4.1 Operator Presence Control (OPC)

4.1.1 Parking Brake OPC

This tractor is equipped with an audible and visible alarm that alerts the operator when he leaves the driving position with the park brake not applied. This audible and visible alarm shall be activated after operator has been detected out of the driving position and the parking brake is not applied. The time-out of alarm is 5-7 seconds. The alarm shall be deactivated when the operator is detected to be present again in the driving position within this time period or when the parking brake is applied with in this time period.

4.1.2 Power take-off OPC

When the operator leaves the driving position with PTO engaged and the vehicle is not in motion, the engine will shut off automatically which will shut off the drive of the power take-off shaft within 7 seconds. The automatic PTO shut off action shall not have negative effects on safety related functions (e.g. braking). A restart of the Power take-off shall only be possible by an intentional actuation of the operator. To start the tractor again, operator has to put all levers in neutral position and press the brake pedal.

Tractor Condition	PTO Condition	Seat Condition	Parking Brake Condition	Buzzer	OPC Feedback
ON	OFF	Operator Leaves Seat	OFF	Will Blow	Buzzer will continuously blow until operator sits on the seat
ON	ON	Operator Leaves Seat	OFF	Will Blow	Buzzer will blow continuously till engine stops with in 5-7 seconds
ON	ON	Operator Leaves Seat	ON	Doesn't Blow	Engine stops with in 5-7 seconds
ON	OFF	Operator Leaves Seat	ON	Doesn`t Blow	No buzzer, no engine shut-off

4.2 Boarding & Leaving the Tractor

Always board the tractor from left hand side where a footrest is provided while taking care the other part of body must not foul with levers. This will provide ease to operator.

After stopping the tractor, leave the tractor from Left or Right side of tractor.



0

4.3.1 Starting the Engine

Ignition switch is used to start the engine. Switch has following four positions. See figure 4.3a to understand ignition switch positions in your tractor model:

- **1.OFF:** When the key is turned to this position, power supply to the electric circuits is cut off, and the key can be removed or inserted in this position.
- **2. ON+HEAT:** When the key is turned to this position, power is supplied to the electric circuits. After the engine starts, the key is held in this position.

In this position, glow plugs would become hot and allow easy startup of a cold engine.

3. START: When the key is turned to this final position, the starter cranks the engine and the engine starts. When the key is released, it automatically returns to 'ON' position.

For Starting in normal weather conditions:

- A Move the low/ high speed selector lever to neutral position.
- B Tractor is equipped with safety starter switch, always press the brake pedal fully before starting the engine.



When the engine is running, keep as a safe distance from the radiator fan.

IMPORTANT: Run the engine at idle RPM for few minutes till the transmission oil temperature reaches above 10°C or 50°F.

4.3.2 Cold Weather Starting (Temperature below 0°C or 32°F):

Proceed as follows:

- 1 Perform operations A to B as instructed above.
- 2 Turn the Ignition key to 'Heat' position (fig. 4.3a) and keep it there for few seconds and then turn the key to start position.
- 3 If the engine fails to start, repeat Step 2 and wait for further 5-10 seconds and then turn the key to start position again.



Fig. 4.3a - Ignition Switch





IMPORTANT: When starting engine, transmission oil temp. should be over -20°C or more.

Note:

- 1 If the engine fails to start after two or three attempts and smoke can be seen coming out of the exhaust, repeat the starting procedure with less time glow plug heater.
- 2 Do not keep the key turned to start position for more than 5-8 seconds at a time.
- 3 Wait at least one minute after every two failed attempts of starting the tractor.

If the engine does not start regularly and easily, do not continue as for you may run down the battery. Bleed any air that may have accumulated in the fuel system and if the problem persists check that:

- 1 Fuel filters are not blocked.
- 2 The battery and Heater plugs are working efficiently.

4.3.3 Running in

It is essential to take the following precautions during the running in period:

- 1 During this period, do not subject the tractor to loads greater than those it will have to deal with during the rest of its working life.
- 2 Engage low gear when towing heavy loads.
- 3 When running in, check regularly that all screws, nuts and bolts are tight.

4.3.4 Turning off the Engine

- 1 Turn the accelerator to idle position.
- 2 Stop the engine by turning the ignition key to 'OFF' position.

4.3.5 Stopping and Parking

- Release speed control pedals. Press the brake pedal to stop the tractor.
- Reduce the engine speed using hand throttle lever.
- Move the hi-low lever to neutral position.
- Lower any implement to the ground.
- Apply the parking brake.
- Turn the ignition key to 'OFF' position to stop the engine.
- Remove the ignition key.



Always apply the parking brake when parking. Failure to do so can cause accidents and damage. As an extra precaution when parking on a slope, chock the rear wheels. **IMPORTANT:** Do not inject starting fluids (ether) to make the engine easier to start in cold weather. The tractor is equipped with a cold start device.

4.4 Under Hood Muffler

Under hood muffler fitted inside the bonnet for better aesthetics, vision and better sound muffing capabilities.



Fig. 4.4

4.5 Opening the Bonnet

Pull the knob 1 (fig. 4.5a) at front left side of the bonnet, till you hear a click sound, to open the bonnet.

Lift the bonnet slightly and it will automatically lift up to the preset height with the assistance of gas spring (fig. 4.5b).



Fig. 4.5a



Fig. 4.5b

4.6 Speed Control Pedals

There are two speed control pedals provided to drive the tractor in forward and reverse direction.

Press pedal "A" to drive the tractor in forward direction.

Press pedal "B" to drive the tractor in reverse direction.



Do not shift from forward speed to backward speed or vice versa suddenly in high range. Sudden change may damage mechanism and cause risk of injury to operator.



Fig. 4.6

4.7 Engaging & Dis-engaging Cruise Operation

The cruise control function is provided for comfort of operator. When the cruise control is engaged, the cruise control indicator on instrument panel will turn on.

Engaging the cruise control:

- Press the forward speed control pedal till getting required speed is achieved.
- Push the cruise control switch to engage cruise control.
- Release the speed control pedal.

Disengaging the cruise control

There are two methods to disengage the cruise control :

- Push cruise control switch "OFF"
 - or
- Press the brake pedal.

IMPORTANT: To avoid damage of mechanism, do not press both of the speed control pedals when the cruise control is engaged.

IMPORTANT: Cruise operation should be disengaged while turning the tractor.

4.8 '2WD / 4WD' Lever

You can drive the tractor in both 2WD or 4WD mode. Select the driving mode by Lever as shown in figures (4.8). **2WD mode:** By engaging the lever in 2WD position (downward direction) the power is transmitted to rear wheels only.

4WD mode: With the lever in 4WD position (upward direction) the power is simultaneously transmitted to all 4 wheels of tractor.

NOTE: 4WD Mode is for field operation and 2WD mode is for road operation.

2WD=Two Wheel Drive, 4WD=Four Wheel Drive



Fig. 4.7



Fig. 4.8

4.9 Hand Throttle Lever

Hand throttle lever mounted on front panel (See fig.4.9) To increase the speed of engine, pull up the lever. To decrease the speed of engine, pull down the lever.



Fig. 4.9

4.10 Power Take off (PTO)

Rear and Mid PTO are provided for variable utility. Both can be engaged simultaneously or separately. The engine will not start if PTO switch is in ON position. The engine will shut-off if the operator leaves the seat with parking brake released and PTO engaged. (See fig.4.10a)

Position	Engine RPM	PTO Speed
Mid PTO	2552	2100
Rear PTO	2565	540



Fig. 4.10a







Mid PTO:

In mid PTO, the PTO speed is 2100 RPM. Engage the mid PTO as per following steps:

- Decrease engine speed at idle RPM.
- Make sure that PTO switch is OFF.
- Shift PTO lever to forward direction.
- Turn on the PTO switch.
- Increase engine speed as desired.

Both PTO:

In both PTO mode, both Mid & Rear PTO will work simultaneously.

Rear PTO:

In rear PTO, the PTO speed is 540 RPM. Engage the rear PTO as per following steps:

- Decrease engine speed at idle RPM.
- Make sure that PTO switch is in OFF position.
- Shift PTO lever to backward direction.
- Turn on the PTO switch .
- Increase engine speed as desired.

IMPORTANT: If operator turns off PTO switch, rear PTO and mid PTO are off at once.

IMPORTANT : When PTO is not operational protect PTO splines with PTO Cap (A).

PTO Cap protects persons from injuries and the shaft splines from damage.



Before connecting adjusting or working on implements operated by the PTO, disengage the PTO, stop the engine, remove the key from the dashboard and engage the parking brake. Do not work under raised implements.



When using the PTO drive with a stationary tractor, ALWAYS make sure that the parking brake is applied.



Check to make sure that all implements operated by the PTO are fitted with the correct protections, are in a good condition and comply with the provisions established by the law.



Before driving an implement through the PTO, ALWAYS make sure that all bystanders are well away from the tractor.



Remove PTO cap (A, fig. 4.10b) only when the PTO is to be used. As soon as PTO-driven implement is removed, re-install cap over PTO stub shaft again afterwards. There are various versions of PTO guard that are not shown here.



VARNING

Never operate PTO unless the master shield (B) is in the position shown. Switch off the PTO before raising the implement.

Before using the PTO, the maximum permissible angle of articulation on the telescoping driveline must be ascertained. During operation, there must be no contact between the PTO guard and the telescoping driveline. This is particularly important when turning corners.



Always put a guard on the telescoping driveline and take action to prevent it from turning with the shaft. Do not operate the telescoping driveline unless a guard is installed that covers the PTO shaft completely and does not turn with the shaft.



Fig. 4.10b





Fig. 4.10c



Fig. 4.10d



Articulation on Telescoping Driveline



Stay clear from the area of the three-point linkage when controlling it.



The mounted machinery must be lowered on the ground before leaving the tractor.

Stay clear from the area between tractor and trailed vehicle.

Information about using implements with power take-off drive shafts



1. Shut off engine and disengage PTO before attaching PTO-driven equipment.

High-inertia implements do not come to a standstill the moment the PTO control lever is shifted to the disengaged position. Do NOT approach the implement while it is "coasting down". Do not work on the implement until it has stopped.



Before attempting to clean, adjust or lubricate a PTO-driven machine, the TPL, always make sure the PTO is switched off and stopped, the tractor engine is shut off and the ignition key is removed.

Turn key off to stop engine.

- 2. Attach implement to tractor before connecting PTO drive line. Lock TPL in upward position if it is not to be used.
- Rotate PTO shield upward for clearance. With engine off, turn shaft slightly by hand if necessary to line up splines. Connect drive line to PTO shaft. Pull out on shaft to be sure drive line is locked to PTO shaft. Place PTO shield in downward position.
- 4. Be sure all shields are in place and in good condition. Never operate PTO unless master shield is properly installed. WITH ENGINE STOPPED, check integral shields on drive line by making sure they rotate freely on shaft. Lubricate or repair as necessary.
- 5. Check carefully for any interference, make sure TPL is locked in the upward position if it is not used.

As far as possible, angles (1) and (2) at the universal joints should be the same at both ends of the Telescoping driveline.

In applications where this is not the case (e.g. sharp turns with PTO engaged), it is recommended to use a continuous-velocity drive shaft.

NOTE: The two schematic drawings do not show any guards on the telescoping driveline. A guard is mandatory when using telescoping drivelines.



Align Forks Correctly 1 - Z-shaped layout 2 - W-shaped layout

Fig. 4.10e

Note: Use only power take-off drive shafts with adequate guards.

IMPORTANT: Before using a PTO-driven implement, take action to ensure that the telescoping driveline is lubricated regularly. Comply with instructions in the Operator's Manual provided by the manufacturer.

IMPORTANT: On multi-component telescoping drivelines, the yokes at each end must be aligned as shown. The yokes at each end must NOT be at 90° to one another.

58 OPERATION

PTO ON-OFF Switch :

This Switch is used to ON/OFF the PTO operation. This switch gives signal to PTO solenoid valve through safety controller. When we press this switch for 3 second then PTO solenoid will be ON & then we press this switch again, it will stop the PTO solenoid immediately.



Fig. 4.10f

PTO External Control Switch

If you want to operate any PTO driven implement in static condition of the tractor without sitting on the driver seat, the same can be achieved with the help of PTO external control switch, This switch is located near Ignition switch (fig. 4.10g).

Mode of Operation:

During static condition (operator leaves the seat and PTO is in running condition), engage the parking brake and press the switch downward direction in 'ON' condition. This will prevent the engine from getting shut-off.



Fig. 4.10g

4.11 Hydraulic Coupling Devices

One Double acting (1DA) with float option detent type Direction control valve (DCV) is equipped as a standard fitment in your tractor. The DCV is used when attaching the implement operated by hydraulic cylinder.

The female Quick release couplers (QRC's) are located at rear side of tractor (see fig. 4.11a).

- 1. Make sure hose end and coupler receptacles (male & female) are in perfectly clean condition.
- 2. Remove dust plug from QRC's.
- 3. To connect male coupler, push it firmly into female coupler receptacle. Pull lightly to make sure positive connection was made.
- 4. Use DCV lever (Fig. 4.11b) for operating DCV.
- 5. Move the DCV lever forward or backward to control the implement.



Fig. 4.11 (a)



Fig. 4.11 (b)



Use cylinder implements only according to DCV fitted in your tractor.



Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.



Make sure that DCV Lever is in neutral position in case of DCV is not in use. Failure to follow this instruction may result in serious damage of hydraulic components.



Never unhitch the implements before removing the QRC's.

4.12 Response Valve

To adjust the lowering speed for three point linkage, use response valve knob. It also acts as a safety device during transportation of implements. It is located on front end side of Hydraulic rear cover & below driver seat (see fig. 4.12). **Operation**: While implements transportation, lift the implement at desired height and then fully tighten (clockwise)

the response valve for its locking.



Response Valve should always be closed during implements transportation.



Fig. 4.12

4.13 Hi-Low Lever

This lever is two positions i.e. High & Low speed range. Each range is identified by a symbol on the knob of the lever.

Speed Selection:

- 1. Neutral Position: Lever in the middle position.
- 2. High Speed: Move the lever backward
- 3. Low Speed: Move the lever forward.

Note: Select the speed after starting tractor as per requirement.



Fig. 4.13

4.14 Differential Lock Pedal

The rear axle differential is equipped with a locking device to engage when one of the rear wheels slip owing to lack of grip. To lock the differential, slow the tractor down and fully press the differential lock pedal (Fig.4.14).

NOTE: For the best results, engage the differential lock before the wheels are likely to slip. Do not lock the differential without having first depressed the clutch pedal.

The differential must remain locked until the driving wheels regain their grip. To disengage the lock, just remove your foot from the pedal. If the differential fails to release, sharply brake on the wheels. Brake the wheel that is out of the furrow during ploughing work.



Fig. 4.14



Do not apply differential lock while tractor speed is more than 6 kmph [3.73 mph] on turning.

IMPORTANT: Differential lock operation should be in straight position only and should be disengaged at turnings to avoid any damage of differential assembly.

4.15 Power Steering

The tractor is equipped with power steering with a pump of 6.7 CC & steering unit of 40 CC which enables the operator for ease in steering operation.

NOTE: The power steering function goes off when the engine is shut-off.



Fig. 4.15

4.16 Service Brake

The service brake pedal located to left hand side of the platform.



Fig. 4.16

4.17 Parking Brake

The Parking brake is located below driver seat and engaged by the parking brake lever which acts on the brake discs by means of a mechanical control.

Parking brake engagement

- Pull the parking brake lever upward to operate the parking Brake (fig. 4.17).

Parking brake disengagement

- Press sleeve (A, fig. 4.17) in forward direction, push the parking brake lever downward and release the sleeve 'A'.

Always engage the parking brake when the tractor is used for work at a standstill, even if only for brief periods of time.

IMPORTANT: Driving the tractor with the parking brake partially engaged may cause damage to internal transmission components. Make sure the brake is fully disengaged during tractor operation.

4.18 Speed Chart

Following listed speeds are at rated engine rpm:

	Direction	Rear Tyre Size / Specifications							
Range		8.3-20 6PR BKT TR171 TT	33X15.5-16.5 10PR BKT LG306 TL	33X15.5-16.5 12PR BKT SKID P HD TL	8.3-24 FARM 2000 8PR BKT	TURF TYRE 13.6X16 (LG306)	280/70 R16 Galaxy Pro	280 70 R 18 A-370 114A8 111B TL	
SLOW	Forward	8.11	7.24	7.49	8.79	8.10	6.91	7.38	
	Reverse	8.11	7.24	7.49	8.79	8.10	6.91	7.38	
FAST	Forward	18.22	16.27	16.84	19.77	18.21	15.54	16.59	
	Reverse	18.22	16.27	16.84	19.77	18.21	15.54	16.59	

Note: Above speeds can vary within ±5 % according to tyre pressure & loading conditions.



Fig. 4.17

4.19 Wheels and Tyres

Tyres play vital role in transportation and agriculture operations. It is the most important factor in the efficient performance of tractor it should be used only as per company recommendation. Here we will discuss only pneumatic tyres.

On any tyre there is some marking which represents its size & capacity e.g. Tyre marking is 8.3x20, 4 ply rating i.e. 8.3 inch is the section width, 20 inch is the bead diameter. Ply rating doesn't show that the same No. of plies are inserted in tyre. It is only comparative measure of the load carrying capacity (L.C.C) of tyre. As more ply rating shows more L.C.C. at the same time as L.C.C. increase the shocks absorption capacity decreases.

In general, tractor is considered for two types of work:

- Work on soft soil where maximum adhesion is needed. In this case there will be use of lowest pressure compatible with the load carried.
- Work on hard ground and roads, towing etc. In this case there will be use of maximum pressure.

In Field Operations

Recommended Tyre Pressure : Front: 20~22 P.S.I / Rear: 14~16 P.S.I



- Good adherence by dirt grousers.
- Good cleaning of the tread
 - Deterioration of



• Reduce adherence through lack of tyre grip.

• Deterioration of tyre casing by traction forces.



Reduce group due to lack of cleaning

 Deterioration due to compacted ground.

On Haulage Operations

Recommended Tyre Pressure: Front: - 22~24 P.S.I / Rear 16~18 P.S.I



· Resistance to Wear



- Reduce adherence through lack of tyre grip.
- Deterioration of tyre casing by traction forces.



- Reduce group due to lack of cleaning
 Deterioration due to compacted
- ground.

Load Carrying Capacity

Tyre Combin ation	Axle	Tyre Dimensions including load capacity index and speed category symbol	Tyre Load rating per tyre [kg]	Maximum permissible mass per axle [kg]	Maximum permissible mass of the vehicle [kg]	Max. permissible vertical load on coupling point [kg]
1	Front	6.00-12 & 76 A6	400	800	2220	248
	Rear	8.3-20 6PR & 96 A6	710	1420		
2	Front	7-14 8 PR & 72 A6	685	1370	2240	
2	Rear	8.3-24 & FARM 2000 8PR	935	1870	3240	
3	Front	6.5/80-12 & 80 A6	650	1300	2660	
	Rear	280/70 R18 & 114 A8	1180	2360	3000	
4	Front	23x8.5-12 & LG 306 TL	960	1920		
4	Rear	33x15.5-16.5 & LG 306 TL	1650	3300	5220	
_	Front	25x8.50-14 (LG306)	750	1500		
5	Rear	13.6x6 (LG306)	950	1900	3400	
6	Front	220/55 R12 Galaxy Pro (82A8/82B)	475	950		
	Rear	280/70 R16 Galaxy Pro (112A8/112B)	1120	2240	3190	
7	Front	23x8.5-12 12 PR SPHD	840	1680		
	Rear	33x15.5-16.5 12 PR SPHD	1950	3900	5580	

4.20 Check Wheel Nut Bolt

Check wheel nut of the front and rear wheel. Torque it as per following specification:

Rear wheel : 130 Nm [103 lbf-ft] Front wheel : 72 Nm [53 lbf-ft]

4.21 Ballasting the Front Axle

Proper ballasting is an important factor in tractor performance. For better performance of tractor, the weight of tractor can be decreased as per requirement. Maximum productivity can be achieved only if tractor weight is appropriate for the job. Ballast is required for traction and stability. The tractor is equipped with detachable front toe hook. Following factors determine amount of ballast.

- Soil surface loose or firm
- Type of implement
- Travel speed and tractor power output partial or full load.

By default, equipped with 2 Front Weights of 15 Kgs each i.e. total 30 Kgs [66.14 pounds].



Fig. 4.21

4.22 Hydraulic Control Lever

This black color lever is mounted on right side of driver seat which enables raising or lowering the lift.



Fig. 4.22

4.23 Three Point Linkage

Three-point linkage is used to mount the implement, which is fully mounted, or semi-mounted and used for different field operation. Three-point linkage is controlled by hydraulic lever. In this two lower link are available, of which one side of the lower link is attached with differential housing and other is used to hitch the lower pin of the implement. Lift rods are mounted on lift arm that is operated through rockshaft. Loose side of Top link is used for attaching upper hitch pin of implement. Top link is adjustable for proper setting of implement and ease at the timing of joining.



Fig. 4.23

Adjustable Lift Rods (Fig. 4.23b)

The lift rods can be adjusted mechanically to make the lower links level and lined up with each other. This will depend on the type of implement being used and the work to be done.

Top Link (Fig. 4.23c)

For length adjustment of top link, fix the top link other end and turn the lever for increasing or decreasing the length. During field operation lock the tube to avoid unnecessary turning.

Lower Links (Fig. 4.23d)

Lower Links are provided for hitching the implement.

Attaching Implement to 3 Point Linkage

Position the tractor to align corresponding linkage with the hitch points of implements. Keep the implement on hard & leveled surface and attach as per given below instructions :

- First attach with Left lower link and Right Lower Link
- Then at last attach with Top Link



Stay clear from the area of three point linkages while attachment and detachment of implements.

NOTE: Maximum allowed vertical load on rear hitch is 248 Kg-f [0.55 pound-force].



Fig. 4.23b



Fig. 4.23c



Fig. 4.23d

4.24 Roll Over Protection Structure (ROPS)

A Safety frame and seat belt is fitted as standard equipment to the platform tractor at the time of factory assembly. If the safety frame was deleted by the original purchaser or has been removed, it is recommended that you equip your tractor with a Safety frame and a seat belt. Safety frames are effective in reducing injuries during overturn accidents.



WARNING : A tractor overturning without safety frame can result in serious injury or death.

Operation:

- Before using the tractor ensure that the safety frame is not damaged, that it is securely fastened to the tractor.
- If the safety frame has been removed from the tractor, it must be refitted or erected immediately using the proper hardware and applying the recommended torque value.
- DO NOT ATTACH chains, ropes or cables to the safety frame for pulling purposes; this will cause the tractor to tip backwards. Always pull from the tractor drawbar.
- Always wear your seat belt-adjusted snugly except when the safety frame has been removed.
- Check the seat belt for damage. A damaged seat belt must be replaced, Fig. 4.24b.

Maintenance and Inspection:

The ROPS has been certified to industry and/or government standards. Any damage or alteration to the ROPS, mounting hardware or seat belt voids the certification and will reduce or eliminate the protection for the operator, in the event of a rollover.

The ROPS, mounting hardware and seat belt should be checked at every service for any evidence of damage wear or cracks.

Normal Operating Position

For normal operation, including transport, always use the ROPS in the upright position with a fastened seat belt for full rollover protection (fig. 4.27a).

Operating Foldable ROPS

- Unscrew the Hex screw M10 (1, Fig. 4.27c) 2 Pcs.
- Remove the snap ring (2,4.27d) 2 Pcs.

as soon as possible.

Remove the Pin (3, 4.27d) - 2 Pcs. from ROPS bracket.



When raising or folding the ROPS, apply parking brake, stop the engine and remove the key. CAUTION Always perform function from a stable position at the rear of tractor. Fold the ROPS down only when absolutely necessary and fold it up and lock it again



Fig. 4.24a



Fig. 4.24b

IMPORTANT: Do not weld, drill, bend or straighten the Safety Frame.



Fig. 4.24a



To avoid personal injury hold the ROPS tightly with both hands and fold the ROPS slowly and carefully.