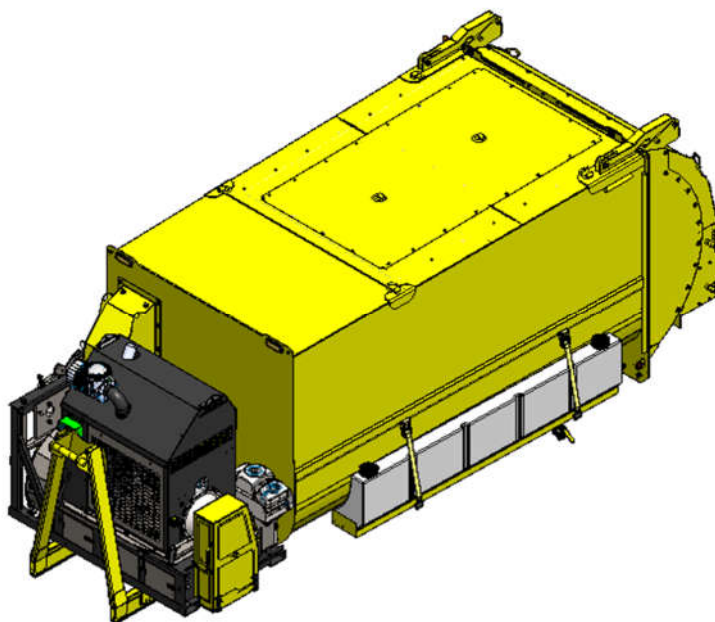




**OPERATION & MAINTENANCE MANUAL**  
**FOR MODEL YEARS 2021 & UP**

REV 5/10/23



**WHEN ORDERING PARTS, PLEASE REFER TO THE  
SERIAL NUMBER OF YOUR LEAF VACUUM.**

**RECORD THEM FROM THE SERIAL TAG ON THE  
FRONT DRIVER'S SIDE OF THE UNIT**

LEAF VAC SERIAL NO.: \_\_\_\_\_

ENGINE MODEL NO.: \_\_\_\_\_

ENGINE SERIAL NO.: \_\_\_\_\_

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# General Safety Information


## 1. General Safety Information





### 1.1 Safety Alert Symbols and Signal Words

**SPECIAL NOTE: This manual contains information pertaining to both the hook lift portion of the leaf vacuum, as well as the equipment mounted on the skid.**

**AND ONE MORE: This unit is 102" wide, which is within legal width for all US interstates and federally designated state highways. When operating on other roadways, consult local and state laws regarding legal width.**

Our units are built with components produced by various manufacturers. Some of these items have separate instruction manuals, and many are included in the supplemental manuals section. Where this manual indicates that you should read another manual, but you do not have that manual, call Bonnell Industries at 800-851-9664 for a free copy. [See page 15 for a list of supplemental manuals that may apply to this piece of equipment.](#)

The safety information in this manual is denoted by the safety alert symbol:   
The level of risk is indicated by the following signal words.

 <b>Danger</b>
DANGER – Immediate hazards which WILL result in severe personal injury or death if the warning is ignored.
 <b>WARNING</b>
WARNING – Hazards or unsafe practices which COULD result in severe personal injury or death if the warning is ignored.
 <b>Caution</b>
CAUTION – Hazards or unsafe practices which could result in minor or moderate injury if the warning is ignored.
 <b>Notice</b>
NOTICE – Practices that could result in damage to the leaf vacuum or other property.



## General Safety Information

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### 1.2 Proposition 65 Warnings

#### WARNING

Operating, servicing and maintaining a passenger vehicle or off-highway motor vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to [www.P65Warnings.ca.gov/passenger-vehicle](http://www.P65Warnings.ca.gov/passenger-vehicle).

#### WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to [www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel).

#### WARNING

Processing wood products can expose you to wood dust, a substance known to the State of California to cause [cancer](#). Avoid inhaling wood dust or leaf debris or use a dust mask or other safeguards for personal protection. For more information go to [www.P65Warnings.ca.gov/wood](http://www.P65Warnings.ca.gov/wood).

## General Safety Information

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### 1.3 Vehicle Overloading

An overloaded vehicle can create dangerous stability and braking problems. The vehicle chassis must be properly sized to not exceed the front / rear GAWR (gross axle weight rating), or total GVWR (gross vehicle weight rating). Refer to the vehicle chassis manufacturer for the chassis ratings. Other considerations for chassis overloading are:

- While operating leaf collection equipment, never exceed the available payload.
- When determining available payload, always account for the weight of optional equipment, operator(s), and completely filled fuel, oil and water tanks.
- Leaf debris is normally estimated at 400 lbs. per cubic yard. The actual weight may vary depending on climate and type of debris being collected.

### 1.4 Safe Driving During Leaf Collection Operations

The leaf collection equipment adds substantial width, height and weight to the vehicle. It is imperative the driver be trained on the safe operation of this vehicle.

- The collection arm and hose add additional width to the vehicle. Ensure enough distance is provided when passing objects.
- Be aware of overhead obstructions such as tree branches and power lines.
- The added weight of the leaf vacuum equipment and debris will increase the required stopping distance.
- Use flashing warning lights during leaf collection operations.
- Leaf collection generates dust which may reduce visibility around the vehicle.
- Always operate the vehicle at a safe speed.
- Never allow riders on leaf vacuum equipment. The operator(s) should be properly seated inside the vehicle cab with seat belts fastened.
- Always be aware of pedestrians near the vehicle.
- Know how to shut down the equipment in an emergency situation.

1.5 Safety Decals

<b>! DANGER</b>	
	<b>ENTANGLEMENT HAZARD</b> Serious injury or death will occur <ul style="list-style-type: none"> <li>• Shut down engine &amp; disconnect safety interlock before removing hose or guards.</li> </ul>
<b>NOTICE</b>	
<ul style="list-style-type: none"> <li>• New belt tension must be checked after first hour of operation and daily thereafter.</li> <li>• Failure to do so will result in premature belt failure..</li> </ul>	

<b>Operation &amp; Maintenance Manuals Inside</b>	

<b>! WARNING</b>	
<b>COLLISION HAZARD</b>	
Serious injury or death could occur <ul style="list-style-type: none"> <li>• Secure Pick-up nozzle for transport.</li> </ul>	

<b>! WARNING</b>	
<b>SUCTION HAZARD</b>	
Serious injury or death could occur <b>HIGH VACUUM!</b> <b>KEEP CLEAR.</b>	

<b>! DANGER</b>	
	<b>ENTANGLEMENT HAZARD</b> Serious injury or death will occur <ul style="list-style-type: none"> <li>• Shut down engine &amp; disconnect safety interlock before removing hose or guards.</li> </ul>

<b>! WARNING</b>	
------------------	--

	<b>PERSONAL INJURY HAZARD</b> <ul style="list-style-type: none"> <li>• Head, Eye and Ear Protection required while operating this machine.</li> </ul>
--	---

<b>! WARNING</b>	
------------------	--

<b>HEAVY IMPACT HAZARD</b>	
Serious injury or death could occur <ul style="list-style-type: none"> <li>• Inspect fan and liners for wear or damage every 80 hours.</li> <li>• Perform an inspection immediately if vibration occurs, or if large heavy debris is run through the machine.</li> </ul>	

<b>! WARNING</b>	
------------------	--

	<b>LOSS OF CONTROL HAZARD</b> <ul style="list-style-type: none"> <li>• Chock wheels when servicing or parking machine.</li> </ul>
--	---

<b>! DANGER</b>	
	<b>ENTANGLEMENT HAZARD</b> Serious injury or death will occur <ul style="list-style-type: none"> <li>• Shut down engine &amp; disconnect safety interlock before removing hose or guards.</li> </ul>

<b>! WARNING</b>	
------------------	--

	<b>PERSONAL INJURY HAZARD</b> <ul style="list-style-type: none"> <li>• Head, Eye and Ear Protection required while operating this machine.</li> </ul>
--	---

<b>! WARNING</b>	
------------------	--

	<b>LOSS OF CONTROL HAZARD</b> <ul style="list-style-type: none"> <li>• Chock wheels when servicing or parking machine.</li> </ul>
--	---

# General Safety Information

LV-4324\_rev0 4/30/20 DECAL SET FOR OLYMPIAN PRO PLUS

<small>[ APPLY TO FLUID COUPLER ZERK (IF EQUIPPED) ]</small> WEEKLY 2 PUMPS	<small>[ APPLY TO FENDERS ]</small> MONTHLY 1 PUMP	<small>[ APPLY NEAR IMPELLER BEARING ZERKS ]</small> DAILY 2 PUMPS
	MONTHLY 1 PUMP	DAILY 2 PUMPS

[ APPLY TO BOOM ]

SAFETY LATCH MUST BE RELEASED BEFORE OPERATING BOOM, AND SECURED BEFORE TRANSPORTING OR SERVICING MACHINE.

[ APPLY NEAR ENGINE CONTROLS ]

**DANGER**

**PERSONAL INJURY HAZARD**  
 Serious injury or death will occur

- Read and understand operator's manual before operating machine.
- Operator seat for leaf collection purposes only.
- Seat belt required at all times.
- Max speed with operator not to exceed 5 MPH.

**WARNING**

**PERSONAL INJURY HAZARD**  
 • Head, Eye and Ear Protection required while operating this machine.

**PRESTART CHECKLIST**

✓ INSPECT TIRES	✓ INSPECT HOSE FOR WEAR
✓ ENGINE OIL & FUEL LEVELS	✓ PICK-UP HOSE SECURE
✓ CHECK ALL LIGHTS	✓ CHECK BELT TENSION
✓ HYDRAULIC OIL LEVEL	✓ ALL GUARDS IN PLACE
✓ WATER LEVEL	✓ DISENGAGE CLUTCH

**WARNING**

**COLLISION HAZARD**  
 Serious injury or death could occur

- Secure Pick-up nozzle for transport.

SAFETY LATCH MUST BE RELEASED BEFORE OPERATING BOOM, AND SECURED BEFORE TRANSPORTING OR SERVICING MACHINE.

**WARNING**

**FIRE HAZARD**  
 • Keep engine and engine area free of leaf debris buildup.

[ APPLY TO HYDRAULIC OIL TANK ]

**HYDRAULIC FLUID ONLY. FILL LINE:**

**CAUTION**

**EQUIPMENT DAMAGE HAZARD**  
 Serious injury or death could occur

- Do not operate engine with ball valve closed.
- Close valve to change hydraulic filter.

↑  
ALIGN ARROW TO BELOW TOP OF RIGHT GLASS WINDOW.

[ APPLY TO TOP OF BLOWER HOUSING GUARD ]

**WARNING**

**HEAVY IMPACT HAZARD**  
 Serious injury or death could occur

- Inspect fan and liners for wear or damage every 80 hours.
- Perform an inspection immediately if vibration occurs, or if large heavy debris is run through the machine.

[ APPLY TO TOP OF BLOWER HOUSING, UNDERNEATH GUARD ]

**WARNING**

**HEAVY IMPACT HAZARD**  
 Serious injury or death could occur

- Shield missing. DO NOT operate.

[ APPLY NEAR FUEL FILL ]

**DANGER**

**EXPLOSION HAZARD**  
 Serious injury or death will occur

- No smoking.
- Keep open flame away.
- Do no weld, cut or burn on or near fuel tank.

**ULTRA LOW SULFUR DIESEL FUEL ONLY**

<small>[ APPLY TO SPARTAN HOIST HINGES ]</small> WEEKLY 2 PUMPS	<small>[ APPLY TO PIVOT ARM ]</small> DAILY 2 PUMPS
WEEKLY 2 PUMPS	DAILY 2 PUMPS
	DAILY 2 PUMPS

[ APPLY TO PREWET TANK (IF EQUIPPED) ]

**NOTICE**

**WATER ONLY**  
 DRAIN WETTING SYSTEM PUMP & INLINE STRAINER TO PREVENT FREEZING.

[ APPLY TO BLOWER HOUSING ]

**NOTICE**

FAN ROTATION

[ APPLY TO BELT GUARD NEAR CLUTCH (IF EQUIPPED) ]

**NOTICE**

**TO OPERATE THE CLUTCH:**

Make sure that there is free play in the engagement handle prior to operation of the power take-off.

If no free play is evident, see adjustment procedure in manual.

1. Engine should be started and running at low idle speed, 1000 rpm or less.
2. Engage the PTO clutch with one single hand lever movement.

Do not slip the clutch for longer than one or two seconds without completely engaging it or disengaging it and allowing it to cool.

Set engine to idle speed before disengaging clutch.

**CLUTCH ADJUSTMENT:**

Clutch adjustment should be checked after the first eight hours of operation.

Adjustments should be made at the ten to fifteen hour intervals thereafter until the new plates are worn in.

Refer to clutch manual for proper adjustment procedures.




# General Safety Information



<b>DANGER</b>	
	<b>CRUSHING HAZARD</b> <b>Serious injury or death will occur</b>
	<ul style="list-style-type: none"> <li>Stay clear of a raised dump body. If service work is required, make sure the body prop is properly used.</li> <li>Dump body must be empty when using body prop.</li> <li>Return the body prop to its storage position after service work is completed.</li> <li>Body must be completely lowered when unattended.</li> </ul>

<b>WARNING</b>	
	<b>CRUSHING HAZARD</b> <b>Serious injury or death can occur</b>
	<ul style="list-style-type: none"> <li>Stay clear while loading, unloading, raising, or lowering dump body.</li> </ul>

**⚠ DANGER**




**FALL/CRUSH HAZARD**  
Serious injury or death could result from being crushed by moving machinery and revolving tires.

**NO RIDERS!**

- Only the machine operator shall occupy the machine when travelling or in operation.
- Do not stand, ride, or sit on machine.
- Keep clear when machine is in operation.
- Avoid driver and machine operator blind spots at all times.

**⚠ DANGER**



**FALL/CRUSH HAZARD**  
Serious injury or death could result from being crushed by moving machinery and revolving tires.

**NO RIDERS!**

- Only the machine operator shall occupy the machine when travelling or in operation.
- Do not stand, ride, or sit on machine.
- Keep clear when machine is in operation.
- Avoid driver and machine operator blind spots at all times.

**EMERGENCY  
ENGINE  
SHUT-OFF**

**EMERGENCY  
ENGINE  
SHUT-OFF**

**USE 3  
POINTS  
OF  
CONTACT**



**WHEN  
ENTERING  
OR EXITING  
VEHICLE**



**Titan** LEAF™ SOLUTIONS **FUSE GUIDE**

SPARE	RELAY 2	WETTING	E-STOP	RELAY 1	E-STOP 10 AMP ROBOOTA 20 AMP DEERE/KOHLER	F1
					WETTING 15 AMP	F2
SPARE	RELAY 4	ALTERNATOR IGNITION	OIL COOLER	RELAY 3	OIL COOLER 30 AMP	F3
					ALTERNATOR/ IGNITION 15 AMP	F4
SPARE	RELAY 5	HFX LO POWER	HFX HI POWER	RELAY 6	HFX HI POWER 15 AMP	F5
					HFX LO POWER 5 AMP	F6
SPARE	RELAY 7	BATTERY POWER	DISPLAY/ JOYSTICK	RELAY 8	DISPLAY/JOYSTICK 5 AMP	F7
					BATTERY POWER 15 AMP	F8

LV-2254

**NOTICE**

Bonnell Industries is not an authorized service center for engines, nor do we stock parts for these engines. Please refer to your engine manual, the yellow pages or internet to find your local authorized engine service center.

BJV-1660

**CAUTION**

- Read and understand Operator's Manual before operating unit. Free replacement manuals are available from Bonnell Industries.
- Keep all shields and guards in place and in good working condition. Keep hands, feet, and clothing away from all moving parts.
- Keep others away while operating or loading equipment. Do not allow children or untrained persons to operate or play on equipment.
- Stop vehicle, disengage power, stop engine, set parking brake and remove key before leaving vehicle. Make sure all movement has stopped before servicing machine.
- Failure to follow safety rules can result in serious injury or death.

BON-011377

**HYDRAULIC CLUTCH LUBRICATION**

Clutch & Shaft bearings:  
20 pumps every  
100 hours

LV-4128

GASOLINE  
ONLY

Reorder: NHE-31240 www.ComplianceSigns.com

⚠ WARNING	⚠ WARNING	⚠ WARNING	⚠ WARNING	⚠ WARNING
<p>Uncoupling will cause trailer to come loose from tow vehicle.</p> <ol style="list-style-type: none"> <li>1. CHECK that pintle LOAD RATING is same or greater than ring LOAD RATING.</li> <li>2. LOCK the clamp in place using a pin or lock.</li> </ol>	<p>ALWAYS use safety chains. Chains hold trailer if connection fails. You must:</p> <ol style="list-style-type: none"> <li>1. CROSS chains underneath coupler.</li> <li>2. ALLOW slack for trailer to turn.</li> <li>3. ATTACH chain hooks securely to tow vehicle frame.</li> </ol>	<p>Trailer can roll if it comes loose. Electric safety brake applies when cable pulls pin out of switch box.</p> <ol style="list-style-type: none"> <li>1. PULL hard to get pin out of switch box.</li> <li>2. CHECK brake by PULLING TRAILER with tow vehicle.</li> <li>3. ATTACH pin CABLE to tow vehicle so pin will be pulled out if trailer separates.</li> <li>4. Promptly REPLACE pin in switch box.</li> </ol>	<p>Lights can prevent trailer from being hit by other vehicles. You must:</p> <ol style="list-style-type: none"> <li>1. CONNECT trailer and tow vehicle electrical connectors.</li> <li>2. CHECK all lights: tail lights, turn signal, and brake lights.</li> <li>3. DO NOT TOW if lights are not working.</li> </ol>	<p>Tire, wheel or lug nut failure can cause loss of control. Before towing, you must CHECK:</p> <ol style="list-style-type: none"> <li>1. Tire pressure and tread.</li> <li>2. Tire and wheel for damage.</li> <li>3. Lug nuts for tightness.</li> </ol> <p>For new and remounted wheels, retighten lug nuts at the first 10, 25 and 50 miles of driving.</p>
<p>Open clamp Pin in place Pin removed Closed clamp</p> <p>© 2002 HATM</p>	<p>ATTACH TO TOW VEHICLE FRAME</p> <p>ENOUGH SLACK FOR TURN</p> <p>© BOSS © RANS</p>	<p>PIN FULLY DOWN ONLY TO TEST BRAKES</p> <p>ATTACH CABLE TO TOW VEHICLE</p>	<p>DISCONNECTED CONNECTED</p>	<p>Lug Nuts TIGHT?</p> <p>Tires and Wheel OK?</p> <p>UT70038</p>

# General Safety Information

## 1.6 General Safety Related to Operation of Vacuum

- Review safety items with all relevant personal at regular intervals.
- Ensure all operators are familiar with this manual before operating.
- Ensure your operation is in compliance with all applicable codes and regulations.
- Before operating machine, do a safety inspection. Refer to the pre-start checklist on page 8 for general procedures.
- Make sure all personal protective equipment is in order before leaving for the job site. Recommended equipment includes hard hat, safety goggles or ski mask, and ear protection.
- Have a fire extinguisher on hand at all times.
- Clean leaf debris from machine and engine screen after each load to prevent build-up of flammable material. A leaf blower works well for this. This can be done during truck change-over.
- Inspect work area before operating machine. Inspect for heavy debris, such as bricks, rocks, or glass bottles.
- Ensure all pedestrians and operators are clear of the vacuum area.
- Keep nozzle away from loose objects that may be near the collection area, and may get caught in the nozzle.
- Remove key and chock wheels when leaving machine unattended.
- **DO NOT** operate machine with guard, hose, or housing cover removed. Refer to safety disconnect section below for lock-out procedures.
- Secure pick-up nozzle for transport.
- When rotating hose per maintenance section, inspect fan for uneven wear, cracks, or looseness. Also check housing for large heavy debris & remove.

## 1.7 Safety Sensors & E-Stops

Your Leaf Machine is equipped with safety sensors & e-stop system which will automatically stop all machine functions and shut down the engine when activated. Safety sensors are located at the hose connection of the blower housing, blower housing cleanout door, and the belt guard.



C.D. PROX  
(CLEANOUT DOOR)  
SAFETY SENSOR

C.H. PROX  
(COLLECTION HOSE)  
SAFETY SENSOR

B.G. PROX  
(BELT GUARD)  
SAFETY SENSOR



## General Safety Information

E-stop switches are located on the control panel near the operator's seat and on the engine housing near the belt guard.



When performing any repair or maintenance work, remove the key from the ignition, active the e-stop switch, and disconnect the safety sensor for the area being serviced.

**The safety sensors, emergency stop switches and wiring must be operable and in their proper locations for the life of the machine. Never operate this machine with broken, incomplete or modified safety components or wiring.**

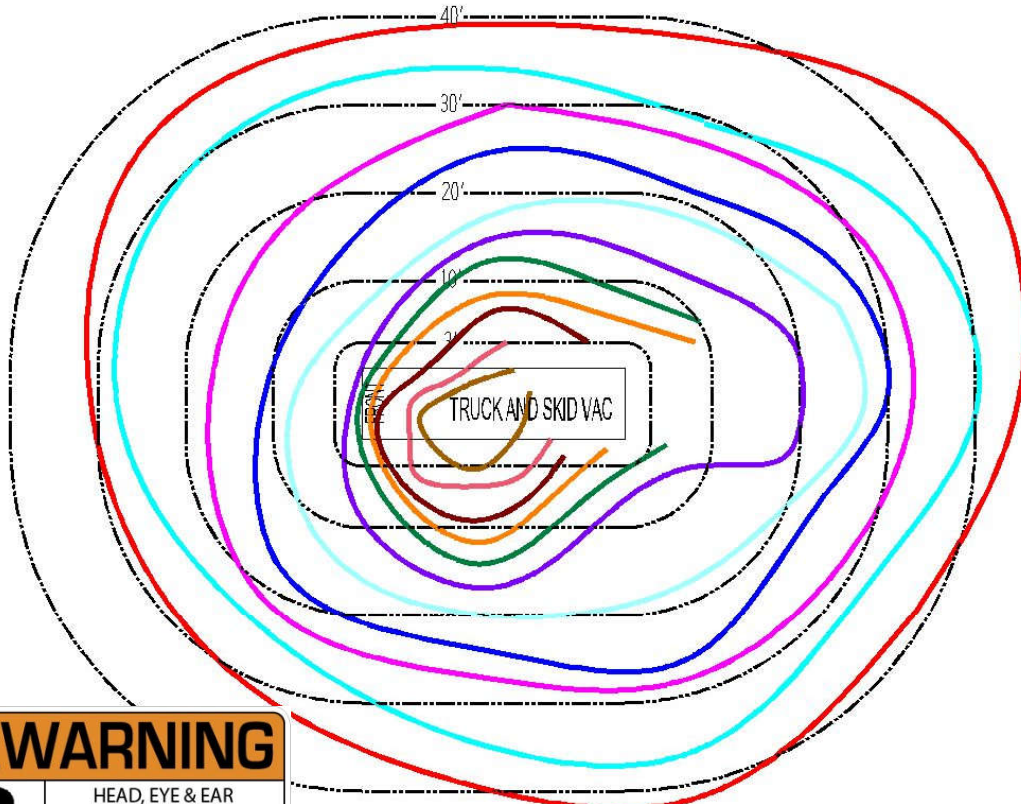
### 1.8 Tilt Switch

Your Leaf Machine is also equipped with tilt switch located towards the front of the hooklift. If the hooklift exceeds 30 degrees of incline, the engine will be shut down. For diagnostics, if the tilt switch senses an incline of more than 30 degrees, a light inside of the safety switch will illuminate.

### 1.9 Decibel Levels

Below is an approximate decibel level chart showing sound levels at given positions around the machine. The purpose of this chart is to illustrate the approximate sound levels of the machine, and provide a guideline for hearing protection. **To prevent hearing loss, ear protection is required when working on or around the leaf vacuum during operation.** The illustration below shows a Titan Leaf Pro Plus leaf vacuum with Kubota 99 HP engine. Decibel levels for the Spartan Leaf Pro Series with Kubota or John Deere engines may vary from below.

## Spartan Leaf Pro Plus Skid Mount Decibel Levels at given distances



**WARNING**

HEAD, EYE & EAR PROTECTION REQUIRED WHILE OPERATING THIS EQUIPMENT.

Continuous dB	Permissible Exposure Time*
85 dB	8 hours
88 dB	4 hours
91 dB	2 hours
94 dB	1 hour
97 dB	30 minutes
100 dB	15 minutes
103 dB	7.5 minutes
106 dB	3.75 min (< 4min)
109 dB	1.875 min (< 2min)
112 dB	.9375 min (~1 min)
115 dB	.46875 min (~30 sec)

- 100 DB ———
- 99 DB ———
- 96 DB ———
- 94 DB ———
- 93 DB ———
- 92 DB ———
- 90 DB ———
- 88 DB ———
- 87 DB ———
- 86 DB ———
- 85 DB ———

\*Permissible Exposure Time is in a 24 hour period.  
Longer exposure than shown above may result in permanent hearing loss.

# General Maintenance

---

## 2. General Maintenance

---

### 2.1 Capacities and Specifications

Fuel Tank .....	40 US Gallons
Hydraulic System .....	23 US Gallons
Hydraulic Tank .....	20 US Gallons
Dust Control System (if equipped) .....	100 US Gallons
Engine, Kubota V3800 .....	74 BHP @2600 RPM
Engine, Kubota V3800G .....	87 BHP @2600 RPM
Engine, John Deere 40457FC03 .....	74 BHP @2400 RPM
Engine, John Deere 4045HFC04 .....	99 BHP @2400 RPM
TransFluid Coupler .....	5-6 Quarts
Battery .....	12 Volt, 1190 AMP, 950 CCA
Fan .....	30" Diameter

### 2.2 Initial Servicing & Break-in

The leaf vacuum machine has been initially serviced at the factory and is ready to operate. Review engine manual for break-in procedures.

### 2.3 List of Supplemental Manuals

Your manual packet includes supplemental manuals for some or all of the following components. Refer to these manuals for service & operation of these items:

Engine .....	Separate Supplement
Hooklift .....	Separate Supplement
Logan Hydraulic Clutch (if equipped) .....	Separate Supplement
Logan Hydraulic Clutch Manifold (if equipped) .....	Separate Supplement
Split Taper Bushing .....	<a href="#">Page 43</a>
Trans Fluid Coupler .....	<a href="#">Page 45</a>
Lighting Systems .....	<a href="#">Page 52</a>
Dust Control System Pump .....	<a href="#">Page 54</a>

### 2.4 Engine Service and Service Parts List

Refer to the engine manual for service information. Bonnell Industries does not service engines. Refer to your local engine dealer for service requirements.

#### Common engine service parts

Below is a helpful list of common engine service parts that may be necessary for engine maintenance on your machine.

Kubota V3800 74HP Engine:

Fuel Filter:	1K947-43172
Fuel Separator Filter:	1J430-43060
Oil Filter:	HH1CO-32430
Inner Air Filter:	55231-26150
Outer Air Filter:	59700-26112

## General Maintenance

### 2.5 Clutch or Fluid Coupler Service

**Hydraulic Clutch:** Self-adjusting design does not require adjustment. Replace inline hydraulic filter element annually. Refer to the clutch manufacturer's manual for detailed service & lubrication information. Bonnell Industries does not service clutches.

**TransFluid Coupler:** The transfluid coupler is filled from the factory with ISO 32 Oil. When put under extreme load, the oil in the coupler will heat up, and in some cases, the safety relief plug will melt, letting out the oil, and therefore stopping power transfer. **In this case, always replace plug with P/N 7018C. DO NOT USE STANDARD ALLEN HEAD PLUG.** Unit could overheat, and cause severe damage to engine, belts, or coupler.

When refilling oil, rotate inner housing until stamped "X" aligns in top vertical slot of outer housing. Fill inner housing with 5-6 quarts, until oil runs out of plug opening. Replace plug.

### 2.6 Radiator Screen

Your leaf machine is equipped with an auxiliary magnetic radiator pre-screen. This screen assists in keeping the engine radiator clean and the engine cool during operation. This screen needs to be checked regularly for debris buildup. Remove magnetic screen using cloth pull tab and shake to clear debris. **The screen should be checked and cleaned once per hour of use.**



### 2.7 Engine Compartment

The engine cooling fan may cause chaff or debris to build up inside the engine compartment. Regular inspection and cleanout of the engine compartment is necessary to prevent an engine fire.



## General Maintenance

---

### 2.8 Fan

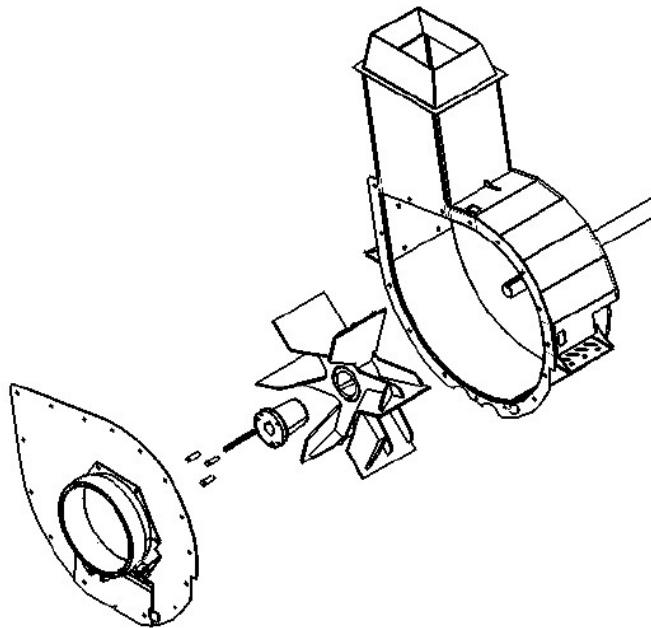
Your leaf machine is equipped with a 30" diameter balanced fan with AR400 impeller blades, mounted to the shaft with a split taper bushing. Inspect the fan regularly for cracks, deformations, and uneven wear. **DO NOT OPERATE THE MACHINE IF THE FAN IS OUT OF BALANCE.**

#### REMOVAL:

- Disconnect safety interlock
- Remove suction hose
- Remove fan cover face plate on inlet side
- Loosen & remove the three bolts on the split taper bushing that hold the fan in place.
- Reinsert the screws into the two tapped holes on the bushing and tighten. This will free the fan from the bushing, and the bushing will slide out.
- Slide fan off of shaft.

#### INSTALLATION:

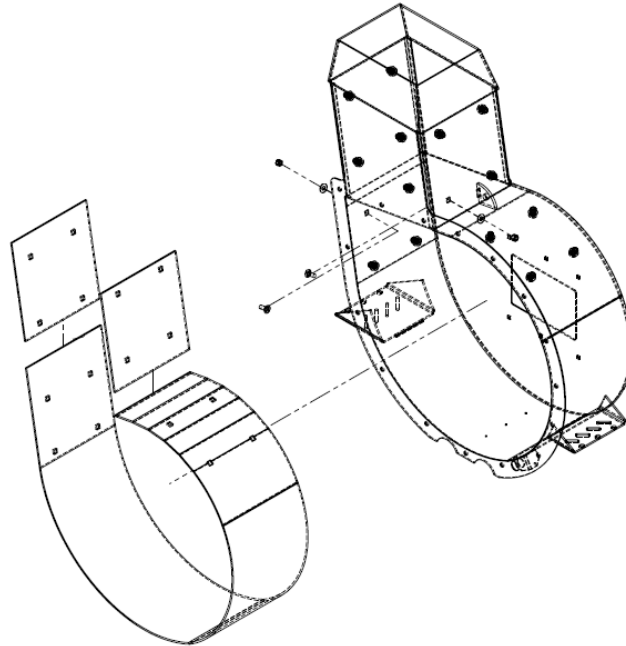
- Clean tapered cone surfaces of taper bushing & fan.
- **NOTE: DO NOT USE ANTISIEZE LUBRICANT ON TAPERED CONE SURFACES OR BOLT THREADS.**
- Slide fan onto shaft, with tapped hole side of fan bushing facing out. Install impeller on shaft as far as possible, with approx..3/8" clearance to back wall.
- Slide split taper bushing onto shaft, insert key, position.
- Install 1/2x2-1/4 grade 8 bolts into tapped holes in coupler.
- Use blue Loctite on bolts.
- Tighten in circular pattern to **82 ft-lbs.** for 1/2" bolts
- Tap collet firmly or use air hammer in between bolts after each tightening.
- Do at least three circular tightening patterns until there is no rotation of the bolts at **82 ft-lbs.** for 1/2" bolts
- Start machine and run fan for several minutes at full RPM.
- Repeat torque procedure after shutting off machine.



## General Maintenance

### 2.9 Blower Housing Liner Removal

To remove the liner from the housing for service or replacement:



- Disconnect safety interlock
- Remove suction hose
- Remove fan cover face plate on inlet side
- Loosen & remove the eight bolts that hold the lower liner in place and four bolts for each upper liner.
- Remove liners.

### 2.10 Body Elbow Liner

- To remove front elbow liner from body, remove four bolts from front and top of body.
- Refer to of this manual for more information.

### 2.11 Suction Hose

To increase the life of the suction hose, the hose should be loosened, removed, and rotated  $\frac{1}{4}$  turn every 40 hours of operation. Inspect liner plate & fan for wear at this time.

### 2.12 Hydraulic System

**FILTER:** The hydraulic filter is equipped with an indicator gauge. Change filter accordingly.

**OIL:** The hydraulic oil should be changed annually.

### 2.13 Dust Control System (If Equipped)

The dust control system is equipped with an 80-mesh strainer screen. Check the screen every 40 hours or as necessary, and clean as needed.

When the machine will be stored or parked in freezing temperatures, the pump and strainer need to be drained. To drain, shut off tank valve, and disconnect right hand pump fitting. Operate pump until line is empty. Shut off pump, and empty strainer canister.

## General Maintenance

---

### 2.14 Grease points

Type of grease: It is recommended that lithium complex grease with a thickness rating of NLGI 2 and operating temperature of -20 – 200 deg. F. be used.

#### Daily:

- Hose arm pivot, 2 pumps each fitting (4 places)

#### Weekly:

- Transfluid coupler output shaft bearing (if equipped), 2 pumps

#### Every 100 hours:

- Hydraulic clutch bearings (if equipped), 20 pumps
- Hydraulic clutch shaft bearings (if equipped), 20 pumps
- Hooklift rear roller axles, 1 pump

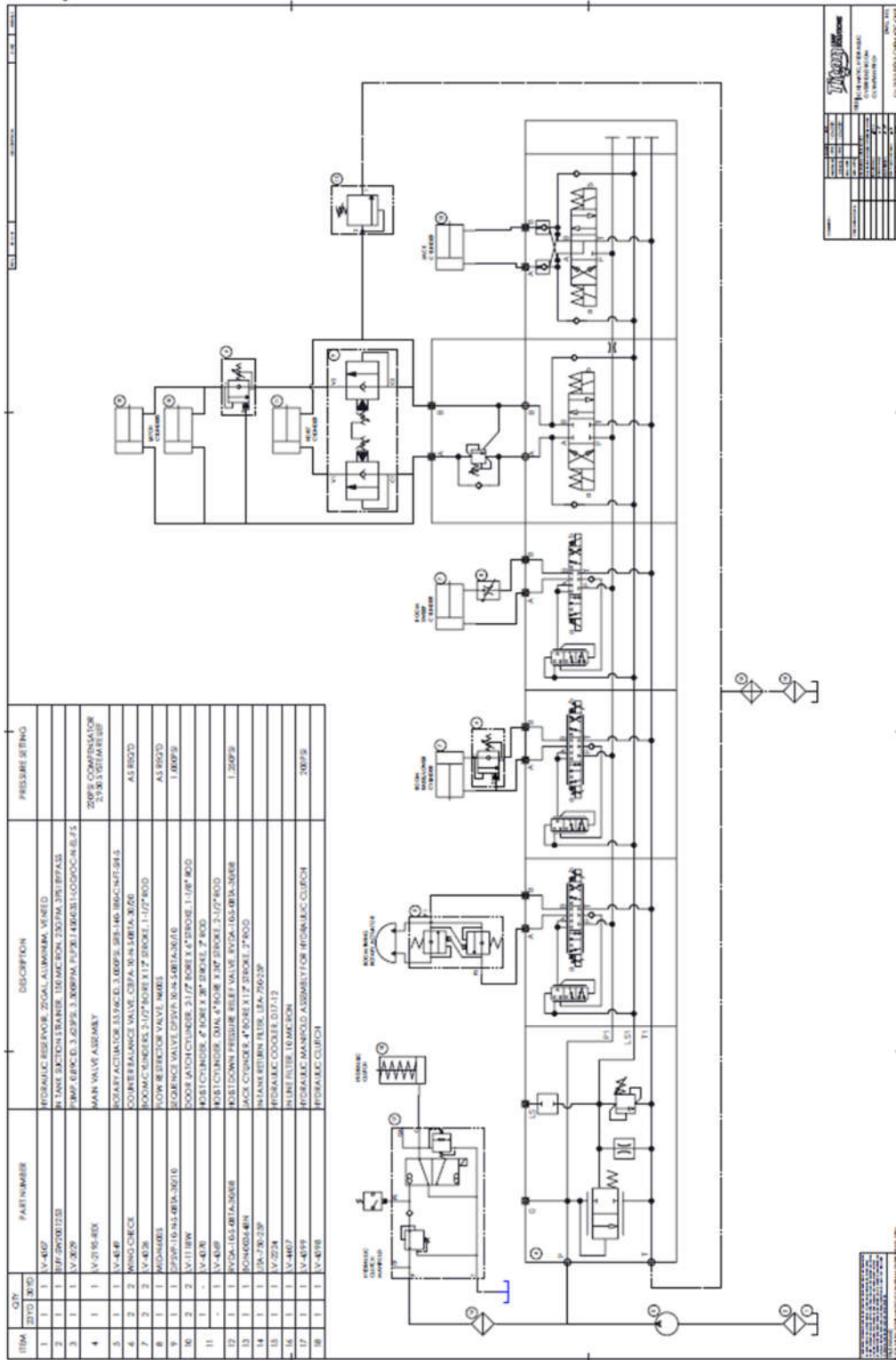
### 2.15 Cleanout Door

- Remove 3 lower bolts to swing open cleanout door.
- Clean out inside of blower housing and reassemble.



### 3. Hydraulic Schematics

#### 3.1 Main Hydraulic Schematic

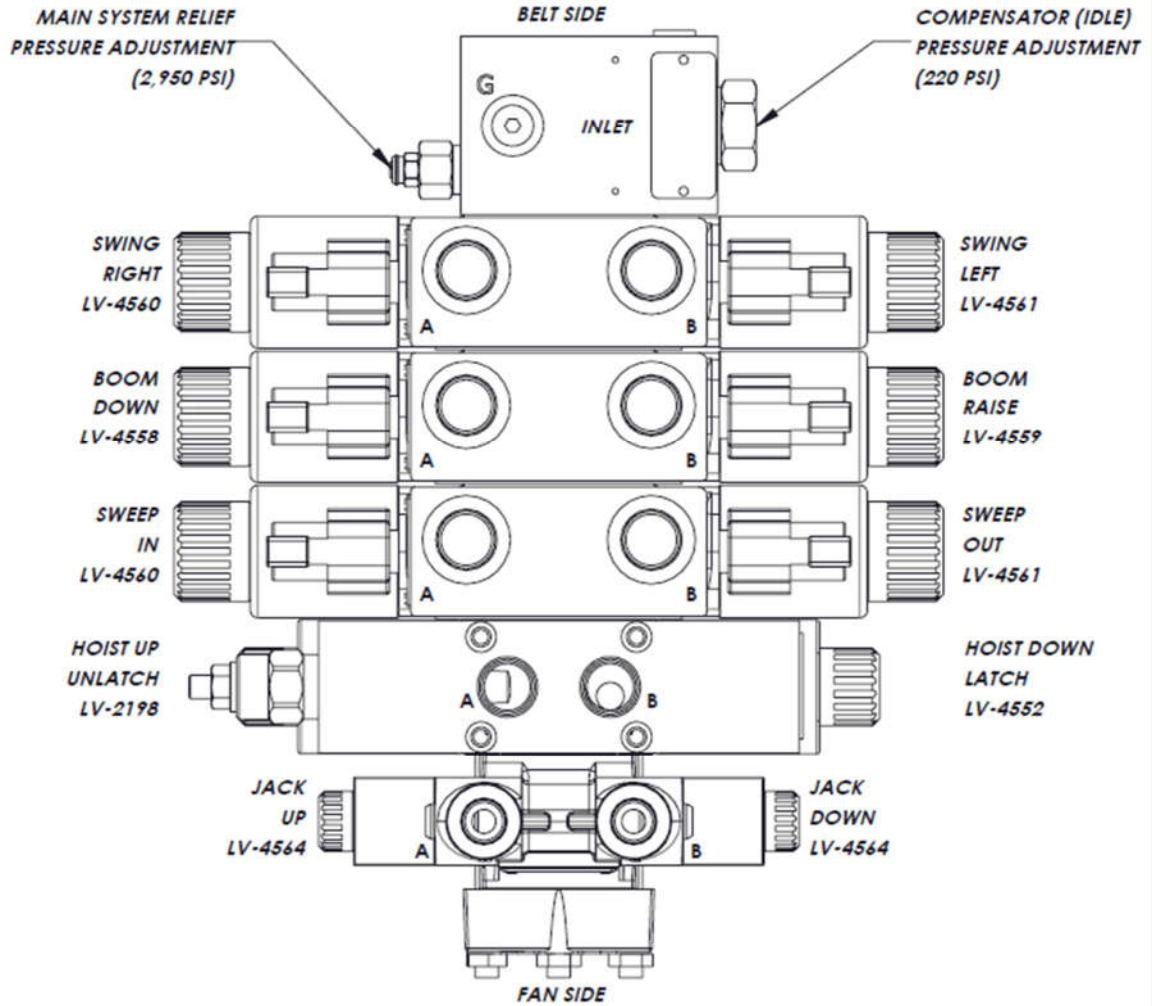




# Hydraulic Schematics

## 3.2 Main Valve Layout

FILE NAME	Main Valve Layout - Olympian
DWG NAME	MAIN VALVE



**VIEWED FROM THE BOTTOM  
LOOKING UP**

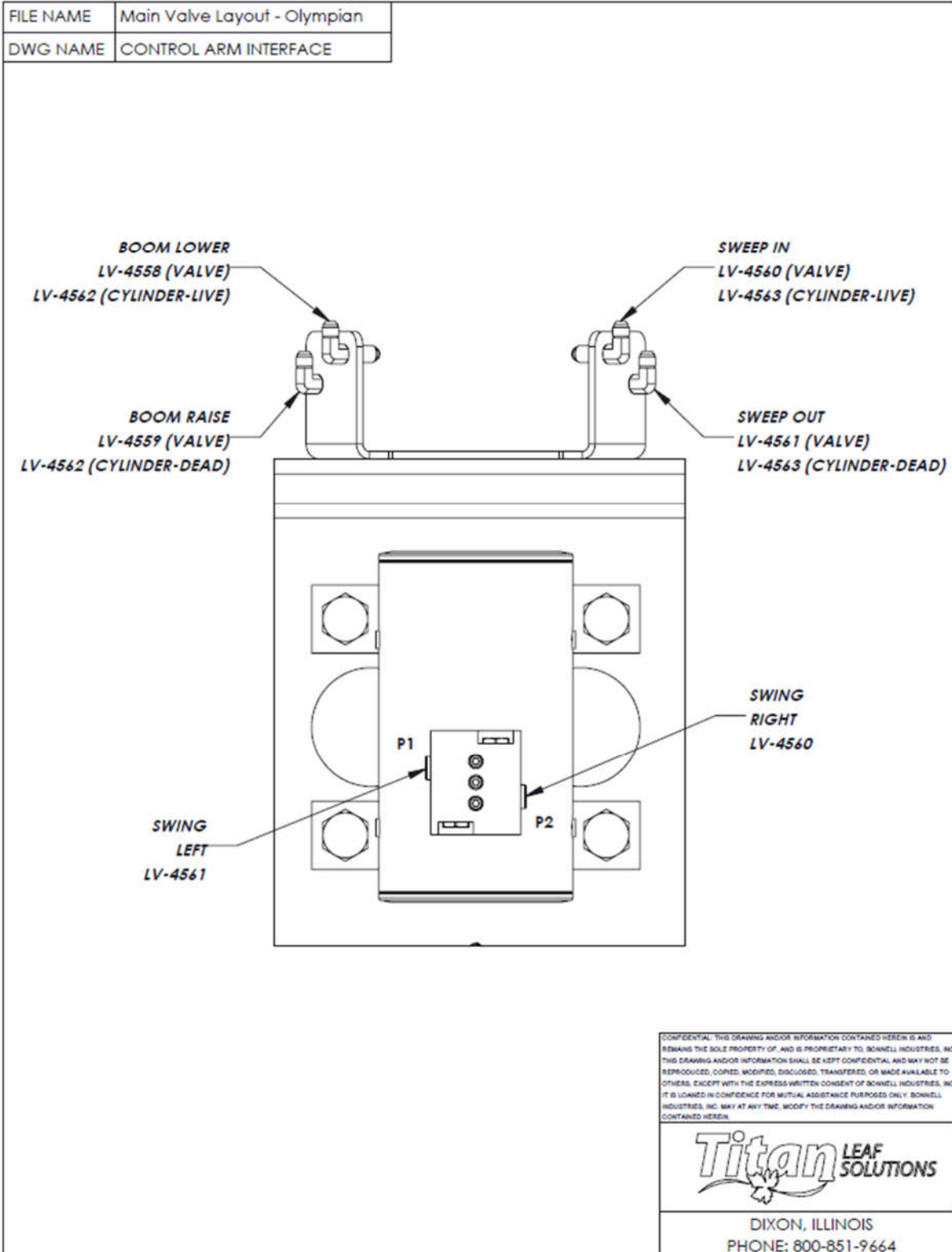
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DIXON, ILLINOIS  
PHONE: 800-851-9664

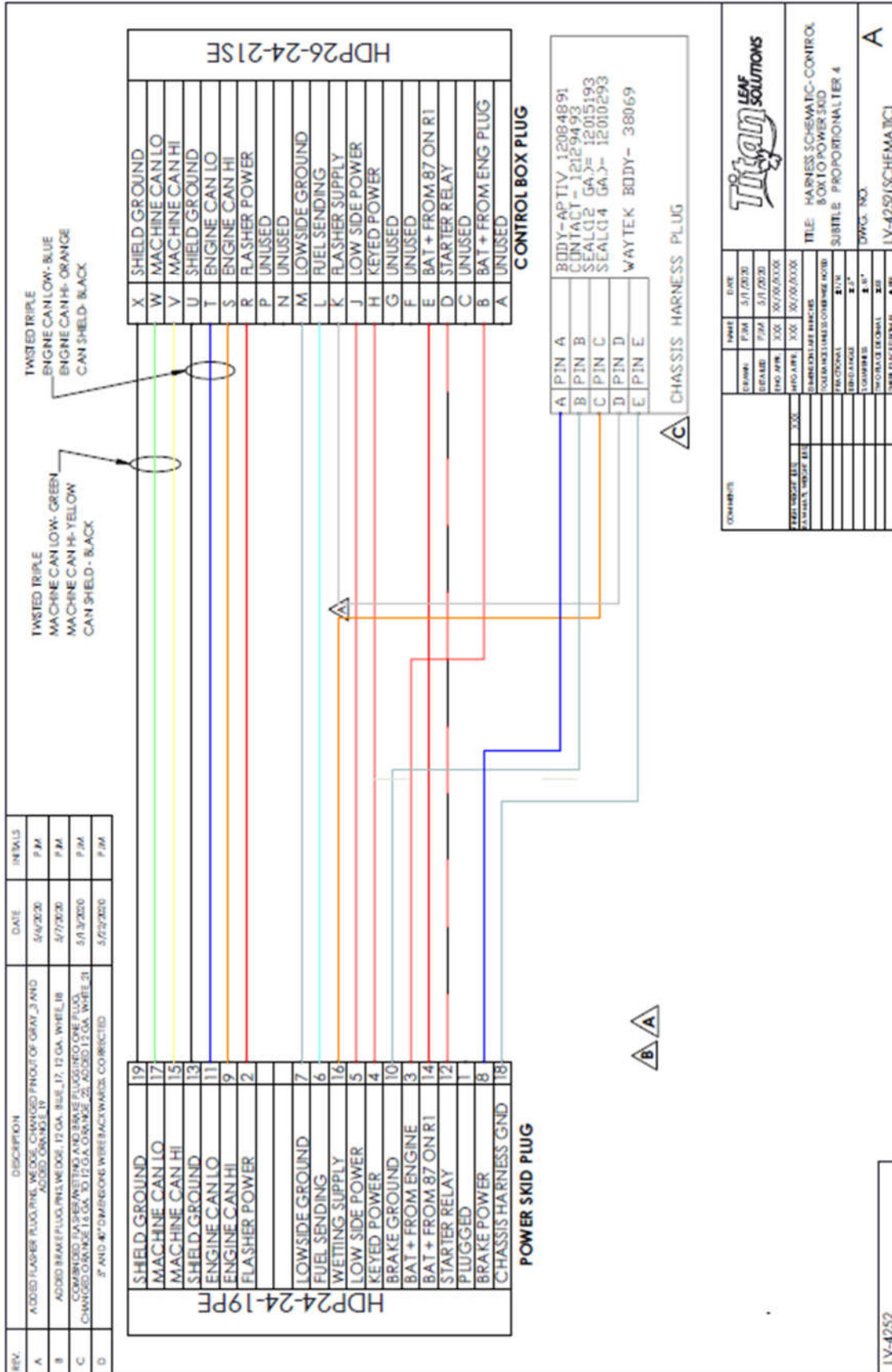
# Hydraulic Schematics

## 3.3 Control Arm Interface Layout





## 4.2 Control Box Extension Harness



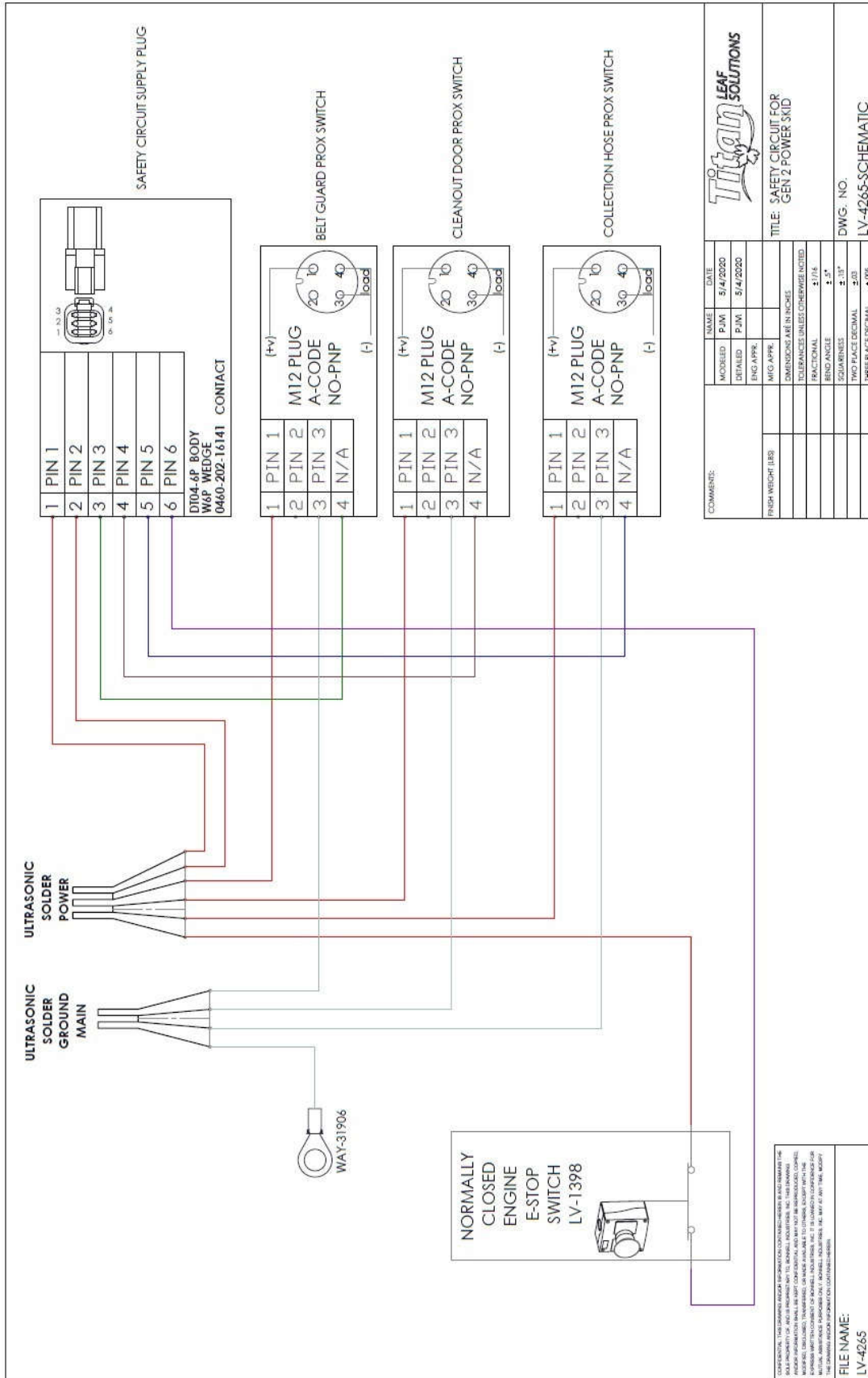






# Electrical Schematics

## 4.5 Safety Circuit Harness



**Titan LEAF SOLUTIONS**

TITLE: SAFETY CIRCUIT FOR GEN 2 POWER SKID

DWG. NO. LV-4265-SCHEMATIC

NAME	DATE
MODELED P/JM	5/4/2020
DETAILED P/JM	5/4/2020
ENG APPR.	
MFG APPR.	

FRONT WEIGHT (LBS)

DIMENSIONS ARE IN INCHES

TOLERANCES UNLESS OTHERWISE NOTED:

FRACTIONAL ± 1/16"

BEND ANGLE ± .5°

SQUAREDNESS ± .13"

TWO PLACE DECIMAL ± .03

THREE PLACE DECIMAL ± .005

COMMENTS:


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FILE NAME: LV-4265

# Electrical Schematics

## 4.6 E-Stop Wiring Assembly

FILE NAME	LV-1398 WIRING ASSY	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	LV-1398 WIRING ASSY	-	ORIGINAL	11/30/2020	LAJ



LV-1398


IF WIRING THRU BACK SIDE  
DRILL 1/2" HOLE.

**TERMINAL BLOCK 1 & 2**  
NORMALLY CLOSED  
(USE EITHER BLOCK)  
-OLYMPIAN (ALL MODELS)


**TERMINAL BLOCK 3**  
NORMALLY OPEN  
-TITAN (ALL MODELS)  
-SPARTAN (ALL MODELS)

**FASTENING HARDWARE:**  
(OPPOSITE CORNERS ONLY)  
6-32 X 1" MACHINE SCREW  
6-32 NUT WITH STAR WASHER  
(3/16" DRILL)


WAY-24594  
STRAIGHT CORDGRIP



REPLACE ONLY E-STOPS WITH GREY BASES  
(E-STOPS WITH BLACK BASES DO NOT NEED REPLACED)



WAY-24612  
Locknut



**EXAMPLE ONLY: TERMINAL BLOCK 3**  
NORMALLY OPEN  
-TITAN (ALL MODELS)  
-SPARTAN (ALL MODELS)  
(USE BLOCK 1 OR 2 FOR OLYMPIAN)

**E-STOP INSTALLATION INSTRUCTIONS:**

**If wiring from the back:**

- Drill 1/2 hole as shown.


**If wiring from side:**

- Use knockout and install fittings as shown.

**Fastening E-Stop to mounting surface:**

- Transfer hole pattern (Opposite corners only)
- If field install - use one existing hole if possible.
- Drill 3/16" holes.
- Mount with 6-32 x 1" machine screws & nuts with star washers.

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**BONNELL INDUSTRIES INC**  
TRUCK & ROAD EQUIPMENT

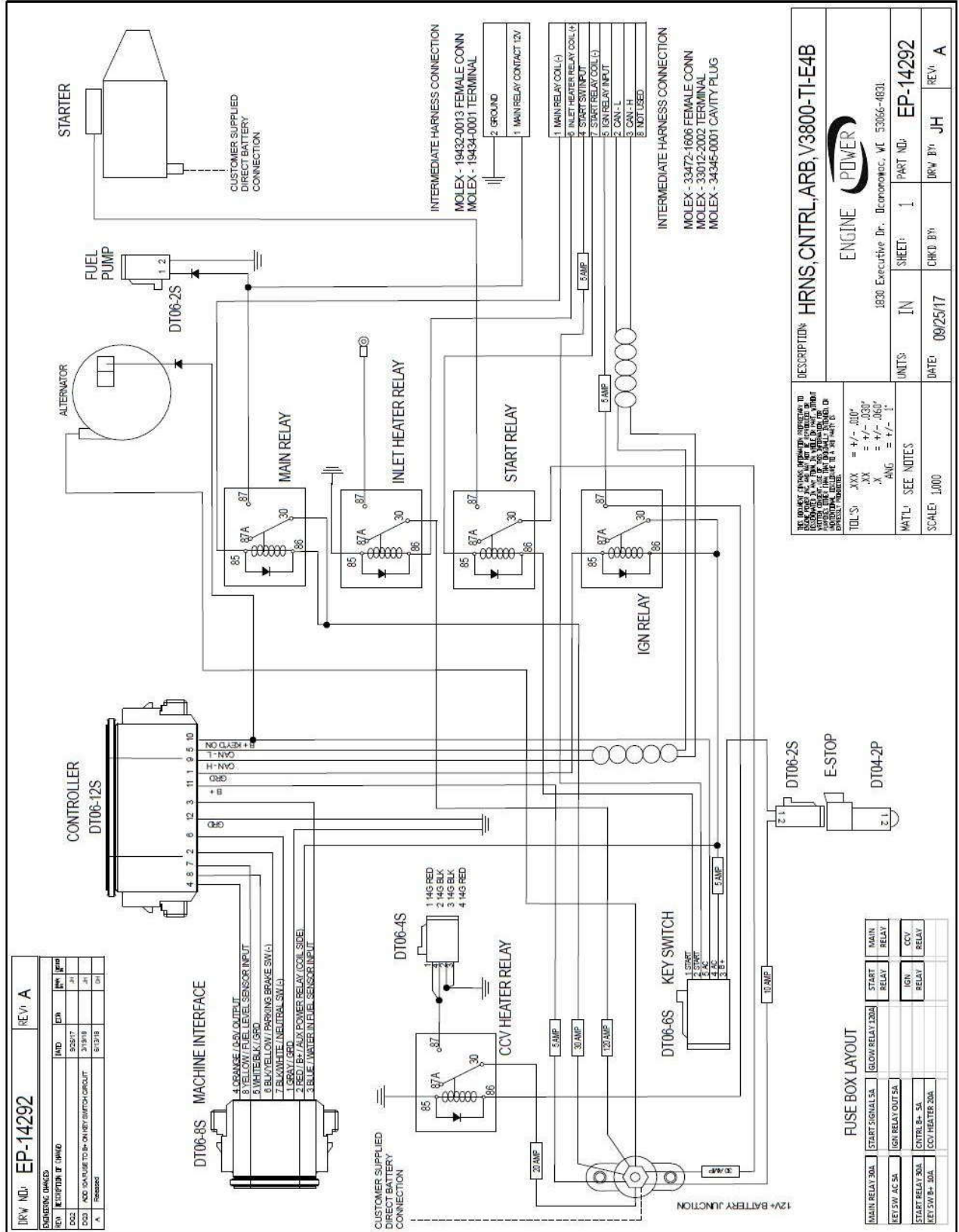
DIXON, ILLINOIS  
PHONE: 800-851-9664





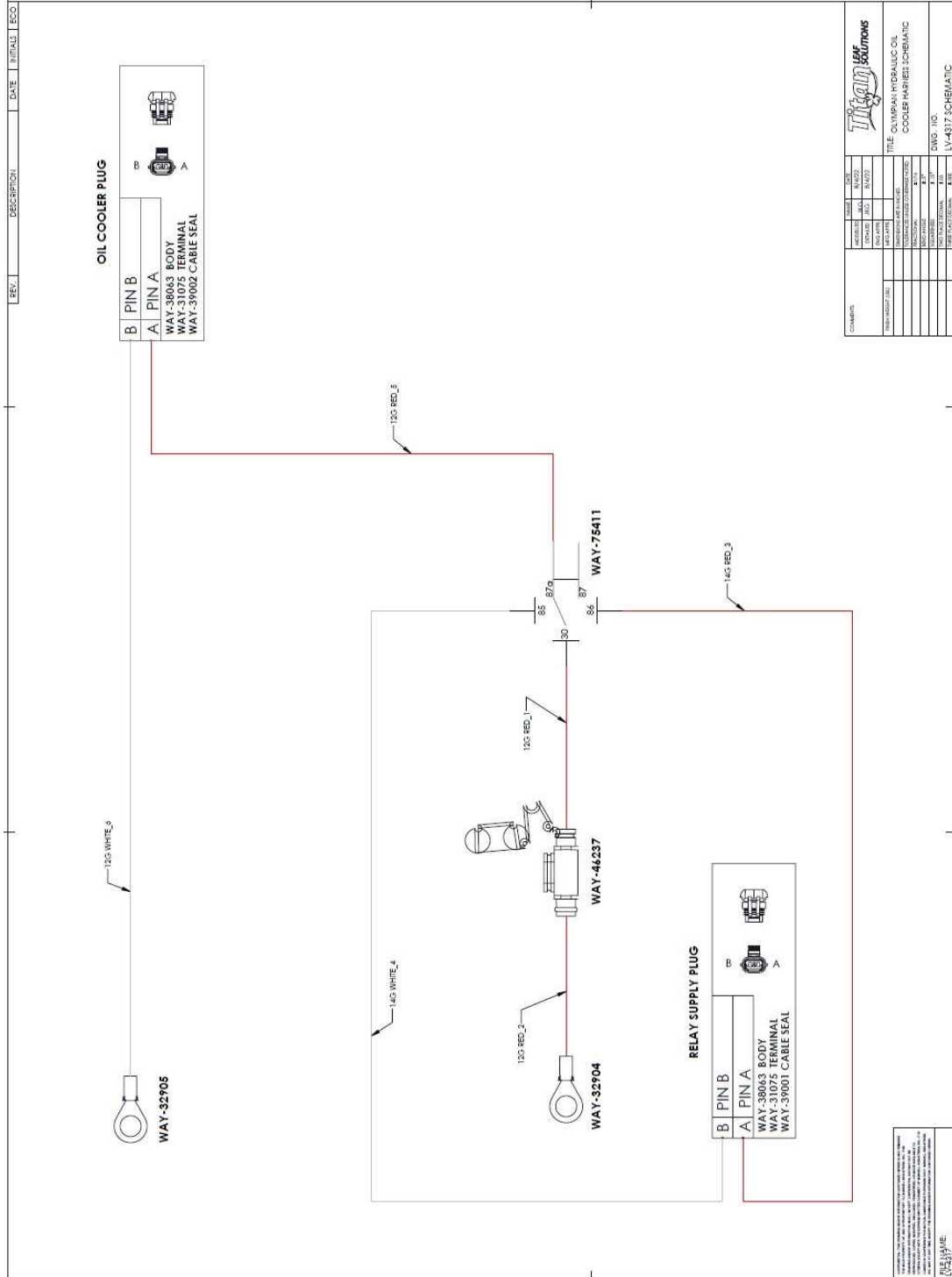
# Electrical Schematics

## 4.8 Kubota 74hp Tier 4 Engine Harness

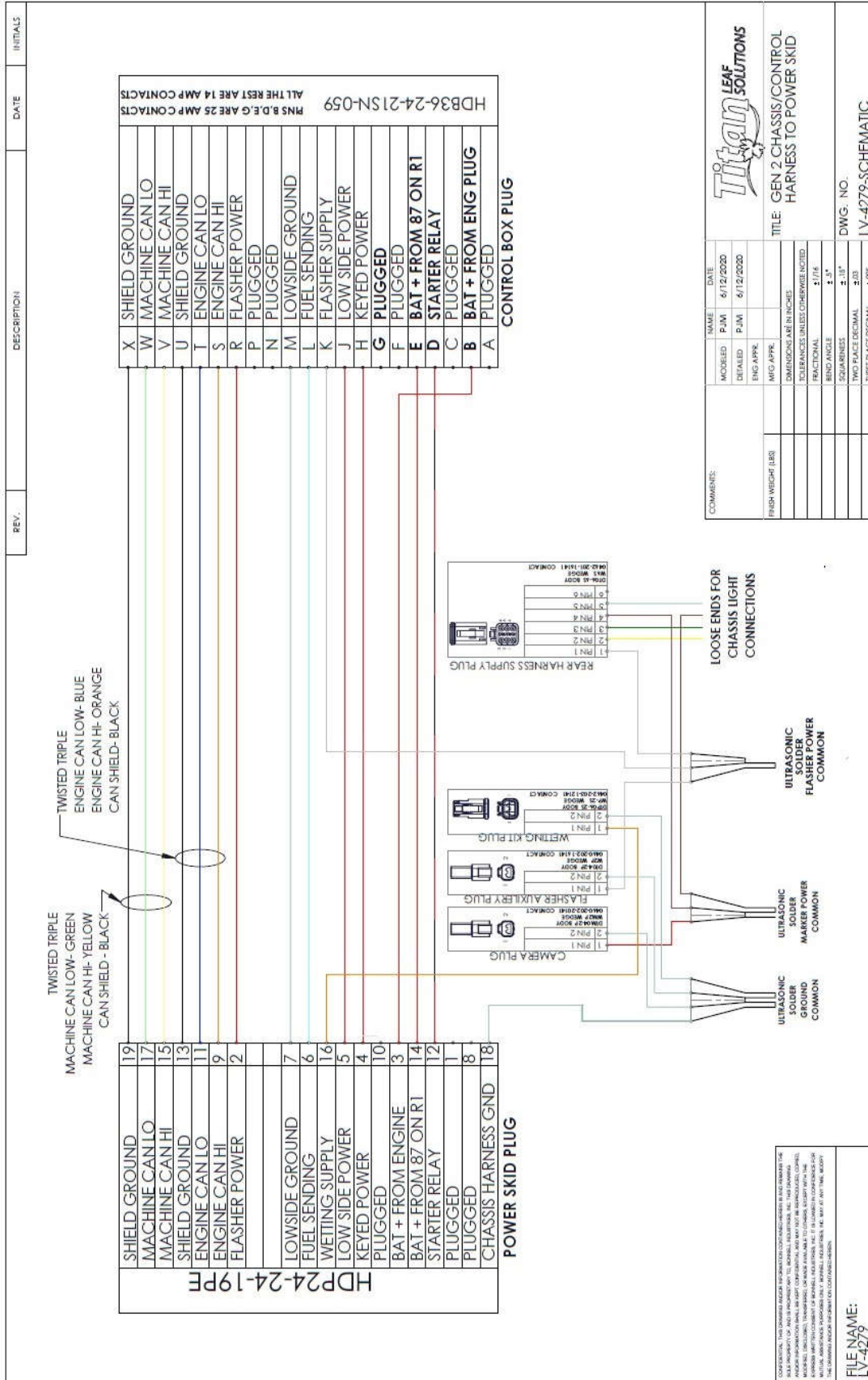


DESCRIPTION: HRNS, CNTRL, ARB, V3800-TI-E4B	
ENGINE POWER	
1830 Executive Dr., Danvers, VT 05645-4831	
UNITS: IN	SHEET: 1
DATE: 09/25/17	PART NO: EP-14292
SCALE: 1:000	CHKD BY: JH
	REV: A

## 4.9 Oil Cooler Harness



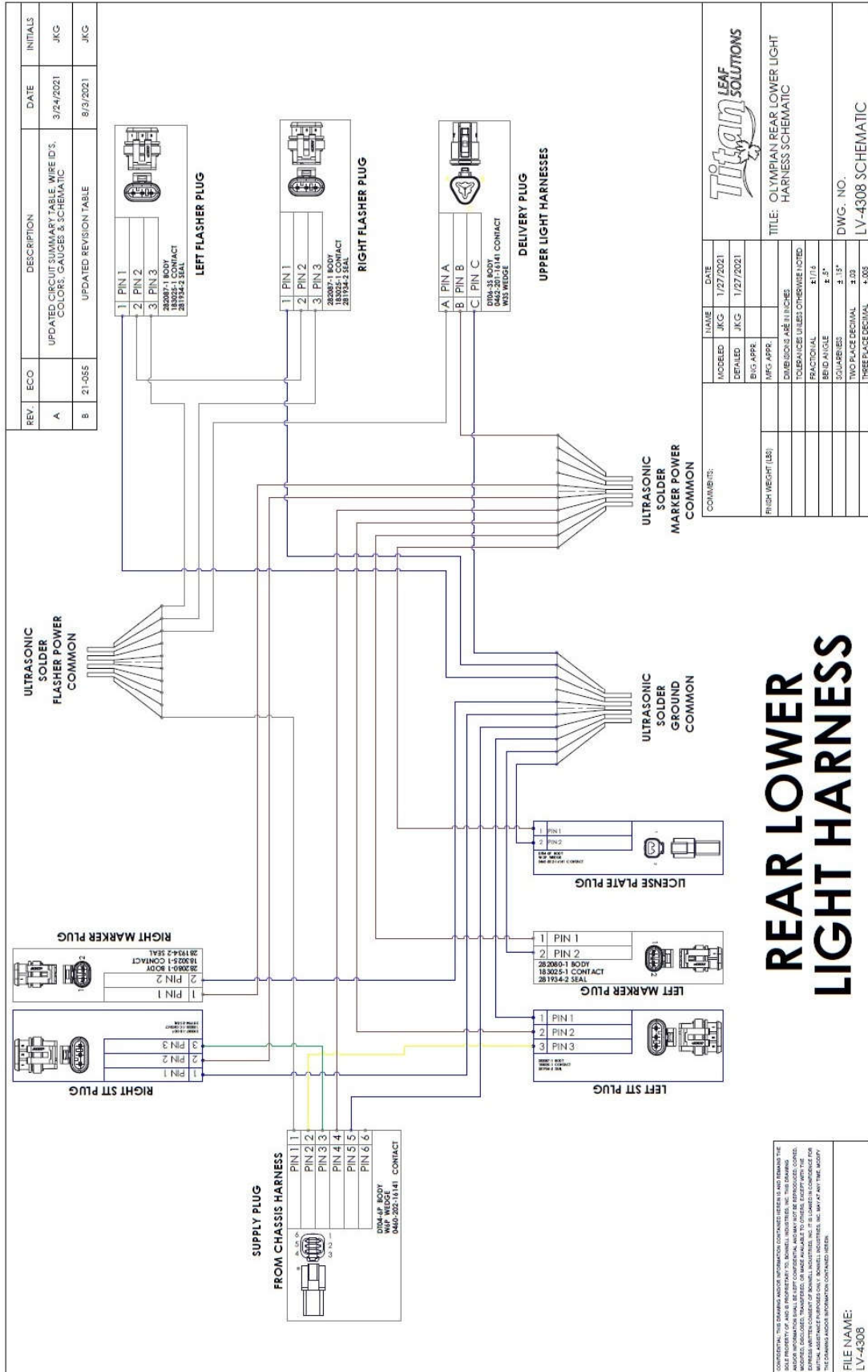
## 4.10 Chassis Harness



**FILE NAME:**  
LV-4279

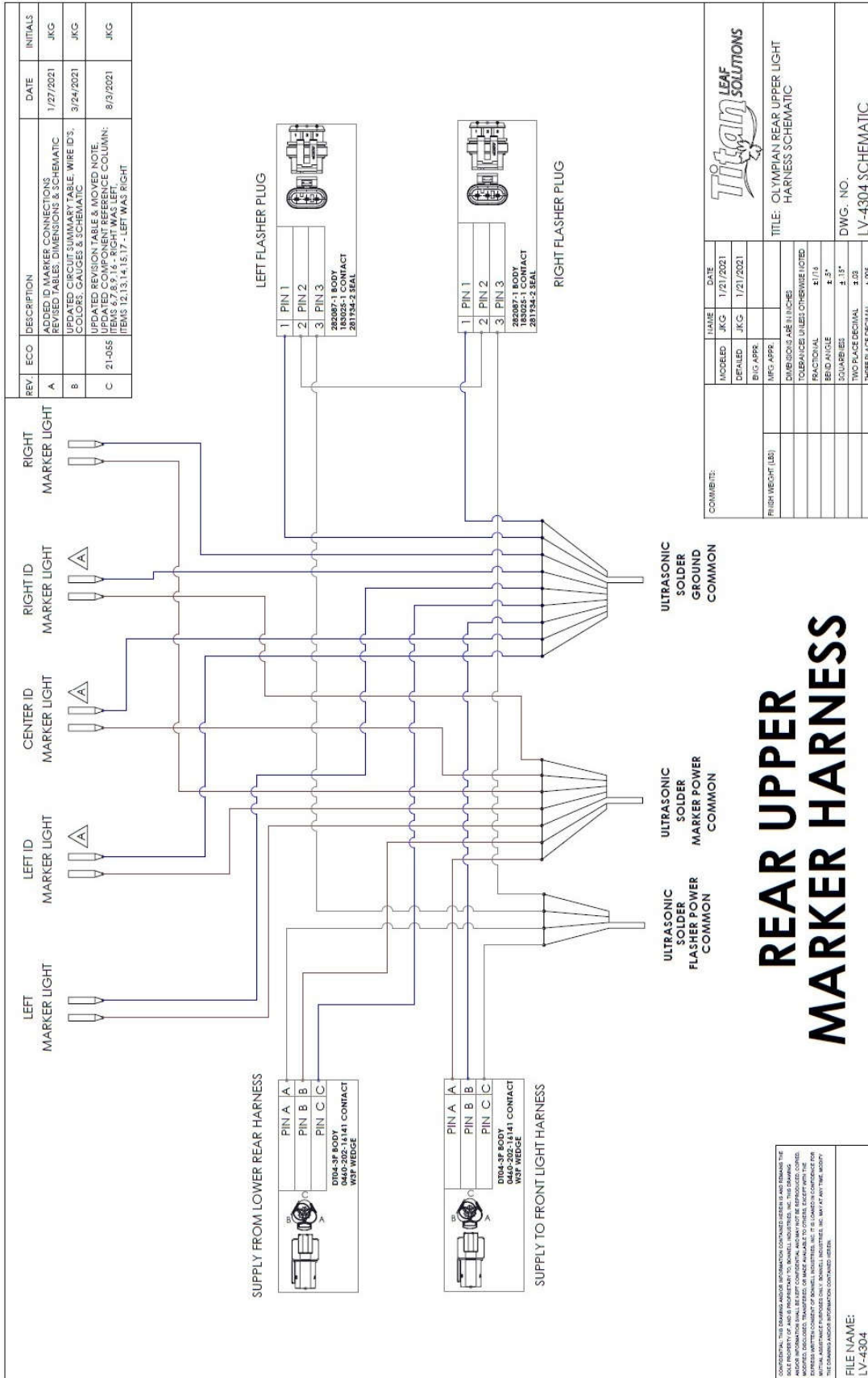
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4.11 Lighting Harness, Body Rear Lower

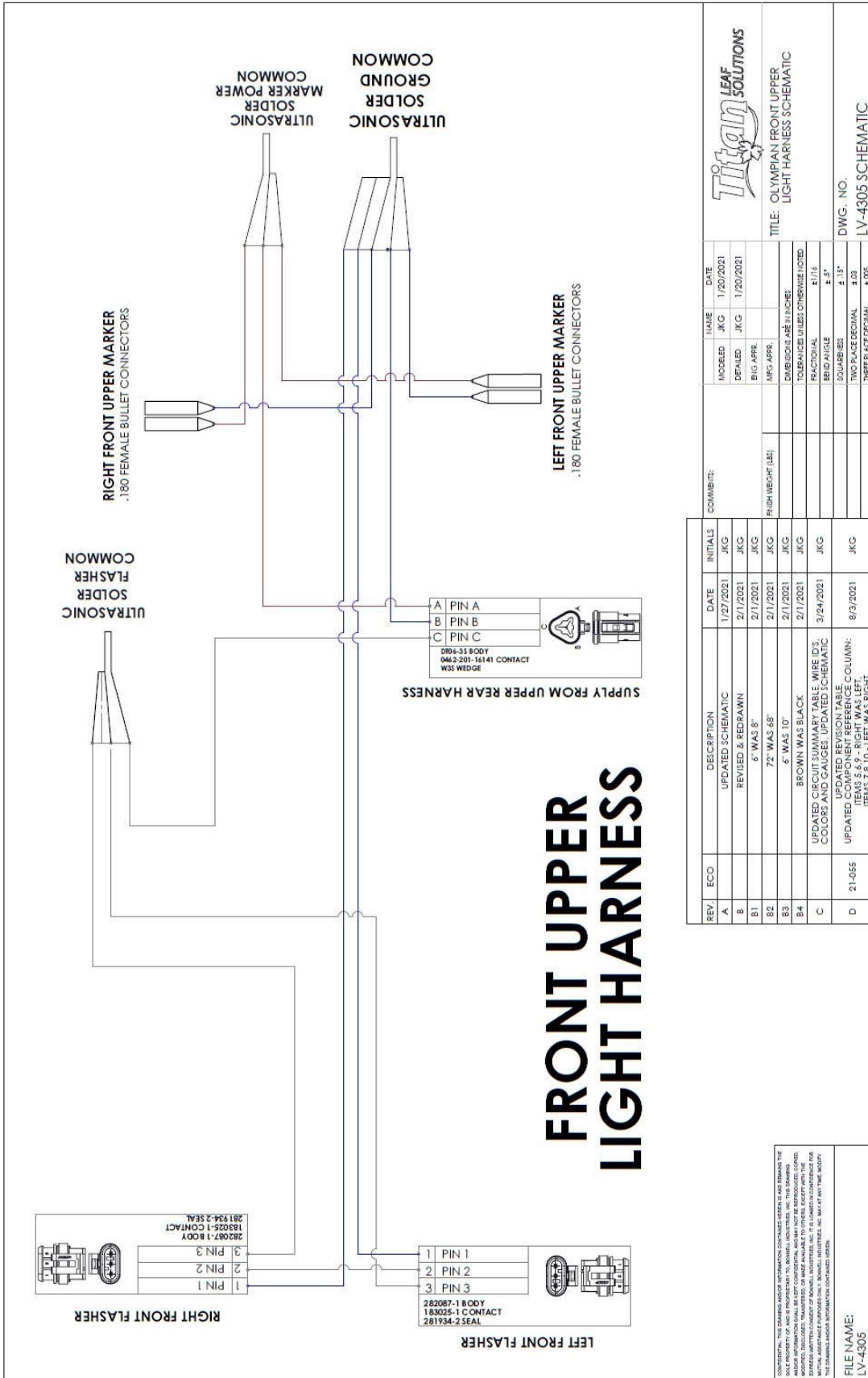




4.12 Lighting Harness, Body Rear Upper



4.13 Lighting Harness, Body Front Upper



REV.	ECO	DESCRIPTION	DATE	INITIALS	COMMENTS:
A		UPDATED SCHEMATIC	1/27/2021	JKG	
B		REVISED & REDRAWN	2/17/2021	JKG	
B1		6" WAS 8"	2/11/2021	JKG	
B2		72" WAS 66"	2/17/2021	JKG	FINISH HEIGHT (IN)
B3		6" WAS 10"	2/17/2021	JKG	TOURNAISE UNLESS OTHERWISE NOTED
B4		BROWN WAS BLACK	2/17/2021	JKG	FRACTIONAL ± 1/16
C		UPDATED CIRCUIT SUMMARY TABLE, WIRE ID'S, COLORS AND GAUGES, UPDATED SCHEMATIC	3/24/2021	JKG	BEND ANGLE ± .5°
D	21-065	UPDATED REVISION TABLE, WIRE ID'S, COLORS AND GAUGES, UPDATED SCHEMATIC, ITEMS 5 & 9 - RIGHT WAS LEFT, ITEMS 7 & 10 - LEFT WAS RIGHT	8/3/2021	JKG	SQUARENESS ± .15° TWO PLACE DECIMAL ± .03 THREE PLACE DECIMAL ± .005

MODIFIED	JKG	1/20/2021
DETAILED	JKG	1/20/2021
BY	JKG	
DATE	JKG	
BY	JKG	
DATE	JKG	

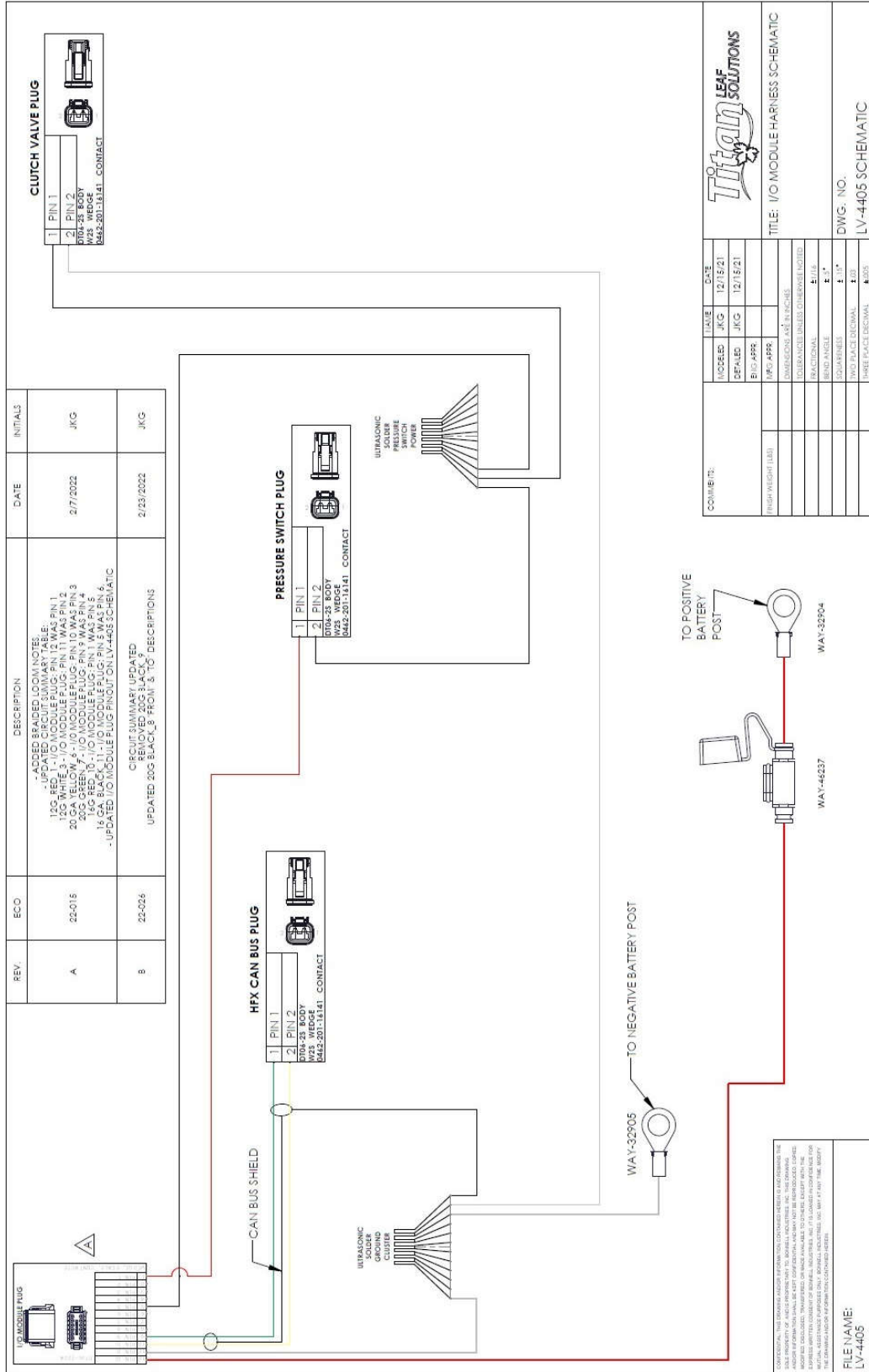
TITLE: OLYMPIAN FRONT UPPER LIGHT HARNESS SCHEMATIC	
DWG. NO. LV-4305 SCHEMATIC	

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FILE NAME:  
LV-4305

# Electrical Schematics

## 4.14 I/O Expansion Module Harness





## General Operating Instructions

### 5. General Operating Instructions

**SPECIAL NOTE:** this section of the manual is intended as a supplement to your specific municipal or business guidelines in leaf collection, and is not intended to be a “complete leaf collection guide”. Training is the key to safe and proper operation of this equipment. Ensure your operation is in compliance with all applicable codes and regulations.

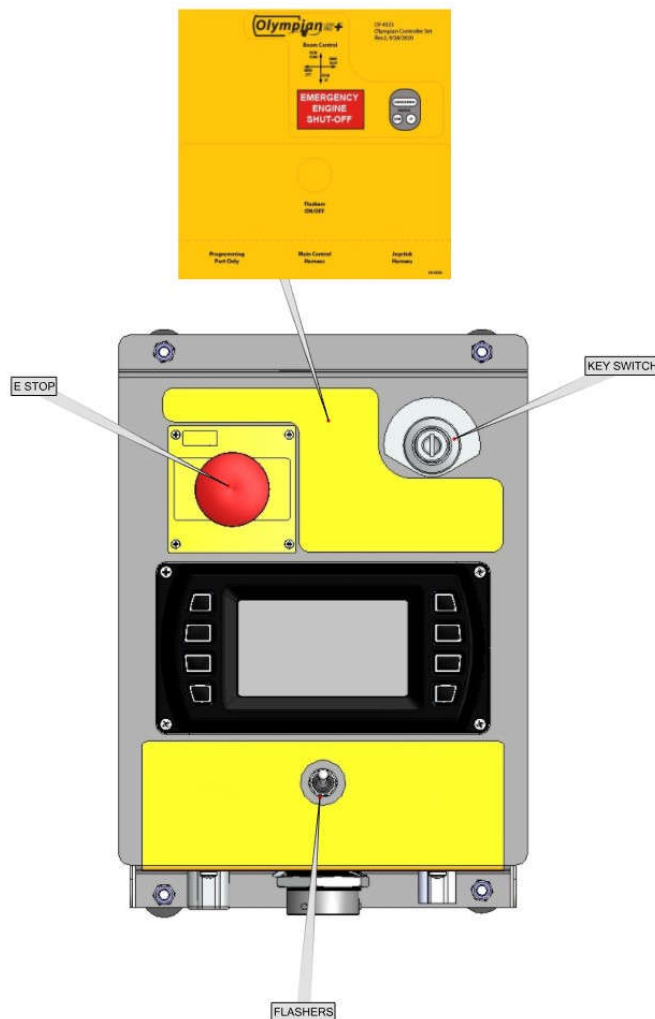
#### 5.1 Prestart Checklist

<b>PRESTART CHECKLIST</b>	
✓ INSPECT TIRES	✓ INSPECT HOSE
✓ ENGINE OIL & FUEL LEVELS	FOR WEAR
✓ CHECK ALL LIGHTS	✓ PICK-UP HOSE SECURE
✓ HYDRAULIC OIL LEVEL	✓ CHECK BELT TENSION
✓ WATER LEVEL	✓ ALL GUARDS IN PLACE
	✓ DISENGAGE CLUTCH

#### 5.2 Control Panel Operation

The control panel assembly contains the PV450 display, key switch and E stop.

1. Turn ignition key to the ON position.
2. Turn ignition key to start the engine.
3. Flip the toggle switch to turn the flashing lights on/off.



# General Operating Instructions

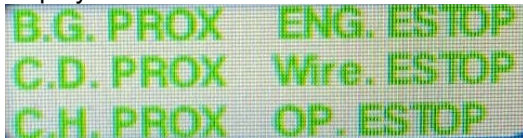
## 5.3 Safety Circuit Operation

The safety circuit is comprised of safety sensors and emergency stop switches. Whenever a safety sensor or e-stop switch is activated all machine functions will be stopped and the engine will shut down. When a safety condition is encountered the control panel will display the message "SAFETY CIRCUIT FAULT!".

It can be determined which safety sensor or E-stop has been activated by viewing the diagnostic menu. Press the softkey shown below to access the diagnostics menu.



A list of safety components is shown within the diagnostics menu. The component causing the fault will be displayed in red.



- B.G. PROX = Belt guard safety sensor
- C.D. PROX = Cleanout door safety sensor
- C.H. PROX = Collection hose safety sensor
- ENG. ESTOP = Engine E-stop switch
- Wire. ESTOP = Wireless controller E-stop
- OP. ESTOP = Operator E-stop switch

When a safety circuit fault has occurred the cause of the fault will need to be addressed before the machine can be operated again.

To clear the fault for e-stop activations, the e-stop switch must be reset by twisting the red button until it pops out, and then recycling the control system power by turning the ignition key switch off and back on again.

To clear the fault for safety sensor activations, the associated guard or cover must be returned to its intended operating position. The guard or cover is in the correct position when the base of the safety sensor is lit. The engine can then be restarted and operation may continue.

SAFETY SENSOR  
BASE IS NOT ILLUMINATED -  
SYSTEM WILL NOT FUNCTION



SAFETY SENSOR  
BASE IS ILLUMINATED -  
SYSTEM WILL FUNCTION



## General Operating Instructions

### 5.4 Hydraulic Clutch

Softkeys are provided on the control panel for engaging & disengaging the hydraulic clutch. The engine throttle will automatically be reduced to idle speed when the clutch is engaged or disengaged. After 5 seconds the engine can be manually throttled up to the desired RPM.



#### Engage Clutch:

Press and hold the clutch engage softkey for one second. The engine throttle will automatically reduce to idle speed. The clutch will engage and the clutch engaged indicator will be displayed.



CLUTCH ENGAGED

#### Disengage Clutch:

Press the clutch disengage softkey. The engine throttle will automatically reduce to idle speed. The clutch will disengage and the clutch disengaged indicator will be displayed.



CLUTCH DISENGAGED

#### Clutch Adjustment:

The hydraulic clutch is a self-adjusting design which does not require adjustments.

# General Operating Instructions

---

## 5.5 Joystick Operation

The collection boom is equipped with two hydraulic cylinders for up & down and sweep angle movements. Boom is supplied with a hydraulic rotary actuator for left & right swing operation. These controls will provide the range of motion needed to operate on varying terrain and conditions.

- Raise Boom – depress trigger and pull joystick towards the operator
- Lower Boom – depress trigger and push joystick away from the operator
- Swing Left - depress trigger and move joystick to the operator's left
- Swing Right – depress trigger and move joystick to the operator's right
- Sweep Angle – depress trigger and move the thumb control left or right

The engine throttle controls are controlled by the joystick buttons.

- Throttle down – depress trigger and press and hold the throttle down button until desired RPM is achieved
- Throttle up – depress trigger and press and hold the throttle up button until the desired RPM is achieved

Note: For machines equipped with a hydraulic clutch, when engaging or disengaging the clutch, the engine throttle will automatically be reduced to idle speed. After 5 seconds the engine can be manually throttled up to the desired RPM.



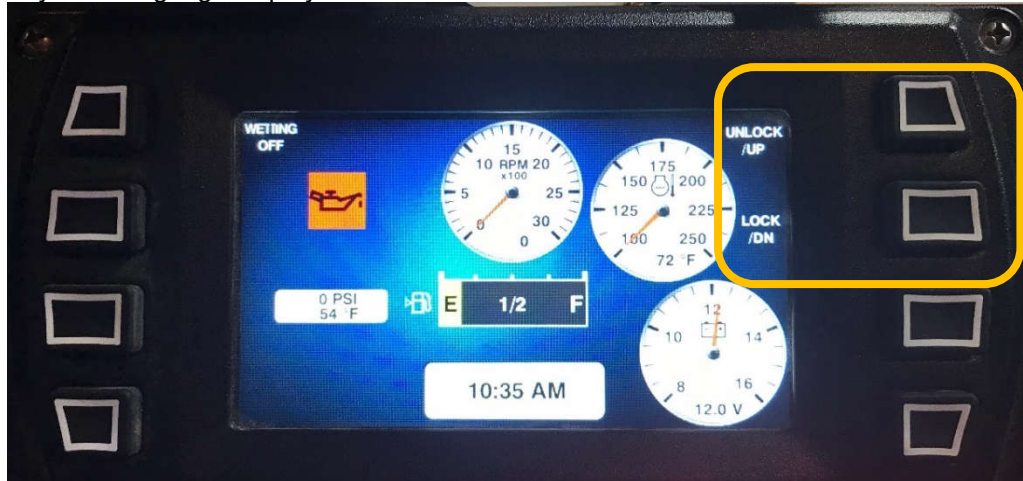
## General Operating Instructions

### 5.6 Engine Rpm

Adjust engine RPM to match working conditions. Generally, lower RPM is better for dryer and dusty conditions. However, engines will have greater vibrations at certain rpms that vary by engine. For example, the vibration of the engine may be higher at 2000 rpm than it is at 2200 rpm. Never collect leaves while the engine is running in idle.

### 5.7 Dump procedures

1. Release the tailgate latches. The body latches are operated using the two upper right softkeys on the gauge display:



2. Turn off the leaf vacuum engine. If the skid is lifted with the engine running, safety switches will kill ignition to the leaf vacuum engine.
3. Raise the body to dump material from the body.
4. Completely lower the body to its "home" position.
5. Start the Leaf vacuum engine and secure the tailgate latches before truck is put in drive. Failure to perform this step will allow the door to swing freely while the truck is moving.

For additional hooklift instructions, please refer to the hooklift manual.

#### **Danger**

**Crush, pinch, and overhead clearance hazard!** Assure that all people and equipment are in the clear when raising the hoist! Also be aware of overhead obstructions such as power-lines. Failure to do so could result in severe injury or death.

#### **WARNING**

**Do not back up while dumping.** Failure to follow this procedure may cause severe damage to the body or tailgate.



## General Operating Instructions

### 5.8 PV450 adjustments

Refer to supplemental controller manual, part number LV-2637. Contact Bonnell Industries to obtain a copy.



### 5.9 Arm Storage

- To remove the arm from the storage position, remove the safety tie up chain from the nozzle of the collection hose.



- Lift using the joystick, lift the arm up before rotating the arm away from the body.
- To store the arm, rotate the arm until it is next to the body and lower it onto the storage bracket.
- The safety chain should be attached to the collection hose any time the unit is in transit.

## General Operating Instructions

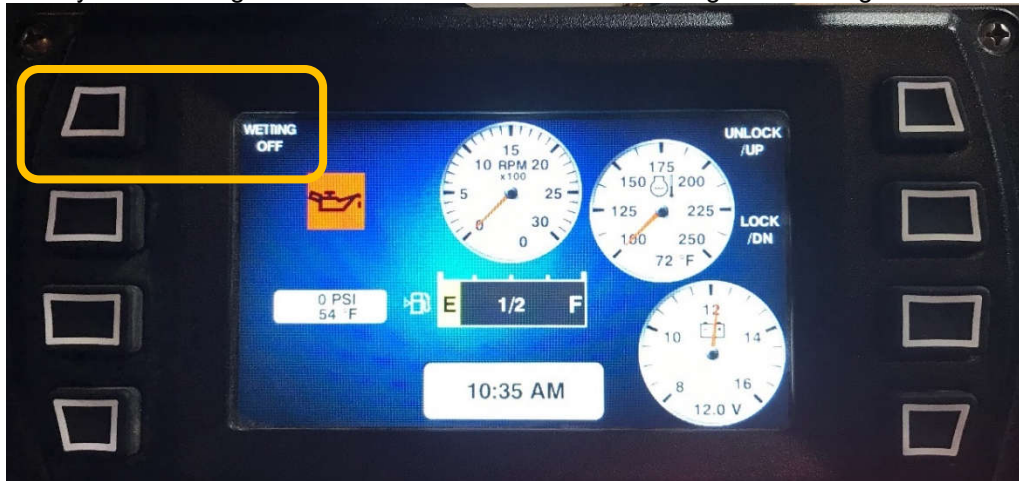
### 5.10 Inspection and Debris Control

It is imperative that all components on the chassis and leaf vacuum be inspected regularly, and that debris removal is performed on a regular basis.



### 5.11 Dust Control system (if equipped)

The dust control system is operated using the upper left softkey on the gauge display. The dust control system is designed to reduce the amount of dust exiting the discharge nozzle.



The dust control system consists of:

- 100 gallon water tank(s)
- Electric pump
- Strainer
- 8 spray nozzles located in the discharge chute that apply water to the debris as it passes through.

The dust control screens should be cleaned each time the water tank is refilled. To clean the screens, open both rear covers. Unlatch the screens allowing them to rotate to the vertical position and then hose the debris off the screens. Return the screens to the horizontal position and re-latch. Close both rear covers.

## General Operating Instructions

### 5.12 Operating Rear Door Prop

Always use door prop when accessing body.

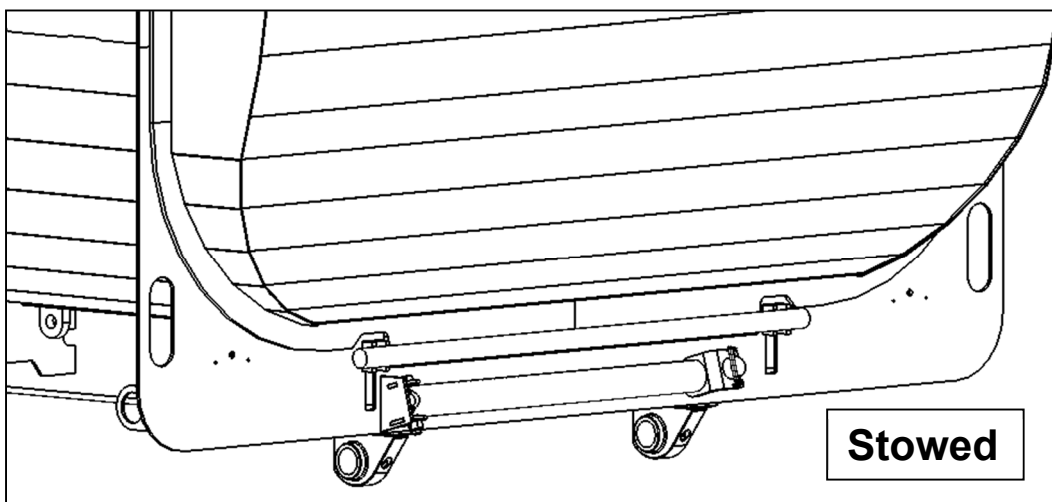
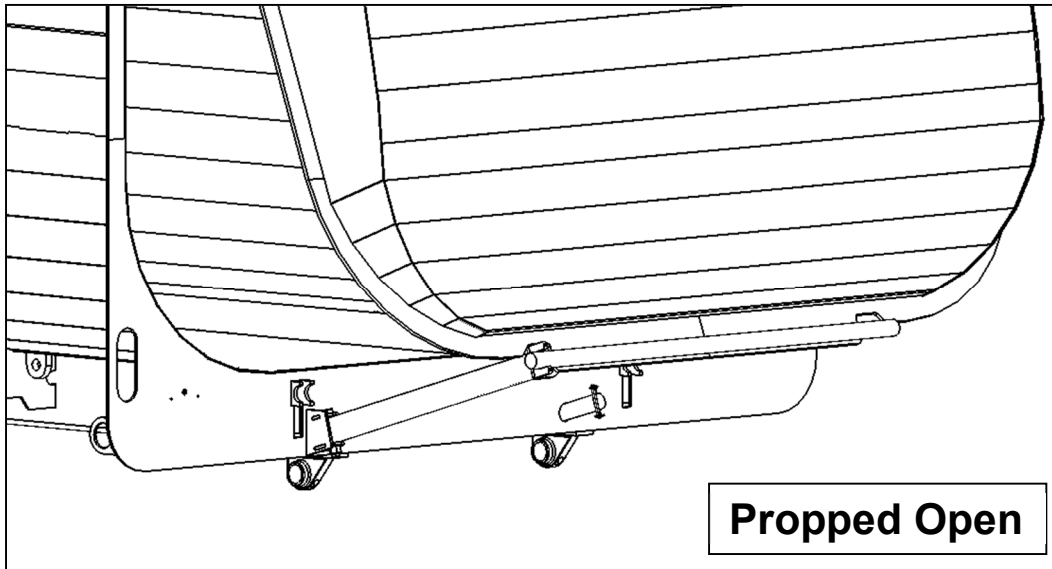
#### **⚠ Caution**

##### TO USE DOOR PROP:

- Raise body to height where rear door swings open on its own.
- Unpin the prop, swing it out, and insert into door cutout as shown.

##### TO STOW THE PROP:

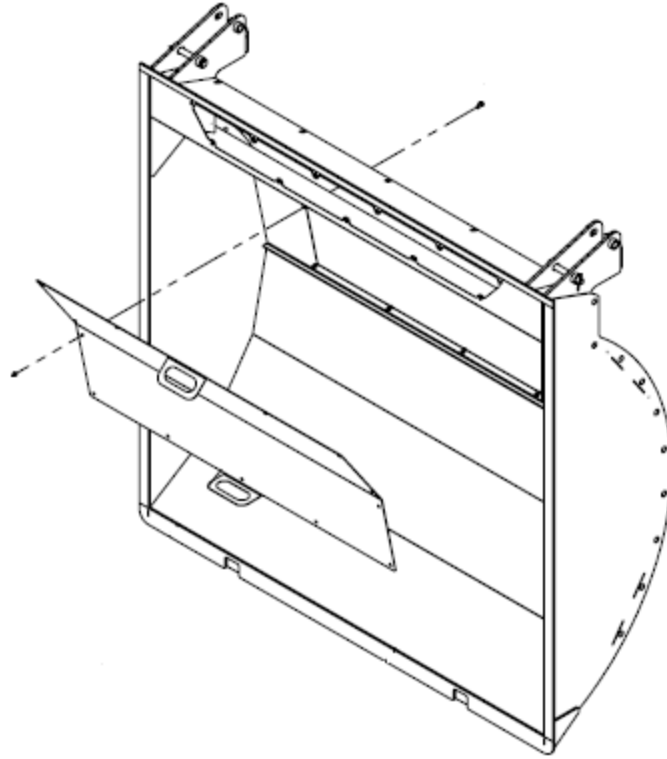
- Push door open and remove prop from door cutout.
- Swing prop in and re-insert pin to keep the prop in place.



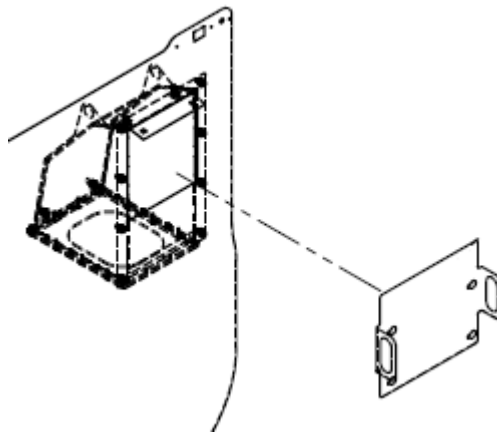
## General Operating Instructions

### 5.13 Chipper Door (if equipped)

The leaf containment body can be converted for use with a wood chipper by removing the down draft module (if equipped). Ensure that the leaf vac is shut down and the body prop is utilized prior to performing the conversion. Unbolt the chipper opening cover plate and set aside.



Install the blower housing cover plate by loosening the middle four mounting bolts on the blower housing transition and sliding the cover plate into place. Re-tighten the mounting bolts.



### 5.14 Loading / Unloading Skid

- For hooklift operation, refer to your hooklift manual
- **BEFORE** unloading the skid from the truck, the user must disconnect all wiring harnesses from the leaf vacuum skid to the truck, otherwise damage to the harness will occur. These are located at the rear of the unit.

## General Operating Instructions

---

### **6. Troubleshooting**

---

---

#### **6.1 If unit does not start.**

- Check that all E-stops are in the out position.
- Check the proximity switches. If they are not illuminated, the range is too far for the sensor.
- Check that the tilt switch is connected.

#### **6.2 If unit is overheating.**

- Check that radiator prescreen is not covered or clogged.
- Check that oil filter gauge to see if filter needs replacement.

#### **6.3 Excessive vibration**

- Inspect fan for damage that could cause an imbalance.
- Verify that engine mounting bolts are secure.
- Check section 2.7 for more information on fan assembly.



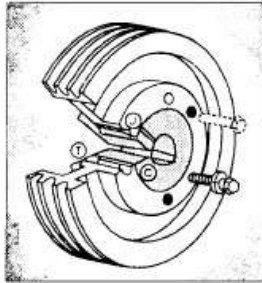
7. Supplemental Manuals

7.1 Split Taper Bushings

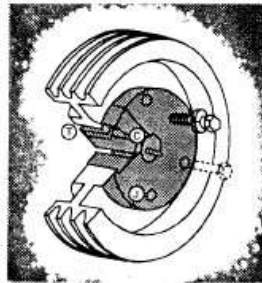
**QD Bushing/Sheaves Installation**



QD bushing sizes JA through N can be assembled in either of the two positions shown below. Sizes P through S should be assembled in position one. *Position One* is the conventional or standard mounting. *Position Two* (Reverse Mounting) may be necessary in some cases, such as mounting small sheaves with blind holes (not drilled through).



Position 1



Position 2

Bushing Size	Cap Screw Size-Thread	Foot Pounds Wrench Torque <sup>‡</sup>
JA	10-24	3
SH-SDS-SD	1/4-20	6
SK	5/16-18	10
SF	3/8-16	20
E	1/2-13	40
F	9/16-12	50
J	5/8-11	90
M	3/4-10	150
N	7/8-9	200
P	1-8	300
W	1-1/8-7	400
S	1-1/4-7	500

<sup>‡</sup>For Normal Applications. For *Severs* (Rock-crusher type) applications these values can be increased by a maximum of 50%.  
 Caution: Excessive cap-screw torque can cause sheave and/or bushing breakage. The use of lubricants can cause sheave breakage.

Therefore,  
**DO NOT USE LUBRICANTS IN THIS INSTALLATION!**

**INSTALLATION:**

1. Make sure the tapered-cone surface of the bushing and the mating bore of the sheave are free of all foreign substances, such as dirt, excess paint accumulations, metal chips, lubricants, etc.
2. For position one or two (whichever applies), line up the unthreaded holes (C) with the threaded holes (t) and insert cap screws with lock washers engaging only two or three threads. (\*a)
3. With key in shaft keyway, slide the loosely-assembled unit onto shaft and position for good belt alignment. (\*b, \*c) Use no lubricants or anti-seize compound on threads or tapered surfaces.
4. Carefully tighten the capscrews alternately and progressively until the tapers are seated (at approximately half the recommended torque).
5. Check alignment and sheave runout (wobble) and correct as necessary.
6. Continue careful alternate and progressive tightening of the cap screws to the recommended torque values shown in the table. Maximum torque should be achieved on each individual bolt only two times in the consecutive tightening.

*Note:* When properly mounted, there will be a gap between the bushing flange and sheave after the screws are tightened.

**Caution:** Use of Lubricants and or excessive screw torque can cause breakage

7. Tighten the set screw, when available, to hold the key securely during installation and until cap screws are securely tightened.

**REMOVAL**

1. Loosen and remove all mounting cap screws.
2. Insert cap screws in all threaded jack screw holes (J).
3. Start with the screws furthest from the bushing saw slot and tighten all jack screws alternately and progressively. Keep turning the screws in small equal amounts until the tapered surfaces disengage.

(\*a) When mounting a sheave on M through W size bushing, position the threaded jack-apart hole (J) as far from the bushing saw as possible to reduce the possibility of bushing breakage.

(\*b) When installing large or heavy parts in *Position One*, it may be easier to mount the key and bushing on the shaft first. Then place the sheave on the bushing and align the holes.

(\*c) **Caution:** When mounting on a vertical shaft, provisions must be made, which will positively prevent the sheave and/or bushing from dropping during installation.

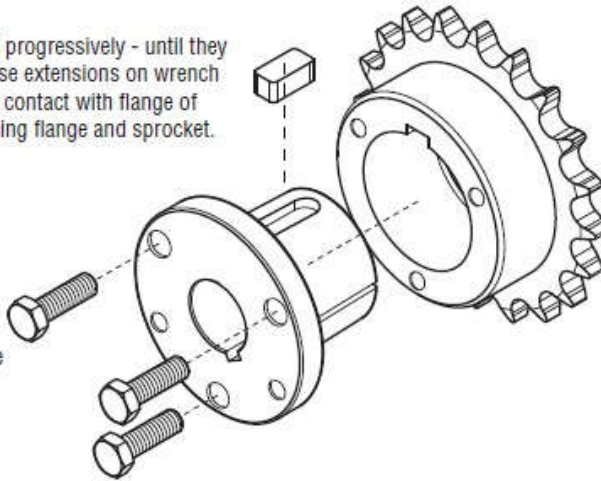


## MST® Bushings Instructions & Removal Instruction

The MST® bushings are easy to install and remove. They are split through the barrel and have a taper to provide a true clamp on the shaft. They are keyed to both the shaft and the hub to help during “blind” installations.

### INSTALLATION

1. Be sure the tapered cone surfaces of the bushing and the inside of the driven product are clean and free of anti-seize lubricants.
2. Place bushing in sprocket or other *Martin* MST® part.
3. Place cap screws loosely in pull-up holes. Bushing remains loose to assure sliding fit on shaft
4. With key on shaft, slide sprocket to desired position on shaft. Be sure heads of cap screws are accessible.
5. Align sprocket. Tighten screws alternately and progressively - until they are pulled up tight (see table below). Do not use extensions on wrench handles. Do not allow sprocket to be drawn in contact with flange of bushing. There should be a gap between bushing flange and sprocket.  
**CAUTION: THIS GAP MUST NOT BE CLOSED**



### REMOVAL

1. Loosen and remove cap screws.
2. Insert cap screws in tapped removal holes.
3. Tighten inserted screws until sprocket is loose on shaft.
4. Remove sprocket from shaft.

WRENCH TORQUE VALUE FOR TIGHTENING BUSHING		
MST® Bushing Size	Size of Cap Screw	Wrench Torque in/lb
G	.25 × .625	95
H	.25 × .75	95
P	.313 × 1	192
Q	.375 × 1.25	348
R	.375 × 1.75	348
S	.5 × 2.25	840
U	.625 × 2.75	1680
W	.75 × 3	3000

### CAUTION

**WARNING: USE OF ANTI-SEIZE LUBRICANT ON TAPERED CONE SURFACE OR ON BOLT THREADS WHEN MOUNTING MAY RESULT IN DAMAGE TO SHEAVE AND SPROCKETS. THIS VOIDS ALL MANUFACTURER'S WARRANTIES**

**WARNING:** Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions given above must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. All rotating power transmission products when used in a drive are potentially dangerous and must be guarded by the user as required by applicable laws, regulations, standards, and good safety practice. (Refer to ANSI Standard B15.1.)

[martinsprocket.com](http://martinsprocket.com)



7.2. Trans Fluid Coupler



# TRANSFLUID trasmissioni industriali

**NORME D'INSTALLAZIONE E MANUTENZIONE**

PRIMA DI MONTARE E METTERE IN FUNZIONE IL PRODOTTO, LEGGERE ATTENTAMENTE TUTTE LE ISTRUZIONI SULLA SICUREZZA ED IL FUNZIONAMENTO RIPORTATE NEL PRESENTE MANUALE.

SEGUIRE SEMPRE TUTTE LE AVVERTENZE ED ASSICURARSI CHE GLI OPERATORI PRESENTI IN PROSSIMITA' DELL'APPARECCHIATURA INDOSSINO TUTTI I DISPOSITIVI DI PROTEZIONE RICHIESTI PER LA SICUREZZA NELL'AMBIENTE DI LAVORO.

NON UTILIZZARE L'APPARECCHIATURA SE LE PRESENTI ISTRUZIONI NON DOVESSERO RISULTARE CHIARE, E CONTATTARE IMMEDIATAMENTE IL COSTRUTTORE O IL DISTRIBUTORE PER L'ASSISTENZA NECESSARIA.

IL PRODOTTO DEVE ESSERE PROTETTO DA UNA COPERTURA ADEGUATA PER EVITARE DANNI ALLE PERSONE. LO SCHERMO DEVE SEMPRE PREVEDERE APERTURE ASSIALI E RADIALI PER LA VENTILAZIONE DEL GIUNTO.

SE FOSSE MONTATO IL TAPPO FUSIBILE, LE SUDETTE APERTURE NON DEVONO ESSERE ORIENTATE VERSO GLI OPERATORI, PARTI CALDE O COLLEGAMENTI ELETTRICI.

**INSTALLATION AND MAINTENANCE**

BEFORE ASSEMBLING AND OPERATING THE PRODUCT, CAREFULLY READ ALL THE SAFETY AND OPERATING INSTRUCTIONS REPORTED IN THIS MANUAL.

ALWAYS FOLLOW ALL THE INSTRUCTIONS AND ASSURE THAT ALL THE OPERATORS STANDING BY THE MACHINERY ARE WEARING ALL THE PROTECTIVE EQUIPMENT NECESSARY FOR THE JOB TYPE AND APPLICATION BEING PERFORMED.

DO NOT USE THE MACHINERY IF YOU DO NOT UNDERSTAND THESE INSTRUCTIONS, AND IMMEDIATELY REFER TO THE MANUFACTURER OR THE CUSTOMER SERVICE DESK FOR ASSISTANCE.

THE PRODUCT MUST BE PROTECTED BY A CONVENIENT COVER GUARD TO AVOID PERSONAL INJURY TO PEOPLE.

AXIAL AND RADIAL VENTILATION OPENINGS SHOULD BE INCORPORATED IN THE GUARD FOR HEAT EXCHANGE.

IF THE PRODUCT IS FITTED WITH FUSIBLE PLUGS, THE SAID OPENINGS SHOULD NOT BE DIRECTED TOWARDS OPERATORS OR ANY HOT OR ELECTRICAL INSTALLATION.

GIUNTI IDRODINAMICI  
FLUID COUPLINGS

13 KFB D

drive with us

156 I - GB

<h2 style="margin: 0;">TRANSFLUID</h2> <p style="margin: 0;"><b>trasmissioni industriali</b></p>	<p><b>13 KFBD</b>  <b>MANUALE INSTALLAZIONE, USO E MANUTENZIONE</b>  <b>INSTALLATION, USE AND MAINTENANCE MANUAL</b></p>	<p><b>TF 6217-A</b>  <b>Rev. 0</b></p>		
<p>Questo manuale contiene le istruzioni per l'installazione, l'avviamento, l'uso e la manutenzione del giunto idrodinamico tipo KFBD. <b>CONSIGLIAMO CHE I RESPONSABILI DELL'USO E DELLA MANUTENZIONE DEL KFBD, VENGANO DOTATI DEL PRESENTE MANUALE. IL NON RISPETTO DELLE REGOLE CITATE IN QUESTO MANUALE, PROVOCA IL DECADERE DELLA GARANZIA.</b> Ricordiamo che, per ordinare le parti di ricambio, e' importante specificare, oltre al numero di dettaglio e quantita' richiesta, anche: TIPO - N° di SPECIFICA - N° di SERIE del KFBD, che si trovano stampigliati sulla targhetta di identificazione a bordo macchina.</p> <p><i>This manual contains instructions for installation, start up, working, and maintenance of KFBD fluid coupling. WE SUGGEST THAT ANY PERSON WHO IS RESPONSIBLE FOR USE AND/OR MAINTENANCE, SHOULD BE PROVIDED WITH THIS MANUAL. THE RESPECT OF RULES, CONTAINED IN THIS MANUAL, IS MANDATORY FOR WARRANTY VALIDITY. We recall that, for spare parts order, it is important to provide, besides detail number and quantity, even: TYPE - SPECIFICATION Nr. - SERIAL Nr. of KFBD that are stamped on identification metal plate.</i></p>				
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<p><b>Prima di iniziare il montaggio del KFBD sul motore, e' bene verificare che il volano rientri nelle tolleranze SAE. Questo e' importante soprattutto per il buon funzionamento del giunto elastico.(Vedere TF6217-B Fig.1)</b></p> <p><b><i>Before KFBD be mounted onto the engine, it is recommended to check that flywheel be within SAE tolerances. This is very important for elastic coupling good working.(see TF6217-B Fig.1)</i></b></p>				
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Infine fissare il gruppo con le apposite viti sulla flangia esterna.</li> <li>5 Riempimento olio giunto (vedere tabella olii consigliati). Togliere il coperchio che protegge il tappo di carico. Ruotare il giunto sino a portare il tappo in corrispondenza del segno di riferimento X sulla verticale (X-1-2-3-4 dipende dall'applicazione). Togliere il tappo e riempire fino allo sbocco dal foro (13KFBD X=5,2 lt.), quindi chiudere utilizzando del sigillante sul filetto. La coppia di serraggio e' 30 Nm per tappo 3/8". Rimontare il coperchio di protezione.</li> <li>6 Riempimento grasso (vedere tabella grassi consigliati). 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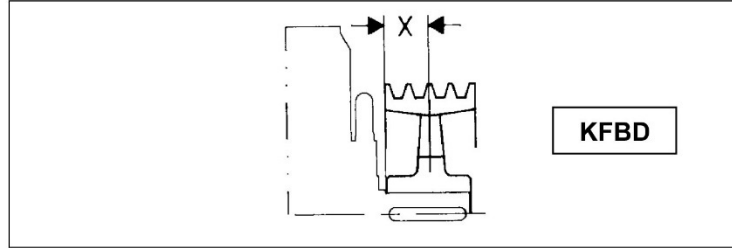




# Supplemental Manuals

<b>trasmissioni industriali</b>	<b>13 KFB</b> <b>MANUALE INSTALLAZIONE, USO E MANUTENZIONE</b> <b>INSTALLATION, USE AND MAINTENANCE MANUAL</b>	<b>TF 6217-C</b> <b>Rev. 0</b>
<b>MANUTENZIONE</b> <ul style="list-style-type: none"> <li>- Controllare, ogni 3 mesi, il livello dell'olio nel giunto.</li> <li>- Cambiare l'olio ogni 4000 ore di funzionamento oppure una volta all'anno.</li> <li>- Ingrassare il cuscinetto dell'albero di uscita ogni settimana.</li> <li>- Controllare, periodicamente, lo stato dei blocchetti in gomma del giunto elastico.</li> <li>- E' consigliabile, ogni 4000 ore di funzionamento, cambiare tutti gli anelli di tenuta rotante e controllare lo stato dei cuscinetti.</li> <li>- Controllare, periodicamente, che la taratura del termostato, se installato, sia uguale al valore originariamente impostato (vedere certificato di collaudo e TF5941-O).</li> <li>- Pulire periodicamente la sonda del termostato, se installato.</li> </ul>	<b>MAINTENANCE</b> <ul style="list-style-type: none"> <li>- Check, every 3 months, the fluid coupling oil level. Change oil every 4000 working hours or once a year, whichever occurs first.</li> <li>- Grease output shaft bearing every week.</li> <li>- Check, periodically, elastic coupling rubber blocks condition.</li> <li>- It is advisable, every 4000 working hours, to change all rotating seals and to check bearings condition.</li> <li>- Check, periodically, that temperature switch whether installed, set value be the same as originally adjusted (see test certificate and TF5941-O).</li> <li>- Clean periodically the temperature switch bulb, whether installed.</li> </ul>	
TABELLA INCONVENIENTI		
SINTOMO	CAUSA	RIMEDIO
Scarse prestazioni.	Livello olio.	Controllare il livello (olio freddo) ed aggiungere se necessario. Controllare la macchina condotta. Controllare i giri del motore.
	Tipo olio.	Utilizzare olio indicato in tabella.
Surriscaldamento.	Scorrimento eccessivo.	Controllare il livello olio. Verificare l'installazione. Controllare i giri del motore.
	Scarsa ventilazione.	Pulire le aperture per la ventilazione.
	Cuscinetto non lubrificato.	Verificare il livello olio ed eventualmente aggiungere.
	Cuscinetto in uscita danneggiato.	Sostituire.
Perdita olio lato motore.	Carico radiale eccessivo.	Ridurre la tensione delle cinghie.
	Tappo conico.	Rimontare con sigillante per filetti.
	Anello OR.	Sostituire.
Perdita olio lato uscita.	Tenuta rotante.	Sostituire. Controllare l'usura sull'albero.
	Tappo conico.	Rimontare con sigillante per filetti.
	Tappo fusibile se installato.	Sostituire.
	Anelli OR.	Sostituire.
Rumore.	Tenuta Rotante.	Sostituire. Controllare l'usura sull'albero.
	Rottura cuscinetto.	Sostituire.
	Olio con troppa schiuma.	Controllare il livello ed il tipo di olio.
	Usura eccessiva giunto elastico (vibrazioni torsionali?, temperatura eccessiva?, disallineamento?, olio.).	Smontare e sostituire i blocchetti od il giunto elastico completo.
Intervento termostato.	Usura della dentatura tra albero uscita mozzo, girante interna.	Smontare e sostituire le parti usurate.
	Alta temperatura olio.	Vedere "surriscaldamento".
	Errata taratura termostato.	Vedere certificato di collaudo e TF 5941-O.
TROUBLE SHOOTING		
SYMPTOM	CAUSE	REMEDY
Poor performances.	Oil level.	Check level (cold oil) and add as necessary. Check driven machine. Check engine rpm.
	Oil type.	Use recommended oil (see table).
Overheating.	High slip.	Check oil level. Check installation. Check engine rpm.
	Low ventilation.	Clean ventilation openings.
	No lubricated bearing.	Check oil level . Add oil if required .
	Damaged output bearing.	Replace.
Oil leakage at engine side.	Too high radial load.	Decrease belt tension.
	Taper plug.	Remount using thread sealent.
	O-ring.	Replace.
Oil leakage at output side.	Rotating seal.	Replace. Check shaft wear.
	Filling plug.	Remount using thread sealent.
	Fusible plug, whether installed.	Replace.
	O-ring.	Replace.
Noise.	Rotating seal.	Replace. Check shaft wear.
	Bearing failure.	Replace.
	Too much oil foam.	Check oil level and type.
	Elastic coupling wear. (Torsional vibration? high temperature? misalignment? oil ?).	Dismantle and replace rubber blocks or complete elastic coupling.
Temperature switch intervention.	Spline wear between output shaft/hub, inner impeller.	Dismantle and replace worn components.
	High oil temperature.	See "overheating".
	Wrong switch setting.	See test certificate and TF 5941-O.

- Calculated bearings life over 10.000 hours.
- Engine speed over those listed, needs approval by Transfluid.
- Pulley diameter is the minimum permissible. (Over 35 m/s, dynamic balancing is recommended).
- Belts nr. is maximum permissible (about belt width: 8V > SPC > 5V).
- Timing belts must be approved by Transfluid.
- "X" distance is according to belts type & number.
- Side load includes 2.5 belt tensioning factor.
- Pilot bearing speed = 5% of max. input speed.



**TRANSMITTABLE POWER CRITERIA: slip < 3%**  
**f.c. oil temperature < 50 °C over ambient**

**13 (pilot brg: dia 30 mm – 33500 N)**

Up to kW/rpm	Max "X" (mm) Max load (N)	Max belts nr Type - Min pulley Ø
90 / 2600	65 / 8300	7 x 5V - 200 mm

**15 (pilot brg: dia 30 mm – 33500 N)**

Up to kW/rpm	Max "X" (mm) Max load (N)	Max belts nr Type - Min pulley Ø
130 / 2400	92 / 13000	10 x 5 V - 200 mm

**17-19 (pilot brg: dia 35 mm – 40500 N)**

Up to kW/rpm	Max "X" (mm) Max load (N)	Max belts nr Type - Min pulley Ø
200 / 2200	110 / 22000	12 x 5 V - 200 mm
		6 x 8V - 315 mm
		7 x SPC - 315 mm
280 / 2200	130 / 22000	14 x 5 V - 280 mm
		8 x 8V - 315 mm
		9 x SPC - 315 mm

**21-24 (pilot brg: dia 45 mm – 58500 N)**

Up to kW/rpm	Max "X" (mm) Max load (N)	Max belts nr Type - Min pulley Ø
370 / 2000	150 / 28000 170 / 25000	10 x 8V - 315 mm
		13 x SPC - 355
500 / 2000	177 / 29800 195 / 26500	12 x 8V - 400 mm
		15 x SPC - 450 mm

**ASK TRANSFLUID FOR ANY APPLICATION DIFFERENT THAN ABOVE.**

## **GARANZIA BASE, TERMINI E CONDIZIONI** TF 6401-I - rev. 0

### **1) Premessa**

TRANSFLUID garantisce che i propri prodotti, al momento della spedizione, sono conformi alle specifiche pubblicate nei propri cataloghi o documenti tecnici validi al momento della spedizione stessa e che sono esenti da difetti nei materiali e nella fabbricazione. Questi termini di garanzia sostituiscono tutte le altre garanzie, anche legali, espresse o implicite, comprese, a titolo esemplificativo e non esaustivo, le garanzie di commerciabilità e di idoneità ad un uso particolare (e qualsiasi garanzia implicita che sorga nel corso delle prestazioni, nel corso delle trattative o dell'uso commerciale). Fatti salvi i casi di dolo e colpa grave, in nessun caso TRANSFLUID sarà responsabile per danni diretti, indiretti, consequenziali, fortuiti od extracontrattuali basati su una richiesta d'indennizzo da parte del Compratore per violazione di garanzia, violazione di contratto, responsabilità oggettiva. In nessun caso il risarcimento da parte di TRANSFLUID potrà superare l'importo che il Compratore ha pagato per il prodotto fornito da TRANSFLUID.

### **2) Durata e limiti della garanzia**

- a) La durata della garanzia è pari a diciotto (18) mesi dalla messa in servizio del prodotto fornito da TRANSFLUID e comunque non oltre ventiquattro (24) mesi dalla data di spedizione del prodotto originale dallo stabilimento TRANSFLUID.
- b) I prodotti, se inutilizzati e stoccati a lungo termine, devono essere immagazzinati e trattati in accordo alle linee guida redatte da TRANSFLUID per tipologia di prodotto che sono rese disponibili su richiesta.
- c) La garanzia per le parti la cui usura o deterioramento è fortemente legata alle condizioni di impiego (tensionamento delle cinghie, condizioni ambientali, urti e sovraccarichi non previsti), alla sensibilità dell'operatore (utilizzo entro i limiti approvati), ad eventi esterni (inceppamenti della macchina condotta), non opera se tali parti sono state utilizzate (non sono nuove), o se non viene chiaramente dimostrato dal Compratore un eventuale difetto di fabbricazione riconducibile a TRANSFLUID.  
Tipiche parti soggette ad usura o deteriorabili sono:
  - filtri, tenute e guarnizioni
  - molle, viti, tappi
  - interruttori e fusibili
  - materiali e superfici di attrito
  - cinghie e catene
  - lubrificanti in genere
- d) L'installazione e la manutenzione dei prodotti TRANSFLUID deve essere eseguita in conformità a quanto indicato nel manuale di installazione, uso e manutenzione che viene sempre fornito a corredo di ogni prodotto.
- e) In caso di fornitura di componenti sfusi/disassemblati, la garanzia copre solo ed esclusivamente eventuali difetti dei componenti stessi, relativamente al materiale o alle lavorazioni meccaniche effettuate da TRANSFLUID.
- f) La garanzia decade nei casi in cui:
  - il prodotto venga utilizzato oltre i limiti indicati nei cataloghi o manuali di installazione o in applicazioni non approvate da TRANSFLUID;
  - la rottura derivi da abuso, negligenza, omessa o inadeguata manutenzione, mancato collegamento o controllo dei dispositivi di protezione o a seguito di incidenti;
  - il prodotto venga modificato o disassemblato senza approvazione scritta di TRANSFLUID.

### **3) Prestazioni incluse/escluse nella garanzia**

- a) Eventuali prodotti o componenti i cui difetti, ad insindacabile giudizio di TRANSFLUID, sono coperti da garanzia, saranno riparati o sostituiti senza alcun addebito, salvo quanto stabilito ai punti successivi. Le parti sostituite saranno coperte dal residuo periodo della garanzia originale che resta in vigore sul prodotto inizialmente fornito (non decorrerà quindi un nuovo termine di garanzia).

## **BASIC GUARANTEE, TERMS AND CONDITIONS** TF 6401-GB - rev. 0

### **1) Preamble**

TRANSFLUID guarantees that at the time of dispatch, its products comply with the specifications published in its catalogues or technical documents, which were valid at the time of dispatch, and that the products are free from defects in material and workmanship. These terms of guarantee substitute all other guarantees, including legal, expressed or implicit guarantees, including but not limited to, guarantees of saleability and suitability for a particular use (and any other implicit guarantee arising during the course of the services, negotiations or commercial use). Except in the event of serious negligence and fraud, under no circumstances will TRANSFLUID be held liable for direct, indirect, consequential, fortuitous or extra contractual damage based upon claims for compensation by the Buyer for violation of the guarantee, contract or objective responsibility. Under no circumstances can the compensation by TRANSFLUID exceed the amount paid by the Buyer for the product supplied by TRANSFLUID.

### **2) Duration and limits of the guarantee**

- a) The duration of the guarantee is equal to eighteen (18) months from the time the product supplied by TRANSFLUID is commissioned, and nonetheless, no more than twenty-four (24) months from the date of dispatch of the original product from TRANSFLUID's plant.
- b) Product that are not used and stored for a long period must be kept and handled in keeping with the guidelines, which are available upon request, drawn up by TRANSFLUID according to product type.
- c) The wear or tear of parts, which is particularly due to conditions of use (tension of the belts, environmental conditions, unforeseen knocks and overloading), or to the sensitivity of the operator (use within the approved limits) or to external circumstances (jamming of the machine), is not covered by the guarantee if these parts have been used (are not new), unless the Buyer can clearly prove the manufacturing defect, which is ascribable to TRANSFLUID.  
Typical parts subject to wear or tear include:
  - filters, seals and gaskets
  - springs, screws, plugs
  - switches and fuses
  - material and friction surfaces
  - belts and chains
  - lubricants in general
- d) Installation and maintenance of TRANSFLUID products must be carried out following the installation, use and maintenance manual, which is always supplied with each product.
- e) With regard to the supply of loose/disassembled parts, the guarantee solely and exclusively covers faults of the components themselves, related to the material or mechanical workmanship carried out by TRANSFLUID.
- f) The guarantee is no longer valid when:
  - the product is used exceeding the limits stated in the catalogues or installation manuals, or in applications that are not approved by TRANSFLUID;
  - breakage results from abuse, negligence, omission or inadequate maintenance, failed connection or control of the protection devices or as a result of accidents;
  - the product is modified or disassembled without TRANSFLUID'S written approval.

### **3) Services included/excluded in the guarantee**

- a) In TRANSFLUID'S final decision, products or components, whose faults are covered by the guarantee, will be repaired or replaced at no extra cost, with the exception of the subsequent points. The replaced parts will be covered from the remaining period of the original guarantee, which stays in force for the product initially supplied (a new guarantee period will therefore not come into effect).



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- b) Sono esclusi dalla garanzia, e pertanto restano a carico del Compratore, costi derivanti da:
- rimozione del prodotto TRANSFLUID dal macchinario in cui è inserito e relativa rimessa in servizio;
  - adeguato imballaggio ed oneri derivanti da trasporti di andata e ritorno del materiale;
  - ripristino di lubrificanti in genere, tubazioni, cofanature insonorizzanti, carter, ecc;
  - qualsiasi altro costo non espressamente approvato per iscritto da TRANSFLUID.
- c) Per le operazioni di smontaggio/reinstallazione/messa in servizio del prodotto, il Compratore potrà richiedere il supporto di un tecnico specializzato inviando un regolare ordine di acquisto. L'intervento sarà fatturato da TRANSFLUID applicando le correnti tariffe ASSIOT (Associazione Italiana costruttori organi di trasmissione, affiliata EUROTRANS).
- d) TRANSFLUID non potrà essere ritenuta responsabile per mancati o minori profitti, costi per macchinari sostitutivi, fermi macchina, danni ad apparecchiature o proprietà causati da un eventuale malfunzionamento dei propri prodotti.

### 4) Modalità di richiesta di prestazioni in garanzia

- a) Il Compratore, qualora intenda avvalersi della garanzia, dovrà informare TRANSFLUID per iscritto, entro 7 (sette) giorni dal momento in cui si è evidenziato un difetto, comunicando:
- descrizione del prodotto;
  - numero di serie (ove previsto), numero di specifica o codice articolo;
  - riferimento alla data ed al documento di acquisto o consegna;
  - ragionevole prova che il difetto rientri nelle condizioni di garanzia completata da una descrizione dettagliata dell'anomalia o malfunzionamento ed eventualmente supportata da fotografie.
- In caso di malfunzionamento occorso dopo la messa in servizio del prodotto, dovranno essere comunicati inoltre:
- tipo di applicazione;
  - potenza e giri del motore (in caso di motore endotermico anche marca e modello);
  - diametro, tipo, numero gole e posizione puleggia (se l'applicazione lo prevede);
  - ore di funzionamento.
- b) In base al prodotto coinvolto, al malfunzionamento segnalato, all'urgenza di intervento, TRANSFLUID indicherà se il prodotto stesso dovrà essere consegnato o spedito in porto franco ad un centro autorizzato o direttamente presso la propria sede.
- c) Una volta ricevuto il prodotto, TRANSFLUID o il distributore autorizzato provvederanno ad una approfondita analisi; se il prodotto sarà ritenuto coperto da garanzia:
- TRANSFLUID riparerà o sostituirà gratuitamente le parti necessarie al ripristino della piena e sicura funzionalità;
- se il prodotto NON sarà ritenuto coperto da garanzia, TRANSFLUID:
- invierà un rapporto tecnico motivando la decisione;
  - stilerà un preventivo di riparazione;
  - solo dopo aver ottenuto l'ordine dal Compratore, procederà con la riparazione.
- d) I prodotti riparati saranno restituiti al Compratore in porto assegnato, utilizzando lo stesso mezzo di trasporto con cui sono pervenuti (a meno che non sia diversamente specificato).
- e) Qualora il Compratore decida di non accettare il preventivo di riparazione, dovrà comunicare per iscritto la propria decisione chiedendo esplicitamente la rottamazione o la restituzione delle parti che saranno spedite nello stato in cui si trovano.

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- b) Excluded from the guarantee and remaining at the Buyer's expense are the costs resulting from:
- removal of the TRANSFLUID product from the machinery onto which it is fitted, and recommissioning;
  - suitable packing and charges resulting from the return transport of the material;
  - restoration of lubricants in general, piping, sound proof canopies, guards, etc.;
  - all other costs not expressly approved in writing by TRANSFLUID.
- c) The Buyer can request the support of a specialised technician to disassemble/re-install/recommission the product by sending a standard purchase order. TRANSFLUID will invoice the work, applying the current ASSIOT rates (Italian Association of Gears and Transmission Elements Manufacturers, a member of EUROTRANS).
- d) TRANSFLUID cannot be held liable for lost or reduced profit, costs for replaced machinery, still machinery, damage to equipment or property caused by failure of its products.

### 4) Conditions for requesting services under guarantee

- a) If the Buyer intends to take advantage of the guarantee, he must inform TRANSFLUID in writing within 7 (seven) days of discovering a fault, stating:
- product description;
  - series number (where foreseen), specification number or article code;
  - reference to the date and document of purchase or delivery;
  - reasonable proof that the fault falls within the conditions of guarantee, together with a detailed description of the irregularity or failure and where possible, supported by photographs.
- In the event of failure after commissioning the product, the following must also be communicated:
- type of application;
  - power and engine rpm (stating also the make and model for endothermic engines);
  - diameter, type, number of races and position of pulley (if foreseen by the application);
  - hours of operation.
- b) TRANSFLUID will indicate whether the product must be delivered or sent free port to an authorised centre or directly to its own plant depending on the product concerned, the failure indicated and the urgency of the intervention.
- c) On receiving the product, TRANSFLUID or the authorised distributor will carry out a thorough analysis; if the product is deemed to be covered by the guarantee:
- TRANSFLUID will repair or replace the parts needed to restore full and safe working at no cost;
- If the product is NOT deemed to be covered by the guarantee, TRANSFLUID:
- will send a technical report explaining its decision;
  - will draw up an estimate for the repair;
  - will carry out the repair upon receipt of the order from the Buyer.
- d) The repaired products will be returned to the Buyer freight collect, by the same means of transport that was used for the arrival (unless stated otherwise).
- e) Should the Buyer decide not to accept the estimate for the repair, he must communicate his decision in writing, explicitly asking for the parts to be scrapped or returned; the parts will be sent in their current state.

7.3 North American Signal Traffic Assist III



**LED Traffic Assist™III (12/24VDC)**

Installation and operating instructions for:  
 TA18LPS-A, TA36LP-A, TA36LP-A2  
 TA42LP-A, TA42LP-A2, TA52LP-A and TA52LP-A2

1. The package should contain the following:
  - a. LED Traffic Assist™ III light bar with 25 feet of cable and 12 pin connector taped to end of cable;
  - b. Control Head with 8 inches of cable;
  - c. 2, 3, or 4 - “L” brackets (depending on model) for optional mounting
  - d. Instruction sheet.
2. Attach the LED Traffic Assist Control Head to the dash using the bolts provided. Connect the red/black duplex wire to power (fused for a minimum of 5 Amps) and to a ground.
3. Install the LED Traffic Assist bar horizontally, with the curved side up (product label facing up and cable exiting the passenger side of the vehicle when installed in the rear of the vehicle), in one of the following two ways:
  - a. Attach to any vertical surface using the ¼” x 20 - 5/8 inch long stainless steel hex bolts coming out the rear of the bar; or
  - b. Mount the two “L” brackets on a horizontal surface and attach the Traffic Assist bar to the “L” brackets.
4. NOTE: For TA18LPS versions, 10’ of interconnect cable connects the two 4-segment heads, each half is clearly marked as “LEFT” & “RIGHT” sides. When positioned correctly the power cable runs up the passenger side of the vehicle for rear mount. Unit comes pre-assembled unless otherwise noted.
5. Run the 12 conductor cable from the LED Traffic Assist™ to the control head. Be sure to leave the connector off until cable is completely installed in the vehicle.
6. Plug the individual wire pins into the 12 pin connector taped to the end of the cable according to the color coded diagram shown below and also the diagram shown on the back of the LED Traffic Assist Control Head.

#	COLOR	#	COLOR	#	COLOR	#	COLOR
4	PINK	3	RED	2	BROWN	1	BLACK
8	TAN	7	WHITE	6	GREEN	5	VIOLET
12	YELLOW	11	ORANGE	10	GRAY	9	BLUE



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7. Assemble the two connectors together and verify everything is working properly.

### OPERATING INSTRUCTIONS

(Use the following diagram for mode operation)

Various functions for either the 7 or 8 segment system.

BUTTON NAME	PRESS ONCE	PRESS TWICE	PRESS THREE TIMES
<b>OFF</b>	Turns system off	N/A	N/A
<b>LEFT ARROW</b>	Lights sequence from right to left until all are on and turn off in the same sequence	Lights sequence from right to left until all are on and then turn off all at once	Lights sequence from right to left until all are on, then the last flashes three times, then all turn off at once
<b>CENTER ARROW</b>	Lights sequence from center out until all are on and the turn off in the same sequence	All lights are quad flashing with the last flash on a delay	Three lights rapidly move from left to right, generating an attention gathering pattern
<b>RIGHT ARROW</b>	Lights sequence from left to right until all are on and turn off in the same sequence	Lights sequence from left to right until all are on and then turn off all at once	Lights sequence from left to right until all are on, then the last flashes three times, then all turn off at once
<b>FAST / SLOW</b>	Fast	Slow	Fast

\* Custom Flash Patterns are available upon request. Please inquire at 1-877-246-6274 or [sales@nasig.com](mailto:sales@nasig.com).

### LIMITED WARRANTY

North American Signal Company warrants that the LED Traffic Assist™III will be free of defects in material and workmanship for a period of 5 years from date of manufacture, under normal use and service. This warranty does not cover ordinary wear and tear, abuse, misuse, overloading, altered products, or damage caused by the purchaser connecting the unit to the wrong voltage or polarity. All products in need of repair must be returned to our factory freight prepaid. North American Signal Company reserves the right to determine in its sole discretion, whether to repair or replace a unit found to be defective under this LIMITED WARRANTY, and will then return the unit freight prepaid. THERE IS NO WARRANTY OF MERCHANTABILITY. THERE ARE NO WARRANTIES WHICH EXTEND THE DESCRIPTION HEREIN. THERE ARE NO WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, EXCEPT AS SET FORTH HEREIN.

In returning product, first try to determine if the controller and / or the Traffic Assist bar is not functioning. If only the bar is having problems, remove the end of the bar where the cable enters the unit and unplug the 12 pin connectors. Then detach the bar from its mounting and return this unit to the factory. If the controller is also not functioning, then detach the controller and bar and send them both to the factory.

North American Signal Company, 605 S. Wheeling Road, Wheeling, IL, 60090  
Toll free: 877-246-6274, Fax: 847-537-8895, Email: [sales@nasig.com](mailto:sales@nasig.com), [www.nasig.com](http://www.nasig.com)

Revision 2.7, 1/1/2018

### 7.4 Shurflo Dust Control System Pump



## **2088 INDUSTRIAL SERIES PUMPS**

### **Installation and Operation Manual**

SHURflo offers various pumps models for different applications. The information outlined by this manual is general, and not specific to all 2088 series pumps. Be certain the pumps' materials will be compatible with the fluid being pumped. 2088 series pumps are intended for intermittent or continuous duty when the proper operating criteria is met. Product Data Sheets outlining specific thermal limits, load, flow curves, and other technical information for a particular model are available. If unsure of the chemical compatibility with a given elastomer or the motors intended design, please call SHURflo for assistance.

**CAUTION:** "Intermittent Duty" is defined as; operated and/or frequently started within a period of time that would cause the motor to reach its maximum thermal limits. Once the maximum thermal limit is obtained, the motor must be allowed to return to ambient temperature before resuming operation.

**CAUTION:** *DO NOT* use to pump flammable liquids. Never operate the pump in an explosive environment. Arcing from the motor brushes, switch or excessive heat from an improperly cycled motor may cause an explosion.

**CAUTION:** *DO NOT* assume fluid compatibility. If the fluid is improperly matched to the pumps' elastomers, a leak may occur. Pumps used to transfer hazardous or hot (max. temperature 170°F [76°C] viton only) chemicals must be in a vented area to guard against the possibility of injury due to harmful or explosive liquid/vapors.

**CAUTION:** *DO NOT* operate the pump at pressures which cause the motor to exceed the amperes rating indicated on the name plate. Various pump models are equipped with thermal breakers to interrupt operation due to excessive heat. Once the temperature of the motor is within proper limits it will automatically reset, and the pump *will start operation without warning.*

**CAUTION:** To prevent electrical shock, disconnect power before initiating any work. In the case of pump failure, the motor housing and/or the pumped fluid may carry high voltage to components normally considered safe.

### **PRESSURE SWITCH OPERATION**

The pressure switch reacts to outlet pressure, and interrupts power at the preset shut-off pressure indicated on the pump label. When outlet pressure drops below a predetermined limit (typically 15-20 psi.[1-1.4 bar] less than the shut-off pressure), the switch will close and the pump will operate until the shut-off (high) pressure is achieved. The shut-off pressure is set to factory calibrated standards. See the motor label and Product Data Sheet for specific pump specifications.

**CAUTION:** Improper adjustment of the pressure switch, may cause severe overload or premature failure. Refer to SHURflo Service Bulletin #1031 for the adjustment procedure. Failures due to improper adjustment of the pressure switch will not be covered under the limited warranty.

If the plumbing is restrictive or the flow rate is very low, the pump may re-pressurize the outlet faster than the fluid is being released causing rapid cycling (ON/OFF within 2 seconds). If the pump is subjected to rapid cycling during normal operation, or for infrequent periods, damage may occur. Applications which exhibit rapid cycling should have restrictions in the outlet minimized. If not feasible considered a SHURflo Accumulator or a SHURflo "bypass" model pump.

### **BYPASS OPERATION**

A bypass pump may be used for applications that normally induce frequent start/stop of the motor, and thereby create a potential for overheating. Models equipped with an internal bypass are designed to pump at high pressure while at low flow rates. Bypass models equipped with a switch may operate for several seconds even though the outlet side has been closed off. Contact SHURflo for information regarding bypass pumps.

### **MOUNTING**

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- The 2088 series pumps are self priming. Horizontal and vertical prime vary depending on the fluid viscosity and pump configuration. Refer to the pumps Product Data Sheet.
- The pump should be located in an area that is dry and provides adequate ventilation. If mounted within an enclosure, provisions to cool the motor may be necessary. Heat sinks which attach to the motor are available from SHURflo if increased heat dissipation is necessary.

**CAUTION:** *DO NOT* locate the motor near low temperature plastics or combustible materials. The surface temperature of the motor may exceed 250°F [120°C]. Refer to the pumps Product Data Sheet.

- The pump may be mounted in any position. However, if mounting the pump vertically the pump head should be in the down position so that in the event of a leak, fluid will not enter the motor.
- Secure the rubber feet with #8 hardware. *DO NOT* compress the feet, doing so will reduce their ability to isolate vibration/noise.

### **PLUMBING**

- Flexible high pressure tubing compatible with the fluid should be used to connect the inlet/outlet ports. Tubing should be either 3/8" or 1/2" [10 or 13 mm] I.D., and at least 18 in. [46 cm] length is suggested to minimize stress on the fitting/ports and reduce noise. Allow for the shortest possible tubing route and avoid sharp bends that may kink over time.

**NOTE:** Restrictions on the inlet may cause vacuum levels to reach the fluid vapor pressure, causing cavitation, degassing, vapor lock and a loss in performance. Inlet pressure *must* not exceed 30 psi.[2.1 bar] maximum.

- **1/2" Male threaded models:** Are intended to be used with SHURflo Swivel Barb Fittings which seal with an internal taper when *hand tightened*. Standard 1/2" NPT fittings may be used when tightened to a maximum torque of 3.7 ft\lb (45 in\lb) [5 Nm].

**NOTE:** SHURflo does not recommend the use of metal fittings or rigid pipe to plumb the inlet/outlet ports. Standard plastic male and female threaded fittings can be acquired at commercial plumbing supply stores. SHURflo also distributes Swivel Barb Fittings, and special fitting through it's dealers (Form #07-010-0011).

**CAUTION:** Sealers and Teflon tape may act as lubricant causing cracked housings or stripped threads due to over-tightening. Care should be used when applying sealers. Sealers may enter the pump inhibiting valve action, causing no prime or no shut-off. *Failures due to foreign debris is not covered under warranty.*

- Installation of a 50 mesh strainer is recommended to prevent foreign debris from entering the pump.
- If a check valve is installed in the plumbing, it must have a cracking pressure of no more than 2 psi [.14 bar].

### **ELECTRICAL**

**CAUTION:** Electrical wiring should be performed by a qualified electrician, in accordance with all local electrical codes.

- The pump should be on a dedicated (individual) circuit, controlled with a double pole switch (U.L./C-UL certified) rated at or above the fuse ampere indicated by the pump motor label. Depending on distance of the power source from the pump and ampere load on the circuit, wire may need to be heavier than indicated by the chart.

**CAUTION:** All 115 VAC and 230 VAC pump motors and systems, *MUST* be ground per local and state electrical codes.

- Improper duty cycle and/or rapid start & stop conditons may cause the internal thermal breaker (if equipped) to trip, or can result in premature motor failure due to excessive heat. Refer to the pumps Product Data Sheet.

- For the pump to meet U.L./C-UL requirements the circuit *MUST be protected with a slow-blow fuse* (U.L./C-UL certified) or equivalent circuit breaker as indicated on the motor label. Use an approved wire of the size specified or heavier.

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VOLTAGE	WIRE LEADS	WIRE SIZE	FUSE RATING
12 DC	RED (positive +) BLACK (negative -)	#14 AWG [2.5 Mm <sup>2</sup> ] (or heavier)	SEE PUMP MOTOR LABEL
24 DC			
36 DC			
115 AC	BLACK (common) WHITE (neutral) GREEN (ground)	#16 AWG C-UL - TEW / UL 1015	
230 ACⓄ	BROWN (common) BLUE (neutral) GRN/YELL (ground)	(or heavier) [1 Mm <sup>2</sup> ]	

① VDE requires a fuse (slow blow) or equivalent circuit breaker.

**CAUTION:** Circuit protection is dependent on the individual application requirements. Failure to provide proper overload / thermal devices may result in a motor failure, which will not be covered under warranty.

## TROUBLESHOOTING

### PUMP WILL NOT START:

- ✓ Fuse or breaker
- ✓ For correct voltage (±10%) and electrical connections
- ✓ Pressure switch operation and correct voltage at switch or motor wires (as equipped).
- ✓ Rectifier or motor for open or grounded circuit
- ✓ For locked drive assembly

### WILL NOT PRIME: (No discharge/Motor runs)

- ✓ Out of product
- ✓ Strainer for debris
- ✓ Inlet tubing/plumbing for severe vacuum leak
- ✓ Inlet/Outlet tubing severely restricted (kinked)
- ✓ Debris in pump inlet/outlet valves
- ✓ Proper voltage with the pump operating (±10%)
- ✓ Pump housing for cracks

### LEAKS FROM PUMP HEAD OR SWITCH:

- ✓ For loose screws at switch or pump head.
- ✓ Switch diaphragm ruptured or pinched
- ✓ For punctured diaphragm if fluid is present at bottom drain

### PUMP WILL NOT SHUT-OFF: (Pressure switch equipped)

- ✓ Output line closed and no leaks
- ✓ For air trapped in outlet line or pump head
- ✓ For correct voltage to pump(±10%)
- ✓ Inlet/Outlet valves for debris or swelling
- ✓ For loose drive assembly or pump head screws
- ✓ Pressure switch operation/adjustment incorrect refer to S/B #1031 for differential and pressure adjustment procedure

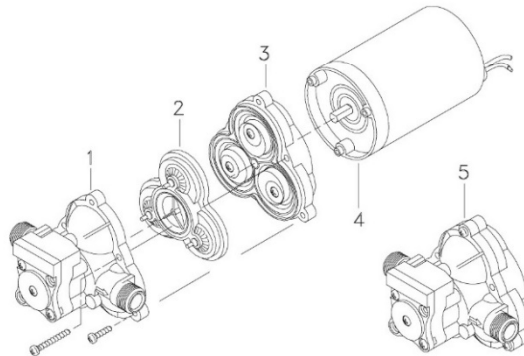
### NOISY / ROUGH OPERATION:

- ✓ Mounting feet that are compressed to tight
- ✓ Does the mounting surface multiply noise (flexible)
- ✓ For loose pump head or drive screws
- ✓ Is the pump plumbed with rigid pipe causing noise to transmit

## SERVICE KITS

Kits are readily available to repair standard 2088 series pumps. Repair kits include simple illustrated instructions allowing easy installation. To insure that the correct kit is received the model numbered and all name plate data must be included with the order. Contact a SHURflo distributor or SHURflo directly to order the necessary repair kit.

1	Switch / Check valve and Upper Housing Kit (Replaces all previous switch designs)
2	Valve plate assembly
3	Diaphragm / Drive assembly
4	Motor
5	Complete Pump Head assembly (includes parts # 1,2,3) (Replaces all previous switch designs)



# Supplemental Manuals

## RETURN POLICY

All Industrial pumps/products **must** be flushed of **any** chemical (ref. OSHA Section 1910.1200 (d)(e)(f)(g)(h)) and hazardous chemicals **must** be labeled/tagged before being \*shipped to SHURflo for service or warranty consideration. SHURflo reserves the right to request a Material Safety Data Sheet from the returnee for any pump/product it deems necessary. SHURflo reserves the right to "disposition as scrap" pumps/products returned which contain unknown fluids. SHURflo reserves the right to charge the returnee for any and all costs incurred for chemical testing, and proper disposal of components containing unknown fluids. SHURflo request this in order to protect the environment and personnel from the hazards of handling unknown fluids.

## LIMITED WARRANTY PROCEDURE

SHURflo warrants Industrial 2088 series pumps to be free from material and workmanship defects (under normal use and service) for a period of one (1) year from the date of manufacture. or (1) one year use with proof of purchase, not to exceed (2) two years in any event.

The limited warranty will not apply to pumps that were improperly installed, misapplied, or incompatible with fluids or components not manufactured by SHURflo. SHURflo will not warrant any pump which is damaged or modified outside the SHURflo factory.

All Industrial pumps/products **must** be flush of **any** chemicals before \*shipping. All warranty considerations are governed by SHURflo's written Return Policy.

Returns are to be shipped postage prepaid to either service center; SHURflo Garden Grove, CA or Elkhart, IN. SHURflo shall not be liable for freight damage incurred during shipping. Package returns carefully.

Upon receiving a pump, it will be tested per SHURflo's test criteria. SHURflo's obligation under this warranty policy is limited to the repair or replacement of the unit. Pumps found not defective (under the terms of this limited warranty) are subject to charges to be paid by the returnee for the testing and packaging of "tested good" units.

No credit or labor allowances will be given to the returnee for pumps returned as defective. Warranty replacements will be shipped on a freight allowed basis. SHURflo reserves the right to choose the method of transportation.

This limited warranty is in lieu of all other warranties, expressed or implied, and no other person is authorized to give any other warranty or assume obligation or liability on SHURflo's behalf. SHURflo shall not be liable for any labor, damage or other expense, nor shall SHURflo be liable for any indirect, incidental or consequential damages of any kind incurred by the reason of the use or sale of any defective product or part. This limited warranty covers pumps distributed within the United States of America. Other world market areas should consult with the distributor for any deviation from this document.

\* Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous materials being shipped. Check with your shipping company for specific instructions. Failure to do so may result in a substantial penalties.



**SHURflo reserves the right to update specifications, prices, or make substitutions.**

**SHURflo ★**  
12650 Westminster Ave.  
Santa Ana, CA 92706-2100  
(800) 854-3218 (714) 554-7709  
FAX (714) 554-4721  
**Shipping/UPS:** 12650 Westminster Ave.  
Garden Grove, CA 92843

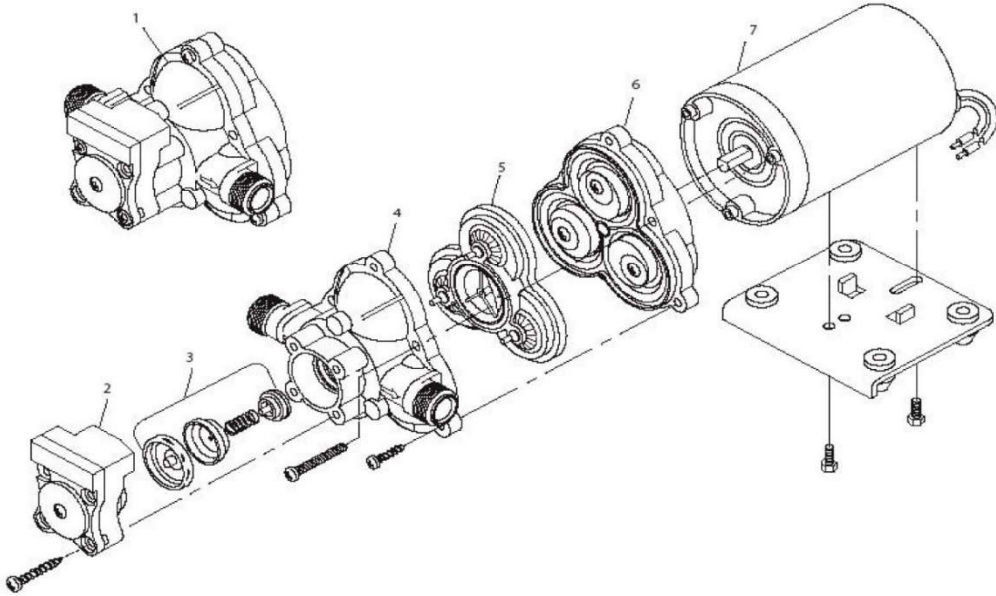
**SHURflo East**  
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## 2088 Replacement Kits



	1	2	3	4	5	6	7
<b>Model Number</b>	<b>Complete Pumphead Assembly</b>	<b>Switch Assembly</b>	<b>Check Valve Assembly</b>	<b>Upper Housing</b>	<b>Bypass/ Non Bypass Valve Assembly</b>	<b>Drive/Impeller Diaphragm Assembly</b>	<b>Motor</b>
<b>2088-514-500</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>94-238-00</b>	<b>94-232-00</b>	<b>94-238-03</b>	<b>11-226-07</b>

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# Parts Breakdown

## 8 Parts Breakdowns

FILE NAME	Blower Housing Assy	<b>OLYMPIAN BLOWER HOUSING LINER</b>	
DWG NAME	Current Units		

ITEM	QTY	PART NUMBER	DESCRIPTION
5	16	BON-000321	LOCKNUT, 1/2"-13 NYLON
4	16	BON-000340	WASHER, 1/2" FLAT
3	16	BON-000261.5	BOLT, 1/2"-13 X 1-1/2" CARRIAGE
2	2	LV-4311-AR	LINER, AR, BLOWER ELBOW
1	1	LV-3024-AR	LINER, AR, BLOWER HOUSING

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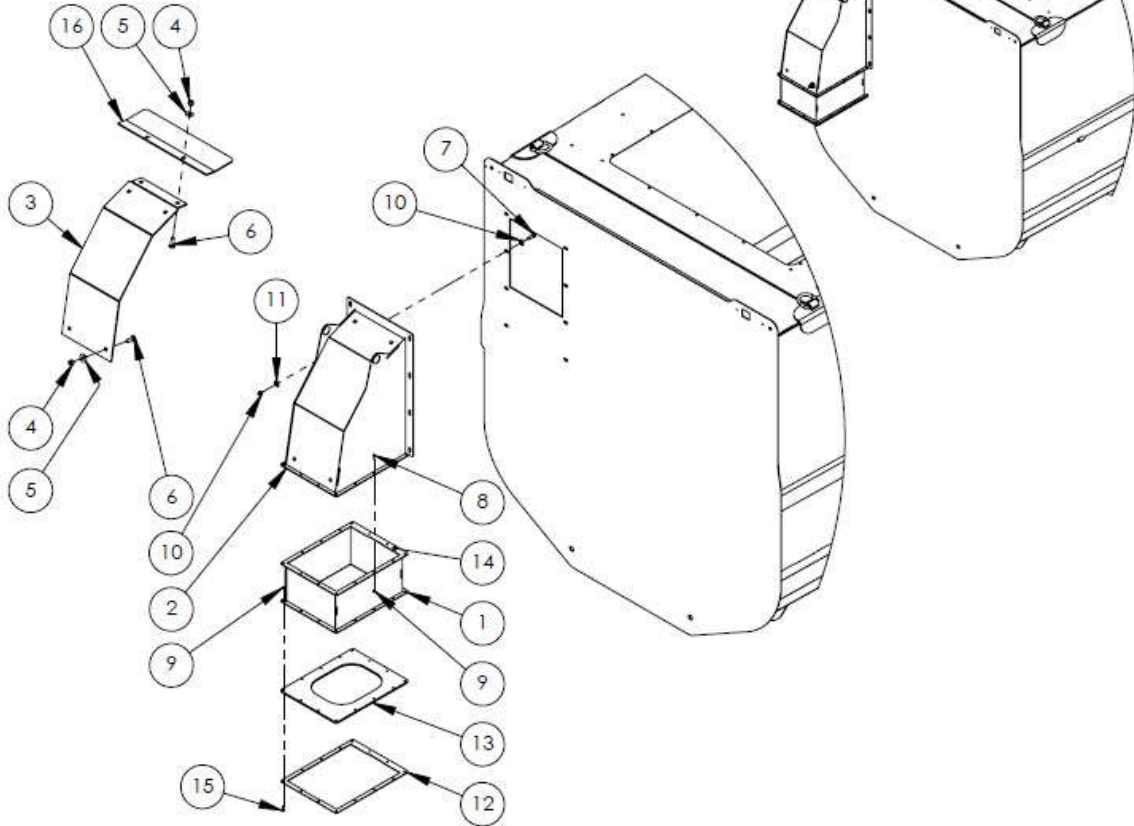
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DIXON, ILLINOIS  
PHONE: 800-851-9664

# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG1

## OLYMPIAN BODY TRANSITION



16	1	LV-4831	TRANSITION LINER EXTENSION
15	14	BON-000006	BOLT, 1/4-20 X 1-1/4 HEX ZP
14	6	LV-4213	SEAL, D BULB X 1/2" WIDE
13	1	LV-4826	TRANSITION GASKET
12	1	LV-4825	TRANSITION SEAL FLANGE
11	16	BON-000340	FLATWASHER, 1/2 ZP
10	8	BON-000321	LOCKNUT, 1/2-13 NYLON ZP
9	24	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
8	10	BON-000005	BOLT, 1/4-20 X 1 HEX ZP
7	8	BON-000107	BOLT, 1/2 -13 X 1-1/2 HEX ZP
6	6	BON-000288	BOLT, 5/8 -11 X 2 CARRIAGE ZP
5	6	BON-000341	FLATWASHER, 5/8 ZP
4	6	BON-000322	LOCKNUT, 5/8-11 NYLON ZP
3	1	LV-4824	TRANSITION LINER
2	1	LV-4823	TRANSITION
1	1	LV-4827	TRANSITION EXTENSION
ITEM	QTY	PART NUMBER	DESCRIPTION

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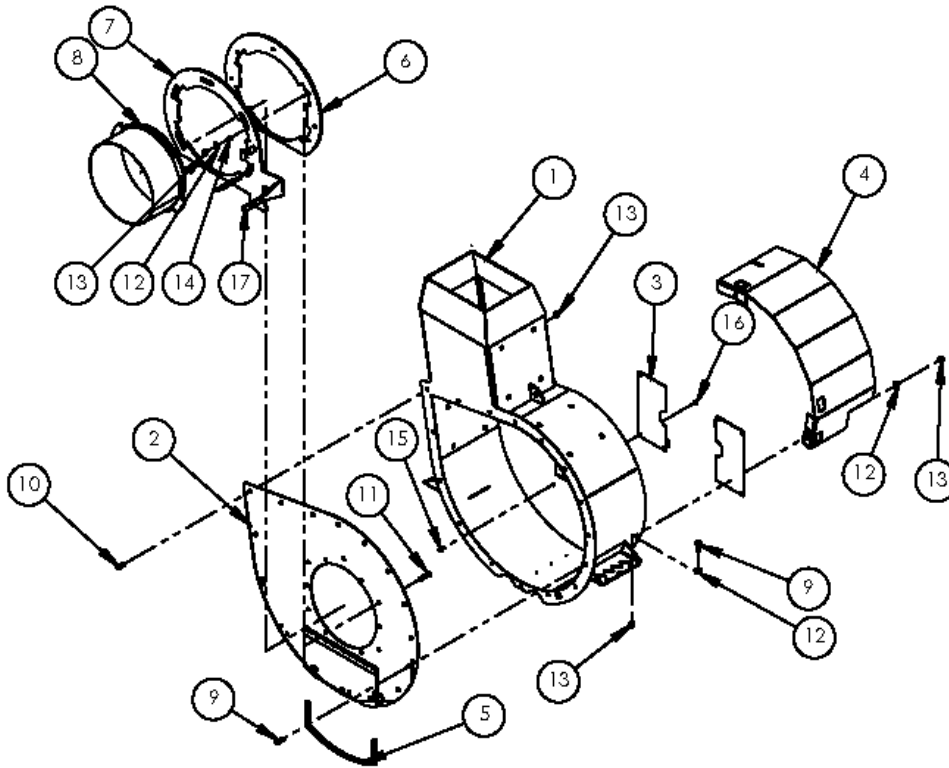


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PHONE: 800-851-9664

# Parts Breakdown

FILE NAME	M1 486	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	M1 486	-	ORIGINAL	1/17/2023	EDG

## OLYMPIAN BLOWER HOUSING



17	BON-009097	1	RUBBER GRIP
16	BON-000319	6	LOCKNUT, 3/8-16 NYLOCK ZP
15	BON-000285.3	6	CARRIAGE BOLT, 3/8-16 X 1"
14	LV-3109	5	BUSHING, BRONZE, 1/2" X 5/8" X 1 1/2"
13	BON-000321	33	LOCKNUT, 1/2-13 NYLOCK ZP
12	BON-000340	12	FLATWASHER, 1/2" ZP
11	BON-000109	5	BOLT, 1/2-13 X 2" ZP
10	BON-000106	17	BOLT, 1/2-13 X 1-1/4" ZP
9	BON-000107	11	BOLT, 1/2-13 X 1-1/2" ZP
8	LV-3105	1	QD NOZZLE TUBE
7	LV-3102	1	QD NOZZLE ROTATING RING
6	LV-3100	1	QD NOZZLE BASE RING
5	LV-4213	2.5	SEAL, D BULB 1/2" WIDE
4	LV-4218	1	BLOWER HOUSING SHIELD
3	LV-4289	2	BLOWER HOUSING BACK PLATE
2	LV-4217	1	BLOWER HOUSING COVER WITH DOOR
2	LV-4216	1	BLOWER HOUSING COVER W/OUT DOOR
1	LV-4291	1	BLOWER HOUSING WELDMENT
ITEM	PART NUMBER	QTY	DESCRIPTION

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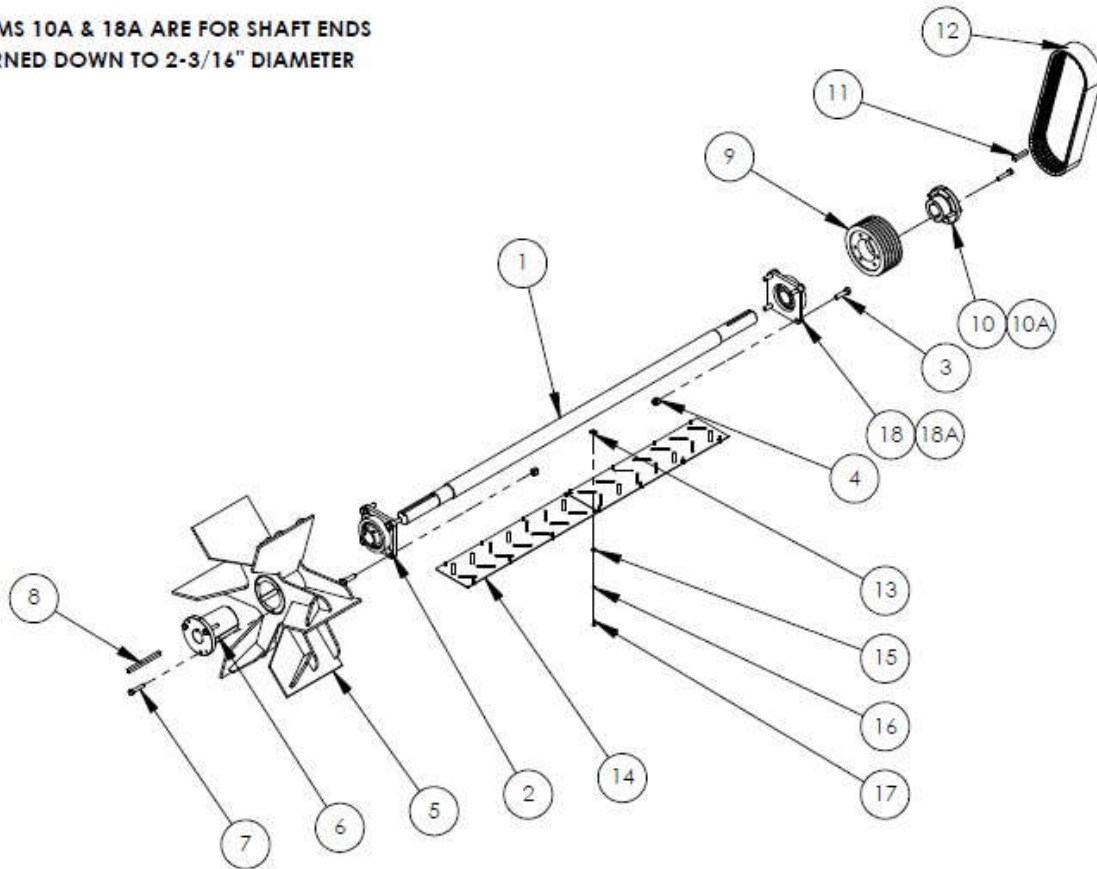
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## Parts Breakdown

FILE NAME	OLYMPIAN Power Unit Skid Assy
DWG NAME	PG2

### OLYMPIAN JACKSHAFT, BEARINGS & FAN

**ITEMS 10A & 18A ARE FOR SHAFT ENDS  
TURNED DOWN TO 2-3/16" DIAMETER**



18A	1	LV-4600	BEARING, 2-3/16" FLANGE
18	1	LV-4589	BEARING, 2-1/4" FLANGE
17	16	BON-000003	BOLT, 1/4-20 X 3/4 HEX ZP
16	16	BON-000350	LOCKWASHER, 1/4 ZP
15	16	BON-000336	FLATWASHER, 1/4 ZP
14	2	LV-4231	SHAFT GUARD COVER
13	16	BON-000301C	CLIP NUT, 1/4-20
12	1	LV-4458	5V600 V-BELT (SET OF 5 BELTS)
11	1	LV-4233	PULLEY DRIVE KEY
10A	1	LV-1272	SHEAVE BUSHING E 2-3/16
10	1	LV-1273	SHEAVE BUSHING E 2-1/4
9	1	LV-1271	FAN SHEAVE, (5 5V 925 E) 74 HP ENGINES
		LV-1280	FAN SHEAVE, (5 5V 900 E) 87 HP ENGINES
		LV-1279	FAN SHEAVE, (5 5V 850 E) 99 HP ENGINES
8	1	LV-4232	FAN DRIVE KEY
7	3	BON-000110	BOLT, 1/2-13 X 2-1/4 HEX ZP
6	1	LV-1633	2-3/16" SPLIT TAPER BUSHING
5	1	LV-1629	30" BELT DRIVE CW FAN
4	8	BON-000322	LOCKNUT, 5/8-11 NYLON ZP
3	8	BON-000154	BOLT, 5/8-11 X 2-1/4 HEX ZP
2	1	LV-4589	BEARING, 2-1/4" FLANGE
1	1	LV-4588	JACKSHAFT, POWERSKID
ITEM	QTY	PART NUMBER	DESCRIPTION

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# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2	<b>OLYMPIAN LUBRICATION COMPONENTS</b>	
DWG NAME	PG13		

ITEM	QTY	PART NUMBER	DESCRIPTION
7	2	50785K81	GREASE FITTING, 45 DEG
6	1	BV2-002405	GREASE EXTENSION HOSE, 60"
5	1	BV2-002404	GREASE EXTENSION HOSE, 12"
4	2	BON-000652	GREASE FITTING, STRAIGHT 1/8 NPT
3	2	BON-000352	LOCKWASHER, 3/8 ZP
2	2	BON-000060	BOLT, 3/8-16 X 1-3/4 HEX, ZP
1	1	BV2-001827	MANIFOLD GREASE EXTENSION

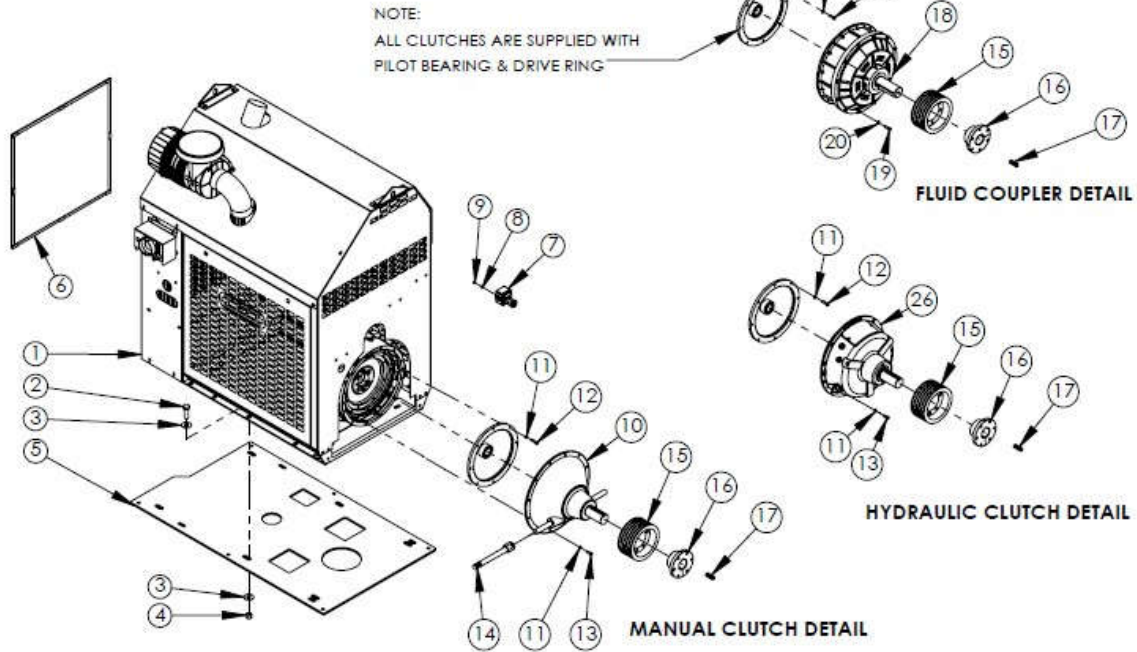
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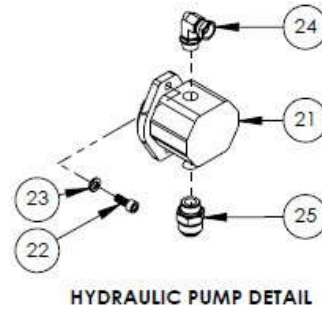
# Parts Breakdown

FILE NAME	OLYMPIAN Engine Assy
DWG NAME	PG1

## OLYMPIAN ENGINE ASSEMBLY - 99 HP DEERE



26	1	LV-4598	HYDRAULIC CLUTCH
25	1	848FSO 16X12	MALE 37° X MALE ORB, 1-5/16-12 X 1-1/16
24	1	60UB 10X08	M ORB X 90° F PIPE SW 7/8-14 X 1/2 NPSM
23	2	BON-000353	LOCKWASHER, 7/16 ZP
22	2	91290A520	BOLT, M10-1.5 X 25MM SHCS
21	1	LV-2029	HYDRAULIC PUMP
20	20	BON-000352	3/8 LOCKWASHER ZP
19	20	BON-000058	3/8-16 X 1 HEX BOLT ZP
18	1	LV-1089	FLUID POWER TAKE OFF
17	1	LV-1132	STEP KEY 1/2" X 5/8" X 2" LONG
16	1	LV-1273	ENGINE SHEAVE BUSHING
15	1	LV-1270	ENGINE SHEAVE
14	1	LV-1339	EXTENSION ARM WELDMENT
13	12	BON-000057	3/8-16 X 1 HEX BOLT ZP
12	8	BON-000059	3/8-16 X 1-1/2 HEX BOLT ZP
11	20	BON-000352	3/8 LOCKWASHER ZP
10	1	LV-4530	OVER CENTER CLUTCH
9	2		#6-32 HEX NUT W/ STAR WASHER ZP
8	2		#6-32 X 1 MACHINE SCREW ZP
7	1	LV-1398	EMERGENCY STOP SWITCH
6	1	LV-2454	MAGNETIC PRESCREEN
5	1	LV-4248	GEN2 ENGINE PLATE
4	6	BON-000323	3/4-10 LOCKNUT, NYLON ZP
3	12	BON-000341	FLATWASHER, 3/4 ZP
2	6	BON-000184	3/4-10 X 2-1/2 HEX BOLT
1	1	LV-4542	ENGINE, JOHN DEERE, 99 HP
ITEM	QTY	PART NUMBER	DESCRIPTION



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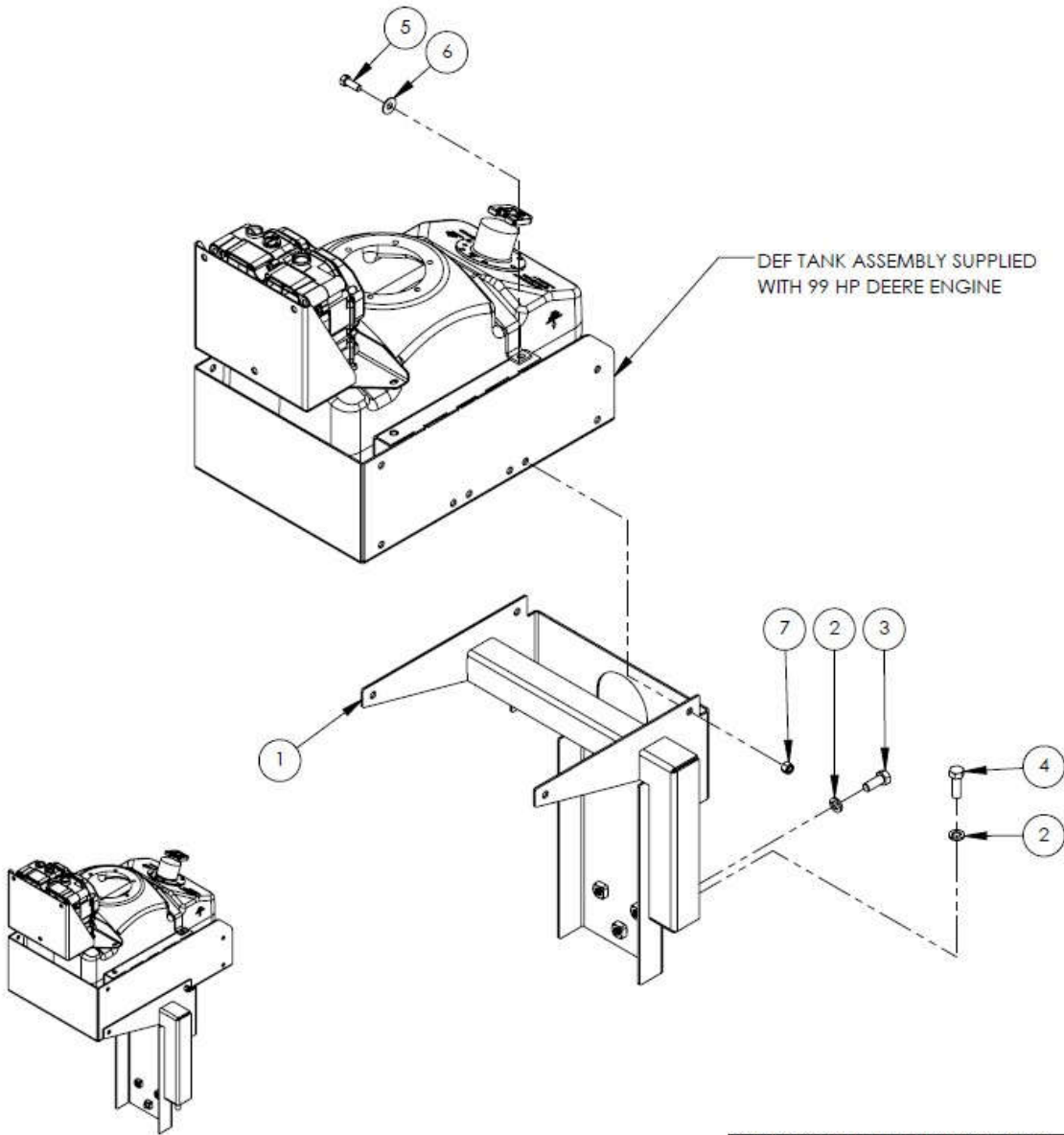
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# Parts Breakdown

FILE NAME	Gen2 Power Unit Skid Assy 2
DWG NAME	PG15

## OLYMPIAN DEF TANK MOUNTING 99 HP JOHN DEERE ENGINE



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7	4	BON-000319	LOCKNUT, 3/8-16 NYLON ZP
6	4	BON-000338	FLATWASHER, 3/8 ZP
5	4	BON-000057	BOLT, 3/8-16 X 1 HEX ZP
4	1	BON-000107	BOLT, 1/2-13 X 1-1/2 HEX ZP
3	3	BON-000106	BOLT, 1/2-13 X 1-1/4 HEX ZP
2	4	BON-000354	LOCKWASHER, 1/2 ZP
1	1	LV-4226	DEF TANK MOUNTING BRACKET
ITEM	QTY	PART NUMBER	DESCRIPTION



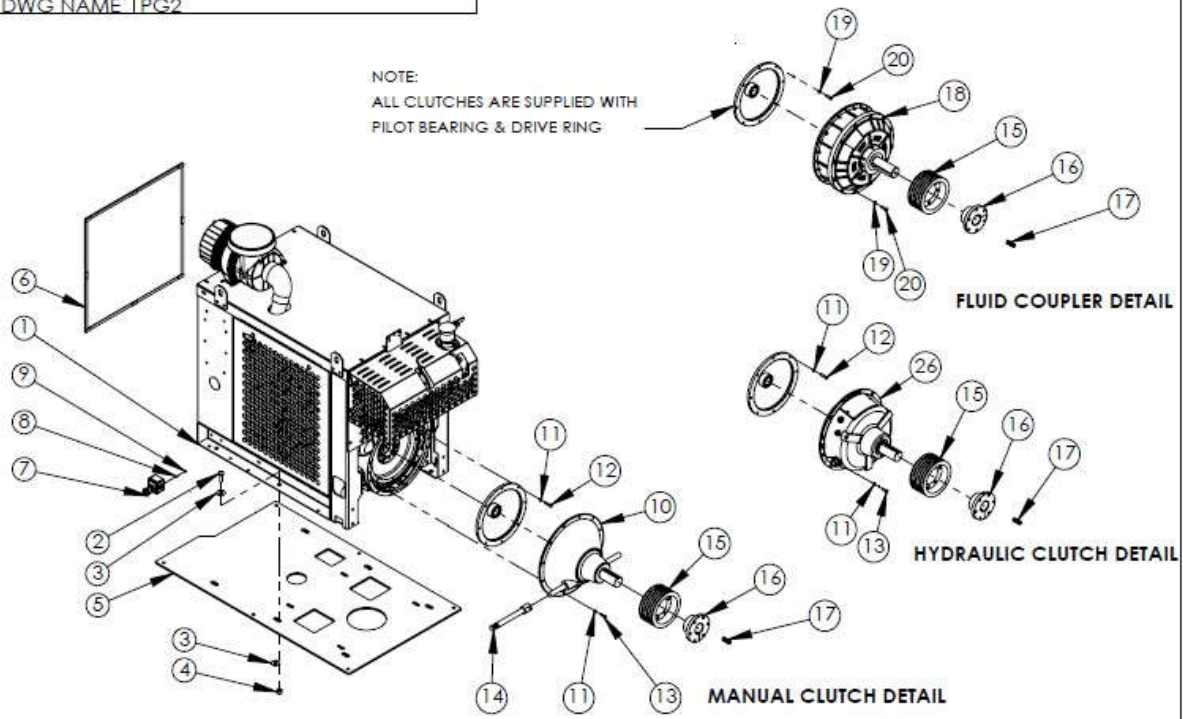
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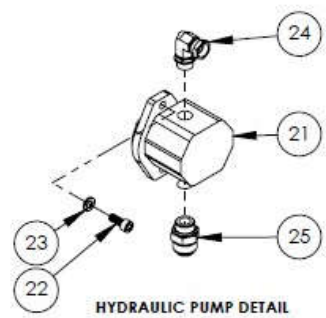
# Parts Breakdown

FILE NAME	OLYMPIAN Engine Assy
DWG NAME	PG2

## OLYMPIAN ENGINE ASSEMBLY - 74 HP DEERE



26	1	LV-4598	HYDRAULIC CLUTCH
25	1	848FSO 16X12	MALE 37° X MALE ORB, 1-5/16-12 X 1-1/16
24	1	60UB 10X08	M ORB X 90° F PIPE SW 7/8-14 X 1/2 NPSM
23	2	BON-000353	LOCKWASHER, 7/16 ZP
22	2	91290A520	BOLT, M10-1.5 X 25MM SHCS
21	1	LV-2029	HYDRAULIC PUMP
20	20	BON-000352	3/8 LOCKWASHER ZP
19	20	BON-000058	3/8-16 X 1 HEX BOLT ZP
18	1	LV-1089	FLUID POWER TAKE OFF
17	1	LV-1132	STEP KEY 1/2" X 5/8" X 2" LONG
16	1	LV-1273	ENGINE SHEAVE BUSHING
15	1	LV-1270	ENGINE SHEAVE
14	1	LV-1339	EXTENSION ARM WELDMENT
13	12	BON-000057	3/8-16 X 1 HEX BOLT ZP
12	8	BON-000059	3/8-16 X 1-1/2 HEX BOLT ZP
11	20	BON-000352	3/8 LOCKWASHER ZP
10	1	LV-4530	OVER CENTER CLUTCH
9	2		#6-32 HEX NUT W/ STAR WASHER ZP
8	2		#6-32 X 1 MACHINE SCREW ZP
7	1	LV-1398	EMERGENCY STOP SWITCH
6	1	LV-2455	MAGNETIC PRESCREEN
5	1	LV-4249	GEN2 ENGINE PLATE
4	6	BON-000322	5/8-11 LOCKNUT, NYLON ZP
3	12	BON-000341	FLATWASHER, 5/8 ZP
2	6	BON-000152	5/8-11 X 1-3/4 HEX BOLT
1	1	LV-4540	ENGINE, JOHN DEERE, 74 HP
ITEM	QTY	PART NUMBER	DESCRIPTION



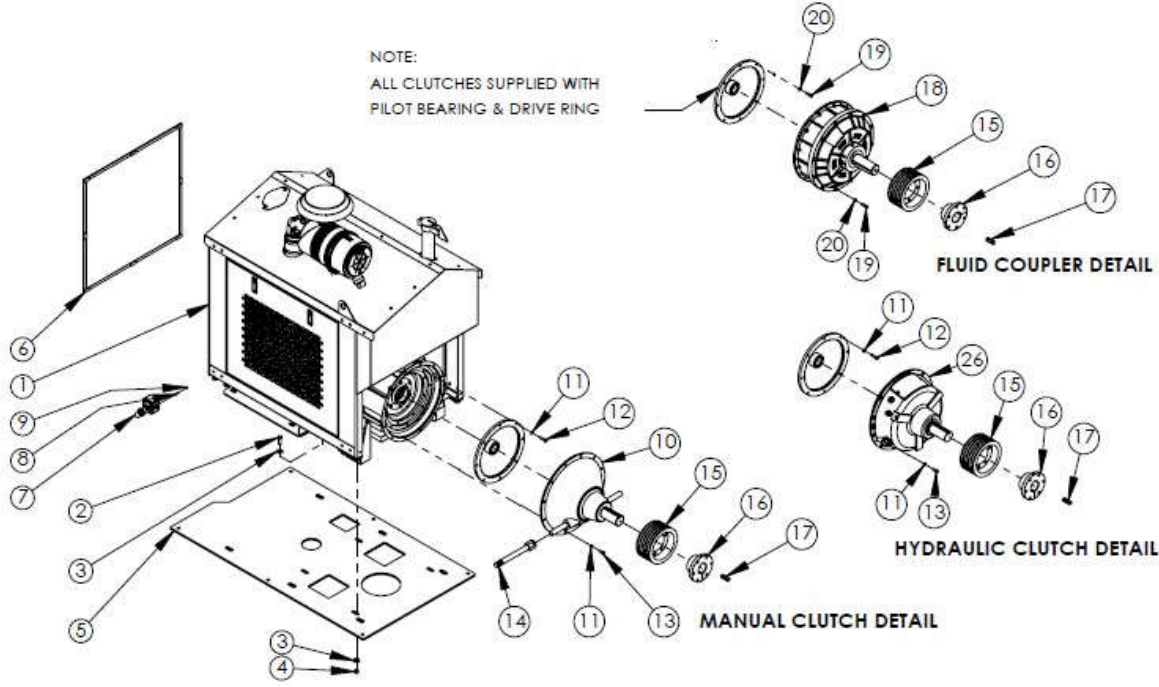
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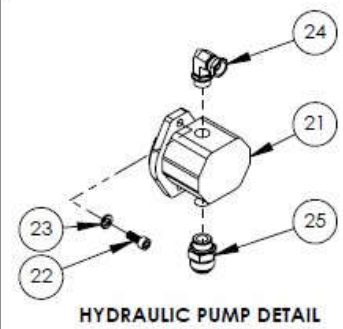
DIXON, ILLINOIS  
PHONE: 800-851-9664

# Parts Breakdown

FILE NAME	OLYMPIAN Engine Assy	<b>OLYMPIAN ENGINE ASSEMBLY - 74 HP KUBOTA</b>
DWG NAME	PG4	



26	1	LV-4598	HYDRAULIC CLUTCH
25	1	848FSO 16X12	MALE 37° X MALE ORB, 1-5/16-12 X 1-1/16
24	1	60UB 10X08	M ORB X 90° F PIPE SW 7/8-14 X 1/2 NPSM
23	2	BON-000353	LOCKWASHER, 7/16 ZP
22	2	96144A256	BOLT, M10-1.25 X 25MM SHCS
21	1	LV-2029	HYDRAULIC PUMP
20	20	BON-000352	3/8 LOCKWASHER ZP
19	20	BON-000058	3/8-16 X 1 HEX BOLT ZP
18	1	LV-1089	FLUID POWER TAKE OFF
17	1	LV-1132	STEP KEY 1/2" X 5/8" X 2" LONG
16	1	LV-1273	ENGINE SHEAVE BUSHING
15	1	LV-1270	ENGINE SHEAVE
14	1	LV-1339	EXTENSION ARM WELDMENT
13	12	BON-000057	3/8-16 X 1 HEX BOLT ZP
12	8	BON-000059	3/8-16 X 1-1/2 HEX BOLT ZP
11	20	BON-000352	3/8 LOCKWASHER ZP
10	1	LV-4530	OVER CENTER CLUTCH
9	2		#6-32 HEX NUT W/ STAR WASHER ZP
8	2		#6-32 X 1 MACHINE SCREW ZP
7	1	LV-1398	EMERGENCY STOP SWITCH
6	1	LV-2455	MAGNETIC PRESCREEN
5	1	LV-4249	GEN2 ENGINE PLATE
4	6	BON-000321	1/2-13 LOCKNUT, NYLON ZP
3	12	BON-000340	FLATWASHER, 1/2 ZP
2	6	BON-000107	1/2-13 X 1-1/2 HEX BOLT
1	1	LV-2442	ENGINE, KUBOTA, 74 HP
ITEM	QTY	PART NUMBER	DESCRIPTION



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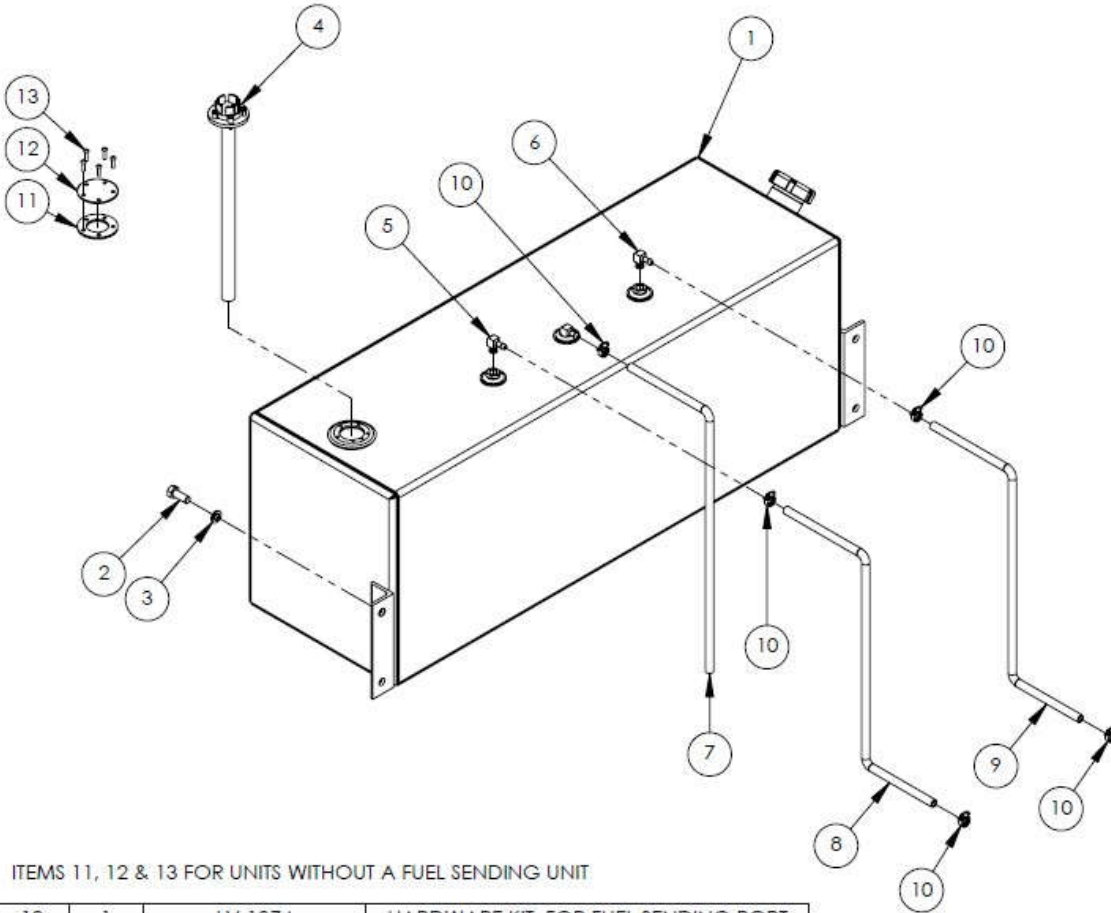
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## Parts Breakdown

FILE NAME	Gen2 Power Unit Skid Assy 2
DWG NAME	PG10

**OLYMPIAN FUEL TANK ASSEMBLY  
JOHN DEERE 74 HP DIESEL ENGINE  
JOHN DEERE 99 HP DIESEL ENGINE  
KOHLER 74 HP DIESEL ENGINE**



ITEMS 11, 12 & 13 FOR UNITS WITHOUT A FUEL SENDING UNIT

13	1	LV-1374	HARDWARE KIT, FOR FUEL SENDING PORT
12	1	LV-1326	COVER PLATE, FUEL SENDING PORT
11	1	LV-1373	GASKET, FUEL SENDING PORT
10	5	VEL-022204	HOSE CLAMP, SAE 4 7/32-5/8
9	6	LV-1444	FUEL LINE, 3/8 IN. ID, SAE 30R7
8	6	LV-1443	FUEL LINE, 1/4 IN. ID, SAE 30R7
7	3	LV-1159	FUEL LINE, 5/16 IN. ID, SAE 30R7
6	1	LV-1442	1/4" NPTF MALE PIPE X 3/8" ID HOSE BARB
5	1	LV-1441	1/4" NPTF MALE PIPE X 1/4" ID HOSE BARB
4	1	LV-4518	FUEL SENDING UNIT
3	4	BON-000354	LOCKWASHER, 1/2 ZP
2	4	BON-000106	BOLT, 1/2-13 X 1-1/4 HEX ZP
1	1	LV-4508	FUEL TANK, 40 GAL ALUMINUM DIESEL
ITEM	QTY	PART NUMBER	DESCRIPTION

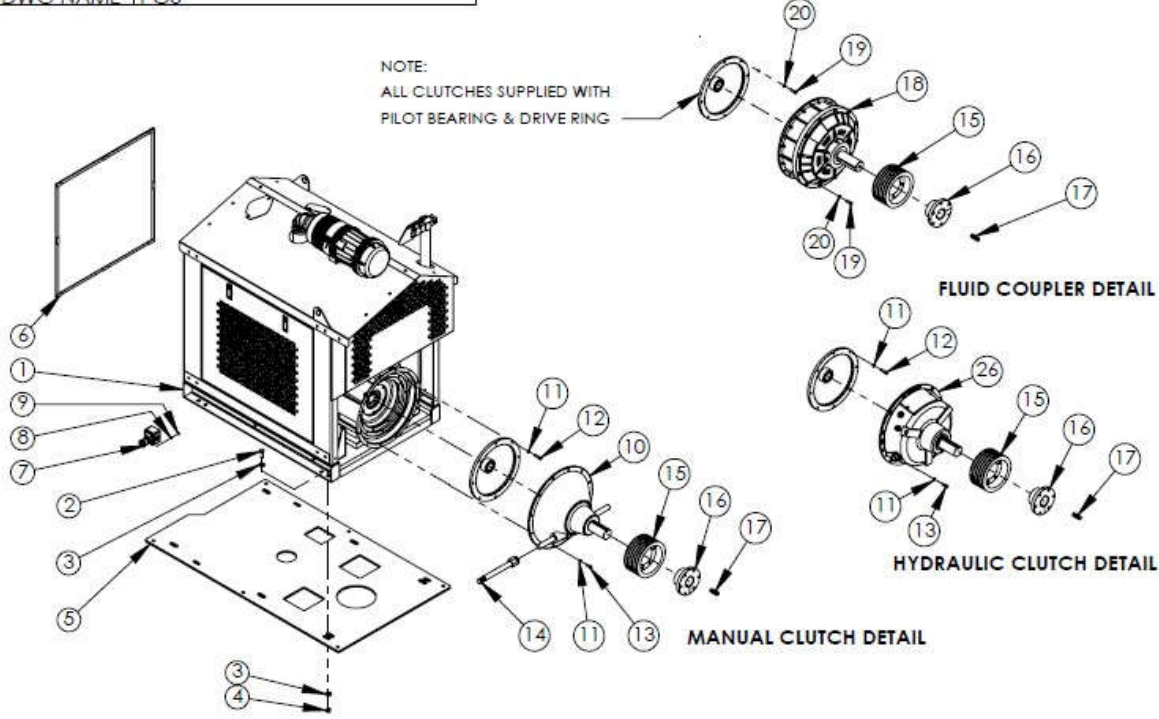
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# Parts Breakdown

FILE NAME	OLYMPIAN Engine Assy	<b>OLYMPIAN ENGINE ASSEMBLY - 87 HP KUBOTA</b>
DWG NAME	PG3	



26	1	LV-4598	HYDRAULIC CLUTCH
25	1	854FSO 16X12	MALE 37° X MALE ORB, 1-5/16-12 X 1-1/16
24	1	60UB 10X08	M ORB X 90° F PIPE SW 7/8-14 X 1/2 NPSM
23	2	BON-000353	LOCKWASHER, 7/16 ZP
22	2	96144A256	BOLT, M10-1.25 X 25MM SHCS
21	1	LV-2029	HYDRAULIC PUMP
20	20	BON-000352	3/8 LOCKWASHER ZP
19	20	BON-000058	3/8-16 X 1 HEX BOLT ZP
18	1	LV-1089	FLUID POWER TAKE OFF
17	1	LV-1132	STEP KEY 1/2" X 5/8" X 2" LONG
16	1	LV-1273	ENGINE SHEAVE BUSHING
15	1	LV-1270	ENGINE SHEAVE
14	1	LV-1339	EXTENSION ARM WELDMENT
13	12	BON-000057	3/8-16 X 1 HEX BOLT ZP
12	8	BON-000059	3/8-16 X 1-1/2 HEX BOLT ZP
11	20	BON-000352	3/8 LOCKWASHER ZP
10	1	LV-4530	OVER CENTER CLUTCH
9	2		#6-32 HEX NUT W/ STAR WASHER ZP
8	2		#6-32 X 1 MACHINE SCREW ZP
7	1	LV-1398	EMERGENCY STOP SWITCH
6	1	LV-2455	MAGNETIC PRESCREEN
5	1	LV-4248	GEN2 ENGINE PLATE
4	6	BON-000321	1/2-13 LOCKNUT, NYLON ZP
3	12	BON-000340	FLATWASHER, 1/2 ZP
2	6	BON-000107	1/2-13 X 1-1/2 HEX BOLT
1	1	LV-4544	ENGINE, KUBOTA, 87 HP GASOLINE
ITEM	QTY	PART NUMBER	DESCRIPTION

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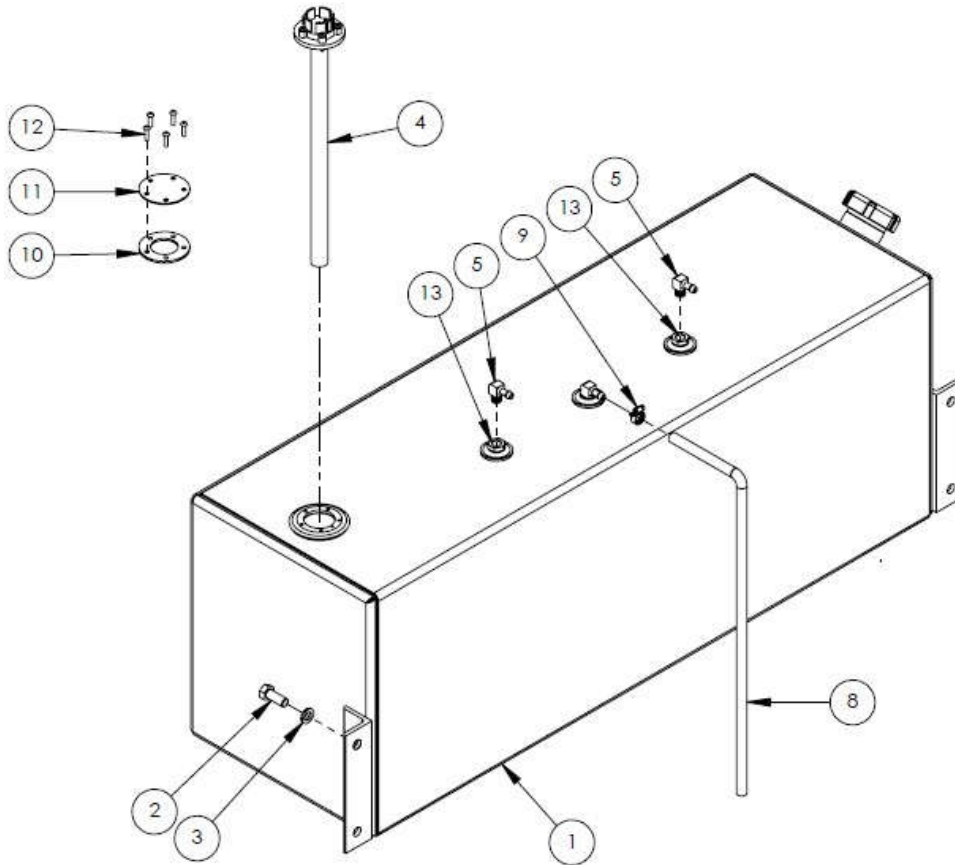


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## Parts Breakdown

FILE NAME	Gen2 Power Unit Skid Assy 2
DWG NAME	PG11

### OLYMPIAN FUEL TANK ASSEMBLY KUBOTA 87 HP GASOLINE ENGINE



ITEMS 10, 11 & 12 FOR UNITS WITHOUT A FUEL SENDING UNIT

13	2	5406-06X04	3/8X1/4 REDUCER BUSHING
12	1	LV-1374	HARDWARE KIT, FOR FUEL SENDING PORT
11	1	LV-1326	COVER PLATE, FUEL SENDING PORT
10	1	LV-1373	GASKET, FUEL SENDING PORT
9	1	LV-4583	HOSE CLAMP
8	3	LV-4581	FUEL LINE, 5/16" 100 PSI
5	1	LV-4582	1/4" NPTF MALE PIPE X 5/16" ID HOSE BARB
4	1	LV-4518	FUEL SENDING UNIT
3	4	BON-000354	LOCKWASHER, 1/2 ZP
2	4	BON-000106	BOLT, 1/2-13 X 1-1/4 HEX ZP
1	1	LV-4517	FUEL TANK, 40 GAL ALUMINUM GAS
ITEM	QTY	PART NUMBER	DESCRIPTION

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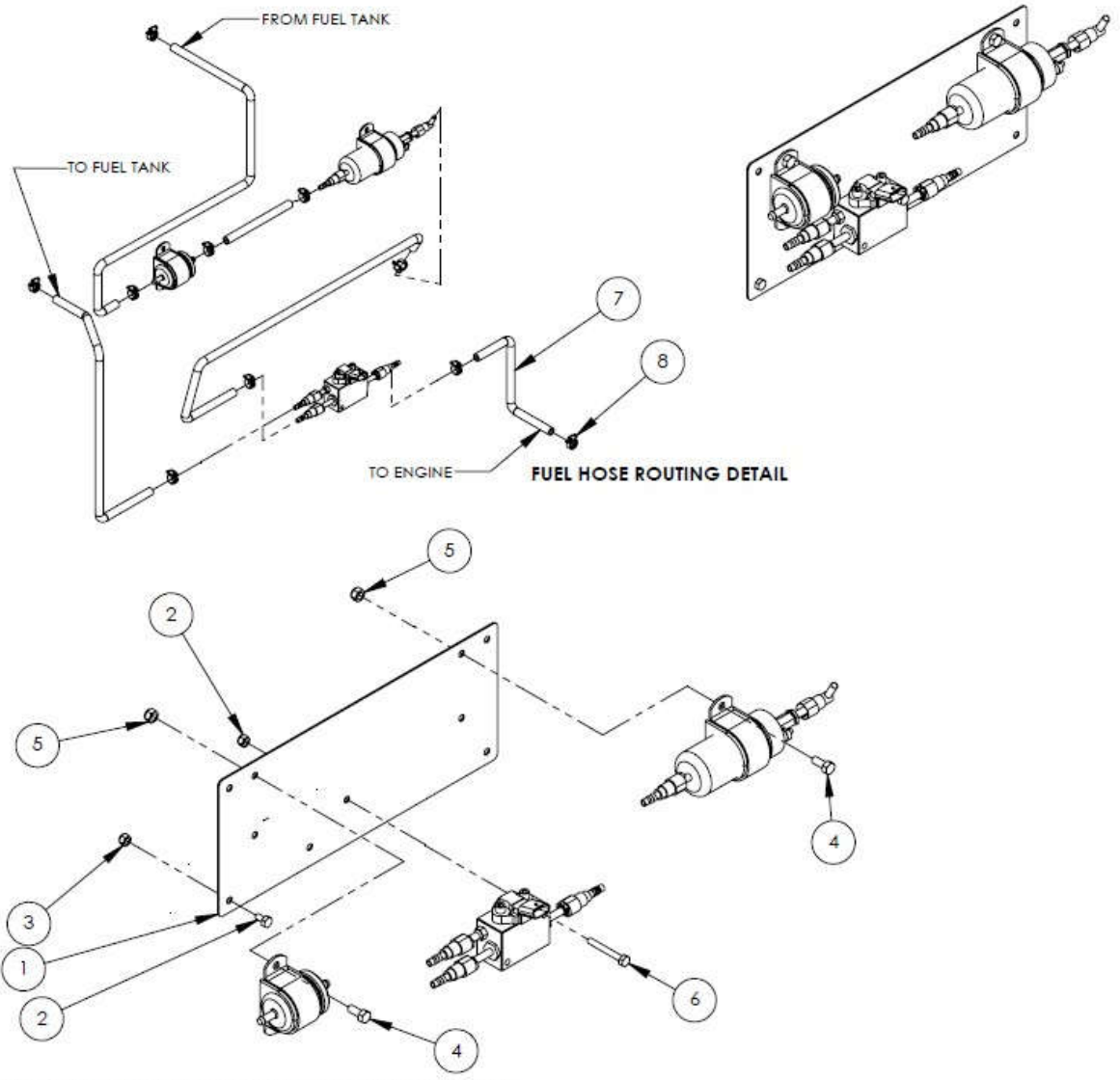
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# Parts Breakdown

FILE NAME	Gen2 Power Unit Skid Assy 2
DWG NAME	PG12

## OLYMPIAN FUEL COMPONENT GROUP KUBOTA 87 HP GASOLINE ENGINE



FUEL FILTER, FUEL PUMP AND FUEL PRESSURE MANIFOLD  
ARE SUPPLIED WITH THE 87 HP KUBOTA ENGINE

ITEM	QTY	PART NUMBER	DESCRIPTION
8	8	LV-4583	HOSE CLAMP
7	17	LV-4581	FUEL LINE, 5/16" 100 PSI
6	2	BON-000009	BOLT, 1/4-20 X 2 HEX ZP
5	4	BON-000320	LOCKNUT, 5/16-18 NYLON ZP
4	4	BON-000028	BOLT, 5/16-18 X 3/4 HEX ZP
3	6	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
2	4	BON-000001	BOLT, 1/4-20 X 1/2 HEX ZP
1	1	LV-4280	FUEL COMPONENT MOUNTING BRACKET

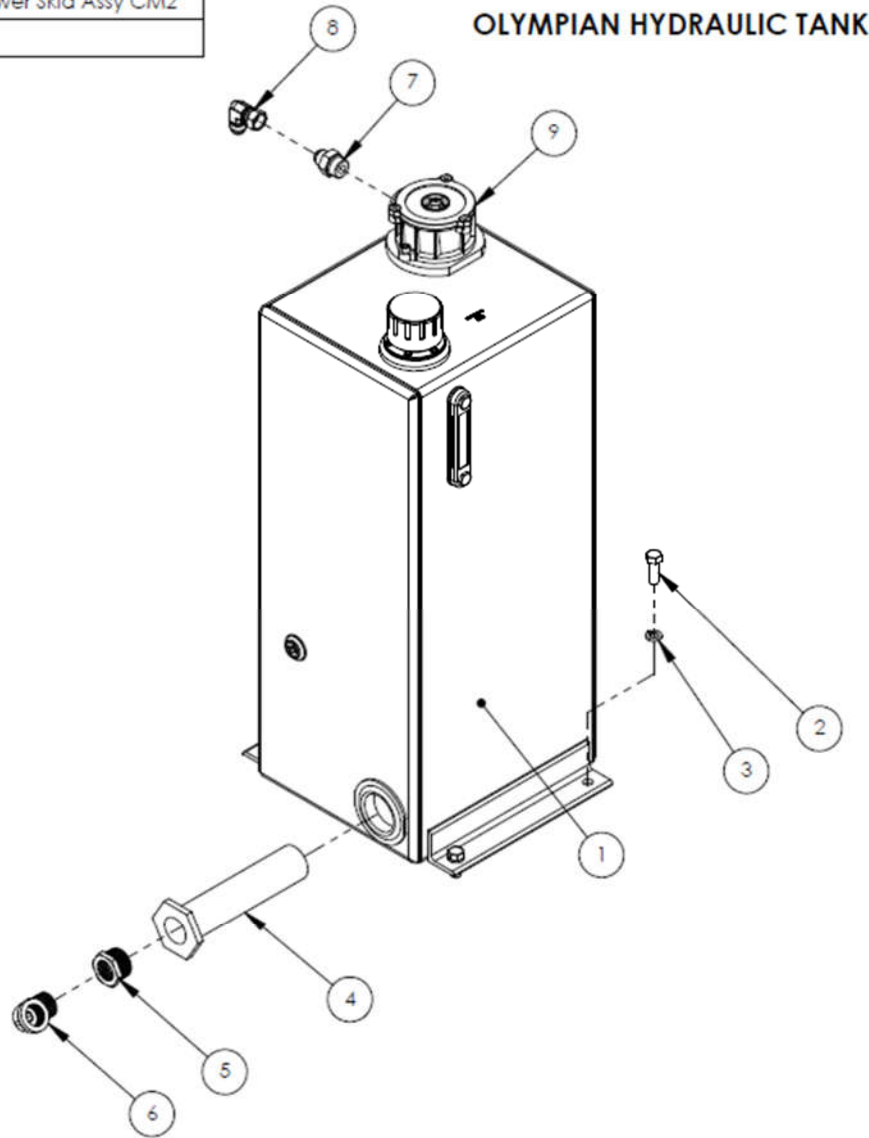
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## Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2
DWG NAME	PG99



**OLYMPIAN HYDRAULIC TANK**

9	1	LV-4575	FILTER, RETURN, IN-TANK, LITA-750-25
8	1	879FS 10	FITTING, M37DEG X F37DEG 90DEG
7	1	848FSO 10X12	ADAPTER, STRAIGHT M37DEG X MORB
6	1	BON-000442	PIPE FITTING, 1" 90DEG STREET ELBOW
5	1	BON-000472	PIPE FITTING BUSHING, 1-1/4X1
4	1	BUY-SW2001253	SUCTION STRAINER
3	4	BON-000354	LOCKWASHER, 1/2 ZP
2	4	BON-000107	BOLT, 1/2-13 X 1-1/2 HEX ZP
1	1	LV-4507	HYDRAULIC TANK 22GAL ALUMINUM
ITEM	QTY	PART NUMBER	DESCRIPTION

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# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2		
DWG NAME	PG96		

**OLYMPIAN MAIN VALVE ASSEMBLY**

ITEM	QTY	PART NUMBER	DESCRIPTION
10	2	839FS 06	PLUG, M37DEG, NO HYD JACK
	2	848FSO 06X06	FITTING, M37DEG X MORB, HYD JACK ONLY
9	8	848FSO 06X08	FITTING, M37DEG X MORB
8	2	848FSO 10X08	FITTING, M37DEG X MORB
7	6	BON-000354	LOCKWASHER, 1/2 ZP
6	6	BON-000106	BOLT, 1/2-13 X 1-1/4 ZP
5	4	BON-000336	FLATWASHER, 1/4 ZP
4	4	BON-000350	LOCKWASHER, 1/4 ZP
3	4	BON-000003	BOLT, 1/4-20 X 3/4 ZP
2	1	LV-2195-REX	VALVE, 5-SECTION PROPORTIONAL
1	1	LV-4230	BRACKET, MAIN VALVE

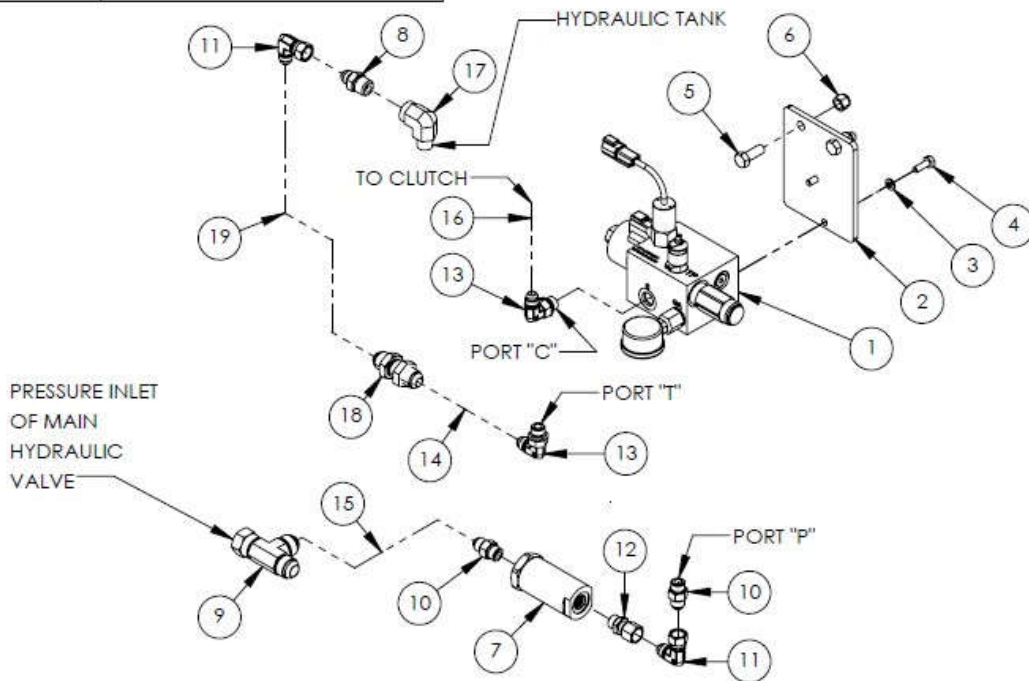
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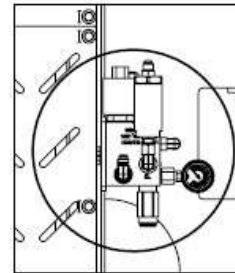
# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2
DWG NAME	PG100

## HYDRAULIC CLUTCH MANIFOLD



19	1	LV-4481	HOSE, BULKHEAD TO TANK
18	1	832FS 08X08	FITTING, M37DEG X M37DEG BH
17	1	25UG 06	ELBOW, 3/8" NPT 90°
16	1	LV-4499	HOSE, MANIFOLD "C" TO CLUTCH
15	1	LV-4411	HOSE, MANIFOLD "P" TO PRESSURE
14	1	LV-4408	HOSE, MANIFOLD "T" TO BULKHEAD
13	2	6801-06X06	FITTING, M37DEG X MORB 90°
12	1	6402-06-06	FITTING, F37DEG X MORB STRAIGHT
11	2	879FS 06	FITTING, M37DEG X M37DEG 90°
10	2	848FSO 06X06	FITTING, M37DEG X MORB STRAIGHT
9	1	10-R6X-S	FITTING, F37DEG X M37DEG X M37DEG TEE
8	1	848FS 06X06	FITTING, M37DEG X 3/8" NPTM
7A	1	LV-4410	10 MICRON FILTER ELEMENT
7	1	LV-4407	INLINE HYD FILTER
6	2	BON-000319	LOCKNUT, 3/8-16 VINYL ZP
5	2	BON-000057	BOLT, 3/8-16 X 1" HEX ZP
4	2	BON-000003	BOLT, 1/4-20 X 3/4" HEX ZP
3	2	BON-000350	LOCKWASHER, 1/4 ZP
2	1	LV-4406	HYD MANIFOLD MTG BRACKET
1	1	LV-4599	HYD CLUTCH MANIFOLD
ITEM	QTY	PART NUMBER	DESCRIPTION



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# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2	<b>OLYMPIAN SEQUENCE VALVE ASSEMBLY</b>	
DWG NAME	PG98		
ITEM	QTY		
7	3	871FS 06	FITTING, M37DEG X F37DEG X M37DEG TEE
6	2	848FSO 06X08	FITTING, M37DEG X MORB STRAIGHT
5	2	849FSO 08X08	FITTING, M37DEG X MORB 90DEG
4	2	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
3	2	BON-000336	FLATWASHER, 1/4 ZP
2	2	BON-000009	BOLT, 1/4-20 X 2 HEX ZP
1	1	DPSVP-10-N-S-08TA-30/10	SEQUENCE VALVE
ITEM	QTY	PART NUMBER	DESCRIPTION

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# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2	<b>OLYMPIAN DOWN PRESSURE RELIEF VALVE ASSY</b>	
DWG NAME	PG97		

ITEM	QTY	PART NUMBER	DESCRIPTION	
7	1	10-R6X-S	FITTING, M37DEG X F37DEG X M37DEG TEE	CONFIDENTIAL: THIS DRAWING AND/OR INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF, AND IS PROPRIETARY TO, BONNELL INDUSTRIES, INC. THIS DRAWING AND/OR INFORMATION SHALL BE KEPT CONFIDENTIAL AND MAY NOT BE REPRODUCED, COPIED, MODIFIED, DISCLOSED, TRANSFERRED, OR MADE AVAILABLE TO OTHERS, EXCEPT WITH THE EXPRESS WRITTEN CONSENT OF BONNELL INDUSTRIES, INC. IF IT IS LOANED IN CONFIDENCE FOR MUTUAL ASSISTANCE PURPOSES ONLY, BONNELL INDUSTRIES, INC. MAY AT ANY TIME, MODIFY THE DRAWING AND/OR INFORMATION CONTAINED HEREIN.
6	1	10-8-F650X-S	FITTING F37DEG X MORB	
5	1	848FSO 06X08	FITTING M37DEG X MORB	
4	2	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP	
3	2	BON-000336	FLATWASHER, 1/4 ZP	
2	2	BON-000009	BOLT, 1/4-20 X 2 HEX ZP	
1	1	RVDA-10-S-08TA-30/08	DOWN PRESSURE RELIEF VALVE	
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# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2		
DWG NAME	PG 14		
<b>OLYMPIAN ELECTRICAL COMPONENTS</b>			
16	2	LV-4359	PUSH BUTTON LATCH
15	2	LV-4293	ACCESS PANEL
14	1	LV-4511	JUMPER TERMINAL, 6-36V, 250A BLACK
13	1	LV-4510	JUMPER TERMINAL, 6-36V, 250A RED
12	2		#10-24 HEX NUT W/ STAR WASHER ZP
11	2		#10-24 X 3/4 MACHINE SCREW ZP
10	1	WAY-47211	JUNCTION BLOCK, 3/8-16 STUD, BLACK
9	4	BON-000005	BOLT, 1/4-20 X 1 HEX ZP
8	1	LV-2532	HFX 20 I/O CONTROLLER 74HP KUBOTA
		LV-2685	HFX 20 I/O CONTROLLER 87HP KUBOTA
		LV-2684	HFX 20 I/O CONTROLLER 74HP DEERE
		LV-2600	HFX 20 I/O CONTROLLER 99HP DEERE
7	4	BON-000320	LOCKNUT, 5/16 ZP
6	4	BON-000031	BOLT, 5/16-18 X 1-1/4 HEX ZP
5	1	LV-2533	VEHICLE ELECTRICAL CENTER
4	6	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
3	2	BON-0000003	BOLT, 1/4-20 X 3/4 HEX ZP
2	1	LV-4294	BATTERY RETAINER BRACKET
1	1	LV-1144	BATTERY, 12V
ITEM	QTY	PART NUMBER	DESCRIPTION

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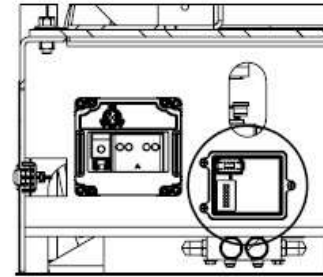
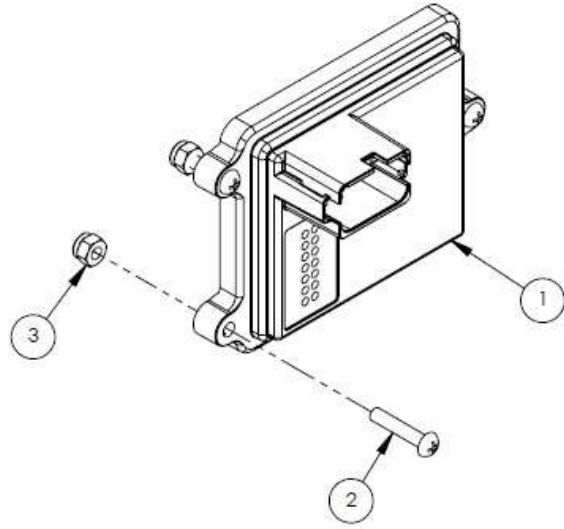
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# Parts Breakdown

FILE NAME	Olympian Power Skid Assy CM2
DWG NAME	PG101

## I/O EXPANSION MODULE



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4	1	LV-4405	HARNESS, I/O MODULE
3	3		LOCKNUT, 10-24 VINYL ZP
2	3		10-24 X 1" MACHINE SCREW
1	1	LV-4404	I/O EXPANSION MODULE
ITEM	QTY	PART NUMBER	DESCRIPTION

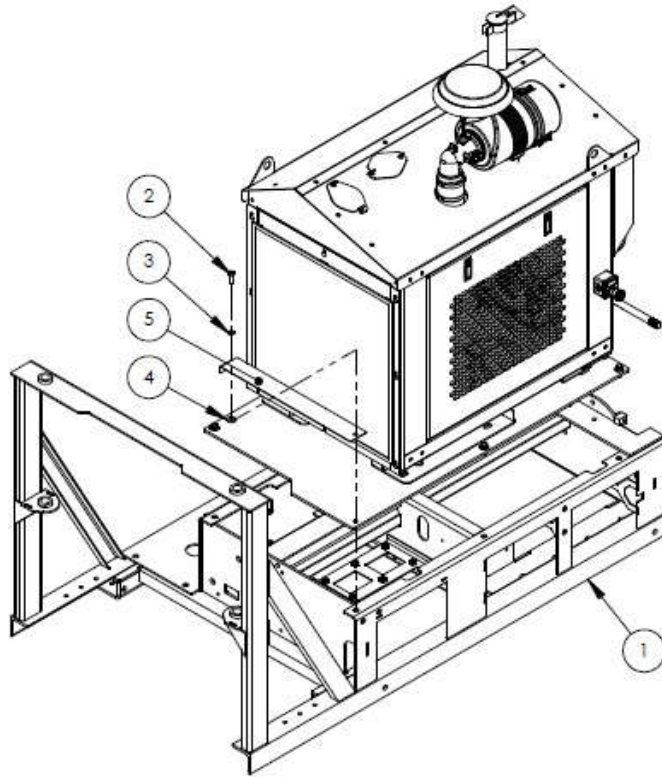


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# Parts Breakdown

FILE NAME	OLYMPIAN Power Unit Skid Assy
DWG NAME	PG1

## OLYMPIAN POWERSKID & ENGINE PLATE MOUNTING



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5	1	LV-4299	FAN BEARING COVER PLATE
4	6	BON-000340	FLATWASHER, 1/2 ZP
3	6	BON-000354	LOCKWASHER, 1/2 ZP
2	6	BON-000107	BOLT, 1/2-13 X 1-1/2 HEX ZP
1	1	LV-4290	POWERSKID WELDMENT
ITEM	QTY	PART NUMBER	DESCRIPTION

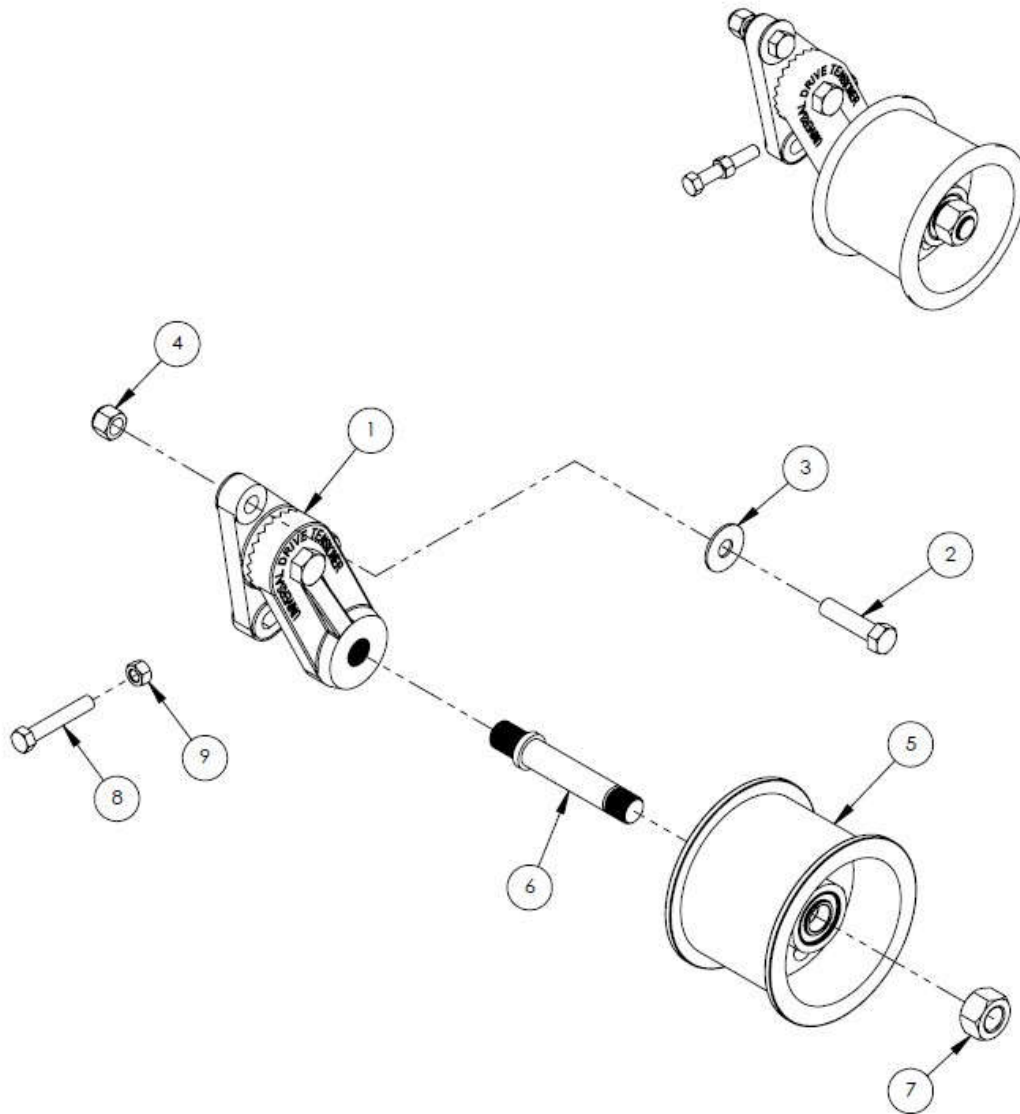


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PHONE: 800-851-9664

# Parts Breakdown

FILE NAME	Gen2 Power Unit Skid Assy
DWG NAME	PG3

## OLYMPIAN BELT TENSIONER

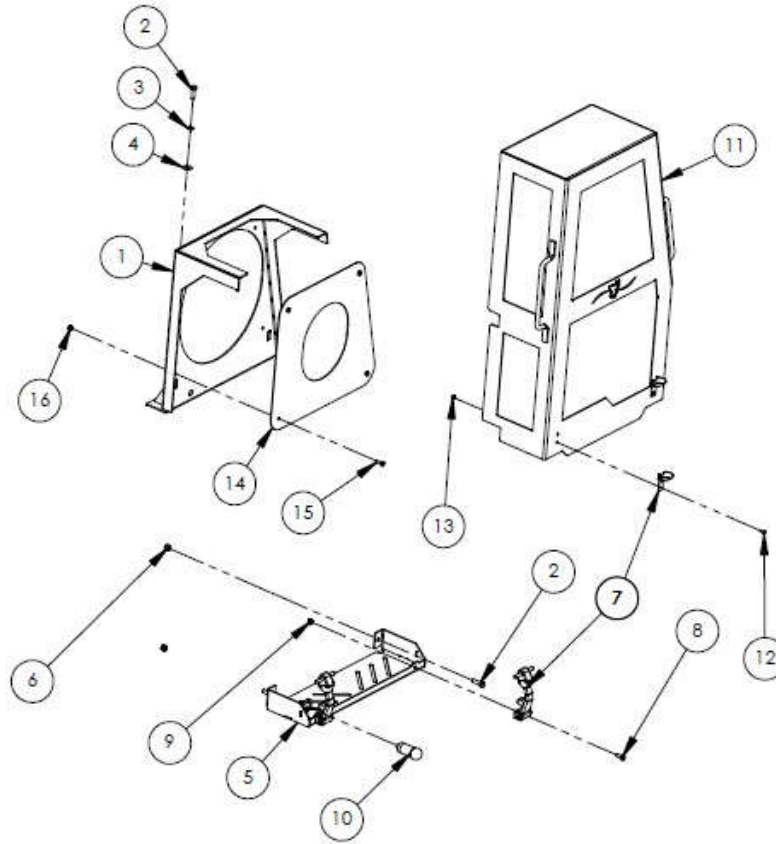


9	1	BON-000305	LOCKNUT, 1/2-13 NYLON ZP	<small>CONFIDENTIAL: THIS DRAWING AND/OR INFORMATION CONTAINED HEREIN IS AND REMAINS THE SOLE PROPERTY OF, AND IS PROPRIETARY TO, BONNELL INDUSTRIES, INC. THIS DRAWING AND/OR INFORMATION SHALL BE KEPT CONFIDENTIAL AND MAY NOT BE REPRODUCED, COPIED, MODIFIED, DISCLOSED, TRANSFERRED, OR MADE AVAILABLE TO OTHERS, EXCEPT WITH THE EXPRESS WRITTEN CONSENT OF BONNELL INDUSTRIES, INC. IT IS LOANED IN CONFIDENCE FOR MUTUAL ASSISTANCE PURPOSES ONLY. BONNELL INDUSTRIES, INC. MAY AT ANY TIME, MODIFY THE DRAWING AND/OR INFORMATION CONTAINED HEREIN.</small>
8	1	BON-000115FT	BOLT, 1/2-13 X 3-1/2 HEX ZP	
7	1	BON-000310	NUT, 1" HEX ZP	
6	1	LV-1662	MACHINED SHOULDER STUD, 1"	
5	1	LV-1661	FLANGED PULLEY IDLER, 7" OD	
4	2	BON-000322	LOCKNUT, 5/8-11 NYLON ZP	
3	2	BON-000341	FLATWASHER, 5/8 ZP	
2	2	BON-000155	BOLT, 5/8-11 X 2-1/2 HEX ZP	
1	1	LV-2491	BELT TENSIONER	
ITEM	QTY	PART NUMBER	DESCRIPTION	 DIXON, ILLINOIS PHONE: 800-851-9664

# Parts Breakdown

FILE NAME	OLYMPIAN Power Unit Skid Assy
DWG NAME	PG4

## OLYMPIAN BELT GUARD



16	4	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP - CLUTCH ONLY
15	4	BON-000003	BOLT, 1/4-20 X 3/4 HEX - CLUTCH ONLY
14	1	LV-4298	BELT GUARD BACK PLATE - CLUTCH ONLY
13	4		#10-24 HEX NUT W/ STAR WASHER ZP
12	4		#10-24 X 1/2 MACHINE SCREW ZP
11	1	LV-4222	BELT GUARD COVER
10	1	LV-4519	PROXIMITY SENSOR
9	2	BON-000320	LOCKNUT, 5/16-18 NYLON ZP
8	2	BON-000028	BOLT, 5/16-18 X 3/4 HEX ZP
7	2	ORR-H-5800	RUBBER LATCH ASSEMBLY
6	2	BON-000319	LOCKNUT, 3/8-16 NYLON ZP
5	1	LV-4221	BELT GUARD BOTTOM
4	4	BON-000338	FLATWASHER, 3/8 ZP
3	4	BON-000352	LOCKWASHER, 3/8 ZP
2	6	BON-000058	BOLT, 3/8-16 X 1-1/4 HEX ZP
1	1	LV-4223	BELT GUARD BACK
ITEM	QTY	PART NUMBER	DESCRIPTION

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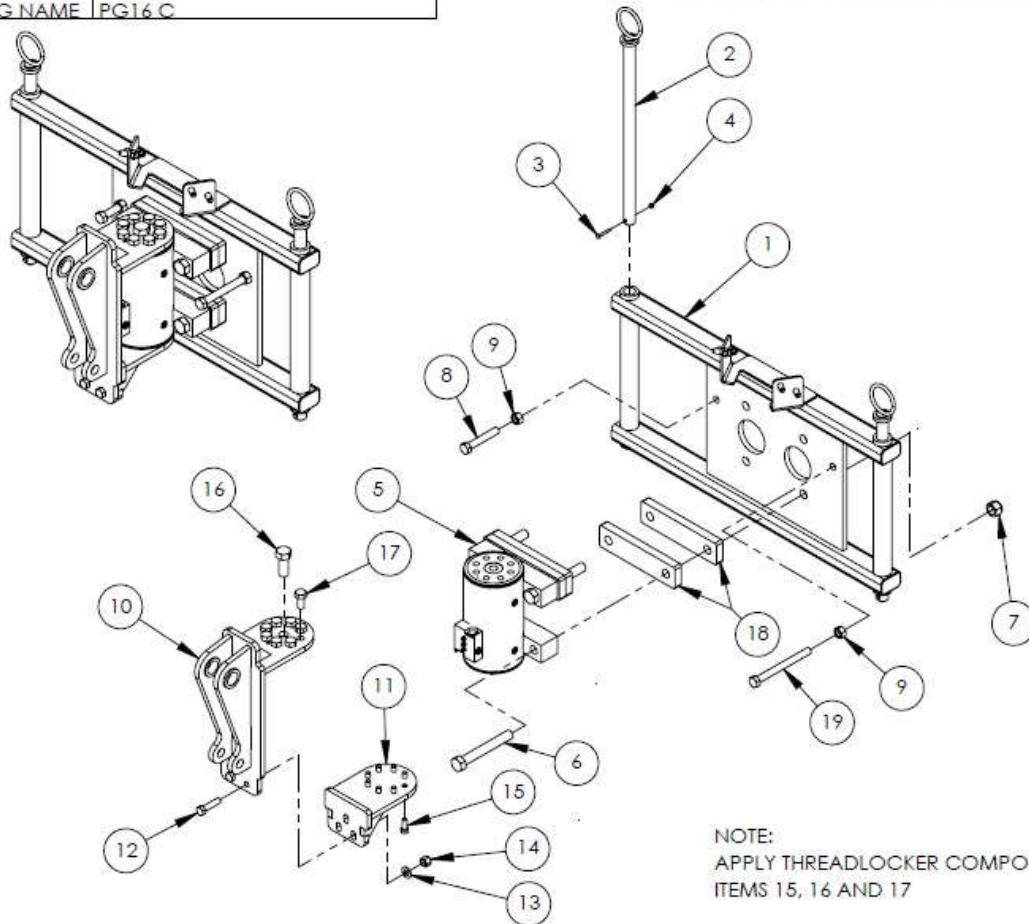
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## Parts Breakdown

FILE NAME	OLYMPIAN Power Unit Skid Assy 2
DWG NAME	PG16.C

### OLYMPIAN CONTROL ARM PIVOT



NOTE:  
APPLY THREADLOCKER COMPOUND TO  
ITEMS 15, 16 AND 17

19	1	BON-000198	BOLT, 3/4-10 X 8 HEX ZP
18	4	LV-4446	1" SPACER
17	8	BON-000180	BOLT, 3/4-10 X 1-1/2 HEX ZP GR 8
16	1	BON-000232	BOLT, 1-8 X 2-1/2 HEX ZP GR 8
15	8	BON-000106	BOLT, 1/2-13 X 1-1/4 HEX ZP GR 8
14	3	BON-000322	LOCKNUT, 5/8-11 NYLON ZP
13	3	BON-00341SAEH	FLATWASHER, 5/8" SAE HARD ZP
12	3	BON-000155	BOLT, 5/8-11 X 2-1/2 HEX ZP
11	1	LV-4379	LOWER TORQUE BRACKET
10	1	LV-4378	UPPER TORQUE BRACKET
9	2	BON-000308	NUT, 3/4-10 HEX ZP
8	1	BON-000191	BOLT, 3/4-10 X 4-1/2 HEX ZP
7	4	BON-000310.3	LOCKNUT, 1-8 NYLON ZP
6	4	BON-000244	BOLT, 1-8 X 7 HEX ZP
5	1	LV-4549	HYDRAULIC ROTARY ACTUATOR
4	2	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
3	2	BON-000008	BOLT, 1/4-20 X 1-3/4 HEX ZP
2	2	LV-4234	HINGE PIN
1	1	LV-4377	COLLECTION ARM PIVOT FRAME
ITEM	QTY	PART NUMBER	DESCRIPTION

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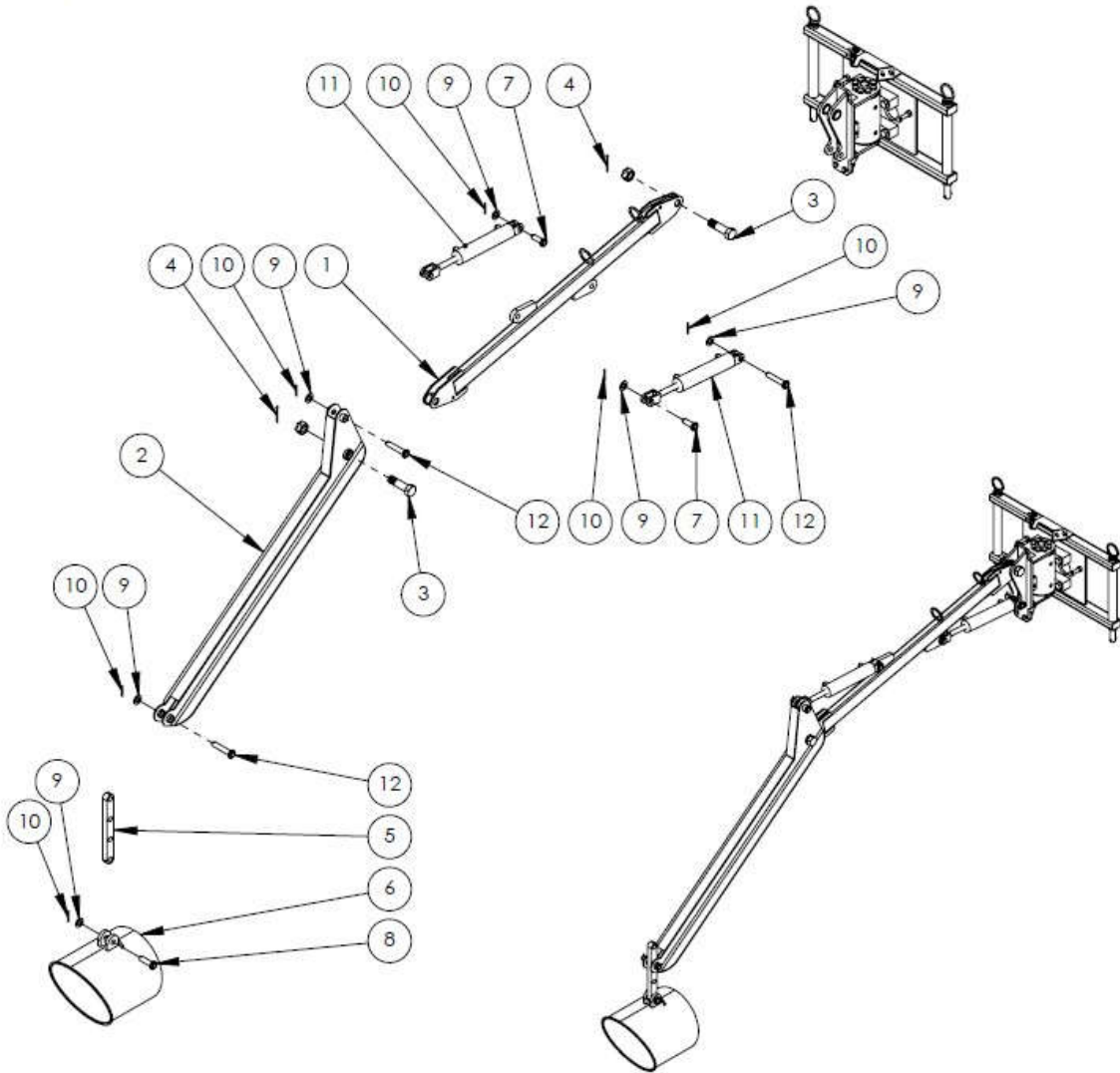
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# Parts Breakdown

FILE NAME	OLYMPIAN Power Unit Skid Assy 2
DWG NAME	PG17 B

## OLYMPIAN CONTROL ARM



12	3	BON-000993	PIN DRAG HITCH, 1" x 5-1/4"
11	2	LV-4526	CYLINDER, HYD 2-1/2" BORE X 12" STROKE
10	6	BON-000602	ROLL PIN 1/4" X 2-1/2"
9	6	BON-000345SAEH	FLATWASHER, 1" SAE HARD ZP
8	1	BON-000997	PIN LIFT RAM, 1" DIA. X 3-1/2"
7	2	BON-000999	PIN LIFT RAM, 1" DIA. X 3"
6	1	LV-1529	PICKUP NOZZLE
5	1	LV-1528	PIVOT BAR
4	2	BON-000386	PIN, 1/4 X 3 COTTER
3	2	BON-003681	SWIVEL BOLT ASSEMBLY
2	1	LV-1527	ARM, LENGTHENED FOR HL, 180°
1	1	LV-1526	SUPPORT, ARM, SUCTION HOSE, SHORT
ITEM	QTY	PART NUMBER	DESCRIPTION

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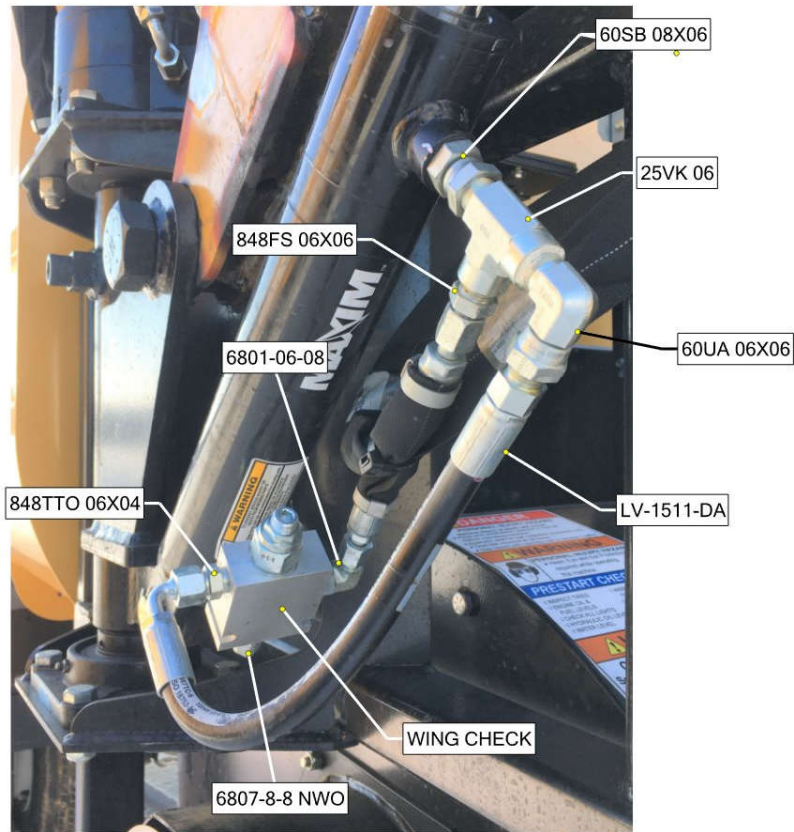
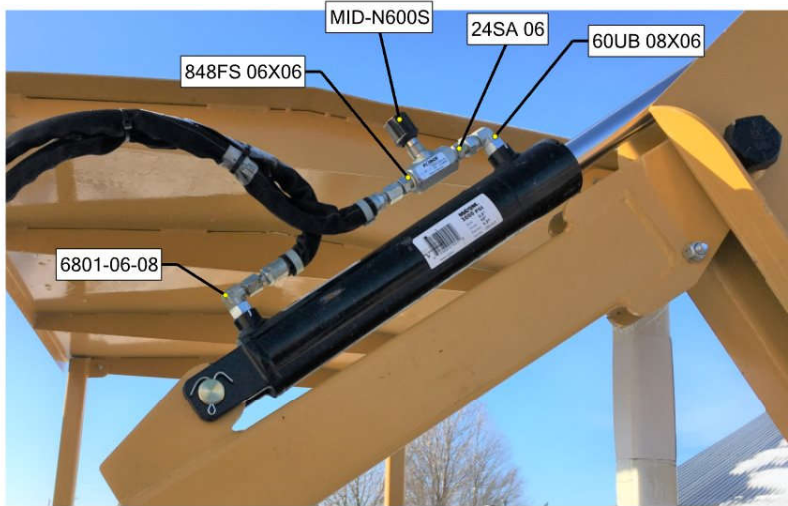


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# Parts Breakdown

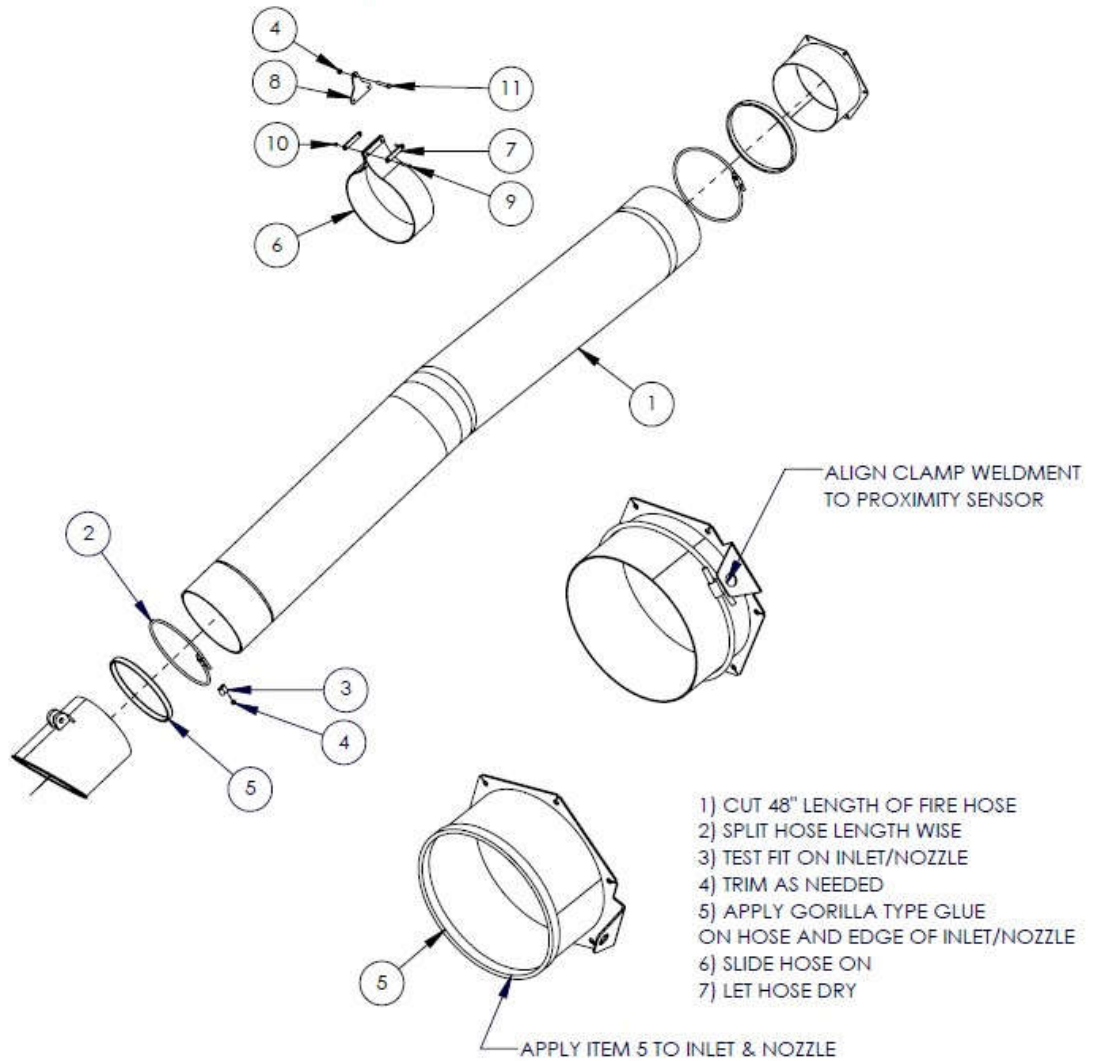
## OLYMPIAN ARM CYLINDER ASSEMBLIES

011221 OLYMPIAN ARM CYLINDER ASSEMBLIES.smg



# Parts Breakdown

FILE NAME	HOSE CLAMP BREAK DOWN	<b>OLYMPIAN FLX-THANE SUCTION HOSE</b>
DWG NAME	HOSE CLAMP BREAKDOWN OLYMPIAN	



11	1	BON-000113	BOLT, 1/2-13 X 3 HEX ZP
10	2	BON-000319	LOCKNUT, 3/8-16 NYLON ZP
9	2	BON-000061	BOLT, 3/8-16 X 2 HEX ZP
8	1	LV-4247	HOSE SADDLE BRACKET
7	2	LV-1313	OUTER CLAMP STRIP
6	1	LV-3040	RUBBER HOSE STRAP
5	8FT	2 ML DISCHARGE	FIRE HOSE COVER
4	5	BON-000321	LOCKNUT, 1/2-13 NYLON ZP
3	2	LV-1669	HOSE CLAMP WELDMENT
2	2	LV-1668	HOSE CLAMP RING
1	1	LV-4533	FLX-THANE VHD 16" X 13' SUCTION HOSE
ITEM	QTY	PART NUMBER	DESCRIPTION

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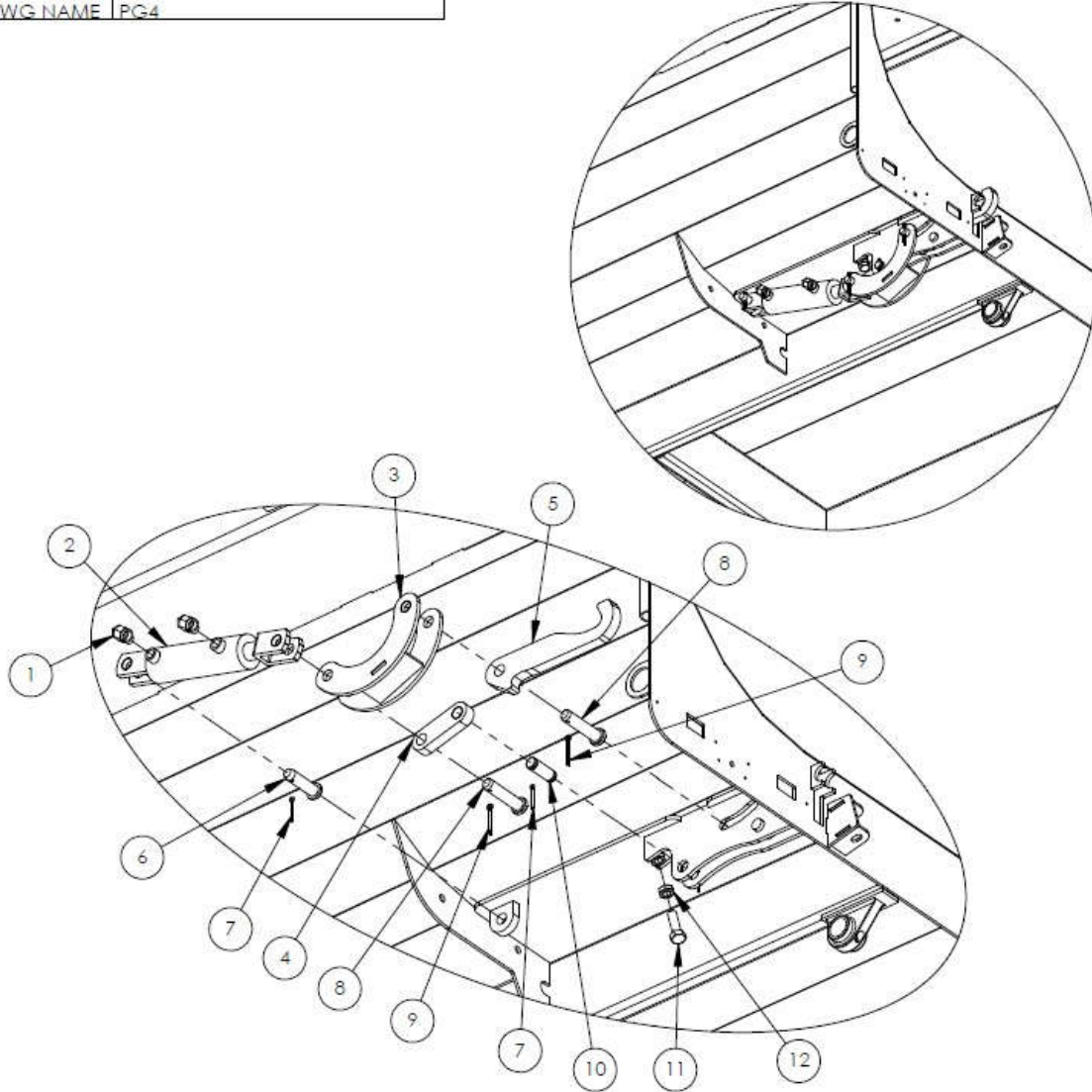
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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG4

## OLYMPIAN TAILGATE LATCH



12	2	BON-000333.3	NUT, 3/4-10 HEX JAM ZP
11	2	BON-000184	BOLT, 3/4-10 X 2-1/2 HEX ZP
10	2	PMC-190400005	CLEVIS PIN, 1" X 2-1/8"
9	4	BON-000385	COTTER PIN 1/4" X 2"
8	4	BON-000991	PIN, 1" DIA. x 4-1/4"
7	6	BON-000383	COTTER PIN 3/16" X 2"
6	2	WES-93079K	RIVET, 1" X 3-1/2"
5	2	LV-2107	DOOR LATCH
4	2	LV-2013	FRONT LATCH PIVOT
3	2	LV-2108	LATCH WELDMENT
2	2	LV-4594	CYLINDER, 2-1/2" BORE X 6" STROKE
1	4	60UB 08X08	MALE PIPE X 90DEG FEMALE PIPE 1/2" NPTF
ITEM	QTY	PART NUMBER	DESCRIPTION

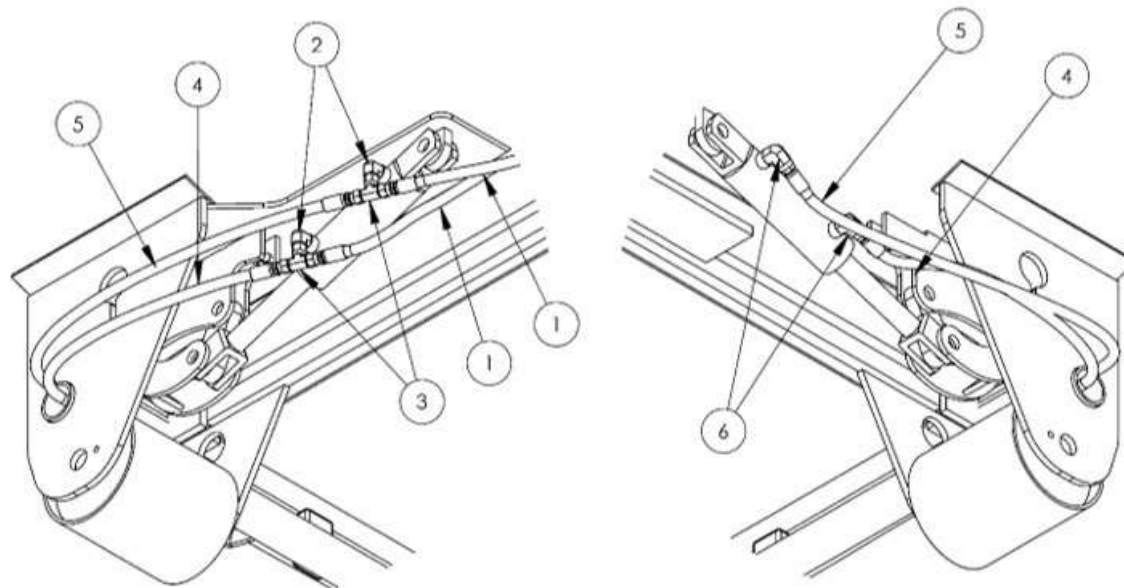
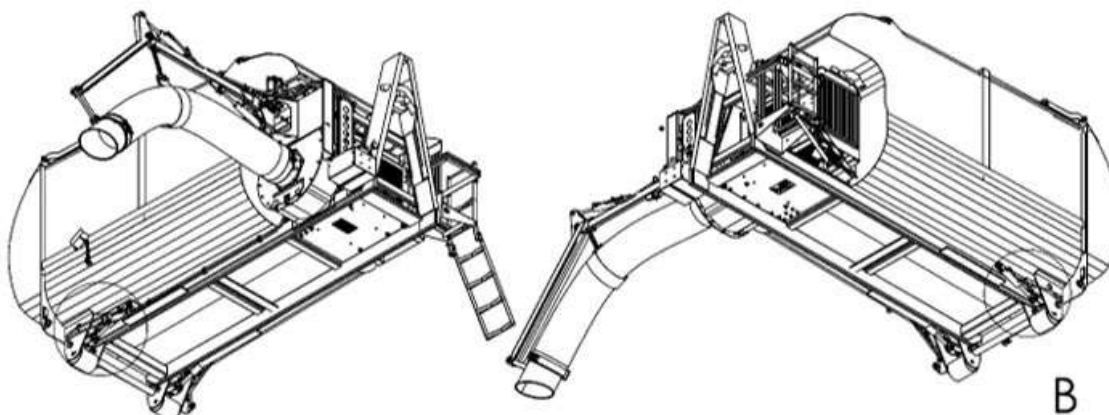
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## Parts Breakdown

FILE NAME	LV-3002 HYDRAULICS	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	DOOR HYDRAULICS	-	ORIGINAL	7/27/17	SHJ



ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	LV-3062	HOSE, HYD,SPARTAN HL,DOOR1
2	2	849FSO 08X08	MALE 37DEGXADJ MALE ORB 90DE 3/4-16 X 3/4-16
3	2	6600-08-08-08	FLARE SWIVEL TEE: 1/2x1/2 X FEMALE 1/2
4	1	LV-3063	HOSE, HYD,SPARTAN HL,DOOR2
5	1	LV-3064	HOSE, HYD,SPARTAN HL,DOOR3
6	2	60UB 08X08	MALE ORB X 90DEG FEMALE PIPE SW 3/4-16TPI TO 1/2



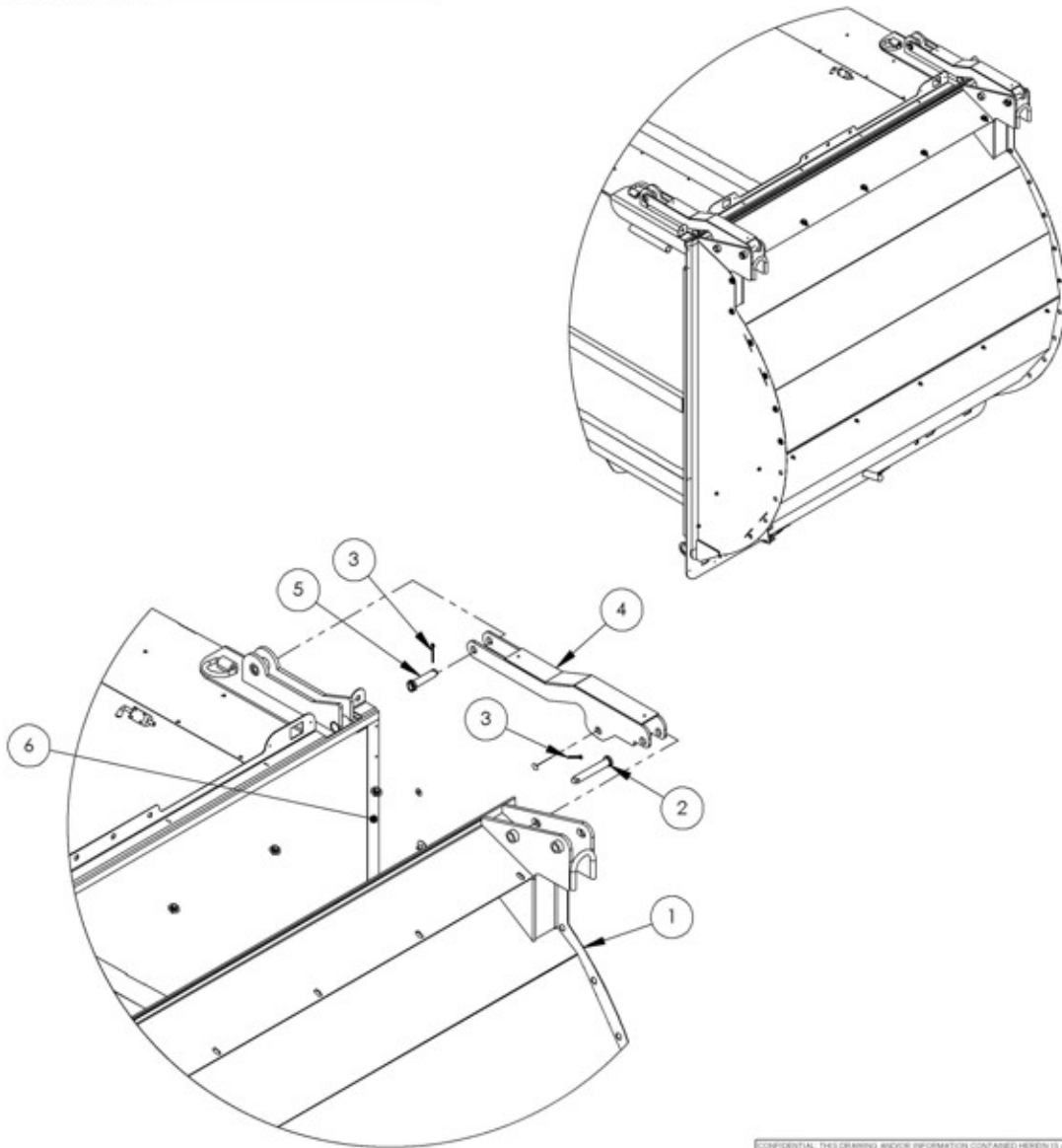
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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG2

## OLYMPIAN TAILGATE & HINGE



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ITEM	QTY	PART NUMBER	DESCRIPTION
6	20'	LV-4213	SEAL, D BULB 1/2" WIDE
5	2	BON-000991	PIN, 1" DIA. x 4-1/4"
4	2	LV-4371	LATCH WELDMENT
3	4	BON-000385	COTTER PIN 1/4" X 2"
2	2	BON-000995	PIN, 1" X 6-3/8"
1	1	LV-4350	TAILGATE

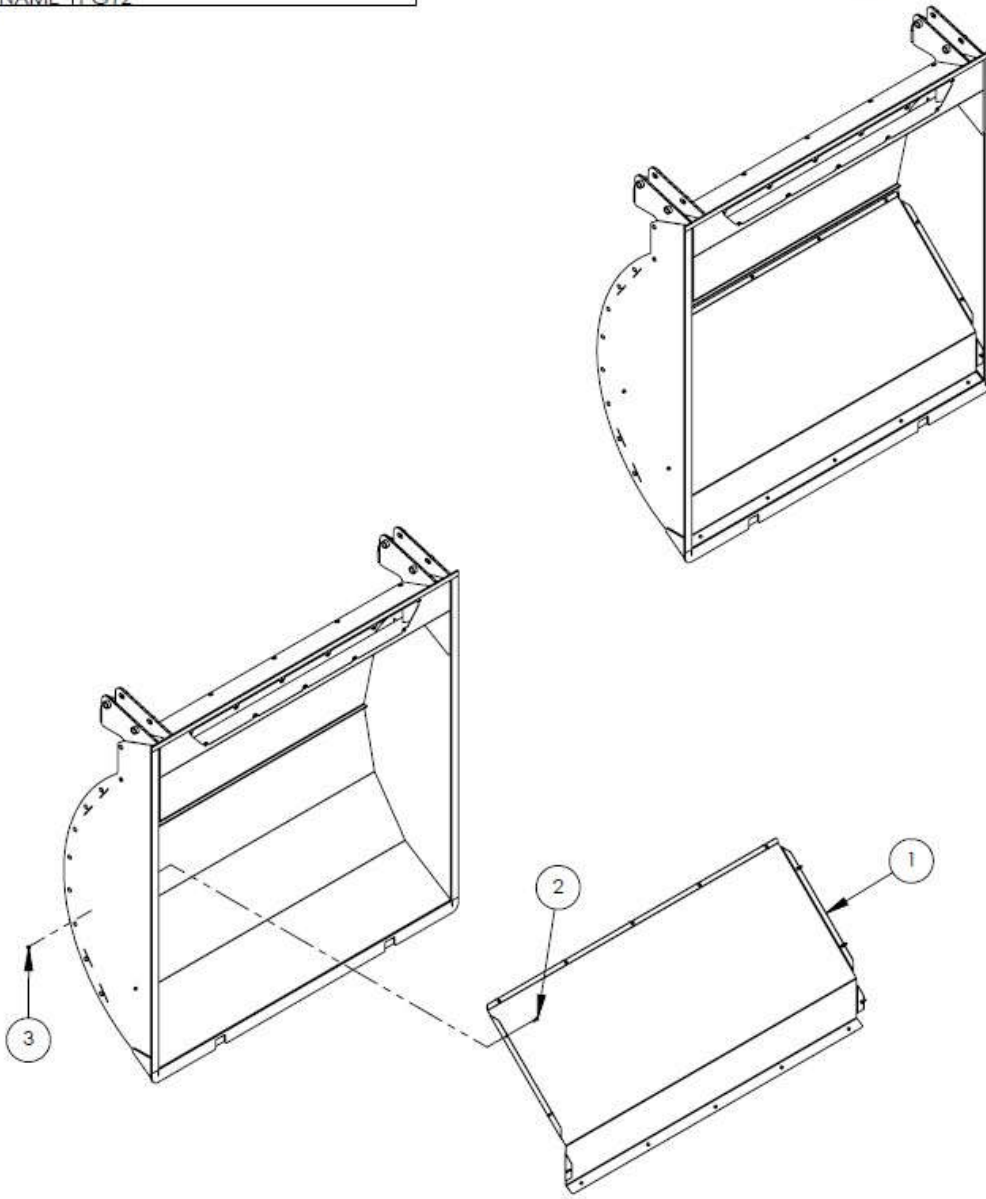


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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG12

## OLYMPIAN DOOR BAFFLE



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3	16	BON-000319	LOCKNUT, 3/8-16 VINYL ZP
2	16	BON-000057	BOLT, 3/8-16 X 1 HEX ZP
1	1	LV-4372	DOOR BAFFLE
ITEM	QTY	PART NUMBER	DESCRIPTION

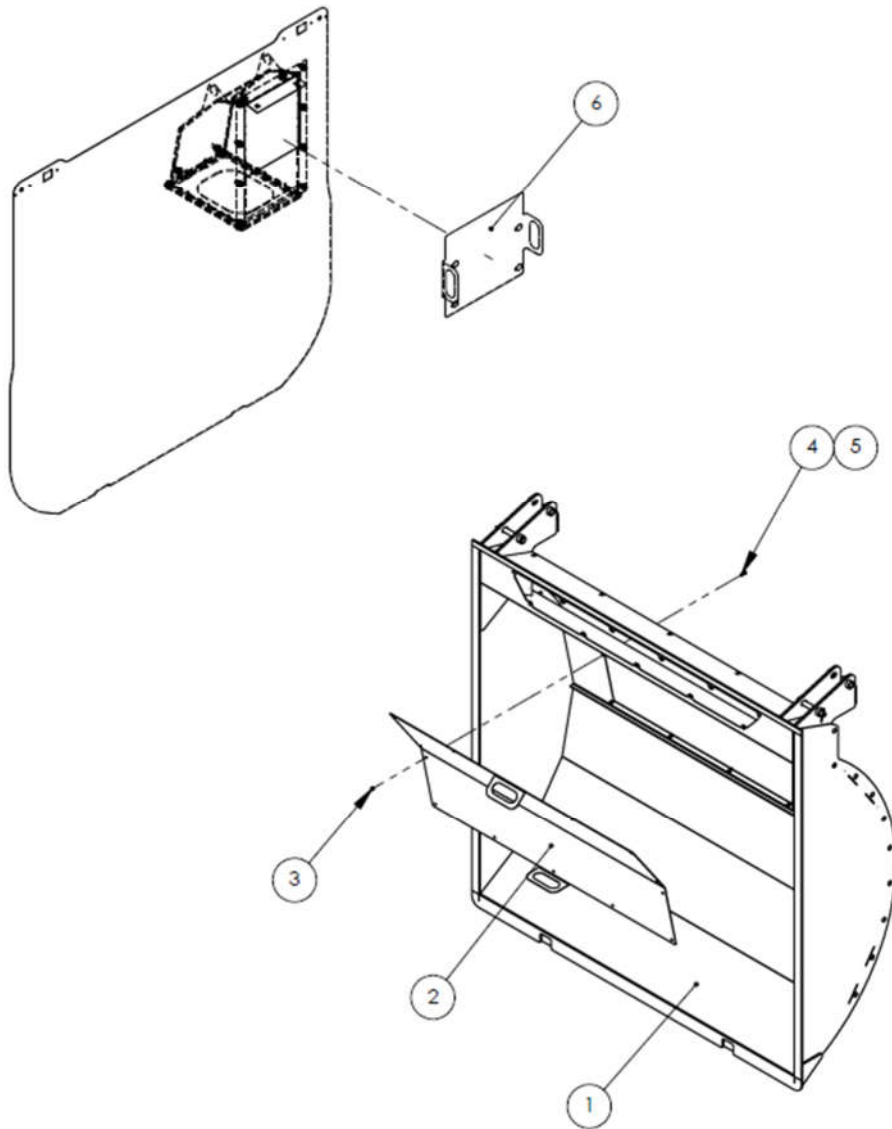
**Titan** LEAF SOLUTIONS

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# Parts Breakdown

FILE NAME	LV-4414 MANUAL
DWG NAME	Sheet1

## CHIPPER DOOR OPTION



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6	1	LV-4416	COVER PLATE, BLOWER HOUSING
5	14	BON-000319	3/8"-16 LOCKNUT, NYLON
4	14	BON-000338	3/8" FLAT WASHER
3	14	BON-000057	3/8"-16 X 1" LG HHCS
2	1	LV-4415	COVER PLATE, REAR DOOR CHIPPER OPENING
1	1	LV-4414	REAR DOOR WITH CHIPPER OPENING
ITEM	QTY	PART NUMBER	DESCRIPTION

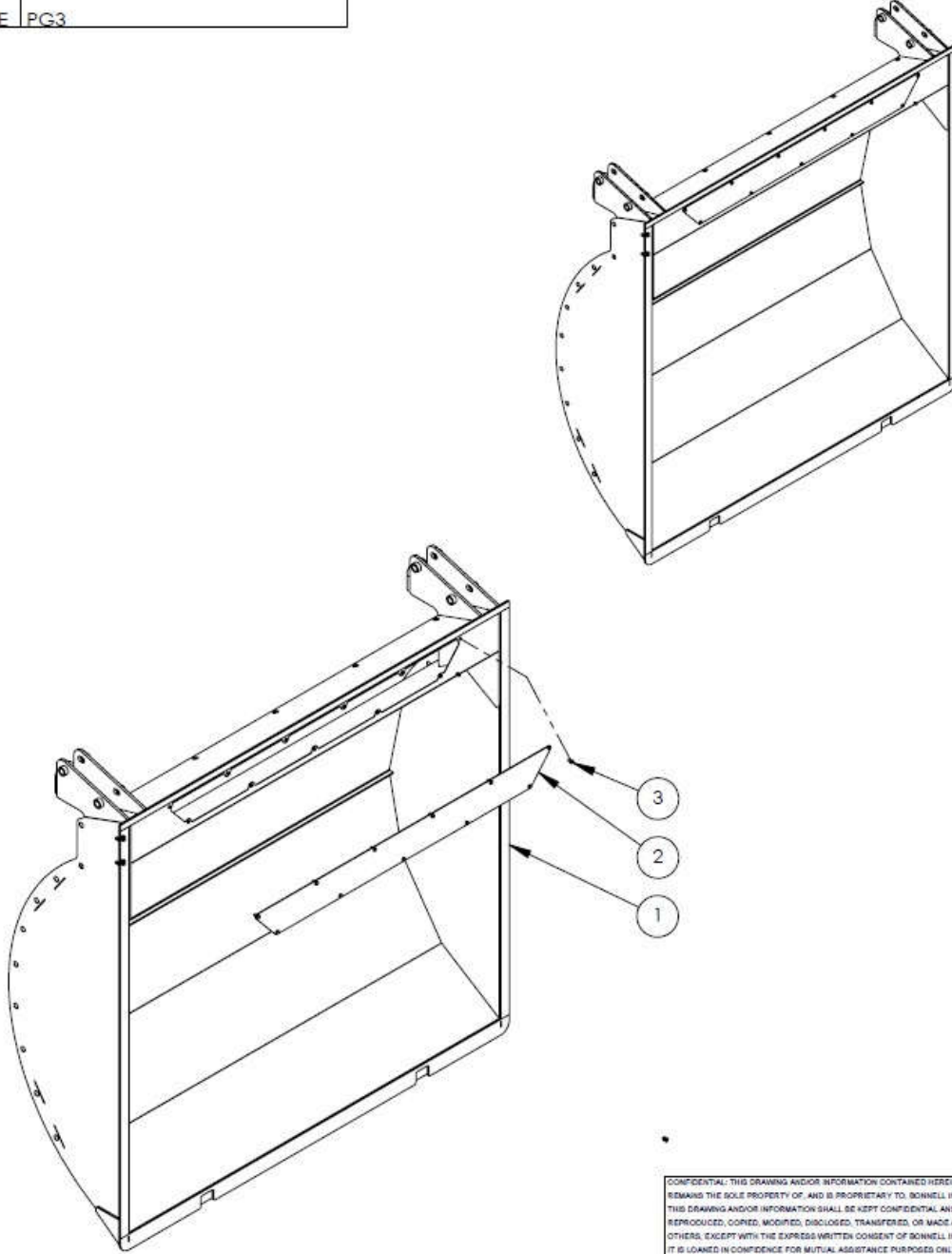


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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG3

## OLYMPIAN TAILGATE EXHAUST COVER



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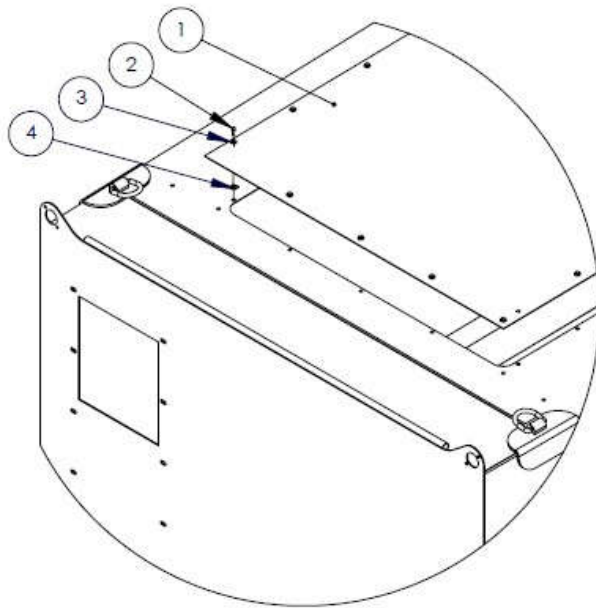
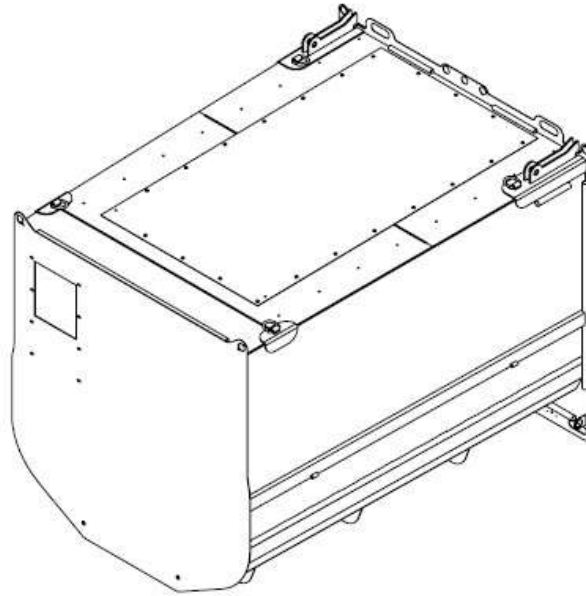
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3	11	BON-000055	BOLT, 3/8-16 X 3/4 HEX ZP
2	1	LV-4357	TAILGATE EXHAUST COVER
1	1	LV-4350	TAILGATE
ITEM	QTY	PART NUMBER	DESCRIPTION

# Parts Breakdown

FILE NAME	GEN2 SPARTAN BODY ASSY
DWG NAME	PG5

## OLYMPIAN BOLT-IN TOP SCREEN



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ITEM	QTY	PART NUMBER	DESCRIPTION
4	28	BON-000302C	NUT, 5/16-18 CLIP-ON
3	28	BON-000337	FLATWASHER, 5/16 ZP
2	28	BON-000030	BOLT, 5/16-18 X 1 HEX ZP
1	1	LV-4342	TOP SCREEN



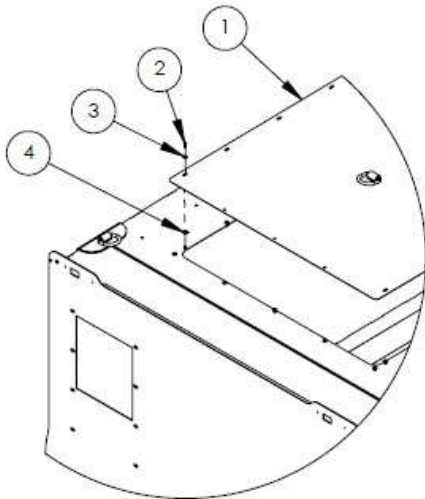
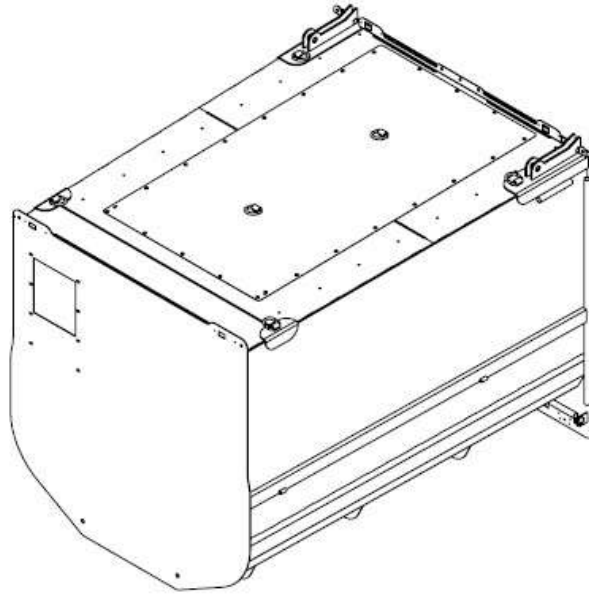
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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG6

## OLYMPIAN ROOF EXHAUST COVER



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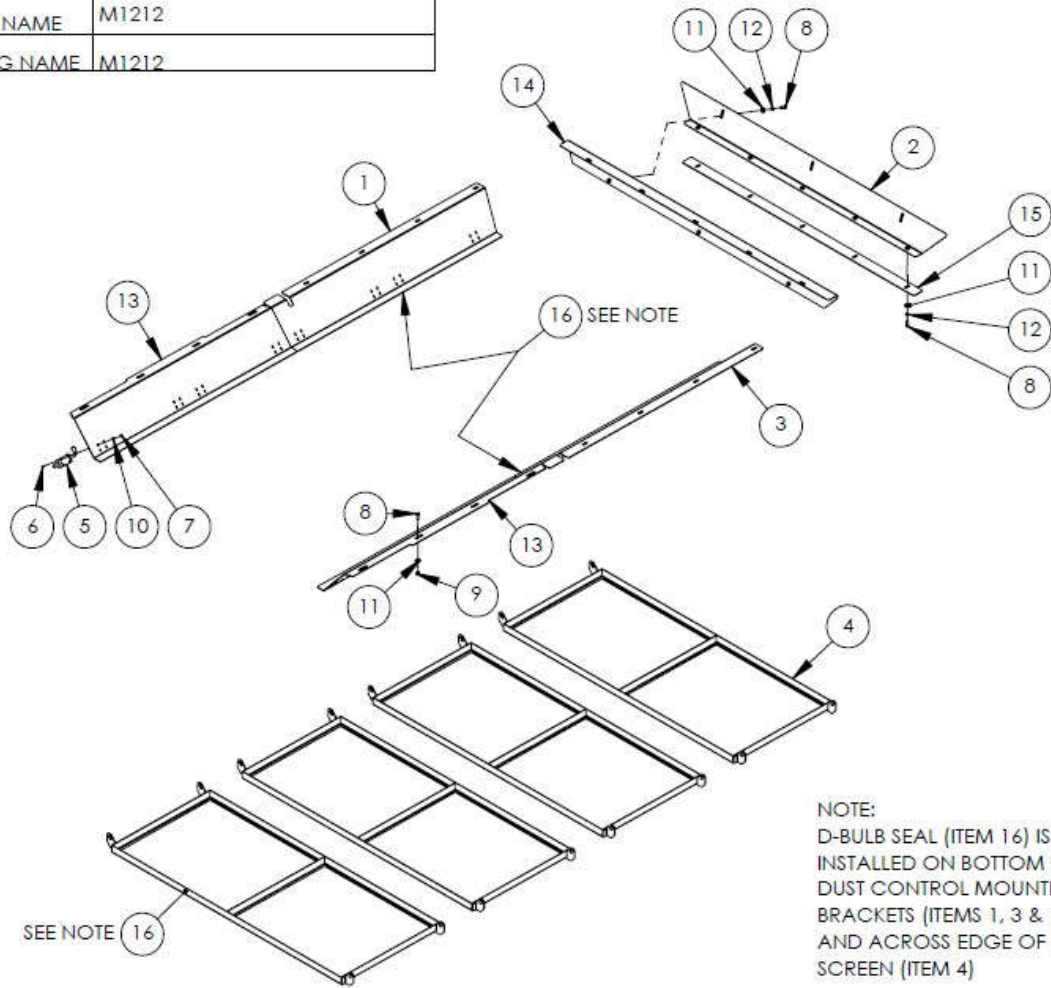
5	30'	LV-4213	SEAL, D BULB 1/2" WIDE
4	22	BON-000302C	NUT, 5/16-18 CLIP-ON
3	22	BON-000337	FLATWASHER, 5/16 ZP
2	22	BON-000030	BOLT, 5/16-18 X 1 HEX ZP
1	1	LV-4358	EXHAUST COVER
ITEM	QTY	PART NUMBER	DESCRIPTION



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# Parts Breakdown

FILE NAME	M1212
DWG NAME	M1212



NOTE:  
D-BULB SEAL (ITEM 16) IS  
INSTALLED ON BOTTOM OF  
DUST CONTROL MOUNTING  
BRACKETS (ITEMS 1, 3 & 13),  
AND ACROSS EDGE OF REAR  
SCREEN (ITEM 4)

16	LV-4213	24	SEAL, D-BULB
15	LV-4495	1	LOWER DEFLECTOR COVER PLATE
14	LV-4344	1	UPPER DEFLECTOR
13	LV-4162	2	DUST CONTROL MOUNTING BRACKET
12	BON-000352	8	3/8 LOCKWASHER ZP
11	BON-000338	34	3/8 FLAT WASHER
10	BON-000335	64	3/16 FLAT WASHER
9	BON-000319	21	3/8-16 NYLON HEX LOCKNUT
8	BON-000057	29	3/8-16 x 1 HEX BOLT
7	10-24 NYLOK	64	NYLON LOCKNUT, 10-24 UNC
6	LV-4158	64	10-24 x 3/4 MACHINE SCREW SS
5	LV-4362	16	SPRING LATCH 1/2" ZINC PLATED
4	LV-4185	4	DUST CONTROL SCREEN
3	LV-4190R	1	DUST CONTROL MOUNTING BRACKET, RH
2	LV-4496	1	LOWER DEFLECTOR
1	LV-4190L	1	DUST CONTROL MOUNTING BRACKET, LH
REF	PART NO.	QTY	DESCRIPTION

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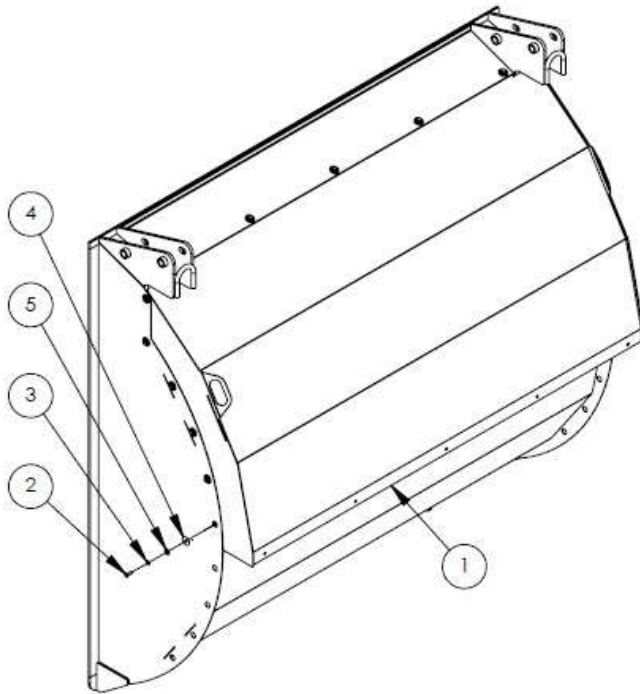
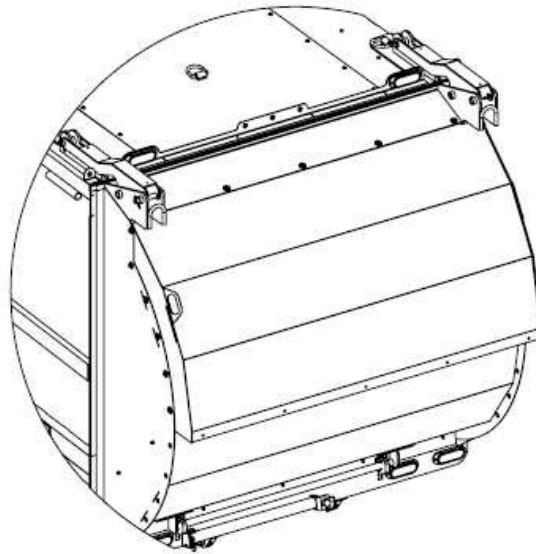


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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG8

## OLYMPIAN TAILGATE DOWN DRAFT MODULE



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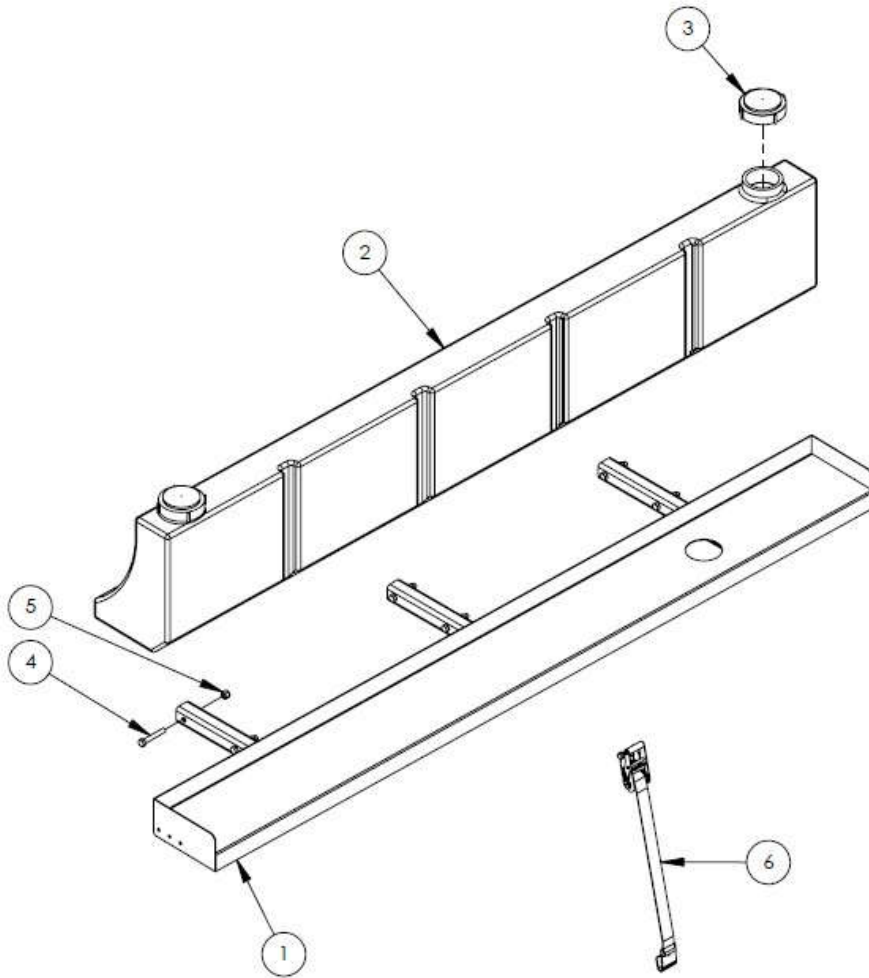
5	17	BON-000338	FLATWASHER, 3/8 ZP
4	17	91090A115	FENDER WASHER, 3/8 X 1-1/2 ZP
3	17	BON-000352	LOCKWASHER, 3/8 ZP
2	17	BON-000057	BOLT, 3/8-16 X 1 HEX ZP
1	1	LV-4351	GEN2 DOWN DRAFT MODULE
ITEM	QTY	PART NUMBER	DESCRIPTION



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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY	<b>OLYMPIAN DUST CONTROL TANK &amp; MOUNTING</b>
DWG NAME	PG11	



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ITEM	QTY	PART NUMBER	DESCRIPTION
6	2	R2X7WF0	STRAP, RATCHET
5	6	BON-000322	LOCKNUT, 5/8-11 NYLON ZP
4	6	BON-000161	BOLT, 5/8-11 X 4 HEX ZP
3	2	LDS1003X001	TANK LID
2	1	LDS1001X008	95 GAL TANK
1	1	LV-4326	95 GAL TANK PAN WELDMENT

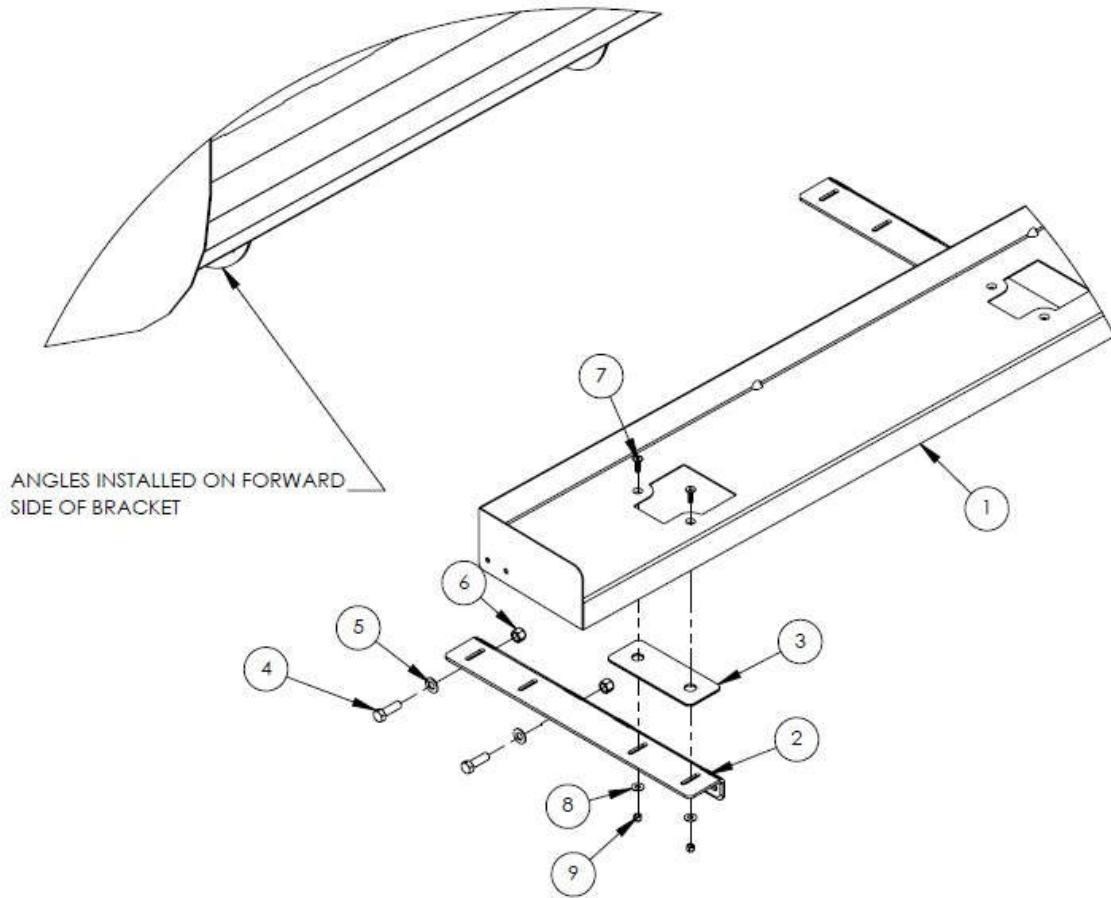


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## Parts Breakdown

FILE NAME	SPARTAN ADJUSTABLE TANK PAN
DWG NAME	ADJ TANK PAN



9	6	BON-000319	LOCKNUT, 3/8-16 NYLON ZP
8	6	BON-000338	FLATWASHER, 3/8 ZP
7	6	BV2-001020	BOLT, 3/8-16 X 1-1/4 CS ZP
6	6	BON-000322	LOCKNUT, 5/8-11 NYLON ZP
5	6	BON-000341SAE	FLATWASHER, 5/8 ZP HARD
4	6	BON-000153	BOLT, 5/8-11 X 2 HEX ZP
3	3	LV-4335	TANK PAN SPACER
1	1	LV-4334	TANK PAN ANGLE
		LV-4332	23YD RH TANK PAN
		LV-4332L	23YD LH TANK PAN
		LV-4333	30YD RH TANK PAN
		LV-4333L	30YD LH TANK PAN
ITEM	QTY	PART NUMBER	DESCRIPTION

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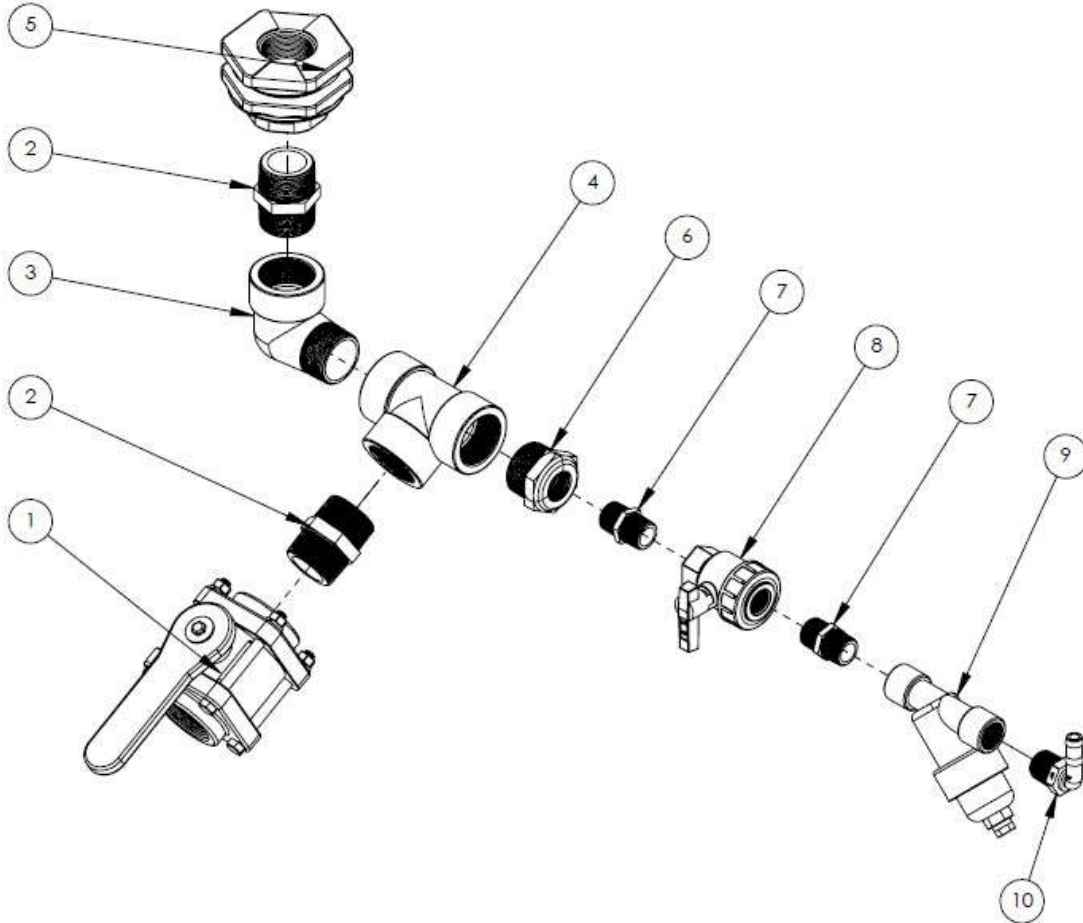


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## Parts Breakdown

FILE NAME	LV-4365	<b>OLYMPIAN DUST CONTROL SYSTEM TANK PLUMBING</b>
DWG NAME	LV-4365 PG1	



ITEM	QTY	PART NUMBER	DESCRIPTION
10	1	HB-075/050-90	3/4" MALE THREAD X 1/2" HOSE SHANK 90
9	1	LS075 80	3/4" 80 MESH STRAINER
8	1	UV075FP	3/4" SINGLE UNION POLY VALVE
7	2	NIP075-SH	3/4" SHORT POLY NIPPLE
6	1	RB 150-075	1-1/2" X 3/4" POLY PIPE BUSHING
5	1	TF150	1-1/2" TANK FITTING
4	1	TEE150	1-1/2" POLY PIPE TEE
3	1	SL150-90	1-1/2" POLY PIPE STREET ELBOW 90°
2	2	NIP150-SH	1-1/2" SHORT POLY NIPPLE
1	1	V150	1-1/2" BALL VALVE RFD SYS

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# Parts Breakdown

FILE NAME	LV-4365	<b>OLYMPIAN DUST CONTROL SYSTEM PUMP ASSEMBLY</b>	
DWG NAME	LV-4365.PG2		
ITEM	QTY		
8	4	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
7	4	BON-000006	BOLT, 1/4-20 X 1-1/4 HEX ZP
6	2	BON-000319	LOCKNUT, 3/8-16 NYLON ZP
5	2	BON-000338	FLATWASHER, 3/8 ZP
4	2	BON-000057	BOLT, 3/8-16 X 1 HEX ZP
3	2	LDS1070X001	1/2" FEMALE X 1/2" HOSE SHANK 90°
2	1	VAR-1066983	12V 4 GPM PUMP
1	1	LV-4327	PUMP MOUNTING BRACKET

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# Parts Breakdown

FILE NAME	LV-4365	<b>OLYMPIAN DUST CONTROL SYSTEM HOSE AND CLAMPS</b>	
DWG NAME	LV-4365 PG3		

CONNECT TO  
DUST CONTROL  
MODULE ON TAILGATE

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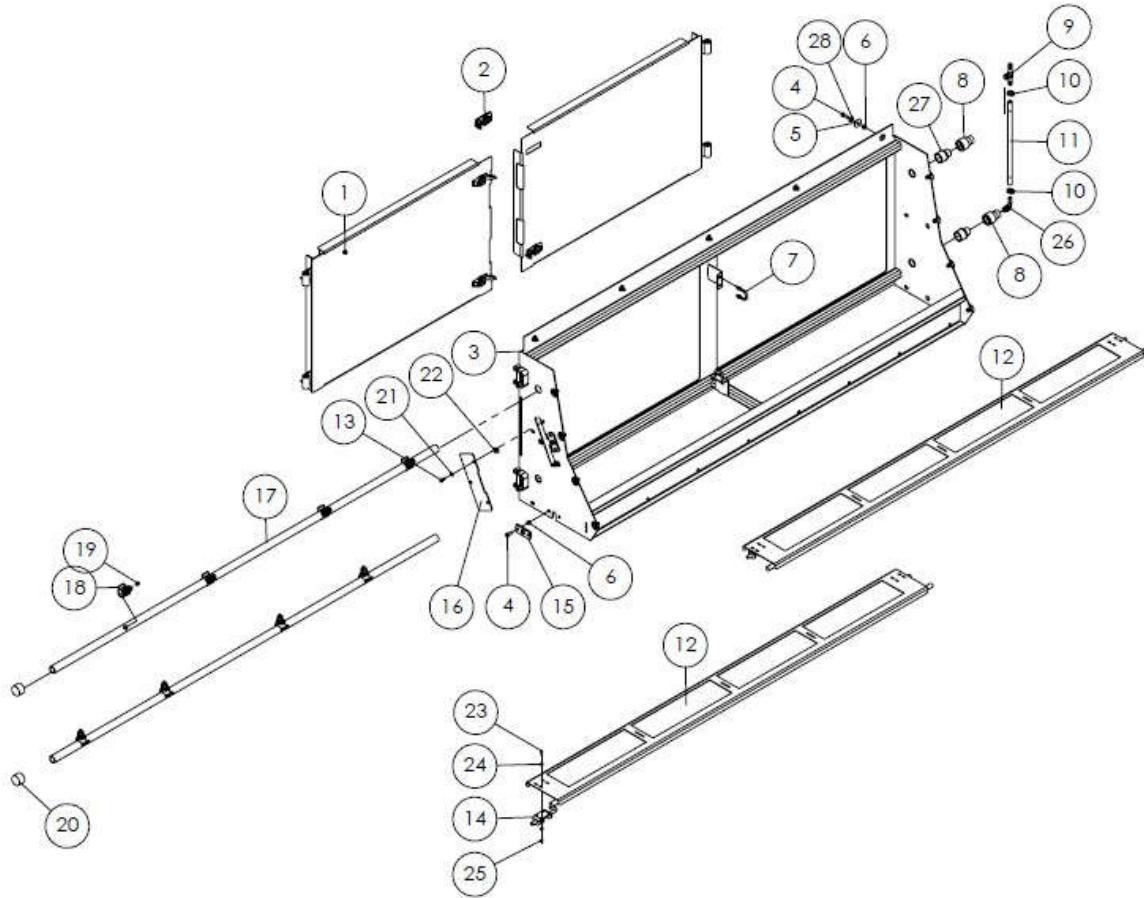
ITEM	QTY	PART NUMBER	DESCRIPTION
5	3	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
4	3	BON-000005	BOLT, 1/4-20 X 1 ZP HEX
3	3	WAY-25112	CUSHION CLAMP
2	11	LDS1009X001	HOSE, 1/2" NYLON BRAIDED
1	4	VEL-022308	HOSE CLAMP, SAE 8 1/2-29/32

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# Parts Breakdown

FILE NAME	M1213
DWG NAME	M1213_PG1 of 2

## OLYMPIAN REAR DUST CONTROL MODULE



13	BON-000028	3	5/16-18 x 3/4 HEX BOLT
12	LV-4151	2	OLYMPIAN REAR EXHAUST SCREEN
11	LDS1009X001	1	HOSE, 1/2" NYLON BRAIDED
10	VEL-022308	2	HOSE CLAMP. SAE 8, 1/2-29/32
9	LV-4363	1	1/2" NPT TO TWO 1/2" HOSE BARB POLY TEE
8	LV-4361	2	1" NPT TO 1/2 NPT POLY REDUCER COUPLER
7	3043T622	2	5/16-18 U-BOLT FOR 1" PIPE
6	BON-000319	17	3/8-16 NYLON HEX LOCKNUT
5	91090A115	13	3/8 x 1-1/2" FENDER WASHER
4	BON-000057	17	3/8-16 x 1" HEX BOLT
3	LV-4161	1	OLYMPIAN REAR EXHAUST DOOR FRAME
2	LV-4359	4	PUSH BUTTON LATCH
1	LV-4195	2	OLYMPIAN REAR EXHAUST ACCESS DOOR
REF	PART NO.	QTY	DESCRIPTION

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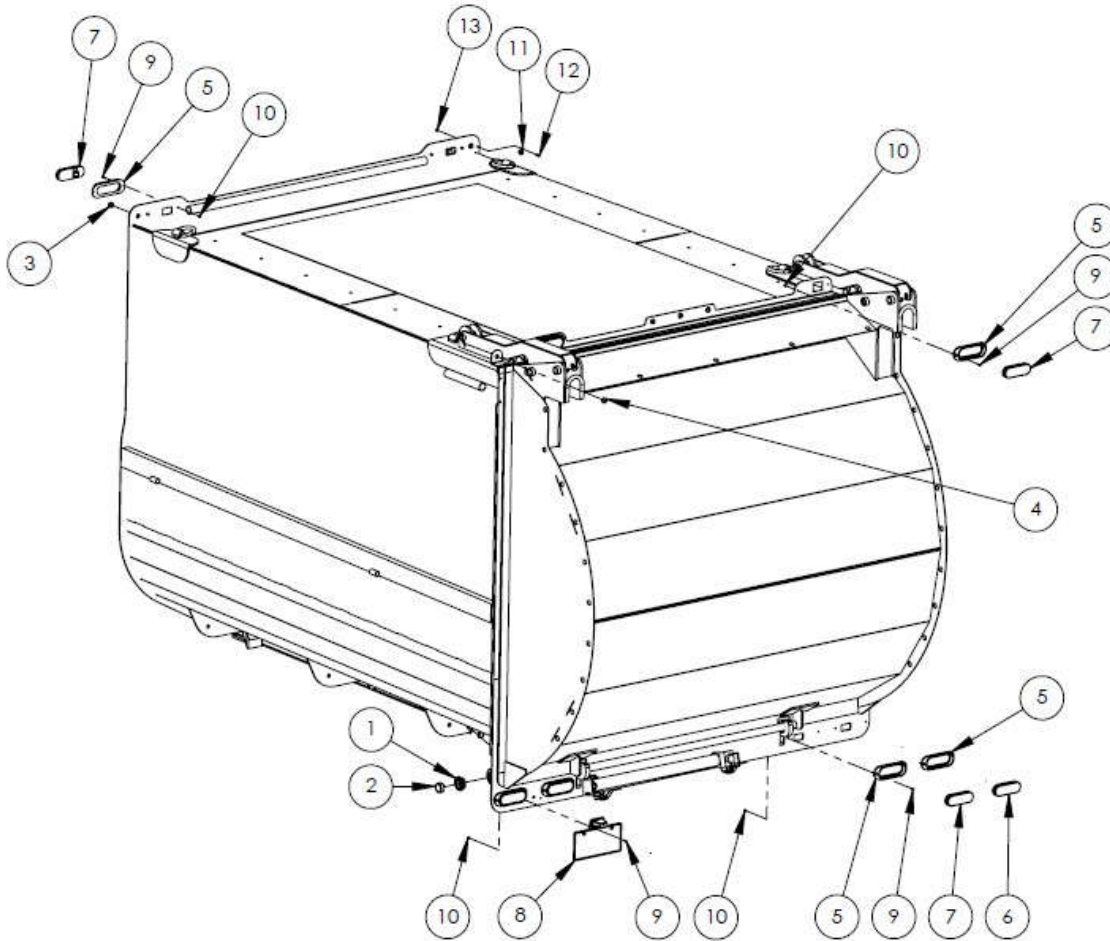
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## Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG10

### OLYMPIAN BODY LIGHTS & LICENSE PLATE BRACKET



13	3	BON-000318.5	LOCKNUT, 1/4-20 NYLON ZP
12	3	BON-00003	BOLT, 1/4-20 X 3/4 HEX ZP
11	3	WAY-25110	5/8" CABLE CLAMP
10	18		LOCKNUT, 10-24 NYLON
9	18		10-24 X 3/4" MACHINE SCREW
8	1	NAP-12250304	LICENSE PLATE BRACKET
7	6	PM-820SA-1	OVAL AMBER LED STROBE LIGHT
6	2	PM-M820R-10	OVAL RED LED ST&T LIGHT
5	8	PM-820-09	OVAL SURFACE MOUNT BRACKET
4	5	BUY-5627513	3/4" RED LED MARKER LIGHT
3	2	BUY-5627523	3/4" AMBER LED CLEARANCE LIGHT
2	2	PM-M194R	2" RED LED MARKER LIGHT
1	2	PM-146-18	GROMMET, 2"
ITEM	QTY	PART NUMBER	DESCRIPTION

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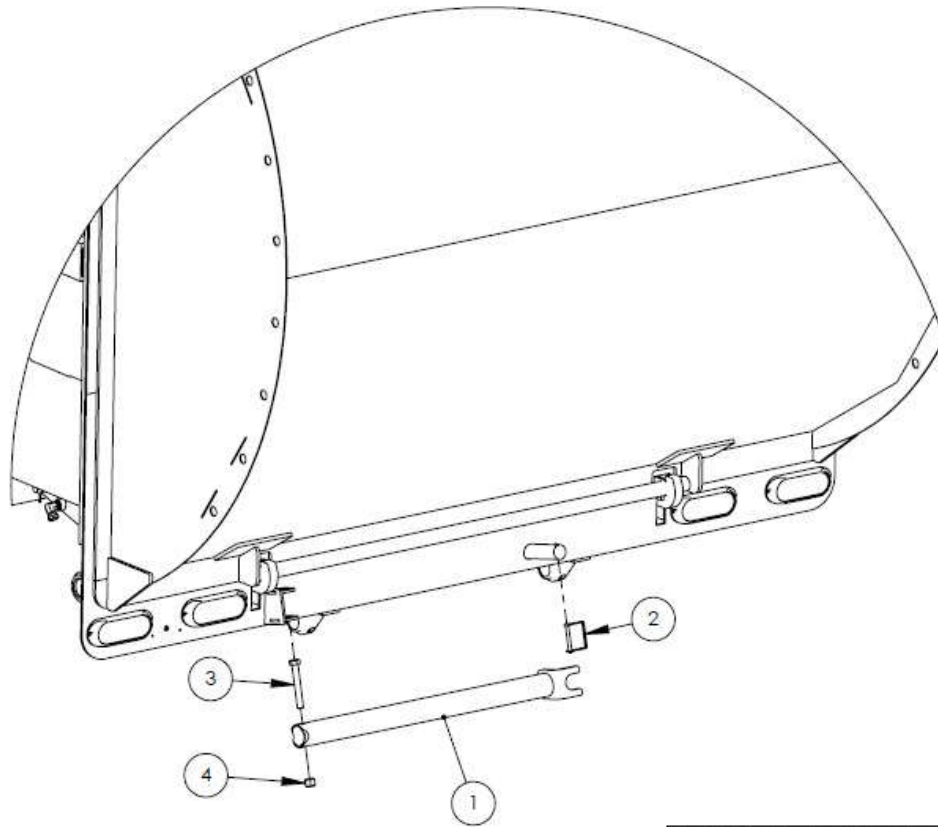
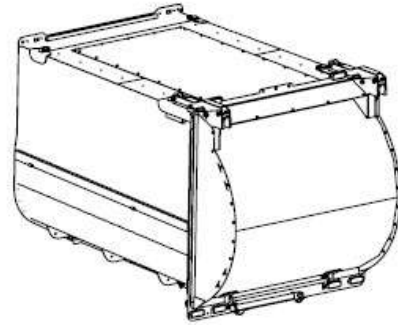
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# Parts Breakdown

FILE NAME	OLYMPIAN BODY ASSY
DWG NAME	PG9

## OLYMPIAN REAR DOOR PROP



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4	1	BON-000322	LOCKNUT, 5/8-11 NYLON ZP
3	1	BON-000162	BOLT, 5/8-11X4-1/2 HEX ZP
2	1	BUY-66053	SNAPPER PIN, 5/16" X 2-1/4"
1	1	LV-3041	DOOR PROP
ITEM	QTY	PART NUMBER	DESCRIPTION



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# Parts Breakdown

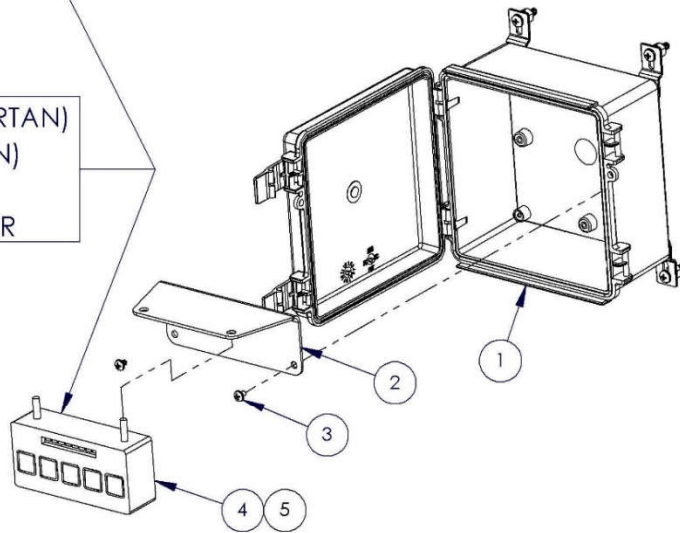
FILE NAME	OLYMPIAN CHASSIS MOUNT MANUAL		
DWG NAME	ARM STOW & BUMPER		
<b>OLYMPIAN ARM STOW &amp; BUMPER</b>			
12	2	BON-000321	LOCKNUT, 1/2-13 NYLON ZP
11	2	BON-000340	WASHER, 1/2 ZP
10	2	BON-000261.5	BOLT, 1/2-13BX 1-1/2 CARRIAGE ZP
9	1	LV-4602	ARM STOW CATCH BRACKET
8	4	BON-000321F	LOCKNUT, 1/2-13 FLANGE ZP
7	4	BON-000109	BOLT, 1/2-13 X 2 HEX ZP
6	8	BON-000319	LOCKNUT, 3/8-16 NYLON ZP
5	4	BON-000057	BOLT, 3/8-16 X 1 HEX ZP
4	4	BON-000285.5	BOLT, 3/8-16 X 1-1/4 CARRIAGE ZP
3	1	LV-4587 MSB	RUBBER BUMPER
2	1	LV-4587	BUMPER BRACKET
1	1	LV-4586	ARM STOW BRACKET
ITEM	QTY	PART NUMBER	DESCRIPTION
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# Parts Breakdown

FILE NAME	LV-2620 WITH CONTROLLER
DWG NAME	LV-2620 HOOKLIFT/CHASSIS/GEN2



LV-2621 LIGHTBAR KIT (SPARTAN)  
 LV-2622 LIGHTBAR KIT (TITAN)  
 INCLUDES:  
 HARNESS AND CONTROLLER



**INSTALL THE LIGHTBAR WITH THE CORD ON THE RIGHT SIDE**

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LV-2620	ENCLOSURE, 6" X 6" X 3.5"
2	1	LV-2623	CONTROLLER BRACKET
3	2	LV-2625	SCREW, M4 X.7MM PITCH X 5MM LONG
4	AR	LV-2621	SPARTAN - LOW PROFILE LED, TOUCH PAD CONTROLLER
5	AR	LV-2622	TITAN - LOW PROFILE LED, TOUCH PAD CONTROLLER

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# Parts Breakdown

FILE NAME	LV-4256	<b>OLYMPIAN CONTROL PANEL ASSEMBLY</b>
DWG NAME	LV-4256 CHASSIS MOUNT	

**\* IGNITION KEY P/N RC101-53630 (NOT SHOWN)**

REF	PART NO.	QTY	DESCRIPTION
20	LV-2274	1	CONTROL MOUNTING BRACKET
19	BON-000003	8	1/4-20 x 3/4 HEX BOLT
18	LV-4323	1	DECAL KIT, CONTROLLER
17	LV-4321	4	SCREW, M5-0.8 X 10MM PAN HEAD, ZP
16	DT6P-DC	1	DUST CAP, 6PIN RECEPTACLE
15	LV-2534	1	COLOR DISPLAY PV-450
14	BON-000318.5	12	LOCKNUT, 1/4-20 NYLON ZP
13		2	#6-32 X 1 MACHINE SCREW ZP
12		6	#6-32 HEX NUT W/ STAR WASHER ZP
11		4	#6-32 X 1/2 MACHINE SCREW ZP
10	EO2	1	IGNITION KEY SWITCH
9	2414-001-2486	1	WAVY LOCK WASHER, SIZE 24
8	2411-001-2405	1	PANEL NUT
7	LV-1173	1	TOGGLE SWITCH
5	LV-1398	1	EMERGENCY STOP SWITCH
4	LV-4254	1	HARNESS, PROGRAMMING EXTENSION
3	LV-4253	1	HARNESS, CONTROL BOX
2	LV-4255	1	FRONT PANEL
1	LV-3047	1	REAR PANEL

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# Parts Breakdown

FILE NAME	OLYMPIAN CHASSIS MOUNT MANUAL		
DWG NAME	JOYSTICK		

## OLYMPIAN JOYSTICK CONTROL

14	2	BON-000338	FLATWASHER, 3/8 ZP
13	1	BON-000062	BOLT, 3/8-16 X 2-1/4 HEX ZP
12	5	BON-000301ACSS	NUT, 1/4-20 ACORN SS
11	6	BON-000336SS	FLAT WASHER, 1/4 SS
10	1	BON-000301SS	NUT, 1/4-20 HEX SS
9	1	BON-000010SS	BOLT, 1/4-20 X 2-1/4 HEX SS
8	1	LV-4264	HARNES, JOYSTICK
7	1	LV-4565	JOYSTICK
6	2	8896T104	U-BOLT, 1/4-20 X 2 X 1-1/8 ID SS
5	7	94205A230	LOCKNUT, M4 NYLON
4	7	90116A217	SCREW, M4 X 20 MACHINE
3	1	LV-3665	JOYSTICK MOUNTING BRACKET
2	1	LV-3664	GRAB HANDLE MOUNTING BRACKET
1	1	RAM-VP-SW1-1218	RAM DOUBLE SWING ARM
ITEM	QTY	PART NUMBER	DESCRIPTION

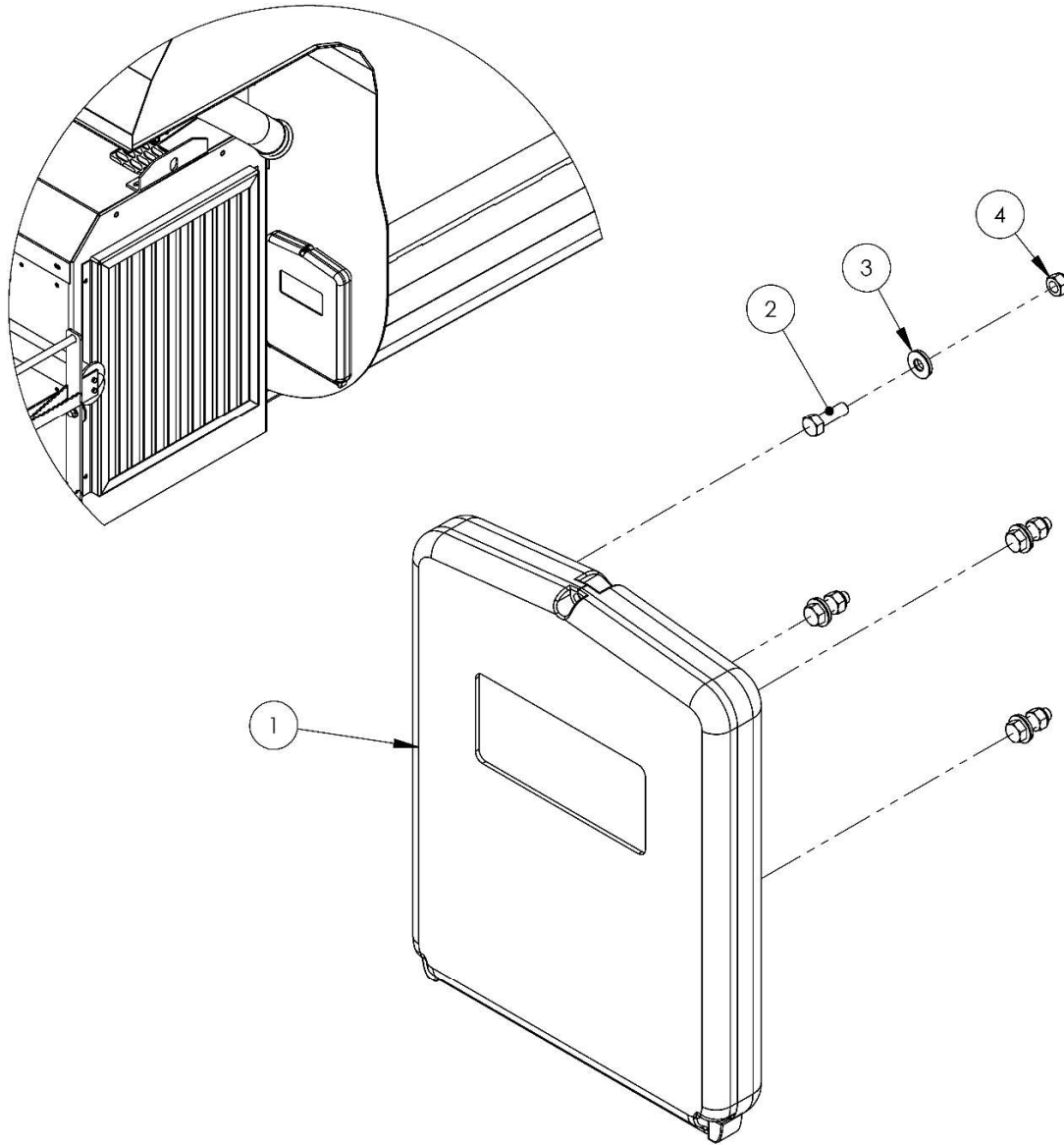
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## Parts Breakdown

FILE NAME	LV-3002 MISC	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	MANUAL BOX	-	ORIGINAL	3/8/18	SHJ



1	1	BON-000952	MANUAL BOX, LARGE
2	4	BON-000030	5/16-18 TPI X 1 LONG GRADE 8 BOLT
3	4	BON-008939	5/16 BONDED FLATWASHER
4	4	BON-000320	5/16"-18TPI HEX LOCK NUT NYLON INSERT
ITEM	QTY	PART NUMBER	DESCRIPTION



DIXON, ILLINOIS  
PHONE: 800-851-9664

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## NOTES

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# WARRANTY



## WARRANTY

Issued: January 1, 2010

Bonnell Industries, Inc. warrants to the original purchaser that if any part of the product proves to be defective in workmanship or material within one year of the date of original installation and is returned to us freight prepaid within 30 days after such defect is discovered and notification thereof is provided Bonnell, we will either replace or repair the defective part (our option). This warranty does not apply to damage resulting from neglect, misuse, accident or improper installation or maintenance. Charges for field service, labor, or other expenses not previously authorized and approved in writing by Bonnell Industries, Inc. will not be accepted. This warranty is exclusive and in lieu of all other warranties whether expressed or implied. Bonnell Industries, Inc. neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with this warranty, and will not be liable for consequential damages. This warranty applies only to products made and/or supplied by Bonnell Industries, Inc. and does not apply to other products not made or supplied by us and to which our products may be attached, such as trucks. We accept no responsibility for damages to such other products, even if our product is alleged to have contributed to the damage of the other product.

Engines, drive line components, hydraulic, electrical, or other components furnished by other manufacturers and used with our products are warranted by that manufacturer and not by Bonnell Industries, Inc. the manufacturer's own warranty will apply to these parts. Hydraulic or electrical components are not to be disassembled without the express written permission of Bonnell Industries, Inc.

All defective parts returned from an end user must include the unit model, serial number, date installed, and dealer from whom purchased.

Bonnell Industries, Inc. reserves the right to make changes or improvements to its products without incurring any liability or obligation and without being required to make corresponding changes or improvements to products manufactured or sold prior to those changes or improvements.

The Bonnell Industries, Inc. Warranty Policy is subject to change without notice.

## Product Information

When ordering parts, please refer to the information below.

INSTALLATION DATE:

This product was manufactured by Bonnell Industries, Inc.,  
located at 1385 Franklin Grove Rd.,  
in the city of Dixon, Illinois, U.S.A.

MADE IN THE USA 