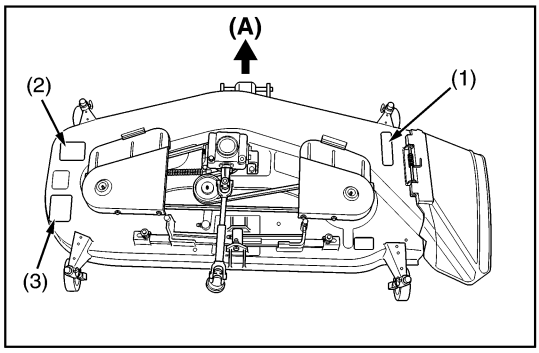
7 MOWER

SAFETY DECALS

The following safety decals are installed on the mower.
If a decal becomes damaged, illegible or is not on the mower, replace it. The decal part number is listed in the parts list.

[RCK60B-23BX, RCK54-23BX, RCK48-18BX]



(A) Forward

(1) Part No. K5112-7311-1

1BDACADAP003E

(2) Part No. K5112-7312-1

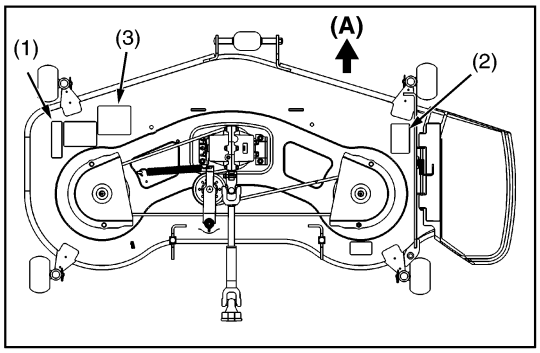
1BDACADAP004E

(3) Part No. K5763-4715-1

1BDACADAP002E

3TAAAAKCP002A

[RCK54P-23BX]

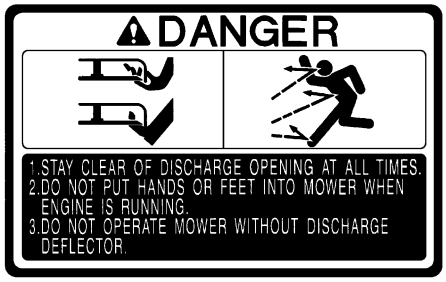


(A) Forward

(1) Part No. K5617-7311-1

1BDABBSAP0030

(2) Part No. K5617-7312-1



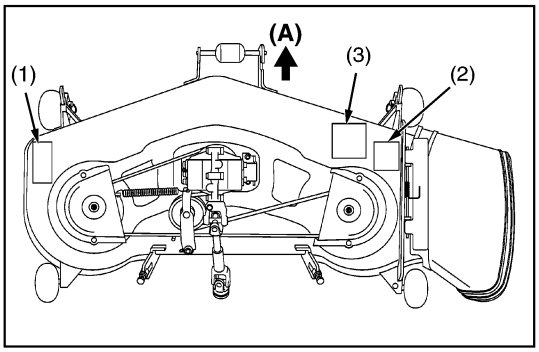
1BDABBSAP0020

(3) Part No. K5763-4715-1

1BDACADAP002E

3TAAAAKCP003A

[RCK48P-18BX]



(A) Forward

(1) Part No. K5617-7311-1

1BDABBSAP0030

(2) Part No. K5617-7312-1

1BDABBSAP0020

(3) Part No. K5763-4715-1

1BDACADAP002E

CARE OF DANGER, WARNING AND CAUTION LABELS

1. Keep danger, warning and caution labels clean and free from obstructing material.
2. Clean danger, warning and caution labels with soap and water, dry with a soft cloth.
3. Replace damaged or missing danger, warning and caution labels with new labels from your local KUBOTA dealer.
4. If a component with danger, warning or caution label (s) affixed is replace with new part, make sure new label (s) is (are) attached in the same locations (s) as the replaced component.
5. Mount new danger, warning and caution labels by applying on a clean dry surface and pressing any bubbles to outside edge.

3TAAAAKCP004A

SPECIFICATIONS

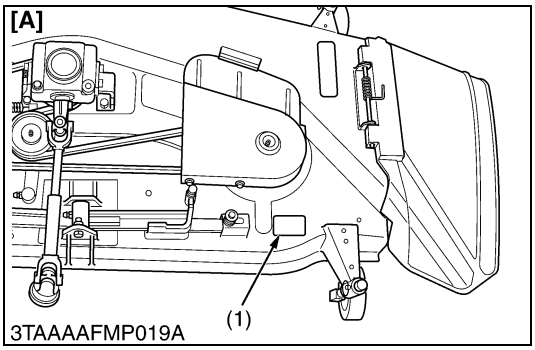
Model		RCK60B-23BX	RCK54P-23BX	RCK54-23BX	RCK48P-18BX	RCK48-18BX
Suitable tractor		BX2360 BX2660	BX2360	BX1860 BX2360	BX1860	
Mounting method		Quick-Joint, Parallel linkage				
		Self-balance suspended linkage	Suspended linkage			
Adjustment of cutting height		Dial gauge				
Cutting width		1524 mm (60 in.)	1375 mm (54 in.)	1372 mm (54 in.)	1225 mm (48 in.)	1219 mm (48 in.)
Cutting height		25 to 102 mm (1.0 to 4.0 in.)				
Weight (Approx.)		115 kg (250 lbs)	86 kg (190 lbs)	95 kg (210 lbs)	82 kg (181 lbs)	75 kg (165 lbs)
Blade spindle speed		44.1 r/s (2647 rpm)	49.5 r/s (2969 rpm)		54.7 r/s (3281 rpm)	
Blade tip velocity		72.5 m/s (14271 fpm)	73.8 m/s (14527 fpm)		72.8 m/s (14331 fpm)	
Blade length		523 mm (20.6 in.)	475 mm (18.7 in.)		424 mm (16.7 in.)	
Number of blades		3				
Dimensions	Overall length	1000 mm (39.4 in.)	908 mm (35.7 in.)	928 mm (36.5 in.)	881 mm (34.7 in.)	895 mm (35.2 in.)
	Overall width	1930 mm (76.0 in.)	1700 mm (67.0 in.)	1780 mm (66.5 in.)	1550 mm (61.0 in.)	1544 mm (60.8 in.)
	Overall height (Min.)	281 mm (11.0 in.)	291 mm (11.5 in.)	281 mm (11.0 in.)	291 mm (11.5 in.)	268 mm (10.5 in.)

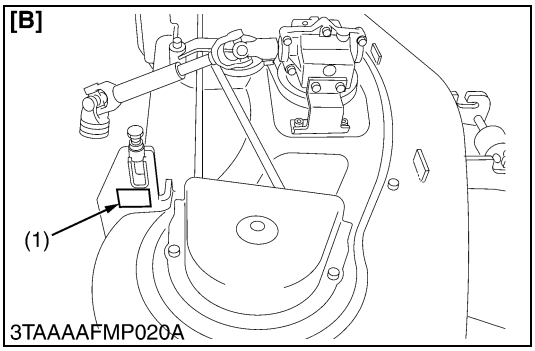
W1028770

GENERAL

CONTENTS

1. MOWER IDENTIFICATION





When contacting your local KUBOTA distributor, always specify mower serial number.

(1) Mower Serial Number

A : RCK60B-23BX, RCK54P-23BX, RCK54-23BX, RCK48-18BX
B : RCK48P-18BX

W1020623

2. LUBRICANTS

No.	Place		Capacity	Lubricants
1	Gear Box	RCK60B-23BX RCK54-23BX RCK48-18BX	0.36 L 0.38 U.S.qts 0.32 Imp.qts	SAE 90 gear oil (API Service GL-5 gear oil)
		RCK54P-23BX RCK48P-18BX	0.15 L 0.16 U.S.qts 0.13 Imp.qts	
Greasing				
2	Universal joint		Until grease overflows.	SAE multi-purpose type grease NLGI-2 or NLGI-1(GC-LB)
3	Three spindle shafts			
4	Belt tension pulley			
5	Belt tension pivot			
6	Balance shaft (RCK60B-23BX only)			
7	Front and rear anti-scalp roller			

3. TIGHTENING TORQUES

Screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual should be tightened according to the table below.

■ GENERAL USE SCREWS, BOLTS AND NUTS

Indication on top of bolt	⬡ 4 No-grade or 4T						⟨7⟩ 7T						⟨9⟩ 9T		
Material of bolt	SS400, S20C						S43C, S48C						SCr435, SCM435		
Material of opponent part	Ordinariness			Aluminum			Ordinariness			Aluminum			Ordinariness		
Unit / Diameter	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 (6 mm, 0.24 in.)	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 (8 mm, 0.31 in.)	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 (10 mm, 0.39 in.)	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 (12 mm, 0.47 in.)	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 (14 mm, 0.55 in.)	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 (16 mm, 0.63 in.)	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 (18 mm, 0.71 in.)	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 (20 mm, 0.79 in.)	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

W1034542

■ STUD BOLTS

Material of opponent part	Ordinariness			Aluminum		
Unit / Diameter	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M8 (8 mm, 0.31 in.)	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 (10 mm, 0.39 in.)	25 to 31	2.5 to 3.2	18 to 23	20 to 25	2.0 to 2.6	15 to 18
M12 (12 mm, 0.47 in.)	29.5 to 49.0	3.0 to 5.0	21.7 to 36.1	31.4	3.2	23.1

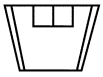
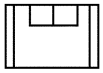
W1048139

■ AMERICAN STANDARD SCREWS, BOLTS AND NUTS WITH UNC OR UNF THREADS

Grade	SAE GR.5			SAE GR.8		
Unit / Nominal Diameter	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
5/16	23.1 to 27.7	2.35 to 2.83	17.0 to 20.5	32.6 to 39.3	3.32 to 4.00	24.0 to 29.0
3/ 8	48 to 56	4.9 to 5.8	35.0 to 42.0	61.1 to 73.2	6.23 to 7.46	45.0 to 54.0
1/ 2	109 to 130	11.1 to 13.2	80.0 to 96.0	149.2 to 178.9	15.21 to 18.24	110.0 to 132.0
9/16	149.2 to 178.9	15.21 to 18.24	110.0 to 132.0	217.0 to 260.3	22.12 to 26.54	160.0 to 192.0
5/ 8	203.4 to 244	20.74 to 24.88	150.0 to 180.0	298.3 to 357.9	30.42 to 36.49	220.0 to 264.0

W1022485

■ PLUGS

Shape	Size	Material of opponent part					
		Ordinariness			Aluminum		
		N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
Tapered screw 	**R1/8**	13 to 21	1.3 to 2.2	9.4 to 15	13 to 21	1.3 to 2.0	9.4 to 15
	R1/4	25 to 44	2.5 to 4.5	18 to 32	25 to 34	2.5 to 3.5	18 to 25
Straight screw 	**G1/4**	25 to 34	2.5 to 3.5	18 to 25	–	–	–
	G3/8	62 to 82	6.3 to 8.4	46 to 60	–	–	–
	G1/2	49 to 88	5.0 to 9.0	37 to 65	–	–	–

0000001666E

4. MAINTENANCE CHECK LIST

To keep the mower working in good condition as well as to avoid any accident and trouble, carry out periodic inspection and maintenance. Check the following points before use.

No.	Period / Item	Service Interval				Reference page
		Daily check	Every 50 hrs	Every 150 hrs	Every 2 years	
1	Oil leakage check	☆				7-G6
2	Make sure blade bolts are tight	☆				7-S5
3	Blade wear check	☆				7-S4
4	All hardware check	☆				–
5	Make sure all pins are in place	☆				–
6	Mower deck cleaning	☆				–
7	Greasing universal joint	☆				7-G6, G7
8	Greasing three spondle shafts	☆				7-G6, G7
9	Greasing belt tension pulley	☆				7-G6, G7
10	Greasing balance shaft	☆				7-G6, G7
11	Greasing front and rear anti-scalp rollers	☆				7-G6, G7
12	Gear box oil check	☆				7-G6
13	Gear box oil change		★	☆		7-G8
14	Gear box oil seal charge				☆	7-G9

■ **IMPORTANT**

- **The jobs indicated by ★ must be done after the first 50 hours of operation.**

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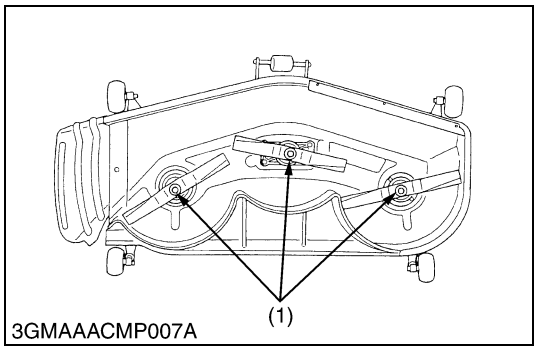
5. CHECK AND MAINTENANCE

[1] CHECK POINTS OF DAILY OR EACH USE



Retightening Mower Blade Screw

CAUTION

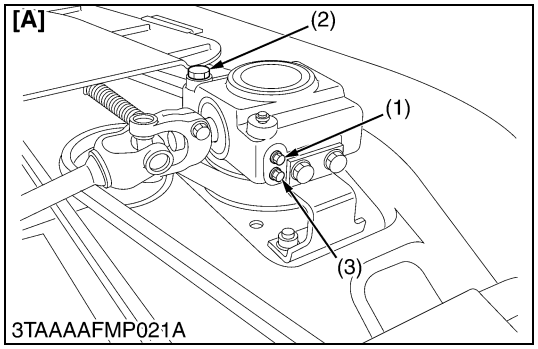
- **To avoid injury, always handle the mower blade with care.**

1. Dismount the mower and turn it over to expose the mower blades.
2. Wedge a block of wood securely between the mower blade and mower deck.
3. Retighten the mower blade screw to the specified torque.
4. If the mower blade screw is worn or broken, replace it.

Tightening torque	Mower blade screw	98.1 to 117 N·m 10.0 to 12.0 kgf·m 72.4 to 86.7 lbf·ft

(1) Mower Blade Screw

W12345678



Checking Gear Box Oil Level

1. Place the mower on level ground.
2. Loosen the check plug (1), and check to see if oil seems from the opening.
3. If the oil level is low, remove the oil filler plug (2) and add new gear oil.

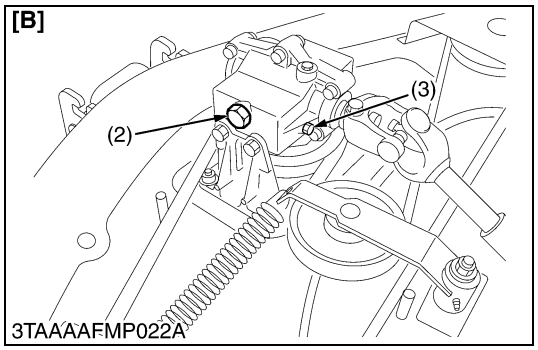
■ **IMPORTANT**

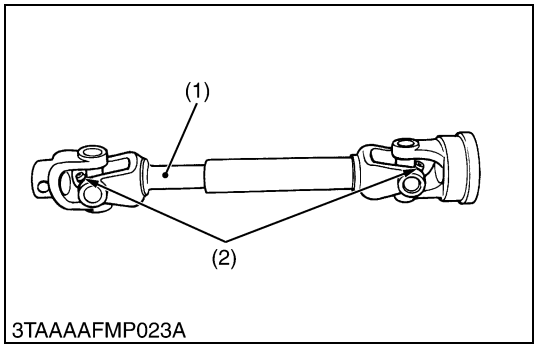
- **Use the specified gear oil.**
  Refer to "LUBRICANTS". (See page 7-G2.)

(1) Check Plug
(2) Oil Filler Plug
(3) Drain Plug

[A] RCK60B-23BX, RCK54-23BX, RCK48-18BX
[B] RCK48P-18BX, RCK54P-23B

W12378945



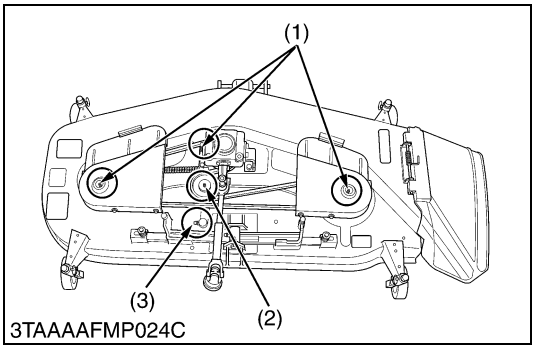


Greasing Universal Joint

1. Grease the internal splines (1) and grease nipples (2) of the universal joint if the amount of grease is insufficient.

(1) Spline
(2) Grease Nipple

W78945645



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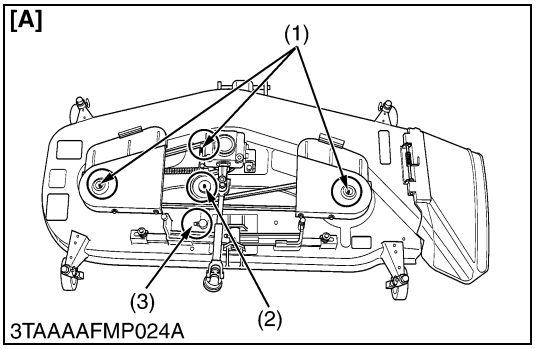
Greasing Spindle Shafts, Belt Tension Pivot and Tension Pulley

1. Grease the grease nipples (1), (2) of the spindle shafts if the amount of grease is insufficient.

(1) Grease Nipple (Spindle Shaft)
(2) Grease Nipple (Belt Tension Pulley)
(3) Grease Nipple (Belt Tension Pivot)

W98745632

[A]



3TAAAAFMP024A

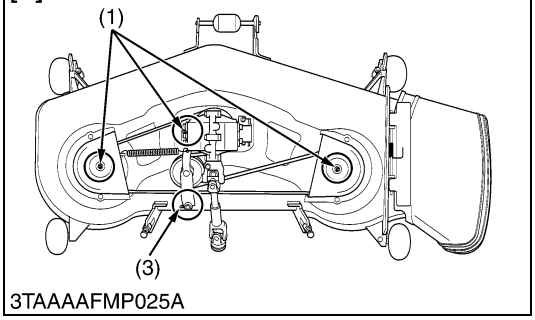
Greasing Spindle Shafts, Belt Tension Pivot and Tension Pulley

1. Grease the grease nipples (1), (2) of the spindle shafts if the amount of grease is insufficient.

(1) Grease Nipple (Splindle Shaft)
(2) Grease Nipple (Belt Tension Pulley)
(3) Grease Nipple (Belt Tension Pivot)

[A] RCK60B-23BX, RCK54-23BX, RCK48-18BX
[B] RCK54P-23BX, RCK48P-18BX

[B]



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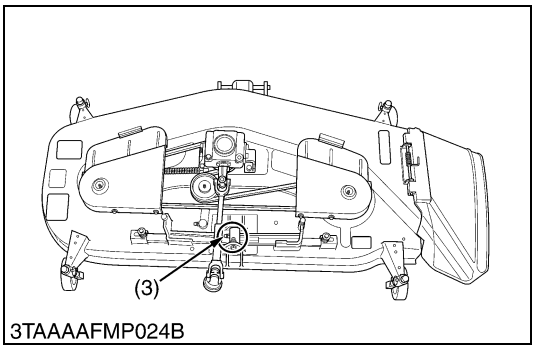


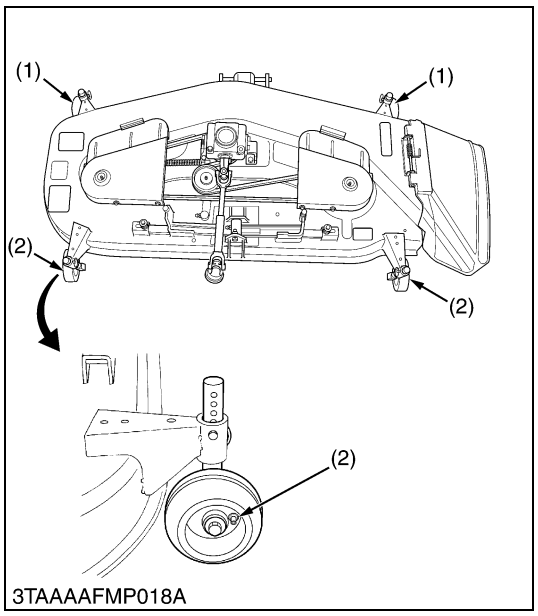
3TAAAAFMP024B

Greasing Balance Shaft [RCK60B-23BX]

1. Grease the grease nipple (1) of the balance shaft if the amount of grease is insufficient.

(1) Grease Nipple

W74136985



3TAAAAFMP018A

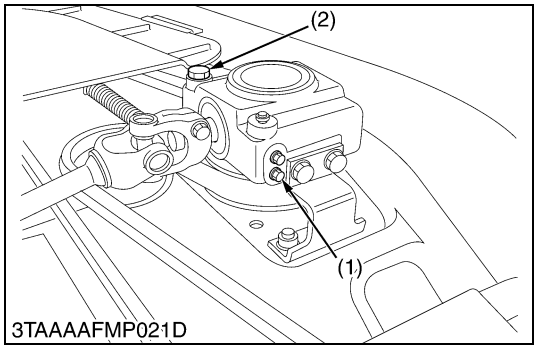
Greasing Front and Rear Anti-scalp Rollers [RCK60B-23BX, RCK54P-23BX, RCK54-23BX]

1. Grease the grease nipple (1), (2) of the front and rear anti-scalp rollers if the amount of grease is insufficient.

(1) Grease Nipple (Front Anti-scalp Roller)
(2) Grease Nipple (Rear Anti-scalp Roller)

W1026897

[2] CHECK POINT OF INITIAL 50 HOURS



3TAAAAFMP021D

Changing Gear Box Oil

CAUTION

- **Be sure to stop the engine and remove the key before changing the oil.**

1. Dismount the mower from the tractor, and place the mower on level ground.
2. Remove the oil filler plug (2).
3. Remove the drain plug (1), and drain the used oil completely.
4. After draining the used oil, reinstall the drain plug.
5. Fill with new oil up to the specified level.

■ **IMPORTANT**

- **Use the specified gear oil.**
  Refer to "LUBRICANTS". (See page 7-G2.)

(1) Drain Plug
(2) Oil Filter Plug

W1027307

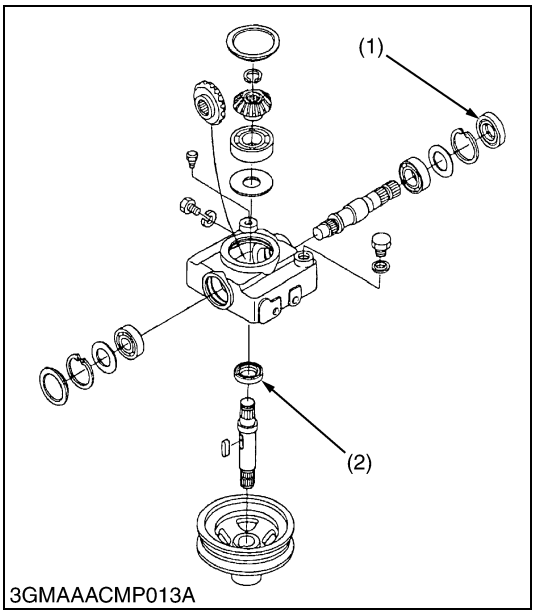
[3] CHECK POINT OF EVERY 150 HOURS

Changing Gear Box Oil

1. See above.

W1027627

[4] CHECK POINT OF EVERY 2 YEARS



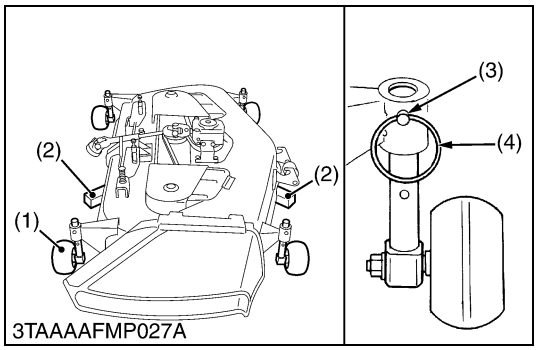
Replacing Gear Box Oil Seal

1. Replace the gear box oil seals (1), (2) with new ones.

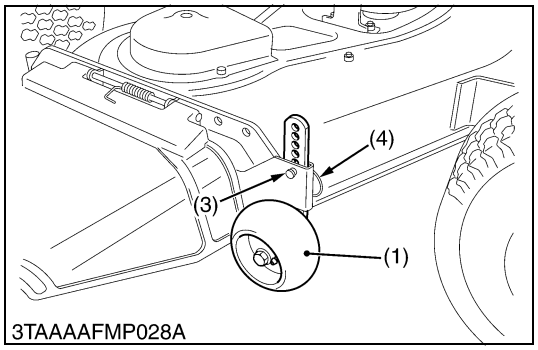
(1) Oil Seal (2) Oil Seal

W1027687

6. SETTING UP MOWER



3TAAAAFMP027A



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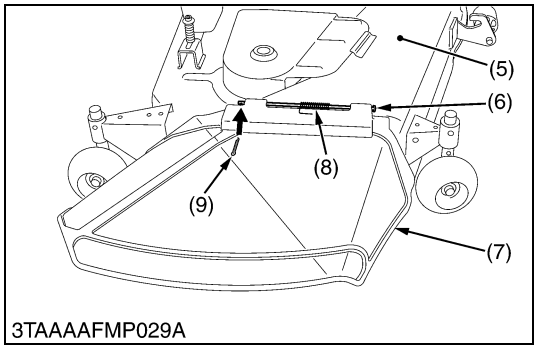

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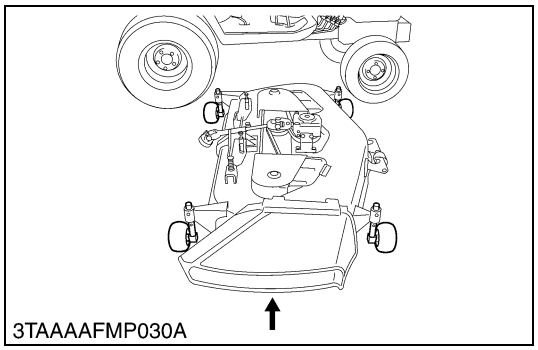
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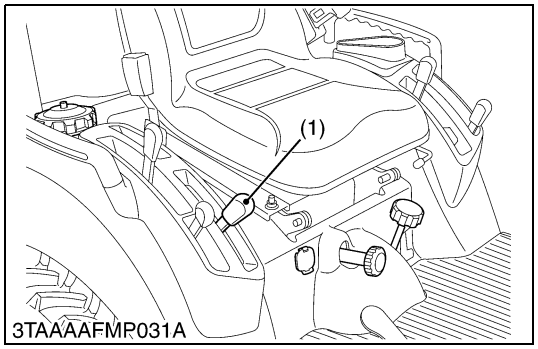

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Assembling Mower

1. Place the mower on blocks as illustrated.
   Turn the anti-scalp rollers sideways and attach to the arms of the deck at the upper position with clevis pins and snap rings.
   Remove the blocks. (RCK60B-23BX, RCK54P-23BX, RCK54-23BX)
2. Attach the front anti-scalp rollers to the deck with clevis pins and snap rings. (RCK48P-18BX, RCK48-18BX)
3. Attach the discharge to the deck with the spring, discharge pin and cotter pin.
   Secure the spring to the discharge deflector as illustrated.

(1) Anti-scalp Roller
(2) Block
(3) Clevis Pin
(4) Snap Ring
(5) Deck
(6) Discharge Pin
(7) Discharge Deflector
(8) Spring
(9) Cotter Pin

W85236974

Setting Mower

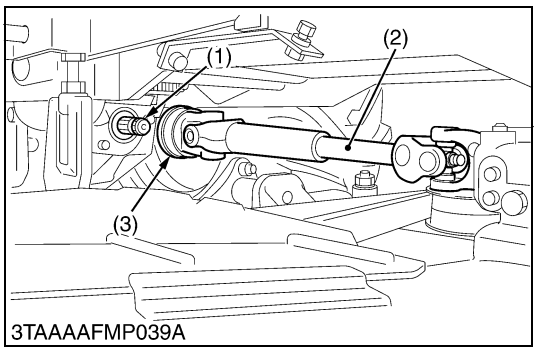
CAUTION

- **Park the tractor on a firm, flat and level surface, set the parking brake, stop the engine and remove the key.**

1. Start the engine and the hydraulic lever rearward to raise the mower rear link to the highest position.
2. Stop the engine and remove the key.
3. Roll the mower under the tractor from right side.

(1) Hydraulic Control Lever

W96321478



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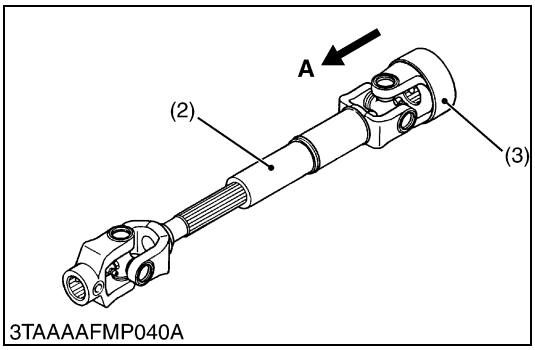

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Universal Joint

1. Pull back the coupler (3) of the universal joint (2).
2. Push the universal joint (2) onto the mid-PTO shaft (1), until the coupler locks.
3. Slide the universal joint back and forward to make sure the universal joint is locked securely.

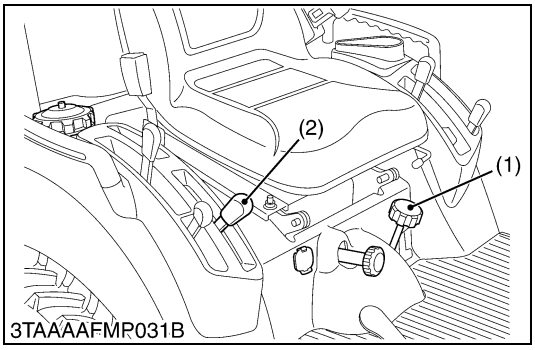
■ **IMPORTANT**

- **Finally, tug on the universal joint to make sure it is locked on the PTO shaft.**

(1) Mid-PTO Shaft
(2) Universal Joint
(3) Coupler

A : Tug

W69724158



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Rear Link

1. Set the cutting height control dial (1) to zero inch position.
2. Operate the tractor's hydraulic control lever (2) forward to lower the mower rear links (3).
   Attach the rear link (3) to the mower with the L-pins (4).

(1) Cutting Height Control Dial
(2) Hydraulic Control Lever
(3) Rear Link
(4) L-pin

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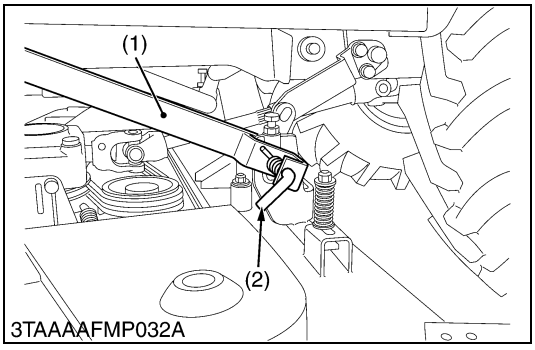

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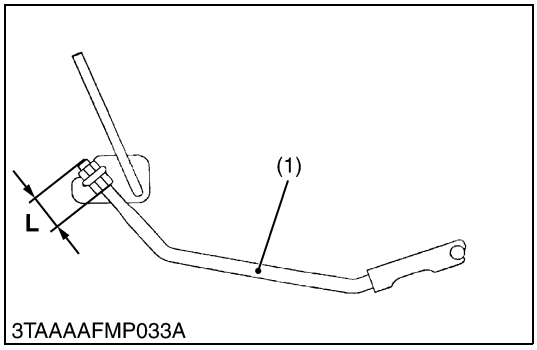

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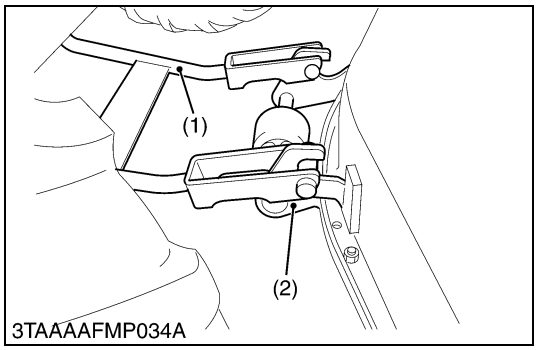

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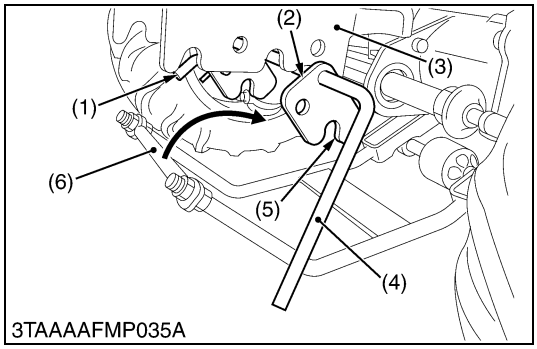

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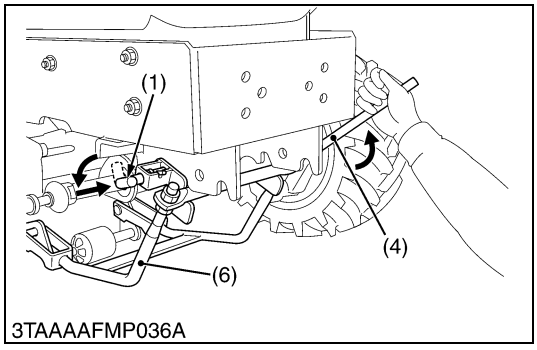

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Front Link

1. Hook the front link (1) to the front bracket groove (2) as shown in the figure.

(Reference)

- Make sure the length (**L**) of the front link (1) is 47 mm (1.85 in.).

(1) Front Link
(2) Front Bracket Groove

W74569821

Mounting Front Link

1. Position the front lever to the front link bracket.
2. Pull and lock the L pin. Then lower the front lever.
3. Hook the front link to the lever fulcrum, and lift the front lever.
4. Release the L pin to lock the front lever.

■ **NOTE**

- **When hooking the front link to the lever fulcrum, normal position of the lever fulcrum groove is open to downward.**

■ **IMPORTANT**

- **Check that the front lever is locked securely with the L pin.**

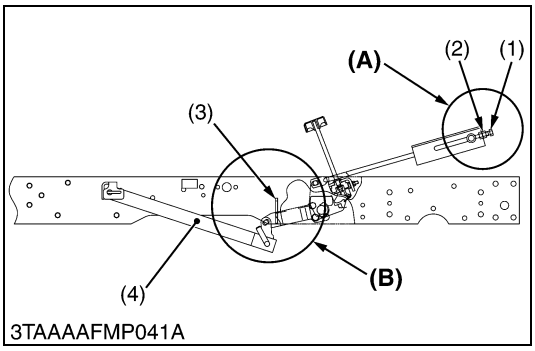
(1) L pin
(2) Lever Fulcrum
(3) Front Link Bracket
(4) Front Lever
(5) Lever Fulcrum Groove
(6) Front Link

W1028530

7. MOWER ADJUSTMENT

CAUTION

- **Park the tractor on a firm, flat and level surface and set the parking brake.**
- **Stoop the engine, remove the key, and allow the blades to stop before making adjustments.**
- **Wear heavy gloves or wrap end of blade with a rag when you handle blades.**
- **Before starting the engine, set the PTO clutch lever to off position and range gear shift lever to the neutral position.**



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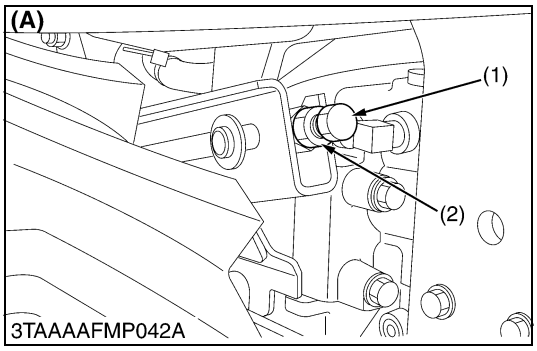

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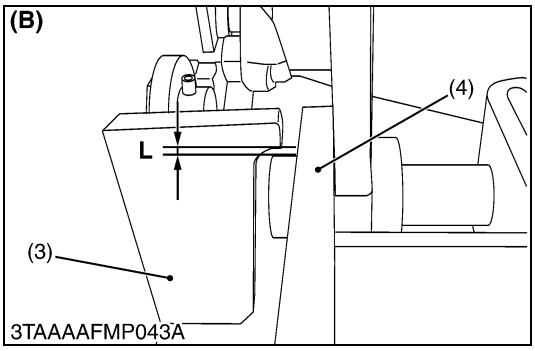

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Adjusting Mower Link

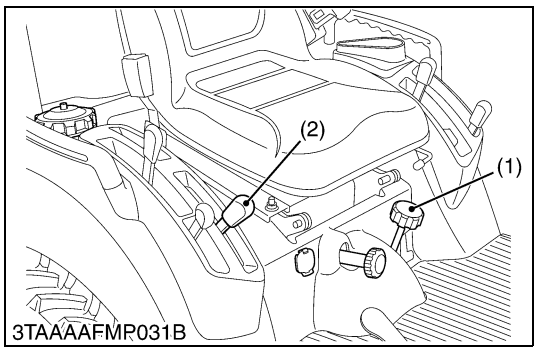
1. Tire pressure must be correct.
2. Move the hydraulic control lever rearward to raise the mower to the highest position.
3. Stop the engine and remove the key.
4. Adjust the left side links with bolt so that the clearance **L** is as follows.

Clearance (**L**) between stopper and rear link	Factory spec.	0 to 0.5 mm 0 to 0.01 in.

(1) Bolt
(2) Lock Nut
(3) Stopper
(4) Rear Link

L : 0 to 0.5 mm (0 to 0.01 in.)
(A) Adjustment Point
(B) Check Point

W8796512



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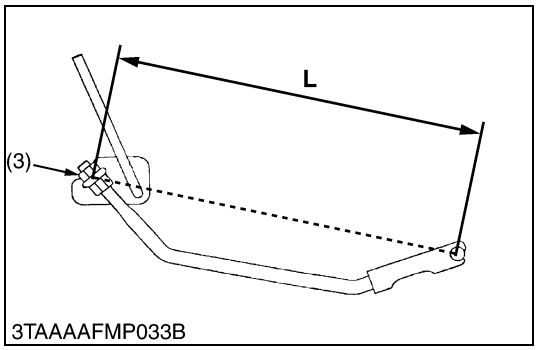

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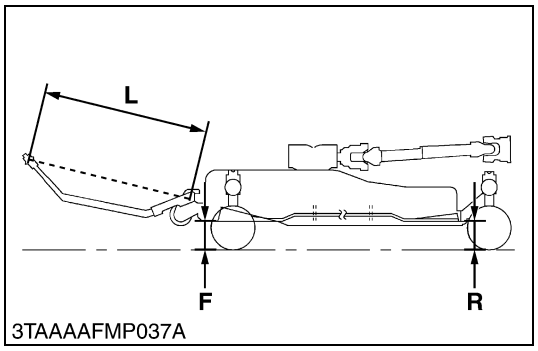

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Adjusting Front and Rear Cutting Height

1. Tire pressure must be correct.
2. Make sure the level of the mower blades is adjusted as shown below. Then tighten the lock nuts securely.
3. Turn the cutting height control dial to “2.0” and the anti-scalp roller’s height to keep clearance between rollers and ground from 6 to 13 mm (0.25 to 0.5 in.).
4. Turn right blade by hand parallel to direction of travel.
5. Adjust (L) of front links with lock nuts so that A is 0 to 5 mm (0 to 0.2 in.) A = (**R**)-(**F**).
6. If the difference between front tip and rear tip of blade is not within the factory specification, adjust the length **L** of front link with lock nut (3). The height of rear blade tip **R** should be bigger than the front.

Difference (**R**-**F**) (**R** ≥ **F**) between front tip and rear tip of blade	Factory spec.	0.0 to 5.0 mm 0.0 to 0.20 in.

(1) Cutting Height Control Dial
(2) Hydraulic Control Lever
(3) Lock Nut

L : Length of Front Link
F : Height of Blade Tip (Front)
R : Height of Blade Tip (Rear)

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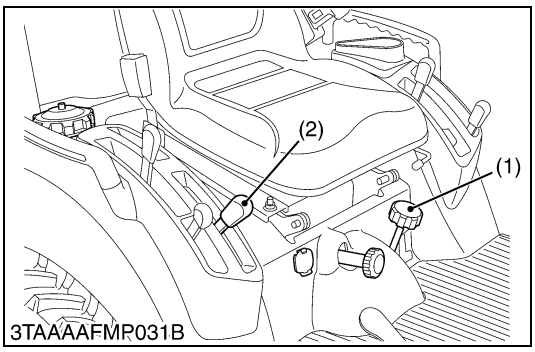

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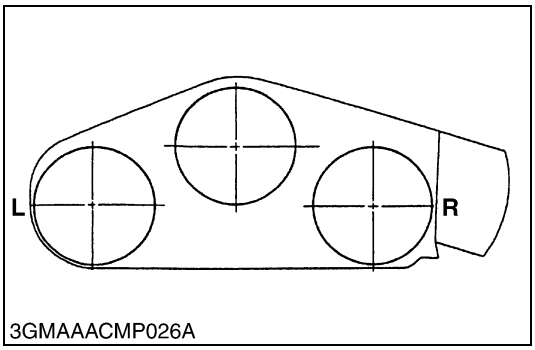

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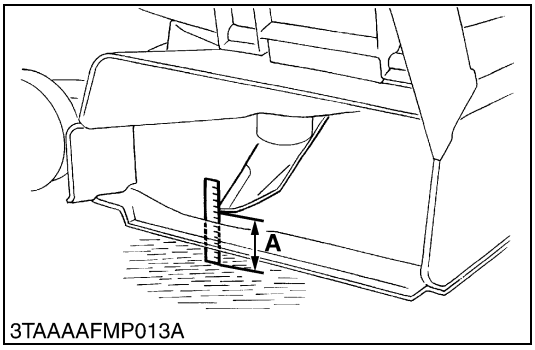

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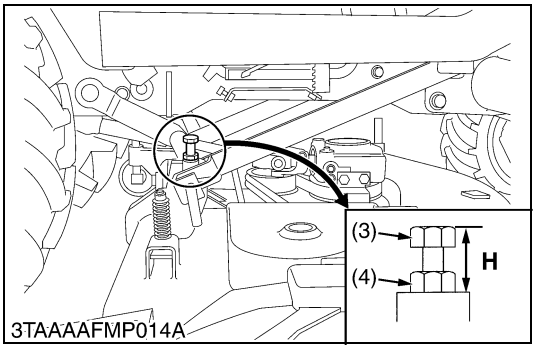

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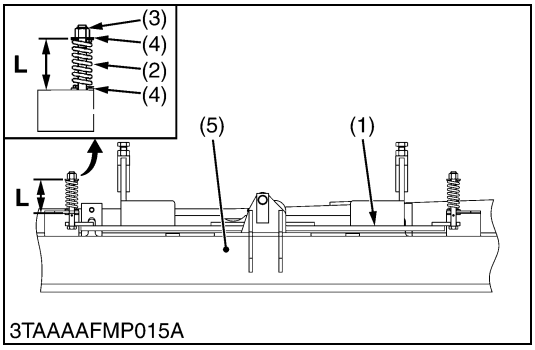

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Adjusting Left and Right Cutting Height

1. Tire pressure must be correct.
2. Operate the hydraulic control lever (2) rearward to raise the mower deck to the highest position.
3. Stop the engine and remove the key.
4. Turn the cutting height control dial to the desired height.
5. Set the anti-scalp roller's height to keep clearance between rollers and ground from 6 to 13 mm (0.2 to 0.5 in.).
6. Lower the mower deck by moving the hydraulic control lever forward.
7. Turn left blade by hand parallel to tractor axle and turn right blade parallel to axle to measure from the outside blade tip at **L** and **R** to the level surface.
8. The difference between measurement should be less than 3 mm (0.12in.).
9. If the difference between measurement is more than 3 mm (0.12 in.), loosen the lock nut of the left side.
10. Adjust the cutting height fine turning bolts so that the difference between measurement **L** and **R** is less than 3 mm (0.12 in.). Then lock the nut.

Difference (**L**-**R**) between left tip and right tip of blade	Factory spec.	Less than 3 mm 0.12 in.

(1) Cutting Height Control Dial
(2) Hydraulic Control Lever
(3) Cutting Height Fine Turning Bolt
(4) Lock Nut
L : Left Blade Measurement Position
R : Right Blade Measurement Position
A : Blade Height

W12398745

Adjusting Self-Balance Suspended Linkage [RCK60B-23BX only]

1. Check the length (**L**) of balancer spring (2).
2. If the length (**L**) is not within the factory specification, adjust the length of balancer spring (2) with lock nut (3).

■ **NOTE**
- **Check the left and right cutting height difference after adjusting the self-balancer linkage.**

Balancer spring length (**L**) (Right and left)	Factory spec.	55.0 mm 2.17 in.

(1) Self-Balancer
(2) Balancer Spring
(3) Lock Nut
(4) Plain Washer
(5) Mower Deck
L : Balancer Spring Length

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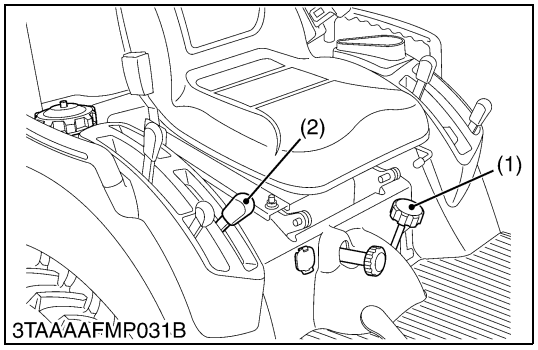

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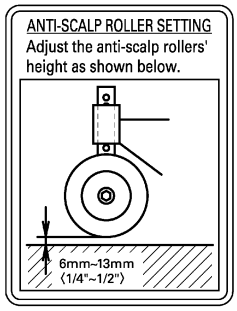

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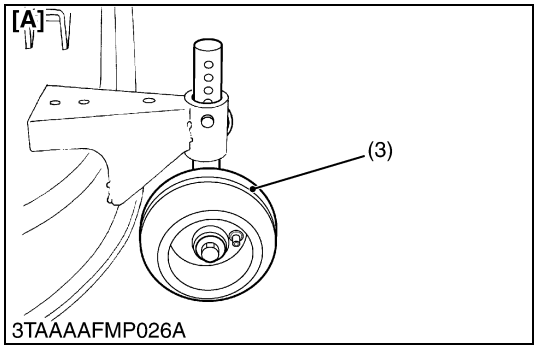

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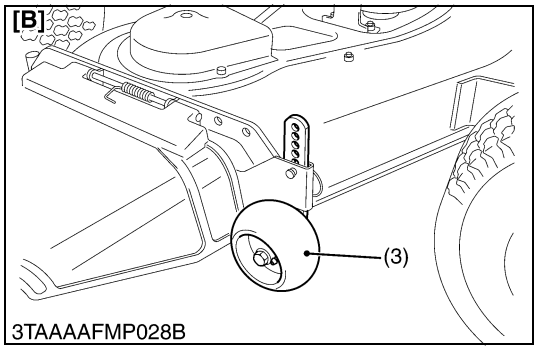

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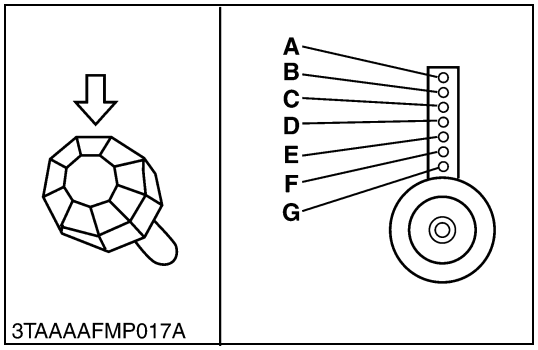

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Cutting Height

DANGER

- **Never operate the mower in transport position.**

■ IMPORTANT

- **(for self-balance suspended linkage)**
  To reduce the stepped difference in cutting height when mowing rolling terrain, follow the procedure below.

1. To set the cutting height, move the hydraulic control lever rearward to raise the mower to the highest position. Turn the cutting height control dial (1) to adjust height.
2. Set the anti-scalp roller's (3) height as shown to keep clearance between rollers and ground from 6 to 13 mm (0.2 to 0.5 in.).
3. Lower the mower deck by moving the hydraulic control lever (2) forward.
4. Use the higher settings for mowing in a rough area or when mowing tall grass. Lower settings should be used only for smooth lawns where short grass is desired.
5. To set the cutting height, move the hydraulic control lever (2) rearward to raise the mower to the highest position. Turn the cutting height control dial to adjust height.
6. Set the anti-scalp roller's (3) position as shown to have the same cutting height.

Dial (Cutting Height)	Anti-scalp Roller
25 mm (1.0 in.), 32 mm (1.25 in.)	**G**
38 mm (1.5 in.), 45 mm (1.75 in.)	**F**
51 mm (2.0 in.), 57 mm (2.25 in.)	**E**
64 mm (2.5 in.), 70 mm (2.75 in.)	**D**
76 mm (3.0 in.), 83 mm (3.25 in.)	**C**
89 mm (3.5 in.), 95 mm (3.75 in.)	**B**
102 mm (4.0 in.)	**A**

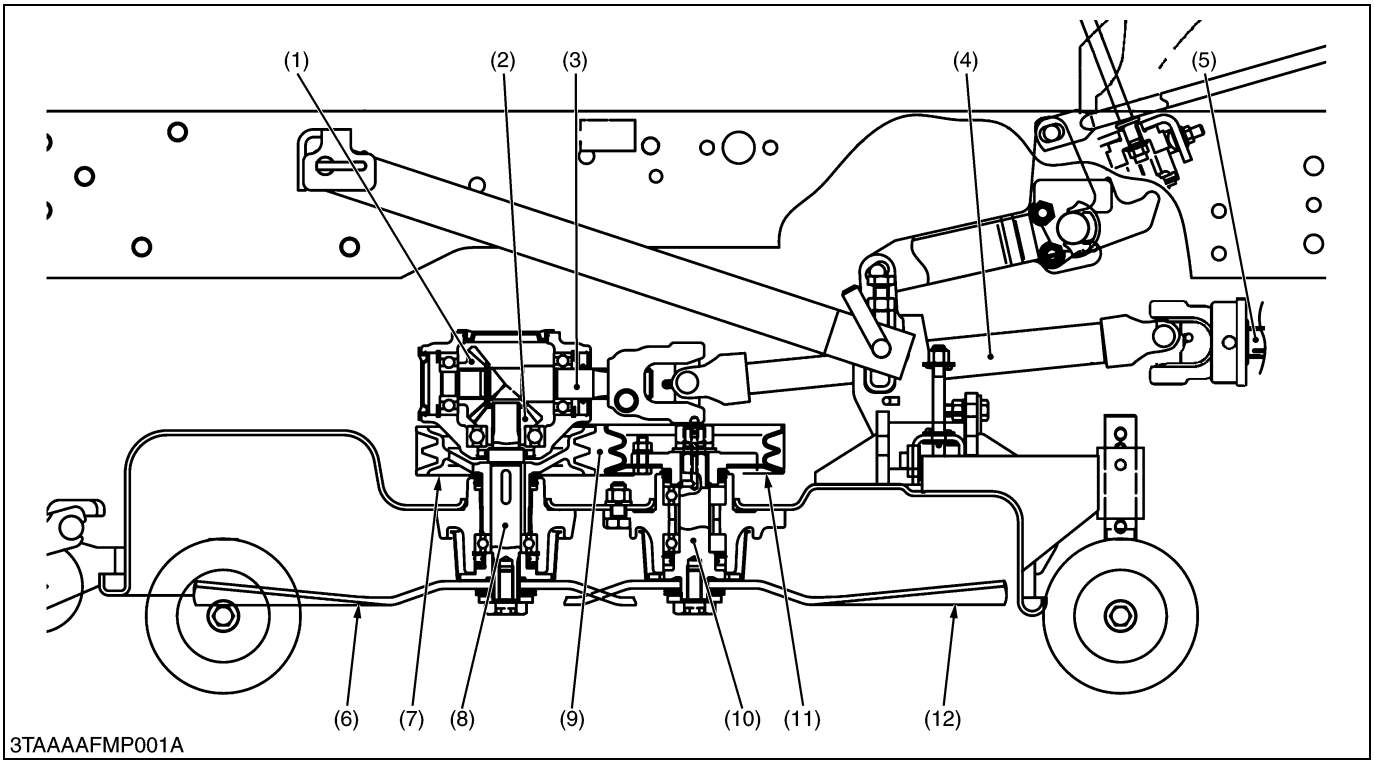
(1) Cutting Height Control Dial
(2) Hydraulic Control Lever
(3) Anti-scalp Roller

[A] RCK60B-23BX, RCK54P-23BX, RCK54-23BX
[B] RCK48P-18BX, RCK48-18BX

MECHANISM

CONTENTS

1. POWER TRANSMISSION



(1) 18T Bevel Gear
(2) 17T Bevel Gear
(3) Pinion Shaft
(4) Universal Joint
(5) Mid-PTO Shaft
(6) Center Blade
(7) Center Pulley
(8) Bevel Gear Shaft
(9) Mower Belt
(10) Blade Shaft
(11) Outer Pulley
(12) Outer Blade

The power is transmitted from mid-PTO to blades as follows:

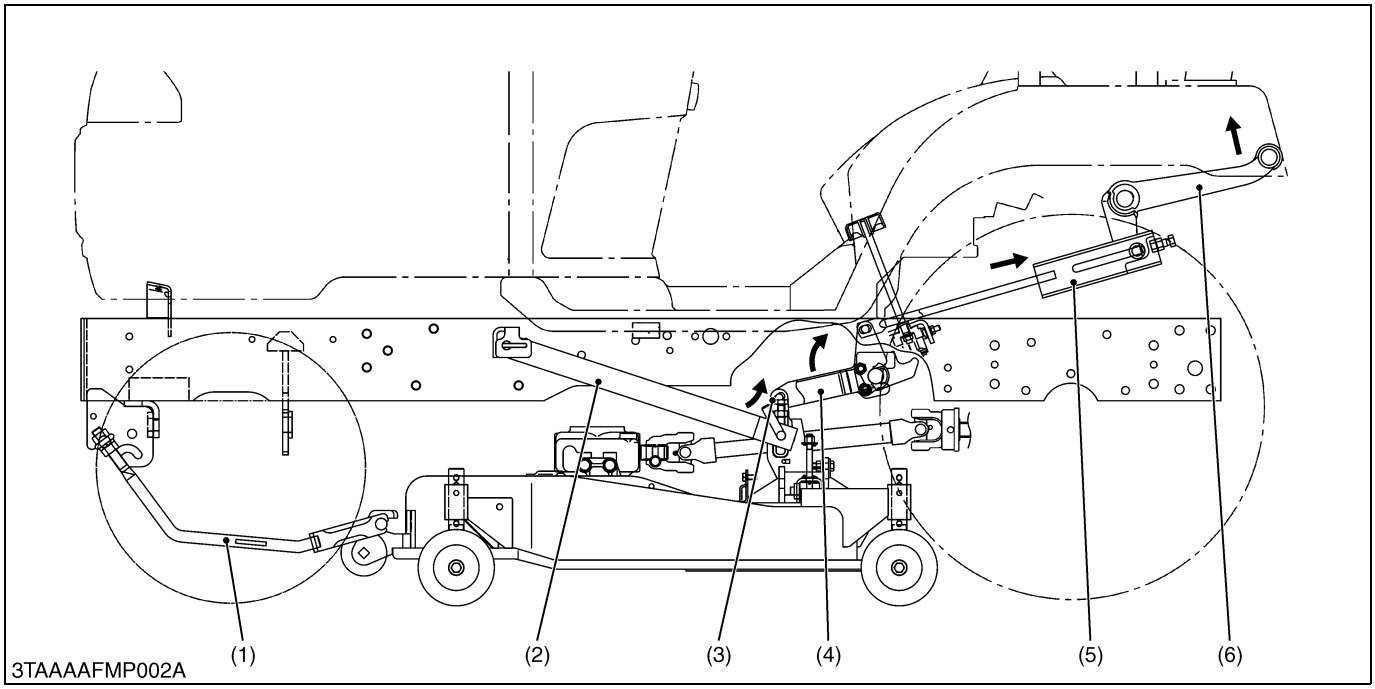
■ **Center Blade**

Mid-PTO Shaft (5) → Universal Joint (4) → Pinion Shaft (3) → Bevel Gear (1) → Bevel Gear (2) → Bevel Gear Shaft (8) → Center Blade (6)

■ **Outer Blade**

Mid-PTO Shaft (5) → Universal Joint (4) → Pinion Shaft (3) → Bevel Gear (1) → Bevel Gear (2) → Bevel Gear Shaft (8) → Center Pulley (7) → Mower Belt (9) → Outer Pulley (11) → Blade Shaft (10) → Outer Blade (12)

2. LIFTING MECHANISM



(1) Front Link
(2) Rear Link
(3) Lift Link
(4) Rear Lift Link (RH)
(5) Rear Lift Link (LH)
(6) Lift Arm

The lifting of mower is performed by the hydraulic system installed on the tractor.

The mower should be kept lift when traveling. When the position control lever is moved to **"LIFT"** position, the lift arm (6) is lifted up by the oil pressure of hydraulic system, and the rear lift link (LH) (5) is pulled rearward.

Therefore, rear lift links (4), (5) rotate and the mower is lifted by the lift links (3) and rear links (2).

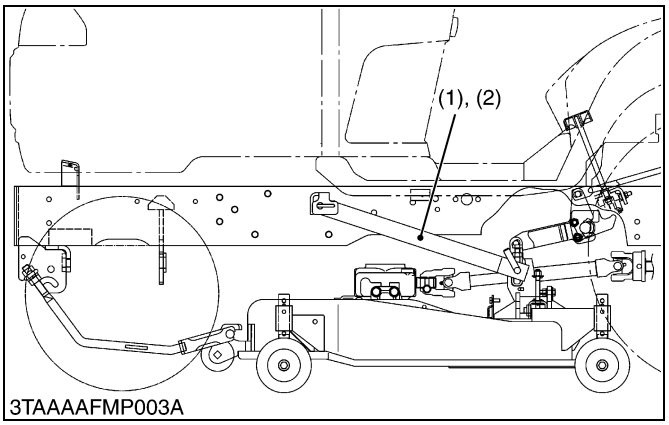
As this link system is a parallel linkage, the mower can be kept parallel at every position.

CAUTION

- **Never operate mower in transport position.**

3. SELF-BALANCER SYSTEM

This system reduces the stepped differences in cutting height when mowing rolling terrain.



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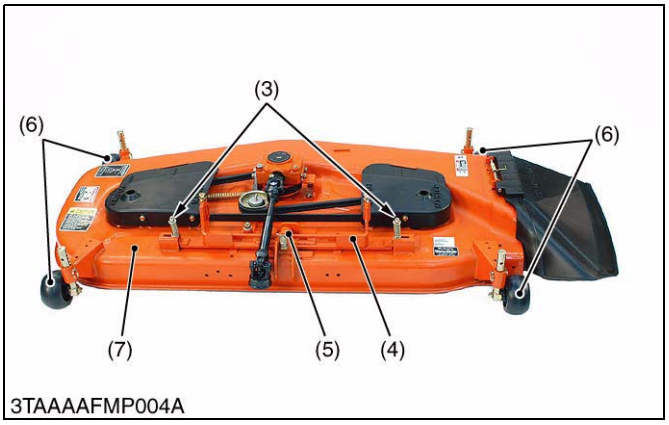

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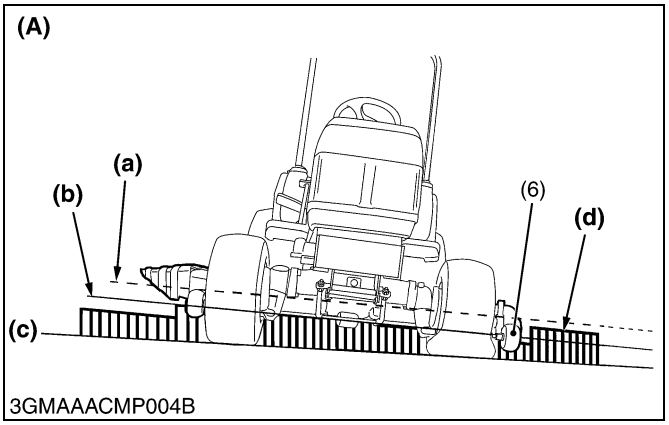

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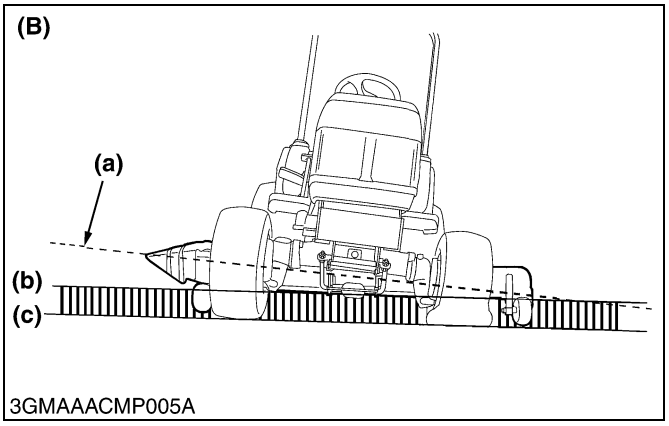

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■ Self-Balancer

1. The mower deck is held in place via the balancer plate (4) and the support by the rear link (1), (2).
2. The mower deck is suspended by, and is tilted to the right and left by, the balancer support (5). The balancer springs (3) at both sides adjust themselves for suitable tension to keep the mower deck out of excessive tilt.

■ Without Self-Balancer Type (A)

- When working on a wavy ground, the tractor itself, with the mower deck, goes along the curves of the terrain. If not equipped with the self-balancer, the tractor tends to tilt itself greater than the ground's waves by its own weight. This may cause an uneven mowing. The wider the mower is, the more unevenness is caused.

■ With Self-Balancer Type (B)

- When working on a wavy ground, the tractor itself goes along the curves of the terrain like with the tractor that is not equipped with the self-balancer. The balancer springs (3), however, serve to keep the mower deck in parallel with the ground's curves until the anti-scalp roller (6) comes in contact with the ground.
- If the tractor temporarily tilts itself more than the ground's slope or the like, the anti-scalp roller (6) touches the ground. Now the mower deck is brought back in parallel with the ground by the counterforce of the roller (6) just hitting the ground as well as the tension of the balancer springs (3). This helps reduce an uneven mowing.

■ NOTE

- **Always keep the anti-scalp roller with specified position (Refer to Operator's Manual).**

(1) Rear Link (RH)
(2) Rear Link (LH)
(3) Balancer Spring
(4) Balancer Plate
(5) Balancer Support
(6) Anti-scalp Roller
(7) Mower Deck

(A) Without Self-Balancer
(B) With Self-Balancer
(a) Tilt : Tractor
(b) Tilt : Mower Deck
(c) Ground
(d) Grass

W1013200

SERVICING

CONTENTS

1. TROUBLESHOOTING

Symptom	Probable Cause	Solution	Reference Page
Blade Does Not Turn	Mid-PTO system malfunctioning	Check transmission	2-S31, S40
	Mower belt broken	Replace mower belt	7-S4
Blade Speed Is Slow	Mower belt loosen	Replace mower belt or tension spring	7-S4
	Grass clogged	Remove grass	–
	Cup washer flattened out or worn	Replace cup washer	7-S5
	Engine rpm too low	Mow at full throttle, check and reset engine rpm	–
Cutting Is Poor	Mower blade worn or broken	Sharpen or replace mower blade	7-S5
	Mower blade screw loosen	Retighten mower blade screw	7-S5
	Cutting height improper	Adjust cutting height	7-G15
	Ground speed too fast	Slow-down	–
	Low tire inflation	Add air to correct	G-41
	Anti-scalp rollers not adjusted correctly	Adjust anti-scalp rollers	7-G16
Mower Is Not Lifted	Linkage system broken	Replace linkage system	7-G12
	Trouble of hydraulic system	Check hydraulic system	–

W1014322

2. SERVICING SPECIFICATIONS

Item		Factory Specification	Allowable Limit
Input Shaft (without Mower Belt)	Turning Force	Less than 118 N 12.0 kgf 26.5 lbf	–
	Turning Torque	Less than 1.5 N·m 0.15 kgf·m 1.1 lbf·ft	–
Bevel Gears in Gear Box **[RCK48-18BX, RCK54-23BX, RCK60B-23BX]**	Backlash	0.10 to 0.20 mm 0.0040 to 0.0078 in.	0.40 mm 0.016 in.
[RCK48P-18BX, RCK54P-23BX]	Backlash	0.13 to 0.25 mm 0.0051 to 0.0098 in.	0.40 mm 0.016 in.

W1013874

3. TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts: See page 7-G3.)

[RCK48-18BX, RCK54-23BX, RCK60B-23BX]

Item	N·m	kgf·m	lbf·ft
Gear box mounting screw and nut	78 to 90	7.9 to 9.2	58 to 66
Mower blade screw	103 to 117	10.5 to 12.0	76.0 to 86.7
Center pulley holder bolt and nut	78 to 90	7.9 to 9.2	58 to 66
Outer pulley mounting nut	197 to 225	20.0 to 23.0	145 to 166
Gear box bracket (RH) mounting bolt and nut	78 to 90	7.9 to 9.2	58 to 66
Pulley boss mounting nut	24 to 27	2.4 to 2.8	18 to 20
Pulley holder mounting bolt and nut	78 to 90	7.9 to 9.2	58 to 66

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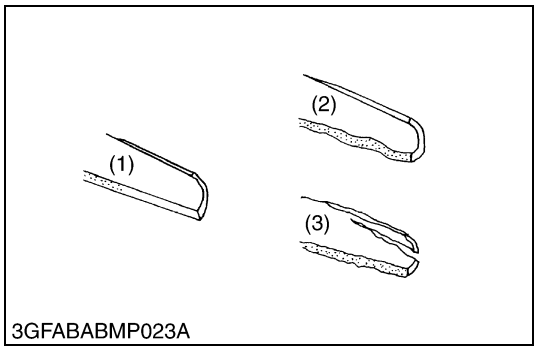
[RCK48P-18BX and RCK54P-23BX]

Item	N·m	kgf·m	lbf·ft
Mower blade screw	103 to 118	10.5 to 12.0	76 to 87
Gear box screw	24 to 28	2.4 to 2.8	17 to 20
Gear box mounting screw (for aluminum gear case)	39 to 44	4.0 to 4.5	49 to 33
Gear box mounting screw and nut	77 to 90	7.9 to 9.2	57 to 67
Center pulley holder bolt and nut	77 to 90	7.9 to 9.2	57 to 67
Outer pulley mounting nut	167 to 186	17.0 to 19.0	123 to 137
Pulley holder mounting bolt and nut	77 to 90	7.9 to 9.2	57 to 67
Gear box bracket (RH) mounting screw (for aluminum gear case)	39 to 44	4.0 to 4.5	29 to 33

W1013579

4. CHECKING, DISASSEMBLING AND SERVICING

[1] CHECKING AND ADJUSTING



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Checking Mower Blade

1. Check the cutting edge of mower blade.
2. Sharpen the cutting edges, if the mower blades are as shown in figure (2).
3. Replace the mower blades, if they are as shown in figure (3).

■ **IMPORTANT**

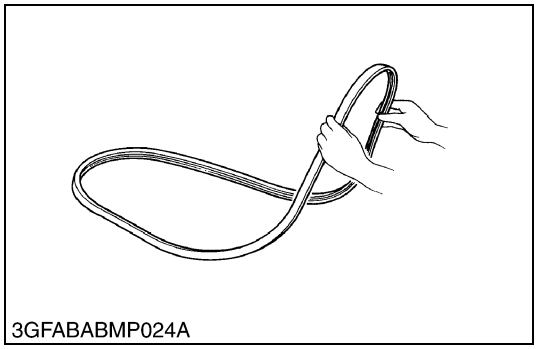
- **Never forget to set the dust cover, cup washer(s) and lock washer, when reassembling the mower blades. (See page 7-S5.)**

■ **NOTE**

- **To sharpen the mower blades by yourself, clamp the mower blade securely in a vise and use a large mill file along the original bevel.**
- **To balance the mower blade, place a small rod through the center hole and check to see if the blade balance evenly. File heavy side of the blade until it balance out even.**

(1) New Blade
(2) Worn Blade
(3) Cracked Blade

W1011041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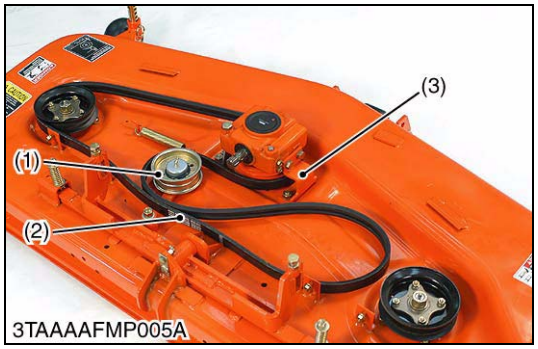
Checking Mower Belt

1. Check to see the mower belt.
2. Replace the mower belt with a new one, if there is found surface split at more than 3 positions.

(When replacing mower belt)

1. Dismount the mower from the tractor.
2. Remove the left and right hand belt cover from the mower deck.
3. Clean around the gear box.
4. Remove the right hand bracket (3) which mounts the gear box to the mower deck.
5. Remove the mower belt (2) from the tension pulley (1). Slip the mower belt over the top of the gear box.
6. To install a new belt, reverse the above procedure.



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Tightening torque	Gear box bracket RH mounting bolt and nut	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft
	Gear box bracket RH mounting screw (for aluminum gear case)	39 to 44 N·m 4.0 to 4.5 kgf·m 29 to 33 lbf·ft

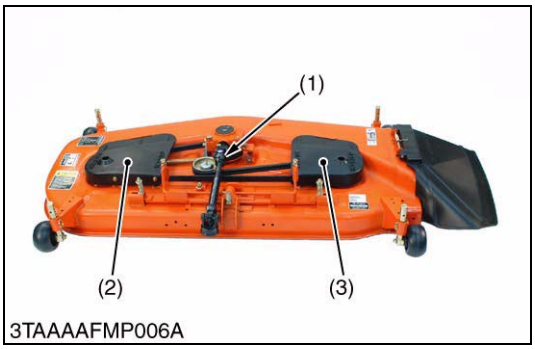
■ **IMPORTANT**

- **After setting the gear box bracket mounting screws on the deck without tightening, then mount the other screws on the gear box. And finally tighten them.**

(1) Tension Pulley
(2) Mower Belt
(3) Gear Box Bracket (Right)

W1011180

[2] DISASSEMBLING AND ASSEMBLING



Universal Joint and Belt Cover

1. Unscrew the universal joint screw.
2. Remove the universal joint (1).
3. Remove the left and right belt covers (2), (3).

(1) Universal Joint
(2) Belt Cover (Left)
(3) Belt Cover (Right)

W1012580

Mower Blades (Center Blade and Outer Blades)

1. Turn over the mower.
2. Unscrew the mower blade screw (5), and remove the lock washer (4), cup washer(s) (3), mower blade (2) and dust cover (1).

■ **NOTE**

- **To remove the blade securely, wedge a block of wood between one blade and the mower deck in such position that it will hold the blade safely while loosing or tightening the blade screw.**

(When reassembling)

[RCK48-18BX, RCK54-23BX, RCK48P-18BX, RCK54P-23BX]

- Install the blade in position together with the dust cover and the cup washer. Tighten them up with the screw.

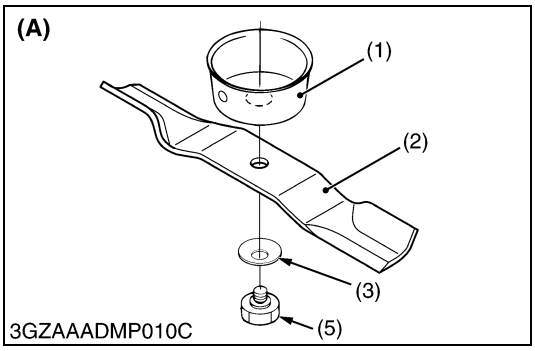
[RCK60B-23BX]

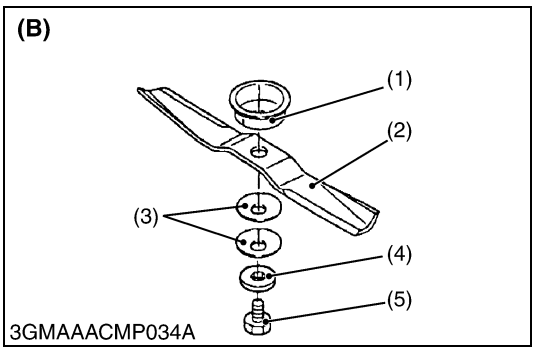
- Install the blade in position together with the dust cover, the lock washer and the 2 cup washers. Tighten them up with the screw.

■ **IMPORTANT**

- **Make sure the cup washer is not flattened out or worn, causing blade to slip easily.**
  Replace cup washer(s) if either is damaged.

Tightening torque	Mower blade screw	103 to 117 N·m 10.5 to 12.0 kgf·m 76.0 to 86.7 lbf-ft

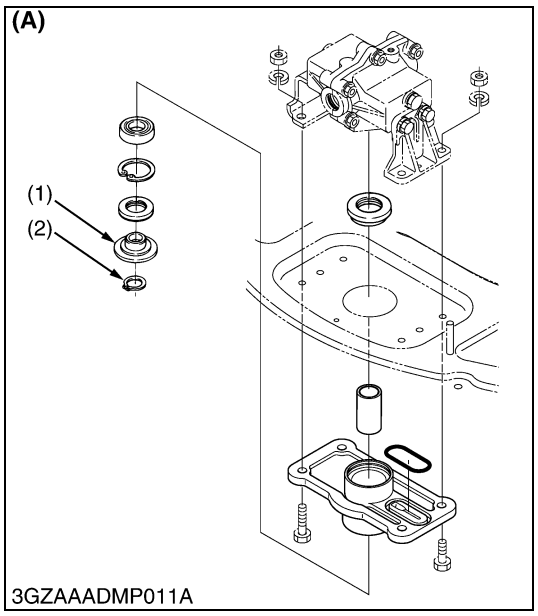


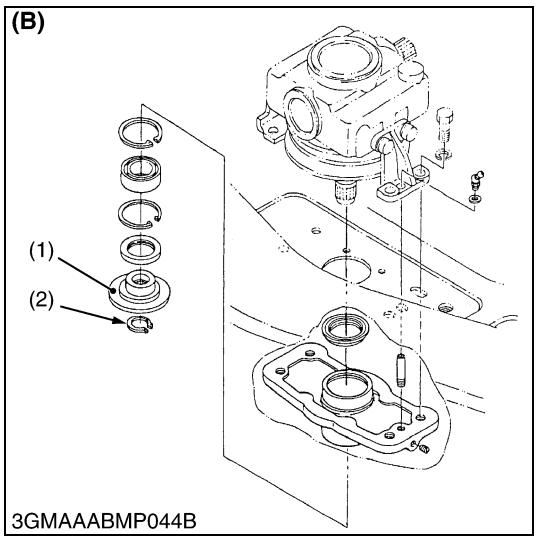


(1) Dust Cover
(2) Mower Blade
(3) Cup Washer
(4) Lock Washer
(5) Mower Blade Screw

(A) RCK48-18BX, RCK54-23BX, RCK48P-18BX, RCK54P-23BX
(B) RCK60B-23BX
a : Loosen

W1012667



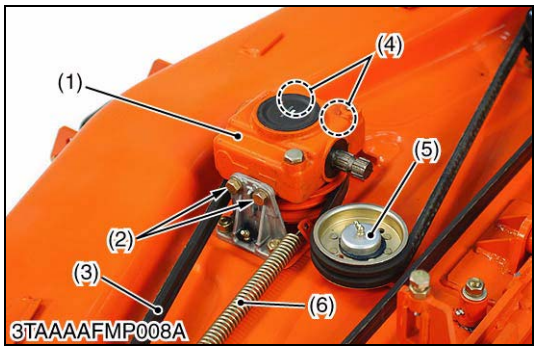


Blade Boss

1. Remove the external snap ring (2).
2. Remove the blade boss (1).

(1) Blade Boss
(2) External Snap Ring

(A) RCK48P-18BX, RCK54P-23BX
(B) RCK48-18BX, RCK54-23BX, RCK60B-23BX



Gear Box and Mower Belt

1. Turn over the mower.
2. Remove the mower belt (3) from the tension pulley (5).
3. Unscrew the left and right gear box mounting screws (2), (4) and remove the gear box (1) from the mower deck.

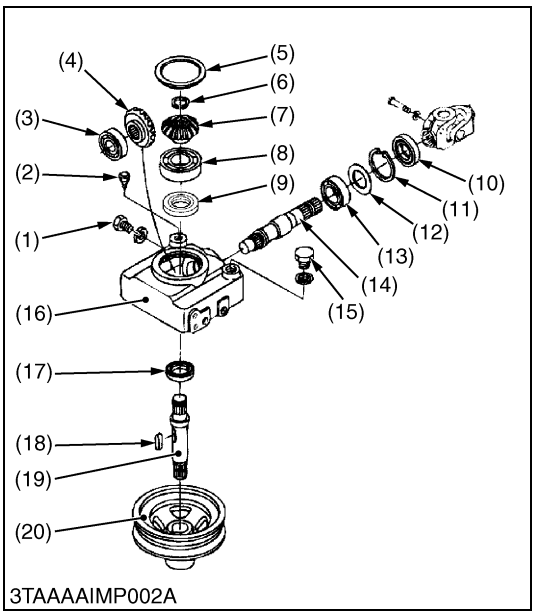
(When reassembling)

- Install the reamer screws (2) at their original positions as shown in the figure.

Tightening torque	Gear box mounting screw and nut	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft

(1) Gear Box
(2) Gear Box Mounting Screw (Reamer Screw)
(3) Mower Belt
(4) Gear Box Mounting Screw
(5) Tension Pulley
(6) Tension Spring

W1012961



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Disassembling Gear Box [RCK54-23BX, RCK60B-23BX]

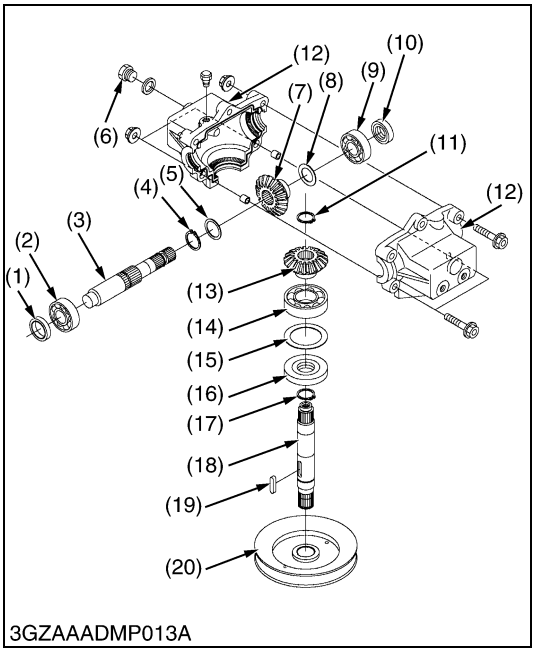
1. Unscrew the drain plug (1), and drain the gear box oil.
2. Remove the center pulley (20) with a puller, and remove the feather key (18) on the bevel gear shaft (19).
3. Remove the gear box cap (5).
4. Remove the oil seal (10), internal snap ring (11) and shim (12).
5. Tap out the pinion shaft (14) with the ball bearing (13), and remove the bevel gear (1).
6. Remove the ball bearing (3) and shims (if installed).
7. Remove the external snap ring (6), and draw out the bevel gear shaft (19).
8. Remove the bevel gear (7), ball bearing (8), shim (9) and oil seal (17).

(When reassembling)

- Replace the oil seals (10), (17) and gear box cap (8) with new ones.
- Check the backlash and turning torque.
  If not proper, adjust with the shims.
  (See page 7-S10.)

(1) 19T Bevel Gear (RCK54-23BX)
18T Bevel Gear (RCK60B-23BX)
(2) Breather
(3) Gear Box
(4) Ball Bearing
(5) Shim
(6) Internal Snap Ring
(7) Gear Box Cap
(8) Gear Box Cap
(9) External Snap Ring
(10) 16T Bevel Gear (RCK54-23BX)
17T Bevel Gear (RCK60B-23BX)
(11) Ball Bearing
(12) Shim
(13) Oil Seal
(14) Internal Snap Ring
(15) Shim
(16) Ball Bearing
(17) Pinion Shaft
(18) Oil Filler Plug
(19) Drain Plug
(20) Oil Seal
(21) Bevel Gear Shaft
(22) Feather Key
(23) Center Pulley

W1018143



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Disassembling Gear Box (RCK54P-23BX)

1. Unscrew the drain plug (6), and drain the gear box oil.
2. Remove the center pulley (20) with a puller.
3. Remove the gear box.
4. Open the gear box.
5. Remove the input shaft (3) and the blade shaft (18).
6. Disassembling the input shaft (3) and the blade shaft (18).

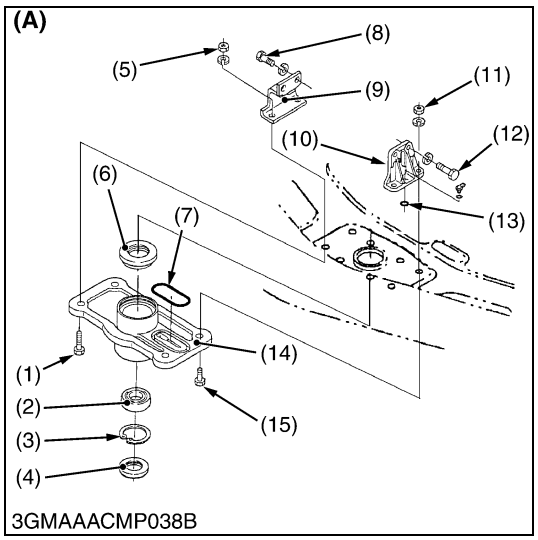
(When reassembling)

- Replace the oil seals (1), (10), (16) and gear box caps with new ones.
- Check the backlash and turning torque.
  If not proper, adjust with the shims.
- After cleaning dirty and gear box oil and the gear box surface, apply the liquid gasket.

Tightening torque	Gear box screw	24 to 27 N·m 2.4 to 2.8 kgf·m 17 to 20 lbf-ft

(1) Oil Seal
(2) Ball Bearing
(3) Input Shaft
(4) External Cir Clip
(5) Shim
(6) Drain Plug
(7) Bevel Gear
(8) Shim
(9) Ball Bearing
(10) Oil Seal
(11) External Cir Clip
(12) Bevel Gear Case
(13) Bevel Gear
(14) Ball Bearing
(15) Shim
(16) Oil Seal
(17) External Cir Clip
(18) Blade Shaft
(19) Feather Key
(20) Center Pulley

W1015954



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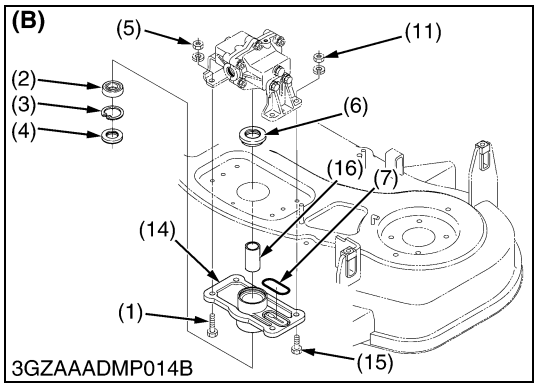

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Center Pulley Holder

1. Unscrew the center pulley holder screws (1), (15) / center pulley nut (5), (11).
2. Remove the upper oil seal (6) and lower oil seal (4).
3. Remove the internal snap ring (3) and ball bearing (2).

(When reassembling)

- Replace the oil seals (4), (6) with new ones.
- Install the reamer screws (12) / reamer bolt (15) at their original positions as shown in the figure.
- Be sure to fix the O-rings (7), (13) to the original position.

■ **NOTE**

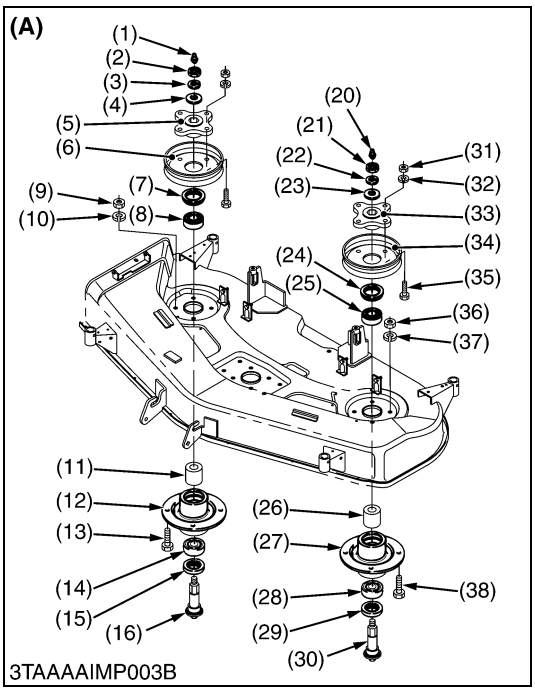
- **When reassembling the center pulley holder (14), gear box and gear box stays (9), (10), tighten the bolts and nuts in the order as below, to prevent the incline the gear box.**
- **Tighten the reamer bolts (12) to the gear box first, then tighten the reamer bolts (15) and nut (11) to the center pulley holder (14) with specified torque.**
- **Tighten the gear box screws (8) to the gear box, then tighten the center pulley holder bolts (1) and nut (5) with specified torque.**
- **See page 7-S6 for tightening torque of gear box screw.**

Tightening torque	Center pulley holder bolt and nut	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft

(1) Center Pulley Holder bolt
(2) Ball Bearing
(3) Snap Ring
(4) Oil Seal
(5) Nut
(6) Oil Seal
(7) O-ring
(8) O-ring
(9) Gear Box Stay RH
(10) Gear Box Stay LH
(11) Nut
(12) Gear Box Reamer Bolt
(13) O-ring
(14) Center Pulley Holder
(15) Center Pulley Holder Reamer Bolt
(16) Collar

(A)RCK48-18BX, RCK54-23BX, RCK60B-23BX
(B) RCK48P-18BX, RCK54P-23BX

W1013720



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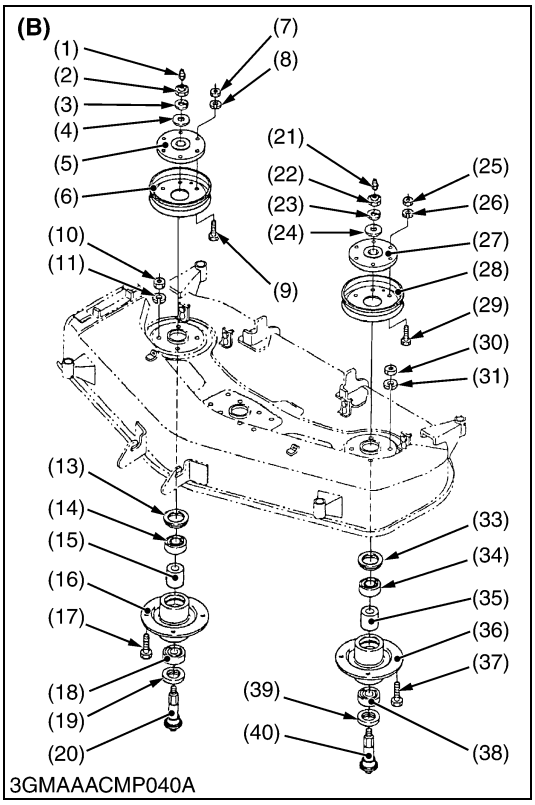

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Outer Pulley and Blade Shaft

1. Unscrew the outer pulley mounting nuts (21), and remove the outer pulley (34).
2. Unscrew the pulley holder mounting nuts (36), and remove the left pulley holder (27).
3. Remove the oil seal (29) and tap out the left blade shaft (30) with the ball bearings (28), (25), taking care not to damage the grease nipple (20).
4. Remove the oil seal (24).
5. Remove the ball bearings (28), (25) and collar (26) from the blade shaft (30).
6. Remove the right pulley holder (12) and blade shaft (16) as above.

(When reassembling)

- Replace the oil seals (33), (39), (13) and (19) with new ones.

Tightening torque	Outer pulley mounting nut	197 to 225 N·m 20.0 to 23.0 kgf·m 145 to 166 lbf·ft
	Pulley boss mounting nut	24 to 27 N·m 2.4 to 2.8 kgf·m 18 to 20 lbf·ft
	Pulley holder mounting bolt and nut (RCK48-18BX)	48.0 to 55.9 N·m 4.9 to 5.7 kgf·m 35.4 to 41.2 lbf·ft
	Pulley holder mounting bolt and nut (RCK54-23BX, RCK60B-23BX)	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft

(1) Grease Nipple
(2) Outer Pulley Mounting Nut
(3) Spring Washer
(4) Plain Washer
(5) Outer Pulley Boss (Right)
(6) Outer Pulley (Right)
(7) Oil Seal
(8) Ball Bearing
(9) Pulley Holder Mounting Nut
(10) Spring Washer
(11) Collar
(12) Pulley Holder (Right)
(13) Pulley Holder Mounting Bolt
(14) Ball Bearing
(15) Oil Seal
(16) Blade Shaft (Right)
(17) Pulley Holder Mounting Nut
(18) Spring Washer
(19) Pulley Boss Mounting Bolt
(20) Grease Nipple
(21) Outer Pulley Mounting Nut
(22) Spring Washer
(23) Plain Washer
(24) Oil Seal
(25) Ball Bearing
(26) Collar
(27) Pulley Holder (Left)
(28) Ball Bearing
(29) Oil Seal
(30) Blade Shaft (Left)
(31) Pulley Boss Mounting Nut
(32) Spring Washer
(33) Outer Pulley Boss (Left)
(34) Outer Pulley (Left)
(35) Pulley Boss Mounting Bolt
(36) Pulley Holder Mounting Nut
(37) Spring Washer
(38) Pulley Holder Mounting Bolt

(A) RCK48-18BX
(B) RCK54-23BX, RCK60B-22BX

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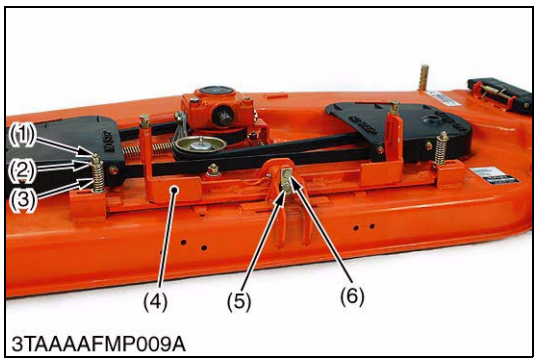

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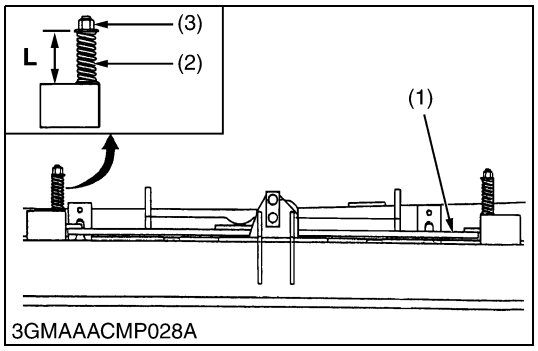

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Balancer

1. Unscrew the lock nut (1) both side.
2. Remove the plain washer (2) and balancer spring (3).
3. Unscrew the center pin bolt (6).
4. Remove the center pin (5) and balancer plate (4).

(When reassembling)

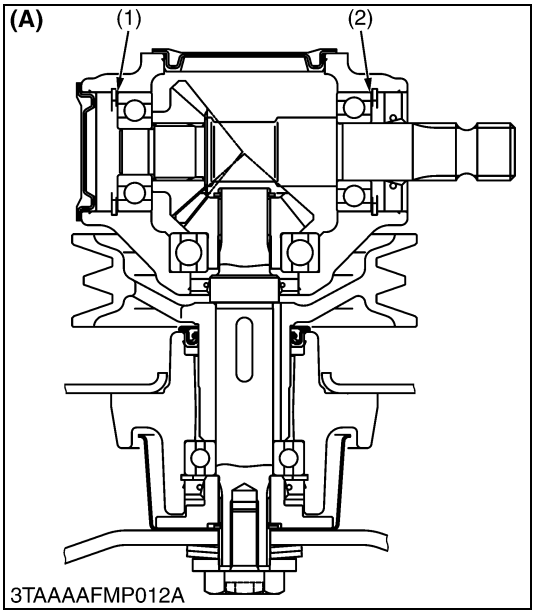
- Apply grease to the center pin (5).
- Adjust the balancer spring (3) length to the factory specification, with lock nut (1).

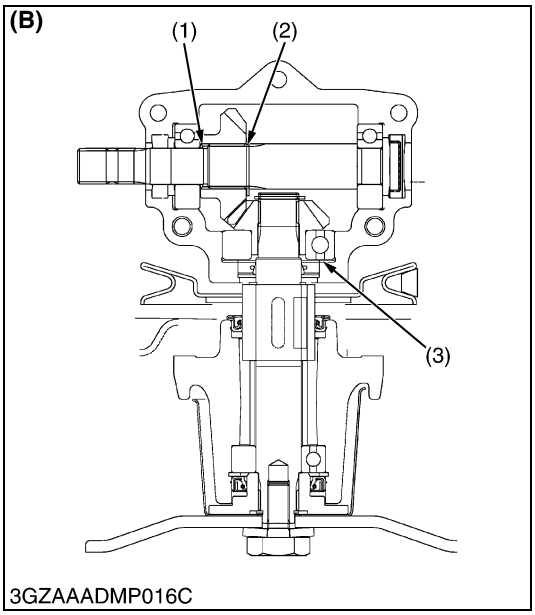
Balancer spring length (**L**) (Right and left)	Factory spec.	55.0 mm 2.17 in.

(1) Lock Nut
(2) Plain Washer
(3) Balancer Spring
(4) Balancer Plate
(5) Center Pin
(6) Center Pin Bolt

W1017924

[3] SERVICING





Turning Torque of Pinion Shaft

1. Remove the mower belt, and reassemble the gear box to the mower deck.
2. Wind a string around the pinion shaft and set a spring balance (or push-pull gauge) to the tip of the string, and then slowly pull the spring balance horizontally to measure the turning force.
3. If the measurement exceeds the factory specification, check the bearing and gears and adjust the adjusting shims (1), (2), (3).

[RCK48-18BX, RCK54-23BX and RCK60B-23BX]

Turning force	Factory spec.	Less than 118 N 12.0 kgf 26.5 lbf
Turning torque	Factory spec.	Less than 1.5 N·m 0.15 kgf·m 1.1 lbf·ft

(Reference)

- Thickness of adjusting shims (1), (2) : 0.2 mm (0.0079 in.)
0.3 mm (0.0118 in.)
- Thickness of adjusting shims (3) : 0.1 mm (0.0039 in.)
0.2 mm (0.0079 in.)

[RCK48P-18BX and RCK54P-23BX]

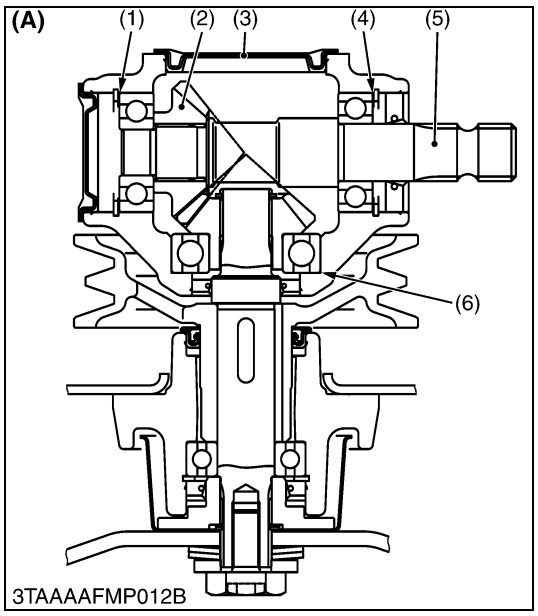
Turning force	Factory spec.	Less than 0.7 N·m 0.07 kgf·m 0.52 lbf-ft

(Reference)

- Thickness of adjusting shims (1), (2) : 0.2 mm (0.0079 in.)
0.3 mm (0.0118 in.)
- Thickness of adjusting shims (3) : 0.2 mm (0.0079 in.)
0.3 mm (0.0118 in.)

(1) Adjusting Shim
(2) Adjusting Shim
(3) Adjusting Shim

(A) RCK48-18BX, RCK54-23BX and RCK60B-23BX
(B) RCK48P-18BX and RCK54P-23BX



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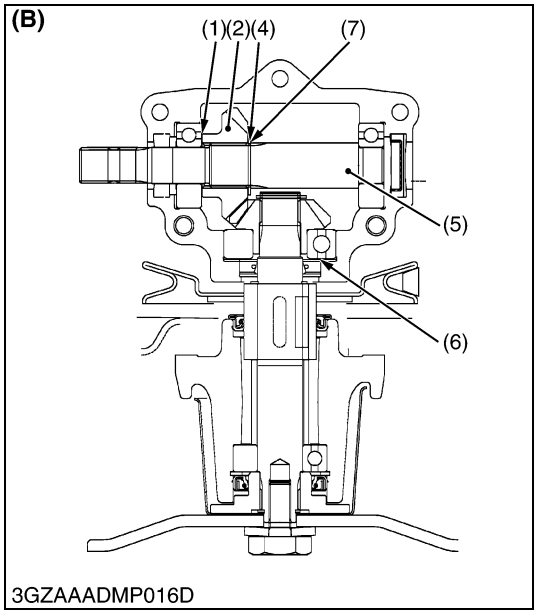

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Backlash between Bevel Gears

1. Remove the gear box cap (3).
2. Place fuses the bevel gear (2) on the input shaft (5).
3. Turn the input shaft (5).
4. Take out the fuses, and measure the thickness of fuses with an outside micrometer. (Backlash equal thickness of fuse)
5. If the backlash exceeds the allowable limit, adjust with shims (1), (4), (6).

[RCK48-18BX, RCK54-23BX and RCK60B-23BX]

Backlash between bevel gears	Factory spec.	0.10 to 0.20 mm 0.0039 to 0.0079 in.
	Allowable limit	0.4 mm 0.0157 in.

(Reference)

- Thickness of adjusting shims (1), (4) : 0.2 mm (0.0079 in.)
  0.3 mm (0.0118 in.)
- Thickness of adjusting shims (6) : 0.1 mm (0.0039 in.)
  0.2 mm (0.0079 in.)

[RCK48P-18BX and RCK54P-23BX]

Backlash between bevel gears	Factory spec.	0.13 to 0.25 mm 0.0051 to 0.0098 in.
	Allowable limit	0.40 mm 0.0157 in.

(Reference)

- Thickness of adjusting shims (1), (4) : 0.2 mm (0.0079 in.)
  0.3 mm (0.0118 in.)
- Thickness of adjusting shims (6) : 0.2 mm (0.0079 in.)
  0.3 mm (0.0118 in.)

(1) Shim
(2) 21T Bevel Gear
(RCK48-18BX, RCK48P-18BX)
19T Bevel Gear
(RCK54-23BX, RCK54P-23BX)
18T Bevel Gear
(RCK60B-23BX)
(3) Gear Box Cap
(4) Shim
(5) Input Shaft
(6) Shim
(7) External Cir Clip

(A) RCK48-18BX, RCK54-23BX and RCK60B-23BX
(B) RCK48P-18BX and RCK54P-23BX

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