Form No. 3445-579 Rev A

TORO

Count on it.

Service Manual

22 Inch AWD/RWD Steel Deck Walk Power Mower Service Manual

Published: March 2022

Revision History

Preface

This service manual was written expressly for Toro service technicians. The Toro Company has made every effort to make the information in this manual complete and correct.

Basic shop safety knowledge and mechanical/electrical skills are assumed. The Table of Contents lists the systems and the related topics covered in this manual.

We are hopeful that you will find this manual a valuable addition to your service shop. If you have any questions or comments regarding this manual, please contact us at the following address:

The Toro Company

RLC/SWS Customer Care Department

8111 Lyndale Avenue South

Bloomington, MN 55420

The Toro Company reserves the right to change product specifications or make changes to this manual without notice.

Service Procedure Icons

The following icons appear throughout this Service Manual to bring attention to specific important details of a service procedure.

Critical Process

This icon is used to highlight:

- Installing safety equipment (shields, guards, seat belts, brakes, and R.O.P.S. components) that may have been removed
- Dimensions or settings that must be maintained for proper machine operation
- A specific fastener tightening sequence
- Component orientation that may not be obvious

Critical Torque

This icon is used to highlight an assembly torque requirement that is different than what is recommended in the Standard Torque Tables.

Fluid Specifications

This icon is used to highlight fluid specifications and capacities that are less common, and may not appear on the machine service decal or in the machine *Operator's Manual.*

Note: Refer to the service decal on the machine and the machine *Operator's Manual* for commonly used fluid specifications and capacities.

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Chapter 1

Safety

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Safety Instructions

DANGER

This safety symbol means danger. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions could cause serious permanent injury, disability, or death.

WARNING

This safety symbol means warning. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions can result in serious injury.

CAUTION

This safety symbol means caution. When you see this symbol, carefully read the instructions that follow. Failure to obey the instructions can result in minor to moderate injury and/or damage to property or equipment.

Think Safety First

Avoid unexpected starting of engine…

Always turn off the engine, remove the ignition key and disconnect the spark plug wire(s) before cleaning, adjusting, or repair.

Avoid lacerations and amputations…

Stay clear of all moving parts whenever the engine is running. Treat all normally moving parts as if they were moving whenever the engine is running or has the potential to start.

Avoid burns…

Do not touch the engine, muffler, or other components, which may be hot during operation, while the unit is running or shortly after it has been running.

Avoid fires and explosions…

Use extreme care in handling fuel. It is flammable and its vapors are explosive. Extinguish all cigarettes, cigars, pipes, and other sources of ignition. Avoid spilling fuel and never smoke while working with any type of fuel or lubricant. Wipe up any spilled fuel or oil immediately. Never remove the fuel cap or add fuel when the engine is running. Always use approved, labeled containers for storing or transporting fuel and lubricants. Do not add or drain fuel in an enclosed space. Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.

Avoid asphyxiation…

Do not operate an engine in a confined area without proper ventilation.

Avoid injury from batteries…

Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Battery gases can explode. Keep cigarettes, sparks and flames away from the battery.

Avoid injury due to inferior parts…

Use only original equipment parts to ensure that important safety criteria are met.

Avoid injury to bystanders…

Always clear the area of bystanders before starting or testing powered equipment.

Avoid injury due to projectiles…

Always clear the area of sticks, rocks or any other debris that could be picked up and thrown by the powered equipment.

Avoid modifications…

Never alter or modify any part unless it is a factory approved procedure.

Avoid unsafe operation…

Always test the safety interlock system after making adjustments or repairs on the machine. Refer to the Electrical section in this manual for more information.

Avoid electrical shock…

Never touch electrical wires or components while the engine is running. They can be sources of shock. De-energize the system if you are having to do repairs. If testing electrical components ensure you are working in a dry environment.

Hydraulic System...

Release all pressure in the hydraulic system before performing any work on the system. Keep your body and hands away from pin-hole leaks or nozzles that eject hydraulic fluid under high pressure. Do not use your hands to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause injury. Seek medical attention right away if hydraulic fluid gets in the skin.

Personal Protective Equipment…

Tie back long hair, and do not wear loose clothing or jewelry. Use appropriate personal protective equipment (PPE) for protecting yourself from potential hazards in the environment in which you will work. Each process outlined in this manual may need different PPE to protect the service person. Use the proper PPE for the task at hand.

Tools…

All tools should be in proper working order. Do not use tools that are broken or in disrepair. Use the proper tool for the proper application.

Lifts, Hoists, and Jacks…

All lifts, hoists, and jacks should be used in accordance with the manufacturer information. Inspect lifts, hoists, and jacks prior to use. Do not overload lifts, hoists, and jacks. Do not work under a suspended load. Ensure chock blocks are used on equipment that can move. Use lifts or jacks and jack stands that are rated to support the total weight of the machine and any attachments. Do not rely on jacks to support the machine. If you are unsure of the operation of any lifts, hoists, and jacks do not use.

Fire Extinguishers…

Think Safety First (continued)

The proper class of fire extinguisher should be used in case of fire.

Class A extinguishers are for ordinary combustible materials such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish. Geometric symbol (green triangle).

Class B fires involve flammable or combustible liquids such as gasoline, kerosene, grease and oil. The numerical rating for class B extinguishers indicates the approximate number of square feet of fire it can extinguish. Geometric symbol (red square).

Class C fires involve electrical equipment, such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish class C fires - the risk of electrical shock is far too great! Class C extinguishers do not have a numerical rating. The C classification means the extinguishing agent is non-conductive. Geometric symbol (blue circle).

ABC fire extinguishers are a dry chemical type used for multiple purposes. See above information for description. Ensure fire extinguishers are serviceable and replace any that are discharged or out of inspection dates

Chapter 2

Specifications and Maintenance

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Specifications

Model	21462	21464	21465	21466/21466T	21467	21468	21472
Engine Manufacture	Briggs and Stratton			Toro (60V)	Honda	Toro (60V)	Briggs and Stratton
Engine Model	7.25 EXI 104M020010F1	625 EXI		60v FLEX-FORCE POWER SYSTEM®	GCV160LA0	60v FLEX-FORCE POWER SYSTEM®	7.25 EXI 104M020010F1
Starter	Zone Start	Recoil/Electric Start		Zone Start			
Engine Oil Capacity	0.44 L (15 fl-oz)			N/A	0.55 L (18.6 fl-oz)	N/A	0.44 L (15 fl-oz)
Engine Oil	SAE 30 or SAE 10W-30 detergent oil			N/A	SAE 30 or SAE 10W-30 detergent oil	N/A	SAE 30 or SAE 10W-30 detergent oil
Cut Width	55.88 cm (22 inches)						
Transmission	Rear Wheel Drive						All Wheel Drive
High Idle (No Load)	3000 ± 100 RPM			N/A	3000 ± 100 RPM	N/A	3000 ± 100 RPM
Front Wheel Size	20.32 cm (8 inches)						
Rear Wheel size	24.51 cm (9.65 inches)						

Torque Specifications

The recommended fastener torque values are listed in the following tables. For critical applications, as determined by Toro, either the recommended torque or a torque that is unique to the application is clearly identified and specified in the service manual.

These torque specifications for the installation and tightening of fasteners shall apply for all fasteners which do not have a specific requirement identified in the service manual. The following factors shall be considered when applying torque: cleanliness of the fastener, use of a thread sealant (Loctite), degree of lubrication on the fastener, presence of a prevailing torque feature, hardness of the surface underneath of the fastener's head, or similar condition which affects the installation.

As noted in the following tables, torque values should be reduced by 25% for lubricated fasteners to achieve the similar stress as a dry fastener. Torque values may also have to be reduced when the fastener is threaded into aluminum or brass. The specific torque value should be determined based on the aluminum or brass material strength, fastener size, length of thread engagement, etc.

The standard method of verifying torque shall be performed by marking a line on the fastener (head or nut) and mating part, then back off fastener 1/4 of a turn. Measure the torque required to tighten the fastener until the lines match up.

Fastener Identification

Inch Series Bolts and Screws

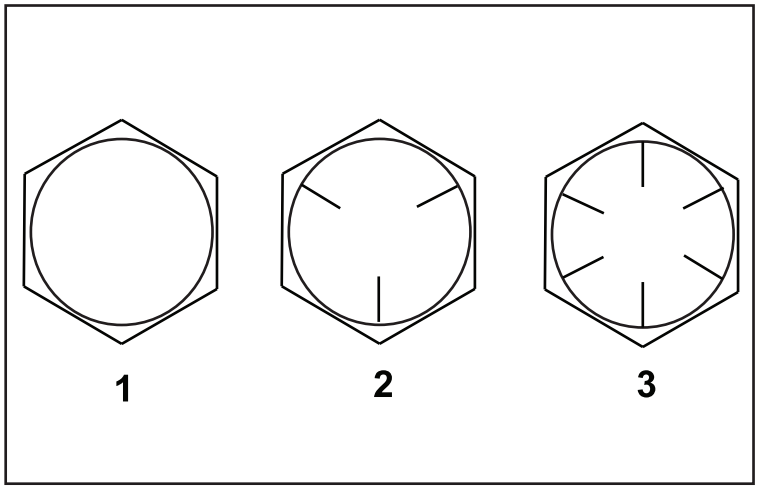

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Figure 1

1. Grade 1
2. Grade 5
3. Grade 8

Metric Bolts and Screws

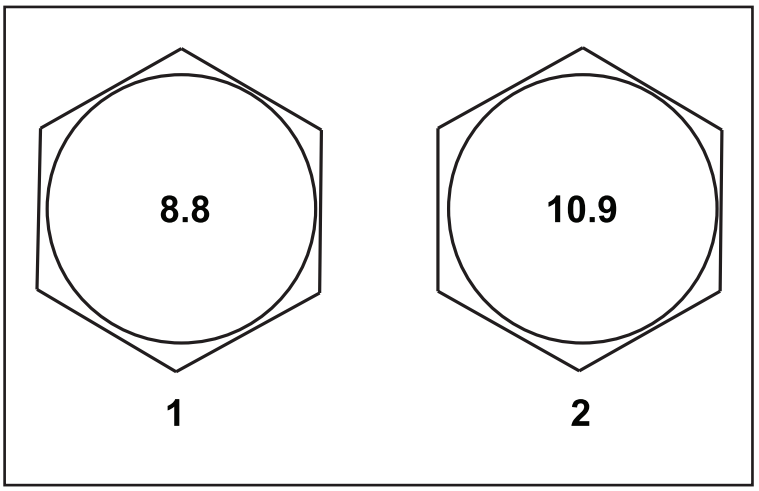

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Figure 2

1. Class 8.8
2. Class 10.9

Standard Torque for Dry, Zinc Plated, and Steel Fasteners (Inch Series)

Thread Size	Grade 1, 5, & 8 Fasteners with Thin Height Nuts	SAE Grade 1 Bolts, Screws, Studes & Sems with Regular Height Nuts (SAE Grade 2 or Better Nut)		SAE Grade 5 Bolts, Screws, Studs & Sems with Regular Height Nuts (SAE Grade 5 or Better Nut)		SAE Grade 8 Bolts, Screws, Studs & Sems with Regular Height Nuts (SAE Grade 8 or Better Nut)	
	in-lb	in-lb	N • cm	in-lb	N • cm	in-lb	N • cm
#6-32 UNC	10 ± 2	13 ± 2	147 ± 23	15 ± 2	169 ± 23	23 ± 3	260 ± 34
#6-40 UNF				17 ± 2	192 ± 23	25 ± 3	282 ± 34
#8-32 UNC	13 ± 2	25 ± 5	282 ± 30	29 ± 3	328 ± 34	41 ± 5	463 ± 56
#8-36 UNF				31 ± 4	350 ± 45	43 ± 5	486 ± 56
#10-24 UNC	18 ± 2	30 ± 5	339 ± 56	42 ± 5	475 ± 56	60 ± 6	678 ± 68
#10-32 UNF				48 ± 5	542 ± 56	68 ± 7	768 ± 79
1/4-20 UNC	48 ± 7	53 ± 7	599 ± 79	100 ± 10	1130 ± 113	140 ± 15	1582 ± 169
1/4-28 UNF	53 ± 7	65 ± 10	734 ± 113	115 ± 12	1299 ± 136	160 ± 17	1808 ± 192
5/16-18 UNC	115 ± 15	105 ± 15	1186 ± 169	200 ± 25	2260 ± 282	300 ± 30	3390 ± 339
5/16-24 UNF	138 ± 17	128 ± 17	1446 ± 192	225 ± 25	2542 ± 282	325 ± 33	3672 ± 373
	ft-lb	ft-lb	N • m	ft-lb	N • m	ft-lb	N • m
3/8-16 UNC	16 ± 2	16 ± 2	22 ± 3	30 ± 3	41 ± 4	43 ± 5	58 ± 7
3/8-24 UNF	17 ± 2	18 ± 2	24 ± 3	35 ± 4	47 ± 5	50 ± 6	68 ± 8
7/16-14 UNC	27 ± 3	27 ± 3	37 ± 4	50 ± 5	68 ± 7	70 ± 7	95 ± 9
7/16-20 UNF	29 ± 3	29 ± 3	39 ± 4	55 ± 6	75 ± 8	77 ± 8	104 ± 11
1/2-13 UNC	30 ± 3	48 ± 7	65 ± 9	75 ± 8	102 ± 11	105 ± 11	142 ± 15
1/2-20 UNF	32 ± 4	53 ± 7	72 ± 9	85 ± 9	115 ± 12	120 ± 12	163 ± 16
5/8-11 UNC	65 ± 10	88 ± 12	119 ± 16	150 ± 15	203 ± 20	210 ± 21	285 ± 28
5/8-18 UNF	75 ± 10	95 ± 15	129 ± 20	170 ± 18	230 ± 24	240 ± 24	325 ± 33
3/4-10 UNC	93 ± 12	140 ± 20	190 ± 27	265 ± 27	359 ± 37	375 ± 38	508 ± 52
3/4-16 UNF	115 ± 15	165 ± 25	224 ± 34	300 ± 30	407 ± 41	420 ± 43	569 ± 58
7/8-9 UNC	140 ± 20	225 ± 25	305 ± 34	430 ± 45	583 ± 61	600 ± 60	813 ± 81
7/8-14 UNF	155 ± 25	260 ± 30	353 ± 41	475 ± 48	644 ± 65	667 ± 66	904 ± 89

Note: Reduce torque values listed in the table above by 25% for lubricated fasteners. Lubricated fasteners are defined as threads coated with a lubricant such as oil, graphite, or thread sealant such as Loctite.

Torque values may have to be reduced when installing fasteners into threaded aluminum or brass. The specific torque value should be determined based on the fastener size, the aluminum or base material strength, length of thread engagement, etc.

The nominal torque values listed above for Grade 5 and 8 fasteners are based on 75% of the minimum proof load specified in SAE J429. The tolerance is approximately ± 10% of the nominal torque value. Thin nuts include jam nuts.

Standard Torque for Dry, Zinc Plated, and Steel Fasteners (Metric Series)

Thread Size	Class 8.8 Bolts, Screws, Studs with Regular Height Nuts (Class 8 or Stronger Nuts)		Class 10.9 Bolts, Screws, Studs with Regular Height Nuts (Class 10 or stronger Nuts)	
	in-lb	N • cm	in-lb	N • cm
M5 X 0.8	57 ± 6	644 ± 68	78 ± 8	881 ± 90
M6 X 1.0	96 ± 10	1085 ± 113	133 ± 14	1503 ± 158
	ft-lb	**N • m**	**ft-lb**	**N • m**
M8 X 1.25	19 ± 2	26 ± 3	28 ± 3	38 ± 4
M10 X 1.5	38 ± 4	52 ± 5	54 ± 6	73 ± 8
M12 X 1.75	66 ± 7	90 ± 10	93 ± 10	126 ± 14
M16 X 2.0	166 ± 17	255 ± 23	229 ± 23	310 ± 31
M20 X 2.5	325 ± 33	440 ± 45	450 ± 46	610 ± 62

Note: Reduce torque values listed in the table above by 25% for lubricated fasteners. Lubricated fasteners are defined as threads coated with a lubricant such as oil, graphite, or thread sealant such as Loctite.

Torque values may have to be reduced when installing fasteners into threaded aluminum or brass. The specific torque value should be determined based on the fastener size, the aluminum or base material strength, length of thread engagement, etc.

The nominal torque values listed above are based on 75% of the minimum proof load specified in SAE J1199. The tolerance is approximately ± 10% of the nominal torque value. Thin height nuts include jam nuts.

SAE Grade 8 Steel Set Screws

Thread Size	Recommended Torque	
	Square Head	Hex Socket
1/4 - 20 UNC	140 ± 20 in-lb	73 ± 12 in-lb
5/16 - 18 UNC	215 ± 35 in-lb	145 ± 20 in-lb
1/2 - 13 UNC	75 ± 15 ft-lb	50 ± 10 ft-lb
3/8 - 16 UNC	35 ± 10 ft-lb	18 ± 3 ft-lb

Wheel Bolts and Lug Nuts

Thread Size	Recommended Torque**	
7/16 - 20 UNF Grade 5	65 ± 10 ft-lb	88 ± 14 N • m
1/2 - 20 UNF Grade 5	80 ± 10 ft-lb	108 ± 14 N • m
M12 X 1.25 Class 8.8	80 ± 10 ft-lb	108 ± 14 N •m
M12 X 1.5 Class 8.8	80 ± 10 ft-lb	108 ± 14 N • m

**For steel wheels and non-lubricated fasteners.

Thread Cutting Screws (Zinc Plated Steel)

Type 1, Type 23, or Type F	
Thread Size	**Baseline Torque***
No. 6 - 32 UNC	20 ± 5 in-lb
No. 8 - 32 UNC	30 ± 5 in-lb
No. 10 - 24 UNC	38 ± 7 in-lb
1/4 - 20 UNC	85 ± 15 in-lb
5/16 - 18 UNC	110 ± 20 in-lb
3/8 - 16 UNC	200 ± 100 in-lb

*Hole size, material strength, material thickness and finish must be considered when determining specific torque values. All torque values are based on non-lubricated fasteners.

Conversion Factors

in-lb X 11.2985 = N • cm

ft-lb X 1.3558 = N • m

N • cm X 0.08851 = in-lb

N • cm X 0.73776 = ft-lb

Thread Cutting Screws (Zinc Plated Steel)

Threads Size	Threads per Inch		Baseline Torque*
	Type A	Type B	
No. 6	18	20	20 ± 5 in-lb
No. 8	15	18	30 ± 5 in-lb
No. 10	12	16	38 ± 7 in-lb
No. 12	11	14	85 ± 15 in-lb

*Hole size, material strength, material thickness and finish must be considered when determining specific torque values. All torque values are based on non-lubricated fasteners.

Equivalents and Conversions

Decimal and Millimeter Equivalents

Fractions	Decimals	mm	Fractions	Decimals	mm
1/64	0.015625	0.397	**33/64**	0.515625	13.097
1/32	0.03125	0.794	**16/32**	0.53125	13.484
3/64	0.046875	1.191	**35/64**	0.546875	13.891
1/16	0.0625	1.588	**9/16**	0.5625	14.288
5/64	0.078125	1.984	**37/64**	0.578125	14.684
3/32	0.9375	2.381	**19/32**	0.59375	15.081
1/8	0.1250	3.175	**5/8**	0.6250	15.875
9/64	0.140625	3.572	**41/64**	0.640625	16.272
5/32	0.15625	3.969	**21/32**	0.65625	16.669
11/64	0.171875	4.366	**43/64**	0.671875	17.066
3/16	0.1875	4.762	**11/64**	0.6875	17.462
13/64	0.203125	5.159	**45/64**	0.703125	17.859
7/32	0.21875	5.556	**23/32**	0.71875	18.256
15/64	0.234375	5.953	**47/64**	0.734375	18.653
1/4	0.2500	6.350	**3/4**	0.7500	19.050
17/64	0.265625	6.747	**49/64**	0.765625	19.447
9/32	0.28125	7.144	**25/32**	0.78125	19.844
19/64	0.296875	7.541	**51/64**	0.796875	20.241
5/16	0.3125	7.541	**13/16**	0.8125	20.638
21/64	0.328125	8.334	**53/64**	0.828125	21.034
11/32	0.34375	8.731	**27/32**	0.84375	21.431
23/64	0.359375	9.128	**55/64**	0.859375	21.828
3/8	0.3750	9.525	**7/8**	0.8750	22.225
25/64	0.390625	9.922	**57/64**	0.890625	22.622
13/32	0.40625	10.319	**29/32**	0.90625	23.019
27/64	0.421875	10.716	**59/64**	0.921875	23.416
7/16	0.4375	11.112	**15/16**	0.9375	23.812
29/64	0.453125	11.509	**61/64**	0.953125	24.209
15/32	0.46875	11.906	**31/32**	0.96875	24.606
31/64	0.484375	12.303	**63/64**	0.984375	25.003
1/2	0.5000	12.700	**1**	1.000	25.400
1 mm = 0.03937 in.			**0.001 in. = 0.0254 mm**		

U.S. to Metric Conversions

	To Convert	Into	Multiply By
Linear Measurement	Miles	Kilometers	1.609
	Yards	Meters	0.9144
	Feet	Meters	0.3048
	Feet	Centimeters	30.48
	Inches	Meters	0.0254
	Inches	Centimeters	2.54
	Inches	Millimeters	25.4
Area	Square Miles	Square Kilometers	2.59
	Square Feet	Square Meters	0.0929
	Square Inches	Square Centimeters	6.452
	Acre	Hectare	0.4047
Volume	Cubic Yards	Cubic Meters	0.7646
	Cubic Feet	Cubic Meters	0.02832
	Cubic Inches	Cubic Centimeters	16.39
Weight	Tons (Short)	Metric Tons	0.9078
	Pounds	Kilograms	0.4536
	Ounces	Grams	28.3495
Pressure	Pounds/Square Inch	Kilopascal	6.895
Work	Foot-Pounds	Newton-Meters	1.356
	Foot-Pounds	Kilogram-Meters	0.1383
	Inch-Pounds	Kilogram-Centimeters	1.152144
Liquid Volume	Quarts	Liters	0.9463
	Gallons	Liters	3.785
Liquid Flows	Gallons/Minute	Liters/Minute	3.785
Temperature	Fahrenheit	Celsius	1. Subtract by 32°
			2. Multiply by 5/9

Chapter 3

Troubleshooting

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GEARS

The Systematic approach to defining, diagnosing and solving problems.

G

Gather Information

- Information reported by the customer
- Information observed by you
- Establish the what, where and when of the issue

E

Evaluate Potential Causes

- Consider possible causes of the problem to develop a hypothesis
- Narrow down the focus of the problem

A

Assess Performance

- Ensure you have all the necessary tools for testing
- Test all potential causes of the failure
- Reevaluate and create new hypotheses if necessary

R

Repair

- Return the unit to service by repairing, rebuilding or replacing

S

Solution Confirmation

- Did the issue go away
- Was the root cause of the issue correctly repaired
- Are there any other new symptoms

General Troubleshooting

Problem	Possible Cause	Corrective Action
The grass blows out the front of the rear bag door	Incorrect alignment of the rear height-of-cut plates.	Correctly align the height-of-cut plates.
	The rear bag door is warped.	Replace the rear bag door.
The drive is weak	The PERSONAL PACE® torsion spring is over wound.	Remove and install the PERSONAL PACE® torsion spring with the correct wrap.
	The belt is worn.	Replace the belt.
	The pulley is worn.	Replace the pulley.
	The traction cable spring is disconnected.	Install the traction cable end to the transmission.
The handle pulls too far backwards towards the operator	The PERSONAL PACE® handle pins are missing.	Disassemble the PERSONAL PACE® handle and install the handle pins.
There is a delayed engagement in the drive	The PERSONAL PACE® handle pins are missing.	Disassemble the PERSONAL PACE® handle and install the handle pins.
The wheels fall off	The wheel bolt threads are damaged.	Replace the wheel bolt.
	The pivot arm threads are damaged.	Replace the pivot arm.
	The wheel bolt is not torqued correctly.	1. Apply thread locker to the wheel bolt threads. 2. Install the wheel bolt and tighten to the correct torque.
Error beeps are coming from the powerhead	The powerhead is faulty.	Refer to the 60v WPM Service Manual for the error beep table.

Chapter 4

Power Source

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General Information

This mower is powered by a gas engine or a 60v powerhead. In both cases, replacement of the assembly only varies slightly.

Service and Repairs

Engine Assembly 1

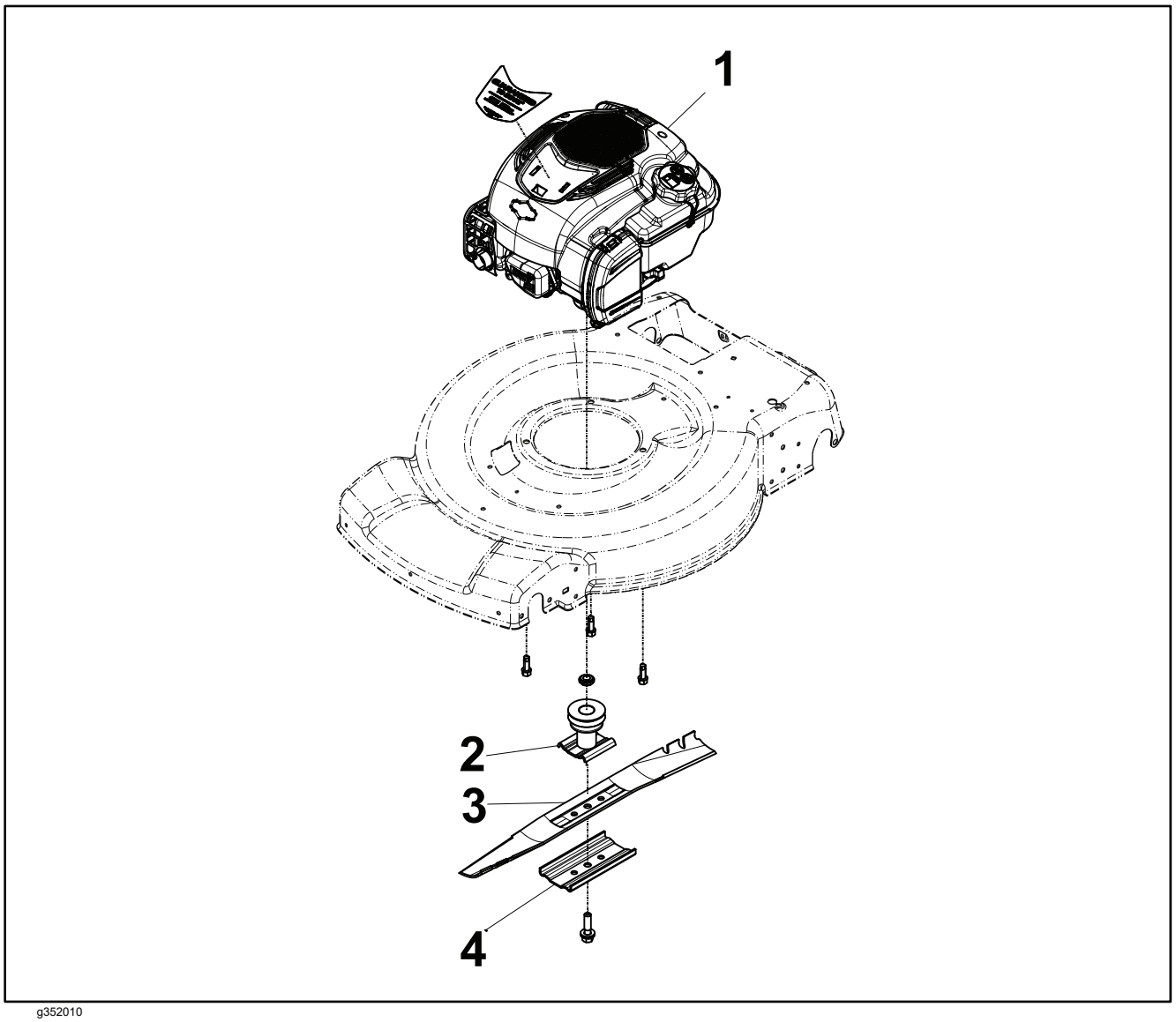

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Figure 3

1. Briggs Engine
2. Blade Driver Assembly
3. 22–inch Blade
4. Blade Support

Engine Assembly 2

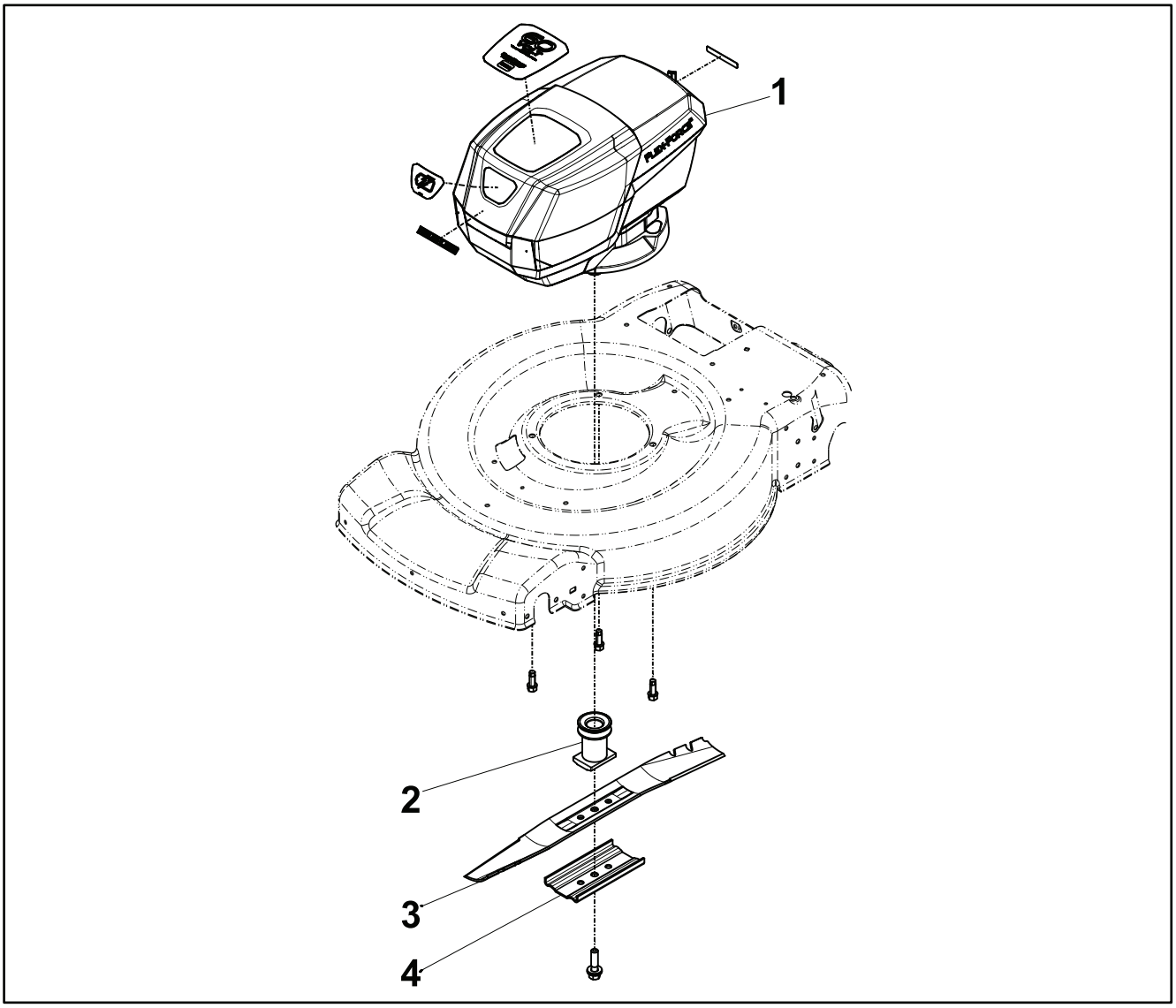

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Figure 4

1. 60V Module Motor
2. Blade Driver
3. Blade
4. Blade Support

Engine/Powerhead Replacement

Engine/Powerhead Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly, if attached.
5. Remove the brake cable from the engine. Brake Cable Removal (page 5–4)
6. Remove the blade the from the engine crank. Refer to the product Operator's Manual for the blade removal procedures.
7. Relieve the belt tension by rocking the transmission forward and removing the belt from the blade drive.
8. Remove the blade driver from the crank.

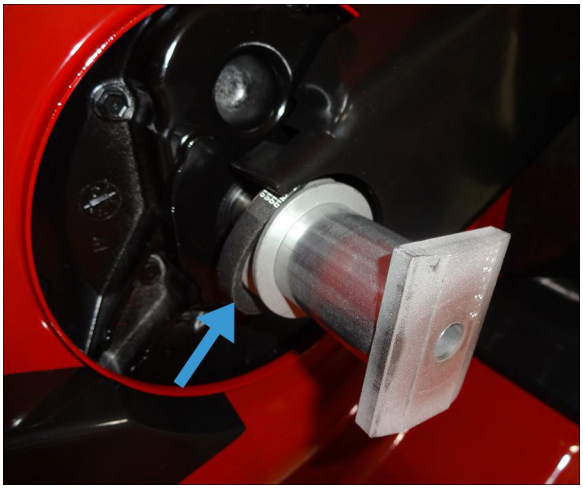

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Figure 5

9. Remove the (1/4 x 1.33 inch) shoulder screw securing the bottom intake cover to the deck.

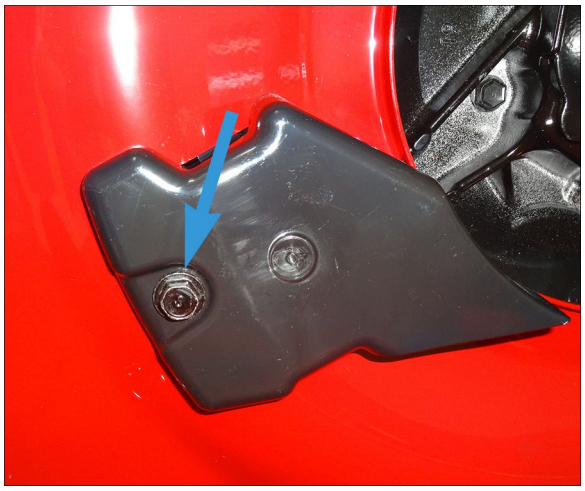

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Figure 6

10. Remove the 3 (3/8–16 x 1.0 inch) screws securing the engine/powerhead to the deck.

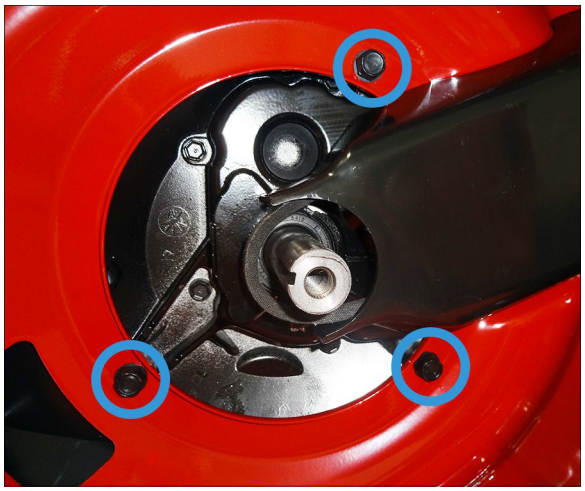

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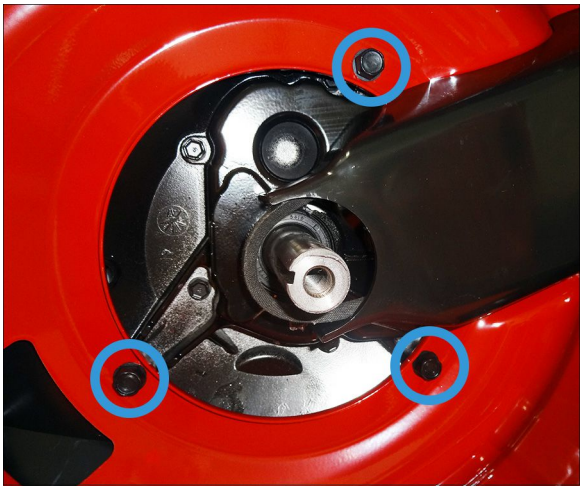
Figure 7

11. Remove the engine/powerhead from the deck.

Engine/Powerhead Installation

1. Install the engine/powerhead onto the deck.

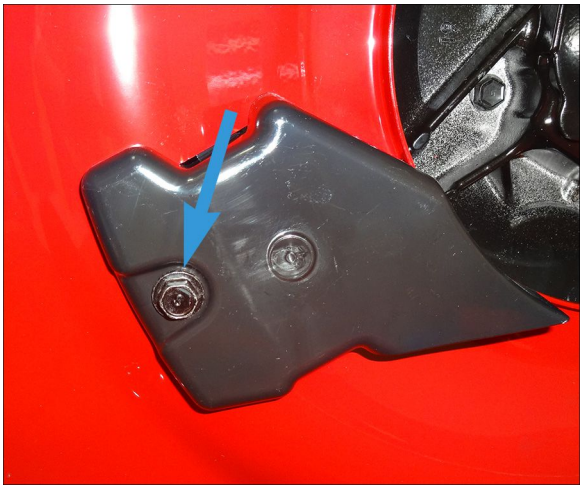
2. Install the 3 (3/8–16 x 1.0 inch) screws securing the engine/powerhead to the deck. Torque the screws to 45.19–56.49 N • m (400–500 in-lbs).



g352013

Figure 8

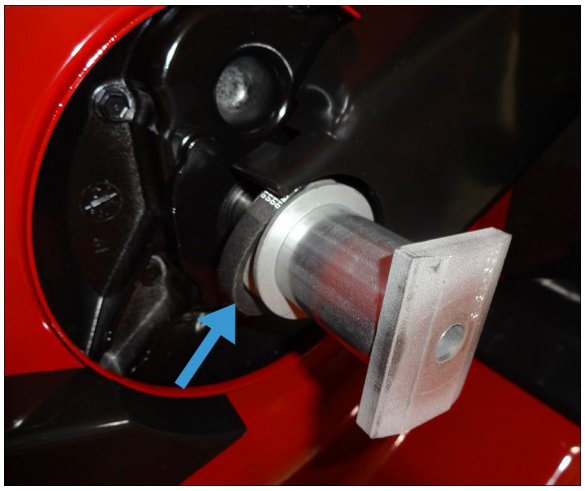
3. Install the (1/4 x 1.33 inch) shoulder screw securing the bottom intake cover to the deck. Torque the screw to 3.39 ± 0.339 N • m (30 ± 3 in-lbs).



g352012

Figure 9

4. Install the blade driver onto the crank.



g352011

Figure 10

5. Install the belt onto the drive blade.
6. Install the blade onto the engine crank. Refer to the product Operator's Manual for the blade installation procedures.
7. Install the brake cable. Brake Cable Installation (page 5–6)

8. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
9. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

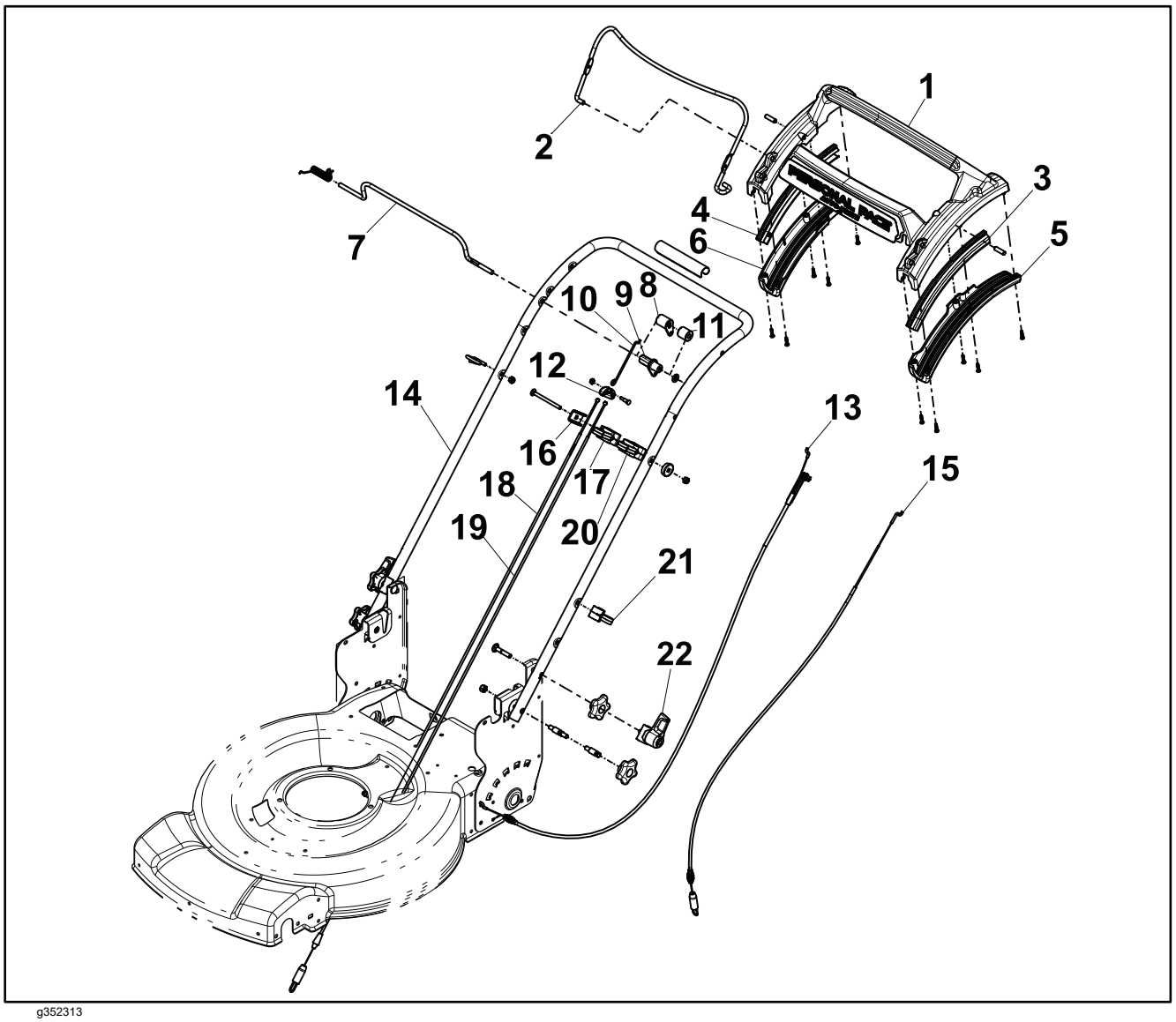
Table of Contents

General Information

The RWD has 1 cable to operate the system and the AWD has 2 cables. The cable is tensioned to engage the drive, setting the proper cable tension is key for the correct operation and feel of the PERSONAL PACE® system.

Service and Repairs

Controls Assembly



g352313

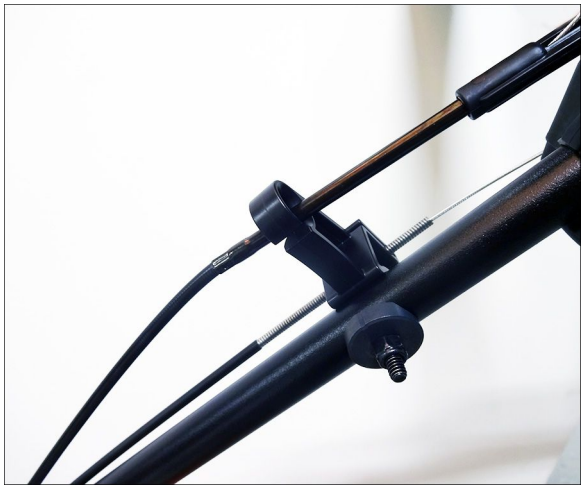
Figure 11

1. Curved PERSONAL PACE® Handle
2. Brake Bail
3. LH Curved Guide
4. RH Curved Guide
5. LH Bottom Handle
6. RH Bottom Handle
7. Traction Control Rod
8. AWD Traction Lever
9. RWD Traction Lever
10. Equalizer Linkage
11. AWD Traction Lever Spacer
12. Cable Yoke
13. Brake Cable
14. Curved Handle
15. RWD Traction Cable
16. Cable Clamp
17. RWD Cable Anchor
18. AWD Front Traction Cable
19. AWD Rear Traction Cable
20. AWD Cable Anchor
21. Quick Release Assembly

Brake Cable Replacement

Brake Cable Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the brake cable from the cable anchor.



g352637

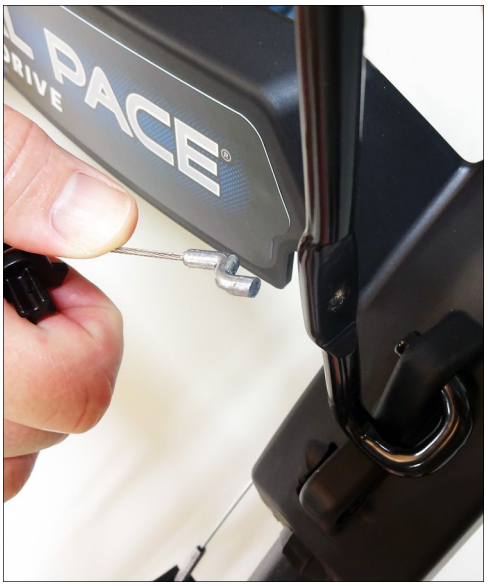
Figure 12

6. At a 90º angle, remove the brake cable from the PERSONAL PACE® handle.

g352638

Figure 13

7. Remove the z bend of the brake cable from the bail.



g352639

Figure 14

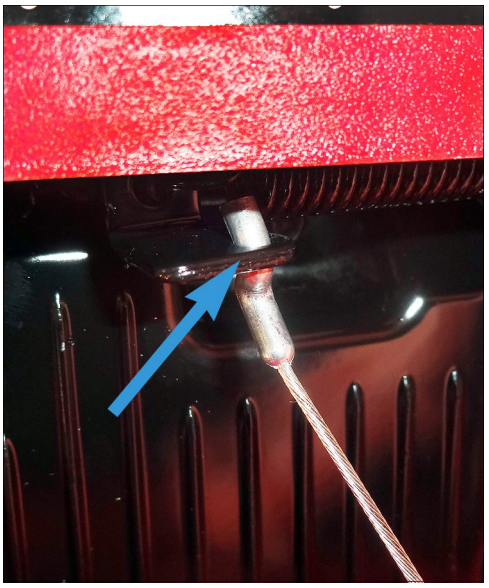
8. Remove the bail from the PERSONAL PACE® handle assembly.
9. Spread and remove the cable guide from the curved handle.
10. Using a needle nose pliers, remove the brake cable anchor from the engine assembly.

g352640

Figure 15

11. Remove the z bend of the brake cable from the anchor.

Brake Cable Removal (continued)

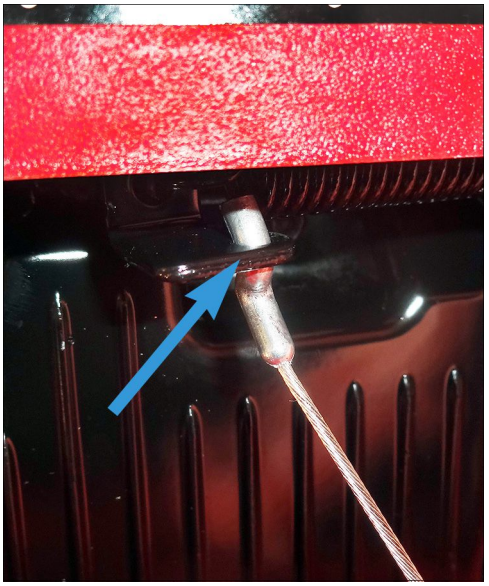


g352641

Figure 16

Brake Cable Installation

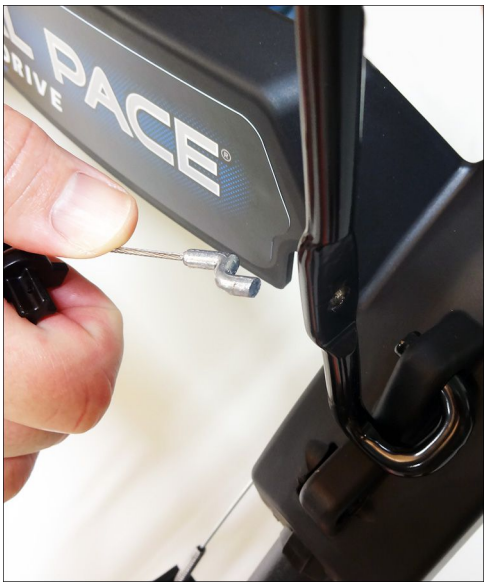
1. Install the z bend of the brake cable onto the anchor.



g352641

Figure 17

2. Install the brake cable anchor onto the engine assembly by pressing the cable anchor into the switch assembly.
3. Install the cable guide onto the curved handle.
4. Install the bail onto the PERSONAL PACE® handle assembly.
5. Install the z bend of the brake cable onto the bail.



g352639

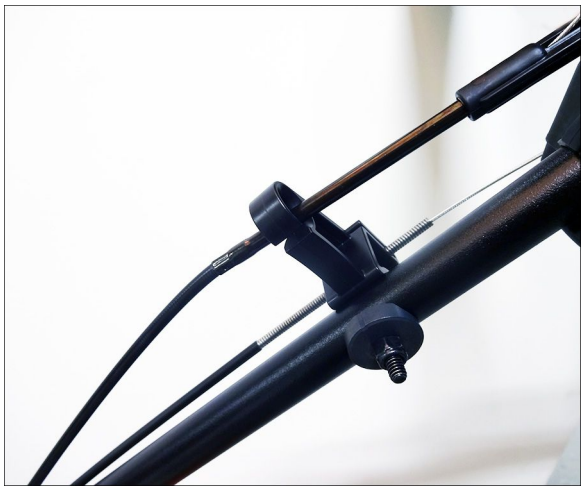
Figure 18

6. Install the brake cable onto the PERSONAL PACE® handle.

g352638

Figure 19

7. Install the brake cable into the cable anchor.



g352637

Figure 20

8. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
9. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

RWD Traction Cable Replacement

RWD Traction Cable Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Using a 3/8 inch wrench, remove the lock nut and curved washer from the cable anchor.

g352893

Figure 21

6. Slide the traction cable upwards and remove the cable anchor from the traction cable.

g352894

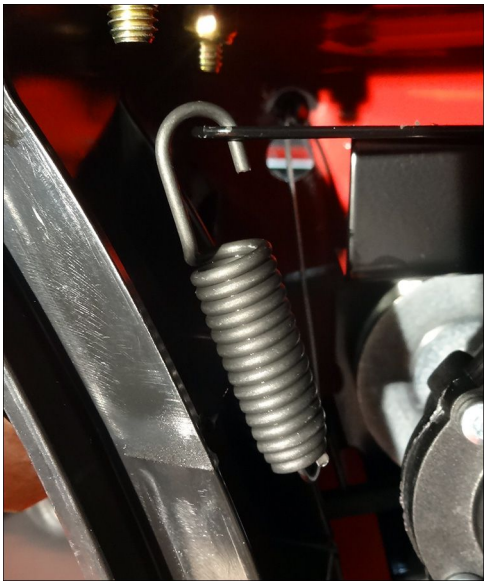
Figure 22

7. Remove the z bend of the traction cable from the traction lever.

g352895

Figure 23

8. At the transmission, pull the traction cable spring downwards and unhook the spring from the traction bracket.

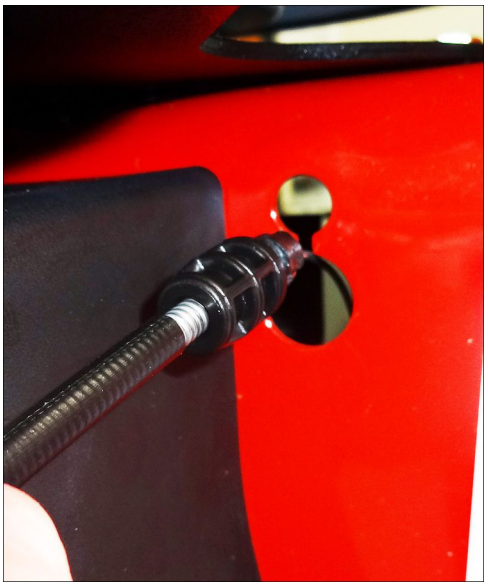


g352896

Figure 24

9. Using a needle nose pliers, pinch and remove the traction cable anchor from the deck.

RWD Traction Cable Removal (continued)



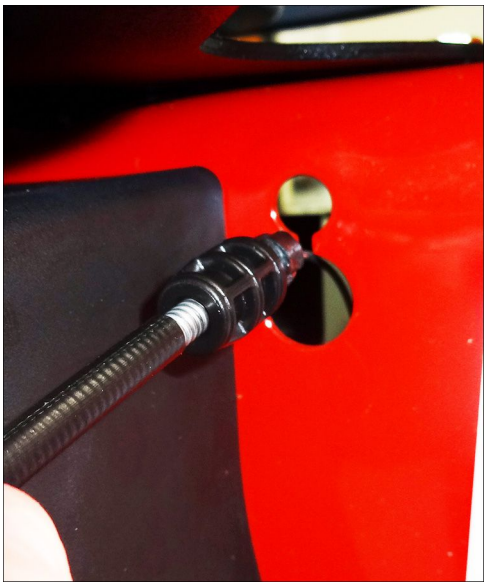
g352897

Figure 25

10. Remove the cable through the large hole in the deck.

RWD Traction Cable Installation

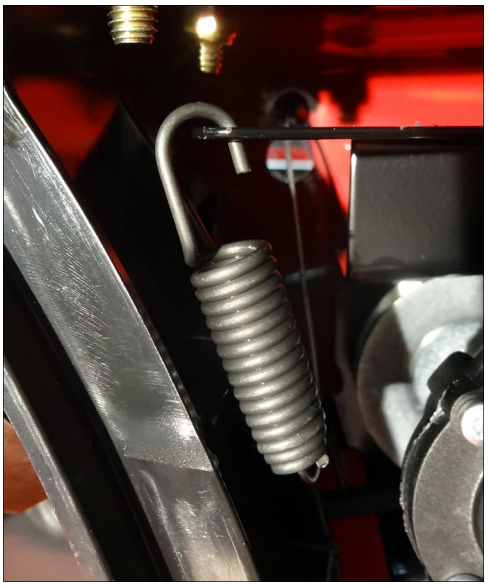
1. Route the traction control cable through the chassis. Install the traction cable anchor into the deck.



g352897

Figure 26

2. At the transmission, install the traction cable spring onto the traction cable bracket.



g352896

Figure 27

3. Install the z bend of the traction cable onto the traction lever.

g352895

Figure 28

4. Install and slide the cable anchor onto the traction cable.

g352894

Figure 29

5. Using a 3/8 inch wrench, install the lock nut and curved washer securing the cable anchor to the handle. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).

g352893

Figure 30

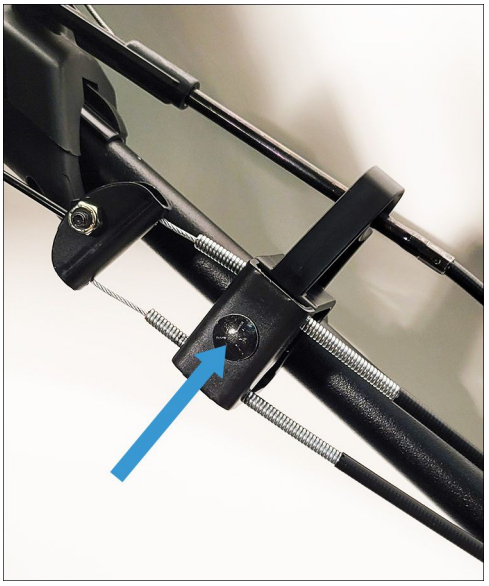
6. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

7. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

AWD Front Traction Cable Replacement

AWD Front Traction Cable Removal

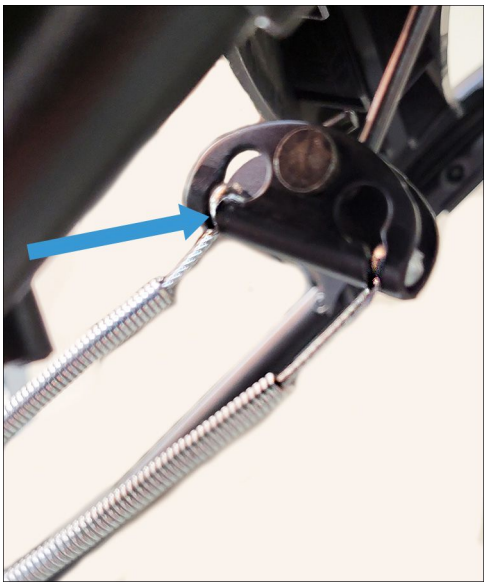
1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. Remove the grass bagger assembly if attached.
3. Remove the nut and (1/4–20 inch) carriage bolt securing the cable anchor to the handle.



g359929

Figure 31

4. Remove the plastic cable clamp and washer.
5. Remove the front traction cable from the cable yoke.



g359932

Figure 32

6. Remove the upper intake from the deck. Upper Intake Removal (page 6–18)
7. Remove the front traction cable anchor from the transmission mount and the cable return spring from the deck.

AWD Front Traction Cable Removal (continued)

g359933

Figure 33

1. Cable Return Spring
2. Front Traction Cable Anchor

8. Remove the front traction cable from the unit.

AWD Front Traction Cable Installation

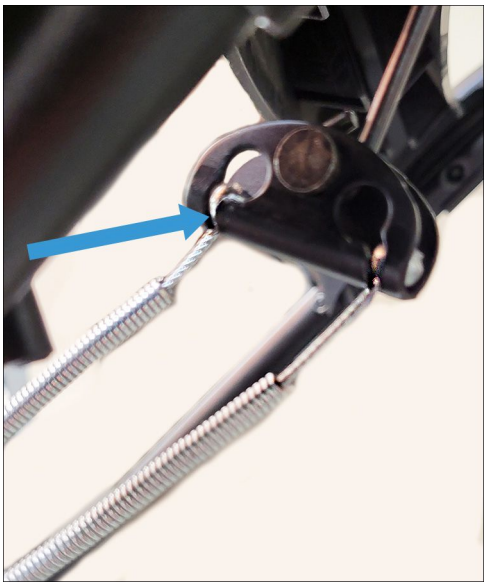
1. Install the cable return spring to the deck and the front traction control cable anchor to the transmission mount.

g359933

Figure 34

1. Cable Return Spring
2. Front Traction Cable Anchor

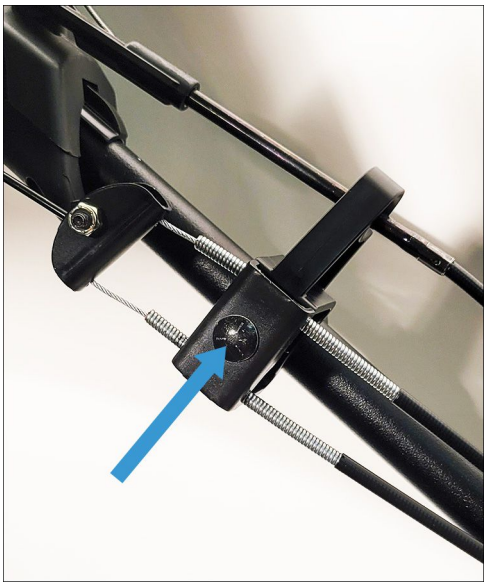
2. Install the upper intake to the deck. Upper Intake Installation (page 6–19)
3. Install the front traction cable to the cable yoke.



g359932

Figure 35

4. Install the plastic cable clamp, secure with the (1/4–20 inch) carriage bolt, washer, and nut. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).



g359929

Figure 36

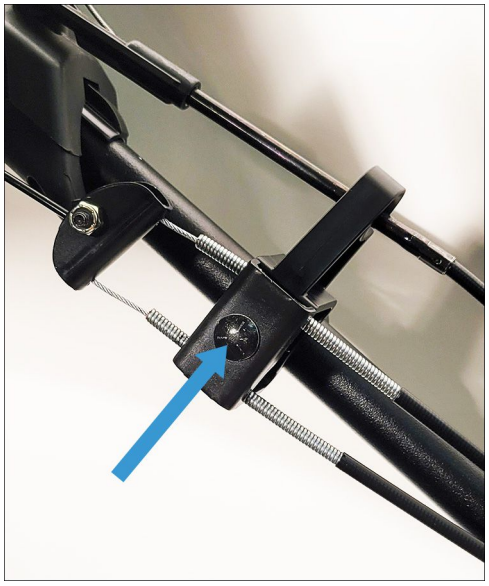
5. Verify the proper cable tension by measuring from the end of cable clamp to the end of the cable conduit. The measurement should be approximately 0.15 cm (0.06 inches). Adjustment may be necessary depending on usage.

AWD Rear Traction Cable Replacement

AWD Rear Traction Cable Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.

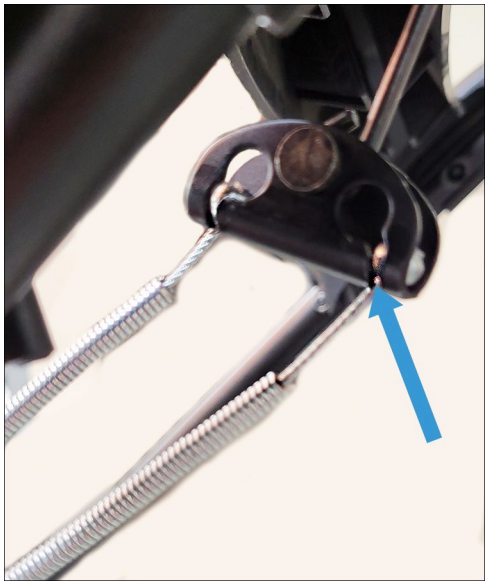
2. Remove the grass bagger assembly if attached.
3. Remove the nut and (1/4–20 inch) carriage bolt securing the cable anchor to the handle.



g359929

Figure 37

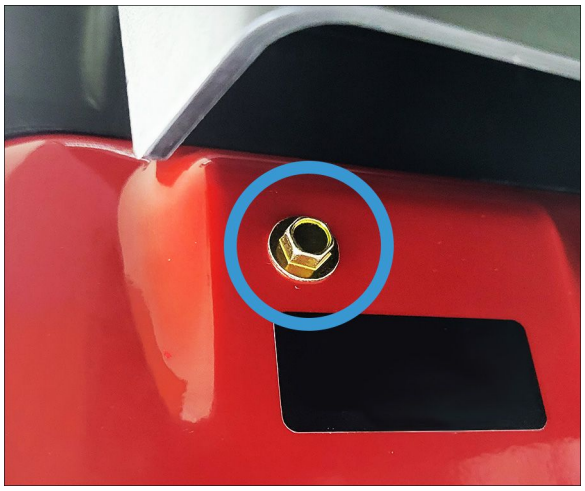
4. Remove the plastic cable clamp and washer.
5. Remove the rear traction cable from the cable yoke.



g359930

Figure 38

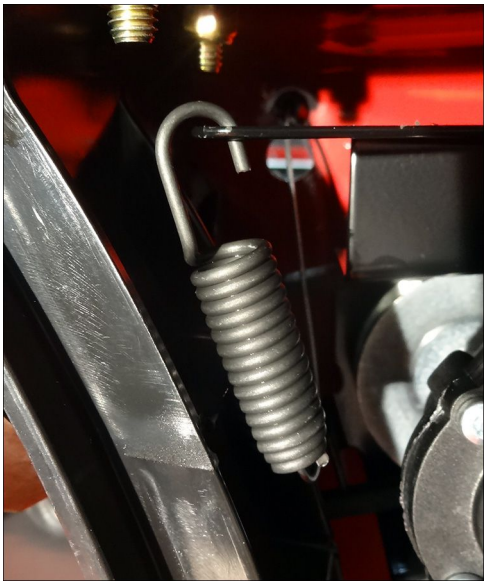
6. Remove the (1/4–20 inch) screw securing the transmission to the deck.



g359931

Figure 39

7. Rotate the transmission forward to gain access to the cable anchor on the belt guide.
8. Release the cable anchor and disconnect the rear traction cable from the transmission arm.



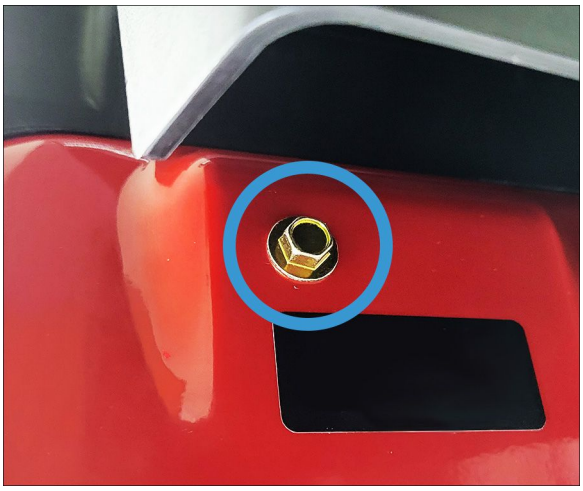
g352896

Figure 40

9. Remove the rear traction cable from the unit.

AWD Rear Traction Cable Installation

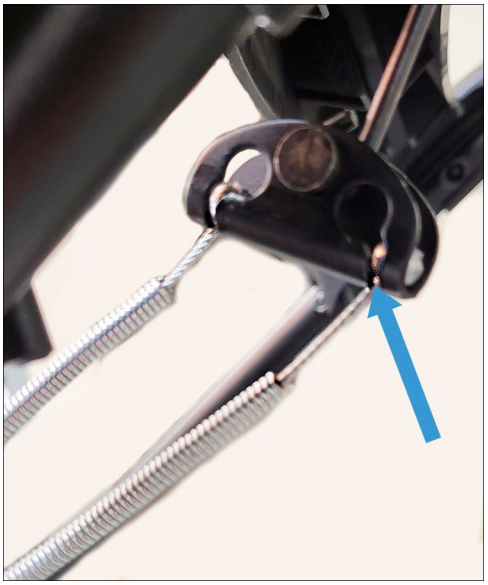
1. Connect the rear traction cable to the traction arm.
2. Install the cable anchor to the belt guide.
3. Install the (1/4–20 inch) screw securing the transmission to the deck. Torque the screw to 9.04 ± 1.69 N • m (80 ± 15 in-lbs).



g359931

Figure 41

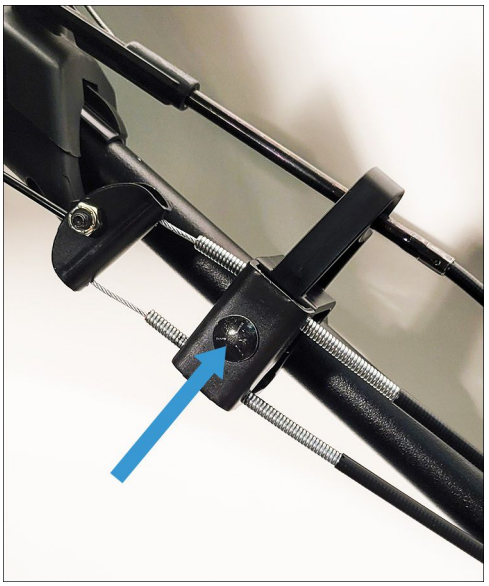
4. Install the rear traction cable to the cable yoke.



g359930

Figure 42

5. Install the plastic cable clamp, secure with the (1/4–20 inch) carriage bolt, washer, and nut. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).



g359929

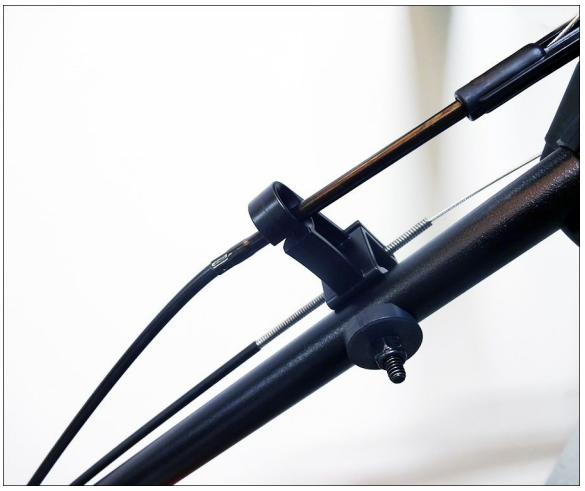
Figure 43

6. Verify the proper cable tension by measuring from the end of cable clamp to the end of the cable conduit. The measurement should be approximately 0.15 cm (0.06 inches). Adjustment may be necessary depending on usage.

RWD PERSONAL PACE® Handle Assembly Replacement

RWD PERSONAL PACE® Assembly Handle Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the recoil rope from the rope guide.
6. Remove the brake cable from the cable anchor.



g352637

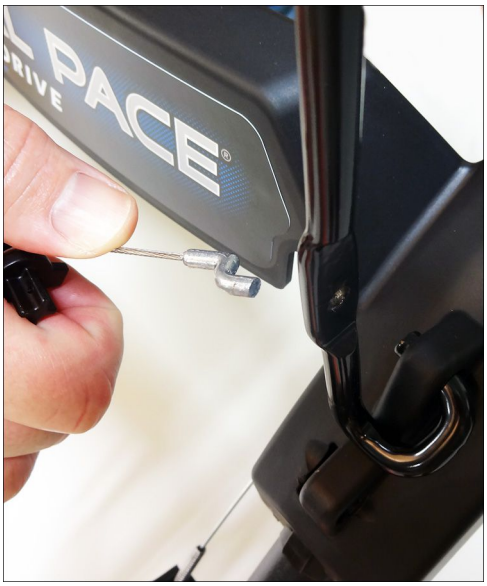
Figure 44

7. At a 90º angle, remove the brake cable from the PERSONAL PACE® handle.

g352638

Figure 45

8. Remove the z bend of the brake cable from the bail.



g352639

Figure 46

9. From the RH side of the unit, remove the bail from the PERSONAL PACE® handle assembly.

g353037

Figure 47

10. Using a 3/8 inch wrench, remove the lock nut and curved washer from the cable anchor.

g352893

Figure 48

11. In an upwards motion, slide and remove the cable anchor from the traction cable.

g352894

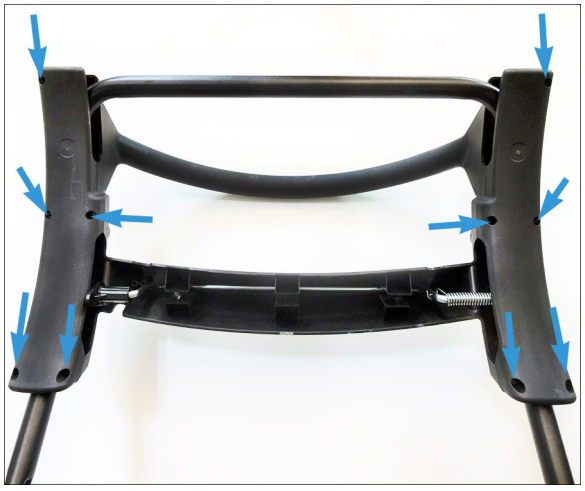
Figure 49

12. Remove the z bend of the traction cable from the traction lever.

g352895

Figure 50

13. Remove the 10 (M4.2 x 2.0) screws securing the LH and RH bottom handles and curved PERSONAL PACE® handle to the curved handle.



g353048

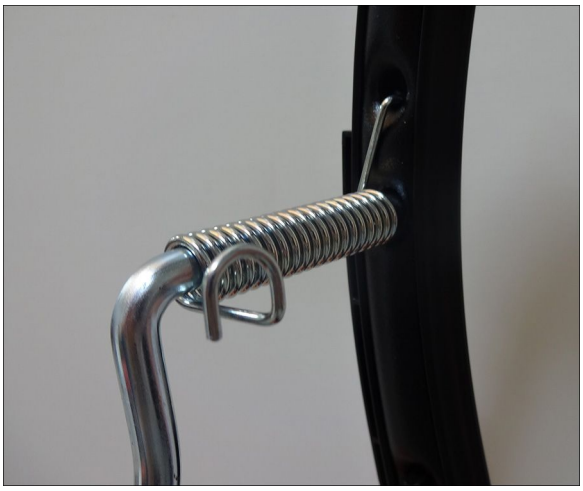
Figure 51

14. Pull and remove the curved PERSONAL PACE® handle from the curved handle.

    Note: The handle pins may fall off when the upper PERSONAL PACE® handle is removed.

15. Remove the torsion spring from the curved handle.

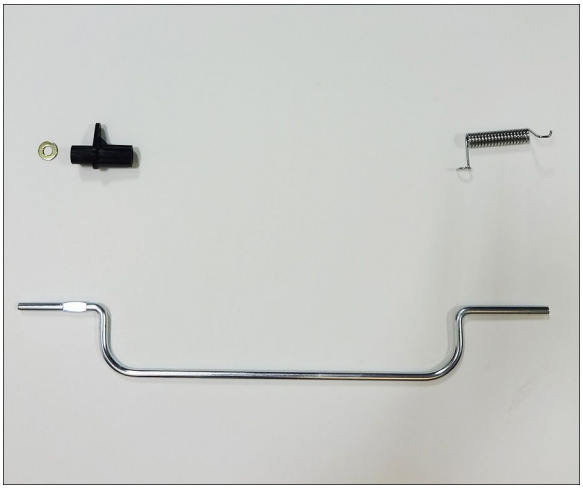
RWD PERSONAL PACE® Assembly Handle Removal (continued)



g353082

Figure 52

16. Remove the RH curved guide from the curved handle.
17. Slide the traction rod to the right, remove the traction rod from the curved handle.
18. Remove the traction lever and washer from the LH side of the traction rod. Remove the torsion spring from the RH side of the traction rod.



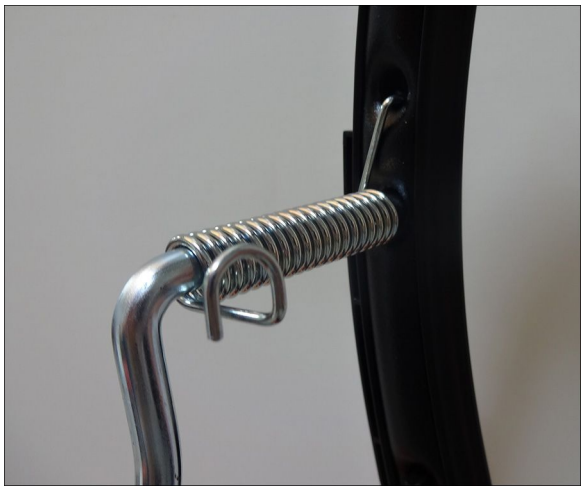
g353179

Figure 53

19. Remove the LH curved guide from the curved handle.

RWD PERSONAL PACE® Handle Assembly Installation

1. Install the traction lever and washer onto the LH side of the traction rod.
2. Install the torsion spring onto the RH side of the traction rod.
3. Install the LH and RH curved guides onto the curved handle.
4. Install the traction rod onto the curved handle.
5. Install the torsion spring onto the curved handle.



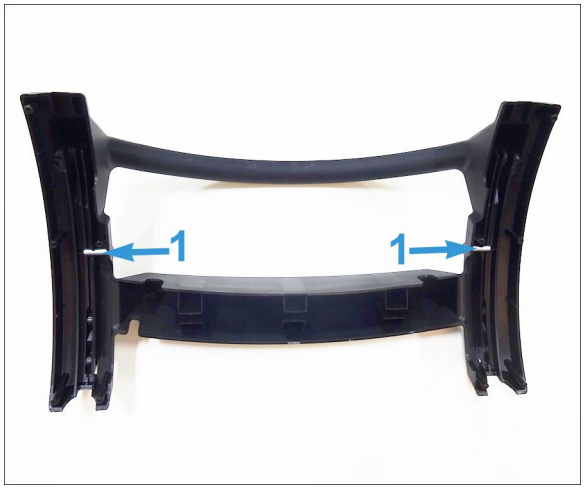
g353082

Figure 54

6. Point the traction lever upwards and rotate the traction rod 3/4 turn so that the traction lever is pointing backwards. Install the upper PERSONAL PACE® handle onto the curved handle.

   Note: The spring has half of the rotation wrap when fully assembled.

7. If the handle pins were removed from the upper PERSONAL PACE® handle, install the handle pins.

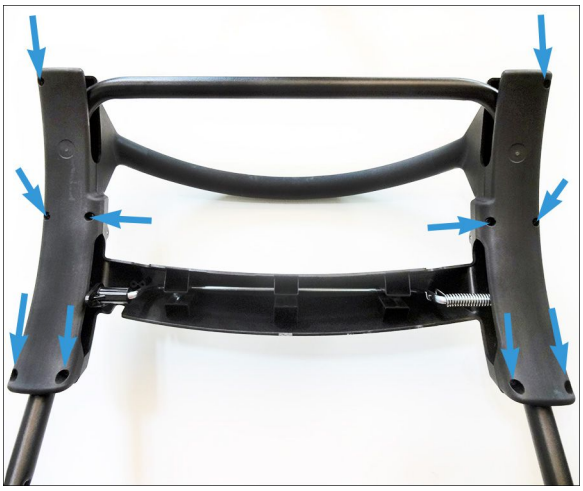


g353060

Figure 55

1. Handle Pins

8. Install the 10 (M4.2 x 2.0) screws securing the LH and RH bottom handles and upper PERSONAL PACE® handle to the curved handle. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).



g353048

Figure 56

9. Install the z bend of the traction cable onto the traction lever.

g352895

Figure 57

10. Install and slide the cable anchor onto the traction cable.

g352894

Figure 58

11. Using a 3/8 inch wrench, install the curved washer and lock nut securing the cable anchor to the curved handle. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).

g352893

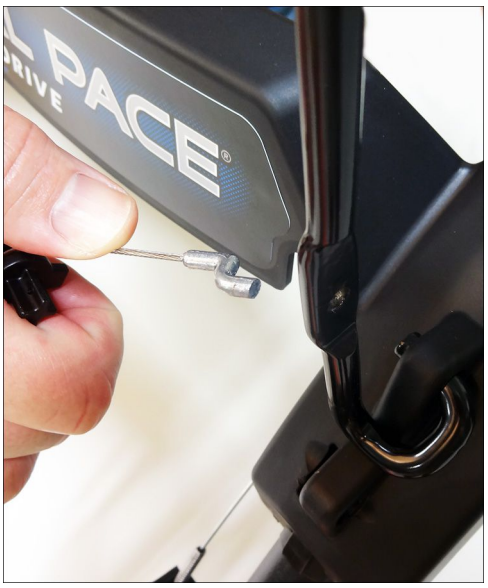
Figure 59

12. Install the bail onto the PERSONAL PACE® handle assembly.

g353037

Figure 60

13. Install the z bend of the brake cable onto the bail.



g352639

Figure 61

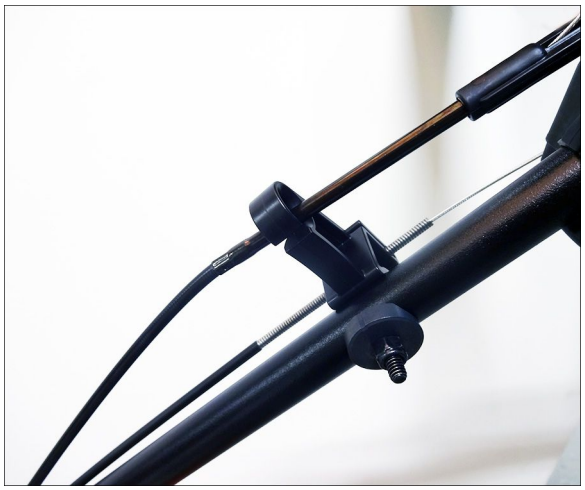
14. At a 90º angle, install the brake cable into the PERSONAL PACE® handle.

RWD PERSONAL PACE® Handle Assembly Installation (continued)

g352638

Figure 62

15. Install the brake cable into the cable anchor.



g352637

Figure 63

16. Install the recoil rope onto the rope guide.

17. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

18. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

RWD PERSONAL PACE® Handle Assembly Inspection

1. Verify the traction control rod returns to a neutral position smoothly. If excessive force is observed, inspect the torsion spring for the correct amount of wrap.

   Note: The spring has half of the rotation wrap when fully assembled.

AWD PERSONAL PACE® Assembly Replacement

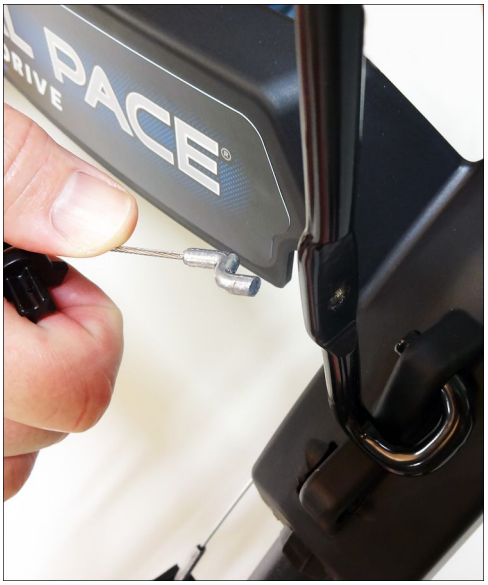
AWD PERSONAL PACE® Handle Assembly Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. Remove the grass bagger assembly if attached.
3. Remove the recoil rope from the rope guide.
4. Remove the brake cable from the cable anchor.
5. At a 90º angle, remove the brake cable from the PERSONAL PACE® handle.

g352638

Figure 64

6. Remove the z bend of the brake cable from the bail.



g352639

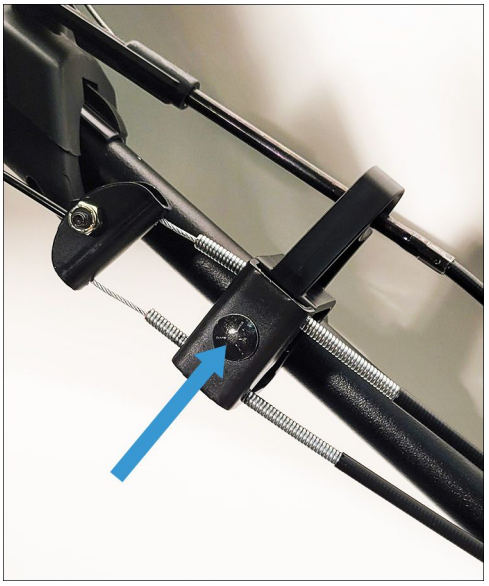
Figure 65

7. From the RH side of the unit, remove the bail from the PERSONAL PACE® handle assembly.

g353037

Figure 66

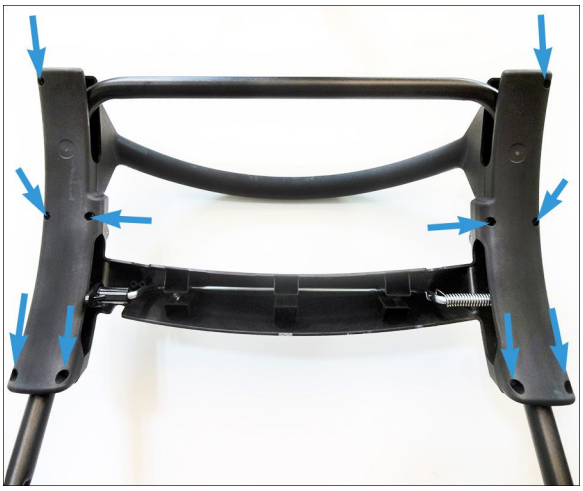
8. Remove the nut and (1/4–20 inch) carriage bolt securing the cable anchor to the handle.



g359929

Figure 67

9. Remove the cable clamp and washer.
10. Remove the front and rear traction cable from the cable yoke.
11. Remove the 10 (M4.2 x 2.0 inch) screws securing the LH and RH bottom handles and curved PERSONAL PACE® handle to the curved handle.



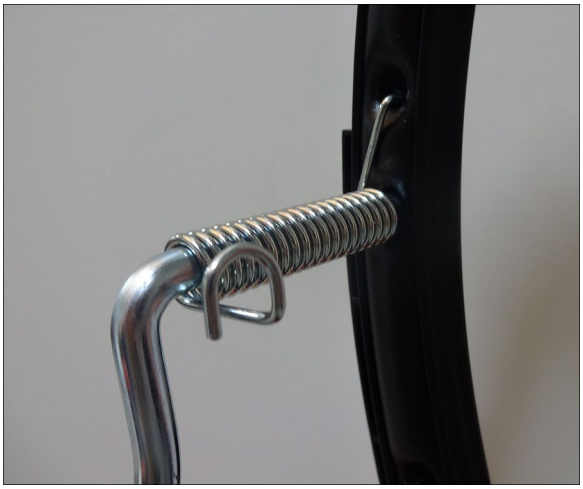
g353048

Figure 68

12. Pull and remove the curved PERSONAL PACE® handle from the curved handle.

    Note: The handle pins may fall off when the upper PERSONAL PACE® handle is removed.

13. Remove the torsion spring from the curved handle.

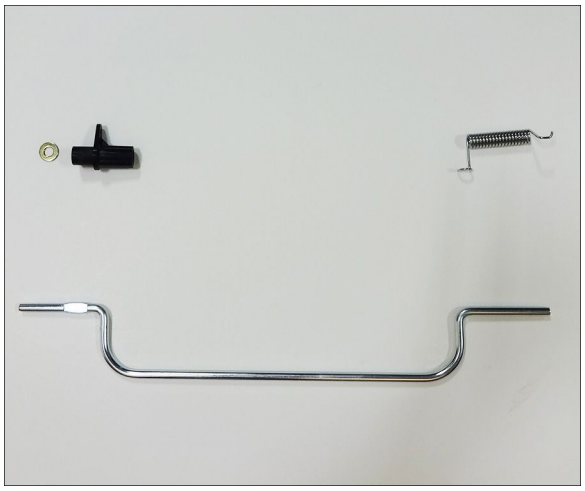


g353082

Figure 69

14. Remove the RH curved guide from the curved handle.
15. Slide the traction rod to the right, remove the traction rod from the curved handle.
16. Remove the traction lever and washer from the LH side of the traction rod. Remove the torsion spring from the RH side of the traction rod.

AWD PERSONAL PACE® Handle Assembly Removal (continued)



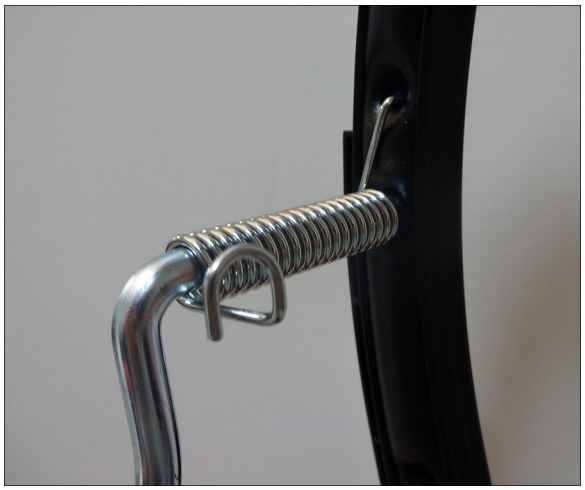
g353179

Figure 70

17. Remove the LH curved guide from the curved handle.

AWD PERSONAL PACE® Handle Assembly Installation

1. Install the traction lever and washer onto the LH side of the traction rod.
2. Install the torsion spring onto the RH side of the traction rod.
3. Install the LH and RH curved guides onto the curved handle.
4. Install the traction rod onto the curved handle.
5. Install the torsion spring onto the curved handle.



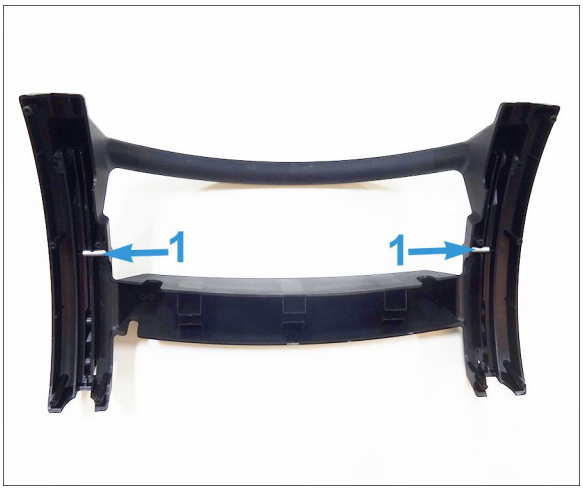
g353082

Figure 71

6. Point the traction lever upwards and rotate the traction rod 3/4 turn so that the traction lever is pointing backwards. Install the upper PERSONAL PACE® handle onto the curved handle.

   Note: The spring has half of the rotation wrap when fully assembled.

7. If the handle pins were removed from the upper PERSONAL PACE® handle, install the handle pins.

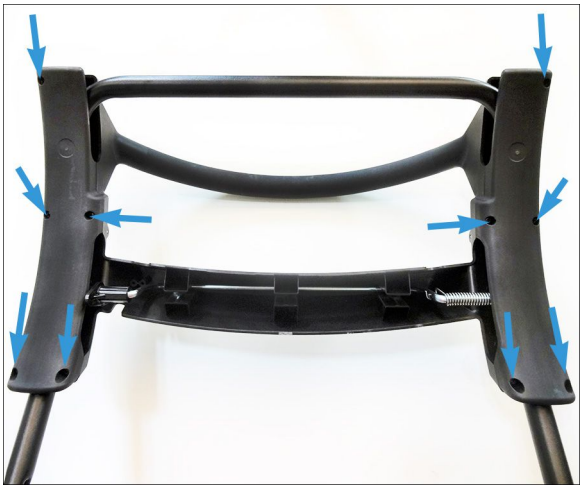


g353060

Figure 72

1. Handle Pins

8. Install the 10 (M4.2 x 2.0) screws securing the LH and RH bottom handles and upper PERSONAL PACE® handle to the curved handle. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).



g353048

Figure 73

9. Install the front and rear traction cables to the cable yolk.

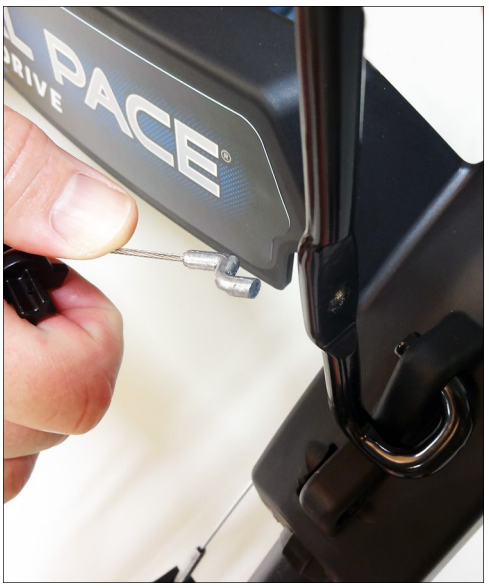
10. Install the cable clamp to the cable anchor, secure with the (1/4–20 inch) carriage screw, washer, and nut. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).

11. Install the bail onto the PERSONAL PACE® handle assembly.

g353037

Figure 74

12. Install the z bend of the brake cable onto the bail.



g352639

Figure 75

13. At a 90º angle, install the brake cable into the PERSONAL PACE® handle.

g352638

Figure 76

14. Install the brake cable into the cable anchor.
15. Install the recoil rope onto the rope guide.

AWD PERSONAL PACE® Handle Assembly Test

1. Verify the traction control rod returns to a neutral position smoothly. If excessive force is observed, inspect the torsion spring for the correct amount of wrap.

   Note: The spring has half of the rotation wrap when fully assembled.

Curved Handle Replacement (Non—Electric Start Models Only)

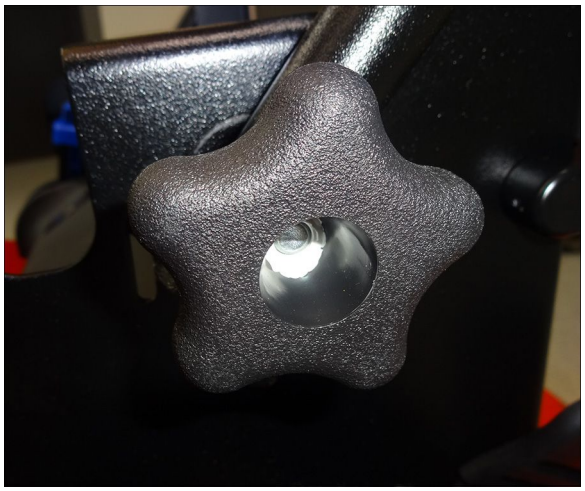
Curved Handle Removal (Non—Electric Start Models Only)

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. Remove the grass bagger assembly if attached.
3. **RWD models only,** remove the RWD PERSONAL PACE® handle. RWD PERSONAL PACE® Assembly Handle Removal (page 5–20)
4. **AWD models only,** remove the AWD PERSONAL PACE® handle. AWD PERSONAL PACE® Handle Assembly Removal (page 5–31)
5. Remove the lock nut securing the rope guide to the curved handle.

g353180

Figure 77

6. Spread and remove the cable guide from the curved handle.
7. Remove the LH handle knob and carriage bolt from the curved handle. Repeat on the RH side of the unit.



g353181

Figure 78

8. Remove the curved handle from the chassis.
9. Spread and remove the quick release assemblies from the curved handle.

Curved Handle Removal (Non—Electric Start Models Only) (continued)

g353182

Figure 79

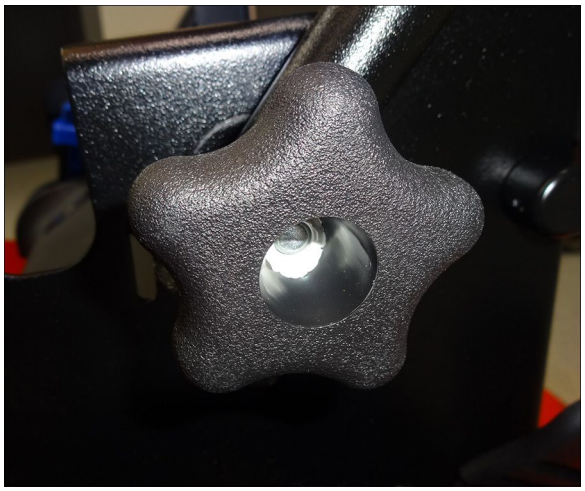
Curved Handle Installation (Non—Electric Start Models Only)

1. Install the quick release assemblies to the curved handle.

g353182

Figure 80

2. Install the curved handle onto the chassis.
3. Install the LH handle knob and carriage bolt onto the curved handle. Repeat on the RH side of the unit.



g353181

Figure 81

4. Install the cable guide onto the curved handle.

5. Install the rope guide onto the curved handle, secure with a nut. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).

g353180

Figure 82

6. **RWD models only,** install the RWD PERSONAL PACE® handle. RWD PERSONAL PACE® Handle Assembly Installation (page 5–25)
7. **AWD models only,** install the AWD PERSONAL PACE® handle. AWD PERSONAL PACE® Handle Assembly Installation (page 5–34)

Curved Handle Replacement (Electric Start Models Only)

Curved Handle Removal (Electric Start Models Only)

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.

2. Remove the grass bagger assembly if attached.
3. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
4. Remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
5. Remove the 2 cable ties securing the electric starter wire harness to the curved handle.

g353634

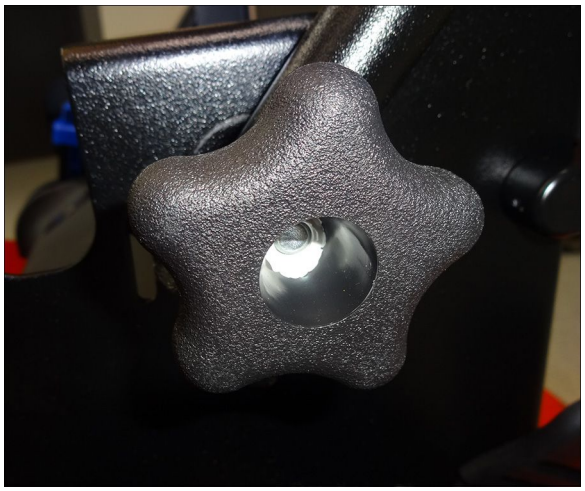
Figure 83

6. Remove the cable guide from the curved handle.
7. Loosen the (7/16 inch) screw and remove captured NI lock nut securing the cable guide and electric starter to the curved handle. Remove the electric starter from the curved handle.
8. Remove the RWD PERSONAL PACE® handle. RWD PERSONAL PACE® Assembly Handle Removal (page 5–20)
9. Remove the lock nut securing the rope guide to the curved handle.

g353180

Figure 84

10. Spread and remove the cable guide from the curved handle.
11. Remove the LH handle knob and carriage bolt from the curved handle. Repeat on the RH side of the unit.



g353181

Figure 85

12. Remove the curved handle from the chassis.
13. Spread and remove the quick release assemblies from the curved handle.

Curved Handle Removal (Electric Start Models Only) (continued)

g353182

Figure 86

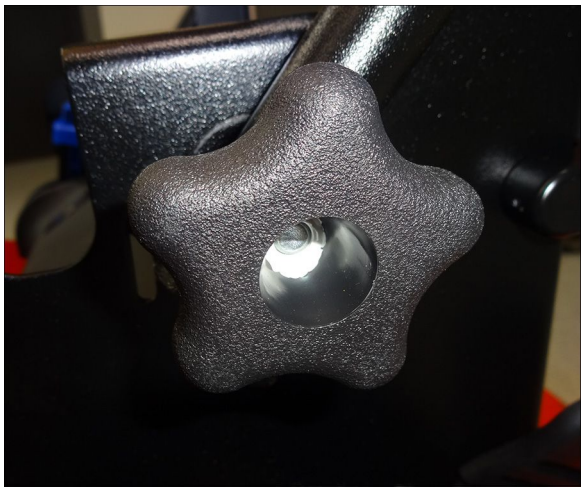
Curved Handle Installation (Electric Start Models Only)

1. Install the quick release assemblies to the curved handle.

g353182

Figure 87

2. Install the curved handle onto the chassis.
3. Install the LH handle knob and carriage bolt onto the curved handle. Repeat on the RH side of the unit.



g353181

Figure 88

4. Install the cable guide onto the curved handle.

5. Install the rope guide onto the curved handle, secure with a nut. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).

g353180

Figure 89

6. Install the RWD PERSONAL PACE® handle. RWD PERSONAL PACE® Handle Assembly Installation (page 5–25)

7. Install the cable guide and electric starter to the curved handle, secure with the NI lock nut and (7/16) bolt. Torque the nut to 4.52 ± 0.56 N • m (40 ± 5 in-lbs).

8. Install the cable guide onto the curved handle.

9. Install the 2 cable ties securing the electric starter wire harness to the curved handle.

g353634

Figure 90

10. Connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

11. **Models equipped with the 60v powerhead,** install the harness onto the powerhead.

Chapter 6

Deck

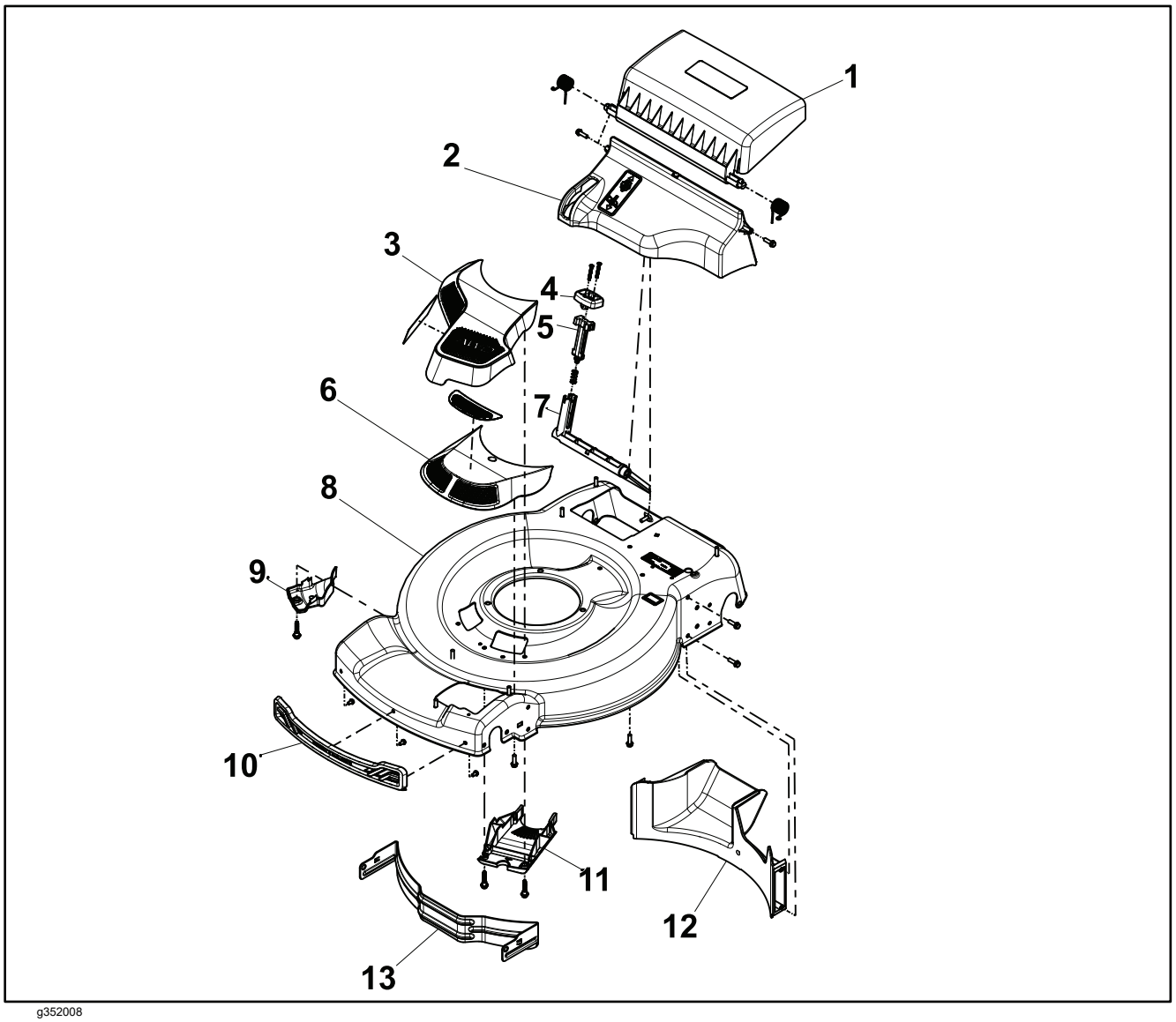
Table of Contents

General Information

This model is equipped with Vortex technology. The upper and lower intake assists with air flow and allows grass clipping to be recycled efficiently.

Service and Repairs

Deck Assembly 1

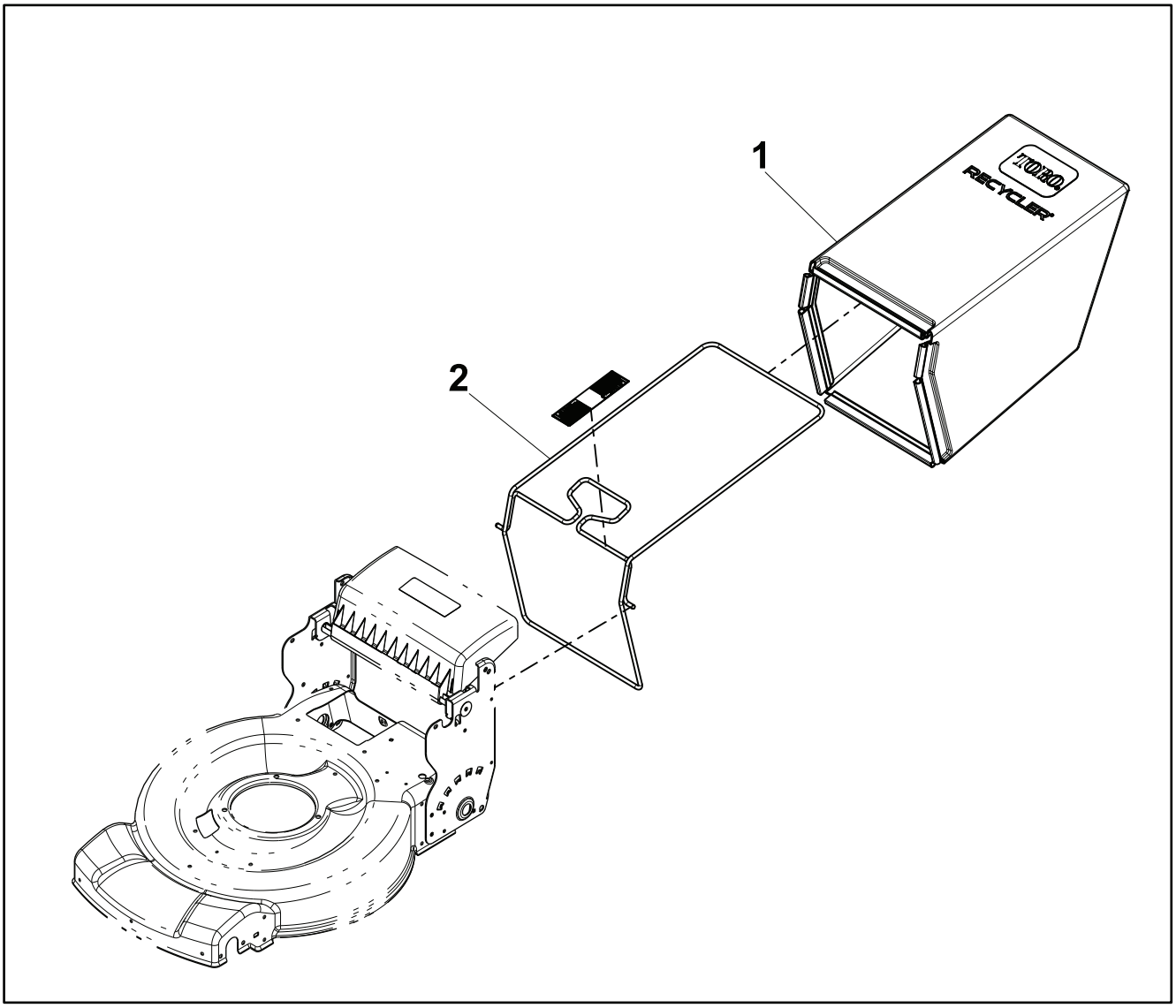


g352008

Figure 91

1. Rear Door Assembly
2. Chute Assembly
3. AWD Intake
4. Recycle Knob
5. Recycle Latch
6. RWD Intake
7. Recycle Deflector
8. 22–inch Deck
9. Bottom Intake Cover
10. Front Bumper
11. AWD Lower Belt Cover
12. RWD Rear Baffle
13. Front Baffle

Deck Assembly 2

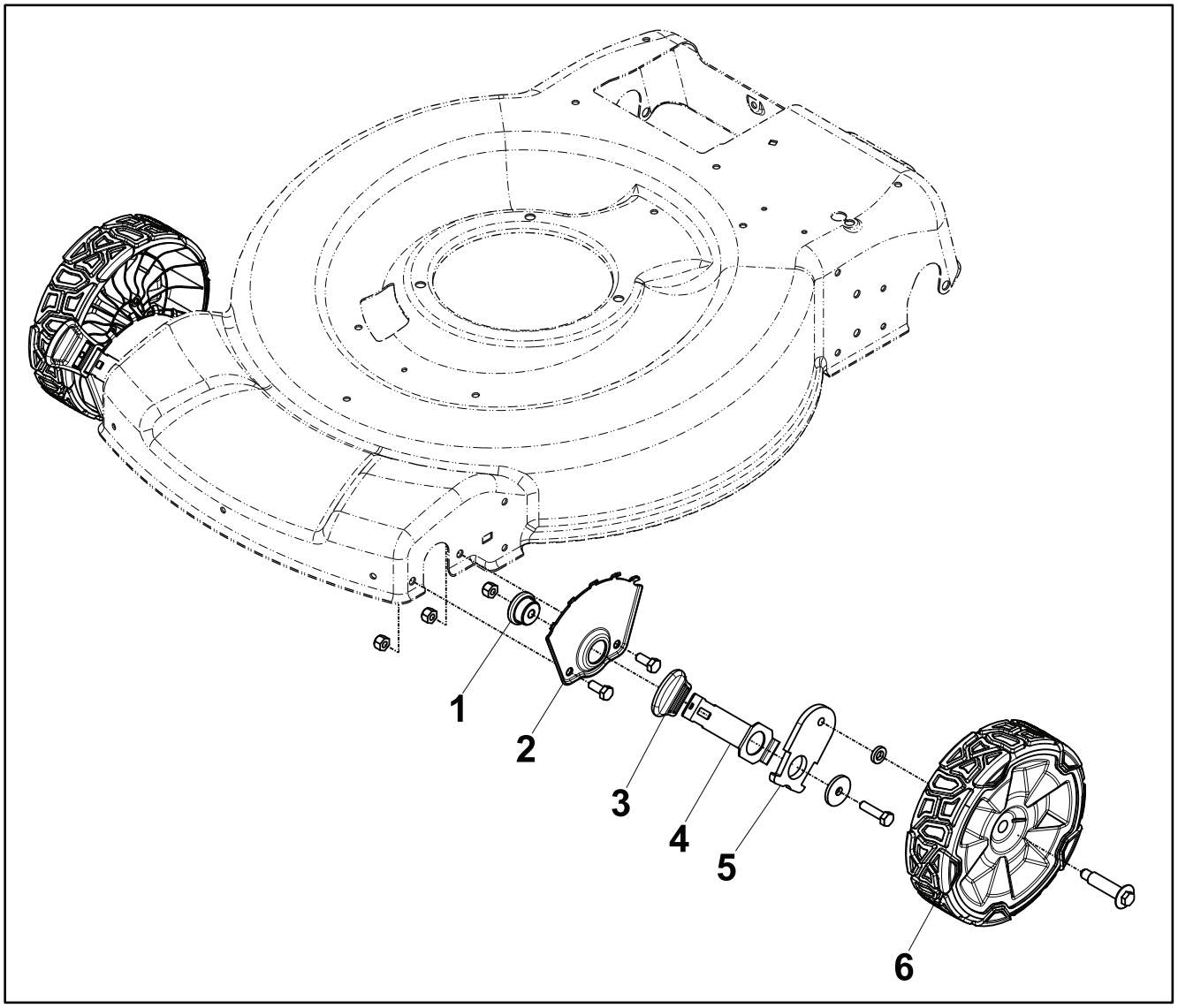


g352009

Figure 92

1. Grass Bag Assembly
2. Bag Frame Assembly

Deck Assembly 3

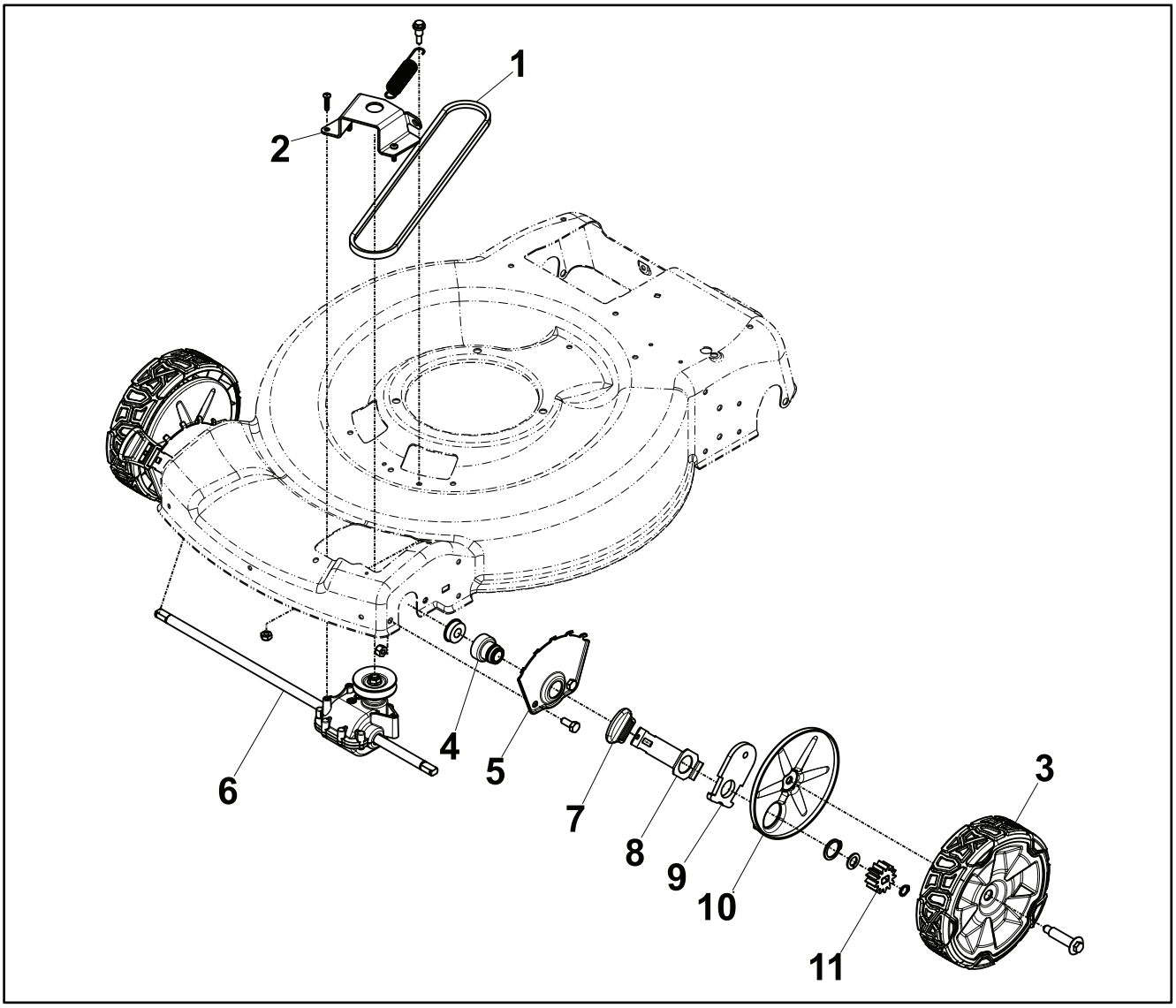


g352310

Figure 93

1. Height—of— Cut Mount Bushing
2. Front Hoc Plate
3. Height—of— Cut Knob
4. Spring Arm
5. Front Pivot Arm
6. Idler Wheel Assembly

Deck Assembly 4



g352311

Figure 94

1. V-Belt
2. Transmission Bracket
3. Fwd Wheel Assembly
4. Spring Arm
5. Height—of— Cut Front Plate
6. Transmission
7. Height—of— Cut Knob
8. Spring Arm
9. Front Pivot Arm
10. Wheel Cover Assembly
11. Pinion Gear

Deck Assembly 5

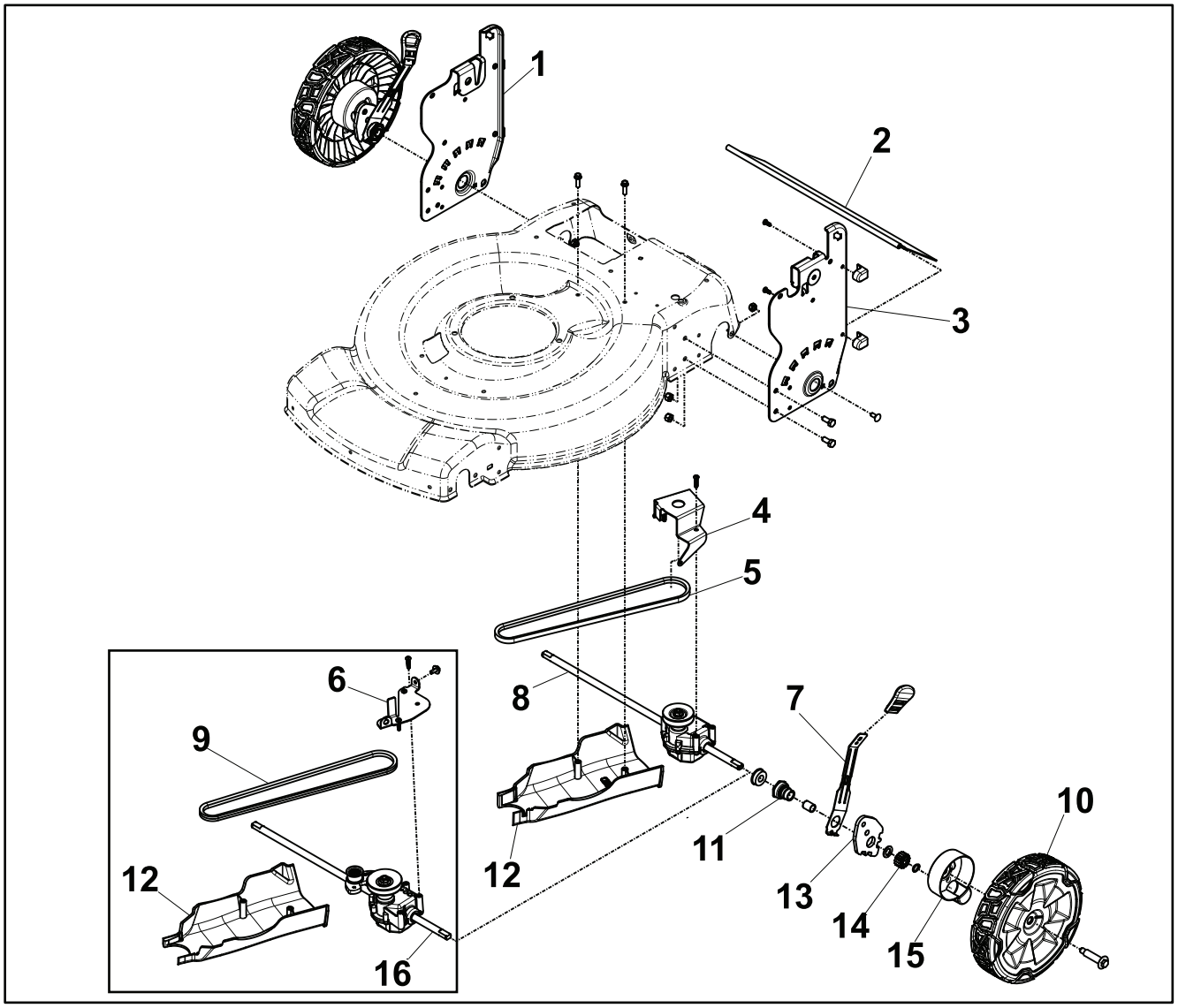


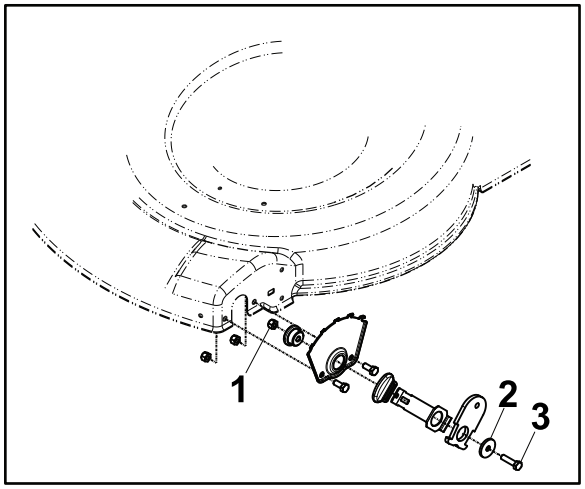
Figure 95

1. RH Height—of— Cut Plate
2. Trailing Shield
3. LH Hoc Plate
4. Transmission Bracket
5. V-Belt
6. AWD Belt Guide
7. Spring Arm
8. RWD Transmission
9. AWD Belt
10. Geared Wheel Assembly
11. Height—of— Cut Bushing Retainer
12. Belt Cover
13. Rear Pivot Arm
14. Pinion Gear
15. Gear Cover Assembly
16. AWD Transmission

RWD Front Height-of-Cut Replacement

RWD Front Height-of-Cut Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the front non-drive wheels. RWD Front Wheel Removal (page 7–6)
6. Tip the unit to gain access to the underside of the unit.
7. Remove the (5/16–18 inch) bolt, flat washer, and lock nut securing the pivot arm to the LH height-of-cut plate. Repeat on the RH side of the unit.



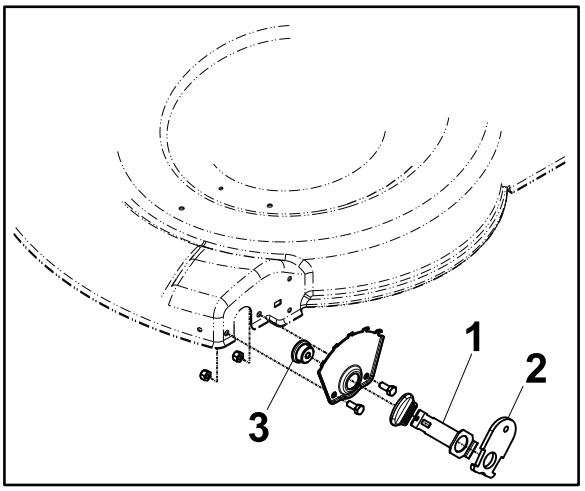
g352364

Figure 96

1. Lock Nut
2. Flat Washer
3. Screw

8. Remove the front pivot arm, spring arm, and mount bushing from the LH deck. Repeat on the RH side of the unit.

RWD Front Height-of-Cut Removal (continued)



g352366

Figure 97

1. Height-of-Cut Lever
2. Front Pivot Arm
3. Mount Bushing

9. Remove the 2 (5/16–18 inch) screws and 2 nuts securing the height-of-cut plate to the LH deck. Remove the height-of-cut plate from the LH deck. Repeat on the RH side of the unit.

g352391

Figure 98

RWD Front Height-of-Cut Installation

1. Install the front height-of-cut plate to the LH deck and secure with 2 (5/16–18 inch) screws and 2 nuts. Torque the nuts to 19.2 ± 3.39 N • m (170 ± 30 in-lb). Repeat on the RH side of the unit.

g352391

Figure 99

2. Install the mount bushing, spring arm, and the front pivot arm to the LH height-of-cut plate and secure with the (5/16–18 inch) screw, flat washer, and nut. Torque the nuts to 19.2 ± 3.39 N • m (170 ± 30 in-lb). Repeat on the RH side of the unit.

g352409

Figure 100

3. Install the front non-drive wheels. RWD Front Wheel Installation (page 7–6)

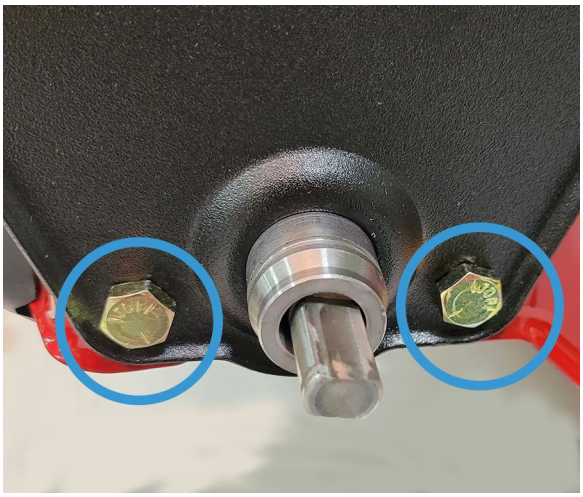
4. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

5. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

AWD Front Height-of-Cut Replacement

AWD Front Height-of-Cut Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. Remove the grass bagger assembly if attached.
3. Remove the AWD front wheels. AWD Front Wheel Removal (page 7–7)
4. Remove the large snap ring from the LH bushing retainer. Repeat on the RH side of the unit.
5. Remove the LH pivot arm and spring arm from the transmission. Repeat on the RH side of the unit.
6. Remove the 2 (½ inch) screws securing the LH AWD front height-of-cut plate to the deck. Repeat on the RH side of the unit.



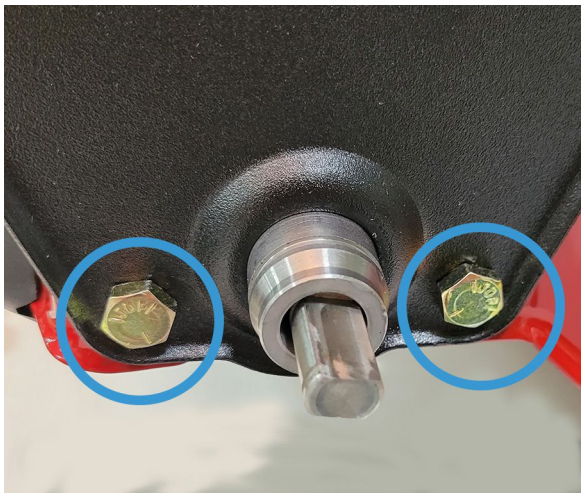
g360548

Figure 101

7. Remove the LH AWD front height-of-cut plate. Repeat on the RH side of the unit.

AWD Front Height-of-Cut Installation

1. Install the LH AWD front height-of-cut plate, secure with 2 (½ inch) screws. Repeat on the RH side of the unit.



g360548

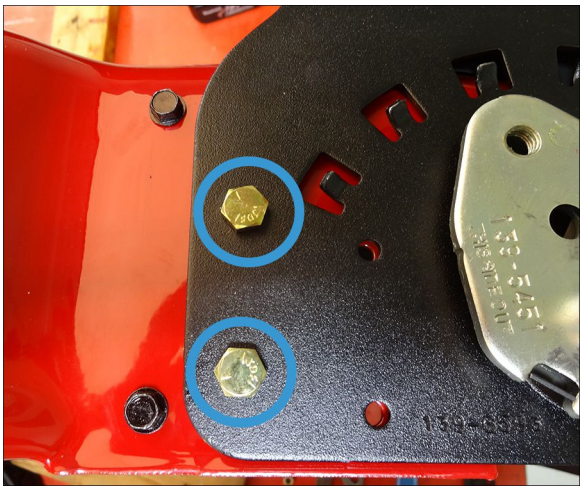
Figure 102

2. Install the LH spring arm and pivot arm onto the transmission. Repeat on the RH side of the unit.
3. Install the large snap ring to the LH bushing retainer. Repeat on the RH side of the unit.
4. Install the AWD front wheels. AWD Front Wheel Installation (page 7–8)

Rear Height-of-Cut Replacement

Rear Height-of-Cut Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the rear wheels. Rear Wheel Removal (page 7–10)
6. Remove the 2 (5/16–18 inch) screws and 2 lock nuts securing the LH height-of-cut plate to the deck. Repeat on the RH side of the unit.



g361220

Figure 103

7. Remove the (1/4–10 inch) screw securing the LH height-of-cut plate to the chute assembly. Repeat on the RH side of the unit.

g361221

Figure 104

8. Remove the (1/4–10 inch) carriage screw and lock nut securing the LH height-of-cut plate to the deck. Repeat on the RH side of the unit.

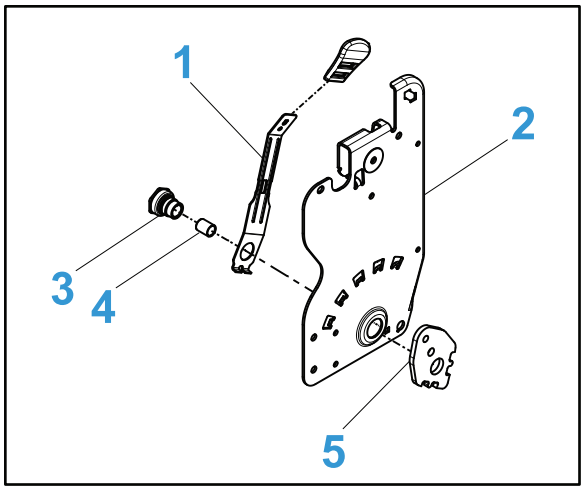
Rear Height-of-Cut Removal (continued)

g361222

Figure 105

9. Position the LH tab on the trailing shield in alignment with the cutout in the LH height-of-cut plate. Repeat on the RH side of the unit.
10. Remove the rear LH height-of-cut plate assembly from the deck. Repeat on the RH side of the unit.

Rear Height-of-Cut Disassembly

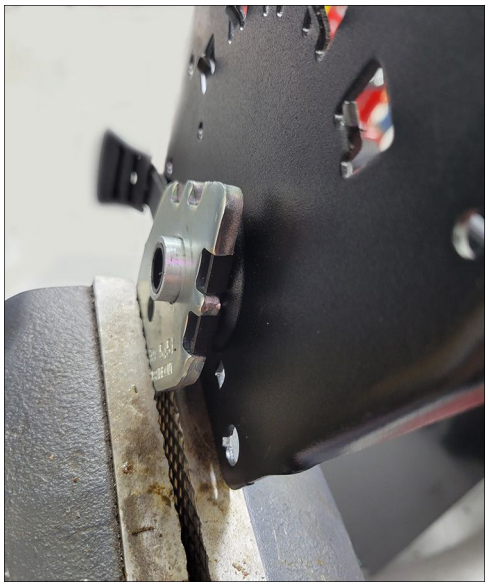


g359631

Figure 106

1. Spring Arm
2. Rear Height-of-Cut Plate
3. Bushing Retainer
4. Sleeve Bushing
5. Rear Pivot Arm

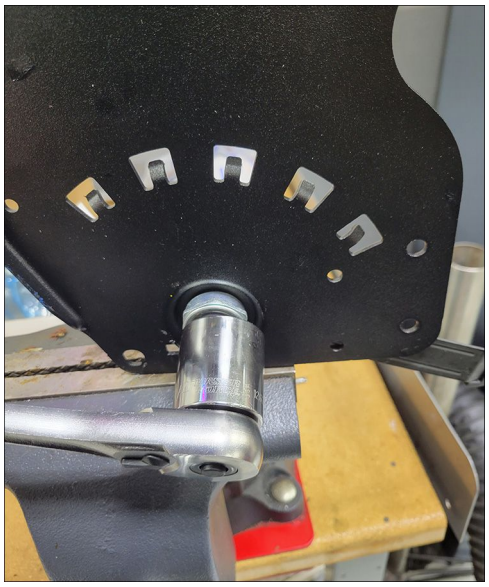
1. Clamp the rear pivot arm in a vice.



g359620

Figure 107

2. Using a 1 ¼ inch socket or wrench, rotate the bushing retainer counterclockwise to remove the bushing retainer and sleeve bushing from the rear pivot arm.



g359619

Figure 108

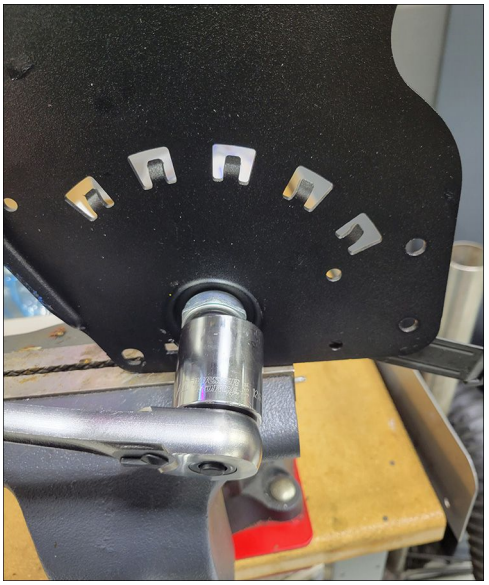
3. Remove the rear pivot arm and spring arm from the height-of-cut plate.

Rear Height-of-Cut Assembly

1. Install the rear pivot arm and spring arm to the height-of-cut plate.
2. Install the sleeve bushing and bushing retainer into the height-of-cut plate.
3. Install the sleeve bushing onto the rear pivot arm.

Rear Height-of-Cut Assembly (continued)

4. Using a 1 ¼ inch socket or wrench, rotate the bushing retainer clockwise to install the bushing retainer to the rear pivot arm. Torque the bushing retainer to 7.9 ± 9 N • m (70 ± 80 in-lbs).

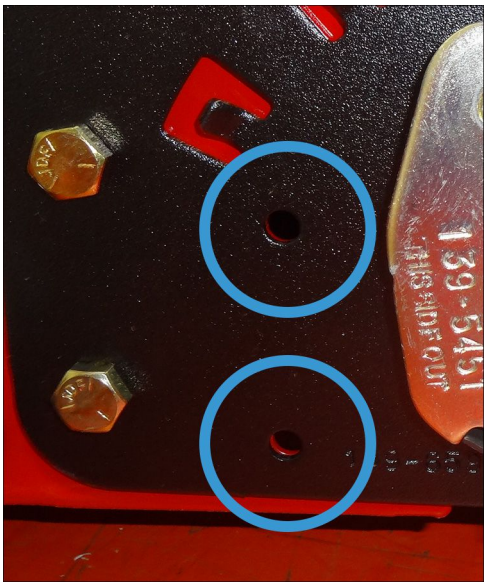


g359619

Figure 109

Rear Height-of-Cut Installation

1. Align the holes on LH the height-of-cut plate to the LH deck. Repeat on the RH side of the unit.



g370908

Figure 110

2. Install the LH height-of-cut plate assembly to the deck, secure with a (1/4–10 inch) carriage screw and lock nut. Torque the nut to 19.2 ± 3.39 N • m (170 ± 30 in-lbs). Repeat on the RH side of the unit.

g361222

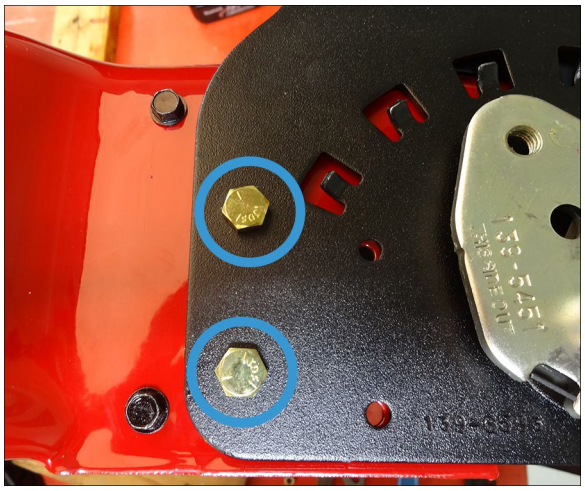
Figure 111

3. Install the (1/4–10 inch) screw securing the LH height-of-cut plate to the chute assembly. Torque the screw to 3.39 ± 0.45 N • m (30 ± 4 in-lbs). Repeat on the RH side of the unit.

g361221

Figure 112

4. Install the 2 (5/16–18 inch) screws and 2 lock nuts securing the LH height-of-cut plate to the deck. Torque the nuts to 19.2 ± 3.39 N • m (170 ± 30 in-lbs). Repeat on the RH side of the unit.



g361220

Figure 113

5. Install the rear wheels. Rear Wheel Installation (page 7–11)

6. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

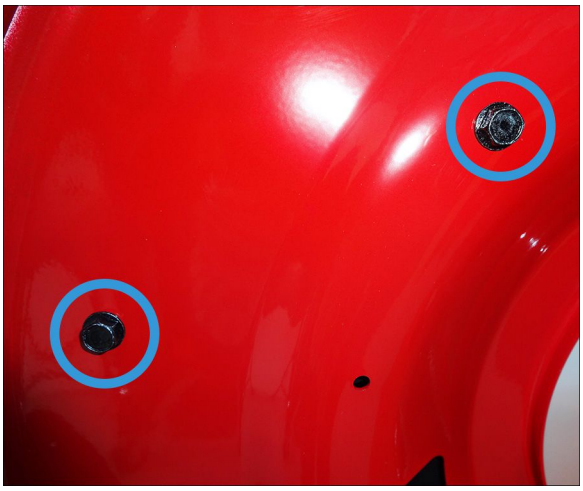
7. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

Upper Intake Replacement

Upper Intake Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Tip the unit to gain access to the underside of the unit.
6. Position the blade out of the way of the lower intake.
7. Remove the (1/4 x 1.33 inch) shoulder screw securing the bottom intake cover to the deck.
8. Remove the bottom intake from the deck.
9. Remove the 2 (1/4 x 1.33 inch) screws securing the upper intake to the deck.

Upper Intake Removal (continued)



g353303

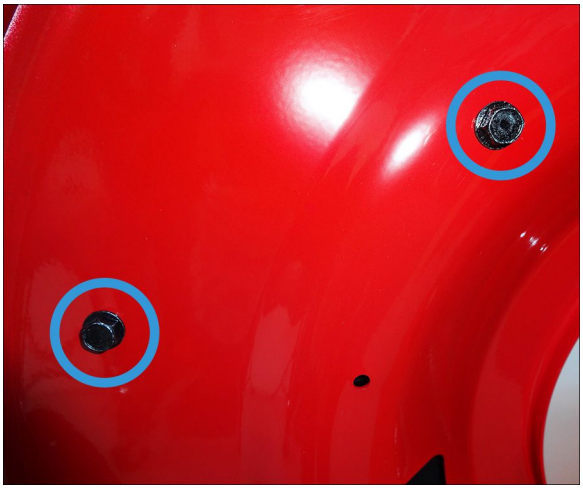
Figure 114

10. Remove the upper intake from the deck.

Upper Intake Installation

1. Position the blade out of the way of the lower intake.

2. Install the upper intake onto the deck, secure with 2 (1/4 x 1.33 inch) screws. Torque the screws to 3.39 ± 0.45 N • m (30 ± 4 in-lbs).



g353303

Figure 115

3. Install the bottom intake cover, secure with a (1/4 x 1.33 inch) screw. Torque the screws to 3.39 ± 0.45 N • m (30 ± 4 in-lbs).

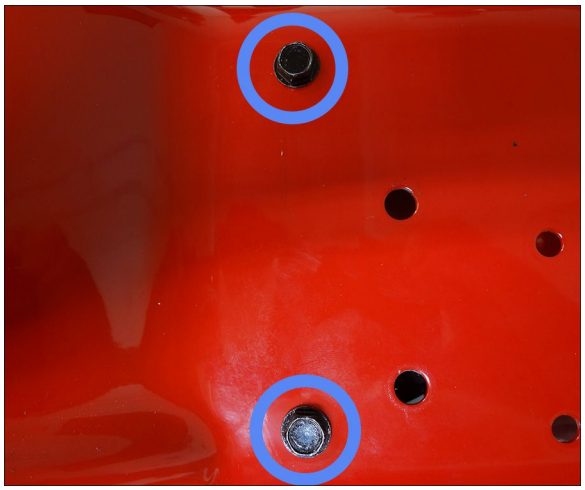
4. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

5. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

Chute Assembly Replacement

Chute Assembly Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the rear height-of-cut plates. Rear Height-of-Cut Removal (page 6–12)
6. Remove the rear back door from the unit.
7. Remove the 2 (1/4–10 inch) LH screws securing the rear baffle to the deck. Repeat on the RH side of the unit.



g352575

Figure 116

8. Remove the (1/4–10 inch) rear screw securing the baffle to the deck.

g352576

Figure 117

9. Remove the baffle from the deck.
10. Remove the 2 (1/4–10 inch) screws securing the belt guide guard to the deck.

g352577

Figure 118

11. Remove the belt guide guard from the deck.
12. Remove the 4 (1/4–10 inch) screws securing the chute to the deck.

Chute Assembly Removal (continued)

g352578

Figure 119

13. Remove the chute from the deck.

Chute Assembly Installation

1. Install the chute to the deck, secure with 4 (1/4–10 inch) screws. Torque the screws to 3.39 ± 0.45 N • m (30 ± 4 in-lbs).

g352578

Figure 120

2. Install the belt guide guard onto the deck, secure with 2 (1/4–10 inch) screws. Torque the screws to 3.39 ± 0.45 N • m (30 ± 4 in-lbs).

g352577

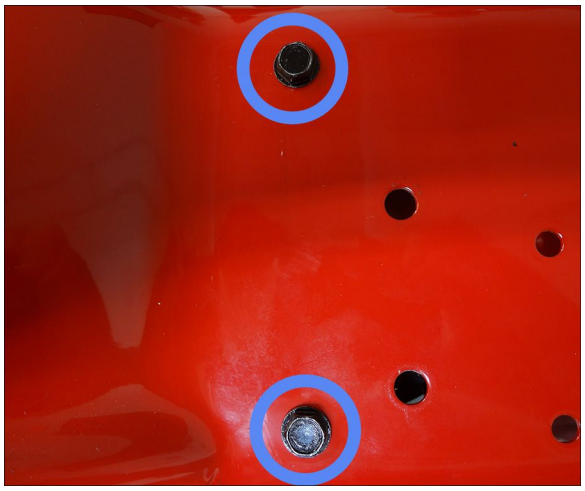
Figure 121

3. Install the baffle to the deck, secure with the (1/4–10 inch) rear screw. Torque the screws to 3.39 ± 0.45 N • m (30 ± 4 in-lbs).

g352576

Figure 122

4. Install the 2 (1/4–10 inch) LH screws securing the rear baffle to the deck. Torque the screws to 3.39 ± 0.45 N • m (30 ± 4 in-lbs). Repeat on the RH side of the unit.



g352575

Figure 123

5. Install the rear back door onto the unit.
6. Install the rear height-of-cut plates. Rear Height-of-Cut Removal (page 6–12)
7. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
8. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

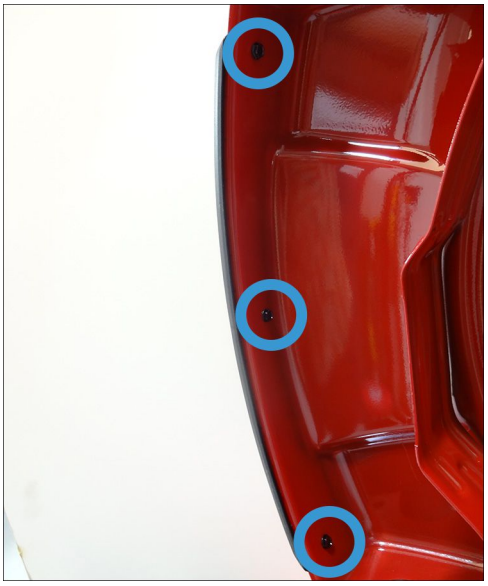
Deck Replacement

Deck Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. **RWD models only,** remove the RWD traction cable. RWD Traction Cable Removal (page 5–8)
6. **AWD models only,** remove the AWD front and rear traction cables. AWD Front Traction Cable Removal (page 5–14) AWD Rear Traction Cable Removal (page 5–16)
7. Remove the brake cable. Brake Cable Removal (page 5–4)
8. Remove the LH handle knob from the curved handle. Repeat on the RH side of the unit.
9. Remove the curved handle from the chassis. Curved Handle Removal (Non—Electric Start Models Only) (page 5–37) Curved Handle Removal (Electric Start Models Only) (page 5–40)

Deck Removal (continued)

10. Remove the power head. Engine/Powerhead Removal (page 4–5)
11. **RWD models only,** remove the RWD front height-of-cut assembly. RWD Front Height-of-Cut Removal (page 6–8)
12. **AWD models only,** remove the AWD front height-of-cut assembly. AWD Front Height-of-Cut Removal (page 6–11)
13. Remove the rear height-of-cut assemblies. Rear Height-of-Cut Removal (page 6–12)
14. **AWD models only,** remove the AWD front transmission. AWD Front Transmission Removal (page 7–17)
15. Remove the 3 (#10–14) screws securing the front bumper to the deck. Remove the bumper from the deck.



g361255

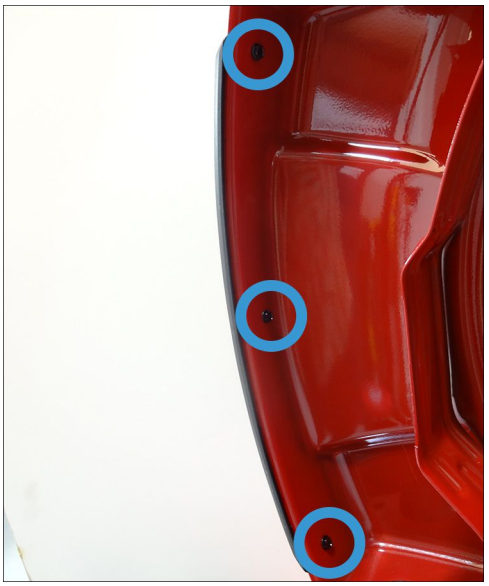
Figure 124

16. Remove the chute assembly from the deck. Chute Assembly Removal (page 6–20)

Deck Installation

1. Install the chute assembly onto the deck. Chute Assembly Removal (page 6–20)

2. Install the front bumper to the deck, secure with 3 (#10–14) screws. Torque the screws to 3.39 ± 0.34 N • m (30 ± 3 in-lbs).



g361255

Figure 125

3. **AWD models only,** install the AWD front transmission. AWD Front Transmission Installation (page 7–19)
4. Install the rear height-of-cut assemblies. Rear Height-of-Cut Installation (page 6–16)
5. **RWD models only,** install the RWD front height-of-cut assembly. RWD Front Height-of-Cut Installation (page 6–9)
6. **AWD models only,** install the AWD front height-of-cut assembly. AWD Front Height-of-Cut Installation (page 6–11)
7. Install the power head. Engine/Powerhead Installation (page 4–6)
8. Install the curved handle onto the chassis. Curved Handle Installation (Non—Electric Start Models Only) (page 5–39) Curved Handle Installation (Electric Start Models Only) (page 5–43)
9. Install the LH handle knob onto the curved handle. Repeat on the RH side of the unit.
10. Install the brake cable. Brake Cable Installation (page 5–6)
11. **RWD models only,** install the RWD traction cable. RWD Traction Cable Installation (page 5–11)
12. **AWD models only,** install the AWD front and rear traction cables. AWD Front Traction Cable Installation (page 5–15) AWD Rear Traction Cable Installation (page 5–18)
13. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
14. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

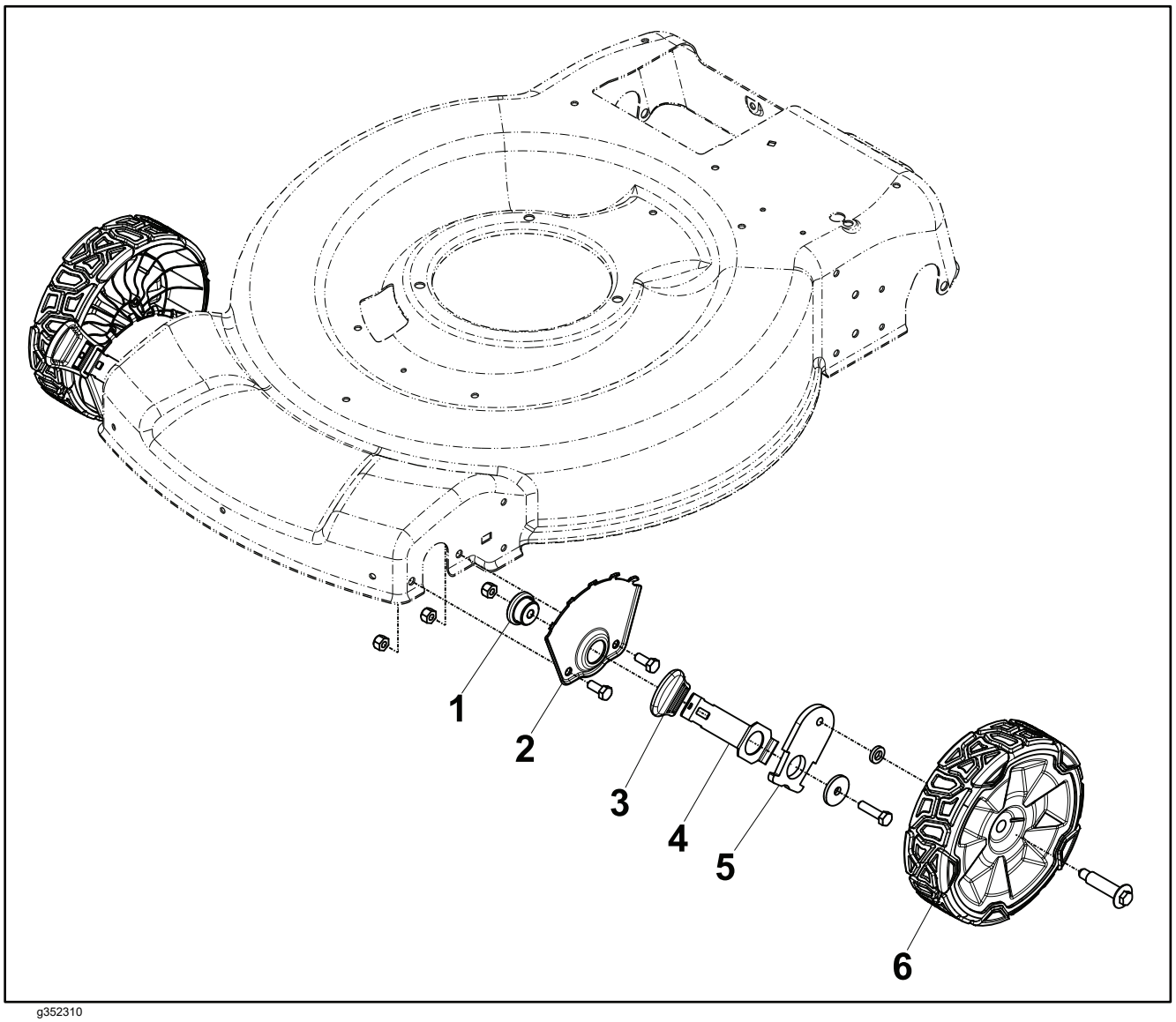
Table of Contents

General Information

The RWD and AWD models share similar components and all of the transmissions are belt driven but have different forms of engagement.

Service and Repairs

Drive System Assembly 1

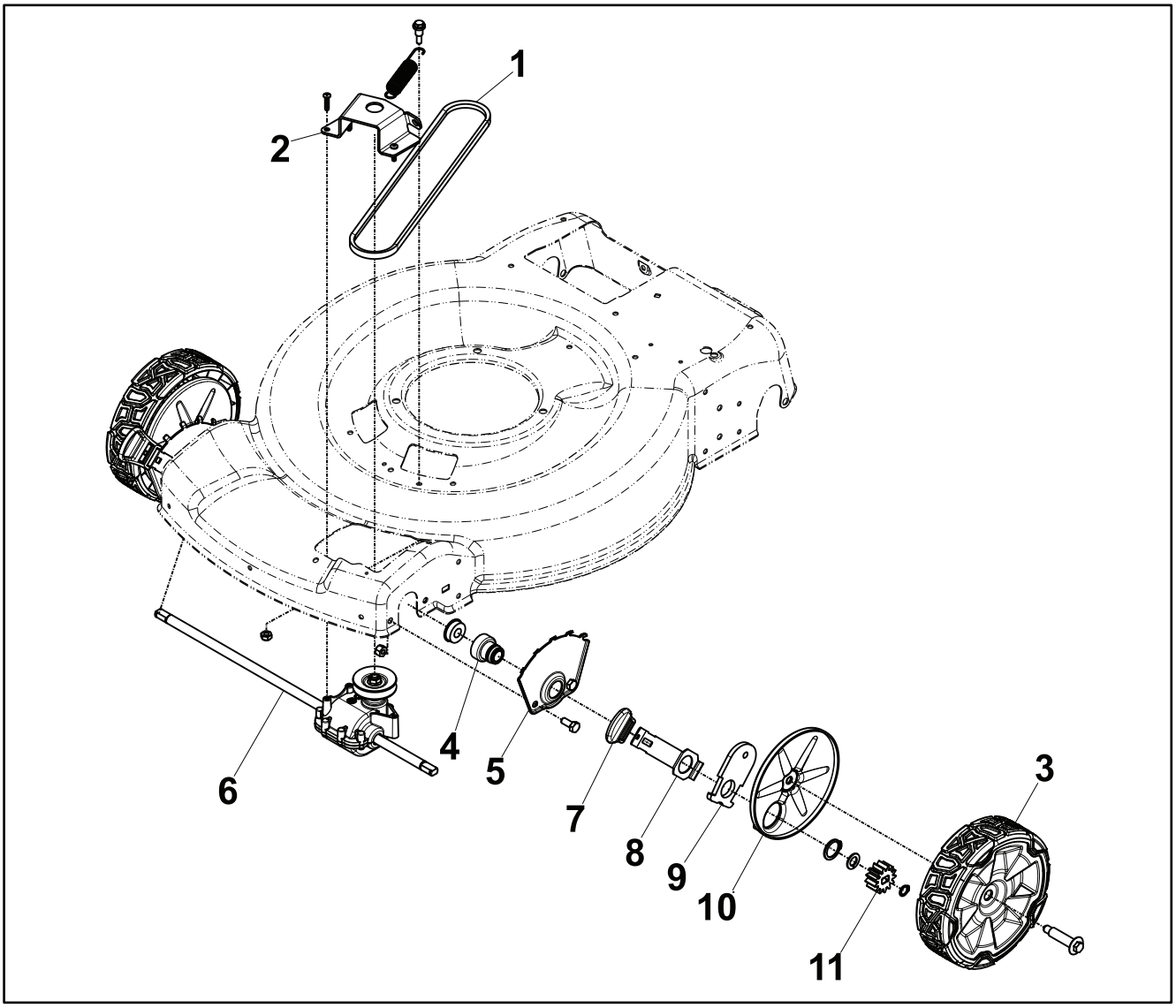


g352310

Figure 126

1. Mount Bushing
2. Front Height—of— Cut Plate
3. Height—of— Cut Knob
4. Spring Arm
5. Front Pivot Arm
6. Front Wheel

Drive System Assembly 2



g352311

Figure 127

1. V-Belt
2. Transmission Bracket
3. FWD Wheel
4. Bearing Retainer
5. Height—of— Cut Front Plate
6. Transmission
7. Height—of— Cut Knob
8. Spring Arm
9. Front Pivot Arm
10. Wheel Cover Assembly
11. Pinion Gear

Drive System Assembly 3

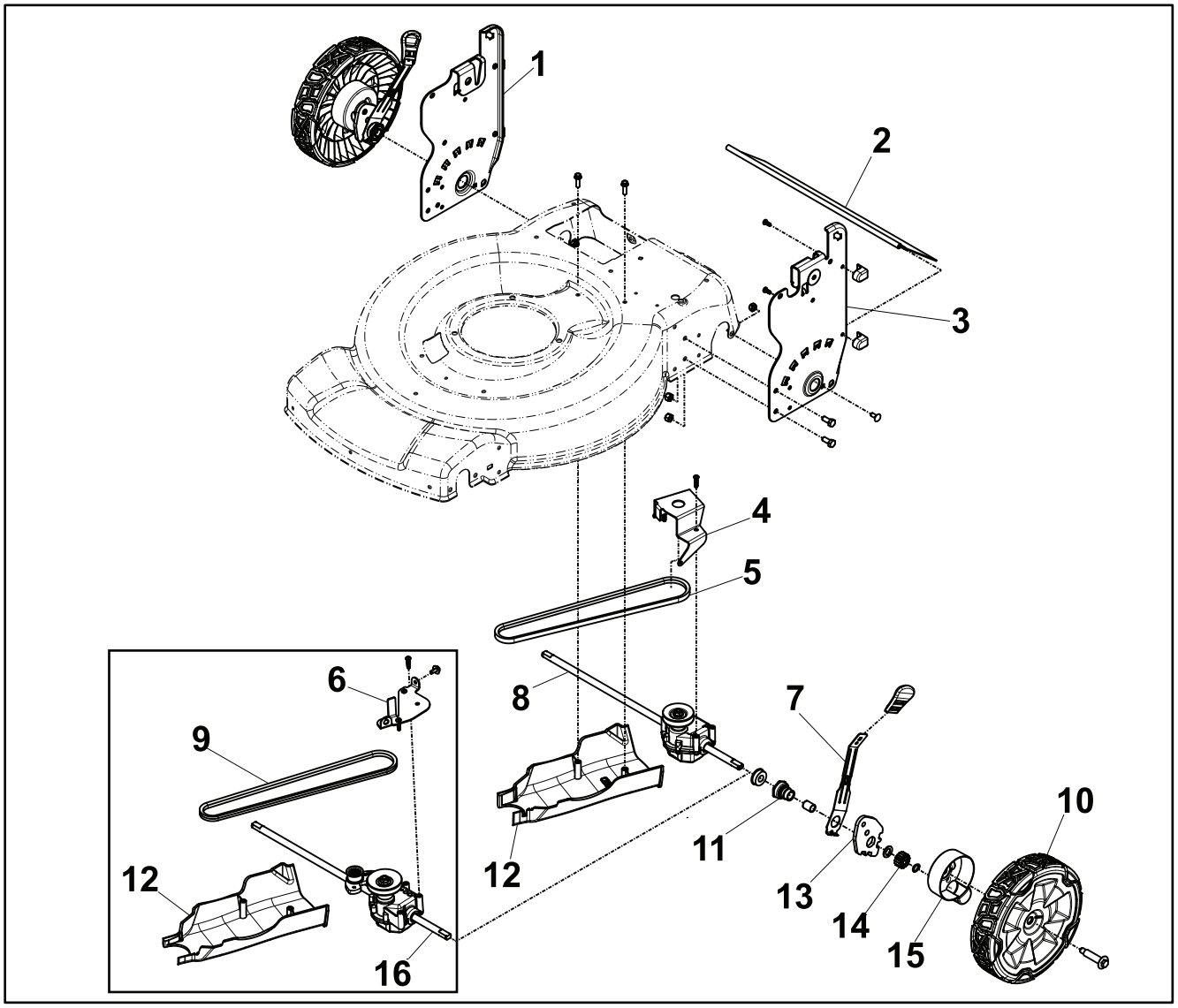


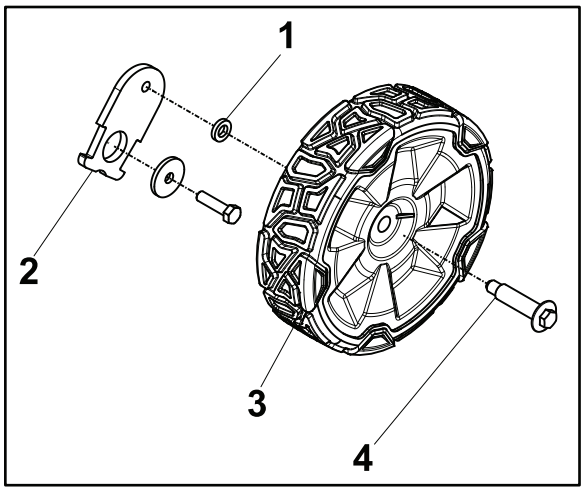
Figure 128

1. RH Height—of— Cut Plate
2. Trailing Shield
3. LH Height—of— Cut Plate
4. RWD Transmission Bracket
5. V-Belt
6. AWD Transmission Bracket
7. Spring Arm
8. RWD Transmission
9. AWD V-Belt
10. Rear Wheel
11. Bushing Retainer
12. Belt Cover
13. Rear Pivot Arm
14. Pinion Gear
15. Gear Cover Assembly
16. AWD Transmission

RWD Front Wheel Replacement

RWD Front Wheel Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Using a ½ inch wrench, remove the LH (3/8–16 inch) shoulder bolt followed by the wheel and washer from the front pivot arm. Repeat on the RH side of the unit.



g352036

Figure 129

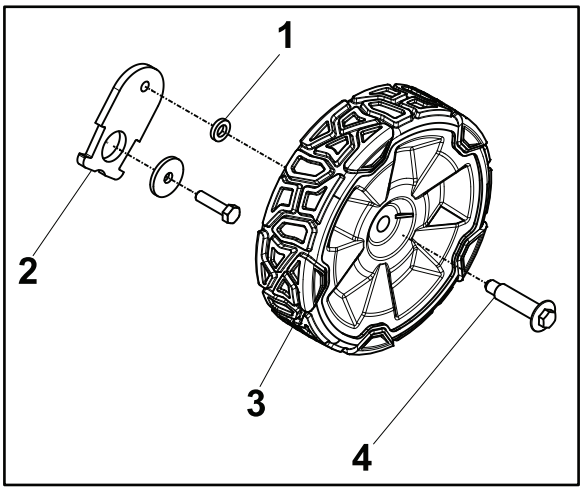
1. Washer
2. Front Pivot Arm
3. Idler Wheel
4. Wheel Bolt

RWD Front Wheel Installation

1. Install the washer, wheel, and LH (3/8–16 inch) shoulder bolt onto the front pivot arm. Torque the bolt to 35 ± 1.69 N • m (315 ± 15 in-lb).

   Note: After installation, verify the pivot arm and wheel assembly rotates freely and that the spring arm engages the individual settings on the height-of-cut plate through all of height-of-cut settings.

   Note: Lubricate the internal diameter of the bushings on the wheel assemblies using lithium multi-purpose grease.



g352036

Figure 130

1. Washer
2. Front Pivot Arm
3. Idler Wheel
4. Wheel Bolt

2. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

3. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

AWD Front Wheel Replacement

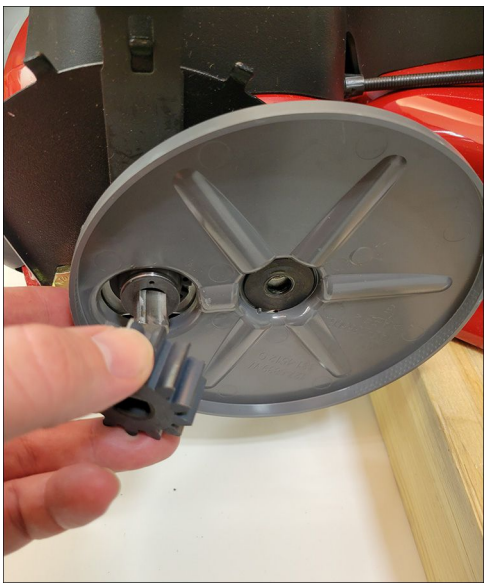
AWD Front Wheel Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Using 1/2 inch socket wrench, remove the (3/8–16 inch) shoulder bolt securing the LH wheel to the LH pivot arm. Repeat on the RH side of the unit.
6. Remove the LH wheel and LH gear cover. Repeat on the RH side of the unit.
7. Using a snap ring pliers, remove the snap ring securing the LH pinion gear to the LH transmission axle shaft. Repeat on the RH side of the unit.

g359881

Figure 131

8. Remove the LH pinion gear and washer from the LH transmission axle shaft. Repeat on the RH side of the unit.



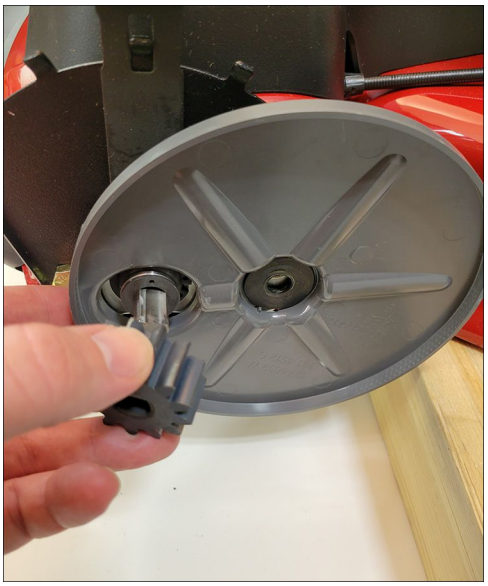
g359882

Figure 132

9. Remove the LH wheel cover from the LH transmission axle shaft. Repeat on the RH side of the unit.

AWD Front Wheel Installation

1. Install the LH wheel cover to the LH transmission axle shaft. Repeat on the RH side of the unit.
2. Install the washer and pinion gear to the LH transmission axle shaft. Repeat on the RH side of the unit.



g359882

Figure 133

3. Install the snap ring securing the pinion gear to the LH transmission axle shaft. Repeat on the RH side of the unit.

g359881

Figure 134

4. Install the LH wheel to the LH pivot arm, secure with the (3/8–16 inch) shoulder bolt. Torque the bolt to 35 ± 1.69 N • m (315 ± 15 in-lb). Repeat on the RH side of the unit.

5. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

6. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

Rear Wheel Replacement

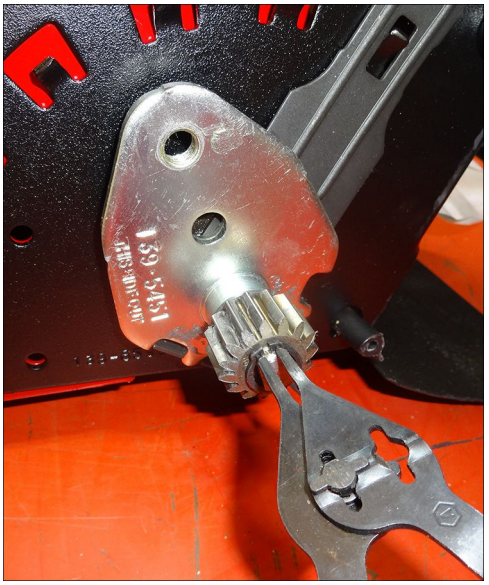
Rear Wheel Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Using ½ inch socket wrench, remove the (3/8–16 inch) wheel bolt securing the LH wheel to the LH pivot arm. Remove the wheel and gear cover. Repeat on the RH side of the unit.

g352317

Figure 135

6. Using a snap ring pliers, remove the snap ring from the LH transmission axle shaft. Repeat on the RH side of the unit.



g352318

Figure 136

Rear Wheel Removal (continued)

7. Remove the pinion gear, thrust washer, and rear pivot from the LH transmission axle shaft. Repeat on the RH side of the unit.

Rear Wheel Installation

1. Install the rear pivot, thrust washer, and pinion gear onto the LH transmission axle shaft. Repeat on the RH side of the unit.
2. Install the snap ring onto the LH transmission axle shaft. Repeat on the RH side of the unit.
3. Install the gear cover and wheel to the LH pivot arm, secure with the (3/8–16 inch) wheel bolt. Torque the bolt to 35 ± 1.69 N • m (315 ± 15 in-lb). Repeat on the RH side of the unit.

g352317

Figure 137

4. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
5. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

RWD Transmission Replacement

RWD Transmission Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the traction cable. RWD Traction Cable Removal (page 5–8)

RWD Transmission Removal (continued)

6. Remove the rear height-of-cut assemblies. Rear Height-of-Cut Removal (page 6–12)
7. Remove the belt from the engine pulley.
8. Remove the transmission and transmission belt.

RWD Transmission Installation

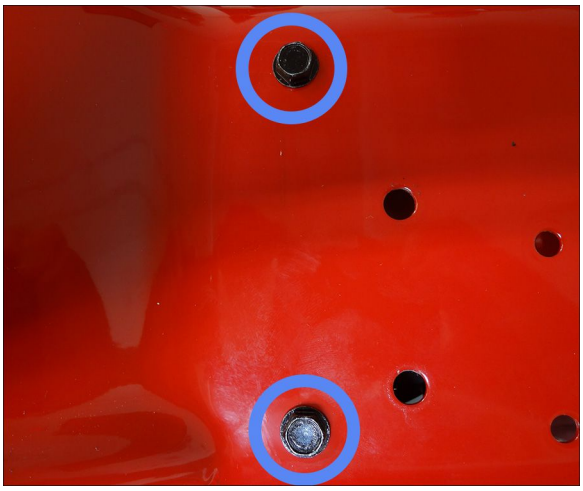
1. Install the transmission and transmission belt.
2. Install the belt onto the engine pulley.
3. Install the rear height-of-cut assemblies. Rear Height-of-Cut Installation (page 6–16)
4. Install the traction cable. RWD Traction Cable Installation (page 5–11)

5. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
6. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

AWD Rear Transmission Replacement

AWD Rear Transmission Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the AWD rear traction cable. AWD Rear Traction Cable Removal (page 5–16)
6. Remove the brake cable. Brake Cable Removal (page 5–4)
7. Remove the blade from the engine crank. Refer to the product Operator's Manual for the blade removal procedures.
8. Remove the 2 (1/4–10 inch) LH screws securing the rear baffle to the deck. Repeat on the RH side of the unit.



g352575

Figure 138

9. Remove the (1/4–10 inch) rear screw securing the baffle to the deck.

g352576

Figure 139

10. Remove the baffle from the deck.
11. Remove the 2 screws (1/4–10 inch) securing the belt guide guard to the deck.

AWD Rear Transmission Removal (continued)

g352577

Figure 140

12. Remove the belt guide guard from the deck.
13. Remove the rear height-of-cut plates. Rear Height-of-Cut Removal (page 6–12)
14. Remove the transmission from the chassis with the belt and cable attached.
15. Using a R2 square bit, remove the 3 (#10–14) screws securing the belt guide to the transmission.

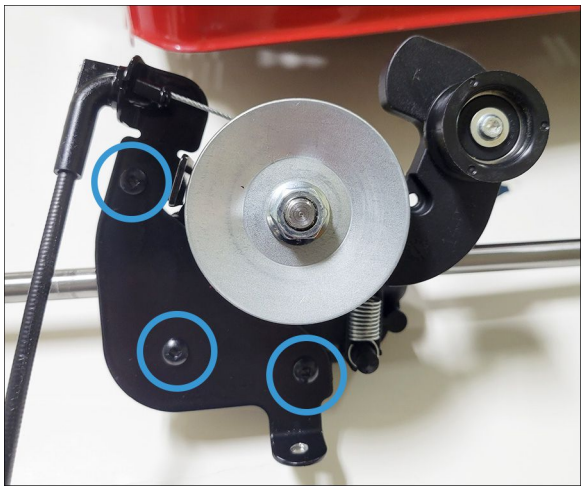


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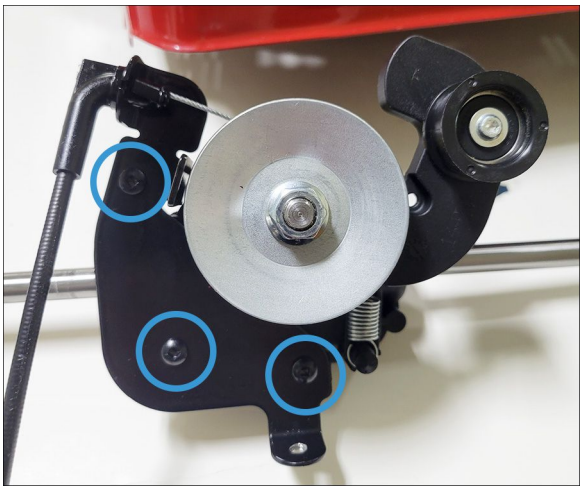
Figure 141

16. Remove the traction cable and spring from the belt guide.

AWD Rear Transmission Installation

1. Install the traction cable and spring to the belt guide.
2. Install the belt guide to the transmission, secure with 3 (#10–14) screws. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).



g359966

Figure 142

3. Install the transmission into the chassis with the belt.
4. Route the belt between the idler pulley and input pulley.
5. Install the rear height-of-cut plates. Rear Height-of-Cut Installation (page 6–16)

6. Install the belt guide guard onto the deck, secure with 2 (1/4–10 inch) screws. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).

g352577

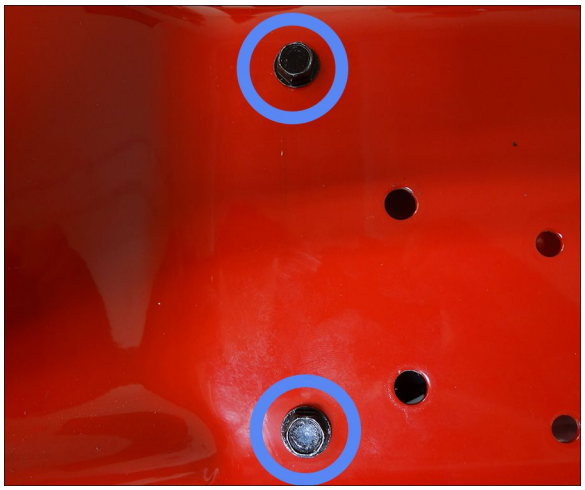
Figure 143

7. Install the baffle onto the deck, secure with a (1/4–10 inch) screw. Torque the screw to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).

g352576

Figure 144

8. Install the 2 (1/4–10 inch) LH screws securing the rear baffle to the deck. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs). Repeat on the RH side of the unit.



g352575

Figure 145

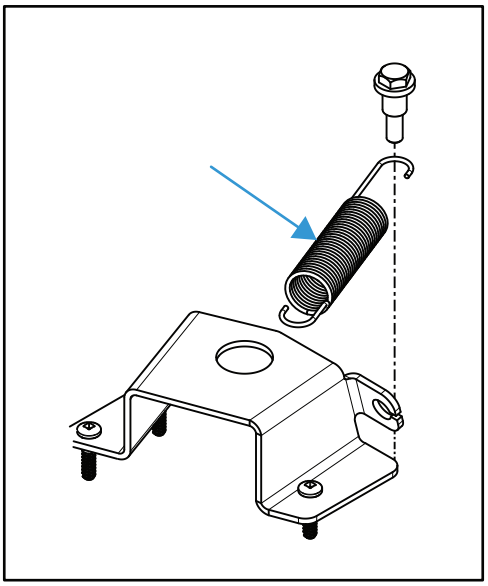
9. Install the blade to the engine crank. Refer to the product Operator's Manual for the blade installation procedures.
10. Install the brake cable. Brake Cable Installation (page 5–6)
11. Install the AWD rear traction cable. AWD Rear Traction Cable Installation (page 5–18)
12. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

13. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

AWD Front Transmission Replacement

AWD Front Transmission Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the AWD front wheels. AWD Front Wheel Removal (page 7–7)
6. Remove the upper intake from the deck. Upper Intake Removal (page 6–18)
7. Remove the transmission return spring from the shoulder bolt and transmission bracket.



g360054

Figure 146

8. Remove the front traction cable anchor from the transmission mount and the cable return spring from the deck.

g359933

Figure 147

1. Cable Return Spring
2. Front Traction Cable Anchor

9. Remove the blade the from the engine crank. Refer to the product Operator's Manual for the blade removal procedures.
10. Remove the 2 (1/4–10 inch) screws securing the belt guide guard to the deck.

g352577

Figure 148

11. Remove the belt guide guard from the deck to gain access to the rear transmission.
12. Using a R2 square bit, remove the 3 (#10/14) screws securing the transmission bracket to the transmission.

AWD Front Transmission Removal (continued)

g360056

Figure 149

13. Remove the belt from the transmission.
14. Remove the transmission from the chassis.
15. Inspect the belt for wear. Replace if necessary.
16. Inspect the blade driver pulley for wear. Replace if necessary.
17. Inspect the transmission pulley for wear. Replace the transmission if wear on the transmission pulley exists.

AWD Front Transmission Installation

1. Install the transmission into the chassis.
2. Install the belt onto the transmission pulley.
3. Install the transmission bracket onto the transmission, secure with 3 (#10–14) screws. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).

g360056

Figure 150

4. Install the belt guide guard onto the deck, secure with 2 (1/4–10 inch) screws. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).

g352577

Figure 151

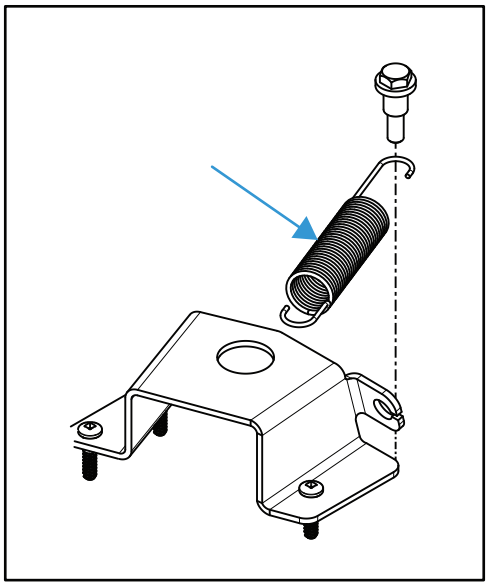
5. Install the blade onto the engine crank. Refer to the product Operator's Manual for the blade installation procedures.
6. Install the cable return spring to the deck and the front traction control cable anchor to the transmission mount.

g359933

Figure 152

1. Cable Return Spring
2. Front Traction Cable Anchor

7. Install the transmission return spring onto the shoulder bolt and transmission bracket.



g360054

Figure 153

8. Install the upper intake to the deck. Upper Intake Installation (page 6–19)
9. Install the AWD front wheels. AWD Front Wheel Installation (page 7–8)
10. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
11. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

Transmission Belt Replacement

Transmission Belt Removal

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. **Models equipped with the 60v powerhead,** remove the harness from powerhead.
3. **Models equipped with electric start only,** remove the 2 (M4.2 x 2.0) screws securing the battery cover. Remove the battery cover and foam pad. Disconnect the battery by removing the negative cable first, then the positive cable from the battery.
4. Remove the grass bagger assembly if attached.
5. Remove the blade the from the engine crank. Refer to the product Operator's Manual for the blade removal procedures.
6. Relieve the transmission belt tension by rocking the transmission forward and removing the belt from the blade drive.
7. Remove the blade driver from the crank.
8. Remove the transmission belt from the crank.
9. **RWD models only,** remove the RWD traction cable. RWD Traction Cable Removal (page 5–8)
10. **AWD models only,** remove the AWD front and rear traction cables. AWD Front Traction Cable Removal (page 5–14) AWD Rear Traction Cable Removal (page 5–16)
11. **RWD models only,** remove the RWD transmission. RWD Transmission Removal (page 7–11)
12. **AWD models only,** remove the AWD front and rear transmissions. AWD Front Transmission Removal (page 7–17) AWD Rear Transmission Removal (page 7–12)
13. Inspect the transmission belt for damage, glazing, and wear. Replace if necessary.
14. Inspect the blade driver and transmission pulley for wear. Replace if necessary

Transmission Belt Installation

1. **RWD models only,** install the RWD transmission. RWD Transmission Installation (page 7–12)
2. **AWD models only,** install the AWD front and rear transmissions. AWD Front Transmission Installation (page 7–19) AWD Rear Transmission Installation (page 7–14)
3. **RWD models only,** install the RWD traction cable. RWD Traction Cable Installation (page 5–11)
4. **AWD models only,** install the AWD front and rear traction cables. AWD Front Traction Cable Installation (page 5–15) AWD Rear Traction Cable Installation (page 5–18)
5. Slide the transmission belt over the engine crank.
6. Install the blade driver to the engine crank.
7. Install the belt to the blade drive.
8. Install the blade to the engine crank. Refer to the product Operator's Manual for the blade installation procedures.

Transmission Belt Installation (continued)

9. **Models equipped with electric start only,** connect the battery by installing the positive cable first, then the negative cable to the battery. Install the foam pad and battery cover. Secure the battery cover with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

10. **Models equipped with the 60v powerhead,** install the harness to the powerhead.

Chapter 8

Electrical

Table of Contents

General Information

This system utilizes a fused wire harness attached to a 12v battery to power a electric starting motor. The push button start has a removable key.

Service and Repairs

Electrical Assembly 1

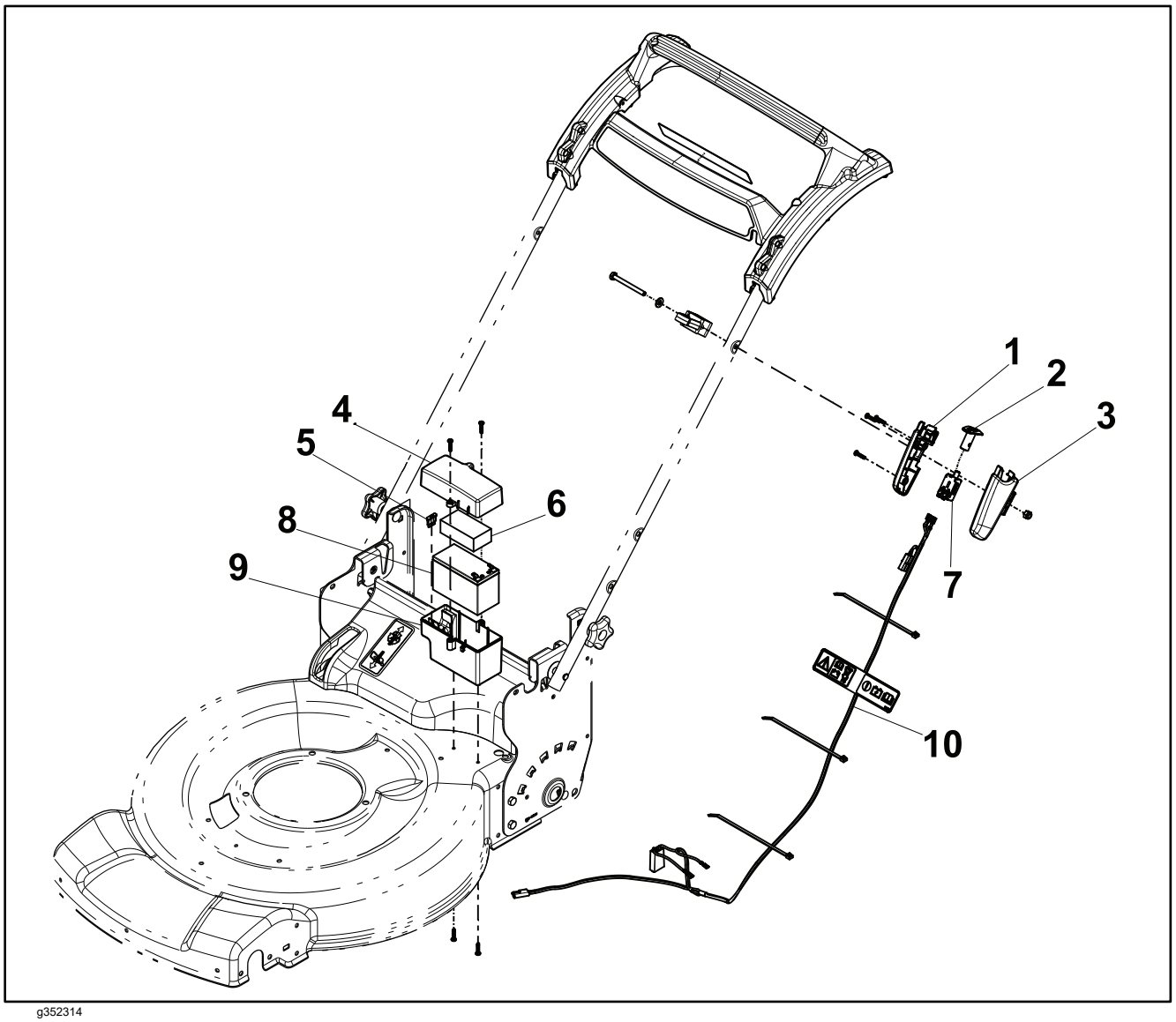
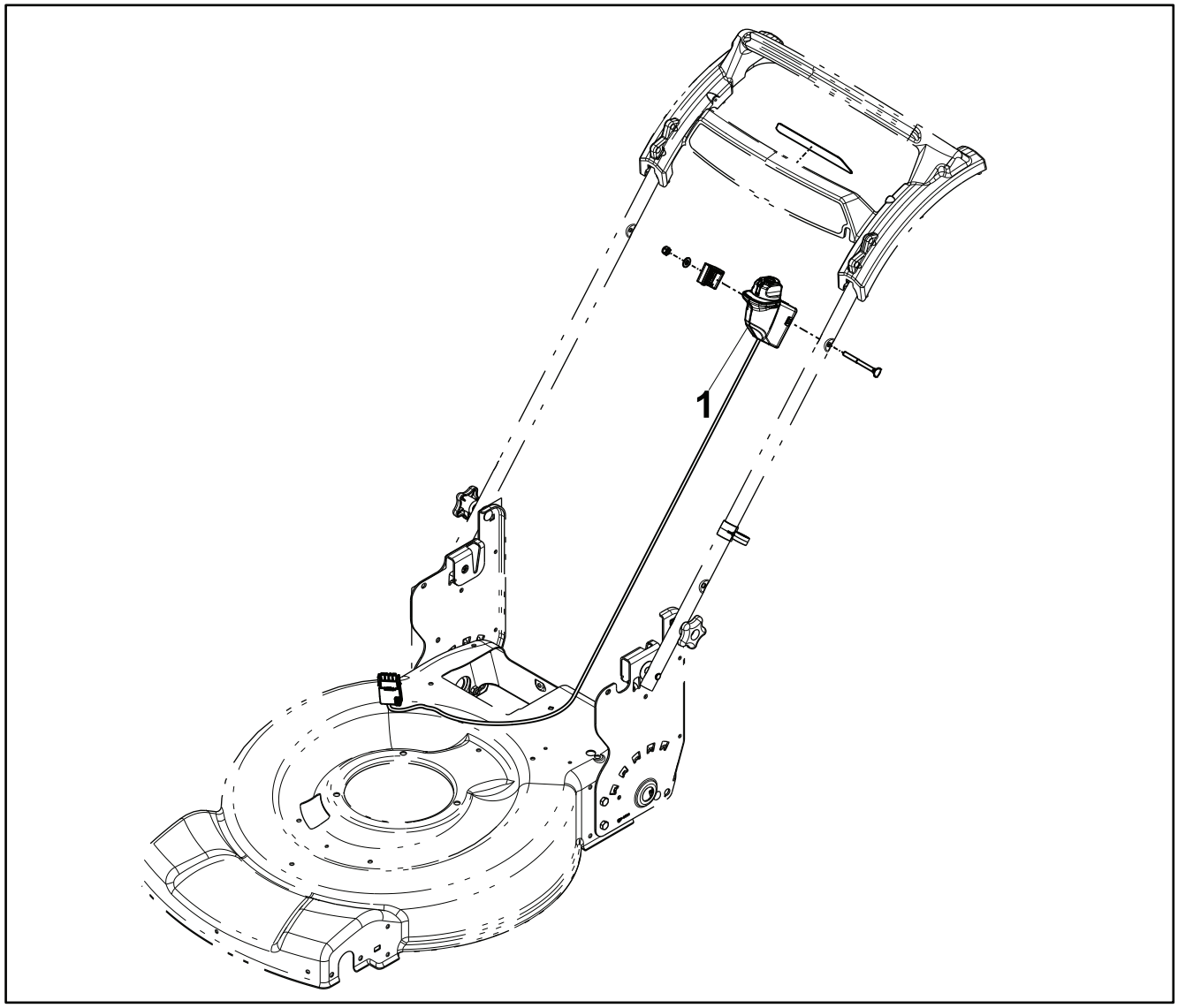


Figure 154

1. RH Switch Housing
2. Switch Button
3. LH Switch Housing
4. Battery Cover
5. 40 Amp Fuse
6. Top Battery Foam
7. Push Button Switch
8. Non-Spillable Battery
9. Battery Tray
10. Wire Harness

Electrical Assembly 2



g352315

Figure 155

1. 60v Starter Switch Assembly

Electric Starter Replacement (Electric Start Models Only)

Electric Starter Removal (Electric Start Models Only)

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. Remove the 2 cable ties securing the electric starter wire harness to the curved handle.

g353634

Figure 156

3. Remove the cable guide from the curved handle.
4. Loosen the (7/16 inch) screw and remove captured NI lock nut securing the cable guide and electric starter to the curved handle. Remove the electric starter from the curved handle.
5. Remove the 2 (M4.2 x 2.0) screws securing the battery cover to the battery box. Remove the battery cover.

g353635

Figure 157

Electric Starter Removal (Electric Start Models Only) (continued)

6. Remove the foam pad and disconnect the positive and negative battery terminals

g353637

Figure 158

7. Disconnect the electric starter harness from the engine harness.

g353638

Figure 159

Electric Starter Disassembly (Models Equipped with Electric Start Only)

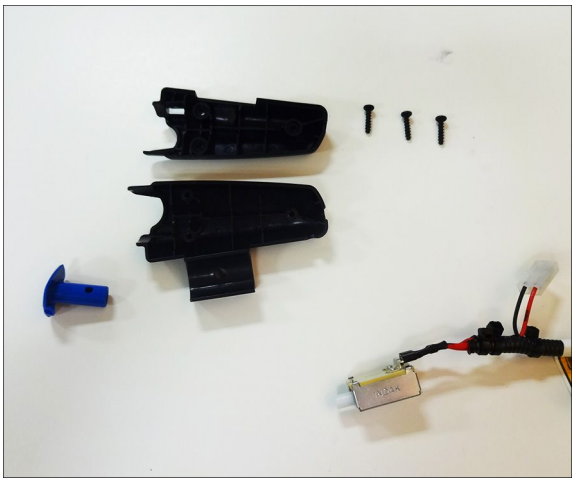
1. Remove the electric starter from the unit. Electric Starter Removal (Electric Start Models Only) (page 8–5)
2. Pull and remove the switch button from the electric starter assembly.

Electric Starter Disassembly (Models Equipped with Electric Start Only) (continued)

g354406

Figure 160

3. Remove the 3 (M4.2 x 2.0) screws securing the LH and RH switch housings. Remove the LH and RH switch housings from the electric starter harness.



g354407

Figure 161

Electric Starter Assembly (Electric Start Models Only)

1. Install the LH and RH switch housings to the electric starter harness.

2. Secure the LH and RH switch housings with 3 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

3. Install switch button onto the electric starter assembly.

Electric Starter Assembly (Electric Start Models Only) (continued)

g354406

Figure 162

4. Install the electric starter to the unit. (page)

Electric Starter Installation (Electric Start Models Only)

1. Connect the electric starter harness to the engine harness.

g353638

Figure 163

2. Install the battery.
3. Connect the battery by installing the positive cable first, then the negative cable to the battery.

g353637

Figure 164

4. Install the foam pad onto the battery.

g353636

Figure 165

5. Install the battery cover onto the battery box, secure with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

g353635

Figure 166

6. Install the cable guide and electric starter to the curved handle, secure with the NI lock nut and (7/16 inch) screw.
7. Install the cable guide onto the curved handle.
8. Install the 2 cable ties securing the electric starter wire harness to the curved handle.

g353634

Figure 167

Battery Assembly Replacement (Electric Start Models Only)

Battery Assembly Removal (Electric Start Models Only)

1. Park the machine on a level surface, stop the engine and wait for all moving parts to stop.
2. Remove the grass bagger assembly if attached.

3. Remove the 2 (M4.2 x 2.0) screws securing the battery cover to the battery box. Remove the battery cover.

g353635

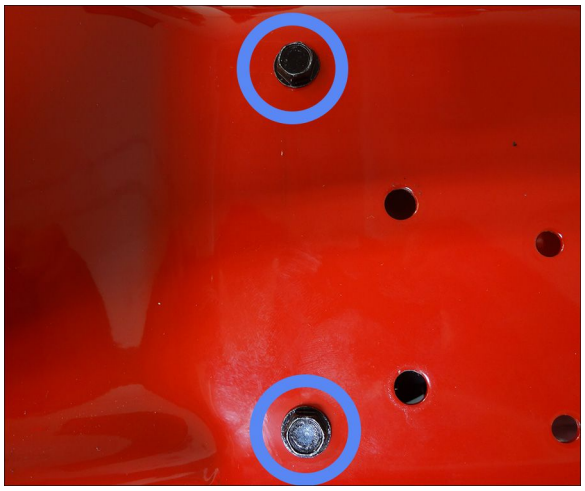
Figure 168

4. Remove the foam pad and disconnect the positive and negative battery terminals

g353637

Figure 169

5. Remove the 2 (1/4–10 inch) LH screws securing the rear baffle to the deck. Repeat on the RH side of the unit.



g352575

Figure 170

6. Remove the (1/4–10 inch) rear screw securing the baffle to the deck.

g352576

Figure 171

7. Remove the baffle from the deck.
8. Remove the 2 (1/4–10) screws securing the belt guide guard to the deck.

Battery Assembly Removal (Electric Start Models Only) (continued)

g352577

Figure 172

9. Remove the belt guide guard from the deck.
10. Remove the 2 (M4.5 x 2.0) screws securing the battery tray to the chassis. Remove the battery tray from the chassis.

Battery Assembly Installation (Electric Start Models Only)

1. Install the battery tray to the chassis, secure with the 2 (M4.5 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).
2. Install the belt guide guard onto the deck, secure with 2 (1/4–10 inch) screws. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).

g352577

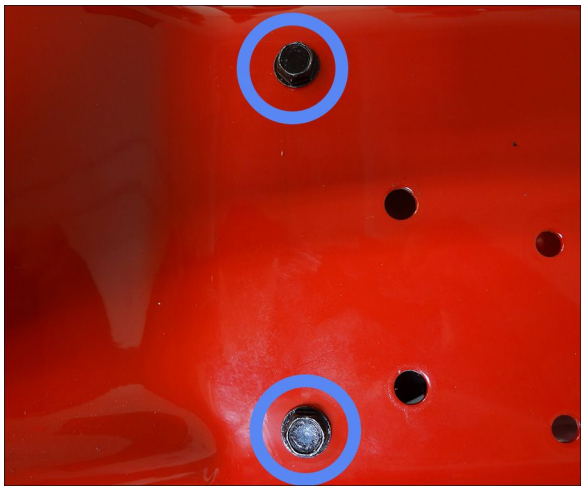
Figure 173

3. Install the baffle to the deck, secure with a (1/4–10 inch) screw. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs).

g352576

Figure 174

4. Install the 2 (1/4–10 inch) LH screws securing the rear baffle to the deck. Torque the screws to 2.82 ± 0.56 N • m (25 ± 5 in-lbs). Repeat on the RH side of the unit.



g352575

Figure 175

5. Install the battery.
6. Connect the battery by installing the positive cable first, then the negative cable to the battery.

g353637

Figure 176

7. Install the foam pad.

g353636

Figure 177

8. Install the battery cover, secure with 2 (M4.2 x 2.0) screws. Torque the screws to 2.26 ± 0.34 N • m (20 ± 3 in-lbs).

g353635

Figure 178

Appendix A

Foldout Drawings

Table of Contents

Electrical Drawing Abbreviations

The following abbreviations are used for wire harness colors on the electrical schematics and wire harness drawings in this chapter.

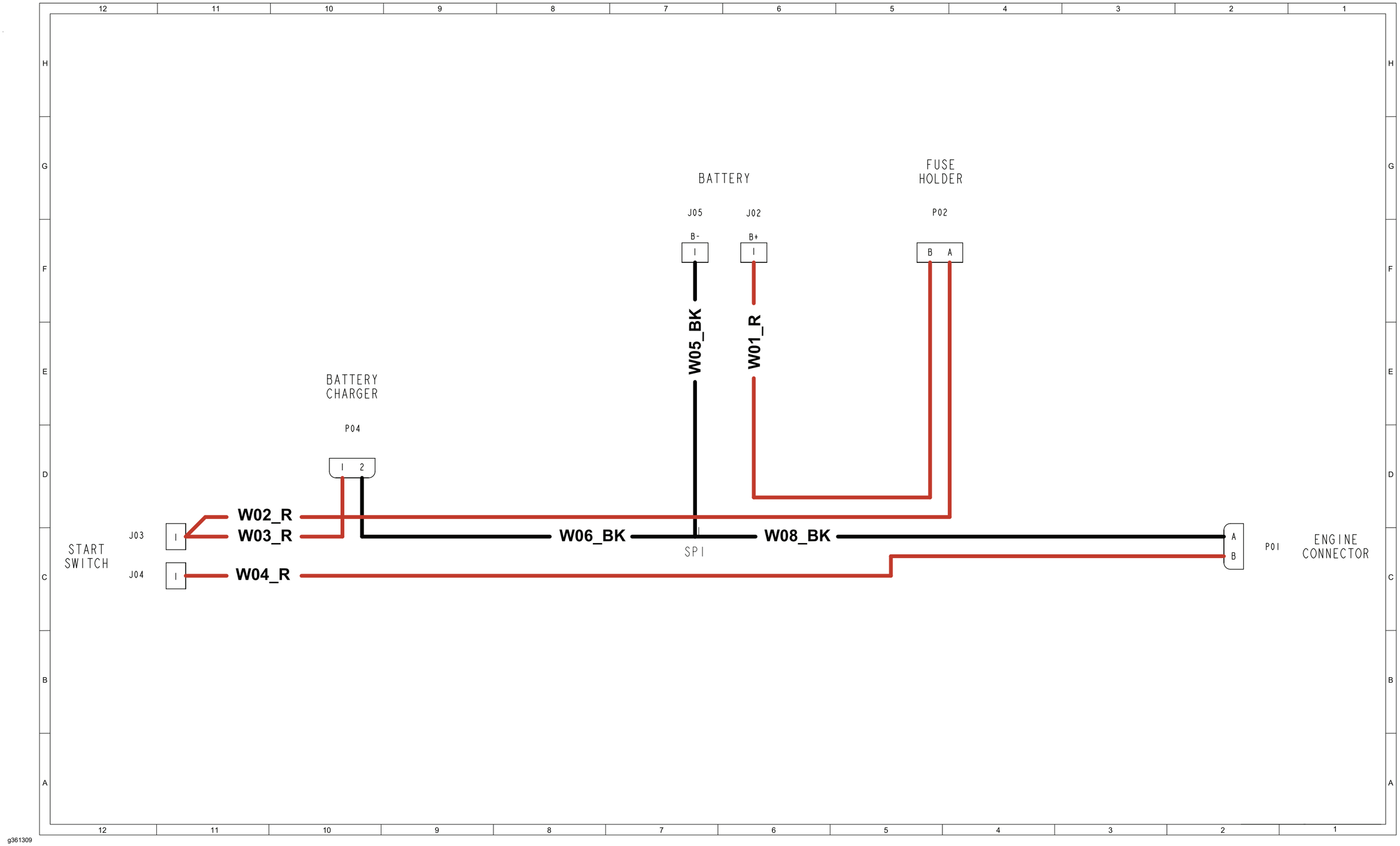
Abbreviation	Color
BK	Black
BR or BN	Brown
BU	Blue
GN	Green
GY	Gray
OR or OG	Orange
PK	Pink
R or RD	Red
T or TN	Tan
VIO or VT	Violet
W or WH	White
Y or YE	Yellow

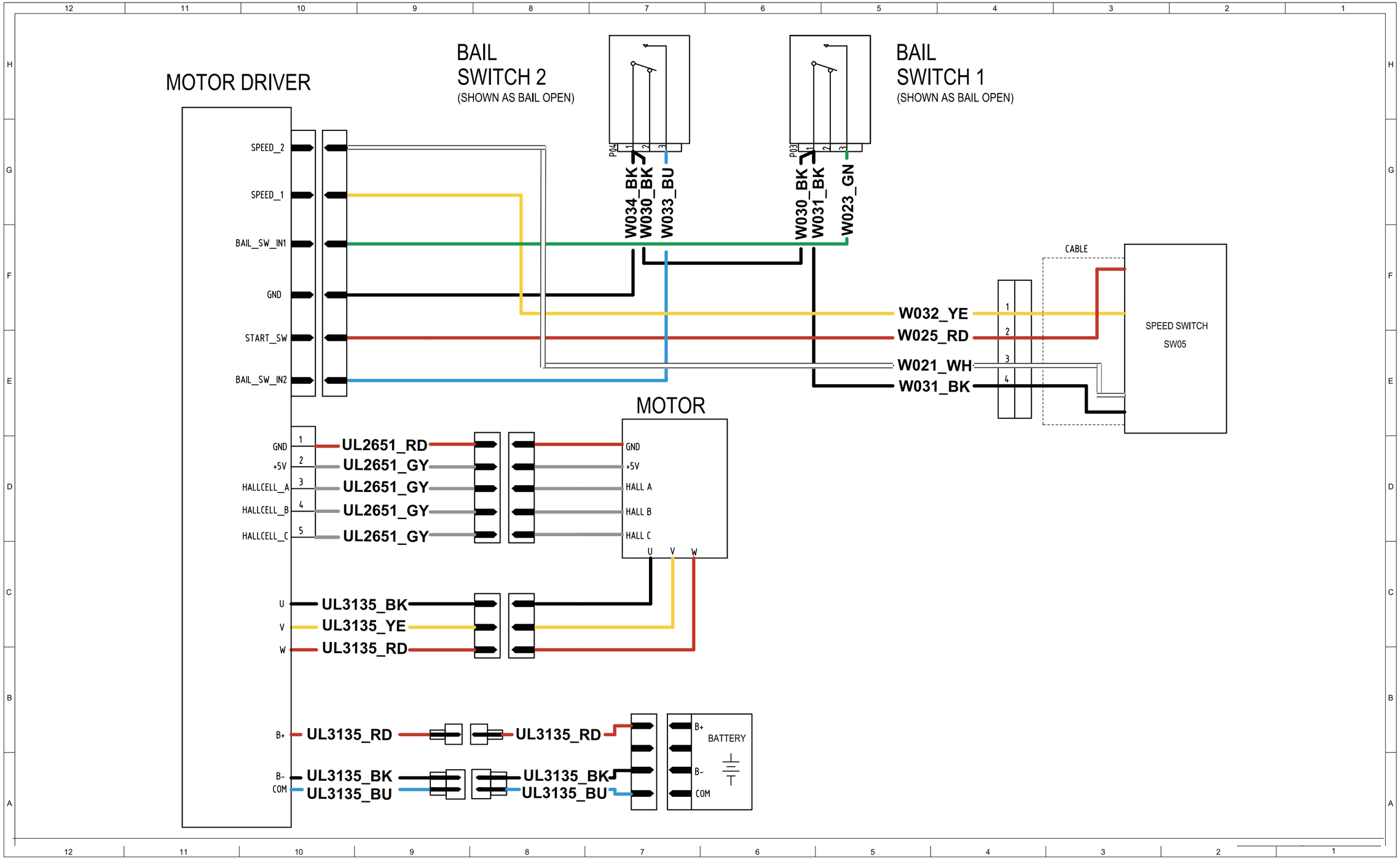
Numerous harness wires include a line with an alternate color. These wires are identified with the wire color followed by a / or _ and then the line color (e.g, R/BK is a red wire with a black line; OR_BK is an orange wire with a black line).

Note: The electrical harness drawings in this chapter identify both the wire color and the wire gauge. For example, 16 BK on a harness diagram identifies a 16 gauge wire with black insulation.

Note: A splice used in a wire harness will be identified on the wire harness diagram by SP. The manufacturing number of the splice is also identified on the wire harness diagram (e.g., SP01 is splice number 1).

Electrical Schematic — Electric Start




MOTOR DRIVER
BAIL SWITCH 2
(SHOWN AS BAIL OPEN)
BAIL SWITCH 1
(SHOWN AS BAIL OPEN)
P04
P03
SPEED_2
SPEED_1
BAIL_SW_IN1
GND
START_SW
BAIL_SW_IN2
W034_BK
W030_BK
W033_BU
W030_BK
W031_BK
W023_GN
W032_YE
W025_RD
W021_WH
W031_BK
CABLE
SPEED SWITCH
SW05
MOTOR
GND
+5V
HALLCELL_A
HALLCELL_B
HALLCELL_C
UL2651_RD
UL2651_GY
UL2651_GY
UL2651_GY
UL2651_GY
GND
+5V
HALL A
HALL B
HALL C
U
V
W
U
V
W
UL3135_BK
UL3135_YE
UL3135_RD
B+
UL3135_RD
UL3135_RD
B-
COM
UL3135_BK
UL3135_BU
UL3135_BK
UL3135_BU
B+
BATTERY
B-
COM

g372500