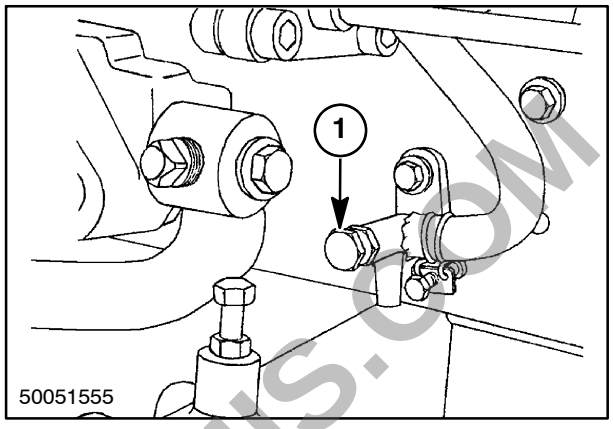
OVERHAUL - ENGINE

ENGINE PREPARATION

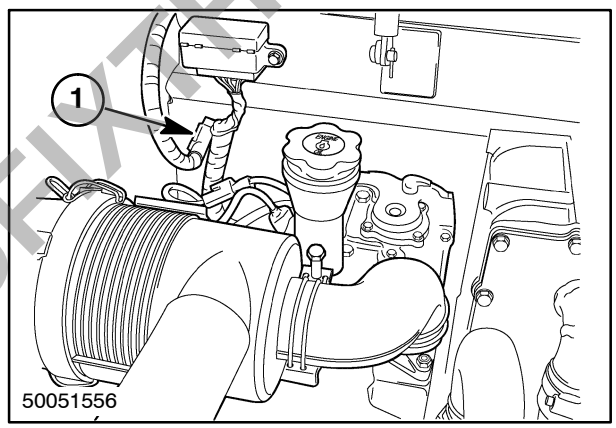
Disassembly

1. Open the radiator drain, 1, and drain and remove the radiator assembly. See “Radiator Removal” discussed later in this section.



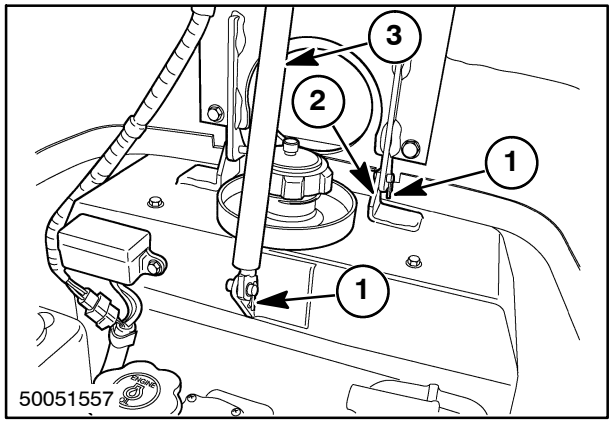
4

2. Disconnect the electrical connector, 1, for the head lamps.



5

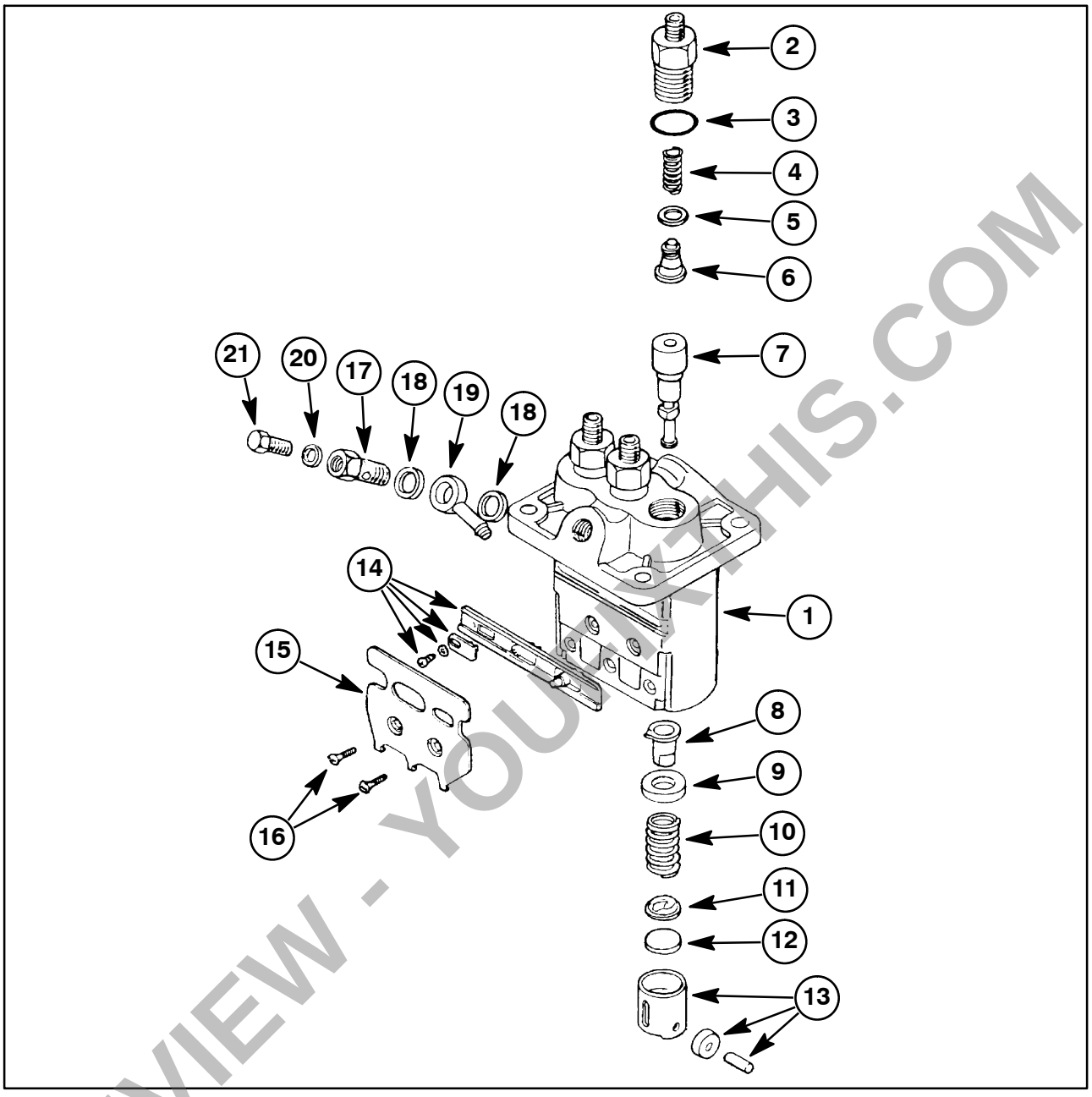
3. Remove the clip pin, 1, from the hood support, 2, and damper, 3, and gradually slide to the left and remove the hood.



6

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2

FUEL INJECTION PUMP

1. Housing Assembly
2. Delivery Valve Holder
3. O Ring
4. Delivery Valve Spring
5. Gasket
6. Valve and Seat Assembly
7. Element Assembly
8. Sleeve Assembly
9. Upper Spring Seat
10. Plunger Spring
11. Lower Spring Seat
12. Plate
13. Tappet Assembly
14. Rack Assembly
15. Bracket
16. Screw
17. Hollow Bolt
18. Washer
19. Nipple
20. Washer
21. Screw

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SECTION 10 - ENGINE

BOOK 1 - 87367141

Chapter 1 - Engine Systems (Continued)

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	Inspection	36

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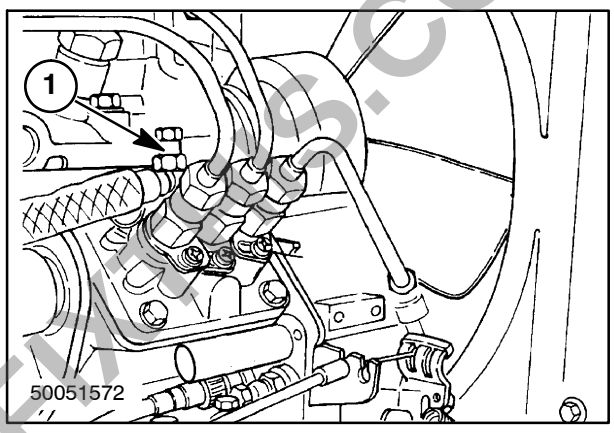
BLEEDING THE FUEL SYSTEM

Bleed the fuel system after any of the following conditions:

1. When a new filter is installed.
2. After the tractor has run out of fuel.
3. When any of the fuel lines have been disconnected.
4. When the injection pump has been removed.

Bleeding Procedure

1. Make sure adequate fuel is in the fuel tank and the fuel shutoff valve is open.
2. Open the bleed screw, 1, on the injection pump.
3. Set the throttle in the full open position and crank the engine for a few seconds to allow the air to be expelled from the injector lines.
4. If the engine does not start, loosen the injector lines at the injectors one at a time while cranking the engine.
5. Be sure all lines are properly tightened when completed.



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FULL SCREW/HIGH IDLE ADJUSTMENT

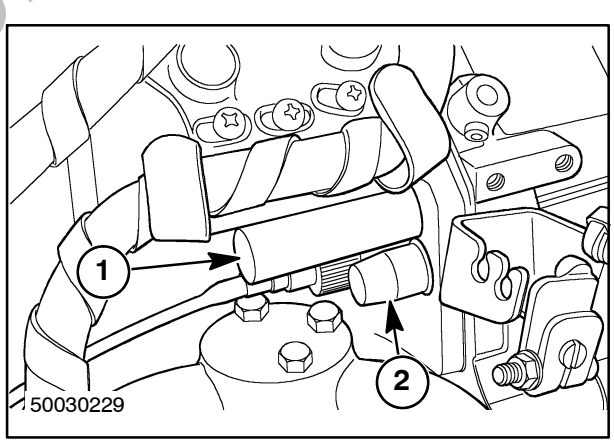
The correct adjustment is required to reset to the original production setting to ensure the engine will be within the certified emission limits.

NOTE: *EPA engine is certified to EPA emission legislation.*

No one is permitted to adjust the fuel flow rate more than the max figure of submitting for power setting.

Adjustment only made by New Holland Area Service Managers, due to EPA emission regulations.

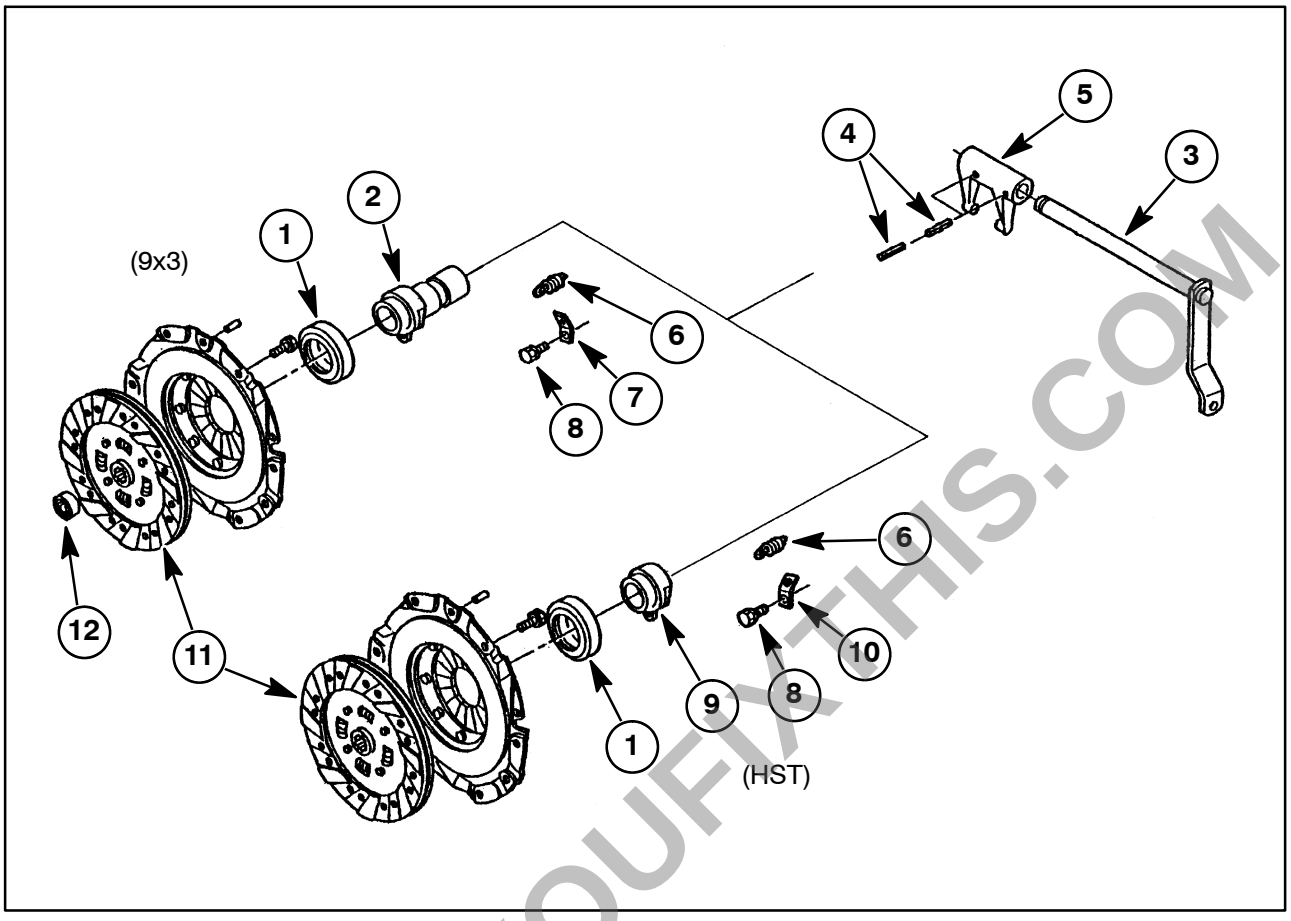
Contact New Holland representative for adjustment of fuel setting, 1, or high speed idle, 2.



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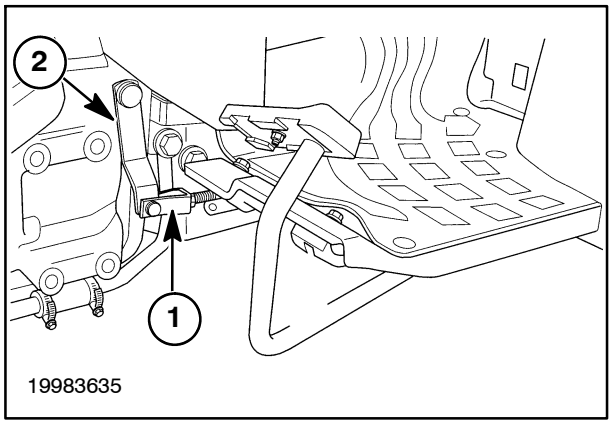


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1. Release Bearing
2. Sliding Hub (9 x 3)
3. Cross Shaft
4. Roll pins
5. Fork
6. Return Spring
7. Hanger (9 x 3)
8. Bolt
9. Sliding Hub (HST)
10. Hanger (HST)
11. Clutch Disc
12. Pilot Bearing

Removal

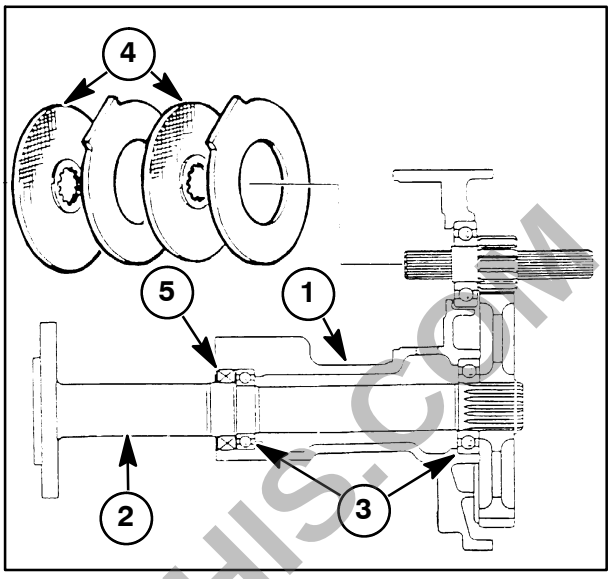
1. Separate the tractor between the engine and the clutch housing. Follow procedure described earlier in this section.
2. Disconnect the clutch adjustment rod, 1, from the clutch release cross shaft bellcrank, 2, Figure 10.
3. Remove the roll pin locking wire and remove the roll pins, 4, from the fork, 5, and cross shaft, 3.
4. Remove the cross shaft, 3, and fork, 5, from the housing.
5. Remove the clutch release bearing, 1, and slide the hub, 2 or 9, from the clutch housing case.
6. Using a suitable puller and step plate, remove the release bearing from the sliding hub.



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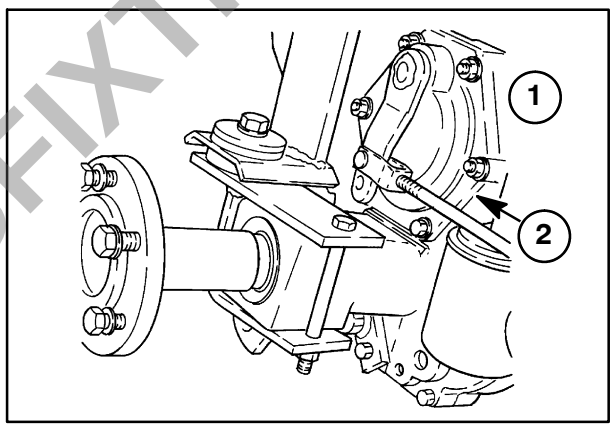
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The axle housing, 1, supports the axle shafts, 2, and bearings, 3, and provides an enclosure for the brakes, 4. The axle shafts must be removed from the housings to service the bearings and oil seal, 5.



9

The brakes are wet disc type and are mechanically actuated. The brakes are located in the outside of the differential housing and are enclosed in the upper portion of the axle housing, 1. The brakes are sealed against dust and moisture entry by the cover, 2.



10

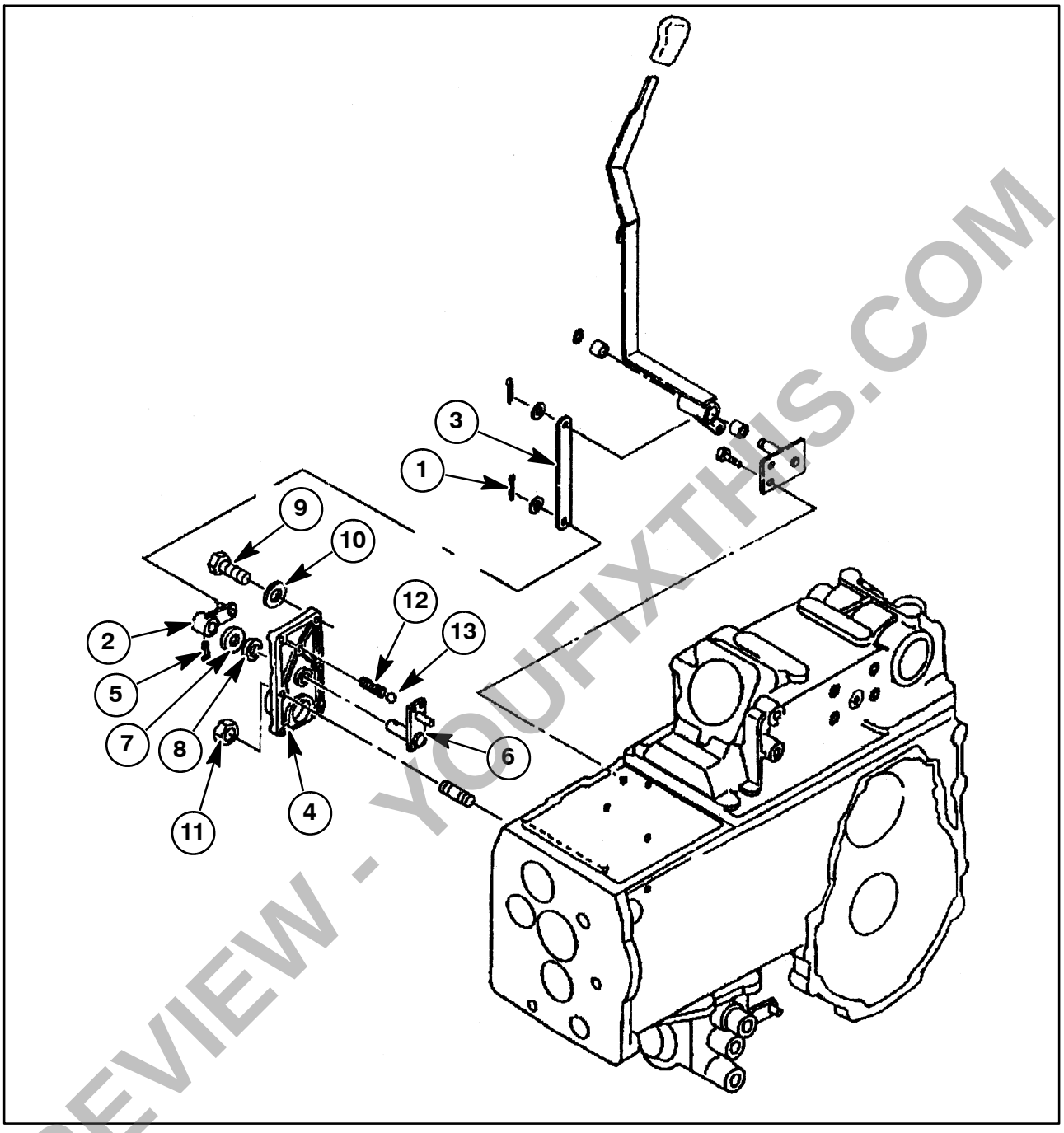
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Ref	Qty	Description
1	1	HST Assembly
1A	1	Block Kit
2	1	Relief Valve Assembly
3	3	Seal
4	1	O ring
5	1	O ring
6	2	Neutral Valve Assembly
7	2	Check Valve Kit
8	1	Snap Ring
9	2	Needle Bearing
10	2	Plug Assembly
11	2	O Ring
12	2	Packing
13	2	Pin
14	2	Plug
15	4	Oil Seal
16	1	Charge Pressure Relief Valve Assembly
17	1	Pump Kit
18	1	Motor Kit
19	2	Thrust Plate
20	1	Trunnion (Swash) Plate
21	1	Input Shaft
22	1	Output Shaft
23	1	Charge Pump Kit
24	1	O Ring
25	1	Plate
26	1	O Ring
27	1	Snap Ring
28	2	Ball Bearing
29	2	Snap Ring
30	1	Pump Casing
31	1	Holder
32	1	Cover Assembly
33	2	O Ring
34	6	Screw
35	1	Cover Assembly
36	1	Gasket
37	1	Motor Casing
38	1	Gasket
39	1	Cover
40	4	Pin
41	2	Pin
42	8	Bolt
43	3	Bolt
44	3	Bolt
45	8	Washer
46	1	Pump Valve Plate
47	1	Motor Valve Plate
48	1	Seal Kit
49	2	Swash Plate Cover
50	2	Bushing
51	1	Charge Pump Housing
52	1	Outer Rotor
53	1	Inner Rotor
54	1	Key
55	2	Pistons
56	2	Piston Retainer
57	2	Retainer Holder
58	6	Pins
59	2	Port Block
60	2	Cylinder Block
61	2	Washer
62	2	Spring
63	2	Washer
64	2	Snap Ring

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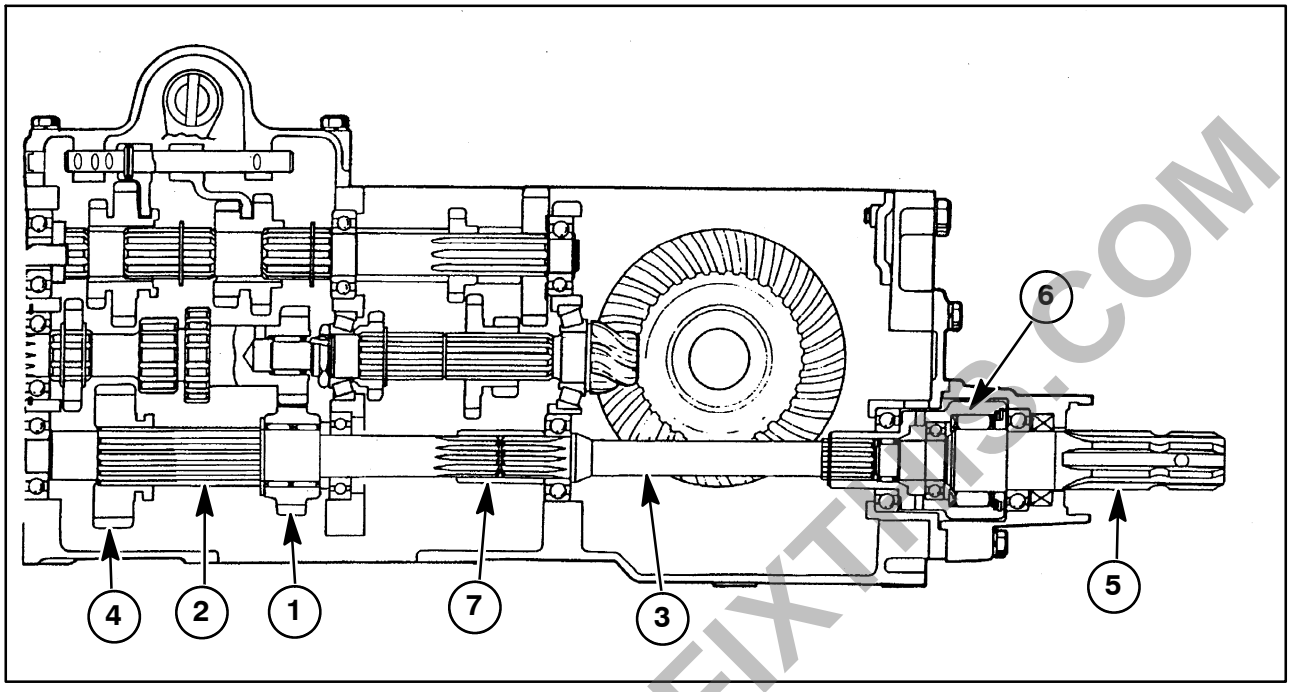
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3. Remove the FWD change lever and linkage from the right side of rear transmission case. Remove split pin, 1, from FWD change lever, 2. Remove linkage shift plate, 3, from FWD change lever.
4. Remove FWD case cover, 4, from the rear transmission case. Drive spring pin, 5, from the change lever. Pull FWD change lever, 2, off shift arm shaft, 6. Remove spacer, 7, and oil seal, 8, from shift arm. Remove one bolt, 9, washer, 10, and five nuts, 11, from the cover. Place one hand inside housing to retain shift arm, 6, and spring, 12, ball, 13, assembly while removing the cover, 4. Remove suction tube and O ring.

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DESCRIPTION AND OPERATION - PTO SYSTEM



1

9 x 3 Gearbox Power Take-Off

1. Idler Gear - Mid-Mount PTO (27T)
2. PTO Countershaft - Front
3. PTO Countershaft - Rear
4. PTO Sliding Gear (32T)
5. Rear PTO - Output Shaft
6. One-Way Clutch Assembly
7. PTO Coupling

Op. 31 110

9 X 3 GEAR TRANSMISSION

The standard 540 rear power take-off is available on the Model TC23DA tractor equipped with the 9 x 3 mechanical gear transmission.

On the mechanical gear transmissions, the PTO drive is taken from the flywheel clutch and input shaft to the transmission PTO countershaft via a set of reduction gears located at the front of the transmission assembly.

The transmission countershaft is in constant mesh with the PTO countershaft gear, 1, on the PTO countershaft, and drives the front PTO countershaft, 2, and rear PTO countershaft, 3. The PTO sliding gear, 4, on the PTO output shaft, 5, engages and disengages the rear PTO countershaft. The one-way clutch assembly, 6, provides a positive drive in one direction only and free wheels in the opposite direction. Viewed from the rear of the tractor, when the PTO shaft is rotated clockwise the shaft will free wheel; when turned in the counterclockwise direction the shaft will lock-up. The one-way clutch prevents the power take-off equipment from transmitting power back into the PTO driveline causing possible damage to the tractor.

NOTE: *Tractors equipped with hydrostatic transmissions do not have a one-way clutch.*

In operation, when the mechanical gear transmission clutch is being disengaged, the momentum of the PTO equipment will cause the output shaft to continue to rotate. This causes the one-way clutch inner race to rotate faster than the drive gear and the one-way bearing will free wheel.

The transmission drive power take-off can be operated only when the transmission clutch and PTO selector lever are in the engaged position. To engage the PTO, fully depress the clutch pedal and then engage the PTO by pushing the lever down. Release the clutch pedal and the PTO shaft will start to rotate. To disengage the PTO, fully depress the clutch pedal and pull the PTO selector lever upward.

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SECTION 41 - STEERING

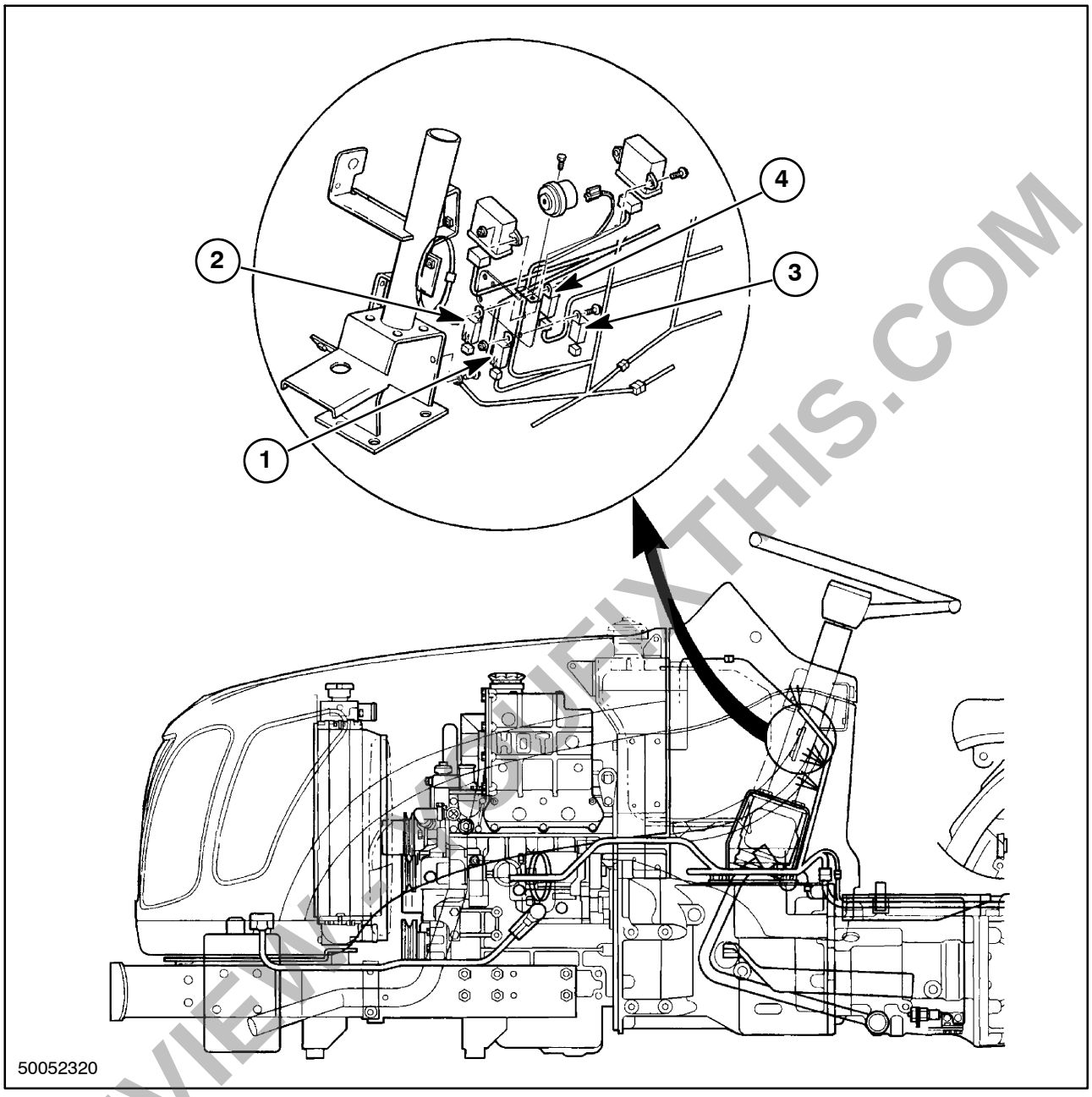
Chapter 1 - Power Steering System

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41 204	Power Steering System	7
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	Assembly	33

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1. Safety Start Relay
2. Work Lights Relay
3. Road Lights Relay
4. HST Cruise Control Relay

RELAYS

Relays monitor the current in a circuit. If current is present, the relay activates a single-pole, single-throw (SPST) switch, causing it to flip over to its other position. The diode is built into the relay on the coil line and it is in parallel with the coil.

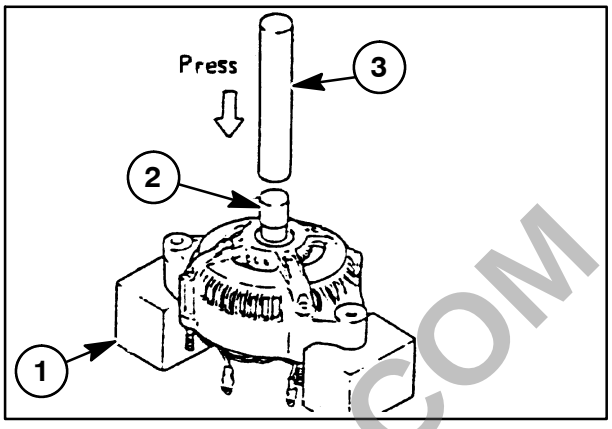
The relays are located on the steering column underneath the instrument panel.

The safety start, HST cruise control, work and road lights relays are all interchangeable.

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NOTE: *Be careful not to damage the stator wire or alternator frame when removing the front bearing. Do not subject the bearing to any kind of shock, as the bearing may be damaged.*

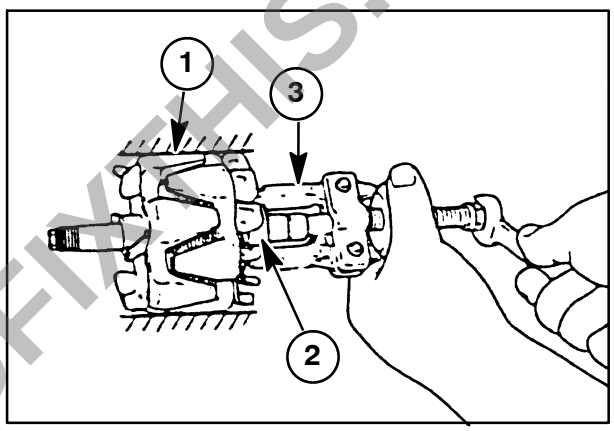
12. Support the front alternator frame in a hydraulic press, 3, with support blocks, 1. Use a drift, 2, to drive the bearing out of the frame. Thoroughly inspect the front and rear frames for damage. Replace as necessary.



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NOTE: *When removing the rear bearing, be sure that the bearing puller contacts the inner race of the bearing only. Bearing damage may occur otherwise.*

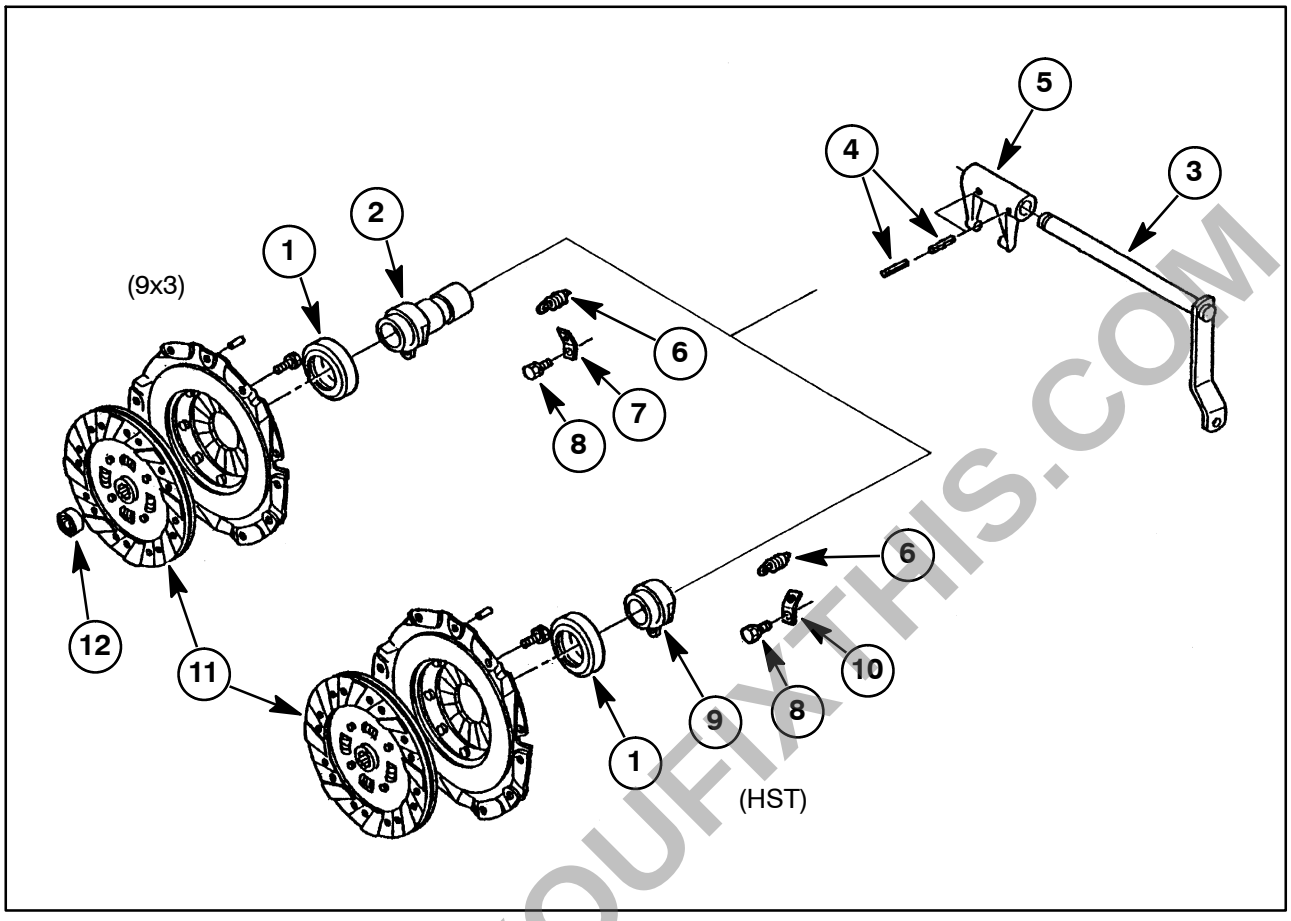
13. Use a bearing puller, 3, to remove the rear bearing, 2, and the inner and outer bearing covers from the rotor, 1.



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1. Release Bearing
2. Sliding Hub (9 x 3)
3. Cross Shaft
4. Roll pins
5. Fork
6. Return Spring
7. Hanger (9 x 3)
8. Bolt
9. Sliding Hub (HST)
10. Hanger (HST)
11. Clutch Disc
12. Pilot Bearing (9 x 3)

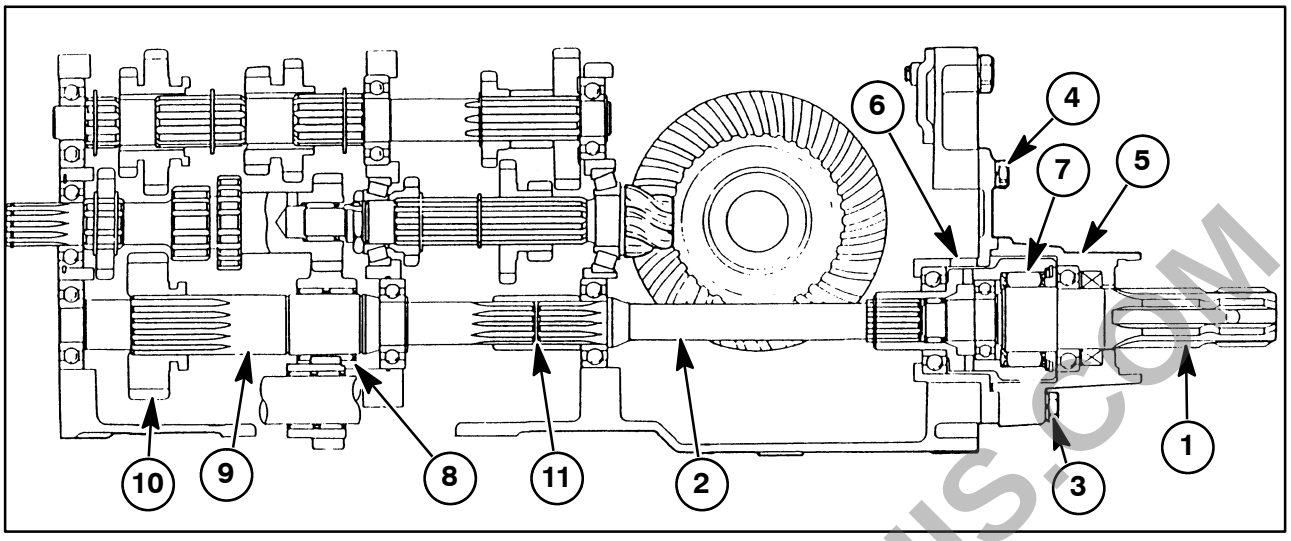
CLUTCH RELEASE BEARING

The clutch release bearing, 1, is a pre-lubricated ball bearing and is mounted on the sliding hub, 2 or 9. The sliding hub assembly is supported in the clutch housing.

A fork, 5, mounted on the cross shaft, 3, is engaged with the bearing, 1, and hub assembly, 2 or 9. When the clutch pedal is depressed, the fork moves the sliding hub and bearing assembly forward. The release bearing contacts the release fingers and disengages the clutch disc, 11, from the flywheel. When the clutch pedal is released, a return spring, 6, attached to the sliding hub and the clutch housing case returns the sliding hub and releases the clutch release finger re-engaging the clutch.

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Rear PTO Shaft Removal

1. Output Shaft
2. PTO Countershaft
3. Bolt M8 x 55
4. Bolt M8 x 25
5. Bearing Holder
6. Bearing Holder
7. One-Way Clutch
8. Idler Gear
9. Front PTO Countershaft
10. PTO Sliding Gear
11. PTO Coupling

PTO FRONT COUNTERSHAFT

Removal

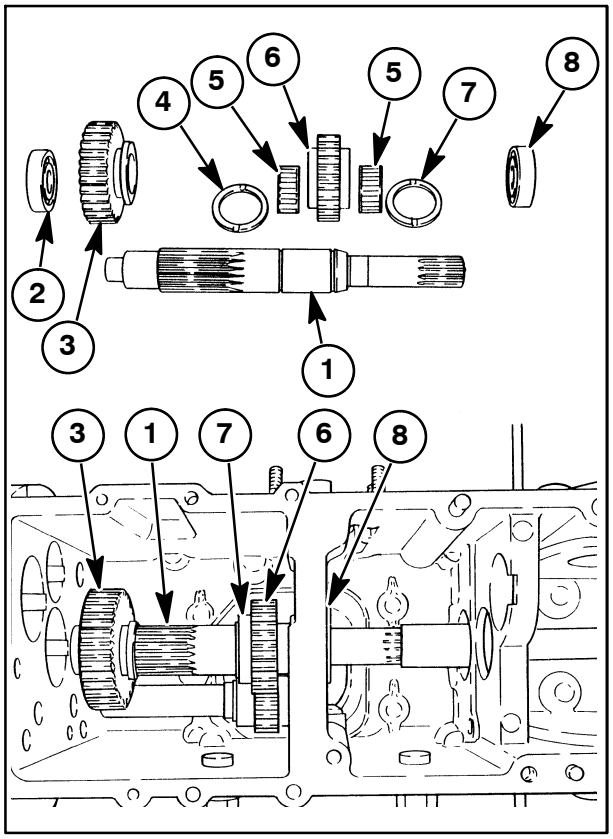
NOTE: *Refer to Figure 37 for location of the countershaft.*

1. If not previously removed, remove the PTO output shaft, 1, Figure 44, and PTO countershaft, 2, from the tractor. See Section 31, “Power Take-Off”.

   Remove four bolts, 3, and two bolts, 4, from bearing holders, 5 and 6. Remove shaft, 1, bearing holder, 5, and one-way clutch, 7, as an assembly. Then remove bearing holder, 6, and PTO countershaft, 2.

   Refer to Figure 45.

2. Gently drive the front PTO countershaft, 1, forward and remove the bearing, 2, sliding gear (32T), 3, thrust washer, 4, needle bearing, 5, idler gear (27T), 6, second needle bearing, 5, and second thrust washer, 7, from the shaft, then lift up through the case.
3. Gently drive the shaft forward and remove from the front of the case, and lift the bearing, 8, through the top of the case.



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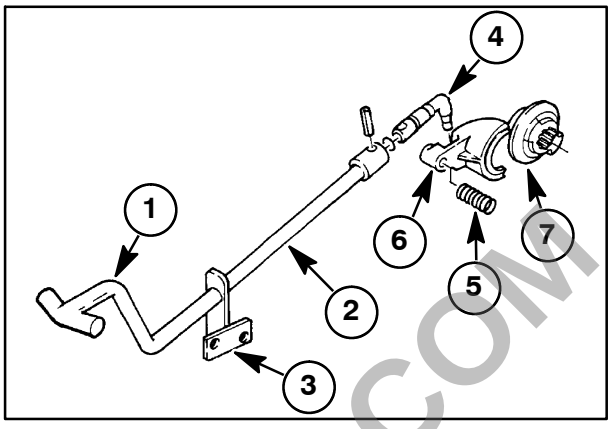
Op. 27 110

DIFFERENTIAL LOCK

A differential lock is provided to lock the differential system so that both rear wheels rotate when power is provided by the transmission even though one wheel may lose traction.

Depressing the differential lock pedal, 1, causes the pedal linkage, 2, to rotate in the support bracket, 3. The rotation of the linkage also rotates the shift arm, 4, to overcome the spring, 5, in the differential lock fork, 6. The fork, 6, forces the differential lock clutch, 7, to engage the ring gear.

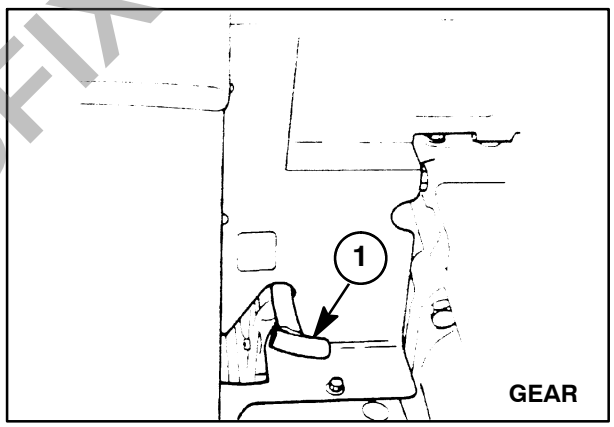
When the differential lock pedal is depressed, both final drive pinion gear shafts are locked together, preventing one wheel from rotating independently of the other.



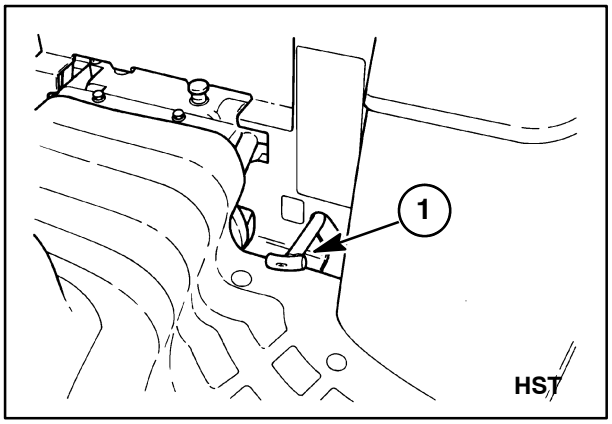
4

1. Pedal
2. Pedal Linkage
3. Support Bracket
4. Shift Arm
5. Spring
6. Fork, Diff. Lock
7. Clutch, Diff. Lock

The differential lock control pedal is foot operated and is located on the right-hand foot platform on the 9 x 3 gear transmission models, 1, (Figure 5) and on the left-hand foot platform on the HST model tractors, 1 (Figure 6).



5



6

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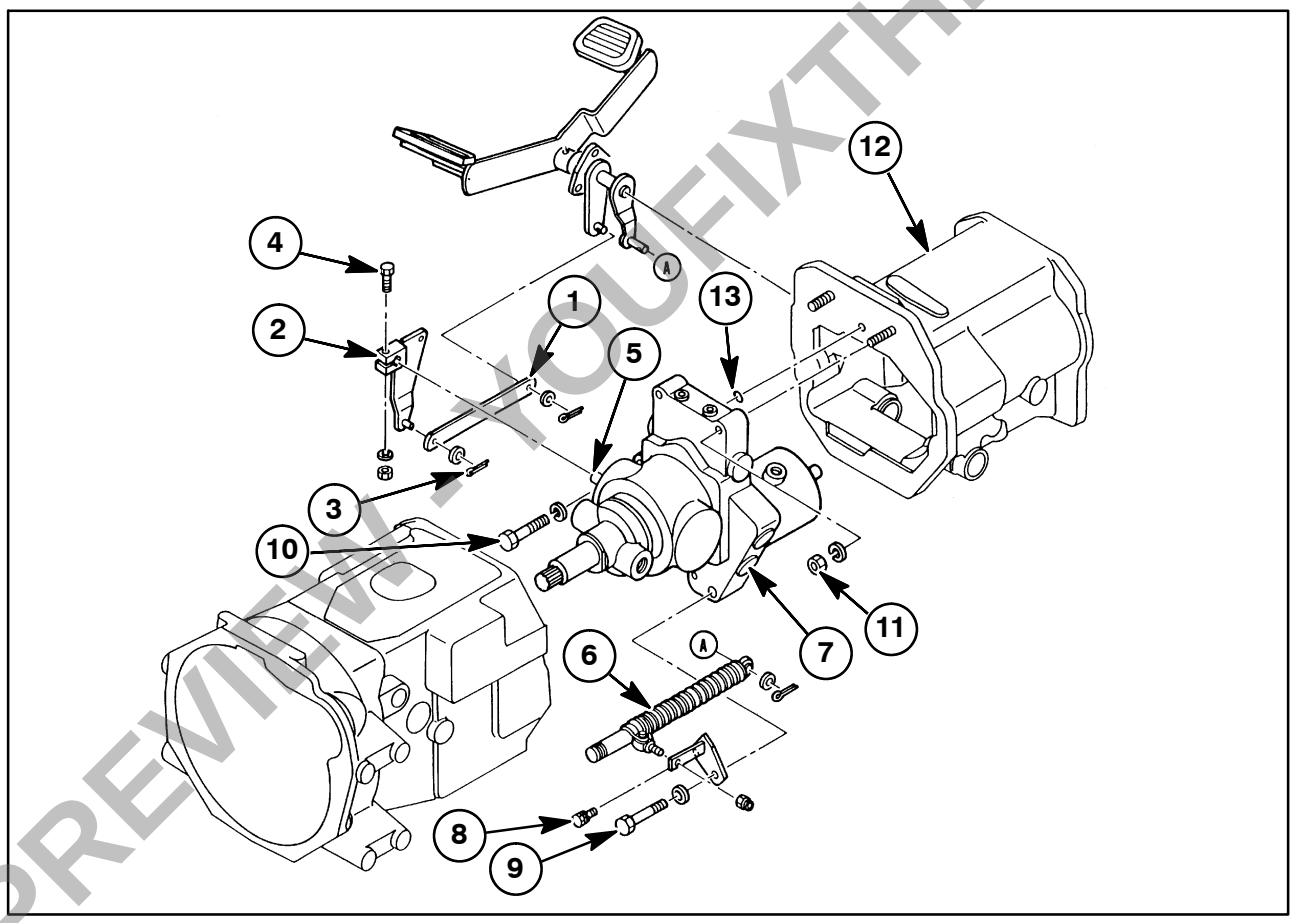
Op. 29 202

HYDROSTATIC UNIT

Removal

1. Disconnect the link, 1, from the lever arm, 2, by removing split pin, 3.
2. Remove the lever clamp bolt, 4, and remove the lever, 2, from the swash plate shaft, 5.
3. Remove the damper assembly, 6, from the HST case, 7, by removing bolts, 8 and 9.
4. Remove the HST mounting bolts, 10, and nuts, 11, and remove the HST from the extension housing, 12.

NOTE: *When separating the HST unit from the extension housing, be careful not to lose the O ring, 13.*



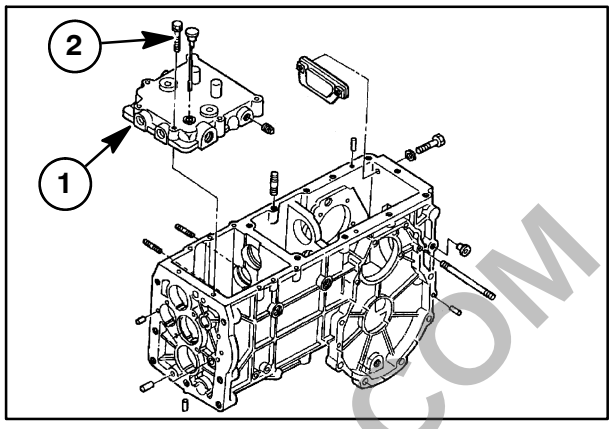
21

1. Link
2. Lever Arm
3. Split Pin
4. Lever Clamp Bolt
5. Swash Plate Shaft
6. Damper
7. HST Unit
8. Bolt
9. Bolt
10. Mounting Bolt
11. Mounting Nut
12. Extension Housing
13. O ring

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27. Remove the hydraulic lift cover. See Section 6, “Power Take-Off”.

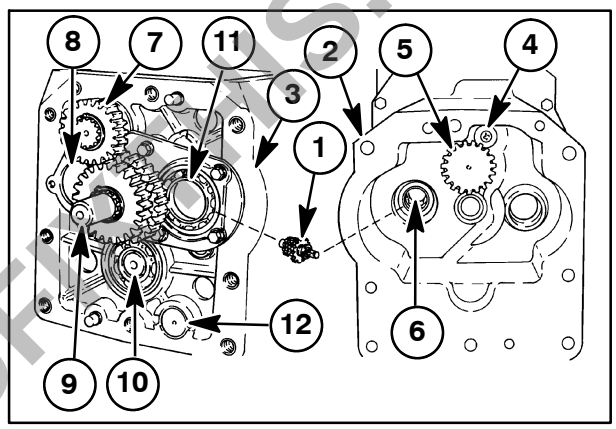


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TRANSMISSION DRIVE SHAFT AND PTO INPUT SHAFT

Removal

1. Remove the transmission drive shaft assembly, 1, from the extension housing, 2, and rear axle housing, 3.
2. Remove the bolt, 4, and remove the PTO input shaft, 5, from the extension housing, 2.



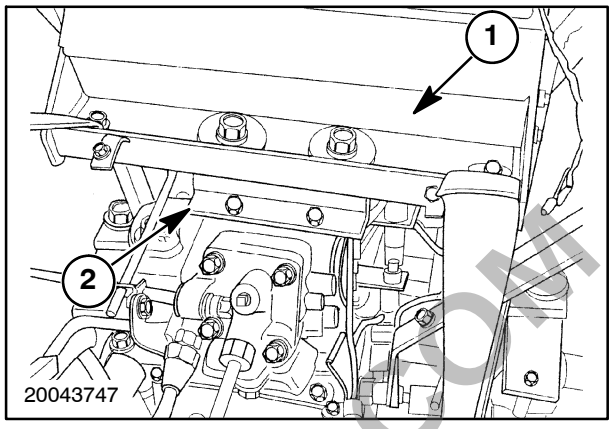
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1. Transmission Drive Shaft
2. Extension Housing
3. Rear Axle Housing
4. Bolt
5. PTO Drive Shaft
6. Transmission Drive Shaft Bearing
7. Main Shaft
8. FWD Shaft Area
9. Countershaft
10. Front PTO Countershaft
11. Retainer Plate
12. Mid-PTO Idler Shaft

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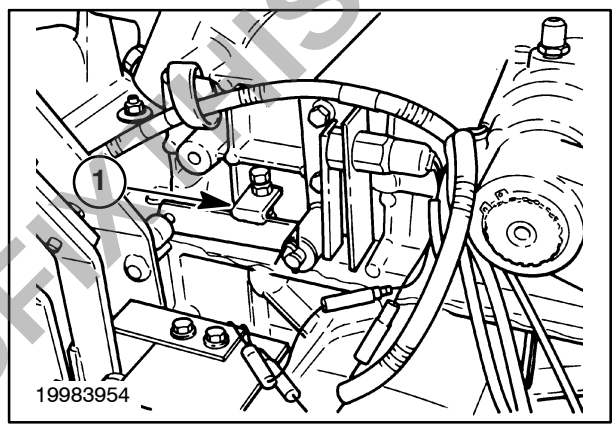
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8. Remove the tool box, 1, and the center frame, 2.



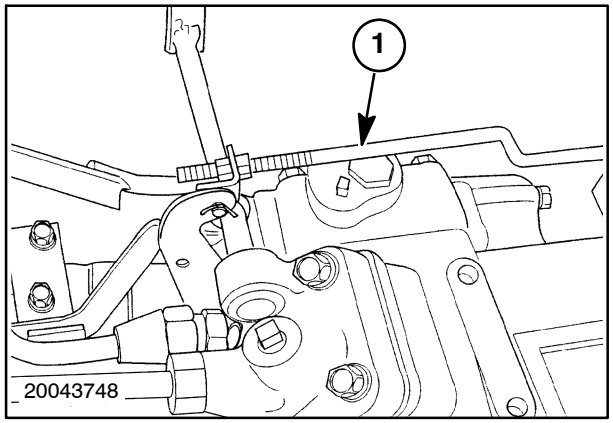
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9. Remove the bracket, 1, for the safety switch from the lift cover (with HST).



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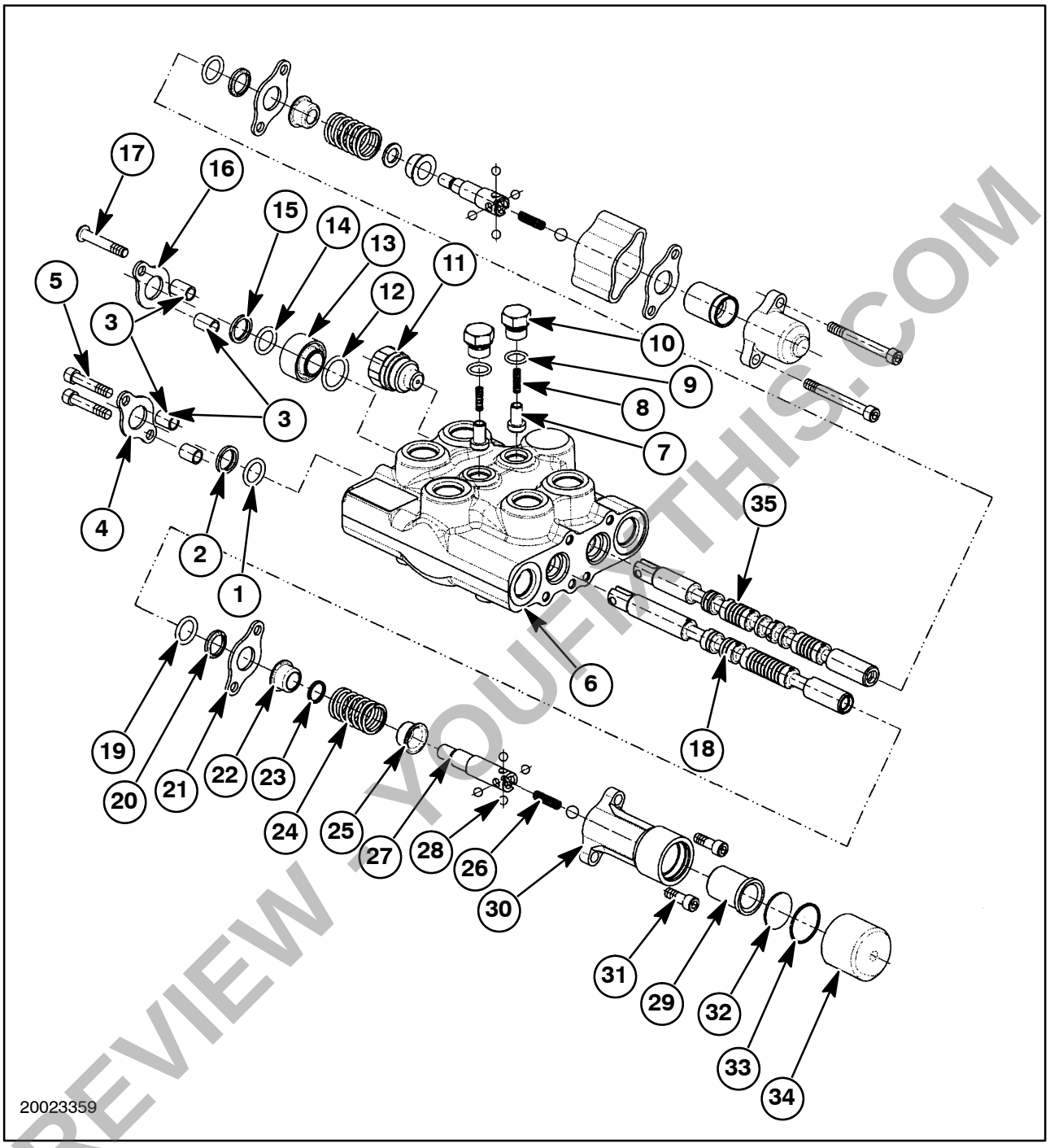
10. Disconnect the control linkage, 1, from the control valve and lift arm.



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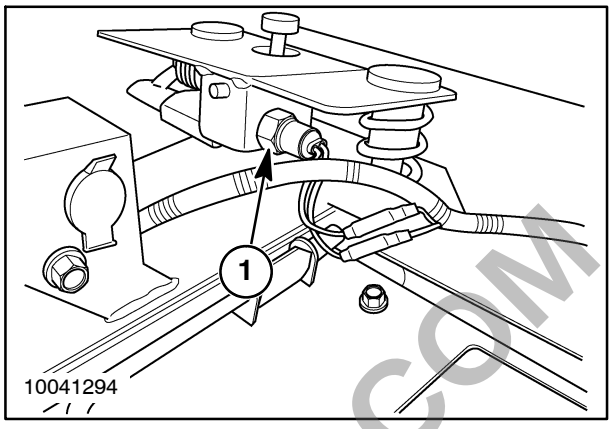
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Op. 55 408

SEAT SAFETY SWITCH

The seat safety start switch, 1, is a single-pole, push-button type switch located underneath the operator seat. When the operator is not present, the switch contacts are open and will not allow the tractor to start. When the operator is present, the switch contacts are closed, allowing the tractor to start.

NOTE: *The operator seat was removed to better show the seat safety switch location. Removal of the seat is not necessary.*



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Removal

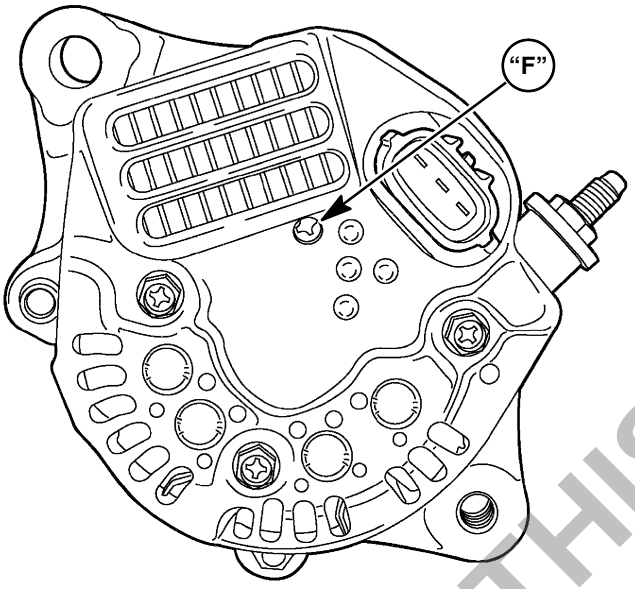
1. Disconnect the negative (-) battery cable from the negative (-) battery terminal.
2. Tilt the operator seat forward to gain access to the seat safety switch.
3. Disconnect the two seat safety switch wire leads from the tractor wiring harness.
4. Unthread the retaining nut to remove the seat safety switch, 1, from the mounting bracket.

Testing

Use an ohmmeter to test the seat safety switch for electrical continuity.

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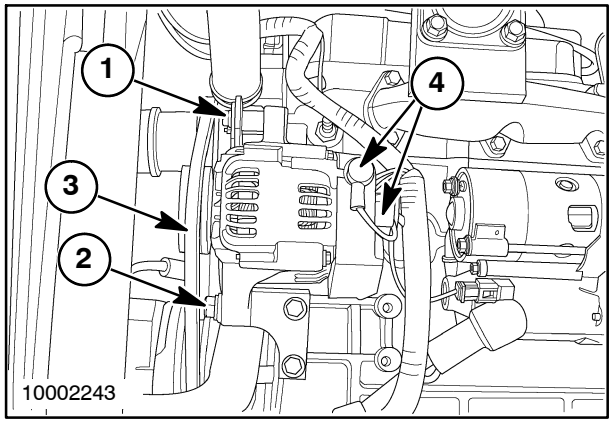
Regulator By-Pass Test

If the voltage regulator is not operating correctly, ground terminal "F" on the alternator.

ALTERNATOR

Removal

1. Disconnect the negative (–) battery cable from the battery.
2. Disconnect the alternator wiring, 4, from the alternator.
3. Loosen the bottom mounting/adjusting bolt, 1, and the top mounting/adjusting bolt, 2.
4. Remove the belt, 3, from the alternator pulley.
5. Remove the mounting bolt, 1, and the top adjusting bolt, 2, and remove the alternator from the tractor engine.



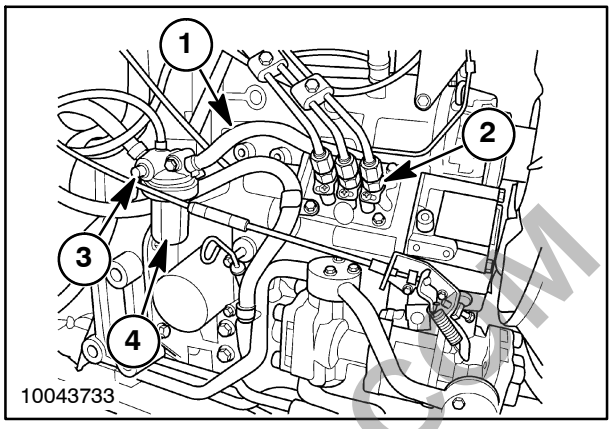
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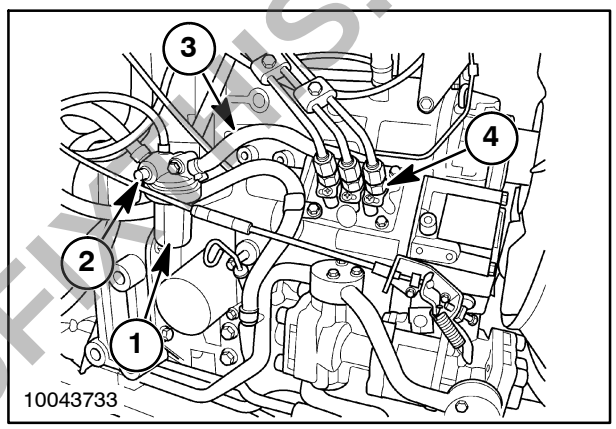
8. Disconnect the fuel line, 1, from the injection pump, 2, and remove the fuel filter attached bolt, 3. Remove the fuel tank and fuel filter, 4.



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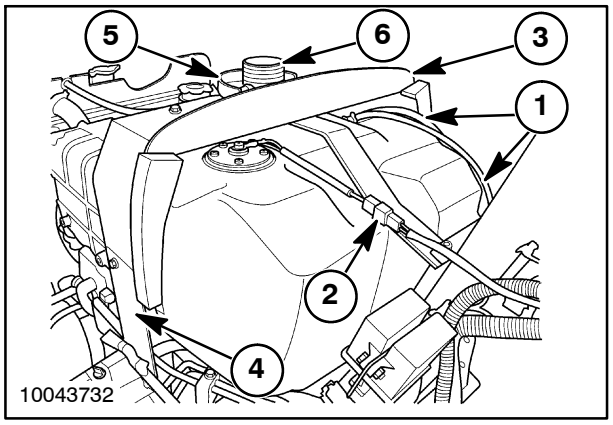
Installation

1. Reinstall the fuel tank, and the fuel filter, 1, with bolt, 2. Reconnect the fuel line, 3, to the injection pump, 4.



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2. Reconnect the fuel return hoses, 1, fuel sending unit connector, 2. Reattach the hood support, 3, to the firewall, 4. Reinstall the spillover collector, 5, to the fuel tank neck, 6.



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