SPECIFICATIONS

Engine:

Make	Briggs and Stratton
Style	Vertical Shaft
Models:	
13 Horsepower	28M707
15 Horsepower	28N700
16 Horsepower (Cast Iron Sleeve)	28Q777
Type	Gasoline, Air Cooled, Single Cylinder, 4-Cycle
Crankcase Oil Capacity	3 Pints
Oil: Warm Climate (Above 40°F)	SE, SF, SG, SAE 30W
Cold Climate (Below 40°F)	SE, SF, SG, SAE 10W30

Electrical:

Ignition System	Magnetron® Magneto Ignition
Magneto Air Gap	0.25 -0.35 mm (0.010 - 0.014 in.)
Charging System	Dual Circuit (AC/DC)
Charging Capacity	2-4 amps, 14 volts DC@3600 rpm (Unregulated)
Spark Plugs	
13 Hp	TY6129 (Champion RJ-19 LM)
15 & 16 Hp	M78543 (Champion RC-12 YC)
Spark Plug Air Gap	0.76 mm (0.030 in.)
Battery Type	BCI Group, U1
Battery Cranking Amps	230 amps at 0° C (32° F)
Battery Cold Cranking Amps	190 amps at 0° C (32° F)
Battery Specific Gravity	Above 1.225 Points
Starter Type	Bendix Inertia Drive
Fuel Shut-Off Solenoid (16 H.P. Only)	Replaceable (Below Carburetor Float Bowl)
Headlight Bulbs	Type 1156, 12 Volt

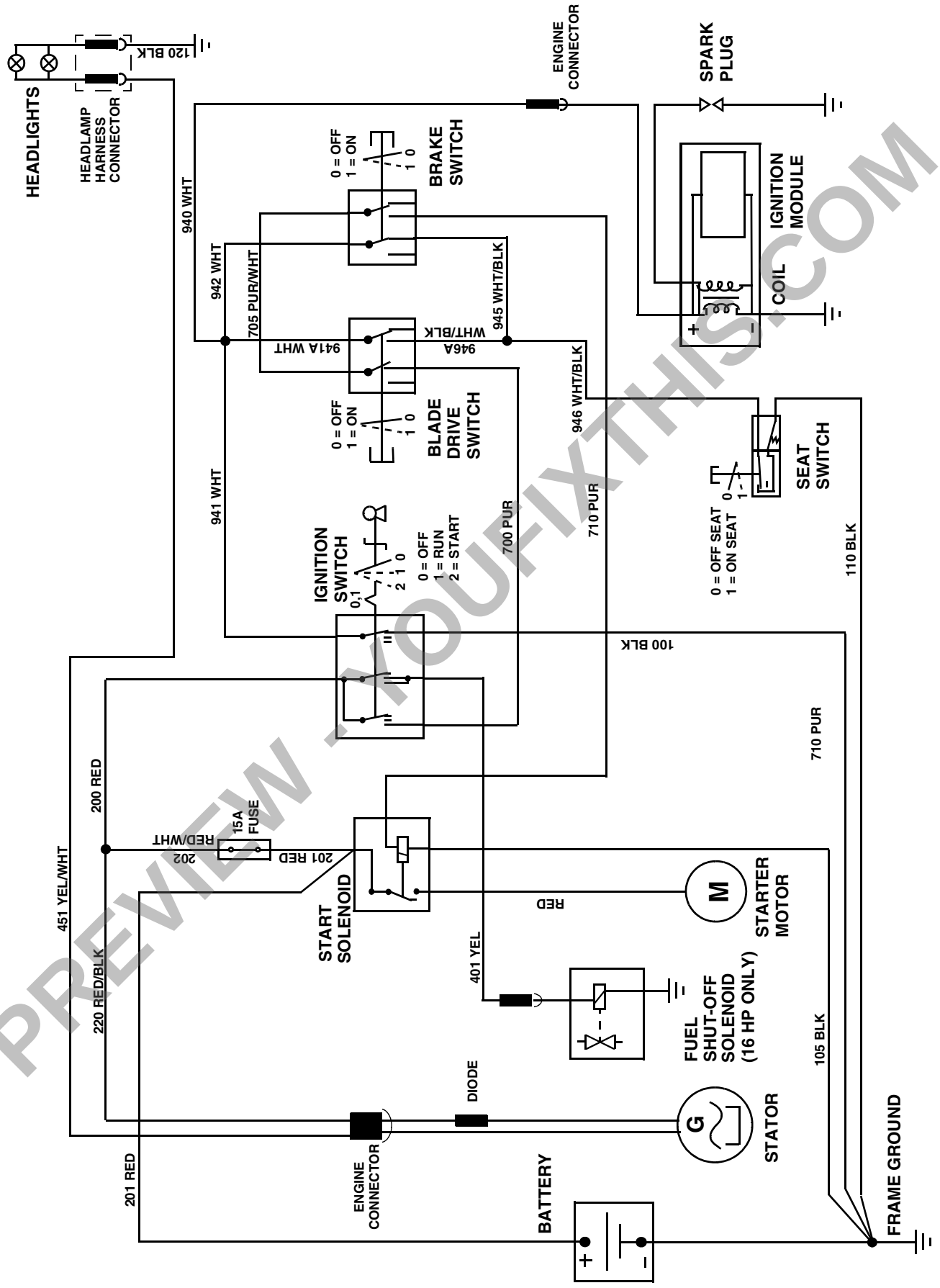
Fuel/Air System:

Carburetor Make	Briggs & Stratton
Carburetor Type	Side Draft
Throttle/Choke	Unitized Control Linkage
Carburetor Fuel Shut-Off Solenoid (Optional)	Electric
Fuel Delivery	Gravity Flow
Fuel Filter	Replaceable Inline type
Fuel Type	Unleaded (87 Octane Minimum)
Fuel Tank Capacity	4.7 L (1.25 gal)
Air Filter	Paper Element with Foam Pre-cleaner
Muffler Type	Anti-Backfire

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ELECTRICAL SCHEMATIC



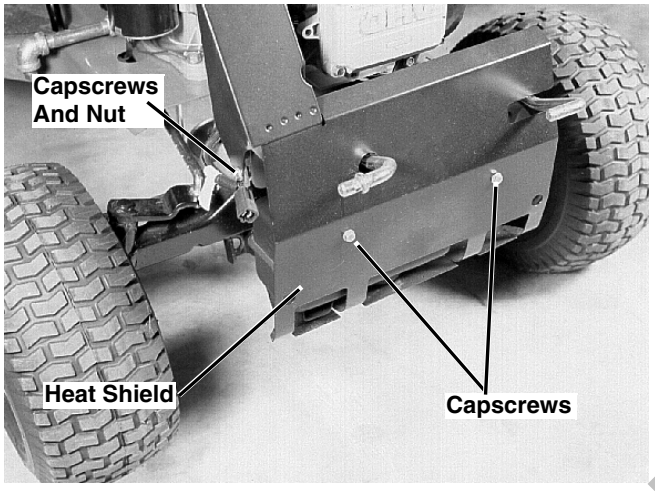
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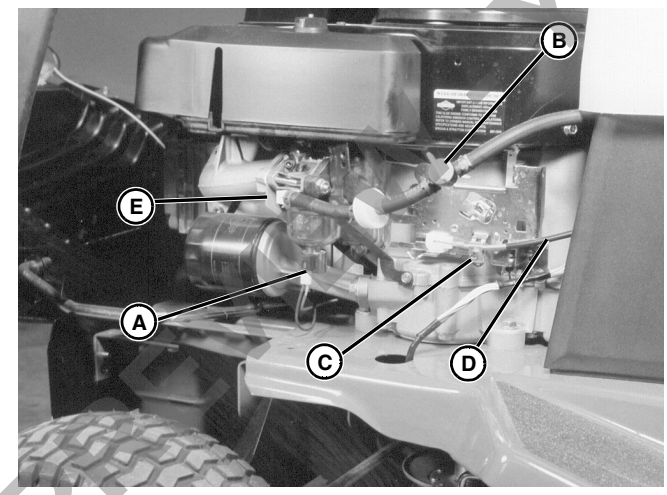
REPAIR

ENGINE REMOVAL

1. Turn all switches OFF and disconnect battery negative (-) cable.
2. Raise hood. Disconnect light harness on right side of hood. Lower hood to approximately 3/4 open and slide off bracket.



3. Remove two capscrews securing heat shield to frame. Remove capscrew and nut on side of heat shield. Remove heat shield.

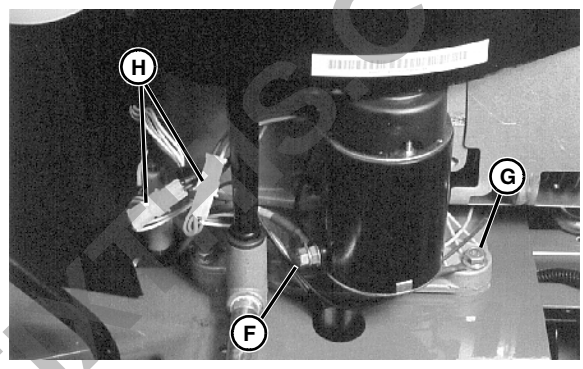


4. Disconnect fuel shutoff solenoid wire (A)(16 horsepower only).
5. Turn fuel shutoff valve (B) (early models only) to OFF position or pinch closed fuel hose to carburetor.
6. Loosen clamp (C) to disconnect throttle cable (D).

CAUTION

Gasoline is explosive. Do not expose to flame or spark. Serious injury can result. Store in a properly marked, safe container. Wipe-up any spills IMMEDIATELY.

7. Disconnect hose clamp (E) and slide fuel line off of hose barb on carburetor.



8. Disconnect wires from starter terminal (F).

NOTE: Ground terminal (G) will be disconnected when engine mounting bolt is removed.

9. Disconnect two (2) harness connectors (H).

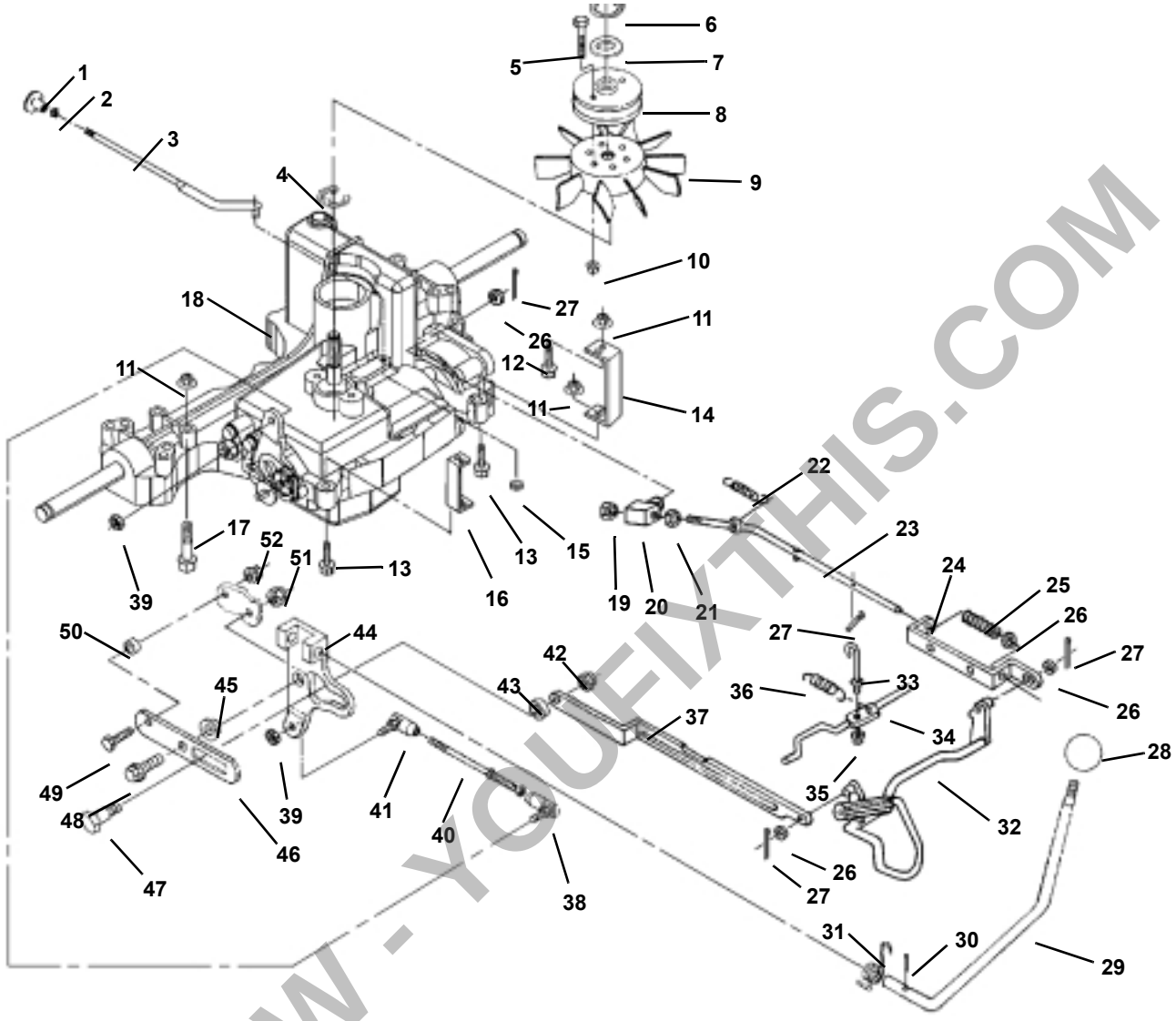


10. Remove traction drive belt and mower drive belt.
11. Remove capscrew securing pulley assembly to engine output shaft. Remove pulley assembly.

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POWER TRAIN LINKAGE SYSTEM REMOVAL/INSTALLATION—K51

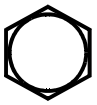
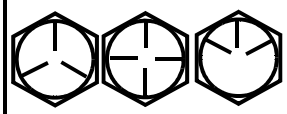
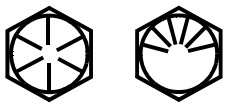


1	M127365	Knob	1	27	11H278	Cotter Pin	4
2		1/4" x 20 Hex Jam Nut	1	28	M125566	Knob	1
3	M127363	Rod	1	29	M125565	Gearshift Lever	1
4	F2863R	E- Ring	1	30	34M7130	Spring Pin, 4 x 20 MM	1
5	19M7874	Bolt, M6 x 30	2	31	M118187	Torsion Spring, R.H.	1
6	M43940	Snap Ring	1	32	AM123439	Shaft	1
7	M127620	Spacer	2	33	M117846	Park Brake Lever	1
8	M127358	Sheave	1	34	M119108	Rod, Parking Brake	1
9	M127359	Fan	1	35	14M7303	Flange Nut, M6	1
10	14M7397	Flange Lock Nut	2	36	M115744	Extension Spring	1
11	14M7298	Lock Nut	8	37	M118512	Strap	1
12	19M7865	Screw	2	38	AT12383	Ball Joint	1
13	19M7798	Screw	2	39	M83389	Lock Nut, 7.952 MM	2
14	M127360	Strap	1	40	M127357	Stud, Adjusting	1
15	M127364	Push Nut	1	41	AM38782	Ball Joint	1
16	M127360	Strap	1	42	T11234	Lock Nut	2
17	19M7803	Screw (R.H. Side)	2	43	M119205	Roller	1
	19M7801	Screw (L.H. Side)	2	44	M118696	Bracket	1
18	AM123230	Transmission Assembly	1	45	M93897	Bushing	1
19	M68954	Lock Nut, 9.525 MM	1	46	M120142	Support	1
20	M117048	Pivot	1	47	M118308	Bolt, 9.525 x 35.60 MM	1
21	14H774	Nut, 3/8”	1	48	19M7785	Scrw, M10 x 25	1
22	M120404	Spring	1	49	19M7867	Screw, M8 x 25	1
23	M115388	Rod	1	50	M111180	Spacer	1
24	M120007	Strap, Comp. Spring	1	51	14M7296	Flange Nut, M10	1
25	M78462	Compression Spring	1	52	14M7298	Flange Nut, M8	1
26	24H1305	Washer, 13/32” x 13/16”	1				

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UNIFIED INCH TORQUE VALUES

SAE Grade and Head Markings	No Marks 1 or 2[b] 	5 5.1 5.2 	8 8.2 
SAE Grade and Nut Markings	No Marks 2 	5 	8 

Size	Grade 1				Grade 2[b]				Grade 5, 5.1 or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft	Nm	lb-ft
1/4	3.8	2.8	4.7	3.5	6	4.4	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.7	9.8	7.2	12	9	15.5	11.5	19.5	14.5	25	18.5	28	20.5	35	26
3/8	13.5	10	17.5	13	22	16	27.5	20	35	26	44	32.5	49	36	63	46
7/16	22	16	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.*

[b] *Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6 in.) long. Grade 1 applies for hex cap screws over 152 mm (6 in.) long, and for all other types of bolts and screws of any length.*

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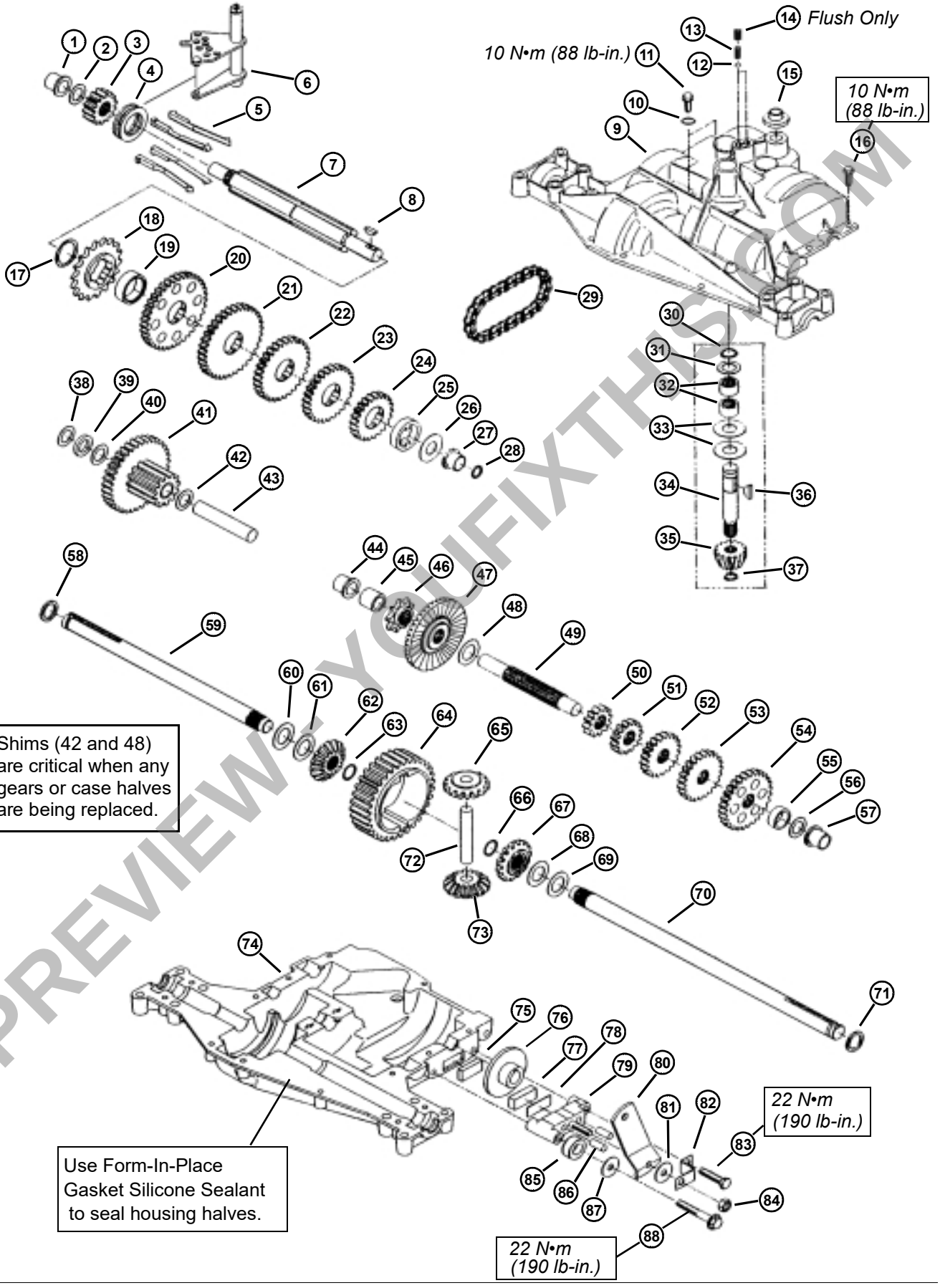
TROUBLESHOOTING

Problem or Symptom / Check or Solution	Engine will not crank.	Engine cranks—will not start.	Engine starts hard or will not stay running.	Engine misses or runs rough.	Weak or no spark.	Engine will not shut off.	Battery goes dead, discharges or overcharges.	Headlights do not light or will not shut off.	Fuel shut-off solenoid will not open (16 hp only)	Fuel shut-off solenoid will not close (16 hp only)	Engine dies when brake lever is released.	Engine dies when blade lever is engaged.
See Cranking Circuit Diagnosis	●						●		●	●		
See Ground Circuit Tests	●	●		●	●	●	●	●	●		●	●
Test battery and connections.	●						●	●	●			
See Ignition Circuit Tests		●	●	●	●	●					●	●
See Charging Circuit Tests	●		●				●	●				
See Starter Solenoid Test	●											
See Seat Switch Tests		●	●								●	●
See headlight circuit test points.								●				
See fuel shut-off solenoid circuit test points (16 hp only)		●	●						●	●		
Check for short circuit.	●	●	●		●	●	●	●	●	●	●	●
Check for high resistance or open circuit.	●	●	●		●	●	●	●	●	●	●	●
Check for correct spark plug and spark plug gap.		●	●	●	●							
Check strength of flywheel ignition module magnet and/or flywheel stator magnets.		●	●	●	●		●					
See fuel and air system tests and adjustments.		●	●	●								
Check for stator shorted to ground					●		●					
Check seat switch connector is plugged in and interlock spring inside connector is good											●	●

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TRANSAXLE COMPONENT LOCATION



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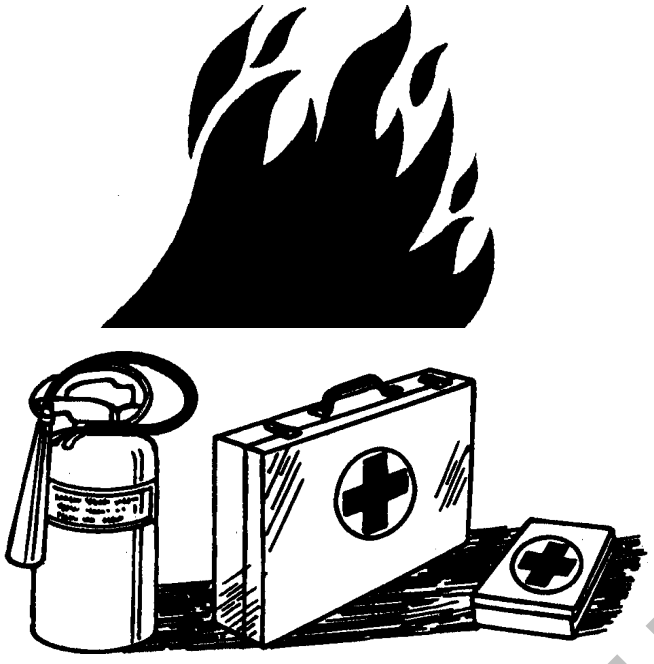
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HANDLE FLUIDS SAFELY-AVOID FIRES

- **BE PREPARED FOR EMERGENCIES**



When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

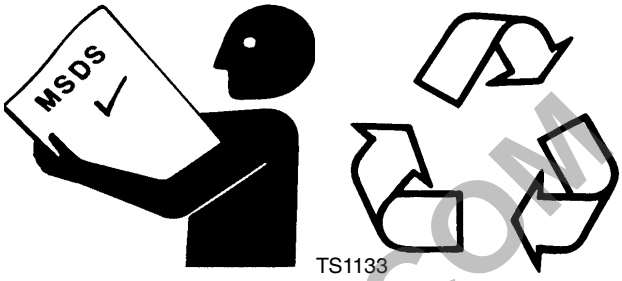
Do not store oily rags; they can ignite and burn spontaneously.

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

HANDLE CHEMICAL PRODUCTS SAFELY



TS1133

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques. Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

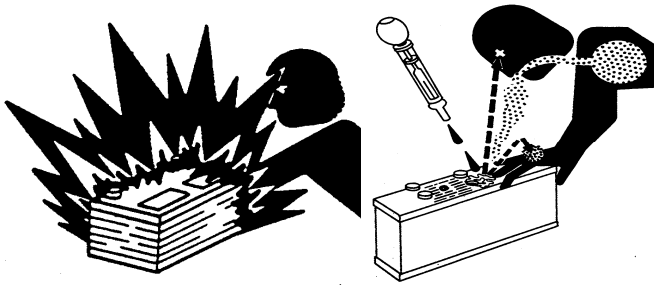
- **DISPOSE OF WASTE PROPERLY**

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste includes oil, fuel, coolant, brake fluid, filters, and batteries. Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source. Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center.

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USE CARE IN HANDLING AND SERVICING BATTERIES



- **PREVENT BATTERY EXPLOSIONS**
  - Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.
  - Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.
  - Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

- **PREVENT ACID BURNS**
  - Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

- **Avoid acid burns by:**
  1. Wearing eye protection and rubber gloves.
  2. Avoiding breathing fumes from electrolyte.
  3. Avoiding tipping battery.
  4. Use proper jump start procedure.

- **If you spill acid on yourself:**
  1. Flush your skin with water.
  2. Apply baking soda to help neutralize the acid.
  3. Flush your eyes with water for 10–15 minutes.
  4. Get medical attention immediately.

- **If acid is swallowed:**
  1. Drink large amounts of water or milk.
  2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
  3. Get medical attention immediately.

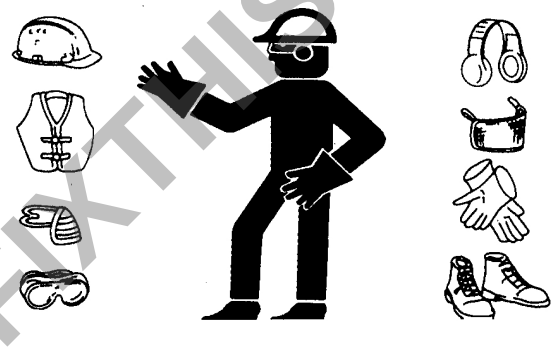
USE SAFE SERVICE PROCEDURES

- **WEAR PROTECTIVE CLOTHING**

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



- **SERVICE MACHINES SAFELY**

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

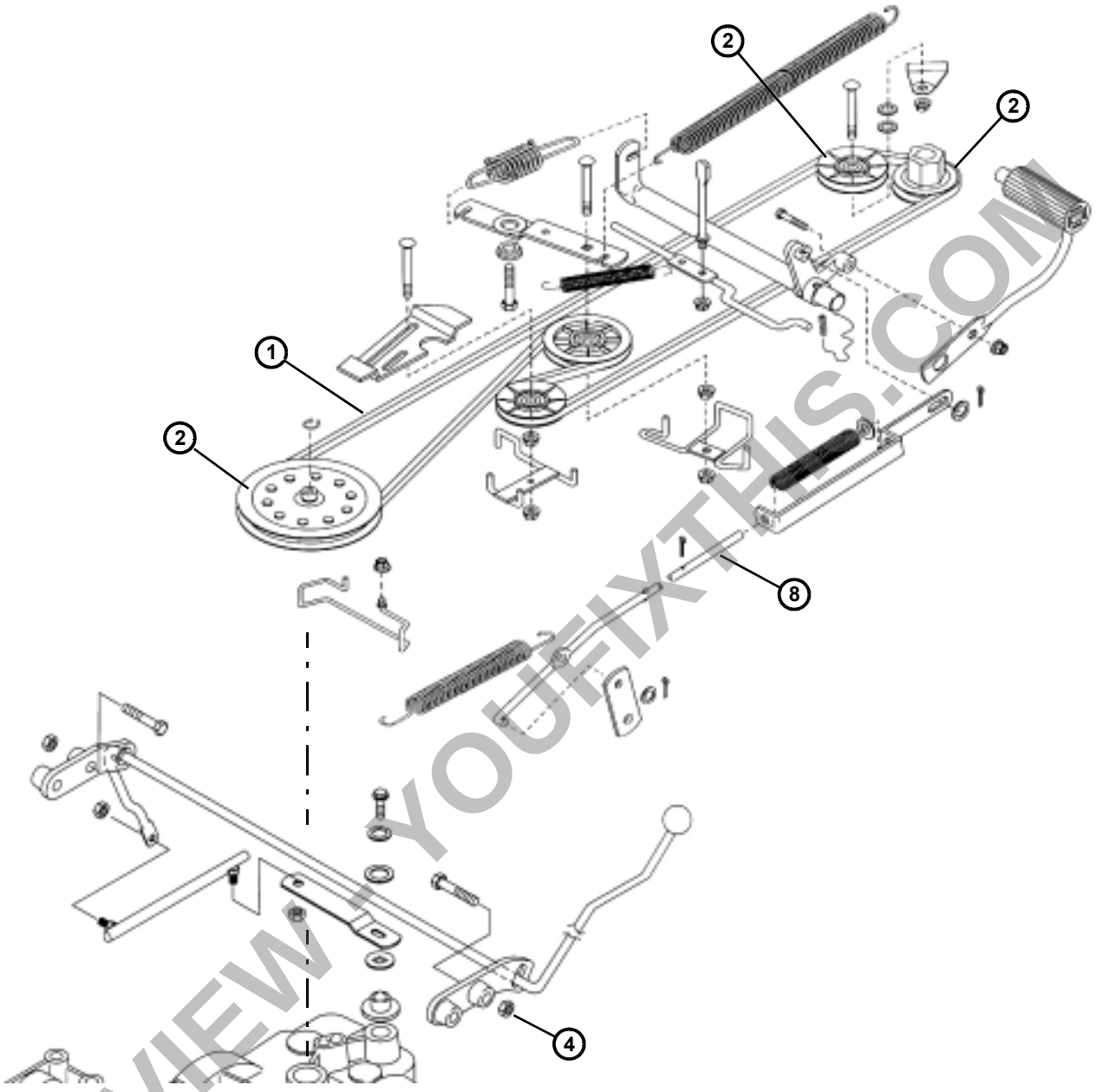
Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

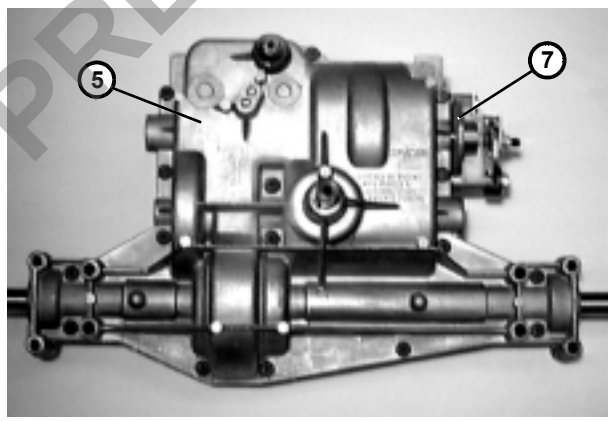
- **USE PROPER TOOLS**

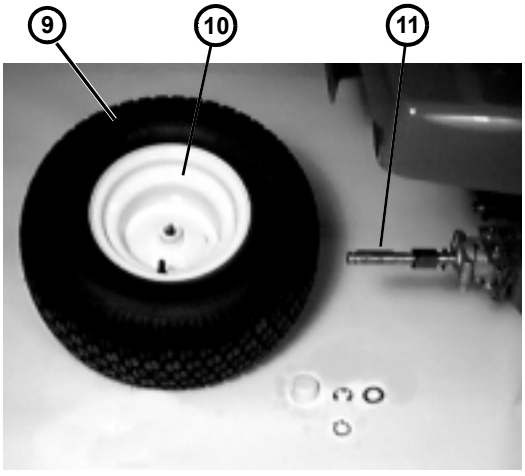
Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards. Use power tools only to loosen threaded parts and fasteners. For loosening and tightening hardware, use the correct size tools. **DO NOT** use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches. Use only service parts meeting John Deere specifications.

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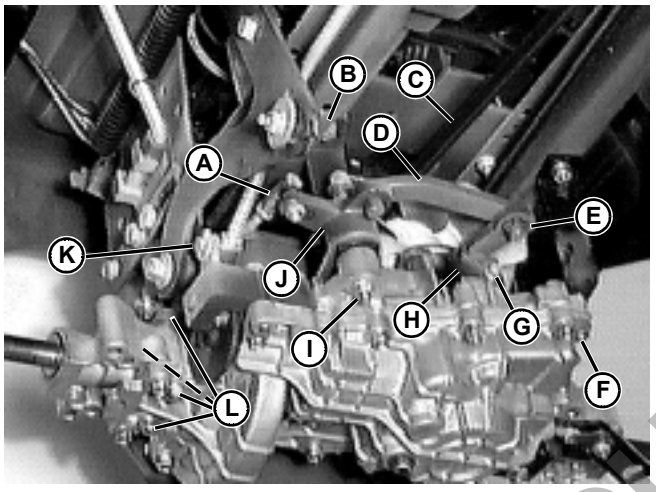
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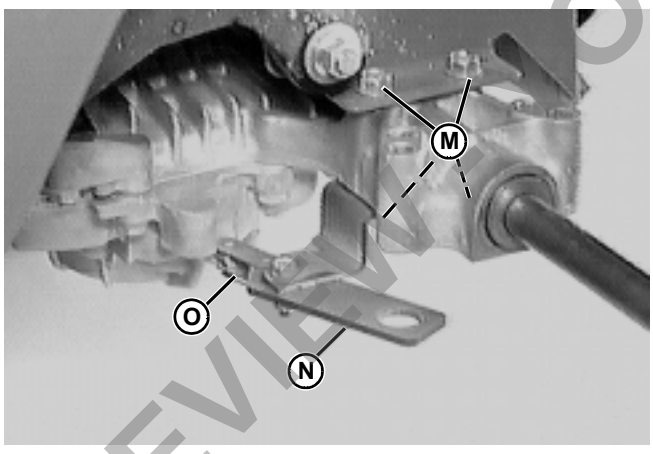
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TRANSAXLE REMOVAL AND INSTALLATION—K55

Removal—

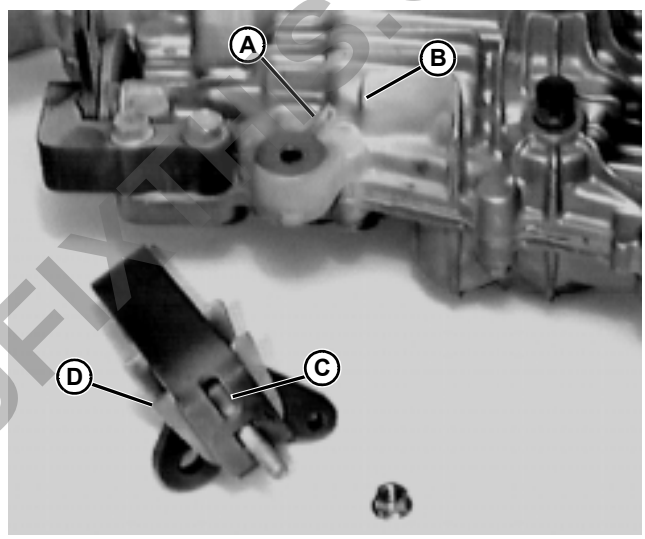
1. Safely raise and block rear of tractor off surface.
2. Safely support bottom of transaxle or have a helper hold transaxle in place when you remove final hardware (Steps 13—14).
3. Remove drive wheels, inspect key and keyways, washers, and snap rings. Replace as necessary.

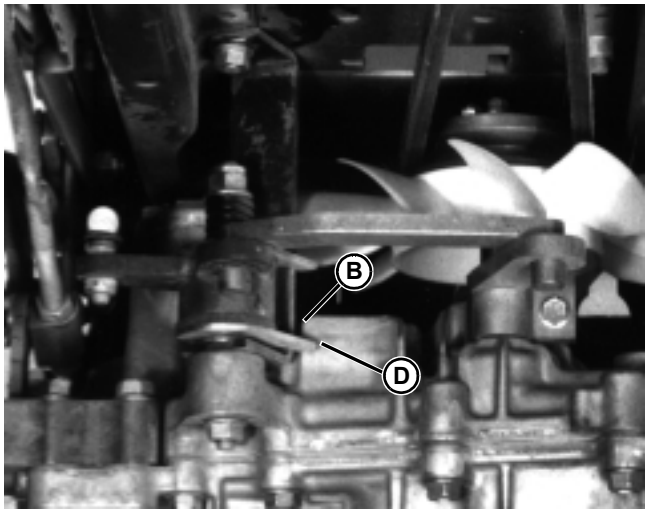




4. Remove traction drive belt (C) from drive sheave.
5. Disconnect shift linkage turnbuckle (A) from bellcrank assembly (J).
6. Remove cotter pin and washer (K) to disconnect brake rod from brake lever.
7. Remove chain link (O) from left-side transport valve assembly.
8. Remove left-front mounting bracket lower cap screw and flange nut (F).
9. Remove flange nut (B) from right-front mounting bracket.
10. Remove two right-side mounting cap screws and flange nuts (L).
11. Pull transport lever (N) into over-center position to remove two left-hand mounting cap screws and flange nuts (M).
12. Remove transaxle to workbench.
13. Remove snap ring (E) to remove shift link (D).
14. Remove cap screw and lock nut (G) to remove shift arm (H). Inspect woodruff key and keyways of shift arm and pump variable swashplate shifter shaft.
15. Remove flange nut (I) slowly to remove bellcrank assembly (J).
16. Drain oil from transaxle.

Installation—





17. Make sure bellcrank assembly and transaxle right, front mounting bracket are oriented properly. Slot (C) should be aligned with transaxle housing rib (A) so that ear (D) of lower anchor washer **is not** wedged behind housing vertical rib (B).
18. Install transaxle in reverse order of removal.
19. Tighten mounting hardware to specifications.

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