



OPERATION & MAINTENANCE MANUAL
FOR TIER 4 MODEL YEARS 2021 & UP

REV 3/08/22



**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.: _____

General Safety Information

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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.

ANOTHER SPECIAL NOTE: An Owner's Manual that provides general trailer information cannot cover all of the specific details necessary for the proper combination of every trailer, tow vehicle and hitch. Therefore, you must read, understand and follow the instructions given by the tow vehicle and trailer hitch manufacturers, as well as the instructions in this manual.

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 13 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.

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

General Safety Information

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General Safety Information

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.

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.

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.

General Safety Information

1.3 Safety Decals

⚠ DANGER



CRUSHING HAZARD
Serious injury or death will occur

- Stay clear of a raised dump body. If service work is required, make sure the body prop is properly used.
- Dump body must be empty when using body prop.
- Return the body prop to its storage position after service work is completed.
- Body must be completely lowered when unattended.

BON-011376

⚠ 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 traveling 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 traveling 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.


↓ APPLY DIRECTLY BELOW SEAT ↓

**EMERGENCY
ENGINE
SHUT-OFF**


**EMERGENCY
ENGINE
SHUT-OFF**

↓ APPLY DIRECTLY ABOVE YELLOW
EMERGENCY SHUT OFF BUTTONS ↓

USE 3
POINTS
OF
CONTACT



WHEN
ENTERING
OR EXITING
VEHICLE



LV-2152_REV2, 9.26.16 DECAL SET FOR TITAN & SPARTAN LEAF PRO SERIES

↓ APPLY TO BOTH SIDES OF TONGUE, DIRECTLY IN FRONT OF CENTER MIRROR LIGHT ↓

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

⚠ WARNING



CRUSHING HAZARD
Serious injury or death can occur

- Stay clear while loading, unloading, raising, or lowering dump body.

BON-011375

⚠ 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

General Safety Information



TT13169

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

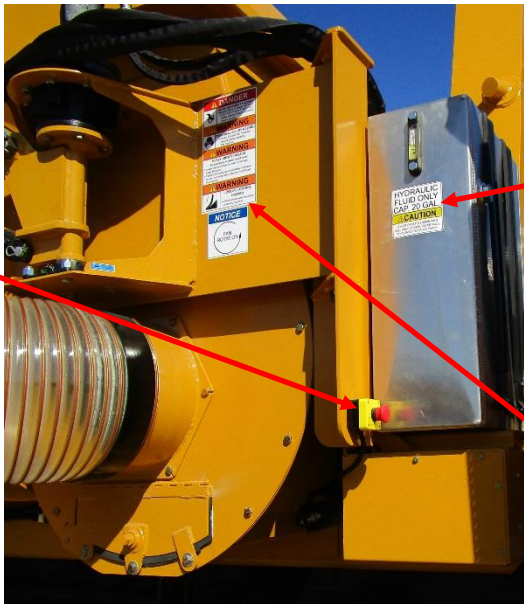
! WARNING	
COLLISION HAZARD Serious injury or death could occur • Secure Pick-up nozzle for transport.	
! WARNING	
SUCTION HAZARD Serious injury or death could occur HIGH VACUUM! KEEP CLEAR.	
DECAL SET: LV-1232	

DECAL SET: LV-1233

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



General Safety Information



**EMERGENCY
ENGINE
SHUT-OFF**

! DANGER

/

**DIESEL FUEL.
FLAMMABLE.
NO SMOKING.**

**DIESEL
FUEL ONLY
CAP. 40 GAL.**

! DANGER

**EXPLOSION HAZARD.
DO NOT WELD, CUT OR BURN ON
OR NEAR FUEL TANK WITHOUT
FIRST REMOVING AND
COMPLETELY PURGING TANK.**

! DANGER

FALLING HAZARD
Serious injury or death will occur

- Return access ladder to its storage position when not in use.
- Allow no exterior riders.
- Use extreme caution accessing fuel fill.

**HYDRAULIC
FLUID ONLY
CAP. 20 GAL.**

! CAUTION

DO NOT OPERATE ENGINE WITH BALL VALVE CLOSED. CLOSE VALVE TO CHANGE HYDRAULIC FILTER.

! DANGER

ENTANGLEMENT HAZARD
Serious injury or death will occur

- Shut down engine & disconnect safety interlock before removing hose or guards.

! WARNING

PERSONAL INJURY HAZARD

- Head, Eye and Ear Protection required while operating this machine.

! 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.

! WARNING

LOSS OF CONTROL HAZARD

- Chock wheels when servicing or parking machine.

NOTICE

FAN
ROTATION


**EMERGENCY
ENGINE
SHUT-OFF**

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.

! WARNING

PERSONAL INJURY HAZARD

- Head, Eye and Ear Protection required while operating this machine.

PRESTART CHECKLIST

√ 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

! WARNING

COLLISION HAZARD
Serious injury or death could occur

- Secure Pick-up nozzle for transport.

STOP

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

General Safety Information

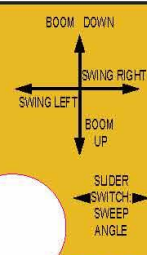
↓ APPLY TO ENGINE ELECTRICAL MANIFOLD ↓

Flasher Bar	Dust Control Pump	Common Ground	Fuel Sending Unit	Engine Safety
-------------	-------------------	---------------	-------------------	---------------

↓ APPLY ON DRIVER'S SIDE, UPPER LEFT CORNER ↓

LV-3038 REV0 08212017
SPARTAN HOOK LIFT VAC.

⚠ DANGER	
	FALLING HAZARD Serious injury or death will occur
	<ul style="list-style-type: none"> Return access ladder to its storage position when not in use. Allow no exterior riders. Use extreme caution accessing fuel fill.

Spartan LEAF PRO +	
EMERGENCY VACUUM SHUT-OFF	
	<small>READ & UNDERSTAND OPERATOR'S MANUAL BEFORE OPERATING MACHINE.</small>

↓ APPLY TO BLOWER HOUSING, INLET SIDE ↓

⚠ DANGER	
	ENTANGLEMENT HAZARD Serious injury or death will occur
<ul style="list-style-type: none"> Shut down engine & disconnect safety interlock before removing hose or guards. 	
⚠ WARNING	
	PERSONAL INJURY HAZARD
<ul style="list-style-type: none"> Head, Eye and Ear Protection required while operating this machine. 	
⚠ WARNING	
HEAVY IMPACT HAZARD Serious injury or death could occur	
<ul style="list-style-type: none"> 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. 	
⚠ WARNING	
	LOSS OF CONTROL HAZARD
<ul style="list-style-type: none"> Chock wheels when servicing or parking machine. 	

⚠ CAUTION Equipment Damage Hazard	NOTICE Leaf vacuum engine will shut down when hoist is raised.
<ul style="list-style-type: none"> Unplug connector prior to roll-off. 	
<small>INDICATOR LIT WHEN REAR PLUG IS CONNECTED</small>	<small>SYSTEM POWER WHEN INDICATOR LIT</small>
DIESEL FUEL ONLY	

Operation & Maintenance Manuals Inside	
Titan LEAF PRO +	Spartan LEAF PRO +

↓ APPLY TO COLLECTION NOZZLE ↓ ↑ APPLY TO MANUAL BOX ↑

⚠ WARNING
COLLISION HAZARD Serious injury or death could occur
<ul style="list-style-type: none"> Secure Pick-up nozzle for transport.
⚠ WARNING
SUCTION HAZARD Serious injury or death could occur
HIGH VACUUM! KEEP CLEAR.

General Safety Information

LV-3039_REV1 022318

SPARTAN HOOK LIFT VAC.

↓ APPLY TO HYDRAULIC OIL TANK ↓

BATTERY SWITCH
NOTICE

TO PREVENT ECU DAMAGE, ALLOW ENGINE TO SET MINIMUM **3 MINUTES** AFTER SHUT DOWN PRIOR TO DISCONNECTING THE BATTERY.

↓ APPLY TO BLOWER HOUSING ↓

NOTICE

FAN ROTATION

↓ APPLY NEAR FUEL FILL ↓

DANGER

DIESEL FUEL. FLAMMABLE. NO SMOKING.

DIESEL FUEL ONLY
CAP. 40 GAL.

DANGER

EXPLOSION HAZARD. DO NOT WELD, CUT OR BURN ON OR NEAR FUEL TANK WITHOUT FIRST REMOVING AND COMPLETELY PURGING TANK.

HYDRAULIC FLUID ONLY
CAP. 20 GAL.

CAUTION

DO NOT OPERATE ENGINE WITH BALL VALVE CLOSED. CLOSE VALVE TO CHANGE HYDRAULIC FILTER.

↓ APPLY TO BOOM ↓

STOP

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

↓ APPLY NEAR ENGINE CONTROLS ↓

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.

STOP

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

↓ APPLY TO PIVOT ARM ↓

EVERY 8 HRS. 2 PUMPS

EVERY 8 HRS. 2 PUMPS

EVERY 8 HRS. 2 PUMPS

EVERY 8 HRS. 2 PUMPS

↓ APPLY TO FLUID COUPLER ZERK ↓ (IF EQUIPPED)

EVERY 8 HRS. 2 PUMPS

General Safety Information

1.4 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.

1.5 Safety Disconnect

Your Leaf Machine is equipped with two physical safety disconnect devices. **These disconnect devices and all wiring are to be left operable and in place at all times, for the life of the machine.** One is located on the cleanout door, and the other is located on the hose connection to the blower housing. When performing any repair or maintenance work related to these areas, remove key from ignition, and disconnect the safety disconnect to the area needing service.

1.6 Proximity Switches

Your Leaf Machine is also equipped with two proximity safety switches located towards the front of the hooklift. If these proximity switches lose connection, the engine will be shut down. For diagnostics, if the proximity switches are not sensing a physical surface in range, a light inside of the safety switch will illuminate.

1.7 Battery Disconnect Switch

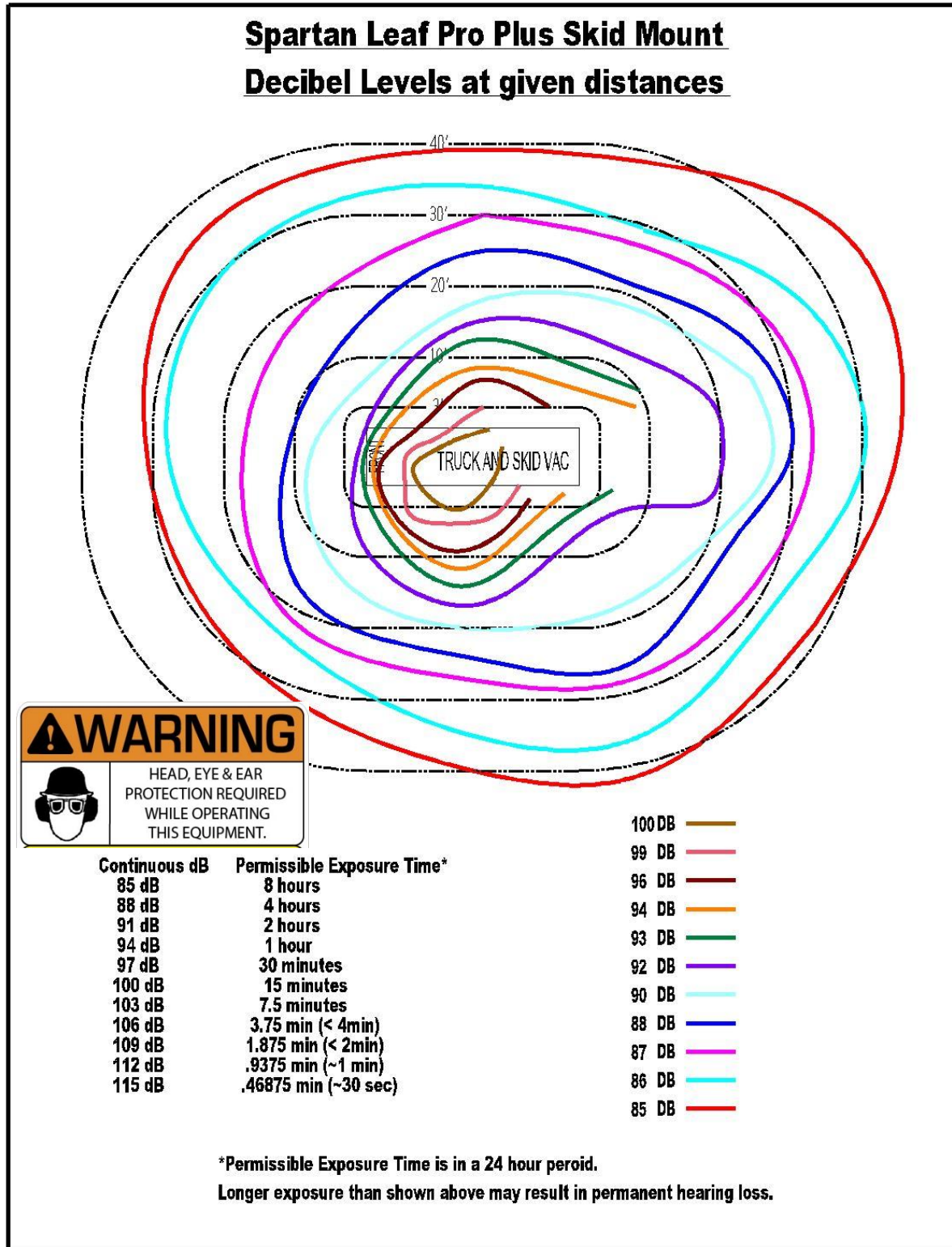
Your leaf Machine is equipped with battery disconnect switch located under the front side of the fuel tank. This switch is used to completely disconnect the electrical circuit of the unit. The primary purpose of the switch is when the unit is disconnected from the truck, the safety proximity switches will illuminate, draining the battery if left for a period of time. It is important to **NOT** engage the battery disconnect switch while the engine is running or for three minutes after the engine has been shut off. The reason for this, the engine will continue to run the ECU and other electrical components to store information crucial to the engine after it is shut off.



General Safety Information

1.8 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.



2. General Maintenance

2.1 Capacities and Specifications

Fuel Tank	40 US Gallons
Hydraulic System	20 US Gallons
Hydraulic Tank	21 US Gallons
Engine, Kubota V3800	99.2 BHP @2600 RPM
Engine, John Deere ES30161	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
Split Taper Bushing	Page 27
Trans Fluid Coupler	Page 28
Lighting Systems	Page 28

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.

To access rear engine door, remove the access panel from the inside of the collection body. Remove engine panel by tipping the top out and sliding the panel to the left of the machine. After sliding left, lift up to remove engine panel. To remove the front engine cover, the battery box needs to be removed. To check engine oil levels, the dipstick can be accessed through a hole in the engine panel by reaching between the body and the engine.




⚠ Danger

DANGER – Make sure that door prop is used to keep door open at all times when person is inside of body.

⚠ DANGER

CRUSHING HAZARD
Serious injury or death will occur

- Stay clear of a raised dump body. If service work is required, make sure the body prop is properly used.
- Dump body must be empty when using body prop.
- Return the body prop to its storage position after service work is completed.
- Body must be completely lowered when unattended.



General Maintenance

Common engine service parts

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

Kohler 2504 74 HP engine

BELT: ED0024001450-S
 FUEL FILTER: ED0021753180-S
 OIL FILTER: ED0021750010-S
 AIR FILTER: CH07-14074
 ST07-14270

Kubota 74 HP Engine:

Oil Filter	HH1C0-32430		
Fuel- Primary	1K947-43172		
Fuel Separator	1J430-43060		
Air Cleaner Inner	55231-26150		
Air Cleaner Outer	59700-26112		
V3800-CR-TE4 V3800-CR-TIE4		13.2 L (3.49 U.S.gals.)	

IMPORTANT :

- Engine oil should be API classification CJ-4.
- Change the type of engine oil according to the ambient temperature.

Above 25°C (77°F)	SAE30 or SAE10W-30 SAE15W-40
-10°C to 25°C (14°F to 77°F)	SAE10W-30 or SAE15W-40
Below -10°C (14°F)	SAE10W-30

- When using oil of different brands from the previous one, be sure to drain all the previous oil before adding the new engine oil.
- On DPF-equipped engines, part of the fuel may get mixed with engine oil during the regenerating process. This may dilute the oil and increase its quantity. If the oil rises above the oil level gauge upper limit, it means the oil has been diluted too much, resulting in a trouble. In such case, immediately change the oil for new one.
 - If the interval of DPF regeneration becomes 5 hours or less, be sure to change the oil for new one.

General Maintenance

2.5 Fluid Coupler Service

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 may be equipped with an optional 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.**



General Maintenance

2.7 Fan

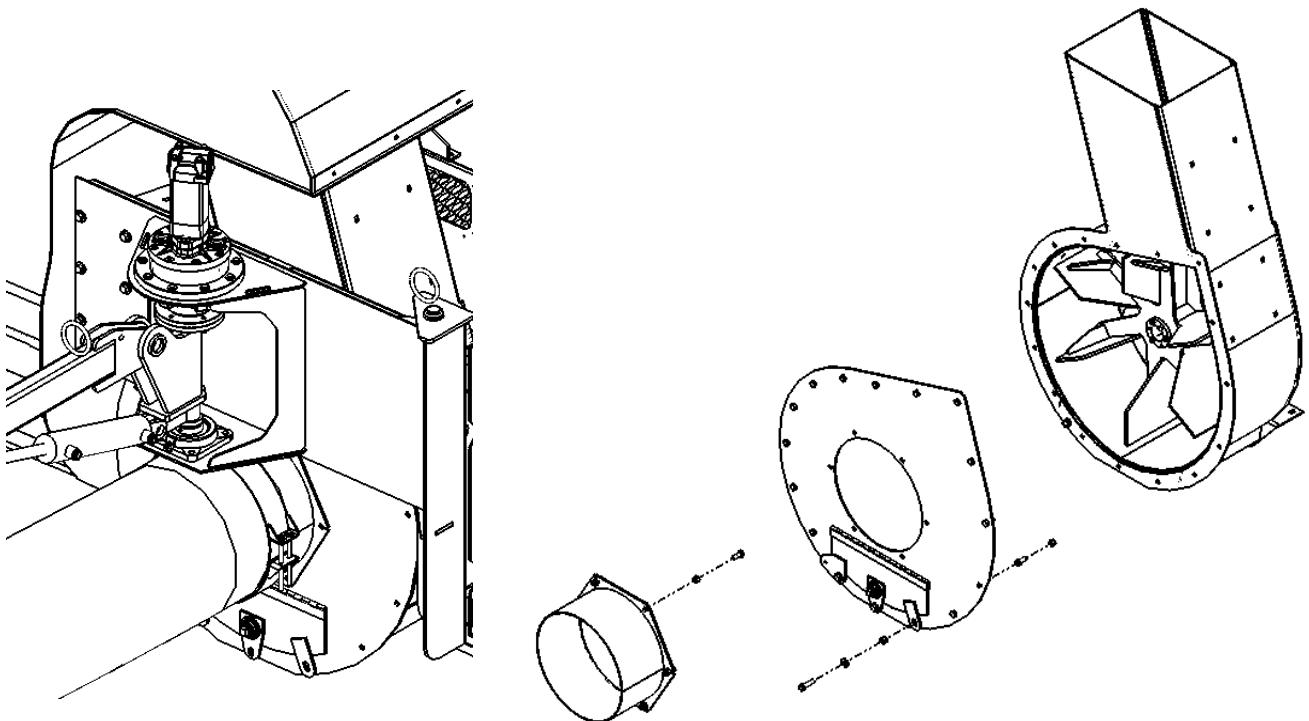
Your leaf machine is equipped with a 30" diameter balanced fan with AR400 impeller blades, mounted to the shaft with a split taper bushing. Inspect the fan regularly for cracks, deformations, and uneven wear. **DO NOT OPERATE THE MACHINE IF THE FAN IS OUT OF BALANCE.**

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:

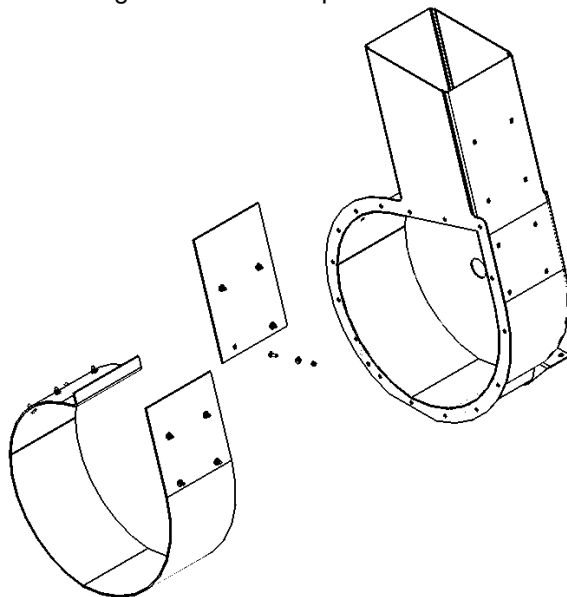
- Clean tapered cone surfaces of taper bushing & fan.
- **NOTE: DO NOT USE ANTISEIZE LUBRICANT ON TAPERED CONE SURFACES OR BOLT THREADS.**
- Slide fan onto shaft, with tapped hole side of fan bushing facing out. Install impeller on shaft as far as possible, with approx..3/8" clearance to back wall.
- 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

2.8 Blower Housing Liner Removal

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



- Disconnect safety interlock
- Remove suction hose
- Remove 6- ½" bolts from left side of arm mount and swing arm mount forward.
- Remove fan cover face plate on inlet side
- Loosen & remove the eight bolts that hold the lower liner in place and four bolts for upper liner.
- Remove liners.

2.9 Body Elbow Liner

- To remove front elbow liner from body, remove six bolts from front and top of body.
- Refer to [page 34](#) of this manual for more information.

2.10 Suction Hose

To increase the life of the suction hose, the hose should be loosened, removed, and rotated ¼ turn every 40 hours of operation. Inspect liner plate & fan for wear at this time.

2.11 Hydraulic System

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

OIL: The hydraulic oil should be changed annually.

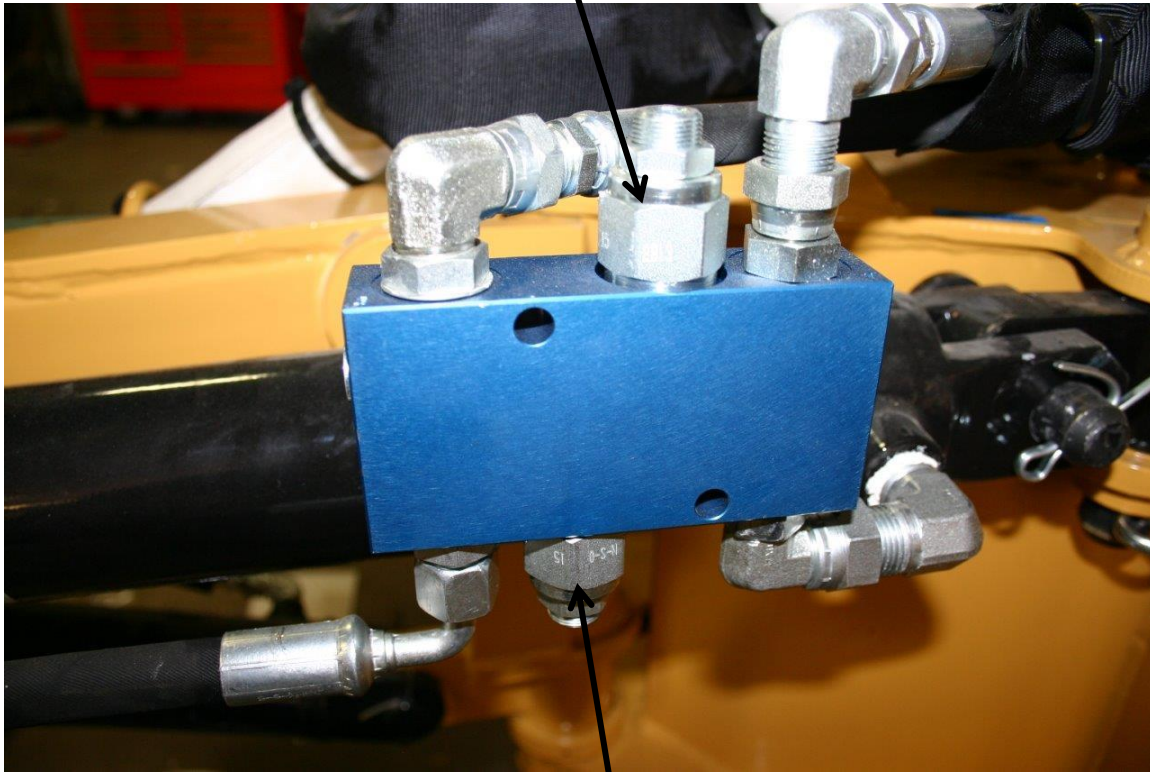
2.11 Hydraulic Arm Swing Adjustment

Note: For hooklift unit, crossover valve is mounted on the front tube frame.

UPPER ADJUSTING SCREW
ADJUSTS THE OUTWARD
CUSHION OF THE SWING CYLINDER

TURN OUT FOR MORE CUSHION/SPRING AND
TURN IN FOR LESS.

1. LOOSEN JAM NUT
2. TURN SCREW DESIRED DIRECTION.
3. RETIGHTEN JAM NUT.



LOWER ADJUSTING SCREW
ADJUST THE INWARD CUSHION
OF THE SWING CYLINDER.

TURN OUT FOR MORE
CUSHION/SPRING AND TURN IN FOR
LESS.

1. LOOSEN JAM NUT
2. TURN SCREW DESIRED
DIRECTION.
3. RETIGHTEN JAM NUT.

2.12 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)
- Clutch release bearing, 2 pumps

Weekly:

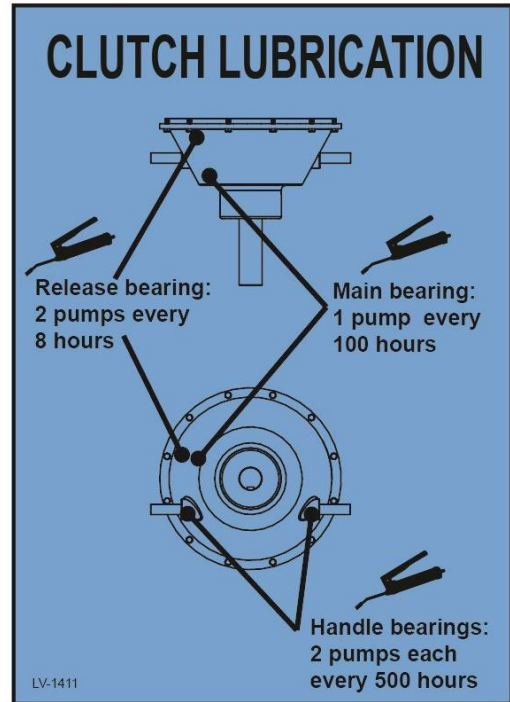
- Transfluid coupler output shaft bearing (if equipped), 2 pumps
- Hoist hinges, 2

Every 100 hours:

- Clutch main bearing (if equipped), 1 pump
- Hoist pivots, 3 pumps each location
- Hubs, 1 pump
- Hooklift rear roller axles, 1 pump

Every 500 hours:

- Clutch handle bearing (if equipped), 2 pumps each



2.13 Cleanout Door

- Remove center plug to drain any liquids that may be trapped in the blower housing.
- Remove 3 lower bolts to swing open cleanout door.
- Clean out inside of blower housing and reassemble.

General Operating Instructions

3. 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.

3.1 Prestart Checklist

PRESTART CHECKLIST	
√ 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

3.2 Clutch Engagement

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.

3.3 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.

3.4 Pusher Fans

If your machine is equipped with a Kohler engine, the fan on the engine has reverse air flow from a typical engine. In other words, the air is sucked in from the sides and bottom, and pushed out the radiator. This could potentially lead to chaff build up in the engine compartment. Regular inspection and cleanout of the engine compartment is necessary to prevent an engine fire.

WARNING

FIRE HAZARD
Serious injury or death can occur

- Remove engine panels and inspect engine compartment regularly.
- Remove any flammable debris buildup before resuming operation.

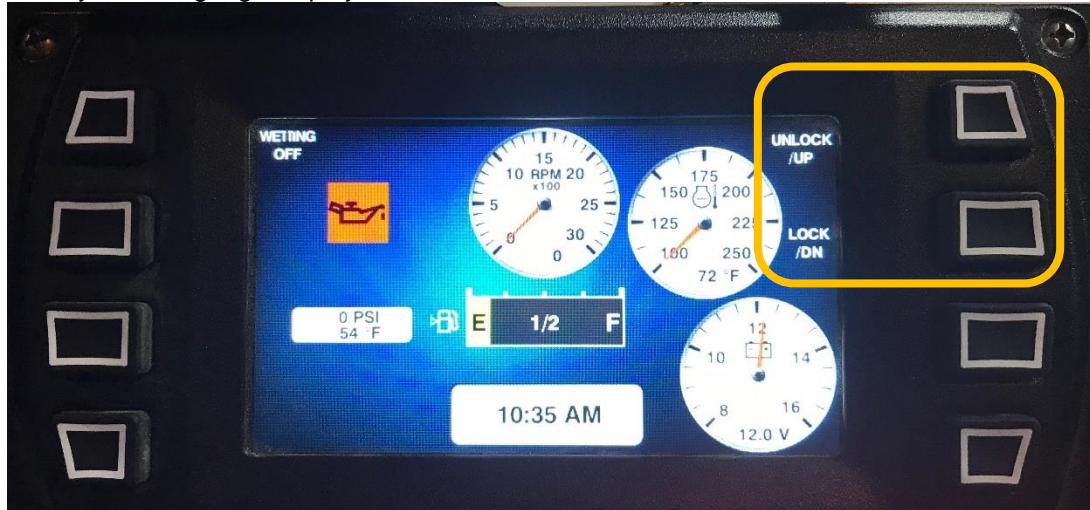
General Operating Instructions

3.5 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.

3.6 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.

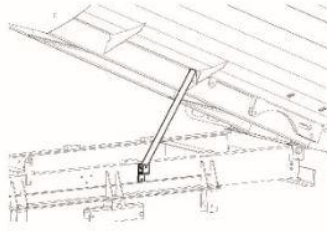
For additional hooklift instructions, please refer to the hooklift manual.

⚠ 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
Engine must be at idle when dumping. Failure to follow this procedure may cause debris to exit the blower housing, and cause injury.
⚠ WARNING
Do not back up while dumping. Failure to follow this procedure may cause severe damage to the body or tailgate.

General Operating Instructions

⚠ OPERATION OF BODY PROP

This machine is equipped with:
() 1 Body Prop
() 2 Body Props



TO USE BODY PROP(S):

1. Raise body to height where prop(s) can be swung upward into position. Place the hoist control valve in the neutral (hold) position.
2. Locate prop(s) (behind fender), and swing "up" to the support position.
3. Lower body slowly until prop(s) rests on prop receiver. Do not power hoist down. Place the hoist control valve in the neutral (hold) position.

TO STORE THE PROP(S):

4. Raise body to a height where the prop(s) will clear the prop receiver. Be sure the hoist control valve is in the neutral (hold) position.
5. Swing prop(s) down to transit position. Before lowering body be certain that the area is clear.

3.7 PV450 adjustments

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



General Operating Instructions

3.8 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.

3.9 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.

 WARNING	
 <small>LV-1057</small>	FIRE HAZARD Serious injury or death can occur <ul style="list-style-type: none">• Inspect entire chassis and vacuum components regularly.• Remove any flammable debris buildup before resuming operation.

General Operating Instructions

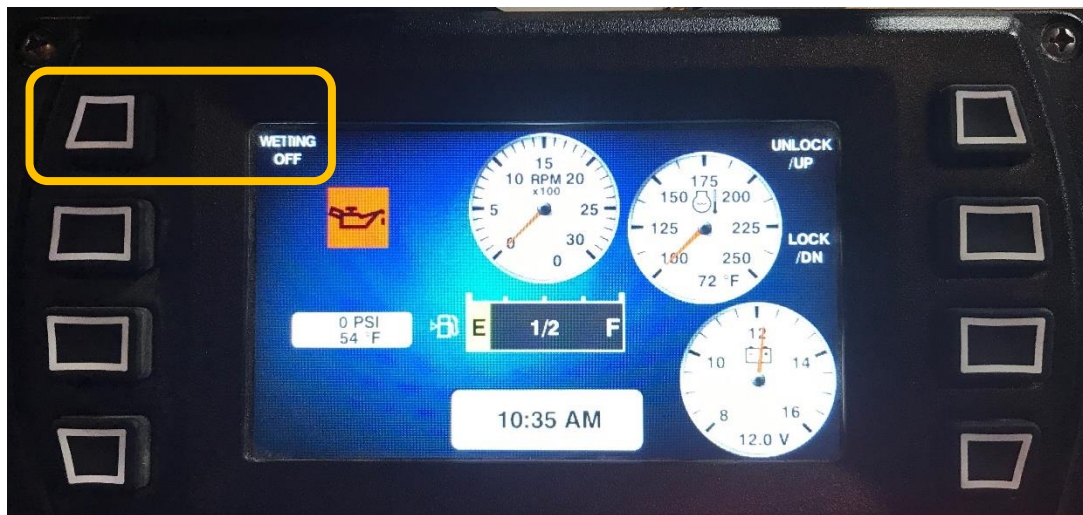
3.10 Fueling

- To add fuel to leaf machine, a ladder is provided to enable fueling without unloading the skid to ground level.
- At all times, three points of contact should be maintained for safety



3.11 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
- Pressure gauge and needle valve adjustment assembly (pictured below)
- 3 spray nozzles located in the discharge chute that apply water to the debris as it passes through.

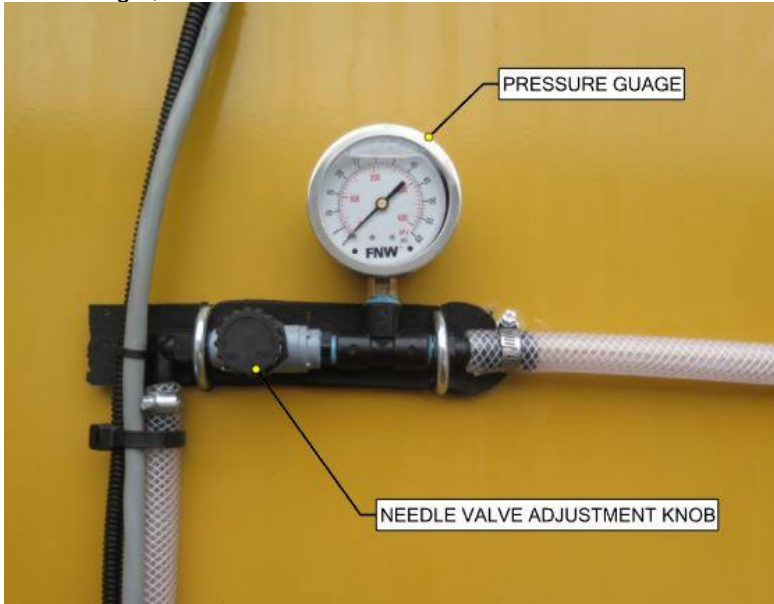
The amount of water being sprayed can be controlled to accommodate different conditions. Refer to the chart below. Machine is equipped with “green” 80015 nozzles. Nozzle sizes can be changed to increase flow, however this will reduce operation time of the dust control system before the tanks are depleted of water. Also keep in mind that excessive water will increase the weight and wetness of the load, which may result in residual leaking from the containment box.

To change the amount of water being sprayed, adjust the pressure using the needle valve knob shown in the photo below:

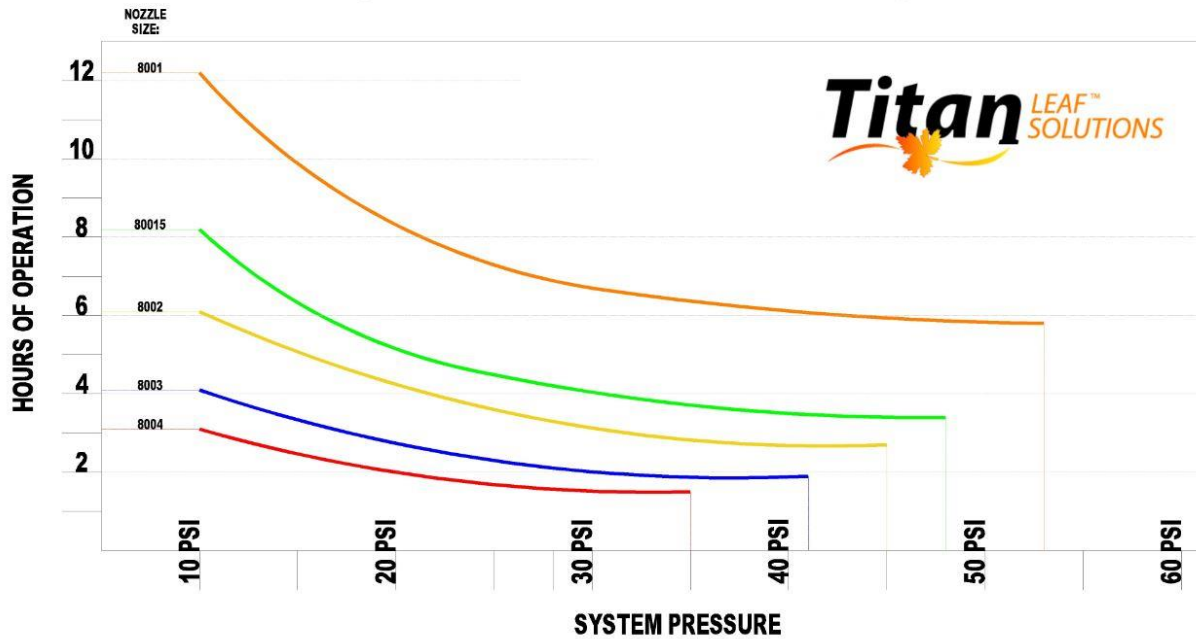
General Operating Instructions

- A REDUCTION in line pressure will REDUCE the amount of water being applied, and INCREASE your run time before depleting the water supply.
- An INCREASE in line pressure will INCREASE the amount of water being applied, and REDUCE your run time before depleting the water supply.

In very dusty conditions, a balance is necessary between lowering the dust level, but not necessarily eliminating it, based on available water refill stations.



**DUST CONTROL SYSTEM RUN TIME CHART
HOURS OF OPERATION PER 100 GALLONS OF WATER
(GREEN NOZZLES INSTALLED AT FACTORY)**



**INSTRUCTIONS: ADJUST NEEDLE VALVE TO SYSTEM PRESSURE SHOWN
TO OBTAIN APPROX. HOURS OF OPERATION LISTED AT LEFT.**

General Operating Instructions

4. Troubleshooting

4.1 If unit does not start.

- Check that all E-stops are in the out position.
- Check both proximity switches. If they are illuminated, the range is too far for the sensor.
- Check that both push button safety switches on cleanout door and collection hose are fully engaged
- Verify that the battery disconnect switch is in the on position to run.
- Verify that truck key is in the ignition position.
- On the control panel in the truck, there are two indicator lights.
 - If both lights are off, there is an issue with the main control plug either at the box, or the connection at the rear of the leaf machine.
 - If the left light is on but the right light is off, then there is a E-stop or proximity switch that is preventing the engine from seeing system power.

4.2 If unit is overheating.

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

4.3 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.

5. Supplemental Manuals

5.1 Split Taper Bushings

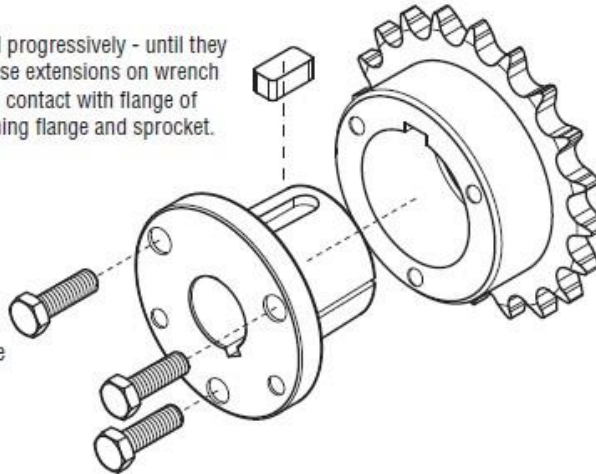
Martin	<p>MST® Bushings Instructions & Removal Instruction</p>
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The MST® bushings are easy to install and remove. They are split through the barrel and have a taper to provide a true clamp on the shaft. They are keyed to both the shaft and the hub to 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.)

5.2. Trans Fluid Coupler

TRANSFLUID



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 KFBD

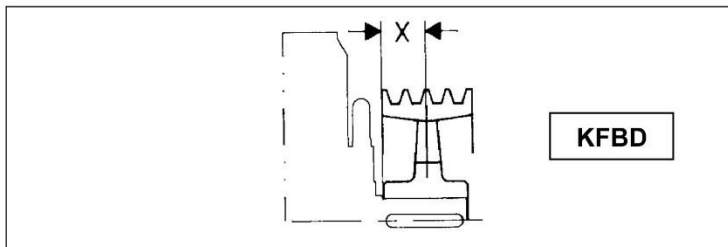
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<h2 style="margin: 0;">TRANSFLUID</h2> <p style="margin: 0;">trasmissioni industriali</p>	<h3 style="margin: 0;">13 KFBD</h3> <p style="margin: 0;">MANUALE INSTALLAZIONE, USO E MANUTENZIONE INSTALLATION, USE AND MAINTENANCE MANUAL</p>	<h3 style="margin: 0;">TF 6217-A</h3> <p style="margin: 0;">Rev. 0</p>		
<p>Questo manuale contiene le istruzioni per l'installazione, l'avviamento, l'uso e la manutenzione del giunto idrodinamico tipo KFBD. 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. 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>				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p style="text-align: center;">DESCRIZIONE</p> <p>Il KFBD e' un giunto idrodinamico la cui parte esterna, motrice, e' collegata al volano di un motore endotermico mediante un giunto elastico ed il cui albero di uscita e' supportato da un cuscinetto orientabile a rulli, lubrificato ad olio, alloggiati in una campana di supporto flangiata al coprivolano del motore. Un secondo cuscinetto, alloggiato nel volano, sostiene l'albero di uscita dal lato motore. Il KFBD e' adatto per applicazioni con puleggia od i linea.</p> </td> <td style="width: 50%; vertical-align: top;"> <p style="text-align: center;">DESCRIPTION</p> <p><i>KFBD is a fluid coupling having the outer driving impeller connected to the internal combustion engine flywheel through an elastic coupling. The output shaft is supported by a spherical roller bearing, oil lubricated, fitted in a cover flanged to the engine flywheel housing. Another bearing, fitted into the flywheel, supports the output shaft at the engine side. The KFBD is suitable for pulley or in line applications.</i></p> </td> </tr> </table>			<p style="text-align: center;">DESCRIZIONE</p> <p>Il KFBD e' un giunto idrodinamico la cui parte esterna, motrice, e' collegata al volano di un motore endotermico mediante un giunto elastico ed il cui albero di uscita e' supportato da un cuscinetto orientabile a rulli, lubrificato ad olio, alloggiati in una campana di supporto flangiata al coprivolano del motore. Un secondo cuscinetto, alloggiato nel volano, sostiene l'albero di uscita dal lato motore. Il KFBD e' adatto per applicazioni con puleggia od i linea.</p>	<p style="text-align: center;">DESCRIPTION</p> <p><i>KFBD is a fluid coupling having the outer driving impeller connected to the internal combustion engine flywheel through an elastic coupling. The output shaft is supported by a spherical roller bearing, oil lubricated, fitted in a cover flanged to the engine flywheel housing. Another bearing, fitted into the flywheel, supports the output shaft at the engine side. The KFBD is suitable for pulley or in line applications.</i></p>
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<p>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)</p> <p><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></p>				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p style="text-align: center;">INSTALLAZIONE (vedere TF6217-B)</p> <ol style="list-style-type: none"> 1 Montare l'anello di trascinamento del giunto elastico sul volano del motore. 2 Montare il cuscinetto pilota, ingrassato a vita, sull'albero del KFBD. 3 Montare la flangia SAE 3 sul coprivolano. 4 Posizionare il gruppo completo, osservando con cura l'allineamento dell'albero nel cuscinetto pilota e dei blocchetti del giunto elastico con l'anello di trascinamento montato sul volano. La campana esterna deve essere orientata in modo da avere l'apertura per il riempimento dell'olio a circa 60° dalla verticale, in senso orario guardando il volano del motore. Cosi' montato, si avra' l'apertura di drenaggio dell'olio in basso. Infine fissare il gruppo con le apposite viti sulla flangia esterna. 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. 6 Riempimento grasso (vedere tabella grassi consigliati). Mediante l'apposito ingrassatore,, riempire la camera di lavoro del cuscinetto fino a far fuoriuscire il grasso attorno all'albero 7 Dare alcuni colpi, con un martello non metallico, sull'estremita' dell'albero onde eliminare ogni eventuale tensione sui cuscinetti dovuta alla resistenza offerta dal cuscinetto pilota, quando esso viene montato forzato nella sede del volano. 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Remove plug and fill untill oil overflows (13KFBD fill X=5,2 lt;). Therefore fit the plug using sealent on thread. Tightening torque is 30 Nm for 3/8" plug .Fit again the cover.</i> 6 Grease filling (see recommended grease table). <i>Through the grease filler, fill grease untill it comes out around the shaft.</i> 7 Rap the shaft on the end to relieve any preloading that may result due to the resistance of pilot bearing when being pressed into the flywheel. 8 At first start up, run the unit engaged and engine at half of max speed for not less than 10 minutes. </td> </tr> </table>			<p style="text-align: center;">INSTALLAZIONE (vedere TF6217-B)</p> <ol style="list-style-type: none"> 1 Montare l'anello di trascinamento del giunto elastico sul volano del motore. 2 Montare il cuscinetto pilota, ingrassato a vita, sull'albero del KFBD. 3 Montare la flangia SAE 3 sul coprivolano. 4 Posizionare il gruppo completo, osservando con cura l'allineamento dell'albero nel cuscinetto pilota e dei blocchetti del giunto elastico con l'anello di trascinamento montato sul volano. 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TF6217-B)</p> <ol style="list-style-type: none"> 1 Mount elastic coupling driving ring, onto engine flywheel. 2 Mount pilot bearing, greased for life, onto KFBD shaft. 3 Mount SAE 3 flange onto flywheel housing. 4 Install complete group paying attention at alignment between shaft and pilot bearing as well as alignment between rubber blocks and driving ring. <i>External housing must be orientated to get the oil fill opening at about 60° clockwise from vertical line, looking at the flywheel. In such a way, the oil drain opening will be downwards. Therefore tighten screws of external flange.</i> 5 Fluid coupling oil filling (see recommended oil table). Remove cover. <i>Turn fluid coupling untill X mark be on vertical line (X-1-2-3-4 depends on application). Remove plug and fill untill oil overflows (13KFBD fill X=5,2 lt;). Therefore fit the plug using sealent on thread. Tightening torque is 30 Nm for 3/8" plug .Fit again the cover.</i> 6 Grease filling (see recommended grease table). <i>Through the grease filler, fill grease untill it comes out around the shaft.</i> 7 Rap the shaft on the end to relieve any preloading that may result due to the resistance of pilot bearing when being pressed into the flywheel. 8 At first start up, run the unit engaged and engine at half of max speed for not less than 10 minutes.
<p style="text-align: center;">INSTALLAZIONE (vedere TF6217-B)</p> <ol style="list-style-type: none"> 1 Montare l'anello di trascinamento del giunto elastico sul volano del motore. 2 Montare il cuscinetto pilota, ingrassato a vita, sull'albero del KFBD. 3 Montare la flangia SAE 3 sul coprivolano. 4 Posizionare il gruppo completo, osservando con cura l'allineamento dell'albero nel cuscinetto pilota e dei blocchetti del giunto elastico con l'anello di trascinamento montato sul volano. La campana esterna deve essere orientata in modo da avere l'apertura per il riempimento dell'olio a circa 60° dalla verticale, in senso orario guardando il volano del motore. Cosi' montato, si avra' l'apertura di drenaggio dell'olio in basso. Infine fissare il gruppo con le apposite viti sulla flangia esterna. 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. 6 Riempimento grasso (vedere tabella grassi consigliati). Mediante l'apposito ingrassatore,, riempire la camera di lavoro del cuscinetto fino a far fuoriuscire il grasso attorno all'albero 7 Dare alcuni colpi, con un martello non metallico, sull'estremita' dell'albero onde eliminare ogni eventuale tensione sui cuscinetti dovuta alla resistenza offerta dal cuscinetto pilota, quando esso viene montato forzato nella sede del volano. Al primo avviamento, far girare il gruppo innestato, per almeno 8 10 minuti, con il motore alla meta' dei giri massimi. 	<p style="text-align: center;">INSTALLATION (see sheet. TF6217-B)</p> <ol style="list-style-type: none"> 1 Mount elastic coupling driving ring, onto engine flywheel. 2 Mount pilot bearing, greased for life, onto KFBD shaft. 3 Mount SAE 3 flange onto flywheel housing. 4 Install complete group paying attention at alignment between shaft and pilot bearing as well as alignment between rubber blocks and driving ring. <i>External housing must be orientated to get the oil fill opening at about 60° clockwise from vertical line, looking at the flywheel. In such a way, the oil drain opening will be downwards. Therefore tighten screws of external flange.</i> 5 Fluid coupling oil filling (see recommended oil table). Remove cover. <i>Turn fluid coupling untill X mark be on vertical line (X-1-2-3-4 depends on application). Remove plug and fill untill oil overflows (13KFBD fill X=5,2 lt;). Therefore fit the plug using sealent on thread. Tightening torque is 30 Nm for 3/8" plug .Fit again the cover.</i> 6 Grease filling (see recommended grease table). <i>Through the grease filler, fill grease untill it comes out around the shaft.</i> 7 Rap the shaft on the end to relieve any preloading that may result due to the resistance of pilot bearing when being pressed into the flywheel. 8 At first start up, run the unit engaged and engine at half of max speed for not less than 10 minutes. 			

trasmissioni industriali	13 KFBD MANUALE INSTALLAZIONE, USO E MANUTENZIONE INSTALLATION, USE AND MAINTENANCE MANUAL	TF 6217-C Rev. 0
MANUTENZIONE <ul style="list-style-type: none"> - Controllare, ogni 3 mesi, il livello dell'olio nel giunto. - Cambiare l'olio ogni 4000 ore di funzionamento oppure una volta all'anno. - Ingrassare il cuscinetto dell'albero di uscita ogni settimana. - Controllare, periodicamente, lo stato dei blocchetti in gomma del giunto elastico - E' consigliabile, ogni 4000 ore di funzionamento, cambiare tutti gli anelli di tenuta rotante e controllare lo stato dei cuscinetti. - Controllare, periodicamente, che la taratura del termostato, se installato, sia uguale al valore originariamente impostato (vedere certificato di collaudo e TF5941-O). - Pulire periodicamente la sonda del termostato, se installato. 	MAINTENANCE <ul style="list-style-type: none"> - <i>Check, every 3 months, the fluid coupling oil level. Change oil every 4000 working hours or once a year, whichever occurs first.</i> - <i>Grease output shaft bearing every week.</i> - <i>Check, periodically, elastic coupling rubber blocks condition.</i> - <i>It is advisable, every 4000 working hours, to change all rotating seals and to check bearings condition.</i> - <i>Check, periodically, that temperature switch whether installed, set value be the same as originally adjusted (see test certificate and TF5941-O).</i> - <i>Clean periodically the temperature switch bulb, whether installed.</i> 	
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.
	Carico radiale eccessivo.	Ridurre la tensione delle cinghie.
Perdita olio lato motore.	Tappo conico.	Rimontare con sigillante per filetti.
	Anello OR.	Sostituire.
	Tenuta rotante.	Sostituire. Controllare l'usura sull'albero.
Perdita olio lato uscita.	Tappo conico.	Rimontare con sigillante per filetti.
	Tappo fusibile se installato.	Sostituire.
	Anelli OR.	Sostituire.
	Tenuta Rotante.	Sostituire. Controllare l'usura sull'albero.
Rumore.	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.
	Usura della dentatura tra albero uscita mozzo, girante interna.	Smontare e sostituire le parti usurate.
	Alta temperatura olio.	Vedere "surriscaldamento".
Intervento termostato.	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.
	Too high radial load.	Decrease belt tension.
Oil leakage at engine side.	Taper plug.	Remount using thread sealant.
	O-ring.	Replace.
	Rotating seal.	Replace. Check shaft wear.
Oil leakage at output side.	Filling plug.	Remount using thread sealant.
	Fusible plug, whether installed.	Replace.
	O-ring.	Replace.
	Rotating seal.	Replace. Check shaft wear.
Noise.	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.
	Spline wear between output shaft/hub, inner impeller.	Dismantle and replace worn components.
	High oil temperature.	See "overheating".
Temperature switch intervention.	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, omissione 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.

5.3 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

Supplemental Manuals

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
OFF	Turns system off	N/A	N/A
LEFT ARROW	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
CENTER ARROW	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
RIGHT ARROW	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
FAST / SLOW	Fast	Slow	Fast

* Custom Flash Patterns are available upon request. Please inquire at 1-877-246-6274 or 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, www.nasig.com

Revision 2.7, 1/1/2018

Whelen Traffic Advisor



51 Winthrop Road
Chester, Connecticut 06412-0684
Phone: (860) 526-9504
Fax: (860) 526-4078
Internet: www.whelen.com
Sales e-mail: autosale@whelen.com
Canadian Sales e-mail: autocan@whelen.com
Customer Service e-mail: custserv@whelen.com

**Installation Guide:
LED Traffic Advisor
TAL65 / TAL65W
TAL85 / TAL85W / TAL85****

Automotive: Traffic Advisor

Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.
- If mounting this product requires drilling holes, the installer **MUST** be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.
- If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro™, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.
- Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.
- For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the **NEGATIVE (-)** battery post.
- If this product uses a remote device to activate or control this product, make sure that this control is located in an area that allows both the vehicle and the control to be operated safely in any driving condition.
- Do not attempt to activate or control this device in a hazardous driving situation.
- This product contains either strobe light(s), halogen light(s), high-intensity LEDs or a combination of these lights. Do not stare directly into these lights. Momentary blindness and/or eye damage could result.
- Use only soap and water to clean the outer lens. Use of other chemicals could result in premature lens cracking (crazing) and discoloration. Lens in this condition have significantly reduced effectiveness and should be replaced immediately. Inspect and operate this product regularly to confirm its proper operation and mounting condition. Do not use a pressure washer to clean this product.
- It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

For warranty information regarding this product, visit www.whelen.com/warranty

Supplemental Manuals

Mounting:

Read all warnings before starting installation.

Note: There are two ways to mount the light array. Both methods require the unit to be secured to the mounting surface using the supplied sheet metal screws. The cable harness can either be routed directly into the mounting surface or routed out the side of the end cap (see illustration below). When facing the L.E.D. display, the cable harness should exit from the right side of the bar.

Note: When routing the wires, it is important to choose a path that will keep these wires away from excessive heat and from any vehicle equipment that could compromise the integrity of the wires (ex. trunk lids, door jams, etc.).

1. Position the unit in its proposed mounting location to ensure that it fits properly. With the unit in place, use an awl or other suitable tool and scribe the areas to be drilled, based on the desired style.

Style 1 - Remove the unit from its mounting area and, using a 5/8" drill bit, drill a hole for the cable harness. Affix the 5/8" grommet to the hole and feed the cable harness through the grommet.

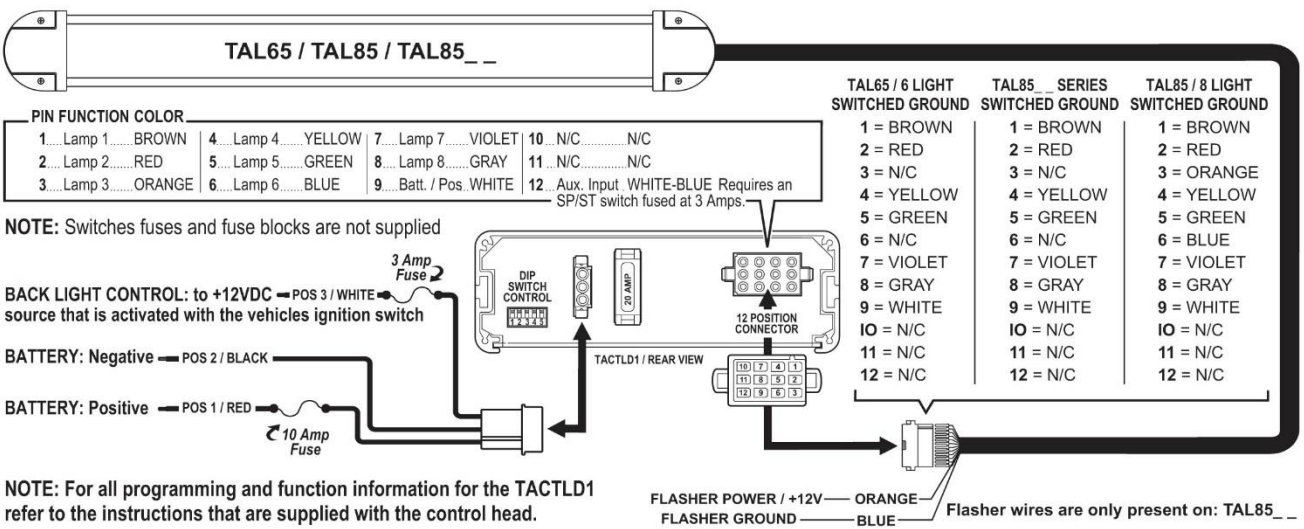
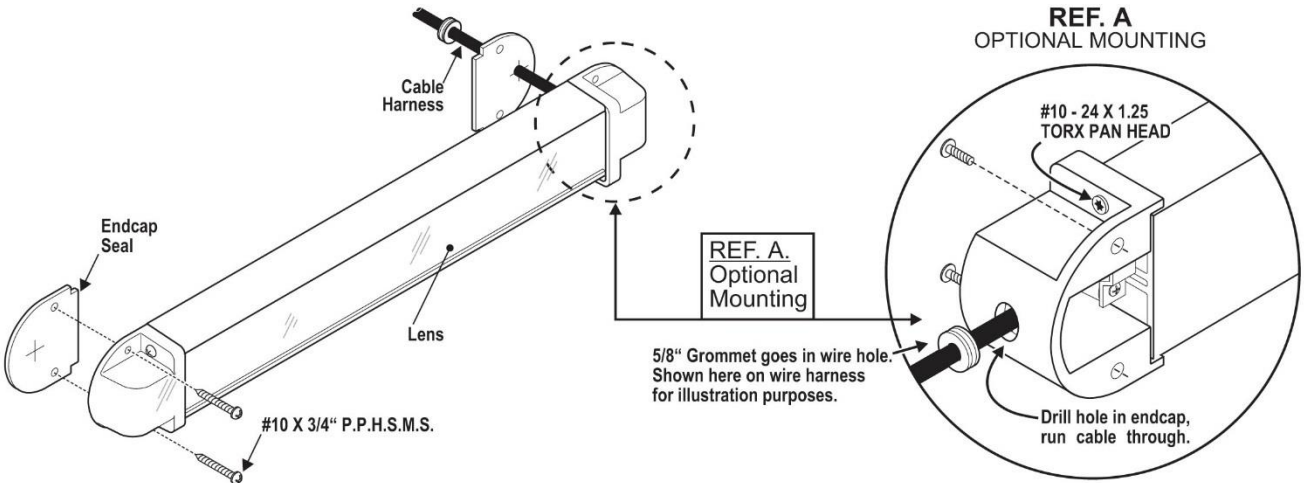
Style 2 (OPTIONAL) - To route the cable harness through the end cap a 5/8" passage hole must be drilled. Remove the endcap from the light array, via the machine screws, as to prevent damage to the cable harness and drill the hole. Place the 5/8" grommet on the hole and feed the cable through. Once this is done, secure the endcap back onto the light array.

2. Using an appropriately sized drill bit, drill a hole in each of the areas scribed in the previous step.

3. Return the unit to its mounting location and using the supplied hardware, mount the unit as shown below.

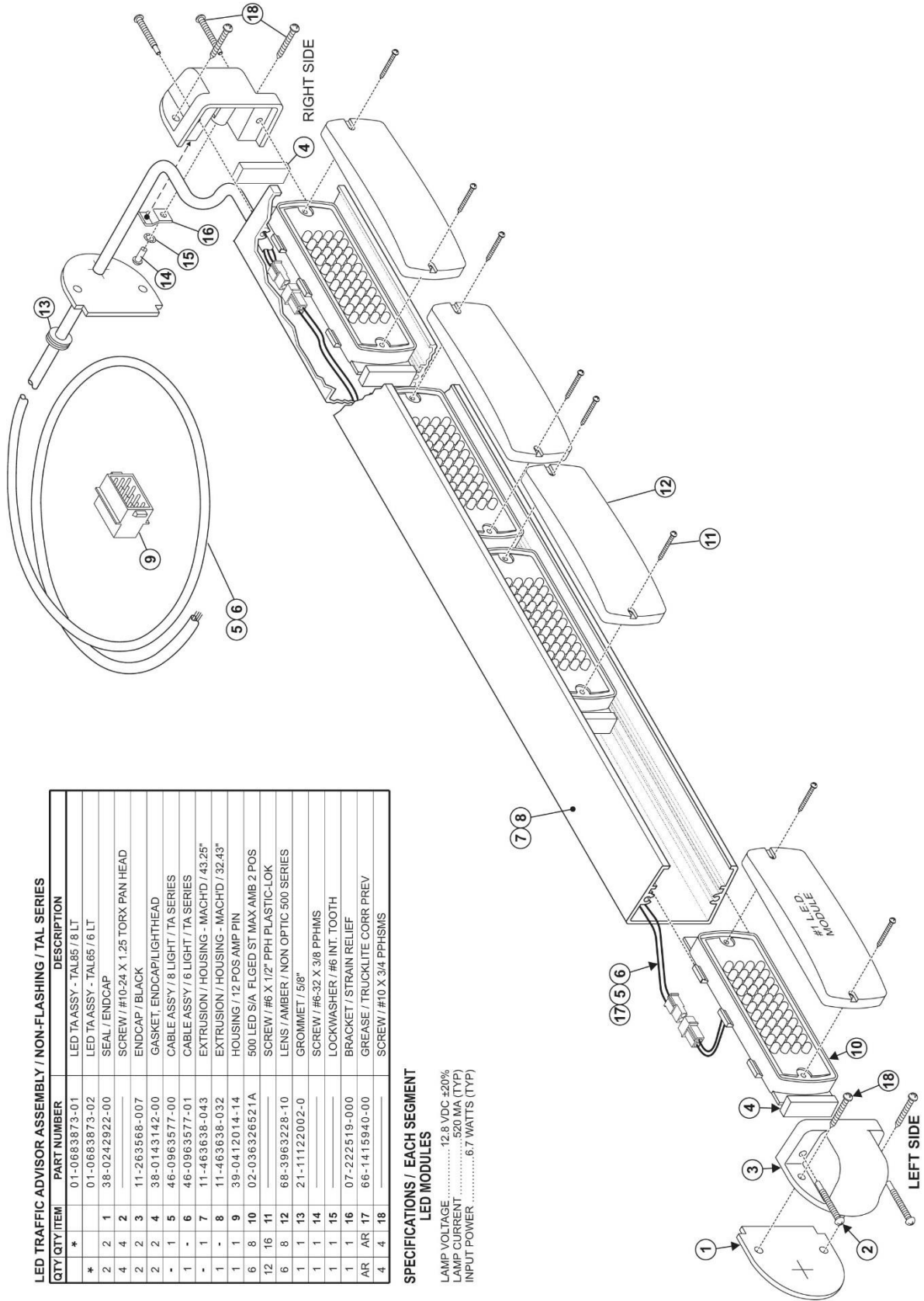
Note: Do not install the fuse required in the fuse block, until all wire connections are completed.

Installation is now complete. Refer to the wiring diagram below and the manual that comes with your control head.



NOTE: For all programming and function information for the TACTLD1 refer to the instructions that are supplied with the control head.

FLASHER POWER / +12V — ORANGE
FLASHER GROUND — BLUE
Flasher wires are only present on: TAL85__



LED TRAFFIC ADVISOR ASSEMBLY / NON-FLASHING / TAL SERIES

QTY / QTY ITEM	PART NUMBER	DESCRIPTION
*	01-0683873-01	LED TA ASSY - TAL85 / 8 LT
*	01-0683873-02	LED TA ASSY - TAL65 / 6 LT
2	38-0242922-00	SEAL / ENDCAP
4	4	SCREW / #10-24 X 1.25 TORX PAN HEAD
2	3	ENDCAP / BLACK
2	4	GASKET, ENDCAP/LIGHTHEAD
-	1	CABLE ASSY / 8 LIGHT / TA SERIES
1	6	CABLE ASSY / 6 LIGHT / TA SERIES
-	1	EXTRUSION / HOUSING - MACH'D / 43.25"
-	1	EXTRUSION / HOUSING - MACH'D / 32.43"
1	9	HOUSING / 12 POS AMP PIN
6	8	500 LED S/A FLG'D ST MAX AMB 2 POS
12	16	SCREW / #6 X 1/2" PPH PLASTIC-LOK
6	8	LENS / AMBER / NON OPTIC 500 SERIES
1	13	GROMMET / 5/8"
1	14	SCREW / #6-32 X 3/8 PPHMS
1	15	LOCKWASHER / #6 INT. TOOTH
1	16	BRACKET / STRAIN RELIEF
AR	AR 17	GREASE / TRUCKLITE CORR PREV
4	4	SCREW / #10 X 3/4 PPHMS

SPECIFICATIONS / EACH SEGMENT

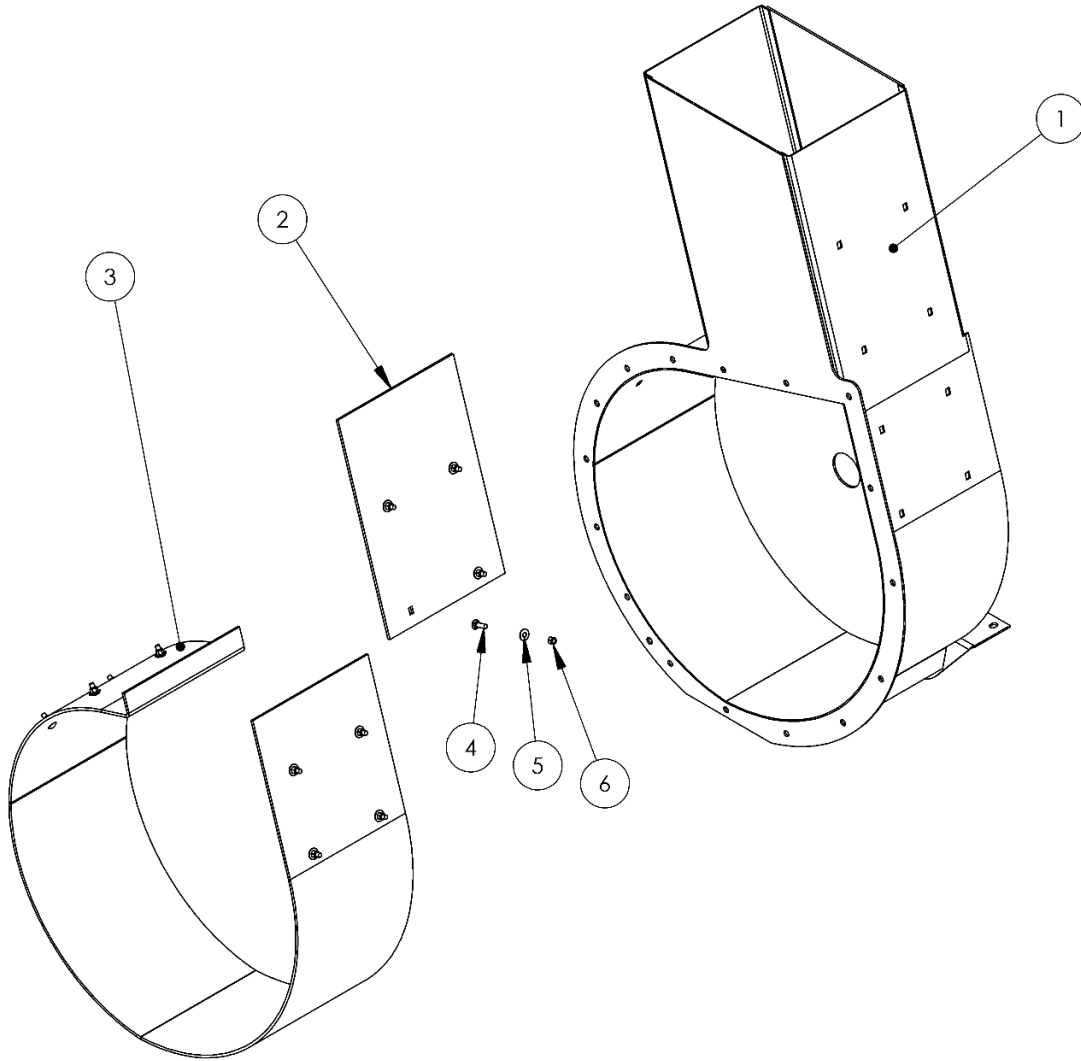
LED MODULES

LAMP VOLTAGE 12.8 VDC ±20%
 LAMP CURRENT 520 MA (TYP)
 INPUT POWER 6.7 WATTS (TYP)

Parts Breakdown

6 Parts Breakdowns

FILE NAME	LV-3002 BLOWER	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	BLOWER LINER	-	ORIGINAL	7/18/2017	SHJ



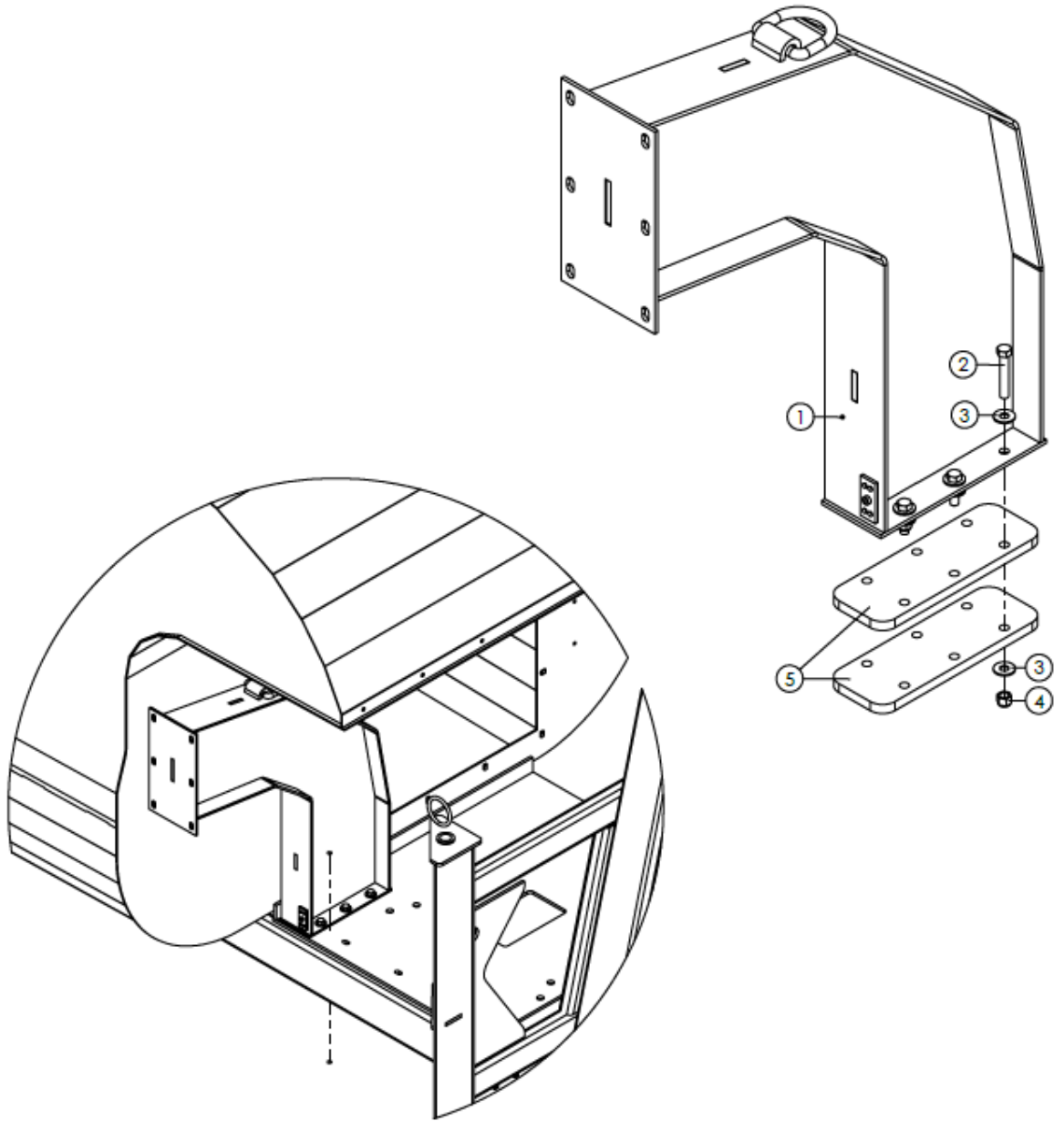
1	1	LV-3022	BLOWER HOUSING, SPARTAN, HL
2	1	LV-3031	LINER, BLOWER, ELBOW
3	1	LV-3024	LINER, BLOWER, HOUSING
4	12	BON-000285.5	3/8"-16 X 1-1/4" CARRIAGE
5	12	BON-000338	FLATWASHER, 3/8", ZP
6	12	BON-000319	3/8"-16, LOCK NUT, NYLON
ITEM	QTY	PART NUMBER	DESCRIPTION



DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	LV-3002 BLOWER
DWG NAME	UPRIGHT INSTALL Rev: 03/12/20



5	LV-2671	2	SPACER - 5/8 x 4-1/2 x 13
4	BON-000321	6	1/2-13 LOCKNUT, NYLON
3	BON-00340	12	FLATWASHER, 1/2, U.S.S. ZP
2	BON-000113	6	1/2-13 x 3 HEX BOLT GR8
1	LV-3025	1	UPRIGHT, WELDMENT, SPARTAN HL
REF	PART NO.	QTY	DESCRIPTION

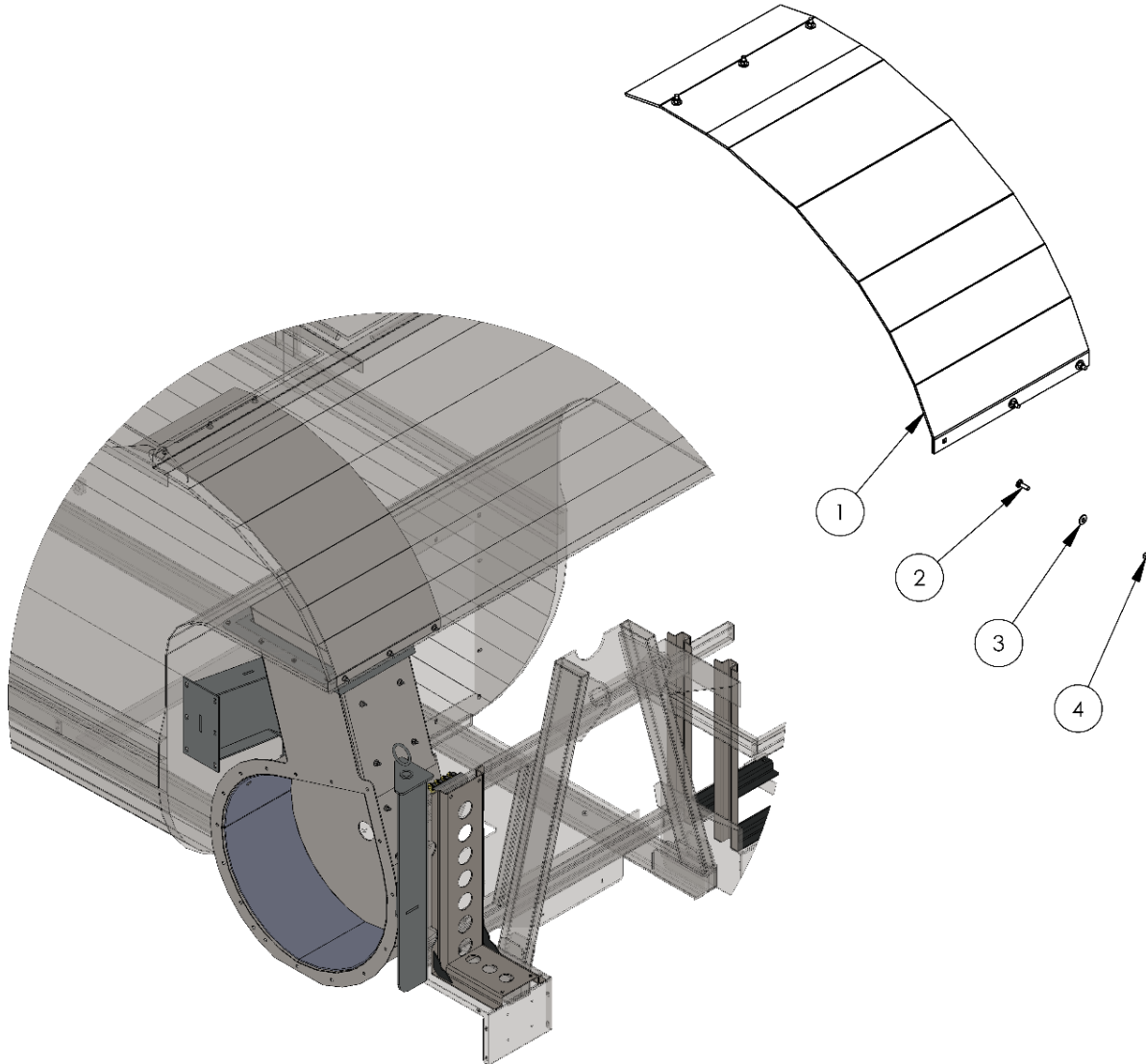


BONNELL INDUSTRIES INC
TRUCK & ROAD EQUIPMENT

DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	LV-3002 BLOWER	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	HOOD LINER INSTALL	-	ORIGINAL	7/18/2017	SHJ



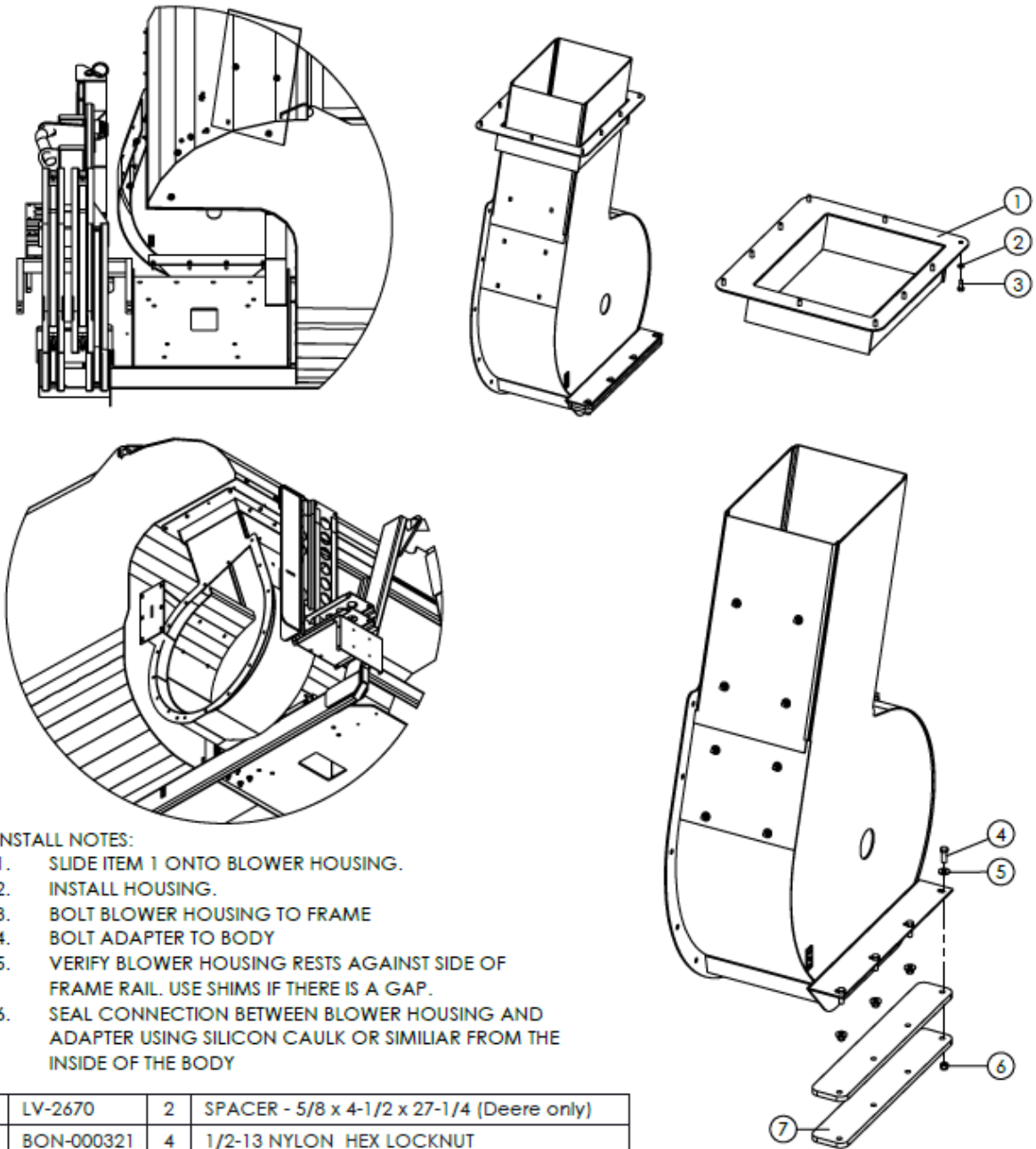
1	1	LV-3032	LINER, BODY, FOR LV-3020
2	6	BON-000285.5	3/8-16 X 1-1/4"L CARRIAGE BOLT
3	6	BON-000338	FLATWASHER, 3/8", ZP
4	6	BON-000319	3/8"-16, LOCK NUT, NYLON
ITEM	QTY	PART NUMBER	DESCRIPTION

BONNELL
INDUSTRIES INC
TRUCK & ROAD EQUIPMENT

DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	LV-3002 BLOWER
DWG NAME	BLOWER INSTALL Rev: 03/20



INSTALL NOTES:

1. SLIDE ITEM 1 ONTO BLOWER HOUSING.
2. INSTALL HOUSING.
3. BOLT BLOWER HOUSING TO FRAME
4. BOLT ADAPTER TO BODY
5. VERIFY BLOWER HOUSING RESTS AGAINST SIDE OF FRAME RAIL. USE SHIMS IF THERE IS A GAP.
6. SEAL CONNECTION BETWEEN BLOWER HOUSING AND ADAPTER USING SILICON CAULK OR SIMILAR FROM THE INSIDE OF THE BODY

7	LV-2670	2	SPACER - 5/8 x 4-1/2 x 27-1/4 (Deere only)
6	BON-000321	4	1/2-13 NYLON HEX LOCKNUT
5	BON-000340	4	FLATWASHER - 1/2 ZP
4	BON-000113	4	1/2-13 x 3 HEX BOLT GR8 (Deere)
	BON-000107		1/2-13 x 1-1/2 HEX BOLT GR8 (Kubota, Kohler)
3	BON-000057	10	3/8-16 x 1 HEX BOLT
2	BON-000352	10	LOCK WASHER - 3/8 ZP
1	LV-3029	1	ADAPTER, BLOWER HOUSING
REF	PART NO.	QTY	DESCRIPTION


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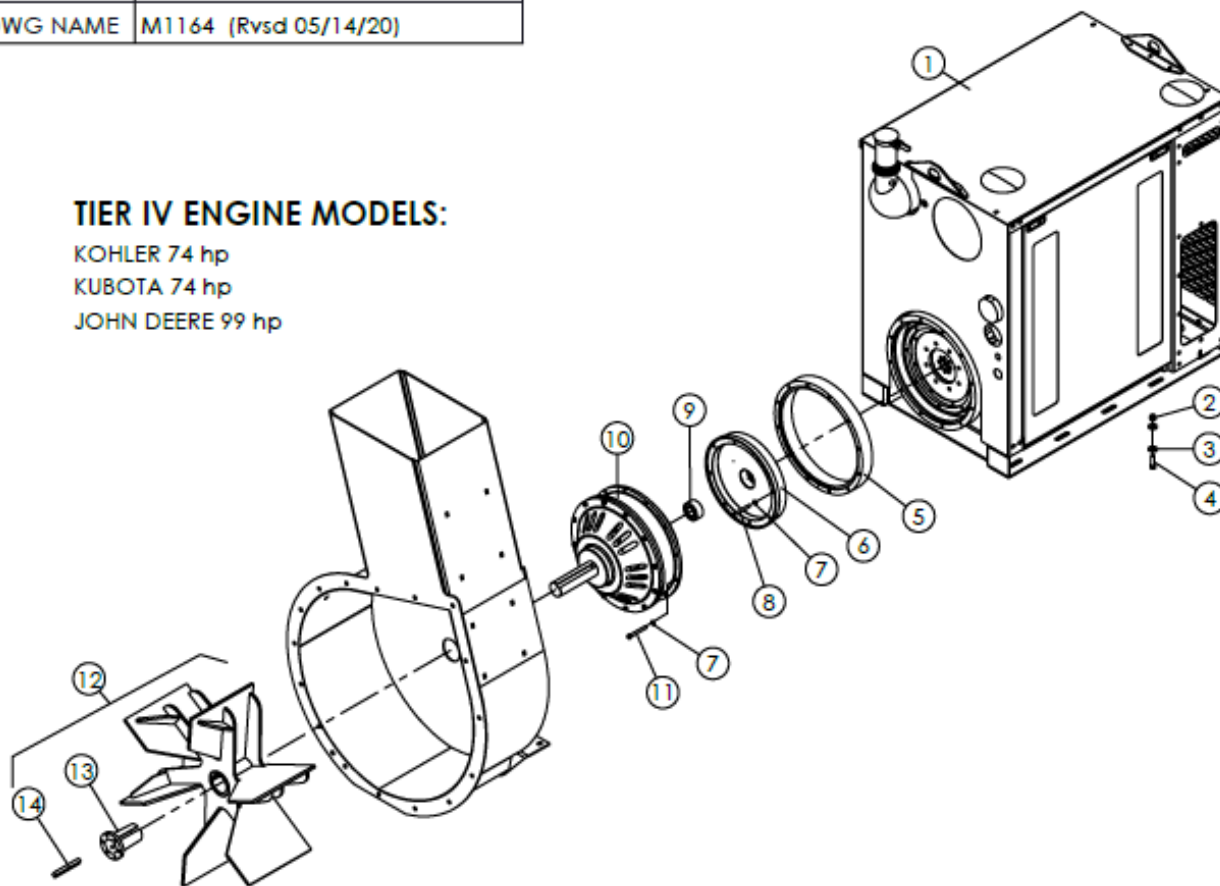
Parts Breakdown

FILE NAME	M1164
DWG NAME	M1164 (Rvsd 05/14/20)

SPARTAN HOOKLIFT ENGINE COMPONENTS

TIER IV ENGINE MODELS:

KOHLER 74 hp
KUBOTA 74 hp
JOHN DEERE 99 hp



14	LV-1628	1	STEP KEY	ALL
13	LV-1607	1	2-1/4" SPLIT TAPER BUSHING	ALL
12	LV-1606	1	30" DIRECT DRIVE CCW FAN	DEERE 99
	LV-1631		27" DIRECT DRIVE CCW FAN	KOHLER 74 & KUBOTA 74
11	BON-000058	12	3/8-16 x 1-1/4 HEX BOLT	KUBOTA 74 & DEERE 99
	LV-2683		3/8-16 x 4 STUD	KOHLER 74
10	LV-1293	1	13KFBD FLUID COUPLER	ALL
9	LV-1595	1	PILOT BEARING	ALL
8	BON-000058	8	3/8-16 x 1-1/4 HEX BOLT	KUBOTA 74 & DEERE 99
	BON-000066		3/8-16 x 3-1/4 HEX BOLT	KOHLER 74
7	BON-000352	20	3/8 LOCK WASHER	ALL
6	LV-2498	1	FLYWHEEL ADAPTER	KOHLER 74
5	LV-2559	1	HOUSING SPACER	KOHLER 74
4	BON-000182	8	3/4-10 x 2 HEX BOLT	DEERE 99
	BON-000153	4	5/8-11 x 2 HEX BOLT	KUBOTA 74
	BON-000108	12	1/2-13 x 1-3/4 HEX BOLT	KOHLER 74
3	BON-000342	16	3/4 FLAT WASHER	DEERE 99
	BON-000341SAEH	8	5/8 FLAT WASHER	KUBOTA 74
	BON-000340SAEH	24	1/2 FLAT WASHER	KOHLER 74
2	BON-000323	8	3/4-10 NYLON HEX LOCKNUT	DEERE 99
	BON-000322	4	5/8-11 NYLON HEX LOCKNUT	KUBOTA 74
	BON-000321	12	1/2-13 NYLON HEX LOCKNUT	KOHLER 74
1		1	CALL FOR QUOTE	ALL
REF	PART NO.	QTY	DESCRIPTION	ENGINE MODEL

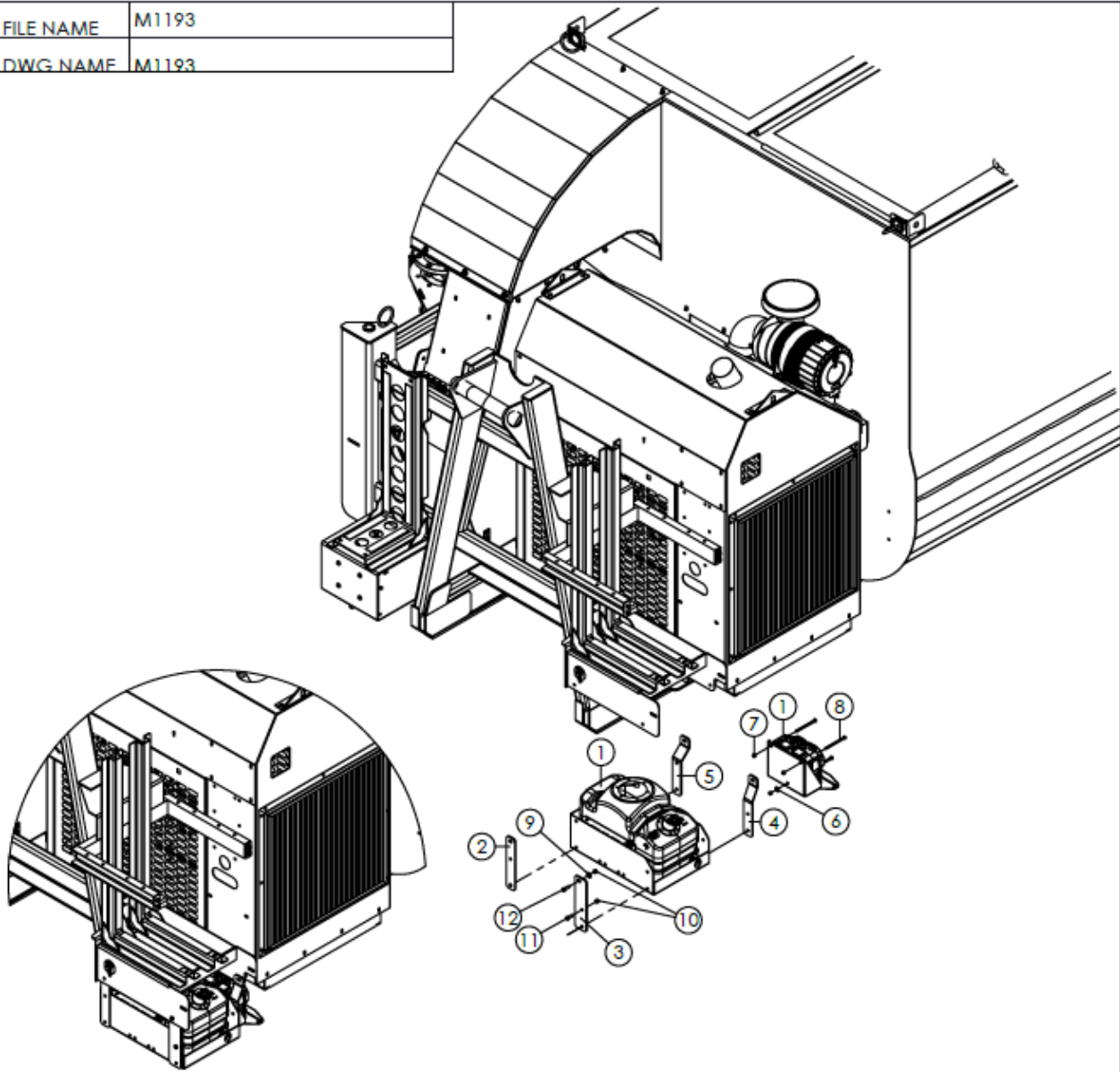
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Parts Breakdown

FILE NAME	M1193
DWG NAME	M1193



12	BON-000058	4	3/8-16 x 1-1/4 HEX BOLT GR8
11	BON-000057	8	3/8-16 x 1 HEX BOLT GR8
10	BON-000319	12	3/8-16 NYLON HEX LOCKNUT
9	BON-000338	4	3/8 STANDARD FLAT WASHER
8	BON-000043	3	5/16-18 x 4-1/2 HEX BOLT GR8
7	BON-000320	3	5/16-18 NYLON HEX LOCKNUT
6	BON-000337	1	5/16 STANDARD FLAT WASHER
5	LV-2673	1	BRACKET - DEERE DEF TANK REAR INNER
4	LV-2674	1	BRACKET - DEERE DEF TANK REAR OUTER
3	LV-2675	1	BRACKET - DEERE DEF TANK FRONT OUTER
2	LV-2672	1	BRACKET - DEERE DEF TANK FRONT INNER
1	CALL FOR INFO	1	DEERE DEF TANK & MOUNTING BRACKET
REF	PART NO.	QTY	DESCRIPTION

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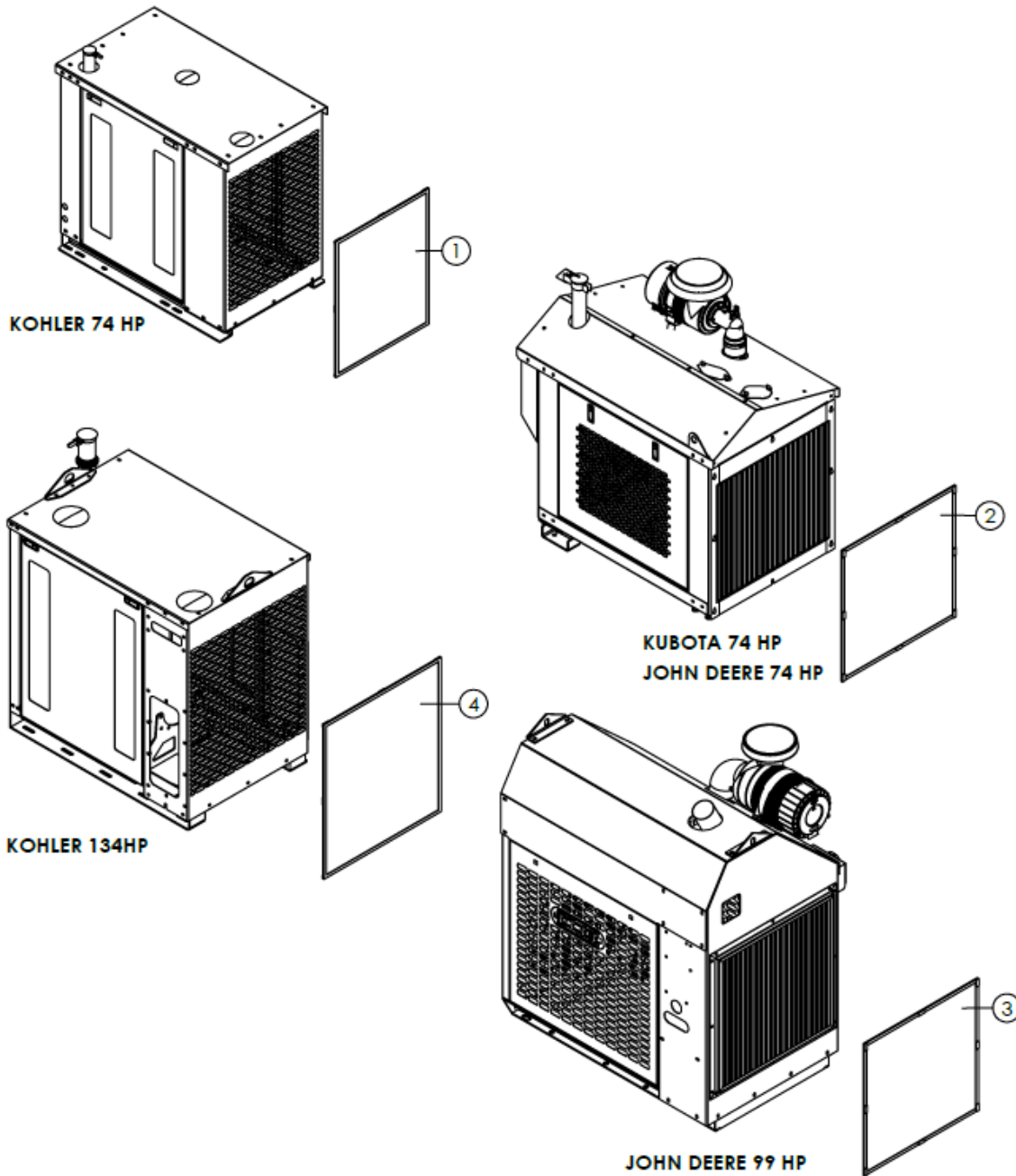


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Parts Breakdown

FILE NAME	M1157
DWG NAME	M1157 (Rev: 03/01/22)

TIER IV ENGINE PREScreens



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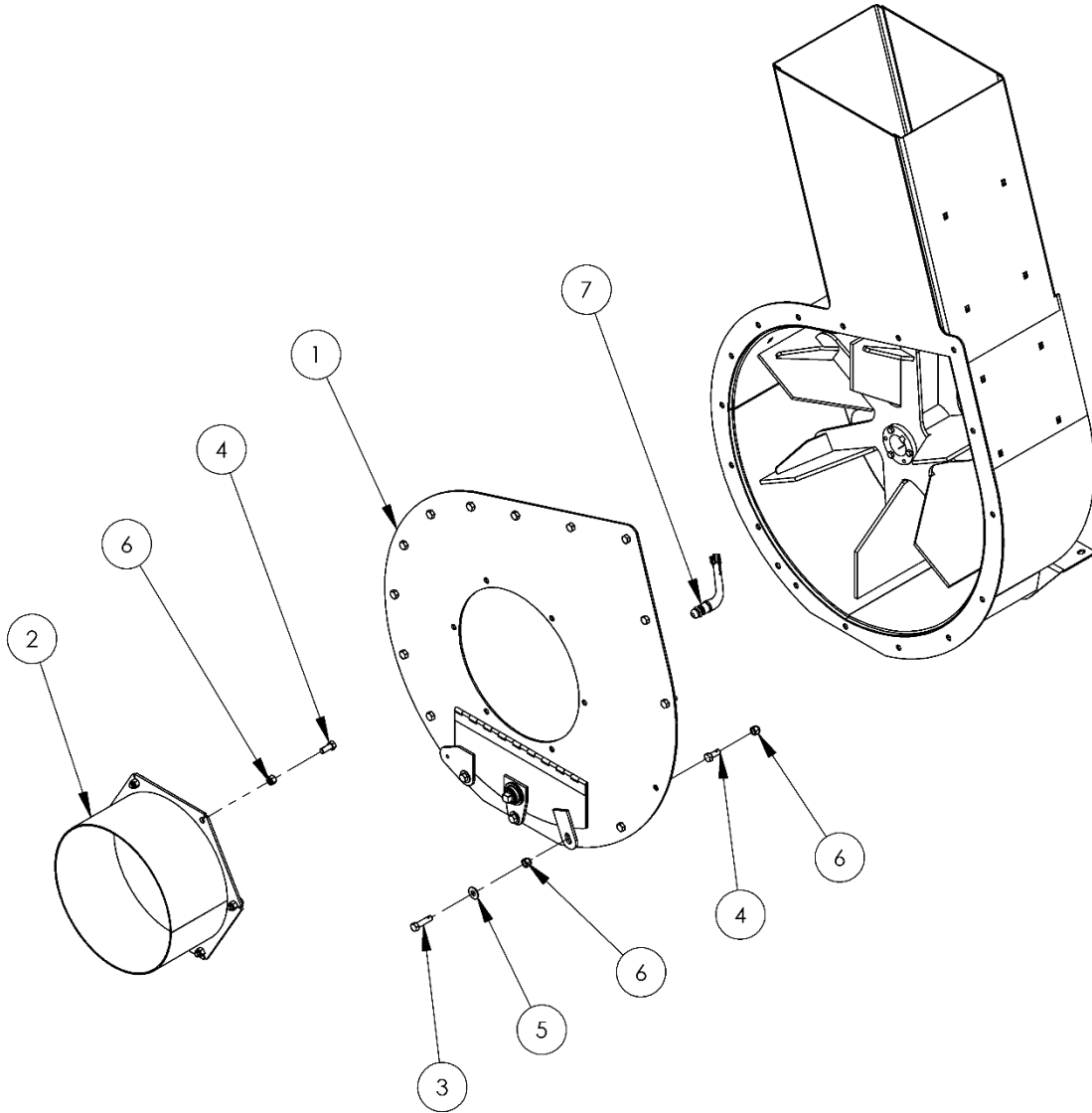
REF	PART NO.	QTY	DESCRIPTION
4	LV-2453	1	29 x 33 MAGNETIC PRESscreen
3	LV-2454	1	28-3/16 x 28-3/16 MAGNETIC PRESscreen
2	LV-2455	1	28 x 28 MAGNETIC PRESscreen
1	LV-4535	1	29 x 23 MAGNETIC PRESscreen



DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	LV-3002 BLOWER	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	BLOWER COVER, ELBOW	-	ORIGINAL	7/18/2017	SHJ



1	1	LV-3023	COVER, BLOWER HOUSING, W/ CLEANOUT
2	1	LV-3035	ADAPTER, SUCTION HOSE, HL
3	3	BON-000109	1/2"-13TPI X 2"L, HEX BOLT, GR. 8
4	19	BON-000106	1/2"-13TPI X 1-1/4"L, HEX BOLT, GR. 8
5	3	BON-000340	FLATWASHER, 1/2", ZP
6	22	BON-000321	1-2"-13TPI, LOCK NUT, NYLON
7	1	LV-1393	PUSH BUTTON SAFETY SWITCH
ITEM	QTY	PART NUMBER	DESCRIPTION

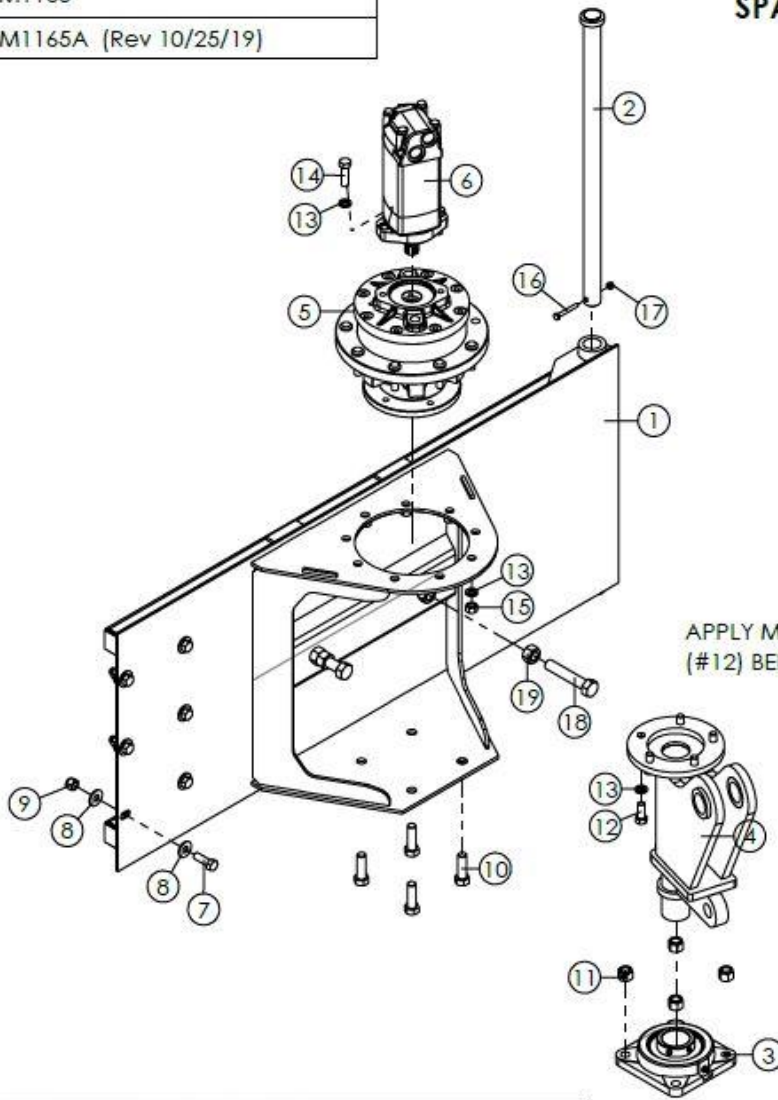


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PHONE: 800-851-9664

Parts Breakdown

FILE NAME	M1165
DWG NAME	M1165A (Rev 10/25/19)

SPARTAN HL CONTROL ARM



APPLY MEDIUM BLUE LOCTITE TO BOLTS (#12) BEFORE INSTALLATION

19	BON-000308	2	3/4-10 HEX NUT ZP
18	BON-000190	2	3/4-10 x 4" HEX BOLT GR8
17	BON-000318.5	1	1/4-20 NYLON HEX LOCKNUT
16	BON-000009	1	1/4-20 x 2" HEX BOLT
15	BON-000305.1	9	1/2-20 HEX NUT ZP
14	BON-000108	2	1/2-13 x 1-3/4" HEX BOLT GR8
13	BON-000354H	16	1/2 LOCK WASHER - HARDENED
12	BON-000106	5	1/2-13 x 1-1/4" HEX BOLT GR8
11	BON-000322	4	5/8-11 NYLON HEX LOCKNUT
10	BON-000153	4	5/8-11 x 2" HEX BOLT GR8
9	BON-000321	6	1/2-13 NYLON HEX LOCKNUT
8	BON-000340	12	1/2 FLAT WASHER ZP
7	BON-000107	6	1/2-13 x 1-1/2" HEX BOLT GR8
6	LV-2207	1	MOTOR - HYDRAULIC
5	LV-3052	1	GEARBOX - PLANETARY
4	LV-1530	1	TUBE - TORQUE, SPARTAN HL
3	BV2-001704	1	BEARING - 4 BOLT FLANGE, 2" BORE
2	BON-005514	1	PIN - HINGE, SPARTAN HL
1	LV-2511	1	MOUNT - BOOM, SPARTAN HL HINGED
REF	PART NO.	QTY	DESCRIPTION

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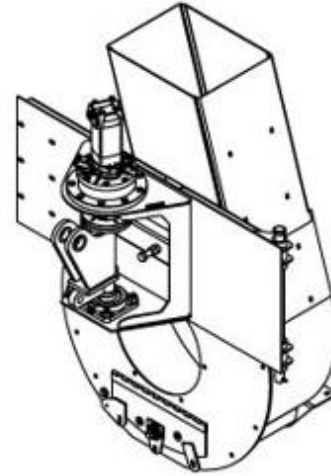
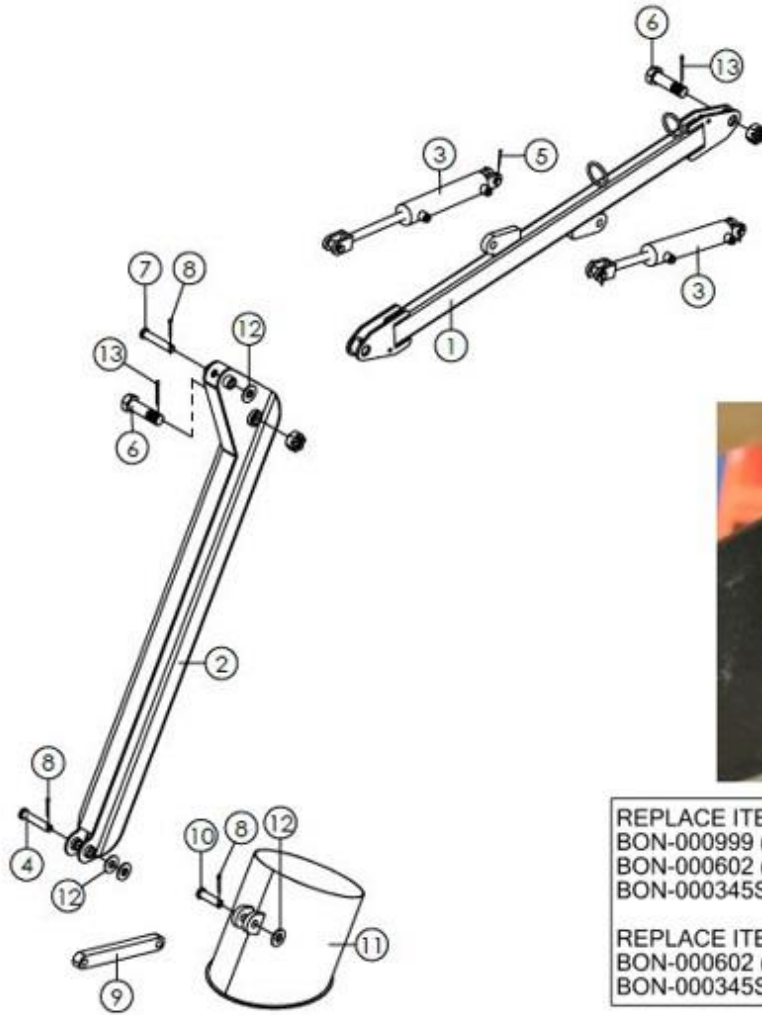


DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	M1167
DWG NAME	M1167

SPARTAN HOOKLIFT CONTROL ARM



REPLACE ITEM 3 CYLINDER PINS (3 PLACES) WITH:
 BON-000999 (PIN)
 BON-000602 (ROLL PIN)
 BON-000345SAEH (FLAT WASHER)

REPLACE ITEM 8 COTTER PINS WITH:
 BON-000602 (ROLL PIN)
 BON-000345SAEH (FLAT WASHER)

13	BON-000386	2	COTTER PIN - 1/4 x 3"
12	BON-000345SAEH	4	FLAT WASHER - 1" SAE HARDENED ZP
11	LV-1529	1	PICKUP NOZZLE - SUCTION HOSE, HL
10	BON-000997	1	PIN - LIFT RAM, 1" x 3-1/2", 3-1/8" WL
9	LV-1528	1	BAR - PIVOT BAR, HL
8	BON-000385	3	COTTER PIN - 1/4 x 2"
7	BON-000993	1	PIN - DRAG HITCH, 1" x 5-1/4", 4-5/8" WL
6	BON-003681	2	SWIVEL BOLT ASSY
5	BON-000380	6	COTTER PIN - 5/32 x 2"
4	WES-93080K	1	RIVET 1" X 5"
3	LV-4592	2	HYDRAULIC CYLINDER - 2-1/2" BORE x 10"
2	LV-1527	1	ARM - LENGTHENED FOR HL, 180°
1	LV-1526	1	BOOM ARM - SUCTION HOSE, SHORT
REF	PART NO.	QTY	DESCRIPTION

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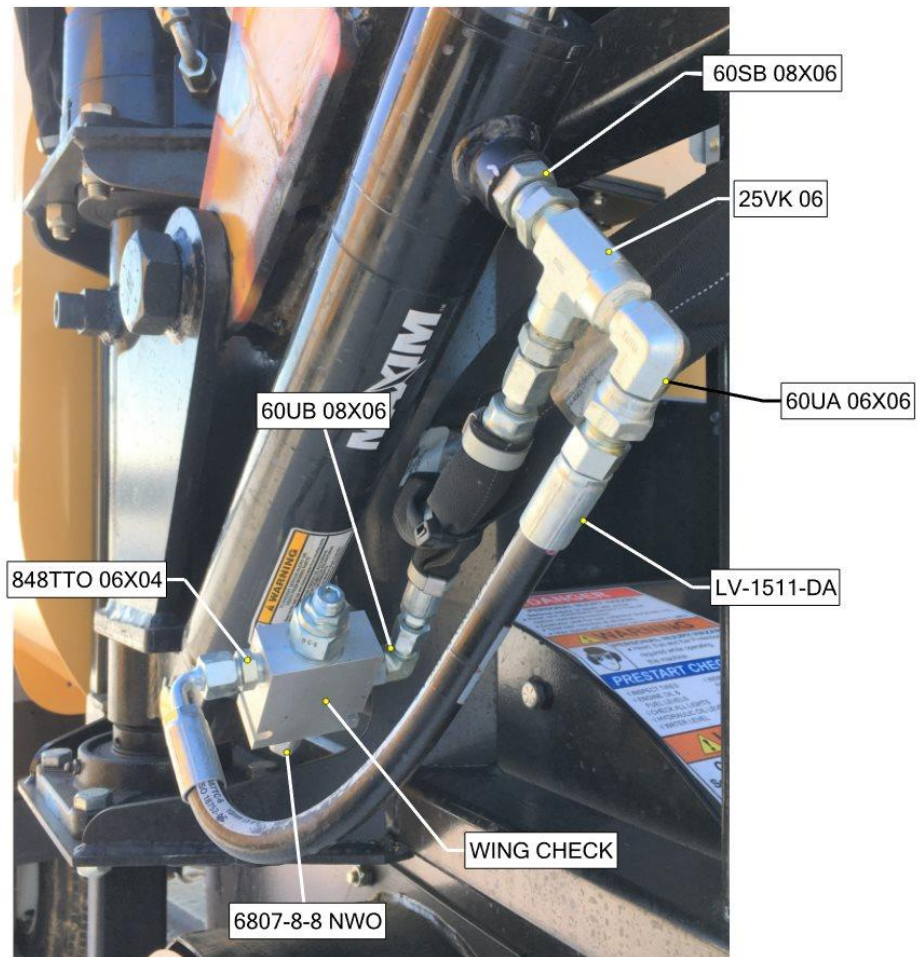
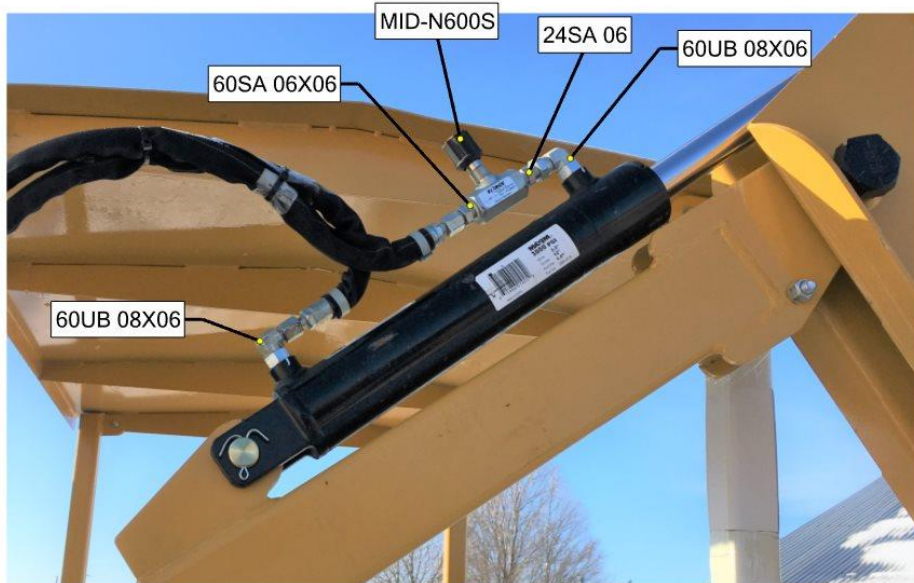
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Parts Breakdown

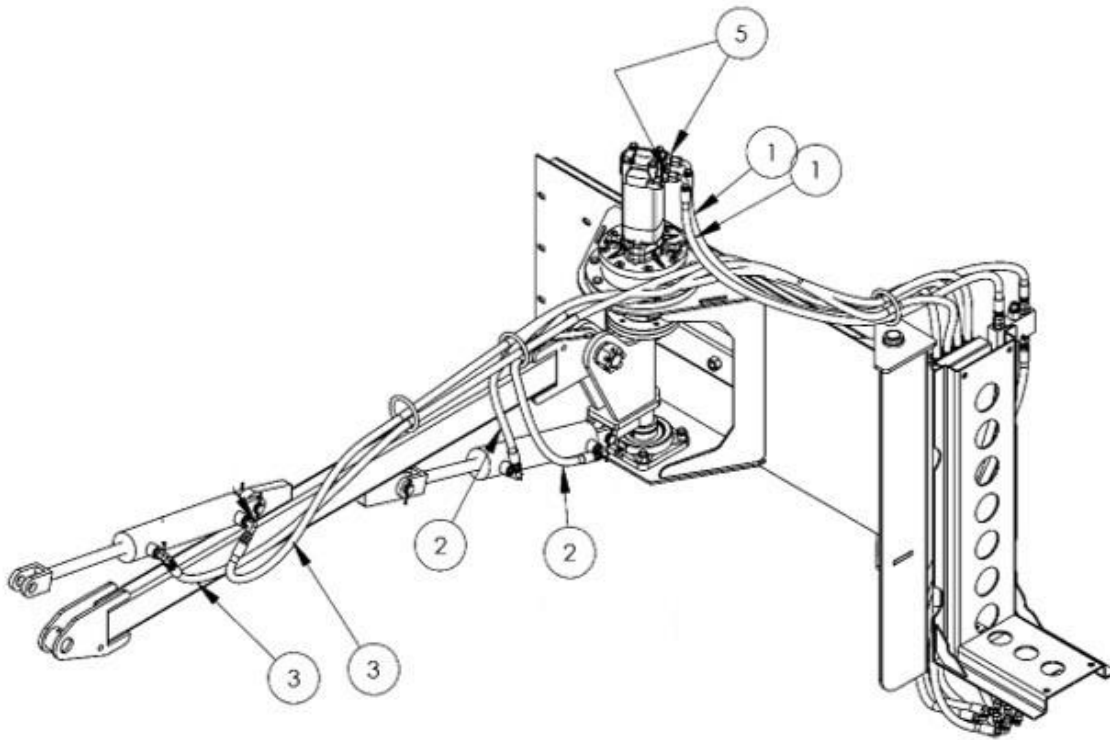
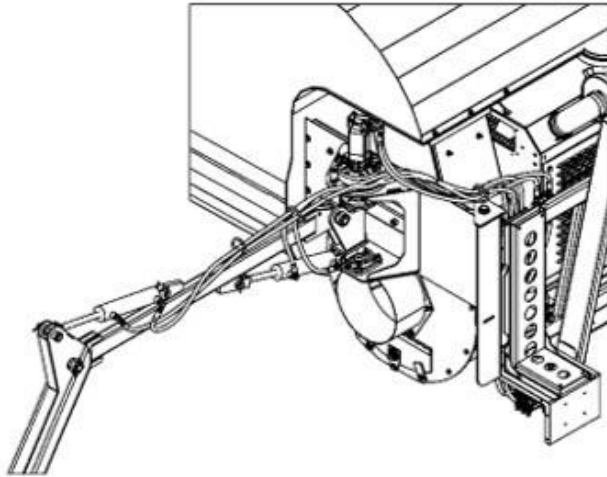
SPARTAN HOOKLIFT & CHASSIS MOUNT ARM CYLINDER ASSEMBLIES

021021 SPARTAN HOOKLIFT & CHASSIS MOUNT ARM CYLINDER ASSEMBLIES REV1.smg



Parts Breakdown

FILE NAME	LV-3002 CONTROL ARM	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	CONTROL ARM HYD	-	ORIGINAL	7/20/2017	SHJ



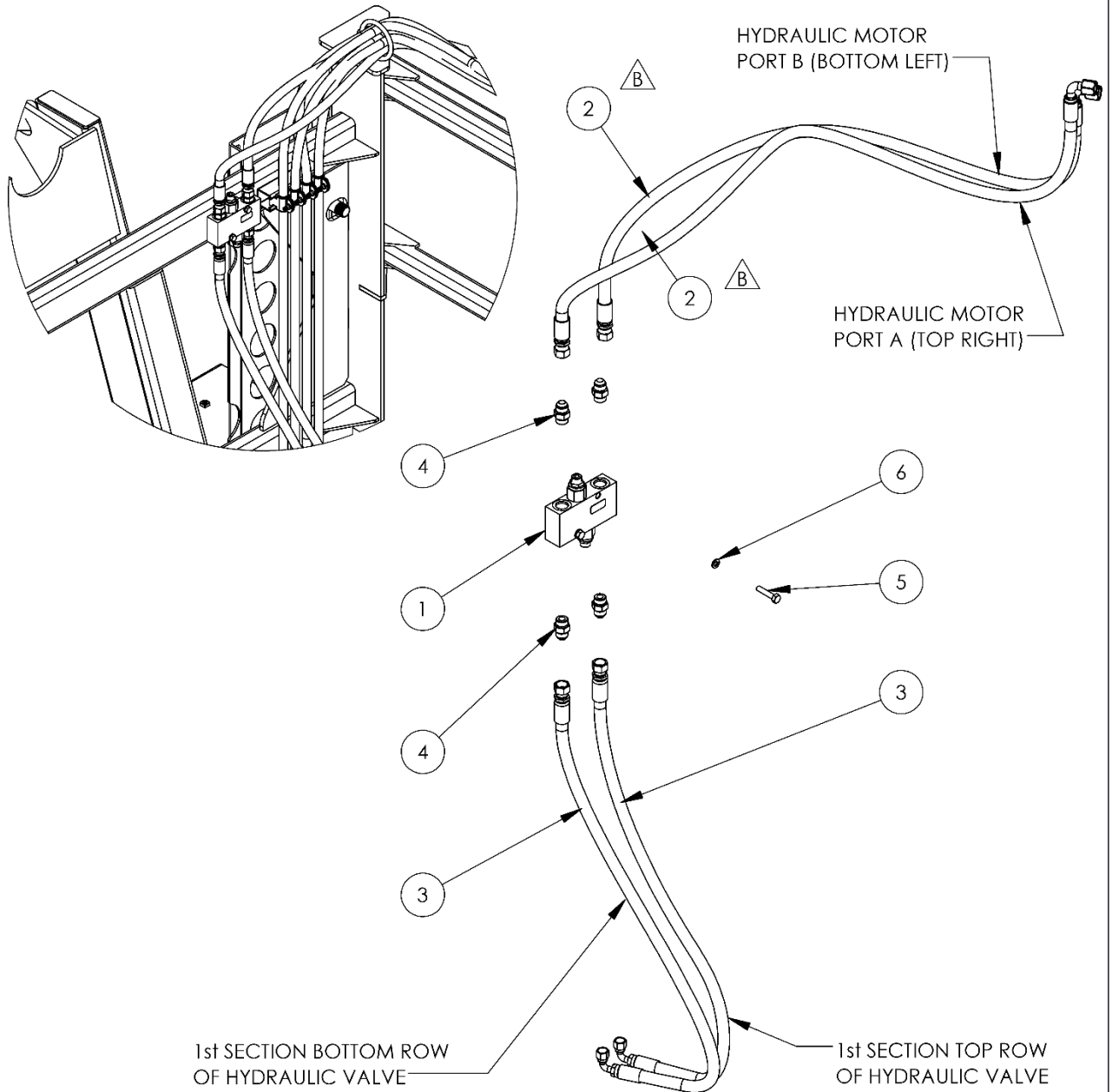
1	2	LV-3058	HOSE, HYD, SPARTAN HL, GEAR BOX I
2	2	LV-3060	HOSE, HYD, SPARTAN HL, BOOM U/D
3	2	LV-3061	HOSE, HYD, SPARTAN HL, BOOM TILT
5	2	848FSO 08X10	M 37° X M O-RING BOSS 3/4"-16 X 7/8"-14
ITEM	QTY	PART NUMBER	DESCRIPTION



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Parts Breakdown

FILE NAME	LV-3002 CONTROL ARM	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	CROSSOVER RELIEF	-	ORIGINAL	7/20/2017	SHJ
		A	REVERSED HOSES FOR PROPER FUNCTION	3/7/2018	SHJ



NOTE: THESE DESCRIPTIONS BASED ON VALVE VIEW IN LV-3002 HYDRAULICS-HYD. VALVE HOSES DRAWING

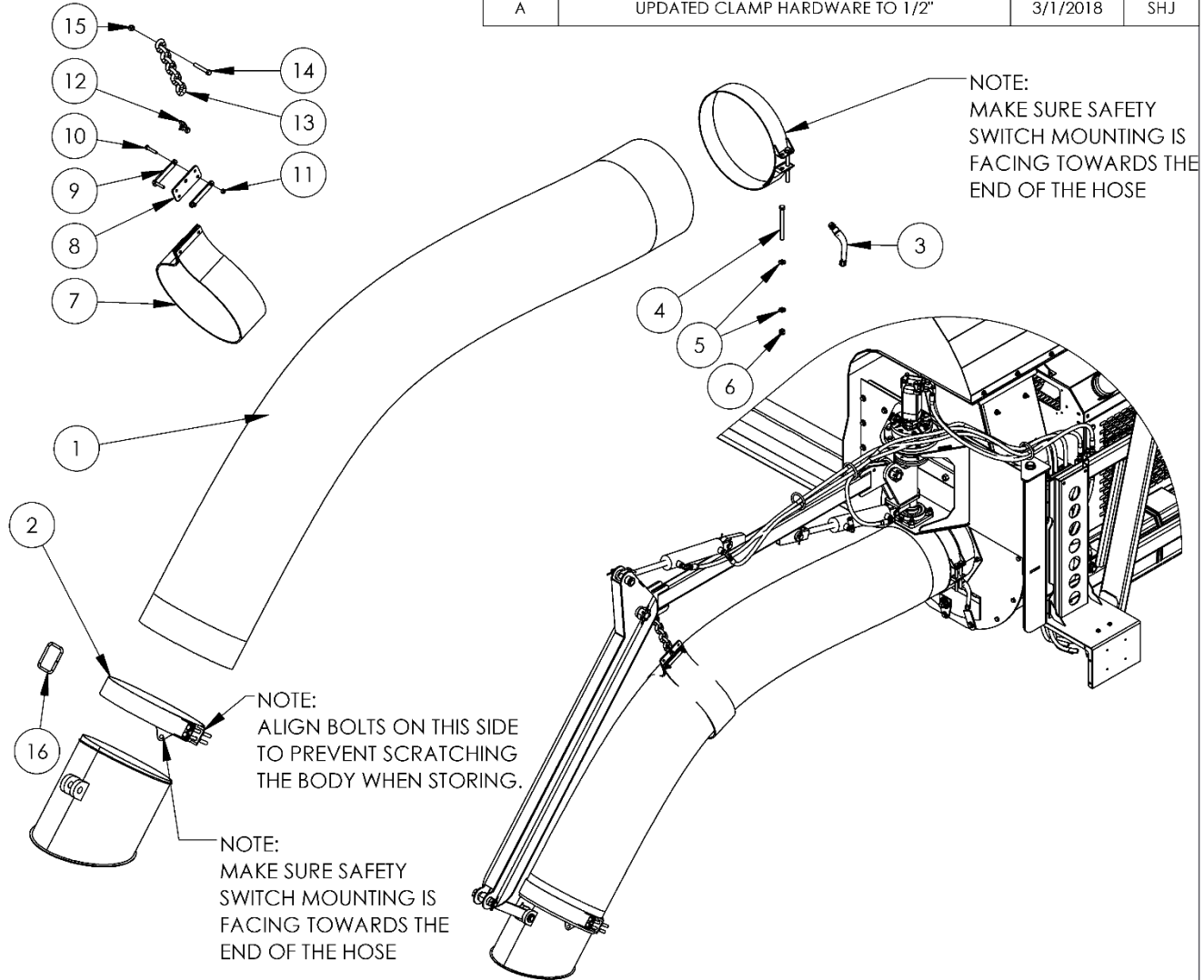
1	1	LV-1513	ADJUSTABLE CROSSOVER RELIEF
2	2	LV-3058	HOSE, HYD, SPARTAN HL, GEAR BOX1
3	2	LV-3059	HOSE, HYD, SPARTAN HL, GEAR BOX2
4	4	848FSO 08X08	STR. ADAPTER MALE 37°JIC TO MALE O.R.B.
5	2	BON-000032	5-16"-18TPI X 1-1/2"L
6	2	BON-000351	LOCK WASHER, 5/16", MED. SPLIT
ITEM	QTY	PART NUMBER	DESCRIPTION

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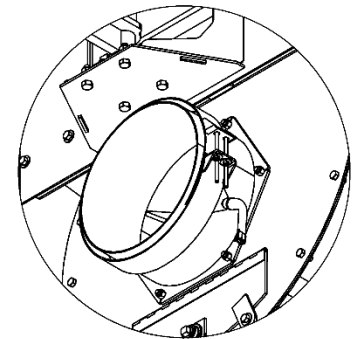
Parts Breakdown

FILE NAME	LV-3002 CONTROL ARM	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	SUCTION TUBE	-	ORIGINAL	7/20/2017	SHJ
		A	UPDATED CLAMP HARDWARE TO 1/2"	3/1/2018	SHJ



BOLT KIT: BK-1053

1	1	LV-3065	FLX-THANE VHD 16" X 12' SUCTION HOSE
2	2	LV-1409	HOSE CLAMP, LEAF VAC, Ø17"
3	1	LV-1393	PUSH BUTTON SAFETY ASSY
4	4	92620A731	1/2"-13 TPI, 6"L GR. 8 FULL THREAD
5	8	BON-000340.5	FLATWASHER, 1/2", SAE, ZP
6	4	BON-000321	1/2"-13 TPI HEX LOCK NUT NYLON INSERT
7	1	LV-3040	RUBBER HOSE STRAP, 6" X 62"
8	1	LV-1440	INNER CLAMP STRIP FOR RUBBER STRAP
9	2	LV-1313	OUTER CLAMP STRIP FOR RUBBER STRAP
10	2	BON-000061	3/8"-16 X 2"L GR. 8, HEX BOLT
11	2	BON-000319	3/8"-16, LOCK NUT, NYLON
12	1	BON-0006660.6	3/8" ANCHOR SHACKLE
13	1	BON-007161	TIE UP CHAIN
14	1	BON-000113	1/2"-13 X 3"L, GR.8, HEX BOLT
15	1	BON-000321	1/2"-13, LOCK NUT, NYLON
16	1	BON-0009028SS	TOP DOOR HANDLE
ITEM	QTY	PART NUMBER	DESCRIPTION

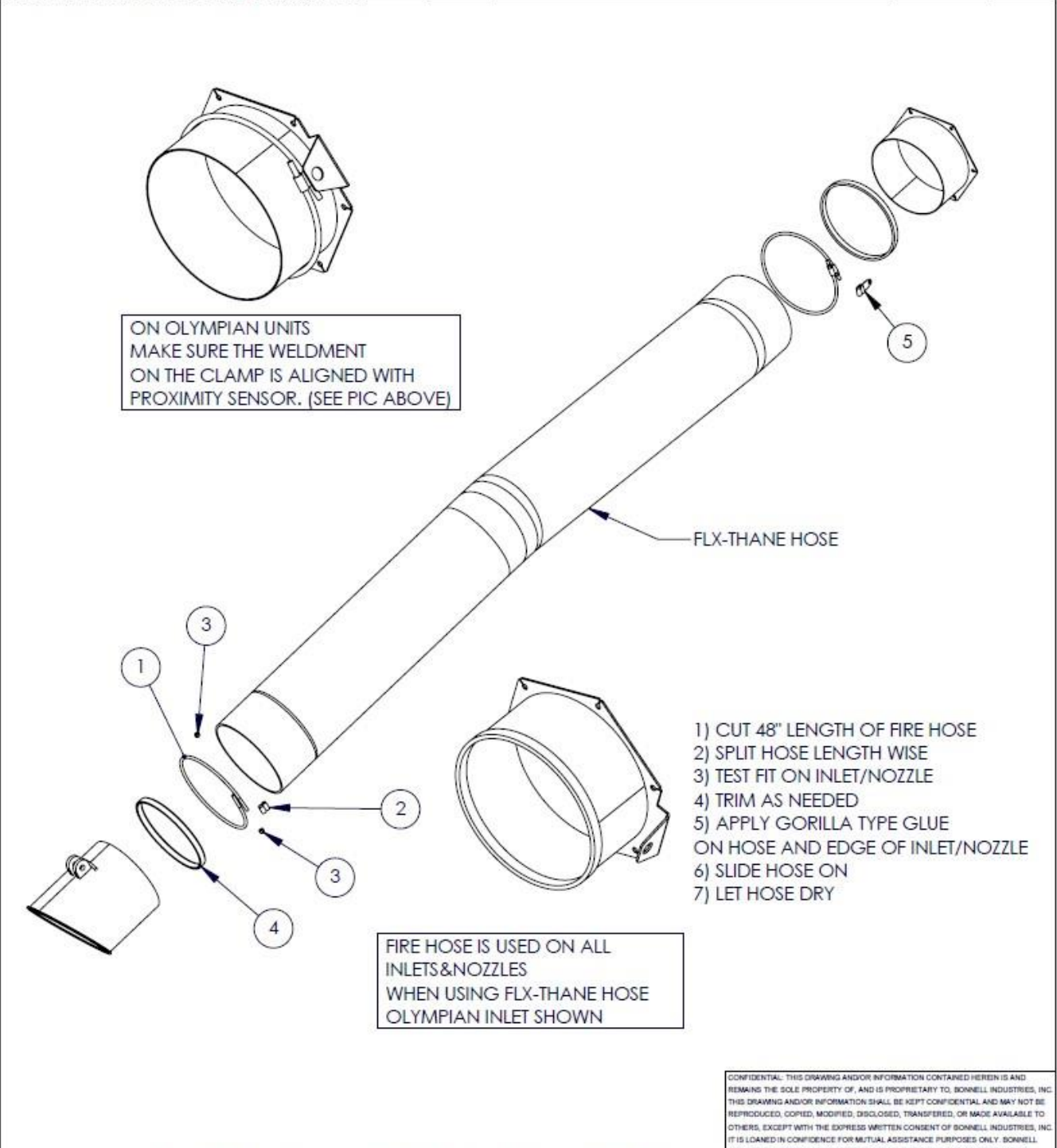


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Parts Breakdown

FILE NAME	HOSE CLAMP BREAK DOWN	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	HOSE CLAMP BREAKDOWN	-	ORIGINAL		



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ITEM	QTY	PART NUMBER	DESCRIPTION
		FLX-THANE HOSE	PN VARIES CONTACT BONNELL IND.
1	1	LV-1668	LEAF VAC HOSE CLAMP RING
2	1	LV-1669	LEAF VAC HOSE CLAMP WELDMENT
3	2	BON-000321	1/2" ZP NYLON LOCK NUT
4	2	LV-2303	FIRE HOSE COVER
5	1	LV-1670	HOSE CLAMP WITH SENSOR FLANGE



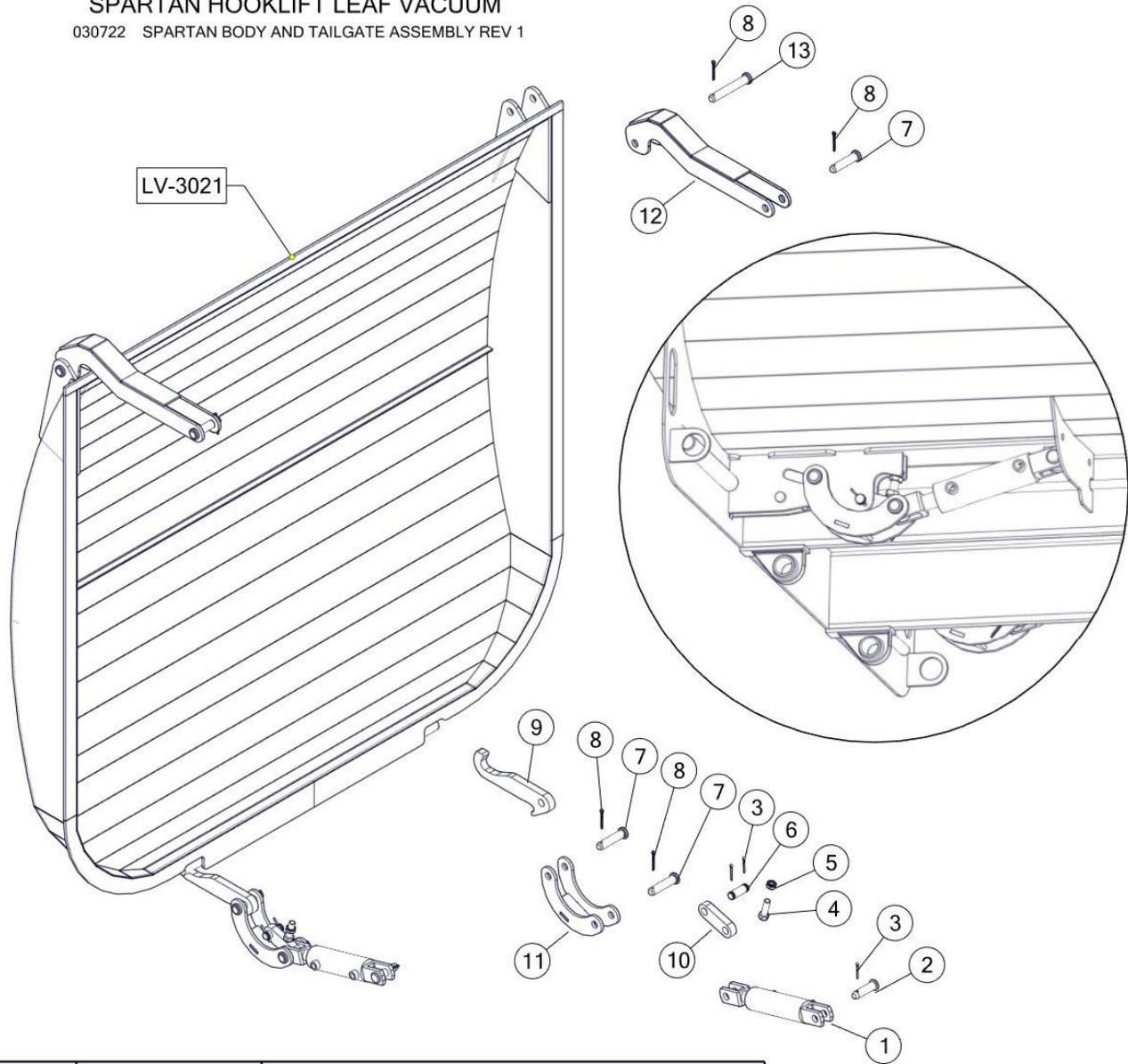
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Parts Breakdown

DISCHARGE DOOR AND LATCH ASSEMBLY

SPARTAN HOOKLIFT LEAF VACUUM

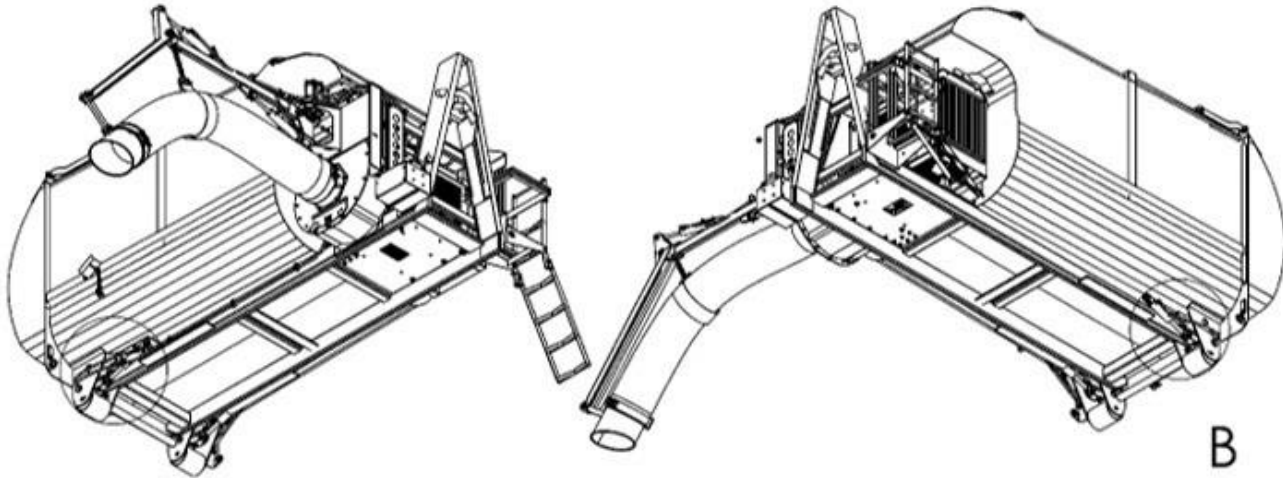
030722 SPARTAN BODY AND TAILGATE ASSEMBLY REV 1



BOM ID	PartNo (config)	Description (config)
1	LV-4594	CYLINDER, 2-1/2" BORE X 6" STROKE
2	WES-93079K	PIN 1 X 3-1/2
3	BON-000383	COTTER PIN 3/16 X 2
4	BON-000184	3/4-10 X 2-1/2" BOLT
5	BON-000333.3	3/4-10 HEX JAM NUT
6	PMC-190400005	CLEVIS PIN, 1" X 2-1/8" WORKING LENGTH
7	BON-000991	PIN, 1" DIA. x 4-1/4 LG 3-5/8" WORKING LENGTH
8	BON-000385	COTTER PIN 1/4 X 2
9	LV-2107	SPARTAN DOOR LATCH
10	LV-2013	SPARTAN FRONT LATCH PIVOT
11	LV-2108	SPARTAN LATCH WELDMENT
12	LV-2110	SPARTAN LATCH WELDMENT
13	BON-000995	PIN, 1"x6-3/8" LG 5-3/4" WORKING LENGTH

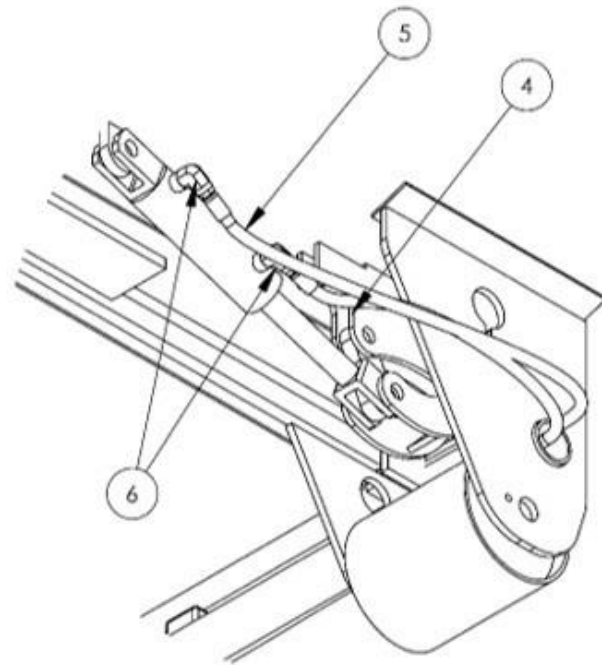
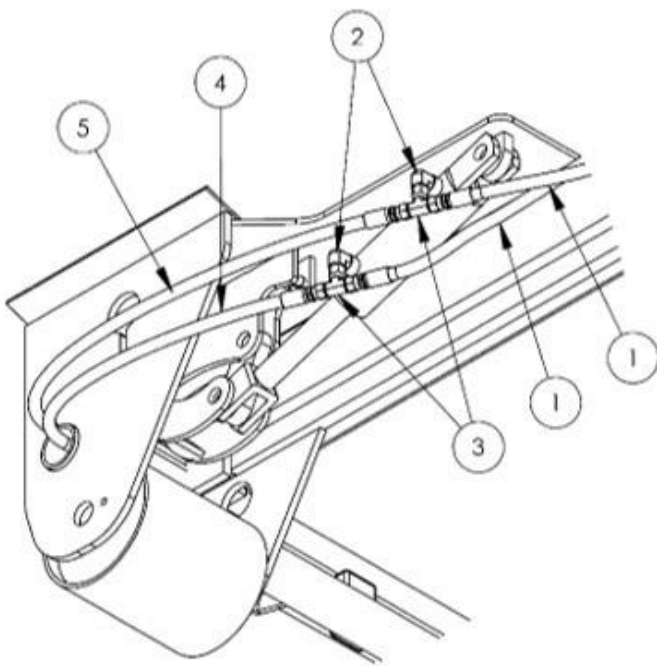
Parts Breakdown

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



A

B



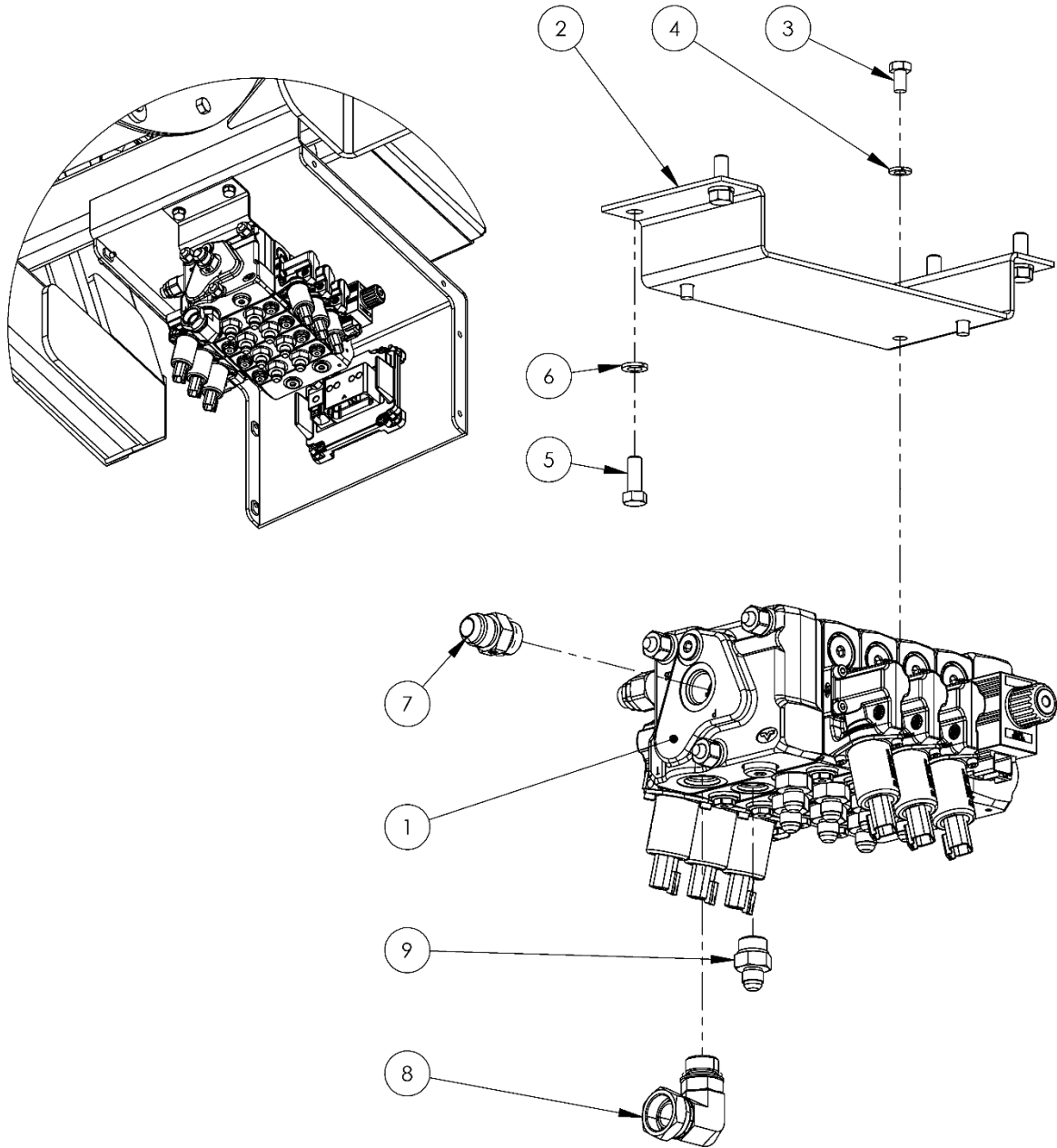
1	2	LV-3062	HOSE, HYD, SPARTAN HL, DOOR1
2	2	849FSO 08X08	MALE 37DEGXADJ MALE ORB 90DE 3/4-16 X 3/4-16
3	2	6600-08-08-08	FLARE SWIVEL TEE; 1/2x1/2 X FEMALE 1/2
4	1	LV-3063	HOSE, HYD, SPARTAN HL, DOOR2
5	1	LV-3064	HOSE, HYD, SPARTAN HL, DOOR3
6	2	60UB 08X08	MALE ORB X 90DEG FEMALE PIPE SW 3/4-16TP1 TO 1/2
ITEM	QTY	PART NUMBER	DESCRIPTION

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Parts Breakdown

FILE NAME	LV-3002 HYDRAULICS	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	HYD. VALVE MOUNT, FITTINGS	-	ORIGINAL	7/27/17	SHJ



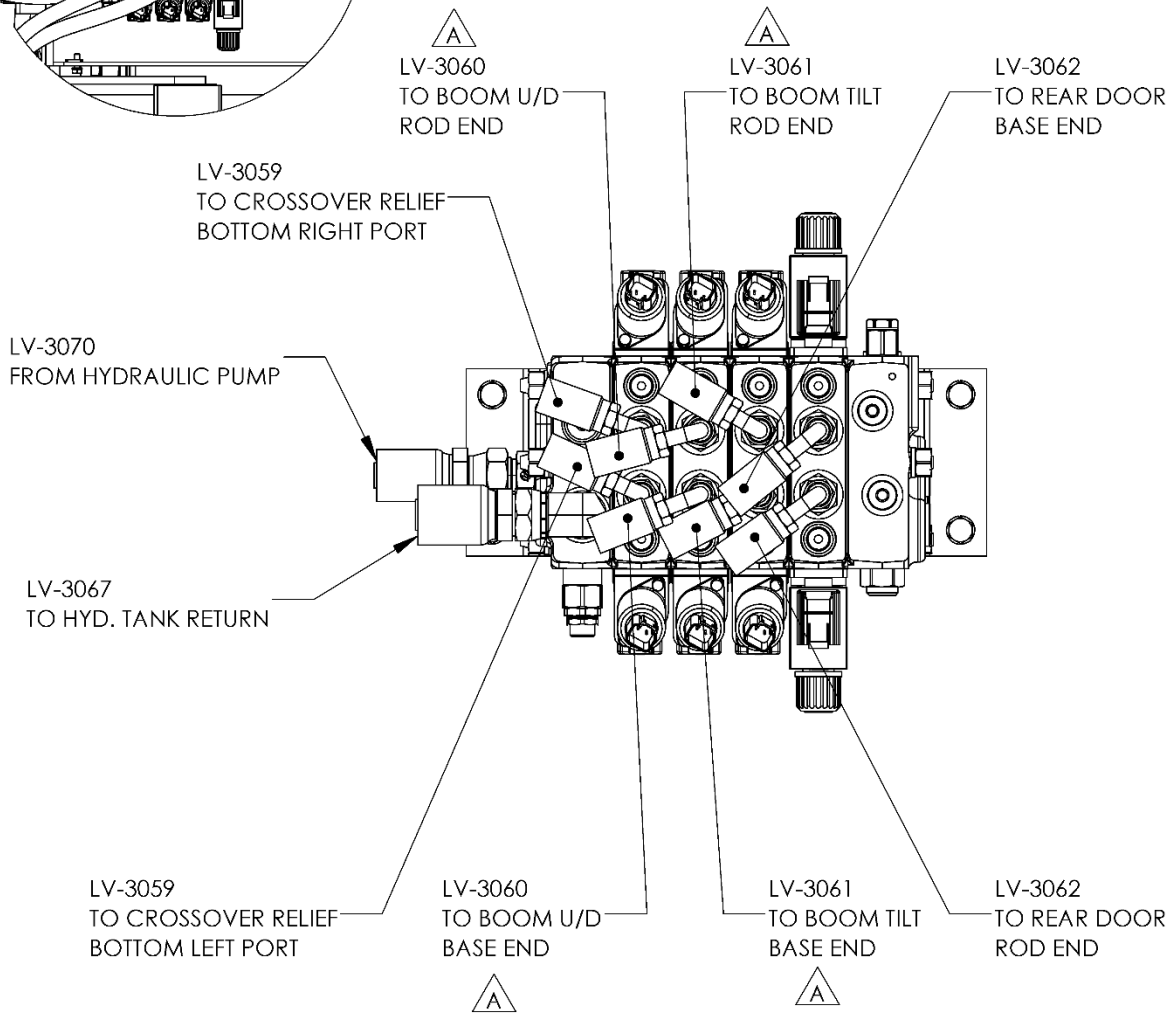
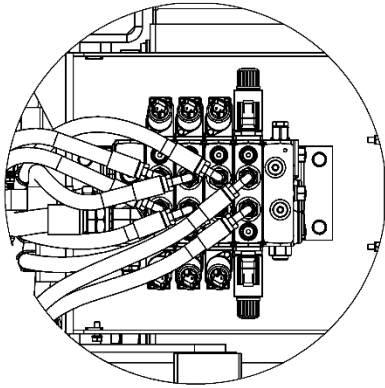
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LV-3050	VALVE FOR SKID MOUNTED LEAF VACUUM
2	1	LV-3034	BRACKET, MOUNTING, HYD. VALVE
3	3	91280A525	M8X14, HEX HEAD SCREW
4	3	BON-000351	LOCK WASHER, 5/16"
5	4	BON-000057	3/8"-16TPI, X 1"L HEX BOLT
6	4	BON-000352	LOCK WASHER, 3/8"
7	1	848FSO 10X10	MALE 37° X MALE ORB 7/8"-14 X 7/8"-14
8	1	60UB 10X12	M ORBX90° F PIPE SW, 7/8-14 X 3/4" NPSM
9	8	848FSO 06X08	MALE 37° X MALE ORB 9/16"-19 X 9/16-18
ITEM	QTY	PART NUMBER	DESCRIPTION



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Parts Breakdown

FILE NAME	LV-3002 HYDRAULICS	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	HYD. VALVE HOSES	-	ORIGINAL	7/27/17	SHJ
		A	REVERSED CYLINDER ENDS FOR CORRECT FUNCTION	3/7/2018	SHJ



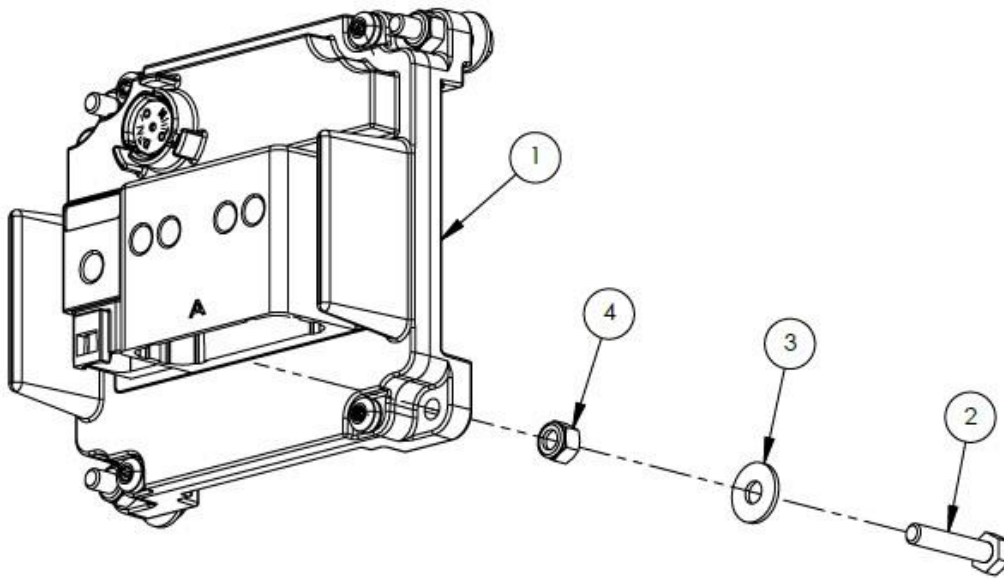
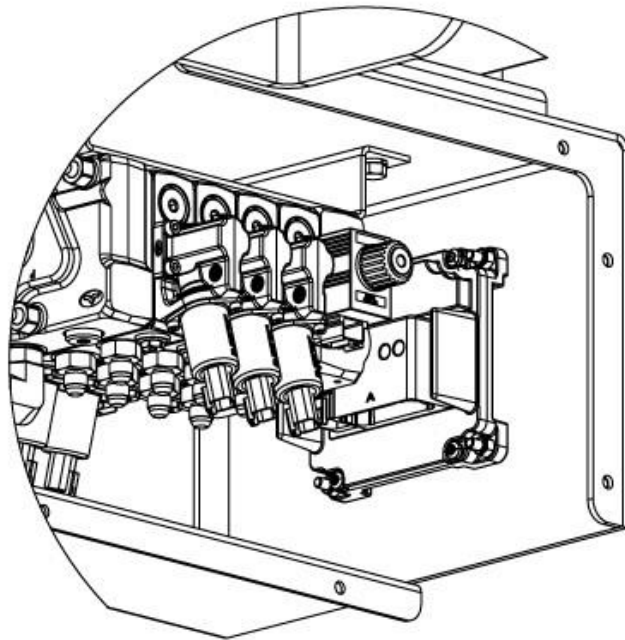
1			
2			
3			
4			
5			
ITEM	QTY	PART NUMBER	DESCRIPTION



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Parts Breakdown

FILE NAME	LV-3002 HYDRAULICS	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	I/O CONTROLLER	-	ORIGINAL	7/27/17	SHJ
		B	ITEM 1 WAS LV-3053	7/16/2019	LAJ



1	AR	LV-2602	KUBOTA - HFX 20 I/O CONTROLLER FOR HL OR CM LV
1	AR	LV-2603	JOHN DEERE - HFX 20 I/O CONTROLLER FOR HL OR CM LV
1	AR	LV-2604	KOHLER - HFX 20 I/O CONTROLLER FOR HL OR CM LV
2	4	BON-000006	1/4"-20TPI X 1 1/4" LONG GR.8
3	4	BON-000336	FLATWASHER, 1/4", ZP
4	4	BON-000318.5	1/4"-20TPI, LOCK NUT, NYLON
ITEM	QTY	PART NO.	DESCRIPTION

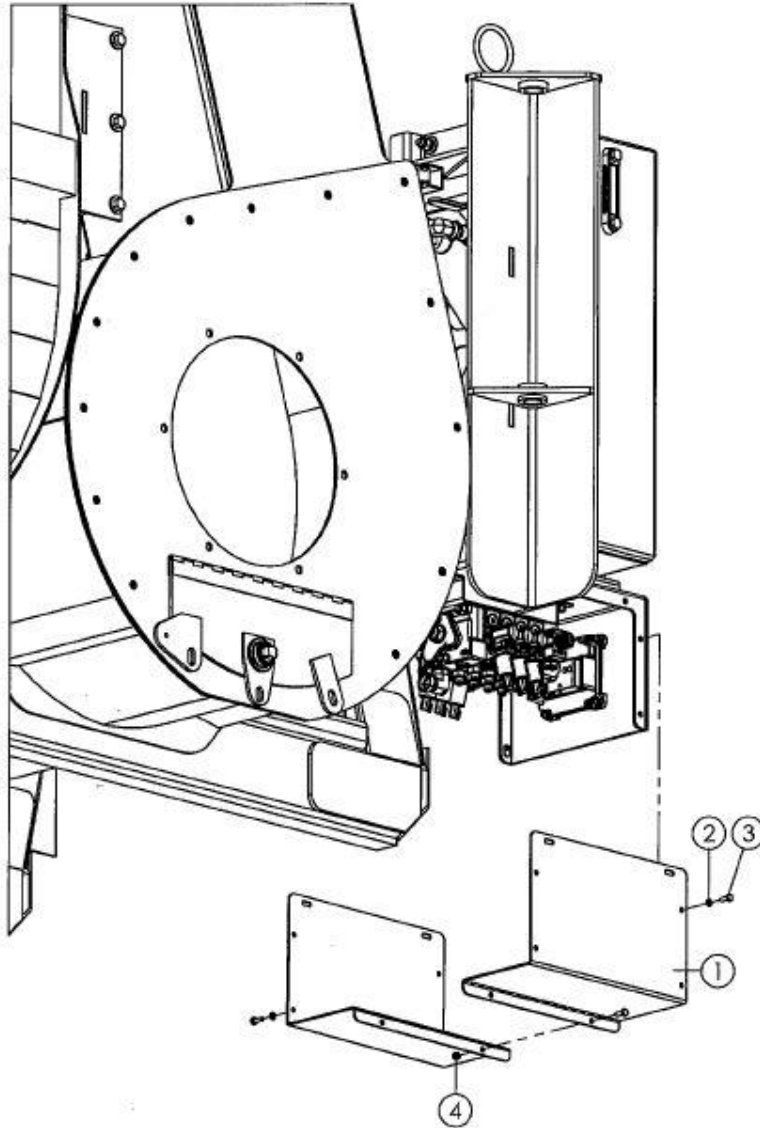
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Parts Breakdown

FILE NAME	M1170
DWG NAME	M1170

SPARTAN HOOK LIFT HYDRAULIC VALVE COVER



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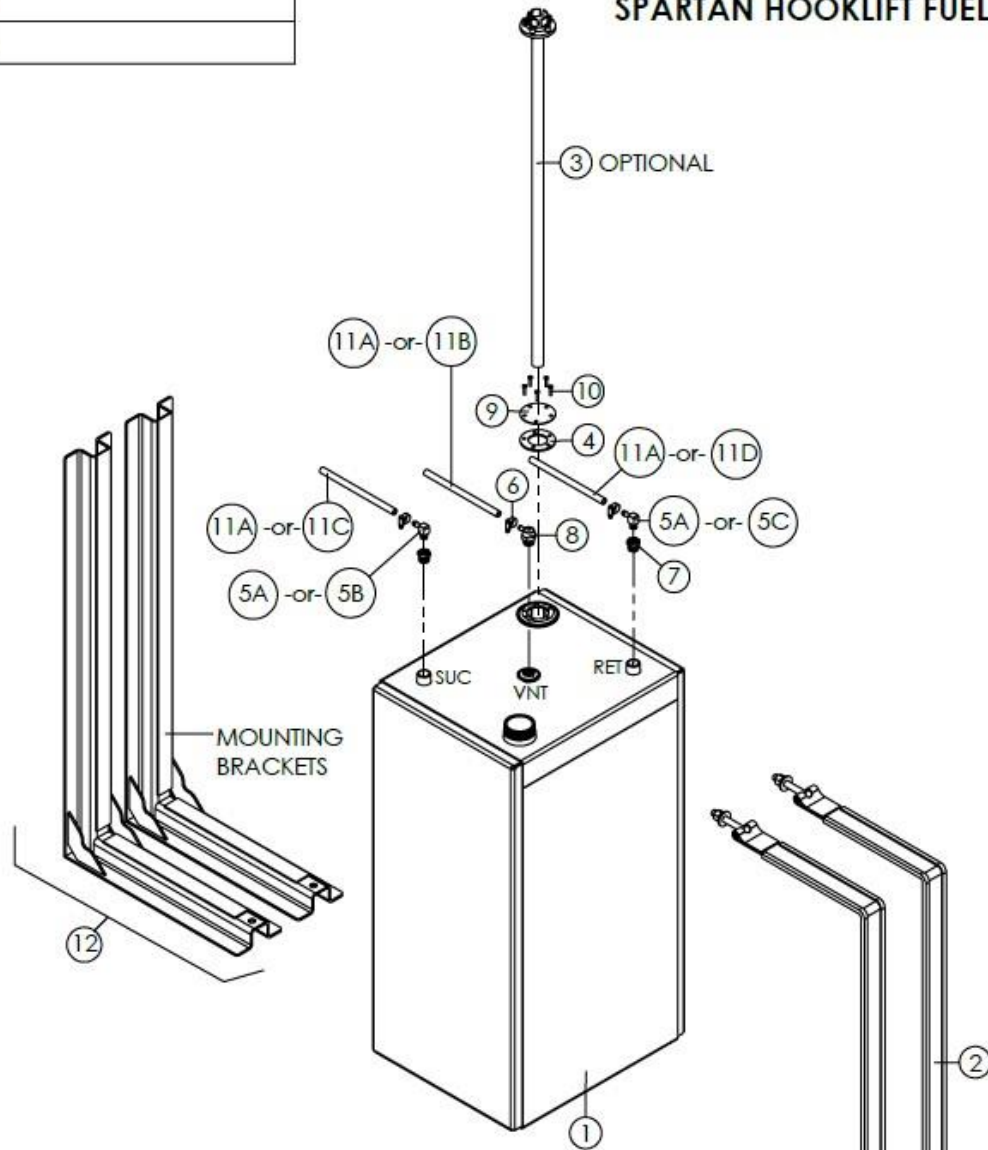
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4	BON-000318.5	2	1/4-20 NYLON HEX LOCKNUT
3	BON-000003	14	1/4-20 x 3/4" HEX BOLT GR8
2	BON-000350	14	1/4 LOCKWASHER ZP
1	LV-3033	2	COVER - VALVE, HYDRAULIC
REF	PART NO.	QTY	DESCRIPTION

Parts Breakdown

FILE NAME	M1168
DWG NAME	M1168

SPARTAN HOOKLIFT FUEL TANK



12	LV-2557	1	STRAP & BRACKET KIT (includes #2)
11D	LV-1443	1	FUEL LINE, 1/4 IN. ID, SAE 30R7 (Deere & Kohler)
11C	LV-1444	1	FUEL LINE, 3/8 IN. ID, SAE 30R7 (Deere & Kohler)
11B	LV-1159	1	FUEL LINE - 5/16 ID, SAE 30R7 (Deere & Kohler)
11A		3	FUEL LINE - 5/16 ID, SAE 30R7 (Kubota)
10	LV-1374	1	SENDING UNIT COVER SCREWS, 5-PACK
9	LV-1326	1	COVER PLATE
8	VNT-0500	1	VENT PLUG - 1/2 NPT
7	LV-3066	2	BUSHING - BRASS, 1/2 NPTM x 1/4 NPTF
6	VEL-022204	3	HOSE CLAMP - SAE, 7/32"-5/8"
5C	LV-1441	1	FITTING - 1/4" NPTM x 1/4 SAE BARB (Deere & Kohler)
5B	LV-1442	1	FITTING - 1/4" NPTM x 3/8 SAE BARB (Deere & Kohler)
5A	LV-1161	2	FITTING - 1/4 NPTM x 5/16 SAE BARB (Kubota)
4	LV-1373	1	GASKET - FUEL SENDING UNIT
3	LV-2560	1	FUEL SENDING UNIT
2	LV-2569	2	ASSY - FUEL TANK MOUNTING STRAP
1	LV-2504	1	SPARTAN HOOKLIFT FUEL TANK W/BAFFLE
REF	PART NO.	QTY	DESCRIPTION

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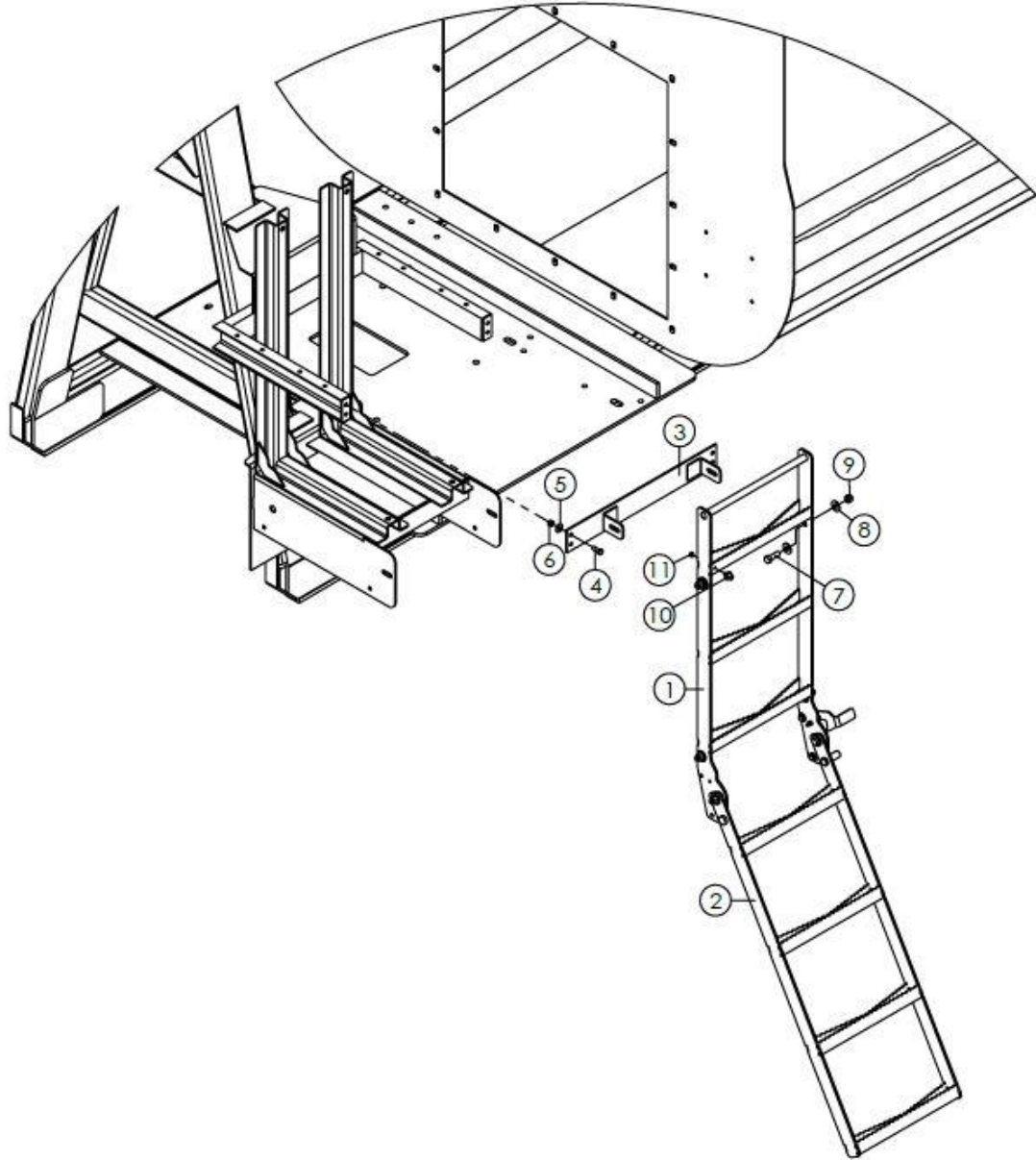


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Parts Breakdown

SPARTAN HOOKLIFT LADDER

FILE NAME	M1166
DWG NAME	M1166



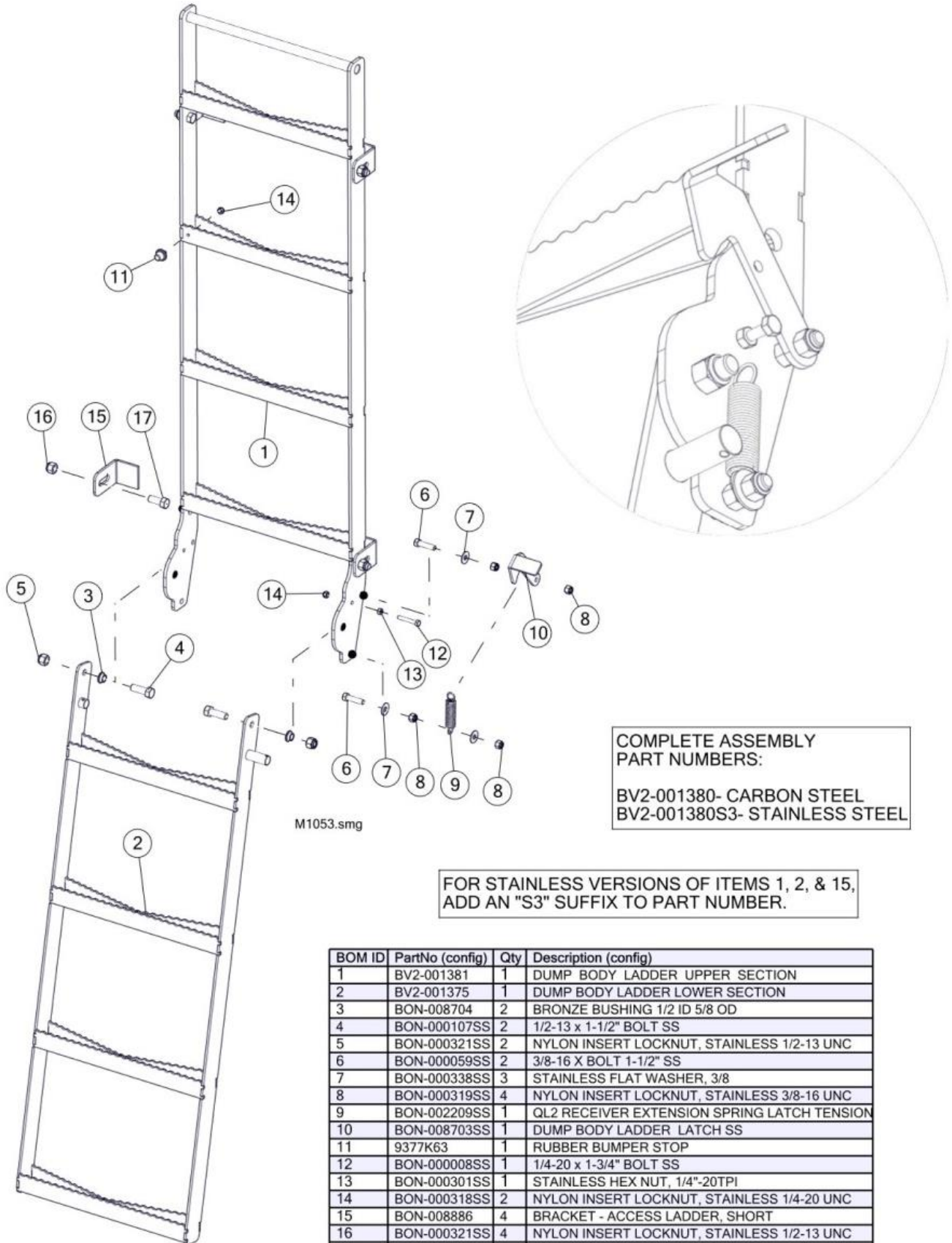
11	BON-000318SS	1	1/4-20 NYLON HEX LOCKNUT SS
10	9377K63	1	RUBBER BUMP STOP
9	BON-000321SS	4	1/5-13 NYLON HEX LOCKNUT SS
8	BON-000340SS	10	1/2 FLAT WASHER SS
7	BON-000107SS	4	1/2-13 x 1-1/2 HEX BOLT SS
6	BON-000319	4	3/8-16 NYLON HEX LOCKNUT
5	BON-000338	4	3/8 FLAT WASHER
4	BON-000057	4	3/8-16 x 1 HEX BOLT GR8
3	LV-2505	1	BRACE - LADDER MOUNT
2	BV2-001375	1	FOLD-UP LADDER SECTION - BOTTOM, 4 RUNG
1	BON-008702	1	FOLD-UP LADDER SECTION - TOP, 3 RUNG
REF	PART NO.	QTY	DESCRIPTION

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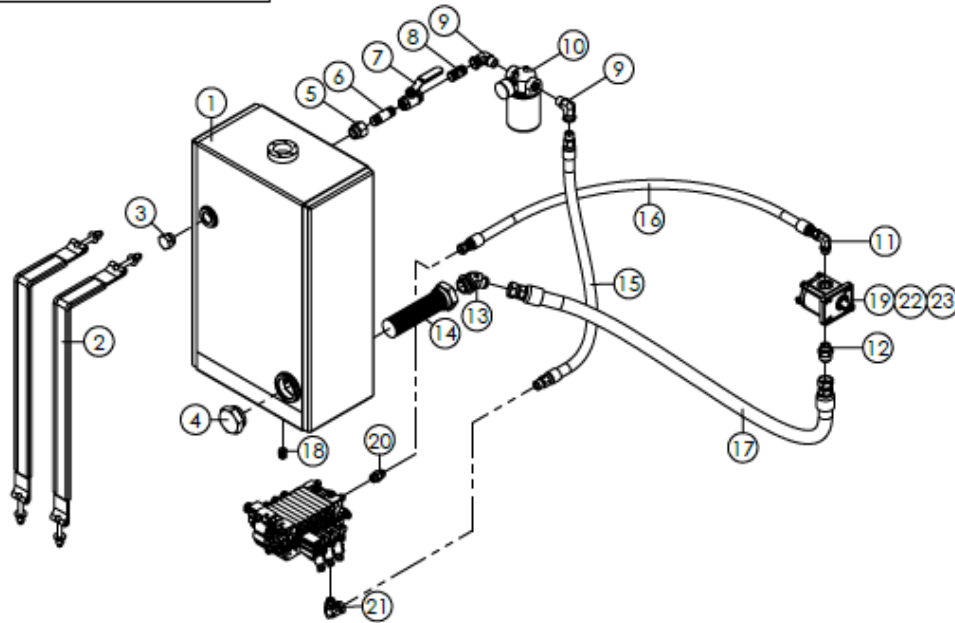
Parts Breakdown



Parts Breakdown

FILE NAME	M1171
DWG NAME	M1171 REV: 7/24/20

SPARTAN HOOKLIFT HYDRAULICS



23	BON-000353	2	7/16 LOCK WASHER ZP (KUBOTA 74 & DEERE 99)
	BON-000351	4	5/16 LOCK WASHER ZP (KOHLER 74)
22	96144A256	2	M10 x 1.25 x 25 MM BOLT (KUBOTA 74 & DEERE 99)
	LV-2408	4	M8 x 1.25 x 30 MM BOLT (KOHLER 74)
21	60 UB 10x12	1	MALE ORB x 90° FEM PIPE SW 7/8-14 to 3/4 NPSM
20	848FSO 10x10	1	MALE 37° x MALE O-RING BOSS 7/8-14 x 7/8-14
19	LV-2029	1	HYD PUMP (KUBOTA 74 & DEERE 99)
	LV-2497	1	HYD PUMP (KOHLER 74)
18	BON-000588	1	PLUG - DRAIN, 1/2 SQ HEAD
17	LV-3069	1	HOSE - HYDRAULIC, TANK to PUMP SUCTION
16	LV-3070	1	HOSE - HYDRAULIC, PUMP to VALVE INTAKE
15	LV-3067	1	HOSE - HYDRAULIC, SPARTAN HL, TANK RETURN
14	LV-3068	1	FILTER - HYDRAULIC IN TANK, SAE -32X -20
13	6802-16-20	1	M 37° x M ORB 45°, 1-5/16-12 x 1-5/8-12 ORB
12	854FSO 16x12	1	MALE 37° x ADJ MALE ORB 45°, 1 5/16-12 x 1-1/16-12 (KUBOTA 74)
	848FSO 16x12	1	MALE 37° x MALE ORB, 1-5/16-12 x 1-1/16 (DEERE 99 & KOHLER 74)
11	6801-10-10	1	MALE 37° x MALE ORB 90°, 7/8-14 x 7/8-14
10	LV-1137	1	HYDRAULIC FILTER ASSEMBLY, SPIN-ON
9	60UA 12x12	2	M PIPE x 90° FE SWIVEL, 3/4 NPTF to 3/4 NPSM
8	LV-3075	1	FITTING - NIPPLE, 3/4 NPTF x 2"
7	LV-1142	1	3/4" BALL VALVE
6	LV-3076	1	FITTING - NIPPLE, 3/4 NPTF x 3"
5	6405-16-12	1	ADAPTOR - 1-5/16-12 ORB to 3/4 NPT
4	6408-32	1	ORB PLUG, 2-1/2-12
3	6408-16	1	ORB PLUG, 1-5/16-12
2	LV-1533	1	BRACKET - MOUNTING, OIL TANK
1	LV-1532	1	TANK - OIL, 21 GAL, AL w/SIGHT GAUGE
REF	PART NO.	QTY	DESCRIPTION

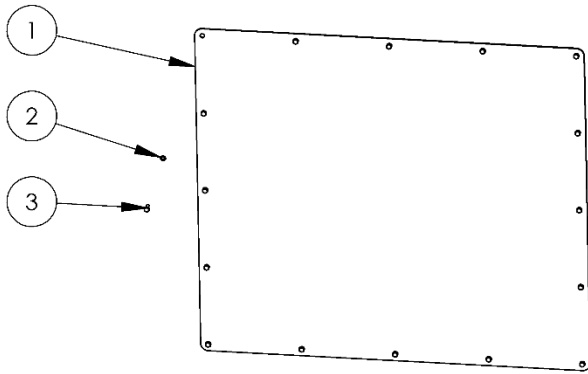
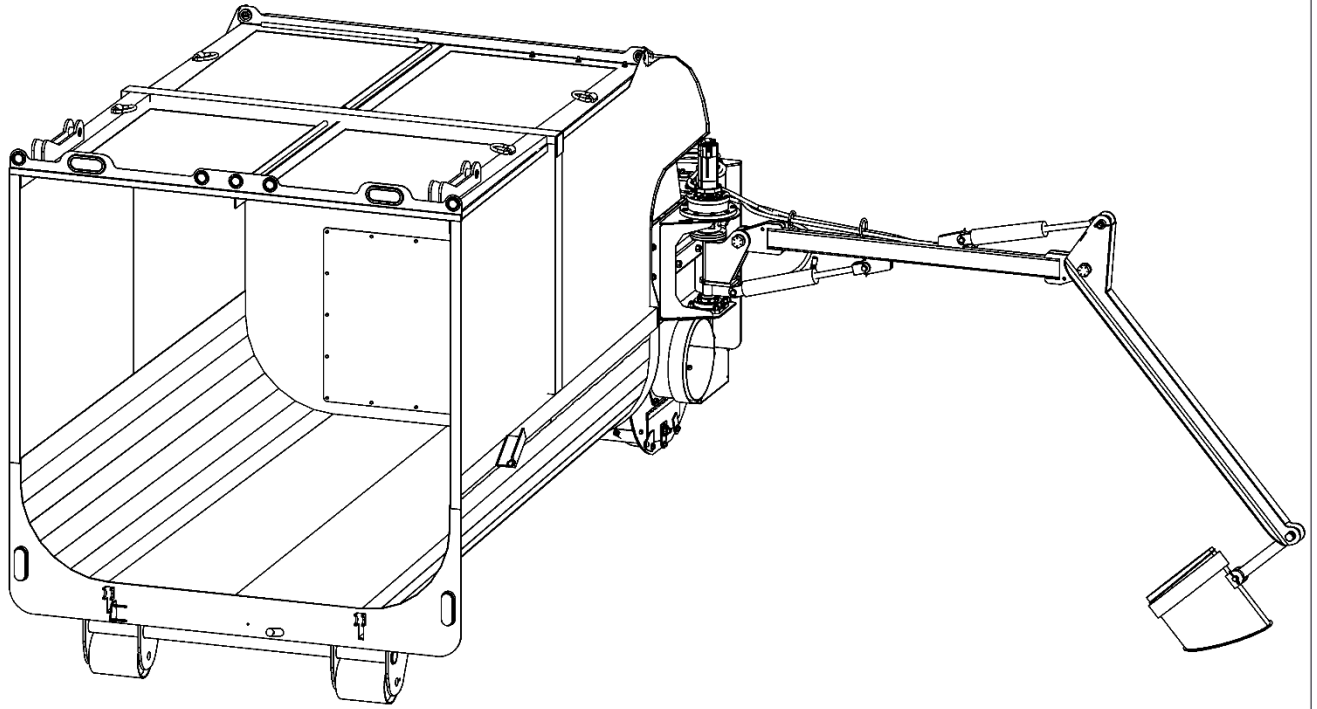
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Parts Breakdown

FILE NAME	LV-3002 TANKS AND LADDER	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	ACCESS PANEL	-	ORIGINAL	7/26/17	SHJ



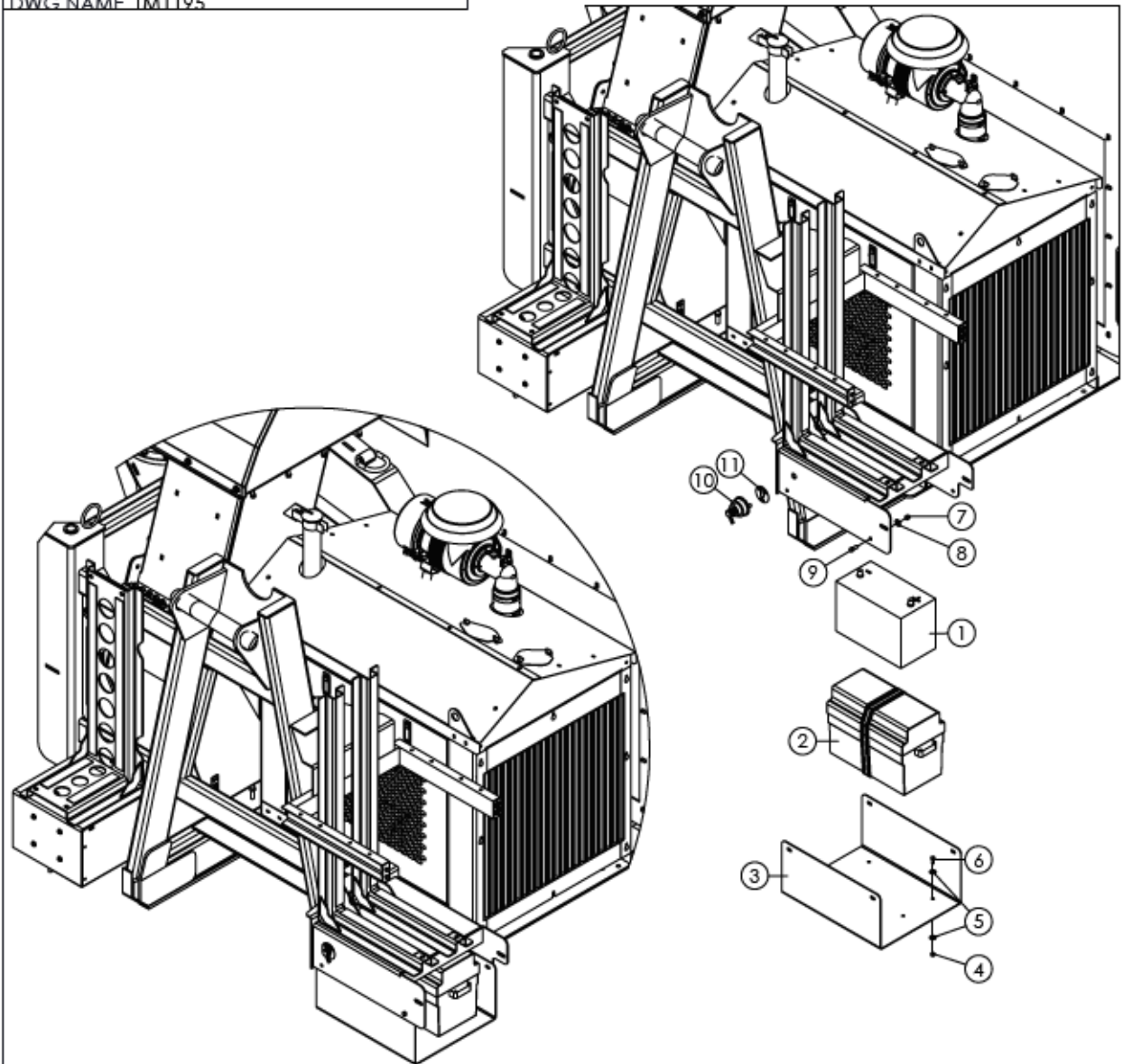
1	1	LV-3030	PANEL, ACCESS, ENGINE, HL
2	16	BON-000350	LOCK WASHER, 1/4" MED SPLIT, ZP
3	16	BON-000003	1/4"-20TPI, X 3/4"L, GR. 8
ITEM	QTY	PART NUMBER	DESCRIPTION

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Parts Breakdown

FILE NAME	M1195
DWG NAME	M1195



11	WAY-44032	1	BATTERY DISCONNECT, FACE PLATE
10	WAY-44030	1	BATTERY DISCONNECT, SWITCH
9	BON-000057	4	3/8-16 x 1 HEX BOLT
8	BON-000338	4	3/8 STANDARD WASHER
7	BON-000319	4	3/8-16 NYLON HEX LOCKNUT
6	BON-000028	4	5/16-18 x 3/4 HEX BOLT GR8
5	BON-000337	8	5/16 STANDARD WASHER
4	BON-000320	4	5/16-18 NYLON HEX LOCKNUT
3	LV-2507	1	BRACKET - SPARTAN HOOKLIFT BATTERY, LOWER
2	LV-1145	1	BATTERY BOX
1	LV-1144	1	BATTERY - 12 VOLT, TOP POST, 1125 CCA
REF	PART NO.	QTY	DESCRIPTION

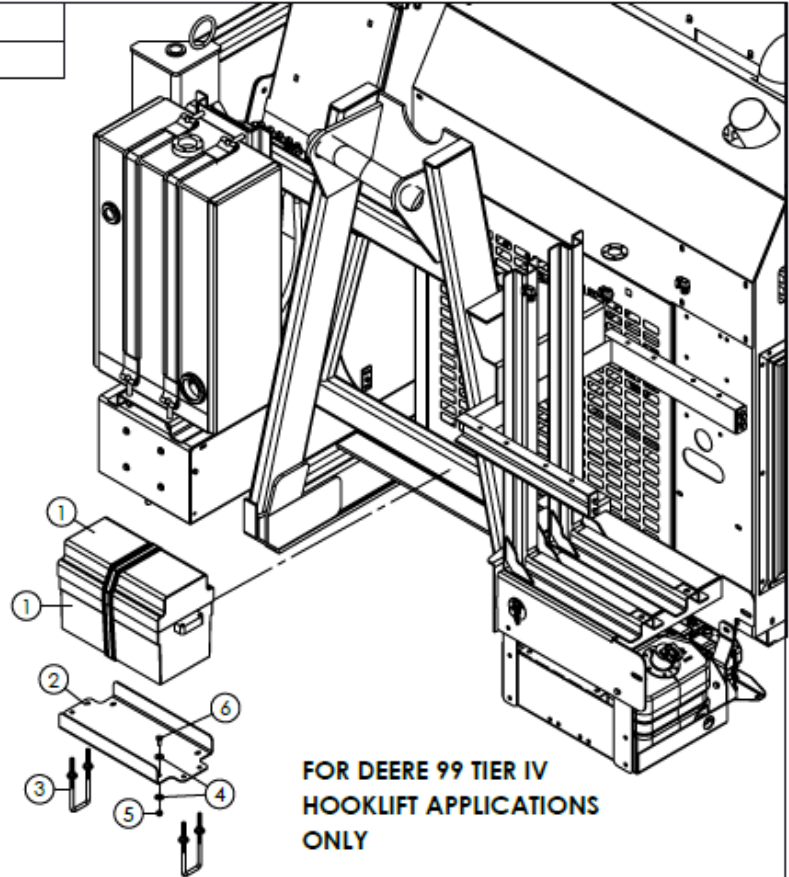
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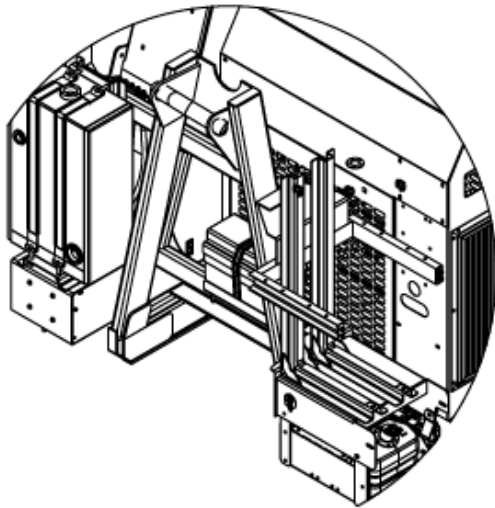
DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	M1194
DWG NAME	M1194



**FOR DEERE 99 TIER IV
HOOKLIFT APPLICATIONS
ONLY**



6	BON-000028	4	5/16-18 x 3/4 HEX BOLT GR8
5	BON-000320	4	5/16-18 NYLON HEX LOCKNUT
4	BON-000337	8	5/16 STANDARD FLAT WASHER
3	BON-006438	2	U-BOLT, 2 x 6, SQUARE
2	LV-2512	1	BRACKET - DEERE 99 BATTERY BOX
1	LV-1145	1	BATTERY BOX
REF	PART NO.	QTY	DESCRIPTION

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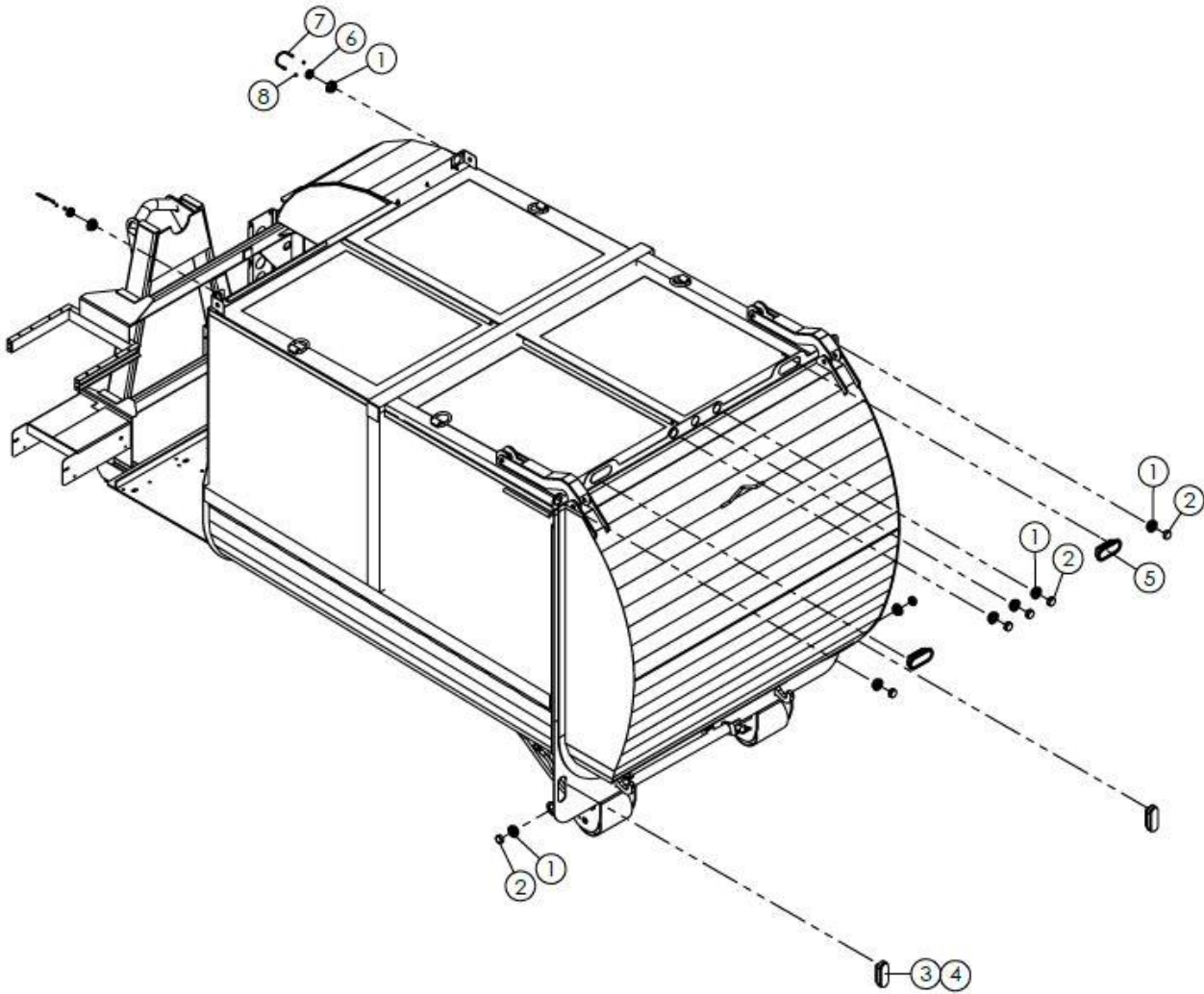
**BONNELL
INDUSTRIES INC**
TRUCK & ROAD EQUIPMENT

DIXON, ILLINOIS
PHONE: 800-851-9664

Parts Breakdown

FILE NAME	M1169
DWG NAME	M1169

SPARTAN HOOKLIFT MARKER LIGHTS



8	BON-000303	4	3/8-16 HEX NUT
7	LV-2567	2	3/8-16 x 3" U-BOLT
6	PM-M194A	2	LED CLEARANCE LIGHT - 2" AMBER
5	ECCO-3920A	2	LED OVAL WARNING LAMP 12V ONLY AMBER 10
4	PM-M820R-10	2	OVAL LED 10 DIODE LUMENX STT LIGHT
3	PM-B421-18	2	GROMMET - OVAL
2	PM-M194R	7	LED CLEARANCE LIGHT - 2" RED
1	PM-146-18	9	GROMMET - 2" CLEARANCE MARKER
REF	PART NO.	QTY	DESCRIPTION

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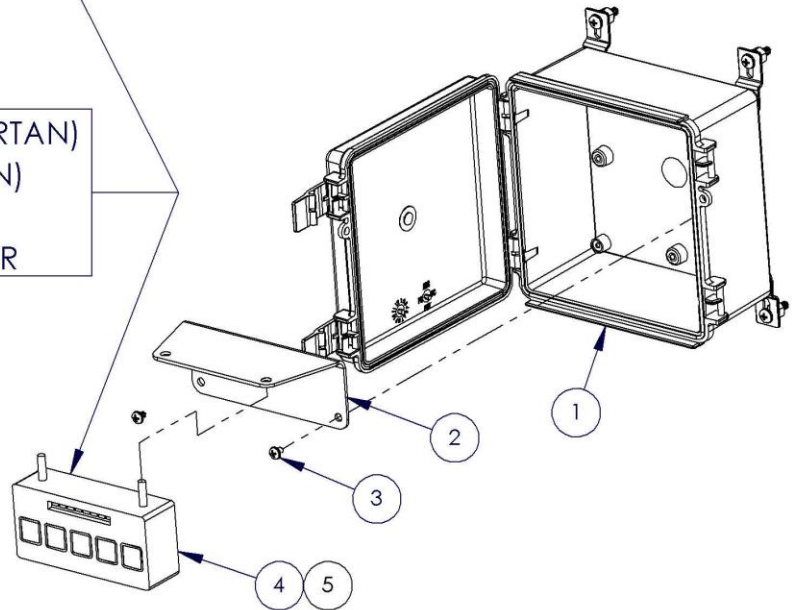
DIXON, ILLINOIS
 PHONE: 800-851-9664

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

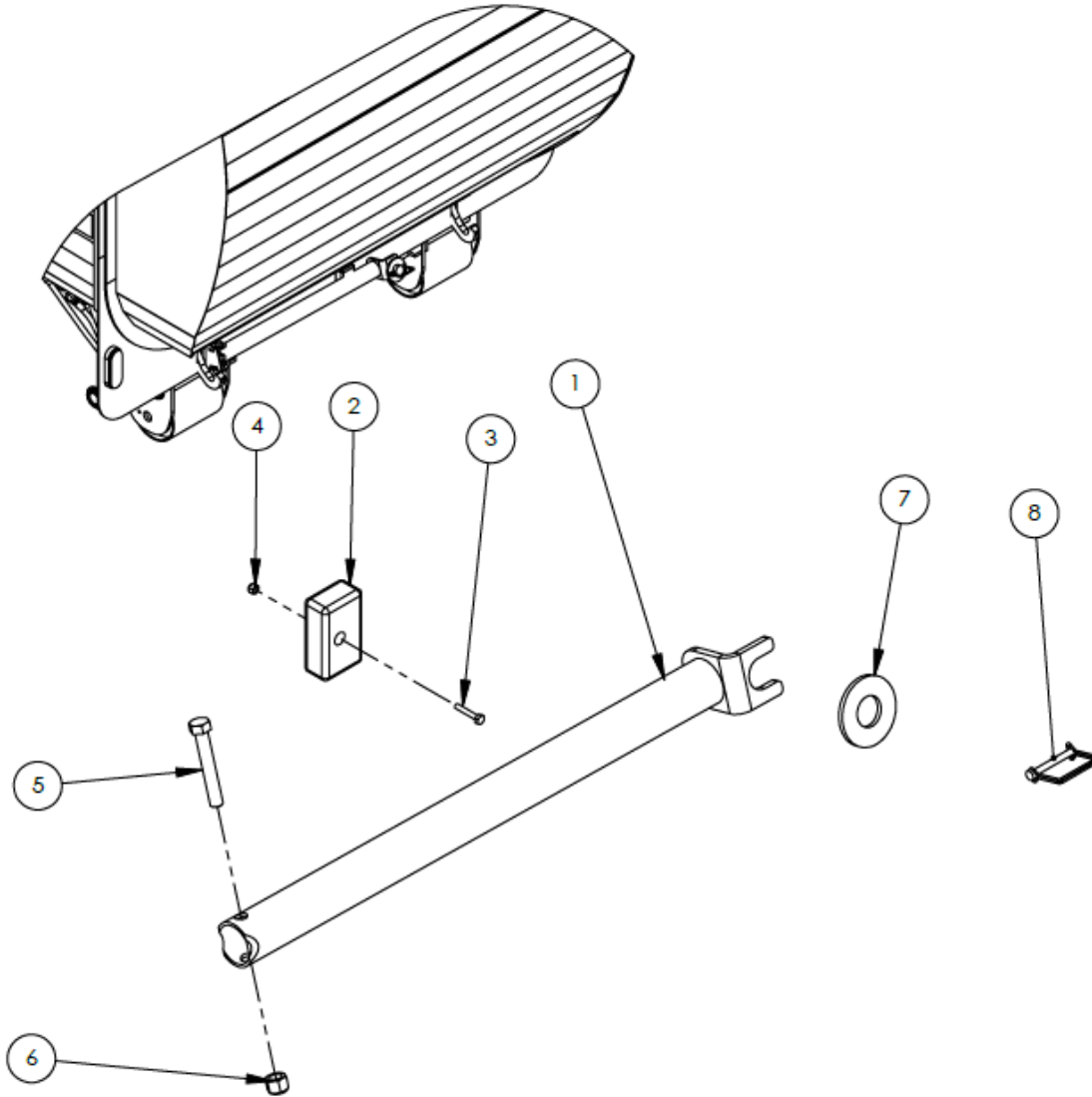
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Parts Breakdown

FILE NAME	LV-3002 MISC	REV.	DESCRIPTION	DATE	INITIALS
DWG NAME	DOOR PROP	-	ORIGINAL	10/5/17	SHJ



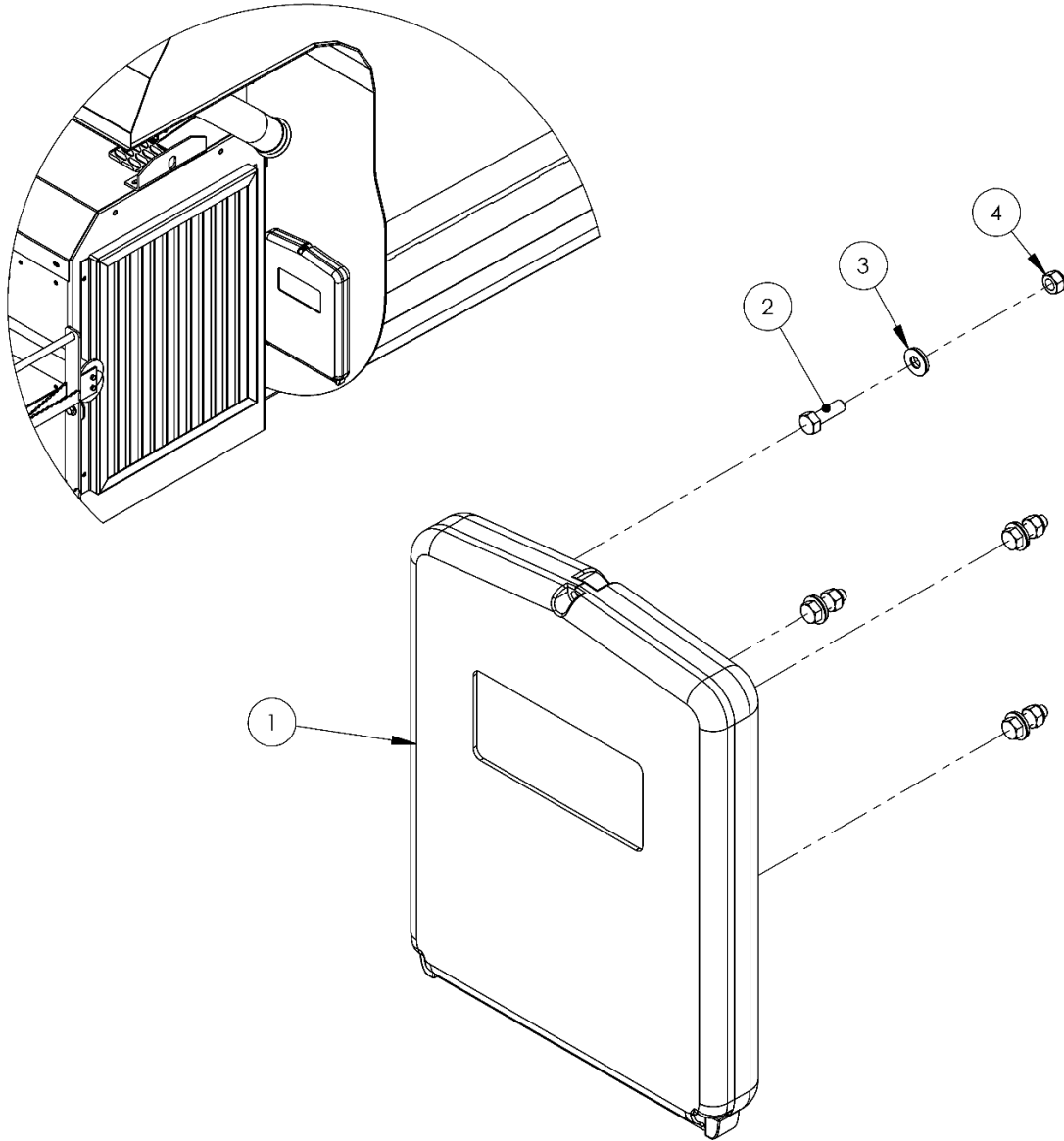
1	1	LV-3041	DOOR PROP, SPARTAN, HOOKLIFT
2	1	BON-020254	CORNER AND SURFACE GUARD
3	1	BON-000007	1/4"-20 X 1-1/2"L, GR. 8, HEX BOLT
4	1	BON-000318.5	1/4"-20 LOCKNUT, NYLON
5	1	BON-000161	5/8"-11 X 4"L, GR.8, HEX BOLT
6	1	BON-000322	5/8-11 LOCKNUT, NYLON
7	1	BON-000348	1-1/2" WASHER, FLAT
8	1	BUY-66053	SNAPPER PIN, 5/16" X 2-3/4"
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

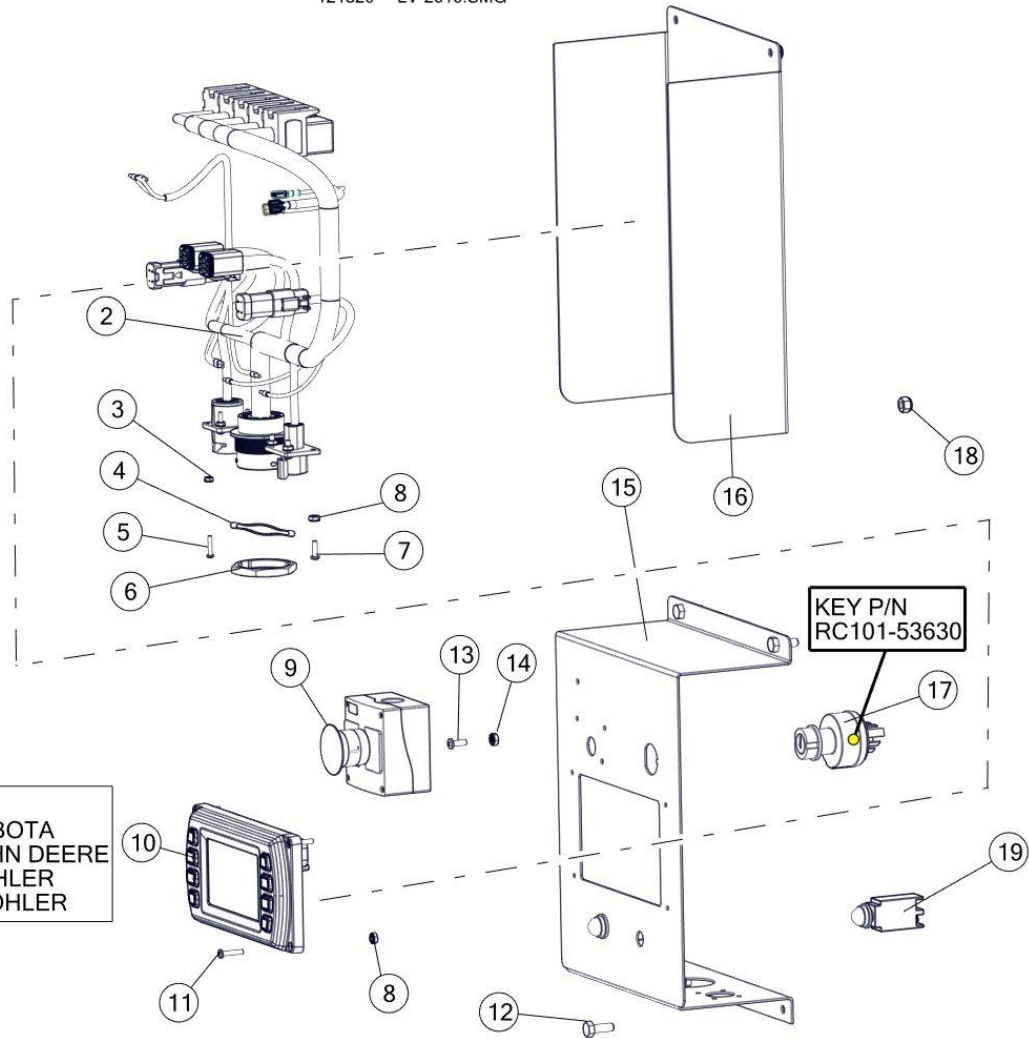


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Parts Breakdown

HOOGLIFT MOUNTED LEAF VAC CONTROL CONSOLE ASSEMBLY

121820 LV-2610.SMG

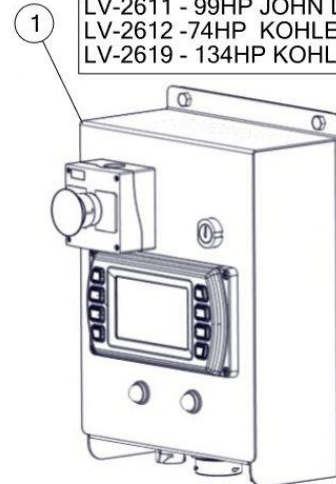


POWerview 450
 LV-2607 - 74HP KUBOTA
 LV-2608 - 99HP JOHN DEERE
 LV-2609 - 74HP KOHLER
 LV-2618 - 134HP KOHLER

KEY P/N
 RC101-53630

BOM ID	Qty	PartNo (config)	Description (config)
1	1	SEE CALLOUT	CONTROL CONSOLE ASSEMBLY
2	1	LV-3055	HARNESS, CONTROL BOX
3	4	96278A005	#4 HEX NUT WITH STAR WASHER
4	1	2414-001-2486	WAVY WASHER
5	4	91772A112	#4-40 X 5/8 MACHINE SCREW
6	1	2411-001-2405	NUT
7	4	72516	6-32X1/2 SS PAN HEAD
8	8	NKEP006CNUT 188	6-32 STAINLESS STAR WASHER NUT
9	1	LV-1398	E-STOP SWITCH AND BOX
10	1	SEE CALLOUT	POWER VIEW 450 FOR HOOGLIFT MOUNTED VACS
11	4	72388	6-32X3/4 PPH MS S/S
12	4	BON-000003	1/4-20 x 3/4" BOLT
13	1		6-32X1 PPHMS S/S
14	1		6-32 STAINLESS STAR WASHER NUT
15	1	LV-3046	CONSOLE FRONT SHEET METAL
16	1	LV-3047	CONSOLE BACK SHEET METAL
17	1	AR58126	DEERE KEY SWITCH
18	4	BON-000318.5	NYLON INSERT LOCKNUT, 1/4-20 UNC
19	2	5339T121	RED LED INDICATOR LIGHT

COMPLETE ASS'Y
 LV-2610 - 74HP KUBOTA
 LV-2611 - 99HP JOHN DEERE
 LV-2612 - 74HP KOHLER
 LV-2619 - 134HP KOHLER



Parts Breakdown

INSTALLATION INSTRUCTIONS FOR ENGINE KILL PROXIMITY SENSORS

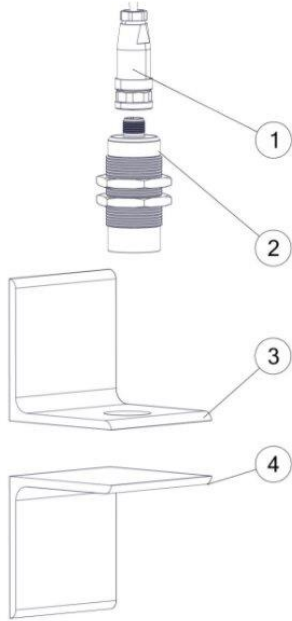
(LV-3044 INSTALLATION.SMG)

GENERAL- All hooklift mounted Leaf Vacuums are equipped with engine kill proximity sensors. These sensors prohibit the engine of the Leaf Vacuum to be run when the hooklift is raised or shifted from it's "home" position. This page shows how the sensors are to be installed. Two sensors are employed (one on each side of the machine.)

Parts affected:
 LV-3074 PROXIMITY SENSOR
 LV-3044 UPPER BRACKET
 LV-3042 LOWER BRACKET
 LV-3073 SAFETY HARNESS

STEP 1- Roll the Leaf Vacuum onto the vehicle so that it is located in its home (operating) position on the main Hook Lift.

STEP 2- Locate the lower bracket (LV-3042) on the front outside area of the truck mounted hooklift. This should be in an area where the upper hooklift skid has sufficient space for the installation of the upper bracket (LV-3044). Make sure that the location will allow for proper adjustment of the sensor. (See below illustration.)



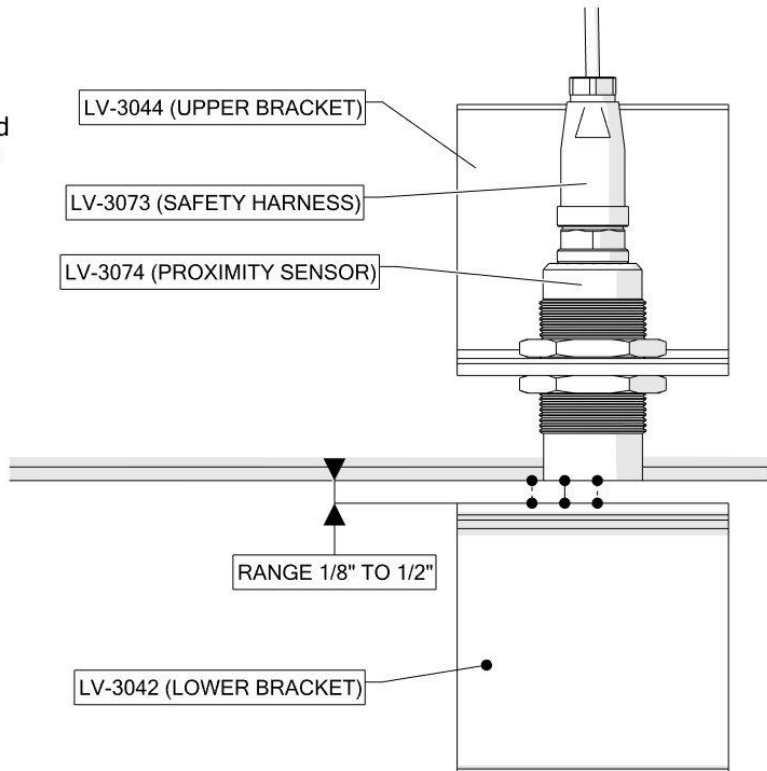
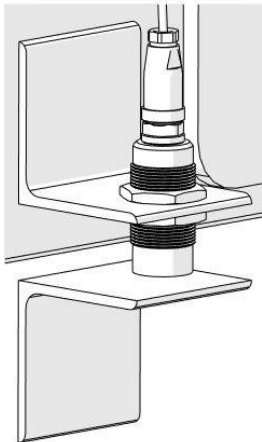
BOM ID	Qty	PartNo (config)	Description (config)
2	1	LV-3074	PROXIMITY SENSOR
3	1	LV-3044	BRACKET, WITH HOLE
4	1	LV-3042	BRACKET, WITHOUT HOLE
1	1	LV-3073	HARNESS, SAFETY

STEP 3- Locate the upper bracket (LV-3044) approximately *** directly above the lower bracket. Tack weld in place.

Step 4- Install the proximity sensor (LV-3074) onto the upper bracket and secure with jam nuts. This should be adjusted to be in the range shown in the image at right, otherwise the engine will not run.

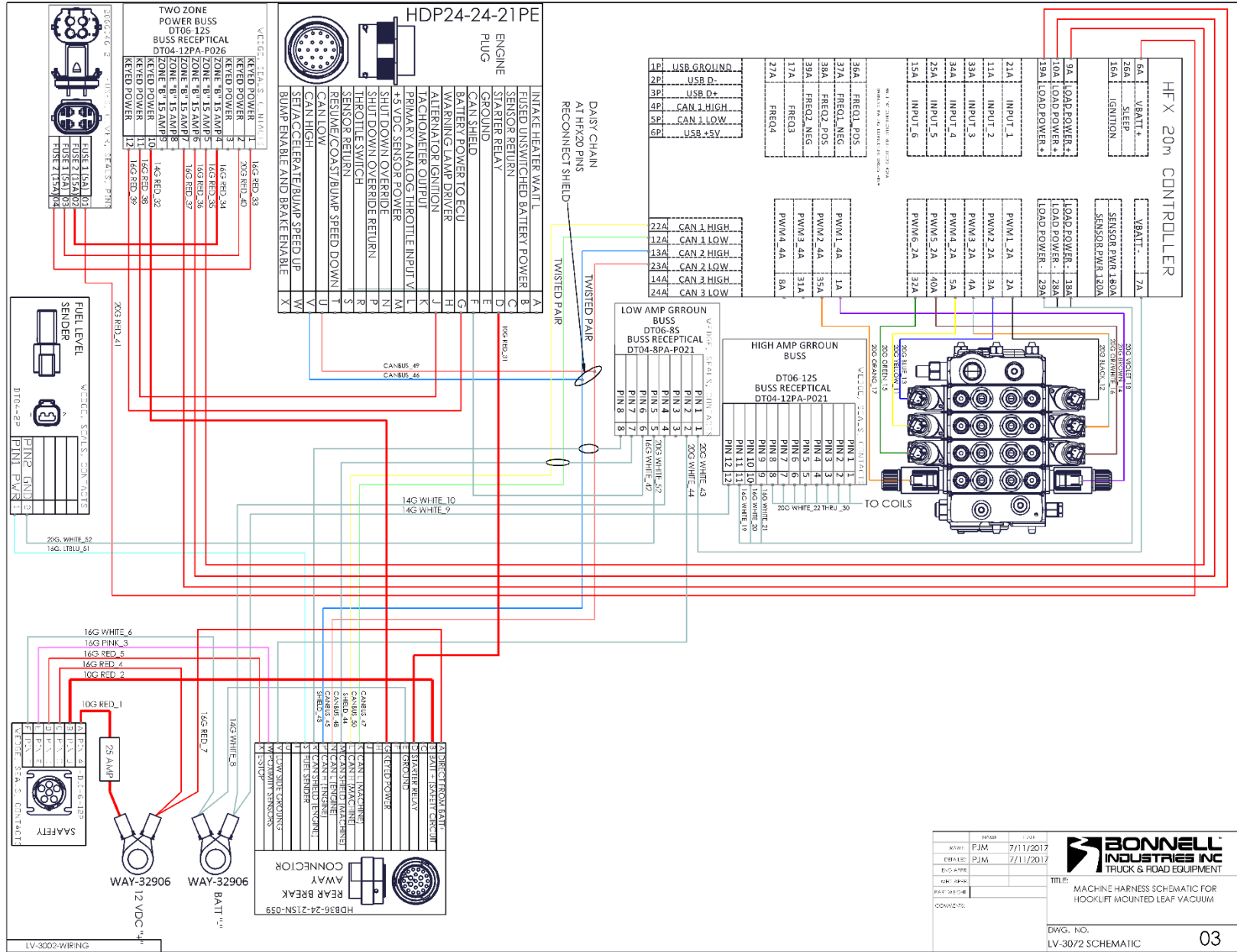
Step 5- Install Safety harness (LV-3073) to the proximity sensors.

This completes the installation.



Wiring

7 Wiring



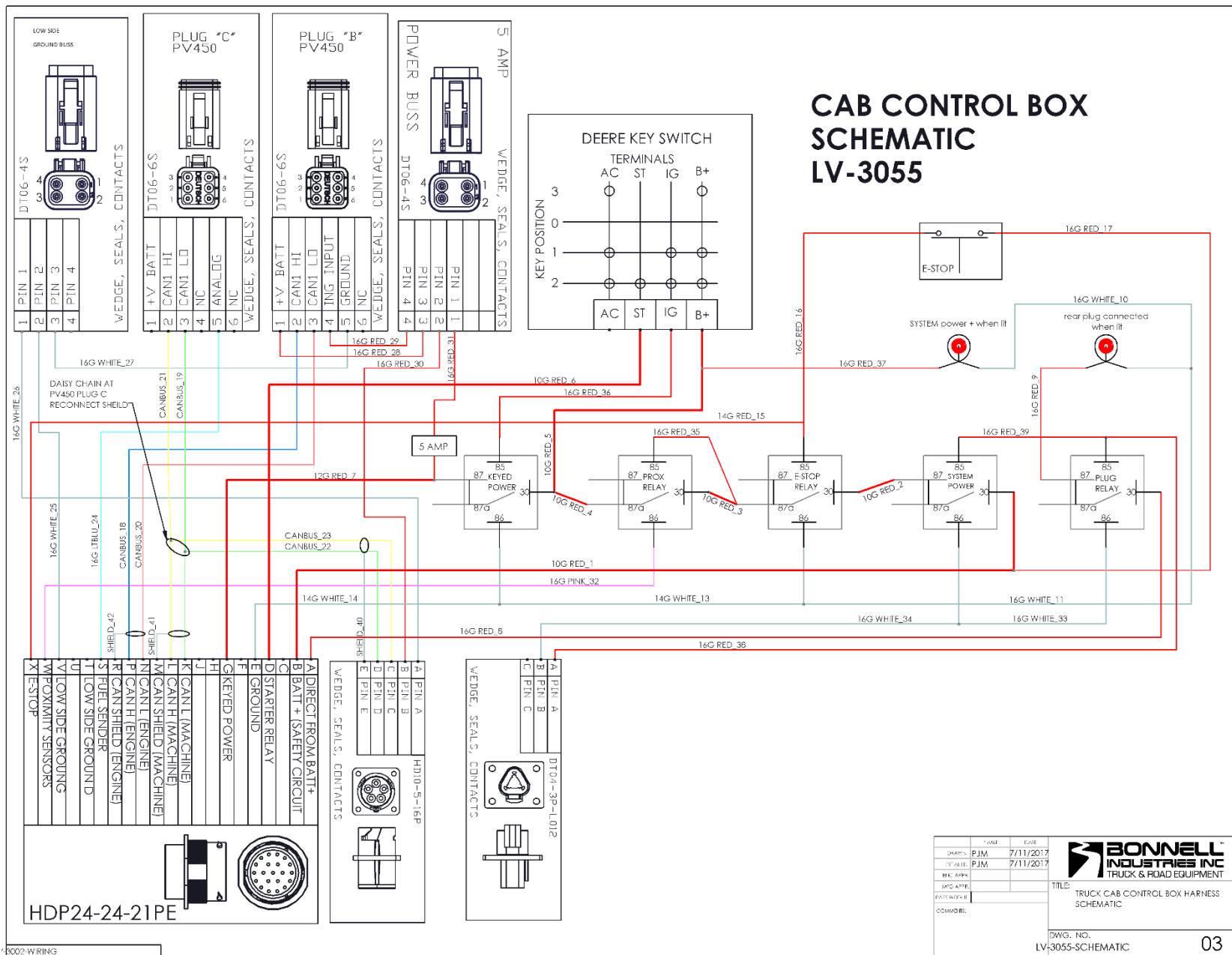
REV	BY	DATE	DESCRIPTION
1	PJM	7/11/2017	INITIAL DESIGN
2	PJM	7/11/2017	REVISIONS

BONNELL INDUSTRIES INC.
TRUCK & ROAD EQUIPMENT

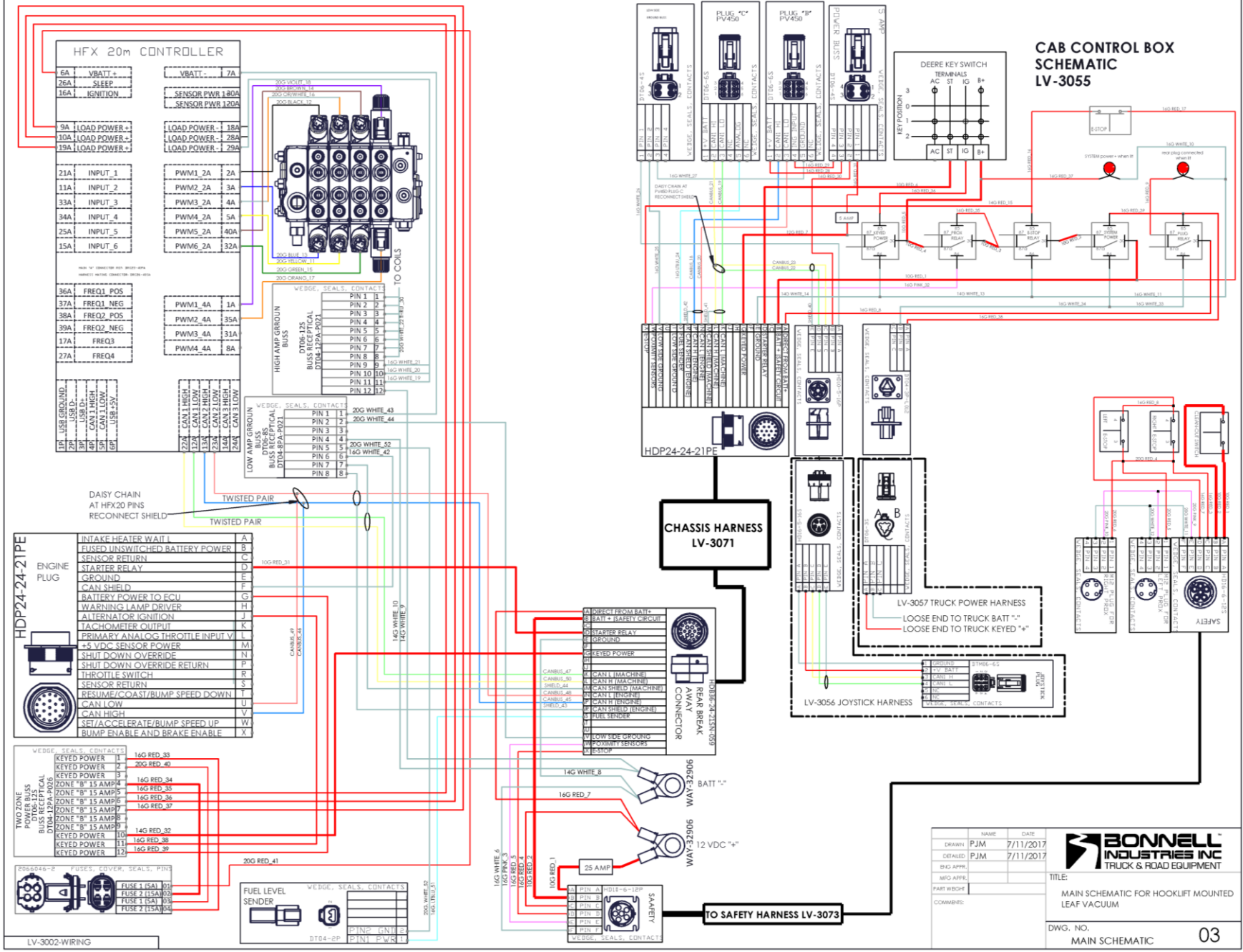
TITLE: MACHINE HARNESS SCHEMATIC FOR HOOKLIFT MOUNTED LEAF VACUUM

DWG. NO. LV-30/2 SCHEMATIC 03

Wiring

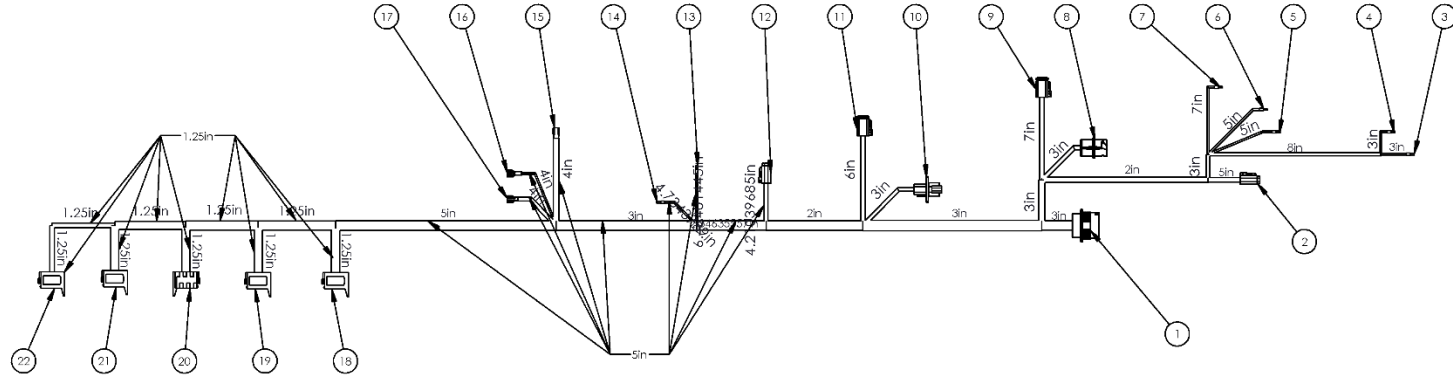


Wiring

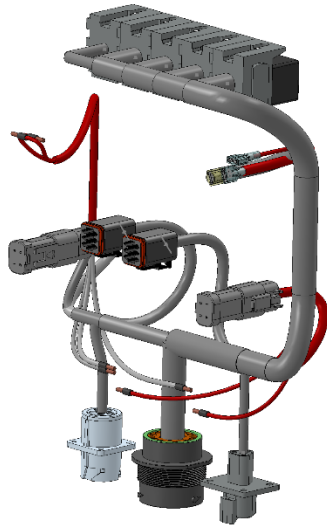


 BONNELL INDUSTRIES INC TRUCK & ROAD EQUIPMENT		
DRAWN: PJM 7/11/2017 DETAIL: PJM 7/11/2017 ENG APPR: MFG APPR: PART WEIGHT: COMMENTS:	TITLE: MAIN SCHEMATIC FOR HOOKLIFT MOUNTED LEAF VACUUM DWG. NO. MAIN SCHEMATIC	
03		

Wiring



NO COVERING IS NEEDED FOR THIS HARNESS



TWISTED PAIR
TWISTED PAIR
TWISTED PAIR

CIRCUIT SUMMARY					
CONDUCTOR-WIRE ID	FROM	From pin	TO	To Pin	
10G RED_1	MAIN HARNESS	B	SYSTEM POWER RELAY	30	
10G RED_2	SYSTEM POWER RELAY	87	E-STOP RELAY	30	
10G RED_3	E-STOP RELAY	87A	PROX SWITCH RELAY	30	
10G RED_4	PROX SWITCH RELAY	87A	KEYED POWER RELAY	30	
10G RED_5	KEYED POWER RELAY	30	KEY SWITCH BATTERY TERM	WAY-32515	
10G RED_6	MAIN HARNESS	D	KEYSWITCH START TERM	TER-B-850	
12G RED_7	MAIN HARNESS	G	KEYED POWER RELAY	87	
16G RED_8	MAIN HARNESS	A	REAR CONNECTION LIGHT RELAY	30	
16G RED_9	REAR CONNECTION LIGHT RELAY	87	REAR CONNECTION LIGHT "A"	1	
16G WHITE "GROUND" 10	REAR CONNECTION LIGHT "A"	1	POWER LIGHT "A"	1	
16 GA. WHITE "GROUND" 11	REAR CONNECTION LIGHT "A" JUMPER		E-STOP RELAY	86	
14G WHITE_13	E-STOP RELAY	86	KEYED POWER RELAY	86	
14G WHITE_14	MAIN HARNESS	E	KEYED POWER RELAY	86	
14G RED_15	MAIN HARNESS	X	E-STOP RELAY	85	
16G RED_16	E-STOP RELAY	85	E-STOP TERMINAL 1	1	
16G RED_17	SYSTEM POWER RELAY	30	E-STOP TERMINAL 2	1	
24G W/BLS_18	MAIN HARNESS	P	"B" PV450	2	
24G W/BLS_20	MAIN HARNESS	N	"B" PV450	3	
24G W/GS_19	MAIN HARNESS	K	"C" PV450	3	
24G W/YLS_21	MAIN HARNESS	L	"C" PV450	2	
24G W/GS_22	JOYSTICK HARNESS	D	"C" PV450	3	
24G W/YLS_23	JOYSTICK HARNESS	C	"C" PV450	2	
16 GA. LIGHT BLUE_24	MAIN HARNESS	S	"C" PV450	5	
16G WHITE "GROUND" 25	MAIN HARNESS	V	LOW AMP GROUND BUSS	2	
16G WHITE "GROUND" 26	JOYSTICK HARNESS	A	LOW AMP GROUND BUSS	1	
16G WHITE "GROUND" 27	LOW AMP GROUND BUSS	3	"B" PV450	5	
16G RED_28	"B" PV450	1	POWER BUSS	3	
16G RED_29	"B" PV450	4	POWER BUSS	4	
16G RED_30	JOYSTICK HARNESS	B	POWER BUSS	7	
16G RED_31	KEYED POWER RELAY	87	POWER BUSS	1	
16 GA. PINK IGN_32	MAIN HARNESS	W	PROX SWITCH RELAY	86	
16G WHITE "GROUND" 33	REAR CONNECTION LIGHT RELAY	86	SYSTEM POWER RELAY	86	
16G WHITE "GROUND" 34	SYSTEM POWER RELAY	86	TRUCK POWER & GROUND	8	
16G RED_35	E-STOP RELAY	87A	PROX SWITCH RELAY	86	
16G RED_36	KEYED POWER RELAY	85	KEYSWITCH IGN-ACC TERM	TER-B-850	
16G RED_37	KEY SWITCH BATTERY TERM	WAY-32515	POWER LIGHT "A"	1	
16G RED_38	TRUCK POWER & GROUND	A	REAR CONNECTION LIGHT RELAY	85	
16G RED_39	REAR CONNECTION LIGHT RELAY	85	SYSTEM POWER RELAY	85	
SHIELD GROUND_40	JOYSTICK HARNESS	E	"C" PV450	SHIELD	
SHIELD GROUND_41	MAIN HARNESS	M	"C" PV450	SHIELD	
SHIELD GROUND_42	MAIN HARNESS	R	"B" PV450	SHIELD	

NOTE 1: LENGTHS ARE MINIMUM AND MAY BE ROUNDED UP.

NOTE 2: ALL WIRE IS TO BE EQUAL TO OR BETTER THAN SAE J1128 SPECIFICATIONS.

NOTE 3: CAN WIRE GAUGE IS ONLY NOTED AS A REFERENCE. USE APPROPRIATE GAUGE FOR LENGTH OF RUN.

NOTE4: CANBUS TERMINATION RESISTOR NOTE USE DT06-35 P006 AS NEEDED.

NOTE5- ALL SEALS, CONTACTS, AND WEDGES TO COMPLETE HARNESS ARE TO BE PROVIDED TO COMPLETE HARNESS. (WHETHER THEY ARE LISTED OR NOT.)

ITEM	QTY	COMPONENT REFERENCE	PART NUMBER
1	1	MAIN HARNESS	HDP24-24-21 PF
2	1	LOW AMP GROUND BUSS	DT06-4S
3	1	E-STOP TERMINAL 1	SINGLE LOOSE END
4	1	E-STOP TERMINAL 2	SINGLE LOOSE END
5	1	REAR CONNECTION LIGHT "A" JUMPER	SINGLE LOOSE END
6	1	REAR CONNECTION LIGHT "A"	SINGLE LOOSE END
7	1	POWER LIGHT "A"	SINGLE LOOSE END
8	1	JOYSTICK HARNESS	HD10-S-16P
9	1	"B" PV450	DT06-6S
10	1	TRUCK POWER & GROUND	DT04-3P-L012
11	1	"C" PV450	DT06-6S
12	1	POWER BUSS	DT06-4S
13	1	REAR CONNECTION LIGHT "A"	SINGLE LOOSE END
14	1	POWER LIGHT "A"	SINGLE LOOSE END
15	1	KEY SWITCH BATTERY TERM	WAY-32515
16	1	KEYSWITCH IGN-ACC TERM	TER-B-850
17	1	KEYSWITCH START TERM	TER-B-850
18	1	KEYED POWER RELAY	VCFA-1002
19	1	PROX SWITCH RELAY	VCFA-1002
20	1	E-STOP RELAY	VCFA-1002
21	1	SYSTEM POWER RELAY	VCFA-1002
22	1	REAR CONNECTION LIGHT RELAY	VCFA-1002
23	2	BUSS PLUGS FOR ITEMS 12&2	DT04-4P-P021
24	5	RELAYS FOR ITEMS 18-22	WAY-75706
25	1	5 AMP MINI FUSE HOLDER W/COVER	

REVISED

DATE: 05/23/2017

BY: J. H. HUBBARD

DATE: 05/23/2017

APP: []

DATE: 05/23/2017

BY: []

DATE: 05/23/2017

BY: []

DATE: 05/23/2017

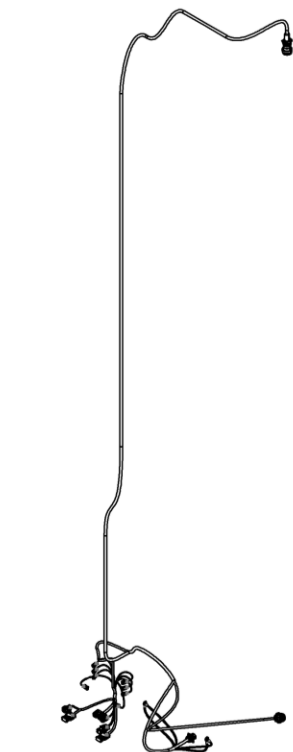
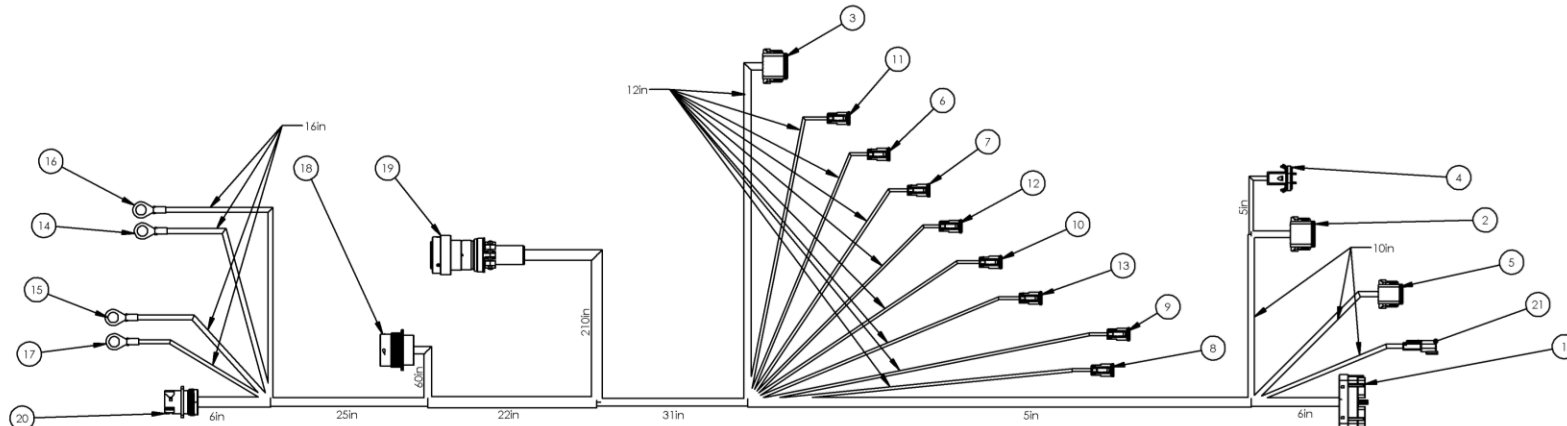


TITLE: HARNESS FOR CAB CONTROL BOX FOR A HOOKLIFT MOUNTED LEAF VACUUM

DWG. NO.
LV-3055

FILE NAME:
LV-3002-WIRING

Wiring



PLACE 25 AMP FUSE HOLDER IN THIS RUN

CIRCUIT SUMMARY				
CONDUCTOR-WIRE ID	FROM	TO	TO Pin	
10G RED_1	SAFETY CIRCUIT CONNECTOR A	BATTERY VDC + TERM 1	1	
10G RED_2	SAFETY CIRCUIT CONNECTOR B	REAR CONNECTOR	B	
16 GA. PINK IGN_3	SAFETY CIRCUIT CONNECTOR E	REAR CONNECTOR	W	
16G RED_4	SAFETY CIRCUIT CONNECTOR C	BATTERY VDC + TERM 2	1	
16G RED_5	SAFETY CIRCUIT CONNECTOR D	REAR CONNECTOR	X	
12G WHITE "GROUND"_6	SAFETY CIRCUIT CONNECTOR F	BATTERY GROUND TERM 1	1	
16G RED_7	BATTERY VDC + TERM 2	1 REAR CONNECTOR	A	
14G WHITE_8	BATTERY GROUND TERM 1	1 REAR CONNECTOR	E	
14G WHITE_9	BATTERY GROUND TERM 2	1 HIGH AMP GROUND BUSS	12	
14G WHITE_10	BATTERY GROUND TERM 2	1 LOW AMP GROUND BUSS	4	
20 GA YELLOW_11	BOOM DOWN	1 HFX CONNECTOR	5	
20G BLACK_12	BOOM SWING LEFT	1 HFX CONNECTOR	2	
20G BLUE_13	BOOM SWING RIGHT	1 HFX CONNECTOR	3	
20G BROWN_14	BOOM SWEEP LEFT	1 HFX CONNECTOR	40	
20G GREEN_15	BOOM SWEEP RIGHT	1 HFX CONNECTOR	32	
20G OR/WHITE_16	BOOM UP	1 HFX CONNECTOR	4	
20G ORANGE_17	TAILGATE LATCH CLOSE	1 HFX CONNECTOR	35	
20G VIOLET_18	TAILGATE LATCH OPEN	1 HFX CONNECTOR	1	
12G WHITE "GROUND"_19	HFX CONNECTOR	29 HIGH AMP GROUND BUSS	11	
12G WHITE "GROUND"_20	HFX CONNECTOR	28 HIGH AMP GROUND BUSS	10	
16G WHITE "GROUND"_21	HFX CONNECTOR	18 HIGH AMP GROUND BUSS	9	
20G WHITE_22	HFX CONNECTOR	7 LOW AMP GROUND BUSS	7	
20G WHITE_23	HIGH AMP GROUND BUSS	8 TAILGATE LATCH OPEN	2	
20G WHITE_24	HIGH AMP GROUND BUSS	7 BOOM SWEEP LEFT	2	
20G WHITE_25	HIGH AMP GROUND BUSS	6 BOOM UP	2	
20G WHITE_26	HIGH AMP GROUND BUSS	5 BOOM SWING LEFT	2	
20G WHITE_27	HIGH AMP GROUND BUSS	4 BOOM SWING RIGHT	2	
20G WHITE_28	HIGH AMP GROUND BUSS	3 BOOM DOWN	2	
20G WHITE_29	HIGH AMP GROUND BUSS	2 BOOM SWEEP RIGHT	2	
20G WHITE_30	HIGH AMP GROUND BUSS	1 TAILGATE LATCH CLOSE	2	
10G RED_31	ENGINE CONNECTOR D	REAR CONNECTOR	D	
14G RED_32	TWO ZONE POWER BUSS	10 REAR CONNECTOR	G	
16G RED_33	TWO ZONE POWER BUSS	1 FUSE HOLDER	4	
16G RED_34	TWO ZONE POWER BUSS	4 FUSE HOLDER	2	
16G RED_35	TWO ZONE POWER BUSS	5 HFX CONNECTOR	19	
16G RED_36	TWO ZONE POWER BUSS	6 HFX CONNECTOR	10	
16G RED_37	TWO ZONE POWER BUSS	7 HFX CONNECTOR	9	
16G RED_38	TWO ZONE POWER BUSS	11 ENGINE CONNECTOR	J	
16G RED_39	TWO ZONE POWER BUSS	12 ENGINE CONNECTOR	G	
20G RED_40	TWO ZONE POWER BUSS	2 FUSE HOLDER	3	
20G RED_41	FUSE HOLDER	1 HFX CONNECTOR	6	
12G WHITE "GROUND"_42	LOW AMP GROUND BUSS	4 ENGINE CONNECTOR	F	
20G WHITE_43	LOW AMP GROUND BUSS	1 HFX CONNECTOR	ENGINE CAN SHIELD	
20G WHITE_44	LOW AMP GROUND BUSS	2 HFX CONNECTOR	MACHINE CAN SHIELD	
24G W/BS_45	REAR CONNECTOR P	HFX CONNECTOR	13	
24G W/BS_46	HFX CONNECTOR	13 ENGINE CONNECTOR	V	
24G W/GS_47	REAR CONNECTOR K	HFX CONNECTOR	12	
24G W/RS_48	REAR CONNECTOR N	HFX CONNECTOR	23	
24G W/RS_49	HFX CONNECTOR	23 ENGINE CONNECTOR	U	
24G W/YS_50	REAR CONNECTOR L	HFX CONNECTOR	22	
16 GA. LIGHT BLUE_51	REAR CONNECTOR S	FUEL SENDER CONNECTOR	1	
20G WHITE_52	LOW AMP GROUND BUSS	5 FUEL SENDER CONNECTOR	2	

TWISTED PAIR
TWISTED PAIR
TWISTED PAIR

NOTE 1- LENGTHS ARE MINIMUM AND MAY BE ROUNDED UP.

NOTE 2- ALL WIRE IS TO BE EQUAL TO OR BETTER THAN SAE-J1128 SPECIFICATIONS.

NOTE 3- CAN WIRE GAUGE IS ONLY NOTED AS A REFERENCE. USE APPROPRIATE GAUGE FOR LENGTH OF RUN.

NOTE 4- CANBUS TERMINATION RESISTOR NOTE USE DT06-35-P006 AS NEEDED.

NOTE 5- ALL SEALS, CONTACTS, AND WEDGES TO COMPLETE HARNESS ARE TO BE PROVIDED TO COMPLETE HARNESS. (WHETHER THEY ARE LISTED OR NOT.)

ITEM	QTY.	COMPONENT REFERENCE	PART NUMBER
1	1	HFX CONNECTOR	DRC26-40SA
2	1	TWO ZONE POWER BUSS	DT06-12SA
3	1	HIGH AMP GROUND BUSS	DT06-12SA
4	1	FUSE HOLDER	2066046-2
5	1	LOW AMP GROUND BUSS	DT06-08SA
6	1	BOOM SWING RIGHT	DT06-25
7	1	BOOM DOWN	DT06-25
8	1	BOOM SWEEP RIGHT	DT06-25
9	1	BOOM SWING LEFT	DT06-25
10	1	BOOM UP	DT06-25
11	1	BOOM SWEEP LEFT	DT06-25
12	1	TAILGATE LATCH OPEN	DT06-25
13	1	TAILGATE LATCH CLOSE	DT06-25
14	1	BATTERY GROUND TERM 1	WAY-32906
15	1	BATTERY VDC + TERM 1	WAY-32906
16	1	BATTERY GROUND TERM 2	WAY-32906
17	1	BATTERY VDC + TERM 2	WAY-32906
18	1	ENGINE CONNECTOR	HDP24-24-21PE
19	1	REAR CONNECTOR	HDB36-24-21SN-059
20	1	SAFETY CIRCUIT CONNECTOR	HD10-6-12P
21	1	FUEL SENDER CONNECTOR	DT04-2P
22	1	TWO ZONE BUSS	DT04-12PA-P026
23	1	BUSS PLUG	DT04-12PA-P021
24	1	BUSS PLUG	DT04-08PA-P021
25	1	25 AMP.ATO FUSE HOLDER	

COMMENTS:		DATE	
MODELED	PJA	7/11/2017	
DETAILED	PJA	7/11/2017	
ENGR APPR.			
MFG APPR.			
DIMENSIONS ARE IN INCHES		UNLESS OTHERWISE NOTED	
TOLERANCES UNLESS OTHERWISE NOTED			
FRAC TIONAL	#/16		
DECIMAL	±.005		
ANGLES	±.1°		
DECIMAL	±.005		
DECIMAL	±.005		



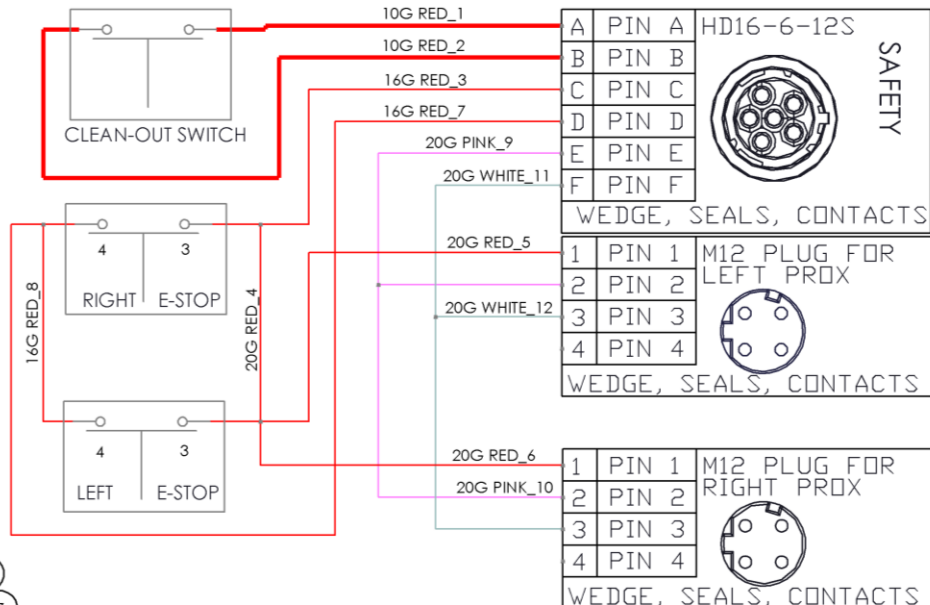
TITLE: MACHINE HARNESS FOR HOOKLIFT MOUNTED LEAF VACUUM

DWG. NO. LV-3072

FILE NAME: LV-3002-WIRING

Wiring

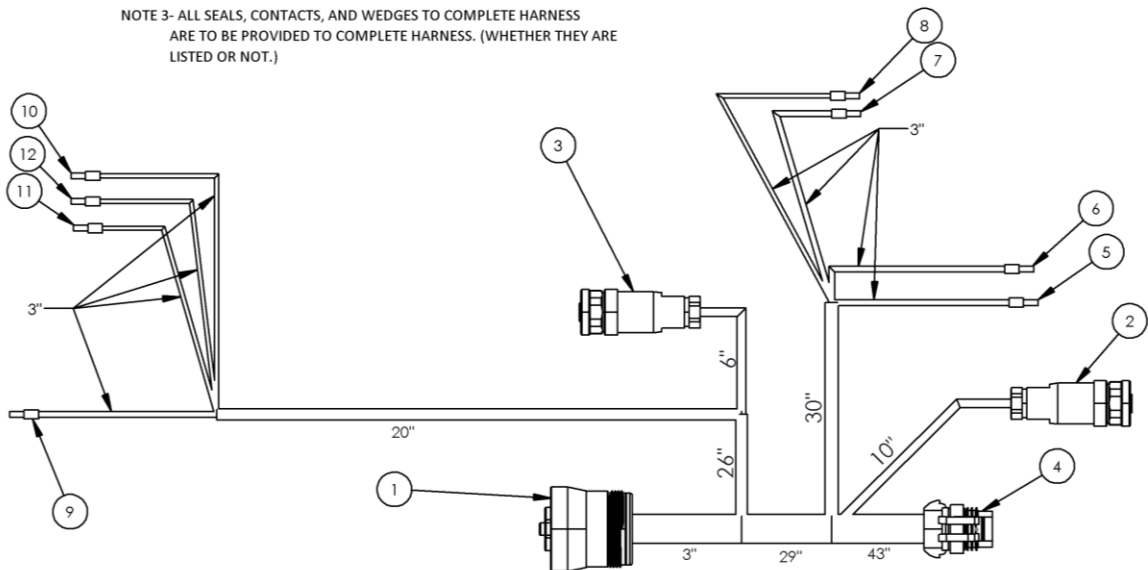
CIRCUIT SUMMARY				
CONDUCTOR-WIRE ID	FROM	From pin	TO	To Pin
10G RED_1	MAIN CONNECTOR-SAFETY HARNESS	A	CLEAN OUT SAFETY CONNECTOR	A
10G RED_2	MAIN CONNECTOR-SAFETY HARNESS	B	CLEAN OUT SAFETY CONNECTOR	B
16G RED_3	MAIN CONNECTOR-SAFETY HARNESS	C	TERM3-WIRE1 RIGHT E-STOP	1
16G RED_7	MAIN CONNECTOR-SAFETY HARNESS	D	TERM4-WIRE1 RIGHT E-STOP	1
20 GA. PINK_9	MAIN CONNECTOR-SAFETY HARNESS	E	LEFT SIDE PROX CONNECTOR	2
20 GA. PINK_10	MAIN CONNECTOR-SAFETY HARNESS	E	RIGHT SIDE PROX CONNECTOR	2
20G WHITE_11	MAIN CONNECTOR-SAFETY HARNESS	F	LEFT SIDE PROX CONNECTOR	3
20G WHITE_12	MAIN CONNECTOR-SAFETY HARNESS	F	RIGHT SIDE PROX CONNECTOR	3
20G RED_4	TERM3-WIRE2 RIGHT E-STOP	1	TERM3-WIRE1 LEFT E-STOP	1
20G RED_5	TERM3-WIRE2 LEFT E-STOP	1	LEFT SIDE PROX CONNECTOR	1
20G RED_6	TERM3-WIRE3 LEFT E-STOP	1	RIGHT SIDE PROX CONNECTOR	1
16G RED_8	TERM4-WIRE2 RIGHT E-STOP	1	TERM4-WIRE1 LEFT E-STOP	1



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NOTE 3- ALL SEALS, CONTACTS, AND WEDGES TO COMPLETE HARNESS ARE TO BE PROVIDED TO COMPLETE HARNESS. (WHETHER THEY ARE LISTED OR NOT.)



FILE NAME:
LV-3002-WIRING

ITEM	QTY.	PART NUMBER	COMPONENT REFERENCE
1	1	HD16-6-12S-B010	MAIN CONNECTOR-SAFETY HARNESS
2	1	T4110501041-000	RIGHT SIDE PROX CONNECTOR
3	1	T4110501041-000	LEFT SIDE PROX CONNECTOR
4	1	WAY-38063	CLEAN OUT SAFETY CONNECTOR
5	1	SINGLE LOOSE END	TERM4-WIRE1 RIGHT E-STOP
6	1	SINGLE LOOSE END	TERM4-WIRE2 RIGHT E-STOP
7	1	SINGLE LOOSE END	TERM3-WIRE1 RIGHT E-STOP
8	1	SINGLE LOOSE END	TERM3-WIRE2 RIGHT E-STOP
9	1	SINGLE LOOSE END	TERM4-WIRE1 LEFT E-STOP
10	1	SINGLE LOOSE END	TERM3-WIRE1 LEFT E-STOP
11	1	SINGLE LOOSE END	TERM3-WIRE2 LEFT E-STOP
12	1	SINGLE LOOSE END	TERM3-WIRE3 LEFT E-STOP

COMMENTS:		
MODELLED	NAME	DATE
PJM		7/11/2017
DETAILED	PJM	7/11/2017
ENG APPR.		
MFG APPR.		
FINISH WEIGHT (LBS)		
DIMENSIONS ARE IN INCHES		
TOLERANCES UNLESS OTHERWISE NOTED		
FRACTIONAL	±1/16	
BEND ANGLE	±5°	
SQUARENESS	±.15°	
TWO PLACE DECIMAL	±.03	
THREE PLACE DECIMAL	±.005	

BONNELL INDUSTRIES INC
TRUCK & ROAD EQUIPMENT

TITLE: SAFETY HARNESS FOR HOOKLIFT MOUNTED LEAF VACUUM

DWG. NO.
LV-3073

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



LV-1398



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

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

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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DIXON, ILLINOIS
PHONE: 800-851-9664

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 