OVERHAUL

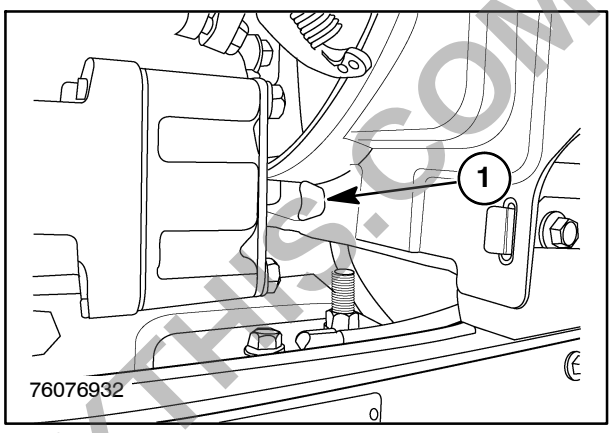
ENGINE ACCESS

Disassembly

1. Remove the engine compartment side panels.
2. Open the radiator drain, 1, and drain the coolant from the radiator.

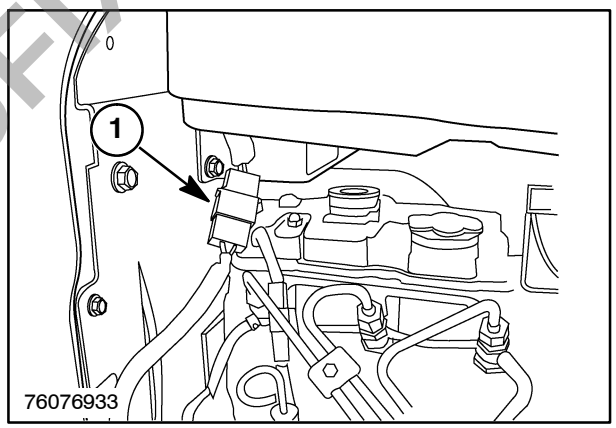
NOTE: *The cooling system capacity is 3.5 L (3.69 qt.).*

3. Remove the radiator assembly. See “Radiator Removal”, discussed later in this section.



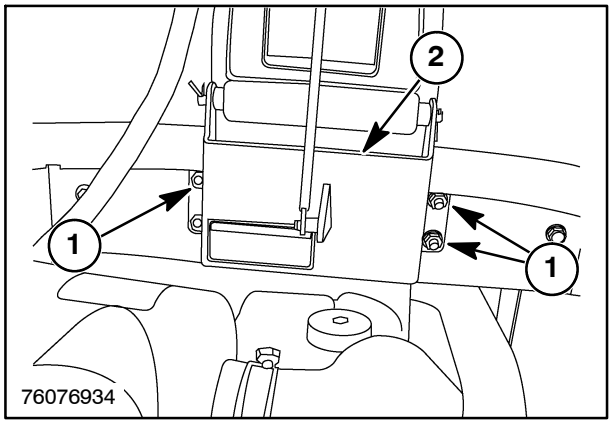
4

4. Disconnect the electrical connector, 1, joining the headlamp wiring harness to the main harness.



5

5. Remove the four hex nuts, 1, securing the hood hinge bracket, 2, to the firewall support, and carefully remove the hood with the hinge bracket attached.



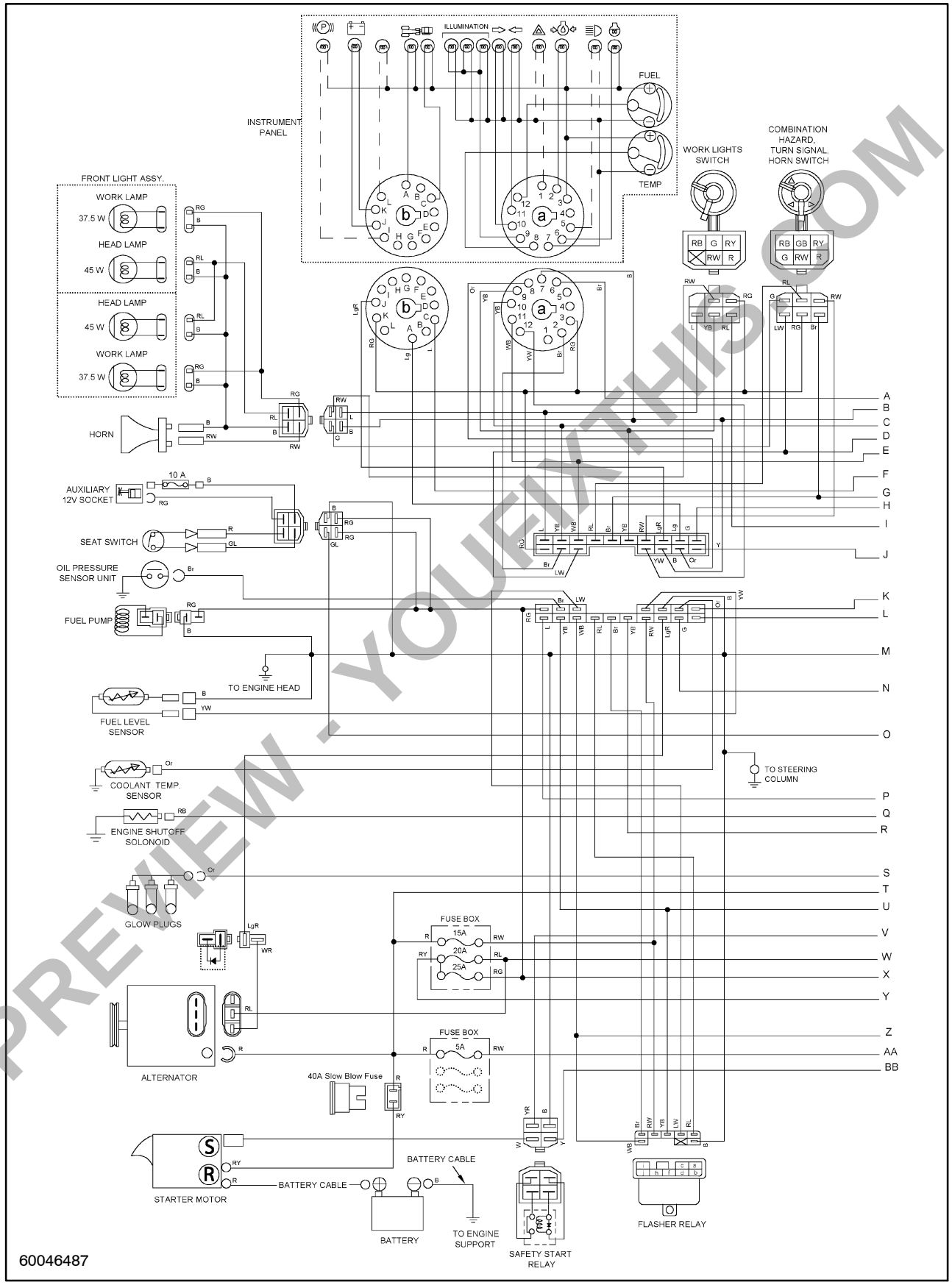
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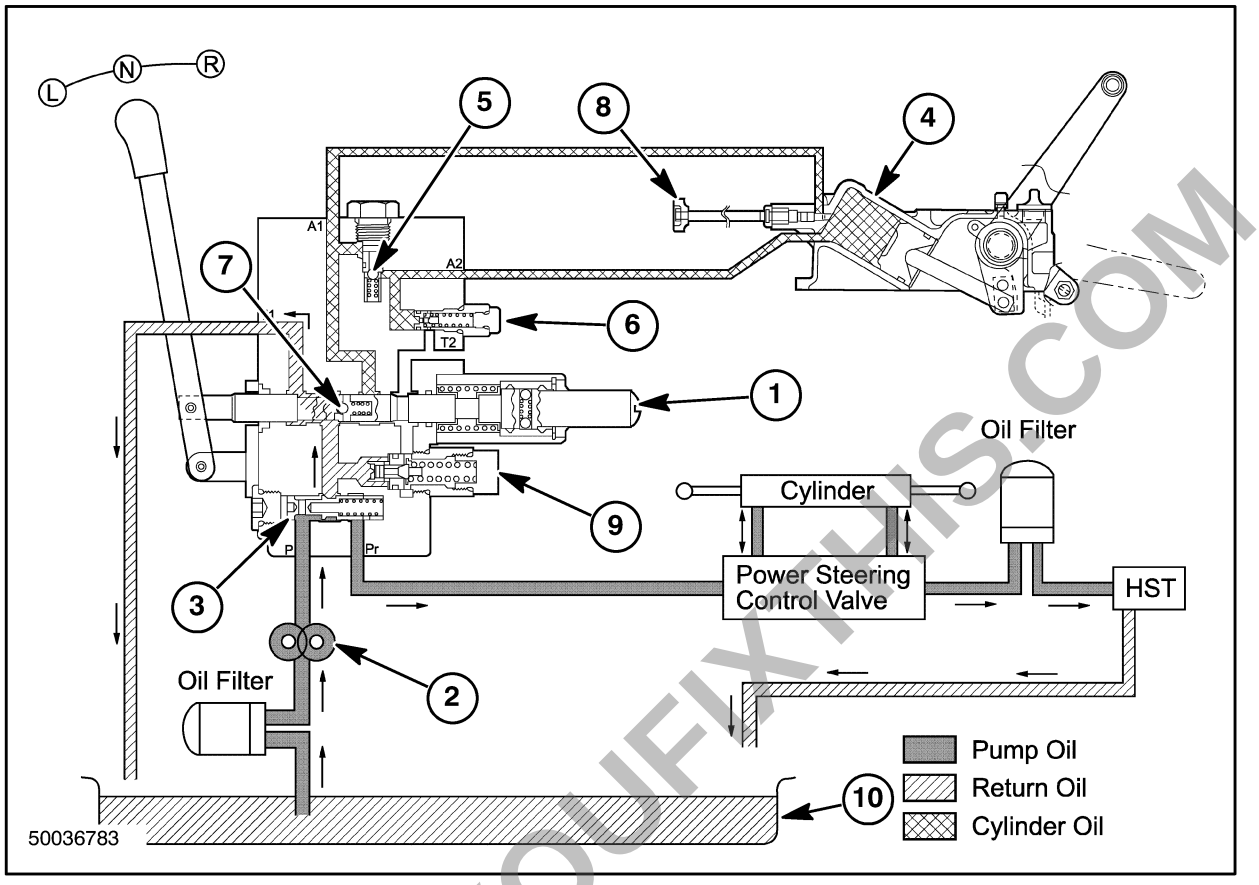
ELECTRICAL CIRCUITS

COMPLETE CIRCUIT DIAGRAM – T1010, T1030, T1110



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10

1. Control Valve Spool
2. Hydraulic Pump
3. Flow Priority Valve
4. Hydraulic Cylinder
5. Lift Check Valve
6. Safety Valve
7. Check Valve
8. Drop Rate Control Valve
9. Relief Valve
10. Sump

OIL FLOW (T1010 AND T1030)

Neutral Position

In the “neutral” position, the control valve spool, 1, is centered in the valve body. Pressurized oil from the hydraulic pump, 2, is directed into the valve body and separated by the flow priority valve, 3. The priority flow 7 L/min (1.85 gpm) is directed out the ‘Pr’ port to the power steering and HST circuits. The remaining oil flow is directed to the control valve spool. Since the spool is centered, and is blocking all of the valve’s working ports in this position, the remaining oil flow is directed around the spool to the tank (‘T1’) port to return to the reservoir.

Oil trapped in the hydraulic cylinder, 4, under the load exerted by the implement on the lift arms, enters the valve body at the ‘A2’ port and exerts pressure on the cylinder side of the check valve, 5, holding the check valve closed. The safety valve, 6, retains the oil in the hydraulic cylinder line, maintaining the implement in a fixed position.

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MINIMUM HARDWARE TIGHTENING TORQUES

IN NEWTON-METERS (FOOT POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS

INCH NON-FLANGED HARDWARE AND LOCKNUTS

NOMINAL SIZE	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		LOCKNUTS		NOMINAL SIZE
	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	GR.B w/GR5 BOLT	GR.C w/GR8 BOLT	
1/4	6.2 (55)*	8.1 (72)*	9.7 (86)*	13 (112)*	14 (121)*	18 (157)*	8.5 (75)*	12.2 (109)*	1/4
5/16	13 (115)*	17 (149)*	20 (178)*	26 (229)*	28 (250)*	37 (324)*	17.5 (155)*	25 (220)*	5/16
3/8	23 (17)	30 (22)	35 (26)	46 (34)	50 (37)	65 (48)	31 (23)	44 (33)	3/8
7/16	37 (27)	47 (35)	57 (42)	73 (54)	80 (59)	104 (77)	50 (37)	71 (53)	7/16
1/2	57 (42)	73 (54)	87 (64)	113 (83)	123 (91)	159 (117)	76 (56)	108 (80)	1/2
9/16	81 (60)	104 (77)	125 (92)	163 (120)	176 (130)	229 (169)	111 (82)	156 (115)	9/16
5/8	112 (83)	145 (107)	174 (128)	224 (165)	244 (180)	316 (233)	153 (113)	215 (159)	5/8
3/4	198 (146)	256 (189)	306 (226)	397 (293)	432 (319)	560 (413)	271 (200)	383 (282)	3/4
7/8	193 (142)	248 (183)	495 (365)	641 (473)	698 (515)	904 (667)	437 (323)	617 (455)	7/8
1	289 (213)	373 (275)	742 (547)	960 (708)	1048 (773)	1356 (1000)	654 (483)	924 (681)	1

NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION
CAP SCREWS AND CARRIAGE BOLTS



SAE GRADE 2 | SAE GRADE 5 | SAE GRADE 8

REGULAR NUTS | SAE GRADE 5 HEX NUTS | SAE GRADE 8 HEX NUTS

LOCKNUTS



GRADE IDENTIFICATION
GRADE A NO NOTCHES
GRADE B ONE CIRCUMFERENTIAL NOTCH
GRADE C TWO CIRCUMFERENTIAL NOTCHES



GRADE IDENTIFICATION
GRADE A NO MARKS
GRADE B THREE MARKS
GRADE C SIX MARKS
MARKS NEED NOT BE LOCATED AT CORNERS



GRADE A NO MARK
GRADE B LETTER B
GRADE C LETTER C

GRADE IDENTIFICATION

86529681 REV F 5.2

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TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine does not develop full power	Clogged air cleaner	Inspect and replace air cleaner if necessary
	Fuel line obstructed	Check for crimping fuel line. Inspect fuel filter for cleanliness. Repair/ replace components as required
	Improper injection Timing	Correct injection timing
	Improper nozzle injection pressure and angle	Inspect for proper injection pressure and angle
	Low cylinder compression	Check engine compression
	Insufficient fuel injection	Repair at authorized shop
	Improper valve lash adjustment	Adjust valves to correct tolerances
	Burned, worn, or sticking valves	Inspect and replace as necessary
	Blown head gasket	Replace head gasket
	Worn or sticking piston rings	Overhaul as necessary
	Faulty engine stop solenoid	Replace stop solenoid
Low oil pressure	Engine oil level low	Fill to proper level
	Wrong grade oil	Replace with correct grade oil
	Clogged oil filter	Change oil filter
	Faulty oil pressure relief valve	Replace relief valve
	Worn oil pump gears, or broken pipe	Inspect oil system and components. Replace defective components
	Excessive main or connecting rod bearing clearance	Replace bearings or crankshaft if necessary
Engine will not stop	Faulty engine stop solenoid	Replace stop solenoid
	Faulty starter switch	Replace starter switch

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SPECIFICATIONS

	Model T1010 Hydrostatic	Model T1030 Hydrostatic	Model T1110 Hydrostatic
ENGINE			
Type	S753 Diesel	S773L Diesel	S773L Diesel
Engine Gross Horsepower	20.0	26.0	28.0
Cylinders	3	3	3
Bore	75 mm (2.95″)	77 mm (3.03″)	77 mm (3.03″)
Stroke	72 mm (2.83″)	81 mm (3.19″)	81 mm (3.19″)
Displacement	0.954 L (58.2 cu. in.)	1.13 L (69.0 cu. in.)	1.13 L (69.0 cu. in.)
Compression Ratio	23.5:1	22.8:1	22.8:1
Firing Order	1 – 2 – 3	1 – 2 – 3	1 – 2 – 3
Low Idle Speed	1350 ± 50 rpm	1350 ± 50 rpm	1350 ± 50 rpm
Maximum Speed			
High Idle	3200 ± 25 rpm	3225 ± 25 rpm	3325 ± 25 rpm
Rated	3000 ± 50 rpm	3000 ± 50 rpm	3000 ± 50 rpm
Valve Clearance (Cold):			
Intake	0.20 mm (0.008″)	0.20 mm (0.008″)	0.20 mm (0.008″)
Exhaust	0.20 mm (0.008″)	0.20 mm (0.008″)	0.20 mm (0.008″)
CAPACITIES			
Fuel Tank	26.0 liters/ 7.1 U.S. gals	26.0 liters/ 7.1 U.S. gals	26.0 liters/ 7.1 U.S. gals
Cooling System	3.5 liters/ 3.7 U.S. qts	3.5 liters/ 3.7 U.S. qts	3.5 liters/ 3.7 U.S. qts
Engine Crankcase			
With Filter	3.3 liters/ 3.5 U.S. qts	3.3 liters/ 3.5 U.S. qts	3.3 liters/ 3.5 U.S. qts
Rear Axle & Transmission	13 liters/ 13.8 U.S. qts	13 liters/ 13.8 U.S. qts	13 liters/ 13.8 U.S. qts
Power Steering	Using Transmission Oil (Common Use)	Using Transmission Oil (Common Use)	Using Transmission Oil (Common Use)
Front Axle Differential/ Final Reduction Gear Case	2.0 liters/ 2.12 U.S. qts	2.0 liters/ 2.12 U.S. qts	2.0 liters/ 2.12 U.S. qts

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SECTION 10 - ENGINE SYSTEMS

BOOK 1 - 87739174

Chapter 1 - Engine Systems

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PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("**DANGER**", "**WARNING**", and "**CAUTION**") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.

⚠ DANGER ⚠

This word "DANGER" indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.

⚠ WARNING ⚠

This word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.

⚠ CAUTION ⚠

This word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

FAILURE TO FOLLOW THE "DANGER", "WARNING", AND "CAUTION" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

MACHINE SAFETY

The precautionary statement ("**IMPORTANT**") is followed by specific instructions. This statement is intended for machine safety.

IMPORTANT: *The word "IMPORTANT" is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.*

INFORMATION

NOTE: *Instructions used to identify and present supplementary information.*

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CRANKSHAFT (Continued)			
Tractor Model	**T1010**	**T1030**	**T1110**
Journal-to-Cylinder Block Bearing Clearance			
Standard	0.039 – 0.101 mm (0.0015 – 0.004 in.)	0.039 – 0.101 mm (0.0015 – 0.004 in.)	0.039 – 0.101 mm (0.0015 – 0.004 in.)
Maximum	0.2 mm (0.008 in.)	0.2 mm (0.008 in.)	0.2 mm (0.008 in.)
No. 1, 2, & 3 Main Journal Regrind Size			
0.25 mm undersize (0.010 in.)	45.714 – 45.725 mm (1.7998 – 1.8002 in.)	45.714 – 45.725 mm (1.7998 – 1.8002 in.)	45.714 – 45.725 mm (1.7998 – 1.8002 in.)
0.50 mm undersize (0.020 in.)	45.464 – 45.475 mm (1.7899 – 1.7904 in.)	45.464 – 45.475 mm (1.7899 – 1.7904 in.)	45.464 – 45.475 mm (1.7899 – 1.7904 in.)
No. 4 Main Journal Regrind Size			
0.25 mm undersize (0.010 in.)	45.704 – 45.715 mm (1.7994 – 1.7998 in.)	45.704 – 45.715 mm (1.7994 – 1.7998 in.)	45.704 – 45.715 mm (1.7994 – 1.7998 in.)
0.50 mm undersize (0.020 in.)	45.454 – 45.465 mm (1.7895 – 1.790 in.)	45.454 – 45.465 mm (1.7895 – 1.790 in.)	45.454 – 45.465 mm (1.7895 – 1.790 in.)
Crankpin Regrind Size			
0.25 mm undersize (0.010 in.)	38.714 – 38.725 mm (1.5242 – 1.5246 in.)	38.714 – 38.725 mm (1.5242 – 1.5246 in.)	38.714 – 38.725 mm (1.5242 – 1.5246 in.)
0.50 mm undersize (0.020 in.)	38.464 – 38.475 mm (1.5143 – 1.5148 in.)	38.464 – 38.475 mm (1.5143 – 1.5148 in.)	38.464 – 38.475 mm (1.5143 – 1.5148 in.)

CAMSHAFT			
Tractor Model	**T1010**	**T1030**	**T1110**
Cam Height-Valve			
Standard	26.565 – 26.62 mm (1.045 – 1.048 in.)	26.565 – 26.62 mm (1.045 – 1.048 in.)	26.565 – 26.62 mm (1.045 – 1.048 in.)
Minimum	26.2 mm (1.031 in.)	26.2 mm (1.031 in.)	26.2 mm (1.031 in.)
Cam Height-Fuel			
Standard	33.94 – 34.06 mm (1.336 – 1.341 in.)	33.94 – 34.06 mm (1.336 – 1.341 in.)	33.94 – 34.06 mm (1.336 – 1.341 in.)
Minimum	33.8 mm (1.33 in.)	33.8 mm (1.33 in.)	33.8 mm (1.33 in.)
Bend			
Standard	0.03 mm (0.001 in.)	0.03 mm (0.001 in.)	0.03 mm (0.001 in.)
Maximum	0.1 mm (0.004 in.)	0.1 mm (0.004 in.)	0.1 mm (0.004 in.)

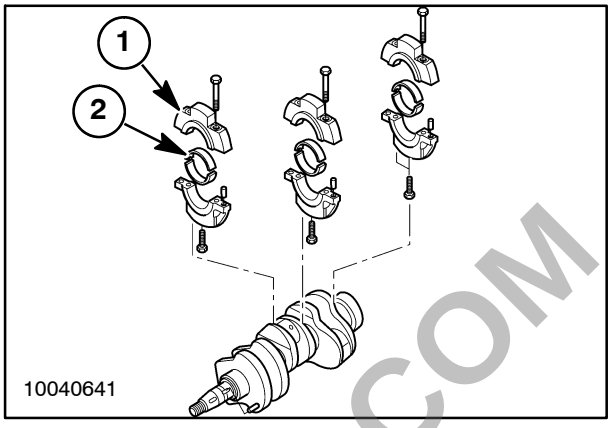
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MAIN BEARING AND THRUST BEARING

Removal and Inspection

1. Remove the two retaining bolts, from the bearing holders, 1.
2. Remove the bearing holders, 1, and bearing liners, 2.

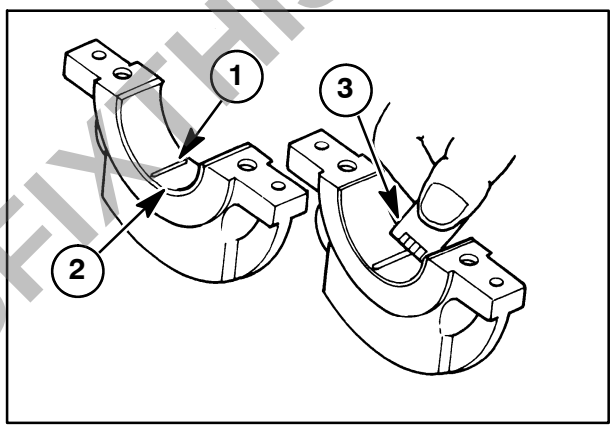


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1. Holder
2. Main liner

3. Position a piece of plastigauge, 1, across the full width of the bearing liner, 2, at approximately 1/4 inch off center.
4. Install the bearing holder and tighten the bolts to 19 – 24 N·m (14 – 18 ft-lbs).

NOTE: *Do not permit the bearing holder to rotate, even the slightest amount.*



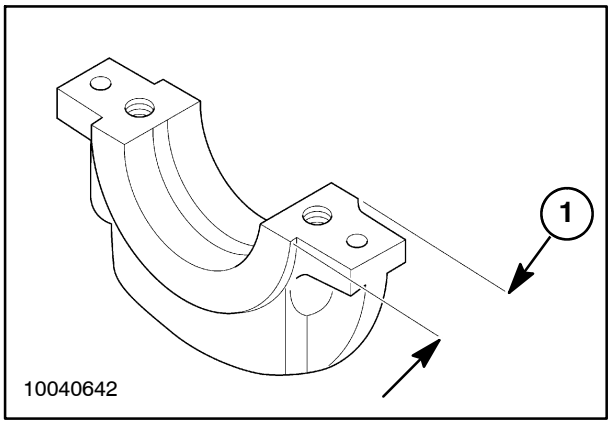
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5. Remove the bearing holder and measure the width of the flattened plastigauge with the plastigauge scale, 3. The width of the plastigauge at the widest point is the minimum clearance and the width of the plastigauge at the narrowest point is the maximum clearance. The difference between the two readings indicates the taper.
6. Replace the bearing liners, or grind the crankshaft journals to obtain the correct bearing clearance.

Standard Thickness	Allowable Limit
0.039 – 0.101 mm (0.0015 – 0.004 in.)	0.2 mm (0.0079 in.)

7. Check the thrust washer for wear, poor contact, burning, or other defects. Using a micrometer measure the holder thickness, 1. If the washer surface is found to be defective or is not within the following tolerance, replace the holder:

Standard Thickness	Allowable Limit
21.85 – 21.95 mm (0.8602 – 0.8642 in.)	21.55 mm (0.848 in.)



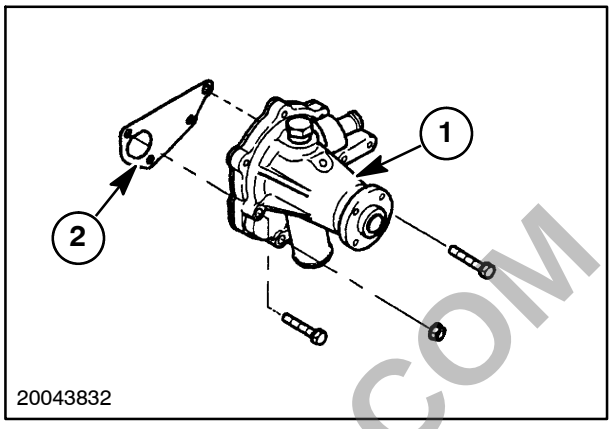
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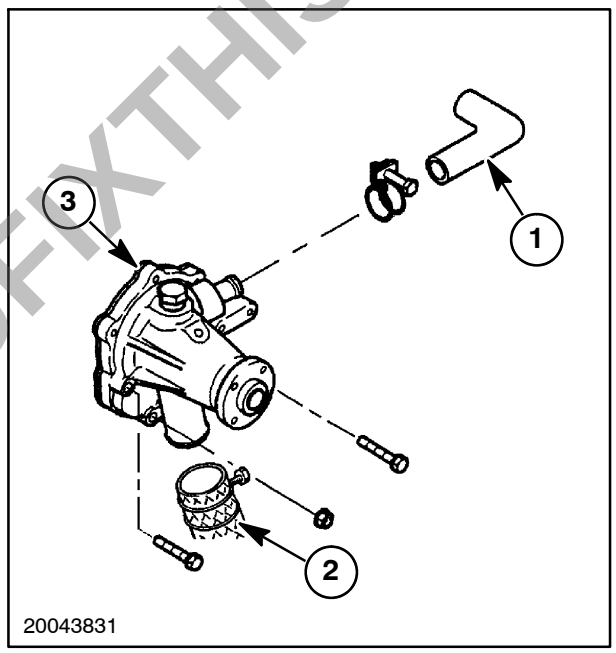
Installation

1. Apply a thin bead of sealant to the surface of the front of the engine block and place a new inner gasket, 2, on the block, aligning the mounting holes.
2. Install the water pump housing, 1, against the gasket.
3. Install the mounting bolts, including the one short, forward-facing bolt on the LH side. Install the hex nut onto the threaded stud on the lower RH side.
4. Torque all assembly hardware to 8 – 13 N·m (6 – 9.5 ft-lbs).



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5. Install the bypass hose, 1, and lower radiator hoses, 2, on the water pump, 3, and tighten the hose clamps to secure the connections.



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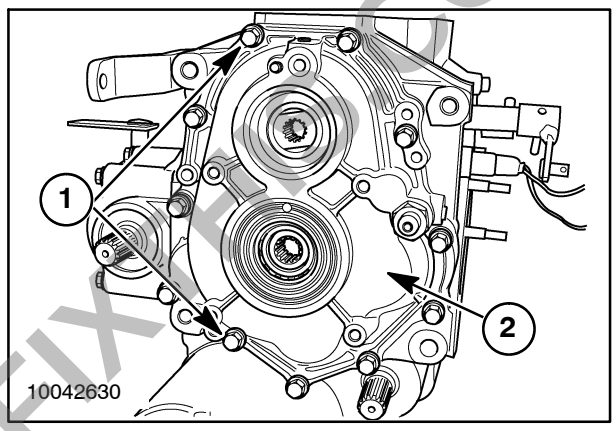
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DRIVE PINION

Removal

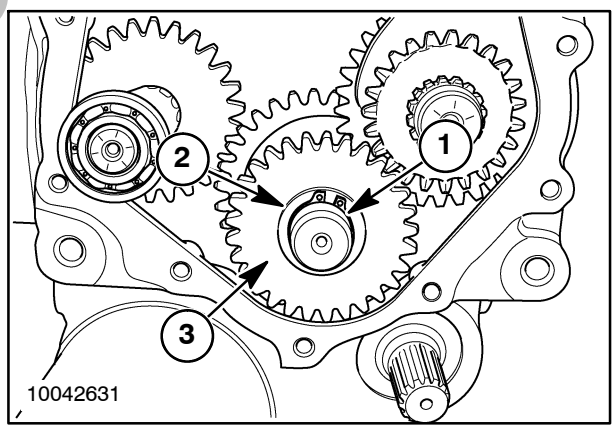
To remove the differential drive pinion, the transmission must be removed from the tractor and separated from the Hydrostatic Transmission (HST). Refer to Section 29, Hydrostatic Transmission for complete disassembly procedures.

1. Remove rear axle differential assembly, as described earlier in this chapter.
2. Remove retaining bolts, 1, and pull off the front cover, 2.



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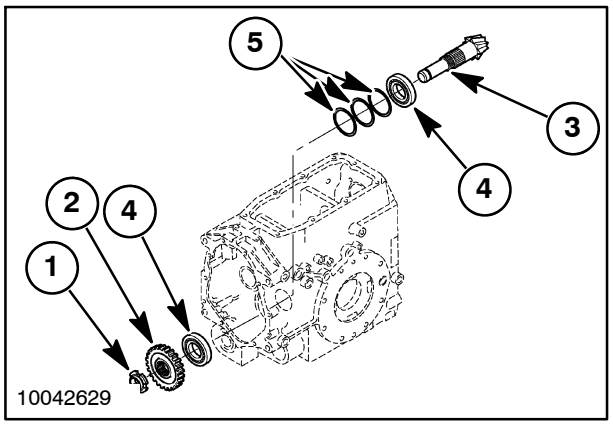
3. Remove retaining ring, 1, thrust washer(s), 2, gear, 3, and roller bearings (not shown) from the pinion shaft.



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4. Remove the pinion lock nut, 1, and discard. Slide the fixed gear, 2, off the pinion shaft. Gently tap the pinion, 3, into the differential housing. Remove the pinion, 3, bearings, 4, and shims, 5, if equipped.

NOTE: *Take note to the quantities and the thickness of the shims, 5, used between the differential housing and the rear bearing outer race.*



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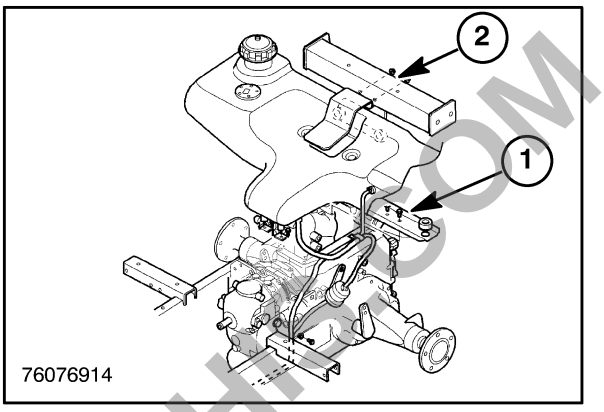
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29. Install the LH and RH ROPS support uprights on the rear axle housings on both side of the tractor. Torque the mounting hardware to 46 – 54 N·m (34 – 40 ft-lbs).

30. Position the center frame/upper link bracket assembly, 1, on the upper rear of the lift cylinder cover. Install the six bolts securing the assembly to the lift cover, and the four bolts attaching the assembly to the ROPS support on each side. Torque the mounting hardware to 69 – 80 N·m (51 – 59 ft-lbs).

31. Install the fuel tank support, 3, on the top of the lift cylinder cover.

32. Install the fuel tank, foot platform, fender assembly, ROPS, and seat. See Section 90 – Platform for installation procedure.



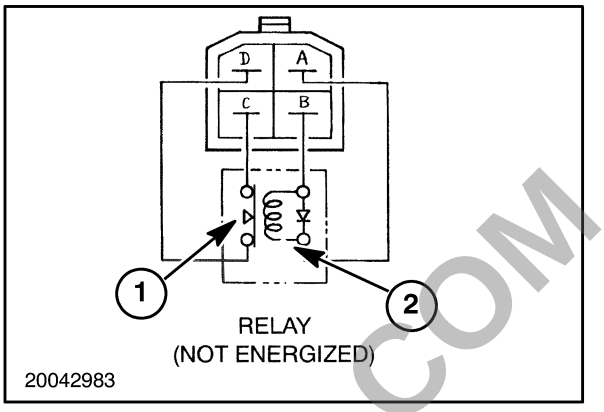
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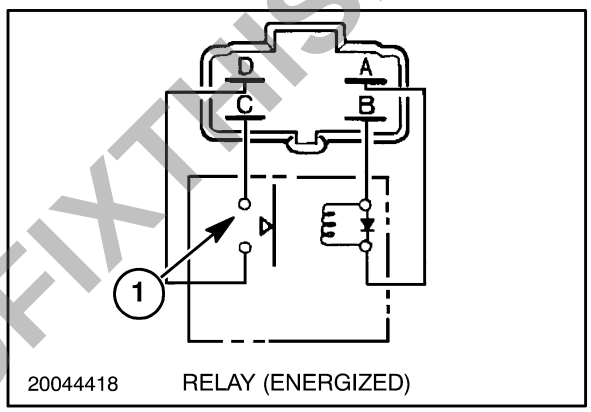
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(Normally Closed Relay)

The function circuit, 1, is normally closed when current is not being supplied to the coil, 2. If a circuit with an SPST relay is energized with current on the tractor, the switch, 1, becomes open and the circuit is not completed.



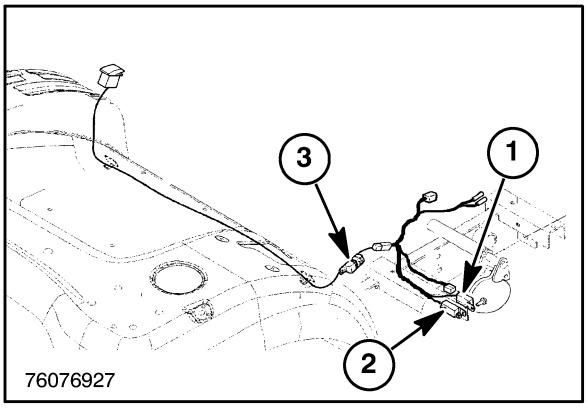
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Removal (all)

1. Remove operator's platform.
2. Remove mounting bolt for cruise latch, 1, and brake, 2, relays mounted to platform support bracket.
3. Instrument panel indicator light relay, 3, is taped to cruise harness.
4. Unplug relay from cruise harness connector.



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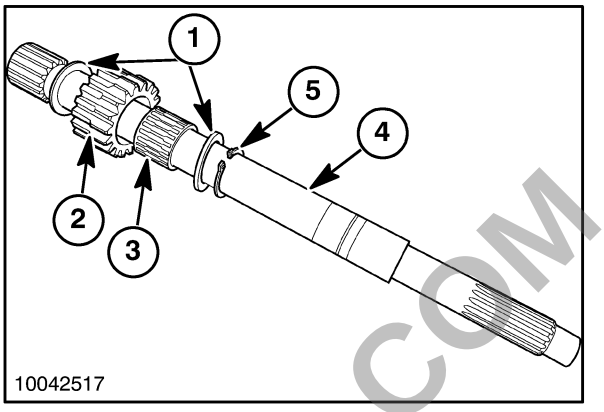
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PTO SHIFT ROD AND INPUT SHAFT

Installation

IMPORTANT: *The oil grooves in the thrust washers, 1, must face the counter gear, 2, when assembled.*

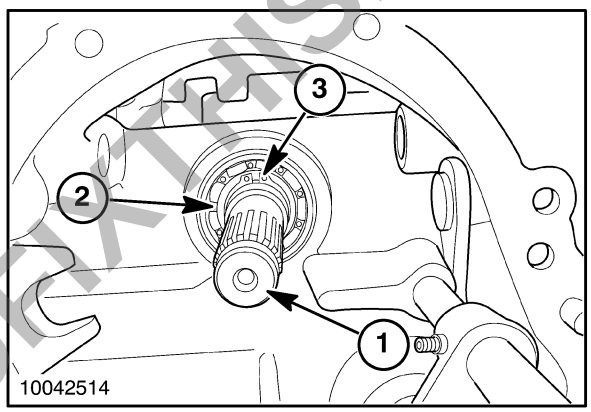
1. Install the thrust washers, 1, 18T counter gear, 2, and needle bearing, 3, on the PTO input shaft, 4.
2. Secure the assembly with the snap ring, 5.



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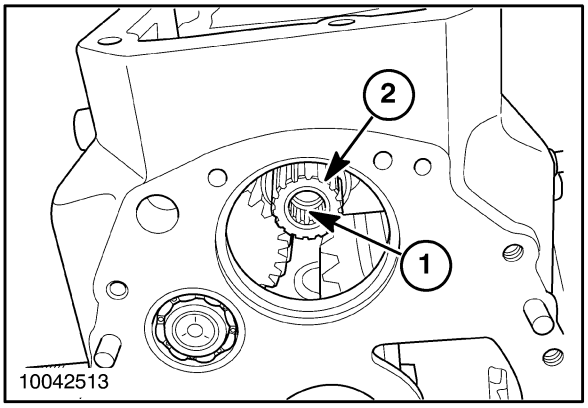
3. Install the PTO input shaft, 1, into the housing from the rear.
4. Install the front bearing, 2, onto the shaft until fully seated.
5. Secure the bearing to the shaft using the snap ring, 3.

NOTE: *Be sure both front and rear bearings are properly seated on the PTO input shaft and in the housing.*



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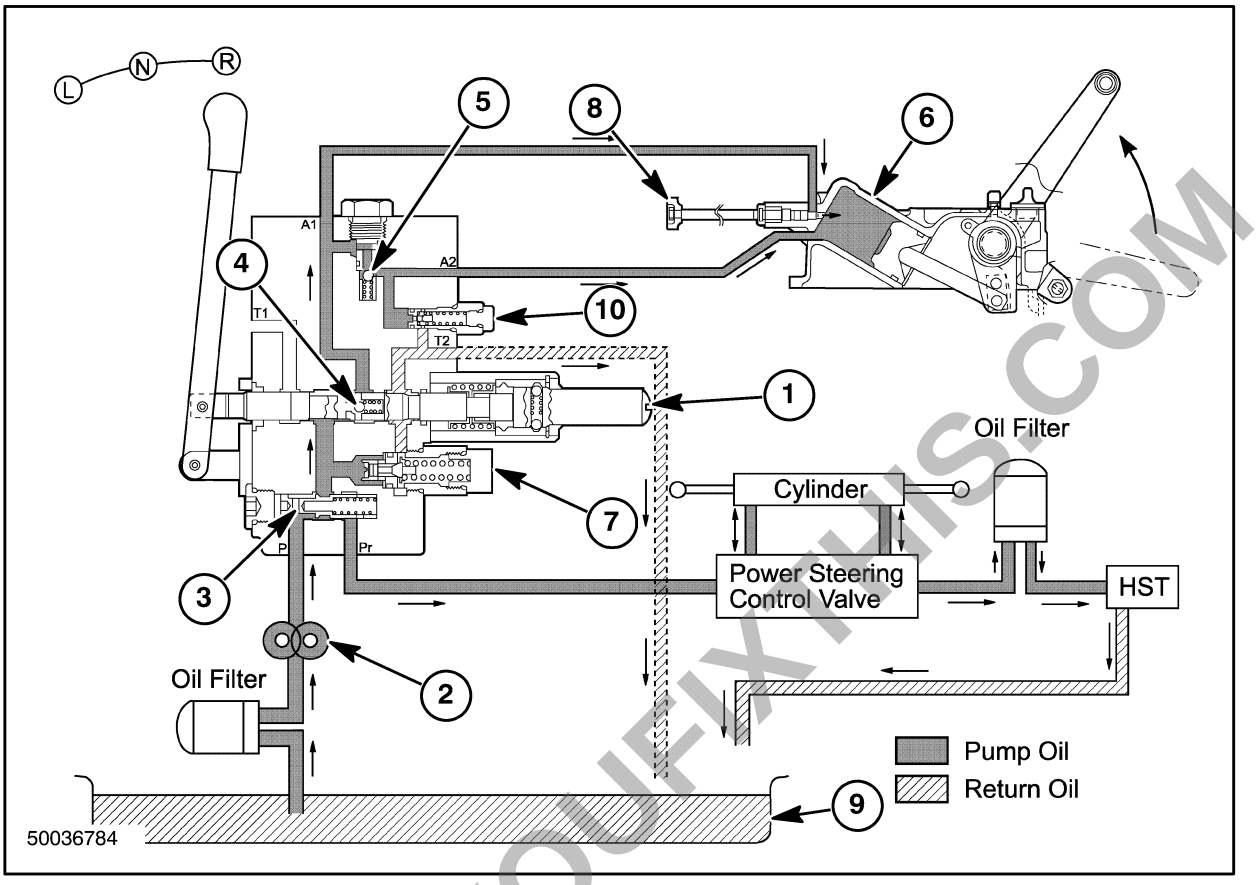
6. Lubricate and install the needle bearing, 1, in the rear of the PTO input shaft, 2.



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1. Control Valve Spool
2. Hydraulic Pump
3. Flow Priority Valve
4. Check Valve
5. Lift Check Valve
6. Hydraulic Cylinder
7. Relief Valve
8. Drop Rate Control Valve
9. Sump
10. Safety Valve

Lifting Position

When the control lever is moved to the "raise" position, the control valve spool, 1, is moved rearward. Pressurized oil from the hydraulic pump, 2, is directed into the valve body and separated by the flow priority valve, 3. The priority flow 7 L/min (1.85 gpm) is directed out the 'Pr' port to the power steering and HST circuits. The remaining oil flow is directed to the control valve spool.

Pressurized oil flows to the front of the check valve, 4. When it overcomes the static pressure in the hydraulic cylinder line (via port 'A1'), the check valve, 5, opens, allowing oil flow to the hydraulic cylinder, 6, through both ports 'A1' and 'A2', to lift the implement.

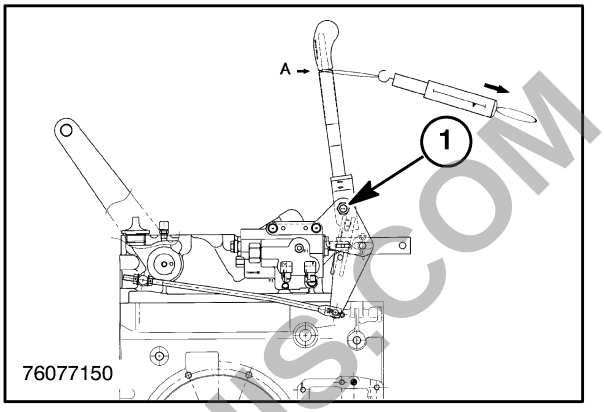
If oil pressure in the system exceeds 128 bar (1850 psi), the relief valve, 7, opens and diverts the oil to the reservoir via the second tank line ('T2').

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HYDRAULIC CONTROL LEVER PRELOAD

Adjustment (T1110)

1. Adjust the hydraulic control lever preload to the lowering direction with two nuts.
2. Place the lever to the highest position and set the spring balancer on the lever, and inspect the preload. Adjust the preload to 12.4–18.5 N (1.26–1.9 kg) at the position “A” by the two nuts, 1, on the pivot shaft.



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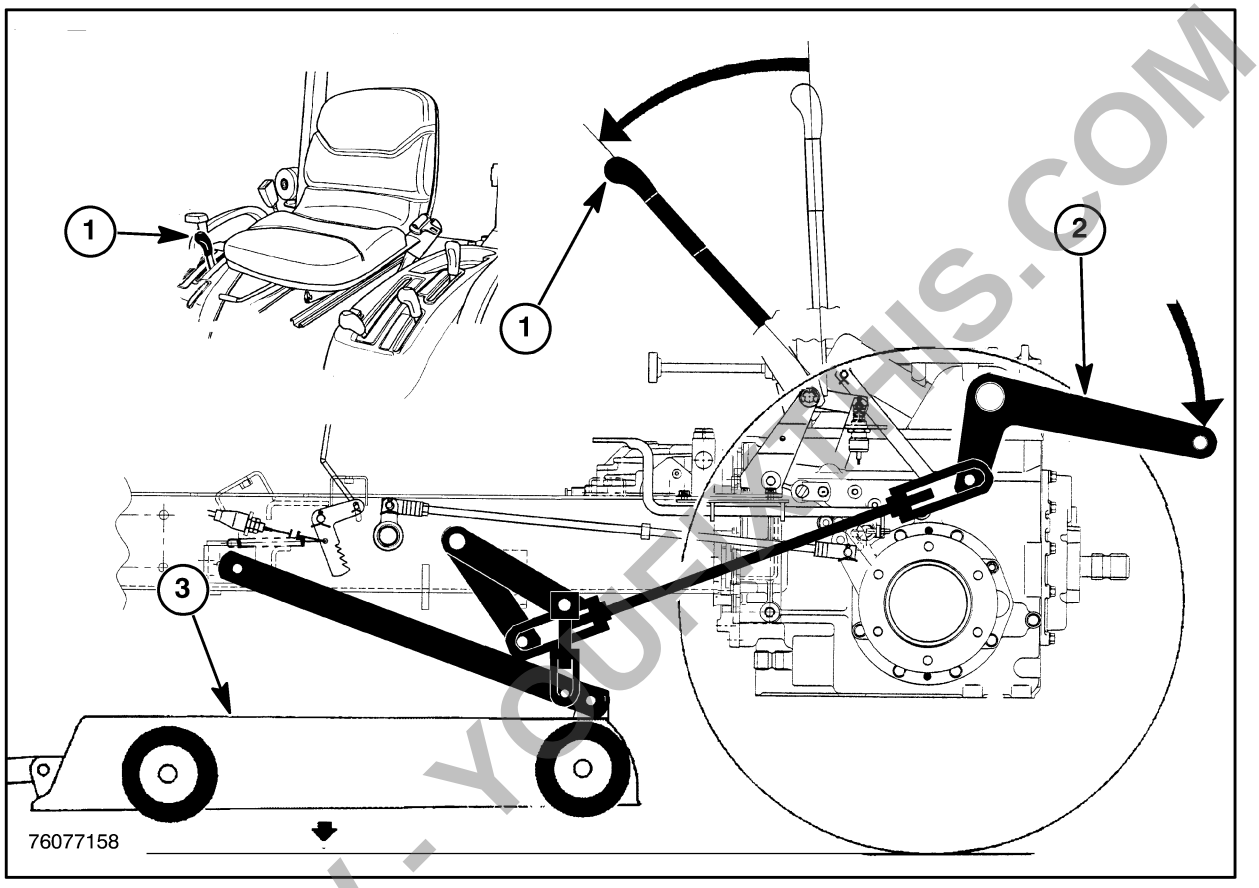
HPL LINKAGE ADJUSTMENTS (T1110)

The length of the position control rod is critical and careful adjustment must be observed for proper operation. If the control rod is adjusted too long, the control valve spool will remain in the raised position when the lift arms have reached their maximum height and the system relief valve will blow. If the control rod is too short, the control valve spool will return to neutral before the lift arms reach their full height. The position control rod should be adjusted any time the link is disconnected for service to the hydraulic system, or any time the relief valve operation is noticed while the lift arms are at the full raise position.

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When the position control lever, 1, is moved to the desired height the oil in the HPL cylinder returns to the reservoir, the lift arm, 2, rotates to the “lowered” position, and the mower deck, 3, descends to the desired height.



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TROUBLESHOOTING CHART

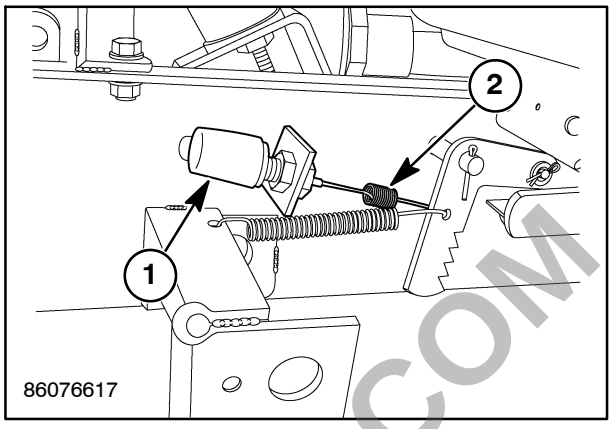
CONDITION	POSSIBLE CAUSE	REMEDY
Hard Steering	1. ORBITROL (Control Valve Unit)	
	(1) ORBITROL not aligned to steering column	Reposition ORBITROL (If loosening its mounting bolts lightens the steering wheel load, it means that the control valve unit was in misalignment)
	(2) Spool and sleeve combination is seized because of foreign matter	Replace
	(3) Over-tightening of the end cap bolts	Retighten to the specified torque limit
	2. Hydraulic Pump	Replace pump
	(1) The pump is stuck and will not work	Replace pump
	(2) The pump is worn	Test pump performance. If necessary, remove the pump; disassemble the pump and replace all internal seals
	(3) Pumping performance is inadequate	Disassemble flow priority valve. Check for contamination or damage
	(4) Flow priority valve not shifting full travel	Replace the control valve assembly
	3. Relief Valve	
	(1) The valve is damaged because of internal deterioration	Replace the control valve assembly
	(2) Pressure setting is too low	
Steering wheel will not return to neutral position or will turn by itself	1. ORBITROL (Control Valve Unit)	
	(1) Spool and sleeve combination is stuck and will not rotate	Replace control valve assembly
	(2) ORBITROL not aligned to the steering column	Realign
Cylinder will not follow steering wheel rotation or will respond sluggishly	1. ORBITROL (Control Valve Unit)	
	(1) Air is trapped in the cylinder	Bleed air out of the cylinder
	(2) Internal oil leakage because of damaged piston seal	Replace the seal
Steering wheel will “kick back”	1. ORBITROL (Control Valve Unit)	
	(1) ORBITROL has been improperly rebuilt, resulting in valve mistiming	Repair the control valve assembly
	2. Piping	
	(1) Pipes are improperly connected to the four ports of ORBITROL	Correct the pipe connections
Oil leakage		
1. From the splined connection of column to spool	1. Leaky oil seal	Replace the seal
	(1) Dirty hydraulic oil	Change the hydraulic oil
2. From mated face joints (valve body, spacer plate, ORBITROL, end cap)	2. Damaged O-ring	Replace the damaged O-ring

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PARK BRAKE SAFETY SWITCH

The park brake safety switch, 1, is a single-pole, pull out plunger-type switch, located on the left side of the tractor, underneath operator's platform. The park brake pedal and switch are connected by a spring and the switch is located in front of the pedal pivot on the frame. When the park brake pedal is depressed, the switch contacts close, allowing the tractor to start or run with the operator out of the operator seat. When the park brake pedal is free, the switch contacts are in the open position and the tractor will not run.



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Removal

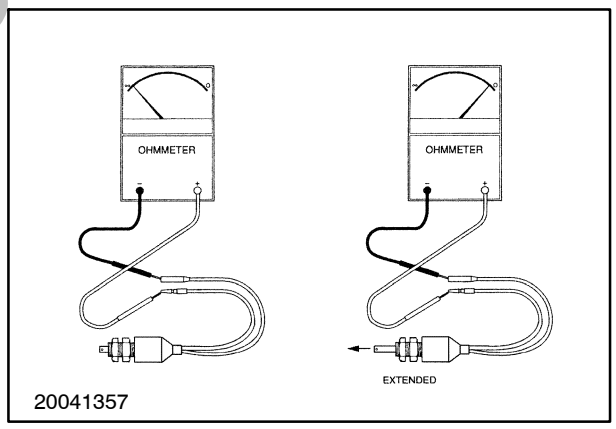
1. Disconnect the negative (–) battery cable from the negative (–) battery terminal.
2. Disconnect the two switch leads, from the tractor wire harness.
3. Disconnect the spring, 2, and remove the adjusting nut to remove the park brake switch from the tractor.

Testing

Use an ohmmeter to test both positions of the park brake safety switch for electrical continuity.

Extended Position

1. With the switch plunger in the "extended" position, touch one of the test probes to the one switch lead. Touch the other test probe to the other switch lead.
2. Observe the ohmmeter. The ohmmeter should show little or no resistance indicating that continuity exists between the two switch terminals. If continuity does not exist between the two switch terminals when the switch is in the "extended" position, the switch is defective and must be replaced.



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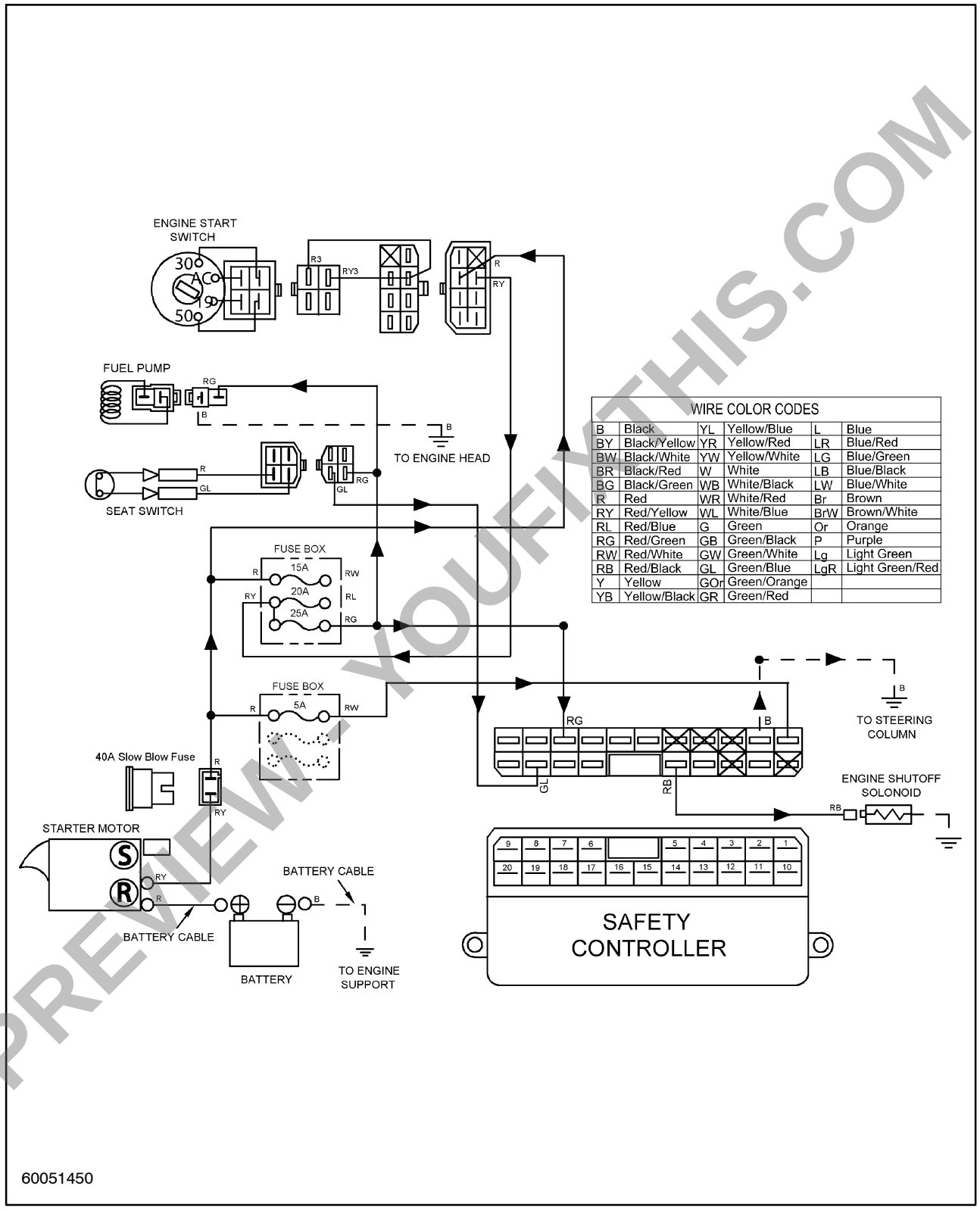
Retracted Position

1. With the switch plunger pushed in to the "retracted" position, there should be no continuity between the two switch terminals. If continuity exists between the two switch terminals when the switch terminals when the switch plunger is in the retracted position, the switch is defective and must be replaced.

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SAFE OPERATION CIRCUIT (OPERATOR PRESENT)
T1010, T1030, T1110



WIRE COLOR CODES					
B	Black	YL	Yellow/Blue	L	Blue
BY	Black/Yellow	YR	Yellow/Red	LR	Blue/Red
BW	Black/White	YW	Yellow/White	LG	Blue/Green
BR	Black/Red	W	White	LB	Blue/Black
BG	Black/Green	WB	White/Black	LW	Blue/White
R	Red	WR	White/Red	Br	Brown
RY	Red/Yellow	WL	White/Blue	BrW	Brown/White
RL	Red/Blue	G	Green	Or	Orange
RG	Red/Green	GB	Green/Black	P	Purple
RW	Red/White	GW	Green/White	Lg	Light Green
RB	Red/Black	GL	Green/Blue	LgR	Light Green/Red
Y	Yellow	GOr	Green/Orange		
YB	Yellow/Black	GR	Green/Red		

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CHARGING CIRCUIT
T1010, T1030, T1110

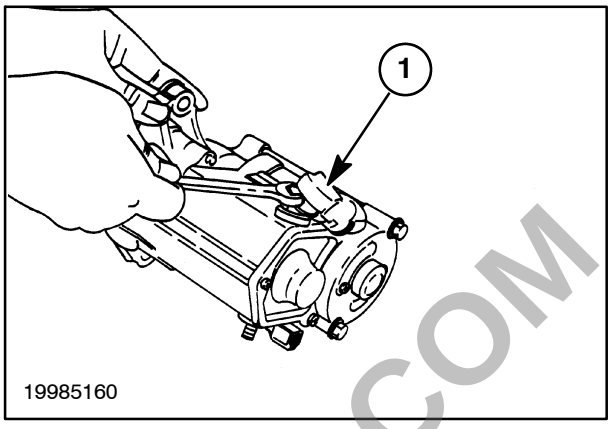
1. Current starts at the battery and flows through the positive (+) battery cable to the engine starter motor.
2. From the engine starter motor, current flows through the 40-amp main slow blow fuse to a wire splice. The wire splice splits current into two different paths.
   - One path goes to the “B” terminal of the alternator.
   - The other path travels to terminal “30” of the key switch.
3. When the key switch is in the “ACC/RUN” position, current flows from the “ACC” terminal to the 20 amp and 25-amp fuses within the fuse panel.
   - 25-amp fuse sends current to terminal “K” of the instrument panel connector. Terminal “K” provides current to the charge indicator light.
   - 20-amp fuse sends current to the “IG” Regulator terminal of the alternator.
4. The alternator is grounded by the “GND” terminal on the alternator through the wiring harness to the engine block.
5. If the tractor engine is not running or the alternator is not producing a sufficient amount of charge, (with the key switch in the “ACC/RUN” position) The charge indicator light will illuminate.
   - The current for the indicator light is provided by terminal “K” of the instrument panel connector.
   - The ground circuit for the indicator light is provided by terminal “J” of the instrument panel connector. From terminal “J” the ground path passes through a diode that is located at alternator connector, then to the “L” terminal of the alternator. The ground source for the “L” terminal is provided by the field coil.
   - When the ground circuit is complete to terminal “J” and current is provided to terminal “K” by the key switch, the charge indicator light will illuminate.
6. When the tractor is running with the alternator rotating and the key switch in the “ACC/RUN” position, the alternator produces an increased regulated voltage to the battery.
   - When the alternator is producing current, the ground circuit, through the “L” terminal, for the charge indicator light is disrupted causing the indicator light to not illuminate.
   - The “IG” regulator terminal controls the voltage output from the alternator. If current is not present at the “IG” terminal the alternator will not produce current.
   - The “B” terminal of the alternator is the output connection between the alternator and the battery.

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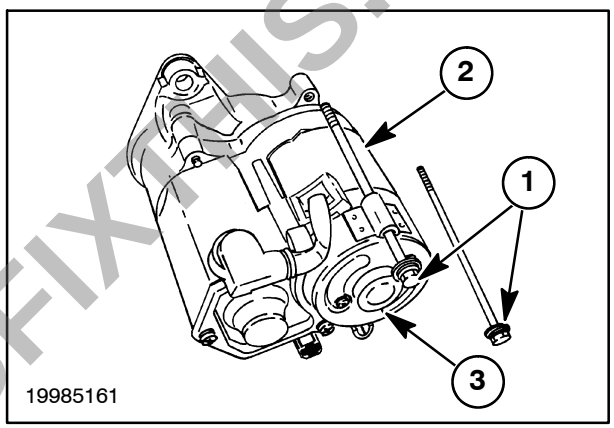
Disassembly

1. Disconnect the connecting lead from the magneto switch, 1.



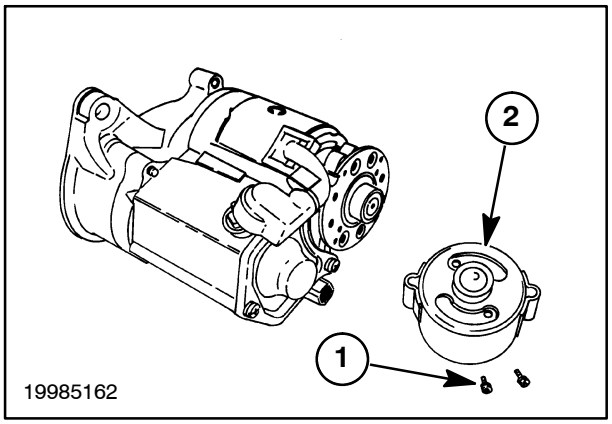
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2. Remove the two through bolts, 1, which tighten the yoke, 2, to the housing, from the end frame side, 3.



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3. Remove the two screws, 1, (end frame-to-brush holder) to remove the end frame, 2.



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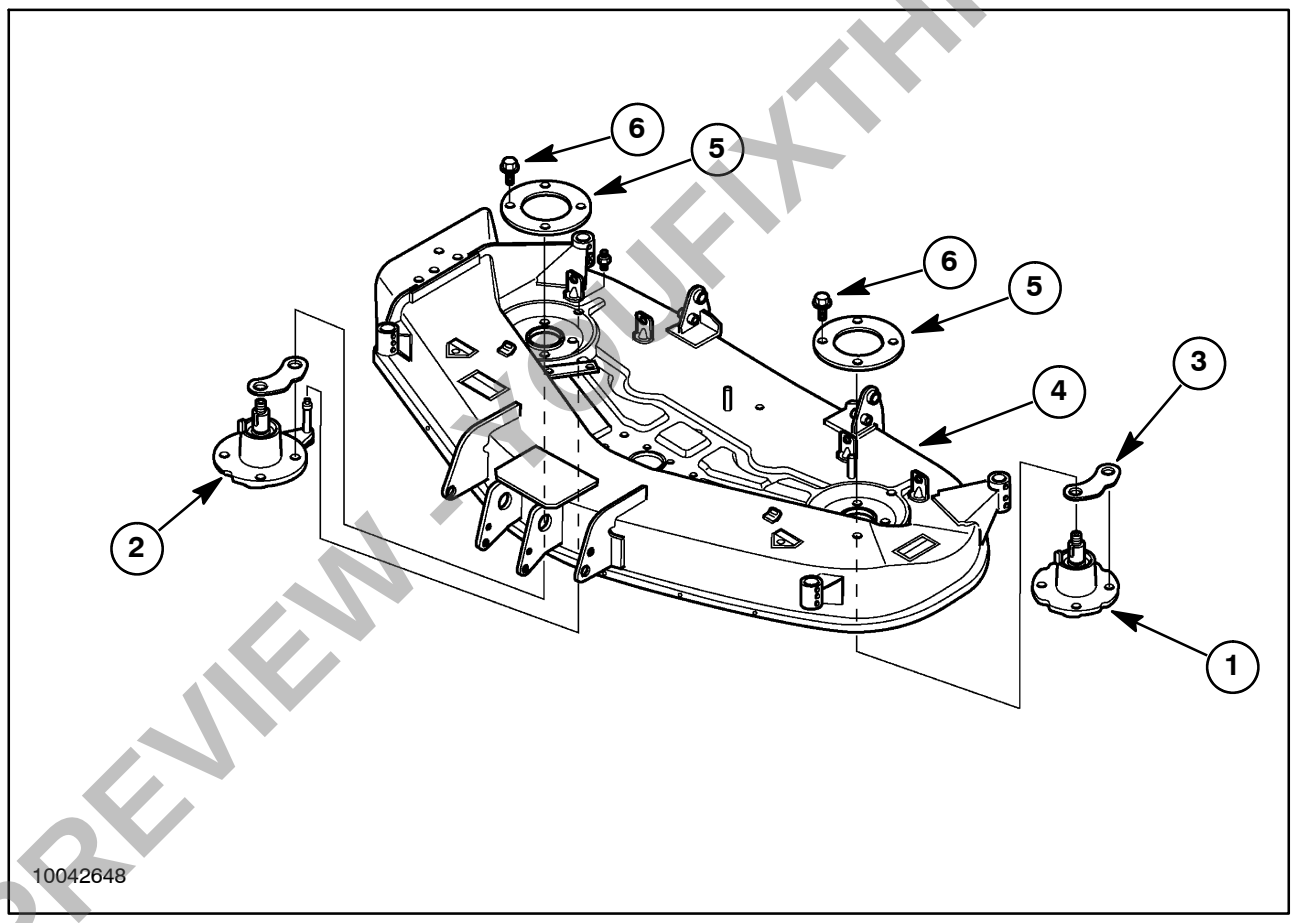
90° GEARBOX, BLADE SPINDLES AND PULLEY HOLDERS

Assembly

NOTE: *The R.H. and L.H. blade shafts and pulley holders are different. The R.H. blade shaft, doesn't have a grease fitting and hole, while the L.H blade shaft does. The R.H. pulley holder, has a grease fitting and hole while the L.H. pulley holder doesn't.*

1. Place R.H. and L.H. spindle assembly, 1, 2, and shims, 3 (if equipped) in position underneath the deck, 4. Insert holders, 5, with bolts, 6. Torque bolts to 90 N·m (65 ft-lbs).

NOTE*: Bolts, 1, are M12 x 1.25 x 25 mm (fine thread).*



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