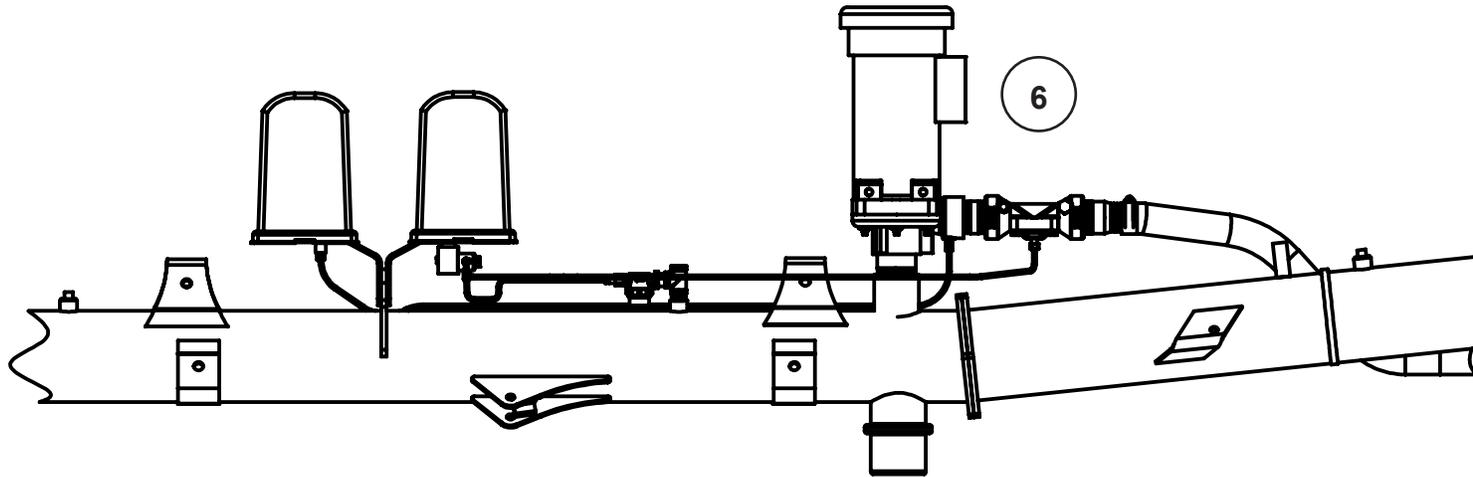


ITEM	QTY	PART#	DESCRIPTION
1	1	07065-12	P93 SAND TRAP EXT G 4" X 2" X 72"
2	1	01618-01	GASKET STD RUB 50 DURO 4"
3	1	02123-08	RING RL PLT ASM CS 4"
4	1	02238-09	MALE THRD CLOSE G 2"
5	1	02289-08	VALVE BALL BRASS STD PORT 2NPT
6	1	07065-20	CP-P93 SAND TRAP EXT SET 72" CMPLT.
7	1	10041-11	REC END TOWER 6.63 X 294.88

**\*5** CP Option Auto EG W/O BP-Reference Sections 7-26 to 28.



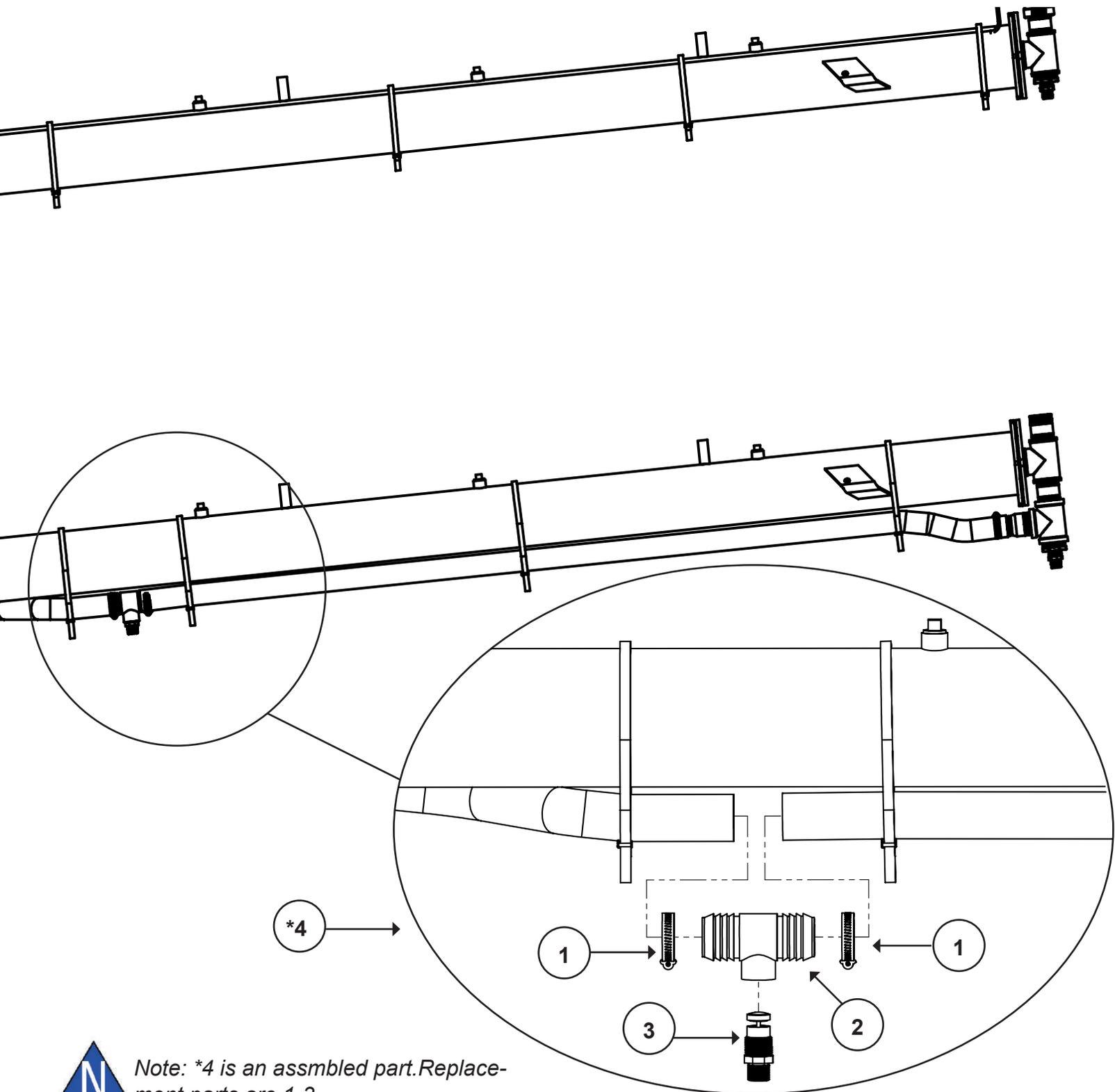
*\*Note: Poly lengths change with length of overhang. See parts list on Section 7-23.*



**\*7** CP Option Auto EG With BP Reference Sections 7-30 to 32.

*\*Note: Poly lengths change with length of overhang. See parts list on Section 7-23.*





Note: \*4 is an assembled part. Replacement parts are 1-3.

## Parts list for Auto EG with and W/O Booster Pump

Item	Part	Qty	Description
1	02245-16	2	CLAMP HOSE CLAMPCO 238
2	02381-02	1	TEE PVC 2 HB X 2 HB X 1 FT W/RELIEF
3	02381-04	1	VALV DRAIN PVC DCHS 1 MT X .75 HT
4	03060-69	1	CP-P93 BOOSTER PUMP POLY PKG
*5	90040-06-OR-	1	CP OPTION AUTO EG W/O BP W/PROX 6FT
	90040-20-OR-	1	CP OPTION AUTO EG W/O BP W/PROX 20FT
	90040-40-OR-	1	CP OPTION AUTO EG W/O BP W/PROX 40FT
	90040-80	1	CP OPTION AUTO EG W/O BP W/PROX 80FT
*	90040-01-OR-	1	CP OPTION AUTO EG EVOLUTION 6FT
*	90055-20-OR-	1	CP OPTION AUTO EG EVOLUTION 20FT
*	90055-40-OR-	1	CP OPTION AUTO EG EVOLUTION 40FT
*	90055-80-OR-	1	CP OPTION AUTO EG EVOLUTION 80FT
*	90055-81	1	CP OPTION AUTO EG EVOLUTION 84FT
6	90038-01	1	CP OPTION BOOSTER PUMP BASIC
*7	03060-73-OR-	1	CP-P93 BOOSTER PUMP POLY 2 20 OH
*	03060-74-OR-	1	CP-P93 BOOSTER PUMP POLY 2 40 OH
*	03060-75-OR-	1	CP-P93 BOOSTER PUMP POLY 2 60 OH
*	03060-76-OR-	1	CP-P93 BOOSTER PUMP POLY 2 80 OH
*	03060-78-OR-	1	CP-P93 BOOSTER PUMP POLY 2 5 OH
*	03060-79-OR-	1	CP-P93 BOOSTER PUMP POLY 2 25 OH
*	03060-80	1	CP-P93 BOOSTER PUMP POLY 2 10 OH

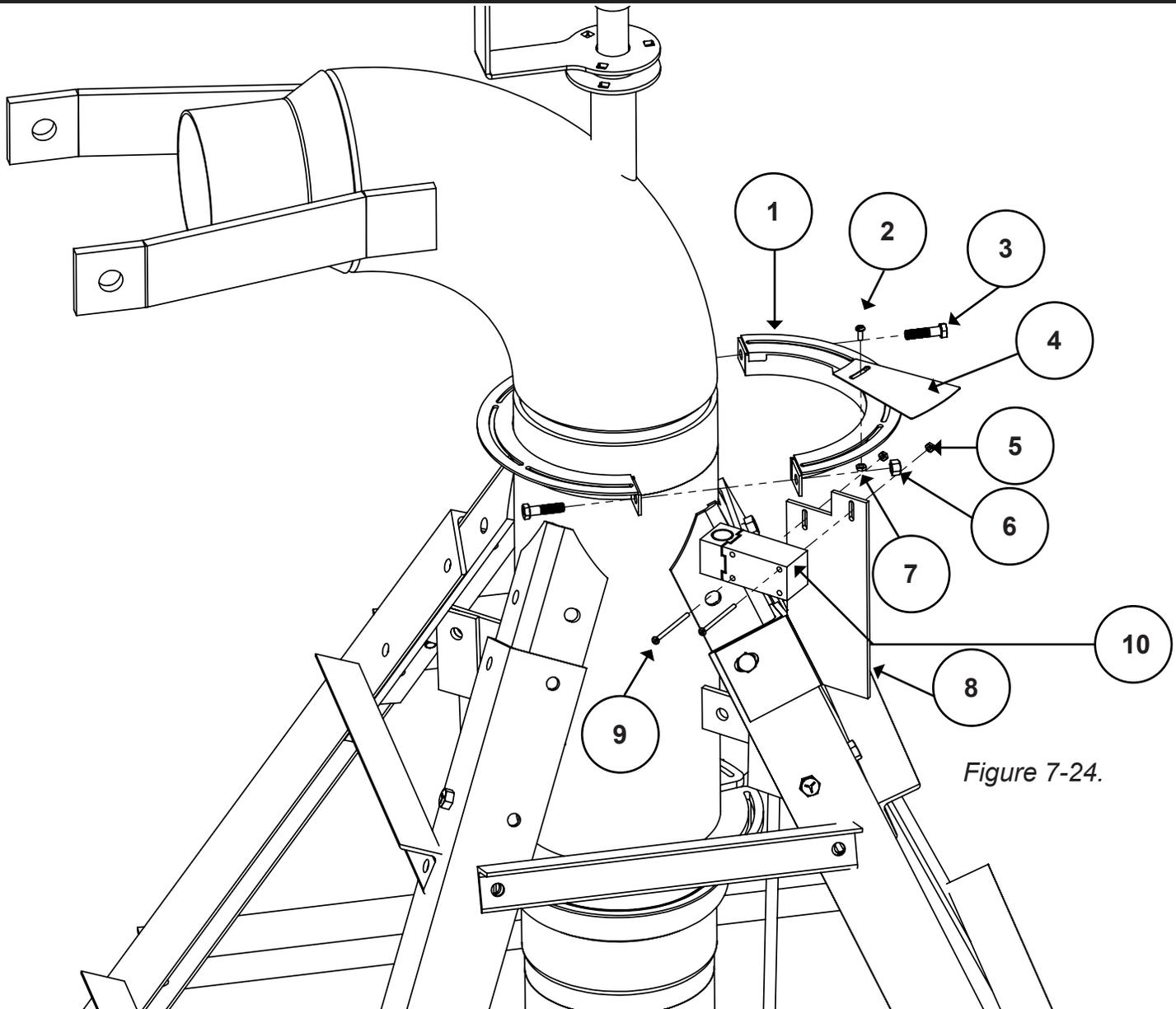


Figure 7-24.

Item	Part	Qty	Description
1	10123-11	2	HALF RING
2	02201-24	11	SLOT BOLT 10-32 x 1/2
3	02064-02	2	HEX BOLT G5 3/8 X 1-1/2
4	10107-11	9	END GUN TRIP
5	02034-03	2	NUT HEX PLT 8-32
6	02031-05	2	NUT LOCK 3/8
7	02034-04	11	NUT HEX PLT 10-32
8	10124-11	1	END GUN BRKT G 8.1
9	02201-19	2	BOLT SLOT 8-32 X 2-1/2
10	02266-01	1	PROX SWITCH

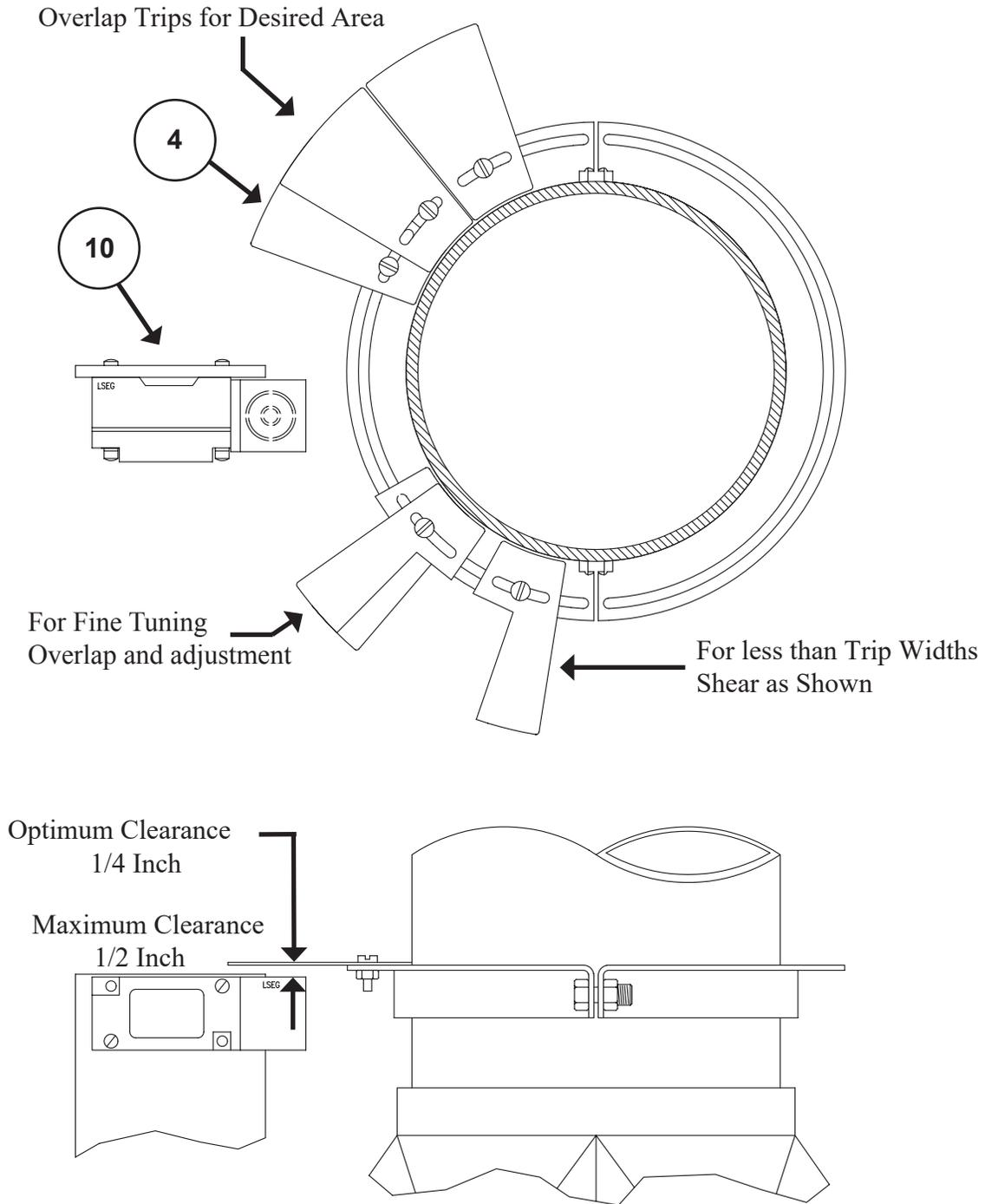
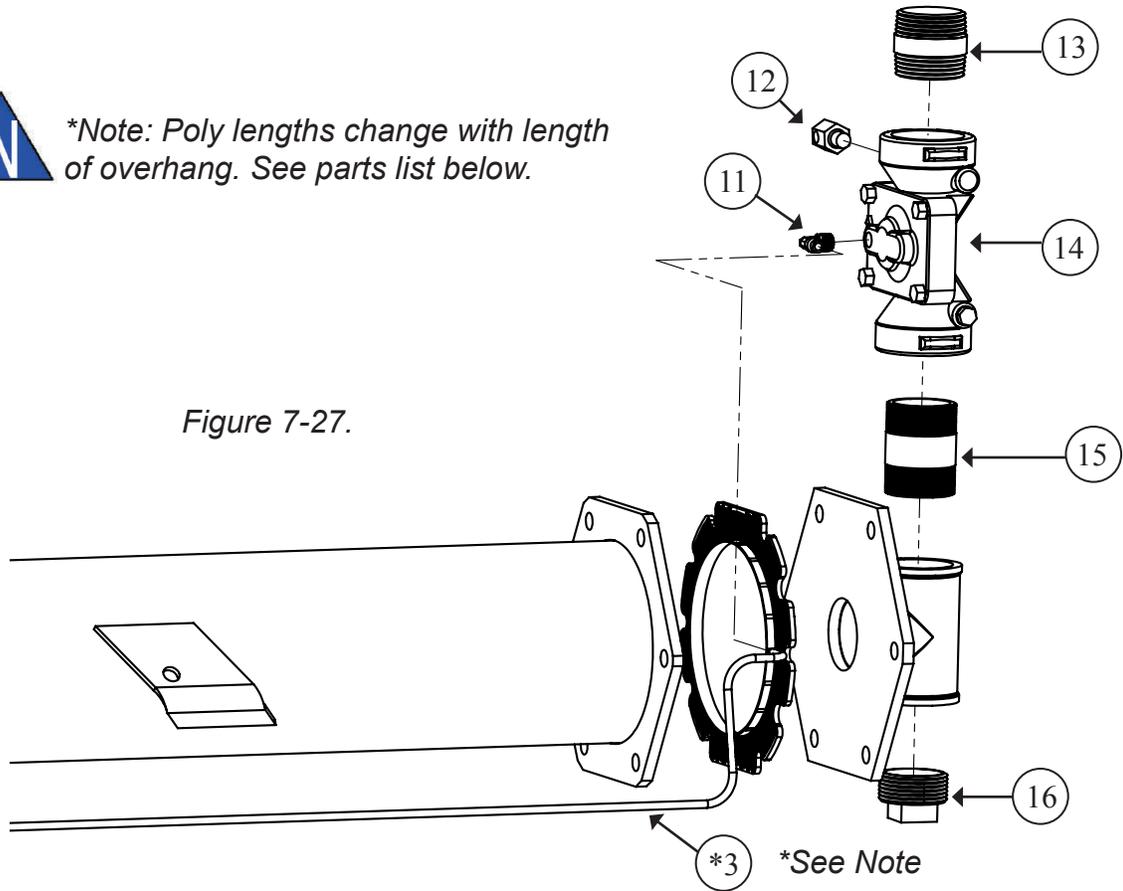


Figure 7-25.





\*Note: Poly lengths change with length of overhang. See parts list below.



Item	Part	Qty	Description
1	02415-01	1	3-WAY SOLENOID VALVE
2	02401-05	2	PUSH LOCK BRASS CONNECTOR
*3	02401-01	11ft	NYLON TUBE- EG W/O BP W/PROX 6FT -OR-
*		25ft	EG W/O BP W/PROX 20FT -OR-
*		45ft	EG W/O BP W/PROX 40FT -OR-
*		85ft	EG W/O BP W/PROX 80FT
4	02403-05	1	NIPPLE CHASE 1/2"
5	02255-05	1	PUSH LOCK CONNECTOR
6	02289-03	1	FILTER FOR VALV P/N 2289-01
7	02401-06	1	REDUCER BRASs 1/4 FT X.13MT NPT
8	02274-05	1	BUSHING STL G 0.75 X.13
9	02276-04	1	TEE NPT 3/4X.3/4 X3/4
10	02238-05	1	MALE THRD CLOSE G.3/4
11	02401-20	1	BRASS PUSH-LOCK ELBOW CONNECTOR
12	02289-22	1	AUTOMATIC DRAIN VALVE
13	02238-09	1	MALE THRD CLOSE NIPPLE
14	02289-21	1	VALVE LF
15	02129-15	1	THREADED MALE NIPPLE
16	02240-09	1	PLUG PIPE G 2

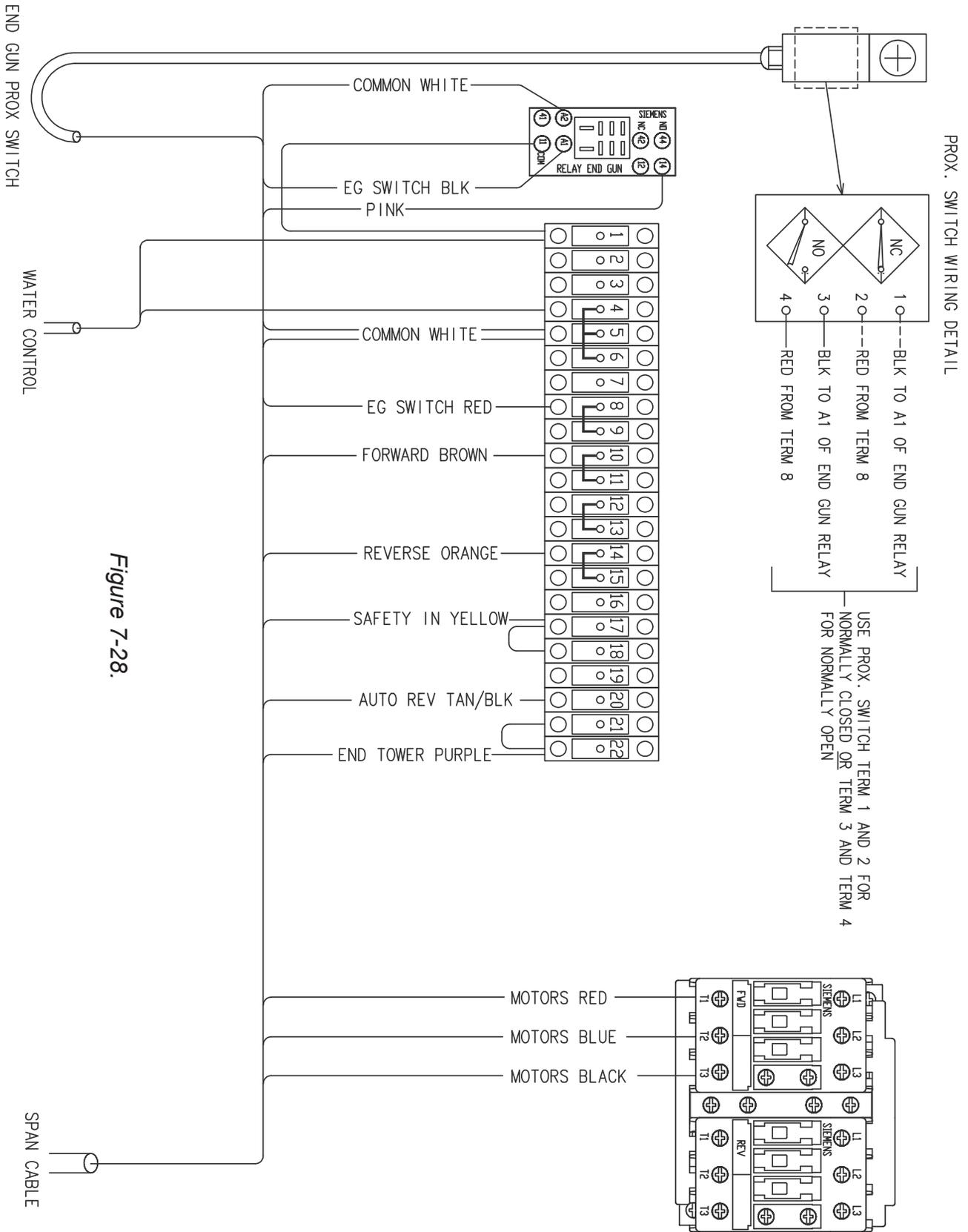
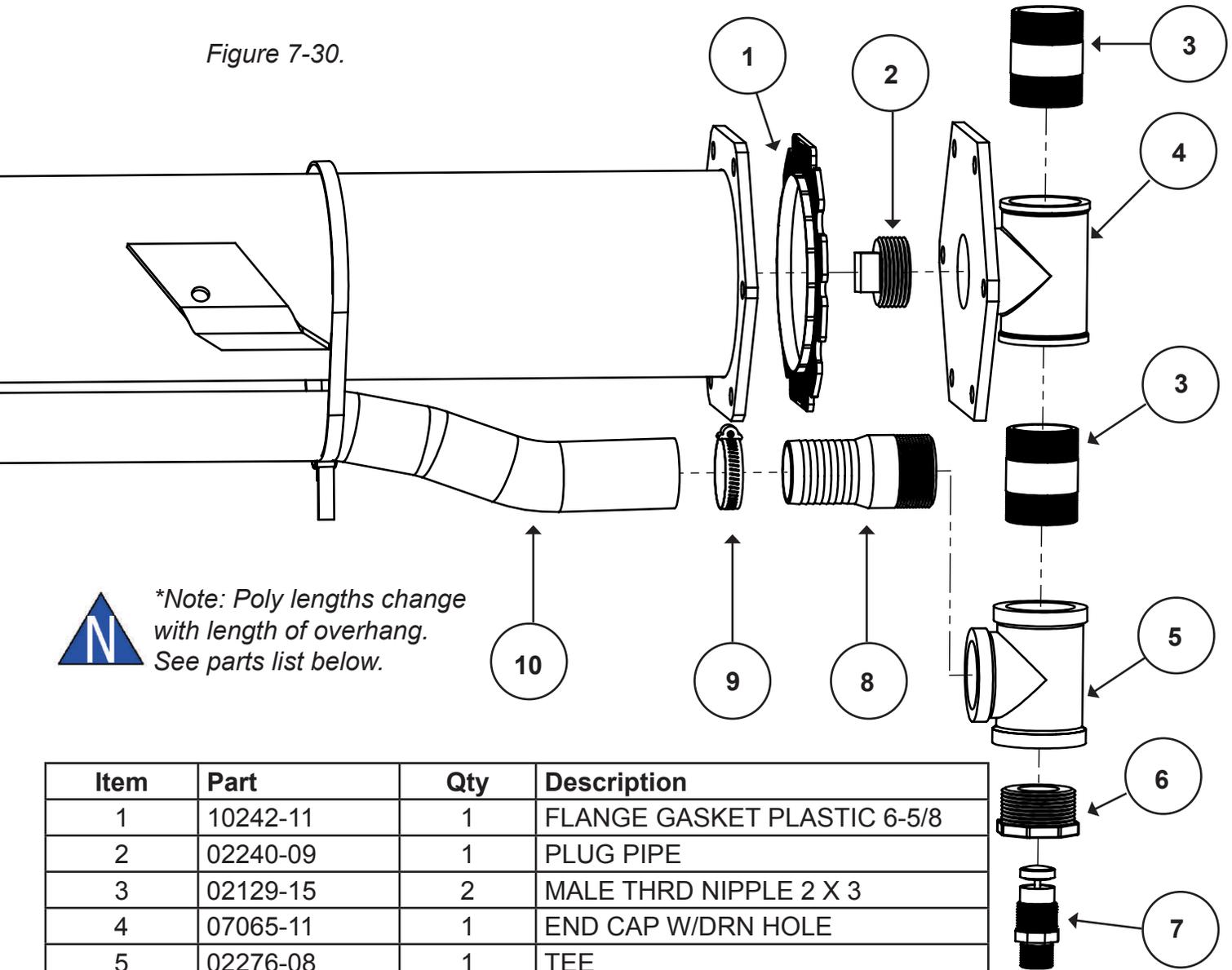


Figure 7-28.

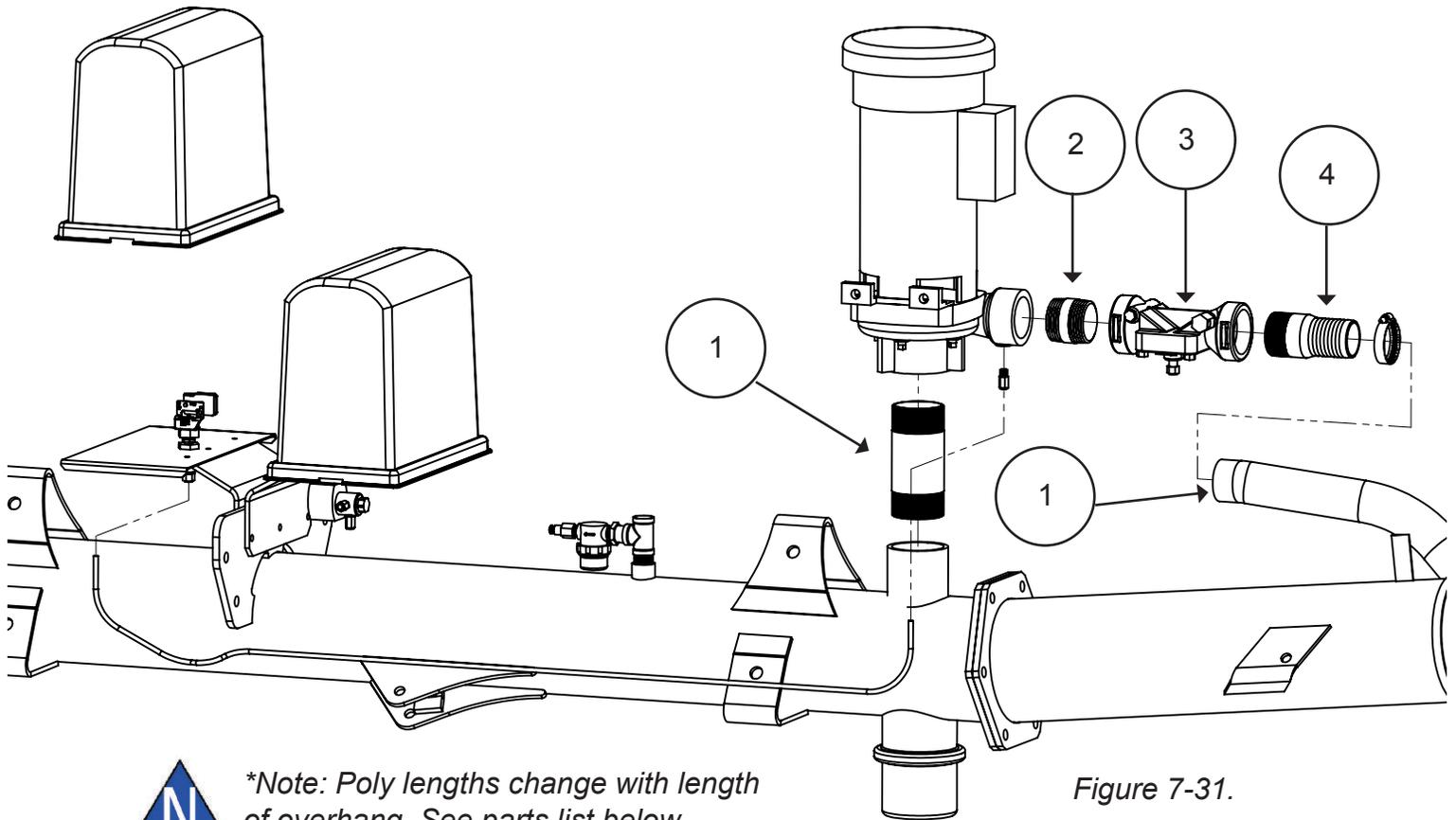


Figure 7-30.



\*Note: Poly lengths change with length of overhang. See parts list below.

Item	Part	Qty	Description
1	10242-11	1	FLANGE GASKET PLASTIC 6-5/8
2	02240-09	1	PLUG PIPE
3	02129-15	2	MALE THRD NIPPLE 2 X 3
4	07065-11	1	END CAP W/DRN HOLE
5	02276-08	1	TEE
6	02275-04	1	PVC BUSHING
7	02381-04	1	DRAIN VALVE
8	02403-04	1	NIPPLE
9	02245-16	1	HOSE CLAMP
*10	02501-05 -OR-	1	TUBING POLY 5' OH
*	02501-10-OR-	1	TUBING POLY 10' OH
*	02501-20-OR-	1	TUBING POLY 20' OH
*	02501-25-OR-	1	TUBING POLY 25' OH
*	02501-40-OR-	1	TUBING POLY 40' OH
*	02501-60-OR-	1	TUBING POLY 60' OH
*	02501-80-OR-	1	TUBING POLY 80' OH



\*Note: Poly lengths change with length of overhang. See parts list below.

Figure 7-31.

Item	Part	Qty	Description
1	02129-20	2	TUBE MALE THREAD 2.5 X 6
2	02238-09	1	MALE THRD CLOSE
3	02289-21	1	VALVE LF
4	02403-04	1	NIPPLE KING #ST-25 2
5	02501-05 -OR-	1	TUBING POLY 5' OH
*	02501-10-OR-	1	TUBING POLY 10' OH
*	02501-20-OR-	1	TUBING POLY 20' OH
*	02501-25-OR-	1	TUBING POLY 25' OH
*	02501-40-OR-	1	TUBING POLY 40' OH
*	02501-60-OR-	1	TUBING POLY 60' OH
*	02501-80	1	TUBING POLY 80' OH

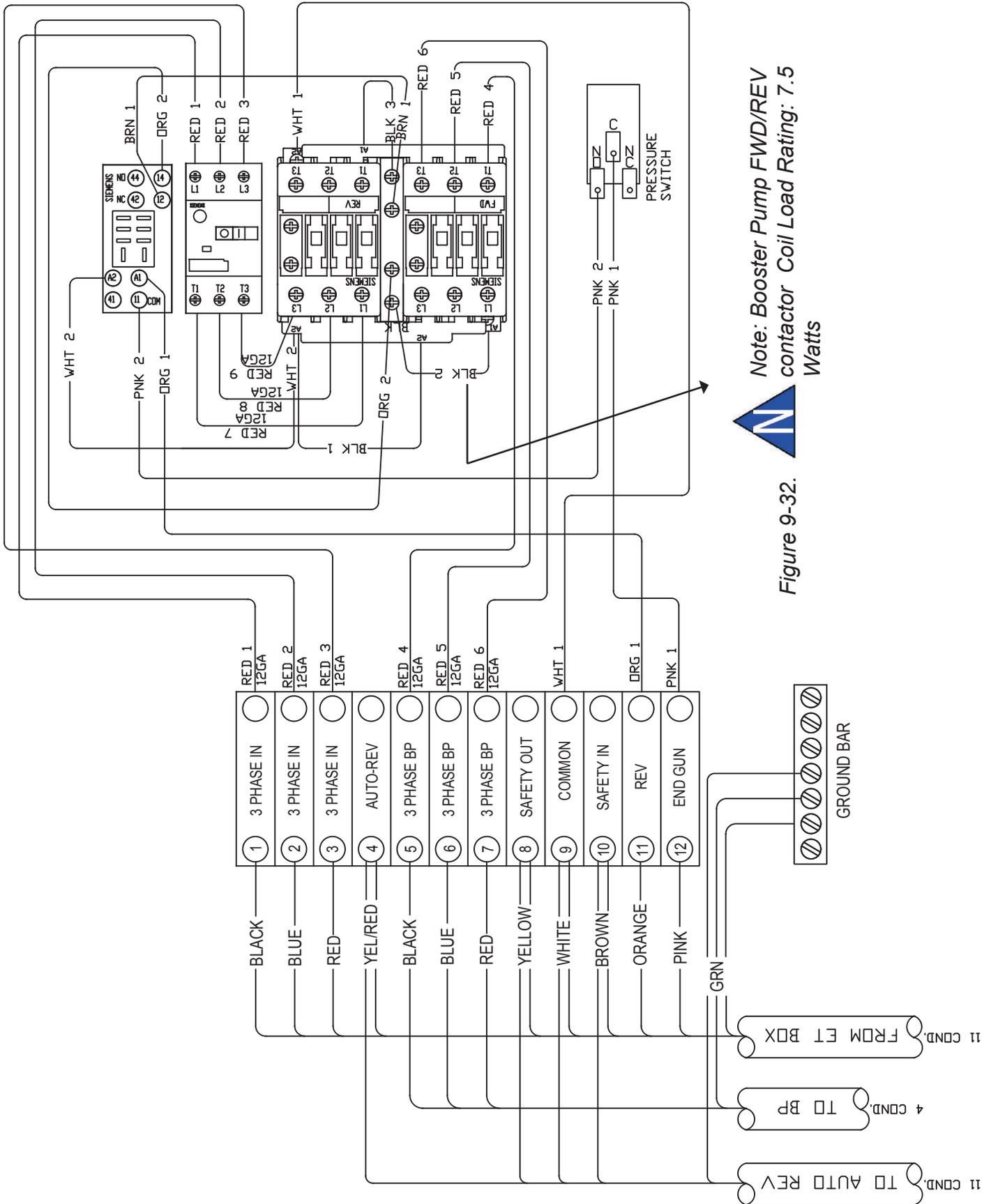
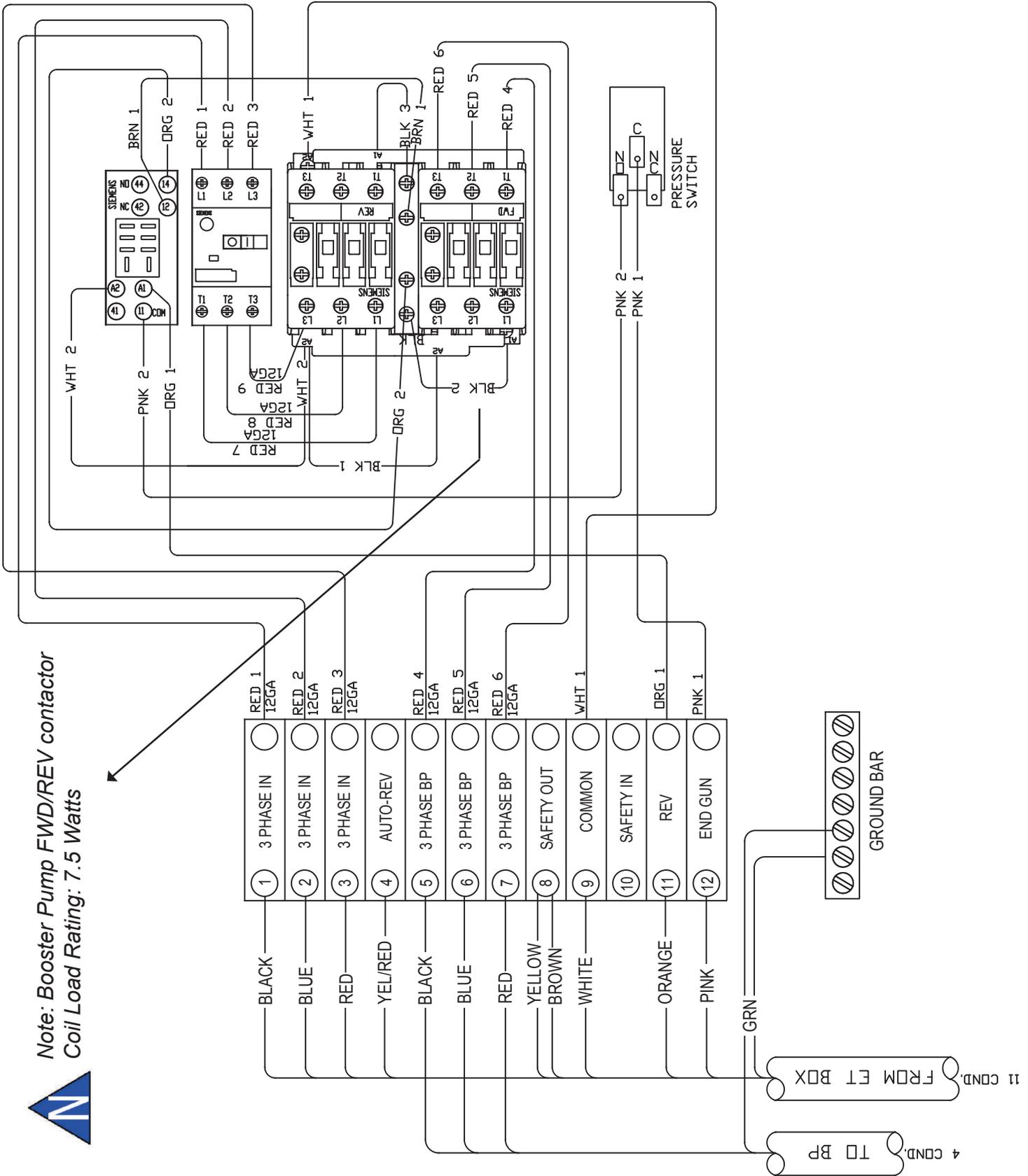


Figure 9-32.

Note: Booster Pump FWD/REV contactor Coil Load Rating: 7.5 Watts



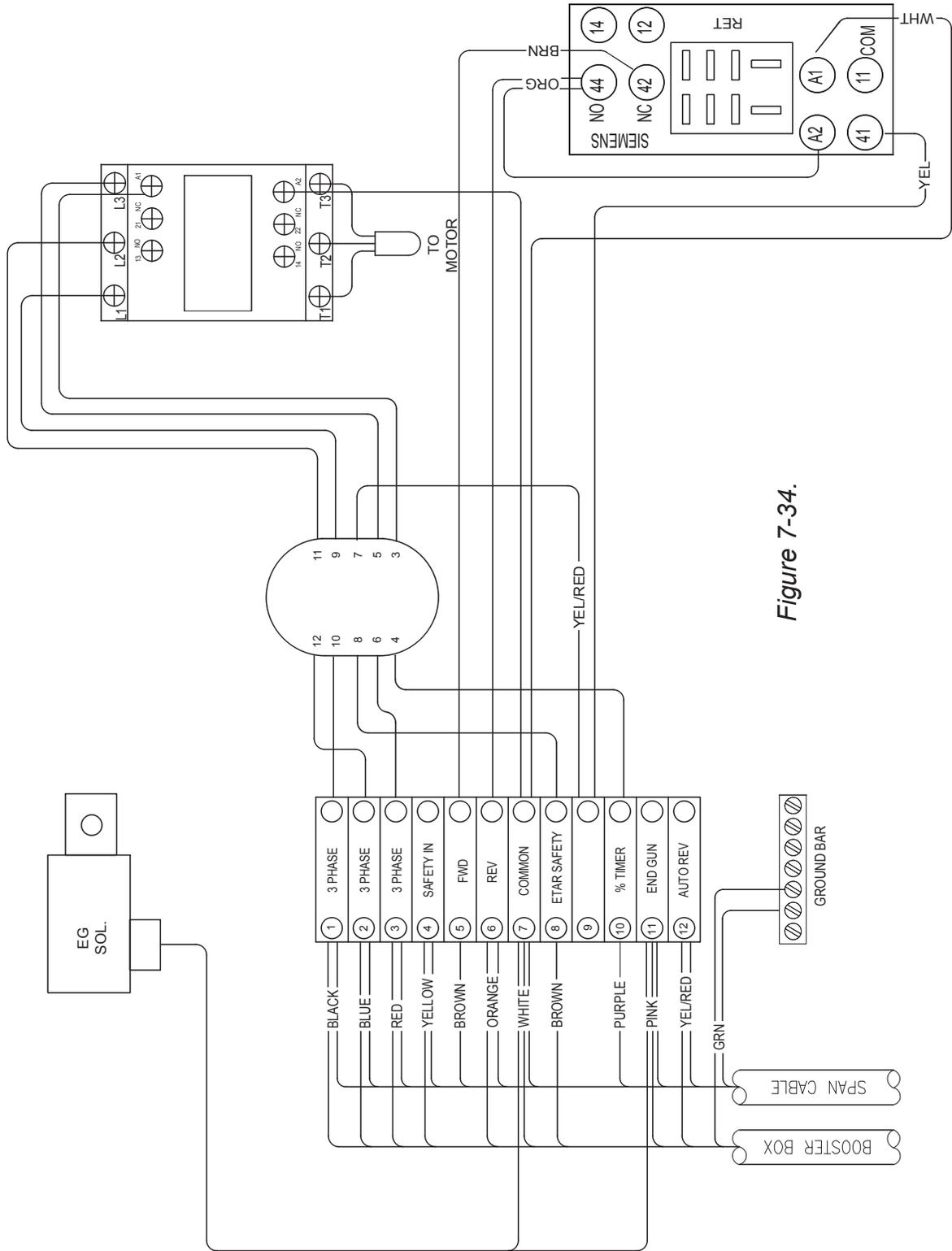


Figure 7-34.

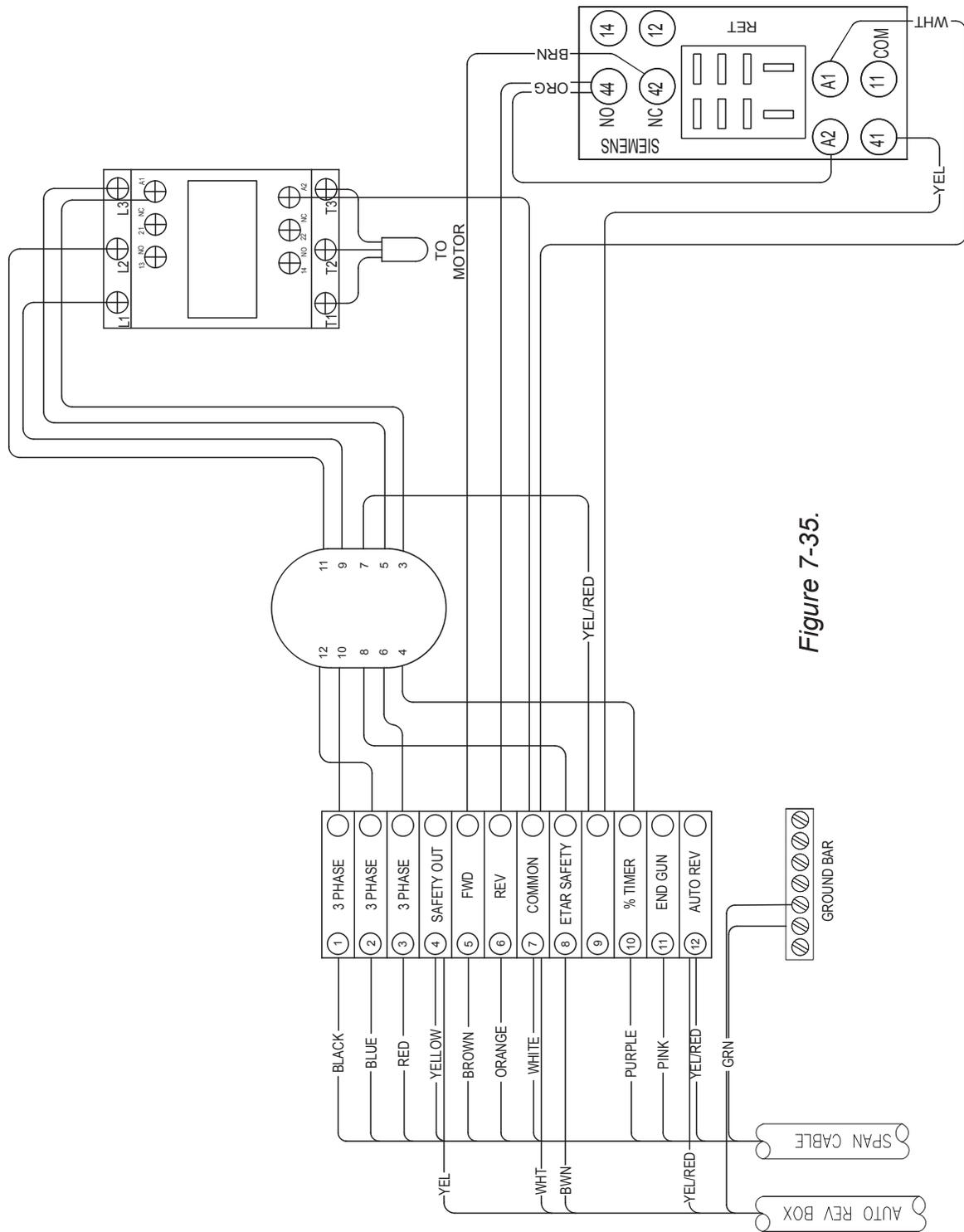


Figure 7-35.

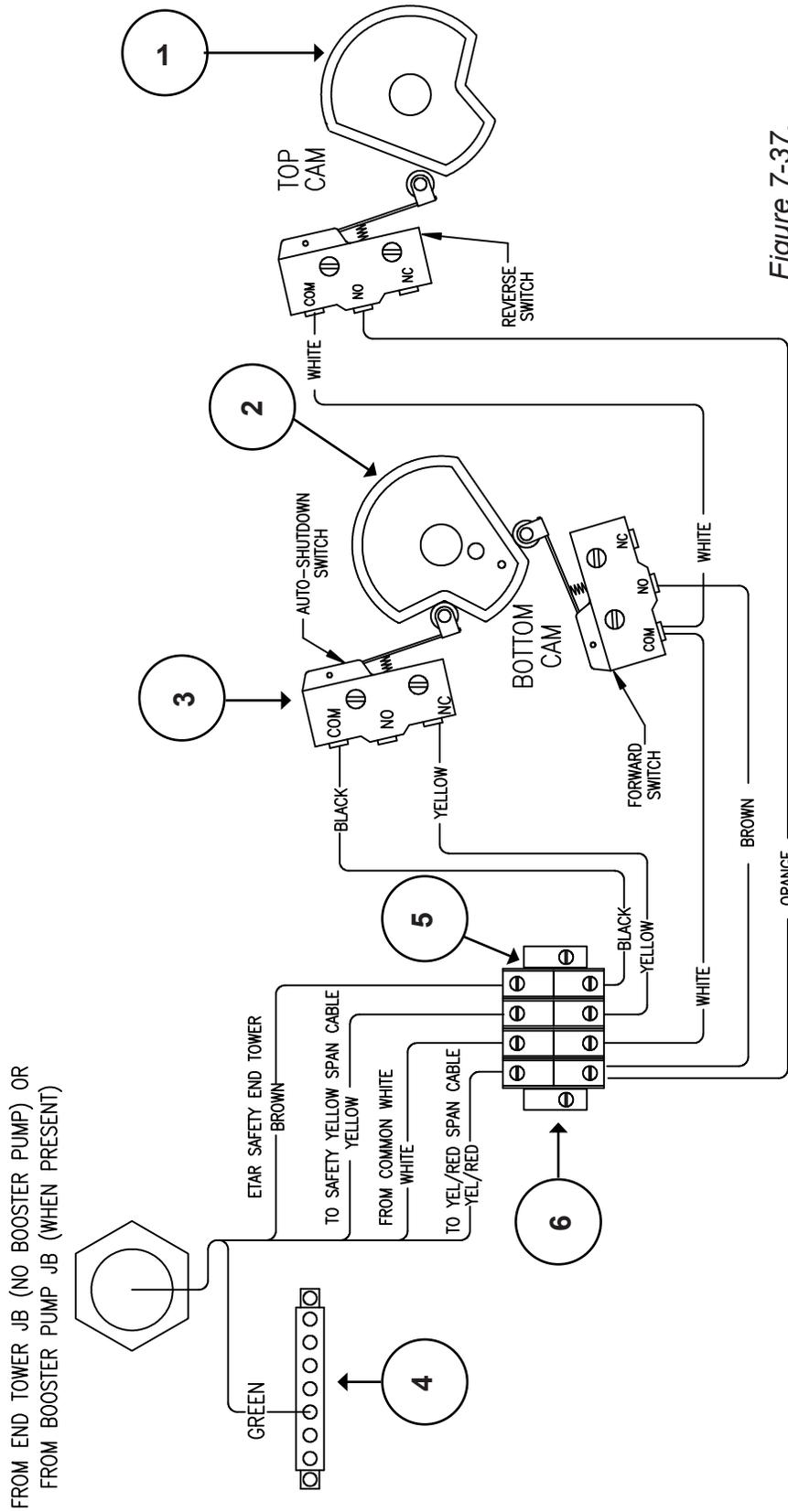
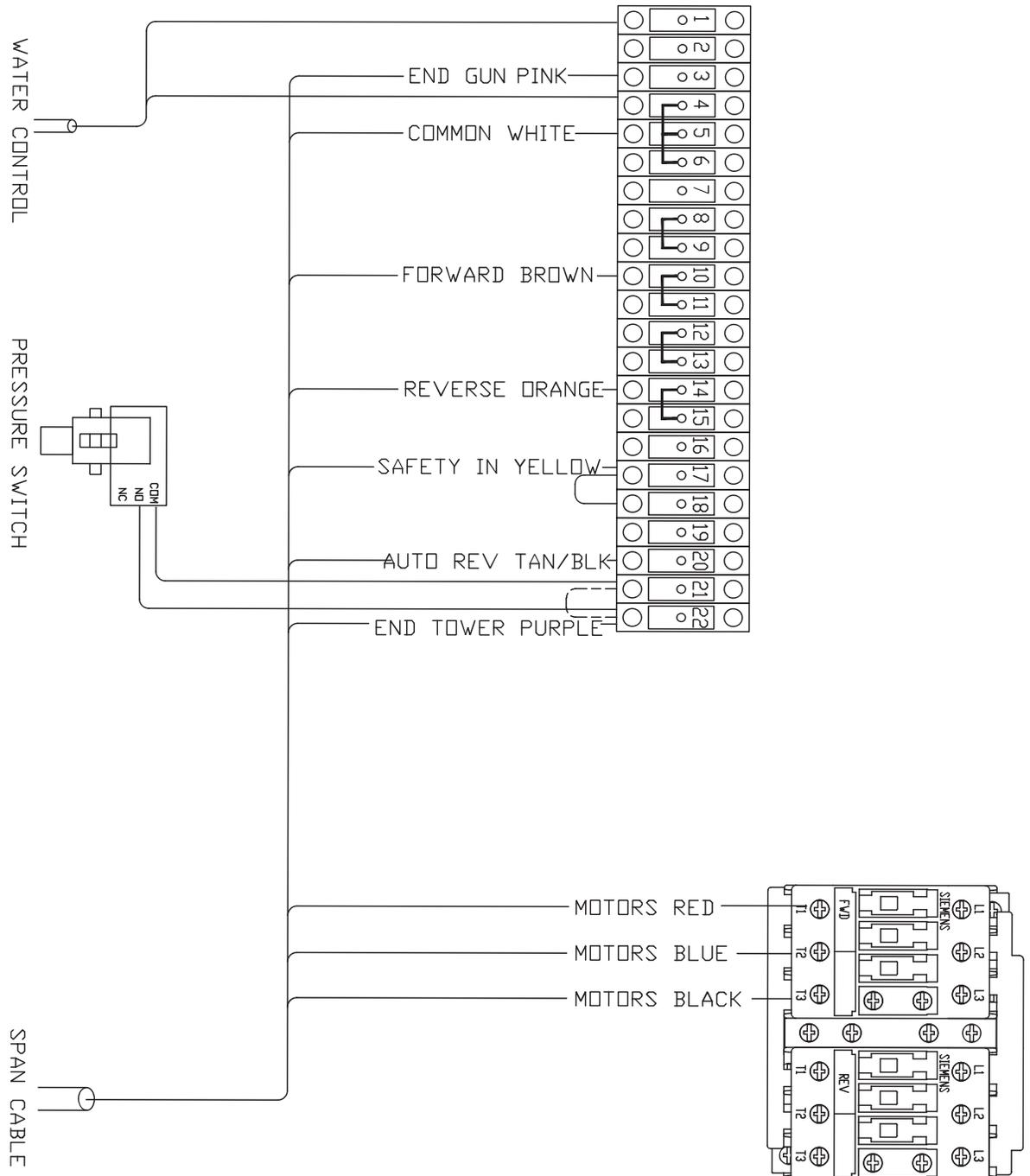


Figure 7-37.

Item	Part	Qty	Description
1	02222-02	1	CAM TOP
2	02222-03	1	CAM CLOSE TOLERANCE
3	02224-02	3	MICRO SWITCH
4	02269-01	1	GROUND BAR 7 POS 1TGL
5	02605-02	4	DIN RAIL
6	12008-03	2	TERM BLOCK END STOP
*	07098-08	1	COMPLETE JUNCTION BOX

CP Option Low Pressure Shutdown-90036-10



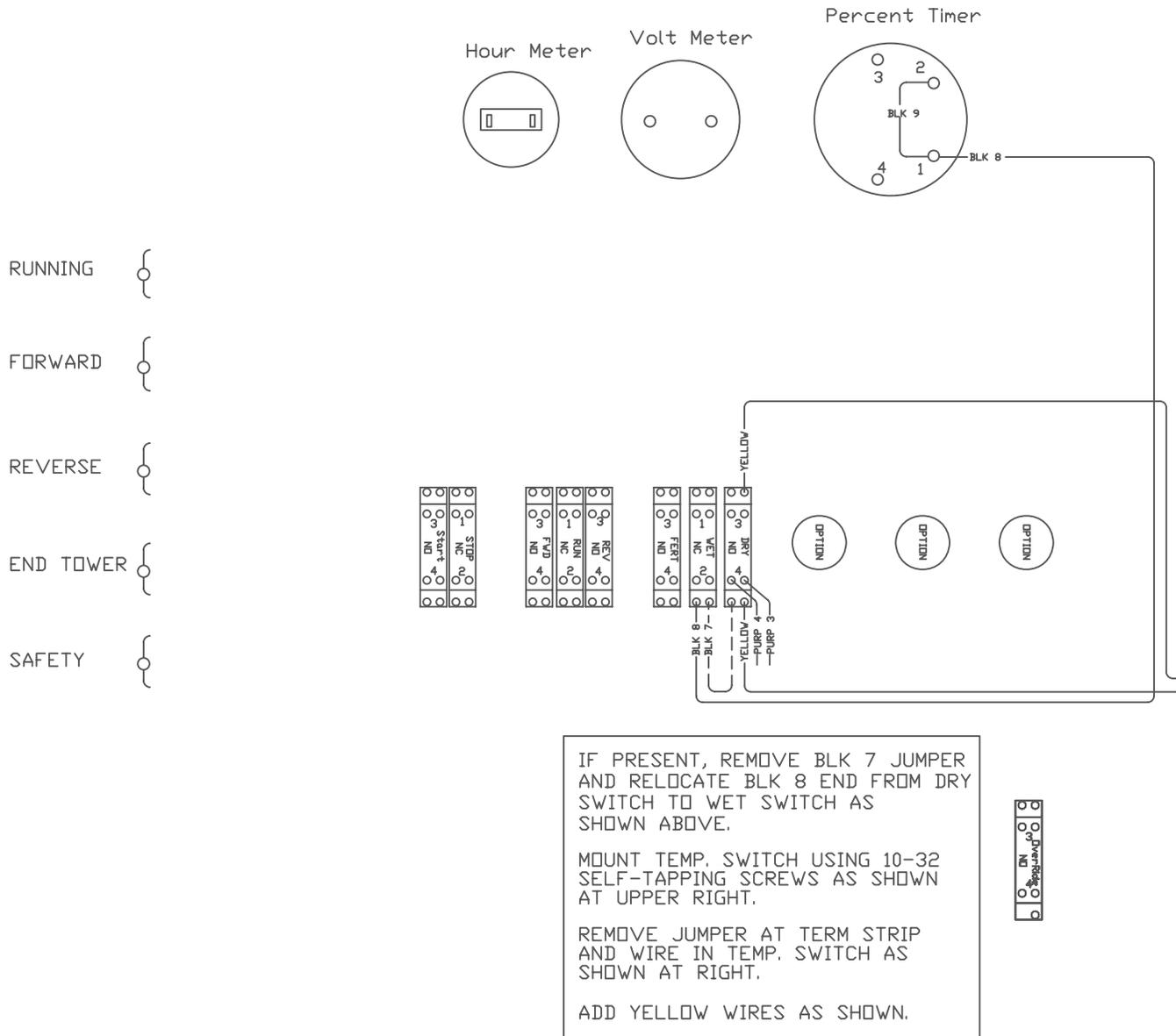
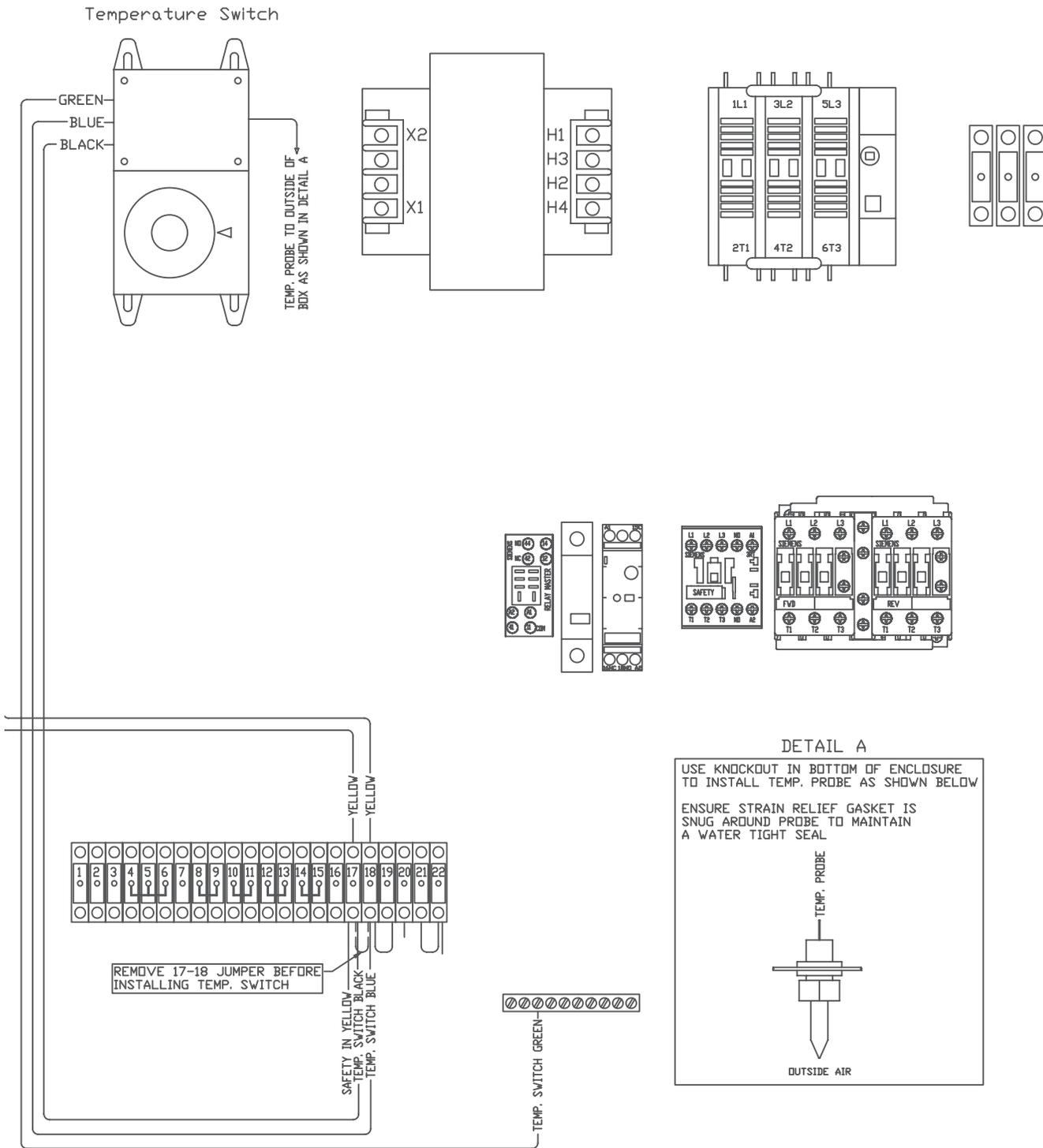
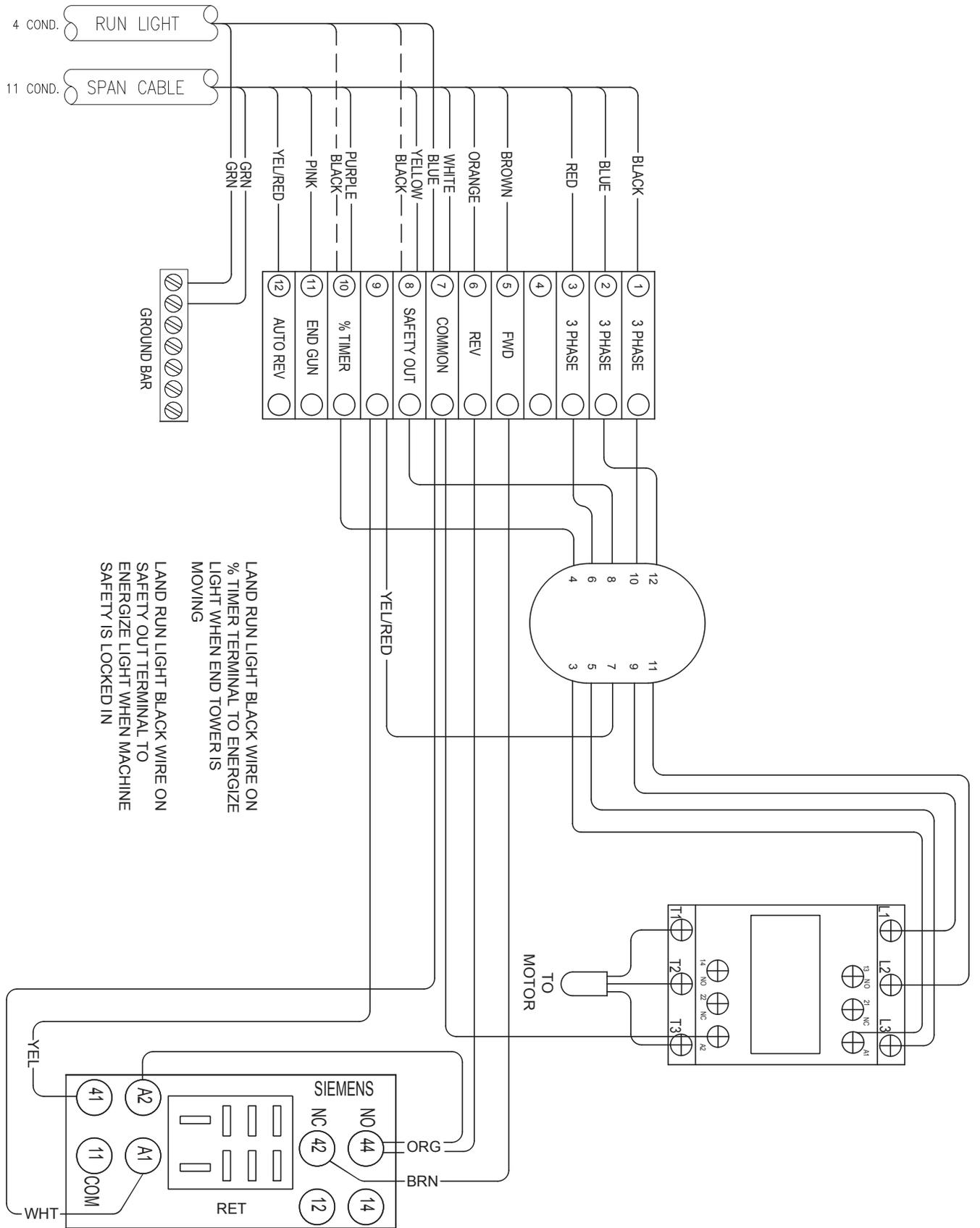


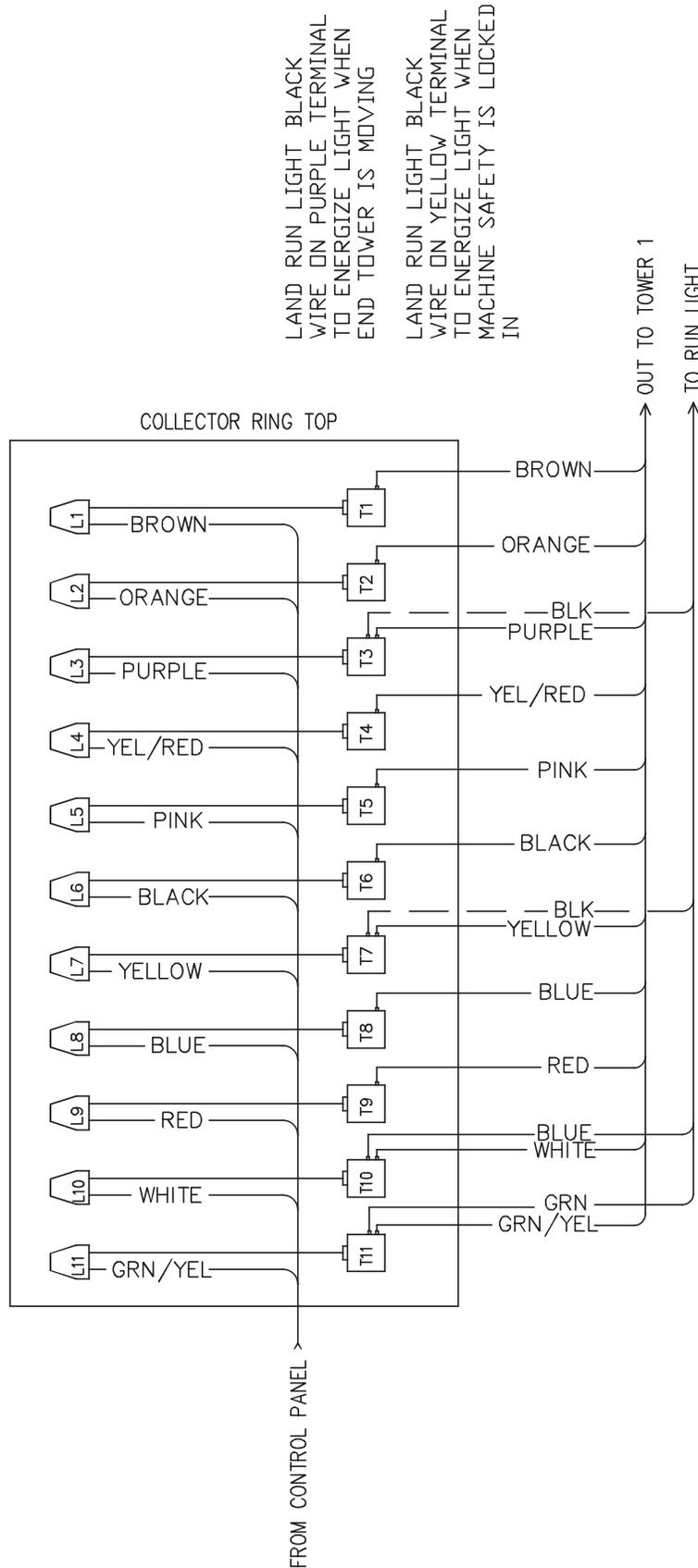
Figure 7-38.

Low Temperature Option-90036-09





Pivot Point Run Light 03060-55



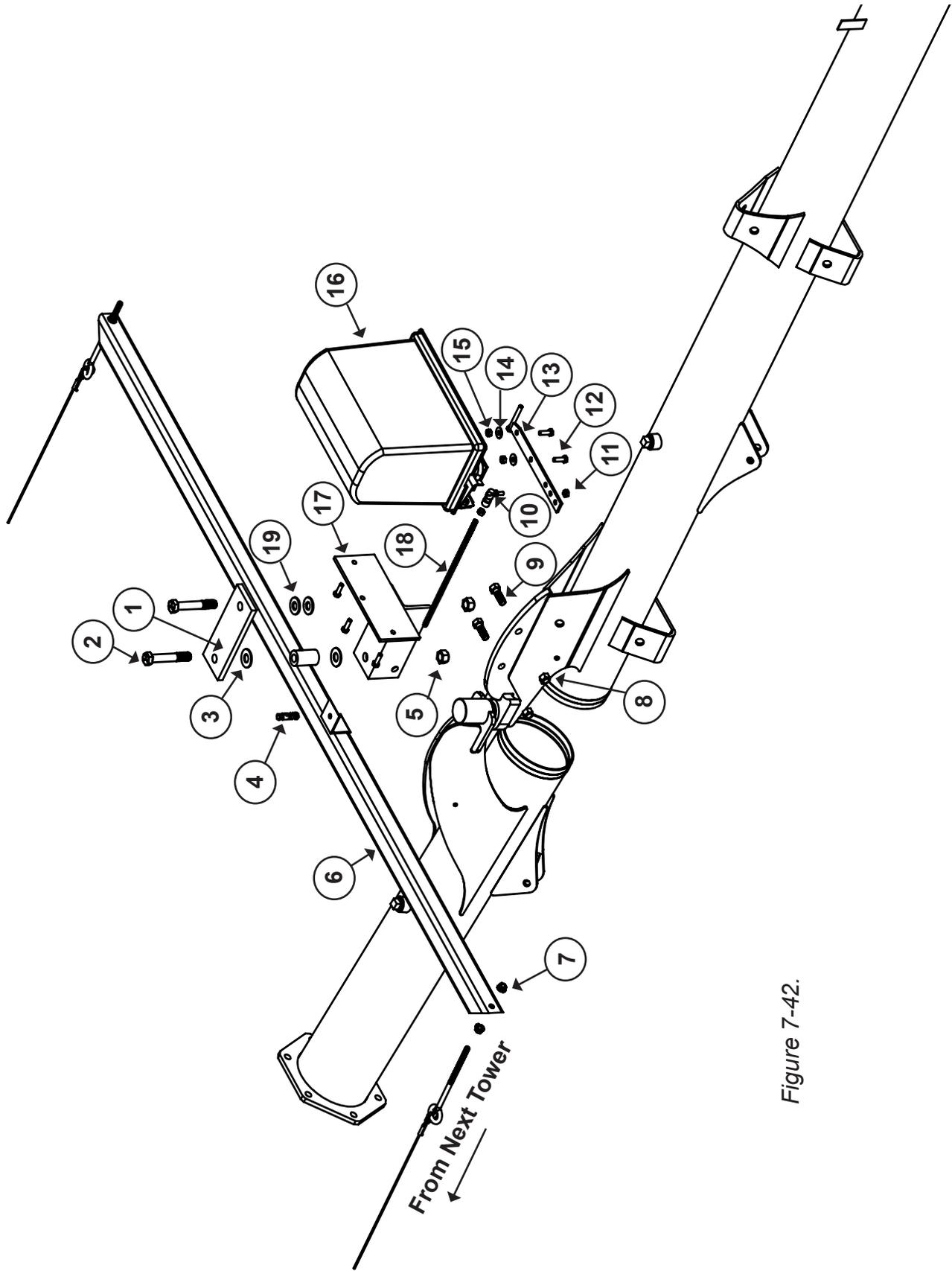
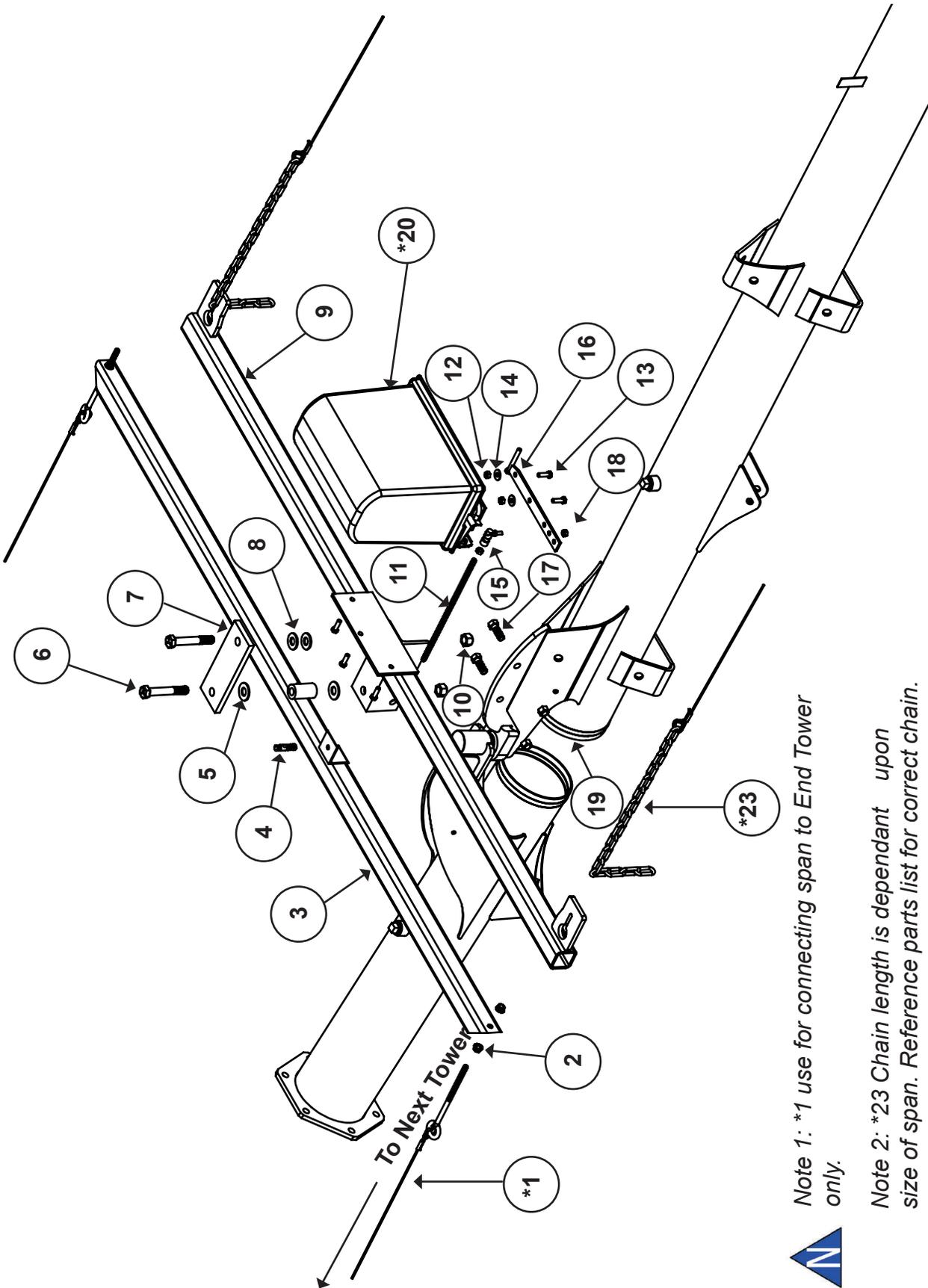


Figure 7-42.

## Wire Alignment First Tower

ITEM	PART	QTY	DESCRIPTION
1	10278-11	1	CABLE ALIGN 1ST SPAN TOP PLATE ANG
2	02068-10	2	HEX BOLT 5/8 X 4
3	02042-12	2	WASHER 5/8
4	02172-01	1	SWIVEL SUPERIOR
5	02031-11	2	NUT LOCK 5/8-11
6	10274-12	1	CP CABLE ALIGN BAR ROTATING WIZERK
7	02510-10	4	NUT FL LOCK .38
8	02031-07	2	NUT LOCK 1/2
9	02066-04	2	HEX BOLT 1/2 X 1-1/2
10	02172-02	1	BALL JOINT SUPERIOR
11	02035-02	2	HEX NUT SS 5/16"
12	02019-02	5	HEX BOLT 5/16 X 1
13	10282-01	1	CP CABLE ALIGN BAR ASM W/NUT
14	02042-07	2	WASHER 5/16
15	02031-03	5	NUT LOCK 5/16
16	10142-01	1	CP JB INT CAM W/COVER
17	10270-11	1	CP CABLE ALIGN 1ST SPAN JB MNT
18	07063-02	1	CABLE ALIGNMENT LINKAGE ROD
19	02103-02	2	WASHER BRASS 5/8
*	02157-13	1	STRAIN RELIEF 1/2 X 1/2
*	02157-15	1	NUT STRAIN RELIEF 1/2

\*Not Shown



 Note 1: \*1 use for connecting span to End Tower only.

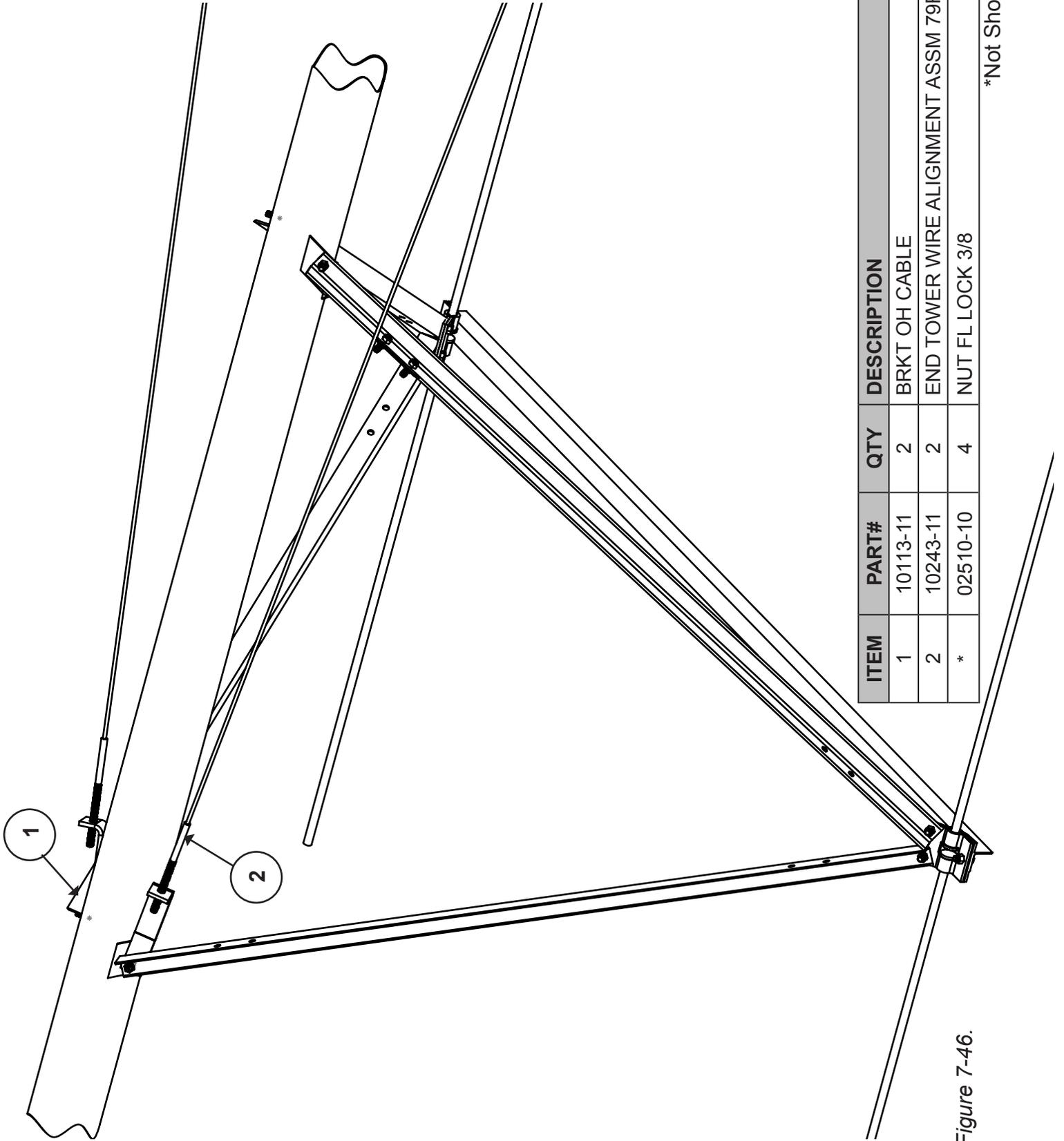
Note 2: \*23 Chain length is dependant upon size of span. Reference parts list for correct chain.

Note 3: \*20 Use p/n 10144-01 for second to last tower installed.

Figure 7-44.

ITEM	PART	QTY	DESCRIPTION
*1	10243-11	1	END TOWER WIRE ALIGNMENT ASSM 79FT G
2	02510-10	4	NUT FL LOCK 3/8
3	10274-12	1	CABLE ALIGN BAR ROTATING WITH ZERK
4	02172-01	1	SWIVEL SUPERIOR
5	02042-12	1	WASHER 5/8
6	02068-10	2	HEX BOLT 5/8X4
7	10278-11	1	CP CABLE ALIGN TOP PLATE
8	02103-02	2	BRASS WASHER 5/8
9	10279-11	1	CABLE ALIGN BAR STATIONARY
10	02031-11	2	NUT LOCK 5/8-11
11	07063-02	1	CABLE ALIGNMENT LINKAGE ROD 12
12	02031-03	5	NUT LOCK 5/16
13	02019-02	5	HEX BOLT 5/16 X 1
14	02042-07	2	WASHER 5/16
15	02172-02	1	BALL JOINT SUPERIOR
16	10282-01	1	CABLE ALIGN BAR ASM W/NUT
17	02066-04	2	HEX BOLT 1/2 X 1-1/2
18	02035-02	2	HEX NUT SS 5/16
19	02031-07	2	NUT LOCK 1/2
*20	10142-01	1	JB INT CAM W/COVER
*	10144-01	1	JB INT CAM W/STALL/COVER
*21	02157-13	1	STRAIN RELIEF.50 NPT X.50 ID
*22	02157-15	1	NUT STRAIN RELIEF.50
*23	10246-11	2	INT TOWER WIRE ALIGNMENT ASSM 125.5 FT
*	10245-11	2	INT TOWER WIRE ALIGNMENT ASSM 145 FT
*	10244-11	2	INT TOWER WIRE ALIGNMENT ASSM 164.5 FT
*	10247-11	2	INT TOWER WIRE ALIGNMENT ASSM 184 FT
*	10248-11	2	CP INT TOWER WIRE ALIGNMENT ASSM 203.5 FT

\*Not Shown



ITEM	PART#	QTY	DESCRIPTION
1	10113-11	2	BRKT OH CABLE
2	10243-11	2	END TOWER WIRE ALIGNMENT ASSM 79FT
*	02510-10	4	NUT FL LOCK 3/8

\*Not Shown

Figure 7-46.

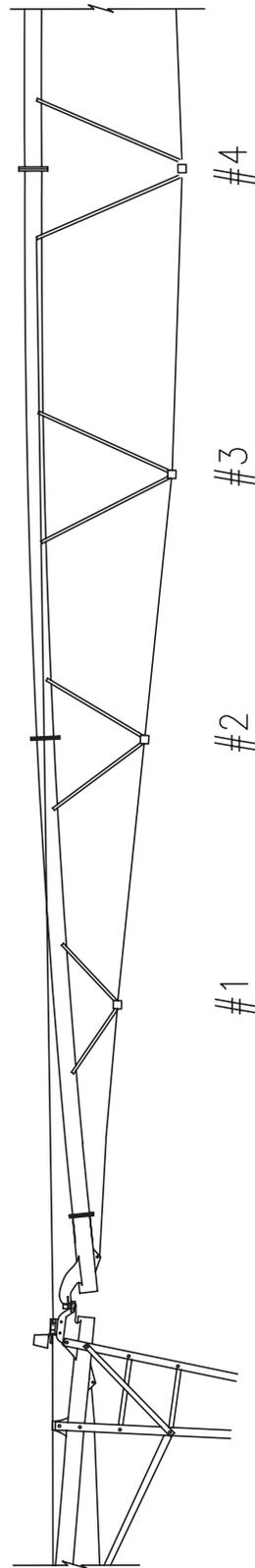
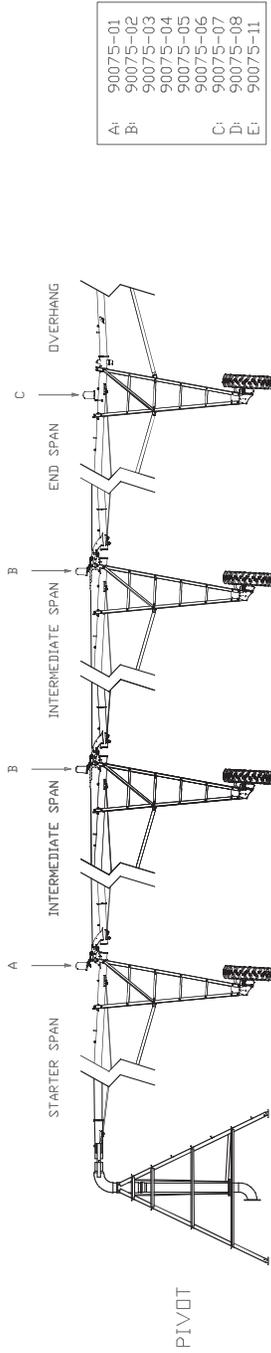
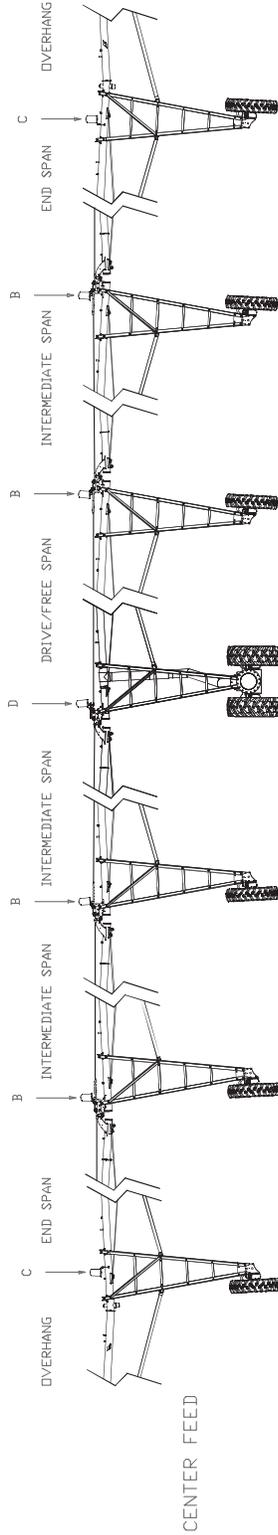


Figure 7-47.

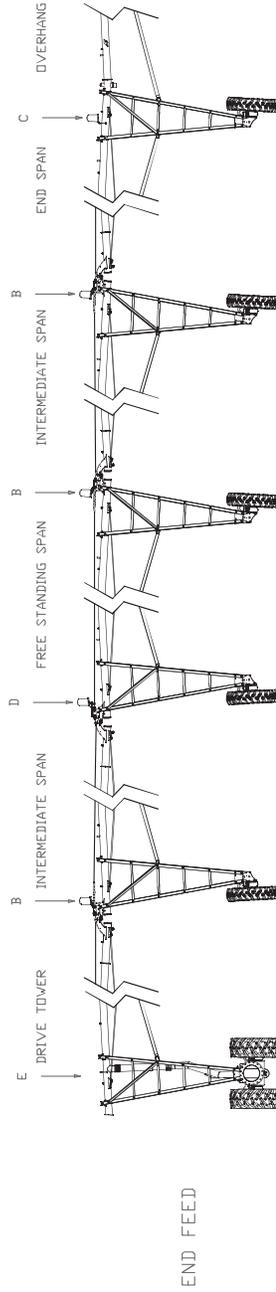


A:	90075-01
B:	90075-02 90075-03 90075-04 90075-05
C:	90075-06 90075-07
D:	90075-08
E:	90075-11



NOTE: PLACE FREESTANDING SPAN NEAR CENTER OF MACHINE FOR BEST PERFORMANCE

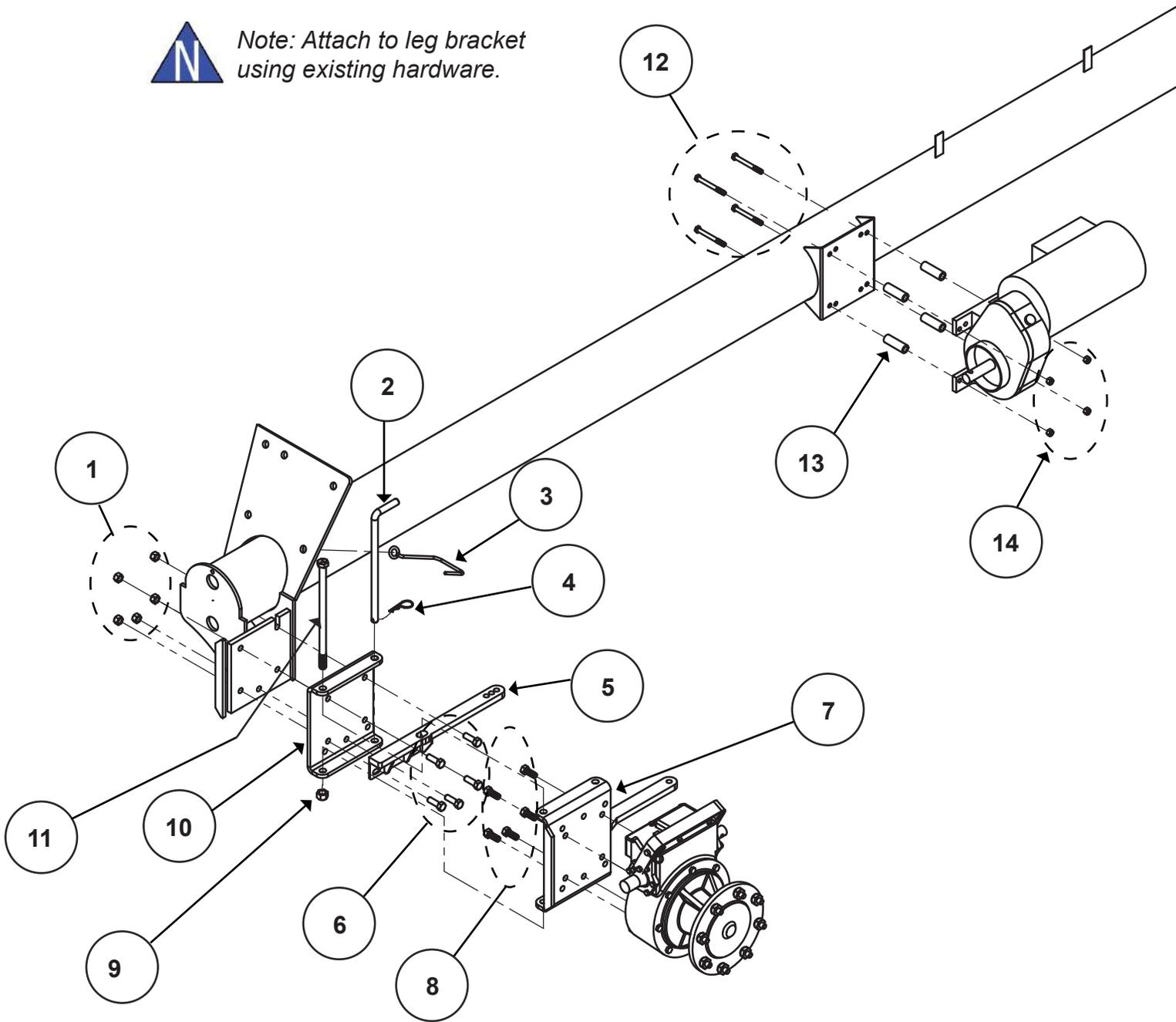
NOTE 2: IF FREE SPAN IS LOCATED AT THE CART ON AN ENDFEED MACHINE, THEN CONFIGURATION IS IDENTICAL TO A PIVOT WITH A 1ST SPAN SET AND NO FREE SPAN SET

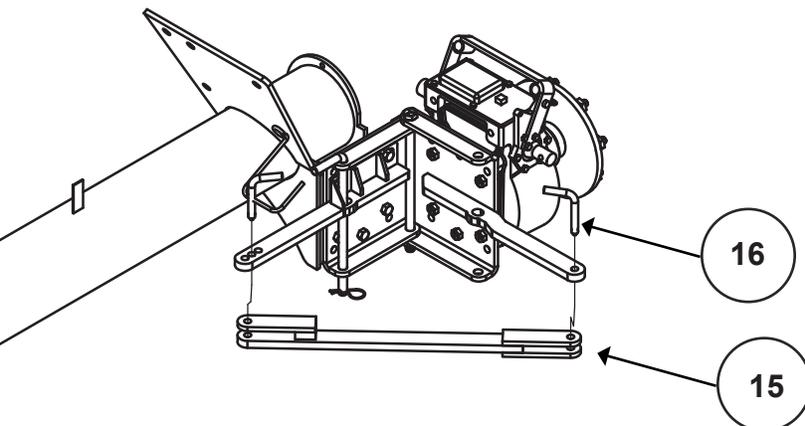


Item	Part	Description
A	90075-01	INT W/CABLE ALIGN 1ST SPAN SET
B	90075-02	INT W/CABLE ALIGN 125-1/2 SPAN SET
*	90075-03	INT W/CABLE ALIGN 145 SPAN SET
*	90075-04	INT W/CABLE ALIGN 164-1/2 SPAN SET
*	90075-05	INT W/CABLE ALIGN 184 SPAN SET
*	90075-06	INT W/CABLE ALIGN 203-1/2 SPAN SET
C	90075-07	INT W/CABLE ALIGN END SPAN SET
D	90075-08	INT W/CABLE ALIGN FREE SPAN SET
E	90075-11	INT W/CABLE ALIGN END FEED SPAN SET



Note: Attach to leg bracket using existing hardware.





*Note: Shown in open tow position.*

Item	Part	Qty	Description
1	02031-07	10	LOCK NUT 1/2
2	10926-11	2	LINK PULL PIN
3	10927-11	2	DRIVELINE HANGER
4	02471-46	2	HAIRPIN 5/8
5	10971-11	2	TOW TOWER LOCK ARM
6	02066-06	10	HEX BOLT G5 1/2 X 2
7	10968-11	2	GEARBOX HINGE PLATE
8	02066-03	10	HEX BOLT G5 1/2 X 1-1/4
9	02031-11	4	LOCK NUT G B 5/8
10	10966-11	2	HINGE PLATE
11	02068-14	2	HEX BOLT 5/8 X 12
12	02064-12	4	HEX BOLT 3/8 X 3-1/2
13	10928-11	4	MOTOR SPACER
14	02031-05	4	LOCK NUT 3/8
15	10975-11	2	TOW TOWER LINK
16	02471-43	4	HITCH PIN BENT 1/2 X 2-1/2
*	90047-01	1	Complete Tow Tower Kit

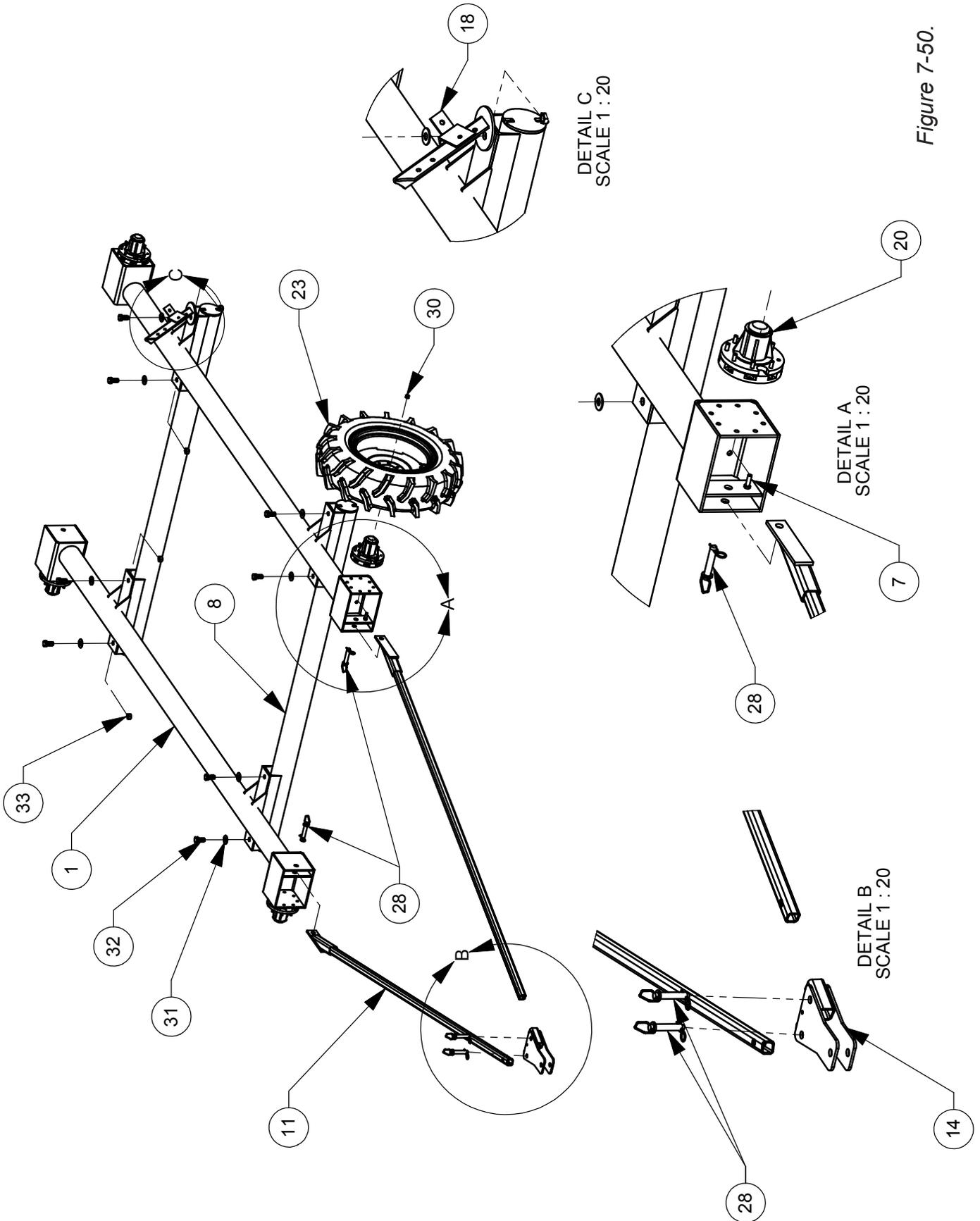
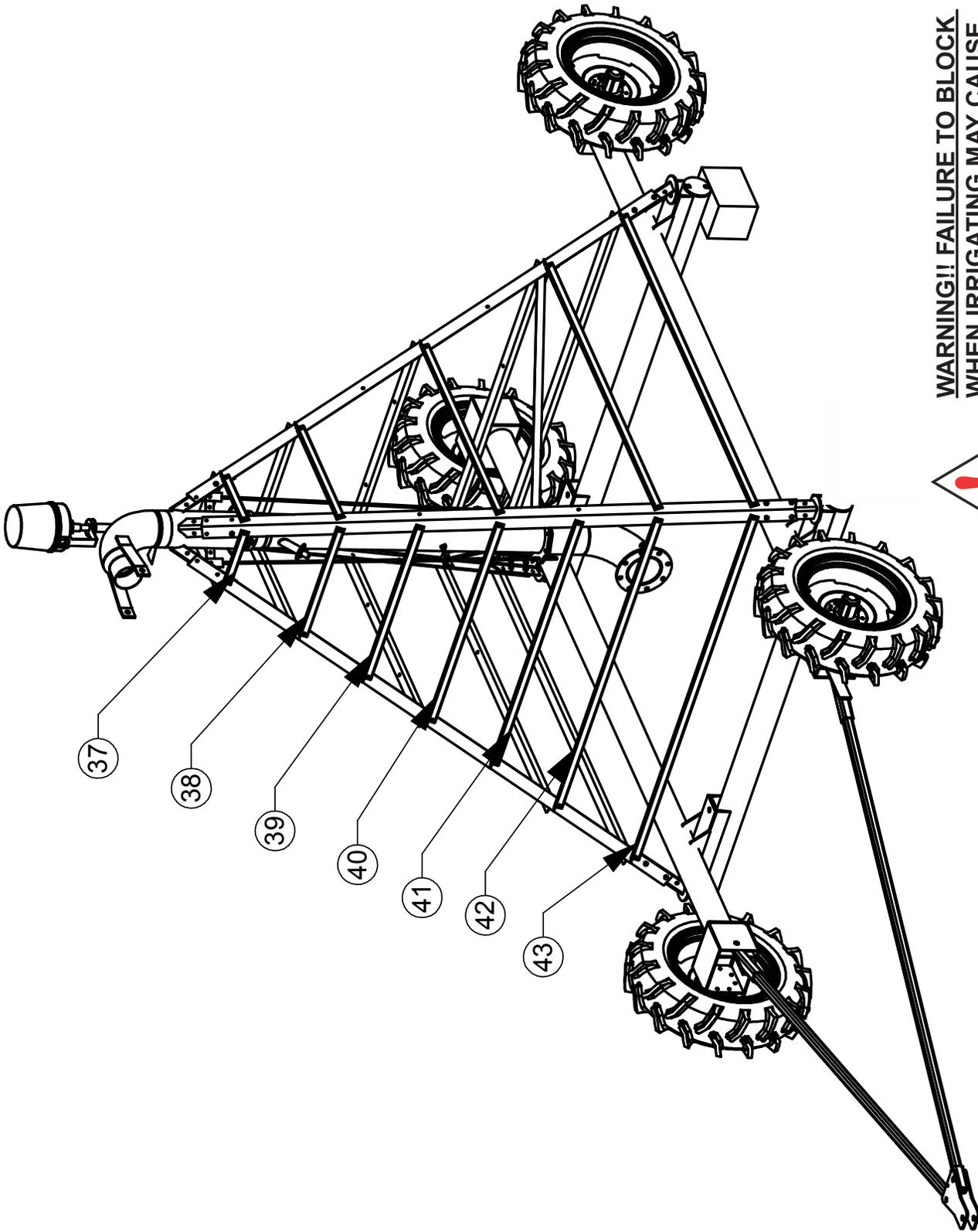


Figure 7-50.

ITEM	PART #	QTY	DESCRIPTION
1	10264-11	2	WHEEL TOW FRAME ASM
7	2069-06	28	HEX BOLT G5 9/16 X 1-1/2
8	10265-11	2	WHEEL TOW CROSS TUBE
11	10266-11	2	WHEEL TOW HITCH ARM
14	7198-11	1	WHEEL TOW HITCH
18	10166-11	4	PIVOT TIE DOWN, BOLT ON
20	2233-05	4	GB TOW HUB ONLY
23	3046-01	2	WHEEL ASM 11.2 X 24 X 8 TUBE CW
*	3046-02	2	WHEEL ASM 11.2 X 24 X 8 TUBE CCW
28	2471-01	4	PIN HITCH 1 X 4-1/2
30	2234-07	28	NUT WHEEL
31	2042-15	8	WASHER PLT 1
32	2070-05	8	HEX BOLT G5 1 X 2-1/4
33	2031-10	10	NUT LOCK 1

\*Not Shown



**WARNING!! FAILURE TO BLOCK  
WHEN IRRIGATING MAY CAUSE  
DAMAGE TO CART AND POSSIBLE  
INJURY OR DEATH.**

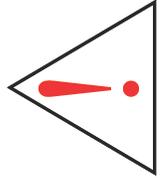


Figure7-52.

Item	Part #	QTY	Description
39	10034-11	3	CP PIVOT ANGLE BRACE #3 47.06
41	10035-11	3	CP PIVOT ANGLE BRACE #5 74.94
43	10036-11	3	CP PIVOT ANGLE BRACE #7 105.63
*	7199-01	1	WHEEL TOW CHAIN 28FT
*	2349-01	4	TURNBUCKLE W/CLEVIS 3/4" X 9
*	2350-01	4	HOOK GRAB W/EYE 1/2"
*	90041-11	1	COMPLETE TOWABLE CART

\*Not Shown

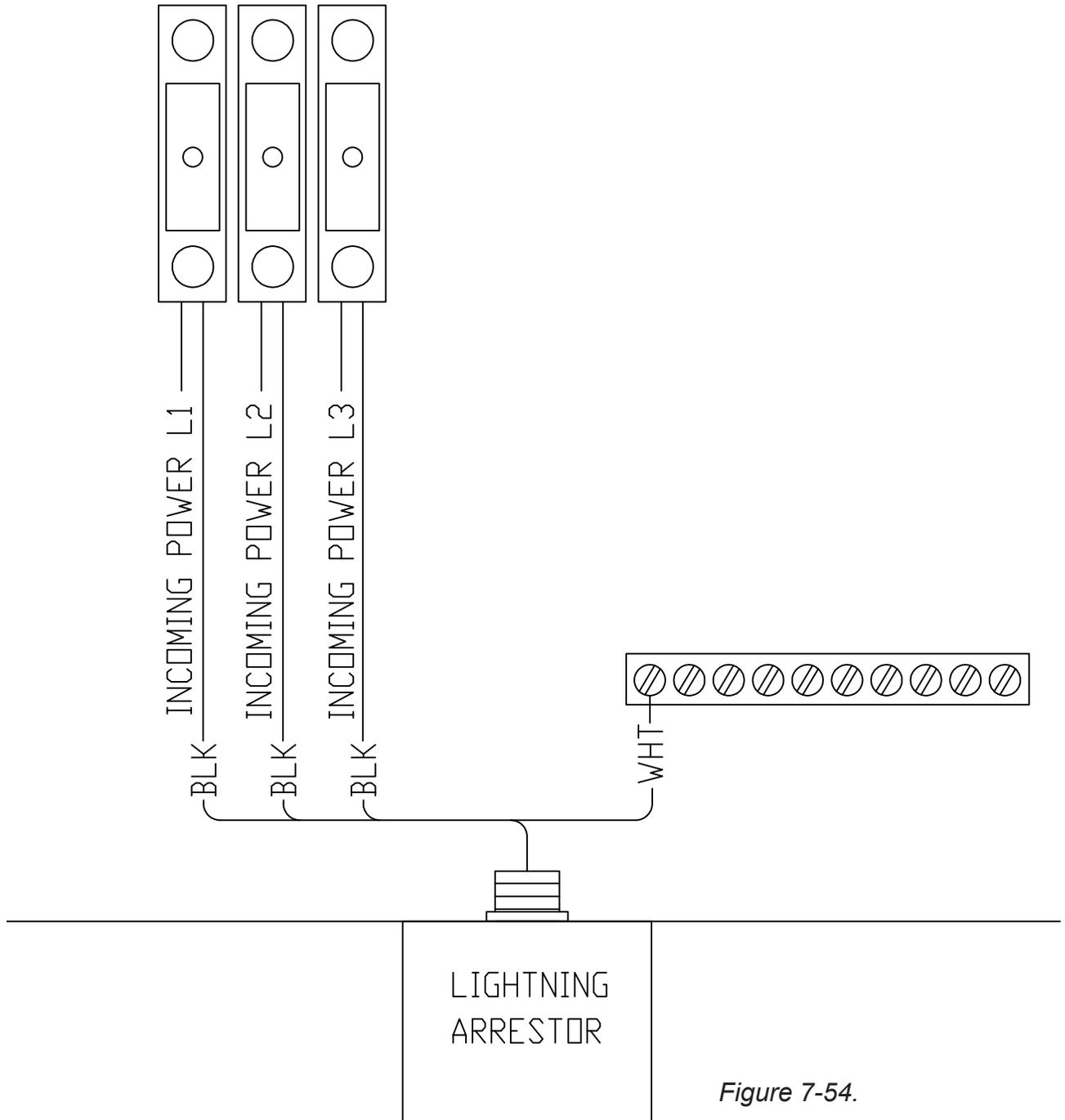


Figure 7-54.

1. Place cover over motor;
2. Align plate to grooves on cover; slide plate to end of cover.

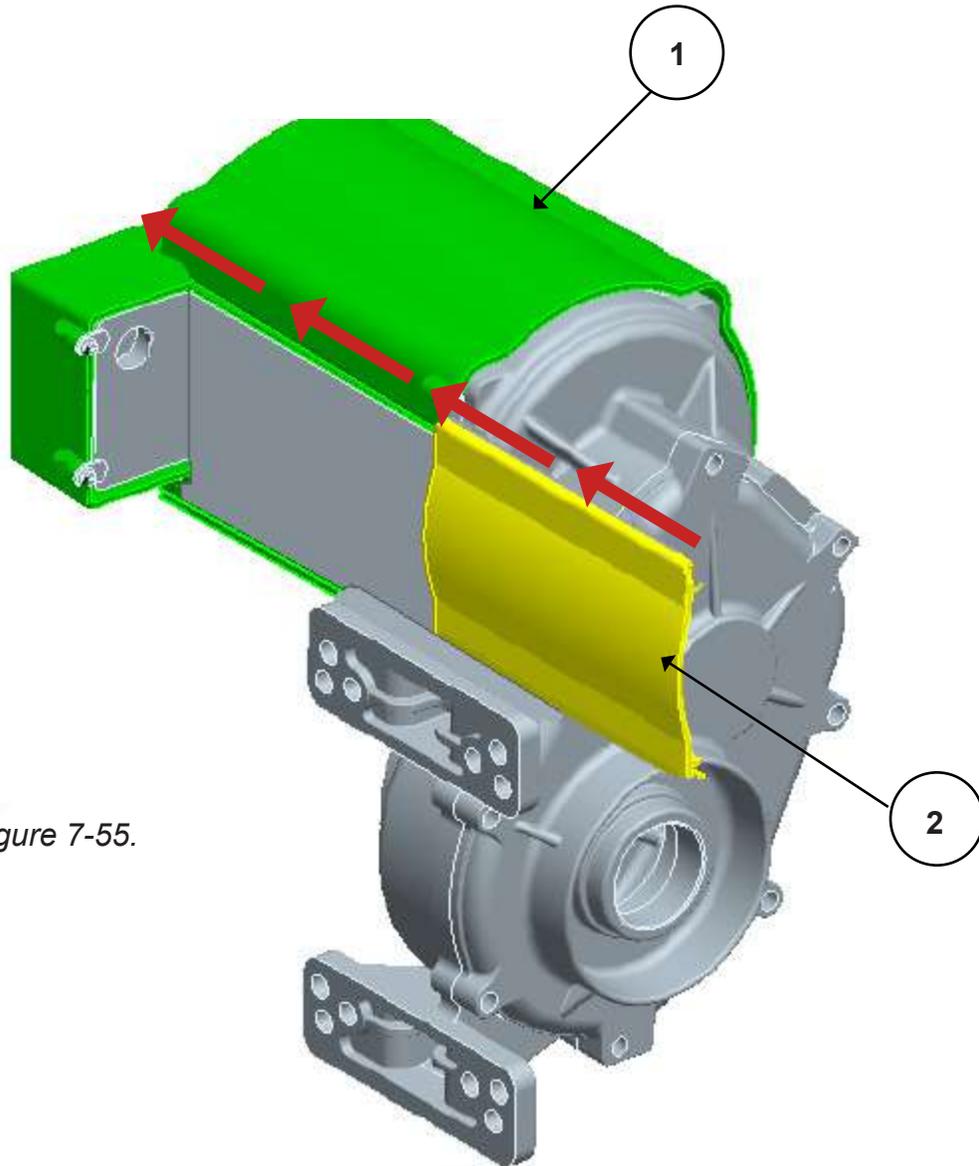


Figure 7-55.

Item	Part	Qty	Description
1	02234-31	1	MOTOR COVER
2	n/a	n/a	Part of Motor Cover Assembly

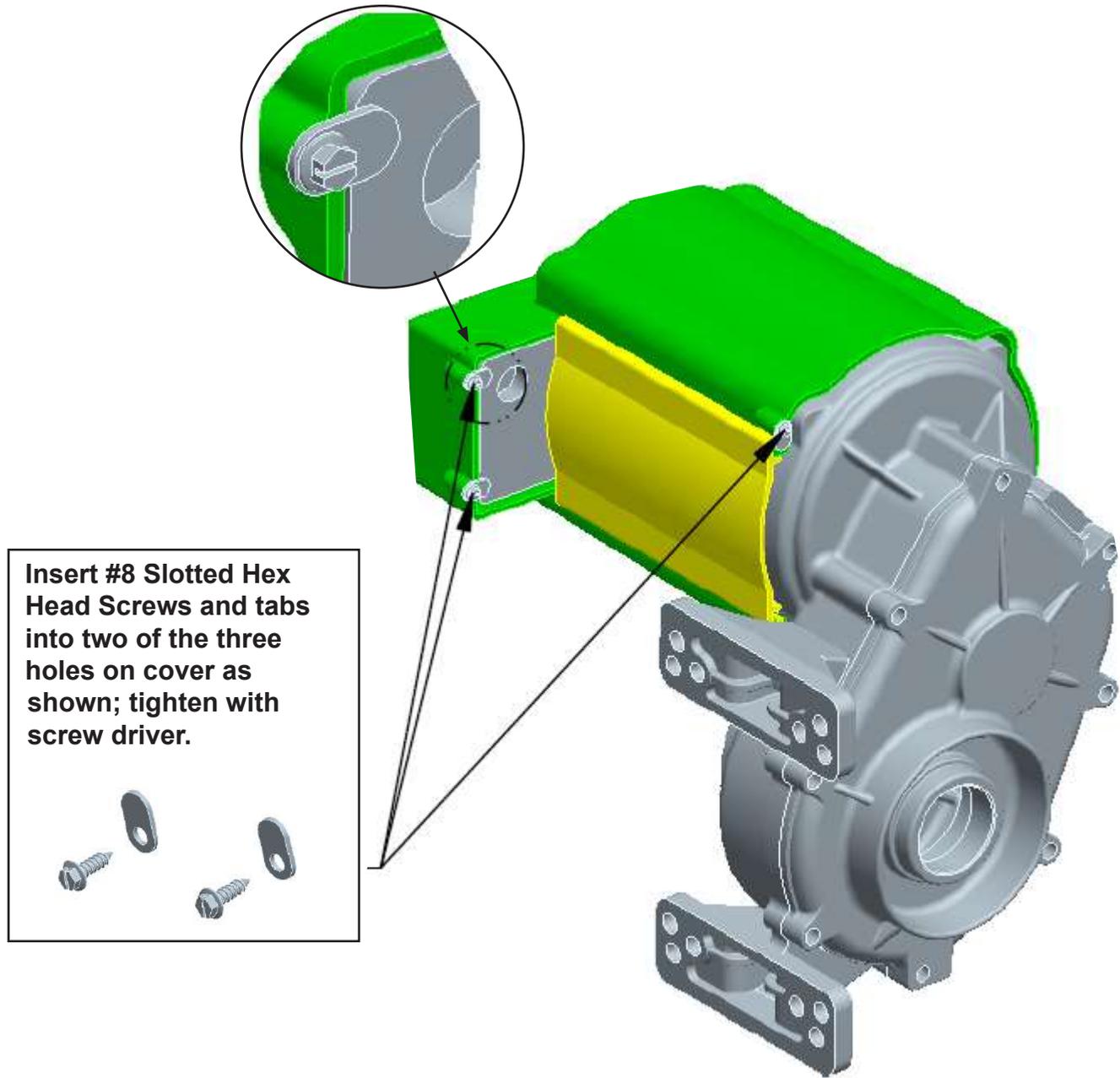
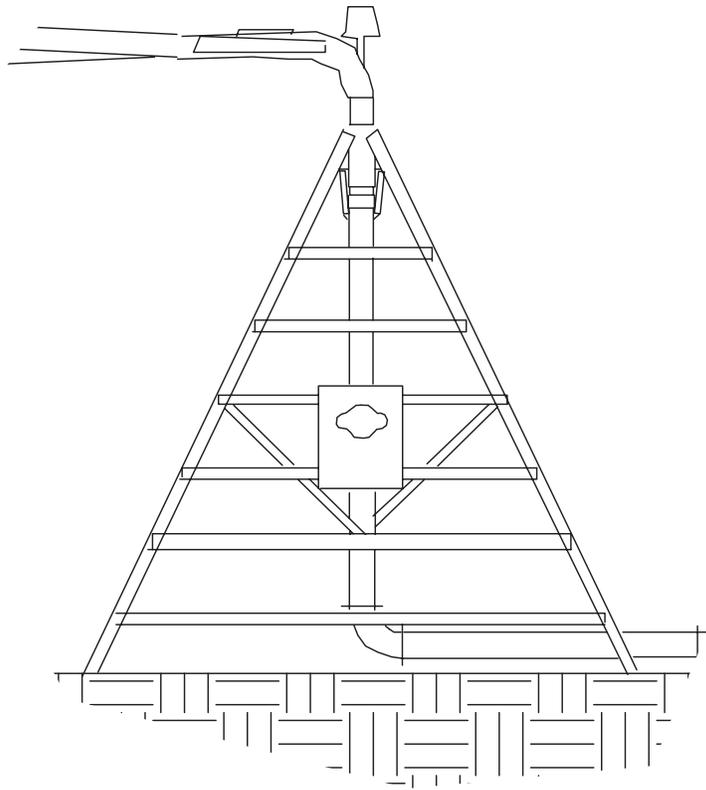
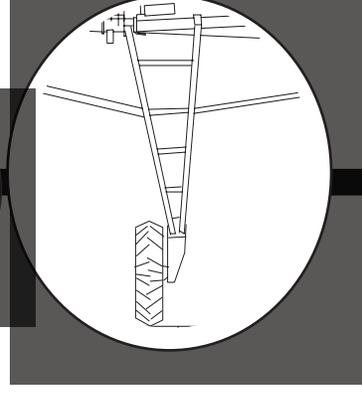
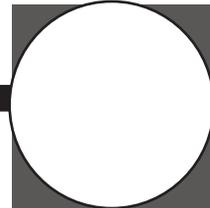
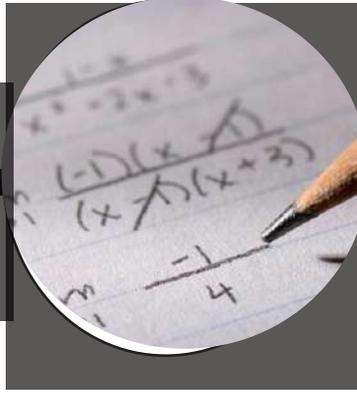
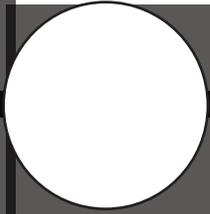
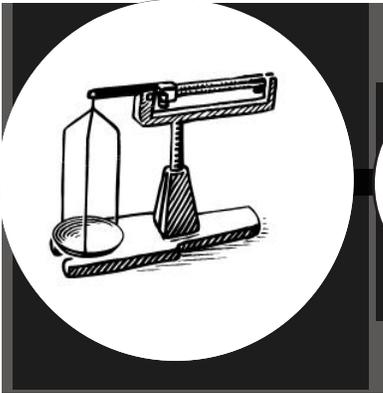


Figure 7-56.

# GENERAL INFORMATION



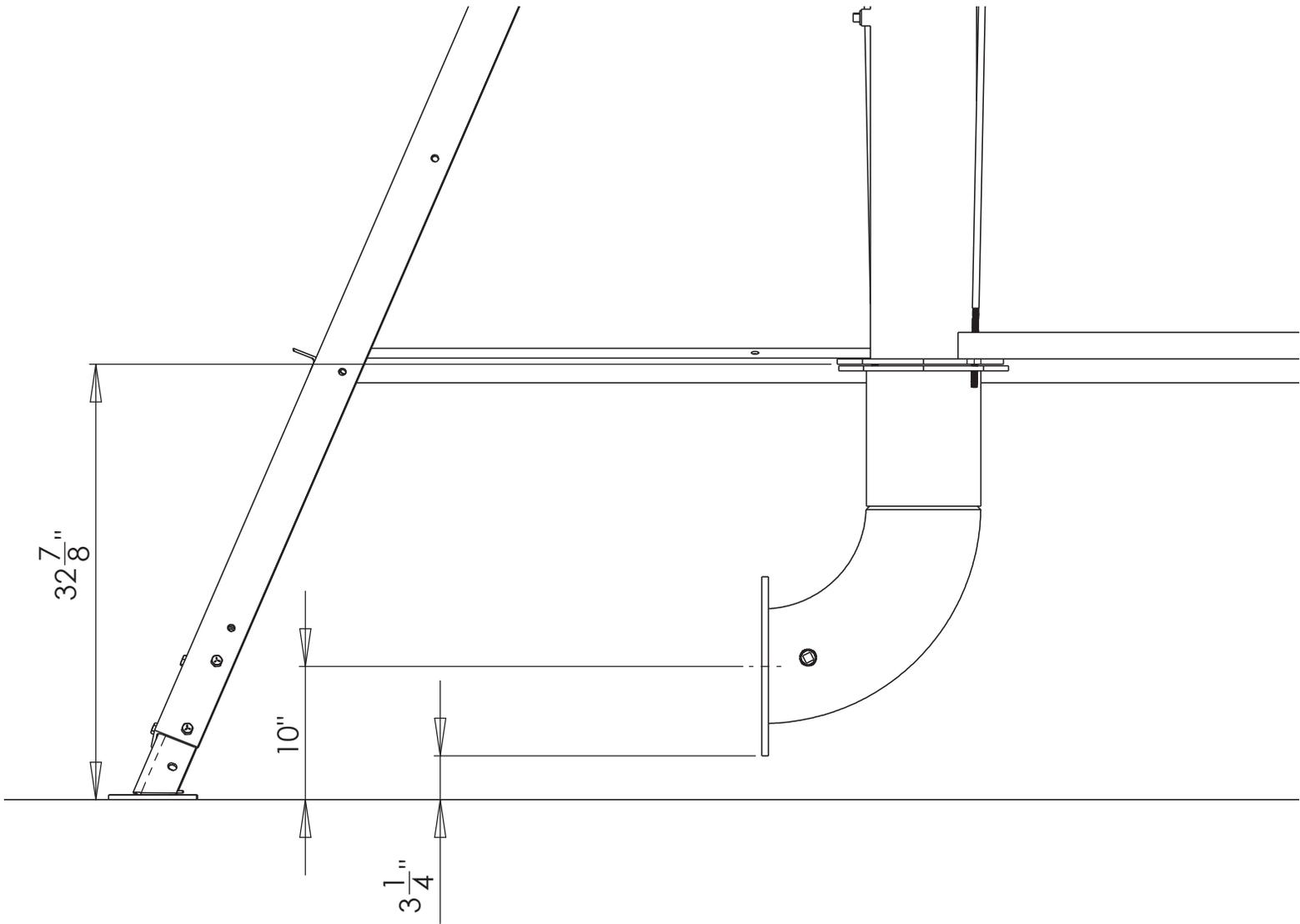
6-5/8" Pipe Span Weights			168mm Pipe Span Weights		
Span	Dry	Wet	Span	Dry	Wet
125.5 Ft	3212	4964	38.3 m	1457 kg	2252 kg
145 Ft	3512	5536	44.2m	1593 kg	2511 kg
164.5 Ft	3853	6149	50.1 m	1748 kg	2789 kg
184 Ft	4173	6741	56.1m	1893 kg	3058 kg
203.5 Ft	4513	7353	62.0 m	2047 kg	3336 kg

8-5/8" Pipe Span Weights			219 mm Pipe Span Weights		
Span	Dry	Wet	Span	Dry	Wet
125.5 ft	3539	6550	38.3m	1605 kg	2971 kg
145 ft	3910	7384	44.2 m	1774 kg	3351 kg
164.5	4375	8321	50.1 m	1985 kg	3775 kg

6- 5/8 Overhang Weights			168 mm Overhang Weights		
Overhang	Dry	Wet	Overhang	Dry	Wet
6 Ft	77	106	1.8 m	35 kg	48 kg
12 Ft	141	308	3.7 m	64 kg	140 kg
19.5 Ft	278	550	5.9m	126 kg	250 kg
25.5 Ft	401	702	7.8m	182 kg	319 kg
31.5 Ft	553	993	9.6m	251 kg	450 kg
39 Ft	593	1137	11.9m	269 kg	516 kg
45 Ft	638	1212	13.7m	289 kg	550 kg
51 Ft	858	1570	15.5m	389 kg	712 kg
58.5 Ft	833	1295	17.8m	378 kg	587 kg
64.5 Ft	878	1369	19.7m	398 kg	621 kg
78 Ft	1031	1765	23.8m	468 kg	801 kg
84 Ft	1075	1838	25.6m	488 kg	834 kg

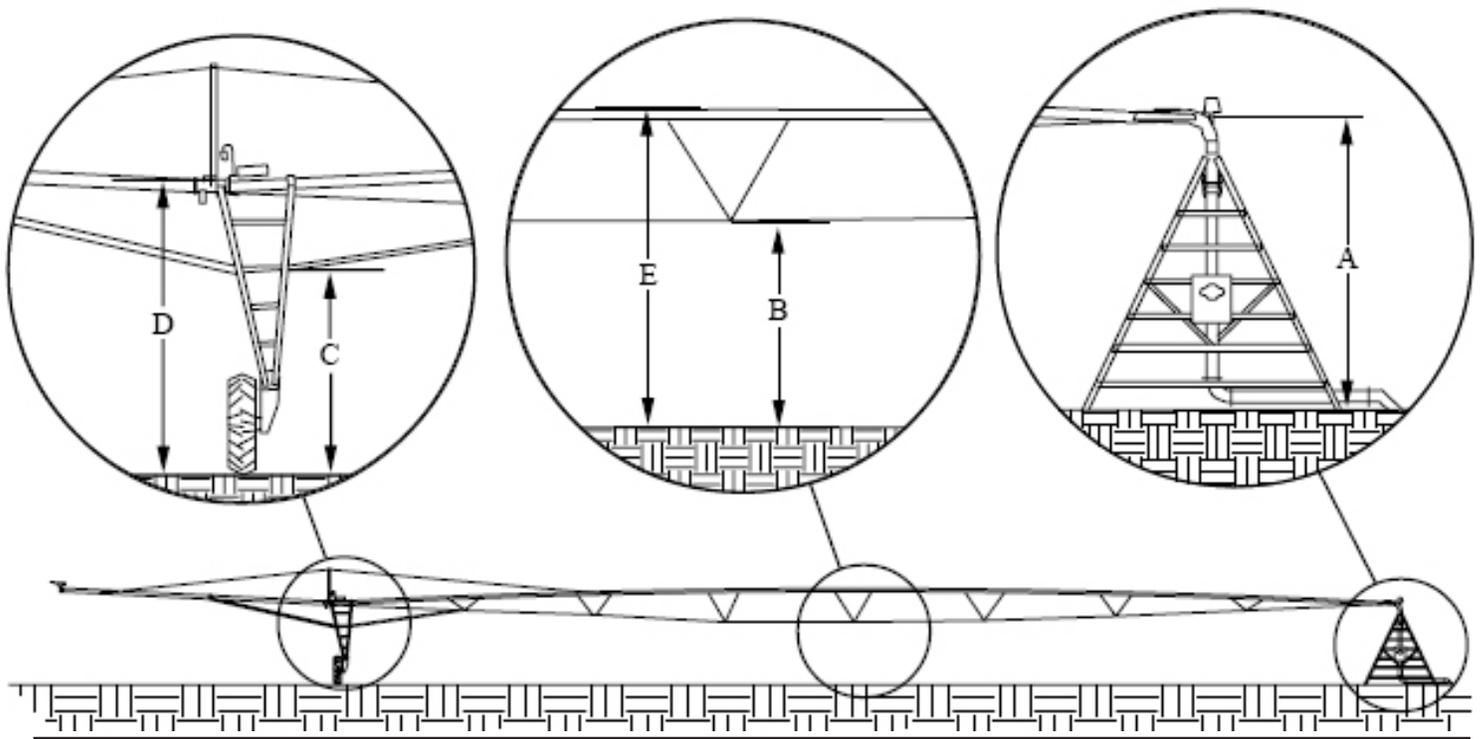
Note: For Low Profile Machines, subtract 126lbs or 157.15kg

For High Profile Machines, add 280lbs or 127.01kg



Span Dimensions with Water						
	Standard	Standard	High Profile	High Profile	Low Profile	Low Profile
<b>A=</b>	12'-2"	3.71m	17'-6"	5.33m	8'-7"	2.65m
<b>B=</b>	9'-6"	2.90m	14'-10"	4.52m	6'-1"	1.86m
<b>C=</b>	9'-6"	2.9m	14'-10"	4.52m	6'-1"	1.86m
<b>D=</b>	14'-1"	4.29m	19'-5"	5.92m	10'-6"	3.23m
<b>E=</b>	16'-7"	5.05m	21'-11"	6.68m	13'-2"	4.02m

Actual Span Dimensions			
Pivot to 1st Wheel Track		Wheel Track to Wheel Track	
125'-11"	38.38m	125' - 7"	38.28m
145'-5 "	44.32m	145' - 1"	44.22m
164' - 11"	50.27 m	164' - 7"	50.17m
184' - 5"	56.21m	184' - 1"	56.11m
203' - 11"	62.15m	203' - 7"	62.05m



**1. Calculating Hours-Per-Revolution of Machine.**

The following steps are necessary to determine how much water will be applied by your VEICHI Center Pivot Machine. While the method of calculating the time it should take for your machine to complete one revolution is shown below, this should be verified by first running the machine for one full revolution at 100% on the percent timer and obtaining the actual time per revolution. Due to field topography and possible wheel slippage, your actual results may vary from the calculated time. If this difference appears to be significant, use your actual time measured for the variable “h” in the following calculations.

**Formula 1:**

$$h = \frac{6.28 \times l \times d}{t \times 21,600}$$

h = Hours per full cycle revolution at 100% on percent timer.

l = Length of your machine from pivot point to the tires at the last tower (Feet)

t = Tire speed of your machine based on tire size and/or type. This number is found in Table 1 below.

d = Number of degrees machine moves through during 1 “revolution”. For example, for a half-circle machine, d=180.

**Table 1. Tire Speed ft/min**

Tire Size	0.75 HP 40:1		1.5 HP 30:1		1.5 HP 20:1	
	60hz	50hz	60hz	50hz	60hz	50hz
11.2X24	9.3	7.4	12.3	10.2	18.4	15.0
14.9X24	10.4	8.2	13.7	11.3	20.5	16.7
11.2X38	12.6	10.0	16.6	13.7	24.9	20.3
16.9X24	11.2	8.9	14.8	12.2	22.1	18.1
MOTOR PART#	02234-01		02385-02		02234-10	

When you have determined the hours per revolution, complete Chart 1 on the following page by inserting the 100% revolution time,  $h$ , in the blanks of Column (h) and completing the arithmetic in the chart.

### 2. Calculating Inches of Water-Per-Revolution of Machine

Use the following formula below to determine how many inches of water your machine will deliver during a single revolution with the percentage timer set at 100%.

**Formula 2:**

$$i = \frac{h \times gpm \times 11029}{l_m \times l_m \times d}$$

- Where:**
- $i$  = Amount of water delivered, in inches per revolution.
  - $h$  = Hours per revolution, from Formula 1 preceding page.
  - $gpm$  = Gallons per minute delivered to the field by your machine.
  - $l_m$  = Length of your machine from pivot point to last drive tower, plus length of OH, and End gun watering radius measured in feet.
  - $d$  = Number of degrees machine moves through in one revolution (see formula 1).

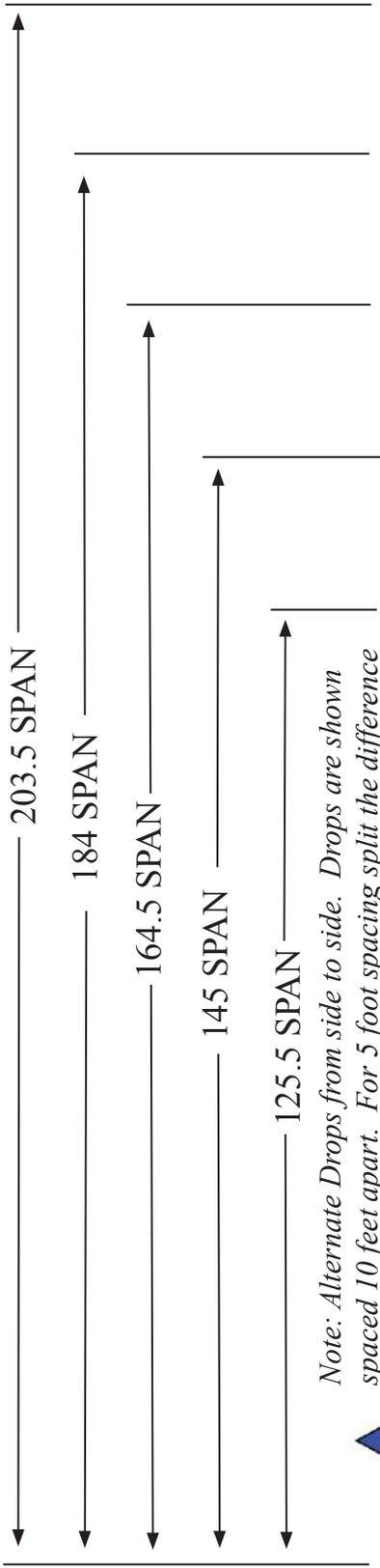
When you have determined the inches per revolution, complete Chart 2 on the following page by inserting the 100% inches-per-revolution time,  $i$ , in the blanks of Column (i) and completing the arithmetic in the chart.

<b>Chart 1</b>			
<b>Hrs / Revolution</b>			
% Timer Setting	Column (H)		
100% =	_____	÷ 1 =	_____ Hrs / Rev
90% =	_____	÷ 0.9 =	_____ Hrs / Rev
80% =	_____	÷ 0.8 =	_____ Hrs / Rev
70% =	_____	÷ 0.7 =	_____ Hrs / Rev
60% =	_____	÷ 0.6 =	_____ Hrs / Rev
50% =	_____	÷ 0.5 =	_____ Hrs / Rev
40% =	_____	÷ 0.4 =	_____ Hrs / Rev
30% =	_____	÷ 0.3 =	_____ Hrs / Rev
20% =	_____	÷ 0.2 =	_____ Hrs / Rev
10% =	_____	÷ 0.1 =	_____ Hrs / Rev

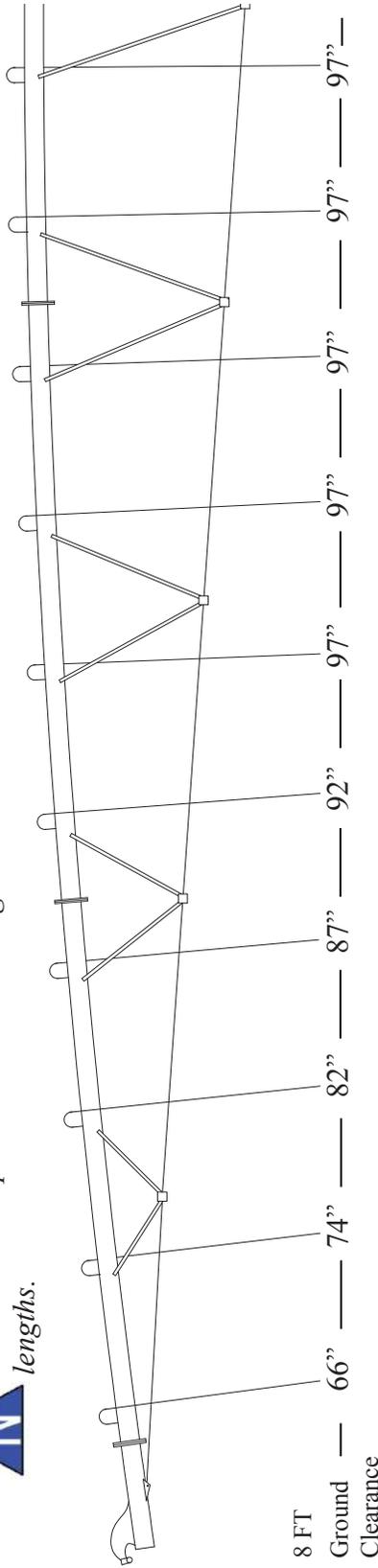
<b>Chart 2</b>			
<b>Inches / Revolution</b>			
% Timer Setting	Column (I)		
100% =	_____	÷ 1 =	_____ = Hrs / Rev
90% =	_____	÷ 0.9 =	_____ = Hrs / Rev
80% =	_____	÷ 0.8 =	_____ = Hrs / Rev
70% =	_____	÷ 0.7 =	_____ = Hrs / Rev
60% =	_____	÷ 0.6 =	_____ = Hrs / Rev
50% =	_____	÷ 0.5 =	_____ = Hrs / Rev
40% =	_____	÷ 0.4 =	_____ = Hrs / Rev
30% =	_____	÷ 0.3 =	_____ = Hrs / Rev
20% =	_____	÷ 0.2 =	_____ = Hrs / Rev
10% =	_____	÷ 0.1 =	_____ = Hrs / Rev

# General Information

## Sprinkler Drops



*Note: Alternate Drops from side to side. Drops are shown spaced 10 feet apart. For 5 foot spacing split the difference between the drops on either side. Lengths shown are hose cut lengths.*



8 FT	66" —	74" —	82" —	87" —	92" —	97" —	97" —	97" —	97" —	97" —	97" —
Ground Clearance	90" —	98" —	106" —	111" —	116" —	121" —	121" —	121" —	121" —	121" —	121" —
6 FT	102" —	110" —	118" —	123" —	128" —	133" —	133" —	133" —	133" —	133" —	133" —
5 FT	114" —	122" —	130" —	135" —	140" —	145" —	145" —	145" —	145" —	145" —	145" —
4 FT											
Ground Clearance											



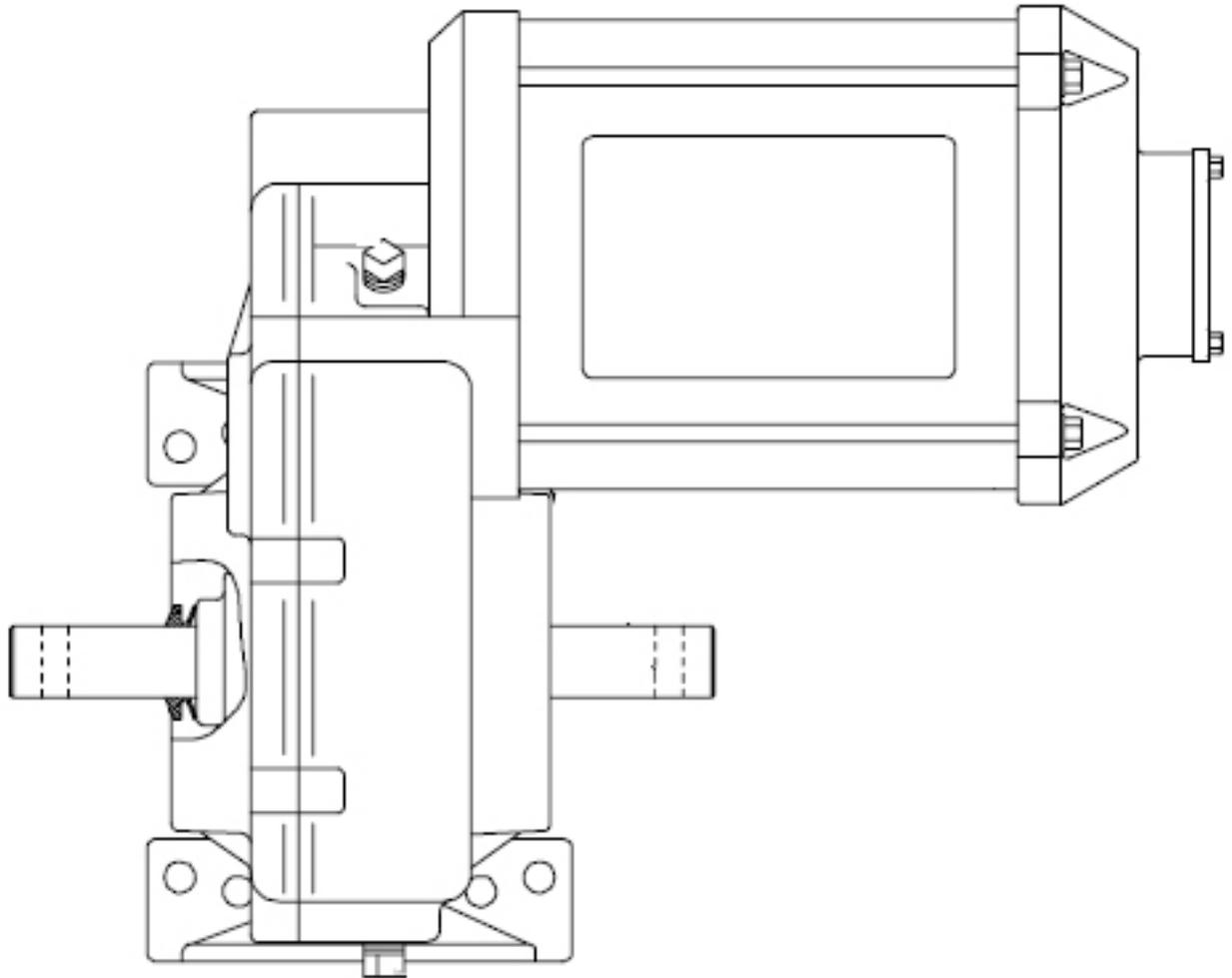
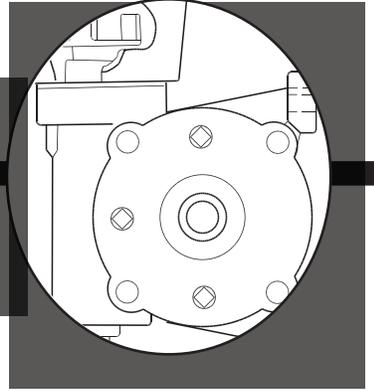
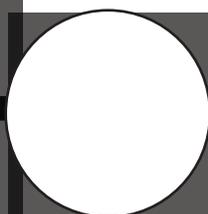
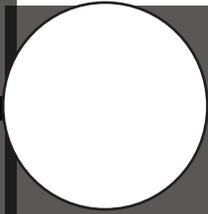
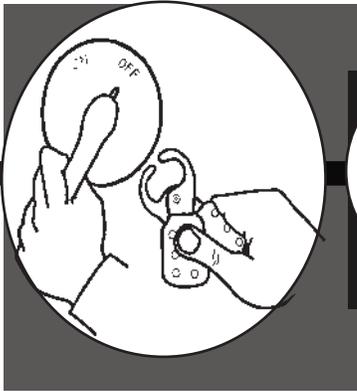
*Note: Lengths were calculated with 14.9 x 24 tires. Please use Chart 2-8. when calculating lengths if other tire sizes are being used:*

Tire Size	Add / Subtract	Inches
11.2 x 24	Subtract	3
11.2 x 38	Add	4
16.9 x 24	Add	2

Chart 2-8.



# OPERATION, SAFETY & MAINTENANCE





## Safety Symbols, Pictures and Definitions

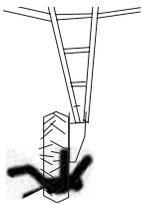
Throughout the manual you will find pictures or symbols that are inserted for your safety. Most of these pictures and symbols are universal and are known to the reader. It is always a good idea to review these pictures and symbols to understand the context of how they are presented in the manual.



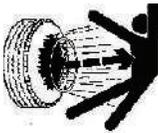
**WARNING: COULD CAUSE SERIOUS INJURY OR POSSIBLE DEATH.**



**WARNING; HIGH VOLTAGE POTENTIAL FOR ELECTROCUTION.**



**WARNING: MACHINE MAY INTERMITTENTLY START OR STOP.**



**WARNING: FOLLOW MANUFACTURERS SPECIFICATIONS FOR PROPER TIRE INFLATION AND INSPECTION. OVER INFLATION MAY CAUSE SERIOUS INJURY OR DEATH.**



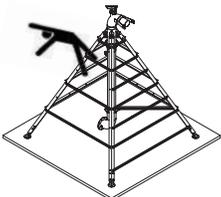
**WARNING: BE AWARE OF SURROUNDING POWER LINES WHEN INSTALLING OR TROUBLESHOOTING EQUIPMENT. FAILURE TO DO SO COULD CAUSE SERIOUS INJURY OR POSSIBLE DEATH.**



**WARNING: KEEP HANDS AND OBJECTS AWAY FROM MECHANICALLY MOVING PARTS. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR POSSIBLE DEATH.**



**WARNING: STAY CLEAR OF HEAVY MATERIAL BEING LIFTED ABOVE.**



**WARNING: DO NOT CLIMB ON OR JUMP OFF MACHINE.**



**WARNING: DO NOT ATTEMPT TO ASSEMBLE OR TROUBLESHOOT MACHINERY IF THERE IS POTENTIAL FOR A LIGHTENING STORM. COMPONENTS ARE HIGHLY CONDUCTIVE AND SERIOUS INJURY OR POSSIBLE DEATH MAY OCCUR IF STRUCK BY LIGHTENING.**



**DANGER: DO NOT IRRIGATE NEXT TO POWER LINES. SPRAYING WATER ON POWER LINES COULD CAUSE SERIOUS INJURY OR DEATH.**



**CAUTION: Could cause minor injury and or damage to machinery equipment, components, product, etc.**



**CAUTION: Be aware of pinch points when assembling equipment.**



**CAUTION or WARNING: Disconnect electrical power prior to servicing or troubleshooting components.**



**CAUTION: Hard hat and steel toe work boots recommended when assembling equipment.**



**Lock Out / Tag Out: Manufacturer recommends locking the main power dis-connect before servicing or troubleshooting electrical components.**



**Winterization: see manufacturers specifications Section 9-24.**



**Note: Manufacturers general comment, recommendation or instruction.**

## FINAL CHECKS AND INITIAL OPERATION

The following list of checks and operation procedures should be followed during the initial start up of the circle. These same basic procedures can also be followed at the initial start up of each irrigation season.

1. Bolts: Check to insure that all bolts have been properly installed and tightened.
2. Grounding: Be sure the machine is properly grounded. Refer to the Getting Started and Electrical sections for proper main panel grounding.
3. Control Limit Switches: The limit switches in the tower junction boxes have been pre-set at the factory, however, they should be checked according to the procedures outlined in maintenance section, Cam and Safety Switch Adjustment.
4. Control rods: Check that all control rods are connected to the cam arm.
5. Machine Alignment: The machine should be in a straight line when erection is completed. Adjust the control rod so the tower safety limit switch roller is in the middle of the "V" of the cam. Tighten the adjusting nuts. After the machine is started, final alignment should be performed according to the procedure in maintenance section, alignment.
6. Voltage: Voltage at the pivot panel should be 480V on all three legs of the power lines. Note: Voltage is dependent upon your location. Voltage should not be more than 5% higher or lower than the recommended voltage or damage may occur.
7. Lubrication: Check the oil level in all gearboxes and motors. Grease the two fittings on the pivot elbow until grease is visible at the top and bottom of bearing.
8. Starting: When all the above checks have been made, the machine is ready to start. Close the main panel inner door and turn the main disconnect switch on. Follow operation instructions outlined in Section 4 Panel Operation.



**WARNING: MAKE SURE POWER IS DISCONNECTED AT THE MAIN SERVICE PANEL BEFORE PERFORMING ANY ELECTRICAL SERVICE TO THE MACHINE OR BEFORE OPENING THE INNER DOOR OF THE CONTROL PANEL**

## MACHINE ALIGNMENT

Your VEICHI Center Pivot irrigation system should be run with a slight leading bow (center towers ahead of pivot and end tower) in both directions. A correctly aligned machine will have an equal bow when operated in either direction. DO NOT let the machine run with a large leading bow in one direction and a lagging bow in the other. To align the machine, follow these steps:

Start at the pivot end of the machine with the machine running in the forward direction and the percentage timer set to 75 percent. Stand between tower 2 and tower 3 and sight across motors No. 2 and 1 to the pivot stand pipe. Tower 1 should start when motor 1 appears to be slightly behind and shut off when it appears to be an equal distance ahead of the center of the standpipe.

When tower 1 is properly aligned, stand between towers 3 and 4 and sight across motors 3 and 2 to the pivot standpipe. Align tower 2 in the same manner as tower 1. As you get to the outer end of the machine and can no longer see the pivot standpipe, pick a motor on one of the inner towers and sight to it as shown in figure 9-7.

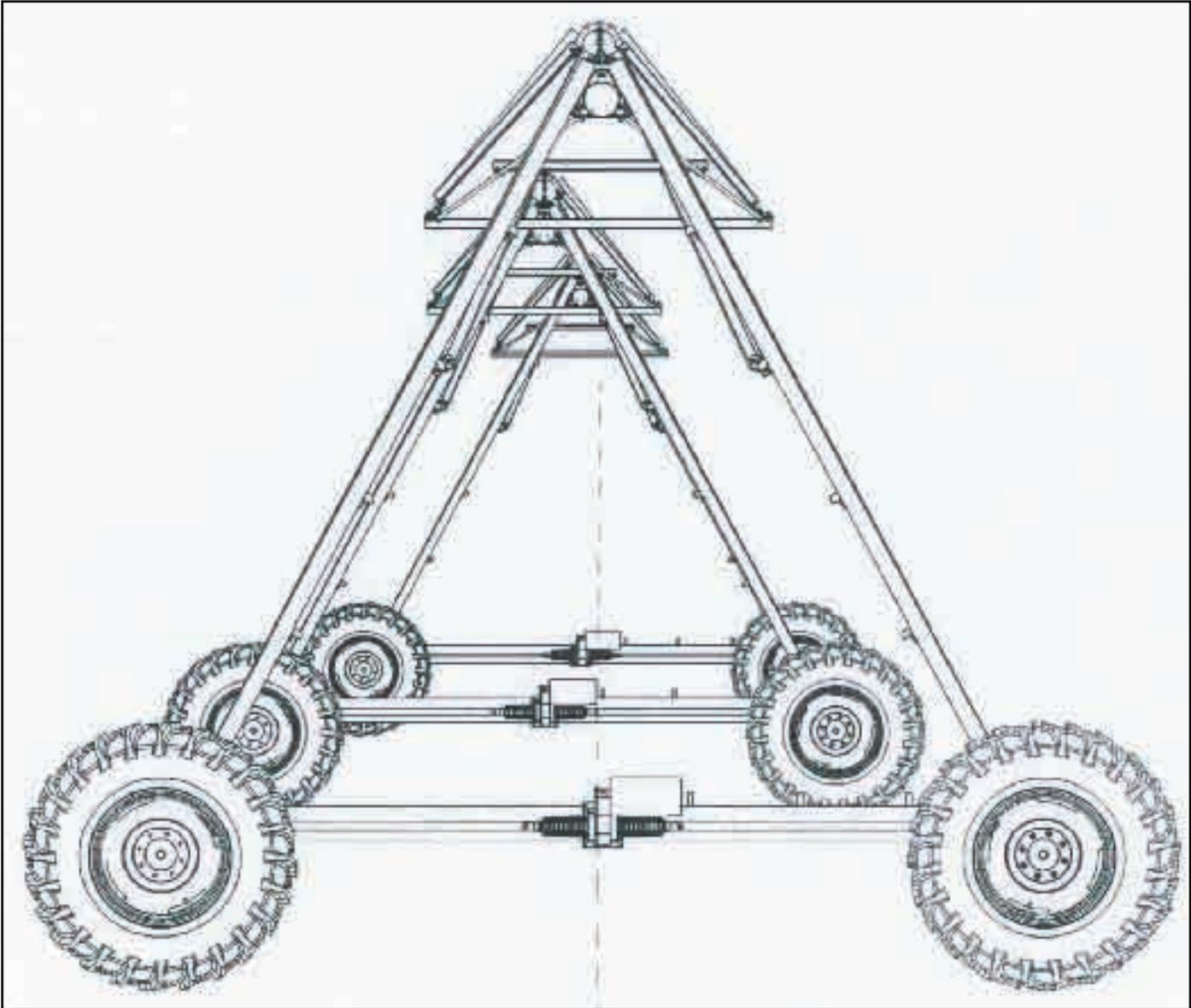


Figure 9-7.

Rotation Forward = Clockwise

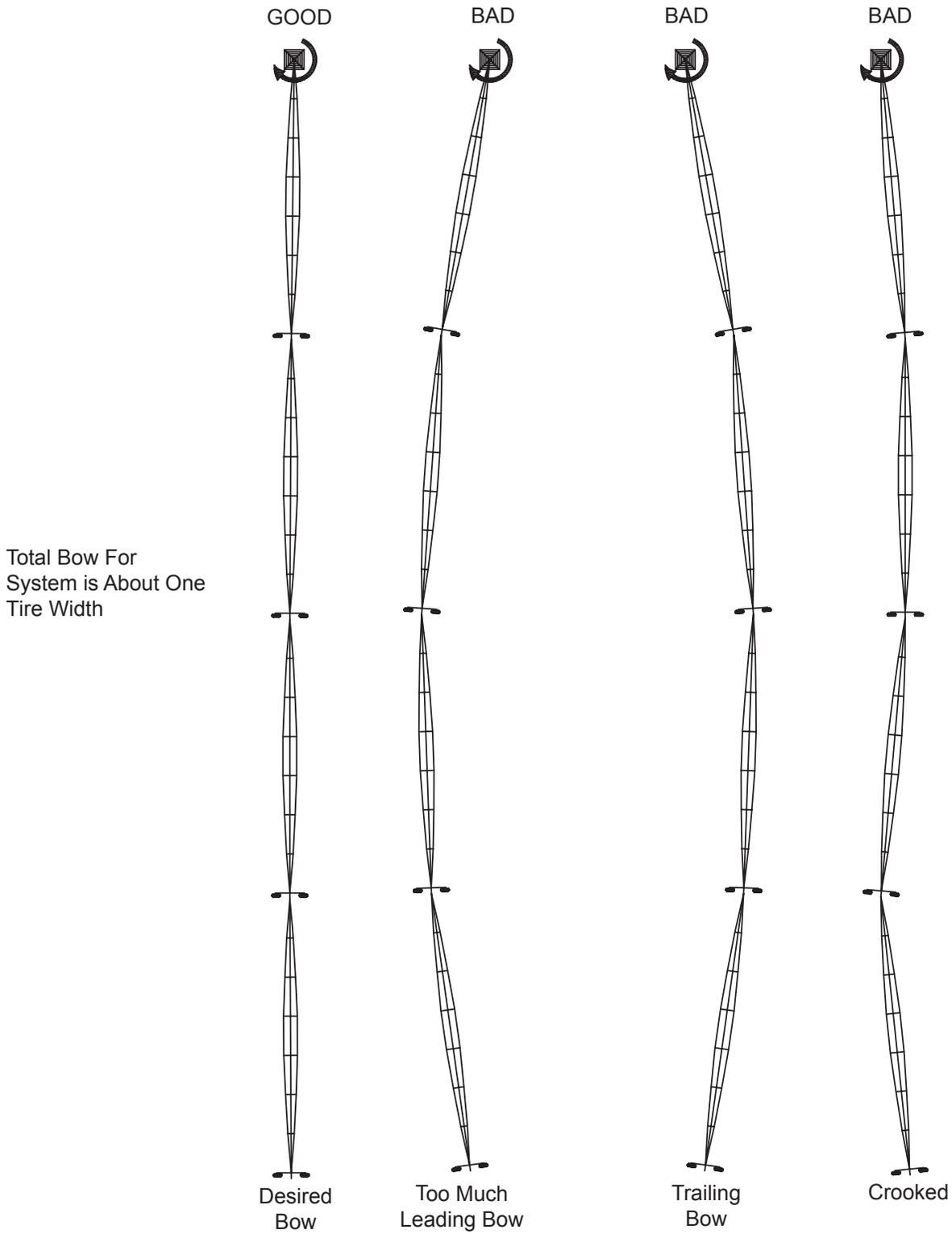


Figure 9-8.

### Instructions Cam Switch Setting:



Note: It may be necessary to disconnect the Alignment Arm to position the cam in the center.

Note: Assemble switches and all wiring prior to final adjustment

Note: Make sure the center of the roller is lined in center groove

1. Physically move the Cam Actuator (Fig. 1a.) and place the roller wheel of the safety switch in the bottom of the safety groove (Fig. 1b.).

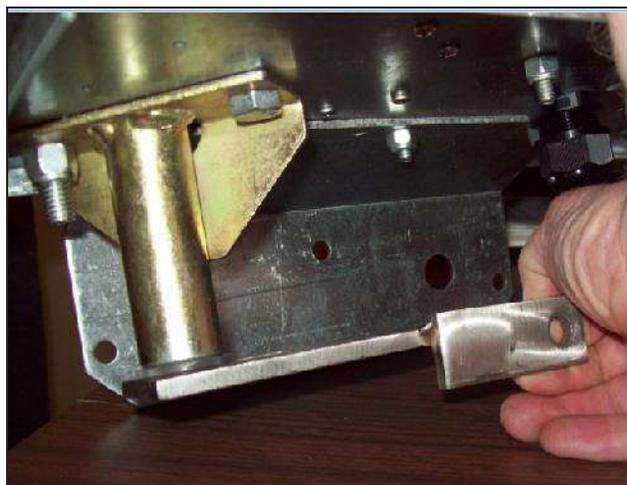


Fig 1a.

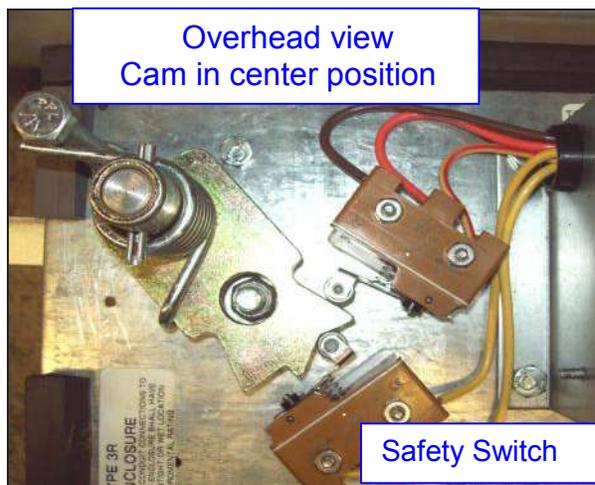


Fig 1b.

2. Hold this position and adjust the break point of the run switch so it is operating as you move either right or left with the centerline position of the Cam.

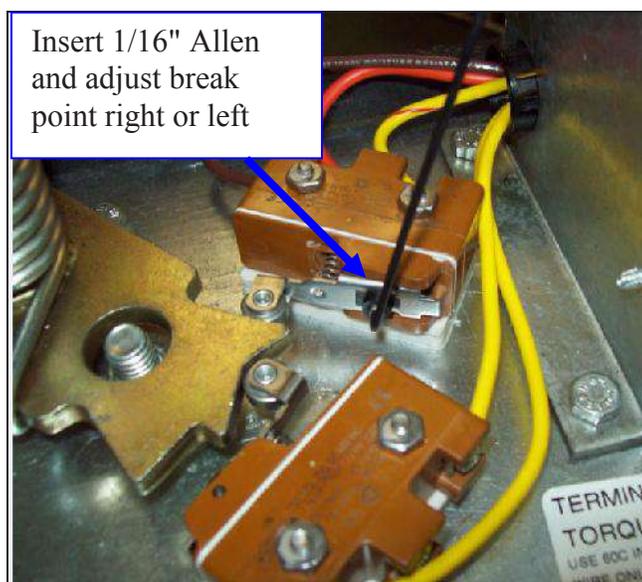


Fig 2.

- Once adjustment is made, the run switch should not need adjustment again.

**Instructions Safety Switch Setting:**

Note: If you cannot hear the switch actuation it may be necessary to check the switch with a continuity tester to find the point of actuation.

**1a. If alignment arm is not attached:**

- move cam back and forth ensuring the safety micro switch actuates before the cam contacts the stop bolt.

**1b. If the cam box is mounted and the cam cannot be moved by hand:**

- Move the switch roller away from the cam only enough for it to actuate (hear a click). The distance between the switch roller and the cam should just accommodate the 5/64" drill bit.

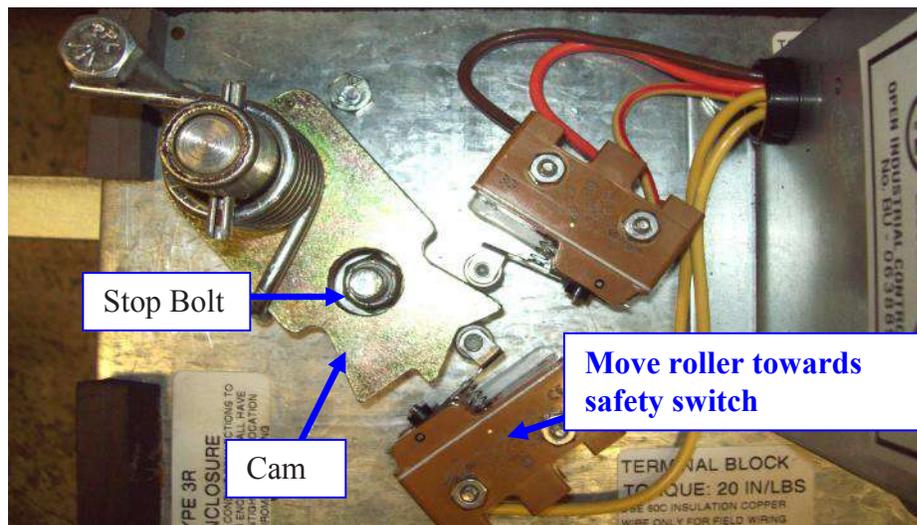
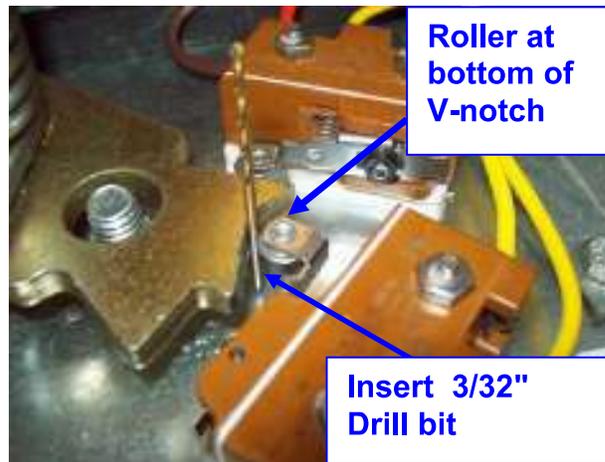


Fig 1.



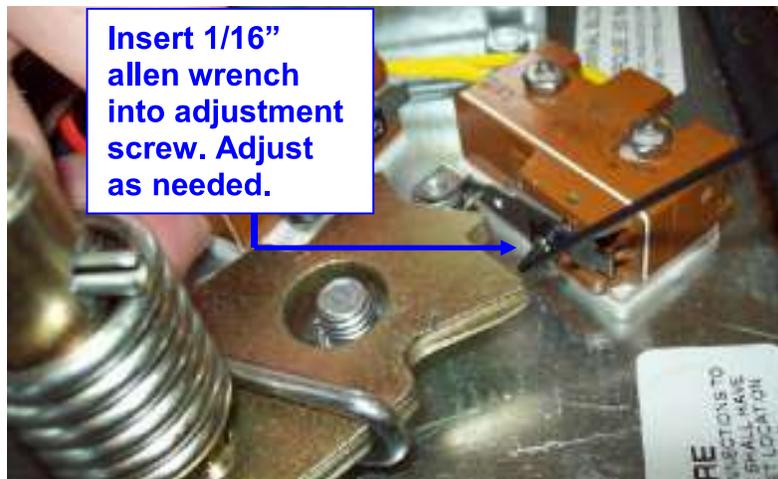
**INSTALLER MUST CHECK THAT SAFETY MICRO SWITCH ACTIVATES IN BOTH DIRECTIONS BEFORE CAM CONTACTS STOP BOLT.**

1. Carefully insert 5/64" drill bit between the center point of cam and roller to determine any needed adjustments. The drill bit should fit precisely between cam and roller for proper actuation. Continue to Step 4 for adjustments.



**Fig 2.**

2. Insert 1/16" allen wrench into adjustment screw and rotate until roller meets specifications. Be aware that a slight rotation produces a significant change in positioning.



**Fig 3.**

3. Re-connect Alignment Arm if it was disconnected.
4. Once two switches are set, the threads of the allen screws can be sealed with a drop of paint from a paint pen.

- **PIVOT:** At start of irrigation season, grease pivot bearings. Repeat every 400 hours of operation.
- **GEARBOXES:** At start of irrigation season, drain all gearboxes and refill with recommended oil. See Power Drivetrain Maintenance section for detailed information.
- **MOTOR GEARBOXES:** At start of irrigation season drain any water that may have accumulated during the irrigation season and fill to the proper level with the proper lubricant.
- **TIRES:** Check tire inflation (use low pressure tire gauge). VEICHI Irrigation inflates all new tires to a higher pressure for truck loading requirements. Set tire pressure so side wall has slight flex. If tire creases, increase pressure. If tire pressure is too low the tires will lose the bead and damage the tube.

**CAUTION: Operating tires below the manufacturers recommended pressure can result in damage to the tire sidewall in addition to voiding your warranty.**

Tire Size	Recommended Pressure	Max Span Length / WT
11 x 22.5 Recap	35 PSI [241 kpa]	All Spans
11.2 x 24 Tire	20-24 PSI [138-165 kpa]	164 x 6-5/8 max
11.2 x38 Tire	20-24 PSI [138-165 kpa]	184 x 6-5/8 max
14.9 x 24 Tire	20-24 PSI [138-165 kpa]	All Spans
16.9 x 24 Tire	18-22 PSI [124-152 kpa]	All Spans

- **WHEEL BOLTS:** Check to ensure they are tight.



*Note: Wheel bolts can loosen after initial installation. They should be checked after 100 hours of operation.*

- **STRUCTURE:** Routinely check pivot, span and tower structures for loose or missing bolts.
- **CONNECTORS:** Check for leaking gaskets, boots, drains, and malfunctioning sprinklers or pressure regulators.



**Lock Out / Tag Out:** Lock the main power disconnect before servicing or troubleshooting electrical components.

- **ELECTRICAL:** Check pivot and junction box starters for burned or pitted contacts.
- **ELECTRICAL:** Check all wire connections, particularly on starters, to ensure they are tight.
- **ELECTRICAL:** Check safety limit switches in tower junction boxes.
- **ELECTRICAL:** Check function of automatic switching devices such as Auto Reverse, Auto Stop and End Gun (lube as required).
- **CONTROL:** Check junction box cam and bushings. Turn cam back and forth several times to ensure there is no binding.

### Power Drivetrain Maintenance



*Note: The following maintenance procedures must be performed or the drivetrain warranty will be void.*

The final drive wheel gearbox, center drive gear motor and the worm gear center drive require pre-season maintenance. Please refer to the following service information for the above items.

If you should have any questions, please call your VEICHI Dealer or Customer Service Representative.

#### FINAL DRIVE GEARBOX MAINTENANCE PROCEDURES

##### A. The final drive gearbox must be serviced as follows after each crop cycle:

1. Inspect input and output shaft seals for leakage. Should either the input or output shaft show excessive leakage, the seals should be replaced. All replaced seals must be installed with generous amounts of #2 Barium/Lithium based grease or use equivalent quality #2 water-resistant grease.
2. External (dust exclusion) seals should be used to keep dirt and water out of internal seal locations. If the external seals are damaged or worn, replace with new seals.
3. The seal drain hole located on both input caps must be kept clear of dirt. Clear the hole with a 12-gauge wire, nail or punch. Rotate the tool to loosen and remove dirt. Make sure the vent hole in the expansion chamber is free of dirt or debris.

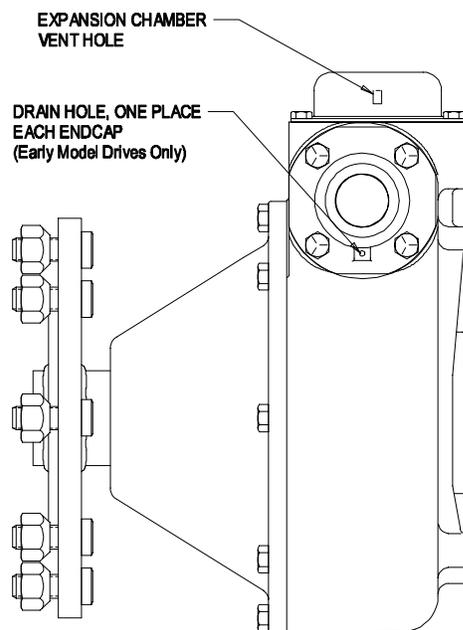


Figure 9-12.

4. Each input and output shaft should be checked for excessive endplay after each crop cycle. Disconnecting the driveline coupler & tapping the input shaft on both sides with a dead blow hammer or mallet does this. If play is present, input shims should be installed to eliminate bearing backlash.
5. All cover and end cap bolts should be torqued to 28-31 ft.-lbs (38-42 N-m).
6. All wheel lug nuts should be torqued to 115-120 ft.-lbs (156-162 N-m).
7.  
If oil is contaminated or emulsified, flush gearbox with a cup of specified oil and let drain completely.
8. Replace drain plug and refill gearbox through top fill hole to the proper operating level (top of worm gear) as shown below. After one or two hours the oil should be re-checked. Air may be trapped in the gearbox during initial filling. Top off with oil as needed.

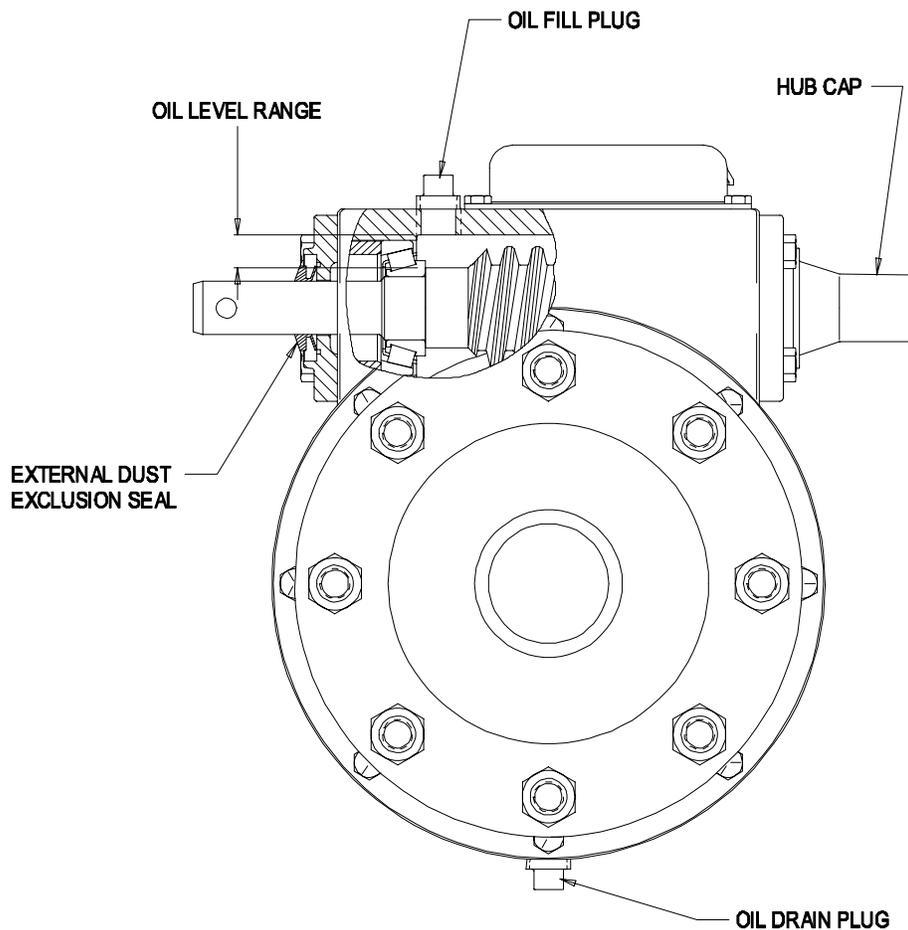


Figure 9-13.

## Power Drivetrain Maintenance

### B. Final drive gearbox lubricants

A GL-5 SAE 140 or MIL-C-2105 gear lube must be used in final gearboxes. Some common brands meeting this specification are shown below. Contact your dealer or local petroleum products distributor for other equivalent products. Use of improper oil will void the gearbox warranty.

- Hector S-150 Philube 1-LB Gear Oil #140
- Chevron Gear Compound #140
- Valvoline 85-140 Gear Oil
- Mobil 85-140 Gear Oil
- Pennzoil 85-140
- Texaco Multigear Lubricant EP SAE 85W-140
- Sprinkler Lube 1200

Oil capacity is approximately 1 U.S. Gallon, (3.8 Liters).

### C. In-season final drive gearbox Maintenance:

Final drive gearboxes should be inspected periodically during the operating season, for the following:

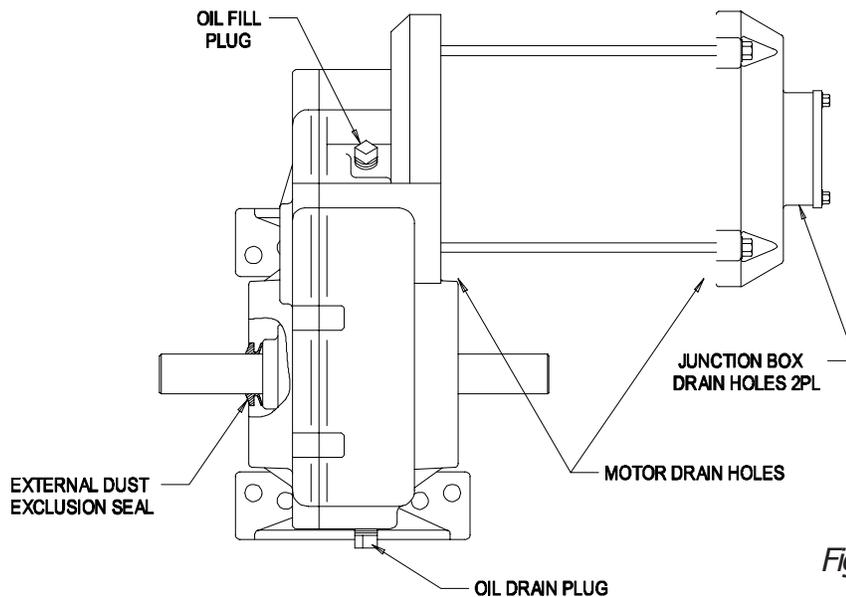
1. The proper oil level should be maintained at all times.
2. Contaminated or emulsified oil should be replaced with fresh oil.
3. Input seal drain holes on the final drive gearbox should be kept clear.
4. Input & output shaft seals should be inspected for excessive leaks and replaced if necessary.
5. Expansion chamber vent holes should be kept clean.



*Note: Failure to maintain gearboxes as specified will void the gearbox warranty.*

**A. The Helical gear center drive must be serviced as follows after each crop cycle (Minimum of once per year):**

1. Inspect input and output seals for leakage. Should either of the seals show excessive leakage, the seals should be replaced. All replaced seals must be installed with generous amounts of #2 Barium/Lithium based grease or equivalent quality #2 water resistant grease.
2. External seals should be used to keep dirt and water out of internal seal locations. If the external seals are damaged or worn, replace with new seals.



*Figure 9-15.*

3. The two (2) drain holes located under the motor can must be kept clear to allow for drainage of accumulated moisture inside the motor if required. Do not VEICHI or remove plug.
4. The two (2) drain holes located under the end bell must be kept clear to allow drainage of accumulated moisture inside of the junction box.
5. Remove drain plug located at bottom of gearbox and completely drain gearbox. If oil was contaminated or emulsified, flush gearbox with a cup of specified oil and let drain completely.
6. Replace drain plug and refill to 1-1/2" (45 mm) from top of gear case as shown in the drawing. Refer to gearbox oil specifications. After one or two hours the oil should be re-checked. Air may be trapped in the gearbox during initial filling. Top off with oil as needed.

## Power Drivetrain Maintenance

### B. Helical gear center drive lubricants Reference Figure 9-16:

Use only SAE 30W, SAE 40W, SAE 50W, or SAE 20W-50 multi-viscosity engine oil. Use of improper oil will void the gearbox warranty. Oil capacity is approximately one (1) U.S. gallon (3.8 Liters).

### C. In-season spur gear center drive maintenance:

Helical gear center drive gearboxes should be inspected periodically during the operation season as follows:

1. The proper oil level (1-1/2" [45 mm] from top of gear case) should be maintained at all times.
2. Contaminated or emulsified oil should be replaced with fresh oil.
3. Input & output shaft seals should be inspected for excessive leaks and replaced if necessary.
4. Motor drain holes must be kept clear to allow moisture to drain.
5. Expansion chamber vent holes.

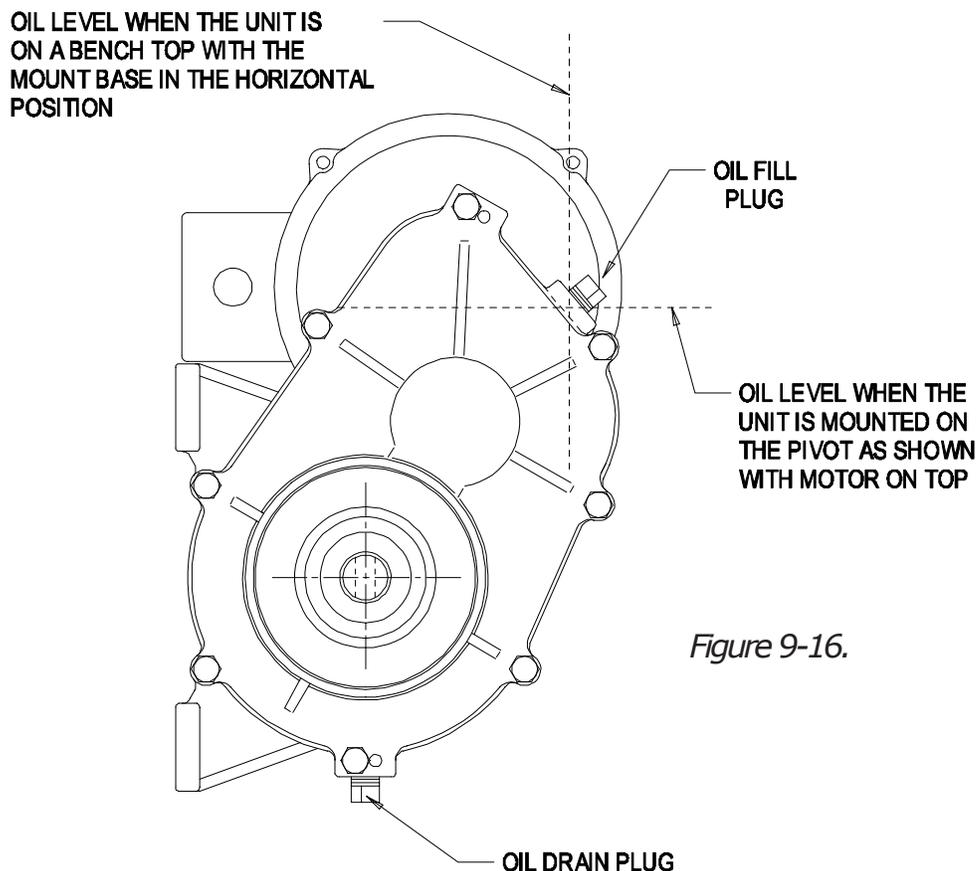


Figure 9-16.

## **Worm Gear Center Drive Maintenance**

- A. The worm gear center drive must be serviced as follows after each crop cycle (minimum of once per year):**
1. Inspect input and output shaft seals for leakage. Should either the input or output shaft seals show excessive leakage, the seals should be replaced. All replaced seals must be installed with generous amounts of #2 Barium/Lithium based grease or equivalent quality #2 water resistant grease.
  2. External dust exclusion seals should be used to keep dirt and water out of internal seal locations. If the external seals are damaged or worn, replace with new seals.
  3. The flange drain hole located under the motor mount flange must be clear. Clear the hole with a 12 gauge wire, nail or punch by rotating the tool in the hole to loosen and remove dirt.
  4. All 5/16-18 flange bolts and end cap bolts should be torqued to 13-15 ft-lbs (18-0N-m).
  5. To drain gearbox, remove drain plug located at bottom of worm gear and bottom of side case cover. If oil is contaminated or emulsified, flush gearbox with a cup of specified oil and let drain completely.
  6. Replace drain plug and refill gearbox through top side fill hole to proper operating level (mid worm gear). Refer to gearbox oil specification. After one or two hours the oil should be re-checked. Air may be trapped in the gearbox during initial filling. Top off with oil as needed.

### Power Drivetrain Maintenance

#### B. Worm gear center drive gearbox lubricants:

A GL-5 SAE 140 or MIL C-2105 gear lube must be in worm gear center drive gearboxes. Some common brands meeting this specification are listed in section B of Final Drive Gearbox. Oil capacity is 3 ½ U.S. pints (1.6 Liters) approximately.

#### C. In-season worm gear center drive maintenance:

1. Proper oil level (mid bull gear) should be maintained at all times.
2. Contaminated or emulsified oil should be replaced with fresh oil.
3. Input and output shaft seals should be inspected for excessive leaks and should be replaced if necessary.

#### A. Driveline Coupler Maintenance

1. Driveline couplers should be inspected periodically for loose bolts and worn rubber inserts. Worn inserts should be replaced.

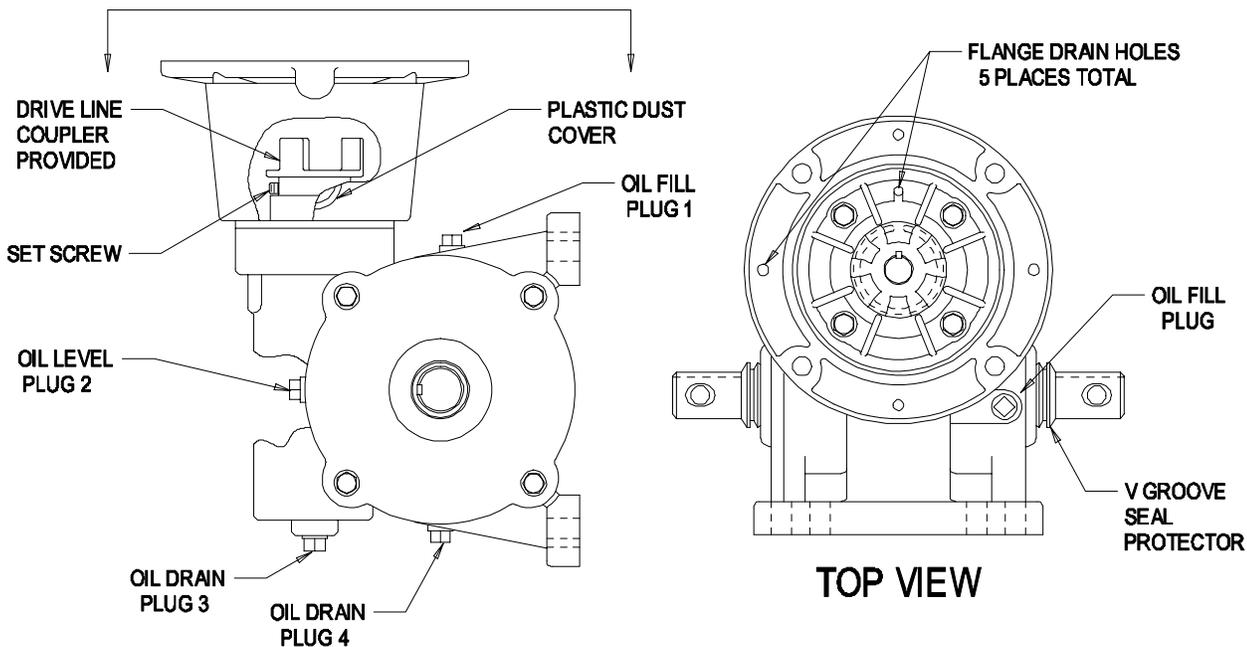


Figure 9-18.



## **Lockout/Tagout Procedures**

This standard covers the lockout/tagout procedures you must use when servicing your VEICHI pivot. The intent of VEICHI corporation's pivot lockout/tagout standard is to protect you or your workers anytime the pivot requires servicing. Before any worker performs maintenance on the pivot where unexpected energizing, start up release stored energy could occur and cause injury, the pivot must be isolated and rendered inoperative. This standard establishes minimum performance requirements for the control of such hazardous energy.

**You must lock the pivot out if you are going to:**

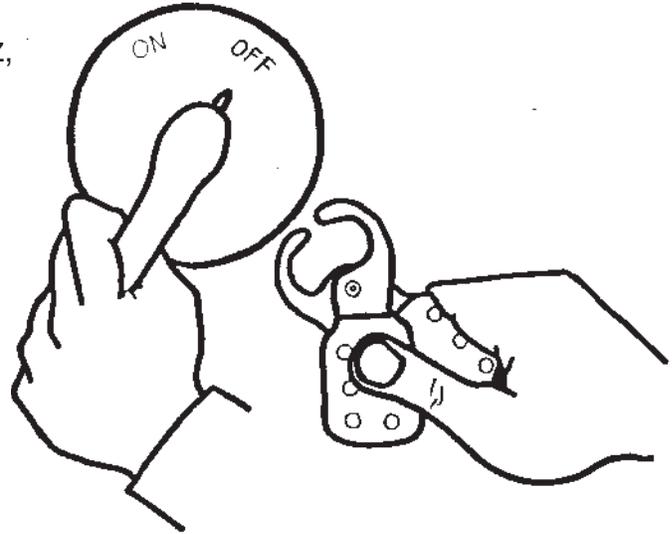
1. Remove or bypass a guard or other safety device.
2. Place any part of your body into an area on the pivot where there is a pinch point.
3. Work on the electrical circuitry.
4. Obstruct the pivot path (wheel track) with vehicles, equipment, or other obstacles while performing work on the field itself.
5. Perform structural service which requires equipment to lift spans (i.e. boom truck).



Your VEICHI pivot requires 380 volts 50 hz, 3-phase electric power to operate sufficient charge. There is also 110-volt control power throughout the system. Other potential hazards include any injected fertilizers and pesticides, and water under pressure.



*Note: Voltage is dependent upon location. Voltage should not be more than +/- 5% than the recommended voltage in your area.*



### Sequence of Lockout or Tagout Procedure

1. Notify all affected persons that you are about to lockout the pivot, and tell them why the pivot is being placed “out of service”. Before locking out the pivot, you must familiarize yourself with the type and magnitude of the pivot’s energy source and determine any related hazards.
2. If the machine or system is operating shut it down by rotating the forward / reverse selector switch to the off position.
3. On the main control panel, turn the main disconnect lever to the off position so the pivot cannot be energized while it is being serviced. Drain all water from the system and disengage any automatic valves. If your pivot is rigged with an automatic valve, it must be locked out so that the pivot does not unexpectedly fill with water while you are servicing.
4. Lockout the main disconnect (energy-isolating device) on the main control panel. If working down line on the pivot, the tower disconnect switches on the individual tower boxes must also be shut off.
5. After ensuring that no personnel are exposed, and as a check on having disconnected the energy source, operate the start button to make certain the pivot will not operate.



**CAUTION:** Return operating controls to “neutral” or “off” position after maintenance is completed.

## Lockout/Tagout Procedures



**WARNING: EVEN THOUGH YOU HAVE LOCKED OUT THE PIVOT CONTROL PANEL DISCONNECT SWITCH, THERE IS STILL 380 VOLTS PRESENT GOING INTO THE PANEL BOX.**

### Locks and Tags

When you purchase lockout/tagout devices, keep the following points in mind:

Lockout devices and tagout devices shall be singularly identified as belonging to only one worker; shall be the only device(s) used for controlling energy; shall not be used for other purposes.

Tagout devices shall warn against hazardous conditions if the pivot is energized and shall include a legend such as the following: DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE, and DO NOT OPERATE. Attachment devices for tags shall be non reusable and have a minimum of 50 lb. (222 N) breaking strength.

Locks used to lockout machines or equipment shall have a key unique to that lock.

### Using Tags without Locks

There are limitations to the tagout system. Since tags are warning devices only, they must meet the following requirements:

- They must be legible. (If you employ migrant workers, the tags should also be bilingual.)
- They must not be removed, bypassed, or ignored.
- They must be sturdy enough to withstand the elements and be securely attached.



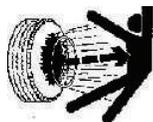
**WARNING: TAGS ARE WARNING DEVICES ONLY, AND DO NOT CARRY THE SAME PROTECTION AS LOCKS, SO USE EXTRA CARE WHEN USING THEM.**

### **Procedure Involving More Than One Person**

In the proceeding steps, if more than one person is required to lockout or tagout equipment, each shall place his/her own lockout or tagout device on the energy-isolating device. When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device may be used that allows the use of multiple locks to secure it. Each worker will then use his own lock(s) or tag(s) to secure the multiple lockout or tagout device. When work is completed and each person no longer needs to maintain his lockout/tagout protection, that person will remove his/her lock(s) or tag(s) from the multiple lockout/tagout device(s).

### **Restoring the Pivot to Normal Operations**

1. After maintenance is complete and the pivot is ready for normal operations, check around the area of the pivot to ensure that the field is not obstructed by vehicles and that everyone is clear of the pathways of all pivot towers. It is especially important to check the entire length of the pivot if it is set up on hilly terrain. It is easy to lose sight of someone working on the opposite side of the hill.
2. After all the tools have been removed from the pivot and all workers are in the clear, remove all lockout or tagout devices. Operate the energy isolating devices to restore energy to the pivot.
3. When possible, test run the machine to ensure proper operation.
4. If additional maintenance or service is required, shut down all systems and follow the lockout/tagout procedure again.



**WARNING: EXPLOSIVE SEPARATION OF A TIRE AND RIM PARTS CAN CAUSE SERIOUS INJURY OR DEATH.**

Always maintain the correct tire pressure. DO NOT inflate tires above the recommended pressure or maximum pressure stated on the tire.

Inspect tires and wheels daily. DO NOT operate with low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.

Carefully inspect any tire and rim assembly that has been run flat or severely under inflated before reinflating the tire. Damage to the rim and tire may have developed. Call your authorized dealer or a qualified repair service to inspect the rim and tire assembly and make necessary repairs.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if possible.

NEVER cut or weld on an inflated tire or rim assembly. Heat from welding could cause an increase in pressure and may result in tire explosion.

Do not attempt to mount a tire if you do not have the proper equipment and experience to perform the job. Have it done by your authorized dealer or a qualified repair service.

Check tire pressure with an accurate gauge having 6.9 kPa (0.07 bar) (1 psi) graduations.

1. Shut off air supply to hose.
2. Move gauge hand to correct pressure.
3. Lock air chuck on tire valve.
4. Turn on air supply. Stand to front or rear of tire when you add air to tire.
5. After tire is at correct pressure, shut off air supply. Release chuck. (See Tire Pressure chart in Specification section.)

1. Lock the power disconnect switch in the “OFF” position. Be sure all electrical panels are closed and securely latched.
2. Drain the center pivot supply line to a level below the frost line.
3. Remove the flush cap and Flex-Span supply hose. Make sure the low pressure drain valves are working and that the center pivot is completely drained.
4. Disconnect poly line tubes from solenoid valves and end gun components to drain water from lines.
5. All sprinkler control valves should be in the “open” position and drained. Valve control hoses should be drained. Solenoid manifold assembly filters should be cleaned.
6. Protect moving parts and bearing surfaces against rust and corrosion by greasing all fittings.
7. Sufficient oil should be drained from the center and wheel gearboxes to remove water and contaminants. Refill with manufacturers specified lubricant.

Component	Operation	Start of Season	Before Operation	100 hrs	400 hrs	End of Season	Oil / Lube
Pivot Elbow Fittings	Grease	<b>X</b>	<b>X</b>			<b>X</b>	
Pivot Bearings	Grease	<b>X</b>			<b>X</b>	<b>X</b>	
Final Drive Gearboxes	Drain Oil and refill	<b>X</b>				<b>X</b>	*Hector S150 Philube 1-LB Gear Oil #140  *Chevron Gear Compound #140  *Valvoline 85-140 Gear Oil  *Mobile 85-140 Gear Oil
	Drain Water and refill oil after first year of operation					<b>X</b>	*Texaco Multi Gear Lubricant EP SAE 85W-14  *Sprinkler Lube 1200
Gearbox input / output shaft seals	Inspect for leakage	<b>X</b>	<b>X</b>			<b>X</b>	#2 Barium /Lithium based grease or equivalent quality #2 water-resistant grease
Helical Gear Center Drive	Lubricants	<b>X</b>	<b>X</b>			<b>X</b>	*SAE 30W *SAE 40W *SAE 50W *SAE 20W-50
	Drain water and refill oil					<b>X</b>	Multiviscosity Engine Oil *Sprinkler Lube 1200
Worm Gear Center Drive	Lubricants	<b>X</b>	<b>X</b>			<b>X</b>	*GL-5 SAE 140 -OR- *MIL C-2105
	Drain water and refill oil					<b>X</b>	
Cover and End Cap Bolts	torque 28-31 ft lbs.		<b>X</b>			<b>X</b>	

Component	Operation	Start of Season	Before Operation	100 hrs	400 hrs	End of Season	Oil / Lube
Tires	Pressure check	X	X			X	
Wheel Bolts	Tighten	X		X		X	
	torque 115-120 ft lbs	X	X			X	
Structure	Inspect for loose or missing bolts	X		X		X	
Automatic Switching Devices	Check for binding	X		X		X	
Auto Reverse	Lubricate	X		X		X	#2 Barium /Lithium based grease or equivalent quality #2 water-resistant grease
Auto Stop	Lubricate	X		X		X	#2 Barium /Lithium based grease or equivalent quality #2 water-resistant grease
End Gun	Lubricate	X		X		X	#2 Barium /Lithium based grease or equivalent quality #2 water-resistant grease



*Note: The charts listed above are intended to be used as a quick reference. Review the sections that pertain to the equipment being serviced or the individual manufacturers warranty for specific details.*







<u>Symptom</u>	<u>Possible Cause</u>	<u>Solution</u>
<p><b>Machine Will Not Start</b></p> <p>No control panel indicator lights turn ON when Start switch is actuated</p>	<ol style="list-style-type: none"> <li>1. Main Disconnect is OFF</li> <li>2. Blown 380VAC fuse</li> <li>3. 120VAC circuit breaker in panel tripped or OFF</li> <li>4. Bad Control Relay (RM) in control panel</li> </ol>	<ol style="list-style-type: none"> <li>1. Move Disconnect to ON position</li> <li>2. When power is OFF, check and replace fuses as necessary</li> <li>3. Check circuit breaker in control panel</li> <li>4. Ensure Master Relay is fully seated in socket. Check resistance of relay coil between A1 and A2. If coil circuit is open or resistance is zero, replace relay. Proper resistance is ~1.8 ohms</li> </ol>
<p>Running panel indicator light and Forward or Reverse panel indicator light turn ON only when Start switch is actuated but Safety panel indicator light does not. All panel indicator lights turn OFF when Start switch is released</p>	<ol style="list-style-type: none"> <li>1. Bad tower alignment</li> <li>2. Machine on barricade Safety (if barricades are present)</li> <li>3. Tower box power switch OFF</li> <li>4. Low temperature switch tripped</li> <li>5. Loose wire in Forward (Brown) circuit, Reverse (Orange) circuit, or Safety (Yellow) circuit</li> <li>6. Stall timer wired incorrectly</li> <li>7. Bad stall timer</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for tower misalignment. Realign machine using Safety Override procedure as necessary (improper use will Damage Machine)</li> <li>2. Move direction switch to proper position to move machine OFF barricade. Hold Safety Override button and Start switch until machine moves off barricade</li> <li>3. Ensure every tower box power switch is in the ON position</li> <li>4. Check temperature switch set point and wiring. Move Water Control switch to Dry to move machine when temperature is low</li> <li>5. With Disconnect off, check connections at control panel terminal strip, in collector ring, and in each tower box</li> <li>6. Check stall timer wiring using wiring diagram in Electrical section of manual</li> <li>7. Replace stall timer</li> </ol>

<u>Symptom</u>	<u>Possible Cause</u>	<u>Solution</u>
<p><b>Machine Starts But End Tower Will Not Move</b></p> <p>Running panel indicator light, Forward or Reverse panel indicator light, and Safety panel indicator light turn ON when Start switch is actuated and STAY ON when Start switch is released. End Tower panel indicator light never turns ON</p>	<ol style="list-style-type: none"> <li>1. Percent timer is set to 0%</li> <li>2. Low pressure switch tripped</li> <li>3. Bad pressure switch</li> <li>4. Bad percent timer</li> </ol>	<ol style="list-style-type: none"> <li>1. Move percent timer to desired setting</li> <li>2. Check pressure switch setting and water pressure at gage and lower pressure setting as necessary. Check pressure switch wiring</li> <li>3. Bypass pressure switch by moving water control switch to Dry. If machines moves and pressure is normal, replace pressure switch</li> <li>4. Set percent timer to 100% and check for power on Purple wire at terminal strip after one minute. If no power on Purple, check for power at terminal 1 and terminal 2 of percent timer. If power is present, check for power at terminal 3 of percent timer. If no power is present, replace percent timer</li> </ol>
<p>Running panel indicator light, Forward or Reverse panel indicator light, and Safety panel indicator light turn ON when Start switch is actuated and STAY ON when Start switch is released. End Tower panel indicator light cycles ON and OFF with Percent Timer</p>	<ol style="list-style-type: none"> <li>1. End tower is stuck</li> <li>2. No power on End Tower (Purple) wire in end tower box</li> <li>3. Bad neutral at contactor in end tower box</li> <li>4. Bad 480VAC connection at contactor in end tower box or a bad connection at motor</li> <li>5. Motor thermal overload is tripped</li> <li>6. Bad contactor in end tower box</li> <li>7. Bad thermal overload or bad motor</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair and maintain wheel ruts</li> <li>2. Check for power on Purple in control panel. If power is present, check for power on Purple in each tower box. If no power is present, turn OFF main disconnect and check collector ring wiring</li> <li>3. Check neutral connection at contactor and terminal strip in end tower box</li> <li>4. Check Purple connection at contactor and terminal strip in end tower box and check connections at motor</li> <li>5. Turn panel OFF and allow motor to cool, then attempt to restart machine</li> <li>6. Check for power across contactor coil. If power is present and contactor does not pull in, replace contactor</li> <li>7. With main disconnect OFF, check resistance of each leg of 480VAC at motor to ground. If continuity to ground is present, replace motor. Check resistance between 480VAC leg 1 and leg 2, leg 2 and leg 3, and leg 1 and leg 3. If one leg is open or shorted, replace motor. If all legs are open, thermal overload is tripped or damaged</li> </ol>

<u>Symptom</u>	<u>Possible Cause</u>	<u>Solution</u>
<p><b>Machine Starts and End Tower Moves But an Intermediate Tower Will Not Move</b></p> <p>Intermediate tower does not move</p>	<ol style="list-style-type: none"> <li>1. Intermediate tower is stuck</li> <li>2. Alignment or micro-switch out of adjustment in tower box</li> <li>3. Bad neutral at contactor in tower that will not move</li> <li>4. Bad 380VAC connection at contactor in tower box or a bad connection at motor</li> <li>5. Motor thermal overload is tripped</li> <li>6. Bad micro-switch in tower box</li> <li>7. Bad contactor in tower box</li> <li>8. Bad thermal overload or bad motor</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair and maintain wheel ruts</li> <li>2. If machine is straight, ensure Run micro-switch (Orange and Brown wires) arm is at center of travel in each direction and that it clicks near the center of travel. Adjust alignment arm and micro-switch as necessary</li> <li>3. Check neutral connection at contactor and terminal strip in intermediate tower box</li> <li>4. Check connection at contactor and terminal strip in intermediate tower box and check connections at motor</li> <li>5. Turn panel OFF and allow motor to cool, then attempt to restart machine</li> <li>6. If power is present at COM of Run micro-switch but not at NC (Brown) when micro-switch is not actuated or NO (Orange) when micro-switch is actuated, replace micro-switch</li> <li>7. Check for power across contactor coil. If power is present and contactor does not pull in, replace contactor</li> <li>8. With main disconnect OFF, check resistance of each leg of 480VAC at motor to ground. If continuity to ground is present, replace motor. Check resistance between 480VAC leg 1 and leg 2, leg 2 and leg 3, and leg 1 and leg 3. If one leg is open or shorted, replace motor. If all legs are open, thermal overload is tripped or damaged</li> </ol>

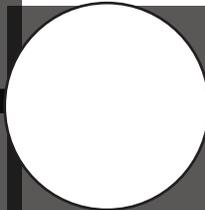
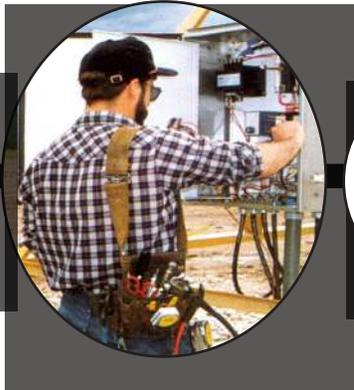
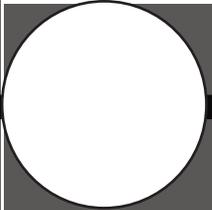
<u>Symptom</u>	<u>Possible Cause</u>	<u>Solution</u>
<p><b>Machine Runs In Forward But Not In Reverse</b></p> <p>Machine runs in Forward only</p>	<ol style="list-style-type: none"> <li>1. Bad neutral at end to wer relay coil in end tower box</li> <li>2. No power on Reverse (Orange) wire at end tower relay coil</li> <li>3. End tower relay not fully seated in relay base in end tower box</li> <li>4. Bad end tower relay</li> </ol>	<ol style="list-style-type: none"> <li>1. Check neutral connection at end tower relay and terminal strip in end tower box</li> <li>2. Check for power across end tower relay coil while attempting to start machine. If no power is present, check for loose connections or improper wiring of Reverse (Orange) circuit at control panel, in collector ring, and in each tower box</li> <li>3. Ensure end tower relay is fully seated in relay base</li> <li>4. Check resistance of relay coil between A1 and A2. If coil circuit is open or resistance is zero, replace relay. Proper resistance is ~1.8 ohms</li> </ol>
<p><b>Machine Starts and Runs In Both Directions But Shuts Down Intermittently</b></p> <p>Intermittent machine shutdowns</p>	<ol style="list-style-type: none"> <li>1. Machine shut down due to a low temperature condition (if low temperature switch is installed)</li> <li>2. Machine shut down due to a stall condition</li> <li>3. Machine shut down due to an alignment problem</li> <li>4. Loss of pressure for longer than the stall timer setting when running in Wet</li> <li>5. Loss of power to control panel during operation</li> <li>6. Loose wire in Forward (Brown) circuit, Reverse (Orange) circuit, or Safety (Yellow) circuit</li> <li>7. Motor thermal overload stopping a tower, causing a stall or alignment t safety shut down</li> </ol>	<ol style="list-style-type: none"> <li>1. Install temperature auto-restart option to restart machine automatically if desired</li> <li>2. If no tower is stuck, check stall timer wiring or replace stall timer if faulty</li> <li>3. Check for tower misalignment. Realign machine using Safety Override procedure as necessary (improper use will Damage Machine)</li> <li>4. Install pressure auto-restart option to restart machine automatically if desired</li> <li>5. Install power auto-restart option to restart machine automatically if desired</li> <li>6. With Disconnect off, check connections at control panel terminal strip, in collector ring, and in each tower box</li> <li>7. With main disconnect OFF, check resistance of each leg of 480VAC at motor to ground. If continuity to ground is present, replace motor. Check resistance between 480VAC leg 1 and leg 2, leg 2 and leg 3, and leg 1 and leg 3. If one leg is open or shorted, replace motor. If all legs are open, thermal overload is tripped or damaged</li> </ol>

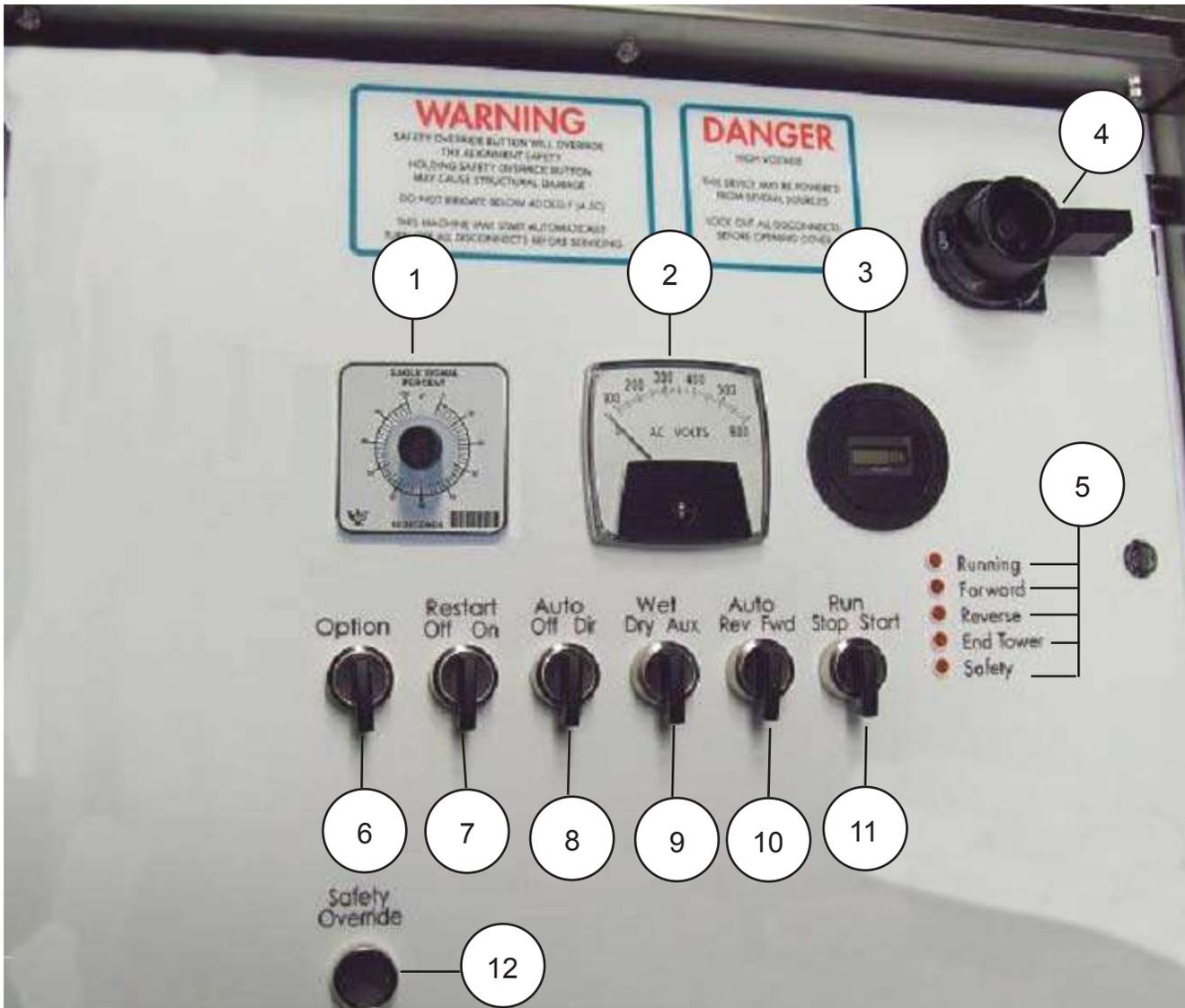
<u>Symptom</u>	<u>Possible Cause</u>	<u>Solution</u>
<p><b>Auto Reverse Problems</b></p>		
<p>Machine does not change directions at barricade</p>	<ol style="list-style-type: none"> <li>1. End tower auto reverse box and/or cables are misadjusted</li> <li>2. Loose wire in the auto reverse (Yel w/Red stripe) circuit</li> <li>3. Direction switch not in the Auto position</li> <li>4. Auto reverse option incorrectly wired in the control panel</li> <li>5. Bad auto reverse latching relay in the control panel</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure Forward and Reverse switch in auto reverse junction box actuate before Safety switch actuates when manually depressing trip arms</li> <li>2. Check connections in control panel, collector ring, and in each tower box</li> <li>3. Refer to the Auto-Reverse/Auto-Off Option section of the Manual for proper switch settings</li> <li>4. Compare wiring to diagrams in the Options section of the Manual</li> <li>5. Actuate the DIR switch to test relay. If relay does not actuate, check for voltage at relay coil when DIR switch is actuated. If voltage is present, replace the latching relay</li> </ol>
<p>Machine does not start in FWD or REV</p>	<ol style="list-style-type: none"> <li>1. Auto reverse latching relay is in the wrong state</li> </ol>	<ol style="list-style-type: none"> <li>1. Actuate the DIR switch to change the state of the relay, then attempt to Start the machine. Refer to the Auto-Reverse/Auto-Off Option section of the Manual for proper switch settings</li> </ol>
<p>No auto stop functionality</p>	<ol style="list-style-type: none"> <li>1. Switches on control panel set incorrectly</li> <li>2. Auto reverse option incorrectly wired in the control panel</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to the Auto-Reverse/Auto-Off Option section of the Manual for proper switch settings</li> <li>2. Compare wiring to diagrams in the Options section of the Manual</li> </ol>
<p>Machine shuts down due to an alignment safety when changing direction at a barricade</p>	<ol style="list-style-type: none"> <li>1. Safety delay timer not set correctly</li> <li>2. Improperly wired safety delay timer</li> <li>3. Bad safety delay timer</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure safety delay timer in control panel is set to 50% and 3s to provide 1.5 seconds of safety dropout delay</li> <li>2. Check delay timer wiring using diagrams in the Electrical section of the Manual</li> <li>3. If delay timer is adjusted correctly and wired properly, replace the delay timer</li> </ol>

Symptom	Possible Cause	Solution
<p><b>Auto End Gun Problems</b> End gun does not turn ON</p>	<ol style="list-style-type: none"> <li>1. Clearance between end gun trips and proximity switch is too large</li> <li>2. Proximity switch is wired incorrectly</li> <li>3. Loose wire in the End Gun (Pink) circuit</li> <li>4. Bad neutral at the end gun solenoid valve</li> <li>5. End gun relay in control panel is not fully seated, is wired incorrectly, or is bad</li> <li>6. End gun solenoid valve is plumbed incorrectly</li> <li>7. Bad end gun solenoid valve</li> <li>8. Bad end gun control valve</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust proximity switch so it passes within ¼" of the end gun trip(s)</li> <li>2. Refer to the Options section of the Manual for proper wiring</li> <li>3. Check connections in control panel, collector ring, and in each tower box</li> <li>4. Check connections at the end gun solenoid valve in the end tower box</li> <li>5. Open control panel and ensure the end gun relay is fully seated in the relay base. Check the relay wiring against the wiring diagrams in the Electrical and Options sections of the Manual</li> <li>6. Refer to the Auto End Gun portion of the Options section in the Manual</li> <li>7. With disconnect in the OFF position, check the resistance of the solenoid valve coil. If the coil is open or has zero resistance, replace the valve</li> <li>8. With the machine running in Wet and at normal operating pressures, disconnect the ¼" poly tubing at the end gun control valve. If the end gun does not turn on, replace the end gun control valve</li> </ol>
<p>End gun does not turn OFF</p>	<ol style="list-style-type: none"> <li>1. Proximity switch is wired incorrectly</li> <li>2. End gun solenoid valve is plumbed incorrectly</li> <li>3. End gun solenoid valve filter is clogged</li> <li>4. Bad end gun solenoid valve</li> <li>5. Bad end gun control valve</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to the Options section of the Manual for proper wiring</li> <li>2. Refer to the Auto End Gun portion of the Options section in the Manual</li> <li>3. Remove filter element and clean or replace</li> <li>4. With disconnect in the OFF position, check the resistance of the solenoid valve coil. If the coil is open or has zero resistance, replace the solenoid valve</li> <li>5. With the machine running in Wet and at normal operating pressures, disconnect the ¼" poly tubing at the end gun control valve. If there is sufficient water pressure at outlet of poly tubing, replace the end gun control valve</li> </ol>

<u>Symptom</u>	<u>Possible Cause</u>	<u>Solution</u>
<b>Booster Pump Problems</b>		
Booster pump will not start	<ol style="list-style-type: none"> <li>1. Pressure switch in booster pump box is improperly adjusted</li> <li>2. Booster pump contactor not pulling in</li> <li>3. Booster pump overload is tripped</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower pressure switch setting until booster pump starts</li> <li>2. Check for power across contactor coil. If power is present and contactor does not pull in, replace contactor. If no power is present but end gun is ON and there is power at end gun solenoid valve in end to wer box, check End Gun (Pink) circuit in booster pump box and end to wer box</li> <li>3. Check overload in junction box and reset if necessary. If overload continues to trip, turn main disconnect OFF, check resistance of each leg of 480VAC at motor to ground. If continuity to ground is present, replace motor. Check resistance between 480VAC leg 1 and leg 2, leg 2 and leg 3, and leg 1 and leg 3. If one leg is open or shorted, replace motor</li> </ol>
Booster pump runs but pressure is not being boosted	<ol style="list-style-type: none"> <li>1. Booster pump motor is rotating backwards</li> </ol>	<ol style="list-style-type: none"> <li>1. With main disconnect OFF, reverse any two legs of 480VAC at motor or at the booster pump contactor</li> </ol>
<b>Miscellaneous Problems</b>		
Machine runs in Forward (clockwise) direction with switch in REV or runs in Reverse direction with switch in FWD	<ol style="list-style-type: none"> <li>1. Phase reversal of the incoming 480VAC power</li> </ol>	<ol style="list-style-type: none"> <li>1. With main disconnect OFF, reverse any two legs of 480VAC at bottom of FWD/REV contactor in the control panel</li> </ol>
A tower or towers move in the opposite direction of the rest of the towers	<ol style="list-style-type: none"> <li>1. Phase reversal of the 480VAC power at the offending motor or tower box contactor</li> </ol>	<ol style="list-style-type: none"> <li>1. Re-phase motors as necessary to obtain proper direction of rotation</li> </ol>
All towers move at once	<ol style="list-style-type: none"> <li>1. Short between the Forward (Brown) and Reverse (Orange) circuits</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for power on both the Forward and Reverse circuits at the same time. If power is present on Brown and Orange, turn off main disconnect and check for short in control panel, collector ring, and in each tower box</li> </ol>

# PANEL OPERATION





1. Percent Timer: To control the overall speed of the machine by controlling how long the end tower motor runs in a 60 seconds time period. For example, if the percent timer is set at 50%, the endtower motor will run for 30 seconds, and then shut off for 30 seconds (50% of one minute). In effect, the machine will take twice as long to make one revolution around the field compared to a 100% timer setting.

2. Voltage Meter: Monitors voltage coming into the panel from main power source.

3. Hour Meter: Clocks amount of hours pivot is used.

4. Main Disconnect: Disconnects all incoming power from the machine.

**N** Note: Panel door will not open unless the Main Disconnect is in the "OFF" position.

5. Operation Indicator Lights: Indicates operations currently in use.

6. Future Option: N/A

7. Option Auto Restart Off / On: Overrides the Auto-Restart option, and prevents the machine from starting in the event of a power outage, or from automatically starting the machine from a remote location.

8. Option Off, Auto, Dir: Reference Section 10-10 for operating instructions.

9. Dry, Wet, Aux: Dry-No water or fertilizer; Wet-water only; Aux- Water and Fertilizer.

10. Rev, Auto, Fwd: Determines the direction of travel and enables the auto-reverse feature. If the auto reverse feature is used, turn the selector switch to AUTO/OFF, and turn the Stop, Run, Start switch to "START". The machine will travel in the direction that the Auto Reverse option is currently set at.



*Note: Forward is to be clockwise.*

11. Stop, Run, Start: Stop or Start machine.



**WARNING! CARE SHOULD BE TAKEN WHEN USING THE SAFETY OVERRIDE FEATURE. SEVERE MISALIGNMENT MAY RESULT IN STRUCTURAL DAMAGE. DO NOT USE OVERRIDE UNLESS MACHINE IS IN COMPLETE VIEW.**

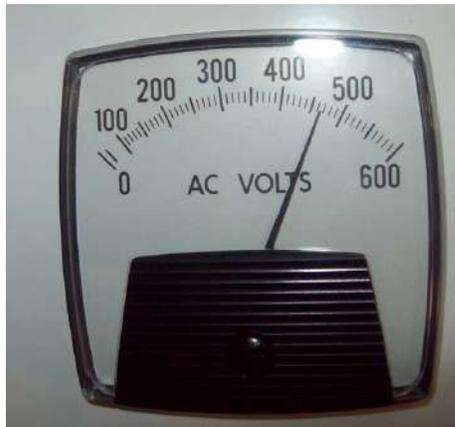
12. Safety Override: The machine shutdown feature may be overridden by pressing the safety override button and turning the Stop, Run, Start switch to "START".  
*See Section 1-6 for proper machine alignment.*

### FWD Operation

1. Turn disconnect switch to on position.
2. Look at voltage meter on panel. Voltage meter will indicate current supply voltage.



*NOTE: Incoming voltage may vary depending on your location. If you are not getting the correct voltage for your area, contact a licensed electrician for diagnosis.*



3. Move selector on panel door to "Fwd" position.



4. Set the Percent Timer on the panel door to desired application rate.  
*NOTE: Reference Sections....for desired results.*



5. Move Dry, Wet, Aux switch to the desired operation.



6. Move Stop-Run-Start switch on panel door to Start to energize safety and latch circuit.



7. Check the lights on the front of the control panel door. The following lights should be ON:  
RUNNING, FORWARD, SAFETY, END TOWER



### REV Operation

1. Turn disconnect switch to on position.
2. Look at voltage meter on panel. Voltage meter will indicate current supply voltage.



*NOTE: Incoming voltage may vary depending on your location. If you are not getting the correct voltage for your area, contact a licensed electrician for diagnosis.*



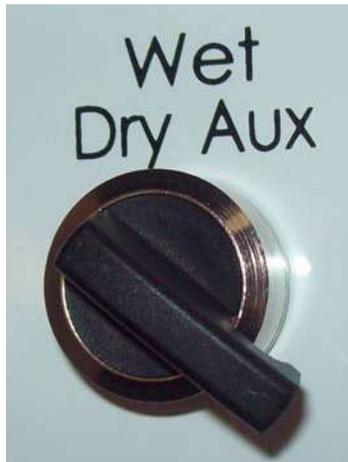
3. Move selector on panel door to "Rev" position.



4. Set the Percent Timer on the panel door to desired application rate.  
*NOTE: Reference Sections....for desired results.*



5. Move Dry, Wet, Aux switch to the desired operation.



6. Move Stop-Run-Start switch on panel door to Start to energize safety and latch circuit.



7. Check the lights on the front of the control panel door. The following lights should be ON:  
RUNNING, REVERSE, SAFETY, END TOWER



The Cp-600 Auto Reverse / Off option is designed for both End Tower and Pivot Point Operation. It uses a single wire in the span cable (Yel/Red) to send a Momentary Pulse signal to the main control panel. The Auto Reverse Switch is located at the End Tower or Pivot point, and uses a Normally Open contact to switch the Yel/Red wire to Neutral (White) wire. Each time the Auto Reverse Switch is activated it alternates the pulse relay and changes the direction on the machine. Reference the following steps in combination with Figure 7-7. to assist you in the successful operation of this feature:

### Activate Auto Reverse Option:

1. Turn the direction switch (1) to Auto position.
2. Turn Auto / Off / Dir switch (2) to Auto position.
3. Turn Run switch (3) to Start position.

When the Machine is started with the START switch (item 3) it should run in the Auto direction that it was running. If the opposite direction is desired then twist the Auto / Off / Dir (2) switch momentarily to the DIR position. This will pulse the Relay and reverse the direction of the machine.

### Auto Off Function:

The Auto Off function is a built-in feature of the Auto Reverse Option. To operate the Auto Off function; place the Auto / Off / Dir switch (2) in the Auto position. Place the direction switch (1) in the direction of travel of the machine. When the Auto Reverse switch is operated at either the barricade or pivot point, the machine will shut down.

To restart the machine, first return the direction switch (1) to either the auto position or the new direction. Turn Run switch (3) to start position.

If the machine fails to restart with the direction switch (1) in Fwd or Rev position, turn Auto/Off/Dir switch (2) to Dir position. This will reset the pulse relay to the desired direction and allow the machine to Auto Off the next time the Auto Reverse switch is activated.

If using the Pivot Point Auto Reverse option, the Auto Reverse Switch can be overridden by placing the Auto/Off/Dir switch (2) in the Off position.

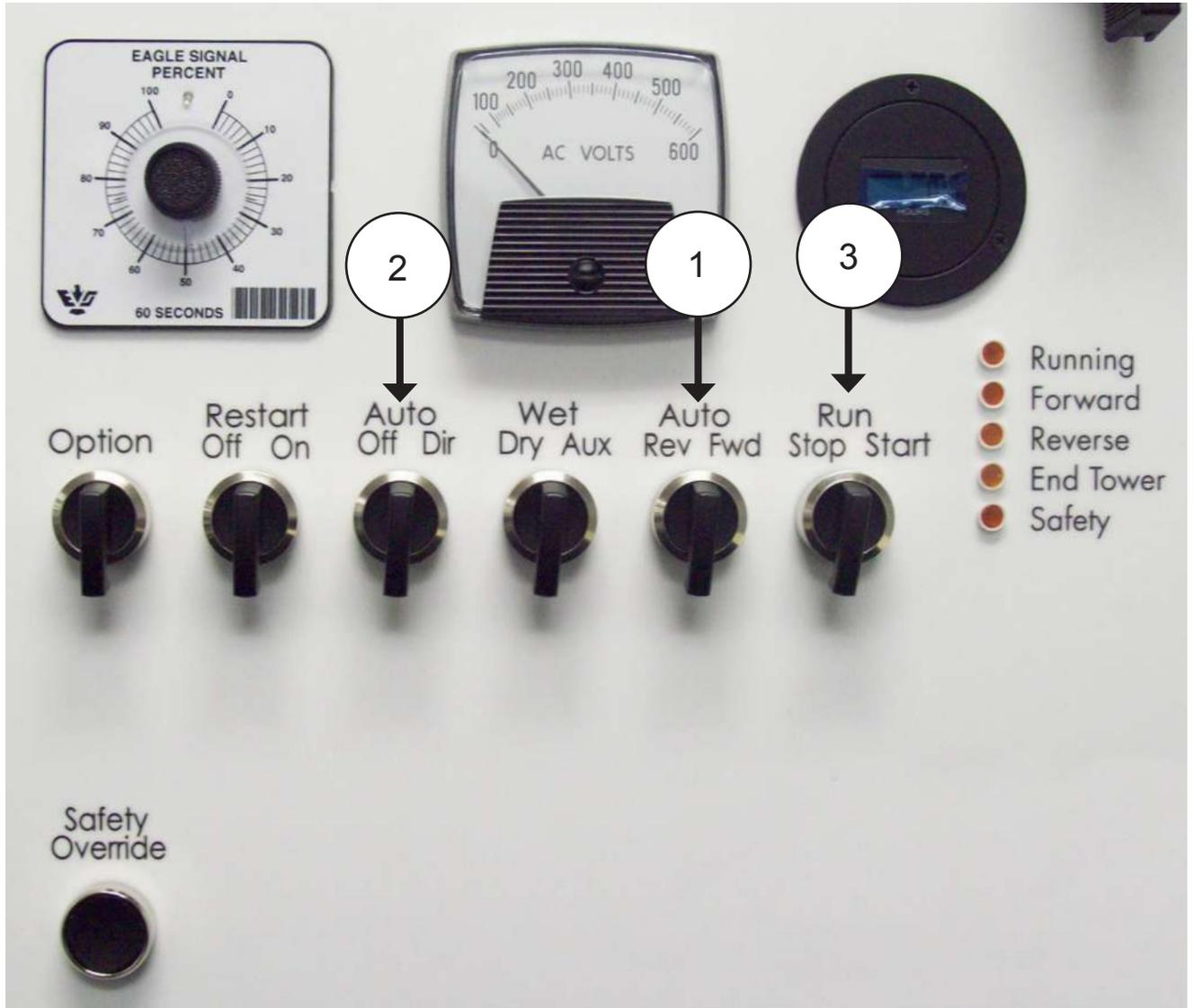
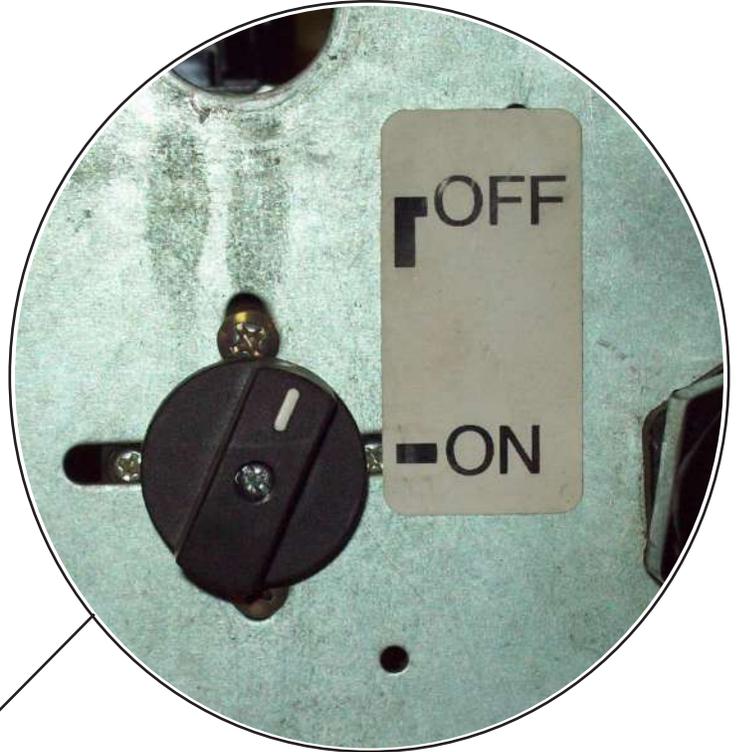


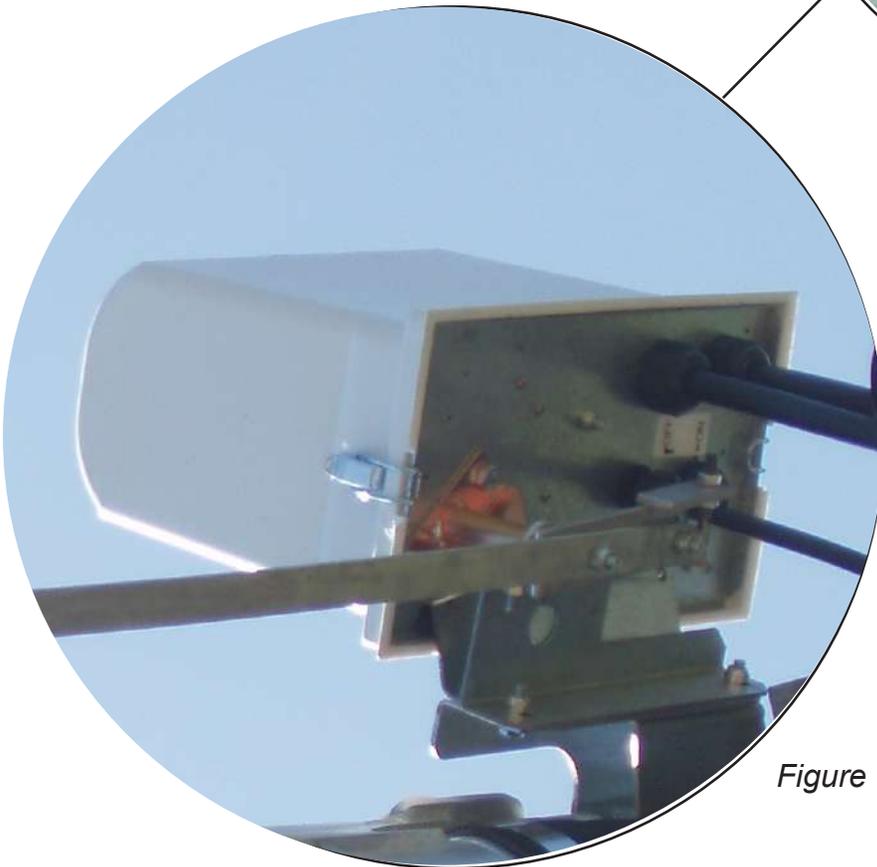
Figure 10-11.

## **STOPPING YOUR MACHINE IN AN EMERGENCY**

The pivot is equipped with a disconnect switch at each tower. An On/ Off switch is located on the underside of each tower junction box, see *Figure 10-12a.* and *Figure 10-12b.* Turning this switch to the “OFF” position will shut down the entire machine by interrupting the safety circuit. This switch is not the machine disconnect and should **ONLY** be used in emergencies.



*Figure 10-12a.*



*Figure 10-12b.*

The pictures shown may not depict what your machine may have. Your tower junction box may be equipped with a gray cover and also may contain a flip switch style emergency shut off.