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SAFETY FIRST

SAFETY FIRST
- **This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.**
- **It is essential that you read the instructions and safety regulations before you try to repair or use this unit.**

DANGER
- **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

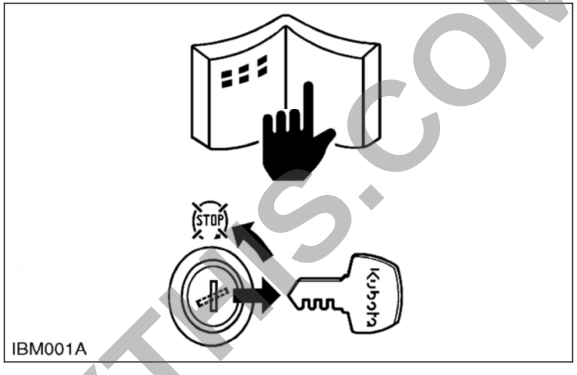
WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

NOTE
- **Gives helpful information.**

1. Before you start service



IBM001A

- Read all instructions and safety instructions in this manual and on your machine safety decals.
- Clean the work area and machine.
- Park the machine on a stable and level ground, and set the parking brake.
- Lower the implement to the ground.
- Stop the engine, then remove the key.
- Disconnect the battery negative cable.
- Hang a **[DO NOT OPERATE]** tag in the operator station.

2. Start safely


IBM002A

- Do not do the procedures below when you start the engine.
  1. Short across starter terminals.
  2. Bypass the safety start switch.
- Do not alter or remove any part of machine safety system.
- Before you start the engine, make sure that all shift levers are in neutral positions or in disengaged positions.

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SPECIFICATIONS

1. Specifications

Model				T2090BR-AU	T2290KW-AU	T2290KWT-AU
Engine	Model			GH660V	GH739V-3	
	Type			OHV air cooled gasoline engine		
	Number of cylinders			2		
	Total displacement		cm^3 (cu. in.)	656 (40.0)	726 (44.3)	
	Maximum horse power		kW (HP)	14.9 (20) *1*2	16.0 (21.5) *1*3	
	Cylinder bore and stroke		mm (in.)	75.4 × 73.4 (2.97 × 2.89)	78 × 76 (3.1 × 3.0)	
	Fuel			Automobile unleaded or regular gasoline		
	Starter			Electric starter with battery		
	Lubrication			Full pressure lubrication		
	Cooling			Forced air cooled		
	Battery type			U1-300 (12V, RC:45min, CCA300, CA:410)		
	Spark plug			CHAMPION XC12YC	NGK BPR4ES	
Capacities	Fuel tank		L (U.S. gals.)	13.6 (3.6)		
	Engine crankcase		L (U.S. qts.)	1.9 (2.0)	2.1 (2.2)	
	Hydrostatic transmission case		L (U.S. qts.)	2.0 (2.1)		2.75 (2.9)
Machine	PTO drive system			Belt		
	Direction of revolution			Clockwise viewed from top		
	Revolution (PTO speed)		rpm	3450		
	PTO clutch			Electric		
	Transmission			Hydrostatic transmission		
	Traveling speeds	Forward	km/h (mph)	0 to 9.2 (0 to 5.7)		0 to 10.8 (0 to 6.7)
		Reverse	km/h (mph)	0 to 5.6 (0 to 3.5)		0 to 6.4 (0 to 3.9)
	Brake			External disk type		
	Tires	Front		15 × 6.00 - 8		16 × 6.00 - 8
		Rear		20 × 10.0 - 10		22 × 10.0 - 10
Dimensions	Overall length		mm (in.)	1900 (74.8)		1910 (75.2)
	Overall width (with mower)		mm (in.)	1392 (54.8)		1540 (60.6)
	Overall height		mm (in.)	1305 (51.4)	1310 (51.6)	
	Wheelbase		mm (in.)	1295 (51.0)		
	Treads	Front	mm (in.)	816 (32.1)		
		Rear	mm (in.)	760 (29.9)		755 (29.7)
	Weight (with mower)		kg (lbs.)	270 (595)	282 (622)	300 (661)

(Specifications and design subject to change without notice)

*1 Manufacturer's estimate

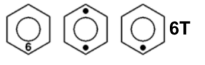
*2 The gross power rating for individual gas engine models is labeled in accordance with SAE (Society of Automotive Engineers) code J1940 (Small Engine Power & Torque Rating Procedure), and rating performance has been obtained and corrected in accordance with SAE J1995 (Revision 2002-05). Torque values are derived at 3060 RPM; horsepower values are derived at 3600 RPM. Actual gross engine power will be lower and is affected by, among other things, ambient operating conditions and engine-to-engine variability. Given both the wide array of products on which engines are placed and the variety of environmental issues applicable to operating the equipment, the gas engine will not develop the rated gross power when used in a given piece of power equipment (actual *"onsite"* or net power). This difference is due to a variety of factors including, but not limited to, accessories (air cleaner, exhaust, charging, cooling, carburetor, fuel pump, etc.), application limitations, ambient operating conditions (temperature, humidity, altitude), and engine-to-engine variability. Due to manufacturing and capacity limitations, Briggs & Stratton may substitute an engine of higher rated power for this Series engine.

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TIGHTENING TORQUES

1. General use screws, bolts, and nuts

Tighten screws, bolts, and nuts whose tightening torques are not specified in the Workshop Manual according to the table below.

Indication on top of bolt	 No-grade or 4T						 7T						 9T		
Indication on top of nut	 No-grade or 4T												 6T		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5	12.3 to 14.2	1.25 to 1.45	9.05 to 10.4
M8	18 to 20	1.8 to 2.1	13 to 15	17 to 19	1.7 to 2.0	13 to 14	24 to 27	2.4 to 2.8	18 to 20	18 to 20	1.8 to 2.1	13 to 15	30 to 34	3.0 to 3.5	22 to 25
M10	40 to 45	4.0 to 4.6	29 to 33	32 to 34	3.2 to 3.5	24 to 25	48 to 55	4.9 to 5.7	36 to 41	40 to 44	4.0 to 4.5	29 to 32	61 to 70	6.2 to 7.2	45 to 52
M12	63 to 72	6.4 to 7.4	47 to 53	—	—	—	78 to 90	7.9 to 9.2	58 to 66	63 to 72	6.4 to 7.4	47 to 53	103 to 117	10.5 to 12.0	76.0 to 86.7
M14	108 to 125	11.0 to 12.8	79.6 to 92.5	—	—	—	124 to 147	12.6 to 15.0	91.2 to 108	—	—	—	167 to 196	17.0 to 20.0	123 to 144
M16	167 to 191	17.0 to 19.5	123 to 141	—	—	—	197 to 225	20.0 to 23.0	145 to 166	—	—	—	260 to 304	26.5 to 31.0	192 to 224
M18	246 to 284	25.0 to 29.0	181 to 209	—	—	—	275 to 318	28.0 to 32.5	203 to 235	—	—	—	344 to 402	35.0 to 41.0	254 to 296
M20	334 to 392	34.0 to 40.0	246 to 289	—	—	—	368 to 431	37.5 to 44.0	272 to 318	—	—	—	491 to 568	50.0 to 58.0	362 to 419

2. Stud bolts

Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8	12 to 15	1.2 to 1.6	8.7 to 11	8.9 to 11	0.90 to 1.2	6.5 to 8.6
M10	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12	30 to 49	3.0 to 5.0	22 to 36	31	3.2	23
M14	62 to 73	6.3 to 7.5	46 to 54	—	—	—
M16	98.1 to 112	10.0 to 11.5	72.4 to 83.1	—	—	—
M18	172 to 201	17.5 to 20.5	127 to 148	—	—	—

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SERVICE INTERVALS

The following servicing tasks should be carried out on the machine at the stated running-time intervals.

T2090BR-AU

No.	Items			Indication hour meter (Hr)														Ref. page	
				25	50	100	150	200	250	300	350	400	450	500	550	600	After since		
1	Air cleaner	Precleaner element	Clean	•	•	•	•	•	•	•	•	•	•	•	•	•	every 25Hr or every 1 year	2-24	*1
			Replace			•		•		•		•		•		•	every 100Hr or every 1 year	2-31	
		Air cleaner element	Check	•	•	•	•	•	•	•	•	•	•	•	•	•	every 25Hr or every 1 year	2-24	*2
			Replace			•		•		•		•		•		•	every 100Hr or every 1 year	2-31	
2	Brake		Check	◎	•	•	•	•	•	•	•	•	•	•	•	•	every 50Hr	2-25	*3
3	Tire		Check		•	•	•	•	•	•	•	•	•	•	•	•	every 50Hr	2-25	
4	Engine oil		Change			•		•		•		•		•		•	every 100Hr or every 1 year	2-26	
5	Engine oil filter		Replace			•		•		•		•		•		•	every 100Hr or every 1 year	2-27	
6	Engine shroud		Clean			•		•		•		•		•		•	every 100Hr	2-28	
7	Spark plug condition and gap		Check			•		•		•		•		•		•	every 100Hr	2-28	
			Replace														every 1 year	2-38	
8	Fuel filter		Check			•		•		•		•		•		•	every 100Hr	2-31	
			Replace			•		•		•		•		•		•	every 100Hr or every 1 year	2-31	
9	Throttle cable		Adjust			•		•		•		•		•		•	every 100Hr	2-29	
10	Battery condition		Check			•		•		•		•		•		•	every 100Hr	2-30	
11	Electric clutch		Adjust											•			every 500Hr	2-35	
12	Combustion chamber		Clean											•			every 500Hr	2-36	
13	Engine valve clearance		Check														every 1 year	2-38	*4
14	Fuel line		Check														every 1 year	2-37	*5
			Replace														every 4 years	2-38	
15	Fuse		Replace														Service as required	2-38	
16	Light bulb		Replace															2-38	
17	Mower blade		Check															2-38	
			Replace																

(Continued)

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SERVICING

1. Troubleshooting for engine

Refer to *"T2090BR, T2090BR-AU BRIGGS & STRATTON ENGINE (SUPPLEMENT)"* service manual for T2090BR-AU. Refer to FR651V Kawasaki Engine Service Manual for T2290KW-AU and T2290KWT-AU.

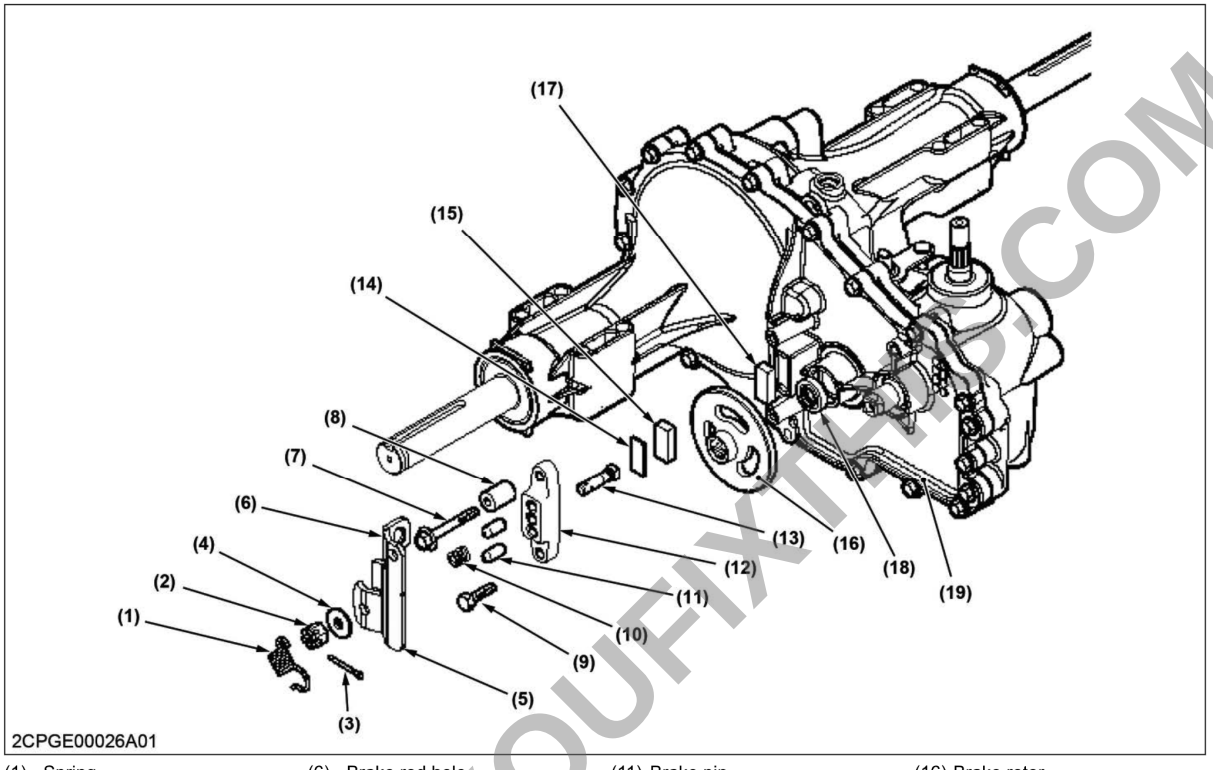
Symptom	Probable cause and checking procedure	Solution	Reference page
Engine is difficult to start or will not start	1. No operator on seat	Sit on operator's seat	2-20
	2. Parking brake lever not in the proper position	Apply the parking brake	—
	3. PTO switch not in the proper position	Make sure PTO switch is in disengaged (off) position	2-21
	4. Main switch is not in the proper position	Make sure main switch is in on position	2-20
	5. No fuel	Fill fuel	2-9 2-22
	6. Fuse is blown	Replace fuse	2-38
	7. Air cleaner is clogged	Clean or replace air cleaner	2-24
	8. Over choking or choke is adjusted incorrectly	Check and adjust	2-30
	9. Battery becomes weak	1. Clean battery cables and terminals	2-30
		2. Charge the battery	2-30
		3. In cold weather, always remove the battery from the engine, charge and store it indoors Install it on the machine only when you use the machine	2-30
	10. Spark plug damaged	1. Check the spark plug wire connection	2-28
		2. Adjust the spark plug gap or replace the spark plug	2-28
	11. Fuel hose or fuel filter clogged or damaged	Clean or replace fuel hose	2-31 2-37
	12. Engine oil viscosity is wrong	Use oils of different viscosities, depending on ambient temperature	2-9
	13. Improper or stale fuel (fuel quality is poor)	Replace fuel and the fuel filter	2-22 2-31 2-37

(Continued)

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2. Structure of brake assembly

T2090BR-AU and T2290KW-AU



(1) Spring
(2) Castle nut
(3) Cotter pin
(4) Washer
(5) Brake arm
(6) Brake rod hole
(7) Flange bolt
(8) Spacer
(9) Bolt
(10) Compression spring
(11) Brake pin
(12) Brake yoke
(13) Brake yoke pin
(14) Puck plate
(15) Outer puck
(16) Brake rotor
(17) Inner puck
(18) Seal
(19) Side housing

When the brake pedal is pressed down, the brake rod turns the brake arm (5). By cam mechanism of the brake arm, it pushes the brake yoke pin (13), outer puck (15), and the inner puck (17). This way, the brake rotor (16) stops.

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4. Checking and adjusting

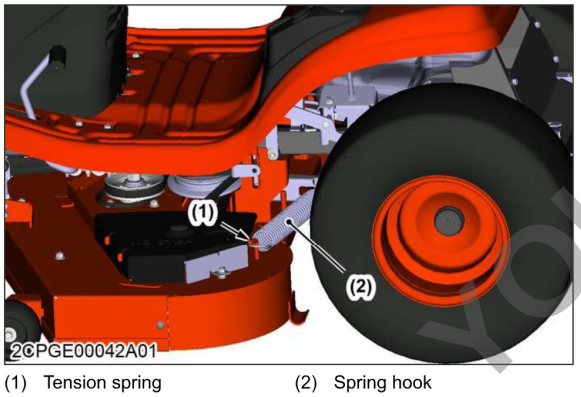
- Refer to 40U8 Briggs & Stratton Engine Service Manual for T2090BR-AU.
- Refer to FR651V Kawasaki Engine Service Manual for T2290KW-AU and T2290KWT-AU.

5. Disassembling and assembling

5.1 Separating engine

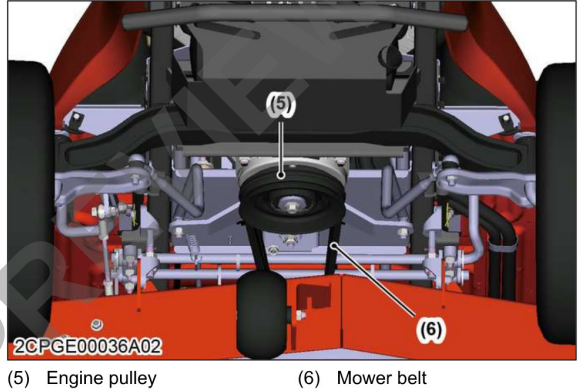
5.1.1 Dismounting mower deck

1. Place the vehicle on level ground, and stop the engine.
2. Set the cutting height adjusting dial to **[1.0]** position, and down the mower.
3. Disconnect the tension spring (1) from the spring hook (2).



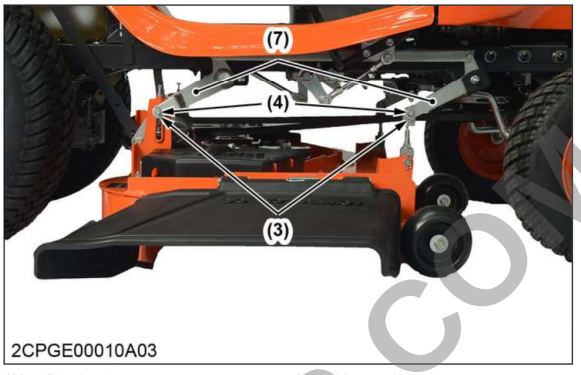
(1) Tension spring (2) Spring hook

4. Remove the mower belt (6) from the engine pulley (5).



(5) Engine pulley (6) Mower belt

5. Disconnect the two clevis pins (3) and four rue-ring pins (4) from the mower link (7).



(3) Clevis pin (7) Mower link
(4) Rue-ring pin

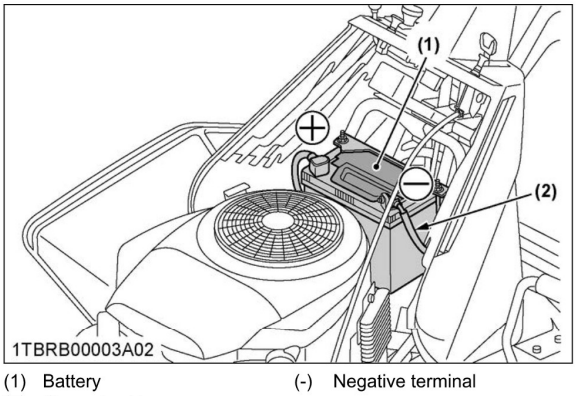
6. Set the lift lever to lift position.
7. Turn the front wheel to the right, and pull out the mower to the right.

5.1.2 Removing battery

WARNING

- **When disconnecting the battery cables, disconnect the negative cable from the battery first.**
- **When connecting, connect the positive cable to the battery first.**

1. Turn the main switch to the off position.
2. Lift the bonnet.
3. Disconnect the negative and positive cables (-), (+) from the battery (1).



(1) Battery (-) Negative terminal
(2) Ground cable
(+) Positive terminal

4. Remove the battery holder.
5. Remove the battery (1).

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- **Blades may be sharp. When you handle blades, wear heavy gloves or wrap the end of the blades with a rag.**

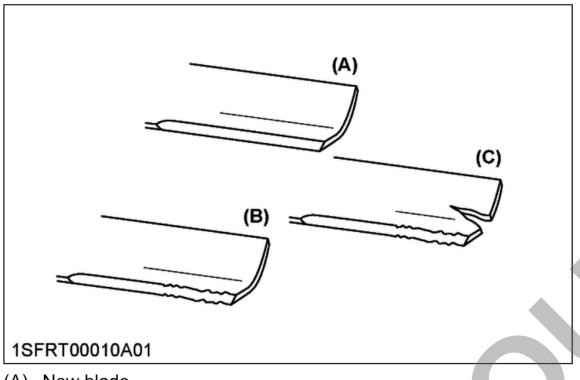
■ NOTE

- **Before checking or replacing the blades, wipe grass and mud off the top and inside of the mower.**
  Especially, clean up inside the belt cover, because otherwise the belt life will be reduced.

Checking

The blade cutting edges should be kept sharp at all times.

1. Sharpen the cutting edges if they look like blade (B).
2. Replace the blades if they look like blade (C).



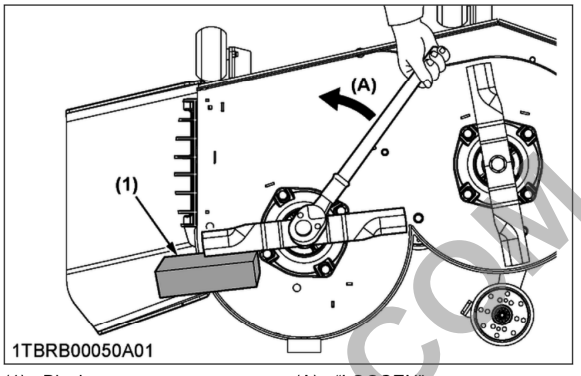
(A) New blade
(B) Worn blade
(C) Cracked blade

Replacing

1. Dismount the mower deck from the machine.
   (See "Dismounting mower deck".)
   Then turn it over to expose the blades.
2. Wedge a block of wood between the blade and mower housing or use a box wrench over the pulley nut to prevent the spindle from rotating while removing the blade bolts; loosen the blade bolt as illustrated.

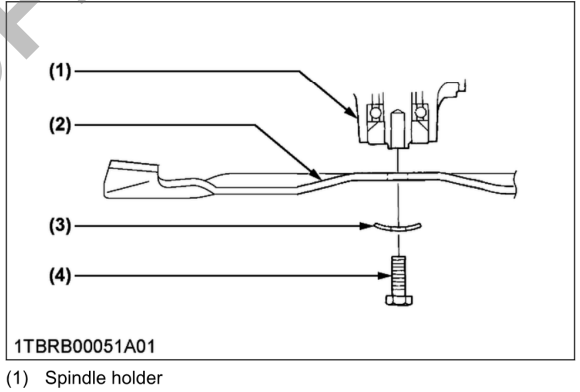
■ IMPORTANT

- **Use the proper metric size box or socket wrench to tighten or loosen the blade mounting bolt.**



(1) Block (A) *"LOOSEN"*

3. To sharpen the blades yourself, clamp the blade securely in a vise.
   Use a large mill file and file along the original bevel until sharp.
4. To check the blade for balance, place a small rod through the center hole. If the blade is not balanced, file the heavy side of the blade until balance is achieved.
5. To attach blades, be sure to install the cup washer between the blade and bolt head. Then tighten the bolt securely.



(1) Spindle holder
(2) Blade
(3) Cup washer
(4) Bolt

■ IMPORTANT

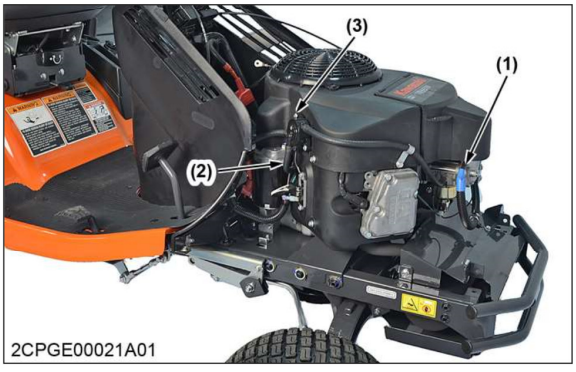
- **Tighten the blade bolts from 103 to 118 N·m (76 to 87 lbf·ft) of torque.**
- **The blade bolts have Right hand threads. Turn them counterclockwise to loosen.**
- **To prolong the service life of the blades, reposition them as shown in the figure below periodically. RCK42P also.**

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2. Disconnect the fuel hose (2) from the fuel pump (3).

T2290KW-AU, T2290KWT-AU



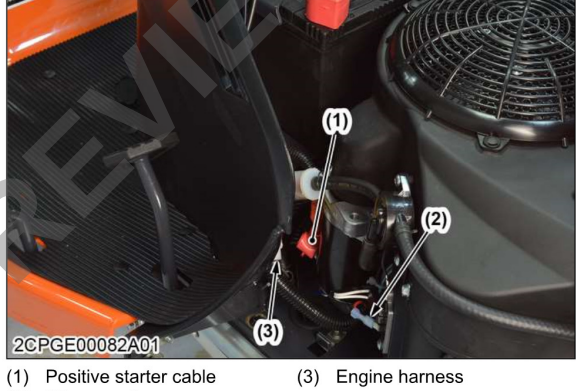
T2090BR-AU



(1) Evaporation hose
(2) Fuel hose
(3) Fuel pump

5.10 Disconnecting wire harness

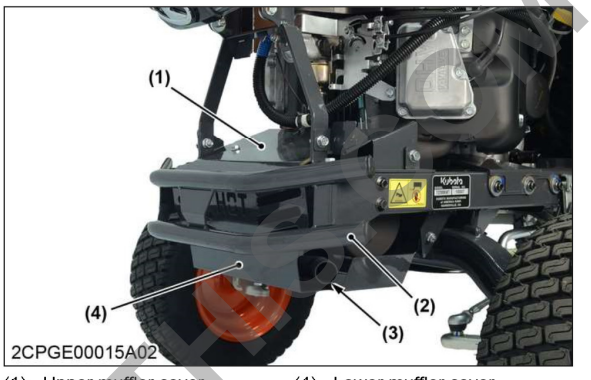
1. Disconnect the positive starter cable (1) from the starter.
2. Disconnect the 1P connector (2).
3. Disconnect the engine harness (3).



(1) Positive starter cable
(2) 1P connector
(3) Engine harness

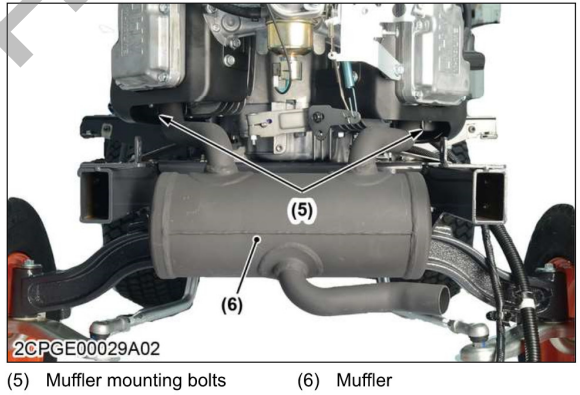
5.11 Removing muffler cover and muffler

1. Remove the front bumper (2) from the frame.
2. Remove the upper muffler cover (1).
3. Remove the lower muffler cover (4).



(1) Upper muffler cover
(2) Front bumper
(3) Muffler pipe
(4) Lower muffler cover

4. Remove the muffler mounting bolts (5) and remove the muffler (6).



(5) Muffler mounting bolts
(6) Muffler

5.12 Removing engine

WARNING

To avoid serious injury or death:

- **The engine is heavy. Use a hoist or crane when removing the engine.**

1. Remove the rolling thread bolts (1) mounting the engine to the frame.

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