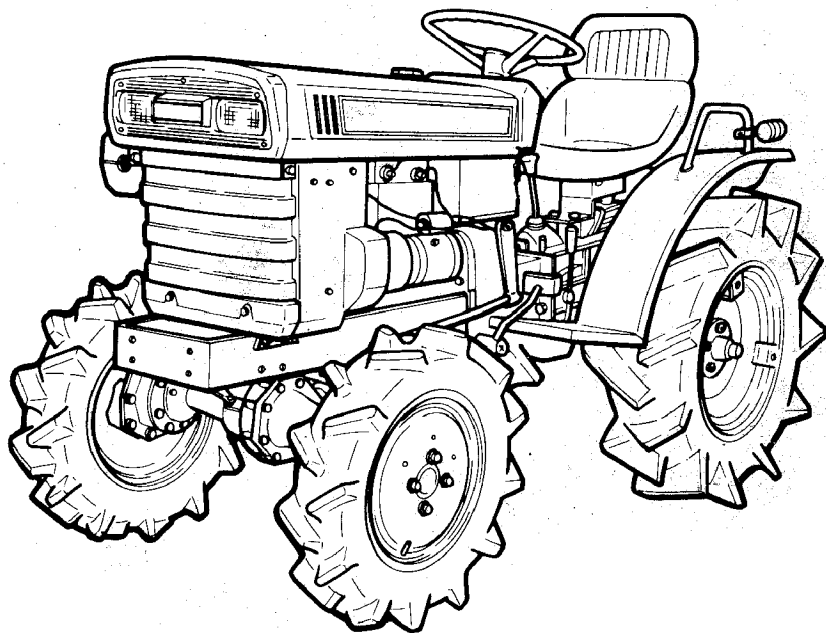


# **Bolens<sup>®</sup>**

## **Tractor**

TX1300 (G152)  
TX1300F (G154)  
TX1500 (G172)  
TX1500F (G174)



## **Safety and Operation Instructions**

## CONGRATULATIONS!

On your purchase of FMC Bolens garden equipment, one of the finest available. Please take a few moments to review this manual to familiarize yourself with the unit, its features and its operation.

This equipment is sold by FMC Corporation, Outdoor Power Equipment Division, 215 South Park Street, Port Washington, Wisconsin, 53074, telephone 414-284-5521. If you should have any questions or encounter any problems, which you feel only the factory can solve, write to the above address or phone, attention the Service Department.

This is a safety operation and general maintenance manual which does not attempt to cover major repairs. This equipment is carefully designed, engineered, and manufactured to give good performance if properly operated and maintained.

Your Warranty Statement is included, under separate cover with this manual. Please read it carefully. Also, please return the completed postpaid owner registration card which is included with this manual. The purpose of this card is to register each unit and owner at the factory for safety purposes.

---

## BE A SAFE OPERATOR

### AVOID ACCIDENTS

Included with this manual is a Safety Poster which we ask that you place in the area where your equipment is stored. This is intended to serve as a constant reminder to be safety conscious.

To read reports from all over the country is to be convinced that a large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power equipment can be safer than the person who is at the controls. If accidents are to be prevented and they most certainly can be prevented - operators must accept their full measure of responsibility.

It is true that the designer, the manufacturer and the safety engineer can help, but their combined efforts can be wiped out by a single careless act.

It is said "the best kind of safety device is a careful operator." We ask you to be that kind of person.

### NATIONAL SAFETY COUNCIL

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## CONTENTS

SAFETY PRECAUTIONS .....	3	Stopping the Engine .....	10	Steering, Brakes and Electrical System .....	13
IDENTIFICATION NUMBERS ..	4	Basic Procedure for Starting the Tractor .....	10	Lubrication .....	13
SPECIFICATIONS .....	4	Operation Check During Work .....	11	Lubrication Chart .....	14
TRACTOR MAIN POINTS .....	5			Fuel .....	14
BEFORE OPERATION .....	6	COLD WEATHER OPERATION ..	12	Inspection and Adjustment .....	16
CONTROLS .....	6	Engine Oil .....	12	Adjusting Operator's Seat ..	18
Warning Lights and Switches .....	6	Transmission Oil .....	12	Servicing Air Cleaner .....	18
Control Levers and Pedals .....	7	Anti-Freeze Solution .....	12	Maintenance Chart .....	19
Operating the Hydraulic System .....	9	Battery Maintenance .....	12		
NORMAL OPERATION .....	10	Operation in Snow or on Frozen Roads .....	12	PROBLEM SOLVING .....	20
Starting the Engine .....	10	MAINTENANCE .....	12	ELECTRICAL WIRING DIAGRAM .....	22
		Engine Coolant .....	12	THREE POINT HITCH ASSEMBLY .....	23
		Fan Belt Tension .....	12	STORAGE .....	Back Cover
		Oil Level Check .....	12		
		Tires and Wheels .....	13		

# GENERAL SAFETY PRECAUTIONS



Preventing accidents is the responsibility of every equipment operator. The following general safety precautions must be fully understood and followed by every operator of this tractor and its attachments. Review them frequently and **NEVER TAKE CHANCES. BE CAREFUL BEFORE, DURING AND RIGHT AFTER USE OF ANY POWERED EQUIPMENT. ACCIDENTS CAN BE PREVENTED.**

1. Know the controls and how to stop quickly. **READ THE SAFETY AND OPERATION INSTRUCTIONS.**

2. Do not allow children to operate the vehicle. Do not allow adults to operate it without proper instructions.

3. Do not carry passengers. Keep children and pets a safe distance away.

4. Clear the work area of objects which might be picked up and thrown.

5. Disengage all attachment clutches and shift into start position before attempting to start the engine (motor).

6. Disengage power to attachment(s) and stop the engine (motor) before leaving the operator's position.

7. Disengage power to attachment(s) and stop the engine (motor) before making any repairs or adjustments.

8. Disengage power to attachment(s) when transporting or not in use.

9. Take all possible precautions when leaving the vehicle unattended, such as disengaging the power-take-off, lowering the attachment(s), shifting into neutral, setting the parking brake, stopping the engine, and removing the key.

10. Do not stop or start suddenly when going uphill or downhill. Mow up and down the face of steep slopes; never across the face.

11. Reduce speed on slopes and in sharp turns to prevent tipping or loss of control. Exercise extreme caution when changing direction on slopes.

12. Stay alert for holes in the terrain and other hidden hazards.

13. Use care when pulling loads or using heavy equipment.

- Use only approved drawbar hitch points.
- Limit loads to those you can safely control.
- Do not turn sharply. Use care when backing.
- Use counterweight(s) or wheel weights when suggested in the owner's manual.

14. Watch out for traffic when crossing or near roadways.

15. When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the vehicle while in operation.

16. Handle diesel fuel with care - it is highly flammable.

- Use approved diesel fuel container.
- Never remove the cap of the fuel tank or add fuel to a running or hot engine, or fill the fuel tank indoors. Wipe up spilled fuel.
- Open doors if the engine is run in the garage - exhaust fumes are dangerous. Do not run the engine (motor) indoors.

17. Keep the vehicle and attachments in good operating condition, and keep safety devices in place.

18. Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.

19. Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark. Allow the engine to cool before storing in any enclosure.

20. To reduce fire hazard, keep the engine free of grass, leaves, or excessive grease.

21. The vehicle and attachments should be stopped and inspected for damage after striking a foreign object, and the damage should be repaired before restarting and operating the equipment.

22. Do not change the engine governor settings or overspeed the engine.

23. When using the vehicle with mower, proceed as follows:

- Mow only in daylight or in good artificial light.
- Never make a cutting height adjustment while the engine (motor) is running if the operator must dismount to do so.
- Shut the engine (motor) off when unclogging chute.
- Check the blade mounting bolts for proper tightness at frequent intervals.

24. Study all attachment manuals thoroughly before using attachments with tractor. By doing so you will be aware of both the tractor and attachment capabilities when used as a unit and also the safest manner in which to operate them.

25. Always follow manufacturer's operational suggestions.

26. Never wear loose clothing when operating unit. Loose clothing can get caught in moving parts and cause severe injuries.

27. Do not tow vehicle. Personal injury or damage to the vehicle could occur.

28. Always disconnect negative (-) battery cable from battery before doing any work on the electrical system. Reconnect it **LAST** when work is done. This is to prevent shorting of electrical system and accidental burns.

29. Do not drive this unit on a public thoroughfare at any time. The operator is risking injury from passing vehicles. Most local ordinances prohibit operating a unit such as this on a public thoroughfare.

30. Do not operate attachments when transporting vehicle.

31. Always wear substantial footwear to provide as much protection as possible.

# IDENTIFICATION NUMBERS

To ensure prompt service when repairs or adjustments are required, your FMC Bolens dealer must have the following information. For your own personal reference, fill in the spaces provided below.

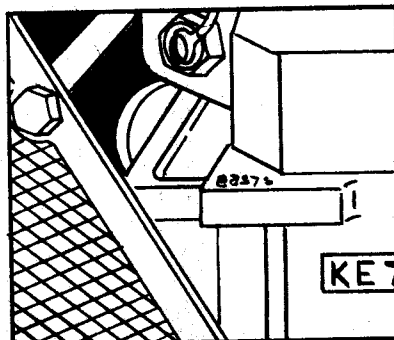
Tractor Model  
Type Number (A) \_\_\_\_\_

Tractor  
Serial Number (B) \_\_\_\_\_

Engine  
Model Number  
(See below) \_\_\_\_\_

Engine  
Serial Number (C) \_\_\_\_\_

Date of Purchase \_\_\_\_\_



3	6	R
ISEKI		
MODEL TYPE	_____	
SERIAL NUMBER	_____	

## SPECIFICATIONS

SPECIFICATIONS	MODELS	G-154 TX 1300F 4 WHEEL DRIVE	G-152 TX 1300 2 WHEEL DRIVE	G-174 TX 1500F 4 WHEEL DRIVE	G-172 TX 1500 2 WHEEL DRIVE
Weight Lbs./Kgs		1122/510	1035/470	1146/520	1057/480
Engine					
Model		KE 70		KE 75	
Type		Water-cooled, 4-cycle, 2-cylinder Diesel Engine			
Displacement in./cm		40.8/669		46.6/764	
Bore x stroke in./mm		2.87 x 3.15/73 x 80		3.07 x 3.15/78 x 80	
Type of combustion chamber		Swirl chamber			
Method of lubrication		Forced circulation			
Method of cooling		Forced water-circulation			
Air cleaner		Dry			
Fuel: Type		Diesel light oil			
Tank capacity Gal./L		3.17/12			
Starting method		Starter motor with glow plug			
Battery		NS60 (12V x 45A)			
Tractor					
Clutch		Dry, single disc			
Method of gear shifting		Selectable, sliding gear			
Differential gear		Bevel gear type, with dif-lock			
Brake		Mechanical, internal expanding type			
Steering gears		Ball screw type			

# SPECIFICATIONS (continued)

SPECIFICATIONS		MODELS		G-154 TX 1300F 4 WHEEL DRIVE	G-152 TX 1300 2 WHEEL DRIVE	G-174 TX 1500F 4 WHEEL DRIVE	G-172 TX 1500 2 WHEEL DRIVE
Tire: Front		5.00-12		4.00-12		5.00-12	
Rear		8-16		8-16			
Implement lift		Hydraulic controlled					
Traveling speed	mph/km/hr	Approx. Speeds					
Forward	1	.66/1.06					
	2	1.02/1.65					
	3	1.70/2.73					
	4	3.0 /4.82					
	5	4.66/7.51					
	6	7.7 /12.41					
Reverse	1	.87/1.40					
	2	4.0 /6.33					
PTO shaft speed (rpm) @ 2700							
Engine RPM	1	472					
	2	752					
	3	1177					

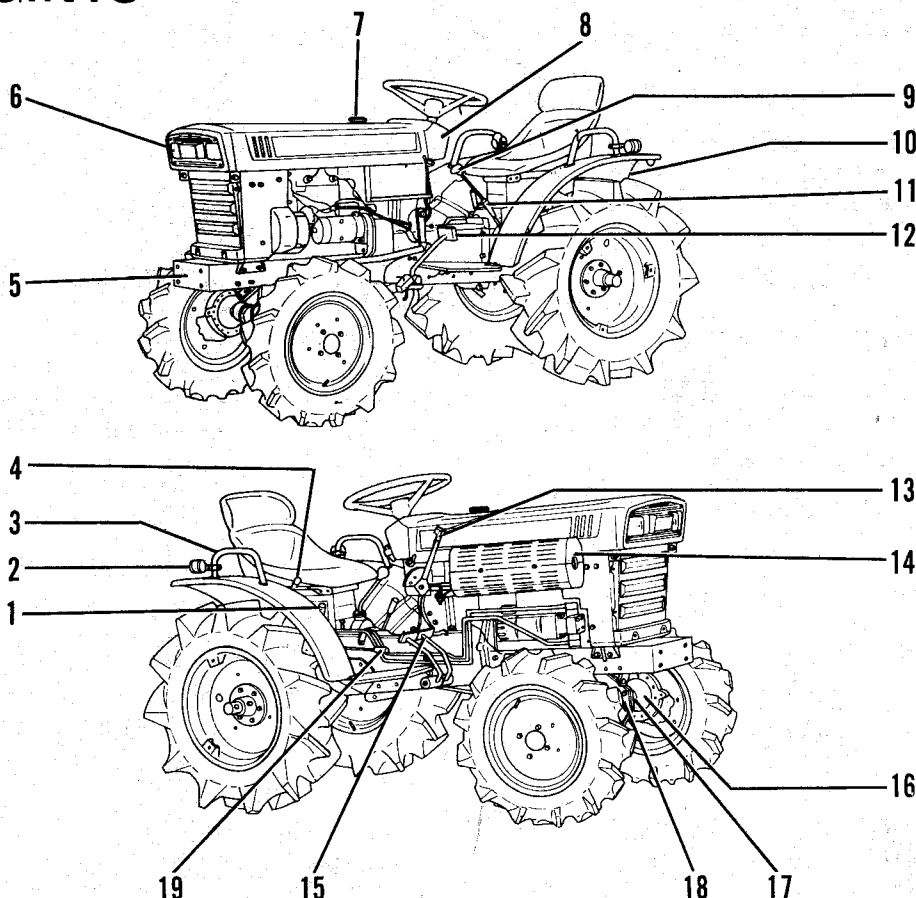
## TRACTOR MAIN POINTS

### 2-Wheel & 4-Wheel Drive Tractor

1. Aux. speed change lever
2. Turn signal light
3. Arm-rest
4. Hydraulic control lever
5. Front hitch
6. Head light
7. Fuel tank cap
8. Instrument panel
9. Main speed change lever
10. Lift arm
11. PTO lever
12. Clutch lever
13. Throttle lever
14. Muffler
15. Brake pedal

### 4-Wheel Tractor Only

16. Front gear case
17. Axle housing
18. Bevel case
19. Front wheel drive lever



# BEFORE OPERATION

It is possible that some of the specifications and instructions in this manual may differ from those applicable to our latest models. When in doubt, refer to your FMC BOLENS dealer.

Your new machine should be operated carefully to prolong its service life, and assure top performance. During the initial 50

hours of operation the following cautions should be adhered to:

## 1. CAUTIONS CONCERNING OPERATION OF THE NEW MACHINE

- Read and thoroughly understand the caution plates attached to the appropriate parts of the machine.



- Warm up the engine at low speed, before starting daily activities.
- Avoid sudden starts, full acceleration and sudden braking.
- Change lubrication oil frequently. Always keep oil at the full level. See MAINTENANCE chart on page 19.

# CONTROLS

## ① WARNING LIGHTS AND SWITCHES

### KEY SWITCH (Fig's 1 and 2)

The key switch is separate from the starter switch. The key can be removed and inserted only at the OFF position. At the three other positions it functions as follows:

1. ON position:  
Electrical power is on.
2.  position:  
Head lights on high beam.
3.  position:  
Head lights on low beam.



**CAUTION**

**NEVER TURN THE KEY TO OFF POSITION DURING TRACTOR OPERATION.**

**COVER THE KEY SWITCH WHEN THE TRACTOR IS NOT IN OPERATION.**

### STARTER SWITCH (Fig's 1 and 3)

The starter switch has two operating positions. Start and Preheat.

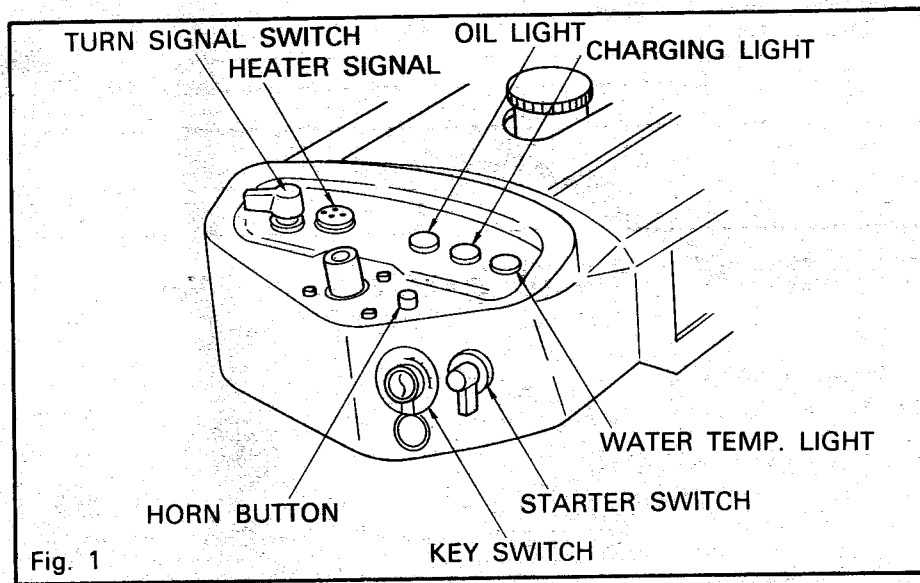


Fig. 1

#### 1. "Start"

When turning the starter switch to the right, the engine is started.

By releasing the switch, it returns to its original position.

#### 2. "Preheat"

When turning the switch to the left, the preheating circuit is energized to preheat the combustion chamber. By releasing the switch, it returns to its original position.

#### HEATER SIGNAL (Fig. 1)

Indicates preheating condition of the engine glow plug. When the combustion chamber is warmed

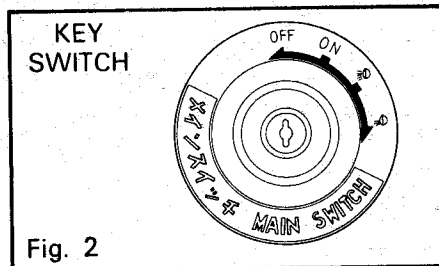


Fig. 2

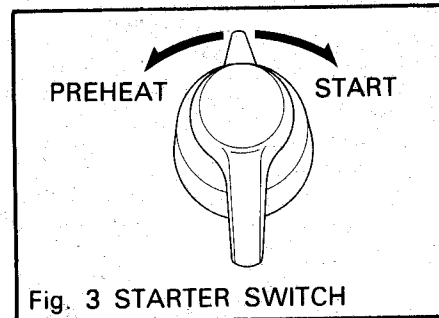






Fig. 3 STARTER SWITCH

up after turning the switch to "Preheat", the signal turns red. **DO NOT HEAT LONGER THAN 2 MINUTES.**

## HORN BUTTON (Fig. 1)



The horn will only sound when the key switch is in ON,  or  position.

## CHARGING LIGHT (Fig. 1)

The red colored oil light is ON at key switch positions of "ON,  and ". During engine operation, the light remains off, indicating proper charging of the battery.

## OIL LIGHT (Fig. 1)

The red colored oil light is ON at key switch positions of "ON,

 and ". During engine operation, the light remains off, indicating proper lubrication of the engine.

## WATER TEMPERATURE LIGHT (Fig. 1)

When the engine is overheated this light is on for warning. If this light should go on during operation, immediately stop the tractor and run the engine at low speed to cool it off. When the water temperature goes down, the light goes off automatically.

## TURN SIGNAL SWITCH (Fig's 1 and 4)

The turn signal is the flashing indicator type. When the switch is at horizontal position, the signal is not functioning.

By turning the switch in a counterclockwise direction, the left turn signal flashes.

By turning the switch in a clockwise direction, the right turn signal flashes.

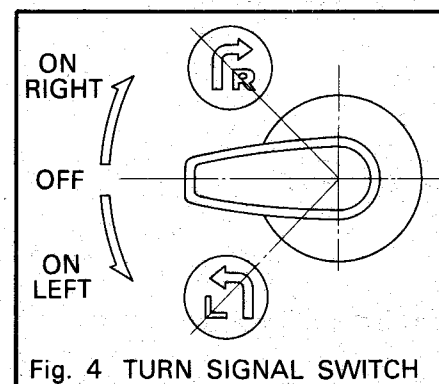


Fig. 4 TURN SIGNAL SWITCH

## ② CONTROL LEVERS AND PEDALS

### MAIN SPEED CHANGE LEVER (Fig. 5)

This tractor has three speeds in forward and one speed in reverse. Combined with the auxiliary speed lever, the machine is capable of six forward speeds and two reverse speeds.

### PTO SPEED LEVER

Three PTO shaft speeds can be selected by using this lever. For example, if the tiller is mounted on the shaft, this lever changes the speed of the tilling blades.



CAUTION

**BEFORE SHIFTING THE PTO LEVER THE CLUTCH MUST BE DISENGAGED AND THE TRACTOR STOPPED. FAILURE TO DO SO WILL RESULT IN DAMAGED GEARS. ALWAYS SHIFT PTO TO NEUTRAL WHEN ATTACHMENT IS NOT IN USE.**

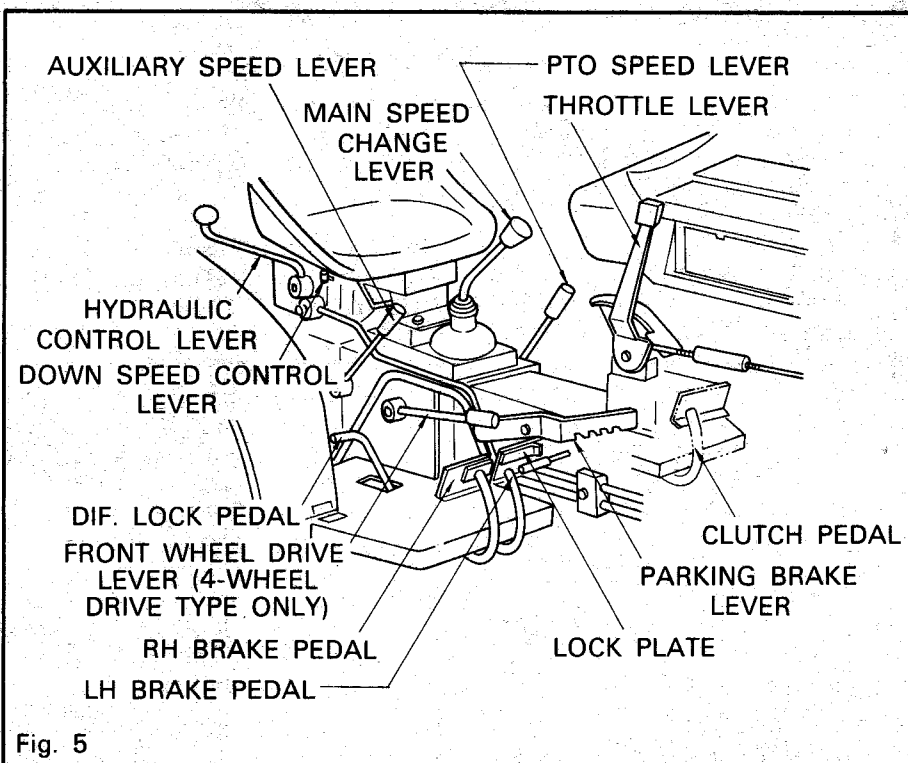
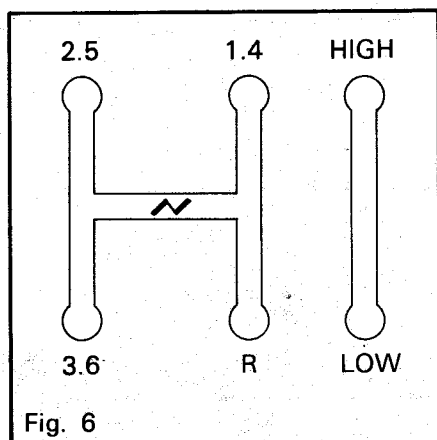


Fig. 5

# CONTROLS (continued)

## AUXILIARY SPEED LEVER (Fig's 5 and 6)

The HIGH and LOW speeds of this tractor are activated by this lever. Push forward for HIGH and pull backward for LOW.



pulling the lever toward the operator the speed slows down.

When the throttle lever is pulled to the notched part of the lever, the engine will idle.

To stop the engine pull the throttle lever all the way back past the notched part of the lever.

## CLUTCH PEDAL (Fig. 5)

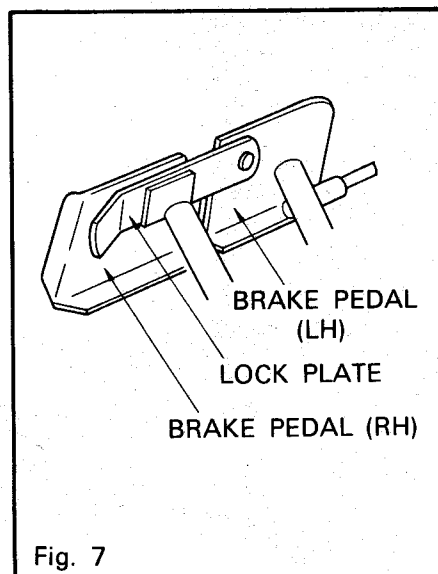
The clutch is disengaged when the clutch pedal is fully depressed.



WHEN DISENGAGING THE CLUTCH, DEPRESS THE CLUTCH PEDAL QUICKLY AND FULLY. WHEN ENGAGING THE CLUTCH, GRADUALLY RELEASE THE PEDAL.

WHEN CHANGING SPEEDS, DISENGAGE THE CLUTCH BEFORE OPERATING THE SPEED LEVER.

NEVER REST YOUR FOOT ON THE CLUTCH PEDAL DURING OPERATION.



## FRONT WHEEL DRIVE LEVER (4-WHEEL DRIVE MODEL ONLY) (Fig. 5)

When operating the tractor on hills, through swamps or other areas requiring extra traction, activate this lever to obtain four wheel drive.

By pushing down on the lever, the front wheels are engaged and put into drive. By pulling up on the lever, the front wheel drive is disengaged.



WHEN ENGAGING FRONT WHEEL DRIVE THE CLUTCH MUST BE DISENGAGED BEFORE OPERATING THE LEVER. USE 4-WHEEL DRIVE ONLY WHEN NECESSARY TO INCREASE TRACTION.

## THROTTLE LEVER (Fig. 5)

By pushing the throttle lever forward the speed is increased. By

## BRAKE PEDALS (Fig. 5 and 7)

Each brake pedal provides separate control over left rear wheel and right rear wheel braking.

By depressing the LH brake pedal, the left rear wheel brake is activated.

By depressing the RH pedal, the right rear wheel is activated. When it is required to turn the machine sharply while moving at slow speed, use the pedals separately.



WHEN TRAVELING ON THE ROAD OR LOADING ON A TRUCK, INTERCONNECT BOTH PEDALS WITH THE LOCK PLATE PROVIDED. ADJUST THE BRAKE SYSTEM TO BRAKE EQUALLY. IF THE BRAKING EFFECT IS UNEQUAL, DANGEROUS OPERATION MAY RESULT.

## PARKING LEVER (Fig. 5)

Interconnect both brake pedals, and keep them depressed. Pull up the parking brake lever, to engage the round bar at the left lower part of the brake pedal with the notch on the parking brake lever. This locks the brake pedal.

When releasing the parking lever, depress the brake pedal and lower the parking lever.

## DIFFERENTIAL LOCK PEDAL (Fig. 5)

The differential lock is used to lock the differential, equalizing the rotational speeds of the left and right tires.

Should the rear tire slip or one tire turn by its self, lock up the differential to drive out of a rough area.

By depressing the pedal, the dif. lock is applied. By releasing it, the lock is disengaged.



If the Dif. lock does not disengage by releasing the pedal, remove the loading or slow the tractor down. Disengagement should occur.



**DO NOT ENGAGE THE DIFFERENTIAL WHEN TRACTOR IS IN MOTION.**

**WHEN TRAVELING ON THE ROAD, WORKING WITH HEAVY LOADS OR WORKING AT HIGH SPEEDS, DO NOT LOCK THE DIFFERENTIAL.**

**DO NOT TURN THE TRACTOR WITH THE DIFFERENTIAL LOCKED.**

### ③ OPERATING THE HYDRAULIC SYSTEM

#### HYDRAULIC CONTROL LEVER (Fig. 8)

The hydraulic control lever is moved to the rear, (Raise position) to lift the attachment.

Move the lever forward to lower the attachment.

The implement is lowered by its own weight.

When the implement is raised to its maximum position, the lever automatically returns to its neutral position.

If the lever does not return to its neutral position reset the lever by adjusting the lever set bolt.

When it is required to stop the implement at a desired height, move this lever set bolt to obtain the desired implement position. See fig. 8.

#### LOWERING SPEED ADJUSTMENT LEVER (Fig. 8)

Adjust the lowering speed to meet conditions and types of work done.

Tiller work: Slow down the lowering speed approx. 2 sec.

Plowing: Quicken the lowering speed approx. 1 sec.

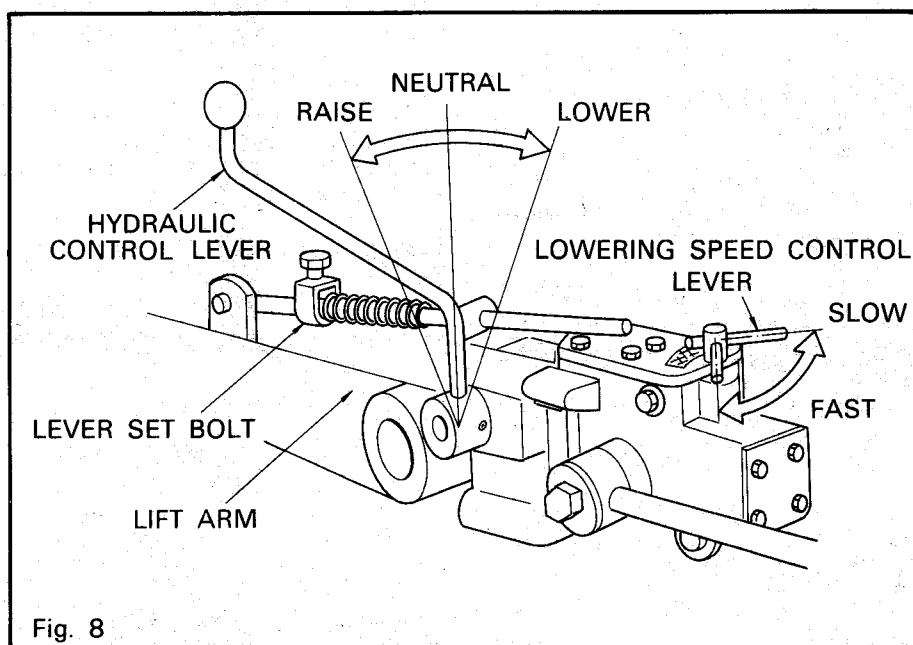


Fig. 8

By turning the adjustment lever clockwise, the lowering speed quickens.

By turning it counterclockwise, the speed is reduced.

The implement is not locked even when turning the lever fully counterclockwise. The lift arm may be lowered gradually.



**WHEN TRAVELING ON THE ROAD, SET THE LOWERING**

**SPEED ADJUSTMENT LEVER TO ITS "SLOWEST" POSITION, AND APPLY THE LOCKING BAR ON THE ATTACHMENT LIFT TO FIX IT IN PLACE.**

**WHEN CHANGING TILLER TINES, REMOVING ENTWINED STRAW OR OTHER DEBRIS OR INSPECTING THE IMPLEMENT, THE ENGINE MUST BE TURNED OFF WITH THE LOWERING SPEED ADJUSTMENT LEVER SET AT THE "SLOWEST" POSITION AND THE LOCKING BARS ATTACHED TO THE ATTACHMENT LIFT TO PREVENT ACCIDENTS.**

# NORMAL OPERATION

Before operating this tractor, the operator should be familiar with the location and functions of all controls.

Before starting each day's operation, preliminary checks should be made. See page 6.

## ① STARTING THE ENGINE



CAUTION

**DO NOT PUSH THIS TRACTOR TO START.**

**DO NOT USE ETHER OR STARTING FLUID.**

- (1) Position the main speed change lever and PTO speed change lever to Neutral position.
- (2) Push the throttle lever half way forward. In cold weather if necessary, go to full throttle.
- (3) Depress the clutch pedal to disengage the clutch.

**AS A SAFETY MEASURE, THE ENGINE WILL NOT START UNLESS THE CLUTCH PEDAL IS DEPRESSED.**

- (4) Insert the key in the switch, and turn it to the ON position. At this time, check that the oil charge light is on.

- (5) Preheat the engine by turning the starter switch to the left. After the heater signal turns red, release the switch to return it to its original position. The heater signal turns red in approx. 25 seconds. This operation is not necessary in hot weather or when the engine is already warm.

- (6) Start the engine by turning the starter switch to the right. Immediately after starting the engine, release the starter switch.

- (7) After the engine starts, warm it up for 5 to 10 minutes at idling speed.



CAUTION

**DO NOT OPERATE THE STARTER MOTOR MORE THAN 10 SECONDS AT ONE TIME. IF THE ENGINE FAILS TO START, WAIT APPROX. 10 SEC. BEFORE ATTEMPTING TO START IT AGAIN.**

**DO NOT ENGAGE STARTER WHEN ENGINE IS RUNNING.**

**NEVER KEEP RUNNING THE STARTER MOTOR AFTER THE ENGINE HAS STARTED. NEVER RUN THE MOTOR DURING MACHINE OPERATION.**

**WHEN STORING MACHINE IN COLD WEATHER, REMOVE THE BATTERY, AND KEEP IT IN A WARM PLACE. THIS WILL HELP THE ENGINE TO START EASILY THE NEXT TIME.**

**THE TIME REQUIRED FOR PREHEATING:**

**OUTSIDE TEMP. MORE THAN 40°F/+5°C, Approx. 20 sec.**

**OUTSIDE TEMP. 25°-40°F/-5°-+5°C, Approx. 30 sec.**

**OUTSIDE TEMP. LESS THAN 25°F/-5°C, Approx. 60 sec.**

- (8) To aid in winter starting where temperatures normally are below freezing, Bolens offer an engine block heater that can be installed by your dealer.

## ② STOPPING THE ENGINE

- (1) Slow down the engine speed by pulling the throttle lever all the way to the rear, past the notched part of the lever guide.
- (2) Turn the key switch to the OFF position.



CAUTION

**DO NOT STOP THE ENGINE WHEN THE ENGINE IS RUNNING AT HIGH SPEED.**

**AFTER LONG CONTINUOUS OPERATION, IDLE THE ENGINE FOR APPROXIMATELY 5 MINUTES BEFORE TURNING IT OFF.**

**IF THE KEY IS LEFT IN THE "ON" POSITION, THE BATTERY MAY BE DISCHARGED.**

**MAKE IT A PRACTICE TO REMOVE THE KEY, AFTER STOPPING THE ENGINE.**

## ③ BASIC PROCEDURE FOR STARTING THE TRACTOR

- (1) Depress the clutch pedal.
- (2) Shift the speed lever to the desired speed.
- (3) Set throttle lever at half throttle.
- (4) Slowly release the clutch pedal. This will start the tractor in motion.
- (5) Increase or decrease throttle setting as needed.



CAUTION

**WHEN TRAVELING ON THE ROAD, DO NOT FORGET TO INTERCONNECT BOTH BRAKE PEDALS. SINGLE-SIDE BRAKING WHEN DRIVING AT HIGH SPEED IS VERY DANGEROUS.**

**WHEN THE TRACTOR IS IN MOTION, KEEP YOUR FOOT OFF OF THE CLUTCH PEDAL AND THE BRAKE PEDAL.**

**DO NOT DISENGAGE CLUTCH WHEN TRAVELING DOWN HILL. DOING SO WILL CAUSE THE TRANSMISSION GEARS TO ROTATE AT AN EXCESSIVE SPEED WHICH MAY RESULT IN FAILURE.**

## BRAKING AND STOPPING THE TRACTOR

1. Slow down the engine speed using the throttle lever.
2. Depress the clutch pedal to disengage the clutch, and at the same time depress the brake pedal to stop the tractor.

## PARKING

1. Be sure that both brake pedals are interconnected, and depress the brake pedals and pull up the parking brake lever.

2. Set the main speed lever to neutral position.



CAUTION

**ALWAYS SET PARKING BRAKE BEFORE LEAVING SEAT.**

**WHEN PARKING THE TRACTOR ON A SLOPE PLACE BLOCKS UNDER THE TIRES. (SEE FIG. 9)**

## SPEED SHIFTING

Never operate speed levers when the tractor is running. The tractor should be stopped before operating. Be sure the PTO shaft has stopped rotating before operating the PTO speed lever.

## TURNING THE TRACTOR

1. Remove the lock plate connecting both brake pedals for easy turning in working fields.

2. When turning the steering wheel, depress the brake pedals on the same side as the direction you are turning. This enables you to make a sharp turn.

## OPERATING ON A SLOPE

- A. Starting on steep slope:

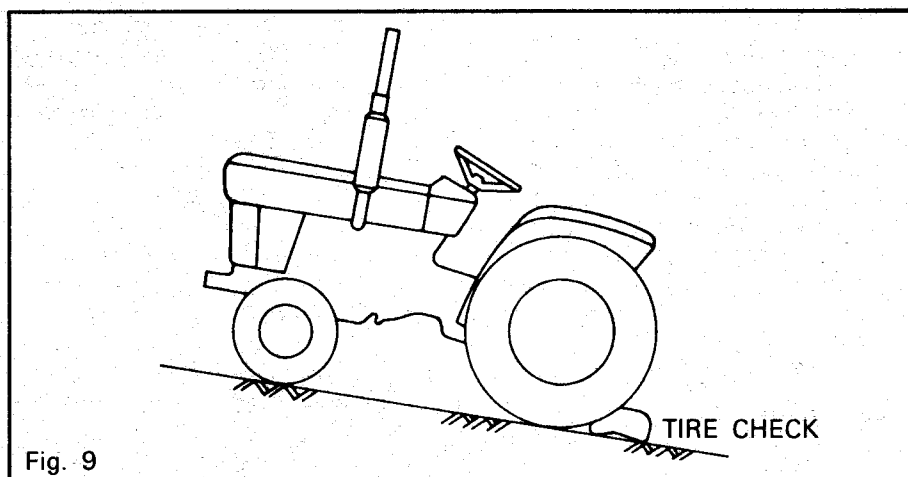


Fig. 9

- (1) Depress the brake pedal.
- (2) Disengage the clutch by depressing the clutch pedal.
- (3) Shift the speed lever to the desired speed.
- (4) Set engine speed to intermediate speed using the throttle lever.
- (5) Gradually release the clutch pedal until the clutch is in the half-engaged position.
- (6) At the same time, release the brake pedal slightly.
- (7) Pick up engine speed by pushing the throttle lever. Release the brake pedal and at the same time, release the clutch pedal gradually. This starts the tractor.

- B. Operation on down slope:

Use engine brake as much as possible.



CAUTION

**REDUCE SPEED BEFORE TURNING A CORNER.**

## ④ OPERATION CHECK DURING WORK



CAUTION

**DURING OPERATION, ALWAYS OBSERVE WARNING LIGHTS TO CONFIRM THAT EACH PART IS FUNCTIONING CORRECTLY.**

## WATER TEMPERATURE LIGHT

During operation, always pay attention to the water temperature light. If the temperature becomes abnormally high, the cooling system should be checked.

## OIL LIGHT

If the oil light goes on during operation, it may indicate trouble with the lubricating system. Immediately stop operation to check and make corrections.

## CHARGE LIGHT

If the charging light goes on during operation it may indicate some problems in the electrical charging.

Check and correct the trouble.

If the cause of the trouble can not be located, have it looked at, and repaired at a service shop.

# COLD WEATHER OPERATION

## ① ENGINE OIL

As the temperature goes down, the engine oil tends to get thicker. It is necessary to use SAE 10W oil in cold weather. Use correct viscosity diesel engine oil consistent with surrounding temperature.

Use Diesel engine oil of CC class or better.

Surrounding Temp. Type of Oil

- More than 70°F/20°C ..... SAE 30
- 32°-70°F/  
0°-20°C ..... SAE 20 or  
SAE 10W/30
- Less than 32°F/0°C ..... SAE 10W

## ② TRANSMISSION OIL

For cold weather operation it is recommended that Bolens transmission Oil #1738157 (1 U.S.

Gallon) be used in the transmission. This special oil can be used year round and will give better hydraulic lift action in cold weather.

## ③ ANTI-FREEZE SOLUTION

Before adding the anti-freeze solution, thoroughly clean the inside of the radiator.

When preparing anti-freeze solution, follow the instructions on the label.

Properly mix the anti-freeze solution with water, before adding to the cooling system.

If the coolant level becomes low due to evaporation, add only water. If the coolant level becomes low due to leakage, add anti-freeze solution mixed with the same proportion of water used originally.

Anti-freeze solution removes body paint. Take care not to spill it on the tractor body.

## ④ BATTERY MAINTENANCE

In cold weather, the battery capacity becomes low. When it is discharged, the specific gravity of battery electrolyte becomes low.

Check and service the charging system to maintain top charging performance.

In cold weather, remove the battery from the machine, and store it in a warm place.

## ⑤ OPERATION IN SNOW OR ON FROZEN ROADS

When operating the tractor in snow or on frozen roads, never drive at high speeds; never accelerate quickly; never brake suddenly; never turn sharply.

# MAINTENANCE

Before starting day's work, check the machine as follows:

## ① Engine Coolant

Removing the radiator cap, check the coolant level. If the level is lower than the filler mouth, refill radiator with clean water.

Tighten the cap securely.



**NEVER USE SALTY WATER OR DIRTY WATER CONTAINING MUD OR GRASS.**

## ② Fan belt tension (Fig. 10)

Check the fan belt tension by, pushing the belt between two

pulleys. It should deflect approx. 3/8 (9 mm). If not, adjust the belt.

## ③ Oil Level Checks (Fig. 11)

When checking oil levels, refer to the "Lubrication Chart," page 14.

- Engine Oil

The oil level gauge is at the right side of the engine. Remove the gauge, and check the engine oil level. Fully screw in the gauge for checking.

- Transmission oil
- Hydraulic oil
- Lubrication of each part

The above need not be checked daily. However, they should be checked periodically.

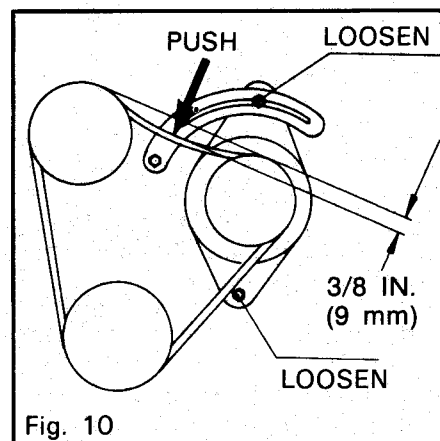


Fig. 10

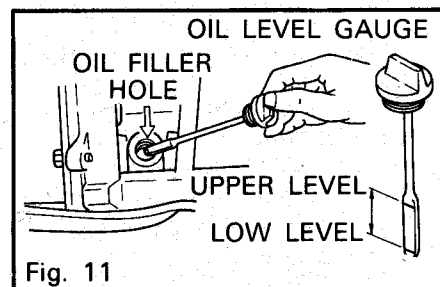


Fig. 11

## MAINTENANCE (continued)

### ④ Looseness of bolts, nuts and pins.

Check bolts and nuts for looseness and check to see if any pins are missing. Pay special attention to the bolts and nuts in the steering system, and the pins of the mounting system for the attachments.

### ⑤ TIRES AND WHEELS

A. Tire air pressure greatly affects tractor performance and tire service life. It is very important to maintain air pressure in the tires at the specified pressure. See "Air Pressure Chart" at right.

At the same time you check pressure, also check the tires for abnormal wear, cracks or damage.

#### B. Wheel Bolts

Confirm that all the wheel bolts for all 4 wheels are securely tightened.

### 6 STEERING, BRAKES AND ELECTRICAL SYSTEM

#### A. Steering Wheel

Check that there is no excessive play or deflection in the steering system. The standard free play is approx. 1-3/16 in. (30 mm) around the steering wheel circumference.

#### B. Brake Pedals

Check that both the left and right brakes have equal braking ability. Free play of the brake pedal should be between 1-3/16-1-9/16 (30 mm - 40 mm).

#### C. Electrical System

##### - Pilot lamps:

Check that the oil light and charge light are functioning properly.

- Head light and working light: Check that the warning lights work.

Check that the upper and lower beam of the headlight function properly.

- Turn signal light and horn:

Check that the turn signal lights flash normally.

Check that the horn works.

### ⑦ LUBRICATION

#### A. Engine oil

Check engine oil level with the level gauge at right side of the engine.

Recommended Oil: Use Diesel engine oil of CC Class or better.

- More than 70°F/20°C ..... SAE 30
- 32° - 70°F/  
0-20°C ..... SAE 20 or SAE 10W/30
- Less than 32°F/0°C ..... SAE 10W

The drain plug is located at the lower part of the oil pan.



CAUTION

USE RECOMMENDED ENGINE OIL.

WHEN REPLENISHING THE OIL, USE THE SAME KIND OF OIL AS IS IN THE ENGINE.

#### B. Transmission oil (Fig. 12)

Check transmission oil level by referring to the level gauge. When the oil level is low, add transmission oil through the filler hole below the operator's seat.

SPECIFIED AIR PRESSURE-PSI/kPa			
4-wheel drive		2-wheel drive	
Front	Rear	Front	Rear
17/117	17/117	19/131	17/117
17/117	17/117	19/131	17/117

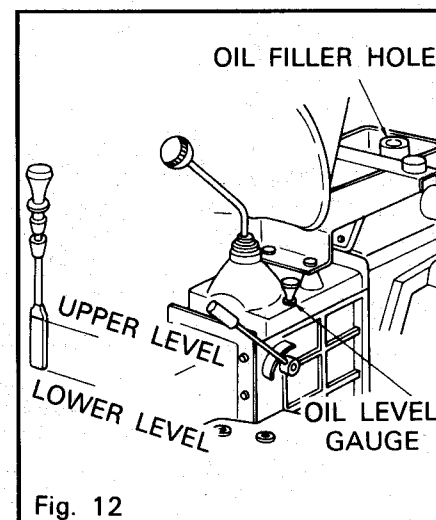


Fig. 12



CAUTION

USE RECOMMENDED GEAR OIL SAE 80W OR BOLENS OIL 1738157.

THE TRANSMISSION OIL IS COMMONLY USED FOR HYDRAULIC OIL. AS PRECISION-MADE PARTS ARE USED IN THE HYDRAULIC SYSTEM, NEVER ALLOW DUST TO GET INTO THE OIL.

THREE DRAIN HOLES ARE PROVIDED. OPEN THESE THREE DRAIN HOLES TO DRAIN THE OIL.

CHANGE THE OIL WHILE THE OIL IS WARM.

## MAINTENANCE (continued)

C. Bevel Case and Front Gear Case Oil (4-Wheel Drive Type Machines only) (Fig. 13)

Add oil to the bevel case from the oil filler hole located at the front part of the bevel case.

Add oil to the front gear case from the oil filler holes located on both sides of the front gear case.



CAUTION

USE RECOMMENDED GEAR OIL SAE 80W OR 90. HOWEVER, NEVER MIX SAE 80W WITH SAE 90 OIL.

### ⑧ Fuel

Fuel has a great effect on engine performance. Therefore high quality fuel should be used. No. 2 Diesel fuel or better is recommended.



CAUTION

IF AIR ENTERS THE FUEL SYSTEM POWER LOSS OR DIFFICULTY IN STARTING THE ENGINE MAY RESULT.

WHEN FUEL IS EXHAUSTED DURING OPERATION, OR WHEN CLEANING THE FUEL FILTER, AIR BLEEDING

SHOULD BE ACCOMPLISHED WITHOUT DELAY. AS FOR AIR BLEEDING\_ REFER TO PAGE 17.

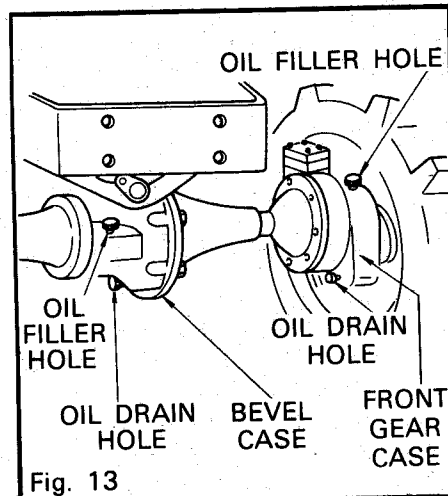


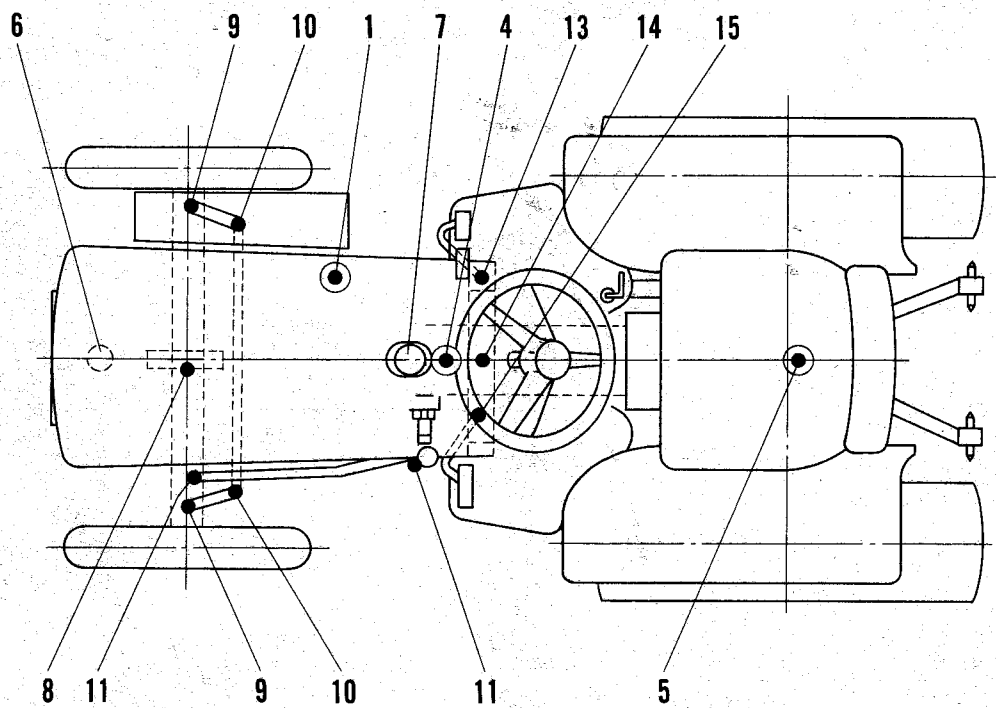
Fig. 13

## LUBRICATION CHART

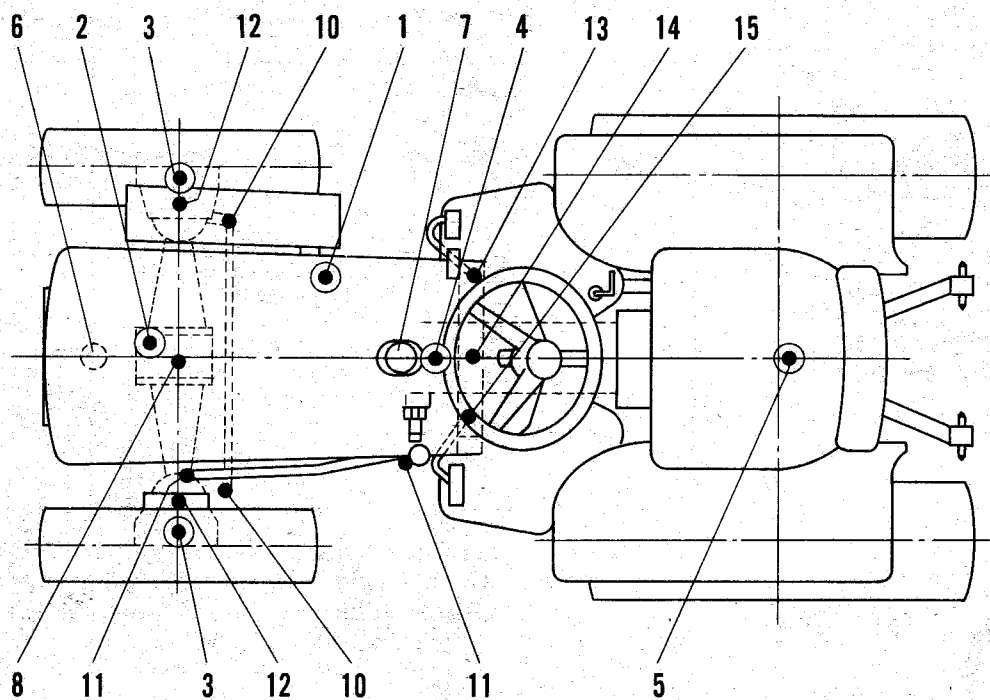
No.	Supplying points	Kinds of oil or water	Quantity Qts./L.				Remarks
			TX1300F G154	TX1300 G152	TX1500F G174	TX1500 G172	
1	Engine	Engine Oil (Class CC or better)	2.7/2.6				
2	Bevel case	Gear oil SAE 80W or 90	.73/.7	—	.73/.7	—	
3	Front gear case		.26/.25 2 Places	—	.26/.25 2 Places	—	
4	Steering gear box	Gear oil SAE 80W or 90	Replenishment		(SAE 140)		
5	Transmission gear case	Gear oil SAE 80W or Bolens No. 1738157*	13.7/13.0				
6	Radiator	Coolant	4.4/4.2				
7	Fuel tank	Diesel light oil No.2 or better	12.7/12				
8	Center pivot	Grease	—	As req'd	—	As req'd	
9	Knuckle spindle	} Grease	} As required				
10	Tie rod end						
11	Drag rod end						
12	King pin						
13	Brake pedal						
14	Brake shaft						
15	Clutch pedal						

\* 1 U.S. Gallon Container

## TWO WHEEL DRIVE TRACTORS



## FOUR WHEEL DRIVE TRACTORS



# MAINTENANCE (continued)

## ⑨ INSPECTION AND ADJUSTMENT

### CLUTCH PEDAL (FIG. 14)

Free play of the clutch pedal decreases after the machine has been broken in.

Normal free play of the pedal is between 9/16-3/4 in. (15-20 mm).

If free play is less than normal, adjust it by loosening the lock nut on the adjustment bolt.

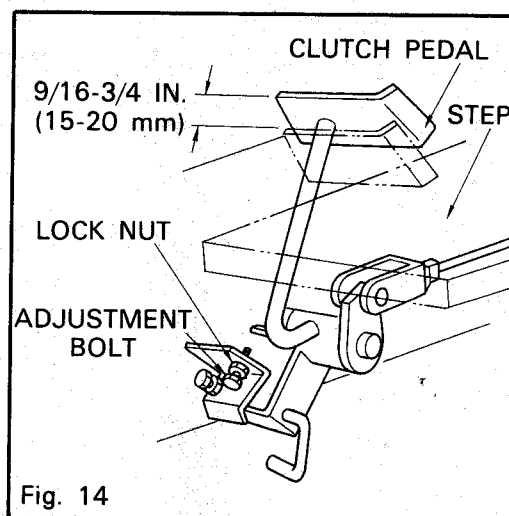


Fig. 14

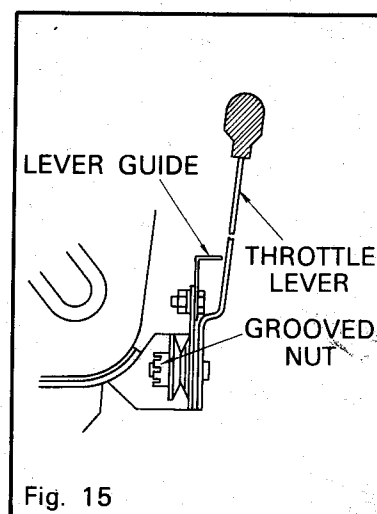


Fig. 15

### THROTTLE LEVER (FIG. 15)

If movement of the throttle lever becomes loose or hard, adjust the grooved nut.

### BRAKE PEDAL (FIG. 16)

Free play of the brake pedal is between 1-3/16-1-9/16 in. (30-40 mm). Always maintain free play as specified, by adjusting the brake rod.

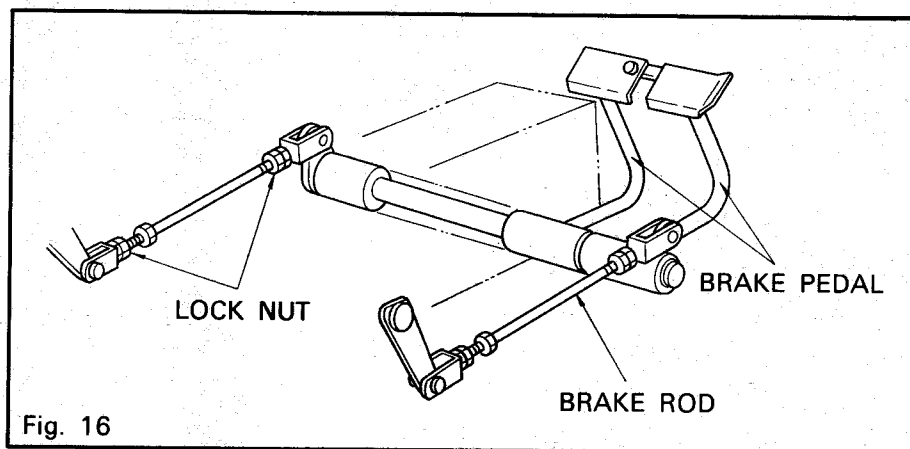


Fig. 16



CAUTION

IF THE LEFT AND RIGHT BRAKE SYSTEMS PROVIDE AN UNEVEN BRAKING EFFECT AND THE MACHINE CANNOT BE STOPPED IN A STRAIGHT POSITION WHEN BOTH PEDALS ARE INTERCONNECTED. ADJUST BOTH RODS CORRECTLY TO OBTAIN THE SAME BRAKING EFFECT IN EACH SYSTEM.

### TOE-IN ADJUSTMENT (FIG. 17)

Standard toe-in is specified to 3/32-5/32 (2-4 mm). If not, loosen the lock nut to adjust.

### FREE PLAY OF STEERING WHEEL (FIG. 18)

The specified free play of the steering wheel is approx. 1-3/16

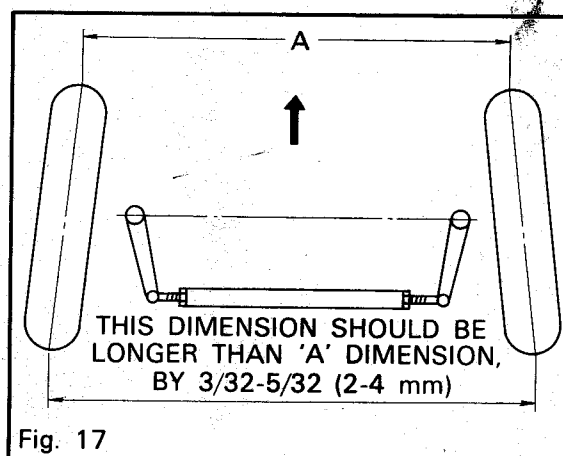


Fig. 17

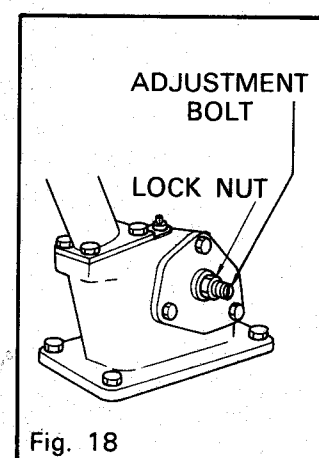


Fig. 18

in. (30 mm) around the circumference of the steering wheel. If free play is found to be excessive, adjust the steering wheel as follows.

The major cause of excessive play is loosening of the ball joint

setting part. Retighten this part. If retightening does not correct excessive play, adjust with the adjustment bolt shown in the figure 18. Screw in the adjustment bolt to decrease the play.

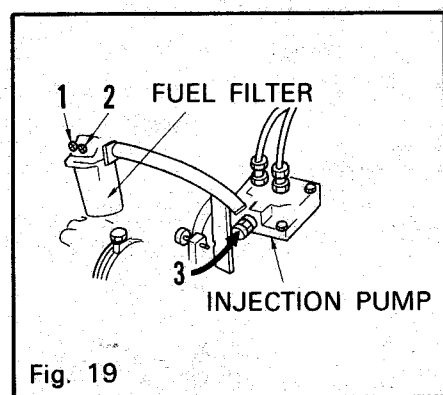


## AIR BLEEDING FROM THE FUEL SYSTEM (FIG. 19)

When screws or bolts of the fuel system are loosened, or fuel is exhausted during operation, air enters into the fuel system. This causes power loss or hard starting of the engine. Air bleeding should be accomplished to prevent this trouble.

1. Loosen an air bleeding screw (1) on the fuel filter, and bleed air.

After the air is bled which is indicated when there are no bubbles coming out, retighten the screw securely.



2. Loosen another air bleeding plug (2) on the fuel filter to bleed air. Then, loosen the air bleeding plug (3) to bleed remaining air.

After bleeding air, do not forget to retighten these plugs.

3. Push the throttle all the way forward. Start the engine.

## ADJUSTING FRONT AND REAR TREADS (FIG. 20)

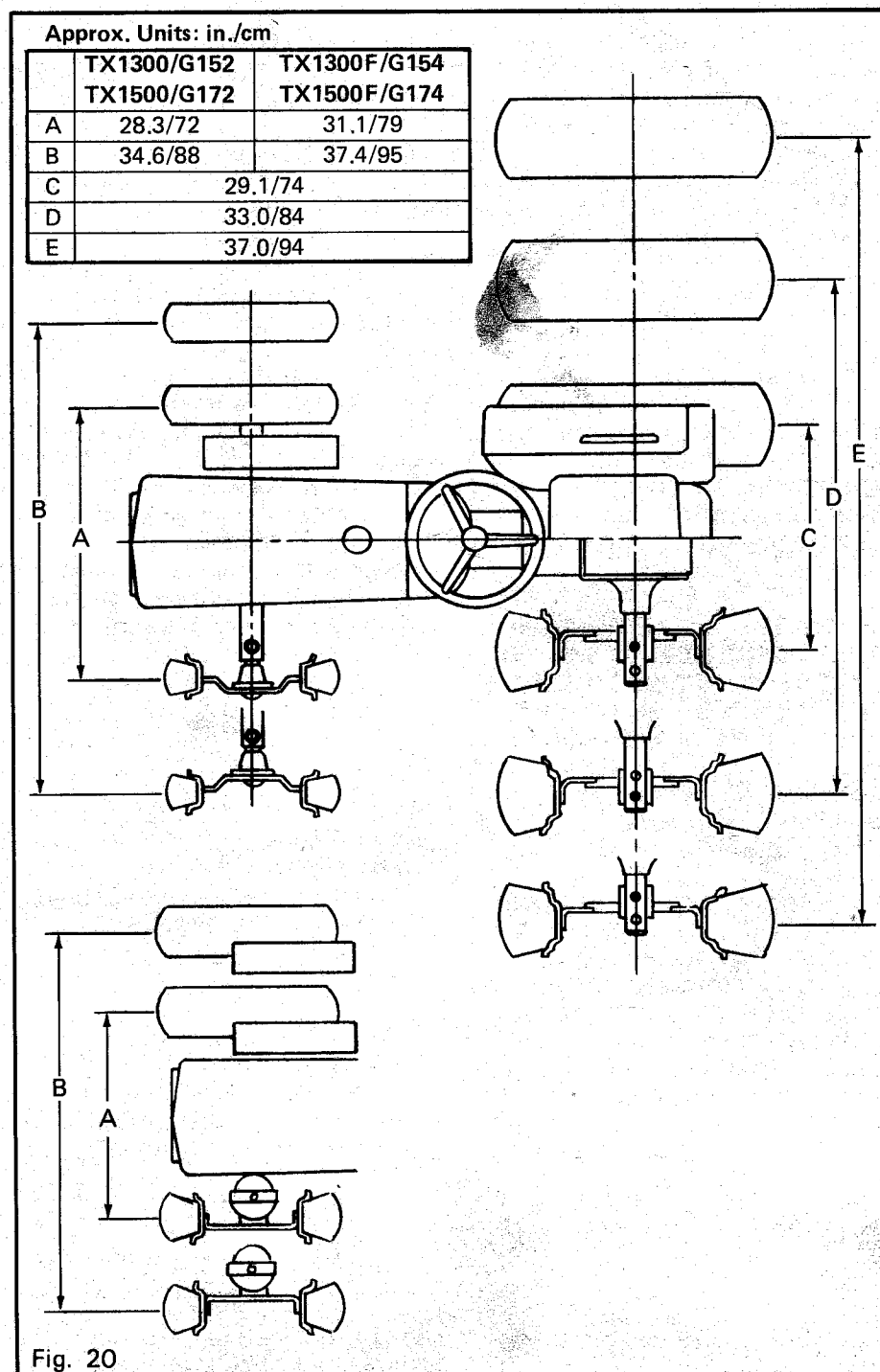
Following is an explanation of adjustment of treads for each tractor model.



CAUTION

WHEN ADJUSTING THE TREAD, ALWAYS KEEP SAFETY IN MIND. ALL BOLTS AND NUTS SHOULD BE SECURELY TIGHTENED.

WHEN ADJUSTING FOR A DIFFERENT WHEEL WIDTH, ALWAYS MAKE SURE THAT THE REAR AXLE SHAFT STICKS OUT OF THE WHEEL HUB. SEE FIGS. BELOW FOR THE DIFFERENT WIDTHS AVAILABLE. ALL DIMENSIONS ARE APPROXIMATE.



# MAINTENANCE (continued)

## ⑩ ADJUSTING OPERATOR'S SEAT

The operator's seat can be adjusted for two positions front to rear. Adjust the seat by removing the pin under the seat and install in other hole.

## BATTERY INSPECTION

The battery is the only power source for starting the engine and electrical system of the tractor. Incorrect battery maintenance shortens its useful life. To obtain a long life for your battery follow the maintenance instructions provided in this manual.



CAUTION

**IF ELECTRICAL ENERGY IN THE BATTERY IS DISCHARGED BEYOND A CERTAIN POINT, THE BATTERY CANNOT START THE ENGINE.**

**WHEN THE BATTERY IS IN THIS CONDITION, IT MAY BE IMPOSSIBLE TO RECOVER THE BATTERY PERFORMANCE EVEN BY RECHARGING IT.**

**ALWAYS MAINTAIN THE BATTERY IN A FULLY CHARGED CONDITION.**

**BATTERY ELECTROLYTE WILL EVAPORATE NATURALLY OR DURING RECHARGING. IF THE BATTERY ELECTROLYTE IS INSUFFICIENT, THE BATTERY MAY BE DAMAGED. IF THE ELECTROLYTE LEVEL IS TOO HIGH, IT WILL SPILL OUT FROM THE BATTERY RESULTING IN CORROSION OF THE MACHINE BODY. IT IS VERY IMPORTANT TO MAINTAIN THE SPECIFIED ELECTROLYTE LEVEL. SEE FIG. 21.**

When electrolyte level becomes low;

1. By natural evaporation - refill with diluted water.

2. By spilling out - add sulphuric acid. Have it done at service center or battery shop.

When the battery is fully charged, specific gravity of the electrolyte should be 1.26 at 70°F/20°C.

## ⑪ INSPECTING AND SERVICING THE AIR CLEANER (FIG. 22)

The following checking and servicing procedure should be accomplished periodically.

Loosening the wing nut, remove the cover and take out the element for cleaning.

- If dry dust sticks:  
Hold the element in your hand, tap it lightly to remove the dust.
- When wet dust or oil sticks:  
Soak the element in a neutral cleaning solvent mixed with water. After soaking the element for half an hour, wash it gently. Then, air dry the element.



CAUTION

**SERVICE THE AIR CLEANER IN ACCORDANCE WITH THE INSTRUCTIONS ON THE CAUTION PLATE ATTACHED TO THE AIR CLEANER.**

## RADIATOR

Before each day's activities, fill the radiator with coolant to the full level. It is very important to make it a habit to check the coolant level every day before work.

### 1. Pressure cap

The pressure cap is completely sealed by spring force. If the cap is not closed correctly, or the washer is not mounted properly, the coolant may leak, thereby

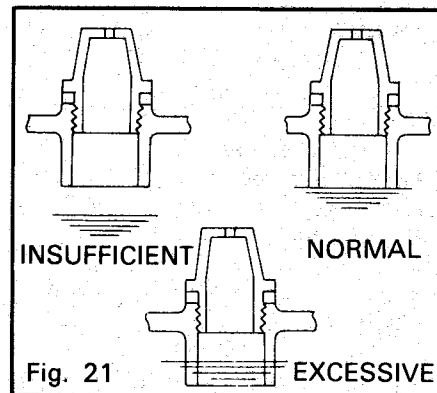


Fig. 21

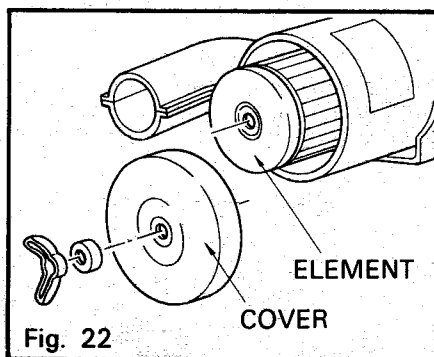


Fig. 22

resulting in a rapid decrease of the coolant level.



CAUTION

**WHEN OPENING THE PRESSURE CAP DURING HIGH LOAD OPERATION OR JUST AFTER WORK, BOILED WATER MAY FLUSH OUT, RESULTING IN SCALDING. THEREFORE, FOR YOUR SAFETY, WAIT MORE THAN 10 MINUTES AFTER STOPPING THE ENGINE, BEFORE OPENING THE CAP. WHEN DRAINING THE ENGINE COOLANT, THE PRESSURE CAP SHOULD ALSO BE REMOVED.**

2. Grass, straw, dust, insects or the like may be stuck to the net in front of the radiator after tractor operation. This results in poor cooling performance. In this case, the water temperature rises abnormally high.

Remove the net, and remove foreign materials periodically.

# MAINTENANCE CHART

△ Cleaning and washing  
★ Repair at service shop

○ Inspection, replenishment and adjustment  
● Replacement

Items	Preliminary check	Periodical inspection and Operation hour (hour meter counter)												Inspection thereafter	Check standard at preliminary check
		50	100	150	200	250	300	350	400	450	500	550	600		
Engine	Engine oil	●		●		●		●		●		●		Replace every 100 hours	Within level gauge
	Air cleaner		△		△		△		●		△		△	Clean every 100 hours Change every 400 hours Replace every year	Filled up to pressure cap (not clogged) Full level
	Radiator coolant	○													
	Fuel	○													
	Fuel filter		○	△	○	△	●	○	△	○	△	○	●	Clean every 100 hours Replace element every 300 hours Do every year Check every 200 hours	3/8 in./10mm can be pressed down with finger.
	Cleaning inside the fuel tank														
	Fan belt	○				○				○					
	Electrolyte level		○		○		○		○		○		○	Inspect every 100 hours Replace every 100 hours	
	Oil filter	○	●		●		●		●		●		●		Tightened securely No damage or leaks .013 in. (0.35mm cooled)
	Tightening of bolts and nuts	○	★											Change part Adjust every 400 hours	
	Damage and leaks	○								★					
	Valve clearance adjustment		★												
	Engine idling adjustment		★												1,706 psi/11,754 kPa (120 kg/cm <sup>2</sup> )
	Nozzle injection starting pressure		★			★			★				★	Check every 200 hours Adjust every 400 hours Check every 400 hours Check every 800 hours	Check broken wiring
	Nozzle								★						
	Starter, alternator & regulator								★						
	Glow plug								★						
	Compression pressures														
	Transmission gear oil	○	●		○		○		●		○		○	Inspect every 100 hours. Replace every 300 hours.	
	Play of clutch pedal	○													
	Play of brake pedal	○													Both brakes work equally.
	Efficiency of brake	○													
	Working of levers	○													Work securely.
	Suction filter	△							△					Clean each 300 hours.	
	Play of steering wheel	○													
	Tire pressure TX1300	○													Refer to page 20.
	TX1500	○													
	TX1300	○													
	TX1500	○													
	Toe-in						○						○		3/32-5/32 (2~4 m/m)
	Greasing front wheel hub (2-wheel drive)													★ Do each 900 hours	
	Retightening front wheel bearing (2-wheel drive)													★ Do each 900 hours	
	Bevel case lubrication (4-wheel drive)						●						●		
	Gear case lubrication (4-wheel drive)						●						●		
	Retightening steering ball joint						○						○	Adjust each 300 hours.	Tightened securely
	Wheel clamping bolt	○													Proper working
	Electric apparatus	○													
	Adjustment of throttle						○						○	Adjust each 300 hours	
	Clamping of bolts and nuts	○													Tightened securely
	Oil leakage of clutch													Inspect every year by removing plug on the bottom clutch chamber.	
	Grease		○	○	○	○	○	○	○	○	○	○	○	Each 50 hours	

# PROBLEM SOLVING

	Problem	Possible Causes	Corrective Action
E N G I N E	Starter motor fails to run.	<ul style="list-style-type: none"> <li>Clutch pedal not depressed</li> <li>Discharged battery</li> <li>Loose wire connections</li> <li>Defective starter switch</li> <li>Defective starter motor</li> </ul>	<ul style="list-style-type: none"> <li>Depress clutch pedal.</li> <li>Recharge battery.</li> <li>Correct.</li> <li>Apply grease.</li> <li>Repair or replace the switch.</li> <li>Repair or replace starter motor.</li> </ul>
	Starter motor runs slowly.	<ul style="list-style-type: none"> <li>Discharged battery</li> <li>Improper grounding</li> <li>Improper viscosity engine oil used</li> </ul>	<ul style="list-style-type: none"> <li>Recharge battery</li> <li>Clean and tighten grounding terminal.</li> <li>Use oil of correct viscosity.</li> </ul>
	Starter runs. Engine does not start.	<ul style="list-style-type: none"> <li>Air trapped in fuel system</li> <li>Fuel filter clogged</li> <li>No fuel injection</li> <li>Engine trouble</li> </ul>	<ul style="list-style-type: none"> <li>Bleed air.</li> <li>Clean or replace the filter.</li> <li>Open fuel cock to inject fuel.</li> <li>Repair at service station.</li> </ul>
	Engine runs irregularly	<ul style="list-style-type: none"> <li>Air trapped in fuel system</li> <li>Clogged injection nozzle</li> <li>Fuel leaks from fuel piping</li> <li>Uneven fuel injections</li> </ul>	<ul style="list-style-type: none"> <li>Bleed air.</li> <li>Clean or replace.</li> <li>Tighten clamps. Replace pipes. Polish and tighten copper washer.</li> <li>Repair at service station.</li> </ul>
	Engine stops at low speed.	<ul style="list-style-type: none"> <li>Defective injection pump</li> <li>Improper valve clearance</li> <li>Defective injection nozzle</li> </ul>	<ul style="list-style-type: none"> <li>Repair at service station.</li> </ul>
	Engine over-runs.	<ul style="list-style-type: none"> <li>Dust in the governor</li> <li>Oil burnt in combustion chamber</li> </ul>	<ul style="list-style-type: none"> <li>Repair at service station.</li> </ul>
	Engine stops suddenly.	<ul style="list-style-type: none"> <li>Insufficient fuel</li> <li>Clogged fuel filter</li> <li>Defective injection nozzle /</li> <li>Engine seizure due to poor lubrication</li> </ul>	<ul style="list-style-type: none"> <li>Add fuel. Bleed air.</li> <li>Replace fuel filter.</li> <li>Repair at service station.</li> <li>Repair at service station.</li> </ul>
	Engine overheats.	<ul style="list-style-type: none"> <li>Lack of engine coolant</li> <li>Loosened or damaged fan belt</li> <li>Clogged radiator cores</li> <li>Lack of engine oil</li> </ul>	<ul style="list-style-type: none"> <li>Add coolant. Check for coolant leaks.</li> <li>Adjust or replace the belt.</li> <li>Clean.</li> <li>Check and replenish oil.</li> </ul>
	High fuel consumption	<ul style="list-style-type: none"> <li>Clogged air cleaner</li> <li>Improper valve clearance</li> <li>Coolant temperature too low</li> <li>Improper fuel</li> </ul>	<ul style="list-style-type: none"> <li>Clean air cleaner element.</li> <li>Correct</li> <li>Apply cover on radiator.</li> <li>Change to correct fuel.</li> </ul>
	High oil consumption	<ul style="list-style-type: none"> <li>Low oil viscosity</li> <li>High oil level</li> <li>Oil leakage</li> </ul>	<ul style="list-style-type: none"> <li>Use oil to suit surrounding temperature.</li> <li>Adjust to specified level.</li> <li>Check and repair.</li> </ul>
	Low engine power	<ul style="list-style-type: none"> <li>Clogged or burnt injection nozzle.</li> <li>Carbon deposit on the nozzle</li> <li>Low compression pressure.</li> <li>Gas leakage from valve seat</li> <li>Improper valve clearance</li> <li>Improper injection timing</li> <li>Lack of fuel</li> <li>Clogged air cleaner</li> </ul>	<ul style="list-style-type: none"> <li>Repair at service station.</li> <li>Check and correct fuel system.</li> <li>Clean air cleaner element.</li> </ul>
	Oil lamp flashes during operation.	<ul style="list-style-type: none"> <li>Lack of engine oil</li> <li>Low viscosity of engine oil</li> <li>Defective oil pressure switch</li> <li>Defective oil pump</li> <li>Clogged oil filter element</li> </ul>	<ul style="list-style-type: none"> <li>Add oil.</li> <li>Use specified viscosity oil.</li> <li>Replace the switch.</li> <li>Repair at service station.</li> <li>Replace the element.</li> </ul>
	Charge lamp flashes during operation.	<ul style="list-style-type: none"> <li>Defective wiring</li> <li>Defective alternator</li> <li>Defective regulator</li> <li>Defective battery</li> <li>Lack of battery electrolyte</li> <li>Loosened or damaged fan belt</li> </ul>	<ul style="list-style-type: none"> <li>Check and correct loose terminals, shorts, etc.</li> <li>Repair at service station.</li> <li>Repair at service station.</li> <li>Change battery.</li> <li>Add electrolyte.</li> <li>Adjust or replace the belt.</li> </ul>
C L U T C H	Clutch slips.	<ul style="list-style-type: none"> <li>Improper pedal adjustment</li> <li>Worn or burnt clutch lining</li> </ul>	<ul style="list-style-type: none"> <li>Adjust free play of pedal.</li> <li>Repair at service station.</li> </ul>
	Clutch does not disengage.	<ul style="list-style-type: none"> <li>Seized clutch lining</li> <li>Improper clutch pedal adjustment</li> </ul>	<ul style="list-style-type: none"> <li>Repair at service station.</li> <li>Adjust free play of pedal.</li> </ul>
B R A K E S Y S T E M	Poor braking Uneven braking	<ul style="list-style-type: none"> <li>Excessive brake pedal free play</li> <li>Oil leaks in brake chamber</li> <li>Worn or burnt brake lining</li> <li>Different brake distances in left and right pedals</li> </ul>	<ul style="list-style-type: none"> <li>Adjust.</li> <li>Repair at service station.</li> <li>Relining at service station.</li> <li>Adjust.</li> </ul>
	Slow return of brake pedal	<ul style="list-style-type: none"> <li>Damaged brake return spring</li> <li>Lack of grease on sliding parts</li> </ul>	<ul style="list-style-type: none"> <li>Replace the spring.</li> <li>Apply grease after removing rust.</li> </ul>

# PROBLEM SOLVING (continued)

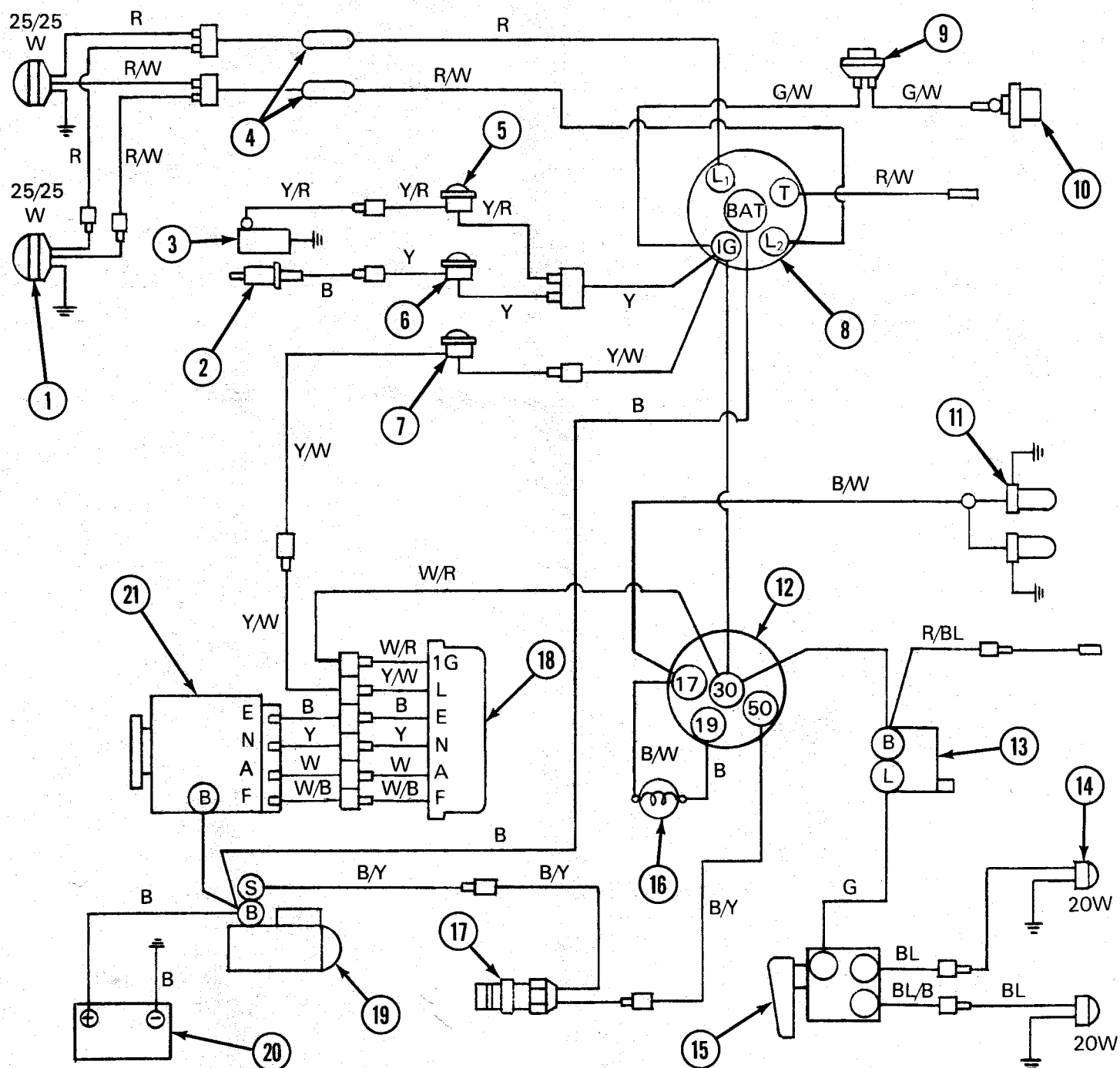
	Problems	Possible Causes	Corrective Actions
HYDRAULIC SYSTEM	Hydraulic system does not raise.	<ul style="list-style-type: none"> <li>• Lack of hydraulic oil</li> <li>• Air taken in from intake pipings</li> <li>• Clogged suction filter</li> <li>• Defective hydraulic pump</li> <li>• Defective control valve</li> <li>• Damaged cylinder</li> </ul>	<ul style="list-style-type: none"> <li>• Add to specified level.</li> <li>• Retighten joints.</li> <li>• Replace cracked pipe.</li> <li>• Replace damaged O-ring.</li> <li>• Clean the filter.</li> <li>• Repair at service station.</li> <li>• Repair at service station.</li> <li>• Replace at service station.</li> </ul>
	Oil leakage from piping	<ul style="list-style-type: none"> <li>• Loosened pipe joints</li> <li>• Cracked pipe</li> </ul>	<ul style="list-style-type: none"> <li>• Retighten joints.</li> <li>• Replace pipe at service station.</li> </ul>
	Buzzer-sound is heard at relief valve when placing hydraulic lever to 'raise'.	<ul style="list-style-type: none"> <li>• Dislocated stopper</li> <li>• Improper setting of auto-return device</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the position.</li> <li>• Adjust the position.</li> </ul>
	Hydraulic system does not lower.	<ul style="list-style-type: none"> <li>• Lowering speed adjustment lever is locked.</li> <li>• Defective control valve</li> <li>• Damaged cylinder</li> <li>• Burnt lift shaft rotating part</li> </ul>	<ul style="list-style-type: none"> <li>• Set to "lower" position.</li> <li>• Repair at service station.</li> <li>• Replace at service station.</li> <li>• Repair at service station.</li> </ul>
STEERING SYSTEM	Heavy steering Difficult steering	<ul style="list-style-type: none"> <li>• Improper toe-in</li> <li>• Improper tire inflation</li> <li>• Deflected rod ends</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust toe-in.</li> <li>• Inflate tires evenly.</li> <li>• Retighten or replace parts.</li> </ul>
	Excessive steering wheel free play	<ul style="list-style-type: none"> <li>• Worn steering shaft</li> <li>• Worn metal</li> <li>• Deflected rod ends</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust by adjustment bolt.</li> <li>• Correct at service station.</li> <li>• Retighten.</li> </ul>
ELECTRICAL SYSTEM	Battery does not charge	<ul style="list-style-type: none"> <li>• Defective wiring</li> <li>• Defective alternator</li> <li>• Defective regulator</li> <li>• Loose or damaged fan belt</li> <li>• Poor maintenance of battery</li> </ul>	<ul style="list-style-type: none"> <li>• Check and correct loosened or dirty terminal, shorts, etc.</li> <li>• Repair at service station.</li> <li>• Repair or replace at service station.</li> <li>• Adjust or replace belt.</li> <li>• Correct loose or rusted terminals.</li> <li>• Correct electrolyte level.</li> </ul>
	Weak head light	<ul style="list-style-type: none"> <li>• Discharged battery</li> <li>• Improper wiring</li> </ul>	<ul style="list-style-type: none"> <li>• Recharge battery.</li> <li>• Check and correct.</li> </ul>
	Head light does not go on.	<ul style="list-style-type: none"> <li>• Broken bulb</li> <li>• Melted fuse</li> <li>• Defective connection</li> </ul>	<ul style="list-style-type: none"> <li>• Replace bulb.</li> <li>• Correct the wiring, and replace fuse.</li> <li>• Check and correct.</li> </ul>

# ELECTRICAL WIRING DIAGRAM

- |                        |                        |
|------------------------|------------------------|
| 1. Headlights          | 12. Starter switch     |
| 2. Oil pressure switch | 13. Flashing unit      |
| 3. Water temp. switch  | 14. Turn indicators    |
| 4. Fuses               | 15. Turn signal switch |
| 5. Water temp.         | 16. Heater signal      |
| 6. Oil light           | 17. Safety switch      |
| 7. Charging light      | 18. Voltage regulator  |
| 8. Key switch          | 19. Starter motor      |
| 9. Horn                | 20. Battery            |
| 10. Horn button        | 21. Alternator         |
| 11. Glow plugs         |                        |

## ABBREVIATIONS OF WIRE COLORS

R = RED  
 Y = YELLOW  
 BL = BLUE  
 B = BLACK  
 G = GREEN  
 W = WHITE



# THREE POINT HITCH ASSEMBLY

1. Except for Ref. letters A thru E, preassemble the three-point hitch as shown in Fig. 1.

2. To fasten the hitch to the tractor first slide lower link shaft A, Fig's. 1 and 2, through the hole in the wheel rim and route through both lugs E, of the rear axle.

3. Position plate E between the lugs and fasten it to the link shaft with a flat washer, lock-washer and bolt. See Fig. 2.

4. Slide on both lower link assemblies G and both chain holders H onto the end of the link shaft. Secure with two click pins. See Fig. 2.

5. Position top link assembly I between support J, Fig. 3, and secure with pin and click pin K.

6. Loosen both lift pins L, Fig. 3, in the lift arms on the tractor and remove. Position both

brackets M, previously assembled to lift rod assemblies N and O on the tractor lift arms.

Slide pin L through and re-tighten the screw in the tractor lift arms.

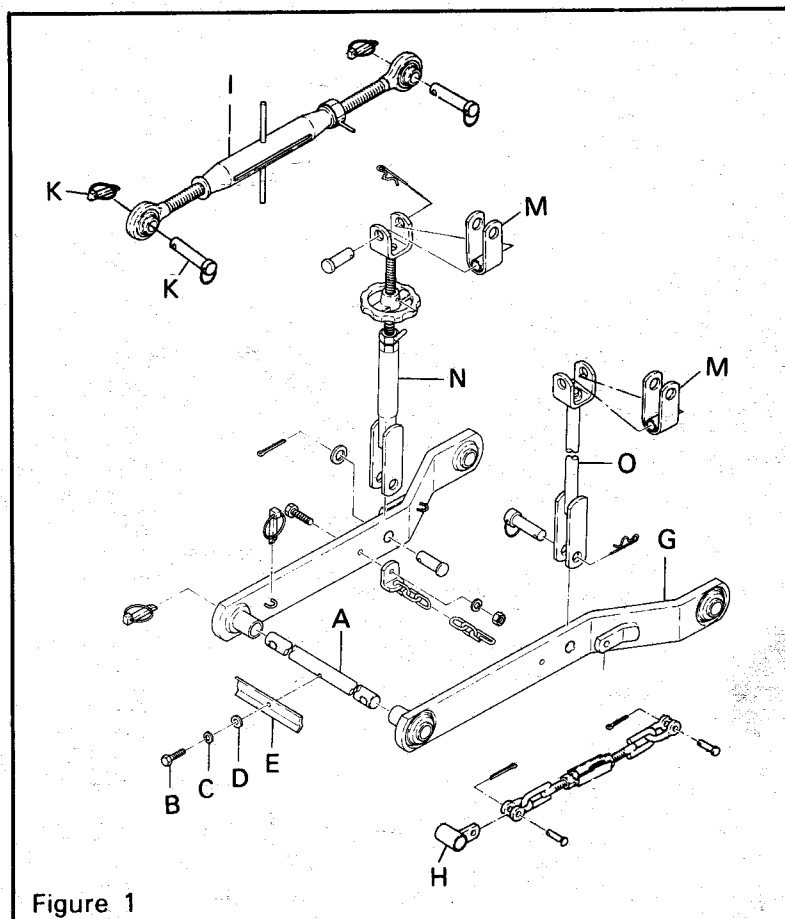


Figure 1

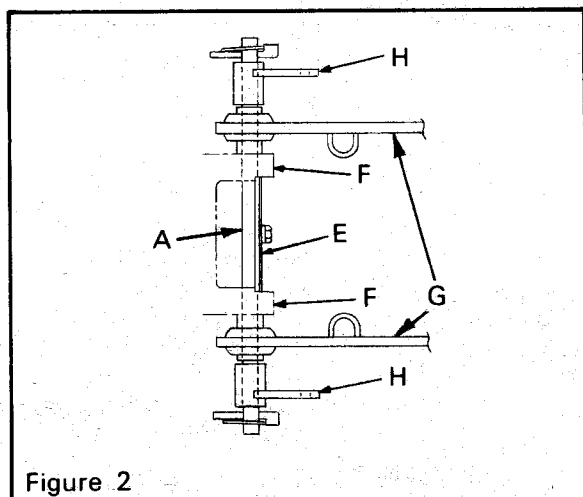


Figure 2

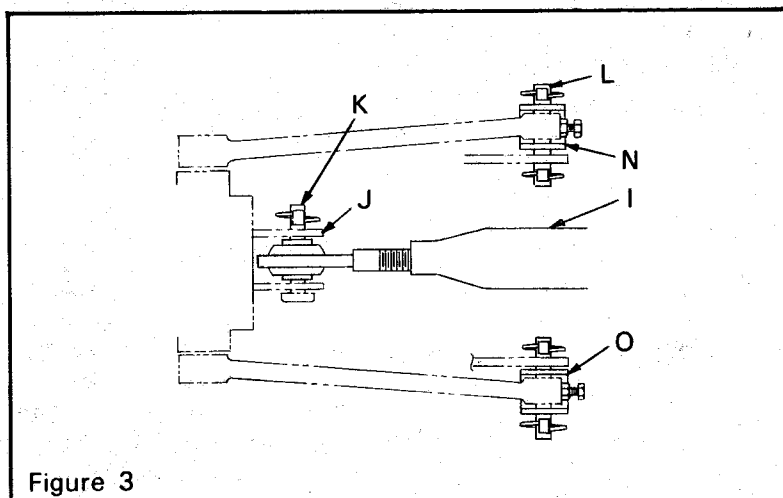


Figure 3

## STORAGE

### ① DAILY STORAGE

After each day's work is done, follow this procedure:

Clean the tractor.



**WHEN WASHING THE MACHINE, DO NOT WASH ELECTRICAL PARTS.**

Fill the fuel tank to maximum level.

Lower the attachment to the ground.

Store the machine indoors as much as possible. When storing the machine in an open space, cover it for protection.

In cold weather, remove the battery and keep it in a warm place.

Handle the engine coolant as follows:



**IF SURROUNDING TEMPERATURE IS EXPECTED TO GO BELOW 0°C (32°F), DRAIN THE COOLANT OR ADD AN ANTI-FREEZE SOLUTION. THIS WILL PREVENT A BROKEN ENGINE BLOCK.**

### ② LONG-TERM STORAGE

Prior to storing the machine for more than a few months, thoroughly clean it. Then, carry out the following maintenance routine:

The engine coolant from the radiator must be drained. Remove the drain cock at the left side of the radiator. Remove the radiator cap and drain. Fill with a new solution of anti-freeze.

Drain the engine oil and fill with new clean oil. Warm up the engine for 5 minutes to circulate the oil to every part of the engine.

Inflate the tires a little more than the normally specified air pressure. See page 13.

Do not forget to lubricate all necessary parts. Apply grease or oil on all parts subject to rust.

Check for loose bolts and nuts. Retighten, if necessary.

Lower the attachment to the ground.

Select a dry place for storage. Cover the machine with a plastic sheet or canvas.

Remove the battery from the tractor. Recharge the battery. After adjusting the electrolyte level correctly, store it in a dry place out of direct sun light.

To protect the engine from rusting, run the engine at 1000 to 1500 rpm for 5 to 10 minutes, once each month.

Carry out preliminary checks.

For correct machine service life and performance, practice the following warm up operation.

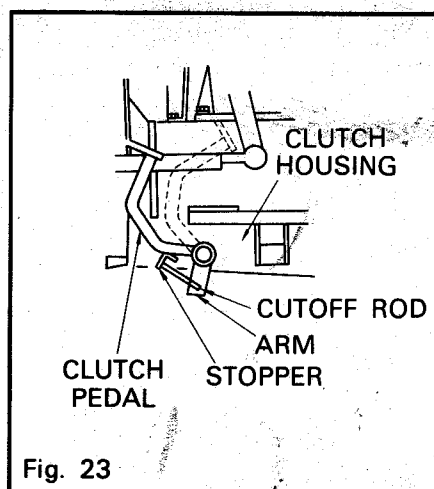
A. Pull the throttle lever to slow position.

B. Turn the ignition key and run the starter till the oil light goes off.

C. Repeat the above operation 2 to 3 times. Then start the engine. Warm up the engine at idling speed for 5 to 10 minutes.

Clutch should be disengaged as follows:

Depress the clutch pedal and lock in place. See Fig. 23.



FMC Bolens reserves the right to change specification, add improvements or discontinue the manufacture of any of its equipment without notice or obligation to purchasers of its equipment.

FMC Bolens' approval of the use of attachments manufactured by allied manufacturers is limited to assurance that

such use will not void FMC Bolens warranty on the FMC Bolens equipment to which the allied manufactured attachments are adapted. The responsibility for the design, performance, durability, safety in operation, service repair availability, and warranty obligation remain with the allied manufacturer.

FMC Bolens specifically excludes from its warranty obligation all such allied manufactured attachments.

FMC Bolens warranty will be voided if unapproved attachments are adapted to use with FMC Bolens equipment and are so used.