

# LENCO BEAR OPERATOR MANUAL



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# **General Information**

**Preface:** This Manual is written with regard to persons who will be operating or maintaining the Lenco BEAR. Operation of the Lenco BEAR without thoroughly reading this manual could result in vehicle damage or personal injury. Operators should familiarize themselves with the format and contents of this manual prior to operating/ maintaining the Lenco BEAR. Learning to navigate this manual will help you locate information quickly and provide knowledge of the equipment being used.

**Scope:** This manual contains basic operator and maintenance instructions for the Lenco BEAR. It includes *Cautions* and *Warnings* regarding safety and function of controls and indicators. It also includes operator maintenance, service procedures and other supporting information.

**Characteristics:** The Lenco BEAR enhances the safety of Police, EMS, Tactical Response Teams, and EOD units. The vehicle is capable of providing enhanced personal protection and survivability in threatening environments including but not limited to Natural Disasters, Riot Control, Barricaded Suspects as well as Search and Rescue. The Lenco BEAR is four-wheel drive and will operate in most weather and terrain conditions

The major sub systems of the vehicle include powertrain, electrical, lighting, body/ chassis, and Heating Ventilating Air Conditioning (HVAC). The vehicle features Ballistic Armor, weapon ports, a top mounted rotating turret with adjustable height stand, as well as an array of electrical and mechanical options to meet the user's specific needs.

# **Pre-Operation Inspection**

Before operation of the Lenco BEAR do a thorough inspection of the vehicle interior, exterior, and all components to ensure maximum protection for operator and crew. This inspection should include both a visual and a physical inspection.

This inspection includes checking all fluid levels, tire pressures, brakes, electrical components, seats, seat restraints, and door locks for proper function. Personnel performing pre-inspections should be familiar with the vehicle and have the experience and qualifications needed to identify potential hazards.

# Warnings

Follow all Safety Warnings, as listed below, before performing any type of maintenance, inspection, or vehicle operation.

# Engine

Ensure hood prop rod is in place before performing maintenance or inspections in the engine compartment. Failure to comply could result in personal injury.

Engine and exhaust will become hot during normal operation. Allow engine to completely cool before performing maintenance. Failure to comply could result in burn injury.

Stay clear of moving parts. Be sure to wear eye protection, long sleeves or a shop coat while performing engine maintenance. Failure to comply could result in personal injury.

# Battery

Be sure main power and all other electrical components are off before performing maintenance on batteries or electrical system. Failure to comply could result in equipment damage.

Do not make contact between terminals or jump studs. Do not wear jewelry while performing maintenance on batteries. Always disconnect the ground and the negative terminals first and re-connect last. Failure to comply could result in equipment damage, electrical shock, or fire hazard.

Always wear face and skin protection i.e. goggles and long sleeves.

# **Engine Coolant**

Wait fifteen minutes after vehicle operation to remove radiator cap or coolant reservoir cap. With vehicle OFF and using a heavy rag; turn radiator cap ¼ to ½ turn counter clockwise to allow pressure to escape. Ensure all personnel are clear of radiator and radiator fans while engine is running. Failure to comply could result in injury to personnel.

Wear safety goggles and work gloves while servicing coolant system. Label all connections before removing any parts. Failure to comply could result in equipment damage or personal injury.

# Fuel

Do not fill fuel tank while engine is running, do not over fill tank, and make sure fuel nozzle is grounded to filler neck to prevent sparks while fueling.

Be alert at all times for the smell of fuel while operating vehicle. If fuel smell is detected shut down engine immediately.

Clean up all fuel spills to prevent fire and slip hazard. Dispose of materials in accordance with local hazardous waste procedures.

Fuel is highly flammable and can explode. Keep open flames, sparks and other ignition sources away from diesel fuel and have a fire extinguisher at hand. Do not smoke while working with fuel; do not work on fuel system while engine is hot. Fuel can be ignited by a hot engine.

# Transmission

Transmission becomes hot during normal operation. When performing maintenance on transmission wear safety goggles, work gloves, and protective clothing to avoid injury. Avoid contact with hot transmission oil while draining. Failure to comply could result in burn injury.

# **Transfer Case**

Transfer Case becomes very hot during normal operation. Allow transfer case to cool before servicing. Wear safety goggles, work gloves and protective clothing. Extreme caution should be used while opening drain valves and removing bolts. Failure to comply could result in burn injury.

# **Engine Fluids**

Engine fluids including, oil, fuel, and coolant may be hazardous to the environment and to human health. Become familiar with *MSDS's (Material Safety Data Sheets)*. Handle all fluids and other contaminated material (Filters, Rags) in accordance with standard operating procedures. Recycle or dispose of engine fluids/filters and other contaminated materials in accordance to standard operating procedures.

# Refrigerant

The temperature of R-134a refrigerant is -20 Degrees Fahrenheit (-29 Degrees Celsius). Wear a full face shield, protective rubberized gloves, and protective clothing when working with refrigerants. If refrigerant contacts skin, remove all contaminated clothing, treat skin as if it is frost bitten or frozen and seek immediate medical attention. If refrigerant contacts eyes do not rub them. Rinse eyes with cold water for fifteen minutes gradually increasing temperature to above freezing point. Seek immediate medical attention.

Do not expose refrigerant containers empty or full to open flames or temperatures above 125 Degrees Fahrenheit (52 Degrees Celsius). Do not discard empty containers where they are subject to heat from a trash burner; containers may explode. Failure to comply may result in equipment failure or personal injury.

Refrigerant may become poisonous in the presence of heat. Do not smoke or allow any type of flame in the immediate area while servicing air conditioning system. Never weld, solder, steam clean or use excessive heat on any part of the air conditioning system while charged or pressurized.

R134a must not be mixed with air before being pressurized. When mixed with large quantities of air and pressurized; R134a becomes combustible.

Refrigerant evaporates quickly and can displace oxygen in the work area. This can cause suffocation. If a leak occurs avoid breathing refrigerant vapor and thoroughly ventilate work area before continuing service to HVAC system.

Federal and State laws require that refrigerant be recovered and recycled. Refrigerant must be recovered from system with authorized recommended equipment before any work can be performed on the unit. Always use approved recycling equipment to prevent accidental discharge.

Do not use parts other than those specified for the system being serviced.

Accidental and intentional introduction of liquid contaminants to the environment is a violation of State, Federal, and Military regulations. Store, install, and dispose of containers in accordance with standard operating procedures.

# Carbon Monoxide

Carbon Monoxide is a dangerous gas that deprives the body of oxygen and causes suffocation. Carbon Monoxide is colorless and odorless, but can be detected with a Carbon Monoxide detector. To avoid Carbon Monoxide poisoning follow these precautions:

• Do not let engine idle for long periods of time. If necessary to run engine indoors during vehicle maintenance use proper ventilation equipment to exhaust gasses outside.

- Do not sleep in vehicle with heater on, or engine idling.
- Notify Fleet Maintenance if exhaust fumes are detected in crew compartment of vehicle while operating.

Be aware at all times for exhaust odors and signs of exposure to carbon monoxide such as headache, dizziness, and loss of muscular control, apparent drowsiness, and coma. Contact your safety personnel for appropriate safety precautions when in contact with carbon monoxide.

#### Brakes

Use Exhaust Brake for constant stop and go, short haul, and steep grade operation.

Do not park vehicle on longitudinal slopes greater than 30 Degrees.

# Wheels and Tires

Do not exceed 25MPH while driving on Run Flats.

Wheel and tire assemblies are heavy; do not attempt to lift wheel or tire assemblies without assistance. Be sure to wear the appropriate PPE while working on wheel assemblies.

Ensure vehicle is parked on a flat level surface before removing Wheel/Tire assemblies. Soft or uneven ground could result in jack or jack stands sinking.

# Jacks / Lifting

Before lifting the vehicle, make sure it is parked on a level surface. Put the vehicle in park, set the emergency brake, and chock the wheels.

Never work under a vehicle supported by only a jack or lifting device. Use properly rated jack stands under frame rails to properly support vehicle components during removal and installation procedures.

#### Towing

Maximum off road towing speed should not exceed 15MPH (24KM/PH). Terrain and weather conditions may require further reduced speeds. On paved roads higher speeds can be accomplished if conditions permit.

#### Doors

The doors are heavy; verify nobody is standing directly behind the doors before opening and closing.

Keep hands and feet clear before closing doors. Use extra caution when vehicle is on an incline.

# **Driving and Operating**

Adjust mirrors properly prior to operation to allow maximum range of view.

Use ground guides in low visibility situations. Be sure ground guides remain clear of the vehicles path and remain in clear view of the driver. Failure to comply may result in vehicle collision or injury to personnel.

Operator should visually check interior and exterior of vehicle for personnel before moving.

Ensure tires are inflated to proper pressure. Failure to do so could result in tire failure which could lead to an accident.

Do not drive the vehicle more than 25 miles or at speeds over 25 MPH when operating on a flat tire with Run Flat inserts. Failure to comply could result in tire fire or loss of vehicle control.

Sharp turns and other maneuvers should be taken cautiously. Adjust driving style to operating conditions. Avoid side slopes, always approach slopes head on when possible.

Soft road shoulders can collapse.

Wear restraint harnesses during vehicle operation. Check harnesses for damage before using. Adjust restraint harnesses properly for maximum protection.

# **Fording Water**

Ensure the ground underwater is firm to avoid sinking. Reduce speed before entering water. Unless absolutely necessary, do not stop while driving through water. Be sure brakes are functioning properly before commencing normal driving after fording water.

# Stowage / Cargo

Stow equipment based on a load plan. Do not block fire extinguishers or vehicle exit points with equipment or cargo.

Do not stow excessively heavy items on the roof of the vehicle.

# **General Vehicle Operation**

Read all instructions thoroughly before attempting to start the vehicle. Before starting the engine, make sure all occupants have fastened their seat belts. Make sure the head lamps and all other electrical accessories are off.

# Main Power

The Vehicle Main Power Switch is located left of the base of the driver seat at floor level. The switch is clearly marked "Main Power", and must be activated to start the vehicle, or for any accessories to function. The switch should be deactivated while the vehicle is not in use to avoid accidental battery discharge.



**Note:** If your vehicle is equipped with the optional Power Inverter, and a Shoreline Charger, the inverter does not require the "Main Power" to be on to function, and should be operated as outlined in the **D/C to A/C power inverter** *section (pg. 39)*.

# **Instrument Control Unit**

The Instrument Control Unit (ICU) provides the driver with engine and vehicle information. The (ICU) is comprised of standard and optional gauges, an audible warning, a driver message center, and a lightbar containing warning and indicator lamps. Warning and indicator lamps illuminate in red (danger), amber (caution), green (status advisory), and blue (high-beam headlights active).

#### Instrument Control Unit (ICU) Overview



- 1. Engine Oil Pressure Gauge
- 2. Light Bar
- 3. Driver Message Center
- 4. Headlight High—Beam Indicator
- 5. Fuel / DEF Level Gauge
- 6. Primary Air Pressure Gauge
- 7. Mode / Reset Button
- 8. Secondary Air Pressure Gauge
- 9. Speedometer
- 10. Tachometer
- 11. Transmission Temperature Gauge
- 12. Coolant Temperature Gauge

#### **Engine Oil Pressure Gauge**



**Note:** A sudden decrease or absence of oil pressure may indicate mechanical failure. Bring the vehicle to a safe stop and investigate the cause to prevent further damage. Do not operate the engine until the cause has been determined and corrected.

The Engine Oil Pressure gauge displays the current engine oil pressure. If oil pressure falls below 15psi at an idle the CHECK engine lamp will illuminate. If the condition does not improve, the STOP engine lamp will illuminate and an audible warning will sound. To protect the engine from derate or shut down; park the vehicle on a level surface, turn off the engine and open the hood. Allow sufficient time for all engine oil to settle into the oil pan. Using gloves and safety glasses to protect you from hot oil; remove the dipstick, wipe it clean, and fully reinsert it. Remove the dipstick again and read the oil level on both sides of the dipstick. Add oil accordingly.

#### **Coolant Temperature Gauge**



**Note:** A sudden increase in coolant temperature may indicate engine or cooling system failure. Bring the vehicle to a safe stop and investigate the cause to prevent further damage. Do not operate the engine until the cause has been determined and corrected.

During normal engine operation, the coolant temperature gauge should read between 175°F and 195°F (79°C to 91°C). If the temperature remains below 160°F (71°C), inspect the cooling system to determine the cause.

If coolant temperature rises above 225°F (107°C) the CHECK engine lamp will illuminate. If the condition does not improve, the STOP engine lamp will also illuminate and an audible warning will sound. To protect the engine from derate or shut down; park the vehicle on a level surface, turn off the engine and open the hood. Allow the engine to fully cool. Using gloves and safety glasses to protect you from hot coolant; remove the radiator cap and the coolant reservoir cap and check the coolant levels. Add coolant as needed.

# **Transmission Fluid Temperature Gauge**



**Note:** A sudden increase in transmission fluid temperature that is not caused by a load increase may indicate mechanical failure. Bring the vehicle to a complete stop and investigate the cause to prevent further damage. Do not operate the vehicle until the cause has been determined and corrected.

The Transmission Fluid Temperature Gauge measures the transmission lubricant operating temperature. Temperatures may vary by application but the transmission temperature gauge should never read over 250°F (121°C).

Under heavy loads, such as when climbing steep grades, temperatures that exceed the normal oil temperature range for a short period of time are not unusual. If the temperature returns to normal when the load decreases there is not a problem.

#### Air Filter Restriction Gauge

The Go/No-Go Air Filter Restriction Gauge is located on the air intake duct in the passenger side of the engine compartment.

The Air Filter Restriction Gauge indicates the vacuum on the engine side of the air filter. Once locked in the red zone the air filter element must be replaced and the gauge reset.

Check the Air Filter Restriction Gauge whenever you open the hood to perform general maintenance or at least every 7,500 miles. If you operate your vehicle in extremely dusty conditions; check the restriction gauge every 500 miles, or every two weeks, whichever comes first.

**Note:** *Ensure the Air Filter is free of rain and snow. Rain and snow clogging the filter can cause a temporary high reading as well as loss of power.* 

**Note:** *Do not blow air filter element with compressed air. This could jeopardize the filter altering its performance.* 



**Warning:** To reduce risk of vehicle damage and/or personal injury do not start the engine with the air filter removed and do not remove the air filter with the engine running.



# Changing the Air Filter

1. Remove (2) <sup>1</sup>/<sub>4</sub> -20 X 1" HX Bolts with lock washers and flat washers from the air filter cover. Remove the cover.

#### **OEM Filter Bolts**



- 2. Remove (3) OEM Air Filter Bolts
- 3. Remove the air filter
- 4. Install the new air filter with the (3) OEM Filter Bolts that were removed from the previous filter
- 5. Re-install the air filter cover using (2) <sup>1</sup>/<sub>4</sub> -20 X 1" HX Bolts with flat washers and lock washers
- 6. Reset the Go/No-go Air Filter Restriction Gauge

# Fuel / DEF Level Gauge



- 1. Diesel Fuel Level Indicator
- 2. DEF Level Indicator
- 3. Low DEF Warning Lamp (Amber when below 10% DEF)

4. Low Fuel Warning Lamp (Amber at 1/8 Tank of Fuel)

The Diesel Fuel and DEF (Diesel Exhaust Fluid) levels are measured in a dual gauge. Fuel level is indicated at the top of the gauge. A low fuel warning lamp illuminates amber below the fuel gauge when the fuel level drops below 1/8th of the fuel tanks capacity.

The lower portion of the gauge has a DEF warning lamp that illuminates amber when the DEF tank is near empty, and a lightbar that indicates the level of DEF in the tank. The DEF light bar illuminates as follows:

- Four bars illuminated green between 75% and 100% full
- *Three bars illuminated green* between 50% and 75% full
- *Two bars illuminated green* between 25% and 50% full
- One bar illuminated green between approximately 10% and 25% full
- One bar illuminated amber DEF very low, refill DEF
- One bar flashing red DEF empty, refill DEF



**STOP Engine:** Indicates a serious fault that requires engine shutdown immediately. The engine protection system will reduce the maximum engine

torque and speed; and, if the condition does not improve, will shut down the engine within 30 to 60 seconds. Safely bring the vehicle to a stop on the side of the road and shut down the engine as soon as the red light is seen.

If the engine shuts down while the vehicle is in a hazardous location, turn the key to the OFF position for a few seconds, then restart the engine and move the vehicle to a safer location.



**High Coolant Temperature:** Indicates the coolant temperature is above the maximum allowable temperature.



**Low Air Pressure:** Indicates air pressure in the primary or secondary reservoir has dropped below approximately 70 psi (483 kPa).



**Low Engine Oil Pressure:** Indicates the engine oil pressure is below the minimum allowable pressure.



**Transmission Overheat:** Indicates high transmission temperature.



**Parking Brake:** Indicates the parking brake is engaged.

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**Low Battery Voltage:** Indicates that battery voltage is 11.9 volts or less.



**Unfastened Seat Belt:** Activates with an audible alert when the system detects that the parking brake is off and the driver seat belt is not fastened on some vehicles. On

other vehicles, this lamp illuminates for 15 seconds when the ignition is first turned on.



**CHECK Engine:** Indicates an engine condition (low oil pressure, low coolant level, high coolant temperature, high DPF soot level, or uncontrolled DPF

regeneration) that requires correction. Correct the condition as soon as possible. If the condition worsens, the STOP engine lamp will illuminate.



**High Exhaust System Temperature** (**HEST**): Slow (10-second) flashing indicates regeneration (regen) is in progress.



**Warning:** *When the HEST lamp is illuminated, do not park the vehicle near flammable material.* 

Solid illumination indicates high exhaust temperatures at the outlet of the tail pipe when speed is below 5 mph (8 km/h).



**Diesel Particulate Filter (DPF) Status:** Solid illumination indicates a regen is required. Change to a more challenging duty cycle (such as highway driving) to

raise exhaust temperatures for at least twenty minutes, or perform a parked regen. Blinking indicates that a parked regen is required immediately. If not tent to an engine derate and shutdown will occur



Malfunction Indicator Lamp (MIL): Indicates an emissions-related fault. See the engine operation manual for details.



**Vehicle ABS:** Momentary illumination indicates the vehicle ABS is engaged. Solid illumination indicates a problem with the vehicles ABS. Repair the ABS immediately

to ensure full braking capability.



**No Charge:** Indicates the alternator is not properly powering the electrical system.



Water in Fuel: Indicates the fuel may contain water. Drain any water collected in the fuel/ water separators.



**Fuel Filter Restriction:** Indicates the fuel filter is clogged and requires service.



**Check Transmission:** Indicates an undesirable transmission condition.



Wait To Start (EPA10): Indicates that the system is preventing the starter from cranking. This can occur when the ignition switch is turned to START before

the gauge sweep has completed, or if the starter has overheated. Turn the ignition switch back to ON, wait for the lamp to go out, then turn the ignition switch to START again.



**Start Blocked (GHG14):** Indicates that the system is preventing the starter from cranking. This can occur when the ignition switch is turned to START before

the gauge sweep has completed, or if the starter has overheated.

**NOTE:** *Illumination of the Start Blocked lamp does not indicate a problem with the starter.* 

Turn the ignition switch back to "ON", wait for the lamp to go out, then turn the ignition switch to "START" again.



**Wheel Spin:** Flashing indicates the ATC system is active, or the ATC button has been pressed to allow wheel slip. Solid illumination indicates a problem with the

ATC system. Repair the ATC system immediately to ensure full braking capability.



**Roll Stability:** Momentary illumination indicates that a stability event has occurred. On vehicles that are also equipped with ATC, flashing indicates

the ATC button has been pressed to allow wheel slip.



**Hill Start Aid (HSA) Override:** Indicates the HSA switch has been pressed to override the hill start assist feature.



**Engine Brake:** Indicates the engine brake is enabled.



**Left-Turn Signal:** Flashing indicates the outside left-turn signal lights are activated.



**Right-Turn Signal:** Flashing indicates the outside right-turn signal lights are activated.



**Cruise Control:** Indicates the cruise control is enabled.



**High-Beam Headlights:** Indicates the high-beam headlights are on.

# Front Seats and Seat Restraints

When used properly the seat, head restraint, and safety belt will provide optimum protection in the event of a crash.

# It is recommended that you follow these guidelines:

- Ensure you are sitting in an upright position with the base of your spine as far back as possible
- Do not recline the seat back more than 30 degrees
- Adjust the head restraint so that the top of it is level with the top of your head and is in a comfortable position
- Keep sufficient distance between yourself and the steering wheel. It is recommended a minimum of 10 inches

(25 centimeters) between your breastbone and the steering wheel.

- Hold the steering wheel with your arms slightly bent
- Bend your legs slightly so that you can press the pedals fully

• Position the lap belts across your hips and position the shoulder strap over the center of your shoulder. Make sure that your driving position is comfortable and that you can maintain full control of your vehicle.



Seat restraints with visible abrasion or tearing must be replaced. Cut the old belt in half, and discard so it cannot be used again. Cuts, tears and other damage to the belt will greatly reduce its effectiveness.

# Adjusting the Front Seats

# To adjust the seat base forward or backwards

- 1. Locate the seat adjust lever on the left hand side of the seat base
- 2. Pull the lever away from the seat base
- 3. Position the seat to the proper position by sliding it forward or backwards
- 4. Release the seat adjust lever and try to slide the seat forward and backwards to ensure seat lock is secure

# To adjust the back of the seat

- 1. Locate the knob on the left hand side of the seat
- 2. Turn the knob forward to bring the backrest forward, or turn the knob backwards to recline the backrest

# To adjust the seat height

- 1. Locate the seat height adjustment lever on the left hand side of the seat
- 2. Pull up on the lever
- 3. Apply weight to the seat to lower its height; or remove weight from the seat to raise its height

# Starting the Vehicle

To start the vehicle, activate the Main Power Switch located on the floor to the left behind the driver's seat. Ensure the parking brake is set and all auxiliary switches are in the "OFF" Position.

**Note:** Before attempting to start the vehicle, make sure all passengers are seated and have seat restraints properly fastened. Ensure the outside of the vehicle is clear of personnel.

The ignition switch is located on the lower portion of the left-hand dash. The switch has four positions: OFF, ACCESSORY, ON, and START.



Turn the ignition key one click to the right, into the "ON" position. The electronic gauges on the Instrumentation Control Unit (ICU) will complete a full sweep of the gauge needles, the warning and indicator lamps will illuminate, and a buzzer will sound for three seconds. The "WAIT TO START" indicator will illuminate and remain illuminated for a few seconds. The length of time the "WAIT TO START" light will stay illuminated depends on ambient temperature. After the light goes out, turn the key one more position to the right into the "START" position and release as soon as the engine starts.

**Note:** *Do not crank the engine until after the ICU self-check is complete.* 

Once vehicle is running, allow air pressure to build up. The Parking Brake will not release until the air pressure is above; between 64 and 76 psi.

# Air Brake System

Vehicle is equipped with a dual air brake system consisting of two independent air systems that use a single set of brake controls. Both systems have their own reservoirs, plumbing, and brake chambers. The primary system operates the service brakes on the rear axle; the secondary system operates the service brakes on the front axle.

# Parking Brake Control Valve

The yellow diamond-shaped knob in the control panel actuates the parking brake valve. Pulling out the parking brake valve applies the spring parking brakes. Depressing the parking brake valve will release the parking brake.



Before driving your vehicle; allow time for the air compressor to build up a minimum of 100 psi in both the primary and secondary systems. Monitor the air pressure system by observing the dual system air pressure gauge and the low air-pressure warning light and buzzer. The warning light and buzzer shut off when air pressure in both systems reaches 64 to 76 psi.

# Allison Six Speed Transmission

Vehicle is equipped with an Automatic Allison Transmission. The transmission has five forward speeds and one reverse speed.



1. Indicator Panel

2. Mode Indicator

**Note:** *Never shift from neutral to drive or neutral to reverse at engine speed above an idle. This could cause the vehicle to lurch, which could cause equipment damage or injury to personnel.* 

**Note:** *Do not allow the vehicle to coast in neutral. This can cause severe transmission damage.* 

# Windshield Wipers

- 1. Windshield Washer
- 2. Off
- 3. Delay settings
- 4. Low speed setting
- 5. High speed setting



**Note:** Fully defrost windshields before turning on windshield wipers to avoid damage to the wiper blades.

**Note:** Clean the windshield and wiper blades if they begin to leave streaks or smears. If that does not resolve the issue, install new wiper blades.

**Note:** *Do not operate the wipers on a dry windshield. This may damage the Ballistic Glass, and the wiper blades or cause the wiper motor to burn out. Always use the windshield washers before wiping a dry windshield.* 

#### Rotate the end of the control:

- Away from you to increase the wiper speed
- Towards you to decrease the wiper speed

# Windshield Washers

**Note:** *Do not operate the washers when the washer reservoir is empty. This may cause the washer pump to overheat.* 

Press the end of the stalk to activate the washer.

# **Engine Brake**

An Exhaust Brake may be used in conjunction with the service brakes during off-highway and mountain driving as well as in traffic or high-speed highway driving. The Exhaust Brake is not intended for use as the primary braking system during vehicle operation.

The Exhaust Brake is activated by a dash-mounted rocker switch. Push the upper half of the switch to activate the Exhaust Brake. Press the bottom of the switch to deactivate the Exhaust Brake. The switch will illuminate when activated.





# Engine Bay Fan

The Engine Fan can be manually activated with the Engine Fan Switch. The fan will continue to operate for a set amount of time and then turn off unless the coolant temperature is high enough to continue the fan operation.

The Engine Fan is activated by pressing the upper part of the dash-mounted rocker switch. The Engine Fan is turned off by pressing on the lower half of the switch.

# All-Wheel Drive (4x4 BEAR)

The Electric Rocker Switches used to switch the vehicle from **2x2** to **4x4** or from **High Range** to **Lo Range** are located on the dash board to the right of the steering wheel. The switches are labeled (Locked/AWD) and (Lo Range/High Range). The Front Axle is engaged by bringing the vehicle to a complete stop and shifting to neutral on the transmission push-button shift selector. Put the (Locked/AWD) rocker switch into the "Locked" position, the switch will illuminate.



At the (Lo Range/High Range) rocker switch select "High Range" or "Lo Range". A light in the dash will indicate when the vehicle is in low range. The vehicle may need to be inched forward or backward for the shift to occur.

To disengage the Front Axle, stop the vehicle, set the transmission push-button shift selector to neutral, set switches from "Locked" to "AWD" and from "Lo Range" to "High Range". Inch the vehicle forward until the transfer is complete.

The vehicle is equipped with Safe-T-Shift to prevent accidental axle engagement while driving. Safe-T-Shift will not allow engagement of the Front Axle or shifting between High and Lo range until the vehicle slows to a predetermined speed. The shift may also not occur until the vehicle is inched forward or backwards from a complete stop.

**Note:** Some noise may be heard as the system shifts or engages; this is normal.

**Note:** 4X4 mode is not intended for use on dry pavement.

# **Fuel and Refueling**



**Warning:** *Do not overfill the fuel tank. The pressure in an overfilled tank may cause leakage and lead to fuel spray and fire.* 



**Warning:** The fuel system may be under pressure. If you hear a hissing sound near the fuel filler door, do not refuel until the sound stops. Otherwise, fuel may spray out, which could cause serious personal injury.



**Warning:** Automotive fuels can cause serious injury or death if you misuse or mishandle them.



**Warning:** When refueling always shut the engine off and never allow sparks or open flames near the filler neck.



**Warning:** Never smoke or use a cell phone while refueling. Fuel vapor is extremely hazardous under certain conditions. Avoid inhaling excess fumes.

# **Observe the following guidelines when handling fuel:**

• Extinguish all smoking materials and any open flames before refueling your vehicle

• Fuels can be harmful or fatal if swallowed. Diesel fuel is highly toxic and if swallowed can cause death or permanent injury. If swallowed, call a physician immediately, even if no symptoms are immediately apparent. The toxic effects of fuel may not be visible for hours.

• Avoid inhaling fuel vapors. Inhaling too much fuel vapor of any kind can lead to eye and respiratory tract irritation. In severe cases, excessive or prolonged breathing of fuel vapor can cause serious illness and permanent injury.

• Avoid getting fuel liquid in your eyes. If you splash fuel in your eyes, remove contact lenses (if worn), flush with water for 15 minutes and seek medical attention. Failure to seek proper medical attention could lead to permanent injury.

• Fuels can be harmful if absorbed through the skin. If you splash fuel on your skin, clothing or both, promptly remove contaminated clothing and wash your skin thoroughly with soap and water. Repeated or prolonged skin contact with fuel liquid or vapor causes skin irritation.

The fuel filler neck is located inside the compartment below the driver side front door. Fuel capacity is 50 gallons.

# Diesel Exhaust Fluid

The vehicle uses a technology known as Selective Catalytic Reduction (SCR) in the exhaust After Treatment System (ATS). The After Treatment System includes an After Treatment Device (ATD), with the addition of Selective Catalytic Reduction to reduce Nitrogen Oxides downstream of the engine. The Selective Catalytic Reduction process requires the introduction of Diesel Exhaust Fluid (DEF) into the exhaust stream. After exhaust gases leave the engine, they flow into the After Treatment System. First the exhaust flows into a two-part After Treatment Device, comprised of a Diesel Oxidation Catalyst (DOC) and a Diesel Particulate Filter (DPF). The Diesel Particulate Filter traps soot particles, and then exhaust heat converts the soot to ash, in a process called Regeneration (regen). After exhaust gases leave the Diesel Particulate Filter, a controlled quantity of Diesel Exhaust Fluid is injected into the exhaust stream. In the presence of heat, Diesel Exhaust Fluid is converted to ammonia gas, which reacts with Nitrogen Oxide in the selective catalyst chamber to yield nitrogen dioxide and water vapor, which exit through the tailpipe



**Note:** Active regeneration can occur automatically anytime the vehicle is moving. The exhaust gas temperature could reach 1500°F (800°C), which is hot enough to cause a fire, heat damage to objects or materials, or personal injury to persons near the exhaust outlet. The exhaust temperature can remain high even after the vehicle has stopped. When stopping the vehicle shortly after an automatic regen, ensure the exhaust outlets are directed away from structures, trees, vegetation, flammable materials, and anything else that may be damaged or injured by exposure to high heat.

When operating conditions do not allow for After Treatment Device filter cleaning by active or passive regen, the vehicle may require a driver-activated parked regen. When this occurs, the DPF lamp illuminates, indicating that a regen is required. The driver must either bring the vehicle up to highway speed to increase the load (thus starting an active regen), or park the vehicle and initiate a parked regen. See Regen Switch below for instructions on initiating a parked regen.

# **Regen Switch**

The Regen Request Switch, located on the dash, is used to initiate a Parked Regen.



**Note:** *The Regen Switch can initiate a parked regen only when the DPF lamp is illuminated.* 

**Note:** During parked regen, exhaust temperatures are very high and could cause a fire, heat damage to objects or materials, or personal injury to persons near the exhaust outlet. Before initiating a parked regeneration, make certain the exhaust outlets are directed away from structures, trees, vegetation, flammable materials, and anything else that may be damaged or injured by prolonged exposure to high heat.

# To initiate a Parked Regen, perform the following steps:

1. Park the vehicle away from all flammable materials, put the transmission in neutral, and set the parking brake

2. Start and warm the engine until the coolant temperature is at least 150°F (66°C)

3. Press and hold the (RGEN) button for five seconds. As the regen process is initiated, engine rpm increases and the HEST lamp illuminates in the instrument cluster to indicate extremely high exhaust temperatures.

# **Note:** *The driver must remain with the vehicle during the entire regen cycle.*

4. The Regen Cycle will finish after 20 to 60 minutes, at which time engine idle speed drops to normal and the vehicle can be driven normally. The HEST lamp is extinguished when vehicle speed exceeds 5 mph (8 km/h) or the system has cooled to normal operating temperature.

# After Treatment System Warning Lamps

There are three warning lamps that alert the driver of high exhaust temperature, the need to perform a parked regen or service the DPF, or of an engine fault that affects emissions.

IMPORTANT		
DPF Regen Needed	<ul> <li>Diesel Particulate Filter (DPF) regeneration is needed.</li> <li>If flashing, regenerate as soon as possible. Engine derate possible.</li> </ul>	
Hot Exhaust	<ul> <li>Hot exhaust can cause fire.</li> <li>Keep flammables and people away from exhaust.</li> </ul>	
DEF Refill Needed	<ul> <li>Diesel Exhaust Fluid (DEF) level is low. Engine derate likely.</li> <li>Refill tank with certified DEF.</li> </ul>	
See operator's manual for complete instructions.		

# **Malfunction Indicator Lamp (MIL)**

A steadily illuminated yellow malfunction indicator lamp (MIL) indicates an engine fault that affects emissions.

# **DPF Status Lamp**

When soot accumulates in the DPF and the DPF status lamp illuminates, perform a parked regen or bring the vehicle up to highway speed to increase the load (thus starting an active regen). If the DPF status lamp blinks while the CHECK engine lamp is illuminated, initiate a parked regen immediately in order to prevent an engine derate. If the red STOP engine lamp illuminates with the blinking DPF lamp and the CHECK engine lamp, begin a parked regen in order to prevent an engine shutdown. Park the vehicle and perform a parked regen.

# High Exhaust System Temperature (HEST) Lamp

Slow (10-second) flashing of the high exhaust system temperature (HEST) lamp indicates that a parked regen is in progress, and the engine's high idle speed is being controlled by the engine software, not the vehicle driver. Steady illumination of the HEST lamp alerts the driver of high exhaust temperature during the regen process if the vehicle speed is below 5 mph (8 km/h), or during a parked regen.

# **DPF** Maintenance

Eventually ash will accumulate in the DPF and the filter will require servicing. DPF servicing must be performed by an authorized technician, following the engine manufacturer's instructions. A record must be maintained for warranty purposes, which include:

- Date of cleaning or replacement
- Vehicle mileage
- Particulate filter part number and serial number

# **Doors and Locks**



**Warning:** *Doors are heavy; confirm nobody is standing directly behind the door before opening and closing.* 



**Warning:** *Keep hands and feet clear of doors before closing. Use caution when opening and closing doors especially while vehicle is on an incline.* 



**Warning:** When entering the cabin of the vehicle use the three points of contact system. Use hand rails for pulling yourself into the vehicle. Avoid using the steering wheel to pull yourself in. Pulling on the steering wheel could cause the vehicle to move which can cause injury to personnel around the vehicle.

# **Door Locks**

The Door Locks are locked/unlocked using a key on the exterior side and a small red lever on the interior. The door latch is released by lifting the door handle up. At the rear doors the right door must be opened first. The left door can then be opened by releasing the interior door handle. All Doors have door stops on the outside to prevent them from making contact with any other part of the vehicle when opened.



**Interior Door Lock** 



Exterior Door Lock

# **Battle Bolts**

During an operation the doors can be secured from the inside using the "Battle Bolts" located separate from the door handles on the interior side of the door. With the door closed, turn the handle 90 degrees to engage the spring loaded Battle Bolt. The doors cannot be opened from the outside with the Battle Bolts engaged. The Battle Bolts can be returned to the unlock position by pulling the handle back and turning 90 degrees.





# **Door Hold Opens**

The **Forward Door Hold Opens** allow the front and side doors to be locked in their fully open positions. Open the door until it hits the door stop and rotate the door hold open latch located on the interior side of the door into the latch holder located on the vehicle floor.

The **Rear Door Hold Opens** located on the interior of the rear doors allow you to lock the rear doors open at 90 degrees. Open the doors until they hit their door stops and rotate the door hold opens into their corresponding floor location.



# **Pull Points**

There are Pull Points at various locations on the vehicle. Forward locations consist of two hooks mounted in the front bumper. Rear locations are at the left and right of the rear wall above the running board. These hooks are for towing with straps, chains or plasma ropes. Always attach from a single anchor point on the vehicle to the object being pulled.

**Caution:** To avoid damage to Ballistic Glass always be aware of the path that debris will follow once it is dislodged. *Always attach from a single anchor point on the vehicle to the object being pulled.* 



# **Electrical / Lighting Controls**

All auxiliary lighting and electric controls are operated from inside the vehicle. Switches and controls are mounted in the dashboard, and in the center console between the two front seats. These features are "Keyed Hot". The vehicle main power and key must be on for them to function. These switches control the following options listed in this section.



Note: Make sure all auxiliary switches are OFF before starting the vehicle.

# Headlight Controls

A three-position headlight paddle switch on the left-hand dash is used to operate the low beam headlights.

When the switch is in the uppermost position, the headlights and all other exterior lights (excluding the optional running lights, spot lights, and flashers) are on. All vehicle lighting is off when the switch is in the middle position. When the switch is in the downward position, only the clearance lights, marker lights, and the taillights are illuminated.

When any exterior lights are on, the instrument panel lights also illuminate.



# **High Beam Control**

With the low-beam headlights on, push the turn signal lever forward to turn on the high-beam headlights. Pull the turn signal lever back to the neutral position to turn the high-beams off.

With the low-beam headlights on, pull the lever towards you to flash the high-beam headlights momentarily.

When the high-beam headlights are on, a blue light illuminates on the instrument cluster between the tachometer and speedometer.

The low-beam headlights remain on continuously during high-beam headlight operation. If the low beams are turned off, the high-beams turn off.



# **Multifunction Turn Signal Lever Controls**

The turn signal lever is mounted on the steering column.

# The lever operates the following functions:

- Turn signals
- Windshield wipers and washers
- Headlight high-beams

# **Turn Signal Controls**

Moving the turn signal lever down turns on the left-turn signal; moving it up turns on the right turn signal.



When a turn signal is activated, a green indicator light flashes on the right or left side of the instrument cluster.

The turn signal lever automatically returns to the neutral position (self-cancels) when the steering wheel returns to the straight ahead position after a turn. To manually cancel the signal, return the lever to the neutral position.

# **Front LEDs**

Front LEDs are mounted in the front bumper and at roof level behind the front doors. Front LEDs alternately flash from left to right when activated.



Front LEDs are turned on by cycling the rocker switch labeled "FRONT LEDs" into the forward position. Once activated the switch will illuminate. Vehicle main power must be "ON" for the Front LEDs to function.



#### **Rear LEDs**

Rear LEDs are mounted at roof level on the exterior rear wall and alternately flash from left to right when activated.

Rear LEDs are turned on by cycling the rocker switch labeled "REAR LEDs" into the forward position. Once activated, the switch will illuminate. Vehicle main power must be "ON" for LEDs to function.





**Rear LEDs** 

# **Exterior Stationary Scene Lighting**

Exterior Stationary Scene Lights are located on each corner of the vehicle at roof level.



The Exterior Stationary Scene Lights are controlled by activating the switches in the center console labeled "LEFT AREA" and "RIGHT AREA" into the forward position. The "Left Area" switch controls both lights on the left side of the vehicle. The "Right Area" switch controls both lights on the right side of the vehicle. The switches will illuminate when activated. Vehicle main power must be "ON" for scene lights to function.



Exterior Stationary Scene Lighting Controls

# **Step Lights**



Step Lights, located at the interior steps of the side and rear doors provide light for safer ingress/ egress while operating at night.



Step Lights are controlled using the switch labeled "STEP LIGHTS" located in the center console. The switch will illuminate when activated. Vehicle main power must be "ON" to use this feature.

# **Driving Lights**

Driving Lights, located in the front bumper, are activated by cycling the switch labeled "DRIVING LIGHTS" into the forward position. The switch will illuminate when in the on position. Vehicle main power must be "ON" for driving lights to function.



# Heated Windshields

The Heated Windshield option is designed to reduce the amount of time necessary to De-Ice the exterior of the windshield. The vehicle main power must be "ON" for the system to function. To operate the Heated Windshields, depress the switch on the center console marked "FRONT DEFROST". A Red LED light will illuminate to indicate that the feature is activated. The windshields will heat for 15 minutes and automatically shut off. The switch can be reactivated for another 15 minutes by depressing the "FRONT DEFROST" switch a second time. At any time throughout the process the Windshields can be turned off using the same switch.



# **Rear Blackout**

Rear Blackout is controlled by a switch located in the center console Labeled "REAR BLACKOUT". Activation of the switch will shut off the rear brake lights, and reverse lights, including the optional Backup alarm. A console mounted LED located above the switch along with an audible beeper reminds the operator that the system is activated. For full blackout all other lighting will need to be shut off using their individual function switches, including headlights, taillights, running lights, wig-wags, and flashers.



**Warning:** *Rear blackout is for tactical operations only. Operating the vehicle in rear blackout mode may be hazardous to other drivers on the road.* 



#### Thermal Camera

The Thermal Camera is mounted on the right hand side of the vehicle. The camera control joy stick is attached to the center console inside the vehicle. There is approximately 5 feet of control wire to allow use of the controller throughout the front of the cab. The camera main power switch is located on the center console, and is marked "CAMERA". Vehicle main power must be "ON" for the system to function. The switch controls power to both cameras and both monitors.



The monitors are located above the windshield centered between the sun visors and on the rear wall of the vehicle. Activation is controlled by the camera main power switch. Toggling between AV1 and AV2 allows each monitor to show color or thermal at the operators' discretion. Picture adjustment can be accomplished using the additional monitor control buttons. Access the adjustment options and use the left and right arrows to change color and orientation. A remote control is also provided with each monitor and controls monitor functions only.



Once the system power is on; use the joystick to control left/ right, and up/ down movement. Up to 28X zoom can be accomplished with the color camera by twisting the joystick clockwise. Zoom out by twisting the joystick counter clockwise. IR zoom can be accomplished by pressing the button labeled "IR Zoom" on the camera control unit once for 2X zoom. Press "IR Zoom" again to zoom out. When the camera is not in use it is recommended that it be stowed facing rearward to protect the cameras lenses.



**Note:** For more information refer to the Camera System manuals that were supplied with your vehicle.

# Intercom System: Inside to Outside

The two-way Intercom System includes an Interior Master Station with volume and Push-to-Talk (PTT) controls and an Exterior Remote Station that is operated hands free. When the system is activated the Remote Station is always transmitting unless interrupted by a transmission from the Master Station.

Vehicle main power and the console mounted Intercom switch must be on for the system to operate. The switch will illuminate when activated. The Interior Master Station is located on the ceiling between the two front seats and the Exterior Remote Station is mounted outside the vehicle on the driver side.



With the Intercom switch activated outside noise can be heard through the interior speaker without opening the door. Adjust the volume using the control knob located on the Interior Master Station. Depress the Push-to-Talk (PTT) button, also located on the Interior Master Station to speak to the outside.





# Heated / Remote Rearview Mirrors

The exterior Heated/Remote Rearview Mirrors are operated using the controls in the center console labeled "MIRROR HEAT" and "ELECTRIC MIRRORS". The Mirror Heat is controlled by a lighted rocker switch. Mirror heat will remain on until the switch is deactivated.

The joystick style electric mirror control switch allows the operator to select between the left and right mirror by twisting the joystick. Using the same control the selected mirror can then be adjusted to tilt up/down or turn left/right.

**Note:** The Heated Mirrors must be turned off manually. To prevent overheating, the system has an internal self-regulator that lowers the amount of heat as the glass temperature rises.



# Light Bar Prep

The Light Bar Prep includes a mount area that is located forward on the roof of the vehicle. Removable exterior panels and internal access holes through the roof help facilitate wiring installation. An ATC style fuse protected power circuit is located in the center console and is marked "Lightbar". One of the locations in the center console is left blank for installation of your light bar controls. The maximum width a light bar can be on a Bear is 55".

# Typical switch configuration for optional lightbar:



Front Bar: Illuminates the front of the light bar

**Rear Bar:** Illuminates the back of the light bar

Take Down/Alley: Optional Take Down and Alley Lights are available

# Wig-Wag Lighting

Wig-Wag Lighting is controlled by activating the switch labeled "WIG-WAG". The switch will illuminate when activated. Vehicle main power must be "ON" for Wig-Wag Lighting to function. Once activated the front headlights and rear taillights including the reverse lights will flash, alternating from side to side.



# **Interior Lighting**

Interior Lighting is mounted along the upper edges of the interior walls and above the driver and passenger front seats. The lights are half Red and half White and are activated by pushing on the desired lens color. The vehicle main power must be "ON" for Interior Lighting to function.



# D/C to A/C Power Inverter

The D/C to A/C Power Inverter is mounted inside the vehicle and provides a 120 VAC receptacle with GFCI (Ground Fault Circuit Interrupt) protection. The unit is operated using an On/Off rocker switch mounted on the front panel.

The Power Inverter is equipped with a Battery Charge Feature that allows the vehicle batteries to be charged via an external 30 amp shore plug. The inverter does not need to be turned on for this feature to function. A 30 amp to 15 amp adapter is provided to allow the use of standard 120 VAC wall outlets for battery charging.

Plug the adapter into the receptacle marked "Shore Line 30 Amp Max" located on the exterior of the vehicle on the driver side. Using a heavy duty extension cord, plug into the adapter and into the 120VAC power supply, charging starts automatically. There is a Remote Temperature Sensor attached to the batteries which allows the unit to monitor the battery temperature to assure correct operation of the charge circuit. Battery state is indicated by lights located on the front panel of the Power Inverter.

When shore power is plugged in an internal transfer switch is activated which allows 120 VAC power to be supplied direct from the wall outlet to the 120 VAC receptacle located on the Power Inverter.

An optional Auto Shoreline Eject is available, which works off of the keyed hot solenoid and will eject the 120 VAC power source from the shoreline upon starting the vehicle.



**Caution:** When shore power is disconnected and the vehicle is not in use the Power Inverter rocker switch must be in the "OFF" position to avoid a power drain on the vehicle batteries.

**Note:** For more information refer to the D/C to A/C Power Inverter Manual supplied with your vehicle.



# **Electric Power Winch**

The Electric Power Winch is available either permanently mounted in the front bumper or in a modular mobile cradle that installs into the front or rear receivers. Remove the weather cover on the control plug and mount the indexed Winch Remote Control. The Controller has a 12 ft. long cord with a handheld remote which uses a rocker switch to control the spool. Pictures on the Control indicate spool direction. A Red LED light is located above the rocker switch and will flash if the winch reaches a temperature that could result in damage to the motor. When not in use the Remote Control should not be left plugged in.

The spool drum clutch handle is located on the winch body opposite the control access plug. Engagement is indicated by decals and arrows. "Free Spool" releases the drum allowing the winch cable to be pulled out without the winch motor running. Always use the supplied Hook Strap to pull the cable by hand. The use of heavy leather gloves is recommended whenever the winch cable is handled. "Engaged" couples the gear train allowing the winch cable to be controlled by the hand held Remote Control. *For Safety it is important to read and understand all, Warnings, Cautions, and Notices referenced in the Winch Operators Guide included with your vehicle.* 



**Warning:** *Do not attach the winch cable to an object and pull with the vehicle. The winch should only be operated by utilizing the winch controller.* 





# Long Range Acoustic Device (LRAD)

The Long Range Acoustical Device (LRAD) consists of an acoustic transducer module and a separate control module. Audio signals from this unit are amplified and projected to distances of up to 500 meters or more. Prerecorded tones can be played at extreme volume levels. The speaker system is yoke mounted to the Rescue Hatch base plate with the control panel mounted inside the vehicle. *Refer to the LRAD Operations Manual that is included with your vehicle for specific operating instructions.* 



# **On-Spot Tire Chains**

The Automatic Tire Chain System is an on-board, on demand traction system that gives the operator the same traction as a single set of conventional snow chains at the flip of a switch without exiting the vehicle. The System consists of a 12V electric switch mounted on the center console, an air solenoid mounted under the vehicle in the frame rail area, and a set of chain wheel assemblies mounted below the rear suspension U-bolts. Vehicle Main Power must be "ON" for the system to function. An air solenoid supplies compressed air from the onboard vehicle air supply. The chain wheels have six lengths of chain spaced at 60 degrees apart on a rubber covered wheel.

The console mounted switch has a safety cover over the toggle switch and is marked "ONSPOT". To activate, flip the safety cover up revealing a lighted switch. A white light indicates the "OFF" position and a red light indicates "ON" or deployed position. In the "ON" position compressed air is fed to the chain wheel air chambers via the air solenoid. The chain wheels will then swing down and come in contact with the inside of the rear tires. The friction created by the spinning tire causes the chain wheels to rotate putting two lengths of chain ahead of the vehicle tires. The system functions in forward or reverse. Turning the console switch to the "OFF" position allows the chain wheels to return to their resting position using return springs located in the air chambers.



**On-Spot Tire Chains Stowed** 

**On-Spot Tire Chains Deployed** 



# **Radiation Detection with External Detector**

The Digital Radiation Detector consists of two parts, a Model 375 Digital Wall-Mount Monitor located in the rear of the vehicle, with an attached 44-2 Gamma Scintillator mounted inside the vehicle at the top edge of the passenger windshield. A Pocket Survey Meter for hand held detection is also included

Vehicle main power must be "ON" for model 375 Digital Wall-Mount Monitor to function. A Green Status Light will be displayed when the monitor is on. If the green Status light is not on, there is an additional power switch located on the left side of the wall unit.

The Model 475 Wall Mount Detector measures the level of Gamma radiation and is calibrated in kcpm (thousand counts per minute). When the unit is activated an audible alarm will sound and a number will be displayed indicating the background radiation for your area. The Low alarm is preset at 20 kcpm and is indicated by a yellow light and a slow beep (1 per second). The High Alarm is preset at 50 kcpm and is indicated by a red light and a fast beep (4 per second). If the detector experiences an overload or instrument failure the Det Fail will be activated and is indicated by a red light and an audible tone greater than 68 dB.



- A "Radiation Area" is equal to 2 mR/hr.
- A "High Radiation Area" is equal to 100 mR/hr.

• **Rem** = (Roentgen Equivalent Man) relates the dose of radiation to the biological effect of that dose on human tissue.

- **R/hr** = Rem per hour.
- **mR/hr** = Millirem per hour or 1000 rem per hour.
- **Cpm** = (Counts per minute) the signal that indicates a radiation event has been detected.
- Kcpm = (Thousand counts per minute) Model 375 Digital Wall-Mount Monitor calibration.
- 175 Kcpm = 1mR/hr.
- **350 Kcpm** = 2mR/hr "Radiation Area".

The Pocket Survey Meter 2401-P is a hand held device that measures alpha, beta and gamma radiation in cpm and mR/hr.

Due to the complicated nature of Radiation Detection it is recommended that you read the instruction manuals provided with the Model 375 Digital Radiation Detector and Model 2401-P Pocket Survey Meter. The manuals outline the specific functions of each of the components. Section Six of the 2401 Pocket Survey Meter Manual gives an overview of radiation basics.

For more information contact Atlantic Nuclear at 800 878-9118 or Ludlum Measurements, Inc. www.ludlums. com Additional information and links can be found at the Center for Disease Control web site www.bt.cdc.gov/radiation

# **Combustible Gas Detector**

The Combustible Gas Detection System is made up of a Polytron IR Gas Transmitter located under the vehicle directly behind the front bumper, a Trip Amplifier mounted inside the center console and an LED Light Display with Audible Alarm mounted on the console. Although the unit is capable of detecting several gases it is calibrated for Methane Gas. Vehicle main power must be "ON" for this feature to function.

The display uses two LED lights and an audible alarm. The alarms are preset to function by measuring the LEL (Lower Explosive Limit) as a percentage of the gas being detected. Using 100% as fully combustible the display operates in the following manner: At 20% of LEL the High LED light is triggered. At 40% LEL the High/High LED light and Audible Alarm are triggered. This gives the vehicle occupants advanced warning before explosive concentrations are reached. The trigger points are preset and tested at the factory before delivery. For more information refer to the Drager Operation Manual



# **Radio Prep Option**

# The following components are part of the Radio Prep Option:

• 118-940 MHz ¼ wave Antenna mounted on an exterior light box at roof level. The RG 58 antenna wire is run to the front of the vehicle via wire ways located along the upper interior walls. The antenna wire terminates inside the center console located between the front seats.

• Keyed radio power is located inside the console on the power module. Attach your power wire to any of the spade connectors marked "Radio" and install an ATC style blade fuse for circuit protection.

• The center console has a blank space with cover for radio mounting



# Rear Auxiliary Heat / Air Conditioning

The Rear Heat/Air Conditioning Unit works in tandem with the existing vehicle Climate Control System. Auxiliary Heater/ Air Conditioners require that the vehicle be running and the existing vehicle Climate Control System be set to the desired temperature before adjusting the controls for the tandem air unit. For optimum operation set the vehicle climate controls and the rear climate controls to maximum until the desired temperature is reached.





#### **Rear Auxiliary Interior Fans**

Rear Auxiliary Fans are located at ceiling level in the rear crew area. Common locations are behind the driver seat facing rearward and in a rear corner facing forward. The fans are designed to assist the climate control system by keeping a constant air flow throughout the vehicle. Vehicle main power must be on for the fans to function. A two speed toggle switch is located on the base of each unit for powering on the fans.



- Fan Power / High / Low

#### **Rear View Backup Camera**

The Rear View Backup Camera has a display that is integrated into the rear view mirror. Half of the unit is a video display and the other half is a rear view mirror. The display is activated when the vehicle main power is "ON" the camera function can be deactivated by pushing the power button located in the center below the mirror face.

The camera will remain on until the ignition key is switched to the off position

For more information refer to the Rear View Backup Camera owner manual that was supplied with your vehicle.



# **Roof Mounted Spot Lights**

The Roof Mounted Spot light is a permanently affixed searchlight. Common locations are at the corners of the vehicle roof. The light is controlled by a 4-way joystick/power switch located on the front of the center console. Vehicle main power must be "ON" for searchlights to function.

Activate the toggle switch at the light controller; a Red LED indicates the light is on. Rotate the light up to 370 degrees horizontal and 135 degrees vertical using the 4-way joystick. If you have multiple lights, each roof location is indicated on the individual controller. The Spot Lights can be positioned by hand without the power being activated. It is recommended that the Spot Lights face rearward during over the road travel.



#### - Roof Mounted Spotlight Controls

**Roof Mounted Spotlight** -



# Siren / Public Address

The Siren P/A consists of an Amplifier mounted under the driver seat, a Control Head mounted in the center console and two 100 Amp Speakers mounted behind the front bumper. Vehicle Main Power must be "ON" for the system to function. Unit power is controlled by a rocker switch on the control head. The various modes are well marked and have back lighting for easy readability. The primary operating modes are Rad, PA, Man, HF, Wail, Yelp, and Pier.



The operating modes can be selected by using the rotary selector switch. Turning the mode to Wail, Yelp, or Pier will result in distinct tones being emitted from the speakers.

Man (Manual) is a silent mode that allows manual operation of the siren. HF will result in the siren being activated after the Manual switch is pushed.

For more information including Microphone Volume Adjustment, refer to the Siren Installation Guide supplied with your vehicle.



# Rotating Front Passenger Seat with Folding Work Table and 120V GFCI

The Front Passenger Seat can be rotated 180 degrees from the forward position. Seat rotation is best accomplished while standing to the left of the seat. Release the slide adjustment handle located under the front of the seat cushion and move the seat to the rear most position. Release the rotation lock handle located to the right of the seat cushion and rotate the seat clockwise. The seat will lock at each 90 degree position. When facing rearward use the lap style safety belt.



Located at the rear of the front passenger seat, the Folding Work Table is raised into position by lifting up past the center point allowing the internal latches to rotate into place. To stow the Table pick up past center and fold down. A 120V GFCI (Ground Fault Circuit Interrupt) is located above the folding work table. These options are used in conjunction with the Rotating Front Passenger Seat.

# **Gun Ports**

The Gunports are firing positions located throughout the vehicle. Common locations include; one at each door, three per side wall, and one in the roof mounted hatch lid. The gunport is opened by pushing the spring loaded handle with the palm of your hand, fingers open, allowing the weight of the port to turn the ballistic plate. To close the ports, grasp the port handle and rotate the ballistic plate back into the closed position. The spring mechanism will assist in properly seating the ballistic plate.

Rectangular Gunports are located at key positions including the hatch lid. The larger opening is meant to accommodate weapons with various sights and other attachments.



# **Internal Storage Compartments**

The Interior Storage Compartments are located under the benches in the rear crew area and include integrated lash points to secure stowed equipment. Each compartment contains a light mounted to the bottom of the bench. There is an additional compartment located under the Gunner Stand base. Rear storage compartments are lockable and share the same key. Vehicle main power must be "ON" for storage compartment lighting to function.



Rear Area Storage Compartment (Located Under Bench Seats)



Rear Area Storage Compartment (Located Under Gunner Stand)

# **Exterior Equipment Storage Compartments**

The Vehicle has two Lighted Exterior Compartments on the driver side, and passenger side of the truck, located at the rear. Both equipment compartments are lockable, and are equipped with lash points, and a push button activated light. The vehicles main power must be "ON" for equipment compartment lighting to function.



# Gunner Stand Military / Law Enforcement

**Note:** *Confirm gunner stand is locked at the desired height before operation out of the hatch.* 

**Note:** *Make sure lock pins are secured in place before attempting to stand on the platform.* 



**Warning:** When lowering the gunner stand to the stowed position; be sure the stand base is free of obstructions.

The Gunner Stand is mounted on the floor below the roof mounted hatch. The height can be adjusted to three predetermined locations by lifting up on the two handholds in the platform. The platform will lock with an audible click at each location. The top position is approximately 22 inches above the vehicle floor.

The gunner stand can be lowered or fully closed by grasping the release pins located inside the handholds and pulling in as the stand is guided into the lower positions.





# **BMI Gunner Seat**

The BMI Gunner Seat attaches to the roof mounted turret and provides a seat for the gunner operating out of the turret. The Gunner Seat has a third connection that comes up through the gunner platform and attaches to the bottom of the seat to increase seat stability.

Gunner seat straps are equipped with quick release pull handles, to remove the gunner seat in an emergency.

To release straps pull down on yellow quick release straps. Be sure feet are planted firmly on the gunner platform.

**Note:** *Be sure restraint straps are not ripped, knotted, cut, or damaged before use.* 

Use extreme caution when standing in gunner position while vehicle is in motion. Gunner should be holding onto weapon or other supports to maintain stability at all times.



# **Rotating Roof Hatch**

The Roof Mounted Rotating Hatch is opened by releasing the rotary latch and pushing upward on the lid. To release rotary latch apply pressure outward on the rotary latch handle. The counter balance hinge system allows the Ballistic lid to be lifted easily. When fully opened the hatch lid will lock in the upright position via a T-Handle Latch. To lower the lid, release the T-Handle and pull the lid simultaneously into the closed position using the internal grab handle.





**T-Handle for Hatch Release** 



**Warning:** Use extreme caution while closing turret lid. Be sure personnel and equipment are clear of the turret lid path before closing. Failure to comply could result in equipment damage or injury to personnel.



**Warning:** Do not attempt to open or close the hatch lid while vehicle is in motion. Be sure hatch lid is securely latched in either the open or closed position before operating the vehicle. Failure to do so could result in personal injury.

The roof mounted hatch is rotated by depressing the secondary red handle on the rotation gear lock and pulling the primary red handle towards you to unlock the gear.

Manually rotate the hatch to the desired location utilizing the handholds that are built into the hatch riser and engage the gear rotation lock.

**Note:** *Do not use the gear rotation lock as a handle to turn the hatch.* 



**Note:** *It is recommended that the turret gear lock be engaged while firing a weapon from the platform.* 



Warning: Release of rotation lock while vehicle is on steep grades can cause the hatch to turn.



**Warning:** Always be aware of low lying branches and power lines while operating out of the hatch. Failure to comply can result in equipment damage, injury or death to personnel.

A Gunport is located in the hatch lid. Push the gunport actuation handle with the palm of your hand, fingers open, allowing the weight of the port to rotate the ballistic plate. There is a metal rain cover attached to the outside of the hatch gunport which can be removed as needed. Once removed, the rain cover should be stowed inside the vehicle until the hatch gunport is no longer in use.

# **Rear Exterior Steps**

The Rear Steps are located on the left and right side of the rear doors and provide ease of access to the roof of the vehicle.

The Retractable Rear Step is stowed under the rear running board and provides an extra step when accessing the back doors of the vehicle. It is deployed and retracted by two pull pins on either side of the step.



# Hood Release / Hood Prop Rod

The Hood Prop Rod is a safety device designed to assist in holding the Ballistic Hood open during servicing. Open the hood by pulling the hood release located inside the vehicle at the driver side kick panel. Go to the front of the vehicle and release the secondary lock located centered just below the front edge of the hood. Apply slight down pressure to the hood while releasing the secondary latch. Move to the side and lift the hood from a corner. Once the hood is fully open swing the Hood Prop Rod into place. When closing, return the Prop Rod to its original stowed position in the retaining clip and pull the hood closed until it is in the fully latched position.



# Ram Bar System

The Ram Bar System is a breaching tool that is deployed by inserting the ram bar system into the hydraulic receiver located at the front of the vehicle. Slide pins on safety lanyards secure the ram bars to the vehicle and to each other. A push plate is mounted in the end of the lead Ram Bar using the same type of pin system. When not in use the bars stow in brackets along the driver side and passenger side exterior walls. The push plate is secured in the hydraulic receiver at the front of the truck for transport.



The following procedure should be used as a basis for any standard breaching operation that utilizes the ram bar system. Once the Ram Bar System has been deployed and is in place in the front receiver with slide pins engaged, proceed to the object to be breached, ease up to the object and apply pressure with the front plate. With pressure applied on the Ram plate, drive forward with the vehicle keeping steady pressure until the breach is complete. When backing out always keep the vehicle as straight as possible to avoid "hooking" the front plate.

**Warning:** Failure to follow basic breaching procedure can result in equipment damage and or injury to personnel.

There is an optional Gas Injection Unit (GIU) and Ram Cam available as add-ons for the Ram Bar System. The front receiver and Ram Bar come prepped for these add-ons. Refer to the GIU manual for more information.

# Self-Contained Breathing Apparatus (SCBA)

The SCBA System consists of two 6000 PSI tanks mounted below floor level in a ballistic holder. Air flow is controlled through an interior mounted regulator with multiple quick connect fittings located throughout the



# **Rear Area Jump Seat**

The Rear Area Jump Seat is located perpendicular to the rear AC / Heat Unit behind the driver seat. This forward facing jump seat provides ease of access to the rear AC / Heat unit, the gunner stand and the driver side and passenger side cargo doors. The seat folds out of the way when not in use to allow for easy ingress and egress through the side cargo door.



# Laptop / Ram Cam Monitor Platform

The Laptop/ Ram Cam Monitor Platform utilizes a four hole bolt pattern that accepts a MDT telescoping post. The platform is located at floor level on the right hand side of the center console. Remove the cover labeled "Laptop / Ram Cam Monitor Platform" to access the bolt holes.



# **Remote Battery Jump Studs**

Remote Battery Jump Studs are attached to the frame of the vehicle directly behind the driver side front tire. There is a positive jump stud and a negative jump stud, both are clearly labeled and have plastic covers over them to prevent corrosion. Remote Jump Studs can be used to jump start the vehicle, or charge the batteries if they become drained.

Note: Always connect the negative terminal last and disconnect the negative terminal first.



# **Run Flat Tire Inserts**

The **CRF Run Flat Tire Insert** is a polymer device designed to provide flat tire mobility in the event of tire air loss. The insert is secured around the drop center of the rim. The run flat is made of a composite material that reduces friction and heat buildup. The interior of the tire crown is coated with a lubricant to further dissipate heat when the run flat is in use. Although the rim is marked with a sticker indicating that a run flat insert has been installed, it is important to alert your service technicians about the run flat insert to avoid damage during the tire changes. Run Flat installation tools can be obtained by contacting Lenco Industries Parts Department.

The **CMRF Run Flat** is used in the off-road style tires. The insert consists of a three piece field serviceable unit used in a two piece rim which includes internal bead lock bands.

#### **Battery Access**

Batteries are located below floor level, directly behind the gunner stand. The Batteries are accessed through the floor by removing the rear carpet, and removing the access cover in the floor. The access cover is retained with (4) 3/8-16 X 1¼" BHCS.



# (4) 3/8-16 X 1 1/4" BHCS

# Maintenance / Glass and Paint Care

# **Scheduled Maintenance**

The scheduled maintenance is outlined in the Freightliner Class 108SD and 114SD Drivers/ Maintenance Manual in the white section 00 General information. Use schedule 1 as a guide. Engine hours rather than miles should be used to determine maintenance intervals. The engine hour meter is accessed by using the Mode/ Reset switch located on the right side of the instrument cluster. The Mode/ Reset switch is used to scroll through the Driver Message Center Display Screen, and to reset the trip distance and trip hour value to zero. All operators should use the driver's manual for routine maintenance and pre trip inspection information.

# **Glass Care and Maintenance**

All windows in the Lenco BEAR are Glass-Clad Polycarbonate; a laminate of multi-layered glass and a polycarbonate core layer with glass on both the inboard and outboard sides to prevent scratching. This product requires special attention and a higher degree of care than conventional automotive glass.

# Store Out of the Sun

When vehicle is not in use, it is important to park it out of direct sunlight. Over time, Ultraviolet light, and harmful rays from the sun will have an adverse effect on the Ballistic Glass and will cause Delamination; separation of the inner layers. Direct summer sun may also cause the vehicles interior temperature to rise to excessive levels, which could also have an adverse effect on the Ballistic Glass. Always park your BEAR in the shade or under a covered structure out of direct sunlight. This will prolong the life of your Ballistic Glass.

# Cleaning

The interior and exterior surface of the Ballistic Glass should be cleaned using mild soap and water or a non-solvent based commercial glass cleaner. "CRL Glass Cleaner No. 1973" is the recommended glass cleaner for this type of glass. You may also use "Green" or "Environmentally Friendly" solutions such as products containing vinegar.

#### Do not use products that contain:

- Ammonia
- Acetone
- Lacquer Thinner
- Turpentine
- Petroleum Distillates

Solvents may attack or cause degradation of the polyurethane inner layers, which will manifest itself as delamination (Inner layer ply separation), or Crazing (Small Hairline Cracks) of the inner layers. Use all cleaning products sparingly. Any excess cleaning product that runs down the glass interior should be wiped away from the bottom framework to prevent it from seeping into the frame.

# Paint Care

#### **Chemical Agent Resistant Coating (CARC)**

Chemical Agent Resistant Coating (CARC) is a two component polyurethane paint that allows for easy decontamination in the case of a liquid chemical exposure. CARC paint is resistant to water, weather, Hydrocarbons and acids. CARC paint also has an infrared signature that makes coated equipment harder to detect with thermal imagers.

Paint Touch-up is an important aspect of maintaining your vehicle. Bare metal oxidizes quickly. Be sure to fix any bare metal spots on the vehicle before oxidation occurs.

Wash the vehicle using mild soap and water and a soft brush. Rinse the vehicle with a standard hose. A lint free rag that is similar in color to the vehicle can be used for spot cleaning as needed.

**Note:** *Do not Pressure wash the vehicle.* 

**Note:** *This type of paint cannot be waxed.* 

#### Lusterless Polyurethane Topcoat

Lusterless Polyurethane Topcoat is a two component top coating that is designed as a top coat for military equipment.

Paint Touch-up is an important aspect of maintaining your vehicle. Bare metal oxidizes quickly. Be sure to fix any bare metal spots on the vehicle before oxidation occurs.

Wash the vehicle using mild soap and water and a soft brush. Rinse the vehicle with a standard hose. A lint free rag that is similar in color to the vehicle can be used for spot cleaning as needed.

Note: Do not Pressure wash the vehicle.

Note: This type of paint cannot be waxed.

#### **High Gloss Polyurethane Topcoat**

High Gloss Polyurethane Topcoat that is suitable for use in any environment where long term color and gloss retention are desired along with chemical agent resistant properties.

Paint Touch-up is an important aspect of maintaining your vehicle. Bare metal oxidizes quickly. Be sure to fix any bare metal spots on the vehicle before oxidation occurs.

Wash the vehicle using mild soap and water and a soft brush. Rinse the vehicle with a standard hose. A lint free rag that is similar in color to the vehicle can be used for spot cleaning as needed.

**Note:** *Do not Pressure wash the vehicle.* 

**Note:** *This type of paint can be polished using automotive car wax.* 

# Storage of Vehicle

Wash vehicle using warm water and mild soap when vehicle is cool to the touch. Dry wet surfaces with a soft cloth that is similar in color to the vehicle.

Inspect paint on the vehicle; touch up all areas that have primer or bare metal exposed with paint to prevent oxidation.

Check radiator, oil, and transmission levels. Cover open ends of exhaust and air intake for heating and air conditioning systems. Fill fuel tank to maximum level and allow venting. Inspect vehicle for leaks, proper tire pressure, and other problems or shortcomings.

#### For Extended Storage

Start and run vehicle at a fast idle until reaching operating temp.

Drive the vehicle a short distance shifting the transmission through every gear; apply and release the parking brake.

To remove surface charge from the battery operate heater and air conditioning and turn on head lights and other accessories for a few minutes.

Turn off air conditioning or heat and shut off all accessories and lights. Park vehicle and turn off the engine.

Disconnect and remove batteries, store in dry, cool, well-ventilated area. Clean terminals and recharge before use.

Lubricate all moving components.

Whenever possible store vehicle indoors; out of sunlight, in a dry ventilated area. If indoor storage is not available select a storage area that eliminates conditions that cause deterioration.

Park Vehicle away from trees, high weeds and tall grass to prevent damage from tree or weed sap, as well as to prevent damage from bird and insect stains.

Park Vehicle away from railroad tracks, paint shops, smoky industry areas, and areas of possible road side debris contact. If vehicle is stowed on an incline chock the wheels.

# Vehicle Lubrication

- *Turret Ring Gear* Use Multipurpose High Temp Grease NLG1 2 ISO VG460 or Equivalent. Do not over grease Turret Ring Gear. Over greasing can cause the Turret Ring Gear to slow down.
- Door Hinge Use Multipurpose High Temp Grease NLG1 2 ISO VG460 or Equivalent.
- Gun Ports equipped with metal oil lite bushing No Lubrication Needed.
- Gunner Stand with bronze slide ways No Lubrication needed to avoid dust/dirt buildup.

# Welding Precautions

It is recommended that Technical Services be contacted at 800-444-5362 before any welding or cutting operation is undertaken. Electronic equipment damage can occur if certain procedures are not followed.

# Lenco Armored Vehicles Contact Information

# **Company Headquarters**

Lenco Industries, Inc. 10 BETNR Industrial Drive Pittsfield, MA 01201 USA Telephone: (413) 443-7359 Toll Free Phone: 1-800-444-5362 Fax: (413) 445-7865 Website: www.LencoArmor.com

#### **Customer Service**

Steve Mix Toll Free Phone: 1-800-444-5362 Telephone: (413) 443-7359 Ext. 128 Fax: (413) 442-7914 Email: stevem@lencoarmor.com

# Parts Department

Dave Pfeiffer Toll Free Phone: 1-800-444-5362 Telephone: (413) 443-7359 Ext. 125 Fax: (413) 442-9612 Email: parts@lencoarmor.com

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