

9. FUEL TANK WATER TRAP - During cold weather be sure to drain the fuel tank water trap daily or damage will occur.

10. DURING EXTREMELY COLD WEATHER, the following extra precautions may be required:

- a. Remove and store the batteries in a moderately warm place (preferably room temperature). Reinstall the batteries just prior to starting.
- b. Drain the crankcase oil while it is still warm from operation. Store it in a warm place. If possible, pre-heat it to approximately 100 degrees Fahrenheit before replacing it just prior to starting.
- c. Drain and store the anti-freeze in a warm place. If possible, the anti-freeze should be warmed before replacing it in the cooling system just prior to starting.

## **CAUTION**

NEVER IDLE THE ENGINE FOR PROLONGED PERIODS OF TIME. DURING EXTREMELY COLD WEATHER, WATCH THE COOLANT TEMPERATURE CAREFULLY AND NEVER OPERATE THE ENGINE FOR PROLONGED PERIODS BELOW THE RECOMMENDED COOLANT TEMPERATURE.

During extremely cold temperatures, the engine will not warm up to or maintain the operating temperature at low engine speeds. Low idling speeds during extremely cold temperatures will result in incomplete combustion, heavy deposit formations on the valves and possible serious damage to the engine.

### **1. ENGINE WARM UP PROCEDURE**

- a. Disengage traction clutch, start the engine and allow it to run at reduced speed just long enough for the oil to circulate through the engine (not over one or two minutes).
- c. Set the throttle hand lever in the FULL SPEED (wide open) position and allow engine to warm up.

### **2. MAINTAINING ENGINE OPERATING TEMPERATURE**

When the engine is not operating under load, but the operator wishes to keep the engine running due to the extremely cold temperatures:

- a. Keep throttle hand lever in the FULL SPEED position, DO NOT IDLE THE ENGINE.
- b. Keep the radiator covered sufficiently to maintain the correct temperature.

## COOLANT HEATER

The engine cylinder block is provided with a passage, located the left hand side of the engine, Figure 32. The coolant heater, Figure 33, can be purchased from your Authorized Case Dealer, No. A40637.

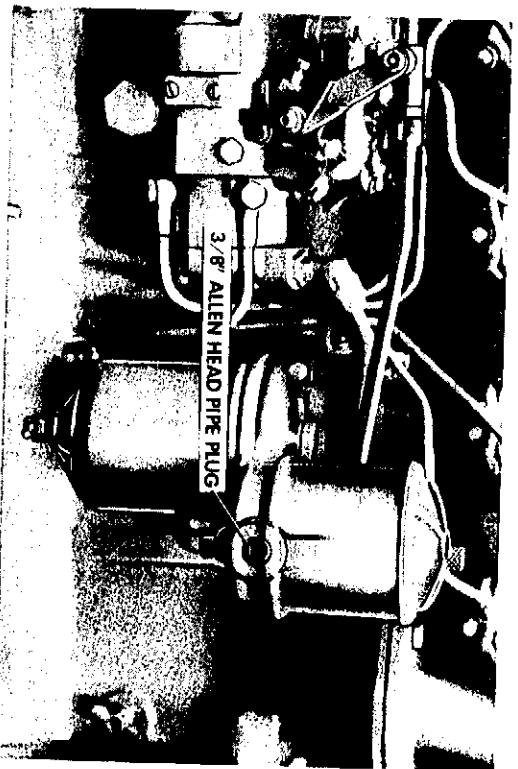


Figure 32

To install the Coolant Heater, remove the Allen Head pipe plug from the cylinder block, Figure 32, and follow the Heating Element Manufacturer's instructions for installation. The heater can be ordered from your Case Dealer under Part No. A40637.

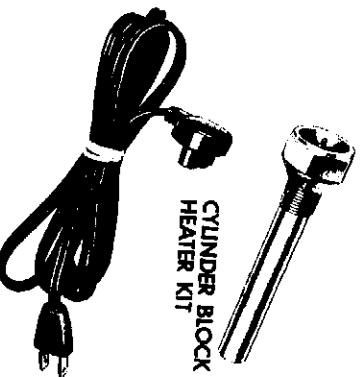


Figure 33. Typical Coolant Block Heater

## APPROXIMATE TRAVEL SPEEDS

RANGE		LOW		1		2		3		4		4*		INTERMEDIATE (DIRECT)		1		2		3		4		4*		HIGH		1		2		3		4	
		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.		FWD. REV.	
STANDARD CLUTCH TRACTORS (1900 ENGINE R.P.M.)		standard		1.6		2.4		3.1		4.1		7.9				2.8		4		5.3		13.2		18.8				4.6		6.8		8.9		22	
		triple range		1.7		2.5		3.3		4.5		11.7				3.4		5		6.6		18.8		23.4				3		4		5		6	
TORQUE CONVERTER TRACTORS (2100 ENGINE R.P.M.)		dual range shuttle		2.2		3.6		4.7		8.7						3.6		4.5		5.9		20.8		20.8				3		4		5		6	
		4 speed		2.2		3.6		4.7		8.7				3.6		4.5		5.9		20.8		20.8		20.8				3		4		5		6	
TORQUE CONVERTER DRIVE		dual range shuttle		1.9		2.8		3.7		12.9		16				2.4		3.1		4.7		11.7		16.6				3		4		5		6	
		4 speed		1.5		2.1		2.8		7		10		2.9		2.4		3.6		4.7		11.7		16.6				3		4		5		6	
TORQUE CONVERTER TRACTORS (2100 ENGINE R.P.M.)		dual range		1.5		2.1		2.8		7		10		2.9		2.4		3.6		4.7		11.7		16.6				3		4		5		6	
		4 speed		1.5		2.1		2.8		7		10		2.9		2.4		3.6		4.7		11.7		16.6				3		4		5		6	
TORQUE CONVERTER DRIVE		dual range shuttle		1.5		2.1		2.8		7		10		2.9		2.4		3.6		4.7		11.7		16.6				3		4		5		6	
		4 speed		1.5		2.1		2.8		7		10		2.9		2.4		3.6		4.7		11.7		16.6				3		4		5		6	

# TORQUE CONVERTER DRIVE OPERATION

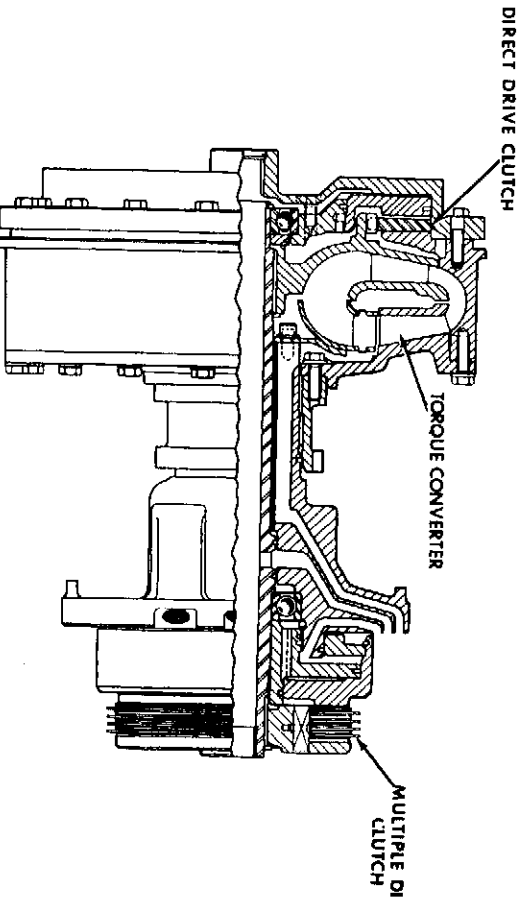


Figure 34

If your Case Tractor is equipped with Torque Converter Drive, can be operated in either a torque converter drive or direct drive with one of the following transmission operations:

1. Standard 4 speed transmission (4 speed forward; 1 speed reverse). (High speed 4th gear).
2. Dual Range Shuttle (8 speeds forward; 8 speeds reverse).

## Torque Converter Drive

Each time the Tractor is started from a standing stop - Torque Converter Drive automatically starts the tractor out in converter mode. When you release the foot clutch pedal to start the tractor moving, the main drive clutch at the rear of the converter is hydraulically engaged to the transmission. Torque converter drive will start heavy loads smoothly and will pull implements or machine through "tough spots." (up to 100% more drawbar pull than standard clutch tractor operation), without necessity of down shifting.

## Direct Drive

When you move the direct drive hand lever down, the front converter clutch is hydraulically actuated which engages the engine direct to the transmission (bypassing the torque converter). Use direct drive for handling light loads at maximum speed or "taking over" heavy loads after they are rolling in torque converter drive.

## Engaging Torque Converter Drive

The torque converter can be engaged in two ways:

1. By releasing the Power-Clutch pedal, Figure 35. The main drive converter clutch automatically engages the Torque Converter drive each time the operator releases the Power-Clutch pedal to start the tractor moving - thus, the tractor always starts from a standing stop in Torque Converter Drive. When operating in direct drive, the Torque Converter can also be engaged by quickly depressing the Power-Clutch pedal and allowing it to release.

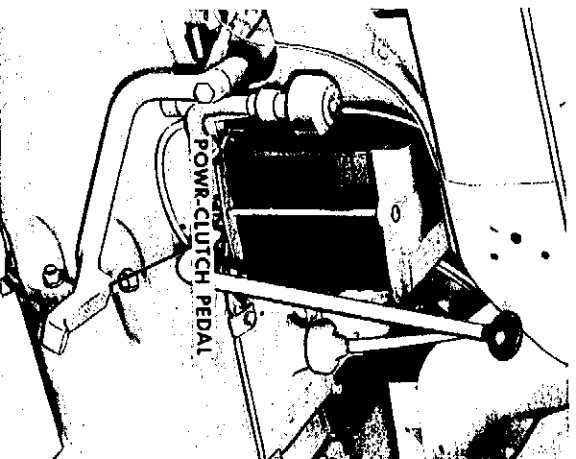


Figure 35

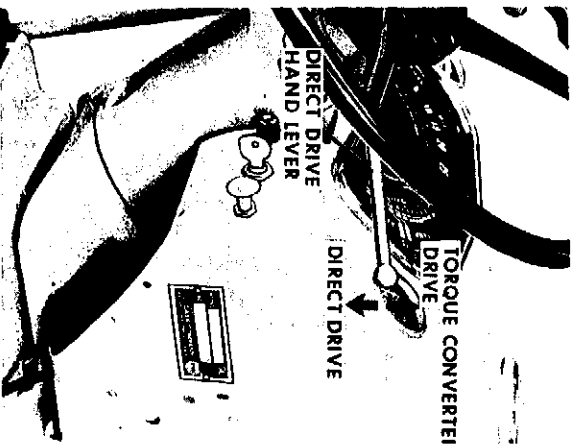


Figure 36

2. Pushing Direct Drive Lever - Upward - if the tractor has been operating in direct drive and the operator wishes to pull through a "tough spot" or up a steep grade, he can return to Torque Converter Drive by simply pushing the direct drive hand lever upward Figure 36.

## Torque Converter Oil Temperature

When operating the tractor in Torque Converter drive - DO NOT operate too long at "Stall Speed" as this may cause the converter oil to overheat and result in damage to the Torque Converter system "Stall Speed" means the point at which, under heavy load, the tractor rear wheels turn very slowly or not at all, yet the engine is turning at normal RPM. The overheating is caused by the engine delivering full horsepower into the converter - and the converter unable to release this power to the rear wheels; thus, this horsepower is released in the form of excess heat. Shift to next lower transmission gear to reduce oil temperature.

## Stopping Tractor in Torque Converter Drive

When operating the tractor in converter drive, there are methods of stopping:

1. Reduce the engine speed to idling with hand or foot throttle - gradually apply both brake pedals to stop the tractor. This method of stopping is very handy for short stop and start operation.
2. Depress foot clutch pedal.

### Starting Tractor in Motion

1. Always keep hand throttle in idle position for starting.
2. Depress brake pedals.
3. Release foot clutch pedal.
4. Release brakes.
5. Gradually accelerate the engine to full power to move the load.

### Engaging Direct Drive

To engage the tractor in direct drive, pull the handle control lever downward. Direct drive can only be engaged while the tractor is in motion. The tractor always is started in converter drive from standing start.

### Stopping Tractor in Direct Drive

To stop the tractor, depress the foot clutch pedal.

### **IMPORTANT**

During down hill transport operation, always operate the tractor in direct drive to utilize the braking power of the engine compression to maintain a safe tractor speed.

### A Working Speed For Every Job

The Torque Converter Drive in both Direct and Torque Converter Drive gives the exact speed for every job. Its no-stall characteristics, its smooth power flow, means more work done easier and with less effort.

## INDEPENDENT PTO

Rotation -----	Clockwise from rear of tractor
Output Shaft Size -----	Standard 1-3/8" - ASAE Spline
Speed (Torque Converter) --	541 RPM (at 1970 Engine RPM)
(Standard Clutch) -----	533 RPM (at 1750 Engine RPM)
Check Interval -----	60 Hours
Change Interval -----	1000 Hours or Yearly

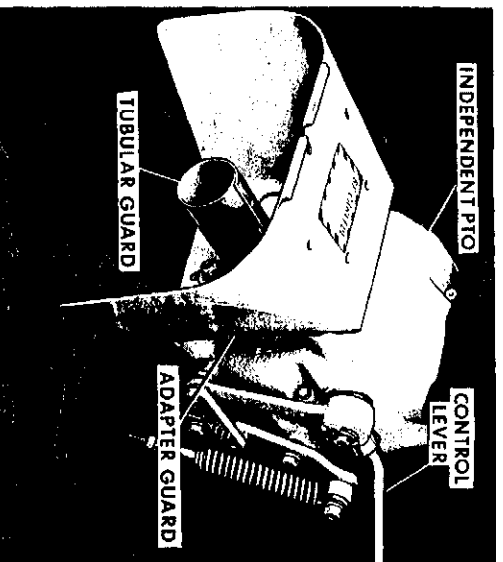


Figure 37



When using this power take-off, be sure the engine speed does not exceed the PTO speed listed on the tachometer. To engage the PTO pull the hand lever up - to disengage, push hand lever down, Figure 37. With the hand lever completely down a disk brake will stop the PTO shaft and prevent the shaft from creeping.

**NOTE** The power take-off operates completely independent of the Torque Converter clutches and the transmission. The power take-off clutch can be engaged or disengaged at any time and the power take-off operated whenever the engine is running.

**IMPORTANT** Engaging the PTO hand clutch too slowly causes undue wear on the drive plates when starting a machine not already in motion.

Always reduce the engine speed to approximately 1/3 throttle, slowly begin to engage the clutch hand lever until the machine begins to operate; then quickly "snap" the PTO hand clutch lever into the fully engaged position. Bring the engine up to 1750 RPMstd. Clutch or 1970 RPM Torque Converter.

When the PTO is not needed, it can be made inoperative by pushing the shift yoke shaft forward as far as possible. Use a small pry bar to shift the yoke shaft.

## STANDARD AND CONSTANT RUNNING PTO

Rotation -----Clockwise from rear of tractor  
Output Shaft Size -----Standard 1-3/8" ASAE Spline  
Speed - Torque Converter -----541 RPM at (1970 Engine RPM  
Standard Clutch -----533 RPM at (1750 Engine RPM

**CAUTION** When the power take-off is not being used put on a small tubular guard. This guard covers the splines. Never operate a tractor without either the large or small guard in place.

When power take-off is connected to driven machinery, it will be necessary to remove the small guard. When this guard is removed, make sure the larger Adapter Guard is installed and properly connected to the telescoping shield which is furnished with all power take-off driven machines.

**NOTE** With either Standard or Constant-Running PTO the operation of the output shaft and control lever remain the same, Figure 38.

### Operating Constant Running

Power Take-off - with the tractor engine idling, depress the foot clutch pedal, engage the power take-off with the control lever and select the proper transmission travel gear. Increase the engine speed and engage the engine clutch slowly and evenly.

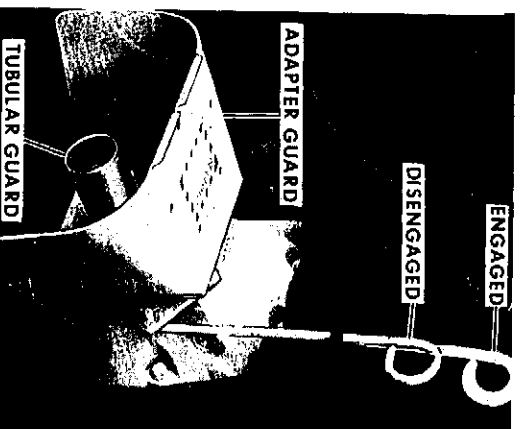


Figure 38

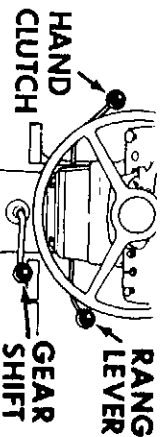


Figure 38A.

To stop tractor travel and continue operating PTO - disengage hand clutch Figure 38 A.

For stationary PTO work - Depress foot clutch and place gear shift lever in neutral - then release foot clutch to engage PTO

Operating Standard Power Take-Off - With the tractor engine idling, depress the foot clutch pedal. Engage the power take-off with the control lever. Select the proper transmission travel speed. Increase the engine speed and engage the engine clutch slowly and evenly. The standard power take-off can only be operated with the traction clutch engaged.

**CAUTION** For Stationary PTO operation, transmission oil level must be up to the full mark on the dipstick.



# CASE DRAFT-O-MATIC HYDRAULIC SYSTEM

Case Draft-O-Matic hydraulic system is a Category I three point hitch system that provides both position control and Draft-O-Matic control of soil engaging implements.

Implement Identifying	
Dimensions	Category I Implement
Diameter of hitch pins	7/8"
Distance between shoulders of hitch pin	26-7/8"
Gap in top of mast	1-3/4"
Diameter of holes in top of mast	3/4"

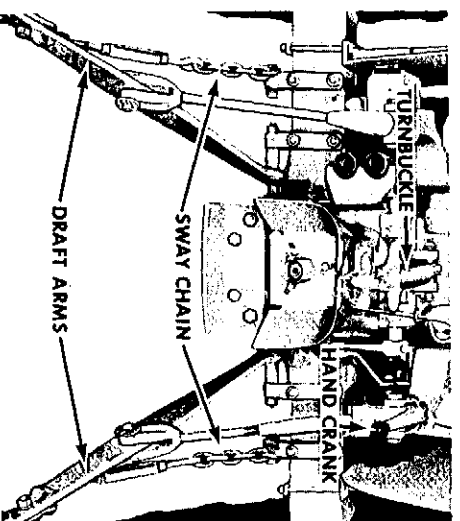


Figure 39

The Quadrant Lever is provided for raising and lowering mounted implements and also for selecting the desired working depth of soil engaging implements.

**RAISING** - Pull the quadrant lever upward to raise a mounted implement. **NOTE** There is an adjustable raise stop on the quadrant that can be adjusted to act as stop for the desired raise position. Figure 40. This stop must never be removed and the lever must never by-pass this stop or serious damage to the pump may result.

**LOWERING** - Push the quadrant lever downward to lower a mounted implement. **NOTE** Refer to Draft-O-Matic Control for positioning of the adjustable TWO POSITION LOWERING STOP.

## Draft-O-Matic Control

1. Lower the implement to the ground and start the Tractor in forward motion. The weight of the implement and the "suction" designed into the soil engaging parts will cause the implement to enter the ground.

2. The depth the tool attains or the distance the tool lowers must be controlled by the quadrant lever.

3. Once the quadrant lever is positioned for the correct depth, adjust the TWO POSITION LOWERING STOP on the quadrant so the lever is against the 1st stop position. The depth of the implement or tool will now automatically be controlled by the draft load on the implement. **NOTE** If a soil condition exists where a slightly lower depth is desired - move lever down against the 2nd stop position on the TWO POSITION STOP. The depth of the implement will now be automatically controlled by the draft load on the implement at a slightly greater depth than at the 1st stop.

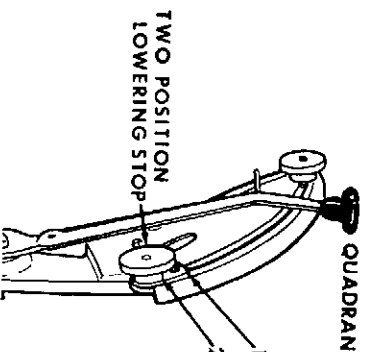


Figure 40

## Position Control

If the operation of a particular implement or tool requires operation at a fixed depth - proceed as follows:

1. Move the automatic sensing control bracket down against the transmission case or the rockshaft housing to the lock out position, Figure 41. Inset A.
2. Lower the draft arms with the quadrant lever, until the desired depth is reached.
3. Move the 2 position adjustable stops so the 1st position is against the quadrant lever, Figure 40.

## Hydraulic Float Control

1. Position the LOWERING STOP to the lowest position on the quadrant.
2. Now move the quadrant lever against the 2nd stop - The Hitch System will now be in Hydraulic Float Control. Refer to implement operator's manuals.

# DRAFT-O-MATIC ADJUSTMENTS

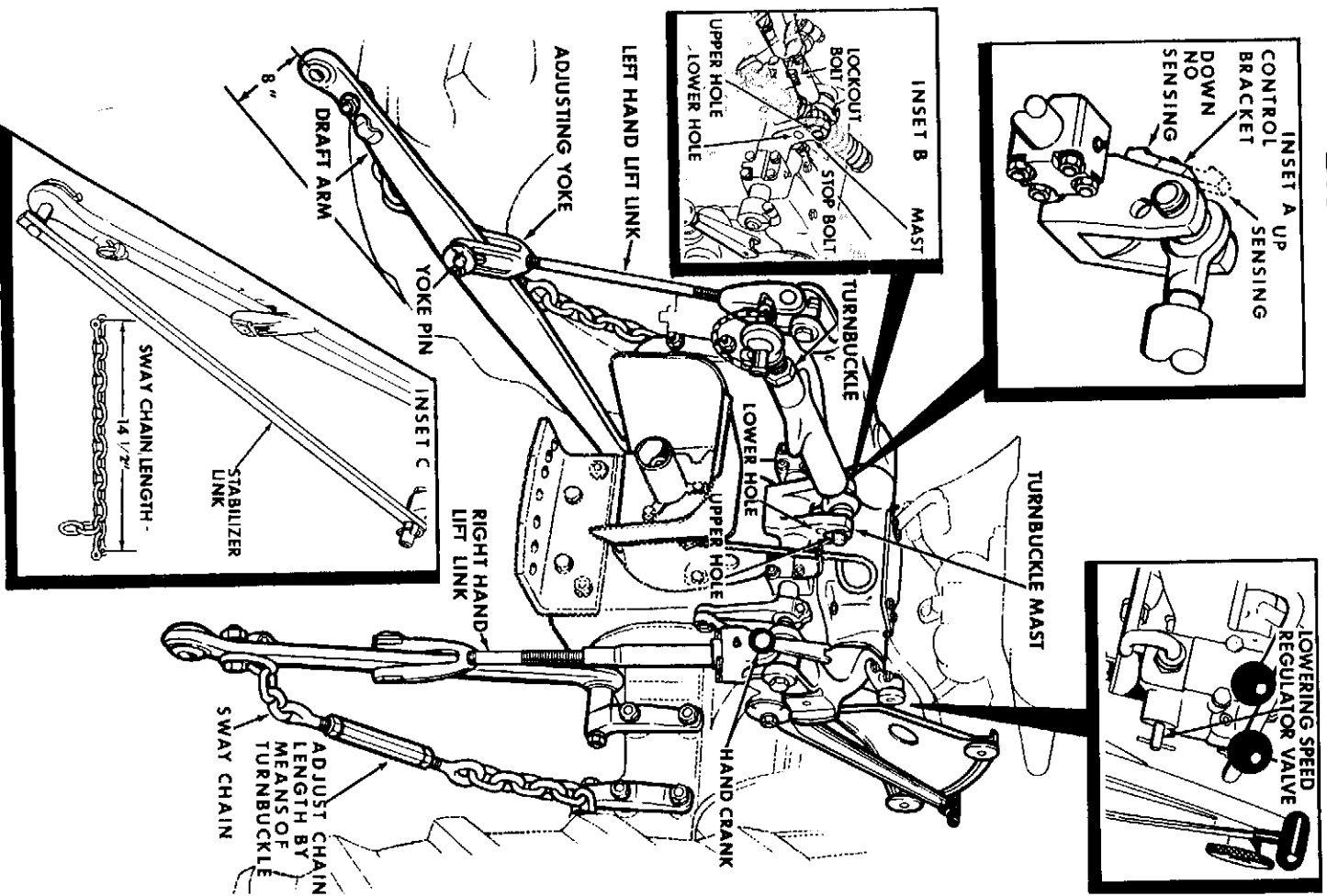


Figure 41

DRAFT ARM LIFT LINK SETTINGS - Locate tractor on a hard and level surface. Inflate tires to operating pressure. Lower draft arms full lowered position. Measure the distance from center of draft implement pin holes to ground. This distance must be 8 inches regardless of rear tire size. To change length of left hand lift link, remove rear yoke pin and turn yoke up or down to obtain this measurement. Turn right hand lift link is adjustable by means of a hand crank.

TURNBUCKLE LINK - The turnbuckle link is the upper center hitch point of the three point hitch. Its length is variable and can be adjusted by rotating turnbuckle. The correct adjustment will depend upon type implement. Check implement Operator's Manual. The maximum length should never exceed 26-1/2". (Center to center of connecting pin holes).

TURNBUCKLE MAST - Where light implements are used, connect turnbuckle to the upper hole in the mast for correct sensitivity. Where heavier implements are used, connect the turnbuckle to the lower hole in the mast for the correct sensitivity.

LOWERING SPEED REGULATOR VALVE - Raise the implement to the full raise position, then lower it by placing the quadrant lever again stop. If implement drops too fast so there is danger of breakage or damage, turn regulator valve in 1/2 turn at a time. Check lowering speed after each adjustment until a safe lowering speed is obtained. If implement lowers too slowly turn regulator valve out 1/2 turn at a time.

AUTOMATIC LOAD DEPTH LOCKOUT - To lockout the automatic sensing, Inset A, the control bracket must be downward against rear rockshaft housing, tighten cap screw. To use automatic sensing, loosen cap screw and swing control bracket to the up position as far as possible and tighten cap screw. DO NOT leave control bracket in any other position as damage may occur. For Inset B, have implement in transport position and turnbuckle link in lower hole, turn lockout bolt all the way 1 against rockshaft housing. To use automatic sensing, screw lockout bolt all the way out till it contacts roll pin, install turnbuckle in proper machine hole. DO NOT leave lockout bolt half way in or out as damage may occur. STABILIZER LINKS - Inset C stabilizer links are used when rigid draft arms are required for operation of certain type implements. The adjustable stabilizer links must be adjusted when implement is attached to the draft arms. Turn stabilizer link adjustable ends further on or off until stabilizer link is as short as possible. Tighten lock nuts.

ADJUSTABLE SWAY CHAINS - The sway chains can be adjusted from no sway to 5" each side of tractor center-line for the maximum sway position of 10". The chain length for maximum sway should never exceed 30-1/4" from center of mounting bolts. The no sway position is obtained by shortening the chains. Refer to Implement Operator's Manual for proper centering of the hitch in the no sway position. For Inset C, the dimension from center to center of shackle pin holes with chain straight should be approximately 14-1/2 inches. **CAUTION** Never operate the Draft-O-Matic 3 point hitch with the chains removed or serious damage could result. **IMPORTANT NOTE** Inset B, THE STOP BOLTS SET AT THE FACTORY AND CAN BE ADJUSTED ONLY BY AN AUTHORIZED CASE DEALER.

## DRAFT ARM MECHANICAL FLOTATION

The two lift links bottom yokes have slotted type holes, Figure 42, which will allow one or both draft arms to float up or down approximately 1-3/4". The mechanical draft arm float feature is very desirable when operating on variable contour conditions as it will allow the implement to remain level even though the tractor does not remain level. It will also allow the implement to follow the contour conditions while the tractor remains level.

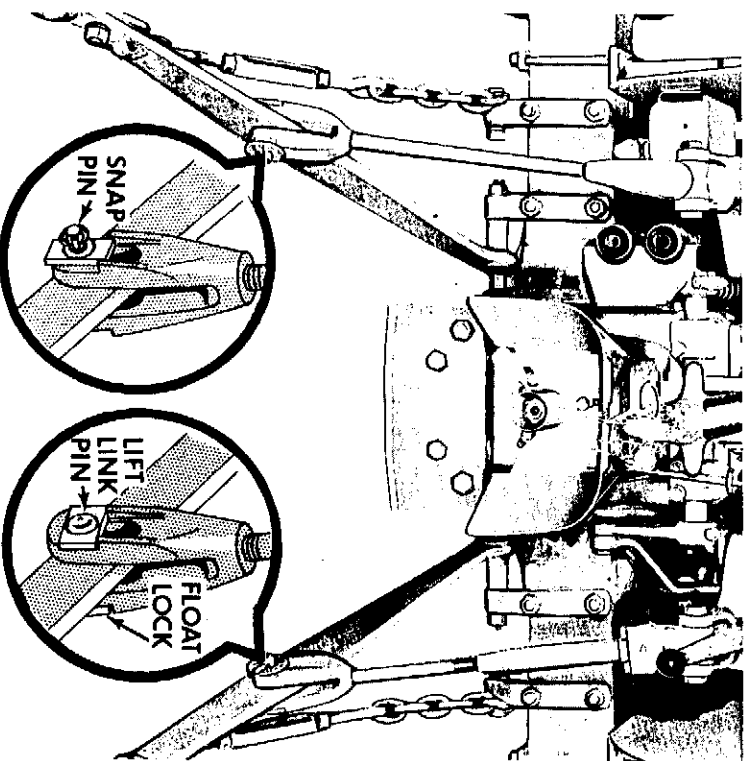


Figure 42

This floatation adjustment can be adjusted so one draft arm is held in place while the other draft link arm can float. Remove the snap pin and pull the lift link pin out about 1/2" and turn it to a vertical position. Remove the float lock and reinstall it in the vertical position. Push the link pin in and install the chain connecting link and snap pin.

**NOTE** Refer to the Implement Operator's Manual to check if mechanical floatation should be used.

## HYDRAULIC CONTROL OPERATION

### Dual Valve

The term "Dual Valve" means that two hydraulic control valve are connected to the tractors hydraulic system and each valve has its own control lever which controls its own hydraulic system individually.

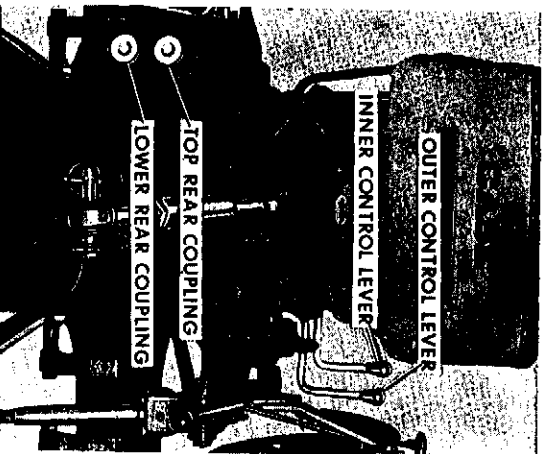


Figure 43

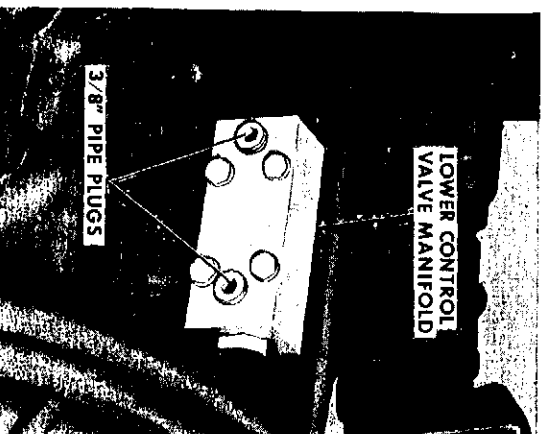


Figure 43A

### Control Levers

The outer hand control lever, Figure 43, controls the oil flow through the upper control valve to the hose couplings at the rear of the tractor. Moving outer control lever forward pressurizes the upper rear coupling and moving the outer control lever rearward pressurizes the lower rear coupling.

The inner hand control lever, Figure 43, controls the oil flow through the lower control valve and can be used for an extra remote cylinder or front mounted implement. Remove the two 3/8" Allen Head pipe plugs in the lower valve manifold, Figure 43A and attach the remote hydraulic lines.

The inner and outer control levers both have three positions, Neutral, Full Forward and Full Rearward.

**NOTE** Either lever can be manually held in any position between neutral and full forward or between neutral and full rearward. The lifting speed and the lowering speed are variable and increase as the lever is moved forward or rearward off the neutral position. When the lever is released, it will return to neutral automatically.

## HYDRAULIC CONTROL SYSTEM COUPLING REMOTE (Portable) CYLINDER

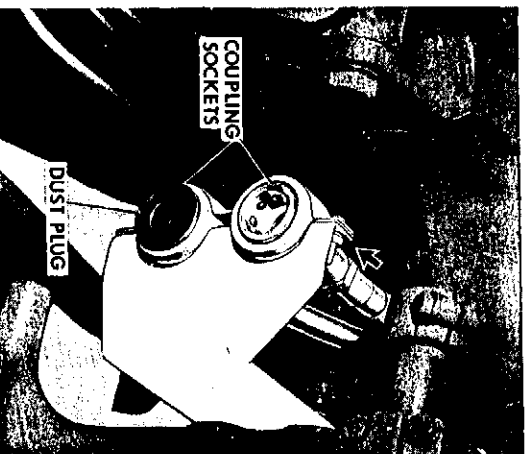


Figure 44

The Case 2-1/2", 3-1/4", or 4" diameter - 8 inch stroke remote cylinders are double acting or two-way type cylinders. They extend and retract under hydraulic pressure. The 2-1/2" diameter cylinder is a faster acting cylinder than the 3-1/4" or 4" diameter cylinder.

To connect this cylinder to the coupling sockets on the tractor hydraulic control:

1. Remove the dust plugs from the coupling sockets by grasping each hose and socket with one hand and pulling rearward. The dust plugs may then be removed, Figure 44.
2. Relieve the pressure in the tractor hose lines by moving the hand control lever forward and rearward off neutral.
3. To connect the portable cylinder hose lines to the coupling sockets on the tractor, pull each socket fully rearward, insert the cylinder coupling plug fully, then release the socket, Figure 45.

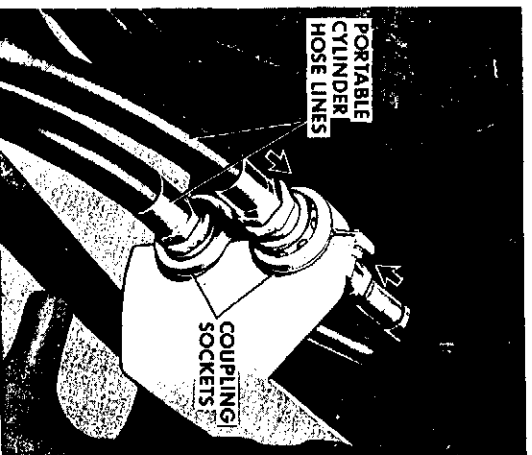


Figure 45

### **NOTE**

Before disconnecting portable cylinder hose lines from tractor, release the pressure off remote cylinder. In some instances this may make it easier to connect hose lines to tractor.

4. Move the hand control lever forward and rearward to equalize the pressure in the cylinder hose lines and the tractor hose lines.

## CYLINDER LIMIT STOP SETTING ON 3-1/ AND 4" DIAMETER REMOTE CYLINDERS

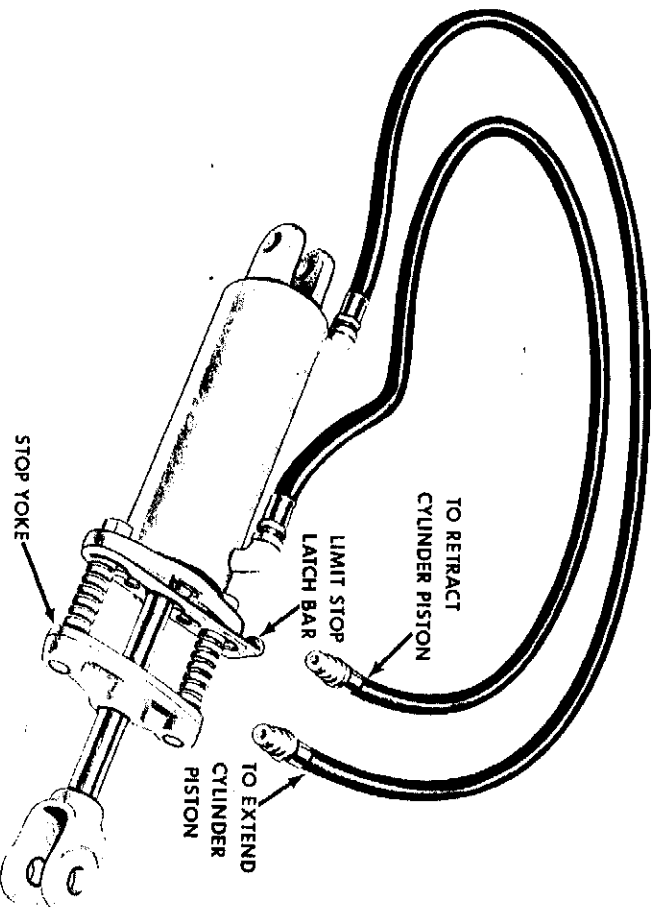


Figure 46

The Case remote cylinder is provided with an adjustable limit stop to control the length of the cylinder stroke, Figure 46.

The stop positions are spaced 7/16 of an inch apart; 8 stops being provided. This gives an adjustable cylinder stroke of from 8 inches maximum to 4-1/2 inches minimum.

To change the limit stops location, extend the cylinder fully. Push the latch bar inward (toward the piston rod) and slide the stop yoke to the desired position.

**NOTE** In-as-much as oil flows in both directions at the coupler socket, it makes no difference which hose is attached to which socket. Some operators would prefer to push the hand lever (Figure 46) forward to extend the ram, others may want to pull it rearward



# *preventive maintenance*



PREVENTIVE MAINTENANCE IS IMPORTANT TO YOU!

AS THE OWNER OF A CASE TRACTOR YOU POSSESS A MACHINE THAT IS MADE TO THE HIGHEST STANDARDS POSSIBLE

PREVENTIVE MAINTENANCE BY YOU OR YOUR OPERATOR IS THE EASIEST AND MOST ECONOMICAL MEANS OF ASSURING MANY SATISFACTORY PRODUCTIVE HOURS OF OPERATION

The preceding sections of this Operator's Manual have dealt with instructions necessary for daily operation of your tractor. The following subjects present detailed instructions concerning the care and adjustment of the various parts.

## COOLING SYSTEM

Capacity of System (Gasoline) ----- 14 Quarts  
(Diesel) ----- 16-1/2 Quarts  
Thermostat ----- 177° F. to 202° F. Range  
Radiator Cap ----- 4 Lb. Pressure Cap

### FACTS ABOUT PRESSURIZED COOLING SYSTEMS

1. **CAUTION** ALWAYS REMOVE THE PRESSURE CAP SLOWLY. Quick removal of the pressure cap could reduce the pressure enough to cause the coolant to boil out of the radiator filler opening and result in painful burns to the operator.

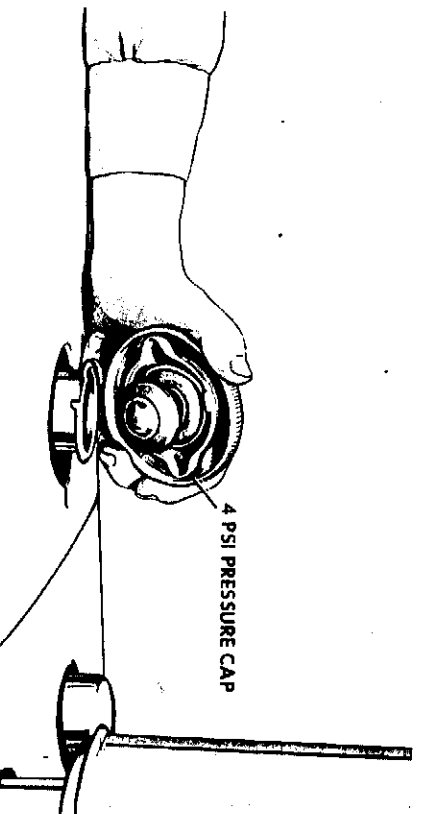


Figure 47

2. The pressure cap on a pressurized cooling system is equipped with a control valve which functions as a SAFETY RELIEF VALVE to keep the pressure within the system at 4 PSI. Operating the engine without a pressure cap or a pressure cap that has a control valve that is not set to function at the designated 4 PSI. can cause SERIOUS DAMAGE.
3. Pressurizing the cooling system reduces the loss of coolant by evaporation, surging or boiling, thus making the efficiency of the cooling system dependent upon good seals at the radiator cap, hoses and hose connections. It is especially important that ALL LEAKS, REGARDLESS OF SIZE, be repaired quickly. A small drip can become a heavy stream when 4 PSI of pressure is built up in the cooling system. A weak hose could burst while the tractor is in operation and cause injury or damage. Check all hoses and hose connections frequently. KEEP HOSES, HOSE CONNECTIONS AND PRESSURE CAP IN GOOD CONDITION.

## Anti-Freeze Solutions

Your Case Tractor is shipped from the factory with high boiling type anti-freeze in the cooling system. **IMPORTANT** This anti-freeze should never be used more than one winter due to the natural breakdown of the rust inhibitor. Use only a nationally recognized brand of High Boiling Point Ethylene Glycol base anti-freeze in your Case Tractor.

Low Boiling Point Type alcohol base anti-freeze solutions are not recommended for use. Loss from evaporation would be excessive since the boiling point of alcohol is frequently below the Tractor minimum operation temperature.

DO NOT mix different type anti-freeze solutions in the cooling system. The exact amount of protection afforded is almost impossible to determine by use of tester when different type solutions are mixed. In addition to the testing problem, there is also the damage that the rust inhibitors and the anti-freeze will not mix and may react chemically with each other, reducing corrosion protection and forming deposits in the cooling system.

NEVER use any of the following as an anti-freeze: solutions of unknown composition; honey or glucose, sodium silicate; inorganic salt base solutions such as sodium chloride, calcium chloride; mineral oil or petroleum base solutions such as kerosene, fuel oil or lubricating oil.

**NOTE** If water is used in the cooling system during the summer months, always add a reputable brand of rust inhibitor.

## Checking Thermostat

Watch the temperature gauge periodically during operation. If the engine warms up slowly, the thermostat may be stuck in and open position. If the engine overheats, the thermostat may be inoperative and is remaining closed.

### Thermostat Replacement (Gasoline)

Drain the cooling system, loosen the lower hose clamp on the upper hose connection and remove the hose from the elbow. The thermostat can now be removed, Figure 48. Install new thermostat having same heat range as the original one. Tighten lower hose clamp before adding coolant to radiator.

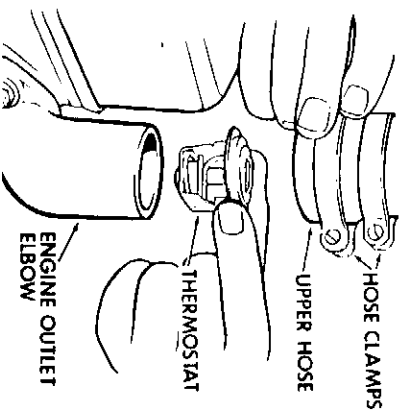


Figure 48

## Thermostat Replacement (Diesel)

Drain the cooling system and remove the hood. Remove the two bolts that hold the housing to the timing gear cover. Loosen the hose clamps on the upper hose and the housing can be removed. The thermostat can be lifted out of the timing gear cover upper water outlet. Install new gasket when the thermostat is reinstalled.

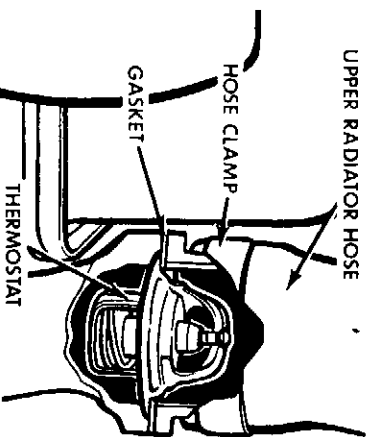
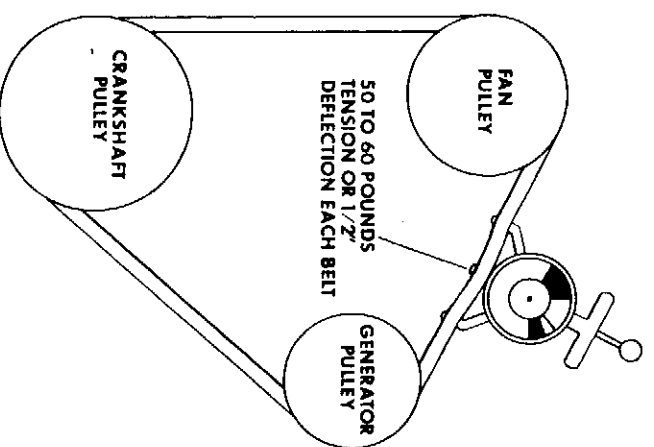


Figure 49

Be sure the new thermostat has the same heat range as the original thermostat. Be sure hose clamps and flange bolts are tight before adding coolant to radiator.

## Fan Belt Adjustment

The generator drive belt should be checked for excessive looseness and wear every 60 hours of operation. The proper belt adjustment will give a deflection of  $1/2$  of an inch (or 50 to 60 pounds) between the fan and generator pulley, Figure 50. When the tension is too tight, the generator and water pump bearings and belt will wear excessively. When belt tension is too loose it will permit excessive belt wear and slippage, also low or no generator output



The most accurate method of checking belt tension is with a Belt Tension Gauge, Figure 50. Belt Tension Gauges are available from your Authorized Case Dealer.

Figure 50

## Cleaning the Cooling System

Clean the cooling system at least once a year. In areas where water containing scale forming mineral is all that is available, clean the system more often. Mineral scale, rust or dirt deposits in the cooling system form an insulation which prevents the heat of combustion from passing into the coolant and being dissipated. To clean the cooling system:

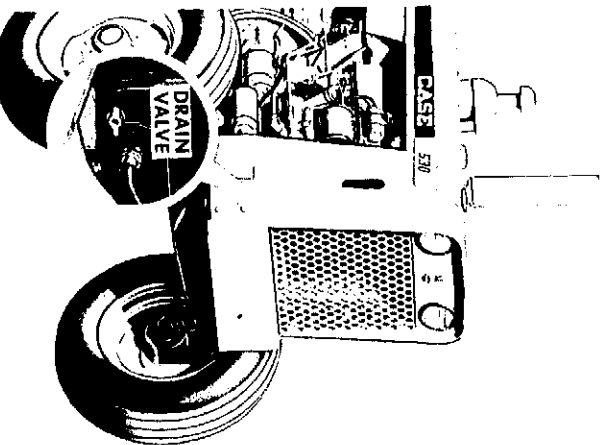


Figure 51

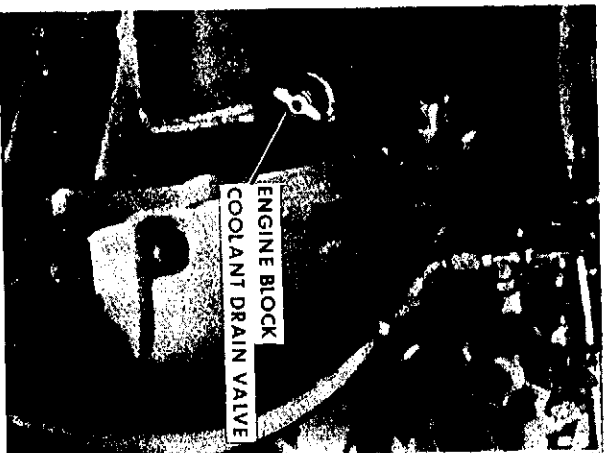


Figure 52

1. While the coolant is still hot, open the radiator drain valve, Figure 51, and the engine block drain valve, Figure 52. Drain all coolant and close both drains.
2. Add a radiator cleaner to the system and refill with clean water. Any nationally known commercial brand cleaner marketed by a reputable manufacturer may be used. Follow the directions provided with the cleaner.
3. After draining the cleaning solutions, flush the system with clean water before refilling for operation.
4. Check hoses, elbows, pump and water manifold for leakage.
5. Make sure the outside of the engine is clean and that radiator fins are cleaned of dirt accumulations.

## Air Cleaner Service Interval

How often the oil in the air cleaner must be changed and the cup cleaned will depend on the working conditions.

During dry severe dust conditions it may be necessary to change the cleaner as often as every 5 hours.

In damp weather where there is little or no dust, it may be necessary to service the cleaner only once every 60 hours.

**DO NOT DEPEND ON A VISIBLE DETECTION OF DUST IN THE AIR TO DETERMINE WHEN THE AIR CLEANER MUST BE SERVICED:** Fine particles of dust that are not too noticeable in the air can quickly contaminate and thicken the oil in the cleaner.

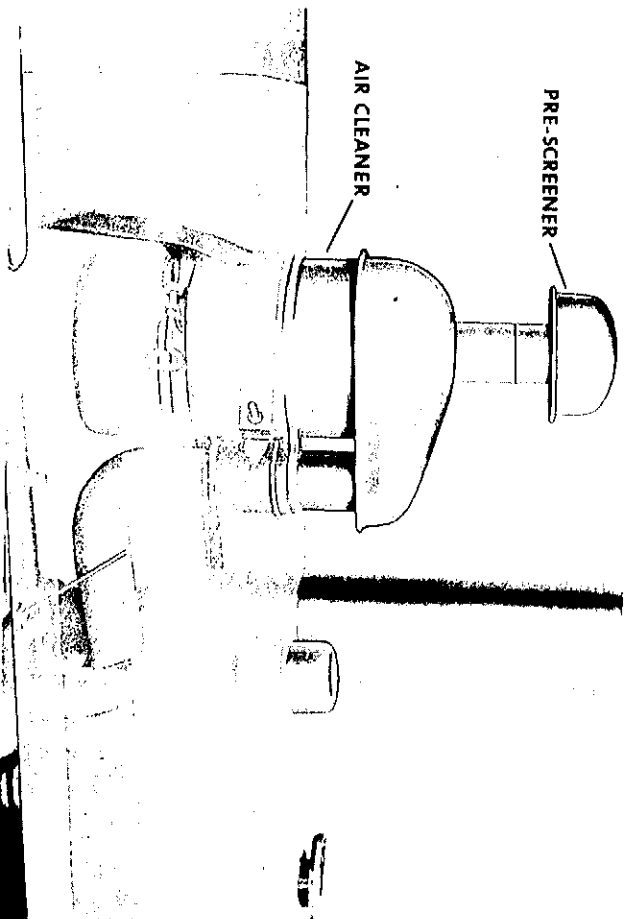


Figure 53

Change the air cleaner oil when the oil becomes thicker than normal due to dust being carried in suspension. The oil must flow freely at all times in the air cleaner for proper operation. Never allow sediment to build up over 1/2 inch in the bottom of the oil cup.

**NOTE** Whenever oil cup is removed be sure screen and baffles are cleaned thoroughly.

Each time the oil cup is removed, check the air intake pre-screen. To prevent the air from being restricted and affecting engine performance, the pre-screener must be kept clean.

**NEVER** attempt to service air cleaner while engine is running.

## Air Cleaner Service Instructions

Oil Cup Capacity Diesel	2-3/4 Pints
Oil Cup Capacity Gasoline	2 Pints
Service Interval	5 to 60 Hours

1. Loosen the oil cup retainer clamp screw so oil cup can be lowered and removed from air cleaner, Figure 54.

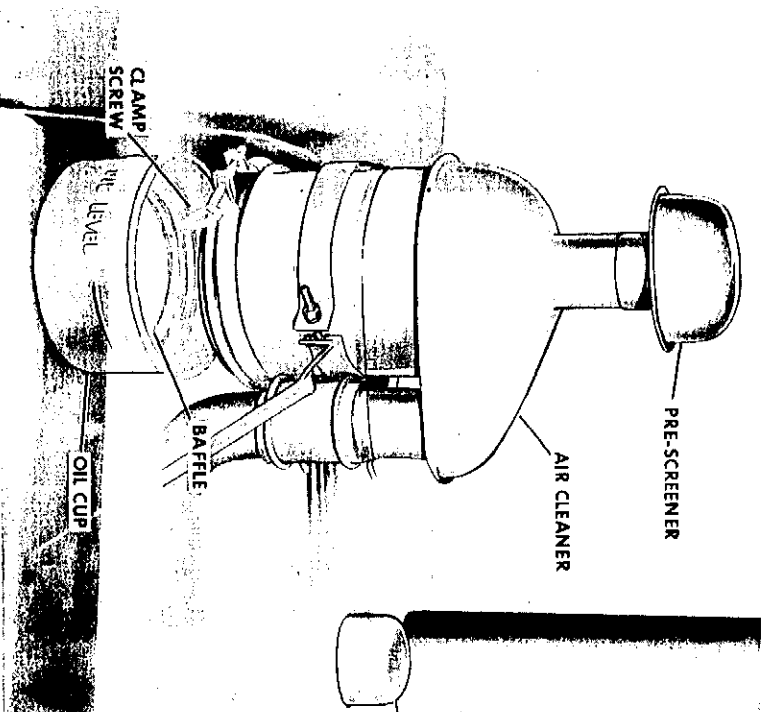


Figure 54

2. Drain the contaminated oil, remove the baffle from the oil cup. Wash baffle and oil cup in clean fuel.
3. Reinstall baffle in oil cup. Refill oil to the level mark with same viscosity oil as used in the crankcase. **DO NOT OVERFILL.**
4. Remove the pre-screener and wash the pre-screener in clean fuel. At least once a season (more often in dusty conditions), remove the entire air cleaner. Remove oil cup and screen, and submerge the entire air cleaner body in clean diesel fuel.

## DIESEL FUEL SYSTEM

The fuel system on your Case Diesel Tractor consists of fuel supply tank, fuel filters and the fuel injection equipment. The service life of the fuel injection equipment on your diesel engine is wholly dependent upon the cleanliness of the fuel. If abrasives or water are permitted to reach the high precision moving parts in the injection equipment, rapid wear will result and poor performance may be expected. To prevent abrasives or water from reaching the injection equipment, it is important that you use clean fuel and regularly service the filters, water trap and sediment bowl as described in this manual.



Figure 55

PROTECT YOUR FUEL SYSTEM

BUY CLEAN FUEL

AND

KEEP IT CLEAN



## DIESEL FUEL SYSTEM

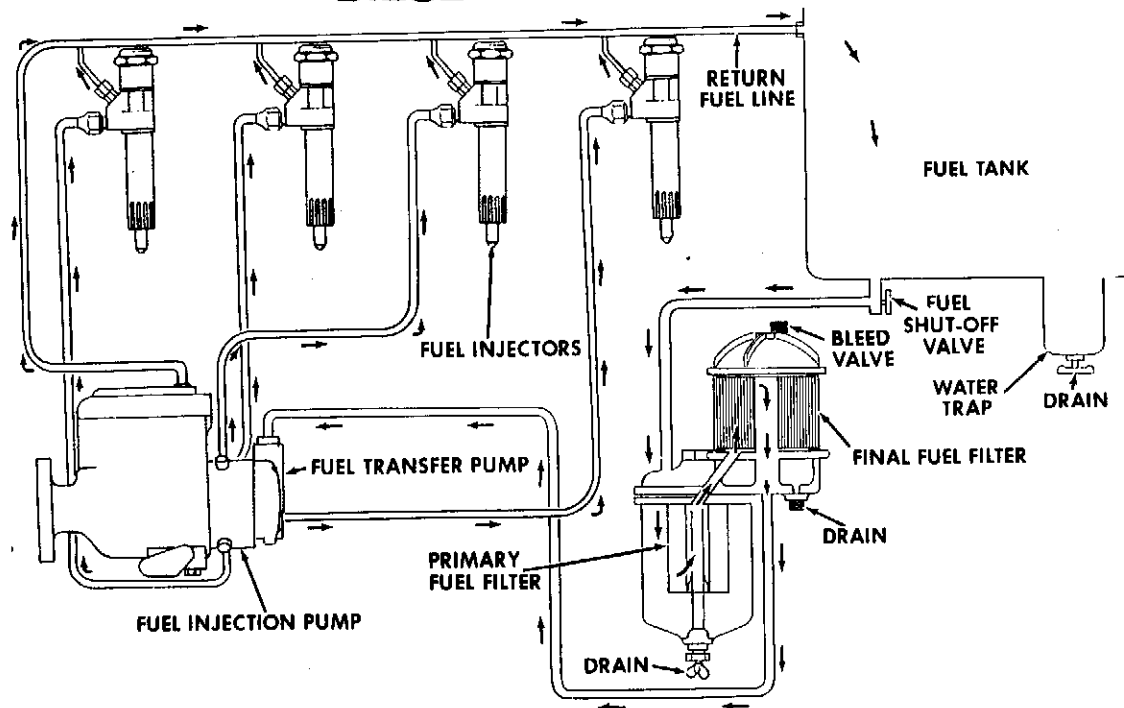


Figure 56. Fuel System -- Schematic Drawing

The fuel system of your Case Tractor consists of the following units.

1. Fuel tank containing a fuel gauge sending unit.
2. Two fuel filters and a water trap attached to the bottom of the fuel tank.
3. Fuel injection pump with built-in governor and transfer pump.
4. Injectors with long-stem nozzles for direct injection into engine combustion chambers.
5. Fuel lines—short and compact installation for simple easy servicing.

## BLEEDING THE DIESEL FUEL SYSTEM

THE FUEL SYSTEM MUST BE BLED IF AIR ENTERS THE FUEL SYSTEM AS A RESULT OF:

1. Engine running out of fuel.
2. Parts removed for servicing.
3. Engine stored for a considerable period of time.

AFTER RUNNING OUT OF FUEL, IT MAY BE POSSIBLE TO RE FUEL AND START THE ENGINE WITHOUT BLEEDING. HOWEVER, A SMALL AMOUNT OF AIR MAY REMAIN IN THE FILTER RESULTING IN LACK OF POWER AND STALLING WHEN A LOAD IS APPLIED.

1. Be certain the fuel tank is full for bleeding operation.
2. Wipe the top of the final filter clean before bleeding the system.
3. Open the shut-off valve and wait a few minutes to make sure the filters are full of fuel.
4. Open the bleed valve on the final filter. Figure 57, and allow the air to bleed out of both the filters. When the bubble free fuel starts to flow, close the bleed valve and wipe the parts free of diesel fuel.

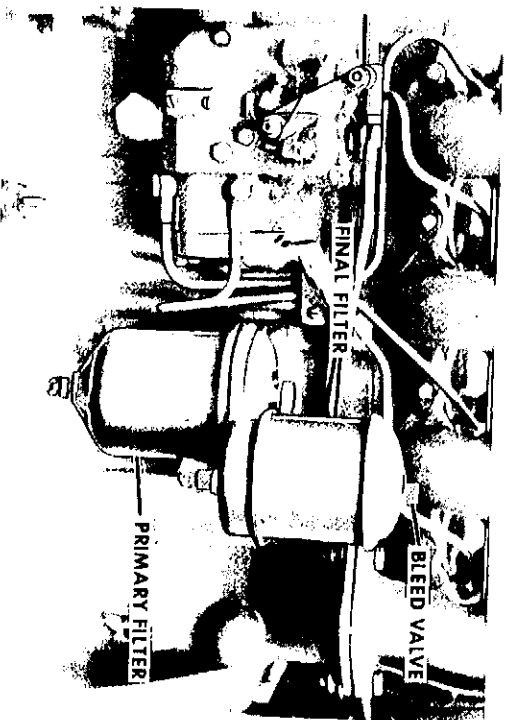


Figure 57

## SERVICING FUEL FILTERS

Clean the filter side of the engine thoroughly. Be sure no dirt is left on the filter bodies.

Close the fuel shut-off valve on the fuel tank. Open the drain valves on the primary filter shell and final filter base.

### Primary Fuel Filter

1. Loosen the filter shell retaining nut until the filter shell can be removed.
2. Lift the contaminated element out of the filter shell and discard it.
3. Wash the filter shell in clean diesel fuel.
4. Install a new Genuine Case Filter Element in the shell and new shell to body gasket. Check the filter shell retaining nut gasket. Replace if necessary.
5. Install shell with new element to body gasket and tighten the retaining nut.
6. Close the drain valve.

### Final Fuel Filter

1. Unscrew the filter cap until the element and cap can be removed.
2. Install new Genuine Case Filter with gaskets in place with the 3/4" hole in the filter down on to the filter base.
3. Install and tighten cap.
4. Close the drain valve and open the fuel tank valve.
5. Bleed the system as described on Page 65. Check filters for leaks.

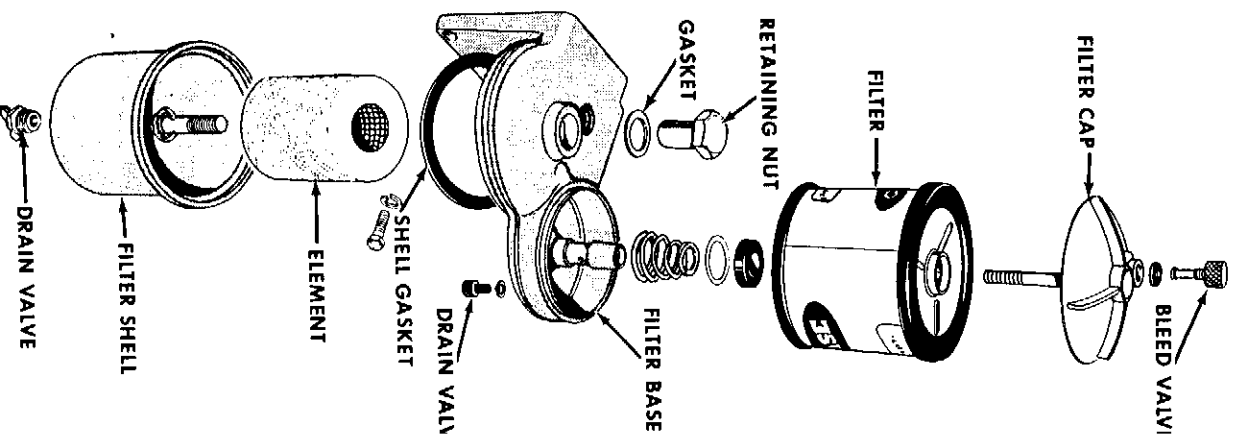


Figure 58

# GASOLINE FUEL SYSTEM

Capacity of tank ----- 22 Gall.  
Gasoline ----- Octane 90.7, Minim

(ASTM Research Meth

## Fuel Filter

Inspect the filter bowl daily for traces of condensed water. Every 200 hours or monthly clean the filter. To do so, shut off the fuel valve, unscrew the jam nut and swing the bail up out of the way. Remove the glass bowl with a gentle downward pull. Clean out the sediment bowl and rinse it in clean fuel. To clean the brass screen carefully remove the cork gasket and extract the screen from the filter body. If the cork gasket becomes damaged or broken, use a new gasket to prevent leakage of fuel.

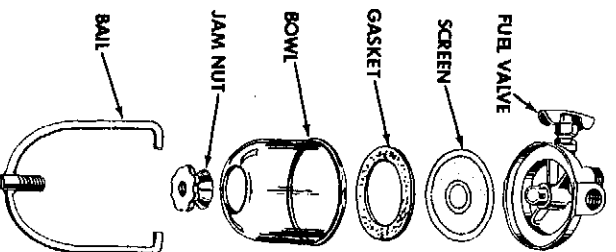


Figure 59

## Carburetor

The carburetor is the "sealed bowl" type, and is simple to adjust when properly adjusted, maximum power with minimum fuel consumption will be the result.

Three adjustments can be made:

1. Idling speed setting.
2. Idling mixture adjustment.
3. Load or power adjustment.

## Idling Speed and Idling Mixture Adjustment

Start the engine and allow it to idle until normal operating temperature is reached. Adjust the idle speed screw to have the engine run just fast enough to prevent stalling. Turn the idling adjustment needle, (approximately 1 turn open), or until the engine runs smoothly without "galloping."

When the engine is idling smoothly, adjust the idling speed screw to have the engine turn over at about 600 RPM with the throttle closed, Figure 60.

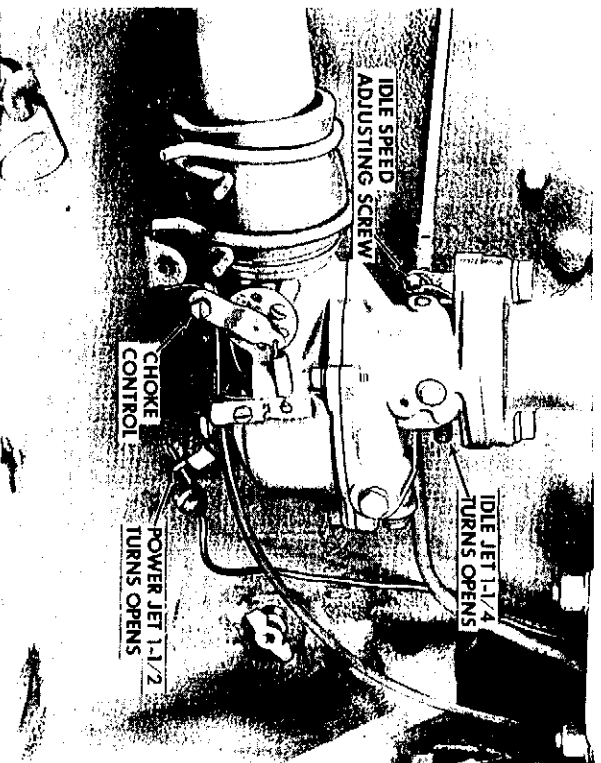


Figure 60

## Load or Power Jet Adjustment

A preliminary load adjustment has been made as part of the dealers pre-delivery service; however, it is necessary to readjust this setting when the Loader is operating under load and up to correct operating temperature.

Adjust the main jet or power needle by turning the adjusting needle clockwise ("in") until the engine misfires and power falls off then turn the adjusting needle counter-clockwise ("out") until the engine runs smoothly. Approximate setting is 1-1/2" turns open.

Place the Tractor under load and observe how the engine handles the load. Loss of power or tendency to stall indicates a lean mixture. Turn adjusting needle counter-clockwise not more than 1/8 of a turn and again try the engine performance. When this power jet is correctly adjusted, it will not be necessary to reset the carburetor unless load conditions or fuel quality have been radically changed.

Operating an engine on too lean a mixture causes loss of power and high exhaust valve heat.

## ADJUSTING DIFFERENTIAL BRAKES

After considerable service, the brakes may require adjustment to compensate for facing wear. The need for adjustment will be indicated when the pedals have too much free travel.

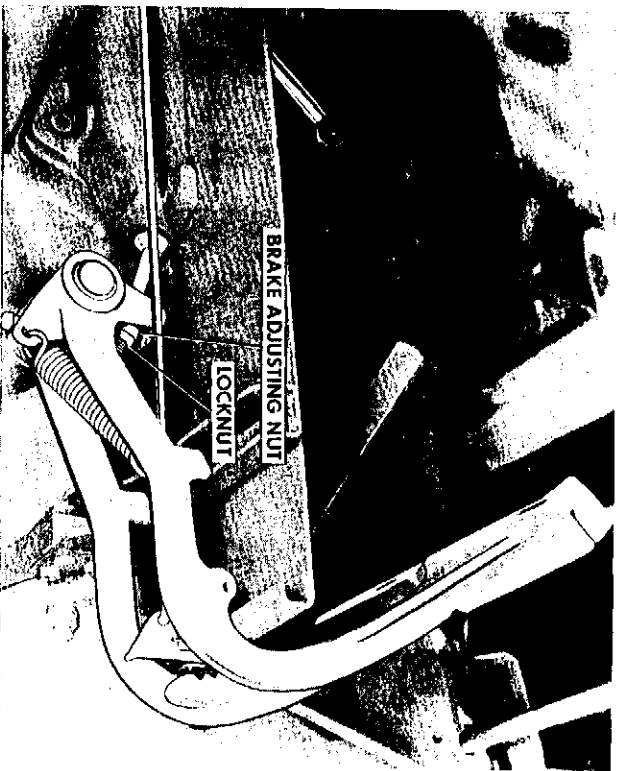


Figure 61. Differential Brake Adjustment

The only adjustment that is necessary, is to reduce the running clearance. To adjust this clearance, proceed as follows:

1. Jack up tractor rear end to have wheels just clear the ground
2. Tighten brake adjusting nut, Figure 61, until a slight drag is felt when the tire is rotated.
3. Loosen the adjusting nut three turns and tighten the jam nut

Repeat the same adjustment on the other brake. When brakes are both adjusted, test the brake action with the interlock in place. When set correctly, both brakes will apply at the same time. If this does not happen, loosen the adjustment on the wheel that stops first, so that both wheels will stop simultaneously when brakes are applied.

After several adjustments have been made, it may be necessary to replace the facings. Consult your Authorized Case Dealer for the necessary service work.

## STANDARD FOOT CLUTCH ADJUSTMENT

The foot clutch will need adjustment occasionally to compensate for normal wear. The correct free pedal movement should be ONE INCH, Figure 62.

As the clutch wears, this free movement decreases. Adjuster must be made before the free pedal movement becomes 1/2 inch

**NOTE** When the tractor is new, it may be necessary to adjust the linkage several times during the first 50 to 150 hours of operation until the clutch facings have "run-in". After this, the clutch will seldom require adjustment.

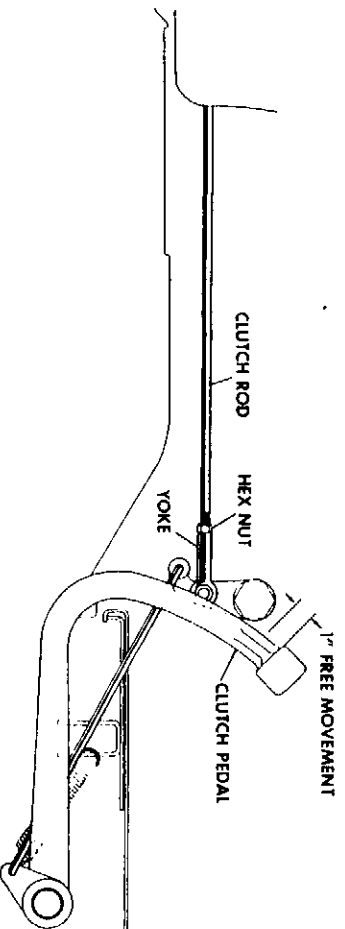


Figure 62

To obtain the necessary free pedal movement (one inch), loosen the hex nut on the clutch rod. Figure 62 and remove the pin from the yoke. Turn the yoke onto the rod until the 1 inch free pedal is obtained. Install the yoke and pin. Tighten hex nut.

### **CAUTION**

Clutch slippage will seriously damage the clutch facings in a short time. If slippage is noted, stop the tractor immediately and make the adjustment listed above.

## PTO CLUTCH ADJUSTMENT

The power take-off clutch will need adjustment occasionally compensate for normal wear. Adjust the clutch immediately if slipage is noted when a power take-off driven machine is attached & started. Failure to make the adjustment will cause excessive wear on the clutch plates resulting in eventual breakdown.

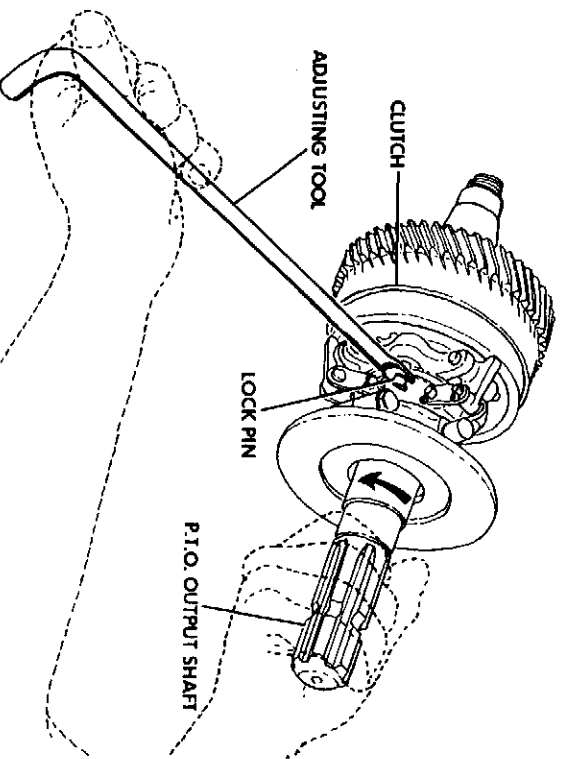


Figure 63

To adjust the power take-off clutch:

1. Have the power take-off clutch hand lever in the full downward disengaged position.
2. Remove the pipe plug from the PTO housing, Figure 63. Using flashlight, look through the hole and manually turn the PTO shaft until the 2 spring loaded lock pins are visible. You will note that one pin is engaged in the "in" position while the other is disengaged.
3. Insert the adjusting tool through the hole as shown and pull the engaged lock pin out with the forked end of the tool, Figure 63.
4. To tighten the clutch, turn the PTO shaft counter-clockwise as shown until the disengaged lock pin drops into a notch. On adjustment is usually sufficient.
5. After each adjustment, check the engagement of the power take-off clutch hand lever by pulling it fully upward. A correctly adjusted clutch will require approximately 60 to 65 pounds pull and will engage with a decided "snap" of the lever.



## SAFETY STARTING SWITCH ADJUSTMENT

If the safety starting switch is not properly adjusted it may result in either the tractor not starting when the gear shift lever is in the start position or being able to start the tractor with the gear shift lever in neutral or in gear.

To adjust the safety starting switch proceed as follows:

- A. If engine will not start with the gear shift lever in start position
  1. Move the gear shift lever to neutral, remove all the shim washers and turn the switch "in" by hand while holding the key switch in the start position. When the safety switch makes contact the engine will start. At this point turn off the engine and add enough shim washers between the switch and transmission cover so the engine will not start with the shift lever in neutral.
  2. Move the gear shift lever to the "S" start position and turn the key to "start" - the engine should start if the safety switch is adjusted properly.

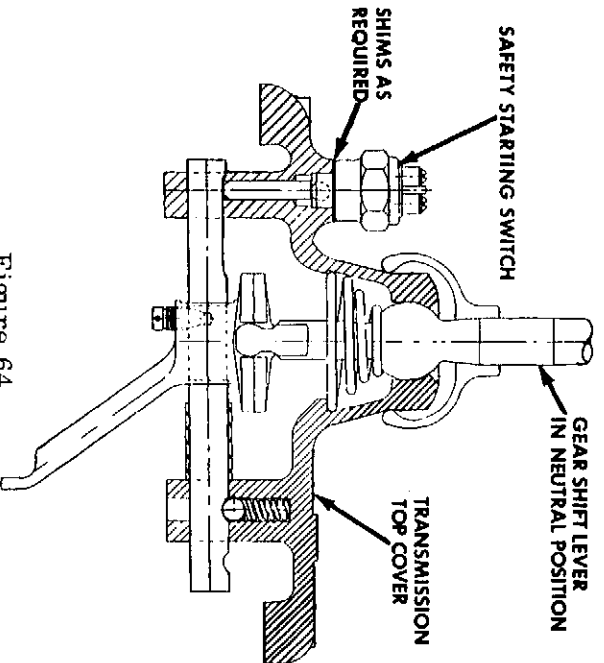


Figure 64

- B. If the engine starts with the gear shift lever in neutral or in gear
  1. With the gear shift lever in neutral position, add one shim at time between the switch and transmission cover until the engine will not start by turning the key switch to the "start" position.

# SPARK IGNITION SYSTEM ENGINES

## Spark Plugs

The type spark plug provided in your engine is listed as medium in the spark plug heat range chart - Prestolite 18 8 or equivalent.

Shank Length ----- 1 1/2 In

Thread Size ----- 18MN

Gap Setting ----- .025 In

**NOTE** It is possible that under unusual conditions "hotter" or "colder" type spark plugs may be required. Consult your Authorized Case Dealer regarding the proper type spark plug to use for your particular conditions.

Spark plugs play a very important part in the power, fuel economy and general performance of your Tractor. The outside of the plugs should be cleaned frequently to prevent shorting of the plugs.

The spark plugs should be removed, checked, cleaned and gapped at the end of every 240 hours of operation.

## Removing

It is important to select the exact size spark plug wrench. The wrong size or type wrench may cause distortion and insulator breakage. Always use a spark plug wrench or a thin wall deep socket wrench of the recommended size.

Thoroughly clean the spark plugs, including the threads. Check the electrode gaps using a .025 inch gauge. A very slight drag should be felt when the gauge wire passes between the electrodes.

Reset the gaps by bending the side electrodes only. Never touch the center electrodes.

## Installing

Place the spark plugs, with gaskets, in their original locations in the engine and seat the plugs on their gasket, finger tight. Tighten each plug about 3/4 of a turn after the plug is seated firmly on its gasket. If a torque wrench is available, tighten each plug to 34 foot pounds. This will assure proper seating and sealing of the spark plugs.

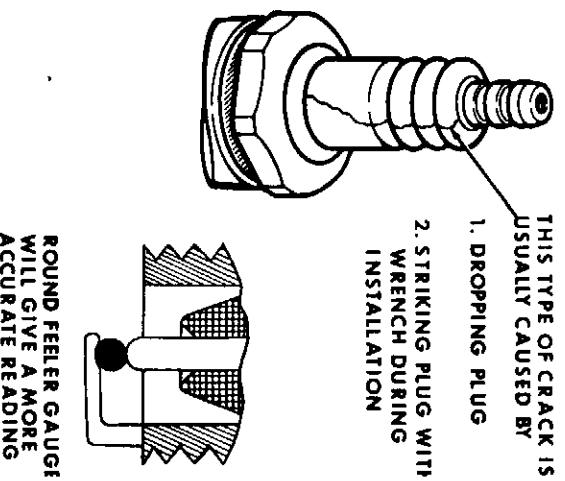


Figure 65

## DISTRIBUTOR

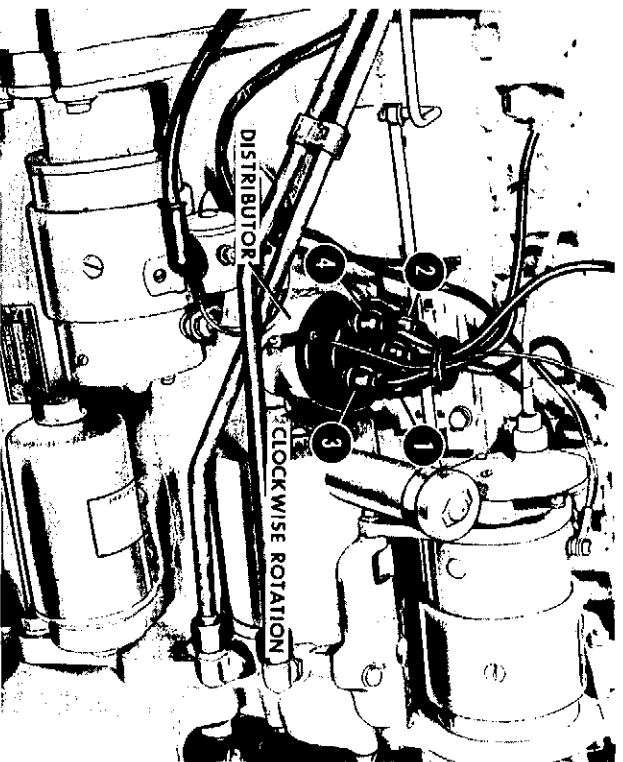


Figure 66. Distributor

The distributor is mounted on the right hand side of the engine and is gear driven from the camshaft, in a clockwise rotation. Automatic advance is built into the distributor and will advance the spark as the engine RPM is increased. The firing order of the engine is 1-3-4-2.

The ease of starting, fuel consumption and the general engine performance are all dependent upon correct distributor ignition timing and the correct adjustment of the distributor points.

After each 500 hours of operation inspect the distributor points for wear and adjustment.

## Adjusting the Distributor Points

1. Remove the distributor cap, pull the rotor from the shaft and move the dust shield.
2. Remove any roughness from the surfaces of the points with small file or hone before checking the point gap with a feeler gauge. This roughness is caused by a normal transfer of metal from one point to the other due to the passage of electrical current across the points.
3. Crank the engine over slowly until the block on the movable distributor point is in contact with the peak of the lobe on the distributor cam, Figure 67.

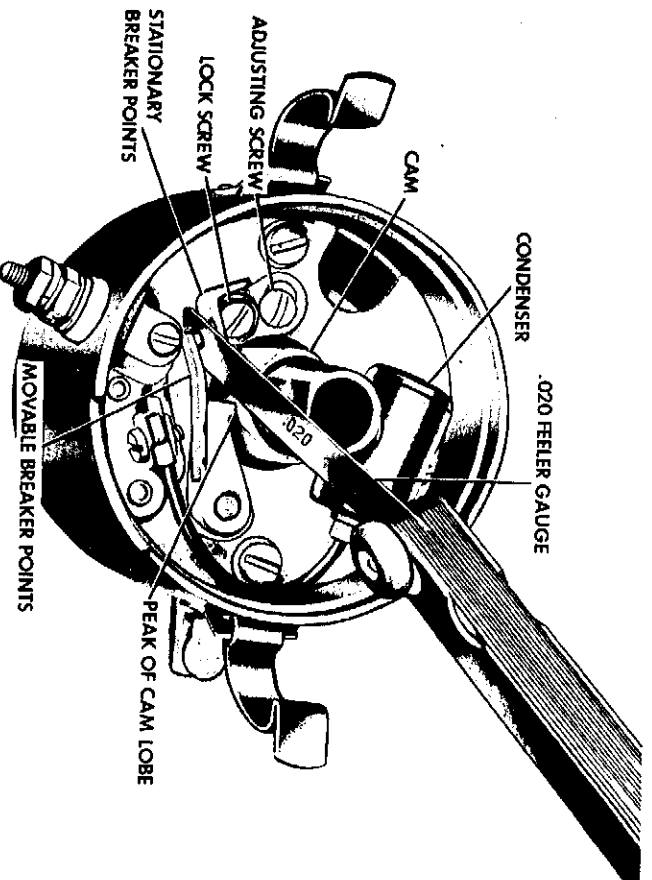


Figure 67

4. Check the distance between the two distributor points with a feeler gauge; the correct point gap is .020 inch. To decrease point gap, turn the adjusting screw clockwise, Figure 67. To increase point gap, turn the adjusting screw counter-clockwise.
5. When the correct point gap of .020 inch is obtained, tighten the lock screw. Then replace the dust shield, rotor and distributor cap.

**NOTE** The distributor rotor and cam drive are designed so the rotor can only be installed in one position.

## CHECKING AND SETTING IGNITION TIMING

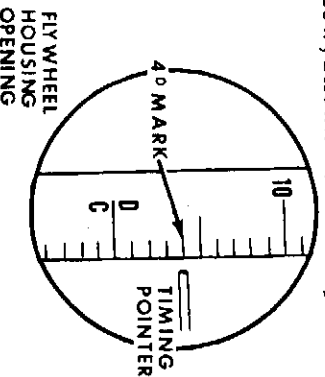
To check the static(engine not running) timing proceed as follows:

Disconnect the center ignition coil wire and remove the No. 1 spark plug.

Hand crank the engine to set the Number 1 piston at TDC of the compression stroke. Outward pressure will be felt when the thumb is placed over the Number 1 spark plug opening when the piston is coming up on the exhaust stroke. A lighter pressure is also felt on the exhaust stroke. DO NOT CONFUSE THE TWO. The crankshaft pulley degree mark, refer to chart below, should be lined up with the timing pointer.

GASOLINE 4° BTDC

Remove the distributor cap, rotor and dust shield, Figure 67. Note the position of the ignition points. If the points are adjusted correctly, they will be just starting to open.



If the distributor is not timed correctly, proceed as follows:

Loosen the clamp at the base of the distributor.

TO RETARD SPARK - Turn the distributor clockwise until the points just begin to open. Then tighten the clamp at the distributor base.

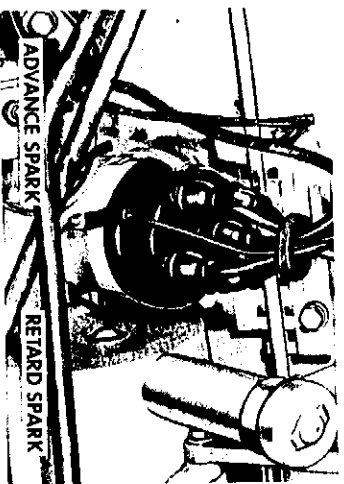


Figure 68

TO ADVANCE SPARK - Turn the distributor counter-clockwise until the points just begin to open. Then tighten the clamp at the distributor base.

After the distributor has been timed correctly, replace the dust shield, rotor, coil wire and spark plug.

### NOTE

SHOULD THE DISTRIBUTOR REQUIRE ATTENTION OTHER THAN DESCRIBED IN THIS MANUAL, HAVE IT SERVICED BY YOUR AUTHORIZED CASE DEALER OR AUTHORIZED ELECTRICAL SERVICE STATION.

## ELECTRICAL SYSTEM

### Headlights

The headlights are 12 volt sealed units.

To install a new sealed unit, remove the retaining screws, retainer and gasket, Figure 69. Remove the old unit and disconnect the wires. When installing the new unit, be sure the connections are tight.

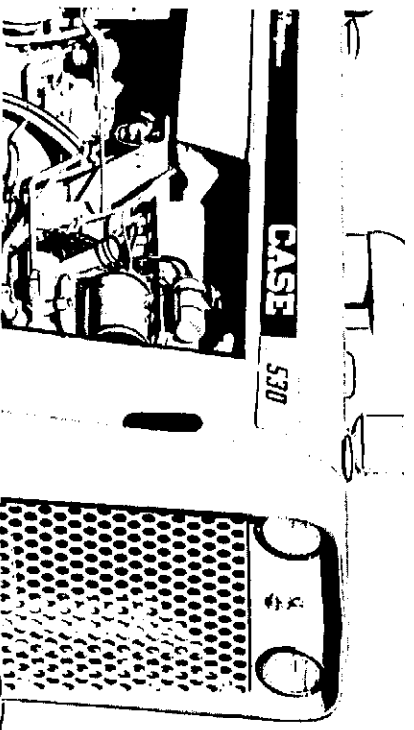


Figure 69

### Rear Stop and Tail Lights

The combination rear stop and tail lights (if equipped) will light whenever the light switch is turned to either the bright or dim position. Whenever one or both brake pedals are depressed, the red stop lights will brighten if the light switch is on or light if the light switch is not on.

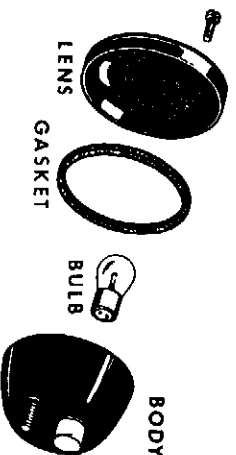


Figure 70

To replace a bulb, remove the two lens retainer screws, lens and gasket from the body. Press in on the bulb and turn bulb, then pull out. **NOTE** These stop and tail lamps have a small drain hole in the bottom, be sure they are kept open.

## Rear Light

To install a new sealed unit or small bulb, remove the clamp screw and lens clamp. To remove the Sealed Unit disconnect the two wires as shown in Figure 71.

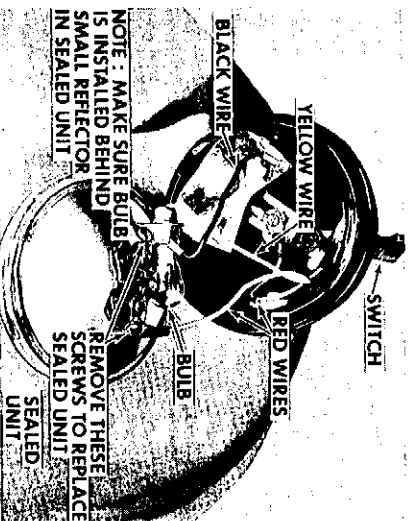
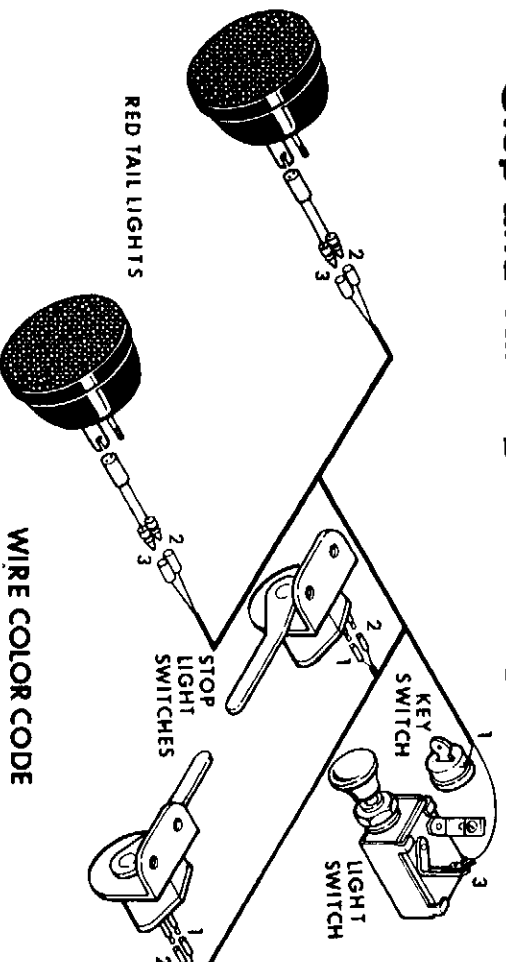


Figure 71

To remove the small bulb push the bulb in and twist slightly. When connecting the new Sealed Unit wires, be sure the connections are tight. Make sure bulb is installed behind small reflector and not touching Sealed Unit, Figure 71.

## Stop and Tail Lights Wiring Diagram



### WIRE COLOR CODE

NO	COLOR	FROM	TO
1	WHITE	KEY SWITCH	STOP LIGHT SWITCH
2	WHITE	STOP LIGHT SWITCH	STOP LIGHT
3	BLACK	LIGHT SWITCH	TAIL LIGHT

## STORAGE BATTERY

### CAUTION

When working around a storage battery/s, remember all of its exposed metal parts are "live." Never lay a metal object across the terminals as spark short circuit may result. Sparks, lighted matches & exposed flames must be kept away from the battery & to the presence of explosive gas in the battery. The liquid in battery/s is acid. Use care not to spit on hands or clothing.

### Rules for Battery Care

1. Add pure or distilled water, as needed, to keep the separator covered. Check every 60 hours weekly. Normal water consumption would be approximately 1 oz. every 60 hours of operation. If it is greater, either the case is leaking or the regulator is overcharging and must be adjusted.
2. Keep the battery's in a healthy state of charge as shown by hydrometer readings.
3. Make sure the battery's are securely fastened in position. Cables leading from the battery should not touch cell connectors or lie on the battery container.
4. Keep the battery's clean and dry.

If a battery will not hold a charge, replace it with a new one meeting the specifications as listed in the specifications section.

Each week, and before adding water, take a hydrometer reading from every cell. The gravity reading from each cell should show full charge.

**NOTE** The full charge gravity reading will usually be indicated on the battery. A battery having a reading of 1.175 will freeze at approximately zero degrees Fahrenheit temperature.

### Cold Weather Precautions

As air temperatures drop, a storage battery's output capacity lowers. A battery actually becomes "numb" from the cold and will not turn an engine over as fast or for as long a period as it will during warm temperatures.

Since starting a Diesel engine is very dependent upon turning the engine over fast enough to cause self-ignition of the Diesel fuel, the importance of having fully charged batteries for cold weather starting cannot be over-emphasized.

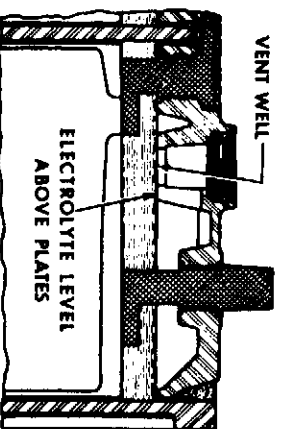


## **Adding Water**

Unless the tap water in your area is "approved" (water free scale-forming minerals), always add distilled water to the battery/

When water is added during freezing weather, the battery's mu receive a charge immediately to mix the water and electrolyte. it is not mixed, the water will remain at the top and freeze.

Check the liquid level in each cell weekly by removing the vent plugs. Water must be added before the tops of the separators are exposed. DO NOT OVERFILL.



## **Vent Plugs**

Always keep the vent plugs in place and tight. Be sure the vent holes are free of dirt to prevent gas pressure in cells from breaching the sealing or the container.

## **Cable Terminals and Battery Posts**

The battery terminals must be kept clean and tight. A good method of cleaning terminals is to remove all excess corrosion with a wire brush, then wash with a weak baking soda solution or ammonia. After cleaning, a thin coating of vasoline or light cup grease will retard further corrosion.

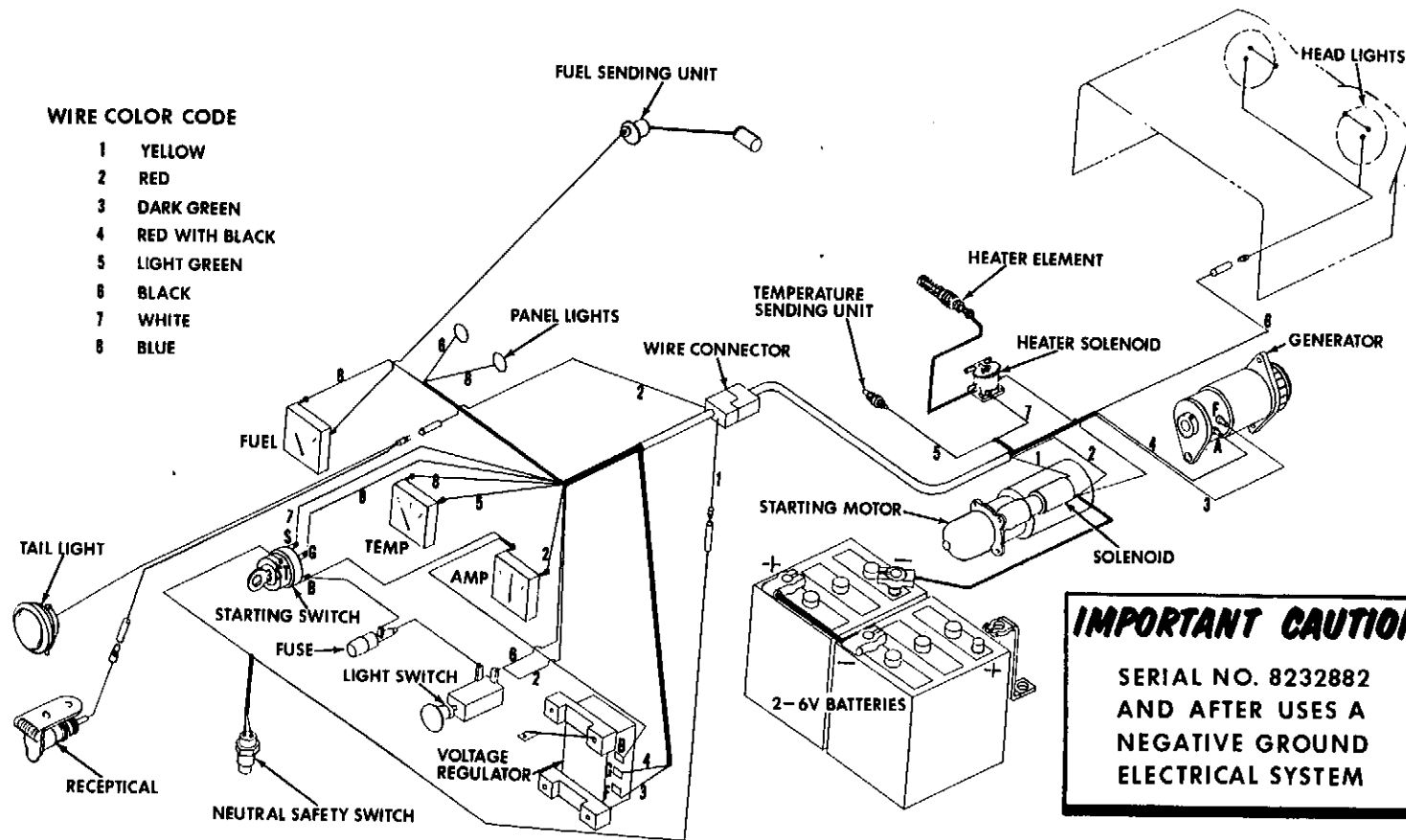
## **Idle Battery**

When the Tractor is not in active use, the battery's will require charge at sufficient intervals to keep the hydrometer reading at or above 1.250. An idle storage battery will slowly discharge.

# DIESEL ENGINE ELECTRICAL SYSTEM

## WIRE COLOR CODE

- 1 YELLOW
- 2 RED
- 3 DARK GREEN
- 4 RED WITH BLACK
- 5 LIGHT GREEN
- 6 BLACK
- 7 WHITE
- 8 BLUE



## IMPORTANT CAUTION

SERIAL NO. 8232882  
AND AFTER USES A  
NEGATIVE GROUND  
ELECTRICAL SYSTEM



# SAFETY PRECAUTIONS



1. Before starting the engine, be sure all operating controls are NEUTRAL.
2. Keep brakes in proper adjustment.
3. Never operate any of the controls from any position, but seated the operator's seat.
4. Be extra careful when going down steep grades.
5. Keep Tractor in gear when going down steep grades.
6. Drive at a speed slow enough to insure safety and complete control, especially over rough terrain.
7. Reduce speed when making a turn going down hill or applying brakes.
8. Never shift to a low range when operating at a high speed.
9. Never leave the engine running while it is unattended.
10. Never dismount from a Tractor when it is in motion.
11. Never permit persons other than the operator to ride on the Tractor.
12. Never stand between a Tractor and machine when hitching or less all the controls are in neutral and the brakes are locked.
13. Disengage Power Take-Off clutch before dismounting from Tractor, STOP Tractor engine before working on PTO driven machine.

## **SAFETY PRECAUTIONS (Continued)**

14. Be careful removing radiator pressure cap when the radiator is hot. Refill only when the engine is stopped.
15. Do not oil, grease or adjust a Tractor when the engine running.
16. Never refuel a Tractor when the engine is hot or running.
17. Do not smoke when refueling or using Starting Fluid.
18. Be careful when using cold weather starting fluid. Read the instructions.
19. Never operate a Tractor in a closed shed or garage.
20. Do not wear loose fitting clothing which may catch in the moving parts.
21. To prevent highway accidents, use red warning flags in the daytime and red warning lamps at night.
22. Keep a first aid kit and fire extinguisher on the Tractor.
23. REMEMBER, A CAREFUL OPERATOR IS ALWAYS THE BEST INSURANCE AGAINST AN ACCIDENT.

## **Towing**

NEVER TRY TO START TRACTOR BY TOWING - IF THIS TRACTOR IS TO BE TOWED BEHIND A TRUCK OR OTHER SIMILAR VEHICLE, NEVER TOW AT A SPEED EXCEEDING GROUND SPEED OF THE TRACTOR, WHEN TOWING TRACTOR BE SURE ALL CONTROLS ARE IN NEUTRAL - USE A RIGID TYPE COUPLER.

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