JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER EQUIPMENT DIVISION

Gator Light Duty Utility Vehicles
CS and CX

TM2119 SEPTEMBER 2005

TECHNICAL MANUAL



JOHN DEERE

North American Version
Litho In U.s.a.

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Manual Description

This technical manual is written for an experienced technician and contains sections that are specifically for this product. It is a part of a total product support program.

The manual is organized so that all the information on a particular system is kept together. The order of grouping is as follows:

- Table of Contents
- Specifications and Information
- Identification Numbers
- Tools and Materials
- Component Location
- Schematics and Harnesses
- Theory of Operation
- Operation and Diagnostics
- Diagnostics
- Tests and Adjustments
- Repair
- Other

Note: Depending on the particular section or system being covered, not all of the above groups may be used.

The bleed tabs for the pages of each section will align with the sections listed on this page. Page numbering is consecutive from the beginning of the Safety section through the last section.

We appreciate your input on this manual. If you find any errors or want to comment on the layout of the manual please contact us.

Safety
Specifications and Information
Engine (FE250D)
Engine (FE290D)
Electrical
Power Train
Steering
Brakes
Miscellaneous

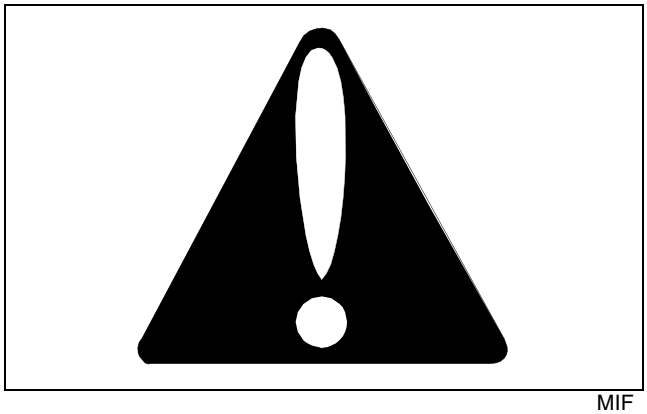
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Recognize Safety Information



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This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

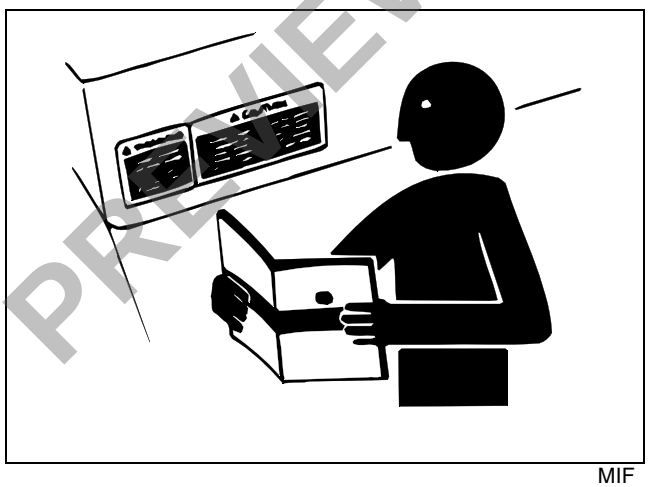
Follow recommended precautions and safe servicing practices.

Understand Signal Words

A signal word - DANGER, WARNING, or CAUTION - is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Replace Safety Signs

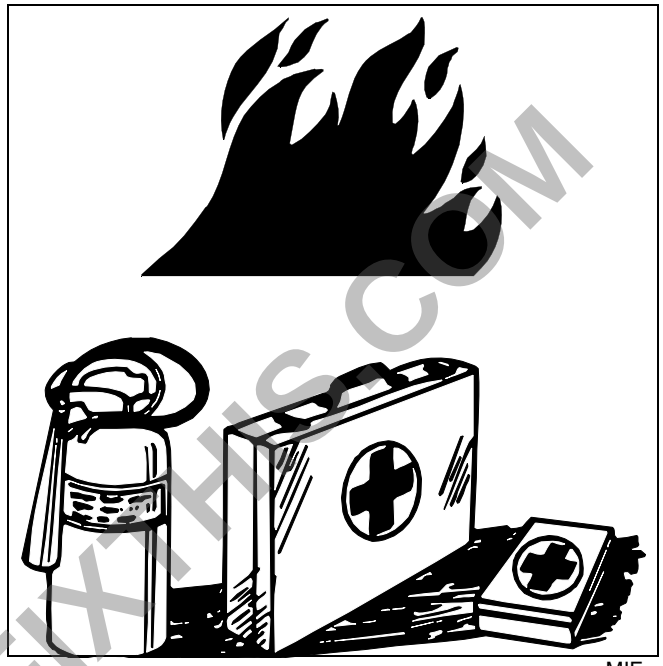


MIF

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

Handle Fluids Safely - Avoid Fires

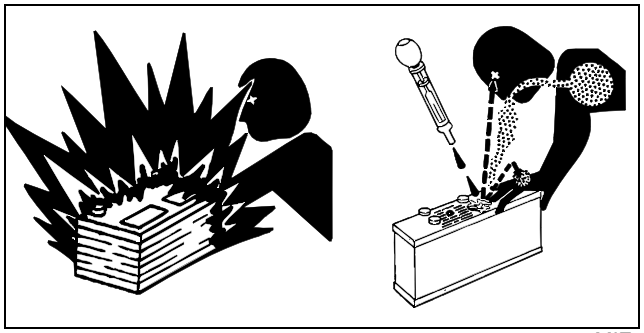
Be Prepared For Emergencies



MIF

- 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.

Use Care In Handling and Servicing Batteries



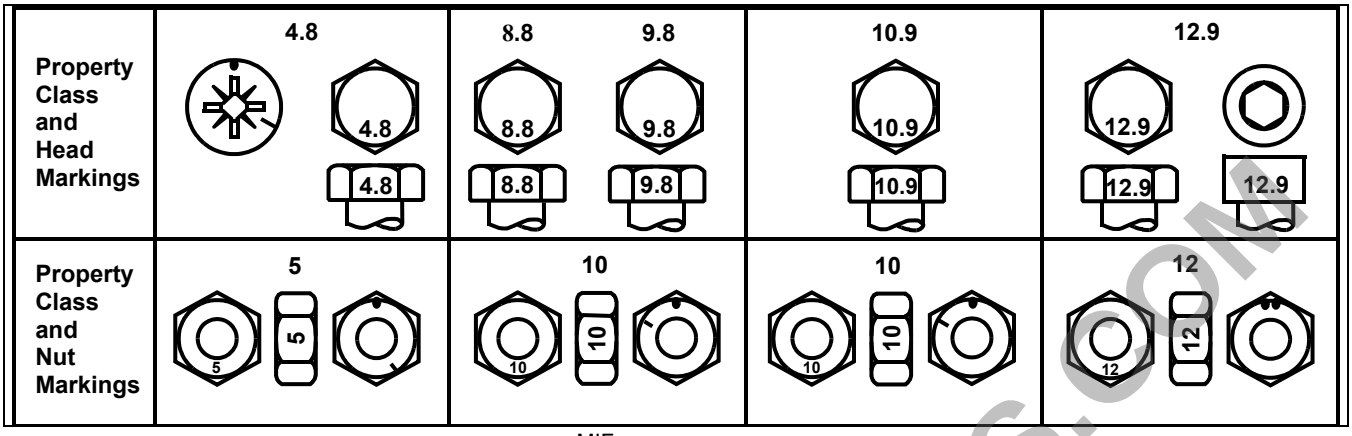
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Fastener Torques

Metric Fastener Torque Values



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	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated a		Dry a		Lubricated a		Dry a		Lubricated a		Dry a		Lubricated a		Dry a	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	109
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these hand torque values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only and include a ±10% variance factor. Check tightness of fasteners periodically. DO NOT use air powered wrenches.

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

Fasteners should be replaced with the same grade. Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

When bolt and nut combination fasteners are used, torque values should be applied to the NUT instead of the bolt head.

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

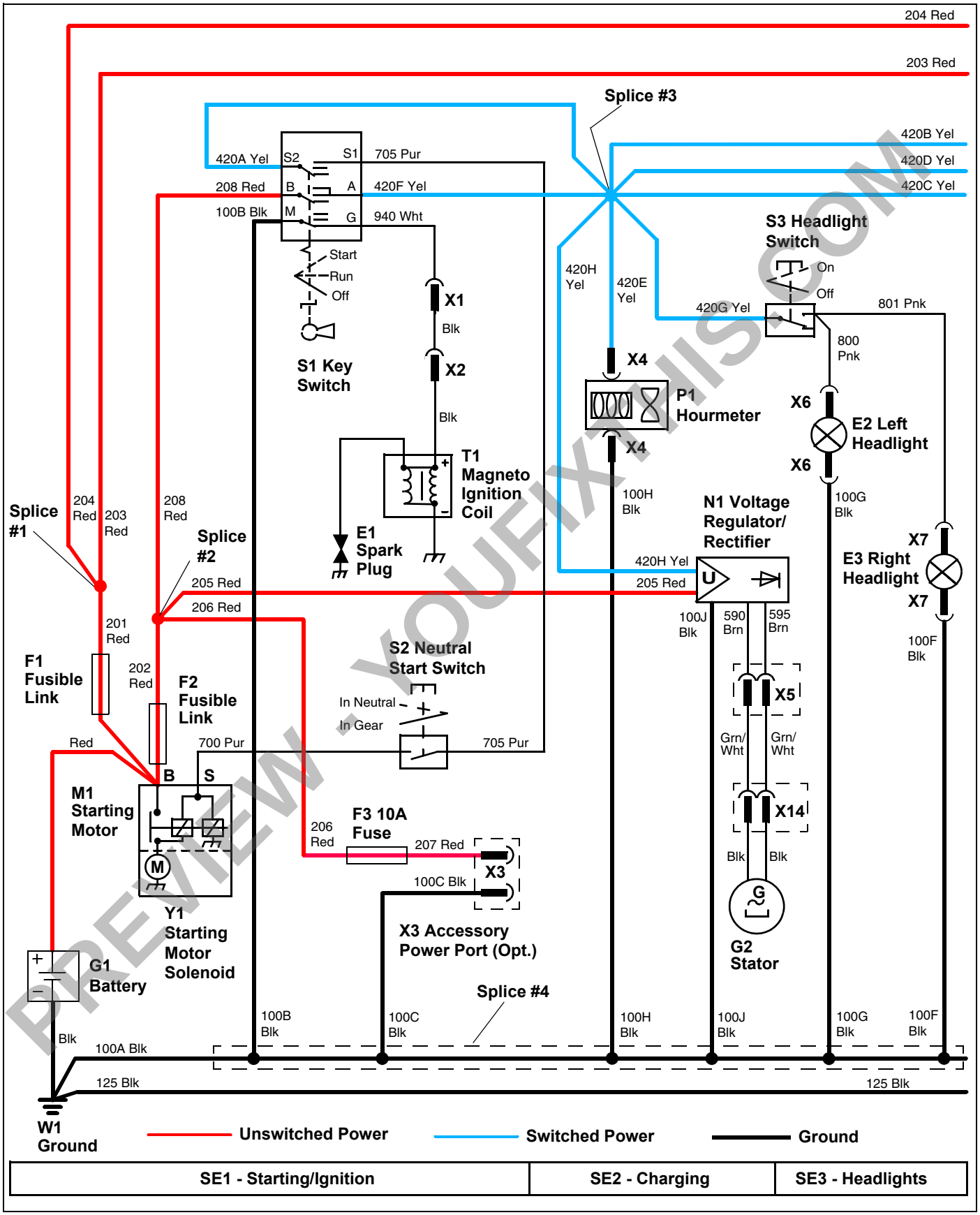
a *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication*.

Reference: JDS - G200.

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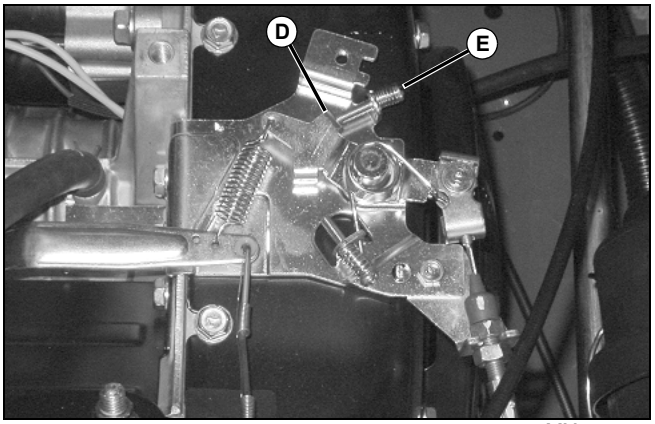
Standard Electrical Wiring Schematic



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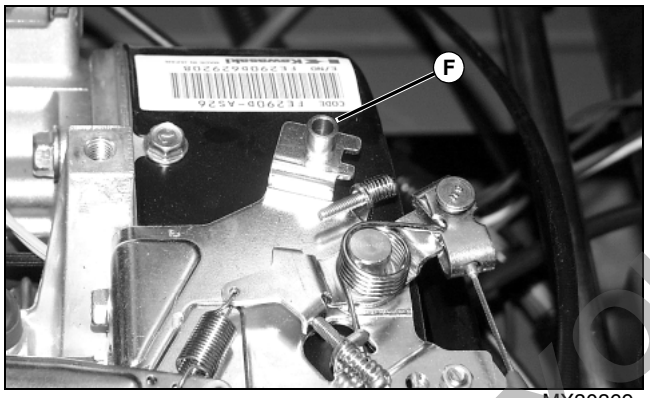
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MX30368

4. Hold throttle pedal in FAST position so tab (D) contacts screw (E).

5. Adjust screw (E) to obtain high idle.



MX30369

6. Install spacer (F) in position shown. Install throttle control arm cover.

Specification:

High Idle . . . . . .3850 ± 75 rpm

Fuel Pump Pressure Test

Reason:

To check output pressure of fuel pump.

Equipment:

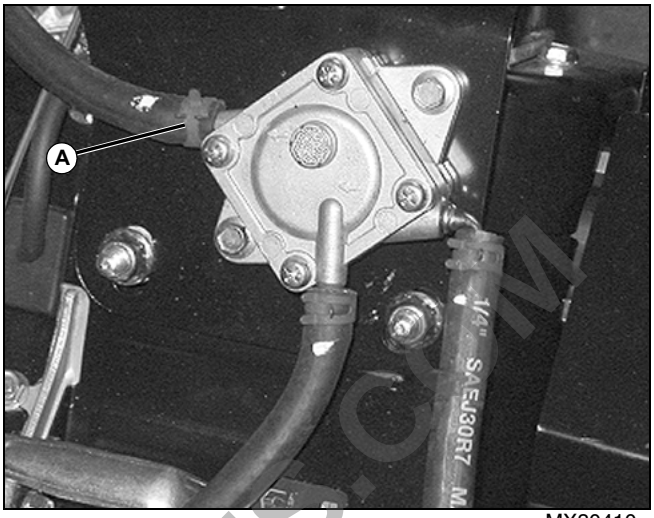
- JDG356 Pressure Gauge

Procedure:

1. Shift lever in NEUTRAL, and park brake LOCKED.

2. Run engine at SLOW idle for 1 minute to fill carburetor with fuel.

3. Turn engine OFF.



MX30410

4. Disconnect and plug hose from fuel pump outlet (A).

5. Connect JDG356 Pressure Gauge to fuel pump outlet.

6. Run engine at FAST idle for 15 seconds, record pressure reading.

7. Turn engine OFF.

8. Remove pressure gauge, connect pump outlet hose and clamp.

Results:

- If fuel pressure is BELOW minimum specification, check fuel pump filter, in-line filter, hoses, and fuel pickup tube assembly in fuel tank for debris or restrictions. Repeat test.
- If pressure is still BELOW minimum specification, replace fuel pump.

Specification:

Minimum Pressure . . . . . 6.12 kPa (0.9 psi)

Fuel Pump Flow Test

Reason:

To check output volume of fuel pump.

Equipment:

- Graduated container

Procedure:

1. Shift lever in NEUTRAL, and park brake LOCKED.

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Diagnostics

Engine Troubleshooting Guide

Caution: Avoid Injury! The engine may start to rotate at any time. Keep hands away from moving parts when testing.

Note: To test specific electrical components, see Electrical Section and refer to either Diagnostics or Tests & Adjustments for further guidance.

Test Conditions:

- Operator On Seat
- Brake ON
- Transmission in NEUTRAL

Starting Problems:

Engine Doesn't Crank

1. Are battery terminals loose or corroded?

Yes: Tighten or clean cable clamps and terminals.

No: Go to next step.

2. Is battery fully charged? See "Battery Test" in the Electrical section.

Yes: Go to next step.

No: Charge battery. See "Charge Battery" in the Electrical section.

3. Is key switch working correctly? Test switch. See "Cranking Circuit Operation," for the appropriate machine, in the Electrical section.

Yes: Go to next step.

No: Replace as needed.

4. Has engine seized?

Yes: See Engine Repair Section.

No: Go to next step.

5. Is starting motor or solenoid defective? See "Starting Motor Solenoid Test" or "Starting Motor No-Load Amperage and RPM Test" in the Electrical section.

Yes: Repair or replace.

No: Go to next step.

6. Is neutral start switch functioning properly?

Yes: Go to next step.

No: Replace switch.

7. Does neutral position of shifter match neutral position on transaxle?

No: Adjust shifter linkage.

Caution: Avoid Injury! Keep spark plug as far away from the plug hole as possible. Gasoline spray from the open cylinders may be ignited by ignition spark and cause an explosion or fire.

Engine Hard To Start

1. Is there a strong blue spark?

Yes: Go to next step.

No: Replace spark plug. Recheck for spark. Check engine starting. Check if spark is produced between high tension lead and ignition block. Check high tension lead, ignition coil air gap and ignition coil.

2. Make starting attempts a number of times, remove spark plug and observe electrodes. Are electrodes wet?

Yes: Check for excessive use of choke, plugged air cleaner, float bowl level too high.

No: Check fuel tank and lines. Go to next step.

3. Check compression. See "Automatic Compression Release (ACR) Test" on page 37. Is compression sufficient?

No: Check piston rings and cylinder for wear. See "Piston/Connecting Rod Inspection" on page 53. Inspect cylinder head. See "Cylinder Head Inspection and Replacement" on page 47.

Engine Runs Erratically

1. Is the air restrictor present and the correct size (21 mm)?

Yes: Go to next step.

No: Install correct size air restrictor.

2. Is fuel delivery correct? See "Fuel Pump Flow Test" on page 35.

Yes: Check for plugged air/fuel passages in carburetor. See "Carburetor Disassembly and Assembly" on page 41.

No: Check for contamination, or an air or vapor lock in the fuel tank and lines. Check tank check valve (PIN - 14950), shut off valve, fuel filter and pump.

Engine Malfunctions At Low Speed

1. Is unusual smoke emitted out of muffler?

Yes: Check choke. See "Choke Cable Adjustment" on page 32.

No: Go to next step.

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Special or Essential Tools

Note: Order tools according to information given in the U.S. SERVICE-GARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

Special or Required Tools

Tool Name	Tool No.	Tool Use
Digital Tachometer	JT05719	Slow idle mixture screw and speed adjustments, and fast idle speed adjustment.
Fuel Pump Pressure Test Kit	JDG356	Fuel pump pressure test.
Carburetor Test Kit	JDZ25-2	Fuel tank check valve test.
Compression Gauge Spark Plug Test Tool	JDM59 JDM-74A-5	Cylinder compression test, and Valve clearance adjustment.
Dial Indicator		Automatic compression relief test, valve inspection, crankshaft end play
Valve Spring Compressor	JDM70	Cylinder head disassembly and assembly.
Valve Guide Driver Tool	JDG504	Replace valve guides.

Carburetor Jets

Jet	Part No.	Part Use
Pilot Air Jet #40	M19186	Used for all altitudes
Main Jet #90	UP04795	0 to 1000 m (0 to 3279 ft)
Main Jet #88	M140510	1000 to 2000 m (3279 to 6557 ft)
Main Jet #85	M128974	2000 m and above (6557 ft and above)

Other Materials

Other Material

Part No.	Part Name	Part Use
M79292	MPG-2® Multipurpose Grease	Apply to engine crankshaft
PT569	John Deere NEVER-SEEZ® Lubricant	Apply to crankshaft end
	SCOTCH-BRIGHT® Abrasive Sheets/ Pads	Clean cylinder head.
	Valve Guide Cleaner	Clean valve guides.
	Stanisol or Kerosene	Finish ream valve guide.
	Prussian Blue Compound	Check valve seat contact.
	Lithium Base Grease	Pack oil seals.
	Zinc Oxide/Wood Alcohol	Check block for cracks.
	Mineral Spirits	Clean electric starter armature.

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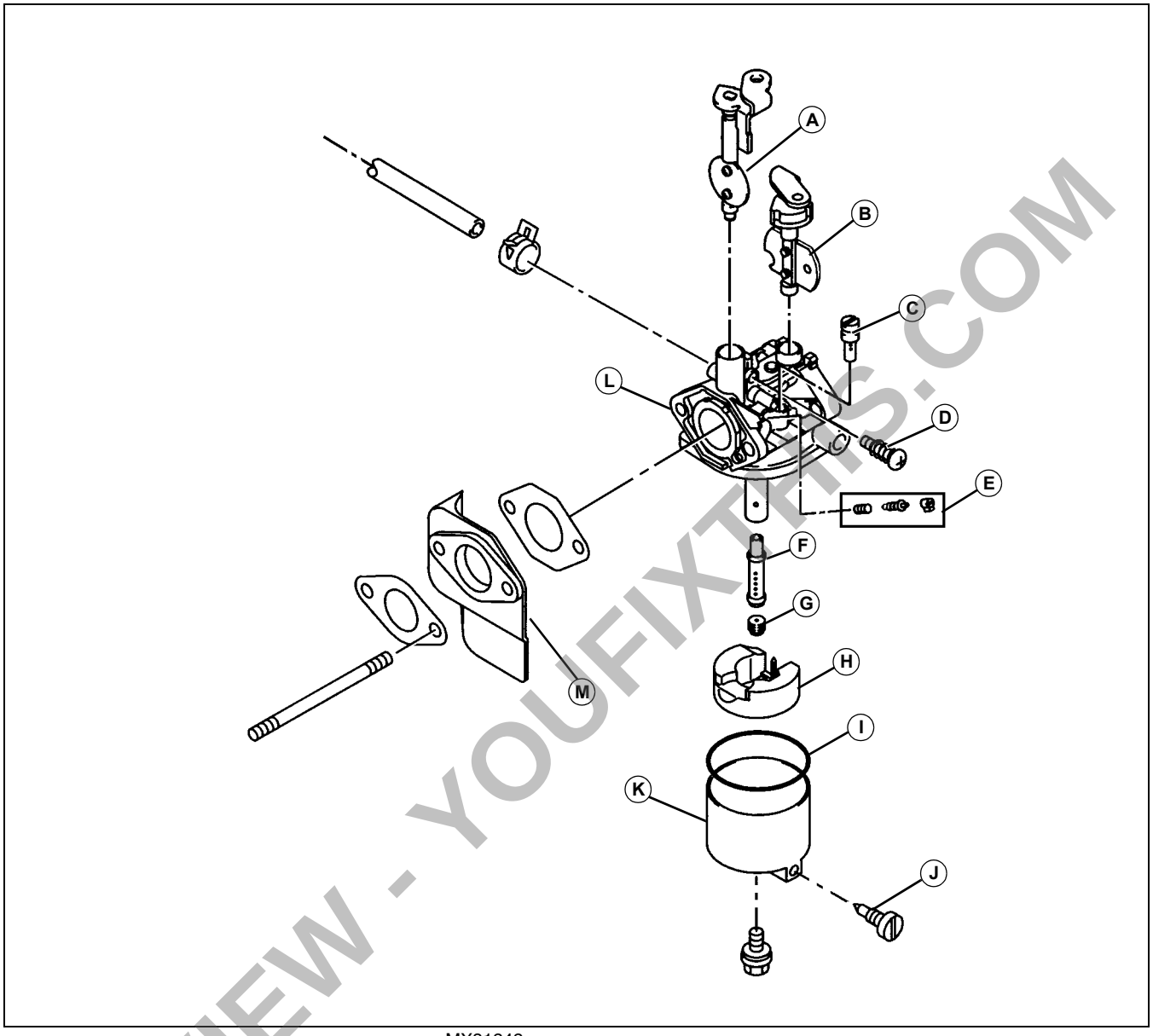
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Carburetor Components



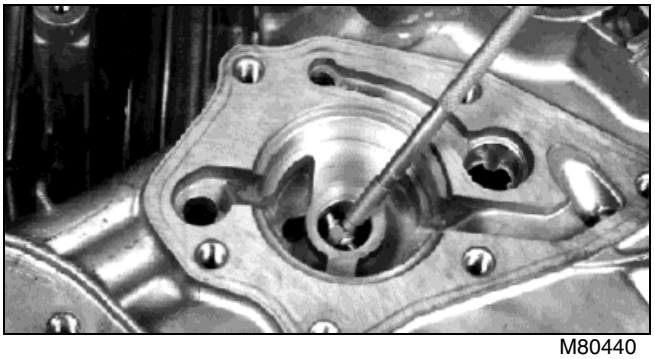
MX31242

A- Throttle Plate
B- Choke Plate
C- Pilot Jet
D- Idle Speed Screw
E- Idle Mixture Screw and Limiter
F- Main Nozzle
G- Main Jet[1]
H- Float
I- Gasket
J- Drain Screw
K- Float Chamber
L- Carburetor Body
M- Insulator

1. For altitude changes, see Carburetor Jets in Specifications for selection.

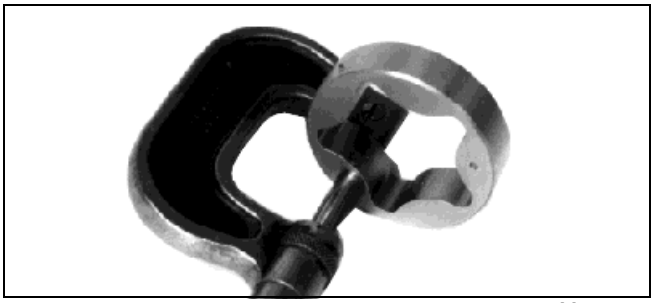
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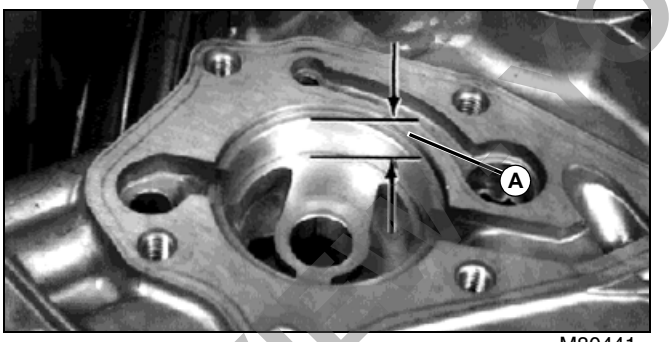
M80440

- Measure rotor shaft bearing. If bearing ID is greater than **12.77 mm (0.503 in.)**, replace cylinder block.



M80015

- Measure thickness of outer rotor. If thickness is less than **9.92 mm (0.391 in.)**, replace both outer rotor and rotor shaft.



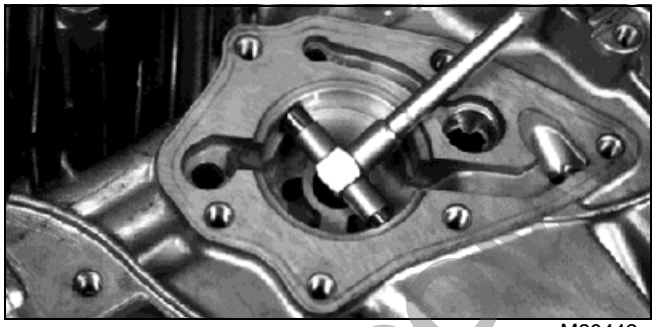
M80441

- Measure outer rotor bearing depth. If depth is greater than **10.17 mm (0.400 in.)** (A), replace cylinder block.



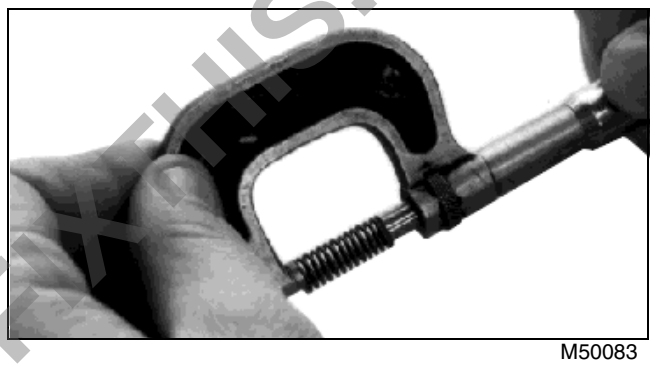
M80017

- Measure outer rotor diameter. If shaft OD is less than **40.47 mm (1.596 in.)**, replace both rotor and rotor shaft.



M80442

- Measure outer rotor bearing. If bearing ID is greater than **40.77 mm (1.605 in.)**, replace cylinder block.

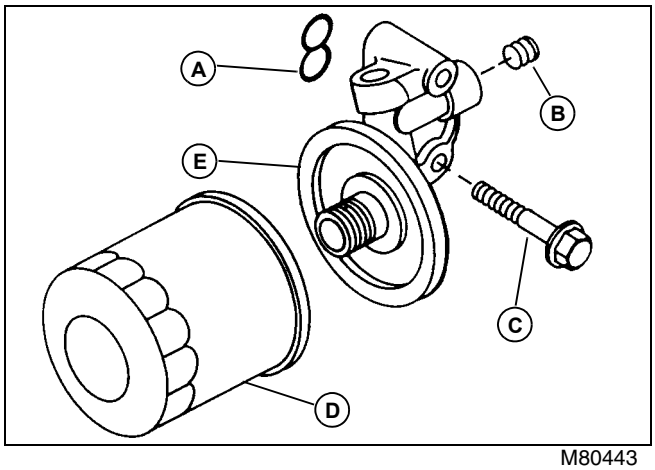


M50083

- Measure relief valve spring free length. Replace spring if measurement is less than **19 mm (0.748 in.)**.

Oil Filter Manifold Removal and Installation

Note: Not all engines are equipped with oil filter manifold



M80443

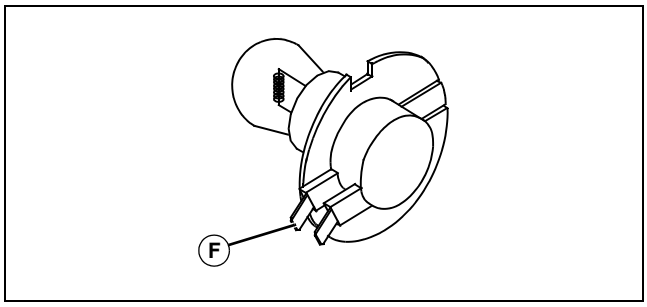
A- Gasket
B- Plug
C- Mounting Cap Screw (2) M6 X 40
D- Oil Filter
E- Oil Filter Manifold

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wire (E)?

Yes: Replace left headlight.

No: Test bulb. Check 800 Pnk wire and connections. If OK, replace headlight switch.



2. Is battery voltage present at E3 right headlight - 801 Pnk wire (F)?

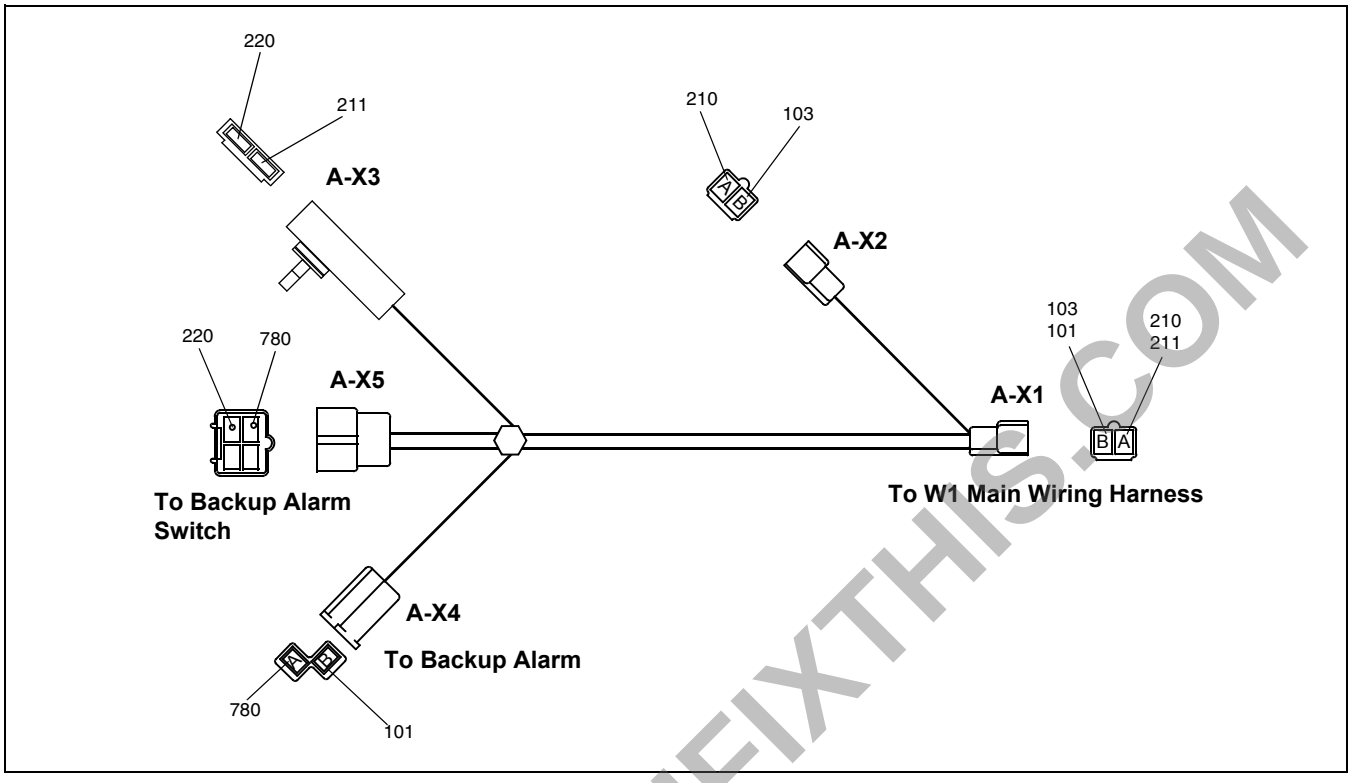
Yes: Replace right headlight.

No: Test bulb. Check 801 Pnk wire and connections. If OK, replace headlight switch.

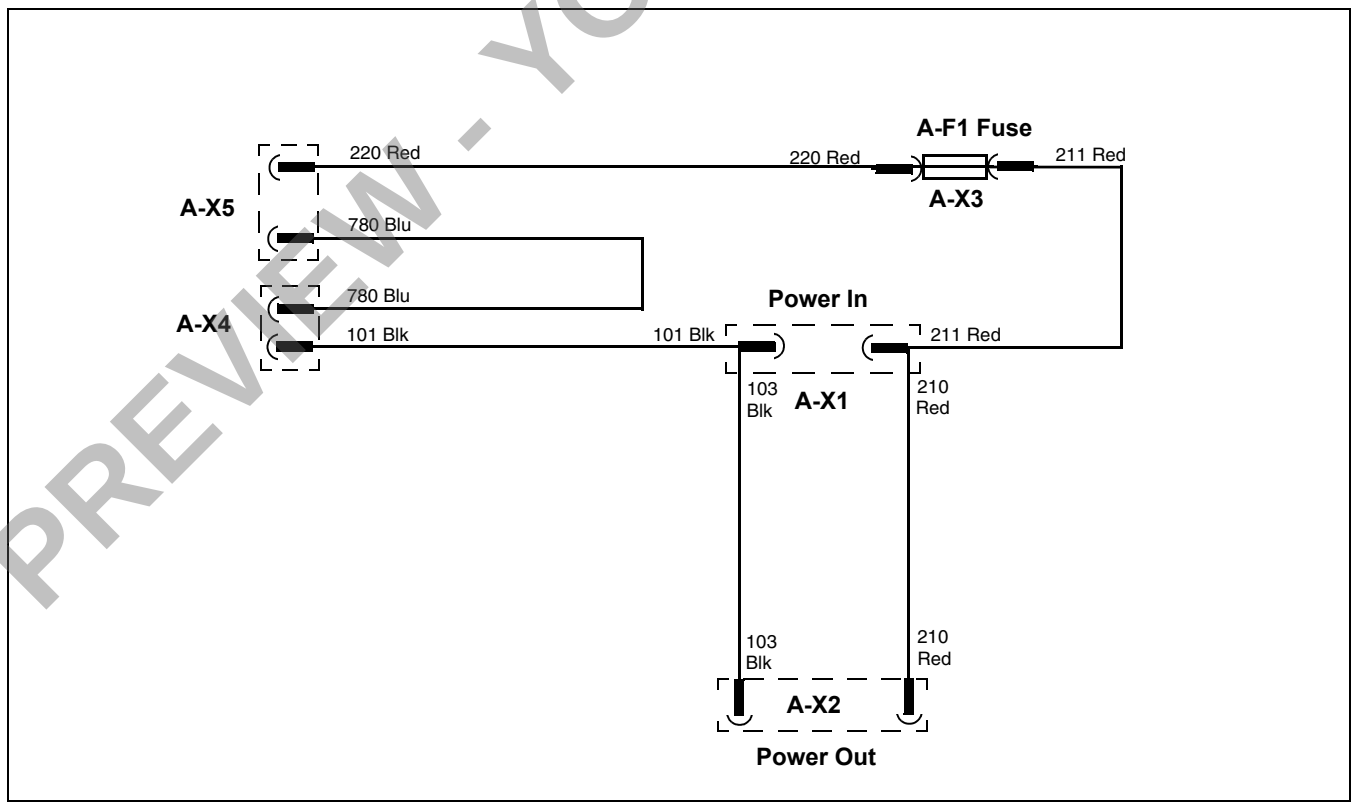
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Backup Alarm Kit Wiring Harness

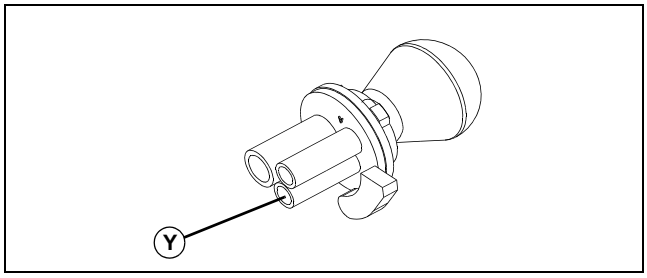


Backup Alarm Kit Wiring Harness Schematic



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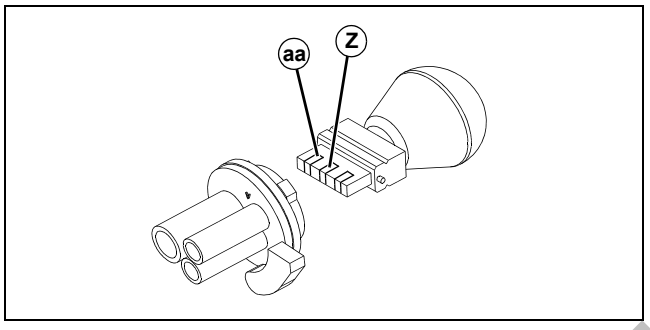
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3. Is battery voltage present at connector T-X4, 832 Pnk wire of T-E1 right rear marker light (Y)?

Yes: Go to next step.

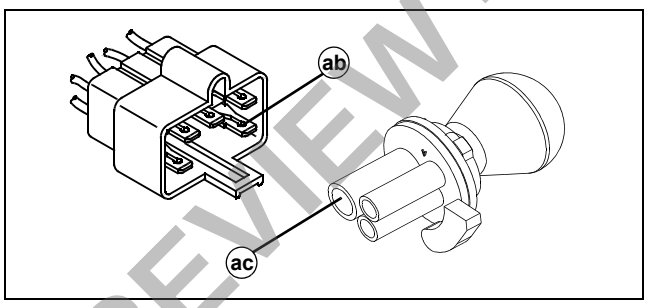
No: Check 832 Pnk wire, T-X1 connector, and connections.



4. Check for continuity between terminals “B” (Z) and “G” (aa) of T-E1 right rear marker lamp. Is continuity present?

Yes: Go to next step.

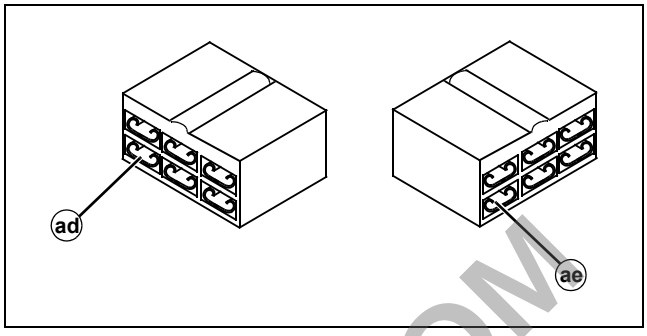
No: Replace lamp.



5. Is continuity present between T-X1 connector, 115A Blk wire (ab) and T-X4 connector, 115D Blk wire of T-E1 right rear marker lamp (ac)?

Yes: Go to next step.

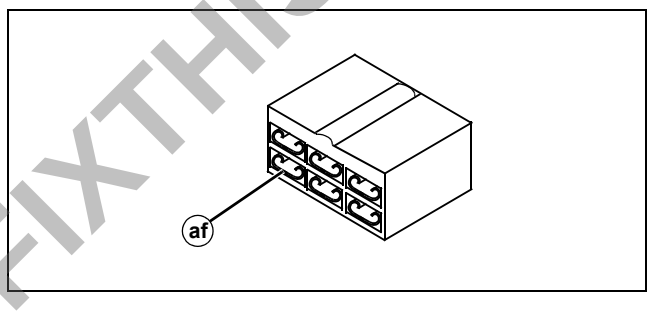
No: Check 115D Blk wire, splice, 115A Blk wire, and connections.



6. Is continuity present between X13 connector (ad) and X12 connector (ae), 115 Blk wire?

Yes: Go to next step.

No: Check 115 Blk wire and connections.



7. Is continuity to ground present at connector X12, 102 Blk wire (af)?

No: Check 102, 100E, 100A Blk wires, and connections.

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2. Do shock absorbers have leaks or broken springs?

Yes: Repair or replace as needed. See “Shock Absorber Replacement” on page 315 in the Miscellaneous section.

No: Go to next step.

3. Are the shock absorber mounts bent, or have worn, loose, broken, or missing hardware?

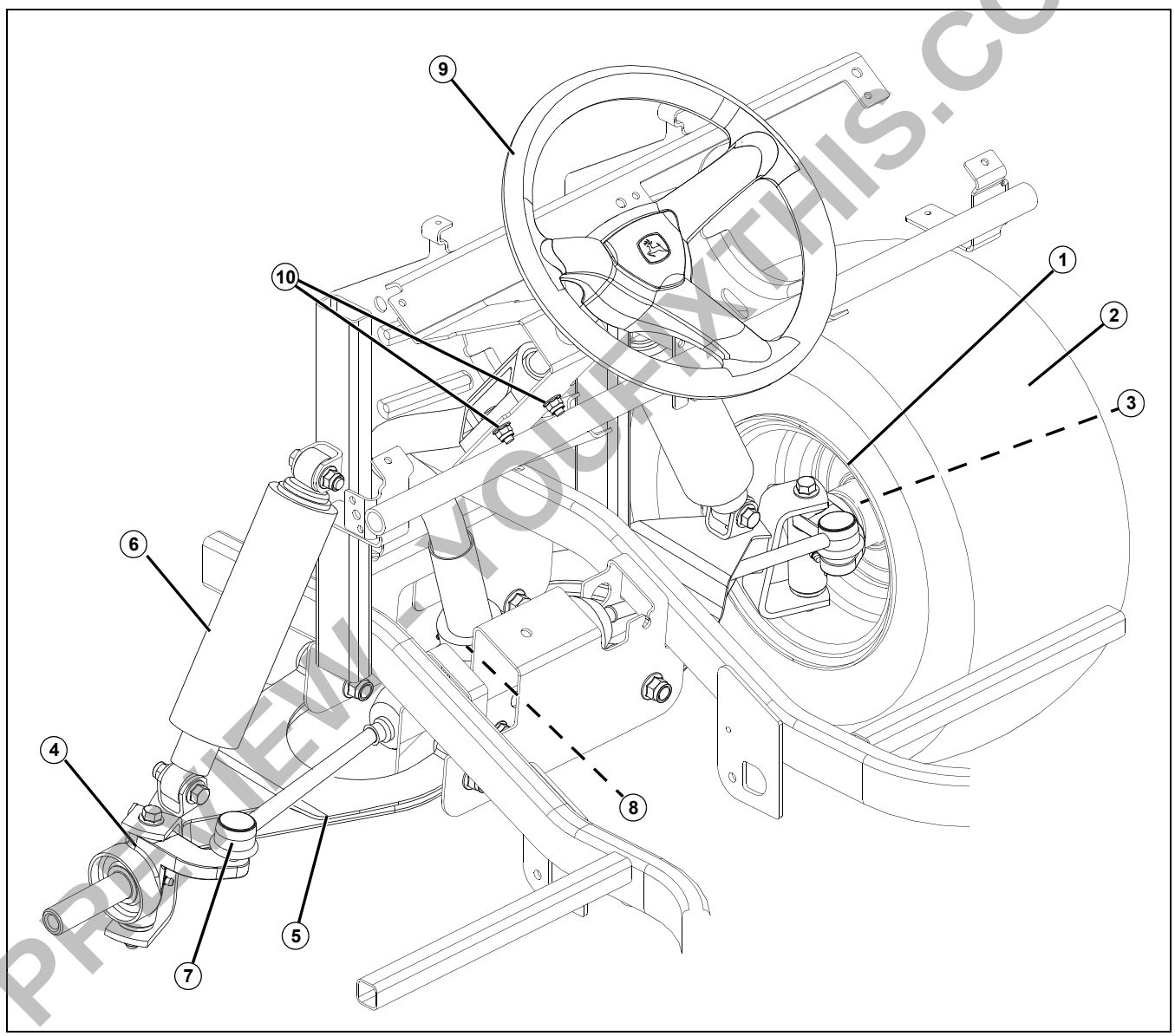
Yes: Repair or replace as needed.

No: Go to next step.

4. Are the shock absorbers mounted upside down?

Yes: Install in proper direction. See “Shock Absorber Replacement” on page 315 in the Miscellaneous section.

Steering Troubleshooting Test Points



mif

Test/Check Point	Normal	If Not Normal
1. Rims	Runout less than 3 mm (0.12 in.)	Replace rims.
	Wheel bolts tight	Tighten to specification.

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