JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER EQUIPMENT DIVISION

Gator Utility Vehicles
4X2 and 4X6

TM1518 JANUARY 2003

TECHNICAL MANUAL



JOHN DEERE

North American Version
Litho in U.S.A.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

INTRODUCTION

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.

All information, illustrations and specifications in this manual are based on the latest information at the time of publication. The right is reserved to make changes at any time without notice.

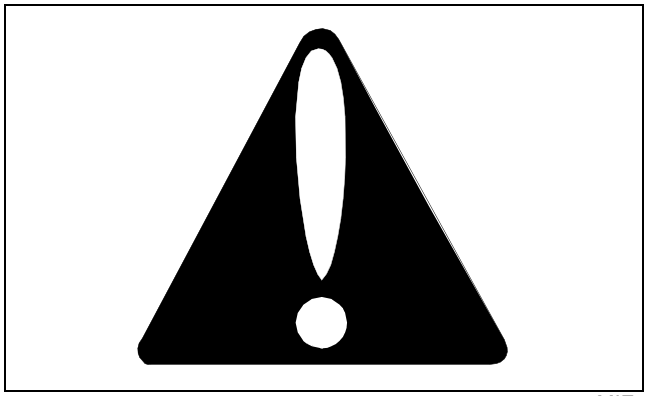
COPYRIGHT© 2003
Deere & Co.
John Deere Worldwide Commercial and Consumer Equipment Division
All rights reserved
Previous Editions
COPYRIGHT©

Safety
Specifications and Information
Engine - Gas (Air-Cooled)
Engine - Gas (Liquid-Cooled)
Engine - Diesel
Electrical
Power Train - Gear
Steering
Brakes
Attachments
Engine - Rotary Broom
Miscellaneous

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Recognize Safety Information



MIF

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.

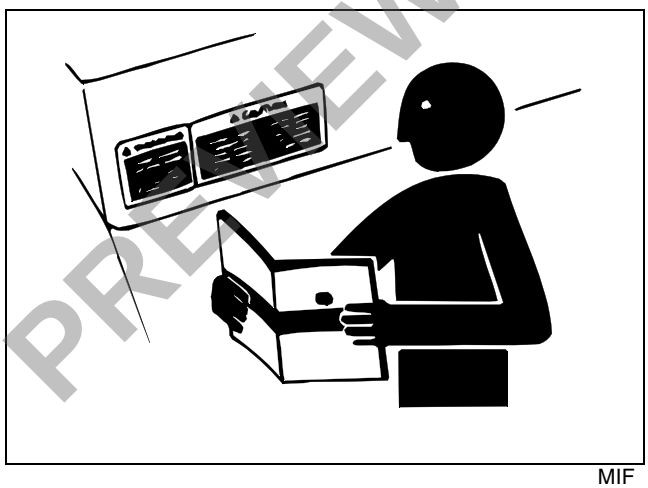
Follow recommended precautions and safe servicing practices.

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

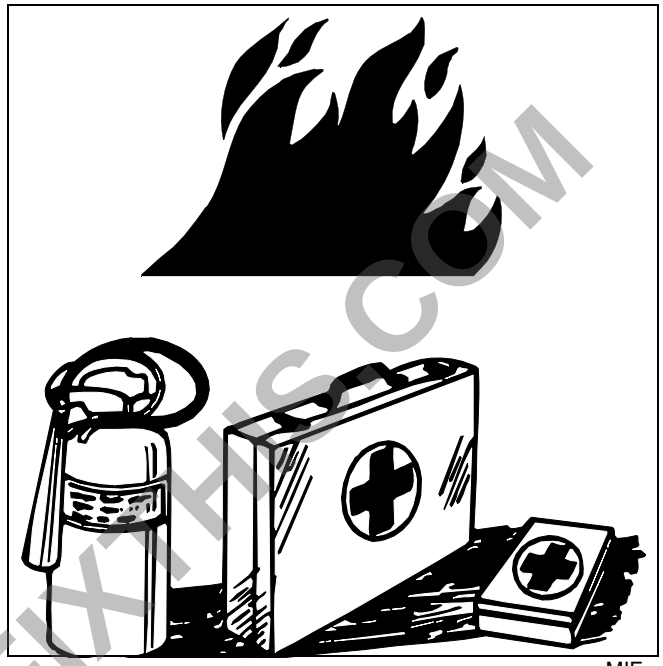


MIF

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

Handle Fluids Safely - Avoid Fires

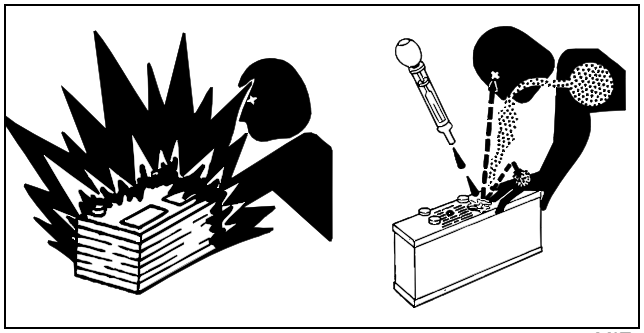
Be Prepared For Emergencies



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



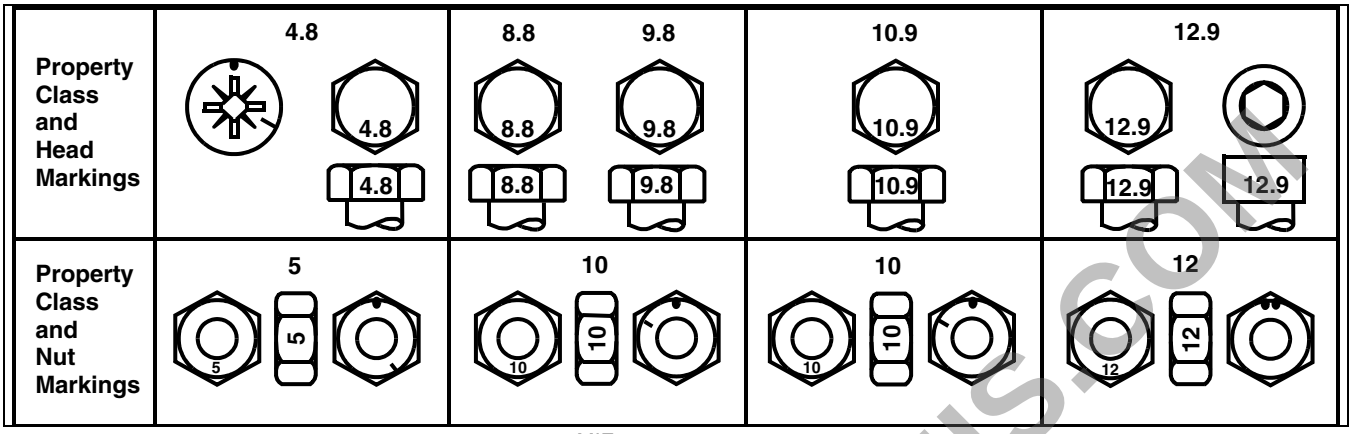
MIF

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Fastener Torques

Metric Fastener Torque Values



MIF

	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.

Download full manual at youfixthis.com

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	Used to set slow idle engine rpm and check fast idle rpm.
Fuel Pump Pressure Test Kit	JDG356	Fuel transfer pump pressure test.
Diesel Fuel Injection Nozzle Tester Adapter Set Straight Adapter	D01109AA D01110AA 23622	Used for fuel injection nozzle test.
Nozzle Cleaning Kit	JDF13	Used to clean fuel injection nozzles.
Compression Gauge	JT01682	Cylinder compression test.
Pressure Gauge Assembly Hose Assembly Connector 1/8" BSP Thread	JT05577 JT03017 JT03349	Oil pressure test.
Tension Gauge or, Belt Tension Gauge	JDG529 JDST28	Used to adjust the water pump/alternator drive belt tension.
Adaptor	JDG472	Used for radiator bubble test.
Cooling System Pressure Pump Radiator Pressure Test Kit Adapters	DO5104ST JDG692	Used for cooling system pressure test
Clutch Removal Tool	JDG813-1	Used to remove clutch from flywheel
Center Distance Gauge	JDG1175-2	Used to determine isolator spacers for engine mount
Dial Indicator	Dial Indicator	Used for valve lift check

Other Materials

Other Material

Part No.	Part Name	Part Use
	SCOTCH-BRIGHT®	Clean cylinder head.
	Valve Guide Cleaner	Clean valve guides.
	Stanisol or Kerosene	Finish ream valve guide.
	Prussion Blue Compound	Check valve seat contact.
	Lithium Base Grease	Pack oil seals.
	Zinc Oxide/Wood Alcohol	Check block for cracks.
	PLASTIGAGE®	Used for clearance measurements
TY15130 LOCTITE® No. 395	John Deere Form-In-Place Gasket	Seal engine block seams

PLASTIGAGE® is a registered trademark of the DANA Corp.

LOCTITE® is a registered trademark of the Loctite Corp.

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

Specifications - 4X2 Gas

Battery:

Voltage	12
BCI group	U-1
CCA rating (Amps at 0° F)	325
Reserve capacity (minutes)	38
Specific gravity	1.225 or above
Electrolyte required fill (approximately)	1.9 L (2.0 qt)
Load test (minimum)	325 amps for 15 seconds

Ignition:

Primary coil resistance	0.67 - 1.10 ohms
Secondary (Plug wire and core)	6 - 10 ohms
Air gap	0.3 mm (0.012 in.)

Spark Plug:

Type	NGK BPR5ES
Gap	0.64 mm (0.025 in.)
Torque	25 N•m (221 lb-in.)

Starting Motor:

Type	Solenoid Shift
Amp draw (on machine)	51 amps at 750 rpm
No-load amp draw (free running)	50 amps (maximum) at 6000 rpm

Stator:

Stator size	13 amps
Regulated amperage/voltage	13 amps (minimum) at 12.2 - 13.8 volts
Unregulated voltage	34 VAC

Alternator: (FE290D)

High Capacity Alternator (Option)	45 amps
Regulated amperage/voltage	45 amp at 12.2 - 13.8 volts

Lighting:

Headlights (halogen)	37.5 watts
Tail/Brake Lights	21 watts
Position Lights	10 watts
Front /Rear Turn Lights	21 watts

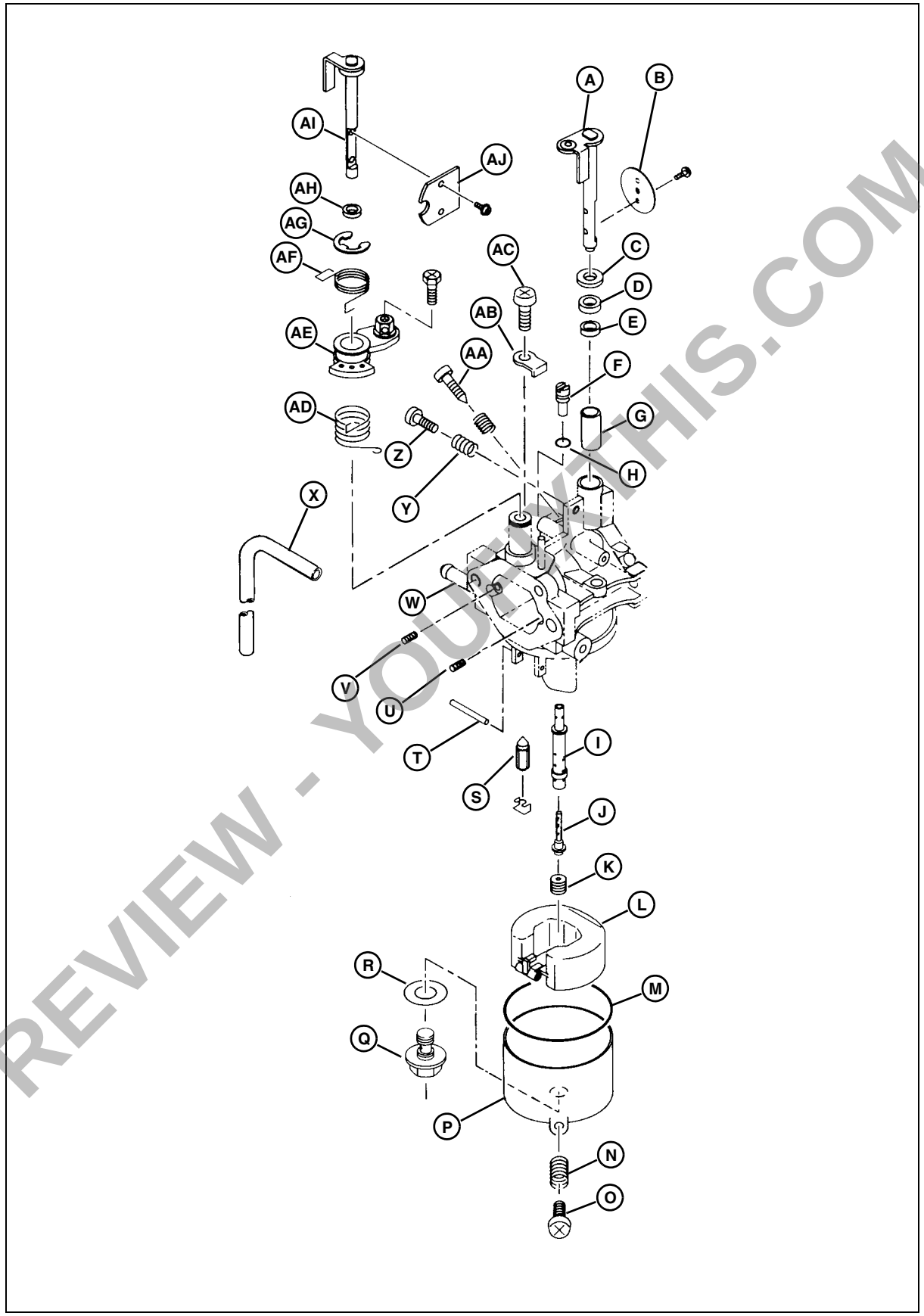
Neutral Start Switch:

Neutral (depressed)	Continuity
In Gear (released)	No Continuity

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Carburetor Components



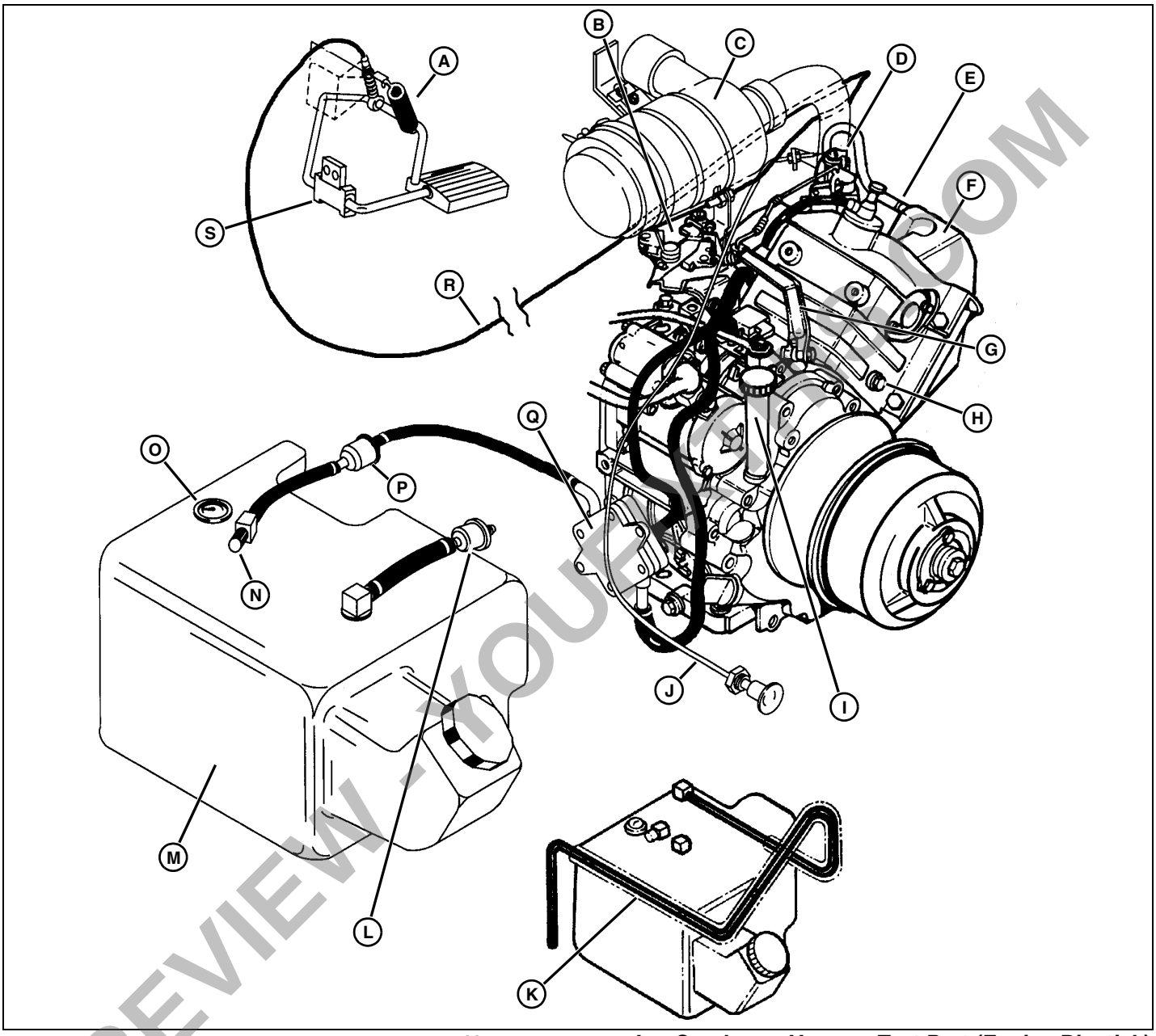
M80402

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Component Location

FE290D Engine

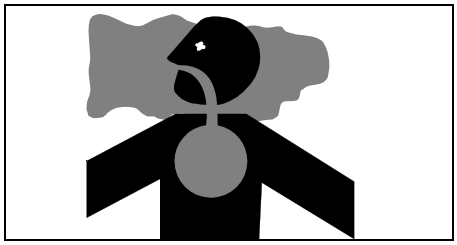


M55734

A - Throttle Pedal Return Spring
B - Throttle Control Arm Assembly
C - Air Filter Assembly
D - Carburetor Assembly
E - Breather Reed Valve Assembly
F - Intake and Exhaust Valves, 0.25 mm (0.01 in.)
G - Governor Arm Assembly, Fully Counter-Clockwise
H - Oil Pressure Test Port, Pressure (Minimum) 314 kPa (46 psi)
I - Crankcase Vacuum Test Port (Engine Dipstick)
J - Choke Cable Assembly (Slight Freeplay)
K - Fuel Tank Vent Hose Assembly (PIN 009369-)
L - Fuel Tank Check Valve Assembly (PIN -009368)
M - Fuel Tank Assembly, 20 L (5.3 U.S. gal)
N - Shutoff Valve
O - Fuel Tank Gauge
P - In-line Fuel Filter
Q - Fuel Pump Assembly
R - Throttle Cable Assembly
S - Throttle Pedal Assembly

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



MIF

IMPORTANT: Avoid damage! California Proposition 65 Warning: Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Gasoline Storage

IMPORTANT: Avoid damage! Keep all dirt, scale, water or other foreign material out of gasoline.

Keep gasoline stored in a safe, protected area. Storage of gasoline in a clean, properly marked ("UNLEADED GASOLINE") POLYETHYLENE PLASTIC container WITHOUT any metal screen or filter is recommended. DO NOT use de-icers to attempt to remove water from gasoline or depend on fuel filters to remove water from gasoline. Use a water separator installed in the storage tank outlet. BE SURE to properly discard unstable or contaminated gasoline. When storing the machine or gasoline, it is recommended that you add **John Deere Gasoline Conditioner and Stabilizer (TY15977)** or an equivalent to the gasoline. BE SURE to follow directions on container and to properly discard empty container.

4 - Cycle Gasoline Engine Oil

Use the appropriate oil viscosity based on the expected air temperature range during the period between recommended oil changes. Operating outside of these recommended oil air temperature ranges may cause premature engine failure.

The following John Deere oils are PREFERRED:

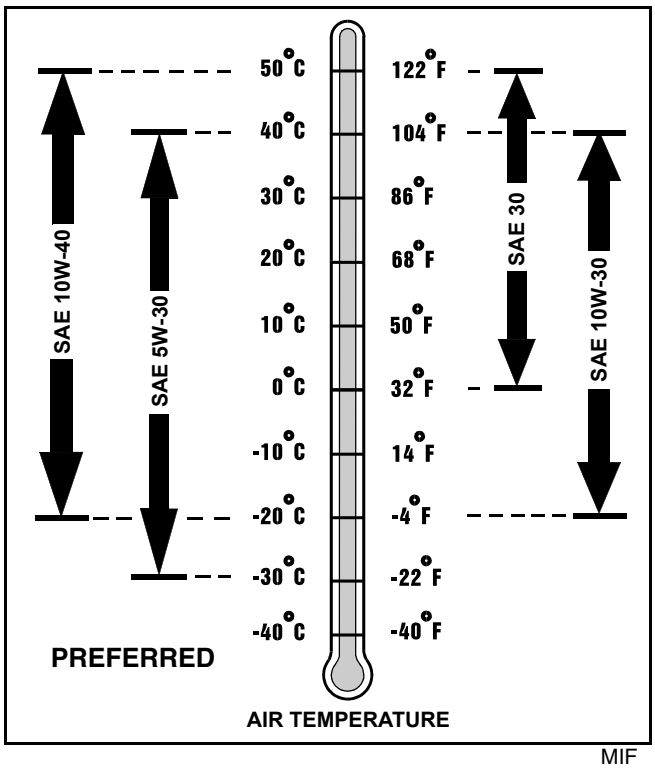
- **PLUS - 4® - SAE 10W-40**;
- **TORQ - GARD SUPREME® - SAE 5W-30**.

The following John Deere oils are **also recommended**, based on their specified temperature range:

- **TURF - GARD® - SAE 10W-30;**
- **PLUS - 4® - SAE 10W-30;**
- **TORQ - GARD SUPREME® - SAE 30.**

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

- SAE 10W-40 - API Service Classifications SG or higher;
- SAE 5W-30 - API Service Classification SG or higher;
- SAE 10W-30 - API Service Classifications SG or higher;
- SAE 30 - API Service Classification SC or higher.



MIF

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

IMPORTANT: Avoid damage! To prevent engine damage, DO NOT use pure anti-freeze or less than a 50% anti-freeze mixture in the cooling system. DO NOT mix or add any additives/ conditioners to the cooling system in Lawn and Grounds Care/Golf and Turf Division equipment. Water used to dilute engine coolant concentrate must be of high quality - clean, clear, potable water (low in chloride and hardness - Table 1) is generally acceptable. DO NOT use salt water. Deionized or distilled water is ideal to use. Coolant that is not mixed to these specified levels and water purity can cause excessive scale, sludge deposits, and increased corrosion potential.

Property	Requirements
Total Solids, Maximum	340 ppm (20 grns/gal)
Total Hardness, Maximum	170 ppm (10 grns/gal)
Chloride (as Cl), Maximum	40 ppm (2.5 grns/gal)
Sulfate (as SO4), Maximum	100 ppm (5.8 grns/gal)

Mix 50 percent anti-freeze concentrate with 50 percent distilled or deionized water. This mixture and the pre-diluted mixture (TY16036) will protect the cooling system down to **-37°C (-34°F)** and up to **108°C (226°F)**.

Certain geographical areas may require lower air temperature protection. See the label on your anti-freeze container or consult your John Deere dealer to obtain the latest information and recommendations.

Gasoline Engine Coolant Drain Interval

When using John Deere Pre-Diluted (TY16036) Automobile and Light Duty Engine Service coolants, drain and flush the cooling system and refill with fresh coolant mixture every 36 months or 3,000 hours of operation, whichever comes first.

When using John Deere Concentrate (TY16034) Automobile and Light Duty Engine Service coolants, drain and flush the cooling system and refill with fresh coolant mixture every 24 months or 2,000 hours of operation, whichever comes first.

If above John Deere Automobile and Light Duty Engine Service coolants are not being used; drain, flush, and refill the cooling system according to instructions found on product container or in equipment operator's manual or technical manual.

Diesel Engine Coolant

The engine cooling system when filled with a proper dilution mixture of anti-freeze and deionized or distilled water provides year-round protection against corrosion, cylinder or liner pitting, and winter freeze protection down to **-37°C (-34°F)**.

The following John Deere coolant is **PREFERRED**:

- **PRE-DILUTED DIESEL ENGINE ANTI-FREEZE/ SUMMER COOLANT™ (TY16036)**.

This coolant satisfies specifications for "Automobile and Light Duty Engine Service" and is safe for use in John Deere Lawn and Grounds Care/Golf and Turf Division equipment, including aluminum block gasoline engines and cooling systems.

The above preferred pre-diluted anti-freeze provides:

- adequate heat transfer
- corrosion-resistant chemicals for the cooling system
- compatibility with cooling system hose and seal material
- protection during extreme cold and extreme hot weather operations
- chemically pure water for better service life
- compliance with ASTM D4656 (JDM H24C2) specifications

If above preferred pre-diluted coolant is not available, the following John Deere concentrate is recommended:

- **DIESEL ENGINE ANTI-FREEZE/SUMMER COOLANT CONCENTRATE™ (TY16034).**

If either of above recommended engine coolants are available use any Automobile and Light Duty Engine Service ethylene glycol base coolant, meeting the following specification:

- ASTM D3306 (JDM H24C1).

Read container label completely before using and follow instructions as stated.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

A - Throttle Shaft
B - Throttle Valve
C - Washer
D - Seal
E - Bushing
F - Pilot Jet
G - Bushing
H - O-Ring
I - Main Nozzle
J - Bleed Pipe (older models only)
K - Main Jet
L - Float
M - Gasket
N - Spring
O - Drain Screw
P - Float Chamber
Q - Plug
R - Washer
S - Needle Valve
T - Float Pin
U - Main Air Jet
V - Pilot Air Jet
W - Carburetor Body
X - Vent Tube
Y - Spring (2)
Z - Idle Screw
AA- Pilot Screw
AB- Lock Plate
AC- Screw
AD- Spring
AE- Lever
AF- Spring
AG- E-Clip
AH- Seal
AI - Choke Shaft
AJ- Choke Valve

NOTE: Main jet high altitude kits for standard or heavy duty air cleaners are available.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Specifications

General Specifications

Make	Kawasaki
Model	FE290D-BS08
Type	4-cycle gas/Air cooled
Power	7.46 kW (10 hp)
Cylinders	1
Cycles	4
Bore	78 mm (3.070 in.)
Stroke	60 mm (2.360 in.)
Displacement	286 cm3 (17.5 cu-in.)

Test and Adjustment Specifications

Engine:

Oil pressure (minimum)	314 kPa (46 psi)
Oil filter bypass valve opening pressure	78 - 118 kPa (11.3 - 17.0 psi)
Compression pressure at operating temperature (minimum)	393 kPa (57 psi)
Compression pressure at operating temperature (maximum)	965 kPa (140 psi)
Crankcase vacuum (minimum)	25 mm (1 in.) water movement
Intake and exhaust valve clearance (cold)	0.125 ± 0.025 mm (0.005 ± 0.001 in.)
Intake and exhaust valve adjustment interval	300 hrs
Valve clearance adjusting nut torque	20 N•m (180 lb-in.)
Auto Compression Release minimum lift	0.6 mm (0.023 in.)
Auto Compression Release standard lift	1.2 mm (0.047 in.)
Auto Compression Release release rpm	600 ± 100 rpm
Breather reed valve tip air gap	0.2 mm (0.008 in.)
Valve cover cap screw torque	6 N•m (53 lb-in.)

Fuel/Air System:

Fuel Pump Minimum Pressure	6.12 kPa (0.9 psi)
Minimum Flow	80 ml (2.7 oz) in 15 seconds
Carburetor SLOW idle mixture screw initial setting (PIN -12700) with no limiter cap	1-3/8 Turns
Throttle control arm SLOW idle stop screw setting	1125 ± 75 rpm
Carburetor SLOW idle stop screw setting	50 rpm less than throttle control arm SLOW idle stop screw setting
Throttle control arm FAST idle stop screw setting (S.N. - 345211)	3750 ± 100 rpm
Throttle control arm FAST idle stop screw setting (S.N. 345212-)	3850 ± 75 rpm
Fuel tank check valve (PIN -14950) maximum opening pressure	3 kPa (0.4 psi)

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Repair Specifications

Miscellaneous Repair Specifications

Breather Maximum Air Gap	0.20 mm (0.008 in.)
Flywheel Nut Torque	85 N•m (63 lb-ft)

Cylinder Head Assembly

Cylinder Head Flatness	0.05 mm (0.002 in.)

Cap Screw Torque

First	18 N•m (159 lb-in.)
Second	21 N•m (186 lb-in.)
Final	24 N•m (212 lb-in.)
Spark Plug Torque	25 N•m (221 lb-in.)

Rocker Arm:

Minimum Shaft OD	11.95 mm (0.470 in.)
Maximum Bearing ID	12.07 mm (0.475 in.)

Push Rod:

Maximum Bend	0.30 mm (0.012 in.)

Valves and Springs:

Valve Clearance	0.127 mm (0.005 in.)
Valve Seat Width	0.50 - 1.10 mm (0.020 - 0.043 in.)

Intake and Exhaust Valves

Maximum Bend	0.03 mm (0.0012 in.)
Minimum Valve Face Margin	0.060 mm (0.024 in.)

Valve Stem OD (Wear Limit)

Intake Valve	6.930 mm (0.2728 in.)
Exhaust Valve	6.915 mm (0.2722 in.)

Valve Guides

Maximum Guide ID	7.065 mm (0.2781 in.)
Finished (Reamed) ID	7.00 - 7.015 mm (0.2756 - 0.2762 in.)
Valve Springs Minimum Free Length	32.75 mm (1.289 in.)

Valve Seat - Recondition

Valve Face Angle	45°
Valve Margin	0.60 mm (0.020 in.)
Valve Narrowing Angle	30°
Valve Seat Angle	45°
Valve Seating Surface Width	0.50 - 1.10 mm (0.020 - 0.043 in.)

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Stator Output Test

Reason:

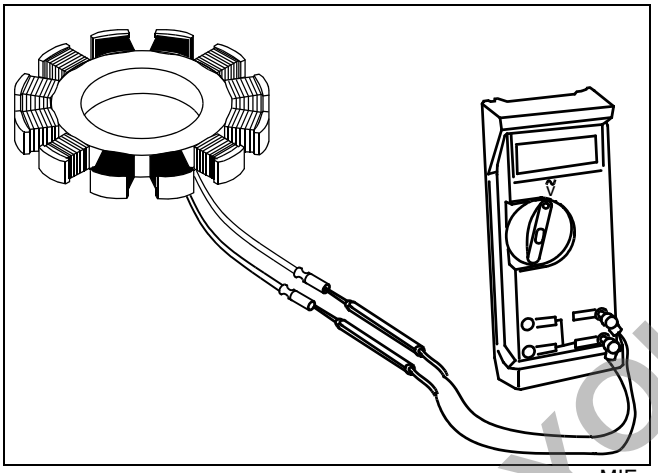
To measure AC voltage output of stator and verify correct resistance of stator.

Equipment:

- Multi-Meter (Set to AC volt scale)

Procedure:

1. Park machine safely. (See Parking Safely in the SAFETY section.
2. Set meter to 50 VAC or Autorange scale.
3. Disconnect regulator/rectifier connector.



MIF

4. Start and run at fast idle.
5. Measure stator voltage. Voltage should read a minimum of 20 volts AC.

Results:

- If voltage is less than specification, test stator with an ohmmeter.
- Stop engine.
- Change meter to ohms scale.
- Measure resistance across stator leads. Resistance should read 0.08 to 0.26 ohms.

Results:

- If resistance is infinite ohms, stator is open. Replace stator.
- Measure resistance from each stator lead to ground. Resistance should read infinite ohms.

Results:

- If resistance (or continuity) is measured, stator leads are shorted to ground. Replace stator.

Spark Test

Reason:

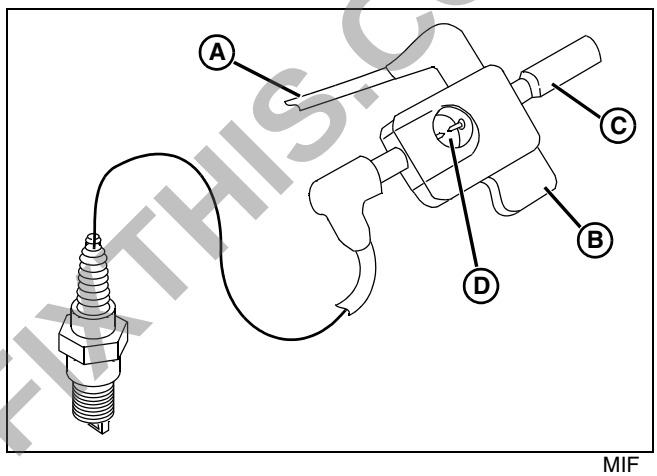
To check overall condition of ignition system.

Equipment:

- D-05351ST Spark Tester

Procedure:

1. Park machine safely. (See Parking Safely in the SAFETY section.



MIF

2. Remove high tension lead (A) from spark plug and connect to spark tester (B).
3. Connect spark tester lead to spark plug.

NOTE: Do not adjust spark tester gap beyond 5.0 mm (0.200 in.) as damage to ignition system components could occur.

4. Adjust spark tester gap to 4.2 mm (0.166 in.) with screw (C).
5. Turn ignition switch to on position and start engine.
6. Watch spark (D) at spark tester.

Results:

- If engine will start, watch spark with engine running. There should be a strong, steady, blue spark
- If spark is weak, or if no spark, install a new spark plug and test again.
- If spark is still weak, or still no spark, tests ignition armature.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

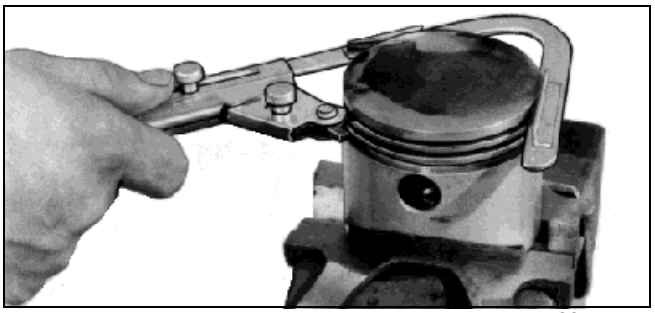
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

NOTE: Replace connecting rod if either measurement is greater than specifications.

IMPORTANT: Avoid damage! Do not use a caustic cleaning solution or a wire brush to clean piston.

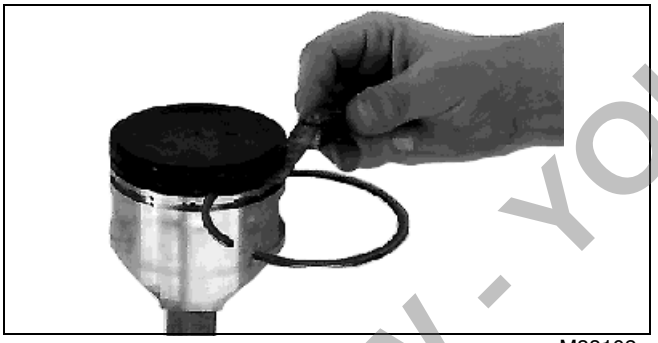
6. Remove all deposits from the piston.



M29946

7. Clean carbon from piston ring grooves with a ring groove cleaner. If a cleaning tool is not available, break an old ring and use it carefully to clean groove.

8. Check that oil return passages in the grooves are open.



M38102

9. Measure piston ring groove clearance. Measure several places around piston.

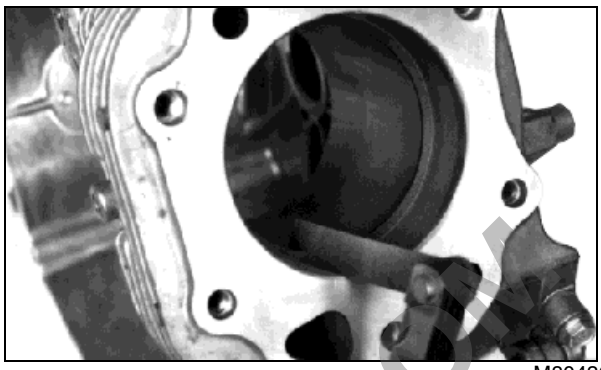
Piston Ring Groove Clearance (Wear Limit):

First Compression Ring . . . . . 0.16 mm (0.006 in.)

Second Compression Ring . . . . . 0.14 mm (0.005 in.)

Oil Ring Assembly . . . . . .Not Measured

NOTE: Replace piston if clearance is greater than specification.



M80430

10. Measure piston ring end gap. Push ring into cylinder bore, using a piston, until ring is approximately 25.4 mm (1 in.) down from top of cylinder bore.

Piston Ring End Gap (Wear Limit):

Compression Rings . . . . . 1.20 mm (0.047 in.)

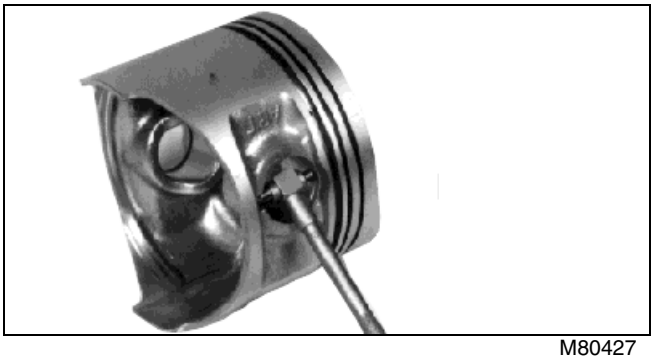
Oil Ring Assembly . . . . . .Not Measured

NOTE: Replace ring if end gap is greater than specifications.



M50064

11. Measure piston pin diameter. Replace pin if diameter is less than 18.98 mm (0.747 in.).



M80427

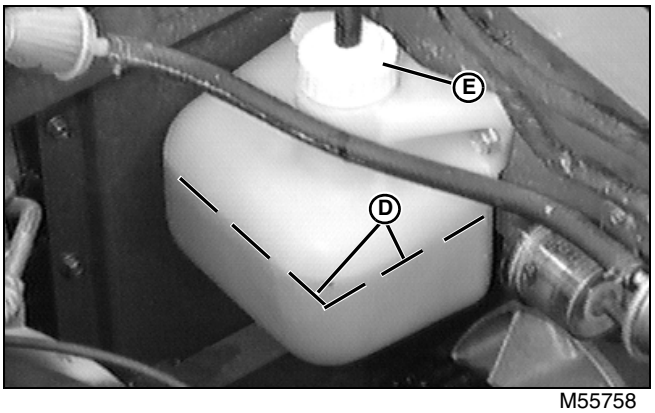
12. Measure piston pin bore diameter. Replace piston if diameter is greater than 19.03 mm (0. 749 in.).

NOTE: If engine has had a previous overhaul, oversize pistons and rings may have been installed. Pistons and rings are available in 0.50 (0.020 in.) oversize.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

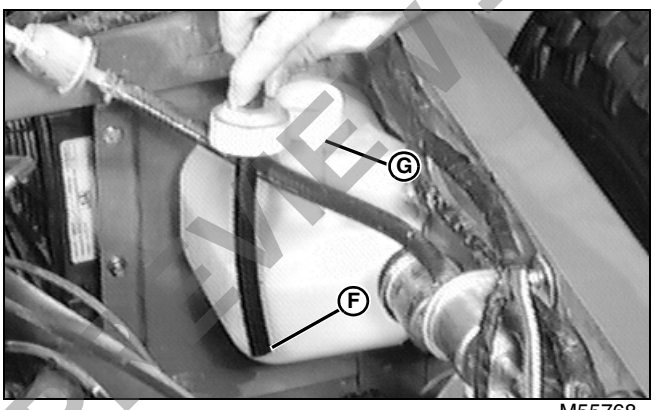
- Add coolant to radiator until only coolant is coming out of bleed screw hole (air bubbles no longer visible). Tighten bleed screw.
- Run engine for approximately five more minutes Check that lower radiator hose is warm indicating coolant is circulating through entire system.
- Run until cooling fan starts, approximately five more minutes (15 minutes total), indicating coolant and engine have reached operating temperature and system is functioning properly.



M55758

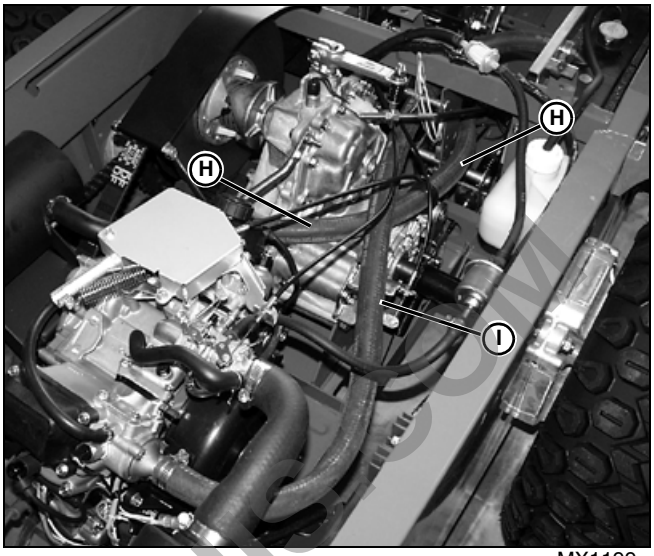
5. Remove cap (E) and fill expansion bottle with coolant to approximate level shown (D).

IMPORTANT: Avoid damage! Be sure expansion bottle hose (F) is positioned SLIGHTLY above bottom of bottle. DO NOT allow hose to touch bottom of bottle or force hose to bend back towards top of bottle.



M55768

6. If hose (F) was removed from bottle cap, remove cap and insert hose into cap. Hold bottom edge of cap on bottle lip (G), just below neck threads. Push hose down through cap until it is slightly above bottom of bottle. Install and tighten hose and cap.



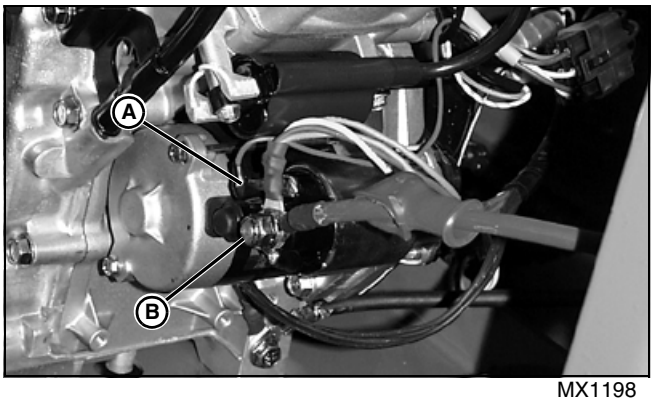
MX1199

NOTE: Radiator hose routing was changed on machines with PIN W006X4X001450 and above. Lower radiator hose (H) is now routed through the hose clamp on the transaxle and under upper radiator hose (I) as it passes over the transaxle to the water pump fitting. Upper radiator hose (I) is routed on top. It is not necessary to reroute these hoses at this time. However, it is advisable to reroute them the first time they are disconnected from the engine or the radiator.

Starting Motor Removal and Installation

Removal:

1. Disconnect both the battery negative (-) and positive (+) cables from the battery and remove the battery.



MX1198

2. Disconnect single (purple) wire (A) connector from starting motor solenoid.
3. Disconnect battery positive (+) cable and wire lead (B) from starting motor solenoid.

Download full manual at youfixthis.com



M35268

2. Measure cam follower diameter.
   - If stem diameter is less than wear limit (see Specifications below), replace cam follower.
3. Measure cam follower bore diameter in cylinder block.
   - If cam follower bore diameter exceeds wear limit, replace cylinder block.
   - If bore clearance (bore ID minus follower stem OD) exceeds specification (see Specifications below), replace cam follower, cylinder block or both.

Specifications:

Cam Follower OD Specifications:

Standard . . . . . 17.95 - 17.97 mm (0.707 - 0.708 in.)

Wear Limit . . . . . 17.93 mm (0.706 in.)

Cam Follower Bore ID Specifications:

Standard . . . . . 18.000 - 18.018 mm (0.7087 - 0.7094 in.)

Wear Limit . . . . . 18.05 mm (0.711 in.)

Clearance . . . . . 0.032 - 0.068 mm (0.0013 - 0.0027 in.)

Camshaft

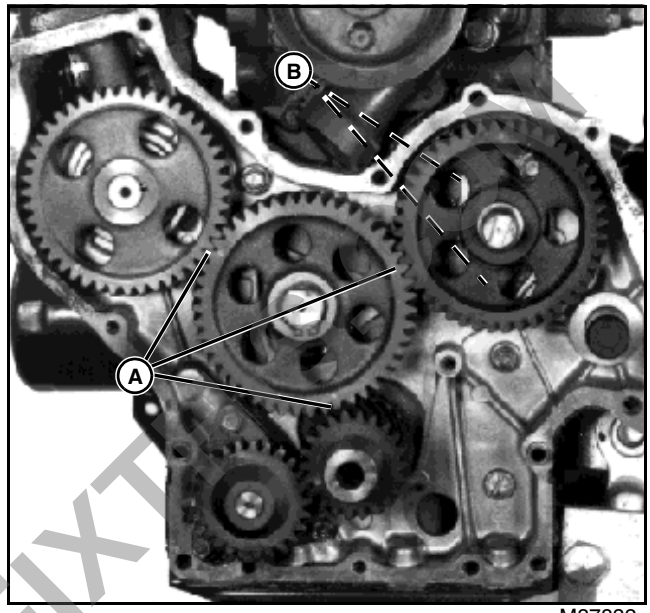
Removal:

1. Remove rocker arm assembly and push rods. See “Rocker Arm” on page 174.
2. Remove timing gear cover. See “Timing Gear Cover” on page 183.
3. Check camshaft end play. See “Camshaft End Play Check” on page 184.
4. Check backlash of timing gears. See “Timing Gear Backlash Check” on page 184.

NOTE: If camshaft is being removed with cylinder head installed, use a magnetic follower holder tool, or turn engine until oil pan is upward, to hold cam followers away from camshaft.

5. Hold cam followers away from camshaft using a magnetic follower holder kit such as D15001NU.

NOTE: Due to the odd number of teeth on the idler gear, timing marks will only align periodically.



M37832

6. Rotate crankshaft and align timing marks (A).
7. Remove two cap screws (B) holding camshaft mounting flange to block (through holes in camshaft gear).

IMPORTANT: Avoid damage! Do not allow camshaft lobes to hit bearing surfaces while removing camshaft. Machined surfaces can be damaged.

8. Inspect all parts for wear or damage. (See Inspection/Replacement procedure below.)

Installation:

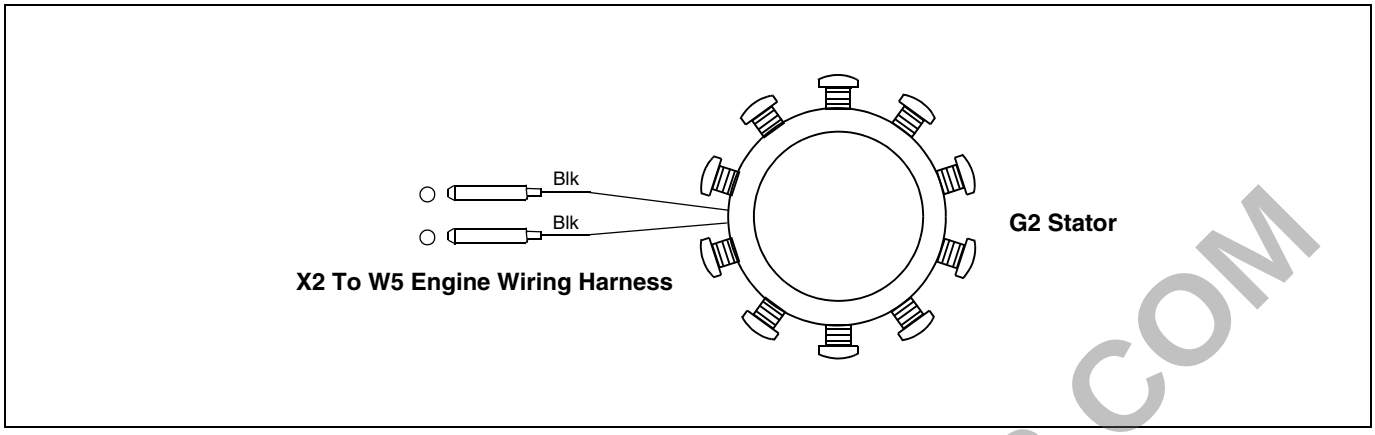
1. Apply clean engine oil on all parts during installation.

IMPORTANT: Avoid damage! Do not allow camshaft lobes to hit bearing surfaces while installing camshaft. Machined surfaces can be damaged.

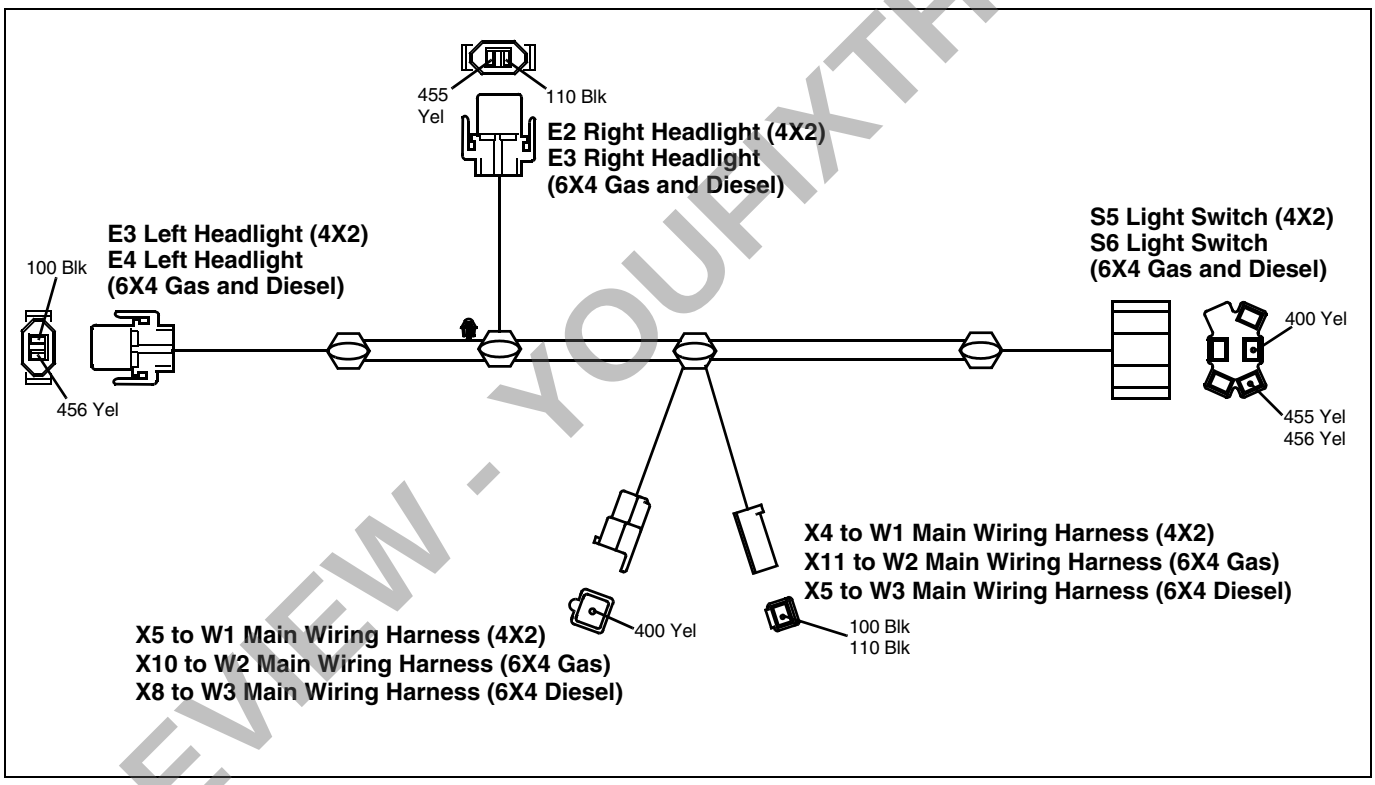
2. Rotate crankshaft to align timing marks.
3. Install camshaft.
4. Install and tighten mounting cap screws to 11 N•m (96 lb-in.).
5. Install timing gear cover. See “Timing Gear Cover” on page 183.
6. Install push rods and rocker arm assembly. See “Rocker Arm” on page 174.

PREVIEW - YOUFIXTHIS
Download full manual at youfixthis.com

W7 Engine Wiring Harness



W4 Standard Headlight Wiring Harness



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Standard Headlight Circuit Operation - 6X4 Gas

NOTE: If the Light and Horn kit option is added, the new harness plugs into the light harness connector (X10) and connector (X11). The light switch and the original light harness are removed.

Function:

Provides power to the headlights.

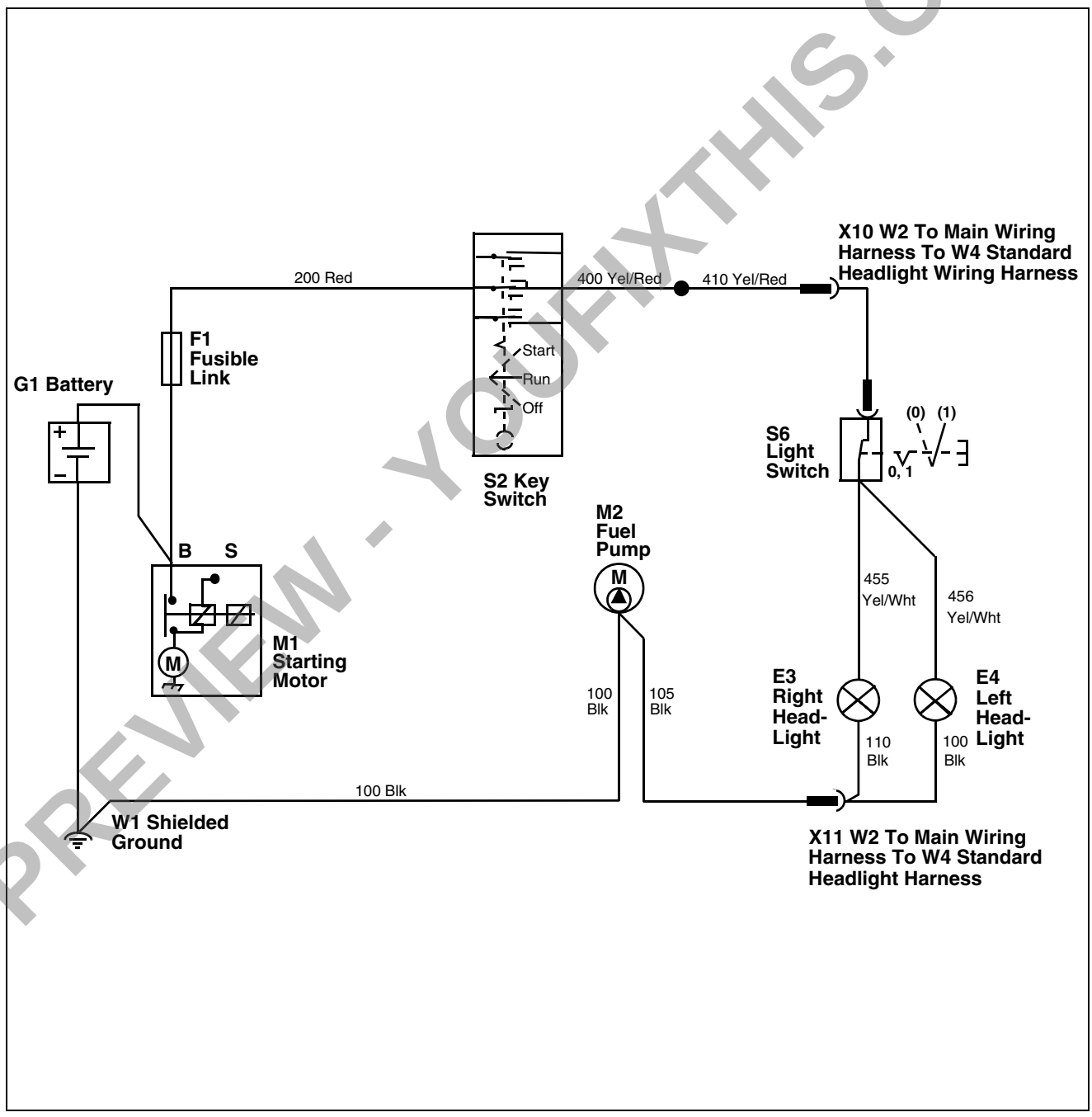
Operating Conditions:

The key switch must be in the RUN position.

Theory of Operation:

The headlight harness is attached to the W2 main wiring harness. Power from the headlight harness connector X10 is connected to the S6 light switch. Current then flows from the switch to the headlights.

Standard Headlight Circuit Schematic - 6X4 Gas



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Engine Oil Pressure Switch Test - 6X4's

Reason:

To determine if the oil pressure switch is functioning properly.

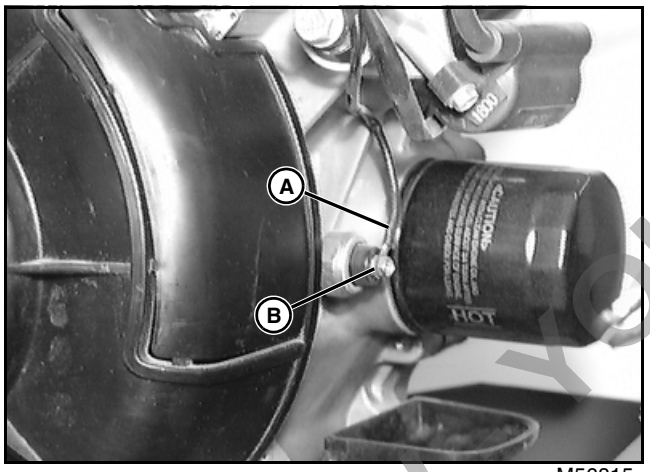
Equipment:

- Ohmmeter

Procedure:

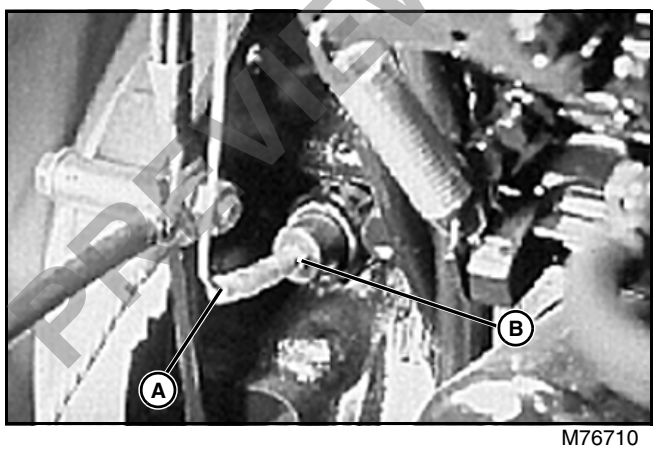
1. Park machine on level surface and turn key switch OFF.
2. Shift lever in NEUTRAL and park brake LOCKED.
3. Cargo box RAISED and LOCKED.

IMPORTANT: Avoid damage! Do not allow wire connector to contact engine or frame because there will be voltage at that point during the test.



M56815

6X4 Gas



M76710

6X4 Diesel

4. Disconnect wiring lead (A) from switch.
5. **Connect black lead of meter to engine block and red lead of meter to terminal (B) of switch.**
6. **Set ohmmeter for 1X ohms scale**.
7. **Read meter.**

Results:

- **There should be continuity to ground.**
- If the switch does NOT have continuity to ground, replace the switch.
- Start and run engine.
- **Read meter**.

NOTE: BE SURE to apply John Deere Pipe Thread Sealant with TEFLON®, or an equivalent to threads of switch anytime it is installed.

Results:

- **The switch should NOT have continuity to ground.**
- If the switch DOES have continuity to ground with the engine running, check engine oil pressure. (See Oil Pressure Test in Engine Tests and Adjustments Section.)
- If the oil pressure is to specification, replace the switch.

Fuse Test

Reason:

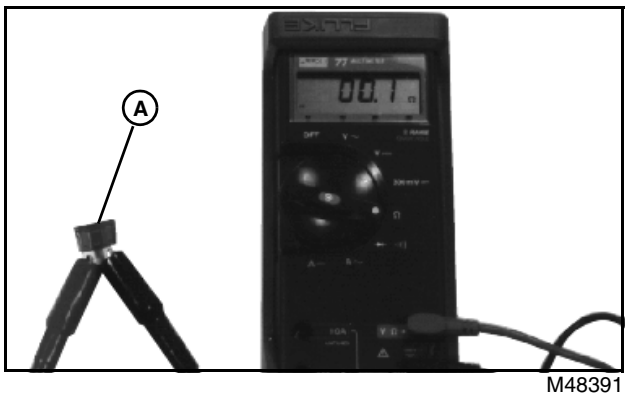
To verify that the fuse has continuity.

Equipment:

- Ohmmeter or continuity tester

Procedure:

1. Remove fuse from connector.



M48391

2. Check visually for broken filament (A).
3. Connect ohmmeter or continuity tester to each end of fuse.
4. Check for continuity.

Results:

- If continuity is not indicated, replace fuse.

Download full manual at youfixthis.com

PREVIEW YOUFIXTHIS.COM

Light and Horn Circuit Operation (Earlier Model)

Function:

Position Lights and Headlights Circuit:
To provide power to illuminate the front and rear position lights, and/or headlights depending on light switch position.

Brake Lights Circuit:
To provide power to illuminate the rear brake lights when the brake pedal is depressed or the park brake is engaged.

Horn Circuit:
To energize the horn when desired by the operator.

Operating Conditions:

Position Lights:
The light switch must be in the position lights position.

Position Lights and Headlights:
The light switch must be in the position lights and headlights position.

Brake Lights:

The key switch must be in the RUN position and the brake pedal depressed or the park brake engaged.

Horn:

The key switch must be in the RUN position and the horn switch depressed.

Theory of Operation:

Position Lights and Headlights:

With the light switch (S5/S6) in the position light position (closed), current flows to the fuses (F4 and F5), and illuminates the Left and Right front position lights (E6 and E7), and Left and Right rear position lights (E5 and E8).

With the light switch (S5/S6) in the position lights and headlights position (closed), current flows to the fuses (F4, F5, F6 and F7) and illuminates all position lights, and the headlights (E9 and E10).

Brake Lights:

With the brake pedal switch (S7) closed (brake pedal depressed), current from fuse (F10) and brake pedal switch illuminates the Left and Right brake lights (E5, E4).

With the park brake switch (S3) closed (park brake engaged), current from fuse (F1), key switch (S2), park brake switch, and diode (V2) illuminates the Left and Right brake lights (E5, E4).

The diode (V2) at the park brake switch connector prevents the park brake light from illuminating when the brake pedal switch is closed.

Horn:

With the horn switch (S8) closed (switch depressed), current from fuse (F9) and horn switch energizes the horn (B1).

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

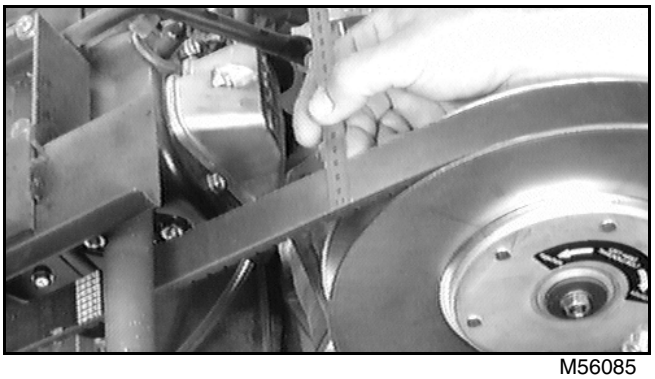
Tests and Adjustments

Drive Belt Check

Reason:

To check drive belt wear and condition of drive belt.

Procedure:



M56085

1. Measure drive belt width. Drive belt must not be less than 27 mm (1-1/16 in.).

2. Check drive belt condition. Drive belt must not be cracked. Some amount of glazing is normal.

Results:

- If drive belt width is less than specification, replace.
- If drive belt is within specification, and there is a performance complaint, check primary clutch and secondary clutch, and run Drive Train Performance Test on next page.

Transaxle Shift Linkage Adjustment

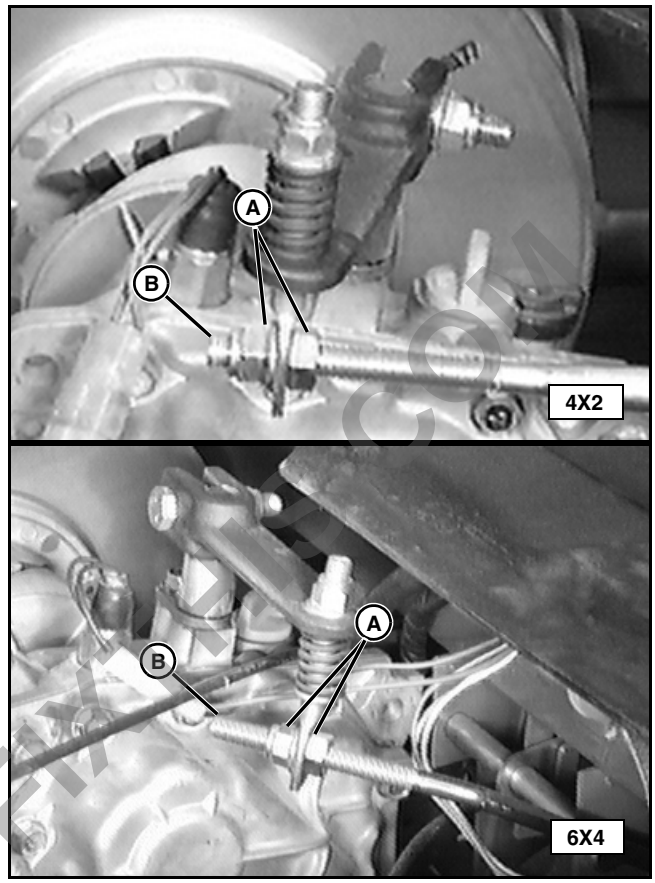
Reason:

- To insure gear shift lever is centered in neutral when transaxle is in neutral.
- To insure both forward and reverse gears will be completely engaged.
- To help prevent shifter from disengaging from gear during operation.

Procedure:

1. Park on level surface and LOCK park brake. Cargo box RAISED, engine OFF, key REMOVED. Plastic shroud under operator's seats must be bolted securely into place.

2. Move shift lever until detent inside transaxle clicks firmly into the center neutral position.



M56088 and M56344

3. Move shift lever until transaxle is in neutral detent position.

NOTE: With transmission in neutral position the shift lever rod will be perpendicular to the transmission.

4. Loosen shift rod nuts on transaxle as necessary. Adjust the shift rod nuts so the shift lever is contacting the shifter quadrant in the neutral slot

5. Shift into forward and reverse. There should be an even gap between the lever and quadrant in both forward and reverse positions. The shift lever should NOT contact the shift quadrant in either forward or reverse. Adjust the shift linkage if the gaps are uneven.Tighten the shift rod nuts.

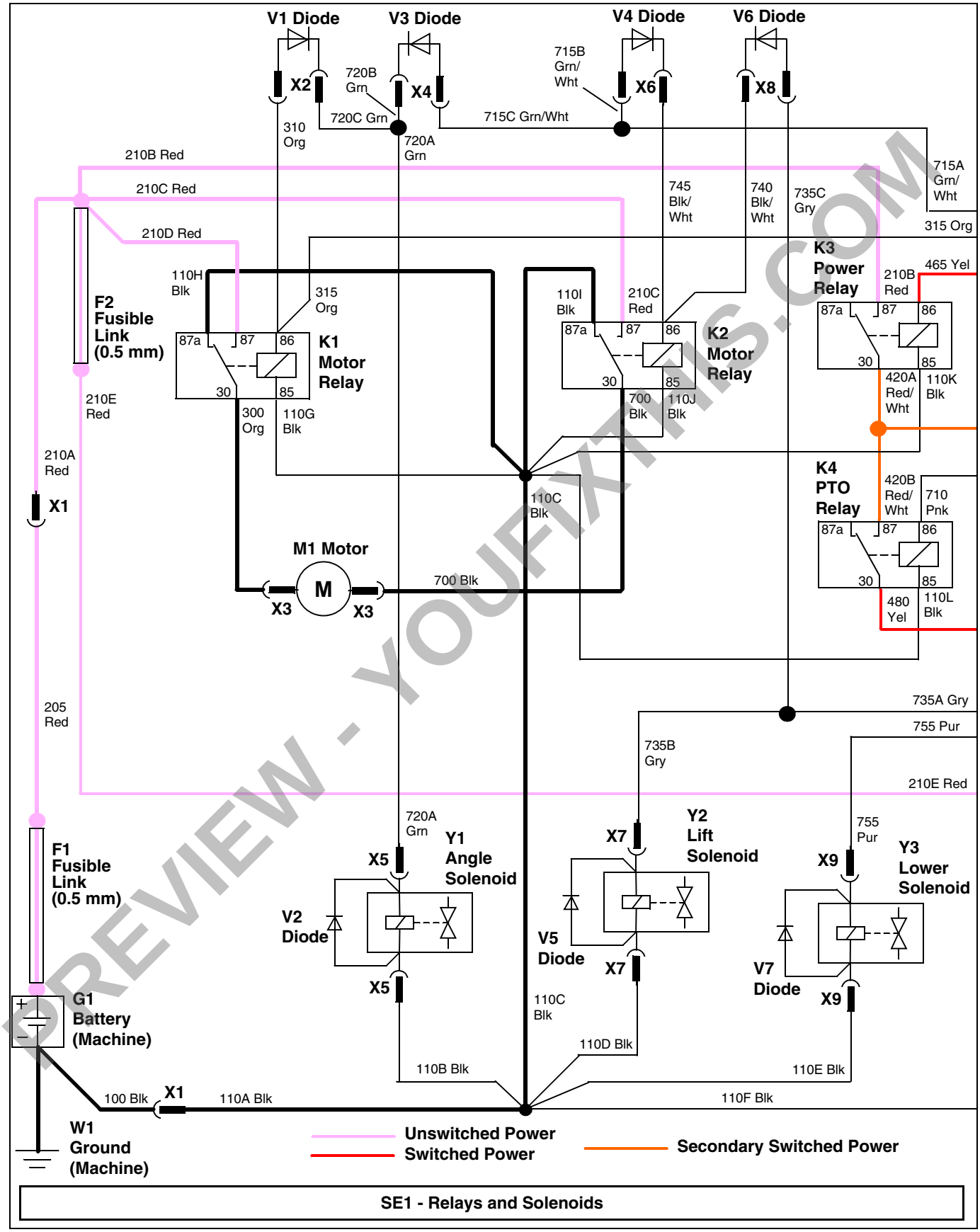
6. Shift into neutral and check neutral start.

7. Drive machine over rough ground to check adjustments.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Rotary Broom Electrical Schematic (1 of 2)



MIF

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 25 of 692 pages

The full manual includes:

- All 692 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

John Deere 4X2, 4X6 Technical Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual