READING ELECTRICAL SCHEMATICS

The schematic is made up of individual circuits laid out in a sequence of related functions. It is formatted with all power wires (A) across the top and all ground wires (B) across the bottom. Current flow is generally from top to bottom through each circuit and component. All components are shown in the OFF position. The diagram does not list connector (C) information unless needed to avoid confusion. If the connector is shown, the number next to it is the terminal pin location (D) in the connector.

Each component is shown by a symbol (E), its name (F), and an identification code (G). The identification code contains a device identifying letter (H) and number (I).

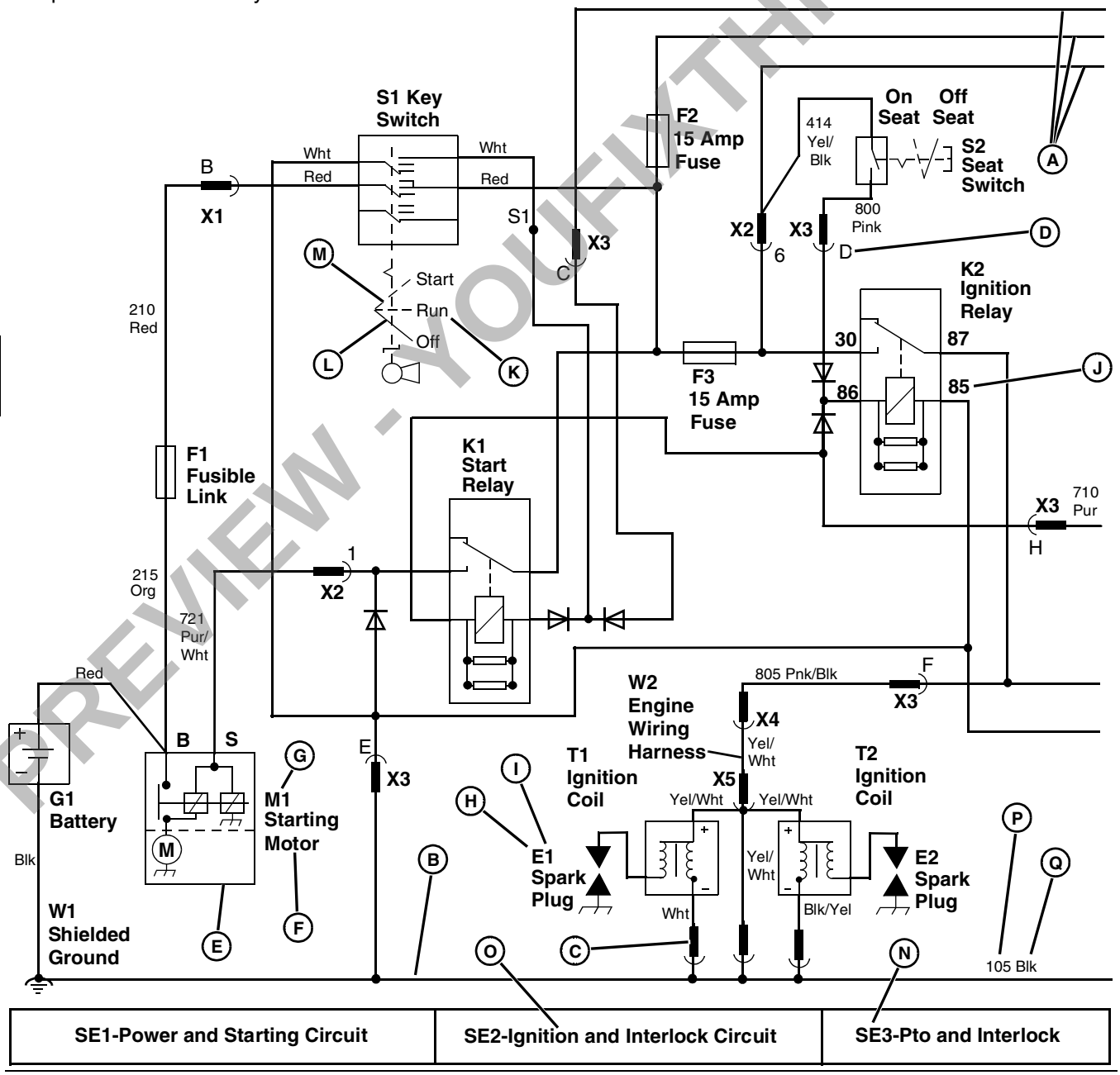
The identifying letter is always the same for a specific component, but the identifying numbers are numbered consecutively from upper left to lower right. The terminal designation (J) is placed directly outside the symbol next to the connecting wire path. Switch positions (K) are also placed directly outside the symbol. The solid line (L) shows the position the switch is currently in and dash lines (M) represent other switch positions.

Each circuit is identified at the bottom of the drawing by a section number (N) and section name (O).

The circuit number (P) and wire color (Q) of the wires are shown directly next to the wire path.

The same component name and identification code are used consistently on all diagrams in this section.

Components can be easily cross-referenced.



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Cutting Width	53.34 cm (21 inches)	53.34 cm (21 inches)	53.34 cm (21 inches)	53.34 cm (21 inches)
Cutting Height	1.3 – 8.9 cm (0.5 – 3.5 inches)	1.3 – 8.9 cm (0.5 – 3.5 inches)	1.3 – 8.9 cm (0.5 – 3.5 inches)	1.3 – 8.9 cm (0.5 – 3.5 inches)
Ground Speeds (2-Speed)	1st - 3.2 kph (2.0 mph) 2nd - 4.8 kph (3.0 mph)	1st - 3.2 kph (2.0 mph) 2nd - 4.8 kph (3.0 mph)	N/A	N/A
Ground Speeds (5-Speed)	1st - 1.9 kph (1.2 mph) 2nd - 2.9 kph(1.8 mph) 3rd - 3.9 kph(2.4 mph) 4th - 4.8 kph(3.0 mph) 5th - 6.6 kph(4.1 mph)	1st - 1.9 kph(1.2 mph) 2nd - 2.9 kph(1.8 mph) 3rd - 3.9 kph(2.4 mph) 4th - 4.8 kph(3.0 mph) 5th - 6.6 kph(4.1 mph)	1st - 1.9 kph(1.2 mph) 2nd - 2.9 kph(1.8 mph) 3rd - 3.9 kph(2.4 mph) 4th - 4.8 kph(3.0 mph) 5th - 6.6 kph(4.1 mph)	1st - 1.9 kph(1.2 mph) 2nd - 2.9 kph(1.8 mph) 3rd - 3.9 kph(2.4 mph) 4th - 4.8 kph(3.0 mph) 5th - 6.6 kph(4.1 mph)

TORQUE SPECIFICATIONS

Briggs & Stratton Engine:

Spark Plug . . . . . 20 N•m (180 lb-in.)
Cylinder Head Cap Screw . . . . . 18 N•m (140 lb-in.)
Flywheel Nut Torque . . . . . 81 N•m (60 lb-ft.)
Intake Manifold Cap Screw . . . . . 13.5 N•m (120 lb-in.)
Muffler Shoulder Bolts (6.0 Quantum) . . . . . 10 N•m (89 lb-in.)
Muffler Bolts (6.5 Intek) . . . . . 10 N•m (89 lb-in.)
Muffler Cylinder Head Bolts (6.5 Intek) . . . . . 9.6 N•m (85 lb-in.)
Carburetor Mount . . . . . 10 N•m (89 lb-in.)
Connecting Rod Cap Screw . . . . . 11.3 N•m (100 lb-in.)
Crankcase Cover Cap Screw . . . . . 9.6 N•m (85 lb-in.)
Engine to Housing Cap Screws . . . . . 55 ± 14 N•m (40 ± 10 lb-ft)

Kawasaki Engine:

Spark Plug . . . . . 20 N•m (180 lb-in.)
Cylinder Head Cap Screw
Initial Torque . . . . . 18 N•m (159 lb-in.)
Final Torque . . . . . 24 N•m (212 lb-in.)
Flywheel Nut Torque . . . . . 45 N•m (33 lb-ft.)
Muffler Nuts . . . . . 10 N•m (89 lb-in.)
Carburetor Mount . . . . . 9 N•m (90 lb-in.)
Connecting Rod Cap Screw . . . . . 12 N•m (106 lb-in.)
Crankcase Cover Cap Screw . . . . . 7 N•m (62 lb-in.)
Engine to Housing Cap Screws . . . . . 55 ± 14 N•m (40 ± 10 lb-ft)
Rocker Arm Lock Nut . . . . . 7 N•m (62 lb-in.)

Blade and Blade Brake Clutch:

Blade Brake Clutch Release Spring Bracket to Deck . . . . . 11 N•m (97 lb-in.)
Blade Brake Clutch (Center Bolt) . . . . . 75 ± 14 N•m (55 ± 10 lb-ft)
Mower Blade to Blade Brake Clutch . . . . . 75 N•m (55 lb-ft)
Mower Blade to Crankshaft Blade Adaptor (JA60 & JA62 Only) 75 ± 14 N•m (55 ± 10 lb-ft)

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TROUBLESHOOTING

ENGINE TROUBLESHOOTING CHART

Problem or Symptom / Check or Solution	Engine cranks but will not start	Engine won't stay running or runs rough	Engine stalls frequently	Engine backfires	Engine surges–has uneven rpm	Engine misses	Engine has low power under load	Engine has no spark	Exhaust smoke black, engine floods	Exhaust smoke blue or uses oil	Engine overheats	Excessive engine noise or vibration
Spark Plug Fouled, Or Gap Not Correct. Wrong Spark Plug	●	●	●	●		●	●				●	
Ignition Module Ground Wire Shorted To Ground, Throttle Not In "Run" Position	●	●	●	●	●	●	●	●				
Ignition Module Bad	●	●	●	●	●	●	●	●				
Fuel Line Restricted. Fuel Stale, Contains Water, or Wrong Type	●	●	●	●	●	●	●				●	
Air filter element plugged, oil soaked, or restricted	●	●	●		●	●	●		●	●		●
Throttle, or Governor Linkage Worn or Misadjusted	●	●	●		●	●	●		●		●	●
Carburetor Dirty or Shafts Worn	●	●	●	●	●		●		●		●	●
Carburetor, Intake Manifold, or Cylinder Head Gaskets Leaking	●	●	●	●	●	●	●				●	●
Low Compression from Worn Piston, Rings, Cylinder, Valves or Warped Head	●	●	●		●	●	●				●	●
Valve Clearance Incorrect. Burned or Warped Valves and Seats. Defective Springs	●	●	●	●	●	●	●		●		●	●
Engine Oil Type or Level Wrong	●						●			●	●	●
Engine Gaskets or Seals Leaking	●	●	●	●	●	●	●			●	●	
Crankcase Breather Restricted, Reed Valve Damaged, Clearance Incorrect, or Drain Hole Plugged					●	●	●			●		●
Valve Guides or Stems Worn				●		●				●	●	
Worn, Stuck, Broken Piston Rings. Cylinder Worn. Check Compression and Vacuum	●	●	●	●	●	●	●		●	●	●	●
Connecting Rod/Crankshaft Worn												●
Engine Mounting Hardware Loose, Broken, or Missing												●

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

IGNITION CIRCUIT OPERATION – JA62

FUNCTION:

At the correct time, supplies a high voltage to the spark plug to ignite a fuel/air mixture.

MAJOR COMPONENTS:

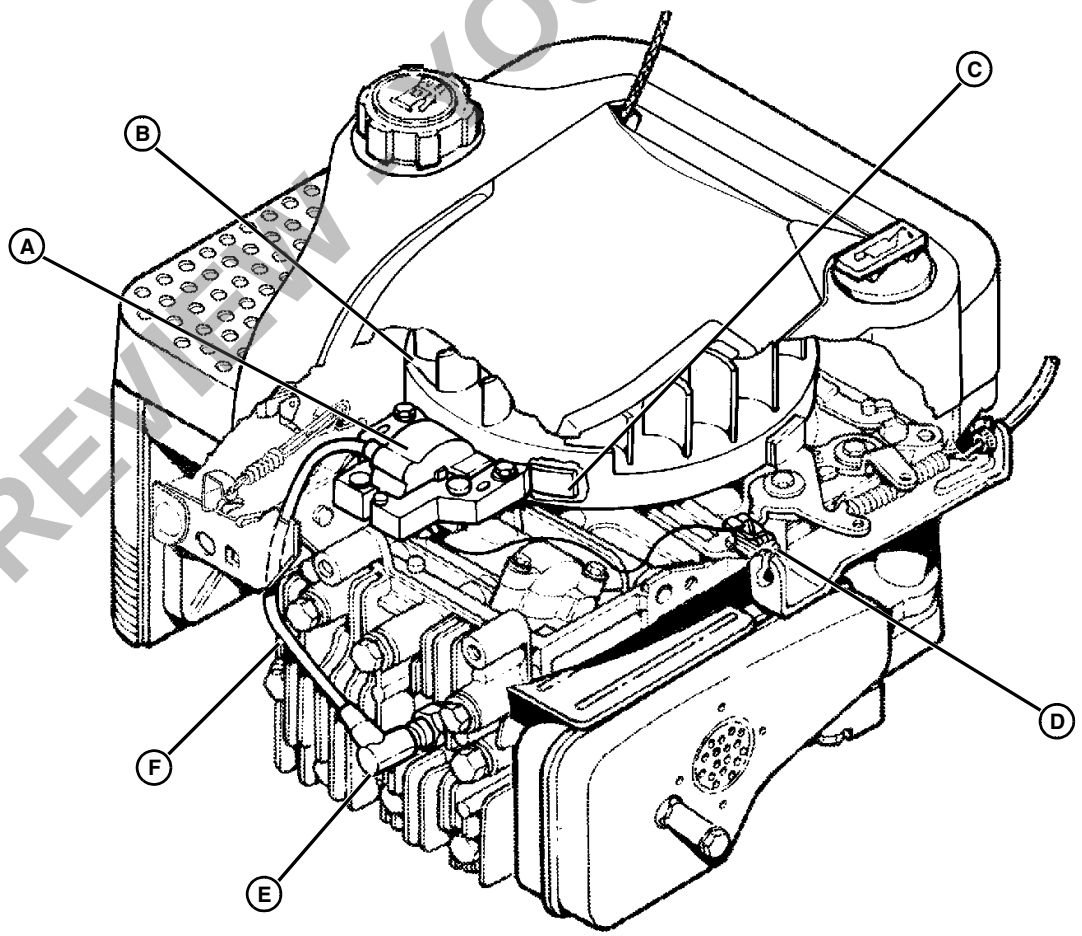
Ignition coil w/Trigger Module, stop switch and flywheel w/magnet.

HOW THE SYSTEM WORKS:

The engine is equipped with a solid state, transistorized, magneto ignition system. There are no moving parts and there is no need for an external power source (battery). The power and the triggering signal are both generated as the permanent magnet (C) on the outside of the flywheel (B) moves past the ignition coil (A) and trigger module. The ignition coil consists of an iron core with two sets of wires around it. The primary winding connects to the trigger, the secondary winding connects to the spark plug (E) through the high tension lead wire (F). The trigger module is a switch that opens and closes the ground circuit of the primary winding of the coil.

As the magnet nears the coil, a magnetic field passes through the core of the coil. This builds up a voltage in the primary winding of the coil. As the flywheel continues to turn, the magnetic field in the core of the coil reverses. Also, a voltage is generated in a small coil in the trigger. The voltage in the trigger closes the ground circuit of the primary winding of the coil. The field reversal and the closed ground of the primary winding cause a very rapid drop in voltage in the primary winding. This causes a very high voltage in the secondary winding of the coil. The high voltage of the secondary winding creates a spark at the spark plug.

The stop switch (D) is also a ground for the primary winding of the coil. When it is closed, a voltage cannot build up in the primary winding and prevents the high voltage in the secondary winding so no spark is generated. The safety switch is connected to the igniter/coil by the kill wire.

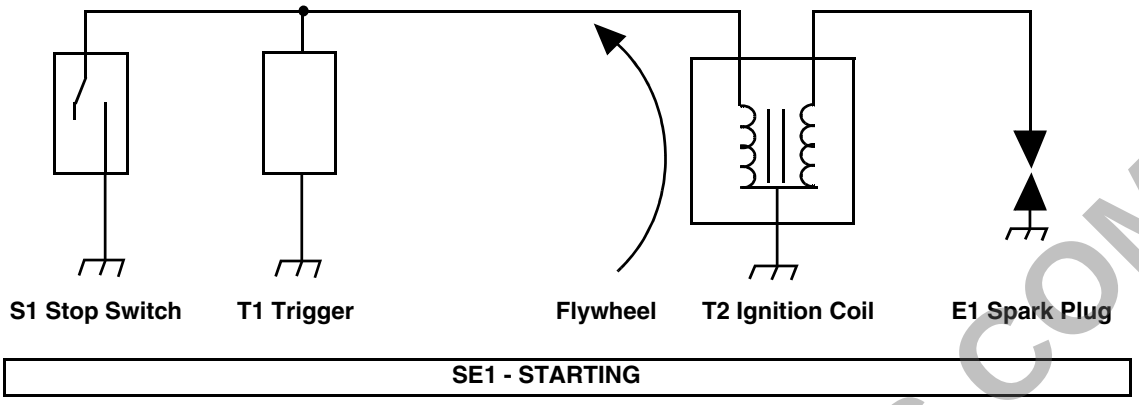


M91074

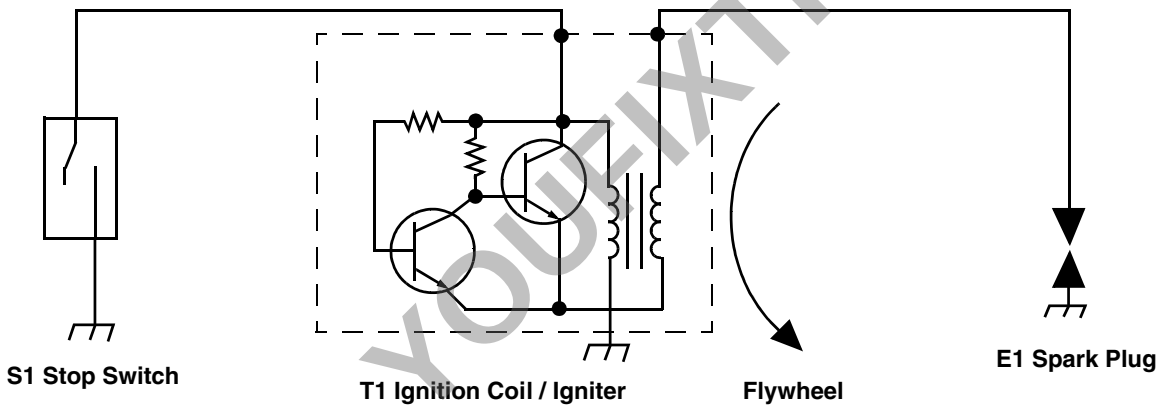
PREVIEW YOUFIXTHIS.COM

Download full manual at youfixthis.com

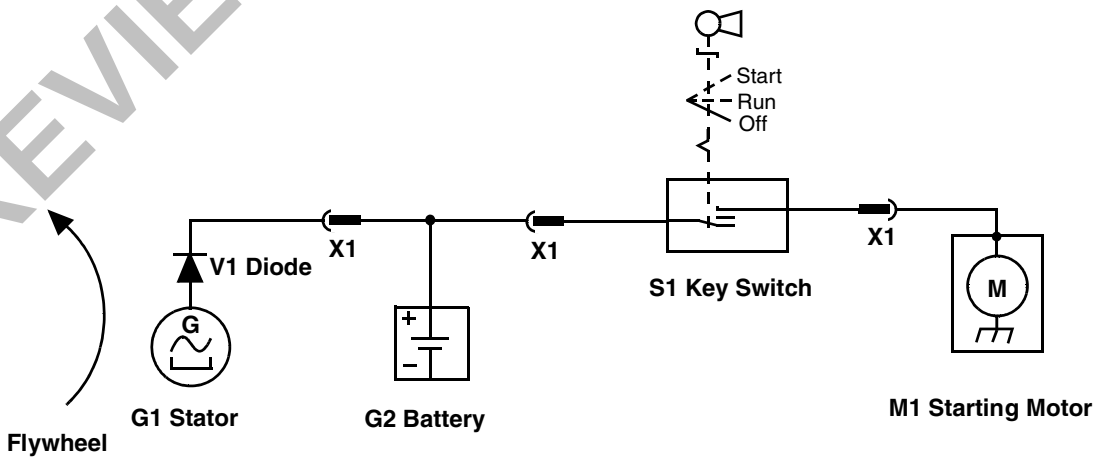
ELECTRICAL SCHEMATIC – B&S ENGINES



ELECTRICAL SCHEMATIC – KAWASAKI ENGINES



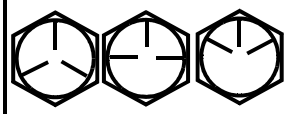
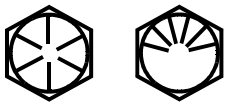
ELECTRICAL SCHEMATIC – ELECTRIC START KAWASAKI ENGINE



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

INCH FASTENER TORQUE VALUES

SAE Grade and Head Markings	**No Marks** 			
SAE Grade and Nut Markings	**No Marks** 			TS1162

	Grade 1				Grade 2[b]				Grade 5, 5.1 or 5.2				Grade 8 or 8.2			
	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
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

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 grade. 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.*

b *"Grade 2" applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. "Grade 1" applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.*

Reference: JDS—G200.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

CARBURETION TROUBLESHOOTING CHART

Problem or Symptom / Check or Solution	Hard Starting	Fuel Leak at Carburetor	Engine Floods	Will Not Idle	Rich Idle	Idles with Idle Needle Closed	Hunts / Erratic Idle	Idles Fast–Won't Adjust	Will Not Accelerate	Over Rich Acceleration	Hesitates	Will Not Run At High Speed	Low Power	Hunts at High Speed	Engine Overspeeds
Plugged Air Filter	●		●	●	●				●	●	●	●	●		
Leaky Manifold Gasket	●			●			●	●			●			●	●
Throttle Shaft Worn	●			●			●	●			●		●	●	●
Air Bleed Restricted				●			●		●		●	●	●	●	
Leaky Bowl Gasket		●												●	
Plugged Tank Filter Screen Or Cap Vent	●			●					●		●	●	●		
Fuel Pick-up Tube Clogged	●			●			●		●		●	●	●		
Idle Port Restricted	●			●			●				●		●		
Incorrect Float Height	●	●	●	●	●	●	●		●	●	●	●	●	●	
Main Nozzle Restricted	●						●		●	●		●	●	●	
Dirty or Stuck Float Needle and Seat	●	●	●	●	●	●	●		●	●	●	●	●	●	
Fuel Inlet Plugged	●			●					●		●	●	●		
Governor Linkage Incorrect				●			●	●	●			●		●	●

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

IGNITION CIRCUIT OPERATION – JA65

FUNCTION:

At the correct time, supplies a high voltage to the spark plug to ignite a fuel/air mixture.

MAJOR COMPONENTS:

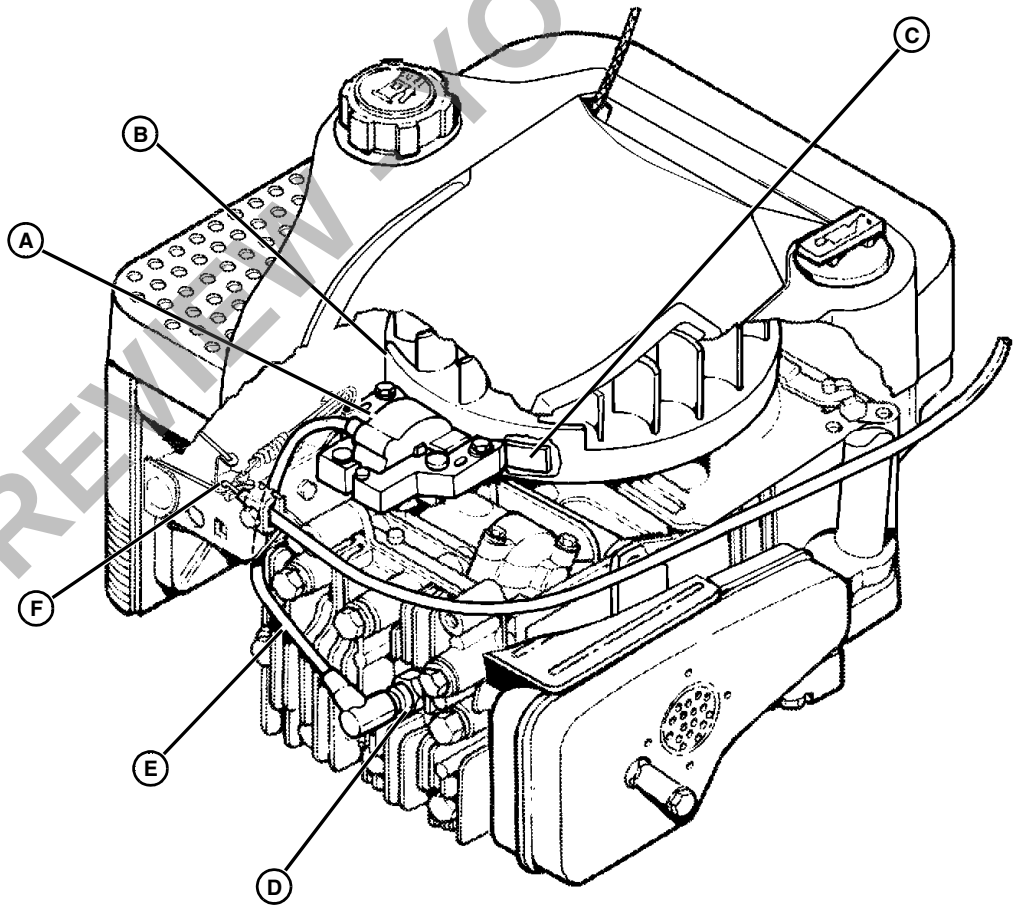
Ignition coil w/Trigger Module, stop switch and flywheel w/magnet.

HOW THE SYSTEM WORKS:

The engine is equipped with a solid state, transistorized, magneto ignition system. There are no moving parts and there is no need for an external power source (battery). The power and the triggering signal are both generated as the permanent magnet (C) on the outside of the flywheel (B) moves past the ignition coil (A) and trigger module. The ignition coil consists of an iron core with two sets of wires around it. The primary winding connects to the trigger, the secondary winding connects to the spark plug (D) through the high tension lead wire (E). The trigger module is a switch that opens and closes the ground circuit of the primary winding of the coil.

As the magnet nears the coil, a magnetic field passes through the core of the coil. This builds up a voltage in the primary winding of the coil. As the flywheel continues to turn, the magnetic field in the core of the coil reverses. Also, a voltage is generated in a small coil in the trigger. The voltage in the trigger closes the ground circuit of the primary winding of the coil. The field reversal and the closed ground of the primary winding cause a very rapid drop in voltage in the primary winding. This causes a very high voltage in the secondary winding of the coil. The high voltage of the secondary winding creates a spark at the spark plug.

The stop switch (F) is also a ground for the primary winding of the coil. When it is closed, a voltage cannot build up in the primary winding and prevents the high voltage in the secondary winding so no spark is generated. The safety switch is connected to the igniter/coil by the kill wire.

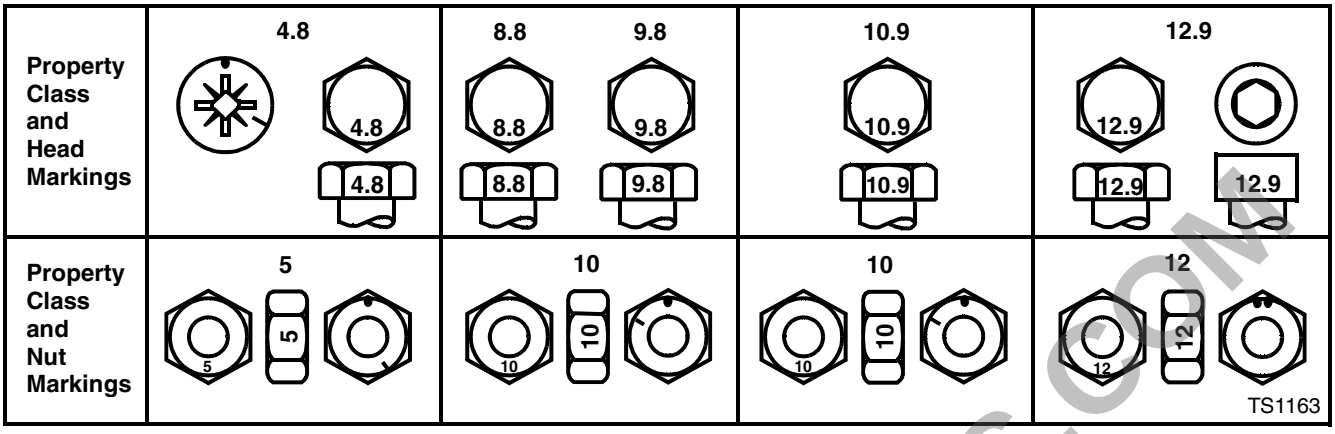


M91211

PREVIEW FROM YOUFIXTHIS.COM

Download full manual at youfixthis.com

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	48	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 grade. 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.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TROUBLESHOOTING

ENGINE TROUBLESHOOTING CHART

Problem or Symptom / Check or Solution	Engine cranks but will not start	Engine won't stay running or runs rough	Engine stalls frequently	Engine backfires	Engine surges–has uneven rpm	Engine misses	Engine has low power under load	Engine has no spark	Exhaust smoke black, engine floods	Exhaust smoke blue or uses oil	Engine overheats	Excessive engine noise or vibration
Spark Plug Fouled, Or Gap Not Correct. Wrong Spark Plug	●	●	●	●		●	●				●	
Ignition Module Ground Wire Shorted To Ground, Throttle Not In "Run" Position	●	●	●	●	●	●	●	●				
Ignition Module Bad	●	●	●	●	●	●	●	●				
Fuel Line Restricted. Fuel Stale, Contains Water, or Wrong Type	●	●	●	●	●	●	●				●	
Air filter element plugged, oil soaked, or restricted	●	●	●		●	●	●		●	●		●
Throttle, or Governor Linkage Worn or Misadjusted	●	●	●		●	●	●		●		●	●
Carburetor Dirty or Shafts Worn	●	●	●	●	●		●		●		●	●
Carburetor, Intake Manifold, or Cylinder Head Gaskets Leaking	●	●	●	●	●	●	●				●	●
Low Compression from Worn Piston, Rings, Cylinder, Valves or Warped Head	●	●	●		●	●	●				●	●
Valve Clearance Incorrect. Burned or Warped Valves and Seats. Defective Springs	●	●	●	●	●	●	●		●		●	●
Engine Oil Type or Level Wrong	●						●			●	●	●
Engine Gaskets or Seals Leaking	●	●	●	●	●	●	●			●	●	
Crankcase Breather Restricted, Reed Valve Damaged, Clearance Incorrect, or Drain Hole Plugged					●	●	●			●		●
Valve Guides or Stems Worn				●		●				●	●	
Worn, Stuck, Broken Piston Rings. Cylinder Worn. Check Compression and Vacuum	●	●	●	●	●	●	●		●	●	●	●
Connecting Rod/Crankshaft Worn												●

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

CARBURETOR PRIMER CIRCUIT OPERATION

FUNCTION:

To provide extra fuel to the air/fuel mixture during starting and warm-up to aid in starting the engine.

MAJOR COMPONENTS:

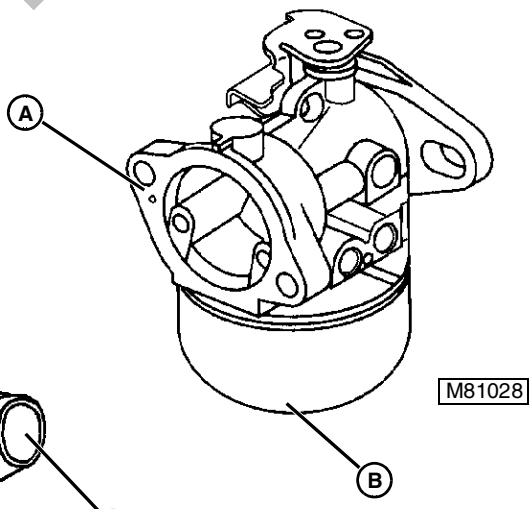
Primer bulb, float bowl nut, float and float valve.

HOW THE SYSTEM WORKS:

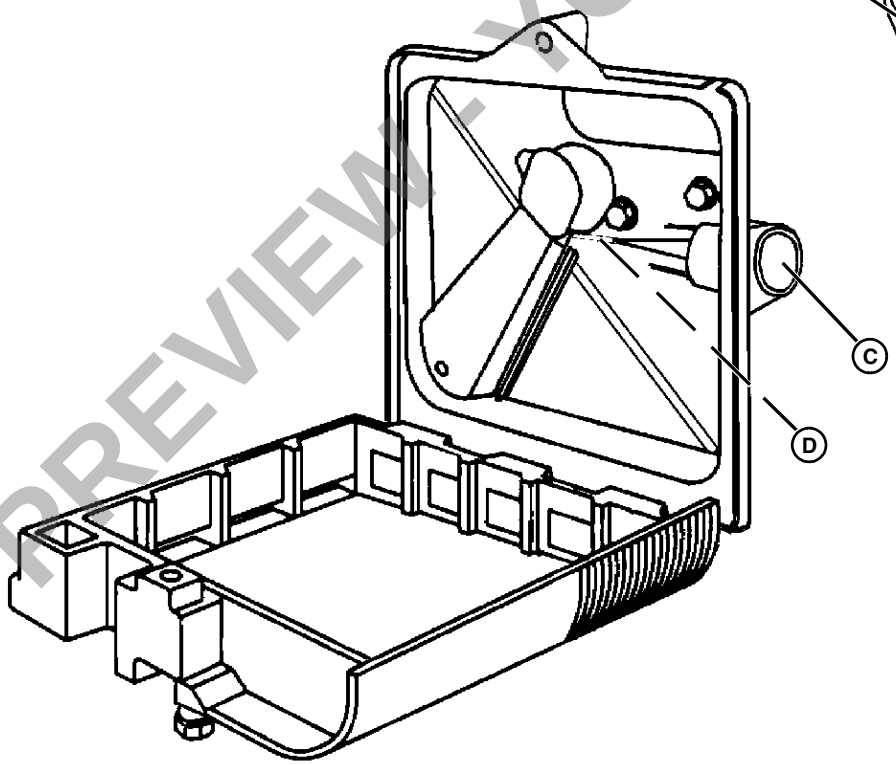
During cold start operation when all the engine surfaces are cold, the cold start system provides a rich air/fuel mixture by increasing the amount of fuel, until the engine warms and begins to vaporize fuel more efficiently. The system relies on the fuel delivery system to provide the proper fuel level in the carburetor float bowl (B). Always check fuel level in tank and float bowl when cold start problems occur, to be sure clean, fresh fuel is being supplied for proper air/fuel mixture.

PRIMER START OPERATION

The carburetor has a primer bulb used for cold starting. Depressing the primer bulb (C) forces air through the primer channel (D) and primer port (A) and into the float bowl (B), which slightly pressurizes the float bowl and pushes fuel up into the main jet and out the main jet nozzle. There is no choke valve used on this engine.



M81028



M81029

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

CONTENTS

Page

GENERAL VEHICLE SPECIFICATIONS 3
ENGINE SPECIFICATIONS 3
ELECTRICAL SPECIFICATIONS 3
FUEL SYSTEM SPECIFICATIONS 3
TRANSMISSION SPECIFICATIONS 3
DIMENSIONS 3
TORQUE SPECIFICATIONS 4
INCH FASTENER TORQUE VALUES 5
METRIC FASTENER TORQUE VALUES 6
LUBRICANTS 7
GASOLINE 7
GASOLINE STORAGE 7
ENGINE OIL 8
ENGINE BREAK–IN OIL 8
TRANSAXLE OIL 9
ANTI-CORROSION GREASE 10
ALTERNATIVE LUBRICANTS 10
SYNTHETIC LUBRICANTS 10
LUBRICANT STORAGE 10
MIXING OF LUBRICANTS 10
CHASSIS GREASE 11
OIL FILTERS 11
PRODUCT IDENTIFICATION LOCATIONS 11

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 12 of 228 pages

The full manual includes:

- All 228 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

John Deere JA60, JA62, JA65, JE75, JX75, JX85 Technical Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual