



# Dutchman

## INDUSTRIES

DIVISION OF  
**Dutchmaster Nurseries Ltd.**

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# Tree Rex

# Owner's Manual

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Manufactured and Sold by  
**Dutchman Industries Inc.**  
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# **DUTCHMAN TREE REX**

## **SAFETY & PROCEDURES**

# DUTCHMAN INDUSTRIES INC.

## SAFETY INSTRUCTIONS

**THESE INSTRUCTIONS ARE OF GREAT IMPORTANCE AND MUST BE READ AND FOLLOWED CAREFULLY AND OBEYED.**

➔ **ATTENTION:** *This ARROW symbol is used throughout this manual to call attention to the safety instructions.*

➔ **WARNING:** *Before attempting to operate the machine, fully read and follow all instructions herein with care.*

The safety of the operator is of great importance to Dutchman Industries Inc. We have provided decals, an Operators Manual, shields, and other safety features to aid you in using your equipment safely. Be a careful operator. Properly use and service your equipment according to instructions provided in this manual.

### A) BEFORE OPERATING

- Read and follow all instructions contained in:
  - This Dutchman Equipment Manual,
  - Loader Operators Manual,
  - Decals placed on the equipment and loader.

**Note: Additional copies of the above items are available from Dutchman Industries Inc. or your local authorized dealer.**
- Be sure the unit is in good operating condition and that all safety devices are in place and secured. If they must be removed for service or maintenance, reinstall them before starting the engine.
- Allow only responsible, properly instructed individuals to operate the equipment. Carefully supervise inexperienced operators.
- Check with proper authorities regarding the location of underground gas lines, water lines, power lines and other installations.
- Check overhead for electrical power lines and/or other obstructions and be certain there is adequate clearance.
- Check the work area for objects, which interfere with the proper operation of the equipment.
- Clear the work area of objects, which might interfere with the proper operation of the equipment.
- A fire extinguisher should be available in case of fire.

### B) DURING OPERATION

- **Do not** allow anyone to ride on the equipment.
- *When moving* the equipment to and from its vertical position, be aware of all height clearances.
- **Do not** attempt to use this equipment for anything other than its intended purpose.

## SAFETY INSTRUCTIONS

- *Do not* deadhead the hydraulic valve control in an open position after the unit has reached the end of its stroke or has come in contact with a solid structure.
- *Keep* all others, especially children, away from the equipment.
- *Be certain* everyone is clear before opening or closing the equipment.
- *Keep* hands, feet and clothing away from all moving parts.
- *Never* allow anyone to work under the equipment. It could drop unexpectedly resulting in severe personal injury.
- Be alert and use *extreme caution* when operating on or near hillsides, ditches, gullies, holes, or obstructions where rollover could occur.

## C) DURING SERVICE AND MAINTENANCE

- *Before* working on or near the equipment, for any reason including servicing, cleaning or equipment inspection, use normal shut down procedure unless instructed differently in this manual.
- *Check* periodically and tighten or replace any loose or cracked bolts, hoses or connections.
- *Use* only parts authorized by Dutchman Industries for repair or replacement.
- *Hydraulic fluid escaping under pressure* can be invisible and can have enough force to penetrate the skin. When checking for suspected leaks use a piece of wood or cardboard rather than your hands. Immediately seek medical attention if injured to prevent serious infection or reaction.
- *Relieve all pressure* in the hydraulic system before disconnecting the lines or performing other work on the system. Make sure all connections are tight and lines are in good condition before applying pressure to the system.
- Spades will drop if drive system components including hydraulic lines are disconnected when spades are raised. Before disconnecting or loosening any part of the spade drive system lower spade to ground to prevent falling.

## D) WHEN TRANSPORTING

- Be courteous and obey all applicable laws governing road use.
- Be sure to properly confine tree branches. In some cases limbs may have to be removed.
- Check with proper authorities regarding maximum width and height limitations.
- Be conscious of all height clearances.

## SAFETY INSTRUCTIONS

**➔ WARNING: Failure to comply with the above safety instructions or those that follow within this manual could result in severe personal injury or death. This equipment is to be used only for those purposes for which it is intended as explained in the Operators Manual.**

### E) SAFETY DECALS

Safety decals located on your equipment contain important and useful information that will help you operate your equipment safely.

To ensure that all decals remain in place and in good condition follow the instructions below:

1. Keep decals clean using soap and water. Do not use mineral spirits, adhesive cleansers or similar cleaners as they will damage decals.
2. Replace any damaged or missing decals. When attaching decals, surface temperature of the metal must be minimum of 40 ° F (5 ° C). The metal must be clean and dry.
3. When replacing a component to which a decal is attached be sure to also replace the decal.
4. Replacement decals can be purchased from your Dutchman Industries Inc, or your local authorized dealer.

### PRE-START INSPECTION INSTRUCTIONS

To ensure long life and economical operation of your equipment, we highly recommend the operator be thoroughly instructed in the maintenance and operation of the equipment. There is no substitute for a sound, preventative maintenance program and a well-trained operator.

Prior to starting the engine we recommend the operator make a visual inspection of the equipment and make any necessary adjustments and repairs. This can be done at the time of machine lubrication.

**➔WARNING: Before inspecting the equipment, use normal shutdown procedures unless instructed differently below.**

Check the following on the equipment:

- Condition of decals
- Components for signs of fatigue
- Bolts for tightness
- Grease points
- Hydraulic components for leaks or damage

**➔WARNING: Hydraulic fluid escaping under pressure can be invisible and can have enough force to penetrate the skin. When searching for suspected leaks use a piece of wood or cardboard not your hands. Immediately seek medical attention if injured, to prevent serious infection/reaction.**

## **NORMAL SHUTDOWN PROCEDURE**

When stopping the equipment use the following normal shutdown procedure:

1. Lower the equipment to ground level unless mechanically suspended with suitable blocks or hoist.
2. Shut off engine.
3. Turn the key back to accessory and flip loader auxiliary oil button back and forth to relieve oil pressure to the equipment.
4. Set parking brake.
5. Remove key.

For the safety of the operator and others, use the normal shutdown procedure before servicing, cleaning or inspecting the tree spade.

A variation of the above procedure may be used if so instructed within the loader manual or if an extreme emergency requires it.

## **STORAGE INSTRUCTIONS**

**➔WARNING:** *When preparing the equipment for storage, use normal shutdown procedure.*

### **BEFORE STORAGE**

1. Clean all mud, dirt, grease and other foreign material from the exterior of the equipment. Wash it completely. Repaint places where bare metal is exposed to inhibit rust.
2. Clean the working components. It is advised to coat them with a rust preventative compound.
3. If possible, store the equipment in a dry, protected place. If storing the equipment outside, cover with waterproof canvas, plastic or other suitable protective material.
4. Lubricate the equipment thoroughly including all grease points.
5. Take the load off all hydraulic cylinders by working the valve controls back and forth. Oil all control valve linkages with a light oil to prevent seizing. Protect exposed cylinder rods with grease or Tectyl 506 oil or equivalent.
6. Check the equipment for any worn or broken parts, as well as torn or ripped decals.
7. Order parts now to prevent delays when taking the equipment out of storage for a new season.
8. When ordering parts/decals, always quote the serial number and model number of the equipment.

## REMOVING FROM STORAGE

1. Remove all protective covering.
2. Tighten all loose bolts, nuts and/or hydraulic fittings.
3. Check hydraulic hoses for deterioration and replace if necessary.
4. Inspect all electrical components for oxidization and/or insect infestations.
5. Make certain working components are free of dirt inside and outside.
6. Ensure all cylinder rods are free from rust and/or pitting.
7. Refer to the pre-starting inspection instructions.

## LUBRICATION INSTRUCTIONS

All Dutchman products are completely serviced at the factory before shipping. However, the operator should check all grease fittings on the unit before beginning to operate it so as to become familiar with their location and the correct service schedule.

**➔WARNING: Use the normal shut-down procedure before lubricating the equipment.**

Use only high quality, multi-purpose grease when lubricating the unit. Make sure all fittings and nozzle of the grease applicator are clean before applying the grease. If any grease fittings are missing or plugged, replace them immediately.

Ensure grease is travelling through the grease fittings. Excess grease bulging at all exit points is evidence of a full and thorough greasing.

Do not grease the inside or outside of working components which utilize wear pads, they must be kept dry and clean. Grease on these components will do more harm than good. Dirt and debris will stick to the grease and thus damage the high-density wear pads.

## SERVICE AND MAINTENANCE

**➔WARNING:** *Before servicing the Tree Rex, use normal shutdown procedure unless instructed differently in this section.*

### A) TREE REX

1. The Tree Rex should be kept and stored in as clean a condition as possible. Before storage, ensure that you clean off the main tilt cylinder and the grapple cylinders to prevent future damage to the seals. Also ensure that any pinch points on the grapple head are free of dirt and debris.
2. Inspect grapple cylinder hoses and ensure they are free and clear from any pinch points. Inspect internal valve assembly and swing cylinders and ensure they are free of debris.
3. Open and close the Tree Rex paddles. The front of both should just make contact. During frequent use, the paddles may stretch and will then need to be adjusted. Adjustment is done by disconnecting the grapple cylinders, turning the threaded rod to the desired length, and then reconnecting the cylinders.
4. Inspect all electrical plug-ends and spray with contact-cleaner to prevent oxidization.
5. Keep the Tree Rex lubricated as per instructions and constantly watch for loose bolts, pins and pivots.

### B) HYDRAULIC COMPONENTS

**➔WARNING:** *Before disconnecting or loosening any component of the drive system, lower the equipment to the ground. Function failure may occur if hydraulic lines are disconnected while the equipment is suspended.*

**➔WARNING:** *Release all oil pressure before starting to work on the hydraulic system. Hydraulic fluid escaping under pressure can be invisible and can have enough force to penetrate the skin. When searching for suspected leaks use a piece of wood or cardboard, not your hands. To prevent serious infection or reaction, immediately seek medical attention if injured.*

The pressure available in the hydraulic system must be known, to quickly and accurately troubleshoot the system.

# MOUNTING INSTRUCTIONS

## GENERAL INFORMATION

The following instructions will assist you in mounting your equipment onto your loader. The majority of equipment will use a universal skid steer quick-attach hook-up.

**➔WARNING:** *For mounting to other host machines see the specific mounting instructions that are supplied separately.*

Remember to read all safety warnings, decals and operating instructions before operating.

## MOUNTING PROCEDURES

1. Remove the steel shipping banding from around the equipment.
2. Remove any attachment from the front of the skid steer loader, such as buckets, forks or other implements.
3. Set the quick-attach locks on the skid steer toolbar to the unlocked position. Lower the loader arms and tilt the toolbar down low enough to pass under the top lip of the hitch on the mainframe.
4. Following all standard safety practices, start the skid steer and slowly drive it in back of the attachment. Position the loader so the top of the toolbar under the lip of the hitch on the mainframe.
5. Tilt the toolbar back to hook the attachment onto the toolbar. It may be necessary to lift the loader arms slightly.
6. Set the quick-attach locks to the locked position to secure the equipment onto the loader. It may be necessary to raise lower or tilt the toolbar to properly align so the locking mechanism can be activated. Ensure that the locking pins are fully deployed.
7. Install your rear stabilizers (if required) by following the instructions that were supplied rear stabilizers for your unit.
8. If installing rear stabilizers, connect the power and return hoses for the rear stabilizers to the two bulkhead fittings on the top of the mainframe (directly beside the power and return hoses for the tree spade). Otherwise continue to step 9.
9. With the auxiliary hydraulic system turned off, route the hydraulic hoses over the mainframe and connect them to their proper auxiliary couplers on the loader.
10. If using an electric valve, connect the cord assembly to the control cord from the equipment. Connect the power cord from the electronic controller to a power source on the skid steer.

**NOTE: Some machines have an auxiliary electrical outlet to plug in the control cord, contained within the loader cab. You can connect to this but ensure the power and ground connections are plugged-in correctly.**

## **MOUNTING PROCEDURES**

**➔ WARNING: *Electrocution Hazard! Provide electrical power to the controller by following your skid steer manufacturer's recommended procedures. The electrical circuit must be fused with a 5 amp fuse to prevent machine damage and serious personal injury or death.***

11. Mount the controller; if equipped with handheld pistol grip controller, please refer to the pistol grip mounting guide on page 33.

12. Complete the included post-delivery checklist. The installation is now complete.



# **DUTCHMAN TREE REX**

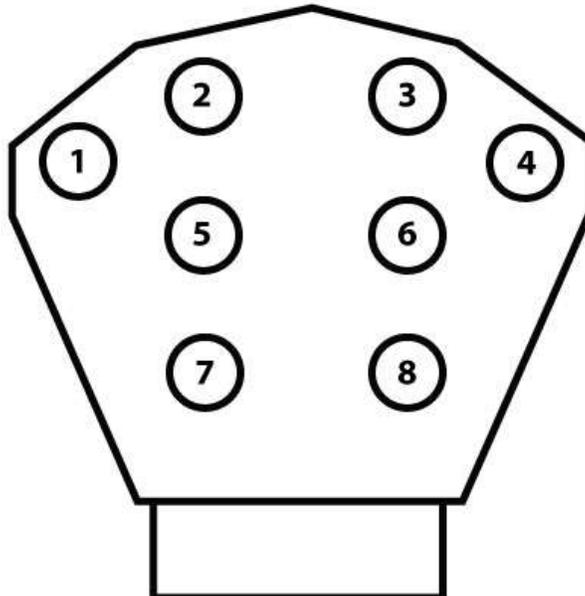
## **CONTROLS & OPERATION**

## DUTCHMAN INDUSTRIES INC. CONTROLS

### PISTOL GRIP JOYSTICK

Your Tree Rex is equipped with a Dutchman pistol grip joystick and is controlled by the joystick and an electrical valve assembly. The joystick control consists of 8 switches and a trigger, and is setup to handle up to eight functions.

#### PISTOL GRIP LAYOUT



Tree Rex		
Button	Function	Wire Colour
1	Close	Yellow
2	Rotate Left	Green
3	Rotate Right	Blue
4	Open	Orange
5	Pivot Left	Black
6	Pivot Right	White
7		Brown
8		*Auxiliary*

## TREE REX OPERATION

Before operating your Tree Rex, determine what size of root balls you will be moving and manipulating. Consult the guidelines below and ensure that the correct paddles are installed.

- Large Paddles for 50"-36" Root balls
- Medium Paddles for 44"-30" Root balls
- Small Paddles for 36"-24" Root balls

**➔WARNING: Do not exceed the recommended root ball size (or weight) that has been stated on your grapple paddles. Excessive weight could cause main pin fracture and/or chain link damage.**

**➔WARNING: All RPM speeds (when depressing functions on the Joystick Controller) should be near or at idle. Excessive RPM speeds will cause the unit to operate at high speeds and will cause unwanted movement and stress on the main pin and/or chain links.**

Before starting the loader and Tree Rex, make sure to complete the following start-up checklist:

1. Ensure that the unit is connected securely and the pin locks for the hook-up plate are locked in place
2. Ensure that the hydraulic couplers connecting to the Tree Rex are locked and secured.
3. Ensure that the plug connector for the pistol grip joystick controller is plugged in securely and a steady 12-volt, 5-amp current is being drawn from the loader.

Once these checks are complete, operation can begin.

### **When loading and unloading a root ball, follow these proper steps.**

1. Activate the auxiliary hydraulics from the loader to power the unit. Note: ensure that the fluid is being sent in the proper direction. (Running oil to the unit in reverse will result in sluggish movement and loader pump labor).
2. Using the pistol grip joystick controller, activate the “open” function and position the grapples around the root ball.
3. Use the “tilt down” or “tilt up” function on the controller to align the grapples around the largest girth of the root ball.
4. Use the “close” function on the controller to close the paddles around the root ball. Larger root balls will encompass almost all of the grapples space while smaller root balls may only contact the front end surface area of the grapples.

**➔WARNING: the “close” section of the valve is designed to be pressure sensitive. Depressing the “close” function again will allow further pressure around the root ball. Too much depressing may cause root ball distortion and/or fracture.**

5. Once the root ball is secured in the grapples, raise the loader arms and travel towards the desired unloading location.

## **TREE REX OPERATION**

➔ ***WARNING: For maximum safety, carry the tree as low as possible when transporting.***

6. Using the “grapple left” or “grapple right” function on the controller, position the root ball towards the desired unloading location.
7. Using the “tilt down” function on the controller, tilt the root ball until it meets the surface of the desired unloading location.
8. Use the “open” function on the controller to open the grapples so the root ball can be released.
9. Lift the loader arms up and move away from the root ball. The root ball should now be lying down in the desired location.
10. Repeat steps 2-9 for any subsequent loading or unloading. The same steps apply for handling pots.



## Troubleshooting for Electric over Hydraulic Tree Rex

If your Tree Rex has lost one or more of its functions, it may be due to a variety of reasons that can be isolated by reviewing the following trouble shooting tips.

- Check the fuse located by the controller. The fuse is a standard 5-amp that can easily be replaced.
- Next, turn the key for the loader unit to the “on” position in order to energize the Tree Rex electronics.

**NOTE: Turn the key to accessory mode if possible.**

- Find and open the “Circuit Board” box, which is located directly above the valve bank attached to the Tree Rex.
- Check to make sure the circuit board “Power” light is on. This will ensure that electric current is flowing to the circuit board.
- Activate all available circuits on the control box or pistol grip controller. This should be done one at a time so as to avoid confusion.
- The circuit board contains lights that correspond to the functions on the controller. Therefore, by pressing or moving a switch, the top row of lights and the bottom row of lights should light up.

### POSSIBLE ISSUES

#### **1. The “Power Light” stays on but only the bottom row of indicator lights light up OR One or more of the bottom lights do not light up.**

- This indicates that a ground wire fault. This can be caused by an unsecured controller or that the ground wire has fallen off from its contact.
- Retrace the ground wire coming from the control box and make certain that the ground lead is fastened to a proper ground that reads “0-volts”. Check to ensure that the positive and negative plugs coming out of the controller are fastened together. Also check that the ground wire from the controller is not severed or spliced into the positive wire.

#### **2. One or more of the top indicator lights do not light up.**

- This indicates that there is a wire coming from the controller to the circuit board that has been severed, pinched, or fallen off of contact from the plug.
- With the use of a test-light, test all plug-ends by having another person press or move the functions. One power light will stay on constantly and the others will light up when activated. (See diagram 1-2 to locate plug schematics). If there is a function(s) that does not light up when activated, examine the cord and plug connections from the circuit board to the controller and be sure that the cord has not been pinched or cut. Also check the ends of the plug to be sure that the wires are securely fastened to the plug ends.
- If a wire “break” can be detected, turn off the power from the loader. Using a small knife, make a small, lengthwise incision in the cable being careful not to cut into another wire. Locate the wire “break” and splice it back together if possible. Make sure the connections are well insulated. Using the test light again, test to see if all functions work.

- If the functions are working again, tape the repaired cable using electrical tape.

### **3. The indicator lights light up but none of the functions operate.**

- This would most likely indicate that the “Main Solenoid,” which is located on the top of the Tree Rex valve, is not functioning.

- Check the wire harness connections on the bottom of the circuit board and be certain that they are fastened securely.

- Also check to see that there is adequate oil flow coming from the loader to the Tree Rex.

- If there is not proper oil flow, it may be attributed to a poor pump sender and/or restricted coupler connections on the loader.

### **4. The indicator lights light up but one or more function(s) do not operate.**

- This would most likely indicate that there is problem at the valve body on the Tree Rex.

- Check the wire harness connections on the bottom of the circuit board and be certain that they are fastened securely.

- If all wires are fastened securely then check the wires that lead into the coils of the valve.

- Listen to hear if the coils are “clicking”. This insures that there is power going to the coils.

- Using a metal end (i.e. pocketknife or screwdriver), check to see that the nut that holds the coil in place has magnetism. The metal end should stick to the nut when the function is activated.

- With a plastic end, lightly tap the nut to see if it releases the function. This would likely indicate that a valve actuator has become stuck and needs a replacement.

### **5. One or more of the functions are operating backwards *OR* the Tree Rex is operating extremely slowly.**

- This likely means that the loader auxiliary fluid is running through the valve backwards. Simply flip the fluid flow in the opposite direction to test if this is the cause.

- If not, it is possible that there is too much pressure applied to the “Tie Rods”.

**The tie rods are the three long bolts that run vertically between all valve sections. Their purpose is to hold all the valve sections in place.**

- Using a “Torque Wrench”, re-adjust the tie rods to **8-foot pound pressure**. If a torque wrench is not available, re-adjust the tie rods so that they are a quarter to half past hand tight.

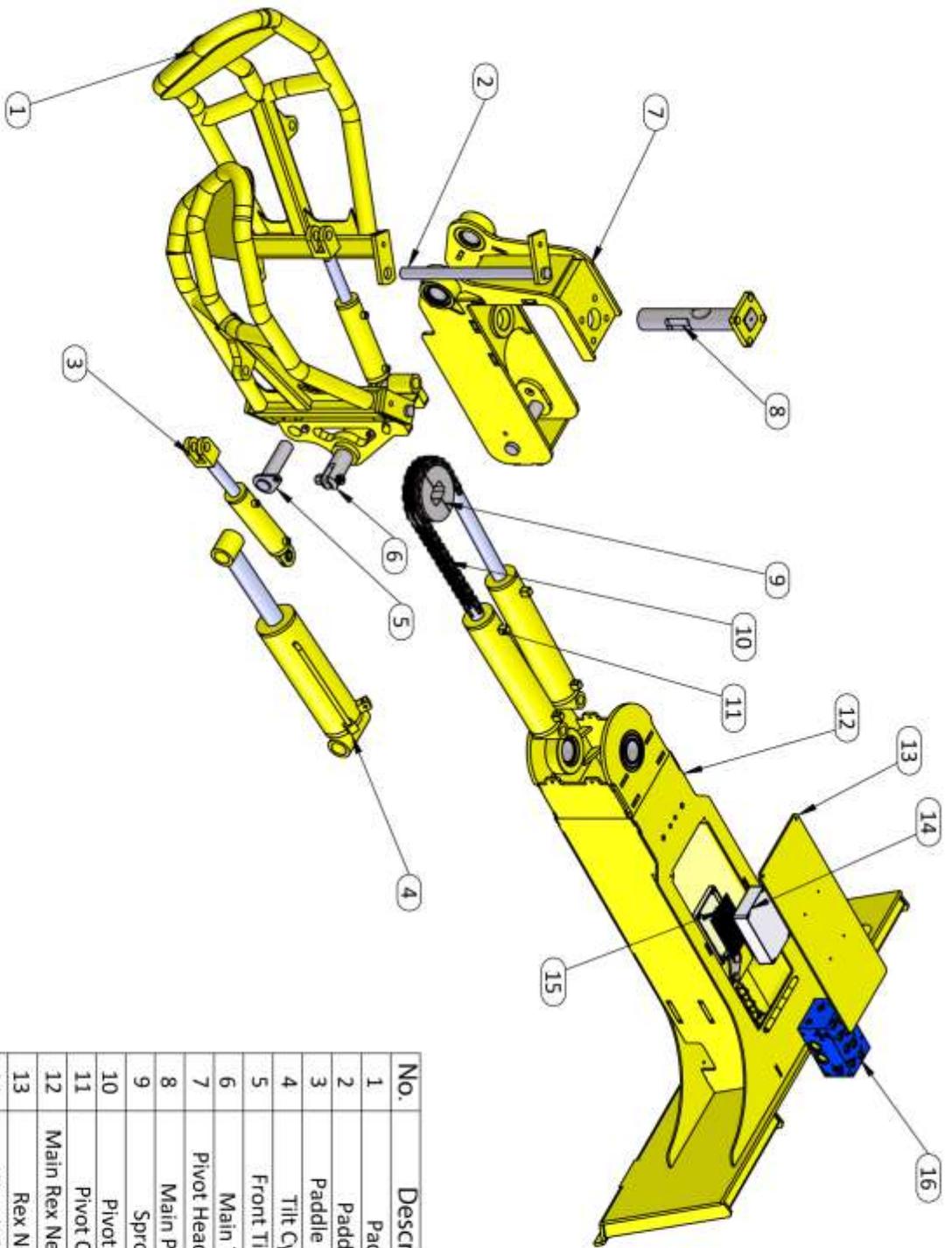
If the above tips do not help the problem, unplug the wire harnesses on the circuit board itself and remove it from its housing by unscrewing the bolts located on the corners and check to see if there is any discoloration on the back of the board.

**If there is discoloration on the back of the circuit board, it is advised that you call for technical support from Dutchman Industries Inc.**



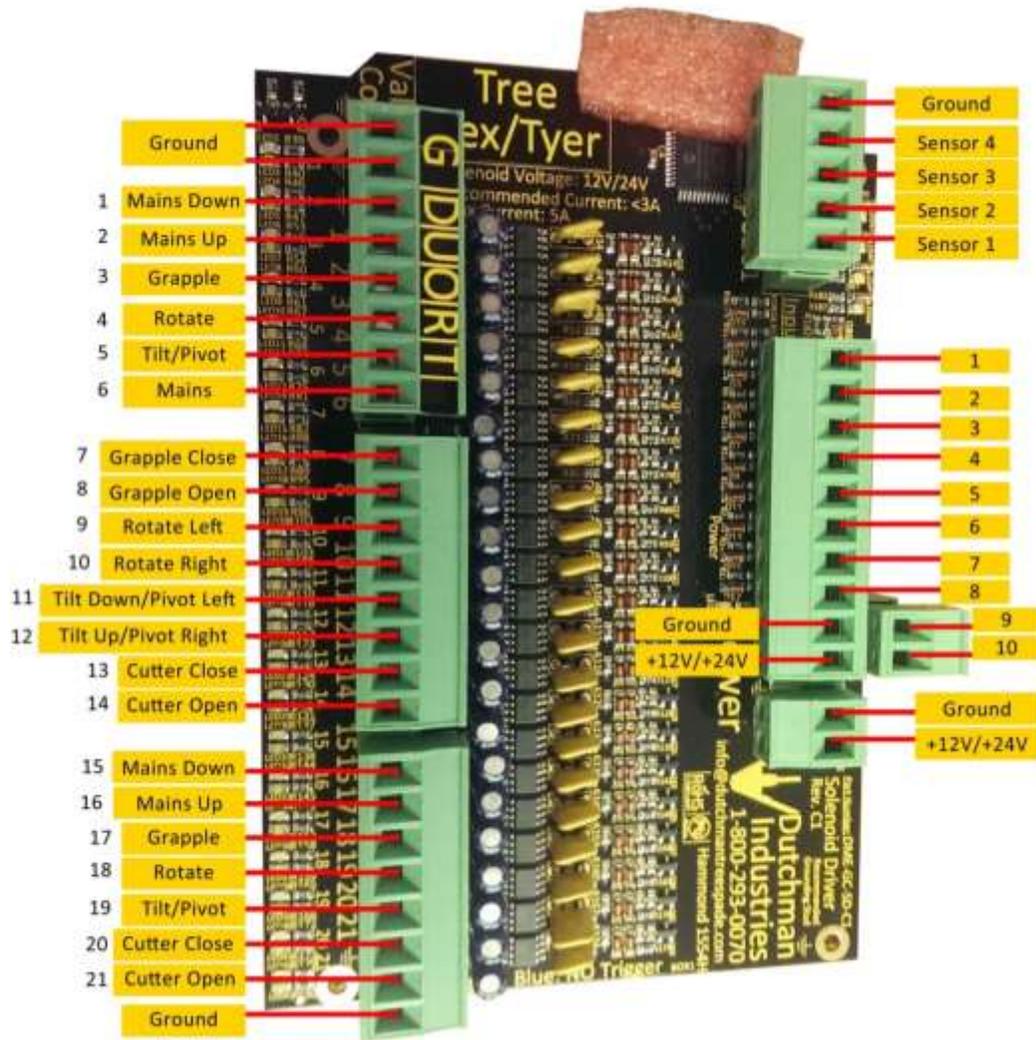
# **DUTCHMAN TREE REX**

## **SCHEMATICS & PARTS LISTS**

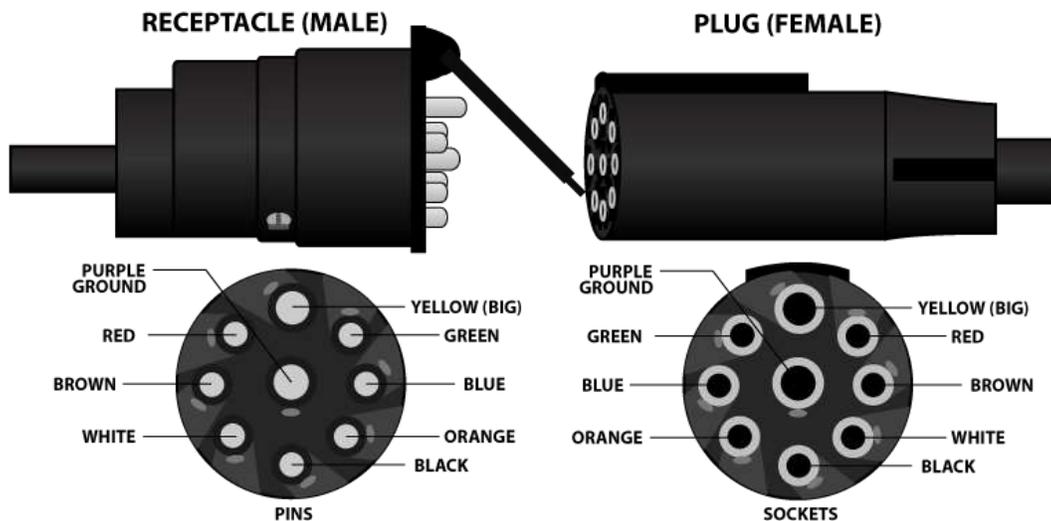


No.	Description
1	Paddle
2	Paddle Pin
3	Paddle Cylinder
4	Tilt Cylinder
5	Front Tilt Cyl Pin
6	Main Tilt Pin
7	Pivot Head Assembly
8	Main Pivot Pin
9	Sprocket
10	Pivot Chain
11	Pivot Cylinder
12	Main Rex Neck & Hookup
13	Rex Neck Lid
14	Circuit Board Box
15	Tree Rex Circuit Board
16	Tree Rex Valve

# TREE REX CONTROL PANEL WITH CIRCUIT BOARD



# PLUG WIRING DIAGRAM



# REPLACEMENT PARTS LIST

## ELECTRIC PARTS

**PLUG**



**RECEPTICAL**



**8 Ft Cable with Hydraulic Hose and Plug**



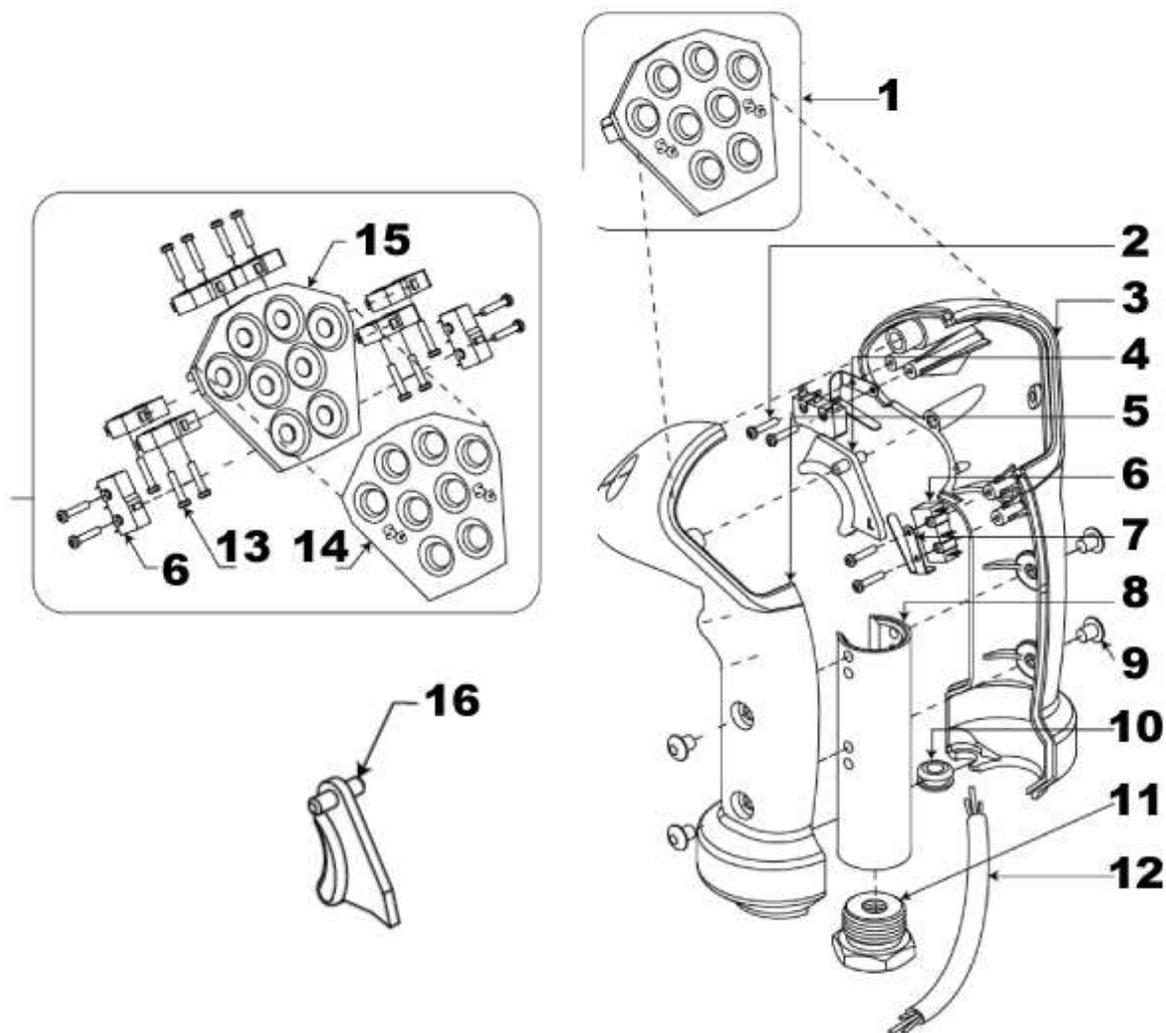
**Pistol Grip Joystick Controller**



**Replacement Wire (Sold By The Foot)**



## DUTCHMAN PISTOL GRIP JOYSTICK CONTROLLER



Ref. #	Part #	Description
1	L-FP-A8	"L" 8 Switch Pack Assy.
2	SC-21	2 X 9/16" Tapping Screen - Pan Head (Trigger)
3	L-HL-R-G	"L" Handle Case Right - Grey (Black) (L-HL-02 Handle Case Right - Old Style)
4	L-TR-02	"L" Double Trigger
5	L-HL-L-G L-HLR-Kit-B	"L" Handle Case Left -Grey (Black) (L-HL-01 Handle Case Left - Old Style) "L" Handle Case Upgrade Kit Assy. - Black (Grey)
6	SW-00	Handle Switch, L/S
7	LS-00	Leaf Spring for Trigger
8	PN-03	Mounting Pin "L/S"
9	SC-02SS	10-32 X 3/8" Capscrew - Button Head
10	GR-01	3/8" X 1/4" Grommet
11	BU-00	Adapter Bushing - 1/4" Hole
12	L2-M8-W	"L" Handle 8 Button Faceplate Wire Harness
13	SC-03	2 X 7 1/16" Tapping Screw - Pan Head (Faceplate)
14	L-ME-A8	"L" 8 Button Overlay
15	L-FP-01	"L" Series Empty Faceplate

## VALVE PARTS



Actuator Stem (Working Section) SV10-28



Solenoid Coil



Actuator Stem (Main Section) SV10-29



Relief Cartridge



Manifold Valve Circuit Board (Black Board)



**TREE REX PARTS**

Tilt Cylinder



Paddle Cylinders



Paddle Pins



Main Pivot Pin



Pivot Cylinders



Pivot Chain



Paddles







# **DUTCHMAN PISTOL GRIP JOYSTICK**

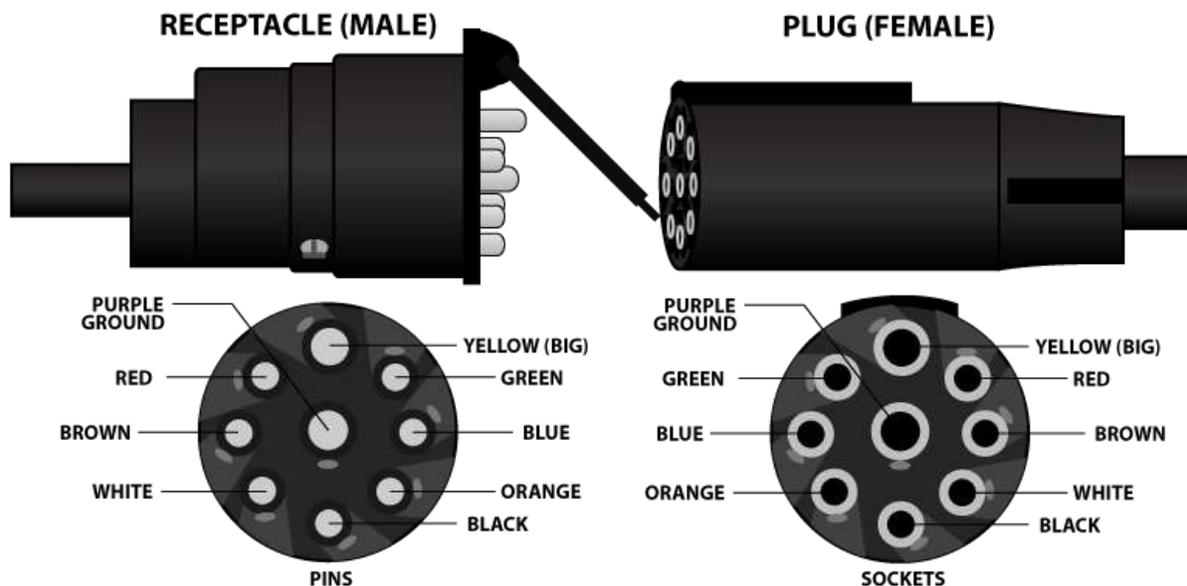
## **MOUNTING INSTRUCTIONS**

## DUTCHMAN INDUSTRIES INC. PISTOL GRIP JOYSTICK MOUNTING

➔ **WARNING:** Always ensure that the vehicle is shut-down and all power is off before beginning installation of the pistol grip joy stick.

Before beginning installation of the pistol grip joystick, check to see if it will be necessary to remove the 9-pin receptacle plug for wiring. Mounting the joystick on a skid steer or track loader according to the instructions below typically requires removing the receptacle. If it is necessary to remove the receptacle, do so before continuing to mounting.

### 9-PIN PLUG



### SKID STEER/TRACK LOADER MOUNTING

Before mounting the pistol grip onto your loader, be certain you have decided exactly what side (left or right) you prefer. Since all loader handles have a multi-button control system, the pistol grip joystick cannot simply replace an existing handle because of the loss of too many functions. To alleviate this problem, your pistol grip joystick will have included an “adapting bracket.” Simply attach the bracket to the side of the desired handle. **Be sure to screw your joystick into the adapting tube before mounting to test the placement.** Clamp down the bracket and tighten it securely. This system will still allow you to operate your loader arms because the pistol grip now becomes an extension of the previous handles.

The pistol grip has an extra wire along with the positive and negative end, approximately 12 inches down from the handle base. This auxiliary wire can be used as a hook-up for any kind of 12-volt, 5-amp external device. If no external device needs to be added, it may be left alone in place.

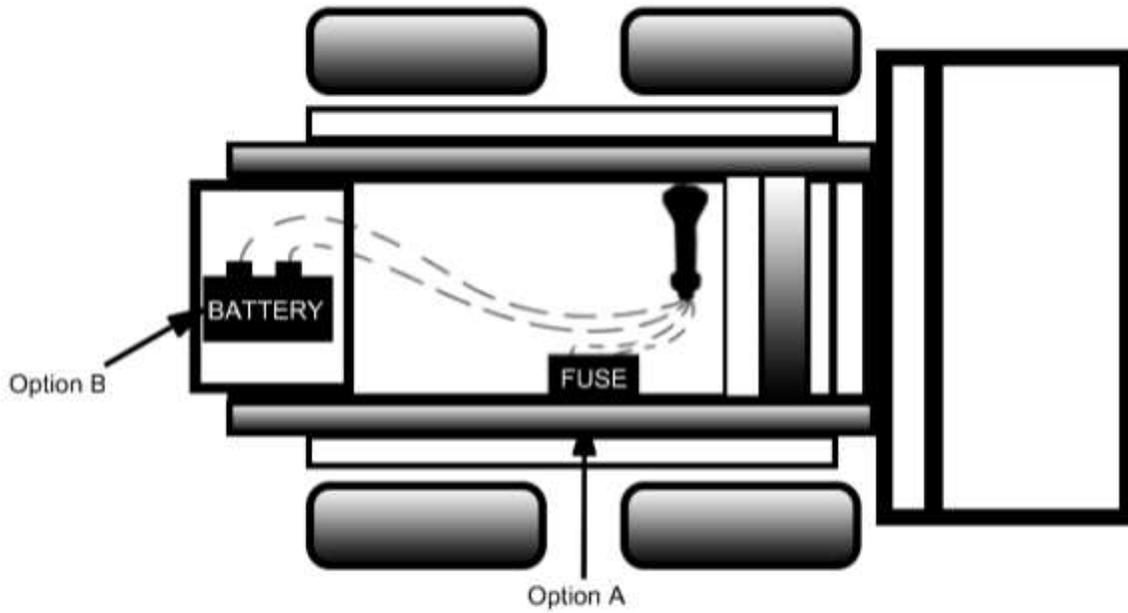
When the wiring in the cab is complete, allow the cable to run out the back of the skid steer cab and onto the back loader arm. Run the cable down towards the front of the loader arm

and attach to the receptacle plug bracket. See the diagram on the next page for an example. Clip cables down as desired and find a positive and negative connection in your skid steer.

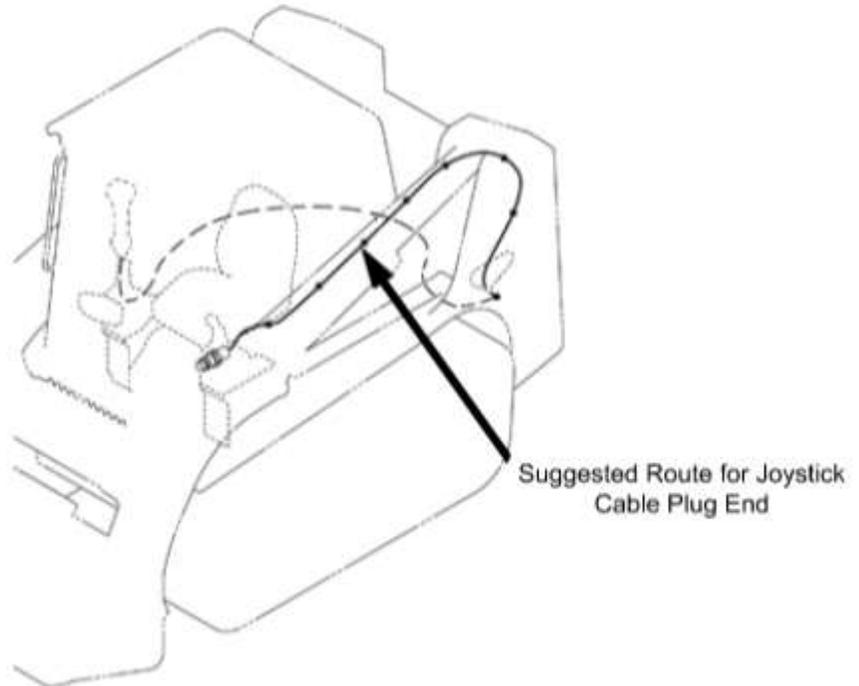
### SKID STEER WIRING DIAGRAM

#### Top View

Suggested Power and Ground Hookup for Joystick



#### Side View

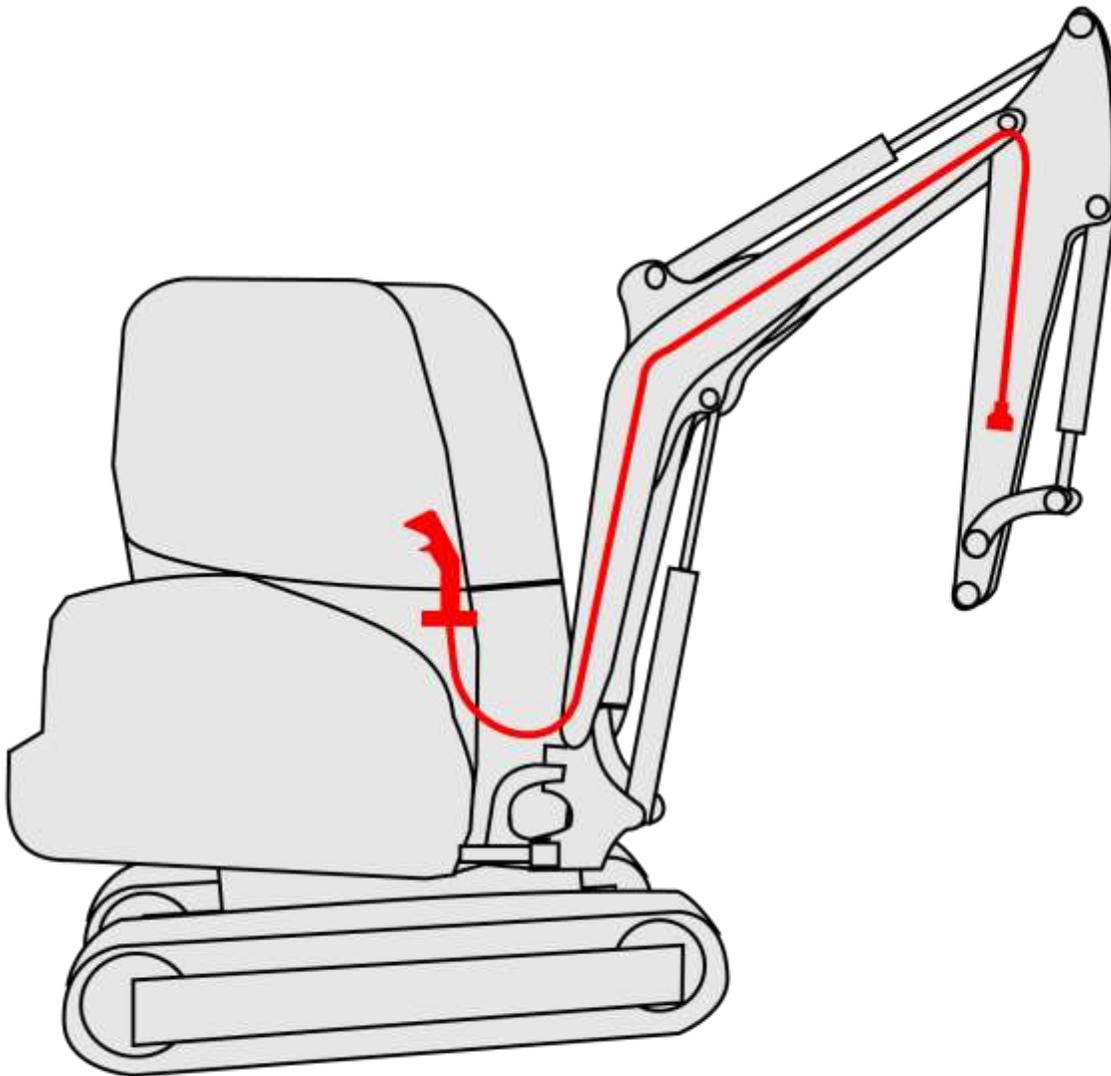


## ARTICULATED LOADER/EXCAVATOR MOUNTING

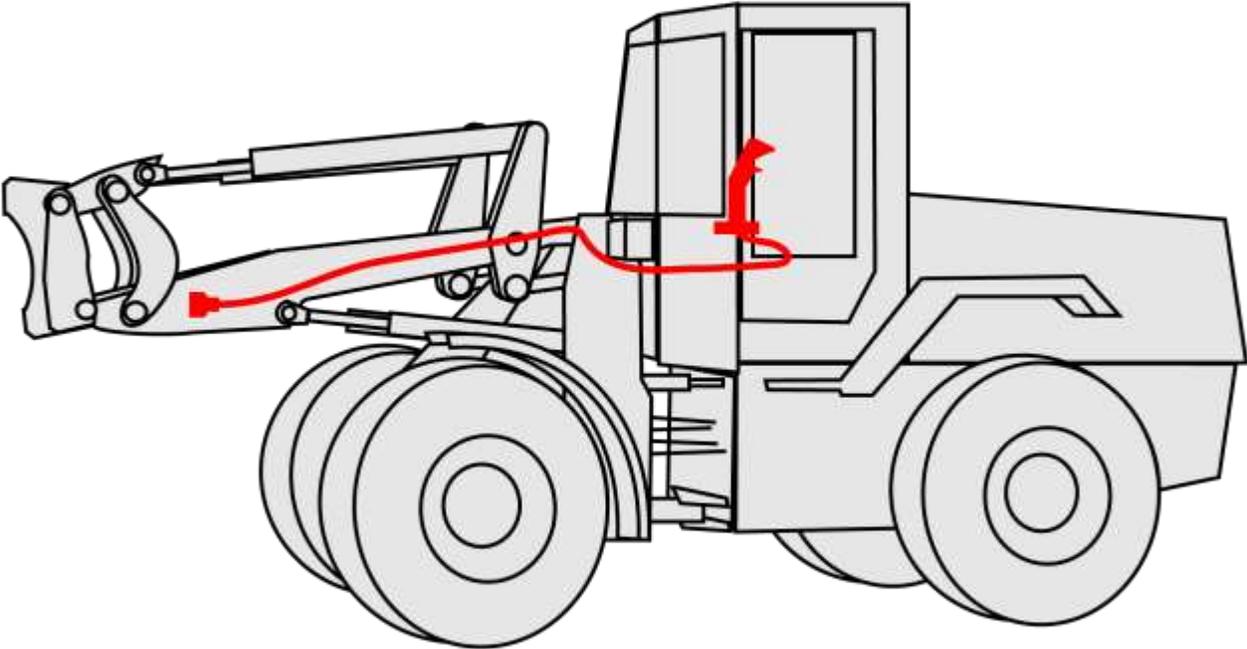
All loaders and excavators will have a mounting system similar to the skid steer/track loader mounting above. Once your pistol grip has been installed, run your cable out of the front of the cab and down your loader arm. This may mean that you have excess cable. Tie up any excess cable in a safe location inside the loader cab to avoid pinching or damage. **Be sure your cable is secured so that it is not subject to pinching or cutting by the loader bucket.** The way the cable runs out of the cab is up to the end user's preference.

**NOTE: After your Pistol Grip Joystick has been installed, proper service checks should be made to ensure that the joystick is functioning properly. Also make sure you have a solid positive and negative connection. Any bad connection will not allow the piece of equipment to function.**

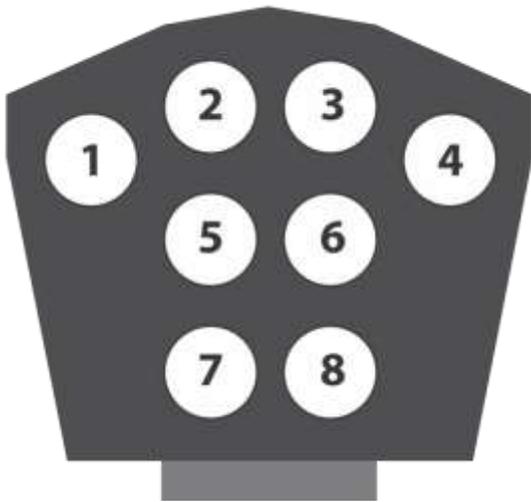
## EXCAVATOR WIRING DIAGRAM



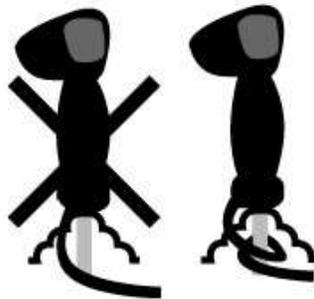
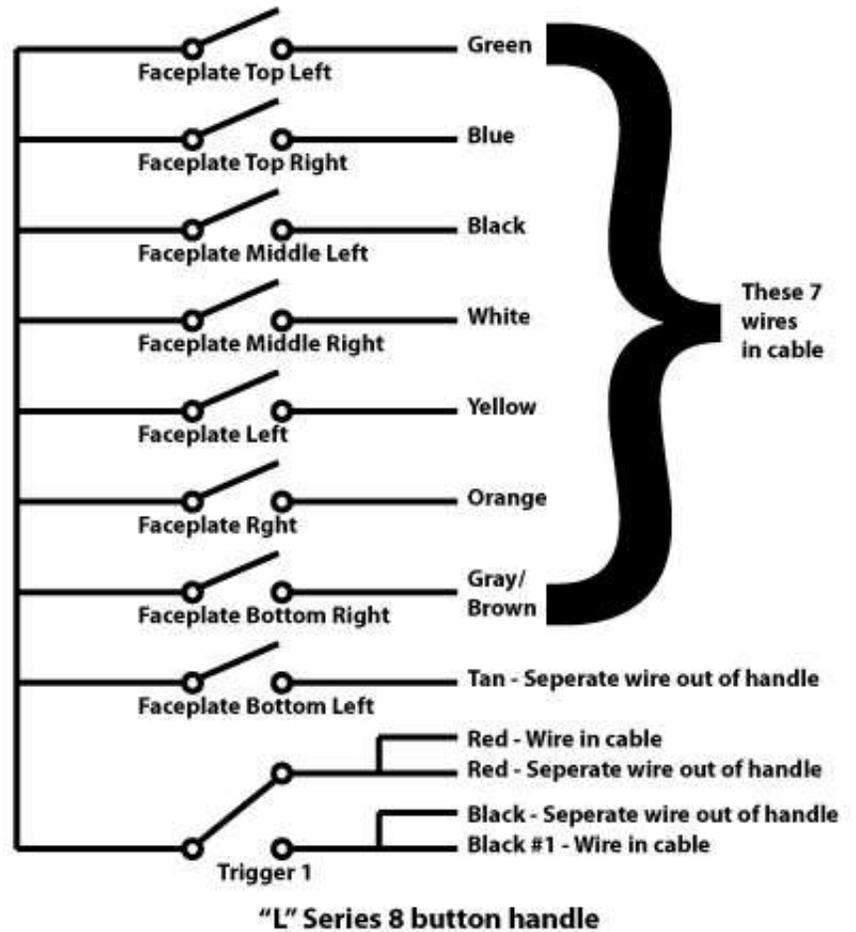
**WHEEL LOADER WIRING DIAGRAM**



## PISTOL GRIP SCHEMATICS



Button Position	Wire Colour
1	Yellow
2	Green
3	Blue
4	Orange
5	Black
6	White
7	Brown
8	*Auxiliary*

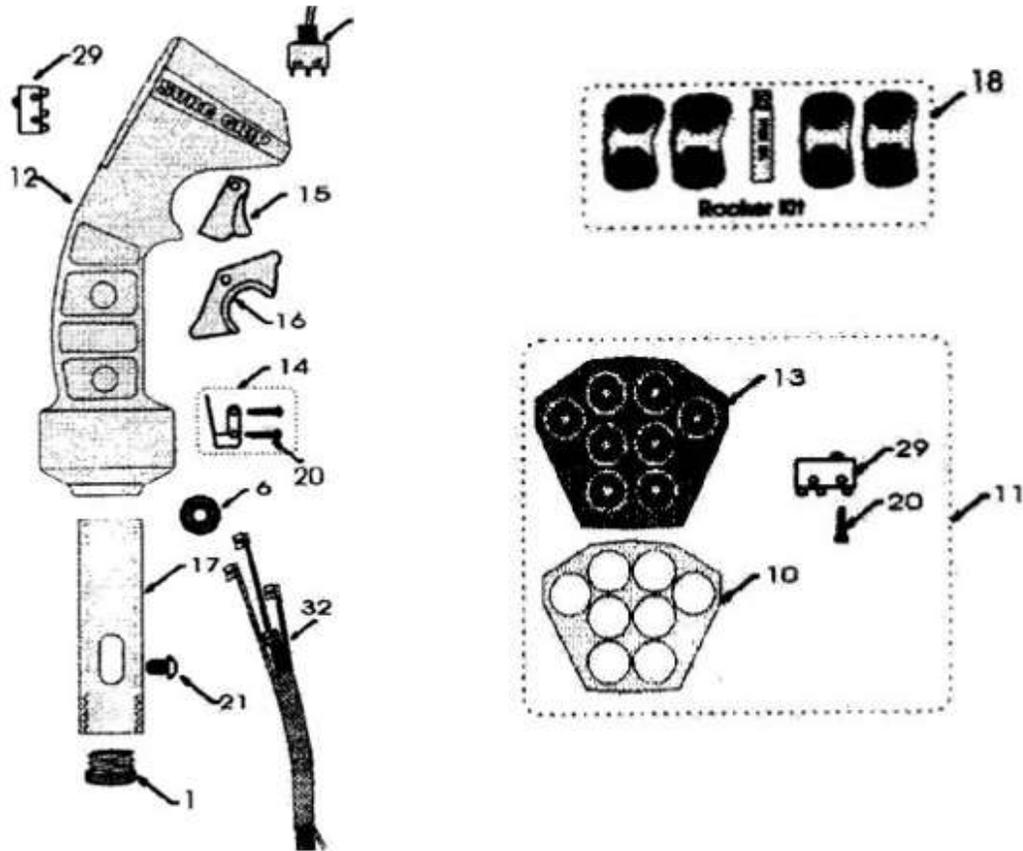


Most wire breakage problems can be traced back to two common installation mistakes.

**Crushing the wire:** Nylon tie wraps are very useful in giving the wire harness a neat and finished appearance, but applying them too tightly can crush the wire insulation and pinch the wires. When the cable is pinched, it doesn't allow the wire to slide inside the cable jacket which creates a stress point.

**Forcing the wire to flex at one point:** If the wire from the control handle is routed down the joystick shaft with little slack the wire will tend to flex over a small area. Eventually the repeated flexing will cause the wire strands to break. The solution is to provide enough slack in the cable so the flexing motion is distributed over a longer section of wire.

## PISTOL GRIP SCHEMATICS & PARTS LIST



#	Part	Description	#	Part	Description
1	BU-00	5/16 Unthreaded Bushing	14	L6-01	Leaf Spring Kit
	BU-01	10 mm X 1.25 Bushing	15	L-TR-01	Single Trigger
	BU-02	12 mm X 1.25 Bushing	16	L-TR-02	Double Trigger
	BU-03	12 mm x 1.75 Bushing	17	PN-03	Mounting Pin
	BU-04	14 mm X 2 Bushing	18	RK-02	Rocker Lid
	BU-05	5/6" NC Bushing	20	SC-03	#2 X7/16" Self-Tapping Screw
8	GR-01	Wire Grommet	21	SC-02	10 - 32 X 3/8" Screw
10	L-FP-01	"L" Series Empty Faceplate	29	SW-00	Switch (Faceplate or Trigger)
11	L-FP-A8	8 Function Switch Pack Assy	31	T0-2MA	Toggle (on/off)
12	L-HL-01	Handle Case - left		T0-3M0	Toggle (on)/off/(on)
	L-HL-02	Handle Case - right	32	L1M8-W	Harness (Single Trigger)
13	L-ME-A8	5 Button Overlay		L2M6-W	Harness (Double Trigger)

# Dutchman Industries Inc.

## W A R R A N T Y

Dutchman Industries Inc., herein referred to as DMI, warrants each new industrial product of its own manufacture to be free from defects in material and workmanship, under normal use and service for one(1) full year after delivery to the owner.

During the warranty period, the authorized selling DMI Dealer shall furnish parts without charge for any DMI product that fails because of defects in material and/ or workmanship. This warranty and any possible liability of DMI hereunder is in lieu of all other warranties express, implied or statutory, including but not limited to any warranties of merchantability or fitness for a particular purpose.

The parties agree that the Buyer's SOLE AND EXCLUSIVE REMEDY against DMI, whether in contact or arising out of warranties, representations, instructions, or defects shall be for the replacement or repair of defective parts as provided herein. The Buyer agrees that no other remedy (including, but not limited to, incidental or consequential loss) shall be available to them. If, during the warranty period, any product becomes defective by reason of material or workmanship and the Buyer immediately notifies DMI of such defect, DMI shall, at its option, supply a replacement part or request return of the product to its plant in Brougham, Ontario, Canada. No parts shall be returned without prior written authorization from DMI, and this warranty does not obligate DMI to bear any transportation charges in connection with the repair or replacement of defective parts. DMI will not accept any charges for labour and/or parts incidental to the removal or remounting of parts repaired or replaced under this Warranty. **A formal, faxed estimate to DMI is required prior to any foreseen warranty repairs, alterations and/or labour.**

This Warranty shall not apply to any part or product which have been installed or operated in a manner not recommended by DMI; nor to any part or product that has been neglected or used in any way, which in the Manufacturer's opinion, adversely affects its performance; not negligence of proper maintenance or other negligence, fire or other accident; not with respect to wear items included but not limited to items such as tree spade blades and wear strips; nor if the unit has been altered or repaired outside of a DMI authorized dealership in a manner of which, in the sole judgment of DMI affects its performance, stability or reliability. Equipment and accessories not of DMI manufacture are warranted only to the extent of the original Manufacturer's Warranty and subject to their allowance to DMI, if found defective by the original Manufacturer.

DMI reserves the right to modify, alter and improve any product or part without incurring any obligation to replace any product or parts previously sold with such modified, altered, or improved product or part.

No person is authorized to give any other Warranty or to assume any additional obligation on the behalf of DMI unless made in writing and signed by an officer of DMI.