Specifications

Engine Specifications

Engine:

Manufacturer	Briggs & Stratton
Series	675
Model	12
Cylinders	1
Cycle	Air cooled (4 cycle)
Valve Type	Flat Head Valves in Cylinder Block
Displacement	190 cc (11.59 cu in.)
Engine Governed Speed	3400 ± 100 rpm
Cylinder Bore (Nominal)	68.26 mm (2.688 in.)
Stroke	51.80 mm (2.040 in.)
Lubrication Type	Splash System
Oil Capacity	0.6 L (20 U.S. oz)
Oil Fill	Top/left of engine
Air Filter Type	Dry Replaceable w/Foam - Dual Element
Throttle Control	Fixed Speed

Fuel

Fuel System:

Type Required	Unleaded Gasoline, 85 Minimum Octane
Fuel Tank Capacity	2 L (2.1 qt)
Carburetor	Float-type CARB/EPA Certified
Choke	Automatic
Fuel Filter	used in California

Electrical Specifications

Ignition:

Armature Air Gap	0.15 - 0.25 mm (0.006 - 0.010 in.)
Stator Air Gap (JS35) (SN -100000)	0.15 - 0.25 mm (0.006 - 0.010 in.)
Ignition	Electronic
Spark plug (resistor)	RJ19LM Champion
Spark Plug Gap	0.076 mm (0.030 in.)
Starting	Recoil with compression release (Electric on JS35).

Repair Specifications

Connecting Rod:

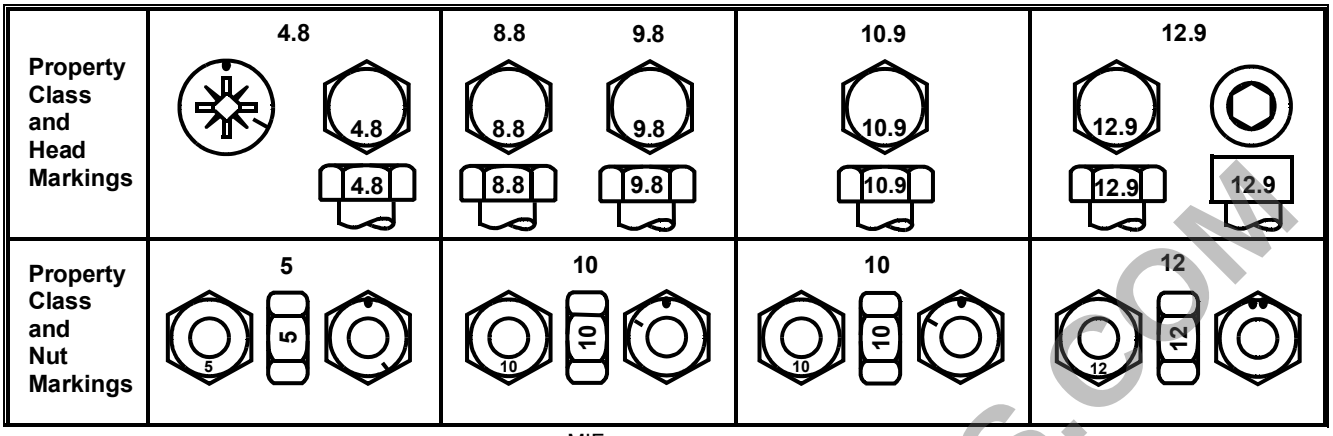
Crankpin Bore (ID)	27.95 - 27.93 mm (1.100 - 1.010 in.)
Crankpin Bore (Reject Size)	27.98 mm (1.102 in.)
Piston Pin Bore (ID)	15.89 - 15.90 mm (0.626 - 0.626 in.)
Piston Pin Bore (Reject Size)	15.93 mm (0.627 in.)

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Fastener Torques

Metric Fastener Torque Values



MIF

	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 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.

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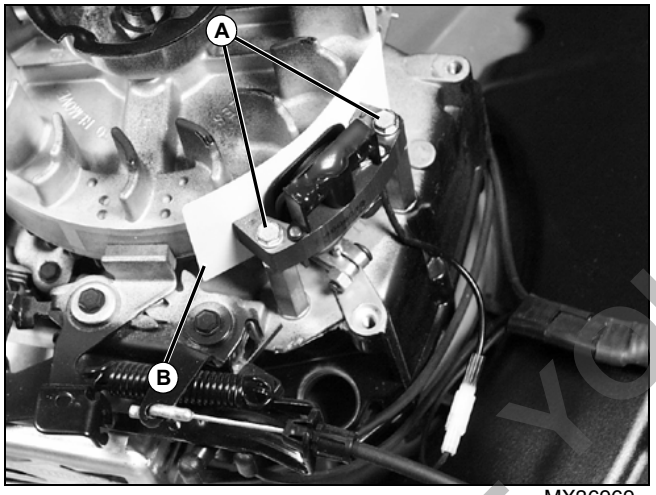
Alternator Air Gap Adjustment

Reason:

The alternator must be positioned the correct distance from the flywheel to provide proper output.

Procedure:

1. Place mower on level surface.
2. Disconnect spark plug lead wire.
3. Remove engine cover. See “Engine Cover Removal” on page 40.
4. Remove fuel tank. See “Fuel Tank Removal and Installation” on page 41.
5. Remove engine blower housing. See “Engine Blower Housing Removal and Installation” on page 41.



MX36969

6. Loosen two screws (A) on the module.
7. Position a feeler gauge (B) between the alternator and the flywheel. Rotate flywheel so that magnets are located by alternator
8. The flywheel magnets will tend to pull the alternator into contact with it. Tighten screws (A).
9. Remove feeler gauge(s), rotate the flywheel and check clearance. Readjust if necessary.

Specification:

Gap. . . . . 0.15 - 0.25 mm (0.006 - 0.010 in.)

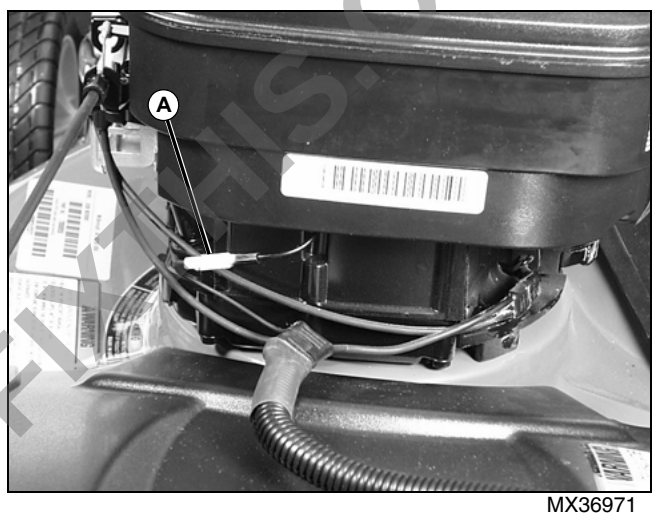
Alternator Output Test

Reason:

To test the alternator to insure that it is producing enough voltage and amperage to keep the battery charged.

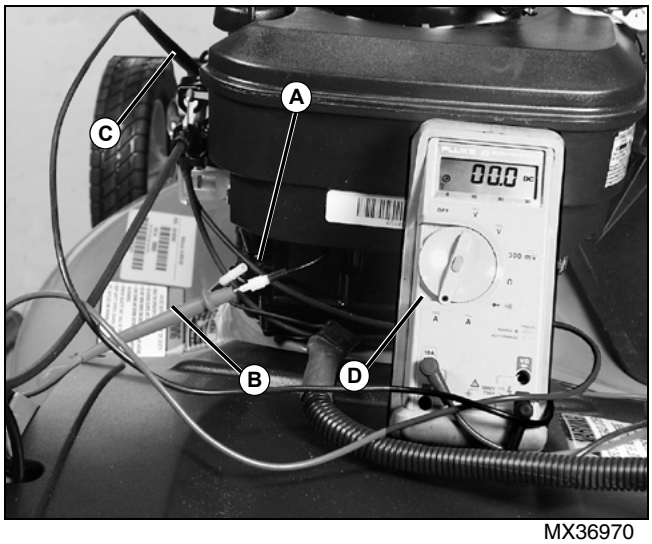
Procedure:

1. Place mower on level surface.
2. Start mower.
3. Check speed with tachometer. Engine speed should be 2800 rpm.



MX36971

4. Disconnect alternator output lead at connector (A).

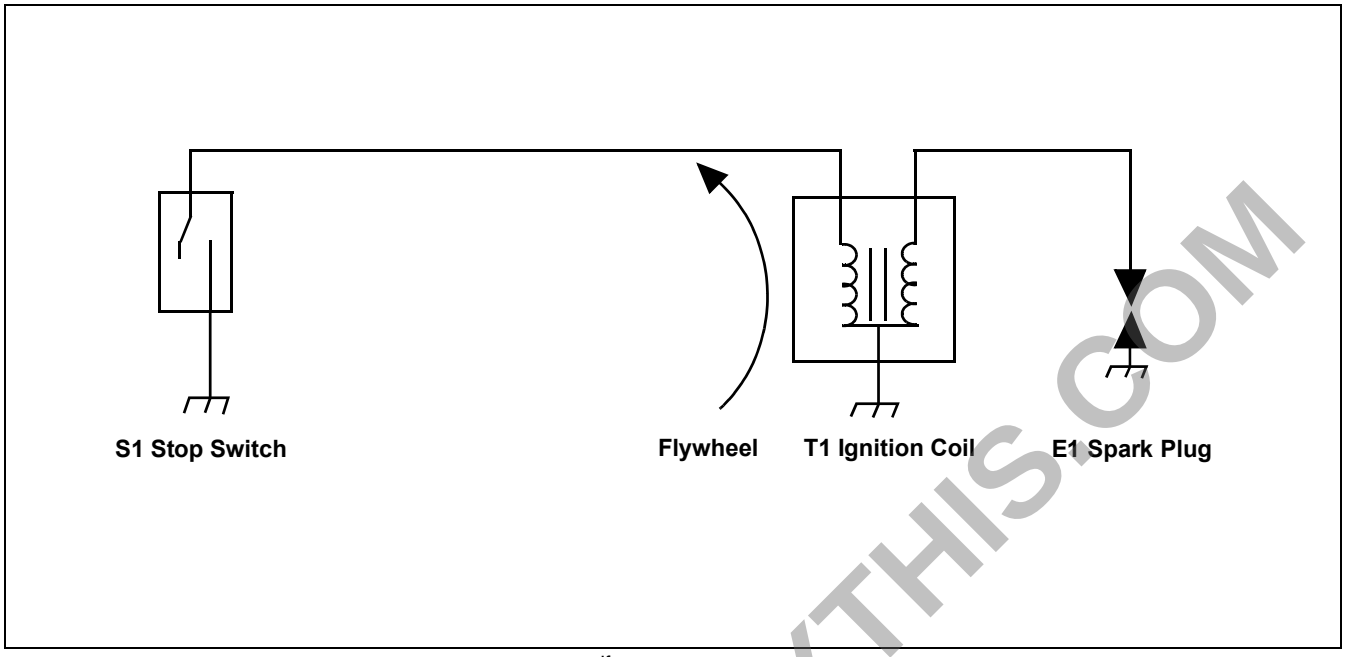


MX36970

5. Hook up multimeter positive red lead (B) to connector (A) from alternator. Be sure that black lead (C) is on a good ground.
6. Turn multimeter to the 10 amp DC setting (D).
7. If low or no output check alternator air gap. See “Alternator Air Gap Adjustment” on page 38.

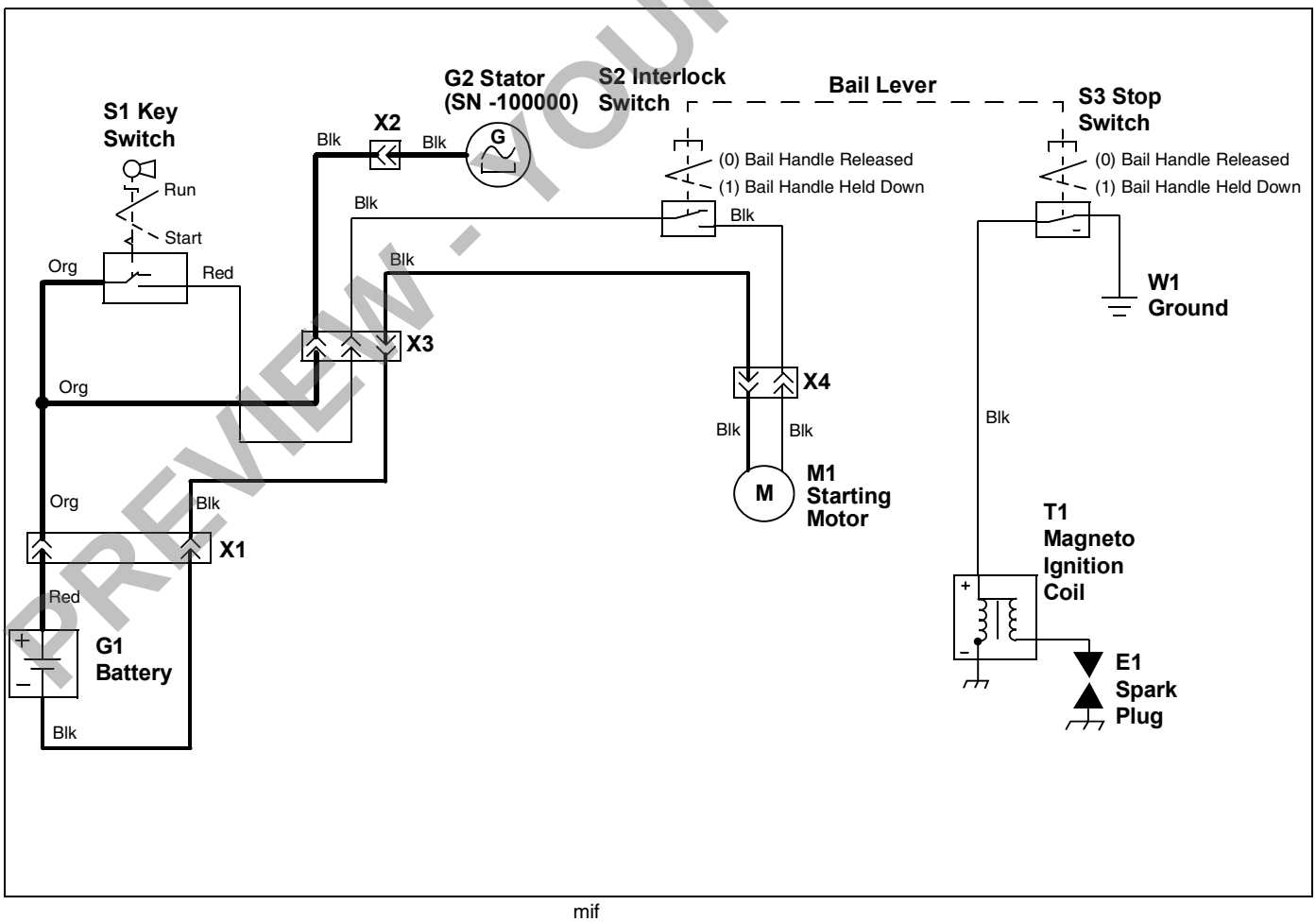
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Electrical Schematic - JS25 and JS45



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Electrical Schematic - JS35



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Diagnosis

Engine Troubleshooting

Engine Starting:

Engine Turns Over But Will Not Start; or, Engine Starts, Then Stops, or Stops When Hot

1. Is spark plug fouled, gap incorrect, or of the wrong type?

Yes: Clean, adjust, or replace spark plug.

No: Go to next step.

2. Is the engine oil type or level incorrect?

Yes: Add or change oil.

No: Go to next step.

3. Is the ignition module ground wire shorted to ground or is the throttle in the OFF position?

Yes: Repair ignition ground wire or adjust/repair blade brake assembly.

No: Go to next step.

4. Check the ignition armature air gap. Is it within specifications and producing a strong, blue spark?

Yes: Go to next step.

No: Adjust gap. See “Ignition Module Air Gap Adjustment” on page 37. If OK and still no spark, replace ignition module.

5. Is the fuel line restricted, fuel stale, contains water, or of wrong type?

Yes: Repair or replace fuel line or fuel.

No: Go to next step.

6. Is the air filter plugged, oil soaked, or otherwise restricted?

Yes: Replace air filter.

No: Go to next step.

7. Are engine gaskets or seals leaking?

Yes: Tighten bolts to specifications or replace gaskets and/or seals as necessary

No: Go to next step.

8. Is the throttle or governor linkage worn or not adjusted?

Yes: Adjust or replace components as necessary. See “Governor Adjustment” on page 35. See “Carburetor Adjustment” on page 39.

No: Go to next step.

9. Is the choke not opening or linkage worn or not adjusted?

Yes: Adjust or replace components as necessary. See “Bi-Metallic Coil Removal” on page 48. See “Carburetor Adjustment” on page 39.

No: Go to next step.

10. Is the carburetor dirty?

Yes: Clean carburetor.

No: Go to next step.

11. Is the carburetor, intake manifold, or cylinder head gasket leaking?

Yes: Tighten bolts to specifications and/or replace gaskets.

No: Go to next step.

12. Test cylinder compression. Is compression within specifications?

Yes: Go to next step.

No: Check valve clearance adjustment. See “Automatic Compression Release (ACR) Test” on page 33, “Cylinder Leak-Down Test” on page 34, and “Valves:” on page 16. If OK, disassemble and inspect internal engine components.

13. Are valves burned or warped? Are valve springs weak or broken?

Yes: Repair or replace components as necessary.

Engine Starting Electric Starter - JS35:

Engine Does Not Turn Over:

1. Is battery fully charged?

Yes: Go to next step.

No: Charge battery.

2. Interlocks functioning properly?

Yes: go to next step.

No: Correct interlock problem.

3. Is there voltage at starter motor?

Yes: Check for problem with starter motor.

No: Go to next step.

4. Check electrical connections and wire harness?

Yes: Go to next step.

No: Replace wire harness as necessary.

5. Is engine free to turn? Check by pulling manual start.

Yes: Go to next step.

No: See engine diagnostics.

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Specifications

Engine Specifications

General Specifications:

Manufacturer	Briggs & Stratton
Series	875
Model	12
Cylinders	1
Cycle	Air cooled (4 cycle)
Valve Type	Over Head Valve (OHV)
Displacement	190 cc (11.59 cu in.)
No-Load Speed	3400 ± 100 RPM
Cylinder Bore (Nominal)	68.26 mm (2.688 in.)
Stroke	51.81 mm (2.040 in.)
Lubrication Type	Splash System
Oil capacity	0.65 L (22 U.S. oz)
Air Filter Type	Dry Replaceable w/Foam - Dual Element
Throttle Control	Fixed Speed

Fuel

Fuel Specifications:

Type Required	Unleaded Gasoline, 85 Minimum Octane
Fuel Tank Capacity	1.5 L (1.6 U.S. qt)
Carburetor	Float-type CARB/EPA Certified
Choke	Primer Bulb
Fuel Filter	N/A

Electrical Specifications

Electrical Specifications:

Armature Air Gap	0.15 - 0.36 mm (0.006 - 0.014 in.)
Ignition	Electronic
Spark plug (resistor)	RC12YC Champion
Spark Plug Gap	0.51 mm (0.020 in.)
Starting	Recoil with compression release standard on all models.

Repair Specifications

Connecting Rod:

Crankpin Bore (Reject Size)	27.98 mm (1.102 in.)
Piston Pin Bore (Reject Size)	15.93 mm (0.627 in.)

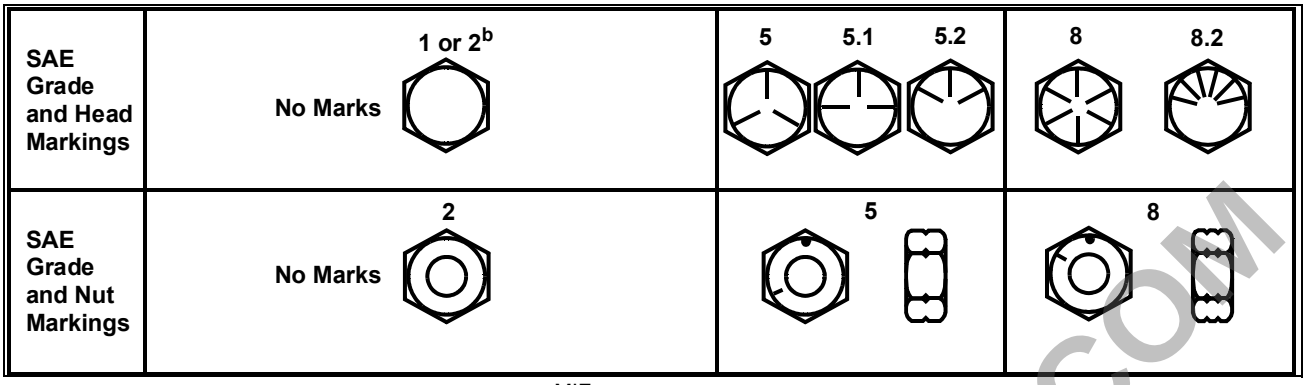
Crankshaft:

Out-of Round (Maximum)	0.013 mm (0.001 in.)
PTO End (Reject Size)	26.92 mm (1.060 in.)
Crankpin (Reject Size)	27.86 mm (1.097 in.)
Flywheel End (Reject Size)	22.17 mm (0.873 in.)

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Inch Fastener Torque Values



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	Grade 1				Grade 2b				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.

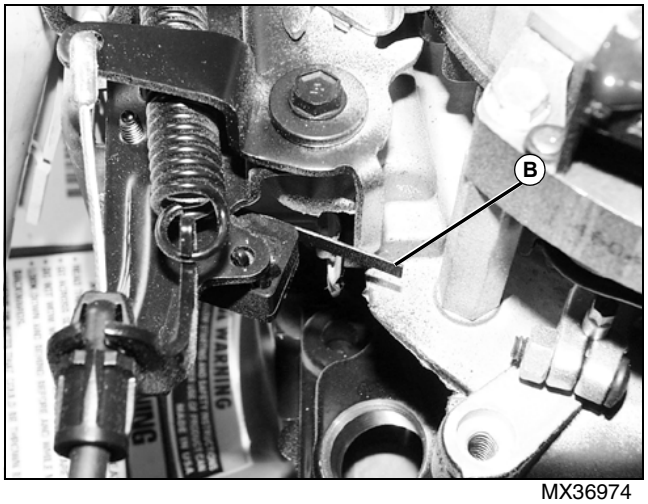
Tighten toothed or serrated-type lock nuts to the full torque value.

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.*

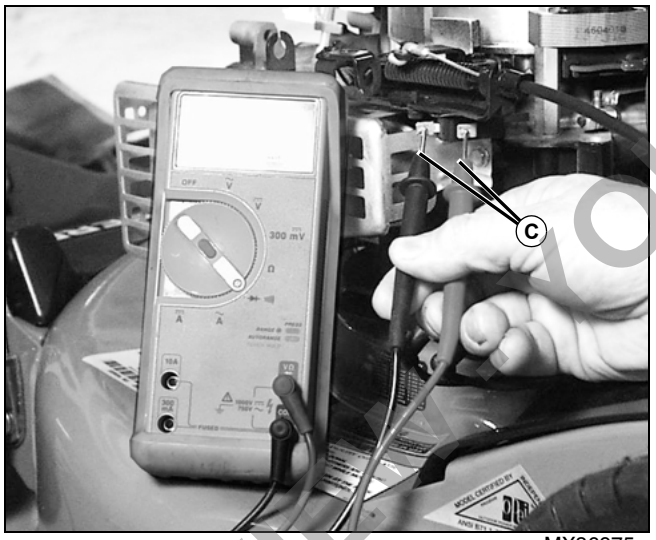
Reference: JDS - G200

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MX36974

3. Depress blade control handle and make sure that switch lever (B) is moving. You should also hear a click and the switch opens and closes. If not, replace switch. See “Starter Interlock Switch Removal and Installation” on page 49.



MX36975

4. Hook up multimeter leads (C) to terminals on switch.

5. With switch in normal position, blade control handle released, there should be no continuity.

6. Depress blade control handle. Meter should read continuity. If not, replace switch. See “Starter Interlock Switch Removal and Installation” on page 49.

Repair

Engine Cover Removal

Special Tools:

- JDM74A-5 Spark Plug Ground Tool

Procedure:

1. Place mower on level surface.

2. Disconnect spark plug high tension lead and ground it to protect the ignition system.

3. Remove recoil starter cord from handle bracket and allow it to rewind.



MX36907

4. Remove screw (A) securing side cover (B), remove side cover.

5. Remove two screws (C) holding engine cover in place.

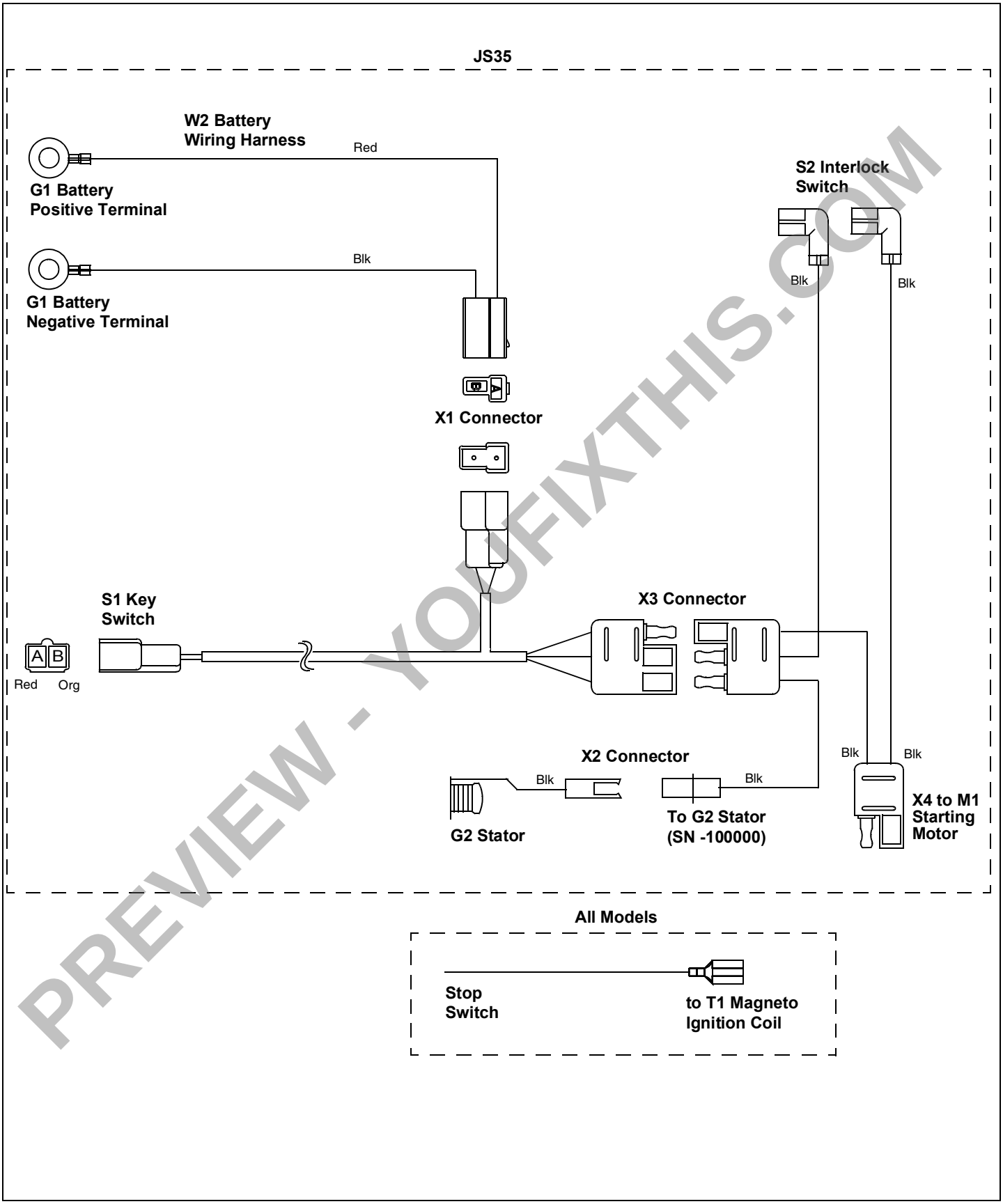
Note: When removing cover, remember to use a screwdriver to move tab (D) towards front of mower to release cover from engine housing.

6. Remove cover (E).

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Wiring Harnesses



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Engine Cranks Slowly:

1. Is battery fully charged?

Yes: Go to next step.

No: Charge battery.

2. Additional load affecting performance? Check to make sure that underside of deck is not plugged with grass.

Yes: Clean.

No: Go to next step.

3. Is the correct oil for the ambient temperature being used?

Yes: Go to next step.

No: Change oil to appropriate grade and viscosity for operating conditions.

4. Is the engine brake fully disengaged?

Yes: Go to next step.

No: Repair as necessary.

5. Is engine free to turn? Check by pulling manual start.

Yes: Go to next step.

No: See engine diagnostics.

6. Is starter operating correctly?

Yes: Go to next step.

No: See engine diagnostics.

Starter Motor Spins But Engine Does Not Crank:

1. Is pinion gear sticking?

Yes: Repair.

No: Go to next step.

2. Is rotation of starter correct?

Yes: Go to next step.

No: Check polarity of battery connections.

Starter Motor Will Not Stop Spinning:

1. Is starter switch operating correctly?

Yes: go to next step.

No: Replace.

2. Is starter solenoid sticking?

Yes: Repair.

No: Check wire harness for worn or effective parts.

Engine Operation:

Engine Surges

1. Is the air filter plugged, oil soaked, or otherwise restricted?

Yes: Replace air filter.

No: Go to next step.

2. Is the engine oil type or level incorrect?

Yes: Add or change oil.

No: Go to next step.

3. Is the fuel line restricted, fuel stale, contains water, or of wrong type?

Yes: Repair or replace fuel line or fuel.

No: Go to next step.

4. Is the throttle or governor linkage worn or not adjusted?

Yes: Adjust or replace components as necessary. See “Governor Adjustment” on page 35. See “Carburetor Adjustment” on page 39.

No: Go to next step.

5. Is the choke not opening or linkage worn or not adjusted?

Yes: Adjust or replace components as necessary. See “Bi-Metallic Coil Removal” on page 48. See “Carburetor Adjustment” on page 39.

No: Go to next step.

6. Is the carburetor, intake manifold, or cylinder head gasket leaking?

Yes: Tighten bolts to specifications and/or replace gaskets.

No: Go to next step.

7. Are engine gaskets or seals leaking?

Yes: Tighten bolts to specifications or replace gaskets and/or seals as necessary

No: Go to next step.

8. Is the crankcase breather restricted, reed valve damaged, or drain hole plugged?

Yes: Repair or replace components. See “Crankcase Breather Removal and Inspection” on page 50.

No: Go to next step.

9. Test cylinder compression. Is compression within specifications?

Yes: Go to next step.

No: Check valve clearance adjustment. See “Automatic Compression Release (ACR) Test” on page 33, or See

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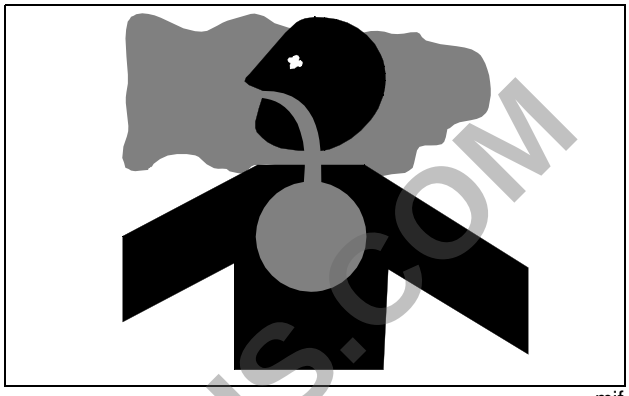
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Metric Fastener Torque Value - Grade 7 (Special)

Size	Steel or Gray Iron Torque	Aluminum Torque
	N•m (lb-ft)	N•m (lb-ft)
M6	11 (8)	8 (6)
M8	24 (18)	19 (14)
M10	52 (38)	41 (30)
M12	88 (65)	70 (52)
M14	138 (102)	111 (82)
M16	224 (165)	179 (132)

General Information

Gasoline



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Caution: Avoid Injury! Fuel vapors are explosive and flammable:

- **Shut engine off and allow to cool before filling fuel tank.**
- **Do not smoke while handling fuel.**
- **Keep fuel away from flames or sparks.**
- **Fill fuel tank outdoors or in well ventilated area.**
- **Clean up spilled fuel immediately.**
- **Use clean approved non-metal container to prevent static electric discharge.**
- **Use clean approved plastic funnel without screen or filter to prevent static electric discharge.**
- **Loosen fuel cap slowly to release pressure and to keep fuel from escaping around the cap.**

To avoid engine damage:

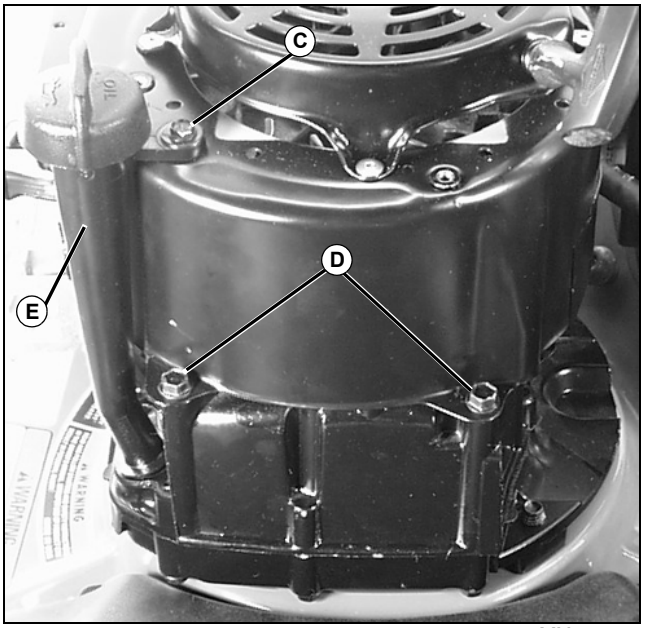
- DO NOT mix oil with gasoline
- **ONLY use clean, fresh unleaded gasoline with an octane rating (anti-knock index) of 87 or higher**
- fill gas tank at the end of each day's operation to help prevent condensation from forming inside a partially filled tank
- keep up with specified service intervals

Use of alternative oxygenated, gasohol blended, unleaded gasoline is acceptable as long as:

- the ethyl or grain alcohol blends DO NOT exceed 10% by volume or
- methyl tertiary butyl ether (MTBE) blends DO NOT exceed 15% by volume

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MX36910

6. Remove two blower housing mounting screws (D) from cylinder block.

7. Remove screw (C) and oil dipstick tube (E) from oil filler inlet on cylinder block.

8. Remove blower housing from engine and inspect for damage or debris.

Engine Blower Housing Installation:

1. Install blower housing aligning front edge on front of engine.

2. Install cap screws into cylinder head and cylinder block.

3. Tighten cap screws to **7.5 N•m (66 lb-in.)**.

4. Inspect oil dipstick gasket and replace if damaged. Install oil dipstick and cap screw.

5. Install fuel tank.

6. Install engine cover.

7. Connect spark plug lead wire.

Engine Removal and Installation

Special Tools:

- JDM74A-5 Spark Plug Ground Tool

Removal:

1. Place mower on level surface.

2. Disconnect spark plug lead wire and ground it to protect the ignition system.

3. Adjust all four wheels to highest cutting position.

4. Remove recoil start pull cord from handle bracket.

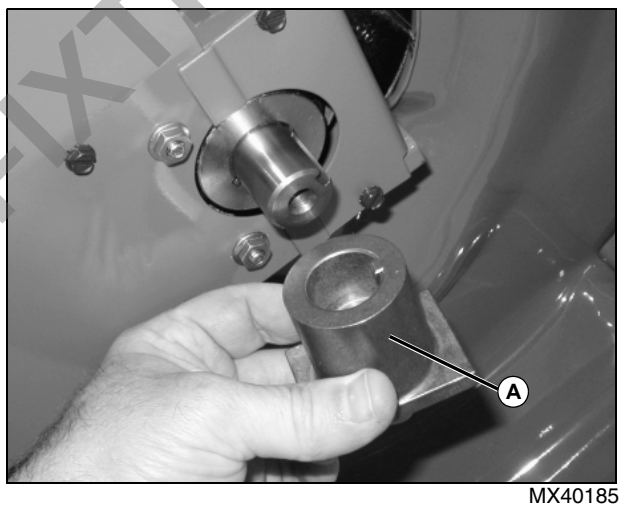
Caution: Avoid Injury! Gasoline is extremely flammable. Do not smoke. Always work in a ventilated area away from open flame or spark producing equipment; including equipment that utilizes pilot lights. Wipe-up any spills IMMEDIATELY

5. Drain fuel from fuel tank.

6. Disconnect flywheel brake cable from engine.

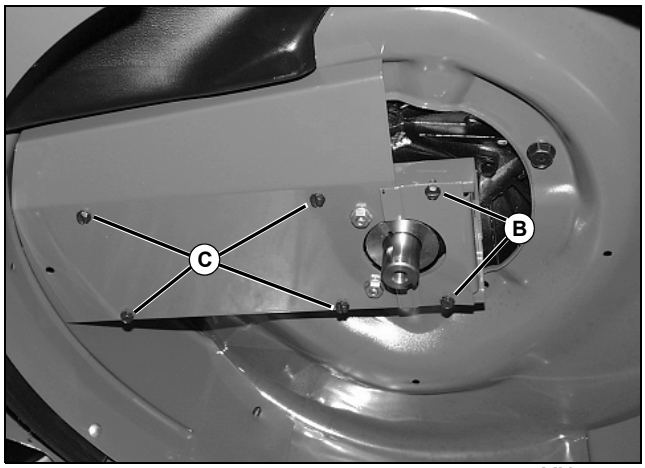
Caution: Avoid Injury! Mower blade has sharp edges! Wear heavy leather gloves or other protection, or wrap blades in cloth to prevent hand injuries.

7. Remove mower blade. See “Blade Assembly Removal and Installation” on page 145.



MX40185

8. Remove blade adaptor (A) from crankshaft.



MX40186

9. Remove two screws (B) from small belt cover and remove cover. Remove four screws (C) from the larger belt

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