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

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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 operating practices.



T81389 -UN-07DEC88

O53,ALERT -19-26JAN90

UNDERSTAND SIGNAL WORDS

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

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



TS187 -19-30SEP88

O53,SIGNAL -19-26JAN90

HANDLE FUEL SAFELY—AVOID FIRES

Handle fuel with care: it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.



TS202 -UN-23AUG88

O53,FIRE1 -19-26JAN90

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BOLT TORQUE CHART

Grade of Bolt		SAE-2	SAE-5	SAE-8	
Min. Tensile Strength		64,000 PSI	105,000 PSI	150,000 PSI	
Grade Marking on Bolt					Socket or Wrench Size
U.S. Standard					U.S. Regular
Bolt Dia.	U.S. Dec. Equiv.		TORQUE IN FOOT POUNDS		Bolt Head / Nut
1/4	0.250	(8.14 N-m) 6	(13.56 N-m) 10	(18.98 N-m) 14	7/16 / 7/16
5/16	0.3125	(17.63 N-m) 13	(27.12 N-m) 20	(40.68 N-m) 30	1/2 / 1/2
3/8	0.375	(31.19 N-m) 23	(47.46 N-m) 35	(67.80 N-m) 50	9/16 / 9/16
7/16	0.4375	(47.46 N-m) 35	(74.58 N-m) 55	(108.48 N-m) 80	5/8 / 11/16
1/2	0.500	(74.58 N-m) 55	(115.26 N-m) 85	(162.72 N-m) 120	3/4 / 3/4
9/16	0.5625	(101.70 N-m) 75	(176.28 N-m) 130	(237.30 N-m) 175	13/16 / 7/8
5/8	0.625	(142.38 N-m) 105	(230.52 N-m) 170	(325.44 N-m) 240	15/16 / 15/16
3/4	0.750	(250.86 N-m) 185	(406.80 N-m) 300	(576.30 N-m) 425	1-1/8 / 1-1/8
7/8	0.875	*(216.96 N-m) 160	(616.98 N-m) 445	(928.86 N-m) 685	1-5/16 / 1-5/16
1	1.000	(339.00 N-m) 250	(908.52 N-m) 670	(1396.68 N-m) 1030	1-1/2 / 1-1/2

Multiply readings by 12 for inch-pound values.

** "B" Grade bolts larger than 3/4-inch (19.1 mm) are sometimes formed hot rather than cold, which accounts fo the lower recommended torque.*

NOTE: Allow a tolerance of plus or minus 10 per cent on all torques given in this chart.

SET SCREW SEATING TORQUE CHART

Screw Size	Cup Point	Square Head
	Torque in Inch Pounds	
#5	(1.02 N-m) 9	—
#6	(1.02 N-m) 9	—
#8	(2.26 N-m) 20	—
#10	(3.73 N-m) 33	—
1/4	(9.83 N-m) 87	(23.96 N-m) 212
5/16	(18.65 N-m) 165	(47.46 N-m) 420
3/8	(32.77 N-m) 290	(93.79 N-m) 830
7/16	(48.59 N-m) 430	—
1/2	(70.06 N-m) 620	(237.30 N-m) 2100
9/16	(70.06 N-m) 620	—
5/8	(138.43 N-m) 1225	(480.25 N-m) 4250
3/4	(240.13 N-m) 2125	(870.10 N-m) 7700

Divide readings by 12 for foot-pound values
NOTE: Allow a tolerance of plus or minus 10 per cent on all torques given in this chart.

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M21,1010K,C -19-25AUG82

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ENGINE

For complete specifications on repair of Kawasaki engines see CTM-5.

Engine sheave mounting cap screw torque	73 ± 13 N·m (54 ± 10 lb-ft)
Engine mounting cap screw torque	19 ± 2 N·m (14 ± 5 lb-ft)
Spark plug gap	0.76 N·M (0.030 in.)
Spark plug torque	9—20 N·m (80—180 lb-in.)
Idle mixture screw (initial setting)	
6 hp	1-1/8 turns open
9 hp	1-1/8 turns open
12.5 hp	1-1/2 turns open
Idle speed	1550 ± 75 rpm
Wide open throttle (no load)	3350 ± 75 rpm
Fuel pump output at 3000 rpm (12.5 hp only)	0.09 L (0.2 pt) in 15 seconds

TRANSAXLE

Cover cap screw torque	10 N·m (95 lb-in.)
Shift lever detent set screw torque	Flush with cover
Brake lever nut torque	10 N·m (95 lb-in.)

STEERING

Tie rod attaching nut torque	25—30 N·m (18.5—2 lb-ft)

BRAKE

Brake pedal free play	19 mm (1-1/4 in.)
Brake pad thickness (min.)	6 mm (1/4 in.)

MOWER DECK

Mower spindle sheave locknut torque	140 N·m (103 lb-ft)

M22,1010G,A -19-01JUL88

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REMOVE ENGINE—12.5 HP MODELS

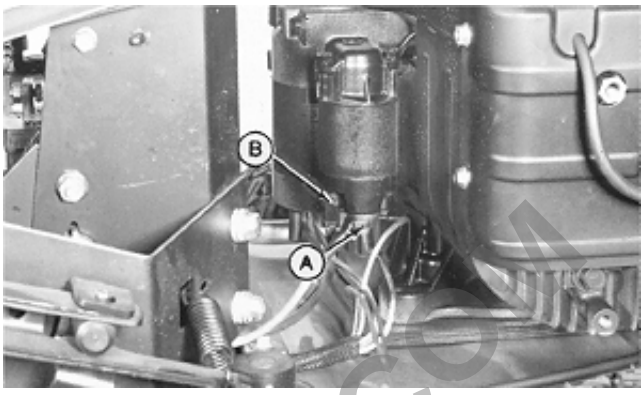
1. Remove engine cowl (SX95 Rider only).

2. Remove engine shroud. See Section 80, Group 15.

3. Remove negative cable from battery.

4. Remove battery cable and leads from starter terminal (A).

5. Disconnect electrical lead (B).



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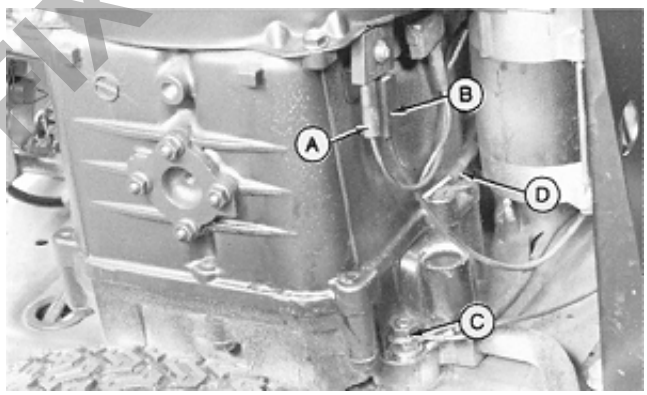
6. Drain oil from crankcase.

NOTE: Oil filler tube removed for clarity of photograph only.

7. Disconnect electrical leads (A) and (B).

8. Remove electrical lead and battery negative cable (C) from base of engine.

9. Disconnect electrical lead (D).

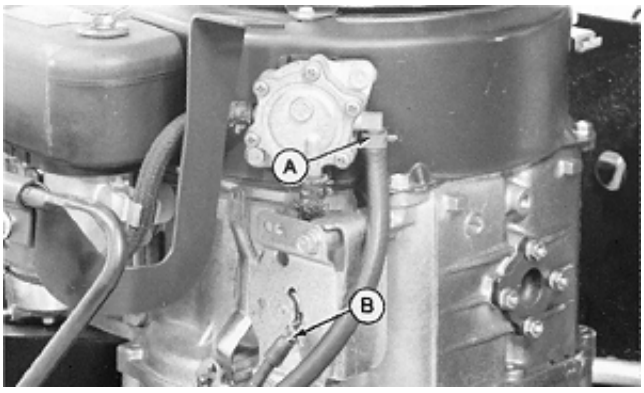


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M22,2005G,B -19-14JUN88

10. Remove fuel line (A) from inlet side of fuel pump.

11. Disconnect throttle cable (B).



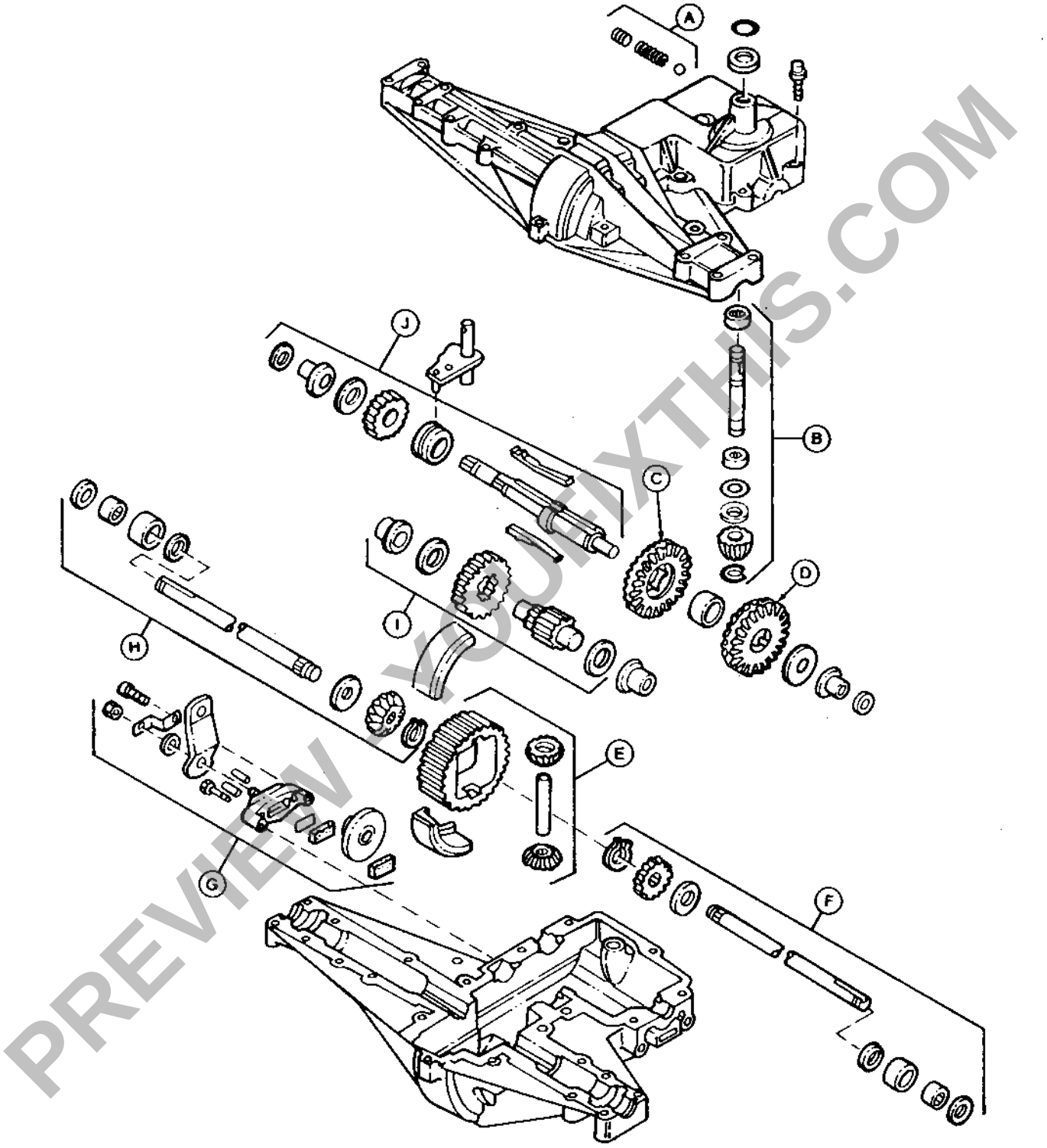
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M49045

M22,2005G,C -19-14JUN88

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TRANSAXLE ASSEMBLY



A—Shift Detent (early units only)
B—Input Shaft Assembly
C—Reverse Gear
D—Forward Gear
E—Differential Assembly
F—Right Axle Assembly
G—Brake Assembly
H—Left Axle Assembly
I—Output Pinion Shaft Assembly
J—Shifter Shaft Assembly

M22,5015G,A -19-14JUN88

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BEFORE YOU START

Always perform the system checkout procedure in Group 05 BEFORE making any tests or adjustments in this group. The step-by-step procedures in this group provide you with the detailed diagnostic information you will need to isolate a malfunction. Basic diagnostic equipment is used.

It is assumed that you are familiar with the machine and its engine and fuel system components.

Engine rpm and temperature are critical in most engine tests. Be sure to follow test specifications carefully.

Fuel can have a great effect on engine performance. Make sure the correct fuel is used. And that it is fresh, clean, and, if possible, without alcohol.

Always start with the first step and follow the sequence from left to right. Read each step completely before performing the tests.

Upon completing a test or adjustment, check to see whether the problem is corrected by performing the checkout procedure in Group 05.

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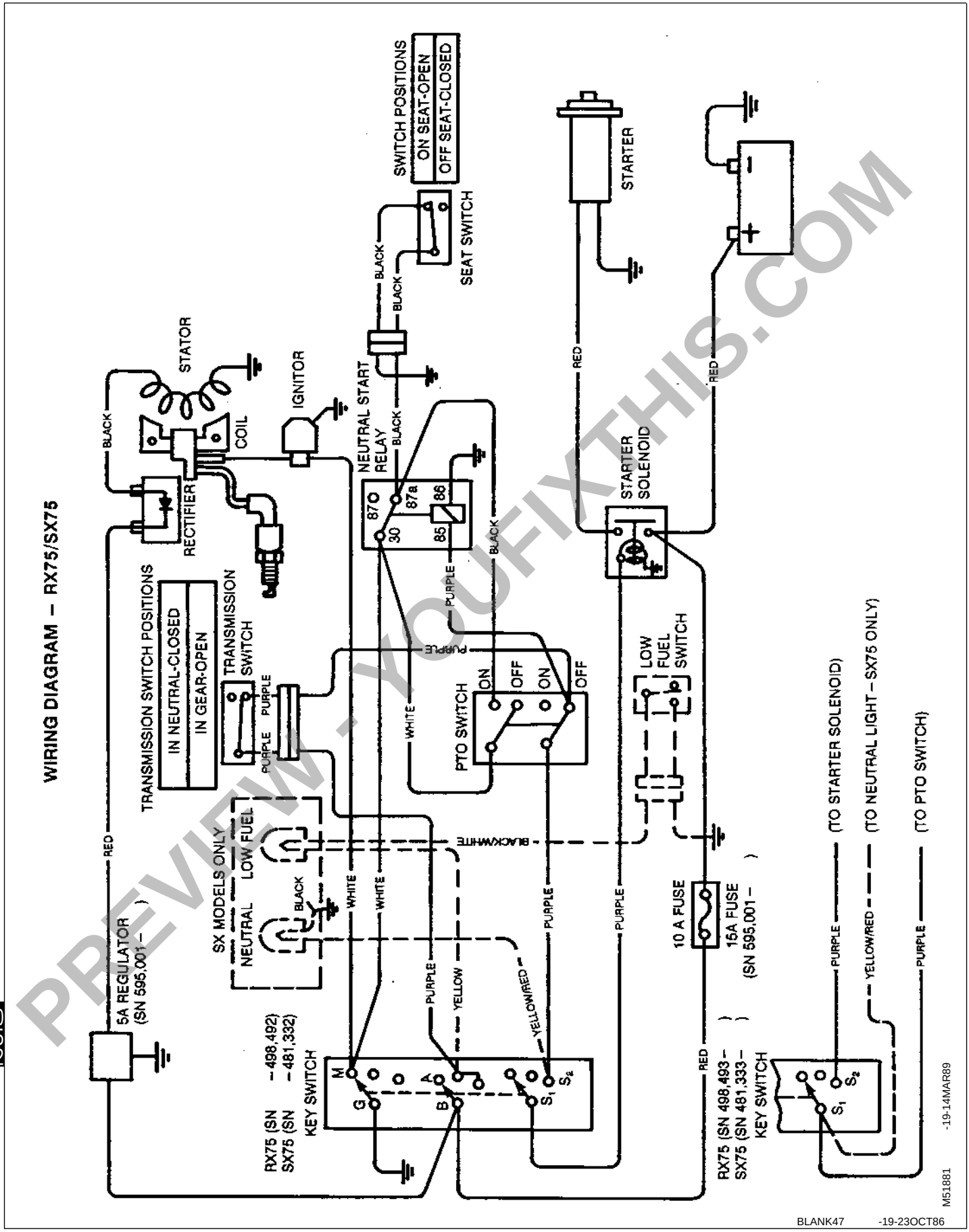
ENGINE/FUEL SYSTEM OPERATING TESTS	If engine/fuel system do not operate properly, select the appropriate symptom. If engine will not crank, see Section 240.	Engine will not start: GO TO A Engine will not stay running: GO TO B Engine surges only at low idle: GO TO C Engine surges only at high idle: GO TO D Engine surges under load or all conditions: GO TO E Engine low idle rpm incorrect: GO TO F Engine high idle rpm incorrect: GO TO G	Engine low on power: GO TO H Engine has black smoke coming from muffler, misfires in turns or over bumps, or fouls spark plugs rapidly: GO TO J Engine backfires at shut-down or start-up: GO TO K Engine starts hard when cold: GO TO L Engine starts hard when hot: GO TO M

BLANK4 -19-23OCT86

220
10
1

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240
15
2

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REMOVE PRIMARY BELT

1. Put shift lever in neutral.

2. Engage parking brake.

3. Remove battery.

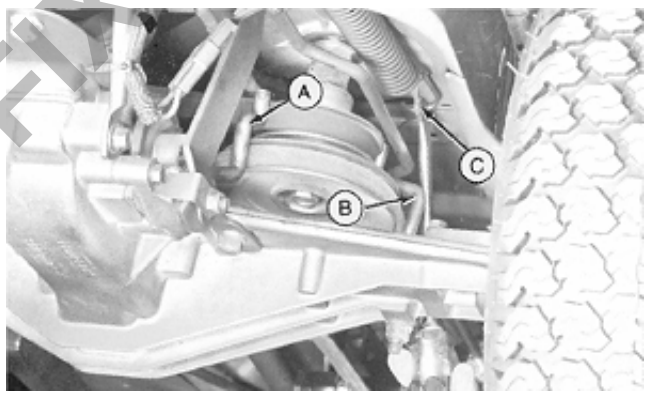
4. Lower mower deck to lowest cutting height.

5. Attach hoist to rear of riding mower and raise machine.

M22,5005G,3 -19-01DEC86

6. Loosen belt guides (A) and (B).

7. Remove secondary spring (C).



M49081 -UN-20DEC89

M22,5005G,4 -19-01DEC86

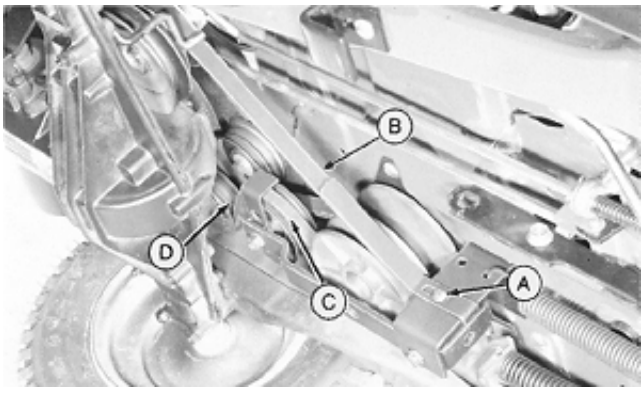
8. Loosen carriage bolt (A).

9. Remove primary belt (B) from variator.

10. Remove primary belt from primary idler (C).

11. Remove primary belt from V-idler (D).

A—Carriage Bolt
B—Primary Belt on Variator
C—Primary Idler
D—V-Idler



M49082 -UN-20DEC89

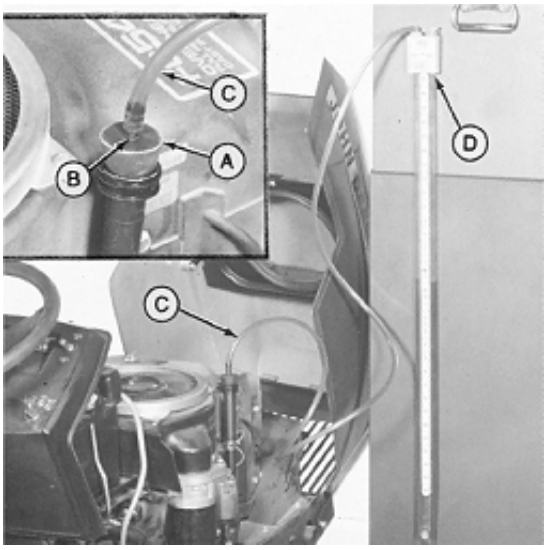
M22,5005G,5 -19-01DEC86

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M43671 -UN-12JAN90

A—8741-F66 Plug
B—JT05703 Barb Fitting
C—JT05699 Line
D—JT05698 U-Tube Manometer

un engine at f

inish making t

ecord crankcas

MINIMUM VACUUM

6 hp . . . . . 200 mm (7.8 in.)
9 hp . . . . . 70 mm (2.8 in.)
12.5 hp . . . . . 250 mm (9.8 in.)

Remove Manometer line from plug before shutting off engine.

OK: Return to Engine/Fuel System Operating Tests.

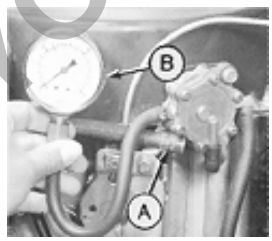
NOT OK: Vacuum Low: GO TO CTM-5 and inspect for: Damaged breather, excessive breather air gap, leaking fuel pump vacuum line, damaged dip stick seals, or leaking piston rings.

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7 FUEL PUMP PRESSURE AND FLOW TESTS

Start and run engine at slow idle for 5 minutes to fill carburetor with fuel.

Stop the engine.



M43674 -UN-12JAN90

Disconnect and plug fuel pump outlet hose (A).

Connect JDG356 0-103 kPa (0-15 psi) Pressure Gauge (B) to fuel pump outlet.

Start and run engine at fast idle for 15 seconds. Record pressure reading and stop engine. Minimum pressure is 3.6 kPa (.5 psi).

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M43675 -UN-12JAN90

Disconnect fuel pump outlet hose (A) and place in a graduated container.

Start and run engine at fast idle for 15 seconds and then stop engine.

Minimum flow for 12.5 hp models is 90 mL/15 seconds (3 oz/15 seconds).

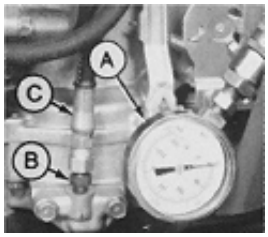
OK: RETURN TO: Engine/Fuel System Operating Tests.

NOT OK: GO TO Section 30, GROUP 05.

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220
10
8

8 OIL PRESSURE TEST FOR 12.5 HP MODELS



M48042 -UN-08JAN90

A—JTO03344 Gauge/2000 kPa (35 psi)
B—JTO3349 Connector
C—JTO3017 Hose

Make test connections from JTO1765 Fitting Kit.

Run engine at fast idle.

LOOK: Minimum oil pressure should be 240 kPa (35 psi).

LOW OIL PRESSURE: GO TO CTM-5. Check for:
Damaged or worn oil pressure relief valve.
Plugged oil pump suction screen.
Damaged or worn oil pump.

M22,22010G,14 -19-02DEC86

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