GX70, GX75, GX85, SX85 GX95, SRX75 and SRX95 Riding Mowers

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TECHNICAL MANUAL

John Deere
Worldwide Commercial and Consumer Equipment Division

TM1491 (JULY99)
Replaces TM1491 (01JAN97)

Litho in U.S.A

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RECOGNIZE SAFETY INFORMATION



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

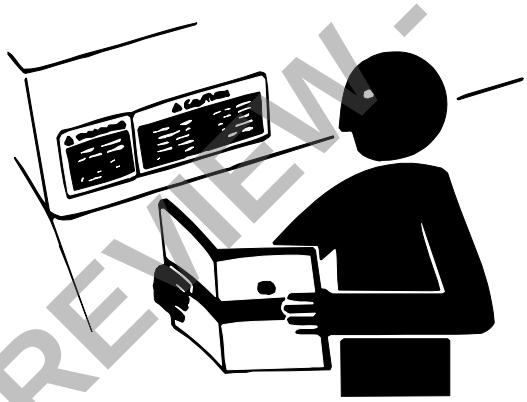
Follow recommended precautions and safe servicing practices.

Understand Signal Words

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

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

REPLACE SAFETY SIGNS

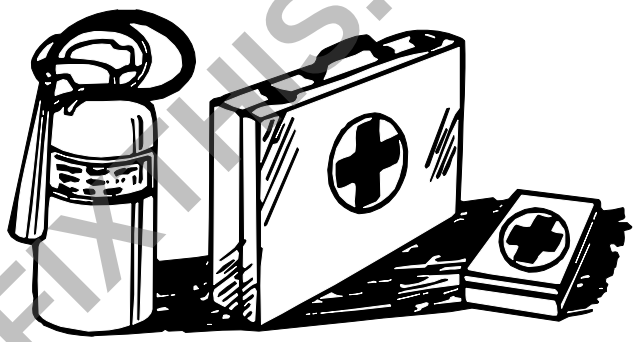


Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

HANDLE FLUIDS SAFELY—AVOID FIRES

Be Prepared for Emergencies





When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

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SPECIFICATIONS—GX70/GX75 AND SRX75

GENERAL SPECIFICATIONS

Engine:

Make . . . . . John Deere “K” Series
Model FC290V
Starting System:
GX70. . . . . Recoil
GX75 and SRX75 . . . . . Electric
Crankcase Capacity . . . . . 1.1 L (1.16 U.S. qt)

Electrical System:

Type GX70 . . . . . N/A
Type GX75 . . . . . 12 Volt
Battery Size GX70. . . . . N/A
Battery Size GX75 and SRX75 . . . . . 160 Cold Cranking Amps at–18°C (0°F)
Alternator. . . . . 3 Amp

Fuel System:

Type . . . . . Carburetor
Fuel Delivery . . . . . Gravity Fed
Capacity . . . . . 4.0 L (1.1 U.S. gal)

Drive Train:

Type . . . . . Gear Transaxle
Number of Speeds 5
Travel Speeds at Full Engine RPM:
Forward. . . . . 0—8.7 km/h (0—5.4 mph)
1st Gear . . . . . 1.8 km/h (1.1 mph)
2nd Gear. . . . . 3.5 km/h (2.2 mph)
3rd Gear . . . . . 5.3 km/h (3.3 mph)
4th Gear . . . . . 6.8 km/h (4.2 mph)
5th Gear . . . . . 8.0 km/h (5.0 mph)
Reverse . . . . . 3.1 km/h (1.9 mph)
Final Drive. . . . . Spur Gear
Brakes. . . . . Disk
Steering. . . . . Sector and Pinion

Tires:

Front . . . . . 11 x 4.00—5
Rear . . . . . 16 x 6.50—8

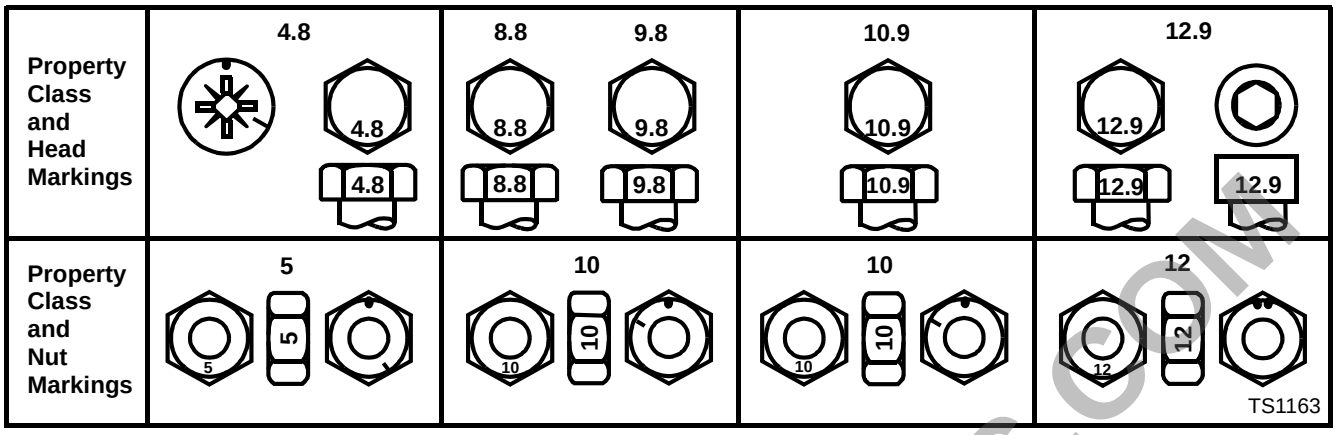
Overall Dimensions:

Wheelbase . . . . . 1060 mm (42 in.)
Minimum Ground Clearance . . . . . 95 mm (3.74 in.)
Overall Length. . . . . 1570 mm (62 in.)
Overall Width:
W/O Deck (Front) . . . . . 694 mm (27.3 in.)
W/O Deck (Rear) . . . . . 780 mm (30.7 in.)
W/Deck. . . . . 790 mm (31.1 in.)
Height . . . . . 1010 mm (39.76 in.)
Weight GX70 . . . . . 143 kg (315 lb)
Weight GX75 . . . . . 155 kg (340 lb)

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METRIC FASTENER TORQUE VALUES



	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 class. Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

When bolt and nut combination fasteners are used, torque values should be applied to the **NUT** instead of the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

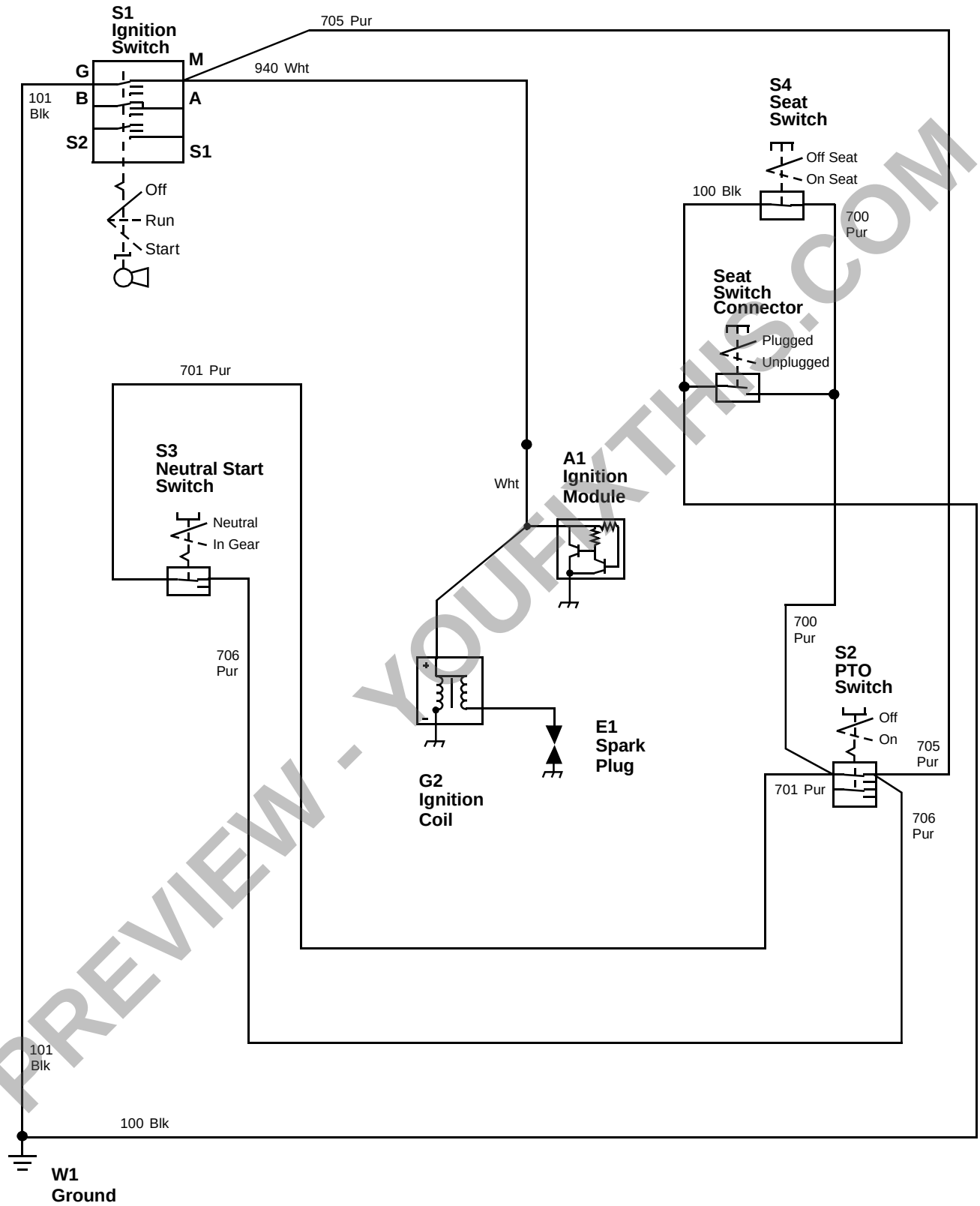
[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication.*

Reference: JDS—G200.

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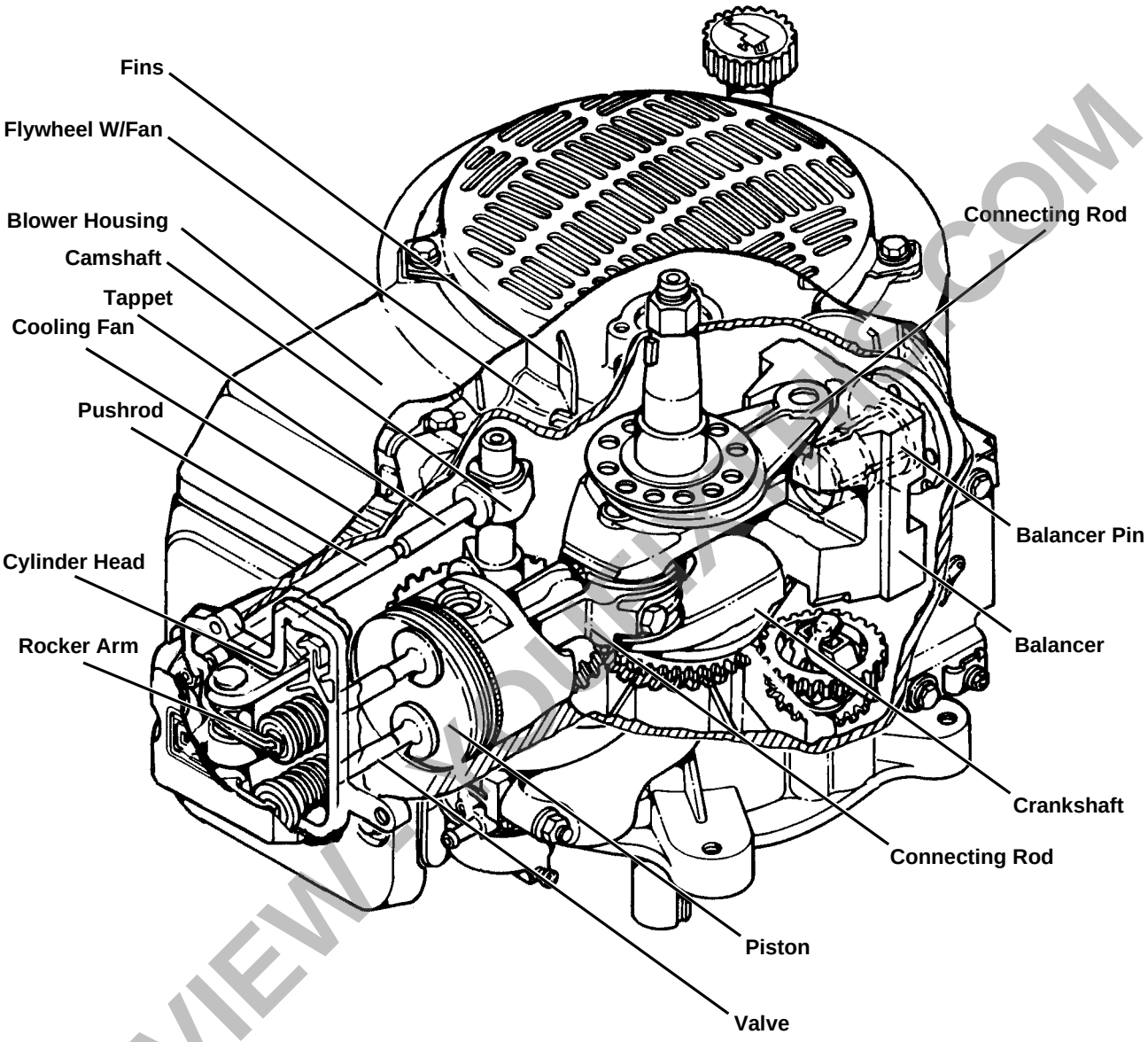
ELECTRICAL SCHEMATIC—GX70



SE1- IGNITON AND OPERATOR PRESENCE

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ENGINE COMPONENT LOCATION—“K” SERIES FC290V



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TROUBLESHOOTING

Problem or Symptom / Check or Solution	Will not start or starts hard	Will not stay running or runs rough	Spins over hard	Black smoke at start or during operation	Blue smoke at start or during operation	Excessive oil consumption	Engine surges	Backfires at shutdown	Uneven or uncontrolled rpm	Loss of power
Carburetor inlet needle not seating	●	●		●			●			●
Choke linkage out of adjustment	●	●		●						●
Faulty ignition switch	●	●								●
Faulty coil/trigger	●	●	●							
Shorted ignition wire/high tension lead	●	●								●
Rings, piston or cylinder walls worn	●	●			●	●				●
Valve sticking	●	●								●
Valve adjustment needed	●	●	●							●
Defective oil seal.						●				
Too much oil in crankcase						●				●
Sticking or damaged oil breather	●	●				●				●
Tank vent plugged	●	●		●			●			●
Fuel shutoff closed	●	●					●			●
Fuel filter plugged	●	●					●			●
Plugged/pinched fuel hoses	●	●					●			●
Faulty fuel pump	●	●					●			
Throttle cable out of adjustment	●	●					●	●		
Air filter plugged	●	●		●	●					●
Transaxle linkage out of adjustment	●	●	●							●
PTO linkage out of adjustment	●	●	●							●

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FUEL AND AIR REPAIR— GX70/GX75/SRX75

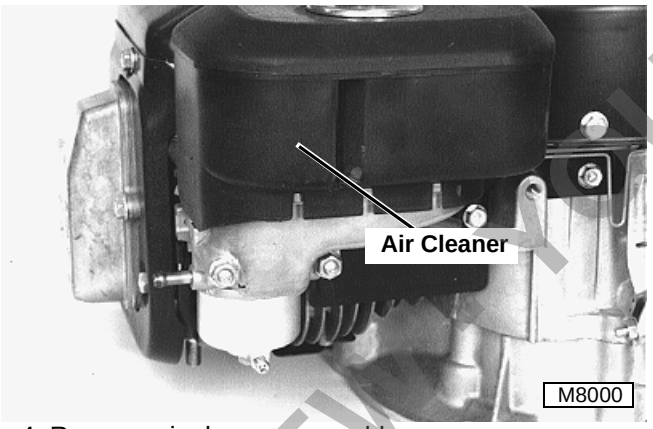
CARBURETOR— REMOVAL/INSTALLATION

CAUTION

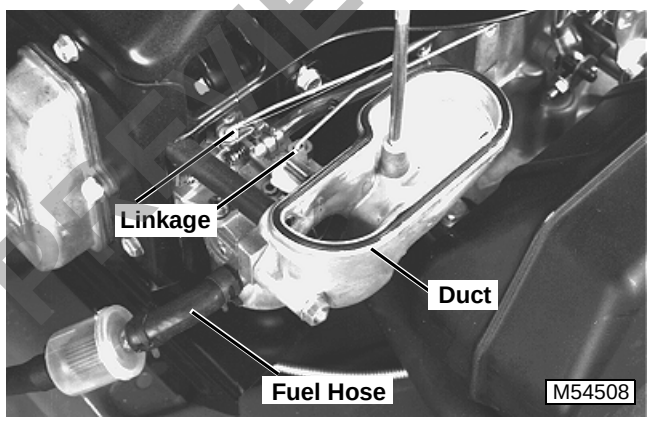
Gasoline vapor is explosive. Do not expose to spark or flame. Serious personal injury can result.

Muffler and shield may be hot. Allow muffler and shield to cool before removing.

1. Close fuel shut-off valve (GX70/GX75).
2. Remove engine shroud (SRX75). (See ENGINE SHROUD—REMOVAL/INSTALLATION in Miscellaneous Section.)
3. Remove muffler heat shield.



4. Remove air cleaner assembly.

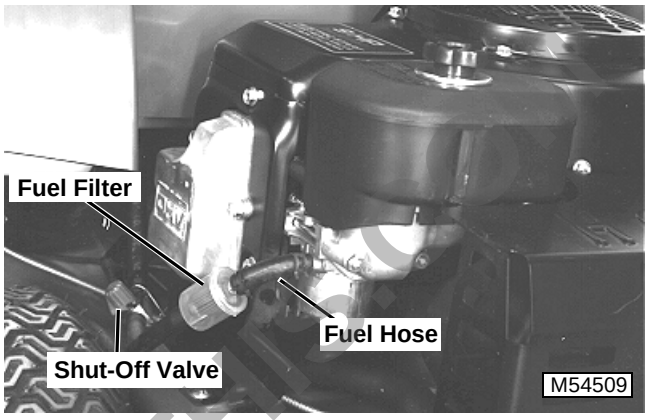


5. Disconnect fuel hose. Close all openings using caps and plugs.
6. Remove duct.
7. Remove carburetor with gaskets.
8. Disconnect linkage.
9. Make repairs as necessary.

Installation is done in the reverse order of removal.

- Run engine and check for leaks.
- Use new gasket for installation.

FUEL FILTER—REPLACEMENT



CAUTION

Gasoline vapor is explosive. Do not expose to spark or flame. Serious personal injury can result.

1. Close fuel shut-off valve.
2. Disconnect hoses from filter. Close all openings using caps and plugs.
3. Remove filter.

NOTE: Arrow on filter housing must point in direction of fuel flow.

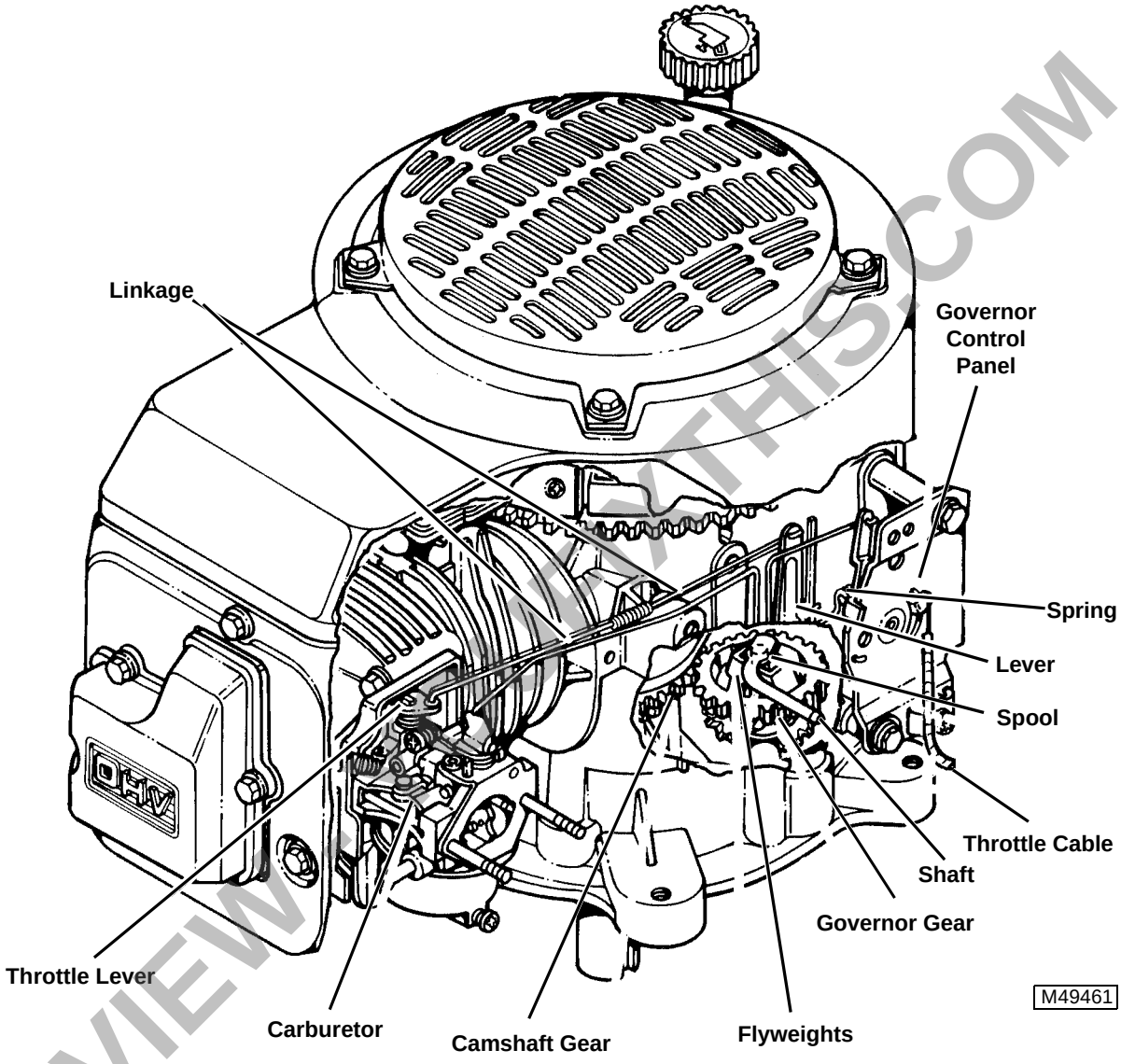
Installation is done in the reverse order of removal.

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THEORY OF OPERATION—"K" SERIES FC290V

GOVERNOR OPERATION



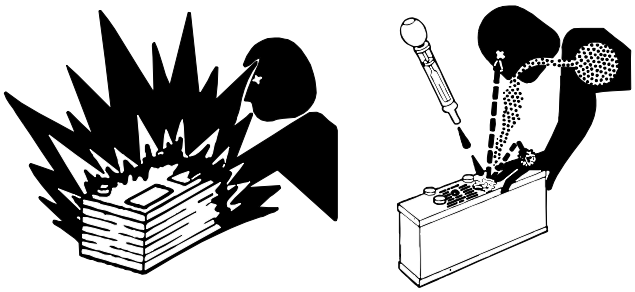
Theory of Operation:

The governor system senses the engine rpms by the position of the flyweights. These flyweights are rotated by the governor gear that is driven by the camshaft gear. The flyweights press against spool that rotates the shaft and lever. This lever is connected to the throttle lever of the carburetor by linkage. As engine rpms increase, the movement of the flyweights tries to close the throttle valve. This movement is opposed by a spring at the control panel. The tension of this spring can be changed by changing the position of the throttle cable. As the throttle is advanced, the tension of the spring is increased and the governed rpms increase. The maximum rpm is controlled by a stop on the control panel. As the load on the engine increases, the rpms will drop. This allows the spring to pull on the linkage and open the throttle valve that increases the power and raises the rpms. When the load decreases, the rpms increase, which causes the flyweights to move the linkage and close the throttle valve. The power is lowered and the rpms drop. The chosen rpm is maintained by the balancing of the forces of the flyweights and the spring.

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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 voltmeter 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.

- **Avoid acid burns by:**

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Using proper jump start procedure.

- **If you spill acid on yourself:**

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10—15 minutes.
4. Get medical attention immediately.

- **If acid is swallowed:**

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

USE CARE AROUND HIGH-PRESSURE FLUID LINES

Avoid High-Pressure Fluids



Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid injury from escaping fluid under pressure by stopping the engine and relieving pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

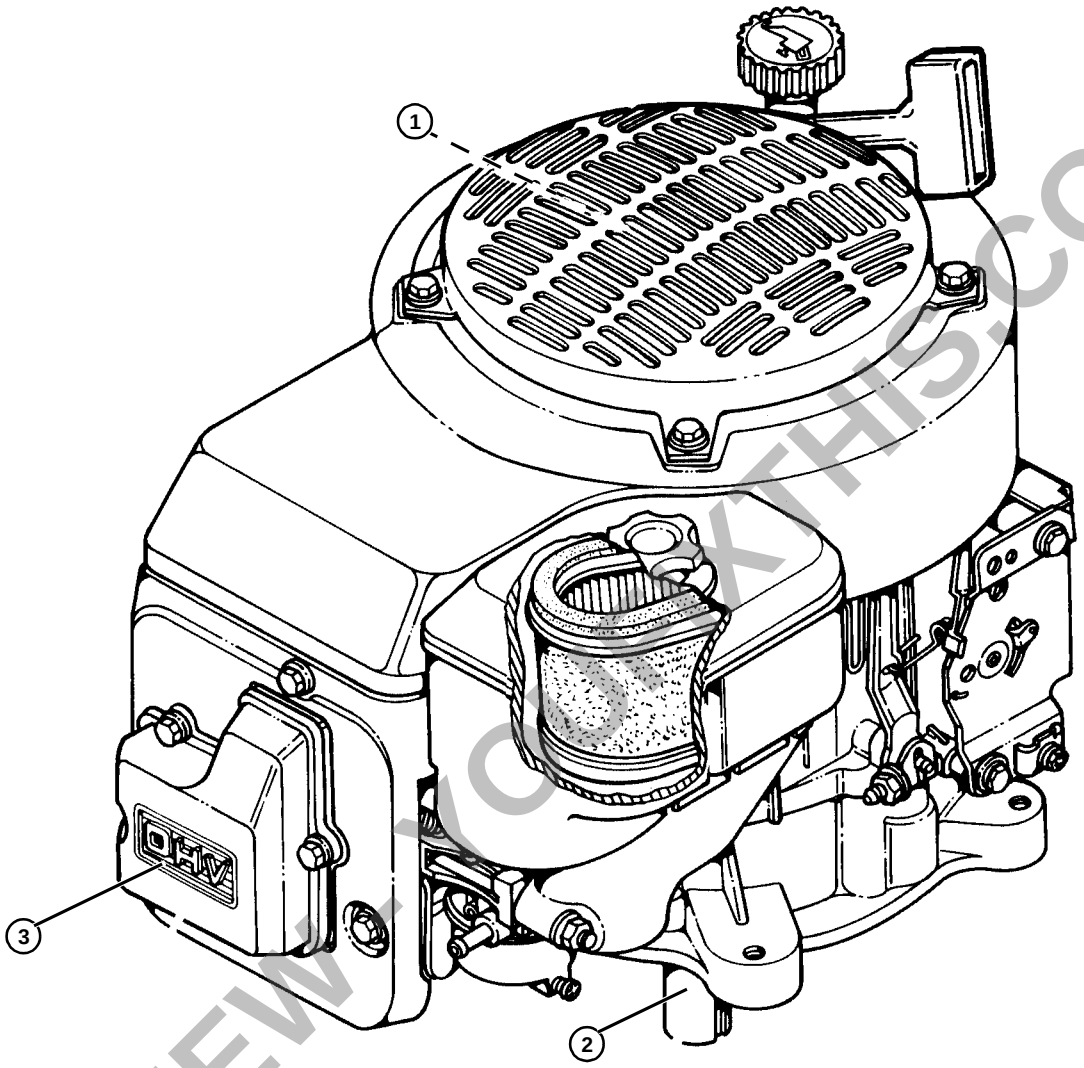
Avoid Heating Near Pressurized Fluid Lines



Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

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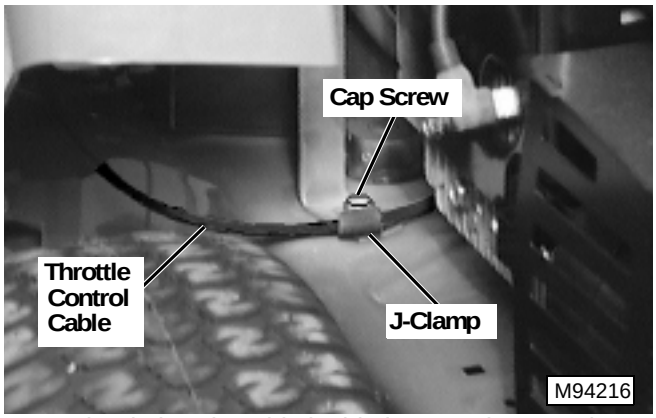


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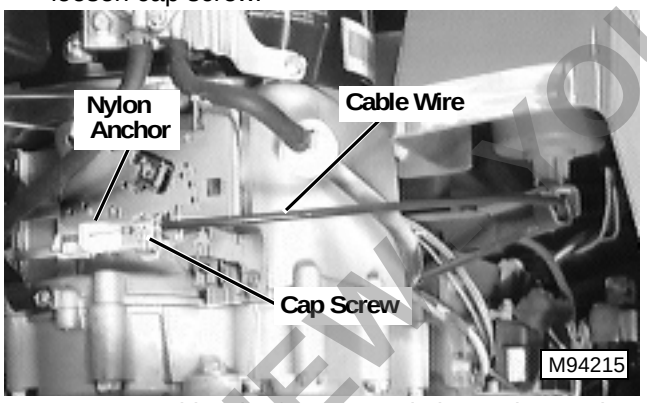
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THROTTLE CONTROL LEVER AND CABLE ASSEMBLY FOR GX85 (S.N. M0GX85X0096966–) AND SX85 (S. N. M0SX85X095909–)—REMOVAL/INSTALLATION

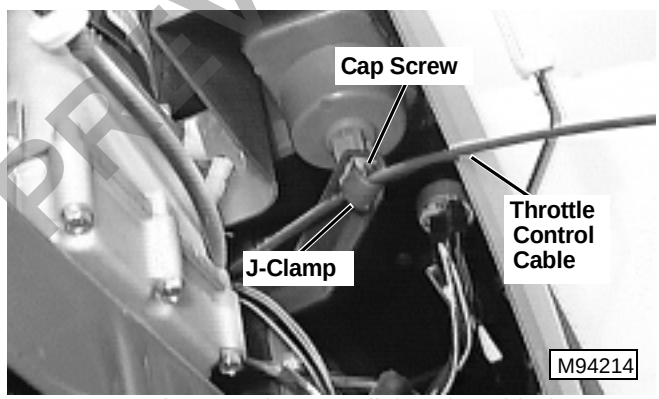
NOTE: The following instructions are for GX85/SX85 Riders without a wrap-around engine shroud.



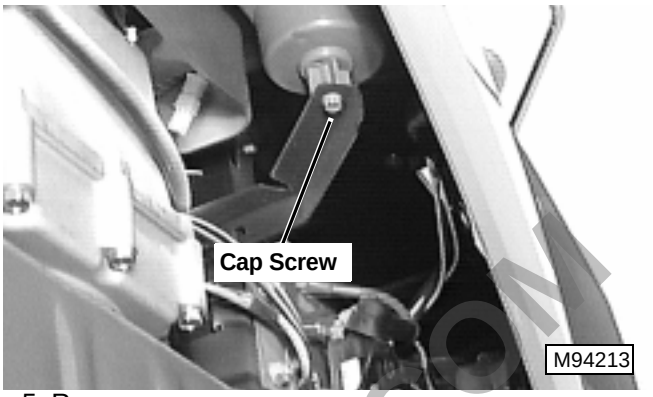
1. Unhook throttle cable inside large J-clamp and loosen cap screw.



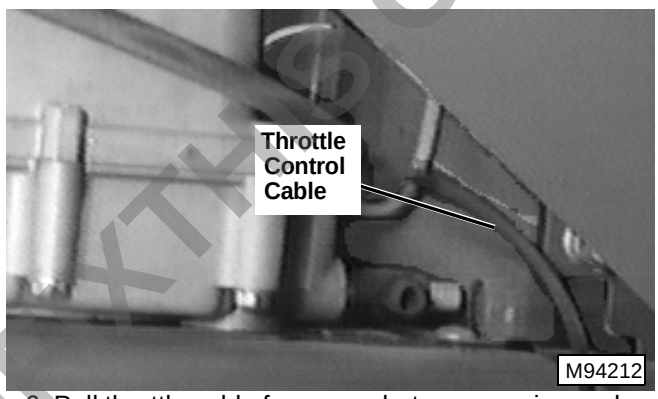
2. Remove cable wire from control plate nylon anchor and unhook cable with clamp and cap screw.



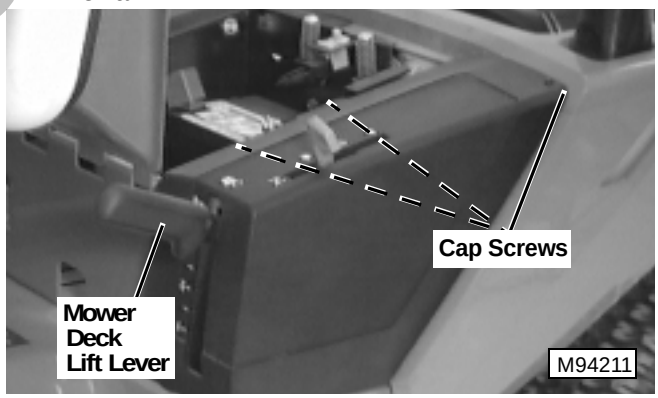
3. Open up large J-clamp. Pull throttle cable from J-clamp.
4. Remove cap screw and large J-clamp.



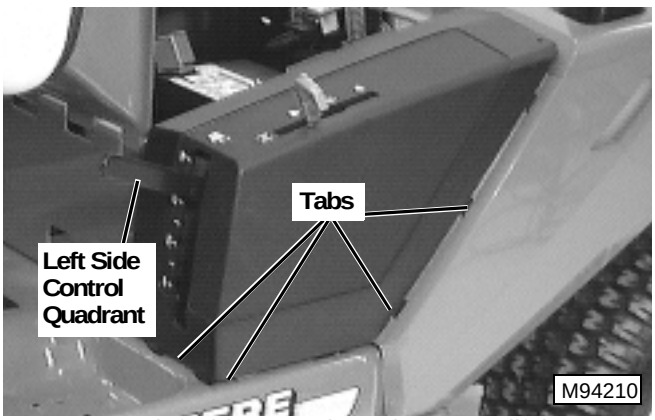
5. Remove cap screw.



6. Pull throttle cable from area between engine and firewall.



7. Remove cap screws and control quadrant.
8. Remove mower deck lift lever.



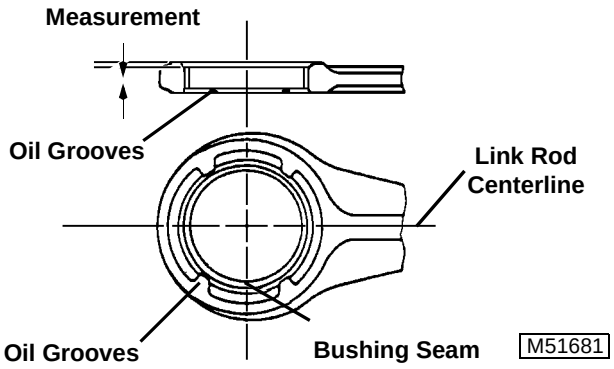
9. Remove left side control quadrant over lift lever. Make sure tabs are unseated in slots.

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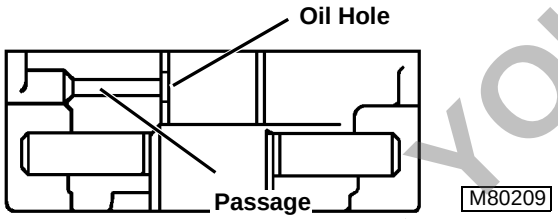
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BALANCER BUSHINGS—REPLACEMENT

NOTE: Remove bushings using a bearing, bushing and seal driver set and a press. Remove link rod bushings with oil groove side facing up.



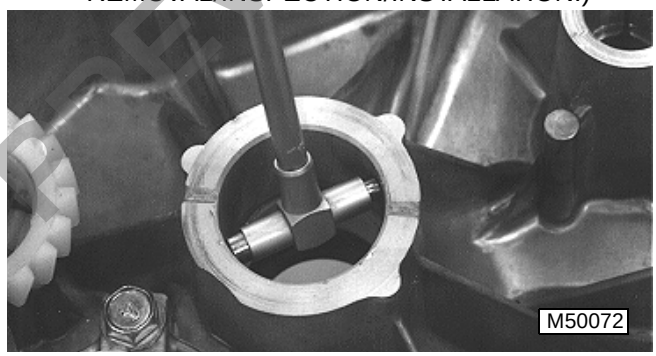
1. Remove bushings.
2. Install link rod bushings with seam at a 90° angle to centerline.
3. Install bushing below surface to **0.50 mm (0.020 in.).**



4. Align oil hole in bushing and oil passage in weight. Install bushing flush to outside surface of weight.

CRANKSHAFT PLAIN BEARING—INSPECTION

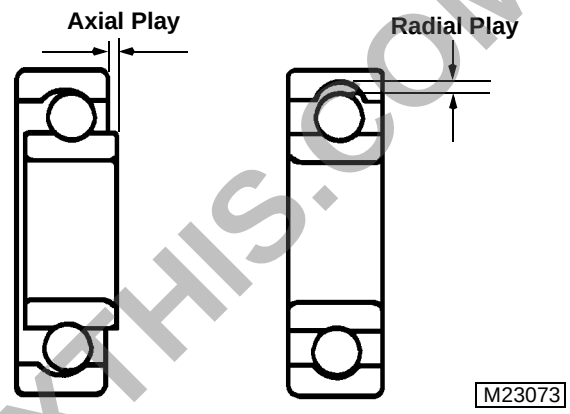
1. Remove crankshaft. (See CRANKSHAFT —REMOVAL/INSPECTION/INSTALLATION.)



2. Measure crankshaft bearing in crankcase cover. Replace cover if diameter is **greater than 35.06 mm (1.38 in.)**.
3. Install crankshaft. (See CRANKSHAFT —REMOVAL/INSPECTION/INSTALLATION.)

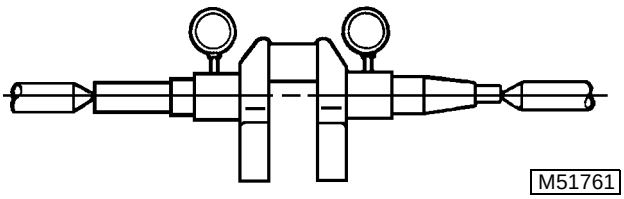
CRANKSHAFT BALL BEARING—INSPECTION

1. Remove flywheel and oil seal. (See FLYWHEEL—REMOVAL/INSTALLATION.)
2. Remove crankshaft bearing using a bearing, bushing and seal driver set.
3. Thoroughly clean bearing in solvent. Dip bearing in light weight oil.



4. Spin bearing by hand and check for axial and radial free play.
5. Replace bearing if it is noisy or has too much play.
6. Install bearing flush to inside of crankcase using a bearing, bushing and seal driver set.
7. Install oil seal.

CRANKSHAFT—ALIGNMENT

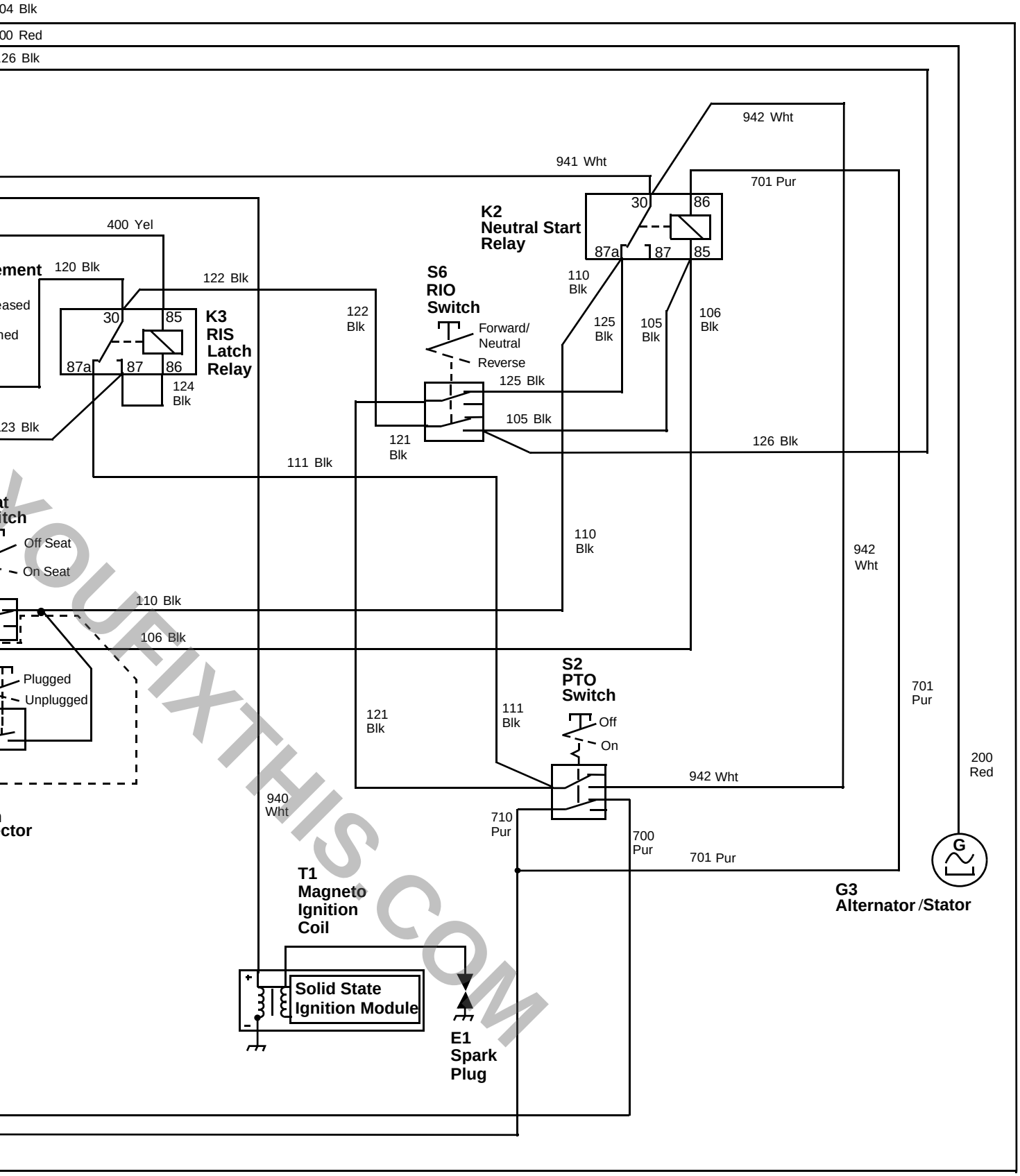


1. Place crankshaft into an alignment jig and rotate crankshaft slowly.
2. Use dial indicators to measure maximum total indicated runout (T.I.R.). If T.I.R. is not **0.05 mm (0.002 in.)** replace crankshaft.

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ELECTRICAL SCHEMATIC—GX85/SX85



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SE2- IGNITION AND OPERATOR PRESENCE	SE3- CHARGE CIRCUIT

REVERSE IMPLEMENT SWITCH (RIS) TEST—GX85/SX85

Reason:

To determine if RIS switch is operating properly.

Test Equipment:

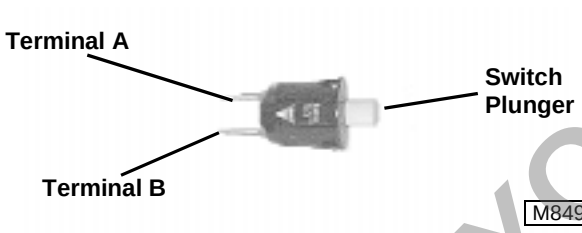
- Ohmmeter

Procedure:

1. Set ohmmeter for 1X ohms scale.

NOTE: On analog (swing needle) ohmmeters, set zero point before every test.

2. Remove connector from RIS switch.
3. Remove RIS switch from machine. (See REVERSE IMPLEMENT SWITCH (RIS)—REMOVAL/ INSTALLATION.)



4. Connect ohmmeter leads to terminals A and B. Press and release plunger of switch.

Results:

- There should be continuity when plunger IS pressed and NO continuity when plunger IS NOT pressed.
- If continuity is not correct, replace switch.

RELAY TEST—GX75/GX85/GX95/SRX75/SX85/SRX95

NOTE: This relay test can be used for the RIS relay, which was added to models with product identification number M0GX85X105001/ M0SX85X105001 and above.

Reason:

To check relay terminal continuity in the energized and de-energized condition.

Test Equipment:

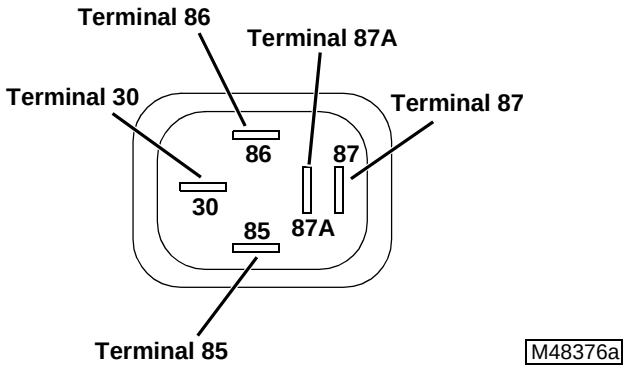
- Ohmmeter
- 12-Volt Battery
- Two Jumper Wires

Procedure:

1. Set ohmmeter to 1X ohms scale.

NOTE: On analog (swing needle) ohmmeters, set zero point before every test.

2. Remove relay from rider.



3. Connect one lead of meter to terminal 30 of relay and other lead of meter to terminal 87A of relay.
4. Connect one jumper between negative terminal of battery and terminal 86 of relay.
5. Connect one jumper to positive terminal of battery and terminal 85.
6. Remove jumper from terminal 85 of relay.
7. Using an ohmmeter, check for continuity between terminals 87A and 30. There should be continuity between terminals 87A and 30.

Results:

- If continuity is not correct, replace relay.

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FOOT CONTROL LINKAGE ADJUSTMENT (OPERATOR'S MANUAL METHOD)—(SX85/SRX)

Reason:

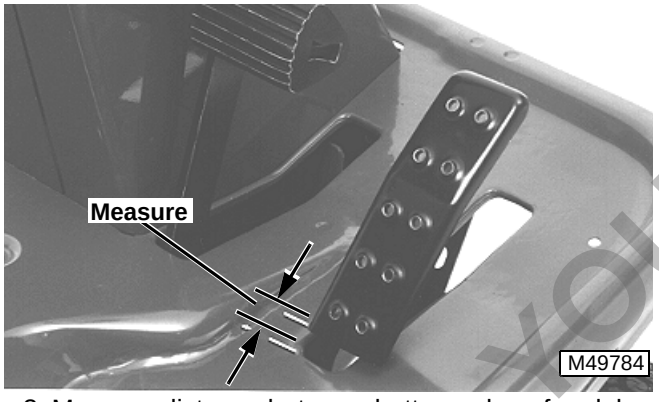
Adjust foot control linkage to restore lost ground speed after variator belts have broken in and stretched.

Test Equipment:

- Small steel inch or metric rule

Test Procedure:

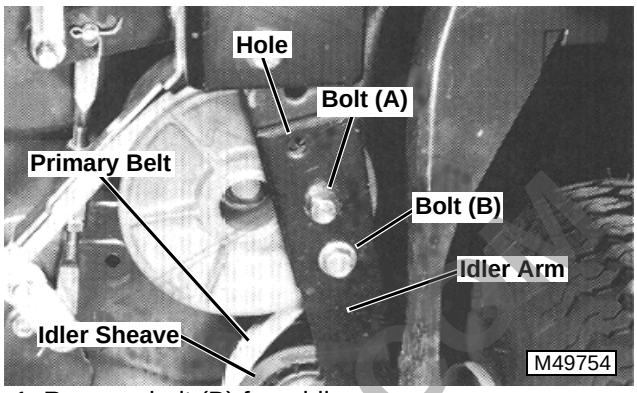
1. Park machine on level surface, turn key switch to off position and move shift lever to forward position.
2. Lightly press on foot control pedal by hand to remove free play.



3. Measure distance between bottom edge of pedal and back of slot.
4. If dimension is **38 mm (1-1/2 in.) or more**, adjustment to the variator primary belt idler arm can be made.

*NOTE: If dimension is **less than 38 mm (1-1/2 in.)**, DO NOT change the arm.*

Procedure:



1. Remove bolt (B) from idler arm.
2. Loosen bolt (A).
3. Push idler sheave toward primary belt.
4. Install bolt (B) in hole.
5. Tighten bolts.

Results:

- After making adjustment, if machine will not stop moving when foot control pedal is not pressed, bolt will need to be installed in original hole.

NOTE: The two test and adjustment procedures of the variator linkage can be made independently or together. A wider range of adjustment is possible if both adjustments are used.

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DIAGNOSIS—30-INCH MOWER DECK

BLADE WILL NOT DRIVE

Test Conditions:

- Machine parked on level surface
- PTO DISENGAGED
- Park brake ENGAGED
- Key switch in OFF position

Test/Check Point	Normal	If Not Normal
1. Jack sheave	Tight on crankshaft and key not damaged or missing. Belt guides in place and properly. adjusted. Belt on sheave. Sheave angle matching belt angle.	Tighten cap screw. Replace key. Repair and adjust as needed. Install. Replace jack sheave.
2. Mower drive belt	Not damaged, worn, or broken. Not turned over.	Replace belt.
3. Fixed sheave	Not damaged or binding. Belt in place. Guide in place and correctly adjusted.	Repair or replace and adjust as needed.
4. Tension sheave	Not damaged or binding. Belt in place. Guide in place and correctly adjusted.	Repair or replace and adjust as needed.
5. Pivot arm	Not binding or worn. Brake releasing when PTO engaged.	Repair or replace as needed. Repair or replace as needed. Adjust PTO linkage.
6. PTO linkage	Not binding or worn. Correctly adjusted. Spring not weak.	Repair or replace as needed. Adjust. Replace spring.
7. Spindle sheave	Tight on spindle and key in place. Not damaged, bent and running straight. Belt on sheave. Sheave angle matches belt angle.	Tighten nut and install key as needed. Repair or replace as needed. Install. Replace sheave.
8. Spindle and housing	Bearings not failed. Blade tight on spindle.	Replace as needed. Tighten hardware.

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