OWNERS MANUAL / SAFETY MANUAL

RVR UTILITY VEHICLES

GAS POWERED & ELECTRIC RVR MODELS (L5 & AMP)

THE LATEST VERSIONS OF THE WIRING DIAGRAMS AND ILLUSTRATED PARTS LISTS ARE ONLINE AT LANDMASTER.COM

CP00269 rev. 0

Table of Contents

YOUR PRODUCT IDENTIFICATION NUMBER (PIN)

Making sure your PIN is noted correctly greatly reduces any delays in getting help with parts, accessories or any warranty work.

MODEL:

17 CHARACTER PIN:

A	4	P														
letter / digit / letter			letter/digit	letter/digit	letter/digit	letter	letter/digit	letter	letter	letter	letter	digits / letters				

THE PIN PLATE IS LOCATED BELOW THE UTV STEERING WHEEL

Landmaster welcomes you to its growing family of new product owners. This Utility Terrain Vehicle (UTV) has been designed with care and built by skilled workers using quality materials. Proper set-up, maintenance and safe operating practices will help you get years of satisfactory use from this vehicle.

PLEASE TAKE A FEW MOMENTS TO GET ACQUAINTED WITH YOUR VEHICLE BY READING THIS OWNERS' MANUAL.

- Before operating this vehicle, the owner, and each operator, must understand that this vehicle was not designed or manufactured to meet specifications for use on public roads, streets, highways and thoroughfares, unless equipped with the LSV package.
- The owner, operator(s) and passenger(s) must read and understand all the instructions for proper assembly and safe operation, as well as the instructions concerning the engine and all other portions of the vehicle as described and illustrated in this manual.
- This vehicle is **NOT** to be operated by anyone under 16 years of age.
- This vehicle is **NOT** a toy.
- Be sure to follow the recommended maintenance schedule and service your vehicle accordingly.

PREVENTATIVE MAINTENANCE IS EXTREMELY IMPORTANT TO THE SAFE OPERATION AND LONGEVITY OF YOUR VEHICLE.

- Inexperienced and first time drivers are urged to seek instruction from a dealer or qualified instructor before and during the initial use of this vehicle. It is also recommended to practice in a large open area to become familiar with the operation of the machine.

FOR MORE INFORMATION ON LANDMASTER AND OUR FULL PRODUCT OFFERING, VISIT OUR WEBSITE AT WWW.LANDMASTER.COM

For a detailed description of warranty coverage for your vehicle, refer to the Warranty section found in this Owners' Manual or go to **www.landmaster.com**

For a detailed description of the emissions warranty for your vehicle, refer to the Emissions Warranty section of this Owners' Manual or go to **www.landmaster.com**

CELL PHONE USE

The use of Mobile Communications Equipment has become increasingly important and prevalent in both personal and business affairs. Drivers must not compromise their own, or others safety when using such equipment. Landmaster recommends against the use of any handheld device while driving this vehicle. We hope you will have a fun, safe experience with our products and thank you again for choosing a Landmaster Utility Vehicle.

USING THIS MANUAL

- Prior to any vehicle operation it is absolutely essential that you read and comprehend each section in this manual to develop and understanding of your vehicle and ensure your safety. After reviewing this manual, store it in a dry and easily accessible place for future reference.
- This manual is designed to help familiarize you with safety, assembly, operation, adjustments, troubleshooting, and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.
- The information contained within this manual was current at the time of printing. Constant improvement in the design and quality of components may result in discrepancies between the actual vehicle and information presented in this manual.
- To view the most up to date manuals or to order a new Operator's or Parts Manual contact you authorized dealer or contact Landmaster Customer Service at 800-643-7332 or visit us on the web at **www.landmaster.com**

This manual has been prepared to instruct you in the safe and responsible operation of your Utility Vehicle. Read and abide by all safety alert information about this vehicle. If you do not understand any part of this manual, contact your local dealer for additional information and clarification. As the operator of this piece of equipment, you are in complete control. Only you can prevent an accident from happening.

TERMINOLOGY

Right-hand and left-hand as used in this manual are determined by facing the direction the vehicle will travel while in use unless otherwise stated.

GETTING ACQUAINTED WITH YOUR UTILITY VEHICLE

This vehicle is designed exclusively for off-road use. It is not designed, properly equipped, or licensed to be safely operated on public streets and highways unless equipped with an Low Speed Vehicle (LSV) package, or as directed by local ordinances.

A vehicle configured as a Low Speed Vehicle (LSV) is street legal where allowed when properly licensed and plated. Although street legal, the LSV is not designed for, nor allowed on highways. Refer to your local ordinances regarding the use of Low Speed Vehicles in your area.

The RVR vehicle is speed limited work vehicle with a maximum travel speed of 15mph and is not equipped with seat belts or a roll-over protective system. Operators must be aware of low hanging limbs, briars, brush or objects that could make contact with occupants during operation of this vehicle.

The cargo bed on your vehicle has been designed to be versatile and durable for a variety of cargo carrying functions. A standard 2" receiver hitch makes towing convenient and easy.

Features / Locations

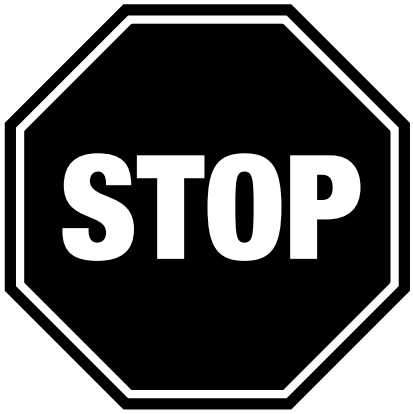
1	Front Receiver Hitch
2	Front Suspension
3	Ultra Guard Bumper
4	LED Headlights
5	Hood
6	Parking Brake
7	Bed Latch Release Lever
8	Convertable Steel Dump Bed
9	2” Receiver Hitch
10	Rear Suspension
11	Side Splash Panel

Landmaster wants you to be satisfied with you new vehicle. If you do not understand any part of this manual or you’re not satisfied with the service received, please take the following actions:

• Discuss the matter with your dealership service manager. Make sure they are aware of any problems so they can assist you.

• If you are still unsatisfied, please call Landmaster customer service at 800-643-7332 or email us at **feedback@landmaster.com** .

section 2 safety



IMPORTANT SAFETY INFORMATION

The following section has been prepared to instruct you in the safe and responsible operation of your utility vehicle. Read and abide by all safety alert information about this vehicle. If you do not understand any part of this section, contact your local dealer for additional information and clarification. As the operator of this piece of equipment, you are in complete control. Only you can prevent an accident from happening.

AGE OF OPERATOR:

This vehicle is not to be operated by anyone under 16 years of age.

ASSUMPTION OF RISK:

The owner or operator assumes all the risks incident to or arising out of the operation of this Utility Vehicle.

WARNINGS AND CAUTIONS

This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury. Read and follow all instructions in this Manual, before attempting to operate this vehicle.

WARNING	***Indicates a potential hazard that could result in severe personal injury or death***
CAUTION	***Indicates a potential hazard which may result in personal injury or damage to the machine.***
NOTE	***will alert you to key information or instructions.***

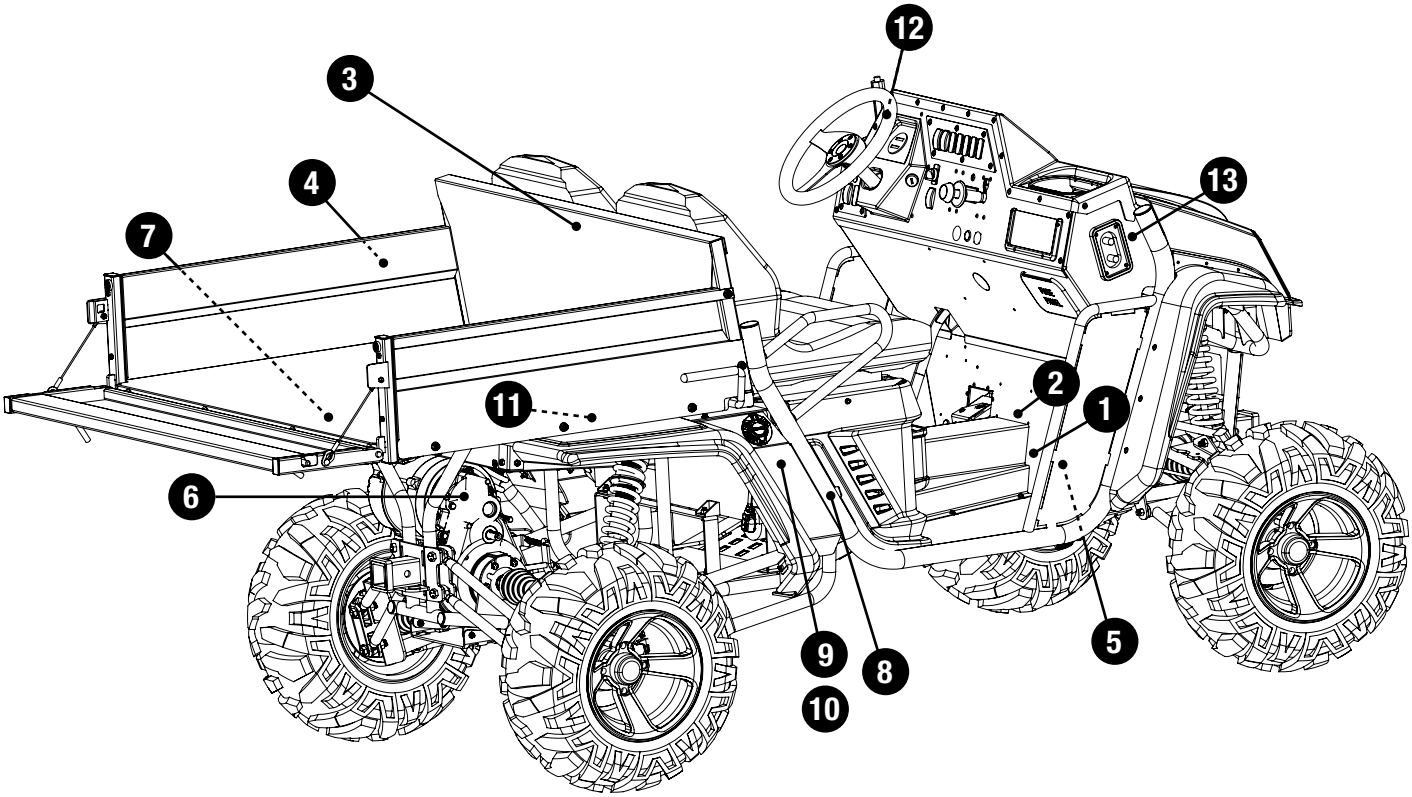
BEFORE OPERATING THIS VEHICLE

Please take a few moments to get well acquainted with your vehicle by reading this Owners' Manual.

- Before operating this vehicle, the owner, and each operator, must understand that this vehicle is designed to be an off-road vehicle and has not been or manufactured to meet specifications for use on public roads, streets, highways and thoroughfares unless equipped with the appropriate LSV package.
- The owner, operator(s) and passenger(s) must read and understand all the instructions for proper assembly and safe operation, as well as the instructions concerning the engine and all other portions of the vehicle as described and illustrated in this manual.
- This unit is not designed for children and should not be operated by anyone under 16 years of age.
- This vehicle is not a toy.
- Be sure to follow the recommended maintenance schedule and service your vehicle accordingly. Preventative maintenance is extremely important to the safe operation and longevity of your vehicle.
- Inexperienced and first time drivers are urged to seek instruction from a dealer or qualified instructor before and during the initial use of this vehicle. It is also recommended to practice in a large open area to become familiar with the operation of the machine.

SAFETY LABEL LOCATIONS

IT IS VERY IMPORTANT TO READ, UNDERSTAND, AND FOLLOW ALL INSTRUCTIONS AND WARNINGS LOCATED ON THE DECALS ON YOUR UTILITY VEHICLE.



SEE FOLLOWING PAGES FOR SAFETY LABEL DETAIL

IT IS VERY IMPORTANT TO READ, UNDERSTAND, AND FOLLOW ALL INSTRUCTIONS AND WARNINGS LOCATED ON THE DECALS ON YOUR UTILITY VEHICLE.

Label illustrations may not be actual size

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⚠ WARNING ⚠ ADVERTENCIA

OBSERVE THE FOLLOWING INSTRUCTIONS

Failure to understand and follow Warnings and Instructions for the safe use and maintenance of this product may result in **Death or Injury!** This information is contained in the Warning Labels, Owner's Manual & Supplements, Safety Video, and Engine Manual supplied with this product. Make sure that you understand and follow all Warnings and Instructions in this material.

- Always wear a D.O.T.-approved motorcycle helmet, eye protection, and protective clothing.
- Reduce speed and use caution on slopes and in sharp turns.
- This vehicle is not to be operated by anyone under 16 years of age.
- Keep arms and legs inside the vehicle at all times.
- Keep all covers and shields properly installed.
- Never ride after consuming alcohol, drugs, or other intoxicants.
- Throttle and Brake Controls must work properly and freely before starting the engine.
- Operator must be seated before operating the vehicle.
- Never operate at speeds too fast for your skills or the conditions. Never attempt jumps or other stunts.
- Check tire pressures before operating. Refer to Owner's Manual for proper operating pressure.
- This vehicle is not street legal and is intended for off-road use only.

If you did not receive any of the material listed above,please call **800-643-7332** and request to have them sent to you at no charge.

OBSERVE LAS SIGUIENTES INSTRUCCIONES

El hecho de no comprender y seguir las Advertencias y Instrucciones para el uso seguro y el mantenimiento de este producto puede causar **¡MUERTE O LESION!**. Esta información esta contenida en las Etiquetas de Advertencia, Manual de Dueño y Suplementos, Video de Seguridad, y el Manual del Motor proveídos con este producto. Asegúrese de comprender y seguir todas las advertencias e instrucciones suministradas.

- Siempre lleve puesto un casco de motocicleta aprobado por D.O.T., protección en los ojos, y ropa de protección.
- Reducir la velocidad y tenga cuidado en las pendientes y en curvas cerradas.
- Este vehículo no debe ser operado por ninguna persona menor de 16 años de edad.
- Mantenga los brazos y las piernas dentro del vehículo en todo momento.
- Nunca maneje después de consumir alcohol, drogas, u otros intoxicantes.
- Acelerador, y controles de frenos deben trabajar apropiada y libremente antes de encender el motor.
- El operador debe estar sentado antes de operar el vehículo.
- Nunca opera a una. Nunca intente saltos o acrobacias. Sus habilidades o las condiciones.
- Checar inflación de llantas antes de operar. Consulte el Manual de Dueño para la presión adecuada de operación.
- Este vehículo no es legal en la calle y destinados a uso solamente afuera de carretera.

Si Usted no recibió alguno de los materiales mencionados anteriormente, por favor llame al **800-643-7332** y solicite que se le envíen sin cargo. CP00250 rev. 0

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⚠ CAUTION ⚠ PRECAUCION

SHUT OFF FUEL VALVE

Always shut off fuel valve before transporting this vehicle.

APAGE LA VÀLVULA DE COMBUSTIBLE

Todo el tiempo apague la válvula de combustible antes de que transporte este vehículo.

CP00032

3

⚠ WARNING	⚠ ADVERTENCIA
NO RIDERS	**NO SUBIR**
All occupants must be inside the vehicle and wearing the proper restraints and safety gear.	Todos los ocupantes deben estar adentro del vehículo usando equipo de seguridad y restricciones adecuadas.

CP00025

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⚠ WARNING ⚠ ADVERTENCIA

LATCH DUMP BED

Driving with the cargo bed raised is hazardous. Always lower and latch bed before driving.

SEGURO DE LA CAJA DE VOLCAR

Manejar con la caja de carga levantada es peligroso. Todo el tiempo manténgala abajo y use el seguro de la caja cuando maneje.

CP00031

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EL VEHÍCULO SE PUEDE VOLCAR

Este vehiculo se maneja y se maniobra diferente de cualquier otro carro o camión común de pasajeros. Curvas cerradas o maniobras bruscas en alta velocidad puede causar una volcadura o pérdida del control. Mantenga los brazos y las piernas dentro del vehículo en todo momento. Lea y comprenda el Manual de Dueño antes de operar este vehículo.

CP00251 rev. 0

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⚠ WARNING

HOT SURFACES

Surfaces around the engine and exhaust can be extremely hot. Allow surfaces to cool before servicing.

⚠ ADVERTENCIA

SUPERFICIES CALIENTES

Las superficies alrededor del motor y el escape estar extremadamente calientes. Permit superficies se enfríen antes de realizar el ma

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⚠ WARNING

EXHAUST GAS HARMFUL

Engine exhaust from this product contains chemicals, known in certain quantities to cause cancer, birth defects, or other reproductive harm.

⚠ ADVERTENCIA

GASES DE ESCAPE NOCIVOS

Gases de motor de este producto contienen productos químicos, conocidos que en determinadas cantidades pueden causar cáncer, defectos de nacimiento u otros daños reproductivos.

CP00029
CP00028

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⚠ CAUTION

USE ONLY MID-GRADE UNLEADED GASOLINE (87 – 93 OCTANE)

E15 E85

This engine is designed to run on automotive gasoline. NEVER use E-15 or E-85 fuel (diesel) or blends with an Ethanol content in excess of 10%. Doing so will cause damage to the engine and void the warranty.

⚠ PRECAUCION

USE SOLO GASOLINA DE MEDIO-GRADO SIN PLOMO (OCTANO 87-93)

E15 E85

Este motor fue diseñado para funcionar con gasolina de automobil con mezclas de etanol permitidos de 0% a 10%.

El intentar utilizar otro tipo del que se requiere, causara daños al motor y no sera valida la garantia del fabricante.

CP00030

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⚠ WARNING ⚠ ADVERTENCIA

TURN OFF ENGINE

Always turn off engine before refueling. Refuel in a well ventilated area. Keep away from flame or sparks.

APAGE EL MOTOR

Todo el tiempo APAGE el motor antes de poner combustibles. Ponga combustible en un área bien ventilada. Aleje de las llamas o chispas.

CP00033

PARKING BRAKE OPERATION

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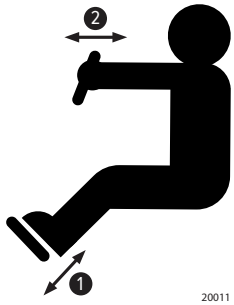
1. Depress Brake
2. Pull Park Lever



20011

10

15 Amp / **12** Gauge

POWER CORD REQUIRED

Extension cord must be a minimum of 14 GAUGE and able to carry at least 15 AMPS. Do not use cords that have damaged or spread terminals. Using an improper cord could result in excessive heat, fire or other damages.

19590 rev. A

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⚠ WARNING

ALWAYS USE SHIELDS

Shields must be installed and properly fastened prior to operating vehicle. See Operator's Safety Manual

⚠ ADVERTENCIA

SIEMPRE USE ESCUDO TERMICO

Escudo termico deben ser instalados y correctamente sujetos antes de operar el vehículo. Vea el Manual de Seguridad del Operador.

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WARNING

DO NOT USE THESE JUMP TERMINALS

Jump terminals are not to be used for electric-powered vehicles.

19416

SAFE OPERATING PROCEDURES

Your Utility Vehicle has been designed with many built-in safety features. However, no one should operate this vehicle before carefully reading this Operator's Manual. Also read all instructions noted on the safety decals.

⚠ WARNING — OPERATION

• Be familiar with all functions of this vehicle

• Do not allow anyone to operate this vehicle who has not fully read and comprehended this manual and who has not been properly trained in the safe operation of this vehicle.

• Do not operate a vehicle with damaged or defective parts. A damaged vehicle should be evaluated and repaired by an authorized service center and defective parts replaced before putting vehicle back in to service

• Operator must always use both hands on the steering wheel

• Operate this vehicle from the driver's seat only.

• Do not leave this vehicle unattended with engine running.

• Do not dismount a moving vehicle as serious injury or death could occur.

• NEVER operate vehicle with engine shields or guards removed.

• Do not touch engine, exhaust pipe, shields and/or muffler. Surfaces on or around the engine can be extremely hot.

• Wear snug-fitting clothing to avoid entanglement with moving parts.

• Long hair, loose clothes, or jewelry can get caught in moving parts below and behind the seat or surrounding environment.
  a. Remove or tie back anything loose that can reach below and behind the seat before riding.

• Always be aware of and avoid tree limbs and brush that have a potential of hitting and/or poking individuals riding the vehicle. Serious body harm could result.

• Avoid sudden stops, starts, and turns.

• Always operate your vehicle at a safe speed that will allow you to maintain control.

• Do not exceed total payload capacity of this vehicle.

⚠ WARNING — OPERATION

• Do not pull ground engaging emplements or trailers with this vehicle, or damage to the vehicle drive system may occur.

• Do not pull a trailer or implement exceeding the specified towing capacity or loss of control may result.

• Do not attach an implement, trailer or other device to the hitch that will produce negative tongue weight.

• Follow all towing instructions in this manual when transporting the UTV behind another vehicle.

• Do not use the vehicle as an anchor device

• Reduce speed when loaded with cargo. Heavy loads take longer to stop and may afffect vehicle handling.

• Beware, tow ropes, cables and chains can break when pulling another vehicle or object causing serious injury or death to anyone in line with the whipping action created when they break. Never jerk when pulling, always ease into a pull gently. Always stay clear of the tow line. Never be in line with the tow line.

• Reduce speed and payload on hilly, rough, wet, slick or unstable ground.

• Do not exceed the rated capacity of the cargo bed (see specifications).

• Do not operate this vehicle on highways or where it may be a hazard to faster moving traffic.

• Always check with your local ordanance for the laws and regulations before driving on public roads.

• Never attempt wheelies, jumps, or other stunts. Never drive recklessly. Always operate your vehicle at a safe speed that will allow you to maintain control.

• Never use vehicle for racing and never modify the engine to exceed the vehicle rated maximum speed.

• Always make sure the vehicle pathway is clear of all objects when backing up. Know location of personnel around vehicle and especially location of small children. Take extra precautions when rear view is hindered by cargo.

• Always park on level ground, stop engine, set parking brake and remove ignition key before leaving the vehicle. Chock tires if condition warrants.

• Use extreme caution when cresting hills or when visibility is limited Proceed slowly until you are sure trail conditions immediately ahead are safe.

• Keep front wheels straight when cresting hills or going over bumps.

• Do not stop, start suddenly or over accelerate on hills. Loss of control and rollover could result.

⚠ WARNING — OPERATION

• Use extreme caution when descending hills or running on loose slippery surfaces. Towing, braking, and traction are greatly diminished

• Do not operate vehicle on 15 degree (26% grade) slopes or steeper

• Avoid changing direction or making sharp steering corrections on slopes or rollover may occur.

• If this vehicle begins to tip when crossing a slope, turn the front wheels downhill to regain stability and control.

• Never allow vehicle to coast or free wheel in neutral or loss of control may result.

• When crossing a slope on soft terrain, turn the front wheels slightly uphill and maintain a constant speed to maintain a straight line of travel.

• When descending hills or slopes apply steady pressure to the foot brake to avoid potential of freewheeling or runaway.

• If your vehicle loses power and stops while climbing a hill, immediately engage the foot brake and back slowly down the hill maintaining a straight downhill line of travel. Do not attempt to turn the vehicle sideways on the hill or a rollover could result.

• When traveling at night always use your headlights and reduce speed according to visibility, trail, and terrain conditions.

• Avoid water crossings when possible and never cross a body of water where depth is unknown. Loss of power will occur if the drive belt becomes submerged or wet. Unnecessary crossing of streams and waterways erodes shore line and damages water-born habitat. If you must cross, do it at a point where banks are not steep and proceed at a slow and steady speed.

• Front bumper and brush guards are not designed as push bars. Do not attempt to push other vehicles or implements or damage may result.

• Do not shift transaxle unless this vehicle is fully stopped and the engine is at idle or damage may occur.

• This vehicle is not designed for use on rental tracks of any kind.

• The safe operation of this vehicle is dependent upon the operator's ability to exercise proper judgment.
  a. Operator and passenger must not be too small or too large for controlled operation.
  b. Operator and passenger must be of sufficient age, understanding, mental capacity, and physical capacity to safely operate and ride in the vehicle.
  c. Vehicle should only be operated after mature, supervised instruction and sufficient practice in an un-congested area.

• NEVER start the engine without checking to see that the throttle control is in idle position.

• ALWAYS use extreme caution when starting the engine
  a. Hot engine, muffler, shield, or drive components can burn on contact.

⚠ WARNING — OPERATION

• NEVER operate the machine while under the influence of alcohol, drugs, or medication of any kind.
  a. Such operation is dangerous to yourself and/or others

• NEVER use hand held electronic devices while driving this vehicle
  a. Driving while distracted can result in loss of vehicle control, accident and injury.

• Wet, slippery, rough, or sloped terrain is potentially dangerous and may result in injury if proper caution is not observed
  a. ALWAYS SLOW DOWN
  b. Operator must use mature judgment, skill, and experience to choose a speed suitable for terrain and riding conditions in protecting operator, passenger, and/or any bystanders
  c. Operator must use mature judgment, skill and experience in choosing suitable terrain for individual operational capabilities.

• ALWAYS SLOW DOWN when turning.
  a. This vehicle is not a passenger car. High-speed turning and failure to operate this vehicle correctly may cause loss of control, vehicle rollover and/or possible death or injury to the vehicle occupant(s).
  b. Turning on a slope increases the risk of rollover.
  c. Practice driving in a safe open area to develop a feel for the vehicles performance and handling characteristics, size and weight.

• When turning on pavement, loose gravel, or similar surfaces, there is an increased risk in loss of control. ** ALWAYS SLOW DOWN! **

• Operating the vehicle in conditions where water, mud, snow, dirt, sand, or other debris can get into the throttle cable conduit and/or on the throttle mechanism may cause binding of the cable and/or the throttle mechanism.
  a. This may result in the throttle sticking which can cause the engine to continue to run and result in loss of control.

• STOP the vehicle and back slowly down any hill that the vehicle lacks the power or traction to climb. Do NOT turn across the slope or try to turn around.
  a. Turning on a slope increases the risk of rollover.
  b. Control the descent speed with the brake (left foot pedal).
  c. Re-applying the throttle when facing up a steep hill increases the risk of the front tires leaving the ground and the vehicle over-turning.

• STOP the engine if the machine makes unusual noises or vibrations.
  a. Check the vehicle for damage.
  b. Excessive noise or vibration is a sign of loose or worn parts.
  c Do not attempt to use the vehicle until it has been serviced to correct the issue

• Secure all cargo and loads with proper tie-downs.

• Always put the vehicle in neutral and set the parking brake when unattended

• The vehicle is NOT to be operated by anyone under 16 years of age

• Keep hands, feet, and all body parts in the vehicle at all times.

⚠ WARNING — MAINTENANCE

• Never modify any parts on the vehicle without authorization Unauthorized modifications will void warranty to all parts directly and indirectly affected by the modification.

• Support this vehicle securely before working beneath. Chock the wheels to prevent the vehicle from rolling.

• Assembly, maintenance, and/or repair of this vehicle should only be performed by designated dealers or authorized small engine centers (for engine repairs) so that no unsafe conditions or modifications are made

• This vehicle may have been supplied to you completely assembled To prevent injury or death read and follow the assembly instructions to make sure the machine was assembled properly.

• NEVER adjust, repair, or clean the vehicle while it is in motion or with the engine running.

• All screws, nuts, and bolts must be properly tightened to make sure the vehicle is in safe operating condition.

• Prevailing-torque type locknuts must be replaced with new after the old locknuts have been removed.
  a. Replace with the same type of locknut to make sure they function properly. Refer to the Owners Manual / Parts Guide maintenance section for more information on locknuts.

• Vehicle modification or removal of original equipment or safety decals can render the machine unsafe for operation.

• Keep all guards and shields in place at all times.
  a. Prevent accidental contact by the operator or service personnel while the machine is running.
  b. The guards over the brake, clutch or torque converter, axle and drive sprockets also help prevent mud and debris from coming in contact with those items.

• NEVER tamper with, alter, or change the vehicle's engine governor settings.
  a. The governor, as set by the engine manufacturer, limits maximum engine RPM.
  b. Excessive engine speed is potentially dangerous to operator, passengers, bystanders, and engine.
  c. Heat shields must be in place to maintain proper temperatures and to avoid burns.

• Make any repairs or adjustments to the vehicle only when the engine is off and the vehicle is stopped. The spark plug wire MUST be disconnected and kept away from the spark plug AND the negative (-) battery cable disconnected from the battery to prevent accidental starting.
a. When working on, around, or restarting the engine, use extreme caution to avoid contact with the muffler, cylinder head, engine, shield, or any potentially hot area on or around the engine
b. Ensure that all guards and shields are in place prior to starting the engine.

• **DO NOT** disconnect the negative battery cable with engine running This may damage the Electronic Control Unit (ECU)

⚠ WARNING — MAINTENANCE

• NEVER place hands, feet, or any body parts or clothing near the engine, wheels, and other rotating parts of the vehicle while riding or running the engine
  a. Use caution even after the engine has been running, since the engine, shields, and other drive components may be extremely hot.

• DO NOT touch engine, exhaust pipe, shields, or muffler. Allow surfaces to cool before servicing.

⚠ WARNING — SAFETY

• Operator and any passengers MUST wear a properly fitting motorcycle helmet approved by agencies such as the Department of Transportation (DOT), Safety Helmet Council of America (SHCA), or Snell Memorial Foundation (SNELL).
  a. Most accident fatalities are due to head injuries.
  b. Operator (and any passenger) should also wear face shields or goggles, boots, gloves and other appropriate protective clothing.

• Exhaust fumes are toxic.
  a. California Proposition 65 WARNING: Gasoline engine exhaust from this machine contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. The engine exhaust contains carbon monoxide, which is a tasteless, odorless, poisonous gas.
  b. NEVER operate this machine indoors or in an enclosed area without adequate ventilation.

• Safety decals must be replaced if they become unreadable or detached from the vehicle.
  a. If decals are unreadable or missing, warning of potential hazards or safety requirements may be lacking.

• Read and keep all supplied printed material.
  a. Supplements to this Operator/Safety Manual contain additional information relative to your specific vehicle model. It is important to keep all of these documents for reference.

⚠ WARNING — FUEL

• Vehicle must be stored where gasoline fumes will not reach an open flame, spark, or other source of ignition.
  a. For long-term storage, fuel tank should be drained in an open, cool area.
  b. Engine must be allowed to cool before storage in any enclosure.
  c. NEVER store the Utility Vehicle in close proximity to appliances such as water heaters or furnaces.

• Check fuel supply before each use.
  a. NEVER fill fuel tank while the engine is running or hot.
  b. DO NOT overfill tank
  c. ALWAYS allow at least ½" of expansion space at the top of tank.
  d. There should not be any fuel in the filler neck.
  e. Replace cap tightly to prevent a fuel spillage fire hazard.

NOTE: Always use an original gas cap or OEM (Original Equipment Manufacturer) replacement

  f. NEVER fill fuel tank while the vehicle is inside a building.
  g. After filling the tank, move the vehicle at least ten feet before attempting to start the engine.

E15 E85

• NEVER use E-15 or E-85 fuel or blends with Ethanol content in excess of 10% Ethanol blends in excess of 10% will cause damage to the engine and void manufacturer warranty.
  a. Use regular unleaded 89 octane gasoline with up to a 10% ethanol blend.
  b. This engine supplied with this Utility Vehicle is NOT designed for Flex Fuel operation.

• When refueling use a (UL) approved non-metallic container that has no screen or filter. Set the container on the ground before fueling to eliminate static discharge and do not use methanol or ethanol fuels

• Do not smoke or use electrical devices including cell phones while refueling.

⚠ WARNING — TIRES

• Always check wheel lug nut torque values two hours after initial operation and two hours after each tire repair and/or replacement Routinely check lug nut torque valves every 100 hours of operation

• Check tire pressure before each use.
  a. Prior to operating the vehicle check and adjust tire pressure to the proper operating pressure as indicated on the sidewall of each tire or in the Owners' Manual. A tire pressure gauge is required to obtain accurate readings.

⚠ WARNING — VEHICLE CARE

• Washing or operating the vehicle in freezing temperatures can result in water freezing in the throttle cable conduit and/or on the throttle mechanism.
  a. This may result in the throttle sticking which can cause the engine to continue to run and result in loss of control

• Keep the engine free of dirt and debris, especially in the throttle linkage area.

⚠ WARNING — BATTERIES

• **Storage and Operating Environment**
  a. Keep in a dry, ventilated environment.
  b. Do not expose the battery pack to high temperatures or direct sunlight.
  c. Avoid using in low-temperature conditions.
• **Charging**
  a. Use a charger that's compatible with the battery.
  b. Avoid overcharging and over-discharging. Do not let the battery level drop too low or charge beyond the recommended maximum capacity.
  c. Monitor the charging process to avoid overheating.
• **Physical Protection**
  a. Do not hit, puncture, or compress the battery pack.
  b. Avoid contact with sharp objects, sources of fire, and water.
• **Battery Health**
  a. Regularly check the battery voltage and capacity to ensure it's within normal range.
• **Avoid Short Circuits**
  a. Keep the battery terminals clean.
  b. Avoid allowing battery terminals to come into contact with conductive objects, such as coins or keys.
• **Regular Maintenance**
  a. Examine the battery's exterior for swelling, damage, or leakage.
  b. Periodically, it's recommended to use professional equipment to check the internal health of the battery.
• **Storage**
  a. If not in use for a long time, charge the battery to about 50% and store in a dry, cool place.
• **Safety**
  a. Keep away from children.
  b. If you notice the battery heating up, emitting smoke, or any other anomalies, stop using it immediately and place it in a safe location.

⚠ CAUTION - LOW OIL

This utility vehicle may be equipped with a Low Oil Indicator Light. This light will come on when the key is turned to the "on" position, and then go off after the engine is started. While operating the vehicle, if the oil light becomes illuminated, immediately turn the keyto the "off" position to stop the engine.

⚠ NOTICE - HIGH ALTITUDE USE

CARBURETED MODELS ONLY

Continual operation of your vehicle in altitudes in excess of 5000 feet, will require the installation of a high altitude jet kit. This service should be performed by an authorized service center. Please refer to your engine owner manual or call LandMaster customer service at 800-643-7332

ARE YOU READY TO RIDE?
SOME WORDS ABOUT RESPONSIBLE OPERATION AND RIDER SAFETY

The following pages present important information and recommendations to help you operate your vehicle responsibly and safely. Forming good habits and developing driving skills is an ongoing process. Even if you are an experienced driver, take time to become familiar with the controls, handling characteristics, capabilities, size and weight of your vehicle. Please read through these pages thoroughly.

Qualifications for Utility Vehicle (UTV) Users

This vehicle is restricted to use by operator and passenger with a minimum age of sixteen (16) years as indicated on the vehicle and vehicle specific literature. UTV's are intended for use by operators who meet the physical and cognitive capabilities set out by the manufacturer in this manual and in the material provided with the vehicle.

Know Your Municipality Rules for Driving On and Off Roads:

Our vehicles can be driven on and off roads. Please always check with your local ordinance on the rules and regulations for driving on roads. They may require special permits, licensing, LSV only, or other qualifications. Keep in mind the type of tires you have on your vehicle will effect the driving experience, steering, vibration, and wear. We have DOT tire options available that are ideal for driving on roadways.

Do not drive in "NO TRESPASSING" areas or other private land without proper authorization. Always obey local on/off-road driving laws and regulations.

CONSUMER RESPONSIBILITY FOR SAFE USE AND MAINTENANCE OF A UTV

1. **UTV's shall not be modified from the manufacturer's original design and configuration.**

2. **UTV's shall not be used to perform racing, stunt riding, jumps, spinouts, donuts, or other maneuvers as they may cause loss of control. As such, these activities are likely to result in possible injury to the operator, passenger, bystanders, or all.**

3. **Prior to each use, the operator shall perform the pre-operational checks specified by the manufacturer, and further verify:**
   a. Smooth throttle operation and positive return of the throttle linkage to a closed throttle position when released;
   b. That the throttle cable and linkages operate properly and the throttle cable or other linkages are adjusted properly;
   c. That the steering mechanism(s) is adjusted and operates smoothly;
   d. That the engine stop switch or keyswitch is properly functioning;
   e. That all guards and shields originally supplied by the manufacturer are in proper place in serviceable condition;
   f. That engine idle speed is below the point of clutch or torque converter engagement;
   g. That the gas tank is in good condition and the proper gas cap is fastened securely;
   h. That the braking system is functioning properly;
   i. That all safety labels are in place, legible and understood;
   j. That any and all guards, torque converter covers, or other covers or guards supplied by the manufacturer are in place and in serviceable condition;
   k. That tires are in good condition, inflated properly, and have sufficient tread remaining; and
   l. That all fasteners are in place and tightened securely.

4. **UTV engines shall not be started unless the operator is seated and in proper position for vehicle operation and the brake is fully engaged and locked with the park brake mechanism.**

5. **Long hair, loose clothes, or jewelry can get caught in moving parts below the seat or surrounding environment. Remove or tie back anything loose that can reach below or behind the seat before riding.**

6. **UTV's shall only be fueled by personnel knowledgeable with regard to proper fuel selection and fueling techniques.**

7. **UTV operators and passengers shall adhere to all manufacturer's recommendations and instructions, as well as comply with all laws and ordinances, and the following:**
   a. Operators shall stay seated with both hands on the steering wheel and both feet in the vehicle at all times, whether moving or stationary, unless the vehicle is stopped completely and the engine has been shut off.
   b. Passengers shall remain seated with arms and legs inside the vehicle at all times during operation.
   c. Shall observe minimum age restrictions.
   d. Shall not allow smoking in the vehicle.
   e. Persons under the influence of drugs, alcohol, or intoxicants shall not supervise, operate, or ride in a UTV.
   f. UTV's shall operate only on a surface or terrain recommended by the UTV's manufacturer.
   g. UTV's shall not be operated on roads, streets, highways, or any other location where road vehicles are intended to travel.

(cont. next page)

CONSUMER RESPONSIBILITY FOR SAFE USE AND MAINTENANCE OF A UTV (cont.)

8. Persons with the following conditions shall not ride in or operate a UTV:

a. Those with heart conditions
b. Pregnant women
c. Persons with head, back, or neck ailments, or prior surgeries to those areas of the body.
d. Persons with any mental or physical conditions, which may make them susceptible to injury or impair their physical dexterity or mental capabilities to recognize, understand, and perform all of the safety instructions, and be able to assume the hazards inherent in motor vehicle use.

9. No operator or other person shall contact any portion of the engine, wheels, or drive train for any purpose including maintenance until the engine has been turned off and allowed to cool, and the UTV is in a stable and stationary position.

10. UTV components shall be maintained and repaired in accordance with the manufacturer's specifications and utilizing only the manufacturer's authorized replacement parts with installation performed by designated dealers or other skilled persons.

11. Control Speed.

Driving at excessive speeds increases the likelihood of an accident. In choosing an appropriate speed, you must consider the capability of your vehicle, the terrain, visibility, and other operating conditions, in addition to the skill and experience of the driver.

12. Use of this Vehicle on Unfamiliar or Rough Terrain

a. Failure to use extra care when operating this vehicle on unfamiliar terrain could result in the unit overturning or going out of control. Go slowly and use extreme caution when operating on unfamiliar terrain. Always be alert to changing terrain conditions when operating the vehicle.
b. Before driving in an unfamiliar area, always check the terrain thoroughly. Don't drive fast on unfamiliar terrain or when visibility is limited (it is often difficult to react to hidden obstructions like rocks, bumps, or holes).
c. Never drive past the limit of visibility. Maintain a safe distance between your vehicle and other off-road vehicles. Always exercise caution and use extreme care on rough, slippery and loose terrain.

13. Do not perform stunts

a. Attempting wheelies, jumps, and other stunts increase the chances of an accident, including an overturn. Never attempt stunt riding of any type and ride responsibly. Don't try to show off.

⚠ WARNING

Always perform a pre-ride inspection of the vehicle using the checklist provided in this manual.

section 3 operation

See back cover for a pre-ride checklist

⚠ WARNING - BEFORE YOU DRIVE

1. **Always perform a pre-ride inspection of the vehicle using the checklist provided on the back cover of this manual.**

2. **Check tire pressure before each use.**
   a. Prior to operating the vehicle check and adjust tire pressure to the proper operating pressure as indicated on the sidewall of each tire or in the Specifications section of the Operator's Safety Manual. A "low pressure" tire gauge is required to obtain accurate readings.

3. **Check fuel supply before each use.**
   a. NEVER fill fuel tank while the engine is running or hot.
   b. DO NOT overfill tank.
   c. ALWAYS allow at least ½" of expansion space at the top of tank.
   d. There should not be any fuel in the filler neck.
   e. Replace cap tightly to prevent a fuel spillage fire hazard.

NOTE: Always use an original gas cap or OEM (Original Equipment Manufacturer) replacement.

   f. NEVER fill fuel tank while the vehicle is inside a building.
   g. After filling the tank, ensure that no fuel has spilled around the vehicle. If there is spilled fuel present, move the vehicle at least ten feet before attempting to start the engine.

4. **NEVER start the engine without the operator properly seated with the brake applied and the vehicle in neutral.**

5. **Keep the engine free of dirt and debris, especially in the throttle linkage area.**

6. **NEVER start the engine without checking to see that the throttle control is in idle position.**

7. **ALWAYS use extreme caution when starting the engine.**
   a. Hot engine, muffler, shields, or drive components can burn on contact.

8. **NEVER operate the machine while under the influence of alcohol, drugs, or medication of any kind.**
   a. Such operation is dangerous to yourself and/or others.

9. **NEVER use hand held electronic devices or items that can distract from safe driving practices.**
   a. Driving while distracted can result in loss of vehicle control, accident and injury.

10. **Long hair, loose clothes, or jewelry can get caught in moving parts below and behind the seat or surrounding environment.**
    a. Remove or tie back anything loose that can reach below and behind the seat before riding.

⚠ WARNING - WHILE OPERATING THIS VEHICLE

OPERATION

1. **NEVER place hands, feet, hair or any body parts or clothing near the engine, wheels, and other rotating parts of the vehicle while riding or running the engine.**
   a. Use caution in performing required maintenance on or near operating engine.
   b. Use caution after the engine has been running, since the engine and other drive components may be extremely hot

2. **Wet, slippery, rough, or sloped terrain is potentially dangerous and may result in injury if proper caution is not observed.**
   a. ALWAYS SLOW DOWN
   b. Operator must use mature judgment, skill, and experience to choose a speed suitable for terrain and riding conditions in protecting operator, passenger, and/or any bystanders.
   c. Operator must use mature judgment, skill and experience in choosing suitable terrain for individual operational capabilities.

3. **ALWAYS SLOW DOWN when turning.**
   a. This vehicle is not a passenger car. High-speed turning and failure to operate this vehicle correctly may cause loss of control, vehicle rollover and/or possible death or injury to the vehicle occupant(s).
   b. Turning on a slope increases the risk of rollover.
   c. Practice driving in a safe open area to develop a feel for the vehicles performance and handling characteristics, size and weight.
   d. Always reduce speed when carrying cargo or bed loads.

4. **When turning on pavement, loose gravel, or similar surfaces, there is an increased risk of loss of control. ** ALWAYS SLOW DOWN! ****

5. **Operating the vehicle in conditions where water, mud, snow, dirt, sand, or other debris can get into the throttle cable conduit and/or on the throttle mechanism may cause binding of the cable and/or the throttle mechanism.**
   a. This may result in the throttle sticking which can cause the engine to continue to run and result in loss of control.

6. **Keep hands, feet, and all body parts in the vehicle at all times.**
   a. In the event of a vehicle roll-over, do NOT extends arms, legs or any other extremity outside the vehicle as possible personal injury can occur.

7. **Keep hands and feet on controls**

8. **STOP the vehicle and back slowly down any hill that the vehicle lacks the power or traction to climb. Do NOT turn across the slope or try to turn around.**
   a. Turning on a slope increases the risk of rollover.
   b. Control the descent speed with the brake (left foot pedal).
   c. Re-applying the throttle when facing up a steep hill increases the risk of the front tires leaving the ground and the vehicle over-turning.

9. **STOP the engine if the machine makes unusual noises or vibrations.**
   a. Check the vehicle for damage.
   b. Excessive noise or vibration is a sign of loose or worn parts.
   c. Do not attempt to use the vehicle until it has been serviced to correct the issue.

10 **Operating this UTV on paved surfaces may seriously affect handling and control of the vehicle, and may cause the vehicle to go out of control.**

11. **Operating this UTV on public streets, roads or highways could result in a collision with another vehicle. Never operate this UTV on any public streets, roads or highways, whether they are dirt, gravel or paved surfaces unless properly equipped.**

12. **Always remove the ignition key when the vehicle is not in use to prevent theft or unauthorized use.**

Gasoline RVR

This section covers the operation of the gasoline RVR vehicle.

NOTE

Perform a Pre-Ride Inspection using the list on the back cover of this book before each use to ensure that your vehicle is in proper working order

General Operation - All Gas Models

Start your Utility Vehicle by following the starting procedures as noted below

1. **Depress brake pedal with your foot and hold. Pull firmly back on the park brake lever with your hand until the lever is tight.**
2. **Place gearshift in neutral.**
3. **Apply choke fully when engine is cold (carbureted models only).**
4. **Turn ignition key fully clockwise and hold to start engine.**
5. **Release ignition key to run position and choke (if applicable) to normal operating position immediately after engine starts.**
6. **Release parking brake.**
7. **Turn ignition key counterclockwise to stop engine.**

Driving is as easy as driving a car with an automatic transmission. A simple forward and reverse shifter provides direction control. Never shift while the vehicle is moving, as damage to the drive train may occur.

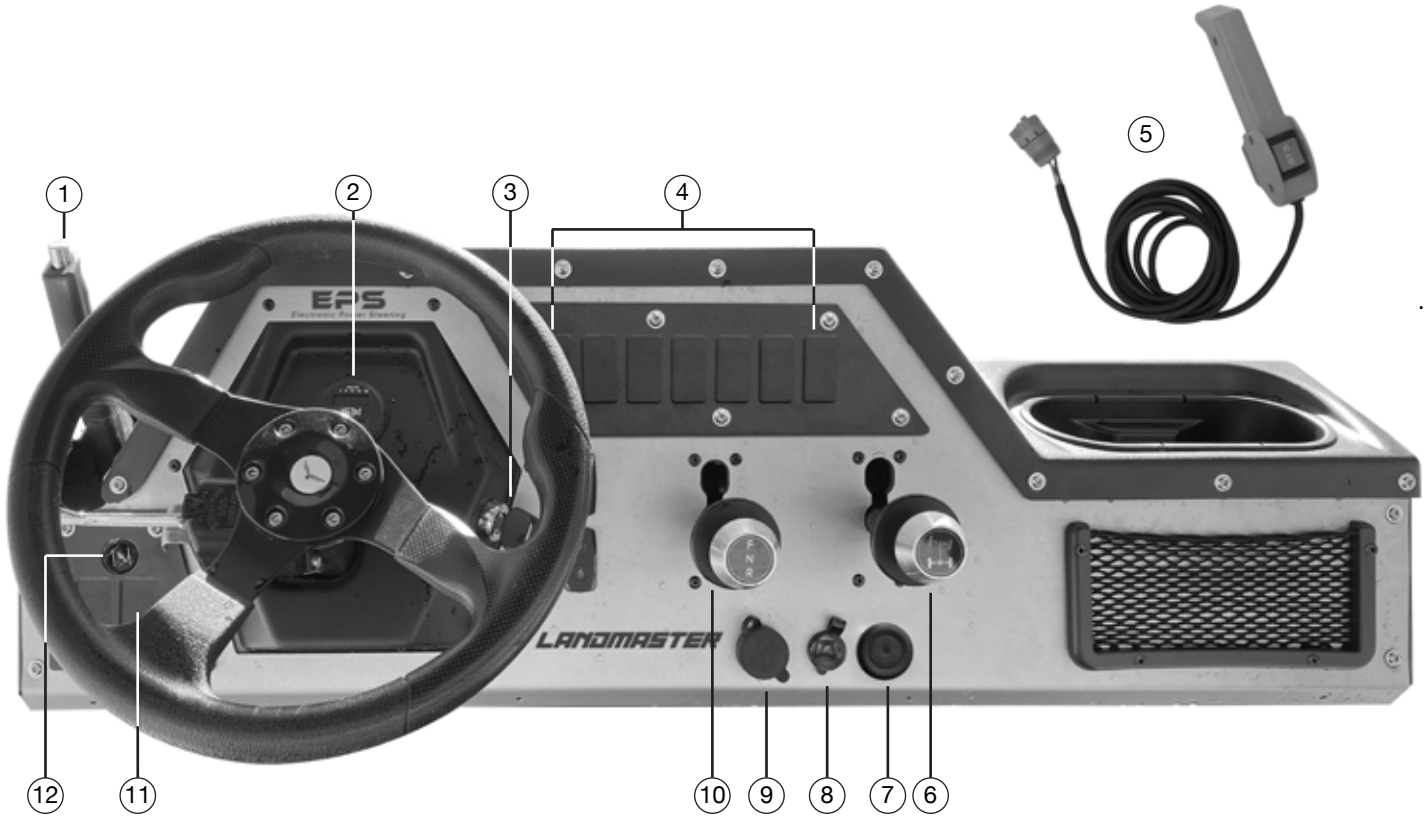
Braking is accomplished by simply releasing the throttle pedal and depressing the brake pedal that is located on the floorboard left of the accelerator. A lever action parking brake control is mounted on the dash located to the left of the steering wheel. Pull up on the lever and depress the button on the park brake control lever to release the park brake.

(Continued on next page)

Operation of the rear axle differential lock

The rear axle is equipped with a manually operated differential lock. It is engaged by moving the dash mounted differential lever to the up position. Locking the differential sends equal power to both rear wheels for better traction.

General Operation - Gas Model (continued)



1	Parking Brake
2	Hour Meter / Volt Meter
3	Ignition Switch
4	Accessories
5	Winch Remote
6	Differential

7	Winch Remote Connector
8	12V Outlet
9	Optional USB
10	F-N-R Lever
11	Horn Connector
12	Choke (if equipped)

NOTE

Locking the differential on paved or hard surfaces may increase steering effort and tire wear.

Hour Meter

Hour meter is key activated. If key is left in the “on” position, hour meter will continue to accumliate run time. Always turn key to the “off” position when not in use.

NOTE

Keyswitch must be in the “RUN” position for vehicle to operate.

DRIVING RECOMMENDATIONS

OPERATION

DRIVING WITH A PASSENGER(S)

• Passengers must be tall enough to comfortably and safely sit in a passenger seat.

• Ensure all passengers are wearing proper protective clothing, including helmet and eye protection.

• Do not exceed the recommended number of passengers for your vehicle. See specifications section. Vehicles equipped with the rear facing flip seat can safely carry an additional (2) passengers.

• Always slow down. Avoid aggressive maneuvers that will cause discomfort or injury to a passenger.

a. Operator must use mature judegment, skill and experience to choose a speed suitable for terrain and riding conditions in protecting operator, passenger, and/or bystanders.

b. This vehicle is not a passenger car. High-speed turning and failure to operate the vehicle correctly may cause loss of control, vehicle rollover and/or possible death or injury to the vehicle occupant(s).

• Handling of the vehicle may change with passengers and/or cargo. Increase time and distance for braking when loaded.

• Read, understand and follow all instructions and warnings in this manual and on the safety decals located on the utility vehicle.

DRIVING ACROSS A HILLSIDE

• Avoid driving across hillside slopes whenever possible. Slow down and exercise extreme caution. Improper driving technique or crossing an excessively steep grade could result in rollover and injury or death

• Keep hands and feet and all body parts in the vehicle at all times

• Do not cross hills that exceed 15 degrees or 26% grade

• Keep front wheels straight when crossing a hillside Steep slopes may require turning the front wheels slightly uphill to maintain a straight line of travel

• If the vehicle begins to tip while crossing a hillside, immediately turn the front wheels in the downhill direction to regain stability and control

• Do not stop or start suddenly or over accelerate on hills
control and rollover could result.

DRIVING UPHILL AND DOWNHILL

• Avoid excessively steep hills, and inspect hill for slippery or loose surfaces before attempting to climb or decend.

• Keep hands and feet and all body parts in the vehicle at all times

• Note that towing, braking and traction are greatly diminished in hill climbing or descending.

• Keep front wheels straight when climbing and/or cresting and descending hills

• Do not stop or start suddenly or over accelerate on hills. Loss of control and rollover could result.

• If the vehicle loses power or traction and stops while climbing a hill, immediately engage the service brake and back slowly down the hill, maintaining a straight, downhill line of travel. Attempting to turn the vehicle could result in a rollover.

• When descending a hill, over application of the service brake may cause skidding and loss of control. Apply the brakes slightly to aid in slowing down.

• Reduce speed and payload on hilly or rough ground.

DRIVING ON SLIPPERY SURFACES

• Note that towing, braking, steering function and traction are greatly diminished when driving on slick or slippery surfaces. Always slow down and exercise extreme caution.

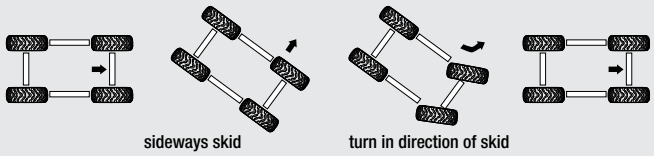
• Do not operate the vehicle on excessively slick, rough or loose terrain

• Avoid sudden acceleration and deceleration of the vehicle as loss of control may occur

• Avoid sudden changes in direction as steering control is greatly diminished when driving on slick or slippery surfaces.

• Increase time and distance for braking.

• Never apply the brakes during a skid. Correct a skid by turning the steering wheel in the direction of the skid.



sideways skid turn in direction of skid

DRIVING RECOMMENDATIONS

DRIVING OVER OBSTACLES

• Always use caution when driving in unfamiliar terrain to avoid obstructions and obstacles that may be hidden from immediate view. Be constantly alert for hazards such as rocks, ruts, holes, logs and low hanging branches.
• Avoid crossing over large obstacles whenever possible. If unavoidable, use extreme caution and slow down. Damage to your vehicle may occur if the obstacle is larger than the ground clearance of your vehicle.
• Keep hands and feet and all body parts in the vehicle at all times
• Have passengers dismount and move away from the vehicle before attempting to drive over an obstacle that could cause rollover.
• When crossing items such as a log, approach the obstacle at 45 degrees to avoid high centering the vehicle.

DRIVING THROUGH WATER

• Avoid water crossings when possible and never cross a body of water where the depth is unknown. Water crossings present unfamiliar and hidden terrain and obstacles that may cause an accident or damage to your vehicle.
• Your Landmaster UTV is capable of operating in water to a maximum depth equal to the ground clearance of the floorboards of your vehicle. Driving in deeper water will cause loss of power by submerging the drive system. Additionally, driving in deeper water will cause water ingestion into the engine cooling fan causing damage to the engine and voiding the manufacturer warranty
• If you must cross a body of water, determine depth of water and current before entering
• Enter and exit the water where both banks have a gradual incline.
• Proceed slowly
• After crossing the water, brake function may be diminished. Apply light pressure to the brake system while driving slowly until the system returns to normal brake operation.
• Frequent water crossings will require more frequent inspection of the engine oil, transaxle oil, and lubrication points of the vehicle.

DRIVING IN REVERSE

• Take extra precautions when rear view is hindered by cargo. Remove or reposition cargo that may obstruct your view. Use a spotter if necessary to assist in avoiding obstacles or people.
• Always make sure the pathway is clear of all objects when backing up. Know the location of personnel around the vehicle and especially the location of small children.
• Avoid backing down hills
• Back up slowly and avoid sudden acceleration.
• Never turn at a sharp angle when driving in reverse. Sharp turns combined with higher speeds in reverse will result in a rollover and injury or death.

PARKING THE VEHICLE

• Always put the vehicle in the Neutral gear and apply the parking brake when leaving the unit unattended or parking the vehicle for any amount of time.
• Turn off the engine. Unattended vehicles should have the ignition key removed to avoid theft or unauthorized use of the vehicle.
• Park on a level surface whenever possible
• If parking the vehicle indoors, ensure that the structure is well ventilated and that the vehicle is not parked over any loose debris or flammable materials. Park well away from any potential ignition sources such as appliance pilot lights or source of sparks.
• Avoid parking on an incline whenever possible, if unavoidable see the following recommendations:
a. Always apply the parking brake
b. Chock the wheels on the downhill side with a wheel chock, rock or large object to prevent the vehicle from rolling.

section 4 maintenance

REPLACEMENT PARTS, ACCESSORIES AND SERVICE

Most replacement parts and accessories are typically available from your dealer. Because of immediate availability and convenience, it is recommended that items be ordered from an authorized dealer. Take this manual and all supplements to the dealer when ordering parts in person.

If replacement parts are not available from a dealer, they may be ordered directly from Landmaster by contacting Customer Service at 1-800-643-7332 or online at www.landmaster.com. Orders may be subject to a minimum fee. A listing of authorized service providers in your area is also available online at www.landmaster.com or from our Customer Service department. Installation of non-Landmaster approved parts or accessories could create a substantial safety hazard and increase risk of injury. Only use authorized Landmaster parts.

Record the Model, Vehicle Identification Number (VIN) and Serial Number in the spaces provided at the front of this Manual.

AIR FILTER ELEMENTS REPLACEMENT PARTS	
Description	**Part No.**
Briggs & Stratton Air Filter 479cc / 570cc	16170

OIL FILTER REPLACEMENT PARTS	
Description	**Part No.**
Briggs & Stratton 479cc / 570cc / 627cc	16172

TUNE UP KITS (kits include all needed filters, fluids)	
Description	**Part No.**
BRIGGS & STRATTON 479cc / 570cc	16164

SPARK PLUG REPLACEMENT PARTS	
Description	**Part No.**
BRIGGS & STRATTON 570cc	
NGK	BPR6ES

PERIODIC CHECKS & SERVICES

The general maintenance intervals in the following table are based upon average driving conditions. Driving in unusually dusty areas may require more frequent servicing. Refer to the engine operation manual for detailed information specific to engine maintenance.

VEHICLE MAINTENANCE SCHEDULE

FLUID LEVEL CHECK AND CHANGE	INSPECTION INTERVAL	MAINTENANCE INTERVAL
Engine Oil	Pre-Ride Inspection	See Engine Mfg Recommendations
Transaxle Oil	6 Months or 200 hours	Yearly or 600 hours
Brake Master Cylinder	Pre-Ride Inspection	N/A

MECHANICAL	INSPECTION INTERVAL	MAINTENANCE INTERVAL
Cables (brake, throttle, choke, shift, etc.)	Pre-Ride Inspection	Lubricate Monthly (or as required by Pre-Ride Inspection)
Air Filter	Monthly	As required by inspection
Spark Plug	Quarterly	Yearly
Fuel Filter	Annually	Annually or every 400 hours
Fuel Hose	Monthly	As required by inspection
Oil Filter	N/A	With Oil Change
Drive Belt	Monthly	As required by inspection
Drive System (CVT)	150 Miles	As required by inspection
Fasteners	Pre-Ride Inspection	As required by inspection
Tires	Pre-Ride Inspection	As required by inspection
Tire Pressure (15 psi)	Pre-Ride Inspection	As required by inspection
Suspension	Pre-Ride Inspection	As required by inspection
Brakes	Pre-Ride Inspection	As required by inspection

ENGINE MAINTENANCE

Your vehicle has been supplied with an engine manufacturers manual. Follow all guidelines and recommended mainentance procedures. If for some reason you did not receive an engine manufacturers manual, please contact Landmaster at 800-643-7332. Manuals are also available for free download at landmaster.com.

NOTE GAS MODELS

PLEASE REFER TO MAINTENANCE WARNINGS ON PAGE 10

General Information

Detailed instructions and recommendations for break-in and regular maintenance are specified in the engine operator's manual. Engine warranty is backed by the engine manufacturer. Please refer to engine manufacturer's manual for engine servicing, lubricating oil levels, oil quality and viscosity recommendations, bolt torques, etc. Special attention should be paid to applicable data that is not duplicated here.

Engine Oil Fill and Drain Locations

Refer to the engine manufacturers manual for oil fill & drain locations.

To access oil check, fill and drain locations, flip the seat bottom forward and remove (figure 4.1).

figure 4.1 (seat removal - lift rear and tilt forward)

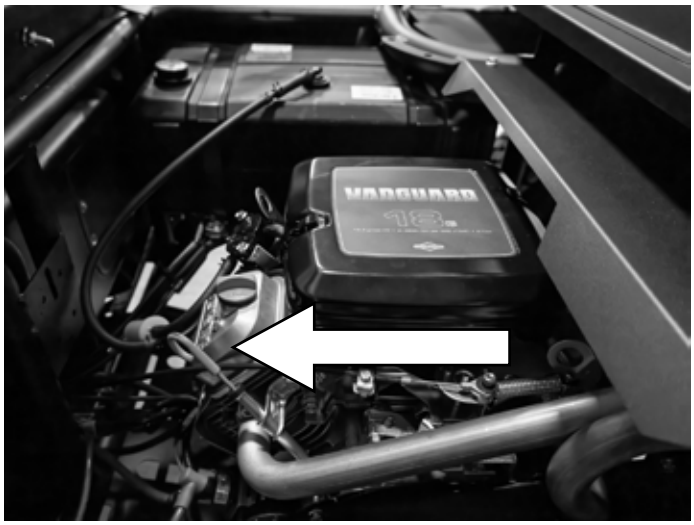


figure 4.2 (exposed engine)

ENGINE OIL

NOTE GAS MODELS

OIL LEVELS:

• Running engine low on oil can cause engine damage and void engine warranty.

• Overfilling of oil level can cause loss of power, engine damage and void engine warranty.

Engine Oil Level Check

Check engine oil daily with filler cap/dipstick as follows:

1. Park Vehicle on a level surface, set park brake, turn off ignition switch, and remove key.
2. Remove filler cap/dipstick and wipe it clean.
3. Insert and remove dipstick. Check oil level shown on dipstick.

NOTE: Some models may require you to screw the dipstick into the fill neck. (refer to the engine manual)

4. Fill to edge of oil fill hole or to the **FULL** mark on the dipstick with recommended oil when oil levels are low.
5. Replace filler cap/dipstick and tighten securely.

ENGINE MAINTENANCE CONT.

Engine Oil Change

Warm oil drains quickly and completely. Therefore, drain used engine oil while engine is still warm as follows:

1. Park vehicle on a level surface, set park brake, turn off ignition switch, and remove key.
2. Place a suitable container below engine to catch used oil. Remove filler cap/dipstick and drain plug.
3. Allow used oil to drain completely and then reinstall and tighten drain plug securely. If unit is equipped with a spin-on oil filter, remove and replace **BEFORE moving to step 4**.
4. Dispose of used motor oil in a manner that is compatible with the environment. ***Do not throw used oil in the trash. Do not pour it on the ground, or down a drain.***
5. Fill oil to the outer edge of the oil fill hole, using a funnel, per engine manual, with recommended oil.
   Engine must be level when filling.
6. Replace filler cap/dipstick and tighten securely.

⚠ NOTICE - HIGH ALTITUDE USE

CARBURETED MODELS ONLY

Continual operation of your vehicle in altitudes in excess of 5000 feet, will require the installation of a high altitude jet kit. This service should be performed by an authorized service center. Please refer to your engine owner manual or call American Landmaster customer service at 800-643-7332

Air Filter Change

1. RVR gas models will require removal of the seat bottom and require removal of the forward heat shield.
2. Replace filter per instructions included in your engine owner manual.

DRIVETRAIN MAINTENANCE

DRIVE BELT

Drive Belt - 2WD

The drive belt is considered a wearable item. Replacement intervals depend on vehicle use and environment. If your belt is slipping it may require replacement.

1. Park vehicle on a level surface, set park brake, place shifter in Neutral, turn off ignition switch, and remove key.
2. Remove the belt covers by removing the perimeter bolts.
3. "Walk" the belt off of the rear pulley as shown in figure 4.3.
4. Install the new belt on the front pulley first and "walk" it onto the rear pulley.
5. Reinstall the belt guards as shown in figure 4.4.

Note: Removal of the rear CVT guard may require upper shock bolt to be removed.

Attention: Failure to reinstall the belt guards may void your warranty.

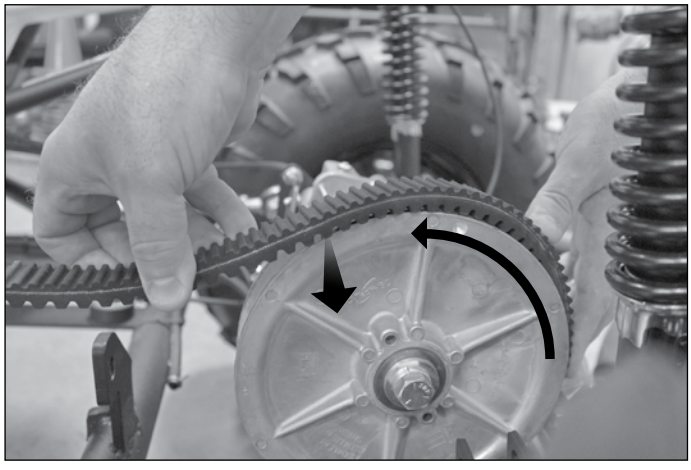


figure 4.3 (removing the exposed drive belt)

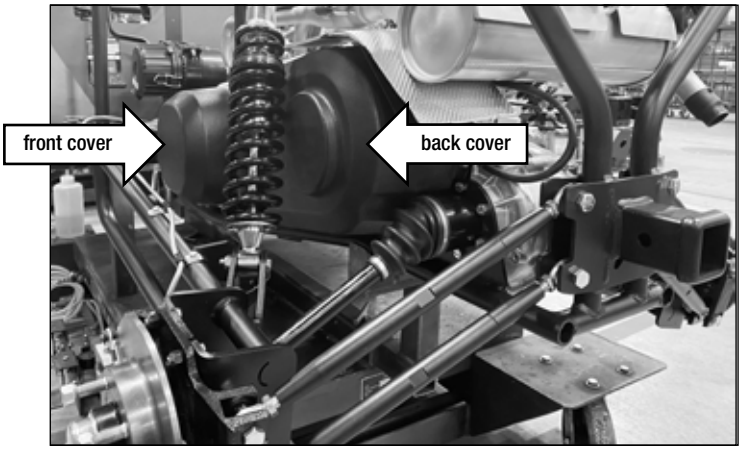


figure 4.4 (drive belt cover)

DRIVETRAIN MAINTENANCE CONT.

TRANSAXLE OIL

NOTE ALL MODELS

LOW TRANSAXLE OIL:
Running vehicle low on transaxle oil can damage transaxle and void warranty.

Transaxle Oil Change

Warm oil drains quickly and completely. Therefore, drain used transaxle oil while transaxle housingis still warm as follows:

1. Park vehicle on a level surface, set park brake, turn off ignition switch, and remove key.
2. Place a suitable container below the transaxle case to catch used oil. Remove fill cap.
3. Using the oil extractor, pump the used oil from the transaxle.
4. Dispose of the used transaxle case oil in a manner that is compatible with the environment. Do not throw used oil in the trash, pour it on the graound. or down a drain.
5. Fill transaxle housing with 24oz. 80/90 oil.
6. Replace fill cap and tighten securely.

Transaxle Oil Type, Fill, and Drain

(Refer to figures 4.5, 4.6, & 4.7)

80/90 oil is used in the transaxle. Oil should be changed after one year of normal use, and every other year after.

- Fill cap location: At rear driver side (see figure 4.5)
- Drain plug location: At bottom center of transaxle.
- Type of Lubrication: 80/90 oil.
- Transaxle Lubrication Capacity: 24 oz.

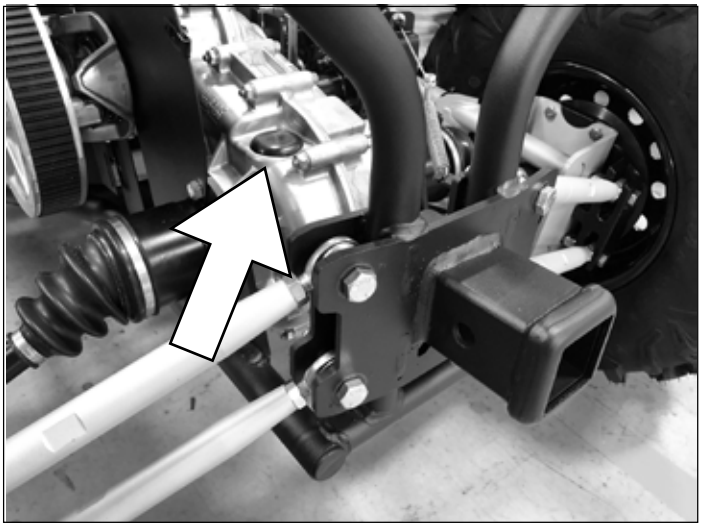


figure 4.5 (transaxle oil fill cap location)

Transaxle Oil Maintenance Schedule

- Check transaxle housing for damage and possibly oil leakage after each use.
- Check transaxle oil level every 6 months or every 200 hours (whichever comes first).

Park vehicle on a level surface, set park brake, turn off ignition switch, and remove key. Use a clean long bladed screw drive at least 7" long (or similar object). Insert into filler hole ntil it touches the bottom of gear case. Remove the screw dirver. There should be approximately 2 1/4" to 2 1/2" of oil visible on screw driver. Refer to figure 4.6

Note on VTwin units, instead of a screw driver, a flexible dipstick item such as a zip-tie may be used to avoid removal of the muffler.

- Change transaxle oil once a year or every 600 hours (whichever comes first).

The L series transaxle cannot be drained with the normal drain plug, and requires the use of an oil extraction pump. These can be purchased at any automotive part store or tool store. Reference Freight SKU's 63391, 92474, 69328, 70770, 63446, 64909

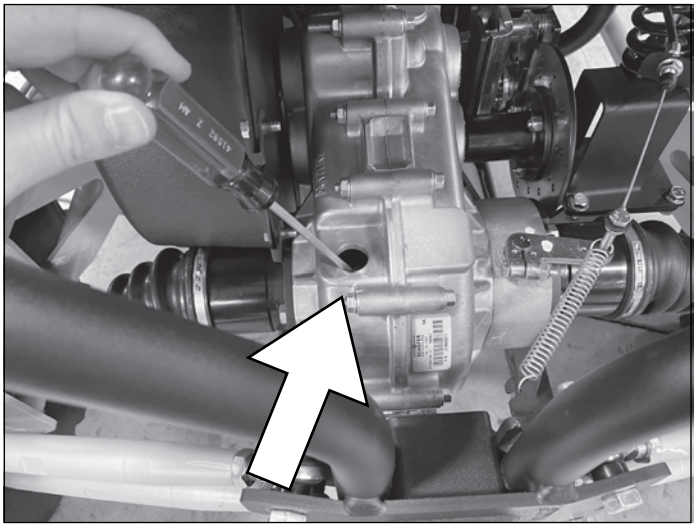


figure 4.6 (checking transaxle oil level)

DRIVETRAIN MAINTENANCE CONT.

PULLEY CLEANING

Driver Pulley Maintenance

The following pulley cleaning instructions are provided by CVTech, the pulley manufacturer.

IMPORTANT NOTICE!

- **A mechanically skilled individual should carry out Variable-Speed Drive maintenance and repair operations.**
- **Identifies operations where a risk of serious injury exists when instructions are not properly followed.**
- **Identifies a step where there exists a risk of part deterioration or component malfunction.**
- **The Tightening Torque Values shown must be precisely applied.**
- **The images are used for representations purposes only. Items may differ from illustration.**

Limit of Liability

In no event shall CVTech be liable for damage or injury due to poor text interpretation, improper Variable-Speed Drive handling or misuse of the recommended tools.

Maintenance Frequency

The CVTech Variable-Speed Drive requires no lubrication. It is designed to run dry. However, basic cleanliness rules apply when handling in order to avoid products or particulates getting in contact with Variable-Speed Drive components during reassembling.

Recommendation

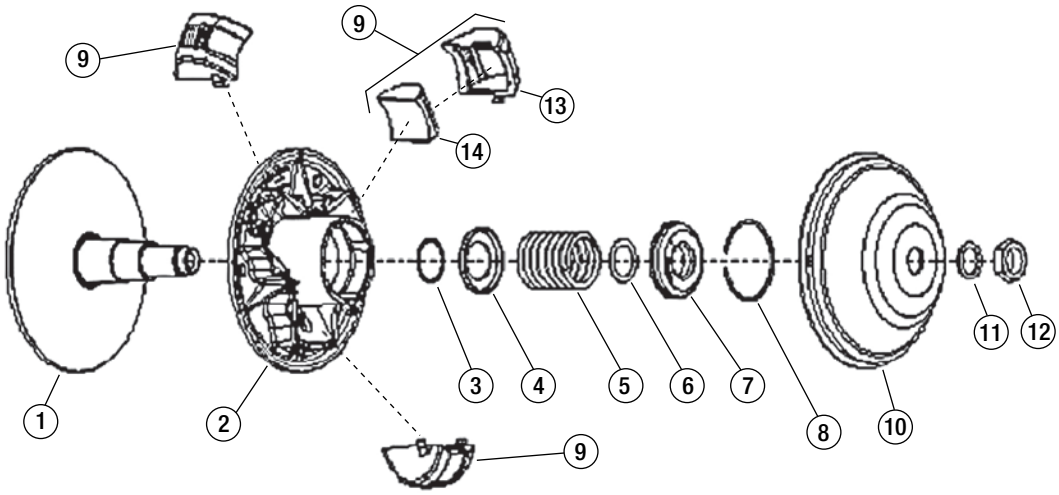
To increase the life of the drive and maintain performance, it is strongly recommended to make a visual check of the CVT:

• Every 150 hours for commercial utility vehicles.

DRIVETRAIN MAINTENANCE CONT.

Exploded view of driver pulley

Ref	Description	Qty
1	Fixed Flange	1
2	Sliding Flange	1
3	Washer	1
4	Spring Seat	1
5	Spring	1
6	Washer	1
7	Spring Cover	1
8	Snap Ring	1
9	Block Assembly	3
10	Cap	1
11	Flat Washer	1
12	Nut	1
13	Block	3
14	Weight	3



Pulley removal from the vehicle

1. Remove the bolt from the engine crankshaft.

Mark the direction of Belt Rotation

2. **Taper Shaft -** Remove the fixed flange using the puller suited for the puley. Screw in the puller until the pulley is freed from the engine shaft.
3. **Straight Shaft -** Remove the fixed flange by pulling.

NEVER HIT THE DRIVE PULLEY WITH A HAMMER OR OTHER TOOL TO REMOVE THE PULLEY OFF THE VEHICLE PTO.

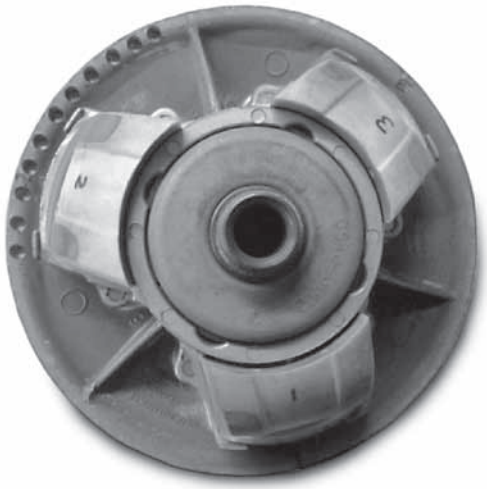
Cleaning the pulley

Removing the cap and block centrifugal

Remove the nut (12) and washer (11). Cap and centrifugal blocks are now released.

Pulley which nut and washer are removed

Not to unbalance the pulley, it is best to note the location of the centrifugal blocks in order to place them in the same location during reassembly.



Pulley with the cap are removed

Cleaning the cap

1. Clean the cap with compressed air.
2. Clean to remove any dust or dirt that can remain on the cap.
3. Pass a scrubbing pad of very fine grade on the cap.
4. Clean the cap with a solent (brake cleaner) and a cloth.
5. Clean again the parts with compressed air.

Before cleaning cap

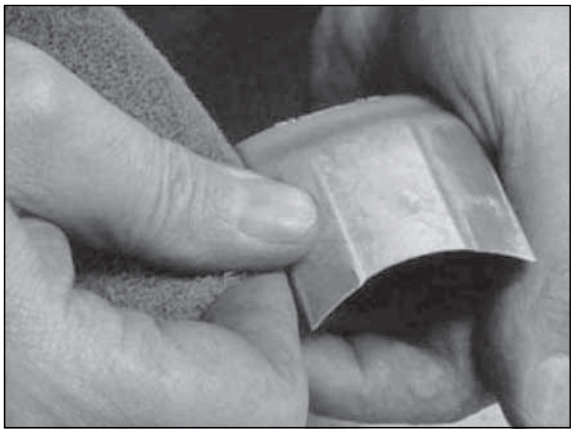
DRIVETRAIN MAINTENANCE CONT.

Cleaning the cap - cont.

After cleaning cap

Cleaning the blocks

1. Clean the blocks with compressed air.
2. Clean to remove any dust or dirt that can remain on the blocks.
3. Pass a scrubbing pad of very fine grade on the blocks.



4. Clean the blocks with a solvent (brake cleaner) and a cloth.
5. Clean again the parts with compressed air.

block before cleaning **block after cleaning**

Cleaning the flanges

1. Clean the flanges with compressed air.
2. Clean to remove any dust or dirt that can remain on the flanges.
3. Pass a scrubbing pad of very fine grade on the angle flanges.
4. Clean the flanges with a solvent (brake cleaner) and a cloth
5. Clean again the flanges with compressed air.

fixed flange before cleaning

fixed flange after cleaning

sliding flange before cleaning

sliding flange after cleaning

Cleaning the ramps

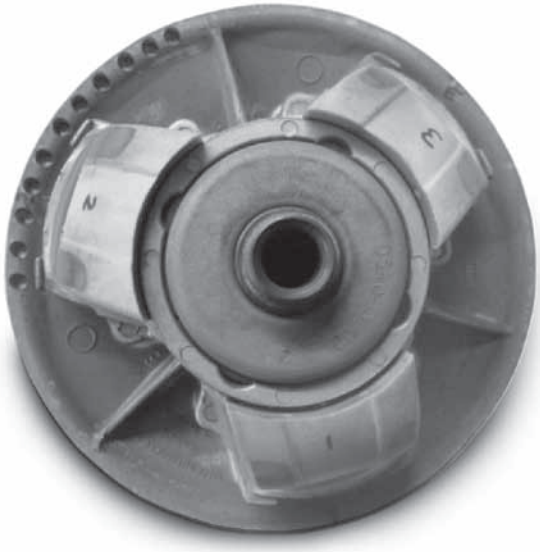
1. Clean the sliding flange ramps with compressed air.
2. Clean to remove any dust or dirt that can remain on the sliding flange ramps.
3. Pass a scrubbing pad of very fine grade on the sliding flange ramps
4. Clean the sliding flange ramps with a solvent (brake cleaner) and a cloth
5. Clean again the sliding flange ramps with compressed air.

the sliding flange ramps once cleaned

DRIVETRAIN MAINTENANCE CONT.

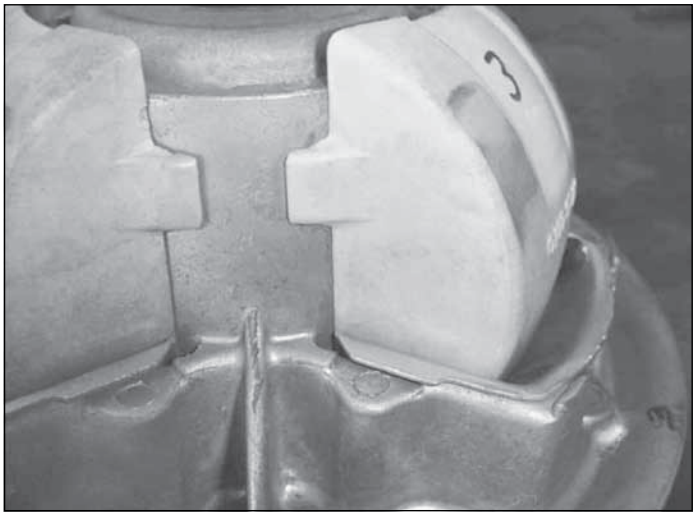
Assembling the cap and block centrifugal

Put the blocks in their respective location previously noted during disassembly in the sliding flange. Make sure that the tabs are positioned upside up as shown in the figure below.



tab positoning on sliding flange

reassembled pulley



Block on the right position with tabs upside up

Now install the cap, the washer and nut into postion.

Apply a torque of 95 Nm at 108 Nm with a torque wrench.

Reassembly of the pulley on the vehicle

Put the pulley on the vehicle and tighten the bolt holding the pulley with a torque wrench as specified by the vehicle manufacturer.

CHASSIS, STEERING, SUSPENSION MAINTENANCE

CABLES

Several cables are used on your vehicle and should be inspected and maintained on a regular basis:

- Throttle cable
- Shift cables
- Differential lock cable
- Park brake cable
- choke cable

Cable Lubrication

Stiff or sticking cables can cause the vehicle to not operate properly. Before attempting to adjust the cables ensure they are lubricated. To lubricate the cables, slide the rubber dust caps up the cable. Drip or spray penetrating oil into the cable housing while working the cable. Do this several times as the oil soaks into the housing. Test the vehicle. If cable is bound or frozen, the cable may require replacement.

Center Console Removal

1. Use 10 mm socket to remove bolts.
2. Gently lift console out of vehicle.

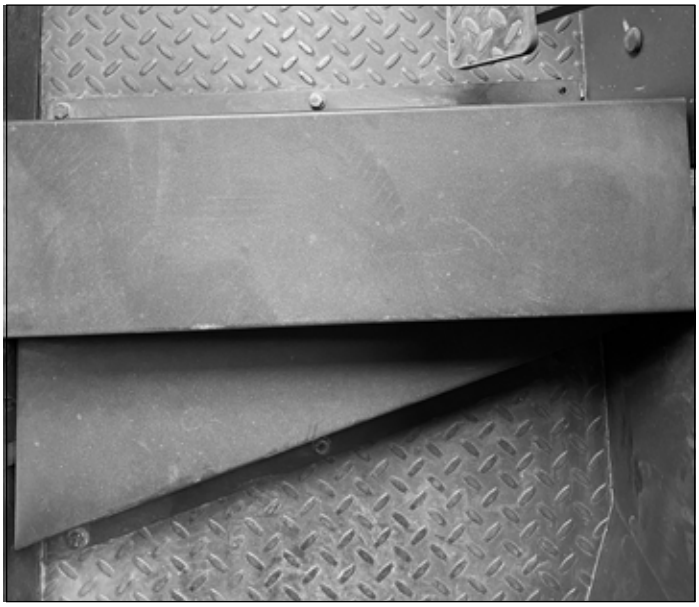


figure 4.11 (4WD drive shaft location)

figure 4.12 (center console removal)

HOOD REMOVAL

The hood of the vehicle can be removed with 8 fasteners.

1. Using 4mm Allen Wrench, remove the (2) front hood fasteners and the 6 rear fender fasteners as shown in Fig 4.13.
2. Gently pull the hood up and forward to remove from vehicle. Note the rear edge of the hood is attached to the dash portion with Hook and Loop attachment points.

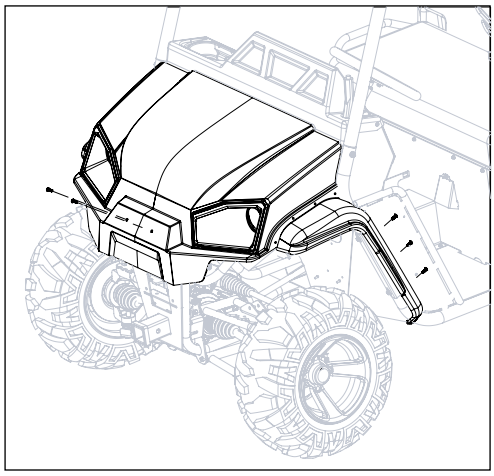


figure 4.13 (hood removal) Note: Rotate screws left to loosen and right to tighten.

Pedals

The pedals on your vehicle require inspection before each use. Pedals should depress and return freely. Pedals may need lubricated with a lithium grease at the locations shown in figure 4.14.

Non-returning pedals should have also the return springs inspected. NOTE: hood removal and protective brake cover must be removed to lubricate components .

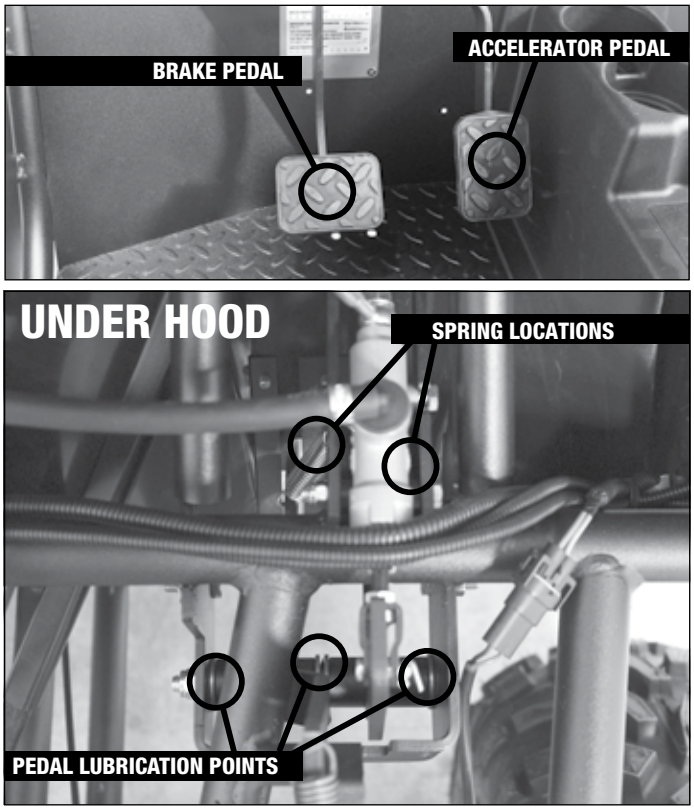
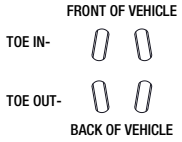


figure 4.14 (pedal lubrication points) NOTE: protective brake cover removed.

WHEEL ALIGNMENT

ALIGNMENT	SPECIFICATION
FRONT END TOE	ZERO TOE
FRONT END CAMBER	1 DEGREE POSITIVE
REAR END TOE	ZERO TO 1 DEGREE OUT
REAR END CAMBER	1 DEGREE POSITIVE



This vehicle is designed to have full alignment adjustability and is pre-set from the factory. If the vehicle requires re-alignment, a basic procedure is outlined below.

NOTE: if a re-alignment is required, a full inspection of the vehicle for bent, broken or damaged components should be completed first. A change of vehicle alignment could very likely be related to impacts from aggressive driving or collisions. Damaged parts should be replaced before any attempts at alignment.

Front Wheel Alignment (Refer to figure 4.15)

The front wheels should be set with a "toe-in" from 1/4" to 3/8". At the centerline of the tires, measure the Distance A and the Distance B. For proper toe adjustment, Dimension A should be 1/4" – 3/8" GREATER than Dimension B.

To make adjustments:
a. Loosen the lock nuts on both sides of Front Tie Rods.
b. Ensure the steering wheel is centered, and adjust Dimension B by equally rotating the tie rods in or out with a 12mm wrench.
c. After adjusting to the desired length, tighten the lock nuts against the rod end.
d. Recheck the dimensions for proper alignment.

Camber Adjustment (Refer to figure 4.15)

PROCEDURE:

Tools required:	¾" wrench
(4) jack stands	5/8" socket
Mason line or #18 nylon string	18mm wrench
7/8" wrench	

1. Empty the vehicle of any payload or occupants
2. Center the steering:
   a. Rotate the steering wheel fully to the right LOCK
   b. At full steering right LOCK, begin to turn the wheel to the left and count the rotations of the steering wheel until you reach the Left LOCK.
   c. Rotate the steering wheel back to the right for ½ of the rotations in the previous step. (for example if you have 3 full rotations lock-to-lock, turn the wheel back 1 ½ turns to center the steering)
3. Support the vehicle:
   a. Using a jack, support the front of the vehicle between the front wheels on the vehicle frame. Do NOT lift the vehicle, just support the weight of the frame.
4. Loosen the adjustment points:
   a. Loosen the UPPER ball joint fasteners
   b. Loosen the radius arm nuts at the rear of the vehicle
5. Adjust Camber
   a. For the FRONT of the vehicle, place a straight edge (or 2' level) placed vertically at the 12 and 6 o'clock position. Using a digital or dial type angle gauge, adjust the wheel end to achieve 1 deg POSITIVE camber (top of wheel outboard slightly) and tighten ball joint fasteners to 45 ft-lb.
   b. For the REAR of the vehicle, place a straight edge (or 2' level) placed vertically at the 12 and 6 o'clock position. Using a digital or dial type angle gauge, adjust the wheel end to achieve 1 deg POSITIVE camber (top of wheel outboard slightly) by rotating the radius arms to the correct position. DO NOT tighten the radius arm fasteners until the TOE adjustments have been made. (REF FIG 4.16)

Toe Adjustment (Refer to figure 4.15)

1. Empty the vehicle of any payload or occupants
2. Center the steering:
   a. Rotate the steering wheel fully to the right LOCK
   b. At full steering right LOCK, begin to turn the wheel to the left and count the rotations of the steering wheel until you reach the Left LOCK.
   c. Rotate the steering wheel back to the right for ½ of the rotations in the previous step. (for example if you have 3 full rotations lock-to-lock, turn the wheel back 1 ½ turns to center the steering)
3. Loosen the adjustment points:
   a. Loosen the tie rod nuts on the front wheel ends
   b. Loosen the radius arm nuts at the rear of the vehicle
4. String the vehicle:
   a. Place (4) jack stands at each corner of the vehicle
   b. Using the center of the vehicle as reference (NOTE: use the hitch receiver to establish the vehicle centerline), start at the front of the vehicle and place the jack stands an equal distance from the centerline of the vehicle such that you have them placed approximately 10-12" wider than the outside of each front tire.
   c. Using the same measurement "A" from the center of the vehicle to the jack stand, set up 2 additional stands at the rear corner of the vehicle. All 4 jack stands should be the same distance "A" from the centerline of the vehicle.
   d. Using string (#18 nylon or mason line), run a string line parallel to the centerline of the vehicle on both the LH and RH side. This will establish the base reference point for alignment.
   e. Tighten the string and tie off such that the line is tight.
5. Set the TOE:
   a. Starting with the REAR of the vehicle, make equal adjustments to the RH and LH upper and lower radius arms to achieve ZERO TOE where measurement "D" is the same for the rear tires. Reference this measurement from the string to the center (or edge) of the tire measurement "D".
   b. At the FRONT of the vehicle, make equal adjustments to the RH and LH tie rod ends to achieve ZERO TOE IN setting. Reference this measurement from the string to center of the tire as shown in measurements "B" and "C". Note that measurement "B" will be 1/8"-3/16" LESS than measurement "C".
   c. Recheck the distances and tighten all fasteners

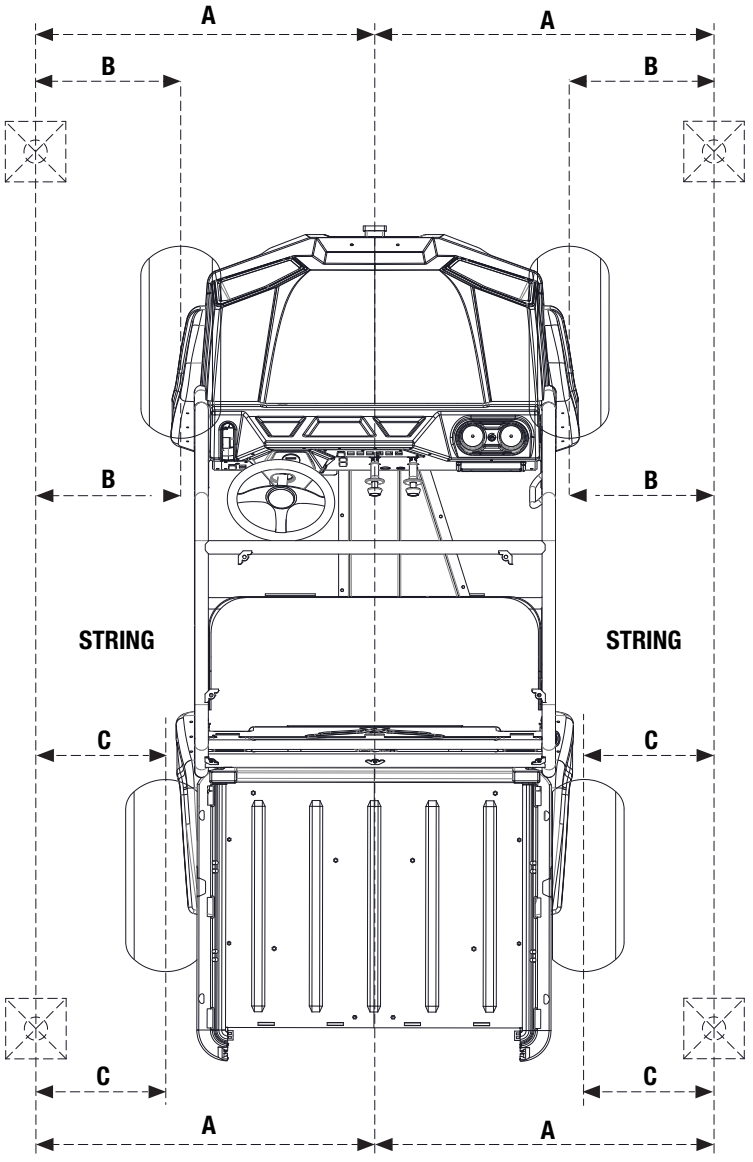


figure 4.15

BRAKES, TIRES MAINTENANCE

Tires

Check tire pressure before each use. Prior to operating the vehicle check and adjust tire pressure to the proper operating pressure as indicated on the sidewall of each tire or in the Specifications section of the Operator's Safety Manual. A "low pressure" tire gauge is required to obtain accurate readings.

Routinely inspect tires for damage, nails, unusual wear or excessive tread wear. NEVER operate a vehicle on underinflated, bald, or damaged tires, or when cording is exposed.

Hydraulic Brakes (refer to figure 4.16)

Hydraulic Brakes use fluid pressure to transfer the braking force to the wheels. To check the fluid level in the reservoir the hood must be removed. The reservoir is located under the hood just in front of the steering wheel. Fill to the MAX line with DOT 3 brake fluid. If you notice that the brake pedal feels spongy or the vehicle is not stopping well, take the vehicle to a qualified service center.

Authorized American Landmaster service centers in your area can be found by visiting www.americanlandmaster.com or by calling customer service toll free at 800-643-7332.

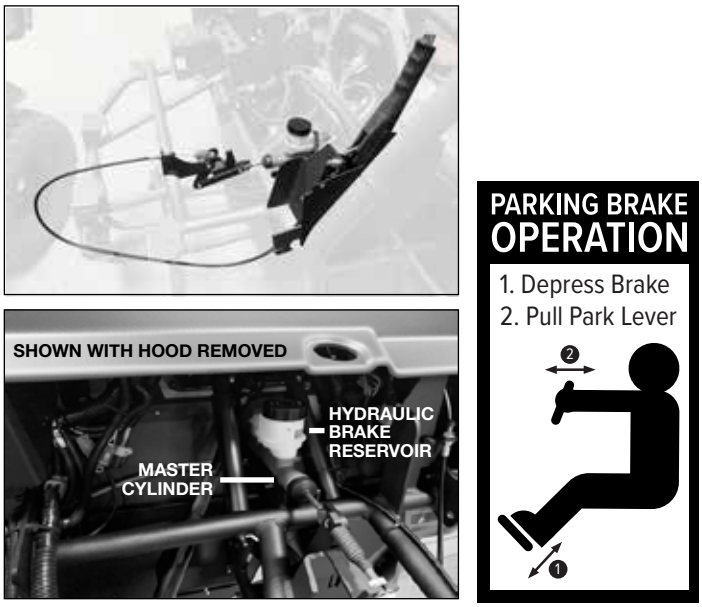


figure 4.16 (hydraulic brake reservoir location)

VEHICLE CARE

Fuel Hose

Inspect fuel hoses monthly for cracks, leaks or other damage. Replace immediately if any damage is suspected.

Compatible Cleaning Agents

Aqueous Solutions (Mix With Water) of Soaps and Detergents

Fantastik, Formula 409, Hexcel, F.O. 554, Joy, Lysol, Mr. Clean, Neleco-Placer, Pine-Sol, Top Job, Windex.

Washing your vehicle (ALL GAS MODELS)

It is acceptable to wash your utility vehicle, though a pressure washer should not be used, and common sense should be exercised The air intake system should be protected during washing by placing a plastic bag or other protection over the top of it and securing underneath prior to washing. Avoid direct water or spray contact with wiring harness, system components, or any electrical component. Remember that the electronics of a fuel injection system are sensitive to water and corrosion.

⚠ CAUTION

Washing or operating the vehicle in freezing temperatures can result in water freezing in the throttle cable conduit, the throttle, and/or the engine's throttle mechanism.

a. This may result in the throttle sticking which can cause the engine to continue to run and result in loss of control.

Headlight Adjustment / Replacement

The headlights on your vehicle are sealed LED lights and must be replaced if damaged as a complete assembly. Headlight adjustment is achieved by loosening the fasteners as shown in figure 4.17, adjusting and re-tightening.

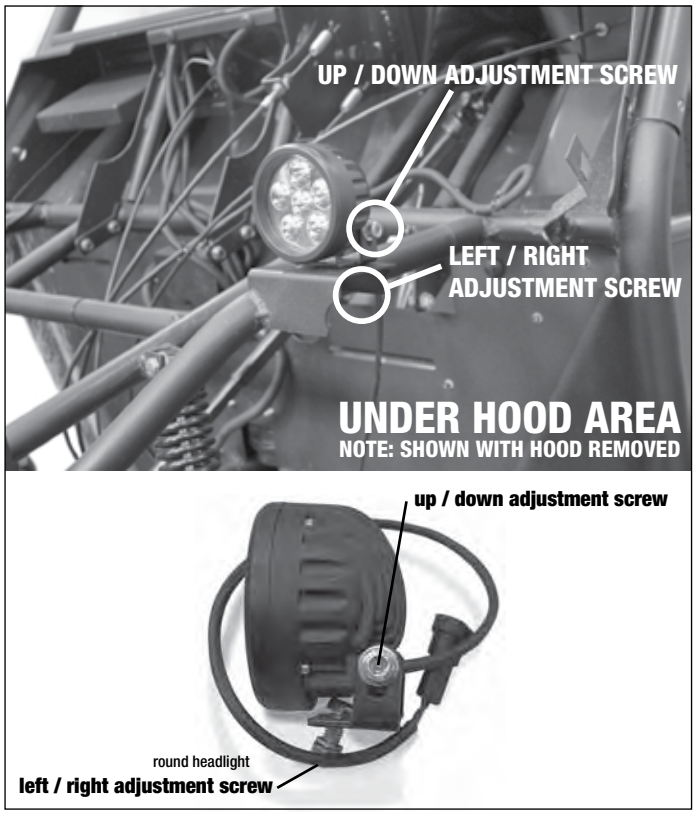


figure 4.17 (headlight adjustment screw locations)

TRANSPORTATION & STORAGE

If your vehicle is going to be trailered or in storage for an extended period of time, follow the instructions below for best results.

TRAILER TIE DOWN RECOMENDATIONS:

When trailering the unit, use tie down points close to the wheel ends to ensure the straps remain tight during transit. Ref figs: 4.18 & 4.19 for front tie points “A” and rear tie points “B”.

1. Use (4) racheting straps with the appropriate load rating for your vehicle.
2. Tie down unit at front across chassis as shown in fig 4.18
3 Tie down rear of unit above suspension bracket as shown in fig 4.19
4 Ensure straps are routed away from sharp edges that may cut or damage the strap webbing.
5. Compress suspension to secure unit to trailer.

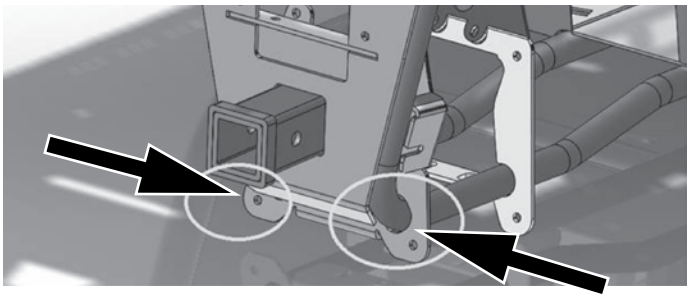


figure 4.18

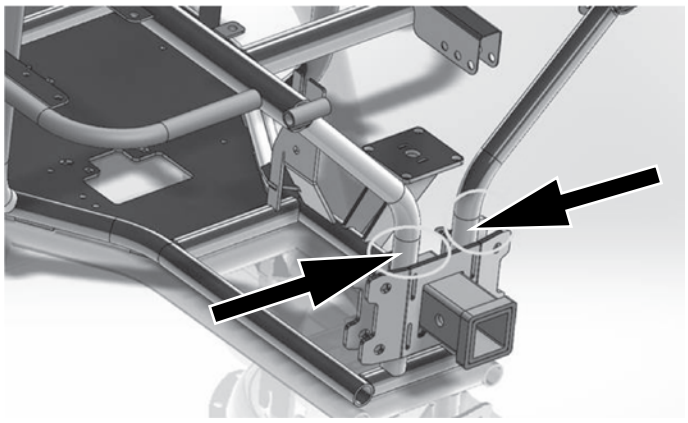


figure 4.19

MAINTAINING FUEL SYSTEM

Using a fuel stabilizer/conditioner in the vehicle can provide benefits such as:

- **Keeps gasoline fresh during storage of 90 days or less. For longer storage, drain the fuel tank.**
- **Cleans the engine during operation.**
- **Eliminates gum-like varnish build-up in the fuel system.**

Add the correct amount of fuel stabilizer/conditioner to the gas. Follow the fuel stabilizer/conditioner manufacturer’s directions for best results.

Engine Fuel Valves (Ref to figures 4.20 & 4.21)

American Landmaster recommends closing the fuel valve whenever the unit is trailered to avoid fuel flooding.

On the L5 model the engine has a fuel valve that opens and closes the passage between the fuel tank and carburetor. Leave fuel valve lever in the OFF position when the engine is not in use to prevent carburetor flooding and reduce possibility of fuel leakage into the cylinder cavity and engine oil reservoir. Turn fuel valve lever to the ON position when running the engine.

Inline fuel valves

On the L5 model an in-line fuel shut-off is standard and located on the fuel line between the fuel tank and the engine as shown in figure 4.20.

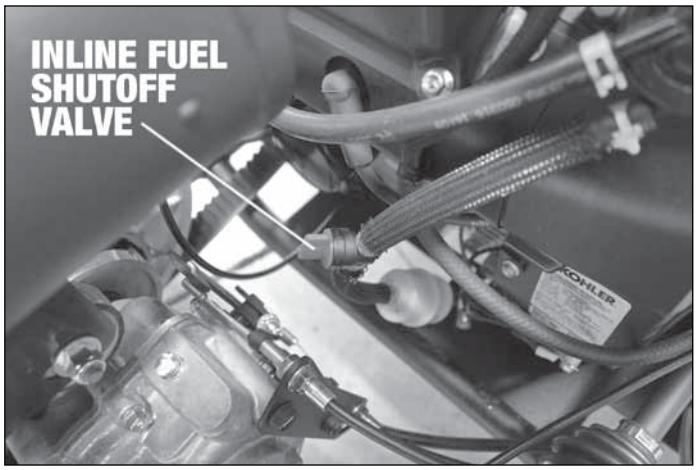


figure 4.20 (inline fuel shutoff valve shown in the “ON”position)

BATTERY CHARGING

Battery Charging - Gas Models

Use a trickle charger to maintain battery voltage as needed.

figure 4.21 (battery charging port)

LONG TERM STORAGE

If you plan to store (and not operate) your vehicle for a period in excess of 30 days, or at the end of each driving season, the unit should be set up for storage as follows:

a. Drain fuel tank and carburetor by allowing the engine to run completely out of fuel.
b. Lubricate the engine cylinder by removing the air cleaner and spraying an engine fogging oil through the carburetor.
c. Do NOT save or store gasoline over the winter. Using old gasoline, which will deteriorate from storage, will make the engine difficult to start and affect the performance of the engine.
d. Remove the battery from the unit and apply a periodic trickle charge to maintain the battery at a proper voltage level for the next riding season.
e. To protect the paint, plastics and upholstery, we recommend covering the unit when not in use.

section 5 troubleshooting

SYMPTOMS	PROBABLE CAUSES	SUGGESTED REMEDIES
DEAD BATTERY	Lights left on	Turn light off, recharge battery
	Key switch left on	Turn key off, recharge battery
	Bad battery	Replace battery
	Shorted starter solenoid	Replace starter solenoid
BATTERY WON'T CHARGE	Loose or corroded battery connection	Clean and tighten connections
	Defective voltage regulator	Contact local service center
	Dead battery cell	Turn key on and pull rope to start engine (if equipped). Replace battery as soon as possible
	Worn out or defective battery	Turn key on and pull rope to start engine (if equipped). Replace battery as soon as possible
	Bad magnet on engine	Contact engine manufacturer service center
ELECTRICAL SYSTEM NOT WORKING	Blown or missing fuse	Replace fuse
	Loose or corroded battery connection	Clean and tighten connections
	Worn out or defective battery	Replace battery
	Defective ignition switch	Replace ignition switch
	Bad connection in wire harness	Repair or replace wire harness
ENGINE BACKFIRES	Fouled sparkplug	Replace or clean sparkplug
	Missing or incorrectly installed air intake restrictor	Replace or correctly install air intake restrictor
	Throttle cable is defective or out of adjustment	Clean and lubricate or replace cable
ENGINE KNOCKS	Engine idle speed too low	Adjust engine idle (see engine manual)
	Overloaded engine	Avoid overloading engine
	Stale or dirty fuel	Replace fuel with new fuel
ENGINE SHUTS DOWN WHILE TURNING, ON INCLINES, OR ON UNEVEN TERRAIN	Low engine oil	Check oil level with unit on level ground
	Oil sensor is bad (if equipped)	Get low oil sensor changed by authorized engine manufacturer service center
STEERING FEELS FUNNY / PULLING TO ONE SIDE / HARD TO STEER (CALL NORMALLY FOR 4WD)	One side may still be engaged in 4WD with the switch off	Put unit in reverse and back up straight a few feet to get the axle to release
	One side may still be engaged in 4WD with the switch off	Take unit to a service center
	Low tire pressure	Inflate tires to proper levels (12 p.s.i. recommended for full size UTVs)
BRAKES DONT WORK WELL / HARD TO PUSH / NO TRAVEL IN PEDAL	Brake rotors are dirty	Clean rotors with brake cleaner and test.
	Low Brake Fluid	Bleed and check brake fluid level.
BELT SLIPPING / WILL NOT PULL UPHILL	Too much weight - bed / cab / towing	Lighten load
	The belt is wet	Dry the belt
	Torque converter pulleys are dirty	Clean the torque converter
	Belt may have stretched or have a low spot causing slipping	Replace the belt

Fuel in the Cylinder Cavity

In the event that the fuel valve is left open while transporting or towing this Utility Vehicle it is possible that fuel has leaked down into the cylinder cavity. If this has occurred the engine will not start. With the cylinder cavity full of fuel the engine will feel like it has "locked up". At right are the proper steps to follow if your Utility Vehicle engine seems to have fuel in the cylinder cavity.

⚠ WARNING

Use EXTREME CAUTION when performing the activity below. Gasoline is EXTREMELY FLAMABLE!

1. Move the vehicle to a well ventilated area, away from sparks or flame.
2. Park Vehicle on a level surface, set park brake, turn off ignition switch, and remove key.
3. Remove the wire connected to the spark plug and remove the spark plug from the engine. (See figure 5.1)
4. **WARNING:** Stand away from the spark plug hole when performing step 5. Fuel can spray several feet.
5. Wearing eye protection, slowly pull the recoil start grip handle in an upward motion (L4 only). This should force the fuel out of the cylinder cavity through the spark plug hole. ***Caution: This gasoline spraying out of the cylinder cavity is very flammable, use extreme caution and make sure there are no sparks or flames nearby.***
6. Repeat step 3 until only air escapes out of the spark plug hole.
7. Properly replace the spark plug back into the cylinder head, move the vehicle away from any spilled fuel. If there is fuel on the vehicle itself, allow for it to evaporate before continuing.
8. Connect the plug wire. Your Utility Vehicle is now ready to start.

Utility Vehicle Shifter Trouble Shooting

- **Engine will not turn over when key is turned to start.**
  – *This vehicle is equipped with a safety switch that only allows starting in neutral.*

Go to **Neutral switch diagnostic procedure** *below.*

- **Gears grind when going into a gear or vehicle stays in gear when shifted to neutral.**
  – *Engine idle is too high.*
  – *Cables need to be lubricated or adjusted.*
- *Go to Cable adjustment procedure at right.*

Neutral Switch Diagnostic Procedure

If starter does not engage when shift lever is in neutral:

1. Apply the parking brake.
2. Turn and hold the key to start. – cycle the shift lever in and out of gear several times. If the starter engages, release the key and call American LandMaster Customer service to order a neutral switch shim kit.
3. If the starter did not engage in step 2, turn and hold the key to start – slowly move the shift lever from neutral to reverse – if the starter engages, release the key. Repeat, moving the shift lever from neutral to forward.

   - **If the starter did engage, go to Cable adjustment procedure section.**
   - **If the starter did not engage call Customer Service at 800-643-7332.**

Cable Adjustment Procedure

Dry cables can cause shifting problems and may affect starting since the vehicle must go to neutral to start. Before attempting to adjust the cables there are several steps that can be taken to ensure the cables are operating properly.

- Lubricate the cables. Remove the hood per the instructions on page 29. Behind the dash there are two cables attached to the gear selector lever. Slide the rubber dust caps up the cable. Drip or spray penetrating oil into the cable housing while working the lever. Do this several times as the oil soaks into the housing. Test the vehicle.

1. Put the vehicle in neutral.
2. Loosen the cable adjusters behind the dash board. (figure 5.3)
3. Make sure the selector lever on the dashboard is in neutral.
4. Make sure the transmission is in neutral. You can check by turning the key to Start. The engine will only turn over if the transmission is in neutral.
5. Pull the slack out of both cables (but do not stretch the springs) and tighten the adjuster nuts or you can also use the adjuster nuts on the cable bracket located on the transmission. (figure 5.4)

   If you have tried all of this and it is still not operating correctly, you may need new cables. Please call Landmaster Customer Service at 1-800-643-7332. Have your PIN number when you call.

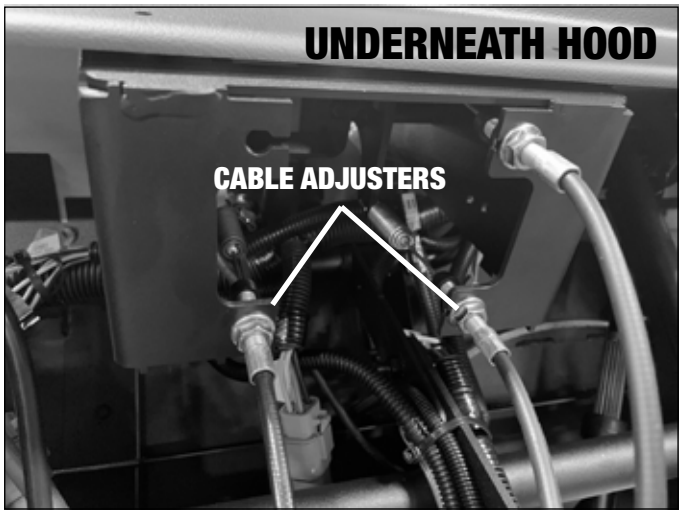


figure 5.3

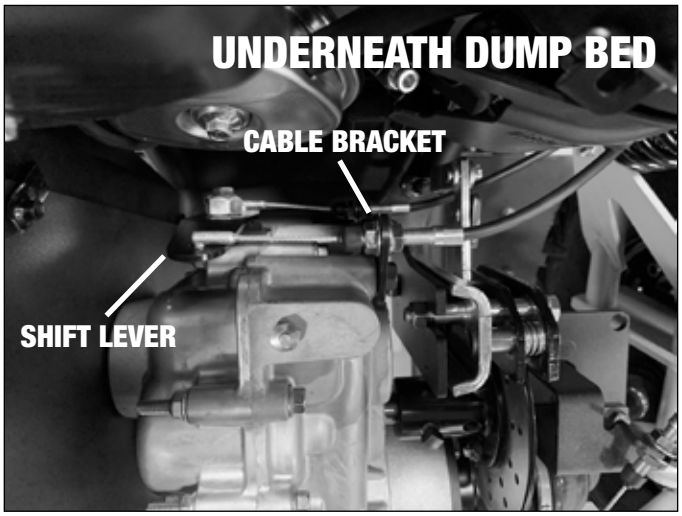


figure 5.4

section 6 AMP RVR

OVERVIEW

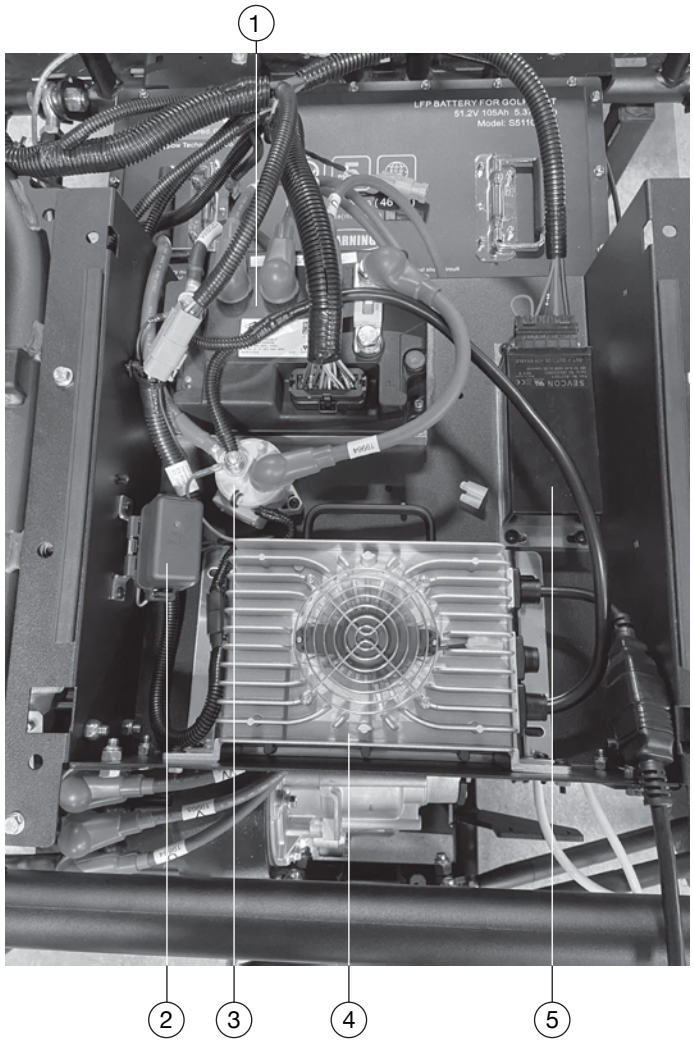
The Landmaster AMP is a completely new design versus our previous legacy electric models. The new EV is built upon the same rugged chassis as all of our gasoline engine models. Superior ride and handlilng with the trailing arm suspension and new shocks are paramount to the design. All new EV DRIVE components are built into this electric vehicle. The heart of the design is an AC motor and controller. This integrated package provides a turn-key system packed with performance and customer focused features. The system provides up to 16 peak horse power for tough applications. Fast acceleration and long distance operation on a single charge provides the customer with reliable performance without the noise, fumes and manintenance of a gasoline engine.

Motor Drive

The motor's controller is located in a housing tray behind the driver seat. The battery charger and other supporting components are also located in this housing. The housing is equipped with a lid to keep debris away from these parts. Removing a few screw fasteners and these parts are easy to access and easy to service.

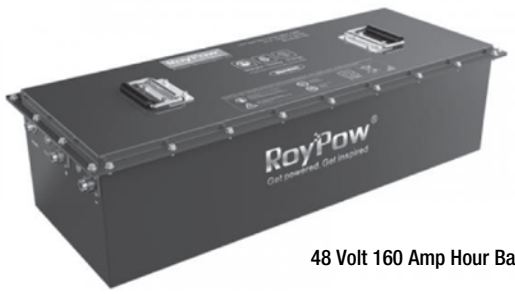
The second major component of the AMP system is the lithium battery pack that provides more than 35000 re-charge cycles. Two different battery sizes are available depending upon the needs of your application, i.e. 105 amp hour versus 160 amp hours of operation. The operator is kept informed on the state of charge of the battery through an intelligent ten segment display on the dash. The lithium battery packs shown below provide at least 200 pound weight savings versus traditional lead acid batteries. These batteries allow a deeper discharge and provide a longer mileage range than lead acid batteries.

The flexible nature of the Landmaster electrical system allows the customer to order any of our existing electrical options on the electric vehicle, except the winch which shall not be offered until sometime in the future. Many common electrical components are also used on the electric vehicle. Even the main instrument panel harness is common across all models. Head lights, tail lights, horns and switches are also common for all models for simplicity and convenience.



Electric Vehicle Module Tray

1	Motor Controller
2	EV Fuse / Relay Box
3	Contactor
4	48 Volt Battery Charger
5	48 To 12 Volt Converter



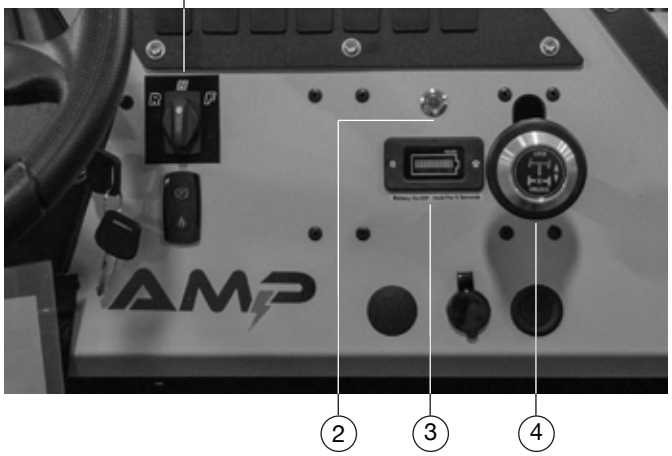
48 Volt 160 Amp Hour Battery

48 Volt 105 Amp Hour Battery

SYSTEM OPERATION

The operation of the electric vehicle is designed to be very simple. The vehicle is designed to only operate with the ignition key in the ON position. No electrical features will work with the key OFF except the electric horn. There are only two switches and a ten segment display associated with the system. The lithium battery pack also has an ON/OFF switch.

Driving the vehicle is as simple as turning on the battery (with the vehicle in neutral), turning the ignition key to the ON position, waiting a moment, placing the gear selector in the Forward position, and then drive away. A more detailed description of each control and system operation is shown below.



Instrument panel view for the AMP vehicle controls

1	Gear Position Switch (Rerverse, Neutral, Forward)
2	Battery On / Off
3	State of Charge Display
4	Locking Differential

Gear Position Switch

The gear selection for the electric vehicle is controlled with a three position rotary switch located in the central instrument panel area.

- Neutral gear is attained with the switch in the middle position.
- Reverse gear is attained with the switch in left most position.
- The forward drive gear is attained with the switch in the right most position.
- The gear selector switch provides a lighted indicator for each gear selected.
  - *–Red for Reverse*
  - *–Green for Neutral*
  - *–Blue for Drive*

Gear Position Switch

1.Gear select in “N”
2.Battery on (hold dash button for 5 seconds)
3.Wait a few seconds and put in gear.

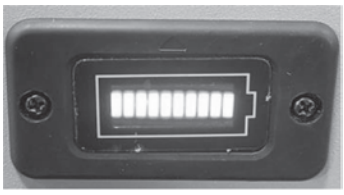
Battery State of Charge Display

The Electric Vehicle is equipped with an intelligent State of Charge Display. Many competitor vehicles only provide a low battery warning light or a battery level meter based upon voltage which can be very inaccurate. The Landmaster AMP provides a true State of Charge display as calculated by the battery management system within the Lithium battery pack. The display provides 10 segments that each indicate a 10% state of charge. Ten bars equals 100% state of charge. The display provides visual warnings when the battery charge reaches 20% (2 bars) and audible warnings when the charge reaches 10% (1 bar). Seek a 120 Volt AC power source when the system reaches 20%.

Differential Lock Operation

Operation:
- Place hand on the shifter knob and pull back on the black slide.
- Push the lever up
- Release the black slide such that it is seated in the top slot

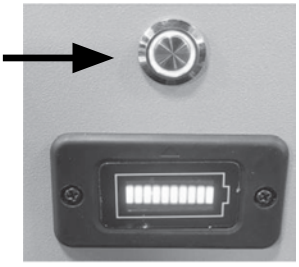
Function:
- The rear differential lock allows power to be transmitted to both rear wheels. This should only be used in areas where the driving conditions are slippery or different from one rear tire to the other.



Powering Up the System

• Dash button - hold for 5 seconds (you will hear a beep from battery when battery is on.
• You can power up at the battery if you want

- To turn the battery on, press and hold the silver push switch for at least 5 seconds or until you hear the dash display beep and see it light up. Release the switch.
- Close the seat and the vehicle is ready for operation.



Powering down the vehicle by way of the battery switch

If the vehicle is not going to be used for more than a week, you should power off the battery.

- Lift the driver seat.
- Locate the circular silver push switch on the side of the battery between the power cables.
- To turn the battery off, press and hold the silver push switch for at least 5 seconds or until you see the dash display shut off. Release the switch.

Note: All vehicles have a remote on / off battery switch located above the battery state of charge meter on the dash. You may power up or power down the battery from this switch instead of raising the seat.

Operating the Vehicle

- Make sure that the battery is turned ON. The ten segment display on the dash shall be illuminated. Recharge the battery if the display shows 2 bars or less.
- While seated in the driver seat, turn the ignition key to the ON position.

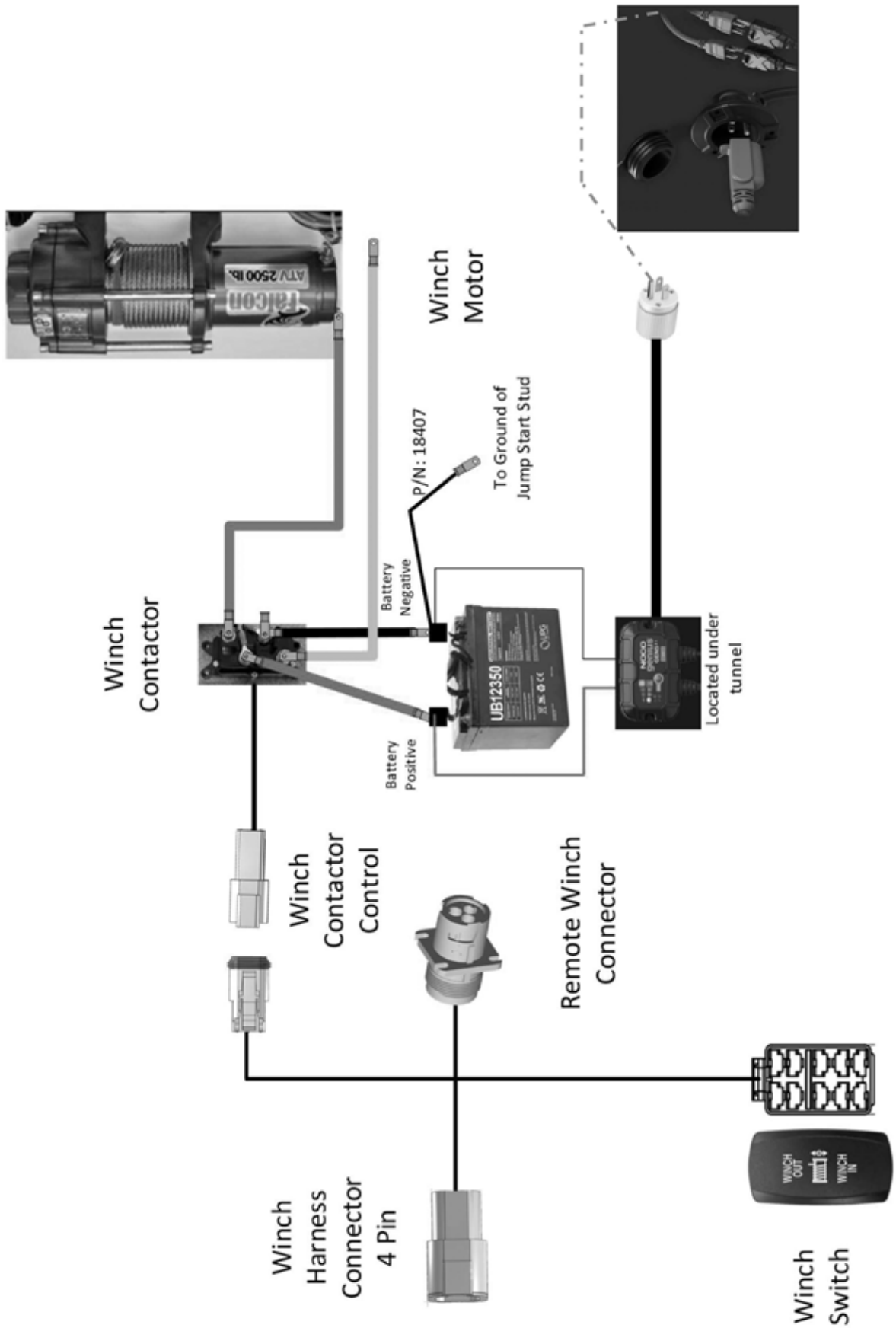
- Connect the side net to the receptacle.
- Release the Park Brake lever. Ensure the park brake light on the dash is OFF.

• Gear select in “N”
• Battery ON (hold dash button for 5 seconds)
• Key ON
• Wait a few seconds (first start up)
• Put in gear and go

NOTE

If the key is turned on while the vehicle is Forward or Reverse, then the switch must be turned to Neutral for a second before switching back into Forward or Reverse. The vehicle will not move if this sequence is not followed.

AMP WINCH WIRING OVERVIEW



BATTERY CHARGING

The lithium batteries need to be charged periodically just like previously used lead acid batteries. A built in on board charger on the vehicle provides a charging profile that is matched with these lithium batteries. The customer connection for powering up the charger is the AC power port on the passenger side of the vehicle.

- Locate the black AC power port plug on the passenger side of the vehicle. It is located halfway down the chassis in place of the fuel cap on a conventional gas powered vehicle.
- Lift the rubber cap to expose a standard 15 amp power plug socket.
- Insert a common extension cord that can carry a minimum of 15 amps and 120 volts AC into the power port.
- The display will show that it is charging by an increasing sequence of display bars lighting up from the current state of charge to the maximum of 10 bars. This process will continue to cycle until the display shows a solid display of ten bars.
- Let the system charge until 100% charge (10 bars) is achieved.
- The winch has additional 12V 5A onboard charger for winch battery. Battery automatically charges when plugged in.

AC Charging Port

Power Cord Plugged Into the AC Port

Charging Times assuming a completely discharged battery

- The smaller 105 Amp Hour battery will require approximately 5 hours to achieve a 100% state of charge.
- The larger 160 amp hour battery will require approximately 8 hours to achieve a 100% state of charge.

MILEAGE

The mileage that is achievable with the new American Landmaster Electric Vehicle is far superior to legacy models with lead acid batteries. No specific mileage range can be guaranteed since there are so many factors that can reduce or increase mileage ranges. Some of that factors that affect the mileage are:

1. Vehicle Speed
2. Acceleration
3. Outside Temperature
4. Cargo Load on the vehicle
5. Power Steering usage on the vehicle
6. Elevation of the drive, i.e. flat land versus hills
7. Driving behavior, i.e. aggressive versus conservative
8. State of charge at the beginning of the trip

The following information is provided based upon American Landmaster testing on warm days above 70 degrees F on flat roads. Note the effects of road speed and acceleration. All driving tests were performed with a full speed continuous run as much as possible. One driver with no cargo load in the bed.

Mileage Estimates:

Up to 45 miles (105 ah battery) | Up to 50 miles (160 ah battery)

Actual top speeds, and vehicle ranges may vary due to driving conditions, terrain, climate and other extenuating circumstances.

Note: This performance data is offered for comparison purposes only and is no guarantee of mileage that will be achieved in your application. Be advised that colder temperatures will decrease your mileage. Reduction of 20 to 30 degrees F below 65 degrees can reduce mileage by 10 to 20%. Heavy cargo loads will reduce your mileage range.

DO'S & DON'TS

Do's:

1. Keep the battery charged often. The lithium batteries are allowed to be deeply discharged, but keep them topped off for your own convenience. Be sure to fully charge the battery if the vehicle will be stored for more than 30 days.

2. Turn battery off when vehicle not in use.

3. Wash the vehicle as required. Keep mud and trail debris from caking on the electric motor and battery connections.

4. Keep the tires inflated to 20 PSI. This will increase your mileage range.

Don'ts:

1. Don't operate the vehicle with outside temperatures below -4 degrees F. The lithium battery capacity will be greatly reduced.

2. Do not charge the battery when the vehicle has been stored in temperatures less than 32 degrees F. If the vehicle has been stored in colder conditions, move the vehicle to a warmer environment and let the vehicle stabilize at a temperature greater than 32 degrees before charging.

3. Do not drive through water sources that will submerge the electric motor.

4. Do not operate the vehicle or charger in a flammable environment.

5. Do not operate vehicle with charging cord installed.

section 7 AMP troubleshooting

ELECTRIC VEHICLE TROUBLESHOOTING

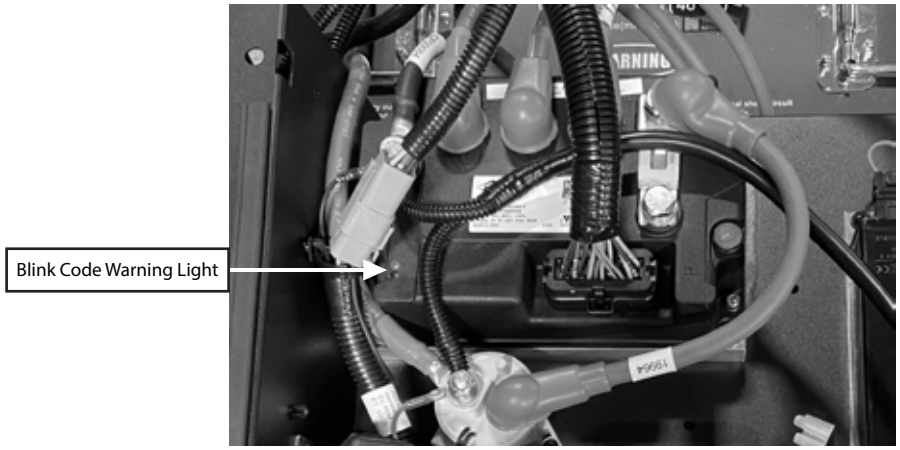
Troubleshooting and diagnosing the Landmaster AMP RVR is straightforward and is guided by a tiered diagnostic approach. This means that this guide shall provide top down troubleshooting instructions, starting at the highest level of general actions and drilling down to more detailed diagnostic measures.

⚠ WARNING

BEFORE SERVICING ANY PART ON THE ELECTRIC VEHICLE, THE 48 VOLT BATTERY MUST BE SHUT OFF. PUSH AND HOLD THE SILVER BUTTON SWITCH ON THE SIDE OF THE BATTERY BY THE BATTERY CABLES FOR AT LEAST 5 SECONDS OR UNTIL THE BATTERY METER GOES OFF.

The two major areas for diagnosis are the motor and controller system and the on board battery charger. Both have built in test resuts to the operator.

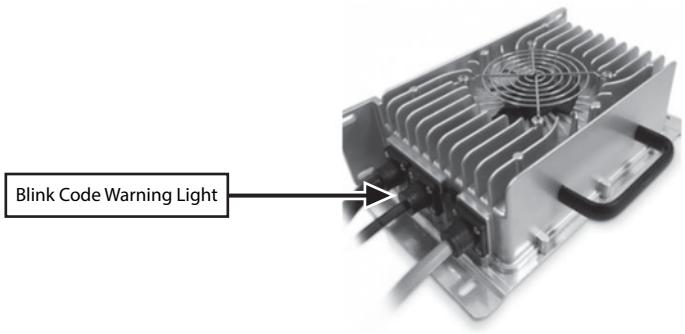
The electric motor and controller system by Navitas provides two methods of diagnostics. A single warning light that is visible through the top of the controller housing shall provide blink codes to describe various failure modes. The blink codes are presented as two digits and display a short pause between the first and second digit. A much longer pause is provided between multiple fault codes. The blink codes are provided in a repeating pattern, meaning that whether there is one or multiple active blink codes, the patterns will continue to display in a circular fashion as long as they key is on and the codes are active.



Motor Controller with Blink Code Light

The second method to display diagnostics with the Navitas System is through a Smart Phone Application which shall be described in detail later in this document. All vehicle owners may download this application for free from their APP Store onto their phone or tablet. It communicates with the Navitas System with a Bluetooth Interface. This is the most intuitive and effective method to diagnose the vehicle.

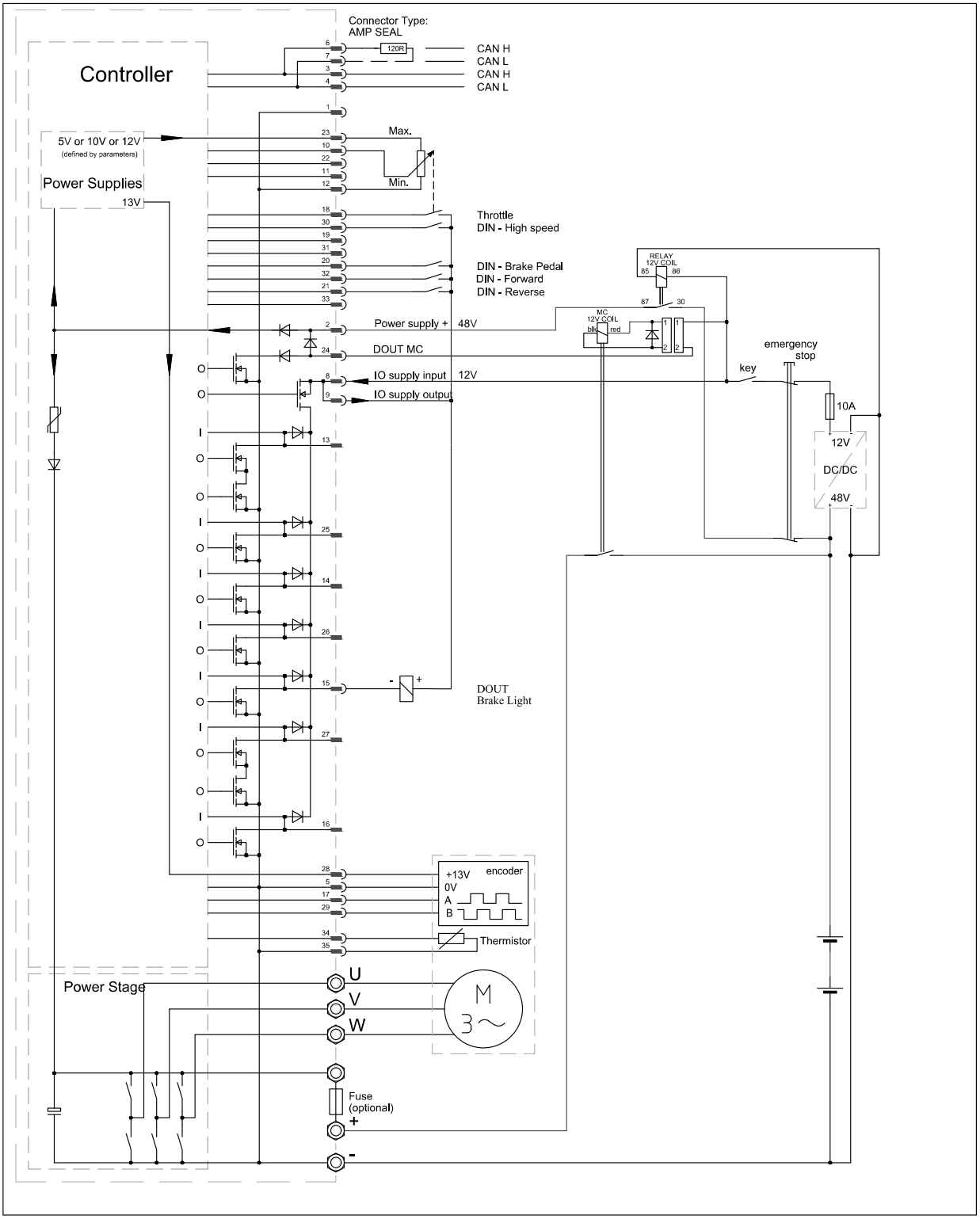
The second section to diagnose is the on board battery charger. It provide internal diagnostic results by way of an external blink code warning light. All blink codes are described later in this document.



On Board Charger

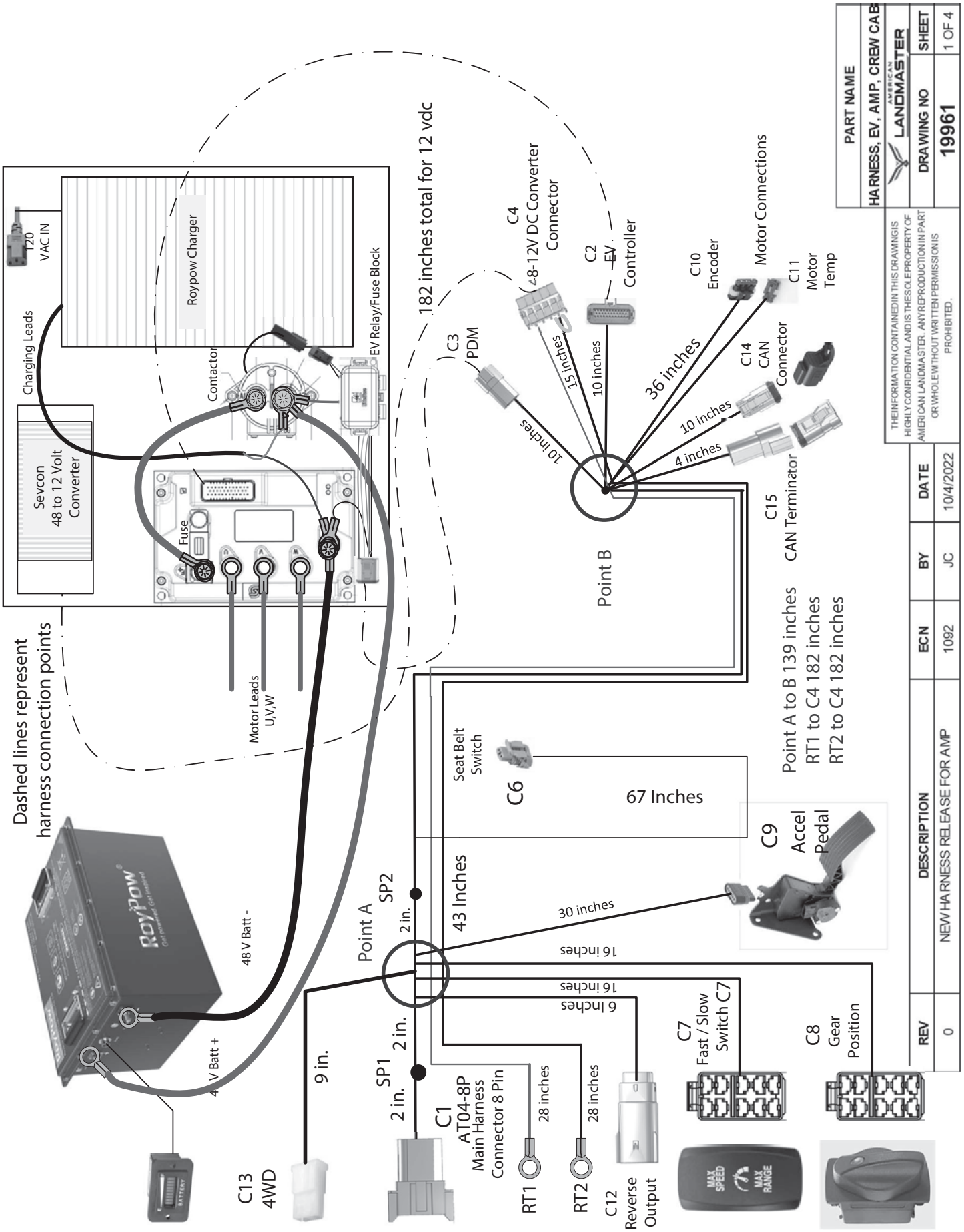
Instructional Information:

The following pages are provided to educate the user with the overall AMP System. First a vehicle mechanization drawing is provided to show the major components of the vehicle. This does not show all connectors and harness partitioning, but does show how the system is assembled functionally. You can see the system is fairly simple with just a few interface signals.



Electric Vehicle Mechanization Drawing

Next a system diagram is provided to show all connections and components. After that, detailed schematics are provided for specific circuit tracing, if needed. The schematics are “table based” which shows source and destination for each wire in the harnesses. Each connector has a reference designator like C1, C2, etc. and a small table to show key information about that connector. It includes the pin number, a wire name, a circuit number and a destination for the other end of the wire. There is a major chassis harness and a minor fuse and relay box harness to make up the system.


Dashed lines represent harness connection points
182 inches total for 12 vdc
Roypow Charger
T20 VAC IN
Charging Leads
Sevcon 48 to 12 Volt Converter
Contactor
EV Relay/Fuse Block
Fuse
Motor Leads U,V,W
48 V Batt +
48 V Batt -
Point A
SP1
SP2
2 in.
9 in.
43 Inches
67 Inches
Point B
Point A to B 139 inches
RT1 to C4 182 inches
RT2 to C4 182 inches
C1 AT04-8P Main Harness Connector 8 Pin
C2 EV Controller
C3 PDM
C4 8-12V DC Converter Connector
C6 Seat Belt Switch
C7 Fast / Slow Switch C7
C8 Gear Position
C9 Accel Pedal
C10 Encoder
C11 Motor Temp
C12 Reverse Output
C13 4WD
C14 CAN Connector
C15 CAN Terminator
Motor Connections
RT1
RT2
28 inches
6 inches
16 inches
30 inches
15 inches
10 inches
36 inches
4 inches
MAX SPEED
MAX RANGE
BATTERY
PART NAME
HARNESS, EV, AMP, CREW CAB
AMERICAN LANDMASTER
DRAWING NO
19961
SHEET
1 OF 4
THE INFORMATION CONTAINED IN THIS DRAWING IS HIGHLY CONFIDENTIAL AND IS THE SOLE PROPERTY OF AMERICAN LANDMASTER. ANY REPRODUCTION IN PART OR WHOLE WITHOUT WRITTEN PERMISSION IS PROHIBITED.
REV
DESCRIPTION
ECN
BY
DATE
0
NEW HARNESS RELEASE FOR AMP
1092
JC
10/4/2022

Main Harness Connector (C1)

Name	Pin	Circuit #	Destination
PLUG	1	PLUG	PLUG
EV IGN	2	4-IG1	C8 Pin 8
PLUG	3	PLUG	PLUG
EV GND	4	4-GN1	Splice 1
PLUG	5	PLUG	PLUG
2/4WD SW	6	4-TA1	C13 Pin 1
Backlight	7	4-HL1	C7 Pin 10
Seat Belt	8	4-SB1	C6 Pin A

PDM (C3)

Name	Pin	Circuit #	Destination
PDM IGN	1	4-IG8	Splice 2
PDM GND	2	4-GN7	Splice 1
PDM_48V_IGN	3	4-IG6	C2 Pin 2
Solenoid_Low	4	4-EC8	C2 Pin 24
48V DC-DC +	5	4-BT1	C4 Pin 4
48V DC-DC -	6	4-GN13	C4 Pin 3

Power Ground Splice (SP1)

Name	Pin	Circuit #	Destination
EV GND	SP1	4-GN1	C1 Pin 4
CNTL GND	SP1	4-GN11	C2 Pin 1
Gear Sw GND	SP1	4-GN3	C8 Pin 7
F/S Sw GND	SP1	4-GN4	C7 Pin 9
SB GND	SP1	4-GN5	C6 Pin B
PDM GND	SP1	4-GN 7	C3 Pin 2
TA GND	SP1	4-GN12	C13 Pin 2

Encoder (C10)

Name	Pin	Circuit #	Destination
5V ENC	1	4-EC9	C2 Pin 23
Encoder GND	4	4-GN2	C2 Pin5
SPD A	2	4-EC11	C2 Pin 17
SPD B	3	4-EC12	C2 Pin 29

Ignition Splice (SP2)

Name+K10:N15	Pin	Circuit #	Destination
PDM IGN	Splice 2	4-IG8	C3 Pin 1
IVS IGN	Splice 2	4-IG7	C9 Pin F
Gear_IGN_JMPR4	Splice 2	4-IG5	C8 Pin 2
F/S IGN	Splice 2	4-IG9	C7 Pin 2
12 Volt Ignition	Splice 2	4-IG10	C2 Pin 8

Reverse (C12)

Name	Pin	Circuit #	Destination
Reverse Out	1	4-EC10	C8 Pin 3
PLUG	2	NA	NA
PLUG	3	NA	NA
PLUG	4	NA	NA
PLUG	5	NA	NA
PLUG	6	NA	NA
PLUG	7	NA	NA
PLUG	8	NA	NA

Seat Belt Switch (C6)

Name	Pin	Circuit #	Destination
Seat Belt	A	4-SB1	C1 Pin 8
SB GND	B	4-GN5	Splice 1

EV Controller Connector (C2)

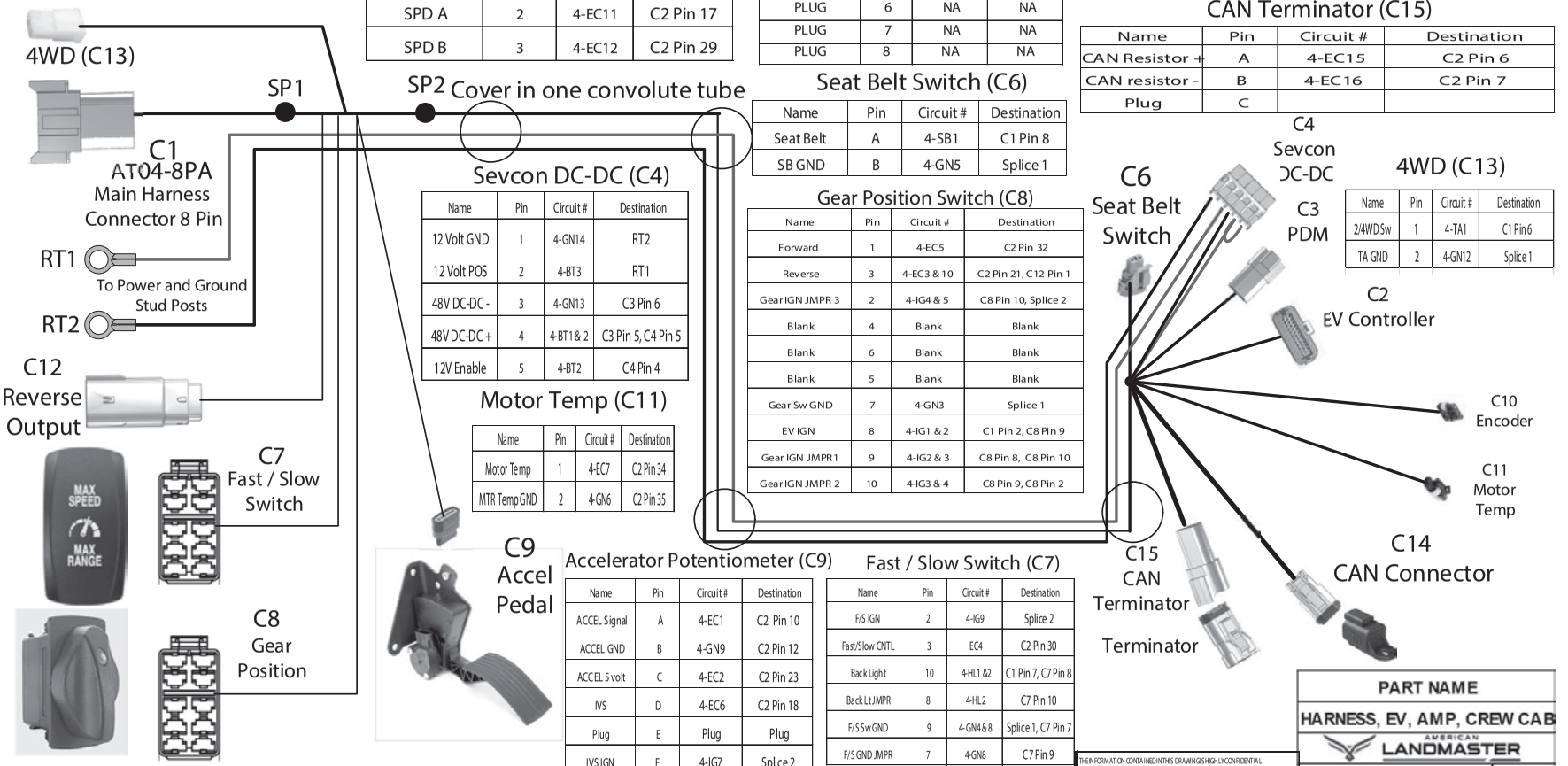
Name	Pin	Circuit #	Destination	Name	Pin	Circuit #	Destination
PDM_48V_IGN	2	4-IG6	C3 Pin 3	Accel 5V	23	4-EC2	C9 Pin C
CNTL GND	1	4-GN11	Splice 1	Accel Signal	10	4-EC1	C9 Pin A
Solenoid Low	24	4-EC8	C3 Pin 4	Accel GND	12	4-GN9	C9 Pin B
Encoder GND	5	4-GN2	C10 Pin 4	Forward	32	4-EC5	C8 Pin 1
Motor Temp	34	4-EC7	C11 Pin 1	5V ENC	28	4-EC9	C10 Pin 1
IVS	18	4-EC6	C9 Pin D	SPD A	17	4-EC11	C10 Pin 2
FAST / SLOW CNTL	30	4-EC4	C7 Pin 3	SPD B	29	4-EC12	C10 Pin 3
12 Volt Ignition	8	4-IG10	Splice 2	Reverse	21	4-EC3	C8 Pin 3
CAN+	3	4-EC13	C14 Pin 1	CAN_Resistor+	6	4-EC15	C15 Pin A
CAN-	4	4-EC14	C14 Pin 2	CAN_Resistor-	7	4-EC16	C15 Pin B
MTR_Temp_GND	35	4-GN6	C11 Pin 2				

CAN Connector (C14)

Name	Pin	Circuit #	Destination
CAN+	1	4-EC13	C2 Pin 3
CAN-	2	4-EC14	C2 Pin 4

CAN Terminator (C15)

Name	Pin	Circuit #	Destination
CAN Resistor +	A	4-EC15	C2 Pin 6
CAN resistor -	B	4-EC16	C2 Pin 7
Plug	C		



Sevcon DC-DC (C4)

Name	Pin	Circuit #	Destination
12 Volt GND	1	4-GN14	RT2
12 Volt POS	2	4-BT3	RT1
48V DC-DC -	3	4-GN13	C3 Pin 6
48V DC-DC +	4	4-BT1 & 2	C3 Pin 5, C4 Pin 5
12V Enable	5	4-BT2	C4 Pin 4

Motor Temp (C11)

Name	Pin	Circuit #	Destination
Motor Temp	1	4-EC7	C2 Pin34
MTR Temp GND	2	4-GN6	C2 Pin35

Gear Position Switch (C8)

Name	Pin	Circuit #	Destination
Forward	1	4-EC5	C2 Pin 32
Reverse	3	4-EC3 & 10	C2 Pin 21, C12 Pin 1
Gear IGN JMPR 3	2	4-IG4 & 5	C8 Pin 10, Splice 2
Blank	4	Blank	Blank
Blank	6	Blank	Blank
Blank	5	Blank	Blank
Gear Sw GND	7	4-GN3	Splice 1
EV IGN	8	4-IG1 & 2	C1 Pin 2, C8 Pin 9
Gear IGN JMPR1	9	4-IG2 & 3	C8 Pin 8, C8 Pin 10
Gear IGN JMPR 2	10	4-IG3 & 4	C8 Pin 9, C8 Pin 2

4WD (C13)

Name	Pin	Circuit #	Destination
2/4WD Sw	1	4-TA1	C1 Pin6
TA GND	2	4-GN12	Splice 1

Accelerator Potentiometer (C9)

Name	Pin	Circuit #	Destination
ACCEL Signal	A	4-EC1	C2 Pin 10
ACCEL GND	B	4-GN9	C2 Pin 12
ACCEL 5 volt	C	4-EC2	C2 Pin 23
IVS	D	4-EC6	C2 Pin 18
Plug	E	Plug	Plug
IVS IGN	F	4-IG7	Splice 2

Fast / Slow Switch (C7)

Name	Pin	Circuit #	Destination
F/S IGN	2	4-IG9	Splice 2
Fast/Slow CNTL	3	EC4	C2 Pin 30
Back Light	10	4-HL1 &2	C1 Pin 7, C7 Pin 8
Back Lt JMPR	8	4-HL2	C7 Pin 10
F/S Sw GND	9	4-GN4 & 8	Splice 1, C7 Pin 7
F/S GND JMPR	7	4-GN8	C7 Pin 9

REV	DESCRIPTION	ECN	BY	DATE
0	NEW HARNESS RELEASE FOR AMP	1092	JC	10/4/2022

PART NAME	
HARNESS, EV, AMP, CREW CAB	
AMERICAN LANDMASTER	
DRAWING NO	SHEET
19961	2 OF 4

Crew Cab Electric Vehicle Harness Overlay

		Starting Connector					Ending Connector							
Circuit Function	Circuit ID	Ref Designator	Pin Number	Part Number	Seal/Plug	Terminal	Ref Designator	Pin Number	Part Number	Seal	Terminal	Wire Gauge	Color	Length
PLUG	Plug	C1	1	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
EV IGN	4-IG1	C1	2	AT04-8PA	NA	AT60-16-0122	C8	8	VC2	NA	60253-2	16	Pink	20
PLUG	Plug	C1	3	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
EV GND	4-GN1	C1	4	AT04-8PA	NA	AT60-16-0122	SP1	NA	NA	NA	NA	NA	Black	2
PLUG	Plug	C1	5	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
PLUG	Plug	C1	6	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
Back Light	4-HL1	C1	7	AT04-8PA	NA	AT60-16-0122	C7	10	VC2	NA	60253-2	16	Yellow	20
Seat Belt	4-SB1	C1	8	AT04-8PA	NA	AT60-16-0122	C6	A	12052644	15324974	12048074	16	Green	114
PLUG	Plug	C12	2,3,4,5,6,7,8	NA	343450001	NA	NA	NA	NA	NA	NA	NA	NA	0
PDM_48V_IGN	4-IG6	C2	2	776164-1	NA	770520-1	C3	3	AT04-6P	NA	AT60-16-0122	16	Pink	20
Solenoid_Low	4-EC8	C2	24	776164-1	NA	770520-1	C3	4	AT04-6P	NA	AT60-16-0122	16	Gray	20
CNTL GND	4-GN11	C2	1	776164-1	NA	770520-1	SP1	NA	NA	NA	NA	16	Black	151
Motor Temp	4-EC7	C2	34	776164-1	NA	770520-1	C11	1	282080-1	282110-1	281934-2	18	Orange	46
IVS	4-EC6	C2	18	776164-1	NA	770520-1	C9	D	15336013	15305351	15326267	18	Violet	179
Fast/Slow CNTL	4-EC4	C2	30	776164-1	NA	770520-1	C7	3	VC2	NA	60253-2	16	Violet	165
Accel 5 volts	4-EC2	C2	23	776164-1	NA	770520-1	C9	C	15336013	15305351	15326267	18	Violet	179
Accel Signal	4-EC1	C2	10	776164-1	NA	770520-1	C9	A	15336013	15305351	15326267	18	Violet	179
Accel GND	4-GN9	C2	12	776164-1	NA	770520-1	C9	B	15336013	15305351	15326267	18	Black	179
Forward	4-EC5	C2	32	776164-1	NA	770520-1	C8	1	VC2	NA	60253-2	16	Violet	165
5V ENC	4-EC9	C2	28	776164-1	NA	770520-1	C10	1	282088-1	282110-1	281934-2	18	Red	46
Speed A	4-EC11	C2	17	776164-1	NA	770520-1	C10	3	282088-1	282110-1	281934-2	18	Gray	46
Speed B	4-EC12	C2	29	776164-1	NA	770520-1	C10	2	282088-1	282110-1	281934-2	18	Blue	46
Reverse	4-EC3	C2	21	776164-1	NA	770520-1	C8	3	VC2	NA	60253-2	16	Green	165
Encoder GND	4-GN2	C2	5	776164-1	NA	770520-1	C10	4	282088-1	282110-1	281934-2	18	Black	46
12 Volts -	4-GN13	C4	1	428160512	NA	428150012	RT2	1	5/16" Dia.	NA	7036K65	10	Black	182
12 Volts +	4-BT1	C4	2	428160512	NA	428150012	RT1	1	5/16" Dia.	NA	7036K65	10	Red	182
F/S SW GND JMPR	4-GN8	C7	9	VC2	NA	60253-2	C7	7	VC2	NA	60253-2	16	Black	3
Back Lt JMPR	4-HL2	C7	10	VC2	NA	60253-2	C7	8	VC2	NA	60253-2	16	Yellow	3
Gear IGN JMPR4	4-IG5	C8	2	VC2	NA	60253-3	Splice 2	NA	NA	NA	NA	16	Pink	18
Reverse Out	4-EC10	C8	3	VC2	NA	60253-2	C12	1	334824801	NA	330000002	16	Green	22
Gear IGN JMPR1	4-IG2	C8	8	VC2	NA	60253-2	C8	9	VC2	NA	60253-2	16	Pink	3
Gear IGN JMPR2	4-IG3	C8	9	VC2	NA	60253-2	C8	10	VC2	NA	60253-2	16	Pink	3
Gear IGN JMPR3	4-IG4	C8	10	VC2	NA	60253-2	C8	2	VC2	NA	60253-2	16	Pink	3
PLUG	Plug	C9	E	NA	15305169	NA	NA	NA	NA	NA	NA	NA	NA	0
Motor Temp GND	4-GN6	C2	35	776164-1	NA	770520-1	C11	2	282080-1	282110-1	281934-2	18	Black	46
PDM GND	4-GN5	SP1	NA	NA	NA	NA	C3	2	AT04-6P	NA	AT60-16-0122	16	Black	151
SB GND	4-GN7	SP1	NA	NA	NA	NA	C6	B	12052644	15324974	12048074	16	Black	112
F/S Sw GND	4-GN4	SP1	NA	NA	NA	NA	C7	9	VC2	NA	60253-2	16	Black	18
Gear Sw GND	4-GN3	SP1	NA	NA	NA	NA	C8	7	VC2	NA	60253-2	16	Black	18
PDM IGN	4-IG8	SP2	NA	NA	NA	NA	C3	1	AT04-6P	NA	AT60-16-0122	16	Pink	147
F/S IGN	4-IG9	SP2	NA	NA	NA	NA	C7	2	VC2	NA	60253-2	16	Pink	18
IVS IGN	4-IG7	SP2	NA	NA	NA	NA	C9	F	15336013	15305351	15326267	18	Pink	32
2/4WD SW	4-TA1	C13	1	1-480318-0	NA	60619-1	C1	6	AT04-8PA	NA	AT60-16-0122	16	Gray	13
TA GND	4-GN12	C13	2	1-480318-0	NA	60619-1	Splice1	NA	NA	NA	NA	16	Black	11
12 Volt Ignition	4-IG10	SP2	NA	NA	NA	NA	C2	8	776164-1	NA	770520-1	16	Pink	147
CAN+	4-EC13	C2	3	776164-1	NA	770520-1	C14	1	AT06-2S	NA	AT60-16-0122	16	Yellow	20
CAN-	4-EC14	C2	4	776164-1	NA	770520-1	C14	2	AT06-2S	NA	AT60-16-0122	16	Green	20
CAN Resistor+	4-EC15	C2	6	776164-1	NA	770520-1	C15	A	AT04-3P	NA	AT60-16-0122	16	Yellow	14
CAN Resistor-	4-IG16	C2	7	776164-1	NA	770520-1	C15	B	AT04-3P	NA	AT60-16-0122	16	Green	14
Plug	Plug	NA	NA	NA	NA	NA	C15	C	AT04-3P	114017-ZZ	NA	NA	NA	NA
48V DC-DC -	4-GN14	C4	3	428160512	NA	428150012	C3	6	AT04-6P	NA	AT60-16-0122	16	Black	20
48V DC-DC+	4-BT1	C4	4	428160512	NA	428150012	C3	5	AT04-6P	NA	AT60-16-0122	16	Red	20
12V Enable	4-BT2	C4	5	428160512	NA	428150012	C4	4	428160512	NA	428150012	16	Red	3

REV	DESCRIPTION	ECN	BY	DATE
0	NEW HARNESS RELEASE FOR AMP	1092	JC	10/4/2022

PART NAME

HARNESS, EV, AMP, CREW CAB

AMERICAN LANDMASTER

DRAWING NO	SHEET
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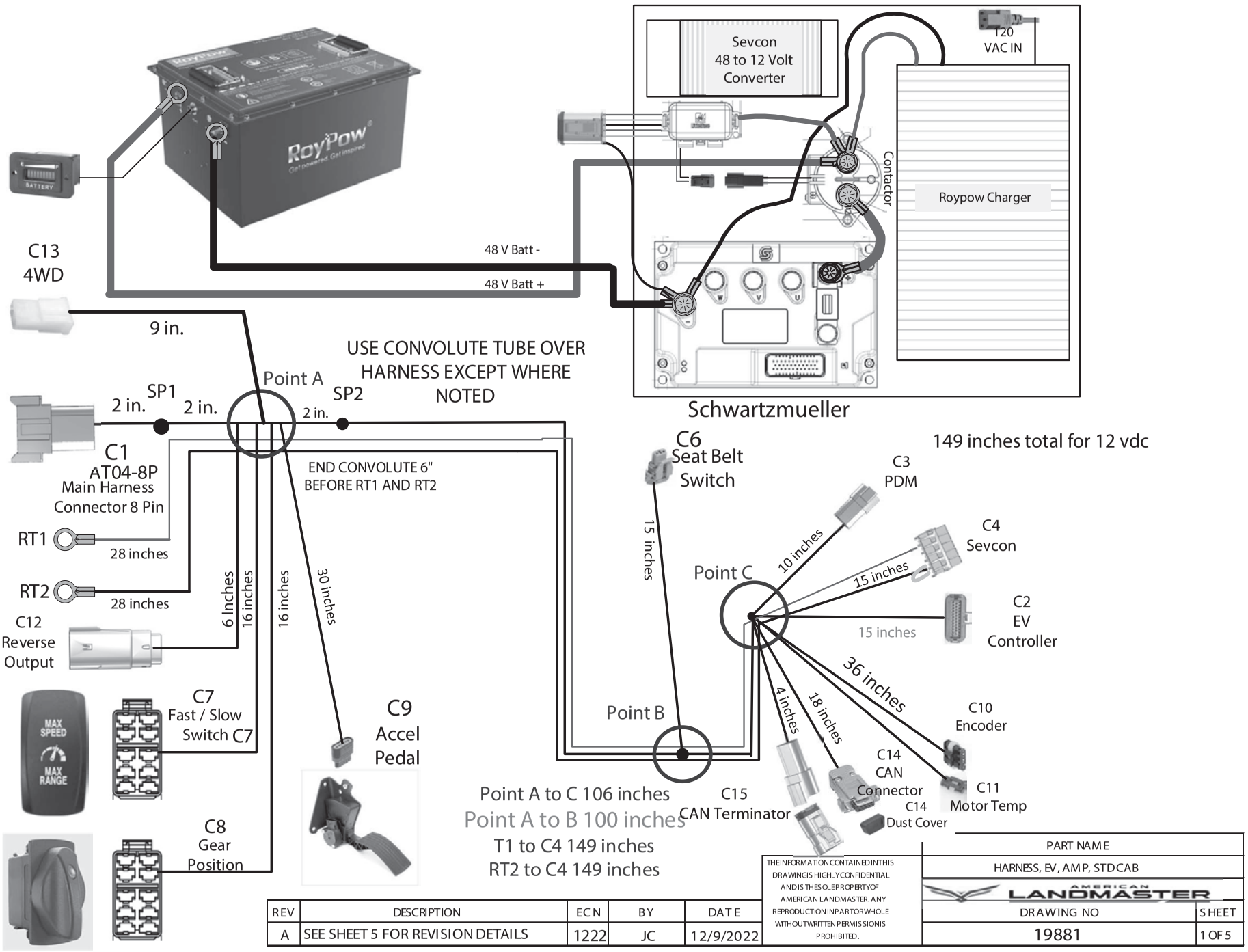


REV	DESCRIPTION	ECN	BY	DATE
A	SEE SHEET 5 FOR REVISION DETAILS	1222	JC	12/9/2022

PART NAME	
HARNESS, EV, AMP, STD CAB	
AMERICAN LANDMASTER	
DRAWING NO	SHEET
19881	1 OF 5

Main Harness Connector (C1)

Name	Pin	Circuit #	Destination
PLUG	1	PLUG	PLUG
EV IGN	2	4-IG1	C8 Pin 8
PLUG	3	PLUG	PLUG
EV GND	4	4-GN1	Splice 1
PLUG	5	PLUG	PLUG
2/4WD SW	6	4-TA1	C13 Pin 1
Backlight	7	4-HL1	C7 Pin 10
Seat Belt	8	4-SB1	C6 Pin A

PDM (C3)

Name	Pin	Circuit #	Destination
PDM IGN	1	4-IG8	Splice 2
PDM GND	2	4-GN7	Splice 1
PDM_48V_IGN	3	4-IG6	C2 Pin 2
Solenoid_Low	4	4-EC8	C2 Pin 24
48V DC-DC +	5	4-BT1	C4 Pin 4
48V DC-DC -	6	4-GN13	C4 Pin 3

Power Ground Splice (SP1)

Name	Pin	Circuit #	Destination
EV GND	SP1	4-GN1	C1 Pin 4
CNTL GND	SP1	4-GN11	C2 Pin 1
Gear Sw GND	SP1	4-GN3	C8 Pin 7
F/S Sw GND	SP1	4-GN4	C7 Pin 9
SB GND	SP1	4-GN5	C6 Pin B
PDM GND	SP1	4-GN 7	C3 Pin 2
TA GND	SP1	4-GN12	C13 Pin 2

Encoder (C10)

Name	Pin	Circuit #	Destination
5V ENC	1	4-EC9	C2 Pin 23
Encoder GND	4	4-GN2	C2 Pin5
SPD A	2	4-EC11	C2 Pin 17
SPD B	3	4-EC12	C2 Pin 29

Ignition Splice (SP2)

Name+K10:N15	Pin	Circuit #	Destination
PDM IGN	Splice 2	4-IG8	C3 Pin 1
IVS IGN	Splice 2	4-IG7	C9 Pin F
Gear_IGN_JMPR4	Splice 2	4-IG5	C8 Pin 2
F/S IGN	Splice 2	4-IG9	C7 Pin 2
12 Volt Ignition	Splice 2	4-IG10	C2 Pin 8

Reverse (C12)

Name	Pin	Circuit #	Destination
Reverse Out	1	4-EC10	C8 Pin 3
PLUG	2	NA	NA
PLUG	3	NA	NA
PLUG	4	NA	NA
PLUG	5	NA	NA
PLUG	6	NA	NA
PLUG	7	NA	NA
PLUG	8	NA	NA

EV Controller Connector (C2)

Name	Pin	Circuit #	Destination	Name	Pin	Circuit #	Destination
PDM_48V_IGN	2	4-IG6	C3 Pin 3	Accel 5V	23	4-EC2	C9 Pin C
CNTL GND	1	4-GN11	Splice 1	Accel Signal	10	4-EC1	C9 Pin A
Solenoid Low	24	4-EC8	C3 Pin 4	Accel GND	12	4-GN9	C9 Pin B
Encoder GND	5	4-GN2	C10 Pin 4	Forward	32	4-EC5	C8 Pin 1
Motor Temp	34	4-EC7	C11 Pin 1	5V ENC	28	4-EC9	C10 Pin 1
IVS	18	4-EC6	C9 Pin D	SPD A	17	4-EC11	C10 Pin 2
FAST / SLOW CNT	30	4-EC4	C7 Pin 3	SPD B	29	4-EC12	C10 Pin 3
12 Volt Ignition	8	4-IG10	Splice 2	Reverse	21	4-EC3	C8 Pin 3
CAN+	3	4-EC13	C14 Pin 7	CAN_Resistor+	6	4-EC15	C15 Pin A
CAN-	4	4-EC14	C14 Pin 2	CAN_Resistor-	7	4-EC16	C15 Pin B
MTR_Temp_GND	35	4-GN6	C11 Pin 2				

CAN Connector (C14)

Name	Pin	Circuit #	Destination
CAN+	7	4-EC13	C2 Pin 3
CAN-	2	4-EC14	C2 Pin 4

CAN Terminator (C15)

Name	Pin	Circuit #	Destination
CAN Resistor +	A	4-EC15	C2 Pin 6
CAN resistor -	B	4-EC16	C2 Pin 7
Plug	C		

Seat Belt Switch (C6)

Name	Pin	Circuit #	Destination
Seat Belt	A	4-SB1	C1 Pin 8
SB GND	B	4-GN5	Splice 1

Sevcon DC-DC (C4)

Name	Pin	Circuit #	Destination
12 Volt GND	1	4-GN14	RT2
12 Volt POS	2	4-BT3	RT1
48V DC-DC -	3	4-GN13	C3 Pin 6
48V DC-DC +	4	4-BT1 & 2	C3 Pin 5, C4 Pin 5
12V Enable	5	4-BT2	C4 Pin 4

Motor Temp (C11)

Name	Pin	Circuit #	Destination
Motor Temp	1	4-EC7	C2 Pin 34
MTR Temp GND	2	4-GN6	C2 Pin 35

Gear Position Switch (C8)

Name	Pin	Circuit #	Destination
Forward	1	4-EC5	C2 Pin 32
Reverse	3	4-EC3 & 10	C2 Pin 21, C12 Pin 1
Gear IGN JMPR 3	2	4-IG4 & 5	C8 Pin 10, Splice 2
Blank	4	Blank	Blank
Blank	6	Blank	Blank
Blank	5	Blank	Blank
Gear Sw GND	7	4-GN3	Splice 1
EV IGN	8	4-IG1 & 2	C1 Pin 2, C8 Pin 9
Gear IGN JMPR1	9	4-IG2 & 3	C8 Pin 8, C8 Pin 10
Gear IGN JMPR 2	10	4-IG3 & 4	C8 Pin 9, C8 Pin 2

4WD (C13)

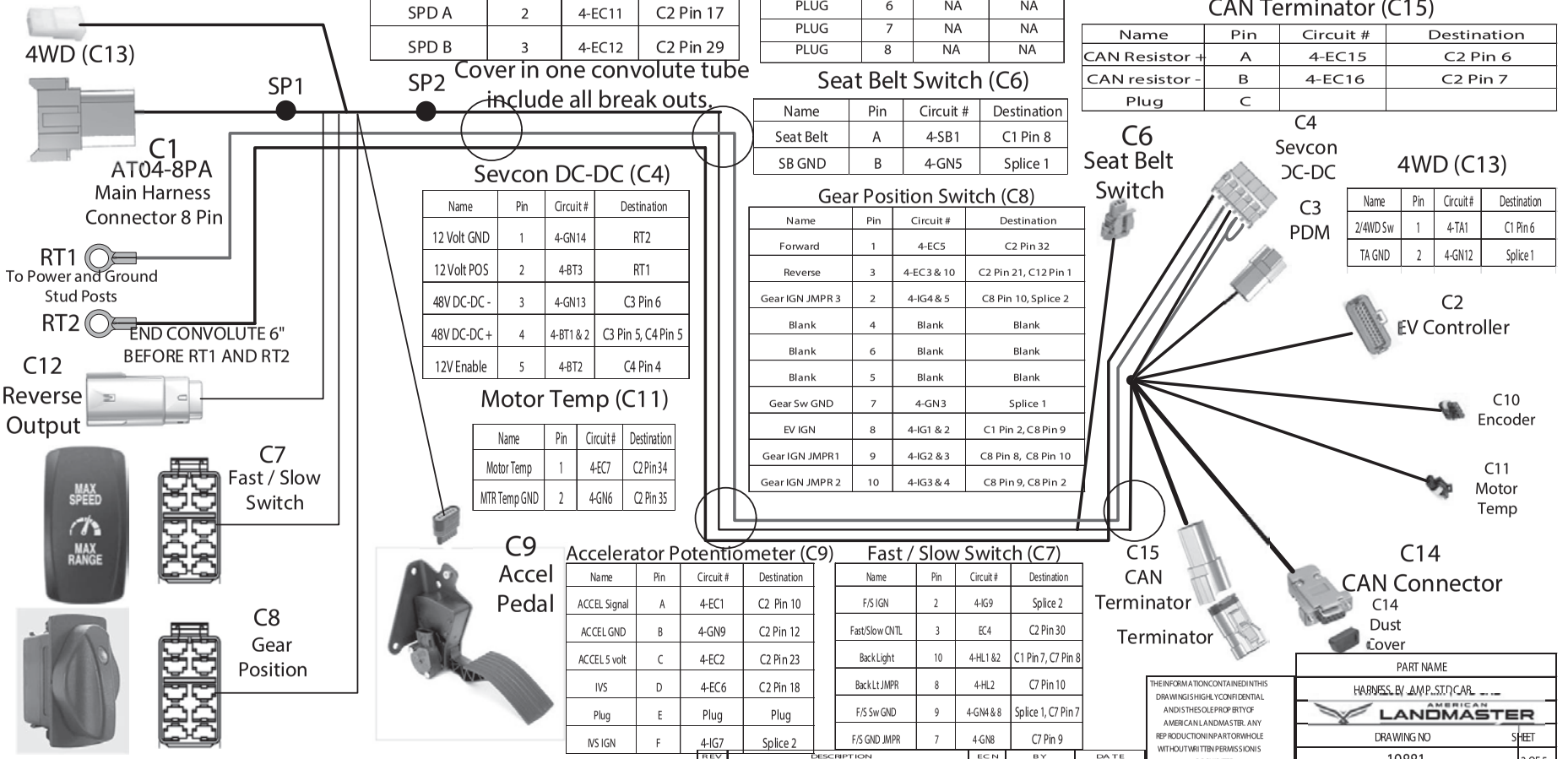
Name	Pin	Circuit #	Destination
2/4WD Sw	1	4-TA1	C1 Pin 6
TA GND	2	4-GN12	Splice 1

Accelerator Potentiometer (C9)

Name	Pin	Circuit #	Destination
ACCEL Signal	A	4-EC1	C2 Pin 10
ACCEL GND	B	4-GN9	C2 Pin 12
ACCEL 5 volt	C	4-EC2	C2 Pin 23
IVS	D	4-EC6	C2 Pin 18
Plug	E	Plug	Plug
IVS IGN	F	4-IG7	Splice 2

Fast / Slow Switch (C7)

Name	Pin	Circuit #	Destination
F/S IGN	2	4-IG9	Splice 2
Fast/Slow CNTL	3	EC4	C2 Pin 30
Back Light	10	4-HL1 &2	C1 Pin 7, C7 Pin 8
Back Lt JMPR	8	4-HL2	C7 Pin 10
F/S Sw GND	9	4-GN4 & 8	Splice 1, C7 Pin 7
F/S GND JMPR	7	4-GN8	C7 Pin 9



REV	DESCRIPTION	EC N	BY	DATE
A	SEE SHEET 5 FOR REVISION DETAILS	1222	JC	12/9/2022

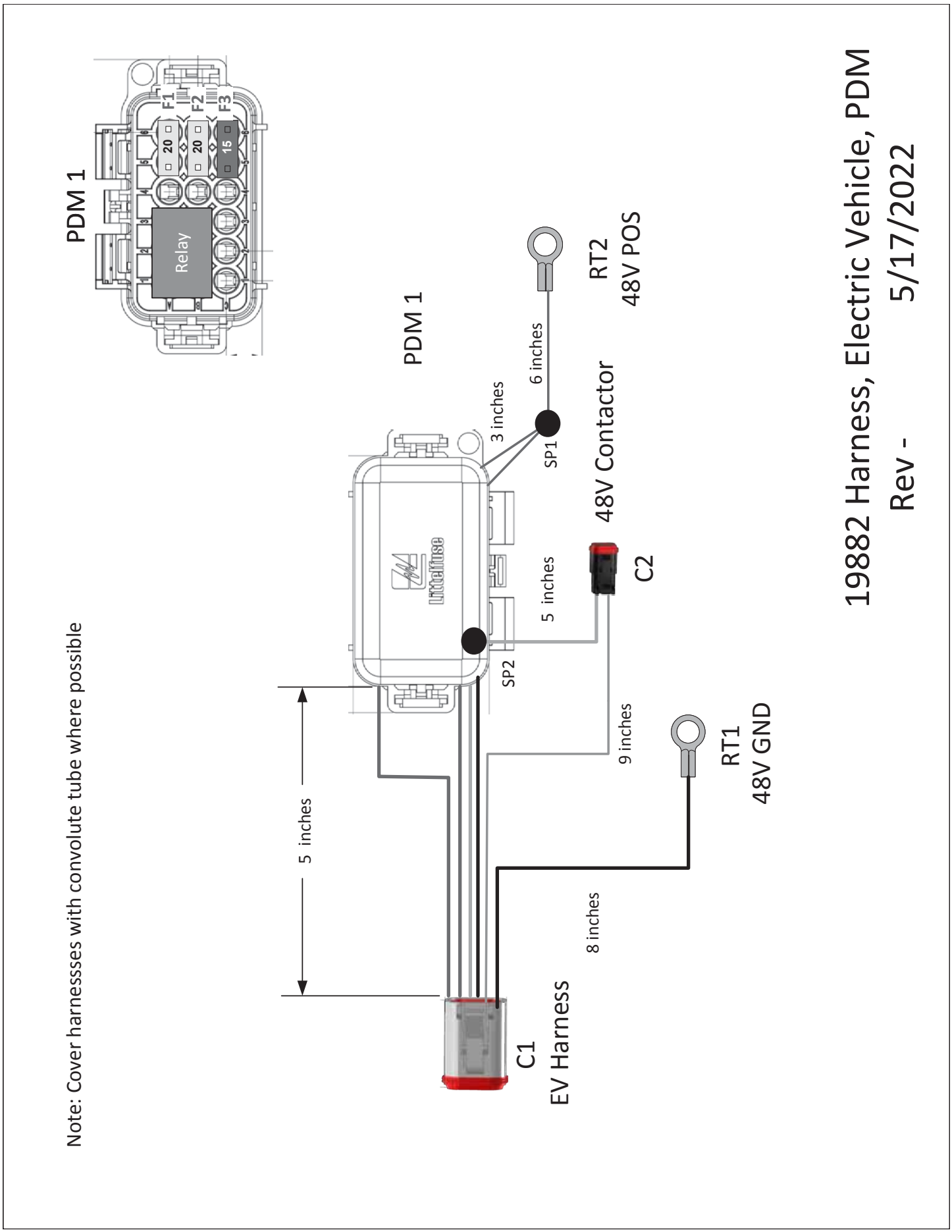
PART NAME	
HARNESS, EV, AMP, STD CAB, [illegible]	
AMERICAN LANDMASTER	
DRAWING NO	SHEET
19881	2 OF 5

Standard Cab Electric Vehicle Harness Overlay

		Starting Connector					Ending Connector							Length
Circuit Desc	Circuit	Conn	Pin	Part No.	Seal/Plug	Terminal	Conn	Pin	Part No.	Seal	Terminal	AWG	Color	inches
PLUG	Plug	C1	1	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
EV IGN	4-IG1	C1	2	AT04-8PA	NA	AT60-16-0122	C8	8	VC2	NA	60253-2	16	Pink	20
PLUG	Plug	C1	3	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
EV GND	4-GN1	C1	4	AT04-8PA	NA	AT60-16-0122	SP1	NA	NA	NA	NA	NA	Black	2
PLUG	Plug	C1	5	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
PLUG	Plug	C1	6	AT04-8PA	114017-ZZ	NA	NA	NA	NA	NA	NA	NA	NA	0
Back Light	4-HL1	C1	7	AT04-8PA	NA	AT60-16-0122	C7	10	VC2	NA	60253-2	16	Yellow	20
Seat Belt	4-SB1	C1	8	AT04-8PA	NA	AT60-16-0122	C6	A	12052644	15324974	12048073	16	Green	119
PLUG	Plug	C12	2 thru 8	NA	343450001	NA	NA	NA	NA	NA	NA	NA	NA	0
PDM_48V_IGN	4-IG6	C2	2	776164-1	NA	770520-1	C3	3	AT04-6P	NA	AT60-16-0122	16	Pink	25
Solenoid_Low	4-EC8	C2	24	776164-1	NA	770520-1	C3	4	AT04-6P	NA	AT60-16-0122	16	Gray	25
CNTL GND	4-GN11	C2	1	776164-1	NA	770520-1	SP1	NA	NA	NA	NA	16	Black	123
Motor Temp	4-EC7	C2	34	776164-1	NA	770520-1	C11	1	282080-1	282110-1	281934-2	18	Orange	51
IVS	4-EC6	C2	18	776164-1	NA	770520-1	C9	D	15336013	15305351	15326267	18	Violet	151
Fast/Slow CNTL	4-EC4	C2	30	776164-1	NA	770520-1	C7	3	VC2	NA	60253-2	16	Violet	137
Accel 5 volts	4-EC2	C2	23	776164-1	NA	770520-1	C9	C	15336013	15305351	15326267	18	Violet	151
Accel Signal	4-EC1	C2	10	776164-1	NA	770520-1	C9	A	15336013	15305351	15326267	18	Violet	151
Accel GND	4-GN9	C2	12	776164-1	NA	770520-1	C9	B	15336013	15305351	15326267	18	Black	151
Forward	4-EC5	C2	32	776164-1	NA	770520-1	C8	1	VC2	NA	60253-2	16	Violet	137
5V ENC	4-EC9	C2	28	776164-1	NA	770520-1	C10	1	282088-1	282110-1	281934-2	18	Red	51
Speed A	4-EC11	C2	17	776164-1	NA	770520-1	C10	2	282088-1	282110-1	281934-2	18	Gray	51
Speed B	4-EC12	C2	29	776164-1	NA	770520-1	C10	3	282088-1	282110-1	281934-2	18	Blue	51
Reverse	4-EC3	C2	21	776164-1	NA	770520-1	C8	3	VC2	NA	60253-2	16	Green	137
Encoder GND	4-GN2	C2	5	776164-1	NA	770520-1	C10	4	282088-1	282110-1	281934-2	18	Black	51
12 Volts -	4-GN13	C4	1	428160512	NA	428150012	RT2	1	5/16" Dia.	NA	7036K65	10	Black	149
12 Volts +	4-BT1	C4	2	428160512	NA	428150012	RT1	1	5/16" Dia.	NA	7036K65	10	Red	149
F/S SW GND JMPR	4-GN8	C7	9	VC2	NA	60253-2	C7	7	VC2	NA	60253-2	16	Black	3
Back Lt JMPR	4-HL2	C7	10	VC2	NA	60253-2	C7	8	VC2	NA	60253-2	16	Yellow	3
Gear IGN JMPR4	4-IG5	C8	2	VC2	NA	60253-3	Splice 2	NA	NA	NA	NA	16	Pink	18
Reverse Out	4-EC10	C8	3	VC2	NA	60253-2	C12	1	334824801	NA	330000002	16	Green	22
Gear IGN JMPR1	4-IG2	C8	8	VC2	NA	60253-2	C8	9	VC2	NA	60253-2	16	Pink	3
Gear IGN JMPR2	4-IG3	C8	9	VC2	NA	60253-2	C8	10	VC2	NA	60253-2	16	Pink	3
Gear IGN JMPR3	4-IG4	C8	10	VC2	NA	60253-2	C8	2	VC2	NA	60253-2	16	Pink	3
PLUG	Plug	C9	E	NA	15305169	NA	NA	NA	NA	NA	NA	NA	NA	0
Motor Temp GND	4-GN6	C2	35	776164-1	NA	770520-1	C11	2	282080-1	282110-1	281934-2	18	Black	51
PDM GND	4-GN5	SP1	NA	NA	NA	NA	C3	2	AT04-6P	NA	AT60-16-0122	16	Black	118
SB GND	4-GN7	SP1	NA	NA	NA	NA	C6	B	12052644	15324974	12048073	16	Black	117
F/S Sw GND	4-GN4	SP1	NA	NA	NA	NA	C7	9	VC2	NA	60253-2	16	Black	18
Gear Sw GND	4-GN3	SP1	NA	NA	NA	NA	C8	7	VC2	NA	60253-2	16	Black	18
PDM IGN	4-IG8	SP2	NA	NA	NA	NA	C3	1	AT04-6P	NA	AT60-16-0122	16	Pink	114
F/S IGN	4-IG9	SP2	NA	NA	NA	NA	C7	2	VC2	NA	60253-2	16	Pink	18
IVS IGN	4-IG7	SP2	NA	NA	NA	NA	C9	F	15336013	15305351	15326267	18	Pink	32
2/4WD SW	4-TA1	C13	1	1-480318-0	NA	60619-1	C1	6	AT04-8PA	NA	AT60-16-0122	16	Gray	13
TA GND	4-GN12	C13	2	1-480318-0	NA	60619-1	Splice1	NA	NA	NA	NA	16	Black	11
12 Volt Ignition	4-IG10	SP2	NA	NA	NA	NA	C2	8	776164-1	NA	770520-1	16	Pink	119
CAN+	4-EC13	C2	3	776164-1	NA	770520-1	C14	7	DB9	NA	NA	20	Yellow	33
CAN-	4-EC14	C2	4	776164-1	NA	770520-1	C14	2	DB9	NA	NA	20	Green	33
CAN Resistor+	4-EC15	C2	6	776164-1	NA	770520-1	C15	A	AT04-3P	NA	AT60-16-0122	18	Yellow	19
CAN Resistor-	4-IG16	C2	7	776164-1	NA	770520-1	C15	B	AT04-3P	NA	AT60-16-0122	18	Green	19
Plug	Plug	NA	NA	NA	NA	NA	C15	C	AT04-3P	114017-ZZ	NA	NA	NA	NA
48V DC-DC -	4-GN14	C4	3	428160512	NA	428150042	C3	6	AT04-6P	NA	AT60-16-0122	16	Black	20
48V DC-DC+	4-BT1	C4	4	428160512	NA	428150012	C3	5	AT04-6P	NA	AT60-16-0122	16	Red	20
12V Enable	4-BT2	C4	5	428160512	NA	428150042	C4	4	428160512	NA	428150012	16	Red	3

REV	DESCRIPTION	ECN	BY	DATE
A	SEE SHEET 5 FOR REVISION DETAILS	1222	JC	12/9/2022

PART NAME	
HARNESS, EV, AMP, STD CAB	
AMERICAN LANDMASTER	
DRAWING NO	SHEET
19881	3 OF 5


19882 Harness, Electric Vehicle, PDM
Rev - 5/17/2022
PDM 1
F1
F2
F3
20
20
15
Relay
PDM 1
Littelfuse
3 inches
6 inches
SP1
RT2
48V POS
48V Contactor
C2
5 inches
SP2
9 inches
RT1
48V GND
5 inches
8 inches
C1
EV Harness
Note: Cover harnesses with convolute tube where possible

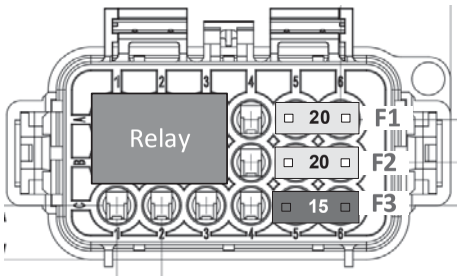
Splice SP1

Name	Pin	Circuit #	Destination
48V POS	Splice 1	4-BT2	RT2
48V POS1	Splice 1	4-BT3	PDM1 B3
48V POS2	Splice 1	4-BT4	PDM1 B5

Splice SP 2

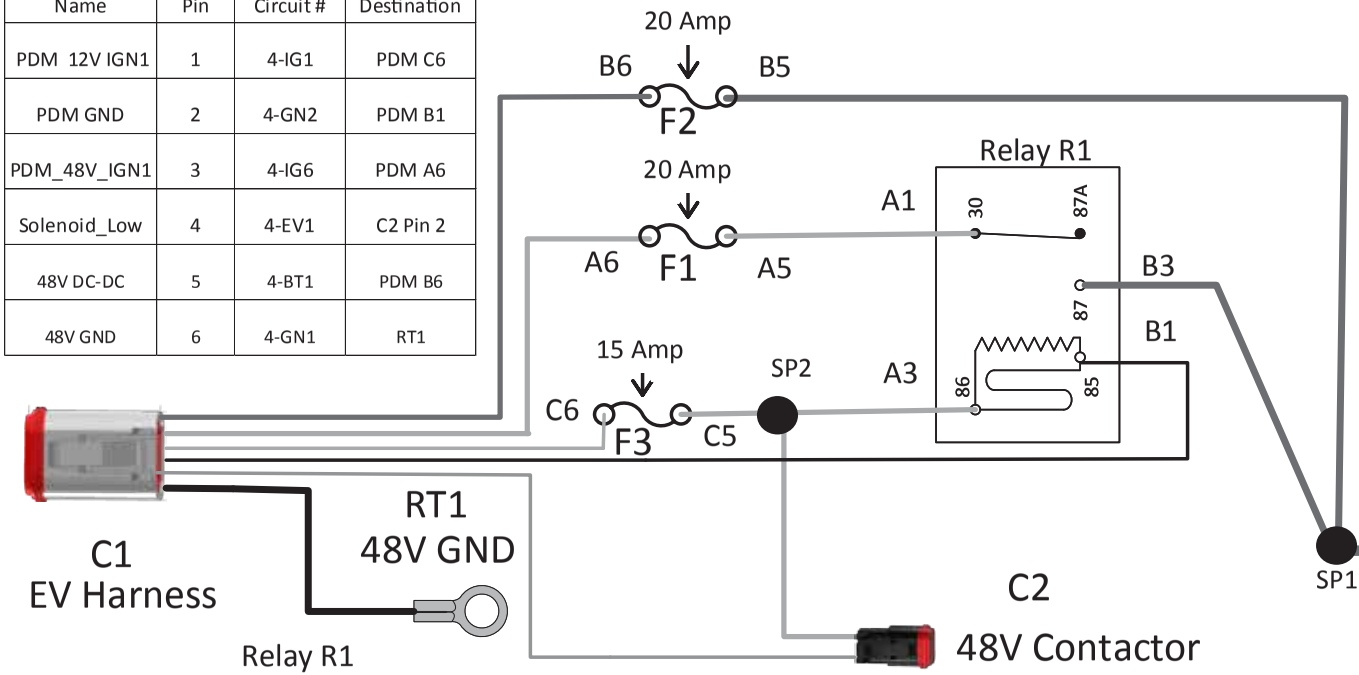
Name	Pin	Circuit #	Destination
12V COIL IGN	Splice 2	4-IG2	C2 Pin 1
PDM_IGN2	Splice 2	4-IG3	PDM1 A3
PDM IGN3	Splice 2	4-IG4	PDM1 C5

PDM 1



EV Harness C1

Name	Pin	Circuit #	Destination
PDM 12V IGN1	1	4-IG1	PDM C6
PDM GND	2	4-GN2	PDM B1
PDM_48V_IGN1	3	4-IG6	PDM A6
Solenoid_Low	4	4-EV1	C2 Pin 2
48V DC-DC	5	4-BT1	PDM B6
48V GND	6	4-GN1	RT1



Fuse F1 20 Amp

Name	Pin	Circuit #	Destination
PDM_48V_IGN1	A6	4-IG5	C1 Pin 3
PDM_48V_IGN2	A5	4-IG6	PDM1 A1

Fuse F2 20 Amp

Name	Pin	Circuit #	Destination
48 V DC-DC	B6	4-BT1	C3 Pin 2
48V POS2	B5	4-BT4	Splice 1

Fuse F3 15 Amp

Name	Pin	Circuit #	Destination
PDM 12V IG1	C6	4-IG1	C1 Pin 1
PDM_IG3	C5	4-IG4	Splice 2

Relay R1

Name	Pin	Circuit #	Destination
PDM IGN 2	A3	4-IG3	Spice 2
PDM GND	B1	4-GN2	PDM1 B1
PDM_48V_IGN2	A1	4-IG6	PDM1 A6
48V POS1	B3	4-BT3	Splice1

Name	Pin	Circuit #	Destination
12V COIL IGN	1	4-IG2	Splice 2
Solenoid_Low	2	4-EV1	C1 Pin 4

19882 Harness, Electric Vehicle, PDM

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		Starting Connector					Ending Connector							
Circuit Function	Circuit ID	Ref Designator	Pin Number	Part Number	Seal/Plug	Terminal	Ref Designator	Pin Number	Part Number	Seal	Terminal	Wire Gauge	Color	Length (inches)
PDM IGN	4-IGN1	C1	1	AT06-6S	NA	AT62-16-0166	PDM1	C6	PDM31001ZXM	15324982	12129493	16	Pink	7
PDM GND	4-GN2	C1	2	AT06-6S	NA	AT62-16-0166	PDM1	B1	PDM31001ZXM	15324982	12129493	16	Black	5
PDM_48V_IGN1	4-IG5	C1	3	AT06-6S	NA	AT62-16-0166	PDM1	A6	PDM31001ZXM	15324982	12129493	16	Pink	7
PDM_48V_IGN2	4-IG6	PDM1	A5	PDM31001ZXM	15324982	12129493	PDM1	A1	PDM31001ZXM	15324982	12129493	16	Pink	3
Solenoid_Low	4-EV1	C1	4	AT06-6S	NA	AT62-16-0166	C2	2	AT06-2S-BLK	NA	AT62-16-0166	16	Gray	9
48V DC-DC	4-BT1	C1	5	AT06-6S	NA	AT62-16-0166	PDM1	B6	PDM31001ZXM	15324982	12129493	16	Red	5
48V GND	4-GN1	C1	6	AT06-6S	NA	AT62-16-0166	RT1	1	NA	NA	7036K36	16	Black	8
48V Contact IGN	4-IGN2	C2	1	AT06-2S-BLK	NA	AT62-16-0166	Splice 2	NA	NA	NA	NA	16	Pink	5
PDM IGN1	4-IGN3	SP2	NA	NA	NA	NA	PDM1	A3	PDM31001ZXM	15324982	12129493	16	Pink	3
PDM_IGN2	4-IGN4	SP2	NA	NA	NA	NA	PDM1	C5	PDM31001ZXM	15324982	12129493	16	Pink	3
48V POS	4-BT2	RT2	NA	NA	NA	7036K36	Splice 1	NA	NA	NA	NA	16	Red	6
48V POS1	4-BT3	PDM1	B3	PDM31001ZXM	15324982	60253-2	Splice 1	NA	NA	NA	NA	16	Red	3
48V POS2	4-BT4	PDM1	B5	PDM31001ZXM	15324982	60253-2	Splice 1	NA	NA	NA	NA	16	Red	3

19882 Harness, Electric Vehicle, PDM
Net List
Rev - 5/17/2022

Pre-checks Before Detailed Diagnostic Troubleshooting:

1. Ensure that the battery is fully charged. Battery meter should show all ten bars when fully charged. Use a voltmeter to verify that that voltage across the battery terminals is at least 51 Volts DC. If the battery will not charge, proceed to the Battery Charger Diagnostic section of this document.

2. Inspect all battery cables for a clean and tight connection. If corrosion is present, clean all cables and terminals and apply a layer of dielectric grease. Tighten all battery cables to 12 Newton meters. Use a torque wrench; do not guess. Snapping off a battery terminal will require complete replacement of the battery at your expense.

3. Do a visual inspection of the entire vehicle electrical system. Have any of the harnesses or components been damaged by trail debris or animal chewing such as from squirrels or chipmunks? Repair as necessary.

4. Ensure all connectors are fully mated with an audible click.

⚠ WARNING

BEFORE SERVICING ANY PART ON THE ELECTRIC VEHICLE, THE 48 VOLT BATTERY MUST BE SHUT OFF. PUSH AND HOLD THE SILVER BUTTON SWITCH ON THE SIDE OF THE BATTERY BY THE BATTERY CABLES FOR AT LEAST 5 SECONDS OR UNTIL THE BATTERY METER GOES OFF. PERMANENT ELECTRICAL COMPONENT DAMAGE COULD OCCUR IF TH BATTERY IS LEFT ON.

Diagnostic Tests:

The following diagnostic procedures are presented in a table approach with a first action, second action and third action approach. It is assumed that the technician has basic electrical troubleshooting skills and is equipped with fundamental tools like a Volt / Ohmeter for troubleshooting electrical systems.

1. Unit is totally inoperative: No power with key on.

There are many reasons why an electric vehicle may be inoperative. This first section walks you through troubleshooting the basic power distribution system for the 48 volt and the 12 volt system. The Navitas motor and controller system runs from 48 volts, but most of the input controls are 12 volt activated. One exception to note is that the main logic power to the controller must be 48 volts as evidenced by the inclusion of a relay in the small fuse / relay box in the module tray.

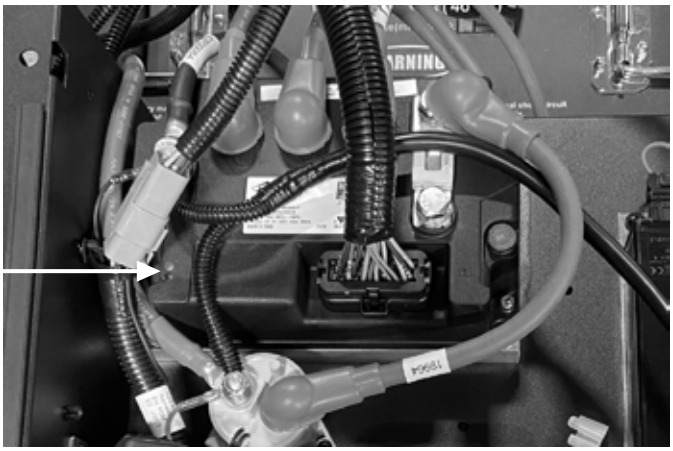
Problem	First Action	Second Action	Third Action
Vehicle is inoperative with Key ON	Verify that the Battery is ON	Verify battery is not discharged. Voltage should be above 46 volts as measured with a DC voltmeter at the main battery terminals.	If 48 volt system is up and running, verify that the 12 volt system is functional. Will the headlights come on with key on? Does the voltmeter in the dash display 12 volts? If no, perform next step.
	Push and hold the battery switch for 5 seconds	If the battery volts are less than 46 volts, plug in the charger until fully charged. Plugging in the charger should automatically turn the battery and the battery meter on.	Verify that 48 volts is present on the gray two pin connector feeding the DC to DC converter. If no, then check the fuse F2 in the fuse box located in the module tray. If blown, replace the fuse. Verify that the fuse does not blow again. If it does, disconnect the DC to DC converter and verify that the 48 volts is present with a new fuse. If the fuse blows again when the DC to DC module is hooked up, replalce the DC to DC converter module. If the system operates, you are done. If the 48 volts are present and the 12 volt system will not come up after replacing the 48 to 12 volt converter, proceed to the next step.
	Battery meter should light up and beep once. If yes, proceed to the next step. If no, proceed to the Second Action	Battery meter should light up when the charger is plugged in. If yes, go to the next step. If no, go the the Charger Diagnostic Section	Disconnect the two one way Deutsch connectors on the DC to DC converter and verify that the output is 12 volts +/- .5 volts. If there is no output, replace the DC to DC converter.
	Verify that the head lights operate with key ON. If yes ad the vehicle will not operate then proceed to the Navitas Diagnostic Section. If no, proceed to the Third Action.	Verity that the head lights operate with the key ON. If yes, system power is up and running. If the batteries are fully charged, the 12 volt system is operational and the vehicle still will not run, proceed to the Navitas Diagnostic Section of this document. If no, then proceed to the Third Action.	If the 12 volt output goes to zero when the converter is hooked up to the vehicles harness, then check the power and ground 10 guage wirres that are routed up to the jump start stud components in the front of the vehicle and look for a short to ground. Check for pinched or chaffed wires along the routing path. Repair wires as needed.
			If problem persists, call Landmaster Customer Service
			Caution: Never hook a 12 volt battery charging source to the jump start studs on the vehicle. This action will permanently damage the 48 to 12 volt converter module.
		Note: the 48 volt ground and the 12 volt ground circuits are isolated for safety. Therefore, when measuring 48 volt circuits the ground lead of the voltmenter must be connected to the ground stud of the Navitas controller. 12 volt circuits must be measured with the voltmeter ground connected to a clean spot on the frame or the ground side of the jump start stud.	Note: the 48 to 12 volt converter module has internal short circuit protection. Once shorted you must remove the 48 volt input with the gray two pin connector to allow the module to reset. Re-apply 48 volts and verify that the 12 volt output returns

2. Battery Charger Diagnostics.

The following table describes the steps to troubleshoot the battery charging system. The charger is intelligent and provides a series of blink codes to identify various failure modes. Common sense diagnostics must still be employed first to verify that you have AC power from you facility and that your power cord is functional. Please follow these action steps.

Problem	First Action	Second Action	Third Action
Vehicle will not take a charge	Verify AC Power is being supplied to the charger. Verify that 120 Volt AC power is present at the end of your extension cord. Connect to the AC power port on the side of the vehicle. Go to next step if the problem persists.		
	Remove the cover from the module tray behind the driver seat and verify that the indicator on the side of the charger with the power cable plugged in is either blinking or ON solid in a green color with AC power applied. If yes, the charger is functioning correctly. If NO proceed to the next steps and verify if a blink code exists as shown below.	Verify that there is at least 52 volts DC present at the charger output by tapping on to the ground stud of the controller and the positive connecion at the input to the contactor with a voltmeter. The charger will provide about 58 volts near the end of the charge cycle.	
	If the charger indicator is blinking red quickly, then input AC power is missing. Verify that the charger AC plug is connected to the AC Power port plug. Verify ther is no corrosion at this connection.	Is there any damage to the AC charger port ins on the side of the vehicle. If yes, replace the AC charger port cable.	
	If the indicator blinks red and green in an alternating pattern then the output is shorted or the charger output cables are reversed. Note: This pattern may appear for a few seconds when power is first applied so wait for 15 seconds before making this check.	If there is no voltage at the output of the charger, then disconnect the postive output wire of charger and cycle AC power off and then back on again. Is the charger output being overloaded? If the charger still has no output when the output is disconnected and AC power is applied, replace the charger.	If charger voltage returns while the output is disconnected, then check for pinched or chaffed wires on the 48 volt battery leads. Repair or replace as required.
	If the indicator blinks red twice followed by a 1 second pause then repeats the sequence, the charger in in an over temperature condition.	Over temperature shutdown should not occurr with this vehicle. However, if it does, move the vehicle to a cooler location before charging the battery.	
	If the indicator blinks red three times followed by a 1 second pause then repeats the sequence, the charger in in an over current condition.	If there is no voltage at the output of the charger, then disconnect the postive output wire of charger and cycle AC power off and then back on again. Is the charger output being overloaded? If the charger still has no output when the output is disconnected and AC power is applied, replace the charger.	If charger voltage returns while the output is disconnected, then check for pinched or chaffed wires on the 48 volt battery leads. Repair or replace as required.
	If the indicator blinks red four times followed by a 1 second pause then repeats the sequence, the charger in in an over voltage condition.	Over voltage shutdown should not occurr with this vehicle. However, if it does, call American Landmster Customer Service.	
	Note: If the battery is fully charged, the charger will shut off and display a solid green light on the blink code light when AC power is applied.		

Your AMP electric motor and controller system provide two methods of diagnostics. A single warning light that is visible through the top of the controller housing shall provide blink codes to describe various failure modes. Interpreting the blink codes is shown below.



Motor Controller with Blink Code Light

The second method can be provided via your Landmaster Dealer. Your dealer has been provided with a diagnostic cable that plugs in to the communications port under the seat. Battery and key must be on for dealer to connect to your vehicle.
AMP Controller Blink Codes:

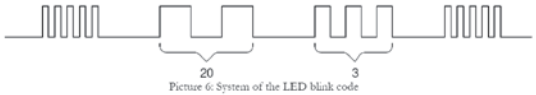
BLINK CODES

LED Blink Codes

The inverter has a green LED showing status information and a red LED showing errors.
If there is no error and everything works correctly, the green LED is permanently on.
Each error and status message is identified with a number of 4 digits length, see appendix A.
The LEDs show the first two digits of this number in the following way:

- Fast flickering as the signal for the beginning of a number
- long flashes for the tens
- short flashes for the ones.

Example: Error 2304 is shown as 23 by the red LED in this way:



Picture 6: System of the LED blink code

KRAFT FLUID SYSTEMS

Common Diagnostic Codes:

COMMON ERRORS AND POTENTIAL CAUSES

Error code	Description	Potential Cause
6101	Service Hour counter	Counter expired
600x	Status at power on	Throttle, F-N-R switches actuated at power up
280x	Encoder / sensor bearing	Wiring issue with Power/ Ground
240x	Contactor coil issue	Wiring issue or bad contactor
540x	Under voltage	Issue with contactor or battery depleted

KRAFT FLUID SYSTEMS

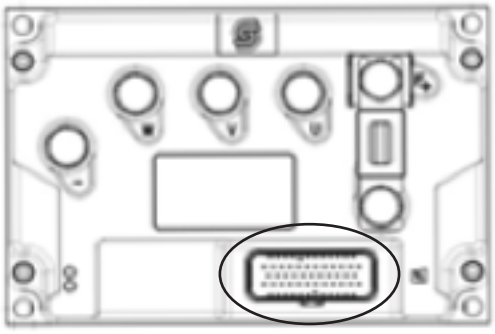
UNDER VOLTAGE RELATED ERRORS 5401 OR 5402

- System voltage truly is lower than set limit or hardware minimum
  1. Check battery voltage
- If main contactor coil is in place (No error "24xx"), the system can't detect an issue with circuit, but can still cause a secondary error.
  - If DC Link voltage drops and then recovers the main contactor most likely has an issue
    Can be logged to compare DC link to key switch voltage

54		Error V_DC_Link		
54	01	Error V_DC_Link; Undervoltage (level 1)	V_DC_Link.Volt < parameter for t > 3s	ErrLev2
54	02	Error V_DC_Link; Undervoltage (level 2)	V_DC_Link.Volt < DeviceInfo.MinVolt for t > 3s	ErrLev0

KRAFT FLUID SYSTEMS

Circled connector pin-out is shown in this table:



All AMP diagnostic codes:

35-Pin Inverter/Controller Converter Connector

Name	Pin	Circuit #	Destination	Name	Pin	Circuit #	Destination
PDM_48V_IGN	2	4-IG6	C3 Pin 3	Accel 5V	23	4-EC2	C9 Pin C
CNTL GND	1	4-GN11	Splice 1	Accel Signal	10	4-EC1	C9 Pin A
Solenoid Low	24	4-EC8	C3 Pin 4	Accel GND	12	4-GN9	C9 Pin B
Encoder GND	5	4-GN2	C10 Pin 4	Forward	32	4-EC5	C8 Pin 1
Motor Temp	34	4-EC7	C11 Pin 1	5V ENC	28	4-EC9	C10 Pin 1
IVS	18	4-EC6	C9 Pin D	SPD A	17	4-EC11	C10 Pin 2
FAST / SLOW CNTL	30	4-EC4	C7 Pin 3	SPD B	29	4-EC12	C10 Pin 3
12 Volt Ignition	8	4-IG10	Splice 2	Reverse	21	4-EC3	C8 Pin 3
CAN+	3	4-EC13	C14 Pin 1	CAN_Resistor+	6	4-EC15	C15 Pin A
CAN-	4	4-EC14	C14 Pin 2	CAN_Resistor-	7	4-EC16	C15 Pin B
MTR_Temp_GND	35	4-GN6	C11 Pin 2				

(This is connector C1 on AMP troubleshooting descriptions)

20003_SingleDriveClass1_Trac_V110

No.	Sub No.	Name	Detection	Level	Comment
0	xx	**No error**			
1		**New software**			
1	01	New software detected	OS.NewSWDetected = 1	StatLev0	**Default parameter values loaded !**
10		**Error analog input, C1p10**			
10	01	Error analog input, C1p10; Config error at. FilterConfig	C1p10.PinStatus; Bit0 = 1	StatLev3	
10	02	Error analog input, C1p10; Input out of range	C1p10.PinStatus; Bit1 = 1	ErrLev6	
10	03	Error analog input, C1p10, Hardware error	C1p10.PinStatus; Bit2 = 1	ErrLev2	
13		**Error general purpose input / output, C1p13**			
13	01	Error general purpose input / output, C1p13; Config error at .PinConfig	C1p13.PinStatus; Bit0 = 1	StatLev3	
13	02	Error general purpose input / output, C1p13; Config error at .DebounceConfig	C1p13.PinStatus; Bit1 = 1	StatLev3	
13	03	Error general purpose input / output, C1p13; Invalid value at .OutputValue	C1p13.PinStatus; Bit2 = 1	StatLev3	
13	04	Error general purpose input / output, C1p13; Overload / output shorted to +I/O supply / transistor damaged	C1p13.PinStatus; Bit3 = 1	ErrLev2	
13	05	Error general purpose input / output, C1p13; Output disconnected / output shorted to -I/O supply / transistor shorted	C1p13.PinStatus; Bit4 = 1	ErrLev2	Only detectable if output = 0
13	06	Error general purpose input / output, C1p13; Switched off because overload	C1p13.PinStatus; Bit5 = 1	ErrLev2	
13	07	Error general purpose input / output, C1p13; Switch on protection after overload	C1p13.PinStatus; Bit6 = 1	StatLev3	
13	08	Error general purpose input / output, C1p13; Hardware watchdog error	C1p13.PinStatus; Bit7 = 1	ErrLev2	
13	09	Error general purpose input / output, C1p13; Safety error	C1p13.SafetyStatus = 1	ErrLev2	
14		**Error general purpose input / output, C1p14**			
14	01	Error general purpose input / output, C1p14; Config error at .PinConfig	C1p14.PinStatus; Bit0 = 1	StatLev3	
14	02	Error general purpose input / output, C1p14; Config error at .DebounceConfig	C1p14.PinStatus; Bit1 = 1	StatLev3	
14	03	Error general purpose input / output, C1p14; Invalide value at .OutputValue	C1p14.PinStatus; Bit2 = 1	StatLev3	
14	04	Error general purpose input / output, C1p14; Overload / output shorted to +I/O supply / transistor damaged	C1p14.PinStatus; Bit3 = 1	ErrLev6	
14	05	Error general purpose input / output, C1p14; Output disconnected / output shorted to -I/O supply / transistor shorted	C1p14.PinStatus; Bit4 = 1	ErrLev6	Only detectable if output = 0
14	06	Error general purpose input / output, C1p14; Switched off because overload	C1p14.PinStatus; Bit5 = 1	ErrLev6	
14	07	Error general purpose input / output, C1p14; Switch on protection after overload	C1p14.PinStatus; Bit6 = 1	StatLev3	
14	08	Error general purpose input / output, C1p14; Hardware watchdog error	C1p14.PinStatus; Bit7 = 1	ErrLev6	

15		**Error general purpose input / output, C1p15**			
15	01	Error general purpose input / output, C1p15; Config error at .PinConfig	C1p15.PinStatus; Bit0 = 1	StatLev3	
15	02	Error general purpose input / output, C1p15; Config error at .DebounceConfig	C1p15.PinStatus; Bit1 = 1	StatLev3	
15	03	Error general purpose input / output, C1p15; Invalide value at .OutputValue	C1p15.PinStatus; Bit2 = 1	StatLev3	
15	04	Error general purpose input / output, C1p15; Overload / output shorted to +I/O supply / transistor damaged	C1p15.PinStatus; Bit3 = 1	ErrLev6	
15	05	Error general purpose input / output, C1p15; Output disconnected / output shorted to -I/O supply / transistor shorted	C1p15.PinStatus; Bit4 = 1	ErrLev6	Only detectable if output = 0
15	06	Error general purpose input / output, C1p15; Switched off because overload	C1p15.PinStatus; Bit5 = 1	ErrLev6	
15	07	Error general purpose input / output, C1p15; Switch on protection after overload	C1p15.PinStatus; Bit6 = 1	StatLev3	
15	08	Error general purpose input / output, C1p15; Hardware watchdog error	C1p15.PinStatus; Bit7 = 1	ErrLev6	
16		**Error general purpose proportional input / output, C1p16**			
16	01	Error general purpose proportional input / output, C1p16; Config error at .PinConfig	C1p16.PinStatus; Bit0 = 1	StatLev3	
16	02	Error general purpose proportional input / output, C1p16; Config error at .DebounceConfig	C1p16.PinStatus; Bit1 = 1	StatLev3	
16	03	Error general purpose proportional input / output, C1p16; Invalid value at .OutputValue	C1p16.PinStatus; Bit2 = 1	StatLev3	
16	04	Error general purpose proportional input / output, C1p16; Invalid value at .DitherAmp	C1p16.PinStatus; Bit3 = 1	StatLev3	
16	05	Error general purpose proportional input / output, C1p16; Output disconnected / output shorted to -I/O / transistor shorted	C1p16.PinStatus; Bit4 = 1	ErrLev6	Only detectable if output = 0
16	06	Error general purpose proportional input / output, C1p16; Hardware watchdog error	C1p16.PinStatus; Bit5 = 1	ErrLev6	
18		**Error multi function input, C1p18**			
18	01	Error multi function input, C1p18: Config error at .PinConfig	C1p18.PinStatus; Bit0 = 1	StatLev3	
18	02	Error multi function input, C1p18: Config error at .DebounceConfig	C1p18.PinStatus; Bit1 = 1	StatLev3	
18	03	Error multi function input, C1p18: Hardware watchdog error	C1p18.PinStatus; Bit2 = 1	ErrLev6	
18	04	Error multi function input, C1p18: Hardware configuration error	C1p18.PinStatus; Bit3 = 1	ErrLev6	
18	05	Error multi function input, C1p18: Config error at .FreqConfig	C1p18.FreqStatus; Bit0 = 1	StatLev3	
18	06	Error multi function input, C1p18: Quad error	C1p18.FreqStatus; Bit1 = 1	ErrLev6	
19		**Error digital input, C1p19**			
19	01	Error digital input, C1p19: Config error at .DebounceConfig	C1p19.PinStatus; Bit0 = 1	StatLev3	
20		**Error digital input, C1p20**			
20	01	Error digital input, C1p20: Config error at .DebounceConfig	C1p20.PinStatus; Bit0 = 1	StatLev3	

21		**Error digital input, C1p21**			
21	01	Error digital input, C1p21: Config error at .DebounceConfig	C1p21.PinStatus; Bit0 = 1	StatLev3	
23		**Error sensor supply, C1p23**			
23	01	Error sensor supply, C1p23; Overvoltage	C1p23.Volt > + 10% of set value for 5s	ErrLev0	
23	02	Error sensor supply, C1p23; Overvoltage	C1p23.Volt > + 40% of set value	ErrLev0	
23	03	Error sensor supply, C1p23; Undervoltage	C1p23.Volt < - 10% of set value for 5s	ErrLev0	
23	04	Error sensor supply, C1p23; Undervoltage	C1p23.Volt < - 50% of set value for 100ms	ErrLev0	
23	05	Error sensor supply, C1p23; Config error at .PinConfig	C1p23.PinStatus; Bit0 = 1	StatLev3	
23	06	Error sensor supply, C1p23; Supply voltage feedback value out of range	C1p23.PinStatus; Bit1 = 1	ErrLev0	
24		**Error main contactor output, C1p24**			
24	01	Error main contactor output, C1p24; Config error at .PinConfig	C1p24.PinStatus; Bit0 = 1	StatLev3	
24	02	Error main contactor output, C1p24; Invalid value at .OutputValue	C1p24.PinStatus; Bit1 = 1	ErrLev2	
24	03	Error main contactor output, C1p24; Overload / output shorted to +I/O supply / transistor damaged	C1p24.PinStatus; Bit2 = 1	ErrLev2	
24	04	Error main contactor output, C1p24; Output disconnected / output shorted to -I/O supply / transistor shorted	C1p24.PinStatus; Bit3 = 1	ErrLev2	Only detectable if output = 0
24	05	Error main contactor output, C1p24; Switched off because overload	C1p24.PinStatus; Bit4 = 1	ErrLev2	
24	06	Error main contactor output, C1p24; Switch on protection after overload	C1p24.PinStatus; Bit5 = 1	StatLev3	
24	07	Error main contactor output, C1p24; Hardware watchdog error	C1p24.PinStatus; Bit6 = 1	ErrLev2	
25		**Error general purpose input / output, C1p25**			
25	01	Error general purpose input / output, C1p25; Config error at .PinConfig	C1p25.PinStatus; Bit0 = 1	StatLev3	
25	02	Error general purpose input / output, C1p25; Config error at .DebounceConfig	C1p25.PinStatus; Bit1 = 1	StatLev3	
25	03	Error general purpose input / output, C1p25; Invalide value at .OutputValue	C1p25.PinStatus; Bit2 = 1	StatLev3	
25	04	Error general purpose input / output, C1p25; Overload / output shorted to +I/O supply / transistor damaged	C1p25.PinStatus; Bit3 = 1	ErrLev6	
25	05	Error general purpose input / output, C1p25; Output disconnected / output shorted to -I/O supply / transistor shorted	C1p25.PinStatus; Bit4 = 1	ErrLev6	Only detectable if output = 0
25	06	Error general purpose input / output, C1p25; Switched off because overload	C1p25.PinStatus; Bit5 = 1	ErrLev6	
25	07	Error general purpose input / output, C1p25; Switch on protection after overload	C1p25.PinStatus; Bit6 = 1	StatLev3	
25	08	Error general purpose input / output, C1p25; Hardware watchdog error	C1p25.PinStatus; Bit7 = 1	ErrLev6	
26		**Error general purpose input / output, C1p26**			
26	01	Error general purpose input / output, C1p26; Config error at .PinConfig	C1p26.PinStatus; Bit0 = 1	StatLev3	
26	02	Error general purpose input / output, C1p26; Config error at .DebounceConfig	C1p26.PinStatus; Bit1 = 1	StatLev3	
26	03	Error general purpose input / output, C1p26; Invalide value at .OutputValue	C1p26.PinStatus; Bit2 = 1	StatLev3	
26	04	Error general purpose input / output, C1p26; Overload / output shorted to +I/O supply / transistor damaged	C1p26.PinStatus; Bit3 = 1	ErrLev6	

26	05	Error general purpose input / output, C1p26; Output disconnected / output shorted to -I/O supply / transistor shorted	C1p26.PinStatus; Bit4 = 1	ErrLev6	Only detectable if output = 0
26	06	Error general purpose input / output, C1p26; Switched off because overload	C1p26.PinStatus; Bit5 = 1	ErrLev6	
26	07	Error general purpose input / output, C1p26; Switch on protection after overload	C1p26.PinStatus; Bit6 = 1	StatLev3	
26	08	Error general purpose input / output, C1p26; Hardware watchdog error	C1p26.PinStatus; Bit7 = 1	ErrLev6	
28		**Error encoder supply, C1p28**			
28	01	Error encoder supply, C1p28; Overcurrent	C1p28.FeedbackValue > parameter	ErrLev2	
28	02	Error encoder supply, C1p28; Undercurrent	C1p28.FeedbackValue < parameter	ErrLev2	
28	03	Error encoder supply, C1p28; Current feedback out of range	C1p28.PinStatus; Bit0 = 1	ErrLev2	
30		**Error multi function input, C1p30**			
30	01	Error multi function input, C1p30: Config error at .DebounceConfig	C1p30.PinStatus; Bit0 = 1	StatLev3	
30	02	Error multi function input, C1p30: Hardware watchdog error	C1p30.PinStatus; Bit1 = 1	ErrLev6	
30	03	Error multi function input, C1p30: Hardware configuration error	C1p30.PinStatus; Bit2 = 1	ErrLev6	
31		**Error digital input, C1p31**			
31	01	Error digital input, C1p31: Config error at .DebounceConfig	C1p31.PinStatus; Bit0 = 1	StatLev3	
32		**Error digital input, C1p32**			
32	01	Error digital input, C1p32: Config error at .DebounceConfig	C1p32.PinStatus; Bit0 = 1	StatLev3	
33		**Error digital input, C1p33**			
33	01	Error digital input, C1p33: Config error at .DebounceConfig	C1p33.PinStatus; Bit0 = 1	StatLev3	
34		**Error analog input (Rheo), C1p34**			
34	01	Error analog input, C1p34; ConfigError at .FilterConfig	C1p34.PinStatus; Bit0 = 1	StatLev3	
34	02	Error analog input, C1p34; Input out of range	C1p34.PinStatus; Bit1 = 1	ErrLev2	
34	03	Error analog input, C1p34, Hardware error	C1p34.PinStatus; Bit2 = 1	ErrLev2	
36		**Error power stage**			
36	01	Error power stage: Wrong value at .PWMFreq	PowerStage.Status; Bit0 = 1	StatLev3	
36	02	Error power stage; Power stage overtemperature	PowerStage.Status; Bit1 = 1	ErrLev2	
36	03	Error power stage; Power stage temperature sensor	PowerStage.Status; Bit2 = 1	ErrLev2	
36	04	Error power stage; Overvoltage	PowerStage.Status; Bit3 = 1	ErrLev2	
36	05	Error power stage; Overcurrent	PowerStage.Status; Bit4 = 1	ErrLev2	
36	06	Error power stage; Unprotected mode active	PowerStage.Status; Bit5 = 1	StatLev3	
36	07	Error power stage; Power stage permanently locked because wrong motor data	PowerStage.Status; Bit6 = 1	ErrLev2	

36	08	Error power stage; Power stage permanently locked because HW watchdog error	PowerStage.Status; Bit7 = 1	ErrLev2	
36	09	Error power stage; Power stage permanently locked because current sensor error	PowerStage.Status; Bit8 = 1	ErrLev2	
36	10	Error power stage; Power stage permanently locked because undervolt detection	PowerStage.Status; Bit9 = 1	ErrLev2	
36	11	Error power stage; PCB overtemperature	PowerStage.Status; Bit10 = 1	ErrLev2	
36	12	Error power stage; PCB temperature sensor	PowerStage.Status; Bit11 = 1	ErrLev2	
37		**Error selftest**			
37	01	Error selftest; Error DC-Link circuit	Selftest.Error; Bit0 = 1	ErrLev2	
37	02	Error selftest; Error in Watchdog circuit, operation impossible	Selftest.Error; Bit1 = 1	ErrLev0	
37	03	Error selftest; Short circuit to -V DC-Link	Selftest.Error; Bit2 = 1	ErrLev2	
37	04	Error selftest; Short circuit to +V DC-Link	Selftest.Error; Bit3 = 1	ErrLev2	
37	05	Error selftest; Error in motor wiring or power stage	Selftest.Error; Bit4 = 1	ErrLev2	
37	06	Error selftest; Shorted power output (motor output)	Selftest.Error; Bit5 = 1	ErrLev2	
37	07	Error selftest; Test not passed, because of hardware overvoltage protection	Selftest.Error; Bit6 = 1	ErrLev0	
37	08	Error selftest; Corrupted production data in EEPROM detected	Selftest.Error; Bit7 = 1	ErrLev0	
38		**Warning selftest**			
38	01	Warning selftest; Error in Watchdog circuit, limited operation possible	Selftest.Warning; Bit0 = 1	ErrLev0	
38	02	Warning selftest; Watchdog not tested, because low voltage at DC-Link	Selftest.Warning; Bit1 = 1	ErrLev0	
38	03	Warning selftest; Corrupted user data (NVRam) in EEPROM detected	Selftest.Warning; Bit2 = 1	ErrLev6	
38	04	Warning selftest; Corrupted error history data in EEPROM detected	Selftest.Warning; Bit3 = 1	n.a.	
39		**Status selftest**			
39	01	Status selftest; DCLink selftest in progress	Selftest.Status = 1	StatLev1	
39	02	Status selftest; Watchdog selftest in progress	Selftest.Status = 2	StatLev0	
39	03	Status selftest; PowerStage selftest in progress	Selftest.Status = 3	StatLev1	
40		**Error motor control**			
40	01	Error motor control; Invalid value at .RPMSetPoint	MotorControl.Status; Bit0 = 1	ErrLev6	
40	02	Error motor control; Invalid value at .SpeedKP	MotorControl.Status; Bit1 = 1	ErrLev6	
40	03	Error motor control; Invalid value at .SpeedKI	MotorControl.Status; Bit2 = 1	ErrLev6	
40	04	Error motor control; Invalid value at .TorqueFF	MotorControl.Status; Bit3 = 1	ErrLev6	
40	05	Error motor control; Invalid value at .UserTorqueLimit	MotorControl.Status; Bit4 = 1	ErrLev6	
40	06	Error motor control; Invalid value at .UserCurrLimit	MotorControl.Status; Bit5 = 1	ErrLev6	
40	10	Error motor control; Invalid value at .EncErrThreshold	MotorControl.Status; Bit9 = 1	ErrLev6	
40	11	Error motor control; One encoder line disconnected	MotorControl.Status; Bit10 = 1	ErrLev2	
40	12	Error motor control; Invalid value at .PartLoadReduc	MotorControl.Status; Bit11 = 1	ErrLev6	
40	13	Error motor control; PCB temperature dependent current derating active	MotorControl.Status; Bit12 = 1	ErrLev6	

41		**Error motor**			
41	01	Error motor; Config error	Motor.Status; Bit0…Bit22 = 1	ErrLev2	
41	02	Error motor; ReInit in progress	Motor.Status; Bit23 = 1	StatLev3	
42		**Error NVMem**			
42	01	Error NVMem; The NVMem was restored to a previouse state	NVMem.Status; Bit0 = 1	ErrLev0	
42	02	Error NVMem; The NVMem checksums are not correct	NVMem.Status; Bit1 = 1	ErrLev0	
42	03	Error NVMem; The reset routine could not access the NV memory	NVMem.Status; Bit2 = 1	ErrLev0	
43		**Error CAN**			
43	01	Error CAN; CAN driver error	CAN[0].DriverError = 1	ErrLev0	Blink code of red LED: f = 1 Hz (on = 800ms, off = 200ms)
43	02	Error CAN; CAN bus off mode	CAN[0].BussOff = 1	ErrLev0	Blink code of red LED: f = 1 Hz (on = 200ms, off = 800ms)
43	03	Error CAN; CAN bus overflow	CAN[0].Overflow = 1	ErrLev0	
51		**Error power stage**			
51	01	Error power stage; Min. temperature	PowerStage.Temp < DeviceInfo.MinTemp	ErrLev0	
51	02	Error power stage; Warning temperature power stage	PowerStage.Temp >= parameter	StatLev3	Hysteresis = 2 °C
52		**Error motor**			
52	01	Error motor; Overtemperature	Motor.ActTemp > parameter	ErrLev2	
52	02	Error motor; Warning temperature motor	Motor.ActTemp >= parameter	StatLev3	Hysteresis = 2 °C
53		**Error loop time**			
53	01	Error loop time (level 1)	OS.ExecTime > OS.ExecTimeOut	ErrLev6	
53	02	Error loop time (level 2)	OS.ExecTime > 2 * OS.ExecTimeOut	ErrLev0	
54		**Error V_DC_Link**			
54	01	Error V_DC_Link; Undervoltage (level 1)	V_DC_Link.Volt < parameter for t > 3s	ErrLev2	
54	02	Error V_DC_Link; Undervoltage (level 2)	V_DC_Link.Volt < DeviceInfo.MinVolt for t > 3s	ErrLev0	
60		**Status Inputs after Power-on**			
60	01	Status Power-on; Forward switch	Input = 1 after power-on	StatLev1	Reset status: Input = 0
60	02	Status Power-on; Reverse switch	Input = 1 after power-on	StatLev1	Reset status: Input = 0
60	03	Status Power-on; Throttle switch	Input = 1 after power-on	StatLev1	Reset status: Input = 0
60	04	Status Power-on; Inching forward switch	Input = 1 after power-on	StatLev1	Reset status: Input = 0
60	05	Status Power-on; Inching reverse switch	Input = 1 after power-on	StatLev1	Reset status: Input = 0

60	06	Status Power-on; Throttle analog input	Input voltage that can cause a speed set value after power-on In_pct >= (CalLo + DbndLo + 3%)	StatLev1	Reset status: In_pct < (CalLo + DbndLo + 3%)
60	07	Status Power-on; Brake switch (C1p20)	Brake pedal pressed after power-on (dependent on switch type: e.g. type = n.c. and input = 0)	StatLev1	Reset status: Brake pedal not pressed
61		**Status Service Hour Counter**			
61	01	Service Hour Counter expired	Service Hour Counter = 0	StatLev3	
63		**Setup/calibration analog input C1p10**			
63	01	Block is not calibrated	CalLo_pct = 0 and CalHi_pct = 0	StatLev1	
63	02	Block is currently in a calibration cycle	CalLo_pct 0 and CalHi_pct = 0	StatLev1	
63	03	Parameters are corrupt		StatLev1	
63	04	Invalid setup/calibration		StatLev1	
64		**Supervision analog input C1p10**			
64	01	Input value is too low		ErrLev2	
64	02	Input value is too high		ErrLev2	
64	03	Value out of range	(MaxIn_mV < In_mV) or (CalCmd > 4)	n.a.	

AMP RVR

POWER / MOTOR	24 hp (18.0 kW) with 71.5 ft lbs torque rating – AC Motor powered by a 48V Lithium-Ion battery powerplant (5.0kW or 8.0kW)
SEATING CAPACITY	2 Person*
SPEED	15 mph
FUEL CONSUMPTION	N/A
RANGE	Up to 50 miles*
STARTING	Keyed on/off
BATTERY	48V 160AH Lithium-Ion
SPARK PLUG	N/A
FUEL CAPACITY	N/A
ALTERNATOR	Converter / 30 amps
TRANSMISSION	Direct drive
TRANSAXLE	Model 24 Shafer
DIFFERENTIAL	Cable Actuated Rear-Locking
DRIVE	2 wheel drive with locking rear differential
FRONT SUSPENSION	Double A-arms, adjustable coil over shock with up to 8" travel
REAR SUSPENSION	Independent trailing arm, with radius rod, adjustable camber & tow control, dual-rate coil over shock with up to 8" of travel
BRAKE SYSTEM	4 wheel disc, hydraulic brake I Hand-operated parking brake
TIRES	24" Turf Tires
DIMENSIONS	112.5" L x 62" W**
WHEEL BASE	73"
TURNING RADIUS	9' inside radius
GVWR	2,300 lbs.
CURB WEIGHT	1,220 lbs.
BED MATERIALS	Heavy Duty powder coated steel
BED DIMENSIONS	11 cu.ft.
BED CAPACITY	750 lbs.
TOWING CAPACITY	1,500 lbs.
TOTAL PAYLOAD	200 lbs. per person, per seat + cargo bed capacity
WARRANTY	3 year engine / All other 1 year limited
ADDITIONAL FEATURES	3pt lap/shoulder belts for driver and passenger, twin 12V auxiliary outlets for accessories, 12V/18W LED headlights, polyurethane powder paint, 2" front and rear receiver hitch, bucket seating, welded steel frame. Complete weather-sealed wiring connections. Wide selection of additional accessories available. Fuel gauge located under seat. In-dash, hour/volt meter standard. EPS Standard

* Estimates. Actual top speeds, fuel consumptions and vehicle ranges may vary due to driving conditions, terrain, climate and other extenuating circumstances.
**Overall vehicle dimensions may vary with the addition of optional accessories

L5 RVR

POWER	Vanguard 570cc V-Twin carbureted
SEATING CAPACITY	2 Person*
SPEED	15mph
FUEL CONSUMPTION	18 mpg*
RANGE	Up to 100 miles*
STARTING	12V keyed ignition
BATTERY	12V / 315 cca utility class
SPARK PLUG	NGK C7HSA
FUEL CAPACITY	5.0 gal
ALTERNATOR	20 amp
TRANSMISSION	CVT automatic
TRANSAXLE	Gear drive Schafer/DANA oil-filled transaxle
DIFFERENTIAL	Cable Actuated Rear-Locking
DRIVE	2 wheel drive with locking rear differential
FRONT SUSPENSION	Double A-arms, adjustable coil over shock with up to 8" travel
REAR SUSPENSION	Independent trailing arm, with radius rod, adjustable camber & tow control, dual-rate coil over shock with up to 8" of travel
BRAKE SYSTEM	4 wheel disc, hydraulic brake I Hand-operated parking brake
TIRES	24" Turf Tires
DIMENSIONS	112.5" L x 62" W**
WHEEL BASE	73"
TURNING RADIUS	9' inside radius
GVWR	2,300 lbs.
CURB WEIGHT	1,220 lbs.
BED MATERIALS	Heavy Duty powder coated steel
BED DIMENSIONS	11 cu. ft.
BED CAPACITY	750 lbs.
TOWING CAPACITY	1,500 lbs.
TOTAL PAYLOAD	200 lbs. per person, per seat + cargo bed capacity
WARRANTY	3 year engine / All other 1 year limited
ADDITIONAL FEATURES	3pt lap/shoulder belts for driver and passenger, twin 12V auxiliary outlets for accessories, 12V/18W LED headlights, polyurethane powder paint, 2" front and rear receiver hitch, bucket seating, welded steel frame. Complete weather-sealed wiring connections. Wide selection of additional accessories available. Fuel gauge located under seat. In-dash, hour/volt meter standard. EPS Standard

* Estimates. Actual top speeds, fuel consumptions and vehicle ranges may vary due to driving conditions, terrain, climate and other extenuating circumstances.
**Overall vehicle dimensions may vary with the addition of optional accessories

LIMITED WARRANTY

Gas Powered Utility Vehicle

Limited Warranty: American LandMaster (hereinafter referred to as "ALM"), hereby warrants to the original purchaser, that your new ALM Utility Vehicle will be free from defects in material and workmanship for a period of one (1) year from date of purchase, except as provided below. Certain engines may carry an engine manufacturer's warranty which is longer than one (1) year. These engines are not covered by this ALM warranty. Please refer to the engine manufacturer's warranty policy included with your ALM product for its warranty repair requirements and procedures.

ALM Warranty Responsibilities: ALM, if notified of a defect in material or workmanship during the period of warranty, will repair or replace, at its option, defective parts covered by this warranty at no charge, other than the reasonable cost for the transportation of the component(s). ALM will also agree to pay reasonable charges for labor, if necessary, to perform a warranty repair.

Warranty Claim Requirements and Procedures: In order to be able to claim under this warranty the original purchaser must maintain and operate the vehicle in accordance with the instructions provided in the Operator's Manual, engine manual, the supplements thereto, and labels affixed to the vehicle. Additionally, within (10) days of the discovery of an alleged defect, the original purchaser must contact ALM's Customer Service Department at 1-800-643-7332, 2499 S 600 E, suite 102, Columbia City, IN 46725 or via the internet at www.americanlandmaster.com. The repair or replacement of any part or parts under this Limited Warranty shall not extend the term of the warranty beyond the original term as set forth above.

General Exclusions: This limited warranty does not cover component failure or damage caused by any of the following: abnormal strain or stress, neglect; abuse; improper assembly of components which were supplied in the factory sealed carton after the vehicle left ALM; improper maintenance, modifications, damage caused by use of non ALM accessories, improper use of the vehicle, including, but not limited to racing, jumping, stunt driving, or any other uses prohibited by the Operator's Manual. Additionally, this warranty does not cover vehicles which are leased, rented, or used at a concession track.

Specific Exclusions: This limited warranty does not apply to components which are subject to normal wear and tear. These items include the tires, battery and brake pads. Downtime, pick-up and delivery charges are not covered by this warranty. This warranty does not apply to select engines which are covered by a separate manufacturer's warranty.

NO IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY: THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. SPECIFICALLY, ALM MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITATIONS SPECIFIED IN THE WARRANTY ABOVE ARE HEREBY DISCLAIMED BY ALM AND EXCLUDED FROM THIS WARRANTY. ADDITIONALLY, THIS WARRANTY EXCLUDES ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE. SOME STATES DO NOT ALLOW A MANUFACTURER TO EXCLUDE OR LIMIT INCIDENTAL OR CONSEQUENTIAL DAMAGES AND, THEREFORE, THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY WILL LAST. IT IS POSSIBLE THAT THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS, WHICH VARY, FROM STATE TO STATE.

Warranty Service: To obtain warranty service you must return your ALM product to the local authorized dealer or service center, inform them of your warranty problem and provide proof of purchase before any warranty service can be provided. The authorized dealer or service center will inspect the product to determine what repairs or parts are needed and whether they are covered under this warranty. To locate the authorized dealer or service center nearest you please call ALM customer service at 800-643-7332, or visit our website at www.americanlandmaster.com for more information.

EPA Requirements: This product complies with all applicable EPA Emissions and, Evaporative requirements. Included with your product's documents are copies of ALM's "Emission Control System Warranty Statement". If your vehicle has a fuel tank mounted remotely from the engine, you will be provided with an "Evaporative Emissions Warranty Statement.

Service and Warranty Special Note

Should your Landmaster product require warranty repair, service or if you have any questions concerning assembly, replacement parts or how to care for your product please contact your local Landmaster dealer or Landmaster directly.

Landmaster Dealers:
To locate the authorized dealer nearest you please call Landmaster customer service at 1-800-643-7332, visit our website at www.landmaster.com or contact your place of purchase.

Mail:
Customer Support
c/o American Landmaster
2499 S 600 E, suite 102
Columbia City, IN 46725

Telephone:
Customer Support
American Landmaster
1-800-643-7332

Fax:
Customer Support
American Landmaster
1-800-399-1399

e-mail:
Customer Support
American Landmaster
feedback@americanlandmaster.com

UTILITY VEHICLE SET-UP / PRE DELIVERY CHECKLIST

MODEL #	SERIAL #	DATE OF PURCHASE

DEALER SET-UP

- ❑ **VISUALLY** - inspect for damage
- ❑ **FASTENERS** - inspect for missing bolts, nuts
- ❑ **CHECK ORDER** - verify all items are as ordered
- ❑ **LOOSE COMPONENTS** - verify all are there
- ❑ **MANUALS** - operators safety manual / engine manual
- ❑ **WELDS** - inspect for missing
- ❑ **CLEAN UP** - check clean up of unit
- ❑ **DECALS** - inspect for missing decals

SET UP BY:

DATE:

PRE DELIVERY

- ❑ **TIRES** - adjust pressure to proper specification
- ❑ **WHEELS** - check lug and axle nut for proper torque
- ❑ **CAGE** - check to insure cage is assembled properly
- ❑ **FASTENERS** - check all fasteners for proper torque
- ❑ **TRANSAXLE** - insure oil level is correct
- ❑ **PARKING BRAKE** - insure that working correctly
- ❑ **DUMP BED** - insure latch is adjusted properly
- ❑ **SHIFT LEVER** - insure working properly
- ❑ **BRAKE** - insure brake is adjusted and working
- ❑ **OIL** - insure that engine oil level is correct
- ❑ **BATTERY** - insure that it is fully charged
- ❑ **KEYS** - verify operations of key switch
- ❑ **LIGHTS** - verify proper operation of all lights
- ❑ **AXLE** - inspect attachment and wheel bearings
- ❑ **ENGINE** - check engine RPM's for settings
- ❑ **SEAT RESTRAINTS** - insure installed properly
- ❑ **SEATS** - insure seat is installed properly
- ❑ **GUARDS** - inspect for missing bolts, nuts, guards
- ❑ **THROTTLE** - insure throttle is working properly

CHECKED BY:

DATE:

DEALER INFORMATION

NAME	PHONE
ADDRESS	FAX
CITY, STATE, ZIP	EMAIL

CUSTOMER CHECKLIST

- ❑ **VISUAL INSPECTION**
- ❑ **RECEIVED SERVICE INSTRUCTIONS**
- ❑ **SHOWN ALL ENGINE CONTROLS**
- ❑ **WARRANTY EXPLAINED FULLY**
- ❑ **RECEIVED OWNERS MANUAL**
- ❑ **MY DEALER DEMONSTRATED ALL CONTROLS**
- ❑ **RECEIVED KEYS & ENGINE MANUAL**
- ❑ I have reviewed and understand the warranty policy
- ❑ I have visually inspected unit and found no defects
- ❑ I understand this vehicle product is not designed for racing
- ❑ I understand that this product is designed for off road use only and is NOT intended for use on public roads or highways unless equipped with an LSV package.*
- ❑ I understand that before operating this vehicle all operators and passengers must read, follow and understand all safe operating instructions

*Landmaster Low Speed Vehicle (LSV) models are street legal where allowed when properly licensed and plated. No ALM vehicles are designed for, nor allowed on highways. Check local ordinances regarding the use of Low Speed Vehicles in your area.

PRE DRIVE INSPECTION CHECKLIST

ITEM	INSPECTION PROCEDURE	ACTION
Engine Oil Level	Add oil if required. Check for leaks. Tighten filler cap securely.	Refer to operator's or engine manual.
Fuel Level	Add fuel if necessary. DO NOT overfill. DO NOT mix oil with gas. Replace cap tightly.	Refer to operator's or engine manual. DO NOT refuel a hot engine. Allow engine to cool before adding fuel. Never use E-85 on E-15 fuel.
Warning Decals	Make sure all warning decals are legible and securely attached.	Replace as necessary.
Tires	Tread must have a minimum height of 1/8" at center of tire. Prior to operating vehicle, check and adjust tire pressure as indicated on the sidewall of each tire, or in the vehicle manual (we recommend 15 p.s.i. for full size UTVs). A tire pressure gauge is required to obtain accurate readings.	Replace tires if tread height is less than 1/8" at center of tire. Add or remove air as necessary to meet requirements indicated on sidewall of each tire or in the specifications section of the vehicle manual (15 p.s.i. recommended for full size UTVs).
Drive Train	Check condition and fluid levels	Lubricate, adjust as necessary.
Throttle	Check for smooth operation. Ensure throttle 'snaps' back to idle. Check for frayed or loose cable. Check for mud, debris, and ice in throttle mechanism Check idle adjustment	Replace damaged cable. Clean out any mud and debris. If ice is present, move vehicle to a warm place and allow the ice to melt and water to dry. Adjust as necessary
Fasteners	Check wheels to see that all wheel nuts are tightened securely at 65 ft. Lbs. Check for missing fasteners. Check that all other fasteners are secure.	Tighten fasteners as necessary. Replace fasteners as necessary.
Brush Bars	Make sure all brush bars are in place and securely attached.	Replace damaged bars or fasteners and tighten as necessary.
Steering	Make sure steering turns freely. Check for proper 'toe-in' of wheels.	Lubricate and adjust as necessary.
Frame / Chassis	Check for bent or otherwise damaged frame and/or other chassis components.	Replace as necessary.
Guards	Check all guards covering moving parts.	Tighten fasteners on loose guards. Replace worn or damaged guards.
Lights	Check for proper operation	See OPERATION section of the Operator's Safety Manual
Suspension and Ball Joints	Check for ball looseness	Replace as necessary
Keyswitch	Perform switch test and ensure that engine shuts off when key is turned to the "OFF" position.	Repair / replace as necessary
Brakes	Ensure brakes function properly.	Adjust / replace as necessary
Shields	Check all shields	Tighten fasteners on loose shields. Replace damaged shields.

NOTES

2499 S. 600 E., Suite 102
Columbia City IN 46725

Call: 800-643-7332
Fax: 800-399-1399

landmaster.com

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