

LENCO BEARCAT OPERATOR & MAINTENANCE MANUAL



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General Information

Preface: This Manual is written with regard to persons who will be operating or maintaining the Lenco BearCat. Operation of the Lenco BearCat 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 BearCat. 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 BearCat. 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 BearCat enhances the safety of Police, EMS, Tactical Response Teams, EOD units and Firefighters. 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, Search and Rescue and Hostage Situations. The Lenco BearCat 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 Ventilation and Air Conditioning (HVAC). The vehicle features Ballistic Armor, weapon ports, a top mounted rotating turret with adjustable height stand, and an array of specific electrical and mechanical options to meet the user's specific needs.

Pre-Operation Inspection

Before operation of the Lenco BearCat perform a thorough inspection of the vehicle interior, exterior, and all of its components to ensure maximum protection for operator and crew. This inspection should include a visual as well as a physical inspection.

This inspection includes checking all fluid levels, tire pressures, brakes, electrical components, interior seats, 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.

<u>Warnings</u>

Follow all safety warnings when performing any type of maintenance or inspection, and before any use of the vehicle.

Engine

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

Engine will become hot during normal operation. Allow engine to completely cool before performing maintenance or inspections. 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 or inspection. Failure to comply could result in personal injury.

Battery

Confirm 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. 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 the coolant reservoir cap. Using a heavy rag, turn radiator cap $\frac{1}{4}$ to $\frac{1}{2}$ of a turn to allow pressure to escape from radiator.

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.

<u>Fuel</u>

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, as they can create a fire and slip hazard. Dispose of materials in accordance with local hazardous waste disposal 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 transmission oil. Failure to comply could result in burn injury.

Transfer Case

Transfer case and oil cooler become very hot during normal operation. Allow transfer case and oil cooler 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

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 with 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. Contact your safety personnel for appropriate safety precautions while handling refrigerants.

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, and 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 it is necessary to the run engine indoors during vehicle maintenance use proper ventilation equipment to exhaust gases outside

- Do not operate personnel heater in enclosed area without proper ventilation
- 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 Tow/Haul 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

If tire air pressure is lost 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. Use hydraulic jack rated for 6 ton or more.

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

If brakes of disabled vehicle are inoperable do not flat tow. Request support from a flat bed or a wrecker. Do not move towing vehicle without a ground guide. Ground guide should be in clear view at all times. Confirm that all personnel are clear of vehicles before removing wheel chocks.

Maximum off road towing speed should not exceed 15MPH (24KM/PH). Terrain and weather conditions may require further reduced speeds. On paved roads speeds up to 25MPH can be accomplished if conditions permit.

Prior to removing tow bar, or straps, park vehicle on level ground with wheels chocked.

Never attach safety chains or straps to axles or suspension components that have been damaged or compromised.

Vehicles with catastrophic axle or suspension damage may require the axle to be properly secured to the chassis for safe recovery of the vehicle.

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 for maximum field of view.

Use ground guides in low visibility situations. Be sure ground guides remain clear of the vehicle 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.

Do not exceed the recommended crew capacity for your specific vehicle layout.

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 loss of vehicle control.

Vehicle has a 30 degree roll over angle. 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.

Avoid driving or parking on soft shoulders. Soft road shoulders can collapse. Vehicle can roll over causing severe injury or death to personnel.

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

Fording Water

Do not attempt to ford water deeper than 32 inches. 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.

Gunner Hatch / Stand

Be sure gunner stand is locked at a predetermined height before operation out of the hatch.

Make sure lock pins are secure before using. Before lowering gunner stand into the stowed position check for obstructions below the stand. Check to make sure all personnel are clear of gunner stand while lowering into the stowed position.

Before moving the vehicle with the hatch in the open position verify the hatch lid is completely locked in the open position.

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

General Vehicle Operation

Restraint Systems

Front Air Bags

Warning: Never place your arm or any objects over an airbag module. Placing your arm over a deploying airbag can result in serious arm fractures or other injuries. Objects placed on or over the airbag inflation area may cause those objects to be propelled by the airbag into your face and torso causing serious injury.

The front passenger airbag on/off switch activates an illuminated light indicating the airbag status. The indicator light is located to the right of the climate controls, and stays on when the airbag switch has been moved to the off position.



Note: The passenger airbag status indicator OFF lamp will illuminate for a short period of time when the ignition is first turned on to confirm it is functional.

Turning the Passenger Airbag OFF

The airbag ON/OFF Switch is located on the driver's side of the center console and is controlled using the ignition key.



PASSENGER AIRBAG

1. Insert the ignition key, turn the switch to OFF and hold in OFF while removing the key.

2. When the ignition is turned on, the "PASS AIRBAG OFF" light illuminates briefly, then momentarily shuts off and turns back on. This indicates that the passenger airbag is deactivated.

Warning: If the light fails to illuminate when the passenger air bag switch is off and the ignition is on, have the passenger air bag switch serviced at your authorized dealer immediately. In order to avoid inadvertent activation of the switch, always remove the ignition key from the passenger air bag on and off switch.

3. The passenger airbag remains off until you turn it back on.

Turning the Passenger Airbag Back ON



PASSENGER AIRBAG

1. Insert the ignition key and turn the switch to ON.

2. The PASS AIRBAG OFF light will briefly illuminate when the ignition is turned to on. This indicates that the passenger airbag is operational.

The passenger side airbag should always be on (the PASS AIRBAG OFF light should not be illuminated) unless the passenger is a person who meets the requirements stated either in Category 1, 2 or 3 of the National Highway Traffic Safety Administration or Transport Canada deactivation criteria. The vast majority of drivers and passengers are much safer with an airbag than without. To do their job and reduce the risk of life threatening injuries, airbags must open with great force, and this force can pose a potentially deadly risk in some situations, particularly when a front seat occupant is not properly buckled up. The most effective way to reduce the risk of unnecessary airbag injuries without reducing the overall safety of the vehicle is to make sure occupants in the front of the vehicle are properly restrained. This provides the protection of safety belts and permits the airbags to provide the additional protection they were designed to provide. If you choose to deactivate your airbag, you are losing the very significant risk reducing benefits of the airbag and you are also reducing the effectiveness of the safety belts, because safety belts in modern vehicles are designed to work as a safety system with the airbags.

Front Seats

When you use them properly, the seat, head restraint, safety belt and air bags will provide optimum protection in the event of a crash.



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

• Keep sufficient distance between yourself and the steering wheel. It is recommend a minimum of 10 inches (25 centimeters) between your breastbone and the air bag cover

- 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, may cause it to fail, and may result in severe injury or death.

Adjusting the Front Seats

Adjusting the seat base forward or backwards

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

Adjusting 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 back rest forward or turn the knob backwards to recline the seat.

Adjusting the Steering Wheel







- 1. Unlock the steering column.
- 2. Adjust the steering wheel to the desired position up/down in/out.
- 3. Lock the steering column.

Instrument Cluster (6.8L V10 Gasoline)



- A. Engine Oil Pressure Gauge
- B. Engine Coolant Temperature Gauge
- C. Transmission Fluid Temperature Gauge
- D. Fuel Gauge
- E. Speedometer
- F. Information Display
- G. Tachometer

Instrument Cluster (6.7L V8 Diesel)



A. Engine Boost Gauge

Engine Oil Pressure Gauge

Engine Oil Pressure Gauge indicates engine oil pressure. The needle should stay in the normal operating range (centered between L and H). If the needle falls below the normal range, stop the vehicle, turn off the engine and check the engine oil level. Add oil if needed. If the oil level is correct, have your vehicle checked by your authorized dealer.

Engine Coolant Temperature Gauge

Engine Coolant Temperature Gauge indicates engine coolant temperature. At normal operating temperature, the level indicator will be in the normal range. If the engine coolant temperature exceeds the normal range, stop the vehicle as soon as safely possible, switch off the engine and let the engine cool.



Warning: *Never remove the coolant reservoir cap while the engine is running or hot.*

Transmission Fluid Temperature Gauge

Transmission Fluid Temperature Gauge indicates transmission fluid temperature. At normal operating temperature, the level indicator will be in the normal range. If the transmission fluid temperature exceeds the normal range, stop the vehicle as soon as safely possible and verify that airflow is not restricted such as snow or debris blocking airflow through the grill. Higher than normal operating temperature can also be caused by special operation conditions (i.e. Towing or off-road use). Operating the transmission with the temperature in the higher than normal range can cause transmission damage. Altering the severity of the driving conditions is recommended to lower the transmission temperature into the normal range. If the gauge continues to show high temperatures, see your authorized dealer.

Fuel Gauge

Note: The fuel gauge may vary slightly when your vehicle is moving or on a gradient.

Switch the ignition on. The fuel gauge will indicate approximately how much fuel is left in the fuel tank. The arrow adjacent to the fuel pump symbol indicates on which side of your vehicle the fuel filler door is located. The needle should move toward F when you refuel your vehicle. If the needle points to E after adding fuel, this indicates your vehicle needs service.

After refueling some variability in needle position is normal.

• It may take a short time for the needle to reach F after fueling. This is normal and depends upon the slope of pavement at the fueling station.

• The fuel amount dispensed into the tank is a little less or more than the gauge indicated. This is normal and depends upon the slope of pavement at the fueling station.

• If the fuel station nozzle shuts off before the tank is full, try a different fuel pump nozzle.

Speedometer

The Speedometer displays the speed of the vehicle in MPH (Miles per Hour) and KPH (Kilometers per Hour). The Speedometer is calibrated in accordance to the tire size.

Information Display

The Information Display can be used to control various systems on the vehicle using the information display controls on the steering wheel. (See *Page 89* in the Ford Owner's Manual for more information).

Tachometer

The Tachometer shows the engine RPM's (Revolutions per Minute).

Boost Gauge

The Boost Gauge displays pounds of boost being produce by the turbo charger.

Starting and Stopping (6.7L V8 Diesel)

Note: *Make sure you are sitting in the correct position before adjusting steering wheel.*

Read all starting instructions thoroughly before attempting to start the vehicle.

Before starting the engine on the vehicle make sure all occupants have fastened their seat belts. Make sure the head lamps and electrical accessories are off. Apply the parking brake. Be sure the gearshift lever is in P (Park).

Turn the ignition key to the start position. The glow plug pre-heat indicator will illuminate in the dash.

Do not turn the key to the start position until the glow plug pre-heat indicator turns off. When the glow plug pre-heat indicator turns off, turn the key to the start position and release the key as soon as the engine starts. If the vehicle does not start after the glow plug activation time ends, you may need to reset the glow plugs by turning the key to the off position and back to run, in order to cycle the glow plugs again.

After the engine starts, allow it to idle for 15 seconds before driving in order to protect the engine.

Note: *Make sure all auxiliary switches and interior lights are off before starting the vehicle.*

Note: *Do not press the accelerator during starting.*

Note: Do not crank the engine for more than 10 seconds as starter damage may occur. If the engine fails to start, turn the key to the off position and wait 30 seconds before attempting to start again.



Warning: Do not use starting fluid, such as ether; in the air intake system (See air filter decal) such fluid could *result in immediate explosive damage to the engine and possible personal injury.*



Warning: Do not add gasoline, gasohol, alcohol, or kerosene to diesel fuel. This practice creates a serious fire *hazard and causes engine performance problems.*

Switching Off the Engine (6.7L V8 Diesel)

Turn the ignition to the off position. To prolong engine life (especially after extended high speed, high ambient temperature, or high GVW/GCW operation, such as heavy loads or heavy trailers), it is recommended that a hot engine be idled for 3-5 minutes. This allows the turbocharged engine to cool down. For more information on GVW/GCW, see the *Load Carrying chapter* in your OEM Owner's Manual.

Starting and Stopping (6.8L V10 Gasoline)

Read all starting instructions thoroughly before attempting to start the vehicle.

Before starting the engine on the vehicle make sure all occupants have fastened their seat belts. Make sure the head lamps and electrical accessories are off. Apply the parking brake. Be sure the gearshift lever is in P (Park).

Turn the ignition key to the start position.

After the engine starts, allow it to idle for 15 seconds before driving in order to protect the engine.

Note: *Make sure all auxiliary switches and interior lights are off before starting the vehicle.*

Note: *Do not press the accelerator during starting.*

Note: *Do not crank the engine for more than 10 seconds as starter damage may occur. If the engine fails to start, turn* the key to the off position and wait 30 seconds before attempting to start again.



Warning: Do not use starting fluid, such as ether; in the air intake system such fluid could result in immediate *A* explosive damage to the engine and possible personal injury.

Cold Weather Operation (6.7L V8 Diesel)

The use of the factory engine block heater assists in engine starting in extreme cold ambient temperatures. The engine block heater plug is located behind the front bumper on the passenger side frame rail.

Note: *The heater is most effective when outdoor temperatures are below* 0°*F* (-18°*C*).

The heater acts as a starting aid by warming the engine coolant. This allows the climate control system to respond quickly. The equipment includes a heater element (installed in the engine block) and a wire harness. You can connect the system to a grounded 120-volt AC electrical source.

• Use a 16-gauge outdoor extension cord that is product certified by Underwriter's Laboratory (UL) or Canadian Standards Association (CSA). This extension cord must be suitable for use outdoors, in cold temperatures, and be clearly marked Suitable for Use with Outdoor Appliances.

- Use as short of an extension cord as possible
- Do not use multiple extension cords

• To avoid electrical shock or fire make sure that the extension cord plug and heater cord plugs are free and clear of water

- Make sure your vehicle is parked in a clean area, clear of combustibles
- Make sure the heater cord and extension cords are firmly connected

• Check for heat anywhere in the electrical hookup once the system has been operating for approximately 30 minutes

• Make sure the system is unplugged and properly stowed before driving your vehicle. Make sure the protective cover seals the prongs of the block heater cord plug when not in use.

• Make sure the heater system is checked for proper operation before winter. Make sure the receptacle terminals are clean and dry prior to use. Clean them with a dry cloth if necessary.

The heater uses 0.4 to 1.0 kilowatt-hours of energy per hour of use. The system does not have a thermostat. It achieves maximum temperature after approximately three hours of operation. Using the heater longer than three hours does not improve system performance and unnecessarily uses electricity.

Your vehicle is equipped with a fuel and water separator that recirculates fuel from the engine to help prevent fuel filter clogging. To avoid engine fuel starvation during cold weather operation of $32^{\circ}F$ (0°C) or below, the manufacturer recommends that the fuel level in your tank should not drop below 1/4 full. This helps prevent air from entering the fuel system and stalling the engine.

In cold weather below 32°F (0°C), the engine may slowly increase to a higher idle speed if left idling in P (Park) due to the engine warming. As the engine warms up, the engine sound level decreases due to the activation of PCM controlled sound reduction features.

If you operate your vehicle in a heavy snowstorm or blowing snow conditions, snow and ice can clog the engine air induction. If this occurs, the engine may experience a significant reduction in power output. At the earliest opportunity, clear all the snow and/or ice away from inside the air filter assembly. Remove the air cleaner cover and the pleated paper filter, leaving the foam filter in and remove any snow or ice. Make sure you install the foam filter correctly in place. Remove any debris, snow or ice on the foam filter by brushing the surface with a soft brush.

Once you have cleared all of the debris, reinstall the air filter and assembly.

Note: Do not use water, solvents, or hard brushes to clean the air filter.



Warning: To reduce the risk of vehicle damage and/or personal burn injuries do not start your engine with the *air filter removed and do not remove it while the engine is running.*

In order to operate the engine in temperatures of $32^{\circ}F(0^{\circ}C)$ or lower, read the following instructions:

• Make sure that the batteries are of sufficient size and are fully charged. Check other electrical components to make sure they are in optimum condition

• Use the proper coolant solution at the concentration recommended protecting the engine against damage from freezing

• Refuel tank at the end of operation to prevent condensation in the fuel system

• Make sure you use proper cold weather engine oil and that it is at its proper level. Also, if necessary, make sure to follow the engine oil and filter change schedule listed in the scheduled maintenance information

• At temperatures of -10°F (-23°C) or below, it is recommended that you use an engine block heater to improve cold engine starting

If operating in arctic temperatures of -20°F (-29°C) or lower, consult your truck dealer for information about special cold weather equipment and precautions. *The following cold weather idling guidelines are recommended:*

• You can use Motorcraft[®] cetane improvers or non-alcohol-based cetane improvers from a reputable manufacturer as needed

• Maintain the engine cooling system properly

• Avoid shutting the engine down after an extensive idling period. Drive your vehicle for several miles with the engine at normal operating temperatures under a moderate load

• For extended idle times in low ambient temperatures use an approved idle speed increase device. See *Stationary* Elevated Idle Control page 31.

Cold Weather Operation (6.8L V10 Gasoline)

To avoid engine fuel starvation during cold weather operation of 32°F (0°C) or below, the manufacturer recommends that the fuel level in your tank should not drop below 1/4 full. This helps prevent air from entering the fuel system and stalling the engine.

If you operate your vehicle in a heavy snowstorm or blowing snow conditions, snow and ice can clog the engine air induction. If this occurs, the engine may experience a significant reduction in power output. At the earliest opportunity, clear all the snow and/or ice away from inside the air filter assembly. Remove the air cleaner cover and the pleated paper filter, leaving the foam filter in and remove any snow or ice. Make sure you install the foam filter correctly in place. Remove any debris, snow or ice on the foam filter by brushing the surface with a soft brush.

Once you have cleared all of the debris, reinstall the air filter and assembly.

Note: Do not use water, solvents, or hard brushes to clean the air filter.



Warning: *To reduce the risk of vehicle damage and/or personal burn injuries do not start your engine with the air filter removed and do not remove it while the engine is running.*

In order to operate the engine in temperatures of 32°F (0°C) or lower, read the following instructions:

• Make sure that the batteries are of sufficient size and are fully charged. Check other electrical components to make sure they are in optimum condition

• Use the proper coolant solution at the concentration recommended for protecting the engine against damage from freezing

• Refuel tank at the end of operation to prevent condensation in the fuel system

• Make sure you use proper cold weather engine oil and that it is at its proper level. Also, if necessary, make sure to follow the engine oil and filter change schedule listed in the scheduled maintenance information in the Ford owner's manual

• Maintain the engine cooling system properly

• Avoid shutting the engine down after an extensive idling period. Drive your vehicle for several miles with the engine at normal operating temperatures under a moderate load

• For extended idle times in low ambient temperatures use an approved idle speed increase device. See *Stationary* Elevated Idle Control page 31.

Fuel and Refueling

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

Four-Wheel Drive Electronic Shift-On-the-Fly (ESOF) 4WD System

Note: Auto-manual hub locks can be manually overridden by rotating the hub lock control from AUTO to LOCK.

For proper operation, make sure that each hub is fully engaged and that both hub locks are set to the same position (both set to LOCK or both set to AUTO). To engage LOCK, turn the hub locks completely clockwise; to engage AUTO, turn the hub locks completely counterclockwise.



The ESOF 4WD System

- Provides 4x4 High engagement and disengagement while the vehicle is moving up to 55Mph
- Is operated by a rotary control located on the instrument panel that allows you to select 4x2, 4x4 High or 4x4 Low
- Uses auto-manual hub locks that can be engaged and disengaged automatically based on the 4x4 mode selected
- Will increase fuel economy when used in the recommended AUTO lock mode

Note: When a 4x4 system fault is present, the system will typically remain in whichever 4x4 mode was selected prior to the fault condition occurring. It will not default to 4x2 in all circumstances. When this warning is displayed, have your vehicle serviced by an authorized dealer.

4WD Indicator Lights



Momentarily illuminates when 2H is selected

4x4 HIGH 4x4 HIGH

Continuously illuminates when 4H is selected

4x4 LOW 4x4

4x4 LOW

Continuously illuminates when 4L is selected



CHECK 4x4

Displays when a 4x4 fault is present

Using the Electronic Shift-On-the-Fly 4WD System

Use the rotary control located on the instrument panel to select the following:



2H (2WD)

Sends power to the rear wheels only and should be used for street and highway driving. It also provides optimal smoothness and fuel economy at high speeds for general on-road driving.

4H (4x4 HIGH)

Used for extra traction such as in snow or icy roads or in off road situations. *This mode is not intended for use on dry pavement.*

4L (4x4 LOW)

Use for extra gearing to provide maximum power to all four wheels at reduced speeds. *Intended only for off-road applications such as deep sand, steep grades, or pulling heavy objects.* Refer to Shifting to/from 4L (4x4 Low) (*pg. 21*) for proper operation.

Note: *If* 4*x*4 *Low is selected while the vehicle is moving above 3 mph (5 km/h), the* 4WD *system will not perform a shift. This is normal and should be no reason for concern.*

Shifting Between System Modes

Note: *Momentarily releasing the accelerator pedal while performing a shift will improve engagement/disengagement times.*

Note: Do not perform this operation if the rear wheels are slipping.

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

Note: 4x4 High mode is not intended for use on dry pavement.

You can move the control from 2H or 4H at a stop or while driving up to 55 MPH. The information display may display a message indicating a 4x4 shift is in progress. Once the shift is complete the message center will then display the system mode selected. If SHIFT DELAYED PULL FORWARD is displayed in the information display during the mode shift, transfer case gear tooth blockage is present. To alleviate this condition, place the transmission in a forward gear and move the vehicle forward approximately 5 feet (1.5 meters) to allow the transfer case to complete the mode shift.

Shifting to / from 4L (4x4 Low)

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

Note: 4x4 Low mode is not intended for use on dry pavement.

1. Bring the vehicle to a speed of 3 mph (5 km/h) or less

- 2. Place the transmission in N (Neutral)
- 3. Move the 4WD control to the desired position

The information display will display a message indicating a 4x4 shift is in progress. The information display will then display the system mode selected. If any of the above shift conditions are not met, the shift will not occur and the information display will display information guiding the driver through the proper shifting procedures.

Note: Auto-manual hub locks can be manually overridden by rotating the hub lock control from AUTO to LOCK.

Four-Wheel Drive Manual Shift On Stop (MSOS) 4WD System

Note: Do not use 4x4 mode on dry, hard surfaced roads. Failure to do so will produce excessive noise, increase tire wear and may damage drive components. 4x4 mode is only intended for consistently slippery or loose surfaces.

Note: If 4x4 low is selected while the vehicle is moving above 3 mph (5 km/h), the 4WD system will not perform a shift. This is normal and should be no reason for concern. Refer to Shifting to/from 4L (4x4 Low) for proper operation of Manual Shift on Stop (MSOS) 4WD system.

Note: *The vehicle should not be driven in 4x4 High or 4x4 Low modes with the hub locks set to FREE as this condition may damage driveline system components.*

The 4WD system is engaged or disengaged by rotating the control for both front wheel hub locks from the FREE or LOCK position, then manually engaging or disengaging the transfer case with the floor-mounted shifter. For increased fuel economy in 2WD, rotate both hub locks to the FREE position.

4WD Indicator Lights

Note: When a 4x4 system fault is present, the system will typically remain in whichever 4x4 mode was selected prior to the fault condition occurring. It will not default to 4x2 in all circumstances. When this warning is displayed, have your vehicle serviced by an authorized dealer.



4x2 4x2

Momentarily illuminates when 2H is selected



4x4 HIGH

Continuously illuminates when 4H is selected



4x4 LOW

Continuously illuminates when 4L is selected



Continuously illuminates when a 4x4 fault is present

Using a Manual Shift on Stop (MSOS) 4WD System

Note: *High shift efforts may be encountered when attempting to shift into and out of 4x4 modes. It is recommended to allow the vehicle to roll at a speed below 3 mph (5 km/h) when shifting between modes.*



2H (2WD)

Used for general on-road driving. Sends power to the rear wheels only and should be used for street and highway driving also provides optimal smoothness and fuel economy at high speeds.

4H (4x4 High)

Used for extra traction such as in snow or icy roads or in off road situations. This mode is not intended for use on dry pavement.

N (Neutral)

Only used when towing the vehicle. No power to front or rear wheels.

4L (4x4 Low)

4L uses extra gearing to provide maximum power to all four wheels at reduced speeds. It is intended only for off road applications such as deep sand, steep grades or pulling heavy objects.

Shifting Between System Modes

Note: *Do not perform these operations if the rear wheels are slipping.*

Note: Some noise may be heard as the 4x4 system shifts or engages. This is normal. In order to reduce engagement noise, it is recommended that all shifts be performed at speeds below 3 mph (5 km/h).

Note: *The vehicle should not be driven in 4x4 High with the hub locks disengaged as this condition may damage driveline system components.*

Shifting from 2H to 4H

Engage the locking hubs by rotating the hub lock control from FREE to LOCK, then move the transfer case lever from 2H (2WD) to 4H (4x4 High) at a stop or a vehicle speed below 3 mph (5 km/h).

Shifting from 4H to 2H

Move the transfer case lever from 4H (4x4 High) to 2H (2WD) at a stop or a vehicle speed below 3 mph (5 km/h), then disengage the locking hubs (optional) by rotating the hub lock control from LOCK to FREE.

Note: For proper operation, make sure that both indicator arrows on the hub are aligned, and that both hubs are set to either FREE or LOCK.

Shifting to / from 4L (4x4 Low)

- 1. Bring the vehicle to a stop or a speed below 3 mph (5 km/h).
- 2. Place the transmission in N (Neutral).

3. Move the transfer case shift lever through N (Neutral) directly to the desired position.

4. If the transfer case does not, or only partially moves to the desired position, perform a shift with the transmission in N (Neutral) and the vehicle rolling at a speed below 3 mph (5 km/h).

5. If shifting to 2H (2WD), with the vehicle at a complete stop, disengage the locking hubs (optional) by rotating the hub lock control from LOCK to FREE.



Warning: Do not leave the vehicle unattended with the transfer case in the N (Neutral) position. Always set the **1** parking brake fully and turn off the ignition when leaving the vehicle.

The transfer case neutral position overrides the transmission and puts the vehicle in neutral regardless of transmission gearshift lever position. The vehicle can move forward or backward.

This position should only be used when towing the vehicle.

Tow / Haul



D (Overdrive) with Tow / Haul OFF

D (Overdrive) with Tow/Haul off is the normal driving position for the best fuel economy. The overdrive function allows automatic upshifts and downshifts through gears one through five.

D (Overdrive) with Tow / Haul ON

The Tow/Haul feature improves transmission operation when towing a trailer or a heavy load. All transmission gear ranges are available when using tow/haul.

To activate Tow/Haul, press the button on the end of the gearshift lever. The TOW HAUL indicator light will illuminate in the instrument cluster.

Tow/haul delays upshifts to reduce frequency of transmission shifting. Tow/haul also provides engine braking in all forward gears when the transmission is in the D (Overdrive) position; this engine braking will slow the vehicle and assist the driver in controlling the vehicle when descending a grade. Depending on driving conditions and load conditions, the transmission may downshift, slow the vehicle and control the vehicle speed when descending a hill, without the accelerator pedal being pressed. The amount of downshift braking provided will vary based upon the amount the brake pedal is pressed.

To deactivate the Tow/Haul feature and return to normal driving mode, press the button on the end of the gearshift lever. The TOW HAUL light will no longer be illuminated.

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 a grade.



Warning: When entering the cabin of the vehicle use the three points of contact system. Use hand rails for pulling yourself into the vehicle.

Operation of Exterior Handles

To open doors from the vehicle exterior depress the door actuator located on the exterior door handle. Use the handle to pull the door open.



Operation of Interior Door Latches

To open doors from the vehicle interior lift upward on the rotary latch handle, apply pressure to the inside of the door, release handle once rotary latch has released.





Warning: *The doors are heavy; ensure nobody is standing directly behind the door before opening from inside the vehicle.*

Battle Bolts

The doors can be secured from the inside using the "Battle Bolts" located on the interior side of the door. With the door closed, rotate the handle 90 degrees to engage the lock. The doors cannot be opened from the outside with the Battle Bolts engaged. The Battle Bolts can be returned to the unlocked position by rotating the handle back 90 degrees into the upright position.



Door Latch Maintenance

Striker Pins



Note: Check all Striker Pins every 2000 miles or if door lock function is impaired.

Striker pins may become loose causing the door to close improperly. It is important to adjust Striker pins so the outside of the doors align properly against the exterior walls. If Striker pins are not adjusted properly weather stripping will not seal and Combat Locks may not latch.

Removal of Rotary Latch

Remove the (4) 1/4-20 X ³/₄" BH bolts and split lock washers that secure the rotary latch cover in place. Remove the Rotary Latch cover.



Remove the (4) 1/4-20 X 1" BH bolts that secure the Rotary Latch in place. Slide Rotary Latch Out of Rotary Latch Lock Box.

(4) 1/4-20 X 1"BH Bolts



Installation of Rotary Latch

Insert Rotary Latch into Rotary Latch Lock Box. Apply Blue Loctite to (4) ¼ - 20 X 1" BH bolts, secure the Rotary Latch.

Re-insert rotary latch cover. Secure cover using (4) ¹/₄ - 20 X ³/₄" BH bolts and ¹/₄" split lock Washers.

Note: Check bolts every 5000 miles or if door lock function is impaired.

Removal of Exterior Door Handle

Remove Rotary Latch Cover, Rotary Latch and Access Panel next the Rotary Latch to access the exterior handle hardware.

Remove the (4) M6 – 1" x 3 MM BH bolts and washers. Remove the exterior handle.



Installation of Black Handle

Insert (4) M6 – 1" x 3MM BH bolts with $\frac{1}{4}$ " flat and lock washers through the bolt holes in the door, secure into handle.

Pull Points

There are pull points at various locations on the vehicle. Forward locations include four on the front bumper and two on the forward corners of the roof. Rear Locations are at the left and right of the rear wall above the running board and two on the rear corners of the roof. The roof mounted points can be utilized when an object needs to be pulled from over a fence or other high obstruction. The lower points can be used for pulling when height is not a factor.



Warning: 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 to the object being pulled.

Warning: *Pull Points are not for use as transportation tie down points.*

Lighting and Accessories

Electrical / Lighting Controls

All auxiliary lighting and electrical controls are operated from inside the vehicle. Most switches and controls are mounted in the dashboard below the Climate Control and in the center console between the front seats. These features are "Keyed Hot". The vehicle main power must be on for them to function.



Note: Switch configurations vary in accordance with vehicle options.

Headlights

Headlights are controlled using the switch located on the left hand side of the steering wheel. Vehicle main power does not have to be on for headlights to function. Rotate the headlight control clockwise to the first position to turn on the parking lamps, instrument panel lamps, license plate lamps and tail lamps. Rotate clockwise to the second position to also turn on the headlights.



High Beams

Push the lever toward the instrument panel to switch the high beams on. Push the lever toward the instrument panel again or pull the lever towards you to switch the high beams off.



Headlight Flasher

Pull the lever toward you to flash the headlamps and release the lever to switch the headlamps off.



Direction Indicators

The turn signal lever does not mechanically lock in the upward or downward position when activated. The turn signal control activation and cancellation is electronic.



- To operate the left turn signal, push the lever down until it stops and release
- To operate the right turn signal, push the lever up until it stops and release
- To manually cancel turn signal operation, push the lever again in either direction

Lane Change

To indicate a left or right lane change:

• Push the lever up/down to the first stop position and release. The turn signals will flash three times and stop.

• Push the lever up/down to the first stop position and hold. The turn signals will flash for as long as the lever is held in this position.

Mirror Control

Mirror Control is located on the left side of the dash.



A. Left-hand mirror

B. Off

C. Right-hand mirror

To Adjust a Mirror

- 1. Rotate the control to select the mirror you want to adjust.
- 2. Adjust the position of the mirror.
- 3. Return the control to the center position to lock mirrors in place.

Fold-Away Exterior Mirrors

For tight parking conditions, you can manually push the mirror toward the door window glass. Before driving, make sure that you fully engage the mirror in its support when returning it to its original position.

Telescoping Mirrors

This feature allows you to extend the mirrors about 3 inches. You can manually pull the mirrors out or push them in. Driving with mirrors fully extended increases your rearward field of view.



Windshield Wipers

Note: Fully defrost windshields before turning on windshield wipers.

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 scratch the Ballistic Glass, damage the wiper blades or cause wiper motor transmission damage. 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.



- A brief press causes a single wipe without washer fluid
- A quick press and hold causes the wipers to swipe three times with washer fluid
- A long press and hold will activate the wipers and washer fluid for up to 10 seconds

A wipe will occur a few seconds after washing to clear any remaining washer fluid. This feature can be turned on and off in the information display.

Stationary Elevated Idle Control

Stationary Elevated Idle Control allows the vehicle to be in Battery Charge Protect mode (BCP) while it is idling in a stationary position. The switch is located in the Ford auxiliary switch panel. The switch will illuminate while in the on position.

Stationary Elevated Idle Control Switch -



The vehicle gear shift selector must be in park with the parking brake set. Flip the idle control switch up. When activated (BCP) will regulate engine RPM based on the degree of battery charge, up to 1200 RPM maximum. The idle control can be deactivated by releasing the parking brake, stepping on the brake pedal, or cycling the switch down into the off position.

Once deactivated the system needs to reset by cycling the dash mounted switch while keeping the previous parameters in place.

Driving Lights

Driving Lights are located in the front bumper and they are activated by cycling the switch labeled "Driving Lights" upwards. The switch is located in the Ford auxiliary switch panel. The switch will illuminate when in the on position. Vehicle main power must be "ON" for driving lights to function.



Wig-Wag Lighting

Wig-Wag Lighting is controlled by toggling the switch labeled "Wig-Wag" upwards. 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.



<u>AUX 4</u>

Note: *The additional switch location, AUX 4, is not in use but is available for future accessory installation. Max power 10amps.*

Roof Mounted Spot Lights

The Roof Mounted Spot Lights are permanently affixed searchlights. The lights are controlled by 4-way joystick/ power switches located on the header between the sun visors. Vehicle main power must be "ON" for spot light to function. Activate the toggle switch on the light controller; a red LED next to the switch indicates the light is on. Rotate the light up to 370 degrees horizontal and 130 degrees vertical using the 4-way joystick. Each roof location is labeled on the individual controller.



Note: *The Spot Lights can be positioned by hand from the outside of the vehicle without the power being activated.* **Note:** *It is recommended that the spotlights face rearward during over the road travel.*

Front LEDs

Front LEDs, mounted in the grill, alternately flash from red to blue when activated.



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



Rear LEDs

Rear LEDs are mounted above the rear door and alternately flash when activated.



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



VSP Style Low Profile Lighting

VSP style lighting consists of a series of LED Visor Lights located at roof level above the windshields and four LED lights located at roof level on the side walls.



LEDs are controlled by rocker switches located in the center console. Fronts are tied in with the existing Front LEDs and rears are tied in with the existing Rear LEDs.



- Side Rear LED Switch

Side Front LED Switch —



Exterior Stationary Scene Lighting

Exterior stationary Scene Lights are located at roof level on the side walls.



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.



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". Locations in the center console are left blank for installation of your light bar controls. The maximum width a light bar can be is 44".

Typical switch configuration for optional lightbar:



Front Bar: Illuminates the front of the light bar

Rear Bar: Illuminates the rear of the light bar

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

Heated Windshield

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, press 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 pressing 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 on the center console. Activation of the switch will shut off the rear brake lights, and reverse lights. 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-wag lights, 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.





Thermal Imager and Color Camera

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 operator's 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 picture orientation.



Once the system power is on; use the joystick to control left/ right, and up/ down movement. Up to 36X 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 camera lenses.



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

Intercom System

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. The intercom system is in place to allow personnel on the inside of the vehicle to communicate with personnel on the outside of the vehicle. The system is turned on by activating the switch labeled "INTERCOM" located on the center console. Vehicle main power must be "ON" for this system to function. When the intercom power is on the switch will illuminate. When the system is activated the exterior station is always transmitting unless interrupted by a transmission from the interior station.



The interior master intercom station is located in the ceiling centered between the two front seats. The exterior remote intercom station is located below the driver side mirror.



With the intercom switch activated, outside noise can be heard through the interior station without opening the door. Adjust the volume using the knob located on the interior master station. Press the Push-To-Talk (PTT) button, also located on the interior master station, to speak to the outside.



Siren / Public Address

The Siren P/A consists of an amplifier, a control head mounted in the center console and two 100 watt speakers mounted behind the front bumper. Main vehicle 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.

Volume can be controlled by adjusting the potentiometer labeled "MIC VOL" with a small flat head screw driver.





Instrument Light Dimmer

Use to adjust the brightness of the instrument panel and all applicable lit components in the vehicle during headlamp and parking lamp operation.

• Tap the top or bottom of the control to brighten/dim all interior lit components incrementally

OR

• Press and hold at the top or bottom of the control until the desired lighting level is reached



Interior Lights

The interior lighting is mounted along the upper edges of the interior walls. The lights are half Red and half White and are activated by pushing on the lens of the desired light. The vehicle main power must be "ON" for the interior lighting to function.



Rear Auxiliary Heat / Air Conditioning

The Rear Heat / Air Conditioning Unit, functions in tandem with the existing vehicle Climate Control System. Auxiliary Heater / Air Conditioner requires the vehicle to be running and the existing vehicle Climate Control System be set to the desired temperature before adjusting the rear climate controls. For optimum operation set the fan speed to medium. Optional engine driven Air Conditioning is also available.



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.



Rear View Backup Camera

The Rear View Backup Camera has a display that is integrated into the rear view mirror. One third of the unit is a video display and the other two thirds 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

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



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" power button 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 120 VAC 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 ensure correct operation of the charge circuit. Battery state is indicated by a display panel located on the front 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.



Warning: When shore power is disconnected and the vehicle is not in use the Power Inverter 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. Once the winch is powered up, remove the weather cover on the control plug and mount the indexed Winch 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.

Note: 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.*



Modular Winch in Front Receiver —



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 the unit are amplified and projected to distances up to 500 meters or more. Prerecorded tones can be played at extreme levels. The speaker system is yolk mounted to the Rescue Hatch with the control panel mounted inside the vehicle. Refer to the LRAD Operations Manual that is included with your vehicle for specific operating instructions.



Water Monitor

The medium flow Water Monitor has adjustable spray patterns and can produce 125-350GPM of water. The monitor is adjustable from 45-90 degrees vertical and 0-320 degrees horizontal.

High speed gear ratios allow for quick response times and accurate target acquisition.

Water for the monitor can be supplied from either a fire hydrant or a pumper truck. The 2.5" NHT with 30 degree EL is located at roof level at the rear of the vehicle.

To change the nozzle pattern from straight stream to fog press the corresponding button on top of the Joystick. To change the horizontal position right or left, move the Joystick towards the appropriate direction. To change the vertical position up or down, move the Joystick forward for down and backwards for up. To open and close the valve, press the trigger to open the valve and release the trigger to close the valve. The valve can be maintained open by pressing the valve switch towards open. Note: When valve is maintained open, the trigger will not operate the valve.

The monitor can be removed by unplugging the power control cable, pulling the quick disconnect pin, and rotating the monitor 45 degrees counter clockwise.

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 side windshield. A pocket Survey Meter for handheld detection is also included.

Vehicle main power must be "ON" for Model 375 Digital Wall-Mount Area 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 375 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 to 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.

<u>Rem</u>= (Roentgen Equivalent Man) Relates to the dose of radiation to the biological effect of that dose on human tissue.

 $\underline{R/hr}$ = rem per hour.

<u>mR/hr</u>= Millirem per hour or 1000 Rem per hour.

<u>Cpm</u>= (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.

<u>175 kcpm</u>= 1mR/hr.

<u>350 kcpm</u>= 2 mR/hr. "Radiation Area".

The Pocket Survey Meter 2401-P is a handheld 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 Mirror. The manuals outline the specific functions of each of the components. Section six of the 2401-P Pocket Survey Meter Manual gives an overview of radiation basics.

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



Radio Prep Option

The following components are part of the Radio Prep Option.

- Max Rad 118-940 MHz ¼ wave Antenna mounted on the rear 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 Maxi fuse for circuit protection.



Combustible Gas Monitoring System

The Combustible Gas Detection System is made up of a Polytron IR Gas Transmitter located under the vehicle, a Trip Amplifier mounted inside the center console. Although the unit is capable of detecting several gases it is calibrated for Methane Gas. Whenever the main vehicle power is "ON" the unit is activated. 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% LEL (Lower Explosive Limit) the High LED light is triggered. At 40% of LEL (Lower Explosive Limit) the High/High LED light and Audible Alarm are triggered. This gives the vehicle occupants advance warning before explosive concentrations are reached. The trigger points are preset and tested at the factory before delivery.

Note: *The Polytron IR Gas Transmitter mounted on a BearCat is located under the vehicle on the driver side ahead of the rear wheels. The Gas Transmitter on a BEAR is mounted behind the front bumper.*

Note: For more information refer to the Drager Operation Manual.

Gunports

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.

When operating Gun Ports; use an open hand to prevent potential pinching of fingers as the port opens. Push the Gun Port Handle all the way in, allow the weight of the Gun Port door to swing the Gun Port open. To close the Gun Port, rotate the handle 180 degrees. The port will seat itself back into the stowed position.

Rectangular ports with larger openings are located at key positions. The larger openings are meant to accommodate weapons with various sights and other attachments.

Note: If a Gunport has an arrow on the interior surface it can only be opened in the direction of the arrow.



Hydraulic Ram Bar System

The Ram Bar System is a breaching tool that is deployed by inserting the Ram Bars into the 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 safety lanyard. The Hydraulic Lift System allows height adjustability of the Ram Bar from the ground to approximately 10 plus feet. The vehicle can be maneuvered with the Ram Bar in place and at different heights. Height adjustment is controlled by a rocker switch located in the switch panel, on center console of the vehicle.



When not in use the Ram Bars are stowed on the exterior brackets located on the driver side of the vehicle. The side mounted carry brackets have slide pins with hitch pins and safety lanyards to secure the assembly during transport. 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 procedures 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.

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 quick connect fittings located throughout the vehicle interior at ceiling level.

The regulator also includes a remote connection for refilling the storage tanks. Based on a ten man team with under stress air usage at 45 cu ft. ½ hr. the onboard air supply would last approximately .75-1.0 hrs.



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 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 20 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 stand and attaches to the bottom of the seat to increase seat stability.

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

To release the gunner seat; pull down on the 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. Operator should be holding onto 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 labeled "Hatch Release" located on the right side of the lid and pull the lid simultaneously into the closed position using the interior grab handle.





Warning: Use 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 and injury to personnel.

Warning: Do not attempt to open or close the hatch lid while vehicle is in motion. Be sure 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 hand-holds that are built into the hatch riser and engage the gear rotation lock. The hatch will spin 360 degrees and lock in any position.

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 the 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.

Rotating Roof Turret (Military)

The rotating roof turret provides a protected gunner position on the roof of the vehicle. 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 labeled "Hatch Release" located on the right side of the lid and pull the lid simultaneously into the closed position using the interior grab handle.



The Turret position can be changed by depressing the secondary Red handle on the rotation gear lock and pulling the handle toward you to unlock the gear. Use the Turret Gear Rotation Handle located to your left outside the hatch to change the orientation of the turret. The Roof Turret will spin 360 degrees and lock in any position.



Warning: Use 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 and injury to personnel.

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

Warning: *Release of the 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.

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

Laptop / Ram Cam Monitor Platform

The Laptop / Ram Cam Monitor Platform utilizes a four hole bolt pattern that accepts an 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.



Fuel Tank Access Cover

The Fuel Tank Access Cover located below floor level, directly inside the rear doors. The Fuel Tank Sender is 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 1¹/₄" BHCS.



Lifting the Vehicle / Changing Wheel Assemblies



Warning: Do not attempt jacking the vehicle from any part of the body (Steps, Side Skirts, or Bumper).



1. Chock the wheels. Slide the notched end of the jack handle over the release valve and use the handle to slide the jack under the vehicle. Make sure the valve is closed by turning it clockwise.

2. Position the jack in accordance with the pictures below



Note: *View shown from the rear of the vehicle to clearly identify the jack point.*

Note: *Place the jack directly under the axle and inboard of the radius arm so that the jack clears the radius arm.*

1. Insert the jack handle into the pump linkage

2. Use an up-and-down motion with the jack handle to raise the wheel completely off the ground

Note: *Hydraulic jacks are equipped with a pressure release valve that prevents lifting loads which exceed the jack's rated capacity.*

3. Remove the lug nuts with the lug wrench

4. Replace the flat tire with the spare tire and reinstall the lug nuts until the wheel is snug against the hub. Do not fully torque the lug nuts until the wheel has been lowered to the ground.

5. Lower the wheel to the ground by slowly turning the release valve on the jack counterclockwise. Opening the release valve slowly will provide a more controlled rate of descent.

6. Remove the jack and fully tighten the lug nuts in the order shown. Torque bolts to 165 ft.-lbs.



7. Stow the jack, jack handle and lug wrench. Make sure the jack is secure before driving so it does not rattle.

8. Remove wheel chocks

Note: *Re-tighten the lug nuts to the specified torque at 100 miles (160 kilometers) after any wheel disturbance (such as tire rotation, changing a flat tire, wheel removal).*

Warning: When a wheel is installed, always remove any corrosion, dirt or foreign materials present on the mounting surfaces of the wheel or the surface of the wheel hub, brake drum or brake disc that contacts the wheel. Make sure that any fasteners that attach the rotor to the hub are secured so they do not interfere with the mounting surfaces of the wheel. Installing wheels without correct metal-to-metal contact at the wheel mounting surfaces can cause the wheel nuts to loosen and the wheel to come off while the vehicle is in motion, resulting in loss of control.

Vehicle Maintenance

Have your vehicle serviced regularly to help maintain its road worthiness. There is a large network of Ford authorized dealers that are there to help you with their professional servicing expertise. Ford specially trained technicians are best qualified to service your vehicle properly and efficiently. They are supported by a wide range of highly specialized tools developed specifically for servicing the Ford components of your vehicle.

Use only recommended fuels, lubricants, fluids and service parts conforming to specifications. Motorcraft parts are designed and built to provide the best performance in your vehicle.

Maintenance Precautions

- Never service a hot engine
- Make sure nothing gets caught in moving parts
- Never service a running vehicle indoors without proper ventilation equipment
- Keep all open flames and other burning materials away from batteries and all fuel components

Working with the Engine OFF

- 1. Set the gear select to P (Park) and set the parking brake
- 2. Turn the ignition to the OFF Position
- 3. Chock the wheels

Working with the Engine ON

- 1. Set the gear select to P (Park) and set the parking brake
- 2. Chock the wheels



Warning: To reduce the risk of vehicle damage and/or personal burn injuries, do not start your engine with the 📣 air cleaner removed and do not remove it while the engine is running.

When servicing your vehicle use "Special Operating Conditions Intervals". This applies to commercial use applications which include:

- Frequent or extended idling (Over 10 minutes per hour of normal driving)
- Frequent low-speed operation
- Sustained heavy traffic less than 25 MPH or 40 KMH
- Sustained vehicle operation in ambient temperatures below -10 degrees Fahrenheit (-23°C) or above 100°F (38°C)
- Operating in severe dust or off road conditions

- Towing a trailer over 1000 miles
- Sustained, high speed driving at gross vehicle weight rating
- Use of any Bio diesel

Engine Maintenance Intervals

Oil and Oil Filter	Oil change service intervals should be completed as indicated by the instrument cluster message center
Air Filter	Inspect filter minder every 5,000 miles or 200 engine hours, replace as needed
Coolant Change	Initial change 60,000 miles or 2400 hours of engine operation; Subsequent changes every 45,000 miles or 1,800 engine hours
Coolant Nitrate Strength Check	Check every 15,000 miles or 600 engine hours
Transmission Fluid and Filter	Check every 15,000 miles or one year, whichever comes first Change Transmission Fluid at 150,000 Miles
Transfer Case Fluid and Rear Axle Fluid	Change every 50,000 miles

In order to keep your vehicle running correctly, it is important to have the systems on your vehicle checked regularly. This can help identify potential issues and prevent major problems. It is recommend having the following multi-point inspection performed at every scheduled maintenance interval to help make sure your vehicle keeps running great.

Multi-Point Inspection

Accessory Drive Belts	Radiator, Cooler, Heater and A/C Hoses
Battery Performance	Suspension Components
Engine Air Filter	Steering and Linkage
Exhaust System	Tires for Wear and Proper Inflation
Exterior and Interior Lamps	Wheel Torque
All Fluid Levels	Ballistic Glass for Cracks, Chips or Delamination
Oil and Fluid Leaks	Washer Spray and Wiper Operation

Opening the Hood / Hood Prop Rod

The Hood Prop Rod is a safety device designed to assist in holding the Ballistic hood open during servicing.

1. To open the hood, go inside the vehicle and pull the hood release handle located on the driver side kick panel



2. Go to the front of the vehicle and release the secondary hood latch located centered just below the front edge of the hood

- 3. Apply slight down pressure to the hood while releasing the secondary latch
- 4. Move to the side and lift the hood from a corner
- 5. Once hood is fully opened pivot the Hood Prop Rod into place



Closing the Hood

To close the hood, return the prop rod to its original stowed position in the retaining clip. Pull the hood down until it is in the fully closed position. Be sure all personnel and equipment are clear before closing the hood.



- A. Engine Oil Dipstick
- B. Automatic Transmission Fluid Dipstick
- C. Brake Fluid Reservoir
- D. Power Distribution Box
- E. Batteries
- E Engine Cooling System Coolant Reservoir (Primary High-Temperature Cooling System)
- G. Power Steering Fluid Reservoir
- H. Engine Oil Fill
- I. Engine Mounted Fuel Filter Assembly
- J. Secondary Cooling System Coolant Reservoir
- K. Air Filter Assembly
- L. Air Filter Restriction Gauge
- M. Windshield Washer Fluid Reservoir

Glass and Paint Care / Maintenance

All windows in the Lenco BearCat are Glass-Clad Polycarbonate; a laminate of multi-layered glass and a polycarbonate core layer with glass on both the inboard and outboards sides. 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 BearCat 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 nonsolvent based commercial glass cleaner. "CRL Glass Cleaner No. 1973" is the recommended glass cleaner for this particular 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
- Any 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 topcoat.

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*

Note: This type of paint cannot be waxed

High Gloss Polyurethane Topcoat

High Gloss Polyurethane Top coat is suitable in any environment where long term color and gloss retention are desired.

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 can be used for spot cleaning as needed.

Note: *Do not pressure wash the vehicle*

Note: *This type of paint can be waxed*

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.

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.

Specifications

Tire Pressures / Wheel Torque

BearCat Model	Rim Size	Air Pressure	Wheel Torque
G-2	19.5	110 psi max cold	165 ft lbs.
G-2	22.5	120 psi max cold	165 ft lbs.
G-3 / G-4	20	75 psi max cold	165 ft lbs. Michelin
G-3 / G-4	20	90 psi max cold	165 ft lbs. Continental
G-3 / G-4	20	80 psi max cold	165 ft lbs. Goodyear
G-3 / G-4	20		165 ft lbs. Rim Halves

Torque Specifications

Rear Driveshaft/Rear Yoke- 46 ft lbs. Rear Driveshaft to circular transmission flange-76 ft lbs. Rear Axle U-Bolts -295 ft lbs. **Recheck all torque values after 100 miles of use**

Tire and Wheels

Rim sizes for the **G-2** are 19.5 inch standard with an optional 22.5 inch available. Both options come fitted with aggressive profile heavy duty tires. Rim size for the **G-3** and **G-4** is 20 inch fitted with military style rough terrain tires. All vehicles can be ordered with optional Run Flat Inserts.

Air Conditioning R134A Refrigerant amount:

2.7 lbs. (with optional rear Auxiliary Heater/Air Conditioner)

<u>Glass</u>

Install Materials:

Dinitrol D-538 one step primer Dinitrol D-500 urethane (low viscosity) CRL Glass Cleaner -1973 CRL General Purpose Solvent-2032 CRL Glazing Tape 74418X14BL Rubber setting Blocks

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 oil lite bushing No Lubrication Needed.
- Gunner Stand has bronze slide ways No Lubrication needed to avoid dust/dirt buildup.

Welding Precautions

It is recommended that Technical Services be contacted at 1-800-444-5362 before any welding or cutting.

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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