

TO THE PURCHASER OF A CASE TRACTOR

The care you give your new Case Tractor will greatly determine the satisfaction and service life you will obtain from it. Use this manual as your guide. By observing the instructions and suggestions in this manual, your Case Tractor will serve you well for many years.

As an Authorized Case Dealer, we stock Genuine Case Parts, which are manufactured with the same precision and skill as the original equipment. Our factory trained staff is kept well informed on the best methods of servicing Case equipment and is ready and able to help you.

Should you require additional aid or information, contact us.

Your Authorized Case Dealer

To insure efficient and prompt service, please furnish us with the Model, Serial and Engine Numbers of your Tractor in all correspondence or contacts.

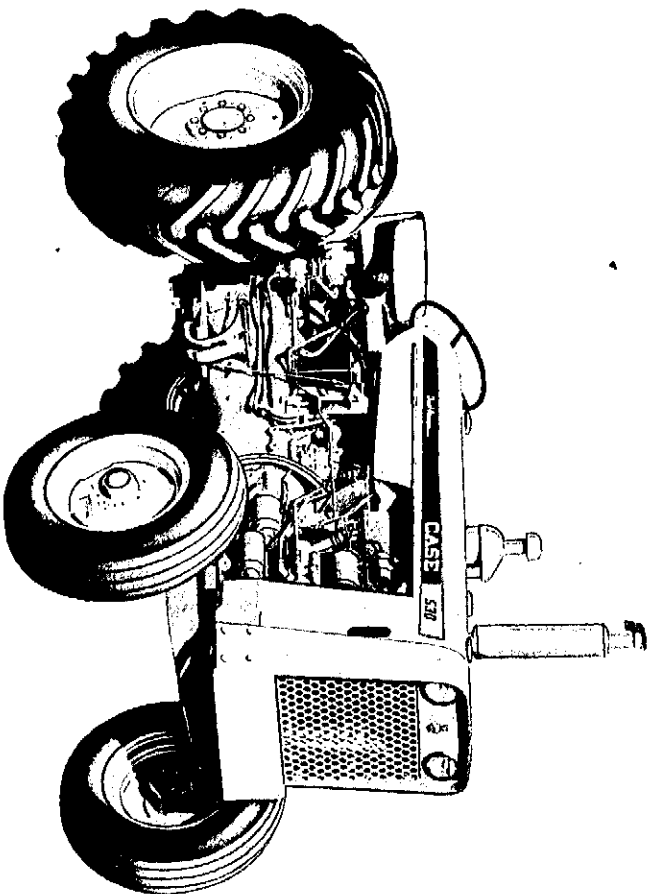


Figure 1

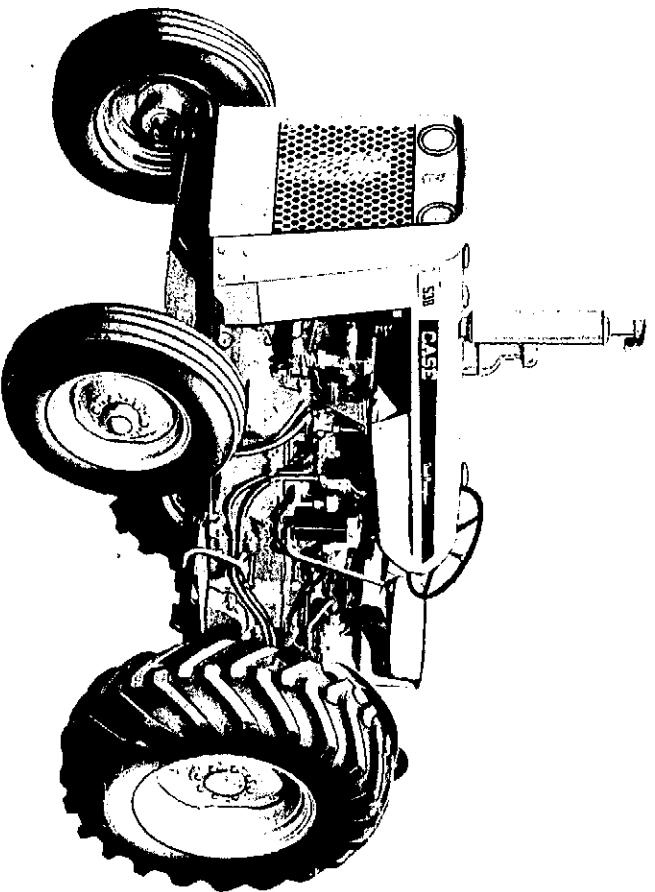


Figure 2

SERIAL NUMBER

When ordering parts from your Authorized Case Industrial Dealer and in all contacts or correspondence with your dealer relative the Tractor, always specify the Serial, Model and Engine Number of your Tractor.

The Model and Serial Numbers are stamped on the number plate located on the right hand side of the instrument panel. See Figure 1. The Engine Number is stamped on a plate fastened to the right hand side of the engine below the starting motor, Figure 4.

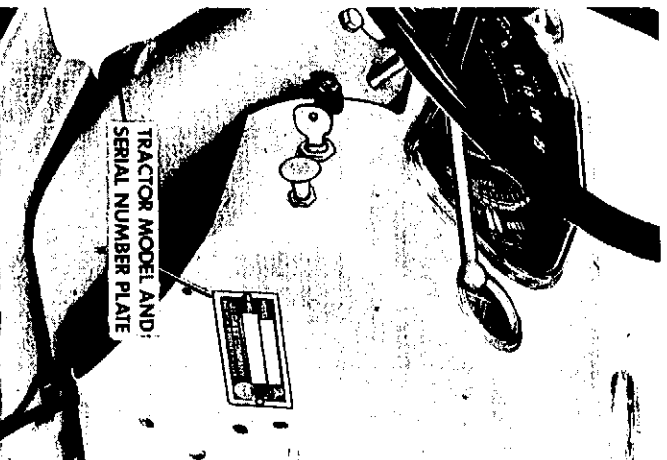


Figure 3

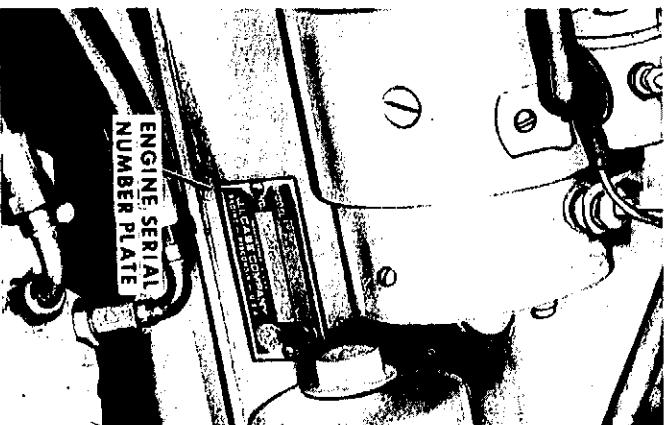


Figure 4

NOTE: The terms "Right Hand" and "Left Hand" whenever used in this manual apply to the tractor when facing in the direction the tractor will move in forward operation.

For reference, fill in the Serial Number, Model Number and Engine Number of your Construction King Tractor in the spaces provide below.

Model Number _____

Engine Number _____

Serial Number _____

159 gasoline engine

SPECIFICATIONS

General

Type	-----	4 Cylinder, 4 Cycle
Firing Order	-----	Valve in Head.
Cylinder Bore	-----	3-1/2 Inches
Stroke	-----	4-1/8 Inches
Piston Displacement	-----	159 Cubic Inches
Compression Ratio	-----	7.42 to 1
Exhaust Valve Rotators	-----	Positive Type
*Valve Clearance (Intake and Exhaust)	-----	.014" (Hot)
Cylinder Sleeves	-----	Wet Replaceable Type
Engine Idle Speed	-----	600 RPM
Full Load Speed(Standard Clutch)	-----	1900 RPM
Full Load Speed (Torque Converter)	-----	2100 RPM
No Load Speed (Standard Clutch)	-----	2060 RPM
No Load Speed (Torque Converter)	-----	2250 RPM

Piston and Connecting Rods

Compression Rings	-----	3
Oil Rings	-----	1
Piston Pins	-----	Full Floating Type
Connecting Rod Bearings	-----	Replaceable Precision Steel Back, Aluminum Lin- ers.

Main Bearings

Number of Bearings	-----	3
Type of Bearings	-----	Replaceable Precision Steel Back, Intermediate Copper - Lead Liners.

Engine Lubricating System

Oil Pressure	-----	24 - 32 Lbs. (With Engine Warm and Operating at Full Governed RPM.)
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*Hot Settings Are Made At Low Idle After The Engine Has Operated at Thermostat Control Temperature For At Least Fifteen Minutes.

Engine Lubricating System (Continued)

Oil Pump ----- Gear Type With Float-
ing Intake Screen.

Fuel System

Carburetor ----- 1-1/4" SAE Flange
Fuel Strainer ----- In Sediment Bowl Under
Fuel Tank.
Fuel Gauge ----- Electrical, Located on
Instrument Panel.
Fuel Tank Capacity ----- 22 Gallons

Distributor Ignition

Contact Point Gap ----- .020"
Dwell Angle ----- 42°
Ignition Timing (Checked with Timing Light) ----- 30°
1900 RPM (Standard Clutch) ----- 30°
2100 RPM (Case-O-Matic) ----- 30°
Spark Plugs ----- Prestolite 18 8 or Equivalent
Thread ----- 18 MM
Gap ----- .025"
Shank Length ----- 1/2"

188 diesel engine

SPECIFICATIONS

General

Type -----	"Case" Open Chamber Combustion -
Firing Order -----	4 Cyl. - Valve in Head
Cylinder Bore -----	1-3-4-2
Stroke -----	3-13/16"
Piston Displacement -----	4-1/8"
Compression Ratio -----	188 Cu. In.
*Valve Clearance (Intake and Exhaust) -----	17.5 to .1
Cylinder Sleeves -----	.014(Hot)
Engine Idle Speed -----	Wet Type Replaceable
Full Load Speed (Standard Clutch) -----	600 RPM
Full Load Speed (Torque Converter) -----	1900 RPM
No Load Speed (Standard Clutch) -----	2100 RPM
No Load Speed (Torque Converter) -----	2060 RPM
Air Cleaner -----	2250 RPM
Cold Weather Starting Aid -----	Oil Bath Type
Fuel Recommendation -----	Electric Heater - Manifold Type
	No.2 Diesel Fuel

Piston and Connecting Rods

Compression Rings -----	2
Oil Rings -----	1
Piston Pins -----	Full Floating Type
Connecting Rod Bearings -----	Replaceable Precision
	Steel Back, Aluminum Lin-
	ers.

Main Bearings

Number of Main Bearings -----	5
Type Bearings -----	Replaceable Precision
	Steel Back, Aluminum Lin-
	ers.

*Hot Settings Are Made At Low Idle After the Engine has Operated At Thermostat Control Temperature For At Least Fifteen Minutes.

Engine Lubricating System

Oil Pressure ----- 50 to 70 Lbs. With Engine Warm
and Operating at Full Governed
RPM.

Type System ----- Gear Type Pump
With Floating Intake
Screen.

Fuel Injection System

Fuel Injection Pump ----- Roosa - Waste
Fuel Injectors ----- (Long Stem Multi
Hole) C.A.V. 2225 to 227

Fuel Injectors Opening Pressure ----- Vane Type (Integr
Fuel Transfer Pump ----- Part of Injection Pump).

Governor ----- Mechanical, Flyweigh
(Integral Part of Injectio
Pump.)

Primary Fuel Filter ----- Replaceable Element Tyf
Final Filter ----- Replaceable Filter Tyf

Fuel Gauge ----- Electrical, Located c
Instrument Panel.

Fuel Tank Water Trap and Drain ----- Bottom of Fuel Tar
Fuel Tank Capacity ----- 22 Gallon

general specifications

COOLING SYSTEM

Type of System	Pressurized, Thermostat Controlled
Radiator Pressure Cap	Open at 4 Lbs
Pump	Impeller Type - Sealed Pre-Lubricated Bearings.
Radiator	Heavy Duty Tube and Fin Construction
Thermostat	Starts to Open at 177° Fully Open at 202°F.

OVERALL MEASUREMENTS

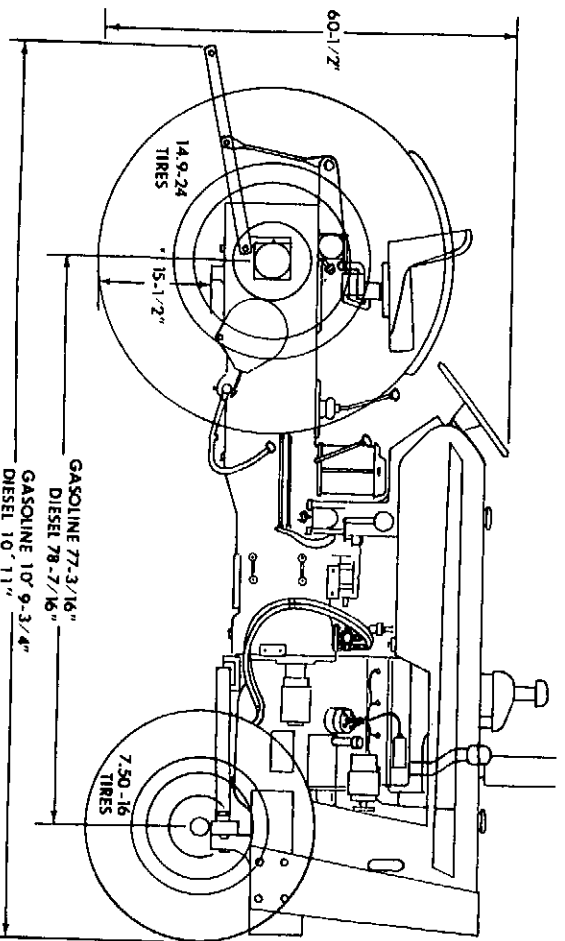


Figure 5

Front Wheel Tread	53"
Rear Wheel Tread	62"
	(Integral Wheel)
	(Integral with offset disc)
	(Demountable Wheel)
Overall Width	60" to 76"
Front Wheel Toe-In	1/8" to 3/16"
Ground Clearance (Rear Transmission Case)	15.1-2"

TIRES AND PRESSURES

Front 6.50-16	4 Ply	28 PSI
7.50-16	6 Ply	36 PSI
7.50-16	10 Ply	56 PSI
Rear 13.6-24	4 Ply	14 PSI
13.6-24	6 Ply	20 PSI
14.9-24	6 Ply	18 PSI
16.8-24	6 Ply	16 PSI

STARTING AND LIGHTING SYSTEM

Batteries - Gasoline ----- (1) 12 Volt, Type 11MS, 54 Plates
Diesel ----- (2) 6 Volt, Type 1M-105R, 45
Plates Connected in Series.

Generator ----- 12V-2 Brush With Full Ventilation
Voltage Regulator ----- 12 V - Automatic Type
Starting Motor ----- 12 V With Solenoid Switch
Manifold Heater (Diesel) ----- 12 Volt - 450 Watt
Headlights ----- (2) 12V - 35 Watt Sealed Beam
Rear Light ----- 12 V Sealed Beam Combination Tail and Flood Lamp.

Fuse ----- 20 AMP - Light Circuit - in Panel
Electrical Socket ----- 12 V - For Auxiliary Tail Light

STANDARD MECHANICAL DRIVE

Clutch Type ----- Foot Operated, Spring Loaded, Single Disc
Size ----- 11"
Throwout Bearing ----- Ball Thrust w/grease Fitting

TORQUE CONVERTER

Main Power-Clutch ----- Multiple Disc, Hydraulically Actuated, Engages Engine and Torque Converter
Direct Drive Power-Clutch ----- Single Disc, Hydraulically Actuated Engages Engine Direct With Main Power-Clutch and Transmission.

Converter Size and Type ----- 11" Single Stage

TRANSMISSION

Standard ----- 4 Speed Transmission
Torque Converter ----- 8 Speed Transmission
Triple Range (Standard Clutch Only) ----- 12 Speed Transmission
Dual Range Shuttle ----- 8 Speed Forward and Reverse

BRAKES

Type ----- Heavy Duty, Disc and Band Differential Brakes.
Brake Pedals ----- Can Be Locked Together for Road Travel or Operation Independently For Steering Assistance.

POWER TAKE - OFF

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

fuel specifications

**BE
ALERT**

CAUTION

NEVER FILL THE FUEL TANK
WHEN THE ENGINE IS RUNNING
OR WHEN NEAR AN OPEN FLAME.
DO NOT SMOKE WHEN WORKING
NEAR INFLAMMABLE FUELS.

GASOLINE

Case Gasoline Engines are designed to operate on REGULAR GRADE gasoline having a minimum research method rating of 90.7 Octane. This will give full power and economy together with long engine life and low maintenance cost.

The average Octane number ratings for regular grade gasoline (December 1964).

Motor Method -----	85.4 Octane Number
Research Method -----	93.7 Octane Number

These two Octane ratings are used to define the anti-knock quality of gasoline. It has become common practice in the Petroleum Industry to refer only to the RESEARCH METHOD RATING.

When only one Octane rating is given for gasoline and the rating method is not specified it can be assumed to be the Research Method Rating.

DIESEL

Case Diesel engines are designed to operate most efficiently when using a number 2 Diesel Fuel. Most well known refiners and distributors market a good grade of Diesel Fuel and there should be no difficulty in obtaining it.

Do not confuse number 2 Diesel Fuel with number 2 furnace oil as this does not always meet the fuel specifications for Diesel Engines.

These are specifications for a suitable number 2 Diesel Fuel.

A.P.I. Gravity	-----	32 - 35
Pour Point	-----	A rating 10 degrees lower than the lowest expected temperature.

VOLATILITY

Initial Boiling Point (Minimum)	-----	320° Fahrenheit
50% Condensed	-----	475° - 550° Fahrenheit
Final Boiling Point (Maximum)	-----	675° Fahrenheit
Distillation Recovery (Minimum)	-----	97%
Flash Point	-----	Legal Minimum
		Limit or Higher
S. U. Viscosity at 100° Fahrenheit	-----	34 - 39 Seconds
Cetane (Minimum)	-----	45 (45-55 for Winter Use)
Diesel Index	-----	43
Water and Sediment (Maximum)	-----	.06%
Ash (Maximum)	-----	.02%
Total Sulphur (Maximum)	-----	.5%
Conradson Carbon	-----	.2%
Copper Strip Corrosion	-----	Pass
Alkali and Mineral Acid	-----	Neutral

The use of number 1 Diesel Fuel, which is a lighter fuel, may result in a loss of engine power and also increased fuel consumption because it has less heat content and a lower viscosity than number 2 Diesel Fuel.

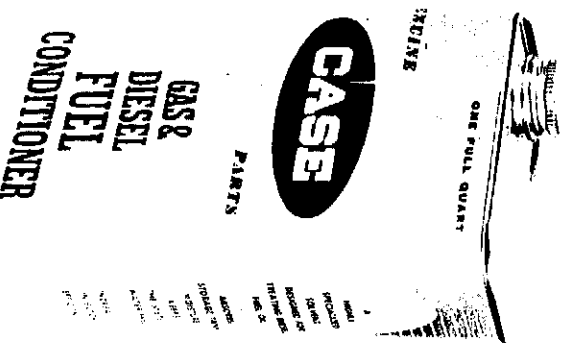
The life of the injection pump may also be affected because of the lack of lubricant in the light number 1 Diesel Fuel.

FUEL CONDITIONER

The following "Fuel Conditioner" recommendations are made for areas troubled with gum and varnish in the fuel:

1. Obtain a "Case Fuel Conditioner" and use it as follows:
 - A. Add it to the fuel in the main storage tank.
 - B. Add a small quantity to the Tractor fuel tank daily.
 - C. Use the "Conditioner" periodically, or when any symptoms develop in the engine that indicates gum and varnish deposits in the Fuel System.

NOTE Refer to the instructions furnished with the "Conditioner" as to the amount that should be used.



IMPORTANT

1. Buy Fuel in quantities that will be used up in 90 days or less.
2. Protect main storage tank with a shelter so the fuel can be kept as cool as possible.

Lubricating your Case Tractor will require only a few minutes of regular daily attention. Whenever possible, automatic lubricator or prepacked bearings have been provided to reduce the demand made on the operator's time.

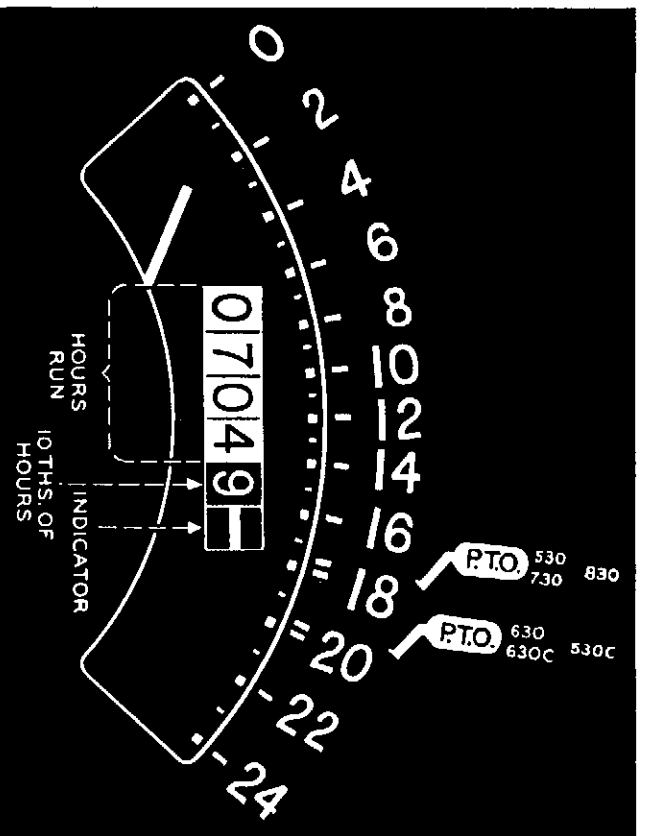
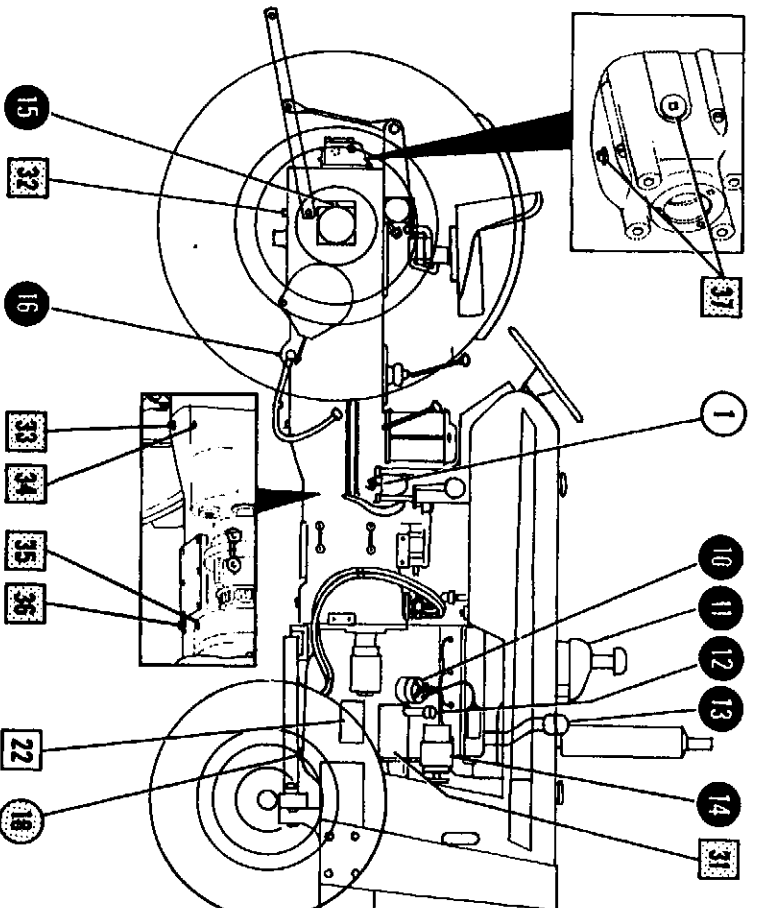


Figure 6. Engine Hour Meter

To assure maximum engine service and complete satisfaction, two factors must be observed:

1. Have a regular schedule of inspection and lubrication. All time intervals in the Lubrication Section and the Preventive Maintenance Section of this manual are based on Hour Meter readings. Reading the Hour Meter provided on your Case Tractor will tell you when to service it.
2. Use only high quality oils and greases of unvarying specifications. Always buy from a reliable dealer who handles reputable, well-known brand lubricants. Use only oil and grease of the specifications recommended in this manual.



LUBRICATION RECOMMENDATIONS AND APPROXIMATE CAPACITIES

LUBRICATION POINTS	APPROXIMATE CAPACITIES	AIR TEMPERATURE RANGES			
		Above 80° F.	80°F. to 32°F.	32°F. to 20°F.	-20°F or lower
Engine Crankcase	4 Quarts	<div> <div>SAE-90</div> <div>Multi-Purpose</div> <div>SAE-80</div> <div>Multi-Purpose</div> </div> <div>Use Engine Oil</div>			
Engine Crankcase (including Oil Filter)	5 Quarts				
Transmission and Differential Case	15 Quarts				
Generator	2 or 3 drops				
Distributor (Gasoline Only)					
All Pressure Fittings	As many strokes as required				
Hydraulic Steering (Reservoir Only)	1 Quart	<div>Use a Good Grade No 1 Gun Grease (Lithium Base)</div>			
Torque Tube and Hydraulic Reservoir (Standard Clutch)	16 Quarts				
Torque Tube and Hydraulic Reservoir (Torque Converter)	12 Quarts				
Independent PTO	1 Quart	<div>Use Case TCH</div>			

REF. NO.		LUBRICATION POINTS										NO. OF OILS		FREQUENCY	
1	Torque Converter Drive Dipstick *	1												10 HOURS OR DAILY	
2	King Pins	2													
3	Engine Oil Dipstick	1													
4	Torque Tube & Hydraulic System Dipstick (Std. Clutch)	1													
5	Front Axle Pivot	1													
6	Steering Cylinder Pivots	4													
7	Radius Rod Pivot	1												16 HOURS OR WEEKLY	
8	Load Depth Pivot Shaft Bracket	2													
9	R. H. Lifting Link	1													
10	Distributor (Gasoline Only)	1													
11	Air Cleaner (Fill to Level Mark) **	1													
12	Power Steering Reservoir Dipstick & Filler	1													
13	Crankcase Breather & Filler	1												240 HOURS	
14	Generator	1													
15	Rear Axle Outer Bearings	2													
16	Brake Cross Shaft	2													
17	Transmission Dipstick	1													
18	Engine Oil Drain **	1												120 HOURS	
19	Clutch Rod Bell Crank (Std. Clutch Only)	1													
20	Clutch Pedal (Std. Clutch Only)	1													
21	Turn Buckle Link	1													
22	Engine Oil Filler *	1													
23	Torque Converter Filter ***	1													
24	Clutch Throwout Bearing (Std. Clutch Only)	1												240 HOURS	
25	Hydraulic Filter (Std. Clutch) ***	1													
26	Torque Tube Hydraulic Breather °	1													
27	Hydraulic System Breather °	1													
28	Hydraulic Filter (Torque Converter Drive) ***	1													
29	Transmission Breather °	1													
30	Front Wheel Bearings °°	2												500 HOURS	
31	Power Steering Reservoir Filter *	1													
32	Transmission Drain	1													
33	Torque Tube Drain +	1													
34	Dual Range Housing Drain +	1													
35	Torque Converter Drain +	1													
36	Torque Converter Housing Drain +	1												2000 HOURS OR YEARLY	
37	Independent PTO Drain	1													

*Refer to Pages 18 thru 22 For Complete Filter Service Instructions.

**Refer to Pages 61 and 62.

+ Refer to Page 23

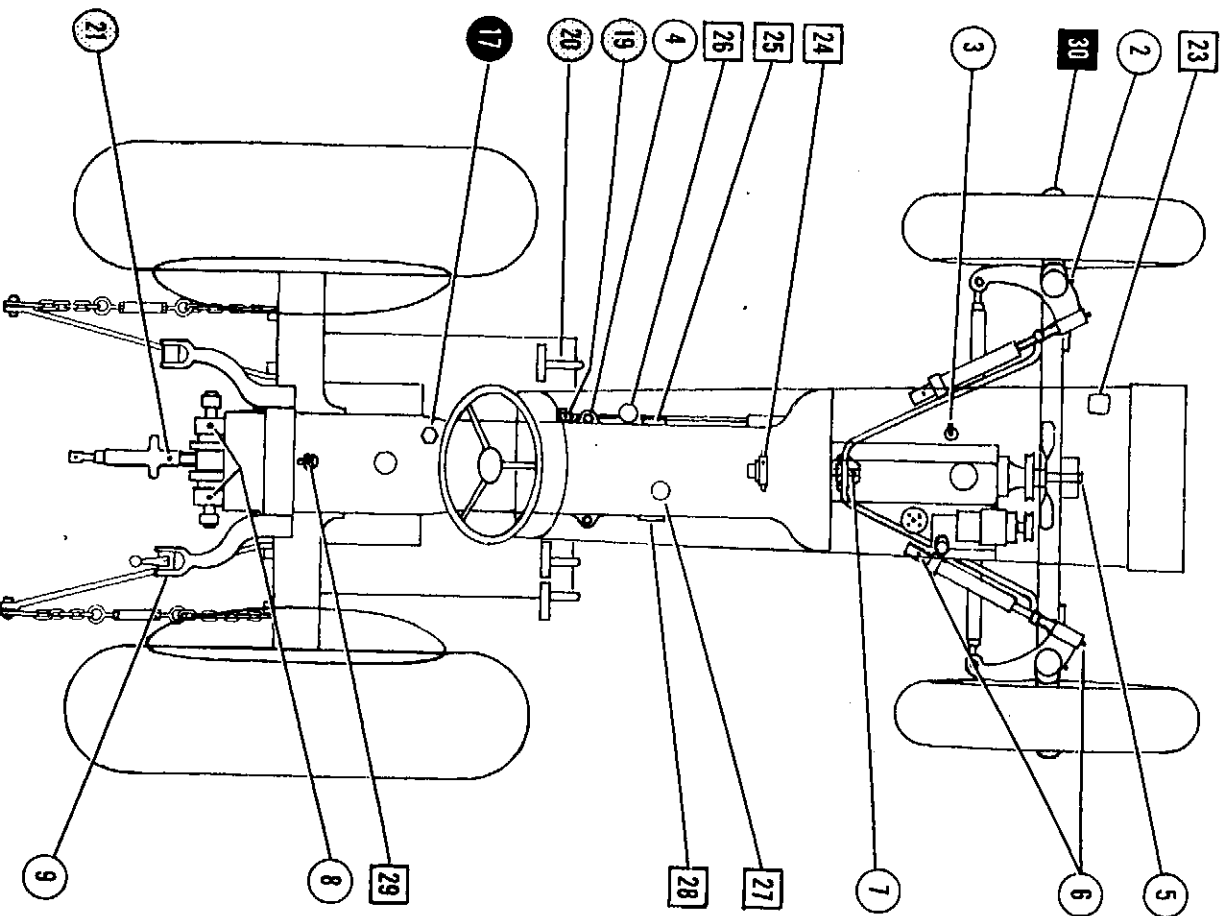
++ Refer to Page 17 for Run-In Oil Drain

° More Often in Dusty Conditions. Refer to Page 24.

°° Clean, Repack and Adjust. Refer to Page 25.

* Engine Idling and Oil Warm.

** Change After the First 20 Hours and Each 1000 Hours Thereafter.



ENGINE LUBRICATION

Selection of Lubricating Oil

It is extremely important that you select and use in your Case Tractor a stable, high quality, "Heavy Duty Type" engine lubricating oil that has the proper body (SAE Viscosity Rating) for the prevailing air temperatures.

Engine Oil SAE Viscosity Rating

SAE 30	-----	Air Temperatures above 80°F
SAE 20-W	-----	Air Temperatures from 80°F. to 32°F
SAE 10-W	-----	Air Temperatures from 32° F. to -20°F
SAE 5-W	-----	Air Temperatures below -20° F

NOTE If the Case Engine is to operate under a heavy constant load during extremely cold weather, it is advisable to use SAE 10-W. It may be necessary to drain the oil while it is still hot and pre-heat it to approximately 100°F. before pouring it back into the crankcase just prior to starting.

Engine Lubricating Oil Service Designation

DIESEL

Use only DS Service Classification oil in the engine crankcase that has passed the required engine performance test for Series 3 oil: Mil-L-45199 rating.

Series 3 oil is the highest quality oil available for diesel engines. It is designed to lubricate the highly finished parts, keep the engine free from sludge and neutralize corrosive acids. The oil change intervals recommended in this manual have been based upon the quality of a series 3 oil - don't shorten your engine life and short-change yourself by using an oil of less quality than a Series 3 oil.

GASOLINE

In the engine crankcase, use only MS Service Classification Oil that has passed Automotive Manufacturers Association (AMA) Test Sequences I, II and III.

ENGINE CRANKCASE OIL CHANGE

Run-In-Oil

Drain the special "run-in" oil after the first 20 hours of operation and replace with fresh oil. Drain and refill the crankcase at le every 120 hours of operation thereafter.

Regular Oil Change

Drain and refill the crankcase at least every 120 hours of operation.

If the engine service is severe - (frequent stopping and starting high or low operating temperature) - the crankcase should be drained more often to prevent the formation of sludge or harmful deposits in the engine.

Crankcase Oil Refill

IMPORTANT

1. When just the crankcase is drained, always refill with 4 measure quarts of oil. Do not refill using the dipstick as a guide.

2. If you have drained the crankcase and replaced the oil filter element, pour in 5 measured quarts, operate the engine for a few minutes to fill the filter body; then check the oil level with the dipstick.

Be sure to allow sufficient time for the oil to run down off the engine parts.

3. By following the above procedure, you will prevent overfilling or underfilling the crankcase, either of which can be detrimental to the engine service life and will give you false oil consumption records.

ENGINE OIL FILTER

Change Interval ----- After the first 20 hours of operation and each 240 hours thereafter



Figure 7

After the first 20 hours of operation and each 240 hours of operation (two oil changes) thereafter, install a new Genuine Case Filter. To remove the filter, unscrew it as shown in Figure 7 and pull straight back from the base.

Be sure the replacement filter and gasket are tightened securely to prevent oil leakage.

CAUTION

NEVER ATTEMPT TO CHANGE AN OIL FILTER WHEN THE ENGINE IS RUNNING.

IMPORTANT

CHANGE THE OIL FILTER AT THE RECOMMENDED TIME INTERVALS.

FILLING RESERVOIR - BLEEDING AIR FROM POWER STEERING SYSTEM

Capacity (Reservoir Only) ----- Approximately 1 Q
Type Fluid ----- Automatic Transmission F

Type A.

Remove the reservoir cap and dipstick. Carefully fill reservoir with clean Automatic Transmission Fluid - Type A until the oil level reaches the "F" mark on the dipstick, Figure 8. Replace the reservoir cap and dipstick and start the engine. Turn the steering wheel through several turns; then stop the engine and refill the reservoir to the "F" mark on the dipstick.

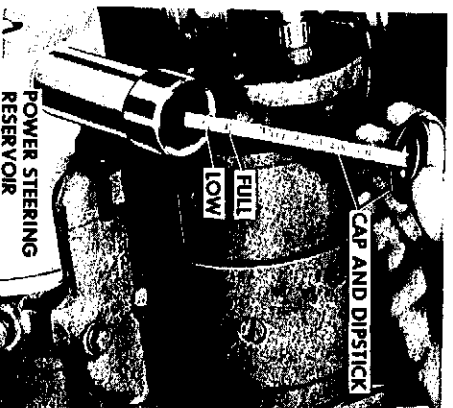


Figure 8

Repeat until the fluid level ceases to drop after turning the steering wheel. The system is then completely filled.

NOTE The first few times you turn the steering wheel, do not make full turns. Make full turns only after a sufficient amount of fluid is added to the system. **IMPORTANT** While bleeding air from system, operate engine at low idle speed (approximately 600 RPM).

Checking The Fluid Level

Check the reservoir fluid level every 60 hours of operation. With the reservoir cover and cap clean before removing the cap. Keep the reservoir filled to the "F" mark on the dipstick, Figure 8. Overfilling the reservoir will cause the oil to surge out of the breath hole in cap.

Hydraulic Power Steering Fluid Temperature

After the engine has been operating for a few minutes, the steering fluid will reach its normal operating temperature and the pump will feel very hot to the hand. This is a normal condition found in any hydraulic system and is caused by the fluid from the reservoir being circulated through the pump and control valve at a very accelerated rate whenever the engine operates. This condition will cause no difficulty as long as the reservoir is kept full.

POWER STEERING FILTER

Capacity of Power Reservoir ----- 1 Quart
Type Fluid ----- Automatic Transmission Fluid - Type ,

Power Steering Fluid and Filter Element

Change Interval ----- 1000 Hours

A replaceable filter element is provided in the reservoir body, Figure 9. Replace the element every 1000 hours of operation (more often in severe dust conditions).

NOTE On gasoline tractors it requires removal of the distributor. Refer to Page 75, for installing and timing of the distributor.

IMPORTANT Before removing steering reservoir shell, mark both shell and pump body, Figure 9 - When reinstalling shell, make sure marks are aligned. This is to insure a good seal and correct oil level reading on dipstick.

To replace filter element, remove the acorn nut, seal, reservoir shell, special hex nut, spring and retainer. Remove contaminated filter element. Install new element, retainer, spring and special hex nut.

Compress the spring from the outside of the special hex nut to the shell flange on the pump body to 4-15/16". See inset, Figure 10 Install "O" ring, shell, seal and acorn nut. Refer to reservoir oil level as described on Page 19.

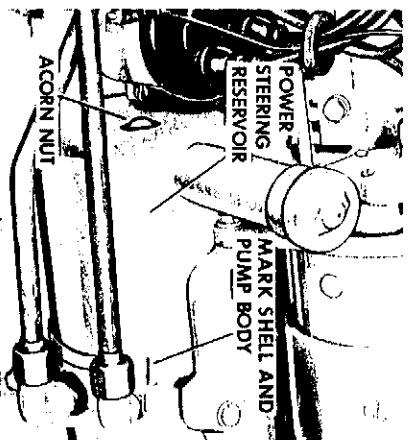


Figure 9

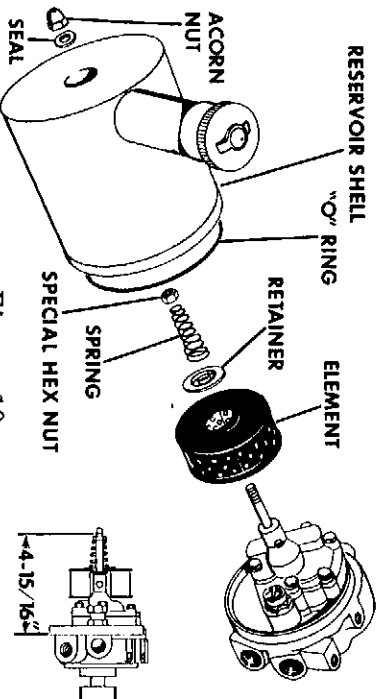


Figure 10

HYDRAULIC SYSTEM OIL FILTER

Filter Change Interval -----

After the first 20 hours of operation and every 240 hours thereafter for change interval and drain points. Refer to P

NOTE

Hydraulic oil is contained in the torque tube. The hydraulic system has a replaceable type filter, located through the filter. The retainer and spring that hold the element position serves to relieve excessive pressure built up from cold c If the filter element becomes plugged due to neglect, the pressure developed will allow contaminated oil to pump through the system.

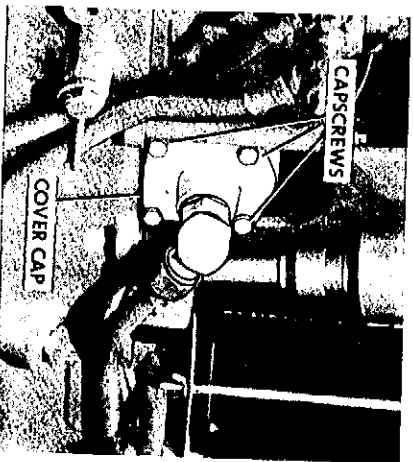


Figure 11. Standard Clutch

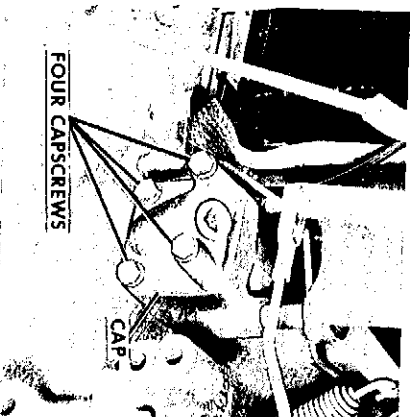


Figure 12. Torque Converter

To replace filter remove the four capscrews, cover cap and "O" ring. Remove the contaminated element. Clean out the filter housing before installing new element.

Install new filter element, new cap "O" ring and cover cap. Install the four capscrews and tighten evenly.

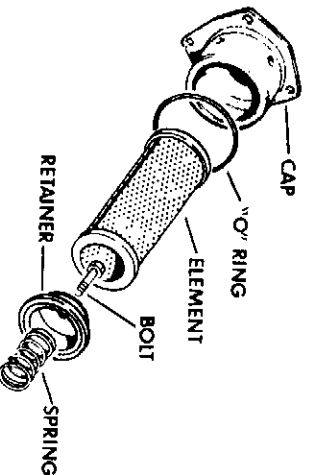


Figure 13. Standard Clutch

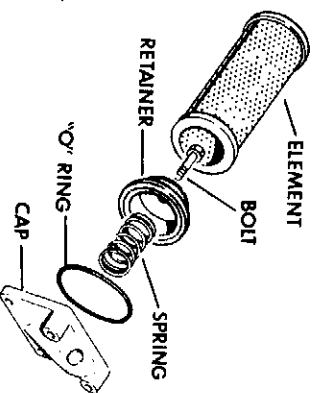


Figure 14. Torque Converter

Operate the tractor until it is up to operating temperature and check filter for leakage.

TORQUE CONVERTER OIL FILTER

Filter Change Interval ----- After the first 20 hours of operation and every 240 hours thereafter

Regular replacement of this filter element is very important to the service life of the Torque Converter system. All converter oil passes through the filter. The retainer and spring that hold the element in position also serve to relieve excessive pressure built up from cold oil. If the filter element becomes plugged due to neglect the pressure developed will allow the contaminated oil to pump through the system.

Remove the radiator grille screen. Remove the four capscrews and the filter cap and "O" ring, Figure 15.

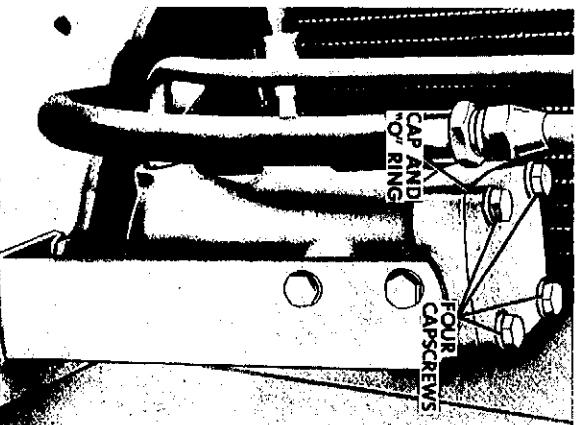
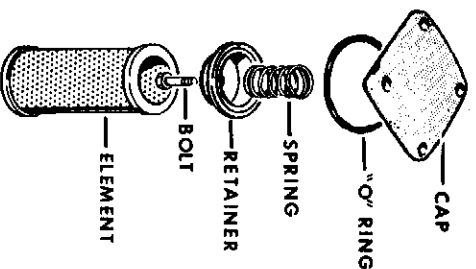


Figure 15



Remove the contaminated element and clean the interior of the filter housing and cap. Install new "O" ring in the filter cap. Install new element in place in the housing. Position the cap w/new "O" ring on top of the element. Press cap down into place by hand and secure with the four capscrews and lockwashers.

IMPORTANT

After new filter element has been installed operate the tractor until the oil is up to operating temperature. Check the filter assembly for oil leakage. Check the converter housing oil level.

Genuine Case filter elements are available from your Authorized Case Dealer.

TORQUE TUBE AND CONVERTER UNIT DRAIN

Drain and refill the torque tube and converter every 1000 hours of operation, or once a season, whichever occurs first.

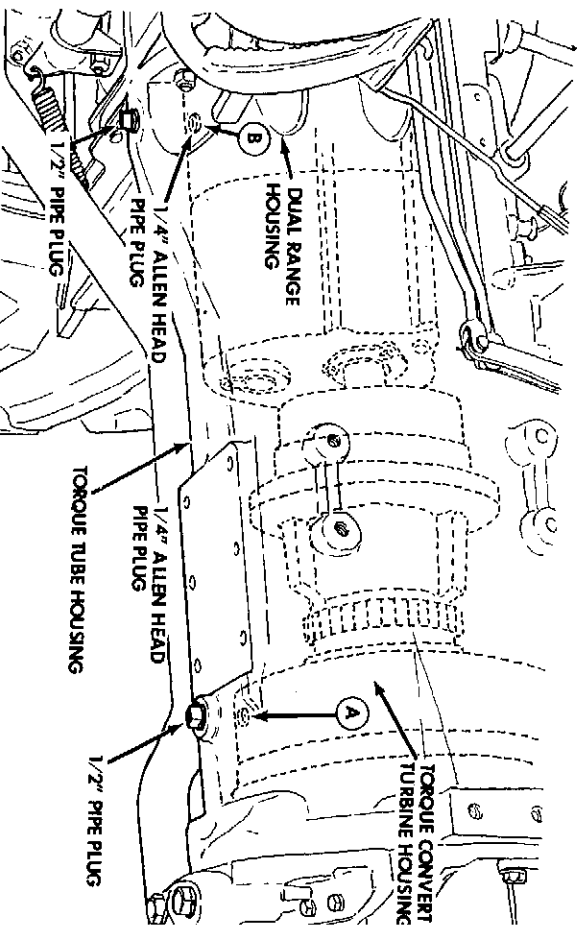


Figure 16

To drain the torque tube and converter unit remove the two 1/2" pipe plugs, see Figure 16 and allow the oil to drain for several minutes. Then use a 3/16" Allen wrench to remove 1/4" plug (A) from the converter turbine housing and the 1/4" plug (B) from the dual range housing. (Be extremely careful not to drop either of these plugs off the end of the Allen wrench when extracting them from the holes in the bottom of the torque tube.) It will be necessary to have an assistant turn the engine over slowly while you observe the lining up of the drain plug (A) with the drain hole in the torque converter housing.

NOTE Because of the nature of this draining procedure, it may be advisable to have your Case Dealer do this work while he is performing the seasonal servicing of your tractor.

HYDRAULIC HOUSING AND TORQUE CONVERTER HOUSING BREATHERS

Cleaning Interval ----- 5 to 60 Hour
Change Interval ----- 1000 Hour

Depending upon dust conditions, remove and clean the edge wound paper element in the hydraulic housing breather, Figure 17, and the Torque Tube housing breather, Figure 18.

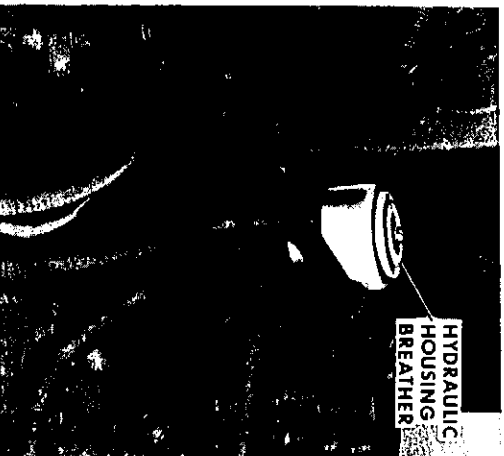


Figure 17

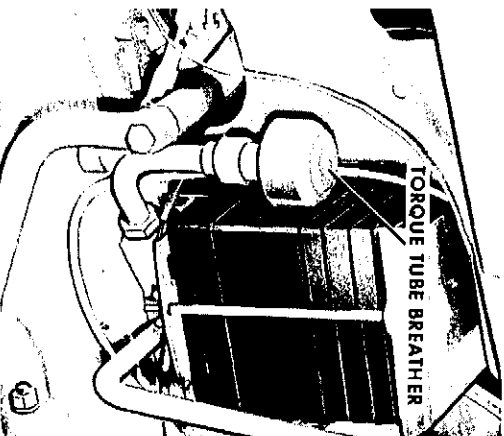


Figure 18

Wash the element, Figure 19, in a greaseless cleaning fluid such as used for removing spots from clothing.

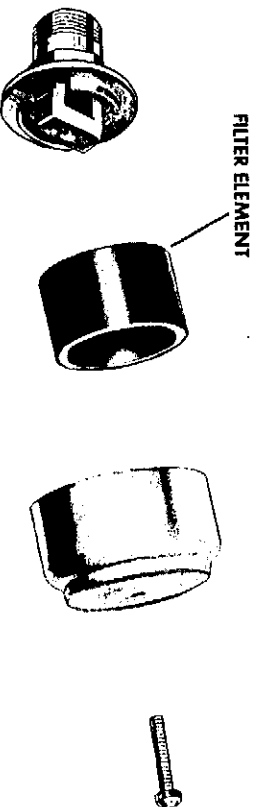


Figure 19

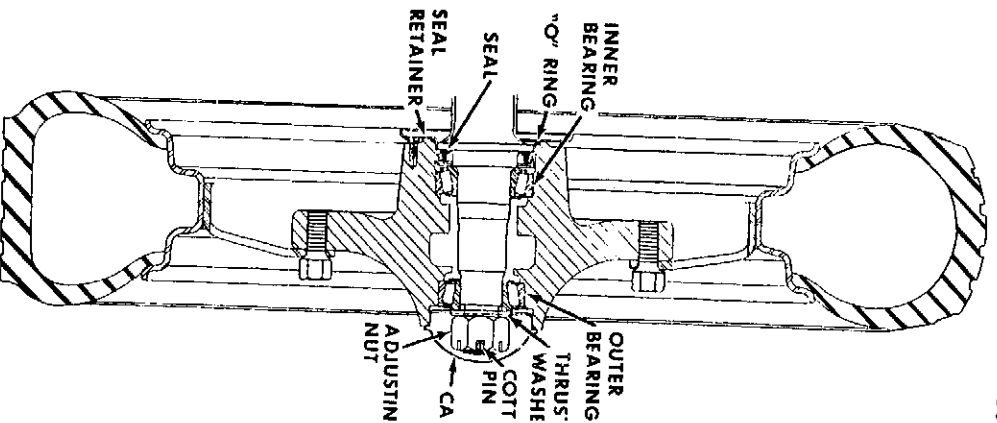
IMPORTANT Failure to keep the filter element clean will restrict the breathing of the housing and will result in oil being forced past the seals by the pressure built up.

PACKING FRONT WHEEL BEARINGS

Interval -----

500 Hours

1. Raise and block up the front end of the tractor. Remove the hub cap.
2. Remove the cotter pin, slotted adjusting nut, and thrust washer, Figure 20.
3. Remove the screws from the seal retainer, Figure 20 and pull the wheel off the spindle.
4. Wash both bearings thoroughly. Clean the grease from hub, hub cap and spindle.
5. Pack each bearing with No. 2 Moly Disulfide grease. Work enough grease into each bearing to completely fill the space around each roller.
6. Install a new bearing seal, (lubricated with No. 2 Moly Disulfide grease) retainer and new "O" ring on the spindle.
7. Reinstall the inner bearing assembly, the hub and wheel, the outer bearing assembly, the thrust washer and the slotted adjusting nut. Replace the screws in the seal retainer.
8. Carefully draw the slotted adjusting nut up against the thrust washer an the outer bearing assembly until the pressure of the nut just causes a noticeable drag when the wheel is revolved.
9. Lock the slotted adjusting nut with a new $3/16"$ x $1-3/4"$ inch cotter pin and replace the hub cap.



RUN-IN PROCEDURE IMPORTANT

AT ALL TIMES, MAINTAIN THE CORRECT OPERATING TEMPERATURE. ALWAYS OPERATE ENGINE AT FULL THROTTLE DURING RUN-IN PERIOD. DO NOT IDLE THE ENGINE.

Careful attention must be given to proper "Run-In" procedure. Pistons rings and cylinder sleeves can be seriously damaged in new engine if "run-in" instructions are not followed. The following procedure is recommended.

1. Load

For the 1st 50 hours, maintain a normal field load. Do not "baby" the engine, but do not "lug" it. (Engine must not be "lugged" down below its full load governed engine speed).

2. Engine Speed

During "run-in" period, always operate the tractor at full governed RPM(throttle wide open). Avoid idling at reduced speed

3. Operating Temperature

Maintain the correct coolant temperature.

Low operating temperatures contribute to the formation of destructive acids and harmful deposits in the engine.

4. Crankcase Oil

Case Tractors are shipped from the factory with a special "run in" oil in the crankcase. After the first 20 hours of operation drain this oil while the engine is hot and replace it with fresh oil. Change the crankcase oil at the recommended 120 hour interval thereafter. DO NOT DRAIN SPECIAL RUN-IN OIL UNTIL THE ENGINE HAS BEEN OPERATED 20 HOURS.

Change crankcase oil filter after first 20 hours of operation and each 240 hours of operation thereafter. Install only a new Genuine Case Filter element.

5. Clutch Adjustments

During the first 50 to 150 hours of operation, it may be necessary to adjust both traction and PTO clutches several times until the drive plate facings have "run-in". Failure to do so can cause serious clutch damage.

6. Hydraulic Filter Change filter after first 20 hours of operation. Refer to Page 21.

7. Torque Converter Filter Change filter after first 20 hours of operation. Refer to Page 22.

PRE - STARTING CHECK LIST

Before starting your new Case Tractor for the first time and before each operating period thereafter, check the following:

1. MAKE SURE EVERYONE RESPONSIBLE FOR THE TRACTOR OPERATION AND MAINTENANCE UNDERSTANDS THE IMPORTANCE OF CLEAN FUEL.
2. Check that all lubrication fittings are serviced as directed in the Lubrication Chart.
3. Check that the crankcase, transmission and torque tube housing are filled to levels indicated in the Lubrication Chart.
4. Be sure air cleaner oil cup is clean and filled exactly to level mark on the cup with clean free flowing oil.
5. Check that radiator is filled. Use only soft water that is free a possible of scale forming minerals - or a reputable nationally recognized brand of "High Boiling Point" type anti-freeze.
6. Check that the tractor fuel tank is filled with clean fuel that meets requirements listed in this manual. Always wipe fuel tank cap clean before removing it.
7. Visually check fuel system for leakage. Check the engine for coolant or crankcase oil leakage.
8. Check that the fan belt is adjusted properly.
9. Drain any accumulated water or sediment from the fuel tank water trap.
10. If your tractor is equipped with an independent power take-off, make sure the power take-off guards are installed.
11. Check the hydraulic power steering reservoir; make sure the fluid reservoir is filled to the proper level.

OPERATING CONTROLS AND INSTRUMENTS

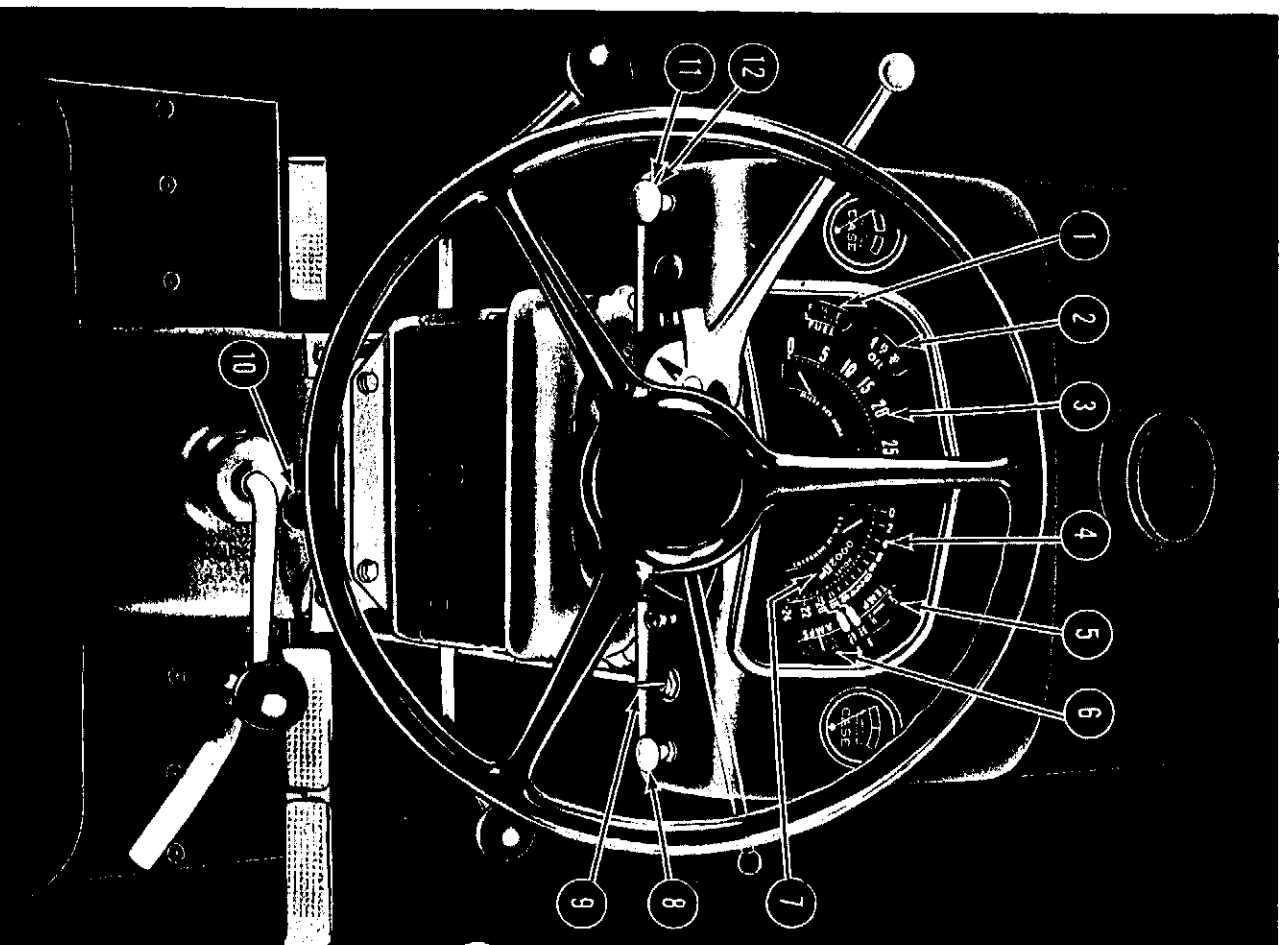


Figure 21

(Refer to Figure 21)

1. **FUEL GAUGE** - Indicates how much fuel is in the tank. Fuel Gauge Pointer normally rests on (empty) when the key switch is "OFF".
2. **OIL PRESSURE GAUGE** - The gauge needle registers (28 to 3 lbs. Gasoline) (50 to 60 lbs. Diesel) pressure when the engine is warm and running at full governed speed.
3. **SPEEDOMETER** - Indicates the tractor travel speed in miles per hour. Convenient indication of travel speed for planting or other operations where speed must be accurately determined.
4. **TACHOMETER** - Indicates engine speed (RPM). RPM is calibrated in hundreds.
5. **TEMPERATURE GAUGE** - The engine needle will be in the "Center bar" when the engine is operating at the correct temperature.
6. **AMMETER** - When the engine is first started the ammeter should show a charging rate and gradually fall back as the battery becomes charged. If the lights are turned on, the charging rate should increase automatically to take care of the additional load. When the action of the ammeter is different as described above (discharged reading) it is an indication that the generator, regulator or batteries should be inspected, tested or adjusted.
7. **HOURLY METER** - Located within Tachometer dial, indicates hours and tenths of hours that engine has run. Hourmeter does not register "clock" hours, but rather the average number of engine hours at a mean speed of 1670 RPM.
8. **LIGHT SWITCH** - Pull switch out to turn on headlights, instrument panel and energize electrical socket and tail light circuit. The combination tail light contains its own switch located on the lamp.
9. **KEY SWITCH** - Four position combination switch with removable key, "ACC," "OFF," "RUN" and "START" position. Tractor cannot be started without key.
10. **STARTING SAFETY SWITCH** - The Gear Shift Lever must be in the (S) START position to start tractor.
11. **CHOKE CONTROL** - (Gasoline only) To start a cold engine, pull choke control button out. Push button all the way in when engine is warmed up.
12. **FUEL STOP BUTTON** - (Diesel Only) Pull the fuel stop button out until engine stops. Push button in before starting engine.

OPERATING CONTROLS AND INSTRUMENTS (continued)

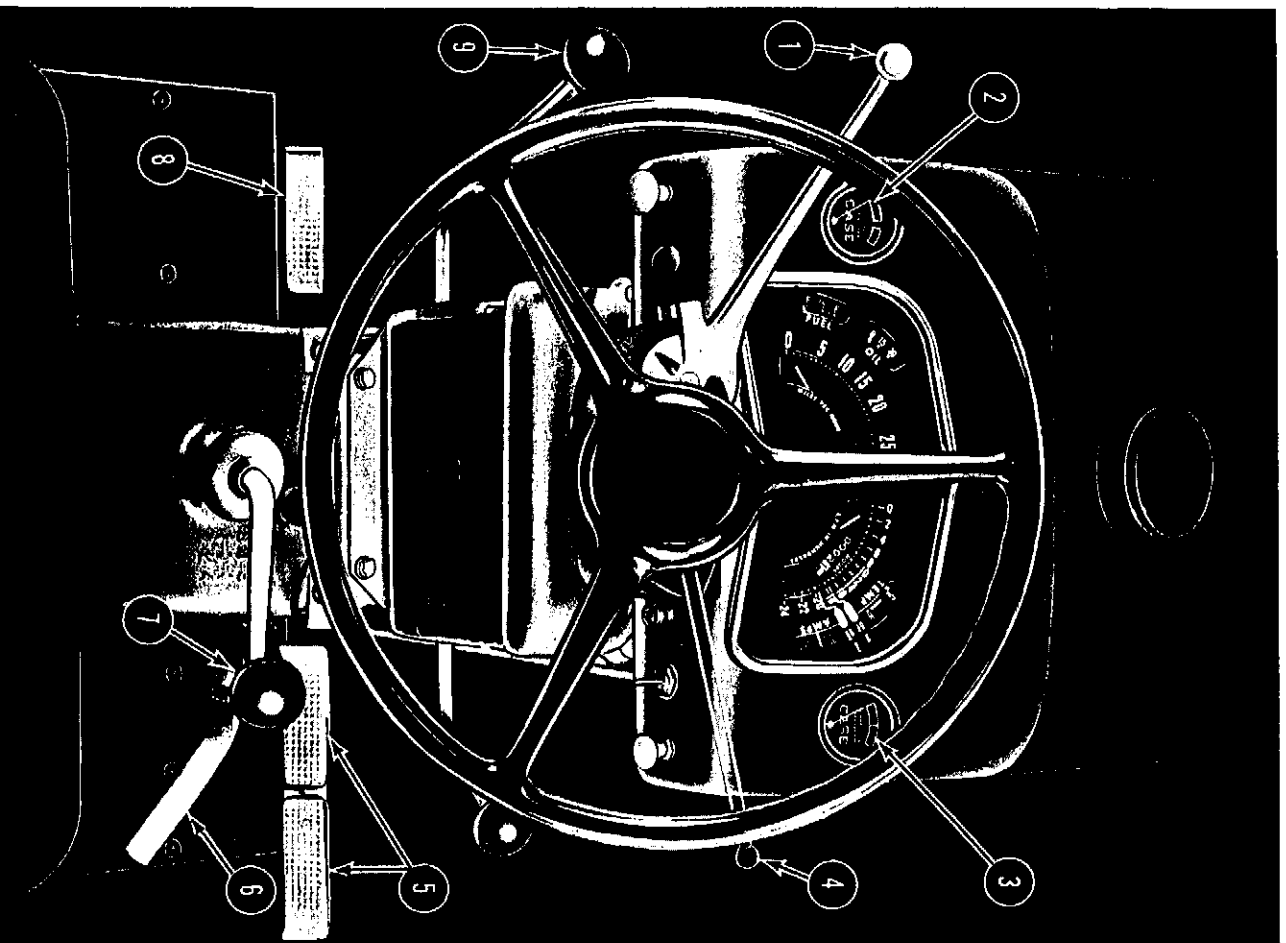


Figure 22

(Refer to Figure 22)

1. **HAND THROTTLE CONTROL LEVER** - Pull lever down to decrease engine speed and push lever up to decrease engine speed.
2. **CLUTCH OIL PRESSURE GAUGE** - (Torque Converter Only) Indicates operating oil pressure in both Main and Direct Drive Traction Clutches. When the needle is in the Green Zone the oil pressure is proper. If the gauge needle drops out of the Green Zone - or will not reach the Green Zone - DO NOT OPERATE THE TRACTOR UNDER LOAD until the cause has been determined and corrected.
3. **CONVERTER TEMPERATURE GAUGE** - (Torque Converter Only) Indicates operating temperature of oil in the torque converter. When the gauge needle is in the Green Zone, the torque converter is operating at the proper temperature. If the gauge needle rises into the Red Zone - Place the Gear Shift Lever in NEUTRAL AND IDLE the engine at 600 RPM until the gauge needle returns to the Green Zone. One cause of the converter oil overheating is operating the converter too long at "Stall Speed" - reduce temperature to the Green Zone, shift to the next low gear and continue operation.
4. **DIRECT DRIVE LEVER** - (Torque Converter Only) Pull lever rearward to operate tractor in Direct Drive. Push lever forward to operate tractor in Torque Converter. It is not necessary to engage and disengage the Power-Clutch pedal when operating in Direct Drive lever.
5. **BRAKE PEDALS** - Pedals can be used individually for turning assistance or locked together for safe road travel. Refer to Page 35.
6. **FOOT THROTTLE CONTROL** - Depress pedal to increase engine speed and release pedal to decrease engine speed.
7. **GEAR SHIFT LEVER** - Tractor must be stopped and tractor clutch disengaged before shifting into any gear.
8. **FOOT CLUTCH PEDAL** - (Standard Clutch Only) Depress pedal to disengage clutch - Release to engage clutch.
9. **HAND CLUTCH LEVER** - (Standard Clutch Only) Push lever forward to engage clutch - Pull lever rearward to disengage clutch

OPERATING CONTROLS AND INSTRUMENTS (continued)

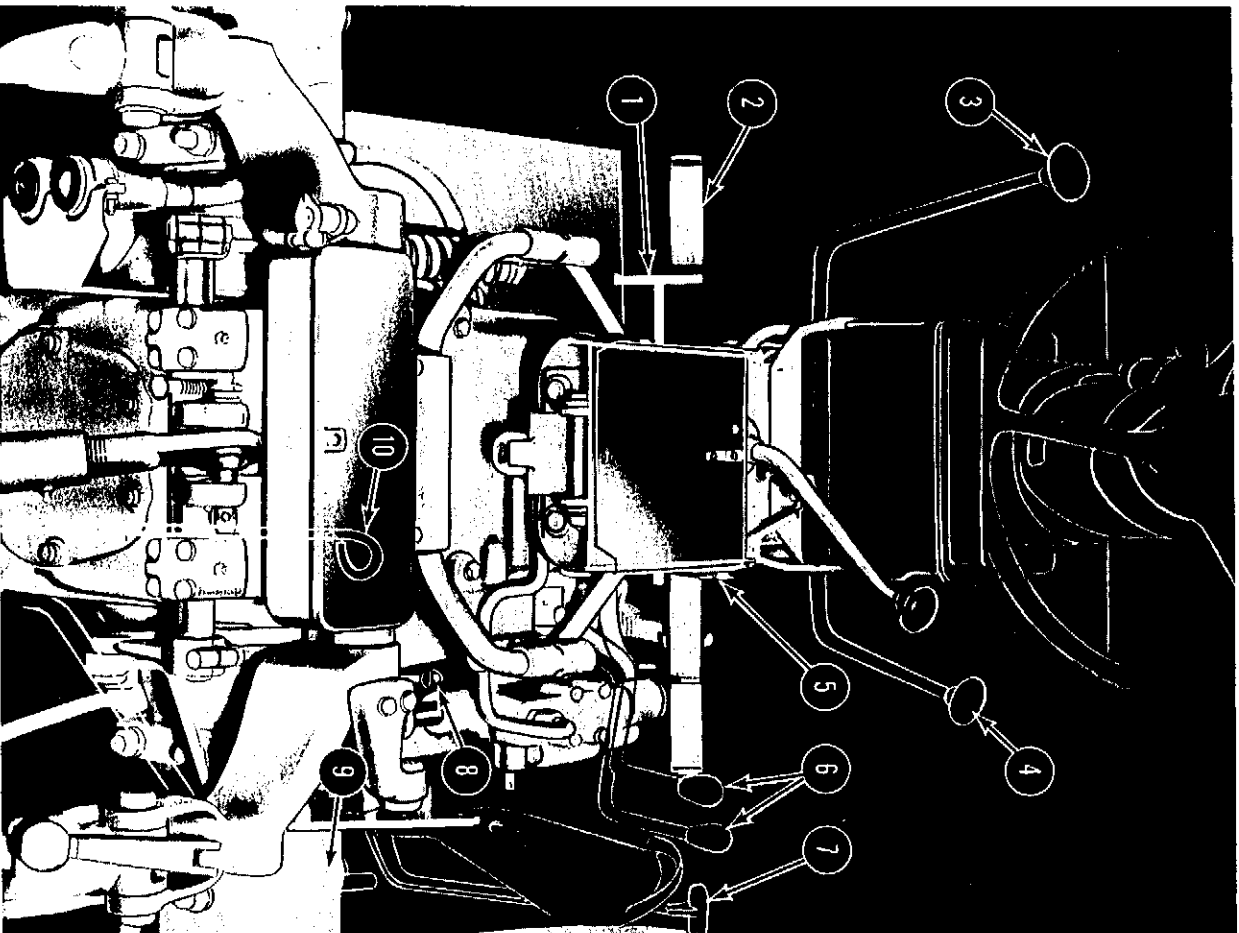


Figure 23

(Refer to Figure 23)

1. SEAT TENSION ADJUSTMENT - Screw handle in to increase tension to operator's weight, screw handle out to increase the rebound of the seat, Refer to Page 35.
2. POWER-CLUTCH PEDAL - (Torque Converter Only) Press pedal to disengage both main and direct drive clutches. Pedal must be depressed when selecting work range. Release pedal to operate tractor in torque converter drive. To shift from Direct Drive to Torque Converter Drive, the operator simply taps the Power Clutch pedal with his foot.
3. SHUTTLE SHIFT LEVER - Push the shuttle lever forward to move tractor in reverse direction and pull the lever rearward to move tractor in a forward direction.
4. RANGE SHIFT LEVER - Shift diagram located on cover. Positioning this lever in one of the two or three position provides operator with 2 or 3 distinct transmission ranges.
5. SEAT SLIDE ADJUSTMENT LEVER - Pull lever out and slide seat forward or backward to the desired position. Refer to Page 35.
6. HYDRAULIC CONTROL LEVERS - Moving outer control lever forward or rearward controls the oil flow through the upper valve to the rear hose couplings. Moving inner control lever forward or rearward controls the oil flow through the lower control valve.
7. DRAFT-O-MATIC CONTROL LEVER - Controls the raising and lowering of mounted implements and for selecting the desired working depth of soil engaging implements.
8. PARKING BRAKE LEVER - Depress the brake pedals and pull parking brake lever upward. To disengage parking brake, depress the brake pedals and push the brake lever downward and release brake pedals.
9. INDEPENDENT POWER TAKE-OFF CLUTCH HAND LEVER. Pull lever up to engage PTO and push lever down to disengage PTO.
10. CONSTANT RUNNING POWER TAKE-OFF LEVER - Disengage the engine clutch and move the lever rearward, select the proper transmission travel gear. To disengage PTO disengage the engine clutch and move the lever forward.

REAR LIGHT SWITCH - Figure 24. The rear light is a combination white flood light for night work and a red tail light for night road travel. The one switch controls both. The headlights must be on

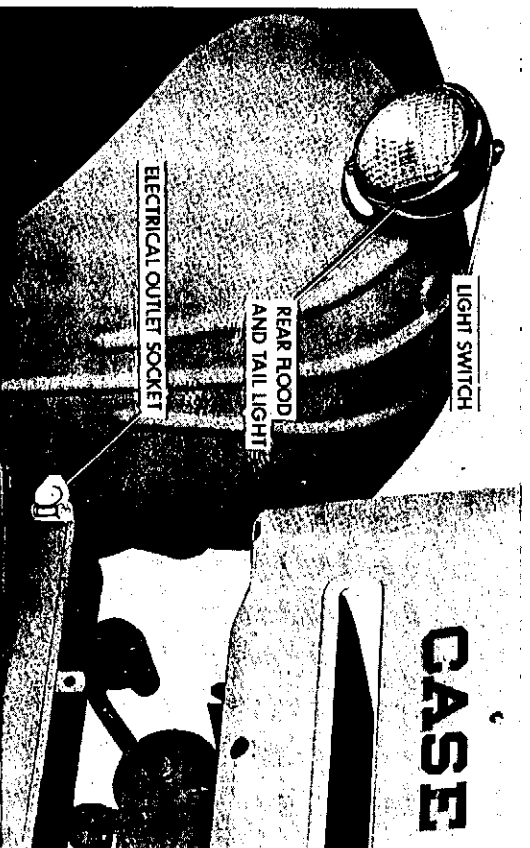


Figure 24

ELECTRICAL OUTLET SOCKET - Figure 24. For obtaining electrical power for auxiliary light mounted on implements and trailers, the headlights must be on.

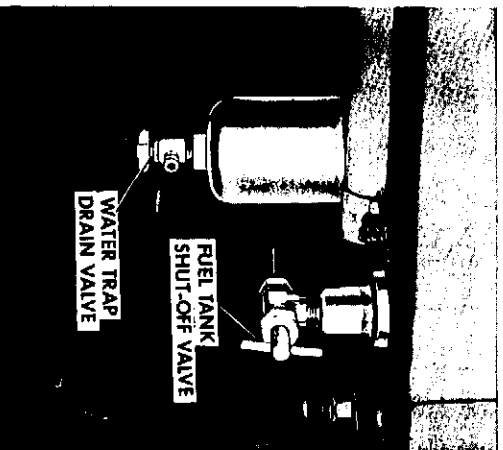


Figure 25 Diesel

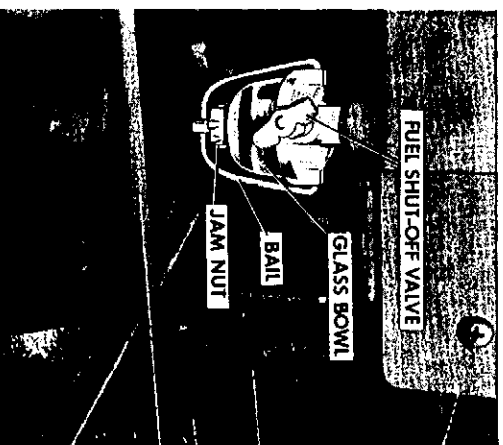


Figure 26. Gasoline

FUEL TANK SHUT-OFF VALVE - Figures 25 and 26. Turn valve fully in to shut off fuel from tank.

DIFFERENTIAL BRAKES

Case Tractors are equipped with heavy duty, differential brakes. These brakes are self-energizing, using the tractor's momentum aid in applying powerful braking action.

Each rear wheel can be braked separately for steering assist. After starting a turn, apply the brake on the side toward which wish to turn.

Do not attempt to "spin" the tractor around with the brakes alone. This is a dangerous practice on any tractor.

For safe road travel, always lock the brake pedals together so both brakes will be applied equally and at the same time.

For safety, check the free movement of each brake pedal daily. Be sure they are equal.

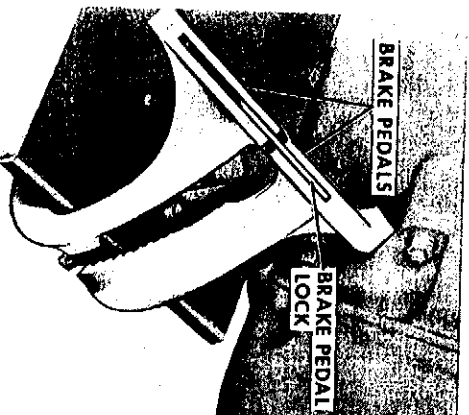


Figure 27

Refer to "Preventive Maintenance" section for adjustment.

The differential brakes can also be used as parking brakes. Lock the pedals together, depress them firmly, and pull the lever upward. To release the brakes and automatically disengage the catch, depress the pedals until the locking pawl releases from the notch on the brake pedal and remove the foot from the pedals.

OPERATOR'S SEAT

Case Tractors are equipped with an extremely comfortable seat. This seat can easily be adjusted forward or back by pulling out on the detent knob at the right, Figure 28, and sliding the seat to the position desired. And whatever you weigh, just a twist of tension screw will balance the seat suspension for your particular weight. Tipping the seat up, as shown, enables the operator to stand when "change of pace" is desired.

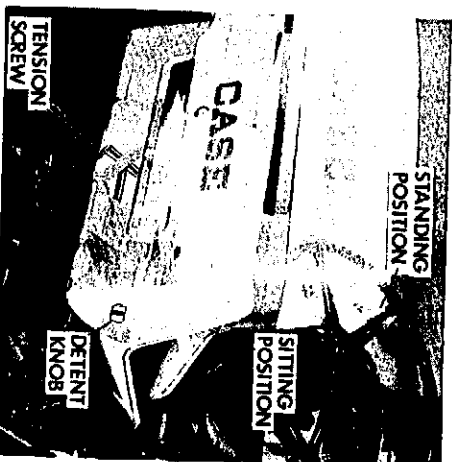


Figure 28

STARTING PROCEDURE

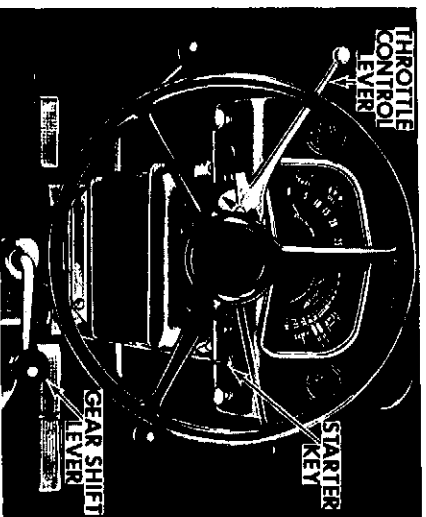


Figure 29

1. Move throttle control lever to 1/2 open position, Figure 29.
2. Move gear shift lever to "Start" position.
3. Turn starter key clockwise until engine starts - then release key

CAUTION

1. Immediately check that the oil pressure gauge is registering proper pressure and the ammeter for generator charging rate. If not stop engine and investigate.
2. If engine fires and stops, wait for starting motor to stop spinning before again turning key switch to start.
3. Do not use starting motor longer than 30 seconds without interruption. Wait at least 3 minutes so batteries can recuperate and starting motor can cool.

NOTE (DIESEL) While the engine is being turned over with the key switch, white or black exhaust smoke should be observed. If none is observed and engine will not start, it is an indication that no fuel is being delivered to the cylinders. See Page 37 for Diesel cold weather starting procedures.

STOPPING PROCEDURE

Gasoline ----- Turn Key Switch to "OFF" Position
Diesel ----- Pull fuel stop button out all the way and turn key switch to "OFF" position.

COLD WEATHER STARTING PROCEDURE

Diesel

Intake Manifold Heater

To start the diesel engine at temperatures near freezing or lower it may be necessary to use the manifold heater. Normally the manifold heater will aid cold weather starting to 10° F.

NOTE For temperatures below 10° F. Refer to Page 3

The manifold heater is located in the air intake manifold and heats the air before it enters the combustion chamber. The heater is operated with the starter key switch.

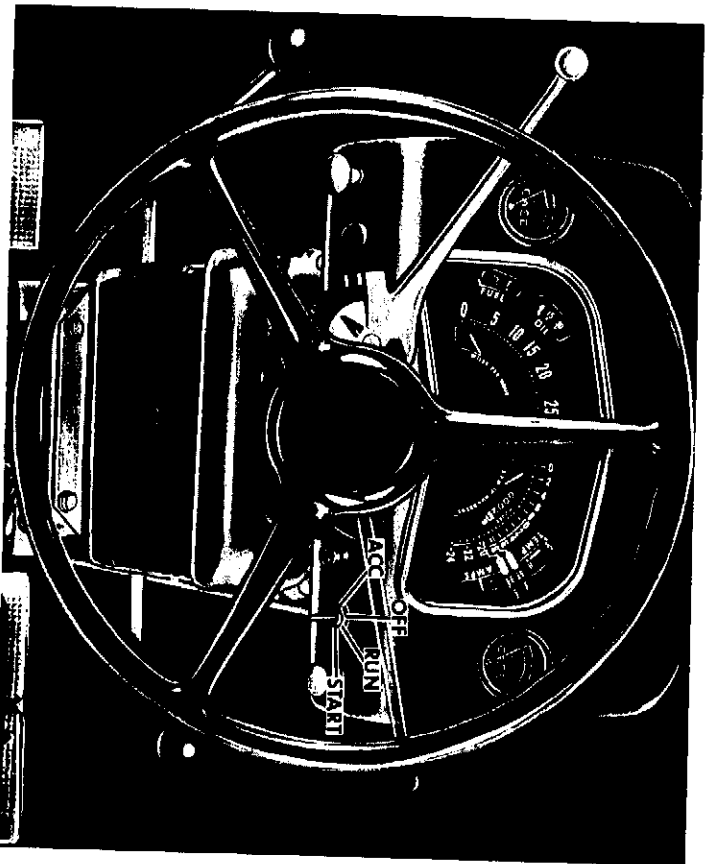


Figure 30

To operate the manifold heater, proceed as follows:

1. Turn and hold the starter key in the manifold heater (extreme left) ACC position for 30 seconds, Figure 30.
2. Release starter key and turn clockwise until engine starts.
3. If engine does not start after starting motor has cranked for 15 seconds, repeat above procedure.

COLD WEATHER STARTING FLUID

For freezing temperatures or below it may be necessary to use starting fluid. Genuine Case Starting Fluid is available through your Authorized Case Dealer.



Figure 31

To use starting fluid proceed as follows:

1. Be sure traction clutch is disengaged.
2. Spray starting fluid into the top of the air cleaner.
3. At the same time turn starter key clockwise to start engine then release key when engine starts.

NOTE: Complete instructions are given on the container.

WARNING

Diesel

WAIT 10 MINUTES BEFORE USING STARTING FLUID IF YOU HAVE ATTEMPTED TO USE THE MANIFOLD HEATER. CRANK ENGINE 5 SECONDS BEFORE ATTEMPTING TO USE MANIFOLD HEATER IF YOU HAVE USED STARTING FLUID.

COLD WEATHER OPERATION



To start and operate your Case Tractor during cold weather the following precautions must be observed:

IMPORTANT

- Always disengage Traction Clutch while starting engine to reduce drag from transmission oil.

1. **BATTERIES** - Batteries must be fully charged. The fuel must be clean.
2. **CRANKCASE OIL** - The oil in the crankcase and in the air cleaner oil cup must be of the recommended viscosity.
3. **TRANSMISSION OIL** - Always use Case Hi Lo TCH or Automatic Transmission Fluid - Type A both winter and summer.
4. **HYDRAULIC HOUSING OIL** - Always use Automatic Transmissior Fluid - Type A or Case Hi Lo TCH both winter and summer.
5. **COOLING SYSTEM** - The cooling system must be protected by a reputable brand of "High Boiling Point" type Ethylene Glycol anti-freeze.
6. **TIRES** - If there is liquid in the tires, it must be protected against freezing. Consult your Authorized Case Dealer.
7. **STOPPING THE ENGINE** - Always allow the engine to reach operating temperature before stopping it. If the engine has been working under load, always idle the engine for a few minutes before stopping it so the engine parts can cool evenly.
8. **CONDENSATION IN FUEL TANK** - Always fill the fuel tank at the end of the day's operation to prevent the tank from "sweating" and water entering the fuel.