JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER EQUIPMENT DIVISION

Professional Greens Mower
2500, 2500A, and 2500E

TM1757 DEC05

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
Gas Engine
Diesel Engine
Electrical
Power Train
Hydraulics
Steering
Brakes
Attachments
Miscellaneous

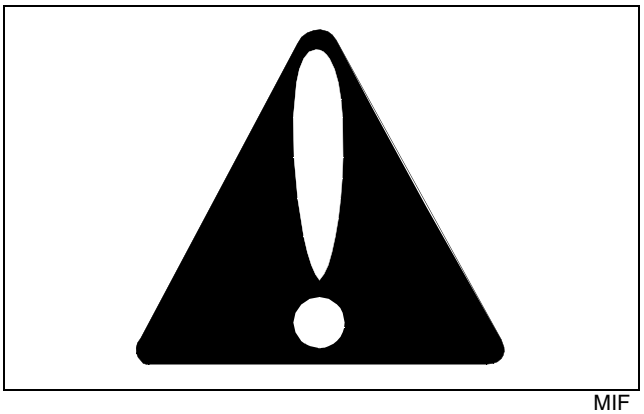
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Recognize Safety Information



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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.

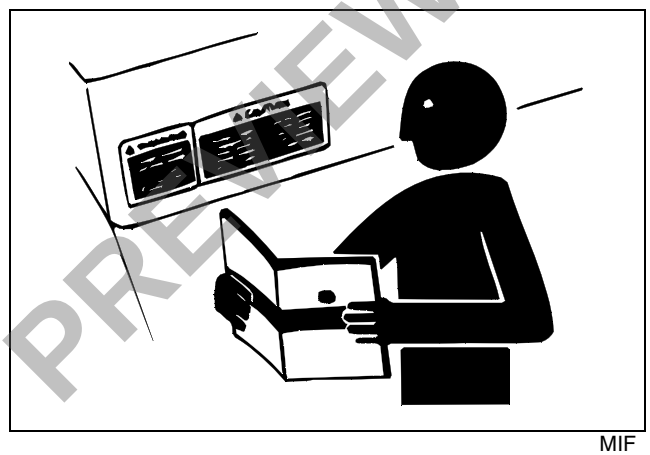
Follow recommended precautions and safe servicing practices.

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

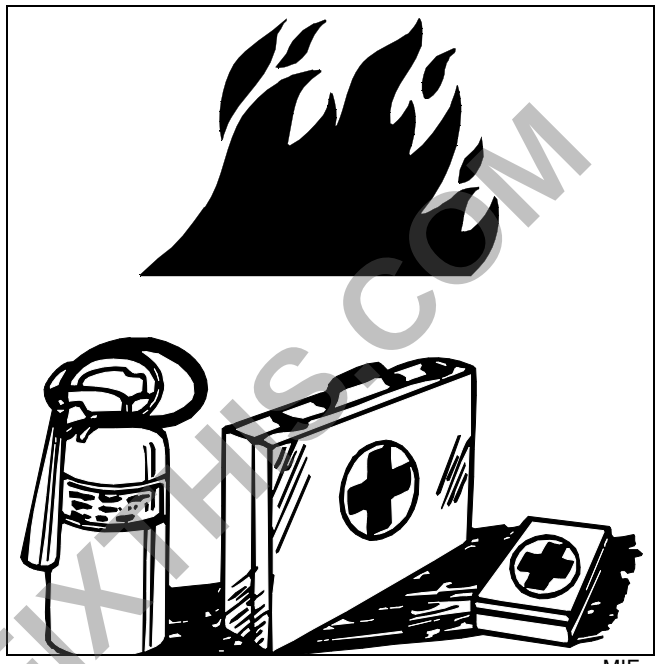


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Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

Handle Fluids Safely - Avoid Fires

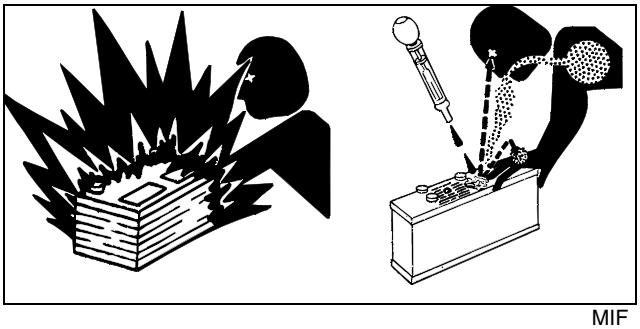
Be Prepared For Emergencies



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- 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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Specifications

General Vehicle Specifications

NOTE: Specifications and design subject to change without notice.

Gasoline Engine

Make	Kawasaki
Type	4 Cycle, V-Twin
Model	FD620D
Displacement	617 mL (37.7 cu in.)
Aspiration	Natural
Cooling System	Liquid cooled
Cooling System Capacity	3.5 L (3.7 qt)
Lubrication	Full pressure
Engine Oil Capacity (With Filter)	1.9 L (2.0 qt)
Oil Filter	Replaceable, full flow
Valving	Overhead valves
Air Cleaner	Paper element with foam pre-cleaner
Bore	79 mm (3.11 in.)
Stroke	68 mm (2.68 in.)
Compression Ratio	9.0:1
Slow Idle	1550 ± 100 rpm
Fast Idle	3400 ± 50 rpm

Fuel System - Gasoline Engine

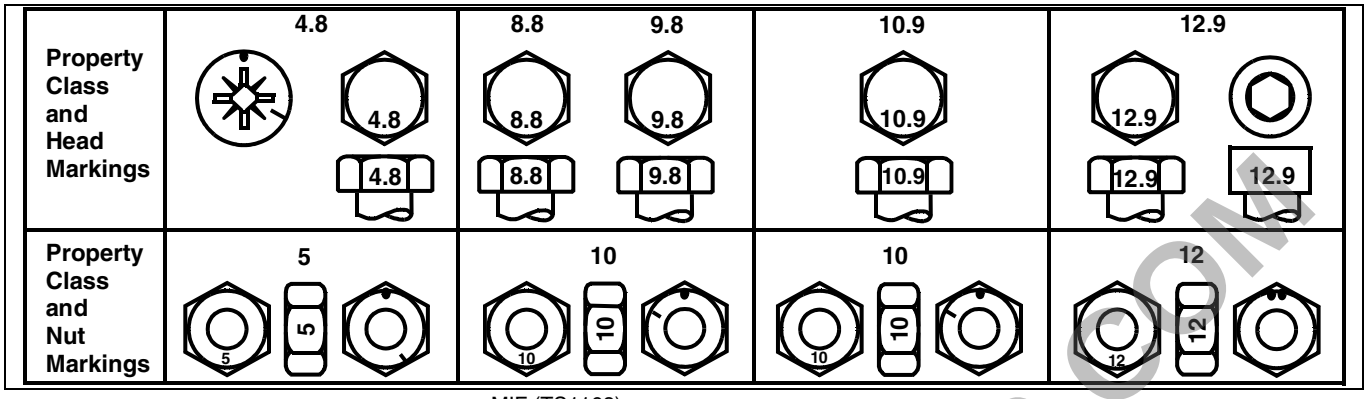
Fuel Tank Location	Behind operator seat
Fuel Tank Capacity	32.2 L (8.5 gal)
Fuel (Minimum Octane)	Unleaded gasoline, 87 octane
Fuel Delivery	Electric fuel pump
Carburetor	Float-type, down draft
Fuel Filter	Replaceable element
Gasoline/Alcohol Blends	Up to 10% Ethyl Alcohol/90% Unleaded (by volume)
Gasoline/Ether Blends	Up to 15% MTBE/85% Unleaded (by volume)
Fuel Shutoff Solenoid	Below carburetor float bowl

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Repair Information

Metric Fastener Torque Values



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	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[1]		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

1. "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.

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 class. 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.

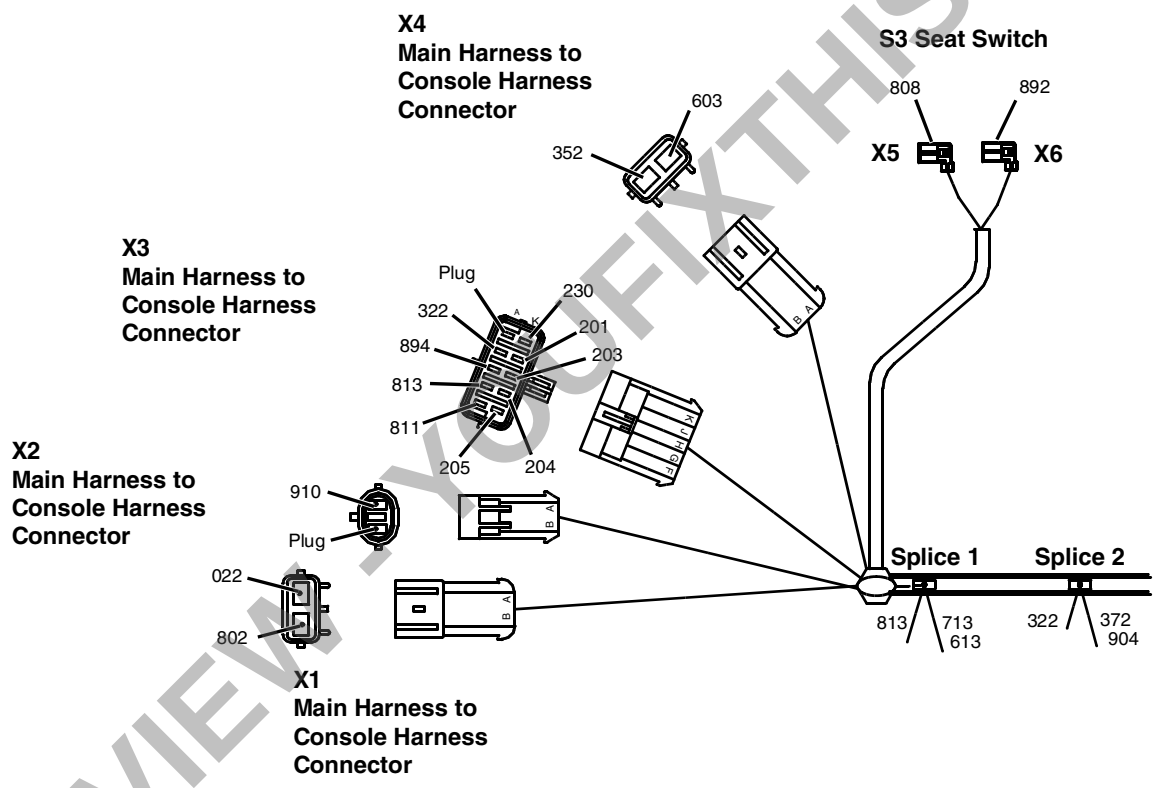
Reference: JDS-G200.

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Main Wiring Harness (W1) - Gasoline Engine

Main Wiring Harness (W1) - Gasoline Engine (1 of 4)



MX84557AA (MIF)

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Schematics and Harnesses

Schematic and Wiring Harness Legend - Gasoline Engine

Component

A1 - Ignition Module (SE3, W7)

A2 - Ignition Delay Module (SE3, W9)

A3 - Electronic Control Module (SE4, W1)

A4 - Right Reel Motor Control Module (SE16) Model 2500E

A5 - Left Reel Motor Control Module (SE16) Model 2500E

A6 - Center Reel Motor Control Module (SE16) Model 2500E

B1 - Pulser Coil (SE3, W8)

B2 - Pulser Coil (SE3, W8)

B3 - Engine Oil Pressure Switch (SE12, W5)

B4 - Engine Coolant Temperature Switch (SE12, W5)

B5 - Hydraulic Oil Temperature Switch (SE12, W1)

B6 - Not Used

B7 - Not Used

B8 - Not Used

E1 - Spark Plug (SE3)

E2 - Spark Plug (SE3)

E3 - Warning Light Module (SE12, W3[1], W17[2])

E4 - Right Headlight (SE13, W12)

E5 - Left Headlight (SE13, W12)

E6 - Rear Grass Catcher Light (SE13, W12)

F1 - Fuse Link (SE1, W1)

F2 - Fuse Link, 15-Amp (SE1, W1)

F3 - Fuse,15-Amp (SE1, W1)

F4 - Fuse Link (SE13, W12)

G1 - Battery (SE1)

G2 - Stator (SE2, W6)

G3 - Not Used

G4 - 48 Volt Alternator (SE16) Model 2500E

H1 - Not Used

H2 - Discharge Light (SE12)

H3 - Engine Oil Pressure Light (SE12)

H4 - Engine Coolant Temperature Light (SE12)

H5 - Hydraulic Oil Temperature Light (SE12)

H6 - Reel Motor Control Module Diagnostic Light (SE16) Model 2500E

K1 - Starting Motor Relay (SE1, W1)

K2 - Headlight Relay (SE13, W12)

K3 - Not Used

K4 - Not Used

M1 - Starting Motor (SE1)

M2 - Fuel Pump (SE3, W1)

M3 - Right Reel Motor (SE16) Model 2500E

M4 - Left Reel Motor (SE16) Model 2500E

M5 - Center Reel Motor (SE16) Model 2500E

N1 - Voltage Regulator/Rectifier (SE2, W1)

N2 - Not Used

P1 - Hour Meter (SE11, W3[1], W17[2])

R1 - Reel Motor Speed Control (SE16)

S1 - Key Switch (SE1, W3[1], W17[2])

S2 - Brake Switch (SE4, W1)

S3 - Seat Switch (SE4, W1)

S4 - Backlap Switch (SE5, W1) Models 2500, 2500A

S5 - Mow/Transport Switch (SE6, W1)

S6 - Raise Switch (Console) (SE8, W3) Models 2500, 2500A (S.N. -020000)

S7 - Raise Switch (Floor) (SE9, W1)

S8 - Lower Switch (Console) (SE8, W3) Models 2500, 2500A (S.N. -020000)

S9 - Lower Switch (Floor) (SE9, W1)

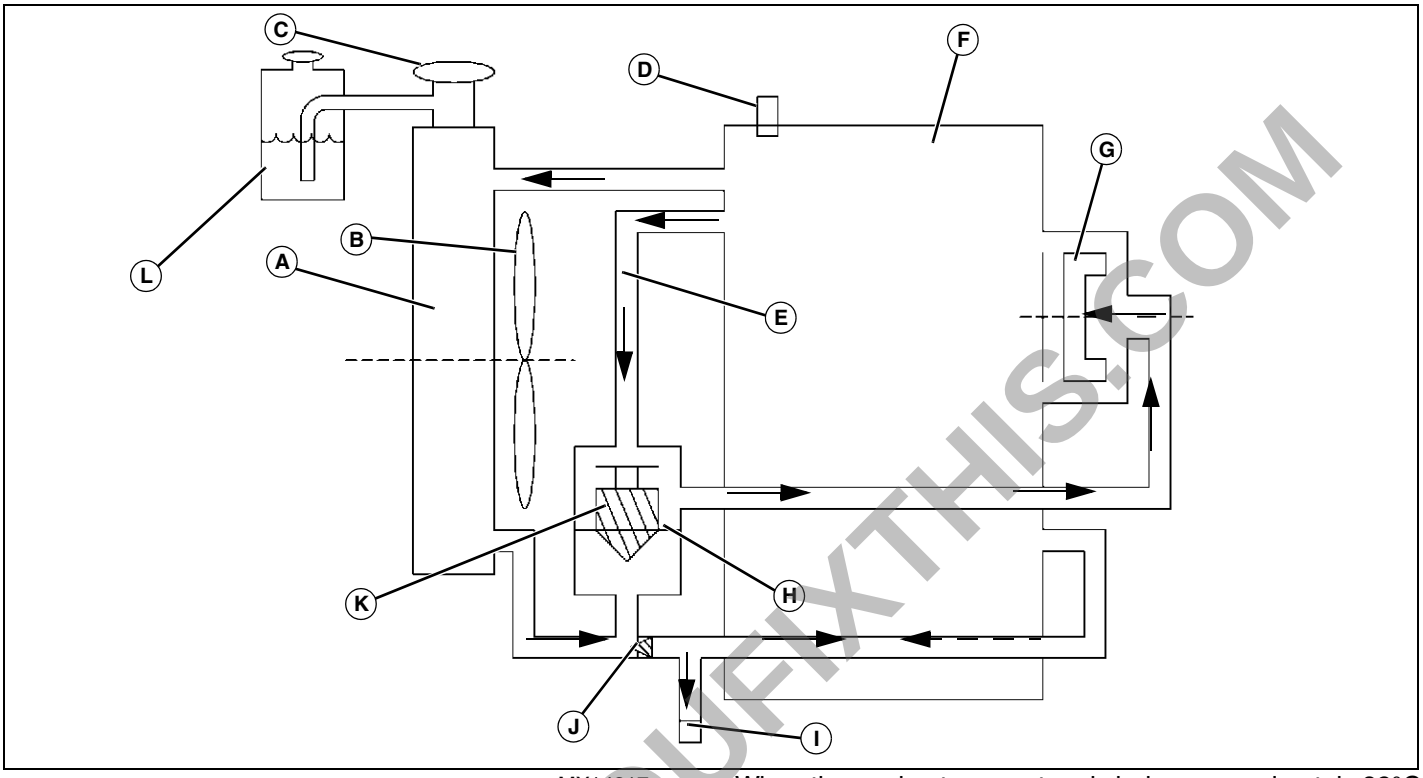
S10 - Headlight Switch (SE13, W3[1], W17[2])

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Theory of Operation

Cooling System Operation



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- **A - Radiator**
- **B - Cooling Fan**
- **C - Radiator Cap**
- **D - Coolant Temperature Switch**
- **E - Bypass Tube**
- **F - Engine Block**
- **G - Coolant Pump**
- **H - Jiggle Valve**
- **I - Drain Plug**
- **J - Valve, One Way**
- **K - Thermostat**
- **L - Coolant Recovery Tank**

Function

The coolant pump (G) circulates coolant through the cooling system, drawing hot coolant from the engine block (F), and circulating it through the radiator (A) for cooling.

System Operation

The impeller-type coolant pump draws coolant from the bottom of the radiator when the thermostat (K) is open, or from the bypass tube (E) when the thermostat is closed. Coolant from the coolant pump flows to the water jackets in the block, up through cylinder heads, intake manifold, past the coolant temperature switch (D).

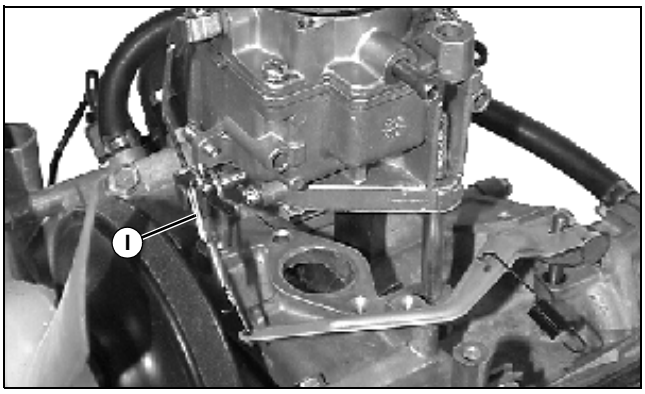
When the engine temperature is below approximately 82°C (180°F), the thermostat is closed and coolant is directed back to the coolant pump through the bypass tube to be recirculated. This allows the engine to warm up to operating temperature quickly.

When the engine temperature is approximately 82°C (180°F), the thermostat begins to open and is fully open at 95°C (203°F). Coolant from the water jackets and cylinder heads now flow through the radiator, which is cooled by the cooling fan (B). The fan is driven by a belt off the crankshaft pulley. If the engine coolant temperature rises to 111°C (232°F), the coolant temperature switch (D) closes and turns on a warning light on the instrument panel, warning you of a potentially dangerous overheating situation.

The radiator cap (C) maintains a pressure of 78-98 kPa (11.3-14.2 psi) in the cooling system, which actually raises the boiling point of the coolant. The radiator cap contains a pressure valve and a vacuum valve. When the coolant is hot and pressure is above 98 kPa (14.2 psi), the pressure valve opens, allowing some coolant to flow to the recovery tank. After the engine is stopped, the coolant cools and the pressure inside the radiator decreases. The pressure difference between the radiator and recovery tank forces the vacuum valve open and some coolant from the recovery tank flows back to the radiator.

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8. Lift carburetor and disconnect throttle link arm (I).

Installation

Installation is done in the reverse order of removal.

- Use a new gasket for installation.
- Tighten carburetor/air cleaner base plate mounting flanged nuts to specification.

Specifications

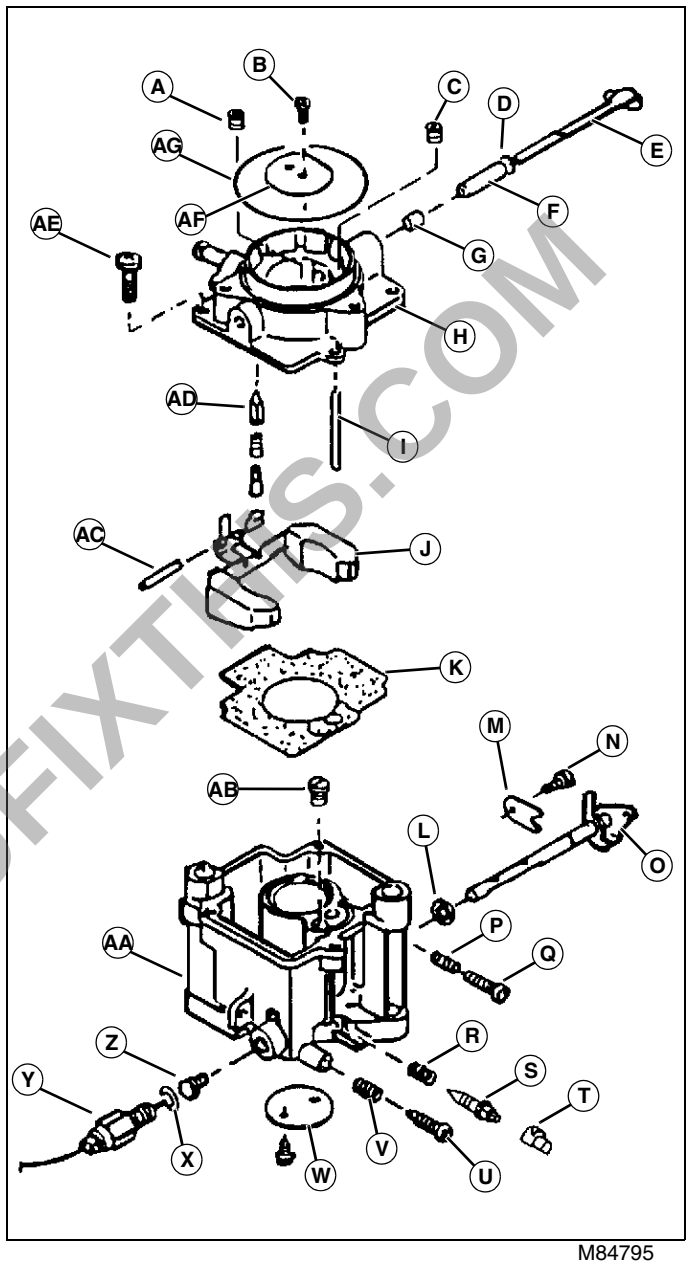
Carburetor/Air Cleaner Base Plate Mounting Nuts . . . . . 17 N•m (144 lb-ft)

Disassemble and Assemble Carburetor

CAUTION: Avoid Injury! Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. DO NOT smoke, and make sure the area is well ventilated and free from any source of flame or sparks.

IMPORTANT: Avoid damage! There are a number of boil plugs on/in the carburetor that should not be removed.

IMPORTANT: Avoid damage! To remove float, use a long-nosed pliers on the deformed end of the pin. DO NOT strike opposite end of pin. Damage to pin holder may result.

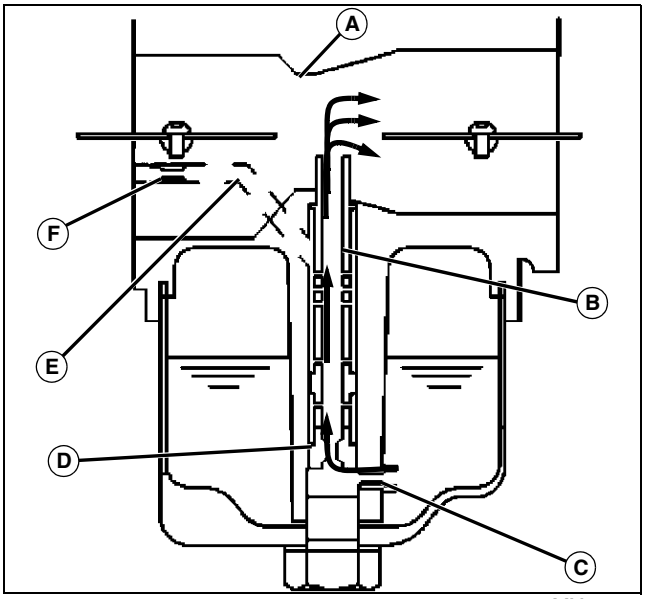


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(idle mixture screw) out (counterclockwise) enrichens the mixture; turning it in (clockwise) leans the mixture.



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Main Fuel Circuit

The main fuel circuit consists of the main jet (C), fuel shut-off valve seat (D), main nozzle (B), main air passage (E), and main air orifice (F). The main system meters fuel to the engine during moderate to heavy load conditions.

The throat of the carburetor incorporates an area having a reduced diameter called a venturi (A). As air passes through the venturi, it increases in speed resulting in a low pressure area. The main nozzle (B) is located in the venturi area. The pressure differential between the fuel in the float chamber and the venturi (A) causes the fuel to be “lifted” through the main nozzle (B).

The main jet (C) controls the amount of fuel that passes into the main nozzle (B). Fuel flows through the main jet (C) and into the main nozzle (B), where it is joined by air from the main air passage (E) to create an air/fuel emulsion that is easier to “lift”. The main air orifice (F) controls air flow through the main air passage (E). The resulting emulsion flows out the end of the main nozzle (B) into the carburetor bore, where it is atomized by the high speed air flow, and carried into the engine.

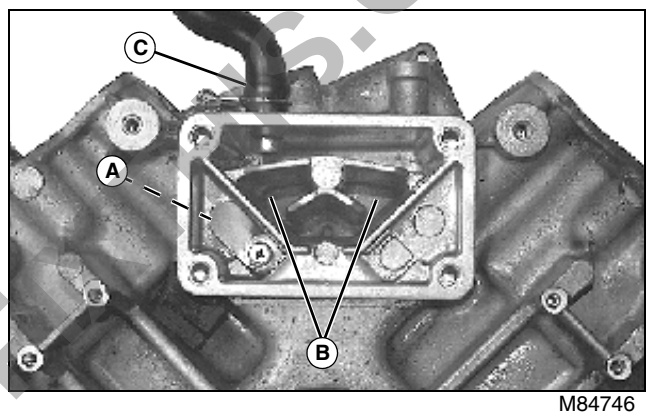
The fuel shutoff solenoid is mounted to the carburetor and shuts off fuel to the main jets, preventing gas fumes from escaping into the air for emission control. An ignition delay module is used with the fuel shutoff solenoid to prevent backfire. The ignition delay module allows the spark plugs to fire for one additional second after the key switch is turned off to burn any remaining fuel in the cylinders.

The throttle control lever, which is connected to the throttle lever and the governor lever, controls engine rpm. The governor lever is connected to the throttle valve inside the carburetor. Slow idle is adjusted by turning the slow idle stop screw and fast idle is adjusted by moving the throttle control plate.

Crankcase Breather Operation

Function

The function of the breather is to create a vacuum in the crankcase which prevents oil from being forced out of the engine through the piston rings, oil seals or gaskets.



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The breather has a reed valve (A), which limits the direction of air flow caused by the piston moving up and down. Air can flow out of the crankcase, but the one way reed valve blocks return flow. It thus maintains a vacuum in the crankcase.

Oil laden air in the crankcase passes through the reed valves and expands into the breather chamber. Here most oil separates from the air and drains back to the crankcase. The air passes through a maze (B) and vents to the air cleaner (C).

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Symptom: Engine Cranks but Will Not Start.

(15) Is carburetor clean and free of any build-up in fuel and air passages? (See "Remove and Install Carburetor" on page 89.)

No - Clean carburetor as necessary.

Symptom: Engine Malfunctions at Low RPM

(1) Is governor linkage adjusted properly? (See "Installation" on page 107.)

Yes - Go to step (2).

No - Adjust governor linkage.

(2) Is choke adjusted properly? (See "Adjust Choke Cable" on page 55.)

Yes - Go to step (3).

No - Adjust choke.

(3) Is slow idle speed adjusted properly? (See "Adjust Slow Idle Speed" on page 55.)

Yes - Go to step (4).

No - Adjust slow idle speed.

(4) Does the ignition system produce a steady, strong blue spark. (See "Test Spark" on page 54.)

Yes - Go to step (5).

No - Follow "Results" of the test spark procedure.

(5) Is engine coolant temperature within normal operating range - engine not overheating?

Yes - Go to step (6).

No - Check for properly tensioned fan belt.

No - Find and repair cause of cooling system malfunction.

(6) Is cylinder compression within specification? (See "Check Compression" on page 57.)

Yes - Go to step (7).

No - Repair or replace engine as necessary. (See "Remove and Install Engine" on page 100.) (See "Disassemble and Assemble Cylinder Head and Valves" on page 95.) (See "Inspect Cylinder Head and Valves" on page 96.) (See "Inspect Piston and Connecting Rod" on page 110.)

(7) Are valves properly adjusted? (See "Check and Adjust Valve Clearance" on page 58.)

Yes - Go to step (8).

No - Adjust valve clearance.

Symptom: Engine Malfunctions at Low RPM

(8) Are carburetor/throttle body and intake manifold flanges properly sealed - no air leaks.?

Yes - Go to step (9).

No - Seal flanged surfaces as required. (See "Remove and Install Carburetor" on page 89.) (See "Remove and Install Intake Manifold" on page 92.)

(9) Is carburetor clean and free of any build-up in fuel and air passages? (See "Remove and Install Carburetor" on page 89.)

Yes - Go to step (10).

No - Clean carburetor as necessary.

(10) Is governor gear assembly in good condition with no binding?

No - Repair as necessary. (See "Remove Governor Assembly" on page 124.) (See "Install Governor Assembly" on page 124.)

Symptom: Engine Malfunctions at High RPM

(1) Is choke adjusted properly? (See "Adjust Choke Cable" on page 55.)

Yes - Go to step (2).

No - Adjust choke.

(2) Is governor spring in good condition?

Yes - Go to step (3).

No - Replace governor spring.

(3) Is fast idle speed adjusted properly? (See "Adjust Fast Idle Speed" on page 56.)

Yes - Go to step (4).

No - Adjust fast idle speed.

(4) Does the ignition system produce a steady, strong blue spark. (See "Test Spark" on page 54.)

Yes - Go to step (5).

No - Follow "Results" of the test spark procedure. Go to step (5) if problem continues.

(5) Do ignition coils test OK? (See "Test Ignition Coil - Gasoline Engine" on page 548.)

Yes - Go to step (6).

No - Replace ignition coil(s).

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Fuel

Using Proper Fuel

Using Proper Fuel (Diesel)

Use the proper diesel fuel to help prevent decreased engine performance and increased exhaust emissions. Failure to follow the fuel requirements listed below can void your engine warranty.

Contact your local fuel distributor for properties of the diesel fuel in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or ASTM D975 are recommended.

Required Fuel Properties

In all cases, the fuel shall meet the following properties:

Cetane number of 45 minimum. Cetane number greater than 50 is preferred, especially when temperatures are below -20°C (-4°F) or elevations above 1500 m (5000 ft).

Cold Filter Plugging Point (CFPP) below the expected low temperature OR **Cloud Point** at least 5°C (9°F) below the expected low temperature.

Fuel lubricity should pass a minimum load level of 3100 grams as measured by ASTM D6078 or maximum scar diameter of 0.45 mm as measured by ASTM D6079 or ISO 12156-1.

If a fuel of low or unknown lubricity is used, addition of John Deere PREMIUM DIESEL FUEL CONDITIONER at the specified concentration is recommended.

Sulfur Content

- Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.
- Sulfur content less that 0.05% (500 ppm) is recommended for best performance.
- Diesel fuel sulfur content greater than 0.5% (5000 ppm) should not be used.

IMPORTANT: Avoid damage! Do not mix diesel engine oil or any other type of lubricating oil with diesel fuel.

Handling and Storing Diesel Fuel

CAUTION: Avoid injury! Handle fuel carefully. Do not fill the fuel tank when engine is running.

Do not smoke while you fill the fuel tank or service the fuel system.

IMPORTANT: Avoid damage! Do not use galvanized containers—diesel fuel stored in galvanized containers reacts with zinc coating in the container to form zinc flakes. If fuel contains water, a zinc gel will also form. The gel and flakes will quickly plug fuel filters and damage fuel injectors and fuel pumps.

- Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.

IMPORTANT: Avoid damage! The fuel tank is vented through the filler cap. If a new cap is required, always replace it with an original vented cap.

- When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel and to prevent water condensation. Contact your fuel supplier for recommendations.

Using Proper Fuel (Gas)

Use regular grade unleaded fuel with an octane rating of 87 octane or higher. Fuel blends containing up to 10% ethanol or up to 15% MTBE reformulated fuel are acceptable. Do not use fuel or additives containing methanol as engine damage can occur.

Always use fresh, clean fuel that is purchased in a quantity that can be used within approximately 30 days, or add fuel stabilizer.

Fuel is blended to give best seasonal performance. To avoid engine performance problems such as hard starting or vapor lock, use in-season fuel. Use fuel during warm weather that was purchased during that season, and use fuel during cold weather that was purchased during that season.

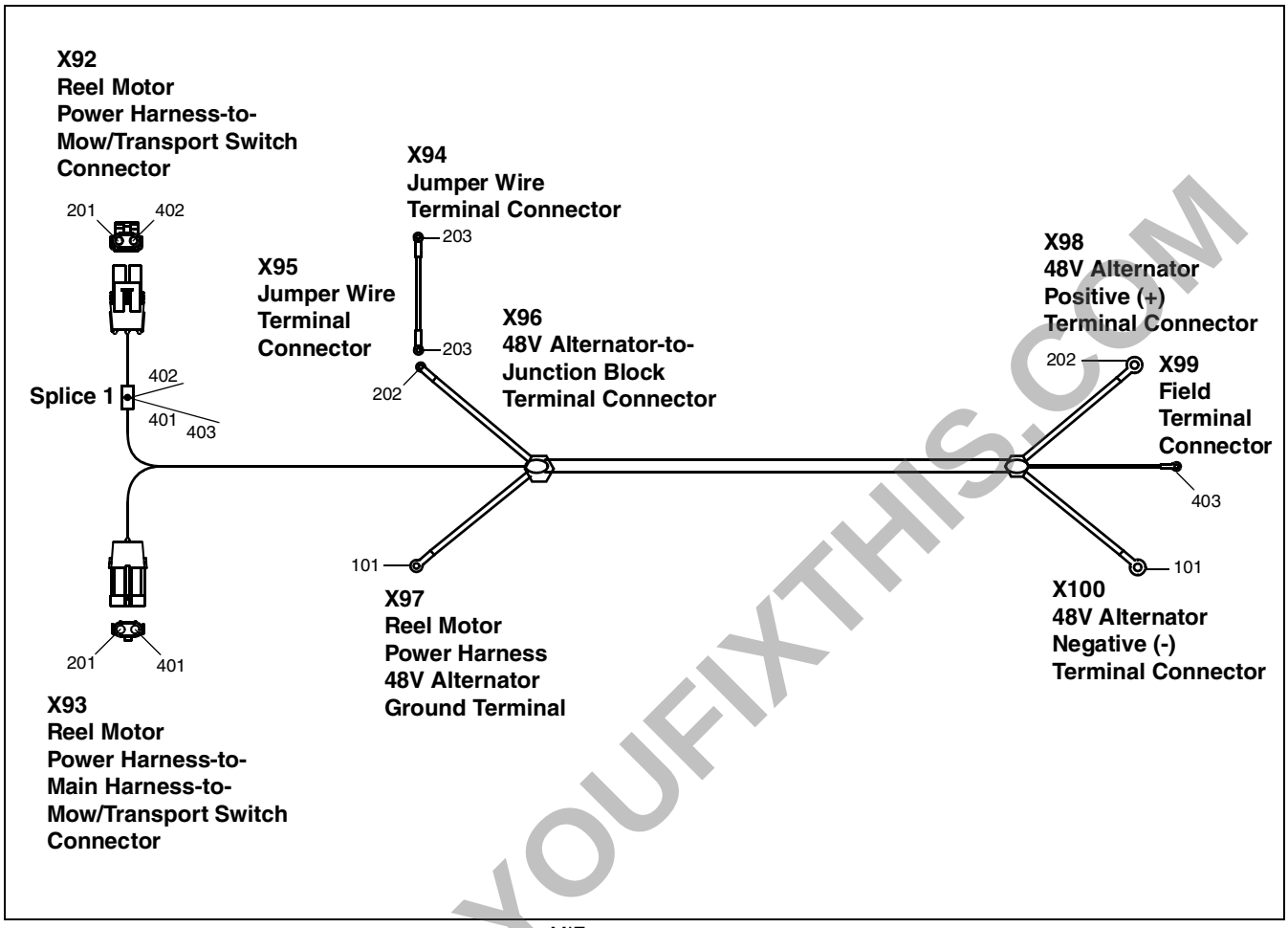
Fuel can become stale in machines with engines that are used seasonally or infrequently during a season. Stale fuel can produce varnish and plug carburetor or injector components which can affect engine performance.

Keep fuel storage container tightly covered and in a cool area out of direct sunlight. Fuel can break down and degrade if not sealed properly or exposed to sun and heat.

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Reel Motor Power Harness (W16)



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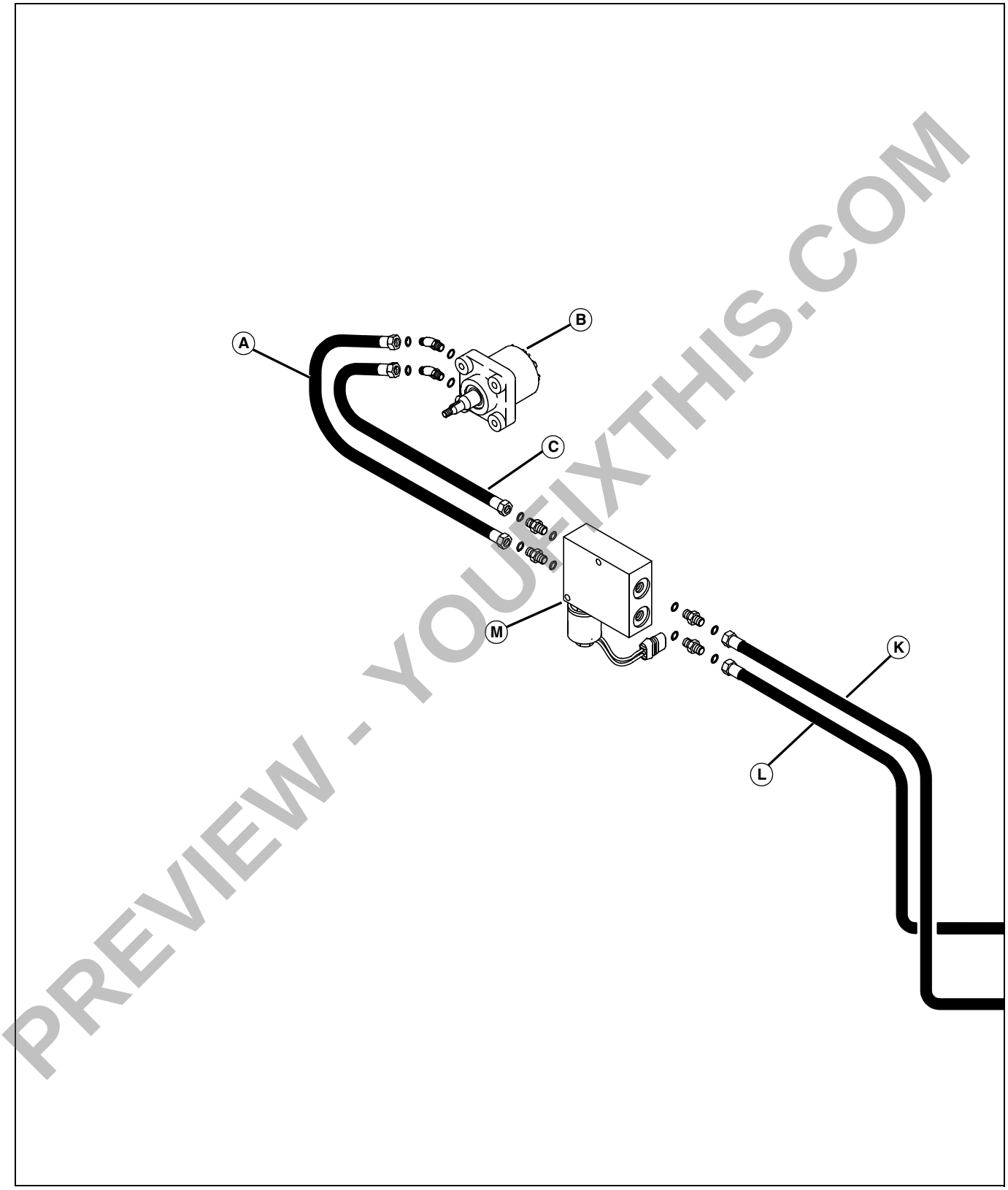
Reel Motor Power Wiring Harness (W16) Wire Code Table - Model 2500E

Circuit Number	Wire Size (mm^2)	Wire Color	Termination Points
101	8.0	Blk	X97, X100
201	0.8	Red	X92 (A), X93 (A)
202	8.0	Red	X96, X98
203	8.0	Red	X94, X95
401	0.8	Yel	X93 (B), Splice 1
402	0.8	Yel	X92 (B), Splice 1
403	0.8	Yel	X99, Splice 1

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Hydraulic System Hose Routing - Motor Drive System



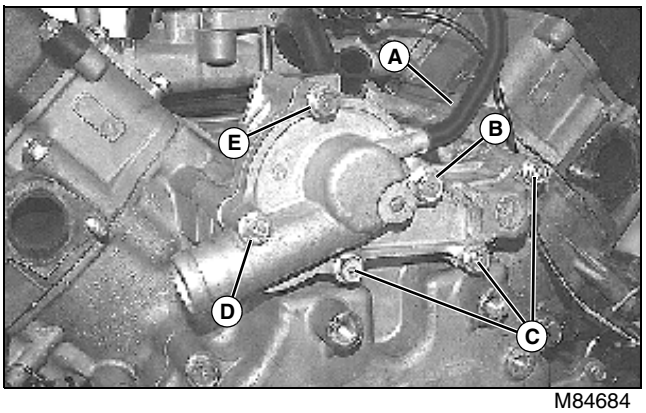
M98518 (MIF)

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M84684

A - Coolant Bypass Hose
B - M8 Cap Screw
C - M6 Cap Screw (45 mm (1.77 in.))
D - M6 Cap Screw (75 mm (2.95 in.))
E - M6 Cap Screw (65 mm (2.56 in.))

4. Loosen tube clamp and disconnect coolant bypass hose (A).

NOTE: Cap screws are different lengths; note location for correct installation.

5. Remove mounting cap screws (B—E), coolant pump, and gasket.

6. Inspect all parts for wear or damage.

Installation

Installation is done in the reverse order of removal.

- Use new gaskets for installation.

NOTE: Be sure coolant pump gear fits together with cam gear when installing pump assembly. DO NOT force pump into position.

Cap screw attaches crankcase cover to crankcase.

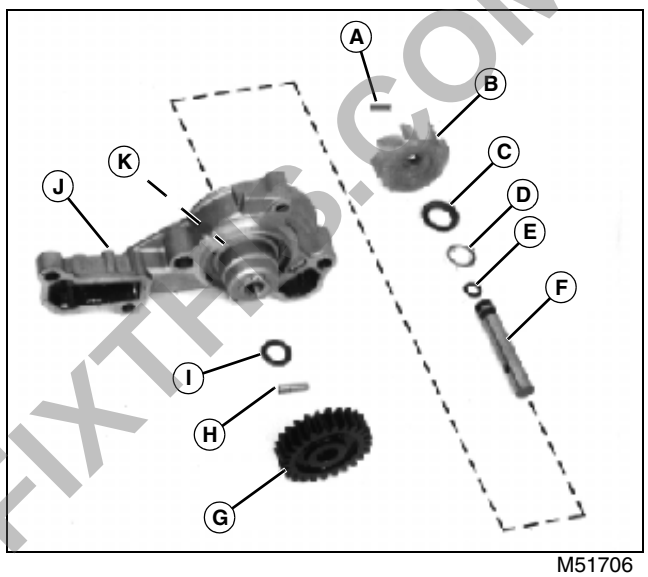
- Tighten cap screws to specification.

Specifications

Coolant Pump Mounting
M6 Cap Screw Torque . . . . . 10 N•m (86 lb-in.)
Coolant Pump Mounting
M8 Cap Screw Torque . . . . . 24 N•m (216 lb-in.)

Disassembly, Inspection and Assembly Coolant Pump

IMPORTANT: Avoid damage! Leakage from coolant pump will drain into the engine block and could cause engine damage. If there is any doubt of the condition of the coolant pump, replace it as a complete assembly.



M51706

A - Dowel Pin
B - Impeller
C - Oil Seal
D - Mating Ring
E - O-Ring
F - Shaft
G - Spur Gear
H - Dowel Pin
I - Washer
J - Housing
K - Mechanical Seal

1. Remove spur gear (G) with puller.

2. Remove impeller assembly from housing (J). Disassemble impeller assembly.

NOTE: Mechanical seal is sealed in place and will be difficult to remove.

3. Drive old mechanical seal from housing.

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Starting Motor Troubleshooting Guide

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

IMPORTANT: Avoid damage! If starting motor continues to run after turning ignition switch to OFF position, disconnect negative (-) lead from battery as soon as possible.

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

Symptom: Starter Does Not Rotate

(1) Is there a click sound from starter solenoid?

Yes - Go to step (2).

No - Check that all starting conditions are met.

(2) Are battery cables clean and tight?

Yes - Go to step (3).

No - Tighten or clean as necessary.

(3) Is battery fully charged? (See "Test Battery" on page 541.)

Yes - Go to step (4).

No - Charge battery. (See "Charge Battery" on page 542.)

(4) Does crankshaft rotate freely?

Yes - Go to step (5).

No - See "Crankshaft and Main Bearings" on page 205.

(5) Are starting circuit and key switch working correctly?

No - Repair as necessary. (See "Cranking Circuit" on page 319.)

Symptom: Starter Rotates Slowly

(1) Are battery cables clean and tight?

Yes - Go to step (2).

Tighten or clean as necessary.

Symptom: Starter Rotates Slowly

(2) Is battery fully charged? (See "Test Battery" on page 541.)

Yes - Go to step (3).

Charge battery. (See "Charge Battery" on page 542.)

(3) Does crankshaft rotate freely?

Yes - Go to step (4).

No - See "Crankshaft and Main Bearings" on page 205.

(4) Are starting motor and solenoid functioning correctly?

Repair or replace. (See "Test Starting Motor Solenoid - Diesel Engine" on page 546.)

Symptom: Starter Rotates But Does Not Crank

(1) Does the pinion mesh with ring gear?

Faulty starter drive. Replace.

Check for worn pinion or ring gear, and incorrect starting motor alignment.

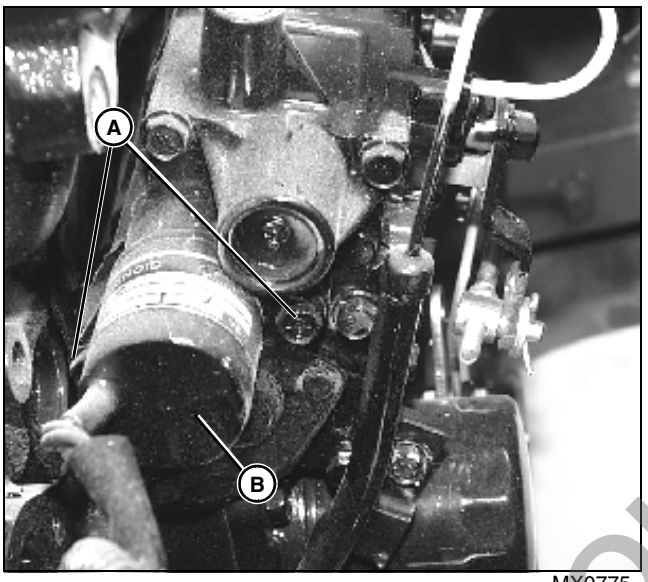
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Remove and Install Fuel Shutoff Solenoid

Removal

1. Park machine on level surface, park brake locked, key switch in off position.
2. Clean around the fuel shutoff solenoid using a parts cleaning solvent or steam cleaner.
3. Disconnect the electrical lead to the fuel shutoff solenoid.



MX0775

4. Disconnect electrical lead and remove fuel shutoff solenoid.
5. Remove the two solenoid mounting cap screws (A) and remove solenoid (B) from governor housing.
6. Test fuel solenoid. (See “Fuel Shutoff Solenoid Test - Diesel Engine” on page 558 in the Electrical section.)

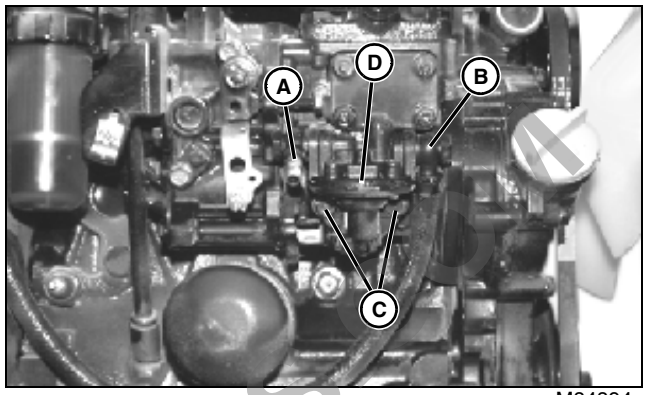
Installation

NOTE: Check condition of O-ring on solenoid before installing.

Install fuel shutoff solenoid. Installation is done in the reverse order of removal.

Remove and Install Fuel Pump

Removal



M84894

1. Disconnect fuel supply line (A).
2. Disconnect fuel hose from fuel filter (B).
3. Remove two cap screws (C).
4. Remove fuel pump (D).

Installation

Installation is done in the reverse order of removal.

IMPORTANT: Avoid damage! Replace all copper washers. Damaged or used washers may leak.

- Remove gasket residue from fuel pump and fuel injection pump mating surfaces.
- Use a new gasket for installation.
- Tighten cap screws to specification.
- Bleed air from fuel system. (See “Procedure for Bleeding Fuel System” on page 159.)

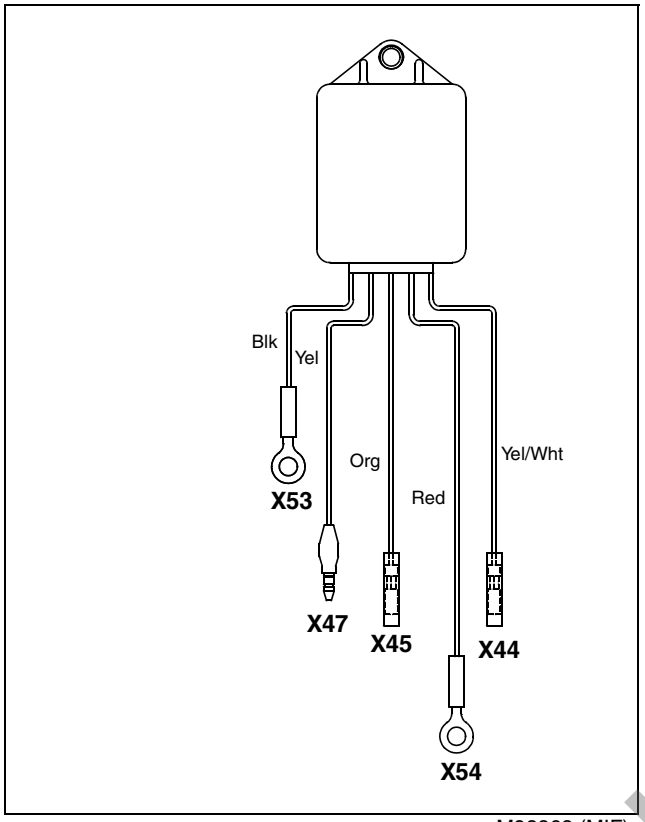
Specifications

Fuel Pump Cap Screw Torque. . . . . 11 N•m (96 lb-in.)

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Ignition Delay Module Wiring Harness (W9)



M98868 (MIF)

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Cutting Unit - Raise Circuit Operation Models 2500, 2500A (S.N. -020000)

Function

To engage the cutting unit raise system.

Operating Conditions

- Key switch in the RUN position.
- Engine running.

Theory of Operation

The power circuit provides current to the key switch (S1) and protects the cutting unit raise circuit with a fusible link (F1) and 15-amp fuse (F3). Current flows from the battery (G1) positive (+) terminal to the fusible link, 15-amp fuse and key switch (red wires No. 002 [W1], 322 [W1] and 332 [W3]), to key switch “B” terminal.

With the key switch in the RUN position, current flows to the connector X8, pin D of the electronic control module (A3) (red wires No. 812 [W1], 802 [W1], 802 [W3] and 212 [W3].

Current also flows to the raise switch (S6) located on the lift and lower lever assembly in the console (red wires No. 852 [W3] and 212 [W3]), and if equipped to the optional floor-mounted raise switch (S7) (red wires No. 752 [W1], 762 [W1], 802 [W1], 802 [W3] and 212 [W3]).

Current is also supplied to the raise valve solenoid (Y3) located on the raise valve assembly (red wires 412 [W1], 762 [W1], 802 [W1], 802 [W3] and 212 [W3]). The ground side of the raise valve solenoid is connected to the control module - connector X7, terminal A (green wire No. 701 [W1]).

As either raise switch is activated, current is supplied to the control module - connector X9, terminal A. The control module complete the path to ground for the raise valve solenoid, energizing the solenoid.

A time delay feature in the electric control module will keep the raise valve solenoid engaged for approximately four seconds, to ensure that the cutting units have been fully raised.

The ground circuit (black wires No. 810 [W1], 820 [W1] and 700 [W1]) provides a path to ground for the control module.

Cutting Unit - Lower Circuit Operation Models 2500, 2500A (S.N. -020000)

Function

To lower the cutting units.

Operating Conditions

- Key switch in the RUN position

Theory of Operation

NOTE: The cutting unit lower system is gravity assisted, and does not require hydraulic oil pressure to function.

The power circuit provides current to the key switch (S1) and protects the cutting unit lower circuit with a fusible link (F1) and 15-amp fuse (F3). Current flows from the battery (G1) positive (+) terminal to the fusible link, 15-amp fuse and key switch (red wires No. 002 [W1], 322 [W1] and 332 [W3]), to key switch “B” terminal.

With the key switch in the RUN position, current flows to the connector X8, pin D of the electronic control module (A3) (red wires No. 812 [W1], 802 [W1], 802 [W3] and 212 [W3].

Current also flows to the lower switch (S8) located on the lift and lower lever assembly in the console (red wires No. 842 [W3] and 212 [W3]), and if equipped to the optional floor-mounted lower switch (S9) (red wires No. 742 [W1], 762 [W1], 802 [W1], 802 [W3] and 212 [W3]).

Current is also supplied to the lower valve solenoid (Y4) located on the raise valve assembly (red wires 432 [W1], 762 [W1], 802 [W1], 802 [W3] and 212 [W3]). The ground side of the lower valve solenoid is connected to the control module - connector X7, terminal C (orange wire No. 703 [W1]).

As either lower switch is activated, current is supplied to the control module - connector X9, terminal B. The control module completes the path to ground for the lower valve solenoid, energizing the solenoid.

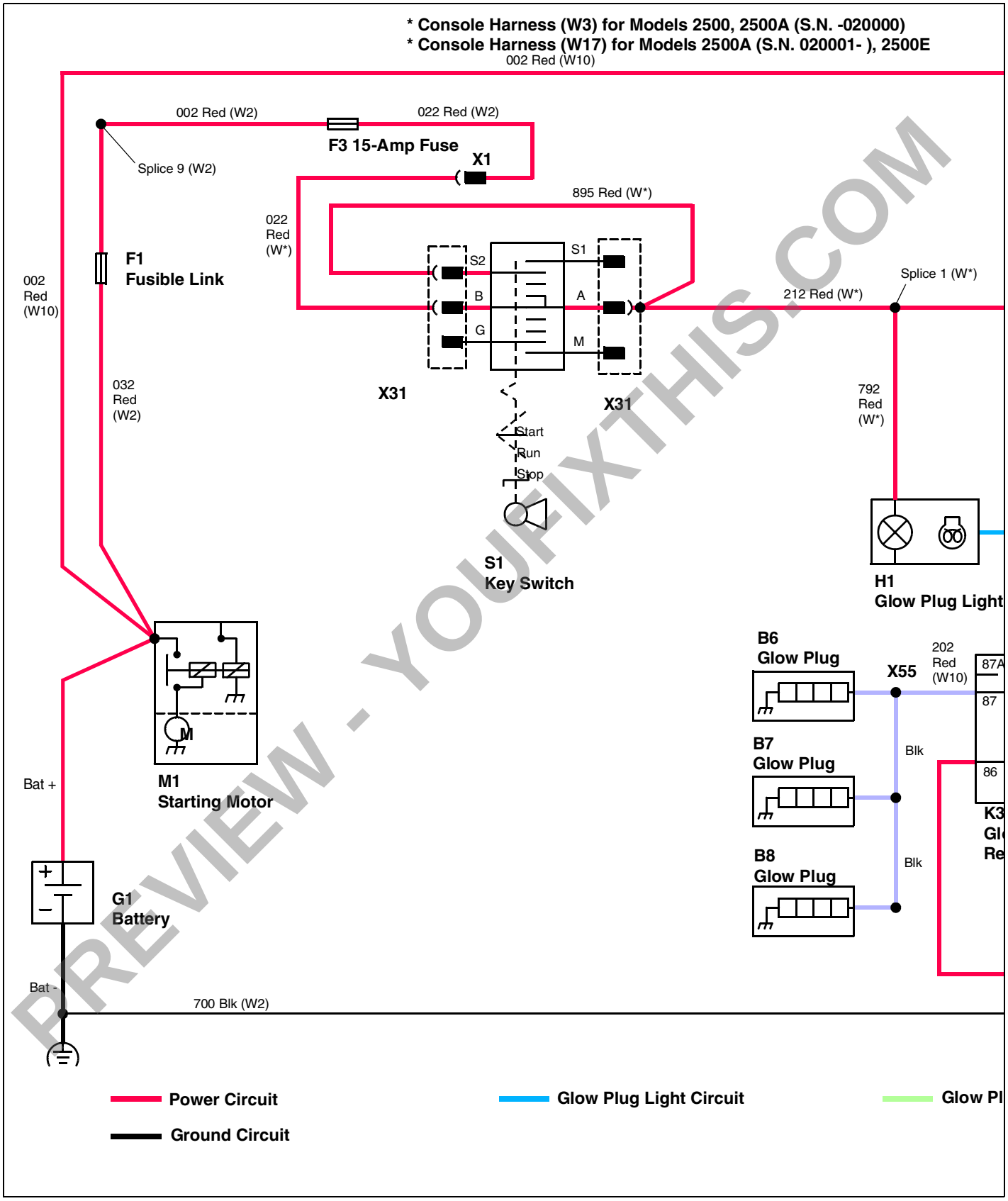
A time delay feature in the control module will keep the lower valve solenoid engaged for approximately four seconds, to ensure that the cutting units have been fully lowered.

The ground circuit (black wires No. 210 [W3], 910 [W3], 910 [W1], 810 [W1], 820 [W1] and 700 [W1]) provides a path to ground for the control module.

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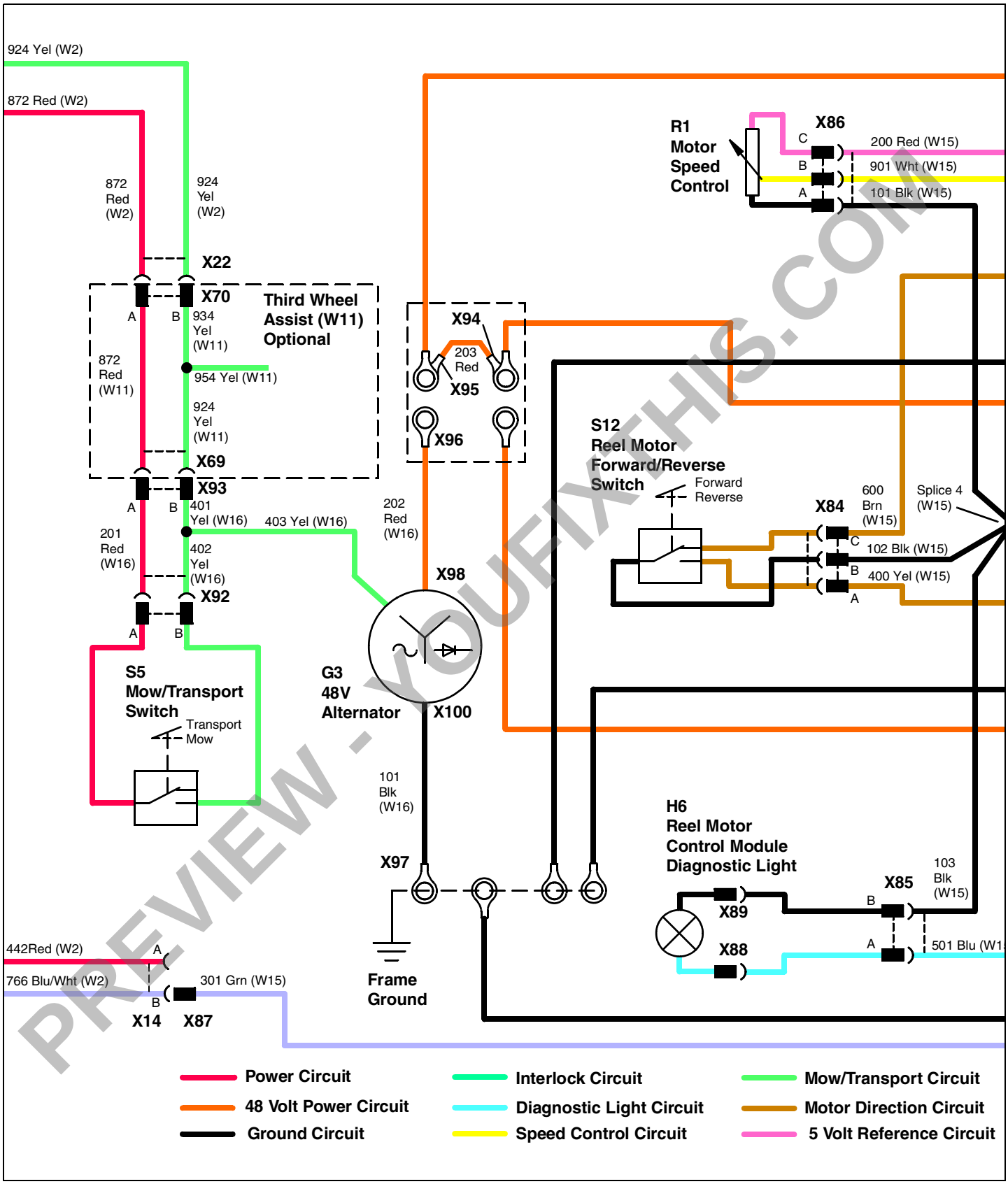
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Glow Plug Circuit



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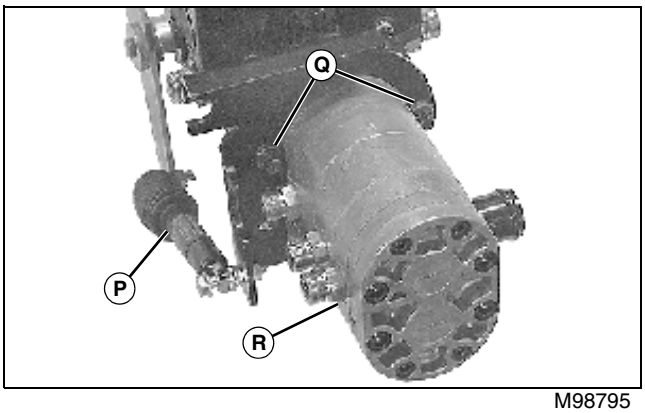
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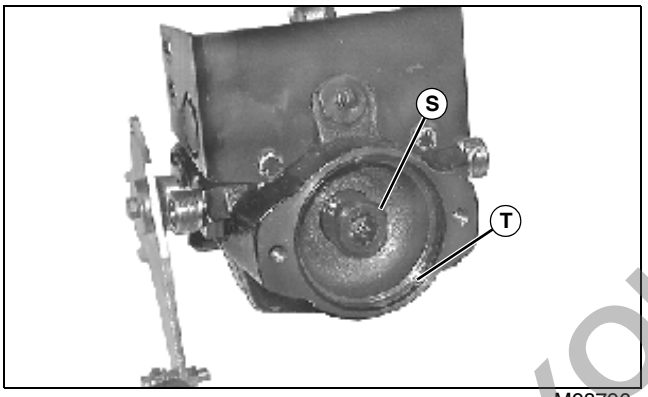


M98795

26.Remove nut and disconnect dampener (P).

27.Remove special cap screws and washers (Q).

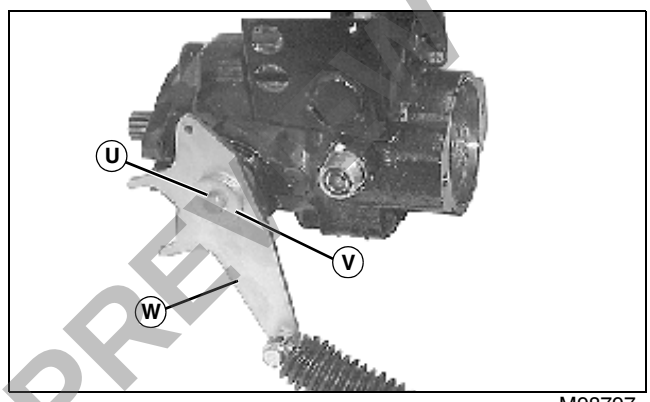
28.Remove hydraulic pump assembly (R).



M98796

29.Remove coupler (S).

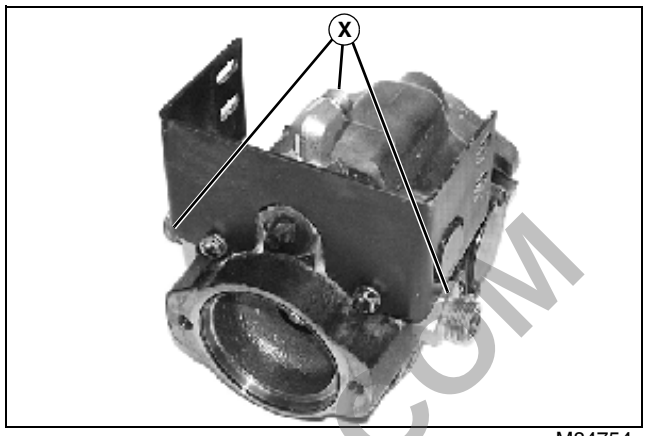
30.Remove O-ring (T).



M98797

31.Remove cap screw (U) and special washer (V).

32.Remove control arm (W).



M84754

33.If hydrostatic pump is to be repaired, remove fittings (X).

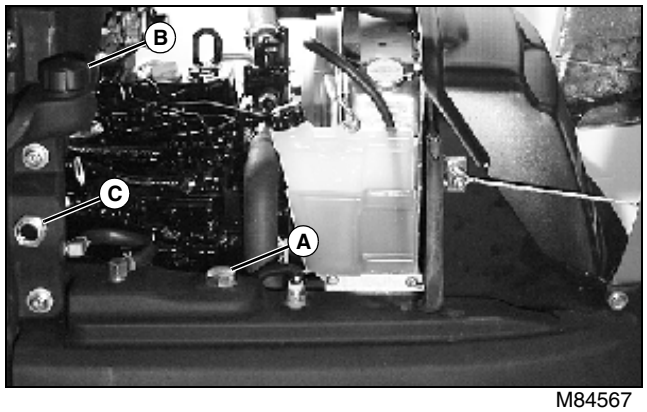
Installation

Installation is performed in reverse order of removal.

- Tighten displacement control arm cap screw to specification.
- Tighten coupler socket head cap screw to specification.
- Tighten input hose connector to specification.

NOTE: Fill main reservoir at the reservoir filler cap. Oil added at the expansion tank will not transfer to the reservoir quickly, resulting in an inaccurate oil level indication.

After main reservoir is filled, add oil to expansion tank until oil level is at the center of the sight glass.



M84567

- Fill hydraulic reservoir at filler cap (A) and at expansion tank (B) using sight glass (C) to correct level with oil meeting correct specifications (See “Hydrostatic Transmission and Hydraulic Oil” on page 20.)
- Bleed air from hydraulic system. (See “Bleed Hydraulic System” on page 651.)

Specifications

Displacement Control Arm
Cap Screw. . . . . 37 N•m (27 lb-ft)

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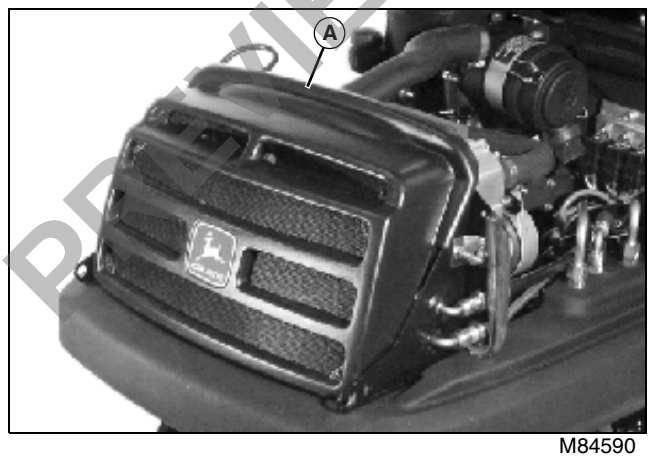
Remove and Install Oil Cooler - Models 2500, 2500A

CAUTION: Avoid injury! Escaping fluid under high pressure can penetrate the skin and cause serious injury. Avoid the hazard by relieving pressure before connecting hydraulic or other lines. Tighten all connections before applying pressure.

- **Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.**
- **If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A. In the United States and Canada only, this information may be obtained by calling 1-800-822-8262.**

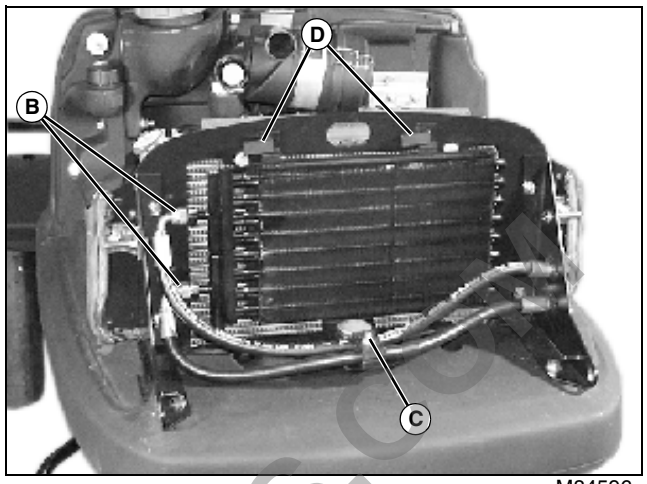
Removal

1. Park machine on a level surface.
2. Lower cutting units to the ground.
3. Move mow and transport lever to TRANSPORT position.
4. Turn key switch to STOP position and allow the machine to cool.
5. Engage park brake.
6. Remove cowling. (See “Remove and Install Cowling” on page 822.)



M84590

7. Remove grille (A).

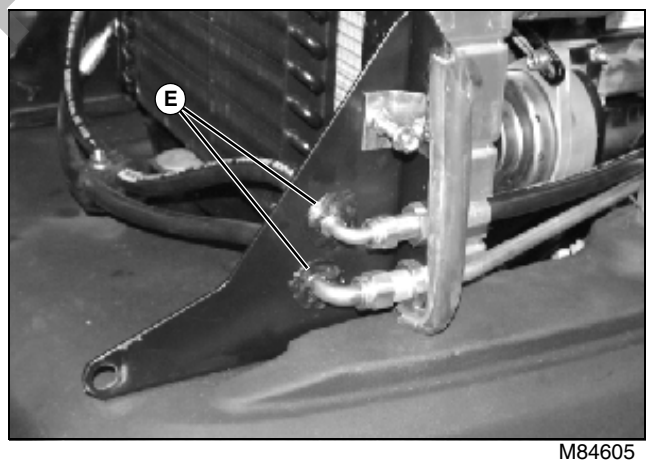


M84596

8. Disconnect hydraulic hoses (B) at oil cooler.
9. Remove hose clamp (C).
10. Release latches (D).
11. Remove oil cooler.

Installation

Installation is done in the reverse order of removal.



M84605

- If hoses are replaced, seal around where hoses pass through support (E) using ribbon sealant.
- Fill expansion tank until oil level is at the center of the sight glass with oil meeting correct specifications. (See “Hydrostatic Transmission and Hydraulic Oil” on page 20.)
- Bleed air from hydraulic system. (See “Bleed Hydraulic System” on page 676.)

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