



SERVICE BULLETIN

SERVICING BREAKERLESS IGNITION SYSTEM

140 Tractor Serial No. (10,001-)

The breakerless ignition system, Figure 1A, on the Kohler K321AS Engine includes four major

components--(1) the ignition winding on the alternator stator, (2) the trigger assembly mounted on the engine bearing plate, (3) the capacitor-ignition coil assembly mounted on the engine shroud, and (4) the special projection on the flywheel which trips the trigger.

In addition, the ignition system also includes an ignition switch, high tension lead and a conventional spark plug.

As a general rule, the system is a work or no-work system. There is no recommended service procedure other than testing and replacement of defective parts with new parts.

The only exception to this is the setting of the trigger air gap, illustrated on page 4.

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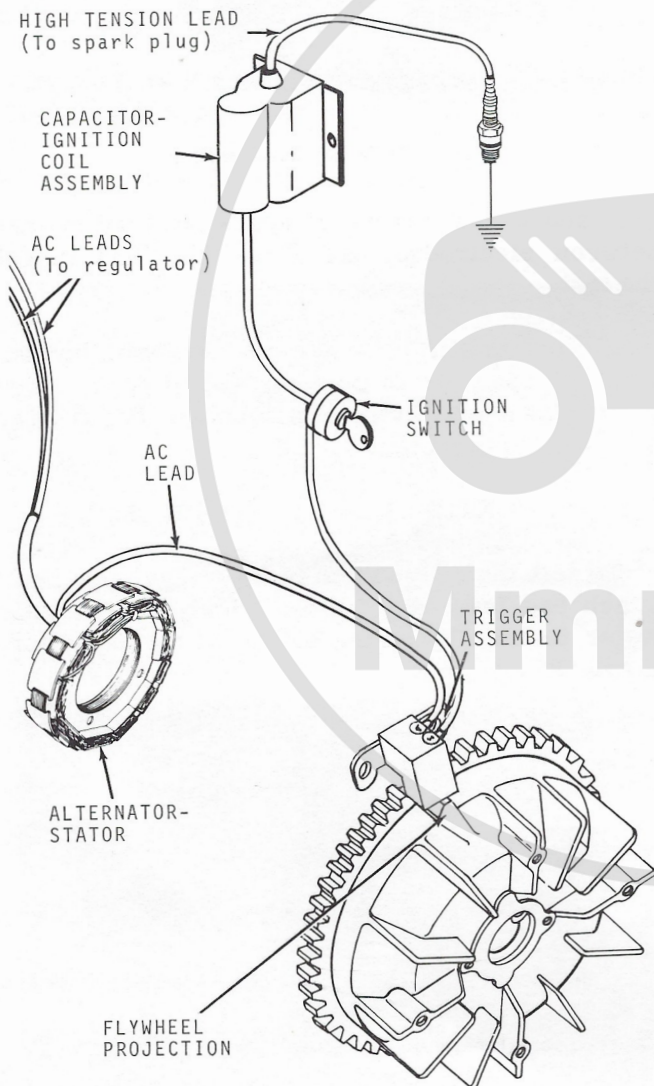


Figure 1A—Ignition System Components

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CONSUMER PRODUCTS?

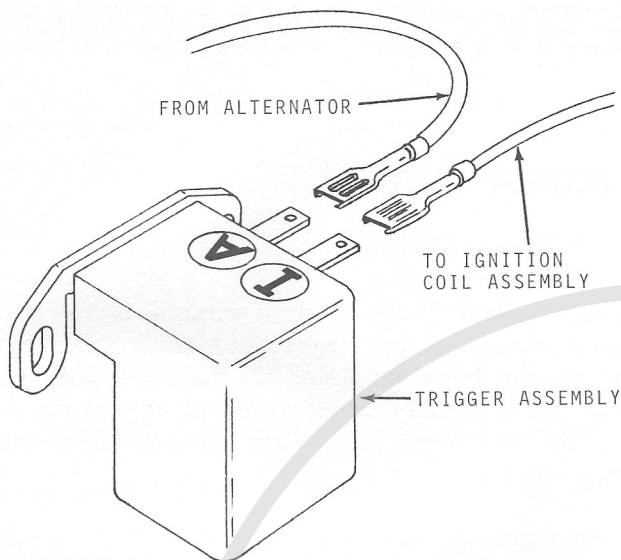
Note that we have changed the product identity of these bulletins. What used to be known as Lawn & Garden Products Service Bulletins, will from now on be Consumer Products Service Bulletins. This name is better, in view of the many uses your customers have for these products - not only lawn and garden work, but everything else from clearing driveways to caring for Christmas tree fields.

Continue to file these bulletins in your Lawn & Garden Parts & Service Binder. Future binders will be imprinted with the new name.

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Figure 2A—Trigger Assembly

The trigger assembly, Figure 2A, contains three diodes (electrical devices permitting flow of current in one direction only), a resistor, a sensing coil and magnet, and an electronic switch called an SCR (Silicon Controlled Rectifier).

The trigger assembly is the "brains" of the ignition system, and as such, should be the first suspect in case of ignition failure. The coil, flywheel projection, and stator should prove relatively trouble-free.

When servicing the engine, always be sure to connect the wire from the alternator stator to the "A" terminal of the trigger and the wire from the ignition coil to the "I" terminal.

TESTING

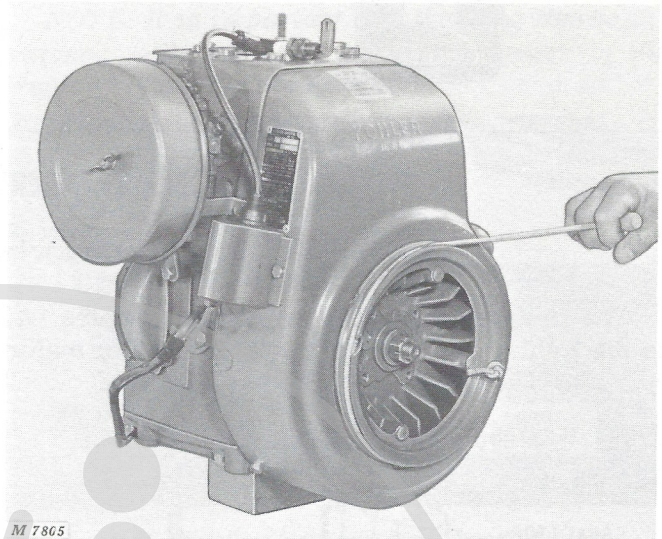
If ignition difficulties are encountered, make the following tests in the sequence indicated. Replace the faulty component.

Use either an ohmmeter or flashlight-type continuity tester, as indicated, when performing the tests.

Tests may be conducted with the engine in or out of the tractor.

SPARK PLUG

Remove spark plug from head, Figure 2B. Attach high tension lead to plug. Ground plug on en-



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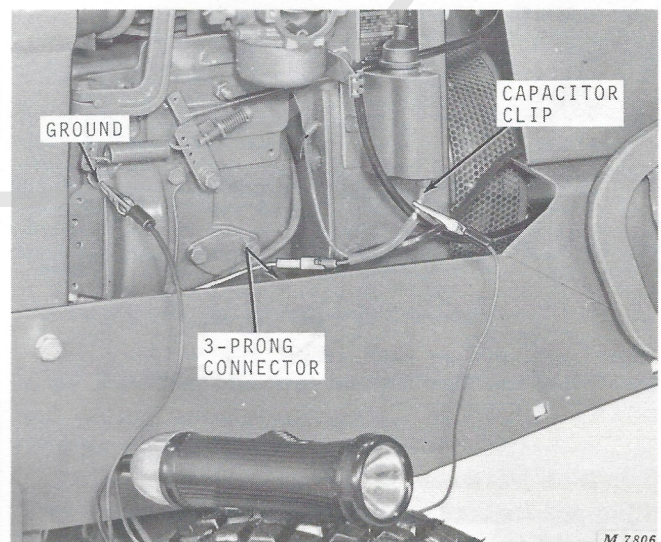
Figure 2B—Testing Spark at Plug

gine and crank engine. If spark does not appear between electrodes, use a new plug and repeat the test.

If there is still no spark, proceed with further tests. If spark is orange instead of blue, move trigger closer to flywheel projection. See trigger air gap adjustment on page 4.

SILICON CONTROLLED RECTIFIER (SCR)

To test the SCR switch in the trigger assembly attach one lead of the flashlight-type continuity tester to the clip on the bottom of the capacitor, Figure 2C.



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Figure 2C—Testing SCR (Silicon Controlled Rectifier) - Air cleaner removed for illustration purposes only

Be sure the wire from the trigger assembly is attached to the clip. Disconnect the 3-prong connector from the stator to the regulator. Attach other tester lead to ground.

If bulb lights, reverse leads. Bulb should not light, as trigger diodes should permit continuity in one direction only.

With leads connected so that bulb does not light, crank engine. Bulb will then light if SCR is working properly.

If it is desirable to repeat the test, it may be necessary to disconnect one test wire temporarily to make the test light go out.

If SCR is found to be defective, replace the trigger assembly.

TRIGGER ASSEMBLY CONTINUITY

AC to Ground Continuity

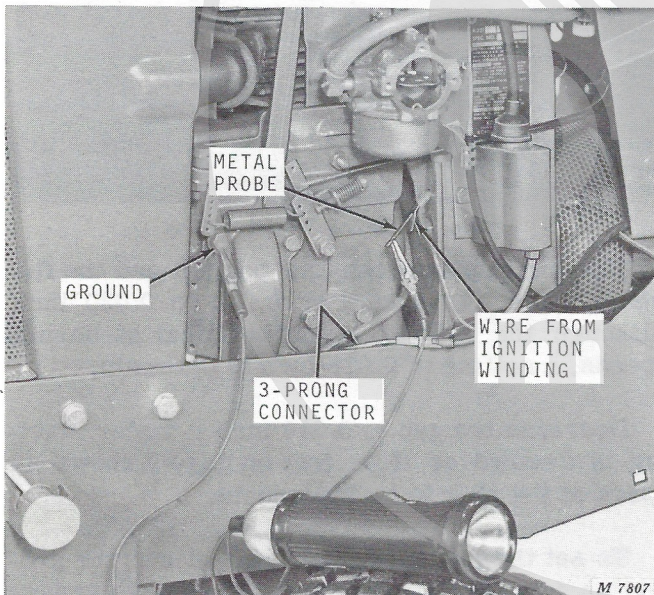


Figure 3A—Testing AC to Ground Continuity

Disconnect the 3-prong connector from the stator to the regulator.

Insert a metal probe into the wire leading from the ignition winding of the stator to the trigger, Figure 3A.

CAUTION: If a metal probe is used in testing, be sure to place electrical tape over probe area upon completion of tests.

Connect one lead of a flashlight-type tester to

the metal probe. Attach other lead to ground. Continuity should be indicated (light should light) in one direction, but not in the other. Reverse leads to check this.

AC to Ignition Continuity

To test continuity between AC terminal of trigger and the ignition terminal, be sure first that the 3-prong connector from stator to the regulator is disconnected.

Remove wire from clip on bottom of capacitor and connect one lead of the flashlight-type continuity tester to this wire. Attach remaining tester lead to the metal probe in the wire shown in Figure 3A.

Continuity should be shown (light should light) in one direction, but not in the other. Reverse leads to check.

Install a new trigger assembly if results from either of these continuity tests indicate malfunction.

IGNITION COIL-CAPACITOR CONTINUITY

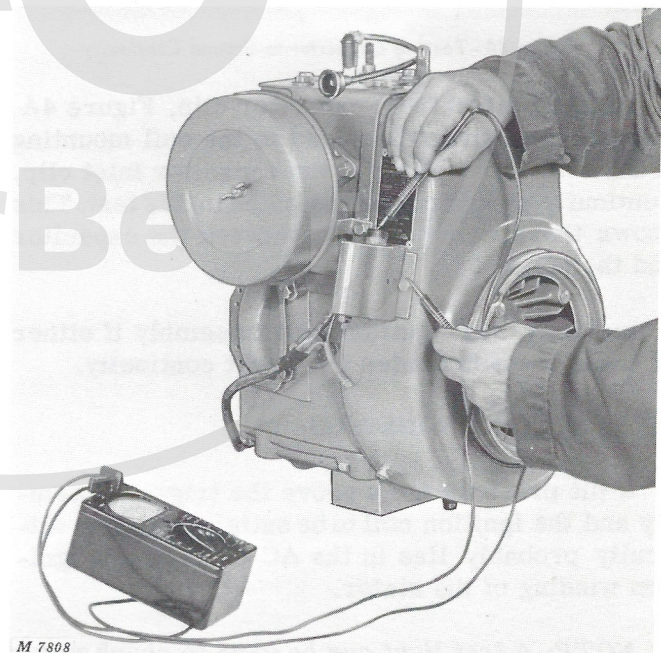


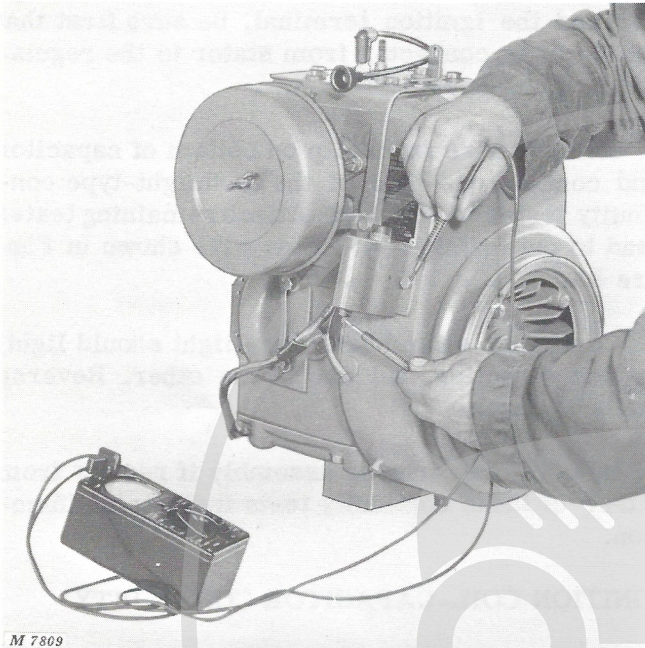
Figure 3B—Testing Coil Continuity

The ignition coil and capacitor may be tested with the engine in the tractor or on the bench. Remove the high tension lead from the terminal on top of the coil assembly.

Continued...

SERVICING BREAKERLESS IGNITION SYSTEM—Continued

Insert one ohmmeter lead in the coil terminal and the other lead to the coil mounting bracket. A flashlight-type continuity tester will not work properly for this test. Continuity should be shown on the ohmmeter scale.



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Figure 4A—Testing Capacitor-to-Ground Continuity

Remove wire from capacitor clip, Figure 4A. Connect one ohmmeter lead to the coil mounting bracket and the other to the capacitor inlet clip. Continuity should not be indicated in this test. This shows there is no leakage between the capacitor and the coil.

Install a new ignition coil assembly if either of these tests indicates incorrect continuity.

AC LEADS AND WINDINGS

If the previous tests prove the trigger assembly and the ignition coil to be satisfactory, the difficulty probably lies in the AC leads or the ignition winding of the stator.

NOTE: A test light can be used to check stator continuity for battery charging coils, but an ohmmeter must be used to check the stator's ignition winding.

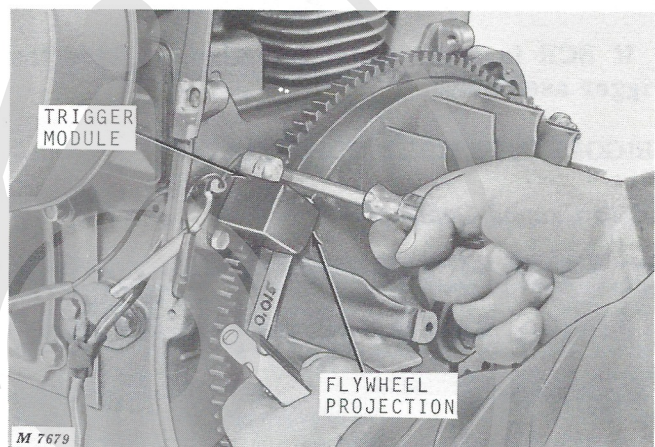
To check the ignition winding of the stator, insert a metal probe in the AC wire as shown in Figure 3A. Attach an ohmmeter wire to this probe and to ground (hookup is similar to that shown in

Figure 3A, only an ohmmeter is used instead of a flashlight-type tester).

A resistance of at least 475 ohms should be registered. If the reading is significantly below 475 ohms, replace stator assembly with new.

CAUTION: If a metal probe is used in testing, be sure to place electrical tape over probe area upon completion of tests.

SETTING AIR GAP BETWEEN TRIGGER AND FLYWHEEL PROJECTION



M 7679

Figure 4B—Setting Trigger Air Gap

The air gap between the trigger and the flywheel projection should be 0.010 to 0.020 inch. Although the setting is not critical at normal speeds, a setting of 0.015 inch is optimum.

Decrease the gap to 0.010 inch if faster starting is desired or if the test on page 2 shows the spark at the plug to be inadequate.

To set the gap, rotate the flywheel until the projection is under the trigger. Loosen cap screws holding the trigger bracket to the bearing plate. Move trigger toward projection until desired gap is measured on the feeler gauge.

Do not set closer than 0.010 inch. Make sure the flat surfaces on the trigger and projection are parallel. Tighten cap screws after gap is set.

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A BETTER WAY TO REMOVE AND INSTALL STEERING GEAR

140 Tractor

Removal of the steering gear on 140 Tractors can be a complicated job unless you follow the tip given by William S. Hockersmith, serviceman for the Fred Keller Implement Company, Lexington, Kentucky.

He has eliminated removal of the engine, drive shaft, clutch throw-out, and hydraulic levers. . . previously necessary just to remove the steering gear. Here's how he advises doing the job:

REMOVAL

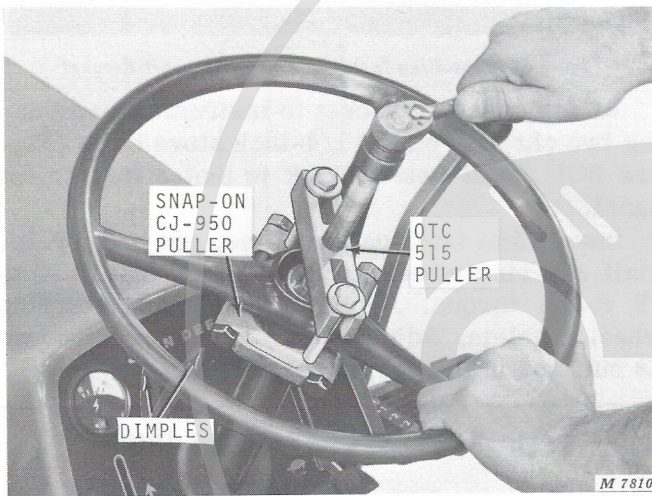


Figure 5A—Removing Steering Wheel

Remove steering wheel with combination of SNAP-ON CJ-950 and OTC 515 Pullers (Figure 5A).

Remove the battery, battery base, and fuel tank.

On the instrument panel, under the "John Deere" decal (Figure 5A) find two dimples, resulting from spot welding the panel to the support bracket. Center punch these dimples and drill 5/16-inch holes to eliminate the two spot welds (Figure 5B).

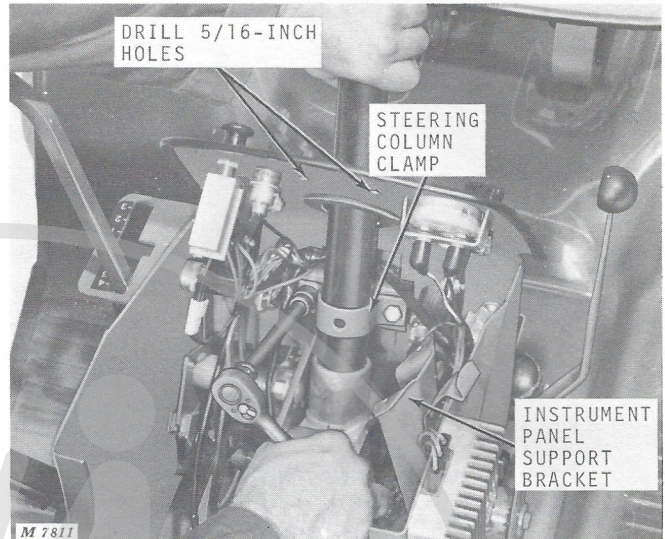


Figure 5B—Removing Steering Column Clamp

Swing panel support bracket away from steering column. Remove clamp holding column to pedestal (Figure 5B). Disconnect drag link from lever arm.

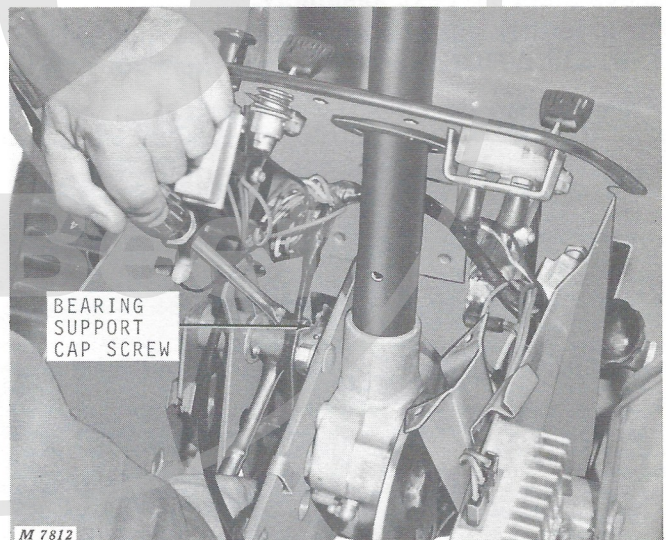


Figure 5C—Removing Steering Gear Cap Screws

Remove three cap screws holding steering column to frame. Remove the cap screw from the hydrostatic control lever shaft bearing support last, using a ratchet and screwdriver as shown in Figure 5C.

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SHARE YOUR SERVICE TIPS

If you have a procedure that makes a tough job easier . . . one that reduces service time . . . or one that improves the operation of the product, advise your branch service manager. He will forward it for use in the John Deere Service Bulletin. In this way, your fellow servicemen can also profit from your experience.

A BETTER WAY TO REMOVE AND INSTALL STEERING GEAR—Continued



Figure 6A—Removing Steering Gear from Tractor

Slide steering gear upward through instrument panel (Figure 6A). Raise the lower end and remove steering gear assembly.

INSTALLATION

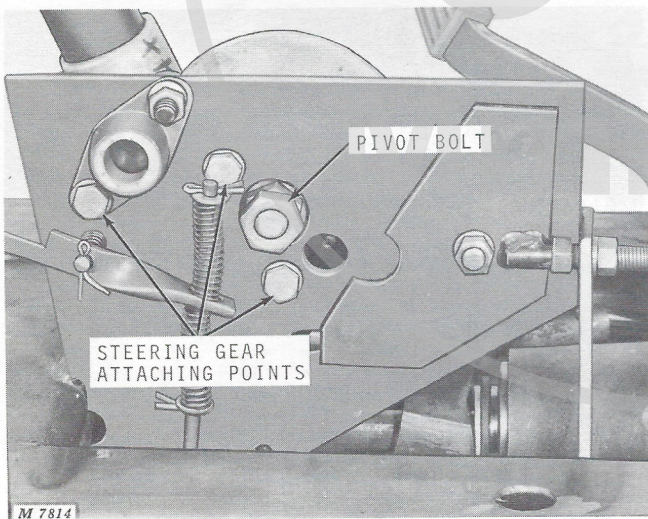


Figure 6B—Installing Steering Gear Cap Screws

Slide steering gear into instrument panel grommet (Figure 6A), and lower the front end into position. Install cap screw in hydrostatic control lever shaft bearing support first (Figure 6B). Install other two cap screws, holding gear to frame.

Attach drag link to lever arm. Install clamp holding steering column to pedestal, Figure 5B.

NOTE: It is important that the drag link be positioned with the bend facing the center of the tractor before tightening nuts.

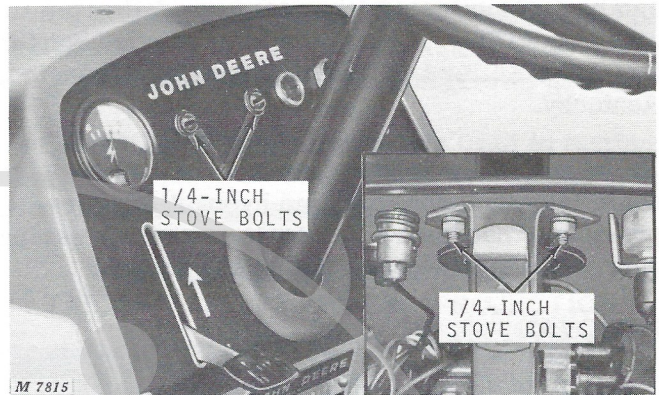


Figure 6C—Installing Instrument Panel Support Bracket

Attach support bracket to instrument panel using two chrome-plated 1/4-inch stove bolts (Figure 6C). Paint heads black to match instrument panel.

Install fuel tank, battery base, and battery. Install steering wheel and tighten the nut to 10 to 12 ft-lbs torque. Replace O-ring and steering wheel emblem. Adjust steering gear mechanism as outlined in the operator's manual.

CLIP PREVENTS WEAR ON WIRE

140 Tractor

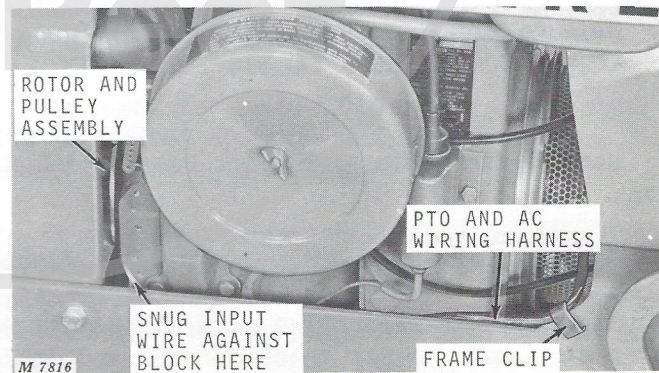


Figure 6D—Frame Clip Installation

To prevent the input wire of the electromagnetic PTO clutch from becoming worn by the rotor and pulley assembly, install an N10025N Frame Clip as shown in Figure 6D.

Pull the wiring harness rearward so that the lead to the PTO is held snugly against the engine block. Place clip over harness and frame near the clutch pedal.

Litho in U.S.A.