Cletrac
Crawler Tractors

2539-4826

OPERATORS
INSTRUCTION BOOK
FOR
CLETRAC "20C"

BEGINNING TRACTOR
SERIAL No. 12000

THE CLEVELAND TRACTOR COMPANY
CLEVELAND, OHIO, U. S. A.

Cletrac
Crawler Tractors

"Cletrac"—a trade-mark registered thruout the world—designates the crawler type tractor built and sold by The Cleveland Tractor Company.

This name was originated by combining "Cle"—the first three letters in the word Cleveland with "trac" the first four of the word tractor—resulting in "Cletrac."

WARRANTY

It is understood and agreed that Cletracs are sold subject to the warranty printed below and no other warranty or guarantee is given.

The manufacturer warrants each new Cletrac manufactured by it and sold hereunder, to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory or at some other place designated by the manufacturer, any part or parts thereof which shall within six months after delivery of such tractor to the original purchaser be returned to it, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been defective, this warranty being expressly in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on its part, and the manufacturer neither assumes nor authorizes any other person to assume for it, any other liability in connection with the sale of its Cletracs.

It is distinctly understood, however, that the manufacturer's warranty does not obligate it to bear the cost of labor in the replacement of defective parts.

This warranty shall not apply to any Cletrac which shall have been repaired or altered outside of the manufacturer's factory in any way so as, in its judgment, to affect the stability or the reliability of such Cletracs, nor to any Cletrac which has been subject to misuse, negligence, or accident, nor to any Cletrac which shall have been loaded beyond the factory rated load capacity. The manufacturer makes no warranty whatever in respect to trade accessories, inasmuch as they are usually warranted separately by their manufacturers.

THE CLEVELAND TRACTOR CO.
Cleveland, Ohio
U. S. A.

 Printed in U. S. A.

INDEX

INTRODUCTION

Certificate of Delivery—Each Cletrac is given a rigid operating test and final inspection at the factory before shipment and also a thoro service inspection by the Distributor before delivery to Purchaser.

The Certificate of Delivery, which includes information pertaining to the tractor and accessories, special equipment, class of work, name and address of purchaser, etc., is the basis of the Service History Record maintained by the Home Office.

Instructions for Operation and Care—Altho the Cletrac is simple to operate and care for, it is important that the operator be thoroly instructed, at the time of delivery, in the proper use and care of the tractor. This is part of the Distributor's Delivery Service.

A metal maintenance instruction plate covering general instructions, is attached to every Cletrac. Complete instructions regarding daily care and maintenance of the Cletrac are found in this book. It should be thoroly studied by the operator before attempting to drive the Cletrac, and should be referred to when in doubt.

The manner in which tractor is operated and cared for during the first 100 Working Hours, determines its future life, freedom from unnecessary troubles, delays, etc. The duty of every operator placed in charge of a tractor is to strictly adhere to instructions received when machine is delivered and to the instructions in this book.

Where capitalized words, such as "TRACK", "COOLING SYSTEM", etc., appear in this book, they are key words to subjects in another part of the book and should be referred to for detailed instructions.

Whenever the word **"right"** or **"left"** is used to designate direction, it refers to the right hand side or left hand side of tractor as viewed from driver's seat looking toward radiator.

Any problem which may arise regarding proper care and maintenance of the Cletrac should be referred immediately to the service department of the Cletrac Distributor.

Lubrication and Maintenance—Proper lubrication and maintenance is essential to satisfactory performance. Follow the LUBRICATION SCHEDULE shown in the front part of this book.

At least once each month make a thoro check of the entire tractor and occasionally have a complete **Service Inspection** made by the Cletrac Distributor who will call attention to any repairs or adjustments needed at that time or in the near future. By advising with the operator concerning certain features of operation or lack of care, the Distributor may save the Owner considerable time and expense due to breakdowns.

Dirt is your worst enemy. Before removing inspection covers, plugs, etc., from any part of the tractor, thoroly clean all dirt away from these parts. Keep oil and grease containers clean and well covered when not in use. Do not allow dust to blow into them. Keep end of pump covered when not in use.

Keep all bolts, nuts and connections tight at all times.

ORDERING NEW PARTS

When ordering replacement parts and in all communications, specify **Engine No.** and **Model**, together with **Tractor Serial No.** and **Model.**

Always give **Part No.** as shown in Parts Book and, as a check on accuracy, give **Part Name** also. Whenever possible, refer to photographs and numbered descriptions which accompany them.

A few minutes care in writing your order may save many delays and extra expense due to shipment of wrong part.

ENGINE SERIAL PLATE ON LEFT SIDE OF ENGINE

TRACTOR SERIAL PLATE ON RIGHT HAND END OF FUEL TANK

SPECIFICATIONS - MODEL 20C

Engine—4 cylinder, L-Head, water-cooled by gear driven pump. Bore 4"—Stroke 4½". Firing Order 1-2-4-3. R.P.M. 1250. Main Bearings—3, dia. 2". Camshaft Bearings—4. Lubrication—Force feed to main and connecting rod bearings and timing gears; splash feed to camshaft, cylinder walls, pistons and wrist pins.

Carburetor—1⅛". Diaphragm Fuel Pump. Full-flow Oil Filter. Magneto Ignition. Flyball Governor. Oil spray Air Cleaner.

Fuel—Gasoline. (In countries where gasoline is not available, or its price unduly high compared with other fuels, Kerosene can be used.) Consult the Cletrac Distributor regarding its use. Fuel Tank Capacity—18 gallons.

Cooling System—Capacity 4 gallons. Tubular Radiator. 4-blade Fan. V-type belt.

Clutch—Double Plate—10" diameter.

Tractor Speeds at 1250 R.P.M.

Low Gear	1.95 M.P.H.
Intermediate Gear	2.8 M.P.H.
High Gear	4.0 M.P.H.
Reverse Gear	1.83 M.P.H.

General Dimensions—Length over-all—106". Width over-all—53½". Height at Radiator—52½". Height at Drawbar—12¾". Clearance—13½". Center to center of tracks—40". Weight—6000 pounds, approximately.

Turning Radius—6½ feet.

Tracks—Standard width shoe plates—11".

Horsepower (approximate) — 23 Maximum Drawbar, 27 Maximum Belt. 18 Rated Drawbar, 25 Rated Belt. Engine N.A.C.C. rating—26.6 H.P.

Drawbar Pull—Low Gear—4800 Lbs. Intermediate Gear—3250 Lbs. High Gear—2100 Lbs. (Corrected to sea level.)

Power Pulley—10½" diameter, 6½" face. Operates at 1040 R.P.M. with belt speed of 2860 feet per minute when engine speed is 1250 R.P.M.

Power Reduction—Shaft—1⅜" A.S.A.E. Standard 6-B Spline. Operates at 550 R.P.M. when engine speed is 1250 R.P.M.

Rear Power Take-Off—Shaft—1⅜" A.S.A.E. Standard 6-B Spline. Operates at 833 R.P.M. when engine speed is 1250 R.P.M.

LUBRICATION SYSTEM

Engine—The oil pump, driven by camshaft, and provided with pressure regulating valve, is mounted on center web of crankcase. Oil is circulated from pump, thru tubing to oil filter, then to main and connecting rod bearings and to timing gears. Oil is sprayed to cylinder walls, tappets, valves and camshaft bearings.

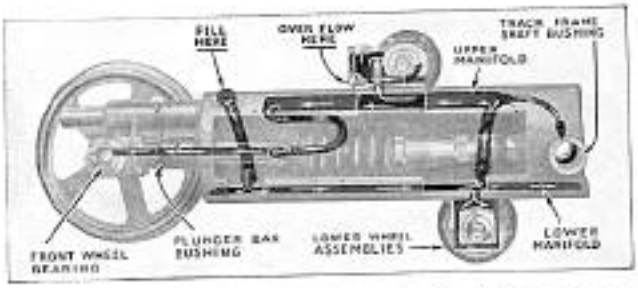
Clutch—Pilot bearing is lubricated thru felt in rear of crankshaft.

Release bearing is lubricated, thru tube, by grease cup on side of clutch compartment.

Transmission—Transmission, differential and final drive compartments have different lubricant levels, maintained by overflow holes in each compartment wall. Lubricant is supplied to all compartments thru breather pipe in transmission cover and kept in circulation by pump which lifts lubricant from final drive compartments and discharges it into transmission and differential compartments.

Correct levels are reached when lubricant begins to flow from level testing holes in final drive compartments.

Track Wheel System—Upper, lower and front wheel bearings are continuously lubricated by the "Pressure Gravity" system. Lubricant is supplied to entire system thru filler at front of each track frame.



From this point, lubricant is forced directly to lower manifold into lower wheel assemblies. As more lubricant is added, it is forced thru tube to upper manifold where the flow divides, part going thru tube and felt to track frame shaft bushings and part to front wheel bearing thru tube connected to rifled hole in plunger bar. Plunger bar bushing is lubricated thru hole drilled at right angles into rifled hole.

Continued filling raises level of lubricant thru stand pipe to reservoir in upper wheel assembly, supplying continuous lubrication to upper wheel bearing.

When all passageways are completely filled, the lubricant will overflow from vent in upper wheel bearing.

Always fill system until lubricant overflows.

Operation in Deep Mud or Water—When tractor is being operated in deep mud or water **keep track wheel system filled and check it every hour.** Clean tractor thoroly after removing from these conditions.

LUBRICANTS

Proper functioning of the lubrication system depends upon the use of correct lubricants and the proper application of them. Lubricants must be of such body and character that they will be circulated and distributed to all working parts under the various temperature conditions encountered in service.

Determining the correct grade of lubricant for any purpose depends upon different features of design, operating conditions, and qualities of the lubricant.

Lubrication Recommendations—We recommend the use of the best lubricants obtainable. When selecting the proper quality and grade lubricants for use in the various units of the Cletrac, refer to the booklet "Lubrication Recommendations" furnished with tractor.

The various grades tabulated in this booklet have been carefully selected by the national oil refiners and distributors listed, as correct for use in Cletracs, under the temperature conditions stated.

Adherence to these recommendations, and to the instructions in this book, will result in satisfactory service and reduce natural wear to a minimum.

Deterioration due to Dilution—Even the best lubricant deteriorates in service. Crankcase oil becomes diluted with unvaporized fuel. This in turn weakens the piston seal, permits "blow-by", loss of compression and overheating and increases the rate of dilution. Sometimes dilution is rapid enough to compensate for normal oil consumption and gives a false impression when reading oil level. Therefore **change regularly.**

Never flush crankcase with kerosene, as some will always remain in oil lines and oil pan and dilute the new oil. Use light engine oil for flushing.

Cause of Sludge—Sludge is the name given the thick pasty mass which forms on inner walls and bottom of crankcase, transmission and differential compartments and in the track wheel system.

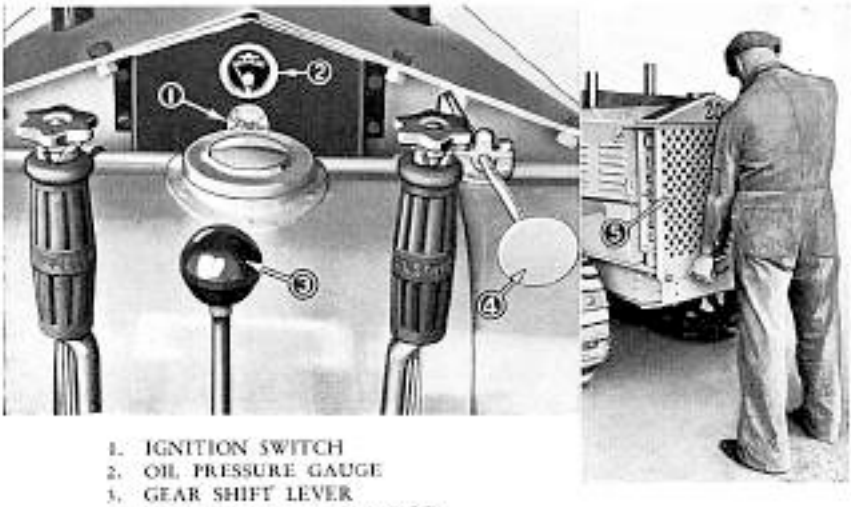
Sludge is caused by contamination of the lubricant with dust and dirt drawn in thru dirty or dry BREATHERS and AIR CLEANER, sediment particles resulting from metallic wear, dirt in oil and grease containers, carbon particles from cylinders, and condensation of moisture in crankcase and rear compartments.

During cold weather, the steam which is present in the exhaust gases that escape past the piston rings and the moisture in the air entering the crankcase and rear compartments thru the breathers, condenses. The resulting water, when mixed with the lubricant, forms a sludge which clogs the OIL SCREEN, OIL FILTER, and passages.

Therefore **drain frequently.**

STARTING THE ENGINE

1. Make sure AIR CLEANER and all BREATHERS have received proper care.
2. Check OIL LEVEL in Crankcase and add oil if necessary.
3. Make sure RADIATOR is full of clean cooling solution.
4. Check FUEL TANK and open Fuel Cock.



1. IGNITION SWITCH
2. OIL PRESSURE GAUGE
3. GEAR SHIFT LEVER
4. THROTTLE CONTROL ROD
5. CHOKE CONTROL

5. Place **Gear Shift Lever** in neutral position.
6. See that **Ignition Switch** is turned off.
7. Pull **Throttle Control Rod** to rear 1 or 2 notches.
8. Pull **Choke Control** out to limit, and crank for one-quarter turn (or pull crank up once) then push choke control all the way in (about half way in for cold weather). Turn **Ignition Switch** on. On next quarter turn of crank, engine should fire.

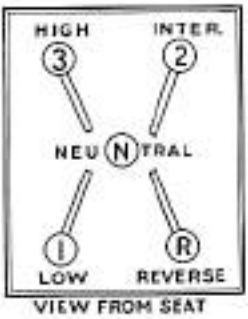
   After engine starts, keep throttle open just enough to prevent engine from stopping while warming up, and regulate choke until engine continues to run with choke fully released.

Cranking: It should not be necessary to spin engine. Crank by quarter turns only. Do not wrap thumb around handle.

9. When engine starts, observe OIL PRESSURE GAUGE. If gauge fails to register, stop immediately and determine cause.

DRIVING INSTRUCTIONS

Before starting to operate tractor be sure it is properly lubricated.



VIEW FROM SEAT

Shifting Gears—Throttle engine to idling speed, press forward on clutch pedal—bringing transmission gears to a stop—then carefully move gear shift lever into position for desired speed.

Do not shift gears if they **grind** or **clash**, or **when tractor is in motion.**

When proper gears are engaged, gradually engage clutch and open throttle sufficiently to start load.

Steering—is accomplished by pulling steering lever back firmly on side toward which the turn is to be made.

Descending Steep Grades—Keep tractor in gear and use engine as a brake. If necessary to further retard speed of tractor, pull back equally on both steering levers at the same time.

When operating over an obstruction, ditch, or bank, shift to either intermediate or low gear and control motor speed accordingly.

1. LATCHES ENGAGED
2. LEVERS BACK TIGHT

Locking Tractor in Stationary Position—To set steering levers for stationary work—rotate latches at top of each lever to correct position and pull both levers back hard. This method is only used when tractor is stationary—as when using power pulley, winch, etc., or for holding loads on steep grades.

COOLING SYSTEM

Capacity of Cooling System—is 4 gallons. Keep system filled at all times.

Drain and Flush—entire system **every 200 to 300 working hours.** Drain plug is located in elbow directly below water pump and drain cock in engine body below oil filter.

Freezing Weather—requires special attention. Never let tractor stand idle with only clear water in cooling system. Either drain cooling system completely or use **anti-freeze** solution of proper strength and quality. If tractor is drained to prevent freezing, make sure all water is out of system and do not replace plug or close drain cock until ready to refill. After draining, crank engine a few turns to remove water from pump.

Water Softener—In certain localities, scale forms on inner walls of entire cooling system, due to use of hard water. This clogs radiator and causes overheating. Use **rain water** or a suitable **water-softener** in such cases to prevent this deposit. After scale has once formed it is very difficult to remove.

RADIATOR—Do not allow dust, leaves, bugs, etc., to accumulate in air passages between tubes of radiator core. If compressed air is available, it may be used at frequent intervals to blow all debris out of passages.

WATER PUMP—Keep packing nuts just tight enough to eliminate leakage. Further adjustment is needless and results in worn-out packing.

Tighten nuts by turning in same direction as shaft rotates.

Keep all hose connections tight.

Lubrication—Every 4 to 5 working hours give each grease cup three complete turns and, when empty, refill with correct grade of water pump lubricant.

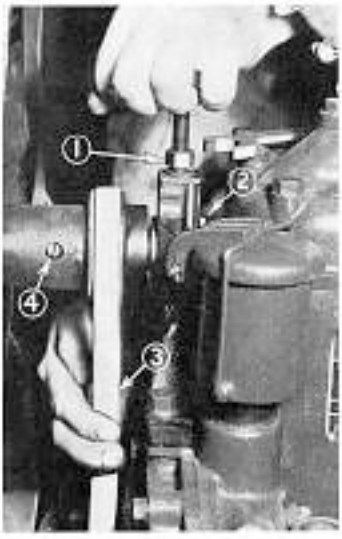
1. PACKING NUTS
2. HOSE
3. HOSE CLAMPS
4. DRAIN PLUG
5. DRAIN COCK
6. GREASE CUP

COOLING SYSTEM - Continued

Repacking Water Pump—If packing in pump is still in good condition, but has been compressed to such an extent that nuts can no longer be tightened, unscrew each nut and insert new packing ring between packing gland and old packing.

If pump is to be repacked completely, remove all old packing and insert new set of packing on each side, being careful to stagger joints.

Use packing specified in parts book.



1. LOCK NUT ON ADJUSTING SCREW
2. CLAMP NUT ON FAN SPINDLE
3. SLACK IN BELT—3/4 TO 1"
4. PLUG IN FAN HUB

FAN—At least **once a week** check Fan Blade screws for tightness to hub. Keep Fan Belts adjusted so that slack varies from ¾ to 1". To make this adjustment, loosen clamp nut on end of fan spindle and lock nut on Adjusting Screw. Then raise or lower fan assembly by means of Adjusting Screw. Tighten both nuts after adjustment.

Lubrication—Every 50 working hours, remove plug in Fan Hub and fill reservoir with correct grade of lubricant.

AIR CLEANER

1. AIR CLEANER BODY 2. OIL CUP
3. BREATHER

The Air Cleaner will remove dust from the incoming air, but the Operator must remove dust from the air cleaner.

At beginning of each day's operation, inspect Air Cleaner and clean, if dirty.

At intervals varying from 1 to 10 working hours, depending upon dust conditions, remove oil cup, wash in gasoline, and refill to circular mark with clean light engine oil.

Every 150 to 300 working hours, depending upon dust conditions, remove entire cleaner, wash thoroly in gasoline and pour clean light oil over screen in top of cleaner.

Keep all connections tight between Air Cleaner and Engine.

When operating in extremely dusty conditions, use an extension on cleaner intake pipe, high enough to get above dust line.

If operating in woods or fields where leaves or grasses may be sucked into intake pipe, use wire screen (available as extra equipment) on end of intake pipe. Examine and clean intake system frequently to prevent clogging.

OIL LEVEL GAUGE—At beginning of each day's operation, and at 8 to 10 hour intervals, drive tractor on level place and check oil level in crankcase. If necessary, add sufficient oil of recommended grade to bring level to 4/4 mark on bayonet gauge.

1. 4/4 MARK

OIL FILLER AND BREATHER— When adding oil to crankcase, spill some oil over breather element.

Every 100 working hours, remove filler and breather assembly, wash in gasoline, and after replacing, pour some oil over breather element.

Keep filler cap clamped down tight and gasket in good condition.

1. BREATHER ELEMENT INSIDE FILLER
2. REMOVE FILLER AND BREATHER HERE
3. GASKET IN CAP
4. CLAMP WIRE

1. IDLE SPEED
2. OPERATING SPEED

OIL PRESSURE GAUGE—should register 25 pounds at governed engine speed and not less than 5 pounds at idle speed. As soon as engine starts, observe gauge. If it fails to register, stop engine and determine cause.

All readings, except pressure at start, must be made when engine is **hot.**

If oil pressure adjustment needs to be changed, Cletrac distributors have special tools for same.

1. NUT OVER SHELL
2. OIL REVERSING VALVE
3. PLUG OVER VALVE
4. FILTER SHELL
5. GASKET
6. FELT ASSEMBLY

OIL FILTER—Just before engine oil is changed, remove plug which covers oil reversing valve and, with engine running, allow about 2 quarts of oil to drain.

Stop engine and drain balance of oil from OIL PAN.

Remove filter shell and scrape sludge from felts. THIS IS IMPORTANT. When filling oil pan, add 1 extra quart to compensate for oil drained from filter and oil lines. When removing shell loosen nut sufficiently to allow shell to be turned on gasket before lifting from filter. **If gasket is damaged, replace immediately.**

Do not remove felt assembly or wash felts in kerosene or gasoline.

1. DRAIN HERE
2. OIL SCREEN

CHANGING OIL—When operating under average conditions, **change oil every 60 working hours** and flush with light engine oil. (Not Kerosene.)

When using KEROSENE FOR FUEL or when working under extreme loads or in dust conditions, **change oil every 30 working hours.**

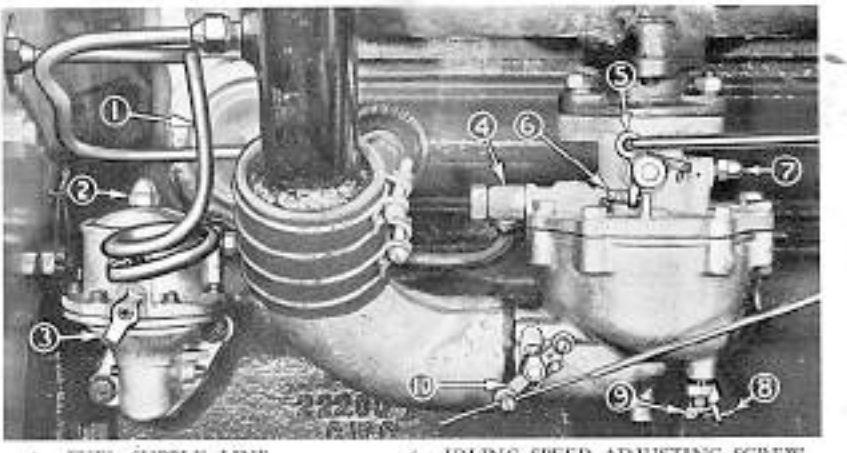
Drain oil when it is **thoroughly heated** and free to flow. Drive tractor on level place, remove drain plug in oil pan. Do not replace plug until oil stops flowing.

Capacity of OIL PAN is 4 quarts and of OIL FILTER, 1 quart. Put in 5 quarts using a clean container of **known** capacity.

OIL SCREEN—Every third oil change, remove oil screen in bottom of oil pan and clean thoroughly.

OIL PAN—Every 1000 working hours, remove oil pan, clean all sludge from inside walls of crankcase and wash oil pan thoroly.

FUEL SYSTEM



1. FUEL SUPPLY LINE
2. ACORN NUT OVER SCREEN
3. FUEL PUMP DRAIN COCK
4. CARBURETOR INLET SCREEN
5. THROTTLE LEVER
6. IDLING SPEED ADJUSTING SCREW
7. NUT OVER LOW SPEED SCREW
8. HIGH SPEED ADJUSTING SCREW
9. CARBURETOR DRAIN COCK
10. CHOKE LEVER

CARBURETOR—Adjustment—run engine until hot.

Open throttle 4 to 6 notches. Slowly turn High Speed Adjusting Screw **In** (clockwise) until engine speed slackens, then turn screw **Out** until speed picks up to maximum. Depending on altitude, this adjustment varies from 1⅛ to 1⅜ turns open.

Close throttle, remove acorn nut and turn Low Speed Adjusting Screw until engine runs smoothly.

Adjust Idling Speed by small screw on throttle lever.

Care—Every 200 working hours thoroly clean inlet screen.

Flooding—is caused by over-choking. If this occurs, turn ignition switch **Off**. Then, with throttle wide open and choke all the way in, crank engine several revolutions to expell the gases. Turn ignition switch **On**, close throttle and proceed with STARTING THE ENGINE.

FUEL PUMP—At start of each day, open drain cock on side of pump to remove water and sediment.

Every 60 working hours, remove acorn nut on top of pump, remove cap and screen assembly, and wash screen thoroly.

REPAIRS—Carburetor repairs should be made by nearest authorized Tillotson Service Station. Fuel Pump repairs should be made by nearest authorized United Motors Service Station.

FUEL TANK AND STRAINERS—At **start of each** day, check **Strainer** for sediment. When removing or replacing glass bowl do not damage gasket.

Shut-off valves are located on top of strainer and at outlet in bottom of tank.

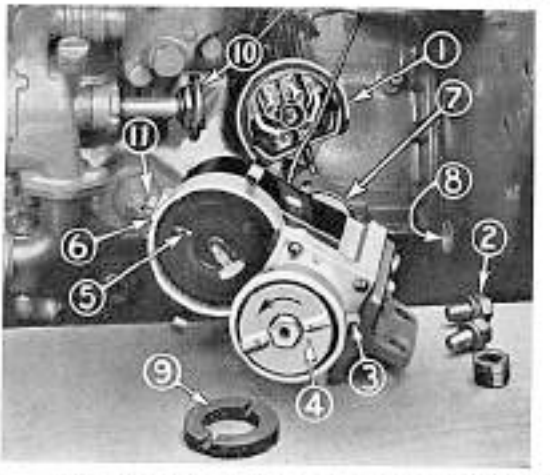
Use only **clean Fuel.**

Keep vent in **Fuel Tank Cap** open.

Keep **Fuel Lines** clean and tight.

Every 500 working hours, remove **Fuel Tank** and clean out sediment.

IGNITION SYSTEM



1. DISTRIBUTOR CAP
2. BRACKET CAP SCREWS
3. RELEASE BUTTON
4. MAGNETO COUPLING
5. ARROW ON ROTOR
6. MARK ON FRAME
7. END CAP
8. TIMING MARK ON FLY WHEEL
9. CENTER COUPLING
10. DRIVE SHAFT COUPLING
11. OIL HOLE SCREW

MAGNETO—Care—See "American Bosch Instructions and Parts List" furnished with tractor.

Lubrication—Every 300 working hours, supply oil to one point only, as specified in Bosch Instructions.

Removal—Remove distributor cap and cap screws holding magneto bracket to engine.

Timing—Remove pipe plug from hole in left side of engine bell housing. Crank engine until No. 1 cylinder is coming up on compression and punch mark on flywheel (3" or 24° before Top Dead Center) is directly in center of plug hole.

Depress Impulse Release Button and turn coupling anti-clockwise until arrow on rotor points to mark on top of magneto. With rotor in this position, interrupter points must be **just opening.**

Mount Magneto to engine, making sure armature shaft does not turn until fibre coupling and cap screws thru bracket are in place. Before cap screws are tightened, crank engine several revolutions to align magneto with drive shaft. Center (Fibre) coupling **must have 1/32-inch end clearance** to prevent binding.

SPARK PLUGS—Examine frequently for cracked or broken porcelains and burned points.

Gaps must be .020 to .025 inch. Measure gaps with feeler gauge attached to magneto wrench.

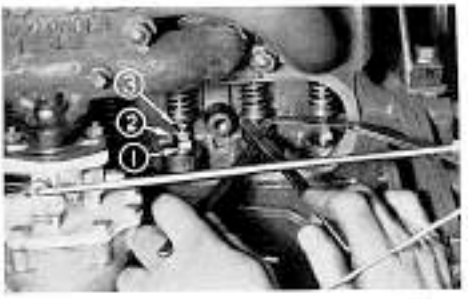
Every 750 working hours, install new plugs.

Keep ignition **connections tight** and **replace all cracked cables.**

GOVERNOR

Keep control linkage lubricated. If necessary, cover can be removed and governor control arms and springs cleaned without changing engine speed or breaking seal. **Breakage of seal** by anyone but an authorized Cletrac representative will void tractor warranty.

VALVES



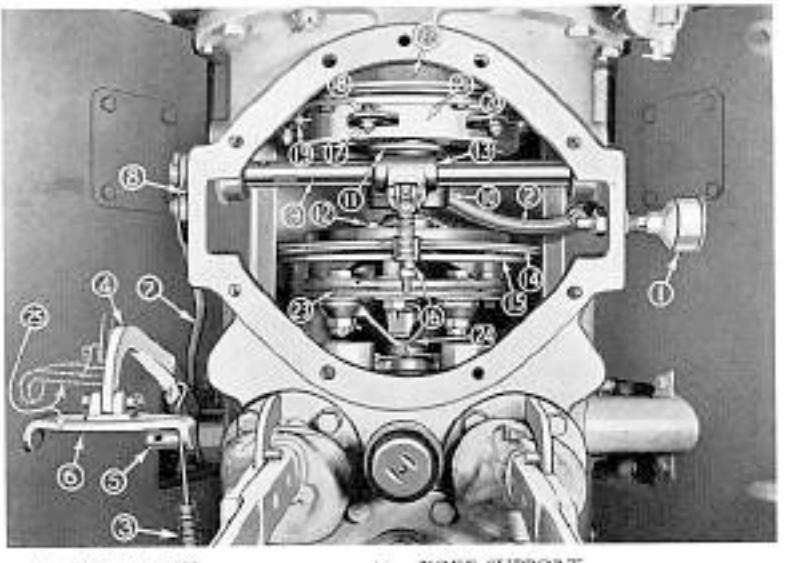
1. TAPPET 2. LOCK NUT
3. ADJUSTING SCREW

Adjustment — Make adjustment only when engine is **hot.** Crank engine until valve closes and tappet is at its lowest position.

Loosen lock nut on tappet adjusting screw, and turn screw until there is proper clearance between valve stem and tappet, as measured with feeler gauge.

Clearances should be .008" on Intake and .012" on Exhaust. (Note: Although these clearances may not correspond to figures stamped on Serial No. Plate of engine, they should be used for best results.)

CLUTCH



1. GREASE CUP
2. GREASE TUBE
3. PEDAL SPRING
4. PEDAL
5. PEDAL STOP
6. PEDAL PAD
7. PEDAL ROD
8. RELEASE SHAFT LEVER
9. RELEASE SHAFT
10. YOKE
11. RELEASE BEARING
12. SET SCREWS
13. YOKE SUPPORT
14. BRAKE PLATE ASSEMBLY
15. BRAKE DISC ASSEMBLY
16. BRAKE ROD ADJUSTING NUTS
17. RELEASE LEVER ADJUSTING NUTS
18. RELEASE LEVERS
19. PLATE ADJUSTING SCREWS
20. DRIVING STUD CAP SCREWS
21. CLUTCH ASSEMBLY COVER PLATE
22. FLY WHEEL
23. FABRIC DISCS
24. REAR COUPLING SPIDER

21. FREE PEDAL TRAVEL

Lubrication—Every 4 to 5 working hours give grease cup three complete turns. When empty, fill with correct grade of lubricant.

CLUTCH - Continued

Every 50 working hours, remove drain plug in bottom of clutch compartment and clean hole in plug. Make sure no oil has accumulated in compartment.

Keep clutch pedal and all its linkage well lubricated to insure freedom of operation.

Every 250 working hours and whenever clutch compartment cover is removed, put a few drops of oil on clutch release shaft bearings and clutch release linkage.

Breathers—At beginning of each day and at 1 to 10 hour intervals, depending on dust conditions, remove and wash in gasoline. Before replacing, dip in clean engine oil.

Inspection Cover Removal—Remove glass bowl and screen from FUEL STRAINER. Remove cap screws in cover, raise rear end of right hand fuel tank support with pry bar, and slide inspection cover to right over fender.

Clutch Pedal Adjustment—Clutch is self-adjusting for friction facing wear and requires only that sufficient free pedal travel be maintained during life of facings. **Form habit of checking free pedal travel, at beginning of each day's operation.** (Free pedal travel is distance pedal pad travels from extreme rear position, when lower end of pedal is against stop, to point where throw-out bearing touches release levers.)

Clutch pedal originally has 1¾ inches free pedal travel. As friction facings wear, this distance gradually reduces. When travel is reduced to ¾-inch, readjust rod between pedal and release shaft lever to give original clearance (1¾ inches.) **Never allow less than ¾-inch travel.** Check CLUTCH BRAKE each time free pedal travel is adjusted. Do not start engine with release mechanism disconnected.

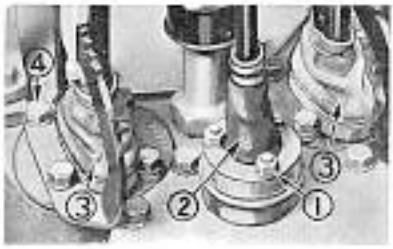
Whenever clutch compartment cover is removed, check distance between release levers and inside edge of clutch cover. **This should never be less than ⅛-inch.** Never attempt to adjust release lever nuts at outer ends of release levers, or slotted head plate adjusting screws, to compensate for friction facing wear.

Clutch Slips—Do not rest foot on pedal with engine running, as this will cause slippage. If clutch slips when there is sufficient free pedal travel, it indicates that friction facings are worn and should be replaced immediately. Never operate tractor in this condition. Slippage will cause excessive heat and damage to clutch and flywheel.

Clutch Brake Adjustment—With engine running, adjust brake so clutch shaft stops turning just before pedal reaches extreme forward position. (Clearance between disc and top of brake plate is about 3/16-inch.)

Facing Replacement—If clutch slips as stated above, facings should be replaced at once with **genuine Cletrac friction facings.** This particular type is required for proper operation of clutch. Under no circumstances allow a substitution. Certain parts of clutch assembly may need replacing when driven plates are refaced, especially if large cracks appear in the pressure or drive plates. Excessive heat, as shown by highly discolored pressure plate, may cause pressure springs to lose their tension. In such case have new springs installed.

GEAR SHIFT AND STEERING LEVERS

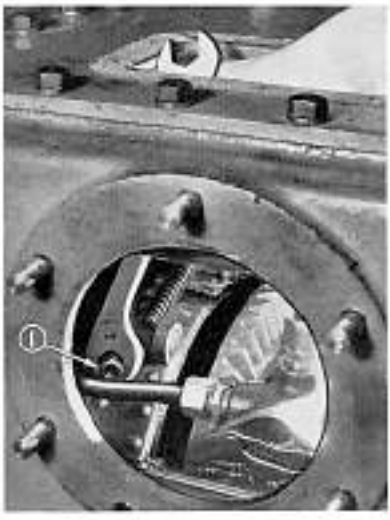


To prevent **dirt** getting into transmission and differential compartments, keep all attaching nuts and screws for levers tight and inspect Boots frequently for holes.

If Boots are damaged, replace at once.

1. GEAR SHIFT ATTACHING NUTS
2. GEAR SHIFT BOOT
3. STEERING LEVER BOOTS
4. STEERING LEVER ATTACHING SCREWS

STEERING BANDS



1. ADJUSTING NUT

Adjustment—Bands should be adjusted so levers can just be pulled back to **fourth** notch.

Turn adjusting nuts to **right** to tighten bands, and to **left** to loosen.

Picture shows both top and rear inspection covers removed. If tractor is equipped with power attachments, adjust steering bands thru top hole, otherwise adjust thru rear opening.

Removal—Remove seat and transmission cover plate.

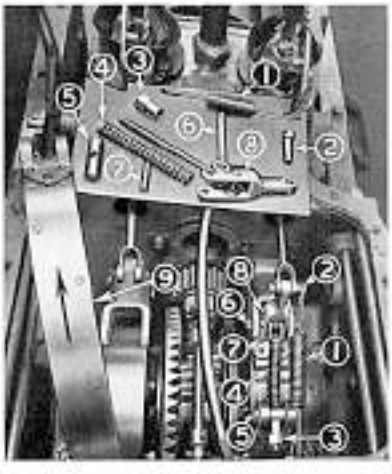
Keep out dust and dirt.

Remove pull-back spring and pin thru steering rod clevis.

Remove adjusting nut, adjusting spring, pin thru steering band rear clip, pin thru shackle and lever, pin thru steering band front clip.

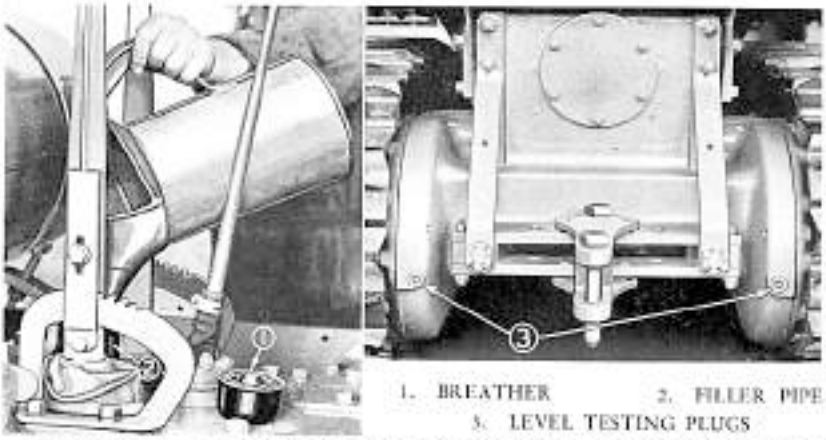
Remove lever with adjusting rod attached, and slide band around drum as shown.

To insure correct operation, use only Cletrac linings when relining bands.



1. PULL-BACK SPRING
2. PIN THRU STEERING ROD CLEVIS
3. ADJUSTING NUT
4. ADJUSTING SPRING
5. PIN THRU STEERING BAND REAR CLIP
6. PIN THRU SHACKLE AND LEVER
7. PIN THRU STEERING BAND FRONT CLIP
8. LEVER AND ADJUSTING ROD ASSEMBLY
9. STEERING BAND

TRANSMISSION - DIFFERENTIAL FINAL DRIVE



1. BREATHER 2. FILLER PIPE
3. LEVEL TESTING PLUGS

Lubrication—Lubrication for Transmission, Differential and Final Drive Compartments is supplied through breather pipe in transmission cover and is kept in circulation by Transmission Oil Pump which lifts lubricant from final drive compartments, and discharges it into transmission and differential compartments. Different oil levels are maintained in each compartment by overflow holes in compartment walls.

Adhere to **"Lubrication Recommendations"** for proper grade lubricant.

Checking Oil Levels—Have tractor level when checking.

Every 8 to 10 working hours, after tractor has been operating so lubricant is **warm** and has been **thoroly circulated,** remove Level Testing Plug in each rear wheel gear cover and, if required, **add** lubricant till it just flows from level holes.

Draining—Have tractor level when draining.

It is best to drain immediately after day's operation, when lubricant is warm and free to flow.

Every 300 working hours remove plug in transmission compartment, two plugs in differential compartment and plug in bottom of each final drive compartment. Do not replace plugs until all compartments are thoroly drained.

Refill with proper grade lubricant. Capacity 10 gallons.

Breather—At beginning of each day and at 1 to 10 hour intervals, depending on dust conditions, remove and wash in gasoline. Before replacing, dip in clean engine oil.

DRAWBAR OR CLEVIS

Keep brackets and supports to transmission case tight.

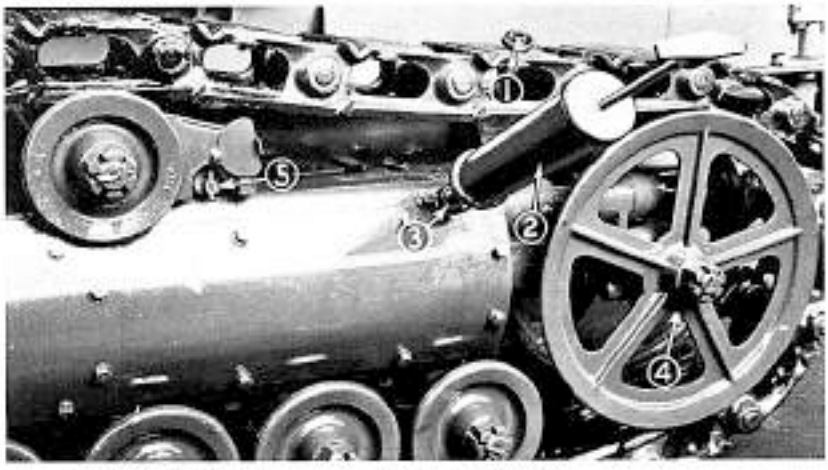
Holes are provided in drawbar support to insert pins for holding Drawbar or Clevis rigid when necessary for certain kinds of work, but **whenever possible, they should swing free.**

MAIN SPRINGS

Every 50 working hours inspect Main Springs and, if necessary, tighten spring hold down bolts and rebound clip bolts.

Do not operate with broken spring leaves or clips.

TRACK WHEEL SYSTEM



1. FILLER COVER
2. PUMP
3. FILLER BODY
4. PLUG IN FRONT WHEEL BEARING
5. VENT COCK

Lubrication—Adhere to Lubrication Recommendations.

At beginning of each day's operation and at 5 hour intervals, fill pump by immersing nozzle in clean lubricant of proper grade and pulling handle back slowly. Open vent cock in upper track wheel bearing. **Thoroly clean dirt away** from filler cover and filler body, then remove filler cover.

Expell all air from pump, then screw pump in filler body. Push pump handle slowly until lubricant flows from vent cock. If one pump full is not sufficient, refill and repeat operation, until lubricant does flow. **Then close vent cock** and apply pressure to pump handle to insure system being completely filled. Remove pump, replace filler cover and pump cap.

When operating in deep mud or water, keep track wheel system filled by checking it every hour, as described above, **and lubricate it after the day's operation.**

If tractor has been idle for several days, thoroly lubricate it **before using.** In this case, remove slotted plug in bottom of each front wheel bearing before filling system and **do not replace until lubricant flows from hole.** Then replace plug and continue filling operation.

Every 300 working hours, when checking tightness of cap screws, remove slotted plugs in each of lower wheel bearings and in each front wheel bearing **one at a time** and flush each bearing with light engine oil by applying pressure with hand pump or compressed air supply. Then refill system with proper grade lubricant depending on temperature conditions.

Capacity of each track frame is 3 quarts.

When temperature conditions change sufficiently, drain, flush, and refill entire system with proper grade lubricant.

Keep pump and all containers clean.

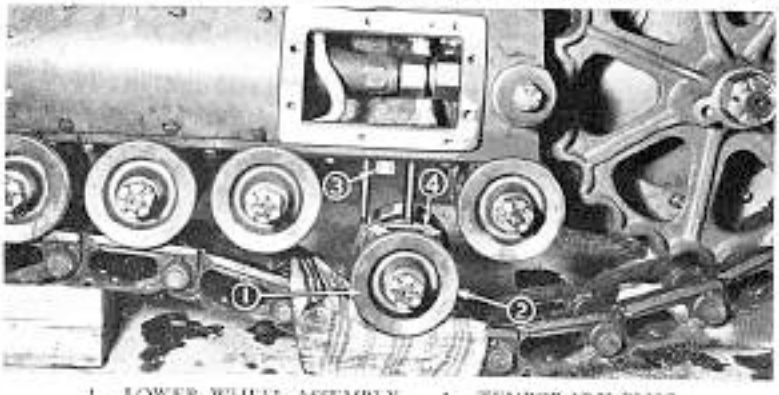
Keep caps on filler body and on pump when not in use.

TRACK WHEEL SYSTEM - Continued

Care—Occasionally during each day's operation, observe all track wheels to see that they **revolve.** The cause of any wheel not revolving must be corrected immediately. Never allow mud to dry and harden around wheels.

After operating tractor in heavy soil, or in **freezing weather,** run tractor in high gear over hard ground at end of shift or day's operation, to shake mud or slush from tracks before storing for night.

Every 300 working hours run tractor up on blocks and test tightness of all screws and nuts holding wheel assemblies to track frame.



1. LOWER WHEEL ASSEMBLY
2. DRAIN PLUG
3. TEMPORARY PLUG
4. GASKET

Removal of Lower Wheel Assembly—Run front of tractor up on an 8" block, then raise rear end about 8 inches with jack placed under drawbar support and block up under rear wheel gear cover.

Loosen TRACK ADJUSTMENT as far as possible. Remove bearing stud nuts and bearing assembly. As bearing is removed, insert plug in hole through track frame to prevent loss of lubricant.

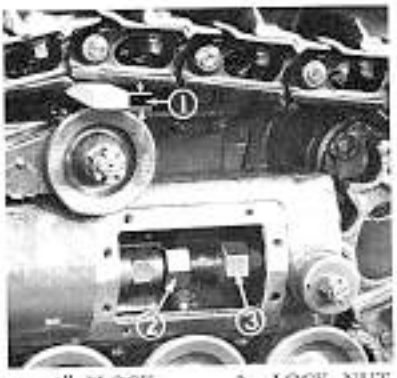
When reassembling, **use new gasket** and apply over tubular dowels to prevent damage. **Make sure stud nuts are tight.** Check track adjustment after operation is completed.

Removal of Upper Wheel Assembly—Loosen TRACK ADJUSTMENT as far as possible.

Block up tracks on both sides of bearing. Remove bearing with cap screws in place.

When reassembling, use **new gasket** and **make sure cap screws are tight.** Check track adjustment after operation is completed.

1. UPPER WHEEL ASSEMBLY
2. LOCK NUT
3. ADJUSTING SCREW
4. CAP SCREWS IN PLACE
5. WOOD BLOCKING



1. 1" BLOCK 2. LOCK NUT
3. ADJUSTING SCREW

Adjustment—Keep track adjusted as loosely as possible to reduce wear and aid in steering.

For average conditions it should be possible to raise track 1" above flanges of upper wheels. Some operating conditions may require more slack. Consult the Cletrac Distributor if in doubt.

Loosen lock nut first, then turn adjusting screw until proper adjustment is reached.

Tighten lock nut after adjusting.

Before reinstalling cover plate, inspect lubrication system inside of track frame for loose connections.

Care—Keep tracks clean. Do not lubricate.

At end of day's operation, during **freezing weather** or after operating in heavy soil, run tractor in high gear over dry hard ground to shake mud or slush loose from tracks.

Plates and Grousers—Keep bolts and nuts tight at all times. When working in gravel, rocks or on hard surfaces, inspect frequently. When installing plates and grousers, pull nuts up tight, then strike each bolt head several blows with hammer and again tighten nuts.

1. MASTER TRACK PIN
2. SLOT FOR LOCK PIN
3. DRIFT

Disconnecting Tracks—Master pin in each track is removed from **right to left. If ever in doubt do not attempt removal until direction is determined by observing arrow and word "OUT" on back face of shoe.** Cut lock pin on right side before removing.

Master pin should be at rear of tractor for most convenient removal. Use a drift of smaller diameter than master pin to drive out pin.

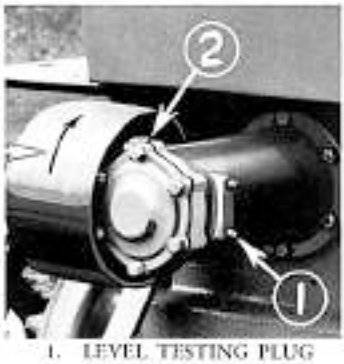
Master pins are shoulder-type construction same as balance of track pins, except they have two holes for lock pins and are not fitted so tightly. With this construction and a larger hole in left track rail than in right, it is only necessary to drive pin the length of the shoulder, after which, pin may be tapped out or in.

Reconnecting Tracks—Install master pins from **left to right** (check with arrow). They may be easily inserted up to shoulder but must be driven the remaining distance.

Bring ends of tracks together and align pin holes of shoes with drift so master pin can be inserted.

Install lock pin in outer end of master pin and align with slot in shoe, then drive it in until lock pin is seated.

Do not fail to install both lock pins.



1. LEVEL TESTING PLUG
2. FILLER PLUG

POWER PULLEY — **Lubrication**—Power pulley driving gears are lubricated inside transmission case, by the overflow pipe from pump.

Every 4 to 5 working hours remove level plug in power pulley housing and fill with same grade lubricant used in transmission case until oil just flows from hole.

Operation—Release clutch in usual manner, allowing transmission gears to stop. Move power pulley gear shifter forward to engage gears. Engage clutch gradually.

Keep assembly tight to transmission case.

To reverse direction of pulley rotation, mount assembly to tractor with pulley on opposite side. In such case, use the other plugs for filling and testing level of lubricant.

1. OIL LEVEL PLUG
2. SPLINE SHAFT

POWER REDUCTION—**Every 4 to 5 working hours** remove level plug and, when necessary, fill with same grade lubricant as used in transmission case until oil just flows from hole.

Power Reduction is operated in same manner as Power Pulley.

Reduction shaft is chain driven.

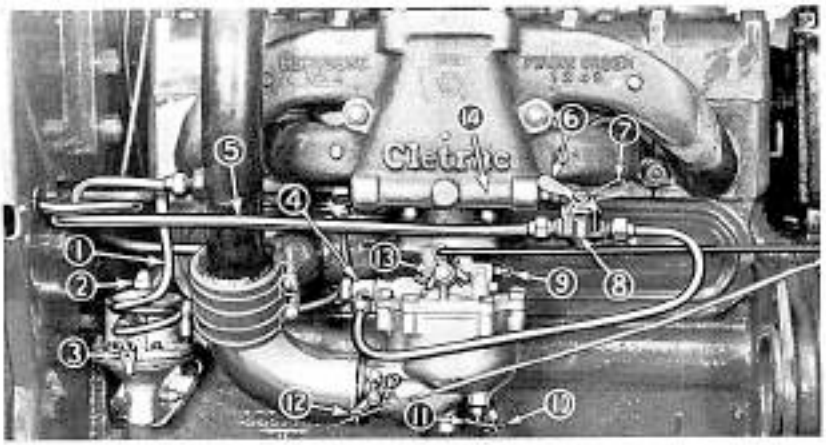
Keep assembly tight to transmission case. Shaft turns in clockwise direction. (See SPECIFICATIONS for sizes and speeds.)

1. SPLINE SHAFT

REAR POWER TAKE-OFF—Lubrication is supplied to driving gears inside transmission case by overflow pipe from pump.

Keep assembly tight to transmission case. Shaft turns in clockwise direction. (See SPECIFICATIONS for sizes and speeds.)

REAR STARTING — When special equipment is mounted on front of tractor which prevents cranking from front, a rear starting crank may be installed. Crank turns in clockwise direction.



1. KEROSENE FUEL SUPPLY
2. ACORN NUT OVER SCREEN
3. FUEL PUMP DRAIN COCK
4. CARBURETOR INLET SCREEN
5. GASOLINE SUPPLY LINE
6. VALVE SET FOR KEROSENE
7. VALVE SET FOR GASOLINE
8. 3-WAY VALVE
9. NUT OVER LOW SPEED SCREW
10. HIGH SPEED ADJUSTING SCREW
11. CARBURETOR DRAIN COCK
12. CHOKE LEVER
13. IDLING SPEED SCREW
14. KEROSENE MANIFOLD PREHEATER

Starting—Drain carburetor to remove any Kerosene left from previous operation. See that strainer valve is open. Turn three-way valve for **Gasoline**, then make sure carburetor is filled with Gasoline.

See that ignition is **Off.**

Pull throttle out 1 to 2 notches.

Pull choke **Out** to limit and pull crank up once, then push choke all the way **In** (about half way in for cold weather). Turn ignition switch **On.** Engine should then start on first or second quarter turn. After engine starts, regulate choke until engine continues to run with choke fully released.

Run engine on gasoline until operating temperature is reached, then turn three-way valve for **Kerosene.**

Running—Water temperature should be 180° to 200°, (just below boiling) for best results. When necessary, cover radiator sufficiently to keep engine temperature up.

When operating in cold weather, remove air cleaner intake pipe and draw air from under hood.

Stopping—If engine is to be stopped for any length of time, turn three-way valve **Off** and allow engine to run until fuel in carburetor is used.

When stopping for a very short period, turn ignition switch **Off** without shutting off fuel. Engine will start again without using gasoline if temperature has not dropped too low.

Adjustment—CARBURETOR is adjusted in same way as for gasoline.

WINTER OPERATION

Follow instructions under COOLING SYSTEM for draining and use of Anti-Freeze Solutions. Refer to Letter LC-28 issued by U. S. Bureau of Standards or consult the Cletrac Distributor for proper proportions to use.

Proper LUBRICATION of ENGINE, TRANSMISSION, and TRACK WHEEL SYSTEM is essential. Use lubricants as described in "Lubrication Recommendations" furnished with tractor. Change to lighter grades just as soon as **temperatures** reach those specified in booklet.

Keep TRACK and TRACK WHEELS clean. Frozen tracks will stall the tractor and may cause damage to driving mechanism. Whenever soil is heavy or weather cold enough to freeze, run tractor in high gear on dry hard ground at end of day's operation, thoroly lubricate it, and clean all slush and mud from tracks and track wheel assemblies. If a high pressure water or steam supply is available it will aid in cleaning.

If tractor is equipped with **storage battery, keep it fully charged** to prevent freezing. A discharged battery will freeze at 32° F. When fresh water (distilled) is added to cells, run engine for 15 or 20 minutes at charging rate of 10 to 12 amperes to thoroly mix battery solution.

When possible, provide warm storage place for tractor. Operator will usually give better care to tractor under these conditions.

CARBON MONOXIDE POISONING

Since exhaust from all gas engines contains deadly carbon monoxide gas, **do not operate engine in closed garage or shop.** Asphixiation may take place inside of 3 minutes. If necessary to run engine inside, **see that windows and doors are wide open and fresh air circulates freely** or, if possible, pipe exhaust gases outside.

If a person is overcome, get him into fresh air quickly, apply artificial respiration and call doctor at once.

WINTER OVERHAULING

Neglecting to make minor repairs often results in costly delays. Therefore, when the working season is over, it is advisable to arrange with the Cletrac Distributor for a thoro SERVICE INSPECTION of the entire tractor and have the necessary work done during the idle season when it can be taken care of with the least expense and without loss of time.

Cletrac Distributors maintain adequate repair parts stocks and have experienced mechanics with the necessary special equipment for general overhauling and prompt service work.

HITCHING TO TRACTOR

The manner of hitching implements to tractor determines its life to a great extent. There are questions of side draft and up-and-down pull on the drawbar to be considered. Different types of implements and different implements of the same type do not pull the same. Therefore, it is the duty of the operator to study the hitch of each implement, adjusting it so that, when pulling, the **drawbar remains in the direct line of tractor travel.** The hitch on the implement should be adjusted to be as nearly **level as possible** with the tractor drawbar, when under load.

Your Cletrac Distributor will gladly advise with you as to the best method.

STORING TRACTOR

Clean entire tractor thoroly.

Drain all fuel from tank and carburetor.

Drain cooling system and leave drains open.

Remove spark plugs, fill each cylinder with a pint of motor oil, turn crank slowly one full revolution, and replace spark plugs.

Release clutch by putting a piece of wood between clutch pedal and fender.

If equipped with battery, remove it and store in warm dry place. Make sure battery is filled to proper level and **fully charged** before storing. Battery should be recharged at intervals of one month. If stored with local Service Station these precautions will be taken.

If this book is lost or becomes unusable, obtain another from the Cletrac Distributor.

Cletrac
Crawler Tractors