Z910A, Z920A, Z925A, Z925A EFI, Z930A, Z950A, Z960A and Z970A ZTrak™ Mower

TECHNICAL MANUAL

Z910A, Z920A, Z925A, Z925A EFI, Z930A, Z950A, Z960A and Z970A ZTrak™ Mowers

TM109119 02OCT12 (ENGLISH)

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John Deere Turf Care
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Contents

Section 10—General Information
- Group 05—Safety
- Group 10—General Specifications
- Group 15—Fuel and Lubricant
- Group 20—Machine Specifications

Section 20—Engine Repair, Kawasaki
- Group 05—General Repair FX651V, FX730V, FX751V, FX801V, and FX850V
- Group 10—Repair FX651V and FX730V
- Group 15—Repair FX751V, FX801V, and FX850V
- Group 25—Repair FX921V and FX1000V

Section 25—Engine Repair, Kohler EFI
- Group 05—Repair

Section 30—Electrical Repair
- Group 10—Component Location
- Group 20—Wire Harness—Standard (Z910A, Z920A, Z925A, Z930A, Z950A) (SN -020000)
- Group 30—Wire Harness—Standard (Z910A, Z920A, Z925A, Z930A, Z950A) (SN 020001-)
- Group 40—Wire Harness—EFI Only (Z925A) (SN 020001-)
- Group 50—Wire Harness—Convenience Package (Z930A, Z950A, Z960A, Z970A)

Section 40—Power Train Repair
- Group 10—Component Location
- Group 20—Repair

Section 50—Attachments Repair
- Group 10—Component Location
- Group 20—Repair
- Group 30—Repair (Optional MCS)

Section 60—Miscellaneous Repair
- Group 10—Wheels
- Group 20—Operators Station
- Group 30—Roll Over Protective Structure (ROPS)
- Group 40—Miscellaneous

Section 220—Engine Diagnosis, Tests, and Adjustments, Kawasaki
- Group 05—Component Location
- Group 10—Theory of Operation
- Group 15—Diagnosis
- Group 20—Tests and Adjustments

Section 225—Engine Diagnosis, Tests, and Adjustments, Kohler
- Group 10—Theory of Operation
- Group 15—Diagnosis
- Group 20—Tests and Adjustments

Section 230—Electrical Diagnosis, Tests, and Adjustments
- Group 10—Theory of Operation
- Group 15—Theory of Operation (EFI)
- Group 20—Diagnosis
- Group 25—Engine Diagnostic Test Codes (EFI)
- Group 30—Tests and Adjustments
- Group 35—Tests and Adjustments (EFI)
- Group 40—Wiring Schematics
- Group 50—Connector Information

Section 240—Power Train Diagnosis, Tests, and Adjustments
- Group 10—Theory of Operation
- Group 20—Diagnosis
- Group 30—Tests and Adjustments

Section 250—Attachments Diagnosis, Tests, and Adjustments
- Group 10—Theory of Operation
- Group 20—Diagnosis
- Group 30—Tests and Adjustments

Section 299—Service Tools and Kits
- Group 10—Service Tools and Kits

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Recognize Safety Information

This is a 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 operating practices.



T81389 —UN—28JUN13

DX,ALERT -19-29SEP98-1/1

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.



TS187 —19—30SEP88

DX,SIGNAL -19-03MAR93-1/1

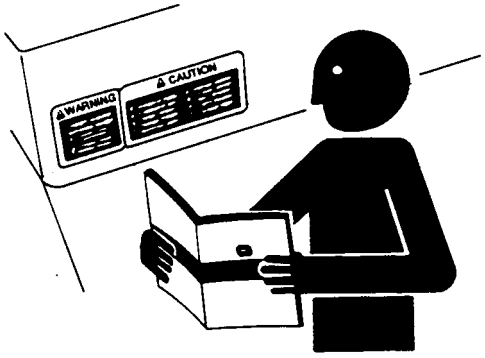
Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.



TS201 —UN—15APR13

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

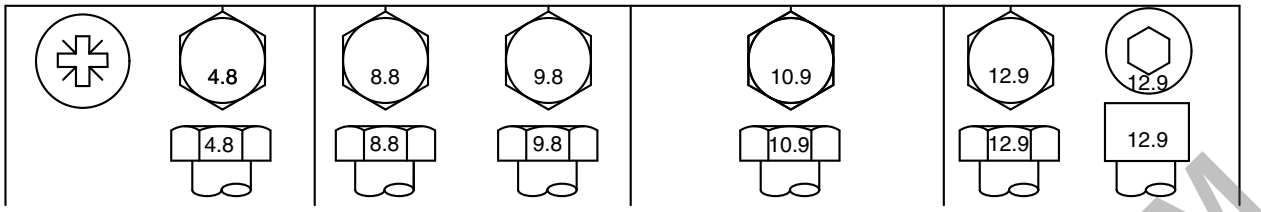
DX,READ -19-16JUN09-1/1

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Metric Bolt and Screw Torque Values

TS1670 —UN—01MAY03



Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]		Lubricated[a]		Dry[b]	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

[a] *"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.*

[b] *"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.*

DX,TORQ2 -19-12JAN11-1/1

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Specifications

Item	Measurement	Specification
Torque Specifications		
Air Cleaner Base Plate Mounting Screw	Torque	5.9 N·m (52 lb.-ft.)
Carburetor Float	Height	Parallel with carburetor body
Engine Mounting Screw	Torque	63 N·m (46 lb.-ft.)
Flywheel Cap Screw	Torque	56 N·m (41 lb.-ft.)
Fuel Pump Mounting Screw	Torque	5.9 N·m (52 lb.-in.)
Ignition Mounting Screw	Torque	6.9 N·m (61 lb.-in.)
Muffler Mount Nut	Torque	15 N·m (11 lb-ft.)
Rocker Cover Screw	Torque	5.9 N·m (52 lb.-in.)
Stator Cap Screw	Torque	3.4 N·m (30 lb.-in.)
Breather Valve		
Breather Valve Mounting Screw	Torque	2 N·m (18 lb.-in.)
Breather Chamber Cover Screw	Torque	5.9 N·m (52 lb.-in.)
Camshaft (FX651V and FX730V)		
Camshaft Side Journal (Wear limit)	OD	15.98 mm (0.629 in.)
Camshaft Lobe (Wear limit)	Height	29.62 mm (1.166 in.)
Camshaft (FX751V, FX801V and FX850V)		
Camshaft Side Journal (Wear limit)	OD	19.98 mm (0.787 in.)
Camshaft Intake Lobe (Wear limit)	Height	34.30 mm (1.350 in.)
Camshaft Exhaust Lobe (Wear limit)	Height	35.13 mm (1.383 in.)
Camshaft Bore (FX651V and FX730V)		
Camshaft Bore (Wear Limit)	ID	16.13 mm (0.635 in.)
Camshaft Bore (FX751V, FX801V and FX850V)		
Camshaft Bore (Wear Limit)	ID	20.14 mm (0.793 in.)

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Replace Fuel Filter

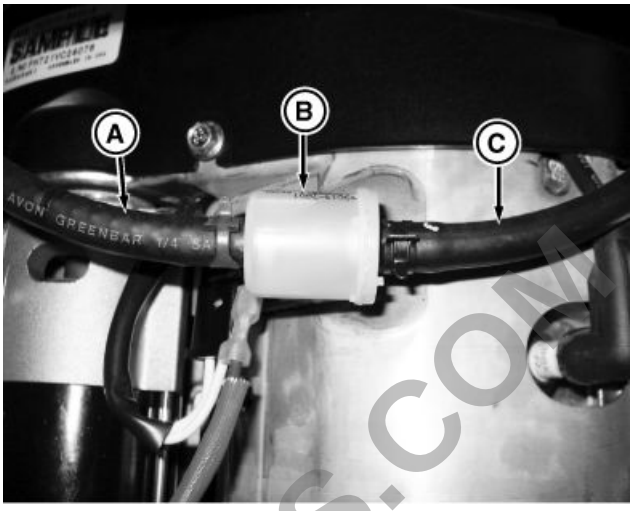
CAUTION: Avoid Injury! Fuel vapors are explosive and flammable:

- **Do not smoke while handling fuel.**
- **Keep fuel away from flames or sparks.**
- **Shut off engine before servicing.**
- **Cool engine before servicing.**
- **Work in a well-ventilated area.**
- **Clean up spilled fuel immediately.**

IMPORTANT: Avoid Damage! Incorrect installation of fuel filter may cause engine damage. Install the filter with the arrow pointing in the direction of fuel flow (toward the engine) for proper operation.

NOTE: Change fuel filter when fuel is low.

1. Park machine safely. (See “Park Machine Safely” in the Safety section.)
2. Allow machine to cool down.
3. Place a drain pan under hoses to catch any fuel that may be left in the hoses.
4. Disconnect fuel hose (A) from the outlet side of the fuel filter (B), and drain gasoline into a properly marked container.



TCT004830 —UN—27SEP12

A—Hose
B—Filter
C—Hose

5. Remove the fuel filter from the inlet fuel hose (C). Discard filter.

NOTE: Make sure fuel filter is installed with arrow pointing in direction of fuel flow.

6. Install new fuel filter.
7. Connect hoses to new fuel filter.

BS62576,00006D2 -19-03JAN13-1/1

Remove and Install Fuel Pump

1. Park machine safely. (See “Park Machine Safely” in the Safety section.)
2. Allow machine to cool down.

CAUTION: Avoid Injury! Gasoline is extremely flammable. Do not smoke. Always work in a ventilated area away from open flame or spark producing equipment, this includes equipment that utilizes pilot lights.

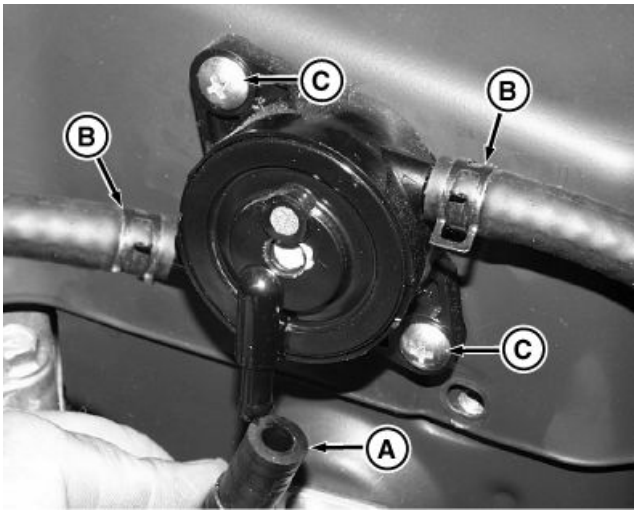
3. Disconnect vacuum line (A) and fuel lines (B).
4. Remove two mounting screws (C).

Installation

Installation is done in the reverse order of removal.

- Tighten mounting screws to specification.

Specification	
Fuel Pump Mounting Screw—Torque	5.9 N·m (52 lb.-in.)



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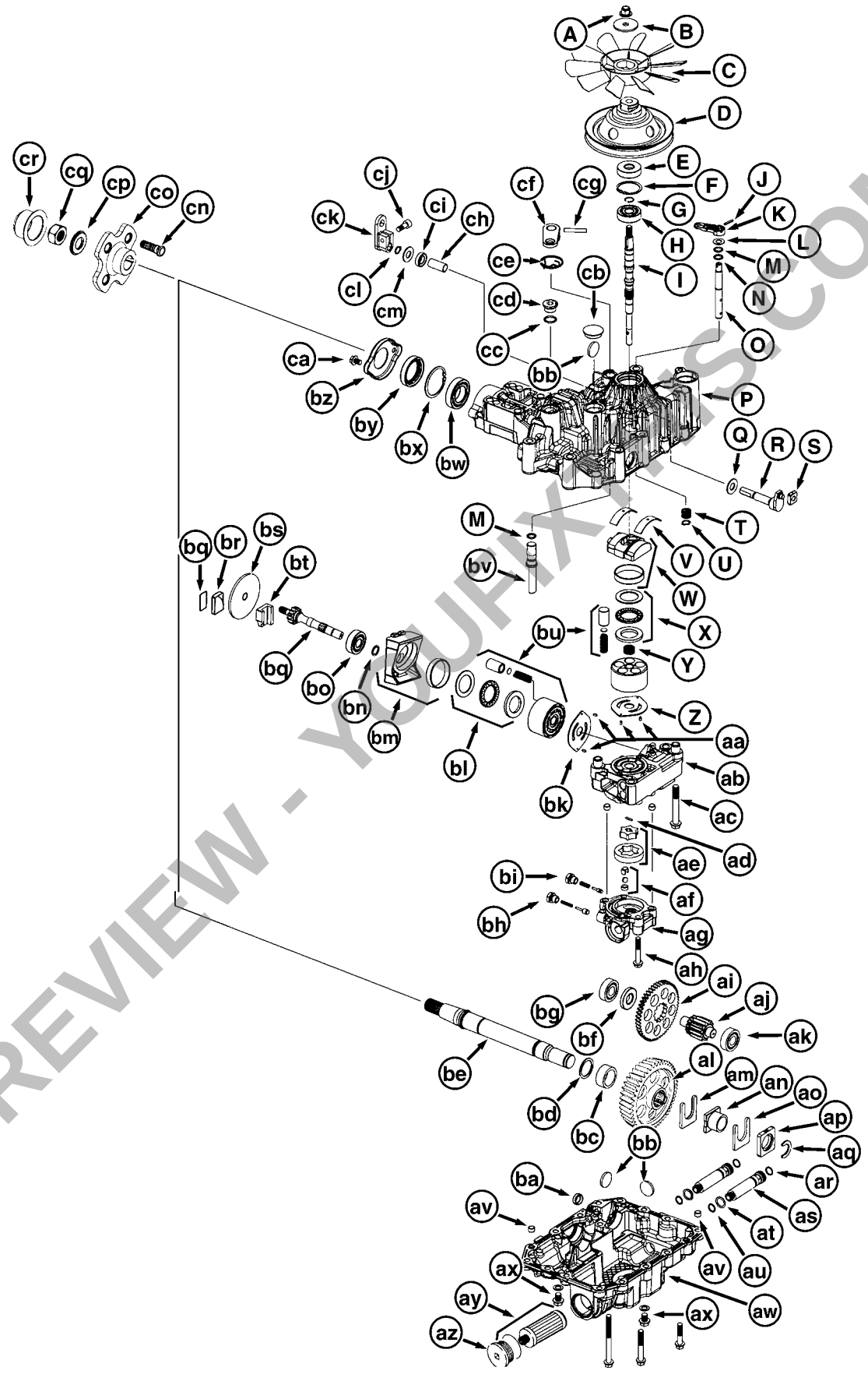
A—Vacuum Line
B—Fuel Line
C—Screws

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Transaxle Components



TCT005667 —UN—04SEP12

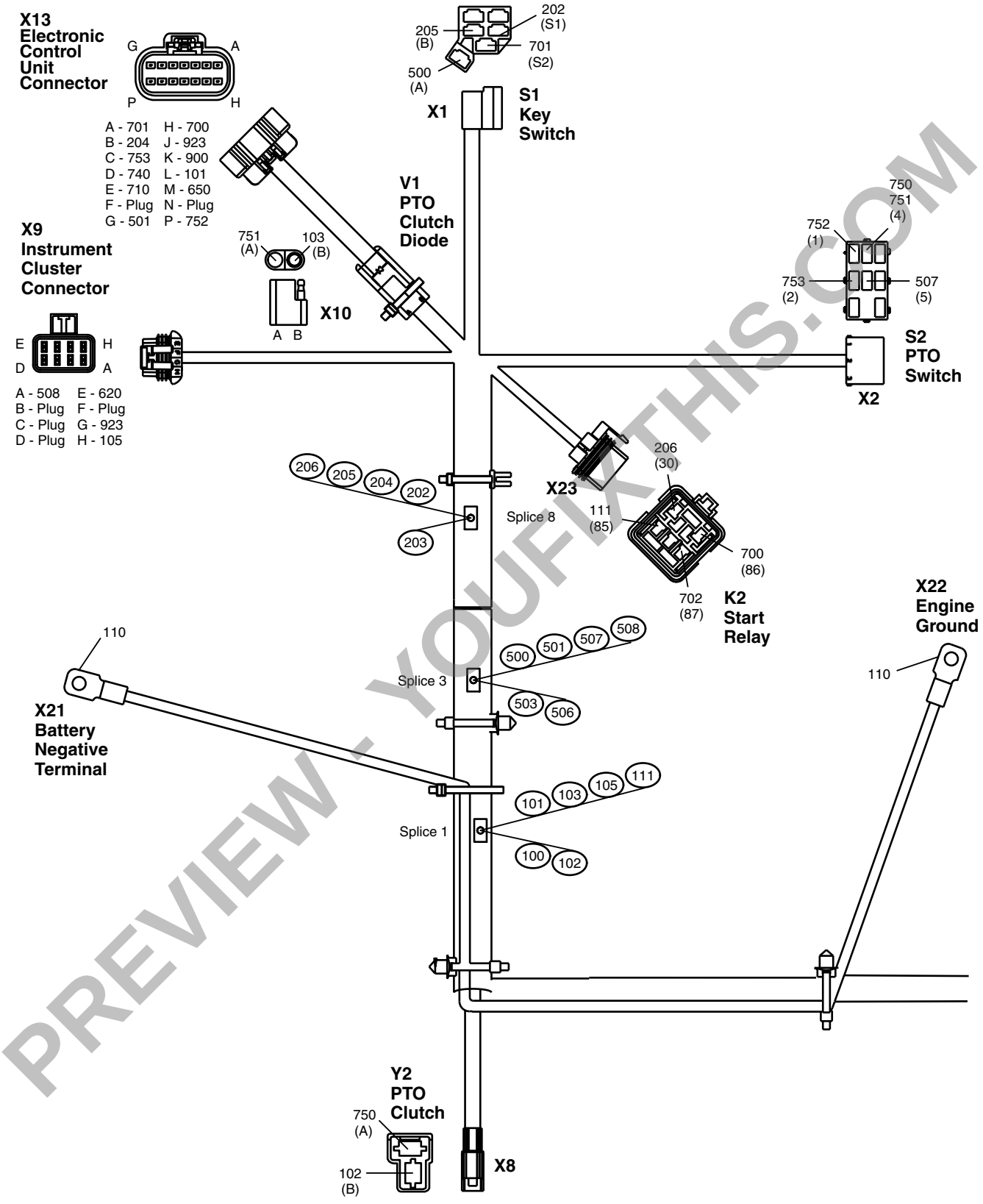
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OUMX258,00004D4 -19-04SEP12-1/2

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W1 Main Harness (SN -020000)



Main Wiring Harness—Standard Z910A, Z920A, Z925A, Z930A, Z950A (SN -020000) (1 of 3)

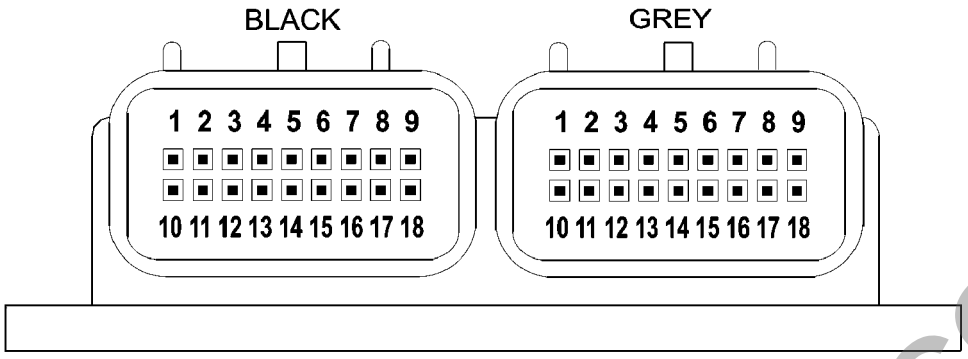
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ECM Connector Pinout



TCT001646 —UN—29AUG12

OUMX258,000054D -19-29AUG12-1/1

ECM Signal and Pinout Table

Pin	Signal	Circuit
1	Not Used	
2	Not Used	
3	Malfunction Indicator Light (MIL) Ground	20A Tan
4	Not Used	
5	Not Used	
6	Not Used	
7	Not Used	
8	Not Used	
9	Battery Ground	2B Blk
10	Ignition Coil #2 Ground	21A Pur
11	Not Used	
12	Not Used	
13	Not Used	
14	Safety Switch Ground	22A Pur
15	Not Used	
16	ECU	23A Wht
17	Fuel Pump Control (+12V)	15B Red
18	Not Used	

Pin	Signal	Circuit
1	Ignition Coil #1 Ground	1A Blk
2	Battery Ground	2A Blk
3	Diagnostic Communication Line	3A Blk
4	Speed Sensor Input	4A Yel
5	Fuel Injector Output #1 Ground	5A Blu
6	Fuel Injector Output #2 Ground	6A Grn
7	Oxygen Sensor Heater	7A Grn
8	Intake Air Temperature (IAT) Sensor Input	8A Tan
9	Fuel Pump Ground	9A Pnk
10	Ground for IAT, TPS, MAP, O2, and Oil Sensors	20 Blk
11	Manifold Absolute Pressure (MAP) Sensor Input	11A Lt Grn
12	Throttle Position Sensor (TPS) Input	12A Blu
13	Speed Sensor Ground	13A Pur
14	Oil Temperature Sensor Input	14A Grn
15	Ignition Switch (Switched +12V)	15A Red/Blk
16	Power for TPS and MAP Sensors (+5V)	16A Gry
17	Oxygen Sensor (O2) Input	17A Pur
18	Battery Power (Unswitched +12V)	18A Pur

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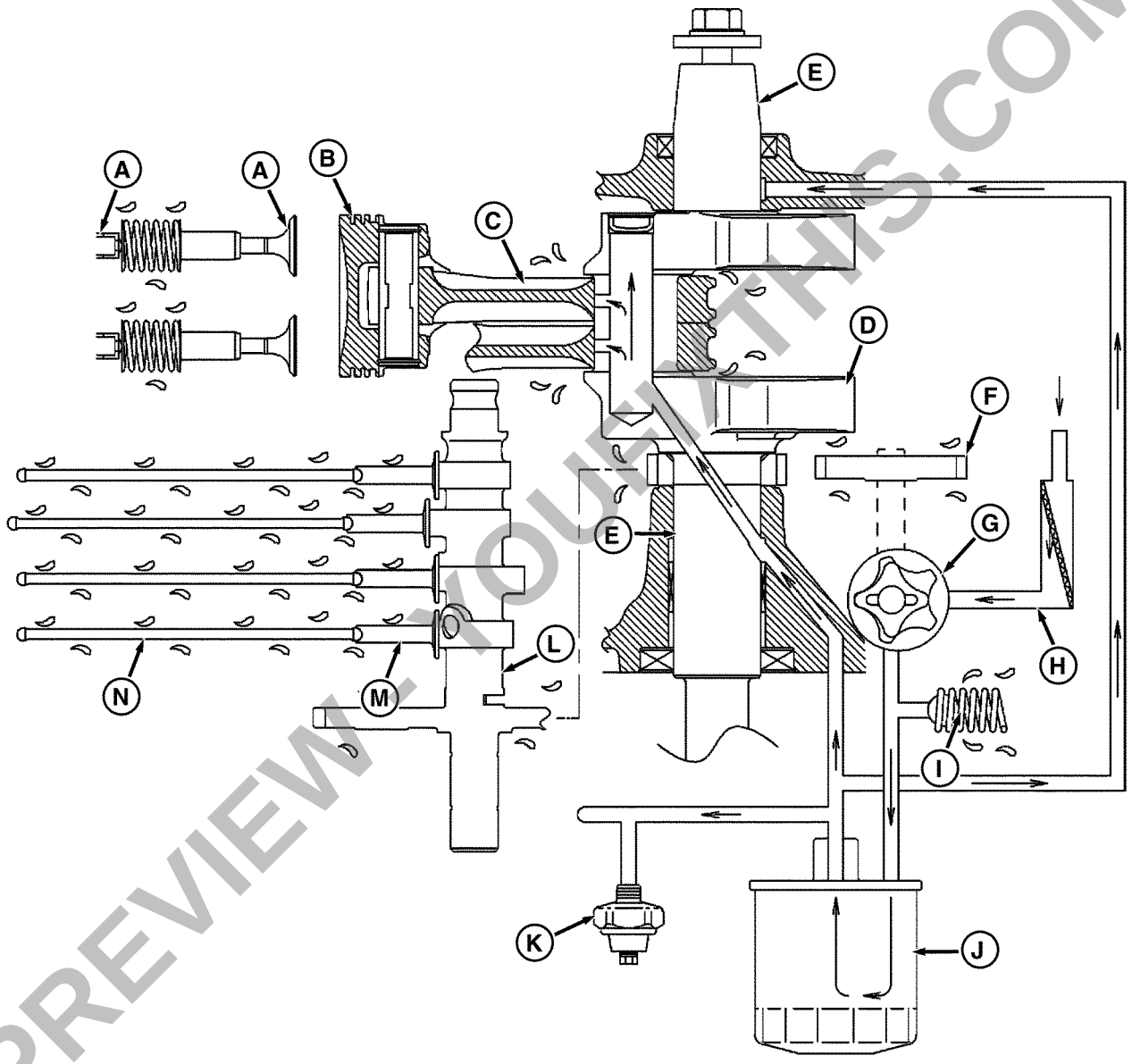
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Summary of References

- Engine Oil Flow Chart
- Lubrication System Operation
- Governor Operation
- Crankcase Breather Operation
- Automatic Compression Release (ACR) Operation
- Cooling System Operation
- Carburetor Operation
- Ignition Operation

BS62576,00006A7 -19-13SEP12-1/1

Engine Oil Flow Chart



A—Rocker Arm and Valve
B—Piston
C—Connecting Rod
D—Crankshaft
E—Crankshaft Main Journal
F—Oil Pump Gear
G—Oil Pump
H—Pickup Screen
I— Oil Pressure Relief Valve
J—Oil Filter
K—Oil Pressure Switch
L—Camshaft
M—Tappet
N—Push Rod

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Diagnose Engine Does Not Crank

Engine Does Not Crank

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

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

Test Conditions

- Park machine safely. (See "Park Machine Safely" in the Safety section.)
- Operator on seat.
- PTO switch in OFF position.
- Park brake LOCKED.

BS62576,000073D -19-26SEP12-1/10

Diagnose Engine Does Not Crank

BS62576,000073D -19-26SEP12-2/10

1 Test Procedure	Are battery cable connection points clean and tight?	**YES:** Go to next step. **NO:** Clean and tighten cable connection points.

BS62576,000073D -19-26SEP12-3/10

2 Continued	Is battery fully charged? (See Battery Load Test.)	**YES:** Go to next step. **NO:** Charge battery. (See Battery Charge.)

BS62576,000073D -19-26SEP12-4/10

3 Continued	Is key switch working correctly?	**YES:** Go to next step. **NO:** Test switch, replace as needed. (See Key Switch Test.)

BS62576,000073D -19-26SEP12-5/10

4 Continued	Is starting motor working?	**YES:** Go to next step. **NO:** Repair or replace as needed. (See "Diagnose Starting Motor")

BS62576,000073D -19-26SEP12-6/10

5 Continued	Is the starting motor solenoid operational?	**YES:** Go to next step. **NO:** Repair or replace. (See Inspect Starting Motor.)

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BS62576,000073D -19-26SEP12-7/10

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Specifications

Item	Measurement	Specification
Engine (FX651V, FX730V)		
Engine Cylinder Compression	Pressure	390 kPa (57 psi)
Difference Between Cylinders	Pressure	41 kPa (6 psi)
Oil Pressure Switch	Torque	9.8 N·m (87 lb.-in.)
Engine (FX651V and FX730V, FX751V, FX801V and FX850V)		
Inner Governor Arm Nut	Torque	7.8 N·m (69 lb.-in.)
Outer Governor Arm Bolt (Left Hand Threads)	Torque	5.9 N·m (52 lb.-in.)
Governor Lever Arm Nut	Torque	7.8 N·m (69 lb.-in.)
Slow Idle (Governed Idle)	RPM	1700 ± 150
Slow Idle (Carburetor Idle)	RPM	1450
Fast Idle Speed	RPM	3600 ± 100
Fan Screen-to-Fan Housing	Clearance	1.0-3.0 mm (0.039-0.118 in.)
Fan Screen Screw	Torque	5.9 N·m (52 lb.-in.)
Rocker Adjusting Nut	Torque	11 N·m (97 lb.-in.)
Valve (Cold)	Clearance	0.05-0.10 mm (0.0020-0.0039 in.)
Ignition Coil Air	Gap	0.2-0.4 mm (0.008-0.016 in.)
Ignition Coil Bolt	Torque	5.9 N·m (52 lb.-in.)
Engine Oil Pressure	Pressure	294-588 kPa (43-85 psi)
Difference Between Cylinders	Pressure	41 kPa (6 psi)
Oil Pressure Switch	Torque	9.8 N·m (87 lb.-in.)
Engine (FX751V, FX801V, FX850V, FX921V, FX1000V)		
Engine Cylinder Compression	Pressure	440 kPa (64 psi)
Engine (FX921V, FX1000V)		
Engine Oil Pressure	Pressure	294-490 kPa (43-71 psi)

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BS62576,0000771 -19-25SEP12-1/2

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Engine Control Module (ECM) Diagnostic Test Codes

To retrieve diagnostic codes from ECM, key switch must be cycled to the ON position three times with a ten second pause in the OFF position between ON cycles. Shortly after the key is left in the ON position for the third time the malfunction indicator light (MIL) on the hour meter will begin to blink out codes.

Fault Code	Connection or Failure Description
0031	Oxygen Sensor Heater Circuit High Voltage
0032	Oxygen Sensor Heater Circuit Low Voltage
0107	Manifold Absolute Pressure Sensor Circuit Low Voltage or Open
0108	Manifold Absolute Pressure Sensor Circuit High Voltage
0112	Intake Air Temperature Sensor Circuit Low Voltage
0113	Intake Air Temperature Sensor Circuit High Voltage or Open
0117	Oil Temperature Sensor Circuit Low Voltage
0118	Oil Temperature Sensor Circuit High Voltage or Open
0122	Throttle Position Sensor Circuit Low Voltage or Open
0123	Throttle Position Sensor Circuit High Voltage
0131	Oxygen Sensor Circuit Low Voltage or Open
0132	Oxygen Sensor Circuit High Voltage
0171	Maximum Adaptation Limit Exceeded
0172	Minimum Adaptation Limit Exceeded
0174	Lean Fuel Condition at High Load (Open Loop)
0201	Injector 1 Circuit Malfunction
0202	Injector 2 Circuit Malfunction
0230	Fuel Pump Module Circuit Low Voltage or Open
0232	Fuel Pump Module Circuit High Voltage
0336	Crankshaft Position Sensor Noisy Signal
0337	Crankshaft Position Sensor No Signal
0351	Cylinder 1 Ignition Coil Malfunction
0352	Cylinder 2 Ignition Coil Malfunction
0562	System Voltage Low
0563	System Voltage High
61	End of Code Transmission

OUMX258,00005B7 -19-12SEP12-1/1

0031 — Diagnostic Test Code

O2 Sensor Heater Circuit

System voltage too high, shorted connection, or faulty sensor.

Condition Code	Condition Description
0031	Oxygen sensor heater circuit high voltage
Component	Oxygen Sensor Heater

Possible Causes:

1. Oxygen sensor related
   a. Sensor connector or wiring problem.
   b. Sensor damaged.
   c. Pin circuit wiring or connectors at Black 7.
2. ECM related
   a. ECM to harness connection problem.

Possible Related Codes:

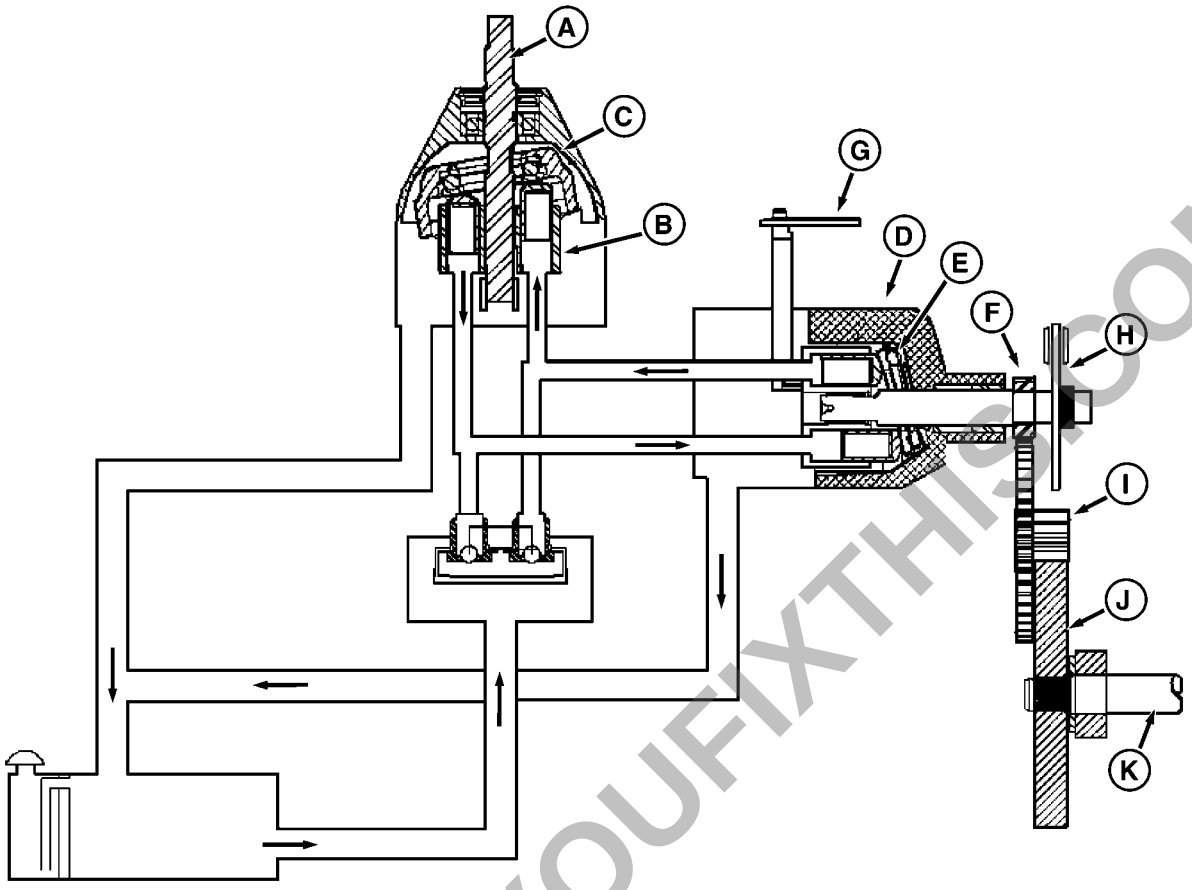
- Code 0563 System voltage high

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Transaxle Operation



TCT005669 —UN—24SEP12

A—Input Shaft
B—Rotating Group
C—Plate
D—Rotating Group
E—Housing
F—Output Shaft
G—Lever
H—Disc
I— Geat Set
J— Gear
K—Axle

Hydraulic Oil Circuit Operation:

The input pulley is rotated by the traction drive belt and rotates the pump input shaft (A). The pump input shaft is splined to the pump rotating group (B) and the charge pump. The pump rotating group is composed of an axial piston pump and a swash plate (C) which provides variable pump displacement. The charge pump draws pressure-free oil from the reservoir through a filter and check valve, and supplies oil to the pump rotating group. The pump rotating group provides oil under pressure to the motor rotating group (D) through one of two passages. Output to one or the other passage is controlled by the direction and amount that the variable swash plate is angled.

The motor rotating group is composed of an axial piston motor and an angled bearing housing (E) which provides fixed motor displacement. Since the motor has a fixed displacement angle it is forced to turn with the flow of oil. The motor converts hydraulic energy into rotary motion, which is output through the motor output shaft (F). This rotary motion of the motor output shaft is the beginning of the gear power flow.

As the angle of the pump swash plate is increased the amount of oil being pumped will increase and cause a higher rotation speed of the motor. Reversing the angle of the swash plate will reverse the direction of oil flow and motor rotation.

Bypass Operation:

The bypass system allows the machine to be pushed forward or reverse with the engine off and the brake released.

When the bypass release rod is pulled toward the front of the machine, the rod rotates the bypass lever (G). The bypass lever lifts the motor block off of the center section running surface. This allows oil (and oil pressure) from the cylinder blocks to be released allowing the operator to push the machine in forward or reverse with the engine off and the brake released.

Gear Operation:

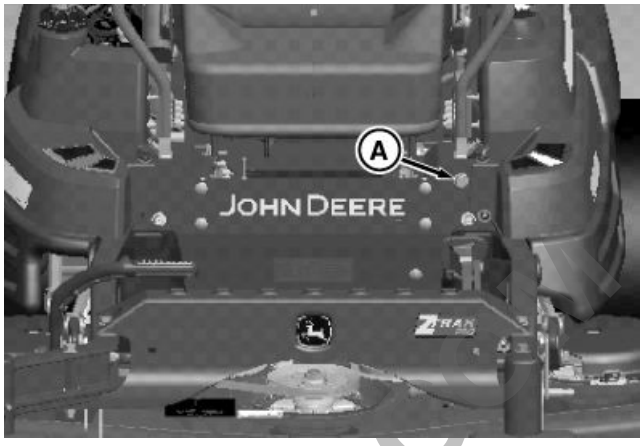
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Adjust Tracking and Speed

If the machine does not track in a straight line while going forward, adjust the tracking:

1. Park machine safely. (See “Park Machine Safely” in the Safety section.)
2. Turn the adjusting screw as required:
   - If machine tracks to right, turn adjusting screw (A) counterclockwise one rotation.
   - If machine tracks to left, turn adjusting screw (A) clockwise one rotation.
3. Test vehicle for proper tracking.
4. Repeat the steps 2 and 3 as necessary to adjust the tracking.
5. Return vehicle to service.



TCT005191 —UN—24SEP12

A—Adjusting Screw

OUMX258,00004E5 -19-21AUG12-1/1

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Index

Page

A

Attachments
- Component location
  - 48 inch deck 50-10-1
  - 54 inch deck 50-10-2
  - 54 inch deck M.O.D. 50-10-3
  - 60 inch deck 50-10-4
  - 60 inch deck M.O.D. 50-10-5
  - 72 inch deck 50-10-6
  - Anti-scalp wheels 50-10-11
  - Deck lift with pedal 50-10-14
  - Idlers and sheaves 50-10-9
  - Idlers and sheaves legend 50-10-10
  - Mower deck lift assist 50-10-15
  - Mower deck lift linkage 50-10-16
  - Mulch-on-demand linkage 50-10-12
  - Mulch-on-demand linkage legend 50-10-13
  - Spindles and sheaves 50-10-7
  - Spindles and sheaves legend 50-10-8
- Diagnosis
  - Clutch slips 250-20-12
  - Excessive noise 250-20-10
  - Mower cuts unevenly 250-20-8
  - Mower deck vibrates 250-20-6
  - Mower deck will not run 250-20-5
  - Mower system 250-20-1
  - Mower system (engine running) 250-20-4
  - Noisy clutch or vibration 250-20-14
  - Poor mulching (M.O.D. deck) 250-20-9
  - PTO clutch 250-20-11
- Mower blade, sharpen and balance 50-20-6
- Repair
  - Mower blades, check and replace 50-20-6
  - Mower deck
    - Belt shields, remove and install 50-20-3
    - Remove and install 50-20-2
  - Mower drive belt, install 50-20-5
  - Mower drive belt, remove 50-20-4
  - PTO clutch, break in 250-30-10
  - PTO clutch, remove and install 50-20-12
  - Spindle assembly, remove and install 50-20-7
  - Spindle cross section 50-20-10
  - Spindle, assemble 50-20-11
  - Spindle, disassemble 50-20-9
- Repair (optional MCS)
  - Blower, assemble 50-30-8
  - Blower, disassemble 50-30-5
  - Drive shaeave and spacer, remove 50-30-1
  - Drive sheave and spacer, install 50-30-2
  - Primary drive belt, install 50-30-3
  - Primary drive belt, remove 50-30-2
  - Secondary drive belt, install 50-30-4
  - Secondary drive belt, remove 50-30-4
- Tests and adjustments
  - Deck lift spring tension, adjust 250-30-5

Page

  - Dump-from-seat hopper linkage, adjust 250-30-9
  - MCS blower primary belt tension, adjust 250-30-9
  - MCS blower secondary belt tension, adjust 250-30-9
  - Mower deck anti-scalp wheels, adjust 250-30-5
  - Mower deck cutting height, adjust 250-30-2
  - Mower deck, adjust and level 250-30-3
  - Mulch-on-demand and mower deck linkage, adjust 250-30-6
  - PTO air gap, check and adjust 250-30-8
- Theory of operation
  - Much on demand (M.O.D.) 250-10-2
  - PTO 250-10-5

B

Battery Handling, Safety
- Safety, Battery Handling 10-05-5

Bolt and screw torque values
- Metric 10-10-3
- Unified inch 10-10-4

C

Component location
- Attachments
  - 48 inch deck 50-10-1
  - 54 inch deck 50-10-2
  - 54 inch deck M.O.D. 50-10-3
  - 60 inch deck 50-10-4
  - 60 inch deck M.O.D. 50-10-5
  - 72 inch deck 50-10-6
  - Anti-scalp wheels 50-10-11
  - Deck lift with pedal 50-10-14
  - Idlers and sheaves 50-10-9
  - Idlers and sheaves legend 50-10-10
  - Mower deck lift assist 50-10-15
  - Mower deck lift linkage 50-10-16
  - Mulch-on-demand linkage 50-10-12
  - Mulch-on-demand linkage legend 50-10-13
  - Spindles and sheaves 50-10-7
  - Spindles and sheaves legend 50-10-8
- Electrical 30-10-1
  - Instrument cluster 30-10-2
- Engine
  - Kawasaki, (FX651V, FX730V)
    - Carburetor 220-05-8
    - Engine block 220-05-2
    - Valves and governor 220-05-11
  - Kawasaki, (FX751V, FX801V, FX850V)
    - Carburetor 220-05-9
    - Engine block 220-05-4
    - Valves and governor 220-05-13

Continued on next page

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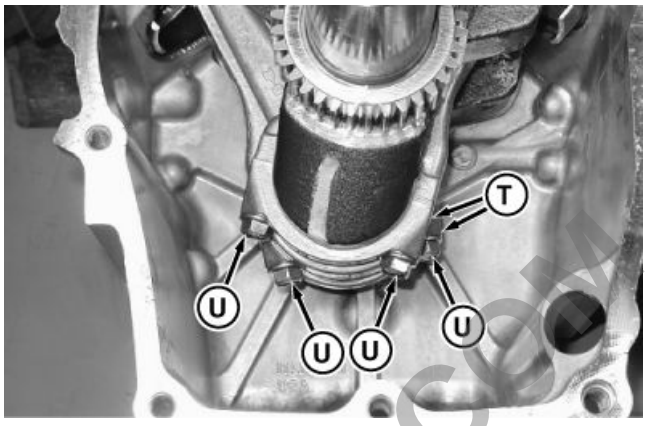
10. Install connecting rod cap (T) and cap screws (U). Tighten cap screws to specification.

Specification

Connecting Rod Screw (FX651V and FX730V)—Torque.....21 N·m (15.5 lb.-ft.)

Connecting Rod Screw (FX751V, FX801V and FX850V)—Torque.....20.6 N·m (15.2 lb.-ft.)

11. Install camshaft, crankcase cover, and cylinder head.



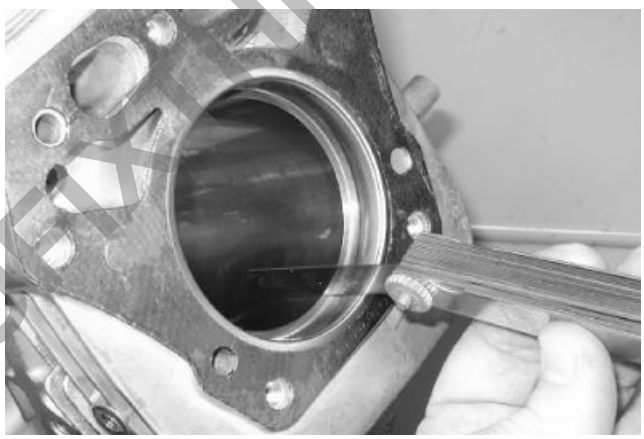
TCT004964 —UN—24SEP12

T—Cap **U—Screw**

BS62576,00006F0 -19-01OCT12-8/8

Check Piston Ring End Gap

1. Measure thickness of top and second piston rings at several places. If thickness is less than specification; replace piston ring.
2. Check piston ring end gap. Install each ring squarely in cylinder bore approximately 25.4 mm (1.0 in.) down from top of cylinder.
3. Check end gap. Replace if end gap is greater than specifications.



TCT004960 —UN—24SEP12

Piston Ring End Gap (FX651V and FX730V)—Specification

Top Piston Ring End (Service Limit)—Gap.....0.65 mm (0.026 in.)

Second Piston Ring End (Service Limit)—Gap.....0.78 mm (0.031 in.)

Oil Piston Ring End (Service Limit)—Gap.....1.05 mm (0.041 in.)

Piston Ring End Gap (FX751V, FX801V and FX850V)—Specification

Top Piston Ring End (Service Limit)—Gap.....0.70 mm (0.028 in.)

Second Piston Ring End (Service Limit)—Gap.....0.80 mm (0.031 in.)

Oil Piston Ring End (Service Limit)—Gap.....1.00 mm (0.039 in.)

BS62576,00006F1 -19-19SEP12-1/1

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Inspect Cylinder Head and Valve Guides (FX921V, FX1000V)

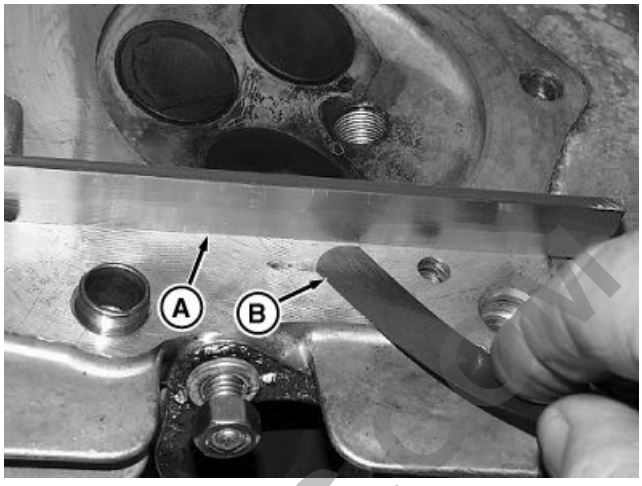
Cylinder Head

1. Remove cylinder heads. (See Remove Cylinder Head (FX921V, FX1000V).)
2. Remove carbon deposits from combustion chamber and gasket surface using Scotch-Brite® abrasive pads or an equivalent.

CAUTION: Avoid Injury! Reduce compressed air to less than 210 kPa (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

3. Clean head with a suitable solvent and dry with compressed air.
4. Inspect for cracks or broken cooling fins.
5. Inspect gasket surface for burrs and nicks.
6. Check that oil drain-back passages are not plugged.
7. Put cylinder head on a surface plate or using a straightedge (A) and feeler gauge (B) to check for distortion at several points around the head. Replace head if distortion is greater than specification.

Scotch-Brite is a trademark of 3M Co.



TCT005153 —UN—24SEP12

A—Straight Edge **B—Gauge**

Specification

Cylinder Head (Max) (FX921V, FX1000V)—Distortion	0.05 mm (0.002 in.)

BS62576,0000722 -19-20SEP12-1/3

Valve Guides

NOTE: Intake and exhaust valve guides cannot be replaced; replace head if worn.

1. Clean inside of valve guides with valve guide cleaner.
2. Measure inside diameter of valve guides (A) in several places down the length of the guide.

A—Valve Guide



TCT005154 —UN—24SEP12

Continued on next page

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3. Remove one screw (C) and pull the MAP sensor out of the intake manifold.

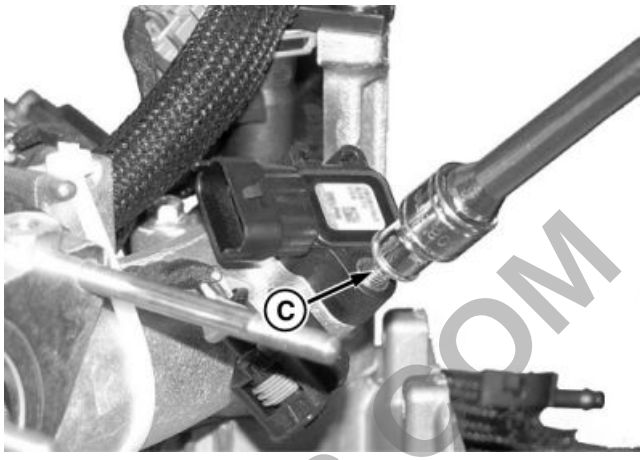
Installation:

1. Lightly oil the MAP sensor O-ring and insert the sensor into the intake manifold bore.
2. Secure sensor with one screw and tighten to specification.

Specification	
MAP Sensor Mounting Screw—Torque	7.3 N·m (65 lb.-in.)

3. Attach electrical connector to sensor securely.

C—Screw



TCT005462 —UN—24SEP12

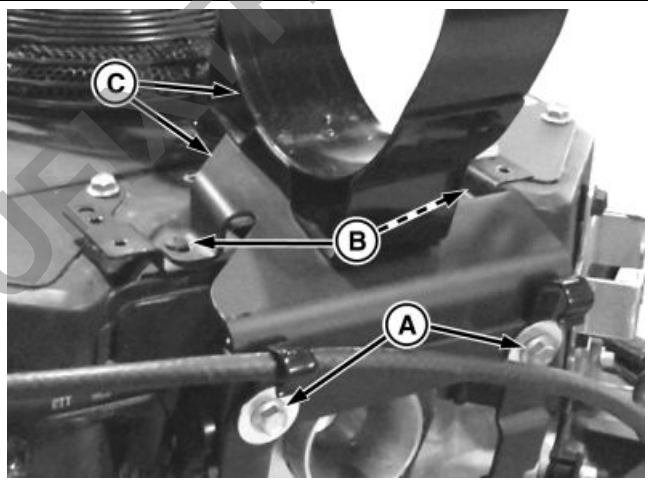
BS62576,0000653 -19-07SEP12-2/2

Remove and Install Intake Air Sensor (EFI)

Removal:

1. Remove the air cleaner assembly. (See Remove and Install Air Cleaner Assembly (EFI).)
2. Remove two bolts with washers (A), two screws (B) and the upper air cleaner mounting bracket assembly (C) from engine.
3. Remove the throttle control panel. (See Remove and Install Throttle Control Panel Assembly (EFI).)

A— Bolts and Washers
B— Screws
C— Air Cleaner Bracket



TCT005463 —UN—24SEP12

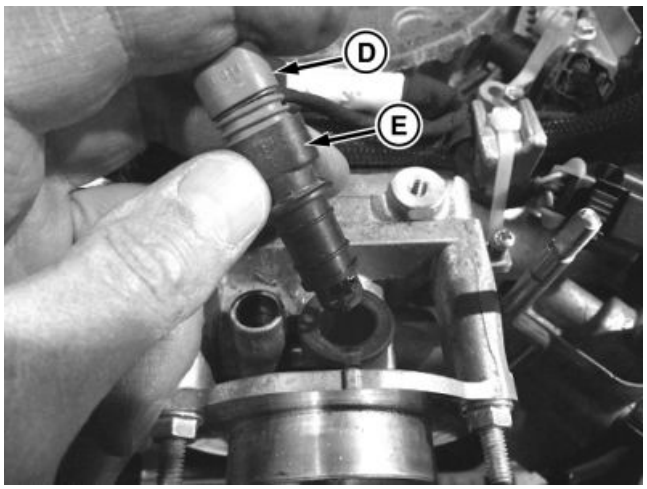
BS62576,0000654 -19-11SEP12-1/2

4. Disconnect the sensor wiring connector (D) and pull the sensor (E) from the throttle body grommet.

Installation:

1. Insert the intake air sensor fully into the throttle body grommet. Connect the wiring harness to the sensor.
2. Install the throttle control panel. (See Remove and Install Throttle Control Panel Assembly (EFI).)
3. Install the air cleaner mounting brackets and air cleaner assembly. (See Remove and Install Air Cleaner Assembly (EFI).)

D— Wire Connector
E— Intake Air Sensor



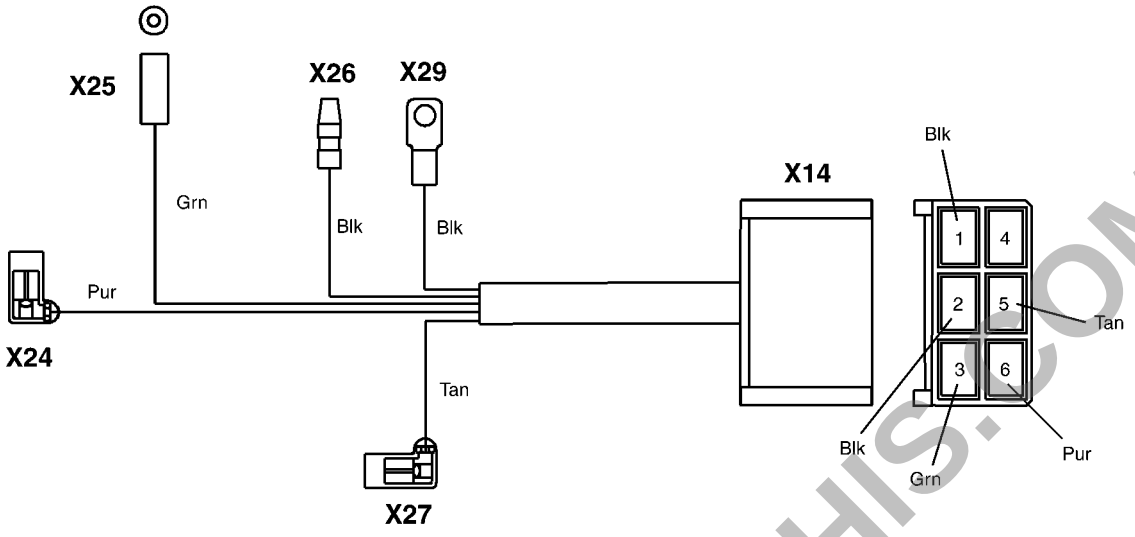
TCT005537 —UN—30AUG12

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W2 Engine Harness (Z930A, Z950A, Z960A, Z970A)



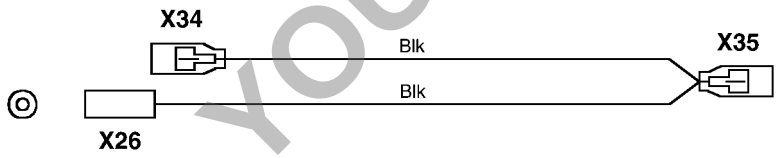
TCT001647 —UN—24SEP12

X24— Starter Solenoid Connector
X25— Fuel Shutoff Solenoid Harness Connector
X26— Ignition Coil Harness Connector
X27— Engine Oil Pressure Switch Connector
X29— Starter Battery Terminal
X14— Engine Harness Connector

OUMX258,000056B -19-17SEP12-1/1

W4 Ignition Coil Harness (Z930A, Z950A, Z960A, Z970A)

TCT005203 —UN—05SEP12



Ignition Coil Wire Harness

X26— Engine Harness to Ignition Coil Harness Connector
X34— Ignition Coil (T2) Conector
X35— Ignition Coil (T1) Conector

OUMX258,000056D -19-17SEP12-1/1

W5 Fuel Shut Off Solenoid Harness (Z930A, Z950A, Z960A, Z970A)



TCT005205 —UN—05SEP12

X25— Fuel Shutoff Solenoid Connector
X32— Fuel Shutoff Solenoid Connector
X36— Fuel Shutoff Solenoid Ground Terminal

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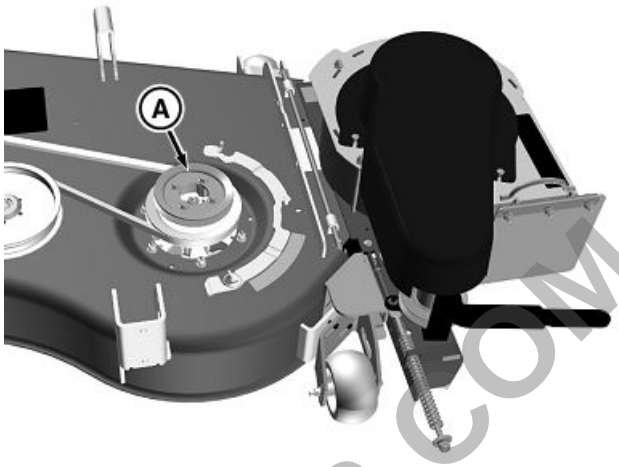
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Install Primary Drive Belt

NOTE: Five spacers are installed for all decks except the 54- and 60-in. M-Series decks, which require seven spacers

1. Install appropriate number of spacers and secondary sheave (A).

A—Secondary Sheave



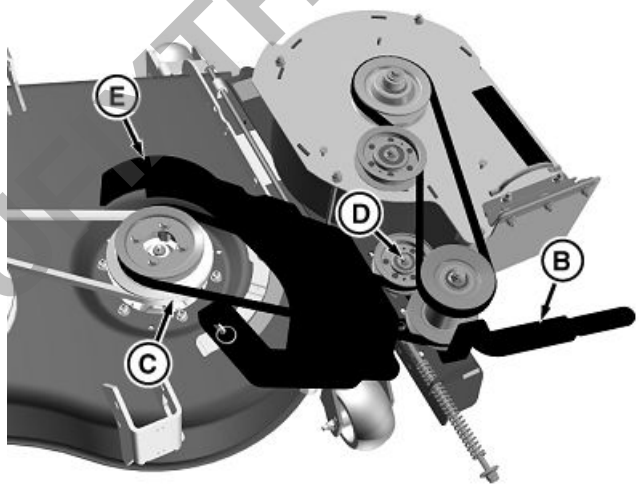
TCT005258 —UN—24SEP12

Parts have been removed for clarity.

OUMX258,00004C5 -19-28AUG12-1/2

2. Using the tension lever (B), install the primary drive belt (C) and tighten nut on tension sheave (D). Check and adjust belt tension. (See Adjust MCS Blower Primary Belt Tension.)
3. Install primary belt shield (E).

B—Tension Lever
C—Primary Belt
D—Sheave
E—Belt Shield



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Parts have been removed for clarity.

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Barbed Fitting	JTO5703	To perform vacuum test

BS62576,000076F -19-25SEP12-9/11

Hose	JTO5699	To perform vacuum test

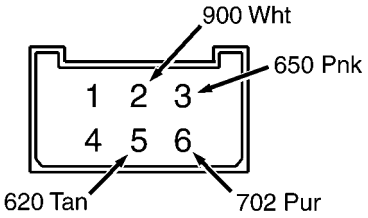
BS62576,000076F -19-25SEP12-10/11

Vacuum Gauge	JTO3503	To perform vacuum test

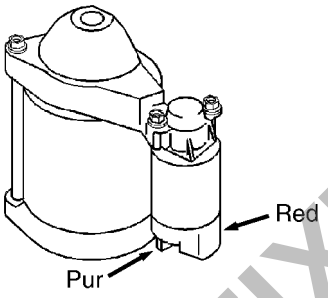
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19 Engine Harness Connector	Is battery voltage present at engine harness connector (X14), terminal 6, 702 Pur wire?  TCT005830 —UN—13SEP12	**YES:** Go to step **20** **NO:** Test 702 Pur wire and connections.

OUMX258,000058D -19-12SEP12-21/22

20 Starting Motor Solenoid	Is battery voltage present at starting motor solenoid terminal?  TCT005824 —UN—13SEP12	**YES:** Test starting motor solenoid. (See Test Starting Motor Solenoid.)

OUMX258,000058D -19-12SEP12-22/22

Diagnose Run Circuit

Diagnose Run Circuit

Procedure A Test Conditions

- Machine parked on level surface
- Key switch in RUN position
- Park brake LOCKED, or operator ON seat
- Meter negative (—) lead on battery negative (—) terminal or chassis ground.
- Check connections for corrosion and looseness

Refer to run circuit theory of operation and schematic. (See Run Circuit Operation.)

NOTE: The electronic control unit requires that the key switch be temporarily toggled (or "bumped") into the start position for output voltage to the starting motor solenoid, fuel solenoid and PTO clutch during diagnostic procedures.

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Procedure A - Run Circuit

Continued on next page

OUMX258,000058E -19-12SEP12-2/20

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