



M K - V T R A C T O R

OPERATOR GUIDE

⚠ WARNING

Keep this Operator Guide with the tractor. Store it in the seat back pocket when not in use. Consult its content before any first use and for any questions. Contact Monarch or one of its authorized dealers with any Product operating or maintenance questions.

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OPERATOR SAFETY WARNINGS

The content of this entire Operator Guide is to be treated as safety instructions and conveyed to every user.

This is an agricultural tractor and not a motor vehicle intended for use on highways and public roads.

Failure to abide by the contents of this Operator Guide can lead to serious injury including death.

This Operator Guide must be kept with the tractor, in the seat back pocket provided for its safe keeping, when not being consulted.

The information contained herein, including depictions, were correct at time of printing, but given our commitment to product quality and innovation some changes may exist between your unit and the illustrations in this Operator Guide.

The tractor has innovative features such as a front trunk or FRUNK. The FRUNK is NOT designed or intended to carry passengers. Passengers can obstruct the operator visibility, the tractor center of gravity and otherwise cause losses of control and injury even death. NEVER allow anyone to sit in the FRUNK.

Children under the age of 16 should not be allowed to operate the Monarch Tractor. Never allow riders. Only the operator can ride/be seated in the tractor.

The Monarch Tractor is an autonomous capable tractor, Check with your local authorities on permissibility of autonomous functions in your area, and never attempt an autonomous function you have not performed while successfully driving the tractor with an operator in the seat first.

Transporting Flammable or Dangerous Material

⚠ WARNING



V03M01G

POTENTIAL HAZARD

Transporting flammable or dangerous material can lead to explosions.

WHAT CAN HAPPEN

This can cause serious injury or death.

HOW TO AVOID THE HAZARD

Never transport flammable or dangerous material.

⚠ WARNING

Be careful when loading and transporting liquid reservoirs. They can affect vehicle stability when side hilling by pulling downhill and increasing the risk of a rollover.



WARNING: Failure to operate the Monarch Tractor or attempts to modify, repair, or maintain the Monarch Tractor in violation of Monarch approved procedures or instructions or otherwise disregard any terms of this Operator Guide. Visit www.monarchtractor.com/safety for instructions on Operator and safe use of Monarch Tractor.



Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



Fasten seat belt snugly.



Always keep arms and feet inside the operator's area.



Do not use tractor in atmosphere with explosive dust, explosive gas, or where exhaust



Never exceed tractor load capacities.



Use only attachments and implements approved by Monarch Company for this tractor.



Never carry riders.



Keep bystanders away from work



Never use the Monarch Tractor without instructions.

See Monarch Tractor decals on the tractor.

Always keep all body parts within operator area

Read Operator Guide



FOREWORD

This Operator Guide was written to give you, the owner / operator, instructions on the safe operation and maintenance of the Monarch Tractor. **READ AND UNDERSTAND THIS OPERATOR GUIDE BEFORE OPERATING YOUR MONARCH TRACTOR.** If you have any questions, see your Monarch dealer. This Operator Guide may illustrate options and accessories not installed on Monarch Tractor.



The innovative and class exclusive FRUNK

Always secure all loads using all 8 attachments points and do not exceed listed and indicated loads.

Handy for bulky items you need access to. DO not block operators' views.

CONTENTS

PREVENTIVE MAINTENANCE

SAFETY AND TRAINING RESOURCES

INSTRUCTIONS

SPECIFICATIONS

WARRANTY

SAFETY EQUIPMENT

The Monarch Tractor must be equipped with safety items necessary for each activity. Ask your dealer for information on the safe use of attachments and accessories.

1. **SEAT BELTS:** Check fasteners, check for damaged webbing or buckle.
2. **ROPS with Integrated Smart Roof Technology:** It must be maintained in good condition with all fasteners tight. **DO NOT** modify the ROPS or roof, including by connecting hardware to the ROPS or by attempting to add any electric connections into the roof.
3. **SAFETY SIGNS (DECALS):** Replace if damaged or missing.
4. **SAFETY INTERLOCK SYSTEM:** Check function.
5. **GRAB HANDLES:** Replace if damaged.
6. **PARKING BRAKE:** Check adjustment.

KEEP OUT PROCESS FOR AUTONOMOUS OPERATION

The State of California has specific requirements and guidelines for autonomous agricultural equipment.

The requirements applicable in California to operate the Monarch Tractor in an autonomous fashion are outlined in the memorandum of understanding we attach in APPENDIX A, starting on Page 67 of this Operator Guide. Owners and Operators must take it upon themselves to follow and comply with the guidelines contained in that appendix, in order to be in compliance for autonomous operations in California.

PROPOSITION 65 WARNING: Operating, serving or otherwise being in the vicinity of vehicles can expose you to chemicals (including lead and phalates, and fluids contained in the vehicle. Battery posts, terminals and related components contain lead and lead compounds. Wash your hands after handling and always wear gloves when servicing) which are known to the State of California to cause cancer and birth defect, or reproductive harm. Minimize exposure, avoid touching components containing such chemicals, use the vehicle in a well-ventilated area and wear gloves or wash your hands frequently. Also be aware that agricultural activities may release such chemicals in the atmosphere. Wear appropriate protective clothing in equipment in consequence and avoid inhaling or ingesting such chemicals. For more information go to www.p65warnings.ca.gov and your consult local SDS data sheets.

REFERENCE INFORMATION

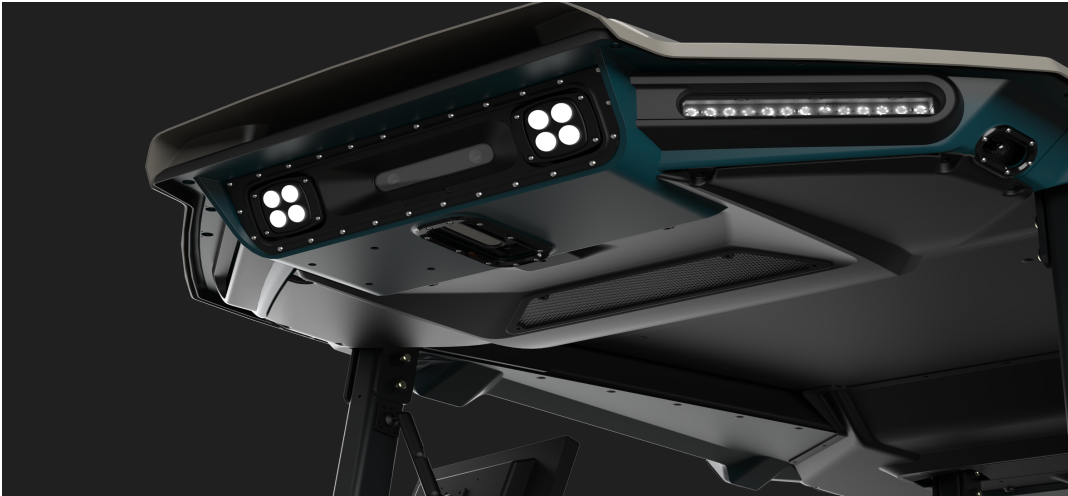
Write the correct information for your Monarch Tractor in the spaces below. Always use these numbers when referring to your Monarch Tractor.

Monarch Tractor PIN Number:

WARNING

Pressure Washing

Do not pressure wash the Monarch tractor. Pressure washing the Monarch tractor can cause electrical issues that would not be covered under warranty.



The Monarch Tractor smart roof has loads of sensors, antenna and cameras that allow connectivity and make the tractor autonomous capable. They can live outside but won't like being underwater or under pressure. Clean them with soft flows of water (garden hose pressure at or below 100PSI) and keep them unobstructed, e.g., dust and dust affecting visibility will impair precision.

WARNING

The same goes for the electrical input/output plugs on the right-hand side of the dash: do not get them wet especially with high pressure. Never connect any plugs that are wet or have moisture. Electricity and water do not mix and doing so could lead to a fire or shock.

Daily Maintenance Checkpoint Table:
Tire pressure, wear, or damage
Oil, hydraulic fluid, or coolant leakage from tractor or implement
Damage to tractor body, tightness of all bolts, nuts, and pins
Implement and accessory blades and belts for wear and damage
Emergency stops, speed control lever, all safety switches and easy checker functions
Abnormal noise or vibrations
Clean – radiator screen and core, panel, and hood screens

**Scheduled
Maintenance**

General Maintenance Checkpoint Table:	Hour Meter Reading: Check or Change at Intervals Shown Below																				
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	Annual	
Gearbox fluid change	x				x					x					x					x	
Hydraulic oil filter	x				x					x					x					x	
Front diff./wheel case oil change					x					x					x					x	
Steering gear case oil					x					x					x					x	
Battery electrolyte level		x		x		x		x		x		x		x		x		x		x	
Greasing all zerk fittings		x		x		x		x		x		x		x		x		x		x	
Brake pedal play		x			x					x					x					x	
Front axle toe-in check		x			x					x					x					x	
Front axle front-back play		x			x					x					x					x	
Clean radiator screen	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Check coolant level	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Check tire pressure	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Check tire wear	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Check all safety switches for correct operation	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Replace coolant										x											x
Check power steering hoses		x			x					x					x					x	x
Check hydraulic lines		x			x					x					x					x	x
Check radiator hoses		x			x					x					x					x	x

MONARCH TRACTOR IDENTIFICATION

PIN NUMBER LOCATIONS

Always use the PIN number of the Monarch Tractor when requesting service information or when ordering parts.

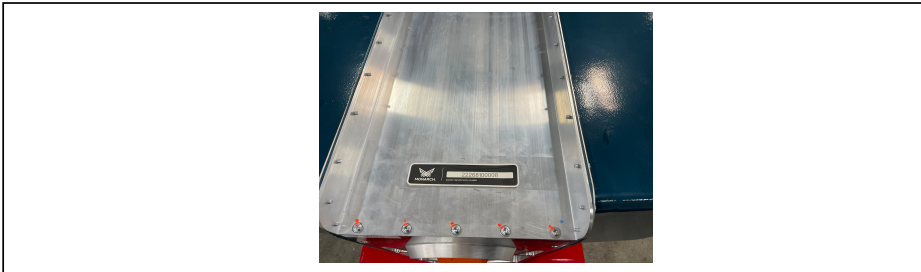
Monarch Tractor PIN Number

The Monarch Tractor PIN number plate is located on the outside of the ROPS frame **on the left hand/ boarding side**



Battery Serial Number

The Monarch Tractor battery serial number is located on top of the battery, which cannot be removed or serviced in the field.





Use only approved accessories or suitable equivalents, such as Monarch Tractor ballast weights designed to enhance your tractor's performance and not void the limited warranty.

WARNING: Do not use the front cross member that allows weights to be mounted as a pulling or pushing device. It is a structural component of the tractor and NOT designed to be used as a bumper or tow or lifting point. Structural damage may occur if you use it for lifting or pushing.

The same is true of our front-end cap. It is designed to help protect the battery against slight and incidental impacts (not exceeding 3MPH) and using the cap as a bumper to push will not only void your warranty it may cause battery damage which in some cases can lead to a fire. **DO NOT USE THE FRONT OF THE REACTOR TO PUSH OR COLLIDE WITH ITEMS.** Our smart roof sensor suite is always present and designed to help you record instances you need to review.

SAFETY AND TRAINING RESOURCES

Safety Instructions



Before Operation

- Wear all protective safety apparel, including high visibility safety vest, approved ANSI eyewear and over the ankle boots and follow your site's safety protocols.
- Complete visual inspection of tractor before boarding.
- Log in to Smart Screen and check active error codes. Contact Monarch Tractor if any Level 3 errors are present.
- Use Monarch Tractor-issued front ballast weights as needed.
- For 3 point hitch mounted implements: Set and test minimum and maximum operating heights via Smart Screen.
- Do not exceed the following capacities:
 - Max. 3 point hitch (24" behind the lift points) lift: 1,650 lbs (750 kg)
 - Max. drawbar tow: 5,500 lbs (2,500 kg)
 - Max. tongue load: 1,100 lbs (500 kg)

Use Safety Rules

- Every autonomously operating tractor must have a designated fleet manager responsible for continuously monitoring each tractor. Do not modify any component of the Monarch Tractor without first consulting Monarch Tractor.
- If any Level 3 error codes are active, do not operate the tractor; seek guidance from Monarch Tractor immediately.
- Only one person should sit in the Monarch Tractor at a time. There are no provisions for a second rider anywhere on the Monarch Tractor. Do not drive the Monarch Tractor on public roads or highways.
- Do not share your personal PIN Code with other Operators. Log out from the Smart Screen when finished using the Monarch Tractor.
- In the event of an emergency, use the Emergency Stop and contact relevant public departments as needed. Contact Monarch Tractor once emergency help is on the way.

Battery Handling

- The Lithium-Ion battery can cause serious injury, including death. Removing or installing the Lithium-Ion battery must be performed by trained and authorized personnel only.
- Do not modify, handle, or remove the battery by hand or with any other equipment. Battery gas can explode and cause serious injury, including death.
- In the event of battery damage, do not drive the Monarch Tractor. Leave the Monarch Tractor at the location of impact and power it down. Report to Monarch Tractor immediately.
- Report all battery damage and concerns to Monarch Tractor. Do not attempt to charge or service the battery. The battery is a very high voltage device and should be serviced by qualified personnel only.
- Charge the battery only using the Monarch Tractor provided J1772 adapter.



SAFETY INSTRUCTIONS (CONT'D)

Before Operation

Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly at least once each year or more often if the tractor is exposed to severe environmental conditions or applications.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolorations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt, and stiffness.
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged, or casing broken.
3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.
4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original color of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

See your Monarch dealer for seat belt system replacement parts for your machine.

Carefully follow the operating and maintenance instructions in this guide.

The Monarch Tractor is highly maneuverable. It is rugged and useful under a wide variety of conditions. This utility presents an operator with hazards associated with off highway, rough terrain applications, common with Monarch tractor usage.

This operating guide covers the capabilities and restrictions of the Monarch Tractor and attachment or implement for each application. Your authorized Monarch Tractor dealer can also demonstrate the safe operation according to Monarch Tractor instructional materials, which are also available to users of Monarch Tractors. An authorized Monarch Tractor dealer can also identify unsafe modifications or use of unapproved attachments or implements. The attachments and implements are designed for the three-point hitch lift capacities. They are designed for secure fastening to the Monarch Tractor. The user must check with an authorized Monarch Tractor dealer, or Monarch Tractor literature, to determine safe loads of materials of specified densities for the Monarch Tractor and attachment / implement combination.

The following publications and training materials provide information on the safe use and maintenance of the Monarch Tractor and attachments / implements:

- The Pre-Delivery Inspection checklist and/or Arrival Condition Report is used to assure that the Monarch Tractor is in delivered to the first user in a safe operating condition.
- The Operator Guide delivered with the Monarch Tractor gives operating information as well as routine maintenance and service procedures. It is a part of the Monarch Tractor and can be stored in a container provided on the Monarch Tractor. Replacement Operator Guides can be ordered from your Monarch Tractor dealer.
- Monarch Tractor signs (decals) instruct users on the safe operation and care of your Monarch Tractor or attachment / implement. The signs and their locations are shown in the Operator Guide. Replacement signs/decals are available from your Monarch Tractor dealer.

The Monarch Tractor dealer and each owner / operator of a Monarch Tractor must review the recommended uses of the Monarch Tractor when delivered. If the owner / operator will be using the Monarch Tractor for a different application(s) he or she must ask their Monarch Tractor dealer for recommendations on the new use.

Objects that are high may affect visibility for the driver and may act as projectiles in case of an accident. Loads that protrude sideways can get snagged or caught in bush, branches or other obstacles. Avoid covering and obstructing the brake lights with the cargo. Ensure no cargo protrudes outside the cargo rack and that cargo will not interfere with your visibility or control of the vehicle.

NOTICE

Do not exceed the cargo racks capacity. Refer to *Technical Specifications*.

Never carry gasoline container(s) or any dangerous liquids on the cargo rack.

Hauling a Load

Never pull a load by attaching it to the bumper; this can cause the vehicle to tip over. Use only the trailer hitch (if installed) to pull a load.

In an emergency situation, use the recovery hook to recover a stuck vehicle, refer to *Recovery Hooks*.

When pulling loads with a chain or cable:

- Ensure that there is no slack before starting and maintain tension while pulling.
- Be sure to brake progressively. The inertia of the load could lead to an impact.

WARNING

A slack in the chain or cable can cause it to break and snap back.

When hauling a load, respect the maximum hauling capacity, refer to *Pulling a Trailer*.

When pulling another vehicle, be sure that someone is controlling the pulled vehicle. They must brake and steer to prevent the vehicle from going out of control.

Reduce your speed when hauling a load and turn gradually.

Avoid hills and rough terrain.

Never attempt steep hills.

Drop-Offs

WARNING

Avoid negotiating drop-offs. Reverse and select an alternate route.

This vehicle will "bottom out" and usually stop if either the front or rear wheels are driven over a drop-off. If the drop is sharp or deep, the vehicle will nose dive and tip over.

POTENTIAL HAZARD

Stalling, rolling backwards or improperly dismounting while climbing a hill.

WHAT CAN HAPPEN

Could result in vehicle overturning.

HOW TO AVOID THE HAZARD

Use low gear and maintain steady speed when climbing a hill.

If you lose all forward speed:

Operator and passenger (2-UP models) must keep their weight uphill.

Never open the throttle suddenly or make sudden gear changes. The vehicle could flip over backwards.

Apply the brakes.

Apply the parking brake after you have stopped.

Disembark on uphill side, or to a side if pointed straight uphill (passenger first on 2-UP models).

If you begin rolling backwards:

Operator and passenger (2-UP models) must keep their weight uphill.

Never open the throttle suddenly or make sudden gear changes. The vehicle could flip over backwards.

Never apply the rear brake while rolling backwards.

Apply the front brake gradually.

When fully stopped, apply rear brake as well and apply the parking brake.

Disembark on uphill side, or to a side if pointed straight uphill (passenger first on 2-UP models).

Turn the vehicle around and remount, following the procedure described further in this Operator's Guide.

POTENTIAL HAZARD

Overloading this vehicle, carrying or towing cargo improperly.

WHAT CAN HAPPEN

Could cause changes in vehicle handling which could lead to an accident.

HOW TO AVOID THE HAZARD

Never exceed the stated load capacity for this vehicle including operator and passenger (2-UP models) as well as other loads and added accessories.

Cargo should be properly distributed and securely attached.

Reduce speed when carrying cargo or pulling a trailer. Allow greater distance for braking.

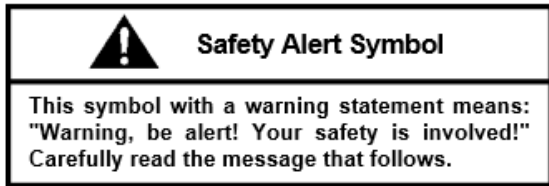
Always follow the instructions in this Operator's Guide for carrying cargo or pulling a trailer.

WARNING

Ensure operator's seat is properly locked in position by pulling back and up several times. Even if a distinctive snap is heard during the installation, always pull it back and up to confirm proper latching.

SAFETY INSTRUCTIONS (CONT'D)

Safe Operation Is the Operator's Responsibility



Operator must have instructions before operating the tractor. Untrained operators can cause injury or death.



This notice identifies procedures which must be followed to avoid damage to the tractor.



The signal word DANGER on the tractor and in the Operation Guide indicates a hazardous situation which, if not avoided, will result in death or serious injury.



The signal word WARNING on the tractor and in the Operation Guide indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

The Monarch Tractor and attachment / implement must be in good operating condition before use.

Check all the items on the Monarch Service Schedule as shown in the Operator Guide.

Safe Operator Needs a Qualified Operator

For an operator to be qualified, he or she must not use drugs or alcoholic drinks which impair alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he or she can safely operate a tractor and the attachment / implement.

A Qualified Operator Must Do the Following:

Understand the Written Instructions, Rules, and Regulations

- The written instructions from Monarch Tractor include the Arrival Condition Report or Pre-Delivery Inspection checklist, Operator Guide, and on product labels (decals).
- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may apply to local driving requirements or use of a Slow-Moving Vehicle (SMV) emblem. Regulations may identify a hazard such as a utility line.

Have Training with Actual Operator

- Operator training must consist of a demonstration and verbal instruction. This training is given by your authorized Monarch dealer before the product is delivered.
- The new operator must start in an area without bystanders and use all the controls until he or she can operate the tractor and attachment / implement safely under all conditions of the work area. Fasten seat belt securely when operating the tractor.

Know the Work Conditions

- Know the weight of the materials being handled. Avoid exceeding the tractor and attachment / implement load capacities. Material which is very dense will be heavier than the same volume of less dense material. Reduce the size of load if handling dense material.
- The operator must know any prohibited uses or work areas, for example, he or she needs to know about excessive slopes.
- Know the location of any underground lines. Call local utilities or the TOLL-FREE phone number found in the *Before Operator* section of this manual.
- Wear tight fitting clothing. Always wear safety glasses and above the ankle safety-toe boots when doing maintenance or service. Safety glasses, hearing protection, or respiratory equipment are required for some work.

SAFETY INSTRUCTIONS (CONT'D)

Use Safety Rules

- Read and follow instructions in the Monarch Tractor and the attachments / implements Operator Guide before operating.
- Check for underground lines before operating attachment / implement (if applicable).
- In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment. Steering and braking can be affected by the implement.
- Check that the attachment mounting pins and hardware are installed correctly and securely fastened (if equipped).
- Check that the implement, if applicable/present, is securely fastened to the tractor.
- Depress brake pedals (or make sure parking brake is engaged) and make sure all the tractor controls are in the NEUTRAL position before starting the tractor.
- Always start the tractor from the operator's seat.
- Operate the attachment / implement according to the Operator Guide.
- When learning to operate the attachment / implement, do it at a slow rate in an area clear of bystanders.
- DO NOT permit personnel to be in the work area when operating the tractor and attachment / implement.
- The attachment / implement must be used ONLY on approved tractors. See your Monarch dealer for updated list of approved attachments / implements for each tractor model.
- DO NOT modify equipment or add attachments / implements that exceed manufacturer's specifications.
- Keep shields and guards in place. Replace if damaged.



WARNING

AVOID INJURY OR DEATH

Rear overturn can occur if loads are improperly hitched above the drawbar.

Pull from the drawbar or the three-point hitch lower links only.

Avoid Silica Dust



Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other job site Rules and Regulations. Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the state of California to cause cancer.



WARNING

AVOID INJURY OR DEATH

- Do NOT exceed the rated implement PTO speed.
- Stay clear of rotating driveline.
- Keep bystanders away.
- Keep hands, feet, clothing, and long hair away.
- Keep PTO shields and all guards in place.
- Disengage PTO, engage the parking brake, stop the tractor, and make sure all rotating components are stopped before exiting the tractor.
- Do NOT service the tractor or implement with the PTO engaged.
- Do NOT service the implement in a raised position unless properly blocked and with all rotating components stopped.
- Disengage PTO for road travel.

Maintenance

LOCK-OUT, TAG-OUT (LOTO)

Per OSHA 1910.147(c)(1) energy control program, the employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a tractor or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the tractor or equipment shall be isolated from the energy source, and rendered inoperative.

The Lock-Out, Tag-Out (LOTO) procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

- A specific statement of the intended use of the procedure.
- Specific procedural steps for shutting down, isolating, blocking, and securing tractors or equipment to control hazardous energy.
- Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them.
- Specific requirements for testing a tractor or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

The Monarch Tractor has two types of batteries as follows:

- 12-volt
- Lithium-Ion

WARNING: Do not attempt to remove, service or repair the Lithium-Ion battery. Any attempt to service or repair the Lithium-Ion battery may result in serious injury or death. If Lithium-Ion battery needs attention, contact your authorized Monarch Dealer.

The Monarch Tractor and some attachments / implements have components that are at high temperatures under normal operating conditions. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the battery compartment is a potential fire hazard.

The operator's area, battery compartment and cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

Most lubricants and some coolant mixtures are flammable. Flammable fluids that are leaking or spilled

onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the tractor where arcs, sparks, or hot components can contact flammable material, explosive dust, or gases.

Electrical



AVOID INJURY OR DEATH

Instructions are necessary before operating or servicing machine. Read and understand the Operator Guide, and signs (decals) on tractor. Follow warnings and instructions in the Operator Guide when making repairs, adjustments, or servicing. Check for correct function after adjustments, repairs, or service. Untrained operators and failure to follow instructions can cause injury or death.



Check all electrical wiring and connections for damage. Keep the 12-volt battery terminals clean and tight. If any damaged part or wires that are loose or frayed, contact your Monarch Dealer immediately.

The main battery is Lithium Ion. This battery must only be serviced by Monarch. Untrained personnel attempting to service or work on this battery may sustain serious injury or death.

Battery gas can explode and cause serious injury or death. Use the procedure in the Operator Guide for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

SAFETY INSTRUCTIONS (CONT'D)

Safety Rules for Power Take-Off (PTO) Driven Implements

- Keep PTO shields and all guards in place. Replace damaged or missing shields and guards before operating.
- Follow warnings and instructions on tractor signs (decals). Replace damaged or missing decals.
- Do not wear loose or bulky clothing around the PTO or other moving parts.
- Keep bystanders away from PTO driven equipment, and never allow children near tractors.
- Read and understand the manuals for the PTO driven equipment and be aware of safe operating procedures and hazards that may not be readily apparent.
- Always walk around equipment to avoid coming near a turning PTO driveline. Stepping over, leaning across or crawling under a turning PTO driveline can cause entanglement.
- Position the tractor and implement hitch correctly to prevent driveline stress and separation.
- Use caution when turning. Turning too sharp can cause driveline damage.
- Use caution when raising PTO driven implement. Excessive driveline angle can cause driveline damage. Use stops if needed.

Monarch Tractor Requirements and Capabilities

- Fasten seat belt securely when Roll-Over Protective Structure (ROPS) is up and locked. DO NOT wear seat belt if ROPS is down.
- The Monarch Tractor must be equipped with sway bars or chains.
- Stop the Monarch Tractor and engage the parking brakes. Install blocks in front of and behind the rear tires of the Monarch Tractor. Install blocks underneath and support the implement securely before working under raised implements.
- Keep bystanders clear of moving parts and the work area. Keep children away.
- Use increased caution on slopes and near banks and ditches to prevent overturn.

- Make certain that the Slow-Moving Vehicle (SMV) emblem is installed so that it is visible and legible. When transporting the equipment, use the Monarch Tractor flashing warning lights and follow all local regulations.
- Operate this equipment with a Monarch Tractor equipped and approved Roll-Over Protective Structure (ROPS). Always wear seat belt when the ROPS is up. Serious injury or death could result from falling off the Monarch Tractor.
- Before leaving the Monarch Tractor operator's seat:
 1. Park on flat level ground.
 2. Fully lower the loader arms and put the attachment flat on the ground (if equipped).
 3. Fully lower the three-point hitch or mid-mount implements (if equipped).
 4. Lock brake pedals together (if equipped) and engage the parking brake.
 5. Place all controls in neutral.
 6. Unfasten seat belt and remove the key.
- Never allow riders on the Monarch Tractor or implement. Falling off can result in serious injury or death.
- Start the Monarch Tractor only when properly seated in the operator's seat. Starting a Monarch Tractor in gear can result in serious injury or death.
- Operate the Monarch Tractor and attachments / implements from the operators position only.
- Add the correct front ballast for rear three-point hitch implements and pull type implements. Front ballast can be purchased from your Monarch Tractor dealer.
- Do not handle large objects (such as round bales or posts) unless the loader is equipped with the proper attachment and the load is secured.
- The parking brake must be engaged before leaving the Monarch Tractor operator's seat. Rollaway can occur because the transmission may not prevent tractor movement.

Caution: do not use front cross member/ballast weight bar to tow, lift or push as it is a structural member and may cause frame damage.

WARNING

AVOID INJURY OR DEATH

Do **NOT** use the joystick lock lever to support the raised loader arms for servicing. Fully lower the loader arms and the attachment flat on the ground before servicing the tractor or attachment.

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.

Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.

WARNING

AVOID INJURY OR DEATH

Hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

WARNING

AVOID BURNS

Hydraulic fluid, tubes, fittings, and quick couplers can get hot when running tractor and attachments. Be careful when connecting and disconnecting quick couplers.

IMPORTANT

To prevent hose damage caused by dragging on the ground, rubbing, pinching or PTO entanglement:

- **Support attachment and implement hydraulic hoses using available hose guides or supports.**
- **Contact your implement or attachment dealer for available hose guides or supports.**

IMPORTANT

Do not use a pressure washer to clean the tractor. High pressure can damage electronics on the tractor.

TOWING THE COMPACT TRACTOR

IMPORTANT

Never tow the tractor faster than 16 km/h (10 mph). Always have someone seated to steer and brake the towed tractor.

Tow the tractor for short distances only.

NOTE: Power steering assist is not available when the tractor is OFF.

Install a tow chain (or cable) to the front of the tractor (for towing in the forward direction) or to the drawbar (for towing in the rearward direction).

The tow chain (or cable) must be rated at 1.5 times the weight of the compact tractor and implement / attachment.

Enter the tractor and fasten the seat belt.

Place all controls in neutral.

Disengage the brake (use the brake pedal for slowing or stopping the compact tractor).

Always have an operator seated in the operator's seat to operate the steering and brakes while towing the compact tractor. Fasten seat belt. Engage the parking brake before leaving the tractor.



IMPORTANT

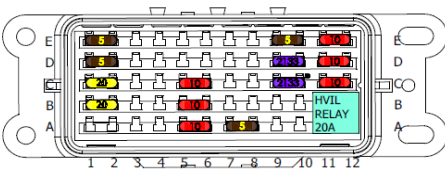
Your Monarch Tractor is connected to the cloud and allows you to have access over the air for features and services such as health status and updates. (OTA).

It is recommended that you plug in the tractor after every use and always do so when not in use for a period of more than 8 hours. If you intend not to use the OTA features and not use the tractor for an extended period rotate the battery disconnect switch clockwise to minimize current draw.

When not in use but connected to the cloud a 10% battery consumption in a 24-hour period is normal.

The Top Fuse box contains the following:

-X-214A



Fuse and relay assignment for Littelfuse Box PN:PDM21001LXM

- E01-E02 - 05A ECOTRON_4
- D01-D02 - 05A ECOTRON_3
- C01-C02 - 20A ECOTRON_2
- B01-B02 - 20A ECOTRON_1
- C05-C06 - 10A TTC580_3
- B05-B06 - 10A TTC580_2
- A05-A06 - 10A TTC580_1
- A07-A08 - 5A TFD_2
- E09-E10 - 5A TFD_1
- D09-D10 - 121OHMS Vmax_BY_Pass_Resistor
- C09-C10 - 121OHMS Vmax_By_Pass_Resistor
- E11-E12 - 10A Vmax_Inner
- D11-D12 - 10A Vmax_Middel
- C11-C12 - 10A Vmax_Outer

FUSES RELAYS

Underneath the tool tray you will find 2 fuse boxes and a battery disconnect switch



Battery Disconnect switch, Rotate to Clockwise to the right to disengage 12V power.

The lower fuse box, outlined in RED in the illustration above, contains the following:

mRFRM Fuse Values/Functions for
Monarch PN: V6012 / Eaton DWG# 154M2-130-0

F01
F02
F03
F04 05A HVIL and mRFRM Ignition
F05 10A ISObus Power (Trailer Power)
F06
F07 2A Left Turn Signal
F08 2A Right Turn Signal
F09 2A HMI Power
F10 10A Steering Valve
F11 2A MTA Power
F12 30A Smart Implement 12V
F13 10A Gen5S9 Power
F14
F15 2A TTC580 Ign (KL15)
F16 2A 12V Hydraulic Pump Ign
F17 2A TTC580 uBatt
F18 5A Lord TFD Steering
F19 2A OTA TTC580 Relay
F20 10A VMAX Power
F21 30A Ecotrons Shift Power
F22 10A mRFRM Power
F23 2A HV Systems Ign
F24 10A TTC32 & BMS Power
F25 10A Addon Front Sensor
F26 5A ACDB Power
F27
F28 30A TTC580 Power

Transporting the Tractor

Loading and Unloading



AVOID SERIOUS INJURY OR DEATH

Adequately designed ramps of sufficient strength are needed to support the weight of the tractor when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

Be sure the transport and towing vehicles are of adequate size and capacity for the weight of the Monarch Tractor. Fasten the Monarch Tractor to the transport vehicle so it can't move, including during turns, stops, hills and emergency maneuvers. This includes lowering any implement and using appropriately rated chains or straps. Make sure the tractor is off and P brake engaged.

Tractor Charging

The Monarch Tractor must be charged when the battery is low. Using a compatible charging unit, plug the charging cord into the J1224 connector on the tractor. The battery level gage will indicate the amount of charge the battery currently has.

Fire Prevention



Welding and Grinding

Always clean the Monarch Tractor and attachment / implement, disconnect the battery, and disconnect the wiring from the Monarch controllers before welding. Cover rubber hoses, battery, and all other flammable parts. Keep a fire extinguisher near the tractor when welding.

Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.

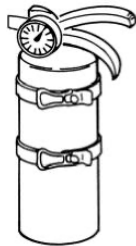
Dust generated from repairing nonmetallic parts such as hoods, fenders or covers can be flammable or explosive.

Repair such components in a well-ventilated area away from open flames or sparks.

Fire Extinguishers



In the event of a Li-On battery fire immediately exit vehicle and cover with material or douse it with water. The chemical reaction from Li-On batteries cannot be extinguished by starving oxygen sources; but its propagation can be slowed by cooling the batteries.



Know where fire extinguishers and first aid kits are located and how to use them. Inspect the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instructions plate.



TOWING

Towing a trailer or implement can substantially affect tractor performance, including braking. Make sure the attachment and hitch are compatible.

Reduce your speed and be prepared to adjust all maneuvers when towing a trailer-including planning your turns. Hills and rough terrain should be avoided. Never attempt steep hills or water crossings with a trailer or implement attached,

An improperly loaded trailer, including a trailer whose loads vary during use such as spraying, can affect the tractor handling sometimes unpredictably and cause loss of control. Never exceed the tractor towing or tongue capacity. Ensure approximately 10% of the trailer weight is on the tongue at all times.

Similarly, 3-point hitch accessories and implements, including “saddle” type implements can affect vehicle stability and should be treated like a trailer.

Make sure loads on tractor and on trailers/implements are always evenly distributed. Always operate in low range and at low speeds when trailering. Not only will the operation be performed in a safer manner that allows the operator to react, but the task also performed is generally better accomplished at lower speeds.

When stopping it is advisable to block the tractor and trailer wheels to prevent inadvertent vehicle movements.

Always stay clear and ensure no one is between the tractor and trailer.

Follow any instructions in trailer or implement guides and manuals.

This tractor has regenerative braking and although they may assist in slowing down the tractor, they are not designed to help stop trailers or vehicle on any hill or slope.

When driving down hills be mindful of run away events especially in towing implement or trailers. Periodically apply brakes to ensure functionality-without overheating or over stressing the system.

WARNING

When driving downhill in reverse, gravity can increase the vehicle speed above the set limited reverse speed.

⚠ WARNING

Before attempting to mount vehicle onto a platform or a trailer, make sure to respect the following safety precautions.

SAFETY PRECAUTIONS

Carrying equipment	The carrying item (platform or trailer or flat bed) must be of appropriate dimensions and capacity to safely support and transport the vehicle.
Hauling vehicle	Do not exceed vehicle hauling capacity and specifications. Ensure the trailer or platform is properly secured to the hauling vehicle hitch.
Visibility	Ensure you have a good visibility during the entire maneuver.

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TRANSPORTING THE VEHICLE

SAFETY PRECAUTIONS

Terrain	The hauling vehicle and trailer must be on a leveled surface. Use wheel chocks on trailer and hauling vehicle to avoid any movement.
Ramps	Use ramps with proper rating and secure ramps to the trailer or platform. Avoid steep ramps.
Bystanders	Always make sure bystanders are not close to the vehicle or the trailering equipment while climbing up.
Seat and Accessories	Make sure all seats, accessories and cargo are properly secured, or remove it to prevent from falling on the road and creating a hazard for following vehicles.

TRACTOR SIGNS (DECALS)

Follow the instructions on all the tractor signs (decals) that are on the Monarch Tractor. Replace any damaged tractor signs and be sure they are in the correct locations. Tractor signs are available from your Monarch dealer.

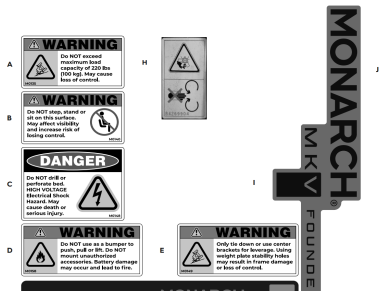
ON UNIT SAFETY LABELLING AND DECALS

Ensure safety labels on are affixed to the unit, in the location depicted in these illustrations, including after every service call and unit transfer.

Replacement labels can be ordered via your authorized Monarch tractor dealer using the Part Numbers shown here.

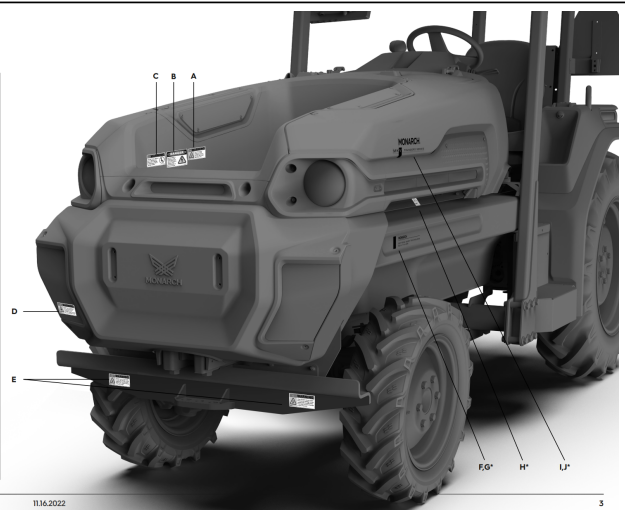
FRONT

NAME	PN	CAD
A. Do not exceed max load	M0335	D5600
B. Do not step, stand, or sit	M0400	D5600
C. Do not drill	M0408	D5600
D. Do not use as a bumper	M0458	B5000
E. Only tie down or use center brackets..	M0409	C5002
F. MK-V Battery Info LH	B0263	B5000
G. MK-V Battery Info RH	B0264	B5000
H. Hands in fan	M027 600	V5000
I. MK-V Model Designator RH	D0023	D5600
J. MK-V Model Designator LH	D0024	D5600



FRONT

NAME
A. Do not exceed max load
B. Do not step, stand, or sit
C. Do not drill
D. Do not use as a bumper
E. Only tie down or use center brackets..
F. MK-V Battery Info LH
G. MK-V Battery Info RH
H. Hands in fan
I. MK-V Model Designator RH
J. MK-V Model Designator LH



*Corresponding parts on RH side

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ON UNIT SAFETY LABELLING AND DECALS (CONT'D)

LEFT SIDE

NAME	PN	CAD
A. Monarch jacking points	M0159	C5002
B. Serial Plate	D0121	R5000
C. Do not powerwash	M0142	R5000
D. Prop 65	M0141	D5001
E. Grab rail	M0123	D5001
F. High Voltage	M0139	V5000
G. 12V and 5V graphic	D0126	C5024
H. Manual (K2)	D0116	D5001

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LEFT SIDE

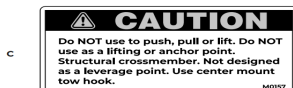
NAME
A. Monarch jacking points
B. Serial Plate
C. Do not powerwash
D. Prop 65
E. Grab rail
F. High Voltage
G. 12V and 5V graphic
H. Manual

*Corresponding parts on RH side
 **On routing channel, below bodywork

ON UNIT SAFETY LABELLING AND DECALS (CONT'D)

BATTERY

NAME	PN	CAD
A. High Voltage (x2)	M0139	B5000
B. Battery ID plate	B0276	B5000
C. Do not use to push, pull or lift	M0157	B5000
D. Do not use as a bumper	M0158	B5000



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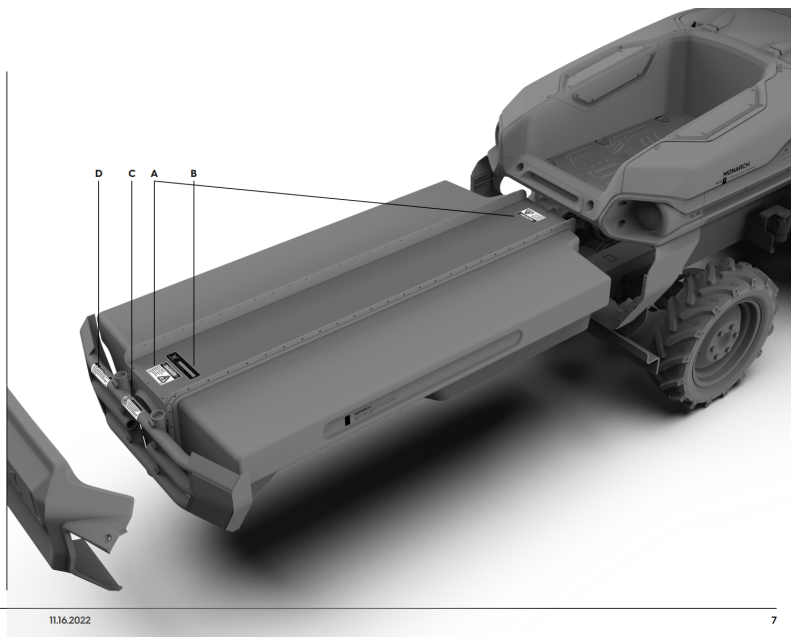
11.16.2022

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BATTERY

NAME

- A. High Voltage (x2)
- B. Battery ID plate
- C. Do not use to push, pull or lift
- D. Do not use as a bumper



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ON UNIT SAFETY LABELLING AND DECALS (CONT'D)


REAR

NAME	PN	CAD
A. Manual	M0116	C5001
B. PTO	M0113	C5001
C. Do not step	M0114	C5001
D. Do not stand between implements	M0115	C5024
E. Do not exceed max implement weight	M0136	C5024
F. Do not exceed max lift...hot fluid	M0137	C5024
G. Do not exceed max lift capacity	M0144	C5024


A




C




D




B




E



F



G



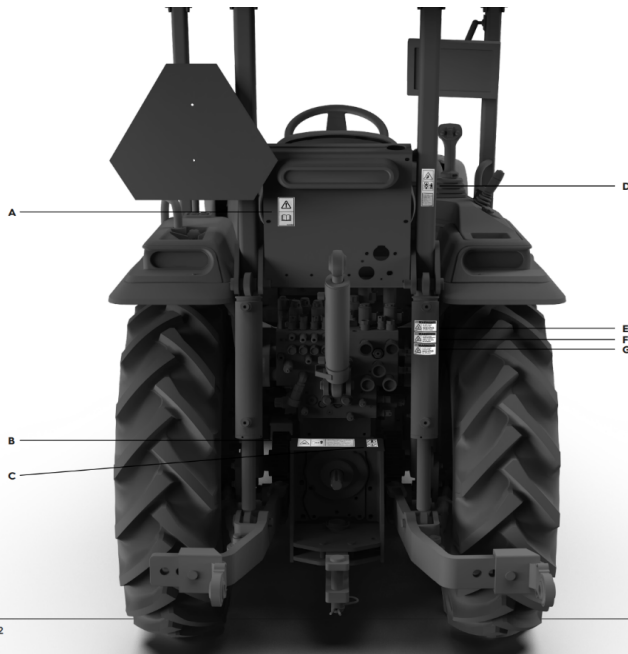
ENTANGLEMENT HAZARD - KEEP CLEAR

- Always keep PTO driveline shields in place to avoid entanglement.
- Be sure implements are matched to tractor PTO speed.
- Center and lock drawbar when using PTO.

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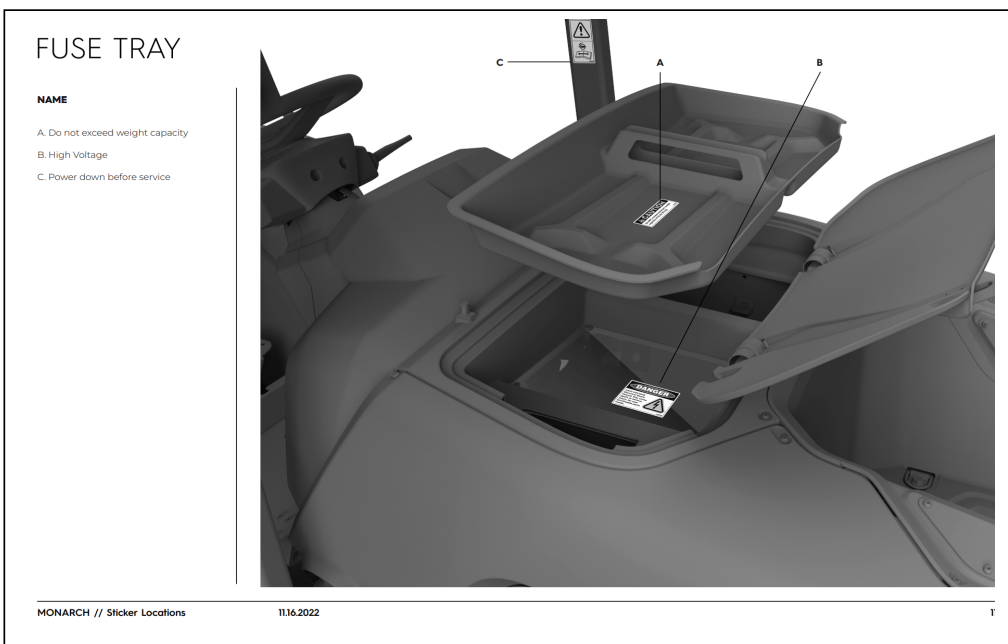
REAR

NAME
A. Manual
B. PTO
C. Do not step
D. Do not stand between implements
E. Do not exceed max implement weight
F. Do not exceed max lift...hot fluid
G. Do not exceed max lift capacity



ON UNIT SAFETY LABELLING AND DECALS (CONT'D)

BEFORE AND AFTER EVERY ACCESS, ALWAYS PROPELY RELATCH AND LOCK TRAY COVER DOOR. Failure to do so may allow debris intrusion into the 12V system and lead to failures and damages including electrical damage. Loose items may thrash around and cause property damage and if the cover is not secure injury t occupants and bystanders. Always latch the cover and avoid storing loose items on the shelf while operating the tractor.



FUSE TRAY

NAME

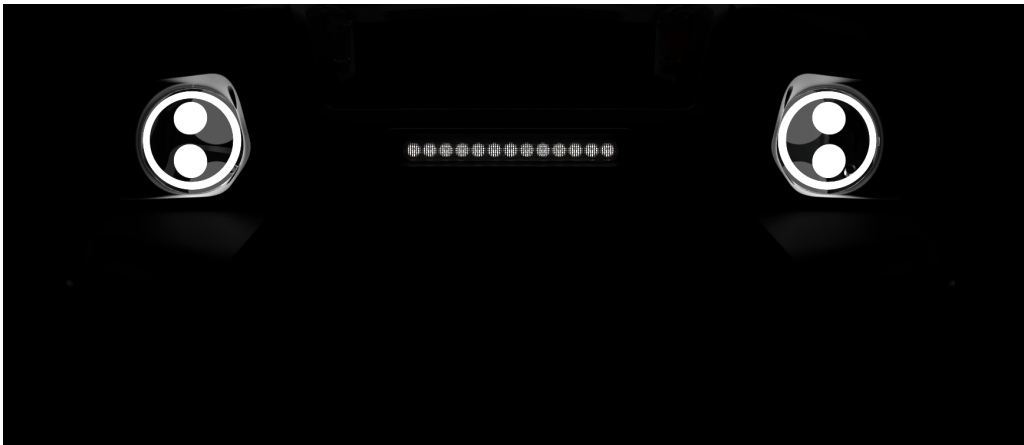
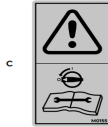
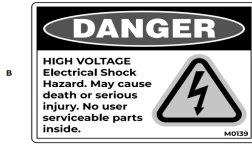
- A. Do not exceed weight capacity
- B. High Voltage
- C. Power down before service

PN

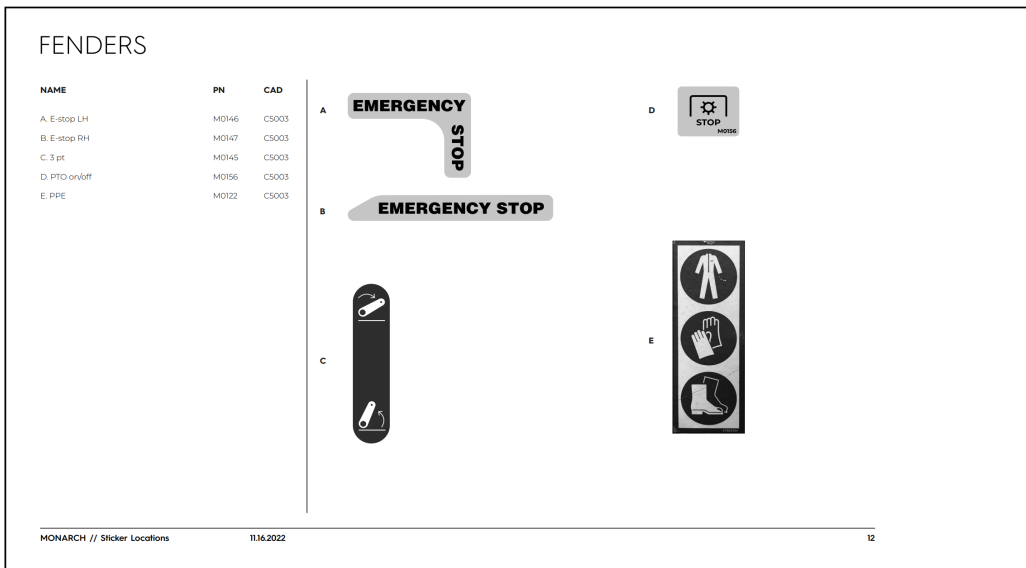
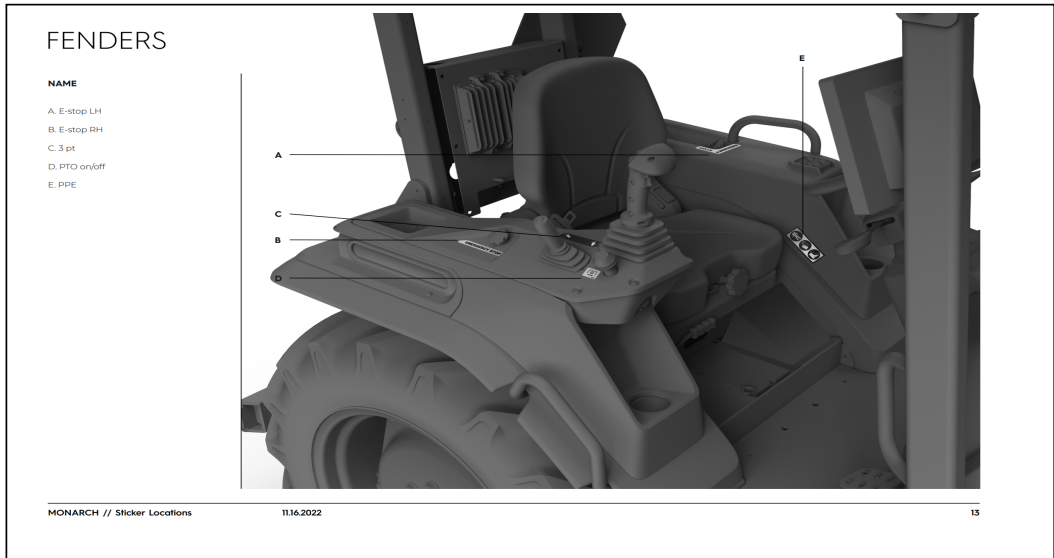
- M016
- M0139
- M0155

CAD

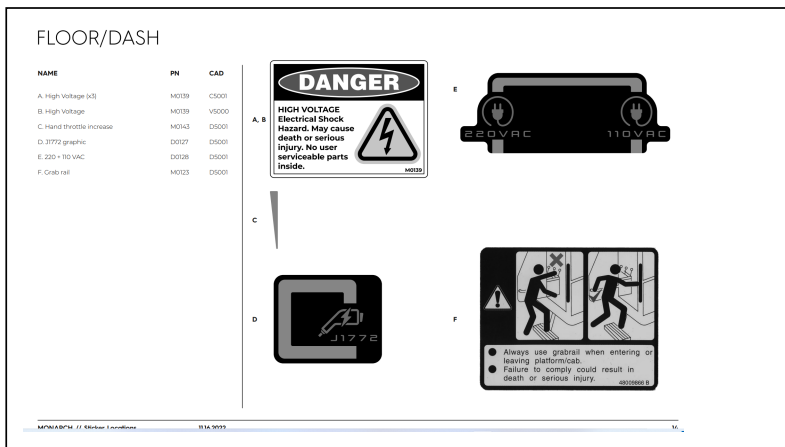
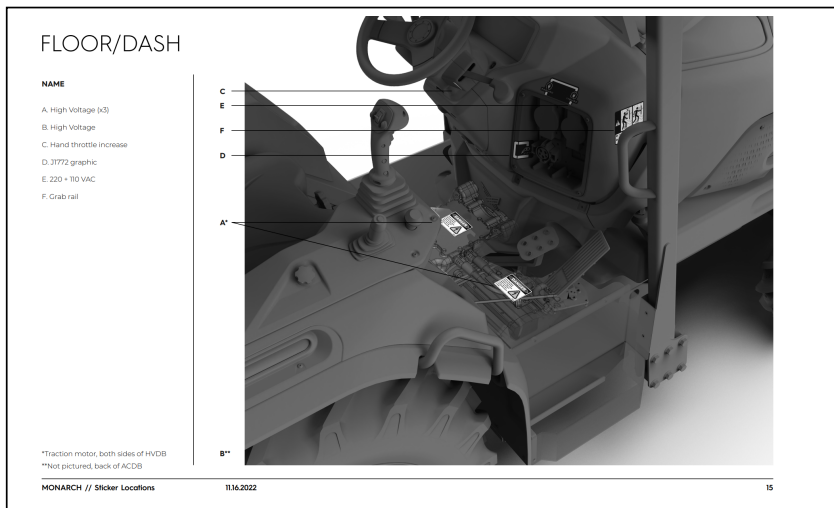
- D5001
- D5001
- R5000



ON UNIT SAFETY LABELLING AND DECALS (CONT'D)



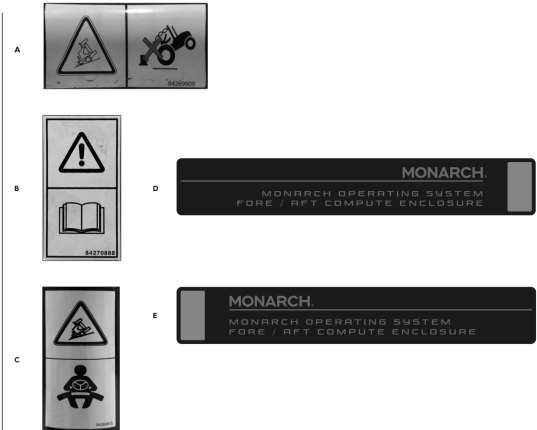
ON UNIT SAFETY LABELLING AND DECALS (CONT'D)



ON UNIT SAFETY LABELLING AND DECALS (CONT'D)

ROOF

NAME	PN	CAD
A. Tip Back	M0117	R5000
B. Manual	M0116	R5000
C. Seat belt	M0120	R5000
D. Roof tech graphic RH	R0186	R5000
E. Roof tech graphic LH	R0187	R5000



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ROOF

NAME
A. Tip Back
B. Manual
C. Seat belt
D. Roof tech graphic RH
E. Roof tech graphic LH



*Corresponding parts on RH side

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TRAINING RESOURCES

For the latest Training information on Monarch Tractors, visit our web site at MonarchTractor.com/training or MonarchTractor.com

OPERATING INSTRUCTIONS

Safety Procedures

Every autonomously operating tractor must have a designated fleet manager responsible for continuously monitoring each tractor. Do not modify any component of the tractor without first consulting Monarch Tractor.

If any Level 3 error codes are active, do not operate the tractor; seek guidance from Monarch Tractor immediately.

Only one person should sit in the tractor at a time. There are no provisions for a second rider anywhere on the tractor. Do not drive the tractor on public roads or highways.

Do not share your personal PIN Code with other Operators. Log out from the Smart Screen when finished using the tractor.

In the event of an emergency, use the Emergency Stop and contact relevant public departments as needed. Contact Monarch Tractor once emergency help is on the way.

BEFORE OPERATION

Wear a high visibility safety vest and follow your site's safety protocols.

Complete visual inspection of tractor before boarding.

Log in to Smart Screen and check active error codes. Contact Monarch if any Level 3 errors are present. Use Monarch-issued front ballast weights as needed.

For 3 PT hitch mounted implements: Set and test min. and max. operating heights via Smart Screen.

Do not exceed the following capacities:

- Max. 3 PT hitch lift (24" behind the lift points): 1,650 lbs. (750 kg)
- Max. drawbar tow: 5,500 lbs. (2,500 kg)
- Max. tongue load: 1,100 lbs. (500 kg)



AVOID INJURY OR DEATH

- Always keep bystanders away from the work area and travel path.
- The operator must always look in the direction of travel.

WARNING:

Ensure tractor is in NEUTRAL before engaging in any mode. Listen before leaving the tractor to ensure auto park brakes to automatically engage. Listen for Drivetrain noises: if none and gear lever is in N you are in Neutral. Confirm via gear selector light or START button icon.

DURING OPERATION

Safe Mode uses cameras to help protect the driver and any surrounding people or objects near the tractor from crashes and any PTO and driving related injuries. All autonomy and drive assist modes use Safe Mode to operate. Safe Mode is always active for autonomous and driver-assist modes. It is optional for manual modes.

In the event of an emergency, press either Emergency Stop on the tractor to immediately engage the brakes and stop implement functions.

Report and track issues in Fleet Tickets:

- Click message button in top right corner of drive screen
- Populate fields
- Send
- See open fleet tickets on Smart Screen



AVOID INJURY OR DEATH

Before backing the compact tractor, look in all directions and make sure no bystanders are in the work area. Do not allow anyone between the compact tractor and the implement when backing up to the implement for installation.



AVOID INJURY OR DEATH

- Keep PTO shields and all guards in place.
- Keep away from moving parts.
- Keep bystanders away.
- Do NOT exceed 540 rear-PTO RPM



AVOID INJURY OR DEATH

Keep fingers and hands out of pinch points when installing and removing implement or attachment.



AVOID INJURY OR DEATH

The parking brake must be engaged before leaving the operator's seat. Rollaway can occur because the transmission may not prevent machine movement.

WARNING

AVOID INJURY OR DEATH

- Steering and braking can be affected by the loader attachment, implements, front wheel assist and the rear differential lock. Always install the correct ballast. Do not exceed the Loader or Three-Point Hitch lift capacities.
- Always carry loads low. Slow down when turning.
- Make sure that the brakes are adjusted correctly so the compact tractor does not pull to one side when braking.

AFTER OPERATION

Lower any implement mounted to the 3 PT hitch.
Place the tractor on the charger if needed.
Logout of the tractor.

WARNING

AVOID INJURY OR DEATH

- Do NOT exceed the rated implement PTO speed.
 - Stay clear of rotating driveline.
 - Keep bystanders away.
 - Keep hands, feet, clothing, and long hair away.
 - Keep PTO shields and all guards in place.
 - Disengage PTO, engage the parking brake, stop the tractor, and make sure all rotating components are stopped before exiting the tractor.
 - Do NOT service the tractor or implement with the PTO engaged.
 - Do NOT service the implement in a raised position unless properly blocked and with all rotating components stopped.
 - Disengage PTO for road travel.
-



General Safety

EN

- If any Level 3 error codes are active, do not operate the tractor and seek guidance from Monarch Tractor immediately.
- In the event of an emergency, use the Emergency Stop and contact relevant public departments as needed. Contact Monarch Tractor once professional help is on the way.
- Only one person should sit in the tractor at a time. There are no provisions for a second rider anywhere on the tractor.

Battery Safety

EN

- Do not modify, handle, or remove the battery by hand or with any other equipment. The battery is a high voltage device and should only be handled by qualified personnel.
- In the event of battery damage, do not drive the tractor. Leave the tractor at the location of impact and power it down. Report to Monarch Tractor immediately.
- Report all battery damage and concerns to Monarch Tractor. Do not attempt to service the battery.

Getting Started

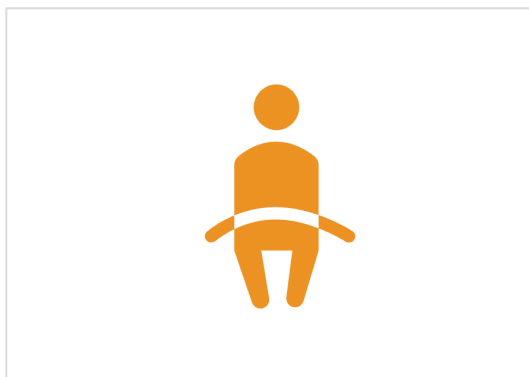


Boarding/Unboarding

EN

Always board/unboard using three points of contact: the two grab handles and the step.

Do not use the steering wheel to board the tractor as you could slip

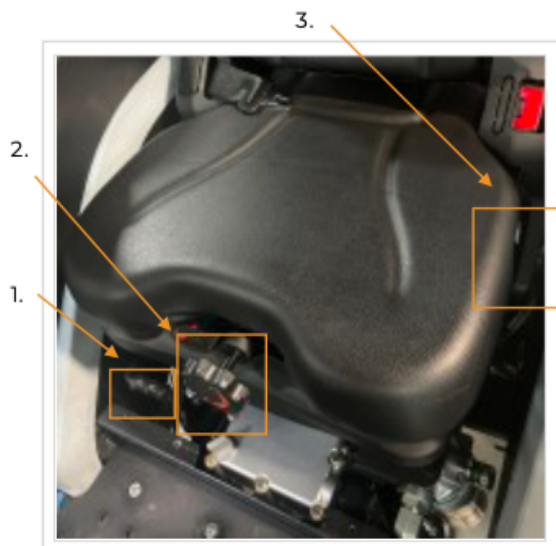


Seatbelt

EN

Fasten the seatbelt before operating. The tractor will not engage the drivetrain without it.

The Rollover Protection Structure (ROPS) will be fully effective when you remain in the seat



Seat Adjustment

EN

For safe and comfortable operation, adjust the seat to preference in these three ways:

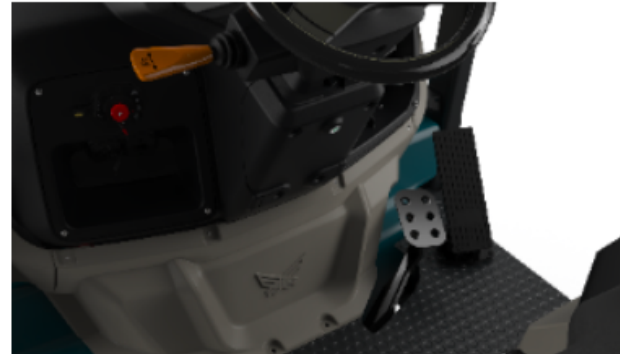
1. Distance from steering wheel
2. Amount of backrest recline
3. Level of suspension



Power Button

EN

To power on, hold down the power button. The power button will illuminate with a blue light and the tractor is usable once the lock screen appears on the Smart Screen.



Emergency Stops can be pressed at any time to immediately:

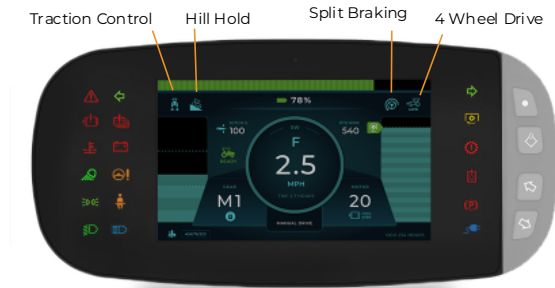
1. Stop the tractor
2. Disengage the drivetrain
3. Turn off the tractor's high voltage
4. Release pressure from the hydraulic accumulators

After 20 seconds, the tractor will power down unless cancelled by following instructions on the Smart Screen.

Drive Controls

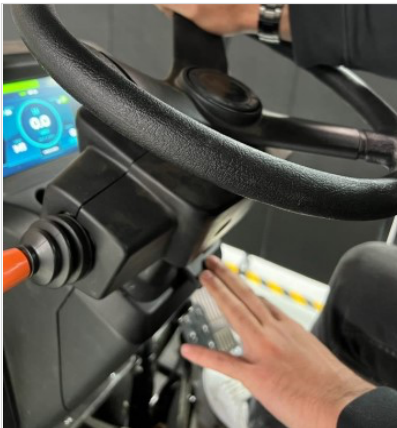


Dashboard



EN

The dashboard shows mission critical information related to tractor driving and implement operation.



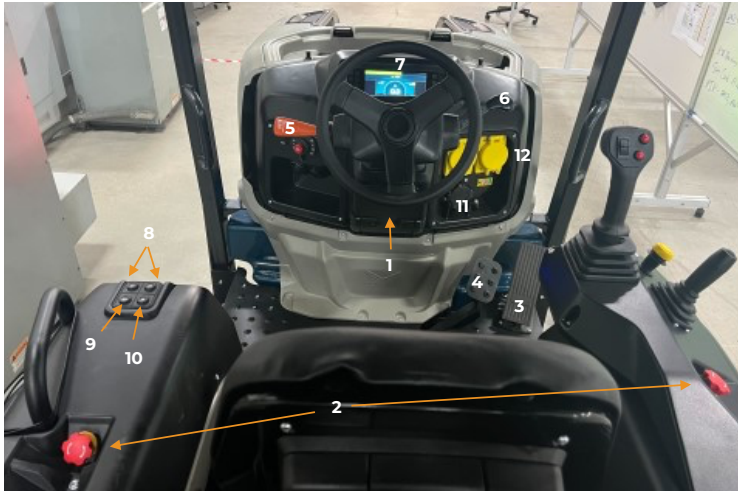
Tilt Adjustment for Steering Wheel

EN

The steering wheel can be tilted towards/away from the operator. Hold the clip under the steering wheel to adjust it.



Drive Controls



1. Power Button (Behind wheel)
2. Emergency Stop
3. Accelerator
4. Foot Brake
5. FNR Lever
6. Hand Throttle
7. Dashboard
8. Gear Shift Buttons
9. Horn
10. Parking Brake
11. Charging Port
12. Exportable Power

EN

Horn: To use the horn, press this button

Parking Brake: To engage and disengage the parking brake, press this button.

Lights Dial: Turn signals, headlights, and hazards are turned off using this dial.

FNR Lever: Use the FNR lever to put the tractor in forward, neutral, or reverse.

Hand Throttle: The hand throttle sets the motor to a fixed RPM. Move the hand throttle downwards to move the motor.

Foot Throttle: The foot throttle accelerates the tractor when depressed.

Foot Brake: Use the foot brake to slow down the tractor

Gear Shifting & Shift On The Fly: Use the up and down arrow buttons to shift gears. There are 9 gears in forward over 3 ranges and 3 gears in reverse. Gears can also be shifted while the tractor is moving, even across ranges.



Drive Controls



Split Braking

EN

To achieve a tighter turning radius, turn the steering wheel all the way in the desired direction. When resistance is felt in the steering wheel, continue turning the steering wheel in the desired turning direction. The rear wheel of the desired turning direction will lock up until the steering wheel is turned in the opposite direction.



Traction Control

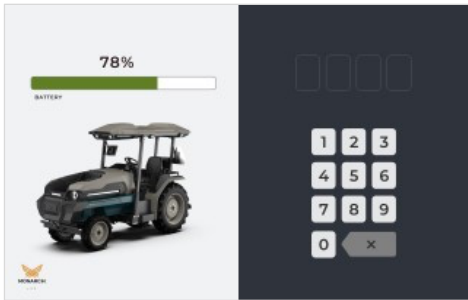
EN

When one of the rear wheels is spinning faster than the other, the brake is temporarily applied to the wheel spinning faster. While this feature is active, its icon will appear on the Dashboard.



Smart Screen Basics

Starting the Tractor



EN

Enter your four digit code to log into the tractor. Your code is confidential and should not be shared with others. Contact your manager if you do not know your operator's code.



Live Camera Views

EN

On the Smart Screen, click the camera icon on the left hand side to see live camera views.

Steering Bar

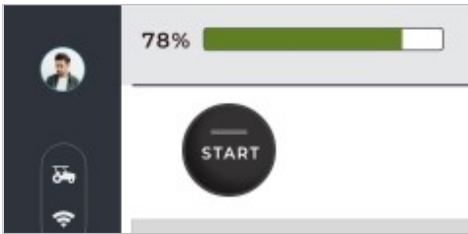
EN

The bar indicates the direction of the front tires.

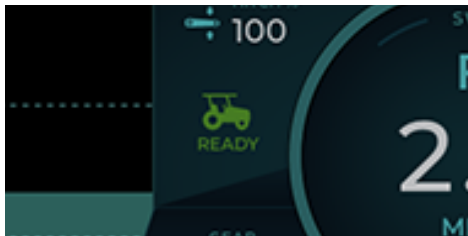


Smart Screen Basics

Smart Screen



Dashboard



Starting the Tractor

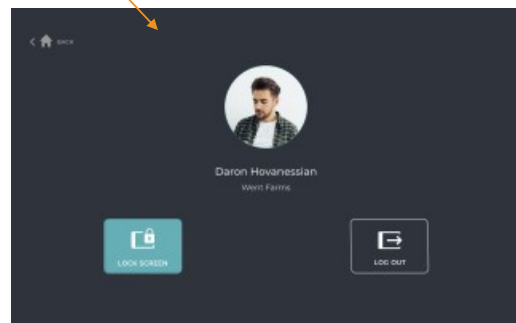
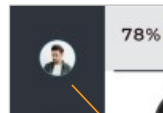
EN

To engage the drivetrain, press the **START** button. The motor will momentarily rev up and then the dashboard will display a **TRACTOR READY** icon when it is operation ready.

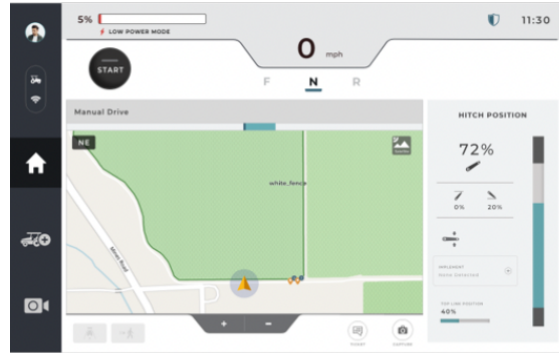
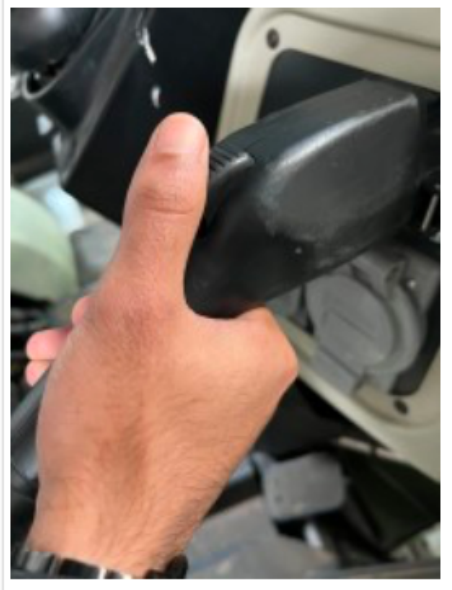
Logging Out

EN

Click your profile picture in the top left corner of the Smart Screen and then press the **LOG OUT** button to end your operation session. The tractor will automatically logout after 10 minutes if there has been no input to the Smart Screen or drive controls.



Battery



Charging

EN



Only charge with Monarch Tractor approved or compatible 40A or 80A chargers. To charge, hold the clip on the charger, plug it into the tractor's charging port, and release the clip. Also ensure connector is free of liquids. Failure to do so may lead to shock, electrocution or a fire.

Low Power Mode

EN

If the tractor's battery percentage reaches 5%, the tractor will go into low power mode until it is charging. In this mode, implement controls, 4WD and exportable power are disabled. Additionally, motor speed and the 3 PT hitch raise/lower speeds are reduced.

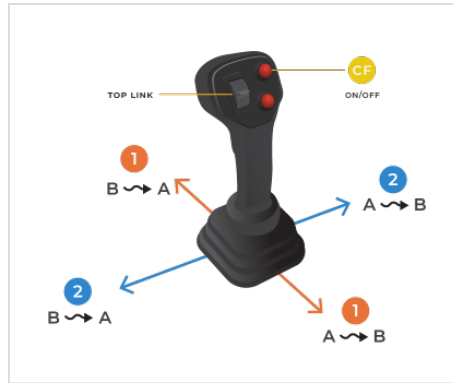


3 POINT HITCH





3PT Hitch



Control

EN

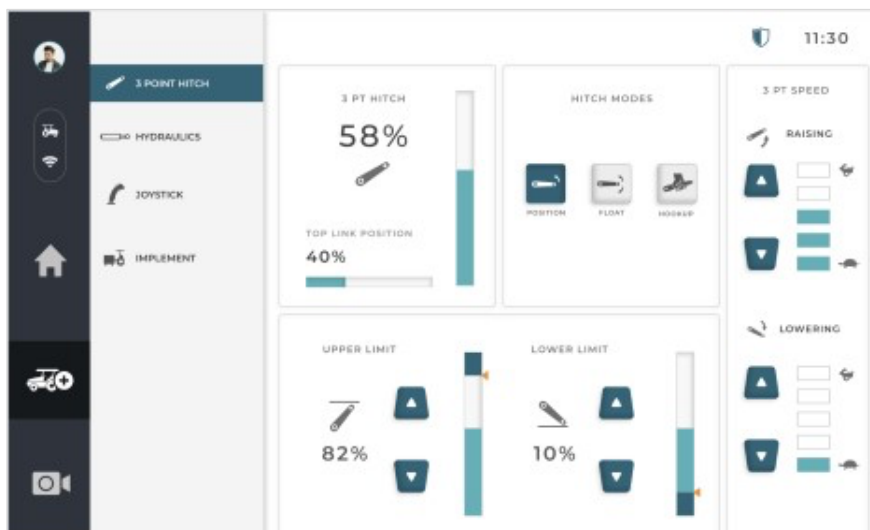
The three point hitch lower links are controlled by the lever in the image. To move the hitch up, press the top button and pull the lever back. To move the hitch down, press the button on the top of the lever and move the lever forward. To move the hitch to the upper or lower limit, first move the lever in the desired direction, then press the top button.

EN

The hydraulic toplink is controlled with the hydraulic joystick. To move it in and out, first press the trigger, then push the rocker switch forward to move it in and pull it back to move the toplink out.



3PT Hitch (cont.)



Control (cont.)

EN

On the Smart Screen, you can set the upper and lower limits for your 3PT Hitch, change the raise and lower speeds, and change the mode of the 3PT Hitch.

Position Mode: The hitch does not move below the set position but is free to move upwards.

Float Mode: The hitch moves up and down freely.

Hookup Mode: The hitch moves up and down freely.



Hydraulics



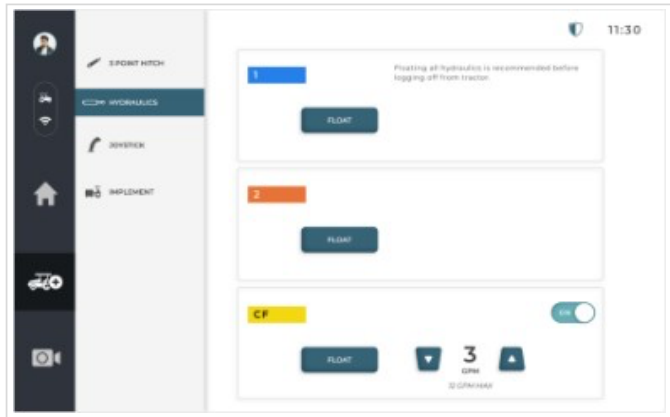
Control

EN

The auxiliary hydraulics on the tractor are controlled using the hydraulic joystick. To extend or retract auxiliary hydraulics, first pull the trigger on the joystick then move the joystick in the desired direction according to which auxiliary hydraulic port is connected. The constant flow circuit can also be turned on and off by first pulling the trigger then pressing the top red button.

EN

On the Smart Screen the auxiliary hydraulic ports can be floated which relieves the pressure in the lines. The constant flow port can also be turned on and off and the flow rate can be changed here.



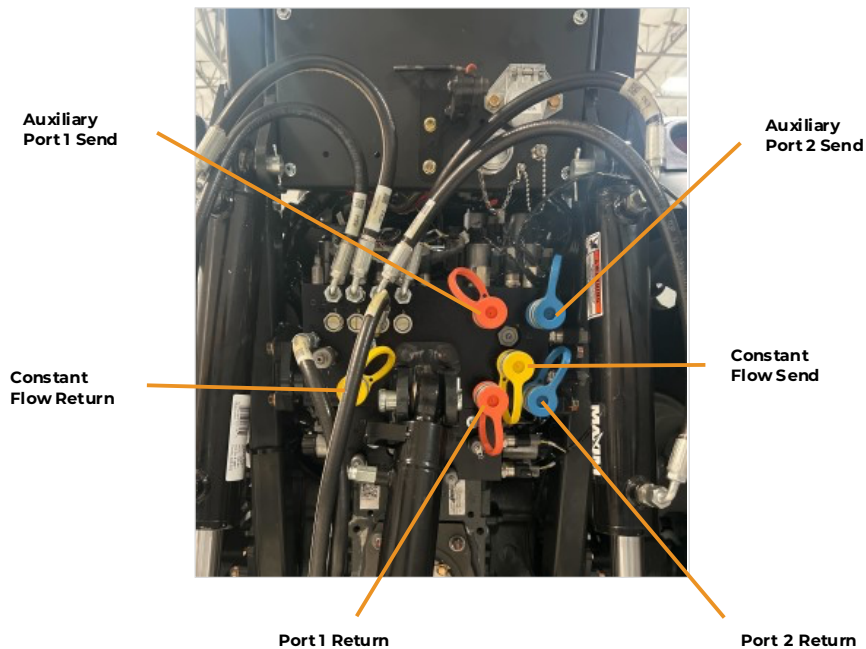


Attaching & Detaching

EN

Always connect hydraulic lines with the tractor turned off, this will ensure there is minimal to no pressure in the lines. Then plug your lines into the appropriate port.

To remove any external hydraulics, first lower the implement, then turn the tractor off to release the pressure in the lines. Then you be able to disconnect your lines from the quick couplers.



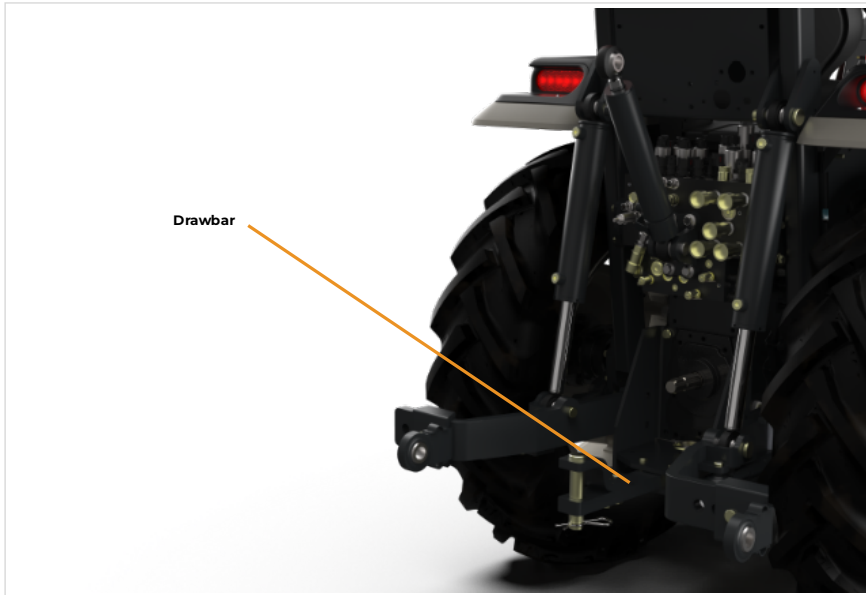
Drawbar



Attaching

EN

The drawbar can accommodate any implements or trailers less than 5,500 lbs. To attach an implement or trailer, reverse to it, then pin it to the drawbar. To move the drawbar position remove two pins at the base and re-pin them in the desired position.





Control

EN

The PTO is turned on and off using the yellow switch near the hydraulic joystick. To turn on, pull the latch up then pull the whole switch up. To turn off press the switch down. The RPM of the PTO is displayed on the dash and Smart Screen. The RPM of the PTO is dependent on the motor RPM.



PTO Switch

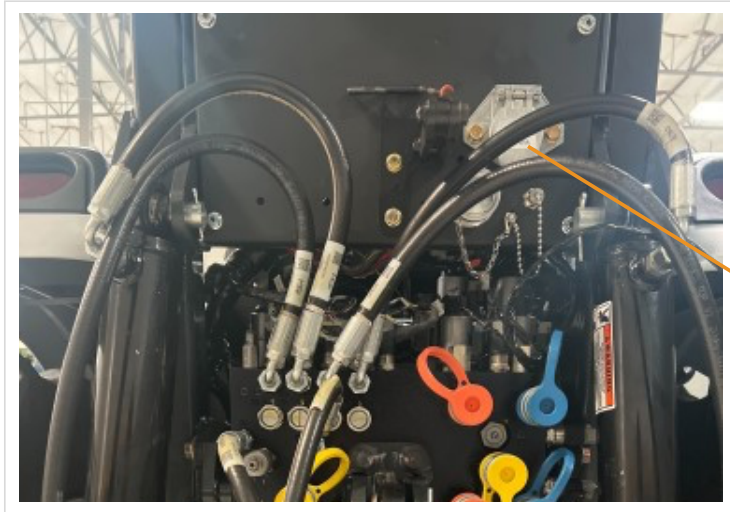
Attaching and Detaching

EN

Once an implement is attached to the 3PT hitch or drawbar, ensure that the tractor is turned off and the PTO is not running. Then slide the PTO shaft onto the tractor PTO. To remove ensure the implement is lowered and the tractor is turned off, then slide the shaft off the tractor PTO.



PTO Shaft



**7-Pin
Trailer
Connector**

Control

EN

There are two types of electrical connections on the tractor, the 7-pin trailer connector and the exportable power. The 7-pin trailer connector is located on the rear of the tractor above the hydraulic ports. The exportable power is located in the operator's station of the tractor and can be turned on and off through the Smart Screen settings.



Wheels, Tires, & Weight



EN

The Monarch Tractor can be equipped with optional front ballast weights. When using a heavy implement it is recommended to use front ballast for best tractor performance.

EN

The track width of the rear wheels can be adjusted to better accommodate the operating environment and implement used. When using a heavier, taller, or less stable implement it is recommended to adjust the rear tires to the widest setting possible to improve tractor stability. The track width of the rear tires can be adjusted by removing the tires and flipping them so the outside faces in. They can be further adjusted by removing the eight bolts on the outside and flipping the inside of the rim. In total there are four adjustable track widths as measured below:

- 36.0 in
- 40.6 in
- 43.9 in
- 48.4 in



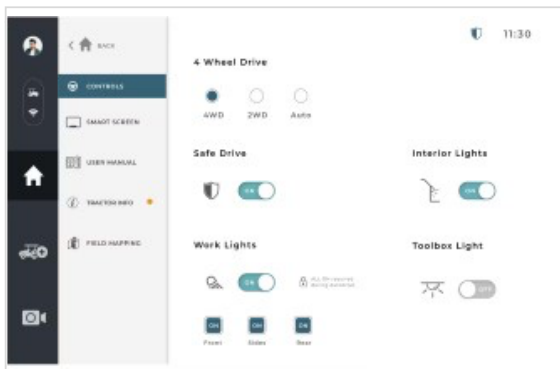
Smart Screen Settings

03





Settings: Controls



Lights

EN

The work lights, interior lights, and toolbox light can be controlled from the Smart Screen.

4 Wheel Drive Modes (4WD)

EN

There are three different modes:

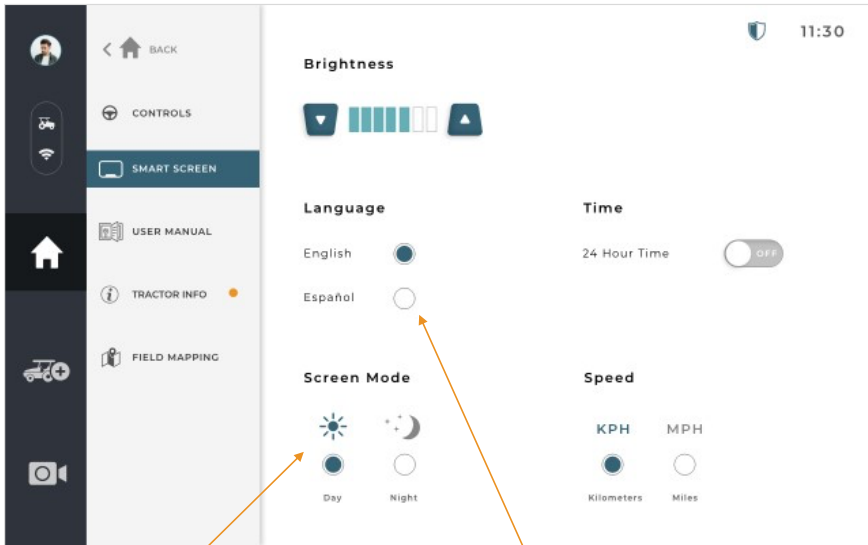
1. Auto - The tractor drives in 2WD and temporarily turns on 4WD when the rear tires slip.
2. 4WD - The tractor always drives with all four wheels.
3. 2WD - The tractor only drives with the rear wheels.

Safe Mode

EN

The tractor stops for any nearby people or objects and turns off the PTO if someone gets too close. **Safe Mode** is always active for autonomous and driver -assist modes and is optional while manually driving.

\



Screen Mode

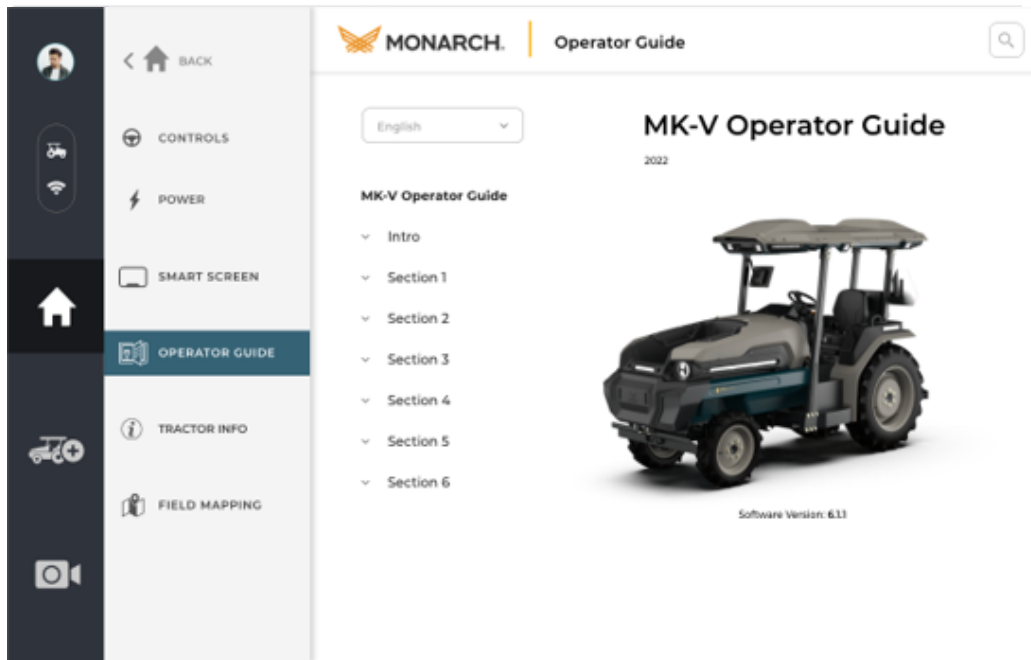
EN

The Smart Screen display can be set to night mode for reduced brightness.

Language

EN

The language on the Smart Screen can be set for English or Spanish.

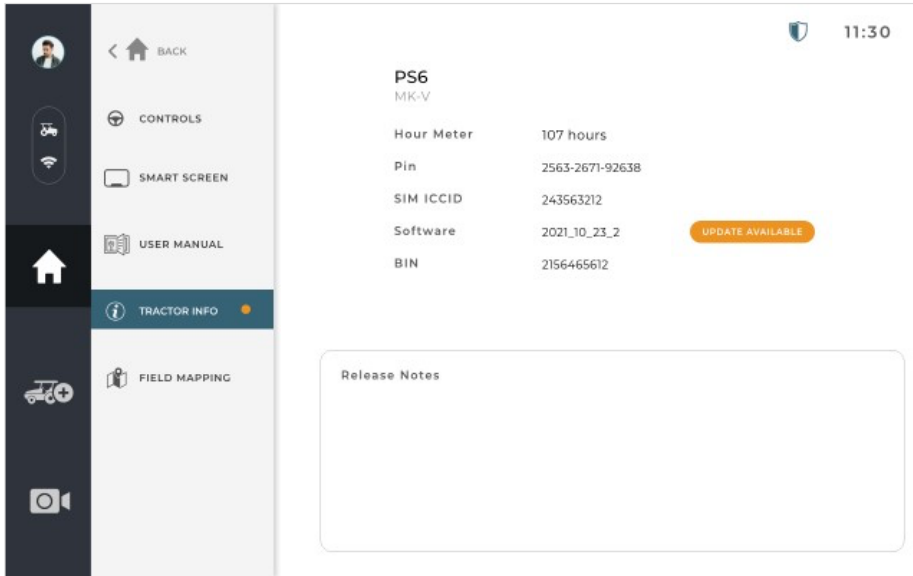


EN

The Tractor's battery can be used to power 110V and 240V equipment. Turn on/off the outlets from here.



Do Not plug in wet connectors or damaged cords in the 110/240 outlets as this may lead to shock, electrocution or fire



PIN

EN

This is the Product Identification Number of your tractor.

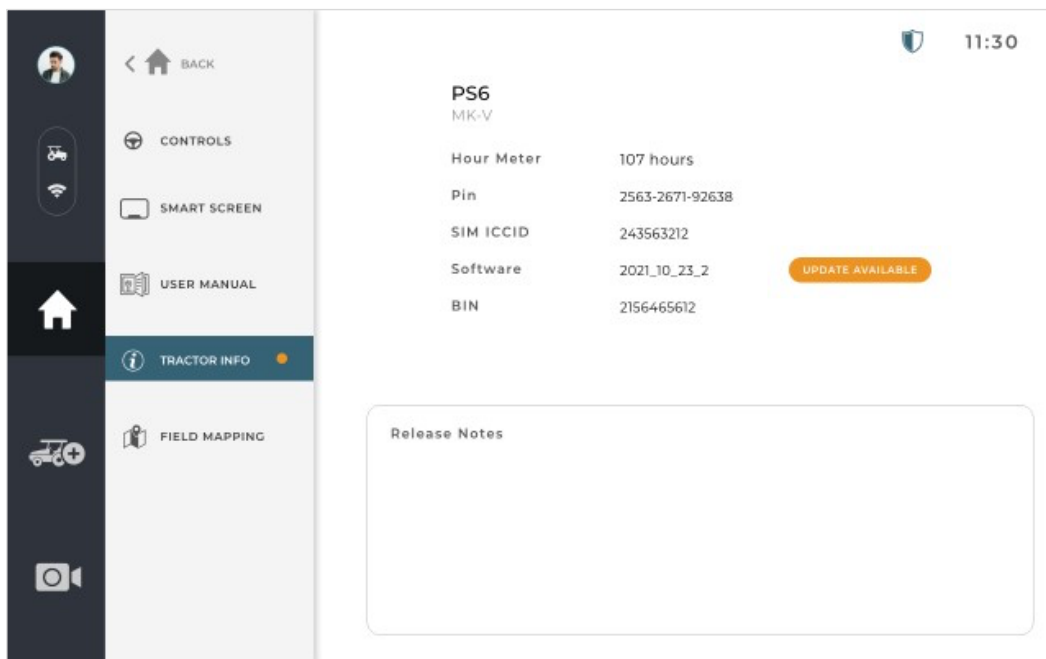
BIN

EN

This is the Battery Identification Number of the battery inside the tractor.



Tractor Info



Software Version

EN

This is the software version that the tractor is currently running. An orange indicator will appear when a new version is available. See the Service & Maintenance section for more details on installing a new software version.

Release Notes

EN

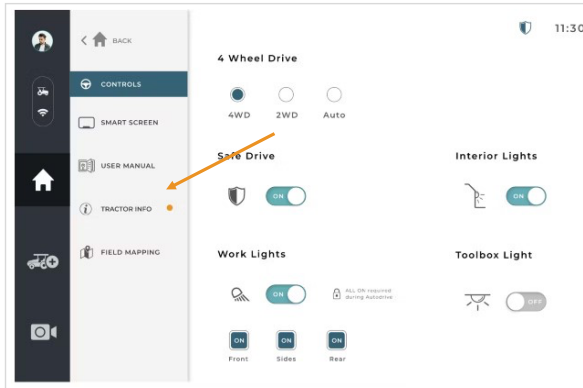
Release Notes explain the improvements or changes made in a software version. Be sure to read the release notes before installing a new software version.



110V & 240V Exportable Power

EN

The Tractor's battery can be used to power 110V and 240V equipment. Turn on/off the outlets from here.



Connectivity



Connecting to WiFi

EN

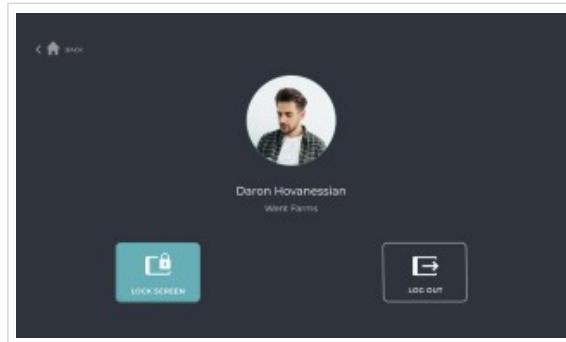
To connect to WiFi, click the [wifi symbol & connectivity symbol]. Press the WiFi logo on the pop-up and follow the prompts on screen.

ES

To connect to WiFi, click the [wifi symbol & connectivity symbol]. Press the WiFi logo on the pop-up and follow the prompts on screen.



Lock Screen



EN

If you do not want others to use a tractor, you can lock it out. Click on your profile picture in the top left-hand corner and press the LOCK OUT button. The tractor's Smart Screen is now locked until your operator's code is re-entered.

Specifications

Power

Peak Motor Power	70 hp (52 kW)
Rated Motor Power	40 hp (30 kW)
Run Time	4 – 10 hrs

Drive Train

Type	4 Wheel Drive
Transmission	Automated Manual Transmission
Number of Speeds	9F / 3R
Clutch Type	Wet
Clutch Actuation	Automated Electro-Hydraulic
Brake Type	Wet, Independent
Brake Actuation	Mechanical/Electro-Hydraulic

Power Take-Off

PTO Power	40 hp (30 kW)
PTO Speed	540 rpm
PTO Location	Rear
PTO Clutch Type	Wet
PTO Actuation	Electro-Hydraulic

Hydraulics

Type	Closed Center
Pump Rated Output	19.8 gpm (75 l/min)
Rated Flow (for Constant Flow Valve)	12.0 gpm (45 l/min)
Rear Remote Valves	2 SCVs + 1 Constant Flow

Implement Interface

3-Point Hitch	CAT I/II
Hitch Lift Capacity, 24 in. behind lift point	1,650 lbs (750 kg)
Drawbar Type	Swinging, 3 positions
Drawbar Towing Capacity	5,500 lbs (2,500 kg)
Drawbar Max. Vertical Load	1,100 lbs (500 kg)
Front Ballast Capacity	up to 10 plates, 55 lbs (25 kg) each

All specs are subject to change

Tires	
Tire Type	R1 AG
Front Tires	200/70R16 Tubeless
Rear Tires	11.2-24 Tubeless

Charging and Exportable Power	
Charge Port	J1722 Type 1 (up to 80A)
Charging Level	AC Level 2
Charging Time (w/ 80 A Charger)	5 – 6 hrs
Charging Time (w/ 40 A Charger)	10 – 12 hrs
220 VAC Power Outlet	NEMA L6-30R (25A)
110 VAC Power Outlet	NEMA 5-15 (15A)

Roof	
ROPS	Rigid, 4-Post
LED Work Lights	8x (2x per side)
LED Work Light Brightness, each	2,000 lumens

Connectivity Modules	
WiFi	802.11ac Dual Band
Cellular	4G (LTE) Ready

Dimensions	
Overall Length	146.7 in (3,725 mm)
Minimum Width	48.4 in (1,230 mm)
Overall Height	92.1 in (2,340 mm)
Wheelbase	85.0 in (2,160 mm)
Front Axle Clearance	12.6 in (320 mm)
Front Track Width	37.0 in (940 mm)
Rear Track Width (Adjustable)	36.0 in (916 mm) 40.6 in (1,030 mm) 43.9 in (1,116 mm) 48.4 in (1,230 mm)
Turning Radius	8.9 ft (2.7 m)
Base Weight	5,200 lbs (2,360 kg)

Warranty	
Tractor	4 years / 6,500 hrs
Battery	10 years / 10,000 hrs

All specs are subject to change

LIMITED WARRANTY

Monarch Tractor warrants to its authorized dealers and authorized dealers of Monarch Tractor., who in turn warrant to the owner, that each new Monarch Tractor will be free from proven defects in material and workmanship with respect to (i) all components of the product except as otherwise specified herein for forty-eight (48) months or 6,500 hours (whichever occurs first), (ii) the powertrain components consisting of clutch housing, transmission case, differential and final drive housing and all parts contained therein plus the drive axles and external driveshafts, and all parts contained therein.

Battery System Warranty for such product sold to the Customer as specified in the delivery report submitted to Monarch is covered for 10 years or 10,000 hours (whichever occurs first).

During the warranty period, the authorized Monarch dealer shall repair or replace, at Monarch Tractor's option, without charge for parts and labor, any part of the Monarch product except as otherwise specified herein which fails because of defects in material or workmanship. The owner shall provide the authorized

Monarch dealer with prompt written notice of the defect and allow reasonable time for repair or replacement.

Monarch Tractor may, at its option, require failed parts to be returned to the factory. The remedies provided in this warranty are exclusive.

This warranty does not apply to tires. The owner shall rely solely on the warranty, if any, of the respective manufacturers thereof. This warranty does not cover replacement of scheduled service items such as fluids, filters, and other high-wear items. This warranty does not cover damages resulting from abuse, accidents, alterations, use of the Monarch product with any accessory or attachment not approved by Monarch Tractor, air flow obstructions, or failure to maintain or use the Monarch product according to the instructions applicable to it.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND CONDITIONS FOR THE PRODUCT. MONARCH TRACTOR DISCLAIMS ALL OTHER WARRANTIES AND CONDITIONS, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MONARCH TRACTOR OR THE AUTHORIZED MONARCH DEALER BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, LOSS OR INTERRUPTION OF BUSINESS, LOST PROFITS, OR LOSS OF TRACTOR

WARRANTY (CONT'D)

USE, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY, STATUTE OR OTHERWISE, EVEN IF MONARCH TRACTOR OR THE AUTHORIZED MONARCH DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE TOTAL LIABILITY OF MONARCH TRACTOR AND THE AUTHORIZED MONARCH DEALERS WITH RESPECT TO THE PRODUCT AND SERVICES FURNISHED HEREUNDER SHALL NOT EXCEED THE PURCHASE PRICE OF THE PRODUCT UPON WHICH SUCH LIABILITY IS BASED.

APPENDIX A

Monarch Tractor “Keep Out” Procedure

I. PURPOSE

The purpose of this keep out procedure (this “**Procedure**”) is to protect employees of Customer from personal injury or property damage while utilizing the driver-optional features of Monarch Tractor equipment and Products, including Tractors (“**Autodrive**”). Capitalized terms used in this Procedure will have the meanings given them in the applicable Sales Order agreed to by Customer (the “**Sales Order**”) and the Subscription End User License Agreement incorporated into the Sales Order (the “**Agreement**”). Any conflicts between the terms of the Sales Order, the Agreement, and this Procedure shall be resolved in the following order: the Sales Order shall prevail over the Agreement, and the Agreement shall prevail over the procedure. This Procedure forms a part of the Agreement and is hereby incorporated by reference. No changes may be made to this Procedure without the prior express written agreement of Monarch Tractor.

II. PROCEDURE SCOPE

This Procedure establishes the process for use of the Tractor during Autodrive operations. This Procedure is designed to ensure that Products and Tractors are isolated from human interaction when performing activities without a driver onboard the vehicle (e.g., while in Autodrive).

III. CUSTOMER RESPONSIBILITIES; PROCEDURE COORDINATOR

- A. Customer shall designate a responsible employee as the process coordinator (the “**Procedure Coordinator**”) for Customer. The Procedure Coordinator shall:
 - a. Provide training on this Procedure to all authorized employees, contractors, and any third party with access to the Tractor or that may be in the vicinity of the Tractor while the Tractor is in Autodrive;
 - b. Maintain a [listing of all employees, contractors, and third parties](#) who have completed training on this Procedure;
 - c. Implement and enforce this Procedure;
 - d. Maintain all Tractors used by Customer in accordance with Monarch Tractor requirements (including any cellular connection requirements, software updates, and periodic maintenance services on Tractors and other Products); and
 - e. Conduct a daily Tractor health check prior to any use of the Tractor.
- B. The Procedure Coordinator shall be responsible for the effective use of this Procedure and to ensure that all required steps are followed in every use of the Tractor in Autodrive.
- C. Each authorized employee, contractor, and third party of Customer is responsible for learning and following this Procedure and develop a safety practice for Tractor operations in Autodrive.

IV. BASIC PROCEDURE PRINCIPLES

The Procedure must be followed in every instance where a Tractor is operating in Autodrive to prevent unintended interactions between humans and the Tractor. Operations in Autodrive are to only be conducted by the authorized employee, contractor, or third party, and a single authorized employee, contractor, or third party should start and complete an operation in Autodrive before handing off the Tractor to any other authorized employee, contractor, or third party for further use. Additionally, the Procedure Coordinator must be notified prior to initiating any operations in Autodrive.

Use of Tractors operated in Autodrive will be limited to the authorized employee, contractor or third party that has been designated in the Customer’s instance of Company’s farm management services as an authorized Tractor operator by the Procedure Coordinator. No one other than the authorized employee, contractor or third party currently in control of the Tractor should attempt to operate Tractors in Autodrive. Disciplinary action, up to and

including immediate termination, will be applied if any employee, contractor, or third party violates this Procedure, regardless of whether physical harm or equipment damage results.

V. PROCEDURE TRAINING

Authorized employees, contractors, and third parties are divided two groups, each group defined as follows:

- **Authorized Employee.** An employee, contractor, or third party whose job requires him/her to operate or use a Tractor that spends any percentage of its time in Autodrive, or whose job requires him/her to work in support of an employee, contractor, or third party operating a Tractor in Autodrive.
- **Managing Employee.** An employee, contractor, or third party who is responsible for training Authorized Employees on this Procedure, implementing this Procedure, and managing Tractor operations while operating in Autodrive. An Authorized Employee may become a Managing Employee when an Authorized Employee hands off control of a Tractor in Autodrive to another Authorized Employee. All Authorized and Managing Employees must be certified that they have completed the Procedure training in accordance with this Procedure.

Each **Authorized and Managing Employee** shall be trained in:

- Proper use of the Tractor in Autodrive following this Procedure;
- The key Autodrive functions of the Tractor, including its navigation system, human robot interfaces, and the detection and collision avoidance system;
- Emergency stop and shut down functions of the Tractor;
- Basic first aid and CPR; and
- Procedures and Tractor functions necessary to extricate a worker who is pinned under a Tractor.

At all times during Autodrive operations, Every Authorized and Managing Employee shall possess an effective means of communication such as a cellular phone or a radio for use during emergencies.

Each **Authorized and Managing Employee** who are operating or supervising the operation of a Tractor in Autodrive shall: (1) wear high visibility reflective vests (ANSI/ISEA 107-2020 Class 3), (2) post signs at the perimeter of the area in which the Autodrive operations are to be completed that provide notice that Autodrive operations are conducted in such area and prohibit entry into such area during Autodrive operations; and (3) receive training in the following:

- Reporting of unintended contact or close calls with a Tractor in Autodrive to the Managing Employee.
- Proper operation of a Tractor in Autodrive mode, and for Managing Employees, proper supervision of Authorized Employees operating Tractors in Autodrive mode. All Authorized and Managing Employees are prohibited from occupying the area in which a Tractor is operating in Autodrive. Such Authorized and Managing Employees shall conduct operations from the perimeter of such area. At no times during Autodrive operations shall an employee be permitted to lay down, sleep, or take a rest break in the area of operation while a Tractor is operating in Autodrive.

All other employees who are not Authorized Employees or Managing Employees will be provided a brief overview of this Procedure.

Training in this Procedure must be administered to all new employees as a part of their new hire orientation. Retraining must be conducted annually or whenever there is a change in job assignment, a change or addition of a Tractor to Customer's fleet, or the initiation of an equipment or process change that presents a new hazard to Tractor operations in Autodrive.

Training records must be kept for all Authorized or Managing Employees covered under this Procedure.

VI. PROCEDURE STEPS

- A. The following are the steps required to initiate and conduct Autodrive operations with a Tractor pursuant to this Procedure:
- a. The Authorized Employee must notify all other relevant employees, contractors, and third parties in writing of when and where driverless operations will occur, at least 6 hours prior to initiating the Autodrive operation.
 - b. The Authorized Employee must place signs that read "Warning: Autonomous Vehicle in Operation. No Entry During Operation" (each a "**Warning Sign**") at each location where a Tractor will be in Autodrive. The Warning Signs shall be in English, Spanish, and other languages spoken by employees, contractors, and third parties as needed to clearly communicate the meaning of the Warning Sign. The Warning Signs shall contain contact information for the Authorized Employee operating the Tractor in Autodrive. The Warning Signs shall be posted at the perimeter of the location where the Autodrive operation will take place and at every usual point of entry to such location, including each road, footpath, walkway, or aisle providing ingress.
 - i. The Warning Signs shall be legible at 25-feet away by a person with normal vision, and if operating in low light environments, must be illuminated.
 - c. Utilizing "Jump and Go" Manual Operation, the Authorized Employee must position the Tractor at the start of the routine or GoTo route prior to initiating Autodrive.
 - d. Use visual inspection and other means to ensure that no humans are present within the perimeter of the location where Autodrive operations will be conducted and no less than 10 meters from the Tractor prior to the start of and for the entirety of Autodrive operations, Confirm on [the ATOM Portal] that the Autodrive process contained therein has been completed and is ready for use, and the Tractor is safe to begin Autodrive operations.
 - e. Click "Start" on the Monarch Tractor web portal to begin Autodrive operations.
 - i. Send an update informing the Managing Employee and all impacted employees, contractors, and third parties that Autodrive operations have commenced and the location for such operations. Send a follow up note advising of the completion of such operations when Autodrive operations are completed.
- B. The following are procedures to return a Tractor from Autodrive back to standard operating mode:
- f. Once the Tractor has notified the Authorized Employee that the Autodrive operation is complete, or has concluded for any other reason, the Authorized Employee will be sent a notification.
 - g. Using visual inspection and other means, the Authorized Employee shall ensure the Autodrive operation was completed as intended. The Authorized Employee must report any abnormal findings to Monarch Tractor.
 - h. Upon completion of the Autodrive operations, the Authorized Employee may remove the Warning Signs from the location.
 - i. Utilizing "Jump and Go" Manual Operation, the Authorized Employee may move the Tractor to its next task.
- C. Procedure for Tractor Recovery if interrupted during an Autodrive routine, Autodrive operation incomplete

[To come]

VII. CONTRACTORS AND THIRD PARTIES

Contractors and third parties involved in the Autodrive operations of a Tractor must also need to be trained on the operation of a Tractor in Autodrive prior to commencing their work.



MONARCH[®]

M K - V T R A C T O R

O P E R A T O R G U I D E