DX18E, DX22E, DX24E, DX25E REPAIR MANUAL COMPLETE CONTENTS

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The following pages are the collation of the contents pages from each section and chapter of the DX18E, DX22E, DX24E, and DX25E Repair manual. Complete Repair part # 87352316.

The sections used through out all Case IH product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the DX18E, DX22E, DX24E, and DX25E Tractors.

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SPECIFICATIONS

	Model DX18E Hydrostatic	Model DX22E Hydrostatic	Model DX24E Hydrostatic	Model DX25E Hydrostatic
ENGINE				
Type	S753 Diesel	S753 Diesel	S773 Diesel	S773 Diesel
Engine Gross Horsepower	18.0	22.0	24.0	25.0
Cylinders	3	3	3	3
Bore	75 mm (2.95″)	75 mm (2.95″)	77 mm (3.03″)	77 mm (3.03″)
Stroke	72 mm (2.83″)	72 mm (2.83″)	72 mm (2.83″)	72 mm (2.83″)
Displacement	0.954 L (58.2 cu. in.)	0.954 L (58.2 cu. in.)	1.005 L (61.3 cu. in.)	1.005 L (61.3 cu. in.)
Compression Ratio	24:1	24:1	23.1:1	24.5:1
Firing Order	1 – 2 – 3	1 – 2 – 3	1 – 2 – 3	1 – 2 – 3
Low Idle Speed	1380 ± 50 rpm	1380 ± 50 rpm	1300 ± 50 rpm	1380 ± 50 rpm
Maximum Speed				
High Idle	3200 ± 25 rpm	3200 ± 25 rpm	3200 ± 50 rpm	3300 ± 25 rpm
Rated	3000 ± 50 rpm	3000 ± 50 rpm	3000 ± 50 rpm	3100 ± 50 rpm
Valve Clearance (Cold):				
Intake	0.20 mm (0.008″)	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″)	0.20 mm (0.008″)
CAPACITIES				
Fuel Tank	29.5 liters/ 7.8 U.S. gals.	29.5 liters/ 7.8 U.S. gals.	29.5 liters/ 7.8 U.S. gals.	29.5 liters/ 7.8 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.	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.	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.	13 liters/ 13.8 U.S. qts.
Power Steering	Using Transmission Oil (Common Use)	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.	2.0 liters/ 2.12 U.S. qts.

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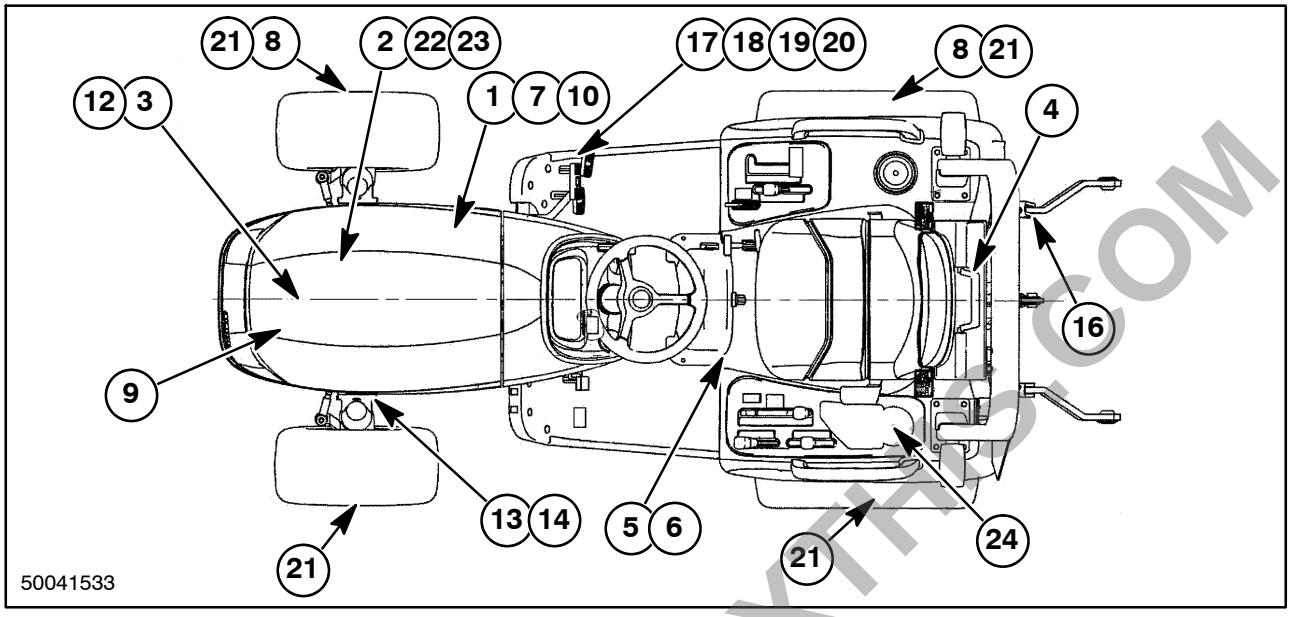
LUBRICATION AND MAINTENANCE CHART
CASE IH DX18E/DX22E/DX24E/DX25E — FRONT-WHEEL DRIVE



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NO.	LUBRICATION & MAINTENANCE ITEMS	CHECK	CLEAN	LUBE	CHANGE	ADJUST	SERVICE INTER-VALS
1	Engine Oil Level	X					Every 10 Hours or Daily
2	Air Cleaner	X					
3	Radiator Coolant	X					
4	Transmission Oil Level	X					
5	Hydraulic Filter				X		First 50 Hours
6	H.S.T. Filter				X		
1, 7	Engine Oil & Filter				X		
8	Tire Pressure	X					
11	Fuel Filter				X		
26	Wheel Bolt Torque	X					
—	All Fluid Levels	X					
8	Tires	X					Every 50 Hours
9	Battery	X					
10	Fuel Filter	D	R	A	I	N	
12	Fan Belt	X					
13	Front Axle Oil Level	X					
14	Final Reduction Gear Cases Oil Level	X					
	Lubrication Fittings:						
16	3-Point Linkage			X			
17	Brake Pedal			X			
18	Pedal Shaft			X			
19	H.S.T. Pedal Pivot			X			
1, 7	Engine Oil & Filter				X		Every 100 Hours
2	Air Cleaner Element		X				
10	Secondary Fuel Filter		X				

NO.	LUBRICATION & MAINTENANCE ITEMS	CHECK	CLEAN	LUBE	CHANGE	ADJUST	SERVICE INTER-VALS
20	Brake					X	Every 200 Hours
10	Fuel Filter Element				X		
12	Fan Belt					X	
21	Wheel Bolt Torque	X					
	Steering Free Play	X				X	
4	Transmission Oil				X		Every 300 Hours
5	Hydraulic Filter				X		
6	H.S.T. Filter				X		
13	Front Axle Oil				X		
14	Final Reduction Gear Cases Oil				X		
24	Primary Fuel Filter				X		
22	Fuel Injector	X				X	Every 600 Hours
23	Valve Clearance	X				X	
2	Air Cleaner Element				X		Seasonal
3	Radiator Coolant				X		
2	Safety Air Filter Element				X		Every 3rd Primary Element Change or Every **1000** Hours, Whichever Comes First

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METRIC BOLT TORQUE SPECIFICATIONS

Bolt Size	Grade No.	Coarse Thread			Fine Thread		
		Pitch (mm)	Pounds-Feet	Newton-Meters	Pitch (mm)	Pounds-Feet	Newton-Meters
M6	4T	1.0	3.6– 5.1	4.9– 6.9	–	–	–
	7T		6.1– 8.3	8.3– 11.3			
	10T		8.7– 11.6	11.8– 15.7			
M8	4T	1.25	9.4– 12.3	12.7– 16.7	1.0	11.2– 14.8	15.2– 20.1
	7T		16.6– 21.0	22.6– 28.4		19.5– 25.3	26.5– 34.3
	10T		21.0– 26.8	28.4– 36.3		22.4– 29.7	30.4– 40.2
M10	4T	1.5	18.8– 24.6	25.5– 33.3	1.25	21.0– 26.8	28.4– 36.3
	7T		32.5– 41.2	44.1– 55.9		36.2– 46.3	49.0– 62.8
	10T		39.8– 51.4	53.9– 69.6		42.7– 54.2	57.9– 73.5
M12	4T	1.75	27.5– 34.7	37.3– 47.1	1.25	31.8– 40.5	43.1– 54.9
	7T		48.5– 61.5	65.7– 83.4		55.0– 69.4	74.5– 94.1
	10T		68.0– 85.4	92.2–116		73.1– 93.3	99.0–127
M14	4T	2.0	46.3– 59.3	62.8– 80.4	1.5	51.4– 64.4	69.6– 87.3
	7T		76.7– 96.9	104 –131		86.1–109	117 –148
	11T		102 –129	139 –175		108 –137	147 –186
M16	4T	2.0	63.6– 81.0	86.3–110	1.5	67.3– 84.6	91.2–115
	7T		110 –136	149 –184		116 –142	157 –192
	11T		152 –188	206 –255		163 –199	221 –270
M18	4T	2.0	83.9–104	114 –141	1.5	96.9–120	131 –163
	7T		145 –174	196 –235		170 –206	230 –279
	11T		203 –246	275 –333		221 –271	299 –368
M20	4T	2.5	106 –132	144 –179	1.5	127 –156	172 –211
	7T		177 –213	240 –289		203 –246	275 –333
	11T		268 –326	363 –441		293 –358	397 –485

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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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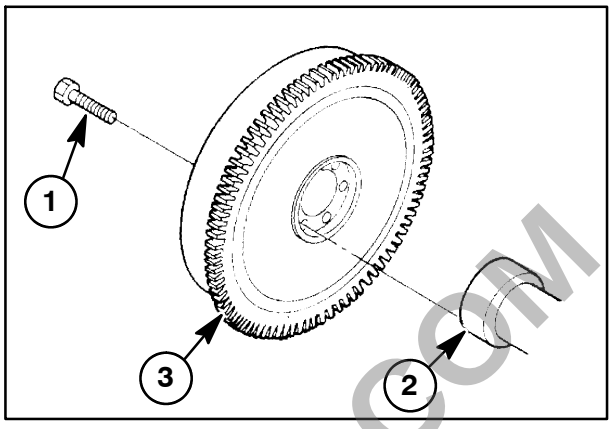
FLYWHEEL

Removal

1. Loosen the flywheel retaining bolts, 1.
2. Using a brass drift and hammer, tap the end of the crankshaft, 2, to loosen the flywheel, 3, from the shaft.
3. Remove the retaining bolts, lock washers, and flywheel from the crankshaft.



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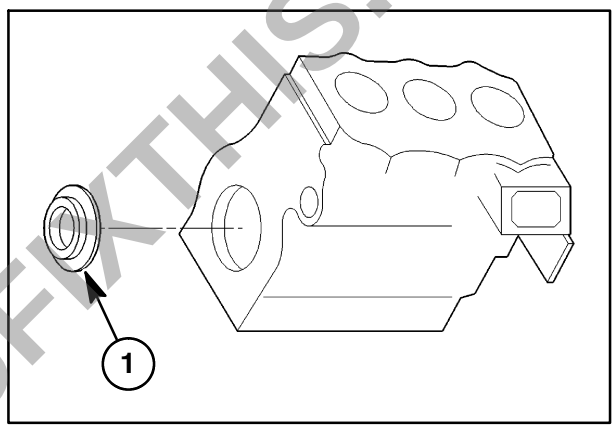
BACKPLATE AND OIL SEAL

Removal

1. Remove the backplate retaining bolts and remove the backplate.
2. Remove the rear oil seal, 1.



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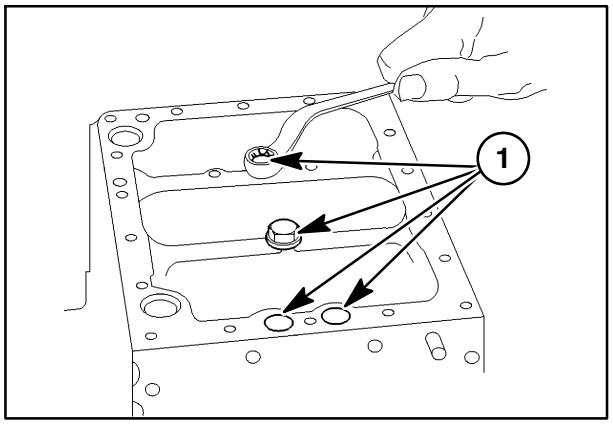
CRANKSHAFT AND MAIN BEARINGS

Removal

1. Remove the crankshaft bearing holder retaining bolts, 1.
2. Slide the crankshaft and main bearing assembly through the rear of the engine.



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OVERHAUL

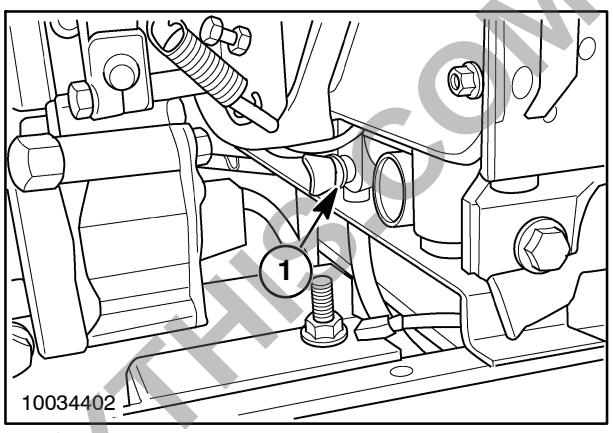
ENGINE ACCESS

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.



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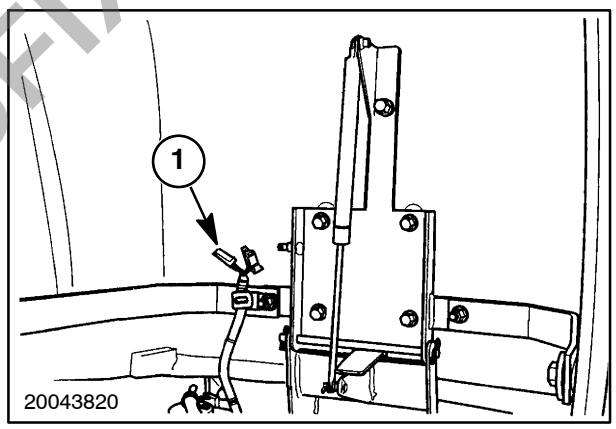
4. Disconnect the electrical connector, 1, joining the headlamp wiring harness to the main harness.



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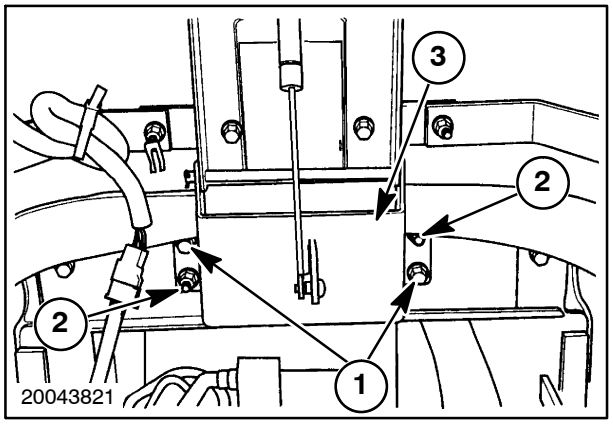
5. Remove the two bolts, 1, and two hex nuts, 2, securing the hood hinge bracket, 3, to the firewall support. Carefully remove the hood with the hinge bracket attached.



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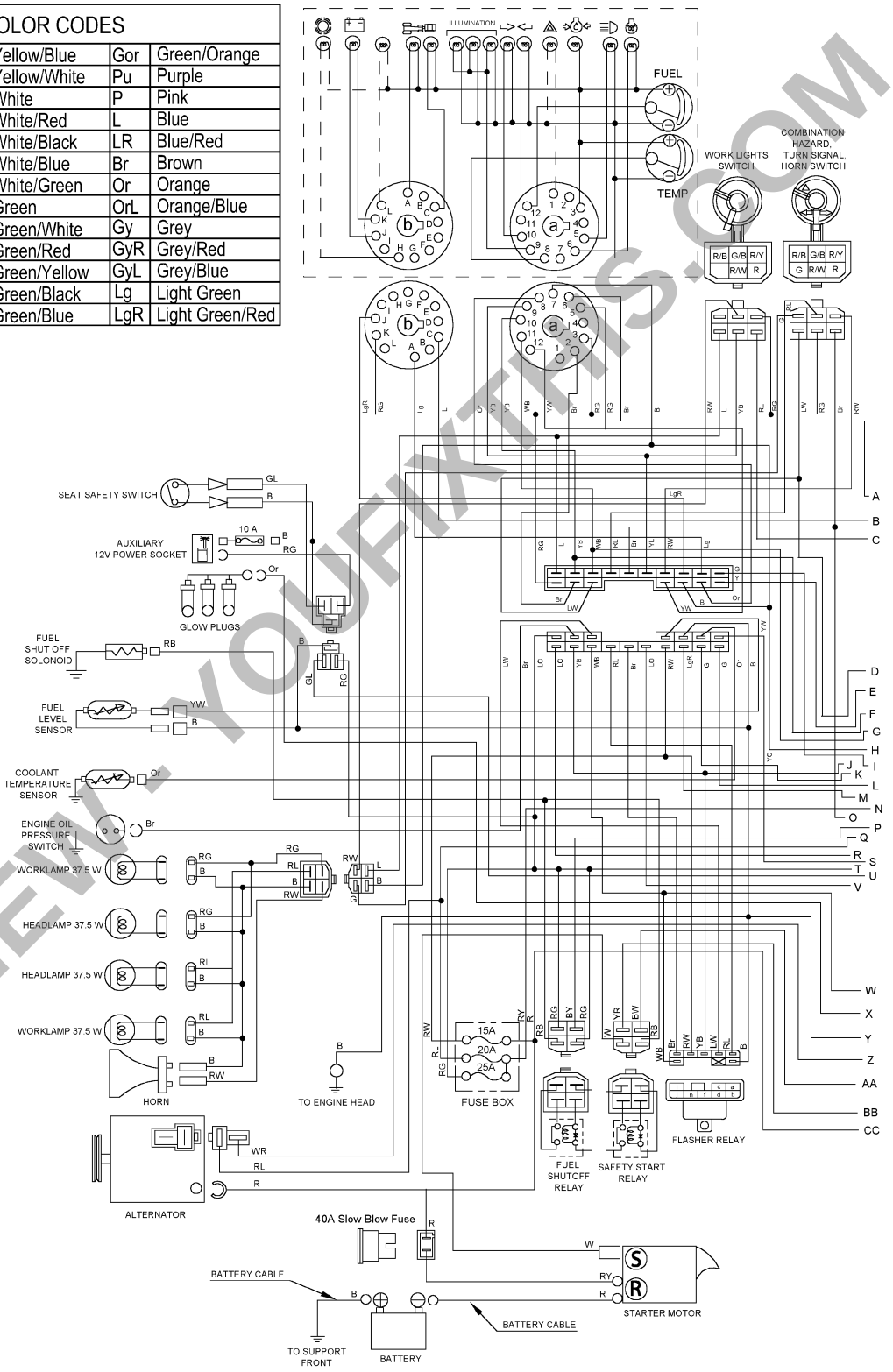
ELECTRICAL CIRCUITS

COMPLETE CIRCUIT DIAGRAM – DX18E – Prior To PIN #HDG110001, DX24E

WIRE COLOR CODES					
B	Black	YL	Yellow/Blue	Gor	Green/Orange
BY	Black/Yellow	YW	Yellow/White	Pu	Purple
BW	Black/White	W	White	P	Pink
R	Red	WR	White/Red	L	Blue
RW	Red/White	WB	White/Black	LR	Blue/Red
RB	Red/Black	WL	White/Blue	Br	Brown
RY	Red/Yellow	WG	White/Green	Or	Orange
RL	Red/Blue	G	Green	OrL	Orange/Blue
RG	Red/Green	GW	Green/White	Gy	Grey
Y	Yellow	GR	Green/Red	GyR	Grey/Red
YR	Yellow/Red	GY	Green/Yellow	GyL	Grey/Blue
YB	Yellow/Black	GB	Green/Black	Lg	Light Green
YG	Yellow/Green	GL	Green/Blue	LgR	Light Green/Red



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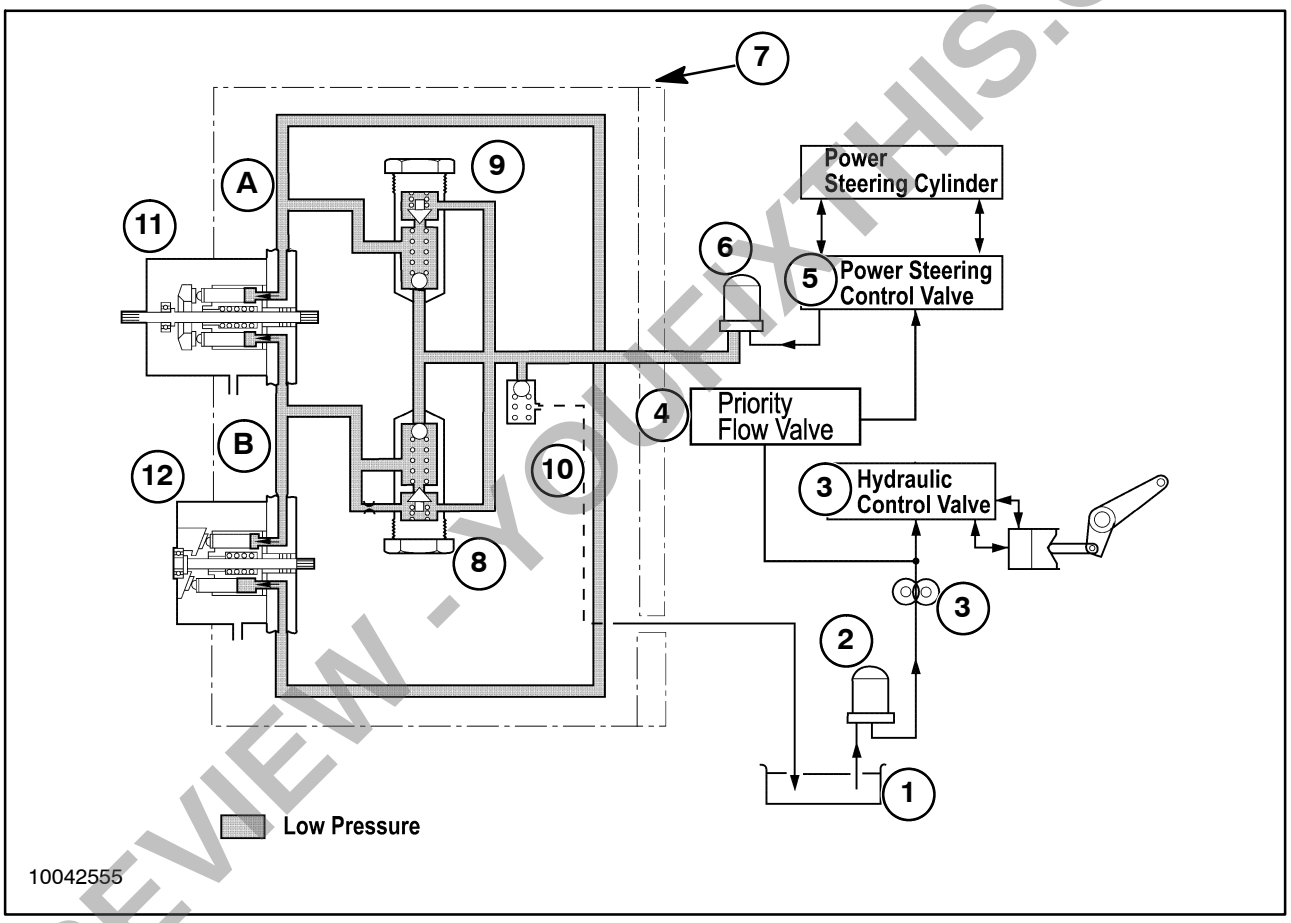
HYDRAULIC FLUID FLOW

Neutral Position

When the hydrostatic transmission is in the neutral position, fluid is drawn from the hydraulic fluid reservoir, 1, through the main hydraulic system filter, 2, to the hydraulic pump, 3. The pump then directs fluid to the priority flow valve, 4, then to the power steering control valve, 5. From the power steering control valve, fluid flows through the HST filter, 6, through the port block, 7. At the port block, fluid flows to the feed (check) valves, 8 and 9, in the high pressure relief valve and returns to the reservoir through the charge pressure relief valve, 10.

The pump and charge pressure relief valve maintains a constant pressure of 3.0 – 5.0 bar (43.5 – 72.5 psi) to the feed (check) valves. Fluid flow past the feed (check) valves pressurizes the passages “A” and “B”, pump, 11, motor, 12, and cylinder blocks. Because the pressure is then equal in passages “A” and “B”, the motor does not rotate, resulting in a neutral condition.



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SECTION 10 - ENGINE SYSTEMS

BOOK 1 - 87352317

Chapter 1 - Engine Systems

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Adjusting Cutting Height
PART NO: SBA390198950
LOCATION: Left Control Quadrant

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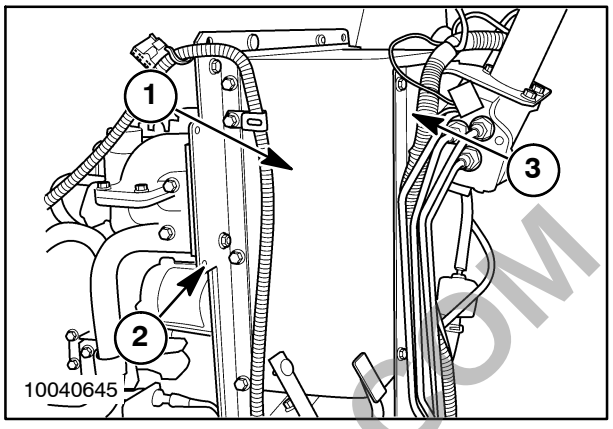
17. Remove the eight hex-head bolts securing the firewall box, 1, to the cowling support frame, 2, and the four bolts securing the firewall box to the steering column support, 3.
18. Carefully slide the firewall box upward from between the two support structures and remove the box.



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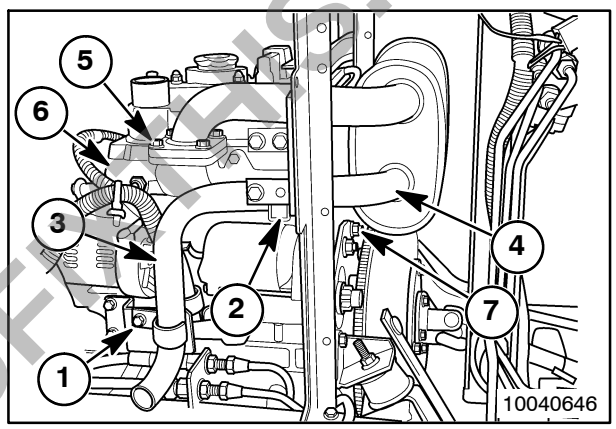
19. Remove the exhaust pipe bracket, 1. Loosen the connecting clamp, 2. Separate and remove the exhaust pipe extension, 3, from the muffler outlet pipe, 4.
20. Remove the four bolts attaching the exhaust pipe flange, 5, to the exhaust manifold outlet, 6, and the two flanged hex nuts securing the muffler to the mounting studs on the rear transverse engine plate, 7.
21. Remove the exhaust muffler assembly, retaining the metal gasket for the connecting flange on the exhaust manifold.



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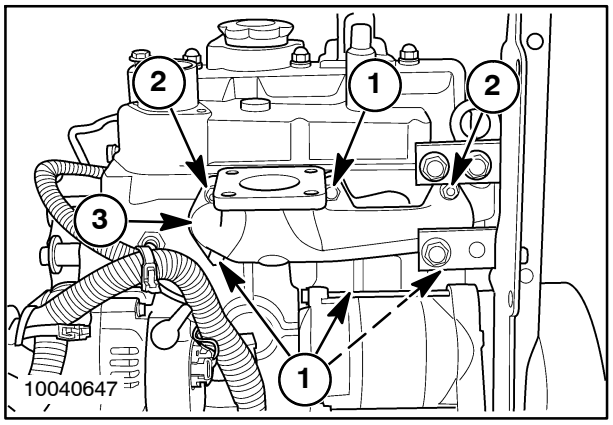
22. Remove the four hex-head bolts, 1, and two flanged hex nuts, 2, securing the exhaust manifold, 3, to the LH side of the engine. Remove the manifold and its metal gasket.



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ENGINE LUBRICATION SYSTEM – DESCRIPTION OF OPERATION

Op. 10 304

The oil pump assembly is located within the idler gear at the front of the block, above and to the left of the crankshaft as viewed from the front of the engine. The oil pump is driven by the crankshaft gear.

Oil is picked up from the sump through the suction strainer, 6, and intake tube and drawn into the lower side drilling in the block to the oil pump, 1. Oil from the pump flows through passages in the block, past the relief valve, 2, through the oil filter, 3, and returns to the main oil gallery in the area of the drilled bolt located in the side of the block. Oil flow in the main oil gallery extends to the four main bearings. Oil flow in the main bearings passes through drilled passages in the crankshaft to the three connecting rod bearings. The remaining portion of the oil is directed through the external oil tube to the rocker arm assembly. Oil flows from the external oil tube into a passage in the rocker arm shaft. Oil Leakage from clearance between the rocker arms and the shaft overflows in the valve cover and lubricates the valve stems, push rods, and tappets. The relief valve, 2, is mounted on the side of the engine block and intersects the main oil passage. When the oil pressure exceeds the rated pressure, oil is bypassed through the relief valve directly to the sump. The cylinder walls, pistons, and piston wrist pins are splash lubricated by the crankshaft.

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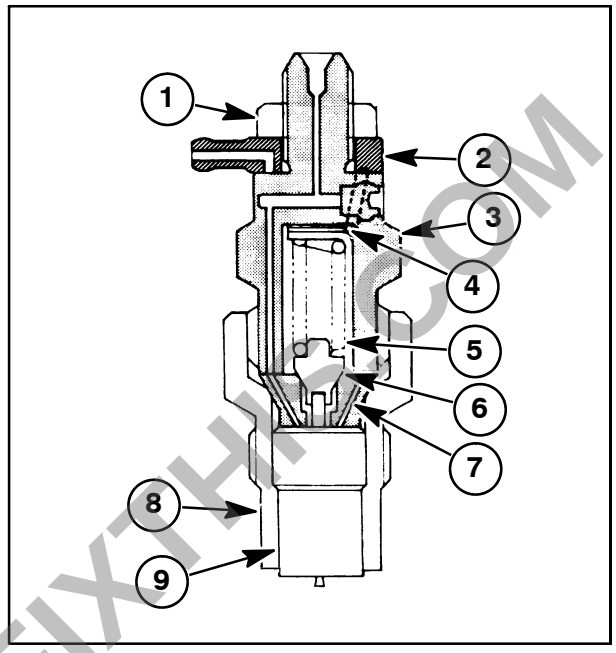
INJECTORS – DESCRIPTION OF OPERATION

Op. 10 218

Throttle-type injectors are used in all engine applications. The injectors have a 1.0 mm (0.040 in.) single orifice and are set at 118 bar (1704 psi). The pressure adjustment is made by adding or deleting shims from the top of the injector pressure adjusting spring. The injectors have an injection angle of 0°. The injector pipes are of the same length for each cylinder to help keep the injection intervals in time.

The engine injection function is to inject fuel into a pressurized cylinder in a fully atomized condition which provides efficient combustion with minimum amount of smoke. Each injector assembly consists of a nozzle assembly containing a needle valve, a nozzle holder assembly, and injector needle valve regulating spring.



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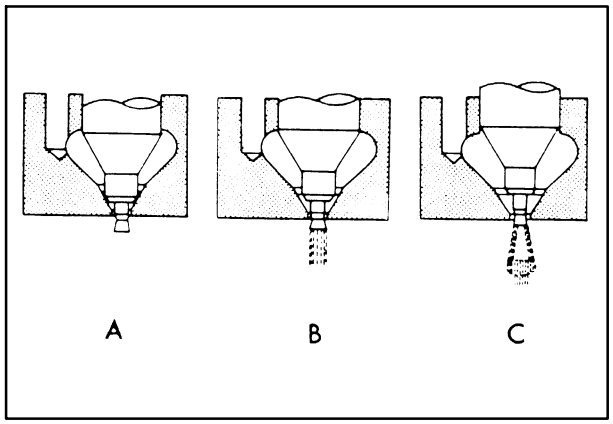
1. Nut
2. Nipple Joint
3. Body
4. Shim
5. Spring
6. Push Rod
7. Distance Piece
8. Nozzle Nut
9. Nozzle Assembly

Fuel from the injection pump enters the injector inlet and passes down through a drilling in the nozzle holder and body to the needle valve seat. The fuel that is pressurized by the injection pump, lifts the needle valve off the seat against the action of the spring pressure. The fuel is then forced, in the atomized state, through the 1.0 mm (0.040 in.) orifice in the nozzle tip. When pressure from the injection pump drops, the needle valve snaps back onto its seat under pressure from the spring.

To provide lubrication of the injector, a small amount of fuel is permitted to leak up between the needle valve and the nozzle body. The excess fuel rises to the top of the injector and returns to the fuel tank through the injection leak-off line.



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A. Nozzle Closed
B. Nozzle Initial Opening
C. Nozzle Fully Opened

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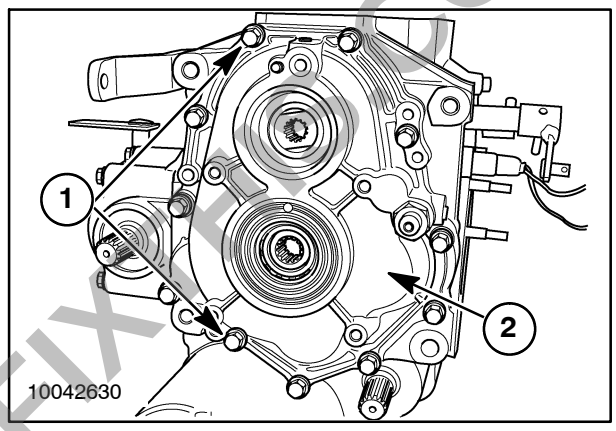
DRIVE PINION

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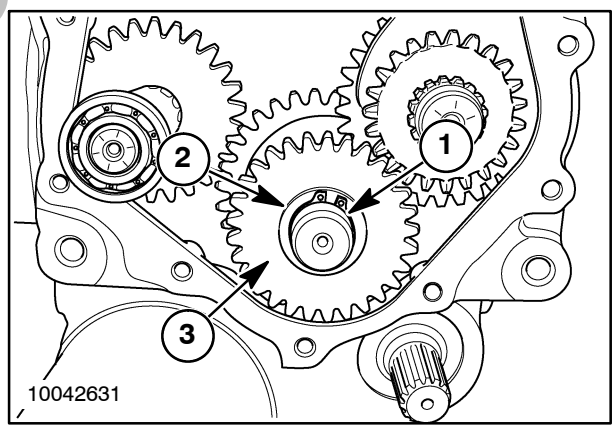
3. Remove retaining ring, 1, thrust washer(s), 2, gear, 3, and roller bearings (not shown) from the pinion shaft.



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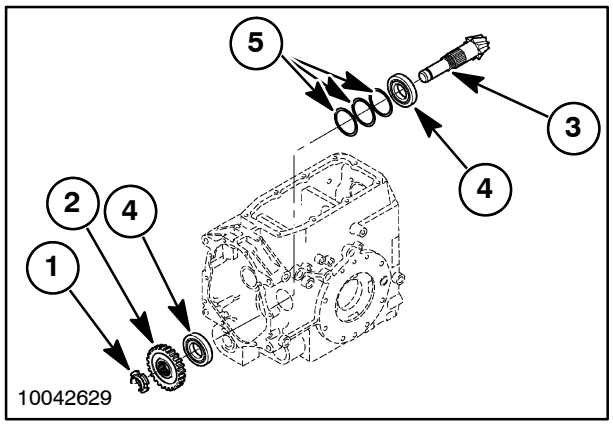
4. Remove the pinion lock nut, 1, and discard. Slide the fixed gear, 2, off the pinion shaft. Gently tap the pinion, 3, into the differential housing. Remove the pinion, 3, bearings, 4, and shims, 5, if equipped.

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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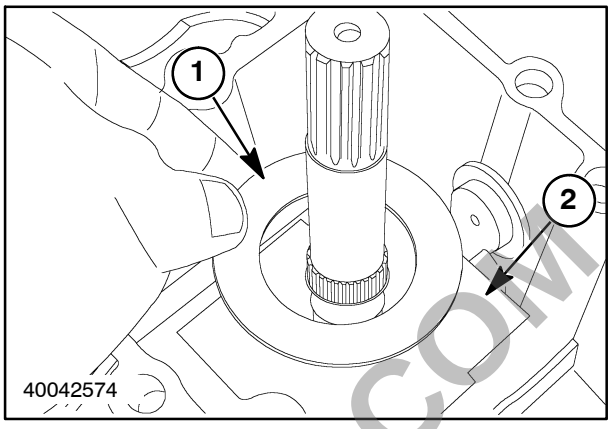
13. Remove the bottom thrust bearing race, 1, from the swash plate, 2.



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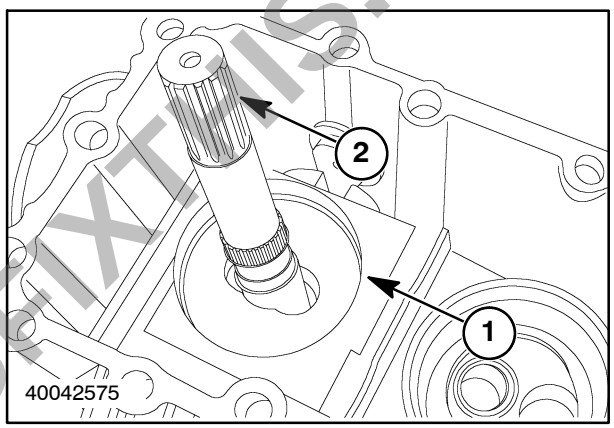
14. Carefully remove the swash plate, 1, over the pump shaft, 2, and out of the pump side of the housing.



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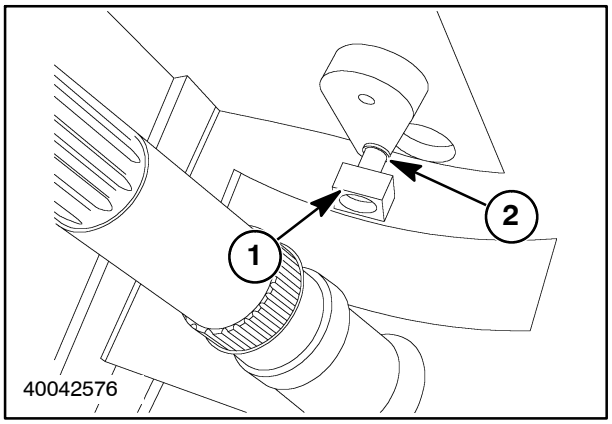
15. Remove the slot guide block, 1, from the displacement control shaft, 2.



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TROUBLESHOOTING

CONDITION	POSSIBLE CAUSE	REMEDY
Brakes will not slow or stop the tractor	1. Incorrect brake adjustment 2. Worn brake discs 3. Worn stator plates	1. Adjust brakes 2. Replace brake discs 3. Replace stator plates
Brakes will not release after applying brake pedal	1. Worn or broken return springs in axle housing 2. Worn or broken return springs on brake pedal	1. Replace springs 2. Replace springs
Brakes grab or pull to one side	1. Incorrect brake adjustment 2. Incorrect hydraulic fluid level 3. Dirty or contaminated hydraulic fluid 4. Worn brake discs 5. Worn stator plates	1. Adjust brakes 2. Adjust hydraulic fluid level 3. Change the hydraulic fluid 4. Replace brake discs 5. Replace stator plates
Parking brake will not hold the tractor	1. Worn pawl or lock tab 2. Worn brake discs	1. Replace worn parts as needed 2. Replace brake discs

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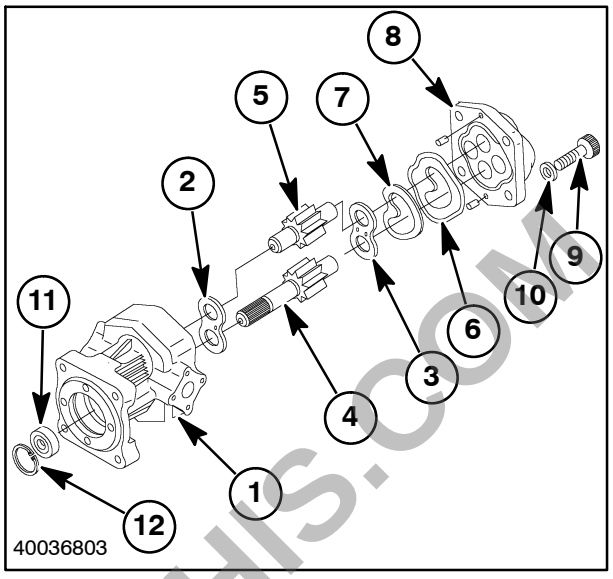
Assembly

1. Apply a thin coating of clean hydraulic fluid to all metal parts during assembly. Lightly lubricate all seals and O-rings with petroleum jelly.
2. Place the pump body, 1, in a soft-jawed vice.
3. Install the inner wear plate, 2, into the pump body.

NOTE: *The inner wear plate, 2, and outer wear plate, 3, are NOT identical. Both plates should be installed with their rectangular slots facing toward the pump's pressure side. Note that the outer wear plate has TWO openings, while the inner plate has only ONE opening.*

4. Install the drive gear, 4, and the driven gear, 5, in the housing, 1.
5. Place the outer wear plate, 3, over the two exposed gear shafts.
6. Install a new seal, 6, and the backup ring, 7, in the seating groove in the pump cover, 8.
7. Place the pump cover on the pump body, aligning the scribed lines made during disassembly, and install the four retaining bolts, 9, and spring washers, 10. Torque the bolts to 22–28 N·m (16–20 lb.-ft.).
8. Remove the pump from the vice. Install a new shaft seal, 11, over the exposed end of the drive gear shaft and secure it with the snap ring, 12.



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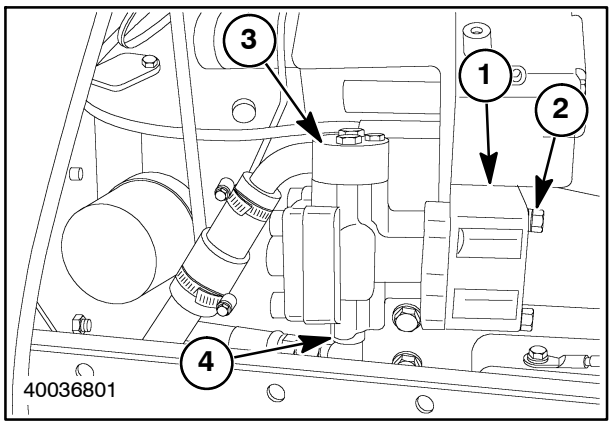
Installation

1. Slide the hydraulic pump forward against the engine oil pump, 1, engaging the splined end of the drive gear shaft in its hub in the oil pump.
2. Install the four bolts, 2, securing the hydraulic pump to the engine oil pump. Torque the bolts to 22–28 N•m (16–20 lb.-ft.).
3. Connect the inlet, 3, and outlet, 4, hydraulic lines to the pump.



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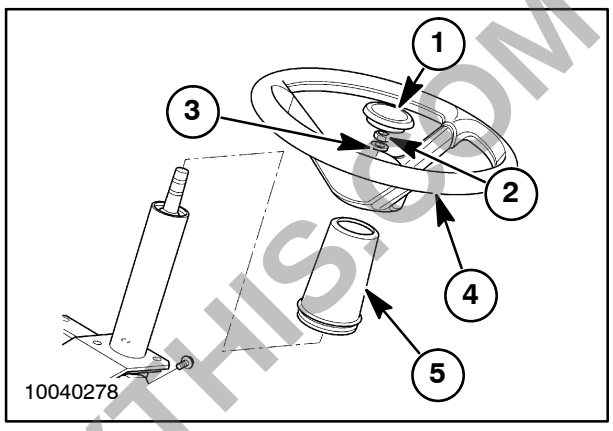
OVERHAUL

STEERING CONTROL VALVE

Removal

1. Remove the steering wheel center cap, 1.
2. Remove the nut, 2, and lock washer, 3.
3. Using a suitable puller, remove the steering wheel, 4, and cover, 5.



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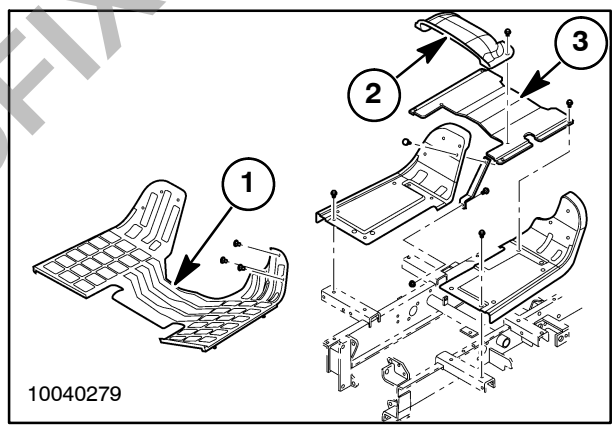
4. Remove the rubber mat, 1, HST fan cover, 2, and center cover, 3.



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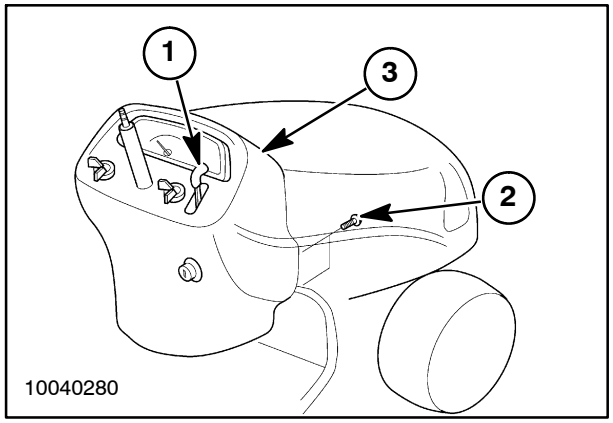
5. Remove the knob, 1, on the engine speed control lever. Remove the cowling retaining bolts, 2, and slightly raise up the cowling, Disconnect the tachometer cable and wire connectors under the dashboard.
6. Remove the cowling.



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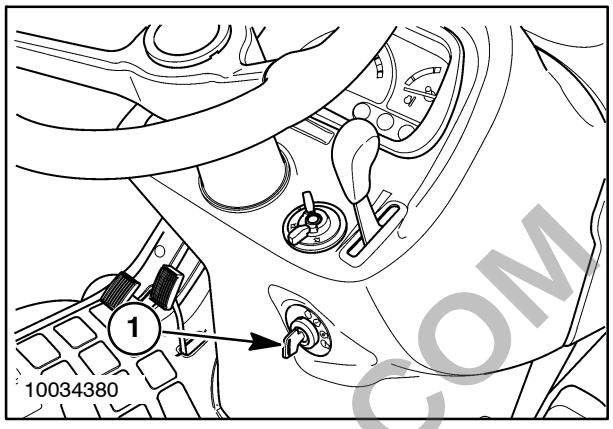
KEY SWITCH

The key start switch, 1, is located on the lower right-hand side of the console, below the steering wheel. The key switch has four key-operated positions: OFF, RUN, HEAT and START. Turning the key to the “ON” position activates the warning lights and instrument panel. The preheat system is activated when the key is turned farther to the right, to the “HEAT” position, and the engine starts when the key is turned to the far right position. The key spring returns to the “ON” position when released.



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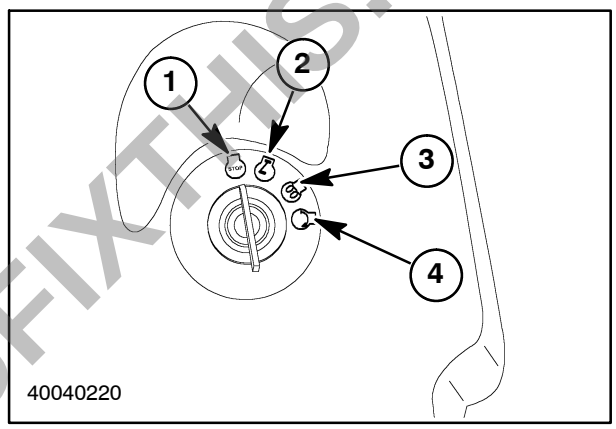
1. STOP POSITION

In the STOP position, 1, there is no battery power supplied to electrical circuits and the key can be removed from the key switch to prevent unauthorized use of the tractor. The STOP position also stops the tractor engine, when running.

2. ACC/RUN POSITION

When the key switch is rotated clockwise to the ACC/RUN position, 2, battery power is supplied to operate the electrical accessories without the engine running. The switch will also be in this position while the tractor is running.



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3. HEAT POSITION

NOTE: *The key switch is spring-loaded to return to the ACC/RUN position, 2, when released from the HEAT position, 3.*

When the key is turned to the HEAT position, 3, current is allowed to flow from the battery to the engine glow plugs. The glow plugs aid in starting the engine in cold climates.

4. START POSITION

NOTE: *The key switch is spring-loaded to return to the ACC/RUN position, 2, when released from the START position, 4.*

When the key switch is turned clockwise to the START position, 4, power is supplied to the starter motor to crank and start the engine. This position also provides current to the engine glow plugs to aid in starting the tractor engine.

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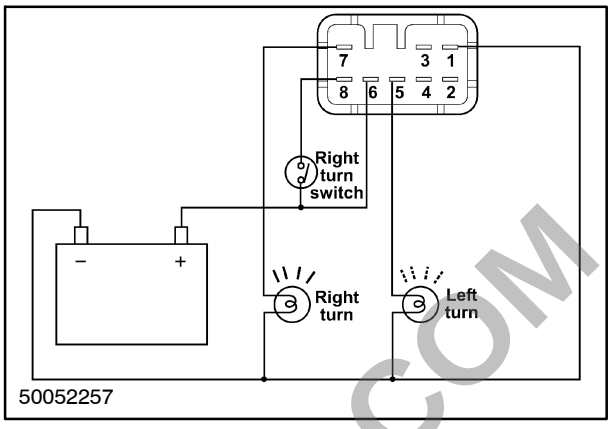
Right Turn Signal Test

1. This test will simulate a right turn signal circuit.
2. Connect terminal #8 of the controller to one side of a switch and connect the other side of the switch to the positive (+) terminal of the battery.
3. Place the switch in the “ON” position.

Results:

- The bulb connected to terminals #5 should flash on and off.
- The bulb connected to terminal terminals #7 will illuminate continuous.

NOTE: *If all the results were as indicated as above, then the controller is functioning properly.*



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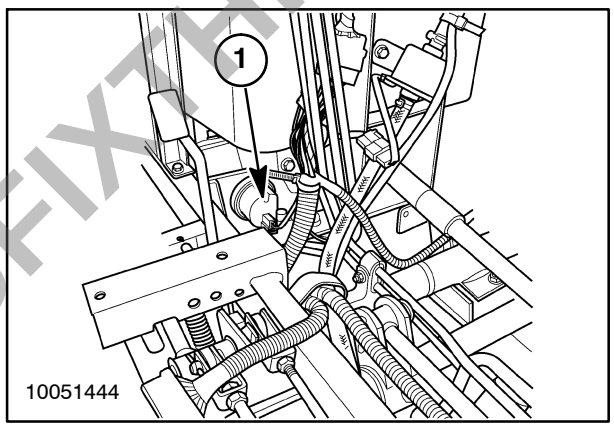
SAFETY ALARM (BUZZER)

The safety alarm buzzer, 1, is located under the dashboard cowling, on the left side of the mainframe. The buzzer will arm for approximately for eight seconds, when an unsafe condition occurs, warning the operator.

For Example:

- The buzzer will alarm, with the key in the “OFF” position and the park brake disengaged.
- The buzzer will alarm, during starting, with the range gear not in neutral (tractor will not start).



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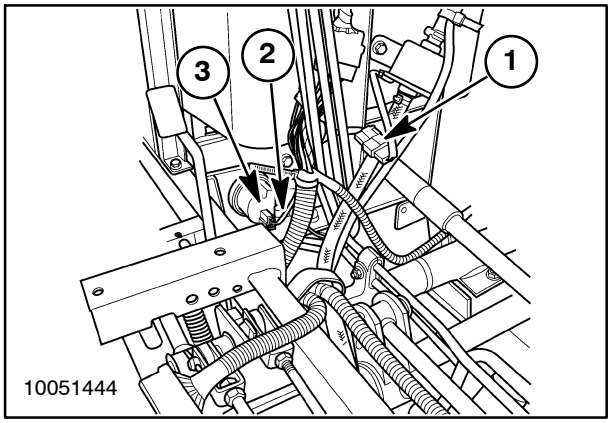
Removal

1. Disconnect the negative (–) battery cable from the battery negative (–) terminal.
2. Remove steering wheel and steering wheel cowling to gain access to alarm buzzer.
3. Disconnect the buzzer connector, 1, from the tractor wire harness.
4. Remove mounting bolt, 2, and buzzer, 3, from the tractor mainframe.



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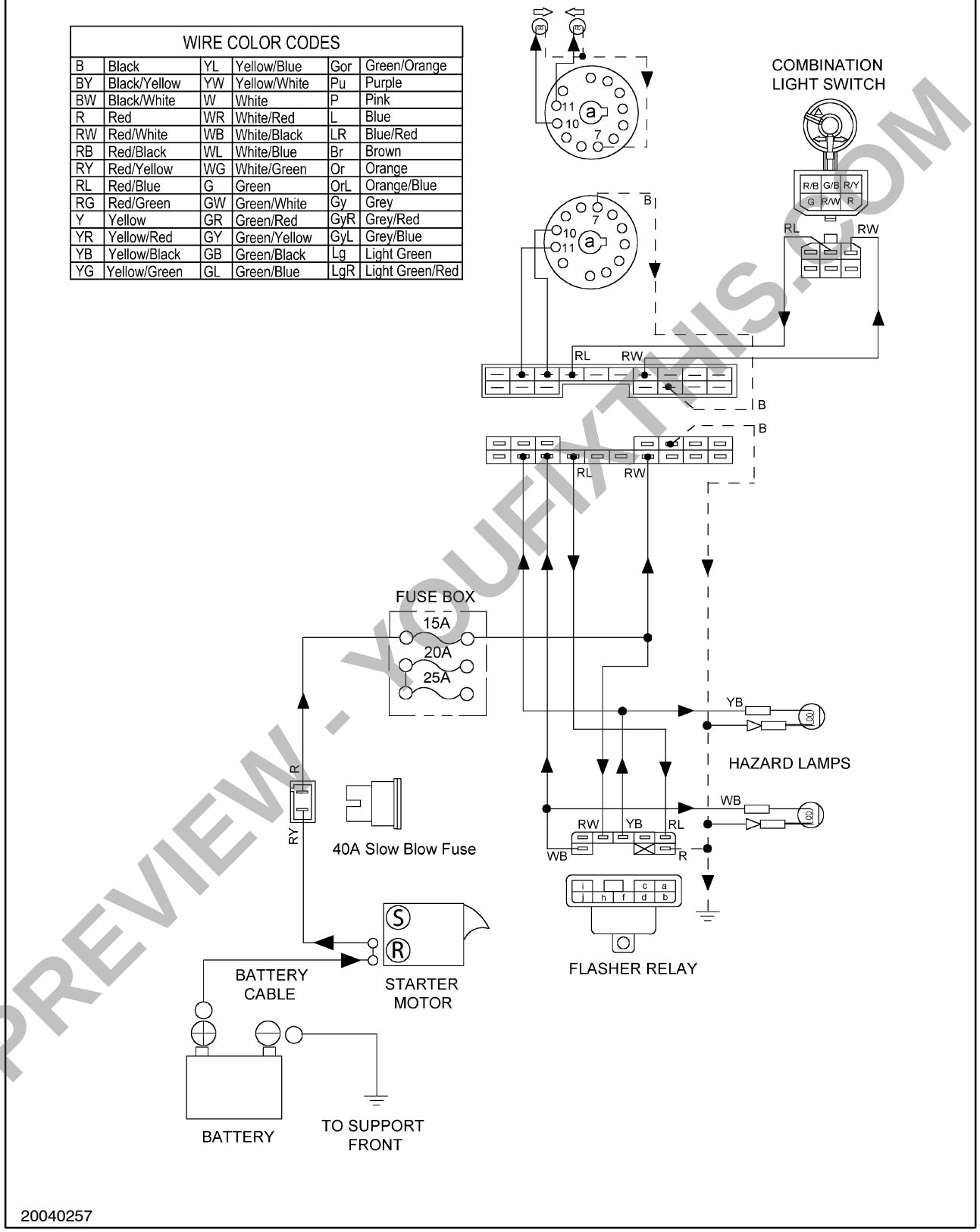
HAZARD FLASHER CIRCUITS (ALL TRACTORS)

WIRE COLOR CODES					
B	Black	YL	Yellow/Blue	Gor	Green/Orange
BY	Black/Yellow	YW	Yellow/White	Pu	Purple
BW	Black/White	W	White	P	Pink
R	Red	WR	White/Red	L	Blue
RW	Red/White	WB	White/Black	LR	Blue/Red
RB	Red/Black	WL	White/Blue	Br	Brown
RY	Red/Yellow	WG	White/Green	Or	Orange
RL	Red/Blue	G	Green	OrL	Orange/Blue
RG	Red/Green	GW	Green/White	Gy	Grey
Y	Yellow	GR	Green/Red	GyR	Grey/Red
YR	Yellow/Red	GY	Green/Yellow	GyL	Grey/Blue
YB	Yellow/Black	GB	Green/Black	Lg	Light Green
YG	Yellow/Green	GL	Green/Blue	LgR	Light Green/Red



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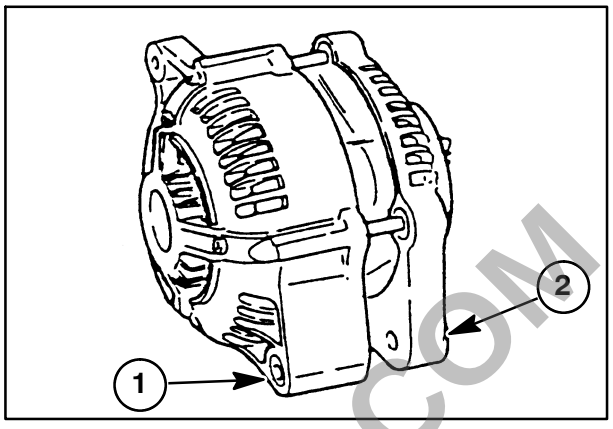
STATOR

The stator consists of a core and a coil and is inserted into the drive end frame, 1, by a press for consolidation. By this arrangement, heat is more easily dissipated through the drive end frame, and cooling efficiency is improved. The end frame, 2, contains the rectifier and regulator.



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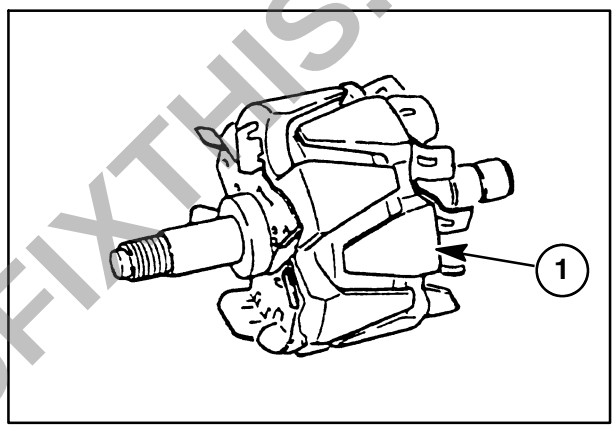
ROTOR

Fans are mounted on both sides of the rotor, 1, and consolidated with it.



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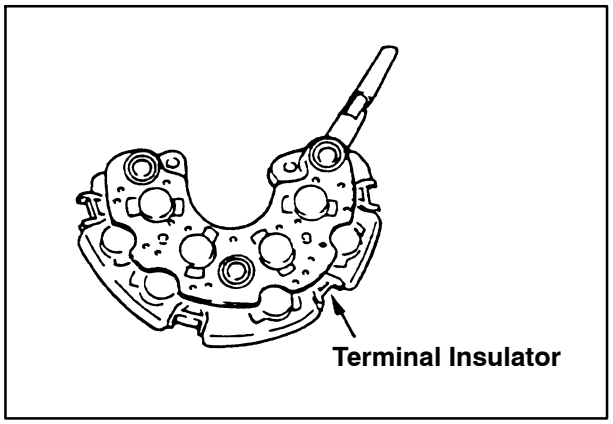
RECTIFIER

A number of protrusions are provided on the rectifier surface to expedite radiation of heat generated by its output current. The rectifier for an alternator is produced in one piece as shown. In appearance, it is very simple and compact because the terminal insulator is also used as wiring between diode elements. The IC rectifier is a solid-state unit and is serviced as an assembly only.



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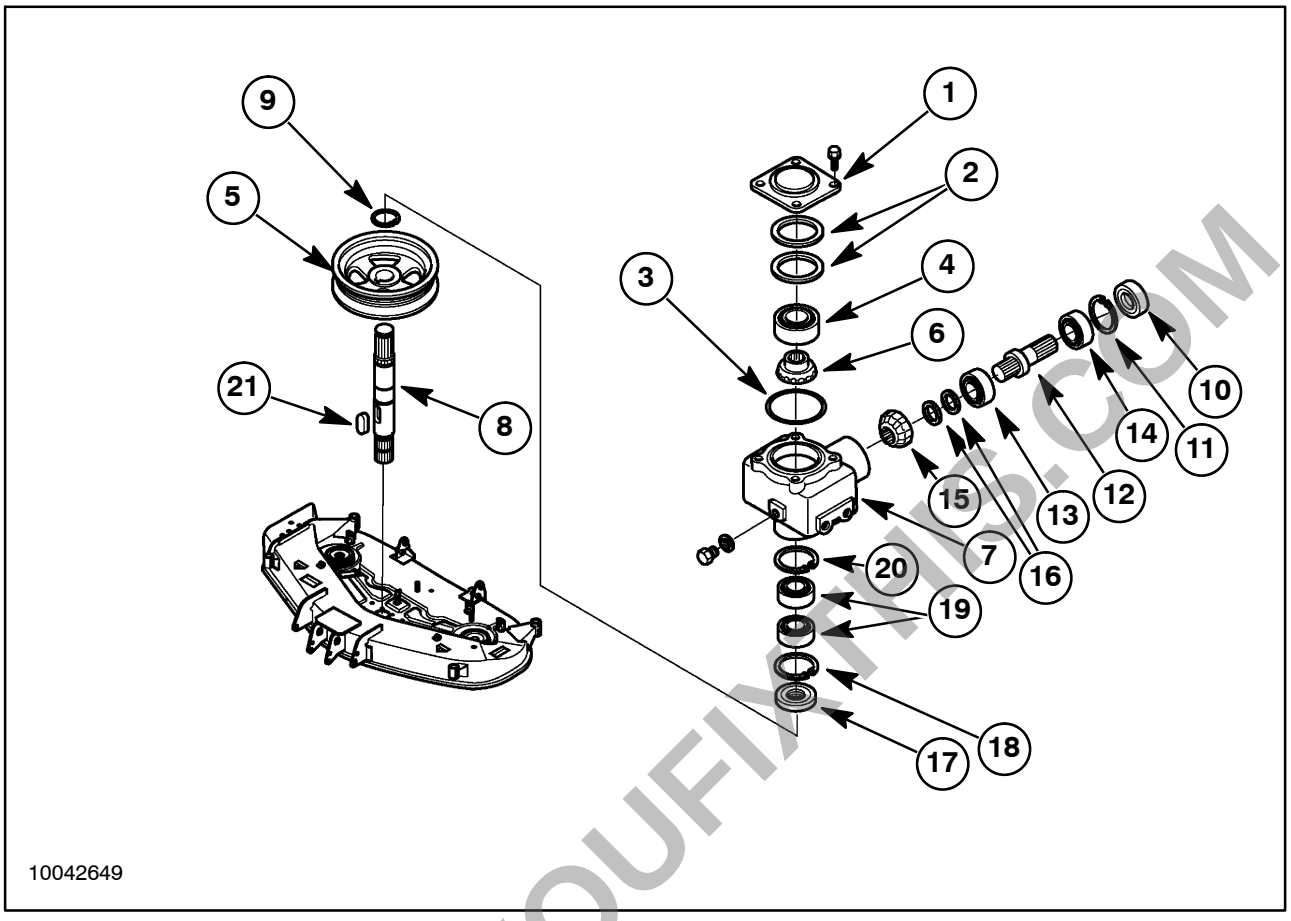

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90° GEAR BOX COMPONENTS

1. Cover
2. Shims
3. O-ring
4. Bearing
5. Pulley
6. Bevel gear
7. Gearbox case
8. Bevel gear shaft
9. Retaining ring
10. Seal
11. Retaining ring
12. Pinion shaft
13. Bearing
14. Bearing
15. Pinion gear
16. Shims
17. Seal
18. Retaining ring
19. Bearing
20. Retaining ring
21. Key

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