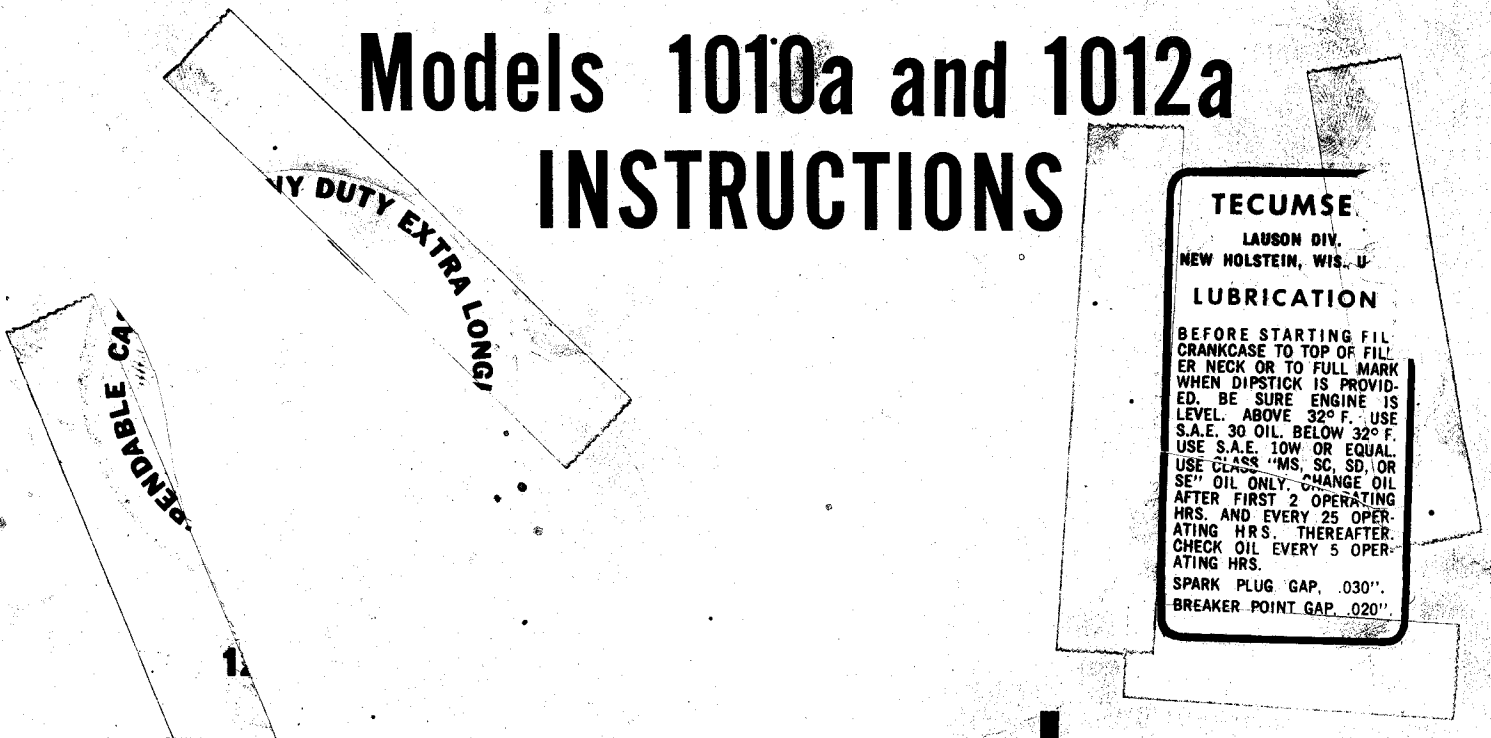
New Engine HH 120 EXE 15222 Ser. 4094X
Mod 11AC12 Mower

PENNSYLVANIA METEOR TRACTORS

Models 1010a and 1012a INSTRUCTIONS



PENNSYLVANIA LAWN PRODUCTS, INC.
Quality Mowers Since 1877

1010 East Main Street
Waynesboro, Virginia 22980
Telephone 703:942-8205
Cable Address: VEEMET

A Division of Virginia Metalcrafters, Inc.

OPERATING AND MAINTAINING THE PENNSYLVANIA METEOR TRACTOR - MODELS 1010a and 1012a

The Meteor Tractor is built for years of fun and service. Time spent learning to properly operate and care for it will yield big dividends in satisfaction. This instruction covers the operation and care of the tractor. A separate manual is provided for the engine.

The Parts Diagram and List is on a separate sheet and should be referred to if needed to find location of parts not shown in the figures here and to get the sizes of the various parts. Figure numbers in parenthesis refer to the parts diagram. If any problems come up you can't find answers to here, please ask your dealer or write us.

PUTTING THE METEOR TRACTOR IN SERVICE

The Meteor was shipped from the factory in one carton, completely assembled.

Your dealer has probably unpacked, serviced and checked your Meteor, but in case he hasn't, proceed as follows: (Some information about operation is included in this section also.)

- 1. Cut strapping and remove the top half of box. Fold out and down the sides of the lower half. Lift off the sleeve or inner tube.
- 2. Cut the strapping holding the carton of battery acid to the rear lift and set the acid aside.
- 3. Take out the lag screw in the bottom of the rear hitch which holds the rear of tractor to skid. Cut the strapping holding the tractor to the skid.

Figure 1 — Releasing Parking Brake

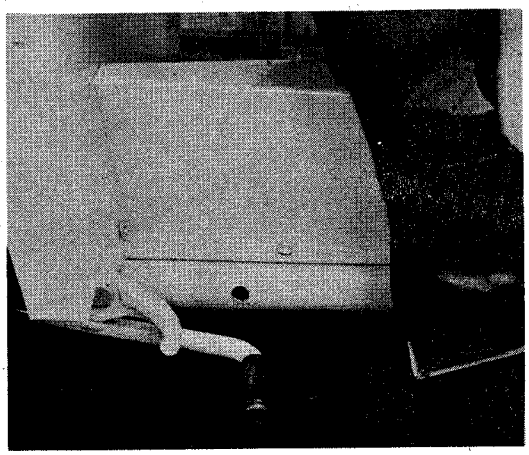


Figure 2 — Parking Brake Released

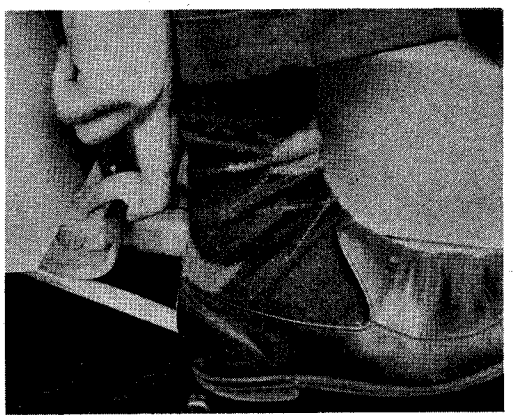


Figure 3 — Applying Parking Brake

- 4. Release parking brake, if it is on. Figures 1, 2, 3, show how to work it. Don't use fingers to release unless pressure is relieved by stepping on brake arm simultaneously.

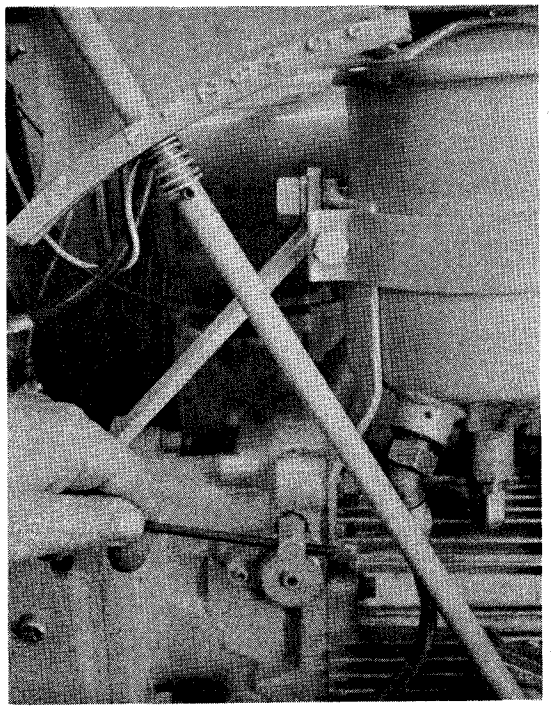


Figure 4 — Free Wheeling Valve

ATTACHMENTS

Separate instructions are supplied with the various Pennsylvania Meteor attachments. The power take-off clutch, the lift handle, and rear hitch are used in various combinations with the attachments.

● 1. Lift Handle

To operate the lift handle push down on the black knob and pull back on the handle. With the knob depressed the lever can be moved freely back and forth. Releasing the knob will let the latch catch and hold the handle where desired. Note that the latch is positive against forward movement only, i.e., it will hold an attachment up, but won't positively latch to lock it down. With a bulldozer blade, for instance, to keep extra heavy down pressure on the blade, you would have to continually push forward on the lift handle.

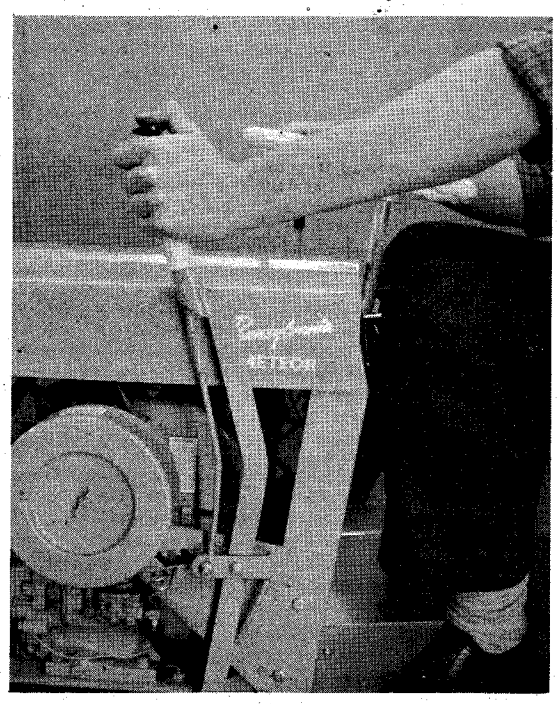


Figure 9 — Lift Handle

● 2. Free Floating Lift

To make the lift action free floating, unhook the small coil spring from the pin in the lift handle as shown in Figure 10.

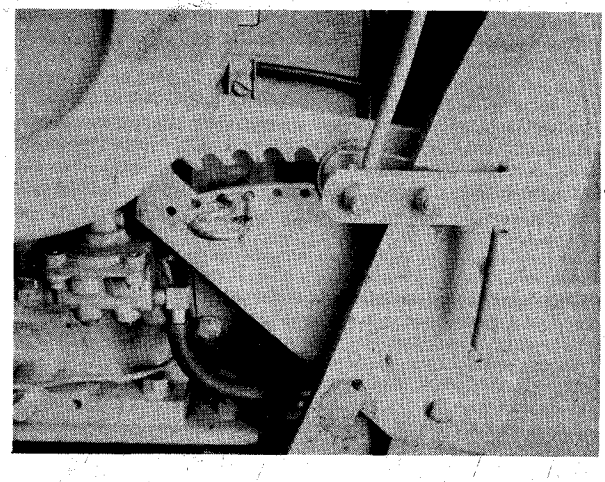


Figure 10 — Free Floating and Stop Adjustments on Lift Handle.

● 3. Lift Stop

In mowing and other operations it is often desirable to limit the lowest depth to which the lift will lower the attachment. The large clip pin, if moved from its storage position at the front of the lift quadrant to a position as shown in Figure 10, will limit the forward travel of the lift to the point set.

● 4. Rear Hitch

When towing or pulling or jerking anything with a Meteor keep the hitch point low and be sure the hitch connection has freedom to allow sharp turns and movement over hills and depressions without binding or locking.

● 5. PTO Clutch Control

Engage the PTO Clutch (only with the engine running) by pulling out the control knob slowly and firmly until the ball locks snap over center and the clutch will stay in. To disengage the clutch push the knob in quickly. The engine does not have to be running to disengage clutch. Always stop attachments before getting off tractor.

ADJUSTING AND MAINTAINING THE METEOR TRACTOR

The Meteor Tractor requires a minimum of maintenance. The routine care and minor adjustments can be easily handled by mechanically inclined owners. Major problems with the engine, hydraulic transmission, or rear end can usually best be handled by qualified Pennsylvania Servicing Dealers.

● The secrets of trouble free operation are:

1. Keep the tractor clean.
2. Keep the tractor oiled and greased.
3. Don't let a speck of dirt get into the hydraulic oil system.
4. Keep things tightened up by an occasional going over with wrenches and screw driver.
5. Change the engine oil and replace the engine air cleaner regularly.
6. Be on lookout for anything not working right and correct at once.

● Because of initial wearing in, it is particularly important to give your Meteor a good checking over after the first few hours of operation. In particular, the drive train should be inspected for loose set screws, and the entire assembly for loose nuts and bolts.

● Operation and maintenance of the engine are well covered in the Engine Manual furnished with your tractor. Keep engine filled with oil, change the oil, and renew the air filter per schedule in engine instruction booklet. If engine does not idle or run smoothly, adjust engine as set forth in engine instructions. For minor and preventive maintenance adjustments, follow engine instructions. For major engine repairs see your nearest gasoline engine service dealer. Contact the engine manufacturer for any engine warranty claims.

● The hydraulic transmission is manufactured by the Sundstrand Corporation and warranty is by them. However, orders for parts and any warranty claims must be handled directly with Pennsylvania. It is not intended that these transmissions be field overhauled at present, and unauthorized dismantling of the hydraulic transmission will void the warranty on it. A short trouble shooting section is, however, included later.

After each use the Meteor should be washed down, greased, and oiled to be ready for the next use. Don't hose off the engine, however.

To care for your Meteor we suggest the following minimum tool kit. These tools can be obtained locally.

1 - Set (3/32" to ¼") Allen wrenches for set screws.
1 - Set of open end wrenches, including following sizes: 5/16, 11/32, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4.
1 - 6" Crescent adjustable wrench.
1 - 12" Crescent adjustable wrench.
1 - 6" Screw driver.
1 - 10" Phillips screwdriver.
1 - 6" Pliers.
1 - Grease gun.
1 - Oil can.
1 - Small Bottle of "Loctite" Nut Locking Fluid. Use sparingly as directed on the bottle where trouble is encounted with nuts, set-screws or studs working loose.

ADJUSTING DRIVE CONTROL CASTING

Setting the neutral point to eliminate creep is accomplished by moving the casting backward or forward as shown. Movement of the casting up and down changes the tension on the spring pushing the detent into the casting and makes the control harder or easier to shift.

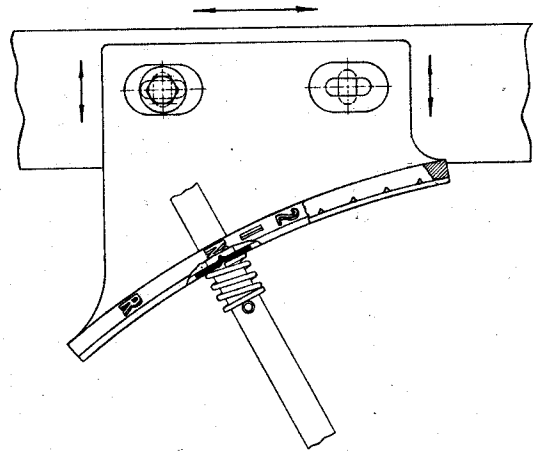


Figure 11 — Adjusting Drive Casting

- Adjust by loosening the two nuts only slightly and move the casting by tapping it with a hammer. The neutral point of the transmission is very sharp.
- In case the forward or backward movement of the casting is not sufficient to reach the neutral point, the control lever must be removed from the transmission and the bend changed slightly in the required direction. This can be done on the tractor, if a conduit bender or the like is used below the bend and a hand at the top so that absolutely no bending load is put on the transmission control shaft itself.
- The up and down adjustment should be set so the detent action is sufficient to hold the lever firmly in place, but still permit easy control. Be sure to get the restraining action uniform by adjusting both ends of casting up and down together. When a foot pedal kit is used the detent action must be lessened.
- Keep the detent channel on the underside of the casting greased. The detent (Fig. 183) will wear and in time require replacement.

BRAKE ADJUSTMENT

Brake pedal position and brake shoe position are individually adjustable on each wheel.

- Pedal position should be adjusted so that the right brake arm is against the parking brake cam when the brake is off. The left brake should be set at the same height. This puts the pedal about level with the bottom of the tractor frame pipe.

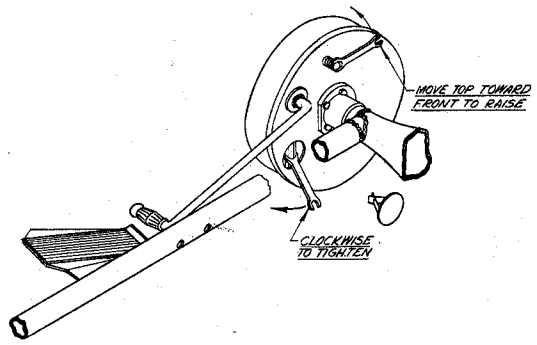


Figure 12 — Adjusting brakes

- To adjust the pedal position turn the ¾" hex nut in the upper center of the brake plate as shown. Turn the top of the nut toward the front of the tractor to raise the pedal position. Opposite will lower, and only a small turn is required. If the brake shoe is adjusted closely, pedal position cannot be lowered until the shoe is slacked off as instructed below.
- The brake shoes should be set up closely so there is little or no free brake travel, and yet not so close that they drag and the tractor can't be rolled by hand (with free wheeling valve open).
- The brake shoes are adjusted by first prying off the brake hole cover with a screw driver and then reaching in from below the frame with a 5/8" open end wrench to turn the hexagonal brake adjusting sleeve as shown. Turn clockwise as viewed from top to tighten.

Replace hole cover by pushing back in so that clip snaps over adjusting sleeve.

The brake shoe can be relined or replaced with a new Plymouth shoe (1949-1956).

STEERING GEAR

The Meteor steering is simple and rugged. It is designed with high wheel and spindle tilt to eliminate steering wheel reaction when one wheel is in soft soil or hits an obstruction. Both front wheels should tilt out 5° to 6°. (It is not impossible, if the tractor is dropped off of a truck or the like, for the spindles to be bent up and the tilt lessened. If steering is not right this should be checked.)

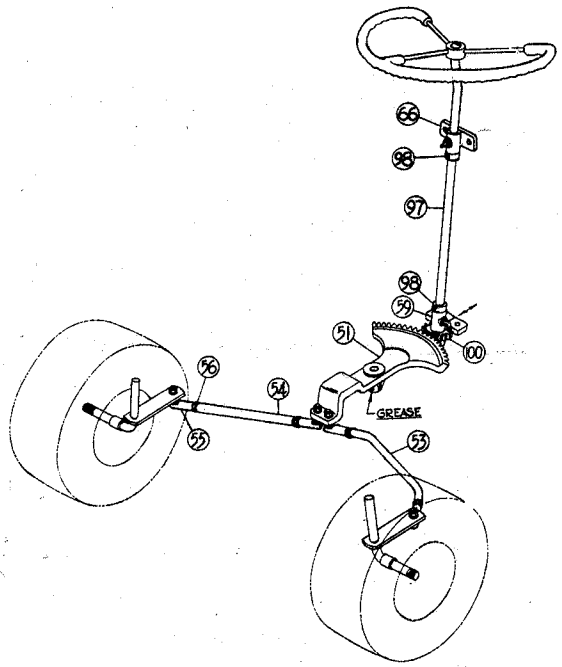


Figure 13 — Steering gear

- Adjustments to correct slack movement, hardness of steering, and centering of steering wheel may be required.
- Source of slack in steering can quickly be located by working the wheel and seeing where looseness is. Unless a ball joint or bolt is simply loose, the slack will normally be in the gear mesh between the steering quadrant gear (Fig. 51) and the steering pinion gear (Fig. 100). Check first to see that the shaft collars on the steering shaft are tight and firm against the pillow blocks so that there is no end play in the shaft. Bring mesh of gears together by either moving pinion down on shaft or by moving pillow block (Fig. 59) forward (bolt holes are slotted). Normally move pillow block first. If gears get tight, but slack still exist, move pinion down instead. If ball joints, pillow blocks, or bushings are worn and loose fitting, replacement will be required.
- The Meteor tractor wheel will normally be fairly hard to turn if the tractor is standing still or moving very slowly and a full turn is attempted quickly. When under way it should steer relatively easily and not require 'fighting the wheel' on soft or rough ground.
- Hardness of steering can be due to plain mechanical binding or to incorrect tire-ground contact. Check the former by jacking front of tractor off of the ground. Steering action should be quite free. If it isn't, isolate and correct the cause by disconnecting the tie rods, etc., and moving each part individually until the tight spot is located.
- If the steering gear is free when jacked up, look at tire inflation and toe-in. Higher air pressure up to maximum of 15 PSI will definitely make steering less difficult. Toe-in should be quite high for easy steering – around 1" total for both wheels measured at tire tread center line front and rear. This can be varied over a range to get an action that suits. Toe-in is varied by screwing the ball joints (Fig. 55 & 49) on or off of the tie rods. Be sure to retighten the lock nuts against the ball joints and keep the left tie which is bent pulled to the rear. The bend is to make rod miss the idlers on the rotary mower attachment.
- Centering of the steering wheel can be varied a little with the tie rods. If centering is far off, it is probably due to the gears not being meshed in right relation, and they will have to be reset correctly.

POWER DRIVE – ENGINE TO TRANSMISSION

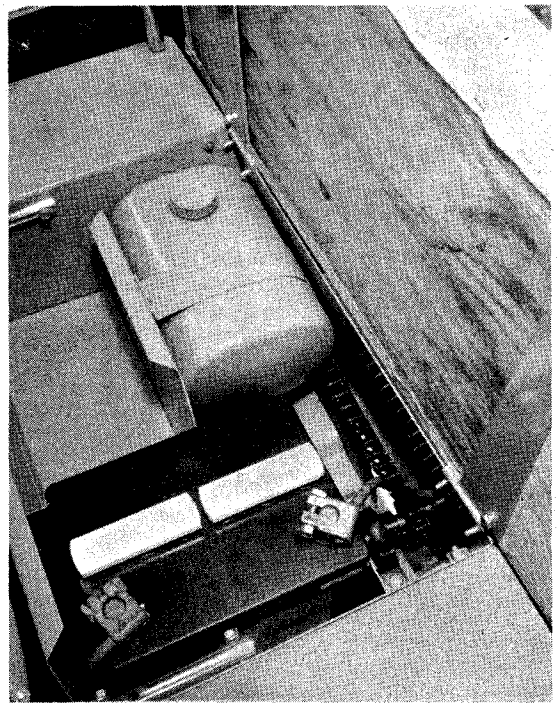
The engine output pulley (Fig. 138) and PTO Clutch are keyed to the engine shaft with a stepped key and held in place with bolt and washer screwed into end of shaft. No set screws are needed in either pulley or clutch (although there is a place for one in the clutch - remove it, if one has been installed.) Keep retaining bolt tight.

- The pulley – cooling fan on the transmission is keyed to the shaft and retained by two set-screws. Alignment with the engine pulley is obtained by moving the fan - pulley on the transmission input shaft. Set-screws must be kept tight. Use "Loctite", if they tend to work loose, and check pulley alignment before tightening.
- A heavy duty belt is used and replacement with fractional horsepower belts will not be satisfactory. The belt is kept tight by a spring loaded idler running on the slack side. Check the alignment of this idler and the freedom of movement of the arm when replacing the belt. If the idler spring breaks or comes unhooked, little power will be transmitted.
- To Change the Drive Belt:
  - Lift idler away from belt.
  - Roll belt off of transmission pulley.
  - Take apart clutch throw-out arm (Fig. 141 & 143) so belt will come off.
  - Put new belt on engine pulley first and roll up onto transmission pulley.
  - Replace throw-out arm.

POWER DRIVE – TRANSMISSION TO REAR END

As seen in the photographs a universal joint keyed and set screwed to the transmission output shaft drives (again thru a key and set screws) a transmission shaft supported at the rear end in a pillow block. Adjacent to the pillow block a chain sprocket is keyed and located in line with the large sprocket bolted to the differential input shaft. Cross pins in the transmission shaft adjacent to the universal and the sprocket are there not to locate the sprocket, but to keep units of the drive shaft from coming completely apart should the set-screws work loose.

- Except for tightening the chain the only maintenance is to see that the universal, the sprocket and inner bearing race stay locked tightly to the shaft. Should any set screws come loose the sprockets can get out of line or the universal joint can move forward and rub against the hydraulic transmission rear seal, so it is vital that they be kept tight. Apply "Loctite" when tightening any set screws that work loose.



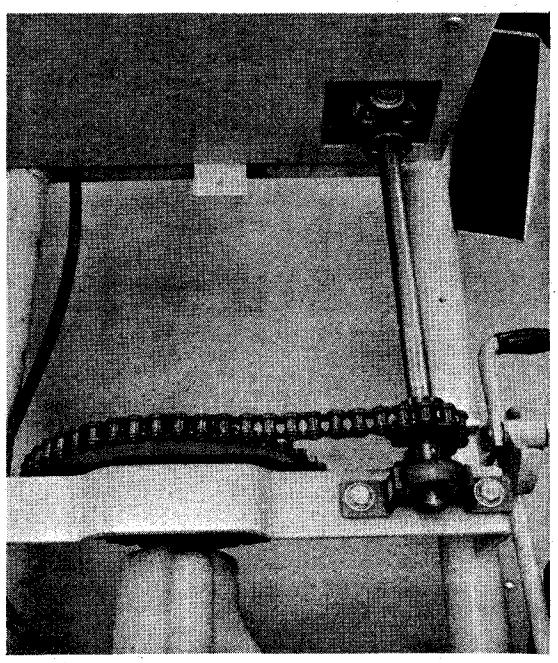


Figure 14 – Rear Power Train:
Upper View – Under Seat
Lower View – Rear Seat Assembly and Deck Removed

● Access – The lower picture in Figure 14 is taken with the seat assembly and floor board removed. Adjustment and tightening is possible without removing these, but, if replacement of bearing, sprocket, shaft, universal joint or keys is required, either the seat assembly and floor board or the hydraulic transmission must be removed to get sufficient end room. The entire seat assembly comes off as a unit, if the gas hose is taken off at the tank and the battery cable disconnected at the solenoid.

● In putting together or checking the drive shaft assembly proceed as follows:

– 1. After checking key, slip universal joint onto output shaft of transmission so that the end of shaft comes thru the hub to within 1/8" of the spider. Lock set-screw tightly.

– 2. Check key and insert the drive shaft (end with pin closer to end) into the other end of the universal joint all of the way and tighten set screw firmly.

– 3. Check that key is in and slip sprocket on, hub to front.

– 4. Slip pillow block on shaft with locking collar to front.

– 5. Bolt pillow block down, but don't tighten.

– 6. Put on chain.

– 7. Line up small sprocket with large and tighten sprocket set screw.

– 8. Tighten chain by moving pillow block sideways. Some eccentricity will probably exist and the chain should be set to just come taut at the tightest place.

– 9. Tighten pillow block bolts.

– 10. Slip eccentric locking collar over boss on inner race of pillow block bearing.

– 11. Before turning it to lock onto shaft, move the shaft back and forth endwise. It will move 0.010" to 0.020". Try to stop it in the middle of this free travel, and then rotate the locking collar to grip the shaft.

– 12. Using a punch or screw driver in one of the holes in the collar (not the set screw hole) drive the collar around tight with a sharp hammer blow and tighten the set screw.

● Of course, if everything has been found to be tight and aligned and all you want to do is tighten the chain, moving the pillow block is all that's required.

● When the pillow block travel has been exhausted, removal of a ½ link will permit further adjustment provided the chain still fits the sprockets well. Replacement of the chain and the small sprocket (and eventually the large sprocket) will be required due to wear.

● Oiling of the chain is recommended unless operating under very dusty or sandy conditions.

REAR END

The rear end in the Meteor Tractor is a reconstructed Plymouth rear end, and if any trouble is encountered, its repair is handled just as it would be in an automobile. Standard auto repair parts can be used in case of gaskets, seals, bearings and brake shoes. Axles and complete differential gear trains should be obtained from Pennsylvania Lawn Products. Don't rebuild a gear train except to replace the pinion shaft seal and front bearing; rather get an entire replacement from Pennsylvania – see parts list.

● Checking and adding differential oil is discussed in the lubrication section. Oil leaking from a tractor rear end is usually caused by too much oil in the rear end. If it is not caused by too much oil, and occurs at either rear wheel, the inner seals should be replaced. If leaking at the forward end of the differential, the differential seal should be replaced. Such replacement should be done by an automobile mechanic as he has the pulling equipment to remove the old seals. Wheel and outer pinion shaft roller bearings should be repacked with grease, if dismantling is done to replace a seal.

Leaking can also occur around the gasket or bolts where the gear carrier bolts into the banjo housing. If leakage is here, tightening the nuts holding the differential in the housing will usually correct. In case a leak persists (in some cases there might even be a pinhole in the housing) carefully cleaning off the spot and applying "plastic steel" or other epoxy resin two component patching material will be the easiest way to stop.

ELECTRICAL SYSTEM

The Meteor 1010a and 1012a are equipped with 12-Volt battery systems for cranking the engine and supplying power for lights etc. The engine ignition is by magneto and thus is not dependent on battery power. Since the maximum charging rate of the generator is about 6 amperes, battery load from lights must not exceed about 4 amperes, and under some conditions of operation supplementary charging will be required to keep the battery charged.

● Battery – The usual care accorded an automobile battery is normally sufficient during the summer season when the tractor is started once or twice a week and run for several hours at a time. During the winter supplementary trickle charging is a must, if the tractor is expected to be started for snow removal chores and if the battery is expected to last more than one season. A discharged battery deteriorates rapidly on standing and is also liable to freeze during cold weather. Keep the acid level over the plates and keep the battery tight in the box and the terminals clean and tight.

● Always note to see that the generator is charging properly and that the battery cranks the engine briskly. Charge the battery if it gets weak; don't let it get dead. A slow charge is best, but a fast booster charge is better than nothing. You can, of course, use jumper cables in a pinch.

● Wires loose from terminals are the most frequent cause of electrical trouble. Return any loose wire at once to its proper spot (see parts diagram) as the generator or voltage regulator can be damaged by open circuits.

● Lack of ground connection is the 2nd most likely trouble. Battery is grounded with cable; ignition switch is grounded to frame thru dash. Paint sometimes prevents proper grounding at these points.

● Generator, voltage regulator, switch and ammeter can, of course, fail.

● Serious damage to the engine magneto, points, and condenser will result if battery voltage is ever applied to the magneto grounding terminal. Inadvertant substitution of an ignition switch and solenoid made for use with a battery ignition engine will do just this.

● Any electric load such as headlights should be connected directly to the "L" terminal of the voltage regulator.

PTO CLUTCH

A cross section of this ball lock clutch is shown on the parts diagram.

– Clutch will not close unless the clutch is rotating.

– The belt is loose when clutch is open or disengaged, as it is relaxed and drops down on idler bearing.

– To engage clutch – apply constant pressure until belt rises to top of groove and clutch locks into engagement. Don't jerk it. It remains locked without continual pressure, but even a slight continual push from the control lever will unlock it.

– In both on and off positions the throw-out bearing should be riding free. Never exert continual pull on control knob to keep clutch engaged, if it won't lock in. To do so will burn up the throw-out bearing.

– If belt creeps when de-clutched, realign so that belts are "in line" with opposite pulley when disengage - belt will then drive slightly, "out of line" when engaged.

– Grease the throw-out collar (fitting) and add a few drops of oil thru set screw access hole with clutch in "out" position.

– If bronze idler bearing sticks or will not turn - flush with Kerosene. Don't oil.

– If clutch does not work easily, remove and disassemble and clean. Clutch is held on by bolt and spring lockwasher only - no set screw should be used - and should come off easily.

ance of .0015 to 0.002 inches and act as a slow bleed in one direction. Sticking because of too little or no clearance can be corrected by taking out the cross pin and lapping open the hole a few ten thousandths with a 3/16" rod and valve grinding compound. Wash out compound, reassemble, insert in position and test transmission.

4. If the piston noted under (2) above is tight and won't move it must be extracted and loosened up. Pull piston and cylinder out with little finger, or, failing in this, crank engine over with starter (spark plug wire grounded) and with control in forward or reverse as required. Entire assembly will be forced out by hydraulic pressure. Lap piston if necessary to get it to work freely, clean carefully and reinstall. Oil will leak out when the plugs are removed so put paper or rags on floor to catch. Don't try to reuse any drained out oil.

● Replacing Transmission — If the difficulty cannot be corrected, the transmission will have to be exchanged.

Remove as follows:

1. Remove belt guard and drive belt.
2. Remove drive control arm from transmission.
3. Loosen set screw in forward end of universal where it attaches to transmission output.
4. Remove nuts from four bolts holding transmission to tractor. Support as last upper nut is removed.
5. Slip transmission and reservoir assembly forward and out. If universal sticks on shaft, pry back with a screw driver between the universal hub and transmission — stay out away from shaft and seal.
6. Replace in reverse order, making sure gasket is on with holes up.

LUBRICATION AND OTHER ROUTINE CHECKS

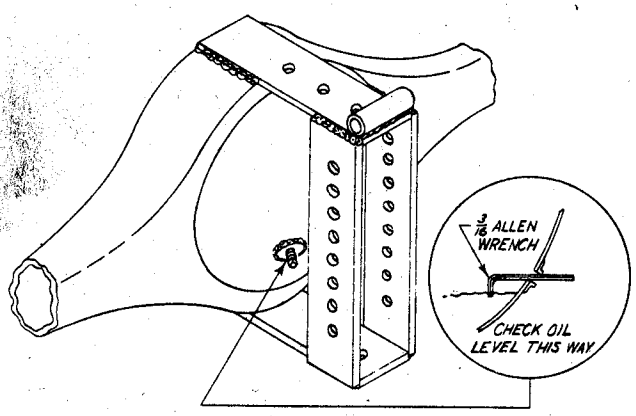
A tractor with a rotary mower or earth working attachments gets as much exposure to dirt and wear in a few hours as a car might in a month. So assume 1 hour of tractor operation equals 50 miles of auto operation on a dusty road, and govern your washing, oiling and greasing accordingly. As a minimum, plan to oil and grease and check over generally after each 8 hours operation.

● Engine — See manufacturer's manual for oil change, air filter care, spark plug change and other engine care items.

● Hydro — Transmission — Oil and filter care — see section on hydraulic system.

● Battery — Like an auto, but see section on electrical system for special instructions.

● Differential — When shipped the differential was charged with 3 pints of #90 E.P. transmission grease or oil. This fills it to within about ¾ of an inch of the fill plug. Check this level occasionally by removing the plug and measuring the oil level with a 3/16 inch allen wrench as shown. Normally, if no leaks develop, you should never have to add or change the differential oil. In case the oil lever is low, #90 E.P. oil should be added. Since all top openings on the differential have been welded shut to prevent overfilling, adding oil had best be done at a service station where pumping equipment is available. However, it can be added with a large oil can or a piece of tubing or a syringe. Under no circumstances bring the oil level above the filling plug level and preferably keep it ¾" below.



● Grease fittings with gun.
  2 — Front Wheels
  2 — Front Steering Spindles
  1 — Front Axle Pivot
  1 — PTO Throw-Out
  1 — Steering Quadrant Pivots (under engine)
  1 — Lift Handle Pivot Casting
  2 — Steering Shaft Pillow Blocks (behind dash)
● Wipe grease on —
— Steering Gears
— Lift Latch Quadrant
— Drive Control Casting
● With oil can (engine oil) place few drops on —
— PTO Clutch and Linkage
— Hood Pivots
— Lift Lever Linkages and Pivot Points
— Engine Throttle and Choke Controls (both ends)
— Parking Brake Pivot
— Brake Pedal Arms (where they go into brake plate)
— Roller chain (unless tractor used continually under dusty conditions)

● Tighten it up — Keep an eye on your Meteor for loose nuts, bolts, set screws, unusual play, etc. When detected correct at once. Periodically check over all fasteners, paying particular attention to the set screws in the drive train and in the steering gear.

● Wash it off — Washing your Meteor and its attachments with a hose after each use is the best way to keep it looking new. Don't squirt water on the engine, especially if hot, but the rest of the tractor can take it o.k. Occasional waxing will help preserve the finish.

ATTACHMENTS

Pennsylvania has available a growing list of attachments to make your Meteor more capable and convenient. The mowers, plows, bulldozer blades, snowthrowers, carts, and so on are legion. Ask your dealer about them.

Also ask him about:

Foot Pedal Kit for "no hands" driving control.

Wheel Weights, Lug Tires, or Tire Chains for increased traction.

Headlight Kits for night mowing.

Hub caps for looks.

We at Pennsylvania are here to serve and will welcome your questions and comments on Pennsylvania products.

Pennsylvania Lawn Products, Inc.
DIVISION OF VIRGINIA METALCRAFTERS, INC.
Waynesboro, Virginia 22980

PENNSYLVANIA LAWN PRODUCTS

A Division of Virginia Metalcrafters, Inc.

1010 East Main Street
Waynesboro, Virginia 22980
Telephone 703:942-8205
Cable Address: VEEMET

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