

MODEL#: 23621216

& 23621217

GRASS COLLECTION SYSTEM

12

DESIGNED FOR THE BOB-CAT PROCAT & PREDATOR PRO G-SERIES & F-SERIES 2008-2012

OPERATOR'S MANUAL

ASSEMBLY • OPERATION • MAINTENANCE

PECO GRASS COLLECTION SYSTEM TABLE OF CONTENTS

SECTION

PAGE SECTION

PAGE

0

	Safety2 Safety Alert Symbols3 Warranty4
	INTRODUCTION AND DESCRIPTION5 1-1 Introduction5 1-2 Description5
11	INSTALLATION FOR USE

	2-14 Imperier Blade Rendval/Replacement 9 2-15 Boot To Mower Deck Installation 10 2-16 Length Of Hose Adjustment 10 2-17 Upper Hose Installation 10 2-18 Lower Hose To Blower Cone Installation 10 2-19 Lower Hose To Boot Installation 10 2-20 Front Weight Installation 10 2-21 Throttle Cable Installation 12 Exploded Views and Parts List 13-16
111	DPERATING INSTRUCTIONS
V	IAINTENANCE 17 4-1 Maintenance Checklist 17
V	ARTS AND SERVICE

2.14 Impeller Plade Demoval/Deplesem

Safety

- **1.** Read the operator's manual carefully and familiarize yourself with the proper use of your attachment. Do not allow anyone who is not acquainted with the Safety Instructions to use your attachment.
- 2. Know the controls and how to stop quickly. READ THE OPERATOR'S MANUAL!
- 3. Do not allow children to operate the vehicle. Do not allow adults to operate it without proper instruction.
- 4. Be especially watchful of children and pets darting into the area while operating.
- 5. Keep your eyes and mind on your unit while mowing or operating your attachment. Don't let others distract you.
- 6. Do not attempt to operate your unit or mower when not in the driver's seat.
- 7. Always stop unit when emptying the container.
- **8.** Stop unit, shut off deck attachment, set parking brake, shut off mower engine and remove spark plug wire before removing clogs, removing or replacing hose, boot, blower cone, or performing any maintenance.
- 9. Mow across the face of slopes (not steeper than 10 degrees); never up and down the face of the slope.
- **10.** It is recommended that the container be kept only half full when negotiating any slopes. Start mowing on slopes when the container is empty.
- **11.** Inspect your lawn and remove any foreign objects before mowing. Never deliberately run the mower across any foreign object.
- **12.** Wear ear protection if the noise level is offensive.
- **13.** Wear eye protection to prevent debris from damaging your eyes.

SAFETY

WARNING! NEVER operate the unit unless the discharge guard and either the deflector assembly or the vacuum collector adapter are fastened securely in place.

WARNING! Do not work around the mower deck boot or the blower area until you are certain that the mower blades and the blower impeller have stopped rotating.

WARNING! To avoid serious injury, perform maintenance on the vacuum collector; **ONLY AFTER STOPPING THE MOWER'S ENGINE AND WAITING FOR ALL MOVING PARTS TO COME TO A COMPLETE STOP.** Set the parking brake. Always remove the ignition key before beginning maintenance.

WARNING! For your own personal safety, **ALWAYS** mow **ACROSS** the face of slopes and **NEVER UP and DOWN** the face. **NEVER** attempt to mow excessively steep slopes, and use caution when turning on any slope.

Safety Alert Symbol



This Safety Alert Symbol means: **"ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!"**

This symbol is used to call attention to safety precautions that Should be followed by the operator to avoid accidents. When you see this symbol, carefully read the message that follows and heed its advice. Failure to comply with safety precautions could result in death or serious bodily injury.

Safety Signs

The signal words **DANGER, WARNING,** and **CAUTION** are used on the equipment safety signs. These words are intended to alert the viewer to the existence and the degree of hazard seriousness.



This signal word indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.

White letters on **RED**



Black letters on **ORANGE**



Black letters on YELLOW

This signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

It may also be used to alert against unsafe practices.

This signal word indicates a potentially hazardous situation exist which, if not avoided, will result in minor or moderate injury.

It may also be used to alert against unsafe practices.

PECO LIMITED WARRANTY FOR NEW PRODUCTS

A. WHAT IS UNDER WARRANTY?

PECO extends the following warranties to the original purchaser of each new PECO consumer product subject to the following limitations.

1. PRODUCT WARRANTY: Any part of any consumer product, which is defective in material or workmanship as delivered to the purchaser will be repaired or replaced, as PECO elects, without charge for parts or labor, if the defect appears within 12 months (On most products, see owners manual for specifics) from the date of delivery

of the product to the original purchaser. ALL DEFECTIVE PARTS MUST BE RETURNED TO PECO

FOR INSPECTION TO DETERMINE VALIDITY OF WARRANTY CLAIMS. Freight and mailing

will

be borne by the customer.

2. PARTS REPLACED DURING WARRANTY: Any new PECO part which is furnished in performance of this warranty and is defective in material or workmanship as delivered to the purchaser will be repaired or replaced, as PECO elects, without charge if the defect appears within 90 days from the date of installation of such part or before the expiration of the original warranty period, whichever is later.

B. SECURING WARRANTY ADJUSTMENTS.

Call PECO for Return Authorization. Damaged or broken parts other than engines or batteries, must be returned to New PECO Inc., 100 Airport Road, Arden, NC 28704 before any warranty adjustment can be authorized. At the time of requesting warranty adjustment, the purchaser must present evidence of the date of delivery of the product. The purchaser shall pay any charge for the product to and from Arden, NC.

C. ITEMS NOT COVERED BY PECO WARRANTY.

Engines and batteries attached to PECO products are covered under a separate warranty by the respective manufacturer.

D. UNAPPROVED ALTERATION OR MODIFICATION.

All obligations of New PECO, Inc. under this warranty shall be terminated if products are altered or modified in ways not approved by New PECO Inc.

E. ACCIDENTS AND NORMAL MAINTENANCE.

The warranty covers only defective material and workmanship. It does not cover depreciation or damage caused by normal wear, accident, improper use or abuse of products. The cost of normal maintenance and normal replacement of service items such as belts, cutting blades, hoses, etc., which are not defective shall be paid for by the purchaser.

F. NO REPRESENTATIONS ADDITIONAL WARRANTIES, DISCLAIMER.

Neither New PECO Inc. nor any company affiliated with it makes any warranties, representations or promises as to the quality of performance of its products other than those set forth herein. Except as described above, New PECO Inc. makes no other warranties **AND SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OF FITNESS AND MERCHANTABILITY.**

G. ANY MACHINE USED FOR RENTAL PURPOSES ARE GUARANTEED FOR 45 DAYS FROM DATE

OF ORIGINAL SALE ONLY.

H. REMEDIED EXCLUSIVE.

The only remedies the purchaser has in connection with the breach or performance of any warranty on New PECO Inc. consumer products are set forth above. In no event will PECO be liable for special incidental or consequential damages.

1. NO SERVICE CENTER WARRANTY.

The selling Service Center makes no warranty on his own on any item warranted by New PECO Inc. unless he delivers to purchaser a separate written warranty certificate specifically warranting the item. The dealer has no authority to make any representation or promise on behalf of PECO or to modify the terms of this warranty in any way.

SECTION I INTRODUCTION AND DESCRIPTION

1-1 Introduction

We are pleased to have you as a PECO customer. Your collection system has been designed to give you a low maintenance, simple and effective way to collect the grass clippings from your mower. This manual is provided to give you the necessary instructions to properly mount and operate the collection system on your mower. Please read this manual thoroughly. Understand what each control is for and how to use it. Observe all safety decal precautions on the machine and noted throughout the manual.

Note: All references made to right, left, front, rear, top or bottom are as viewed from the normal operator's position on the mower.

1-2 Description

The collection system is designed for turf maintenance where there is a need to collect the grass clippings as the mower cuts the turf. It is also good for picking up leaves and twigs in pre-season and post-season cleanup. The engine/blower/blade assembly, is mounted on the right side of the unit. The blower draws grass clippings from the discharge area of the cutter deck up to the aluminum container mounted over the rear portion of the frame. The operator can engage the engine/blower/blade assembly by starting the engine.

Once the container is full of clippings, the operator can easily push and raise the lift handle, releasing the container's rear door and the container will pivot towards the ground.

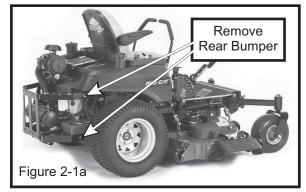
Section II PREPARATION FOR USE

2-1 Preparation Of Mower

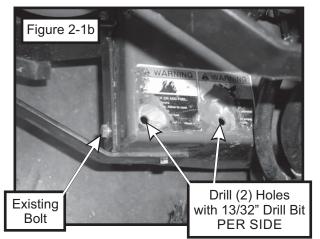
Carefully dismantle wooden shipping crate from around the components. Cut retaining straps and separate the parts. Remove and sort all parts for easy identification. Before each step of assembly it will help to study the exploded drawings on pages 15 through 20.

G-SERIES

Remove the bumper from the rear frame of the mower before proceeding. <u>NOTE:</u> Leave all mounting hardware loose until the main frame assembly is installed.

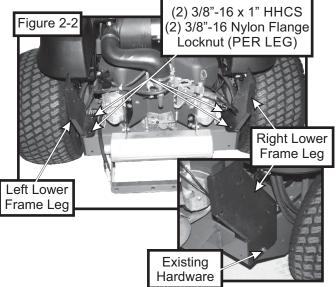


On the rear right side of the mower chassis drill two 13/32" holes. There are several ways of doing this, the best is to remove the bolt that connects the lower rear bumper to the mower's chassis (Figure 2-1b) and loosely fasten the right lower frame leg assembly P#(A0679) with the existing bolt and nut to use as a template. Use a center punch to mark the holes, then remove the right lower frame leg assembly. Another way to mark the holes is to use the full scale drill template to center-punch the holes (Page 21), or by using the dimensions provided on the drill template for laying out the holes. We recommend when laying out the holes to use a square and a metal scribe. **NOTE:** For the F-Series mower, follow the instructions listed for the G-Series, but do not remove the rear bumper.

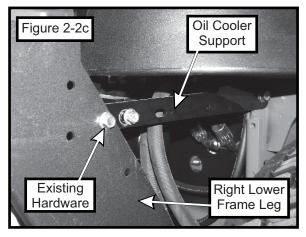


2-2 Left and Right Lower Frame Leg Installation

Secure the left lower frame leg P#(A0681) and the right lower frame leg P#(A0679) to the rear frame of the mower, using (2) 3/8"-16 x 1" HHCS P#(K1191), (2) 3/8"-16 nylon flange locknuts P#(K2038) (PER LEG) and existing hardware removed from the rear bumper. Refer to Figure 2-2.

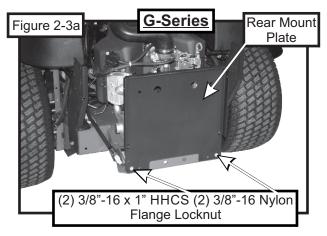


<u>G-SERIES ONLY:</u> Secure the oil cooler support to the left and right lower frame legs using existing hardware from the bumper removal. It may be necessary to loosen all hardware on the oil cooler support in order to align the mounting hole on the frame leg. Once the support is secured to the leg, tighten all hardware. Figure 2-2b shows the right lower frame leg.

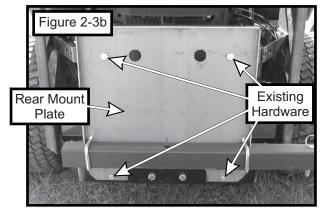


2-3 Rear Mount Plate Installation

G-SERIES: Secure the rear mount plate P#(B0047) to the rear frame of the mower using (2) 3/8"-16 x 1" HHCS P#(K1191) and (2) 3/8"-16 nylon flange locknuts P#(K2038). Refer to Figure 2-3a.

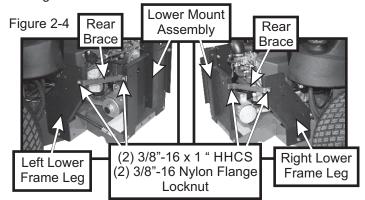


F-SERIES: Secure the rear mount plate P#(B0047) to the rear bumper using the existing hardware as shown in Figure 2-3b.



2-4 Rear Brace Installation

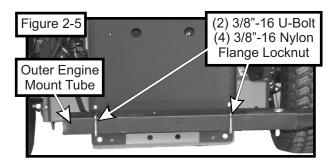
G-SERIES ONLY: Secure (1) rear brace P#(B0668) to the lower mount assembly and the left lower frame leg. Use (2) 3/8"-16 x 1" HHCS P#(K1191) and (2) 3/8"-16 nylon flange locknuts P#(K2038). Secure (1) rear brace P#(B0668) to the lower mount assembly and the right lower frame leg. Use (2) 3/8"-16 x 1" HHCS P#(K1191) and (2) 3/8"-16 nylon flange locknuts P#(K2038). Refer to Figure 2-4.



2-5 Outer Engine Mount Tube

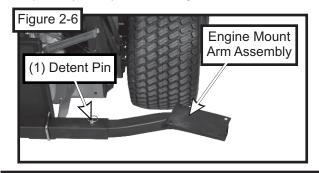
Installation

Position the outer engine mount tube P#(B1117) as shown in Figure 2-5. Secure the outer engine mount tube to the rear mount plate using (2) 3/8"-16 u-bolts P#(K1119) and (4) 3/8"-16 nylon flange locknuts P#(K2038).



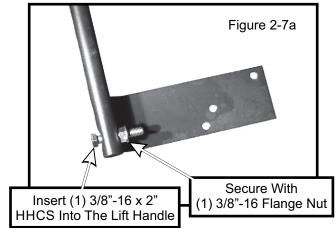
2-6 Engine Mount Arm Assembly Installation

Insert the engine mount arm assembly P#(A1824) into the outer engine mount tube and align the mounting holes on both parts. Secure the engine mount arm assembly to the outer engine mount tube using (1) detent pin P#(J0248). Refer to Figure 2-6.

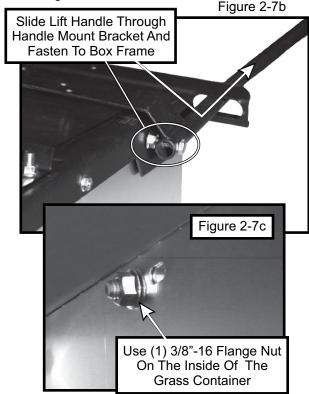


2-7 Lift Handle Installation

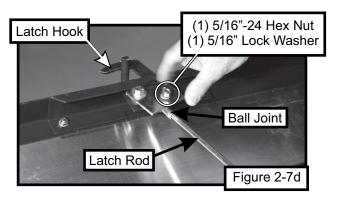
NOTE: Before continuing the lift handle installation, have someone assist you in turning the grass container upside down. Insert (1) 3/8"-16 x 2" HHCS P#(K1208) into the lift handle P#(A0273), and secure with (1) 3/8"-16 flange nut P#(K1215). Thread the flange nut onto the bolt upside down, as shown in Figure 2-7a.



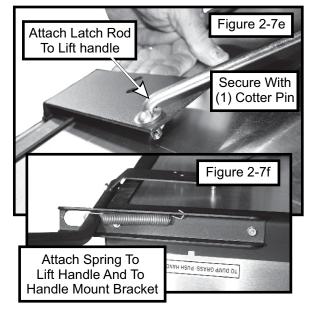
Slide the lift handle through the slot on the handle mount bracket. Insert the lift handle into the box frame as shown in Figure 2-7b, and secure using (1) 3/8"-16 flange nut P#(K1215) on the inside of the container as shown in Figure 2-7c.



Fasten the ball joint P#(K1442) to the end of the latch rod P#(A0620). Tighten the ball joint to approximately half way down the threads on the latch rod. Attach the ball joint to the latch hook as shown in Figure 2-7d, using (1) 5/16"-24 hex nut P#(K1444) and (1) 5/16" lock washer P#(K0043).

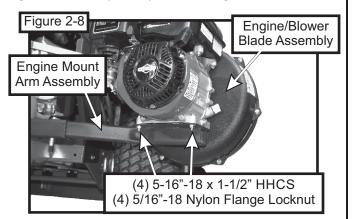


Attach the other end of the latch rod to the lift handle, as shown in Figure 2-7e. Attach on end of the spring P#(J0176) to the lift handle and the other end of the spring to the handle mount bracket as shown in Figure 2-7f. Adjust the ball joint up or down on the latch rod threads until the latch hook closes completely. After adjusting the latch hook, secure the latch rod to the lift handle using (1) cotter pin P#(K0094).



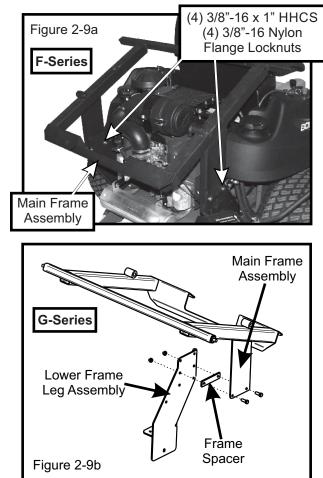
2-8 Engine/Blower/Blade Assembly Installation

Position the engine/blower/blade assembly on top of the engine mount arm assembly and secure with (4) 5-16"-18 x 1-1/2" HHCS P#(K1157) and (4) 3/8"-16 nylon flange locknuts P#(K2516). Refer to Figure 2-8.



2-9 Main Frame Assembly Installation

Attach the main frame assembly P#(A0680) to the left and right lower frame leg assemblies using (4) 3/8"-16 x 1" HHCS P#(K1191) and (4) 3/8"-16 nylon flange locknuts P#(K2038) (Figure 2-9a). (G-Series only) Position (1) frame spacer P#(B0669) between **each** frame leg on the main frame and the lower frame legs. Refer to Figure 2-9b.



2-10 Aluminum Grass Container

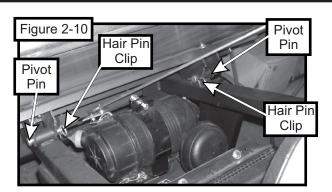
Installation

NOTE: It is recommended that (3) people assist in mounting the container.

With three people available, two can lower the container onto the frame while the third person inserts the pivot pins P#(K0172) through the holes. Insert the pins from the outside to the inside. Secure with (1) 5/8" washer P#(K0058) and (1) 5/32" x 2-5/8" hair pin clip P#(K0088) per pivot pin (Figure 2-10).

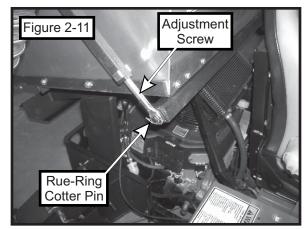
Reattach the bottom ends of the door opening linkages to the main frame by using (1) Rue-Ring cotter pin P#(K1437) per side.

To test the functionality of the dump mechanism, pull the lift handle away from the unit, and lift upward. The door of the container should open and the box should pivot clockwise towards the ground.



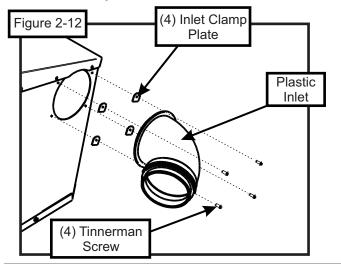
2-11 Dump Mechanism Adjustment

The linkage may be adjusted in two places, at the adjusting screw P#(K1435) and the latch assembly items. See page 13 for visual clarification. To change the door closure tightness, screw the adjusting screw (Figure 2-11) in or out. To adjust the latch, change the length of the latch rod by screwing the latch adjusting ball joint in or out. The latch hook pivot should be in the middle of the slot in the latch hook pivot plate. Slide the pivot back or forth and then re-tighten.



2-12 Inlet Installation

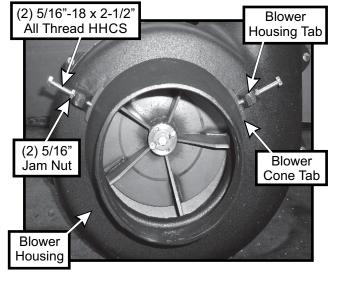
Remove the (4) tinnerman screws P#(K1092) and (4) inlet clamp plates P#(B1668) from the inlet opening on the aluminum box. Insert the plastic inlet from the inside of the aluminum box, through the inlet opening. Secure the inlet with (4) tinnerman screws and (4) inlet clamp plates. Refer to Figure 2-12.



2-13 Blower Cone Installation

Thread (1) 5/16"-18 jam nut P#(K0120) onto each end of (2) 5/16"-18 x 2-1/2" HHCS P#(K0125). Now partially thread the bolts into each of the two tabs located on the blower housing. Place blower cone so the two tabs line up with the bolts then tighten completely. Refer to Figure 2-13 for reference.

Figure 2-13

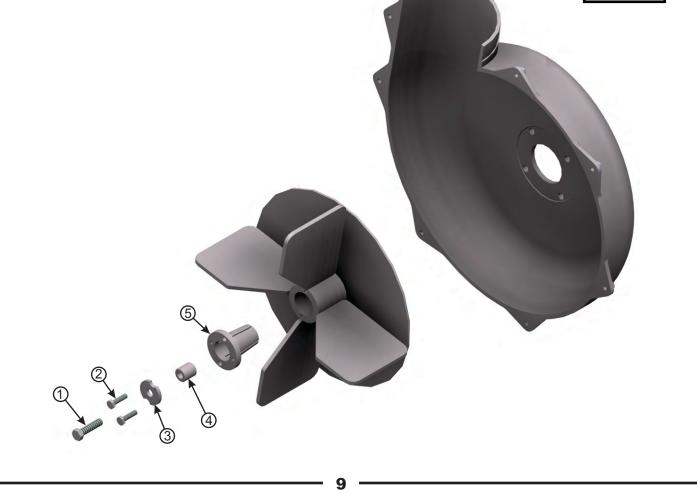


2-14 Impeller Blade Removal/Replacement

To Remove: First remove the 3/8"-16 x 1-1/2" HHCS P#(K1211) (#1), taper lock bushing washer P#(K0278) (#3) and spacer bushing P#(S3242) (#4) from the taper-lock bushing (#5). See Figure 2-14. Next remove the (2) 1/4"-20 x 1" HHCS P#(K1225) (#2) and place them into the threaded holes of the taper-lock bushing P#(S4302) (#5). Gradually thread each bolt evenly into the taper-lock bushing, forcing the blade to break-away from the taper-lock bushing. If the impeller will not move, carefully hit the base of the impeller, between each vein, with a hammer, then try again.

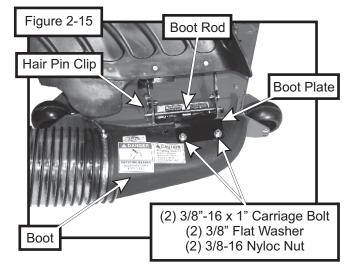
To Replace: Place impeller blade over the engine shaft. Slide the taper-lock bushing (#5) on to the engine shaft and into the impeller blade, aligning the **non-threaded** holes of the taper-lock bushing to the threaded holes of the impeller blade. Fasten by using (2) 1/4"-20 x 1" HHCS (#2), (1) spacer bushing (#4) (1) taper lock bushing washer (#3), and (1) 3/8"-16 x 1-1/2" HHCS (#1). Torque to the proper specifications in the torque chart on the back of this manual. Next, rotate the impeller blade to ensure that the blade is clear of contact on all sides of the blower housing.

Figure 2-14



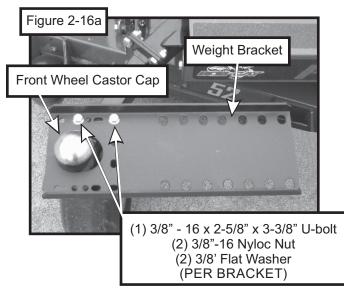
2-15 Boot to Mower Deck Installation

Secure the boot plate P#(B0673) to the mower deck using (1) boot rod P#(B0288) and (1) hair pin clip P#(K0099). Secure the boot P#(E1030) to the boot plate using (2) 3/8"-16 x 1" carriage bolt P#(K1182), (2) 3/8" flat washer P#(K0047), and (2) 3/8"-16 nyloc nut P#(K1216). Insert the carriage bolt from the inside of the boot so that the threads are on the outside. This will prevent grass clippings from collecting on the threads. Refer to Figure 2-15.

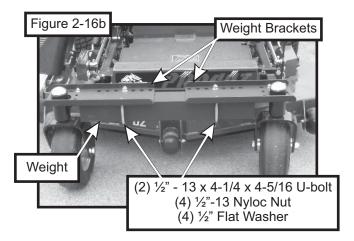


2-16 Front Weight Assembly Installation

NOTE: A floor jack should be used to help position weights onto the brackets. When installing the weights you should have another person to help position the weights. Align the weight bracket holes over the front wheel castor cap (Figure 2-16a). Secure brackets with (1) 3/8"-16 x 2-5/8" x 3-3/8" U-bolt P#(K1460), (2) 3/8" flat washers P#(K0047) and (2) 3/8"-16 nyloc nuts P#(K1216) per side. The U-bolt is inserted from the bottom. Repeat steps for weight bracket on opposite side.



Position the weight P#(B0026) under the weight brackets and secure with (1)1/2"-13 x 4-1/4" x 4-5/16" U-bolt P#(K0331), (2) 1/2" flat washers P#(K0055) and (2) 1/2"-13 nyloc nuts P#(K1247) per side (Figure 2-16b).



2-17 Length Of Hose Adjustment

The hoses in steps 2-18 and 2-19 must be cut to fit your machine. Follow steps 2-18 and 2-19. Do not cut the hoses until you have tried to fit them on your machine. Remember that the hoses have to be long enough to allow for enough clamping surface between the inlet, blower assembly, and the deck boot, but have to remain short enough to prevent hose "kinks".

2-18 Upper Hose Installation

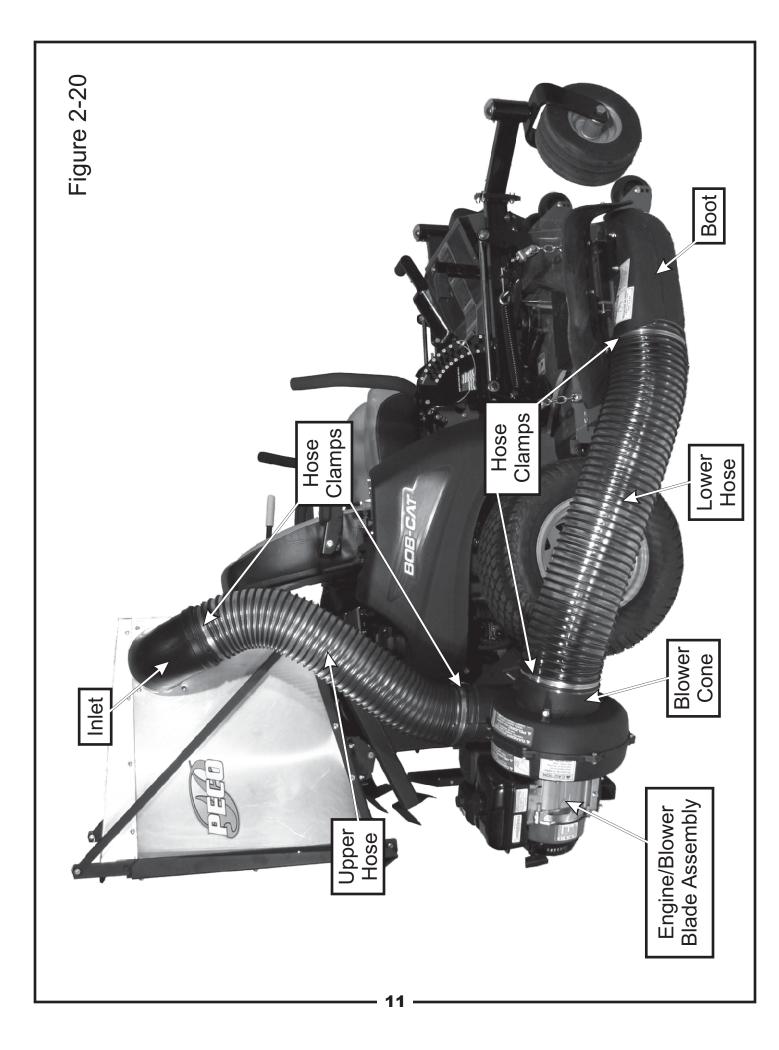
Slide a 2"-10" hose clamp P#(J1000) onto both ends of the 6" upper hose P#(F0001) (Figure 2-20). Then slide one end of the 6" hose onto the inlet. Make sure there is about a two-inch overlap between the hose end and the container inlet. Proceed to slide the opposite end of the 6" hose onto the outlet of the blower assembly. See Figure 2-18 for details. Make sure both ends of the hose are clearly attached to the inlet and the blower assembly inlet. Tighten the hose clamps.

2-19 Lower Hose To Blower Cone Installation

Slide a 2"-10" hose clamp P#(J1000) over both ends of the lower hose. Then proceed to slide the lower hose onto the blower cone. Tighten the hose clamp. The assembly should look like Figure 2-20.

2-20 Lower Hose To Boot Installation

Take the unattached end of the lower hose and slide it over the circular end of the boot. Use the lower hose clamp to secure the hose to the boot (Figure 2-20). Tip: Before securing clamp rotate hose counter-clockwise (away from yourself) approximately 1" to add in retaining boot to mower deck.



2-21 Throttle Cable Installation

To install the throttle cable kit P#A0060 to the box assembly, align the large end of the slot in the throttle base plate (Figure 2-21a) with the rivets located on the front of the box assembly frame (Figure 2-21b). Place the throttle base plate over the rivets, Slide the throttle cable kit to the right, moving the smaller end of the slot over the rivets. When positioned correctly, the throttle spring plate will snap into place (Figure 2-21c).

To remove the throttle cable kit, lift the throttle spring plate and slide the throttle kit to the left.

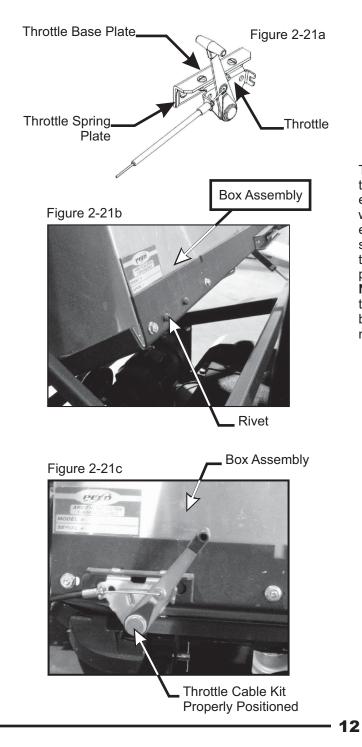
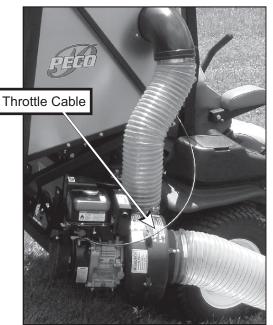
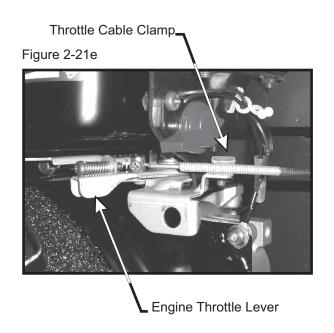


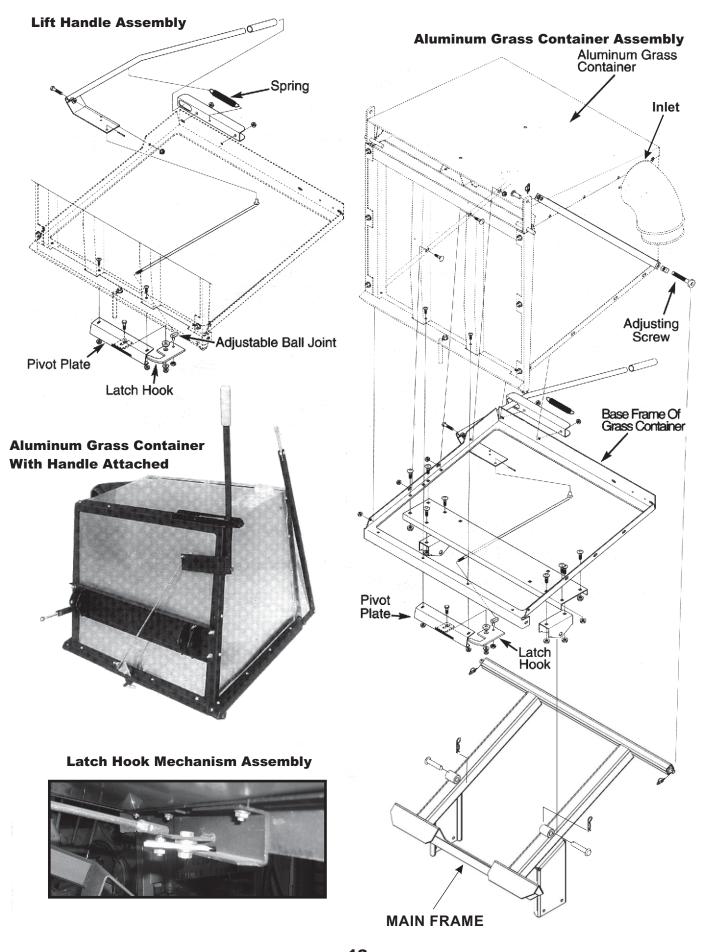
Figure 2-21d

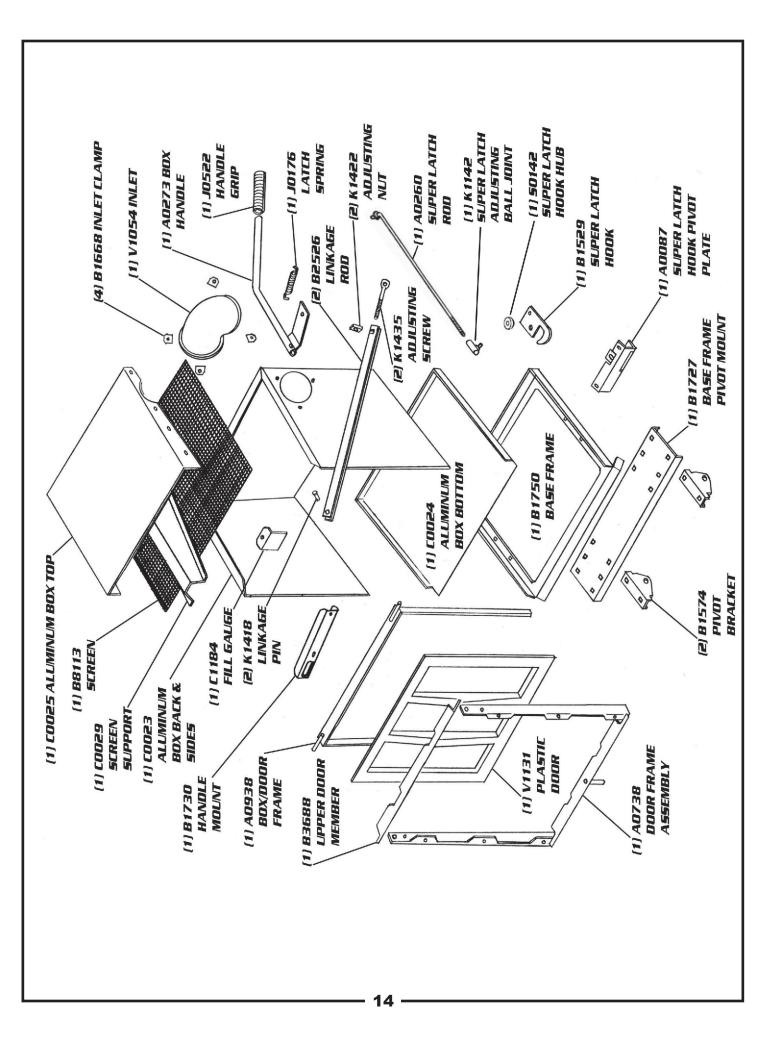


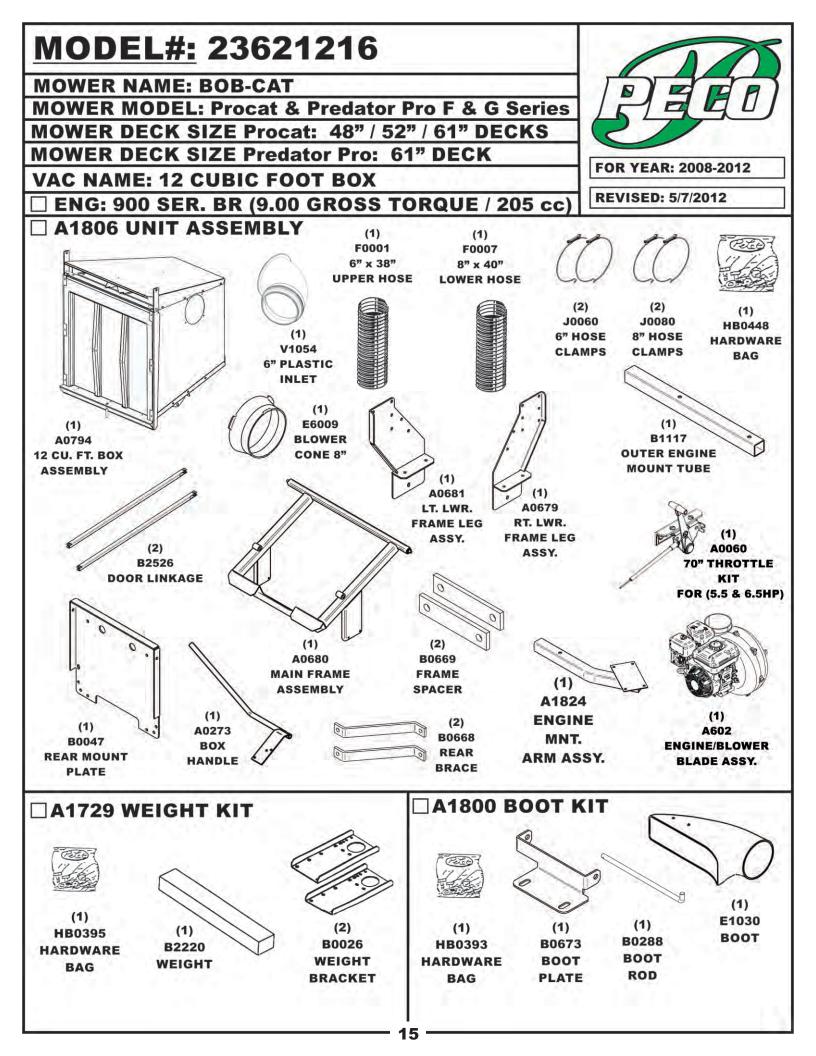
To fasten the throttle cable end to the engine, place the throttle control lever into the "stop" position. Rotate the engine throttle lever to the "stop" position. Thread the wire end of the throttle cable into the engine throttle lever eyelet and tighten the screw. Fasten the throttle cable sleeve to the clamp on the engine throttle. Rotate the throttle control lever into the "fast" position to check for proper installation.

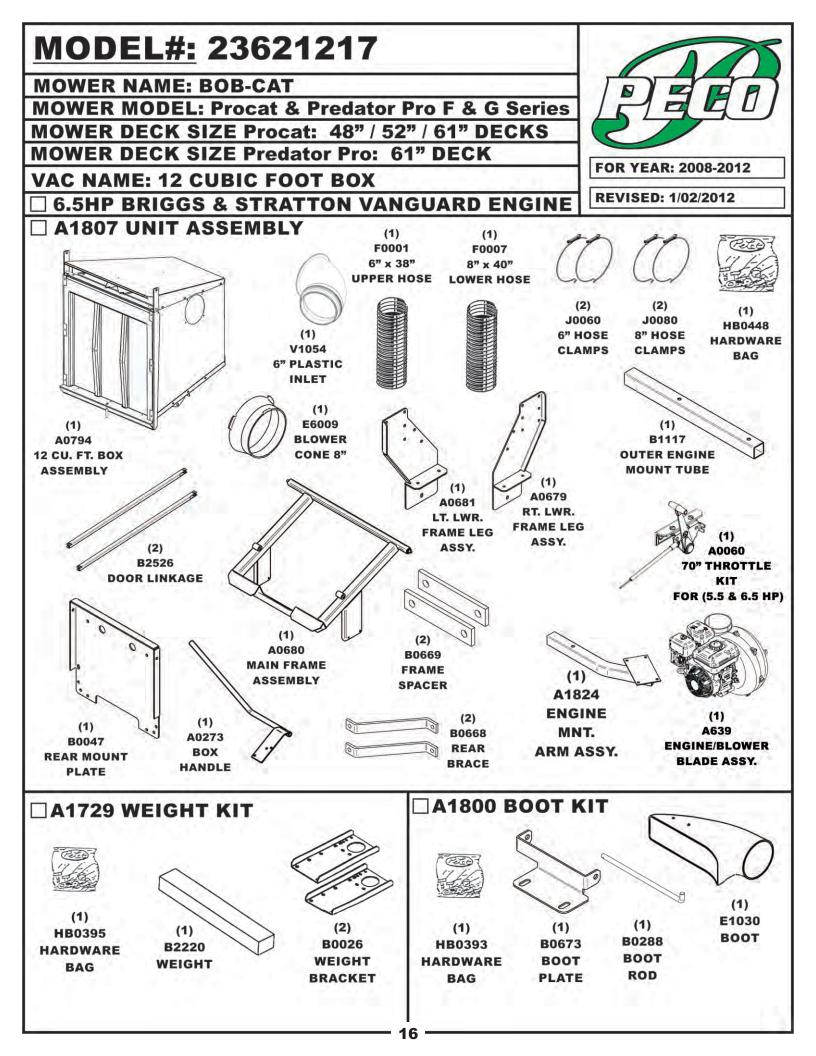
Note: Cable sleeve may need to be cut depending on the engine type. Once throttle cable is attached, pull the box handle to dump the box and be sure the cable does not alter the movement of the box.











SECTION III OPERATING INSTRUCTIONS

3-1 General Safety

Only qualified people familiar with this operator's manual and the mower's operator's manual should operate this machine.

3-2 Operation & Tips On Mowing

- A. Perform BEFORE EACH USE maintenance list in paragraph 4-1.
- B. Start the engine/blower/blade assembly.
- B. Start mower.
- C. With the mower at high idle speed, engage the mower deck.
- D. Proceed to operate the control levers of the mower.

Note: If the collection system does not appear to be collecting the grass clippings; disengage the deck, and blower, engage the parking brake and turn the mower off. Check the upper hose, lower hose, top screen and boot for clogs.

To obtain the maximum effectiveness from your collection system the tips listed below should be followed:

- * Watch your speed- Normal conditions will allow a speed of up to approximately 5 mph, but thick, heavy damp conditions will require reduced ground speed.
- * Mow with sharp blades- A sharp blade cuts cleaner.
- * Wet grass and leaves will decrease effectiveness and will increase horsepower requirements.
- * Mow at higher cutting heights- Remove and mulch no more than 2" of grass length with each mowing.
 (Experts recommend not cutting off more than 1/3 of the grass blade length at any given time.)
- * Mow twice, at different height settings, (high, then low), if grass is extra tall.
- * Remember that horsepower requirements will vary with the mowing conditions such as type and height of turf grass, moisture content, amount of leaves, whether the terrain is flat or hilly, etc.

3-3 Unloading The Collection System

Note: Press the tab, located behind the operator's left side, downward to feel if the collection system is full. If the container is full there will be resistance when depressing the tab.

- A. Stop the forward movement of the mower.
- B. Disengage the mower deck.
- C. Using the throttle cable slow the engine down to idle.
- D. Push the dump handle, on the left of the operator, away from the unit. While holding the handle pushed away, move the handle upward. The container door will swing upward and the container will rotate downward. The container will release its contents.
- E. Once the contents of the container have fallen out, the container is ready to move back into its normal operating position. With the handle in the 'away' position, pull the handle downward until it stops. Move the handle towards the center of the mower. This motion will allow the latch to lock back into collection position.

Note: If you do not hold the handle away from the mower as you pull the handle downward, the latch will not lock and the container can unexpectedly release the contents collected.

SECTION IV MAINTENANCE

4-1 Maintenance Checklist

Before each use:

- Check blades and spindles to be sure that no foreign objects, such as wire or steel strapping bands, are wrapped around them.
- Inspect blades for wear. Replace if necessary. If it is necessary to sharpen the blades, remove the blades from the spindles before sharpening. DO NOT sharpen blades while still attached to the mower.
- 3. Make sure all shields are in place and in good condition. Repair or replace any missing or damaged shields.
- 4. Listen for abnormal sounds, which might indicate loose parts, damaged bearings, or other damage. Correct any deficiency before continuing operation.
- Check for wear or deterioration of the upper or lower hoses. If there are any portions of the hose that have been torn or worn through, replace with genuine PECO parts.

After Each Use:

- 1. Clean all debris from machine especially from the container, and off of safety decals. Replace any missing or illegible decals.
- 2. Clean all debris from the box screen.
- Inspect unit for worn or damaged components. Repair or replace before the next use. Any replacement component installed during repair shall include the components current safety decal specified by the manufacturers to be affixed to the component.

17

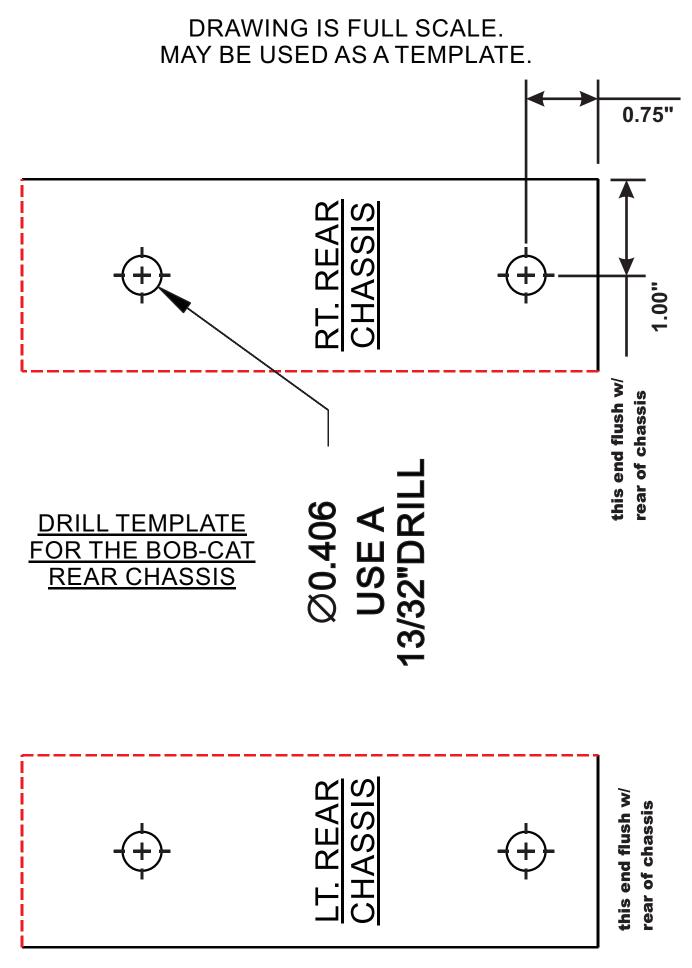


SAFETY DECALS

To promote safe operation, PECO supplies safety decals on all products manufactured. Damage can occur to safety decals either through shipment, use or reconditioning. Contact your local Service Center for replacement decals.



TORQUE SPECIFICATIONS											
AMERICAN Proper toque for American fasteners used on Peco equipment. Recommended Torque in Foot Pounds (Newton Meters).*											
Bolt Head	Markings	WRENCH SIZE (IN.) "A	(IN.	DIAMETER) "B" AND READ SIZE	SAE GRADE 2		AE IDE 5	SAE GRADE 8			
		7/16	1/4	- 20 UNC	6 (7)	8(11)	12 (16)			
			1/4	- 28 UNF	6 (8)	10	(13)	14 (18)			
	SAE Grade 2 (No Dashes)	1/2	5/16	- 18 UNC	11 (15)	17	(23)	25 (33)			
		1/2	5/16	- 24 UNF	13 (17)	19	(26)	27 (37)			
	(No Dasties)	9/16	3/8	- 16 UNC	20 (27)	31	(42)	44 (60)			
		9/16	3/8	- 24 UNF	23 (31)	35	(47)	49 (66)			
		5/8	7/16	- 14 UNC	32 (43)	49	(66)	70 (95)			
		5/8	. 7/16	- 20 UNF	36 (49)	55	(75)	78 (106)			
		3/4	1/2	- 13 UNC	49 (66)	76 (103)	106 (144)			
		3/4	1/2	- 20 UNF	55 (75)	85 (115)	120 (163)			
		7/8	9/16	- 12 UNC	70 (95)	109	(148)	153 (207)			
	SAE Grade 5	7/8	9/16	9/16 - 18 UNF		122	(165)	172 (233)			
	(3 Dashes)	15/16	5/8	5/8 - 11 UNC		150	(203)	212 (287)			
	-		5/8	- 18 UNF	110 (149)	170	(230)	240 (325)			
		1-1/8	3/4	- 10 UNC	144 (195)	266	(360)	376 (509)			
	11 m	1-1/8	3/4	- 16 UNF	192 (260)	297	(402)	420 (569)			
	Diameter B	1-5/16	7/8	- 9 UNC	166 (225)	430	(583)	606 (821)			
	Diame		7/8	- 14 UNF	184 (249)	474	(642)	668 (905)			
		1-1/2	1	- 8 ŲNC	250 (339)	644	(873)	909 (1232)			
Wrench		1-1/2	1 -	12 UNF	274 (371)	705	(955)	995 (1348)			
Size "A"	SAE Grade 8	1-1/2	1 -	14 UNF	280 (379)	721	(977)	1019 (1381)			
	(6 Dashes)	1-11/16	1-1/	8 - 7 UNC	354 (480)	795 (1077)	1288(1745)			
Т		1-11/16	1-1/8	3 - 12 UNF	397 (538)	890 (1206)	1444 (1957)			
		1-7/8	1-1/4 - 7 UNC		500 (678)	500 (678) 1120		1817 (2462)			
		1-7/8	1-1/4 - 12 UNF		553 (749)	1241	(1682)	2013 (2728)			
			1-3/8 - 6 UNC		655 (887)	1470	(1992)	2382 (3228)			
		2-1/16	1-3/8	3 - 12 UNF	746 (1011) 1672	(2266)	2712 (3675)			
		2-1/4	1-1/	2 - 6 UNC	870 (1179)) 1950	(2642)	3161 (4283)			
		2-1/4	1-1/2	2 - 12 UNF	979 (1327) 2194	(2973)	3557 (4820)			
METRIC											
	Bolt Diameter "B"		WRENCH SIZE (mm) "A"	BOLT DIA. (mm) "B"	ASTM 4.6	ASTM 8.8	ASTM 9.8	ASTM 10.9			
			8	5	1.8 (2.4)		5.1 (6.9)				
Wironah	and the second s		10	6 8	3 (4) 7.3 (10)		8.7 (12) 21.1 (29)	11.1 (15) 27 (37)			
Wrench Size "A" Numbers appearing on bolt heads indicate ASTM class.			16	10	14.5 (20)		42 (57)	53 (72)			
		18	12	25 (34)	74 (100)	73 (99)	93 (126)				
		21 24	14 16	40 (54)	118 (160)	116 (157					
			30	16 20	62 (84) 122 (165)	167 (226) 325 (440)	181 (245) 230 (312) 449 (608)			
			33	22	- (/	443 (600)		611 (828)			
*Use 75% of the specified torque value for plated fasteners. Use 85% of the specified torque values for lubricated fasteners.		36	24	211 (286)	563 (763)		778 (1054)				
			41 46	27 30	418 (566)	821 (1112) 1119 (1516)		1138 (1542) 1547 (2096)			
			-10	50	+10 (000)		L	1047 (2080)			





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