READING ELECTRICAL SCHEMATICS

The schematic is made up of individual circuits laid out in a sequence of related functions. It is formatted with all power wires (A) across the top and all ground wires (B) across the bottom. Current flow is generally from top to bottom through each circuit and component. All components are shown in the OFF position. The diagram does not list connector (C) information unless needed to avoid confusion. If the connector is shown, the number next to it is the terminal pin location (D) in the connector.

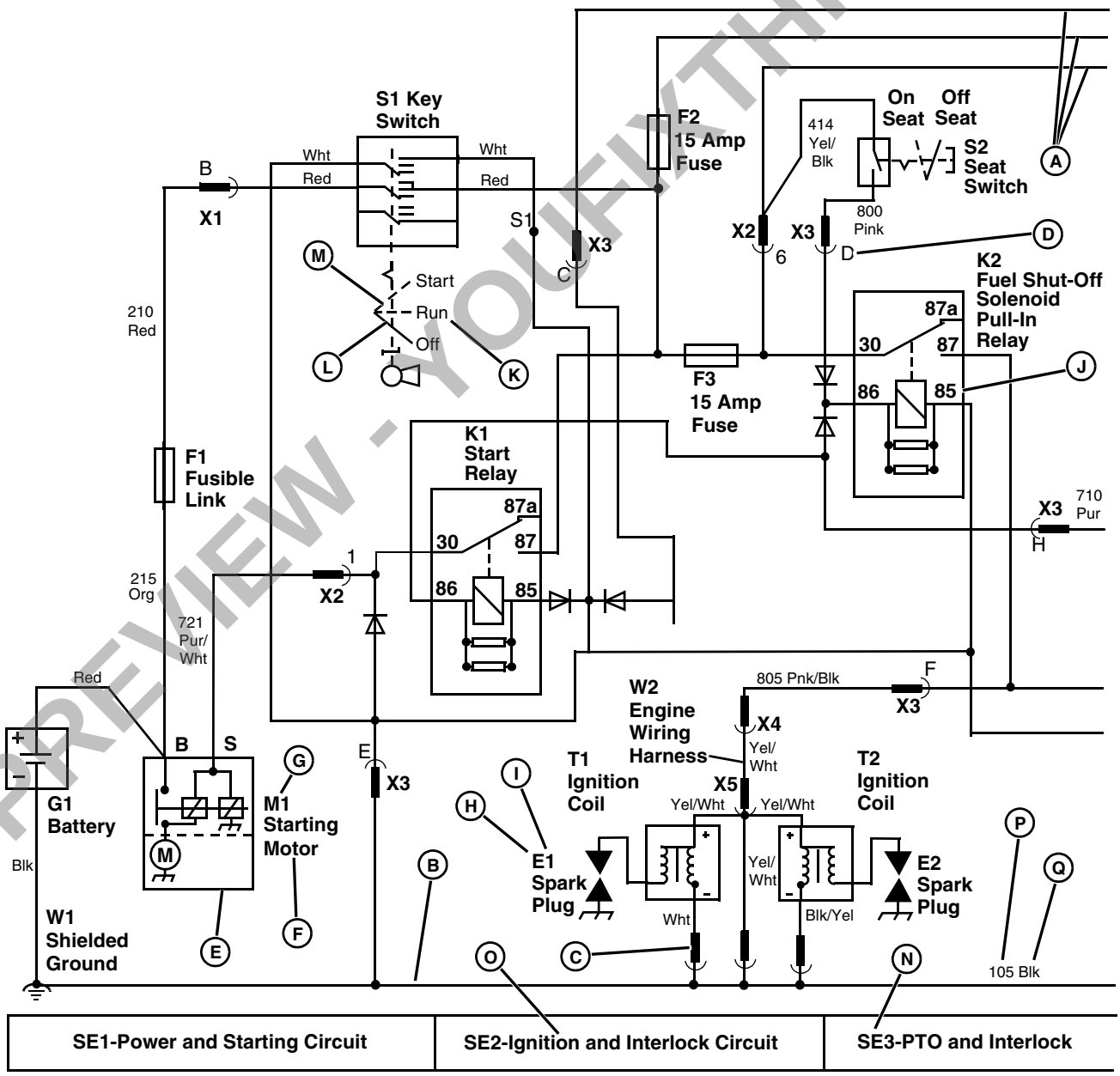
Each component is shown by a symbol (E), its name (F), and an identification code (G). The identification code contains a device identifying letter (H) and number (I).

The identifying letter is always the same for a specific component, but the identifying numbers are numbered consecutively from upper left to lower right. The terminal designation (J) is placed directly inside the symbol next to the connecting wire path. Switch positions (K) are placed directly outside the symbol. The solid line (L) shows the position the switch is currently in and dash lines (M) represent other switch positions.

Each circuit is identified at the bottom of the drawing by a section number (N) and section name (O).

The circuit number (P) and wire color (Q) of the wires are shown directly next to the wire path.

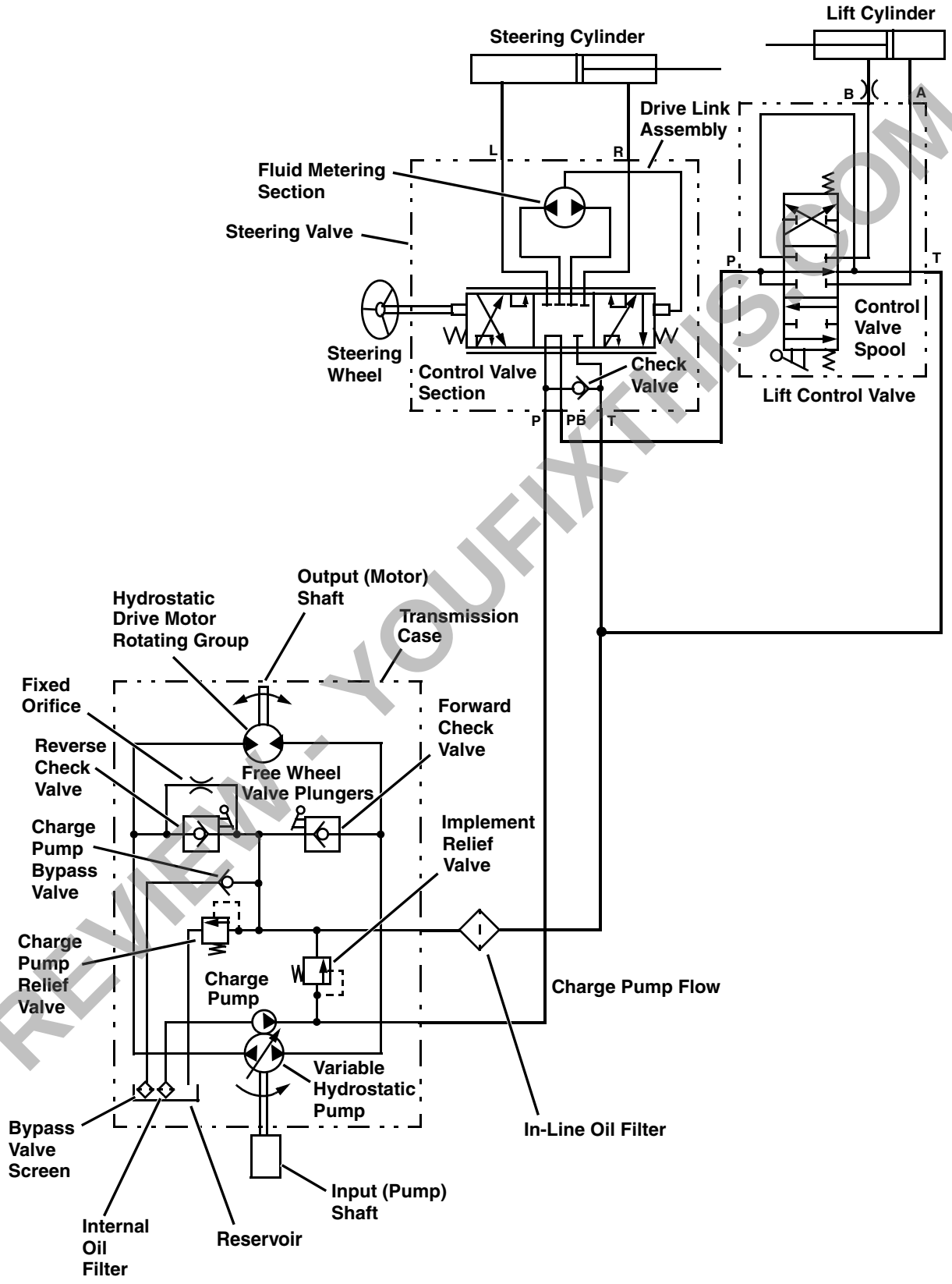
The same component name and identification code are used consistently on all diagrams in this section. Components can be easily cross-referenced.



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HYDRAULIC SCHEMATIC

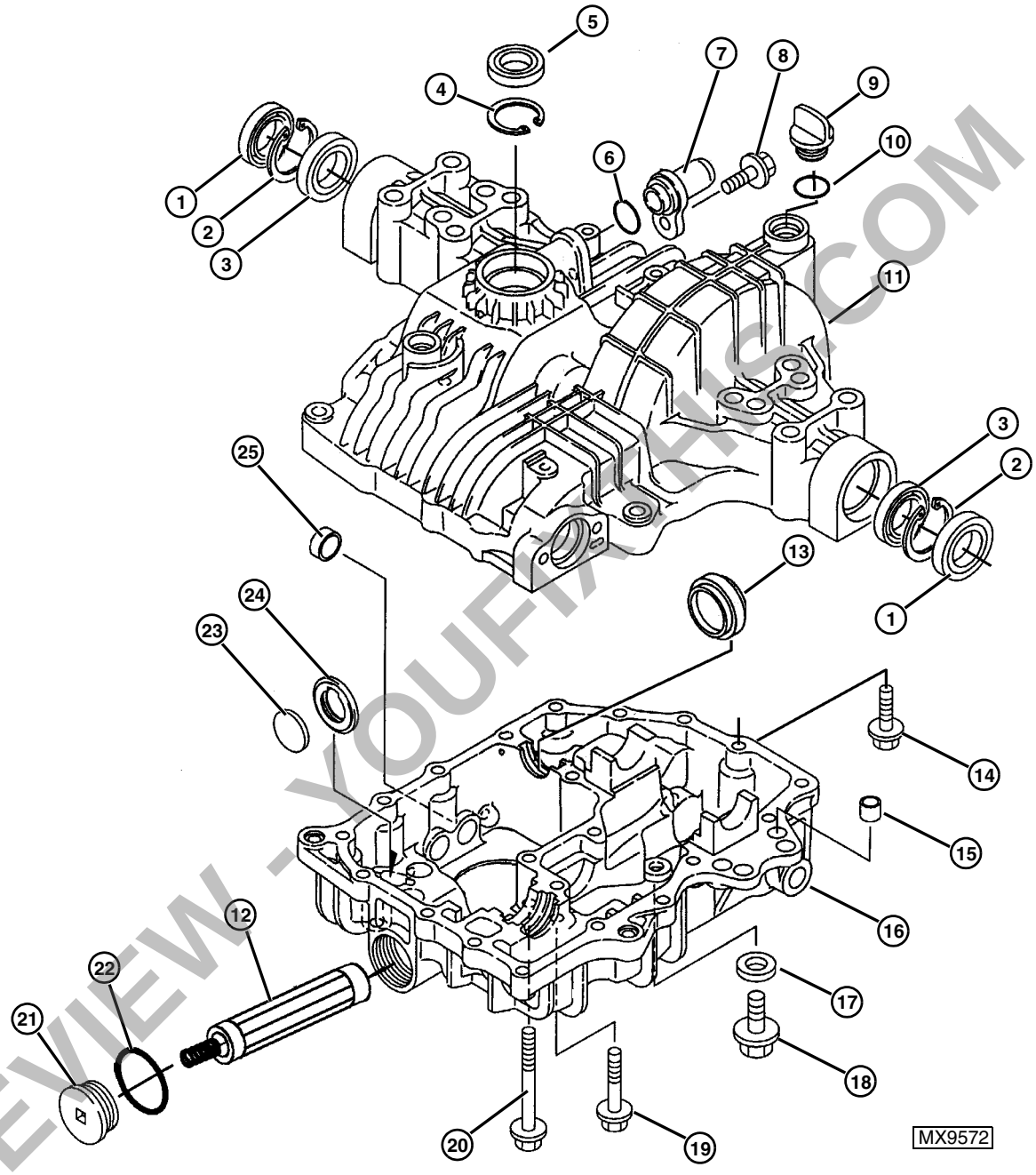


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COMPONENT LOCATION

TRANSAXLE CASE HALVES

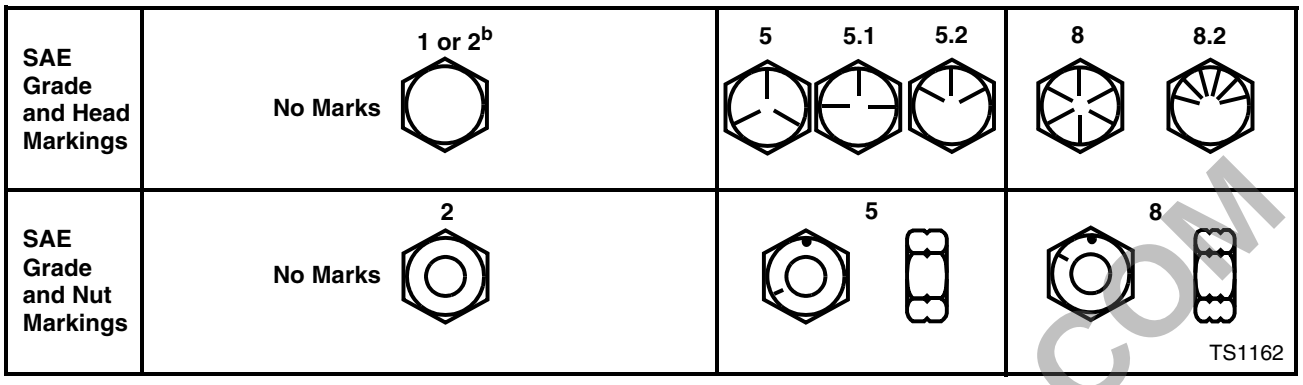


1. Seal	8. Cap Screw	15. Bushing	22. O-Ring
2. Snap Ring	9. Oil Fill Cap	16. Lower Case Housing	23. Magnet
3. Bearing	10. O-Ring	17. Washer Seal	24. Magnet Cover
4. Snap Ring	11. Upper Case Housing	18. Plug	25. Plug
5. Seal	12. Filter	19. Cap Screw	
6. O-Ring	13. Filter	20. Cap Screw	
7. Reservoir Fitting	14. Cap Screw	21. Plug	

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INCH FASTENER TORQUE VALUES



	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]	
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
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

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.*

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.*

Reference: JDS—G200.

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TESTS AND ADJUSTMENTS

OIL PRESSURE TEST

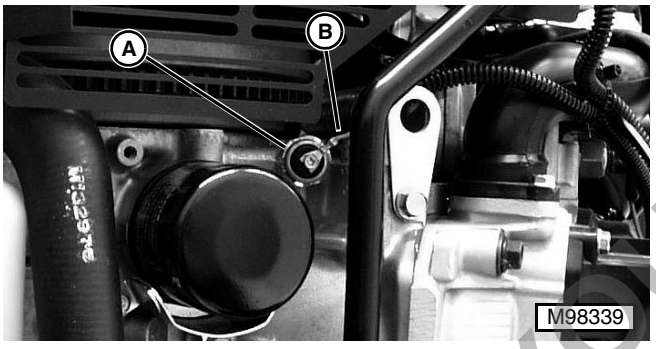
Reason:

To determine if the engine bearings or the lubrication system components are worn.

Test Equipment:

- JT03017 Hose Assembly
- JT05577 Pressure Gauge 689 kPa (100 psi)
- JT0334a Connector

Procedure:



1. Remove wire (B) and oil pressure sensor (A) on right side of engine, next to the oil filter.
2. Install JT0334a Connector.
3. Connect JT03017 Hose Assembly and JT05577 Pressure Gauge.

NOTE: Export and late model Domestic tractors respectively—hold hood switch closed or make sure blue jumper wire is good.

4. Start engine and warm engine to operating temperature (approximately five minutes).
5. Check oil pressure at FAST idle. Oil pressure should meet or exceed specification.

Specification:

Engine Oil Pressure. . . . . 241 kPa (35 psi)

Results:

- If oil pressure is not within specifications, inspect the oil pump.
- If oil pump is within specifications, the engine may have parts worn beyond specification.

6. Coat threads of sensor with John Deere TY15934 No. 2 PERMATEX sealant and install. DO NOT over-tighten.
7. Connect wire to sensor.

CYLINDER COMPRESSION TEST

Reason:

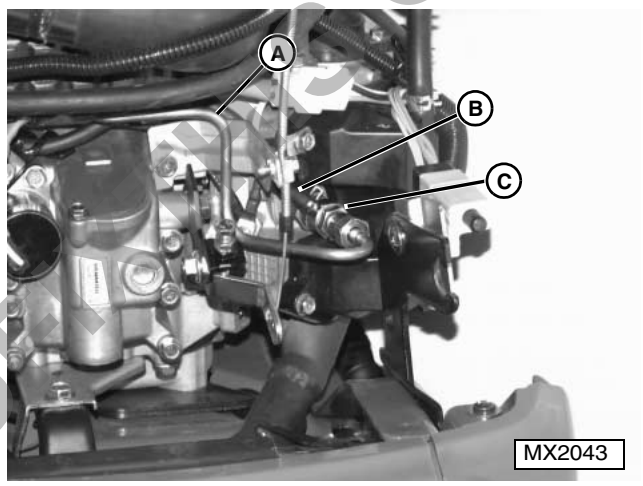
To determine the condition of the pistons, rings, cylinder walls and valves.

Test Equipment:

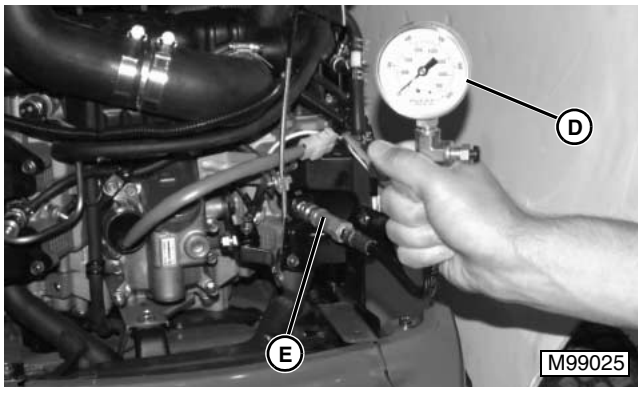
- JT01682 Compression Gauge Assembly
- JDG472 Adapter

Procedure:

1. Remove hood.



2. Remove injection line (A), leak-off line (B), and injector (C) (see FUEL INJECTOR—REMOVE AND INSTALL, in the REPAIR section).
3. Disconnect fuel shutoff solenoid connector.



IMPORTANT: Injector sealing washer must be used when installing JDG472 Adapter (E) to prevent damage to injector sealing surface.

4. Install JDG472 Adapter (E).
5. Connect JT01682 Compression Gauge Assembly (D) to adapter.

IMPORTANT: DO NOT overheat starter motor during test.

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TRANSMISSION & HYDRAULIC OIL

The same type of oil is recommended for all transmissions in the 45, 46, 4700 tractors. Use the appropriate oil viscosity based on these air temperature ranges. Operating outside of these recommended oil air temperature ranges may cause premature hydrostatic transmission or hydraulic system failures.

IMPORTANT: Mixing of LOW VISCOSITY HY–GARD® and HY–GARD® oils is permitted. DO NOT mix any other oils in this transmission. DO NOT use engine oil or "Type F" (Red) Automatic Transmission Fluid in this transmission.

The following John Deere transmission and hydraulic oil is **PREFERRED**:

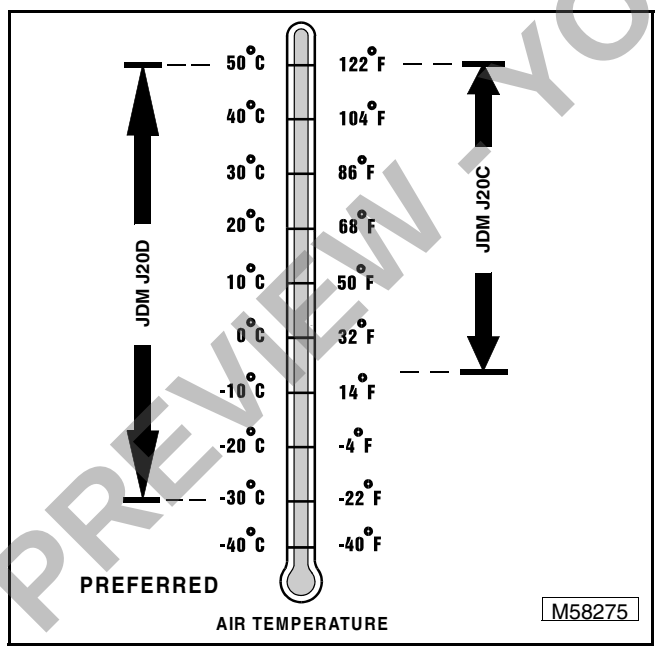
- **LOW VISCOSITY HY–GARD®—JDM J20D**.

The following John Deere oil is **also recommended** if above preferred oil is not available:

- **HY–GARD®—JDM J20C.**

Other oils may be used if above recommended John Deere oils are not available, provided they meet one of the following specifications:

- John Deere Standard JDM J20D;
- John Deere Standard JDM C.



John Deere Dealers: You may want to cross-reference the following publications to recommend the proper oil for your customers:

- Module DX,ANTI in JDS–G135;
- Section 530, Lubricants & Hydraulics, of the John Deere Merchandise Sales Guide;
- Lubrication Sales Manual PI7032.

CHASSIS GREASE

IMPORTANT: ONLY use a quality grease in this application. DO NOT mix any other greases in this application. DO NOT use any BIO–GREASE in this application.

The following John Deere greases are **PREFERRED**:

- **MOLY HIGH-TEMPERATURE EP GREASE®**—JDM J25C, NLGI Grade 2;
- **HIGH-TEMPERATURE EP GREASE®**—JDM J13E4, NLGI Grade 2.
- GREASE–GARD™—JDM J25C, NLGI Grade 2.

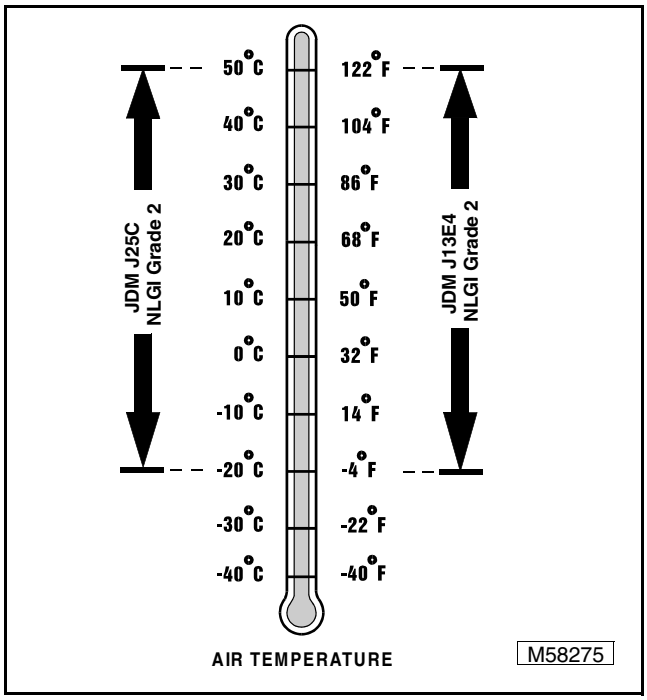
Other greases may be used if above preferred John Deere greases are not available, provided they meet one of the following specifications:

- John Deere Standard JDM J25C, NLGI Grade 2;
- John Deere Standard JDM J13E4, NLGI Grade 2.

IMPORTANT: If minimum air temperature should fall below -10 °C (14 °F), the grease must be heated to at least five degrees above the lower limit before start-up or components may be damaged.

John Deere Dealers: You may want to cross-reference the following publications to recommend the proper grease for your customers:

- Module DX,GREA1 in JDS–G135;
- Section 530, Lubricants & Hydraulics, of the John Deere Merchandise Sales Guide;
- the Lubrication Sales Manual PI7032.



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VEHICLE SPECIFICATIONS

ENGINE

Make	Yanmar
Type	Diesel
Model	2V78
Horsepower (SAEJ1940)	13.4 kW (18 hp)
Cylinders	2, V-twin
Displacement	749 cm^3 (46 cu in.)
Stroke/Cycle	4 Cycle
Bore	78 mm (3.07 in.)
Stroke	78.4 mm (3.09 in.)
Compression Ratio	22:1
Slow Idle	1000 ± 50 rpm
Valves	Overhead
Lubrication	Pressurized
Oil Filter	Full Flow Filter
Cooling System	Liquid Cooled
Coolant Capacity	3.6 L (3.8 U.S. qt)
Air Cleaner	Paper, Dry-type with Primary and Secondary Elements
Muffler	Horizontal discharge below frame
Engine Oil Capacity	
With Filter	2.3 L (2.4 U.S. qt)
Without Filter	2.1 L (2.2 U.S. qt)

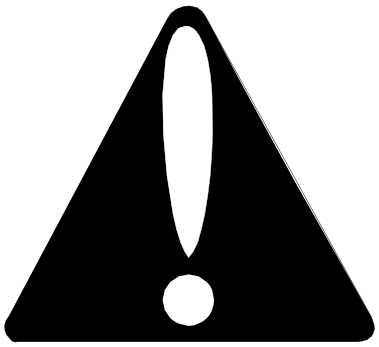
FUEL SYSTEM

Fuel Tank Location	Rear
Fuel Tank Capacity (Total)	14.4 L (3.8 U.S. gal)
Fuel (min. octane)	Diesel, No. 1 or No. 2
Fuel Pump Location	Left Side Frame Rail - Under Hood
Fuel Pump Type	In-line with Electric Shutoff
Fuel Delivery	Indirect Injection
Fuel Shut-Off	Injection Pump
Fuel Filter	Replaceable, In-line
Fuel Gauge	Translucent Fuel Tank

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RECOGNIZE SAFETY INFORMATION



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.

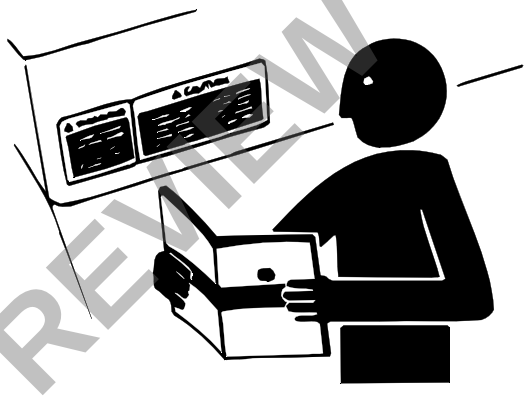
Follow recommended precautions and safe servicing practices.

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

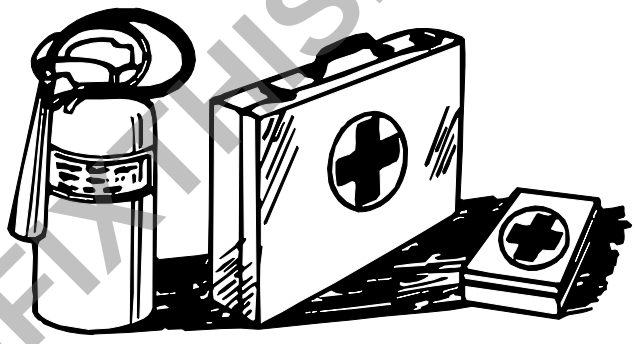


Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

HANDLE FLUIDS SAFELY-AVOID FIRES

Be Prepared For Emergencies





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.

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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.

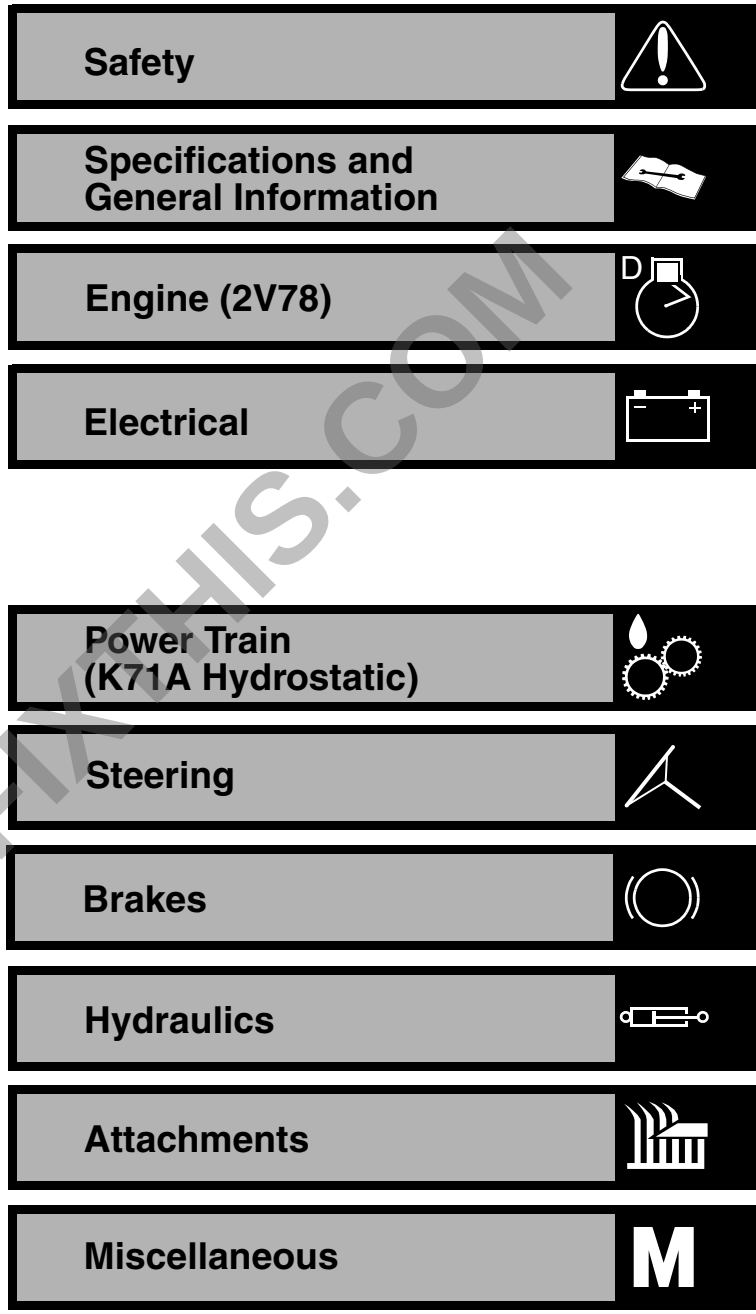
The manual is organized so that all the information on a particular system is kept together. The order of grouping is as follows:

- Table of Contents
- General Diagnostic Information
- Specifications
- Electrical Wiring Harness Legend
- Component Location
- System Schematic
- Wiring Harness
- Troubleshooting Chart
- Theory of Operation
- Diagnostics
- Tests & Adjustments
- Repair

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

Each section will be identified with a symbol rather than a number. The groups and pages within a section will be consecutively numbered.

We appreciate your input on this manual. To help, there are postage paid post cards included at the back. If you find any errors or want to comment on the layout of the manual please fill out one of the cards and mail it back to us.



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Horicon, WI
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7. Remove muffler and gaskets, discard gaskets.
8. Remove all gasket material from mating surfaces.

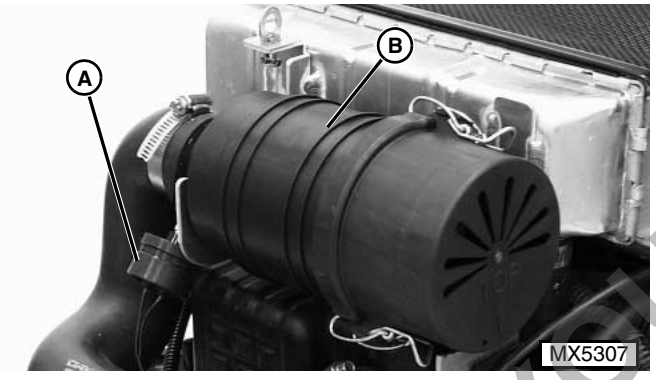
Install:

1. Install muffler with new gaskets. Tighten nuts to **18 – 19 N•m (157 – 173 lb-in.)**.
2. Install heat shield and bumper.
3. Install hood and connect headlights.

INTAKE MANIFOLD—REMOVE AND INSTALL

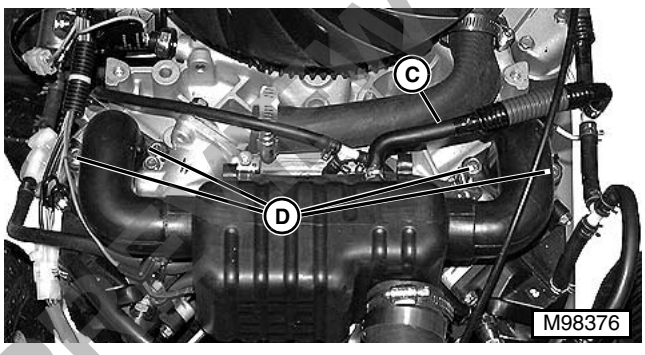
Remove:

1. Allow engine to cool.
2. Disconnect headlights and remove hood.

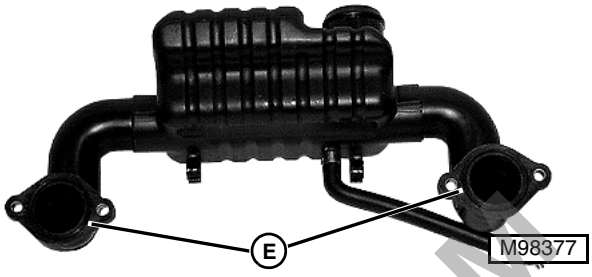


3. Disconnect air restriction indicator sensor wiring connector (A).
4. Remove air cleaner assembly (B).

.



5. Remove cap screws (D) and breather hose (C).
6. Remove intake manifold.



7. Inspect condition of intake manifold and seals (E). Replace if damaged.

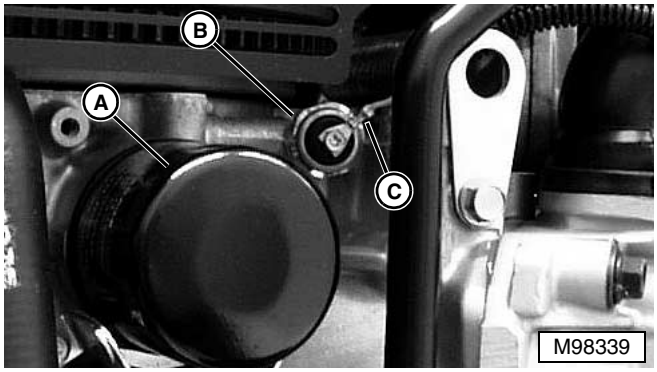
Install:

1. Install manifold and tighten cap screws to **8 – 9 N•m (70 – 86 lb-in).**
2. Install air cleaner assembly.
3. Install hood and connect headlights.

OIL PRESSURE SENSOR—REMOVE AND INSTALL

Remove:

1. Allow engine to cool.
2. Disconnect negative battery cable.



3. Disconnect wiring lead (C) from oil pressure sensor (B) on right side of engine, by the oil filter (A).
4. Remove sensor from engine.
5. Replace oil pressure sensor as necessary.

Install:

1. Apply John Deere General Purpose Sealant (TY15934) or equivalent to threads of sensor and install. DO NOT over-tighten.
2. Connect wiring lead to oil pressure sensor.
3. Connect negative battery cable.

NOTE: Export and late model Domestic tractors respectively—hold hood switch closed or make sure blue jumper wire is good.

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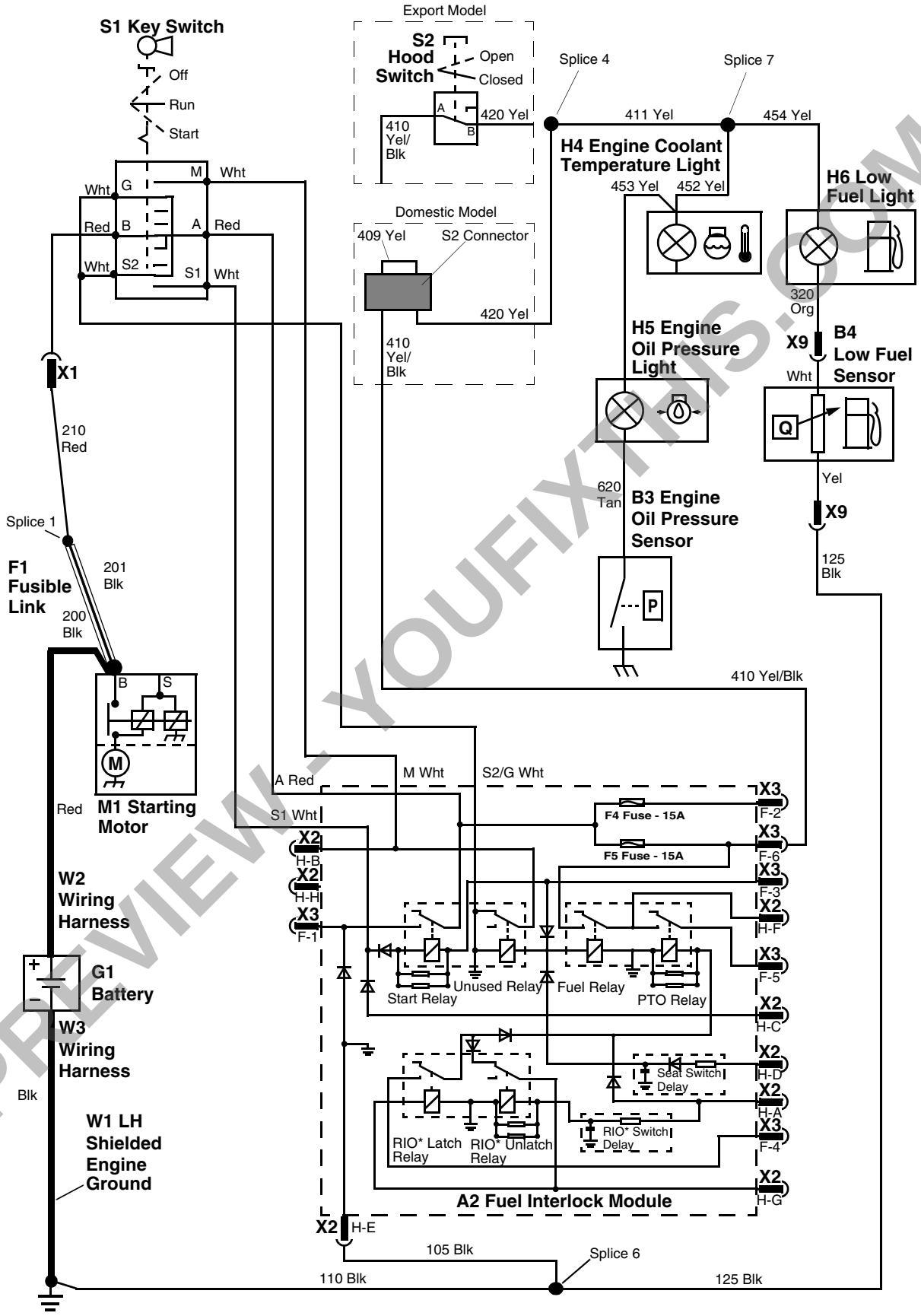
SWITCHED POWER CIRCUIT #2 DIAGNOSIS—GX355

Test/Check Point	Normal	If Not Normal
6. Voltage check at S5 brake switch.	Battery voltage on wire 710 Pur. **Go To Step 7.**	Make certain S5 switch is actuated. Check voltage on wire 705 Pur/Blk. • If voltage on wire 705 Pur/Blk but not 710, replace S5 switch. • If no voltage, **Go To "SWITCHED POWER CIRCUIT #1 DIAGNOSIS—GX355" on pag e26 Step 8.**
7. Voltage check at A2 fuel interlock module connector X3—terminal F-3.	Battery voltage on wire 710 Pur.	Check for voltage at S5 switch on wire 710 Pur. • If voltage, check for broken 710 Pur wire between S5 switch and A2 fuel interlock module. • If no voltage, **Go To Step 6.**

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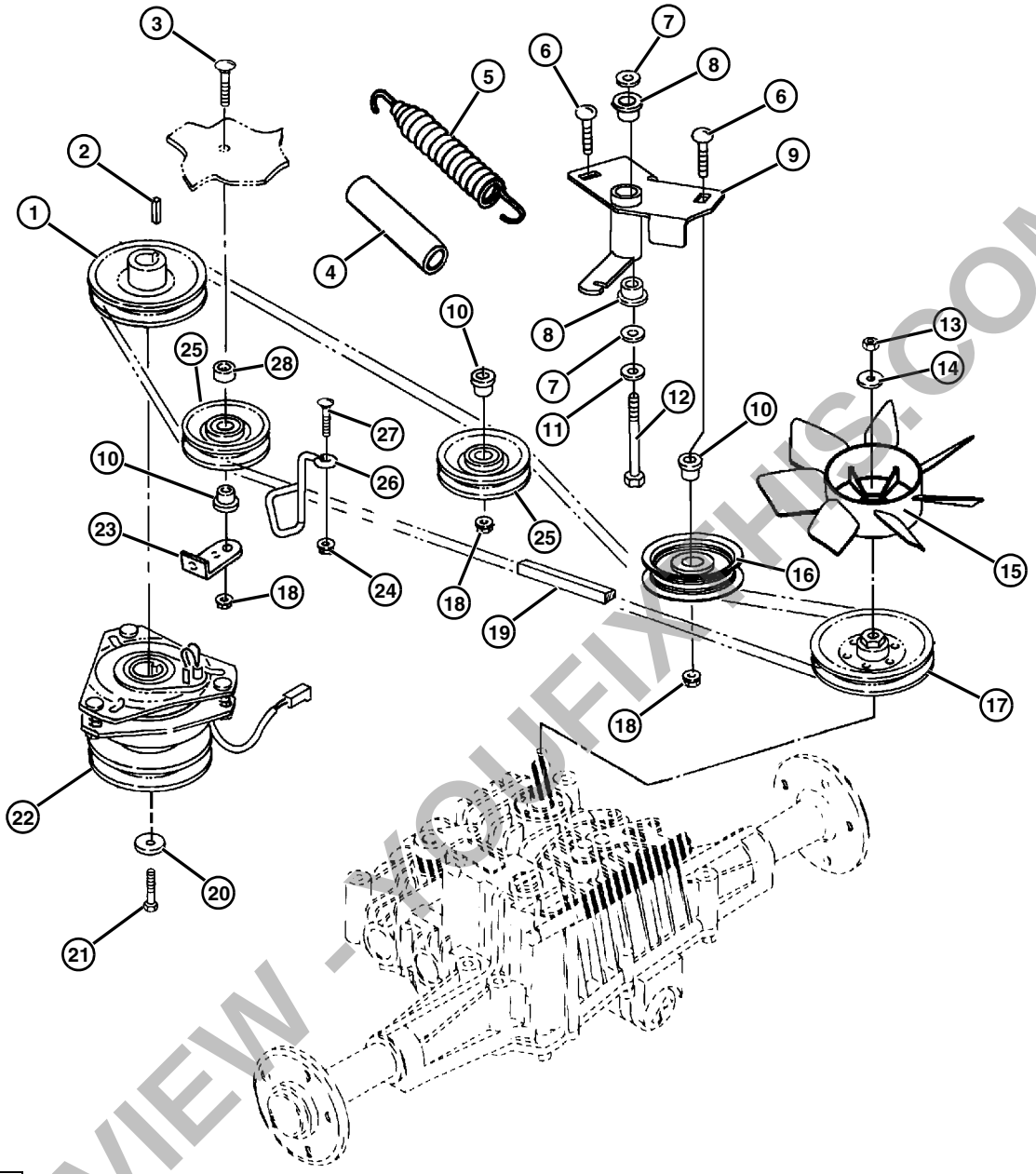
OIL PRESSURE & LOW FUEL SENSOR CIRCUIT SCHEMATIC—GX355



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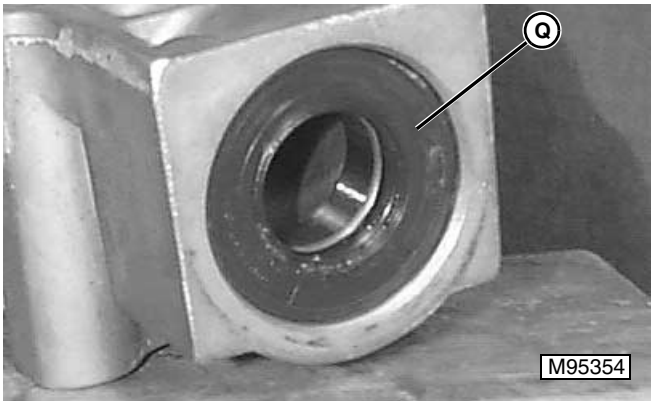
BELT DRIVE AND IDLERS



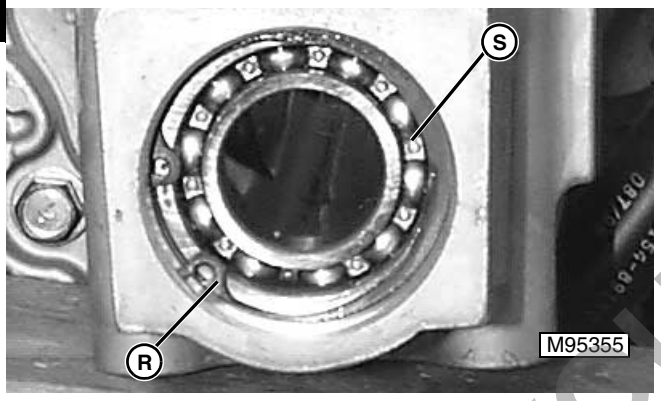
1. Engine Sheave
2. Shaft Key
3. Carriage Bolt
4. Traction Spring Hose
5. Spring
6. Carriage Bolt
7. Seal
8. Bushing
9. Idler Arm
10. Bushing
11. Washer
12. Cap Screw
13. Lock Nut
14. Washer
15. Fan Blade
16. Flat Idler
17. Transmission Sheave
18. Flange Nut
19. Belt
20. Washer
21. Screw
22. Clutch
23. Angle
24. Flange Nut
25. V-Idler Sheave
26. Guide
27. Carriage Bolt
28. Bushing

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13. Remove seals (Q) from case.

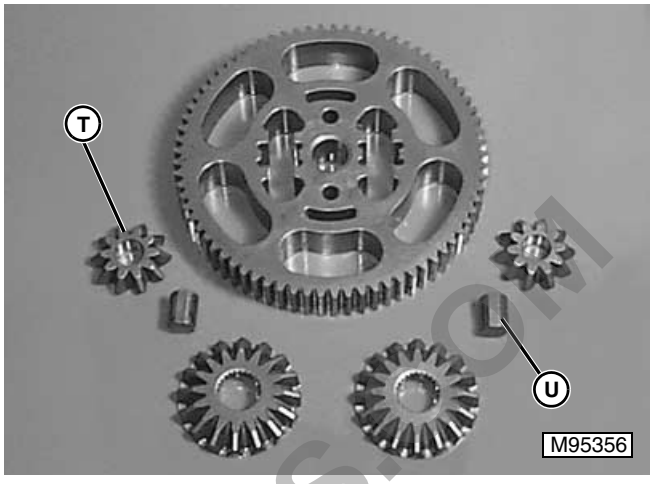


14. Remove snap rings (R) and bearings (S).
15. Inspect bearings for wear or damage. Replace if needed.
16. Inspect bearing surfaces of axle shafts for wear or damage. Measure OD of both axle shafts, and ID of both bushings. Replace parts as needed if clearance is greater than maximum allowed.

Specifications:

Bushing ID . . . . 25.38 - 25.52 mm (0.999 - 1.005 in.)
Axle OD . . . . . 25.27 - 25.37 mm (0.995 - 0.999 in.)
Clearance (maximum) . . . . . 0.5 mm (0.020 in.)

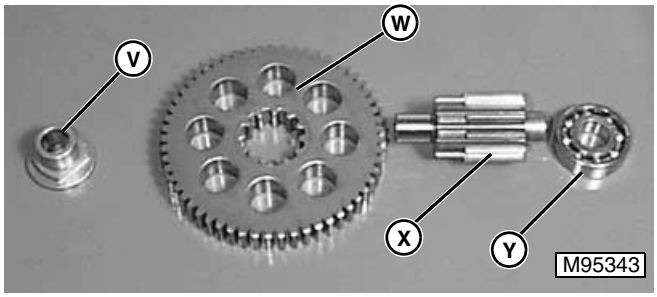
NOTE: Replace axle shaft seals with new seals when assembling transaxle.



17. Inspect differential gear assembly for wear or damage. Replace parts as needed.
18. Measure ID of differential pinion gears (T) and OD of differential pinion shaft (U). Replace parts as needed if clearance is greater than maximum allowed.

Specifications:

Pinion Gear ID
. . . . . 17.00 - 17.06 mm (0.669 - 0.672 in.)
Pinion Shaft OD
. . . . . 16.90 - 16.98 mm (0.665 - 0.668 in.)
Clearance (maximum) . . . . . 0.5 mm (0.020 in.)



19. Remove bearing (Y), pinion gear (X), and bushing (V) from reduction gear (W).
20. Inspect components for wear or damage. Replace if needed.
21. Measure ID of bushing and OD of bearing surfaces on pinion gear. Replace bushing and/or pinion gear if clearance is greater than maximum allowed.

Specifications:

Reduction Pinion Gear ID
. . . . . 15.05 - 15.13 mm (0.592 - 0.597 in.)
Reduction Shaft OD
. . . . . 14.97 - 14.99 mm (0.589 - 0.590 in.)
Clearance (maximum) . . . . . 0.5 mm (0.020 in.)

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STEERING SHIMMY OR VIBRATION

Test Conditions:

- Key switch in OFF position.
- Machine parked on level surface.
- Parking brake ENGAGED.
- Transmission in NEUTRAL.

Test/Check Point	Normal	If Not Normal
1. Front axle spindles.	Axle bushings lubricated. Turns with little resistance with no side freeplay.	Lubricate axle bushings. Replace worn or damaged axle or spindles.
2. Tie rod.	Tie rod not bent. Rod ends are tight. Toe-in within specification.	Replace parts if necessary. Perform Toe-In Adjustment.
3. Steering cylinder ball joint.	Ball joint is tight, not worn and properly lubricated. Rod not bent.	Tighten, lubricate or replace if necessary. Replace if necessary.
4. Tires and wheels.	Correct size, matched circumference. Rims not bent. Tires running true (no wobble). No excessive play in wheel hubs. Wheel bearings lubricated and not rough. Tires inflated to correct air pressure.	Replace as needed. Lubricate or replace as necessary. Inflate tires to recommended pressure.

NOISE DURING TURN

Test Conditions:

- Machine parked on level surface.
- Parking brake ENGAGED.
- Transmission in NEUTRAL.
- Steering cylinder disconnected from steering link.
- Hydraulic oil at operating temperature.
- Engine running at **fast idle**.

Test/Check Point	Normal	If Not Normal
1. Steering wheel.	Steering wheel turns smoothly with no binding. Steering cylinder extends and retracts. Maximum of 3 revolutions of steering wheel to fully extended cylinder. Compare steering effort with cylinder connected.	Steering cylinder does not move. Go to step 3. Steering cylinder moves. Go to step 4. Steering wheel revolutions more than three. Go to step 4.

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SPECIFICATIONS

MOWER DECK ADJUSTMENT SPECIFICATIONS

Side-to-Side Blade Height Difference (Maximum) . . . . . 3 mm (0.125 in.)
Front-to-Rear Blade Height Difference
48C and 54C . . . . . 3 – 6 mm (0.125 – 0.250 in.) front lower than rear

MOWER DECK REPAIR SPECIFICATIONS

48-Inch and 54-Inch Convertible Mower Decks:

Gauge Wheels
Roller Shaft Nut Torque. . . . . 30 N•m (22 lb-ft)
Idlers and Sheaves
Jack Sheave Nut Torque. . . . . 136 N•m (100 lb-ft)
Tensioning Idler Sheave Nut Torque. . . . . 27 N•m (20 lb-ft)
Spindle
Mounting Nut Torque. . . . . 27 N•m (20 lb-ft)
Sheave Nut Torque . . . . . 145 N•m (106 lb-ft)
Lower Seal Installation Position . . . . . 7.3 mm (0.29 in.) below hub flange
Blade
Blade Cap Screw Torque . . . . . 68 N•m (50 lb-ft)
Cutting Edge Width . . . . . 0.40 mm (0.016 in.)

SPECIAL TOOLS

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

RECOMMENDED TOOLS

Number	Name	Use
TY15272	Blade Height Gauge	Use to check mower side-to-side level.

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