

Coleman Implement, Inc.
P. O. Box 456
Bonner Springs, Ks. 66012



**220, 222, 224,
444 and 446 Tractors**
Operator's Manual No. 9-4392

casecollectorsoll.com

J I Case
A Tenneco Company



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

NOTE

THIS MANUAL APPLIES TO THE FOLLOWING TRACTORS

Model	Serial number and after
220	9656747
222	9658189
224	9667000
444	9661261
446	9668000



LOOK FOR THIS SYMBOL
TO POINT OUT IMPORTANT
SAFETY PRECAUTIONS

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

MKSKO

PRICE \$.75

Printed in USA

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Figure 1. Left Hand View of Case 220 Compact Tractor.



Figure 2. Left Hand View of Case 222 Compact Tractor.



Figure 3. Right Hand View of Case 224 Compact Tractor..



Figure 4. Left Hand View of Case 444 Compact Tractor.



Figure 5. Left Hand View of Case 446 Compact Tractor.

SERIAL NUMBER

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

The Tractor Model and Serial Numbers are stamped on the number plate located on the instrument panel, Figure 6. The Engine, Model, Serial and Engine Specification Numbers are stamped on a plate fastened to the right or upper front side of the engine. Figure 7. On Model 446 the plate is on the left, top blower housing.

TRACTOR MODEL
AND SERIAL NUMBER

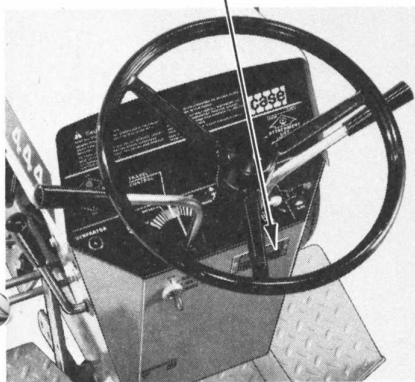


Figure 6.

ENGINE MODEL, SERIAL AND
SPECIFICATION NUMBER

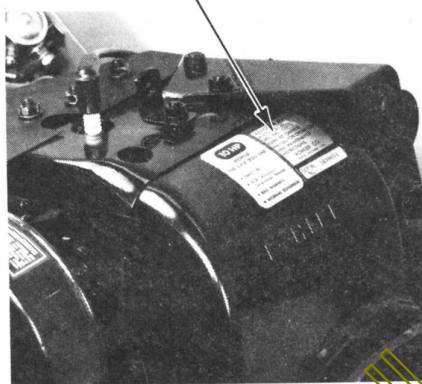


Figure 7.

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 Numbers of your tractor in the spaces provided below.

Tractor Model Number _____

Tractor Serial Number _____

Engine Model Number _____

Engine Serial Number _____

Engine Specification Number _____

SPECIFICATIONS**General**

	220	222	224 and 444	446
Type.....	Kohler	Kohler	Kohler	Onan
Model.....	K241A	K301A	K321A	BF-MS/2425A
Cycle.....	4	4	4	4
Cylinders.....	1	1	1	2
Cylinder Bore.....	3-1/4 in.	3-3/8 in.	3-1/2 in.	3-1/8 in.
Stroke.....	2-7/8 in.	3-1/4 in.	3-1/4 in.	2-5/8 in.
Piston Displacement.....	23.9 cu. in.	29.07 cu. in.	31.27 cu. in.	40.3 cu. in.
Horsepower.....	10 HP.	12 HP.	14 HP.	16 @ 3600 RPM
Compression Ratio.....	6 to 1	6 to 1	6 to 1	7 to 1
Full Load Speed.....	3500 RPM	3500 RPM	3500 RPM	3500 RPM
No Load Speed.....	3600 RPM	3600 RPM	3600 RPM	3600 RPM
Idle Speed.....	1000 RPM	1000 RPM	1000 RPM	1200 RPM
Valve Cold (Intake).....	.010 in.	.010 in.	.010 in.	.007 - .009
Valve Cold (Exhaust).....	.020 in.	.020 in.	.020 in.	.012 - .014

Piston and Connecting Rod

Piston -----	Aluminum
Compression Rings -----	2
Oil Rings -----	1
Connecting Rod -----	Aluminum

Fuel System

Carburetor -----	1 SAE Flange
Fuel Filter -----	In tank outlet fitting
Fuel Tank Capacity -----	3 Gallons

Ignition System

	446	220, 222, 224, 444
Breaker Point Gap -----	.021 in.	.020 in.
Ignition timing -----	21° BTDC	SP Mark
Prestolite Spark Plug (or equivalent) -----	14 L4	14 L7
Thread -----	14 MM	14 MM
Gap -----	.025 in.	.030 in.

Cooling System

Flywheel Blower -----	Forced air with baffles directing air around finned cylinder and head area
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Hydraulic System

Independent 5 quart reservoir, pump, control valve, hydraulic motor and heat exchanger. Pump delivers approximately 8 gallons per minute at 3600 RPM. Maximum drive system operating pressure (relief valve) setting: 2000 psi. Maximum attachment lift system operating pressure setting: 575 psi.

Electrical System

Type of System ----- 12 Volt, Negative Ground
 Battery ----- Case, 24 Ampere Hour at 20 Hour Rate
 Headlights ----- 12 Volt
 Starter-Generator 220, 222, 224, 444 ----- 12 Volt
 Starter - 446 ----- 12 Volt

Brake

Type ----- Double acting, self energizing, mechanical contracting band, with the drum shaft driven from transmission differential. Includes parking lock.

Trans axle

Type ----- Hydraulic Driven, Dual Gear Range
 Differential ----- Automotive Type Bevel Gear
 Oil Capacity ----- 3 Quarts

SPEED RANGE		FORWARD	REVERSE
220, 222 and 224	Low	0 to 3.0 MPH	0 to 3.0 MPH
	High	0 to 7.3 MPH	0 to 7.3 MPH
444 AND 446	Low	0 to 3.2 MPH	0 to 3.2 MPH
	High	0 to 7.8 MPH	0 to 7.8 MPH

WHEELS AND TIRES

Tire Size	Ply	Type	PSI	
		Recommended	Max.	
FRONT				
6.50-8	2	High Flotation	8	14
REAR				
8.50-12	2	High Flotation	8	10
8.00-16	2	High Flotation	8	14

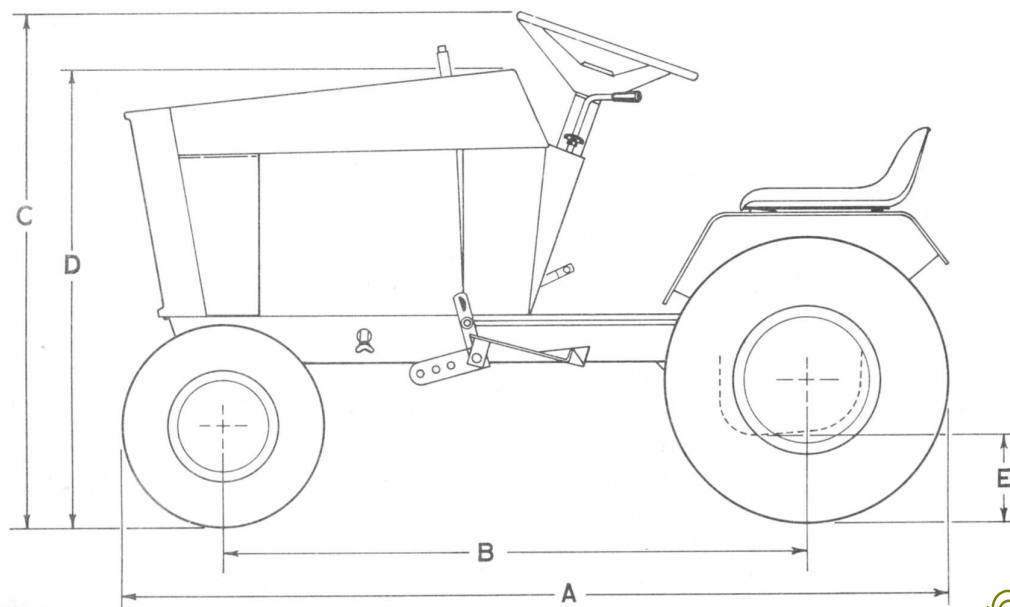


Figure 8.

	220, 222 & 224	444 & 446
A Overall Length	65"	70"
B Wheel Base	46"	46"
C Overall Height	40"	43-1/2"
D Hood Height - Rear	35-1/2"	38-1/2"
E Minimum Ground Clearance at Gear Case	7-1/8"	11"
Rear Wheel Tread	27-3/4"	31-1/2"
Front Wheel Tread	28-3/4"	33-1/2"
Overall Width	37"	41"
Shipping Weight	715 lbs.	770 lbs.

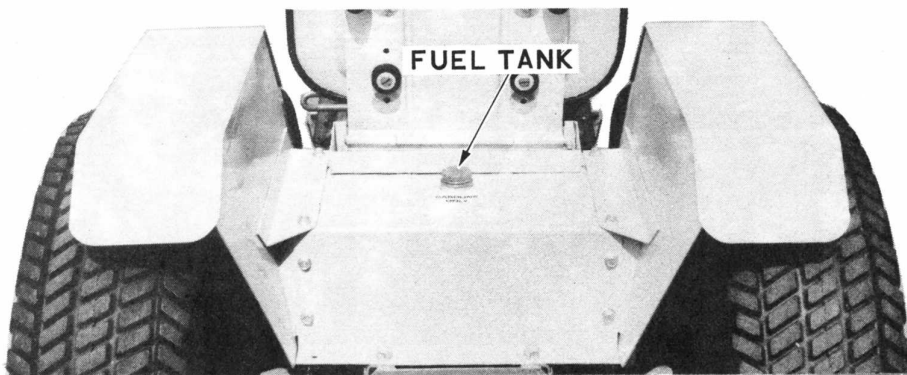


Figure 9.



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

FOR ADDED SAFETY THE FUEL TANK IS LOCATED UNDER THE HINGED SEAT AWAY FROM THE ELECTRICAL AND ENGINE COMPONENTS. SEE FIGURE 9.

GASOLINE

Engines used in Case Tractors 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 (March 1967).

Motor Method -----	86.2 Octane Number
Research Method-----	94.2 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.

FUEL CONDITIONER

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

1. Obtain "Case Lubra-Gas Conditioner" and use it as follows:
 - A. Add it to the fuel in the main storage container in proportions specified on the label.
 - 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 indicate 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.

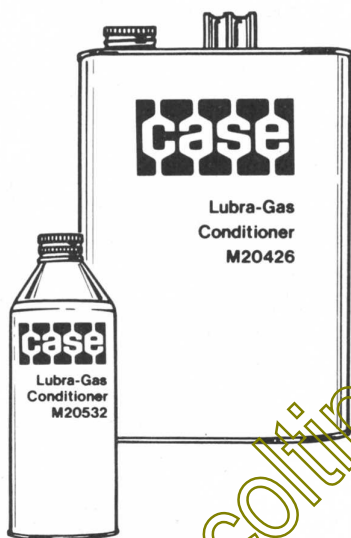


Figure 10

IMPORTANT

1. Buy Fuel in quantities that will be used up in 90 days or less.
2. Keep the main storage container sheltered so the fuel can be kept as cool as possible.



SAFETY PRECAUTIONS

1. BECOME THOROUGHLY FAMILIAR WITH ALL TRACTOR AND ATTACHMENT CONTROLS BEFORE OPERATING.
2. Stop and inspect the mower for damage immediately after striking a foreign object and repair damage before restarting and operating the machine.
3. Never operate any of the controls from any position but seated in the operator's seat.
4. Be extra careful when going down steep grades.
5. Drive at a speed slow enough to insure safety and complete control, especially over rough terrain or steep grades.
6. Reduce ground speed when making a turn, going down hill or applying the brake.
7. Always operate the tractor in low range whenever on hills or steep inclines.
8. Never leave the tractor parked unattended on hills or steep inclines.
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 unless the transmission is in NEUTRAL and the brake is engaged and locked.
13. DO NOT OIL, GREASE OR ADJUST A TRACTOR WHEN THE ENGINE IS RUNNING.
14. Never refuel a tractor when the engine is running.
15. Do not smoke when refueling.
16. Never operate a tractor in a closed shed or garage.
17. Do not wear loose fitting clothing which may catch in the moving parts.
18. To prevent highway accidents, use red warning flags in the daytime and red warning lamps at night.
19. Always have PTO lever disengaged and the clutch brake pedal depressed and locked when parking or starting the tractor.
20. REMEMBER, A CAREFUL OPERATOR IS ALWAYS THE BEST INSURANCE AGAINST AN ACCIDENT.

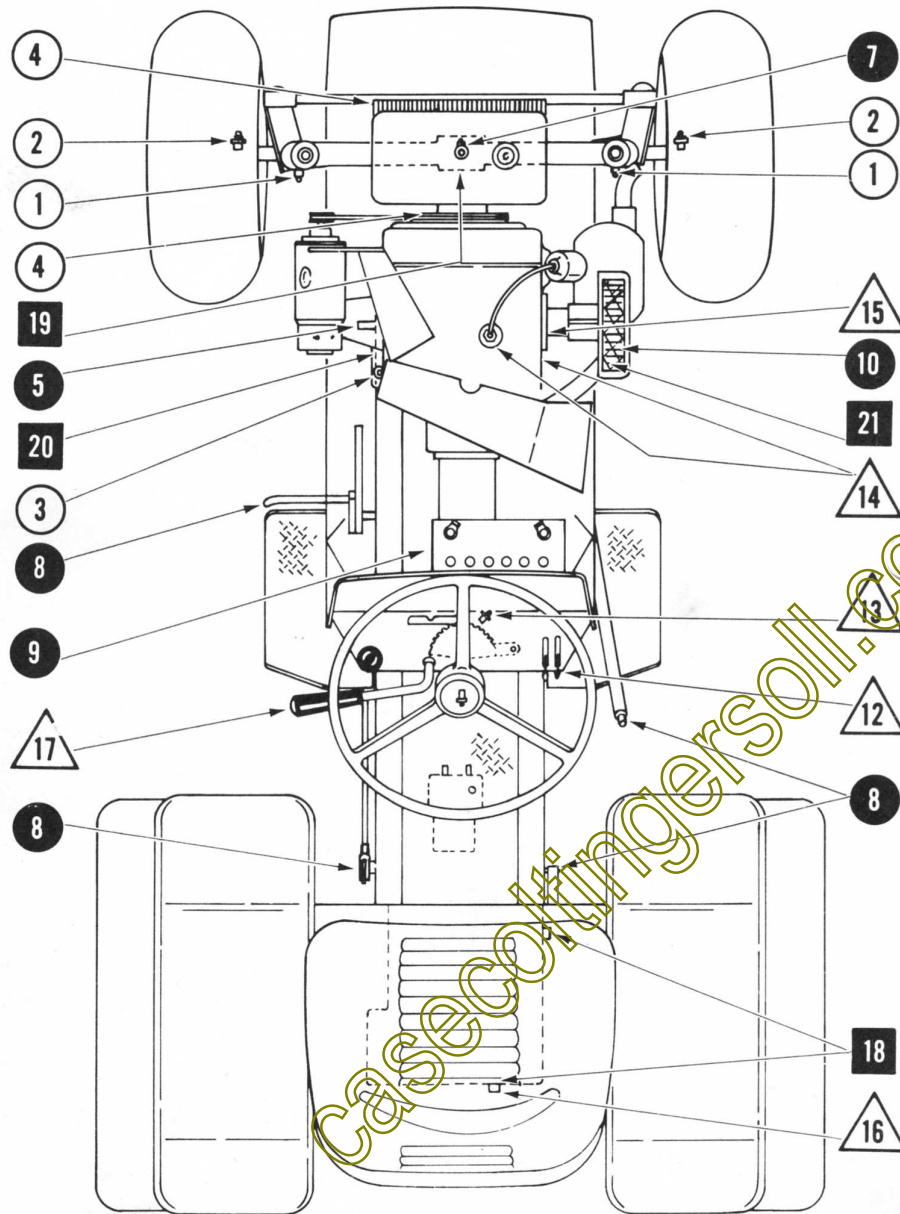


Figure 11.

REF. NO.	SERVICE POINTS	NO. OF POINTS	GREASE	DRAIN	CHECK	CLEAN	CHANGE	OIL (Few Drops)	FREQUENCY
1	Front Spindles (king pins)	2							5 HOURS OR DAILY
2	Front Wheel Bearings	2							
3	Engine Oil *	1							
4	Blower Air Intake Screen	1							
5	Engine Oil + (50 hrs. on 446)	2							25 HOURS OR WEEKLY
6	Air Leaks **	**							
7	Front Axle Pivot Pin	1							
8	Implement Lever and Brake Linkage	6							
9	Battery	1							50 HOURS OR MONTHLY
10	Air Cleaner ***	1							
11	Hydraulic Oil +	1							
12	Throttle and Choke Controls	2							
13	Steering Gear	3							500 HOURS OR YEARLY
14	Spark Plug° (100 hrs. on 446)	1							
15	Crankcase Breather *** (200 hrs. on 446)	1							
16	Transmission Oil +	1							
17	Travel and Lift Lever and Linkage	3							500 HOURS OR YEARLY
18	Transmission Oil +	2							
19	Hydraulic Oil +	1							
20	Engine Cooling Fins ***	1							
21	Air Cleaner Element ***	1							

*Keep oil level between marks on dipstick. Capacity 3 pts for Model 220, 222, 224 and 444; 4 pts for model 446. See page 13 for engine oil recommendations.

**Be sure there are no leaks between gaskets, joints at carburetor, air cleaner and cylinder block.

***More often in dusty conditions.

°Clean and regap.

+Hydraulic System: Use SAE 5W-20 Motor Oil in winter (below 32° F.) and SAE 20W-40 Motor Oil in summer. Use only oil which is rated at API engine service classification SE or CC. Prior service classifications for these oils were "MS" or "DM". Use SAE 20W-40 Motor Oil or SAE No. 80 EP Gear Lube in transmission the year around.

The hydraulic system reservoir is located under the hood ahead of the engine. Maintain oil level between two and three inches from the top of the filler opening. The drain plug is located on the bottom side of the travel valve.

Use number 1 gun grease (Lithium Base) for all pressure fittings (as many strokes as required).

ENGINE LUBRICATION

Selection of Lubricating Oil

It is extremely important that you select and use in your Case Tractor Engine a detergent type, high quality, SD or CC API Service Classification Oil for model 220, 222, 224 and 444.

Use SE or SE/CC API Service Classification Oil for model 446. Do not use Service DS oil. Do not mix brands nor grades of oil.

Engine Oil SAE Viscosity Rating

Model 220, 222, 224, & 444

SAE 30 or 20W-40 -----Air Temperatures 30° F and Above

SAE 10W-30 -----Air Temperatures 0° F to 30° F

SAE 5W-20 -----Air Temperatures 0° F or Below

Engine Oil SAE Viscosity Rating Model 446

SAE 5W-30 -----Air Temperatures 30° F or Below

SAE 30 -----Air Temperatures 30° F and Above

REGULAR OIL CHANGE

Drain and refill the crankcase at least every 25 hours of operation. (50 hours for model 446)

If possible, run engine just prior to changing oil--the oil will flow more freely and carry away a greater amount of contaminant when hot.

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.

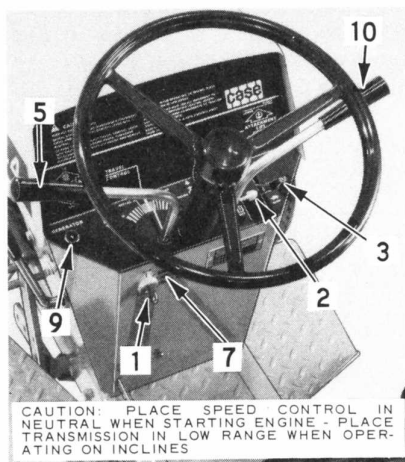
CRANKCASE OIL CHANGE

IMPORTANT

1. When the crankcase is drained, refill with 3 measured pints of oil for models 220, 222, 224, 444 and 4 measured pints of oil for model 446.
2. Operate the engine for a few minutes 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.



CAUTION: PLACE SPEED CONTROL IN NEUTRAL WHEN STARTING ENGINE - PLACE TRANSMISSION IN LOW RANGE WHEN OPERATING ON INCLINES

Figure 12.

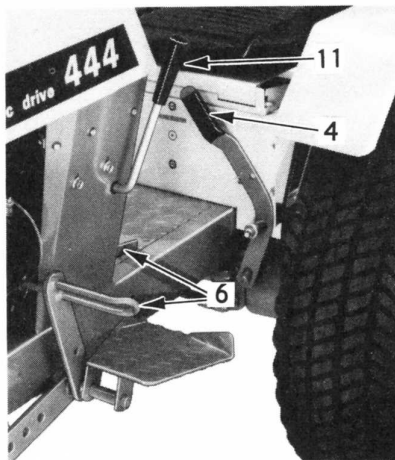


Figure 13.



DO NOT START THE ENGINE WITH THE PTO ENGAGED.

1. **IGNITION KEY AND STARTER SWITCH** - Turn the key to the right (Start) position to start the engine. When shutting the engine off, turn the key to the full "Off" (upright position).

2. **CHOKE** - To start a cold engine, push choke lever forward. Pull lever rearward when engine is started. Little or no choking is required if starting a warm engine.

3. **THROTTLE** - When the throttle lever is all the way rearward, the engine should be idling. To increase the engine RPM, push the lever forward until the desired throttle setting is obtained. As a general rule, set the throttle as low as possible to obtain maximum fuel economy but high enough to prevent engine lug-down or labor which will cause overheating.

NOTE When starting a cold engine in temperatures below 32° F, do not set the throttle more than 1/3 open and leave it run for a few minutes at this setting to allow the hydraulic system to warm up. When cold, the hydraulic system is noisier at higher engine RPM. The quickest way to warm up a cold hydraulic system is to position the High-Low Range Shift Lever in neutral and place the Travel Control Lever in Forward or Reverse to circulate the oil through the hydraulic motor.

4. HIGH - LOW RANGE SHIFT LEVER - When shifting into Low or High Range, make certain the lever is located past the neutral locking pin. Likewise, when shifting to neutral, the lever must be locked to the pin. Gear damage can result if the tractor is operated while the shift lever is not fully engaged beyond the locking pin.
5. TRAVEL "CUSHION" CONTROL LEVER - This single lever provides effortless and smooth "finger-tip Cushion Control" of speed and travel direction. Move the lever forward as desired to obtain either full speed ahead or to "creep" through heavy grass or deep snow. For reverse, simply move the lever rearward. Thus the tractor ground travel speed may be regulated independently of engine RPM.

NOTE The travel control lever quadrant has an anti over-run detent on each side of the neutral detent. See figure 14. Put the lever in these positions when a very slow speed is desired or when operating on an incline to prevent the tractor from over-riding the oil flow, and running away.

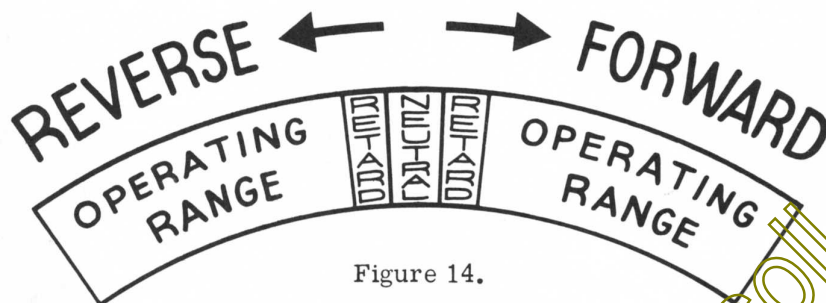
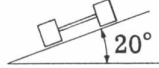
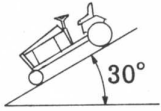


Figure 14.

NOTE The tractor is equipped with "Safety-Start" and cannot be started unless the Travel Control Lever is in the NEUTRAL position.

The Travel Control Lever automatically returns to neutral when the brake is applied.

6. BRAKING AND PARKING - The travel control lever (Fig. 14.) can also be used as a brake by returning it to the neutral position. On a level surface the tractor will come to a normal stop by returning the Travel Control Lever to neutral. If on a hill or if a fast stop is necessary, depress the brake pedal or move the travel control lever part way into the opposite direction. When getting off the tractor, always depress and lock the brake to prevent tractor movement.



Do not operate this tractor on grades steeper than 30°, forward or reverse, or 20° side slope. Always drive in a forward motion while proceeding down hill. If necessary, back up a slope to the desired position. Operate the tractor in low range on hills or inclines. Do not leave tractor parked unattended on hills unless the wheels are adequately blocked. Always lock the brake and turn off the engine when parking and leaving the tractor.

The travel control lever can be used in lieu of the brake pedal to control the tractor ground speed on hillside operation. Remember, however, that if the brake is applied the speed control lever will be automatically returned to neutral. Again, keep in mind that the travel lever can be moved into forward or reverse while your foot is still on the brake.

7. HEADLIGHTS - The headlights are turned on when the ignition key is turned to the "Light" position after the engine is started. Do not operate the headlights unless the engine is running and the Generator Warning Light is off.

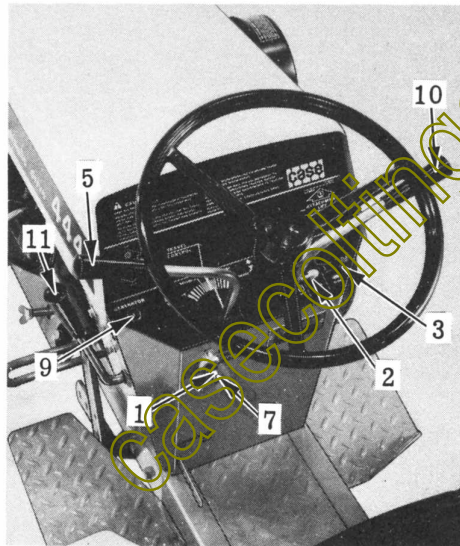


Figure 15.

8. AMMETER - 446 only - When the engine is started and running the ammeter will gradually fall back as the battery becomes charged. If a no charge or discharge rate is indicated with a freshly started engine or when operating with the lights on and engine above half throttle, stop the engine immediately and have the cause corrected.
9. GENERATOR WARNING LIGHT - 220 thru 444 - The Warning Light goes on when the key switch is turned on and should go off when the engine starts. If the warning light does not go off when the engine is running, it is an indication that the battery is discharging and the generator is not supplying current. STOP THE ENGINE AND CHECK FOR THE CAUSE.

NOTE If the Warning Light flickers when the engine is at low idle, the battery generator or regulator may not necessarily require servicing. However, if the Warning Light remains on when engine speed is increased, stop the engine immediately and have the cause corrected.

10. ATTACHMENT LIFT LEVER

MECHANICAL - Pull this lever to the rear until the catch engages to raise the attachment into transport position. Depress the button at the top of the lever to release and lower the attachment to operating position. A slight pulling pressure on the lever will permit the release button to be more easily depressed.

HYDRAULIC LIFT (Optional, except on Model 444 & 446) - The hydraulic lift lever has three operating positions. Pull the lever to the rear to raise the attachment into transport position. Push the lever ahead to operating position or to apply "down pressure". Moving the lever further ahead will keep the lever in a "hold" position allowing the attachment to "float". The "float" position is recommended for snow removal and tilling operations. "Down-pressure" can be used to advantage for dozing and ground leveling operations.

NOTE Refer to instructions furnished with each attachment for specific information covering lift lever operation.

11. ATTACHMENT DRIVE LEVER - As a Safety Start feature, this lever must be in the OFF position in order to start the tractor. Push the lever all the way forward to engage the attachment drive. To disengage the drive, pull the lever rearward.

RUN-IN PROCEDURE

Your new tractor should be subjected to a run-in period before it is operated at full load. Drive the tractor for approximately an hour to get the feel of operation. Actuate the travel control through its full range during the run-in period.

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'S OPERATION AND MAINTENANCE UNDERSTANDS THE IMPORTANCE OF CLEAN FUEL, OILS, CONTAINERS AND FUNNELS.
2. Check that all lubricating fittings are serviced as directed in the Lubrication Chart.
3. Check engine oil level and add as necessary.
4. Be sure that air cleaner, and blower air intake screen on engine are free of obstructions and excessive dirt.
5. Check that tractor fuel tank is filled with clean fuel that meets requirements listed under Fuel Specifications. Always wipe fuel tank cap clean before removing it. Be sure vent hole in fuel tank cap is open.
6. This tractor is equipped with a "safety start" feature. The Travel Control Lever must be in NEUTRAL and the Attachment Drive Lever must be OFF to start the engine.

STARTING PROCEDURE

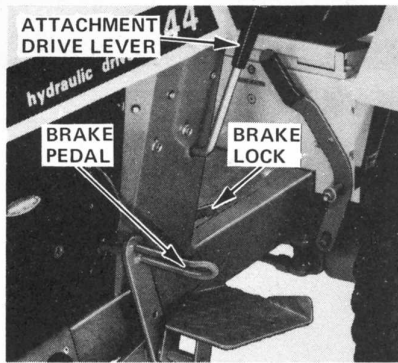


Figure 16.

1. Place the travel control lever in the NEUTRAL position. The "Safety-Start" feature prevents the engine from starting unless the travel control lever is in neutral and the Attachment Drive Lever is OFF.
2. Pull the attachment drive lever back to the OFF position.
4. Close the choke by pushing the control lever forward. More or less choking may be necessary due to variations in temperature, grade of fuel, etc. Little or no choking will be needed when engine is warm. In cold weather, it is advisable to position the throttle lever about one-third open.
5. Turn the starter key all the way to the right to start engine.

IMPORTANT DO NOT USE THE STARTER LONGER THAN 30 SECONDS WITHOUT INTERRUPTION. WAIT AT LEAST 3 MINUTES SO THE STARTER CAN COOL DOWN BETWEEN PERIODS OF USEAGE.

6. After the engine starts and runs, pull the choke control lever all the way rearward. Always allow engine and hydraulic system to warm up before applying a load. Release the brake pedal slowly after engine starts.

NOTE Under normal operating conditions it is recommended the throttle be set approximately 3/4 open. If operating under light load, the throttle can be set 1/2 open or less. For maximum economy, operate at a throttle setting which will perform the job without lugging or laboring and subsequent overheating of the engine.

STOPPING THE ENGINE

1. An engine that has been working under load should idle for a few minutes so the engine parts can cool evenly before it is shut off.
2. Turn starter key to "OFF" position.

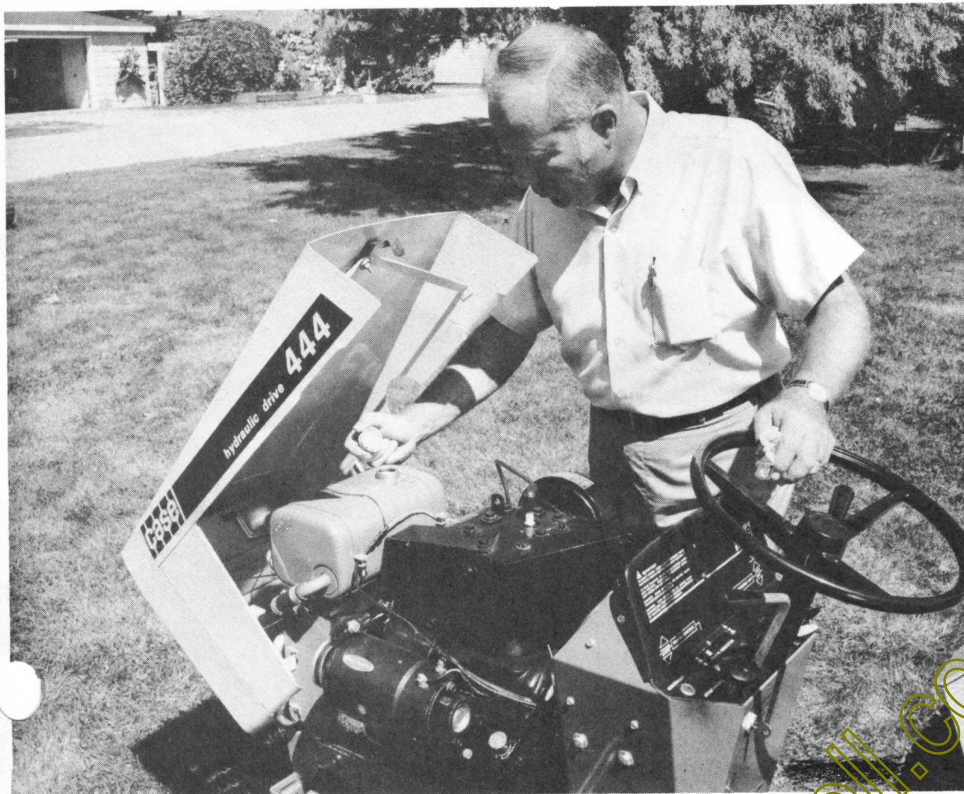


Figure 17.

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 Tractor.

BRAKE ADJUSTMENT

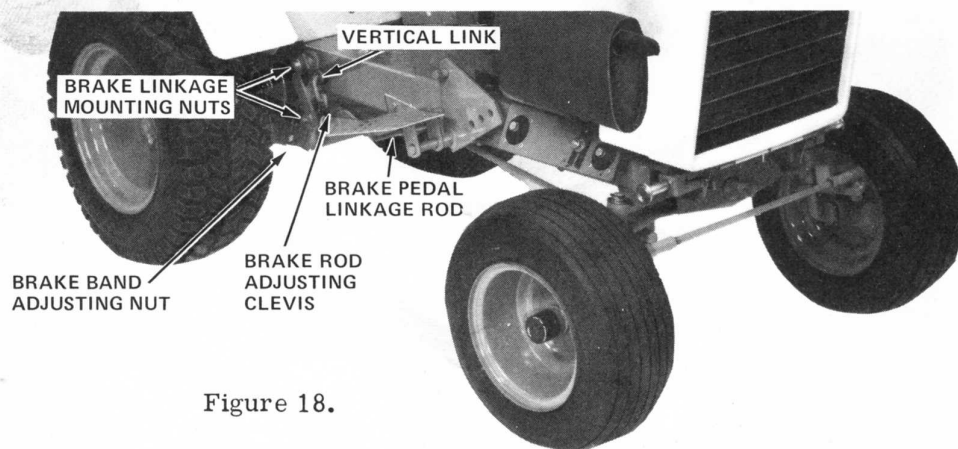


Figure 18.

The brake is properly adjusted when depressing the pedal brings the tractor to a prompt stop and when there is sufficient pedal travel to allow the spring to return the speed control lever from both the forward and reverse travel positions.

BRAKE ADJUSTMENT AND PROCEDURE -See Figures 18 & 19.

1. Tighten brake linkage mounting units to .010" to .015" clearance between washers and brake arm.
2. Disconnect brake pedal linkage rod at vertical link.
3. Tighten brake band adjusting nut to the point where the tractor can not be pushed with transaxle in neutral, then back it off 1-1/2 turns.

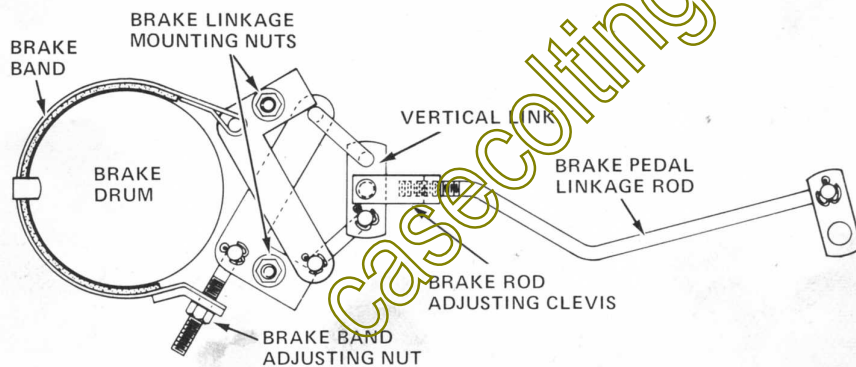


Figure 19.

4. Hold brake vertical link in the vertical position and push to rear until all slack is taken out of linkage. Then with brake pedal in full release position turn clevis in or out on brake pedal linkage rod until holes in clevis line up with hole in brake vertical link and pin slips through freely.
5. Oil all pivot points.

MAIN TRAVEL SPOOL ADJUSTMENT

The travel spool is in proper adjustment when the spool is in the middle of its travel from snap ring to snap ring with the travel lever in its neutral detent.

ADJUSTMENT PROCEDURE

1. Place travel lever in neutral detent.
2. To adjust spool position, first loosen locknut at sleeve end of linkage rod.
3. Then turn sleeve on or off rod until there is the same distance from front of valve casting to front snapring as there is from the rear of the valve casting to the rear snap ring.
4. Hold sleeve in position and tighten locknut.

To check for proper spool adjustment, start tractor and move travel lever until the tractor just starts to move forward. Observe the position of the travel indicator with respect to the neutral position. Do the same thing in reverse. The tractor should start to move in both directions with the same amount of travel in either direction from neutral.

This tractor is equipped with an automatic return to neutral feature which works in conjunction with the brake.

The return to neutral linkage is adjusted properly when depressing the brake pedal brings the tractor to a prompt stop and when the spring returns the travel lever to neutral from both forward and reverse travel positions.

RETURN TO NEUTRAL ADJUSTMENT PROCEDURE

1. Be sure travel spool linkage is adjusted according to procedure above.
2. Be sure brake linkage is adjusted according to procedure on page 21.

3. If travel lever returns all the way from forward but not from reverse, turn adjusting nuts to move spring to right, toward center of tractor.
4. If the travel lever returns all the way from reverse, but not from forward, turn adjusting nuts to move spring to left.

AIR CLEANER

Remove and clean element after each 25 hours or weekly. Install new element every 500 hours or yearly or when loss of power is noticeable.

Tap element lightly on a flat surface to cause the loose dirt to fall off. Handle the element with care to avoid damage.

Replace the element with a new one if dirt does not drop off easily or if it is damaged. When replacing the element, be sure it fits snugly around the inside edge of the air cleaner base. Then replace the cover and tighten the wing nut finger tight.

An optional precleaner, Case part number KO237421, is available and will extend the life of the air cleaner element.

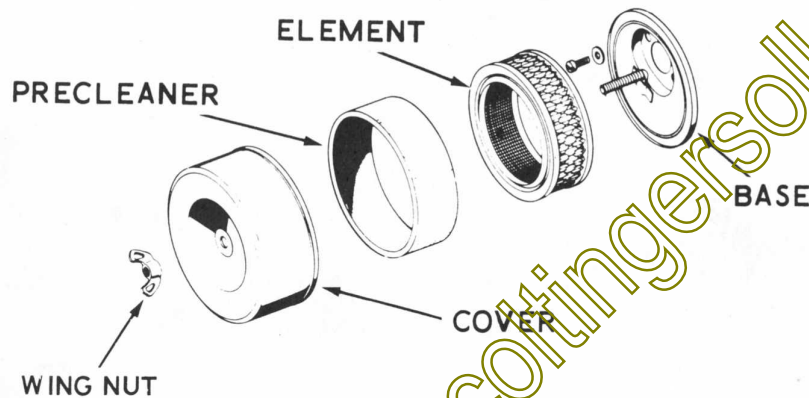


Figure 20

CARBURETOR ADJUSTMENTS Models 22, 220, 224 & 444

The carburetor has three simple adjustments:

1. High Speed Mixture Adjustment
2. Idle Mixture Adjustment
3. Idle Speed Adjustment

High Speed Adjustment

NOTE Turn the high speed adjusting screw counterclockwise approximately 2 turns from the closed position.

With engine running and throttle fully open, adjust the high speed screw, Figure 21, by turning the adjusting screw clockwise (in) until the engine misfires or falls off; then turn the adjusting screw counterclockwise (out) until the engine runs smoothly.

Place the tractor under load and observe how the engine handles the load. Loss of power, tendency to stall, or excessive backfiring all indicate a lean mixture. Turn adjusting screw counterclockwise not more than 1/8 of a turn and again try the engine performance. When the high speed screw is correctly adjusted, it will not be necessary to reset the carburetor unless load conditions of fuel quality have been radically changed.

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

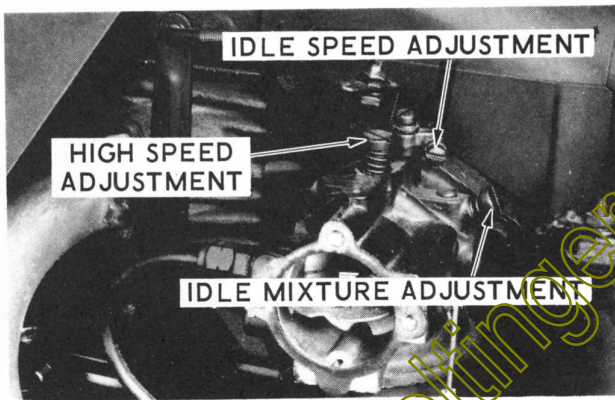


Figure 21.

Idling Speed and Idling Mixture Adjustment

Turn the idle mixture screw, Figure 21, counterclockwise approximately 1-1/4 turns from the closed position. Place the throttle in 1/2 open position and start engine. With the throttle all the way up, turn the idle speed adjusting screw, Figure 21, until 1000 RPM is obtained. The idle mixture screw can be adjusted in or out until the engine runs smoothly while maintaining 1000 RPM with the idle speed adjusting screw.

CARBURETOR ADJUSTMENTS Model 466

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The carburetor has a main fuel (high speed) adjustment and a idle fuel adjustment. The main adjustment affects operation under heavy load conditions. Idle adjustment affects operation under light or no load conditions. Under normal circumstances, factory carburetor adjustments should not be disturbed. If the adjustments have been disturbed, turn needles off their seats, $7/8$ to $1-1/8$ turns to permit starting. Then, readjust them for smooth operation.

IMPORTANT

Forcing the needle against its seat will damage it. The needle does not completely shut off fuel when turned fully in.

Before final adjustment, allow the engine to warm up. Make the idle adjustment under no load. Open the main jet until the engine runs smooth under acceleration with no load. Slightly more fuel may be needed (open about $1/4$ turn further) when sudden load is applied.

Set the throttle stop screw (located on carburetor throttle lever) with no load connected and while running at a low speed setting. Turn the screw to give approximately $1/32$ inch clearance between the screw and pin.

If the engine develops a "hunting" condition (alternate increase and decrease of engine speed), try correcting by opening the main adjusting needle a little more. Do not open more than $1/2$ turn beyond the maximum point of power.

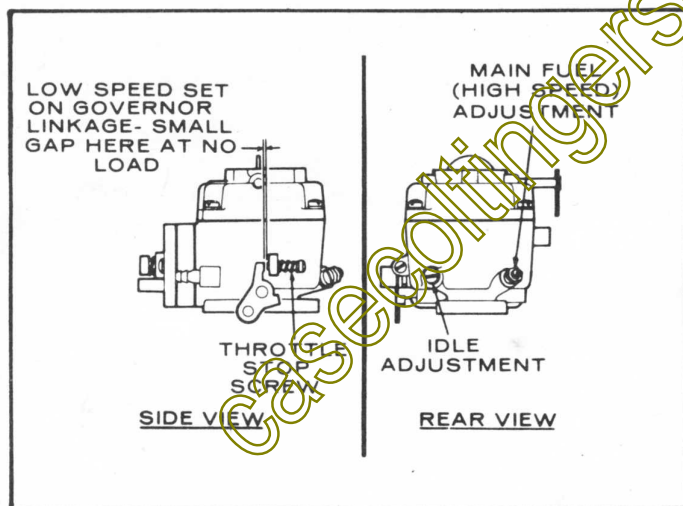


Figure 22.

The type spark plug provided in your engine is listed as medium in the spark plug heat range chart - Prestolite 14 L4 or equivalent for 446. Prestolite L7 or equivalent for 220, 222, 224, and 444.

Shank Length ----- 7/16"
Thread Size ----- 14 MM
Gap Setting ----- .025 Inch

NOTE

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

The spark plug plays a very important part in the power, fuel economy and general performance of your engine. The outside of the plug should be cleaned frequently to prevent shorting of the plug.

The spark plug should be removed, checked, cleaned and gapped at the end of every 100 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 plug, including the threads. Check the electrode gap using a .025 inch gauge. A very slight drag should be felt when the gauge wire passes between the electrodes.

Reset the gap by bending the side electrode only. Never bend the center electrode.

Installing

Install the spark plug, with a new gasket, in the engine and seat the plug on the gasket, finger tight. Tighten the plug about 3/4 of a turn after the plug is seated firmly on its gasket. If a torque wrench is available, tighten the plug to 27 foot-pounds. This will assure proper seating and sealing of the spark plug.

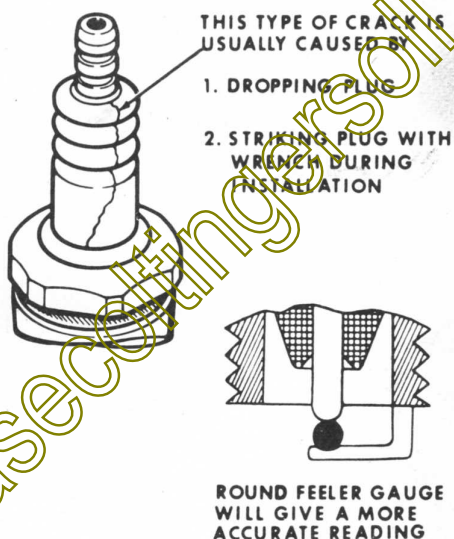


Figure 23.

Steering Adjustment

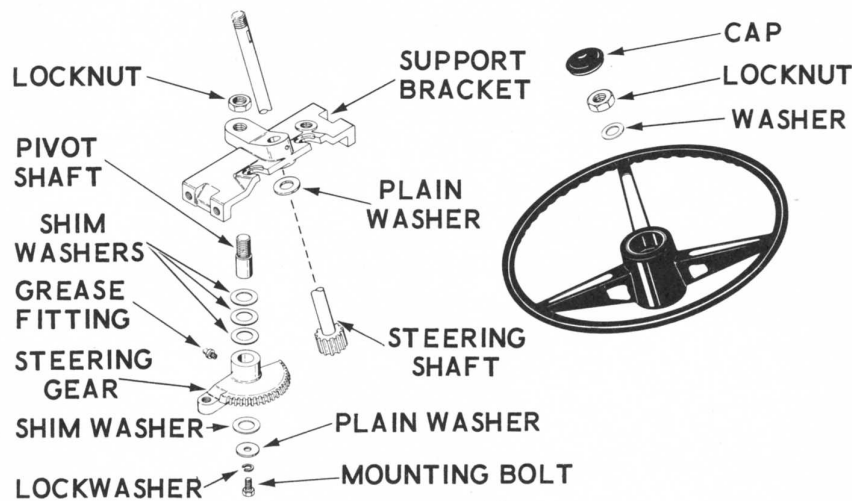


Figure 24.

IMPORTANT Excessive steering wheel free play may not require gear adjustment as covered below. First check to make certain all ball joints on the drag link and tie rods are tight.

The tractor is designed with two or more shim washers between the steering gear and support bracket as illustrated in Figure 24. As the gear teeth wear in, additional steering wheel free play may occur. If the free play becomes excessive, one (more if necessary) of the shims can be relocated to the bottom side of the steering gear.

NOTE First make certain there is not excessive end play on the steering shaft. Tighten steering wheel locknut to remove excessive end play without causing binding.

Disconnect the drag link from the steering gear. Remove the mounting bolt, lockwasher and plain washer (shims also if present) from the base of the pivot shaft. Slip the steering gear and one of the shim washers off the pivot shaft. Place the gear back on the pivot shaft and secure with the original mounting bolt, lockwasher, plain washer, shim(s) plus the shim removed from the upper side. The total number of shim washers must remain the same.



Make certain that some free play remains since a tight fit with no clearance between the two gears may cause binding and possible tooth failure.

Always coat all gear teeth with grease each time the two steering fittings are lubricated or at least each 50 hours operation.

1. Locate the tractor on a hard level surface preferably concrete. Place front wheels in a straight ahead position.
2. Make sure the front tire pressures are equal.
3. The front tires should show a mold part-line which coincides with the centerline of the tire. If the centerline of the tire is not readily visible then the wheel can be raised off the ground, spun and marked at the approximate centerline location.
4. Measure the distance between the tire center lines or the chalk marks.

MEASUREMENT A MUST BE $1/8$ TO $3/8$ -INCH LESS THAN MEASUREMENT B. BOTH MEASUREMENTS - FRONT AND REAR MUST BE TAKEN AT SPINDLE HEIGHT ABOVE THE FLOOR.

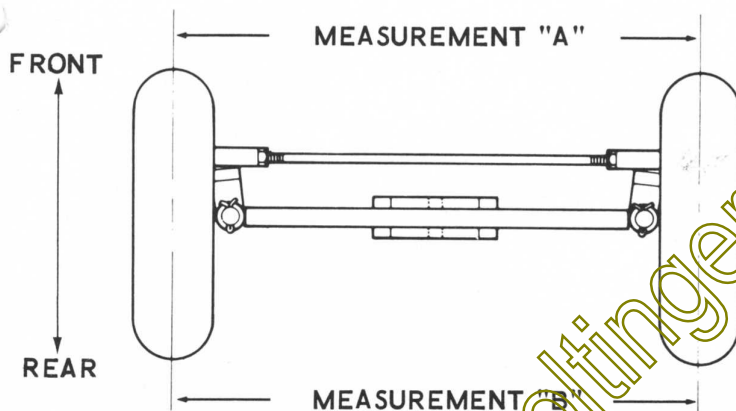


Figure 25.

1. Loosen both tie rod joints.
2. Turn both joints on or off the tie rod an equal amount. Retighten the joints when correct toe-in is obtained. Turning the joints on the tie rod increases the toe-in. Turning the joints off the tie rod decreases the toe-in.

ELECTRICAL SYSTEM

Headlights

To install a new Case 12 volt replacement headlight bulb, loosen the Retainer Screws and with the hood raised turn the Retainers off the Receptacle. Carefully lift the Receptacle off the Lens. Remove the old bulb by pushing inward and turning it counter-clockwise. Install the new Case bulb and replace the receptacle making certain one gasket is located between the lens and grille and the other is properly seated between the lens and receptacle.

NOTE The new bulb will not light unless the receptacle is re-installed or manually grounded to a metal part on the tractor.

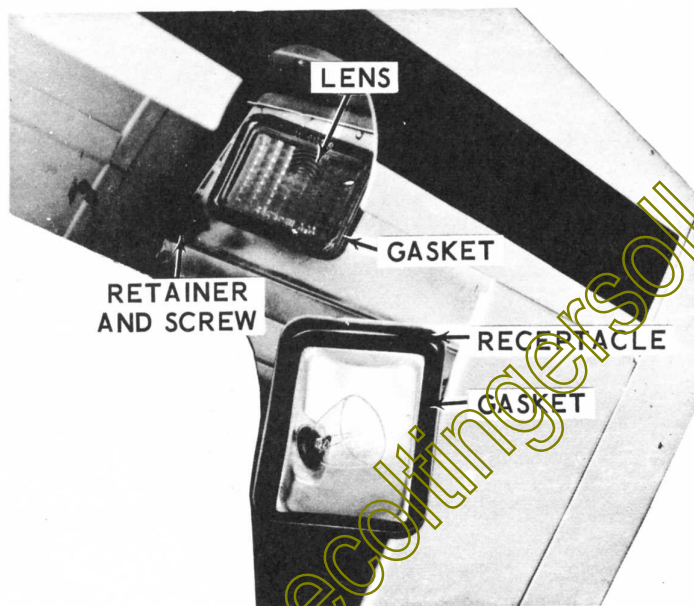


Figure 26.

After installing the new unit, make sure all the connections are tight.

STORAGE BATTERY



When working around a storage battery, remember all of its exposed metal parts are "live". Never lay a metal object across the terminals as spark or short circuit may result. Sparks, lighted matches and exposed flames must be kept away due to the presence of explosive gas in the battery.

The liquid in the battery is acid. Use care not to spill it on hands or clothing.

Rules for Battery Care

1. Add pure or distilled water, as needed, to keep the separators covered. Check every 25 hours or weekly depending on air temperature. Normal water consumption would be approximately 1 ounce every 25 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 in a healthy state of charge as shown by hydrometer readings.
3. Make sure the battery is securely fastened in position. Cable leading from the battery should not touch cell connectors or lay on the battery container.
4. Keep the battery clean and dry.

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

IMPORTANT

The full charge gravity reading will usually be specified on the battery. A battery having a reading of 1.175 will freeze at approximately 0° Fahrenheit temperature.

Adding Water

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

When water is added during freezing weather, the battery must receive a charge immediately to mix the water and electrolyte. If 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. Add water before the tops of the separators become exposed. DO NOT OVERFILL.

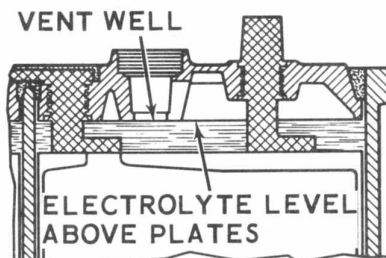


Figure 27.

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 breaking the sealing or the container.

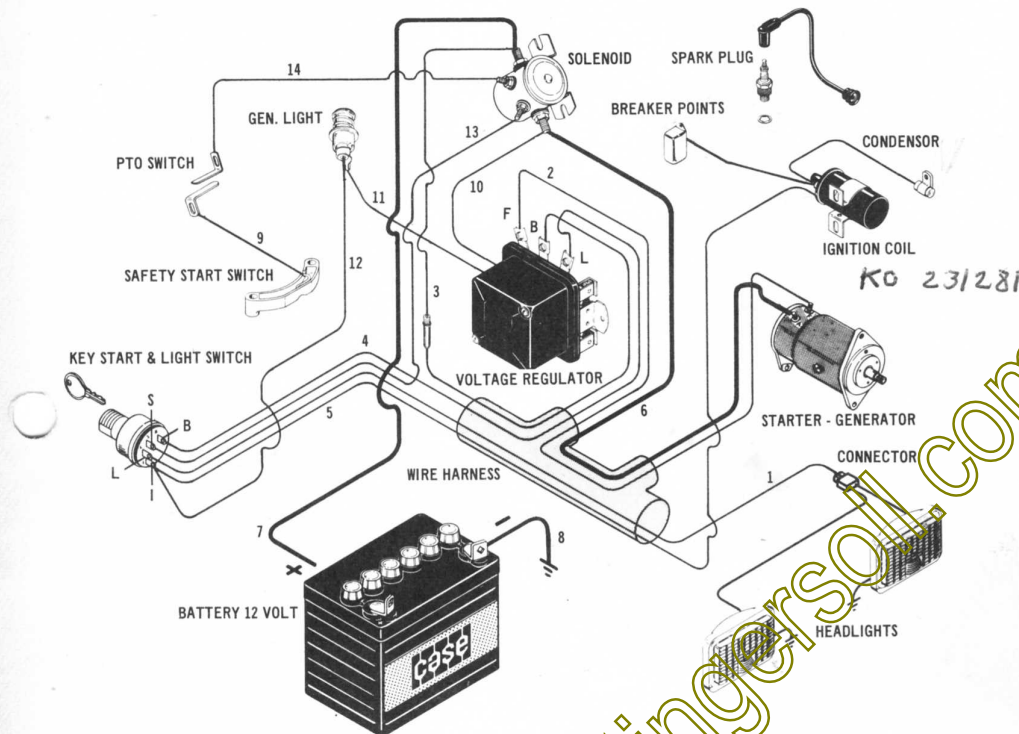
Cable Terminals and Battery Posts

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 vaseline or light cup grease will retard further corrosion.

Idle Battery

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

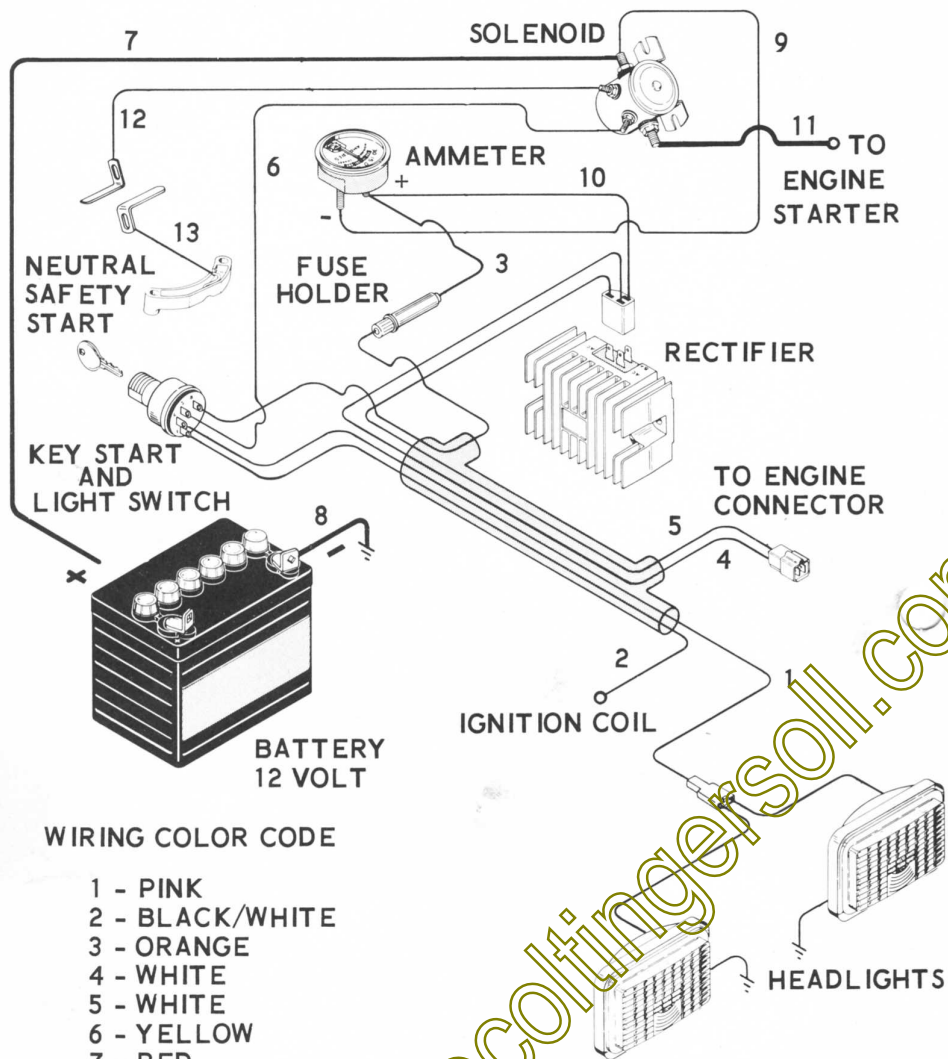
WIRING DIAGRAM (FOR KOHLER ELECTRICAL SYSTEM)



WIRE ROUTING AND COLOR CODE

- | | |
|-----------------|-------------|
| 1 - PINK | 8 - BLACK |
| 2 - GREEN | 9 - BLACK |
| 3 - ORANGE | 10 - WHITE |
| 4 - RED | 11 - WHITE |
| 5 - BLACK/WHITE | 12 - PURPLE |
| 6 - BLACK | 13 - YELLOW |
| 7 - RED | 14 - BLACK |

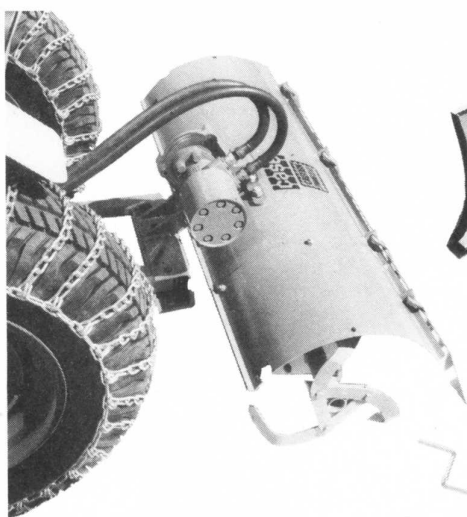
WIRING DIAGRAM (FOR ONAN ELECTRICAL SYSTEM)



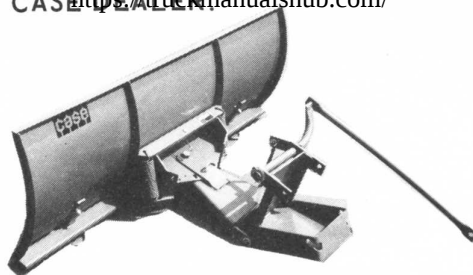
WIRING COLOR CODE

- 1 - PINK
- 2 - BLACK/WHITE
- 3 - ORANGE
- 4 - WHITE
- 5 - WHITE
- 6 - YELLOW
- 7 - RED
- 8 - BLACK
- 9 - WHITE
- 10 - RED
- 11 - BLACK
- 12 - BLACK
- 13 - BLACK

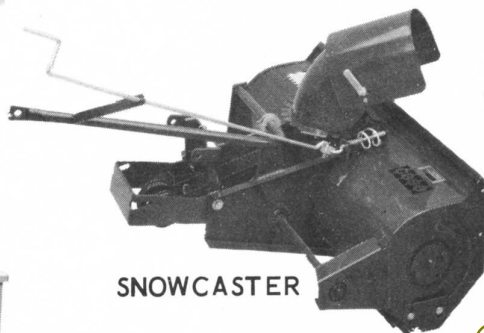
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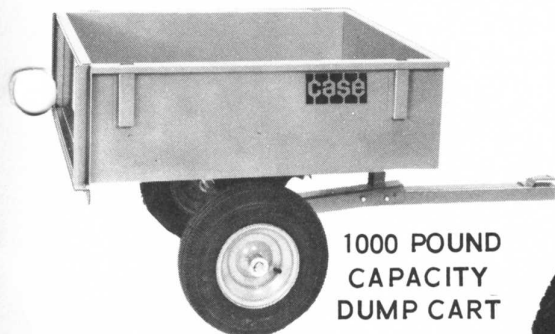
HYDRAULIC DRIVE TILLER



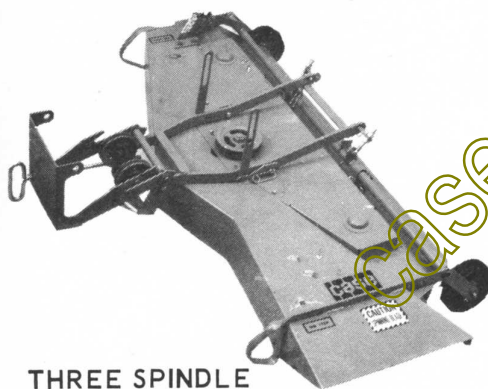
DOZER AND SNOW BLADE
WITH SPRING TRIP



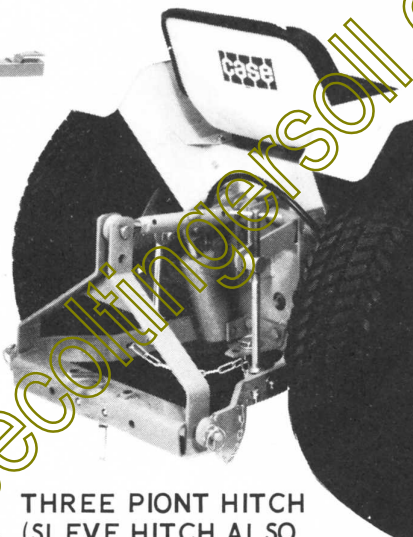
SNOWCASTER



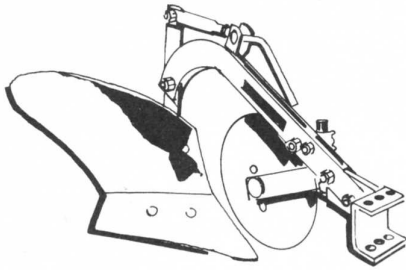
1000 POUND
CAPACITY
DUMP CART



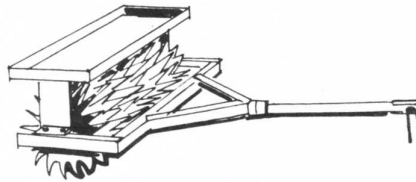
THREE SPINDLE
ROTARY MOWER



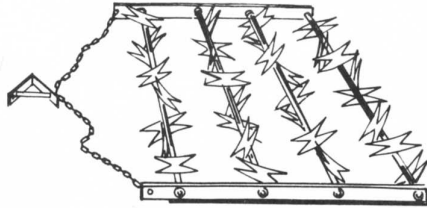
THREE POINT HITCH
(SLEEVE HITCH ALSO
AVAILABLE)



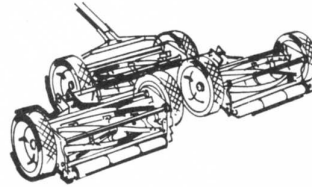
PLOW



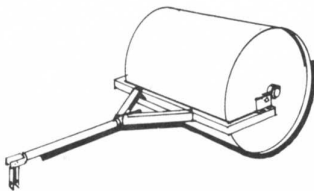
SPIKER AERATOR



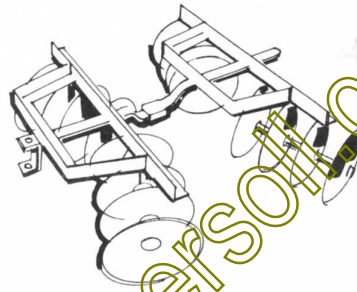
SPIKE HARROW



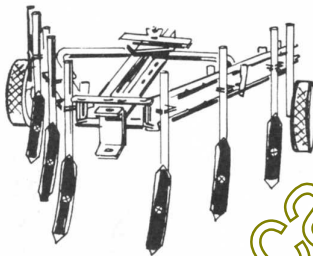
REEL MOWER



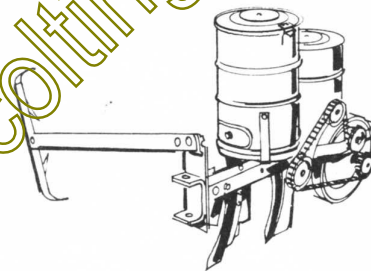
ROLLER



DISC HARROW



SPRING HARROW



PLANTER-FERTILIZER

**MANY OTHER USEFUL ATTACHMENTS ARE
AVAILABLE THROUGH YOUR J I CASE DEALER.**

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NOTICE

At the time your Case Dealer delivers your new tractor, he will acquaint you with its operation and maintenance as outlined in the "Delivery Procedure and Warranty Registration". When your Dealer has completed these instructions, he will ask you to sign the report and will then hand you a copy for your records.

NOTE

The "Delivery Procedure and Warranty Registration" also contains a record of the Pre-Delivery Checkup which your Dealer made on your tractor.

A factory completed Quality Audit just prior to crating is further assurance that your new tractor has been manufactured and tested to the highest possible standards and is ready to provide you with long, trouble free service. The Quality Control Department copy of the Certificate of Quality is packed with the tractor.

AFTER DELIVERY CHECKUP

The Authorized Case Dealer from whom you purchased your new tractor will perform the "After Delivery Checkup" outlined on the following page, if you will arrange to bring your tractor to his Service Shop within - - -

60 days after date of delivery or 100 hours of operation (whichever occurs first).

NOTE

The only charge your dealer will make for this inspection will be for oil, filter, or other accessories.

ALL NEW CASE PRODUCTS ARE SOLD
SUBJECT TO THE FOLLOWING WARRANTY

The J I Case Company, hereinafter called Company, warrants new Case products to its Authorized Dealers and they, in turn, warrant said products to the Original Purchaser as follows: That for a period of twelve (12) consecutive months from date of delivery of a new Case product to the Original Purchaser (except stationary engine power units, which are warranted for three (3) consecutive months from date of delivery). Selling Dealer will repair or replace at Dealer's business location each part of said product which is proven to the satisfaction of the Company to have been defective in material or workmanship. (It is understood that Purchaser will pay Dealer for travel time and expense if purchaser chooses to have Dealer repair said product at another location.) This warranty shall not apply to any part of said product which, in the judgment of the Dealer or the Company, has been subjected to misuse, negligence, alteration, or accident, or which has served its normal wear life. In no event shall Dealer or Company be liable for consequential damage of any kind or nature. Dealer and Company make no warranty whatsoever with respect to tires and tubes, injection equipment or trade accessories not manufactured by the Company, although these items may be warranted by their respective manufacturers.

The placing upon any Case product of any attachment or equipment not manufactured and sold by the Company, or authorized by it, shall operate to void and waive any warranty whatsoever by the Dealer and Company. This warranty is in lieu of all other warranties and conditions, express, implied, or statutory, and all other obligations or liabilities on the part of the Dealer and Company. No representative of the Company has authority to change the terms of this Warranty in any manner whatsoever and no assistance to Purchaser by the Dealer or Company in the repair or operation of the Case product shall constitute a waiver of the conditions of this warranty, nor shall such assistance extend or revive it. This warranty does not apply to used or second-hand machines.

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