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JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER EQUIPMENT DIVISION

Spin-Steer Lawn Tractor
SST15, SST16 and SST18

TM1908 MAY02

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

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

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

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

Safety
Specifications and Information
Engine - (Briggs and Stratton)
Engine - (Kohler)
Electrical
Power Train
Steering
Brakes
Attachments
Miscellaneous

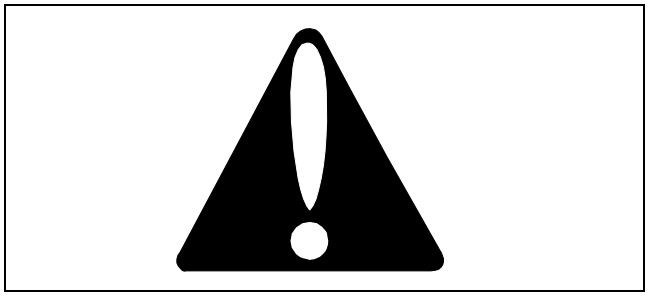
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Recognize Safety Information



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

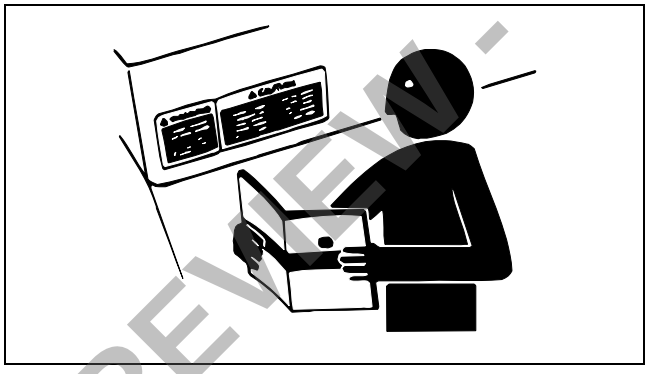
Follow recommended precautions and safe servicing practices.

Understand Signal Words

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

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

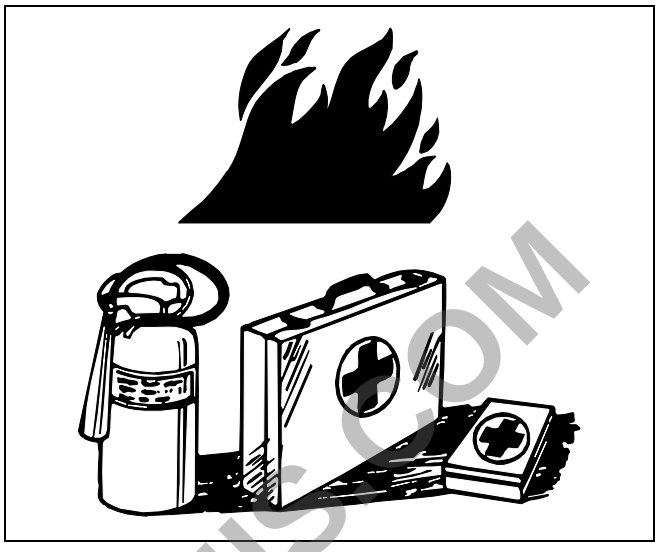
Replace Safety Signs



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

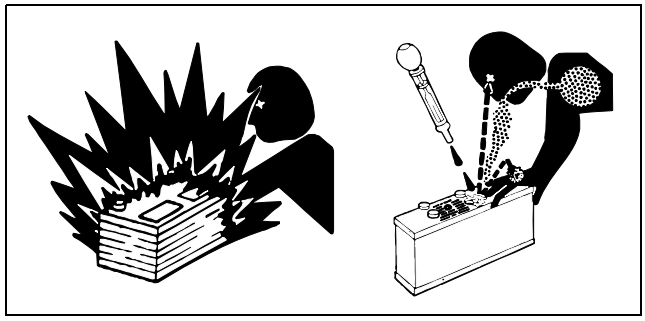
Be Prepared For Emergencies

- When you work around fuel, do not smoke or work near heaters or other fire hazards.
- Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.



- Make sure machine is clean of trash, grease, and debris.
- Do not store oily rags; they can ignite and burn spontaneously.
- Be prepared if a fire starts.
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

Use Care In Handling And Servicing Batteries



Prevent Battery Explosions

- Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.
- Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.
- Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

Prevent Acid Burns

- Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

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Specifications

Engine Specifications

SST15

Make	Kohler
Engine Model Number	CV15S-41611
Type	Gasoline
Horsepower	11.2 kW (15 hp)
Displacement	426 cm^3 (26.0 cu-in.)
Cylinders	1
Cycle	4
Valves	Overhead Valves
Cooling Type	Air
Oil Filter	Replaceable Full Flow Filter
Crankcase Capacity (With Filter)	1.8 L (1.9 qt)
Without Filter)	1.4 L (1.5 qt)
Air Cleaner	Paper Element with Foam Precleaner
Muffler	Horizontal discharge below frame
Spark Plug Gap	1 mm (0.040 in.)
Spark Plug Torque	40 N•m (30 lb-ft)

SST16

Make	Briggs & Stratton
Series	Vanguard V-Twin
Type	Gasoline
Model	303777
Horsepower	11.9 kW (16.0 hp)
Displacement	480 cm3 (29.3 cu in.)
Cylinders	2
Stroke/Cycle	4
Valves	Overhead Valves
Lubrication	Pressurized
Oil Filter	Full Flow Filter (w/o By-Pass Valve)
Crankcase Capacity (With Filter)	1.5 L (1.6 qt)
Crankcase Capacity (With Out Filter)	1.4 L (1.5 qt)
Cooling System	Air Cooled
Air Cleaner	Paper with outer foam element
Muffler	Horizontal discharge below frame
Spark Plug Gap	0.76 mm (0.030 in.)
Spark Plug Torque	20 N•m (15 lb-ft)

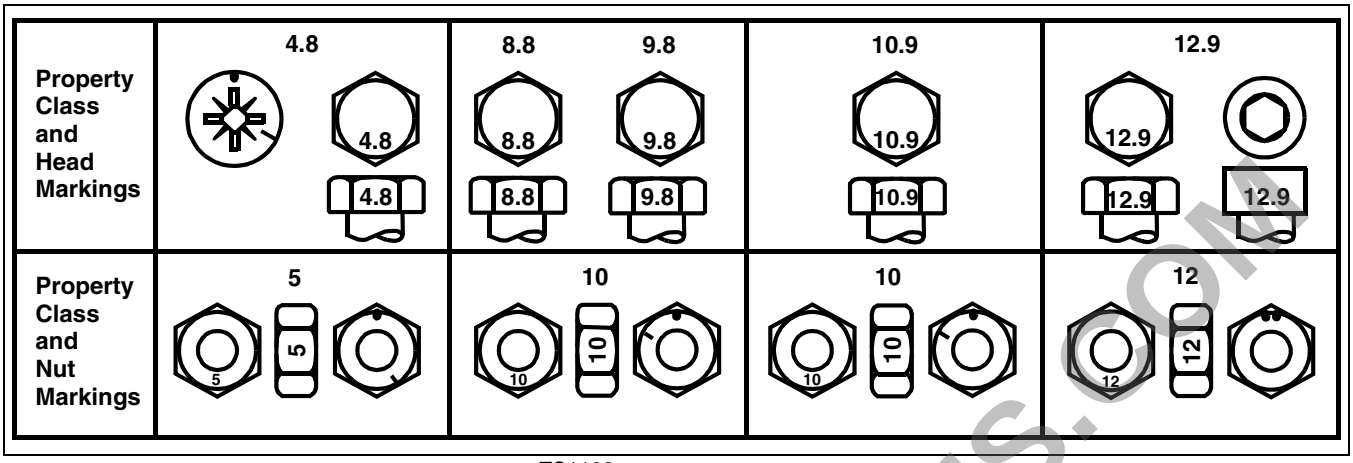
SST18

Make	Briggs & Stratton

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Fastener Torques

Metric Fastener Torque Values



TS1163

	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

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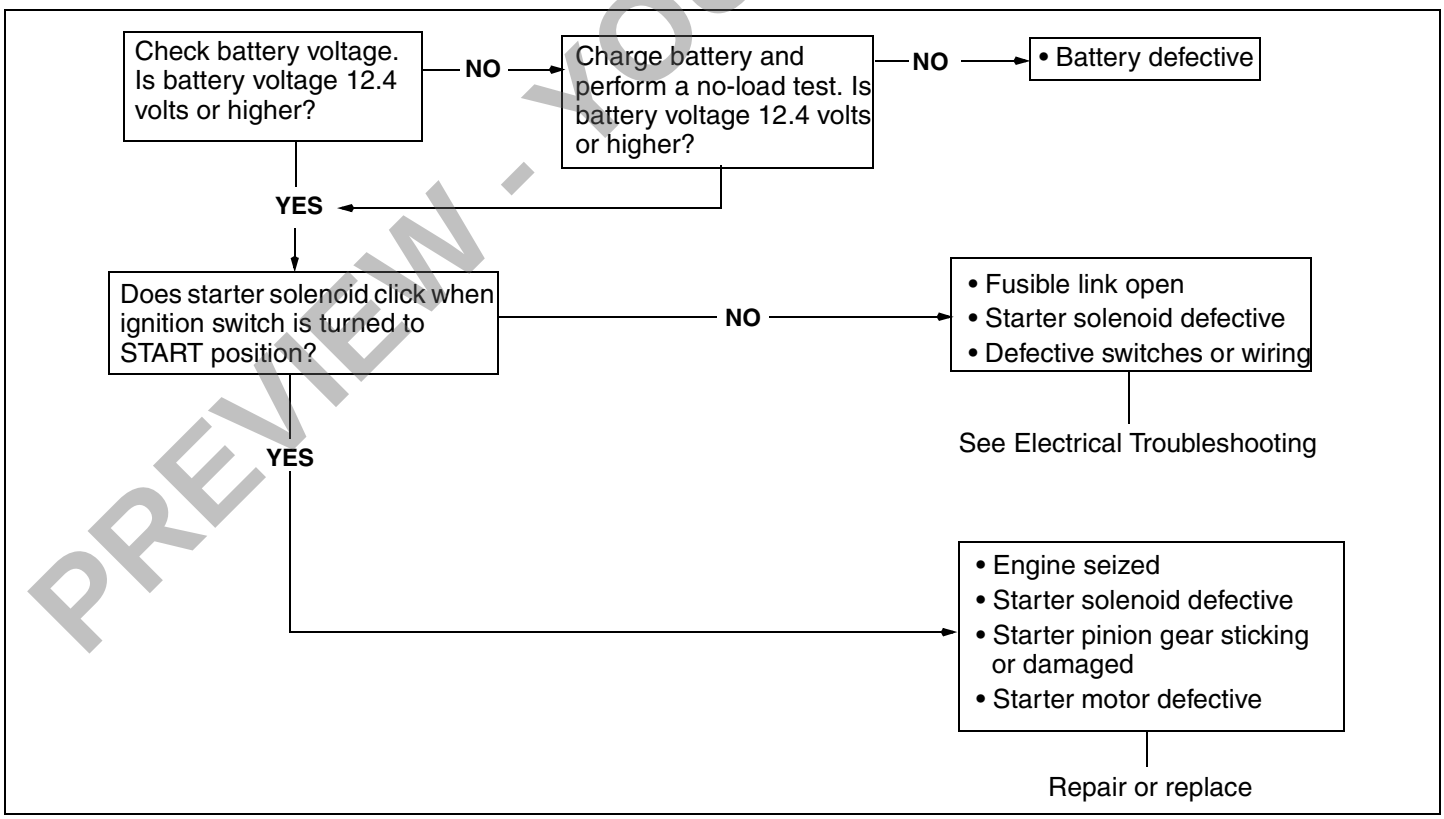
Troubleshooting

Engine Troubleshooting: Engine Will Not Crank

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

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

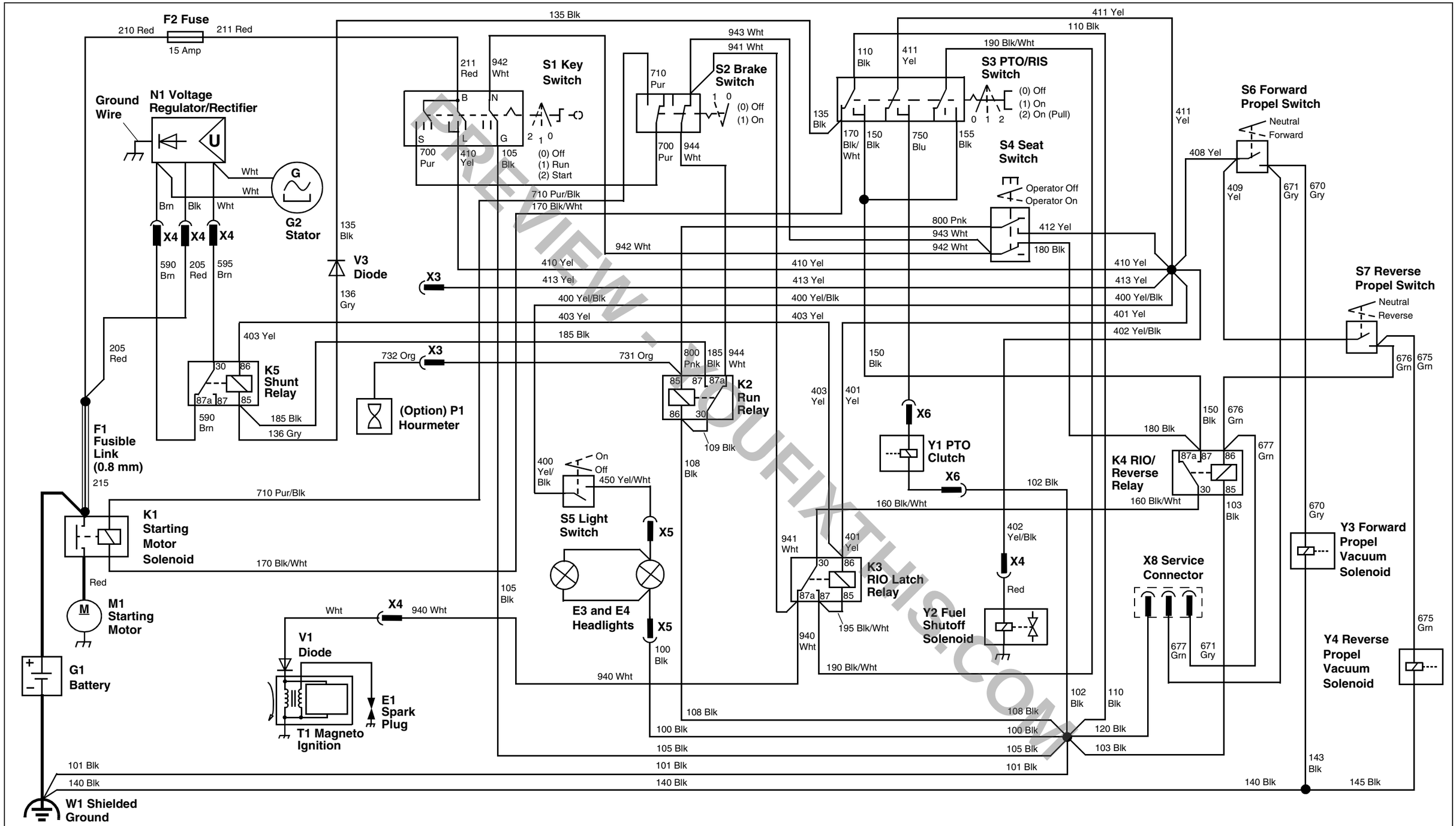
Test/Check Point	Normal	If Not Normal
1. Check battery voltage. Is battery voltage 12.4 volts or higher?	Battery voltage. Go to step 2. • Less than battery voltage, charge battery and perform a no-load test. Go to step 2.	Battery defective.
2. Does starter solenoid click when ignition switch is turned to START position?	Starter solenoid clicks. Go to step 3. • Less than battery voltage, replace battery.	Fusible link open. Starter solenoid defective. Defective switch or wiring.
3. Does starter solenoid click when ignition switch is turned to START position?	**Engine starts. Test complete** • Engine seized. • Starter solenoid defective • Starter pinion gear sticking or damaged • Starter motor defective	Repair or replace.



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W1 Main Electrical Schematic - SST15

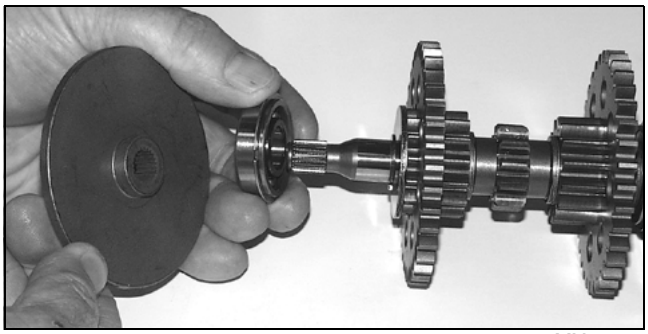


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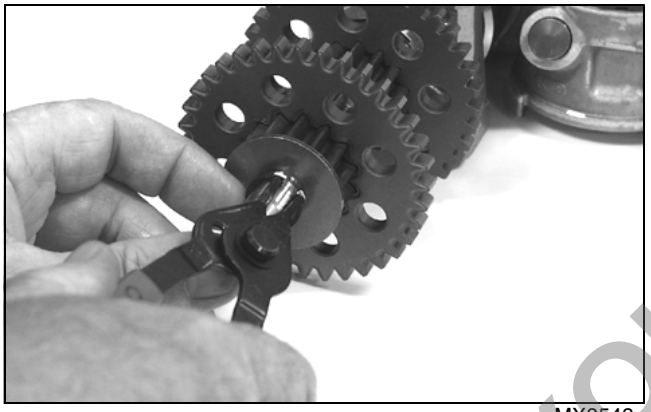
Propel Unit Disassembly And Assembly

Procedure:



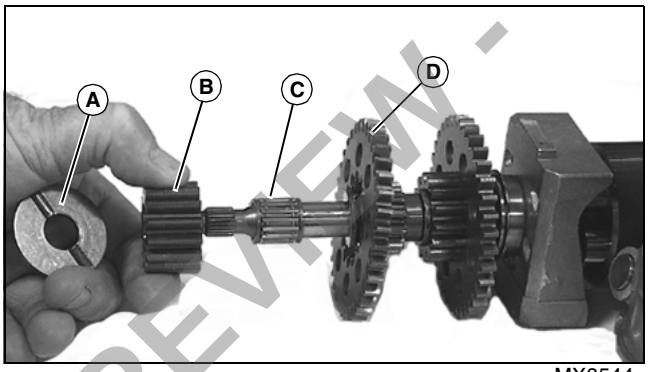
MX8542

1. Remove brake disc and ball bearing from shaft.



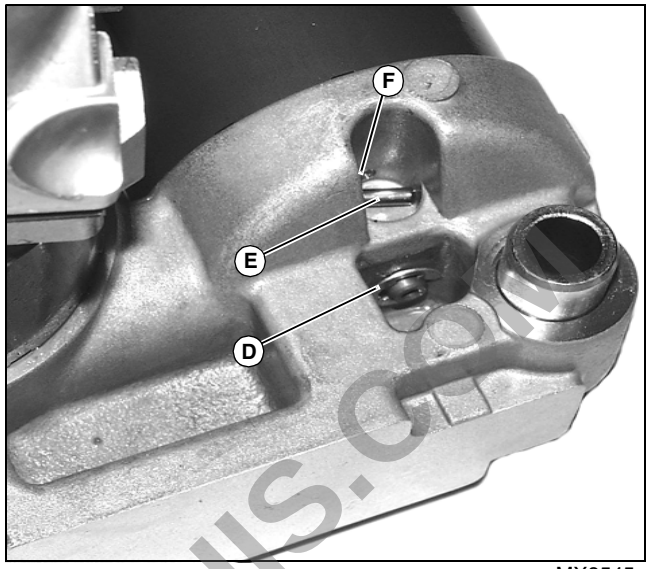
MX8543

2. Remove snap ring.



MX8544

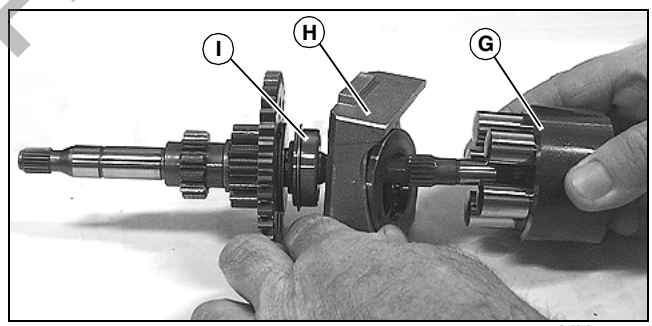
3. Remove washer (A), gear (B), needle bearing (C), and gear (D).



MX8545

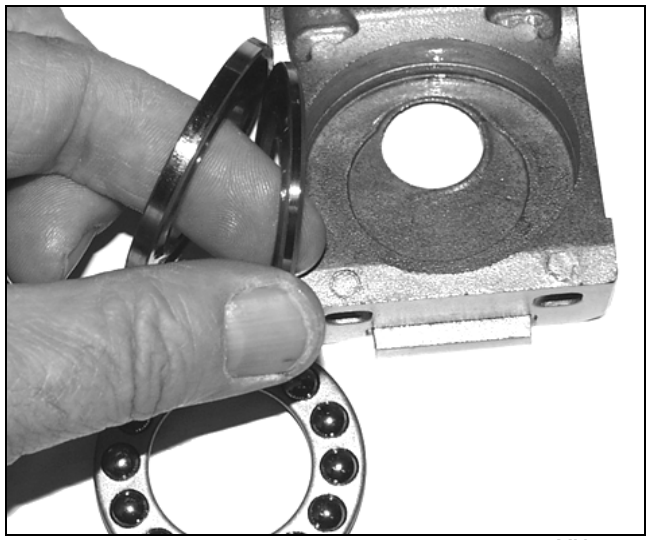
4. Push shaft in to relieve pressure on C-clip (D) and remove C-clip. Slide shaft assembly out of housing.

5. Remove pin (E). Pin (E) may have remained in hole (F), but usually falls out into recess as shown, or to bottom of transmission.



MX8547

6. Remove rotating assembly (G), and swash plate (H).



MX8571

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Tests And Adjustments

Throttle Cable Adjustment

Reason:

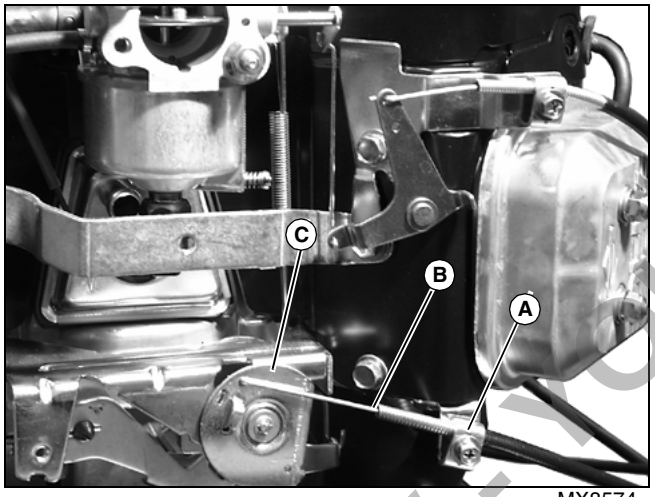
To make sure the throttle cable moves the throttle through its full range of movement.

Procedure:

1. Remove air cleaner assembly and base.

NOTE: Nuts securing air cleaner base to carburetor also secure carburetor to intake manifold. DO NOT run engine with nuts removed.

2. Install nuts on carburetor studs.
3. Move throttle lever to FAST idle position.



MX8574

4. Loosen throttle cable clamp (A).
5. Move throttle cable (B) until governor control swivel (C) is at end of travel.
6. Tighten throttle cable clamp.

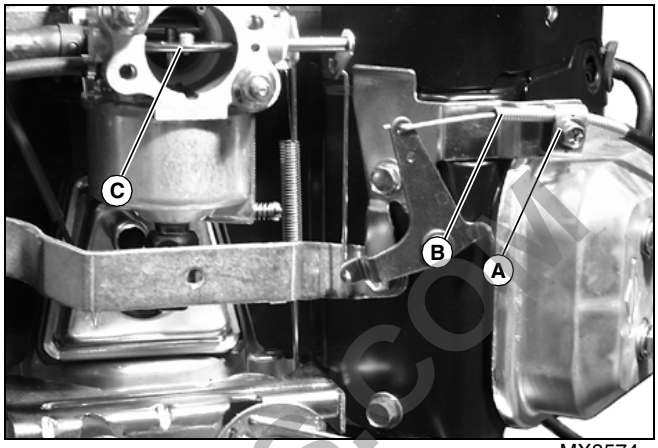
Choke Cable Adjustment

Reason:

To make sure the choke cable moves the choke through its full range of movement.

Procedure:

1. Stop engine and set parking brake.
2. Remove air cleaner assembly from carburetor.
3. Pull choke lever at dash completely back towards operator.
4. With lever entirely back, choke “butterfly” should be vertical or entirely closed.
5. If not:



MX8574

- Push choke lever at dash completely inward.
- Loosen cable clamp (A) and pull choke cable (B) so butterfly is in the horizontal position (C). Tighten clamp.

6. Move lever through full range of motion. Make sure choke is closed at full choke. Readjust if necessary.

Fuel Shutoff Solenoid Test

Reason:

To test proper operation of fuel shutoff solenoid.

Required Tools:

- Jumper wire

Procedure:

1. Listen for an audible click when ignition switch is turned from OFF to ON.
2. If solenoid does not click, problem could be in equipment wiring.
3. Disconnect wire from solenoid.
4. Momentarily place a jumper wire from solenoid wire to battery positive terminal.
5. If solenoid now clicks, the solenoid is working properly.

NOTE: If battery voltage drops below 9 volts when cranking engine or while engine is running, the solenoid will not function.

Results:

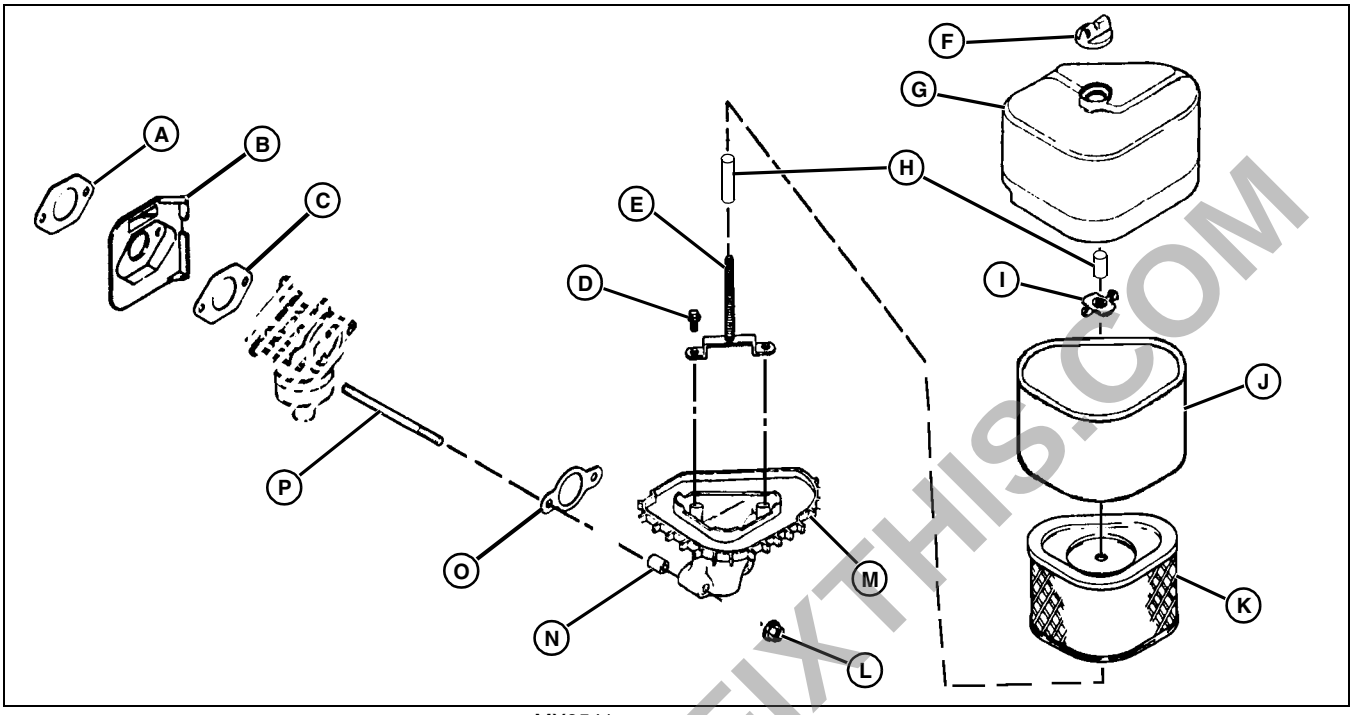
- Solenoid is operating properly if a click is heard when ignition switched from off to on.

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Fuel And Air Repair

Air Intake System Components



MX9541

A. Gasket
B. Shield
C. Gasket
D. Stud Retaining Screw (Use Thread Lock and Sealer)
E. Stud
F. Knob
G. Cover
H. Rubber Seal
I. Wing Nut
J. Foam Element
K. Paper Element
L. Nut (Tighten to 10 N•m (88 lb-in.))
M. Air Cleaner Housing
N. Sleeve)
O. Gasket
P. Stud

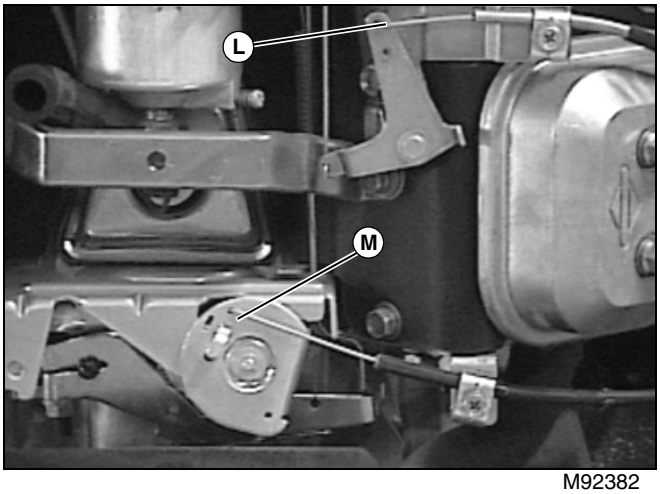
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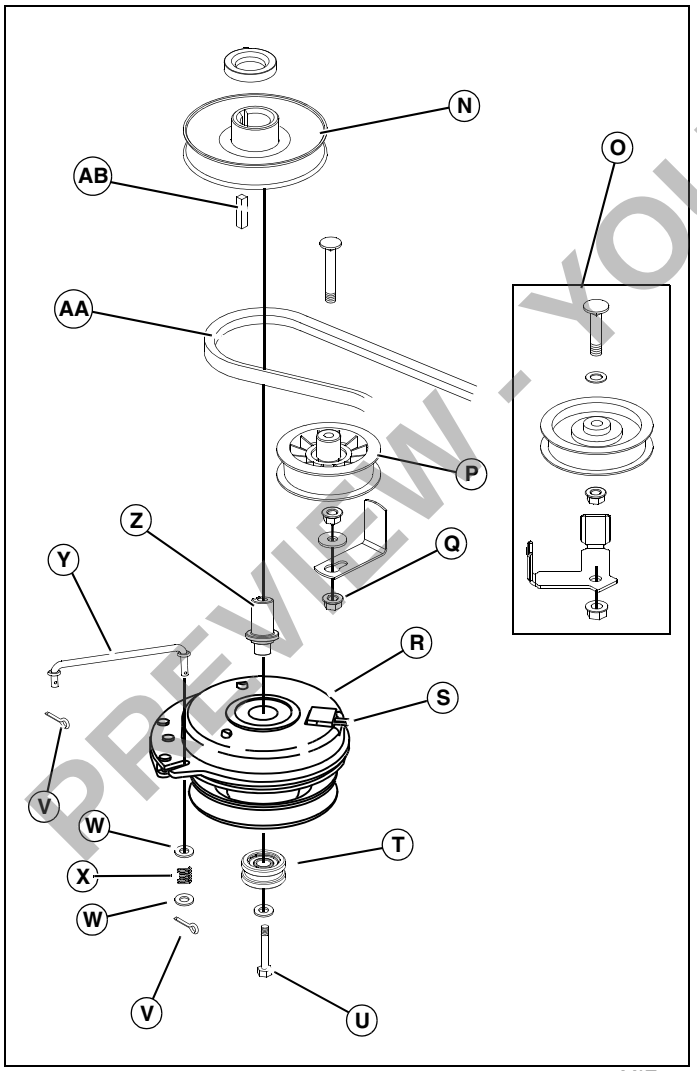
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M92382

13.Loosen clamps, and disconnect choke cable (L) and throttle cable (M).

NOTE: It is not necessary to completely remove drive belt to remove engine.



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14.Remove front belt guide assembly (O) and loosen idler nut (Q) and slide idler (P) forward until belt (AA) can be removed from sheave (N).

15.Remove cotter pins (V), spring (X), washers (W), and anti-rotation rod (Y) from electric PTO clutch and frame.

16.Disconnect electric clutch wiring harness at connector (S) from electric clutch.

17.Remove cap screw (U), washer, bearing housing (T) and electric PTO clutch (R) from engine shaft.

18.Remove traction drive belt (AA), spacer (Z), engine sheave (N), and crankshaft spacer from engine shaft.

NOTE: Drive key (AB) is a part of the sheave. DO NOT attempt to remove key from sheave bore.

19.Remove four engine mounting bolts and engine.

Installation:

Installation is the reverse of removal:

- Tighten four engine mounting bolts and flange nuts to specification.
- Install electric clutch. Tighten clutch bolt to specification.
- Install traction drive belt. (See “Traction Drive Belt Removal And Installation” on page 16 in Hydrostatic Power Train section.)
- Inspect muffler flanges for flatness. Install muffler with new gaskets. Tighten exhaust manifold bolts to specification.

Specifications:

Engine Mounting Bolt Torque . . . . . 32 N•m (24 lb-ft)
Clutch Mounting Bolt Torque . . . . . 75 N•m (55 lb-ft)
Exhaust Manifold Bolt Torque. . . . . 20 N•m (180 lb-in.)
Oil Capacity Without Filter . . . . . 1.4 L (1.5 qt)
Oil Capacity With Filter . . . . . 1.5 L (1.6 qt)

Air Guides Removal And Installation

Removal:

1. Remove upper blower housing.
2. Remove air filter assembly.
3. Remove carburetor (B).

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9. Move throttle to SLOW idle and turn engine OFF.

10. Remove rubber plug and install dipstick.

Specification:

Minimum crankcase
Vacuum at 3400 rpm. . . . . 10.2 cm (4 in. water)

Results:

If crankcase vacuum does not meet specification, check the following:

NOTE: A new engine may have low vacuum readings due to the fact that the rings are not seated.

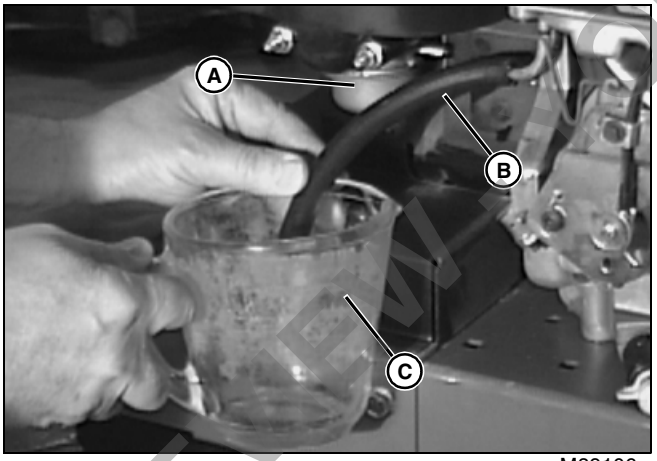
- Breather reed valve clearance and condition
- Seals and gaskets for leakage
- Rocker arm cover O-ring for leakage
- Rings, piston, and cylinder bore for wear or damage

Fuel Flow Test

Equipment:

- Proper Fuel Container

Procedure:



M89106

1. Clamp fuel line (B) or turn off fuel shut-off valve, if equipped, to prevent fuel flow.

IMPORTANT: Avoid damage! Ensure that the fuel container is clean if fuel is to be returned to the tank after test.

2. Disconnect fuel line from carburetor (A) and place in container (C).

3. Release clamp on fuel line (B) or turn on fuel shut-off valve, if equipped.

4. Crank engine, fuel should flow freely into container (C).

5. Clamp line or close fuel shut-off valve to install fuel line on carburetor (A).

6. Pour captured fuel into tank.

Results:

If fuel flow is slow, check the following:

- Replace fuel filter
- Check fuel lines, fuel pump, shut-off valve (if equipped), fuel tank outlet, and fuel tank cap for restrictions

Oil Pressure Test

Reason:

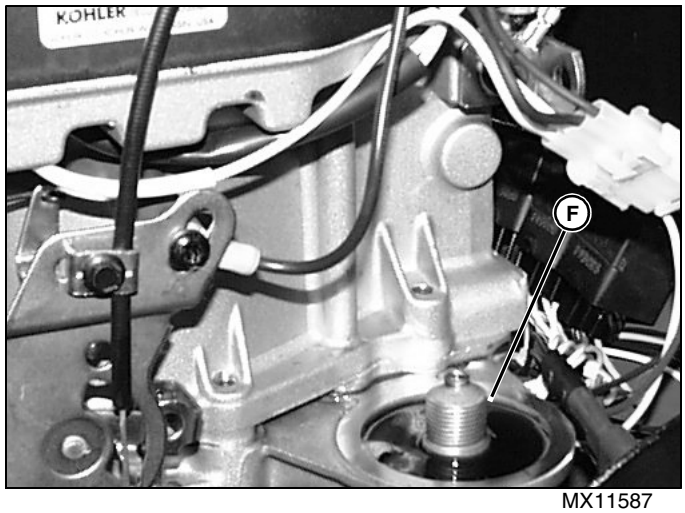
To verify that the engine has enough oil pressure to lubricate the internal engine components.

Equipment:

- JT07262 Oil Pressure Test Adapter w/ O-ring (required ONLY on engines without test ports)
- JT05847 Connector
- JT03017 Hose Assembly
- JT03262 Coupler
- JT07034 Gauge, 0 – 700 kPa (0 – 100 psi)

NOTE: The connector, hose assembly, coupler, and gauge are found in other SERVICEGARD™ test kits. The connector pipe thread (NPT) also matches the oil pressure switch port on early Kohler engines.

Procedure:



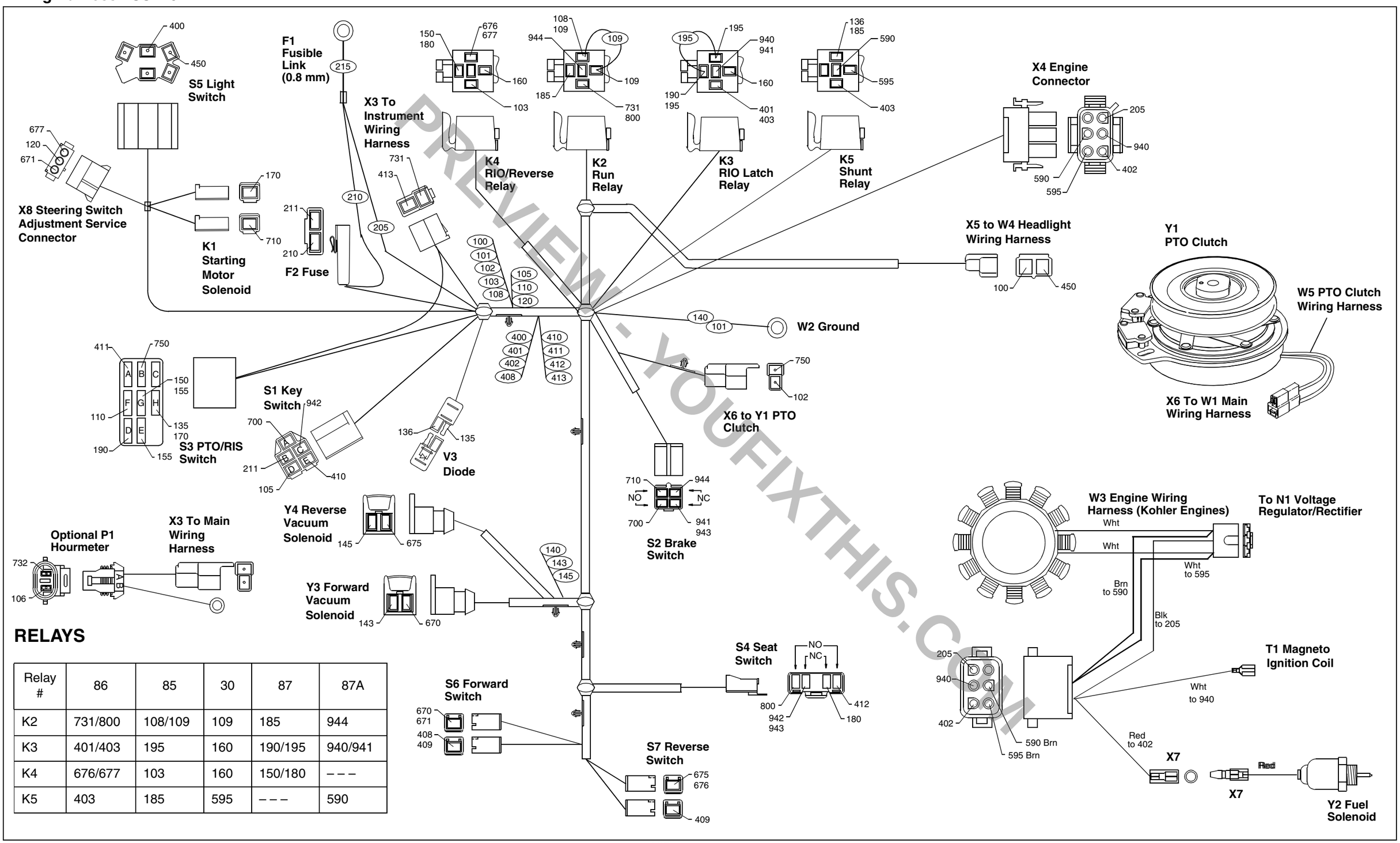
MX11587

Test Procedure At Oil Filter Base:

1. Perform test procedure with engine level.
2. Stop engine.
3. Disconnect spark plug wire and allow engine to cool.

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Wiring Harness - SST15



RELAYS

Relay #	86	85	30	87	87A
K2	731/800	108/109	109	185	944
K3	401/403	195	160	190/195	940/941
K4	676/677	103	160	150/180	– – –
K5	403	185	595	– – –	590

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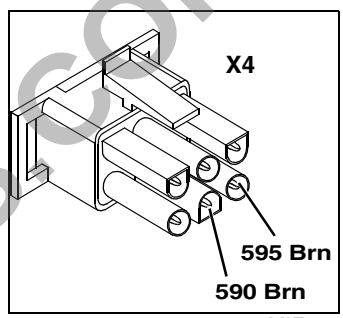
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Test Procedure B

Test Conditions:

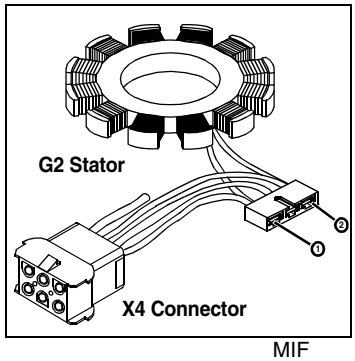
- Key switch in RUN position, engine OFF.
- X4 connector unplugged from main wiring harness.
- PTO in OFF position.
- Park brake ON.
- Seat switch in ON position (operator ON seat.

Test Point/Procedure	Results	
Step (1) (X4) Main wiring harness connector at 595 and 590 Brn wires, test for continuity.	**No continuity, Go To Step (1) of Test Procedure C.** • If continuity, test K4 shunt relay. Replace as needed. Retest. • If continuity, check ground paths for K5 shunt relay coil. • Retest, less than **0.2 Ohms**, Go to Step (1) of Test Procedure C.	 MIF

Test Procedure C

Test Conditions:

- Engine running full throttle.
- Park brake ON.
- PTO in OFF position.
- Alternator stator X2 connector unplugged.

Test Point/Procedure	Results	
Step (1) Alternator stator connector. Measure for AC volts between connector pins.	**Above 28 volts AC, Go To Test Procedure D.** • If below **28 volts AC**, replace stator.	 MIF

Test Procedure D

Test Conditions:

- Engine running full throttle.
- Park brake ON.
- PTO in OFF position.
- Alternator stator reconnected.

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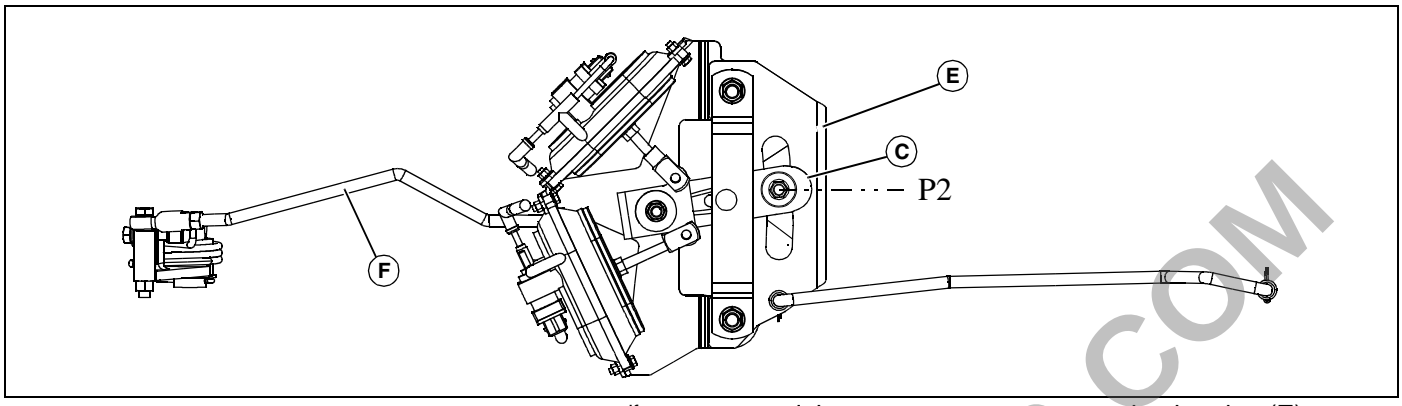
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Test/Check Point	Normal	If Not Normal
Drive machine forward and reverse	Machine moves in the appropriate direction without drifting left or right (40 ft with 4 ft or less drift)	If machine tracks left or right check tire pressure and adjust steering tracking. See “Steering Troubleshooting” Section If machine does not move, check for proper fluid level in transaxle. Drive belt for condition, routing and proper tension. Check transaxle input pulley for security of attachment. Check free wheeling lever for correct position and proper operation. Check brake for complete disengagement and proper operation. Check propel rods and levers for attachment and proper operation If all the above items are satisfactory, replace transaxle assembly.
Drive machine forward and reverse in full speed and record time over a predetermined distance.	In forward, 2.5 meters/sec (8.2 ft/sec) In reverse, 1.4 meters/sec (4.5 ft/sec)	Check tires for proper pressure and size. Check forward and reverse pedals for proper operation, full travel, and adjustment. check drive belt for condition, routing and proper tension. Check brake for complete disengagement. Check free wheeling lever for correct position and proper operation.

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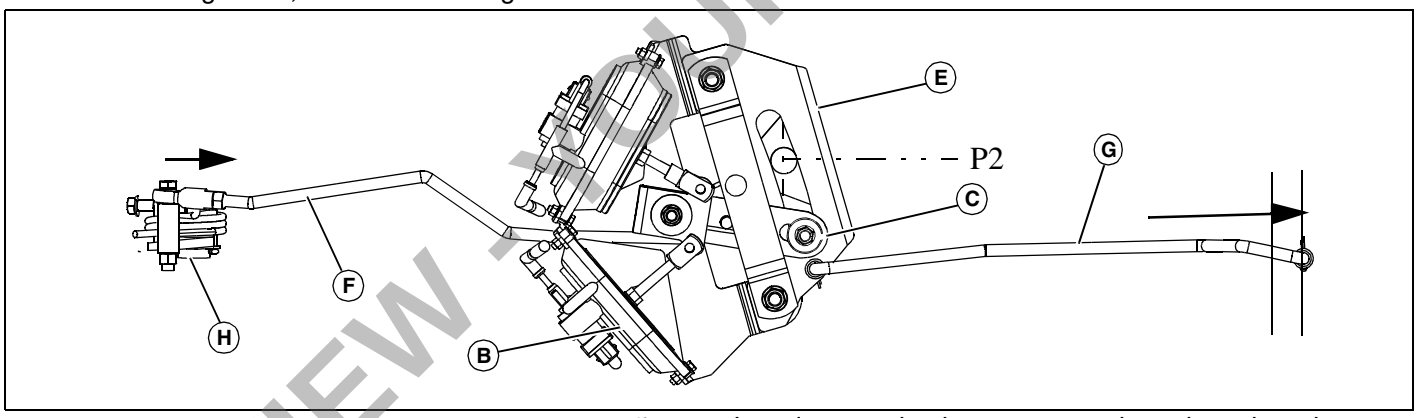
the forward/reverse pivot arm (C) and rotates the forward end to the left of its pivot point P1.



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When neither of the foot control pedals (forward or reverse) are pushed down, the solenoids on the vacuum actuators are not activated. A spring returns the forward/reverse pivot arm (C) and steering wheel to its neutral position. In the neutral position the front of the forward/reverse pivot arm (C) aligns on top of the pivot point P2 of the vacuum actuator mounting bracket (E). The front of the forward/reverse pivot arm (C) is where the rear steering control rod (F) is attached.

Because of the alignment, when the steering wheel is



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When the forward control pedal is pressed down, the forward vacuum actuator (B) pulls the forward/reverse pivot arm (C) to the right side of the actuator mounting bracket (E). When the steering wheel is turned to the right, the front steering rod (G) pulls the entire logic assembly forward, rotating at pivot point P2. The rear steering rod (F) moves in the same direction as the front, pulling the steering control arm (H) forward. The further the steering wheel is turned, the faster the steering motor turns.

Turning the steering wheel to the left simply rotates the logic assembly the opposite way at pivot point P2. When the steering wheel is turned left, both front and rear steering rods move backward. This reverses the direction of the steering motor and the tractor turns to the left.

Steering Operation - Reverse Travel

Steering Operation - Neutral

turned the vacuum actuator mounting bracket (E) rotates but the rear steering control rod (F) does not move. Therefore, there is no steering in neutral. The forward pedal or the reverse pedal must be pushed down.

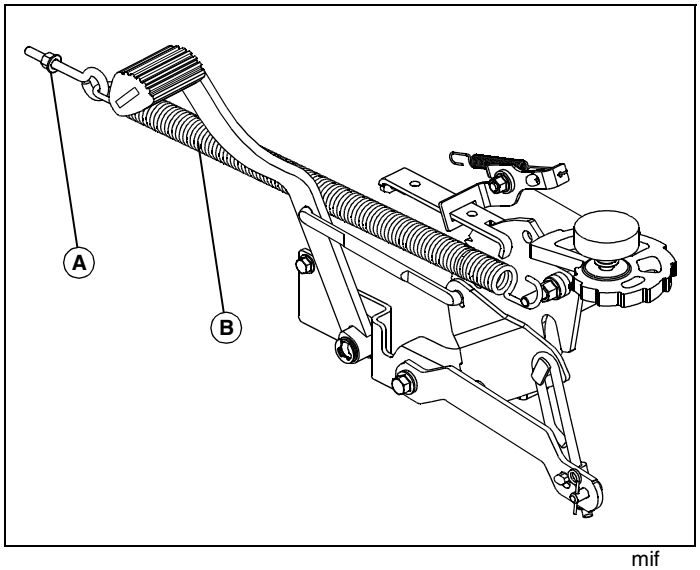
Steering Operation - Forward Travel

Since there is no steering in neutral, one of the foot control pedals must be depressed to activate a diaphragm and engage the forward/reverse pivot arm in the vacuum actuator bracket.

In order to maintain correct steering orientation when operating in reverse, the steering motor must turn in the opposite direction from when operating in forward.

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Purpose or 42M decks.



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1. If deck does not raise and/or lower with the correct lifting assist motion, the lift assist spring does not have correct tension. Tighten nut (A) clockwise to increase tension on spring (B).

2. If tension is too tight on spring, turn nut (A) counterclockwise, releasing tension on spring (B).

Adjusting Mower Deck Wheels (42 All Purpose)

CAUTION: Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

- **Disconnect spark plug wire(s) to prevent engine from starting accidently.**
- **Always wear gloves when handling mower blades or working near blades.**

IMPORTANT: Avoid damage! The mower deck can be damaged if mower wheels are adjusted wrong:

- **Wheels must not ride on ground supporting mower weight.**
- **Check wheel adjustment each time cutting height is changed.**

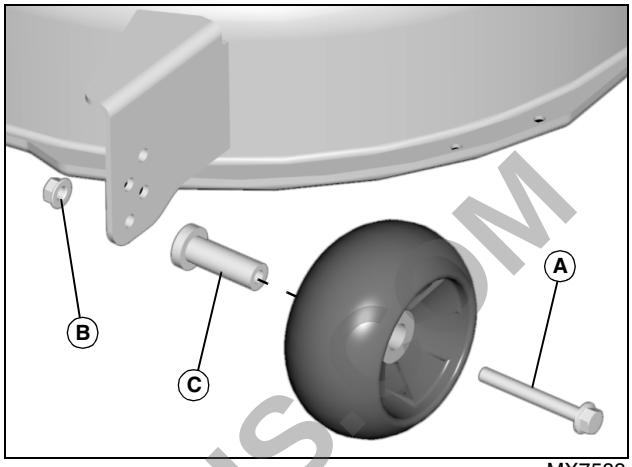
1. Park machine safely. Stop engine and set parking brake.

2. Inflate tires to the correct pressure.

3. Raise mower deck to the transport position and adjust cutting height.

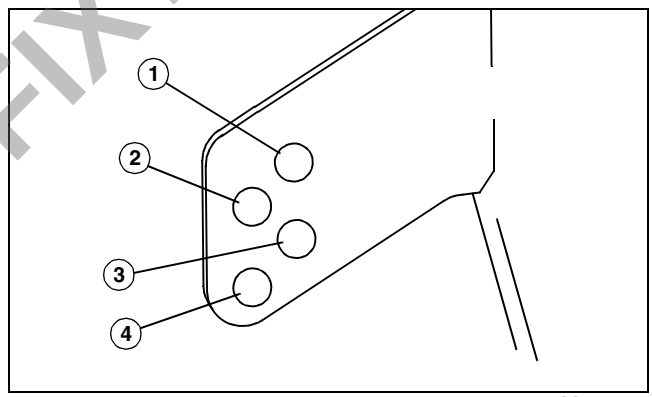
4. Lower mower deck to the desired mowing position.

NOTE: Bottom of wheels should be approximately 3-13 mm (1/8-1/2 in.) from the ground.



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5. Check mower wheel position. Remove bolt (A) and nut (B) on all wheels and move wheels with bushing (C) to proper hole.



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1 - 38 mm (1.5-In.)
2 - 51 mm (2-In.)
3 - 64 mm (2.5-In.)
4 - 76 mm (3-In.) and above

6. Install bolts and nuts to lock wheels in position. Tighten nuts to **34 N•m (25 lb-ft)**.

Adjusting Mower Deck Wheels (42M)

CAUTION: Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

- **Disconnect spark plug wire(s) to prevent engine from starting accidently.**
- **Always wear gloves when handling mower blades or working near blades.**

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