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Service Manual

Lawn Tractors

Models 09GN2101, 09GN2102, 09GN2103, 09GN2104, 09GN2105, 09GN2106, 09GN2107

Reprinted

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LT 8 & 11 GEAR DRIVE LAWN TRACTORS
(Models 09GN-2101/2102/2104)

IMPORTANT: The replacement of any part on this product by other than the manufacturers' authorized replacement part may adversely affect the performance, durability or safety of this product.

The manufacturer reserves the right to make changes on and to add improvements upon its products at any time without notice or obligation. The manufacturer also reserves the right to discontinue manufacture of any product at its discretion at any time.

Notice to Serviceman in the State of California — The engine on this unit is NOT equipped with a spark arresting muffler.

IMPORTANT: USE OR OPERATION OF THIS ENGINE ON ANY FOREST COVERED, BRUSH COVERED, OR GRASS COVERED LAND WITHOUT A STATE APPROVED SPARK ARRESTOR IN EFFECTIVE WORKING ORDER CONSTITUTES A VIOLATION OF THE LAW OF THE STATE OF CALIFORNIA.

LT 8 & 11 GEAR DRIVE

INTRODUCTION

This manual contains service and maintenance instructions for Lawn Tractors. It has been prepared to provide the information the serviceman needs to correctly service and maintain a Lawn Tractor. All sections of this manual should be carefully studied by the serviceman before beginning to work on the tractor.

ALL WARNINGS used throughout this manual should be heeded and followed very closely. Failure to obey these rules could result in personal injury or death to yourself or others.

All references made to the left side, right side, front and rear are given from the operator's position.

SAFETY

Safety is No Accident . . . . Be Alert!

This symbol is used to attract your attention to the safety precautions that should be understood by the serviceman to avoid accidents.

Please read and follow these instructions on safety procedures before servicing the tractor.

PERSONAL CONSIDERATIONS:

1. Never let shop rags, used for cleaning, lay around to become fire hazards.
2. Always use safety glasses when servicing or inspecting the tractor.
3. Do not wear loose fitting clothing that might get caught in moving parts. Also, keep hands and feet away from moving parts.
4. Be certain that the work bench or support being used is strong enough. The weight of the part plus the force applied to it during assembly or disassembly may put a great strain on the bench or support.
5. Use jack stands or blocks to hold up the unit in any potentially dangerous positions required for access. Do not rely only on jack for support.

EQUIPMENT CONSIDERATIONS:

1. Always disconnect spark plug wire and secure away from spark plug. This **must** be performed every time any servicing is done and will prevent accidental starting of engine.
2. Always store gasoline or flammable solvents used for cleaning in closed containers specifically designed for that purpose.
3. Before cleaning, servicing or inspecting tractor, make certain all moving parts have stopped and engine and exhaust assemblies have cooled down.
4. Never operate tractor without proper guards, plates or other safety protective devices in place.
5. Never store tractor with gasoline in the tank, inside a building where fumes may reach an open flame or spark. Allow engine to cool before storing in any enclosure.
6. Disengage power to attachment(s) and stop engine before servicing, repairing or making any adjustments.
7. Disengage power to attachment(s) when transporting or not in use.
8. Take all possible precautions when leaving the vehicle unattended, such as disengaging the power-take-off, lowering the attachment, shifting into neutral, setting the parking brake, stopping the engine and removing the key.
9. Do not change governor setting or over speed the engine.
10. Be certain that any part being removed is properly supported or held to prevent injury or damage.

OPERATIONAL CONSIDERATIONS:

1. Do not start or run the engine indoors. Fumes from engine exhaust can kill.
2. Disengage all clutches and place gear shift lever in neutral before attempting to start engine.
3. Be sure that all parts are securely fastened before starting tractor.
4. Be sure all tools and cleaning materials are removed before starting tractor.
5. If the equipment should start to vibrate abnormally, stop engine and check immediately for the cause. Vibration is generally a warning of trouble.
6. If test running is required, make sure you are thoroughly familiar with the complete operation of the tractor. Know how to stop the tractor.
7. Never operate machine at high transport speeds on slippery surfaces. Use care when backing.
8. Never operate without good visibility or light.

Whenever you see this symbol it means:
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

IDENTIFICATION PLATE LOCATION

The tractor model and serial number identification plate is located on the left side of engine base assembly below the engine. (Fig. 1)

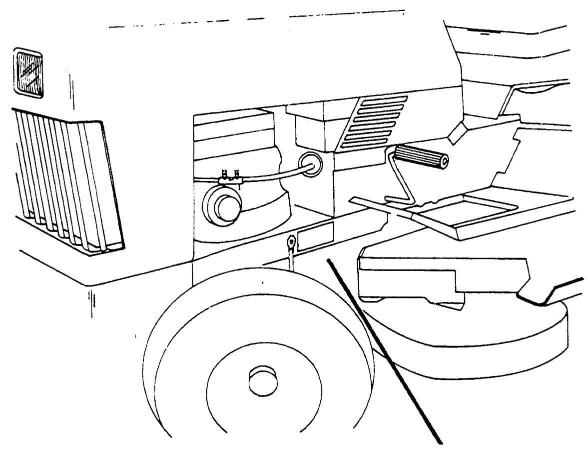


FIG. 1

Refer to engine manufacturer's engine literature for location of engine model and serial number.

LUBRICATION AND MAINTENANCE

LUBRICATION:

1. ENGINE - Check engine oil level before each engine operation. Change engine oil every 25 operating hours (more often under dusty conditions). Consult engine manufacturer's service manual for all lubrication and maintenance specifications.
2. GREASE - Every 25 operating hours grease the following lubrication points with NLGI Grade 2 Lithium base EP grease (Ford 1T-M1C137-B). Reference (Figs. 2 and 3).

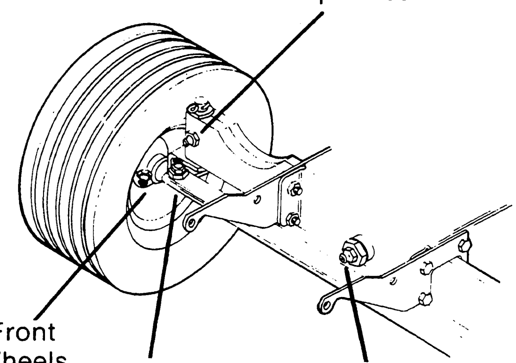


FIG. 2

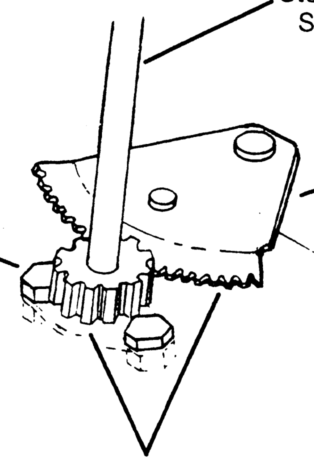


FIG. 3

NOTE: Clean off grease fittings before attaching grease gun. Grease only until grease comes out of bearings. Wipe off excess grease. Use a pressure type grease gun.

a. Front Wheels - one fitting located on inside of each front wheel. (Fig. 2)

b. Tie Bar - one fitting on both ends. (Fig. 2)

c. Spindles - one fitting on both ends of front axle. (Fig. 2)

d. Axle Pivot - one fitting in center of axle. (Fig.2)

e. Steering Gears - clean gear teeth on steering gear and gear sector. Apply grease liberally to all gear teeth. (Fig. 3)

Form No. 620-240
Rev. 11/85

3. ALL OTHER PIVOT POINTS - Clean all pivot points and linkages and lubricate with SAE No. 30 wt. oil every 25 operating hours.
4. TRANSAXLE - The transaxle is filled for life and should not require additional lubrication. Make periodic visual inspections for damage of leaks every 100 operating hours. If damage or leaks occur, consult transaxle manufacturer's service manual for proper lubrication and maintenance specifications. (Lubricant type-E.P. Lithium Grease, 30 ounces).

MAINTENANCE:

1. GENERAL - Make a visual inspection for loose or damaged parts. Damaged parts should be repaired or replaced.
2. BATTERY - Terminals should be tight and free of corrosion. Battery hold down bracket should be snug over battery. Top of battery should be clean and dry. Check level of electrolyte. Add clean distilled water as needed.
3. BELT - Inspect traction drive belt for cracking, excessive wear and for proper tension. Refer to "ADJUSTMENTS AND SERVICING - TRACTION DRIVE BELT" section to check belt tension.
4. TIRE PRESSURES - Recommended tire pressure for both front and rear tires is 10 p.s.i.

ADJUSTMENTS AND SERVICING

ATTENTION: All procedures listed in this section for adjustments and servicing of the tractor are described with the **mower deck removed**. Reference "ATTACHMENTS" section of this service manual for all information specific to the mower deck mounted on this tractor.

ENGINE:

1. Refer to Engine Manufacturer's Service Manual for all adjustments and servicing information.
2. Maximum engine RPM high speed, no load, range is 3500 RPM to 3700 RPM.
3. **Engine Removal —**

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

WARNING: To avoid severe burns, DO NOT attempt this procedure when engine is hot. Wait for engine and muffler to cool down before proceeding.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT"section of this service manual.

B. Loosen (do not remove) each capscrew securing right and left transaxle pulley belt guides to main frame. Swing belt guides out of the way. (Fig. 4)

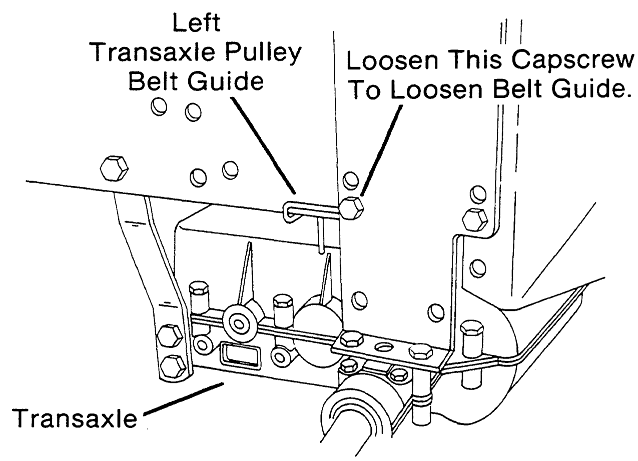


FIG. 4

C. Remove two capscrews securing upper front engine pulley belt guide to main frame. Remove belt guide. (Fig. 5)

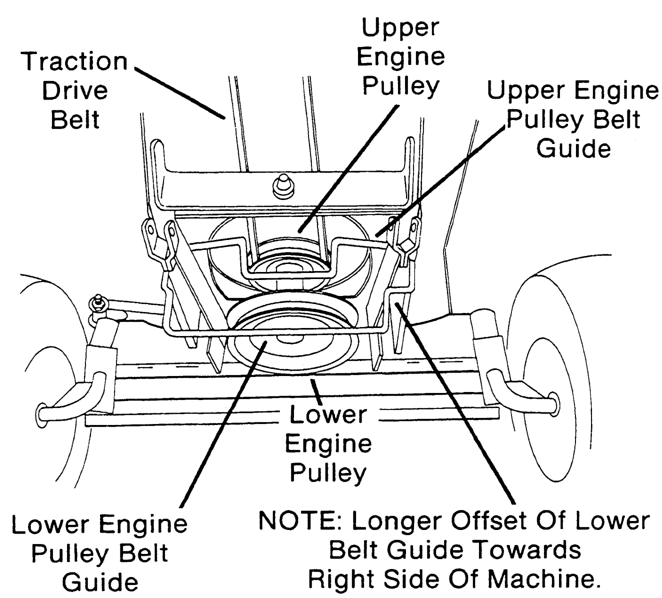


FIG. 5

D. Depress clutch/brake pedal and set parking brake and work traction drive belt off rear transaxle pulley. Push belt forward and remove belt completely from front engine pulley.

E. Unclip hood latches and remove capscrew at engine shroud holding hood restraint cable to engine. Disconnect green headlight wire at connector clipped to engine shroud on right side. (Fig. 6) Remove E-ring from one end of hood hinge pin. Pull hinge pin out and remove hood from tractor.

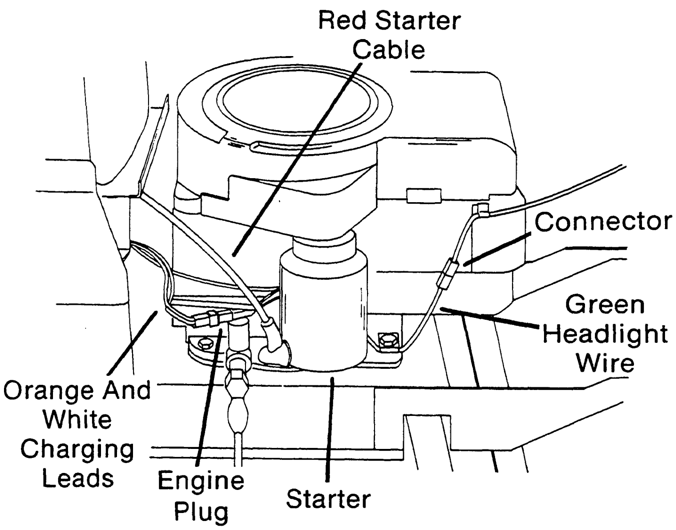


FIG. 6

F. Disconnect throttle cable at engine, by loosening throttle cable clamp screw enough so that cable can be removed. Disconnect cable end from throttle speed control block (Fig. 7)

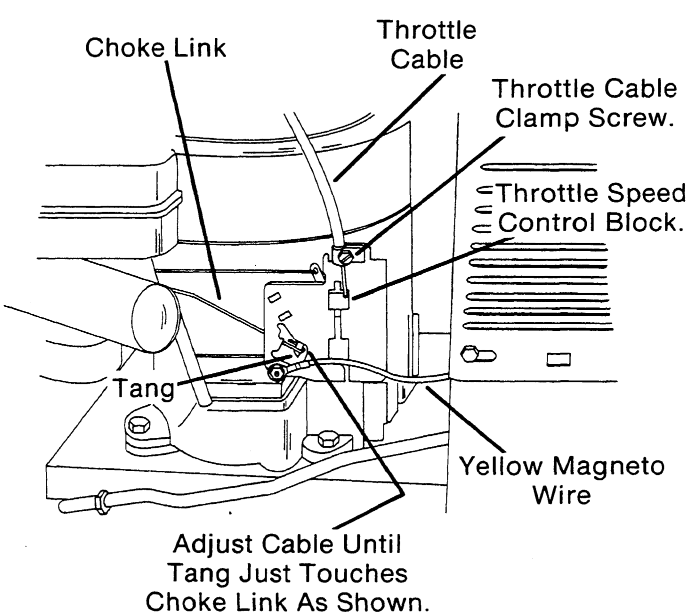


FIG. 7

G. Disconnect the following lead wires at engine:

   a. Orange and white charging lead wires at engine plug on right side. (Fig. 6)

   b. Red starter cable lead at starter on right side. (Fig. 6)

   c. Yellow magneto wire at left rear corner next to throttle cable clamp screw. (Fig. 7)

H. Disconnect fuel line at fuel filter. (Fig. 8) Cap line to prevent leakage. Remove fuel filter from fuel line, inspect and replace filter per engine manufacturer's specifications.

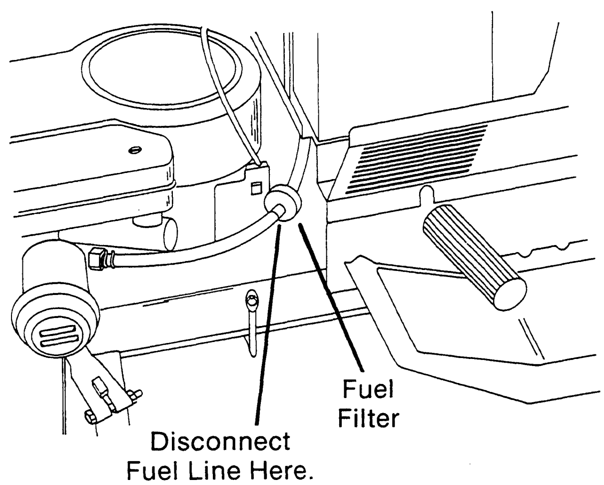


FIG. 8

I. Turn steering wheel until front wheels are as far right as possible. Remove four capscrews holding engine to engine base assembly. Lift engine from tractor.

J. Service or replace engine as required per engine manufacturer's specifications.

K. Reverse above procedures to install engine until you reach the point of connecting throttle control cable. Then follow this adjustment procedure: Move throttle control lever up to the "FULL FAST" position (which is the detent before the "START" position is reached.) (Fig. 9) Attach end of throttle control cable to throttle speed control block and slip cable up until tang on speed control lever just touches choke link, as shown in (Fig. 7). Tighten throttle cable clamp screw. NOTE: Set belt guides to a maximum of ⅛" away from traction drive belt and transaxle pulley when brake/clutch pedal is fully depressed (ENGAGED).

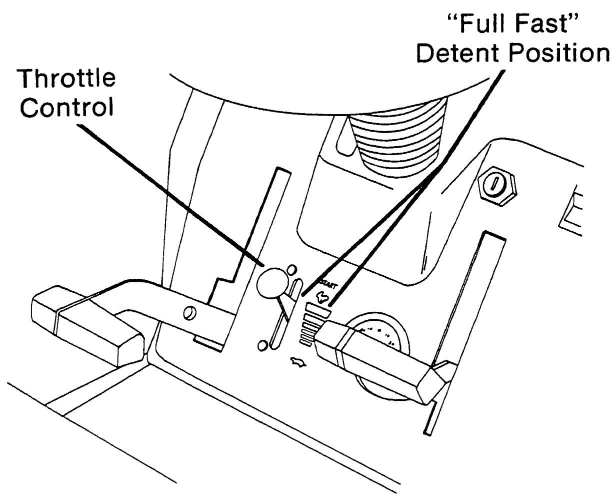


FIG. 9

L. Add gas and oil (if **new** engine) as prescribed by engine manufacturer. Check and test operation.

4. Engine Pulley Removal and Replacement —

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Remove PTO drive belt, if still attached to lower engine pulley.

B. Remove two capscrews securing each engine pulley belt guide (upper and lower guides) to main frame. Remove belt guides. (Fig. 5)

C. Depress clutch/brake pedal and set parking brake. Work traction drive belt up and off of engine pulley towards engine.

D. Remove engine pulley capscrew holding pulley to engine crankshaft.

E. Pull pulley off crankshaft.

F. Service pulley as required and reverse above procedure to install.

NOTE: Torque on engine pulley capscrew should be 25 to 37 ft. lbs.

5. Muffler Removal and Replacement —
(11-H.P. Engine Only)

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

WARNING: To avoid severe burns, DO NOT attempt this procedure when engine is hot. Wait for engine and muffler to cool down before proceeding.

A. Unclip hood latches and raise hood and secure in upright position.

B. Remove three capscrews attaching muffler assembly to engine. One at front of engine, the other two at the left front corner. Remove muffler assembly from engine. (Fig. 10)

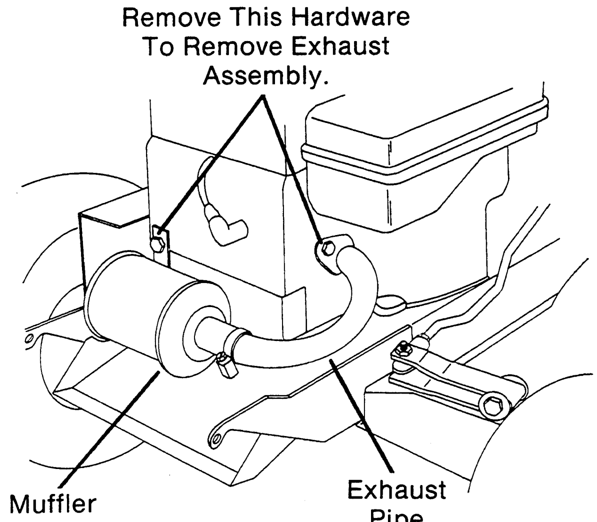


FIG. 10

C. Remove muffler clamp securing muffler to muffler pipe. Slip muffler off pipe.

D. Service as required, reverse above procedure to install muffler.

6. Fuel Tank Removal and Replacement —

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Disconnect fuel line at fuel filter. (Fig. 8) Cap both ends to prevent leakage. Inspect and replace fuel filter per engine manufacturer's specifications.

B. Loosen (do not remove) two hex nuts holding battery hold down bracket against battery. (Fig. 11)

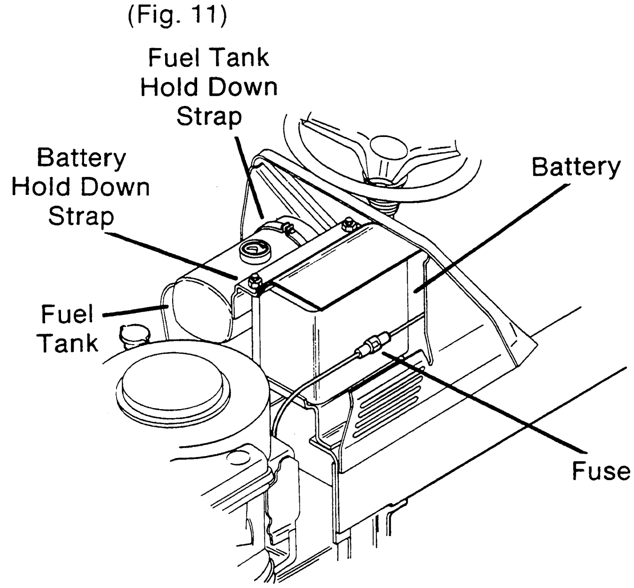


FIG. 11

C. Remove capscrew thru fuel tank hold down strap at top of fuel tank. (Fig. 11)

D. Carefully spread fuel tank strap until fuel tank can be removed.

E. Lift fuel tank up and out with fuel line still attached. Service tank as required.

F. Reverse above procedures to install fuel tank.

NOTE: **Do Not** overtighten battery hold down bracket. Overtightening may cause battery case to crack.

TRANSAXLE:

1. Transaxle Removal and Replacement —

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section of this service manual.

B. Loosen (do not remove) each capscrew securing right and left transaxle pulley belt guides to main frame. Swing belt guides out of the way. (Fig. 4)

C. Depress clutch/brake pedal and set parking brake and work traction drive belt off transaxle pulley. Depress clutch/brake pedal again to release parking brake.

D. Remove cotter pin attaching speed control link to gear select lever at front of transaxle. (Fig. 12)

E. Remove cotter pin attaching brake adjustment rod to brake arm at transaxle disc brake. (Fig. 12) Detach brake adjustment rod from brake arm.

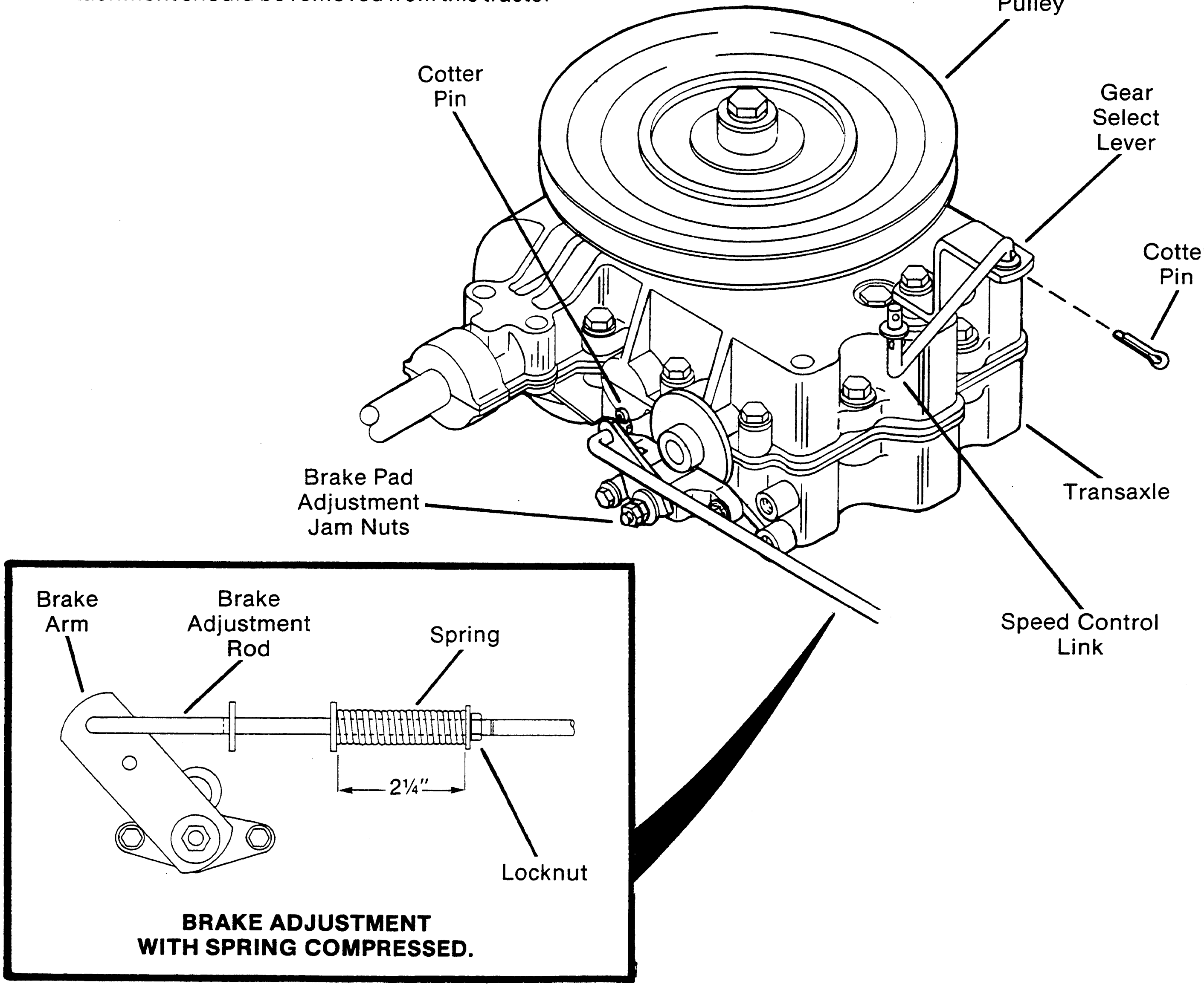


FIG. 12

F. Jack rear of tractor up until rear wheels are off the ground and support rear of tractor on jack stands (Fig. 13) Snap off right and left wheel bearing caps and pry "E" ring off of both ends of axle. Remove washers from both ends of axle.

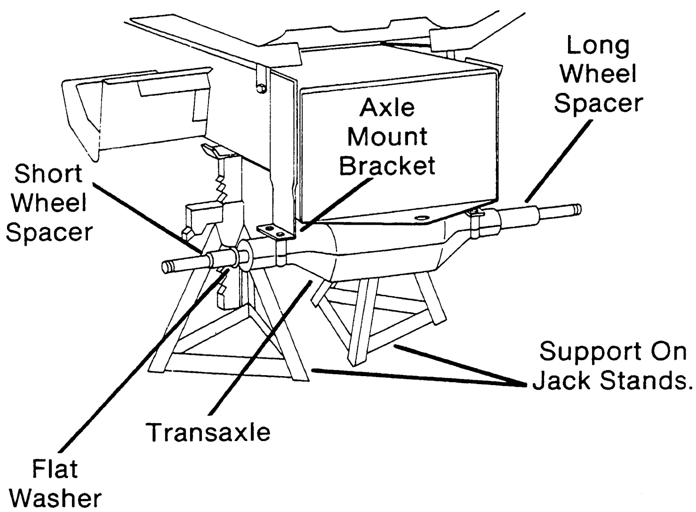


FIG. 13

G. Pull right and left wheel assemblies off axle. Remove both square keys and slide right and left wheel spacers and flat washers off axle.

NOTE: When reinstalling wheel spacers, longer spacer should be installed on right axle. (Fig. 13)

H. Jack rear of tractor up and remove jack stands. Lower rear of tractor to the ground.

I. Unbolt two capscrews, attaching left and right axle mount brackets to transaxle.

J. Raise rear of tractor up and disconnect speed control link from gear select lever (Fig. 12) and push tractor forward over transaxle and lower to the ground.

K. Service transaxle as required per manufacturer's specifications. Reverse above procedures to install transaxle. Pay attention to the various "NOTES" called out in disassembly procedures when reassembling.

NOTE: After traction drive belt is installed on pulley and transaxle is securely tightened, set transaxle pulley belt guides to a maximum ⅛" away from belt and pulley when belt is in the "ENGAGED" position.

2. Traction Drive Brake Adjustment —

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Check adjustment at brake adjustment rod. With brake "ENGAGED", spring should be compressed to dimension shown in (Fig. 12). If it isn't, turn locknut until dimension is achieved.

B. Test Brake adjustment by pushing tractor forward while holding clutch/brake pedal down. If brake does not stop rear wheels, continue with step "C".

C. With gear shift lever in "N" (neutral) position and clutch/brake pedal up, hold inside jam nut of brake pad adjustment nuts at transaxle brake and loosen outside jam nut. (Fig. 12)

D. Turn inside jam nut clockwise to tighten brake.

E. Check adjustment by pushing tractor forward while holding clutch/brake pedal down. If brake does not stop rear wheels, repeat step "D" until brake is tight.

F. With clutch/brake pedal up, push tractor forward. If brake pad drags against brake disc, turn inside jam nut counterclockwise one half turn. Repeat procedure if brake pad still drags.

G. When adjustment is correct, hold inside jam nut and tighten outside jam nut against it. (100 in./lbs.)

NOTE: If brake still does not perform properly, follow procedures below for (BRAKE PAD REPLACEMENT).

3. Brake Pad Replacement —

Replace **both** brake pads when the brake can no longer be adjusted to hold the tractor or when the thickness of either pad is less than the thickness of ignition key. Follow procedures below for brake pad replacement.

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Jack right rear wheel up and support off the floor. Pry "E" ring off axle. Remove washers and right wheel assembly to gain access to transaxle brake.

B. Remove cotter pin attaching brake adjustment rod to brake arm. Detach brake adjustment rod. (Fig. 12)

C. Remove two thread forming screws securing brake pad holder to transaxle case. (retorque to 85-110 in./lbs.) (Fig. 14)

   NOTE: Note location of the spacer on rear mounting screw for reassembly. (Fig. 14)

D. Brake pad holder is now loose and outer brake pad can be removed.

   NOTE: Brake pad back-up plate and dowel pins may fall out at this time. (Fig. 14) Remember to replace plate and pins when reassembling.

TRACTION DRIVE BELT:

1. Adjustment —

No adjustment is required. This belt is self adjusted by the spring loaded pivot bracket. Periodically check pivot bracket to be sure it is pivoting freely and providing tension.

2. Removal and Replacement —

This belt was designed and engineered to provide long, trouble-free service. If replacement is necessary, use **only** the belt recommended by

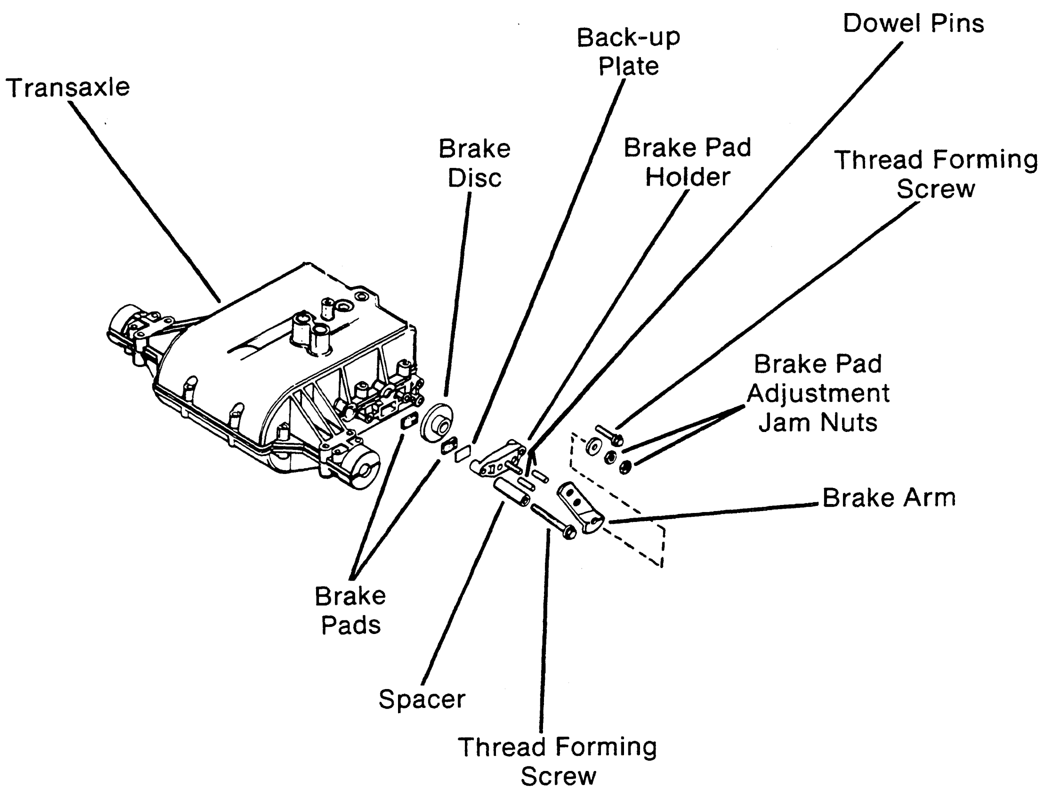


FIG. 14

E. Pull brake disc off output shaft, inner brake pad will fall out of transaxle case.

F. Replace brake pads with new parts and reassemble brake by reversing above procedures.

   NOTE: It may be necessary to readjust brake engagement. Refer to procedures under "TRACTION DRIVE BRAKE ADJUSTMENT".

manufacturer to be sure you have a belt that will provide the life and service required.

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section of this service manual.

B. Depress clutch/brake pedal and set parking brake.

C. Remove capscrews holding flat idler pulley and V-idler pulley to pivot bracket. (Fig. 15) Save all hardware and belt fingers. Note location and placement of each part.

D. (For machines equipped as shown in DETAIL "A," the following procedure applies).

Detach speed control rod clevis from gear select lever by removing spring clip (DETAIL "A").

(For machines equipped as shown in DETAIL "B," the following procedure applies).

Disconnect gear select lever at transaxle input shaft by removing hex socket head capscrew and washers, and carefully punching gear select lever up. (DETAIL "B")

NOTE: Torque, hex socket head capscrew to 5-7 ft./lbs. when reassembling gear select lever to transaxle.

E. Loosen (do not remove) left and right transaxle pulley belt guides. Swing guides out of the way, then slip traction drive belt up and off of transaxle pulley.

F. Remove upper engine pulley belt guide. Save hardware.

G. Slip traction drive belt down and around both engine pulleys, then through lower belt guide.

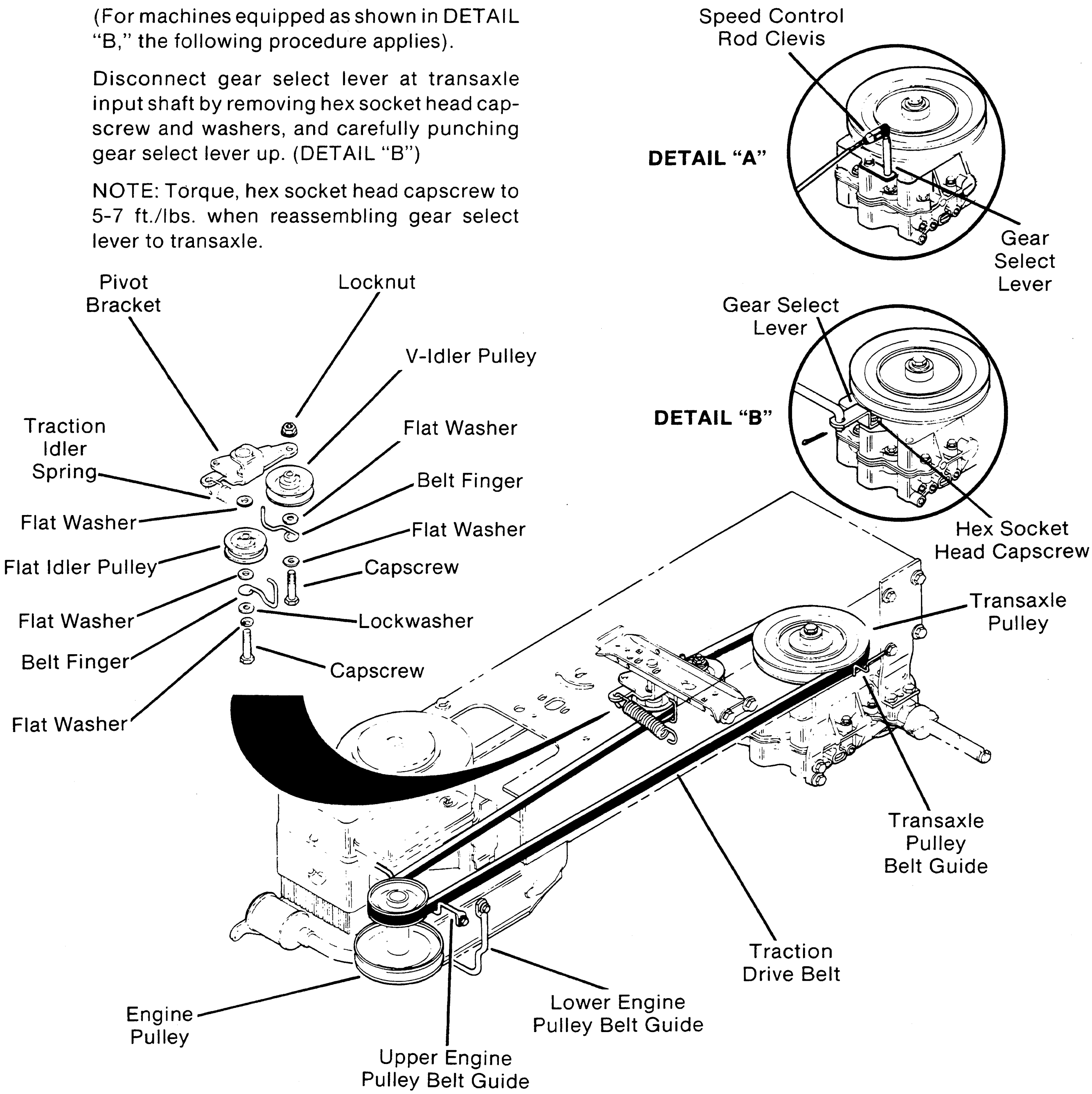
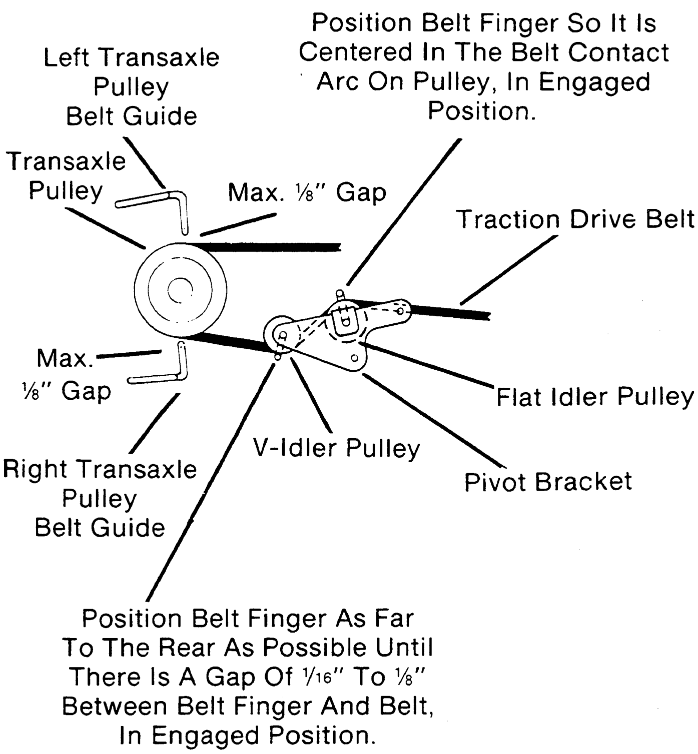


FIG. 15

H. Remove old belt and replace with a new one by reversing above procedures. Pay special attention to "NOTES" below:

NOTE: Set transaxle belt guides to a maximum ⅛"away from belt and pulley when belt is in the "ENGAGED" position. (Fig. 16)

NOTE: Position belt finger on rear V-idler pulley as far to the rear as possible until there is a gap of 1/16" to ⅛" between belt finger and belt when belt is in the "ENGAGED" position. (Fig. 16)



TOP VIEW LT1015

FIG. 16

FRONT AXLE REMOVAL AND REPLACEMENT:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Jack front of tractor up and support with jack stands on frame as shown in (Fig. 17).

B. Remove capscrew and locknut securing steering drag link to left spindle steering arm. (Fig. 17)

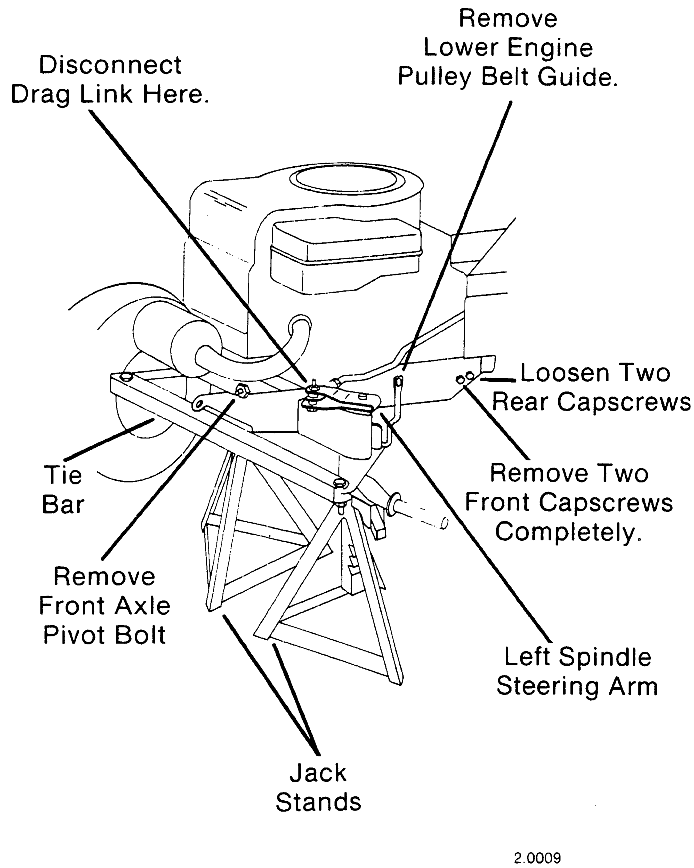


FIG. 17

C. Remove two thread forming screws attaching lower engine pulley belt guide to frame. (Fig. 17)

D. Loosen (do not remove) two rear capscrews holding rear axle pivot bracket to frame. Remove two front capscrews completely. (Fig. 17)

E. Holding inside locknut, remove front axle pivot bolt and pull bolt out forward. (Fig. 17)

WARNING: To avoid injury from falling parts, care should be taken to secure assembly when removing the pivot bolt.

F. Pull entire axle assembly down and forward to remove. The rear axle pivot bracket will pivot on the two remaining capscrews and allow the front axle pivot bracket to separate from the rear bracket.

G. Service front axle as required. Check all bushings, spindles and front tie bar for excessive wear. Replace any worn parts and regrease all lube fittings with NLGI Grade 2 Lithium base EP grease (Ford 1T-M1C137-B), after axle is reassembled.

H. Reverse above procedures to install front axle until you reach the point of connecting the drag link, then follow steering adjustment procedures below:

   a. Manually set front wheels all the way to the left, allowing maximum ⅛" gap between left spindle stop and rear of axle wall as shown in (Fig. 18).

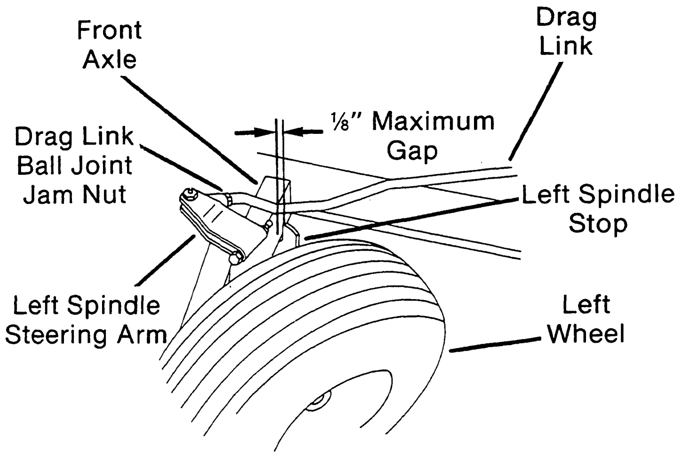


FIG. 18

   b. Turn steering wheel to the left until sector gear reaches the end of its travel. Hold in this position.

   c. Adjust ball joints on ends of steering drag link. Loosen jam nut and turn ball joint, so hole in ball joint aligns with hole in left spindle steering arm. Lock ball joint by tightening jam nut. (Fig. 17)

   d. Bolt drag link into left spindle steering arm, with capscrew coming from bottom up.

STEERING SHAFT REMOVAL

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section of this service manual.

B. Unclip hood latches and raise hood and secure in upright position.

C. Disconnect both battery cables from battery. Disconnect negative (-) terminal **first**. Loosen (do not remove) hex nuts on battery hold down clamp and remove battery from tractor.

D. Remove cotter pin and gear spacers (shims) from lower end of steering shaft and loosen (do not remove) hex nuts on two lower bearing mounting capscrews. (Fig. 19)

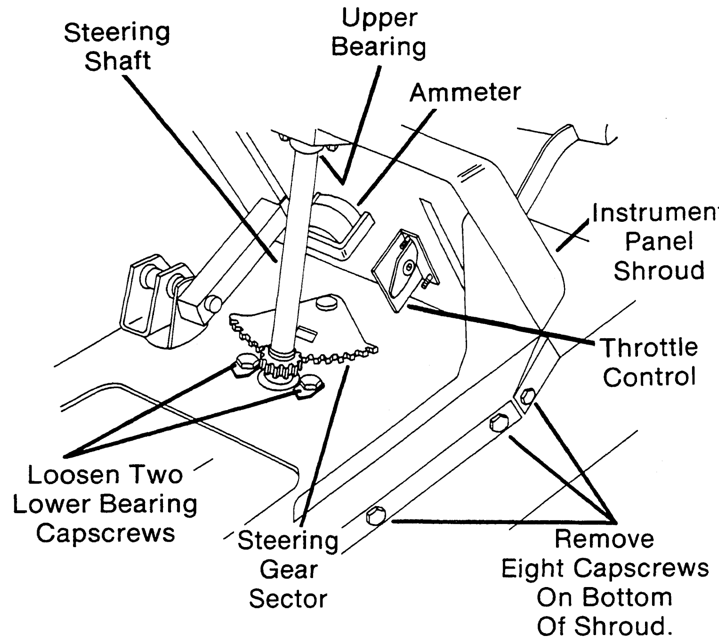


FIG. 19

E. Compress steering shaft bellows to expose capscrew through steering wheel adaptor. Remove capscrew and locknut. Lift steering wheel assembly and bellows off steering shaft.

F. Unbolt two capscrews holding upper bearing to instrument panel shroud. (Fig. 19)

G. Remove eight thread forming screws along bottom side edges of instrument panel shroud. (Fig. 19)

H. Lift instrument panel, pivoting front upward, to remove panel over steering shaft.

I. Pull steering shaft upward and out of lower bearing to remove.

J. Service steering shaft as required and check condition of both upper and lower shaft bearings. Replace any worn parts.

K. Replace steering shaft by reversing above procedures and pay special attention to "NOTES" below:

NOTE: When instrument panel was tipped to get panel over steering shaft, some wire connections may have come loose. Check all wire connections, reference "WIRING DIAGRAM" for proper connections.

NOTE: When reattaching steering wheel onto steering shaft, manually set front wheels in the forward drive position. Slip bellows and steering wheel onto steering shaft. Compress bellows and insert capscrew through adaptor and hole in shaft. Secure with locknut. Raise steering wheel up and align logo facing operator. Lower steering shaft so steering gear and gear sector mesh together and steering wheel spokes centered with the centerline of the tractor. Slide lower bearing towards gear sector assembly carefully. (Fig. 20) When steering gear and gear sector mesh evenly and smoothly, tighten both capscrews on lower bearing to a torque of 10 - 15 ft./lbs.

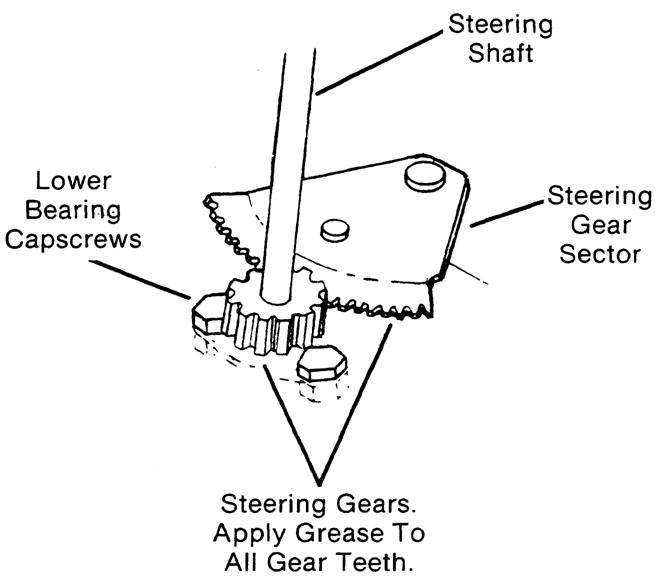


FIG. 20

STEERING GEAR ADJUSTMENT:

If excessive play develops in steering wheel, (must not exceed 1½" measured at O.D. of wheel) adjust steering gear by repositioning lower flange bearing.

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip hood latches and raise hood and secure in upright position.

B. Disconnect both battery cables from battery. Disconnect negative (-) terminal **first**. Loosen (do not remove) hex nuts on battery hold down clamp and remove battery from tractor.

C. Loosen two capscrews that secure lower flange bearing to frame. (Fig. 20)

D. Slide lower flange bearing towards gear sector assembly carefully.

E. When steering gear and gear sector mesh evenly and smoothly, tighten both capscrews on lower bearing to torque of 10 -15 ft./lbs.

F. Replace battery and lower hood.

STEERING SECTOR REMOVAL:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section of this service manual.

B. Unclip hood latches and raise hood and secure in upright position.

C. Disconnect both battery cables from battery. Disconnect negative (-) terminal **first**. Loosen (do not remove) hex nuts on battery hold down clamp and remove battery from tractor.

D. Loosen two capscrews that secure lower flange steering shaft bearing to frame. (Fig. 20)

E. Disconnect drag link ball joint at steering gear sector arm by removing capscrew, locknut and washer. (Fig. 21)

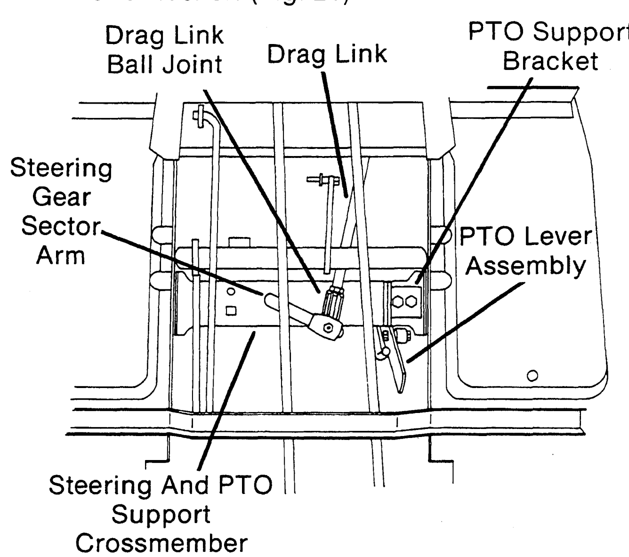


FIG. 21

F. Remove spring clip and clevis pin, joining clevis (on end of speed control rod) to speed control bellcrank. (Fig. 15 - DETAIL "A" or DETAIL "B").

G. Screw knob off parking brake link. (Fig. 22) Remove push nut and washers. Push brake link in and allow to drop down as far as possible.

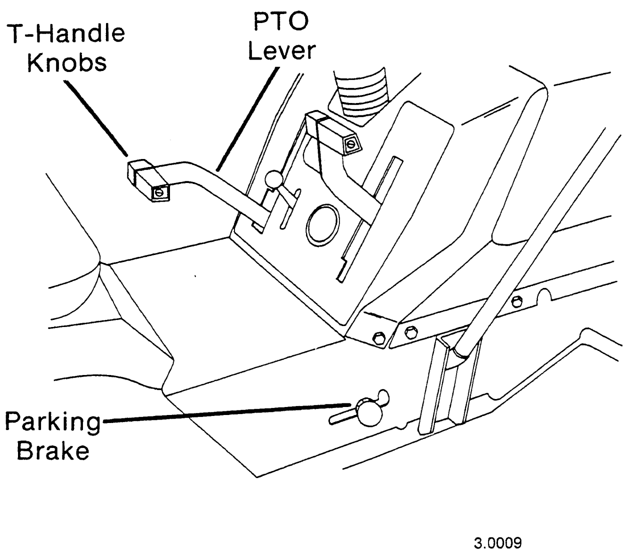


FIG. 22

H. Remove "T" handle knobs on PTO lever by removing slotted machine screw. (Fig. 22)

I. Unbolt two capscrews attaching PTO support bracket to bottom side of steering and PTO support crossmember. (Fig. 21) Work PTO lever assembly out behind the crossmember.

J. Remove "E" clip on steering gear sector arm below split bushing in crossmember. Carefully pry plastic split bushing out of crossmember and remove bushing from gear sector arm.

NOTE: Locating tab on bushing should be aligned in slot in crossmember.

K. Remove four capscrews holding steering and PTO support crossmember between frame. (Fig. 21) Rotate crossmember 90° and work crossmember off of steering gear sector arm.

L. Gently tap top bushing, on steering gear sector arm, upward until unseated from frame saddle.

M. Remove knob, and two screws attaching throttle control to instrument panel. (Fig. 19) Work throttle control out slot in instrument panel and secure out of the way towards left side of tractor.

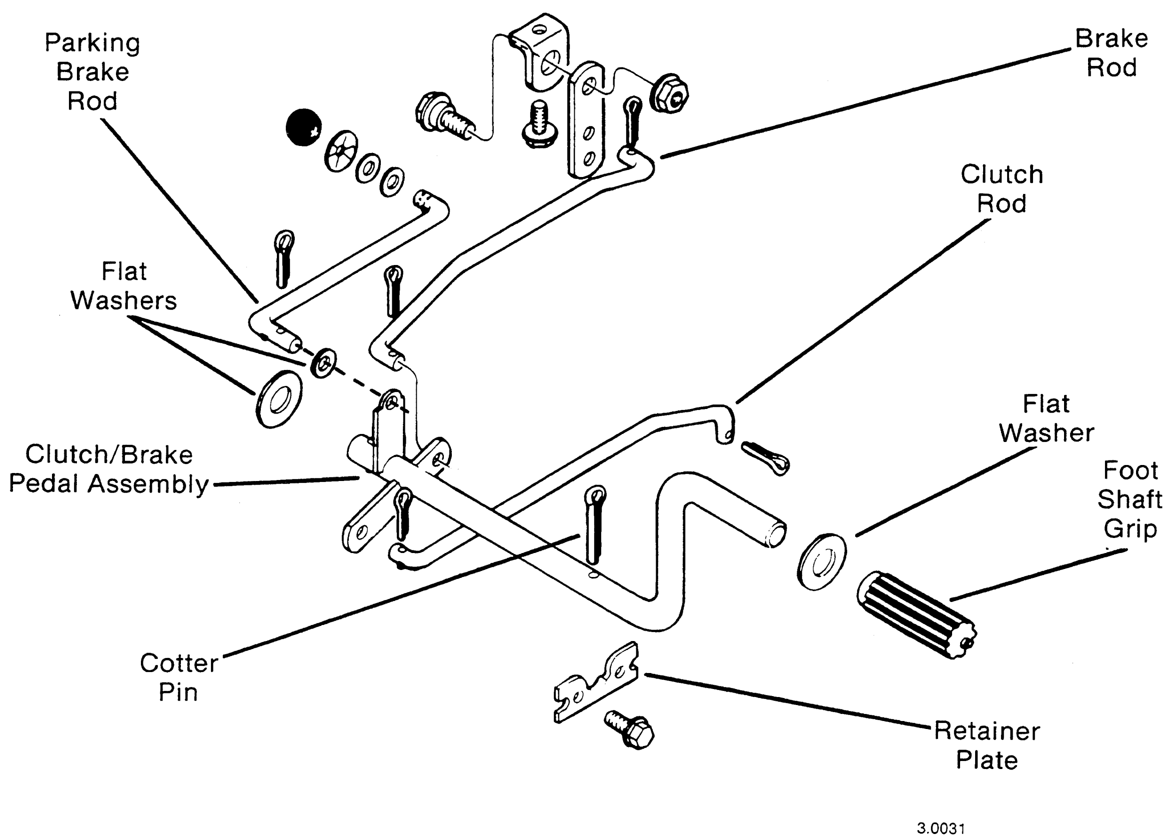


FIG. 23

N. Remove nuts and wire connections at ammeter. (Fig. 19) Tag wires for reassembly. Slide fastener bracket off terminals and remove ammeter out front of instrument panel.

O. Remove eight thread forming screws along bottom side edges of instrument panel shroud. (Fig 19) Push shroud rearward as far as possible.

P. Work steering gear sector assembly up and out of hole in frame. Service gear sector as required.

Q. Replace steering gear sector assembly by reversing above procedures and pay attention to "NOTES" below:

NOTE: Be sure to liberally grease gear teeth with NLGI Grade 2 Lithium EP grease (Ford 1T-M1C137-B), after installation is made.

NOTE: Before tightening capscrews securing lower flange steering shaft bearing, alignment of steering wheel and front wheels should be set. Manually set front wheels in the forward drive position. Turn steering wheel so logo is facing operator and steering wheel spokes are centered with the centerline of the tractor. Slide lower bearing towards gear sector assembly carefully. When steering gear and gear sector mesh evenly and smoothly, tighten both capscrews on lower bearing to a torque of 10 - 15 ft./lbs.

CLUTCH/BRAKE FOOT PEDAL REMOVAL:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section in this service manual.

B. Remove foot shaft grip from shaft.

C. Remove all cotter pins and washers securing the clutch rod, brake rod and parking brake rod to pedal shaft assembly (Fig. 23) Clutch and brake rods can be detached from pedal shaft assembly at this time. Parking brake rod will be detached in a later step.

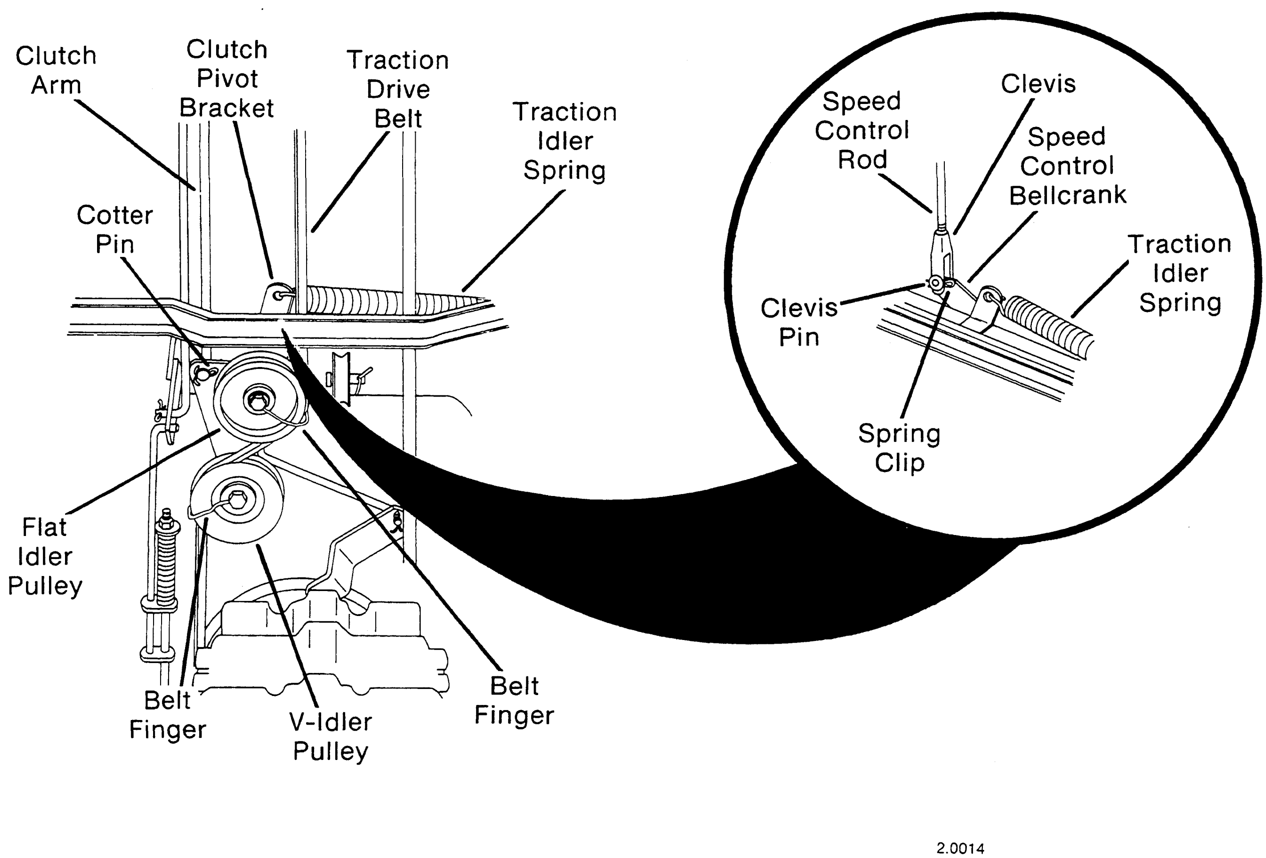


FIG. 24

Note location and orientation of all washers and rod ends attaching to pedal shaft assembly. (Fig. 23)

D. Remove cotter pin through clutch/brake pedal shaft located next to the left inside of frame.

E. Remove two capscrews securing retainer plate to left inside of frame (Fig. 23) along with one capscrew and nut on frame lip. Remove retainer plate.

F. Pull clutch/brake pedal assembly to the left and remove parking brake rod and flat washer on right end of pedal shaft. (Fig. 23) Work clutch/brake pedal assembly to the right and out bottom of tractor.

HINT: The attachment lift lever may have to be moved to the raised and lowered position in order to remove clutch/brake pedal assembly.

G. Service clutch/brake pedal assembly as required. Reverse above procedures to install. Recheck position of all rods and lubricate all pivot points with SAE 30 wt. oil. Depress clutch brake pedal and check to see that rods are not binding. Check operation of parking brake.

TRACTION DRIVE GEAR SHIFT LEVER ADJUSTMENT:

(Models 09GN2101-YC02162: 09GN2102-YC04593: 09GN2104-YC02057 and before)

Traction drive gear shift lever is factory set and should not normally need adjustment. If at such time that some gears cannot be achieved or "NEUTRAL" is not in the proper position, adjustment of the control rod yoke end may be necessary. To perform this adjustment, follow procedures below:

WARNING: To avoid accidental starting, remove spark plug wires and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section in this service manual.

B. Remove spring clip from clevis pin in yoke. Remove clevis pin. (Fig. 24).

C. Set gear shift lever in "NEUTRAL" position.

D. Adjust yoke end on control rod until clevis pin can be inserted through hole in bellcrank. (Fig. 24).

E. Jack rear of tractor up and rotate wheels while checking engagement in NEUTRAL, REVERSE and 5th gear, before running tractor under power.

TRACTION DRIVE GEAR SHIFT LEVER ADJUSTMENT:

(Models 09GN2101-YC02163: 09GN2102-YC04594: 09GN2104-YC02058 and after)

Traction drive gear shift lever is factory set and should not normally need adjustment. If at such time that some gears cannot be achieved or "NEUTRAL" is not in the proper position, adjustment of the control rod clevis may be necessary. To perform this adjustment, follow procedures below:

WARNING: To avoid accidental starting, remove spark plug wires and secure away from spark plugs.

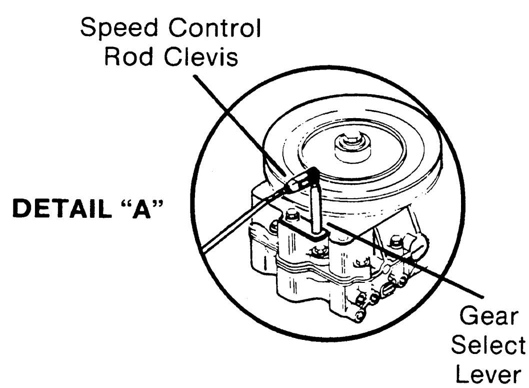


FIG. 24A

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section of this service manual.

B. Remove spring clip from top of gear select lever. Detach speed control rod clevis from gear select lever (Fig. 24A).

C. Set gear shift lever in "NEUTRAL" position. Manually set gear select lever in the "NEUTRAL" position.

D. Adjust speed control rod clevis until clevis can be inserted onto pin on top of gear select lever.

E. Jack rear of tractor up and rotate wheels while checking engagement in NEUTRAL, REVERSE and 5th gear, before running tractor under power. Readjust if necessary.

CLUTCH PIVOT BRACKET REMOVAL:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section in this service manual.

B. Depress clutch/brake pedal and set parking brake.

C. Loosen (do not remove) capscrew on V-idler pulley far enough to slip belt out between pulley and belt finger. (Fig. 24)

D. Release parking brake and disconnect and remove traction idler spring attached to clutch pivot bracket. (Fig. 24)

E. Remove cotter pin from clutch arm connected to clutch pivot bracket. Disconnect clutch arm. (Fig. 24)

F. Remove capscrew from flat idler pulley and pull pulley down and slip belt out from between pulley and belt finger. Clutch pivot bracket can also be pulled off support shaft at this time. Note the sequence of parts for reassembly. (Fig. 25)

G. Service clutch pivot bracket as required. Check condition of two nyliner bushings in bracket and replace as necessary. Replace clutch pivot bracket by reversing above procedures and pay attention to belt finger adjustments below:

NOTE: Position belt finger on front (flat) idler pulley so that it is centered in the belt contact arc on pulley when belt is in "ENGAGED" position. (Fig. 16)

NOTE: Position belt finger on rear V-idler pulley as far to the rear as possible until there is a gap of 1/16" to 1/8" between belt finger and belt when belt is in the "ENGAGED" position. (Fig. 16)

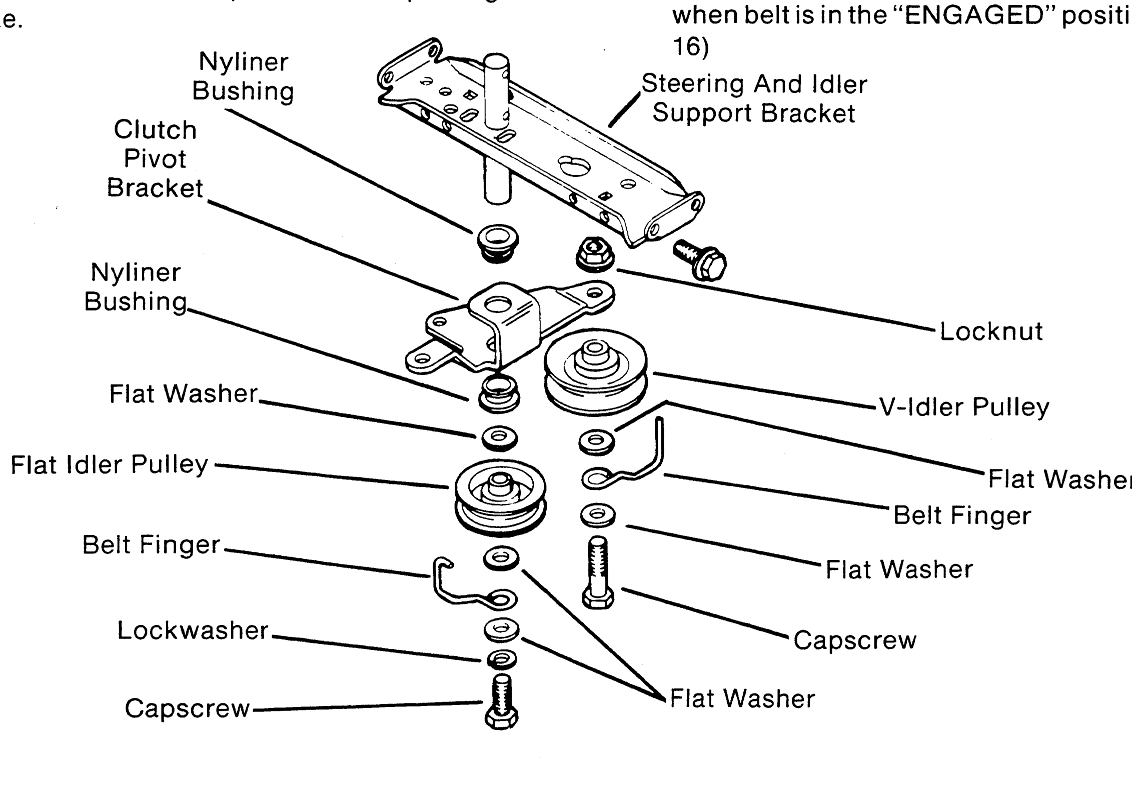


FIG. 25

PTO LEVER REMOVAL AND REPLACEMENT:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section in this service manual.

B. Remove machine screw through T-handle and remove handle knobs from PTO lever. (Fig. 26)

C. Remove capscrew holding PTO lever to PTO support bracket. Remove washer, rubber bushing and spacer in PTO lever. (Fig. 26)

D. Carefully work PTO lever out bottom of tractor.

IMPORTANT: Do not bend leaf spring on interlock switch when removing PTO lever.

E. Service PTO lever as required and reverse above procedures to install.

NOTE: When PTO lever is secured to support bracket, rubber bushing should be compressed to a thickness of ⅝". (Fig. 26)

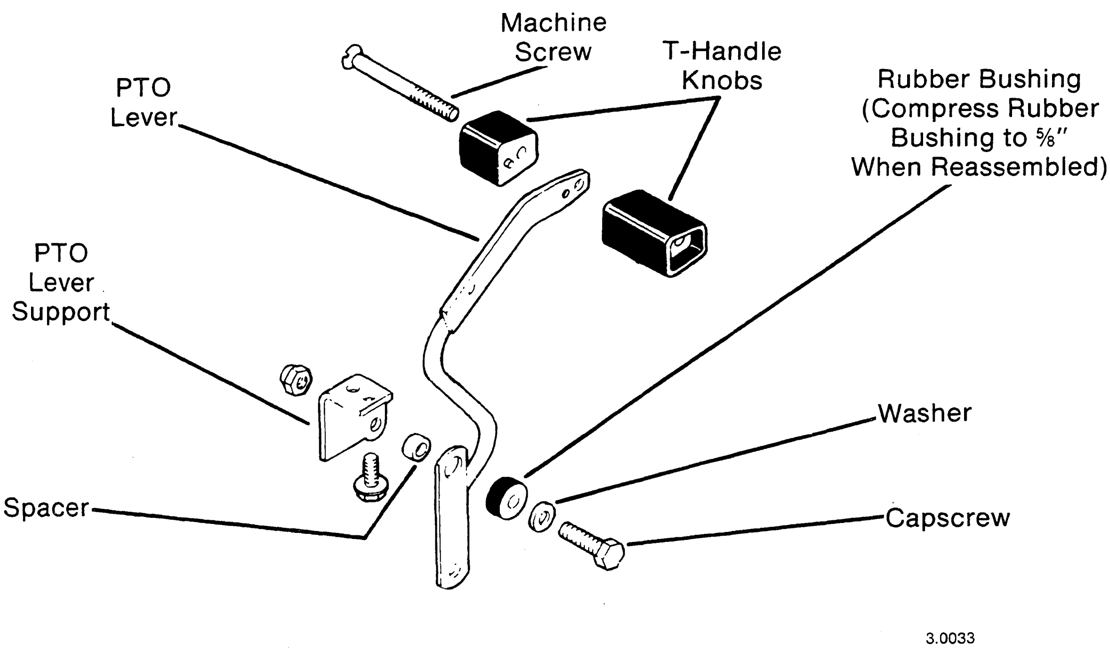


FIG. 26

ATTACHMENT LIFT LEVER SHAFT REMOVAL AND REPLACEMENT:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Before this procedure is performed, the attachment should be removed from this tractor as outlined in "ATTACHMENT" section of this service manual.

B. Remove right side running board by removing one front mounting screw, and the rear two carriage bolts attaching it to the support braces. (Fig. 27)

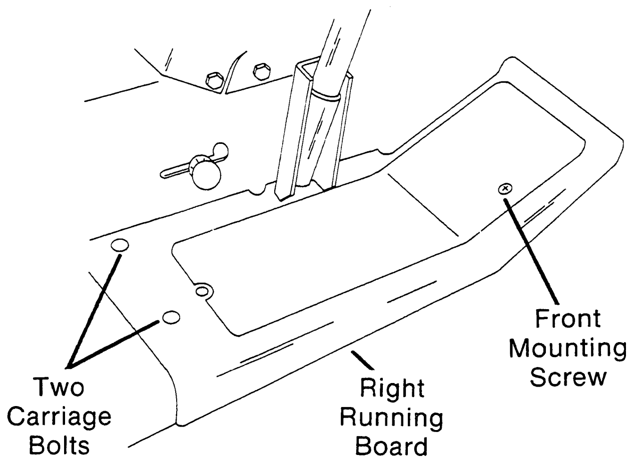


FIG. 27

C. Remove snap ring and all thrust (shim) washers from left end of lift lever shaft. (Fig. 28)

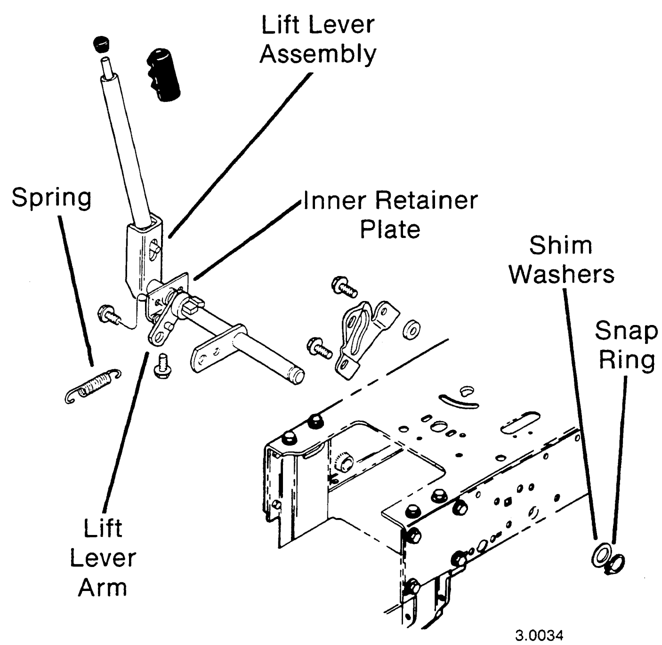


FIG. 28

D. Remove cotter pin from front end of clutch rod passing below lift lever shaft. Disconnect rod from clutch arm (Fig. 23).

E. Detach spring from right side lift lever arm. (Fig 28)

F. Remove four thread forming screws securing inner retainer bracket to right frame rail. (Fig. 28) Slide bracket away from frame until it clears frame lip. Pull lift lever handle down and away from right side of tractor until left side of shaft comes out of frame. Work lift lever assembly out bottom of tractor.

G. Service lift lever assembly as required and reverse above procedures to replace.

NOTE: Lubricate all pivot points with NLGI Grade 2 Lithium base EP grease (Ford 1T-M1C137-B), during installation.

THROTTLE CONTROL LEVER REMOVAL AND REPLACEMENT:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip and raise hood and secure in upright position.

B. Disconnect throttle cable at engine, by loosening throttle cable clamp screw enough so that cable can be removed. Disconnect cable end from throttle speed control block (Fig. 29)

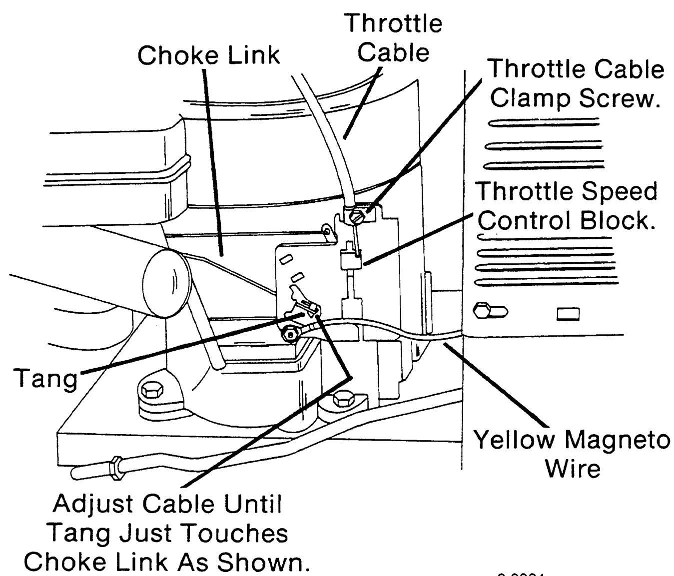


FIG. 29

C. Remove throttle control knob by prying off of control lever.

D. Remove two screws attaching throttle control assembly to instrument panel.

E. Push throttle control lever through slotted hole in instrument panel. Work throttle control assembly out upper left corner of instrument panel above battery, pulling cable along from between battery and battery hold down bracket.

F. Service or replace throttle control assembly as required.

G. To reinstall throttle control, insert throttle cable from the rear of battery, in the gap between battery and battery hold down bracket and push forward.

H. Mount throttle control assembly to instrument panel with two screws. Push knob back on control lever all the way, locking knob in place.

I. Move throttle control lever up to the "FULL FAST" position (which is the detent before the "START" position is reached) (Fig. 30). Attach end of throttle cable to throttle speed control block and slip cable under cable clamp. Pull throttle cable up until tang on speed control lever just touches choke link, as shown in (Fig. 29). Tighten throttle cable clamp screw.

J. Close hood and secure with clips and test unit for proper operation.

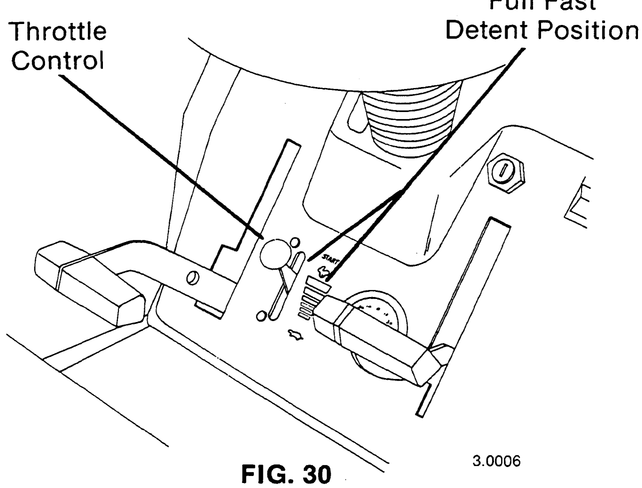


FIG. 30

ELECTRICAL SYSTEM:

1. System Functions —

A. To start the lawn tractor the operator should be seated, the clutch/brake pedal **must** be completely depressed and the PTO lever **must** be in the OFF position. Ignition switch can now be turned and the engine will start.

The clutch/brake pedal, PTO lever and seat; actuate seperate switches that make up the Safety Interlock System. This interlock system is provided for the safety of the operator and should not be tampered with.

B. The safety functions of the interlock system are as follows:

a. If either the clutch/brake pedal is up (ENGAGED position) or PTO lever is engaged or both levers are in their operating positions. The ignition switch can be turned to the START position and the engine will not start.

b. The seat switch is also an intregal part of the safety interlock system. Should the operator leave the seat with engine running while either the clutch/brake pedal is up or PTO lever engaged, the engine will stop.

IMPORTANT: In some instances, it may be necessary for the serviceman to be off of the operator's seat with engine running to make certain engine adjustments. This can be achieved by depressing the clutch/brake pedal and setting the parking brake and setting the PTO lever in the OFF position. Special precautions should be taken by the serviceman when operating tractor in this mode, as this is NOT a recommended method of operating for this tractor.

WARNING: To avoid serious injury, DO NOT run engine without an operator in the seat except for necessary engine adjustments. KNOW HOW TO STOP THE ENGINE.

C. To aid in trouble-shooting the starting and ignition electrical systems, we have isolated each system in the following wiring diagrams to make servicing each system easier. The function of each system is described as follows:

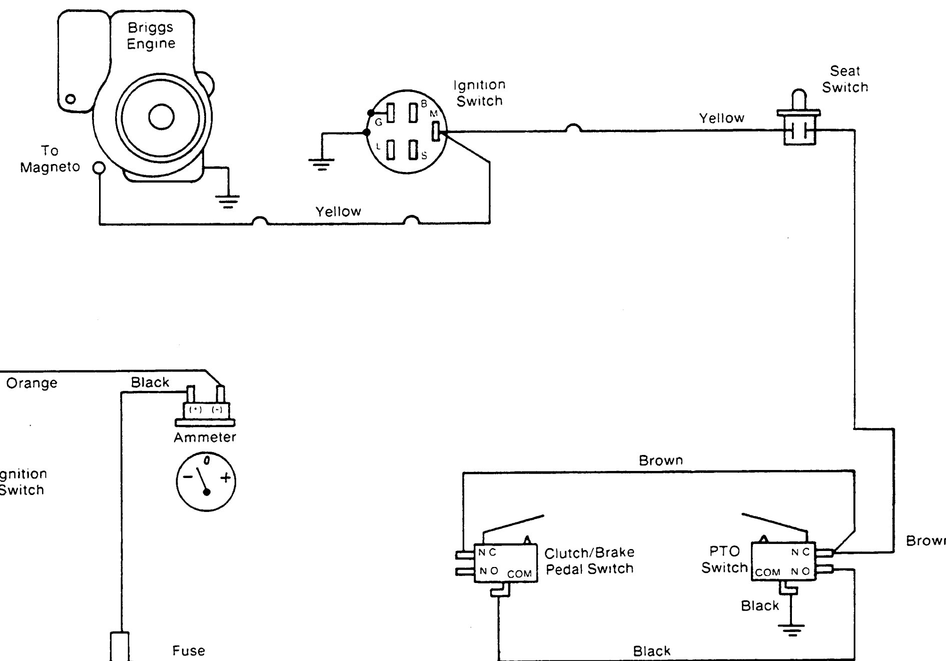
a. Starting System — (Fig. 31)

Power from the battery flows through the fuse and ammeter to the ignition switch terminal "B". When ignition switch is turned to the START position, current flows from terminal "S" to the control windings of the solenoid to the normally open terminals of the micro switches. The clutch/brake pedal must be depressed and the PTO lever moved to the OFF position to actuate the switches allowing the current to flow to ground. At this time the solenoid is energized and current will flow to the starter.

b. Ignition System — (Fig. 32)

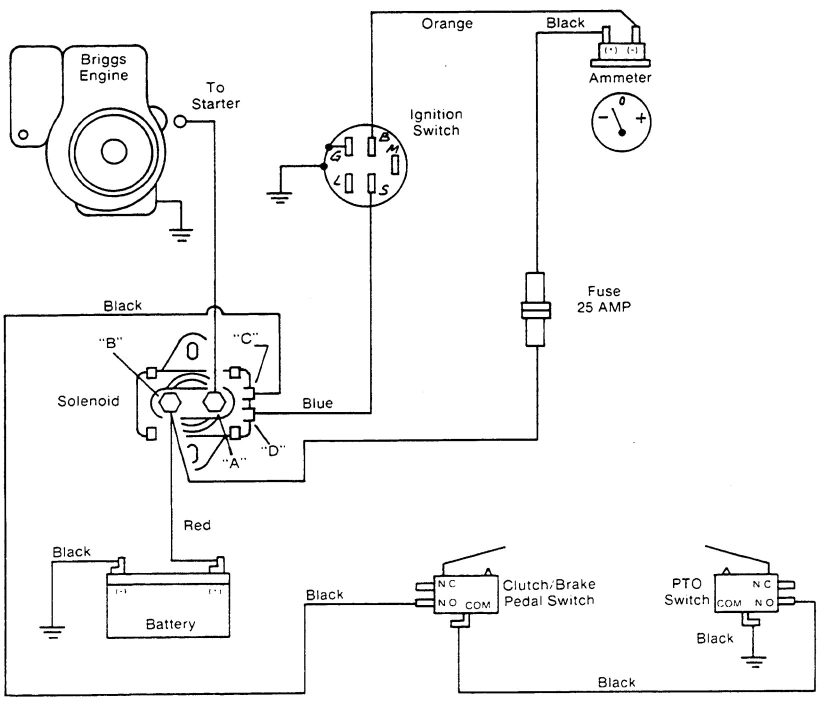
When the ignition switch is in the START or RUN position the "M" terminal is isolated. In the OFF position, "M" terminal is connected to ground, through the "G" terminal. Since the engine is sparked by a magneto, the ignition switch will cut off spark when turned to the OFF position. When in the START or RUN position, the current from the magneto can also flow to the seat switch which is a normally closed switch. If the operator is **on** the seat, the current will be **unable** to find a ground and the engine can run or start. If the operator is **off** the seat current **can** flow to both micro switches. Should either the clutch/brake pedal be released or the PTO lever is engaged, the current will flow to ground and short out the ignition magneto, stopping the engine.

c. If either of these systems require servicing, all wire connections and components should be checked to see if they are connected and functioning properly. Reference individual test procedures for testing each component in these systems.



(IGNITION SYSTEM)

FIG. 32



(STARTING SYSTEM)

FIG. 31

D. To stop engine:

a. Move gear shift lever to neutral "N".

b. Move PTO lever to OFF.

c. Set parking brake.

d. Turn ignition key to OFF. Remove key.

2. Battery —

The battery used is a 12 volt wet cell type.

WARNING: When the alternator is charging, an explosive gas is produced inside the battery; therefore, always check the electrolyte level with the engine stopped. DO NOT use an exposed flame and DO NOT smoke when checking the battery.

WARNING: The battery contains sulfuric acid which can cause severe burns. Avoid contact with skin, eyes or clothing.

FIRST AID:

External Contact - Flush with water.

Internal Contact - Drink large quantities of water. Follow with Milk of Magnesia, beaten egg or vegetable oil. Call a physician immediately! IMPORTANT -In case of internal contact, **DO NOT** give fluids that would induce vomiting.

Eyes - Flush with water for at least 15 minutes and get medical attention immediately!

Battery Charging - If battery is dead, engine may be started with jumper cables and operated without damage to electrical system, with battery connected. IMPORTANT: Be certain jumper cables are connected positive to positive and negative from booster battery to the engine block not to negative terminal of battery.

Battery Removal —

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip and raise hood and secure in upright position.

B. Turn ignition key OFF. Loosen (do not remove) two hex nuts on battery hold down clamp. (Fig. 33)

C. Lift rubber battery cover and dissconnect negative (-) battery cable from negative terminal.

D. Disconnect positive (+) battery cable (with protective cap) from positive battery terminal. Remove battery from its mounting.

E. Service battery as required and reverse above procedures to replace.

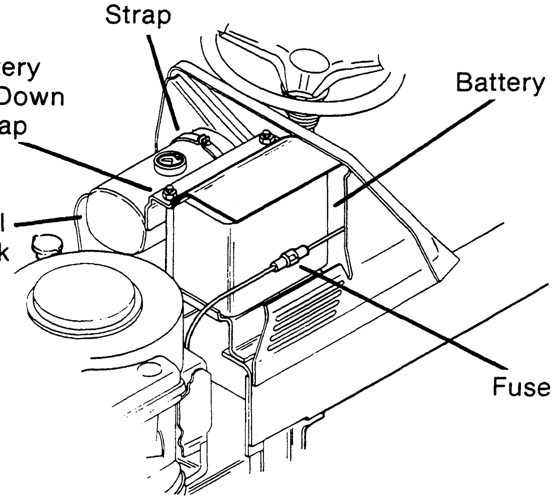


FIG. 33

3. Solenoid Check —

The starter solenoid is a sealed unit and serviced only as a complete assembly. To check for defective solenoid, follow procedures below to remove and test solenoid.

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Remove battery as described in steps A thru D for "Battery Removal" above.

B. Disconnect all leads attached to solenoid.

IMPORTANT — Tag all leads to insure proper reinstallation. For further aid in reassembly, refer to "Wiring Diagram".

C. Remove two capscrews, nuts and lockwashers securing solenoid to main frame. Remove solenoid (To replace solenoid, reverse above procedures).

D. Connect leads of continuity tester or ohmmeter to the "A" and "B" terminals (Fig. 34) of solenoid. If continuity exists or ohmmeter reads zero, replace solenoid. If no continuity exists, go on to step "E". Repeat this procedure two or three times to insure a positive test.

E. Using two 14 gauge jumper wires and 12 volt battery, connect one jumper wire to positive (+) battery terminal then to terminal "C" on solenoid. Connect other jumper wire to negative (-) battery terminal then to terminal "D" on solenoid. An audible click should be heard

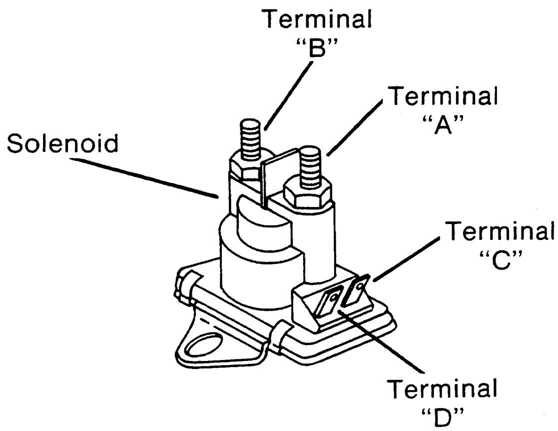


FIG. 34

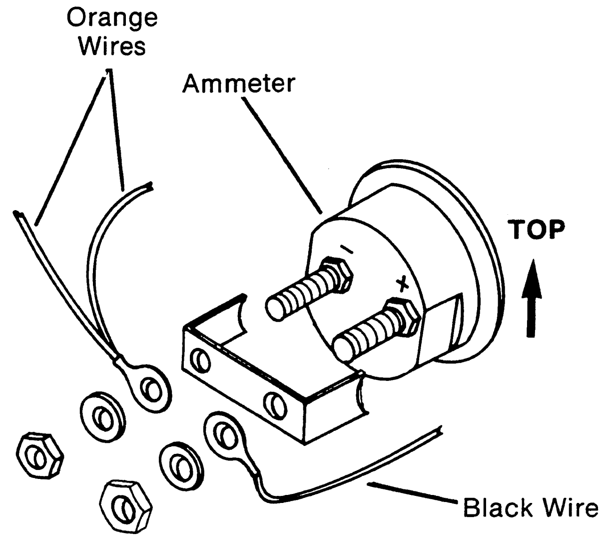


FIG. 35

and continuity tester (still attached to solenoid terminals "A" and "B") should be brightly lit or ohmmeter should register zero ohms.

WARNING: Be sure to make the last jumper wire connection at the solenoid NOT at the battery. This will prevent a spark from igniting explosive gases at battery.

If poor or no continuity exists, replace solenoid. Repeat this procedure two or three times to insure a positive test.

4. Ammeter Check —

The ammeter indicates whether battery is charging or discharging. Movement of ammeter needle to the right of center indicates battery is charging; movement to the left indicates battery is discharging.

Normal operation of the tractor will keep the battery fully charged. NOTE: If ammeter does not move, or indicates constant discharging, remove ammeter from instrument panel and follow test procedure below to check for defective ammeter.

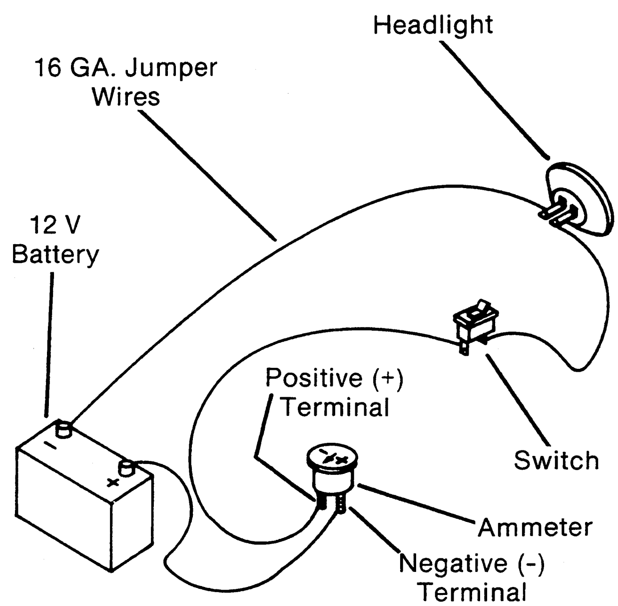
WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip hood latches and raise hood and secure in upright position.

B. Remove nuts on back of ammeter at terminal connections. Remove wire connections from both terminals. (Fig. 35)

C. Slide ammeter fastener bracket off terminals and remove ammeter out front of instrument panel.

D. Connect ammeter into the test circuit below. (Fig. 36)



TEST CIRCUIT
FIG. 36

E. Use a 12 volt battery that is fully charged and a headlight and switch that works.

F. With ammeter in circuit as shown, close switch, ammeter should show a charge condition.

G. Reverse the connections at the ammeter and close switch again, ammeter should show a discharge.

H. If ammeter does not perform above tests, ammeter is defective. Replace ammeter.

I. When connecting lead wires to ammeter, double orange wires should be connected to the negative (-) terminal.

5. Ignition Switch Check —

For safety the tractor is equipped with an automotive type ignition switch that controls all the electrical circuits. To check for defective ignition switch, follow procedures below to remove and test switch:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip hood latches and raise hood and secure in upright position.

B. Disconnect lead wire connector from rear of ignition switch.

C. Remove keys from ignition switch and remove jam nut securing ignition switch to instrument panel. Switch may now be removed from instrument panel.

D. Replace key into ignition switch and begin continuity test with switch in "OFF" position.

E. Using continuity tester or ohmmeter, attach one lead to terminal "M" on ignition switch (Fig. 37) and touch all other terminals with other lead. Continuity should **only** appear between terminals "M" and "G". If continuity appears between any other terminals, switch is defective, replace switch.

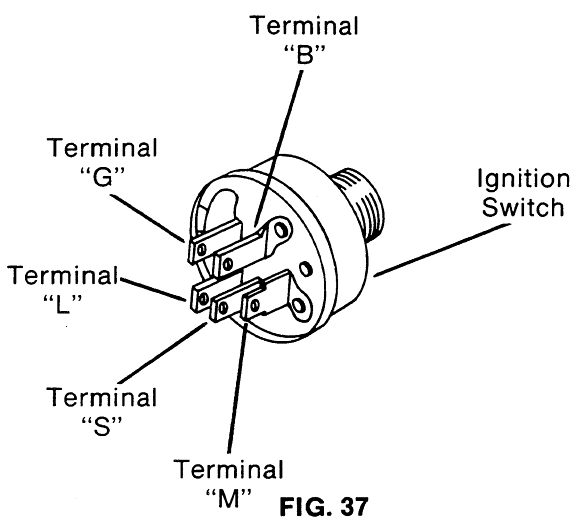


FIG. 37

F. Switch key to "ON" position and attach one lead to terminal "B" and touch all other terminals with other lead. Continuity should **only** appear between terminals "B" and "L". If continuity appears between any other terminals, switch is defective, replace switch.

G. Switch key to "START" position and attach one lead to terminal "B" and touch all other terminals with other lead. Continuity should **only** appear between terminals "B" and "S". If continuity appears between any other terminals, switch is defective, replace switch.

H. To reassemble switch back onto instrument panel, reverse procedures "A" thru "C" above.

6. Interlock Switch System Check —

WARNING: To avoid accidental starting of engine and to avoid serious bodily injury, DO NOT disconnect, by-pass or remove any of the interlock safety switches. Proper operation of this system is mandatory for the safety of the operator.

The interlock micro switches control the starting and stopping functions of the lawn tractor. Simple continuity tests should be made of the system if any of the following situations are present:

a. Engine will not crank to start.

b. Engine starts when either clutch/brake foot pedal or PTO lever is engaged.

c. Engine fails to stop when either clutch/-brake foot pedal or PTO lever are engaged with operator off the seat.

Start continuity tests by first checking battery electrolyte levels, battery charge, battery terminal connections for corrosion, blown fuse and loose or broken wires at solenoid. If all of these conditions are good, proceed with continuity tests below:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Disconnect yellow magneto wire at left rear corner of engine. (Fig. 38)

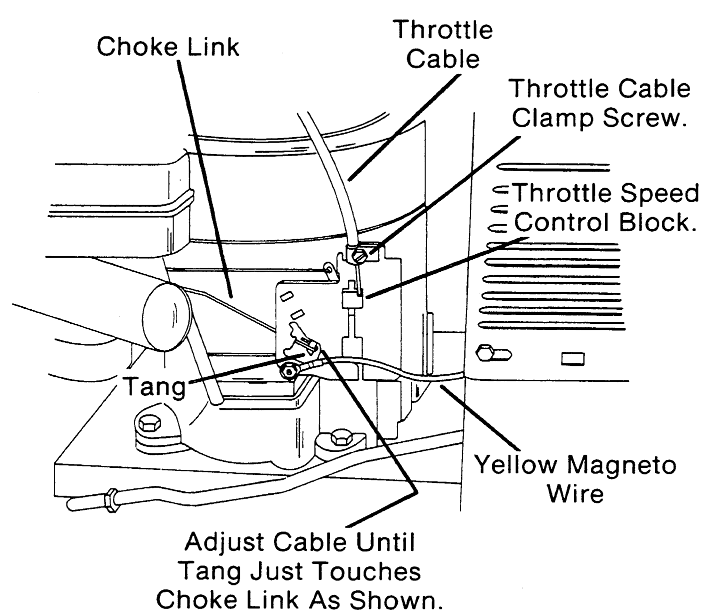


FIG. 38

B. Using ohmmeter or continuity tester, connect one probe to yellow magneto wire and other probe to engine mounting bolt (Ground).

C. With parking brake set and PTO lever in OFF position with operator off seat, turn ignition switch to the "ON" position. Continuity should **not** exist. If continuity **does** exists, go on to Step "D".

D. Repeat condition is Step "B" and "C" except this time sit in operator's seat so seat switch is depressed. Again continuity should **not** exist. If continuity is present in this test and in test Step "C", then ignition switch may be defective. Follow procedures to test ignition switch under "ELECTRICAL SYSTEM — IGNITION SWITCH". If continuity was present only in Step "C", then interlock micro switches may be defective. Follow next procedures to test interlock micro switches.

E. Test clutch/brake foot pedal switch located attached to right inside wall of main frame behind engine. Remove and tag all lead wires at switch terminals. Test switch for continuity as follows: (Fig. 39)

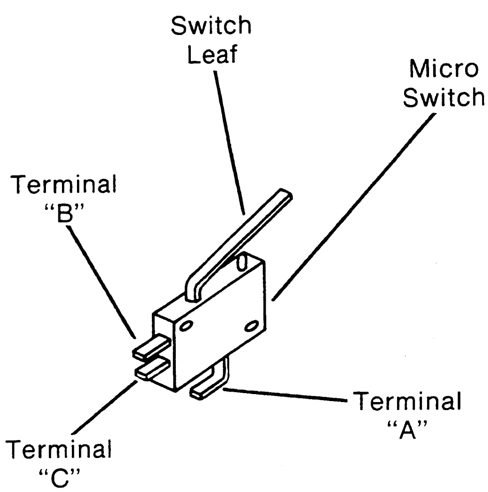


FIG. 39

a. Without leaf depressed.

Terminal Connections	Function
A to B	Continuity exists.
A to C	Continuity does **not** exist.

b. With leaf depressed.

Terminal Connections	Function
A to B	Continuity does **not** exist.
A to C	Continuity exists.

F. Test PTO lever switch located attached to top main frame behind instrument panel to the rear of the battery, by following the same procedures above to test clutch/brake foot pedal switch. Remove and tag all lead wires at switch terminals to perform test.

G. Check gap between the end of plunger and seat support bracket. (Fig. 40) There should be 1/32" to 1/16" gap between end of plunger and bracket, **without** operator on the seat. If gap is anything else shim accordingly on top of seat support bracket or bend bracket down if plunger is touching.

Test seat switch located under seat pan assembly. Raise rear of seat pan and squeeze locking tabs on switch and pull switch out hole in mounting bracket. Remove and tag lead wires at switch terminals. With switch plunger up, continuity should exist. With switch plunger depressed, continuity should **not** exist. (Fig. 40)

NOTE: If switch is replaced, switch **must** be a N. C. (normally closed) type **only**. For easy identification of a N.C. type switch, the switch bottom is white in color.

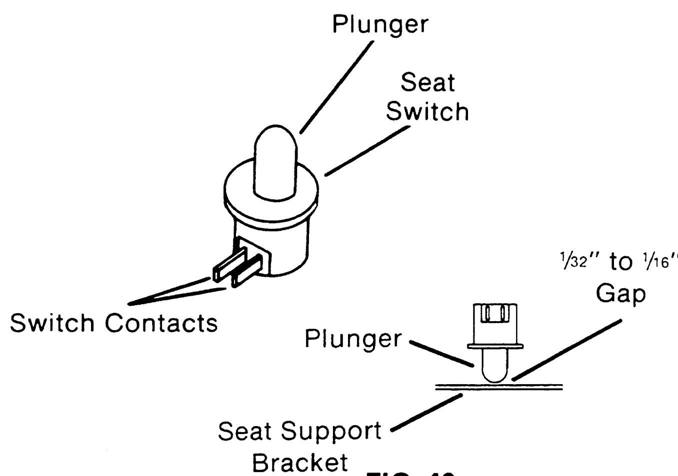


FIG. 40

7. Headlight Switch Check —

This switch is a rocker type switch and headlights should only work with engine running.

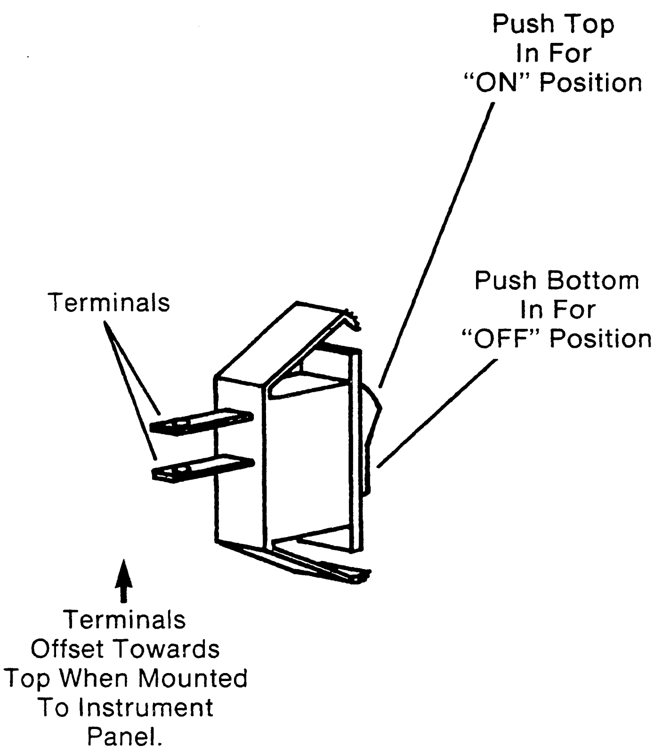
Follow procedures below to remove and test switch:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip hood latches and raise hood and secure in upright position.

B. Reach behind instrument panel and pinch switch locking tabs together and push switch tabs together and push switch through hole in panel.

C. Remove and tag both lead wires at switch terminals. Note also the orientation of switch when mounted to instrument panel (Terminal offset should be toward top of instrument panel). (Fig. 41)



HEADLIGHT SWITCH
FIG. 41

D. Connect a continuity tester or ohmmeter across terminals. (Fig. 41)

E. With switch in "ON" position, continuity should exist.

F. With switch in "OFF" position, continuity should **not** exist.

G. If switch fails to perform above test switch is defective and should be replaced.

8. Headlights —

To replace headlights, follow procedure below:

WARNING: To avoid accidental starting, remove spark plug wire and secure away from spark plug.

A. Unclip hood latches and raise hood and secure in upright position.

B. Remove and tag wires attached to headlight terminals.

C. Remove two nuts holding headlight backing plate and headlight to hood assembly.

NOTE: Hood restraint cable is attached to left mounting stud on right headlight. (Fig. 42) When nut is removed, hood should be held from falling forward and damaging hood.

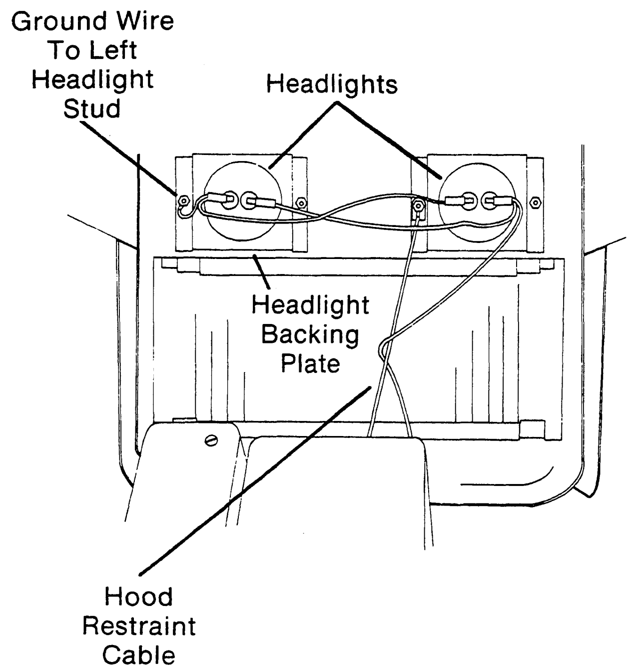


FIG. 42

D. Remove backing plate and headlight. Replace headlight and reassemble to hood.

NOTE: If left headlight is replaced, be sure to connect ground wire to left mounting stud when reassembling. (Fig. 42)

9. Fuse —

The fuse protects all electrical circuits except starter and magneto. Fuse holder is located in black wire attached to positive terminal at solenoid. The fuse may be one of the following three types: an automotive plug type Bussman ATC 25, Little Fuse 3AG 25, or a Bussman AGC 25. All fuses are rated at 25 amp capacity, and replacements are available at most service stations.

NOTE: To open fuse holder, push in on both ends of holder and turn ends in opposite directions, then pull apart.

WARNING: For electrical safety, always disconnect negative (-) battery cable before removing fuse. Replace fuse, then battery cable.