

 5.1 Maintenance Schedule
Observe the following maintenance schedule. This maintenance schedule is applied to tractors which are operated under normal conditions. When your tractor is frequently operated in muddy places, greasing must be carried out more frequently and when the tractor is often operated in dusty places, clean the air cleaner element and fuel filter more frequently. Extra servicing must be carried out according to particular situation.

Parameters	1st Service 50 Hours	2nd Service 250 Hours	3rd Service 500 Hours			6th Service 1250 Hours	
General							
Washing	W	W	W	W	W	W	W
Greasing	G	G	G	G	G	G	G
Re-tighten All Fasteners	СТ	СТ	СТ	СТ	СТ	СТ	СТ
Rear View Mirror Holder	СТ	СТ	СТ	СТ	СТ	СТ	СТ
Safety Frame (ROPS)	С	С	С	С	С	С	С
Engine							
Engine Oil	R	R	R	R	R	R	R
Engine Oil Filter	R	R	R	R	R	R	R
Tappet Clearance	CA	CA	CA	CA	CA	CA	СА
Fuel Filter Element	R	R	R	R	R	R	R
Fan Belt Tension	СТ	СТ	СТ	СТ	СТ	СТ	СТ
Radiator Coolant Level	СР	СР	СР	СР	СР	СР	СР
Air Cleaner Element	CL	CL	CL	R	CL	CL	CL
Transmission / Hydraulic							
Transmission Oil	R	R	R	R	R	R	R
Hydraulic Oil Filter (Suction)	R	R	R	R	R	R	R
Hydraulic Oil Filter (Delivery)	R	R	R	R	R	R	R
Transmission Breather Assy	CL	CL	CL	CL	CL	CL	CL
Operation of Hydraulic Lift	С	С	С	С	С	С	С
Hydraulic Oil Strainer	CL	CL	CL	R	CL	CL	R

Parameters	50 hrs/ 1st Service	250 hrs/ 2nd Service	500 hrs/ 3rd Service	750 hrs/ 4th Service	1000 hrs/ 5th Service	1250 hrs/ 6th Service	1500 hrs/ 7th Service
Brakes	-		*				
Operation of Brakes	С	С	С	С	С	С	С
Brake Pedal Free Play	CA	CA	CA	CA	CA	CA	CA
Steering	1	1	1	1	1		
Steering Operation	С	С	С	С	С	С	С
Front Axle 4x4	1	1	<u>I</u>	<u>I</u>	<u>I</u>	<u>.</u>	
Front Axle Differential Oil	R	С	R	С	R	С	R
Breather Assy	CL	CL	CL	CL	CL	CL	CL
Front Axle Pivot	С	С	СА	С	CA	С	СА
Wheels and Tyres							
Front Wheel Bolts	СТ	СТ	СТ	СТ	СТ	СТ	СТ
Rear Wheel Nuts	СТ	СТ	СТ	СТ	СТ	СТ	СТ
Tyre Inflation Pressure	CA	CA	CA	CA	CA	CA	CA
Battery							
Battery Electrolyte Level	С	С	С	С	С	С	С
Battery Terminals	CL	CL	CL	CL	CL	CL	CL
Electrical				-	-		
Functioning of All Gauges & Meters	С	С	С	С	С	С	С
Functioning of Alternator & Starter	С	С	С	С	С	С	С

Legends: R-Replace, C-Check, CT-Check & Tight, CA-Check & Adjust, CL-Clean Beyond 1500 hours, repeat the cycle every 250 hours.

IMPORTANT:

- Engine oil grade should be selected as per operating temperature condition.
- Anti freeze should be used in sub zero ambient temperature.
- Clean Air Cleaner system as and when required as per field operating conditions.

5.2.1 Fuel Tank Filling

Comply with the following instructions when working with the diesel fuel:

- 1. Do not smoke while filling the fuel tank because diesel is flammable liquid and catch fire easily.
- 2. Mixtures of diesel fuel and alcohol are not approved since the resulting lubrication of the fuel injection system is insufficient.
- 3. Clean the area around the filler neck where the fuel is poured.
- 4. Fill the tank at the end of the day to prevent the formation of overnight condensation.
- 5. Never remove the plug or fuel the tractor while the engine is running. Keep control of the pump nozzle whilst the tank is being filled.
- 6. The tank must not be completely filled. Allow space for an increase in volume. If the original tank plug is lost, it must be replaced with an original spare which must be fully tightened.
- 7. Dry up any fuel spill immediately.

5.2.2 Fuel Requisites

It is important to use good quality fuel for the long life & good performance of the engine. The fuels must be clean, well refined and non-corrosive for the fuel system components. Make sure that you use fuel of a known quality and reliable origin.

5.2.3 Fueling

Before you fuel the tractor, clean the zone around the filler neck to prevent foreign bodies from entering the tank. After fuelling, tighten the plug properly.

5.2.4 Fuel Storage

Take all the necessary precautions to ensure that stored fuel does not become polluted with dirt, water or other substances.

Store fuel in black iron cans. Do not store it in galvanized cans as the galvanization treatment would react with the fuel and form compounds that would spoil the injection pump and injectors.

- Store fuel cans away from direct sunlight and slightly tilted, so that any sediment inside is eliminated through the outlet tube.
- To make sludge and water condensation easier to remove; there should be a discharge plug (c), in the lowest point, on the opposite side to the drain tube.
- If the fuel is not filtered from the storage can, use a funnel with the fine gauge mesh over the fuel tank fill plug inlet when fueling.
- Plan your fuel purchases so that summer fuels are not kept for too long and used in the winter.

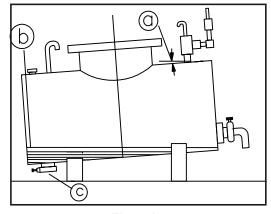


Fig. 5.2a

Setting up a tank for fuel storage and decanting.

- a. Slop 25 %
- b. Condensation water.
- c. Sludge drain plug.

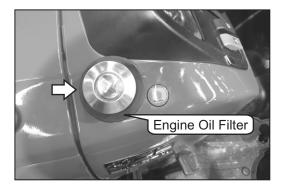


Fig. 5.2b: Fuel Tank Cap

Fuel Tank Capacity: 29 ±3 Liters (7.66 ±0.79 US Gallons)

5.3.1 Checking Engine Oil Level

Before checking the oil level be ensure that tractor is parked on leveled ground. Stop the engine and wait for some time, as all oil should return to oil sump.

Check the oil level by unscrewing dipstick (located at RHS of the Engine). Top up the oil level if the level is below the minimum level mark. Do not over fill than maximum level mark. Oil level should be between maximum and minimum marks (see fig. 5.3a).

5.3.2 Replacement of Oil Filter & Engine Oil

Changing Oil Filter:

 Stop your tractor to the side of road on leveled surface and drain the engine oil in an oil pan after removing the drain plug.
Remove the oil filter by rotating it in anti-clockwise direction by hand or with the filter wrench.

3. Take new oil filter and check it for proper seating of gasket.

4. Apply clean engine oil to gasket on the new oil filter.

5. Install oil filter. When the filter gasket contacts the mounting surface of filter, tighten the new oil filter.

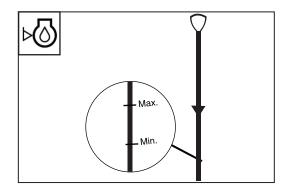


Fig. 5.3a: Dipstick marks

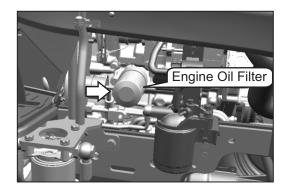


Fig. 5.3b

Refilling Engine Oil :

1. Re-install the Drain plug and remove the oil filler cap.

2. Fill the engine oil with the specified engine oil to the specified level to sump capacity from oil filler cap (fig. 5.3c & 5.3d).

3. Insert into the oil level gauge guide, then pull out the gauge again.

4. Ensure that oil level should be between the MAX. & MIN. marks on the dipstick. If less, then pour the oil to bring it to specified level.

5. Install the oil filler cap after a refill.

6. Check the oil pan and other parts for oil leakage.

7. Start the engine, allow it to run idle and don't race it immediately.

Recommended grade of Engine Oil: SAE-10W40.

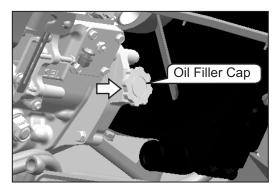


Fig. 5.3c

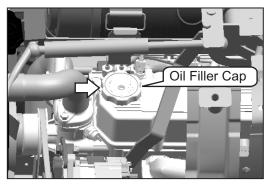


Fig. 5.3d

5.4 Replacement of Fuel Filter

- 1. Turn off the ignition switch.
- 2. Remove the filter by rotating it in anti-clockwise direction by hand or special wrench.
- 3. Take new filter and check it for proper seating of gasket.
- 4. Apply clean engine oil to gasket on the new fuel filter.
- 5. Install fuel filter, when the filter gasket contacts the mounting surface of filter, tighten the filter and ensure that there is no leakage.

5.5 Air Bleeding of Fuel System

After changing the fuel filter the system must be air - bleed in following manner:

- 1. Switch ON the ignition key to start the electric pump till completion of air bleeding process.
- 2. Loosen the vent plug (A) at the top of fuel filter body.
- 3. Tighten the vent plug (A) until the bubble free fuel flows from the air vent plug hole.
- 4. Loosen the vent plug (B) of FIP and allow the air to flow out from the system.
- 5. Tighten the vent plug (B) until the bubble free fuel flows from the return valve.

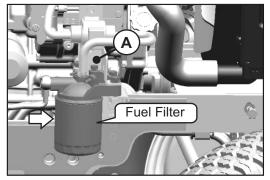


Fig. 5.4a

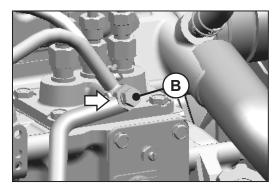


Fig. 5.4b

5.6 Radiator

5.6.1 Coolant Level in Radiator (When Hot)

Slowly open the radiator cap (1, fig. 5.6a) up to the safety catch (about 1/3 turn). Wait to allow the steam to escape. Continue opening the cap, press it down firmly to release the safety catch. The level of coolant should just touch the tab located in the filling spout.

If the level has dropped, check the entire cooling system for leakage (radiator, hoses etc.) If there is no leakage, Top up the coolant.

Fill the reserve tank (2, fig. 5.6a) with coolant up to the FULL line mark for coolant Top up.

Coolant is a mixture of water and anti rusting / anti freezing agent in a recommended ratio.

In sub zero temperature climate conditions use Glysantin G40 antifreeze agent along with water in following ratio (table 5.6.1):

Temperature Range [°] C [[°] F]	0 to -3 [32 to 26.6]	-3 to -8 [26.6 to 17.6]	-8 to - 16 [17.6 to 3.2]	25 [3.2	37 [-13	55 [-34.6
Antifreeze (%)	10	20	30	40	50	60

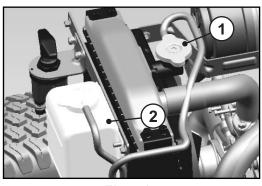


Fig. 5.6a

5.6.2 Radiator Draining & Flushing (When cold)

1. Remove the radiator cap and drain plug (fig. 5.5b).

2. Let the coolant drain out. Close drain cock and plugs. Flush the cooling system with water / Cleaning Solution for 15 minutes, then drain the cleaning solution.

3. Refit the drain plug and refill the coolant (Mixture of water, anti scaling agent, antifreeze).

4. Run the engine with radiator cap open and accelerate 2-3 times and Top up coolant if required.

5. Refit the radiator cap and ensure tightness all the connections for any leakage.

5.6.3 Radiator Fins Cleaning (Fig. 5.6c)

- 1. Check Radiator Fins for holes or cracks for chocking.
- 2. To clean the radiator blow compressed air from engine side to outside.

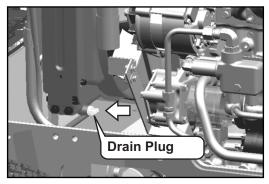


Fig. 5.6b

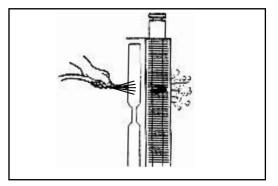


Fig. 5.6c

5.6.4 Radiator Mesh Cleaning (Fig. 5.6d)

- 1. Raise the bonnet.
- 2. Pull out the radiator mesh.
- 3. Clean straw and dust attached from the radiator mesh.

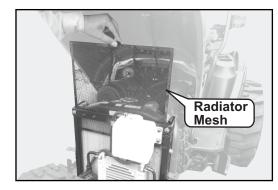


Fig. 5.6d

5.6.5 Radiator Cap (Fig. 5.6e)

Cooling system is closed pressurized system so don't operate the tractor without radiator cap or cap with damaged rubber seals (A) / defective release valve to avoid water loss and engine overheating.

Use genuine radiator cap only.

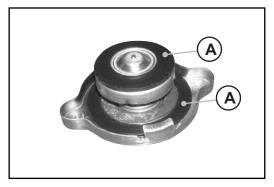


Fig. 5.6e

MAINTENANCE | 73

5.7 Inspection of Hoses

Check/Replace Hoses

- Check hoses regularly on every service/before cranking tractor after long idle standing– for leaks, kinks, cuts, tears, rubbing, bulges, corrosion, exposed fabric and other signs of wear and damage.
- · Replace worn or damaged hoses immediately.
- · Replacement hoses are available from your dealer.

NOTE: Refer Maintenance Schedule for Inspection interval of Hoses.

5.8 Air Cleaner Maintenance

Air Cleaner Components (Fig. 5.8a,b,c)

- (1) Air Filter Housing
- (2) Clamp
- (3) Cover
- (4) Rubber Valve
- (5) Air Cleaner Element
- (6) Clogging Sensor

Important Instructions :

Clean the air cleaner element at first 50 hours & then after every 250 hrs of operation or whenever choke indicator glows on dashboard.

Clean filter element by blowing air from inside. Maximum pressure should not exceed 1.6 bar (23 P.S.I).

Use clean cloth to wipe sealing areas of element.

After replacing new filter element ensure matching of (\blacktriangleleft) mark on cover with the mark (\blacktriangleright) on air filter housing.

Ensure proper seating of filter into housing before latching the cover. Do not use latches on the cover to force the filter into air cleaner that could cause damage to housing and will void the warranty.

Ensure proper seating of all rubber rings. Replace the damaged ones.

Replace air cleaner element after three cleaning operations or at every 750 hours, whichever is earlier.

IMPORTANT: NEVER attempt to clean the filter element with exhaust gas from the engine. NEVER ever use oil on dry filter. NEVER ever use oil, diesel fuel, paraffin or solvents to clean the filter element.

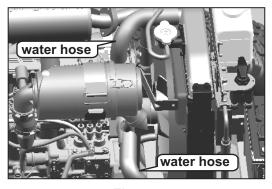


Fig. 5.7

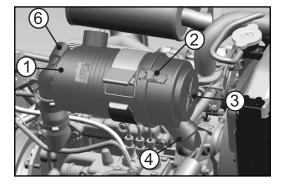


Fig. 5.8a

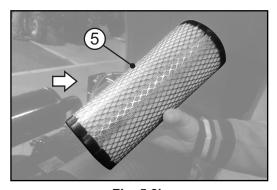


Fig. 5.8b

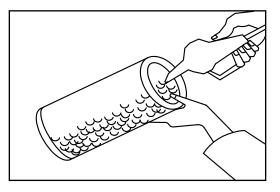


Fig. 5.8c

5.9 Brake Pedal

Brake pedal is located at the left side of the platform (see fig. 5.9). Tractor motion is controlled by gradually pressing the brake pedal as per requirement.

5.10 Brake Pedal Free Play

Press down the brake pedal until you feel the restriction and measure the free play of pedal as shown in the figure. The distance should be 25 to 30 mm [0.98 inch to 1.18 inch]. If the distance is less than 25 mm [0.98 inch] or higher than 30 mm [1.18 inch] then get it adjusted.

IMPORTANT: Do not keep foot on brake pedal while tractor is in running condition. It may cause excessive wear of brake liner and brake falls before its life time.

5.11 Steering Cylinder Knuckle Joints

Have the knuckle joint nuts checked by an authorized service center after the first 50 hours and then at every service.

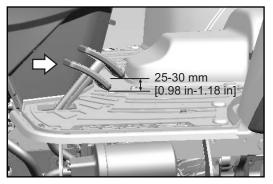


Fig. 5.9

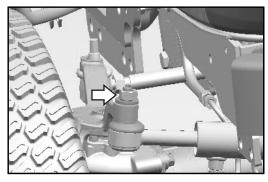


Fig. 5.11

5.12 Check Oil Level in Front Axle (4WD)

Oil filling plug is provided on left hand side of the front axle (as shown in fig.). Open the plug and check the oil level. The lower point of the plug should be immersed in the oil.

Front Axle Oil Capacity: 2.7 Liters [0.71 US Gallons] Oil Grade: EP-80

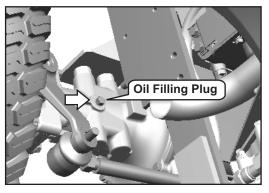


Fig. 5.12

5.13 Oil Changes for Transmission, Rear Final Drives and Power Lift Hydraulic Circuits

NOTE: When draining out and filling oil and checking oil level, take care that the transmission is in horizontal position.

Oil draining

- 1. Lower the lift arms to the ground.
- 2.Unscrew the all plugs located as shown in fig 5.13a to make oil draining easier.
- 3. Place vessel under all drain plugs of transmission housing to collect the oil as it drains out.
- 4. Remove the plugs and drain out the oil.
- 5. Clean the plugs and fit back on.



Beware of powerful oil jets. Follow all safety rules.

Filling up the transmission

- 1. Fill up the transmission oil from filler plug (A) opening to the maximum level mark on the dipstick.
- 2.Let it run on idle until the oil reaches a temperature over 25 °C [77 °F].
- 3.Check that the transmission oil reaches the required level mark on the dipstick.
- 4.If required, fill up to the correct level.

NOTE : Let the oil stabilize before checking its level.

NOTE : If implement used require more quantity of oil, make sure that the transmission contains enough oil for every work condition. Top up as required.

5.14 Recommended Oil Grade & Application Range

We recommend use of **ISO VG-32** oil grade for transmission. **Transmission Oil Capacity: 20 Liters** [4.75 US Gallons] Refer Table 5.14 for appropriate oil viscosity according to the ambient temperature.

Oil Grade	Ambient Temp. (°C)	Oil Temp.(°C)
VG 32	-10~27	3~70
VG 46	0~36	10~80
VG 52	5~43	14~85

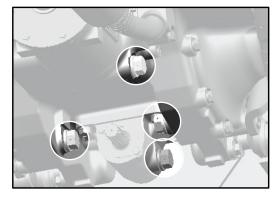


Fig. 5.13a

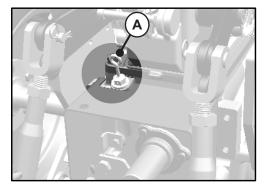
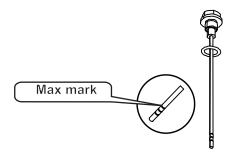


Fig. 5.13b

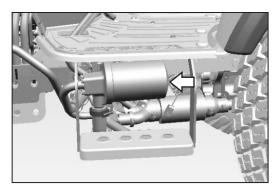




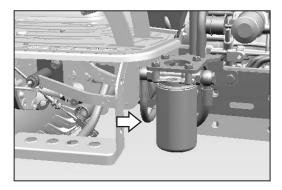
5.15 Hydraulic Filter Replacement

Replace the hydraulic filters with genuine parts as per schedule to enhance the life and performance of hydraulic system.

Replacement: Replace the hydraulic filters (suction & delivery) at first 50 hours and afterwards at every 250 Hours.



LHS (Suction Filter)



RHS (Delivery Filter)

5.16 Cleaning of Suction Strainer (Fig. 5.16a)

At each service, thoroughly clean suction strainer by washing with light oil or kerosene.

Failure to observe this will result in extensive shortening life of hydraulic system.

Cleaning Procedure of Suction Strainer (fig. 5.16b,c,d):

- (1) Remove all hose warm clips (1).
- (2) Separate the Hose pipes (2) from Strainer Assy.
- (3) Hold the strainer assembly in left hand & remove the wire clip (5) & magnetic strainer (4) from the housing (3) with the help of right hand fingers.
- (4) Unscrew the nut (6) & remove supporting cup (7). After dis-assembling supporting cup remove the sheath (8) having ferrous dust by sliding it with the help of plastic support (10).
- (5) Clean the sheath from ferrous dust with the help of soft cloth and refit the same.
- (6) Assemble the supporting cup & tighten the nut.
- (7) Assemble magnetic strainer in strainer housing and lock it with the wire clip.
- (8) Fix the hose pipes and tighten the hose warm clips.

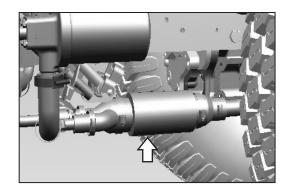
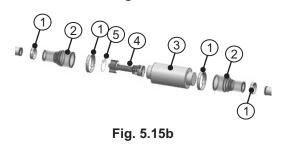


Fig. 5.16a



Replacement: Replace the magnetic strainer at every 750 Hours.

IMPORTANT: Do not dismantle the magnets (9) as these are assembled in polarity sequence and it should not be disturbed (fig. 5.16d).

5.17 General Maintenance of Electrical System

- Never Patch up the electrical circuits.
- Never replace a blown fuse by a higher capacity fuse. It could cause a fire.
- Never work on components such as the alternator or starter motor when the engine is running.
- Lastly when you are cleaning the tractor and using the pressure spray, take care not to damage the connections on the various electrical cable.

5.18 Battery and its Maintenance

Battery Removal Procedure

Battery is located at front of the tractor as shown in the figure, follow the below procedure to access the battery:

- 1. Open the bonnet.
- 2. Remove fly nut by rotating it anticlockwise.
- 3. Detach the (-)ve & (+)ve terminals (5.18a) respectively.

Check Electrolyte Level

It must be as per the recommendation of battery manufacturer. If required, top up with distilled water just touching the 'Max' mark on the battery (fig. 5.18b). Electrolyte level should never be below 'Min' mark. Never add acid.

Check Carefully Battery Charging

Protect against freezing. Insure that terminals are clean and tight. Check specific gravity of battery using a battery hydrometer (fig. 5.18c). Specific gravity of a fully charged battery is 1.265 ±0.005 at 27 °C [80.6 °F].

Battery Eye Indicator (Optional)

Battery eye indicator for easy maintenance check.

Indicator Sign	Description		
Green with red dot	Battery OK		
White with red dot	Charge the Battery		
Red with white dot	Add Distilled Water		

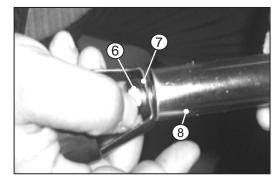


Fig. 5.16c

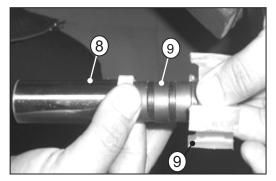


Fig. 5.16d

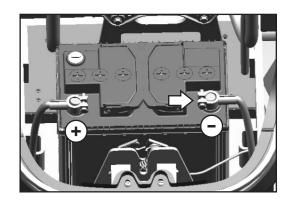


Fig. 5.18a

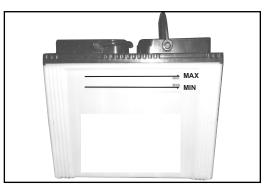


Fig. 5.18b



Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.



Remember to disconnect the cables before you recharge the battery. It is advisable to remove the battery from its location and to recharge it well away from the tractor. The place of battery recharge must be well ventilated.

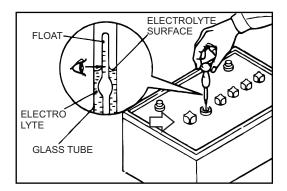


Fig. 5.18c

5.19 Starter Motor

Starter motor is mounted on the left side of the engine. The starting motor rotates the engine crankshaft for starting.

Visually check the starter for damage. If starter is dusty, blow off dust using compressed air.

Note: If defects are found in the starter, contact your dealer.

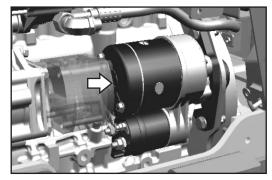


Fig. 5.19

5.20 Alternator

Alternator is fitted on Left side of engine and generates current which charges battery for healthy electrical back up.

Visually check the alternator for damage. If the alternator is dusty, blow off dust using compressed air.

Remove V-belt, and turn the pulley with hands to make sure it rotates smoothly.

NOTE: If defects are found in the alternator, contact your dealer.

Fig. 5.20a

Checking V-belt

1.Ensure that V-Belt is free from defects such as wear, cuts or surface separations, otherwise replace with genuine specified belt.

2. Inspect belt tension by pushing the belt downward with approx. 98N (10kgf) (22lbf) force midway between pulleys. If the deflection is 10 to 12mm [0.39 to 0.47 in], the tension is correct. If the tension out of the specified value, adjust belt tension.

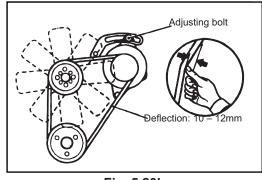


Fig. 5.20b

MAINTENANCE 79

Adjusting V-belt tension

1.Loose all retaining bolts of the alternator and adjusting plate.

- 2. Insert a bar between the alternator and cylinder block and use leverage to move that alternator to have proper v-belt tension.
- 3. While V-belt tension is appropriate, retighten all the retaining bolts of the alternator and adjusting plate.

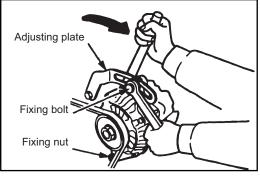


Fig. 5.20c

5.21 Fuses in Fuse Box (Fig. 5.21)

Fuses against short circuits and excessive power draw protect the tractor's electrical system. The number of the fuses in the electrical system depends on the tractor model.

NOTE : Before replacing a blown fuse with a new, equivalent ohm, the cause that lead to the fault should be ascertained and removed.

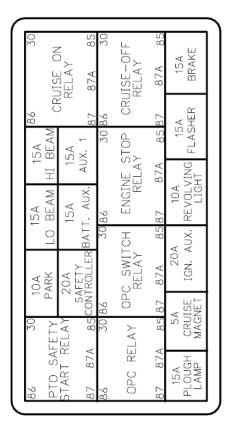


Fig. 5.21: Fuse Box



5.22 Long Idle Period

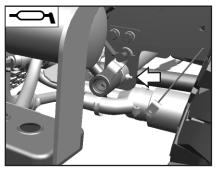
Take the following precautionary measures when your tractor is not going to be used for a long period of time.

- Park the tractor in dry sheltered place.
- Drain the coolant from the radiator and engine.
- Grease all points provided with grease nipples.
- Remove the injectors and squirt a small quantity of engine oil into the cylinders. Turn the engine over by hand, and then fit the injectors back in place.
- Generally clean the tractor .particularly the bodywork components. Protect the painted parts by applying silicon wax and the unpainted metal parts by applying protective lubricant. Park the tractor in a dry, sheltered and possibly ventilated place.
- Make sure that all the controls are in neutral (including the electric switches and parking brake controls).
- Remove the ignition key from ignition switch.
- Make sure that the cylinder stems (of the power steering, power lift system, etc) are positioned.
- Empty the fuel tank and fill with it with new diesel fuel until the maximum level is reached.
- Remove the battery, clean the cover and spread Vaseline on the terminal and terminal caps. Now connect the battery in the ventilated place where the temperature is not liable to drop below 10 and where it is not exposed to direct sunlight.
- Check the battery charge with a voltmeter as described in the battery part of this section Recharge if it is necessary.
- Place stands or other supports under the axles in order totake the weight off the wheels. When the tractor is raised in this way, it is advisable to deflate the tyres. If this is not possible, the tire pressure must be periodically checked.
- Cover the tractor with a tarpaulin (not plastic or waterproof).

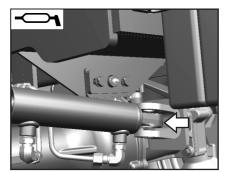
At the end of the idle period. When you start the engine again, pay particular attention to the instruction about starting engine in the operation chapter.

5.23 Greasing Points

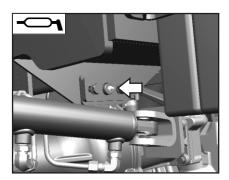
1. Brake pedal	- 1 Point
2. Power Steering Cylinder Mounting Min	- 1 Point
3. Front Axle Pivot Pin	- 1 Point
4. Drag Link (LH and RH)	- 2 Points
5. Top Link	- 2 Points



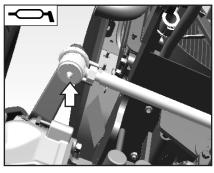
1. Brake Pedal



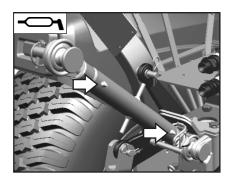
2. Power Steering Cylinder Mounting Min



3. Front Axle Pivot Pin



4. Drag Link



5. Top Link

5.24 Jack Up the Tractor - Lifting Points

The illustrations show the recommended lifting points for jacking up the tractor. Use a stable lifting jack with sufficient lifting force.

- A- Raise Right End of Axle, e.g. to Remove Right Front Wheel.
- B- Raise Center of Axle (Use Wooden Wedges to Prevent Axle from Tilting).
- C- Raise Left End of Axle, e.g. to Remove Left Front Wheel.
- D Raise Rear of Tractor, e.g. to Remove Rear Wheel
- Use approved lifting equipment only.
- Jack up tractor on firm, level ground only.
- Before doing any further work on the tractor, first secure it using suitable support stands.

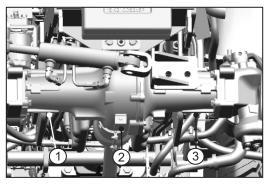


Fig. 5.24a - Raise front of tractor

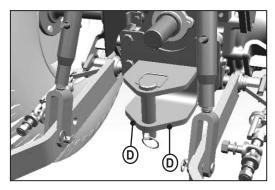


Fig. 5.24b - Raise rear of tractor

Aggregate	Capacity	Recommended Grade		
Engine Oil	4.2 Litres [1.11 US Gallons]	SAE-10W40		
Transmission Oil	20 Litres [4.75 US Gallons]	ISO VG-32		
4x4 Front Axle Oil	2.7 Litres [0.71 US Gallons]	EP-80		
Fuel	29 ± 3 Litres [7.66 ± 0.79 US Gallons]	High Speed Diesel conforming to IS: 1460-2000 Density 0.840 g/cm ²		

5.25 Oil and Lubrication Chart

Table 5.25