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TM1351-19-18APR90

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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 -19-16JUN87

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 -19-07OCT85

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

053,FIRE1 -19-23APR87

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TRACTOR SPECIFICATIONS

ENGINE

Manufacture	KAWASAKI
Engine Model Number	
130	FC290V
160/165	FB460V
175	FC420V
180/185	FC540V
Horsepower	
130	9
160/165	12.5
175	14
180/185	17
Cylinders	One
Cycle	Four
Speeds	
Full throttle, no load	3350 ± 100 rpm
Slow idle, no load	1400 ± 100 rpm
Spark Plug Type	
130	Champion RN11YC
160/165	Champion RCJ8 NGK-BMR4A
175	Champion RN11YC
180/185	Champion RN11YC
Spark Plug Gap	
130, 175, 180/185	0.70—0.80 mm (0.028—0.031 in.)
160/165	0.60—0.70 mm (0.024—0.028 in.)

ELECTRICAL SYSTEM

Battery, John Deere	
(TY6109)	12 Volt
255 amp cold cranking capacity capacity at 25 amp	
Alternator Charging Capacity	
130	13 Amp
160/165	13 Amp
175	13 Amp
180/185	15 Amp
Ignition	Solid State

CAPACITIES

Fuel Tank	8.3 L (2.2 gal)
Engine Oil, Without Filter	
130	1.1 L (2.3 pt)
160/165	1.4 L (3 pt)
175	1.3 L (2.7 pt)
180/185	1.6 L (3.4 pt)
Engine Oil, With Filter	
160/165	1.6 L (3.4 pt)
175	1.7 L (3.6 pt)
180/185	2.0 L (4.2 pt)
Transaxle	
130/160/180	1.1 L (2.3 pt)
Hydrostatic Transmission	
165/175/185	0.7 L (1.5 pt)
Differential	
165/175/185	0.7 L (1.5 pt)

TRAVEL SPEEDS AT 3300 RPM

First Gear-Transaxle	
130/160/180	2.2 km/h (1.4 mph)
180 w/46 in. Mower	2.4 km/h (1.5 mph)
Second Gear	
130/160/180	3.5 km/h (2.2 mph)
180 w/46 in. Mower	3.8 km/h (2.4 mph)
Third Gear	
130/160/180	5.3 km/h (3.3 mph)
180 w/46 in. Mower	5.6 km/h (3.5 mph)
Fourth Gear	
130/160/180	6.7 km/h (4.2 mph)
180 w/46 in. Mower	7.2 km/h (4.5 mph)
Fifth Gear	
130/160/180	7.8 km/h (4.9 mph)
180 w/46 in. Mower	8.5 km/h (5.3 mph)
Hydrostatic Transmission	
Forward	0-8 km/h (0-5 mph)
Reverse	0-4 km/h (0-2.5 mph)

APPROXIMATE WEIGHT

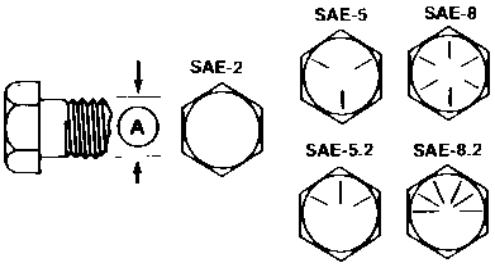
130	184 kg (405 lb)
160	202 kg (445 lb)
165 and 175	213 kg (470 lb)
180 with 30 in. Mower	220 kg (485 lb)
180 with 46 in. Mower	236 kg (520 lb)
180 with 38 in. Mower	231 kg (510 lb)

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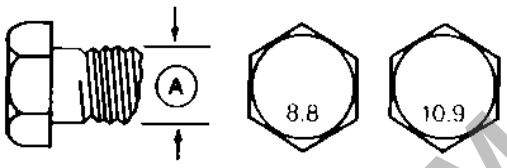
CAP SCREW TORQUE VALUES



TS299 -UN-09AUG89

Inch Cap Screw Head Markings

TS300 -UN-09AUG89



Metric Cap Screw Head Markings

INCH CAP SCREW TORQUE VALUES

Bolt Diameter (A)	Wrench Size	Cap Screw Grade SAE 2 N·m	SAE 2 lb-ft	SAE 5 N·m	SAE 5 lb-ft	SAE 8 N·m	SAE 8 lb-ft
1/4“	7/16“	7	(5)	11	(8)	16	(12)
5/16“	1/2“	14	(10)	23	(17)	33	(24)
3/8“	9/16“	24	(18)	41	(30)	54	(40)
7/16“	5/8“	41	(30)	68	(50)	95	(70)
1/2“	3/4“	61	(45)	102	(75)	142	(105)
9/16“	13/16“	88	(65)	142	(105)	203	(150)
5/8“	15/16“	122	(90)	197	(145)	278	(205)
3/4“	1-1/8“	217	(160)	353	(260)	495	(365)
7/8“	1-5/16“	224	(165)	563	(415)	800	(590)
1“	1-1/2“	332	(245)	848	(625)	1193	(880)
1-1/4“	1-7/8“	665	(490)	1492	(1100)	2393	(1765)

METRIC CAP SCREW TORQUE VALUES

Bolt Diameter (A)	Wrench Size	Markings on Cap Screw Heads 8.8 N·m	8.8 lb-ft	10.9 N·m	10.9 lb-ft
5 mm	8 mm	6	(4.5)	9	(6.5)
6 mm	10 mm	10	(7.5)	15	(11)
8 mm	13 mm	25	(18)	35	(26)
10 mm	16 mm	50	(37)	75	(55)
12 mm	18 mm	85	(63)	130	(97)
16 mm	24 mm	215	(159)	315	(232)
20 mm	30 mm	435	(312)	620	(457)
24 mm	36 mm	750	(553)	1070	(789)
30 mm	46 mm	1495	(1103)	2130	(1571)

CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

DO NOT use these values if a different torque value or tightening procedure is listed for a specific application. Torque values listed are for general use only. Check tightness of cap screws periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

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

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of amount shown in chart. Tighten toothed or serrated-type lock nuts to full torque value.

O53,TORQ3 -19-07OCT88

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FUEL

CAUTION: Handle fuel carefully. Always stop engine before refueling. Fill fuel tank outdoors. If engine is hot, let engine cool several minutes before you add fuel. Do not smoke while you fill the fuel tank or service the fuel system. Fill fuel tank only to bottom of filler neck.



TS185 -UN-23AUG88

IMPORTANT: DO NOT mix oil with gasoline.

Unleaded fuel is recommended. Regular leaded gasoline with an anti-knock index of 87 or higher may be used. Avoid switch from unleaded to regular gasoline to prevent engine damage.

Use of gasohol is acceptable as long as the ethyl alcohol blend does not exceed 10 per cent. Unleaded gasohol is preferred over leaded gasohol.

Fuel tank capacity is 2-1/2 gal (9.5 L).

Lift seat. Fill fuel tank at end of each day's operation. This helps to keep condensation out of fuel tank.

M21,FLS,A -19-03APR87

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KAWASAKI ENGINE REPAIR—USE CTM-5

For complete repair information the component technical manual (CTM) is also required.

Use the component manual in conjunction with this machine manual.



TS225 -UN-17JAN89

M21,2005S,A1 -19-18APR88

OTHER MATERIAL

Number	Name	Use
PT569	NEVER-SEEZ® Lubricant	Lubricate crankshaft

NEVER-SEEZ is a trademark of the Never-Seez Corp.

M21,2005S,X -19-20JAN86

REMOVE AND INSTALL ENGINE—130

1. Remove hood, muffler and pedestal shroud.

CAUTION: Gasoline is dangerous. Avoid fires due to smoking or careless maintenance practices.

2. Close fuel shut-off valve. Disconnect fuel line.



M50205 -UN-22DEC89

M21,2005S,A2 -19-18APR88

3. Loosen cap screw and disconnect throttle cable.



M50206 -UN-22DEC89

M21,2005S,A3 -19-18APR88

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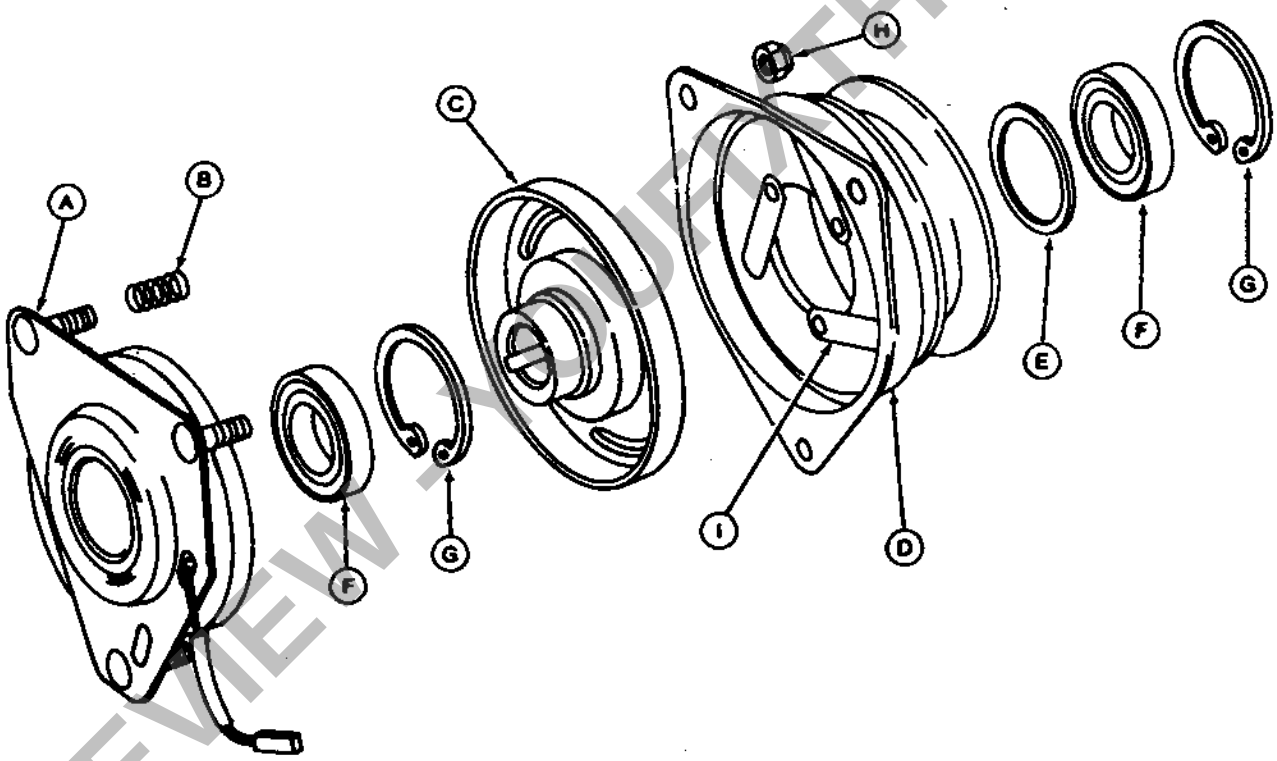
8. Press bearing from electrical coil assembly.



M50446 -UN-31AUG88

M21,4005S,K -19-03FEB86

INSPECT ELECTRIC PTO CLUTCH



M50456 -UN-31AUG88

A—Electric Coil Assembly
B—Spring (3 used)
C—Rotor
D—Armature Housing
E—Spacer (2 used)
F—Bearing (2 used)
G—Snap Ring
H—Lock Nut (3 used)
I—Contact Springs

1. Inspect bearings (F) for wear or damage. Replace if necessary.

2. Inspect springs (B) for broken condition. Replace springs if necessary.

3. Inspect contact surfaces of rotor (C) and armature (D) for scored or grooved condition. Check for weak or broken contact springs (I). Replace parts as needed.

M21,4005S,L -19-27MAR86

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1 ENGINE PROBLEM IDENTIFICATION	If engine does not operate properly, select the appropriate symptom/problem from list at right. After selecting the appropriate symptom or problem, go to that step and perform the checks, tests, or adjustments in the order shown to isolate and repair malfunction. If engine does not crank, see Section 240.	ENGINE WILL NOT START: GO TO A ENGINE STARTS HARD WHEN COLD, HOT, SITTING OR ENGINE KILLS WHEN HOT (HAS SPARK): GO TO B ENGINE SURGES OR SURGES AT FAST IDLE WITH NO LOAD: GO TO C ENGINE SURGES (NEW UNIT): GO TO D ENGINE BACKFIRES WHEN STARTING OR BACKFIRES THROUGH CARBURETOR: GO TO E ENGINE BACKFIRES THROUGH MUFFLER WHEN SHUT OFF: GO TO F ENGINE MISSES: GO TO G ENGINE LOSES POWER OR RUNS ROUGH WHEN HOT: GO TO H ENGINE KNOCKS AT SLOW IDLE: GO TO I ENGINE KNOCKS OR VIBRATES AT FAST IDLE: GO TO J ENGINE OIL LEVEL INCREASES OR GAS IN OIL: GO TO K ENGINE CONTINUES TO RUN (DIESELS) AFTER KEY IS SHUT OFF: GO TO L	ENGINE KILLS WHEN PTO IS ENGAGED: See Section 240. ENGINE KILLS WHEN TRANSMISSION LEVER IS MOVED OUT OF NEUTRAL: See Section 240. ENGINE OVERHEATS: GO TO M ENGINE HAS BLACK EXHAUST SMOKE: GO TO N ENGINE HAS BLUE EXHAUST SMOKE OR OIL IN AIR CLEANER: GO TO O ENGINE USES TOO MUCH OIL: GO TO P ENGINE USES TOO MUCH FUEL: GO TO Q

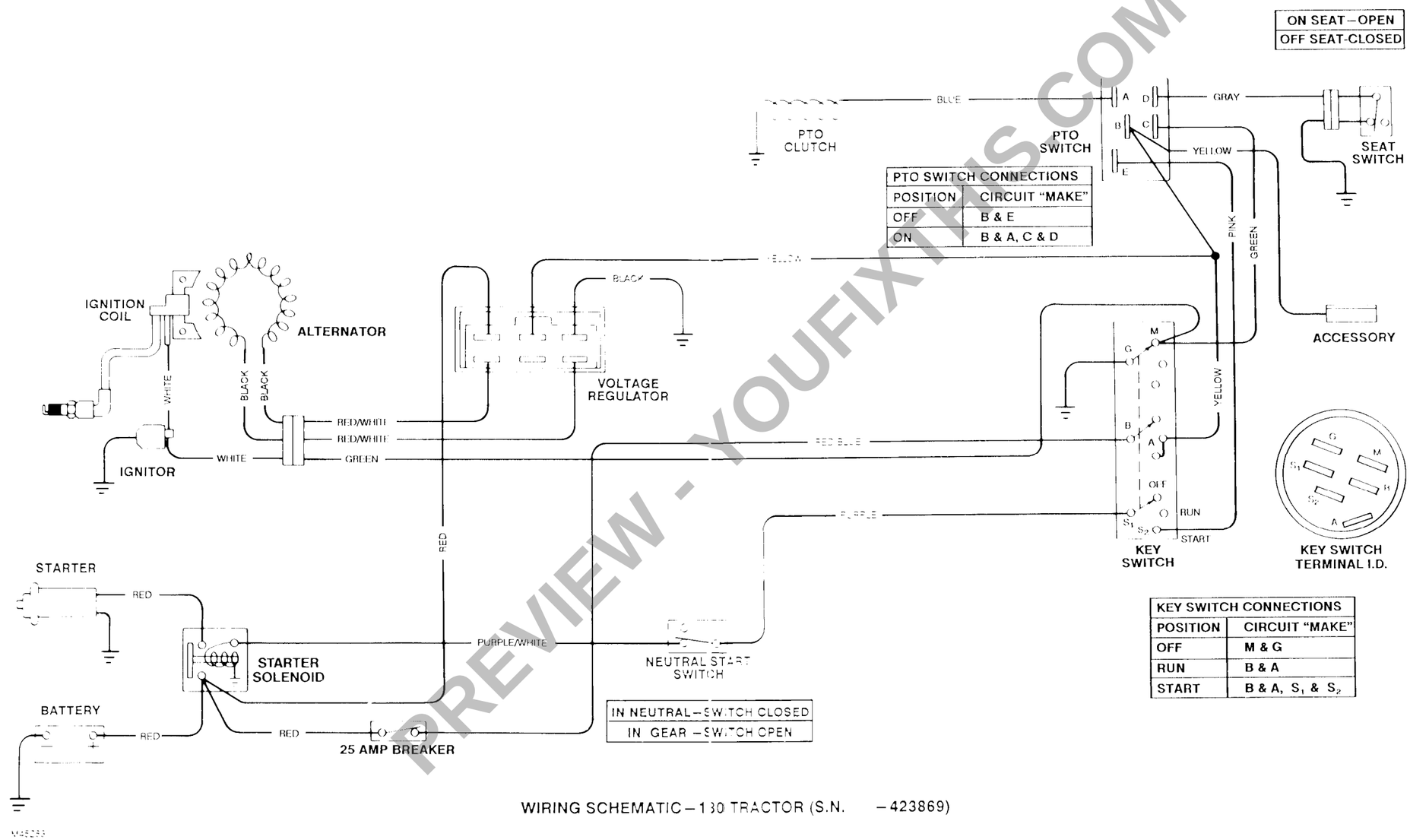
M21,22010,2 -19-24MAY89

A Engine Will Not Start		Drain fuel and replace with fresh fuel. Test ignition spark. GO TO 11 Test fuel transfer pump output. GO TO 10 Inspect and adjust throttle cable: GO TO 2 Inspect and adjust choke. GO TO 3 Adjust carburetor idle mixture screw. GO TO 6 Check and adjust governor linkage. GO TO 4 Check carburetor float adjustment.	See CTM-5. Check starter cranking RPM: See Section 240. Test compression: GO TO 7 Test crankcase vacuum: GO TO 8 Check and adjust valve clearance. See CTM-5.

M21,22010,3 -19-23MAY89

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WIRING SCHEMATIC – 130 TRACTOR (S.N. – 423869)

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10
20
30
40
50
60
80
210
220
240

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10. Remove key (A) and spacer (B).

11. Remove output shaft (C).



M50345 -UN-22DEC89

M21,5020S,S -19-22JAN86

12. Remove retaining ring.

13. Remove bearing (A) and oil seal (B).



M50346 -UN-22DEC89

M21,5020S,T -19-22JAN86

14. Remove retaining ring from input shaft.

15. Remove key (A) from shaft.



M50347 -UN-22DEC89

M21,5020S,U -19-22JAN86

16. Remove dump valve shaft.

IMPORTANT: DO NOT allow rotor assembly to lift with pivot pin assembly. The ball piston assembly MUST remain intact as the ball pistons are matched to the rotor bores.

17. Remove pivot pin assembly (A).



M50348 -UN-03JAN90

M21,5020S,V -19-27MAR86

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