Pushback and Tow Tractor Operating Instructions

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## Pushback and Tow Tractor Operating Instructions

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OPERATING INSTRUCTIONS

EQUIPMENT: Baggage or Baggage/Pushback Tractor  TYPE: Electric
MANUFACTURER: Charlatte  MODEL: T-135

Operator Controls
NOTICE

A REGENERATIVE BRAKING SYSTEM IS TURNED ON BY RELEASING THE ACCELERATOR. THIS SYSTEM USES THE GENERATOR PROPERTIES OF THE DRIVE MOTOR TO SLOW THE TRACTOR BY CHARGING THE BATTERY DURING COASTING OR DOWNHILL OPERATION. ADDITIONAL BREAKING IS OBTAINED BY PRESSING THE FOOTBRAKE PEDAL.
Safety
This tractor is designed to travel on relatively smooth terrain and to tow freight and baggage to and from the aircraft. COMPLETE understanding of the operation and use of this unit is required to maintain a safe environment for the operator and other persons in the work area.

Starting
• Do not operate any controls located inside the operator’s compartment from outside the operator’s compartment to prevent the unit from hitting you or other personnel.

Operating
• Operation and servicing of this unit must be performed by properly trained and authorized persons only.
• Always make sure that no person or obstruction is in your line of travel before starting the unit into motion.
• Never climb onto, or climb out of the unit while it is in motion.
• Do not operate the unit with any part of your body outside of the operator’s compartment.
• Use extreme caution and be observant when maneuvering unit or working in close quarters or blind travel areas. Slow down and sound horn when operating unit in this type of area.
• Never carry passengers to prevent the passengers from being thrown off or crushed between the unit and outside objects.
• Always look in all directions before changing your direction of travel.
• Always follow all safety rules of each particular airline when operating unit.
• If problems or equipment malfunctions are encountered while operating the unit, it must be properly shutdown and repaired. Continuing to use malfunctioning equipment can not only be unsafe for the operator and other personnel, but can lead to further damage to the unit as well.

Stopping
• Always set the parking brake when the unit is not in operation.
• Consider the size and weight of the unit when allowing for maneuverability and braking. This situation is magnified in severe weather conditions and on grades.
• Always park the unit on solid level ground. If this is not possible, chock all four (4) wheels in both directions.
• Use proper flags, warnings or barriers when parking in areas of traffic.
Starting the Tow Tractor
1. For maximum safety observe all safety precautions specified at the beginning of this section.
2. Enter the operator’s compartment.
3. The unit is equipped with an adjustable seat that can be adjusted closer to or farther from the foot pedals. If adjustment is required:
   a. Lift the seat adjustment lever located on the lower front of the seat and slide the seat to a comfortable position relative to the foot and hand controls and release the lever.
4. If the unit is equipped with a COBO console, adjustment can be made to the tilt of the console.
5. Buckle seat belt, if equipped.
6. Check that the direction control lever is in the “NEUTRAL” position.
7. Rotate the master switch to the “ON” position. When the tractor is turned on, the Controller Readout Panel goes through the following sequence depending on the controller type installed on the unit.
   a. For units with MC610 or MOS90 controllers:
      1. The Hours Count will appear (950 Hr.) The operator does not have to wait for the hour count to begin operation of the machine.
      2. The Battery Discharge Indicator will appear. The BDI is the normal display during operation. It is displayed as a percentage of full charge. A display of C.65 would indicate that 65% of the charge remains.
   b. For units with PowerPak controllers:
      1. The Traction Hours Count will appear momentarily (Figure 1-3-20). This shows the total number of hours that the unit has logged in traction (driving). The Battery Discharge Indicator will also appear and remain on.
      2. The Pump Hours Count will appear momentarily (Figure 1-3-21). This count is disabled on the unit and will always register as 0.0
      3. The Key Hours Count will appear and remain on throughout operation (Figure 1-3-23). This shows the total number of hours that the unit has been in service (powered on).
8. Turn on the required accessories such as work lights, beacon lights, etc.
9. Move the direction control lever to either “FORWARD” or “REVERSE” position.
10. Release the parking brake.
11. Slowly depress the accelerator pedal.
### Shutdown
1. Drive the unit to its designated parking place.
2. Stop the unit by releasing the accelerator pedal and depressing the brake pedal.
3. Set the parking brake by pulling the parking brake lever to the up position.
4. Move the direction control lever to the “NEUTRAL” position.
5. Turn “OFF” all accessories.
6. Turn master switch to the “OFF” position.

### Inching Device Operation Procedure
1. Turn the main switch to the on position.
2. Set the direction lever to neutral.
3. Release the parking brake, if applied.
4. Walk to the rear of the tractor, on the side the inching device controls are located.
5. While standing beside the tractor, out of the area of movement, press the forward or reverse button to move the tractor.
6. Repeat until the desired towbar is aligned with the hitch.
7. Connect the towbar.

### Warning
- THIS OPTION IS ONLY TO BE USED ON LEVEL GROUND.
- NEVER USE THE OPTION TO MOVE THE TRACTOR FROM LEVEL GROUND TO A SLOPED AREA.
- IF THE FRONT WHEELS ARE TURNED, THE TRACTOR WILL MOVE IN THE SHADED AREA.
- STAY CLEAR OF THIS AREA.
- THE OPERATOR MUST BE SURE THAT NO ONE IS IN THE AREA OF TRAVEL.
- THE OPERATOR MUST NEVER BE IN THE AREA OF TRAVEL.
- IF THE DIRECTION LEVER IS SET IN A DIRECTION, THE INCHING DEVICE WILL WORK IN THIS DIRECTION ONLY.
- THE STOP BUTTON SHUTS OFF POWER TO THE TRACTOR ONLY. THE BRAKES ARE NOT APPLIED; THEREFORE THE TRACTOR WILL COAST A VERY SHORT DISTANCE.
CLARK CTA-30,M-30
EQUI TECH M30HmHTA30D
HARLAN BT345,MA30-8
TUG and S/S CTA6-30D
JETLINE MA30-4,MA30H, MA30-13,14,15

Perkins 4.236 and D2300 Hercules Engine
CLARK, EQUITECH, HARLAN, TUG and S/S, JETLINE with Perkins 4.236 and D2300 Hercules Engine

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: DIESEL
MANUFACTURE: CLARK, EQUITECH, HARLAN, TUG and S/S, JETLINE MODEL: CTA-30, M-30, M30HMHTA30D, BT345, MA30-8, CTA6-30D, MA30-4, MA30H, MA30-13, 14, 15

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES: (Perkins 4.236 and D2300 Hercules Engine)
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Make certain the engine STOP control is pushed all the way in to the RUN position (if applicable)
4. Place foot on service brake pedal and apply pressure.
5. Push accelerator pedal ½ to ¾ of travel during start.
6. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.

CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
7. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
8. Allow engine to warm up before using.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation
CAUTION:
OPERATE ONLY WITH DOORS CLOSED ( IF EQUIPPED ).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:
1. Set Handbrake.
2. Place Morse shift lever in NEUTRAL position.
3. Pull engine STOP control until engine stops ( if equipped ).
4. Turn ignition or key switch clockwise to the off position.
5. Assure all lights and accessories have been turned OFF.
CLARK CTA-30, M-30
EQUITECH M30HmHTA30D
HARLAN BT345, MA30-8
TUG and S/S CTA6-30D
JETLINE MA30-4, MA30H, MA30-13, 14, 15

ONAN L634D Engine and Deutz Engine
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR  TYPE: DIESEL
MANUFACTURE: CLARK, EQUITECH, HARLAN, TUG and S/S, JETLINE
MODEL: CTA-30,M-30, M30HmHTA30D, BT345,MA30-8,
CTA6-30D, MA30-4,MA30H, MA30-13,14,15

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting Procedures (ONAN L634D Engine and Deutz Engine)
1. Set Handbrake.
2. Place Morse shift lever in NEUTRAL position.
3. Place foot on service brake pedal and apply pressure.
4. Push accelerator pedal down ½ to ¾ of travel during start.
5. Turn key switch to RUN position.

NOTE: Glow plug light will illuminate.
6. WAIT for glow plug light to go out (about seven seconds). When glow plug light goes out, the plugs have heated sufficiently to assist starting.
7. Deutz starter won’t engage until pre-glow times out in a few seconds.

CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
8. Turn key switch the rest of the way to the START position to crank engine and release back to RUN position as soon as engine starts.
9. Allow engine to warm up before using.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:

OPERATE ONLY WITH DOORS CLOSED ( IF EQUIPPED ).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:

1. Set Handbrake.
2. Place Morse shift lever in NEUTRAL position.
3. Pull engine STOP control until engine stops ( if equipped ).
4. Turn ignition or key switch clockwise to the off position.
5. Assure all lights and accessories have been turned OFF.
CLARK, EQUITECH, HARLAN, TUG and S/S, JETLINE – Gasoline Engine

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
TYPE: Gasoline
MANUFACTURE: CLARK, EQUITECH, HARLAN, TUG, S/S, JETLINE
MODEL: CTA-30, M-30, M-50, M30Hm, HTA30D, BT345, MA30-8,
CTA6-30D, MA30-4, MA30H, MA30-13,14,15

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting Procedures
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.
   NOTE: Use the CHOKE and THROTTLE controls as needed during start.
   CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
5. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
6. Allow engine to warm up before using.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:
OPERATE ONLY WITH DOORS CLOSED ( IF EQUIPPED ).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:
1. Place Morse shift lever in NEUTRAL position.
2. Set Handbrake.
3. Turn ignition or key switch clockwise to the off position.
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: Gasoline
MANUFACTURER: Clark, Jetline MODEL: CT-120, M-120

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting Procedures
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.
   
   NOTE: Use the CHOKE and THROTTLE controls as needed during start.

   CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
5. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
6. Allow engine to warm up before using.
**WARNING:** ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

**Vehicle Operation**

**CAUTION:**
- OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
- DO NOT USE TO PUSH OTHER EQUIPMENT.
- NEVER EXCEED AIRPORT SPEED LIMIT
- NEVER PULL MORE THAN FOUR (4) CARTS.
- NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
- NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
- NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

**Engine Shut Down:**

1. Place the shift lever in “P” position.
2. Set Handbrake.
3. Reduce engine speed to idle if the engine is hot. Allow the engine to idle for several minutes to cool to below 195 degrees. Then turn the ignition switch to “OFF.”
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: Eagle
TYPE: Gasoline
MODEL: TT-8

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting & Shut-Down Procedures
Never start the tractor's engine while standing on the ground.
Start the engine from the operator's seat with the transmission
in neutral or park and the parking brake in the "ON" position.

Your tractor's seat(s) is/are equipped with retractable seat belts
for your safety. Fasten your seat belt and adjust the seat before
starting the engine. Be sure seat belt is fitted snugly around the
hips, not around the waist as failure to do so may cause injury
in the event of a collision.

Your tractor may be equipped with an operator's seat
containing a safety pressure switch and/or an operator floor
mat containing a safety pressure switch (depending on model
and options). If it is, it will automatically shut the engine down
anytime the transmission is in gear and the operator is not
present in the operator’s workstation.
Gasoline/LP Tractors

Be sure that the transmission is in "Park" or "Neutral".
1. Turn ignition switch to the "ON" position.
2. Depress accelerator pedal once and release.
3. Turn ignition to the "crank" (Start) position to activate the starter motor. Do not crank the engine more than 10 seconds if it doesn't start. If engine does not start, turn ignition switch off. Turn ignition switch to “ON” position. Depress accelerator pedal twice and release. Turn ignition to the "crank" position to activate the starter motor.
4. As soon as the engine starts, release the ignition switch and allow it to return to the “ON” position to avoid damage to the starter and/or flywheel gear teeth.
5. Allow the engine to warm up for a minute or two.
6. Read all instrument panel gauges to verify they are all within the normal operating ranges defined previously under "Instrumentation".

Next page for Diesel Engine Starting Procedure

Transmission Operation

The transmission is controlled by a "lever type" gearshift located in the instrument pan-el or console. The control has six selector positions- P (Park), R (Reverse), N (Neutral), D (Drive), 2 (Second) and 1 (First). In entering or leaving a gear position, the lever must be moved past a gate. To do this, place the palm of your hand on the top of the selector lever and reach under with your fingers and grip the release mechanism and pull up (or squeeze). Shift to the desired position and release the selector.

1. Keep your foot ON the brake pedal and OFF the accelerator and release the parking brake before shifting the transmission into gear.
2. Before shifting from forward to reverse or reverse to forward, bring the vehicle to a complete stop. Do not shift into gear except when the engine is at idle speed.
3. Before dismounting from the tractor, place the transmission in "PARK" and apply the parking brake.
Diesel Engine Equipped Starting Procedures

Diesel Engine (4TNV98)
Be sure the transmission is in "Park" or "Neutral".
1. Turn ignition switch to the "ON" position.
2. See “Starting the Unit” in section 5.4.
3. Allow the engine to run at idle speed approximately 6 minutes (1/10 of an hour on the hour meter) to circulate and warm engine oil to a safe operating temperature.
4. To shut down the engine, reduce engine speed to idle if the engine is hot. Allow the engine to idle for several minutes to cool to below 195 degrees. Then turn the ignition switch to “OFF.”

Diesel Engine (With Dash Mounted Glow Plug)
Be sure the transmission is in "Park" or "Neutral".
1. Turn ignition switch to the "ON" position.
2. Push the Red or Black Rubber button labeled “Glow Plug” on the instrument panel. Hold down for the recommended length of time shown on the chart next to the button, then release.
3. Turn the ignition to the “Crank” position to activate the starter motor. Do not crank the engine more that 10 seconds. If the engine does not start, turn the ignition switch to the “OFF” position and repeat the steps above.
4. Allow the engine to run at idle speed approximately 6 minutes (1/10 of an hour on the hour meter) to circulate and warm engine oil to a safe operating temperature.
5. To shut down the engine, reduce engine speed to idle if the engine is hot. Allow the engine to idle for several minutes to cool to below 195 degrees. Then turn the ignition switch to “OFF.”

Warning: External starting fluids should not be used in a diesel engine air intake system. The use of these fluids will cause severe internal engine damage.

Note: Diesel Tugs powered by a TMD, TMD27, 4JB1, 4JG1, or 4JG1T engine that are equipped with “Low Oil / Hi Temp Shutdown System” must follow the above start procedure as the system will recognize low oil pressure after 10 to 15 seconds of ignition “ON” position before the starter engages. The ignition must be put back into the “OFF” position to reset the timer or the engine will not attempt to restart.
Parking Brake
The parking brake is operated by hand lever action. By pulling back on the lever, you activate and set the brake. Pushing forward will release the brake. The brake is adjustable for braking pressure by rotating the knob on the end of the handle lever. A clockwise direction is used to increase the brake holding pressure and counter clockwise to reduce the pressure.

All trucks feature a safety system to protect the parking brake from accidental misuse. Depending on engine type, either the accelerator pedal will not respond when the parking brake is engaged, or the engine will shut off when both the parking brake is engaged and the truck is shifted out of Park or Neutral.

Foot Brake
The foot brake is power assisted and should be applied with a steady and firm downward pressure. If the power assist should fail, the brakes will still operate mechanically but will require increased foot pressure. Always anticipate that you may have to stop unexpectedly.

Speed should always be adjusted to allow for a safe and controlled stop. Adjust your speed based on the surface conditions, the space available for stopping and the weight of the load being moved. Be aware of your surroundings. Always be prepared to stop and avoid sudden stops.

Caution: If driving on wet or slippery surfaces, lower speed and allow for more stopping distance. Do not spin the wheels when starting up as this may cause damage to the drive mechanisms.

Your tractor is equipped with both front and rear wheel brakes. The front and rear brakes operate on a dual system--if one set should fail the operation of the other set will continue. The system has an emergency back up of up to three hard applications of the brakes should both systems fail.

Parking
Every time you park, apply the hand brake, turn the engine off, turn the ignition switch to "OFF" and return the transmission shift lever to neutral or park position.

Do not park where you may block other vehicles paths or movement by emergency vehicles.
Moving Loads
Maximum capacity towing or pushing of loads shall be done with the transmission selector lever in 1(first) or REV (reverse) gears.

Load Towing Safety
If towing a load, check to see that:
• The towed load is securely connected to the hitch of the tractor. Be sure hitch is locked/fastened into the closed position.
• The towed cargo load is secure and within the exterior frame of the vehicle that is carrying the load.
• For maximum tractor and load control and stability, as well as towing power, be sure the tongue of the trailer is parallel to the ground when connected to the tractor's hitch.
• Watch the trailer's rear swing clears any obstructions when cornering.

Load Pushing Safety
If pushing a load:
• Be sure the tractor is designed for and intended to be used to push the load.
• If using the tractor for "pushback" of an aircraft, be sure the tow bar is securely fastened to both the aircraft and the tractor and the tractor hitch is in the locked position.
Equitech

Model: M-30

OPERATING INSTRUCTIONS

EQUIPMENT: TOW TRACTOR

MANUFACTURER: Equitech

TYPE: Gasoline

MODEL: M-30

BEFORE STARTING:

Complete Daily Check before using.

Check placards for special instructions and restrictions.

Check location of levers, switches and controls.

Check general condition of entire unit.

Starting Procedures

1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.

   NOTE: Use the CHOKE and THROTTLE controls as needed during start.

   CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.

5. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
6. Allow engine to warm up before using.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:

OPERATE ONLY WITH DOORS CLOSED ( IF EQUIPPED ).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:

1. Place the shift lever in “P” position.
2. Set Handbrake.
3. Reduce engine speed to idle if the engine is hot. Allow the engine to idle for several minutes to cool to below 195 degrees. Then turn the ignition switch to “OFF.”
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR  TYPE: Diesel
MANUFACTURER: FMC, EQUITECH, JETLINE/JETWAY  MODEL: B-350, B-250, B-320

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting and Warm-up Procedures

(1) Starting the engine, normal starts (ambient temperature above 32°F [0°C]).
   
   (a) Ensure that the park brake lever is pulled to engage brake to prevent vehicle movement.
   
   (b) Place transmission shift lever in neutral “N.”
   
   (c) Turn the ignition starter switch to the ignition position to activate the electrical circuit. Be sure the alternator warning and engine warning lights are operational.
   
   (d) Depress the accelerator pedal approximately halfway.
   
   (e) Turn the ignition starter switch to the start position to engage the starter. Once the switch has been turned to the start position, it can not be returned to the start position without first turning to the off position. If engine does not start after 10 seconds of cranking, repeat starting procedure.

   CAUTION
   IF THE ENGINE DOES NOT START WITHIN 30 SECONDS, RELEASE THE START SWITCH AND WAIT 2 MINUTES FOR THE STARTING MOTOR TO COOL DOWN BEFORE ATTEMPTING TO START THE ENGINE AGAIN.
(2) Starting the engine, cold starts (ambient temperature below 32°F [0°C]).

(a) **PERKINS & DEUTZ**: Pre-heat the engine and transmission, then follow the steps outlined in paragraph B (1).

(b) **DEUTZ ONLY**: Pre-heat the engine starting fuel by raising the Cold Start momentary action toggle switch, located next to the Ignition switch, for 15 to 30 seconds. Next, try to start the engine. If the engine does not start, repeat the process.

**NOTE**: To pre-heat the engine and transmission fluids, an optional engine heater and fuel heater may be required. See cold environment specifications in Section 1-3 for lubricants and coolant.

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**Mobile Operation**

Follow these procedures for maneuvering the vehicle:

(1) Check all instruments and gauges for normal indication and proper function.

(2) With the park brake on and shift lever in neutral, accelerate and decelerate the engine to make sure the throttle works correctly.

(3) Test foot brake pedal for travel and firmness that is associated with solid stopping action.

(4) Be sure you can control the direction of travel. Shift transmission control lever in both directions. The brake must be applied when shifting direction.

(5) Look to see that the intended path of the vehicle is clear of obstacles and any safety hazards.

(6) Apply the service brake with your right foot and hold firmly.

(7) With the engine at idle speed, place the transmission shift lever into the desired direction and gear.

**CAUTION** **DO NOT SHIFT GEARS WHEN TOWING OR PUSHING LOAD!**
(8) Release the parking brake.

(9) Release the foot brake gently, then depress the accelerator smoothly and evenly until desired speed is reached.

**NOTE:** Hard acceleration will result in excessive fuel consumption.

**D. Stopping Procedure**

(1) Decrease speed by removing your foot from the accelerator pedal.

(2) Use moderate pressure on the brake pedal and bring the vehicle to a gradual stop.

**CAUTION** THE PARKING BRAKE IS DESIGNED TO HOLD THE TRACTOR. IT IS NOT TO BE USED TO STOP THE TRACTOR.

(3) With the tractor completely stopped, place transmission shift lever into "N" (neutral).

(4) Pull the parking brake lever to apply parking brake.

(5) Release service brake, allowing the engine to idle.

**WARNING** WHENEVER LEAVING THE DRIVER'S SEAT OF THE TOW TRACTOR UNATTENDED, THE TOW TRACTOR MUST BE SHUT DOWN!

**WARNING** IF THE ENGINE SHUTS DOWN, THE OPERATOR HAS FIVE BRAKE ACTUATIONS TO STOP THE VEHICLE!

**E. Shutdown Procedures**

(1) When shutting down the engine, always allow it to idle for at least two minutes to stabilize and cool the engine temperature.

**CAUTION** FAILURE TO ALLOW THE ENGINE TO COOL DOWN WILL RESULT IN DAMAGE TO THE SEALS AND GASKETS OF THE ENGINE!

(2) Turn the ignition starter switch to OFF to shut off the tractor and any other lights or accessories that are still operating.

(3) Chock tow tractor wheels.
GILIBERTI  Model: G12

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR  TYPE: DIESEL
MANUFACTURER: GILIBERTI  Model: G10

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Check Fuel and Battery Charge Level
The gauge should indicate 4 green lights when the vehicle is fully charged. If all four lights are red, the vehicle is not charged and should be placed back on charge. If the unit is 50% charged or less (2 green lights or 1) only use the unit with the onboard generator engaged (Hybrid mode).
STARTING PROCEDURES:

1. To turn the vehicle on by moving the first switch on the far left of the top row of the control panel, to the forward position (labeled POWER - ON/OFF).

2. Check to see that both lights, below the POWER switch, illuminate once and then go out. (If they continue to blink, cycle the POWER switch on and off and try again) If they continue to blink please notify technician.

- NOTE -

DO NOT USE THE VEHICLE TO PULL ANY LOADS OR AIRCRAFT IF ONLY ONE LIGHT IS ILLUMINATED.

Hybrid Mode:

To operate in Hybrid mode, pull the throttle cable (located in front of seat plate) up towards seat and turn to right and lock- in. Then depress the plunger ball to the left of cable and push until generator starts or no more than 3 to 5 seconds. If the generator does not start, do not depress plunger ball until throttle cable is checked it has been raised and that the unit had sufficient fuel in fuel tank. If yes to both these then repeat above operation.

To shut off diesel turn throttle handle to the left of the lock position and push lever down, generator will shut off automatically.
To commence driving the vehicle the driver should place the second switch to the right of MAIN POWER SWITCH on the top row of the control panel, labeled FORWARD/REVERSE, forward to go forward or backward to go in reverse. Then the driver should release parking hand brake and then remove his/her right foot from the brake pedal.

With the right foot, the driver should depress the accelerator pedal slowly, and at the same time, briefly look down at the two red lights under the power switch to make sure neither is illuminated or blinking. If neither light is blinking then the unit is ready for normal operation.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:

OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:

1. To stop operation of vehicle place right foot on brake and depress.
2. Put vehicle in neutral (second switch top row) then turn vehicle off (first switch top row) and pull up on parking brake.
3. Make sure diesel is no longer running.
4. Exit vehicle and plug in chargers by 110-volt electricity using extension cords. A/C receptacles are located front under dash on left side of vehicle.
OPERATING INSTRUCTIONS
EQUIPMENT: Baggage or Baggage/Pushback Tractor  TYPE: Electric
MANUFACTURER: HARLAN  MODEL: HLE

BEFORE STARTING
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting the Tow Tractor
Complete these steps to start the tow tractor:
1. Check all controls (see indicator locations) and disengage all emergency stop switches.
2. Remove all obstructions from in front of and behind the tires.
3. Sit in the operator’s seat.
4. Be sure that the directional control lever is in the Neutral position (N).
5. Turn the key switch to the ON position.
6. Select direction of travel (F) or (R).
Switch Options
Tractors with the Push-Back option have a Mode switch with Aircraft and Bag Cart modes. When set to Aircraft mode, it reduces the maximum speed to one third of the Bag Cart setting. It also makes acceleration more gradual.

Figure 2, Controls and Gauges
1. Tractor Key Switch
2. Tractor Emergency Stop Button
3. Directional Control Lever
   The directional control lever has three positions, forward, reverse and neutral and is held in each position by a spring detent. The direction of travel is labeled on the dash.
4. Dash Switches
   Switch assignments vary somewhat according to the options installed in the tractor. See Figure 4
   Dash Switch Options.
   - Headlights
   - Windshield Wiper
   - Heater
   - Optional Switch
5. Dash Display
6. Horn Button
7. Brake Pedal
8. Accelerator Pedal
9. Park Brake Lever
10. Heater

Warning: The heater gets very hot during normal operation.
11. Steering Wheel
12. Turn Signal
13. Park Brake Operation Label
Operating the Tractor/Pushback

Battery Condition Indicator (BCI)

If your tractor has the gauge shown in Figure 3, Battery Condition Indicator (BCI), instead of the display shown in Figure 4, Electronic Dash Display, skip these headings:

• Electronic Dash Display
• User Interface
• enGage™ IV Menu System
• Choosing Items within the Menu System
• TRIP Odometer reset:

The BCI displays the remaining charge in the battery and, if the controller detects a fault, the BCI displays the fault code. To decode a fault code, see the HBLE O&M Manual.

Electronic Dash Display

This section contains instructions for operating the tractor under normal conditions. The operator must have a complete understanding of the location and function of all of the operating controls before attempting to operate the tractor.

The electronic dash display functions as a (1) speedometer, (2) trip odometer, (3) total odometer, (4) belt loader hour meter, (5) battery charge meter and (6) Park Brake / Directional Control indicator. You can set up additional functions with the (7) menu button and (8) navigation buttons.
Driving the Tractor

Complete these steps to drive the tractor:
1. Apply the brakes by depressing the brake pedal and release the hand brake.
2. Select forward (F) or reverse (R) with the directional control lever.
3. Release the pressure on the brake pedal and slowly depress the accelerator pedal to put the tractor into motion.

Stopping the Tractor

Do not exceed the tractor’s Draw Bar Pull capacity. Getting the load moving should not be your main concern. The load you are towing has a major effect on stopping distance.

Complete these steps to stop the tractor:
1. Release the accelerator pedal.
2. Press the brake pedal so that the tractor decelerates smoothly.
3. When the tractor comes to a halt, put the directional control lever in the neutral position (N).
4. To park the tractor, turn OFF the ignition switch and apply the parking brake. (If you park on a flight deck, put chocks in their proper places to secure the wheels.)

This tractor has an anti-roll feature that will hold the tractor’s position on an inclined surface with no operator input. It is not intended to replace the parking brake.

CAUTION Always apply the parking brake before you get out of the tractor or turn off the power.
Inching (Optional)
Moving the tractor very slowly using the buttons on the back of the tractor is called Inching. Because using this feature requires getting out of the tractor with the power on and the park brake off, it conflicts with some organizations’ safety policies. In those cases, this feature is disabled.
If the Inching feature is enabled on your tractor complete these steps to use it:
1. Stop close to the trailer.
2. Place the directional control lever in the Neutral position (N).
3. Walk to the back of the tractor.
4. Use the inching buttons to move the tractor several inches forward or backward by pushing the appropriate button. Each time the button is depressed and released the tractor will move several inches.
5. Once the tractor is position, return to the driver’s seat and proceed to drive the tractor.

Caution
The Emergency Stop Buttons are for emergency use only. They disable the entire tractor and will allow the tractor to roll on an incline.
OPERATING INSTRUCTIONS

EQUIPMENT: TOW TRACTOR
TYPE: DIESEL

MANUFACTURER: Harlan
MODEL: HTAZ30SDWDN

BEFORE STARTING:

Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES: (PERKINS 4.236 ENGINE)

1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn “IGNITION” switch clockwise to the “START” position to crank engine. Release to the “RUN” position as soon as the engine starts.

   (use this procedure if equipped with the high heat/low oil shut down)

5. Depress the push button located on the dash until an oil pressure reading appears on the gauge (25 psi) and then crank.
6. Release button, allow engine to warm up before using.

   CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.

7. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:
OPERATE ONLY WITH DOORS CLOSED ( IF EQUIPPED ).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Turn ignition or key switch clockwise to the “OFF” position.
4. Assure that all lights and accessories have been turned “OFF”.
Harlan                             Model: HTAZ, HTAW

OPERATING INSTRUCTIONS            TYPE: DIESEL
EQUIPMENT: TOW TRACTOR            MANUFACTURER: Harlan     MODEL: HTAZ, HTAW

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES: (PERKINS 4.236 ENGINE)
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn “IGNITION” switch clockwise to the “START” position to crank engine. Release to the “RUN” position as soon as the engine starts.
   
   (use this procedure if equipped with the high heat/low oil shut down)
5. Depress the push button located on the dash until an oil pressure reading appears on the gauge (25 psi) and then crank.
6. Release button, allow engine to warm up before using.

   CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
7. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
Vehicle Operation
CAUTION:
OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

1. Engine Start and "Ignition" Switch. Turn past spring pressure to start engine. If engine does not start within 15 seconds, turn switch off and wait one minute before trying again.
2. Engine Coolant Temperature. If temperature exceeds 225°, shut down engine and check coolant level.
3. Fuel Level: Avoid running until out of fuel.
4. Volt Meter: Normal = 13V with engine at idle or stopped, not over 14.5V with engine above idle. Avoid operating tractor voltages above or below normal.
5. Hour Meter. Hours increase while oil pressure is greater than zero.

Accelerator Pedal
7. Brake Pedal
8. Transmission Shift Lever. There are two options available: F-N-R proves only Forward, Neutral, and Reverse positions. P-R-N-D-3-2-1 provides 4 forward speeds and aark position in additional to Neutral and Reverse.

6. Park Brake Lever.
9. Headlight Switch.
10. Heater Fan Switch
11. Heater. The hot water supply control valve on the front of the engine where the water hose connects to it.
12. Windshield Wiper
13. Windshield Wiper Switch
14. Optional Switch, usually for beacon light
15. Optional Switch, alternate location for Work Light.
16. Optional Switch, usually for Work Lights
17. Cab Fan and Switch. Caution: This switch may be connected to the battery. If so, avoid running the fan too long with the engine off or you may deplete the battery.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Note: Be sure that all of the gauges are in the normal operating ranges while the tractor is in operation.

1. Complete these steps to drive the tractor:
2. Step on the brake pedal and release the hand brake.
3. Select the proper gear with the transmission selection lever. Be sure that the gear selected is suitable to move the intended load.
4. Release the pressure on the brake pedal and slowly depress the accelerator pedal to put the tractor into motion.
5. When shifting from a forward gear to reverse gear, bring the tractor to a complete stop.

Caution  Do not shift between forward and reverse while the tractor is moving except in a brake failure emergency. Do not shift into forward or reverse with the engine running faster than idle. Both of these actions can damage the transmission, drive line, and drive axle.

6. If the tractor is stopped for longer than a minute with the engine running, shift the transmission into neutral (N).

Engine Shut Down:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Turn ignition or key switch clockwise to the “OFF” position.
4. Assure that all lights and accessories have been turned “OFF”.

**Kubota**

**Model: L2550**

**OPERATING INSTRUCTIONS**

**EQUIPMENT: TOW TRACTOR**

**TYPE: Gasoline**

**MANUFACTURER: Kubota**

**MODEL: L2550**

**BEFORE STARTING:**

- Complete Daily Check before using.
- Check placards for special instructions and restrictions.
- Check location of levers, switches and controls.
- Check general condition of entire unit.

**Starting Procedures**

1. Set hand brake.
2. Place foot on service brake pedal and apply pressure.
3. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.

   **NOTE:** Use the CHOKE and THROTTLE controls as needed during start.

   **CAUTION:** DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.

4. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
5. Allow engine to warm up before using.
**WARNING:** ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

**CAUTION:**

OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

**Engine Shut Down:**

1. Place the shift lever in “P” position.
2. Set Handbrake.
3. Reduce engine speed to idle if the engine is hot. Allow the engine to idle for several minutes to cool to below 195 degrees. Then turn the ignition switch to “OFF.”
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: Lektro

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Controls:

a. Nose Wheel Cradle Raise/Lower Switch
b. Winch Strap Motor Control Switch
c. EV200 Dash Display
d. Motive Power Key Switch
e. Monitor for Cradle Camera
a. MAIN POWER DISCONNECT SWITCH
b. PARK BRAKE SWITCH
c. FORWARD/NEUTRAL/REVERSE LEVER
d. DRIVER SELECT TOGGLE SWITCH
   (DUAL HELM OPERATOR OPTION ONLY)
e. 12 V POWER OUTLET
f. CUP HOLDER
Aircraft Nose Wheel Cradle:
This is a hydraulically operated cradle assembly to carry the aircraft wheel during towing operations.
During aircraft capture and release, the front portion of the cradle is lowered to provide an access ramp to the back of the cradle.
When the aircraft wheel is winched onto the back of the cradle, the front portion of the cradle is raised to provide ground clearance during towing operations.

Side Gates:
Two adjustable side gates, attached to a slide bar on the rear of the nose wheel cradle, are installed as an integral part of the nose wheel cradle assembly.
Each gate is equipped with locks to secure the gates close to the nose wheel cradle in the required positions and secure the aircraft tire to the nose wheel cradle.
In most cases, the gates will be left in their most outward positions to allow the aircraft wheel to pivot on the cradle. At other times when it is necessary to prevent movement of the aircraft wheel, the gates can be moved inward to better secure the wheel.
**Winch Assembly**

The winch assembly consists of an electrically controlled, hydraulically powered winch motor and drum unit located under the front deck to which is attached a winch strap equipped with a safety hook latch extending from an opening in the tug body, just above the nose wheel cradle. Its purpose is to pull the aircraft nose wheel onto the nose wheel cradle and to secure it in place during towing.

When using the fender control, a limit switch, located on the back wall of the nose wheel cradle stops the winch motor when the nose wheel is winched against the back wall switch. The operation of the hydraulic power disconnect button: This is a 2-position switch. Pushing it IN switches the power supply to the winch system off.

**NOTE 1:** The winch control switch located on the instrument panel overrides these switches so that the winch and strut straps can be adjusted while towing.

To extend the winch strap:

- Move either of the two winch strap motor control switches to the extend position.

To retract the winch strap:

- Move either of the two winch strap motor control switches to the retract position.
**Park Brake System:**
The park brake system on this tug is unique in that it requires power to be released. This is a "fail-safe" system to ensure the unit does not move accidentally.

- The park brake will engage automatically if one of the following conditions exist:
  - Electrical power is not available from the battery.
  - Electrical failures occur which affect the drive circuits.
  - Leakage or loss of pressure occurs in the hydraulic system.

The park brake can be engaged by taking one of the following actions:

- Moving the key switch to the OFF position.
- Moving the main power disconnect switch to the OFF position.
- Pulling the Park Brake Switch to the applied position.

**CAUTION:** APPLICATION OF THE EMERGENCY PARK BRAKE SYSTEM WHILE THE TUG IS IN MOTION SHOULD BE DONE ONLY IN AN EMERGENCY SINCE IT WILL BRING THE TUG TO AN ABRUPT STOP.
To release the park brake:

- Pull the main power disconnect switch to the ON position.
- Turn the key switch to the ON position.
- Push the yellow diamond Park Brake Switch to the down position to release Park Brakes.
- Move the forward/neutral/reverse lever to the FORWARD or REVERSE position.
- Press the accelerator pedal - or - operate the cradle or winch motors from the dash switches or remote location switches.

NOTE 1: If the park brake system was engaged while the forward/neutral/reverse selectors were engaged, to disengage the park brake:

- Move the forward/neutral/reverse lever to the NEUTRAL position. Then select the desired and forward or reverse direction.

NOTE 2: The park brake will be operationally released if the cradle or winch motors are operated while the Park Brake Switch is in the released position.

NOTE 3: To release the park brake system in the event of an automatic emergency application, one of the following actions must be taken:

- Restore electrical power.
- Restore hydraulic system pressure.
- If the above action steps are not possible or if they fail to release the brakes call GSE Maintenance.
Pre Driving:
- Ensure that a formal Operator's Pre-Use Safety Inspection has been performed.
- Perform a Walk-Around inspection to ensure the unit is free to move without causing damage and that all objects on the unit are secured.
- Lift the operator's console to provide access to the operator's seat.
- Sit in the operator’s seat and ensure arms and legs are inside the perimeter of the unit.
- Lower and adjust the operator's console as required for operator comfort and safety.
- Lock the operator’s console into place.
- Adjust the operator's seat as required to ensure all driving controls can be reached and operated safely and comfortably.
- Fasten the seat belts as required for operator and passenger safety and comfort.
- Adjust the arm rests as required for operator and passenger safety and comfort.
- Ensure the Main Power Disconnect switch is placed in the contact position.
- Turn the master key on.
- Verify that sufficient charge remains to accomplish the required task.

Driving:
- Press the brake pedal to apply the brakes.
- Release Park Brake by Pushing Yellow Park Brake Switch DOWN.
- Place the forward/neutral/reverse selector to NEUTRAL.
- Place the forward/neutral/reverse selector in the desired position.
- After two (2) seconds, gradually press the accelerator as required to move the unit.
- If the unit does not move on initial accelerator application, lift foot and let the accelerator pedal return, then press again. This will reset the controller and the unit should then move.
- Control the speed of the unit using the accelerator and brake pedal as required.
- Turn as required using the steering wheel.
- Stop the unit using the brake pedal.

WARNING: Because the tug uses the rear wheels to steer, the operator must be aware of how this affects the handling of the unit and be prepared to take special precautions to avoid accidents. When moving the tug, start slowly until it is determined in which direction the steer wheels are oriented and correct, if necessary, before accelerating. When the steer wheels are turned, check the path of the rear of the tug to ensure it is free from obstructions. Prior to parking the tug and, while still moving, always center the steer wheels so that the tug will move in a straight line.
Stopping the unit can be accomplished in a number of ways:

• By applying controlled pressure to the service brake foot pedal bringing the tug to a gradual and controlled stop.

• When the tug is not engaged in towing, by switching the forward/reverse selector to the position opposite to the direction of travel and then applying controlled pressure on the accelerator foot pedal to bring the unit to a controlled stop. This technique, known as "Plug Braking", is explained in greater detail below.

• Emergency braking by engaging the park brake. This should be done only in an emergency since it will bring the tug to an abrupt stop.

Plug Braking is a procedure unique to electric vehicles. Simply put, it uses the tug’s drive motor to act as a brake to slow the unit down and reverse direction in one motion. It does not damage any portion of the tug. The amount of foot pressure on the accelerator determines the resulting braking and acceleration force.

To use Plug Braking:

• While the unit is moving in one direction, remove foot pressure on the accelerator.

• Switch the forward/neutral/reverse selector to the opposite direction of travel.

• Apply foot pressure to stop the tug and, if desired, accelerate in the opposite direction.

**CAUTION:** Except in an emergency event of primary brake failure, do not use plug braking while towing an aircraft for these reasons:

• The resulting force is more sudden and not as finely controlled as service braking and could cause the aircraft wheel to override the cradle envelope.

• Plug braking is pre-set at the factory to safely and smoothly stop the tug when empty.
**Emergency Braking:**

- In the event an emergency stop is warranted due to an immediate danger of collision and service foot brake pedal fails to stop the tug, apply the park brake system to stop the tug. Should the park brake system also fail, use the plug braking technique to stop the tug.

- In the event a stop is required due to the failure of the service foot brake and an immediate danger of collision does not exist, use the plug braking technique to stop the operation before attempting to apply the park brake system.

**Leaving the Operator’s Compartment Temporarily:**

- Press the brake pedal to apply the brakes.
- Place the forward/neutral/reverse selector lever in the NEUTRAL position.
- Place the park switch in the applied position.
- Turn the key switch OFF.

**Shut Down:**

If the tug is to be left unattended for an extended period of time:

- Center the steer wheels.
- Press the brake pedal to apply the brakes.
- Place the forward/neutral/reverse selector lever in the NEUTRAL position.
- Place the park/switch lever in the applied position.
- Turn the key switch off.
Lektro Model: AP8750A

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: Lektro

TYPE: Electric
Model: AP8750A

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Controls:
Dash Panel (steering wheel removed)
**Cradle and Winch Assembly:**

![Diagram of cradle and winch assembly]

**a. Aircraft Nose Wheel Cradle:**

This is a hydraulically operated cradle assembly to carry the aircraft wheel during towing operations. Once lifted in the cradle, the aircraft's nosewheel weight becomes tractor mass and provides the towbarless tug with a variable and correct drawbar pull and traction limit rating, proportional to the aircraft's ramp weight.

During aircraft capture and release, the front portion of the cradle is lowered to provide an access ramp to the back of the cradle.

When the aircraft wheel is winched onto the back of the cradle, the front portion of the cradle is raised to provide ground clearance during towing operations. For normal towing and pushing operations, the cradle is only raised enough to clear ground obstacles, at an average of about 4" at the cradle front.
Winch Assembly:

The winch assembly consists of an electrically controlled, hydraulically powered winch motor and drum unit located on the rear deck, to which is attached a winch strap equipped with a safety-latched hook. This winch strap extends forward through a mid-deck fairlead and a foredeck roller guide to just above the nose wheel cradle. Its purpose is to pull the aircraft nose or tail wheel onto the cradle and to secure it in place during towing. The winch motor is equipped with a lever which when turned with the handle pointed opposite to engaged position, allows the winch motor to free-wheel to ease and speed up extending the winch strap for next aircraft capture sequence.
Winch and Cradle Remote Controls:

The winch motor and cradle raise/lower hydraulics are activated by toggle switches located on the left front tug fender in an enclosure. This forward location allows easier manipulation when capturing aircraft. Both toggle switches are two position spring return on/off. A second fixed winch remote control is fitted on the left front cowling face, and reachable by the operator when towing for strap tension adjustment on-the-run. The toggle switch to the rear of the enclosure controls the winch strap "in/out" as shown on the decal.

This forward remote control "IN/OUT" toggle switch at the left front fender is interconnected with a Winch Cut-Off Limit Switch on a nosewheel tire contact bar located on the back wall of the nosewheel cradle, which stops the winch motor when the aircraft wheel is winched against the back wall winch cut-off bar, even if the remote control is toggled to the IN position.

The winch "IN/OUT" control mounted on the left front of cowling, and reachable from the driving position, bypasses this nosewheel contact bar limit switch, so that the operator can adjust strap tension when underway during a tow if the cradle height has to be adjusted. This feature also permits tightening winch strap in event of a downhill capture if nosewheel rolls on faster than winch rate and contacts cut-off bar before winch strap fully tight. (cont.)

**NOTE:** The winch cut-off override switch must be pushed and held down at the same time as cowl mounted IN / OUT winch control switch is toggled to activate winch in the IN direction only. This is a safety feature to force operators to routinely use the fender mounted winch IN switch with auto-winch cut-off, reserving use of cowl switch for exigency situations such as downhill captures.
**Pre Driving:**

- Ensure that a formal Operator's Pre-Use Safety Inspection has been performed.
- Perform a Walk-Around inspection to ensure the unit is free to move without causing damage and that all objects on the unit are secured.
- Ensure that a set of aircraft wheel chocks is stowed on the tug in a side storage compartment.
- Stand at the operator's position and ensure arms and legs are inside the perimeter of the unit.
- Lower the operator's and as applicable the passenger's arm rest/restraint to maximize operator control, comfort and safety and to provide passenger safety.
- Ensure the Main Power Disconnect Handle is in the connected "power on" position.
- Turn the master key on.
- Verify that sufficient motive and if applicable GPU battery charge remains to accomplish the required task/s.
Driving:

- Press the service brake pedal to apply the brakes.
- Step on the deadman pedal with the left foot to release the park brake and activate power to the drive controller. Place most of your body weight on the left leg for maximum comfort and best service brake control with the free right foot.
- Move the directional/accelerator control handle slightly in the desired direction, with a hand steadied by resting the palm on the console top just behind this lever and gripping same with thumb and forefinger/s for the most sensitive control.
- If the unit does not move on initial accelerator application, let the accelerator handle return to neutral, then move it again. This will reset the controller and the unit should then move.
- Control the speed of the unit using the accelerator handle and brake pedal as required.
- Turn as required using the steering wheel.
- Stop the unit using the service brake pedal (not the deadman brake pedal).

**WARNING:** BECAUSE THE TUG USES THE REAR WHEELS TO STEER, THE OPERATOR MUST BE AWARE OF HOW THIS AFFECTS THE HANDLING OF THE UNIT AND BE PREPARED TO TAKE SPECIAL PRECAUTIONS TO AVOID ACCIDENTS. WHEN MOVING THE TUG, START SLOWLY UNTIL IT IS DETERMINED IN WHICH DIRECTION THE STEER WHEELS ARE ORIENTED AND CORRECT, IF NECESSARY, BEFORE ACCELERATING. WHEN THE STEER WHEELS ARE TURNED, CHECK THE PATH OF THE REAR OF THE TUG TO ENSURE IT IS FREE FROM OBSTRUCTIONS. PRIOR TO PARKING THE TUG AND, WHILE STILL MOVING, ALWAYS CENTER THE STEER WHEELS SO THAT THE TUG WILL MOVE IN A STRAIGHT LINE ON THE NEXT START UP.

Emergency Braking:

- In the event an emergency stop is warranted due to an immediate danger of collision and service foot brake pedal fails to stop the tug, apply the emergency/park deadman brake system to stop the tug, by lifting your foot off the deadman pedal. Should the park brake system also fail or be inadequate, use the plug braking technique to stop the tug, by moving the directional/accelerator control handle opposite to direction of travel until a rapid stop is experienced.
- In the event a stop is required due to the failure of the service foot brake and an immediate danger of collision does not exist, use a gradually applied plug braking technique to slow or stop the operation before attempting to apply the emergency/park deadman brake system.
**Leaving the Operator’s Compartment Temporarily:**

- Press the brake pedal with the right foot to apply the brakes.
- Release the directional/accelerator control handle to the NEUTRAL position.
- Step off the deadman brake pedal which when released, sets the park brakes and cuts electric power to the drive motor.
- Turn the power "key" switch OFF.

**Shut Down:**

If the tug is to be left unattended for an extended period of time:

- Center the steer wheels.
- Release the directional/accelerator control handle to the NEUTRAL position.
- Step off the deadman brake pedal which when released, sets the park brakes and cuts electric power to the drive motor.
- Turn the power "key" switch OFF.

**NOTE:** For very long unattended parking where there is a risk of unfamiliar persons tampering with the tug, pull the main power disconnect handle to cut all power.
OPERATING INSTRUCTIONS

EQUIPMENT: TOW TRACTOR
MANUFACTURER: NMC/Wollard

Model: 100DCTC6-8K

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn “IGNITION” switch clockwise to the “START” position to crank engine. Release to the “RUN” position as soon as the engine starts.

CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.

5. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
6. Allow engine to warm up before using.
**WARNING:** ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

**Vehicle Operation**

**CAUTION:**
- OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
- DO NOT USE TO PUSH OTHER EQUIPMENT.
- NEVER EXCEED AIRPORT SPEED LIMIT
- NEVER PULL MORE THAN FOUR (4) CARTS.
- NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
- NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
- NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

**Engine Shut Down:**
1. Place Morse shift lever in NEUTRAL position.
2. Set Handbrake.
3. Turn ignition or key switch clockwise to the off position.
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: NMC/Wollard

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Diesel: Hold rocker switch for about 15 seconds, until green indicator on dash lights.
5. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.

CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
6. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
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WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

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Engine Shut Down:
1. Place Morse shift lever in NEUTRAL position.
2. Set Handbrake.
3. Turn ignition or key switch clockwise to the off position.
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: DIESEL
MANUFACTURER: NMC/Wollard Model: 60F-6K

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Diesel: Hold rocker switch for about 15 seconds, until green indicator on dash lights.
5. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.

CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.

6. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
7. Allow engine to warm up before using.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:

OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:
1. Place Morse shift lever in NEUTRAL position.
2. Set Handbrake.
3. Turn ignition or key switch clockwise to the off position.
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: NMC/Wollard
TYPE: Gasoline
MODEL: 100-F-8000

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Starting Procedures
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn key switch clockwise to the START position to crank engine and release to the RUN position as soon as engine starts.

   NOTE: Use the CHOCKE and THROTTLE controls as needed during start.

   CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.

5. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
6. Allow engine to warm up before using.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:
- OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
- DO NOT USE TO PUSH OTHER EQUIPMENT.
- NEVER EXCEED AIRPORT SPEED LIMIT
- NEVER PULL MORE THAN FOUR (4) CARTS.
- NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
- NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
- NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:
1. Place Morse shift lever in NEUTRAL position.
2. Set Handbrake.
3. Turn ignition or key switch clockwise to the off position.
4. Assure all lights and accessories have been turned OFF.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: Diesel/Gasoline
MANUFACTURER: TIGER, MODEL: Tig-30, 60
Taylor Dunn TC-100/120

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Place foot on service brake pedal and apply pressure.
4. Turn “IGNITION” switch clockwise to the “START” position to crank engine. Release to the “RUN” position as soon as the engine starts.
   (use this procedure if equipped with the high heat/low oil shut down)
5. Depress the push button located on the dash until an oil pressure reading appears on the gauge (25 psi) and then crank.
6. Release button, allow engine to warm up before using.

CAUTION: DO NOT ENGAGE STARTER FOR MORE THAN 15 SECONDS. IF ENGINE FAILS TO START, ALLOW STARTER TO COOL FOR TWO (2) MINUTES; THEN REPEAT PROCEDURE.
7. Check instruments. If not registering correctly, turn engine off and notify Supervisor.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:
OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Engine Shut Down:
1. Set hand brake.
2. Place Morse shift lever in “NEUTRAL” position.
3. Turn ignition or key switch clockwise to the “OFF” position.
4. Assure that all lights and accessories have been turned “OFF”.
OPERATING INSTRUCTIONS

EQUIPMENT: Baggage Tractor
MANUFACTURER: TLD

TYPE: Electric
MODEL: JET-16

BEFORE STARTING

Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

JET-16 Controls

Figure 4

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&quot;Dead man's&quot; pedal (depending on versions)</td>
</tr>
<tr>
<td>2</td>
<td>Brake pedal</td>
</tr>
<tr>
<td>3</td>
<td>Accelerator pedal</td>
</tr>
<tr>
<td>4</td>
<td>Parking brake lever</td>
</tr>
<tr>
<td>5</td>
<td>Dashboard (see detail fig.5)</td>
</tr>
<tr>
<td>6</td>
<td>Driver seat with &quot;dead man&quot; switch</td>
</tr>
<tr>
<td>7</td>
<td>Steering wheel</td>
</tr>
<tr>
<td>8</td>
<td>Electrical compartment (relays, fuses)</td>
</tr>
<tr>
<td>9</td>
<td>Passenger seat</td>
</tr>
</tbody>
</table>
## JET-16 Controls

![Control Panel Diagram](image5)

### ALARMS

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Location</th>
<th>Definition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPD</td>
<td>Display</td>
<td>Accelerator pedal activated on power up</td>
<td>Remove the action on the pedal</td>
</tr>
<tr>
<td>SRO</td>
<td>Display</td>
<td>Gear engaged on power up</td>
<td>Set the direction selector to neutral</td>
</tr>
<tr>
<td>Handbrake</td>
<td>Display</td>
<td>Parking brake on</td>
<td>Release the parking brake</td>
</tr>
<tr>
<td>Inchng</td>
<td>Display</td>
<td>Slow speed (inchng) selected</td>
<td>Switch the rotating button #3 to driving position</td>
</tr>
</tbody>
</table>

### Contents

1. Display:
   - Time recorder
   - Charge status
   - Faults and breakdowns

2. Contact
   - 2-speed ventilation *

3. Working position selection rotating button:
   - Step by step approach position
   - Button to the right
   - Driving position - button to the left - driving position

4. Set of lights:
   - 4-1 Direction indicator
   - 4-2 Night light
   - 4-3 Codes
   - 4-4 Headlights
   - 4-5 Battery
   - 4-6 Parking brake on / Brake pad wear
   - 4-7 Brake fluid level
   - Parking brake on

5. Movement direction selector
   - Heater socket connected (movement prohibited) *

### COMMAND BUTTONS:

- 6-Rear working lights
- 7- Heating ON/OFF *
- 9- Front wiper *
- 10- Rear wiper *
- 11- Warning (hazard) lights
- 12- Horn
- 13- Night light - codes
- 14- Headlights
- 15- Rear window de-mister/de-icer
- 16- Direction indicator
- 17-Front working lights *

### LIGHTS:

- 20- Heating socket connected (movement prohibited) *

* depending on versions
Parking brake indicator
Parking brake: positive, works on the rear wheels. It is commanded manually. The parking brake position is checked by an electric contact.
As soon as the parking brake is activated, the parking brake indicator must come on.
The parking brake must only be applied after the vehicle has come to a complete stop. Pull the brake lever (4 fig. 4). The indicator must come on (see 4-6 fig. 5).
To use the service brake, press the central pedal (2 fig. 4). The service brake acts on the 4 wheels.

**WARNING:**
IN THE EVENT OF AN EMERGENCY STOP, USE THE EMERGENCY STOP BUTTON TO STOP THE VEHICLE QUICKLY.
IF THE EMERGENCY STOP PROCEDURE IS USED, REFER TO THE PARKING BRAKE CHECKS.

MAIN BRAKE - ENGINE BRAKE:
- Main brake: - by activating the brake pedal, works on the front and rear wheels.
- Engine brake: - when the accelerator pedal is released.
  - by pushing the brake pedal switch;
  - when the tractor is put into neutral;
  - when the "dead man" pedal is released.

"DEAD MAN" PEDAL (DEPENDING ON VERSIONS):
- Releasing the "dead man" pedal for over 1s will cause the engine to decelerate.
- Releasing the pedal for longer will shut down the central hydraulic unit and the wipers (if activated)

**WARNING:**
IN THIS CASE, THERE IS NO STEERING AND BRAKING ASSISTANCE. IT IS THEREFORE PROHIBITED TO MOVE DOWNHILL OR FREE WHEEL BY RELEASING THE "DEAD MAN" PEDAL ON PURPOSE.
STARTING UP

• Make sure that the working position selection button (3 fig.5) is positioned to the left.
• Make sure that the emergency stop button in the remote control unit (fig. 5) has not been pushed in.
• Push in the power plug (7 fig.3).
• Make sure that the movement direction selector (5 fig. 4) is in neutral (3 fig. 6)
• Put the key into the contact (2 fig.5). Turn the key to the right to apply the contact.

IMPORTANT:
- Tow at a speed compatible with the load and adhesion, or else there is a risk of slipping at the rear when braking or cornering;
- Drive in a straight line to be able to change steering mode;
- Do not exceed the plane's front axle rotation limits, or else an alarm will be triggered and there will be a preventive break in the tow bar.

Running:

NOTE:
DEPENDING ON THE VERSIONS, THE "DEAD MAN" CONTACT MAY BE ACTIVATED BY A PEDAL OR BY THE SEAT.

• Depending on the versions, press the "dead man" pedal (1 fig. 4) ;
• Select the movement direction (5 fig. 4) to forward or reverse ;
• Release the parking brake (4 fig. 4)
• Gradually press the accelerator pedal (3 fig. 4).

WARNING:
WAIT UNTIL THE VEHICLE HAS COME TO A COMPLETE STOP BEFORE SWITCHING TO NEUTRAL AND MOVING IN THE OTHER DIRECTION.

PRECAUTION:
DO NOT TRY TO ADJUST THE SEAT POSITION WHILE DRIVING.
SLOW APPROACH (INCHING)

**DANGER:**
DO NOT USE THIS FUNCTION FOR FRONT HITCHING. THIS OPERATION WOULD BE TOO DANGEROUS.

The slow approach enables the tow tractor's tow pin to be brought close to the baggage trolley's tow bar, while remaining outside the cab (better view). This approach is a "step by step" approach, with each command pulse moving the vehicle backwards or forwards one step.

**OPERATION**

- Activate the function from the control panel by pushing the working position selection button (3 fig.5) to the right;
- Now from the external command it is possible to move the tow tractor forward and backward and so bring its tow bar close to the traction bar.

**DANGER:**
FOR THE OPERATOR'S SAFETY, THE REAR COMMAND MUST ONLY BE USED ON FLAT AND HORIZONTAL GROUND.

**DANGER: CRUSHING RISK!**
DO NOT STAND BEHIND THE VEHICLE DURING SLOW APPROACH.

**NOTE:**
PRESSING ONE OF THE 2 SLOW APPROACH COMMAND BUTTONS MAKES THE MANOEUVRE POSSIBLE FOR 1 SECOND. TO EXTEND THE APPROACH, YOU MUST PRESS ONE OF THE 2 BUTTONS AGAIN.
STOPPING

• Do not leave the driving position while the vehicle is operating;
• Always disconnect the contact before exiting the vehicle;
• Always park the vehicle on a flat, adapted surface;
• Use the appropriate flags, signals and barriers when parking in areas with high traffic;
• Do not block access to fire fighting positions when you park the vehicle;
• Never park your vehicle or leave the equipment towed in such a way as to hinder fire fighting equipment, an emergency exit or any other place where it might constitute an obstacle or a danger;
• If the vehicle needs to be left without supervision, remove the contact key;
• Never uncouple the towed equipment unless its parking brake is on or the wheels have been wedged.

In a slope:
• Never park your vehicle on a ramp;
• If the vehicle needs to be parked on a ramp following a breakdown, etc., wedge the wheels firmly.

ALWAYS CHECK THAT THE PARKING BRAKE IS APPLIED.

WARNING:
NEVER CUT THE CONTACT WHILE MOVING!!!
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: TLD
TYPE: Gasoline
MODEL: TPX-100

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Controls

1. Battery isolator switch / Emergency stop.
2. Driver's seat.
3. Accelerator pedal.
4. Brake pedal.
5. "Dead man's" pedal.
6. Steering wheel.
7. Control lever.
8. Gearstick.
10. Display with engine hour meter, battery charge status.
11. Wheel alignment indicator.
12. Cycle panel / Ignition key / Parking brake control.
13. Cycle indicators.
15. Travel stop (optional).
17. Additional heating control (optional).
18. Passenger seat.
BATTERY ISOLATOR SWITCH / EMERGENCY STOP.

- Pull the emergency button up to position 1 to unlock the battery isolator switch / emergency stop functions.
- Push the emergency button down to position 2 to trigger the battery isolator switch / emergency stop functions.

ADJUSTING THE SEAT

<table>
<thead>
<tr>
<th></th>
<th>Adjusting the weight</th>
<th>Set the shock absorbers to the “soft” position. Pull on the adjustment knob, whilst remaining in the sitting position and not moving.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Adjusting the height of the seat</td>
<td>Set the shock absorbers to the “soft” position. Pull or fully push in the control lever until reaching the desired height. Warning: do not operate the compressor for more than a minute at a time.</td>
</tr>
<tr>
<td>3</td>
<td>Adjusting the shock absorption</td>
<td>Turn the knob to the desired setting then release.</td>
</tr>
<tr>
<td></td>
<td>1. soft; 2. medium; 3. hard.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adjusting longitudinal position</td>
<td>Set the knob in the desired position. Note: Once the knob is blocked, you cannot move the seat.</td>
</tr>
<tr>
<td>5</td>
<td>Adjusting seat depth</td>
<td>Pull the right handle up and move the seat forwards or backwards.</td>
</tr>
<tr>
<td>6</td>
<td>Adjusting the angle of the seat</td>
<td>Pull the left handle up and exert or release pressure on the seat.</td>
</tr>
<tr>
<td>7</td>
<td>Adjusting the height of armrests</td>
<td>Remove the cover on the side of the seat. Unscrew the hexagonal nut (13 mm Allen key). Adjust the height of the armrests (5 positions). Tighten the hexagonal nut, 25 Nm. Replace the cover.</td>
</tr>
<tr>
<td>8</td>
<td>Adjusting the angle of armrests</td>
<td>Turn the wheel outwards to raise the armrest. Turn the wheel inwards to lower the armrest.</td>
</tr>
<tr>
<td>9</td>
<td>Adjusting the headrest</td>
<td>Adjust the angle of forward or rear inclination by pushing on the top of the headrest.</td>
</tr>
<tr>
<td>10</td>
<td>Adjusting the lumbar support</td>
<td>The top switch adjusts the top of the seat. The bottom switch adjusts the bottom of the seat. Press on “+” or “-” to adjust the curve of the seat.</td>
</tr>
<tr>
<td>11</td>
<td>Adjusting the angle of the backrest</td>
<td>Pull the knob up to unlock the backrest. Adjust the angle by increasing or reducing pressure on the backrest. Release the knob to lock into position.</td>
</tr>
<tr>
<td>12</td>
<td>Adjusting the horizontal shock absorber (optional)</td>
<td>Move to position 1 to activate the horizontal shock absorber. Move to position 2 to deactivate the horizontal shock absorber.</td>
</tr>
</tbody>
</table>
THE GEARSTICK

- Push the gearstick forwards to put the tractor in drive.
- Push the gearstick back to put the tractor in reverse.
- The middle position places the gearbox in neutral.

TABLE OF DASHBOARD INDICATORS

1. Dipped-beam indicator.
2. Main-beam indicator.
3. Flashing / rotating beam indicator (optional).
4. Front working indicator.
5. Position lights indicator.
6. "Turn indicator" dashboard indicator.
7. Overtorque "Operating limit" indicator.
8. Overtorque "Safety limit" indicator.
9. Mechanical engine hour meter.
10. "General fault" indicator.
11. "Overtorque system fault" indicator.
CYCLE INDICATORS

1. "Low chassis" indicator.
2. "Gates open" indicator.
3. "Backplate out" indicator.
4. "Removable MD80 tool fault" indicator (optional).
5. "High chassis" indicator.
7. "Backplate in" indicator.
8. "Aircraft present" indicator.

CONTROL BUTTONS

1. Warning lights button.
2. Front working light button.
3. Flashing / rotating beam lights button (optional).
4. Front windscreen wipers button.
5. Rear windscreen wipers button (optional).
6. "Light test" button.
7. Ventilation button.
8. Heating button.
9. Window defrosting button.
10. Ceiling light button (optional).
1. Family selection controls (depending on options chosen).
2. Force reverse button.
3. Parking brake controls.
4. Ignition switch.
5. Cycle in progress indicator.
6. Lifting confirmation button.
7. Loading/unloading lever.
8. Button to confirm the presence of the By pass pin of the aircraft (option)
WARNINGS

⚠️ WARNING: READ THE GENERAL SAFETY INSTRUCTIONS IN CHAPTER ZERO.

PRELIMINARY CHECKS

- Perform a preliminary check according to the daily inspection instructions, see "Maintenance manual".

DANGERS AND RISKS RELATED TO USE

⚠️ WARNING: ALWAYS DRIVE WITH THE DOORS CLOSED.

ACCESS AND TAKING THE CONTROLS

⚠️ WARNING: DO NOT EXCEED THE MAXIMUM CAB LOAD. THE MAXIMUM WEIGHT IS SPECIFIED ON A LABEL.

⚠️ WARNING: THE CAB IS DESIGNED FOR TWO PEOPLE; THE DRIVER AND PASSENGER.

USING THE VEHICLE IN LOW TEMPERATURES

Note: in the event of low temperatures, the hydraulic oil is less fluid and can trigger the clogging indicators.

- Remove ice on windscreens and headlights.
- Press on the dead man's pedal for 5 minutes to trigger the hydraulic pump.
- Drive for five minutes to heat up the oil before performing any operations on aircraft.
- Use the brakes several times while driving over 100 metres to ensure they are not frozen.

NOTE: if the clogging indicators remain lit up after performing these operations, the vehicle may have another problem that is unrelated to the operating temperature.
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Alarm</th>
<th>Location</th>
<th>Definition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Alarm bell</td>
<td>Dashboard</td>
<td>General fault</td>
<td>Stop the vehicle immediately. Make sure that the maintenance team consult with the diagnostics centre to find the cause of the alarm.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>General fault warning indicator and buzzer</td>
<td>Dashboard indicators</td>
<td>General fault</td>
<td>Stop the vehicle immediately. Ensure the maintenance team consult with the diagnostics centre to determine the cause of the alarm.</td>
</tr>
<tr>
<td>![Icon]</td>
<td>Removable MD80 tooling fault indicator (optional).</td>
<td>Cycle indicators</td>
<td>Problem with the installation of the removable MD80 tools.</td>
<td>Stop the vehicle immediately. Check that the removable tools are installed correctly.</td>
</tr>
<tr>
<td>Percentage</td>
<td>Indicator</td>
<td>Location</td>
<td>Description</td>
<td>Action</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>----------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>100%</td>
<td>&quot;Safety limit&quot; indicator.</td>
<td>Dashboard indicators</td>
<td>The overtorque safety limit has been reached</td>
<td>Stop the vehicle immediately. Ensure the relevant authority inspects the landing gear strut.</td>
</tr>
<tr>
<td>50%</td>
<td>&quot;Operating limit&quot; indicator.</td>
<td>Dashboard indicators</td>
<td>The overtorque operating limit has been reached</td>
<td>Realign the vehicle.</td>
</tr>
<tr>
<td>0%</td>
<td>&quot;Overtorque system fault&quot; indicator.</td>
<td>Dashboard indicators</td>
<td>Unit fault, battery fault or sensor fault.</td>
<td>Stop the vehicle immediately.</td>
</tr>
<tr>
<td>0%</td>
<td>Drive fault indicator and error code on the screen</td>
<td>Display unit</td>
<td>Problem with the speed drive</td>
<td>Stop the vehicle immediately. Refer to the table of alarms in chapter 5.</td>
</tr>
</tbody>
</table>
OPERATION

STARTING

THE PARKING BRAKE MUST BE ON

- Move the battery isolator / emergency stop button to "ON".
  **NOTE:** the travel stop (optional) must not be engaged.
- Adjust the seat according to your weight and height.
- Fasten the seatbelt.
- Select neutral with the gearstick.
- Put the key into the ignition switch and turn.
  Or
- Insert the chip key (optional).
  ✓ *The system initialises itself.*

DRIVING THE VEHICLE

- Press down on the "dead man's" pedal.
  Note: pressing on the "dead man's pedal" is compulsory for all operations.
- Select forward or reverse.
- Release the parking brake.
- Accelerate progressively.

**NOTE:** when the tractor is powered up, some dashboard indicators turn on then off after a few seconds; this corresponds to the initialisation process.
MOORING, LOADING AND UNLOADING

APPROACHING AN AIRCRAFT

⚠️ WARNING: THE LASER POINTERS USED ON OUR VEHICLES CORRESPOND TO CATEGORY 2 OF INTERNATIONAL STANDARD IEC 60825-1 (FRENCH VERSION: NF EN 60825-1).
IN ACCORDANCE WITH THIS STANDARD, A WARNING PICTOGRAM INDICATES ITS PRESENCE.

⚠️ WARNING: DO NOT LOOK DIRECTLY INTO THE BEAM.

1. Align and centre the tractor in relation to the front landing gear strut of the aircraft.
2. Stop the tractor around two metres away from the landing gear strut.
3. Put the gearbox in neutral position.
4. Apply the parking brake.
5. Install the aircraft "By pass Pin".
6. If necessary, install the two MD80 tools (optional).
7. Remove the chocks from the front landing gear of the aircraft.
8. Go back to the tractor.
✓ The aircraft is ready for mooring.
MOORING AND LOADING AN AIRCRAFT (STANDARD AND MD80 OPTION)

⚠️ WARNING: TO PERFORM THIS OPERATION YOU MUST ALREADY HAVE COMPLETED THE APPROACH PHASE.

⚠️ WARNING: DO NOT ACCELERATE DURING THE CYCLE, EXCEPT TO MOVE FORWARDS AND BACKWARDS.

- Press on the "dead man's pedal" and push on the "loading/unloading" selector.

![Diagram of control panel]

- The "Cycle in progress" indicator 🔄 is on.
- The cradle moves down to an intermediary height.
- The family selection buttons flash.
• Release the loading selector, then select the family corresponding to the aircraft to push back with the help of the "Family selection" label.

```
1- ERJ-135/140/145  2- MD-90
  SAAB-2000       DC-9
3- B737-100/200  4- A318/319/320/321
  BAe-146        B727
  CRJ-700/900/1000° B737-300/400/500/600
  FOKKER-70/100   B737-700/800/900
  EMBRAER-170/190° B757 °
```

• Push the "loading/unloading" selector 🛠.

✓ The cradle lowers to the "Low" position; the "Low chassis" indicator 🎯 is on steady, at the same time, the optional indicator of "the Button to confirm the presence of the By pass pin of the aircraft" the flashes.

✓ The gates are open, the "Gates open" indicator 🚪 is on.
✓ The parking brake indicator turns off.
- Push on the Button to confirm the presence of the By pass pin of the aircraft” to confirm that the by pass pin is in (option).

**NOTE:** As the driver do not confirm the presence of the pin, there is no translation (option).

- Use the laser pointing system to align and centre the landing gear strut in the tractor's cradle in order not to damage it.

- Hold the "loading/unloading" selector down then progressively press down on the accelerator to approach the aircraft, until the tractor stops automatically thanks to the landing gear strut detection system.

✓ The "Aircraft present" indicator is on
Hold the "loading/unloading" selector down and release the accelerator.

✓ The gates close, the "Gates closed" indicator comes on.
✓ The backplate extends and tightens around the landing gear strut until reaching the pre-tightening value. The "Backplate out" indicator comes on.
✓ The type of aircraft selected is recognised, the family indicator stays on steady.

NOTE: if the type of aircraft is not recognised, the family indicator flashes, the general fault indicator comes on and the buzzer sounds. Unload the aircraft and start the cycle again.

✓ The "Lifting confirmation" indicator flashes.

• Release the "loading/unloading" selector; the first loading phase is finished.

NOTE: release the loading/unloading lever to stop the loading.

• Remove the chocks on the main landing gear of the aircraft.
• Wait for all ground support equipment to move clear of the aircraft, then for the authorisation to lift the aircraft.
• Ensure that the parking brake of the aircraft is on, push on the "loading/unloading" selector while pressing the "Lifting confirmation" button.

✓ The "High chassis" indicator is on

✓ The "Cycle in progress" indicator is off.

WARNING: THE SERVICE BRAKE SHOULD NOT BE APPLIED DURING THE CYCLE BECAUSE IT STOPS THE OPERATION. THE FOLLOWING SEQUENCE IS ENTIRELY AUTOMATIC.
✓ The aircraft is ready for pushback.
MOORING AND LOADING AN AIRCRAFT (SINGLE-FAMILY OPTION)

WARNING: TO PERFORM THIS OPERATION YOU MUST ALREADY HAVE COMPLETED THE APPROACH PHASE.

WARNING: DO NOT ACCELERATE DURING THE CYCLE, EXCEPT TO MOVE FORWARDS AND BACKWARDS.

- Press on the "dead man's pedal" and push on the "loading/unloading" selector.

✓ The cradle lowers to the "Low" position; the "Low chassis" indicator is on steady, at the same time, the optional indicator of “the Button to confirm the presence of the By pass pin of the aircraft” the flashes.

✓ The gates are open, the "Gates open" indicator is on.
✓ The parking brake indicator turns off.

- Push on the Button to confirm the presence of the By pass pin of the aircraft to confirm that the by pass pin is in (option).
NOTE: As the driver does not confirm the presence of the pin, there is no translation (option).

- Use the laser pointing system to align and centre the landing gear strut in the tractor's cradle in order not to damage it (see standard procedure).
- Hold the "loading/unloading" selector down then progressively press down on the accelerator to approach the aircraft, until the tractor stops automatically thanks to the landing gear strut detection system.

✓ The "Aircraft present" indicator is on

- Hold the "loading/unloading" selector down and release the accelerator.

✓ The gates close, the "Gates closed" indicator comes on.
✓ The backplate comes out and tightens around the landing gear strut, the "Backplate out" indicator comes on.
✓ The family indicator corresponding to the recognised family flashes.
- Release the "loading/unloading" selector.
- Press on the family selection button which is flashing to validate the recognised aircraft family, using the "Family selection" label.
✓ The family selection button turns on steady.
- Wait for all ground support equipment to move clear of the aircraft, then for the authorisation from the captain to lift the aircraft.
- Ensure that the aircraft parking brake is applied, then press on the "loading/unloading" selector.

✓ The "High chassis" indicator is on.
✓ The "Cycle in progress" indicator is off.

WARNING: THE SERVICE BRAKE SHOULD NOT BE APPLIED DURING THE CYCLE BECAUSE IT STOPS THE OPERATION. THE FOLLOWING SEQUENCE IS ENTIRELY AUTOMATIC.

✓ The aircraft is ready for pushback.
AIRCRAFT PUSHBACK

⚠️ **WARNING:** TO PERFORM THIS OPERATION YOU MUST ALREADY HAVE COMPLETED THE LOADING PHASE.

⚠️ **WARNING:** DO NOT PUT THE GEARBOX IN NEUTRAL WHEN THE TRACTOR IS MOVING.

⚠️ **WARNING:** THE TRACTOR IS EQUIPPED WITH AN OVERTORQUE ALARM. IF AN ALARM IS TRIGGERED (50% OR 100%), STRAIGHTEN UP THE VEHICLE. REFER TO CHAPTER 2 ON MAINTENANCE FOR MORE INFORMATION.

- Ask the pilot to release the parking brake of the aircraft to begin the pushback operation.
- The tractor is ready for pushback, with the landing gear locked in the high position.
- Select forward or reverse.
- Release the parking brake of the tractor and accelerate slowly to begin the pushback operation.
- Drive at a maximum speed of 5 km/h.

**NOTE:** acceleration is controlled by an automated system (PLC) to protect the aircraft's landing gear strut from overloading during pushback. Acceleration may vary depending on the situation.
UNLOADING AN AIRCRAFT

⚠️ WARNING: TO PERFORM THIS OPERATION YOU MUST ALREADY HAVE COMPLETED THE LOADING PHASE.

⚠️ WARNING: WHEN UNLOADING, ALIGN THE TRACTOR WITH THE AIRCRAFT. THE WHEELS OF THE AIRCRAFT MUST BE STRAIGHT.

- Make sure that the aircraft and tractor are at a completely stopped.
- Ask the pilot to apply the aircraft's parking brake.
- Place the gearbox in neutral.
- Apply the tractor's parking brake.
- Place the loading/unloading selector in the unloading position.

✓ The "Cycle in progress" indicator comes on.

⚠️ WARNING: THE SERVICE BRAKE SHOULD NOT BE APPLIED DURING THE CYCLE BECAUSE IT STOPS THE OPERATION. THE FOLLOWING SEQUENCE IS ENTIRELY AUTOMATIC.
NOTE: release the loading/unloading lever to stop the unloading.

✓ The chassis lowers to the low position, and the "Low chassis" indicator comes on.

✓ The gates open and the backplate retracts automatically; the "Gates open" and "Backplate in" indicators come on.

- When the gates are fully open, lightly press down on the accelerator to reverse the tractor.
- When the landing gear is released and clear of the tractor, press on the "Lifting confirmation" button; the cradle moves into the high position and cancels the aircraft selection.

NOTE: the lifting of the chassis stops automatically when the chassis moves into the high position. The "High chassis" indicator comes on.

NOTE: with the single family option, the chassis is automatically lifted without needing to press on a control button.

✓ The unloading cycle is finished.

- Release the loading/unloading selector.

✓ The "Cycle in progress" indicator switches off.

- Stop the vehicle.
- Remove the two MD80 tools (optional) if necessary.

✓ The vehicle is ready for another operation.
USING THE PARKING BRAKE.

**WARNING:** THE PARKING BRAKE MUST ONLY BE USED WHEN THE TRACTOR IS AT A STANDSTILL.

RELEASING THE PARKING BRAKE

- Turn the switch to the right to release the parking brake.
  ✓ *The "Parking brake" indicator switches off.*

LOCKING THE PARKING BRAKE.

- Turn the switch to the left to lock the parking brake.
  ✓ *The "Parking brake" indicator switches on.*
STOPPING THE VEHICLE

⚠️ WARNING: NEVER SWITCH OFF THE IGNITION WHEN MOVING.
- Move the gearbox to the neutral position.
- Apply the parking brake.
- Switch off active equipment.
- Turn the key to the "0-STOP" position.

Or
- Remove the chip key (optional).
- Move the battery isolator switch to the "Off" position.

EMERGENCY STOP

⚠️ WARNING: THIS IS ONLY TO BE USED IN HAZARDOUS SITUATIONS, AND IS NOT A NORMAL PROCEDURE FOR STOPPING THE VEHICLE.
- Press on the emergency stop button located between the two seats.
TLD Model: TMX-150

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: Gasoline
MANUFACTURER: TLD MODEL: TMX-150

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Controls

1 – Light switch
2 – Steering wheel
3 – Gearbox shifting lever
4 – Dashboard
5 – Brake pedal
6 – Gas pedal
1 – Main switch, engine start
2 – Gauge cluster
3 – Tachometer (option)
4 – Hour meter, fuel gauge
5 – Oil temperature
6 – Hazard lights
7 – Front working light
8 – Rotating beacon
9 – Front windscreen wiper
10 – Lave-glace
11 – Rear windscreen wiper (option)
12 – Heater valve
13 – Vent (2 speeds)
14 – Emergency stop button
15 – Emergency power plant (option)
1-2-1-2-ENGINE START

CAUTION: NEVER START ENGINE OR OPERATE IT FROM OUTSIDE CAB

- Check that parking brake is applied.
- Put gear lever in neutral position.
- Start engine by turning key to the right release key as soon as engine has started.

WARNING: NEVER ADJUST SEAT WHILE MOVING

1-2-1-3-ENGINE STOP

- Put gear level in neutral position.
- Apply parking brake.
- Switch all accessories off.
- Turn the key to the left.

WARNING: DON'T TURN WHEELS WHEN PARKING BRAKE IS APPLIED

1-2-1-5-PARKING BRAKE

Parking brake is located on front axle, operated by cable.

- Apply parking brake as soon as tractor has stopped by pulling up lever.
- Parking brake light should light.
- Before moving push down parking brake lever.
- Parking brake light should go off.

Parking brake trimming is done by turning handle.
**EGS means Electronic Gear Shift**

EGS has 8 numbered LED (lights)
These LED can light in 3 colors RED, GREEN or YELLOW

They show the position of the gearbox lever and are also used for fault and diagnosis.
The 'N' red LED shows when transmission is in neutral.
The 'F' yellow LED shows when a failure is detected.
The gear is indicated by the corresponding LED.
The direction is indicated by the color of the LED.

RED for NEUTRAL
GREEN for FORWARD
YELLOW for REVERSE

Choose moving direction by pushing lever in required position.
Push lever to the right to shift gear up, to the left to shift gear down.
If lever is kept in shift position, shifting is automatically done every 1.5 second.

3d and 4th gear can only be selected when tractor is moving.

When towing a plane it is recommended to select required gear before starting. Start in 2d gear and then shift to 3d or 4th gear to reduce shocks

**NOTE: WHEN TOWING, TRY TO AVOID SHIFTING IN ORDER TO REDUCE CHOCKS.**
1-2-5- COMBINED LIGHT SWITCH

1 – Right directional light
2 – Side lights
3 – Horn
4 – Low beam
5 – Left directional light
6 – Headlight flash
7 – High beam
1-2-5-5 SLOW DISPLACEMENT OUTER FROM CAB (OPTION)

PRINCIPLE

The Slow Approach (slow motion) allow to approach the tractor and it hitch to the aircraft towbar, fitted on the aircraft nose landing gear, outer from the tractor cab (with a better view).

OPERATION

- Activate this function by turning the corresponding knob from the cab

- Now you can use the external command to move forward or backward the tractor and approach the tractor hitch to the towbar.

![Figure 18: Slow displacement - in cab](image1.jpg)

![Figure 19: Slow displacement - Outer cab](image2.jpg)

DANGER: FOR USER SECURITY, THE BACK CONTROL WILL EVER USE ON FLAT GROUND!!
TRONAIR                             Model: JP100SSCUS

OPERATING INSTRUCTIONS
EQUIPMENT: Pushback                         TYPE: Electric
MANUFACTURER: TRONAIR                        MODEL: JP100SSCUS

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Operating Instructions
1. To start, the E-stop button on the driver’s console must be in the released position, the E-stop button on the left front fender must be in the released position, and the charger plug door must be closed. To release E-stops, turn clockwise and release.
2. Sit down in the operator’s seat. Turn the “Off- On-Start” switch to “Start” and hold for one second. You will hear the hydraulic pump run as the accumulator charges. Release switch to “On” position.
3. Make sure the cradle is completely closed and completely up before moving. This is accomplished by pressing the “Cradle Closed” rocker switch until movement stops, and pressing the “Cradle Up” rocker switch until movement stops.
4. This tug is NOT designed to coast. Accelerating, braking, and maintaining a constant speed, are all very dependent on foot pedal position. This results in a tug that is very easy to drive and extremely easy to control on inclines. Push the throttle pedal to accelerate, slowly release the throttle to brake. Hold the throttle steady for a steady speed.
5. The switch located under the driver’s seat and the proximity switch for the “Cradle Up” position must both make contact before the Jetporter will drive at normal speed (approximately 5.5 MPH). It will otherwise be limited to “Creep Speed”.
6. The Forward-Neutral-Reverse (F-N-R) toggle switch is on the center console. When initially starting the JETporter, move the F-N-R switch to the Neutral position before choosing a direction. Any time the JETporter is turned off and re-started, the F-N-R switch must be returned to the Neutral position.

7. To set the parking brake, press and hold the foot service brake for 3 seconds without touching the accelerator pedal, then release. The parking brake will also set when the key is turned off or when the E-Stop button is pressed. (Either of the latter two actions will cause the hydraulic accumulator to discharge.)

   **WARNING**

   Turning the “Off-ON-Start” switch to “Off” while driving will result in a regenerative braking stop.
   Pressing the Emergency-Stop button on the left front fender will result in a regenerative braking stop.
   Pressing the Emergency-Stop button on the driver’s console will cut all control power and the JETporter will be brought to a stop by the parking brake.

8. The JETporter steers very easily. Turning the steering wheel 3-1/4 turns from center will result in turning the steering tires approximately 88º. During a sharp turn, both motors will slow down and the inside motor will slow to a stop. The JETporter is designed to be very maneuverable at slow speeds in tight places, NEVER enter into a turn at high speed. Loss of control will cause personal injury and property damage. Do not move your JETporter any faster than is necessary.

9. The JP100SSCUS is intended to be driven while standing for capture and release. The steering console can be fully raised to allow the driver to stand for positioning the tug at the aircraft nose wheel. While the driver is in the standing position, the JETporter will be limited to “Creep Speed”. This provides better throttle control for capture and release. To protect both the driver and the aircraft, the JETporter will not have sufficient power to move an aircraft while in “Creep Speed”. Care needs to be taken while driving the tug from a standing position. Do not apply any sudden throttle or brake that may cause loss of balance. Never drive while standing except for very slow final positioning. Do not allow anyone in the passenger compartment to stand while the tug is in motion. The steering console is raised by pulling the lever on the right hand side of the console and lifting upward.

   **WARNING**

   Do not make sharp turns while moving rapidly. Always look behind you before backing up.
CAPTURE OF THE NOSE LANDING GEAR (NLG)

**WARNING**
Be extra careful when moving aircraft on inclines as aircraft or tug may move unexpectedly. Make sure no personnel are in the direct path of the aircraft or tug.

**WARNING**
Pay close attention to scissor location, whether connected or disconnected. Be certain that scissors are not damaged as cradle is closed and raised.

1. Move the aircraft selector switch to the proper position for the aircraft being moved. The aircraft selector switch is extremely important for the protection of the aircraft. The selector switch sets the overload protection and oversteer protection for the aircraft chosen.
2. Approach the aircraft while making best attempt to align with the NLG. The reflectors on the top of the JETporter and inside the cradle can be used to aid in alignment.
3. Stop 2-3 feet short of the NLG.
4. Stand while capturing aircraft. Raise the steering console to the full up position (must use sliding release lever on right hand side of console).
5. The JETporter will now be limited to “creep-speed”.
6. Push the “Cradle Down” button until movement stops.
7. To open the cradle, push the “Cradle Down” and “Cradle Open” button simultaneously. Hold both buttons until cradle movement stops.
8. Drive toward the NLG while centering the white rollers with the NLG tires.
9. If the NLG is not aligned with the aircraft body, align the JETporter with the angle of the NLG.
10. When the cradle bar contacts the NLG tires, the throttle will disengage.
11. Push the “Cradle Close” button until movement stops. If the aircraft has the brakes set, do not use the JETporter foot brake during capture. The JETporter will roll, if needed, during the capture process to prevent horizontal force on the NLG.
12. Push the “Cradle Up” button until movement stops. The cradle MUST be in the full up position to move the aircraft.
13. Lower the steering console and sit in the driver’s seat. With the cradle up and the driver sitting in the seat, the JETporter will have power available for pushing or towing.
14. Press the “AC Selector Reset” button
MOVING THE AIRCRAFT
Move the aircraft by choosing the direction of desired travel and slowly pressing the foot throttle.

RELEASE OF THE NOSE LANDING GEAR (NLG)
1. Stand while releasing aircraft. Raise the steering console to full up position (must use sliding release lever on right hand side of console).
2. To release the aircraft, push the “Cradle Down” button until movement stops. Do not use the JETporter foot brake during release. The Jetporter will roll, if needed, during the release process to prevent horizontal force on the NLG.
3. To open cradle, push the “Cradle Down” and “Cradle Open” button simultaneously. Hold both buttons until cradle movement stops.
4. Back straight away from the aircraft. Do not attempt to turn the JETporter until the cradle is completely clear of the aircraft tires.
5. When clear of the aircraft, push the “Cradle Close” button until movement stops.
6. Push the “Cradle Up” button until movement stops.
7. Lower the steering console and sit in the driver seat.
8. Full power is available when the cradle is up and the driver is in the seat.
BRAKING

The JP100SSCUS has two separate braking systems. The main braking system is the regenerative braking provided by the drive motors. As the throttle is let up the motors begin braking. The motors act like generators trying to force a charge back into the batteries.

*Note: This tug is designed NOT to coast*

Holding the throttle steady will result in a steady speed. “Pumping” the throttle will result in speed fluctuations (the same as accelerating and braking). Regenerative braking, as currently programmed, will provide approximately 1800 ft-lbs of torque at the drive wheels.

The parking/foot brake consists of two “multiple disc type” brakes, one on each drive motor. These are located between the motor and the gear reduction hub. The brakes are spring set and will provide approximately 7630 ft-lbs of torque at the drive wheels. The brake is hydraulically opened when the throttle pedal is used. When the throttle is let up the brake valves will activated in 2 seconds (programmable) if there is no regenerative braking taking place. After the valves shift the hydraulic fluid bleeds through an orifice adding another second before the brakes reach full potential. If sitting on an incline hold the foot brake for 3 seconds before leaving the tug with the key on.

The foot brake overrides the hydraulics that release the parking brake. The foot brake can be used when needed and should be used when coming to a stop on a slope.

*Note: the parking brake will not set if the tug is rolling enough to cause regenerative braking current.*

The foot brake may also be needed during cradle movement if the tug is on an incline (the parking brake will release during cradle movement) but should not be used while closing the cradle gates of lifting or lowering an aircraft that has the MLG brakes set. In this situation the JP100SSCUS need to be able to roll to the aircraft position.
BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Adjust the operator's seat so that all controls may be comfortably reached. Fasten your seat belts.
2. Verify that the parking brake is set ON and the shift selector is in neutral (N).
3. Check that all other switches are OFF.
4. Turn the Engine Switch clockwise to RUN. The Glow Plug Light will illuminate for approximately 10 seconds. Do not start the engine.
5. When the Glow Plug Light goes off, turn the Engine Switch to Crank.
6. Start the engine and check the engine oil pressure gauges and the voltmeter. Observe that they are within limits.
7. Allow the engine to idle for approximately 5 minutes (warm up).
8. Turn on all necessary system switches (lights, etc.) for the operation.
9. Depress the (foot) brake pedal. Release the parking brake by moving the handle forward and down.
10. Place the shifter in the gear most appropriate for the speed and weight of the tow.
11. Release the foot brake pedal and slowly depress the accelerator pedal.
<table>
<thead>
<tr>
<th>NAME OF CONTROL OR INDICATOR</th>
<th>ITEM</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge, Fuel Level</td>
<td>1</td>
<td>Shows level of fuel with starter switch in crank or run position</td>
</tr>
<tr>
<td>Tachometer (Optional)</td>
<td>2</td>
<td>Shows engine RPM in hundreds with starter switch in crank or run position</td>
</tr>
<tr>
<td>Meter, Battery Voltage</td>
<td>3</td>
<td>Shows battery voltage with starter switch in crank or run position</td>
</tr>
<tr>
<td>Wheel, Steering</td>
<td>4</td>
<td>Tractor steering is accomplished by rotating the steering wheel</td>
</tr>
<tr>
<td>Button, Horn</td>
<td>5</td>
<td>Press button to sound horn</td>
</tr>
<tr>
<td>Lamp, Parking Brake Warning</td>
<td>6</td>
<td>Light illuminates to warn operator that the parking brake is applied and the transmission selector is in gear. Horn also sounds as an additional warning</td>
</tr>
<tr>
<td>Gauge, Engine Oil Pressure</td>
<td>7</td>
<td>Shows engine oil pressure in PSI and kPa/cm²</td>
</tr>
<tr>
<td>Gauge, Engine Coolant Temperature</td>
<td>8</td>
<td>Shows engine coolant temperature in degrees Fahrenheit and Celsius</td>
</tr>
<tr>
<td>Selector, Transmission</td>
<td>9</td>
<td>Transmission selector is used to select the gear in which the tractor transmission is to be operated</td>
</tr>
<tr>
<td>Lamp, Panel</td>
<td>10</td>
<td>Illuminates to furnish light to operator's control panel. Operates in conjunction with either the parking lights or the head lights.</td>
</tr>
<tr>
<td>Lamp, Glow Plugs</td>
<td>11</td>
<td>Illuminates for approximately 10 seconds, with starter switch in run position, to indicate that glow plugs are too cold for engine start.</td>
</tr>
<tr>
<td>Switch, Engine Start</td>
<td>12</td>
<td>3 Position (Stop, Run, Crank) spring loaded switch, used to start engine</td>
</tr>
<tr>
<td>Switch, Head Lights</td>
<td>13</td>
<td>Two position toggle switch used to operate headlights</td>
</tr>
<tr>
<td>Switch, Parking Lights</td>
<td>14</td>
<td>Two position toggle switch used to operate parking lights</td>
</tr>
<tr>
<td>Item</td>
<td>Page</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------</td>
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<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Switch, Hazard Lights</td>
<td>15</td>
<td>Two position toggle switch used to operate hazard lights</td>
</tr>
<tr>
<td>Lamp, Low Oil Pressure Warning</td>
<td>16</td>
<td>Illuminates with engine operating, at approximately 10 PSI (69 kPa) to warn of low engine oil pressure</td>
</tr>
<tr>
<td>Lamp, Engine Coolant Temperature Warning</td>
<td>17</td>
<td>Illuminates when engine coolant temperature reaches 235°F (113°C), to warn of excessively high engine coolant temperatures</td>
</tr>
<tr>
<td>Lamp, Brake Booster Pump Warning</td>
<td>18</td>
<td>Illuminates to indicate electrical operation of the brake booster pump</td>
</tr>
<tr>
<td>Lever, Parking Brake</td>
<td>19</td>
<td>Used to apply parking brake</td>
</tr>
<tr>
<td>Meter, Hours</td>
<td>20</td>
<td>Indicates total number of hours of engine operation in tenths of an hour</td>
</tr>
<tr>
<td>Pedal, Service Brake</td>
<td>21</td>
<td>The brake pedal is used to activate the service brake system of the tractor</td>
</tr>
<tr>
<td>Pedal, Accelerator</td>
<td>22</td>
<td>The accelerator is used to regulate engine speed (RPM).</td>
</tr>
</tbody>
</table>
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION

DO NOT DRIVE TRACTOR WITH THE PARKING BRAKE ON. IF THE TRANSMISSION LEVER IS NOT IN NEUTRAL (N) AND THE PARKING BRAKE IS ON, A HORN WILL SOUND AND A RED LIGHT WILL BEAM AT THE DRIVER.

CAUTION

WHEN TOWING AIRCRAFT ONLY TRANSMISSION RANGE ONE (1) OR REVERSE (R) SHALL BE USED.

CAUTION

NEVER ALLOW ENGINE SPEED TO EXCEED THE RECOMMENDED MAXIMUM R.P.M. (3,000 RPM) LIMIT. DOING SO COULD CAUSE TRANSMISSION TO AUTOMATICALLY SHIFT INTO THE HIGHER GEARS, RESULTING IN DRIVE LINE DAMAGE.

Shutdown Procedure.

1. Bring the tractor to a full stop.
2. Place the transmission in Neutral (N).
3. Set the parking brake (Pull handle fully up).
4. Turn off all system and accessory switches.
5. To stop the vehicle engine, shut it down by turning the Engine Switch to the STOP position.
TUG Model: GT32

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR  TYPE: DIESEL
MANUFACTURER: TUG  Model: GT32

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

OPERATING PROCEDURES.

a. To start the engine, turn the engine START-RUN-STOP switch fully clockwise to the START position until the engine starts; then release to the RUN position, OR depress the engine START switch until the engine starts; then release.

CAUTION
To avoid overheating of starter motor, do not operate starting motor more than 30 seconds without allowing a minimum cooling period of two minutes.

NOTE
In cold weather conditions, automatic ether injection (if applicable) will assist engine starting. Otherwise, it may be necessary to manually inject ether into the engine air box by pulling ether aid T-handle in the operator's compartment. (Refer to paragraph 4-11.)

b. Depress the brake pedal and release the parking brake.
c. Select the desired position on the transmission shift lever.
d. Release the brake pedal and depress the accelerator pedal to the desired vehicle speed.
e. To stop the tow tractor, release the accelerator pedal and depress the brake pedal.

NOTE
The parking brake is not intended to be used for normal stopping.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:

OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

SHUTDOWN PROCEDURES.

a. Halt the tow tractor at its parking location.
b. Select the transmission shift lever to the neutral (N) position.
c. Apply the parking brake.
d. Turn off all accessory equipment (light, etc.).
e. To stop vehicle engine, turn the engine START-RUN-STOP switch to the STOP position, or pull the engine STOP handle to stop the engine.

Warning

The EMERGENCY STOP switch is not intended to be used for normal engine shutdown. Use of this method can cause oil to be drawn past the oil seals in the engine blower housing.

ENGINE PROTECTIVE SHUTDOWN.

When operating in the RUN condition, the engine will automatically shut down from the abnormal conditions described in Chapter 1, Section 2. This causes the flapper inside the air intake housing to shut and block the air passage to the engine; thus, the engine shuts down. Use of the emergency stop switch causes this same effect.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR
MANUFACTURER: TUG

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Adjust the operator's seat so that all controls may be comfortably reached. Fasten your seat belts.
2. Verify that the parking brake is set ON and the shift selector is in neutral (N).
3. Check that all other switches are OFF.
4. Turn the STOP, RUN, START switch clockwise to RUN.
5. Turn the STOP, RUN, START switch to START.
6. Start the engine and check the engine oil pressure gauges and the voltmeter. Observe that they are within limits.
7. Allow the engine to idle for approximately 5 minutes (warm up).
8. Turn on all necessary system switches (lights, etc.) for the operation.
9. Turn the steering wheel until the wheels are in the straight-ahead position. Set the steering mode select switch to the desired steering mode.
10. Depress the (foot) brake pedal. Release the parking brake by setting the parking brake switch to OFF.
11. Select the desired direction of travel and speed range by placing the shifter in the gear most appropriate for the speed and weight of the tow.
12. Release the foot brake pedal and slowly depress the accelerator pedal.
Parking Brake Operation

**WARNING**

ALWAYS SET THE PARKING BRAKE ON PRIOR TO SHUTTING OFF THE ENGINE OR EXITING THE CAB. OTHERWISE, THE TRACTOR CAN ROLL AWAY, CAUSING DEATH, SEVERE PERSONAL INJURY, AND/OR PROPERTY DAMAGE.

**CAUTION**

RELEASE THE PARKING BRAKE BEFORE MOVING THE TRACTOR. EXCEPT IN AN EMERGENCY, DO NOT APPLY THE PARKING BRAKE WHILE THE TRACTOR IS IN MOTION. PARKING BRAKE DAMAGE WILL OCCUR.

**NOTE**

The parking brake must be released (set to OFF) before any forward or reverse gear is selected with the transmission shift selector. If not, the horn will sound and the BRAKE ON/TRANSMISSION ENGAGED PARKING BRAKE WARNING LIGHT will turn on.

Transmission Range Selection

1. The transmission shifter is a cable-driven dual-selector unit. The shifter is located to the right of the steering wheel. The selector closest to the operator determines the direction of travel (F-N-R). The selector farthest from the operator picks the speed range (1-2-3). Shifting is manual, accomplished by moving the speed range selector to a higher or lower gear as appropriate.

2. Start the operation in the gear most appropriate for the tow conditions. Shift to the next higher speed when the top speed in any particular gear is reached.

3. Generally, up shifting and down shifting is best accomplished by shifting through the normal sequence of speeds. Down-shifting will generally produce a braking effect.

4. Stop the tractor before shifting into any reverse speed.
CAUTION
DO NOT COAST THE TOW TRACTOR IN NEUTRAL. SEVERE DAMAGE TO THE TRANSMISSION MAY RESULT.
CAUTION
NEVER SHIFT FROM ANY FORWARD GEAR TO REVERSE OR FROM REVERSE TO ANY FORWARD GEAR WHILE THE TRACTOR IS IN MOTION. THE TRACTOR CAN BE DAMAGED OR STOP SUDDENLY.

Transmission Range Selection (cont.)

5. Neutral (N). Select Neutral when starting the engine, when checking the tractor's accessories and when idling the engine for extended periods. Use NEUTRAL with the parking brake set if leaving the tractor unattended with the engine running.

6. Forward (F). Shifting into Forward (F) selects the forward gears.

7. Reverse (R). Shifting into Reverse (R) selects the gears that drive the tractor backwards.

8. 1-2-3 Range Selections. Occasionally certain conditions make it necessary to restrict shifting to a lower range. In addition to more pulling power at lower speeds these selections provide progressively greater engine braking for going down medium grades (the lower the gear range, the greater the braking effect).
Steering Mode Selection.
If optional two mode steering is installed (Reference Figure 2), select a steering mode as follows:

1. Bring the tractor to a full stop. Turn the steering wheel until the wheels are straight-ahead. The Front and/or Rear Axle Center Lights (DS43, DS44) will illuminate.

2. Set the steering mode select switch to desired steering mode, i.e., four wheel coordinated mode (COORD) or two wheel track mode (TRACK).

NOTE
When the steering mode select switch is in the TRACK or COORD position, the steering mode will not change until the appropriate axle is centered. When the steering mode switch is in the TRACK position, the steering mode will not change to COORD until the FRONT axle is centered. In COORD, the steering mode will not change to TRACK until the REAR axle is centered.

WARNING
MOVING THE STEERING MODE SELECT SWITCH WHILE THE TRACTOR IS IN MOTION CAN CAUSE A LOSS OF TRACTOR CONTROL, RESULTING IN SEVERE PERSONAL INJURY, DEATH, AND/OR PROPERTY DAMAGE.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NAME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COORD Indicator</td>
<td>The light indicates when four wheel coordinated steering (COORD) has been engaged.</td>
</tr>
<tr>
<td>2</td>
<td>Steering Mode Switch</td>
<td>The switch is used to select the desired steering mode.</td>
</tr>
<tr>
<td>3</td>
<td>TRACK Indicator</td>
<td>This indicator tells when two wheel steering (TRACK) has been engaged.</td>
</tr>
<tr>
<td>4</td>
<td>Rear Axle Centered Indicator</td>
<td>The indicator illuminates when the rear axle is centered. A change to TRACK steering mode may be made.</td>
</tr>
<tr>
<td>5</td>
<td>Front Axle Centered Indicator</td>
<td>This light turns on when the front axle is centered. A change to COORD steering mode may be made.</td>
</tr>
</tbody>
</table>
Moving an Aircraft

Each individual airline has established aircraft detaching procedures for attaching the tractor to an aircraft, detaching the tractor from an aircraft, or for towing or pushing back an aircraft. All operators must be familiar with these procedures prior to operating the tractor during any aircraft rerated operations.

Shutdown Procedure.

1. Bring the tractor to a full stop.
2. Place the transmission in Neutral (N).
3. Set the parking brake switch to ON.
4. Turn off all system and accessory switches.
5. Allow the engine to run at idle for approximately 5 minutes, then shut it down by turning the STOP, RUN, START switch to STOP.
TUG  Model: GT50

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR  TYPE: Gasoline
MANUFACTURER: TUG  MODEL: GT50

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Controls
See Next Page
<table>
<thead>
<tr>
<th>ITEM</th>
<th>NAME OF CONTROL OR INDICATOR</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lamp, HAND BRAKE ON (Parking Brake) (DS1)</td>
<td>The HAND BRAKE ON lamp illuminates when the hand (parking) brake is actuated.</td>
</tr>
<tr>
<td>2</td>
<td>Gauge, FUEL Level (GA1)</td>
<td>The FUEL level gauge indicates the level of fuel in the tractor fuel tank.</td>
</tr>
<tr>
<td>3</td>
<td>Gauge, Engine Oil Pressure (GA2)</td>
<td>The engine Oil Pressure gauge is used to monitor engine lube oil pressure.</td>
</tr>
<tr>
<td>4</td>
<td>Gauge, Water Temperature (Engine Coolant Temperature) (GA3)</td>
<td>The engine coolant temperature gauge is used to monitor engine coolant temperature.</td>
</tr>
<tr>
<td>5</td>
<td>Meter, Time Elapsed (Hourmeter) (M1)</td>
<td>The time elapsed meter (Hourmeter) indicates total engine operating time.</td>
</tr>
<tr>
<td>6</td>
<td>Meter, Battery Voltage (Voltmeter) (M2)</td>
<td>The battery voltage meter (Voltmeter) indicates battery voltage when the tractor is in the CRANK or RUN position.</td>
</tr>
<tr>
<td>7</td>
<td>Switch, ENGINE STOP-RUN-CRANK (S1)</td>
<td>The ENGINE STOP-RUN-CRANK switch is a three-position, spring-return switch used to electrically start and stop the tractor engine.</td>
</tr>
<tr>
<td>8</td>
<td>Switch, PARKING LIGHTS ON/OFF (S9)</td>
<td>The PARKING LIGHTS switch is used to turn on the front and rear parking lights.</td>
</tr>
<tr>
<td>9</td>
<td>Switch, HEAD LIGHTS ON/OFF (S11)</td>
<td>The HEAD LIGHTS switch is used to turn on the headlights on the tractor. (It also turns on the parking lights if they are not already on.)</td>
</tr>
<tr>
<td>Page</td>
<td>Description</td>
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<tr>
<td>------</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>Switch, HAZARD LIGHTS ON/OFF (S12)</td>
<td>The HAZARD LIGHTS switch is used to turn on the front and rear hazard lights. (If optional turn signal switch is furnished; S12 is removed.)</td>
</tr>
<tr>
<td>11</td>
<td>Transmission Shift Lever</td>
<td>The transmission shift lever is used to activate the six-speed forward and three speed reverse Funk automatic transmission.</td>
</tr>
<tr>
<td>12</td>
<td>Parking Brake Lever</td>
<td>The parking brake lever is used to actuate the parking brake.</td>
</tr>
<tr>
<td>13</td>
<td>Accelerator</td>
<td>The accelerator is used by the operator to regulate the speed of the tow tractor.</td>
</tr>
<tr>
<td>14</td>
<td>Brake Pedal</td>
<td>The brake pedal is used by the operator to manually activate the brake system on the tow tractor.</td>
</tr>
<tr>
<td>15</td>
<td>Lamp, ENGINE COOLANT TEMPERATURE (DS11)</td>
<td>The ENGINE COOLANT TEMPERATURE warning lamp illuminates when engine block temperature exceeds 239 °F (115 °C).</td>
</tr>
<tr>
<td>16</td>
<td>Lamp, Engine LOW OIL PRESS (DS 12)</td>
<td>The engine LOW OIL PRESSure warning lamp illuminates when engine lubricating oil pressure drops to 5.8 psi (40 kPa).</td>
</tr>
<tr>
<td>17</td>
<td>Switch, FRONT PINTLE LIGHT ON/OFF</td>
<td>The FRONT PINTLE LIGHT switch is used to illuminate the FRONT PINTLE LIGHTS on the tractor.</td>
</tr>
<tr>
<td>18</td>
<td>Switch, PANEL LIGHTS ON/OFF (S20)</td>
<td>The PANEL LIGHTS switch operates the panel lights in operator’s compartment.</td>
</tr>
<tr>
<td>19</td>
<td>Lamp, BRAKE BOOSTER PUMP ON (DS13)</td>
<td>The BRAKE BOOSTER PUMP ON lamp illuminates whenever the booster pump is supplying brake pressure to the brake system in an emergency situation.</td>
</tr>
<tr>
<td>Page</td>
<td>Description</td>
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<td></td>
</tr>
<tr>
<td>20</td>
<td>Gauge, Tachometer (GA4)</td>
<td>The tachometer indicates engine rpm.</td>
</tr>
<tr>
<td>21</td>
<td>Lamp, Parking Brake Warning (DS17)</td>
<td>Warning lamp illuminates with the parking brake applied, in addition to lamp DS1.</td>
</tr>
<tr>
<td>*22</td>
<td>Switch, Cab Heater Fan</td>
<td>Operates fan motor for cab heating.</td>
</tr>
<tr>
<td>*23</td>
<td>Switch, Windshield Defroster, FRONT</td>
<td>Operates blower motor for front defroster tube.</td>
</tr>
<tr>
<td>*24</td>
<td>Switch, Windshield Defroster, REAR</td>
<td>Operates blower motor for rear defroster tube.</td>
</tr>
<tr>
<td>*25</td>
<td>Switch, Rear Wiper Motor</td>
<td>Operates rear windshield wiper motor.</td>
</tr>
<tr>
<td>*26</td>
<td>Switch, Beacon</td>
<td>Operates rotating towing beacon.</td>
</tr>
<tr>
<td>*27</td>
<td>Switch, Front Wiper (Left)</td>
<td>Operates left front windshield wiper motor.</td>
</tr>
<tr>
<td>*28</td>
<td>Switch, Light, Dome</td>
<td>Operates the cab's dome light.</td>
</tr>
<tr>
<td>*29</td>
<td>Switch, Defogger Fan</td>
<td>Operates defogger fan.</td>
</tr>
<tr>
<td>*30</td>
<td>Defogger Fan</td>
<td>Circulates air in cab area to defog windows.</td>
</tr>
<tr>
<td>*31</td>
<td>Speedometer</td>
<td>Indicates vehicle speed.</td>
</tr>
<tr>
<td>*32</td>
<td>Switch, Overhead Wiper</td>
<td>Operates overhead wiper motor.</td>
</tr>
<tr>
<td>*33</td>
<td>Switch, Front Wiper (Right)</td>
<td>Operates right front windshield wiper motor.</td>
</tr>
<tr>
<td>*34</td>
<td>Selector, STEERING MODE COORD/TRACK</td>
<td>Selects vehicle STEERING MODE.</td>
</tr>
<tr>
<td>*35</td>
<td>Switch, EMERGENCY STEERING PUMP ON/OFF</td>
<td>Operates EMERGENCY STEERING PUMP.</td>
</tr>
<tr>
<td>36</td>
<td>Lamp, GENERATOR NO CHARGE</td>
<td>Warning lamp illuminates when alternator has failed.</td>
</tr>
</tbody>
</table>
*37  Gauge, TRANSMISSION OIL TEMPERATURE
The transmission oil temperature gauge is used to monitor transmission fluid temperature.

38  Lamp, GLOW PLUGS
Lamp illuminates when GLOW PLUGS are hot and engine start can occur.

*39  Phone Jack (Not illustrated)
The headphone jack is mounted on the rear wall of the cab, between the operators seats.

*40  Light, Dome
Illuminates cab area.

*Optional Equipment
Starting Procedures

WARNING

MAKE SURE ALL PERSONNEL ARE CLEAR OF THE
TOW TRACTOR BEFORE STARTING THE ENGINE.

(a) Check that parking brake is applied and transmission lever is in Neutral (N) position.

CAUTION

TO AVOID OVERHEATING OF STARTER MOTOR, DO
NOT OPERATE STARTING MOTOR MORE THAN 30
SECONDS WITHOUT ALLOWING A MINIMUM COOLING
PERIOD OF 2 MINUTES.

(b) To start engine, turn engine STOP-RUN-CRANK switch to RUN position. Observe the GLOW
PLUG Lamp, when the lamp extinguishes, turn the STOP-RUN-CRANK switch to the CRANK position.

(c) Depress brake pedal and release parking brake.

(d) Select desired position on transmission shift lever.

WARNING

DO NOT BACK UP (REVERSE) TRACTOR WITHOUT
FIRST OPERATING BACKUP LIGHTS SWITCH TO ON
POSITION. OPERATE SWITCH TO OFF POSITION WHEN
TRACTOR IS NO LONGER IN REVERSE.

DO NOT SHIFT TRANSMISSION WHILE HANDLING
AIRCRAFT.

(e) Release brake pedal and depress accelerator pedal to desired tractor speed.

CAUTION

THE PARKING BRAKE IS NOT INTENDED TO BE USED
FOR NORMAL STOPPING.

(f) To stop tow tractor, release accelerator pedal and depress brake pedal.
**SHUTDOWN PROCEDURE.**

(a) Halt tow tractor at its parking location.

(b) Position transmission shift lever to *Neutral (N)* position.

(c) Apply parking brake.

(d) Turn off all accessory equipment (lights, etc.).

(e) To stop tractor engine, turn engine STOP-RUN-CRANK switch to STOP position.
Tug Model: M3A, M3A-35

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: Electric
MANUFACTURER: TUG MODEL: M3A, M3A-35

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

Controls:
STARTING PROCEDURES:

1. Switch main power switch ("ignition") to ON.
2. Release parking brake
3. Select drive direction (FWD/REV)
4. Depress foot throttle
5. Maneuver vehicle with steering wheel.

**WARNING:** ALWAYS USE PARK BRAKE WHEN LEAVING VEHICLE. DRIVE TRAIN HAS NO "PARK" POSITION AND MUST RELY ON PARK BRAKE TO PREVENT VEHICLE FROM ROLLING.

**WARNING:** ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

DRIVE DIRECTION SELECTOR (SHIFTER):
A drive direction lever controls the operation of limit switches to transfer current flow through the drive motor. To select a vehicle drive direction:

1. Move direction selector lever up (towards front of vehicle) to select reverse drive direction.
2. Move direction selector lever down (towards driver’s seat) to select forward drive direction.
3. Neutral is located midway between forward and reverse.

PARKING BRAKE
The parking brake is a cable actuated type, manually engaging the rear brake pads onto the rotors. The brake actuating device is located to the right of the driver’s seat in the driver’s compartment.

1. To apply parking brake, lift actuating lever up.
2. To release parking brake, push actuating lever down.

**WARNING:** ALWAYS USE PARK BRAKE WHEN LEAVING VEHICLE. DRIVE TRAIN HAS NO "PARK" POSITION AND MUST RELY ON PARK BRAKE TO PREVENT VEHICLE FROM ROLLING.
Vehicle Operation

CAUTION:
OPERATE ONLY WITH DOORS CLOSED ( IF EQUIPPED ).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Shut Down:
1. Set hand brake.
2. Switch main power switch to the “OFF” position.
OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: DIESEL
MANUFACTURER: TUG Model: MC13, 15, 22

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.

STARTING PROCEDURES:
1. Place shift lever in neutral.
2. Make sure that parking brake is set.
3. Turn ignition switch to “ON” position.
4. Press and hold glow plug button for 20 seconds.
5. Release glow plug button and press safety override button.
6. Turn ignition switch to engage starter.
7. Apply service brakes.
9. Select the appropriate transmission setting. (i.e. forward, or reverse)
10. Select first gear.
11. Slowly release the brake, and press the accelerator to move the tractor.

NOTE: The governor limits the speed to approximately 8 mph, by limiting the engine rpm.
WARNING: ALWAYS CHECK THE OPERATION OF THE SERVICE BRAKES BEFORE MOVING VEHICLE.

Vehicle Operation

CAUTION:
OPERATE ONLY WITH DOORS CLOSED (IF EQUIPPED).
DO NOT USE TO PUSH OTHER EQUIPMENT.
NEVER EXCEED AIRPORT SPEED LIMIT
NEVER PULL MORE THAN FOUR (4) CARTS.
NEVER CHANGE SHIFT LEVER POSITION WITHOUT FIRST COMING TO A COMPLETE STOP.
NEVER ALLOW DIESEL POWERED EQUIPMENT TO RUN OUT OF FUEL.
NEVER SET PARKING BRAKE WITHOUT FIRST BRINGING VEHICLE TO COMPLETE STOP.

Parking the Tractor:

1. To slow the tractor, release the accelerator and apply the service brakes.
2. To park the tractor, return the transmission shift lever to neutral, apply the parking brake, and turn off the engine.
3. Assure all lights and accessories have been turned OFF.
United MODEL: SMLP-120

OPERATING INSTRUCTIONS
EQUIPMENT: TOW TRACTOR TYPE: Gasoline
MANUFACTURER: United MODEL: SMLP-120

BEFORE STARTING:
Complete Daily Check before using.
Check placards for special instructions and restrictions.
Check location of levers, switches and controls.
Check general condition of entire unit.
ENGINE STARTING.

a. Ensure that parking brake is applied and that transmission control lever is in neutral position.

b. Pull choke control out. If engine is warm from previous operation or warm weather, use choke sparingly.

c. Press down on accelerator pedal approximately one-third the distance from its normal position.

d. Pull ignition control out and depress starter switch until starter cranks engine; when engine starts, immediately release starter switch.

NOTE

Do not operate the starter motor continuously for more than 15 seconds. If engine fails to start after 15 seconds, allow starter motor to cool for at least 10 to 15 seconds before attempting to start engine again.

ENGINE WARM-UP. Hold accelerator pedal steady and allow engine to warm-up at a fast idling speed. Adjust choke control as necessary to obtain smooth engine performance. Observe meters on instrument panel as follows:

a. Engine Oil Pressure Meter. Pressure should register on the oil pressure meter within 10 seconds after the engine has started. When normal operating temperature is reached, the meter should indicate a pressure reading of 30 to 40 pounds. If there is no pressure reading or if pressure reading is low or erratic, immediately stop engine and check engine.

b. Engine Temperature Meter. When warmed up, the engine should operate at a minimum coolant temperature of 170°F (76.7°C). If the engine temperature meter does not indicate this temperature after a reasonable warm-up period, stop engine and check engine. If meter indicates over 210°F (99°C), immediately stop engine and check engine coolant level.

c. Torque Converter Temperature Meter. When warmed up, the torque converter should operate at a temperature between 200°F (93.4°C) and 230°F (110°C). If the torque converter temperature meter indicates over 250°F (121.1°C), stop the towing tractor immediately, place transmission control lever in neutral position, and check transmission oil level. Check transmission for leaks and run engine at fast idle to decrease torque converter temperature. If temperature does not decrease, stop engine and check radiator and transmission.

d. Ammeter. When the engine is first started, the ammeter should indicate a high charging rate. The rate will normally decrease after a reasonable length of time unless the battery is defective or excessively discharged. If the ammeter registers a discharge rate when the engine is operating, or if the ammeter remains at zero or moves erratically, stop the engine and check alternator drive belt tension.
OPERATING THE TOWING TRACTOR. Operation of the tractor is essentially the same as that for any automotive-type equipment; all controls and instruments are positioned conveniently for operators use, and in approximately the same location or relationship as that used in an ordinary truck or passenger car. Operators should familiarize themselves with the steering and performance characteristics of the vehicle before attempting to perform any actual towing operations. Sudden starts, stops, and turns are to be avoided except in cases of emergency. Perform the following to place the tractor in motion:

a. Select gear range that will provide adequate torque for negotiation of grades.

b. Release the parking brake.

c. Depress the accelerator pedal slowly to increase vehicle speed as desired. Vehicle speed must be kept low enough to safely stop vehicle and towed load within an assured clear distance.

d. Check the pintle hook connection periodically to ensure that hook is properly engaged with the drawbar lunette eye or coupling.

e. When negotiating turns or operating in areas where clearances are restricted, always take into consideration the physical size and steering characteristics of the load being towed.

f. When towing loads at or near maximum capacity, and operating in low range continuously, closely monitor transmission oil temperature gage. DO NOT ALLOW OIL TEMPERATURE TO EXCEED 250°F. If temperature reaches 250°F, stop vehicle, shift to neutral range and run engine at a fast idle until oil temperature drops to a normal level.

STOPPING THE TOWING TRACTOR

a. Release the accelerator pedal.

b. Slowly depress the brake pedal.

c. When tractor stops, shift the directional control lever to the neutral (N) position. Apply light pressure, if required, to service brakes to prevent vehicle creeping.

d. If tractor is to remain stationary for any length of time, apply parking brake.

REVERSING THE TOWING TRACTOR.

CAUTION

Never change from forward to reverse or reverse to forward until tractor is completely stopped.

a. Shift the directional control lever to the reverse position.

b. Release the parking brake.

c. Depress the accelerator pedal slowly to increase vehicle speed to the desired speed.

STOPPING THE ENGINE. To stop the engine, depress the ignition switch.